SERVICING & STORMWATER MANAGEMENT IMPLEMENTATION REPORT

LAFARGE COLLINGWOOD PLANT

555 TENTH LINE
TOWN OF COLLINGWOOD
COUNTY OF SIMCOE

PREPARED FOR:

LAFARGE CANADA INC.

PREPARED BY:

C.F. CROZIER & ASSOCIATES INC.
70 HURON STREET, SUITE 100
COLLINGWOOD
ON L9Y 4L4

DECEMBER 2025

CFCA FILE NO. 2577-6904

The material in this report reflects best judgment in light of the information available at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. C.F. Crozier & Associates Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

CROZIER

Revision Number	Date	Comments
Rev. 0	June 2025	Issued for First SPA Submission
Rev. 1	December 2025	Issued for Second SPA Submission

TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 GENERAL SITE DESCRIPTION 1

2.1 Existing Conditions 1
2.2 Proposed Development 1

3.0 WATER SERVICING 2

3.1 Existing Water Servicing 2
3.2 Proposed Water Servicing 2
3.3 Design Water Demand 2
3.4 Fire Flow Demand 2

4.0 SANITARY SERVICING 3

4.1 Existing Sanitary Servicing 3
4.2 Proposed Sanitary Servicing 3

5.0 PROPOSED STORMWATER MANAGEMENT 3

5.1 Stormwater Management Criteria 3
5.2 Existing Drainage Conditions 4
5.3 Proposed Drainage 4
5.4 Stormwater Quantity Control 4
5.5 Stormwater Quality Control 6

6.0 EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION 7

7.0 CONCLUSIONS AND RECOMMENDATIONS 8

LIST OF APPENDICES

Appendix A: As-Built Drawings

Appendix B: Water Demand Calculations

Appendix C: VO6 Modelling Files

Appendix D: Stormwater Management Calculations

Appendix E: External Reports and Reference Materials

LIST OF DRAWINGS

Drawing C101: Site Plan

Drawing C101A: General Site Servicing Plan

Drawing C102: Removals Erosion and Sediment Control Plan

Drawing C103: Grading Plan

Drawing C104: Post Development Storm Drainage Plan

Drawing C105A: Stormwater Management Facility Plan

Drawing C105B: Stormwater Management Facility Profile

Drawing C105C: Stormwater Management Details

Drawing C106: Water Service Connection Profile

Drawing T300: Vehicle Maneuvering Analysis

1.0 Introduction

C.F. Crozier & Associates Inc. (Crozier) was retained by Lafarge Canada Inc. to prepare a Servicing & Stormwater Management (SSWM) Implementation Report to support a Site Plan Application (SPA) to replace the existing ready mix concrete plant with a new ready mix concrete plant in the Town of Collingwood (Town), County of Simcoe (County).

This report outlines the proposed servicing and stormwater management strategy for the Site per the Town of Collingwood (Town) and County of Simcoe (County) requirements.

The following reports, drawings, and design standards were referenced during the preparation of this report:

- Site Plan prepared by C.F. Crozier & Associates (December 2025)
- Ministry of the Environment (now Ministry of Environment, Conservation, and Parks (MECP)) – Stormwater Management Planning and Design Manual (March 2003)
- Ministry of Environment, Conservation, and Parks – Design Guidelines for Drinking-Water Systems (May 11, 2023)
- Town of Collingwood – Engineering Development Standards (2022)
- 185 Mountain Road Industrial Development – Stormwater Management Report (C.C. Tatham & Associates Ltd. July 2018)

2.0 General Site Description

2.1 Existing Conditions

The subject site covers an area of approximately 2.0 ha. The site is currently used as a ready-mix concrete supplier. The site consists of a concrete mix plant, aggregate storage areas, parking, and gravel roadways. An existing pond is also located at the north end of the site.

The property is bounded by:

- Existing self storage facility to the south
- Existing businesses to the north
- Tenth Line to the west
- An existing SWM Pond (185 Mountain Road Industrial Development) to the east

2.2 Proposed Development

According to the Site Plan, the elements envisioned for this industrial development include:

- Control room/office (40 m^2);
- Concrete plant with an upper area that contains bulk storage bins (133.7 m^2 with a height of 14.6 m);

- Three (3) bulk storage silos (with a height of 19.82 m);
- Six (6) bulk storage bins for aggregate on existing grade; and
- Heating system and ACC structure with lunchroom (21.3 m^2).

3.0 Water Servicing

3.1 Existing Water Servicing

Existing water infrastructure in the vicinity of the Subject Development as per the as-constructed drawings completed by Ainley and Associates Ltd. (November 1991) include a 300 mm diameter watermain on Mountain Road and Tenth Line. There are also two existing fire hydrants along the Tenth Line Right of Way (ROW) fronting the Subject Development at the north and south ends of the site. Refer to **Appendix A** for the as built drawings which show the existing water infrastructure.

Although not seen on the as-constructed drawings, the Subject Development is serviced by an existing water connection to the existing 300 mm diameter watermain on Tenth Line. Per EPCOR monthly bills, 555 Tenth Line is being charged a fixed water supply charge that corresponds with the Town of Collingwood 2-inch (50 mm) water service. The location and size of the service will be verified at the time of construction.

3.2 Proposed Water Servicing

The proposed water servicing for the Subject Development is to remove the 50 mm diameter existing water service to the current plant and replace it with a new 100 mm diameter watermain that connects to the new plant and will act as the fire service. A 50 mm diameter domestic water service will tee off the 100 mm fire service before the property line and connect to the proposed plant. The new water service will tie into the existing 50 mm water service at the property line. A water meter at the proposed facility will also be required for the domestic service and is shown on the General Site Servicing Plan. Refer to **Drawing C101** for the proposed water infrastructure.

3.3 Design Water Demand

The proposed new plant will replace the existing plant; however, it is not anticipated that water usage will increase for the proposed plant operations. Historical water demand from water bills have been used to quantify projected water demands in the Subject Development. This will be used alongside the Town of Collingwood Engineering Standards and OBC standards to quantify peak water demands through the proposed watermains.

Water usage data was obtained from the Client's water bills from EPCOR for the years of 2022-2024 and is summarized in **Appendix B**. Water usage was the highest in the year 2022 with an average day demand of 26.04 m^3/day or 0.3 L/s. Using the Per capita demand and maximum hour parameters from the Collingwood engineering standards, the max hourly domestic demand for the Subject Development is 0.81L/s. When combined with the minimum fire flow for industrial subdivision requirement in the Town, the Total peak water demand in the proposed system is 136.81L/s. Refer to **Appendix B** for the relevant water demand calculations. It is assumed there is sufficient water supply and allocation in the Town of Collingwood water system to accommodate these demands.

3.4 Fire Flow Demand

The fire flow demands for the proposed development will remain similar to the existing required fire flow, therefore the current fire protection flow provided in the existing system should remain sufficient.

There are two hydrants in the vicinity of the Subject Development, but for additional coverage a hydrant has been proposed on the frontage of the Subject Development along tenth street. Using the gross floor area proposed for the main building and the max building height, fire flow calculations have been estimated for the Subject Development using OBC standards. As shown in **Appendix B**, the fire flow for the new building is 45L/s. As this is below the Town of Collingwood minimum fire flow demand for Industrial subdivisions, the fire flow required for the Subject Development is 136L/s. A dedicated fire service to the plant will be able to provide additional fire protection measures.

4.0 Sanitary Servicing

4.1 Existing Sanitary Servicing

Existing sanitary infrastructure in the vicinity of the Subject Development as per the as-constructed drawings completed by Ainley and Associates Ltd. (Nov 1991) includes a 375 mm diameter sewer on Mountain Road. There is also an existing sanitary pumping station (SPS) located at 545 Tenth Line. A 100 mm diameter forcemain along Tenth Line discharges flows from the SPS to a maintenance hole along Mountain Road.

The current method of sanitary servicing on site is by using a holding tank that is pumped off site regularly by pump truck.

4.2 Proposed Sanitary Servicing

The sanitary servicing for the Subject Development can be achieved with an on-site holding tank system. The existing holding tank will continue to be utilized unless deemed needing replacement by the Owner.

5.0 Proposed Stormwater Management

5.1 Stormwater Management Criteria

The management of stormwater and site drainage for the proposed development must comply with the policies and standards of the various agencies including the Town of Collingwood, Nottawasaga Valley Conservation Authority (NVCA), and the MECP.

The stormwater management criteria for the Subject Development includes:

- Water Quantity Control
    - Control of post development peak flows to pre-development levels for all storms up to and including the 100-year storm event.

- Water Quality Control
    - 80% removal efficiency of total suspended solids per MECP “enhanced protection” requirements.

- Erosion Control
    - Minimum 24-hour detention of the 25mm event.

- Development Standards
    - Minor and major drainage system to convey frequent and infrequent rainfall/runoff events, respectively.

5.2 Existing Drainage Conditions

A review of the topographic survey indicates that stormwater runoff drains from south to north. The majority of stormwater runoff from the subject site ultimately discharges to the on-site pond. As part of the 185 Mountain Road Industrial Development – Stormwater Management Report (C.C. Tatham & Associates Ltd. July 2018) the Subject Development was incorporated into Tatham's stormwater management design. Refer to **Appendix E** for the SWM Report completed by Tatham.
The existing site is split into two (2) catchment areas, Catchment 105 and Catchment 107 as shown on Drawing DP-1 from the Tatham SWM Report. **Table 1** summarizes the pre-development catchment areas with their respective curve numbers.

Table 1: Pre-Development Catchment Areas and Runoff Coefficients

Catchment ID	Description	Area (ha)	Curve Number
105	Existing Lafarge Site	2.00	77.8
107	Pond Area	0.71	57.8

5.3 Proposed Drainage

The proposed drainage will follow the same drainage patterns as in pre-development. The areas and catchment IDs will match the 185 Mountain Road SWM Report completed by Tatham, however, the impervious areas will be revised based on the proposed site plan. **Table 2** summarizes the post development catchment areas with their proposed impervious percentages. Catchbasins are not proposed for the Subject Development and all runoff will be conveyed towards the forebay in the SWM Facility by way of overland flow routes. The external area will sheet flows towards the flow routes or the swale to the SWM Facility. Please refer to **Drawing C102** for the Site Grading Plan.

Table 2: Post-Development Catchment Areas and Impervious %

Catchment ID	Description	Area (ha)	Impervious %
205	Proposed Lafarge Site	2.00	80
207	External Area South of Lafarge Site	0.71	50

5.4 Stormwater Quantity Control

Quantity control for the Subject Development will be provided by a hybrid wet pond/wetland SWM Facility. A hydrologic model was prepared for the pre-development and post-development scenarios using the stormwater management hydrologic computer program Visual OTTHYMO 6.2 (VO6). The purpose of the modeling was to ensure that quantity control requirements are met (i.e., post-development peak flow rates do not exceed the pre-development flows to the respective drainage outlet for the site).

Rainfall was simulated using a 24-hour SCS Type II distribution and a 4-hour Chicago distribution, consistent with Town Standards. Rainfall depths and intensities were obtained from the MTO IDF Look Up Tool based on the location of the Subject Development. VO6 modelling files, including input and output have been provided in **Appendix C**.

Table 3 below summarizes the pre and post development peak flows at the SWM Facility outlet.

Table 3: Summary of "Post to Pre" Peak Flows - SWM Facility

Return Period (Years)	Flow Rates (m^3/s)	
	Pre-Development (2.71 ha)	Post-Development (2.71 ha)
4 Hour Chicago		
2	0.089	0.011
5	0.154	0.023
10	0.204	0.034
25	0.272	0.049
50	0.328	0.063
100	0.385	0.077
24 Hour SCS Type II		
2	0.115	0.015
5	0.177	0.030
10	0.217	0.041
25	0.274	0.057
50	0.316	0.070
100	0.360	0.084
Regional		
Regional	0.229	0.169

As shown in **Table 2**, the proposed SWM Facility provides 'Post-to-Pre' peak flow control for all storm events up to and including the 100-year storm event. The Regional event will outlet via an overland emergency spillway from the pond.

An outlet structure has been designed to address both erosion and quantity control requirements. The outlet structure will consist of a 100 mm diameter extended detention orifice set at the permanent pool elevation. A secondary outlet structure which consists of a 300 mm rectangular weir has been included at the extended detention storage elevation to control effluent from the pond for storms exceeding the 25 mm event. SWM Facility calculations have been provided in **Appendix D**. Refer to **Drawings C105A-C** for details regarding the SWM Facility.

Using the ROUTE RESERVOIR command in VO6, the volume of detention storage required in the SWMF to attenuate the post-development peak flows to pre-development was determined based on a storage – discharge relationship. The ROUTE RESERVOIR command was used to model the SWM facility storage.

A summary of the release rates and storage volumes for the SWM Facility have been provided in **Table 4** below.

Table 4: Summary of SWM Facility Release Rate & Storage Volumes

Return Period (Years)	SWM Facility	
	Release Rate (m^3/s)	Storage Volume (m^3)
4 Hour Chicago		
2	0.017	581
5	0.032	739
10	0.044	833
25	0.061	959
50	0.075	1058
100	0.088	1148
24 Hour SCS Type II		
2	0.024	652
5	0.042	804
10	0.054	893
25	0.071	1020
50	0.084	1105
100	0.097	1193
Regional	0.169	1671

5.5 Stormwater Quality Control

Stormwater management quality and erosion control will be provided by the SWM Facility. The design of the proposed SWM Facility has incorporated permanent pools and sediment forebays to provide appropriate water quality treatment. As Georgian Bay is the ultimate receivers from the Subject Lands, the development must incorporate measures to provide "enhanced protection" (*Stormwater Management Planning and Design Manual*, Ministry of the Environment, 2003).

Erosion control will be principally achieved by incorporating extended detention into the operation of the ponds. Sizing was based on providing minimum 24-hour drawdown of the runoff volume produced during the 25 mm event.

The Subject Development drainage area for the SWM Facility is 72% impervious and 2.71 ha. As such, the minimum water quality volume for a stormwater hybrid wet pond/wetland is 178 m^3/ha (*Stormwater Management Planning and Design Manual, Ministry of the Environment, 2003)*. The total water quality volume consists of 138 m^3/ha for permanent pool and 40 m^3/ha for extended detention. The required and provided extended detention and permanent pool values have been summarized in **Table 5**. Refer to **Appendix D** for the water quality and extended detention calculations.

Table 5: SWM Facility Quality Control Characteristics

	SWM Facility	
	Required Volume (m^3)	Provided Volume (m^3)
Permanent Pool	374	1017
MOE Extended Detention	108	558
Erosion Control	519	

6.0 Erosion and Sediment Controls During Construction

Erosion and sediment controls will be installed prior to the beginning of any construction activities. They will be maintained until the Site is stabilized or as directed by the Site Engineer and/or Town of Collingwood.

The subsequent erosion and sediment controls will be included during construction on the Site:

- Silt Fencing: Silt fencing will be installed on the perimeter of the Site to intercept sheet flow. Additional silt fence may be added based on-field decisions by the Site Engineer and Owner before, during, and following construction.

- Mud Mat: A mud mat will be installed, at each entrance (two total) to the construction zone to prevent mud tracking from the Site onto surrounding lands and the perimeter roadway network. All construction traffic will be restricted to these accesses with a mud mat.

- Temporary Straw Bale Flow Check Dams: Check dams will be utilized on-site in order to prevent any silt mitigation off site during and after construction activities. These dams will promote settling of suspended solids and will reduce flow velocities. Sediment accumulation will be monitored and removed as necessary.

The Erosion & Sediment Control Plan on **Drawing C103** identifies the location of the above-mentioned recommended controls. Controls will be inspected after each significant rainfall event and maintained in proper working condition.

7.0 Conclusions and Recommendations

Based on the information provided in this report, we offer the following conclusions and recommendations:

1. Access to the Subject Development will be provided with two entrances off Tenth Line.

2. Water servicing for the new plant will include a 100 mm fire service along with a 50 mm diameter domestic water service that will both tee off the 300 mm diameter watermain that runs along Tenth Line.

3. Sanitary servicing for new plant will be to maintain the exiting holding tank on site.

4. The SWM Facility will provide both quality and quantity control. The proposed SWM Facilities are adequately sized to provide "enhanced protection" level treatment while controlling post-development flows to pre-development levels for all storms up to the 100-year storm event. The facility will incorporate 24-hour retention of the 25mm event to provide erosion control.

Based on the above conclusions, we recommend the approval of the Site Plan Application from the perspective of functional servicing and stormwater management.

Respectfully submitted,

C.F. CROZIER & ASSOCIATES INC.

Curtis Scobie, P.Eng.
Project Manager

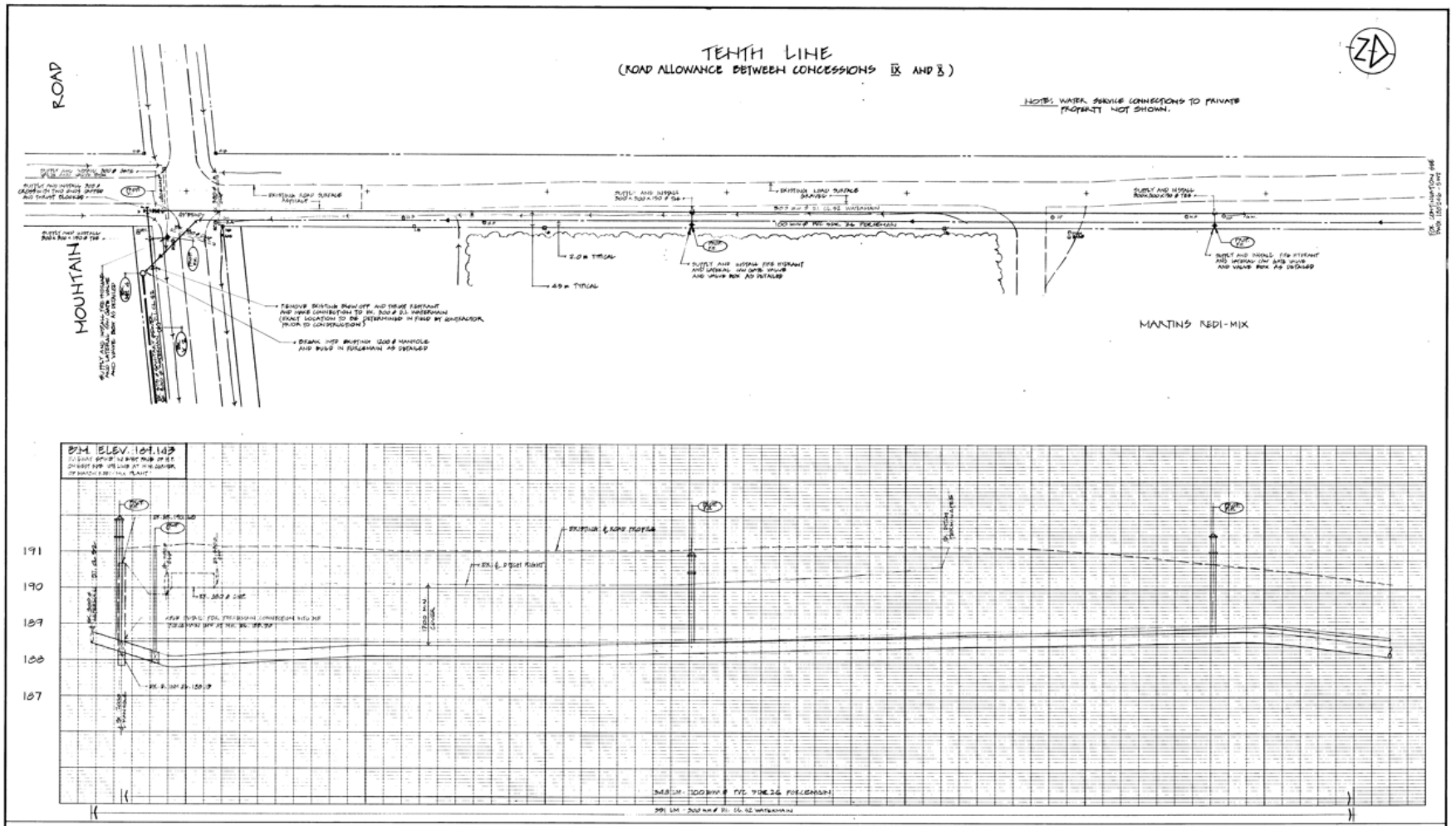
C.F. CROZIER & ASSOCIATES INC.

Jonathon Kerschbaumer, P.Eng.
Project Engineer

J:\2500\2577 - LaFarge Canada Inc\6904 - 555 Tenth Line\Reports\Servicing & SWM Report\2025.12.11_SSWM Report.docx

APPENDIX A

As Built Drawings



Notes:

NO.	REVISIONS	DATE	INITIAL

Approved C. K. KENT

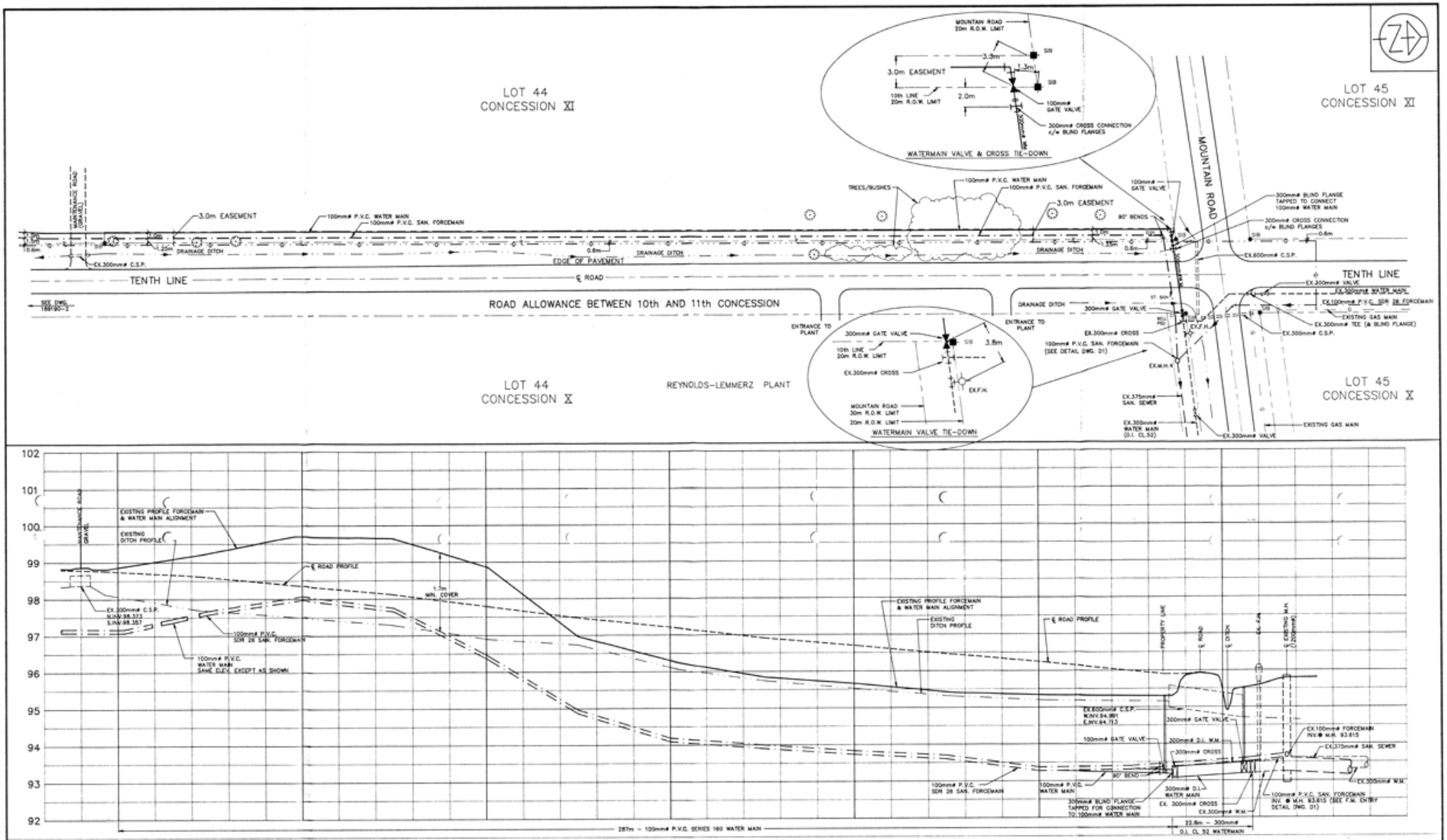
TOWN of COLLINGWOOD
PUBLIC WORKS GARAGE
SEWER AND WATER SERVICING

PLAN AND PROFILE
TENTH LINE - STA. 0+026 TO 0+329

Ainley and Associates Ltd.
Consulting Engineers and Planners
Collingwood — Barrie — Belleville

SCALE: HORZ. 1:500 VERT. 1:50
DESIGN D.L. CHECKED C.K.K.
DRAWN W.J.V. DATE JULY, 1988
DWG. No 88246-DW1

DSA - 2008



NOTE:
ELEVATION SHOWN IS OBVERT OF FORCEMAIN.

℄ FORCEMAIN	97.14		97.69		98.07		97.75		96.47		94.96		94.19		93.99		93.83		93.70		93.37		93.40		95.59		95.80
℄ DITCH		98.10		97.70		97.50		97.30		96.80		94.70		96.10		95.75		95.50		95.30		95.20		95.18		94.60	
DRAINAGE		0+250		0+275		0+300		0+325		0+350		0+375		0+400		0+425		0+450		0+475		0+500		0+525		0+550	0+572

LEGEND
- PROPERTY LINE
- EXISTING DITCH
- GAS MAIN

B.M.ELEV.99.771
(ASSUMED)
RAILWAY SPIKE IN HYDRO POLE

NO.	REVISIONS	DATE	INITIAL
2	REVISED "AS CONSTRUCTED".	NOV/91	R.H.M.
1	PROPOSED GAS MAIN ADDED, SEPARATION BETWEEN WATER MAIN AND FORCEMAIN REVISED	OCT/90	R.H.M.

AS CONSTRUCTED DRAWINGS

COMPILED BY	D.B.	DATE	DEC. 1990
CHECKED BY	D.B.	DATE	DEC. 1990
DRAWN BY	D.P.	DATE	NOV. 1991
CHECKED BY	J.S.R.	DATE	NOV. 1991

BLUE MOUNTAIN GOLF AND COUNTRY CLUB
PRIVATE SEWAGE AND WATER SYSTEM

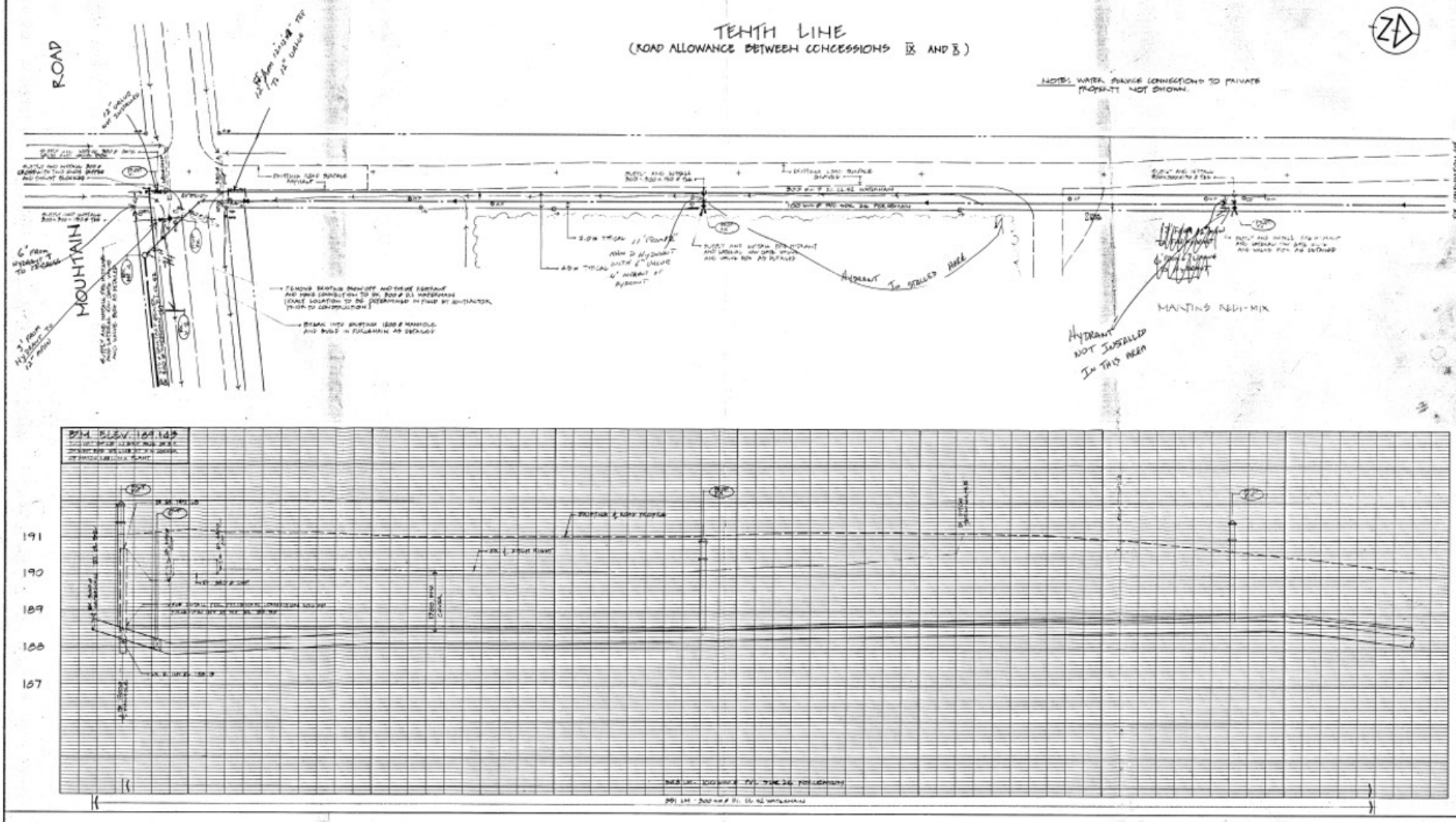
SANITARY FORCEMAIN AND WATER MAIN PLAN AND PROFILE:
STA. 0+250 TO STA. 0+572

Ainley and Associates Ltd.
Consulting Engineers and Planners
Collingwood – Barrie – Belleville

SCALE: HORIZ: 1:500 VERT: 1:50			
DESIGN: R.H.M.	CHECKED: J.S.R.	DWG. 189190-SW2AC	
DRAWN: D.E.	DATE: JULY 1990		

TENTH LINE

(ROAD ALLOWANCE BETWEEN CONCESSIONS IX AND X)



NO.	REVISIONS	DATE	INITIAL

Notes:

Approved

C. K. KENT

TOWN of COLLINGWOOD
PUBLIC WORKS GARAGE
SEWER AND WATER SERVICING

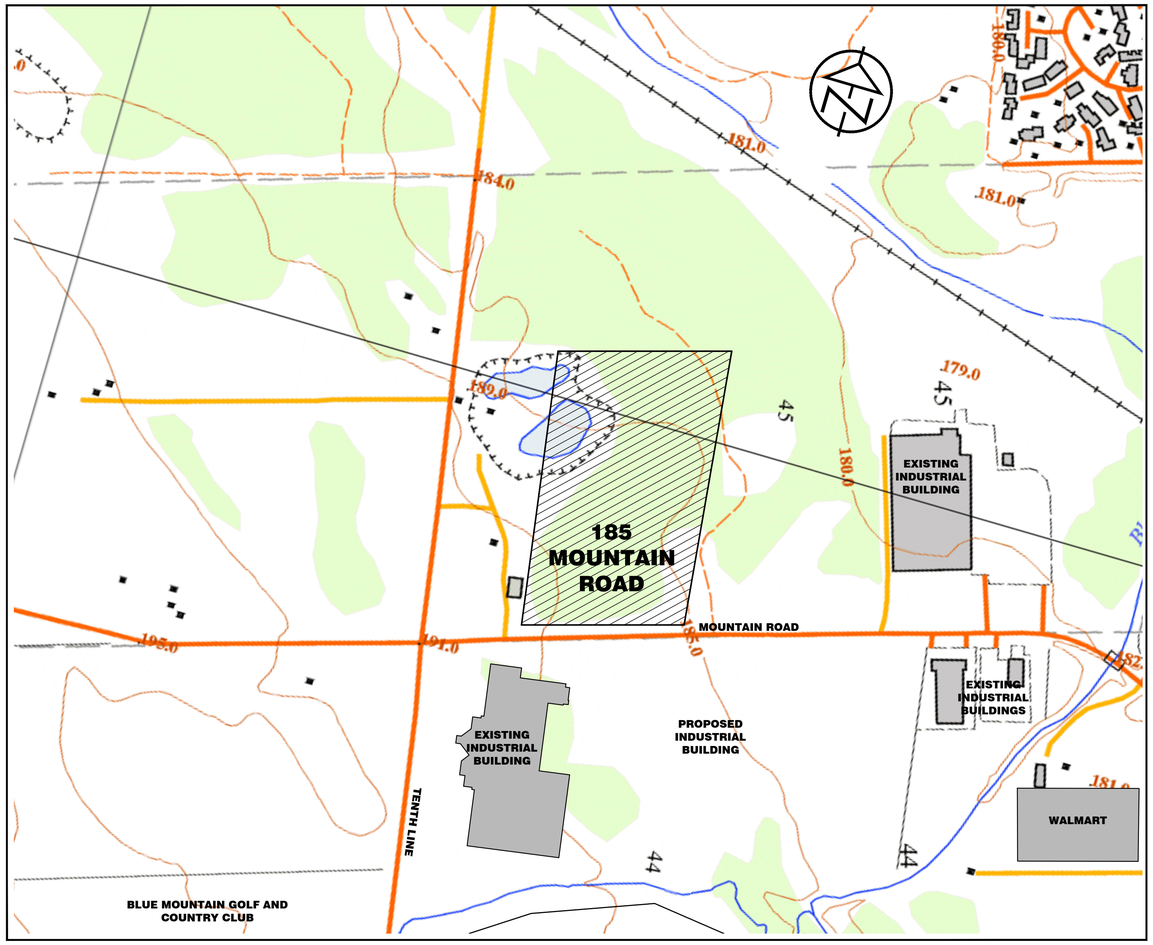
PLAN AND PROFILE
TENTH LINE - STA. 0+026 TO 0+525

Ainley and Associates Ltd.
Consulting Engineers and Planners
Collingwood — Barrie — Belleville

SCALE: HORZ. 1:500
VERT. 1:50
DESIGN S.L. CHECKED C.K.K.
DRAWN W.J.N. DATE JULY, 1988
DWG. No 188242-SW1

INDUSTRIAL SUBDIVISION

185 MOUNTAIN ROAD
TOWN OF COLLINGWOOD



KEY PLAN

TATHAM ENGINEERING

AS-BUILT INFORMATION
MARCH 2022
116023

INDEX

Dwg.	Description
116023-TP-1	TITLE PAGE
116023-IN-1	DRAWING INDEX AND LEGEND
116023-LG-1	OVERALL GRADING PLAN
116023-PP-1	PLAN AND PROFILE - STREET A
116023-PND-1	POND LAYOUT AND DETAILS
116023-DE-1	DETAILS, SECTIONS AND NOTES - SHEET 1
116023-DE-2	DETAILS, SECTIONS AND NOTES - SHEET 2
17168P-E1	POLE LINE AND STREET LIGHTING LAYOUT
17168P-E2	INSTALLATION DETAILS AND ROAD CROSS-SECTION
17168P-E3	PHOTOMETRICS AND STREET LIGHT DETAILS
17168P-E4	COLLUS POWERSTREAM STANDARDS
17168P-E5	COLLUS POWERSTREAM STANDARDS
17168P-E6	COLLUS POWERSTREAM STANDARDS
17168P-E7	COLLUS POWERSTREAM STANDARDS

LEGEND

PROPERTY LINE	
EXISTING CENTERLINE	
PROPOSED CENTRELINE	
EXISTING EDGE OF ASPHALT	
PROPOSED EDGE OF ASPHALT	
EXISTING EDGE OF SHOULDER	
PROPOSED EDGE OF SHOULDER	
EXISTING DITCH/DIRECTION OF FLOW	
PROPOSED DITCH/DIRECTION OF FLOW	
EXISTING SANITARY SEWER/SIZE/DIRECTION OF FLOW	200ø SAN
PROPOSED SANITARY SEWER/SIZE/DIRECTION OF FLOW	200ø SAN
EXISTING SANITARY SERVICE	
PROPOSED SANITARY SERVICE	
PROPOSED SANITARY FORCEMAIN/SIZE/DIRECTION OF FLOW	100ø SAN F/M
EXISTING WATERMAIN/SIZE	150ø W/M
PROPOSED WATERMAIN/SIZE	150ø W/M
EXISTING WATER SERVICE	
PROPOSED WATER SERVICE	
EXISTING STORM SEWER/SIZE/DIRECTION OF FLOW	375ø STM
PROPOSED STORM SEWER/SIZE/DIRECTION OF FLOW	375ø STM
EXISTING CULVERT	
PROPOSED CULVERT	
PROPOSED SWALE LOCATION	
PROPOSED JOINT HYDRO, BELL AND ROGERS	
EXISTING GAS MAIN	
PROPOSED GAS MAIN	
EXISITNG FENCELINE	
PROPOSED FENCELINE	
EXISTING BUSHLINE	
EXISTING CONTOUR	179.00
EXISTING SPOT ELEVATION	× 179.00
PROPOSED SPOT ELEVATION	×179.00
EXISTING GRADING DIRECTION	
PROPOSED GRADING DIRECTION	
PROPOSED SWALE LOCATION	
EXISTING TEMPORARY BENCHMARK	TBM

EXISTING STANDARD IRON BAR	SIB
EXISTING BOREHOLE/NUMBER	BH9
EXISTING GAS VALVE	GAS
EXISTING HYDRO TRANSFORMER	
EXISTING CABLE PEDESTAL	
EXISTING BELL PEDESTAL	
EXISTING BELL MAINTENANCE HOLE	BELL MH
EXISTING BELL POLE	BP
EXISTING HYDRO POLE	HP
EXISTING HYDRO GUY WIRE	
PROPOSED LIGHT STANDARD	LS
EXISTING TRAFFIC SIGN	TS
PROPOSED TRAFFIC SIGN	TS
PROPOSED STOP SIGN	STOP SIGN
PROPOSED STREET NAME SIGN	STREET NAME SIGN
PROPOSED SIGN (MISCELLANEOUS)	SIGN
EXISTING DECIDUOUS TREE	
EXISTING CONIFEROUS TREE	
EXISTING SANITARY MAINTENANCE HOLE/NUMBER	SAN MH20
PROPOSED SANITARY MAINTENANCE HOLE/NUMBER	SAN MH17
EXISTING BUSH	
EXISTING HYDRANT AND VALVE	HYD & WV
PROPOSED HYDRANT AND VALVE	HYD & WV
EXISTING WATER VALVE	WV
PROPOSED WATER VALVE	WV
PROPOSED CURB STOP VALVE	CSV
EXISTING WATERMAIN PLUG AND THRUST BLOCK	
PROPOSED WATERMAIN PLUG AND THRUST BLOCK	
EXISTING STORM MAINTENANCE HOLE	STM MH20
PROPOSED STORM MAINTENANCE HOLE/NUMBER	STM MH9
EXISTING CATCH BASIN	CBMH 18
PROPOSED CATCH BASIN	CB
PROPOSED CATCH BASIN MAINTENANCE HOLE/NUMBER	CBMH12
PROPOSED DOUBLE CATCH BASIN MAINTENANCE HOLE/NUMBER	DCBMH4
PROPOSED DOUBLE CATCH BASIN	DCB
PROPOSED DITCH INLET CATCH BASIN	DICB

AS-BUILT DRAWINGS

COMPILED BY: NR	DATE: 01/31/2019
CHECKED BY: SH	DATE: 01/31/2019
DRAWN BY: RD	DATE: 11/15/2021
CHECKED BY: JPA	DATE: 03/28/2022

AS-BUILT DRAWINGS: NOTICE TO USERS

INFORMATION CONTAINED ON THIS DRAWING HAS BEEN COMPILED FROM VARIOUS SOURCES AND MAY HAVE CHANGED SINCE COMPLETION OF CONSTRUCTION. NO WARRANTY CAN BE PROVIDED AS TO ITS ACCURACY AND/OR COMPLETENESS. CCTA SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY RESULT FROM RELIANCE ON INFORMATION HEREIN.

DISCLAIMER AND COPYRIGHT

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.

TATHAM ENGINEERING LIMITED CLAIMS COPYRIGHT TO THIS DRAWING WHICH MAY NOT BE USED FOR ANY PURPOSE OTHER THAN THAT PROVIDED IN THE CONTRACT BETWEEN THE OWNER/CLIENT AND THE ENGINEER WITHOUT THE EXPRESS CONSENT OF TATHAM ENGINEERING LIMITED.

BENCHMARKS

TBM2 - ELEVATION 189.765m
NAIL & WASHER ON NORTH FACE OF HYDRO POLE LOCATED ON NORTH SIDE OF MOUNTAIN ROAD JUST WEST OF EXISTING ACCESS TO SITE.

NOTES

NOTES

No.	REVISION DESCRIPTION	DATE
1.	AS-BUILT INFORMATION	MAR/2022

ENGINEER STAMP

ORIGINAL STAMPED BY
M. J. CULLIP
JULY 31/18

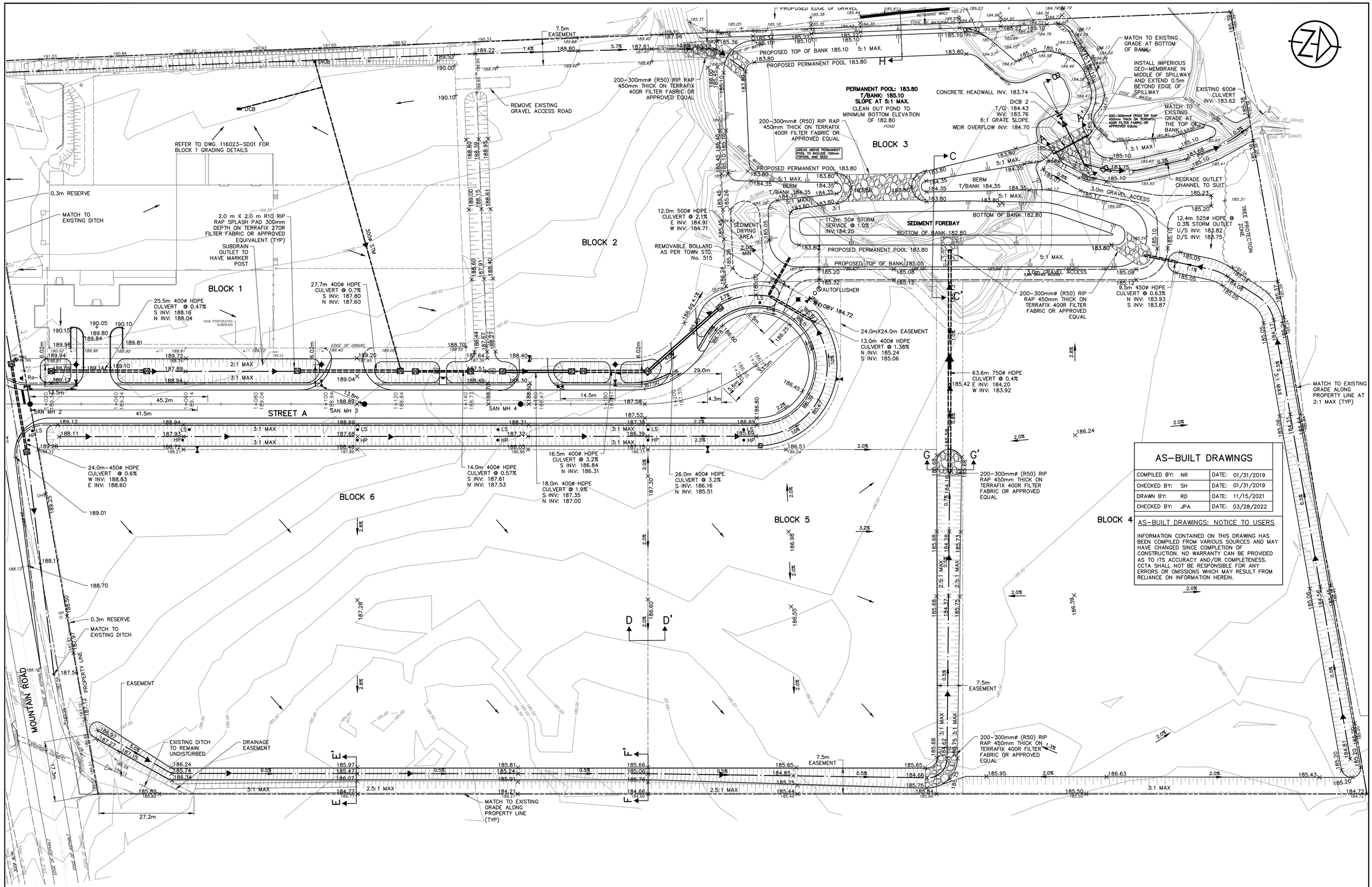
INDUSTRIAL SUBDIVISION
185 MOUNTAIN ROAD
TOWN OF COLLINGWOOD

TATHAM ENGINEERING

DRAWING INDEX AND LEGEND

DESIGN: APR/DFM	FILE: 116023	DWG: IN-1
DRAWN: APR/DFM	DATE: DEC 2017	
CHECK: JPA/MJC	SCALE: AS SHOWN	

Drawing Name: 116023-TP01-OVERALL - ASBUILT.dwg, Plotted: Mar 31, 2022



DISCLAIMER AND COPYRIGHT

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.

TATHAM ENGINEERING LIMITED CLAIMS COPYRIGHT TO THIS DRAWING WHICH MAY NOT BE USED FOR ANY PURPOSE OTHER THAN THAT PROVIDED IN THE CONTRACT BETWEEN THE OWNER/CLIENT AND THE ENGINEER WITHOUT THE EXPRESS CONSENT OF TATHAM ENGINEERING LIMITED.

BENCHMARKS

TBM2 – ELEVATION 189.765m
NAIL & WASHER ON NORTH FACE OF HYDRO POLE LOCATED ON NORTH SIDE OF MOUNTAIN ROAD JUST WEST OF EXISTING ACCESS TO SITE.

NOTES

NOTES

No.	REVISION DESCRIPTION	DATE
1.	AS-BUILT INFORMATION	MAR/2022

ENGINEER STAMP

ORIGINAL STAMPED BY
M. J. CULLIP
JULY 31/18

INDUSTRIAL SUBDIVISION

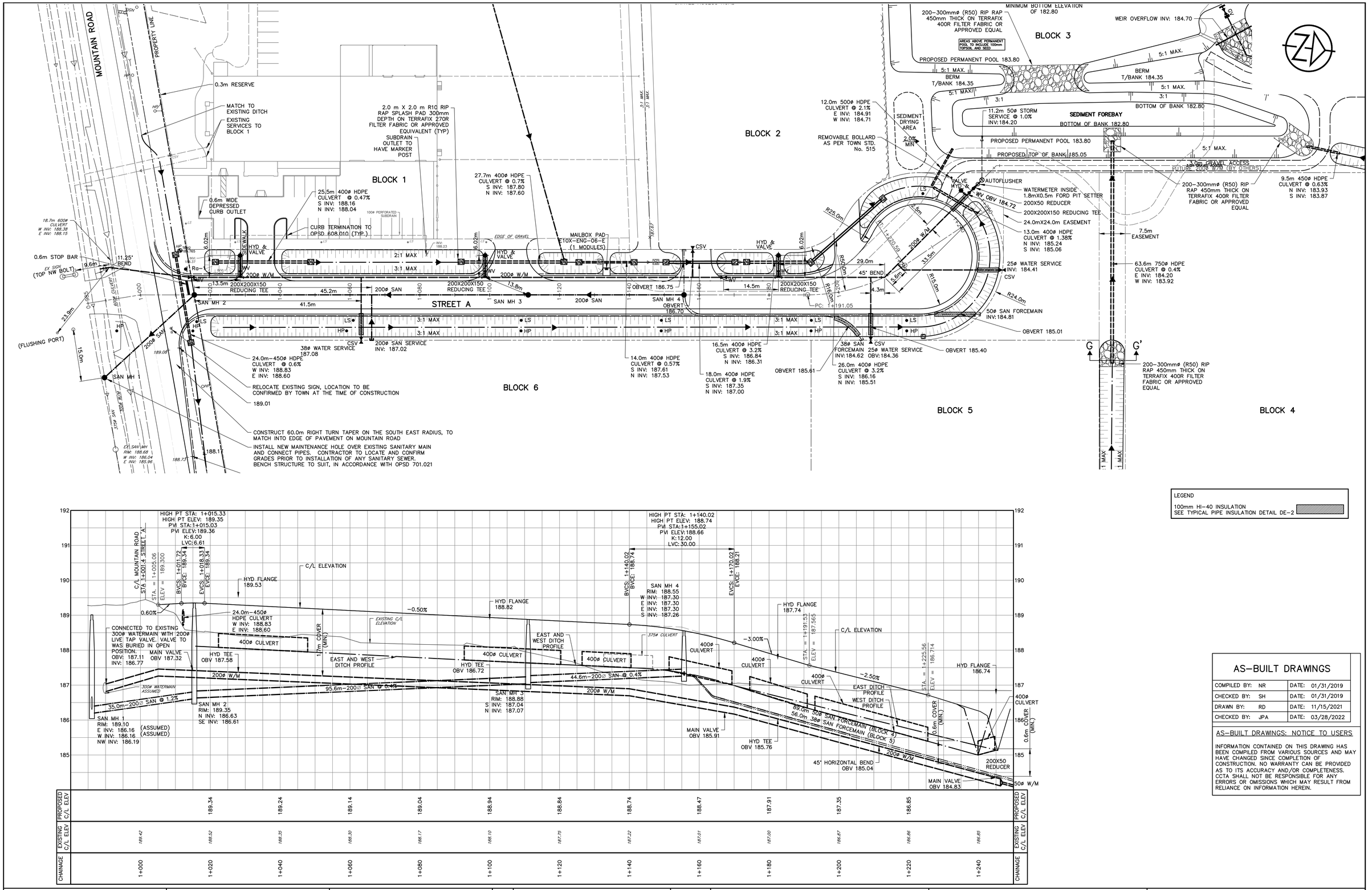
185 MOUNTAIN ROAD
TOWN OF COLLINGWOOD

TATHAM ENGINEERING

OVERALL GRADING PLAN

DESIGN: APR/DFM	FILE: 116023	DWG:
DRAWN: APR/DFM	DATE: DEC 2017	**LG-1**
CHECK: JPA/MJC	SCALE: 1:500	

Drawing Name: 116023-LG01 – AS BUILT.dwg, Plotted: Mar 31, 2022



LEGEND

100mm HI-40 INSULATION
SEE TYPICAL PIPE INSULATION DETAIL DE-2

AS-BUILT DRAWINGS

COMPILED BY: NR	DATE: 01/31/2019
CHECKED BY: SH	DATE: 01/31/2019
DRAWN BY: RD	DATE: 11/15/2021
CHECKED BY: JPA	DATE: 03/28/2022

AS-BUILT DRAWINGS: NOTICE TO USERS

INFORMATION CONTAINED ON THIS DRAWING HAS BEEN COMPILED FROM VARIOUS SOURCES AND MAY HAVE CHANGED SINCE COMPLETION OF CONSTRUCTION. NO WARRANTY CAN BE PROVIDED AS TO ITS ACCURACY AND/OR COMPLETENESS. CCTA SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY RESULT FROM RELIANCE ON INFORMATION HEREIN.

DISCLAIMER AND COPYRIGHT

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.

TATHAM ENGINEERING LIMITED CLAIMS COPYRIGHT TO THIS DRAWING WHICH MAY NOT BE USED FOR ANY PURPOSE OTHER THAN THAT PROVIDED IN THE CONTRACT BETWEEN THE OWNER/CLIENT AND THE ENGINEER WITHOUT THE EXPRESS CONSENT OF TATHAM ENGINEERING LIMITED.

BENCHMARKS

TBM2 – ELEVATION 189.765m
NAIL & WASHER ON NORTH FACE OF HYDRO POLE LOCATED ON NORTH SIDE OF MOUNTAIN ROAD JUST WEST OF EXISTING ACCESS TO SITE.

NOTES

NOTES

No.	REVISION DESCRIPTION	DATE
1.	AS-BUILT INFORMATION	MAR/2022

ENGINEER STAMP

ORIGINAL STAMPED BY
M. J. CULLIP
JULY 31/18

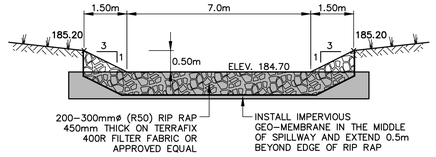
INDUSTRIAL SUBDIVISION
185 MOUNTAIN ROAD
TOWN OF COLLINGWOOD

PLAN AND PROFILE STREET A

TATHAM ENGINEERING

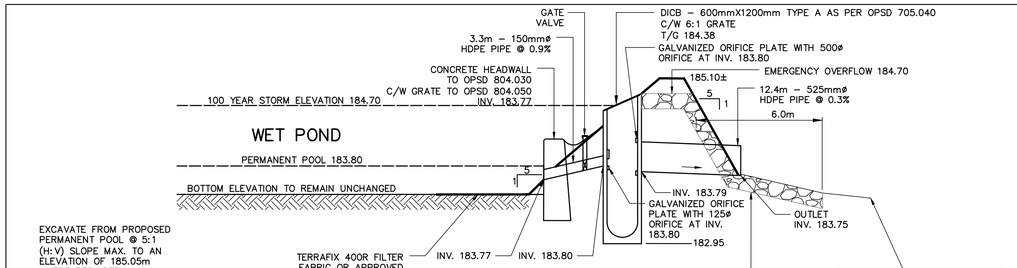
DESIGN: APR/DFM	FILE: 116023	DWG: PP-1
DRAWN: APR/DFM	DATE: DEC 2017	
CHECK: JPA/MJC	SCALE: H1:500, V1:50	

Drawing Name: 116023-PP01 – AS BUILT.dwg, Plotted: Mar 31, 2022



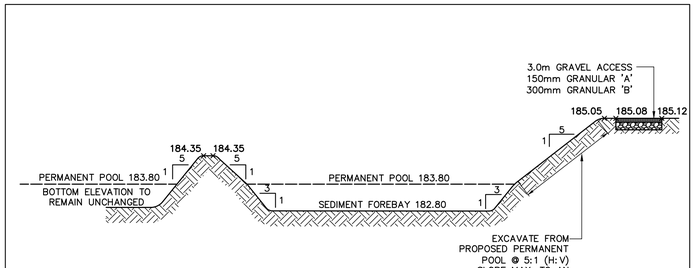
OVERFLOW WEIR CROSS SECTION A–A'

SCALE: NTS



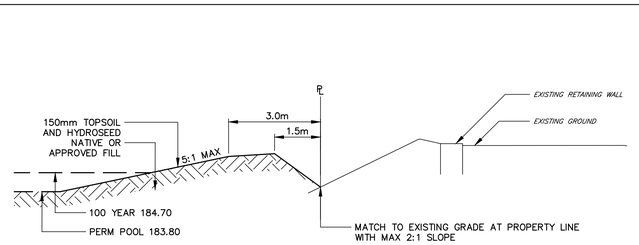
POND OUTLET CROSS SECTION B–B'

SCALE: NTS



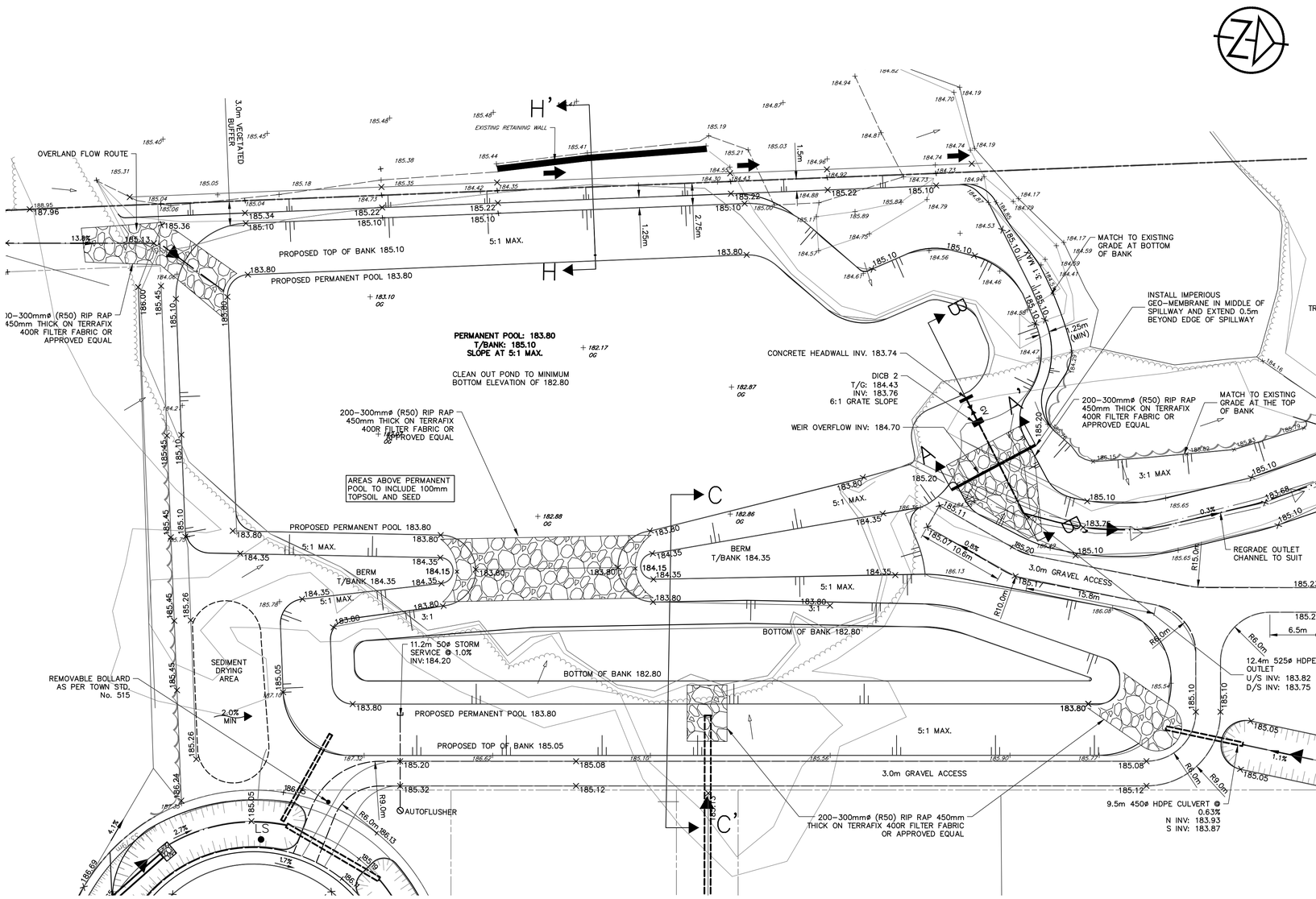
POND CROSS SECTION C–C'

SCALE: NTS



POND CROSS SECTION H–H'

SCALE: NTS



SEED MIX NOTES

1. SEED MIX 'A' TO BE USED AT ALL DISTURBED AREAS WITHIN 2.0 m OF THE WATER'S EDGE.

SEED MIX 'A' – FACW WETLAND MEADOW MIXTURE

10% NEW ENGLAND ASTER
1% HEATH ASTER
1% ZIG ZAG ASTER
5% LURID SEDGE
25% FOX SLEDGE
25% VIRGINIA WILD RYE
1% SPOTTED JOE PYE WEED
1% BONSET
1% CANADA GOLDENROD
5% FOWL MANAGRASS
1% BLUE LOBELIA
24% BLUE VERVAIN

SEED AT 125 g / 45 m²

- SEEDING RATE FOR ABOVE: PACKAGE OF 125 GRAMS COVERS 45 M² (5,000 ft²)
- NURSE CROP FOR ABOVE: OATS (AVENA SATIVA) – APPLY HYDROSEED USING A MULCH SLURRY WITH ADHESIVE AT A RATE OF 34 kg/ha (30 lbs/acre).

2. SEED MIX 'B' TO BE USED AT ALL DISTURBED AREAS OUTSIDE OF 2.0 m OF THE WATER'S EDGE.

SEED MIX 'B' – NATIVE PRARIE MEADOW MIXTURE

2% BEARDTONGUE
7% BLACKEYED SUSAN
4% COMMON MILKWEED
1% EARL GOLDENROD
20% FOWL BLUEGRASS
20% INDIANGRASS
30% LITTLE BLUESTEM
1% NEW ENGLAND ASTER
1% SHOWY TICK TREFOIL
12% SWITCHGRASS
1% WHITE VERVAIN
1% WILD BERGAMOT

SEED AT 125 g / 45 m²

- SEEDING RATE FOR ABOVE: 20 – 25 kg/ha (18 – 22 lbs/acre)
- NURSE CROP FOR ABOVE: OATS (AVENA SATIVA) – APPLY HYDROSEED USING A MULCH SLURRY WITH ADHESIVE AT A RATE OF 34 kg/ha (30 lbs/acre).

AS–BUILT DRAWINGS			
COMPILED BY:	NR	DATE:	01/31/2019
CHECKED BY:	SH	DATE:	01/31/2019
DRAWN BY:	RD	DATE:	11/15/2021
CHECKED BY:	JPA	DATE:	03/28/2022

AS–BUILT DRAWINGS: NOTICE TO USERS

INFORMATION CONTAINED ON THIS DRAWING HAS BEEN COMPILED FROM VARIOUS SOURCES AND MAY HAVE CHANGED SINCE COMPLETION OF CONSTRUCTION. NO WARRANTY CAN BE PROVIDED AS TO ITS ACCURACY AND/OR COMPLETENESS. CCTA SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY RESULT FROM RELIANCE ON INFORMATION HEREIN.

DISCLAIMER AND COPYRIGHT

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.

TATHAM ENGINEERING LIMITED CLAIMS COPYRIGHT TO THIS DRAWING WHICH MAY NOT BE USED FOR ANY PURPOSE OTHER THAN THAT PROVIDED IN THE CONTRACT BETWEEN THE OWNER/CLIENT AND THE ENGINEER WITHOUT THE EXPRESS CONSENT OF TATHAM ENGINEERING LIMITED.

BENCHMARKS

TBM2 – ELEVATION 189.765m
NAIL & WASHER ON NORTH FACE OF HYDRO POLE LOCATED ON NORTH SIDE OF MOUNTAIN ROAD JUST WEST OF EXISTING ACCESS TO SITE.

NOTES

NOTES

No.	REVISION DESCRIPTION	DATE
1.	AS–BUILT INFORMATION	MAR/2022

ENGINEER STAMP

ORIGINAL STAMPED BY
M. J. CULLIP
JULY 31/18

INDUSTRIAL SUBDIVISION

185 MOUNTAIN ROAD
TOWN OF COLLINGWOOD

TATHAM ENGINEERING

POND LAYOUT AND DETAILS

DESIGN: APR/DFM	FILE: 116023	DWG:	
DRAWN: APR/DFM	DATE: DEC 2017		**PND-1**
CHECK: JPA/MJC	SCALE: 1:300		

Drawing Name: 116023–PND01 – AS BUILT.dwg, Plotted: Mar 31, 2022

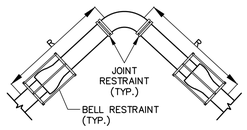


FIGURE 1
HORIZONTAL BEND

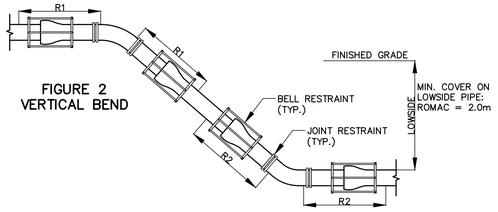


FIGURE 2
VERTICAL BEND

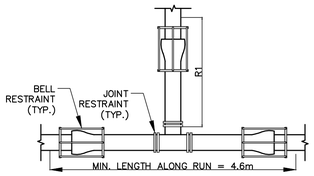


FIGURE 3
TEE

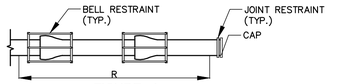


FIGURE 4
DEAD END

CHARACTERISTICS USED TO CALCULATE RESTRAINT LENGTH:

PIPE MATERIAL:	DUCTILE IRON
SOIL TYPE:	ML (INORGANIC SILTS, VERY FINE SANDS, SILTY OR CLAYEY FINE SANDS, ROCK FLAIR)
SAFETY FACTOR:	1.5 TO 1
TRENCH TYPE:	5 (PIPE BEDDED IN COMPACT GRANULAR MATERIAL)
DEPTH OF BURY:	1.52m (5 ft)
TEST PRESSURE:	1035 kPa (150 p.s.i.)
PROGRAM:	ROMAC INDUSTRIES INC. – THRUST RESTRAINT CALCULATOR

TABLE 2: PIPE RESTRAINT SCHEDULE FOR DI TEES
(ALL JOINTS AND BELLS LOCATED WITHIN THE CALCULATED RESTRAINT LENGTH SHALL BE RESTRAINED WITH APPROVED BELL AND JOINT RESTRAINTS)

TEES		
NOMINAL PIPE DIA.	BRANCH PIPE DIA.	RESTRAINT 1 LENGTH (m)
300	200	1.5
200	150	0
150	150	0

REDUCERS		
LARGER PIPE DIA.	SMALLER PIPE DIA.	RESTRAINT ON LARGER SIDE (m)
200	150	5.8
150	50	7.1

TABLE 1: PIPE RESTRAINT SCHEDULE FOR DI PIPE
(ALL JOINTS AND BELLS LOCATED WITHIN THE CALCULATED RESTRAINT LENGTH SHALL BE RESTRAINED WITH APPROVED BELL AND JOINT RESTRAINTS)

		HORIZONTAL BEND	VERTICAL BEND		DEAD END (NO BEND ANGLE)
PIPE DIA.	BEND ANGLE	RESTRAINT LENGTH (m)	RESTRAINT 1 LENGTH (m)	RESTRAINT 2 LENGTH (m)	RESTRAINT LENGTH (m)
200ø	90°	4.9	–	–	13.8
	45°	2.0	5.7	1.6	
	22.5°	1.0	2.8	0.8	
	11.25°	0.5	1.4	0.4	
150ø	90°	3.8	–	–	10.6
	45°	1.6	4.4	1.3	
	22.5°	0.8	2.1	0.6	
	11.25°	0.4	1.1	0.3	

NOTES:
1. CONTRACTOR TO REPORT IN WRITING TO THE ENGINEER ANY CHANGES TO SOIL OR SITE CHARACTERISTIC THAT MAY ALTER THE PIPE RESTRAINT CALCULATION.
2. THE CONTRACTOR IS RESPONSIBLE TO CONFIRM THRUST RESTRAINT REQUIREMENTS WITH THE PIPE AND RESTRAINT MANUFACTURERS.
3. VALVES TO BE RESTRAINED AS IF THEY ARE DEAD ENDS.

AS–BUILT DRAWINGS

COMPILED BY:	NR	DATE:	01/31/2019
CHECKED BY:	SH	DATE:	01/31/2019
DRAWN BY:	RD	DATE:	11/15/2021
CHECKED BY:	JPA	DATE:	03/28/2022

AS–BUILT DRAWINGS: NOTICE TO USERS

INFORMATION CONTAINED ON THIS DRAWING HAS BEEN COMPILED FROM VARIOUS SOURCES AND MAY HAVE CHANGED SINCE COMPLETION OF CONSTRUCTION. NO WARRANTY CAN BE PROVIDED AS TO ITS ACCURACY AND/OR COMPLETENESS. CCTA SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY RESULT FROM RELIANCE ON INFORMATION HEREIN.

GENERAL

1. ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH TOWN OF COLLINGWOOD STANDARDS AND OPS STANDARDS. WHERE CONFLICT OCCURS, TOWN STANDARDS TO GOVERN.
2. THE ENGINEER SHALL PROVIDE BENCHMARK ELEVATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DETAILED LAYOUT OF THE WORK.
3. LEGAL SURVEY BOUNDARIES SHOWN ON DRAWING ARE APPROXIMATE, CONTRACTOR SHALL CONFIRM ALL BOUNDARIES AS REQUIRED TO COMPLETE THE WORK.
4. ALL PROPERTY BARS TO BE PRESERVED AND REPLACED BY OLS AT CONTRACTOR'S EXPENSE IF DISTURBED DURING CONSTRUCTION.
5. THE CONTRACTOR SHALL MAKE ARRANGEMENTS FOR THE SUPPLY OF TEMPORARY WATER AND POWER.
6. DEWATERING TO BE CARRIED OUT IN ACCORDANCE WITH OPSS 517 AND OPSS 518. MAINTAIN ALL TRENCHES IN A DRY CONDITION. A MOECC PERMIT TO TAKE WATER (PTTW) HAS NOT BEEN OBTAINED FOR THIS PROJECT. IF THE CONTRACTOR CANNOT MAINTAIN DRY TRENCH CONDITIONS WITH CONVENTIONAL PUMP TECHNIQUES WHILE TAKING LESS THAN 50,000 L/DAY, THEN A PTTW MUST BE OBTAINED FROM THE MINISTRY OF ENVIRONMENT AND CLIMATE CHANGE.
7. ALL ENGINE DRIVEN PUMPS TO BE ADEQUATELY SILENCED, SUITABLE FOR OPERATION IN A RESIDENTIAL DISTRICT.
8. GENERAL INSTALLATION AND TESTING OF SEWERS, WATERMAIN AND APPURTENANCES TO BE IN ACCORDANCE WITH OPSS.MUNI 407, 408, 409 (CCTV), OPSS.MUNI 410, OPSS.MUNI 421, AND 441 AND ALL SPECIFICATIONS REFERENCED WITHIN THESE SECTIONS.
9. ALL MAINTENANCE HOLES ARE 1200 mm DIAMETER, UNLESS OTHERWISE SPECIFIED.
10. EXCAVATION AND GRADING TO BE IN ACCORDANCE WITH OPSS.MUNI 206 AND OPSS.MUNI 510.
11. ALL STRUCTURES TO BE INSTALLED WITH FROST STRAPS IN ACCORDANCE WITH OPSD 701.100.
12. PIPE SUPPORT AT ALL STRUCTURES IN ACCORDANCE WITH OPSD 708.020.
13. ALL MAINTENANCE HOLE AND CATCH BASIN FRAME AND GRATES TO BE SET TO BINDER COURSE ASPHALT ELEVATION IN ACCORDANCE WITH OPSD 704.010. FRAME AND GRATES TO BE RAISED TO FINISHED GRADE PRIOR TO THE PLACEMENT OF SURFACE COURSE ASPHALT USING CONCRETE ADJUSTMENT UNITS IN ACCORDANCE WITH OPSD 704.010.
14. TRENCH BACKFILL TO BE SELECT NATIVE MATERIAL OR IMPORTED SELECT SUBGRADE MATERIAL IN ACCORDANCE WITH OPSS.MUNI 1010. BACKFILL TO BE PLACED IN MAXIMUM 200 mm THICK LIFTS (OR AS OTHERWISE DIRECTED BY THE GEOTECHNICAL ENGINEER) AND COMPACTED TO A DRY DENSITY OF AT LEAST 95% OF THE MATERIAL'S STANDARD PROCTOR MAXIMUM DRY DENSITY (SPMDD).
15. PIPE EMBEDMENT TO BE COMPACTED TO A DRY DENSITY OF AT LEAST 95% OF THE MATERIAL'S SPMDD. BACKFILL AND EMBEDMENT IN ACCORDANCE WITH OPSD 802.010 (FLEXIBLE PIPE), GRANULAR 'A' EMBEDMENT OR OPSD 802.031 (RIGID PIPE) CLASS "B", GRANULAR 'A' BEDDING, GRANULAR 'B' COVER (MAX. AGGREGATE SIZE 25 mm). MINIMUM BEDDING DEPTH 150 mm, MINIMUM COVER DEPTH 300 mm ON ALL PIPES. WHERE EXCESSIVELY WET OR POOR SUBGRADE IS ENCOUNTERED AT THE INVERT LEVEL, IT MAY BE NECESSARY TO INCREASE THE BEDDING THICKNESS.
16. CLEAR STONE COMPLETELY WRAPPED IN FILTER FABRIC CAN BE SUBSTITUTED FOR EMBEDMENT MATERIAL IF APPROVED BY THE ENGINEER.
17. DISTURBED AREAS TO BE REINSTATED TO PREVIOUS CONDITION OR BETTER.
18. REINSTATEMENT OF MOUNTAIN ROAD TO INCLUDE SUPPLY AND PLACEMENT OF NEW GRANULAR AND ASPHALT MATERIALS TO MATCH THE TYPE AND DEPTH, AS A MINIMUM, THE DEPTH SHALL BE – GRANULAR 'B': 450mm, GRANULAR 'A': 150mm, HL8: 50mm, HL3: 50mm. REINSTATEMENT OF ALL DITCHES AND BOULEVARD AREAS TO INCLUDE 150mm TOPSOIL, HYDROSEED AND MULCH IN ACCORDANCE WITH OPSS 802 AND OPSS.MUNI 804 SEED MIX SHALL BE TO OPSS STANDARD ROADSIDE MIX. REINSTATEMENT OF EXISTING GRANULAR TRAIL SHALL INCLUDE NEW GRANULAR MATERIAL TO MATCH EXISTING TYPE AND DEPTH. AS A MINIMUM, THE DEPTH SHALL BE – LIMESTONE SCREENINGS: 150mm ON FILTER FABRIC.
19. LOCATION OF EXISTING INFRASTRUCTURE BASED ON A TOPOGRAPHICAL SURVEY COMPLETED BY C.C. TATHAM & ASSOCIATES LTD., AS–BUILT DRAWINGS AND/OR GIS INFORMATION PROVIDED BY THE TOWN.
20. LOCATIONS OF EXISTING UTILITIES ARE NOT GUARANTEED. THE CONTRACTOR SHALL OBTAIN LOCATES FROM ALL RELEVANT UTILITY COMPANIES, 48 HOURS PRIOR TO THE COMMENCEMENT OF ANY WORK AND IF NECESSARY LOCATE UTILITIES BY HAND DIGGING.
21. THE CONTRACTOR IS RESPONSIBLE FOR THE PRESERVATION OF ALL EXISTING INFRASTRUCTURE/FACILITIES AS WELL AS NOTIFYING ALL UTILITY COMPANIES PRIOR TO COMMENCING WORK AND CO–ORDINATE CONSTRUCTION ACCORDINGLY.
22. ALL ON–SITE MATERIAL SHALL BE PROPERLY STORED, SECURED, MONITORED AND COVERED AS REQUIRED. SPECIFICALLY, ALL PVC PIPE SHALL BE COVERED WHILE STORED ON–SITE.
23. ALL SILTATION AND EROSION CONTROL PROTECTION DEVICES ARE TO BE INSTALLED PRIOR TO COMMENCEMENT OF CONSTRUCTION. CONTRACTOR SHALL MAINTAIN CONTROL DEVICES THROUGHOUT CONSTRUCTION AND REMOVE THE CONTROL DEVICES ONCE GROUND COVER IS ESTABLISHED IN ALL DISTURBED AREAS.
24. ALL CONSTRUCTION MATERIALS SHALL BE REMOVED FROM THE SITE PRIOR TO RESTORATION OF DISTURBED AREAS.
25. ALL FENCING TO BE LAWFULLY ERECTED AND MAINTAINED IN ACCORDANCE TO THE TOWN FENCE BYLAW.
26. CLEARING, GRUBBING AND REMOVAL OF SURFACE BOULDERS TO OPSS 201.
27. GRADING TO OPSS.MUNI 206.
28. COMPACTING TO OPSS.MUNI 501.

ROADS

1. SUBGRADE AND BOULEVARD MATERIAL TO BE COMPACTED TO A DRY DENSITY OF AT LEAST 95% OF THE MATERIAL'S SPMDD. SUBGRADE TO BE PROOF ROLLED AND CERTIFIED PRIOR TO PLACING GRANULAR 'B'.
2. GRANULAR 'A' AND 'B' TO BE COMPACTED TO A DRY DENSITY OF AT LEAST 100% OF THE MATERIAL'S RESPECTIVE SPMDD.
3. ALL GRANULARS AND ASPHALT MATERIAL TO BE PLACED IN ACCORDANCE WITH OPSS 310 AND OPSS.MUNI 314.
4. ASPHALT TO BE COMPACTED TO A MINIMUM OF 92% OF THE MATERIAL'S MAXIMUM RELATIVE DENSITY.
5. ROAD TO BE CONSTRUCTED WITH MIN. 450 mm GRANULAR 'B', 150 mm GRANULAR 'A', 50 mm HL8 AND 50mm HL3.
6. JOINTS WITH EXISTING ASPHALT TO BE SAW CUT STRAIGHT PRIOR TO PLACING NEW ASPHALT AND TACK COAT SHALL BE APPLIED TO EXISTING ASPHALT. WHERE EXISTING ASPHALT IS GREATER THAN 75 mm DEPTH, A 300 mm WIDE BY 40 mm DEEP LAP JOINT SHALL BE GROUND INTO EXISTING ASPHALT, OTHERWISE A BUTT JOINT SHALL BE USED.
7. SELECT SUBGRADE MATERIAL, OR IMPORTED GRANULAR MATERIAL APPROVED BY THE ENGINEER, COMPACTED TO 98% SPMDD TO BE USED AS FILL IN ALL AREAS WHERE PROPOSED PIPE INVERTS ARE HIGHER THAN EXISTING GRADE OR AS INSTRUCTED BY THE ENGINEER.
8. BASE COURSE SHALL BE CLEANED AND WASHED AND TACK COAT TO BE APPLIED TO THE ENTIRE SURFACE PRIOR TO THE PLACEMENT OF SURFACE COURSE ASPHALT. TACK COAT SHALL BE APPLIED AT A RATE OF 0.35Kg/m².
9. CONCRETE BARRIER CURB IN ACCORDANCE WITH OPSD 600.110 AND OPSS 353.
10. ACCESS ROAD WITHIN POND BLOCK TO BE CONSTRUCTED WITH 300 mm GRANULAR 'B' AND 150 mm GRANULAR 'A'.
11. EDGE OF PAVEMENT FOR STREET 'A' (8.0m WIDTH) AND THE RIGHT TURN TAPER ON MOUNTAIN ROAD TO BE PAINTED SOLID WHITE, 10cm WIDTH. PAINT TO BE ORGANIC SOLVENT BASED OR WATER–BORNE TRAFFIC PAINT COMPLETE WITH GLASS BEADS, MINIMUM 2 APPLICATIONS. WORK TO BE IN ACCORDANCE WITH OPSS 710, 1712, 1716 AND 1750 AND THE ONTARIO TRAFFIC MANUAL BOOK 11, MINISTRY OF TRANSPORTATION OF ONTARIO. LAYOUT TO BE APPROVED BY ENGINEER PRIOR TO APPLICATION.

STORM SEWER

1. INLET STRUCTURES TO BE FITTED WITH SEDIMENT TRAPS DURING CONSTRUCTION ACTIVITIES. CONTRACTOR TO CLEAN AND MAINTAIN REGULARLY THROUGHOUT THE WARRANTY PERIOD. SEDIMENT TRAPS TO BE REMOVED AND DISPOSED OF ONCE VEGETATION HAS BEEN ESTABLISHED AT THE DIRECTION OF THE ENGINEER.
2. DITCH INLET CATCH BASINS IN ACCORDANCE WITH OPSD 705.040, GRATES AS SPECIFIED ON DRAWINGS.
3. SUBDRAIN OUTLETS TO OPSD 206.050, COMPLETE WITH MARKER POST AND RODENT GRATE.

SANITARY SEWER

1. MAINTENANCE HOLES IN ACCORDANCE WITH OPSD 701.010.
2. MAINTENANCE HOLES TO BE BENCHED IN ACCORDANCE WITH OPSD 701.021 ALL CONNECTIONS TO MAINTENANCE HOLES TO INCLUDE KOR–N–SEAL RUBBER BOOT PIPE CONNECTION.
3. MAINTENANCE HOLE STEPS IN ACCORDANCE WITH OPSD 405.010.
4. MAINTENANCE HOLE FRAME AND COVER IN ACCORDANCE WITH OPSD 401.010 TYPE 'A' CLOSED COVER.
5. GRAVITY SERVICE CONNECTIONS IN ACCORDANCE WITH OPSD 1006.020, 125 mm DIAMETER, TERMINATED WHERE SPECIFIED ON THE DRAWING COMPLETE WITH PLUG AND MARKED WITH A 38mm X 89mm POST PAINTED GREEN FROM THE INVERT OF THE SERVICE TO 600 mm ABOVE GRADE. GRANULAR 'A' EMBEDMENT (MIN. 150 mm BEDDING AND 300 mm COVER).
6. FORCEMAIN SERVICE CONNECTIONS TO HAVE MIN. 100mm GRANULAR 'A' EMBEDMENT (MIN 100mm BEDDING AND 300mm COVER), FORCEMAIN TO BE INSTALLED WITH MINIMUM 1.7m COVER. INSULATION LESS THAN 1.7m COVER AS PER DETAILS AND AS DIRECTED BY THE ENGINEER. TERMINATED WHERE SPECIFIED ON THE DRAWING COMPLETE WITH PLUG AND MARKED WITH A 38mm X 89mm POST PAINTED GREEN FROM THE INVERT OF THE SERVICE TO 600 mm ABOVE GRADE. GRANULAR 'A' EMBEDMENT (MIN. 150 mm BEDDING AND 300 mm COVER).
7. RIGID BOARD INSULATION (HI–40) REQUIRED FOR FROST PROTECTION OF SANITARY SEWER AND SERVICES WITH LESS THAN 1.7m MINIMUM COVER. INSULATION TO BE MINIMUM 50mm THICK AND HAVE A MINIMUM WIDTH OF 1.2m FOR EVERY 0.3m OF COVER LESS THAN 1.7m. MAXIMUM DEPTH OF INSULATION TO BE 100mm.

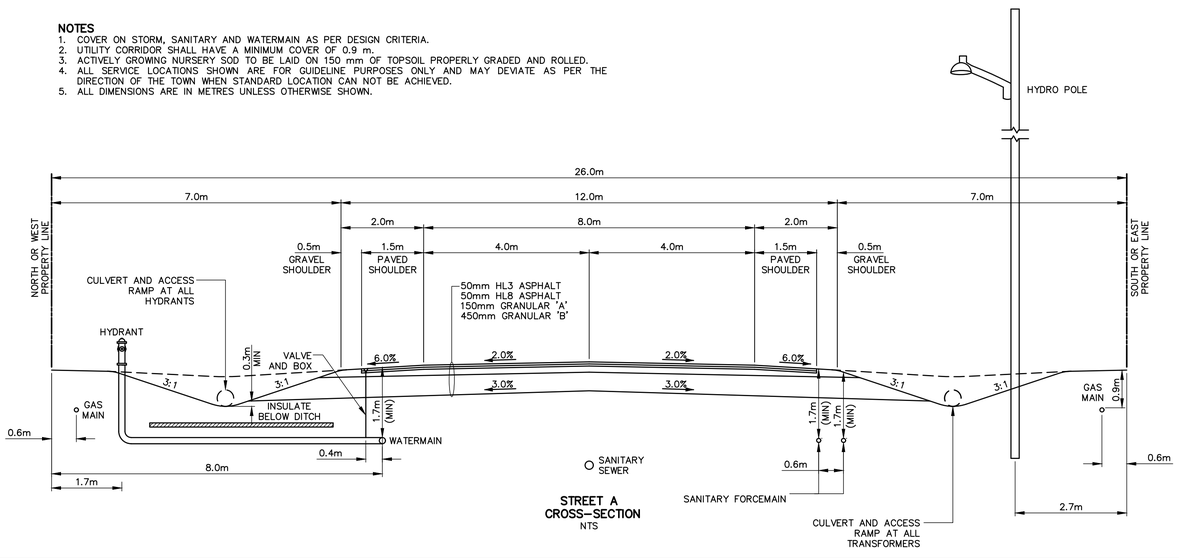
WATERMAIN

1. ALL WATERMAINS AND SERVICES ARE TO BE CONSTRUCTED IN ACCORDANCE WITH TOWN WATER DEPARTMENT STANDARDS.
2. ALL WORK ON TOWN WATER MAINS MUST BE UNDERTAKEN BY THE TOWN OF COLLINGWOOD WATER DEPARTMENT OR BY CONTRACTOR APPROVED BY THE TOWN OF COLLINGWOOD WATER DEPARTMENT, ALL AT THE DEVELOPER'S COST.
3. ALL SERVICES ARE TO BE CONSTRUCTED IN ACCORDANCE WITH TOWN STANDARDS. SERVICE CONNECTIONS TO OPSD 1104.010 DIRECT TAP, 100mm GRANULAR 'A' EMBEDMENT AND COVER OVER PIPE TERMINATE AT PROPERTY LINE C/W CURB STOP AND BOX, TESTING TAIL TO SURFACE ATTACHED TO A 38mm x 89mm MARKER POST PAINTED BLUE.
4. EACH BLOCK SHALL HAVE ONE SERVICE AND ONE METER. ADDITIONAL METERS CAN BE ADDED INTERNALLY TO MEASURE THE WATER USE FOR EACH UNIT. HOWEVER, THE MUNICIPALITY WILL HAVE ONE METER, CONNECTED TO ONE WATER BILL, PER BUILDING
5. COMMERCIAL UNITS WILL REQUIRE PREMISE PROTECTION BACKFLOW PREVENTION DEVICES AS PER CSAB64.10–11/B64.10.1–11, OBC AND THE TOWN WATER BY–LAW. THESE DEVICES WILL REQUIRE ANNUAL TESTING, WITH ALL ASSOCIATED COSTS THE RESPONSIBILITY OF THE OWNER.
6. A CONSTRUCTION WATER FEE IN ACCORDANCE WITH THE CURRENT FEES AND CHARGES BY–LAW IS DUE WHEN A BUILDING REMIT IS OBTAINED.
7. NO WATER VALVES SHALL BE OPERATED WITHOUT THE APPROVAL OF THE TOWN WATER DEPARTMENT.
8. ALL WORK DONE ON EXISTING WATERMAIN TO BE COORDINATED WITH THE TOWN.
9. THRUST PROTECTION TO BE PROVIDED BY THE USE OF RESTRAINING GLANDS WHERE THRUST PRESSURES OCCUR. WATER VALVES SHALL BE RESTRAINED ON BOTH SIDES TO THE SAME STANDARD AS A DEAD END. PIPE RESTRAINTS SHALL BE PER DETAIL ON DRAWING DE–1, AND IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS. WHERE RESTRAINING GLANDS CANNOT BE USED (OR AS OTHERWISE SPECIFIED), THRUST BLOCKS SHALL BE USED IN ACCORDANCE WITH OPSD 1103.010 AND OPSD 1103.020.
10. FIRE HYDRANTS TO OPSD 1105.010. HYDRANTS ARE TO BE 1.85 m LONG. EXTENSIONS IF REQUIRED ARE TO BE INSTALLED BELOW THE 1.85 m SECTION. DRAIN PLUGS TO INSTALLED WHERE HIGH WATER TABLE IS ENCOUNTERED.
11. MINIMUM COVER ON WATERMAIN AND SERVICES TO BE 1.7 m.
12. RIGID BOARD INSULATION (HI–40) REQUIRED FOR FROST PROTECTION OF WATERMAIN AND SERVICES WITH LESS THAN 1.7m MINIMUM COVER. INSULATION TO BE MINIMUM 50mm THICK AND HAVE A MINIMUM WIDTH OF 1.2m FOR EVERY 0.3m OF COVER LESS THAN 1.7m. MAXIMUM DEPTH OF INSULATION TO BE 100mm.
13. SEPARATION BETWEEN WATERMAINS AND SEWERS TO BE A MINIMUM OF 0.5 m VERTICALLY AND A MINIMUM OF 2.5 m HORIZONTAL.
14. FOLLOWING TESTING, THE CONTRACTOR SHALL CONTACT THE TOWN, WHO WILL THEN OPERATE EACH WATER SERVICE TO VERIFY FULL FLOW AND PRESSURE AT THE WATER VALVE TO THE SATISFACTION OF THE ENGINEER AND THE TOWN.
15. GENERAL INSTALLATION AND TESTING OF WATERMAIN AND APPURTENANCES TO BE IN ACCORDANCE WITH OPSS.MUNI 441 AND TOWN SPECIFICATIONS.
    – ALL WATERMAINS ARE TO BE SWABBED BY THE CONTRACTOR. ENGINEER AND THE TOWN TO BE PRESENT DURING TESTING.
    – ALL WATERMAINS ARE TO BE PRESSURE TESTED BY THE CONTRACTOR, WITH A COPY OF THE PRESSURE TEST REPORT SENT TO THE ENGINEER AND TOWN. ENGINEER AND THE TOWN TO BE PRESENT DURING TESTING.
    – THE TOWN WILL DISINFECT THE WATERMAIN.
    – WATERMAINS SHALL NOT TO BE CONNECTED TO THE EXISTING WATERMAIN UNTIL BACTERIOLOGICAL TESTING HAS BEEN SUCCESSFULLY COMPLETED. THE TOWN WILL COLLECT THE SAMPLES AND ADVISE THE CONTRACTOR OF THE RESULTS.
16. THE TOWN AND ENGINEER TO RECEIVE A MINIMUM 48 HOURS NOTICE PRIOR TO TESTING OF THE WATERMAINS.
17. KUPFERLE ECLIPSE 9800 AUTOMATIC FLUSHING DEVICE WITH A 1.8mX0.5m FORD PIT SETTER AND A 25mm iPERL WATERMETER UPSTREAM OF THE AUTOFLUSHER AND AN ISOLATION VALE AHEAD OF THE FORD PIT SETTER AND WATERMETER.

MATERIALS

1. ALL MATERIAL TO COMPLY WITH CSA, OPSS AND TOWN STANDARDS.
2. SANITARY SERVICE CONNECTIONS (GRAVITY) – PVC SDR 28 (GREEN).
3. STORM SEWER – CONCRETE, PVC DR35 OR SMOOTH WALL HDPE (BOSS 2000 WITH BELL AND SPIGOT AND MIN. PIPE STIFFNESS OF 320Kpa OR EQUAL).
4. SANITARY SERVICE CONNECTIONS (FORCEMAIN) – HDPE SDR 11.
5. PERFORATED SUBDRAIN – BIG 'O' WITH GEOTEXTILE FILTER SOCK.
6. AGGREGATES IN ACCORDANCE WITH OPSS.MUNI 1010.
7. FILTER FABRIC – TERRAFIX 270R OR APPROVED EQUAL.
8. WATERMAIN – DUCTILE IRON CLASS 52, OR PRESSURE CLASS 350 CEMENT LINED DUCTILE IRON, AS APPROVED BY THE TOWN. CONDUCTIVITY CONNECTORS TO BE USED ON ALL JOINTS.
9. WATER SERVICES – TYPE 'K' COPPER.
10. HYDRANTS – CENTURY NUMBER 1, OPEN LEFT (o/l), 2 HOSE CSA, 33B PUMPER PORT, 6" MJ BASE, DRAINING. YELLOW BASE WITH SILVER BONNET AND PORTS. MARKER'S FLEX STAKE MODEL FHV804, REFLECTIVE HYDRANT DECAL ON EACH SIDE, YELLOW, 48" LENGTH WITH ANTI TAMPER DEVICE, BLUE.
11. VALVES – RESILIENT SEATED (RSGV), MECHANICAL JOINT (MJ), OPEN LEFT (o/l) CLOW OR MUELLER.
12. VALVE BOXES – 5 SL–48 SLIDING.
13. MECHANICAL JOINT DUCTILE FITTINGS – AWWA/ANSI C153/A21.53.
14. RESTRAINER GLANDS – ROMAC GRIP RINGS AND ROMAC 600 SERIES FOR BELL RESTRAINTS ON WATERMAIN UP TO AND INCLUDING 300ø.
15. LIVE TAP SADDLES – EPOXY COATED C/W STAINLESS STEEL BOLTS.
16. LIVE TAP VALVE – RESILIENT SEATED (RSGV), LIVE TAP VALVE, OPEN LEFT CLOW OR MUELLER.
17. MAIN STOPS – 30INL–A3H3, BALL STYLE COMPLETE WITH STAINLESS STEEL STEM, AWWA THREAD BY COMPRESSION CAMBRIDGE BRASS.
18. CURB STOPS – 203NL–H3H3 BALLSTYLE WITH DRAIN COMPLETE WITH STAINLESS STEEL STEM, COMPRESSION JOINT CAMBRIDGE BRASS.
19. SERVICE BOXES – NUMBER 7 D–1 CLOW OR MUELLER 24" BLACK RODS STRAIGHT.
20. CULVERTS – SMOOTH WALL HDPE (MIN. PIPE STIFFNESS = 320 kPa).
21. RIP RAP TO OPSS.MUNI 1004.05.05.
22. SEDIMENT TRAPS – RECTANGLE CBST BY LAYFIELD OR APPROVED EQUAL.

NOTES
1. COVER ON STORM, SANITARY AND WATERMAIN AS PER DESIGN CRITERIA.
2. UTILITY CORRIDOR SHALL HAVE A MINIMUM COVER OF 0.9 m.
3. ACTIVELY GROWING NURSERY SOD TO BE LAID ON 150 mm OF TOPSOIL PROPERLY GRADED AND ROLLED.
4. ALL SERVICE LOCATIONS SHOWN ARE FOR GUIDELINE PURPOSES ONLY AND MAY DEVIATE AS PER THE DIRECTION OF THE TOWN WHEN STANDARD LOCATION CAN NOT BE ACHIEVED.
5. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN.



STREET A
CROSS–SECTION
NTS

DISCLAIMER AND COPYRIGHT

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.

TATHAM ENGINEERING LIMITED CLAIMS COPYRIGHT TO THIS DRAWING WHICH MAY NOT BE USED FOR ANY PURPOSE OTHER THAN THAT PROVIDED IN THE CONTRACT BETWEEN THE OWNER/CLIENT AND THE ENGINEER WITHOUT THE EXPRESS CONSENT OF TATHAM ENGINEERING LIMITED.

BENCHMARKS

TBM2 – ELEVATION 189.765m
NAIL & WASHER ON NORTH FACE OF HYDRO POLE LOCATED ON NORTH SIDE OF MOUNTAIN ROAD JUST WEST OF EXISTING ACCESS TO SITE.

NOTES

NOTES

No.	REVISION DESCRIPTION	DATE
1.	AS–BUILT INFORMATION	MAR/2022

ENGINEER STAMP

ORIGINAL STAMPED BY
M. J. CULLIP
JULY 31/18

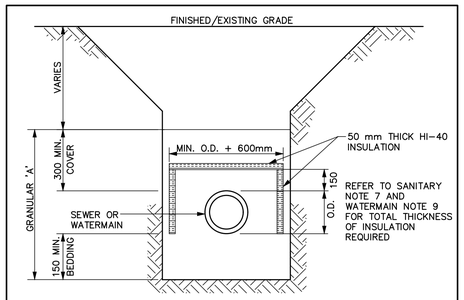
INDUSTRIAL SUBDIVISION
185 MOUNTAIN ROAD
TOWN OF COLLINGWOOD

TATHAM ENGINEERING

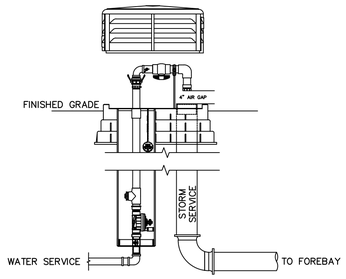
DETAILS, SECTIONS AND NOTES
SHEET 1

DESIGN: APR/DFM	FILE: 116023	DWG: DE-1
DRAWN: APR/DFM	DATE: DEC 2017	
CHECK: JPA/MJC	SCALE: AS SHOWN	

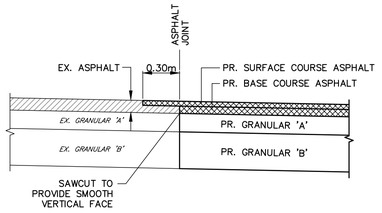
Drawing Name: 116023–DE01 – AS BUILT.dwg, Plotted: Mar 31, 2022



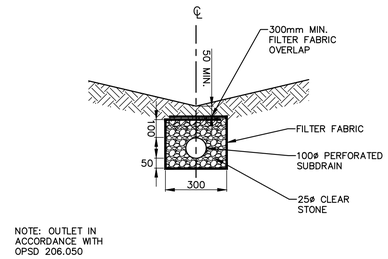
TYPICAL PIPE INSULATION DETAIL
NTS



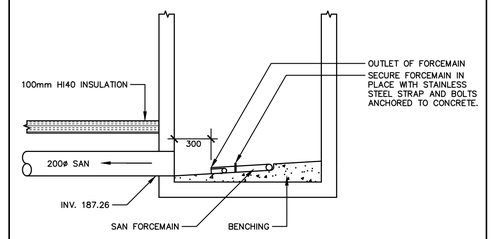
KUPFERLE ECLIPSE 9800 AUTOMATIC FLUSHING DEVICE
NTS



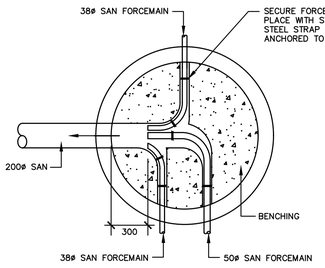
LAP JOINT DETAIL
NTS



SWALE C/W PERFORATED SUBDRAIN
NTS

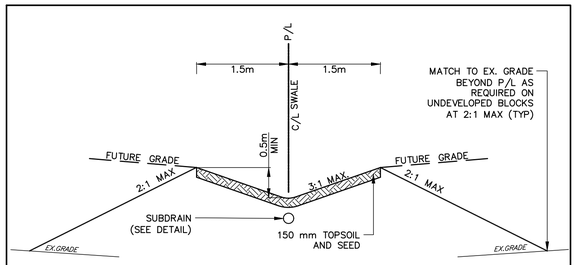


SECTION

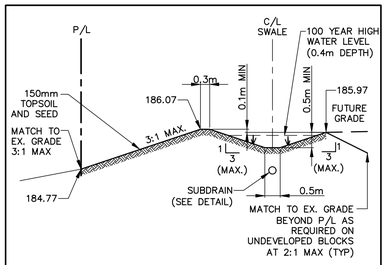


PLAN

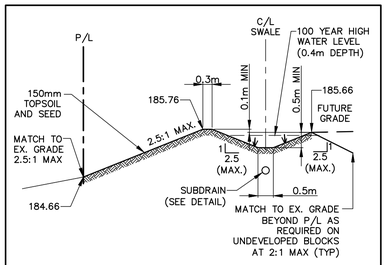
SAN MH 4 BENCHING DETAIL
NTS



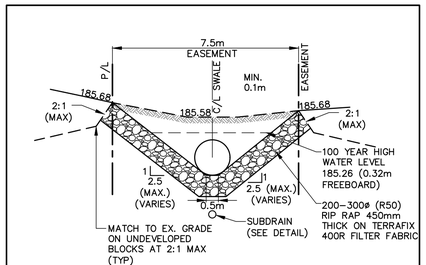
TYPICAL INTERNAL SWALE SECTION D–D'
NTS



EXTERNAL SWALE SECTION E–E'
NTS



EXTERNAL SWALE SECTION F–F'
NTS



INTERNAL SWALE SECTION G–G'
NTS

AS–BUILT DRAWINGS

COMPILED BY: NR	DATE: 01/31/2019
CHECKED BY: SH	DATE: 01/31/2019
DRAWN BY: RD	DATE: 11/15/2021
CHECKED BY: JPA	DATE: 03/28/2022

AS–BUILT DRAWINGS: NOTICE TO USERS

INFORMATION CONTAINED ON THIS DRAWING HAS BEEN COMPILED FROM VARIOUS SOURCES AND MAY HAVE CHANGED SINCE COMPLETION OF CONSTRUCTION. NO WARRANTY CAN BE PROVIDED AS TO ITS ACCURACY AND/OR COMPLETENESS. CCTA SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY RESULT FROM RELIANCE ON INFORMATION HEREIN.

DISCLAIMER AND COPYRIGHT

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.

TATHAM ENGINEERING LIMITED CLAIMS COPYRIGHT TO THIS DRAWING WHICH MAY NOT BE USED FOR ANY PURPOSE OTHER THAN THAT PROVIDED IN THE CONTRACT BETWEEN THE OWNER/CLIENT AND THE ENGINEER WITHOUT THE EXPRESS CONSENT OF TATHAM ENGINEERING LIMITED.

BENCHMARKS

TBM2 – ELEVATION 189.765m
NAIL & WASHER ON NORTH FACE OF HYDRO POLE LOCATED ON NORTH SIDE OF MOUNTAIN ROAD JUST WEST OF EXISTING ACCESS TO SITE.

NOTES

NOTES

No.	REVISION DESCRIPTION	DATE
1.	AS–BUILT INFORMATION	MAR/2022

ENGINEER STAMP

ORIGINAL STAMPED BY
M. J. CULLIP
JULY 31/18

INDUSTRIAL SUBDIVISION

185 MOUNTAIN ROAD
TOWN OF COLLINGWOOD

TATHAM ENGINEERING

DETAILS, SECTIONS AND NOTES
SHEET 2

DESIGN: APR/DFM	FILE: 116023	DWG: DE-2
DRAWN: APR/DFM	DATE: DEC 2017	
CHECK: JPA/MJC	SCALE: AS SHOWN	

Drawing Name: 116023–DE01 – AS BUILT.dwg, Plotted: Mar 31, 2022

POLE ASSEMBLY REQUIREMENTS ◇2 — RULING SPAN = 45m

POLE TAG NUMBER	POLE HEIGHT	POLE CLASS	VOLTAGES PRIMARY	VOLTAGES SECONDARY	USF POLE STANDARD NUMBER 44kV	USF POLE STANDARD NUMBER 4.16/2.4kV	SECONDARY	GUY WIRE USF STD. NO. ◇3	GROUND USF STD. NO.
GP01	40'	3						06-104, 06-105, 06-106(4)	
P01	65'	2	44kV-4.16kV/2.4kV	240/120	01-308, 01-326	01-316, 01-332	10-200A(2)	06-100, 06-105, 06-106(4)	09-100
◇5 P02	60'	3	44kV-4.16kV/2.4kV	240/120	01-308A	01-308A	10-200(1)		
P03	60'	3	44kV-4.16kV/2.4kV	240/120	01-300	01-310	10-200(1)		
P04	60'	3	44kV-4.16kV/2.4kV	240/120	01-300	01-310	10-200(1)		
P05	60'	3	44kV-4.16kV/2.4kV	240/120	01-300	01-310	10-200(1)		
P06	60'	3	44kV-4.16kV/2.4kV	240/120	01-306	01-306	10-200A(3), 10-400	06-100, 06-105, 06-106(4)	09-100
◇4 EP04	65'	2	44kV-4.16kV/2.4kV	240/120	01-300	01-316	10-200(1)		
EP04A	65'	2	44kV-4.16kV/2.4kV	240/120	01-300	01-316	10-200(1)		

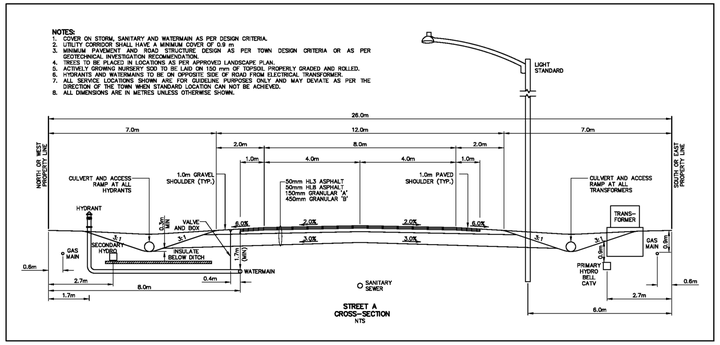
NOTES:

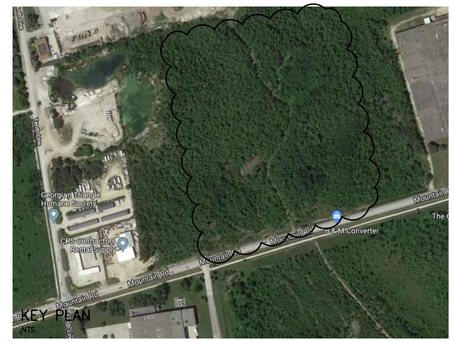
◇2 USF STANDARD NUMBERS LISTED FOR REFERENCE ONLY. OTHER USF STANDARDS MAY APPLY TO THIS WORK.

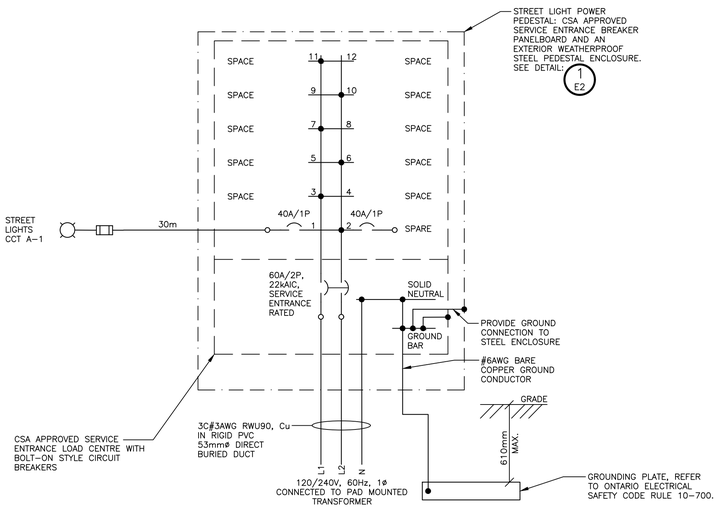
◇3 SOILS TESTING HAS NOT BEEN CONDUCTED FOR THIS PROJECT. THE DESIGN OF THE ANCHORS IS BASED ON SOIL CLASSIFICATION 4 AS DESCRIBED IN USF TABLE 06-12. THE SOIL CLASSIFICATION IS TO BE CONFIRMED BY THE INSTALLER/CONTRACTOR DURING CONSTRUCTION. IF SOIL OF A DIFFERENT CLASSIFICATION IS ENCOUNTERED, THE INSTALLER MUST CONTACT RUNGE & ASSOCIATES INC. FOR FURTHER DIRECTION/INVESTIGATION.

◇4 FRAMING OF EXISTING POLES IS SIMILAR TO USF STANDARD NUMBERS SHOWN.

◇5 TRANSFORMER INSTALLATION FRAMING AND GROUNDING SPECIFICATION BY OTHERS.

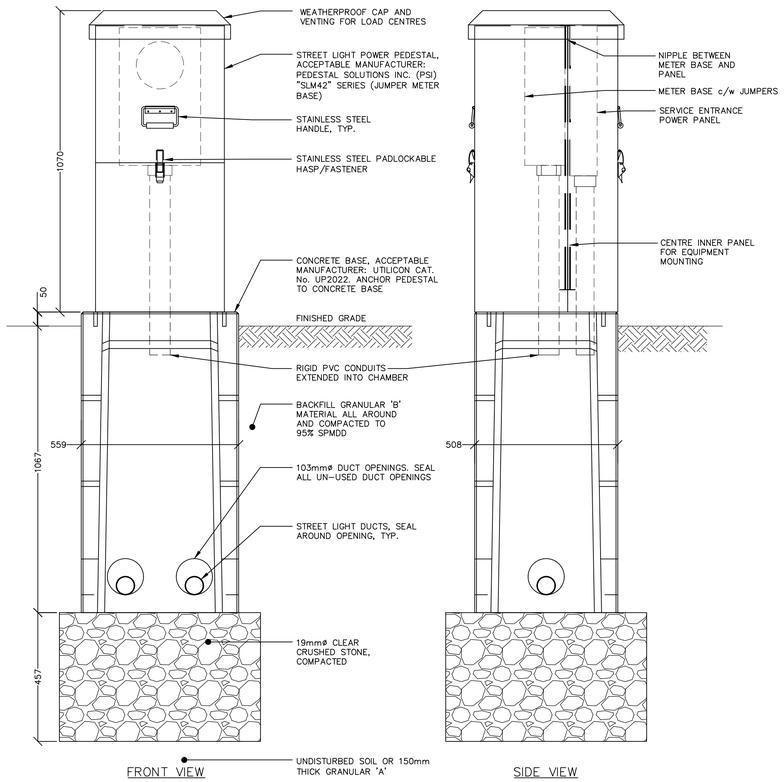



Mountain Rd
Mountain Rd
Mountain Rd



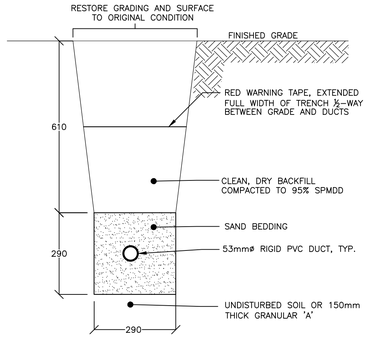
2 E2 UNMETERED POWER PEDESTAL PANEL, LC-A WIRING DETAIL

– NTS



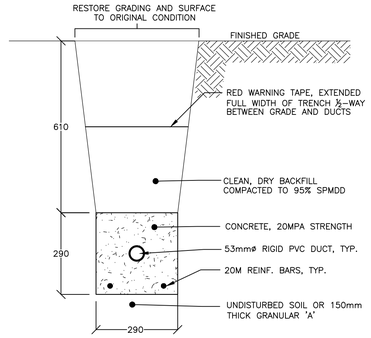
1 E2 TYP. UNMETERED STREETLIGHT POWER PEDESTAL DETAIL

– NTS, DIMENSIONS SHOWN IN MILLIMETRES (mm)



3 E2 TYP. SECONDARY AND STREET LIGHT DUCTBANK DETAIL

– NTS 1



4 E2 ROAD CROSSING STREETLIGHT DUCTBANK

– NTS 1

NOTES

1. DUCTBANK NOTES:
   - DIMENSIONS SHOWN IN mm.
   - ALL DUCTS ARE 103mmø RIGID PVC, UNLESS OTHERWISE NOTED
   - PROVIDE 915mm "LONG SWEEP BENDS" FOR ALL BENDS: 90°, 45°, AND 22.5° BENDS
   - PROVIDE FISH ROPE IN EACH SPARE DUCT
   - INSTALL SPACERS EVERY 1524mm TO ASSEMBLE DUCTBANK. OFFSET OR STAGGER SPACERS
   - GLUE ALL PVC JOINTS
   - PROVIDE END-BELLS WHEN FINISHING DUCTSIN CHAMBER OR WALLS
   - B = BELL DUCTS, R = ROGERS DUCTS
   - C = COMMUNICATION, S = SPARE

SPECIFICATIONS:

1.0 GENERAL SCOPE OF WORK

1.1 All work and materials must comply with COLLUS PowerStream Corp. (COLLUS) conditions of supply, as indicated on contract drawings and as directed by COLLUS' inspector.

1.2 Perform all work in accordance with the latest edition and amendments (bulletins) of the Ontario Electrical Safety Code (latest Edition).

1.3 Contractor to supply and install the following electrical services, as per contract drawings:
- 1.3.1 Supply and install complete streetlighting system including metered power pedestal (jumper meter base), concrete base, luminaire, pole, arm, conduit, wiring,etc.
- 1.3.2 Supply and install underground ductbank as indicated on contract drawings.

1.4 COLLUS PowerStream will supply a quote to the owner/developer for the labour and material required to accomodate the additional equipment being added to COLLUS Powerstreams system and install the following electrical services, as per contract drawings (Note that work will not commence until all quotes are paid in full by the owner/developer):
- 1.4.1 Complete overhead power line including but not limited to poles, primary and secondary conductors, street lights, guys & anchors.

1.5 Cable Terminations: see sections 6.0

1.6 Contractor to supply and install underground trench system for primary and secondary service cables as shown on the Electrical Servicing Plans. Include conduit for all cables including primary and secondary services; refer to drawings and specifications for conduit type and size.

1.7 Contractor to supply and install underground road crossing concrete encased duct banks are shown on the Electrical Servicing Plans.

1.8 Contractor to supply all necessary labour, equipment and materials to install a complete electrical system, as per the contract drawings and COLLUS' requirements.

1.9 Contractor to coordinate electrical inspections with COLLUS' Inspector. Contractor to pay all associated fees to obtain the approvals, inspections and certificates as indicated in Section 3 (below).

1.10 System coordination with other services:
- 1.10.1 Contractor to assist in coordinating with the local telephone and cable television utilities.
- 1.10.2 Contractor to ensure there is optimization of the common utility corridor (trenching) and placement of equipment, i.e. pedestals, amplifiers, transformers, switches and cabling.

2.0 COLLUS' LIST OF APPROVED ELECTRICAL CONTRACTORS

2.1 COLLUS shall have the right to require the Contractor to submit proof of previous experience and satisfactory performance. COLLUS shall also have the right to investigate such proof prior to awarding the contract to the successful bidder.

3.0 COLLUS' APPROVAL AND INSPECTION REQUIREMENTS

3.1 COLLUS PowerStream Corp. will provide an inspector who will be on duty for the duration of the work. Prior to inspection of any works the Contractor must submit contract drawings for approval by COLLUS.

3.2 Once approval has been given, the Contractor shall complete an "Application for Inspection" form. Seventy-two (72) hours after the completion of this form COLLUS PowerStream Corp. inspector will be available for inspection.

3.3 A pre-construction meeting must be held prior to starting the project; the Contractor's foreman the inspector and any other key personnel shall attend.

3.4 COLLUS' inspector shall have the authority to stop work at any time if the Contractor is NOT proceeding in accordance with COLLUS PowerStream Corp. requirements.

3.5 If any work is done in the absence of an inspector the work may be ordered to be "opened up" for examination. If any faults in the workmanship or materials are discovered, the Contractor must rebuild or replace as directed by COLLUS' inspector, at the Contractor's sole expense.

3.6 COLLUS' inspector shall NOT be responsible to ensure the trenches are in accordance with the Trench Excavation Act or the Occupational Health and Safety Act, nor shall the inspector set out work, or give any stakes, lines, levels or grades.

3.7 Contractor responsible for all layout. There will be no excavation allowed prior to proper layout.

3.8 Prior to any installation the site must be prepared to within 150mm of final grade. There will be no exceptions made to this requirement.

3.9 SPECIFIC INSPECTION TIMES:
- 3.9.1 Once the trench has been excavated, sand padded and conduits/ducts installed, the COLLUS inspector must approve all works to date.
- 3.9.2 After ALL cables have been installed in ducts/conduits, the COLLUS inspector must be on site to approve the installation. The inspector must be on site to approve all works to date prior to any backfilling.
- 3.9.3 The above specific inspection times shall not be perceived to be the only dates that the inspector will be available. It is the inspector's discretion to be on site when required.

4.0 BACKFILLING REQUIREMENTS

4.1 Trench shall be backfilled by hand with a minimum of 150 mm of clean, mason sand before mechanical backfilling. During winter construction when there is considerable frost penetration, a minimum of 300 mm of clean sand must be installed over cables before backfilling.

4.2 COMPACTION: Compact all trenches as required by COLLUS' inspector, however, as a minimum provide 95% Standard Proctor Maximum Dry Density.

5.0 EQUIPMENT INSTALLATION REQUIREMENTS

5.1 A minimum separation of 2 metres must be maintained between all natural gas and electrical trenches.

5.2 All equipment must meet COLLUS PowerStream Corp. and Electrical Safety Authority Inspections requirements.

6.0 CABLE TERMINATION REQUIREMENTS

6.1 COLLUS PowerStream Corp. will make the following terminations :
- 6.1.1 All high voltage terminations i.e.: stress cones at cubicles and riser poles and load break elbows at transformers and cubicles etc.
- 6.1.2 Low voltage terminations up to 250mcm in size will be completed by COLLUS Power Corp. personnel on services to be assumed by COLLUS Powerstream.

6.2 COLLUS shall also perform cable tagging for each cable.

7.0 SHOP DRAWING REVIEW

7.1 Where equipment is supplied by other than COLLUS PowerStream, ALL manufacture test records, specifications and or shop drawings must be submitted to the Owner and to COLLUS PowerStream Corp. prior to installation for Utility Approval.

7.2 Show all details of construction, dimensions, capacities, weights, and electrical performance characteristics of equipment or material. Identify each shop drawing accordingly.

7.3 Submit four (4) copies of each shop drawing to Owner for review, and two (2) copies to COLLUS PowerStream. Following the review, two (2) copies will be returned to the Contractor, one from Owner and one from COLLUS.

7.4 Owner's and COLLUS' Shop Drawing Review:
- 7.4.1 Review of shop drawings shall not relieve Contractor from responsibilities or results arising from any errors or omissions.
- 7.4.2 Review of shop drawings and specifications shall, in every case, be subject to final acceptance of equipment and materials after they have been put into commission, all guarantees have been fulfilled and the general operation of the equipment and materials have been found satisfactory to the Owner and COLLUS.
- 7.4.3 Review of shop drawings does not release Contractor of responsibility for proper installation and performance of any material or equipment, nor from the liability to replace same should it prove defective or deficient.

7.5 Owner and COLLUS will review and return shop drawings to Contractor within ten (10) working days. No claims for delay will be entertained if review extends beyond this time.

8.0 STANDARD MATERIAL SPECIFICATIONS

NOTE: FOR STANDARD MATERIAL SPECIFICATIONS REFER TO COLLUS POWERSTREAM'S GENERAL CONTRACTOR REQUIREMENTS AND MATERIAL SPECIFICATIONS FOR MUNICIPAL SUBDIVISIONS ON COLLUS POWER CORP.'S WEBSITE (www.collus.com). THIS SECTION COVERS STANDARD SPECIFICATION PERTAINING TO ELECTRICAL EQUIPMENT. NOT ALL ITEMS MAY BE APPLICABLE TO THIS PROJECT.

1. This drawing is the exclusive property of Runge & Associates Inc. and the reproduction of any part without prior written consent of this office is strictly prohibited.

2. The contractor shall verify all dimensions, levels, and datums on site and report any discrepancies or omissions to this office prior to construction.

3. This drawing is to be read and understood in conjunction with all other plans and documents applicable to this project.

4. Drawing revision must be note "Issued For Construction" before any work commences

ACCEPTED FOR CONSTRUCTION
COLLUS POWER CORP
per Ted Burrell
Date: Nov. 7, 2017

No.	ISSUE OR REVISION	DATE DD/MM/YY	ISSUER
1	ISSUED FOR CLIENT REVIEW	02/04/18	SRT
2	ISSUED FOR COLLUS POWERSTREAM, BELL AND ROGERS REVIEW	02/04/18	SRT
3	SECOND SUBMISSION	03/04/18	SRT
4	ISSUED FOR TENDER	25/04/18	SRT
5	REISSUED FOR COLLUS AND TOWN REVIEW	14/06/18	SRT
6	ISSUED FOR CONSTRUCTION	01/08/18	SRT
7	RE-ISSUED FOR CONSTRUCTION	24/04/19	SRT
8	AS BUILT	28/04/20	SRT

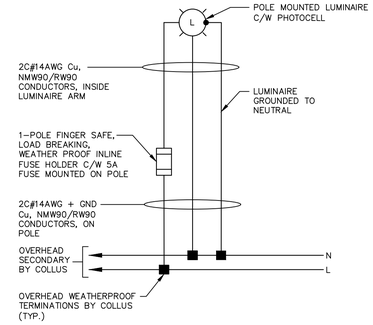
runge
& associates inc. ENGINEERS
864 Hurontario Street
P.O. Box 387
Collingwood, ON, L9Y 3Z7
b: (705) 446-3590
f: (705) 446-3588
www.raiengineers.ca

Client
VAN DOLDER'S HOME TEAM
20 BALSAM ST
COLLINGWOOD, ON L9Y 4H7

Project Name
185 MOUNTAIN RD
VAN DOLDER'S SUBDIVISION

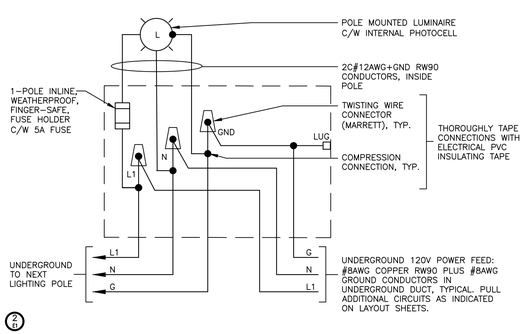
Drawing Title
INSTALLATION DETAILS AND ROAD CROSS SECTION

Drawn By	Checked By	Drawing No.
SRT	GGR	E2
Scale: AS SHOWN	Project No.: 17168P	



4 E3 PROPOSED OVERHEAD STREET LIGHT WIRING DETAIL

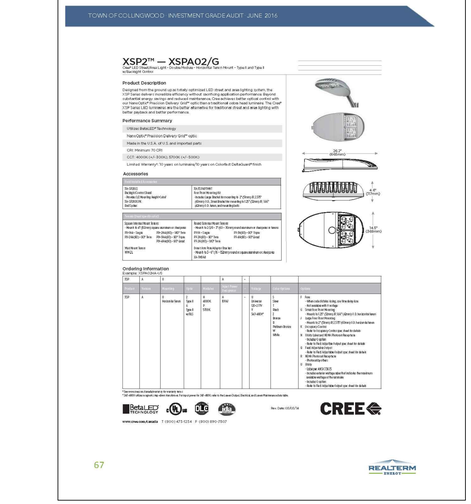
NTS



2 E3

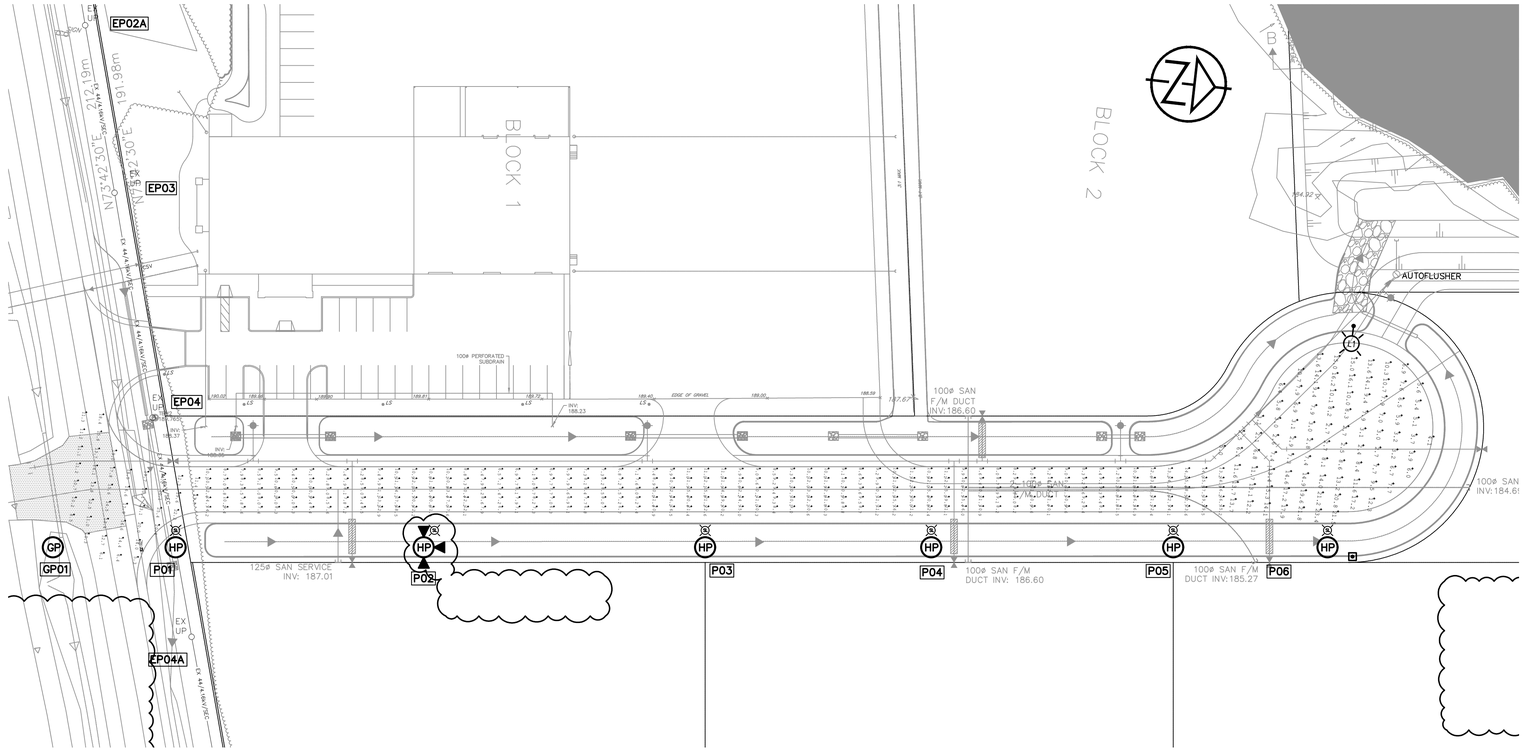
5 E3 TYP. STREETLIGHT WIRING DETAIL

–NTS, DIMENSIONS SHOWN IN MILLIMETRES (mm)



6 E3 LUMINAIRE CATALOGUE SHEETS

NTS



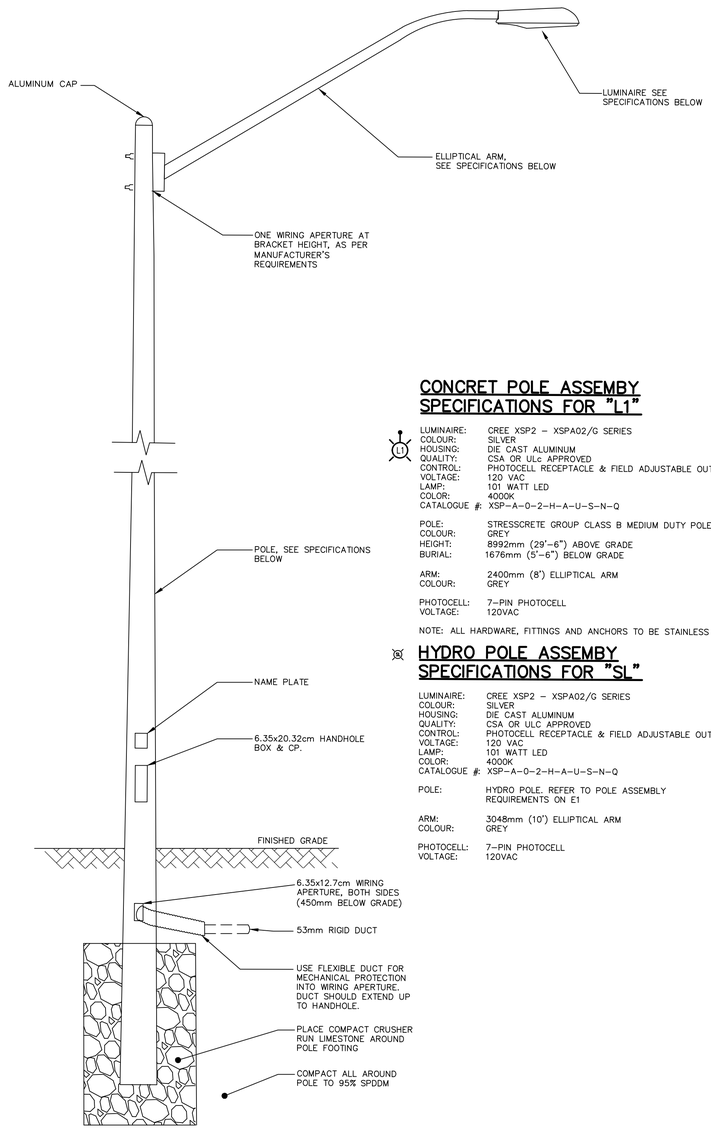
1 E3 PHOTOMETRIC LAYOUT & CALCULATION SUMMARY

NTS

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
Roadway	Illuminance	Lux	11.27	24.1	6.1	1.85	3.95
Roadway Entrance	Illuminance	Lux	14.85	25.4	5.3	2.80	4.79
Round About	Illuminance	Lux	9.27	23.4	2.1	4.41	11.14

7 E3 PHOTOMETRIC CALCULATION SUMMARY

NTS



CONCRET POLE ASSEMBY SPECIFICATIONS FOR "L1"

L1

LUMINAIRE:	CREE XSP2 – XSPA02/G SERIES
COLOUR:	SILVER
HOUSING:	DIE CAST ALUMINUM
QUALITY:	CSA OR ULc APPROVED
CONTROL:	PHOTOCELL RECEPTACLE & FIELD ADJUSTABLE OUTPUT
VOLTAGE:	120 VAC
LAMP:	101 WATT LED
COLOR:	4000K
CATALOGUE #:	XSP–A–0–2–H–A–U–S–N–Q
POLE:	STRESSCRETE GROUP CLASS B MEDIUM DUTY POLE
COLOUR:	GREY
HEIGHT:	8992mm (29'–6") ABOVE GRADE
BURIAL:	1676mm (5'–6") BELOW GRADE
ARM:	2400mm (8') ELLIPTICAL ARM
COLOUR:	GREY
PHOTOCELL:	7–PIN PHOTOCELL
VOLTAGE:	120VAC

NOTE: ALL HARDWARE, FITTINGS AND ANCHORS TO BE STAINLESS STEEL

HYDRO POLE ASSEMBY SPECIFICATIONS FOR "SL"

LUMINAIRE:	CREE XSP2 – XSPA02/G SERIES
COLOUR:	SILVER
HOUSING:	DIE CAST ALUMINUM
QUALITY:	CSA OR ULC APPROVED
CONTROL:	PHOTOCELL RECEPTACLE & FIELD ADJUSTABLE OUTPUT
VOLTAGE:	120 VAC
LAMP:	101 WATT LED
COLOR:	4000K
CATALOGUE #:	XSP–A–0–2–H–A–U–S–N–Q
POLE:	HYDRO POLE. REFER TO POLE ASSEMBLY REQUIREMENTS ON E1
ARM:	3048mm (10') ELLIPTICAL ARM
COLOUR:	GREY
PHOTOCELL:	7–PIN PHOTOCELL
VOLTAGE:	120VAC

2 E3 LUMINAIRE, ARM AND POLE INSTALLATION DETAILS AND SPECIFICATIONS

NTS

1. This drawing is the exclusive property of Runge & Associates Inc. and the reproduction of any part without prior written consent of this office is strictly prohibited.

2. The contractor shall verify all dimensions, levels, and datums on site and report any discrepancies or omissions to this office prior to construction.

3. This drawing is to be read and understood in conjunction with all other plans and documents applicable to this project.

4. Drawing revision must be note "Issued For Construction" before any work commences

ACCEPTED FOR CONSTRUCTION
COLLUS POWER CORP
per Ted Burrell
Date: Nov. 7, 2017

No.	ISSUE OR REVISION	DATE DD/MM/YY	ISSUER
1	ISSUED FOR CLIENT REVIEW	02/04/18	SRT
2	ISSUED FOR COLLUS POWERSTREAM, BELL AND ROGERS REVIEW	02/04/18	SRT
3	SECOND SUBMISSION	03/04/18	SRT
4	ISSUED FOR TENDER	25/04/18	SRT
5	REISSUED FOR COLLUS AND TOWN REVIEW	14/06/18	SRT
6	ISSUED FOR CONSTRUCTION	01/08/18	SRT
7	RE–ISSUED FOR CONSTRUCTION	24/04/19	SRT
8	AS BUILT	28/04/20	SRT

runge & associates inc. ENGINEERS
864 Hurontario Street
P.O. Box 387
Collingwood, ON, L9Y 3Z7
b: (705) 446–3590
f: (705) 446–3588
www.rainengineers.ca

Client
VAN DOLDER'S HOME TEAM

20 BALSAM ST
COLLINGWOOD, ON L9Y 4H7

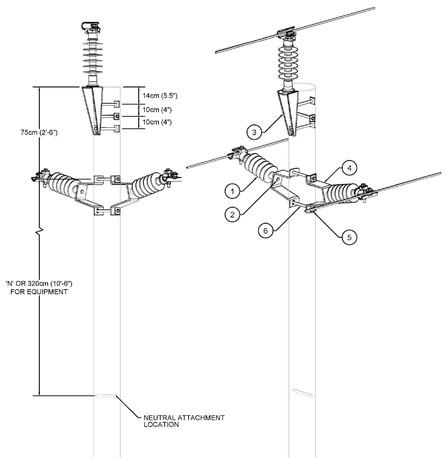
Project Name
185 MOUNTAIN RD
VAN DOLDER'S SUBDIVISION

Drawing Title
PHOTOMETRICS AND STREET LIGHT DETAILS

Drawn By	Checked By	Drawing No.
SRT	GGR	E3
Scale: AS SHOWN	Project No.: 1716BP	

DATE:	SCALE:	REV:	DWG NO.:
2016-01-01	NTS	2	01-300-46kV

TITLE: PRIMARY 3-PHASE TANGENT, MAX SPAN 90m

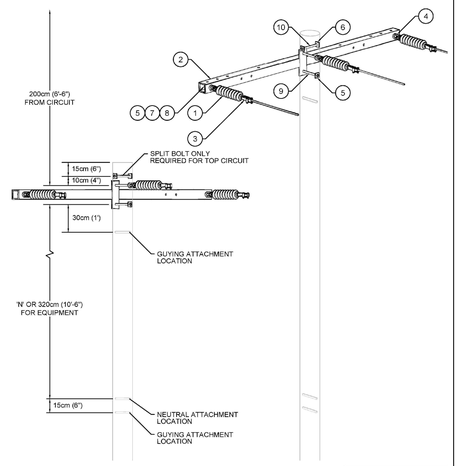


SPAN LENGTH	MIN. STAND-OFF BRACKET REQ'D
0-75m	22.5cm (9")
76-90m	45m (18")

SECTION 1.6	
SPAN LENGTH	'N' MIN. CLEARANCE
0-45m	1.5m (5')
46-60m	1.8m (6')
61-70m	2.1m (7')
71-90m	2.4m (8')

DATE:	SCALE:	REV:	DWG NO.:
2011-10-15	NTS	1	01-306-46kV

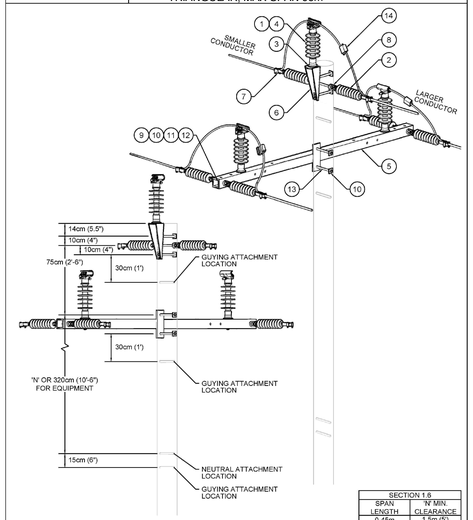
TITLE: PRIMARY 3-PHASE DEADEND FLAT, MAX SPAN 90m



SECTION 1.6	
SPAN LENGTH	'N' MIN. CLEARANCE
0-45m	1.5m (5')
46-60m	1.8m (6')
61-70m	2.1m (7')
71-90m	2.4m (8')

DATE:	SCALE:	REV:	DWG NO.:
2016-01-01	NTS	2	01-308-46kV

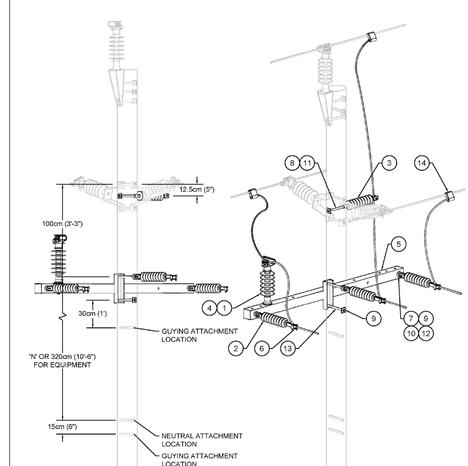
TITLE: PRIMARY 3-PHASE LINE TENSION CHANGE TRIANGULAR, MAX SPAN 90m



SECTION 1.6	
SPAN LENGTH	'N' MIN. CLEARANCE
0-45m	1.5m (5')
46-60m	1.8m (6')
61-70m	2.1m (7')
71-90m	2.4m (8')

DATE:	SCALE:	REV:	DWG NO.:
2011-10-15	NTS	1	01-326-46kV

TITLE: PRIMARY 3-PHASE LINE TAP FLAT, MAX SPAN 90m



SECTION 1.6	
SPAN LENGTH	'N' MIN. CLEARANCE
0-45m	1.5m (5')
46-60m	1.8m (6')
61-70m	2.1m (7')
71-90m	2.4m (8')

MATERIAL LIST 01-300-46kV			
Part #	Qty.	Description	Part Number
1	3	Insulator Universal 46kV	U00004
2	3	Stud Insulator Short	U00006
3	1	Bracket Pole Top Tangent	U00005
4	2	Bracket Stand-off 9"	U00036
5	6	Washer 5/8"x2"x2"	U00022
6	5	Bolt 5/8" (6" to 24")	U00010-U00019
7*	As Req'd	Bracket Stand-off 18"	U00052

*Item 4 - Clamp Conductor Deadend can be substituted with items 7.

MATERIAL LIST 01-306-46kV			
Part #	Qty.	Description	Part Number
1	3	Insulator Deadend 46kV	U00027
2	1	Crossarm Apitong 7"	U00876
2	1	Crossarm Steel 7.5'	U00257
2	1	Crossarm Steel 9.5'	U00259
2	1	Crossarm Fiberglass 7.5'	U00268
2	1	Crossarm Fiberglass 9.5'	U00265
3	3	Clamp Conductor Deadend (Waveseat)	U00030
4	3	Eye 3/4" Bolt (D-Ring)	U00072
5	4	Washer 3/4"x2"x2"	U00058
6	2	Washer 5/8"x2"x2"	U00022
7	2	Lock Washer for 3/4" Bolt	U00059
8	2	Bolt 3/4"x6"	U00060
9	2	Bolt 3/4" (6" to 24")	U00060-U00069
10	1	Bolt 5/8" (6" to 24")	U00010-U00019
11*	As Req'd	Clevis Bail Deadend	U00031
12*	As Req'd	Grip Conductor Preformed Deadend	U00032

*Item 3 - Clamp Conductor Deadend can be substituted with items 11 & 12.

MATERIAL LIST 01-308-46kV			
Part #	Qty.	Description	Part Number
1	3	Insulator Universal 46kV	U00004
2	6	Insulator Deadend 46kV	U00027
3	1	Stud Insulator Short	U00006
4	2	Stud Insulator Long	U00038
5	1	Crossarm Steel 9.5'	U00259
5	1	Crossarm Fiberglass 9.5'	U00265
6	1	Bracket Pole Top Tangent	U00005
7	6	Clamp Conductor Deadend (Waveseat)	U00030
8	3	Eye for 5/8" Bolt (D-Ring)	U00029
9	3	Eye Nut for 5/8" Bolt	U00037
10	7	Washer 5/8"x2"x2"	U00022
11	2	Lock Washer for 5/8" Bolt	U00023
12	2	Bolt 5/8"x6"	U00010
13	5	Bolt 5/8" (6" to 24")	U00010-U00019
14	3	Connector Wedge Type	Refer to Chart 13-01
15*	As Req'd	Clevis Bail Deadend	U00031
16*	As Req'd	Grip Conductor Preformed Deadend	U00032

*Item 7 - Clamp Conductor Deadend can be substituted with items 15 & 16.

MATERIAL LIST 01-326-46kV			
Part #	Qty.	Description	Part Number
1	1	Insulator Universal 46kV	U00004
2	3	Insulator Deadend 46kV	U00027
3	1	Insulator Riser Support 46kV	U00043
4	1	Stud Insulator Long	U00038
5	1	Crossarm Apitong 7"	U00876
5	1	Crossarm Steel 7.5'	U00257
5	1	Crossarm Steel 9.5'	U00259
5	1	Crossarm Fiberglass 7.5'	U00268
5	1	Crossarm Fiberglass 9.5'	U00265
6	3	Clamp Conductor Deadend (Waveseat)	U00030
7	3	Eye 3/4" Bolt (D-Ring)	U00072
8	2	Washer 5/8"x2"x2"	U00022
9	4	Washer 3/4"x2"x2"	U00058
10	2	Lock Washer for 3/4" Bolt	U00059
11	1	Bolt 5/8" (6" to 24")	U00010-U00019
12	2	Bolt 3/4"x6"	U00060
13	2	Bolt 3/4" (6" to 24")	U00060-U00069
14	3	Connector Wedge Type	Refer to Chart 13-01
15*	As Req'd	Clevis Bail Deadend	U00031
16*	As Req'd	Grip Conductor Preformed Deadend	U00032

*Item 6 - Clamp Conductor Bolted Deadend can be substituted with items 15 & 16.

1. This drawing is the exclusive property of Runge & Associates Inc. and the reproduction of any part without prior written consent of this office is strictly prohibited.

2. The contractor shall verify all dimensions, levels, and datums on site and report any discrepancies or omissions to this office prior to construction.

3. This drawing is to be read and understood in conjunction with all other plans and documents applicable to this project.

4. Drawing revision must be note "Issued For Construction" before any work commences

ACCEPTED FOR CONSTRUCTION
COLLUS POWER CORP

per .....

Date: .....

No.	ISSUE OR REVISION	DATE DD/MM/YY	ISSUER
1	ISSUED FOR CLIENT REVIEW	02/04/18	SRT
2	ISSUED FOR COLLUS POWERSTREAM, BELL AND ROGERS REVIEW	02/04/18	SRT
3	SECOND SUBMISSION	03/04/18	SRT
4	ISSUED FOR TENDER	25/04/18	SRT
5	REISSUED FOR COLLUS AND TOWN REVIEW	14/06/18	SRT
6	ISSUED FOR CONSTRUCTION	01/08/18	SRT
7	RE-ISSUED FOR CONSTRUCTION	24/04/19	SRT
8	AS BUILT	28/04/20	SRT

runge
& associates inc. ENGINEERS
864 Hurontario Street
P.O. Box 387
Collingwood, ON, L9Y 3Z7
b: (705) 446-3590
f: (705) 446-3588
www.rangengineers.ca

Client
VAN DOLDER'S HOME TEAM

20 BALSAM ST
COLLINGWOOD, ON L9Y 4H7

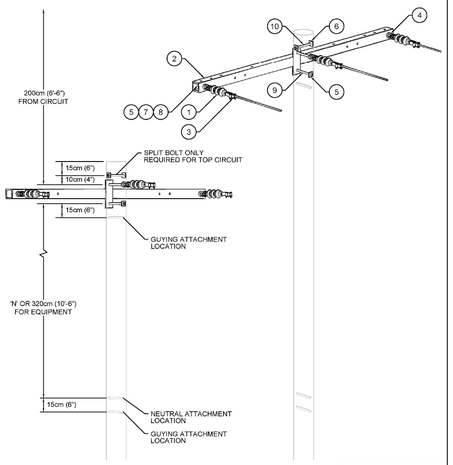
Project Name
185 MOUNTAIN RD
VAN DOLDER'S SUBDIVISION

Drawing Title
COLLUS POWERSTREAM STANDARDS

Drawn By	Checked By	Drawing No.
SRT	GGR	E4
Scale	Project No.	
AS SHOWN	1716BP	

Utilities Standards Forum	DATE:	SCALE:	REV:	DWG NO.:
USF	2011-10-15	NTS	1	01-306-15kV

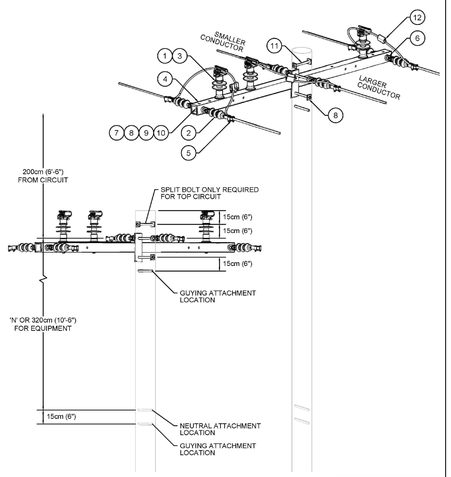
TITLE: PRIMARY 3-PHASE DEADEND FLAT, MAX SPAN 90m



SECTION 1.6	
SPAN LENGTH	'N' MIN. CLEARANCE
0-45m	1.5m (5')
46-60m	1.8m (6')
61-70m	2.1m (7')
71-90m	2.4m (8')

Utilities Standards Forum	DATE:	SCALE:	REV:	DWG NO.:
USF	2011-10-15	NTS	1	01-309-15kV

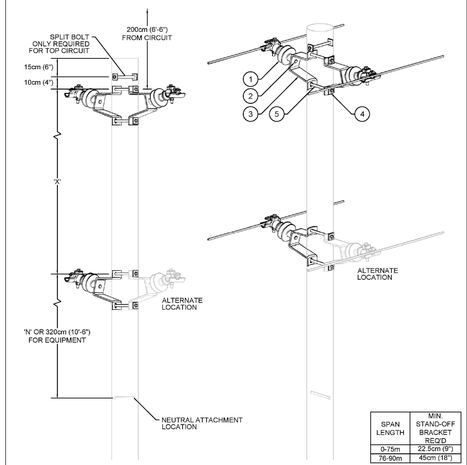
TITLE: PRIMARY 3-PHASE LINE TENSION CHANGE, MAX SPAN 90m



SECTION 1.6	
SPAN LENGTH	'N' MIN. CLEARANCE
0-45m	1.5m (5')
46-60m	1.8m (6')
61-70m	2.1m (7')
71-90m	2.4m (8')

Utilities Standards Forum	DATE:	SCALE:	REV:	DWG NO.:
USF	2016-01-01	NTS	2	01-310-15kV

TITLE: PRIMARY 3-PHASE TANGENT, MAX SPAN 90m



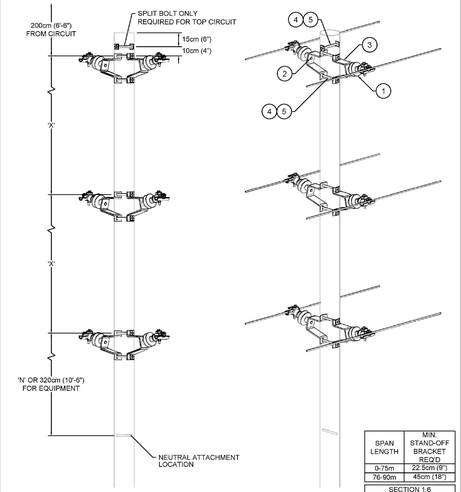
SPAN LENGTH	MIN. STAND-OFF BRACKET REQ'D
0-75m	22.5cm (9")
76-90m	45cm (18")

	'X'	
SYSTEM VOLTAGE	SPAN LENGTH 0-75m	SPAN LENGTH 75-90m
4.16kV	75cm (2'-6")	105cm (3'-6")
8.32kV	120cm (4')	150cm (5')
13.8kV	120cm (4')	150cm (5')

SECTION 1.6	
SPAN LENGTH	'N' MIN. CLEARANCE
0-45m	1.5m (5')
46-60m	1.8m (6')
61-70m	2.1m (7')
71-90m	2.4m (8')

Utilities Standards Forum	DATE:	SCALE:	REV:	DWG NO.:
USF	2016-01-01	NTS	2	01-316-15kV

TITLE: PRIMARY 3-PHASE 2-CCT TANGENT, MAX SPAN 90m



SPAN LENGTH	MIN. STAND-OFF BRACKET REQ'D
0-75m	22.5cm (9")
76-90m	45cm (18")

	'X'	
SYSTEM VOLTAGE	SPAN LENGTH 0-75m	SPAN LENGTH 75-90m
4.16kV	75cm (2'-6")	105cm (3'-6")
8.32kV	120cm (4')	150cm (5')
13.8kV	120cm (4')	150cm (5')

SECTION 1.6	
SPAN LENGTH	'N' MIN. CLEARANCE
0-45m	1.5m (5')
46-60m	1.8m (6')
61-70m	2.1m (7')
71-90m	2.4m (8')

MATERIAL LIST 01-306-15kV			
Part #	Qty.	Description	Part Number
1	3	Insulator Deadend 15kV	U00024
2	1	Crossarm Apitong 5'	U00875
2	1	Crossarm Apitong 7'	U00876
2	1	Crossarm Steel 4.5'	U00255
2	1	Crossarm Steel 5.5'	U00256
2	1	Crossarm Steel 7.5'	U00257
2	1	Crossarm Steel 9.5'	U00259
2	1	Crossarm Fiberglass 7.5'	U00268
2	1	Crossarm Fiberglass 9.5'	U00265
3	3	Clamp Conductor Deadend (Waveseat)	U00030
4	3	Eye 3/4" Bolt (D-Ring)	U00072
5	4	Washer 3/4"x2"x2"	U00058
6	2	Washer 5/8"x2"x2"	U00022
7	2	Lock Washer for 3/4" Bolt	U00059
8	2	Bolt 3/4"x6"	U00060
9	2	Bolt 3/4" (6" to 24")	U00060-U00069
10	1	Bolt 5/8" (6" to 24")	U00010-U00019
11*	As Req'd	Clevis Bail Deadend	U00031
12*	As Req'd	Grip Conductor Preformed Deadend	U00032

*Item 3 - Clamp Conductor Deadend can be substituted with items 11 & 12.

MATERIAL LIST 01-309-15kV			
Part #	Qty.	Description	Part Number
1	3	Insulator Universal 15kV	U00001
2	6	Insulator Deadend 15kV	U00024
3	3	Stud Insulator Long	U00038
4	1	Crossarm Steel 9.5'	U00259
4	1	Crossarm Fiberglass 9.5'	U00265
5	6	Clamp Conductor Deadend (Waveseat)	U00030
6	3	Eye for 5/8" Bolt (D-Ring)	U00029
7	3	Eye Nut for 5/8" Bolt	U00037
8	6	Washer 5/8"x2"x2"	U00022
9	2	Lock Washer for 5/8" Bolt	U00023
10	2	Bolt 5/8" & 6"	U00010
11	3	Bolt 5/8" (6" to 24")	U00010-U00019
12	3	Connector Wedge Type	Refer to Chart 13-01
13*	As Req'd	Clevis Bail Deadend	U00031
14*	As Req'd	Grip Conductor Preformed Deadend	U00032

*Item 5 - Clamp Conductor Deadend can be substituted with items 13 & 14.

MATERIAL LIST 01-310-15kV			
Part #	Qty.	Description	Part Number
1	3	Insulator Universal 15kV	U00001
2	3	Stud Insulator Short	U00006
3	3	Bracket Stand-off 9"	U00036
4	6	Washer 5/8"x2"x2"	U00022
5	5	Bolt 5/8" (6" to 24")	U00010-U00019
6*	As Req'd	Bracket Stand-off 18"	U00052

*Item 3 - Bracket Stand-off can be substituted with item 6.

MATERIAL LIST 01-316-15kV			
Part #	Qty.	Description	Part Number
1	6	Insulator Universal 15kV	U00001
2	6	Stud Insulator Short	U00006
3	6	Bracket Stand-off 9"	U00036
4	8	Washer 5/8"x2"x2"	U00022
5	7	Bolt 5/8" (6" to 24")	U00010-U00019
6*	As Req'd	Bracket Stand-off 18"	U00052

* Item 3 - Bracket Stand-off can be substituted with item 6.

1. This drawing is the exclusive property of Runge & Associates Inc. and the reproduction of any part without prior written consent of this office is strictly prohibited.

2. The contractor shall verify all dimensions, levels, and datums on site and report any discrepancies or omissions to this office prior to construction.

3. This drawing is to be read and understood in conjunction with all other plans and documents applicable to this project.

4. Drawing revision must be note "Issued For Construction" before any work commences

ACCEPTED FOR CONSTRUCTION
COLLUS POWER CORP

per .....

Date: .....

No.	ISSUE OR REVISION	DATE DD/MM/YY	ISSUER
1	ISSUED FOR CLIENT REVIEW	02/04/18	SRT
2	ISSUED FOR COLLUS POWERSTREAM, BELL AND ROGERS REVIEW	02/04/18	SRT
3	SECOND SUBMISSION	03/04/18	SRT
4	ISSUED FOR TENDER	25/04/18	SRT
5	REISSUED FOR COLLUS AND TOWN REVIEW	14/06/18	SRT
6	ISSUED FOR CONSTRUCTION	01/08/18	SRT
7	RE-ISSUED FOR CONSTRUCTION	24/04/19	SRT
8	AS BUILT	28/04/20	SRT

runge
& associates inc. ENGINEERS

864 Hurontario Street
P.O. Box 387
Collingwood, ON, L9Y 3Z7

b: (705) 446-3590
f: (705) 446-3588
www.rainengineers.ca

Client
VAN DOLDER'S HOME TEAM

20 BALSAM ST
COLLINGWOOD, ON L9Y 4H7

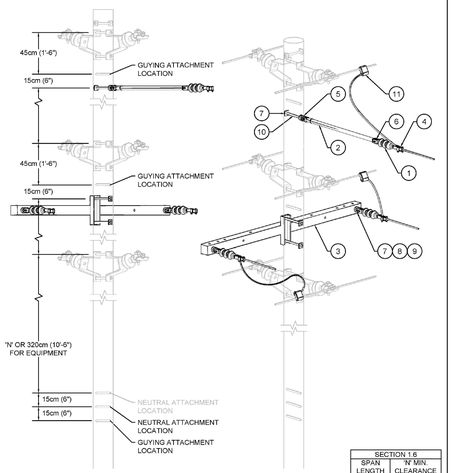
Project Name
185 MOUNTAIN RD
VAN DOLDER'S SUBDIVISION

Drawing Title
COLLUS POWERSTREAM STANDARDS

Drawn By	Checked By	Drawing No.
SRT	GGR	E5
Scale	Project No.	
AS SHOWN	1716BP	

Utilities Standards Forum	DATE:	SCALE:	REV:	DWG NO.:
USF	2016-01-01	NTS	2	01-332-15kV

TITLE: PRIMARY 3-PHASE LINE TAP TRIANGULAR NEAR SIDE, MAX SPAN 90m



SECTION 1.6	
SPAN LENGTH	'N' MIN. CLEARANCE
0-45m	1.5m (5')
46-60m	1.8m (6')
61-70m	2.1m (7')
71-90m	2.4m (8')

NOTE:
1. BACKGROUND FRAMING MUST MEET 01-316 MINIMUM CLEARANCES.

Utilities Standards Forum	DATE:	SCALE:	REV:	DWG NO.
USF	2014-11-21	NTS	1	10-200

TITLE: FACTORY ASSEMBLED BUS

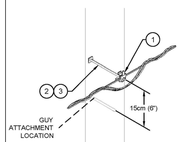


FIG 1 - NEUTRAL CLAMP 0-15°

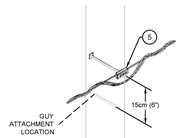


FIG 2 - TWO BOLT CLAMP 0-3°

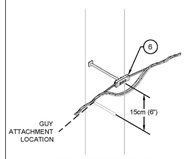


FIG 3 - TWO BOLT CLAMP 0-15°

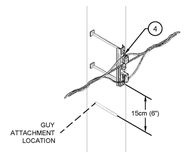


FIG 4 - RACK 0-15°

NOTE:
1. APPLICABLE FOR 1-PHASE (AS SHOWN) AND 3-PHASE INSTALLATION.

ALL DIMENSIONS ARE IN cm UNLESS OTHERWISE SPECIFIED.

Utilities Standards Forum				
USF	2014-11-21	NTS	1	10-200A

TITLE: FACTORY ASSEMBLED BUS

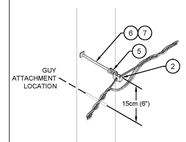


FIG 1 - ANGLES 16-60°

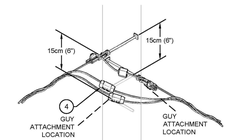


FIG 2 - ANGLES 61-90°

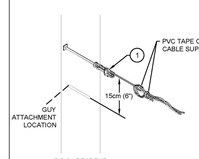


FIG 3 - DEADEND

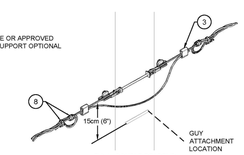


FIG 4 - DOUBLE DEADEND

NOTES:
1. APPLICABLE FOR 1-PHASE (AS SHOWN) AND 3-PHASE INSTALLATION.
2. WAVESEAT CLAMPS MAY BE REPLACED WITH PREFORM GRIPS FOR CONDUCTOR SIZES OF 3/0 AND SMALLER.

ALL DIMENSIONS ARE IN cm UNLESS OTHERWISE SPECIFIED.

Utilities Standards Forum	DATE:	SCALE:	REV:	DWG NO.:
USF	2014-11-21	NTS	1	10-400

TITLE: SECONDARY RISER - 1-PHASE OR 3-PHASE

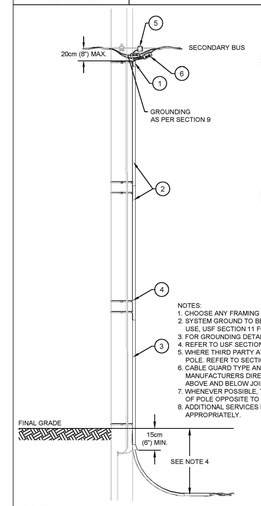


FIG 1 - DUCT

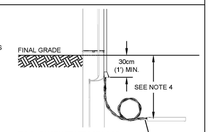


FIG 2 - DUCT WITH FROST LOOP

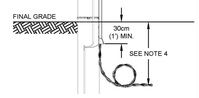


FIG 3 - DIRECT BURIED

NOTES:
1. CHOOSE ANY FRAMING WITHIN THIS SECTION.
2. SYSTEM GROUND TO BE INSTALLED AS PER USF SECTION 09 FOR NON-JOINT USE, USF SECTION 11 FOR JOINT USE APPLICATION.
3. FOR GROUNDING DETAILS ON METALLIC CABLE GUARDS, REFER TO SECTION 09.
4. REFER TO USF SECTION 12 FOR DUCT AND TRENCH DETAILS.
5. WHERE THIRD PARTY ATTACHMENT ARE PRESENT OR EXPECTED ON THE POLE, REFER TO SECTION 11 FOR DETAILS ON CABLE GUARD HEIGHTS.
6. CABLE GUARD TYPE AND MOUNTING DETAILS ARE TO BE AS PER MANUFACTURERS DIRECTIONS. CABLE GUARD SUPPORTS TO BE INSTALLED ABOVE AND BELOW JOINTS AS A MINIMUM.
7. WHENEVER POSSIBLE, THE RISER CABLES SHOULD BE LOCATED TO THE SIDE OF POLE OPPOSITE TO ON-COMING TRAFFIC (OESC BULLETIN DTB-0606).
8. ADDITIONAL SERVICES MAY BE ADDED AS REQUIRED. ADJUST MATERIAL APPROPRIATELY.

ALL DIMENSIONS ARE IN cm UNLESS OTHERWISE SPECIFIED.

MATERIAL LIST 01-332-15kV			
Part #	Qty.	Description	Part Number
1	3	Insulator Deadend 15kV	U00024
2	1	Insulator Strain Rod 18"	U00033
3	1	Crossarm Apitong 5'	U00875
3	1	Crossarm Apitong 7'	U00876
3	1	Crossarm Steel 4.5'	U00255
3	1	Crossarm Steel 5.5'	U00256
3	1	Crossarm Steel 7.5'	U00257
3	1	Crossarm Steel 9.5'	U00259
3	1	Crossarm Fiberglass 7.5'	U00268
3	1	Crossarm Fiberglass 9.5'	U00265
4	3	Clamp Conductor Deadend (Waveseat)	U00030
5	3	Eye 3/4" Bolt (D-Ring)	U00072
6	As Req'd	Eye Link Straight Double	U00035
7	5	Washer 3/4"x2"x2"	U00058
8	2	Lock Washer for 3/4" Bolt	U00059
9	2	Bolt 3/4"x6"	U00060
10	3	Bolt 3/4" (6" to 24")	U00060-U00069
11	3	Connector Wedge Type	Refer to Chart 13-01
12*	As Req'd	Clevis Bail Deadend	U00031
13*	As Req'd	Grip Conductor Preformed Deadend	U00032

*Item 4 - Clamp Conductor Bolted Deadend can be substituted with items 12 & 13.

MATERIAL LIST 10-200			
Part #	Qty.	Description	Part Number
1	As Req'd	Clamp, Neutral Conductor	U00021
2	As Req'd	Bolt, 5/8" (6" to 24")	U00010-U00019
3	As Req'd	Washer, 5/8" x 2" x 2"	U00022
4	As Req'd	Rack, Triplex Support	U06640
5	As Req'd	Straight Line Clamp	U07270
6	As Req'd	Angled Clamp	U07275

MATERIAL LIST 10-200A			
Part #	Qty.	Description	Part Number
1	As Req'd	Clamp, Conductor, Bolted, Deadend	U00030
2	As Req'd	Clamp, Conductor, Angle	U00028
3	As Req'd	Connector, Wedge Type	Refer to Chart 13-01
4	As Req'd	Connector, Wedge Type & Cover	Refer to Chart 13-01
5	As Req'd	Bolt Eye for 5/8" Bolt	U00029
6	As Req'd	Bolt, 5/8" (6" to 24")	U00010-U00019
7	As Req'd	Washer, 5/8" x 2" x 2"	U00022
8	As Req'd	Cable Support	U02500
9*	As Req'd	Clevis Bail, Deadend	U00031
10*	As Req'd	Grip, Conductor, Preformed, Deadend	U00032

*Item 1 - Clamp, Conductor, Bolted, Deadend can be substituted with items 9 & 10.

MATERIAL LIST 10-400			
Part #	Qty.	Description	Part Number
1	1	Clip, Throat	U03005-U03006
2	As Req'd	Guard, Cable, Straight	U00372-U00374
3	1	Guard, Cable, Flared	U00369-U00371
4	6	Straps, Cable Guard	U00375-U00379
5	As Req'd	Connector, Wedge Type	Refer to Chart 13-01
6	As Req'd	Connector, Wedge Type & Cover	Refer to Chart 13-01

1. This drawing is the exclusive property of Runge & Associates Inc. and the reproduction of any part without prior written consent of this office is strictly prohibited.

2. The contractor shall verify all dimensions, levels, and datums on site and report any discrepancies or omissions to this office prior to construction.

3. This drawing is to be read and understood in conjunction with all other plans and documents applicable to this project.

4. Drawing revision must be note "Issued For Construction" before any work commences

ACCEPTED FOR CONSTRUCTION
COLLUS POWER CORP

per .....

Date: .....

No.	ISSUE OR REVISION	DATE DD/MM/YY	ISSUER
1	ISSUED FOR CLIENT REVIEW	02/04/18	SRT
2	ISSUED FOR COLLUS POWERSTREAM, BELL AND ROGERS REVIEW	02/04/18	SRT
3	SECOND SUBMISSION	03/04/18	SRT
4	ISSUED FOR TENDER	25/04/18	SRT
5	REISSUED FOR COLLUS AND TOWN REVIEW	14/06/18	SRT
6	ISSUED FOR CONSTRUCTION	01/08/18	SRT
7	RE-ISSUED FOR CONSTRUCTION	24/04/19	SRT
8	AS BUILT	28/04/20	SRT

runge
& associates inc. ENGINEERS
864 Hurontario Street
P.O. Box 387
Collingwood, ON, L9Y 3Z7
b: (705) 446-3590
f: (705) 446-3588
www.rajengineers.ca

Client
VAN DOLDER'S HOME TEAM

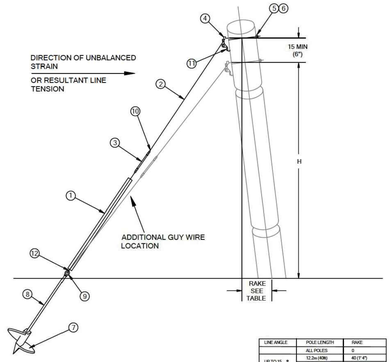
20 BALSAM ST
COLLINGWOOD, ON L9Y 4H7

Project Name
185 MOUNTAIN RD
VAN DOLDER'S SUBDIVISION

Drawing Title
COLLUS POWERSTREAM STANDARDS

Drawn By	Checked By	Drawing No.
SRT	GGR	E6
Scale: AS SHOWN	Project No.: 1716BP	

06-100



LINE ANGLE	POLE LENGTH	RAKE
	ALL POLES	0
UP TO 15 °	12.2m (40ft)	40 (1'4")
	13.7m (45ft)	40 (1'4")
OVER 15 °	15.2m (50ft)	30 (0'3")
	16.8m (55ft)	30 (0'3")
	18.3m (60ft)	60 (2'0")
	19.8m (65ft)	60 (2'0")
	21.3m (70ft)	30 (0'3.5")
	22.9m (75ft)	30 (0'3.5")
	24.4m (80ft)	60 (2'0")

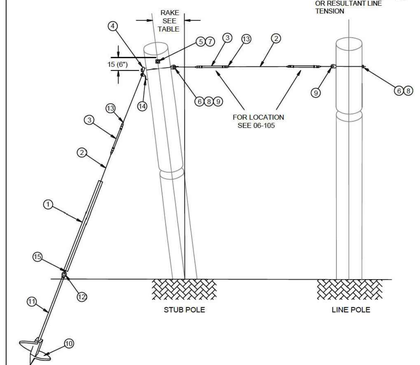
NOTE:
1. ANCHOR TYPE TO SUIT SOIL CONDITIONS SEE TABLE 06-12 OF SECTION 06.
2. ITEM 12 - CLAMP, GUY, 3-BOLT CAN BE SUBSTITUTED WITH ITEM 10 - GRIP, GUY WIRE, 3/8" (9mm)
3. ALL DIMENSIONS ARE IN cm UNLESS OTHERWISE SPECIFIED.

Utilities Standards Forum USF

Title: DOWN GUY(S)

SIZE	FILE NAME	DWG NO.	REV
A	06-100.DWG	06-100	1
SCALE NTS	DATE 2011-10-15	SHEET 1	

06-104



NOTE:
1. ANCHOR TYPE TO SUIT SOIL CONDITIONS SEE TABLE 06-12 OF SECTION 06.
2. ITEM 16 - CLAMP, GUY, 3-BOLT CAN BE SUBSTITUTED WITH ITEM 14 - GRIP, GUY WIRE, 3/8" (9mm)
3. ALL DIMENSIONS ARE IN cm UNLESS OTHERWISE SPECIFIED.

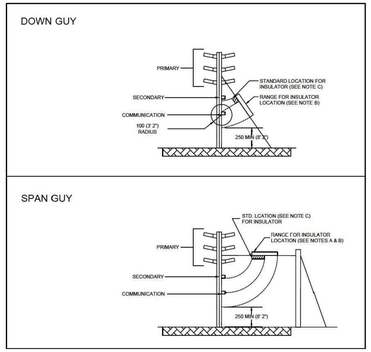
STUB LENGTHS	RAKE
9.1m (30ft)	60cm (2' 0")
10.7m (35ft)	75cm (2' 5 1/2")
12.2m (40ft)	90cm (2' 7 1/2")

Utilities Standards Forum USF

Title: SPAN and ANCHOR GUY

SIZE	FILE NAME	DWG NO.	REV
A	06-104.DWG	06-104	1
SCALE NTS	DATE 2011-10-15	SHEET 1	

06-105



A) A SECOND INSULATOR IS REQUIRED IF POWER CIRCUIT OF A SEPERATE LINE IS CROSSING ABOVE OR BELOW SPAN GUY. THIS SECOND INSULATOR SHOULD BE LOCATED SO AS TO ISOLATE THE SECTION OF THE SPAN GUY WHICH IS EXPOSED TO THE CROSSING CIRCUIT.

B) THE INSULATOR SHOULD FALL BELOW ALL POWER ATTACHMENTS (INCLUDING NEUTRAL) UNDER BROKEN GUY CONDITIONS AND IT SHOULD BE A MINIMUM OF 200cm (WHERE POSSIBLE) FROM THE POLE ATTACHMENT.

C) IF COMMUNICATION (TELEPHONE OR CABLE T.V.) CONNECTIONS ARE ON POLE, GUY INSULATOR MUST BE IN THE STANDARD LOCATION AS SHOWN.

D) DIMENSIONS ARE IN cm UNLESS OTHERWISE SPECIFIED.

Utilities Standards Forum USF

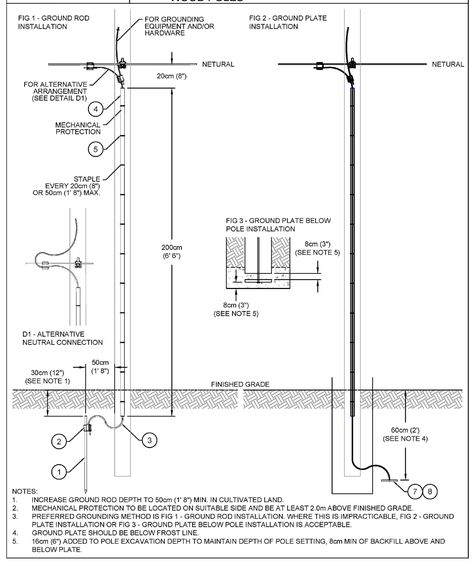
Title: LOCATION of GUY STRAIN INSULATOR

SIZE	FILE NAME	DWG NO.	REV
A	06-105.DWG	06-105	1
SCALE NTS	DATE 2011-10-15	SHEET 1	

Utilities Standards Forum USF

DATE:	SCALE:	REV:	DWG NO.:
2016-01-01	NTS	3	09-100

TITLE: GROUNDING FOR OVERHEAD INSTALLATIONS ON WOOD POLES



NOTES:
1. INCREASE GROUND ROD DEPTH TO 50cm (1' 8") MIN. IN CULTIVATED LAND.
2. MECHANICAL PROTECTION TO BE LOCATED ON SUITABLE SIDE AND BE AT LEAST 2.0m ABOVE FINISHED GRADE.
3. PREFERRED GROUNDING METHOD IS FIG 1 - GROUND ROD INSTALLATION. WHERE THIS IS IMPRACTICABLE, FIG 2 - GROUND PLATE INSTALLATION OR FIG 3 - GROUND PLATE BELOW POLE INSTALLATION IS ACCEPTABLE.
4. GROUND PLATE SHOULD BE BELOW FROST LINE.
5. 15cm (6") ADDED TO POLE EXCAVATION DEPTH TO MAINTAIN DEPTH OF POLE SETTING, 8cm MIN OF BACKFILL ABOVE AND BELOW PLATE.

USF STANDARD 06-100

Material List

Part #	Qty.	Description	4.16kV to 13.8kV	27.6kV	34.5kV	44kV
1	1	Guard, Guy	U01941			
2	As Req'd	Wire, Guy, 3/8" (9mm), Grade 180	U01890			
3**	1	Insulator, Guy	U01880-U01881			
4	1	Hook, Guy, Combination Type	U01900-U01903			
5	1	Bolt, 3/4" (6" to 24")	U00060-U00069			
6	1	Washer, 3/4"	U00110-U00111			
7***	1	Anchor	U01925-U01931, U00600-U00608			
8***	1	Rod, Anchor	U01934-U01937			
9***	1	Nut, Eye	U01917-U01922			
10	3	Grip, Guy Wire, 3/8" (9mm)	U00381			
11	1	Screw, Lag, 1/2" x 4 1/2"	U00048			
12*	2	Clamp, Guy, 3-Bolt	U00380			

* Item 12 - Clamp, Guy, 3-Bolt can be substituted with item 10 - Grip, Guy Wire, 3/8" (9mm)
** Item 3 - Can be replaced by strain rod insulator (U01882-U01887)
*** Items 7,8 & 9 - Anchor selection is dependent on soil type, Table 06-12.

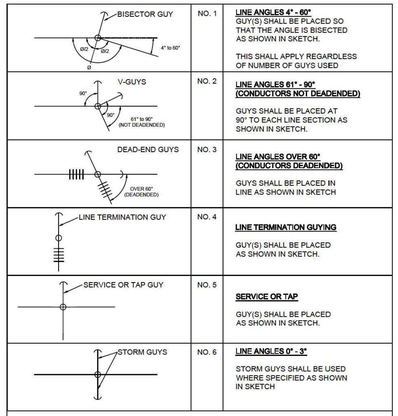
USF STANDARD 06-104

Material List

Part #	Qty.	Description	4.16kV to 13.8kV	27.6kV	34.5kV	44kV
1	1	Guard, Guy	U01941			
2	As Req'd	Wire, Guy, 3/8" (9mm), Grade 180	U01890			
3**	1	Insulator, Guy	U01880-U01881			
4	1	Hook, Guy, Combination Type	U01900-U01903			
5	1	Bolt, 5/8" (6" to 24")	U00010-U00019			
6	2	Bolt, 3/4" (6" to 24")	U00060-U00069			
7	2	Washer, 5/8"	U00022			
8	2	Washer, 3/4"	U00110-U00111			
9	2	Thimble, Eye, Tapped, 3/4" hole	U01913			
10***	1	Anchor	U01925-U01931, U00600-U00608			
11***	1	Rod, Anchor	U01934-U01937			
12***	1	Nut, Eye	U01917-U01922			
13	9	Grip, Guy Wire, 3/8" (9mm)	U00381			
14	1	Screw, Lag, 1/2" x 4 1/2"	U00048			
15*	2	Clamp, Guy, 3-Bolt	U00380			

* Item 15 - Clamp, Guy, 3-Bolt can be substituted with Item 13 - Grip, Guy Wire, 3/8" (9mm)
** Item 3 - Can be replaced by strain rod insulator (U01882-U01887)
*** Items 10, 11 & 12 - Anchor selection is dependent on soil type, Table 06-12.

06-106



NOTE: THESE ARRANGEMENTS MAY BE ALTERED TO SUIT LOCAL CONDITIONS

Utilities Standards Forum USF

Title: TYPICAL GUY ARRANGEMENTS

SIZE	FILE NAME	DWG NO.	REV
A	06-106.DWG	06-106	1
SCALE NTS	DATE 2011-10-15	SHEET 1	

MATERIAL LIST 09-100

Part #	Qty.	Description	Part Number
1	1	Ground Rod	U00484
2	1	Connector	U01145-U01146
3	As Req'd	Ground Wire	U02000
4	As Req'd	Guard, Ground Wire	U00368
5	As Req'd	Staples	U00378
6	1	Ground Plate	U0049X
7	1	Connector, Ground Plate	U5270

1. This drawing is the exclusive property of Runge & Associates Inc. and the reproduction of any part without prior written consent of this office is strictly prohibited.

2. The contractor shall verify all dimensions, levels, and datums on site and report any discrepancies or omissions to this office prior to construction.

3. This drawing is to be read and understood in conjunction with all other plans and documents applicable to this project.

4. Drawing revision must be note "Issued For Construction" before any work commences

ACCEPTED FOR CONSTRUCTION
COLLUS POWER CORP
per .....
Date: .....

No.	ISSUE OR REVISION	DATE DD/MM/YY	ISSUER
1	ISSUED FOR CLIENT REVIEW	02/04/18	SRT
2	ISSUED FOR COLLUS POWERSTREAM, BELL AND ROGERS REVIEW	02/04/18	SRT
3	SECOND SUBMISSION	03/04/18	SRT
4	ISSUED FOR TENDER	25/04/18	SRT
5	REISSUED FOR COLLUS AND TOWN REVIEW	14/06/18	SRT
6	ISSUED FOR CONSTRUCTION	01/08/18	SRT
7	RE-ISSUED FOR CONSTRUCTION	24/04/19	SRT
8	AS BUILT	28/04/20	SRT

runge & associates inc. ENGINEERS
864 Hurontario Street
P.O. Box 387
Collingwood, ON, L9Y 3Z7
b: (705) 446-3590
f: (705) 446-3588
www.rungengineers.ca

Client
VAN DOLDER'S HOME TEAM
20 BALSAM ST
COLLINGWOOD, ON L9Y 4H7

Project Name
185 MOUNTAIN RD
VAN DOLDER'S SUBDIVISION

Drawing Title
COLLUS POWERSTREAM STANDARDS

Drawn By	Checked By	Drawing No.
SRT	GGR	E7
Scale: AS SHOWN	Project No.: 1716BP	

APPENDIX B

Water Demand Calculations

CROZIER

Project: 555 Tenth Line
Project No.: 2577-6904
Date: 2025.05.13
By: AM

555 Tenth Line - Historical Water Usage

Year	Month	Meter Usage (m3)	Usage Per Day (m3)	Days Billed	
2022	Jan	561	18.09	31	
	Feb	565	20.17	28	
	March	509	16.41	31	
	April	564	18.8	30	
	May	853	27.53	31	
	June	980	32.67	30	
	July	876	28.25	31	
	Aug	863	27.85	31	
	Sept	961	32.03	30	
	Oct	1085	35	31	
	Nov	1107	36.89	30	*max month demand
	Dec	581	18.75	31	
	Average	**792**	**26.04**		

Year	Month	Meter Usage (m3)	Usage Per Day (m3)	Days Billed	
2023	Jan	582	18.78	31	
	Feb	393	14.04	28	
	March	755	24.36	31	
	April	784	26.13	30	
	May	968	31.22	31	
	June	1170	39.01	30	*max month demand
	July	1070	34.52	31	
	Aug	920	29.67	31	
	Sept	826	27.55	30	
	Oct	834	26.91	31	
	Nov	704	23.47	30	
	Dec	280	9.03	31	
	Average	**774**	**25.39**		

Year	Month	Meter Usage (m3)	Usage Per Day (m3)	Days Billed	
2024	Jan	267	8.63	31	
	Feb	430	14.82	29	
	March	364	11.73	31	
	April	819	27.29	30	
	May	543	17.53	31	
	June	605	20.16	30	
	July	590	19.02	31	
	Aug	670	21.61	31	
	Sept	618	20.61	30	
	Oct	633	20.43	31	
	Nov				*no data obtained for this month
	Dec				*no data obtained for this month
	Average	**554**	**18.18**		

555 Tenth Line
Fire Protection Volume Calculation - OBC Method
CFCA File: 2577-6904

Date: 2025.12.11
Design By: J.Chowen
Checked By: C.Scobie

Fire Protection Water Supply Guidelines - Main Building
For Part 3 in the OBC

Notes:

1.) Proposed Building Per Tecwill Oy dated 2024.12.01 and Site Plan Per Crozier dated December 2025
2.)
3.)
4.)

$Q = KVS_{TOT}$

Q = minimum supply of water in litres (L)
K = water supply coefficient
V = total building volume in cubic metres
S_{TOT} = total of spatial coefficient values from property line exposures on all sides

K =	19	Group F3 building with non-combustible construction (Table 1)
V =	2536	Floor Area of Main Building (173.7m^2) by 14.6m height
S_{TOT} =	1	S_{TOT} Need Not Exceed 2.0

Q = 48,184 L

Based on ranges listed in Table 2, the required minimum water supply flow rate is **2700** **L/min**

Calculated Fire Flow Demand Per OBC	**45**	**L/s**
Minimum Fire Flow Demand Per Town of Collingwood Standards 4.4.3.1	**136**	**L/s**

CROZIER
CONSULTING ENGINEERS

Project: 555 Tenth Line
Project No.: 2577-6904
Date: Dec 11, 2025
By: JC
Check: CS

555 Tenth Line - Industrial Water Demand

WATER DEMAND FLOWS		
Average Daily Industrial Flow per Historical Water Usage	**26,040**	**L/d**
	0.30	**L/s**
Max Day per Capita Demand (Town of Collingwood Standards 4.4.3.2)	260	L/C-day
Equivalent Industrial Population	101	persons
Peaking Factors		
Max Day (Town of Collingwood Standards 4.4.3)	1.77	
Max Hour (Town of Collingwood Standards 4.4.3)	2.70	
Total Maximum Day Domestic Demand	**0.53**	**L/s**
Total Peak Hourly Domestic Demand	**0.81**	**L/s**
Minimum Fire Flow for Industrial Subdivisions (Town of Collingwood Standards 4.4.3.1)	136	L/s
Total Peak Water Demand (Water Demand + Fire Flow)	**136.81**	**L/s**

APPENDIX C

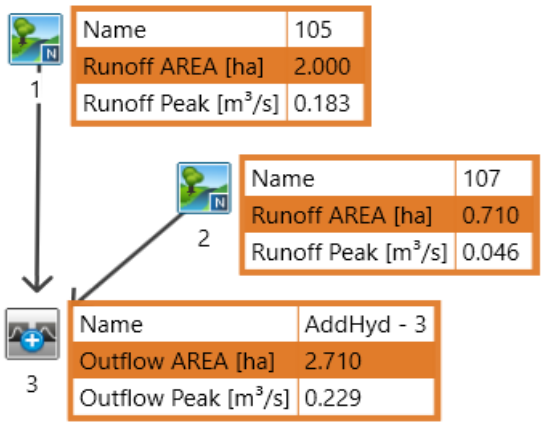
VO6 Modelling Files

CROZIER

Project: 555 Tenth Line
Project No.: 2577-6904
File: Model Schematic (Pre-Development)
Design by: AM
Date: 6/24/2025

Visual OTTHYMO 6.2 Model Schematic

Pre-Development

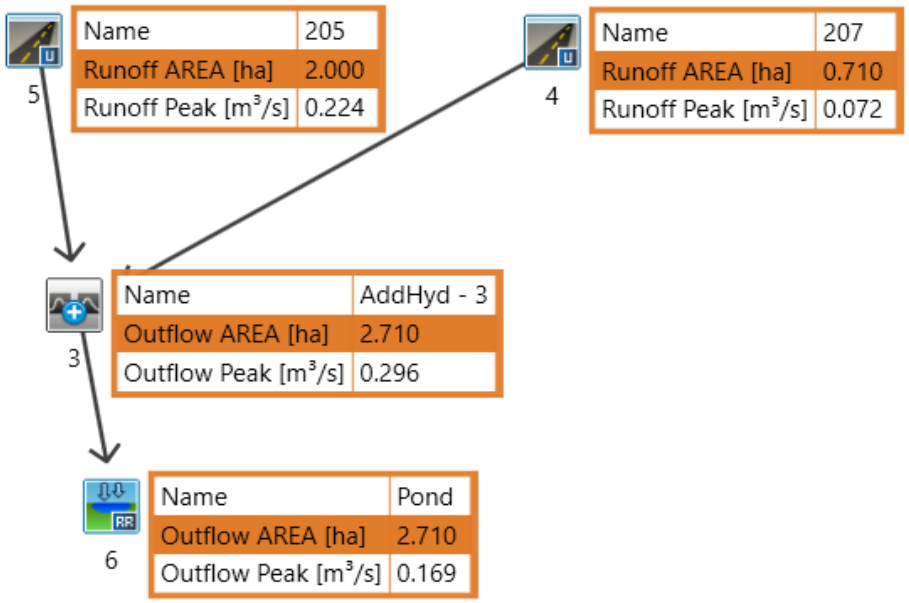


CROZIER CONSULTING ENGINEERS

Project: 555 Tenth Line
Project No.: 2577-6904
File: Model Schematic (Pre-Development)
Design by: AM
Date: 6/24/2025

Visual OTTHYMO 6.2 Model Schematic

Post-Development



```
****************************************
** SIMULATION:A. 2yr 4hr 10min Chicago **
****************************************
--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 807.440
| Ptotal= 33.75 mm |                          B=   6.750
--------------------                          C=   0.828
                       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
                0.00    1.90 |  1.00   18.51 |  2.00    4.92 |  3.00    2.30
                0.17    2.21 |  1.17   78.28 |  2.17    4.11 |  3.17    2.12
                0.33    2.64 |  1.33   24.65 |  2.33    3.53 |  3.33    1.97
                0.50    3.32 |  1.50   12.40 |  2.50    3.11 |  3.50    1.84
                0.67    4.51 |  1.67    8.22 |  2.67    2.78 |  3.67    1.73
                0.83    7.17 |  1.83    6.14 |  2.83    2.51 |  3.83    1.63


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0001)|   Area    (ha)=   2.00   Curve Number   (CN)= 77.8
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.06   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.07

        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    1.90 | 1.083   18.51 | 2.083    4.92 |  3.08    2.30
               0.167    1.90 | 1.167   18.51 | 2.167    4.92 |  3.17    2.30
               0.250    2.21 | 1.250   78.28 | 2.250    4.11 |  3.25    2.12
               0.333    2.21 | 1.333   78.28 | 2.333    4.11 |  3.33    2.12
               0.417    2.64 | 1.417   24.65 | 2.417    3.53 |  3.42    1.97
               0.500    2.64 | 1.500   24.65 | 2.500    3.53 |  3.50    1.97
               0.583    3.32 | 1.583   12.40 | 2.583    3.11 |  3.58    1.84
               0.667    3.32 | 1.667   12.40 | 2.667    3.11 |  3.67    1.84
               0.750    4.51 | 1.750    8.22 | 2.750    2.78 |  3.75    1.73
               0.833    4.51 | 1.833    8.22 | 2.833    2.78 |  3.83    1.73
               0.917    7.17 | 1.917    6.14 | 2.917    2.51 |  3.92    1.63
               1.000    7.17 | 2.000    6.14 | 3.000    2.51 |  4.00    1.63

    Unit Hyd Qpeak  (cms)=   1.091

    PEAK FLOW       (cms)=   0.088 (i)
    TIME TO PEAK    (hrs)=   1.333
    RUNOFF VOLUME    (mm)=   7.868
    TOTAL RAINFALL   (mm)=  33.748
    RUNOFF COEFFICIENT   =   0.233

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=   0.71   Curve Number   (CN)= 57.8
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.20   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

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


                          ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083    1.90 | 1.083   18.51 | 2.083    4.92 |  3.08    2.30
               0.167    1.90 | 1.167   18.51 | 2.167    4.92 |  3.17    2.30
               0.250    2.21 | 1.250   78.28 | 2.250    4.11 |  3.25    2.12
               0.333    2.21 | 1.333   78.28 | 2.333    4.11 |  3.33    2.12
               0.417    2.64 | 1.417   24.65 | 2.417    3.53 |  3.42    1.97
               0.500    2.64 | 1.500   24.65 | 2.500    3.53 |  3.50    1.97
               0.583    3.32 | 1.583   12.40 | 2.583    3.11 |  3.58    1.84
               0.667    3.32 | 1.667   12.40 | 2.667    3.11 |  3.67    1.84
               0.750    4.51 | 1.750    8.22 | 2.750    2.78 |  3.75    1.73
               0.833    4.51 | 1.833    8.22 | 2.833    2.78 |  3.83    1.73
               0.917    7.17 | 1.917    6.14 | 2.917    2.51 |  3.92    1.63
               1.000    7.17 | 2.000    6.14 | 3.000    2.51 |  4.00    1.63

    Unit Hyd Qpeak  (cms)=   0.108

    PEAK FLOW       (cms)=   0.004 (i)
    TIME TO PEAK    (hrs)=   1.667
    RUNOFF VOLUME    (mm)=   2.650
    TOTAL RAINFALL   (mm)=  33.748
    RUNOFF COEFFICIENT   =   0.079

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

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

--------------------
| ADD HYD  (  0003)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
```

```
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):     2.00   0.088     1.33     7.87
     + ID2= 2 (  0002):     0.71   0.004     1.67     2.65
       ================================================
       ID = 3 (  0003):     2.71   0.089     1.33     6.50

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
****************************************
** SIMULATION:B. 5yr 4hr 10min Chicago **
****************************************
--------------------
| CHICAGO STORM    |    IDF curve parameters: A=1135.400
| Ptotal= 44.06 mm |                          B=   7.500
--------------------                          C=   0.841
                       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
                0.00    2.37 |  1.00   24.78 |  2.00    6.34 |  3.00    2.88
                0.17    2.76 |  1.17  102.27 |  2.17    5.26 |  3.17    2.65
                0.33    3.33 |  1.33   33.10 |  2.33    4.50 |  3.33    2.45
                0.50    4.21 |  1.50   16.50 |  2.50    3.94 |  3.50    2.29
                0.67    5.79 |  1.67   10.79 |  2.67    3.50 |  3.67    2.14
                0.83    9.38 |  1.83    7.99 |  2.83    3.16 |  3.83    2.01


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0001)|   Area    (ha)=   2.00   Curve Number   (CN)= 77.8
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.06   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.07

        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    2.37 | 1.083   24.78 | 2.083    6.34 |  3.08    2.88
               0.167    2.37 | 1.167   24.78 | 2.167    6.34 |  3.17    2.88
               0.250    2.76 | 1.250  102.27 | 2.250    5.26 |  3.25    2.65
               0.333    2.76 | 1.333  102.27 | 2.333    5.26 |  3.33    2.65
               0.417    3.33 | 1.417   33.10 | 2.417    4.50 |  3.42    2.45
               0.500    3.33 | 1.500   33.10 | 2.500    4.50 |  3.50    2.45
               0.583    4.21 | 1.583   16.50 | 2.583    3.94 |  3.58    2.29
               0.667    4.21 | 1.667   16.50 | 2.667    3.94 |  3.67    2.29
               0.750    5.79 | 1.750   10.79 | 2.750    3.50 |  3.75    2.14
               0.833    5.79 | 1.833   10.79 | 2.833    3.50 |  3.83    2.14
               0.917    9.38 | 1.917    7.99 | 2.917    3.16 |  3.92    2.01
               1.000    9.38 | 2.000    7.99 | 3.000    3.16 |  4.00    2.01

     Unit Hyd Qpeak  (cms)=   1.091

     PEAK FLOW       (cms)=   0.152 (i)
     TIME TO PEAK    (hrs)=   1.333
     RUNOFF VOLUME    (mm)=  12.975
     TOTAL RAINFALL   (mm)=  44.063
     RUNOFF COEFFICIENT   =   0.294

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=   0.71   Curve Number   (CN)= 57.8
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.20   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

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


                          ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083    2.37 | 1.083   24.78 | 2.083    6.34 |  3.08    2.88
               0.167    2.37 | 1.167   24.78 | 2.167    6.34 |  3.17    2.88
               0.250    2.76 | 1.250  102.27 | 2.250    5.26 |  3.25    2.65
               0.333    2.76 | 1.333  102.27 | 2.333    5.26 |  3.33    2.65
               0.417    3.33 | 1.417   33.10 | 2.417    4.50 |  3.42    2.45
               0.500    3.33 | 1.500   33.10 | 2.500    4.50 |  3.50    2.45
               0.583    4.21 | 1.583   16.50 | 2.583    3.94 |  3.58    2.29
               0.667    4.21 | 1.667   16.50 | 2.667    3.94 |  3.67    2.29
               0.750    5.79 | 1.750   10.79 | 2.750    3.50 |  3.75    2.14
               0.833    5.79 | 1.833   10.79 | 2.833    3.50 |  3.83    2.14
               0.917    9.38 | 1.917    7.99 | 2.917    3.16 |  3.92    2.01
               1.000    9.38 | 2.000    7.99 | 3.000    3.16 |  4.00    2.01

     Unit Hyd Qpeak  (cms)=   0.108

     PEAK FLOW       (cms)=   0.009 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=   5.224
     TOTAL RAINFALL   (mm)=  44.063
     RUNOFF COEFFICIENT   =   0.119
```

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

ADD HYD (0003)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0001):	2.00	0.152	1.33	12.98
	+ ID2= 2 (0002):	0.71	0.009	1.67	5.22
	ID = 3 (0003):	2.71	0.154	1.33	10.94

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:C. 10yr 4hr 10min Chicago **
****

CHICAGO STORM	Ptotal= 50.58 mm

IDF curve parameters: A=1387.000
B= 7.970
C= 0.852
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
0.00	2.59	1.00	28.90	2.00	7.16	3.00	3.17
0.17	3.04	1.17	118.36	2.17	5.91	3.17	2.91
0.33	3.68	1.33	38.72	2.33	5.03	3.33	2.69
0.50	4.70	1.50	19.11	2.50	4.38	3.50	2.50
0.67	6.52	1.67	12.38	2.67	3.89	3.67	2.34
0.83	10.72	1.83	9.08	2.83	3.49	3.83	2.20

CALIB NASHYD (0001)	ID= 1 DT= 5.0 min	Area (ha)= 2.00	Ia (mm)= 4.06	U.H. Tp(hrs)= 0.07	Curve Number (CN)= 77.8	# of Linear Res.(N)= 3.00

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.59	1.083	28.90	2.083	7.16	3.08	3.17
0.167	2.59	1.167	28.90	2.167	7.16	3.17	3.17
0.250	3.04	1.250	118.36	2.250	5.91	3.25	2.91
0.333	3.04	1.333	118.36	2.333	5.91	3.33	2.91
0.417	3.68	1.417	38.72	2.417	5.03	3.42	2.69
0.500	3.68	1.500	38.72	2.500	5.03	3.50	2.69
0.583	4.70	1.583	19.11	2.583	4.38	3.58	2.50
0.667	4.70	1.667	19.11	2.667	4.38	3.67	2.50
0.750	6.52	1.750	12.38	2.750	3.89	3.75	2.34
0.833	6.52	1.833	12.38	2.833	3.89	3.83	2.34
0.917	10.72	1.917	9.08	2.917	3.49	3.92	2.20
1.000	10.72	2.000	9.08	3.000	3.49	4.00	2.20

Unit Hyd Qpeak (cms)= 1.091

PEAK FLOW (cms)= 0.199 (i)
TIME TO PEAK (hrs)= 1.333
RUNOFF VOLUME (mm)= 16.586
TOTAL RAINFALL (mm)= 50.580
RUNOFF COEFFICIENT = 0.328

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

CALIB NASHYD (0002)	ID= 1 DT= 5.0 min	Area (ha)= 0.71	Ia (mm)= 10.20	U.H. Tp(hrs)= 0.25	Curve Number (CN)= 57.8	# of Linear Res.(N)= 3.00

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.59	1.083	28.90	2.083	7.16	3.08	3.17
0.167	2.59	1.167	28.90	2.167	7.16	3.17	3.17
0.250	3.04	1.250	118.36	2.250	5.91	3.25	2.91
0.333	3.04	1.333	118.36	2.333	5.91	3.33	2.91
0.417	3.68	1.417	38.72	2.417	5.03	3.42	2.69
0.500	3.68	1.500	38.72	2.500	5.03	3.50	2.69
0.583	4.70	1.583	19.11	2.583	4.38	3.58	2.50
0.667	4.70	1.667	19.11	2.667	4.38	3.67	2.50
0.750	6.52	1.750	12.38	2.750	3.89	3.75	2.34
0.833	6.52	1.833	12.38	2.833	3.89	3.83	2.34
0.917	10.72	1.917	9.08	2.917	3.49	3.92	2.20
1.000	10.72	2.000	9.08	3.000	3.49	4.00	2.20

```
     Unit Hyd Qpeak  (cms)=   0.108

     PEAK FLOW       (cms)=   0.013 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=   7.214
     TOTAL RAINFALL   (mm)=  50.580
     RUNOFF COEFFICIENT   =   0.143

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

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

--------------------
| ADD HYD  (  0003)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     2.00   0.199     1.33    16.59
      + ID2= 2 (  0002):     0.71   0.013     1.67     7.21
        ================================================
        ID = 3 (  0003):     2.71   0.204     1.33    14.13

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
****************************************
** SIMULATION:D. 25yr 4hr 10min Chicago **
****************************************
--------------------
| CHICAGO STORM    |    IDF curve parameters: A=1676.200
| Ptotal= 59.07 mm |                          B=   8.300
--------------------                          C=   0.858
                       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
                0.00    2.95 |  1.00   34.10 |  2.00    8.31 |  3.00    3.63
                0.17    3.47 |  1.17  138.40 |  2.17    6.83 |  3.17    3.32
                0.33    4.22 |  1.33   45.75 |  2.33    5.80 |  3.33    3.07
                0.50    5.41 |  1.50   22.49 |  2.50    5.04 |  3.50    2.85
                0.67    7.56 |  1.67   14.49 |  2.67    4.46 |  3.67    2.66
                0.83   12.52 |  1.83   10.58 |  2.83    4.00 |  3.83    2.50


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0001)|   Area    (ha)=   2.00   Curve Number   (CN)= 77.8
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.06   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.07

         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    2.95 | 1.083   34.10 | 2.083    8.31 |  3.08    3.63
                0.167    2.95 | 1.167   34.10 | 2.167    8.31 |  3.17    3.63
                0.250    3.47 | 1.250  138.40 | 2.250    6.83 |  3.25    3.32
                0.333    3.47 | 1.333  138.40 | 2.333    6.83 |  3.33    3.32
                0.417    4.22 | 1.417   45.75 | 2.417    5.80 |  3.42    3.07
                0.500    4.22 | 1.500   45.75 | 2.500    5.80 |  3.50    3.07
                0.583    5.41 | 1.583   22.49 | 2.583    5.04 |  3.58    2.85
                0.667    5.41 | 1.667   22.49 | 2.667    5.04 |  3.67    2.85
                0.750    7.56 | 1.750   14.49 | 2.750    4.46 |  3.75    2.66
                0.833    7.56 | 1.833   14.49 | 2.833    4.46 |  3.83    2.66
                0.917   12.52 | 1.917   10.58 | 2.917    4.00 |  3.92    2.50
                1.000   12.52 | 2.000   10.58 | 3.000    4.00 |  4.00    2.50

     Unit Hyd Qpeak  (cms)=   1.091

     PEAK FLOW       (cms)=   0.265 (i)
     TIME TO PEAK    (hrs)=   1.333
     RUNOFF VOLUME    (mm)=  21.648
     TOTAL RAINFALL   (mm)=  59.070
     RUNOFF COEFFICIENT   =   0.366

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=   0.71   Curve Number   (CN)= 57.8
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.20   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

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


                              ---- TRANSFORMED HYETOGRAPH ----
                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.083    2.95 | 1.083   34.10 | 2.083    8.31 |  3.08    3.63
                0.167    2.95 | 1.167   34.10 | 2.167    8.31 |  3.17    3.63
                0.250    3.47 | 1.250  138.40 | 2.250    6.83 |  3.25    3.32
                0.333    3.47 | 1.333  138.40 | 2.333    6.83 |  3.33    3.32
```

0.417	4.22	1.417	45.75	2.417	5.80	3.42	3.07
0.500	4.22	1.500	45.75	2.500	5.80	3.50	3.07
0.583	5.41	1.583	22.49	2.583	5.04	3.58	2.85
0.667	5.41	1.667	22.49	2.667	5.04	3.67	2.85
0.750	7.56	1.750	14.49	2.750	4.46	3.75	2.66
0.833	7.56	1.833	14.49	2.833	4.46	3.83	2.66
0.917	12.52	1.917	10.58	2.917	4.00	3.92	2.50
1.000	12.52	2.000	10.58	3.000	4.00	4.00	2.50

Unit Hyd Qpeak (cms)= 0.108

PEAK FLOW (cms)= 0.019 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 10.184
TOTAL RAINFALL (mm)= 59.070
RUNOFF COEFFICIENT = 0.172

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

ADD HYD (0003)		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0001):		2.00	0.265	1.33	21.65
+ ID2= 2 (0002):		0.71	0.019	1.58	10.18
ID = 3 (0003):		2.71	0.272	1.33	18.64

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:E. 50yr 4hr 10min Chicago **
****

CHICAGO STORM	
Ptotal= 65.64 mm	

IDF curve parameters: A=1973.100
B= 9.000
C= 0.868
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
0.00	3.16	1.00	38.66	2.00	9.18	3.00	3.91
0.17	3.73	1.17	153.18	2.17	7.50	3.17	3.57
0.33	4.57	1.33	51.95	2.33	6.33	3.33	3.28
0.50	5.90	1.50	25.44	2.50	5.48	3.50	3.04
0.67	8.33	1.67	16.25	2.67	4.83	3.67	2.84
0.83	13.99	1.83	11.77	2.83	4.32	3.83	2.66

CALIB					
NASHYD (0001)	Area	(ha)=	2.00	Curve Number	(CN)= 77.8
ID= 1 DT= 5.0 min	Ia	(mm)=	4.06	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.07		

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	3.16	1.083	38.66	2.083	9.18	3.08	3.91
0.167	3.16	1.167	38.66	2.167	9.18	3.17	3.91
0.250	3.73	1.250	153.18	2.250	7.50	3.25	3.57
0.333	3.73	1.333	153.18	2.333	7.50	3.33	3.57
0.417	4.57	1.417	51.95	2.417	6.33	3.42	3.28
0.500	4.57	1.500	51.95	2.500	6.33	3.50	3.28
0.583	5.90	1.583	25.44	2.583	5.48	3.58	3.04
0.667	5.90	1.667	25.44	2.667	5.48	3.67	3.04
0.750	8.33	1.750	16.25	2.750	4.83	3.75	2.84
0.833	8.33	1.833	16.25	2.833	4.83	3.83	2.84
0.917	13.99	1.917	11.77	2.917	4.32	3.92	2.66
1.000	13.99	2.000	11.77	3.000	4.32	4.00	2.66

Unit Hyd Qpeak (cms)= 1.091

PEAK FLOW (cms)= 0.318 (i)
TIME TO PEAK (hrs)= 1.333
RUNOFF VOLUME (mm)= 25.799
TOTAL RAINFALL (mm)= 65.642
RUNOFF COEFFICIENT = 0.393

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

CALIB					
NASHYD (0002)	Area	(ha)=	0.71	Curve Number	(CN)= 57.8
ID= 1 DT= 5.0 min	Ia	(mm)=	10.20	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.25		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	3.16	1.083	38.66	2.083	9.18	3.08	3.91
0.167	3.16	1.167	38.66	2.167	9.18	3.17	3.91
0.250	3.73	1.250	153.18	2.250	7.50	3.25	3.57
0.333	3.73	1.333	153.18	2.333	7.50	3.33	3.57
0.417	4.57	1.417	51.95	2.417	6.33	3.42	3.28
0.500	4.57	1.500	51.95	2.500	6.33	3.50	3.28
0.583	5.90	1.583	25.44	2.583	5.48	3.58	3.04
0.667	5.90	1.667	25.44	2.667	5.48	3.67	3.04
0.750	8.33	1.750	16.25	2.750	4.83	3.75	2.84
0.833	8.33	1.833	16.25	2.833	4.83	3.83	2.84
0.917	13.99	1.917	11.77	2.917	4.32	3.92	2.66
1.000	13.99	2.000	11.77	3.000	4.32	4.00	2.66

Unit Hyd Qpeak (cms)= 0.108

PEAK FLOW (cms)= 0.024 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 12.749
TOTAL RAINFALL (mm)= 65.642
RUNOFF COEFFICIENT = 0.194

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

ADD HYD (0003)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0001):	2.00	0.318	1.33	25.80
	+ ID2= 2 (0002):	0.71	0.024	1.58	12.75
	ID = 3 (0003):	2.71	0.328	1.33	22.38

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:F. 100yr 4hr 10min Chicago **
****

CHICAGO STORM	Ptotal= 71.75 mm

IDF curve parameters: A=2193.100
B= 9.040
C= 0.871
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
0.00	3.40	1.00	42.35	2.00	9.96	3.00	4.21
0.17	4.02	1.17	168.45	2.17	8.12	3.17	3.84
0.33	4.93	1.33	56.97	2.33	6.85	3.33	3.53
0.50	6.38	1.50	27.80	2.50	5.92	3.50	3.27
0.67	9.03	1.67	17.71	2.67	5.21	3.67	3.05
0.83	15.23	1.83	12.80	2.83	4.66	3.83	2.85

CALIB	NASHYD (0001)	ID= 1 DT= 5.0 min	Area (ha)= 2.00	Ia (mm)= 4.06	U.H. Tp(hrs)= 0.07	Curve Number (CN)= 77.8	# of Linear Res.(N)= 3.00

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	3.40	1.083	42.35	2.083	9.96	3.08	4.21
0.167	3.40	1.167	42.35	2.167	9.96	3.17	4.21
0.250	4.02	1.250	168.45	2.250	8.12	3.25	3.84
0.333	4.02	1.333	168.45	2.333	8.12	3.33	3.84
0.417	4.93	1.417	56.97	2.417	6.85	3.42	3.53
0.500	4.93	1.500	56.97	2.500	6.85	3.50	3.53
0.583	6.38	1.583	27.80	2.583	5.92	3.58	3.27
0.667	6.38	1.667	27.80	2.667	5.92	3.67	3.27
0.750	9.03	1.750	17.71	2.750	5.21	3.75	3.05
0.833	9.03	1.833	17.71	2.833	5.21	3.83	3.05
0.917	15.23	1.917	12.80	2.917	4.66	3.92	2.85
1.000	15.23	2.000	12.80	3.000	4.66	4.00	2.85

Unit Hyd Qpeak (cms)= 1.091

PEAK FLOW (cms)= 0.374 (i)
TIME TO PEAK (hrs)= 1.333
RUNOFF VOLUME (mm)= 29.815
TOTAL RAINFALL (mm)= 71.753
RUNOFF COEFFICIENT = 0.416

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

```
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=   0.71   Curve Number   (CN)= 57.8
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.20   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	3.40	1.083	42.35	2.083	9.96	3.08	4.21
0.167	3.40	1.167	42.35	2.167	9.96	3.17	4.21
0.250	4.02	1.250	168.45	2.250	8.12	3.25	3.84
0.333	4.02	1.333	168.45	2.333	8.12	3.33	3.84
0.417	4.93	1.417	56.97	2.417	6.85	3.42	3.53
0.500	4.93	1.500	56.97	2.500	6.85	3.50	3.53
0.583	6.38	1.583	27.80	2.583	5.92	3.58	3.27
0.667	6.38	1.667	27.80	2.667	5.92	3.67	3.27
0.750	9.03	1.750	17.71	2.750	5.21	3.75	3.05
0.833	9.03	1.833	17.71	2.833	5.21	3.83	3.05
0.917	15.23	1.917	12.80	2.917	4.66	3.92	2.85
1.000	15.23	2.000	12.80	3.000	4.66	4.00	2.85

```
    Unit Hyd Qpeak  (cms)=   0.108

    PEAK FLOW       (cms)=   0.030 (i)
    TIME TO PEAK    (hrs)=   1.583
    RUNOFF VOLUME    (mm)=  15.326
    TOTAL RAINFALL   (mm)=  71.753
    RUNOFF COEFFICIENT   =   0.214

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

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

--------------------
| ADD HYD  (  0003)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     2.00   0.374     1.33    29.81
      + ID2= 2 (  0002):     0.71   0.030     1.58    15.33
        ========================================================
        ID = 3 (  0003):     2.71   0.385     1.33    26.02

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
*********************************************
** SIMULATION:G. 2yr 24hr 15min SCS Type II **
```

```
*********************************************

--------------------
|    READ STORM    |    Filename: C:\Users\amysliwiec\AppD
|                  |              ata\Local\Temp\
|                  |              719a532b-c862-417c-8729-d844365672f4\20b6dfc4
| Ptotal= 46.83 mm |    Comments: 2yr 24hr 15min SCS Type II
--------------------
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.00	6.25	0.86	12.50	5.46	18.75	0.77
0.25	0.47	6.50	0.88	12.75	3.76	19.00	0.74
0.50	0.49	6.75	0.90	13.00	3.17	19.25	0.71
0.75	0.50	7.00	0.92	13.25	2.69	19.50	0.68
1.00	0.51	7.25	0.95	13.50	2.37	19.75	0.65
1.25	0.52	7.50	0.97	13.75	2.08	20.00	0.62
1.50	0.53	7.75	1.00	14.00	1.85	20.25	0.61
1.75	0.54	8.00	1.02	14.25	1.69	20.50	0.60
2.00	0.56	8.25	1.09	14.50	1.61	20.75	0.59
2.25	0.57	8.50	1.20	14.75	1.53	21.00	0.59
2.50	0.58	8.75	1.33	15.00	1.45	21.25	0.58
2.75	0.59	9.00	1.44	15.25	1.36	21.50	0.58
3.00	0.60	9.25	1.50	15.50	1.28	21.75	0.57
3.25	0.62	9.50	1.50	15.75	1.20	22.00	0.56
3.50	0.63	9.75	1.60	16.00	1.12	22.25	0.56
3.75	0.64	10.00	1.78	16.25	1.06	22.50	0.55
4.00	0.65	10.25	2.02	16.50	1.03	22.75	0.55
4.25	0.67	10.50	2.29	16.75	1.00	23.00	0.54
4.50	0.69	10.75	2.68	17.00	0.98	23.25	0.54
4.75	0.71	11.00	3.13	17.25	0.95	23.50	0.53
5.00	0.74	11.25	3.96	17.50	0.92	23.75	0.52
5.25	0.76	11.50	5.04	17.75	0.89	24.00	0.52
5.50	0.78	11.75	20.53	18.00	0.86		
5.75	0.81	12.00	50.66	18.25	0.83		
6.00	0.83	12.25	8.02	18.50	0.80		

```
--------------------------------------------------------------------------------

--------------------
| CALIB            |
| NASHYD   (  0001)|   Area    (ha)=   2.00   Curve Number   (CN)= 77.8
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.06   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.07

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr

0.083	0.00	6.167	0.83	12.250	50.66	18.33	0.83
0.167	0.00	6.250	0.83	12.333	8.03	18.42	0.83
0.250	0.00	6.333	0.86	12.417	8.02	18.50	0.83
0.333	0.47	6.417	0.86	12.500	8.02	18.58	0.80
0.417	0.47	6.500	0.86	12.583	5.46	18.67	0.80
0.500	0.47	6.583	0.88	12.667	5.46	18.75	0.80
0.583	0.49	6.667	0.88	12.750	5.46	18.83	0.77
0.667	0.49	6.750	0.88	12.833	3.76	18.92	0.77
0.750	0.49	6.833	0.90	12.917	3.76	19.00	0.77
0.833	0.50	6.917	0.90	13.000	3.76	19.08	0.74
0.917	0.50	7.000	0.90	13.083	3.17	19.17	0.74
1.000	0.50	7.083	0.92	13.167	3.17	19.25	0.74
1.083	0.51	7.167	0.92	13.250	3.17	19.33	0.71
1.167	0.51	7.250	0.92	13.333	2.69	19.42	0.71
1.250	0.51	7.333	0.95	13.417	2.69	19.50	0.71
1.333	0.52	7.417	0.95	13.500	2.69	19.58	0.68
1.417	0.52	7.500	0.95	13.583	2.37	19.67	0.68
1.500	0.52	7.583	0.97	13.667	2.37	19.75	0.68
1.583	0.53	7.667	0.97	13.750	2.37	19.83	0.65
1.667	0.53	7.750	0.97	13.833	2.08	19.92	0.65
1.750	0.53	7.833	1.00	13.917	2.08	20.00	0.65
1.833	0.54	7.917	1.00	14.000	2.08	20.08	0.62
1.917	0.54	8.000	1.00	14.083	1.85	20.17	0.62
2.000	0.54	8.083	1.02	14.167	1.85	20.25	0.62
2.083	0.56	8.167	1.02	14.250	1.85	20.33	0.61
2.167	0.56	8.250	1.02	14.333	1.69	20.42	0.61
2.250	0.56	8.333	1.09	14.417	1.69	20.50	0.61
2.333	0.57	8.417	1.09	14.500	1.69	20.58	0.60
2.417	0.57	8.500	1.09	14.583	1.61	20.67	0.60
2.500	0.57	8.583	1.20	14.667	1.61	20.75	0.60
2.583	0.58	8.667	1.20	14.750	1.61	20.83	0.59
2.667	0.58	8.750	1.20	14.833	1.53	20.92	0.59
2.750	0.58	8.833	1.33	14.917	1.53	21.00	0.59
2.833	0.59	8.917	1.33	15.000	1.53	21.08	0.59
2.917	0.59	9.000	1.33	15.083	1.45	21.17	0.59
3.000	0.59	9.083	1.44	15.167	1.45	21.25	0.59
3.083	0.60	9.167	1.44	15.250	1.45	21.33	0.58
3.167	0.60	9.250	1.44	15.333	1.36	21.42	0.58
3.250	0.60	9.333	1.50	15.417	1.36	21.50	0.58
3.333	0.62	9.417	1.50	15.500	1.36	21.58	0.58
3.417	0.62	9.500	1.50	15.583	1.28	21.67	0.58
3.500	0.62	9.583	1.50	15.667	1.28	21.75	0.58
3.583	0.63	9.667	1.50	15.750	1.28	21.83	0.57
3.667	0.63	9.750	1.50	15.833	1.20	21.92	0.57
3.750	0.63	9.833	1.60	15.917	1.20	22.00	0.57
3.833	0.64	9.917	1.60	16.000	1.20	22.08	0.56
3.917	0.64	10.000	1.60	16.083	1.12	22.17	0.56
4.000	0.64	10.083	1.78	16.167	1.12	22.25	0.56
4.083	0.65	10.167	1.78	16.250	1.12	22.33	0.56
4.167	0.65	10.250	1.78	16.333	1.06	22.42	0.56
4.250	0.65	10.333	2.02	16.417	1.06	22.50	0.56
4.333	0.67	10.417	2.02	16.500	1.06	22.58	0.55
4.417	0.67	10.500	2.02	16.583	1.03	22.67	0.55
4.500	0.67	10.583	2.29	16.667	1.03	22.75	0.55
4.583	0.69	10.667	2.29	16.750	1.03	22.83	0.55
4.667	0.69	10.750	2.29	16.833	1.00	22.92	0.55
4.750	0.69	10.833	2.68	16.917	1.00	23.00	0.55
4.833	0.71	10.917	2.68	17.000	1.00	23.08	0.54
4.917	0.71	11.000	2.68	17.083	0.98	23.17	0.54
5.000	0.71	11.083	3.13	17.167	0.98	23.25	0.54
5.083	0.74	11.167	3.13	17.250	0.98	23.33	0.54
5.167	0.74	11.250	3.13	17.333	0.95	23.42	0.54
5.250	0.74	11.333	3.96	17.417	0.95	23.50	0.54
5.333	0.76	11.417	3.96	17.500	0.95	23.58	0.53
5.417	0.76	11.500	3.96	17.583	0.92	23.67	0.53
5.500	0.76	11.583	5.04	17.667	0.92	23.75	0.53
5.583	0.78	11.667	5.04	17.750	0.92	23.83	0.52
5.667	0.78	11.750	5.04	17.833	0.89	23.92	0.52
5.750	0.78	11.833	20.52	17.917	0.89	24.00	0.52
5.833	0.81	11.917	20.53	18.000	0.89	24.08	0.52
5.917	0.81	12.000	20.53	18.083	0.86	24.17	0.52
6.000	0.81	12.083	50.65	18.167	0.86	24.25	0.52
6.083	0.83	12.167	50.66	18.250	0.86		

Unit Hyd Qpeak (cms)= 1.091

PEAK FLOW (cms)= 0.109 (i)
TIME TO PEAK (hrs)= 12.250
RUNOFF VOLUME (mm)= 14.476
TOTAL RAINFALL (mm)= 46.830
RUNOFF COEFFICIENT = 0.309

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

CALIB			
NASHYD (0002)	Area (ha)= 0.71	Curve Number (CN)= 57.8	
ID= 1 DT= 5.0 min	Ia (mm)= 10.20	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.25		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	0.83	12.250	50.66	18.33	0.83
0.167	0.00	6.250	0.83	12.333	8.03	18.42	0.83
0.250	0.00	6.333	0.86	12.417	8.02	18.50	0.83

0.333	0.47	6.417	0.86	12.500	8.02	18.58	0.80
0.417	0.47	6.500	0.86	12.583	5.46	18.67	0.80
0.500	0.47	6.583	0.88	12.667	5.46	18.75	0.80
0.583	0.49	6.667	0.88	12.750	5.46	18.83	0.77
0.667	0.49	6.750	0.88	12.833	3.76	18.92	0.77
0.750	0.49	6.833	0.90	12.917	3.76	19.00	0.77
0.833	0.50	6.917	0.90	13.000	3.76	19.08	0.74
0.917	0.50	7.000	0.90	13.083	3.17	19.17	0.74
1.000	0.50	7.083	0.92	13.167	3.17	19.25	0.74
1.083	0.51	7.167	0.92	13.250	3.17	19.33	0.71
1.167	0.51	7.250	0.92	13.333	2.69	19.42	0.71
1.250	0.51	7.333	0.95	13.417	2.69	19.50	0.71
1.333	0.52	7.417	0.95	13.500	2.69	19.58	0.68
1.417	0.52	7.500	0.95	13.583	2.37	19.67	0.68
1.500	0.52	7.583	0.97	13.667	2.37	19.75	0.68
1.583	0.53	7.667	0.97	13.750	2.37	19.83	0.65
1.667	0.53	7.750	0.97	13.833	2.08	19.92	0.65
1.750	0.53	7.833	1.00	13.917	2.08	20.00	0.65
1.833	0.54	7.917	1.00	14.000	2.08	20.08	0.62
1.917	0.54	8.000	1.00	14.083	1.85	20.17	0.62
2.000	0.54	8.083	1.02	14.167	1.85	20.25	0.62
2.083	0.56	8.167	1.02	14.250	1.85	20.33	0.61
2.167	0.56	8.250	1.02	14.333	1.69	20.42	0.61
2.250	0.56	8.333	1.09	14.417	1.69	20.50	0.61
2.333	0.57	8.417	1.09	14.500	1.69	20.58	0.60
2.417	0.57	8.500	1.09	14.583	1.61	20.67	0.60
2.500	0.57	8.583	1.20	14.667	1.61	20.75	0.60
2.583	0.58	8.667	1.20	14.750	1.61	20.83	0.59
2.667	0.58	8.750	1.20	14.833	1.53	20.92	0.59
2.750	0.58	8.833	1.33	14.917	1.53	21.00	0.59
2.833	0.59	8.917	1.33	15.000	1.53	21.08	0.59
2.917	0.59	9.000	1.33	15.083	1.45	21.17	0.59
3.000	0.59	9.083	1.44	15.167	1.45	21.25	0.59
3.083	0.60	9.167	1.44	15.250	1.45	21.33	0.58
3.167	0.60	9.250	1.44	15.333	1.36	21.42	0.58
3.250	0.60	9.333	1.50	15.417	1.36	21.50	0.58
3.333	0.62	9.417	1.50	15.500	1.36	21.58	0.58
3.417	0.62	9.500	1.50	15.583	1.28	21.67	0.58
3.500	0.62	9.583	1.50	15.667	1.28	21.75	0.58
3.583	0.63	9.667	1.50	15.750	1.28	21.83	0.57
3.667	0.63	9.750	1.50	15.833	1.20	21.92	0.57
3.750	0.63	9.833	1.60	15.917	1.20	22.00	0.57
3.833	0.64	9.917	1.60	16.000	1.20	22.08	0.56
3.917	0.64	10.000	1.60	16.083	1.12	22.17	0.56
4.000	0.64	10.083	1.78	16.167	1.12	22.25	0.56
4.083	0.65	10.167	1.78	16.250	1.12	22.33	0.56
4.167	0.65	10.250	1.78	16.333	1.06	22.42	0.56
4.250	0.65	10.333	2.02	16.417	1.06	22.50	0.56
4.333	0.67	10.417	2.02	16.500	1.06	22.58	0.55
4.417	0.67	10.500	2.02	16.583	1.03	22.67	0.55
4.500	0.67	10.583	2.29	16.667	1.03	22.75	0.55
4.583	0.69	10.667	2.29	16.750	1.03	22.83	0.55
4.667	0.69	10.750	2.29	16.833	1.00	22.92	0.55
4.750	0.69	10.833	2.68	16.917	1.00	23.00	0.55
4.833	0.71	10.917	2.68	17.000	1.00	23.08	0.54
4.917	0.71	11.000	2.68	17.083	0.98	23.17	0.54
5.000	0.71	11.083	3.13	17.167	0.98	23.25	0.54
5.083	0.74	11.167	3.13	17.250	0.98	23.33	0.54
5.167	0.74	11.250	3.13	17.333	0.95	23.42	0.54
5.250	0.74	11.333	3.96	17.417	0.95	23.50	0.54
5.333	0.76	11.417	3.96	17.500	0.95	23.58	0.53
5.417	0.76	11.500	3.96	17.583	0.92	23.67	0.53
5.500	0.76	11.583	5.04	17.667	0.92	23.75	0.53
5.583	0.78	11.667	5.04	17.750	0.92	23.83	0.52
5.667	0.78	11.750	5.04	17.833	0.89	23.92	0.52
5.750	0.78	11.833	20.52	17.917	0.89	24.00	0.52
5.833	0.81	11.917	20.53	18.000	0.89	24.08	0.52
5.917	0.81	12.000	20.53	18.083	0.86	24.17	0.52
6.000	0.81	12.083	50.65	18.167	0.86	24.25	0.52
6.083	0.83	12.167	50.66	18.250	0.86		

Unit Hyd Qpeak (cms)= 0.108

PEAK FLOW (cms)= 0.008 (i)
TIME TO PEAK (hrs)= 12.417
RUNOFF VOLUME (mm)= 6.036
TOTAL RAINFALL (mm)= 46.830
RUNOFF COEFFICIENT = 0.129

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

ADD HYD (0003)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0001):	2.00	0.109	12.25	14.48
+ ID2= 2 (0002):	0.71	0.008	12.42	6.04
ID = 3 (0003):	2.71	0.115	12.25	12.26

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:H. 5yr 24hr 15min SCS Type II **
****

READ STORM	Filename: C:\Users\amysliwiec\AppD

	ata\Local\Temp\
	719a532b-c862-417c-8729-d844365672f4\02eea314
Ptotal= 59.88 mm	Comments: 5yr 24hr 15min SCS Type II

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.00	6.25	1.09	12.50	6.98	18.75	0.98
0.25	0.61	6.50	1.12	12.75	4.80	19.00	0.95
0.50	0.62	6.75	1.15	13.00	4.06	19.25	0.91
0.75	0.64	7.00	1.18	13.25	3.43	19.50	0.87
1.00	0.65	7.25	1.21	13.50	3.03	19.75	0.83
1.25	0.67	7.50	1.24	13.75	2.66	20.00	0.80
1.50	0.68	7.75	1.27	14.00	2.37	20.25	0.77
1.75	0.70	8.00	1.30	14.25	2.16	20.50	0.77
2.00	0.71	8.25	1.40	14.50	2.06	20.75	0.76
2.25	0.73	8.50	1.54	14.75	1.95	21.00	0.75
2.50	0.74	8.75	1.69	15.00	1.85	21.25	0.74
2.75	0.76	9.00	1.84	15.25	1.74	21.50	0.74
3.00	0.77	9.25	1.92	15.50	1.64	21.75	0.73
3.25	0.79	9.50	1.92	15.75	1.53	22.00	0.72
3.50	0.80	9.75	2.04	16.00	1.43	22.25	0.71
3.75	0.82	10.00	2.27	16.25	1.36	22.50	0.71
4.00	0.83	10.25	2.58	16.50	1.32	22.75	0.70
4.25	0.85	10.50	2.93	16.75	1.28	23.00	0.69
4.50	0.88	10.75	3.43	17.00	1.25	23.25	0.69
4.75	0.91	11.00	4.00	17.25	1.21	23.50	0.68
5.00	0.94	11.25	5.06	17.50	1.17	23.75	0.67
5.25	0.97	11.50	6.44	17.75	1.13	24.00	0.66
5.50	1.00	11.75	26.25	18.00	1.10		
5.75	1.03	12.00	64.77	18.25	1.06		
6.00	1.06	12.25	10.26	18.50	1.02		

CALIB			
NASHYD (0001)	Area (ha)= 2.00	Curve Number (CN)= 77.8	
ID= 1 DT= 5.0 min	Ia (mm)= 4.06	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.07		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.06	12.250	64.77	18.33	1.06
0.167	0.00	6.250	1.06	12.333	10.27	18.42	1.06
0.250	0.00	6.333	1.09	12.417	10.26	18.50	1.06
0.333	0.61	6.417	1.09	12.500	10.26	18.58	1.02
0.417	0.61	6.500	1.09	12.583	6.98	18.67	1.02
0.500	0.61	6.583	1.12	12.667	6.98	18.75	1.02
0.583	0.62	6.667	1.12	12.750	6.98	18.83	0.98
0.667	0.62	6.750	1.12	12.833	4.81	18.92	0.98
0.750	0.62	6.833	1.15	12.917	4.80	19.00	0.98
0.833	0.64	6.917	1.15	13.000	4.80	19.08	0.95
0.917	0.64	7.000	1.15	13.083	4.06	19.17	0.95
1.000	0.64	7.083	1.18	13.167	4.06	19.25	0.95
1.083	0.65	7.167	1.18	13.250	4.06	19.33	0.91
1.167	0.65	7.250	1.18	13.333	3.43	19.42	0.91
1.250	0.65	7.333	1.21	13.417	3.43	19.50	0.91
1.333	0.67	7.417	1.21	13.500	3.43	19.58	0.87
1.417	0.67	7.500	1.21	13.583	3.03	19.67	0.87
1.500	0.67	7.583	1.24	13.667	3.03	19.75	0.87
1.583	0.68	7.667	1.24	13.750	3.03	19.83	0.83
1.667	0.68	7.750	1.24	13.833	2.66	19.92	0.83
1.750	0.68	7.833	1.27	13.917	2.66	20.00	0.83
1.833	0.70	7.917	1.27	14.000	2.66	20.08	0.80
1.917	0.70	8.000	1.27	14.083	2.37	20.17	0.80
2.000	0.70	8.083	1.30	14.167	2.37	20.25	0.80
2.083	0.71	8.167	1.30	14.250	2.37	20.33	0.77
2.167	0.71	8.250	1.30	14.333	2.16	20.42	0.77
2.250	0.71	8.333	1.40	14.417	2.16	20.50	0.77
2.333	0.73	8.417	1.40	14.500	2.16	20.58	0.77
2.417	0.73	8.500	1.40	14.583	2.06	20.67	0.77
2.500	0.73	8.583	1.54	14.667	2.06	20.75	0.77
2.583	0.74	8.667	1.54	14.750	2.06	20.83	0.76
2.667	0.74	8.750	1.54	14.833	1.95	20.92	0.76
2.750	0.74	8.833	1.69	14.917	1.95	21.00	0.76
2.833	0.76	8.917	1.69	15.000	1.95	21.08	0.75
2.917	0.76	9.000	1.69	15.083	1.85	21.17	0.75
3.000	0.76	9.083	1.84	15.167	1.85	21.25	0.75
3.083	0.77	9.167	1.84	15.250	1.85	21.33	0.74
3.167	0.77	9.250	1.84	15.333	1.74	21.42	0.74
3.250	0.77	9.333	1.92	15.417	1.74	21.50	0.74
3.333	0.79	9.417	1.92	15.500	1.74	21.58	0.74
3.417	0.79	9.500	1.92	15.583	1.64	21.67	0.74
3.500	0.79	9.583	1.92	15.667	1.64	21.75	0.74
3.583	0.80	9.667	1.92	15.750	1.64	21.83	0.73
3.667	0.80	9.750	1.92	15.833	1.53	21.92	0.73
3.750	0.80	9.833	2.04	15.917	1.53	22.00	0.73
3.833	0.82	9.917	2.04	16.000	1.53	22.08	0.72
3.917	0.82	10.000	2.04	16.083	1.43	22.17	0.72
4.000	0.82	10.083	2.27	16.167	1.43	22.25	0.72
4.083	0.83	10.167	2.27	16.250	1.43	22.33	0.71
4.167	0.83	10.250	2.27	16.333	1.36	22.42	0.71
4.250	0.83	10.333	2.58	16.417	1.36	22.50	0.71
4.333	0.85	10.417	2.58	16.500	1.36	22.58	0.71
4.417	0.85	10.500	2.58	16.583	1.32	22.67	0.71
4.500	0.85	10.583	2.93	16.667	1.32	22.75	0.71

4.583	0.88	10.667	2.93	16.750	1.32	22.83	0.70
4.667	0.88	10.750	2.93	16.833	1.28	22.92	0.70
4.750	0.88	10.833	3.43	16.917	1.28	23.00	0.70
4.833	0.91	10.917	3.43	17.000	1.28	23.08	0.69
4.917	0.91	11.000	3.43	17.083	1.25	23.17	0.69
5.000	0.91	11.083	4.00	17.167	1.25	23.25	0.69
5.083	0.94	11.167	4.00	17.250	1.25	23.33	0.69
5.167	0.94	11.250	4.00	17.333	1.21	23.42	0.69
5.250	0.94	11.333	5.06	17.417	1.21	23.50	0.69
5.333	0.97	11.417	5.06	17.500	1.21	23.58	0.68
5.417	0.97	11.500	5.06	17.583	1.17	23.67	0.68
5.500	0.97	11.583	6.44	17.667	1.17	23.75	0.68
5.583	1.00	11.667	6.44	17.750	1.17	23.83	0.67
5.667	1.00	11.750	6.44	17.833	1.13	23.92	0.67
5.750	1.00	11.833	26.24	17.917	1.13	24.00	0.67
5.833	1.03	11.917	26.25	18.000	1.13	24.08	0.66
5.917	1.03	12.000	26.25	18.083	1.10	24.17	0.66
6.000	1.03	12.083	64.77	18.167	1.10	24.25	0.66
6.083	1.06	12.167	64.77	18.250	1.10		

Unit Hyd Qpeak (cms)= 1.091

PEAK FLOW (cms)= 0.165 (i)
TIME TO PEAK (hrs)= 12.250
RUNOFF VOLUME (mm)= 22.149
TOTAL RAINFALL (mm)= 59.880
RUNOFF COEFFICIENT = 0.370

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

CALIB	
NASHYD (0002)	Area (ha)= 0.71 Curve Number (CN)= 57.8
ID= 1 DT= 5.0 min	Ia (mm)= 10.20 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.25

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.06	12.250	64.77	18.33	1.06
0.167	0.00	6.250	1.06	12.333	10.27	18.42	1.06
0.250	0.00	6.333	1.09	12.417	10.26	18.50	1.06
0.333	0.61	6.417	1.09	12.500	10.26	18.58	1.02
0.417	0.61	6.500	1.09	12.583	6.98	18.67	1.02
0.500	0.61	6.583	1.12	12.667	6.98	18.75	1.02
0.583	0.62	6.667	1.12	12.750	6.98	18.83	0.98
0.667	0.62	6.750	1.12	12.833	4.81	18.92	0.98
0.750	0.62	6.833	1.15	12.917	4.80	19.00	0.98
0.833	0.64	6.917	1.15	13.000	4.80	19.08	0.95
0.917	0.64	7.000	1.15	13.083	4.06	19.17	0.95
1.000	0.64	7.083	1.18	13.167	4.06	19.25	0.95
1.083	0.65	7.167	1.18	13.250	4.06	19.33	0.91
1.167	0.65	7.250	1.18	13.333	3.43	19.42	0.91
1.250	0.65	7.333	1.21	13.417	3.43	19.50	0.91
1.333	0.67	7.417	1.21	13.500	3.43	19.58	0.87
1.417	0.67	7.500	1.21	13.583	3.03	19.67	0.87
1.500	0.67	7.583	1.24	13.667	3.03	19.75	0.87
1.583	0.68	7.667	1.24	13.750	3.03	19.83	0.83
1.667	0.68	7.750	1.24	13.833	2.66	19.92	0.83
1.750	0.68	7.833	1.27	13.917	2.66	20.00	0.83
1.833	0.70	7.917	1.27	14.000	2.66	20.08	0.80
1.917	0.70	8.000	1.27	14.083	2.37	20.17	0.80
2.000	0.70	8.083	1.30	14.167	2.37	20.25	0.80
2.083	0.71	8.167	1.30	14.250	2.37	20.33	0.77
2.167	0.71	8.250	1.30	14.333	2.16	20.42	0.77
2.250	0.71	8.333	1.40	14.417	2.16	20.50	0.77
2.333	0.73	8.417	1.40	14.500	2.16	20.58	0.77
2.417	0.73	8.500	1.40	14.583	2.06	20.67	0.77
2.500	0.73	8.583	1.54	14.667	2.06	20.75	0.77
2.583	0.74	8.667	1.54	14.750	2.06	20.83	0.76
2.667	0.74	8.750	1.54	14.833	1.95	20.92	0.76
2.750	0.74	8.833	1.69	14.917	1.95	21.00	0.76
2.833	0.76	8.917	1.69	15.000	1.95	21.08	0.75
2.917	0.76	9.000	1.69	15.083	1.85	21.17	0.75
3.000	0.76	9.083	1.84	15.167	1.85	21.25	0.75
3.083	0.77	9.167	1.84	15.250	1.85	21.33	0.74
3.167	0.77	9.250	1.84	15.333	1.74	21.42	0.74
3.250	0.77	9.333	1.92	15.417	1.74	21.50	0.74
3.333	0.79	9.417	1.92	15.500	1.74	21.58	0.74
3.417	0.79	9.500	1.92	15.583	1.64	21.67	0.74
3.500	0.79	9.583	1.92	15.667	1.64	21.75	0.74
3.583	0.80	9.667	1.92	15.750	1.64	21.83	0.73
3.667	0.80	9.750	1.92	15.833	1.53	21.92	0.73
3.750	0.80	9.833	2.04	15.917	1.53	22.00	0.73
3.833	0.82	9.917	2.04	16.000	1.53	22.08	0.72
3.917	0.82	10.000	2.04	16.083	1.43	22.17	0.72
4.000	0.82	10.083	2.27	16.167	1.43	22.25	0.72
4.083	0.83	10.167	2.27	16.250	1.43	22.33	0.71
4.167	0.83	10.250	2.27	16.333	1.36	22.42	0.71
4.250	0.83	10.333	2.58	16.417	1.36	22.50	0.71
4.333	0.85	10.417	2.58	16.500	1.36	22.58	0.71
4.417	0.85	10.500	2.58	16.583	1.32	22.67	0.71
4.500	0.85	10.583	2.93	16.667	1.32	22.75	0.71
4.583	0.88	10.667	2.93	16.750	1.32	22.83	0.70
4.667	0.88	10.750	2.93	16.833	1.28	22.92	0.70
4.750	0.88	10.833	3.43	16.917	1.28	23.00	0.70

4.833	0.91	10.917	3.43	17.000	1.28	23.08	0.69
4.917	0.91	11.000	3.43	17.083	1.25	23.17	0.69
5.000	0.91	11.083	4.00	17.167	1.25	23.25	0.69
5.083	0.94	11.167	4.00	17.250	1.25	23.33	0.69
5.167	0.94	11.250	4.00	17.333	1.21	23.42	0.69
5.250	0.94	11.333	5.06	17.417	1.21	23.50	0.69
5.333	0.97	11.417	5.06	17.500	1.21	23.58	0.68
5.417	0.97	11.500	5.06	17.583	1.17	23.67	0.68
5.500	0.97	11.583	6.44	17.667	1.17	23.75	0.68
5.583	1.00	11.667	6.44	17.750	1.17	23.83	0.67
5.667	1.00	11.750	6.44	17.833	1.13	23.92	0.67
5.750	1.00	11.833	26.24	17.917	1.13	24.00	0.67
5.833	1.03	11.917	26.25	18.000	1.13	24.08	0.66
5.917	1.03	12.000	26.25	18.083	1.10	24.17	0.66
6.000	1.03	12.083	64.77	18.167	1.10	24.25	0.66
6.083	1.06	12.167	64.77	18.250	1.10		

Unit Hyd Qpeak (cms)= 0.108

PEAK FLOW (cms)= 0.015 (i)
TIME TO PEAK (hrs)= 12.417
RUNOFF VOLUME (mm)= 10.488
TOTAL RAINFALL (mm)= 59.880
RUNOFF COEFFICIENT = 0.175

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

ADD HYD (0003)		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0001):		2.00	0.165	12.25	22.15
+ ID2= 2 (0002):		0.71	0.015	12.42	10.49
ID = 3 (0003):		2.71	0.177	12.25	19.09

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:I. 10yr 24hr 15min SCS Type II **
****

READ STORM	Filename: C:\Users\amysliwiec\AppData\Local\Temp\719a532b-c862-417c-8729-d844365672f4\0b95a0fa
Ptotal= 67.50 mm	Comments: 10yr 24hr 15min SCS Type II

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.00	6.25	1.23	12.50	7.87	18.75	1.11
0.25	0.68	6.50	1.26	12.75	5.42	19.00	1.07
0.50	0.70	6.75	1.30	13.00	4.57	19.25	1.02
0.75	0.72	7.00	1.33	13.25	3.87	19.50	0.98
1.00	0.73	7.25	1.37	13.50	3.42	19.75	0.94
1.25	0.75	7.50	1.40	13.75	3.00	20.00	0.90
1.50	0.77	7.75	1.44	14.00	2.67	20.25	0.87
1.75	0.78	8.00	1.47	14.25	2.44	20.50	0.87
2.00	0.80	8.25	1.57	14.50	2.32	20.75	0.86
2.25	0.82	8.50	1.73	14.75	2.20	21.00	0.85
2.50	0.84	8.75	1.91	15.00	2.09	21.25	0.84
2.75	0.85	9.00	2.07	15.25	1.96	21.50	0.83
3.00	0.87	9.25	2.16	15.50	1.85	21.75	0.82
3.25	0.89	9.50	2.16	15.75	1.73	22.00	0.81
3.50	0.90	9.75	2.30	16.00	1.61	22.25	0.81
3.75	0.92	10.00	2.56	16.25	1.53	22.50	0.80
4.00	0.94	10.25	2.91	16.50	1.49	22.75	0.79
4.25	0.96	10.50	3.30	16.75	1.45	23.00	0.78
4.50	0.99	10.75	3.86	17.00	1.41	23.25	0.77
4.75	1.03	11.00	4.51	17.25	1.36	23.50	0.76
5.00	1.06	11.25	5.70	17.50	1.32	23.75	0.75
5.25	1.10	11.50	7.26	17.75	1.28	24.00	0.75
5.50	1.13	11.75	29.59	18.00	1.24		
5.75	1.17	12.00	73.01	18.25	1.19		
6.00	1.20	12.25	11.57	18.50	1.15		

CALIB / NASHYD (0001) / ID= 1 DT= 5.0 min	Area (ha)= 2.00	Curve Number (CN)= 77.8
	Ia (mm)= 4.06	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.07	

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.20	12.250	73.01	18.33	1.19
0.167	0.00	6.250	1.20	12.333	11.57	18.42	1.19
0.250	0.00	6.333	1.23	12.417	11.57	18.50	1.19
0.333	0.68	6.417	1.23	12.500	11.57	18.58	1.15
0.417	0.68	6.500	1.23	12.583	7.87	18.67	1.15
0.500	0.68	6.583	1.26	12.667	7.87	18.75	1.15
0.583	0.70	6.667	1.26	12.750	7.87	18.83	1.11
0.667	0.70	6.750	1.26	12.833	5.42	18.92	1.11

0.750	0.70	6.833	1.30	12.917	5.42	19.00	1.11
0.833	0.72	6.917	1.30	13.000	5.42	19.08	1.07
0.917	0.72	7.000	1.30	13.083	4.57	19.17	1.07
1.000	0.72	7.083	1.33	13.167	4.57	19.25	1.07
1.083	0.73	7.167	1.33	13.250	4.57	19.33	1.02
1.167	0.73	7.250	1.33	13.333	3.87	19.42	1.02
1.250	0.73	7.333	1.37	13.417	3.87	19.50	1.02
1.333	0.75	7.417	1.37	13.500	3.87	19.58	0.98
1.417	0.75	7.500	1.37	13.583	3.42	19.67	0.98
1.500	0.75	7.583	1.40	13.667	3.42	19.75	0.98
1.583	0.77	7.667	1.40	13.750	3.42	19.83	0.94
1.667	0.77	7.750	1.40	13.833	3.00	19.92	0.94
1.750	0.77	7.833	1.44	13.917	3.00	20.00	0.94
1.833	0.78	7.917	1.44	14.000	3.00	20.08	0.90
1.917	0.78	8.000	1.44	14.083	2.67	20.17	0.90
2.000	0.78	8.083	1.47	14.167	2.67	20.25	0.90
2.083	0.80	8.167	1.47	14.250	2.67	20.33	0.87
2.167	0.80	8.250	1.47	14.333	2.44	20.42	0.87
2.250	0.80	8.333	1.57	14.417	2.44	20.50	0.87
2.333	0.82	8.417	1.57	14.500	2.44	20.58	0.87
2.417	0.82	8.500	1.57	14.583	2.32	20.67	0.87
2.500	0.82	8.583	1.73	14.667	2.32	20.75	0.87
2.583	0.84	8.667	1.73	14.750	2.32	20.83	0.86
2.667	0.84	8.750	1.73	14.833	2.20	20.92	0.86
2.750	0.84	8.833	1.91	14.917	2.20	21.00	0.86
2.833	0.85	8.917	1.91	15.000	2.20	21.08	0.85
2.917	0.85	9.000	1.91	15.083	2.09	21.17	0.85
3.000	0.85	9.083	2.07	15.167	2.09	21.25	0.85
3.083	0.87	9.167	2.07	15.250	2.09	21.33	0.84
3.167	0.87	9.250	2.07	15.333	1.96	21.42	0.84
3.250	0.87	9.333	2.16	15.417	1.96	21.50	0.84
3.333	0.89	9.417	2.16	15.500	1.96	21.58	0.83
3.417	0.89	9.500	2.16	15.583	1.85	21.67	0.83
3.500	0.89	9.583	2.16	15.667	1.85	21.75	0.83
3.583	0.90	9.667	2.16	15.750	1.85	21.83	0.82
3.667	0.90	9.750	2.16	15.833	1.73	21.92	0.82
3.750	0.90	9.833	2.30	15.917	1.73	22.00	0.82
3.833	0.92	9.917	2.30	16.000	1.73	22.08	0.81
3.917	0.92	10.000	2.30	16.083	1.61	22.17	0.81
4.000	0.92	10.083	2.56	16.167	1.61	22.25	0.81
4.083	0.94	10.167	2.56	16.250	1.61	22.33	0.81
4.167	0.94	10.250	2.56	16.333	1.53	22.42	0.81
4.250	0.94	10.333	2.91	16.417	1.53	22.50	0.81
4.333	0.96	10.417	2.91	16.500	1.53	22.58	0.80
4.417	0.96	10.500	2.91	16.583	1.49	22.67	0.80
4.500	0.96	10.583	3.30	16.667	1.49	22.75	0.80
4.583	0.99	10.667	3.30	16.750	1.49	22.83	0.79
4.667	0.99	10.750	3.30	16.833	1.45	22.92	0.79
4.750	0.99	10.833	3.86	16.917	1.45	23.00	0.79
4.833	1.03	10.917	3.86	17.000	1.45	23.08	0.78
4.917	1.03	11.000	3.86	17.083	1.41	23.17	0.78
5.000	1.03	11.083	4.51	17.167	1.41	23.25	0.78
5.083	1.06	11.167	4.51	17.250	1.41	23.33	0.77
5.167	1.06	11.250	4.51	17.333	1.36	23.42	0.77
5.250	1.06	11.333	5.70	17.417	1.36	23.50	0.77
5.333	1.10	11.417	5.70	17.500	1.36	23.58	0.76
5.417	1.10	11.500	5.70	17.583	1.32	23.67	0.76
5.500	1.10	11.583	7.26	17.667	1.32	23.75	0.76
5.583	1.13	11.667	7.26	17.750	1.32	23.83	0.75
5.667	1.13	11.750	7.26	17.833	1.28	23.92	0.75
5.750	1.13	11.833	29.58	17.917	1.28	24.00	0.75
5.833	1.17	11.917	29.59	18.000	1.28	24.08	0.75
5.917	1.17	12.000	29.59	18.083	1.24	24.17	0.75
6.000	1.17	12.083	73.01	18.167	1.24	24.25	0.75
6.083	1.20	12.167	73.01	18.250	1.24		

Unit Hyd Qpeak (cms)= 1.091

PEAK FLOW (cms)= 0.201 (i)
TIME TO PEAK (hrs)= 12.250
RUNOFF VOLUME (mm)= 27.005
TOTAL RAINFALL (mm)= 67.500
RUNOFF COEFFICIENT = 0.400

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

CALIB			
NASHYD (0002)	Area (ha)= 0.71	Curve Number (CN)= 57.8	
ID= 1 DT= 5.0 min	Ia (mm)= 10.20	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.25		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.20	12.250	73.01	18.33	1.19
0.167	0.00	6.250	1.20	12.333	11.57	18.42	1.19
0.250	0.00	6.333	1.23	12.417	11.57	18.50	1.19
0.333	0.68	6.417	1.23	12.500	11.57	18.58	1.15
0.417	0.68	6.500	1.23	12.583	7.87	18.67	1.15
0.500	0.68	6.583	1.26	12.667	7.87	18.75	1.15
0.583	0.70	6.667	1.26	12.750	7.87	18.83	1.11
0.667	0.70	6.750	1.26	12.833	5.42	18.92	1.11
0.750	0.70	6.833	1.30	12.917	5.42	19.00	1.11
0.833	0.72	6.917	1.30	13.000	5.42	19.08	1.07
0.917	0.72	7.000	1.30	13.083	4.57	19.17	1.07

1.000	0.72	7.083	1.33	13.167	4.57	19.25	1.07
1.083	0.73	7.167	1.33	13.250	4.57	19.33	1.02
1.167	0.73	7.250	1.33	13.333	3.87	19.42	1.02
1.250	0.73	7.333	1.37	13.417	3.87	19.50	1.02
1.333	0.75	7.417	1.37	13.500	3.87	19.58	0.98
1.417	0.75	7.500	1.37	13.583	3.42	19.67	0.98
1.500	0.75	7.583	1.40	13.667	3.42	19.75	0.98
1.583	0.77	7.667	1.40	13.750	3.42	19.83	0.94
1.667	0.77	7.750	1.40	13.833	3.00	19.92	0.94
1.750	0.77	7.833	1.44	13.917	3.00	20.00	0.94
1.833	0.78	7.917	1.44	14.000	3.00	20.08	0.90
1.917	0.78	8.000	1.44	14.083	2.67	20.17	0.90
2.000	0.78	8.083	1.47	14.167	2.67	20.25	0.90
2.083	0.80	8.167	1.47	14.250	2.67	20.33	0.87
2.167	0.80	8.250	1.47	14.333	2.44	20.42	0.87
2.250	0.80	8.333	1.57	14.417	2.44	20.50	0.87
2.333	0.82	8.417	1.57	14.500	2.44	20.58	0.87
2.417	0.82	8.500	1.57	14.583	2.32	20.67	0.87
2.500	0.82	8.583	1.73	14.667	2.32	20.75	0.87
2.583	0.84	8.667	1.73	14.750	2.32	20.83	0.86
2.667	0.84	8.750	1.73	14.833	2.20	20.92	0.86
2.750	0.84	8.833	1.91	14.917	2.20	21.00	0.86
2.833	0.85	8.917	1.91	15.000	2.20	21.08	0.85
2.917	0.85	9.000	1.91	15.083	2.09	21.17	0.85
3.000	0.85	9.083	2.07	15.167	2.09	21.25	0.85
3.083	0.87	9.167	2.07	15.250	2.09	21.33	0.84
3.167	0.87	9.250	2.07	15.333	1.96	21.42	0.84
3.250	0.87	9.333	2.16	15.417	1.96	21.50	0.84
3.333	0.89	9.417	2.16	15.500	1.96	21.58	0.83
3.417	0.89	9.500	2.16	15.583	1.85	21.67	0.83
3.500	0.89	9.583	2.16	15.667	1.85	21.75	0.83
3.583	0.90	9.667	2.16	15.750	1.85	21.83	0.82
3.667	0.90	9.750	2.16	15.833	1.73	21.92	0.82
3.750	0.90	9.833	2.30	15.917	1.73	22.00	0.82
3.833	0.92	9.917	2.30	16.000	1.73	22.08	0.81
3.917	0.92	10.000	2.30	16.083	1.61	22.17	0.81
4.000	0.92	10.083	2.56	16.167	1.61	22.25	0.81
4.083	0.94	10.167	2.56	16.250	1.61	22.33	0.81
4.167	0.94	10.250	2.56	16.333	1.53	22.42	0.81
4.250	0.94	10.333	2.91	16.417	1.53	22.50	0.81
4.333	0.96	10.417	2.91	16.500	1.53	22.58	0.80
4.417	0.96	10.500	2.91	16.583	1.49	22.67	0.80
4.500	0.96	10.583	3.30	16.667	1.49	22.75	0.80
4.583	0.99	10.667	3.30	16.750	1.49	22.83	0.79
4.667	0.99	10.750	3.30	16.833	1.45	22.92	0.79
4.750	0.99	10.833	3.86	16.917	1.45	23.00	0.79
4.833	1.03	10.917	3.86	17.000	1.45	23.08	0.78
4.917	1.03	11.000	3.86	17.083	1.41	23.17	0.78
5.000	1.03	11.083	4.51	17.167	1.41	23.25	0.78
5.083	1.06	11.167	4.51	17.250	1.41	23.33	0.77
5.167	1.06	11.250	4.51	17.333	1.36	23.42	0.77
5.250	1.06	11.333	5.70	17.417	1.36	23.50	0.77
5.333	1.10	11.417	5.70	17.500	1.36	23.58	0.76
5.417	1.10	11.500	5.70	17.583	1.32	23.67	0.76
5.500	1.10	11.583	7.26	17.667	1.32	23.75	0.76
5.583	1.13	11.667	7.26	17.750	1.32	23.83	0.75
5.667	1.13	11.750	7.26	17.833	1.28	23.92	0.75
5.750	1.13	11.833	29.58	17.917	1.28	24.00	0.75
5.833	1.17	11.917	29.59	18.000	1.28	24.08	0.75
5.917	1.17	12.000	29.59	18.083	1.24	24.17	0.75
6.000	1.17	12.083	73.01	18.167	1.24	24.25	0.75
6.083	1.20	12.167	73.01	18.250	1.24		

Unit Hyd Qpeak (cms)= 0.108

PEAK FLOW (cms)= 0.019 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 13.514
TOTAL RAINFALL (mm)= 67.500
RUNOFF COEFFICIENT = 0.200

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

ADD HYD (0003)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0001):	2.00	0.201	12.25	27.01
	+ ID2= 2 (0002):	0.71	0.019	12.33	13.51
	ID = 3 (0003):	2.71	0.217	12.25	23.47

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:J. 25yr 24hr 15min SCS Type II **
****

READ STORM	Filename: C:\Users\amysliwiec\AppData\Local\Temp\719a532b-c862-417c-8729-d844365672f4\854dae27
Ptotal= 78.08 mm	Comments: 25yr 24hr 15min SCS Type II

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.00	6.25	1.43	12.50	9.11	18.75	1.28
0.25	0.79	6.50	1.46	12.75	6.27	19.00	1.24

0.50	0.81	6.75	1.50	13.00	5.29	19.25	1.19
0.75	0.83	7.00	1.54	13.25	4.48	19.50	1.14
1.00	0.85	7.25	1.58	13.50	3.95	19.75	1.09
1.25	0.87	7.50	1.62	13.75	3.47	20.00	1.04
1.50	0.89	7.75	1.66	14.00	3.09	20.25	1.01
1.75	0.91	8.00	1.70	14.25	2.82	20.50	1.00
2.00	0.93	8.25	1.82	14.50	2.69	20.75	0.99
2.25	0.95	8.50	2.01	14.75	2.54	21.00	0.98
2.50	0.97	8.75	2.21	15.00	2.41	21.25	0.97
2.75	0.99	9.00	2.40	15.25	2.27	21.50	0.96
3.00	1.00	9.25	2.50	15.50	2.14	21.75	0.95
3.25	1.03	9.50	2.50	15.75	2.00	22.00	0.94
3.50	1.04	9.75	2.66	16.00	1.87	22.25	0.93
3.75	1.06	10.00	2.96	16.25	1.77	22.50	0.92
4.00	1.08	10.25	3.37	16.50	1.72	22.75	0.91
4.25	1.11	10.50	3.82	16.75	1.67	23.00	0.90
4.50	1.15	10.75	4.47	17.00	1.63	23.25	0.89
4.75	1.19	11.00	5.22	17.25	1.58	23.50	0.88
5.00	1.23	11.25	6.60	17.50	1.53	23.75	0.87
5.25	1.27	11.50	8.40	17.75	1.48	24.00	0.86
5.50	1.31	11.75	34.22	18.00	1.43		
5.75	1.35	12.00	84.46	18.25	1.38		
6.00	1.39	12.25	13.38	18.50	1.33		

CALIB		
NASHYD (0001)	Area (ha)= 2.00	Curve Number (CN)= 77.8
ID= 1 DT= 5.0 min	Ia (mm)= 4.06	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.07	

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.39	12.250	84.46	18.33	1.38
0.167	0.00	6.250	1.39	12.333	13.39	18.42	1.38
0.250	0.00	6.333	1.43	12.417	13.38	18.50	1.38
0.333	0.79	6.417	1.43	12.500	13.38	18.58	1.33
0.417	0.79	6.500	1.43	12.583	9.11	18.67	1.33
0.500	0.79	6.583	1.46	12.667	9.11	18.75	1.33
0.583	0.81	6.667	1.46	12.750	9.11	18.83	1.28
0.667	0.81	6.750	1.46	12.833	6.27	18.92	1.28
0.750	0.81	6.833	1.50	12.917	6.27	19.00	1.28
0.833	0.83	6.917	1.50	13.000	6.27	19.08	1.24
0.917	0.83	7.000	1.50	13.083	5.29	19.17	1.24
1.000	0.83	7.083	1.54	13.167	5.29	19.25	1.24
1.083	0.85	7.167	1.54	13.250	5.29	19.33	1.19
1.167	0.85	7.250	1.54	13.333	4.48	19.42	1.19
1.250	0.85	7.333	1.58	13.417	4.48	19.50	1.19
1.333	0.87	7.417	1.58	13.500	4.48	19.58	1.14
1.417	0.87	7.500	1.58	13.583	3.95	19.67	1.14
1.500	0.87	7.583	1.62	13.667	3.95	19.75	1.14
1.583	0.89	7.667	1.62	13.750	3.95	19.83	1.09
1.667	0.89	7.750	1.62	13.833	3.47	19.92	1.09
1.750	0.89	7.833	1.66	13.917	3.47	20.00	1.09
1.833	0.91	7.917	1.66	14.000	3.47	20.08	1.04
1.917	0.91	8.000	1.66	14.083	3.09	20.17	1.04
2.000	0.91	8.083	1.70	14.167	3.09	20.25	1.04
2.083	0.93	8.167	1.70	14.250	3.09	20.33	1.01
2.167	0.93	8.250	1.70	14.333	2.82	20.42	1.01
2.250	0.93	8.333	1.82	14.417	2.82	20.50	1.01
2.333	0.95	8.417	1.82	14.500	2.82	20.58	1.00
2.417	0.95	8.500	1.82	14.583	2.69	20.67	1.00
2.500	0.95	8.583	2.01	14.667	2.69	20.75	1.00
2.583	0.97	8.667	2.01	14.750	2.69	20.83	0.99
2.667	0.97	8.750	2.01	14.833	2.54	20.92	0.99
2.750	0.97	8.833	2.21	14.917	2.54	21.00	0.99
2.833	0.99	8.917	2.21	15.000	2.54	21.08	0.98
2.917	0.99	9.000	2.21	15.083	2.41	21.17	0.98
3.000	0.99	9.083	2.40	15.167	2.41	21.25	0.98
3.083	1.00	9.167	2.40	15.250	2.41	21.33	0.97
3.167	1.00	9.250	2.40	15.333	2.27	21.42	0.97
3.250	1.00	9.333	2.50	15.417	2.27	21.50	0.97
3.333	1.03	9.417	2.50	15.500	2.27	21.58	0.96
3.417	1.03	9.500	2.50	15.583	2.14	21.67	0.96
3.500	1.03	9.583	2.50	15.667	2.14	21.75	0.96
3.583	1.04	9.667	2.50	15.750	2.14	21.83	0.95
3.667	1.04	9.750	2.50	15.833	2.00	21.92	0.95
3.750	1.04	9.833	2.66	15.917	2.00	22.00	0.95
3.833	1.06	9.917	2.66	16.000	2.00	22.08	0.94
3.917	1.06	10.000	2.66	16.083	1.87	22.17	0.94
4.000	1.06	10.083	2.96	16.167	1.87	22.25	0.94
4.083	1.08	10.167	2.96	16.250	1.87	22.33	0.93
4.167	1.08	10.250	2.96	16.333	1.77	22.42	0.93
4.250	1.08	10.333	3.37	16.417	1.77	22.50	0.93
4.333	1.11	10.417	3.37	16.500	1.77	22.58	0.92
4.417	1.11	10.500	3.37	16.583	1.72	22.67	0.92
4.500	1.11	10.583	3.82	16.667	1.72	22.75	0.92
4.583	1.15	10.667	3.82	16.750	1.72	22.83	0.91
4.667	1.15	10.750	3.82	16.833	1.67	22.92	0.91
4.750	1.15	10.833	4.47	16.917	1.67	23.00	0.91
4.833	1.19	10.917	4.47	17.000	1.67	23.08	0.90
4.917	1.19	11.000	4.47	17.083	1.63	23.17	0.90
5.000	1.19	11.083	5.22	17.167	1.63	23.25	0.90
5.083	1.23	11.167	5.22	17.250	1.63	23.33	0.89
5.167	1.23	11.250	5.22	17.333	1.58	23.42	0.89

5.250	1.23	11.333	6.60	17.417	1.58	23.50	0.89
5.333	1.27	11.417	6.60	17.500	1.58	23.58	0.88
5.417	1.27	11.500	6.60	17.583	1.53	23.67	0.88
5.500	1.27	11.583	8.39	17.667	1.53	23.75	0.88
5.583	1.31	11.667	8.40	17.750	1.53	23.83	0.87
5.667	1.31	11.750	8.40	17.833	1.48	23.92	0.87
5.750	1.31	11.833	34.22	17.917	1.48	24.00	0.87
5.833	1.35	11.917	34.22	18.000	1.48	24.08	0.86
5.917	1.35	12.000	34.22	18.083	1.43	24.17	0.86
6.000	1.35	12.083	84.45	18.167	1.43	24.25	0.86
6.083	1.39	12.167	84.46	18.250	1.43		

Unit Hyd Qpeak (cms)= 1.091

PEAK FLOW (cms)= 0.253 (i)
TIME TO PEAK (hrs)= 12.250
RUNOFF VOLUME (mm)= 34.109
TOTAL RAINFALL (mm)= 78.080
RUNOFF COEFFICIENT = 0.437

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

CALIB	
NASHYD (0002)	Area (ha)= 0.71 Curve Number (CN)= 57.8
ID= 1 DT= 5.0 min	Ia (mm)= 10.20 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.25

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.39	12.250	84.46	18.33	1.38
0.167	0.00	6.250	1.39	12.333	13.39	18.42	1.38
0.250	0.00	6.333	1.43	12.417	13.38	18.50	1.38
0.333	0.79	6.417	1.43	12.500	13.38	18.58	1.33
0.417	0.79	6.500	1.43	12.583	9.11	18.67	1.33
0.500	0.79	6.583	1.46	12.667	9.11	18.75	1.33
0.583	0.81	6.667	1.46	12.750	9.11	18.83	1.28
0.667	0.81	6.750	1.46	12.833	6.27	18.92	1.28
0.750	0.81	6.833	1.50	12.917	6.27	19.00	1.28
0.833	0.83	6.917	1.50	13.000	6.27	19.08	1.24
0.917	0.83	7.000	1.50	13.083	5.29	19.17	1.24
1.000	0.83	7.083	1.54	13.167	5.29	19.25	1.24
1.083	0.85	7.167	1.54	13.250	5.29	19.33	1.19
1.167	0.85	7.250	1.54	13.333	4.48	19.42	1.19
1.250	0.85	7.333	1.58	13.417	4.48	19.50	1.19
1.333	0.87	7.417	1.58	13.500	4.48	19.58	1.14
1.417	0.87	7.500	1.58	13.583	3.95	19.67	1.14
1.500	0.87	7.583	1.62	13.667	3.95	19.75	1.14
1.583	0.89	7.667	1.62	13.750	3.95	19.83	1.09
1.667	0.89	7.750	1.62	13.833	3.47	19.92	1.09
1.750	0.89	7.833	1.66	13.917	3.47	20.00	1.09
1.833	0.91	7.917	1.66	14.000	3.47	20.08	1.04
1.917	0.91	8.000	1.66	14.083	3.09	20.17	1.04
2.000	0.91	8.083	1.70	14.167	3.09	20.25	1.04
2.083	0.93	8.167	1.70	14.250	3.09	20.33	1.01
2.167	0.93	8.250	1.70	14.333	2.82	20.42	1.01
2.250	0.93	8.333	1.82	14.417	2.82	20.50	1.01
2.333	0.95	8.417	1.82	14.500	2.82	20.58	1.00
2.417	0.95	8.500	1.82	14.583	2.69	20.67	1.00
2.500	0.95	8.583	2.01	14.667	2.69	20.75	1.00
2.583	0.97	8.667	2.01	14.750	2.69	20.83	0.99
2.667	0.97	8.750	2.01	14.833	2.54	20.92	0.99
2.750	0.97	8.833	2.21	14.917	2.54	21.00	0.99
2.833	0.99	8.917	2.21	15.000	2.54	21.08	0.98
2.917	0.99	9.000	2.21	15.083	2.41	21.17	0.98
3.000	0.99	9.083	2.40	15.167	2.41	21.25	0.98
3.083	1.00	9.167	2.40	15.250	2.41	21.33	0.97
3.167	1.00	9.250	2.40	15.333	2.27	21.42	0.97
3.250	1.00	9.333	2.50	15.417	2.27	21.50	0.97
3.333	1.03	9.417	2.50	15.500	2.27	21.58	0.96
3.417	1.03	9.500	2.50	15.583	2.14	21.67	0.96
3.500	1.03	9.583	2.50	15.667	2.14	21.75	0.96
3.583	1.04	9.667	2.50	15.750	2.14	21.83	0.95
3.667	1.04	9.750	2.50	15.833	2.00	21.92	0.95
3.750	1.04	9.833	2.66	15.917	2.00	22.00	0.95
3.833	1.06	9.917	2.66	16.000	2.00	22.08	0.94
3.917	1.06	10.000	2.66	16.083	1.87	22.17	0.94
4.000	1.06	10.083	2.96	16.167	1.87	22.25	0.94
4.083	1.08	10.167	2.96	16.250	1.87	22.33	0.93
4.167	1.08	10.250	2.96	16.333	1.77	22.42	0.93
4.250	1.08	10.333	3.37	16.417	1.77	22.50	0.93
4.333	1.11	10.417	3.37	16.500	1.77	22.58	0.92
4.417	1.11	10.500	3.37	16.583	1.72	22.67	0.92
4.500	1.11	10.583	3.82	16.667	1.72	22.75	0.92
4.583	1.15	10.667	3.82	16.750	1.72	22.83	0.91
4.667	1.15	10.750	3.82	16.833	1.67	22.92	0.91
4.750	1.15	10.833	4.47	16.917	1.67	23.00	0.91
4.833	1.19	10.917	4.47	17.000	1.67	23.08	0.90
4.917	1.19	11.000	4.47	17.083	1.63	23.17	0.90
5.000	1.19	11.083	5.22	17.167	1.63	23.25	0.90
5.083	1.23	11.167	5.22	17.250	1.63	23.33	0.89
5.167	1.23	11.250	5.22	17.333	1.58	23.42	0.89
5.250	1.23	11.333	6.60	17.417	1.58	23.50	0.89
5.333	1.27	11.417	6.60	17.500	1.58	23.58	0.88
5.417	1.27	11.500	6.60	17.583	1.53	23.67	0.88

5.500	1.27	11.583	8.39	17.667	1.53	23.75	0.88
5.583	1.31	11.667	8.40	17.750	1.53	23.83	0.87
5.667	1.31	11.750	8.40	17.833	1.48	23.92	0.87
5.750	1.31	11.833	34.22	17.917	1.48	24.00	0.87
5.833	1.35	11.917	34.22	18.000	1.48	24.08	0.86
5.917	1.35	12.000	34.22	18.083	1.43	24.17	0.86
6.000	1.35	12.083	84.45	18.167	1.43	24.25	0.86
6.083	1.39	12.167	84.46	18.250	1.43		

Unit Hyd Qpeak (cms)= 0.108

PEAK FLOW (cms)= 0.026 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 18.174
TOTAL RAINFALL (mm)= 78.080
RUNOFF COEFFICIENT = 0.233

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

ADD HYD (0003)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0001):		2.00	0.253	12.25	34.11
+ ID2= 2 (0002):		0.71	0.026	12.33	18.17
ID = 3 (0003):		2.71	0.274	12.25	29.93

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:K. 50yr 24hr 15min SCS Type II **
****

READ STORM	Filename: C:\Users\amysliwiec\AppData\Local\Temp\719a532b-c862-417c-8729-d844365672f4\d4b37525
Ptotal= 85.42 mm	Comments: 50yr 24hr 15min SCS Type II

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.00	6.25	1.56	12.50	9.96	18.75	1.40
0.25	0.87	6.50	1.60	12.75	6.85	19.00	1.35
0.50	0.89	6.75	1.65	13.00	5.79	19.25	1.30
0.75	0.91	7.00	1.69	13.25	4.90	19.50	1.25
1.00	0.93	7.25	1.73	13.50	4.33	19.75	1.19
1.25	0.95	7.50	1.77	13.75	3.79	20.00	1.14
1.50	0.97	7.75	1.82	14.00	3.38	20.25	1.11
1.75	0.99	8.00	1.86	14.25	3.08	20.50	1.10
2.00	1.01	8.25	1.99	14.50	2.94	20.75	1.08
2.25	1.04	8.50	2.20	14.75	2.78	21.00	1.07
2.50	1.06	8.75	2.42	15.00	2.64	21.25	1.06
2.75	1.08	9.00	2.62	15.25	2.49	21.50	1.05
3.00	1.10	9.25	2.73	15.50	2.34	21.75	1.04
3.25	1.12	9.50	2.73	15.75	2.19	22.00	1.03
3.50	1.14	9.75	2.91	16.00	2.04	22.25	1.02
3.75	1.16	10.00	3.24	16.25	1.94	22.50	1.01
4.00	1.18	10.25	3.68	16.50	1.89	22.75	1.00
4.25	1.22	10.50	4.18	16.75	1.83	23.00	0.99
4.50	1.26	10.75	4.89	17.00	1.78	23.25	0.98
4.75	1.30	11.00	5.71	17.25	1.72	23.50	0.97
5.00	1.34	11.25	7.22	17.50	1.67	23.75	0.95
5.25	1.39	11.50	9.18	17.75	1.62	24.00	0.94
5.50	1.43	11.75	37.44	18.00	1.56		
5.75	1.47	12.00	92.40	18.25	1.51		
6.00	1.52	12.25	14.64	18.50	1.46		

CALIB NASHYD (0001) ID= 1 DT= 5.0 min	Area (ha)= 2.00	Curve Number (CN)= 77.8
	Ia (mm)= 4.06	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.07	

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.52	12.250	92.40	18.33	1.51
0.167	0.00	6.250	1.52	12.333	14.65	18.42	1.51
0.250	0.00	6.333	1.56	12.417	14.64	18.50	1.51
0.333	0.87	6.417	1.56	12.500	14.64	18.58	1.46
0.417	0.87	6.500	1.56	12.583	9.96	18.67	1.46
0.500	0.87	6.583	1.60	12.667	9.96	18.75	1.46
0.583	0.89	6.667	1.60	12.750	9.96	18.83	1.40
0.667	0.89	6.750	1.60	12.833	6.85	18.92	1.40
0.750	0.89	6.833	1.65	12.917	6.85	19.00	1.40
0.833	0.91	6.917	1.65	13.000	6.85	19.08	1.35
0.917	0.91	7.000	1.65	13.083	5.79	19.17	1.35
1.000	0.91	7.083	1.69	13.167	5.79	19.25	1.35
1.083	0.93	7.167	1.69	13.250	5.79	19.33	1.30
1.167	0.93	7.250	1.69	13.333	4.90	19.42	1.30
1.250	0.93	7.333	1.73	13.417	4.90	19.50	1.30
1.333	0.95	7.417	1.73	13.500	4.90	19.58	1.25

1.417	0.95	7.500	1.73	13.583	4.33	19.67	1.25
1.500	0.95	7.583	1.77	13.667	4.33	19.75	1.25
1.583	0.97	7.667	1.77	13.750	4.33	19.83	1.19
1.667	0.97	7.750	1.77	13.833	3.79	19.92	1.19
1.750	0.97	7.833	1.82	13.917	3.79	20.00	1.19
1.833	0.99	7.917	1.82	14.000	3.79	20.08	1.14
1.917	0.99	8.000	1.82	14.083	3.38	20.17	1.14
2.000	0.99	8.083	1.86	14.167	3.38	20.25	1.14
2.083	1.01	8.167	1.86	14.250	3.38	20.33	1.11
2.167	1.01	8.250	1.86	14.333	3.08	20.42	1.11
2.250	1.01	8.333	1.99	14.417	3.08	20.50	1.11
2.333	1.04	8.417	1.99	14.500	3.08	20.58	1.10
2.417	1.04	8.500	1.99	14.583	2.94	20.67	1.10
2.500	1.04	8.583	2.20	14.667	2.94	20.75	1.10
2.583	1.06	8.667	2.20	14.750	2.94	20.83	1.08
2.667	1.06	8.750	2.20	14.833	2.78	20.92	1.08
2.750	1.06	8.833	2.42	14.917	2.78	21.00	1.08
2.833	1.08	8.917	2.42	15.000	2.78	21.08	1.07
2.917	1.08	9.000	2.42	15.083	2.64	21.17	1.07
3.000	1.08	9.083	2.62	15.167	2.64	21.25	1.07
3.083	1.10	9.167	2.62	15.250	2.64	21.33	1.06
3.167	1.10	9.250	2.62	15.333	2.49	21.42	1.06
3.250	1.10	9.333	2.73	15.417	2.49	21.50	1.06
3.333	1.12	9.417	2.73	15.500	2.49	21.58	1.05
3.417	1.12	9.500	2.73	15.583	2.34	21.67	1.05
3.500	1.12	9.583	2.73	15.667	2.34	21.75	1.05
3.583	1.14	9.667	2.73	15.750	2.34	21.83	1.04
3.667	1.14	9.750	2.73	15.833	2.19	21.92	1.04
3.750	1.14	9.833	2.91	15.917	2.19	22.00	1.04
3.833	1.16	9.917	2.91	16.000	2.19	22.08	1.03
3.917	1.16	10.000	2.91	16.083	2.04	22.17	1.03
4.000	1.16	10.083	3.24	16.167	2.04	22.25	1.03
4.083	1.18	10.167	3.24	16.250	2.04	22.33	1.02
4.167	1.18	10.250	3.24	16.333	1.94	22.42	1.02
4.250	1.18	10.333	3.68	16.417	1.94	22.50	1.02
4.333	1.22	10.417	3.68	16.500	1.94	22.58	1.01
4.417	1.22	10.500	3.68	16.583	1.89	22.67	1.01
4.500	1.22	10.583	4.18	16.667	1.89	22.75	1.01
4.583	1.26	10.667	4.18	16.750	1.89	22.83	1.00
4.667	1.26	10.750	4.18	16.833	1.83	22.92	1.00
4.750	1.26	10.833	4.89	16.917	1.83	23.00	1.00
4.833	1.30	10.917	4.89	17.000	1.83	23.08	0.99
4.917	1.30	11.000	4.89	17.083	1.78	23.17	0.99
5.000	1.30	11.083	5.71	17.167	1.78	23.25	0.99
5.083	1.34	11.167	5.71	17.250	1.78	23.33	0.98
5.167	1.34	11.250	5.71	17.333	1.72	23.42	0.98
5.250	1.34	11.333	7.22	17.417	1.72	23.50	0.98
5.333	1.39	11.417	7.22	17.500	1.72	23.58	0.97
5.417	1.39	11.500	7.22	17.583	1.67	23.67	0.97
5.500	1.39	11.583	9.18	17.667	1.67	23.75	0.97
5.583	1.43	11.667	9.18	17.750	1.67	23.83	0.95
5.667	1.43	11.750	9.18	17.833	1.62	23.92	0.95
5.750	1.43	11.833	37.44	17.917	1.62	24.00	0.95
5.833	1.47	11.917	37.44	18.000	1.62	24.08	0.94
5.917	1.47	12.000	37.44	18.083	1.56	24.17	0.94
6.000	1.47	12.083	92.39	18.167	1.56	24.25	0.94
6.083	1.52	12.167	92.40	18.250	1.56		

Unit Hyd Qpeak (cms)= 1.091

PEAK FLOW (cms)= 0.290 (i)
TIME TO PEAK (hrs)= 12.250
RUNOFF VOLUME (mm)= 39.243
TOTAL RAINFALL (mm)= 85.420
RUNOFF COEFFICIENT = 0.459

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

CALIB			
NASHYD (0002)	Area (ha)= 0.71	Curve Number (CN)= 57.8	
ID= 1 DT= 5.0 min	Ia (mm)= 10.20	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.25		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.52	12.250	92.40	18.33	1.51
0.167	0.00	6.250	1.52	12.333	14.65	18.42	1.51
0.250	0.00	6.333	1.56	12.417	14.64	18.50	1.51
0.333	0.87	6.417	1.56	12.500	14.64	18.58	1.46
0.417	0.87	6.500	1.56	12.583	9.96	18.67	1.46
0.500	0.87	6.583	1.60	12.667	9.96	18.75	1.46
0.583	0.89	6.667	1.60	12.750	9.96	18.83	1.40
0.667	0.89	6.750	1.60	12.833	6.85	18.92	1.40
0.750	0.89	6.833	1.65	12.917	6.85	19.00	1.40
0.833	0.91	6.917	1.65	13.000	6.85	19.08	1.35
0.917	0.91	7.000	1.65	13.083	5.79	19.17	1.35
1.000	0.91	7.083	1.69	13.167	5.79	19.25	1.35
1.083	0.93	7.167	1.69	13.250	5.79	19.33	1.30
1.167	0.93	7.250	1.69	13.333	4.90	19.42	1.30
1.250	0.93	7.333	1.73	13.417	4.90	19.50	1.30
1.333	0.95	7.417	1.73	13.500	4.90	19.58	1.25
1.417	0.95	7.500	1.73	13.583	4.33	19.67	1.25
1.500	0.95	7.583	1.77	13.667	4.33	19.75	1.25
1.583	0.97	7.667	1.77	13.750	4.33	19.83	1.19

1.667	0.97	7.750	1.77	13.833	3.79	19.92	1.19
1.750	0.97	7.833	1.82	13.917	3.79	20.00	1.19
1.833	0.99	7.917	1.82	14.000	3.79	20.08	1.14
1.917	0.99	8.000	1.82	14.083	3.38	20.17	1.14
2.000	0.99	8.083	1.86	14.167	3.38	20.25	1.14
2.083	1.01	8.167	1.86	14.250	3.38	20.33	1.11
2.167	1.01	8.250	1.86	14.333	3.08	20.42	1.11
2.250	1.01	8.333	1.99	14.417	3.08	20.50	1.11
2.333	1.04	8.417	1.99	14.500	3.08	20.58	1.10
2.417	1.04	8.500	1.99	14.583	2.94	20.67	1.10
2.500	1.04	8.583	2.20	14.667	2.94	20.75	1.10
2.583	1.06	8.667	2.20	14.750	2.94	20.83	1.08
2.667	1.06	8.750	2.20	14.833	2.78	20.92	1.08
2.750	1.06	8.833	2.42	14.917	2.78	21.00	1.08
2.833	1.08	8.917	2.42	15.000	2.78	21.08	1.07
2.917	1.08	9.000	2.42	15.083	2.64	21.17	1.07
3.000	1.08	9.083	2.62	15.167	2.64	21.25	1.07
3.083	1.10	9.167	2.62	15.250	2.64	21.33	1.06
3.167	1.10	9.250	2.62	15.333	2.49	21.42	1.06
3.250	1.10	9.333	2.73	15.417	2.49	21.50	1.06
3.333	1.12	9.417	2.73	15.500	2.49	21.58	1.05
3.417	1.12	9.500	2.73	15.583	2.34	21.67	1.05
3.500	1.12	9.583	2.73	15.667	2.34	21.75	1.05
3.583	1.14	9.667	2.73	15.750	2.34	21.83	1.04
3.667	1.14	9.750	2.73	15.833	2.19	21.92	1.04
3.750	1.14	9.833	2.91	15.917	2.19	22.00	1.04
3.833	1.16	9.917	2.91	16.000	2.19	22.08	1.03
3.917	1.16	10.000	2.91	16.083	2.04	22.17	1.03
4.000	1.16	10.083	3.24	16.167	2.04	22.25	1.03
4.083	1.18	10.167	3.24	16.250	2.04	22.33	1.02
4.167	1.18	10.250	3.24	16.333	1.94	22.42	1.02
4.250	1.18	10.333	3.68	16.417	1.94	22.50	1.02
4.333	1.22	10.417	3.68	16.500	1.94	22.58	1.01
4.417	1.22	10.500	3.68	16.583	1.89	22.67	1.01
4.500	1.22	10.583	4.18	16.667	1.89	22.75	1.01
4.583	1.26	10.667	4.18	16.750	1.89	22.83	1.00
4.667	1.26	10.750	4.18	16.833	1.83	22.92	1.00
4.750	1.26	10.833	4.89	16.917	1.83	23.00	1.00
4.833	1.30	10.917	4.89	17.000	1.83	23.08	0.99
4.917	1.30	11.000	4.89	17.083	1.78	23.17	0.99
5.000	1.30	11.083	5.71	17.167	1.78	23.25	0.99
5.083	1.34	11.167	5.71	17.250	1.78	23.33	0.98
5.167	1.34	11.250	5.71	17.333	1.72	23.42	0.98
5.250	1.34	11.333	7.22	17.417	1.72	23.50	0.98
5.333	1.39	11.417	7.22	17.500	1.72	23.58	0.97
5.417	1.39	11.500	7.22	17.583	1.67	23.67	0.97
5.500	1.39	11.583	9.18	17.667	1.67	23.75	0.97
5.583	1.43	11.667	9.18	17.750	1.67	23.83	0.95
5.667	1.43	11.750	9.18	17.833	1.62	23.92	0.95
5.750	1.43	11.833	37.44	17.917	1.62	24.00	0.95
5.833	1.47	11.917	37.44	18.000	1.62	24.08	0.94
5.917	1.47	12.000	37.44	18.083	1.56	24.17	0.94
6.000	1.47	12.083	92.39	18.167	1.56	24.25	0.94
6.083	1.52	12.167	92.40	18.250	1.56		

Unit Hyd Qpeak (cms)= 0.108

PEAK FLOW (cms)= 0.031 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 21.688
TOTAL RAINFALL (mm)= 85.420
RUNOFF COEFFICIENT = 0.254

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

ADD HYD (0003)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0001):	2.00	0.290	12.25	39.24
	+ ID2= 2 (0002):	0.71	0.031	12.33	21.69
	ID = 3 (0003):	2.71	0.316	12.25	34.64

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:L. 100yr 24hr 15min SCS Type II **
****

READ STORM	Filename: C:\Users\amysliwiec\AppData\Local\Temp\719a532b-c862-417c-8729-d844365672f4\c459837c
Ptotal= 92.89 mm	Comments: 100yr 24hr 15min SCS Type II

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.00	6.25	1.70	12.50	10.83	18.75	1.53
0.25	0.94	6.50	1.74	12.75	7.45	19.00	1.47
0.50	0.96	6.75	1.79	13.00	6.29	19.25	1.41
0.75	0.99	7.00	1.83	13.25	5.33	19.50	1.35
1.00	1.01	7.25	1.88	13.50	4.70	19.75	1.29
1.25	1.03	7.50	1.93	13.75	4.12	20.00	1.24
1.50	1.06	7.75	1.97	14.00	3.68	20.25	1.20
1.75	1.08	8.00	2.02	14.25	3.35	20.50	1.19
2.00	1.10	8.25	2.16	14.50	3.20	20.75	1.18
2.25	1.13	8.50	2.39	14.75	3.03	21.00	1.17

2.50	1.15	8.75	2.63	15.00	2.87	21.25	1.16
2.75	1.17	9.00	2.85	15.25	2.70	21.50	1.14
3.00	1.19	9.25	2.97	15.50	2.55	21.75	1.13
3.25	1.22	9.50	2.97	15.75	2.38	22.00	1.12
3.50	1.24	9.75	3.17	16.00	2.22	22.25	1.11
3.75	1.27	10.00	3.52	16.25	2.11	22.50	1.10
4.00	1.29	10.25	4.01	16.50	2.05	22.75	1.08
4.25	1.32	10.50	4.54	16.75	1.99	23.00	1.07
4.50	1.37	10.75	5.31	17.00	1.93	23.25	1.06
4.75	1.42	11.00	6.21	17.25	1.87	23.50	1.05
5.00	1.46	11.25	7.85	17.50	1.82	23.75	1.04
5.25	1.51	11.50	9.99	17.75	1.76	24.00	1.03
5.50	1.55	11.75	40.71	18.00	1.70		
5.75	1.60	12.00	100.48	18.25	1.64		
6.00	1.65	12.25	15.92	18.50	1.59		

CALIB			
NASHYD (0001)	Area (ha)=	2.00	Curve Number (CN)= 77.8
ID= 1 DT= 5.0 min	Ia (mm)=	4.06	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.07	

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.65	12.250	100.48	18.33	1.64
0.167	0.00	6.250	1.65	12.333	15.93	18.42	1.64
0.250	0.00	6.333	1.70	12.417	15.92	18.50	1.64
0.333	0.94	6.417	1.70	12.500	15.92	18.58	1.59
0.417	0.94	6.500	1.70	12.583	10.84	18.67	1.59
0.500	0.94	6.583	1.74	12.667	10.83	18.75	1.59
0.583	0.96	6.667	1.74	12.750	10.83	18.83	1.53
0.667	0.96	6.750	1.74	12.833	7.45	18.92	1.53
0.750	0.96	6.833	1.79	12.917	7.45	19.00	1.53
0.833	0.99	6.917	1.79	13.000	7.45	19.08	1.47
0.917	0.99	7.000	1.79	13.083	6.29	19.17	1.47
1.000	0.99	7.083	1.83	13.167	6.29	19.25	1.47
1.083	1.01	7.167	1.83	13.250	6.29	19.33	1.41
1.167	1.01	7.250	1.83	13.333	5.33	19.42	1.41
1.250	1.01	7.333	1.88	13.417	5.33	19.50	1.41
1.333	1.03	7.417	1.88	13.500	5.33	19.58	1.35
1.417	1.03	7.500	1.88	13.583	4.70	19.67	1.35
1.500	1.03	7.583	1.93	13.667	4.70	19.75	1.35
1.583	1.06	7.667	1.93	13.750	4.70	19.83	1.29
1.667	1.06	7.750	1.93	13.833	4.12	19.92	1.29
1.750	1.06	7.833	1.97	13.917	4.12	20.00	1.29
1.833	1.08	7.917	1.97	14.000	4.12	20.08	1.24
1.917	1.08	8.000	1.97	14.083	3.68	20.17	1.24
2.000	1.08	8.083	2.02	14.167	3.68	20.25	1.24
2.083	1.10	8.167	2.02	14.250	3.68	20.33	1.20
2.167	1.10	8.250	2.02	14.333	3.35	20.42	1.20
2.250	1.10	8.333	2.16	14.417	3.35	20.50	1.20
2.333	1.13	8.417	2.16	14.500	3.35	20.58	1.19
2.417	1.13	8.500	2.16	14.583	3.20	20.67	1.19
2.500	1.13	8.583	2.39	14.667	3.20	20.75	1.19
2.583	1.15	8.667	2.39	14.750	3.20	20.83	1.18
2.667	1.15	8.750	2.39	14.833	3.03	20.92	1.18
2.750	1.15	8.833	2.63	14.917	3.03	21.00	1.18
2.833	1.17	8.917	2.63	15.000	3.03	21.08	1.17
2.917	1.17	9.000	2.63	15.083	2.87	21.17	1.17
3.000	1.17	9.083	2.85	15.167	2.87	21.25	1.17
3.083	1.19	9.167	2.85	15.250	2.87	21.33	1.16
3.167	1.19	9.250	2.85	15.333	2.70	21.42	1.16
3.250	1.19	9.333	2.97	15.417	2.70	21.50	1.16
3.333	1.22	9.417	2.97	15.500	2.70	21.58	1.14
3.417	1.22	9.500	2.97	15.583	2.55	21.67	1.14
3.500	1.22	9.583	2.97	15.667	2.55	21.75	1.14
3.583	1.24	9.667	2.97	15.750	2.55	21.83	1.13
3.667	1.24	9.750	2.97	15.833	2.38	21.92	1.13
3.750	1.24	9.833	3.17	15.917	2.38	22.00	1.13
3.833	1.27	9.917	3.17	16.000	2.38	22.08	1.12
3.917	1.27	10.000	3.17	16.083	2.22	22.17	1.12
4.000	1.27	10.083	3.52	16.167	2.22	22.25	1.12
4.083	1.29	10.167	3.52	16.250	2.22	22.33	1.11
4.167	1.29	10.250	3.52	16.333	2.11	22.42	1.11
4.250	1.29	10.333	4.01	16.417	2.11	22.50	1.11
4.333	1.32	10.417	4.01	16.500	2.11	22.58	1.10
4.417	1.32	10.500	4.01	16.583	2.05	22.67	1.10
4.500	1.32	10.583	4.54	16.667	2.05	22.75	1.10
4.583	1.37	10.667	4.54	16.750	2.05	22.83	1.08
4.667	1.37	10.750	4.54	16.833	1.99	22.92	1.08
4.750	1.37	10.833	5.31	16.917	1.99	23.00	1.08
4.833	1.42	10.917	5.31	17.000	1.99	23.08	1.07
4.917	1.42	11.000	5.31	17.083	1.93	23.17	1.07
5.000	1.42	11.083	6.20	17.167	1.93	23.25	1.07
5.083	1.46	11.167	6.21	17.250	1.93	23.33	1.06
5.167	1.46	11.250	6.21	17.333	1.87	23.42	1.06
5.250	1.46	11.333	7.85	17.417	1.87	23.50	1.06
5.333	1.51	11.417	7.85	17.500	1.87	23.58	1.05
5.417	1.51	11.500	7.85	17.583	1.82	23.67	1.05
5.500	1.51	11.583	9.99	17.667	1.82	23.75	1.05
5.583	1.55	11.667	9.99	17.750	1.82	23.83	1.04
5.667	1.55	11.750	9.99	17.833	1.76	23.92	1.04
5.750	1.55	11.833	40.71	17.917	1.76	24.00	1.04
5.833	1.60	11.917	40.71	18.000	1.76	24.08	1.03

5.917	1.60	12.000	40.71	18.083	1.70	24.17	1.03
6.000	1.60	12.083	100.47	18.167	1.70	24.25	1.03
6.083	1.65	12.167	100.48	18.250	1.70		

Unit Hyd Qpeak (cms)= 1.091

PEAK FLOW (cms)= 0.328 (i)
TIME TO PEAK (hrs)= 12.250
RUNOFF VOLUME (mm)= 44.613
TOTAL RAINFALL (mm)= 92.890
RUNOFF COEFFICIENT = 0.480

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

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

Area (ha)= 0.71 Curve Number (CN)= 57.8
Ia (mm)= 10.20 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.25

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.65	12.250	100.48	18.33	1.64
0.167	0.00	6.250	1.65	12.333	15.93	18.42	1.64
0.250	0.00	6.333	1.70	12.417	15.92	18.50	1.64
0.333	0.94	6.417	1.70	12.500	15.92	18.58	1.59
0.417	0.94	6.500	1.70	12.583	10.84	18.67	1.59
0.500	0.94	6.583	1.74	12.667	10.83	18.75	1.59
0.583	0.96	6.667	1.74	12.750	10.83	18.83	1.53
0.667	0.96	6.750	1.74	12.833	7.45	18.92	1.53
0.750	0.96	6.833	1.79	12.917	7.45	19.00	1.53
0.833	0.99	6.917	1.79	13.000	7.45	19.08	1.47
0.917	0.99	7.000	1.79	13.083	6.29	19.17	1.47
1.000	0.99	7.083	1.83	13.167	6.29	19.25	1.47
1.083	1.01	7.167	1.83	13.250	6.29	19.33	1.41
1.167	1.01	7.250	1.83	13.333	5.33	19.42	1.41
1.250	1.01	7.333	1.88	13.417	5.33	19.50	1.41
1.333	1.03	7.417	1.88	13.500	5.33	19.58	1.35
1.417	1.03	7.500	1.88	13.583	4.70	19.67	1.35
1.500	1.03	7.583	1.93	13.667	4.70	19.75	1.35
1.583	1.06	7.667	1.93	13.750	4.70	19.83	1.29
1.667	1.06	7.750	1.93	13.833	4.12	19.92	1.29
1.750	1.06	7.833	1.97	13.917	4.12	20.00	1.29
1.833	1.08	7.917	1.97	14.000	4.12	20.08	1.24
1.917	1.08	8.000	1.97	14.083	3.68	20.17	1.24
2.000	1.08	8.083	2.02	14.167	3.68	20.25	1.24
2.083	1.10	8.167	2.02	14.250	3.68	20.33	1.20
2.167	1.10	8.250	2.02	14.333	3.35	20.42	1.20
2.250	1.10	8.333	2.16	14.417	3.35	20.50	1.20
2.333	1.13	8.417	2.16	14.500	3.35	20.58	1.19
2.417	1.13	8.500	2.16	14.583	3.20	20.67	1.19
2.500	1.13	8.583	2.39	14.667	3.20	20.75	1.19
2.583	1.15	8.667	2.39	14.750	3.20	20.83	1.18
2.667	1.15	8.750	2.39	14.833	3.03	20.92	1.18
2.750	1.15	8.833	2.63	14.917	3.03	21.00	1.18
2.833	1.17	8.917	2.63	15.000	3.03	21.08	1.17
2.917	1.17	9.000	2.63	15.083	2.87	21.17	1.17
3.000	1.17	9.083	2.85	15.167	2.87	21.25	1.17
3.083	1.19	9.167	2.85	15.250	2.87	21.33	1.16
3.167	1.19	9.250	2.85	15.333	2.70	21.42	1.16
3.250	1.19	9.333	2.97	15.417	2.70	21.50	1.16
3.333	1.22	9.417	2.97	15.500	2.70	21.58	1.14
3.417	1.22	9.500	2.97	15.583	2.55	21.67	1.14
3.500	1.22	9.583	2.97	15.667	2.55	21.75	1.14
3.583	1.24	9.667	2.97	15.750	2.55	21.83	1.13
3.667	1.24	9.750	2.97	15.833	2.38	21.92	1.13
3.750	1.24	9.833	3.17	15.917	2.38	22.00	1.13
3.833	1.27	9.917	3.17	16.000	2.38	22.08	1.12
3.917	1.27	10.000	3.17	16.083	2.22	22.17	1.12
4.000	1.27	10.083	3.52	16.167	2.22	22.25	1.12
4.083	1.29	10.167	3.52	16.250	2.22	22.33	1.11
4.167	1.29	10.250	3.52	16.333	2.11	22.42	1.11
4.250	1.29	10.333	4.01	16.417	2.11	22.50	1.11
4.333	1.32	10.417	4.01	16.500	2.11	22.58	1.10
4.417	1.32	10.500	4.01	16.583	2.05	22.67	1.10
4.500	1.32	10.583	4.54	16.667	2.05	22.75	1.10
4.583	1.37	10.667	4.54	16.750	2.05	22.83	1.08
4.667	1.37	10.750	4.54	16.833	1.99	22.92	1.08
4.750	1.37	10.833	5.31	16.917	1.99	23.00	1.08
4.833	1.42	10.917	5.31	17.000	1.99	23.08	1.07
4.917	1.42	11.000	5.31	17.083	1.93	23.17	1.07
5.000	1.42	11.083	6.20	17.167	1.93	23.25	1.07
5.083	1.46	11.167	6.21	17.250	1.93	23.33	1.06
5.167	1.46	11.250	6.21	17.333	1.87	23.42	1.06
5.250	1.46	11.333	7.85	17.417	1.87	23.50	1.06
5.333	1.51	11.417	7.85	17.500	1.87	23.58	1.05
5.417	1.51	11.500	7.85	17.583	1.82	23.67	1.05
5.500	1.51	11.583	9.99	17.667	1.82	23.75	1.05
5.583	1.55	11.667	9.99	17.750	1.82	23.83	1.04
5.667	1.55	11.750	9.99	17.833	1.76	23.92	1.04
5.750	1.55	11.833	40.71	17.917	1.76	24.00	1.04
5.833	1.60	11.917	40.71	18.000	1.76	24.08	1.03
5.917	1.60	12.000	40.71	18.083	1.70	24.17	1.03
6.000	1.60	12.083	100.47	18.167	1.70	24.25	1.03
6.083	1.65	12.167	100.48	18.250	1.70		

```
     Unit Hyd Qpeak  (cms)=   0.108

     PEAK FLOW       (cms)=   0.037 (i)
     TIME TO PEAK    (hrs)=  12.333
     RUNOFF VOLUME    (mm)=  25.480
     TOTAL RAINFALL   (mm)=  92.890
     RUNOFF COEFFICIENT   =   0.274

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

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

--------------------
| ADD HYD  (  0003)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):     2.00   0.328    12.25    44.61
     + ID2= 2 (  0002):     0.71   0.037    12.33    25.48
       ================================================
       ID = 3 (  0003):     2.71   0.360    12.25    39.60

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
*******************************
** SIMULATION:tim             **
*******************************

--------------------
|    READ STORM    |    Filename: C:\Users\amysliwiec\AppD
|                  |              ata\Local\Temp\
|                  |              719a532b-c862-417c-8729-d844365672f4\e6319d3a
| Ptotal=193.00 mm |    Comments: tim
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00   15.00 |  3.00    3.00 |  6.00   43.00 |  9.00   13.00
                1.00   20.00 |  4.00    5.00 |  7.00   20.00 | 10.00   13.00
                2.00   10.00 |  5.00   20.00 |  8.00   23.00 | 11.00    8.00

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

--------------------
| CALIB            |
| NASHYD   (  0001)|   Area    (ha)=   2.00   Curve Number   (CN)= 77.8
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.06   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.07

        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   15.00 | 3.083    3.00 | 6.083   43.00 |  9.08   13.00
               0.167   15.00 | 3.167    3.00 | 6.167   43.00 |  9.17   13.00
               0.250   15.00 | 3.250    3.00 | 6.250   43.00 |  9.25   13.00
               0.333   15.00 | 3.333    3.00 | 6.333   43.00 |  9.33   13.00
               0.417   15.00 | 3.417    3.00 | 6.417   43.00 |  9.42   13.00
               0.500   15.00 | 3.500    3.00 | 6.500   43.00 |  9.50   13.00
               0.583   15.00 | 3.583    3.00 | 6.583   43.00 |  9.58   13.00
               0.667   15.00 | 3.667    3.00 | 6.667   43.00 |  9.67   13.00
               0.750   15.00 | 3.750    3.00 | 6.750   43.00 |  9.75   13.00
               0.833   15.00 | 3.833    3.00 | 6.833   43.00 |  9.83   13.00
               0.917   15.00 | 3.917    3.00 | 6.917   43.00 |  9.92   13.00
               1.000   15.00 | 4.000    3.00 | 7.000   43.00 | 10.00   13.00
               1.083   20.00 | 4.083    5.00 | 7.083   20.00 | 10.08   13.00
               1.167   20.00 | 4.167    5.00 | 7.167   20.00 | 10.17   13.00
               1.250   20.00 | 4.250    5.00 | 7.250   20.00 | 10.25   13.00
               1.333   20.00 | 4.333    5.00 | 7.333   20.00 | 10.33   13.00
               1.417   20.00 | 4.417    5.00 | 7.417   20.00 | 10.42   13.00
               1.500   20.00 | 4.500    5.00 | 7.500   20.00 | 10.50   13.00
               1.583   20.00 | 4.583    5.00 | 7.583   20.00 | 10.58   13.00
               1.667   20.00 | 4.667    5.00 | 7.667   20.00 | 10.67   13.00
               1.750   20.00 | 4.750    5.00 | 7.750   20.00 | 10.75   13.00
               1.833   20.00 | 4.833    5.00 | 7.833   20.00 | 10.83   13.00
               1.917   20.00 | 4.917    5.00 | 7.917   20.00 | 10.92   13.00
               2.000   20.00 | 5.000    5.00 | 8.000   20.00 | 11.00   13.00
               2.083   10.00 | 5.083   20.00 | 8.083   23.00 | 11.08    8.00
               2.167   10.00 | 5.167   20.00 | 8.167   23.00 | 11.17    8.00
               2.250   10.00 | 5.250   20.00 | 8.250   23.00 | 11.25    8.00
               2.333   10.00 | 5.333   20.00 | 8.333   23.00 | 11.33    8.00
               2.417   10.00 | 5.417   20.00 | 8.417   23.00 | 11.42    8.00
               2.500   10.00 | 5.500   20.00 | 8.500   23.00 | 11.50    8.00
               2.583   10.00 | 5.583   20.00 | 8.583   23.00 | 11.58    8.00
               2.667   10.00 | 5.667   20.00 | 8.667   23.00 | 11.67    8.00
               2.750   10.00 | 5.750   20.00 | 8.750   23.00 | 11.75    8.00
               2.833   10.00 | 5.833   20.00 | 8.833   23.00 | 11.83    8.00
               2.917   10.00 | 5.917   20.00 | 8.917   23.00 | 11.92    8.00
               3.000   10.00 | 6.000   20.00 | 9.000   23.00 | 12.00    8.00

Unit Hyd Qpeak  (cms)=   1.091

PEAK FLOW       (cms)=   0.183 (i)
TIME TO PEAK    (hrs)=   7.000
RUNOFF VOLUME    (mm)= 124.541
TOTAL RAINFALL   (mm)= 193.000
RUNOFF COEFFICIENT   =   0.645

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

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=   0.71   Curve Number   (CN)= 57.8
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.20   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	15.00	3.083	3.00	6.083	43.00	9.08	13.00
0.167	15.00	3.167	3.00	6.167	43.00	9.17	13.00
0.250	15.00	3.250	3.00	6.250	43.00	9.25	13.00
0.333	15.00	3.333	3.00	6.333	43.00	9.33	13.00
0.417	15.00	3.417	3.00	6.417	43.00	9.42	13.00
0.500	15.00	3.500	3.00	6.500	43.00	9.50	13.00
0.583	15.00	3.583	3.00	6.583	43.00	9.58	13.00
0.667	15.00	3.667	3.00	6.667	43.00	9.67	13.00
0.750	15.00	3.750	3.00	6.750	43.00	9.75	13.00
0.833	15.00	3.833	3.00	6.833	43.00	9.83	13.00
0.917	15.00	3.917	3.00	6.917	43.00	9.92	13.00
1.000	15.00	4.000	3.00	7.000	43.00	10.00	13.00
1.083	20.00	4.083	5.00	7.083	20.00	10.08	13.00
1.167	20.00	4.167	5.00	7.167	20.00	10.17	13.00
1.250	20.00	4.250	5.00	7.250	20.00	10.25	13.00
1.333	20.00	4.333	5.00	7.333	20.00	10.33	13.00
1.417	20.00	4.417	5.00	7.417	20.00	10.42	13.00
1.500	20.00	4.500	5.00	7.500	20.00	10.50	13.00
1.583	20.00	4.583	5.00	7.583	20.00	10.58	13.00
1.667	20.00	4.667	5.00	7.667	20.00	10.67	13.00
1.750	20.00	4.750	5.00	7.750	20.00	10.75	13.00
1.833	20.00	4.833	5.00	7.833	20.00	10.83	13.00
1.917	20.00	4.917	5.00	7.917	20.00	10.92	13.00
2.000	20.00	5.000	5.00	8.000	20.00	11.00	13.00
2.083	10.00	5.083	20.00	8.083	23.00	11.08	8.00
2.167	10.00	5.167	20.00	8.167	23.00	11.17	8.00
2.250	10.00	5.250	20.00	8.250	23.00	11.25	8.00
2.333	10.00	5.333	20.00	8.333	23.00	11.33	8.00
2.417	10.00	5.417	20.00	8.417	23.00	11.42	8.00
2.500	10.00	5.500	20.00	8.500	23.00	11.50	8.00
2.583	10.00	5.583	20.00	8.583	23.00	11.58	8.00
2.667	10.00	5.667	20.00	8.667	23.00	11.67	8.00
2.750	10.00	5.750	20.00	8.750	23.00	11.75	8.00
2.833	10.00	5.833	20.00	8.833	23.00	11.83	8.00
2.917	10.00	5.917	20.00	8.917	23.00	11.92	8.00
3.000	10.00	6.000	20.00	9.000	23.00	12.00	8.00

```
     Unit Hyd Qpeak  (cms)=   0.108

     PEAK FLOW       (cms)=   0.046 (i)
     TIME TO PEAK    (hrs)=   7.000
     RUNOFF VOLUME    (mm)=  90.670
     TOTAL RAINFALL   (mm)= 193.000
     RUNOFF COEFFICIENT   =   0.470

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

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

--------------------
| ADD HYD  (  0003)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     2.00   0.183     7.00   124.54
      + ID2= 2 (  0002):     0.71   0.046     7.00    90.67
        ================================================
        ID = 3 (  0003):     2.71   0.229     7.00   115.67

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
```

```
********************************
** SIMULATION:25mm            **
********************************

--------------------
|    READ STORM    |    Filename: C:\Users\amysliwiec\AppD
|                  |              ata\Local\Temp\
|                  |              1915adf3-1193-4333-b5c4-9f3f2a29696d\3be8570d
| Ptotal= 26.26 mm |    Comments: 25mm
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    2.10 |  0.83   30.00 |  1.67    4.67 |  2.50    2.37
                0.08    2.29 |  0.92   80.70 |  1.75    4.23 |  2.58    2.26
                0.17    2.52 |  1.00   37.00 |  1.83    3.88 |  2.67    2.17
                0.25    2.81 |  1.08   20.30 |  1.92    3.58 |  2.75    2.08
                0.33    3.18 |  1.17   13.27 |  2.00    3.33 |  2.83    2.00
                0.42    3.68 |  1.25   10.09 |  2.08    3.11 |  2.92    1.93
                0.50    4.39 |  1.33    8.15 |  2.17    2.92 |  3.00    1.93
                0.58    5.49 |  1.42    6.85 |  2.25    2.76 |  3.08    1.93
                0.67    7.40 |  1.50    5.92 |  2.33    2.61 |  3.17    1.93
                0.75   11.54 |  1.58    5.22 |  2.42    2.48 |

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

--------------------
| CALIB            |
| STANDHYD (  0004)|   Area    (ha)=   0.71
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  50.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.35         0.35
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      68.80        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      80.70         3.64
               over (min)        5.00        30.00
     Storage Coeff.  (min)=       2.22 (ii)   28.79 (ii)
     Unit Hyd. Tpeak (min)=       5.00        30.00
     Unit Hyd. peak  (cms)=       0.30         0.04
                                                    *TOTALS*
     PEAK FLOW       (cms)=       0.07         0.00          0.074 (iii)
     TIME TO PEAK    (hrs)=       1.00         1.58           1.00
     RUNOFF VOLUME    (mm)=      25.26         3.34          14.27
     TOTAL RAINFALL   (mm)=      26.26        26.26          26.26
     RUNOFF COEFFICIENT   =       0.96         0.13           0.54

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  69.0    Ia = Dep. 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 (  0005)|   Area    (ha)=   2.00
|ID= 1 DT= 5.0 min |   Total Imp(%)=  80.00   Dir. Conn.(%)=  80.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.60         0.40
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     115.47        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      80.70         5.81
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       3.03 (ii)    7.45 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.27         0.13
                                                    *TOTALS*
     PEAK FLOW       (cms)=       0.31         0.00          0.314 (iii)
     TIME TO PEAK    (hrs)=       1.00         1.17           1.00
     RUNOFF VOLUME    (mm)=      25.26         3.34          20.87
     TOTAL RAINFALL   (mm)=      26.26        26.26          26.26
     RUNOFF COEFFICIENT   =       0.96         0.13           0.79

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  69.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0003)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0004):     0.71   0.074     1.00    14.27
     + ID2= 2 (  0005):     2.00   0.314     1.00    20.87
       ================================================
       ID = 3 (  0003):     2.71   0.388     1.00    19.14
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0006)	OVERFLOW IS OFF
IN= 2---> OUT= 1	
DT= 5.0 min	

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0630	0.1060
0.0000	0.0110	0.0840	0.1190
0.0050	0.0210	0.1060	0.1320
0.0070	0.0330	0.1310	0.1460
0.0090	0.0440	0.1570	0.1600
0.0100	0.0560	0.1850	0.1740
0.0170	0.0680	0.2140	0.1890
0.0300	0.0800	0.2440	0.2050
0.0450	0.0930	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0003)	2.710	0.388	1.00	19.14
OUTFLOW: ID= 1 (0006)	2.710	0.009	3.25	14.90

PEAK FLOW REDUCTION [Qout/Qin](%)= 2.34
TIME SHIFT OF PEAK FLOW (min)=135.00
MAXIMUM STORAGE USED (ha.m.)= 0.0448

****
** SIMULATION:A. 2yr 4hr 10min Chicago **
****

CHICAGO STORM	IDF curve parameters: A= 807.440
Ptotal= 33.75 mm	B= 6.750
	C= 0.828

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
0.00	1.90	1.00	18.51	2.00	4.92	3.00	2.30
0.17	2.21	1.17	78.28	2.17	4.11	3.17	2.12
0.33	2.64	1.33	24.65	2.33	3.53	3.33	1.97
0.50	3.32	1.50	12.40	2.50	3.11	3.50	1.84
0.67	4.51	1.67	8.22	2.67	2.78	3.67	1.73
0.83	7.17	1.83	6.14	2.83	2.51	3.83	1.63

CALIB	
STANDHYD (0004)	Area (ha)= 0.71
ID= 1 DT= 5.0 min	Total Imp(%)= 50.00 Dir. Conn.(%)= 50.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.35	0.35
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	68.80	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	1.90	1.083	18.51	2.083	4.92	3.08	2.30
0.167	1.90	1.167	18.51	2.167	4.92	3.17	2.30
0.250	2.21	1.250	78.28	2.250	4.11	3.25	2.12
0.333	2.21	1.333	78.28	2.333	4.11	3.33	2.12
0.417	2.64	1.417	24.65	2.417	3.53	3.42	1.97
0.500	2.64	1.500	24.65	2.500	3.53	3.50	1.97
0.583	3.32	1.583	12.40	2.583	3.11	3.58	1.84
0.667	3.32	1.667	12.40	2.667	3.11	3.67	1.84
0.750	4.51	1.750	8.22	2.750	2.78	3.75	1.73
0.833	4.51	1.833	8.22	2.833	2.78	3.83	1.73
0.917	7.17	1.917	6.14	2.917	2.51	3.92	1.63
1.000	7.17	2.000	6.14	3.000	2.51	4.00	1.63

				TOTALS
Max.Eff.Inten.(mm/hr)=	78.28	7.95		
over (min)	5.00	25.00		
Storage Coeff. (min)=	2.25 (ii)	21.68 (ii)		
Unit Hyd. Tpeak (min)=	5.00	25.00		
Unit Hyd. peak (cms)=	0.30	0.05		
PEAK FLOW (cms)=	0.08	0.00		0.077 (iii)
TIME TO PEAK (hrs)=	1.33	1.75		1.33
RUNOFF VOLUME (mm)=	32.75	5.78		19.25
TOTAL RAINFALL (mm)=	33.75	33.75		33.75
RUNOFF COEFFICIENT =	0.97	0.17		0.57

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. 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 (0005)	Area (ha)= 2.00
ID= 1 DT= 5.0 min	Total Imp(%)= 80.00 Dir. Conn.(%)= 80.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.60	0.40
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	115.47	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	1.90	1.083	18.51	2.083	4.92	3.08	2.30
0.167	1.90	1.167	18.51	2.167	4.92	3.17	2.30
0.250	2.21	1.250	78.28	2.250	4.11	3.25	2.12
0.333	2.21	1.333	78.28	2.333	4.11	3.33	2.12
0.417	2.64	1.417	24.65	2.417	3.53	3.42	1.97
0.500	2.64	1.500	24.65	2.500	3.53	3.50	1.97
0.583	3.32	1.583	12.40	2.583	3.11	3.58	1.84
0.667	3.32	1.667	12.40	2.667	3.11	3.67	1.84
0.750	4.51	1.750	8.22	2.750	2.78	3.75	1.73
0.833	4.51	1.833	8.22	2.833	2.78	3.83	1.73
0.917	7.17	1.917	6.14	2.917	2.51	3.92	1.63
1.000	7.17	2.000	6.14	3.000	2.51	4.00	1.63

				TOTALS
Max.Eff.Inten.(mm/hr)=		78.28	9.99	
over (min)		5.00	10.00	
Storage Coeff. (min)=		3.07 (ii)	7.54 (ii)	
Unit Hyd. Tpeak (min)=		5.00	10.00	
Unit Hyd. peak (cms)=		0.27	0.13	
PEAK FLOW	(cms)=	0.34	0.01	0.343 (iii)
TIME TO PEAK	(hrs)=	1.33	1.42	1.33
RUNOFF VOLUME	(mm)=	32.75	5.78	27.35
TOTAL RAINFALL	(mm)=	33.75	33.75	33.75
RUNOFF COEFFICIENT	=	0.97	0.17	0.81

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0003)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0004):	0.71	0.077	1.33	19.25
	+ ID2= 2 (0005):	2.00	0.343	1.33	27.35
	ID = 3 (0003):	2.71	0.421	1.33	25.23

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0006)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0630	0.1060
	0.0000	0.0110	0.0840	0.1190
	0.0050	0.0210	0.1060	0.1320
	0.0070	0.0330	0.1310	0.1460
	0.0090	0.0440	0.1570	0.1600
	0.0100	0.0560	0.1850	0.1740
	0.0170	0.0680	0.2140	0.1890
	0.0300	0.0800	0.2440	0.2050
	0.0450	0.0930	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0003)	2.710	0.421	1.33	25.23
OUTFLOW: ID= 1 (0006)	2.710	0.011	3.75	20.99

PEAK FLOW REDUCTION [Qout/Qin](%)= 2.67
TIME SHIFT OF PEAK FLOW (min)=145.00
MAXIMUM STORAGE USED (ha.m.)= 0.0581

****
** SIMULATION:B. 5yr 4hr 10min Chicago **
****

CHICAGO STORM	IDF curve parameters: A=1135.400
Ptotal= 44.06 mm	B= 7.500
	C= 0.841

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
0.00	2.37	1.00	24.78	2.00	6.34	3.00	2.88
0.17	2.76	1.17	102.27	2.17	5.26	3.17	2.65
0.33	3.33	1.33	33.10	2.33	4.50	3.33	2.45
0.50	4.21	1.50	16.50	2.50	3.94	3.50	2.29
0.67	5.79	1.67	10.79	2.67	3.50	3.67	2.14
0.83	9.38	1.83	7.99	2.83	3.16	3.83	2.01

CALIB
STANDHYD (0004) | Area (ha)= 0.71
ID= 1 DT= 5.0 min | Total Imp(%)= 50.00 Dir. Conn.(%)= 50.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.35	0.35
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	68.80	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	2.37	1.083	24.78	2.083	6.34	3.08	2.88
0.167	2.37	1.167	24.78	2.167	6.34	3.17	2.88
0.250	2.76	1.250	102.27	2.250	5.26	3.25	2.65
0.333	2.76	1.333	102.27	2.333	5.26	3.33	2.65
0.417	3.33	1.417	33.10	2.417	4.50	3.42	2.45
0.500	3.33	1.500	33.10	2.500	4.50	3.50	2.45
0.583	4.21	1.583	16.50	2.583	3.94	3.58	2.29
0.667	4.21	1.667	16.50	2.667	3.94	3.67	2.29
0.750	5.79	1.750	10.79	2.750	3.50	3.75	2.14
0.833	5.79	1.833	10.79	2.833	3.50	3.83	2.14
0.917	9.38	1.917	7.99	2.917	3.16	3.92	2.01
1.000	9.38	2.000	7.99	3.000	3.16	4.00	2.01

Max.Eff.Inten.(mm/hr)=	102.27	15.66	
over (min)	5.00	20.00	
Storage Coeff. (min)=	2.02 (ii)	16.84 (ii)	
Unit Hyd. Tpeak (min)=	5.00	20.00	
Unit Hyd. peak (cms)=	0.31	0.06	
			TOTALS
PEAK FLOW (cms)=	0.10	0.01	0.103 (iii)
TIME TO PEAK (hrs)=	1.33	1.58	1.33
RUNOFF VOLUME (mm)=	43.06	9.96	26.50
TOTAL RAINFALL (mm)=	44.06	44.06	44.06
RUNOFF COEFFICIENT =	0.98	0.23	0.60

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. 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 (0005) | Area (ha)= 2.00
ID= 1 DT= 5.0 min | Total Imp(%)= 80.00 Dir. Conn.(%)= 80.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.60	0.40
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	115.47	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	2.37	1.083	24.78	2.083	6.34	3.08	2.88
0.167	2.37	1.167	24.78	2.167	6.34	3.17	2.88
0.250	2.76	1.250	102.27	2.250	5.26	3.25	2.65
0.333	2.76	1.333	102.27	2.333	5.26	3.33	2.65
0.417	3.33	1.417	33.10	2.417	4.50	3.42	2.45
0.500	3.33	1.500	33.10	2.500	4.50	3.50	2.45
0.583	4.21	1.583	16.50	2.583	3.94	3.58	2.29
0.667	4.21	1.667	16.50	2.667	3.94	3.67	2.29
0.750	5.79	1.750	10.79	2.750	3.50	3.75	2.14
0.833	5.79	1.833	10.79	2.833	3.50	3.83	2.14
0.917	9.38	1.917	7.99	2.917	3.16	3.92	2.01
1.000	9.38	2.000	7.99	3.000	3.16	4.00	2.01

```
     Max.Eff.Inten.(mm/hr)=     102.27        18.54
                over (min)        5.00        10.00
     Storage Coeff.  (min)=       2.76 (ii)    6.78 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.28         0.14
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.45         0.02          0.457 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42           1.33
     RUNOFF VOLUME    (mm)=      43.06         9.96          36.44
     TOTAL RAINFALL   (mm)=      44.06        44.06          44.06
     RUNOFF COEFFICIENT   =       0.98         0.23           0.83

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  69.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0003)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0004):     0.71   0.103     1.33    26.50
     + ID2= 2 (  0005):     2.00   0.457     1.33    36.44
       ================================================
       ID = 3 (  0003):     2.71   0.560     1.33    33.84

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0006)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.0630      0.1060
                          0.0000      0.0110   |    0.0840      0.1190
                          0.0050      0.0210   |    0.1060      0.1320
                          0.0070      0.0330   |    0.1310      0.1460
                          0.0090      0.0440   |    0.1570      0.1600
                          0.0100      0.0560   |    0.1850      0.1740
                          0.0170      0.0680   |    0.2140      0.1890
                          0.0300      0.0800   |    0.2440      0.2050
                          0.0450      0.0930   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0003)      2.710      0.560      1.33      33.84
   OUTFLOW: ID= 1 (  0006)      2.710      0.023      2.75      29.59

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  4.17
                  TIME SHIFT OF PEAK FLOW         (min)= 85.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0739

--------------------------------------------------------------------------------
****************************************
** SIMULATION:C. 10yr 4hr 10min Chicago **
****************************************
--------------------
| CHICAGO STORM    |    IDF curve parameters: A=1387.000
| Ptotal= 50.58 mm |                          B=   7.970
--------------------                          C=   0.852
                       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
               0.00    2.59 |  1.00   28.90 |  2.00    7.16 |  3.00    3.17
               0.17    3.04 |  1.17  118.36 |  2.17    5.91 |  3.17    2.91
               0.33    3.68 |  1.33   38.72 |  2.33    5.03 |  3.33    2.69
               0.50    4.70 |  1.50   19.11 |  2.50    4.38 |  3.50    2.50
               0.67    6.52 |  1.67   12.38 |  2.67    3.89 |  3.67    2.34
               0.83   10.72 |  1.83    9.08 |  2.83    3.49 |  3.83    2.20


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0004)|   Area    (ha)=   0.71
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  50.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.35         0.35
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      68.80        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	2.59	1.083	28.90	2.083	7.16	3.08	3.17
0.167	2.59	1.167	28.90	2.167	7.16	3.17	3.17
0.250	3.04	1.250	118.36	2.250	5.91	3.25	2.91
0.333	3.04	1.333	118.36	2.333	5.91	3.33	2.91
0.417	3.68	1.417	38.72	2.417	5.03	3.42	2.69
0.500	3.68	1.500	38.72	2.500	5.03	3.50	2.69
0.583	4.70	1.583	19.11	2.583	4.38	3.58	2.50
0.667	4.70	1.667	19.11	2.667	4.38	3.67	2.50
0.750	6.52	1.750	12.38	2.750	3.89	3.75	2.34
0.833	6.52	1.833	12.38	2.833	3.89	3.83	2.34
0.917	10.72	1.917	9.08	2.917	3.49	3.92	2.20
1.000	10.72	2.000	9.08	3.000	3.49	4.00	2.20

Max.Eff.Inten.(mm/hr)=	118.36	21.19	
over (min)	5.00	20.00	
Storage Coeff. (min)=	1.91 (ii)	15.04 (ii)	
Unit Hyd. Tpeak (min)=	5.00	20.00	
Unit Hyd. peak (cms)=	0.32	0.07	
			TOTALS
PEAK FLOW (cms)=	0.12	0.01	0.120 (iii)
TIME TO PEAK (hrs)=	1.33	1.58	1.33
RUNOFF VOLUME (mm)=	49.58	13.01	31.28
TOTAL RAINFALL (mm)=	50.58	50.58	50.58
RUNOFF COEFFICIENT =	0.98	0.26	0.62

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. 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 (0005) | Area (ha)= 2.00
ID= 1 DT= 5.0 min | Total Imp(%)= 80.00 Dir. Conn.(%)= 80.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.60	0.40
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	115.47	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	2.59	1.083	28.90	2.083	7.16	3.08	3.17
0.167	2.59	1.167	28.90	2.167	7.16	3.17	3.17
0.250	3.04	1.250	118.36	2.250	5.91	3.25	2.91
0.333	3.04	1.333	118.36	2.333	5.91	3.33	2.91
0.417	3.68	1.417	38.72	2.417	5.03	3.42	2.69
0.500	3.68	1.500	38.72	2.500	5.03	3.50	2.69
0.583	4.70	1.583	19.11	2.583	4.38	3.58	2.50
0.667	4.70	1.667	19.11	2.667	4.38	3.67	2.50
0.750	6.52	1.750	12.38	2.750	3.89	3.75	2.34
0.833	6.52	1.833	12.38	2.833	3.89	3.83	2.34
0.917	10.72	1.917	9.08	2.917	3.49	3.92	2.20
1.000	10.72	2.000	9.08	3.000	3.49	4.00	2.20

Max.Eff.Inten.(mm/hr)=	118.36	25.20	
over (min)	5.00	10.00	
Storage Coeff. (min)=	2.60 (ii)	6.39 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.29	0.15	
			TOTALS
PEAK FLOW (cms)=	0.52	0.02	0.534 (iii)
TIME TO PEAK (hrs)=	1.33	1.42	1.33
RUNOFF VOLUME (mm)=	49.58	13.01	42.26
TOTAL RAINFALL (mm)=	50.58	50.58	50.58
RUNOFF COEFFICIENT =	0.98	0.26	0.84

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0003) | 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0004):	0.71	0.120	1.33	31.28
+ ID2= 2 (0005):	2.00	0.534	1.33	42.26
ID = 3 (0003):	2.71	0.654	1.33	39.39

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0006) | OVERFLOW IS OFF

| IN= 2---> OUT= 1 |
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0630	0.1060
	0.0000	0.0110	0.0840	0.1190
	0.0050	0.0210	0.1060	0.1320
	0.0070	0.0330	0.1310	0.1460
	0.0090	0.0440	0.1570	0.1600
	0.0100	0.0560	0.1850	0.1740
	0.0170	0.0680	0.2140	0.1890
	0.0300	0.0800	0.2440	0.2050
	0.0450	0.0930	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0003)	2.710	0.654	1.33	39.39
OUTFLOW: ID= 1 (0006)	2.710	0.034	2.50	35.14

PEAK FLOW REDUCTION [Qout/Qin](%)= 5.17
TIME SHIFT OF PEAK FLOW (min)= 70.00
MAXIMUM STORAGE USED (ha.m.)= 0.0833

****
** SIMULATION:D. 25yr 4hr 10min Chicago **
****

CHICAGO STORM
Ptotal= 59.07 mm

IDF curve parameters: A=1676.200
B= 8.300
C= 0.858
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
0.00	2.95	1.00	34.10	2.00	8.31	3.00	3.63
0.17	3.47	1.17	138.40	2.17	6.83	3.17	3.32
0.33	4.22	1.33	45.75	2.33	5.80	3.33	3.07
0.50	5.41	1.50	22.49	2.50	5.04	3.50	2.85
0.67	7.56	1.67	14.49	2.67	4.46	3.67	2.66
0.83	12.52	1.83	10.58	2.83	4.00	3.83	2.50

CALIB
STANDHYD (0004)

Area (ha)= 0.71

ID= 1 DT= 5.0 min	Total Imp(%)= 50.00	Dir. Conn.(%)= 50.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.35	0.35
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	68.80	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	2.95	1.083	34.10	2.083	8.31	3.08	3.63
0.167	2.95	1.167	34.10	2.167	8.31	3.17	3.63
0.250	3.47	1.250	138.40	2.250	6.83	3.25	3.32
0.333	3.47	1.333	138.40	2.333	6.83	3.33	3.32
0.417	4.22	1.417	45.75	2.417	5.80	3.42	3.07
0.500	4.22	1.500	45.75	2.500	5.80	3.50	3.07
0.583	5.41	1.583	22.49	2.583	5.04	3.58	2.85
0.667	5.41	1.667	22.49	2.667	5.04	3.67	2.85
0.750	7.56	1.750	14.49	2.750	4.46	3.75	2.66
0.833	7.56	1.833	14.49	2.833	4.46	3.83	2.66
0.917	12.52	1.917	10.58	2.917	4.00	3.92	2.50
1.000	12.52	2.000	10.58	3.000	4.00	4.00	2.50

Max.Eff.Inten.(mm/hr)=		138.40	29.06	
over (min)		5.00	15.00	
Storage Coeff. (min)=		1.79 (ii)	13.36 (ii)	
Unit Hyd. Tpeak (min)=		5.00	15.00	
Unit Hyd. peak (cms)=		0.32	0.08	
				TOTALS
PEAK FLOW	(cms)=	0.14	0.02	0.144 (iii)
TIME TO PEAK	(hrs)=	1.33	1.50	1.33
RUNOFF VOLUME	(mm)=	58.07	17.38	37.72
TOTAL RAINFALL	(mm)=	59.07	59.07	59.07
RUNOFF COEFFICIENT	=	0.98	0.29	0.64

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. 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 (  0005)|   Area    (ha)=   2.00
|ID= 1 DT= 5.0 min |   Total Imp(%)=  80.00   Dir. Conn.(%)=  80.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.60         0.40
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     115.47        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    2.95 | 1.083   34.10 | 2.083    8.31 |  3.08    3.63
              0.167    2.95 | 1.167   34.10 | 2.167    8.31 |  3.17    3.63
              0.250    3.47 | 1.250  138.40 | 2.250    6.83 |  3.25    3.32
              0.333    3.47 | 1.333  138.40 | 2.333    6.83 |  3.33    3.32
              0.417    4.22 | 1.417   45.75 | 2.417    5.80 |  3.42    3.07
              0.500    4.22 | 1.500   45.75 | 2.500    5.80 |  3.50    3.07
              0.583    5.41 | 1.583   22.49 | 2.583    5.04 |  3.58    2.85
              0.667    5.41 | 1.667   22.49 | 2.667    5.04 |  3.67    2.85
              0.750    7.56 | 1.750   14.49 | 2.750    4.46 |  3.75    2.66
              0.833    7.56 | 1.833   14.49 | 2.833    4.46 |  3.83    2.66
              0.917   12.52 | 1.917   10.58 | 2.917    4.00 |  3.92    2.50
              1.000   12.52 | 2.000   10.58 | 3.000    4.00 |  4.00    2.50

     Max.Eff.Inten.(mm/hr)=     138.40        34.73
                over (min)        5.00        10.00
     Storage Coeff.  (min)=       2.45 (ii)    6.00 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.30         0.15
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.61         0.03          0.631 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42           1.33
     RUNOFF VOLUME    (mm)=      58.07        17.38          49.93
     TOTAL RAINFALL   (mm)=      59.07        59.07          59.07
     RUNOFF COEFFICIENT   =       0.98         0.29           0.85

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  69.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0003)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0004):     0.71   0.144     1.33    37.72
     + ID2= 2 (  0005):     2.00   0.631     1.33    49.93
       ==========================================================
       ID = 3 (  0003):     2.71   0.776     1.33    46.73

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0006)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           0.0000      0.0000   |    0.0630      0.1060
                           0.0000      0.0110   |    0.0840      0.1190
                           0.0050      0.0210   |    0.1060      0.1320
                           0.0070      0.0330   |    0.1310      0.1460
                           0.0090      0.0440   |    0.1570      0.1600
                           0.0100      0.0560   |    0.1850      0.1740
                           0.0170      0.0680   |    0.2140      0.1890
                           0.0300      0.0800   |    0.2440      0.2050
                           0.0450      0.0930   |    0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0003)      2.710      0.776      1.33      46.73
   OUTFLOW: ID= 1 (  0006)      2.710      0.049      2.25      42.49

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  6.31
                  TIME SHIFT OF PEAK FLOW         (min)= 55.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0959

--------------------------------------------------------------------------------
****************************************
** SIMULATION:E. 50yr 4hr 10min Chicago **
****************************************
--------------------
| CHICAGO STORM    |    IDF curve parameters: A=1973.100
| Ptotal= 65.64 mm |                          B=   9.000
--------------------                          C=   0.868
                       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
0.00	3.16	1.00	38.66	2.00	9.18	3.00	3.91
0.17	3.73	1.17	153.18	2.17	7.50	3.17	3.57
0.33	4.57	1.33	51.95	2.33	6.33	3.33	3.28
0.50	5.90	1.50	25.44	2.50	5.48	3.50	3.04
0.67	8.33	1.67	16.25	2.67	4.83	3.67	2.84
0.83	13.99	1.83	11.77	2.83	4.32	3.83	2.66

CALIB
STANDHYD (0004) | Area (ha)= 0.71
ID= 1 DT= 5.0 min | Total Imp(%)= 50.00 Dir. Conn.(%)= 50.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.35	0.35
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	68.80	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	3.16	1.083	38.66	2.083	9.18	3.08	3.91
0.167	3.16	1.167	38.66	2.167	9.18	3.17	3.91
0.250	3.73	1.250	153.18	2.250	7.50	3.25	3.57
0.333	3.73	1.333	153.18	2.333	7.50	3.33	3.57
0.417	4.57	1.417	51.95	2.417	6.33	3.42	3.28
0.500	4.57	1.500	51.95	2.500	6.33	3.50	3.28
0.583	5.90	1.583	25.44	2.583	5.48	3.58	3.04
0.667	5.90	1.667	25.44	2.667	5.48	3.67	3.04
0.750	8.33	1.750	16.25	2.750	4.83	3.75	2.84
0.833	8.33	1.833	16.25	2.833	4.83	3.83	2.84
0.917	13.99	1.917	11.77	2.917	4.32	3.92	2.66
1.000	13.99	2.000	11.77	3.000	4.32	4.00	2.66

Max.Eff.Inten.(mm/hr)=		153.18	42.63	
over (min)		5.00	15.00	
Storage Coeff. (min)=		1.72 (ii)	11.65 (ii)	
Unit Hyd. Tpeak (min)=		5.00	15.00	
Unit Hyd. peak (cms)=		0.32	0.09	
				TOTALS
PEAK FLOW	(cms)=	0.15	0.03	0.162 (iii)
TIME TO PEAK	(hrs)=	1.33	1.50	1.33
RUNOFF VOLUME	(mm)=	64.64	21.04	42.83
TOTAL RAINFALL	(mm)=	65.64	65.64	65.64
RUNOFF COEFFICIENT	=	0.98	0.32	0.65

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. 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 (0005) | Area (ha)= 2.00
ID= 1 DT= 5.0 min | Total Imp(%)= 80.00 Dir. Conn.(%)= 80.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.60	0.40
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	115.47	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	3.16	1.083	38.66	2.083	9.18	3.08	3.91
0.167	3.16	1.167	38.66	2.167	9.18	3.17	3.91
0.250	3.73	1.250	153.18	2.250	7.50	3.25	3.57
0.333	3.73	1.333	153.18	2.333	7.50	3.33	3.57
0.417	4.57	1.417	51.95	2.417	6.33	3.42	3.28
0.500	4.57	1.500	51.95	2.500	6.33	3.50	3.28
0.583	5.90	1.583	25.44	2.583	5.48	3.58	3.04
0.667	5.90	1.667	25.44	2.667	5.48	3.67	3.04
0.750	8.33	1.750	16.25	2.750	4.83	3.75	2.84
0.833	8.33	1.833	16.25	2.833	4.83	3.83	2.84
0.917	13.99	1.917	11.77	2.917	4.32	3.92	2.66
1.000	13.99	2.000	11.77	3.000	4.32	4.00	2.66

Max.Eff.Inten.(mm/hr)=		153.18	42.63
over (min)		5.00	10.00
Storage Coeff. (min)=		2.35 (ii)	5.77 (ii)
Unit Hyd. Tpeak (min)=		5.00	10.00
Unit Hyd. peak (cms)=		0.30	0.15

```
                                                    *TOTALS*
     PEAK FLOW       (cms)=       0.67         0.04          0.704 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42           1.33
     RUNOFF VOLUME    (mm)=      64.64        21.04          55.92
     TOTAL RAINFALL   (mm)=      65.64        65.64          65.64
     RUNOFF COEFFICIENT   =       0.98         0.32           0.85

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  69.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0003)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0004):     0.71   0.162     1.33    42.83
     + ID2= 2 (  0005):     2.00   0.704     1.33    55.92
       ================================================
       ID = 3 (  0003):     2.71   0.866     1.33    52.49

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0006)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.0630      0.1060
                          0.0000      0.0110   |    0.0840      0.1190
                          0.0050      0.0210   |    0.1060      0.1320
                          0.0070      0.0330   |    0.1310      0.1460
                          0.0090      0.0440   |    0.1570      0.1600
                          0.0100      0.0560   |    0.1850      0.1740
                          0.0170      0.0680   |    0.2140      0.1890
                          0.0300      0.0800   |    0.2440      0.2050
                          0.0450      0.0930   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0003)     2.710      0.866      1.33      52.49
   OUTFLOW: ID= 1 (  0006)     2.710      0.063      2.17      48.25

                 PEAK   FLOW   REDUCTION [Qout/Qin](%)=  7.24
                 TIME SHIFT OF PEAK FLOW         (min)= 50.00
```

```
                 MAXIMUM  STORAGE   USED       (ha.m.)=  0.1058

--------------------------------------------------------------------------------
******************************************
** SIMULATION:F. 100yr 4hr 10min Chicago **
******************************************
--------------------
| CHICAGO STORM    |    IDF curve parameters: A=2193.100
| Ptotal= 71.75 mm |                          B=   9.040
--------------------                          C=   0.871
                        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
               0.00    3.40 |  1.00   42.35 |  2.00    9.96 |  3.00    4.21
               0.17    4.02 |  1.17  168.45 |  2.17    8.12 |  3.17    3.84
               0.33    4.93 |  1.33   56.97 |  2.33    6.85 |  3.33    3.53
               0.50    6.38 |  1.50   27.80 |  2.50    5.92 |  3.50    3.27
               0.67    9.03 |  1.67   17.71 |  2.67    5.21 |  3.67    3.05
               0.83   15.23 |  1.83   12.80 |  2.83    4.66 |  3.83    2.85


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0004)|   Area    (ha)=   0.71
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  50.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.35         0.35
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      68.80        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    3.40 | 1.083   42.35 | 2.083    9.96 |  3.08    4.21
              0.167    3.40 | 1.167   42.35 | 2.167    9.96 |  3.17    4.21
              0.250    4.02 | 1.250  168.45 | 2.250    8.12 |  3.25    3.84
              0.333    4.02 | 1.333  168.45 | 2.333    8.12 |  3.33    3.84
              0.417    4.93 | 1.417   56.97 | 2.417    6.85 |  3.42    3.53
```

0.500	4.93	1.500	56.97	2.500	6.85	3.50	3.53
0.583	6.38	1.583	27.80	2.583	5.92	3.58	3.27
0.667	6.38	1.667	27.80	2.667	5.92	3.67	3.27
0.750	9.03	1.750	17.71	2.750	5.21	3.75	3.05
0.833	9.03	1.833	17.71	2.833	5.21	3.83	3.05
0.917	15.23	1.917	12.80	2.917	4.66	3.92	2.85
1.000	15.23	2.000	12.80	3.000	4.66	4.00	2.85

Max.Eff.Inten.(mm/hr)=	168.45	50.98	
over (min)	5.00	15.00	
Storage Coeff. (min)=	1.66 (ii)	10.90 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.32	0.09	
			TOTALS
PEAK FLOW (cms)=	0.17	0.03	0.180 (iii)
TIME TO PEAK (hrs)=	1.33	1.50	1.33
RUNOFF VOLUME (mm)=	70.75	24.64	47.69
TOTAL RAINFALL (mm)=	71.75	71.75	71.75
RUNOFF COEFFICIENT =	0.99	0.34	0.66

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. 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 (0005)	Area (ha)= 2.00
ID= 1 DT= 5.0 min	Total Imp(%)= 80.00 Dir. Conn.(%)= 80.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.60	0.40
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	115.47	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	3.40	1.083	42.35	2.083	9.96	3.08	4.21
0.167	3.40	1.167	42.35	2.167	9.96	3.17	4.21
0.250	4.02	1.250	168.45	2.250	8.12	3.25	3.84
0.333	4.02	1.333	168.45	2.333	8.12	3.33	3.84
0.417	4.93	1.417	56.97	2.417	6.85	3.42	3.53
0.500	4.93	1.500	56.97	2.500	6.85	3.50	3.53
0.583	6.38	1.583	27.80	2.583	5.92	3.58	3.27
0.667	6.38	1.667	27.80	2.667	5.92	3.67	3.27
0.750	9.03	1.750	17.71	2.750	5.21	3.75	3.05
0.833	9.03	1.833	17.71	2.833	5.21	3.83	3.05
0.917	15.23	1.917	12.80	2.917	4.66	3.92	2.85
1.000	15.23	2.000	12.80	3.000	4.66	4.00	2.85

Max.Eff.Inten.(mm/hr)=	168.45	50.98	
over (min)	5.00	10.00	
Storage Coeff. (min)=	2.26 (ii)	5.55 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.30	0.16	
			TOTALS
PEAK FLOW (cms)=	0.74	0.05	0.779 (iii)
TIME TO PEAK (hrs)=	1.33	1.42	1.33
RUNOFF VOLUME (mm)=	70.75	24.64	61.53
TOTAL RAINFALL (mm)=	71.75	71.75	71.75
RUNOFF COEFFICIENT =	0.99	0.34	0.86

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0003)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0004):		0.71	0.180	1.33	47.69
+ ID2= 2 (0005):		2.00	0.779	1.33	61.53
ID = 3 (0003):		2.71	0.959	1.33	57.90

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0006)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0630	0.1060
	0.0000	0.0110	0.0840	0.1190

	0.0050	0.0210		0.1060	0.1320		
	0.0070	0.0330		0.1310	0.1460		
	0.0090	0.0440		0.1570	0.1600		
	0.0100	0.0560		0.1850	0.1740		
	0.0170	0.0680		0.2140	0.1890		
	0.0300	0.0800		0.2440	0.2050		
	0.0450	0.0930		0.0000	0.0000		

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0003)	2.710	0.959	1.33	57.90
OUTFLOW: ID= 1 (0006)	2.710	0.077	2.08	53.66

PEAK FLOW REDUCTION [Qout/Qin](%)= 8.04
TIME SHIFT OF PEAK FLOW (min)= 45.00
MAXIMUM STORAGE USED (ha.m.)= 0.1148

****
** SIMULATION:G. 2yr 24hr 15min SCS Type II **
****

READ STORM	Filename: C:\Users\amysliwiec\AppData\Local\Temp\1915adf3-1193-4333-b5c4-9f3f2a29696d\20b6dfc4
Ptotal= 46.83 mm	Comments: 2yr 24hr 15min SCS Type II

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.00	6.25	0.86	12.50	5.46	18.75	0.77
0.25	0.47	6.50	0.88	12.75	3.76	19.00	0.74
0.50	0.49	6.75	0.90	13.00	3.17	19.25	0.71
0.75	0.50	7.00	0.92	13.25	2.69	19.50	0.68
1.00	0.51	7.25	0.95	13.50	2.37	19.75	0.65
1.25	0.52	7.50	0.97	13.75	2.08	20.00	0.62
1.50	0.53	7.75	1.00	14.00	1.85	20.25	0.61
1.75	0.54	8.00	1.02	14.25	1.69	20.50	0.60
2.00	0.56	8.25	1.09	14.50	1.61	20.75	0.59
2.25	0.57	8.50	1.20	14.75	1.53	21.00	0.59
2.50	0.58	8.75	1.33	15.00	1.45	21.25	0.58
2.75	0.59	9.00	1.44	15.25	1.36	21.50	0.58
3.00	0.60	9.25	1.50	15.50	1.28	21.75	0.57
3.25	0.62	9.50	1.50	15.75	1.20	22.00	0.56
3.50	0.63	9.75	1.60	16.00	1.12	22.25	0.56
3.75	0.64	10.00	1.78	16.25	1.06	22.50	0.55
4.00	0.65	10.25	2.02	16.50	1.03	22.75	0.55
4.25	0.67	10.50	2.29	16.75	1.00	23.00	0.54
4.50	0.69	10.75	2.68	17.00	0.98	23.25	0.54
4.75	0.71	11.00	3.13	17.25	0.95	23.50	0.53
5.00	0.74	11.25	3.96	17.50	0.92	23.75	0.52
5.25	0.76	11.50	5.04	17.75	0.89	24.00	0.52
5.50	0.78	11.75	20.53	18.00	0.86		
5.75	0.81	12.00	50.66	18.25	0.83		
6.00	0.83	12.25	8.02	18.50	0.80		

CALIB STANDHYD (0004) ID= 1 DT= 5.0 min	Area (ha)= 0.71 Total Imp(%)= 50.00 Dir. Conn.(%)= 50.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.35	0.35
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	68.80	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	0.83	12.250	50.66	18.33	0.83
0.167	0.00	6.250	0.83	12.333	8.03	18.42	0.83
0.250	0.00	6.333	0.86	12.417	8.02	18.50	0.83
0.333	0.47	6.417	0.86	12.500	8.02	18.58	0.80
0.417	0.47	6.500	0.86	12.583	5.46	18.67	0.80
0.500	0.47	6.583	0.88	12.667	5.46	18.75	0.80
0.583	0.49	6.667	0.88	12.750	5.46	18.83	0.77
0.667	0.49	6.750	0.88	12.833	3.76	18.92	0.77
0.750	0.49	6.833	0.90	12.917	3.76	19.00	0.77
0.833	0.50	6.917	0.90	13.000	3.76	19.08	0.74
0.917	0.50	7.000	0.90	13.083	3.17	19.17	0.74
1.000	0.50	7.083	0.92	13.167	3.17	19.25	0.74
1.083	0.51	7.167	0.92	13.250	3.17	19.33	0.71
1.167	0.51	7.250	0.92	13.333	2.69	19.42	0.71
1.250	0.51	7.333	0.95	13.417	2.69	19.50	0.71
1.333	0.52	7.417	0.95	13.500	2.69	19.58	0.68
1.417	0.52	7.500	0.95	13.583	2.37	19.67	0.68
1.500	0.52	7.583	0.97	13.667	2.37	19.75	0.68
1.583	0.53	7.667	0.97	13.750	2.37	19.83	0.65
1.667	0.53	7.750	0.97	13.833	2.08	19.92	0.65
1.750	0.53	7.833	1.00	13.917	2.08	20.00	0.65
1.833	0.54	7.917	1.00	14.000	2.08	20.08	0.62
1.917	0.54	8.000	1.00	14.083	1.85	20.17	0.62
2.000	0.54	8.083	1.02	14.167	1.85	20.25	0.62

2.083	0.56	8.167	1.02	14.250	1.85	20.33	0.61
2.167	0.56	8.250	1.02	14.333	1.69	20.42	0.61
2.250	0.56	8.333	1.09	14.417	1.69	20.50	0.61
2.333	0.57	8.417	1.09	14.500	1.69	20.58	0.60
2.417	0.57	8.500	1.09	14.583	1.61	20.67	0.60
2.500	0.57	8.583	1.20	14.667	1.61	20.75	0.60
2.583	0.58	8.667	1.20	14.750	1.61	20.83	0.59
2.667	0.58	8.750	1.20	14.833	1.53	20.92	0.59
2.750	0.58	8.833	1.33	14.917	1.53	21.00	0.59
2.833	0.59	8.917	1.33	15.000	1.53	21.08	0.59
2.917	0.59	9.000	1.33	15.083	1.45	21.17	0.59
3.000	0.59	9.083	1.44	15.167	1.45	21.25	0.59
3.083	0.60	9.167	1.44	15.250	1.45	21.33	0.58
3.167	0.60	9.250	1.44	15.333	1.36	21.42	0.58
3.250	0.60	9.333	1.50	15.417	1.36	21.50	0.58
3.333	0.62	9.417	1.50	15.500	1.36	21.58	0.58
3.417	0.62	9.500	1.50	15.583	1.28	21.67	0.58
3.500	0.62	9.583	1.50	15.667	1.28	21.75	0.58
3.583	0.63	9.667	1.50	15.750	1.28	21.83	0.57
3.667	0.63	9.750	1.50	15.833	1.20	21.92	0.57
3.750	0.63	9.833	1.60	15.917	1.20	22.00	0.57
3.833	0.64	9.917	1.60	16.000	1.20	22.08	0.56
3.917	0.64	10.000	1.60	16.083	1.12	22.17	0.56
4.000	0.64	10.083	1.78	16.167	1.12	22.25	0.56
4.083	0.65	10.167	1.78	16.250	1.12	22.33	0.56
4.167	0.65	10.250	1.78	16.333	1.06	22.42	0.56
4.250	0.65	10.333	2.02	16.417	1.06	22.50	0.56
4.333	0.67	10.417	2.02	16.500	1.06	22.58	0.55
4.417	0.67	10.500	2.02	16.583	1.03	22.67	0.55
4.500	0.67	10.583	2.29	16.667	1.03	22.75	0.55
4.583	0.69	10.667	2.29	16.750	1.03	22.83	0.55
4.667	0.69	10.750	2.29	16.833	1.00	22.92	0.55
4.750	0.69	10.833	2.68	16.917	1.00	23.00	0.55
4.833	0.71	10.917	2.68	17.000	1.00	23.08	0.54
4.917	0.71	11.000	2.68	17.083	0.98	23.17	0.54
5.000	0.71	11.083	3.13	17.167	0.98	23.25	0.54
5.083	0.74	11.167	3.13	17.250	0.98	23.33	0.54
5.167	0.74	11.250	3.13	17.333	0.95	23.42	0.54
5.250	0.74	11.333	3.96	17.417	0.95	23.50	0.54
5.333	0.76	11.417	3.96	17.500	0.95	23.58	0.53
5.417	0.76	11.500	3.96	17.583	0.92	23.67	0.53
5.500	0.76	11.583	5.04	17.667	0.92	23.75	0.53
5.583	0.78	11.667	5.04	17.750	0.92	23.83	0.52
5.667	0.78	11.750	5.04	17.833	0.89	23.92	0.52
5.750	0.78	11.833	20.52	17.917	0.89	24.00	0.52
5.833	0.81	11.917	20.53	18.000	0.89	24.08	0.52
5.917	0.81	12.000	20.53	18.083	0.86	24.17	0.52
6.000	0.81	12.083	50.65	18.167	0.86	24.25	0.52
6.083	0.83	12.167	50.66	18.250	0.86		

Max.Eff.Inten.(mm/hr)=	50.66	11.27		
over (min)	5.00	20.00		
Storage Coeff. (min)=	2.68 (ii)	19.58 (ii)		
Unit Hyd. Tpeak (min)=	5.00	20.00		
Unit Hyd. peak (cms)=	0.29	0.06		
			TOTALS	
PEAK FLOW (cms)=	0.05	0.01	0.055 (iii)	
TIME TO PEAK (hrs)=	12.25	12.42	12.25	
RUNOFF VOLUME (mm)=	45.83	11.22	28.51	
TOTAL RAINFALL (mm)=	46.83	46.83	46.83	
RUNOFF COEFFICIENT =	0.98	0.24	0.61	

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. 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 (0005)	Area (ha)= 2.00
ID= 1 DT= 5.0 min	Total Imp(%)= 80.00 Dir. Conn.(%)= 80.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.60	0.40
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	115.47	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	0.83	12.250	50.66	18.33	0.83
0.167	0.00	6.250	0.83	12.333	8.03	18.42	0.83
0.250	0.00	6.333	0.86	12.417	8.02	18.50	0.83
0.333	0.47	6.417	0.86	12.500	8.02	18.58	0.80
0.417	0.47	6.500	0.86	12.583	5.46	18.67	0.80
0.500	0.47	6.583	0.88	12.667	5.46	18.75	0.80
0.583	0.49	6.667	0.88	12.750	5.46	18.83	0.77
0.667	0.49	6.750	0.88	12.833	3.76	18.92	0.77
0.750	0.49	6.833	0.90	12.917	3.76	19.00	0.77
0.833	0.50	6.917	0.90	13.000	3.76	19.08	0.74
0.917	0.50	7.000	0.90	13.083	3.17	19.17	0.74

1.000	0.50	7.083	0.92	13.167	3.17	19.25	0.74
1.083	0.51	7.167	0.92	13.250	3.17	19.33	0.71
1.167	0.51	7.250	0.92	13.333	2.69	19.42	0.71
1.250	0.51	7.333	0.95	13.417	2.69	19.50	0.71
1.333	0.52	7.417	0.95	13.500	2.69	19.58	0.68
1.417	0.52	7.500	0.95	13.583	2.37	19.67	0.68
1.500	0.52	7.583	0.97	13.667	2.37	19.75	0.68
1.583	0.53	7.667	0.97	13.750	2.37	19.83	0.65
1.667	0.53	7.750	0.97	13.833	2.08	19.92	0.65
1.750	0.53	7.833	1.00	13.917	2.08	20.00	0.65
1.833	0.54	7.917	1.00	14.000	2.08	20.08	0.62
1.917	0.54	8.000	1.00	14.083	1.85	20.17	0.62
2.000	0.54	8.083	1.02	14.167	1.85	20.25	0.62
2.083	0.56	8.167	1.02	14.250	1.85	20.33	0.61
2.167	0.56	8.250	1.02	14.333	1.69	20.42	0.61
2.250	0.56	8.333	1.09	14.417	1.69	20.50	0.61
2.333	0.57	8.417	1.09	14.500	1.69	20.58	0.60
2.417	0.57	8.500	1.09	14.583	1.61	20.67	0.60
2.500	0.57	8.583	1.20	14.667	1.61	20.75	0.60
2.583	0.58	8.667	1.20	14.750	1.61	20.83	0.59
2.667	0.58	8.750	1.20	14.833	1.53	20.92	0.59
2.750	0.58	8.833	1.33	14.917	1.53	21.00	0.59
2.833	0.59	8.917	1.33	15.000	1.53	21.08	0.59
2.917	0.59	9.000	1.33	15.083	1.45	21.17	0.59
3.000	0.59	9.083	1.44	15.167	1.45	21.25	0.59
3.083	0.60	9.167	1.44	15.250	1.45	21.33	0.58
3.167	0.60	9.250	1.44	15.333	1.36	21.42	0.58
3.250	0.60	9.333	1.50	15.417	1.36	21.50	0.58
3.333	0.62	9.417	1.50	15.500	1.36	21.58	0.58
3.417	0.62	9.500	1.50	15.583	1.28	21.67	0.58
3.500	0.62	9.583	1.50	15.667	1.28	21.75	0.58
3.583	0.63	9.667	1.50	15.750	1.28	21.83	0.57
3.667	0.63	9.750	1.50	15.833	1.20	21.92	0.57
3.750	0.63	9.833	1.60	15.917	1.20	22.00	0.57
3.833	0.64	9.917	1.60	16.000	1.20	22.08	0.56
3.917	0.64	10.000	1.60	16.083	1.12	22.17	0.56
4.000	0.64	10.083	1.78	16.167	1.12	22.25	0.56
4.083	0.65	10.167	1.78	16.250	1.12	22.33	0.56
4.167	0.65	10.250	1.78	16.333	1.06	22.42	0.56
4.250	0.65	10.333	2.02	16.417	1.06	22.50	0.56
4.333	0.67	10.417	2.02	16.500	1.06	22.58	0.55
4.417	0.67	10.500	2.02	16.583	1.03	22.67	0.55
4.500	0.67	10.583	2.29	16.667	1.03	22.75	0.55
4.583	0.69	10.667	2.29	16.750	1.03	22.83	0.55
4.667	0.69	10.750	2.29	16.833	1.00	22.92	0.55
4.750	0.69	10.833	2.68	16.917	1.00	23.00	0.55
4.833	0.71	10.917	2.68	17.000	1.00	23.08	0.54
4.917	0.71	11.000	2.68	17.083	0.98	23.17	0.54
5.000	0.71	11.083	3.13	17.167	0.98	23.25	0.54
5.083	0.74	11.167	3.13	17.250	0.98	23.33	0.54
5.167	0.74	11.250	3.13	17.333	0.95	23.42	0.54
5.250	0.74	11.333	3.96	17.417	0.95	23.50	0.54
5.333	0.76	11.417	3.96	17.500	0.95	23.58	0.53
5.417	0.76	11.500	3.96	17.583	0.92	23.67	0.53
5.500	0.76	11.583	5.04	17.667	0.92	23.75	0.53
5.583	0.78	11.667	5.04	17.750	0.92	23.83	0.52
5.667	0.78	11.750	5.04	17.833	0.89	23.92	0.52
5.750	0.78	11.833	20.52	17.917	0.89	24.00	0.52
5.833	0.81	11.917	20.53	18.000	0.89	24.08	0.52
5.917	0.81	12.000	20.53	18.083	0.86	24.17	0.52
6.000	0.81	12.083	50.65	18.167	0.86	24.25	0.52
6.083	0.83	12.167	50.66	18.250	0.86		

Max.Eff.Inten.(mm/hr)=	50.66	11.27	
over (min)	5.00	25.00	
Storage Coeff. (min)=	3.66 (ii)	20.55 (ii)	
Unit Hyd. Tpeak (min)=	5.00	25.00	
Unit Hyd. peak (cms)=	0.25	0.05	
			TOTALS
PEAK FLOW (cms)=	0.22	0.01	0.227 (iii)
TIME TO PEAK (hrs)=	12.25	12.50	12.25
RUNOFF VOLUME (mm)=	45.83	11.22	38.90
TOTAL RAINFALL (mm)=	46.83	46.83	46.83
RUNOFF COEFFICIENT =	0.98	0.24	0.83

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0003)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0004):	0.71	0.055	12.25	28.51
+ ID2= 2 (0005):	2.00	0.227	12.25	38.90
ID = 3 (0003):	2.71	0.282	12.25	36.18

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0006)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW	STORAGE	OUTFLOW	STORAGE

	(cms)	(ha.m.)	(cms)	(ha.m.)
	0.0000	0.0000	0.0630	0.1060
	0.0000	0.0110	0.0840	0.1190
	0.0050	0.0210	0.1060	0.1320
	0.0070	0.0330	0.1310	0.1460
	0.0090	0.0440	0.1570	0.1600
	0.0100	0.0560	0.1850	0.1740
	0.0170	0.0680	0.2140	0.1890
	0.0300	0.0800	0.2440	0.2050
	0.0450	0.0930	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0003)	2.710	0.282	12.25	36.18
OUTFLOW: ID= 1 (0006)	2.710	0.015	13.75	31.93

PEAK FLOW REDUCTION [Qout/Qin](%)= 5.45
TIME SHIFT OF PEAK FLOW (min)= 90.00
MAXIMUM STORAGE USED (ha.m.)= 0.0652

****
** SIMULATION:H. 5yr 24hr 15min SCS Type II **
****

READ STORM	Filename: C:\Users\amysliwiec\AppData\Local\Temp\1915adf3-1193-4333-b5c4-9f3f2a29696d\02eea314
Ptotal= 59.88 mm	Comments: 5yr 24hr 15min SCS Type II

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.00	6.25	1.09	12.50	6.98	18.75	0.98
0.25	0.61	6.50	1.12	12.75	4.80	19.00	0.95
0.50	0.62	6.75	1.15	13.00	4.06	19.25	0.91
0.75	0.64	7.00	1.18	13.25	3.43	19.50	0.87
1.00	0.65	7.25	1.21	13.50	3.03	19.75	0.83
1.25	0.67	7.50	1.24	13.75	2.66	20.00	0.80
1.50	0.68	7.75	1.27	14.00	2.37	20.25	0.77
1.75	0.70	8.00	1.30	14.25	2.16	20.50	0.77
2.00	0.71	8.25	1.40	14.50	2.06	20.75	0.76
2.25	0.73	8.50	1.54	14.75	1.95	21.00	0.75
2.50	0.74	8.75	1.69	15.00	1.85	21.25	0.74
2.75	0.76	9.00	1.84	15.25	1.74	21.50	0.74
3.00	0.77	9.25	1.92	15.50	1.64	21.75	0.73
3.25	0.79	9.50	1.92	15.75	1.53	22.00	0.72
3.50	0.80	9.75	2.04	16.00	1.43	22.25	0.71
3.75	0.82	10.00	2.27	16.25	1.36	22.50	0.71
4.00	0.83	10.25	2.58	16.50	1.32	22.75	0.70
4.25	0.85	10.50	2.93	16.75	1.28	23.00	0.69
4.50	0.88	10.75	3.43	17.00	1.25	23.25	0.69
4.75	0.91	11.00	4.00	17.25	1.21	23.50	0.68
5.00	0.94	11.25	5.06	17.50	1.17	23.75	0.67
5.25	0.97	11.50	6.44	17.75	1.13	24.00	0.66
5.50	1.00	11.75	26.25	18.00	1.10		
5.75	1.03	12.00	64.77	18.25	1.06		
6.00	1.06	12.25	10.26	18.50	1.02		

CALIB STANDHYD (0004) ID= 1 DT= 5.0 min	Area (ha)= 0.71 Total Imp(%)= 50.00 Dir. Conn.(%)= 50.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.35	0.35
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	68.80	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.06	12.250	64.77	18.33	1.06
0.167	0.00	6.250	1.06	12.333	10.27	18.42	1.06
0.250	0.00	6.333	1.09	12.417	10.26	18.50	1.06
0.333	0.61	6.417	1.09	12.500	10.26	18.58	1.02
0.417	0.61	6.500	1.09	12.583	6.98	18.67	1.02
0.500	0.61	6.583	1.12	12.667	6.98	18.75	1.02
0.583	0.62	6.667	1.12	12.750	6.98	18.83	0.98
0.667	0.62	6.750	1.12	12.833	4.81	18.92	0.98
0.750	0.62	6.833	1.15	12.917	4.80	19.00	0.98
0.833	0.64	6.917	1.15	13.000	4.80	19.08	0.95
0.917	0.64	7.000	1.15	13.083	4.06	19.17	0.95
1.000	0.64	7.083	1.18	13.167	4.06	19.25	0.95
1.083	0.65	7.167	1.18	13.250	4.06	19.33	0.91
1.167	0.65	7.250	1.18	13.333	3.43	19.42	0.91
1.250	0.65	7.333	1.21	13.417	3.43	19.50	0.91
1.333	0.67	7.417	1.21	13.500	3.43	19.58	0.87
1.417	0.67	7.500	1.21	13.583	3.03	19.67	0.87
1.500	0.67	7.583	1.24	13.667	3.03	19.75	0.87
1.583	0.68	7.667	1.24	13.750	3.03	19.83	0.83
1.667	0.68	7.750	1.24	13.833	2.66	19.92	0.83
1.750	0.68	7.833	1.27	13.917	2.66	20.00	0.83

1.833	0.70	7.917	1.27	14.000	2.66	20.08	0.80
1.917	0.70	8.000	1.27	14.083	2.37	20.17	0.80
2.000	0.70	8.083	1.30	14.167	2.37	20.25	0.80
2.083	0.71	8.167	1.30	14.250	2.37	20.33	0.77
2.167	0.71	8.250	1.30	14.333	2.16	20.42	0.77
2.250	0.71	8.333	1.40	14.417	2.16	20.50	0.77
2.333	0.73	8.417	1.40	14.500	2.16	20.58	0.77
2.417	0.73	8.500	1.40	14.583	2.06	20.67	0.77
2.500	0.73	8.583	1.54	14.667	2.06	20.75	0.77
2.583	0.74	8.667	1.54	14.750	2.06	20.83	0.76
2.667	0.74	8.750	1.54	14.833	1.95	20.92	0.76
2.750	0.74	8.833	1.69	14.917	1.95	21.00	0.76
2.833	0.76	8.917	1.69	15.000	1.95	21.08	0.75
2.917	0.76	9.000	1.69	15.083	1.85	21.17	0.75
3.000	0.76	9.083	1.84	15.167	1.85	21.25	0.75
3.083	0.77	9.167	1.84	15.250	1.85	21.33	0.74
3.167	0.77	9.250	1.84	15.333	1.74	21.42	0.74
3.250	0.77	9.333	1.92	15.417	1.74	21.50	0.74
3.333	0.79	9.417	1.92	15.500	1.74	21.58	0.74
3.417	0.79	9.500	1.92	15.583	1.64	21.67	0.74
3.500	0.79	9.583	1.92	15.667	1.64	21.75	0.74
3.583	0.80	9.667	1.92	15.750	1.64	21.83	0.73
3.667	0.80	9.750	1.92	15.833	1.53	21.92	0.73
3.750	0.80	9.833	2.04	15.917	1.53	22.00	0.73
3.833	0.82	9.917	2.04	16.000	1.53	22.08	0.72
3.917	0.82	10.000	2.04	16.083	1.43	22.17	0.72
4.000	0.82	10.083	2.27	16.167	1.43	22.25	0.72
4.083	0.83	10.167	2.27	16.250	1.43	22.33	0.71
4.167	0.83	10.250	2.27	16.333	1.36	22.42	0.71
4.250	0.83	10.333	2.58	16.417	1.36	22.50	0.71
4.333	0.85	10.417	2.58	16.500	1.36	22.58	0.71
4.417	0.85	10.500	2.58	16.583	1.32	22.67	0.71
4.500	0.85	10.583	2.93	16.667	1.32	22.75	0.71
4.583	0.88	10.667	2.93	16.750	1.32	22.83	0.70
4.667	0.88	10.750	2.93	16.833	1.28	22.92	0.70
4.750	0.88	10.833	3.43	16.917	1.28	23.00	0.70
4.833	0.91	10.917	3.43	17.000	1.28	23.08	0.69
4.917	0.91	11.000	3.43	17.083	1.25	23.17	0.69
5.000	0.91	11.083	4.00	17.167	1.25	23.25	0.69
5.083	0.94	11.167	4.00	17.250	1.25	23.33	0.69
5.167	0.94	11.250	4.00	17.333	1.21	23.42	0.69
5.250	0.94	11.333	5.06	17.417	1.21	23.50	0.69
5.333	0.97	11.417	5.06	17.500	1.21	23.58	0.68
5.417	0.97	11.500	5.06	17.583	1.17	23.67	0.68
5.500	0.97	11.583	6.44	17.667	1.17	23.75	0.68
5.583	1.00	11.667	6.44	17.750	1.17	23.83	0.67
5.667	1.00	11.750	6.44	17.833	1.13	23.92	0.67
5.750	1.00	11.833	26.24	17.917	1.13	24.00	0.67
5.833	1.03	11.917	26.25	18.000	1.13	24.08	0.66
5.917	1.03	12.000	26.25	18.083	1.10	24.17	0.66
6.000	1.03	12.083	64.77	18.167	1.10	24.25	0.66
6.083	1.06	12.167	64.77	18.250	1.10		

Max.Eff.Inten.(mm/hr)=		64.77	22.03	
over (min)		5.00	20.00	
Storage Coeff. (min)=		2.43 (ii)	15.35 (ii)	
Unit Hyd. Tpeak (min)=		5.00	20.00	
Unit Hyd. peak (cms)=		0.30	0.07	
				TOTALS
PEAK FLOW	(cms)=	0.06	0.01	0.073 (iii)
TIME TO PEAK	(hrs)=	12.25	12.42	12.25
RUNOFF VOLUME	(mm)=	58.88	17.82	38.34
TOTAL RAINFALL	(mm)=	59.88	59.88	59.88
RUNOFF COEFFICIENT	=	0.98	0.30	0.64

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. 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 (0005)
ID= 1 DT= 5.0 min

Area (ha)= 2.00
Total Imp(%)= 80.00 Dir. Conn.(%)= 80.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.60	0.40
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	115.47	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.06	12.250	64.77	18.33	1.06
0.167	0.00	6.250	1.06	12.333	10.27	18.42	1.06
0.250	0.00	6.333	1.09	12.417	10.26	18.50	1.06
0.333	0.61	6.417	1.09	12.500	10.26	18.58	1.02
0.417	0.61	6.500	1.09	12.583	6.98	18.67	1.02
0.500	0.61	6.583	1.12	12.667	6.98	18.75	1.02
0.583	0.62	6.667	1.12	12.750	6.98	18.83	0.98
0.667	0.62	6.750	1.12	12.833	4.81	18.92	0.98

0.750	0.62	6.833	1.15	12.917	4.80	19.00	0.98
0.833	0.64	6.917	1.15	13.000	4.80	19.08	0.95
0.917	0.64	7.000	1.15	13.083	4.06	19.17	0.95
1.000	0.64	7.083	1.18	13.167	4.06	19.25	0.95
1.083	0.65	7.167	1.18	13.250	4.06	19.33	0.91
1.167	0.65	7.250	1.18	13.333	3.43	19.42	0.91
1.250	0.65	7.333	1.21	13.417	3.43	19.50	0.91
1.333	0.67	7.417	1.21	13.500	3.43	19.58	0.87
1.417	0.67	7.500	1.21	13.583	3.03	19.67	0.87
1.500	0.67	7.583	1.24	13.667	3.03	19.75	0.87
1.583	0.68	7.667	1.24	13.750	3.03	19.83	0.83
1.667	0.68	7.750	1.24	13.833	2.66	19.92	0.83
1.750	0.68	7.833	1.27	13.917	2.66	20.00	0.83
1.833	0.70	7.917	1.27	14.000	2.66	20.08	0.80
1.917	0.70	8.000	1.27	14.083	2.37	20.17	0.80
2.000	0.70	8.083	1.30	14.167	2.37	20.25	0.80
2.083	0.71	8.167	1.30	14.250	2.37	20.33	0.77
2.167	0.71	8.250	1.30	14.333	2.16	20.42	0.77
2.250	0.71	8.333	1.40	14.417	2.16	20.50	0.77
2.333	0.73	8.417	1.40	14.500	2.16	20.58	0.77
2.417	0.73	8.500	1.40	14.583	2.06	20.67	0.77
2.500	0.73	8.583	1.54	14.667	2.06	20.75	0.77
2.583	0.74	8.667	1.54	14.750	2.06	20.83	0.76
2.667	0.74	8.750	1.54	14.833	1.95	20.92	0.76
2.750	0.74	8.833	1.69	14.917	1.95	21.00	0.76
2.833	0.76	8.917	1.69	15.000	1.95	21.08	0.75
2.917	0.76	9.000	1.69	15.083	1.85	21.17	0.75
3.000	0.76	9.083	1.84	15.167	1.85	21.25	0.75
3.083	0.77	9.167	1.84	15.250	1.85	21.33	0.74
3.167	0.77	9.250	1.84	15.333	1.74	21.42	0.74
3.250	0.77	9.333	1.92	15.417	1.74	21.50	0.74
3.333	0.79	9.417	1.92	15.500	1.74	21.58	0.74
3.417	0.79	9.500	1.92	15.583	1.64	21.67	0.74
3.500	0.79	9.583	1.92	15.667	1.64	21.75	0.74
3.583	0.80	9.667	1.92	15.750	1.64	21.83	0.73
3.667	0.80	9.750	1.92	15.833	1.53	21.92	0.73
3.750	0.80	9.833	2.04	15.917	1.53	22.00	0.73
3.833	0.82	9.917	2.04	16.000	1.53	22.08	0.72
3.917	0.82	10.000	2.04	16.083	1.43	22.17	0.72
4.000	0.82	10.083	2.27	16.167	1.43	22.25	0.72
4.083	0.83	10.167	2.27	16.250	1.43	22.33	0.71
4.167	0.83	10.250	2.27	16.333	1.36	22.42	0.71
4.250	0.83	10.333	2.58	16.417	1.36	22.50	0.71
4.333	0.85	10.417	2.58	16.500	1.36	22.58	0.71
4.417	0.85	10.500	2.58	16.583	1.32	22.67	0.71
4.500	0.85	10.583	2.93	16.667	1.32	22.75	0.71
4.583	0.88	10.667	2.93	16.750	1.32	22.83	0.70
4.667	0.88	10.750	2.93	16.833	1.28	22.92	0.70
4.750	0.88	10.833	3.43	16.917	1.28	23.00	0.70
4.833	0.91	10.917	3.43	17.000	1.28	23.08	0.69
4.917	0.91	11.000	3.43	17.083	1.25	23.17	0.69
5.000	0.91	11.083	4.00	17.167	1.25	23.25	0.69
5.083	0.94	11.167	4.00	17.250	1.25	23.33	0.69
5.167	0.94	11.250	4.00	17.333	1.21	23.42	0.69
5.250	0.94	11.333	5.06	17.417	1.21	23.50	0.69
5.333	0.97	11.417	5.06	17.500	1.21	23.58	0.68
5.417	0.97	11.500	5.06	17.583	1.17	23.67	0.68
5.500	0.97	11.583	6.44	17.667	1.17	23.75	0.68
5.583	1.00	11.667	6.44	17.750	1.17	23.83	0.67
5.667	1.00	11.750	6.44	17.833	1.13	23.92	0.67
5.750	1.00	11.833	26.24	17.917	1.13	24.00	0.67
5.833	1.03	11.917	26.25	18.000	1.13	24.08	0.66
5.917	1.03	12.000	26.25	18.083	1.10	24.17	0.66
6.000	1.03	12.083	64.77	18.167	1.10	24.25	0.66
6.083	1.06	12.167	64.77	18.250	1.10		

Max.Eff.Inten.(mm/hr)=	64.77	23.71	
over (min)	5.00	10.00	
Storage Coeff. (min)=	3.31 (ii)	8.14 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.26	0.13	
			TOTALS
PEAK FLOW (cms)=	0.29	0.02	0.306 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	58.88	17.82	50.67
TOTAL RAINFALL (mm)=	59.88	59.88	59.88
RUNOFF COEFFICIENT =	0.98	0.30	0.85

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0003)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0004):		0.71	0.073	12.25	38.34
+ ID2= 2 (0005):		2.00	0.306	12.25	50.67
ID = 3 (0003):		2.71	0.379	12.25	47.44

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0006)		OVERFLOW IS OFF			
IN= 2---> OUT= 1					
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)	
	0.0000	0.0000	0.0630	0.1060	
	0.0000	0.0110	0.0840	0.1190	
	0.0050	0.0210	0.1060	0.1320	
	0.0070	0.0330	0.1310	0.1460	
	0.0090	0.0440	0.1570	0.1600	
	0.0100	0.0560	0.1850	0.1740	
	0.0170	0.0680	0.2140	0.1890	
	0.0300	0.0800	0.2440	0.2050	
	0.0450	0.0930	0.0000	0.0000	

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0003)	2.710	0.379	12.25	47.44
OUTFLOW: ID= 1 (0006)	2.710	0.030	13.08	43.19

PEAK FLOW REDUCTION [Qout/Qin](%)= 8.03
TIME SHIFT OF PEAK FLOW (min)= 50.00
MAXIMUM STORAGE USED (ha.m.)= 0.0804

****
** SIMULATION:I. 10yr 24hr 15min SCS Type II **
****

READ STORM	Filename: C:\Users\amysliwiec\AppData\Local\Temp\1915adf3-1193-4333-b5c4-9f3f2a29696d\0b95a0fa
Ptotal= 67.50 mm	Comments: 10yr 24hr 15min SCS Type II

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.00	6.25	1.23	12.50	7.87	18.75	1.11
0.25	0.68	6.50	1.26	12.75	5.42	19.00	1.07
0.50	0.70	6.75	1.30	13.00	4.57	19.25	1.02
0.75	0.72	7.00	1.33	13.25	3.87	19.50	0.98
1.00	0.73	7.25	1.37	13.50	3.42	19.75	0.94
1.25	0.75	7.50	1.40	13.75	3.00	20.00	0.90
1.50	0.77	7.75	1.44	14.00	2.67	20.25	0.87
1.75	0.78	8.00	1.47	14.25	2.44	20.50	0.87
2.00	0.80	8.25	1.57	14.50	2.32	20.75	0.86
2.25	0.82	8.50	1.73	14.75	2.20	21.00	0.85
2.50	0.84	8.75	1.91	15.00	2.09	21.25	0.84
2.75	0.85	9.00	2.07	15.25	1.96	21.50	0.83
3.00	0.87	9.25	2.16	15.50	1.85	21.75	0.82
3.25	0.89	9.50	2.16	15.75	1.73	22.00	0.81
3.50	0.90	9.75	2.30	16.00	1.61	22.25	0.81
3.75	0.92	10.00	2.56	16.25	1.53	22.50	0.80
4.00	0.94	10.25	2.91	16.50	1.49	22.75	0.79
4.25	0.96	10.50	3.30	16.75	1.45	23.00	0.78
4.50	0.99	10.75	3.86	17.00	1.41	23.25	0.77
4.75	1.03	11.00	4.51	17.25	1.36	23.50	0.76
5.00	1.06	11.25	5.70	17.50	1.32	23.75	0.75
5.25	1.10	11.50	7.26	17.75	1.28	24.00	0.75
5.50	1.13	11.75	29.59	18.00	1.24		
5.75	1.17	12.00	73.01	18.25	1.19		
6.00	1.20	12.25	11.57	18.50	1.15		

CALIB				
STANDHYD (0004)	Area (ha)= 0.71			
ID= 1 DT= 5.0 min	Total Imp(%)= 50.00	Dir. Conn.(%)= 50.00		

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.35	0.35
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	68.80	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.20	12.250	73.01	18.33	1.19
0.167	0.00	6.250	1.20	12.333	11.57	18.42	1.19
0.250	0.00	6.333	1.23	12.417	11.57	18.50	1.19
0.333	0.68	6.417	1.23	12.500	11.57	18.58	1.15
0.417	0.68	6.500	1.23	12.583	7.87	18.67	1.15
0.500	0.68	6.583	1.26	12.667	7.87	18.75	1.15
0.583	0.70	6.667	1.26	12.750	7.87	18.83	1.11
0.667	0.70	6.750	1.26	12.833	5.42	18.92	1.11
0.750	0.70	6.833	1.30	12.917	5.42	19.00	1.11
0.833	0.72	6.917	1.30	13.000	5.42	19.08	1.07
0.917	0.72	7.000	1.30	13.083	4.57	19.17	1.07
1.000	0.72	7.083	1.33	13.167	4.57	19.25	1.07
1.083	0.73	7.167	1.33	13.250	4.57	19.33	1.02
1.167	0.73	7.250	1.33	13.333	3.87	19.42	1.02
1.250	0.73	7.333	1.37	13.417	3.87	19.50	1.02
1.333	0.75	7.417	1.37	13.500	3.87	19.58	0.98
1.417	0.75	7.500	1.37	13.583	3.42	19.67	0.98
1.500	0.75	7.583	1.40	13.667	3.42	19.75	0.98

1.583	0.77	7.667	1.40	13.750	3.42	19.83	0.94
1.667	0.77	7.750	1.40	13.833	3.00	19.92	0.94
1.750	0.77	7.833	1.44	13.917	3.00	20.00	0.94
1.833	0.78	7.917	1.44	14.000	3.00	20.08	0.90
1.917	0.78	8.000	1.44	14.083	2.67	20.17	0.90
2.000	0.78	8.083	1.47	14.167	2.67	20.25	0.90
2.083	0.80	8.167	1.47	14.250	2.67	20.33	0.87
2.167	0.80	8.250	1.47	14.333	2.44	20.42	0.87
2.250	0.80	8.333	1.57	14.417	2.44	20.50	0.87
2.333	0.82	8.417	1.57	14.500	2.44	20.58	0.87
2.417	0.82	8.500	1.57	14.583	2.32	20.67	0.87
2.500	0.82	8.583	1.73	14.667	2.32	20.75	0.87
2.583	0.84	8.667	1.73	14.750	2.32	20.83	0.86
2.667	0.84	8.750	1.73	14.833	2.20	20.92	0.86
2.750	0.84	8.833	1.91	14.917	2.20	21.00	0.86
2.833	0.85	8.917	1.91	15.000	2.20	21.08	0.85
2.917	0.85	9.000	1.91	15.083	2.09	21.17	0.85
3.000	0.85	9.083	2.07	15.167	2.09	21.25	0.85
3.083	0.87	9.167	2.07	15.250	2.09	21.33	0.84
3.167	0.87	9.250	2.07	15.333	1.96	21.42	0.84
3.250	0.87	9.333	2.16	15.417	1.96	21.50	0.84
3.333	0.89	9.417	2.16	15.500	1.96	21.58	0.83
3.417	0.89	9.500	2.16	15.583	1.85	21.67	0.83
3.500	0.89	9.583	2.16	15.667	1.85	21.75	0.83
3.583	0.90	9.667	2.16	15.750	1.85	21.83	0.82
3.667	0.90	9.750	2.16	15.833	1.73	21.92	0.82
3.750	0.90	9.833	2.30	15.917	1.73	22.00	0.82
3.833	0.92	9.917	2.30	16.000	1.73	22.08	0.81
3.917	0.92	10.000	2.30	16.083	1.61	22.17	0.81
4.000	0.92	10.083	2.56	16.167	1.61	22.25	0.81
4.083	0.94	10.167	2.56	16.250	1.61	22.33	0.81
4.167	0.94	10.250	2.56	16.333	1.53	22.42	0.81
4.250	0.94	10.333	2.91	16.417	1.53	22.50	0.81
4.333	0.96	10.417	2.91	16.500	1.53	22.58	0.80
4.417	0.96	10.500	2.91	16.583	1.49	22.67	0.80
4.500	0.96	10.583	3.30	16.667	1.49	22.75	0.80
4.583	0.99	10.667	3.30	16.750	1.49	22.83	0.79
4.667	0.99	10.750	3.30	16.833	1.45	22.92	0.79
4.750	0.99	10.833	3.86	16.917	1.45	23.00	0.79
4.833	1.03	10.917	3.86	17.000	1.45	23.08	0.78
4.917	1.03	11.000	3.86	17.083	1.41	23.17	0.78
5.000	1.03	11.083	4.51	17.167	1.41	23.25	0.78
5.083	1.06	11.167	4.51	17.250	1.41	23.33	0.77
5.167	1.06	11.250	4.51	17.333	1.36	23.42	0.77
5.250	1.06	11.333	5.70	17.417	1.36	23.50	0.77
5.333	1.10	11.417	5.70	17.500	1.36	23.58	0.76
5.417	1.10	11.500	5.70	17.583	1.32	23.67	0.76
5.500	1.10	11.583	7.26	17.667	1.32	23.75	0.76
5.583	1.13	11.667	7.26	17.750	1.32	23.83	0.75
5.667	1.13	11.750	7.26	17.833	1.28	23.92	0.75
5.750	1.13	11.833	29.58	17.917	1.28	24.00	0.75
5.833	1.17	11.917	29.59	18.000	1.28	24.08	0.75
5.917	1.17	12.000	29.59	18.083	1.24	24.17	0.75
6.000	1.17	12.083	73.01	18.167	1.24	24.25	0.75
6.083	1.20	12.167	73.01	18.250	1.24		

Max.Eff.Inten.(mm/hr)=	73.01	27.45	
over (min)	5.00	15.00	
Storage Coeff. (min)=	2.31 (ii)	14.15 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.30	0.08	
			TOTALS
PEAK FLOW (cms)=	0.07	0.02	0.087 (iii)
TIME TO PEAK (hrs)=	12.25	12.33	12.25
RUNOFF VOLUME (mm)=	66.50	22.12	44.30
TOTAL RAINFALL (mm)=	67.50	67.50	67.50
RUNOFF COEFFICIENT =	0.99	0.33	0.66

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. 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 (0005) | Area (ha)= 2.00
ID= 1 DT= 5.0 min | Total Imp(%)= 80.00 Dir. Conn.(%)= 80.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.60	0.40
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	115.47	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.20	12.250	73.01	18.33	1.19
0.167	0.00	6.250	1.20	12.333	11.57	18.42	1.19
0.250	0.00	6.333	1.23	12.417	11.57	18.50	1.19
0.333	0.68	6.417	1.23	12.500	11.57	18.58	1.15
0.417	0.68	6.500	1.23	12.583	7.87	18.67	1.15

0.500	0.68	6.583	1.26	12.667	7.87	18.75	1.15
0.583	0.70	6.667	1.26	12.750	7.87	18.83	1.11
0.667	0.70	6.750	1.26	12.833	5.42	18.92	1.11
0.750	0.70	6.833	1.30	12.917	5.42	19.00	1.11
0.833	0.72	6.917	1.30	13.000	5.42	19.08	1.07
0.917	0.72	7.000	1.30	13.083	4.57	19.17	1.07
1.000	0.72	7.083	1.33	13.167	4.57	19.25	1.07
1.083	0.73	7.167	1.33	13.250	4.57	19.33	1.02
1.167	0.73	7.250	1.33	13.333	3.87	19.42	1.02
1.250	0.73	7.333	1.37	13.417	3.87	19.50	1.02
1.333	0.75	7.417	1.37	13.500	3.87	19.58	0.98
1.417	0.75	7.500	1.37	13.583	3.42	19.67	0.98
1.500	0.75	7.583	1.40	13.667	3.42	19.75	0.98
1.583	0.77	7.667	1.40	13.750	3.42	19.83	0.94
1.667	0.77	7.750	1.40	13.833	3.00	19.92	0.94
1.750	0.77	7.833	1.44	13.917	3.00	20.00	0.94
1.833	0.78	7.917	1.44	14.000	3.00	20.08	0.90
1.917	0.78	8.000	1.44	14.083	2.67	20.17	0.90
2.000	0.78	8.083	1.47	14.167	2.67	20.25	0.90
2.083	0.80	8.167	1.47	14.250	2.67	20.33	0.87
2.167	0.80	8.250	1.47	14.333	2.44	20.42	0.87
2.250	0.80	8.333	1.57	14.417	2.44	20.50	0.87
2.333	0.82	8.417	1.57	14.500	2.44	20.58	0.87
2.417	0.82	8.500	1.57	14.583	2.32	20.67	0.87
2.500	0.82	8.583	1.73	14.667	2.32	20.75	0.87
2.583	0.84	8.667	1.73	14.750	2.32	20.83	0.86
2.667	0.84	8.750	1.73	14.833	2.20	20.92	0.86
2.750	0.84	8.833	1.91	14.917	2.20	21.00	0.86
2.833	0.85	8.917	1.91	15.000	2.20	21.08	0.85
2.917	0.85	9.000	1.91	15.083	2.09	21.17	0.85
3.000	0.85	9.083	2.07	15.167	2.09	21.25	0.85
3.083	0.87	9.167	2.07	15.250	2.09	21.33	0.84
3.167	0.87	9.250	2.07	15.333	1.96	21.42	0.84
3.250	0.87	9.333	2.16	15.417	1.96	21.50	0.84
3.333	0.89	9.417	2.16	15.500	1.96	21.58	0.83
3.417	0.89	9.500	2.16	15.583	1.85	21.67	0.83
3.500	0.89	9.583	2.16	15.667	1.85	21.75	0.83
3.583	0.90	9.667	2.16	15.750	1.85	21.83	0.82
3.667	0.90	9.750	2.16	15.833	1.73	21.92	0.82
3.750	0.90	9.833	2.30	15.917	1.73	22.00	0.82
3.833	0.92	9.917	2.30	16.000	1.73	22.08	0.81
3.917	0.92	10.000	2.30	16.083	1.61	22.17	0.81
4.000	0.92	10.083	2.56	16.167	1.61	22.25	0.81
4.083	0.94	10.167	2.56	16.250	1.61	22.33	0.81
4.167	0.94	10.250	2.56	16.333	1.53	22.42	0.81
4.250	0.94	10.333	2.91	16.417	1.53	22.50	0.81
4.333	0.96	10.417	2.91	16.500	1.53	22.58	0.80
4.417	0.96	10.500	2.91	16.583	1.49	22.67	0.80
4.500	0.96	10.583	3.30	16.667	1.49	22.75	0.80
4.583	0.99	10.667	3.30	16.750	1.49	22.83	0.79
4.667	0.99	10.750	3.30	16.833	1.45	22.92	0.79
4.750	0.99	10.833	3.86	16.917	1.45	23.00	0.79
4.833	1.03	10.917	3.86	17.000	1.45	23.08	0.78
4.917	1.03	11.000	3.86	17.083	1.41	23.17	0.78
5.000	1.03	11.083	4.51	17.167	1.41	23.25	0.78
5.083	1.06	11.167	4.51	17.250	1.41	23.33	0.77
5.167	1.06	11.250	4.51	17.333	1.36	23.42	0.77
5.250	1.06	11.333	5.70	17.417	1.36	23.50	0.77
5.333	1.10	11.417	5.70	17.500	1.36	23.58	0.76
5.417	1.10	11.500	5.70	17.583	1.32	23.67	0.76
5.500	1.10	11.583	7.26	17.667	1.32	23.75	0.76
5.583	1.13	11.667	7.26	17.750	1.32	23.83	0.75
5.667	1.13	11.750	7.26	17.833	1.28	23.92	0.75
5.750	1.13	11.833	29.58	17.917	1.28	24.00	0.75
5.833	1.17	11.917	29.59	18.000	1.28	24.08	0.75
5.917	1.17	12.000	29.59	18.083	1.24	24.17	0.75
6.000	1.17	12.083	73.01	18.167	1.24	24.25	0.75
6.083	1.20	12.167	73.01	18.250	1.24		

Max.Eff.Inten.(mm/hr)=	73.01	29.40	
over (min)	5.00	10.00	
Storage Coeff. (min)=	3.16 (ii)	7.76 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.27	0.13	
			TOTALS
PEAK FLOW (cms)=	0.32	0.03	0.348 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	66.50	22.12	57.62
TOTAL RAINFALL (mm)=	67.50	67.50	67.50
RUNOFF COEFFICIENT =	0.99	0.33	0.85

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0003)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0004):	0.71	0.087	12.25	44.30
+ ID2= 2 (0005):	2.00	0.348	12.25	57.62
ID = 3 (0003):	2.71	0.435	12.25	54.13

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0006) IN= 2---> OUT= 1 DT= 5.0 min	OVERFLOW IS OFF			
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0630	0.1060
	0.0000	0.0110	0.0840	0.1190
	0.0050	0.0210	0.1060	0.1320
	0.0070	0.0330	0.1310	0.1460
	0.0090	0.0440	0.1570	0.1600
	0.0100	0.0560	0.1850	0.1740
	0.0170	0.0680	0.2140	0.1890
	0.0300	0.0800	0.2440	0.2050
	0.0450	0.0930	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0003)	2.710	0.435	12.25	54.13
OUTFLOW: ID= 1 (0006)	2.710	0.041	12.92	49.89

PEAK FLOW REDUCTION [Qout/Qin](%)= 9.37
TIME SHIFT OF PEAK FLOW (min)= 40.00
MAXIMUM STORAGE USED (ha.m.)= 0.0893

****
** SIMULATION:J. 25yr 24hr 15min SCS Type II **
****

READ STORM Ptotal= 78.08 mm	Filename: C:\Users\amysliwiec\AppData\Local\Temp\1915adf3-1193-4333-b5c4-9f3f2a29696d\854dae27 Comments: 25yr 24hr 15min SCS Type II

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.00	6.25	1.43	12.50	9.11	18.75	1.28
0.25	0.79	6.50	1.46	12.75	6.27	19.00	1.24
0.50	0.81	6.75	1.50	13.00	5.29	19.25	1.19
0.75	0.83	7.00	1.54	13.25	4.48	19.50	1.14
1.00	0.85	7.25	1.58	13.50	3.95	19.75	1.09
1.25	0.87	7.50	1.62	13.75	3.47	20.00	1.04
1.50	0.89	7.75	1.66	14.00	3.09	20.25	1.01
1.75	0.91	8.00	1.70	14.25	2.82	20.50	1.00
2.00	0.93	8.25	1.82	14.50	2.69	20.75	0.99
2.25	0.95	8.50	2.01	14.75	2.54	21.00	0.98
2.50	0.97	8.75	2.21	15.00	2.41	21.25	0.97
2.75	0.99	9.00	2.40	15.25	2.27	21.50	0.96
3.00	1.00	9.25	2.50	15.50	2.14	21.75	0.95
3.25	1.03	9.50	2.50	15.75	2.00	22.00	0.94
3.50	1.04	9.75	2.66	16.00	1.87	22.25	0.93
3.75	1.06	10.00	2.96	16.25	1.77	22.50	0.92
4.00	1.08	10.25	3.37	16.50	1.72	22.75	0.91
4.25	1.11	10.50	3.82	16.75	1.67	23.00	0.90
4.50	1.15	10.75	4.47	17.00	1.63	23.25	0.89
4.75	1.19	11.00	5.22	17.25	1.58	23.50	0.88
5.00	1.23	11.25	6.60	17.50	1.53	23.75	0.87
5.25	1.27	11.50	8.40	17.75	1.48	24.00	0.86
5.50	1.31	11.75	34.22	18.00	1.43		
5.75	1.35	12.00	84.46	18.25	1.38		
6.00	1.39	12.25	13.38	18.50	1.33		

CALIB STANDHYD (0004) ID= 1 DT= 5.0 min	Area (ha)= 0.71 Total Imp(%)= 50.00 Dir. Conn.(%)= 50.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.35	0.35
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	68.80	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.39	12.250	84.46	18.33	1.38
0.167	0.00	6.250	1.39	12.333	13.39	18.42	1.38
0.250	0.00	6.333	1.43	12.417	13.38	18.50	1.38
0.333	0.79	6.417	1.43	12.500	13.38	18.58	1.33
0.417	0.79	6.500	1.43	12.583	9.11	18.67	1.33
0.500	0.79	6.583	1.46	12.667	9.11	18.75	1.33
0.583	0.81	6.667	1.46	12.750	9.11	18.83	1.28
0.667	0.81	6.750	1.46	12.833	6.27	18.92	1.28
0.750	0.81	6.833	1.50	12.917	6.27	19.00	1.28
0.833	0.83	6.917	1.50	13.000	6.27	19.08	1.24
0.917	0.83	7.000	1.50	13.083	5.29	19.17	1.24
1.000	0.83	7.083	1.54	13.167	5.29	19.25	1.24
1.083	0.85	7.167	1.54	13.250	5.29	19.33	1.19
1.167	0.85	7.250	1.54	13.333	4.48	19.42	1.19
1.250	0.85	7.333	1.58	13.417	4.48	19.50	1.19

1.333	0.87	7.417	1.58	13.500	4.48	19.58	1.14
1.417	0.87	7.500	1.58	13.583	3.95	19.67	1.14
1.500	0.87	7.583	1.62	13.667	3.95	19.75	1.14
1.583	0.89	7.667	1.62	13.750	3.95	19.83	1.09
1.667	0.89	7.750	1.62	13.833	3.47	19.92	1.09
1.750	0.89	7.833	1.66	13.917	3.47	20.00	1.09
1.833	0.91	7.917	1.66	14.000	3.47	20.08	1.04
1.917	0.91	8.000	1.66	14.083	3.09	20.17	1.04
2.000	0.91	8.083	1.70	14.167	3.09	20.25	1.04
2.083	0.93	8.167	1.70	14.250	3.09	20.33	1.01
2.167	0.93	8.250	1.70	14.333	2.82	20.42	1.01
2.250	0.93	8.333	1.82	14.417	2.82	20.50	1.01
2.333	0.95	8.417	1.82	14.500	2.82	20.58	1.00
2.417	0.95	8.500	1.82	14.583	2.69	20.67	1.00
2.500	0.95	8.583	2.01	14.667	2.69	20.75	1.00
2.583	0.97	8.667	2.01	14.750	2.69	20.83	0.99
2.667	0.97	8.750	2.01	14.833	2.54	20.92	0.99
2.750	0.97	8.833	2.21	14.917	2.54	21.00	0.99
2.833	0.99	8.917	2.21	15.000	2.54	21.08	0.98
2.917	0.99	9.000	2.21	15.083	2.41	21.17	0.98
3.000	0.99	9.083	2.40	15.167	2.41	21.25	0.98
3.083	1.00	9.167	2.40	15.250	2.41	21.33	0.97
3.167	1.00	9.250	2.40	15.333	2.27	21.42	0.97
3.250	1.00	9.333	2.50	15.417	2.27	21.50	0.97
3.333	1.03	9.417	2.50	15.500	2.27	21.58	0.96
3.417	1.03	9.500	2.50	15.583	2.14	21.67	0.96
3.500	1.03	9.583	2.50	15.667	2.14	21.75	0.96
3.583	1.04	9.667	2.50	15.750	2.14	21.83	0.95
3.667	1.04	9.750	2.50	15.833	2.00	21.92	0.95
3.750	1.04	9.833	2.66	15.917	2.00	22.00	0.95
3.833	1.06	9.917	2.66	16.000	2.00	22.08	0.94
3.917	1.06	10.000	2.66	16.083	1.87	22.17	0.94
4.000	1.06	10.083	2.96	16.167	1.87	22.25	0.94
4.083	1.08	10.167	2.96	16.250	1.87	22.33	0.93
4.167	1.08	10.250	2.96	16.333	1.77	22.42	0.93
4.250	1.08	10.333	3.37	16.417	1.77	22.50	0.93
4.333	1.11	10.417	3.37	16.500	1.77	22.58	0.92
4.417	1.11	10.500	3.37	16.583	1.72	22.67	0.92
4.500	1.11	10.583	3.82	16.667	1.72	22.75	0.92
4.583	1.15	10.667	3.82	16.750	1.72	22.83	0.91
4.667	1.15	10.750	3.82	16.833	1.67	22.92	0.91
4.750	1.15	10.833	4.47	16.917	1.67	23.00	0.91
4.833	1.19	10.917	4.47	17.000	1.67	23.08	0.90
4.917	1.19	11.000	4.47	17.083	1.63	23.17	0.90
5.000	1.19	11.083	5.22	17.167	1.63	23.25	0.90
5.083	1.23	11.167	5.22	17.250	1.63	23.33	0.89
5.167	1.23	11.250	5.22	17.333	1.58	23.42	0.89
5.250	1.23	11.333	6.60	17.417	1.58	23.50	0.89
5.333	1.27	11.417	6.60	17.500	1.58	23.58	0.88
5.417	1.27	11.500	6.60	17.583	1.53	23.67	0.88
5.500	1.27	11.583	8.39	17.667	1.53	23.75	0.88
5.583	1.31	11.667	8.40	17.750	1.53	23.83	0.87
5.667	1.31	11.750	8.40	17.833	1.48	23.92	0.87
5.750	1.31	11.833	34.22	17.917	1.48	24.00	0.87
5.833	1.35	11.917	34.22	18.000	1.48	24.08	0.86
5.917	1.35	12.000	34.22	18.083	1.43	24.17	0.86
6.000	1.35	12.083	84.45	18.167	1.43	24.25	0.86
6.083	1.39	12.167	84.46	18.250	1.43		

Max.Eff.Inten.(mm/hr)=		84.46	35.55	
over (min)		5.00	15.00	
Storage Coeff. (min)=		2.18 (ii)	12.86 (ii)	
Unit Hyd. Tpeak (min)=		5.00	15.00	
Unit Hyd. peak (cms)=		0.31	0.08	
				TOTALS
PEAK FLOW	(cms)=	0.08	0.02	0.103 (iii)
TIME TO PEAK	(hrs)=	12.25	12.33	12.25
RUNOFF VOLUME	(mm)=	77.08	28.53	52.79
TOTAL RAINFALL	(mm)=	78.08	78.08	78.08
RUNOFF COEFFICIENT	=	0.99	0.37	0.68

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. 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 (0005)	Area (ha)=	2.00	
ID= 1 DT= 5.0 min	Total Imp(%)=	80.00	Dir. Conn.(%)= 80.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.60	0.40
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	115.47	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.39	12.250	84.46	18.33	1.38
0.167	0.00	6.250	1.39	12.333	13.39	18.42	1.38

0.250	0.00	6.333	1.43	12.417	13.38	18.50	1.38
0.333	0.79	6.417	1.43	12.500	13.38	18.58	1.33
0.417	0.79	6.500	1.43	12.583	9.11	18.67	1.33
0.500	0.79	6.583	1.46	12.667	9.11	18.75	1.33
0.583	0.81	6.667	1.46	12.750	9.11	18.83	1.28
0.667	0.81	6.750	1.46	12.833	6.27	18.92	1.28
0.750	0.81	6.833	1.50	12.917	6.27	19.00	1.28
0.833	0.83	6.917	1.50	13.000	6.27	19.08	1.24
0.917	0.83	7.000	1.50	13.083	5.29	19.17	1.24
1.000	0.83	7.083	1.54	13.167	5.29	19.25	1.24
1.083	0.85	7.167	1.54	13.250	5.29	19.33	1.19
1.167	0.85	7.250	1.54	13.333	4.48	19.42	1.19
1.250	0.85	7.333	1.58	13.417	4.48	19.50	1.19
1.333	0.87	7.417	1.58	13.500	4.48	19.58	1.14
1.417	0.87	7.500	1.58	13.583	3.95	19.67	1.14
1.500	0.87	7.583	1.62	13.667	3.95	19.75	1.14
1.583	0.89	7.667	1.62	13.750	3.95	19.83	1.09
1.667	0.89	7.750	1.62	13.833	3.47	19.92	1.09
1.750	0.89	7.833	1.66	13.917	3.47	20.00	1.09
1.833	0.91	7.917	1.66	14.000	3.47	20.08	1.04
1.917	0.91	8.000	1.66	14.083	3.09	20.17	1.04
2.000	0.91	8.083	1.70	14.167	3.09	20.25	1.04
2.083	0.93	8.167	1.70	14.250	3.09	20.33	1.01
2.167	0.93	8.250	1.70	14.333	2.82	20.42	1.01
2.250	0.93	8.333	1.82	14.417	2.82	20.50	1.01
2.333	0.95	8.417	1.82	14.500	2.82	20.58	1.00
2.417	0.95	8.500	1.82	14.583	2.69	20.67	1.00
2.500	0.95	8.583	2.01	14.667	2.69	20.75	1.00
2.583	0.97	8.667	2.01	14.750	2.69	20.83	0.99
2.667	0.97	8.750	2.01	14.833	2.54	20.92	0.99
2.750	0.97	8.833	2.21	14.917	2.54	21.00	0.99
2.833	0.99	8.917	2.21	15.000	2.54	21.08	0.98
2.917	0.99	9.000	2.21	15.083	2.41	21.17	0.98
3.000	0.99	9.083	2.40	15.167	2.41	21.25	0.98
3.083	1.00	9.167	2.40	15.250	2.41	21.33	0.97
3.167	1.00	9.250	2.40	15.333	2.27	21.42	0.97
3.250	1.00	9.333	2.50	15.417	2.27	21.50	0.97
3.333	1.03	9.417	2.50	15.500	2.27	21.58	0.96
3.417	1.03	9.500	2.50	15.583	2.14	21.67	0.96
3.500	1.03	9.583	2.50	15.667	2.14	21.75	0.96
3.583	1.04	9.667	2.50	15.750	2.14	21.83	0.95
3.667	1.04	9.750	2.50	15.833	2.00	21.92	0.95
3.750	1.04	9.833	2.66	15.917	2.00	22.00	0.95
3.833	1.06	9.917	2.66	16.000	2.00	22.08	0.94
3.917	1.06	10.000	2.66	16.083	1.87	22.17	0.94
4.000	1.06	10.083	2.96	16.167	1.87	22.25	0.94
4.083	1.08	10.167	2.96	16.250	1.87	22.33	0.93
4.167	1.08	10.250	2.96	16.333	1.77	22.42	0.93
4.250	1.08	10.333	3.37	16.417	1.77	22.50	0.93
4.333	1.11	10.417	3.37	16.500	1.77	22.58	0.92
4.417	1.11	10.500	3.37	16.583	1.72	22.67	0.92
4.500	1.11	10.583	3.82	16.667	1.72	22.75	0.92
4.583	1.15	10.667	3.82	16.750	1.72	22.83	0.91
4.667	1.15	10.750	3.82	16.833	1.67	22.92	0.91
4.750	1.15	10.833	4.47	16.917	1.67	23.00	0.91
4.833	1.19	10.917	4.47	17.000	1.67	23.08	0.90
4.917	1.19	11.000	4.47	17.083	1.63	23.17	0.90
5.000	1.19	11.083	5.22	17.167	1.63	23.25	0.90
5.083	1.23	11.167	5.22	17.250	1.63	23.33	0.89
5.167	1.23	11.250	5.22	17.333	1.58	23.42	0.89
5.250	1.23	11.333	6.60	17.417	1.58	23.50	0.89
5.333	1.27	11.417	6.60	17.500	1.58	23.58	0.88
5.417	1.27	11.500	6.60	17.583	1.53	23.67	0.88
5.500	1.27	11.583	8.39	17.667	1.53	23.75	0.88
5.583	1.31	11.667	8.40	17.750	1.53	23.83	0.87
5.667	1.31	11.750	8.40	17.833	1.48	23.92	0.87
5.750	1.31	11.833	34.22	17.917	1.48	24.00	0.87
5.833	1.35	11.917	34.22	18.000	1.48	24.08	0.86
5.917	1.35	12.000	34.22	18.083	1.43	24.17	0.86
6.000	1.35	12.083	84.45	18.167	1.43	24.25	0.86
6.083	1.39	12.167	84.46	18.250	1.43		

Max.Eff.Inten.(mm/hr)=	84.46	37.89	
over (min)	5.00	10.00	
Storage Coeff. (min)=	2.98 (ii)	7.32 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.28	0.13	
			TOTALS
PEAK FLOW (cms)=	0.37	0.03	0.407 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	77.08	28.53	67.37
TOTAL RAINFALL (mm)=	78.08	78.08	78.08
RUNOFF COEFFICIENT =	0.99	0.37	0.86

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0003)					
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.	
	(ha)	(cms)	(hrs)	(mm)	
ID1= 1 (0004):	0.71	0.103	12.25	52.79	
+ ID2= 2 (0005):	2.00	0.407	12.25	67.37	

```
        ==================================================
        ID = 3 (  0003):     2.71   0.511    12.25    63.55

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0006)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.0630      0.1060
                          0.0000      0.0110   |    0.0840      0.1190
                          0.0050      0.0210   |    0.1060      0.1320
                          0.0070      0.0330   |    0.1310      0.1460
                          0.0090      0.0440   |    0.1570      0.1600
                          0.0100      0.0560   |    0.1850      0.1740
                          0.0170      0.0680   |    0.2140      0.1890
                          0.0300      0.0800   |    0.2440      0.2050
                          0.0450      0.0930   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0003)     2.710     0.511     12.25      63.55
   OUTFLOW: ID= 1 (  0006)     2.710     0.057     12.83      59.31

                 PEAK   FLOW   REDUCTION [Qout/Qin](%)= 11.21
                 TIME SHIFT OF PEAK FLOW         (min)= 35.00
                 MAXIMUM  STORAGE   USED       (ha.m.)=  0.1020

--------------------------------------------------------------------------------
**********************************************
** SIMULATION:K. 50yr 24hr 15min SCS Type II **
**********************************************

--------------------
|    READ STORM    |    Filename: C:\Users\amysliwiec\AppD
|                  |              ata\Local\Temp\
|                  |              1915adf3-1193-4333-b5c4-9f3f2a29696d\d4b37525
| Ptotal= 85.42 mm |    Comments: 50yr 24hr 15min SCS Type II
--------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.00    0.00 |  6.25    1.56 | 12.50    9.96 | 18.75    1.40
               0.25    0.87 |  6.50    1.60 | 12.75    6.85 | 19.00    1.35
               0.50    0.89 |  6.75    1.65 | 13.00    5.79 | 19.25    1.30
               0.75    0.91 |  7.00    1.69 | 13.25    4.90 | 19.50    1.25
               1.00    0.93 |  7.25    1.73 | 13.50    4.33 | 19.75    1.19
               1.25    0.95 |  7.50    1.77 | 13.75    3.79 | 20.00    1.14
               1.50    0.97 |  7.75    1.82 | 14.00    3.38 | 20.25    1.11
               1.75    0.99 |  8.00    1.86 | 14.25    3.08 | 20.50    1.10
               2.00    1.01 |  8.25    1.99 | 14.50    2.94 | 20.75    1.08
               2.25    1.04 |  8.50    2.20 | 14.75    2.78 | 21.00    1.07
               2.50    1.06 |  8.75    2.42 | 15.00    2.64 | 21.25    1.06
               2.75    1.08 |  9.00    2.62 | 15.25    2.49 | 21.50    1.05
               3.00    1.10 |  9.25    2.73 | 15.50    2.34 | 21.75    1.04
               3.25    1.12 |  9.50    2.73 | 15.75    2.19 | 22.00    1.03
               3.50    1.14 |  9.75    2.91 | 16.00    2.04 | 22.25    1.02
               3.75    1.16 | 10.00    3.24 | 16.25    1.94 | 22.50    1.01
               4.00    1.18 | 10.25    3.68 | 16.50    1.89 | 22.75    1.00
               4.25    1.22 | 10.50    4.18 | 16.75    1.83 | 23.00    0.99
               4.50    1.26 | 10.75    4.89 | 17.00    1.78 | 23.25    0.98
               4.75    1.30 | 11.00    5.71 | 17.25    1.72 | 23.50    0.97
               5.00    1.34 | 11.25    7.22 | 17.50    1.67 | 23.75    0.95
               5.25    1.39 | 11.50    9.18 | 17.75    1.62 | 24.00    0.94
               5.50    1.43 | 11.75   37.44 | 18.00    1.56 |
               5.75    1.47 | 12.00   92.40 | 18.25    1.51 |
               6.00    1.52 | 12.25   14.64 | 18.50    1.46 |

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

--------------------
| CALIB            |
| STANDHYD (  0004)|   Area    (ha)=   0.71
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  50.00
--------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.35          0.35
     Dep. Storage     (mm)=       1.00          5.00
     Average Slope     (%)=       1.00          2.00
     Length            (m)=      68.80         40.00
     Mannings n             =     0.013         0.250

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

                          ---- TRANSFORMED HYETOGRAPH ----
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
              0.083    0.00 | 6.167    1.52 |12.250   92.40 | 18.33    1.51
              0.167    0.00 | 6.250    1.52 |12.333   14.65 | 18.42    1.51
              0.250    0.00 | 6.333    1.56 |12.417   14.64 | 18.50    1.51
              0.333    0.87 | 6.417    1.56 |12.500   14.64 | 18.58    1.46
              0.417    0.87 | 6.500    1.56 |12.583    9.96 | 18.67    1.46
              0.500    0.87 | 6.583    1.60 |12.667    9.96 | 18.75    1.46
              0.583    0.89 | 6.667    1.60 |12.750    9.96 | 18.83    1.40
              0.667    0.89 | 6.750    1.60 |12.833    6.85 | 18.92    1.40
              0.750    0.89 | 6.833    1.65 |12.917    6.85 | 19.00    1.40
              0.833    0.91 | 6.917    1.65 |13.000    6.85 | 19.08    1.35
              0.917    0.91 | 7.000    1.65 |13.083    5.79 | 19.17    1.35
              1.000    0.91 | 7.083    1.69 |13.167    5.79 | 19.25    1.35
```

1.083	0.93	7.167	1.69	13.250	5.79	19.33	1.30
1.167	0.93	7.250	1.69	13.333	4.90	19.42	1.30
1.250	0.93	7.333	1.73	13.417	4.90	19.50	1.30
1.333	0.95	7.417	1.73	13.500	4.90	19.58	1.25
1.417	0.95	7.500	1.73	13.583	4.33	19.67	1.25
1.500	0.95	7.583	1.77	13.667	4.33	19.75	1.25
1.583	0.97	7.667	1.77	13.750	4.33	19.83	1.19
1.667	0.97	7.750	1.77	13.833	3.79	19.92	1.19
1.750	0.97	7.833	1.82	13.917	3.79	20.00	1.19
1.833	0.99	7.917	1.82	14.000	3.79	20.08	1.14
1.917	0.99	8.000	1.82	14.083	3.38	20.17	1.14
2.000	0.99	8.083	1.86	14.167	3.38	20.25	1.14
2.083	1.01	8.167	1.86	14.250	3.38	20.33	1.11
2.167	1.01	8.250	1.86	14.333	3.08	20.42	1.11
2.250	1.01	8.333	1.99	14.417	3.08	20.50	1.11
2.333	1.04	8.417	1.99	14.500	3.08	20.58	1.10
2.417	1.04	8.500	1.99	14.583	2.94	20.67	1.10
2.500	1.04	8.583	2.20	14.667	2.94	20.75	1.10
2.583	1.06	8.667	2.20	14.750	2.94	20.83	1.08
2.667	1.06	8.750	2.20	14.833	2.78	20.92	1.08
2.750	1.06	8.833	2.42	14.917	2.78	21.00	1.08
2.833	1.08	8.917	2.42	15.000	2.78	21.08	1.07
2.917	1.08	9.000	2.42	15.083	2.64	21.17	1.07
3.000	1.08	9.083	2.62	15.167	2.64	21.25	1.07
3.083	1.10	9.167	2.62	15.250	2.64	21.33	1.06
3.167	1.10	9.250	2.62	15.333	2.49	21.42	1.06
3.250	1.10	9.333	2.73	15.417	2.49	21.50	1.06
3.333	1.12	9.417	2.73	15.500	2.49	21.58	1.05
3.417	1.12	9.500	2.73	15.583	2.34	21.67	1.05
3.500	1.12	9.583	2.73	15.667	2.34	21.75	1.05
3.583	1.14	9.667	2.73	15.750	2.34	21.83	1.04
3.667	1.14	9.750	2.73	15.833	2.19	21.92	1.04
3.750	1.14	9.833	2.91	15.917	2.19	22.00	1.04
3.833	1.16	9.917	2.91	16.000	2.19	22.08	1.03
3.917	1.16	10.000	2.91	16.083	2.04	22.17	1.03
4.000	1.16	10.083	3.24	16.167	2.04	22.25	1.03
4.083	1.18	10.167	3.24	16.250	2.04	22.33	1.02
4.167	1.18	10.250	3.24	16.333	1.94	22.42	1.02
4.250	1.18	10.333	3.68	16.417	1.94	22.50	1.02
4.333	1.22	10.417	3.68	16.500	1.94	22.58	1.01
4.417	1.22	10.500	3.68	16.583	1.89	22.67	1.01
4.500	1.22	10.583	4.18	16.667	1.89	22.75	1.01
4.583	1.26	10.667	4.18	16.750	1.89	22.83	1.00
4.667	1.26	10.750	4.18	16.833	1.83	22.92	1.00
4.750	1.26	10.833	4.89	16.917	1.83	23.00	1.00
4.833	1.30	10.917	4.89	17.000	1.83	23.08	0.99
4.917	1.30	11.000	4.89	17.083	1.78	23.17	0.99
5.000	1.30	11.083	5.71	17.167	1.78	23.25	0.99
5.083	1.34	11.167	5.71	17.250	1.78	23.33	0.98
5.167	1.34	11.250	5.71	17.333	1.72	23.42	0.98
5.250	1.34	11.333	7.22	17.417	1.72	23.50	0.98
5.333	1.39	11.417	7.22	17.500	1.72	23.58	0.97
5.417	1.39	11.500	7.22	17.583	1.67	23.67	0.97
5.500	1.39	11.583	9.18	17.667	1.67	23.75	0.97
5.583	1.43	11.667	9.18	17.750	1.67	23.83	0.95
5.667	1.43	11.750	9.18	17.833	1.62	23.92	0.95
5.750	1.43	11.833	37.44	17.917	1.62	24.00	0.95
5.833	1.47	11.917	37.44	18.000	1.62	24.08	0.94
5.917	1.47	12.000	37.44	18.083	1.56	24.17	0.94
6.000	1.47	12.083	92.39	18.167	1.56	24.25	0.94
6.083	1.52	12.167	92.40	18.250	1.56		

Max.Eff.Inten.(mm/hr)=		92.40	44.11	
over (min)		5.00	15.00	
Storage Coeff. (min)=		2.11 (ii)	11.90 (ii)	
Unit Hyd. Tpeak (min)=		5.00	15.00	
Unit Hyd. peak (cms)=		0.31	0.09	
				TOTALS
PEAK FLOW	(cms)=	0.09	0.03	0.116 (iii)
TIME TO PEAK	(hrs)=	12.25	12.33	12.25
RUNOFF VOLUME	(mm)=	84.42	33.25	58.82
TOTAL RAINFALL	(mm)=	85.42	85.42	85.42
RUNOFF COEFFICIENT	=	0.99	0.39	0.69

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. 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 (0005)	Area (ha)= 2.00
ID= 1 DT= 5.0 min	Total Imp(%)= 80.00 Dir. Conn.(%)= 80.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.60	0.40
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	115.47	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN

hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	1.52	12.250	92.40	18.33	1.51
0.167	0.00	6.250	1.52	12.333	14.65	18.42	1.51
0.250	0.00	6.333	1.56	12.417	14.64	18.50	1.51
0.333	0.87	6.417	1.56	12.500	14.64	18.58	1.46
0.417	0.87	6.500	1.56	12.583	9.96	18.67	1.46
0.500	0.87	6.583	1.60	12.667	9.96	18.75	1.46
0.583	0.89	6.667	1.60	12.750	9.96	18.83	1.40
0.667	0.89	6.750	1.60	12.833	6.85	18.92	1.40
0.750	0.89	6.833	1.65	12.917	6.85	19.00	1.40
0.833	0.91	6.917	1.65	13.000	6.85	19.08	1.35
0.917	0.91	7.000	1.65	13.083	5.79	19.17	1.35
1.000	0.91	7.083	1.69	13.167	5.79	19.25	1.35
1.083	0.93	7.167	1.69	13.250	5.79	19.33	1.30
1.167	0.93	7.250	1.69	13.333	4.90	19.42	1.30
1.250	0.93	7.333	1.73	13.417	4.90	19.50	1.30
1.333	0.95	7.417	1.73	13.500	4.90	19.58	1.25
1.417	0.95	7.500	1.73	13.583	4.33	19.67	1.25
1.500	0.95	7.583	1.77	13.667	4.33	19.75	1.25
1.583	0.97	7.667	1.77	13.750	4.33	19.83	1.19
1.667	0.97	7.750	1.77	13.833	3.79	19.92	1.19
1.750	0.97	7.833	1.82	13.917	3.79	20.00	1.19
1.833	0.99	7.917	1.82	14.000	3.79	20.08	1.14
1.917	0.99	8.000	1.82	14.083	3.38	20.17	1.14
2.000	0.99	8.083	1.86	14.167	3.38	20.25	1.14
2.083	1.01	8.167	1.86	14.250	3.38	20.33	1.11
2.167	1.01	8.250	1.86	14.333	3.08	20.42	1.11
2.250	1.01	8.333	1.99	14.417	3.08	20.50	1.11
2.333	1.04	8.417	1.99	14.500	3.08	20.58	1.10
2.417	1.04	8.500	1.99	14.583	2.94	20.67	1.10
2.500	1.04	8.583	2.20	14.667	2.94	20.75	1.10
2.583	1.06	8.667	2.20	14.750	2.94	20.83	1.08
2.667	1.06	8.750	2.20	14.833	2.78	20.92	1.08
2.750	1.06	8.833	2.42	14.917	2.78	21.00	1.08
2.833	1.08	8.917	2.42	15.000	2.78	21.08	1.07
2.917	1.08	9.000	2.42	15.083	2.64	21.17	1.07
3.000	1.08	9.083	2.62	15.167	2.64	21.25	1.07
3.083	1.10	9.167	2.62	15.250	2.64	21.33	1.06
3.167	1.10	9.250	2.62	15.333	2.49	21.42	1.06
3.250	1.10	9.333	2.73	15.417	2.49	21.50	1.06
3.333	1.12	9.417	2.73	15.500	2.49	21.58	1.05
3.417	1.12	9.500	2.73	15.583	2.34	21.67	1.05
3.500	1.12	9.583	2.73	15.667	2.34	21.75	1.05
3.583	1.14	9.667	2.73	15.750	2.34	21.83	1.04
3.667	1.14	9.750	2.73	15.833	2.19	21.92	1.04
3.750	1.14	9.833	2.91	15.917	2.19	22.00	1.04
3.833	1.16	9.917	2.91	16.000	2.19	22.08	1.03
3.917	1.16	10.000	2.91	16.083	2.04	22.17	1.03
4.000	1.16	10.083	3.24	16.167	2.04	22.25	1.03
4.083	1.18	10.167	3.24	16.250	2.04	22.33	1.02
4.167	1.18	10.250	3.24	16.333	1.94	22.42	1.02
4.250	1.18	10.333	3.68	16.417	1.94	22.50	1.02
4.333	1.22	10.417	3.68	16.500	1.94	22.58	1.01
4.417	1.22	10.500	3.68	16.583	1.89	22.67	1.01
4.500	1.22	10.583	4.18	16.667	1.89	22.75	1.01
4.583	1.26	10.667	4.18	16.750	1.89	22.83	1.00
4.667	1.26	10.750	4.18	16.833	1.83	22.92	1.00
4.750	1.26	10.833	4.89	16.917	1.83	23.00	1.00
4.833	1.30	10.917	4.89	17.000	1.83	23.08	0.99
4.917	1.30	11.000	4.89	17.083	1.78	23.17	0.99
5.000	1.30	11.083	5.71	17.167	1.78	23.25	0.99
5.083	1.34	11.167	5.71	17.250	1.78	23.33	0.98
5.167	1.34	11.250	5.71	17.333	1.72	23.42	0.98
5.250	1.34	11.333	7.22	17.417	1.72	23.50	0.98
5.333	1.39	11.417	7.22	17.500	1.72	23.58	0.97
5.417	1.39	11.500	7.22	17.583	1.67	23.67	0.97
5.500	1.39	11.583	9.18	17.667	1.67	23.75	0.97
5.583	1.43	11.667	9.18	17.750	1.67	23.83	0.95
5.667	1.43	11.750	9.18	17.833	1.62	23.92	0.95
5.750	1.43	11.833	37.44	17.917	1.62	24.00	0.95
5.833	1.47	11.917	37.44	18.000	1.62	24.08	0.94
5.917	1.47	12.000	37.44	18.083	1.56	24.17	0.94
6.000	1.47	12.083	92.39	18.167	1.56	24.25	0.94
6.083	1.52	12.167	92.40	18.250	1.56		

Max.Eff.Inten.(mm/hr)=	92.40	44.11	
over (min)	5.00	10.00	
Storage Coeff. (min)=	2.87 (ii)	7.06 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.28	0.14	
			TOTALS
PEAK FLOW (cms)=	0.41	0.04	0.449 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	84.42	33.25	74.18
TOTAL RAINFALL (mm)=	85.42	85.42	85.42
RUNOFF COEFFICIENT =	0.99	0.39	0.87

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0003)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.

```
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0004):     0.71   0.116    12.25    58.82
      + ID2= 2 (  0005):     2.00   0.449    12.25    74.18
        ================================================
        ID = 3 (  0003):     2.71   0.565    12.25    70.16

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0006)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           0.0000      0.0000   |    0.0630      0.1060
                           0.0000      0.0110   |    0.0840      0.1190
                           0.0050      0.0210   |    0.1060      0.1320
                           0.0070      0.0330   |    0.1310      0.1460
                           0.0090      0.0440   |    0.1570      0.1600
                           0.0100      0.0560   |    0.1850      0.1740
                           0.0170      0.0680   |    0.2140      0.1890
                           0.0300      0.0800   |    0.2440      0.2050
                           0.0450      0.0930   |    0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0003)      2.710      0.565     12.25      70.16
   OUTFLOW: ID= 1 (  0006)      2.710      0.070     12.75      65.91

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 12.45
                  TIME SHIFT OF PEAK FLOW         (min)= 30.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1105

--------------------------------------------------------------------------------
**********************************************
** SIMULATION:L. 100yr 24hr 15min SCS Type II **
**********************************************

--------------------
|    READ STORM    |    Filename: C:\Users\amysliwiec\AppD
|                  |              ata\Local\Temp\
|                  |              1915adf3-1193-4333-b5c4-9f3f2a29696d\c459837c
| Ptotal= 92.89 mm |    Comments: 100yr 24hr 15min SCS Type II
--------------------
                TIME     RAIN |  TIME     RAIN |'  TIME     RAIN |  TIME     RAIN
                 hrs    mm/hr |   hrs    mm/hr |'   hrs    mm/hr |   hrs    mm/hr
               0.00     0.00 |  6.25     1.70 | 12.50    10.83 | 18.75     1.53
               0.25     0.94 |  6.50     1.74 | 12.75     7.45 | 19.00     1.47
               0.50     0.96 |  6.75     1.79 | 13.00     6.29 | 19.25     1.41
               0.75     0.99 |  7.00     1.83 | 13.25     5.33 | 19.50     1.35
               1.00     1.01 |  7.25     1.88 | 13.50     4.70 | 19.75     1.29
               1.25     1.03 |  7.50     1.93 | 13.75     4.12 | 20.00     1.24
               1.50     1.06 |  7.75     1.97 | 14.00     3.68 | 20.25     1.20
               1.75     1.08 |  8.00     2.02 | 14.25     3.35 | 20.50     1.19
               2.00     1.10 |  8.25     2.16 | 14.50     3.20 | 20.75     1.18
               2.25     1.13 |  8.50     2.39 | 14.75     3.03 | 21.00     1.17
               2.50     1.15 |  8.75     2.63 | 15.00     2.87 | 21.25     1.16
               2.75     1.17 |  9.00     2.85 | 15.25     2.70 | 21.50     1.14
               3.00     1.19 |  9.25     2.97 | 15.50     2.55 | 21.75     1.13
               3.25     1.22 |  9.50     2.97 | 15.75     2.38 | 22.00     1.12
               3.50     1.24 |  9.75     3.17 | 16.00     2.22 | 22.25     1.11
               3.75     1.27 | 10.00     3.52 | 16.25     2.11 | 22.50     1.10
               4.00     1.29 | 10.25     4.01 | 16.50     2.05 | 22.75     1.08
               4.25     1.32 | 10.50     4.54 | 16.75     1.99 | 23.00     1.07
               4.50     1.37 | 10.75     5.31 | 17.00     1.93 | 23.25     1.06
               4.75     1.42 | 11.00     6.21 | 17.25     1.87 | 23.50     1.05
               5.00     1.46 | 11.25     7.85 | 17.50     1.82 | 23.75     1.04
               5.25     1.51 | 11.50     9.99 | 17.75     1.76 | 24.00     1.03
               5.50     1.55 | 11.75    40.71 | 18.00     1.70 |
               5.75     1.60 | 12.00   100.48 | 18.25     1.64 |
               6.00     1.65 | 12.25    15.92 | 18.50     1.59 |

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

--------------------
| CALIB            |
| STANDHYD (  0004)|   Area    (ha)=   0.71
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  50.00
--------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.35          0.35
     Dep. Storage     (mm)=       1.00          5.00
     Average Slope     (%)=       1.00          2.00
     Length            (m)=      68.80         40.00
     Mannings n           =      0.013         0.250

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


                              ---- TRANSFORMED HYETOGRAPH ----
                TIME     RAIN |  TIME     RAIN |'  TIME     RAIN |  TIME     RAIN
                 hrs    mm/hr |   hrs    mm/hr |'   hrs    mm/hr |   hrs    mm/hr
               0.083     0.00 | 6.167     1.65 |12.250   100.48 | 18.33     1.64
               0.167     0.00 | 6.250     1.65 |12.333    15.93 | 18.42     1.64
               0.250     0.00 | 6.333     1.70 |12.417    15.92 | 18.50     1.64
               0.333     0.94 | 6.417     1.70 |12.500    15.92 | 18.58     1.59
               0.417     0.94 | 6.500     1.70 |12.583    10.84 | 18.67     1.59
               0.500     0.94 | 6.583     1.74 |12.667    10.83 | 18.75     1.59
               0.583     0.96 | 6.667     1.74 |12.750    10.83 | 18.83     1.53
               0.667     0.96 | 6.750     1.74 |12.833     7.45 | 18.92     1.53
               0.750     0.96 | 6.833     1.79 |12.917     7.45 | 19.00     1.53
```

0.833	0.99	6.917	1.79	13.000	7.45	19.08	1.47
0.917	0.99	7.000	1.79	13.083	6.29	19.17	1.47
1.000	0.99	7.083	1.83	13.167	6.29	19.25	1.47
1.083	1.01	7.167	1.83	13.250	6.29	19.33	1.41
1.167	1.01	7.250	1.83	13.333	5.33	19.42	1.41
1.250	1.01	7.333	1.88	13.417	5.33	19.50	1.41
1.333	1.03	7.417	1.88	13.500	5.33	19.58	1.35
1.417	1.03	7.500	1.88	13.583	4.70	19.67	1.35
1.500	1.03	7.583	1.93	13.667	4.70	19.75	1.35
1.583	1.06	7.667	1.93	13.750	4.70	19.83	1.29
1.667	1.06	7.750	1.93	13.833	4.12	19.92	1.29
1.750	1.06	7.833	1.97	13.917	4.12	20.00	1.29
1.833	1.08	7.917	1.97	14.000	4.12	20.08	1.24
1.917	1.08	8.000	1.97	14.083	3.68	20.17	1.24
2.000	1.08	8.083	2.02	14.167	3.68	20.25	1.24
2.083	1.10	8.167	2.02	14.250	3.68	20.33	1.20
2.167	1.10	8.250	2.02	14.333	3.35	20.42	1.20
2.250	1.10	8.333	2.16	14.417	3.35	20.50	1.20
2.333	1.13	8.417	2.16	14.500	3.35	20.58	1.19
2.417	1.13	8.500	2.16	14.583	3.20	20.67	1.19
2.500	1.13	8.583	2.39	14.667	3.20	20.75	1.19
2.583	1.15	8.667	2.39	14.750	3.20	20.83	1.18
2.667	1.15	8.750	2.39	14.833	3.03	20.92	1.18
2.750	1.15	8.833	2.63	14.917	3.03	21.00	1.18
2.833	1.17	8.917	2.63	15.000	3.03	21.08	1.17
2.917	1.17	9.000	2.63	15.083	2.87	21.17	1.17
3.000	1.17	9.083	2.85	15.167	2.87	21.25	1.17
3.083	1.19	9.167	2.85	15.250	2.87	21.33	1.16
3.167	1.19	9.250	2.85	15.333	2.70	21.42	1.16
3.250	1.19	9.333	2.97	15.417	2.70	21.50	1.16
3.333	1.22	9.417	2.97	15.500	2.70	21.58	1.14
3.417	1.22	9.500	2.97	15.583	2.55	21.67	1.14
3.500	1.22	9.583	2.97	15.667	2.55	21.75	1.14
3.583	1.24	9.667	2.97	15.750	2.55	21.83	1.13
3.667	1.24	9.750	2.97	15.833	2.38	21.92	1.13
3.750	1.24	9.833	3.17	15.917	2.38	22.00	1.13
3.833	1.27	9.917	3.17	16.000	2.38	22.08	1.12
3.917	1.27	10.000	3.17	16.083	2.22	22.17	1.12
4.000	1.27	10.083	3.52	16.167	2.22	22.25	1.12
4.083	1.29	10.167	3.52	16.250	2.22	22.33	1.11
4.167	1.29	10.250	3.52	16.333	2.11	22.42	1.11
4.250	1.29	10.333	4.01	16.417	2.11	22.50	1.11
4.333	1.32	10.417	4.01	16.500	2.11	22.58	1.10
4.417	1.32	10.500	4.01	16.583	2.05	22.67	1.10
4.500	1.32	10.583	4.54	16.667	2.05	22.75	1.10
4.583	1.37	10.667	4.54	16.750	2.05	22.83	1.08
4.667	1.37	10.750	4.54	16.833	1.99	22.92	1.08
4.750	1.37	10.833	5.31	16.917	1.99	23.00	1.08
4.833	1.42	10.917	5.31	17.000	1.99	23.08	1.07
4.917	1.42	11.000	5.31	17.083	1.93	23.17	1.07
5.000	1.42	11.083	6.20	17.167	1.93	23.25	1.07
5.083	1.46	11.167	6.21	17.250	1.93	23.33	1.06
5.167	1.46	11.250	6.21	17.333	1.87	23.42	1.06
5.250	1.46	11.333	7.85	17.417	1.87	23.50	1.06
5.333	1.51	11.417	7.85	17.500	1.87	23.58	1.05
5.417	1.51	11.500	7.85	17.583	1.82	23.67	1.05
5.500	1.51	11.583	9.99	17.667	1.82	23.75	1.05
5.583	1.55	11.667	9.99	17.750	1.82	23.83	1.04
5.667	1.55	11.750	9.99	17.833	1.76	23.92	1.04
5.750	1.55	11.833	40.71	17.917	1.76	24.00	1.04
5.833	1.60	11.917	40.71	18.000	1.76	24.08	1.03
5.917	1.60	12.000	40.71	18.083	1.70	24.17	1.03
6.000	1.60	12.083	100.47	18.167	1.70	24.25	1.03
6.083	1.65	12.167	100.48	18.250	1.70		

Max.Eff.Inten.(mm/hr)=	100.48	50.69	
over (min)	5.00	15.00	
Storage Coeff. (min)=	2.04 (ii)	11.30 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.31	0.09	
			TOTALS
PEAK FLOW (cms)=	0.10	0.03	0.128 (iii)
TIME TO PEAK (hrs)=	12.25	12.33	12.25
RUNOFF VOLUME (mm)=	91.89	38.24	65.05
TOTAL RAINFALL (mm)=	92.89	92.89	92.89
RUNOFF COEFFICIENT =	0.99	0.41	0.70

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. 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 (0005) | Area (ha)= 2.00
ID= 1 DT= 5.0 min | Total Imp(%)= 80.00 Dir. Conn.(%)= 80.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.60	0.40
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	115.47	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.65	12.250	100.48	18.33	1.64
0.167	0.00	6.250	1.65	12.333	15.93	18.42	1.64
0.250	0.00	6.333	1.70	12.417	15.92	18.50	1.64
0.333	0.94	6.417	1.70	12.500	15.92	18.58	1.59
0.417	0.94	6.500	1.70	12.583	10.84	18.67	1.59
0.500	0.94	6.583	1.74	12.667	10.83	18.75	1.59
0.583	0.96	6.667	1.74	12.750	10.83	18.83	1.53
0.667	0.96	6.750	1.74	12.833	7.45	18.92	1.53
0.750	0.96	6.833	1.79	12.917	7.45	19.00	1.53
0.833	0.99	6.917	1.79	13.000	7.45	19.08	1.47
0.917	0.99	7.000	1.79	13.083	6.29	19.17	1.47
1.000	0.99	7.083	1.83	13.167	6.29	19.25	1.47
1.083	1.01	7.167	1.83	13.250	6.29	19.33	1.41
1.167	1.01	7.250	1.83	13.333	5.33	19.42	1.41
1.250	1.01	7.333	1.88	13.417	5.33	19.50	1.41
1.333	1.03	7.417	1.88	13.500	5.33	19.58	1.35
1.417	1.03	7.500	1.88	13.583	4.70	19.67	1.35
1.500	1.03	7.583	1.93	13.667	4.70	19.75	1.35
1.583	1.06	7.667	1.93	13.750	4.70	19.83	1.29
1.667	1.06	7.750	1.93	13.833	4.12	19.92	1.29
1.750	1.06	7.833	1.97	13.917	4.12	20.00	1.29
1.833	1.08	7.917	1.97	14.000	4.12	20.08	1.24
1.917	1.08	8.000	1.97	14.083	3.68	20.17	1.24
2.000	1.08	8.083	2.02	14.167	3.68	20.25	1.24
2.083	1.10	8.167	2.02	14.250	3.68	20.33	1.20
2.167	1.10	8.250	2.02	14.333	3.35	20.42	1.20
2.250	1.10	8.333	2.16	14.417	3.35	20.50	1.20
2.333	1.13	8.417	2.16	14.500	3.35	20.58	1.19
2.417	1.13	8.500	2.16	14.583	3.20	20.67	1.19
2.500	1.13	8.583	2.39	14.667	3.20	20.75	1.19
2.583	1.15	8.667	2.39	14.750	3.20	20.83	1.18
2.667	1.15	8.750	2.39	14.833	3.03	20.92	1.18
2.750	1.15	8.833	2.63	14.917	3.03	21.00	1.18
2.833	1.17	8.917	2.63	15.000	3.03	21.08	1.17
2.917	1.17	9.000	2.63	15.083	2.87	21.17	1.17
3.000	1.17	9.083	2.85	15.167	2.87	21.25	1.17
3.083	1.19	9.167	2.85	15.250	2.87	21.33	1.16
3.167	1.19	9.250	2.85	15.333	2.70	21.42	1.16
3.250	1.19	9.333	2.97	15.417	2.70	21.50	1.16
3.333	1.22	9.417	2.97	15.500	2.70	21.58	1.14
3.417	1.22	9.500	2.97	15.583	2.55	21.67	1.14
3.500	1.22	9.583	2.97	15.667	2.55	21.75	1.14
3.583	1.24	9.667	2.97	15.750	2.55	21.83	1.13
3.667	1.24	9.750	2.97	15.833	2.38	21.92	1.13
3.750	1.24	9.833	3.17	15.917	2.38	22.00	1.13
3.833	1.27	9.917	3.17	16.000	2.38	22.08	1.12
3.917	1.27	10.000	3.17	16.083	2.22	22.17	1.12
4.000	1.27	10.083	3.52	16.167	2.22	22.25	1.12
4.083	1.29	10.167	3.52	16.250	2.22	22.33	1.11
4.167	1.29	10.250	3.52	16.333	2.11	22.42	1.11
4.250	1.29	10.333	4.01	16.417	2.11	22.50	1.11
4.333	1.32	10.417	4.01	16.500	2.11	22.58	1.10
4.417	1.32	10.500	4.01	16.583	2.05	22.67	1.10
4.500	1.32	10.583	4.54	16.667	2.05	22.75	1.10
4.583	1.37	10.667	4.54	16.750	2.05	22.83	1.08
4.667	1.37	10.750	4.54	16.833	1.99	22.92	1.08
4.750	1.37	10.833	5.31	16.917	1.99	23.00	1.08
4.833	1.42	10.917	5.31	17.000	1.99	23.08	1.07
4.917	1.42	11.000	5.31	17.083	1.93	23.17	1.07
5.000	1.42	11.083	6.20	17.167	1.93	23.25	1.07
5.083	1.46	11.167	6.21	17.250	1.93	23.33	1.06
5.167	1.46	11.250	6.21	17.333	1.87	23.42	1.06
5.250	1.46	11.333	7.85	17.417	1.87	23.50	1.06
5.333	1.51	11.417	7.85	17.500	1.87	23.58	1.05
5.417	1.51	11.500	7.85	17.583	1.82	23.67	1.05
5.500	1.51	11.583	9.99	17.667	1.82	23.75	1.05
5.583	1.55	11.667	9.99	17.750	1.82	23.83	1.04
5.667	1.55	11.750	9.99	17.833	1.76	23.92	1.04
5.750	1.55	11.833	40.71	17.917	1.76	24.00	1.04
5.833	1.60	11.917	40.71	18.000	1.76	24.08	1.03
5.917	1.60	12.000	40.71	18.083	1.70	24.17	1.03
6.000	1.60	12.083	100.47	18.167	1.70	24.25	1.03
6.083	1.65	12.167	100.48	18.250	1.70		

			TOTALS
Max.Eff.Inten.(mm/hr)=	100.48	50.69	
over (min)	5.00	10.00	
Storage Coeff. (min)=	2.78 (ii)	6.83 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.28	0.14	
PEAK FLOW (cms)=	0.45	0.05	0.492 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	91.89	38.24	81.16
TOTAL RAINFALL (mm)=	92.89	92.89	92.89
RUNOFF COEFFICIENT =	0.99	0.41	0.87

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
--------------------
| ADD HYD  (  0003)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0004):     0.71   0.128    12.25    65.05
     + ID2= 2 (  0005):     2.00   0.492    12.25    81.16
       ================================================
       ID = 3 (  0003):     2.71   0.620    12.25    76.94

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0006)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.0630      0.1060
                          0.0000      0.0110   |    0.0840      0.1190
                          0.0050      0.0210   |    0.1060      0.1320
                          0.0070      0.0330   |    0.1310      0.1460
                          0.0090      0.0440   |    0.1570      0.1600
                          0.0100      0.0560   |    0.1850      0.1740
                          0.0170      0.0680   |    0.2140      0.1890
                          0.0300      0.0800   |    0.2440      0.2050
                          0.0450      0.0930   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0003)     2.710      0.620     12.25      76.94
   OUTFLOW: ID= 1 (  0006)     2.710      0.084     12.67      72.69

                 PEAK   FLOW   REDUCTION [Qout/Qin](%)= 13.63
                 TIME SHIFT OF PEAK FLOW         (min)= 25.00
                 MAXIMUM  STORAGE   USED       (ha.m.)=  0.1193

--------------------------------------------------------------------------------
*******************************
** SIMULATION:tim             **
*******************************

--------------------
|    READ STORM    |    Filename: C:\Users\amysliwiec\AppD
|                  |              ata\Local\Temp\
|                  |              1915adf3-1193-4333-b5c4-9f3f2a29696d\e6319d3a
| Ptotal=193.00 mm |    Comments: tim
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00   15.00 |  3.00    3.00 |  6.00   43.00 |  9.00   13.00
                1.00   20.00 |  4.00    5.00 |  7.00   20.00 | 10.00   13.00
                2.00   10.00 |  5.00   20.00 |  8.00   23.00 | 11.00    8.00

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

--------------------
| CALIB            |
| STANDHYD (  0004)|   Area    (ha)=   0.71
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  50.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.35         0.35
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      68.80        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   15.00 | 3.083    3.00 | 6.083   43.00 |  9.08   13.00
              0.167   15.00 | 3.167    3.00 | 6.167   43.00 |  9.17   13.00
              0.250   15.00 | 3.250    3.00 | 6.250   43.00 |  9.25   13.00
              0.333   15.00 | 3.333    3.00 | 6.333   43.00 |  9.33   13.00
              0.417   15.00 | 3.417    3.00 | 6.417   43.00 |  9.42   13.00
              0.500   15.00 | 3.500    3.00 | 6.500   43.00 |  9.50   13.00
              0.583   15.00 | 3.583    3.00 | 6.583   43.00 |  9.58   13.00
              0.667   15.00 | 3.667    3.00 | 6.667   43.00 |  9.67   13.00
              0.750   15.00 | 3.750    3.00 | 6.750   43.00 |  9.75   13.00
              0.833   15.00 | 3.833    3.00 | 6.833   43.00 |  9.83   13.00
              0.917   15.00 | 3.917    3.00 | 6.917   43.00 |  9.92   13.00
              1.000   15.00 | 4.000    3.00 | 7.000   43.00 | 10.00   13.00
              1.083   20.00 | 4.083    5.00 | 7.083   20.00 | 10.08   13.00
              1.167   20.00 | 4.167    5.00 | 7.167   20.00 | 10.17   13.00
              1.250   20.00 | 4.250    5.00 | 7.250   20.00 | 10.25   13.00
              1.333   20.00 | 4.333    5.00 | 7.333   20.00 | 10.33   13.00
              1.417   20.00 | 4.417    5.00 | 7.417   20.00 | 10.42   13.00
              1.500   20.00 | 4.500    5.00 | 7.500   20.00 | 10.50   13.00
              1.583   20.00 | 4.583    5.00 | 7.583   20.00 | 10.58   13.00
              1.667   20.00 | 4.667    5.00 | 7.667   20.00 | 10.67   13.00
              1.750   20.00 | 4.750    5.00 | 7.750   20.00 | 10.75   13.00
              1.833   20.00 | 4.833    5.00 | 7.833   20.00 | 10.83   13.00
              1.917   20.00 | 4.917    5.00 | 7.917   20.00 | 10.92   13.00
              2.000   20.00 | 5.000    5.00 | 8.000   20.00 | 11.00   13.00
              2.083   10.00 | 5.083   20.00 | 8.083   23.00 | 11.08    8.00
              2.167   10.00 | 5.167   20.00 | 8.167   23.00 | 11.17    8.00
              2.250   10.00 | 5.250   20.00 | 8.250   23.00 | 11.25    8.00
              2.333   10.00 | 5.333   20.00 | 8.333   23.00 | 11.33    8.00
```

```
              2.417   10.00 | 5.417   20.00 | 8.417   23.00 | 11.42    8.00
              2.500   10.00 | 5.500   20.00 | 8.500   23.00 | 11.50    8.00
              2.583   10.00 | 5.583   20.00 | 8.583   23.00 | 11.58    8.00
              2.667   10.00 | 5.667   20.00 | 8.667   23.00 | 11.67    8.00
              2.750   10.00 | 5.750   20.00 | 8.750   23.00 | 11.75    8.00
              2.833   10.00 | 5.833   20.00 | 8.833   23.00 | 11.83    8.00
              2.917   10.00 | 5.917   20.00 | 8.917   23.00 | 11.92    8.00
              3.000   10.00 | 6.000   20.00 | 9.000   23.00 | 12.00    8.00

     Max.Eff.Inten.(mm/hr)=      43.00        31.40
               over (min)        5.00        15.00
     Storage Coeff.  (min)=      2.86 (ii)   14.08 (ii)
     Unit Hyd. Tpeak (min)=      5.00        15.00
     Unit Hyd. peak  (cms)=      0.28         0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.04         0.03          0.072 (iii)
     TIME TO PEAK    (hrs)=      6.67         7.00           7.00
     RUNOFF VOLUME    (mm)=    192.00       116.99         154.48
     TOTAL RAINFALL   (mm)=    193.00       193.00         193.00
     RUNOFF COEFFICIENT   =      0.99         0.61           0.80

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  69.0    Ia = Dep. 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 (  0005)|   Area    (ha)=   2.00
|ID= 1 DT= 5.0 min |   Total Imp(%)=  80.00   Dir. Conn.(%)=  80.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      1.60         0.40
     Dep. Storage     (mm)=      1.00         5.00
     Average Slope     (%)=      1.00         2.00
     Length            (m)=    115.47        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   15.00 | 3.083    3.00 | 6.083   43.00 |  9.08   13.00
              0.167   15.00 | 3.167    3.00 | 6.167   43.00 |  9.17   13.00
              0.250   15.00 | 3.250    3.00 | 6.250   43.00 |  9.25   13.00
              0.333   15.00 | 3.333    3.00 | 6.333   43.00 |  9.33   13.00
              0.417   15.00 | 3.417    3.00 | 6.417   43.00 |  9.42   13.00
              0.500   15.00 | 3.500    3.00 | 6.500   43.00 |  9.50   13.00
              0.583   15.00 | 3.583    3.00 | 6.583   43.00 |  9.58   13.00
              0.667   15.00 | 3.667    3.00 | 6.667   43.00 |  9.67   13.00
              0.750   15.00 | 3.750    3.00 | 6.750   43.00 |  9.75   13.00
              0.833   15.00 | 3.833    3.00 | 6.833   43.00 |  9.83   13.00
              0.917   15.00 | 3.917    3.00 | 6.917   43.00 |  9.92   13.00
              1.000   15.00 | 4.000    3.00 | 7.000   43.00 | 10.00   13.00
              1.083   20.00 | 4.083    5.00 | 7.083   20.00 | 10.08   13.00
              1.167   20.00 | 4.167    5.00 | 7.167   20.00 | 10.17   13.00
              1.250   20.00 | 4.250    5.00 | 7.250   20.00 | 10.25   13.00
              1.333   20.00 | 4.333    5.00 | 7.333   20.00 | 10.33   13.00
              1.417   20.00 | 4.417    5.00 | 7.417   20.00 | 10.42   13.00
              1.500   20.00 | 4.500    5.00 | 7.500   20.00 | 10.50   13.00
              1.583   20.00 | 4.583    5.00 | 7.583   20.00 | 10.58   13.00
              1.667   20.00 | 4.667    5.00 | 7.667   20.00 | 10.67   13.00
              1.750   20.00 | 4.750    5.00 | 7.750   20.00 | 10.75   13.00
              1.833   20.00 | 4.833    5.00 | 7.833   20.00 | 10.83   13.00
              1.917   20.00 | 4.917    5.00 | 7.917   20.00 | 10.92   13.00
              2.000   20.00 | 5.000    5.00 | 8.000   20.00 | 11.00   13.00
              2.083   10.00 | 5.083   20.00 | 8.083   23.00 | 11.08    8.00
              2.167   10.00 | 5.167   20.00 | 8.167   23.00 | 11.17    8.00
              2.250   10.00 | 5.250   20.00 | 8.250   23.00 | 11.25    8.00
              2.333   10.00 | 5.333   20.00 | 8.333   23.00 | 11.33    8.00
              2.417   10.00 | 5.417   20.00 | 8.417   23.00 | 11.42    8.00
              2.500   10.00 | 5.500   20.00 | 8.500   23.00 | 11.50    8.00
              2.583   10.00 | 5.583   20.00 | 8.583   23.00 | 11.58    8.00
              2.667   10.00 | 5.667   20.00 | 8.667   23.00 | 11.67    8.00
              2.750   10.00 | 5.750   20.00 | 8.750   23.00 | 11.75    8.00
              2.833   10.00 | 5.833   20.00 | 8.833   23.00 | 11.83    8.00
              2.917   10.00 | 5.917   20.00 | 8.917   23.00 | 11.92    8.00
              3.000   10.00 | 6.000   20.00 | 9.000   23.00 | 12.00    8.00

     Max.Eff.Inten.(mm/hr)=      43.00        31.40
               over (min)        5.00        20.00
     Storage Coeff.  (min)=      3.90 (ii)   15.12 (ii)
     Unit Hyd. Tpeak (min)=      5.00        20.00
     Unit Hyd. peak  (cms)=      0.25         0.07
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.19         0.03          0.224 (iii)
     TIME TO PEAK    (hrs)=      6.92         7.00           7.00
     RUNOFF VOLUME    (mm)=    192.00       116.99         176.99
     TOTAL RAINFALL   (mm)=    193.00       193.00         193.00
     RUNOFF COEFFICIENT   =      0.99         0.61           0.92

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
```

```
           CN*  =  69.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0003)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0004):     0.71   0.072     7.00   154.48
      + ID2= 2 (  0005):     2.00   0.224     7.00   176.99
        ================================================
        ID = 3 (  0003):     2.71   0.296     7.00   171.10

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0006)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.0630      0.1060
                          0.0000      0.0110   |    0.0840      0.1190
                          0.0050      0.0210   |    0.1060      0.1320
                          0.0070      0.0330   |    0.1310      0.1460
                          0.0090      0.0440   |    0.1570      0.1600
                          0.0100      0.0560   |    0.1850      0.1740
                          0.0170      0.0680   |    0.2140      0.1890
                          0.0300      0.0800   |    0.2440      0.2050
                          0.0450      0.0930   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0003)     2.710      0.296      7.00     171.10
   OUTFLOW: ID= 1 (  0006)     2.710      0.169      7.17     166.85

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 57.27
                  TIME SHIFT OF PEAK FLOW         (min)= 10.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1671

--------------------------------------------------------------------------------
```

APPENDIX D

Stormwater Management Facility Calculations

Project No:	2577-6904
Project:	555 Tenth Line
File:	Water Quality
Design by:	AM
Date:	24-Jun-25

Proposed Scenario Water Quality Requirements

Catchments Contributing	Area (ha)	% Imp	25 mm RV (mm)	25 mm RV (m^3)	
205	2.00	80%	20.87		
207	0.71	50%	14.27		
Total	**2.71**	**72%**	**19.14**	**519**	
MOE Total WQ Volume (m^3/ha)				178	Hybrid Wet Pond/Wetland
MOE ED Volume (m^3/ha)				40	
MOE ED Volume (m^3)				108	
MOE PP Volume (m^3/ha)				138	
MOE PP Volume (m^3)				374	
Pond Required PP Volume (m^3)				**374**	
Pond Required ED Volume (m^3)				519	
Pond Required 100 Year Volume (m^3)				1193	
Pond Required Regional Volume (m^3)				1671	
Provided PP Volume (m^3)				**1018**	
Provided ED Volume (m^3)				558	
Provided 100 Year Volume (m^3)				2047	
Provided Regional Volume (m^3)				2989	

CROZIER
CONSULTING ENGINEERS

Project:	2577-6904
Project No.:	555 Tenth Line
File:	Water Quality
Design by:	AM
Date:	24-Jun-25

EXTENDED DETENTION SPECIFICATIONS
(Per MECP)

Extended Detention Volume (Area x runoff from 25mm event)		519
t (drawdown time - seconds, *hours in italics*)	*24.0*	86400
Ao (cross section area of orifice - sqm)		0.0079
h (maximum water elevation above orifice for extended detention- m)		0.25
C (discharge coefficient)		0.64
Ap (average surface area for extended detention - sqm)		2234

t = 2*Ap*(h^0.5)/(C*Ao*(g*2)^0.5)

Ao = 0.00911911 sqm d = 108 mm

Extended Detention Orifice Diameter (as designed) d = **100** mm

ACTUAL DRAWDOWN TIME
*Neglecting tailwater conditions

Extended Detention Volume Used	558
d (orifice diameter, mm)	100
h (maximum head acting on orifice for extended detention, m)	0.25
Ao (cross section area of orifice, m^2)	0.0079
C (discharge coefficient)	0.64
Ap (average surface area for extended detention, m^2)	2234

t = 2*Ap*(h^0.5)/(C*Ao*(g*2)^0.5)

t (hours) 28

CROZIER CONSULTING ENGINEERS

Project:	2577-6904
Project No.:	555 Tenth Line
File:	Water Quality
Design by:	AM
Date:	24-Jun-25

STAGE STORAGE DISCHARGE

SWM Facility Storage - Outflow Calculations

Outlet Structure		
E.D. Orifice Diameter:	0.100	m
E.D. Orifice Invert Elevation:	183.90	m
V-notch angle	0	degrees
V-notch constant	0.00	const
Vnotch invert	0.00	m
Rect weir length	0.3	m
Rect weir invert	184.15	m
Extended Detention Depth:	0.25	m

Emergency Spill Elev.	184.70	m
Emerg Spill Bot. Width	1	m
Trap. Side Slopes	5 :1	H:V

	Pond Dimensions				Outlet Structure			Cell Spillway			
	Elev.	Depth Above PP	Area	Storage Volume	ED Orifice Discharge	V-notch Discharge	Rect. Weir Discharge	Emerg. Weir Ave. Width	Emerg. Weir Discharge	Total Discharge	Storage
	(m)	(m)	(sqm)	(cu.m)	(cu.m/s)	(cu.m/s)	(cu.m/s)	(m)	(cu.m/s)	(cu.m/s)	(ha-m)
PP	183.90	0.00	2086	0	0.0000	0.0000	0.000	0.00	0.00	0.000	0.000
	183.95	0.05	2145	106	0.0000	0.0000	0.000	0.00	0.00	0.000	0.011
	184.00	0.10	2204	215	0.0050	0.0000	0.000	0.00	0.00	0.005	0.021
	184.05	0.15	2263	326	0.0070	0.0000	0.000	0.00	0.00	0.007	0.033
	184.10	0.20	2322	441	0.0086	0.0000	0.000	0.00	0.00	0.009	0.044
ED	184.15	0.25	2381	558	0.0100	0.0000	0.000	0.00	0.00	0.010	0.056
	184.20	0.30	2437	678	0.0111	0.0000	0.006	0.00	0.00	0.017	0.068
	184.25	0.35	2494	802	0.0122	0.0000	0.017	0.00	0.00	0.030	0.080
	184.30	0.40	2550	928	0.0132	0.0000	0.032	0.00	0.00	0.045	0.093
	184.35	0.45	2607	1057	0.0141	0.0000	0.049	0.00	0.00	0.063	0.106
	184.40	0.50	2663	1188	0.0149	0.0000	0.069	0.00	0.00	0.084	0.119
	184.45	0.55	2720	1323	0.0157	0.0000	0.091	0.00	0.00	0.106	0.132
	184.50	0.60	2776	1460	0.0165	0.0000	0.114	0.00	0.00	0.131	0.146
	184.55	0.65	2832	1601	0.0172	0.0000	0.140	0.00	0.00	0.157	0.160
	184.60	0.70	2889	1744	0.0180	0.0000	0.167	0.00	0.00	0.185	0.174
	184.65	0.75	2945	1890	0.0186	0.0000	0.195	0.00	0.00	0.214	0.189
HWL	184.70	0.80	3002	2047	0.0193	0.0000	0.225	1.00	0.00	0.244	0.205

APPENDIX E

External Reports & Reference Material

C.C. Tatham & Associates Ltd.
Consulting Engineers

185 MOUNTAIN ROAD INDUSTRIAL DEVELOPMENT

Town of Collingwood

Stormwater Management Report

prepared by:

C.C. Tatham & Associates Ltd.
115 Sandford Fleming Drive, Suite 200
Collingwood, ON L9Y 5A6
Tel: (705) 444-2565 Fax: (705) 444-2327
info@cctatham.com

prepared for

Van Dolder's Home Team

August 29, 2016
Revised July 2018

CCTA File 116023

TABLE OF CONTENTS

1	Introduction	1
1.1	Site Description	1
1.2	Objectives	1
1.3	Background and Guidelines	1
1.4	Proposed Land Use	3
2	Existing Drainage Conditions	4
3	Stormwater Management Plan	7
3.1	Design Criteria	7
3.2	Proposed Drainage Conditions	7
3.3	Water Quantity Control	9
3.4	Water Quality Control	10
4	Siltation and Erosion Control	12
5	Conclusions	13

APPENDICES

Appendix A: Pre-Development Hydrology

Appendix B: Hydraulic Calculations

Appendix C: Stage-Storage-Discharge Calculations

Appendix D: Post Development Hydrology

Appendix E: Water Quality Calculations

LIST OF TABLES

Table 1: Pre-Development Hydrologic Analysis Results Summary 6

Table 2: Post Development Hydrologic Analysis Results Summary 10

LIST OF FIGURES

Figure 1: Site Location Plan 2

LIST OF DRAWINGS

Pre-Development Drainage Plan (Drawing DP-1)

Post Development Drainage Plan (Drawing DP-2)

Pond Layout and Details (Drawing PND-1)

Siltation and Erosion Control Plan (Drawing SC-1)

1 Introduction

C.C. Tatham & Associates Ltd. (CCTA) has been retained to prepare a Stormwater Management (SWM) Report and final design in support of an application for Draft Plan of Subdivision for the proposed 185 Mountain Road Industrial Development in the Town of Collingwood. Specifically, this report has been prepared to address internal and external servicing requirements related to the stormwater management associated with this development. A separate design brief (August 2016) was prepared by CCTA which detailed the SWM works required for site plan approval of the Van Dolder's site while maintaining compatibility with the overall SWM plan for the industrial development.

This report was originally prepared in support of a first engineering submission in August 2016. This revision addresses comments received from the Town, the NVCA and the MOECC.

1.1 Site Description

The subject property consists of approximately 8.04 ha of undeveloped land located on the north side of Mountain Road east of Tenth Line in the Town of Collingwood. The site is primarily wooded with an existing natural pond in the northwest corner and several wet areas along an existing trail along the east property line. The property is part of the Black Ash Creek Subwatershed as identified in the Nottawasaga Valley Conservation Authority (NVCA) Black Ash Creek Subwatershed Plan. The subject property is bounded by Mountain Road to the south, industrial development along the west and north property lines and vacant forested land to the east. Figure 1 provided overleaf illustrates the location of the subject property.

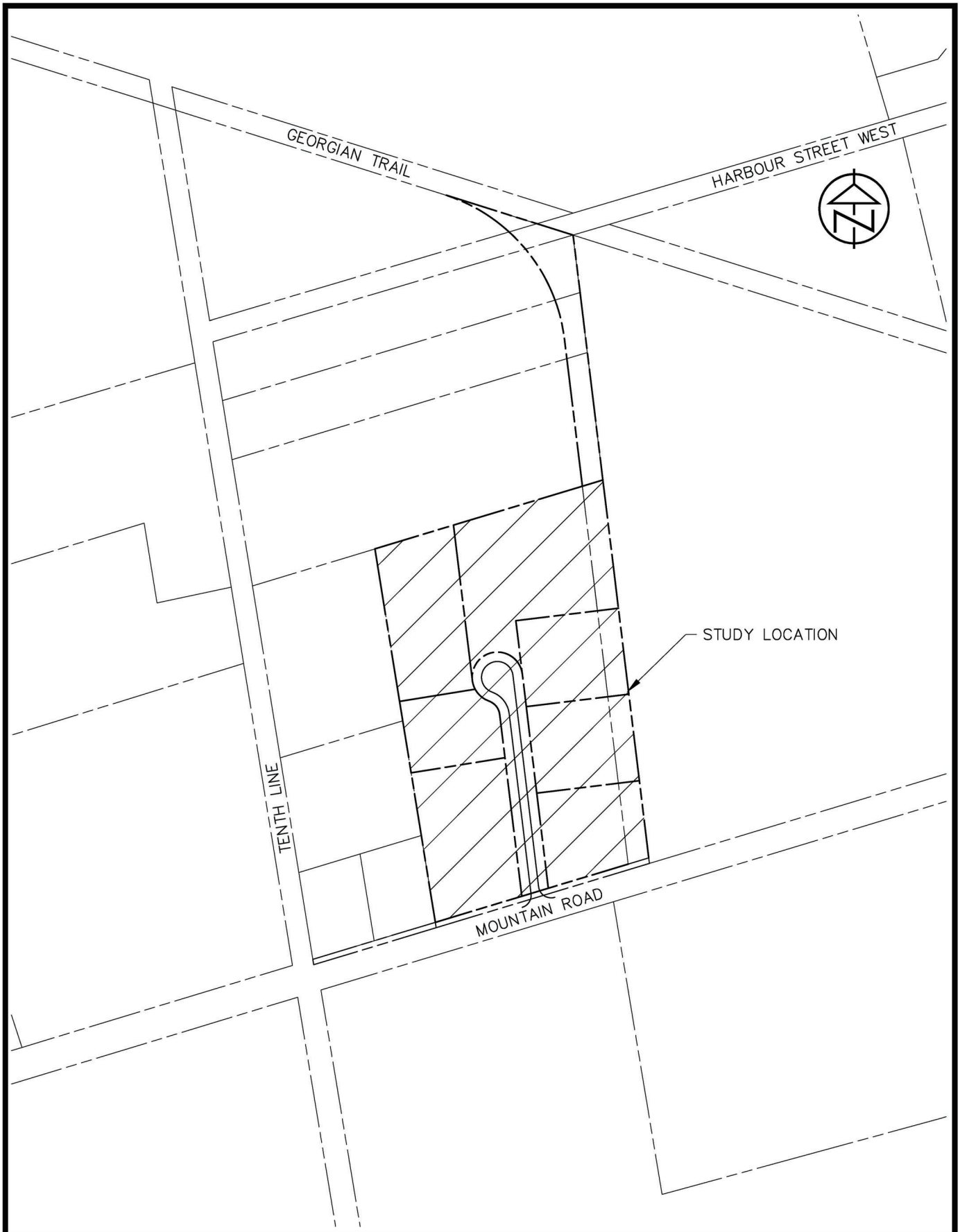
1.2 Objectives

The primary objective of this report is to investigate the existing and future drainage conditions in the area of the site in order to develop a stormwater management plan that will conform to all applicable Municipal, Regional and Provincial guidelines while minimizing the impact of the development on the local drainage systems.

1.3 Background and Guidelines

This report was prepared recognizing the pertinent Municipal and Provincial guidelines on water resources and the environment including the following publications:

- Black Ash Creek Subwatershed Plan. Nottawasaga Valley Conservation Authority (August, 2000);
- Design Guidelines for Sewage Works. Ministry of the Environment (2008);
- Development Review Guidelines. Nottawasaga Valley Conservation Authority (December, 2013);



C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie Ottawa

VAN DOLDER'S HOME TEAM
185 MOUNTAIN ROAD
FIGURE 1: SITE LOCATION AND ORIENTATION PLAN
TOWN OF COLLINGWOOD

SCALE: 1:5000	DATE: AUG/16	DWG NO. FIG.1

- Development Standards. Corporation of the Town of the Collingwood (July, 2007); and
- Stormwater Management Planning and Design Manual. Ministry of the Environment and Climate Change (March, 2003).

The NVCA regulation mapping has been reviewed to determine if the subject property is located in a NVCA regulated area under Ontario Regulation 172/06. Specifically, the NVCA Interactive Property Map was reviewed and it has been determined that the subject property is located outside NVCA regulated areas.

WSP Canada Inc. undertook a geotechnical investigation on the subject property in support of the proposed development. The results of the geotechnical investigation indicate that site soils are composed of sandy silt overlying sand at depths between 3.0 and 5.0 meters below ground. Groundwater level was encountered at depths between 1.8 and 4.8 meters below ground.

1.4 Proposed Land Use

The proposal for this site is to develop 6 industrial blocks. The remaining block (Block 3) is designated for stormwater management (SWM). Block 1 is the location of the Van Dolder's commercial development site which was submitted for immediate Site Plan Approval and approved with a separate design brief detailing the specific SWM requirements. Block 3 contains an existing pond that is to be retrofitted to provide the required stormwater control before outletting to an existing channel to the north. The development will be serviced by an industrial roadway and cul-de-sac accessed from Mountain Road. The industrial roadway will have ditches on both sides to collect, store and treat the surface runoff generated from Blocks 1 and 2 and convey the water to the SWM pond. The drainage from Blocks 4, 5, 6 and 7 will be collected in ditches along the east and north property lines and outlet to the SWM pond. Sanitary service will be provided by the existing gravity trunk sanitary sewer running east on Mountain Road to the Collingwood Wastewater Treatment Plant. Water service to the development will be provided by the existing trunk watermain on Mountain Road. Utilities (hydro, gas, telephone and cable) will be provided by the respective utility providers in the surrounding area.

2 Existing Drainage Conditions

Existing site topography, ground cover, land use and drainage patterns on site were established through site visitation, interpretation of the available topographic maps, aerial photography and a site survey. A Pre-Development Drainage Plan (Drawing DP-1) illustrating the existing drainage conditions is enclosed and should be referenced when reviewing the following sections.

The subject property is located in the Black Ash Creek Subwatershed as identified in the Black Ash Creek Subwatershed Plan. Several drainage areas have been identified on-site. All site drainage converges just downstream of the site before crossing the Georgian Trail and eventually outlets to the Black Ash Creek and Georgian Bay. The drainage areas and their respective outlets are described as follows and are illustrated on Drawing DP-1.

1. Catchment 101 (4.09 ha) is a wooded area that comprises the southern half of the property. It drains northeast across the property as sheet flow and continues as sheet flow to the north and east, ultimately outletting to Black Ash Creek.

2. Catchment 102 (0.55 ha) is a wooded area that comprises the northeast corner of the property and drains northeast as sheet flow to the Georgian Trail and Black Ash Creek.

3. Catchment 103 (1.91 ha) comprises the north central portion of the property. It is a wooded area that drains north and west to an existing culvert that outlets to the north. Beyond the property, the flow is primarily conveyed via an open channel across the existing Town works yard to the Georgian Trail. The flow continues east along the Georgian Trail and ultimately outlets to Black Ash Creek.

4. Catchment 104 (1.96 ha) is external to the site and comprises the Mountain Road Mini Storage and CRS properties to the west. Drainage from this catchment flows east onto Catchment 101 as sheet flow.

5. Catchment 105 (2.00 ha) is external to the site and is primarily comprised of the Lafarge Plant industrial area to the west of the subject property. Drainage from this catchment enters the existing natural pond in the northwest corner of the subject property. The pond outlets north via an open channel to the existing culvert and open channel described for Catchment 103.

6. Catchment 106 (1.12 ha) is comprised of the existing natural pond on the subject property and the wooded area on the site that drains to the pond. The pond outlets to the north channel as previously described.

7. Catchment 107 (0.71 ha) is primarily comprised of an existing natural pond to the west of the site. The pond outlets west via open channel to the existing culvert and open channel previously described.

To quantify pre-development flows to the outlet channel and to the northeast of the site, a hydrologic analysis using Visual OTTHYMO was completed. The hydrologic analysis and associated calculations are included in Appendix A and the results are summarized in the following table:

Table 1: Pre-Development Hydrologic Analysis Results Summary

Design Storm	Peak Flow Rates Off-Site to Northeast AddHyd 806 (cms)		Peak Flow Rates to Channel Outlet AddHyd 803 (cms)	
	Chicago Storm	24 Hour SCS Storm	Chicago Storm	24 Hour SCS Storm
25 mm Storm	0.109	-	0.060	-
2 Year	0.200	0.197	0.117	0.130
5 Year	0.330	0.299	0.201	0.204
10 Year	0.427	0.372	0.264	0.258
25 Year	0.559	0.470	0.353	0.333
50 Year	0.665	0.546	0.424	0.391
100 Year	0.774	0.625	0.500	0.451
Regional Timmins	0.512	-	0.422	-

3 Stormwater Management Plan

The stormwater management plan developed for the subject property is in accordance with the criteria set forth in the MOECC Stormwater Management Planning and Design Manual and the Town of Collingwood Development Standards. The stormwater management plan has been designed in accordance with the SWM criteria established for the site and is presented in the following sections.

3.1 Design Criteria

Based on the information gathered on-site, the background information collected and our analysis of this information, a clear understanding of the SWM issues was gained. In summary, the following issues are to be addressed in the proposed SWM plan:

- The SWM plan must maintain existing stormwater runoff rates to the existing outlet points by restricting post development peak flow rates to pre-development levels for the 2-year through 100-year design storms;
- The SWM plan must achieve the required Level 1 "Enhanced" water quality treatment to Provincial standards in the form of 80% total suspended solids (TSS) removal for the site effluent in accordance with the Black Ash Creek Subwatershed Plan; and
- The stormwater management plan must accommodate the flows from the external drainage areas west of the subject property and must provide safe conveyance of the Regulatory storm event peak flows through the site to the downstream drainage system.

3.2 Proposed Drainage Conditions

The proposed grading and stormwater design of the development has been completed to maximize the drainage to the existing pond in the northwest corner of the site. A Post-Development Drainage Plan (Drawing DP-2) illustrating the proposed drainage conditions is enclosed and should be referenced when reviewing the following sections.

1. Catchment 201 (3.28 ha) comprises industrial blocks (Blocks 5, 6, 7) with a future imperviousness of 70%. It will drain via an overland flow route along the east property line. The overland flow route shall be a grassed ditch with a minimum 0.5% slope. The overland flow route has been designed to convey flows from the 2-year through 100-year and Regional Timmins storm event flows. The overland flow route will convey flows from the southeast corner of the property draining north then west between Blocks 4 and 5 towards the SWM pond forebay. The final 60 m leading into the SWM pond shall be conveyed via a 750 mm diameter smooth walled HDPE storm pipe. A minimum top of bank elevation of 185.65 m shall be provided to maintain flow capacity within the ditch given the potential tailwater elevations. A 7.5 m drainage easement is required for the overland flow route. Detailed calculations for this overland flow route and storm pipe are included in Appendix B.

2. Catchment 202 (0.97 ha) is an industrial block in the northeast corner of the site (Block 4) with a projected imperviousness of 70%. This catchment shall drain to an overland flow route along the north property line constructed to convey flows from the 2-year through 100-year and Regional Timmins storm event to the SWM pond forebay. Similar to Catchment 201, the overland flow route shall be a grassed ditch with a minimum 0.5% slope. Detailed calculations for this overland flow route are included in Appendix B.

3. Catchment 203 (2.34 ha) comprises the roadway and the industrial blocks on the west half of the property (Blocks 1 and 2) with a calculated imperviousness of 73%. Catchment 203 will primarily drain to the industrial roadway. The roadside ditches shall provide conveyance for the minor storm events and the roadway shall provide conveyance for the major storm events. A 400 mm diameter smooth walled HDPE culvert shall be provided at the end of the cul-de-sac to convey the 5-year storm flows to the SWM pond forebay. Flows that exceed the culvert capacity will spill overland to the forebay. The associated hydraulic calculations included in Appendix B demonstrate that the roadside ditches have capacity for the major storm events. The roadway provides an emergency overland flow route in case of culvert blockages. It is noted that Catchment 203 includes the Van Dolder's site (Block 1) which has been constructed under a separate Site Plan Application.

4. Catchment 204 (2.08 ha) comprises the Mountain Road Mini Storage and CRS properties to the west of the subject property and the rear drainage from Blocks 1 and 2. Drainage from this catchment shall be collected in a grassed ditch along the subject property's west property line. A ditch inlet catch basin and 300 mm diameter storm sewer shall convey the minor storm events to the roadside ditch of the industrial roadway. Major storm events will drain overland to the industrial roadway or continue along the west property line ditch to the SWM pond. All flows from minor storm events will enter the SWM pond forebay and receive water quality treatment.

5. Catchment 205 (2.00 ha) is primarily comprised of the Lafarge Plant industrial area to the west of the subject property. Drainage from this catchment will be directed to the existing natural pond on the Lafarge Plant property. The drainage to the channel outlet from this catchment shall remain consistent with existing conditions.

6. Catchment 206 (0.96 ha) is primarily comprised of the retrofitted SWM pond. Catchment 206 includes the area north of the pond that shall be regraded to enter the SWM pond forebay as sheet flow.

7. Catchment 207 (0.71 ha) is primarily comprised of an existing natural pond to the west of the site. Drainage in this area will not be altered as a result of the proposed SWM plan.

It is noted that a small amount of external flows from Mountain Road are conveyed via roadside ditches and enter the site at the southeast corner of Block 7. They continue in a northeast direction onto the neighbouring property. The proposed grading for the development ensures that external and internal flows are separated. Internal flows are conveyed to the SWM facility as described for Catchment 201.

3.3 Water Quantity Control

The existing stormwater runoff rates to the existing channel outlet must be maintained under proposed conditions by restricting post development peak flow rates to pre-development levels for the 2-year through 100-year design storms. Safe conveyance of the Regulatory Timmins storm event must also be provided. This will be achieved through a retrofit of the existing pond. The pond top of bank has been set at an elevation of 185.05 m and the maximum pond depth under the Regional event shall be 184.75 m such that 0.30 m of freeboard is maintained. The existing permanent pool elevation is approximately 184.20 m as determined through site survey. This elevation will be lowered to 183.80 m through re-grading of the outlet ditch to maximize the active storage while maintaining positive drainage to the outlet channel. The proposed improvements are illustrated on the Pond Layout and Details Plan (Drawing PND-1) enclosed and the improvements are described as follows:

- A sediment forebay will be constructed to facilitate sediment settling;
- An outlet to the existing channel to the north shall be provided to ensure quantity control occurs. The outlet will be comprised of one reverse grade 150 mm diameter pipe with a 125 mm diameter orifice, a 600 mm x 1200 mm ditch inlet catchbasin and a secondary 525 mm diameter pipe outletting to the existing channel;
- A concrete headwall shall be provided for the reverse grade pipe and a gate valve shall be installed to allow the outlet of the pond to be closed in the event of a spill/contamination from future industrial operations;
- An overflow spillway will be constructed to control the release of major storm peak flows downstream while maintaining 0.3 m of freeboard; and
- The grading of the existing channel outlet shall be improved as required to the north property line.

As described in the previous section, the area draining to the pond is increased under proposed drainage conditions. Through implementation of the outlet controls described above, control of the 2-year through 100-year storms to pre-development levels will be maintained. The associated Stage-Storage-Discharge calculations are included in Appendix C. To confirm post-development flows to the channel, a hydrologic analysis using Visual OTTHYMO was completed. The hydrologic analysis and associated calculations are included in Appendix D and the results are summarized in the following table:

Table 2: Post Development Hydrologic Analysis Results Summary

Design Storm	Peak Flow Rates to Channel Outlet (cms)	
	Chicago Storm	24 Hour SCS Storm
25 mm Storm	0.060 *(0.060)*	-
2 Year	0.115 *(0.117)*	0.125 *(0.130)*
5 Year	0.197 *(0.201)*	0.192 *(0.204)*
10 Year	0.257 *(0.264)*	0.240 *(0.258)*
25 Year	0.341 *(0.353)*	0.303 *(0.333)*
50 Year	0.407 *(0.424)*	0.352 *(0.391)*
100 Year	0.475 *(0.500)*	0.403 *(0.451)*
Regional Timmins	0.917 *(0.934*)*	-

Note: *(0.060)* – equivalent pre-development flow rate

(0.934)* – summation of total flow from northeast corner and channel outlet under pre-development conditions

Comparison of the post and pre-development flow summaries confirms that the proposed stormwater management plan for the development will attenuate the 2-year through 100-year post development peak flows below pre-development levels. Under the Regional Timmins storm event, safe conveyance on-site is provided. Downstream, the overall flow off-site is reduced and is combined to outlet at the most appropriate location which is the existing outlet channel. The Town is the downstream landowner and has accepted this outlet and site plan

3.4 Water Quality Control

As discussed, Level 1 "Enhanced" water quality treatment is required in the form of 80% total suspended solids (TSS) removal. This will be achieved on-site through the retrofitted SWM pond. The following elements have been incorporated into the SWM pond retrofit to improve water quality:

- Reverse grade pipe to promote sedimentation and pollutant removal;
- Extended flow path to further promote sedimentation and pollutant removal;
- Sediment forebay to provide the primary removal and storage of sediment and debris along with a cell that is easy to clean out and maintain; and
- Construction of grassed overland flow routes to provide pre-treatment and sediment removal.

Under proposed conditions, approximately 9.63 ha will drain to the retrofitted pond at a combined imperviousness of 67%. For Level 1 water quality treatment, the required permanent pool and extended detention volumes are approximately 1,715 m^3 and 385 m^3 respectively. The proposed permanent pool volume is approximately 2,175 m^3 and the proposed extended detention volume is approximately 2,400 m^3. The extended detention volume is equivalent to approximately 250 m^3 of storage per hectare of drainage. This is well above the erosion control requirements of the MOECC SWM Design Manual Simplified Design Approach.

The pond drawdown time for the 25 mm design storm is approximately 27 hours and the pond drawdown time for the maximum extended detention water level is approximately 51 hours. The extended detention is controlled by the 125 mm diameter orifice. The forebay has been designed to meet the required settling and dispersion lengths and to have a reasonable cleanout frequency. Water quality and forebay calculations are included in Appendix E for reference.

4 Siltation and Erosion Control

Siltation and erosion control will be implemented for all construction activities within the development site, including vegetation clearing, topsoil stripping, road construction and stockpiling of materials. The basic principles considered to minimize erosion and sedimentation and resultant negative environmental impacts include:

- Minimize disturbance activities where possible;
- Expose the smallest possible land area to erosion for the shortest possible time;
- Institute erosion control measures as required immediately;
- Implement sediment control measures before the outset of construction activities; and,
- Carry out regular inspections of erosion/sediment control measures and repair or maintain as necessary.

The detailed siltation and erosion control measures proposed to be implemented during and after construction are identified on the Siltation and Erosion Control Plan (Drawing SC-1) and include the following:

- Heavy duty silt fences will be erected around the perimeter of the site before any grading operations commence to control sediment movement sites;
- A construction vehicle entrance will be constructed and maintained consisting of a stone mud mat to reduce off-site tracking of materials;
- Ditch inlet catchbasins will be fitted with sediment traps during construction activities, and cleaned out as required; and
- Straw bale flow check dams and rock flow check dams will be installed in the on-site and off-site overland flow routes/ditches to prevent the movement of sediment downstream to Black Ash Creek.

5 Conclusions

The proposed stormwater management plan demonstrates that the development will meet the established criteria with respect to stormwater management set forth in the governing documents and can proceed without negatively impacting the local drainage systems. Level 1 'Enhanced' water quality control in the form of 80% TSS removal and water quantity control in the form of post to pre-development peak flow matching will be provided through a retrofit of the existing pond on the subject property. Some external drainage will continue to drain onto the site and will be redirected to the pond for treatment and quantity control.

In conclusion, the proposed stormwater management plan supports the concept of an environmentally sustainable development. The proposed plan will mitigate anticipated stormwater impacts associated with the development of the proposed industrial subdivision.

Authored by: David Marshall, B.A.Sc., E.I.T.
Intern Engineer

Reviewed by: Dan Hurley, B.A.Sc., P.Eng., LEED AP
Vice President
Manager Water Resources Engineering

© C.C. Tatham & Associates Ltd

The information contained in this document is solely for the use of the Client identified on the cover sheet for the purpose for which it has been prepared and C.C. Tatham & Associates Ltd. undertakes no duty to or accepts any responsibility to any third party who may rely upon this document.

This document may not be used for any purpose other than that provided in the contract between the Owner/Client and the Engineer nor may any section or element of this document be removed, reproduced, electronically stored or transmitted in any form without the express written consent of C.C. Tatham & Associates Ltd.

APPENDIX A:
PRE-DEVELOPMENT HYDROLOGY

C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie

Project:	185 Mountain Road
File No.:	116023
Date:	25-Aug-16
Designed By:	DAM
Checked By:	DJH
Subject:	CN Calculation

CURVE NUMBER, INITIAL ABSTRACTION & TIME TO PEAK CALCULATIONS

Catchment 101 **Area** 4.09 ha

WEIGHTED CN VALUE

Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient Type	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Meadows			Gravel			Impervious			Wetland/Lakes/SWMF			Average CN for Soil Type
					Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
WI	WIARTON	B	Loam or Silt Loam	2	4.0906	1	4.0906	1	60	0		69	0		65	0	0	85	0	0	100	0	0	50	60
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	4.0906	1	4.0906	1		0	0		0	0		0	0		0	0		0	0		60.0

Time of Concentration Calculations

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	190	m
Minimum Catchment Elevation	184.2	m
Catchment length	240	m
Catchment Slope	2.417%	
Catchment Area	4.0906	ha
Time of Concentration (Minutes)	**9.96**	
Time of Concentration (Hours)	**0.17**	
Time to Peak (2/3 x Time of Concentration)	**0.11**	

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	190	m
Minimum Catchment Elevation	184.2	m
Catchment length	240	m
Catchment Slope	2%	
Catchment Area	4.0906	ha
Time of Concentration (Minutes)	**32.08**	
Time of Concentration (Hours)	**0.53**	
Time to Peak (2/3 x Time of Concentration)	**0.36**	

Time to Peak	**0.36 hrs**

Initial Abstraction	**10 mm**

Woods	10
Meadows	8
Gravel	2
Lawns	5
Impervious	2

Runoff Coefficient	**0.25**

Landuse Type	Soil Series				
	WI	0	0	0	0
	2	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.25	#N/A	#N/A	#N/A	#N/A
Gravel	0.8	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.28	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.27	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.25	#N/A	#N/A	#N/A	#N/A

C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie

Project:	185 Mountain Road
File No.:	116023
Date:	25-Aug-16
Designed By:	DAM
Checked By:	DJH
Subject:	CN Calculation

CURVE NUMBER, INITIAL ABSTRACTION & TIME TO PEAK CALCULATIONS

Catchment 102 **Area** 0.55 ha

WEIGHTED CN VALUE

Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient Type	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Meadows			Gravel			Impervious			Wetland/Lakes/SWMF			Average CN for Soil Type
					Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
WI	WIARTON	B	Loam or Silt Loam	2	0.5487	1	0.5487	1	60	0		69	0		65	0	0	85	0	0	100	0	0	50	60
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	0.5487	1	0.5487	1		0	0		0	0		0	0		0	0		0	0		60.0

Time of Concentration Calculations

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	185.5	m
Minimum Catchment Elevation	185.1	m
Catchment length	70	m
Catchment Slope	1%	
Catchment Area	0.55	ha
Time of Concentration (Minutes)	**4.74**	
Time of Concentration (Hours)	**0.08**	
Time to Peak (2/3 x Time of Concentration)	**0.05**	

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	185.5	m
Minimum Catchment Elevation	185.1	m
Catchment length	70	m
Catchment Slope	1%	
Catchment Area	0.55	ha
Time of Concentration (Minutes)	**27.89**	
Time of Concentration (Hours)	**0.46**	
Time to Peak (2/3 x Time of Concentration)	**0.31**	

Time to Peak	**0.31 hrs**

Initial Abstraction	**10 mm**

Woods	10
Meadows	8
Gravel	2
Lawns	5
Impervious	2

Runoff Coefficient	**0.25**

Landuse Type	Soil Series				
	WI	0	0	0	0
	2	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.25	#N/A	#N/A	#N/A	#N/A
Gravel	0.8	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.28	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.27	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.25	#N/A	#N/A	#N/A	#N/A

C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie

Project:	185 Mountain Road
File No.:	116023
Date:	25-Aug-16
Designed By:	DAM
Checked By:	DJH
Subject:	CN Calculation

CURVE NUMBER, INITIAL ABSTRACTION & TIME TO PEAK CALCULATIONS

Catchment 103 **Area** 1.91 ha

WEIGHTED CN VALUE

Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient Type	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Meadows			Gravel			Impervious			Wetland/Lakes/SWMF			Average CN for Soil Type
					Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
WI	WIARTON	B	Loam or Silt Loam	2	1.9094	1	1.9094	1	60	0		69	0		65	0	0	85	0	0	100	0	0	50	60
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	1.9094	1	1.9094	1		0	0		0	0		0	0		0	0		0	0		60.0

Time of Concentration Calculations

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	185.7	m
Minimum Catchment Elevation	184.7	m
Catchment length	190	m
Catchment Slope	1%	
Catchment Area	1.91	ha
Time of Concentration (Minutes)	**11.54**	
Time of Concentration (Hours)	**0.19**	
Time to Peak (2/3 x Time of Concentration)	**0.13**	

Time to Peak	**0.52 hrs**

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	185.7	m
Minimum Catchment Elevation	184.7	m
Catchment length	190	m
Catchment Slope	1%	
Catchment Area	1.91	ha
Time of Concentration (Minutes)	**47.21**	
Time of Concentration (Hours)	**0.79**	
Time to Peak (2/3 x Time of Concentration)	**0.52**	

Initial Abstraction	**10 mm**

Woods	10
Meadows	8
Gravel	2
Lawns	5
Impervious	2

Runoff Coefficient	**0.25**

Landuse Type	Soil Series				
	WI	0	0	0	0
	2	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.25	#N/A	#N/A	#N/A	#N/A
Gravel	0.8	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.28	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.27	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.25	#N/A	#N/A	#N/A	#N/A

C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie

Project:	185 Mountain Road
File No.:	116023
Date:	25-Aug-16
Designed By:	DAM
Checked By:	DJH
Subject:	CN Calculation

CURVE NUMBER, INITIAL ABSTRACTION & TIME TO PEAK CALCULATIONS

Catchment 104 **Area** 1.96 ha

WEIGHTED CN VALUE

Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient Type	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Meadows			Gravel			Impervious			Wetland/Lakes/SWMF			Average CN for Soil Type
					Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
WI	WIARTON	B	Loam or Silt Loam	2	1.9583	1	0	0	60	0.2076	0.106	69	0		65	1.5275	0.78	85	0.2232	0.114	100	0	0	50	85.014
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	1.9583	1	0	0		0.20758	0.106		0	0		1.52747	0.78		0.22325	0.114		0	0		85.0

Time of Concentration Calculations

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	191	m
Minimum Catchment Elevation	190	m
Catchment length	120	m
Catchment Slope	1%	
Catchment Area	1.96	ha
Time of Concentration (Minutes)	**6.63**	
Time of Concentration (Hours)	**0.11**	
Time to Peak (2/3 x Time of Concentration)	**0.07**	

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	191	m
Minimum Catchment Elevation	190	m
Catchment length	120	m
Catchment Slope	1%	
Catchment Area	1.96	ha
Time of Concentration (Minutes)	**12.82**	
Time of Concentration (Hours)	**0.21**	
Time to Peak (2/3 x Time of Concentration)	**0.14**	

Time to Peak	**0.07 hrs**

Initial Abstraction	**2.318 mm**

Woods	10
Meadows	8
Gravel	2
Lawns	5
Impervious	2

Runoff Coefficient	**0.76**

Landuse Type	Soil Series				
	WI	0	0	0	0
	2	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.25	#N/A	#N/A	#N/A	#N/A
Gravel	0.8	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.28	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.27	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.762	#N/A	#N/A	#N/A	#N/A

C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie

Project:	185 Mountain Road
File No.:	116023
Date:	25-Aug-16
Designed By:	DAM
Checked By:	DJH
Subject:	CN Calculation

CURVE NUMBER, INITIAL ABSTRACTION & TIME TO PEAK CALCULATIONS

Catchment 105 **Area** 2.00 ha

WEIGHTED CN VALUE

Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient Type	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Meadows			Gravel			Impervious			Wetland/Lakes/SWMF			Average CN for Soil Type
					Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
WI	WIARTON	B	Loam or Silt Loam	2	2.0032	1	0.3165	0.158	60	0.5298	0.2645	69	0		65	1.0216	0.51	85	0.1352	0.0675	100	0	0	50	77.8305
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	2.0032	1	0.31651	0.158		0.52985	0.2645		0	0		1.02163	0.51		0.13522	0.0675		0	0		77.8

Time of Concentration Calculations

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	191	m
Minimum Catchment Elevation	185	m
Catchment length	160	m
Catchment Slope	4%	
Catchment Area	2.00	ha
Time of Concentration (Minutes)	**6.53**	
Time of Concentration (Hours)	**0.11**	
Time to Peak (2/3 x Time of Concentration)	**0.07**	

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	191	m
Minimum Catchment Elevation	185	m
Catchment length	160	m
Catchment Slope	4%	
Catchment Area	2.00	ha
Time of Concentration (Minutes)	**13.71**	
Time of Concentration (Hours)	**0.23**	
Time to Peak (2/3 x Time of Concentration)	**0.15**	

Time to Peak	**0.07 hrs**

Initial Abstraction	**4.0575 mm**

Woods	10
Meadows	8
Gravel	2
Lawns	5
Impervious	2

Runoff Coefficient	**0.59**

Landuse Type	Soil Series				
	WI	0	0	0	0
	2	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.25	#N/A	#N/A	#N/A	#N/A
Gravel	0.8	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.28	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.27	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.5857	#N/A	#N/A	#N/A	#N/A

C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie

Project:	185 Mountain Road
File No.:	116023
Date:	25-Aug-16
Designed By:	DAM
Checked By:	DJH
Subject:	CN Calculation

CURVE NUMBER, INITIAL ABSTRACTION & TIME TO PEAK CALCULATIONS

Catchment 106 **Area** 1.12 ha

WEIGHTED CN VALUE

Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient Type	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Meadows			Gravel			Impervious			Wetland/Lakes/SWMF			Average CN for Soil Type
					Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
WI	WIARTON	B	Loam or Silt Loam	2	1.1179	1	0.6869	0.6145	60	0		69	0		65	0	0	85	0	0	100	0.431	0.3855	50	56.145
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	1.1179	1	0.68695	0.6145		0	0		0	0		0	0		0	0		0.43095	0.3855		56.1

Time of Concentration Calculations

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	187.7	m
Minimum Catchment Elevation	183.9	m
Catchment length	90	m
Catchment Slope	4%	
Catchment Area	1.12	ha
Time of Concentration (Minutes)	**3.80**	
Time of Concentration (Hours)	**0.06**	
Time to Peak (2/3 x Time of Concentration)	**0.04**	

Time to Peak	**0.20 hrs**

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	187.7	m
Minimum Catchment Elevation	183.9	m
Catchment length	90	m
Catchment Slope	4%	
Catchment Area	1.12	ha
Time of Concentration (Minutes)	**17.83**	
Time of Concentration (Hours)	**0.30**	
Time to Peak (2/3 x Time of Concentration)	**0.20**	

Initial Abstraction	**10.771 mm**

Woods	10
Meadows	8
Gravel	2
Lawns	5
Wetland	12
Impervious	2

Runoff Coefficient	**0.17**

Landuse Type	Soil Series				
	WI	0	0	0	0
	2	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.25	#N/A	#N/A	#N/A	#N/A
Gravel	0.8	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.28	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.27	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.1729	#N/A	#N/A	#N/A	#N/A

C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie

Project:	185 Mountain Road
File No.:	116023
Date:	25-Aug-16
Designed By:	DAM
Checked By:	DJH
Subject:	CN Calculation

CURVE NUMBER, INITIAL ABSTRACTION & TIME TO PEAK CALCULATIONS

Catchment 107 **Area** 0.71 ha

WEIGHTED CN VALUE

Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient Type	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Meadows			Gravel			Impervious			Wetland/Lakes/SWMF			Average CN for Soil Type
					Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
WI	WIARTON	B	Loam or Silt Loam	2	0.7133	1	0.3096	0.434	60	0	0	69	0		65	0.070	0.098	85	0		100	0.3338	0.468	50	57.77
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	0.7133	1	0.30957	0.434		0	0		0	0		0.0699	0.098		0	0		0.33382	0.468		57.8

Time of Concentration Calculations

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	193	m
Minimum Catchment Elevation	183.7	m
Catchment length	180	m
Catchment Slope	5%	
Catchment Area	0.71	ha
Time of Concentration (Minutes)	**7.64**	
Time of Concentration (Hours)	**0.13**	
Time to Peak (2/3 x Time of Concentration)	**0.08**	

Time to Peak	**0.25 hrs**

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	193	m
Minimum Catchment Elevation	183.7	m
Catchment length	180	m
Catchment Slope	5%	
Catchment Area	0.71	ha
Time of Concentration (Minutes)	**22.08**	
Time of Concentration (Hours)	**0.37**	
Time to Peak (2/3 x Time of Concentration)	**0.25**	

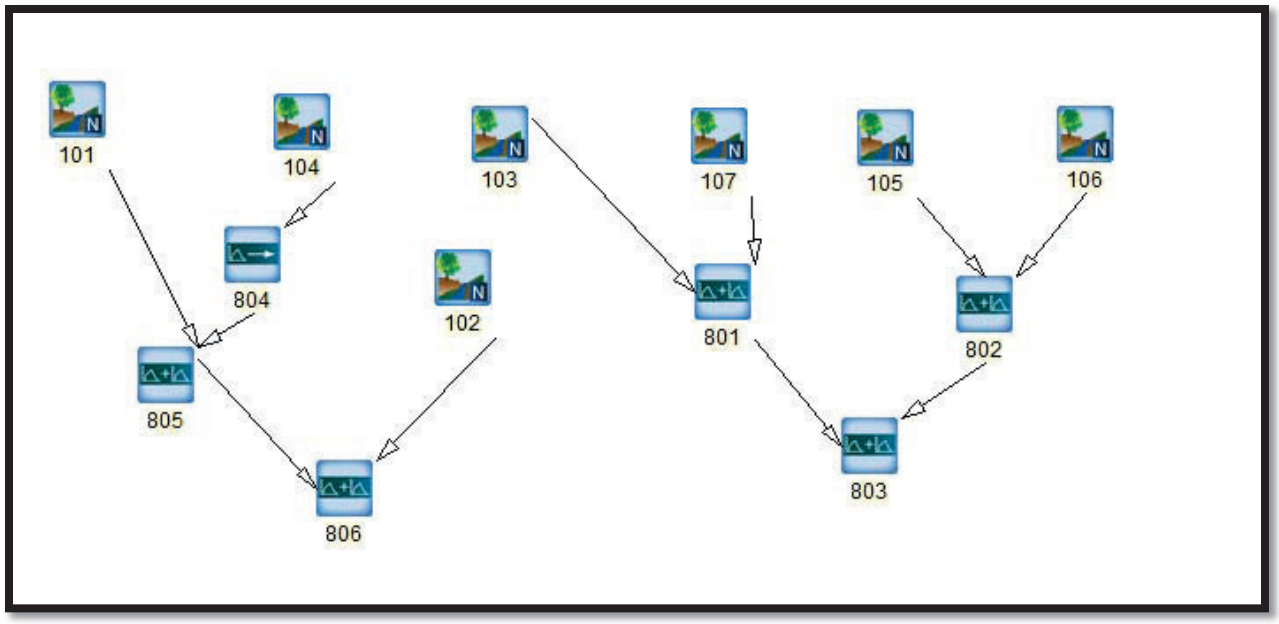
Initial Abstraction	**10.152 mm**

Woods	10
Meadows	8
Gravel	2
Lawns	5
Wetland	12
Impervious	2

Runoff Coefficient	**0.23**

Landuse Type	Soil Series				
	WI	0	0	0	0
	2	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.3	#N/A	#N/A	#N/A	#N/A
Gravel	0.8	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.35	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.33	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.232	#N/A	#N/A	#N/A	#N/A

Existing Conditions OTTHYMO Model Schematic



```
       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
```

Developed and Distributed by Clarifica Inc.
Copyright 1996, 2007 Clarifica Inc.
All rights reserved.

***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 2.3.2\voin.dat
Output filename: I:\2016PR~1\116023~1\Design\HYDROL~1\185MOU~2\Pre-Development Chicago.out
Summary filename: I:\2016PR~1\116023~1\Design\HYDROL~1\185MOU~2\Pre-Development Chicago.sum

DATE: 8/25/2016 TIME: 1:36:32 PM

USER:

COMMENTS: _____

****
** SIMULATION NUMBER: 1 **
****

READ STORM	Filename: I:\2016 Projects\116023 - 185 Mountain Road\ Design\Hydrologic Model\ Owen Sound Design Storms\CHIC25MM.4HR
Ptotal= 24.97 mm	Comments: OWEN SOUND 25 mm (from a 2 year-4hr stor

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.10	1.29	1.10	2.81	2.10	13.05	3.10	2.04
.20	1.36	1.20	3.22	2.20	8.44	3.20	1.89
.30	1.44	1.30	3.77	2.30	6.21	3.30	1.76
.40	1.53	1.40	4.55	2.40	4.91	3.40	1.65
.50	1.63	1.50	5.77	2.50	4.06	3.50	1.55
.60	1.75	1.60	7.86	2.60	3.47	3.60	1.46
.70	1.89	1.70	12.27	2.70	3.03	3.70	1.39
.80	2.06	1.80	26.17	2.80	2.70	3.80	1.32
.90	2.26	1.90	72.58	2.90	2.43	3.90	1.26
1.00	2.50	2.00	26.96	3.00	2.22	4.00	1.20

CALIB		
NASHYD (0106)	Area (ha)= 1.12	Curve Number (CN)= 56.1
ID= 1 DT= 2.0 min	Ia (mm)= 10.80	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= .20	

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.033	1.29	1.033	2.81	2.033	13.05	3.03	2.04
.067	1.29	1.067	2.81	2.067	13.05	3.07	2.04
.100	1.29	1.100	2.81	2.100	13.05	3.10	2.04
.133	1.36	1.133	3.22	2.133	8.44	3.13	1.89
.167	1.36	1.167	3.22	2.167	8.44	3.17	1.89
.200	1.36	1.200	3.22	2.200	8.44	3.20	1.89
.233	1.44	1.233	3.77	2.233	6.21	3.23	1.76
.267	1.44	1.267	3.77	2.267	6.21	3.27	1.76
.300	1.44	1.300	3.77	2.300	6.21	3.30	1.76
.333	1.53	1.333	4.55	2.333	4.91	3.33	1.65
.367	1.53	1.367	4.55	2.367	4.91	3.37	1.65
.400	1.53	1.400	4.55	2.400	4.91	3.40	1.65
.433	1.63	1.433	5.77	2.433	4.06	3.43	1.55
.467	1.63	1.467	5.77	2.467	4.06	3.47	1.55
.500	1.63	1.500	5.77	2.500	4.06	3.50	1.55

.533	1.75	1.533	7.86	2.533	3.47	3.53	1.46
.567	1.75	1.567	7.86	2.567	3.47	3.57	1.46
.600	1.75	1.600	7.86	2.600	3.47	3.60	1.46
.633	1.89	1.633	12.27	2.633	3.03	3.63	1.39
.667	1.89	1.667	12.27	2.667	3.03	3.67	1.39
.700	1.89	1.700	12.27	2.700	3.03	3.70	1.39
.733	2.06	1.733	26.17	2.733	2.70	3.73	1.32
.767	2.06	1.767	26.17	2.767	2.70	3.77	1.32
.800	2.06	1.800	26.17	2.800	2.70	3.80	1.32
.833	2.26	1.833	72.58	2.833	2.43	3.83	1.26
.867	2.26	1.867	72.58	2.867	2.43	3.87	1.26
.900	2.26	1.900	72.58	2.900	2.43	3.90	1.26
.933	2.50	1.933	26.96	2.933	2.22	3.93	1.20
.967	2.50	1.967	26.96	2.967	2.22	3.97	1.20
1.000	2.50	2.000	26.96	3.000	2.22	4.00	1.20

Unit Hyd Qpeak (cms)= .213

PEAK FLOW (cms)= .003 (i)
TIME TO PEAK (hrs)= 2.233
RUNOFF VOLUME (mm)= .943
TOTAL RAINFALL (mm)= 24.971
RUNOFF COEFFICIENT = .038

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

CALIB					
NASHYD (0105)	Area (ha)=	2.00	Curve Number (CN)=	77.8	
ID= 1 DT= 2.0 min	Ia (mm)=	4.06	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	.07			

Unit Hyd Qpeak (cms)= 1.093

PEAK FLOW (cms)= .059 (i)
TIME TO PEAK (hrs)= 1.933
RUNOFF VOLUME (mm)= 4.667
TOTAL RAINFALL (mm)= 24.971
RUNOFF COEFFICIENT = .187

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

CALIB					
NASHYD (0107)	Area (ha)=	.71	Curve Number (CN)=	57.8	
ID= 1 DT= 2.0 min	Ia (mm)=	10.20	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	.25			

Unit Hyd Qpeak (cms)= .109

PEAK FLOW (cms)= .002 (i)
TIME TO PEAK (hrs)= 2.267
RUNOFF VOLUME (mm)= 1.089
TOTAL RAINFALL (mm)= 24.971
RUNOFF COEFFICIENT = .044

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

CALIB					
NASHYD (0103)	Area (ha)=	1.91	Curve Number (CN)=	60.0	
ID= 1 DT= 2.0 min	Ia (mm)=	10.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	.52			

Unit Hyd Qpeak (cms)= .140

PEAK FLOW (cms)= .004 (i)
TIME TO PEAK (hrs)= 2.667
RUNOFF VOLUME (mm)= 1.215
TOTAL RAINFALL (mm)= 24.971
RUNOFF COEFFICIENT = .049

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

CALIB					
NASHYD (0102)	Area (ha)=	.55	Curve Number (CN)=	60.0	
ID= 1 DT= 2.0 min	Ia (mm)=	10.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	.31			

Unit Hyd Qpeak (cms)= .068

PEAK FLOW (cms)= .002 (i)
TIME TO PEAK (hrs)= 2.367
RUNOFF VOLUME (mm)= 1.215

```
     TOTAL RAINFALL   (mm)=  24.971
     RUNOFF COEFFICIENT   =    .049

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0101) |   Area    (ha)=   4.09   Curve Number   (CN)= 60.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .36

     Unit Hyd Qpeak  (cms)=    .434

     PEAK FLOW       (cms)=    .011 (i)
     TIME TO PEAK    (hrs)=   2.433
     RUNOFF VOLUME    (mm)=   1.216
     TOTAL RAINFALL   (mm)=  24.971
     RUNOFF COEFFICIENT   =    .049

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0104) |   Area    (ha)=   1.96   Curve Number   (CN)= 85.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   2.32   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .07

     Unit Hyd Qpeak  (cms)=   1.069

     PEAK FLOW       (cms)=    .098 (i)
     TIME TO PEAK    (hrs)=   1.933
     RUNOFF VOLUME    (mm)=   7.579
     TOTAL RAINFALL   (mm)=  24.971
     RUNOFF COEFFICIENT   =    .304

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

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

--------------------
| ADD HYD   (0802) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0106):     1.12    .003     2.23      .94
        + ID2= 2 (0105):     2.00    .059     1.93     4.67
          ================================================
          ID = 3 (0802):     3.12    .059     1.93     3.33

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0801) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0107):      .71    .002     2.27     1.09
        + ID2= 2 (0103):     1.91    .004     2.67     1.22
          ================================================
          ID = 3 (0801):     2.62    .005     2.53     1.18

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| SHIFT HYD (0804) |
| IN= 2---> OUT= 1 |
| SHIFT= 22.0 min  |      AREA     QPEAK     TPEAK      R.V.
--------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (0104):    1.96      .10      1.93      7.58
    SHIFT ID= 1 (0804):    1.96      .10      2.27      7.58

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

--------------------
| ADD HYD   (0803) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0802):     3.12    .059     1.93     3.33
        + ID2= 2 (0801):     2.62    .005     2.53     1.18
          ================================================
          ID = 3 (0803):     5.74    .060     1.93     2.35

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
```

ADD HYD (0805)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0101):	4.09	.011	2.43	1.22
	+ ID2= 2 (0804):	1.96	.098	2.27	7.58
	ID = 3 (0805):	6.05	.107	2.27	3.28

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0806)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0102):	.55	.002	2.37	1.21
	+ ID2= 2 (0805):	6.05	.107	2.27	3.28
	ID = 3 (0806):	6.60	.109	2.27	3.10

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

READ STORM	Filename: I:\2016 Projects\116023 - 185 Mountain Road\Design\Hydrologic Model\Owen Sound Design Storms\OSCHI2.4HR
Ptotal= 33.75 mm	Comments: OWEN SOUND 2 YEAR 4 HOUR DURATION CHICAG

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.10	1.75	1.10	3.80	2.10	17.64	3.10	2.75
.20	1.84	1.20	4.35	2.20	11.41	3.20	2.55
.30	1.95	1.30	5.09	2.30	8.39	3.30	2.38
.40	2.07	1.40	6.16	2.40	6.63	3.40	2.23
.50	2.21	1.50	7.80	2.50	5.49	3.50	2.09
.60	2.37	1.60	10.63	2.60	4.69	3.60	1.98
.70	2.56	1.70	16.59	2.70	4.10	3.70	1.88
.80	2.78	1.80	35.38	2.80	3.65	3.80	1.78
.90	3.05	1.90	98.09	2.90	3.29	3.90	1.70
1.00	3.38	2.00	36.45	3.00	2.99	4.00	1.63

CALIB			
NASHYD (0106)	Area (ha)= 1.12	Curve Number (CN)= 56.1	
ID= 1 DT= 2.0 min	Ia (mm)= 10.80	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= .20		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.033	1.75	1.033	3.80	2.033	17.64	3.03	2.75
.067	1.75	1.067	3.80	2.067	17.64	3.07	2.75
.100	1.75	1.100	3.80	2.100	17.64	3.10	2.75
.133	1.84	1.133	4.35	2.133	11.41	3.13	2.55
.167	1.84	1.167	4.35	2.167	11.41	3.17	2.55
.200	1.84	1.200	4.35	2.200	11.41	3.20	2.55
.233	1.95	1.233	5.09	2.233	8.39	3.23	2.38
.267	1.95	1.267	5.09	2.267	8.39	3.27	2.38
.300	1.95	1.300	5.09	2.300	8.39	3.30	2.38
.333	2.07	1.333	6.16	2.333	6.63	3.33	2.23
.367	2.07	1.367	6.16	2.367	6.63	3.37	2.23
.400	2.07	1.400	6.16	2.400	6.63	3.40	2.23
.433	2.21	1.433	7.80	2.433	5.49	3.43	2.09
.467	2.21	1.467	7.80	2.467	5.49	3.47	2.09
.500	2.21	1.500	7.80	2.500	5.49	3.50	2.09
.533	2.37	1.533	10.63	2.533	4.69	3.53	1.98
.567	2.37	1.567	10.63	2.567	4.69	3.57	1.98
.600	2.37	1.600	10.63	2.600	4.69	3.60	1.98
.633	2.56	1.633	16.59	2.633	4.10	3.63	1.88
.667	2.56	1.667	16.59	2.667	4.10	3.67	1.88
.700	2.56	1.700	16.59	2.700	4.10	3.70	1.88
.733	2.78	1.733	35.38	2.733	3.65	3.73	1.78
.767	2.78	1.767	35.38	2.767	3.65	3.77	1.78
.800	2.78	1.800	35.38	2.800	3.65	3.80	1.78
.833	3.05	1.833	98.09	2.833	3.29	3.83	1.70
.867	3.05	1.867	98.09	2.867	3.29	3.87	1.70

.900	3.05	1.900	98.09	2.900	3.29	3.90	1.70
.933	3.38	1.933	36.45	2.933	2.99	3.93	1.63
.967	3.38	1.967	36.45	2.967	2.99	3.97	1.63
1.000	3.38	2.000	36.45	3.000	2.99	4.00	1.63

Unit Hyd Qpeak (cms)= .213

PEAK FLOW (cms)= .009 (i)
TIME TO PEAK (hrs)= 2.167
RUNOFF VOLUME (mm)= 2.376
TOTAL RAINFALL (mm)= 33.755
RUNOFF COEFFICIENT = .070

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

CALIB					
NASHYD (0105)	Area	(ha)= 2.00	Curve Number	(CN)= 77.8	
ID= 1 DT= 2.0 min	Ia	(mm)= 4.06	# of Linear Res.	(N)= 3.00	
	U.H. Tp(hrs)= .07				

Unit Hyd Qpeak (cms)= 1.093

PEAK FLOW (cms)= .112 (i)
TIME TO PEAK (hrs)= 1.933
RUNOFF VOLUME (mm)= 8.603
TOTAL RAINFALL (mm)= 33.755
RUNOFF COEFFICIENT = .255

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

CALIB					
NASHYD (0107)	Area	(ha)= .71	Curve Number	(CN)= 57.8	
ID= 1 DT= 2.0 min	Ia	(mm)= 10.20	# of Linear Res.	(N)= 3.00	
	U.H. Tp(hrs)= .25				

Unit Hyd Qpeak (cms)= .109

PEAK FLOW (cms)= .005 (i)
TIME TO PEAK (hrs)= 2.233
RUNOFF VOLUME (mm)= 2.654
TOTAL RAINFALL (mm)= 33.755
RUNOFF COEFFICIENT = .079

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

CALIB					
NASHYD (0103)	Area	(ha)= 1.91	Curve Number	(CN)= 60.0	
ID= 1 DT= 2.0 min	Ia	(mm)= 10.00	# of Linear Res.	(N)= 3.00	
	U.H. Tp(hrs)= .52				

Unit Hyd Qpeak (cms)= .140

PEAK FLOW (cms)= .010 (i)
TIME TO PEAK (hrs)= 2.600
RUNOFF VOLUME (mm)= 2.922
TOTAL RAINFALL (mm)= 33.755
RUNOFF COEFFICIENT = .087

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

CALIB					
NASHYD (0102)	Area	(ha)= .55	Curve Number	(CN)= 60.0	
ID= 1 DT= 2.0 min	Ia	(mm)= 10.00	# of Linear Res.	(N)= 3.00	
	U.H. Tp(hrs)= .31				

Unit Hyd Qpeak (cms)= .068

PEAK FLOW (cms)= .004 (i)
TIME TO PEAK (hrs)= 2.300
RUNOFF VOLUME (mm)= 2.921
TOTAL RAINFALL (mm)= 33.755
RUNOFF COEFFICIENT = .087

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

CALIB					
NASHYD (0101)	Area	(ha)= 4.09	Curve Number	(CN)= 60.0	
ID= 1 DT= 2.0 min	Ia	(mm)= 10.00	# of Linear Res.	(N)= 3.00	
	U.H. Tp(hrs)= .36				

Unit Hyd Qpeak (cms)= .434

PEAK FLOW (cms)= .027 (i)
TIME TO PEAK (hrs)= 2.400
RUNOFF VOLUME (mm)= 2.922
TOTAL RAINFALL (mm)= 33.755
RUNOFF COEFFICIENT = .087

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

CALIB			
NASHYD (0104)	Area (ha)= 1.96	Curve Number (CN)= 85.0	
ID= 1 DT= 2.0 min	Ia (mm)= 2.32	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= .07		

Unit Hyd Qpeak (cms)= 1.069

PEAK FLOW (cms)= .170 (i)
TIME TO PEAK (hrs)= 1.933
RUNOFF VOLUME (mm)= 12.917
TOTAL RAINFALL (mm)= 33.755
RUNOFF COEFFICIENT = .383

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

ADD HYD (0802)

1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0106):	1.12	.009	2.17	2.38
+ ID2= 2 (0105):	2.00	.112	1.93	8.60
ID = 3 (0802):	3.12	.115	1.93	6.37

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0801)

1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0107):	.71	.005	2.23	2.65
+ ID2= 2 (0103):	1.91	.010	2.60	2.92
ID = 3 (0801):	2.62	.014	2.43	2.85

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

SHIFT HYD (0804)
IN= 2---> OUT= 1
SHIFT= 22.0 min

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID= 2 (0104):	1.96	.17	1.93	12.92
SHIFT ID= 1 (0804):	1.96	.17	2.27	12.92

ADD HYD (0803)

1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0802):	3.12	.115	1.93	6.37
+ ID2= 2 (0801):	2.62	.014	2.43	2.85
ID = 3 (0803):	5.74	.117	1.93	4.76

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0805)

1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0101):	4.09	.027	2.40	2.92
+ ID2= 2 (0804):	1.96	.170	2.27	12.92
ID = 3 (0805):	6.05	.196	2.27	6.16

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
--------------------
| ADD HYD   (0806) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0102):       .55     .004     2.30     2.92
        + ID2= 2 (0805):      6.05     .196     2.27     6.16
          ================================================
          ID = 3 (0806):      6.60     .200     2.27     5.89

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
  ****************************
  ** SIMULATION NUMBER:   3 **
  ****************************


--------------------
|    READ STORM    |    Filename: I:\2016 Projects\116023 - 185 Mountain Road\
|                  |              Design\Hydrologic Model\
|                  |              Owen Sound Design Storms\OSCHI5.4HR
| Ptotal= 44.07 mm |    Comments: OWEN SOUND 5 YEAR 4 HOUR DURATION CHICAG
--------------------
                TIME    RAIN |  TIME    RAIN |  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr
                 .10    2.16 |  1.10    4.86 |  2.10   23.63 |  3.10    3.47
                 .20    2.29 |  1.20    5.59 |  2.20   15.14 |  3.20    3.21
                 .30    2.42 |  1.30    6.58 |  2.30   11.03 |  3.30    2.98
                 .40    2.58 |  1.40    8.01 |  2.40    8.65 |  3.40    2.78
                 .50    2.76 |  1.50   10.23 |  2.50    7.11 |  3.50    2.61
                 .60    2.97 |  1.60   14.08 |  2.60    6.04 |  3.60    2.46
                 .70    3.22 |  1.70   22.20 |  2.70    5.25 |  3.70    2.33
                 .80    3.51 |  1.80   47.44 |  2.80    4.65 |  3.80    2.21
                 .90    3.86 |  1.90  127.12 |  2.90    4.17 |  3.90    2.11
                1.00    4.30 |  2.00   48.87 |  3.00    3.79 |  4.00    2.01

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

--------------------
| CALIB            |
| NASHYD    (0106) |   Area    (ha)=   1.12   Curve Number   (CN)= 56.1
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.80   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .20

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


                          ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr
                .033    2.16 | 1.033    4.86 | 2.033   23.63 |  3.03    3.47
                .067    2.16 | 1.067    4.86 | 2.067   23.63 |  3.07    3.47
                .100    2.16 | 1.100    4.86 | 2.100   23.63 |  3.10    3.47
                .133    2.29 | 1.133    5.59 | 2.133   15.14 |  3.13    3.21
                .167    2.29 | 1.167    5.59 | 2.167   15.14 |  3.17    3.21
                .200    2.29 | 1.200    5.59 | 2.200   15.14 |  3.20    3.21
                .233    2.42 | 1.233    6.58 | 2.233   11.03 |  3.23    2.98
                .267    2.42 | 1.267    6.58 | 2.267   11.03 |  3.27    2.98
                .300    2.42 | 1.300    6.58 | 2.300   11.03 |  3.30    2.98
                .333    2.58 | 1.333    8.01 | 2.333    8.65 |  3.33    2.78
                .367    2.58 | 1.367    8.01 | 2.367    8.65 |  3.37    2.78
                .400    2.58 | 1.400    8.01 | 2.400    8.65 |  3.40    2.78
                .433    2.76 | 1.433   10.23 | 2.433    7.11 |  3.43    2.61
                .467    2.76 | 1.467   10.23 | 2.467    7.11 |  3.47    2.61
                .500    2.76 | 1.500   10.23 | 2.500    7.11 |  3.50    2.61
                .533    2.97 | 1.533   14.08 | 2.533    6.04 |  3.53    2.46
                .567    2.97 | 1.567   14.08 | 2.567    6.04 |  3.57    2.46
                .600    2.97 | 1.600   14.08 | 2.600    6.04 |  3.60    2.46
                .633    3.22 | 1.633   22.20 | 2.633    5.25 |  3.63    2.33
                .667    3.22 | 1.667   22.20 | 2.667    5.25 |  3.67    2.33
                .700    3.22 | 1.700   22.20 | 2.700    5.25 |  3.70    2.33
                .733    3.51 | 1.733   47.44 | 2.733    4.65 |  3.73    2.21
                .767    3.51 | 1.767   47.44 | 2.767    4.65 |  3.77    2.21
                .800    3.51 | 1.800   47.44 | 2.800    4.65 |  3.80    2.21
                .833    3.86 | 1.833  127.12 | 2.833    4.17 |  3.83    2.11
                .867    3.86 | 1.867  127.12 | 2.867    4.17 |  3.87    2.11
                .900    3.86 | 1.900  127.12 | 2.900    4.17 |  3.90    2.11
                .933    4.30 | 1.933   48.87 | 2.933    3.79 |  3.93    2.01
                .967    4.30 | 1.967   48.87 | 2.967    3.79 |  3.97    2.01
               1.000    4.30 | 2.000   48.87 | 3.000    3.79 |  4.00    2.01

     Unit Hyd Qpeak  (cms)=    .213

     PEAK FLOW       (cms)=    .019 (i)
     TIME TO PEAK    (hrs)=   2.133
     RUNOFF VOLUME    (mm)=   4.769
     TOTAL RAINFALL   (mm)=  44.068
```

RUNOFF COEFFICIENT = .108

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

CALIB					
NASHYD (0105)	Area (ha)=	2.00	Curve Number (CN)=	77.8
ID= 1 DT= 2.0 min	Ia (mm)=	4.06	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	.07		

Unit Hyd Qpeak (cms)= 1.093

PEAK FLOW (cms)= .188 (i)
TIME TO PEAK (hrs)= 1.933
RUNOFF VOLUME (mm)= 14.184
TOTAL RAINFALL (mm)= 44.068
RUNOFF COEFFICIENT = .322

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

CALIB					
NASHYD (0107)	Area (ha)=	.71	Curve Number (CN)=	57.8
ID= 1 DT= 2.0 min	Ia (mm)=	10.20	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	.25		

Unit Hyd Qpeak (cms)= .109

PEAK FLOW (cms)= .011 (i)
TIME TO PEAK (hrs)= 2.200
RUNOFF VOLUME (mm)= 5.229
TOTAL RAINFALL (mm)= 44.068
RUNOFF COEFFICIENT = .119

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

CALIB					
NASHYD (0103)	Area (ha)=	1.91	Curve Number (CN)=	60.0
ID= 1 DT= 2.0 min	Ia (mm)=	10.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	.52		

Unit Hyd Qpeak (cms)= .140

PEAK FLOW (cms)= .021 (i)
TIME TO PEAK (hrs)= 2.567
RUNOFF VOLUME (mm)= 5.706
TOTAL RAINFALL (mm)= 44.068
RUNOFF COEFFICIENT = .129

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

CALIB					
NASHYD (0102)	Area (ha)=	.55	Curve Number (CN)=	60.0
ID= 1 DT= 2.0 min	Ia (mm)=	10.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	.31		

Unit Hyd Qpeak (cms)= .068

PEAK FLOW (cms)= .008 (i)
TIME TO PEAK (hrs)= 2.300
RUNOFF VOLUME (mm)= 5.705
TOTAL RAINFALL (mm)= 44.068
RUNOFF COEFFICIENT = .129

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

CALIB					
NASHYD (0101)	Area (ha)=	4.09	Curve Number (CN)=	60.0
ID= 1 DT= 2.0 min	Ia (mm)=	10.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	.36		

Unit Hyd Qpeak (cms)= .434

PEAK FLOW (cms)= .057 (i)
TIME TO PEAK (hrs)= 2.367
RUNOFF VOLUME (mm)= 5.706
TOTAL RAINFALL (mm)= 44.068
RUNOFF COEFFICIENT = .129

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

```
--------------------
| CALIB            |
| NASHYD    (0104) |   Area    (ha)=   1.96   Curve Number   (CN)= 85.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   2.32   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .07

     Unit Hyd Qpeak  (cms)=   1.069

     PEAK FLOW       (cms)=    .267 (i)
     TIME TO PEAK    (hrs)=   1.933
     RUNOFF VOLUME    (mm)=  20.068
     TOTAL RAINFALL   (mm)=  44.068
     RUNOFF COEFFICIENT   =    .455

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

```
--------------------
| ADD HYD   (0802) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0106):     1.12    .019     2.13     4.77
        + ID2= 2 (0105):     2.00    .188     1.93    14.18
          ================================================
          ID = 3 (0802):     3.12    .196     1.93    10.81

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ADD HYD   (0801) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0107):      .71    .011     2.20     5.23
        + ID2= 2 (0103):     1.91    .021     2.57     5.71
          ================================================
          ID = 3 (0801):     2.62    .029     2.40     5.58

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| SHIFT HYD (0804) |
| IN= 2---> OUT= 1 |
| SHIFT= 22.0 min  |       AREA     QPEAK     TPEAK      R.V.
--------------------       (ha)     (cms)     (hrs)      (mm)
          ID= 2 (0104):    1.96      .27      1.93     20.07
    SHIFT ID= 1 (0804):    1.96      .27      2.27     20.07
```

```
--------------------
| ADD HYD   (0803) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0802):     3.12    .196     1.93    10.81
        + ID2= 2 (0801):     2.62    .029     2.40     5.58
          ================================================
          ID = 3 (0803):     5.74    .201     1.93     8.42

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ADD HYD   (0805) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0101):     4.09    .057     2.37     5.71
        + ID2= 2 (0804):     1.96    .267     2.27    20.07
          ================================================
          ID = 3 (0805):     6.05    .322     2.27    10.36

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ADD HYD   (0806) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0102):      .55    .008     2.30     5.70
        + ID2= 2 (0805):     6.05    .322     2.27    10.36
          ================================================
          ID = 3 (0806):     6.60    .330     2.27     9.97
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
**** SIMULATION NUMBER: 4 ****
****

READ STORM	Filename: I:\2016 Projects\116023 - 185 Mountain Road\Design\Hydrologic Model\Owen Sound Design Storms\OSchi10.4hr
Ptotal= 50.59 mm	Comments: OWEN SOUND 10 YEAR 4 HOUR DURATION CHICA

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.10	2.37	1.10	5.44	2.10	27.54	3.10	3.85
.20	2.50	1.20	6.28	2.20	17.50	3.20	3.54
.30	2.66	1.30	7.44	2.30	12.66	3.30	3.29
.40	2.84	1.40	9.10	2.40	9.86	3.40	3.06
.50	3.04	1.50	11.71	2.50	8.06	3.50	2.87
.60	3.28	1.60	16.26	2.60	6.81	3.60	2.70
.70	3.56	1.70	25.85	2.70	5.89	3.70	2.55
.80	3.89	1.80	55.53	2.80	5.20	3.80	2.42
.90	4.29	1.90	146.69	2.90	4.65	3.90	2.30
1.00	4.80	2.00	57.21	3.00	4.21	4.00	2.20

CALIB			
NASHYD (0106)	Area (ha)= 1.12	Curve Number (CN)= 56.1	
ID= 1 DT= 2.0 min	Ia (mm)= 10.80	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= .20		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.033	2.37	1.033	5.44	2.033	27.54	3.03	3.85
.067	2.37	1.067	5.44	2.067	27.54	3.07	3.85
.100	2.37	1.100	5.44	2.100	27.54	3.10	3.85
.133	2.50	1.133	6.28	2.133	17.50	3.13	3.54
.167	2.50	1.167	6.28	2.167	17.50	3.17	3.54
.200	2.50	1.200	6.28	2.200	17.50	3.20	3.54
.233	2.66	1.233	7.44	2.233	12.66	3.23	3.29
.267	2.66	1.267	7.44	2.267	12.66	3.27	3.29
.300	2.66	1.300	7.44	2.300	12.66	3.30	3.29
.333	2.84	1.333	9.10	2.333	9.86	3.33	3.06
.367	2.84	1.367	9.10	2.367	9.86	3.37	3.06
.400	2.84	1.400	9.10	2.400	9.86	3.40	3.06
.433	3.04	1.433	11.71	2.433	8.06	3.43	2.87
.467	3.04	1.467	11.71	2.467	8.06	3.47	2.87
.500	3.04	1.500	11.71	2.500	8.06	3.50	2.87
.533	3.28	1.533	16.26	2.533	6.81	3.53	2.70
.567	3.28	1.567	16.26	2.567	6.81	3.57	2.70
.600	3.28	1.600	16.26	2.600	6.81	3.60	2.70
.633	3.56	1.633	25.85	2.633	5.89	3.63	2.55
.667	3.56	1.667	25.85	2.667	5.89	3.67	2.55
.700	3.56	1.700	25.85	2.700	5.89	3.70	2.55
.733	3.89	1.733	55.53	2.733	5.20	3.73	2.42
.767	3.89	1.767	55.53	2.767	5.20	3.77	2.42
.800	3.89	1.800	55.53	2.800	5.20	3.80	2.42
.833	4.29	1.833	146.69	2.833	4.65	3.83	2.30
.867	4.29	1.867	146.69	2.867	4.65	3.87	2.30
.900	4.29	1.900	146.69	2.900	4.65	3.90	2.30
.933	4.80	1.933	57.21	2.933	4.21	3.93	2.20
.967	4.80	1.967	57.21	2.967	4.21	3.97	2.20
1.000	4.80	2.000	57.21	3.000	4.21	4.00	2.20

Unit Hyd Qpeak (cms)= .213

PEAK FLOW (cms)= .027 (i)
TIME TO PEAK (hrs)= 2.133
RUNOFF VOLUME (mm)= 6.636
TOTAL RAINFALL (mm)= 50.590
RUNOFF COEFFICIENT = .131

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

CALIB			
NASHYD (0105)	Area (ha)= 2.00	Curve Number (CN)= 77.8	
ID= 1 DT= 2.0 min	Ia (mm)= 4.06	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= .07		

```
     Unit Hyd Qpeak  (cms)=   1.093

     PEAK FLOW       (cms)=    .245 (i)
     TIME TO PEAK    (hrs)=   1.933
     RUNOFF VOLUME    (mm)=  18.134
     TOTAL RAINFALL   (mm)=  50.590
     RUNOFF COEFFICIENT   =    .358

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0107) |   Area    (ha)=    .71   Curve Number   (CN)= 57.8
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.20   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .25

     Unit Hyd Qpeak  (cms)=    .109

     PEAK FLOW       (cms)=    .016 (i)
     TIME TO PEAK    (hrs)=   2.200
     RUNOFF VOLUME    (mm)=   7.223
     TOTAL RAINFALL   (mm)=  50.590
     RUNOFF COEFFICIENT   =    .143

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0103) |   Area    (ha)=   1.91   Curve Number   (CN)= 60.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .52

     Unit Hyd Qpeak  (cms)=    .140

     PEAK FLOW       (cms)=    .029 (i)
     TIME TO PEAK    (hrs)=   2.567
     RUNOFF VOLUME    (mm)=   7.848
     TOTAL RAINFALL   (mm)=  50.590
     RUNOFF COEFFICIENT   =    .155

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0102) |   Area    (ha)=    .55   Curve Number   (CN)= 60.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .31

     Unit Hyd Qpeak  (cms)=    .068

     PEAK FLOW       (cms)=    .012 (i)
     TIME TO PEAK    (hrs)=   2.267
     RUNOFF VOLUME    (mm)=   7.847
     TOTAL RAINFALL   (mm)=  50.590
     RUNOFF COEFFICIENT   =    .155

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0101) |   Area    (ha)=   4.09   Curve Number   (CN)= 60.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .36

     Unit Hyd Qpeak  (cms)=    .434

     PEAK FLOW       (cms)=    .081 (i)
     TIME TO PEAK    (hrs)=   2.333
     RUNOFF VOLUME    (mm)=   7.848
     TOTAL RAINFALL   (mm)=  50.590
     RUNOFF COEFFICIENT   =    .155

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0104) |   Area    (ha)=   1.96   Curve Number   (CN)= 85.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   2.32   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .07

     Unit Hyd Qpeak  (cms)=   1.069

     PEAK FLOW       (cms)=    .336 (i)
     TIME TO PEAK    (hrs)=   1.933
```

```
     RUNOFF VOLUME    (mm)=  24.949
     TOTAL RAINFALL   (mm)=  50.590
     RUNOFF COEFFICIENT   =    .493

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

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

--------------------
| ADD HYD   (0802) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0106):     1.12    .027     2.13     6.64
        + ID2= 2 (0105):     2.00    .245     1.93    18.13
          ================================================
          ID = 3 (0802):     3.12    .256     1.93    14.02

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0801) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0107):      .71    .016     2.20     7.22
        + ID2= 2 (0103):     1.91    .029     2.57     7.85
          ================================================
          ID = 3 (0801):     2.62    .041     2.40     7.68

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| SHIFT HYD (0804) |
| IN= 2---> OUT= 1 |
| SHIFT= 22.0 min  |      AREA     QPEAK     TPEAK      R.V.
--------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (0104):    1.96      .34      1.93     24.95
    SHIFT ID= 1 (0804):    1.96      .34      2.27     24.95

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

--------------------
| ADD HYD   (0803) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0802):     3.12    .256     1.93    14.02
        + ID2= 2 (0801):     2.62    .041     2.40     7.68
          ================================================
          ID = 3 (0803):     5.74    .264     1.93    11.12

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0805) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0101):     4.09    .081     2.33     7.85
        + ID2= 2 (0804):     1.96    .336     2.27    24.95
          ================================================
          ID = 3 (0805):     6.05    .415     2.27    13.38

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0806) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0102):      .55    .012     2.27     7.85
        + ID2= 2 (0805):     6.05    .415     2.27    13.38
          ================================================
          ID = 3 (0806):     6.60    .427     2.27    12.92

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
  ****************************
  ** SIMULATION NUMBER:   5 **
  ****************************


--------------------
|    READ STORM    |    Filename: I:\2016 Projects\116023 - 185 Mountain Road\
|                  |              Design\Hydrologic Model\
```

| | Owen Sound Design Storms\OSCHI25.4HR
| Ptotal= 59.08 mm | Comments: OWEN SOUND 25 YEAR 4 HOUR DURATION CHICA

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.10	2.69	1.10	6.28	2.10	32.51	3.10	4.41
.20	2.85	1.20	7.27	2.20	20.58	3.20	4.06
.30	3.03	1.30	8.63	2.30	14.82	3.30	3.76
.40	3.24	1.40	10.61	2.40	11.50	3.40	3.50
.50	3.47	1.50	13.69	2.50	9.37	3.50	3.28
.60	3.75	1.60	19.10	2.60	7.89	3.60	3.08
.70	4.07	1.70	30.50	2.70	6.82	3.70	2.91
.80	4.46	1.80	65.56	2.80	6.00	3.80	2.76
.90	4.94	1.90	170.99	2.90	5.35	3.90	2.62
1.00	5.53	2.00	67.54	3.00	4.84	4.00	2.50

CALIB				
NASHYD (0106)	Area (ha)= 1.12	Curve Number (CN)= 56.1		
ID= 1 DT= 2.0 min	Ia (mm)= 10.80	# of Linear Res.(N)= 3.00		
	U.H. Tp(hrs)= .20			

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.033	2.69	1.033	6.28	2.033	32.51	3.03	4.41
.067	2.69	1.067	6.28	2.067	32.51	3.07	4.41
.100	2.69	1.100	6.28	2.100	32.51	3.10	4.41
.133	2.85	1.133	7.27	2.133	20.58	3.13	4.06
.167	2.85	1.167	7.27	2.167	20.58	3.17	4.06
.200	2.85	1.200	7.27	2.200	20.58	3.20	4.06
.233	3.03	1.233	8.63	2.233	14.82	3.23	3.76
.267	3.03	1.267	8.63	2.267	14.82	3.27	3.76
.300	3.03	1.300	8.63	2.300	14.82	3.30	3.76
.333	3.24	1.333	10.61	2.333	11.50	3.33	3.50
.367	3.24	1.367	10.61	2.367	11.50	3.37	3.50
.400	3.24	1.400	10.61	2.400	11.50	3.40	3.50
.433	3.47	1.433	13.69	2.433	9.37	3.43	3.28
.467	3.47	1.467	13.69	2.467	9.37	3.47	3.28
.500	3.47	1.500	13.69	2.500	9.37	3.50	3.28
.533	3.75	1.533	19.10	2.533	7.89	3.53	3.08
.567	3.75	1.567	19.10	2.567	7.89	3.57	3.08
.600	3.75	1.600	19.10	2.600	7.89	3.60	3.08
.633	4.07	1.633	30.50	2.633	6.82	3.63	2.91
.667	4.07	1.667	30.50	2.667	6.82	3.67	2.91
.700	4.07	1.700	30.50	2.700	6.82	3.70	2.91
.733	4.46	1.733	65.56	2.733	6.00	3.73	2.76
.767	4.46	1.767	65.56	2.767	6.00	3.77	2.76
.800	4.46	1.800	65.56	2.800	6.00	3.80	2.76
.833	4.94	1.833	170.99	2.833	5.35	3.83	2.62
.867	4.94	1.867	170.99	2.867	5.35	3.87	2.62
.900	4.94	1.900	170.99	2.900	5.35	3.90	2.62
.933	5.53	1.933	67.54	2.933	4.84	3.93	2.50
.967	5.53	1.967	67.54	2.967	4.84	3.97	2.50
1.000	5.53	2.000	67.54	3.000	4.84	4.00	2.50

Unit Hyd Qpeak (cms)= .213

PEAK FLOW (cms)= .039 (i)
TIME TO PEAK (hrs)= 2.133
RUNOFF VOLUME (mm)= 9.433
TOTAL RAINFALL (mm)= 59.076
RUNOFF COEFFICIENT = .160

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

CALIB				
NASHYD (0105)	Area (ha)= 2.00	Curve Number (CN)= 77.8		
ID= 1 DT= 2.0 min	Ia (mm)= 4.06	# of Linear Res.(N)= 3.00		
	U.H. Tp(hrs)= .07			

Unit Hyd Qpeak (cms)= 1.093

PEAK FLOW (cms)= .322 (i)
TIME TO PEAK (hrs)= 1.933
RUNOFF VOLUME (mm)= 23.665
TOTAL RAINFALL (mm)= 59.076
RUNOFF COEFFICIENT = .401

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

```
--------------------
| CALIB            |
| NASHYD    (0107) |   Area    (ha)=    .71   Curve Number   (CN)= 57.8
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.20   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .25

     Unit Hyd Qpeak  (cms)=    .109

     PEAK FLOW       (cms)=    .024 (i)
     TIME TO PEAK    (hrs)=   2.200
     RUNOFF VOLUME    (mm)=  10.194
     TOTAL RAINFALL   (mm)=  59.076
     RUNOFF COEFFICIENT   =    .173

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0103) |   Area    (ha)=   1.91   Curve Number   (CN)= 60.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .52

     Unit Hyd Qpeak  (cms)=    .140

     PEAK FLOW       (cms)=    .042 (i)
     TIME TO PEAK    (hrs)=   2.533
     RUNOFF VOLUME    (mm)=  11.027
     TOTAL RAINFALL   (mm)=  59.076
     RUNOFF COEFFICIENT   =    .187

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0102) |   Area    (ha)=    .55   Curve Number   (CN)= 60.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .31

     Unit Hyd Qpeak  (cms)=    .068

     PEAK FLOW       (cms)=    .017 (i)
     TIME TO PEAK    (hrs)=   2.267
     RUNOFF VOLUME    (mm)=  11.026
     TOTAL RAINFALL   (mm)=  59.076
     RUNOFF COEFFICIENT   =    .187

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0101) |   Area    (ha)=   4.09   Curve Number   (CN)= 60.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .36

     Unit Hyd Qpeak  (cms)=    .434

     PEAK FLOW       (cms)=    .116 (i)
     TIME TO PEAK    (hrs)=   2.333
     RUNOFF VOLUME    (mm)=  11.027
     TOTAL RAINFALL   (mm)=  59.076
     RUNOFF COEFFICIENT   =    .187

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0104) |   Area    (ha)=   1.96   Curve Number   (CN)= 85.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   2.32   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .07

     Unit Hyd Qpeak  (cms)=   1.069

     PEAK FLOW       (cms)=    .428 (i)
     TIME TO PEAK    (hrs)=   1.933
     RUNOFF VOLUME    (mm)=  31.610
     TOTAL RAINFALL   (mm)=  59.076
     RUNOFF COEFFICIENT   =    .535

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

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

--------------------
| ADD HYD   (0802) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
```

	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0106):	1.12	.039	2.13	9.43
+ ID2= 2 (0105):	2.00	.322	1.93	23.66
ID = 3 (0802):	3.12	.340	1.93	18.57

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0801)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0107):	.71	.024	2.20	10.19
+ ID2= 2 (0103):	1.91	.042	2.53	11.03
ID = 3 (0801):	2.62	.059	2.37	10.80

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

SHIFT HYD (0804)
IN= 2---> OUT= 1
SHIFT= 22.0 min

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID= 2 (0104):	1.96	.43	1.93	31.61
SHIFT ID= 1 (0804):	1.96	.43	2.27	31.61

ADD HYD (0803)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0802):	3.12	.340	1.93	18.57
+ ID2= 2 (0801):	2.62	.059	2.37	10.80
ID = 3 (0803):	5.74	.353	1.93	15.02

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0805)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0101):	4.09	.116	2.33	11.03
+ ID2= 2 (0804):	1.96	.428	2.27	31.61
ID = 3 (0805):	6.05	.541	2.27	17.69

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0806)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0102):	.55	.017	2.27	11.03
+ ID2= 2 (0805):	6.05	.541	2.27	17.69
ID = 3 (0806):	6.60	.559	2.27	17.14

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION NUMBER: 6 **
****

READ STORM	Filename: I:\2016 Projects\116023 - 185 Mountain Road\Design\Hydrologic Model\Owen Sound Design Storms\OSchi50.4hr
Ptotal= 65.65 mm	Comments: OWEN SOUND 50 YEAR 4 HOUR DURATION CHICA

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.10	2.87	1.10	6.88	2.10	36.93	3.10	4.78
.20	3.04	1.20	8.01	2.20	23.25	3.20	4.39
.30	3.24	1.30	9.55	2.30	16.64	3.30	4.05
.40	3.47	1.40	11.81	2.40	12.83	3.40	3.76
.50	3.73	1.50	15.34	2.50	10.39	3.50	3.52
.60	4.04	1.60	21.55	2.60	8.71	3.60	3.30

.70	4.40	1.70	34.62	2.70	7.49	3.70	3.11
.80	4.84	1.80	74.20	2.80	6.56	3.80	2.94
.90	5.37	1.90	187.94	2.90	5.84	3.90	2.79
1.00	6.03	2.00	76.42	3.00	5.26	4.00	2.65

CALIB			
NASHYD (0106)	Area (ha)= 1.12	Curve Number (CN)= 56.1	
ID= 1 DT= 2.0 min	Ia (mm)= 10.80	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= .20		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.033	2.87	1.033	6.88	2.033	36.93	3.03	4.78
.067	2.87	1.067	6.88	2.067	36.93	3.07	4.78
.100	2.87	1.100	6.88	2.100	36.93	3.10	4.78
.133	3.04	1.133	8.01	2.133	23.25	3.13	4.39
.167	3.04	1.167	8.01	2.167	23.25	3.17	4.39
.200	3.04	1.200	8.01	2.200	23.25	3.20	4.39
.233	3.24	1.233	9.55	2.233	16.64	3.23	4.05
.267	3.24	1.267	9.55	2.267	16.64	3.27	4.05
.300	3.24	1.300	9.55	2.300	16.64	3.30	4.05
.333	3.47	1.333	11.81	2.333	12.83	3.33	3.76
.367	3.47	1.367	11.81	2.367	12.83	3.37	3.76
.400	3.47	1.400	11.81	2.400	12.83	3.40	3.76
.433	3.73	1.433	15.34	2.433	10.39	3.43	3.52
.467	3.73	1.467	15.34	2.467	10.39	3.47	3.52
.500	3.73	1.500	15.34	2.500	10.39	3.50	3.52
.533	4.04	1.533	21.55	2.533	8.71	3.53	3.30
.567	4.04	1.567	21.55	2.567	8.71	3.57	3.30
.600	4.04	1.600	21.55	2.600	8.71	3.60	3.30
.633	4.40	1.633	34.62	2.633	7.49	3.63	3.11
.667	4.40	1.667	34.62	2.667	7.49	3.67	3.11
.700	4.40	1.700	34.62	2.700	7.49	3.70	3.11
.733	4.84	1.733	74.20	2.733	6.56	3.73	2.94
.767	4.84	1.767	74.20	2.767	6.56	3.77	2.94
.800	4.84	1.800	74.20	2.800	6.56	3.80	2.94
.833	5.37	1.833	187.94	2.833	5.84	3.83	2.79
.867	5.37	1.867	187.94	2.867	5.84	3.87	2.79
.900	5.37	1.900	187.94	2.900	5.84	3.90	2.79
.933	6.03	1.933	76.42	2.933	5.26	3.93	2.65
.967	6.03	1.967	76.42	2.967	5.26	3.97	2.65
1.000	6.03	2.000	76.42	3.000	5.26	4.00	2.65

Unit Hyd Qpeak (cms)= .213

PEAK FLOW (cms)= .050 (i)
TIME TO PEAK (hrs)= 2.133
RUNOFF VOLUME (mm)= 11.863
TOTAL RAINFALL (mm)= 65.654
RUNOFF COEFFICIENT = .181

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

CALIB			
NASHYD (0105)	Area (ha)= 2.00	Curve Number (CN)= 77.8	
ID= 1 DT= 2.0 min	Ia (mm)= 4.06	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= .07		

Unit Hyd Qpeak (cms)= 1.093

PEAK FLOW (cms)= .384 (i)
TIME TO PEAK (hrs)= 1.933
RUNOFF VOLUME (mm)= 28.206
TOTAL RAINFALL (mm)= 65.654
RUNOFF COEFFICIENT = .430

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

CALIB			
NASHYD (0107)	Area (ha)= .71	Curve Number (CN)= 57.8	
ID= 1 DT= 2.0 min	Ia (mm)= 10.20	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= .25		

Unit Hyd Qpeak (cms)= .109

PEAK FLOW (cms)= .030 (i)
TIME TO PEAK (hrs)= 2.200
RUNOFF VOLUME (mm)= 12.764

```
     TOTAL RAINFALL   (mm)=  65.654
     RUNOFF COEFFICIENT   =    .194

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0103) |   Area    (ha)=   1.91   Curve Number   (CN)= 60.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .52

     Unit Hyd Qpeak  (cms)=    .140

     PEAK FLOW       (cms)=    .053 (i)
     TIME TO PEAK    (hrs)=   2.533
     RUNOFF VOLUME    (mm)=  13.766
     TOTAL RAINFALL   (mm)=  65.654
     RUNOFF COEFFICIENT   =    .210

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0102) |   Area    (ha)=    .55   Curve Number   (CN)= 60.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .31

     Unit Hyd Qpeak  (cms)=    .068

     PEAK FLOW       (cms)=    .022 (i)
     TIME TO PEAK    (hrs)=   2.267
     RUNOFF VOLUME    (mm)=  13.766
     TOTAL RAINFALL   (mm)=  65.654
     RUNOFF COEFFICIENT   =    .210

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0101) |   Area    (ha)=   4.09   Curve Number   (CN)= 60.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .36

     Unit Hyd Qpeak  (cms)=    .434

     PEAK FLOW       (cms)=    .147 (i)
     TIME TO PEAK    (hrs)=   2.333
     RUNOFF VOLUME    (mm)=  13.767
     TOTAL RAINFALL   (mm)=  65.654
     RUNOFF COEFFICIENT   =    .210

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0104) |   Area    (ha)=   1.96   Curve Number   (CN)= 85.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   2.32   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .07

     Unit Hyd Qpeak  (cms)=   1.069

     PEAK FLOW       (cms)=    .499 (i)
     TIME TO PEAK    (hrs)=   1.933
     RUNOFF VOLUME    (mm)=  36.968
     TOTAL RAINFALL   (mm)=  65.654
     RUNOFF COEFFICIENT   =    .563

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

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

--------------------
| ADD HYD   (0802) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
          ID1= 1 (0106):     1.12     .050     2.13    11.86
        + ID2= 2 (0105):     2.00     .384     1.93    28.21
          ================================================
          ID = 3 (0802):     3.12     .407     1.93    22.35

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
```

| ADD HYD (0801) |
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0107):	.71	.030	2.20	12.76
+ ID2= 2 (0103):	1.91	.053	2.53	13.77
ID = 3 (0801):	2.62	.074	2.37	13.49

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| SHIFT HYD (0804) |
| IN= 2---> OUT= 1 |
SHIFT= 22.0 min	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID= 2 (0104):	1.96	.50	1.93	36.97
SHIFT ID= 1 (0804):	1.96	.50	2.27	36.97

| ADD HYD (0803) |
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0802):	3.12	.407	1.93	22.35
+ ID2= 2 (0801):	2.62	.074	2.37	13.49
ID = 3 (0803):	5.74	.424	1.93	18.31

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0805) |
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0101):	4.09	.147	2.33	13.77
+ ID2= 2 (0804):	1.96	.499	2.27	36.97
ID = 3 (0805):	6.05	.643	2.27	21.28

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0806) |
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0102):	.55	.022	2.27	13.77
+ ID2= 2 (0805):	6.05	.643	2.27	21.28
ID = 3 (0806):	6.60	.665	2.27	20.65

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION NUMBER: 7 **
****

READ STORM	Filename: I:\2016 Projects\116023 - 185 Mountain Road\Design\Hydrologic Model\Owen Sound Design Storms\OSCHI100.4HR
Ptotal= 71.77 mm	Comments: OWEN SOUND 100 YEAR 4 HOUR DURATION CHIC

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.10	3.08	1.10	7.44	2.10	40.41	3.10	5.16
.20	3.27	1.20	8.67	2.20	25.38	3.20	4.73
.30	3.49	1.30	10.36	2.30	18.12	3.30	4.37
.40	3.73	1.40	12.83	2.40	13.95	3.40	4.05
.50	4.02	1.50	16.70	2.50	11.28	3.50	3.79
.60	4.35	1.60	23.51	2.60	9.44	3.60	3.55
.70	4.75	1.70	37.88	2.70	8.10	3.70	3.35
.80	5.22	1.80	81.47	2.80	7.09	3.80	3.16
.90	5.80	1.90	206.92	2.90	6.31	3.90	3.00
1.00	6.52	2.00	83.92	3.00	5.67	4.00	2.85

CALIB	
NASHYD (0106)	Area (ha)= 1.12 Curve Number (CN)= 56.1
ID= 1 DT= 2.0 min	Ia (mm)= 10.80 # of Linear Res.(N)= 3.00

---------- U.H. Tp(hrs)= .20

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.033	3.08	1.033	7.44	2.033	40.41	3.03	5.16
.067	3.08	1.067	7.44	2.067	40.41	3.07	5.16
.100	3.08	1.100	7.44	2.100	40.41	3.10	5.16
.133	3.27	1.133	8.67	2.133	25.38	3.13	4.73
.167	3.27	1.167	8.67	2.167	25.38	3.17	4.73
.200	3.27	1.200	8.67	2.200	25.38	3.20	4.73
.233	3.49	1.233	10.36	2.233	18.12	3.23	4.37
.267	3.49	1.267	10.36	2.267	18.12	3.27	4.37
.300	3.49	1.300	10.36	2.300	18.12	3.30	4.37
.333	3.73	1.333	12.83	2.333	13.95	3.33	4.05
.367	3.73	1.367	12.83	2.367	13.95	3.37	4.05
.400	3.73	1.400	12.83	2.400	13.95	3.40	4.05
.433	4.02	1.433	16.70	2.433	11.28	3.43	3.79
.467	4.02	1.467	16.70	2.467	11.28	3.47	3.79
.500	4.02	1.500	16.70	2.500	11.28	3.50	3.79
.533	4.35	1.533	23.51	2.533	9.44	3.53	3.55
.567	4.35	1.567	23.51	2.567	9.44	3.57	3.55
.600	4.35	1.600	23.51	2.600	9.44	3.60	3.55
.633	4.75	1.633	37.88	2.633	8.10	3.63	3.35
.667	4.75	1.667	37.88	2.667	8.10	3.67	3.35
.700	4.75	1.700	37.88	2.700	8.10	3.70	3.35
.733	5.22	1.733	81.47	2.733	7.09	3.73	3.16
.767	5.22	1.767	81.47	2.767	7.09	3.77	3.16
.800	5.22	1.800	81.47	2.800	7.09	3.80	3.16
.833	5.80	1.833	206.92	2.833	6.31	3.83	3.00
.867	5.80	1.867	206.92	2.867	6.31	3.87	3.00
.900	5.80	1.900	206.92	2.900	6.31	3.90	3.00
.933	6.52	1.933	83.92	2.933	5.67	3.93	2.85
.967	6.52	1.967	83.92	2.967	5.67	3.97	2.85
1.000	6.52	2.000	83.92	3.000	5.67	4.00	2.85

Unit Hyd Qpeak (cms)= .213

PEAK FLOW (cms)= .061 (i)
TIME TO PEAK (hrs)= 2.133
RUNOFF VOLUME (mm)= 14.311
TOTAL RAINFALL (mm)= 71.769
RUNOFF COEFFICIENT = .199

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

CALIB					
NASHYD (0105)	Area (ha)=	2.00	Curve Number (CN)=	77.8	
ID= 1 DT= 2.0 min	Ia (mm)=	4.06	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	.07			

Unit Hyd Qpeak (cms)= 1.093

PEAK FLOW (cms)= .448 (i)
TIME TO PEAK (hrs)= 1.933
RUNOFF VOLUME (mm)= 32.598
TOTAL RAINFALL (mm)= 71.769
RUNOFF COEFFICIENT = .454

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

CALIB					
NASHYD (0107)	Area (ha)=	.71	Curve Number (CN)=	57.8	
ID= 1 DT= 2.0 min	Ia (mm)=	10.20	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	.25			

Unit Hyd Qpeak (cms)= .109

PEAK FLOW (cms)= .037 (i)
TIME TO PEAK (hrs)= 2.200
RUNOFF VOLUME (mm)= 15.345
TOTAL RAINFALL (mm)= 71.769
RUNOFF COEFFICIENT = .214

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

CALIB					
NASHYD (0103)	Area (ha)=	1.91	Curve Number (CN)=	60.0	
ID= 1 DT= 2.0 min	Ia (mm)=	10.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	.52			

```
     Unit Hyd Qpeak  (cms)=    .140

     PEAK FLOW       (cms)=    .064 (i)
     TIME TO PEAK    (hrs)=   2.533
     RUNOFF VOLUME    (mm)=  16.509
     TOTAL RAINFALL   (mm)=  71.769
     RUNOFF COEFFICIENT   =    .230

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0102) |   Area    (ha)=    .55   Curve Number   (CN)= 60.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .31

     Unit Hyd Qpeak  (cms)=    .068

     PEAK FLOW       (cms)=    .026 (i)
     TIME TO PEAK    (hrs)=   2.267
     RUNOFF VOLUME    (mm)=  16.508
     TOTAL RAINFALL   (mm)=  71.769
     RUNOFF COEFFICIENT   =    .230

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0101) |   Area    (ha)=   4.09   Curve Number   (CN)= 60.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .36

     Unit Hyd Qpeak  (cms)=    .434

     PEAK FLOW       (cms)=    .178 (i)
     TIME TO PEAK    (hrs)=   2.333
     RUNOFF VOLUME    (mm)=  16.509
     TOTAL RAINFALL   (mm)=  71.769
     RUNOFF COEFFICIENT   =    .230

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0104) |   Area    (ha)=   1.96   Curve Number   (CN)= 85.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   2.32   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .07

     Unit Hyd Qpeak  (cms)=   1.069

     PEAK FLOW       (cms)=    .572 (i)
     TIME TO PEAK    (hrs)=   1.933
     RUNOFF VOLUME    (mm)=  42.073
     TOTAL RAINFALL   (mm)=  71.769
     RUNOFF COEFFICIENT   =    .586

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

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

--------------------
| ADD HYD   (0802) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0106):     1.12    .061     2.13    14.31
       + ID2= 2 (0105):     2.00    .448     1.93    32.60
         ================================================
         ID = 3 (0802):     3.12    .478     1.93    26.05

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0801) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0107):      .71    .037     2.20    15.35
       + ID2= 2 (0103):     1.91    .064     2.53    16.51
         ================================================
         ID = 3 (0801):     2.62    .090     2.37    16.19

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
```

SHIFT HYD (0804)					
IN= 2---> OUT= 1					
SHIFT= 22.0 min		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID= 2 (0104):	1.96	.57	1.93	42.07
	SHIFT ID= 1 (0804):	1.96	.57	2.27	42.07

ADD HYD (0803)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 1 (0802):	3.12	.478	1.93	26.05
	+ ID2= 2 (0801):	2.62	.090	2.37	16.19
	ID = 3 (0803):	5.74	.500	1.93	21.55

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0805)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 1 (0101):	4.09	.178	2.33	16.51
	+ ID2= 2 (0804):	1.96	.572	2.27	42.07
	ID = 3 (0805):	6.05	.747	2.27	24.79

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0806)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 1 (0102):	.55	.026	2.27	16.51
	+ ID2= 2 (0805):	6.05	.747	2.27	24.79
	ID = 3 (0806):	6.60	.774	2.27	24.10

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION NUMBER: 8 **
****

READ STORM	Filename: I:\2016 Projects\116023 - 185 Mountain Road\Design\Hydrologic Model\Owen Sound Design Storms\TIMMINS.12
Ptotal=193.00 mm	Comments: TIMMINS REGIONAL 12 HOUR DURATION STORM

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.20	15.00	3.20	3.00	6.20	43.00	9.20	13.00
.40	15.00	3.40	3.00	6.40	43.00	9.40	13.00
.60	15.00	3.60	3.00	6.60	43.00	9.60	13.00
.80	15.00	3.80	3.00	6.80	43.00	9.80	13.00
1.00	15.00	4.00	3.00	7.00	43.00	10.00	13.00
1.20	20.00	4.20	5.00	7.20	20.00	10.20	13.00
1.40	20.00	4.40	5.00	7.40	20.00	10.40	13.00
1.60	20.00	4.60	5.00	7.60	20.00	10.60	13.00
1.80	20.00	4.80	5.00	7.80	20.00	10.80	13.00
2.00	20.00	5.00	5.00	8.00	20.00	11.00	13.00
2.20	10.00	5.20	20.00	8.20	23.00	11.20	8.00
2.40	10.00	5.40	20.00	8.40	23.00	11.40	8.00
2.60	10.00	5.60	20.00	8.60	23.00	11.60	8.00
2.80	10.00	5.80	20.00	8.80	23.00	11.80	8.00
3.00	10.00	6.00	20.00	9.00	23.00	12.00	8.00

CALIB			
NASHYD (0106)	Area (ha)= 1.12	Curve Number (CN)= 56.1	
ID= 1 DT= 2.0 min	Ia (mm)= 10.80	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= .20		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.033	15.00	3.033	3.00	6.033	43.00	9.03	13.00
.067	15.00	3.067	3.00	6.067	43.00	9.07	13.00
.100	15.00	3.100	3.00	6.100	43.00	9.10	13.00
.133	15.00	3.133	3.00	6.133	43.00	9.13	13.00
.167	15.00	3.167	3.00	6.167	43.00	9.17	13.00
.200	15.00	3.200	3.00	6.200	43.00	9.20	13.00
.233	15.00	3.233	3.00	6.233	43.00	9.23	13.00
.267	15.00	3.267	3.00	6.267	43.00	9.27	13.00
.300	15.00	3.300	3.00	6.300	43.00	9.30	13.00
.333	15.00	3.333	3.00	6.333	43.00	9.33	13.00
.367	15.00	3.367	3.00	6.367	43.00	9.37	13.00
.400	15.00	3.400	3.00	6.400	43.00	9.40	13.00
.433	15.00	3.433	3.00	6.433	43.00	9.43	13.00
.467	15.00	3.467	3.00	6.467	43.00	9.47	13.00
.500	15.00	3.500	3.00	6.500	43.00	9.50	13.00
.533	15.00	3.533	3.00	6.533	43.00	9.53	13.00
.567	15.00	3.567	3.00	6.567	43.00	9.57	13.00
.600	15.00	3.600	3.00	6.600	43.00	9.60	13.00
.633	15.00	3.633	3.00	6.633	43.00	9.63	13.00
.667	15.00	3.667	3.00	6.667	43.00	9.67	13.00
.700	15.00	3.700	3.00	6.700	43.00	9.70	13.00
.733	15.00	3.733	3.00	6.733	43.00	9.73	13.00
.767	15.00	3.767	3.00	6.767	43.00	9.77	13.00
.800	15.00	3.800	3.00	6.800	43.00	9.80	13.00
.833	15.00	3.833	3.00	6.833	43.00	9.83	13.00
.867	15.00	3.867	3.00	6.867	43.00	9.87	13.00
.900	15.00	3.900	3.00	6.900	43.00	9.90	13.00
.933	15.00	3.933	3.00	6.933	43.00	9.93	13.00
.967	15.00	3.967	3.00	6.967	43.00	9.97	13.00
1.000	15.00	4.000	3.00	7.000	43.00	10.00	13.00
1.033	20.00	4.033	5.00	7.033	20.00	10.03	13.00
1.067	20.00	4.067	5.00	7.067	20.00	10.07	13.00
1.100	20.00	4.100	5.00	7.100	20.00	10.10	13.00
1.133	20.00	4.133	5.00	7.133	20.00	10.13	13.00
1.167	20.00	4.167	5.00	7.167	20.00	10.17	13.00
1.200	20.00	4.200	5.00	7.200	20.00	10.20	13.00
1.233	20.00	4.233	5.00	7.233	20.00	10.23	13.00
1.267	20.00	4.267	5.00	7.267	20.00	10.27	13.00
1.300	20.00	4.300	5.00	7.300	20.00	10.30	13.00
1.333	20.00	4.333	5.00	7.333	20.00	10.33	13.00
1.367	20.00	4.367	5.00	7.367	20.00	10.37	13.00
1.400	20.00	4.400	5.00	7.400	20.00	10.40	13.00
1.433	20.00	4.433	5.00	7.433	20.00	10.43	13.00
1.467	20.00	4.467	5.00	7.467	20.00	10.47	13.00
1.500	20.00	4.500	5.00	7.500	20.00	10.50	13.00
1.533	20.00	4.533	5.00	7.533	20.00	10.53	13.00
1.567	20.00	4.567	5.00	7.567	20.00	10.57	13.00
1.600	20.00	4.600	5.00	7.600	20.00	10.60	13.00
1.633	20.00	4.633	5.00	7.633	20.00	10.63	13.00
1.667	20.00	4.667	5.00	7.667	20.00	10.67	13.00
1.700	20.00	4.700	5.00	7.700	20.00	10.70	13.00
1.733	20.00	4.733	5.00	7.733	20.00	10.73	13.00
1.767	20.00	4.767	5.00	7.767	20.00	10.77	13.00
1.800	20.00	4.800	5.00	7.800	20.00	10.80	13.00
1.833	20.00	4.833	5.00	7.833	20.00	10.83	13.00
1.867	20.00	4.867	5.00	7.867	20.00	10.87	13.00
1.900	20.00	4.900	5.00	7.900	20.00	10.90	13.00
1.933	20.00	4.933	5.00	7.933	20.00	10.93	13.00
1.967	20.00	4.967	5.00	7.967	20.00	10.97	13.00
2.000	20.00	5.000	5.00	8.000	20.00	11.00	13.00
2.033	10.00	5.033	20.00	8.033	23.00	11.03	8.00
2.067	10.00	5.067	20.00	8.067	23.00	11.07	8.00
2.100	10.00	5.100	20.00	8.100	23.00	11.10	8.00
2.133	10.00	5.133	20.00	8.133	23.00	11.13	8.00
2.167	10.00	5.167	20.00	8.167	23.00	11.17	8.00
2.200	10.00	5.200	20.00	8.200	23.00	11.20	8.00
2.233	10.00	5.233	20.00	8.233	23.00	11.23	8.00
2.267	10.00	5.267	20.00	8.267	23.00	11.27	8.00
2.300	10.00	5.300	20.00	8.300	23.00	11.30	8.00
2.333	10.00	5.333	20.00	8.333	23.00	11.33	8.00
2.367	10.00	5.367	20.00	8.367	23.00	11.37	8.00
2.400	10.00	5.400	20.00	8.400	23.00	11.40	8.00
2.433	10.00	5.433	20.00	8.433	23.00	11.43	8.00
2.467	10.00	5.467	20.00	8.467	23.00	11.47	8.00
2.500	10.00	5.500	20.00	8.500	23.00	11.50	8.00
2.533	10.00	5.533	20.00	8.533	23.00	11.53	8.00
2.567	10.00	5.567	20.00	8.567	23.00	11.57	8.00
2.600	10.00	5.600	20.00	8.600	23.00	11.60	8.00
2.633	10.00	5.633	20.00	8.633	23.00	11.63	8.00
2.667	10.00	5.667	20.00	8.667	23.00	11.67	8.00
2.700	10.00	5.700	20.00	8.700	23.00	11.70	8.00
2.733	10.00	5.733	20.00	8.733	23.00	11.73	8.00
2.767	10.00	5.767	20.00	8.767	23.00	11.77	8.00
2.800	10.00	5.800	20.00	8.800	23.00	11.80	8.00
2.833	10.00	5.833	20.00	8.833	23.00	11.83	8.00
2.867	10.00	5.867	20.00	8.867	23.00	11.87	8.00
2.900	10.00	5.900	20.00	8.900	23.00	11.90	8.00

2.933	10.00	5.933	20.00	8.933	23.00	11.93	8.00
2.967	10.00	5.967	20.00	8.967	23.00	11.97	8.00
3.000	10.00	6.000	20.00	9.000	23.00	12.00	7.99

Unit Hyd Qpeak (cms)= .213

PEAK FLOW (cms)= .071 (i)
TIME TO PEAK (hrs)= 7.033
RUNOFF VOLUME (mm)= 87.134
TOTAL RAINFALL (mm)= 192.999
RUNOFF COEFFICIENT = .451

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

CALIB					
NASHYD (0105)	Area (ha)=	2.00	Curve Number (CN)=	77.8	
ID= 1 DT= 2.0 min	Ia (mm)=	4.06	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	.07			

Unit Hyd Qpeak (cms)= 1.093

PEAK FLOW (cms)= .200 (i)
TIME TO PEAK (hrs)= 7.000
RUNOFF VOLUME (mm)= 136.119
TOTAL RAINFALL (mm)= 192.999
RUNOFF COEFFICIENT = .705

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

CALIB					
NASHYD (0107)	Area (ha)=	.71	Curve Number (CN)=	57.8	
ID= 1 DT= 2.0 min	Ia (mm)=	10.20	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	.25			

Unit Hyd Qpeak (cms)= .109

PEAK FLOW (cms)= .047 (i)
TIME TO PEAK (hrs)= 7.033
RUNOFF VOLUME (mm)= 90.740
TOTAL RAINFALL (mm)= 192.999
RUNOFF COEFFICIENT = .470

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

CALIB					
NASHYD (0103)	Area (ha)=	1.91	Curve Number (CN)=	60.0	
ID= 1 DT= 2.0 min	Ia (mm)=	10.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	.52			

Unit Hyd Qpeak (cms)= .140

PEAK FLOW (cms)= .112 (i)
TIME TO PEAK (hrs)= 7.233
RUNOFF VOLUME (mm)= 95.048
TOTAL RAINFALL (mm)= 192.999
RUNOFF COEFFICIENT = .492

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

CALIB					
NASHYD (0102)	Area (ha)=	.55	Curve Number (CN)=	60.0	
ID= 1 DT= 2.0 min	Ia (mm)=	10.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	.31			

Unit Hyd Qpeak (cms)= .068

PEAK FLOW (cms)= .037 (i)
TIME TO PEAK (hrs)= 7.067
RUNOFF VOLUME (mm)= 95.046
TOTAL RAINFALL (mm)= 192.999
RUNOFF COEFFICIENT = .492

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

CALIB					
NASHYD (0101)	Area (ha)=	4.09	Curve Number (CN)=	60.0	
ID= 1 DT= 2.0 min	Ia (mm)=	10.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	.36			

Unit Hyd Qpeak (cms)= .434

PEAK FLOW (cms)= .265 (i)
TIME TO PEAK (hrs)= 7.100
RUNOFF VOLUME (mm)= 95.048
TOTAL RAINFALL (mm)= 192.999
RUNOFF COEFFICIENT = .492

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

CALIB					
NASHYD (0104)	Area (ha)=	1.96	Curve Number (CN)=	85.0	
ID= 1 DT= 2.0 min	Ia (mm)=	2.32	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	.07			

Unit Hyd Qpeak (cms)= 1.069

PEAK FLOW (cms)= .214 (i)
TIME TO PEAK (hrs)= 7.000
RUNOFF VOLUME (mm)= 153.894
TOTAL RAINFALL (mm)= 192.999
RUNOFF COEFFICIENT = .797

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

ADD HYD (0802)

1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0106):	1.12	.071	7.03	87.13
+ ID2= 2 (0105):	2.00	.200	7.00	136.12
ID = 3 (0802):	3.12	.271	7.00	118.57

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0801)

1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0107):	.71	.047	7.03	90.74
+ ID2= 2 (0103):	1.91	.112	7.23	95.05
ID = 3 (0801):	2.62	.155	7.13	93.88

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

SHIFT HYD (0804)
IN= 2---> OUT= 1

SHIFT= 22.0 min	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID= 2 (0104):	1.96	.21	7.00	153.89
SHIFT ID= 1 (0804):	1.96	.21	7.33	153.89

ADD HYD (0803)

1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0802):	3.12	.271	7.00	118.57
+ ID2= 2 (0801):	2.62	.155	7.13	93.88
ID = 3 (0803):	5.74	.422	7.00	107.30

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0805)

1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0101):	4.09	.265	7.10	95.05
+ ID2= 2 (0804):	1.96	.214	7.33	153.89
ID = 3 (0805):	6.05	.476	7.10	114.10

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
--------------------
| ADD HYD   (0806) |
|   1 +  2 =  3    |          AREA     QPEAK     TPEAK      R.V.
--------------------          (ha)     (cms)     (hrs)      (mm)
          ID1= 1 (0102):       .55      .037      7.07     95.05
        + ID2= 2 (0805):      6.05      .476      7.10    114.10
          ================================================
          ID = 3 (0806):      6.60      .512      7.10    112.51

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

 FINISH
================================================================================================================
```

```
       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
```

Developed and Distributed by Clarifica Inc.
Copyright 1996, 2007 Clarifica Inc.
All rights reserved.

***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 2.3.2\voin.dat
Output filename: I:\2016PR~1\116023~1\Design\HYDROL~1\185MOU~2\Pre-Development SCS.out
Summary filename: I:\2016PR~1\116023~1\Design\HYDROL~1\185MOU~2\Pre-Development SCS.sum

DATE: 8/25/2016 TIME: 1:39:50 PM

USER:

COMMENTS: _____

****
** SIMULATION NUMBER: 1 **
****

MASS STORM	Filename: I:\2016 Projects\116023 - 185 Mountain Road\Design\Hydrologic Model\SCS Storms\SCS24H.MST
Ptotal= 44.60 mm	Comments: SCS Type II 24 HR MASS CURVE

Duration of storm = 23.75 hrs
Mass curve time step = 15.00 min

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.25	.54	6.25	.89	12.25	6.42	18.25	.71
.50	.36	6.50	.71	12.50	3.39	18.50	.89
.75	.54	6.75	.89	12.75	3.21	18.75	.71
1.00	.54	7.00	.89	13.00	2.50	19.00	.89
1.25	.54	7.25	1.07	13.25	2.32	19.25	.71
1.50	.36	7.50	.89	13.50	1.96	19.50	.89
1.75	.54	7.75	1.07	13.75	1.78	19.75	.71
2.00	.54	8.00	1.07	14.00	1.43	20.00	.54
2.25	.71	8.25	1.25	14.25	1.25	20.25	.54
2.50	.54	8.50	1.25	14.50	1.43	20.50	.54
2.75	.54	8.75	1.25	14.75	1.25	20.75	.54
3.00	.54	9.00	1.43	15.00	1.43	21.00	.54
3.25	.71	9.25	1.43	15.25	1.25	21.25	.54
3.50	.54	9.50	1.61	15.50	1.43	21.50	.54
3.75	.54	9.75	1.61	15.75	1.25	21.75	.54
4.00	.71	10.00	1.96	16.00	.89	22.00	.54
4.25	.71	10.25	2.14	16.25	.71	22.25	.54
4.50	.71	10.50	2.68	16.50	.89	22.50	.54
4.75	.71	10.75	2.85	16.75	.71	22.75	.54
5.00	.71	11.00	4.28	17.00	.89	23.00	.54
5.25	.71	11.25	4.28	17.25	.71	23.25	.54
5.50	.71	11.50	13.20	17.50	.89	23.50	.54
5.75	.71	11.75	54.59	17.75	.71	23.75	.54
6.00	.71	12.00	6.42	18.00	.89		

CALIB	
NASHYD (0103)	Area (ha)= 1.91 Curve Number (CN)= 60.0
ID= 1 DT= 2.0 min	Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= .52

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr

.033	.54	6.000	.71	11.967	6.42	17.93	.89
.067	.54	6.033	.89	12.000	6.42	17.97	.89
.100	.54	6.067	.89	12.033	6.42	18.00	.89
.133	.54	6.100	.89	12.067	6.42	18.03	.71
.167	.54	6.133	.89	12.100	6.42	18.07	.71
.200	.54	6.167	.89	12.133	6.42	18.10	.71
.233	.54	6.200	.89	12.167	6.42	18.13	.71
.267	.45	6.233	.89	12.200	6.42	18.17	.71
.300	.36	6.267	.80	12.233	6.42	18.20	.71
.333	.36	6.300	.71	12.267	4.90	18.23	.71
.367	.36	6.333	.71	12.300	3.39	18.27	.80
.400	.36	6.367	.71	12.333	3.39	18.30	.89
.433	.36	6.400	.71	12.367	3.39	18.33	.89
.467	.36	6.433	.71	12.400	3.39	18.37	.89
.500	.36	6.467	.71	12.433	3.39	18.40	.89
.533	.54	6.500	.71	12.467	3.39	18.43	.89
.567	.54	6.533	.89	12.500	3.39	18.47	.89
.600	.54	6.567	.89	12.533	3.21	18.50	.89
.633	.54	6.600	.89	12.567	3.21	18.53	.71
.667	.54	6.633	.89	12.600	3.21	18.57	.71
.700	.54	6.667	.89	12.633	3.21	18.60	.71
.733	.54	6.700	.89	12.667	3.21	18.63	.71
.767	.54	6.733	.89	12.700	3.21	18.67	.71
.800	.54	6.767	.89	12.733	3.21	18.70	.71
.833	.54	6.800	.89	12.767	2.85	18.73	.71
.867	.54	6.833	.89	12.800	2.50	18.77	.80
.900	.54	6.867	.89	12.833	2.50	18.80	.89
.933	.54	6.900	.89	12.867	2.50	18.83	.89
.967	.54	6.933	.89	12.900	2.50	18.87	.89
1.000	.54	6.967	.89	12.933	2.50	18.90	.89
1.033	.54	7.000	.89	12.967	2.50	18.93	.89
1.067	.54	7.033	1.07	13.000	2.50	18.97	.89
1.100	.54	7.067	1.07	13.033	2.32	19.00	.89
1.133	.54	7.100	1.07	13.067	2.32	19.03	.71
1.167	.54	7.133	1.07	13.100	2.32	19.07	.71
1.200	.54	7.167	1.07	13.133	2.32	19.10	.71
1.233	.54	7.200	1.07	13.167	2.32	19.13	.71
1.267	.45	7.233	1.07	13.200	2.32	19.17	.71
1.300	.36	7.267	.98	13.233	2.32	19.20	.71
1.333	.36	7.300	.89	13.267	2.14	19.23	.71
1.367	.36	7.333	.89	13.300	1.96	19.27	.80
1.400	.36	7.367	.89	13.333	1.96	19.30	.89
1.433	.36	7.400	.89	13.367	1.96	19.33	.89
1.467	.36	7.433	.89	13.400	1.96	19.37	.89
1.500	.36	7.467	.89	13.433	1.96	19.40	.89
1.533	.54	7.500	.89	13.467	1.96	19.43	.89
1.567	.54	7.533	1.07	13.500	1.96	19.47	.89
1.600	.54	7.567	1.07	13.533	1.78	19.50	.89
1.633	.54	7.600	1.07	13.567	1.78	19.53	.71
1.667	.54	7.633	1.07	13.600	1.78	19.57	.71
1.700	.54	7.667	1.07	13.633	1.78	19.60	.71
1.733	.54	7.700	1.07	13.667	1.78	19.63	.71
1.767	.54	7.733	1.07	13.700	1.78	19.67	.71
1.800	.54	7.767	1.07	13.733	1.78	19.70	.71
1.833	.54	7.800	1.07	13.767	1.60	19.73	.71
1.867	.54	7.833	1.07	13.800	1.43	19.77	.62
1.900	.54	7.867	1.07	13.833	1.43	19.80	.54
1.933	.54	7.900	1.07	13.867	1.43	19.83	.54
1.967	.54	7.933	1.07	13.900	1.43	19.87	.54
2.000	.54	7.967	1.07	13.933	1.43	19.90	.54
2.033	.71	8.000	1.07	13.967	1.43	19.93	.54
2.067	.71	8.033	1.25	14.000	1.43	19.97	.54
2.100	.71	8.067	1.25	14.033	1.25	20.00	.54
2.133	.71	8.100	1.25	14.067	1.25	20.03	.54
2.167	.71	8.133	1.25	14.100	1.25	20.07	.54
2.200	.71	8.167	1.25	14.133	1.25	20.10	.54
2.233	.71	8.200	1.25	14.167	1.25	20.13	.54
2.267	.62	8.233	1.25	14.200	1.25	20.17	.54
2.300	.54	8.267	1.25	14.233	1.25	20.20	.54
2.333	.54	8.300	1.25	14.267	1.34	20.23	.54
2.367	.54	8.333	1.25	14.300	1.43	20.27	.54
2.400	.54	8.367	1.25	14.333	1.43	20.30	.54
2.433	.54	8.400	1.25	14.367	1.43	20.33	.54
2.467	.54	8.433	1.25	14.400	1.43	20.37	.54
2.500	.54	8.467	1.25	14.433	1.43	20.40	.54
2.533	.54	8.500	1.25	14.467	1.43	20.43	.54
2.567	.54	8.533	1.25	14.500	1.43	20.47	.54
2.600	.54	8.567	1.25	14.533	1.25	20.50	.54
2.633	.54	8.600	1.25	14.567	1.25	20.53	.54
2.667	.54	8.633	1.25	14.600	1.25	20.57	.54
2.700	.54	8.667	1.25	14.633	1.25	20.60	.54
2.733	.54	8.700	1.25	14.667	1.25	20.63	.54
2.767	.54	8.733	1.25	14.700	1.25	20.67	.54
2.800	.54	8.767	1.34	14.733	1.25	20.70	.54
2.833	.54	8.800	1.43	14.767	1.34	20.73	.54
2.867	.54	8.833	1.43	14.800	1.43	20.77	.54
2.900	.54	8.867	1.43	14.833	1.43	20.80	.54
2.933	.54	8.900	1.43	14.867	1.43	20.83	.54
2.967	.54	8.933	1.43	14.900	1.43	20.87	.54

3.000	.54	8.967	1.43	14.933	1.43	20.90	.54
3.033	.71	9.000	1.43	14.967	1.43	20.93	.54
3.067	.71	9.033	1.43	15.000	1.43	20.97	.54
3.100	.71	9.067	1.43	15.033	1.25	21.00	.54
3.133	.71	9.100	1.43	15.067	1.25	21.03	.54
3.167	.71	9.133	1.43	15.100	1.25	21.07	.54
3.200	.71	9.167	1.43	15.133	1.25	21.10	.54
3.233	.71	9.200	1.43	15.167	1.25	21.13	.54
3.267	.62	9.233	1.43	15.200	1.25	21.17	.54
3.300	.54	9.267	1.52	15.233	1.25	21.20	.54
3.333	.54	9.300	1.61	15.267	1.34	21.23	.54
3.367	.54	9.333	1.61	15.300	1.43	21.27	.54
3.400	.54	9.367	1.61	15.333	1.43	21.30	.54
3.433	.54	9.400	1.61	15.367	1.43	21.33	.54
3.467	.54	9.433	1.61	15.400	1.43	21.37	.54
3.500	.54	9.467	1.61	15.433	1.43	21.40	.54
3.533	.54	9.500	1.61	15.467	1.43	21.43	.54
3.567	.54	9.533	1.61	15.500	1.43	21.47	.54
3.600	.54	9.567	1.61	15.533	1.25	21.50	.54
3.633	.54	9.600	1.61	15.567	1.25	21.53	.54
3.667	.54	9.633	1.61	15.600	1.25	21.57	.54
3.700	.54	9.667	1.61	15.633	1.25	21.60	.54
3.733	.54	9.700	1.61	15.667	1.25	21.63	.54
3.767	.62	9.733	1.61	15.700	1.25	21.67	.54
3.800	.71	9.767	1.78	15.733	1.25	21.70	.54
3.833	.71	9.800	1.96	15.767	1.07	21.73	.54
3.867	.71	9.833	1.96	15.800	.89	21.77	.54
3.900	.71	9.867	1.96	15.833	.89	21.80	.54
3.933	.71	9.900	1.96	15.867	.89	21.83	.54
3.967	.71	9.933	1.96	15.900	.89	21.87	.54
4.000	.71	9.967	1.96	15.933	.89	21.90	.54
4.033	.71	10.000	1.96	15.967	.89	21.93	.54
4.067	.71	10.033	2.14	16.000	.89	21.97	.54
4.100	.71	10.067	2.14	16.033	.71	22.00	.54
4.133	.71	10.100	2.14	16.067	.71	22.03	.54
4.167	.71	10.133	2.14	16.100	.71	22.07	.54
4.200	.71	10.167	2.14	16.133	.71	22.10	.54
4.233	.71	10.200	2.14	16.167	.71	22.13	.54
4.267	.71	10.233	2.14	16.200	.71	22.17	.54
4.300	.71	10.267	2.41	16.233	.71	22.20	.54
4.333	.71	10.300	2.68	16.267	.80	22.23	.54
4.367	.71	10.333	2.68	16.300	.89	22.27	.54
4.400	.71	10.367	2.68	16.333	.89	22.30	.54
4.433	.71	10.400	2.68	16.367	.89	22.33	.54
4.467	.71	10.433	2.68	16.400	.89	22.37	.54
4.500	.71	10.467	2.68	16.433	.89	22.40	.54
4.533	.71	10.500	2.68	16.467	.89	22.43	.54
4.567	.71	10.533	2.85	16.500	.89	22.47	.54
4.600	.71	10.567	2.85	16.533	.71	22.50	.54
4.633	.71	10.600	2.85	16.567	.71	22.53	.54
4.667	.71	10.633	2.85	16.600	.71	22.57	.54
4.700	.71	10.667	2.85	16.633	.71	22.60	.54
4.733	.71	10.700	2.85	16.667	.71	22.63	.54
4.767	.71	10.733	2.85	16.700	.71	22.67	.54
4.800	.71	10.767	3.57	16.733	.71	22.70	.54
4.833	.71	10.800	4.28	16.767	.80	22.73	.54
4.867	.71	10.833	4.28	16.800	.89	22.77	.54
4.900	.71	10.867	4.28	16.833	.89	22.80	.54
4.933	.71	10.900	4.28	16.867	.89	22.83	.54
4.967	.71	10.933	4.28	16.900	.89	22.87	.54
5.000	.71	10.967	4.28	16.933	.89	22.90	.54
5.033	.71	11.000	4.28	16.967	.89	22.93	.54
5.067	.71	11.033	4.28	17.000	.89	22.97	.54
5.100	.71	11.067	4.28	17.033	.71	23.00	.54
5.133	.71	11.100	4.28	17.067	.71	23.03	.54
5.167	.71	11.133	4.28	17.100	.71	23.07	.54
5.200	.71	11.167	4.28	17.133	.71	23.10	.54
5.233	.71	11.200	4.28	17.167	.71	23.13	.54
5.267	.71	11.233	4.28	17.200	.71	23.17	.54
5.300	.71	11.267	8.75	17.233	.71	23.20	.54
5.333	.71	11.300	13.20	17.267	.80	23.23	.54
5.367	.71	11.333	13.20	17.300	.89	23.27	.54
5.400	.71	11.367	13.20	17.333	.89	23.30	.54
5.433	.71	11.400	13.20	17.367	.89	23.33	.54
5.467	.71	11.433	13.20	17.400	.89	23.37	.54
5.500	.71	11.467	13.20	17.433	.89	23.40	.54
5.533	.71	11.500	13.25	17.467	.89	23.43	.54
5.567	.71	11.533	54.59	17.500	.89	23.47	.54
5.600	.71	11.567	54.59	17.533	.71	23.50	.54
5.633	.71	11.600	54.59	17.567	.71	23.53	.54
5.667	.71	11.633	54.59	17.600	.71	23.57	.54
5.700	.71	11.667	54.59	17.633	.71	23.60	.54
5.733	.71	11.700	54.59	17.667	.71	23.63	.54
5.767	.71	11.733	54.59	17.700	.71	23.67	.54
5.800	.71	11.767	30.44	17.733	.71	23.70	.54
5.833	.71	11.800	6.42	17.767	.80	23.73	.54
5.867	.71	11.833	6.42	17.800	.89	23.77	.27
5.900	.71	11.867	6.42	17.833	.89		
5.933	.71	11.900	6.42	17.867	.89		

```
             5.967     .71 |11.933    6.42 |17.900     .89 |

     Unit Hyd Qpeak  (cms)=    .140

     PEAK FLOW       (cms)=    .012 (i)
     TIME TO PEAK    (hrs)=  12.267
     RUNOFF VOLUME    (mm)=   5.828
     TOTAL RAINFALL   (mm)=  44.466
     RUNOFF COEFFICIENT   =    .131

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD    (0107) |   Area    (ha)=    .71   Curve Number   (CN)= 57.8
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.20   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .25

     Unit Hyd Qpeak  (cms)=    .109

     PEAK FLOW       (cms)=    .007 (i)
     TIME TO PEAK    (hrs)=  11.933
     RUNOFF VOLUME    (mm)=   5.343
     TOTAL RAINFALL   (mm)=  44.466
     RUNOFF COEFFICIENT   =    .120

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD    (0105) |   Area    (ha)=   2.00   Curve Number   (CN)= 77.8
|ID= 1 DT= 2.0 min |   Ia      (mm)=   4.06   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .07

     Unit Hyd Qpeak  (cms)=   1.093

     PEAK FLOW       (cms)=    .113 (i)
     TIME TO PEAK    (hrs)=  11.733
     RUNOFF VOLUME    (mm)=  14.417
     TOTAL RAINFALL   (mm)=  44.466
     RUNOFF COEFFICIENT   =    .324

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD    (0106) |   Area    (ha)=   1.12   Curve Number   (CN)= 56.1
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.80   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .20

     Unit Hyd Qpeak  (cms)=    .213

     PEAK FLOW       (cms)=    .012 (i)
     TIME TO PEAK    (hrs)=  11.867
     RUNOFF VOLUME    (mm)=   4.876
     TOTAL RAINFALL   (mm)=  44.466
     RUNOFF COEFFICIENT   =    .110

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD    (0104) |   Area    (ha)=   1.96   Curve Number   (CN)= 85.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   2.32   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .07

     Unit Hyd Qpeak  (cms)=   1.069

     PEAK FLOW       (cms)=    .157 (i)
     TIME TO PEAK    (hrs)=  11.733
     RUNOFF VOLUME    (mm)=  20.359
     TOTAL RAINFALL   (mm)=  44.466
     RUNOFF COEFFICIENT   =    .458

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD    (0101) |   Area    (ha)=   4.09   Curve Number   (CN)= 60.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .36

     Unit Hyd Qpeak  (cms)=    .434
```

```
     PEAK FLOW       (cms)=    .035 (i)
     TIME TO PEAK    (hrs)=  12.033
     RUNOFF VOLUME    (mm)=   5.829
     TOTAL RAINFALL   (mm)=  44.466
     RUNOFF COEFFICIENT   =    .131

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0102) |   Area    (ha)=    .55   Curve Number   (CN)= 60.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .31

     Unit Hyd Qpeak  (cms)=    .068

     PEAK FLOW       (cms)=    .005 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=   5.827
     TOTAL RAINFALL   (mm)=  44.466
     RUNOFF COEFFICIENT   =    .131

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

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

--------------------
| ADD HYD   (0801) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0103):     1.91    .012    12.27     5.83
        + ID2= 2 (0107):      .71    .007    11.93     5.34
          ================================================
          ID = 3 (0801):     2.62    .017    12.10     5.70

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0802) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0105):     2.00    .113    11.73    14.42
        + ID2= 2 (0106):     1.12    .012    11.87     4.88
          ================================================
          ID = 3 (0802):     3.12    .121    11.73    11.00

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| SHIFT HYD (0804) |
| IN= 2---> OUT= 1 |
| SHIFT= 22.0 min  |      AREA     QPEAK     TPEAK      R.V.
--------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (0104):    1.96      .16     11.73     20.36
    SHIFT ID= 1 (0804):    1.96      .16     12.07     20.36

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

--------------------
| ADD HYD   (0805) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0804):     1.96    .157    12.07    20.36
        + ID2= 2 (0101):     4.09    .035    12.03     5.83
          ================================================
          ID = 3 (0805):     6.05    .192    12.07    10.53

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0806) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0805):     6.05    .192    12.07    10.53
        + ID2= 2 (0102):      .55    .005    12.00     5.83
          ================================================
          ID = 3 (0806):     6.60    .197    12.07    10.14

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
```

ADD HYD (0803)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0801):	2.62	.017	12.10	5.70
+ ID2= 2 (0802):	3.12	.121	11.73	11.00
ID = 3 (0803):	5.74	.130	11.77	8.58

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

MASS STORM
Ptotal= 56.50 mm

Filename: I:\2016 Projects\116023 - 185 Mountain Road\Design\Hydrologic Model\SCS Storms\SCS24H.MST

Comments: SCS Type II 24 HR MASS CURVE

Duration of storm = 23.75 hrs
Mass curve time step = 15.00 min

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.25	.68	6.25	1.13	12.25	8.14	18.25	.90
.50	.45	6.50	.90	12.50	4.29	18.50	1.13
.75	.68	6.75	1.13	12.75	4.07	18.75	.90
1.00	.68	7.00	1.13	13.00	3.16	19.00	1.13
1.25	.68	7.25	1.36	13.25	2.94	19.25	.90
1.50	.45	7.50	1.13	13.50	2.49	19.50	1.13
1.75	.68	7.75	1.36	13.75	2.26	19.75	.90
2.00	.68	8.00	1.36	14.00	1.81	20.00	.68
2.25	.90	8.25	1.58	14.25	1.58	20.25	.68
2.50	.68	8.50	1.58	14.50	1.81	20.50	.68
2.75	.68	8.75	1.58	14.75	1.58	20.75	.68
3.00	.68	9.00	1.81	15.00	1.81	21.00	.68
3.25	.90	9.25	1.81	15.25	1.58	21.25	.68
3.50	.68	9.50	2.03	15.50	1.81	21.50	.68
3.75	.68	9.75	2.03	15.75	1.58	21.75	.68
4.00	.90	10.00	2.49	16.00	1.13	22.00	.68
4.25	.90	10.25	2.71	16.25	.90	22.25	.68
4.50	.90	10.50	3.39	16.50	1.13	22.50	.68
4.75	.90	10.75	3.62	16.75	.90	22.75	.68
5.00	.90	11.00	5.42	17.00	1.13	23.00	.68
5.25	.90	11.25	5.42	17.25	.90	23.25	.68
5.50	.90	11.50	16.72	17.50	1.13	23.50	.68
5.75	.90	11.75	69.16	17.75	.90	23.75	.68
6.00	.90	12.00	8.14	18.00	1.13		

CALIB
NASHYD (0103)
ID= 1 DT= 2.0 min

Area (ha)= 1.91 Curve Number (CN)= 60.0
Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= .52

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.033	.68	6.000	.90	11.967	8.14	17.93	1.13
.067	.68	6.033	1.13	12.000	8.14	17.97	1.13
.100	.68	6.067	1.13	12.033	8.14	18.00	1.13
.133	.68	6.100	1.13	12.067	8.14	18.03	.90
.167	.68	6.133	1.13	12.100	8.14	18.07	.90
.200	.68	6.167	1.13	12.133	8.14	18.10	.90
.233	.68	6.200	1.13	12.167	8.14	18.13	.90
.267	.56	6.233	1.13	12.200	8.14	18.17	.90
.300	.45	6.267	1.02	12.233	8.14	18.20	.90
.333	.45	6.300	.90	12.267	6.21	18.23	.90
.367	.45	6.333	.90	12.300	4.29	18.27	1.02
.400	.45	6.367	.90	12.333	4.29	18.30	1.13
.433	.45	6.400	.90	12.367	4.29	18.33	1.13
.467	.45	6.433	.90	12.400	4.29	18.37	1.13
.500	.45	6.467	.90	12.433	4.29	18.40	1.13
.533	.68	6.500	.90	12.467	4.29	18.43	1.13
.567	.68	6.533	1.13	12.500	4.29	18.47	1.13
.600	.68	6.567	1.13	12.533	4.07	18.50	1.13
.633	.68	6.600	1.13	12.567	4.07	18.53	.90
.667	.68	6.633	1.13	12.600	4.07	18.57	.90
.700	.68	6.667	1.13	12.633	4.07	18.60	.90
.733	.68	6.700	1.13	12.667	4.07	18.63	.90
.767	.68	6.733	1.13	12.700	4.07	18.67	.90
.800	.68	6.767	1.13	12.733	4.07	18.70	.90
.833	.68	6.800	1.13	12.767	3.61	18.73	.90

.867	.68	6.833	1.13	12.800	3.16	18.77	1.02
.900	.68	6.867	1.13	12.833	3.16	18.80	1.13
.933	.68	6.900	1.13	12.867	3.16	18.83	1.13
.967	.68	6.933	1.13	12.900	3.16	18.87	1.13
1.000	.68	6.967	1.13	12.933	3.16	18.90	1.13
1.033	.68	7.000	1.13	12.967	3.16	18.93	1.13
1.067	.68	7.033	1.36	13.000	3.16	18.97	1.13
1.100	.68	7.067	1.36	13.033	2.94	19.00	1.13
1.133	.68	7.100	1.36	13.067	2.94	19.03	.90
1.167	.68	7.133	1.36	13.100	2.94	19.07	.90
1.200	.68	7.167	1.36	13.133	2.94	19.10	.90
1.233	.68	7.200	1.36	13.167	2.94	19.13	.90
1.267	.56	7.233	1.36	13.200	2.94	19.17	.90
1.300	.45	7.267	1.24	13.233	2.94	19.20	.90
1.333	.45	7.300	1.13	13.267	2.71	19.23	.90
1.367	.45	7.333	1.13	13.300	2.49	19.27	1.02
1.400	.45	7.367	1.13	13.333	2.49	19.30	1.13
1.433	.45	7.400	1.13	13.367	2.49	19.33	1.13
1.467	.45	7.433	1.13	13.400	2.49	19.37	1.13
1.500	.45	7.467	1.13	13.433	2.49	19.40	1.13
1.533	.68	7.500	1.13	13.467	2.49	19.43	1.13
1.567	.68	7.533	1.36	13.500	2.49	19.47	1.13
1.600	.68	7.567	1.36	13.533	2.26	19.50	1.13
1.633	.68	7.600	1.36	13.567	2.26	19.53	.90
1.667	.68	7.633	1.36	13.600	2.26	19.57	.90
1.700	.68	7.667	1.36	13.633	2.26	19.60	.90
1.733	.68	7.700	1.36	13.667	2.26	19.63	.90
1.767	.68	7.733	1.36	13.700	2.26	19.67	.90
1.800	.68	7.767	1.36	13.733	2.26	19.70	.90
1.833	.68	7.800	1.36	13.767	2.03	19.73	.90
1.867	.68	7.833	1.36	13.800	1.81	19.77	.79
1.900	.68	7.867	1.36	13.833	1.81	19.80	.68
1.933	.68	7.900	1.36	13.867	1.81	19.83	.68
1.967	.68	7.933	1.36	13.900	1.81	19.87	.68
2.000	.68	7.967	1.36	13.933	1.81	19.90	.68
2.033	.90	8.000	1.36	13.967	1.81	19.93	.68
2.067	.90	8.033	1.58	14.000	1.81	19.97	.68
2.100	.90	8.067	1.58	14.033	1.58	20.00	.68
2.133	.90	8.100	1.58	14.067	1.58	20.03	.68
2.167	.90	8.133	1.58	14.100	1.58	20.07	.68
2.200	.90	8.167	1.58	14.133	1.58	20.10	.68
2.233	.90	8.200	1.58	14.167	1.58	20.13	.68
2.267	.79	8.233	1.58	14.200	1.58	20.17	.68
2.300	.68	8.267	1.58	14.233	1.58	20.20	.68
2.333	.68	8.300	1.58	14.267	1.70	20.23	.68
2.367	.68	8.333	1.58	14.300	1.81	20.27	.68
2.400	.68	8.367	1.58	14.333	1.81	20.30	.68
2.433	.68	8.400	1.58	14.367	1.81	20.33	.68
2.467	.68	8.433	1.58	14.400	1.81	20.37	.68
2.500	.68	8.467	1.58	14.433	1.81	20.40	.68
2.533	.68	8.500	1.58	14.467	1.81	20.43	.68
2.567	.68	8.533	1.58	14.500	1.81	20.47	.68
2.600	.68	8.567	1.58	14.533	1.58	20.50	.68
2.633	.68	8.600	1.58	14.567	1.58	20.53	.68
2.667	.68	8.633	1.58	14.600	1.58	20.57	.68
2.700	.68	8.667	1.58	14.633	1.58	20.60	.68
2.733	.68	8.700	1.58	14.667	1.58	20.63	.68
2.767	.68	8.733	1.58	14.700	1.58	20.67	.68
2.800	.68	8.767	1.70	14.733	1.58	20.70	.68
2.833	.68	8.800	1.81	14.767	1.70	20.73	.68
2.867	.68	8.833	1.81	14.800	1.81	20.77	.68
2.900	.68	8.867	1.81	14.833	1.81	20.80	.68
2.933	.68	8.900	1.81	14.867	1.81	20.83	.68
2.967	.68	8.933	1.81	14.900	1.81	20.87	.68
3.000	.68	8.967	1.81	14.933	1.81	20.90	.68
3.033	.90	9.000	1.81	14.967	1.81	20.93	.68
3.067	.90	9.033	1.81	15.000	1.81	20.97	.68
3.100	.90	9.067	1.81	15.033	1.58	21.00	.68
3.133	.90	9.100	1.81	15.067	1.58	21.03	.68
3.167	.90	9.133	1.81	15.100	1.58	21.07	.68
3.200	.90	9.167	1.81	15.133	1.58	21.10	.68
3.233	.90	9.200	1.81	15.167	1.58	21.13	.68
3.267	.79	9.233	1.81	15.200	1.58	21.17	.68
3.300	.68	9.267	1.92	15.233	1.58	21.20	.68
3.333	.68	9.300	2.03	15.267	1.70	21.23	.68
3.367	.68	9.333	2.03	15.300	1.81	21.27	.68
3.400	.68	9.367	2.03	15.333	1.81	21.30	.68
3.433	.68	9.400	2.03	15.367	1.81	21.33	.68
3.467	.68	9.433	2.03	15.400	1.81	21.37	.68
3.500	.68	9.467	2.03	15.433	1.81	21.40	.68
3.533	.68	9.500	2.03	15.467	1.81	21.43	.68
3.567	.68	9.533	2.03	15.500	1.81	21.47	.68
3.600	.68	9.567	2.03	15.533	1.58	21.50	.68
3.633	.68	9.600	2.03	15.567	1.58	21.53	.68
3.667	.68	9.633	2.03	15.600	1.58	21.57	.68
3.700	.68	9.667	2.03	15.633	1.58	21.60	.68
3.733	.68	9.700	2.03	15.667	1.58	21.63	.68
3.767	.79	9.733	2.03	15.700	1.58	21.67	.68
3.800	.90	9.767	2.26	15.733	1.58	21.70	.68

3.833	.90	9.800	2.49	15.767	1.35	21.73	.68
3.867	.90	9.833	2.49	15.800	1.13	21.77	.68
3.900	.90	9.867	2.49	15.833	1.13	21.80	.68
3.933	.90	9.900	2.49	15.867	1.13	21.83	.68
3.967	.90	9.933	2.49	15.900	1.13	21.87	.68
4.000	.90	9.967	2.49	15.933	1.13	21.90	.68
4.033	.90	10.000	2.49	15.967	1.13	21.93	.68
4.067	.90	10.033	2.71	16.000	1.13	21.97	.68
4.100	.90	10.067	2.71	16.033	.90	22.00	.68
4.133	.90	10.100	2.71	16.067	.90	22.03	.68
4.167	.90	10.133	2.71	16.100	.90	22.07	.68
4.200	.90	10.167	2.71	16.133	.90	22.10	.68
4.233	.90	10.200	2.71	16.167	.90	22.13	.68
4.267	.90	10.233	2.71	16.200	.90	22.17	.68
4.300	.90	10.267	3.05	16.233	.90	22.20	.68
4.333	.90	10.300	3.39	16.267	1.02	22.23	.68
4.367	.90	10.333	3.39	16.300	1.13	22.27	.68
4.400	.90	10.367	3.39	16.333	1.13	22.30	.68
4.433	.90	10.400	3.39	16.367	1.13	22.33	.68
4.467	.90	10.433	3.39	16.400	1.13	22.37	.68
4.500	.90	10.467	3.39	16.433	1.13	22.40	.68
4.533	.90	10.500	3.39	16.467	1.13	22.43	.68
4.567	.90	10.533	3.62	16.500	1.13	22.47	.68
4.600	.90	10.567	3.62	16.533	.90	22.50	.68
4.633	.90	10.600	3.62	16.567	.90	22.53	.68
4.667	.90	10.633	3.62	16.600	.90	22.57	.68
4.700	.90	10.667	3.62	16.633	.90	22.60	.68
4.733	.90	10.700	3.62	16.667	.90	22.63	.68
4.767	.90	10.733	3.62	16.700	.90	22.67	.68
4.800	.90	10.767	4.52	16.733	.90	22.70	.68
4.833	.90	10.800	5.42	16.767	1.02	22.73	.68
4.867	.90	10.833	5.42	16.800	1.13	22.77	.68
4.900	.90	10.867	5.42	16.833	1.13	22.80	.68
4.933	.90	10.900	5.42	16.867	1.13	22.83	.68
4.967	.90	10.933	5.42	16.900	1.13	22.87	.68
5.000	.90	10.967	5.42	16.933	1.13	22.90	.68
5.033	.90	11.000	5.42	16.967	1.13	22.93	.68
5.067	.90	11.033	5.42	17.000	1.13	22.97	.68
5.100	.90	11.067	5.42	17.033	.90	23.00	.68
5.133	.90	11.100	5.42	17.067	.90	23.03	.68
5.167	.90	11.133	5.42	17.100	.90	23.07	.68
5.200	.90	11.167	5.42	17.133	.90	23.10	.68
5.233	.90	11.200	5.42	17.167	.90	23.13	.68
5.267	.90	11.233	5.42	17.200	.90	23.17	.68
5.300	.90	11.267	11.09	17.233	.90	23.20	.68
5.333	.90	11.300	16.72	17.267	1.02	23.23	.68
5.367	.90	11.333	16.72	17.300	1.13	23.27	.68
5.400	.90	11.367	16.72	17.333	1.13	23.30	.68
5.433	.90	11.400	16.72	17.367	1.13	23.33	.68
5.467	.90	11.433	16.72	17.400	1.13	23.37	.68
5.500	.90	11.467	16.72	17.433	1.13	23.40	.68
5.533	.90	11.500	16.79	17.467	1.13	23.43	.68
5.567	.90	11.533	69.16	17.500	1.13	23.47	.68
5.600	.90	11.567	69.16	17.533	.90	23.50	.68
5.633	.90	11.600	69.16	17.567	.90	23.53	.68
5.667	.90	11.633	69.16	17.600	.90	23.57	.68
5.700	.90	11.667	69.16	17.633	.90	23.60	.68
5.733	.90	11.700	69.16	17.667	.90	23.63	.68
5.767	.90	11.733	69.16	17.700	.90	23.67	.68
5.800	.90	11.767	38.57	17.733	.90	23.70	.68
5.833	.90	11.800	8.14	17.767	1.02	23.73	.68
5.867	.90	11.833	8.14	17.800	1.13	23.77	.34
5.900	.90	11.867	8.14	17.833	1.13		
5.933	.90	11.900	8.14	17.867	1.13		
5.967	.90	11.933	8.14	17.900	1.13		

Unit Hyd Qpeak (cms)= .140

PEAK FLOW (cms)= .022 (i)
TIME TO PEAK (hrs)= 12.233
RUNOFF VOLUME (mm)= 9.952
TOTAL RAINFALL (mm)= 56.330
RUNOFF COEFFICIENT = .177

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

CALIB			
NASHYD (0107)	Area (ha)= .71	Curve Number (CN)= 57.8	
ID= 1 DT= 2.0 min	Ia (mm)= 10.20	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= .25		

Unit Hyd Qpeak (cms)= .109

PEAK FLOW (cms)= .013 (i)
TIME TO PEAK (hrs)= 11.900
RUNOFF VOLUME (mm)= 9.188
TOTAL RAINFALL (mm)= 56.330

```
     RUNOFF COEFFICIENT   =    .163

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0105) |   Area    (ha)=   2.00   Curve Number   (CN)= 77.8
|ID= 1 DT= 2.0 min |   Ia      (mm)=   4.06   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .07

     Unit Hyd Qpeak  (cms)=   1.093

     PEAK FLOW       (cms)=    .172 (i)
     TIME TO PEAK    (hrs)=  11.733
     RUNOFF VOLUME    (mm)=  21.832
     TOTAL RAINFALL   (mm)=  56.330
     RUNOFF COEFFICIENT   =    .388

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0106) |   Area    (ha)=   1.12   Curve Number   (CN)= 56.1
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.80   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .20

     Unit Hyd Qpeak  (cms)=    .213

     PEAK FLOW       (cms)=    .022 (i)
     TIME TO PEAK    (hrs)=  11.867
     RUNOFF VOLUME    (mm)=   8.485
     TOTAL RAINFALL   (mm)=  56.330
     RUNOFF COEFFICIENT   =    .151

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0104) |   Area    (ha)=   1.96   Curve Number   (CN)= 85.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   2.32   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .07

     Unit Hyd Qpeak  (cms)=   1.069

     PEAK FLOW       (cms)=    .227 (i)
     TIME TO PEAK    (hrs)=  11.733
     RUNOFF VOLUME    (mm)=  29.421
     TOTAL RAINFALL   (mm)=  56.330
     RUNOFF COEFFICIENT   =    .522

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0101) |   Area    (ha)=   4.09   Curve Number   (CN)= 60.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .36

     Unit Hyd Qpeak  (cms)=    .434

     PEAK FLOW       (cms)=    .063 (i)
     TIME TO PEAK    (hrs)=  12.033
     RUNOFF VOLUME    (mm)=   9.953
     TOTAL RAINFALL   (mm)=  56.330
     RUNOFF COEFFICIENT   =    .177

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0102) |   Area    (ha)=    .55   Curve Number   (CN)= 60.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .31

     Unit Hyd Qpeak  (cms)=    .068

     PEAK FLOW       (cms)=    .009 (i)
     TIME TO PEAK    (hrs)=  11.967
     RUNOFF VOLUME    (mm)=   9.952
     TOTAL RAINFALL   (mm)=  56.330
     RUNOFF COEFFICIENT   =    .177

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

```
--------------------------------------------------------------------------------

--------------------
| ADD HYD   (0801) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0103):     1.91    .022    12.23     9.95
        + ID2= 2 (0107):      .71    .013    11.90     9.19
          ================================================
          ID = 3 (0801):     2.62    .032    12.07     9.74

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0802) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0105):     2.00    .172    11.73    21.83
        + ID2= 2 (0106):     1.12    .022    11.87     8.48
          ================================================
          ID = 3 (0802):     3.12    .188    11.73    17.05

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| SHIFT HYD (0804) |
| IN= 2---> OUT= 1 |
| SHIFT= 22.0 min  |      AREA     QPEAK     TPEAK      R.V.
--------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (0104):    1.96      .23     11.73     29.42
    SHIFT ID= 1 (0804):    1.96      .23     12.07     29.42

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

--------------------
| ADD HYD   (0805) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0804):     1.96    .227    12.07    29.42
        + ID2= 2 (0101):     4.09    .063    12.03     9.95
          ================================================
          ID = 3 (0805):     6.05    .290    12.07    16.26

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0806) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0805):     6.05    .290    12.07    16.26
        + ID2= 2 (0102):      .55    .009    11.97     9.95
          ================================================
          ID = 3 (0806):     6.60    .299    12.07    15.73

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0803) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0801):     2.62    .032    12.07     9.74
        + ID2= 2 (0802):     3.12    .188    11.73    17.05
          ================================================
          ID = 3 (0803):     5.74    .204    11.77    13.71

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
  ****************************
  ** SIMULATION NUMBER:   3 **
  ****************************

--------------------
| MASS STORM       |    Filename: I:\2016 Projects\116023 - 185 Mountain Road\
|                  |              Design\Hydrologic Model\SCS Storms\
|                  |              SCS24H.MST
| Ptotal= 64.40 mm |    Comments: SCS Type II 24 HR MASS CURVE
--------------------
                       Duration of storm    = 23.75 hrs
                       Mass curve time step = 15.00 min

                TIME    RAIN |  TIME    RAIN |  TIME    RAIN |  TIME    RAIN
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.25	.77	6.25	1.29	12.25	9.27	18.25	1.03
.50	.52	6.50	1.03	12.50	4.89	18.50	1.29
.75	.77	6.75	1.29	12.75	4.64	18.75	1.03
1.00	.77	7.00	1.29	13.00	3.61	19.00	1.29
1.25	.77	7.25	1.55	13.25	3.35	19.25	1.03
1.50	.52	7.50	1.29	13.50	2.83	19.50	1.29
1.75	.77	7.75	1.55	13.75	2.58	19.75	1.03
2.00	.77	8.00	1.55	14.00	2.06	20.00	.77
2.25	1.03	8.25	1.80	14.25	1.80	20.25	.77
2.50	.77	8.50	1.80	14.50	2.06	20.50	.77
2.75	.77	8.75	1.80	14.75	1.80	20.75	.77
3.00	.77	9.00	2.06	15.00	2.06	21.00	.77
3.25	1.03	9.25	2.06	15.25	1.80	21.25	.77
3.50	.77	9.50	2.32	15.50	2.06	21.50	.77
3.75	.77	9.75	2.32	15.75	1.80	21.75	.77
4.00	1.03	10.00	2.83	16.00	1.29	22.00	.77
4.25	1.03	10.25	3.09	16.25	1.03	22.25	.77
4.50	1.03	10.50	3.86	16.50	1.29	22.50	.77
4.75	1.03	10.75	4.12	16.75	1.03	22.75	.77
5.00	1.03	11.00	6.18	17.00	1.29	23.00	.77
5.25	1.03	11.25	6.18	17.25	1.03	23.25	.77
5.50	1.03	11.50	19.06	17.50	1.29	23.50	.77
5.75	1.03	11.75	78.83	17.75	1.03	23.75	.77
6.00	1.03	12.00	9.27	18.00	1.29		

CALIB			
NASHYD (0103)	Area (ha)= 1.91	Curve Number (CN)= 60.0	
ID= 1 DT= 2.0 min	Ia (mm)= 10.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= .52		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.033	.77	6.000	1.03	11.967	9.27	17.93	1.29
.067	.77	6.033	1.29	12.000	9.27	17.97	1.29
.100	.77	6.067	1.29	12.033	9.27	18.00	1.29
.133	.77	6.100	1.29	12.067	9.27	18.03	1.03
.167	.77	6.133	1.29	12.100	9.27	18.07	1.03
.200	.77	6.167	1.29	12.133	9.27	18.10	1.03
.233	.77	6.200	1.29	12.167	9.27	18.13	1.03
.267	.64	6.233	1.29	12.200	9.27	18.17	1.03
.300	.52	6.267	1.16	12.233	9.27	18.20	1.03
.333	.52	6.300	1.03	12.267	7.08	18.23	1.03
.367	.52	6.333	1.03	12.300	4.89	18.27	1.16
.400	.52	6.367	1.03	12.333	4.89	18.30	1.29
.433	.52	6.400	1.03	12.367	4.89	18.33	1.29
.467	.52	6.433	1.03	12.400	4.89	18.37	1.29
.500	.52	6.467	1.03	12.433	4.89	18.40	1.29
.533	.77	6.500	1.03	12.467	4.89	18.43	1.29
.567	.77	6.533	1.29	12.500	4.89	18.47	1.29
.600	.77	6.567	1.29	12.533	4.64	18.50	1.29
.633	.77	6.600	1.29	12.567	4.64	18.53	1.03
.667	.77	6.633	1.29	12.600	4.64	18.57	1.03
.700	.77	6.667	1.29	12.633	4.64	18.60	1.03
.733	.77	6.700	1.29	12.667	4.64	18.63	1.03
.767	.77	6.733	1.29	12.700	4.64	18.67	1.03
.800	.77	6.767	1.29	12.733	4.64	18.70	1.03
.833	.77	6.800	1.29	12.767	4.12	18.73	1.03
.867	.77	6.833	1.29	12.800	3.61	18.77	1.16
.900	.77	6.867	1.29	12.833	3.61	18.80	1.29
.933	.77	6.900	1.29	12.867	3.61	18.83	1.29
.967	.77	6.933	1.29	12.900	3.61	18.87	1.29
1.000	.77	6.967	1.29	12.933	3.61	18.90	1.29
1.033	.77	7.000	1.29	12.967	3.61	18.93	1.29
1.067	.77	7.033	1.55	13.000	3.61	18.97	1.29
1.100	.77	7.067	1.55	13.033	3.35	19.00	1.29
1.133	.77	7.100	1.55	13.067	3.35	19.03	1.03
1.167	.77	7.133	1.55	13.100	3.35	19.07	1.03
1.200	.77	7.167	1.55	13.133	3.35	19.10	1.03
1.233	.77	7.200	1.55	13.167	3.35	19.13	1.03
1.267	.64	7.233	1.55	13.200	3.35	19.17	1.03
1.300	.52	7.267	1.42	13.233	3.35	19.20	1.03
1.333	.52	7.300	1.29	13.267	3.09	19.23	1.03
1.367	.52	7.333	1.29	13.300	2.83	19.27	1.16
1.400	.52	7.367	1.29	13.333	2.83	19.30	1.29
1.433	.52	7.400	1.29	13.367	2.83	19.33	1.29
1.467	.52	7.433	1.29	13.400	2.83	19.37	1.29
1.500	.52	7.467	1.29	13.433	2.83	19.40	1.29
1.533	.77	7.500	1.29	13.467	2.83	19.43	1.29
1.567	.77	7.533	1.55	13.500	2.83	19.47	1.29
1.600	.77	7.567	1.55	13.533	2.58	19.50	1.29
1.633	.77	7.600	1.55	13.567	2.58	19.53	1.03
1.667	.77	7.633	1.55	13.600	2.58	19.57	1.03

1.700	.77	7.667	1.55	13.633	2.58	19.60	1.03
1.733	.77	7.700	1.55	13.667	2.58	19.63	1.03
1.767	.77	7.733	1.55	13.700	2.58	19.67	1.03
1.800	.77	7.767	1.55	13.733	2.58	19.70	1.03
1.833	.77	7.800	1.55	13.767	2.32	19.73	1.03
1.867	.77	7.833	1.55	13.800	2.06	19.77	.90
1.900	.77	7.867	1.55	13.833	2.06	19.80	.77
1.933	.77	7.900	1.55	13.867	2.06	19.83	.77
1.967	.77	7.933	1.55	13.900	2.06	19.87	.77
2.000	.77	7.967	1.55	13.933	2.06	19.90	.77
2.033	1.03	8.000	1.55	13.967	2.06	19.93	.77
2.067	1.03	8.033	1.80	14.000	2.06	19.97	.77
2.100	1.03	8.067	1.80	14.033	1.80	20.00	.77
2.133	1.03	8.100	1.80	14.067	1.80	20.03	.77
2.167	1.03	8.133	1.80	14.100	1.80	20.07	.77
2.200	1.03	8.167	1.80	14.133	1.80	20.10	.77
2.233	1.03	8.200	1.80	14.167	1.80	20.13	.77
2.267	.90	8.233	1.80	14.200	1.80	20.17	.77
2.300	.77	8.267	1.80	14.233	1.80	20.20	.77
2.333	.77	8.300	1.80	14.267	1.93	20.23	.77
2.367	.77	8.333	1.80	14.300	2.06	20.27	.77
2.400	.77	8.367	1.80	14.333	2.06	20.30	.77
2.433	.77	8.400	1.80	14.367	2.06	20.33	.77
2.467	.77	8.433	1.80	14.400	2.06	20.37	.77
2.500	.77	8.467	1.80	14.433	2.06	20.40	.77
2.533	.77	8.500	1.80	14.467	2.06	20.43	.77
2.567	.77	8.533	1.80	14.500	2.06	20.47	.77
2.600	.77	8.567	1.80	14.533	1.80	20.50	.77
2.633	.77	8.600	1.80	14.567	1.80	20.53	.77
2.667	.77	8.633	1.80	14.600	1.80	20.57	.77
2.700	.77	8.667	1.80	14.633	1.80	20.60	.77
2.733	.77	8.700	1.80	14.667	1.80	20.63	.77
2.767	.77	8.733	1.80	14.700	1.80	20.67	.77
2.800	.77	8.767	1.93	14.733	1.80	20.70	.77
2.833	.77	8.800	2.06	14.767	1.93	20.73	.77
2.867	.77	8.833	2.06	14.800	2.06	20.77	.77
2.900	.77	8.867	2.06	14.833	2.06	20.80	.77
2.933	.77	8.900	2.06	14.867	2.06	20.83	.77
2.967	.77	8.933	2.06	14.900	2.06	20.87	.77
3.000	.77	8.967	2.06	14.933	2.06	20.90	.77
3.033	1.03	9.000	2.06	14.967	2.06	20.93	.77
3.067	1.03	9.033	2.06	15.000	2.06	20.97	.77
3.100	1.03	9.067	2.06	15.033	1.80	21.00	.77
3.133	1.03	9.100	2.06	15.067	1.80	21.03	.77
3.167	1.03	9.133	2.06	15.100	1.80	21.07	.77
3.200	1.03	9.167	2.06	15.133	1.80	21.10	.77
3.233	1.03	9.200	2.06	15.167	1.80	21.13	.77
3.267	.90	9.233	2.06	15.200	1.80	21.17	.77
3.300	.77	9.267	2.19	15.233	1.80	21.20	.77
3.333	.77	9.300	2.32	15.267	1.93	21.23	.77
3.367	.77	9.333	2.32	15.300	2.06	21.27	.77
3.400	.77	9.367	2.32	15.333	2.06	21.30	.77
3.433	.77	9.400	2.32	15.367	2.06	21.33	.77
3.467	.77	9.433	2.32	15.400	2.06	21.37	.77
3.500	.77	9.467	2.32	15.433	2.06	21.40	.77
3.533	.77	9.500	2.32	15.467	2.06	21.43	.77
3.567	.77	9.533	2.32	15.500	2.06	21.47	.77
3.600	.77	9.567	2.32	15.533	1.80	21.50	.77
3.633	.77	9.600	2.32	15.567	1.80	21.53	.77
3.667	.77	9.633	2.32	15.600	1.80	21.57	.77
3.700	.77	9.667	2.32	15.633	1.80	21.60	.77
3.733	.77	9.700	2.32	15.667	1.80	21.63	.77
3.767	.90	9.733	2.32	15.700	1.80	21.67	.77
3.800	1.03	9.767	2.58	15.733	1.80	21.70	.77
3.833	1.03	9.800	2.83	15.767	1.54	21.73	.77
3.867	1.03	9.833	2.83	15.800	1.29	21.77	.77
3.900	1.03	9.867	2.83	15.833	1.29	21.80	.77
3.933	1.03	9.900	2.83	15.867	1.29	21.83	.77
3.967	1.03	9.933	2.83	15.900	1.29	21.87	.77
4.000	1.03	9.967	2.83	15.933	1.29	21.90	.77
4.033	1.03	10.000	2.83	15.967	1.29	21.93	.77
4.067	1.03	10.033	3.09	16.000	1.29	21.97	.77
4.100	1.03	10.067	3.09	16.033	1.03	22.00	.77
4.133	1.03	10.100	3.09	16.067	1.03	22.03	.77
4.167	1.03	10.133	3.09	16.100	1.03	22.07	.77
4.200	1.03	10.167	3.09	16.133	1.03	22.10	.77
4.233	1.03	10.200	3.09	16.167	1.03	22.13	.77
4.267	1.03	10.233	3.09	16.200	1.03	22.17	.77
4.300	1.03	10.267	3.48	16.233	1.03	22.20	.77
4.333	1.03	10.300	3.86	16.267	1.16	22.23	.77
4.367	1.03	10.333	3.86	16.300	1.29	22.27	.77
4.400	1.03	10.367	3.86	16.333	1.29	22.30	.77
4.433	1.03	10.400	3.86	16.367	1.29	22.33	.77
4.467	1.03	10.433	3.86	16.400	1.29	22.37	.77
4.500	1.03	10.467	3.86	16.433	1.29	22.40	.77
4.533	1.03	10.500	3.86	16.467	1.29	22.43	.77
4.567	1.03	10.533	4.12	16.500	1.29	22.47	.77
4.600	1.03	10.567	4.12	16.533	1.03	22.50	.77
4.633	1.03	10.600	4.12	16.567	1.03	22.53	.77

4.667	1.03	10.633	4.12	16.600	1.03	22.57	.77	
4.700	1.03	10.667	4.12	16.633	1.03	22.60	.77	
4.733	1.03	10.700	4.12	16.667	1.03	22.63	.77	
4.767	1.03	10.733	4.12	16.700	1.03	22.67	.77	
4.800	1.03	10.767	5.15	16.733	1.03	22.70	.77	
4.833	1.03	10.800	6.18	16.767	1.16	22.73	.77	
4.867	1.03	10.833	6.18	16.800	1.29	22.77	.77	
4.900	1.03	10.867	6.18	16.833	1.29	22.80	.77	
4.933	1.03	10.900	6.18	16.867	1.29	22.83	.77	
4.967	1.03	10.933	6.18	16.900	1.29	22.87	.77	
5.000	1.03	10.967	6.18	16.933	1.29	22.90	.77	
5.033	1.03	11.000	6.18	16.967	1.29	22.93	.77	
5.067	1.03	11.033	6.18	17.000	1.29	22.97	.77	
5.100	1.03	11.067	6.18	17.033	1.03	23.00	.77	
5.133	1.03	11.100	6.18	17.067	1.03	23.03	.77	
5.167	1.03	11.133	6.18	17.100	1.03	23.07	.77	
5.200	1.03	11.167	6.18	17.133	1.03	23.10	.77	
5.233	1.03	11.200	6.18	17.167	1.03	23.13	.77	
5.267	1.03	11.233	6.18	17.200	1.03	23.17	.77	
5.300	1.03	11.267	12.64	17.233	1.03	23.20	.77	
5.333	1.03	11.300	19.06	17.267	1.16	23.23	.77	
5.367	1.03	11.333	19.06	17.300	1.29	23.27	.77	
5.400	1.03	11.367	19.06	17.333	1.29	23.30	.77	
5.433	1.03	11.400	19.06	17.367	1.29	23.33	.77	
5.467	1.03	11.433	19.06	17.400	1.29	23.37	.77	
5.500	1.03	11.467	19.06	17.433	1.29	23.40	.77	
5.533	1.03	11.500	19.13	17.467	1.29	23.43	.77	
5.567	1.03	11.533	78.83	17.500	1.29	23.47	.77	
5.600	1.03	11.567	78.83	17.533	1.03	23.50	.77	
5.633	1.03	11.600	78.83	17.567	1.03	23.53	.77	
5.667	1.03	11.633	78.83	17.600	1.03	23.57	.77	
5.700	1.03	11.667	78.83	17.633	1.03	23.60	.77	
5.733	1.03	11.700	78.83	17.667	1.03	23.63	.77	
5.767	1.03	11.733	78.83	17.700	1.03	23.67	.77	
5.800	1.03	11.767	43.96	17.733	1.03	23.70	.77	
5.833	1.03	11.800	9.27	17.767	1.16	23.73	.77	
5.867	1.03	11.833	9.27	17.800	1.29	23.77	.39	
5.900	1.03	11.867	9.27	17.833	1.29			
5.933	1.03	11.900	9.27	17.867	1.29			
5.967	1.03	11.933	9.27	17.900	1.29			

Unit Hyd Qpeak (cms)= .140

PEAK FLOW (cms)= .030 (i)
TIME TO PEAK (hrs)= 12.233
RUNOFF VOLUME (mm)= 13.144
TOTAL RAINFALL (mm)= 64.206
RUNOFF COEFFICIENT = .205

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

CALIB					
NASHYD (0107)	Area (ha)=	.71	Curve Number (CN)=	57.8	
ID= 1 DT= 2.0 min	Ia (mm)=	10.20	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	.25			

Unit Hyd Qpeak (cms)= .109

PEAK FLOW (cms)= .018 (i)
TIME TO PEAK (hrs)= 11.900
RUNOFF VOLUME (mm)= 12.180
TOTAL RAINFALL (mm)= 64.206
RUNOFF COEFFICIENT = .190

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

CALIB					
NASHYD (0105)	Area (ha)=	2.00	Curve Number (CN)=	77.8	
ID= 1 DT= 2.0 min	Ia (mm)=	4.06	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	.07			

Unit Hyd Qpeak (cms)= 1.093

PEAK FLOW (cms)= .215 (i)
TIME TO PEAK (hrs)= 11.733
RUNOFF VOLUME (mm)= 27.190
TOTAL RAINFALL (mm)= 64.206
RUNOFF COEFFICIENT = .423

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

CALIB					
NASHYD (0106)	Area (ha)=	1.12	Curve Number (CN)=	56.1	

|ID= 1 DT= 2.0 min | Ia (mm)= 10.80 # of Linear Res.(N)= 3.00
--- U.H. Tp(hrs)= .20

Unit Hyd Qpeak (cms)= .213

PEAK FLOW (cms)= .030 (i)
TIME TO PEAK (hrs)= 11.867
RUNOFF VOLUME (mm)= 11.310
TOTAL RAINFALL (mm)= 64.206
RUNOFF COEFFICIENT = .176

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

| CALIB |
| NASHYD (0104) | Area (ha)= 1.96 Curve Number (CN)= 85.0
|ID= 1 DT= 2.0 min | Ia (mm)= 2.32 # of Linear Res.(N)= 3.00
--- U.H. Tp(hrs)= .07

Unit Hyd Qpeak (cms)= 1.069

PEAK FLOW (cms)= .276 (i)
TIME TO PEAK (hrs)= 11.733
RUNOFF VOLUME (mm)= 35.776
TOTAL RAINFALL (mm)= 64.206
RUNOFF COEFFICIENT = .557

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

| CALIB |
| NASHYD (0101) | Area (ha)= 4.09 Curve Number (CN)= 60.0
|ID= 1 DT= 2.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
--- U.H. Tp(hrs)= .36

Unit Hyd Qpeak (cms)= .434

PEAK FLOW (cms)= .085 (i)
TIME TO PEAK (hrs)= 12.033
RUNOFF VOLUME (mm)= 13.144
TOTAL RAINFALL (mm)= 64.206
RUNOFF COEFFICIENT = .205

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

| CALIB |
| NASHYD (0102) | Area (ha)= .55 Curve Number (CN)= 60.0
|ID= 1 DT= 2.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
--- U.H. Tp(hrs)= .31

Unit Hyd Qpeak (cms)= .068

PEAK FLOW (cms)= .013 (i)
TIME TO PEAK (hrs)= 11.967
RUNOFF VOLUME (mm)= 13.143
TOTAL RAINFALL (mm)= 64.206
RUNOFF COEFFICIENT = .205

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

| ADD HYD (0801) |
| 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
--- (ha) (cms) (hrs) (mm)
ID1= 1 (0103): 1.91 .030 12.23 13.14
+ ID2= 2 (0107): .71 .018 11.90 12.18
==========
ID = 3 (0801): 2.62 .043 12.07 12.88

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0802) |
| 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
--- (ha) (cms) (hrs) (mm)
ID1= 1 (0105): 2.00 .215 11.73 27.19
+ ID2= 2 (0106): 1.12 .030 11.87 11.31
==========
ID = 3 (0802): 3.12 .236 11.73 21.50

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| SHIFT HYD (0804) |
| IN= 2---> OUT= 1 |
| SHIFT= 22.0 min |

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID= 2 (0104):	1.96	.28	11.73	35.78
SHIFT ID= 1 (0804):	1.96	.28	12.07	35.78

| ADD HYD (0805) |
| 1 + 2 = 3 |

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0804):	1.96	.276	12.07	35.78
+ ID2= 2 (0101):	4.09	.085	12.03	13.14
ID = 3 (0805):	6.05	.360	12.07	20.47

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0806) |
| 1 + 2 = 3 |

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0805):	6.05	.360	12.07	20.47
+ ID2= 2 (0102):	.55	.013	11.97	13.14
ID = 3 (0806):	6.60	.372	12.07	19.86

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0803) |
| 1 + 2 = 3 |

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0801):	2.62	.043	12.07	12.88
+ ID2= 2 (0802):	3.12	.236	11.73	21.50
ID = 3 (0803):	5.74	.258	11.77	17.57

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION NUMBER: 4 **
****

| MASS STORM |
| Ptotal= 74.40 mm |

Filename: I:\2016 Projects\116023 - 185 Mountain Road\Design\Hydrologic Model\SCS Storms\SCS24H.MST

Comments: SCS Type II 24 HR MASS CURVE

Duration of storm = 23.75 hrs
Mass curve time step = 15.00 min

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.25	.89	6.25	1.49	12.25	10.71	18.25	1.19
.50	.60	6.50	1.19	12.50	5.65	18.50	1.49
.75	.89	6.75	1.49	12.75	5.36	18.75	1.19
1.00	.89	7.00	1.49	13.00	4.17	19.00	1.49
1.25	.89	7.25	1.79	13.25	3.87	19.25	1.19
1.50	.60	7.50	1.49	13.50	3.27	19.50	1.49
1.75	.89	7.75	1.79	13.75	2.98	19.75	1.19
2.00	.89	8.00	1.79	14.00	2.38	20.00	.89
2.25	1.19	8.25	2.08	14.25	2.08	20.25	.89
2.50	.89	8.50	2.08	14.50	2.38	20.50	.89
2.75	.89	8.75	2.08	14.75	2.08	20.75	.89
3.00	.89	9.00	2.38	15.00	2.38	21.00	.89
3.25	1.19	9.25	2.38	15.25	2.08	21.25	.89
3.50	.89	9.50	2.68	15.50	2.38	21.50	.89
3.75	.89	9.75	2.68	15.75	2.08	21.75	.89
4.00	1.19	10.00	3.27	16.00	1.49	22.00	.89
4.25	1.19	10.25	3.57	16.25	1.19	22.25	.89
4.50	1.19	10.50	4.46	16.50	1.49	22.50	.89
4.75	1.19	10.75	4.76	16.75	1.19	22.75	.89
5.00	1.19	11.00	7.14	17.00	1.49	23.00	.89
5.25	1.19	11.25	7.14	17.25	1.19	23.25	.89
5.50	1.19	11.50	22.02	17.50	1.49	23.50	.89
5.75	1.19	11.75	91.07	17.75	1.19	23.75	.89
6.00	1.19	12.00	10.71	18.00	1.49		

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0103) |   Area    (ha)=   1.91   Curve Number   (CN)= 60.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .52

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.033	.89	6.000	1.19	11.967	10.71	17.93	1.49
.067	.89	6.033	1.49	12.000	10.71	17.97	1.49
.100	.89	6.067	1.49	12.033	10.71	18.00	1.49
.133	.89	6.100	1.49	12.067	10.71	18.03	1.19
.167	.89	6.133	1.49	12.100	10.71	18.07	1.19
.200	.89	6.167	1.49	12.133	10.71	18.10	1.19
.233	.89	6.200	1.49	12.167	10.71	18.13	1.19
.267	.74	6.233	1.49	12.200	10.71	18.17	1.19
.300	.60	6.267	1.34	12.233	10.71	18.20	1.19
.333	.60	6.300	1.19	12.267	8.18	18.23	1.19
.367	.60	6.333	1.19	12.300	5.65	18.27	1.34
.400	.60	6.367	1.19	12.333	5.65	18.30	1.49
.433	.60	6.400	1.19	12.367	5.65	18.33	1.49
.467	.60	6.433	1.19	12.400	5.65	18.37	1.49
.500	.60	6.467	1.19	12.433	5.65	18.40	1.49
.533	.89	6.500	1.19	12.467	5.65	18.43	1.49
.567	.89	6.533	1.49	12.500	5.65	18.47	1.49
.600	.89	6.567	1.49	12.533	5.36	18.50	1.49
.633	.89	6.600	1.49	12.567	5.36	18.53	1.19
.667	.89	6.633	1.49	12.600	5.36	18.57	1.19
.700	.89	6.667	1.49	12.633	5.36	18.60	1.19
.733	.89	6.700	1.49	12.667	5.36	18.63	1.19
.767	.89	6.733	1.49	12.700	5.36	18.67	1.19
.800	.89	6.767	1.49	12.733	5.36	18.70	1.19
.833	.89	6.800	1.49	12.767	4.76	18.73	1.19
.867	.89	6.833	1.49	12.800	4.17	18.77	1.34
.900	.89	6.867	1.49	12.833	4.17	18.80	1.49
.933	.89	6.900	1.49	12.867	4.17	18.83	1.49
.967	.89	6.933	1.49	12.900	4.17	18.87	1.49
1.000	.89	6.967	1.49	12.933	4.17	18.90	1.49
1.033	.89	7.000	1.49	12.967	4.17	18.93	1.49
1.067	.89	7.033	1.79	13.000	4.17	18.97	1.49
1.100	.89	7.067	1.79	13.033	3.87	19.00	1.49
1.133	.89	7.100	1.79	13.067	3.87	19.03	1.19
1.167	.89	7.133	1.79	13.100	3.87	19.07	1.19
1.200	.89	7.167	1.79	13.133	3.87	19.10	1.19
1.233	.89	7.200	1.79	13.167	3.87	19.13	1.19
1.267	.74	7.233	1.79	13.200	3.87	19.17	1.19
1.300	.60	7.267	1.64	13.233	3.87	19.20	1.19
1.333	.60	7.300	1.49	13.267	3.57	19.23	1.19
1.367	.60	7.333	1.49	13.300	3.27	19.27	1.34
1.400	.60	7.367	1.49	13.333	3.27	19.30	1.49
1.433	.60	7.400	1.49	13.367	3.27	19.33	1.49
1.467	.60	7.433	1.49	13.400	3.27	19.37	1.49
1.500	.60	7.467	1.49	13.433	3.27	19.40	1.49
1.533	.89	7.500	1.49	13.467	3.27	19.43	1.49
1.567	.89	7.533	1.79	13.500	3.27	19.47	1.49
1.600	.89	7.567	1.79	13.533	2.98	19.50	1.49
1.633	.89	7.600	1.79	13.567	2.98	19.53	1.19
1.667	.89	7.633	1.79	13.600	2.98	19.57	1.19
1.700	.89	7.667	1.79	13.633	2.98	19.60	1.19
1.733	.89	7.700	1.79	13.667	2.98	19.63	1.19
1.767	.89	7.733	1.79	13.700	2.98	19.67	1.19
1.800	.89	7.767	1.79	13.733	2.98	19.70	1.19
1.833	.89	7.800	1.79	13.767	2.68	19.73	1.19
1.867	.89	7.833	1.79	13.800	2.38	19.77	1.04
1.900	.89	7.867	1.79	13.833	2.38	19.80	.89
1.933	.89	7.900	1.79	13.867	2.38	19.83	.89
1.967	.89	7.933	1.79	13.900	2.38	19.87	.89
2.000	.89	7.967	1.79	13.933	2.38	19.90	.89
2.033	1.19	8.000	1.79	13.967	2.38	19.93	.89
2.067	1.19	8.033	2.08	14.000	2.38	19.97	.89
2.100	1.19	8.067	2.08	14.033	2.08	20.00	.89
2.133	1.19	8.100	2.08	14.067	2.08	20.03	.89
2.167	1.19	8.133	2.08	14.100	2.08	20.07	.89
2.200	1.19	8.167	2.08	14.133	2.08	20.10	.89
2.233	1.19	8.200	2.08	14.167	2.08	20.13	.89
2.267	1.04	8.233	2.08	14.200	2.08	20.17	.89
2.300	.89	8.267	2.08	14.233	2.08	20.20	.89
2.333	.89	8.300	2.08	14.267	2.23	20.23	.89
2.367	.89	8.333	2.08	14.300	2.38	20.27	.89
2.400	.89	8.367	2.08	14.333	2.38	20.30	.89
2.433	.89	8.400	2.08	14.367	2.38	20.33	.89
2.467	.89	8.433	2.08	14.400	2.38	20.37	.89
2.500	.89	8.467	2.08	14.433	2.38	20.40	.89

2.533	.89	8.500	2.08	14.467	2.38	20.43	.89
2.567	.89	8.533	2.08	14.500	2.38	20.47	.89
2.600	.89	8.567	2.08	14.533	2.08	20.50	.89
2.633	.89	8.600	2.08	14.567	2.08	20.53	.89
2.667	.89	8.633	2.08	14.600	2.08	20.57	.89
2.700	.89	8.667	2.08	14.633	2.08	20.60	.89
2.733	.89	8.700	2.08	14.667	2.08	20.63	.89
2.767	.89	8.733	2.08	14.700	2.08	20.67	.89
2.800	.89	8.767	2.23	14.733	2.08	20.70	.89
2.833	.89	8.800	2.38	14.767	2.23	20.73	.89
2.867	.89	8.833	2.38	14.800	2.38	20.77	.89
2.900	.89	8.867	2.38	14.833	2.38	20.80	.89
2.933	.89	8.900	2.38	14.867	2.38	20.83	.89
2.967	.89	8.933	2.38	14.900	2.38	20.87	.89
3.000	.89	8.967	2.38	14.933	2.38	20.90	.89
3.033	1.19	9.000	2.38	14.967	2.38	20.93	.89
3.067	1.19	9.033	2.38	15.000	2.38	20.97	.89
3.100	1.19	9.067	2.38	15.033	2.08	21.00	.89
3.133	1.19	9.100	2.38	15.067	2.08	21.03	.89
3.167	1.19	9.133	2.38	15.100	2.08	21.07	.89
3.200	1.19	9.167	2.38	15.133	2.08	21.10	.89
3.233	1.19	9.200	2.38	15.167	2.08	21.13	.89
3.267	1.04	9.233	2.38	15.200	2.08	21.17	.89
3.300	.89	9.267	2.53	15.233	2.08	21.20	.89
3.333	.89	9.300	2.68	15.267	2.23	21.23	.89
3.367	.89	9.333	2.68	15.300	2.38	21.27	.89
3.400	.89	9.367	2.68	15.333	2.38	21.30	.89
3.433	.89	9.400	2.68	15.367	2.38	21.33	.89
3.467	.89	9.433	2.68	15.400	2.38	21.37	.89
3.500	.89	9.467	2.68	15.433	2.38	21.40	.89
3.533	.89	9.500	2.68	15.467	2.38	21.43	.89
3.567	.89	9.533	2.68	15.500	2.38	21.47	.89
3.600	.89	9.567	2.68	15.533	2.08	21.50	.89
3.633	.89	9.600	2.68	15.567	2.08	21.53	.89
3.667	.89	9.633	2.68	15.600	2.08	21.57	.89
3.700	.89	9.667	2.68	15.633	2.08	21.60	.89
3.733	.89	9.700	2.68	15.667	2.08	21.63	.89
3.767	1.04	9.733	2.68	15.700	2.08	21.67	.89
3.800	1.19	9.767	2.98	15.733	2.08	21.70	.89
3.833	1.19	9.800	3.27	15.767	1.78	21.73	.89
3.867	1.19	9.833	3.27	15.800	1.49	21.77	.89
3.900	1.19	9.867	3.27	15.833	1.49	21.80	.89
3.933	1.19	9.900	3.27	15.867	1.49	21.83	.89
3.967	1.19	9.933	3.27	15.900	1.49	21.87	.89
4.000	1.19	9.967	3.27	15.933	1.49	21.90	.89
4.033	1.19	10.000	3.27	15.967	1.49	21.93	.89
4.067	1.19	10.033	3.57	16.000	1.49	21.97	.89
4.100	1.19	10.067	3.57	16.033	1.19	22.00	.89
4.133	1.19	10.100	3.57	16.067	1.19	22.03	.89
4.167	1.19	10.133	3.57	16.100	1.19	22.07	.89
4.200	1.19	10.167	3.57	16.133	1.19	22.10	.89
4.233	1.19	10.200	3.57	16.167	1.19	22.13	.89
4.267	1.19	10.233	3.57	16.200	1.19	22.17	.89
4.300	1.19	10.267	4.02	16.233	1.19	22.20	.89
4.333	1.19	10.300	4.46	16.267	1.34	22.23	.89
4.367	1.19	10.333	4.46	16.300	1.49	22.27	.89
4.400	1.19	10.367	4.46	16.333	1.49	22.30	.89
4.433	1.19	10.400	4.46	16.367	1.49	22.33	.89
4.467	1.19	10.433	4.46	16.400	1.49	22.37	.89
4.500	1.19	10.467	4.46	16.433	1.49	22.40	.89
4.533	1.19	10.500	4.46	16.467	1.49	22.43	.89
4.567	1.19	10.533	4.76	16.500	1.49	22.47	.89
4.600	1.19	10.567	4.76	16.533	1.19	22.50	.89
4.633	1.19	10.600	4.76	16.567	1.19	22.53	.89
4.667	1.19	10.633	4.76	16.600	1.19	22.57	.89
4.700	1.19	10.667	4.76	16.633	1.19	22.60	.89
4.733	1.19	10.700	4.76	16.667	1.19	22.63	.89
4.767	1.19	10.733	4.76	16.700	1.19	22.67	.89
4.800	1.19	10.767	5.95	16.733	1.19	22.70	.89
4.833	1.19	10.800	7.14	16.767	1.34	22.73	.89
4.867	1.19	10.833	7.14	16.800	1.49	22.77	.89
4.900	1.19	10.867	7.14	16.833	1.49	22.80	.89
4.933	1.19	10.900	7.14	16.867	1.49	22.83	.89
4.967	1.19	10.933	7.14	16.900	1.49	22.87	.89
5.000	1.19	10.967	7.14	16.933	1.49	22.90	.89
5.033	1.19	11.000	7.14	16.967	1.49	22.93	.89
5.067	1.19	11.033	7.14	17.000	1.49	22.97	.89
5.100	1.19	11.067	7.14	17.033	1.19	23.00	.89
5.133	1.19	11.100	7.14	17.067	1.19	23.03	.89
5.167	1.19	11.133	7.14	17.100	1.19	23.07	.89
5.200	1.19	11.167	7.14	17.133	1.19	23.10	.89
5.233	1.19	11.200	7.14	17.167	1.19	23.13	.89
5.267	1.19	11.233	7.14	17.200	1.19	23.17	.89
5.300	1.19	11.267	14.60	17.233	1.19	23.20	.89
5.333	1.19	11.300	22.02	17.267	1.34	23.23	.89
5.367	1.19	11.333	22.02	17.300	1.49	23.27	.89
5.400	1.19	11.367	22.02	17.333	1.49	23.30	.89
5.433	1.19	11.400	22.02	17.367	1.49	23.33	.89
5.467	1.19	11.433	22.02	17.400	1.49	23.37	.89

5.500	1.19	11.467	22.02	17.433	1.49	23.40	.89
5.533	1.19	11.500	22.11	17.467	1.49	23.43	.89
5.567	1.19	11.533	91.07	17.500	1.49	23.47	.89
5.600	1.19	11.567	91.07	17.533	1.19	23.50	.89
5.633	1.19	11.600	91.07	17.567	1.19	23.53	.89
5.667	1.19	11.633	91.07	17.600	1.19	23.57	.89
5.700	1.19	11.667	91.07	17.633	1.19	23.60	.89
5.733	1.19	11.700	91.07	17.667	1.19	23.63	.89
5.767	1.19	11.733	91.07	17.700	1.19	23.67	.89
5.800	1.19	11.767	50.78	17.733	1.19	23.70	.89
5.833	1.19	11.800	10.71	17.767	1.34	23.73	.89
5.867	1.19	11.833	10.71	17.800	1.49	23.77	.45
5.900	1.19	11.867	10.71	17.833	1.49		
5.933	1.19	11.900	10.71	17.867	1.49		
5.967	1.19	11.933	10.71	17.900	1.49		

Unit Hyd Qpeak (cms)= .140

PEAK FLOW (cms)= .041 (i)
TIME TO PEAK (hrs)= 12.233
RUNOFF VOLUME (mm)= 17.637
TOTAL RAINFALL (mm)= 74.176
RUNOFF COEFFICIENT = .238

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

CALIB					
NASHYD (0107)	Area (ha)=	.71	Curve Number (CN)=	57.8
ID= 1 DT= 2.0 min	Ia (mm)=	10.20	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	.25		

Unit Hyd Qpeak (cms)= .109

PEAK FLOW (cms)= .024 (i)
TIME TO PEAK (hrs)= 11.900
RUNOFF VOLUME (mm)= 16.408
TOTAL RAINFALL (mm)= 74.176
RUNOFF COEFFICIENT = .221

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

CALIB					
NASHYD (0105)	Area (ha)=	2.00	Curve Number (CN)=	77.8
ID= 1 DT= 2.0 min	Ia (mm)=	4.06	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	.07		

Unit Hyd Qpeak (cms)= 1.093

PEAK FLOW (cms)= .272 (i)
TIME TO PEAK (hrs)= 11.733
RUNOFF VOLUME (mm)= 34.367
TOTAL RAINFALL (mm)= 74.176
RUNOFF COEFFICIENT = .463

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

CALIB					
NASHYD (0106)	Area (ha)=	1.12	Curve Number (CN)=	56.1
ID= 1 DT= 2.0 min	Ia (mm)=	10.80	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	.20		

Unit Hyd Qpeak (cms)= .213

PEAK FLOW (cms)= .041 (i)
TIME TO PEAK (hrs)= 11.867
RUNOFF VOLUME (mm)= 15.321
TOTAL RAINFALL (mm)= 74.176
RUNOFF COEFFICIENT = .207

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

CALIB					
NASHYD (0104)	Area (ha)=	1.96	Curve Number (CN)=	85.0
ID= 1 DT= 2.0 min	Ia (mm)=	2.32	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	.07		

Unit Hyd Qpeak (cms)= 1.069

PEAK FLOW (cms)= .339 (i)
TIME TO PEAK (hrs)= 11.733
RUNOFF VOLUME (mm)= 44.110

```
     TOTAL RAINFALL   (mm)=  74.176
     RUNOFF COEFFICIENT   =    .595

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0101) |   Area    (ha)=   4.09   Curve Number   (CN)= 60.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .36

     Unit Hyd Qpeak  (cms)=    .434

     PEAK FLOW       (cms)=    .116 (i)
     TIME TO PEAK    (hrs)=  12.033
     RUNOFF VOLUME    (mm)=  17.637
     TOTAL RAINFALL   (mm)=  74.176
     RUNOFF COEFFICIENT   =    .238

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0102) |   Area    (ha)=    .55   Curve Number   (CN)= 60.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .31

     Unit Hyd Qpeak  (cms)=    .068

     PEAK FLOW       (cms)=    .017 (i)
     TIME TO PEAK    (hrs)=  11.967
     RUNOFF VOLUME    (mm)=  17.636
     TOTAL RAINFALL   (mm)=  74.176
     RUNOFF COEFFICIENT   =    .238

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

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

--------------------
| ADD HYD   (0801) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0103):     1.91    .041    12.23    17.64
        + ID2= 2 (0107):      .71    .024    11.90    16.41
          ================================================
          ID = 3 (0801):     2.62    .059    12.03    17.30

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0802) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0105):     2.00    .272    11.73    34.37
        + ID2= 2 (0106):     1.12    .041    11.87    15.32
          ================================================
          ID = 3 (0802):     3.12    .302    11.73    27.55

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| SHIFT HYD (0804) |
| IN= 2---> OUT= 1 |
| SHIFT= 22.0 min  |      AREA     QPEAK     TPEAK      R.V.
--------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (0104):    1.96      .34     11.73     44.11
    SHIFT ID= 1 (0804):    1.96      .34     12.07     44.11

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

--------------------
| ADD HYD   (0805) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0804):     1.96    .339    12.07    44.11
        + ID2= 2 (0101):     4.09    .116    12.03    17.64
          ================================================
          ID = 3 (0805):     6.05    .454    12.07    26.21

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
```

ADD HYD (0806)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0805):	6.05	.454	12.07	26.21
	+ ID2= 2 (0102):	.55	.017	11.97	17.64
	ID = 3 (0806):	6.60	.470	12.07	25.49

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0803)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0801):	2.62	.059	12.03	17.30
	+ ID2= 2 (0802):	3.12	.302	11.73	27.55
	ID = 3 (0803):	5.74	.333	11.77	22.87

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION NUMBER: 5 **
****

MASS STORM	Filename: I:\2016 Projects\116023 - 185 Mountain Road\Design\Hydrologic Model\SCS Storms\SCS24H.MST
Ptotal= 81.80 mm	Comments: SCS Type II 24 HR MASS CURVE

Duration of storm = 23.75 hrs
Mass curve time step = 15.00 min

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.25	.98	6.25	1.64	12.25	11.78	18.25	1.31
.50	.65	6.50	1.31	12.50	6.22	18.50	1.64
.75	.98	6.75	1.64	12.75	5.89	18.75	1.31
1.00	.98	7.00	1.64	13.00	4.58	19.00	1.64
1.25	.98	7.25	1.96	13.25	4.25	19.25	1.31
1.50	.65	7.50	1.64	13.50	3.60	19.50	1.64
1.75	.98	7.75	1.96	13.75	3.27	19.75	1.31
2.00	.98	8.00	1.96	14.00	2.62	20.00	.98
2.25	1.31	8.25	2.29	14.25	2.29	20.25	.98
2.50	.98	8.50	2.29	14.50	2.62	20.50	.98
2.75	.98	8.75	2.29	14.75	2.29	20.75	.98
3.00	.98	9.00	2.62	15.00	2.62	21.00	.98
3.25	1.31	9.25	2.62	15.25	2.29	21.25	.98
3.50	.98	9.50	2.94	15.50	2.62	21.50	.98
3.75	.98	9.75	2.94	15.75	2.29	21.75	.98
4.00	1.31	10.00	3.60	16.00	1.64	22.00	.98
4.25	1.31	10.25	3.93	16.25	1.31	22.25	.98
4.50	1.31	10.50	4.91	16.50	1.64	22.50	.98
4.75	1.31	10.75	5.24	16.75	1.31	22.75	.98
5.00	1.31	11.00	7.85	17.00	1.64	23.00	.98
5.25	1.31	11.25	7.85	17.25	1.31	23.25	.98
5.50	1.31	11.50	24.21	17.50	1.64	23.50	.98
5.75	1.31	11.75	100.12	17.75	1.31	23.75	.98
6.00	1.31	12.00	11.78	18.00	1.64		

CALIB			
NASHYD (0103)	Area (ha)= 1.91	Curve Number (CN)= 60.0	
ID= 1 DT= 2.0 min	Ia (mm)= 10.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= .52		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.033	.98	6.000	1.31	11.967	11.78	17.93	1.64
.067	.98	6.033	1.64	12.000	11.78	17.97	1.64
.100	.98	6.067	1.64	12.033	11.78	18.00	1.64
.133	.98	6.100	1.64	12.067	11.78	18.03	1.31
.167	.98	6.133	1.64	12.100	11.78	18.07	1.31
.200	.98	6.167	1.64	12.133	11.78	18.10	1.31
.233	.98	6.200	1.64	12.167	11.78	18.13	1.31
.267	.82	6.233	1.64	12.200	11.78	18.17	1.31
.300	.65	6.267	1.47	12.233	11.78	18.20	1.31
.333	.65	6.300	1.31	12.267	8.99	18.23	1.31
.367	.65	6.333	1.31	12.300	6.22	18.27	1.47

.400	.65	6.367	1.31	12.333	6.22	18.30	1.64
.433	.65	6.400	1.31	12.367	6.22	18.33	1.64
.467	.65	6.433	1.31	12.400	6.22	18.37	1.64
.500	.65	6.467	1.31	12.433	6.22	18.40	1.64
.533	.98	6.500	1.31	12.467	6.22	18.43	1.64
.567	.98	6.533	1.64	12.500	6.22	18.47	1.64
.600	.98	6.567	1.64	12.533	5.89	18.50	1.64
.633	.98	6.600	1.64	12.567	5.89	18.53	1.31
.667	.98	6.633	1.64	12.600	5.89	18.57	1.31
.700	.98	6.667	1.64	12.633	5.89	18.60	1.31
.733	.98	6.700	1.64	12.667	5.89	18.63	1.31
.767	.98	6.733	1.64	12.700	5.89	18.67	1.31
.800	.98	6.767	1.64	12.733	5.89	18.70	1.31
.833	.98	6.800	1.64	12.767	5.23	18.73	1.31
.867	.98	6.833	1.64	12.800	4.58	18.77	1.47
.900	.98	6.867	1.64	12.833	4.58	18.80	1.64
.933	.98	6.900	1.64	12.867	4.58	18.83	1.64
.967	.98	6.933	1.64	12.900	4.58	18.87	1.64
1.000	.98	6.967	1.64	12.933	4.58	18.90	1.64
1.033	.98	7.000	1.64	12.967	4.58	18.93	1.64
1.067	.98	7.033	1.96	13.000	4.58	18.97	1.64
1.100	.98	7.067	1.96	13.033	4.25	19.00	1.64
1.133	.98	7.100	1.96	13.067	4.25	19.03	1.31
1.167	.98	7.133	1.96	13.100	4.25	19.07	1.31
1.200	.98	7.167	1.96	13.133	4.25	19.10	1.31
1.233	.98	7.200	1.96	13.167	4.25	19.13	1.31
1.267	.82	7.233	1.96	13.200	4.25	19.17	1.31
1.300	.65	7.267	1.80	13.233	4.25	19.20	1.31
1.333	.65	7.300	1.64	13.267	3.93	19.23	1.31
1.367	.65	7.333	1.64	13.300	3.60	19.27	1.47
1.400	.65	7.367	1.64	13.333	3.60	19.30	1.64
1.433	.65	7.400	1.64	13.367	3.60	19.33	1.64
1.467	.65	7.433	1.64	13.400	3.60	19.37	1.64
1.500	.65	7.467	1.64	13.433	3.60	19.40	1.64
1.533	.98	7.500	1.64	13.467	3.60	19.43	1.64
1.567	.98	7.533	1.96	13.500	3.60	19.47	1.64
1.600	.98	7.567	1.96	13.533	3.27	19.50	1.64
1.633	.98	7.600	1.96	13.567	3.27	19.53	1.31
1.667	.98	7.633	1.96	13.600	3.27	19.57	1.31
1.700	.98	7.667	1.96	13.633	3.27	19.60	1.31
1.733	.98	7.700	1.96	13.667	3.27	19.63	1.31
1.767	.98	7.733	1.96	13.700	3.27	19.67	1.31
1.800	.98	7.767	1.96	13.733	3.27	19.70	1.31
1.833	.98	7.800	1.96	13.767	2.94	19.73	1.31
1.867	.98	7.833	1.96	13.800	2.62	19.77	1.14
1.900	.98	7.867	1.96	13.833	2.62	19.80	.98
1.933	.98	7.900	1.96	13.867	2.62	19.83	.98
1.967	.98	7.933	1.96	13.900	2.62	19.87	.98
2.000	.98	7.967	1.96	13.933	2.62	19.90	.98
2.033	1.31	8.000	1.96	13.967	2.62	19.93	.98
2.067	1.31	8.033	2.29	14.000	2.62	19.97	.98
2.100	1.31	8.067	2.29	14.033	2.29	20.00	.98
2.133	1.31	8.100	2.29	14.067	2.29	20.03	.98
2.167	1.31	8.133	2.29	14.100	2.29	20.07	.98
2.200	1.31	8.167	2.29	14.133	2.29	20.10	.98
2.233	1.31	8.200	2.29	14.167	2.29	20.13	.98
2.267	1.15	8.233	2.29	14.200	2.29	20.17	.98
2.300	.98	8.267	2.29	14.233	2.29	20.20	.98
2.333	.98	8.300	2.29	14.267	2.45	20.23	.98
2.367	.98	8.333	2.29	14.300	2.62	20.27	.98
2.400	.98	8.367	2.29	14.333	2.62	20.30	.98
2.433	.98	8.400	2.29	14.367	2.62	20.33	.98
2.467	.98	8.433	2.29	14.400	2.62	20.37	.98
2.500	.98	8.467	2.29	14.433	2.62	20.40	.98
2.533	.98	8.500	2.29	14.467	2.62	20.43	.98
2.567	.98	8.533	2.29	14.500	2.62	20.47	.98
2.600	.98	8.567	2.29	14.533	2.29	20.50	.98
2.633	.98	8.600	2.29	14.567	2.29	20.53	.98
2.667	.98	8.633	2.29	14.600	2.29	20.57	.98
2.700	.98	8.667	2.29	14.633	2.29	20.60	.98
2.733	.98	8.700	2.29	14.667	2.29	20.63	.98
2.767	.98	8.733	2.29	14.700	2.29	20.67	.98
2.800	.98	8.767	2.45	14.733	2.29	20.70	.98
2.833	.98	8.800	2.62	14.767	2.45	20.73	.98
2.867	.98	8.833	2.62	14.800	2.62	20.77	.98
2.900	.98	8.867	2.62	14.833	2.62	20.80	.98
2.933	.98	8.900	2.62	14.867	2.62	20.83	.98
2.967	.98	8.933	2.62	14.900	2.62	20.87	.98
3.000	.98	8.967	2.62	14.933	2.62	20.90	.98
3.033	1.31	9.000	2.62	14.967	2.62	20.93	.98
3.067	1.31	9.033	2.62	15.000	2.62	20.97	.98
3.100	1.31	9.067	2.62	15.033	2.29	21.00	.98
3.133	1.31	9.100	2.62	15.067	2.29	21.03	.98
3.167	1.31	9.133	2.62	15.100	2.29	21.07	.98
3.200	1.31	9.167	2.62	15.133	2.29	21.10	.98
3.233	1.31	9.200	2.62	15.167	2.29	21.13	.98
3.267	1.15	9.233	2.62	15.200	2.29	21.17	.98
3.300	.98	9.267	2.78	15.233	2.29	21.20	.98
3.333	.98	9.300	2.94	15.267	2.45	21.23	.98

3.367	.98	9.333	2.94	15.300	2.62	21.27	.98
3.400	.98	9.367	2.94	15.333	2.62	21.30	.98
3.433	.98	9.400	2.94	15.367	2.62	21.33	.98
3.467	.98	9.433	2.94	15.400	2.62	21.37	.98
3.500	.98	9.467	2.94	15.433	2.62	21.40	.98
3.533	.98	9.500	2.94	15.467	2.62	21.43	.98
3.567	.98	9.533	2.94	15.500	2.62	21.47	.98
3.600	.98	9.567	2.94	15.533	2.29	21.50	.98
3.633	.98	9.600	2.94	15.567	2.29	21.53	.98
3.667	.98	9.633	2.94	15.600	2.29	21.57	.98
3.700	.98	9.667	2.94	15.633	2.29	21.60	.98
3.733	.98	9.700	2.94	15.667	2.29	21.63	.98
3.767	1.15	9.733	2.94	15.700	2.29	21.67	.98
3.800	1.31	9.767	3.27	15.733	2.29	21.70	.98
3.833	1.31	9.800	3.60	15.767	1.96	21.73	.98
3.867	1.31	9.833	3.60	15.800	1.64	21.77	.98
3.900	1.31	9.867	3.60	15.833	1.64	21.80	.98
3.933	1.31	9.900	3.60	15.867	1.64	21.83	.98
3.967	1.31	9.933	3.60	15.900	1.64	21.87	.98
4.000	1.31	9.967	3.60	15.933	1.64	21.90	.98
4.033	1.31	10.000	3.60	15.967	1.64	21.93	.98
4.067	1.31	10.033	3.93	16.000	1.64	21.97	.98
4.100	1.31	10.067	3.93	16.033	1.31	22.00	.98
4.133	1.31	10.100	3.93	16.067	1.31	22.03	.98
4.167	1.31	10.133	3.93	16.100	1.31	22.07	.98
4.200	1.31	10.167	3.93	16.133	1.31	22.10	.98
4.233	1.31	10.200	3.93	16.167	1.31	22.13	.98
4.267	1.31	10.233	3.93	16.200	1.31	22.17	.98
4.300	1.31	10.267	4.42	16.233	1.31	22.20	.98
4.333	1.31	10.300	4.91	16.267	1.47	22.23	.98
4.367	1.31	10.333	4.91	16.300	1.64	22.27	.98
4.400	1.31	10.367	4.91	16.333	1.64	22.30	.98
4.433	1.31	10.400	4.91	16.367	1.64	22.33	.98
4.467	1.31	10.433	4.91	16.400	1.64	22.37	.98
4.500	1.31	10.467	4.91	16.433	1.64	22.40	.98
4.533	1.31	10.500	4.91	16.467	1.64	22.43	.98
4.567	1.31	10.533	5.24	16.500	1.64	22.47	.98
4.600	1.31	10.567	5.24	16.533	1.31	22.50	.98
4.633	1.31	10.600	5.24	16.567	1.31	22.53	.98
4.667	1.31	10.633	5.24	16.600	1.31	22.57	.98
4.700	1.31	10.667	5.24	16.633	1.31	22.60	.98
4.733	1.31	10.700	5.24	16.667	1.31	22.63	.98
4.767	1.31	10.733	5.24	16.700	1.31	22.67	.98
4.800	1.31	10.767	6.55	16.733	1.31	22.70	.98
4.833	1.31	10.800	7.85	16.767	1.47	22.73	.98
4.867	1.31	10.833	7.85	16.800	1.64	22.77	.98
4.900	1.31	10.867	7.85	16.833	1.64	22.80	.98
4.933	1.31	10.900	7.85	16.867	1.64	22.83	.98
4.967	1.31	10.933	7.85	16.900	1.64	22.87	.98
5.000	1.31	10.967	7.85	16.933	1.64	22.90	.98
5.033	1.31	11.000	7.85	16.967	1.64	22.93	.98
5.067	1.31	11.033	7.85	17.000	1.64	22.97	.98
5.100	1.31	11.067	7.85	17.033	1.31	23.00	.98
5.133	1.31	11.100	7.85	17.067	1.31	23.03	.98
5.167	1.31	11.133	7.85	17.100	1.31	23.07	.98
5.200	1.31	11.167	7.85	17.133	1.31	23.10	.98
5.233	1.31	11.200	7.85	17.167	1.31	23.13	.98
5.267	1.31	11.233	7.85	17.200	1.31	23.17	.98
5.300	1.31	11.267	16.05	17.233	1.31	23.20	.98
5.333	1.31	11.300	24.21	17.267	1.47	23.23	.98
5.367	1.31	11.333	24.21	17.300	1.64	23.27	.98
5.400	1.31	11.367	24.21	17.333	1.64	23.30	.98
5.433	1.31	11.400	24.21	17.367	1.64	23.33	.98
5.467	1.31	11.433	24.21	17.400	1.64	23.37	.98
5.500	1.31	11.467	24.21	17.433	1.64	23.40	.98
5.533	1.31	11.500	24.30	17.467	1.64	23.43	.98
5.567	1.31	11.533	100.12	17.500	1.64	23.47	.98
5.600	1.31	11.567	100.12	17.533	1.31	23.50	.98
5.633	1.31	11.600	100.12	17.567	1.31	23.53	.98
5.667	1.31	11.633	100.12	17.600	1.31	23.57	.98
5.700	1.31	11.667	100.12	17.633	1.31	23.60	.98
5.733	1.31	11.700	100.12	17.667	1.31	23.63	.98
5.767	1.31	11.733	100.12	17.700	1.31	23.67	.98
5.800	1.31	11.767	55.84	17.733	1.31	23.70	.98
5.833	1.31	11.800	11.78	17.767	1.47	23.73	.98
5.867	1.31	11.833	11.78	17.800	1.64	23.77	.49
5.900	1.31	11.867	11.78	17.833	1.64		
5.933	1.31	11.900	11.78	17.867	1.64		
5.967	1.31	11.933	11.78	17.900	1.64		

Unit Hyd Qpeak (cms)= .140

PEAK FLOW (cms)= .050 (i)
TIME TO PEAK (hrs)= 12.233
RUNOFF VOLUME (mm)= 21.254
TOTAL RAINFALL (mm)= 81.554
RUNOFF COEFFICIENT = .261

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

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0107) |   Area    (ha)=    .71   Curve Number   (CN)= 57.8
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.20   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .25

     Unit Hyd Qpeak  (cms)=    .109

     PEAK FLOW       (cms)=    .030 (i)
     TIME TO PEAK    (hrs)=  11.900
     RUNOFF VOLUME    (mm)=  19.825
     TOTAL RAINFALL   (mm)=  81.554
     RUNOFF COEFFICIENT   =    .243

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0105) |   Area    (ha)=   2.00   Curve Number   (CN)= 77.8
|ID= 1 DT= 2.0 min |   Ia      (mm)=   4.06   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .07

     Unit Hyd Qpeak  (cms)=   1.093

     PEAK FLOW       (cms)=    .316 (i)
     TIME TO PEAK    (hrs)=  11.733
     RUNOFF VOLUME    (mm)=  39.915
     TOTAL RAINFALL   (mm)=  81.554
     RUNOFF COEFFICIENT   =    .489

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0106) |   Area    (ha)=   1.12   Curve Number   (CN)= 56.1
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.80   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .20

     Unit Hyd Qpeak  (cms)=    .213

     PEAK FLOW       (cms)=    .050 (i)
     TIME TO PEAK    (hrs)=  11.867
     RUNOFF VOLUME    (mm)=  18.573
     TOTAL RAINFALL   (mm)=  81.554
     RUNOFF COEFFICIENT   =    .228

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0104) |   Area    (ha)=   1.96   Curve Number   (CN)= 85.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   2.32   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .07

     Unit Hyd Qpeak  (cms)=   1.069

     PEAK FLOW       (cms)=    .387 (i)
     TIME TO PEAK    (hrs)=  11.733
     RUNOFF VOLUME    (mm)=  50.444
     TOTAL RAINFALL   (mm)=  81.554
     RUNOFF COEFFICIENT   =    .619

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0101) |   Area    (ha)=   4.09   Curve Number   (CN)= 60.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .36

     Unit Hyd Qpeak  (cms)=    .434

     PEAK FLOW       (cms)=    .141 (i)
     TIME TO PEAK    (hrs)=  12.033
     RUNOFF VOLUME    (mm)=  21.254
     TOTAL RAINFALL   (mm)=  81.554
     RUNOFF COEFFICIENT   =    .261

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
```

```
| NASHYD    (0102) |   Area     (ha)=    .55   Curve Number   (CN)= 60.0
|ID= 1 DT= 2.0 min |   Ia       (mm)=  10.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=    .31

     Unit Hyd Qpeak  (cms)=    .068

     PEAK FLOW       (cms)=    .021 (i)
     TIME TO PEAK    (hrs)=  11.967
     RUNOFF VOLUME    (mm)=  21.253
     TOTAL RAINFALL   (mm)=  81.554
     RUNOFF COEFFICIENT   =    .261

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

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

--------------------
| ADD HYD   (0801) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0103):     1.91    .050    12.23    21.25
        + ID2= 2 (0107):      .71    .030    11.90    19.83
          ================================================
          ID = 3 (0801):     2.62    .072    12.03    20.87

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0802) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0105):     2.00    .316    11.73    39.91
        + ID2= 2 (0106):     1.12    .050    11.87    18.57
          ================================================
          ID = 3 (0802):     3.12    .352    11.73    32.27

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| SHIFT HYD (0804) |
| IN= 2---> OUT= 1 |
| SHIFT= 22.0 min  |      AREA     QPEAK     TPEAK      R.V.
--------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (0104):    1.96      .39     11.73     50.44
    SHIFT ID= 1 (0804):    1.96      .39     12.07     50.44

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

--------------------
| ADD HYD   (0805) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0804):     1.96    .387    12.07    50.44
        + ID2= 2 (0101):     4.09    .141    12.03    21.25
          ================================================
          ID = 3 (0805):     6.05    .527    12.07    30.70

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0806) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0805):     6.05    .527    12.07    30.70
        + ID2= 2 (0102):      .55    .021    11.97    21.25
          ================================================
          ID = 3 (0806):     6.60    .546    12.07    29.92

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0803) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0801):     2.62    .072    12.03    20.87
        + ID2= 2 (0802):     3.12    .352    11.73    32.27
          ================================================
          ID = 3 (0803):     5.74    .391    11.77    27.06

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
```

```
  ****************************
  ** SIMULATION NUMBER:   6 **
  ****************************

--------------------
| MASS STORM       |    Filename: I:\2016 Projects\116023 - 185 Mountain Road\
|                  |              Design\Hydrologic Model\SCS Storms\
|                  |              SCS24H.MST
| Ptotal= 89.20 mm |    Comments: SCS Type II 24 HR MASS CURVE
--------------------
                       Duration of storm    = 23.75 hrs
                       Mass curve time step = 15.00 min

                TIME    RAIN |  TIME    RAIN |  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr
                 .25    1.07 |  6.25    1.78 | 12.25   12.84 | 18.25    1.43
                 .50     .71 |  6.50    1.43 | 12.50    6.78 | 18.50    1.78
                 .75    1.07 |  6.75    1.78 | 12.75    6.42 | 18.75    1.43
                1.00    1.07 |  7.00    1.78 | 13.00    5.00 | 19.00    1.78
                1.25    1.07 |  7.25    2.14 | 13.25    4.64 | 19.25    1.43
                1.50     .71 |  7.50    1.78 | 13.50    3.92 | 19.50    1.78
                1.75    1.07 |  7.75    2.14 | 13.75    3.57 | 19.75    1.43
                2.00    1.07 |  8.00    2.14 | 14.00    2.85 | 20.00    1.07
                2.25    1.43 |  8.25    2.50 | 14.25    2.50 | 20.25    1.07
                2.50    1.07 |  8.50    2.50 | 14.50    2.85 | 20.50    1.07
                2.75    1.07 |  8.75    2.50 | 14.75    2.50 | 20.75    1.07
                3.00    1.07 |  9.00    2.85 | 15.00    2.85 | 21.00    1.07
                3.25    1.43 |  9.25    2.85 | 15.25    2.50 | 21.25    1.07
                3.50    1.07 |  9.50    3.21 | 15.50    2.85 | 21.50    1.07
                3.75    1.07 |  9.75    3.21 | 15.75    2.50 | 21.75    1.07
                4.00    1.43 | 10.00    3.92 | 16.00    1.78 | 22.00    1.07
                4.25    1.43 | 10.25    4.28 | 16.25    1.43 | 22.25    1.07
                4.50    1.43 | 10.50    5.35 | 16.50    1.78 | 22.50    1.07
                4.75    1.43 | 10.75    5.71 | 16.75    1.43 | 22.75    1.07
                5.00    1.43 | 11.00    8.56 | 17.00    1.78 | 23.00    1.07
                5.25    1.43 | 11.25    8.56 | 17.25    1.43 | 23.25    1.07
                5.50    1.43 | 11.50   26.40 | 17.50    1.78 | 23.50    1.07
                5.75    1.43 | 11.75  109.18 | 17.75    1.43 | 23.75    1.07
                6.00    1.43 | 12.00   12.84 | 18.00    1.78 |

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0103) |   Area    (ha)=   1.91   Curve Number   (CN)= 60.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .52

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


                          ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr
                .033    1.07 | 6.000    1.43 |11.967   12.84 | 17.93    1.78
                .067    1.07 | 6.033    1.78 |12.000   12.84 | 17.97    1.78
                .100    1.07 | 6.067    1.78 |12.033   12.84 | 18.00    1.78
                .133    1.07 | 6.100    1.78 |12.067   12.84 | 18.03    1.43
                .167    1.07 | 6.133    1.78 |12.100   12.84 | 18.07    1.43
                .200    1.07 | 6.167    1.78 |12.133   12.84 | 18.10    1.43
                .233    1.07 | 6.200    1.78 |12.167   12.84 | 18.13    1.43
                .267     .89 | 6.233    1.78 |12.200   12.84 | 18.17    1.43
                .300     .71 | 6.267    1.61 |12.233   12.84 | 18.20    1.43
                .333     .71 | 6.300    1.43 |12.267    9.80 | 18.23    1.43
                .367     .71 | 6.333    1.43 |12.300    6.78 | 18.27    1.61
                .400     .71 | 6.367    1.43 |12.333    6.78 | 18.30    1.78
                .433     .71 | 6.400    1.43 |12.367    6.78 | 18.33    1.78
                .467     .71 | 6.433    1.43 |12.400    6.78 | 18.37    1.78
                .500     .71 | 6.467    1.43 |12.433    6.78 | 18.40    1.78
                .533    1.07 | 6.500    1.43 |12.467    6.78 | 18.43    1.78
                .567    1.07 | 6.533    1.78 |12.500    6.78 | 18.47    1.78
                .600    1.07 | 6.567    1.78 |12.533    6.42 | 18.50    1.78
                .633    1.07 | 6.600    1.78 |12.567    6.42 | 18.53    1.43
                .667    1.07 | 6.633    1.78 |12.600    6.42 | 18.57    1.43
                .700    1.07 | 6.667    1.78 |12.633    6.42 | 18.60    1.43
                .733    1.07 | 6.700    1.78 |12.667    6.42 | 18.63    1.43
                .767    1.07 | 6.733    1.78 |12.700    6.42 | 18.67    1.43
                .800    1.07 | 6.767    1.78 |12.733    6.42 | 18.70    1.43
                .833    1.07 | 6.800    1.78 |12.767    5.71 | 18.73    1.43
                .867    1.07 | 6.833    1.78 |12.800    5.00 | 18.77    1.61
                .900    1.07 | 6.867    1.78 |12.833    5.00 | 18.80    1.78
                .933    1.07 | 6.900    1.78 |12.867    5.00 | 18.83    1.78
                .967    1.07 | 6.933    1.78 |12.900    5.00 | 18.87    1.78
               1.000    1.07 | 6.967    1.78 |12.933    5.00 | 18.90    1.78
               1.033    1.07 | 7.000    1.78 |12.967    5.00 | 18.93    1.78
               1.067    1.07 | 7.033    2.14 |13.000    4.99 | 18.97    1.78
               1.100    1.07 | 7.067    2.14 |13.033    4.64 | 19.00    1.78
               1.133    1.07 | 7.100    2.14 |13.067    4.64 | 19.03    1.43
               1.167    1.07 | 7.133    2.14 |13.100    4.64 | 19.07    1.43
               1.200    1.07 | 7.167    2.14 |13.133    4.64 | 19.10    1.43
```

1.233	1.07	7.200	2.14	13.167	4.64	19.13	1.43
1.267	.89	7.233	2.14	13.200	4.64	19.17	1.43
1.300	.71	7.267	1.96	13.233	4.64	19.20	1.43
1.333	.71	7.300	1.78	13.267	4.28	19.23	1.43
1.367	.71	7.333	1.78	13.300	3.92	19.27	1.61
1.400	.71	7.367	1.78	13.333	3.92	19.30	1.78
1.433	.71	7.400	1.78	13.367	3.92	19.33	1.78
1.467	.71	7.433	1.78	13.400	3.92	19.37	1.78
1.500	.71	7.467	1.78	13.433	3.92	19.40	1.78
1.533	1.07	7.500	1.78	13.467	3.92	19.43	1.78
1.567	1.07	7.533	2.14	13.500	3.92	19.47	1.78
1.600	1.07	7.567	2.14	13.533	3.57	19.50	1.78
1.633	1.07	7.600	2.14	13.567	3.57	19.53	1.43
1.667	1.07	7.633	2.14	13.600	3.57	19.57	1.43
1.700	1.07	7.667	2.14	13.633	3.57	19.60	1.43
1.733	1.07	7.700	2.14	13.667	3.57	19.63	1.43
1.767	1.07	7.733	2.14	13.700	3.57	19.67	1.43
1.800	1.07	7.767	2.14	13.733	3.57	19.70	1.43
1.833	1.07	7.800	2.14	13.767	3.21	19.73	1.43
1.867	1.07	7.833	2.14	13.800	2.85	19.77	1.25
1.900	1.07	7.867	2.14	13.833	2.85	19.80	1.07
1.933	1.07	7.900	2.14	13.867	2.85	19.83	1.07
1.967	1.07	7.933	2.14	13.900	2.85	19.87	1.07
2.000	1.07	7.967	2.14	13.933	2.85	19.90	1.07
2.033	1.43	8.000	2.14	13.967	2.85	19.93	1.07
2.067	1.43	8.033	2.50	14.000	2.85	19.97	1.07
2.100	1.43	8.067	2.50	14.033	2.50	20.00	1.07
2.133	1.43	8.100	2.50	14.067	2.50	20.03	1.07
2.167	1.43	8.133	2.50	14.100	2.50	20.07	1.07
2.200	1.43	8.167	2.50	14.133	2.50	20.10	1.07
2.233	1.43	8.200	2.50	14.167	2.50	20.13	1.07
2.267	1.25	8.233	2.50	14.200	2.50	20.17	1.07
2.300	1.07	8.267	2.50	14.233	2.50	20.20	1.07
2.333	1.07	8.300	2.50	14.267	2.68	20.23	1.07
2.367	1.07	8.333	2.50	14.300	2.85	20.27	1.07
2.400	1.07	8.367	2.50	14.333	2.85	20.30	1.07
2.433	1.07	8.400	2.50	14.367	2.85	20.33	1.07
2.467	1.07	8.433	2.50	14.400	2.85	20.37	1.07
2.500	1.07	8.467	2.50	14.433	2.85	20.40	1.07
2.533	1.07	8.500	2.50	14.467	2.85	20.43	1.07
2.567	1.07	8.533	2.50	14.500	2.85	20.47	1.07
2.600	1.07	8.567	2.50	14.533	2.50	20.50	1.07
2.633	1.07	8.600	2.50	14.567	2.50	20.53	1.07
2.667	1.07	8.633	2.50	14.600	2.50	20.57	1.07
2.700	1.07	8.667	2.50	14.633	2.50	20.60	1.07
2.733	1.07	8.700	2.50	14.667	2.50	20.63	1.07
2.767	1.07	8.733	2.50	14.700	2.50	20.67	1.07
2.800	1.07	8.767	2.68	14.733	2.50	20.70	1.07
2.833	1.07	8.800	2.85	14.767	2.68	20.73	1.07
2.867	1.07	8.833	2.85	14.800	2.85	20.77	1.07
2.900	1.07	8.867	2.85	14.833	2.85	20.80	1.07
2.933	1.07	8.900	2.85	14.867	2.85	20.83	1.07
2.967	1.07	8.933	2.85	14.900	2.85	20.87	1.07
3.000	1.07	8.967	2.85	14.933	2.85	20.90	1.07
3.033	1.43	9.000	2.85	14.967	2.85	20.93	1.07
3.067	1.43	9.033	2.85	15.000	2.85	20.97	1.07
3.100	1.43	9.067	2.85	15.033	2.50	21.00	1.07
3.133	1.43	9.100	2.85	15.067	2.50	21.03	1.07
3.167	1.43	9.133	2.85	15.100	2.50	21.07	1.07
3.200	1.43	9.167	2.85	15.133	2.50	21.10	1.07
3.233	1.43	9.200	2.85	15.167	2.50	21.13	1.07
3.267	1.25	9.233	2.85	15.200	2.50	21.17	1.07
3.300	1.07	9.267	3.03	15.233	2.50	21.20	1.07
3.333	1.07	9.300	3.21	15.267	2.68	21.23	1.07
3.367	1.07	9.333	3.21	15.300	2.85	21.27	1.07
3.400	1.07	9.367	3.21	15.333	2.85	21.30	1.07
3.433	1.07	9.400	3.21	15.367	2.85	21.33	1.07
3.467	1.07	9.433	3.21	15.400	2.85	21.37	1.07
3.500	1.07	9.467	3.21	15.433	2.85	21.40	1.07
3.533	1.07	9.500	3.21	15.467	2.85	21.43	1.07
3.567	1.07	9.533	3.21	15.500	2.85	21.47	1.07
3.600	1.07	9.567	3.21	15.533	2.50	21.50	1.07
3.633	1.07	9.600	3.21	15.567	2.50	21.53	1.07
3.667	1.07	9.633	3.21	15.600	2.50	21.57	1.07
3.700	1.07	9.667	3.21	15.633	2.50	21.60	1.07
3.733	1.07	9.700	3.21	15.667	2.50	21.63	1.07
3.767	1.25	9.733	3.21	15.700	2.50	21.67	1.07
3.800	1.43	9.767	3.57	15.733	2.50	21.70	1.07
3.833	1.43	9.800	3.92	15.767	2.14	21.73	1.07
3.867	1.43	9.833	3.92	15.800	1.78	21.77	1.07
3.900	1.43	9.867	3.92	15.833	1.78	21.80	1.07
3.933	1.43	9.900	3.92	15.867	1.78	21.83	1.07
3.967	1.43	9.933	3.92	15.900	1.78	21.87	1.07
4.000	1.43	9.967	3.92	15.933	1.78	21.90	1.07
4.033	1.43	10.000	3.93	15.967	1.78	21.93	1.07
4.067	1.43	10.033	4.28	16.000	1.78	21.97	1.07
4.100	1.43	10.067	4.28	16.033	1.43	22.00	1.07
4.133	1.43	10.100	4.28	16.067	1.43	22.03	1.07
4.167	1.43	10.133	4.28	16.100	1.43	22.07	1.07

4.200	1.43	10.167	4.28	16.133	1.43	22.10	1.07
4.233	1.43	10.200	4.28	16.167	1.43	22.13	1.07
4.267	1.43	10.233	4.28	16.200	1.43	22.17	1.07
4.300	1.43	10.267	4.82	16.233	1.43	22.20	1.07
4.333	1.43	10.300	5.35	16.267	1.61	22.23	1.07
4.367	1.43	10.333	5.35	16.300	1.78	22.27	1.07
4.400	1.43	10.367	5.35	16.333	1.78	22.30	1.07
4.433	1.43	10.400	5.35	16.367	1.78	22.33	1.07
4.467	1.43	10.433	5.35	16.400	1.78	22.37	1.07
4.500	1.43	10.467	5.35	16.433	1.78	22.40	1.07
4.533	1.43	10.500	5.35	16.467	1.78	22.43	1.07
4.567	1.43	10.533	5.71	16.500	1.78	22.47	1.07
4.600	1.43	10.567	5.71	16.533	1.43	22.50	1.07
4.633	1.43	10.600	5.71	16.567	1.43	22.53	1.07
4.667	1.43	10.633	5.71	16.600	1.43	22.57	1.07
4.700	1.43	10.667	5.71	16.633	1.43	22.60	1.07
4.733	1.43	10.700	5.71	16.667	1.43	22.63	1.07
4.767	1.43	10.733	5.71	16.700	1.43	22.67	1.07
4.800	1.43	10.767	7.14	16.733	1.43	22.70	1.07
4.833	1.43	10.800	8.56	16.767	1.61	22.73	1.07
4.867	1.43	10.833	8.56	16.800	1.78	22.77	1.07
4.900	1.43	10.867	8.56	16.833	1.78	22.80	1.07
4.933	1.43	10.900	8.56	16.867	1.78	22.83	1.07
4.967	1.43	10.933	8.56	16.900	1.78	22.87	1.07
5.000	1.43	10.967	8.56	16.933	1.78	22.90	1.07
5.033	1.43	11.000	8.56	16.967	1.78	22.93	1.07
5.067	1.43	11.033	8.56	17.000	1.78	22.97	1.07
5.100	1.43	11.067	8.56	17.033	1.43	23.00	1.07
5.133	1.43	11.100	8.56	17.067	1.43	23.03	1.07
5.167	1.43	11.133	8.56	17.100	1.43	23.07	1.07
5.200	1.43	11.167	8.56	17.133	1.43	23.10	1.07
5.233	1.43	11.200	8.56	17.167	1.43	23.13	1.07
5.267	1.43	11.233	8.56	17.200	1.43	23.17	1.07
5.300	1.43	11.267	17.50	17.233	1.43	23.20	1.07
5.333	1.43	11.300	26.40	17.267	1.61	23.23	1.07
5.367	1.43	11.333	26.40	17.300	1.78	23.27	1.07
5.400	1.43	11.367	26.40	17.333	1.78	23.30	1.07
5.433	1.43	11.400	26.40	17.367	1.78	23.33	1.07
5.467	1.43	11.433	26.40	17.400	1.78	23.37	1.07
5.500	1.43	11.467	26.40	17.433	1.78	23.40	1.07
5.533	1.43	11.500	26.50	17.467	1.78	23.43	1.07
5.567	1.43	11.533	109.18	17.500	1.78	23.47	1.07
5.600	1.43	11.567	109.18	17.533	1.43	23.50	1.07
5.633	1.43	11.600	109.18	17.567	1.43	23.53	1.07
5.667	1.43	11.633	109.18	17.600	1.43	23.57	1.07
5.700	1.43	11.667	109.18	17.633	1.43	23.60	1.07
5.733	1.43	11.700	109.18	17.667	1.43	23.63	1.07
5.767	1.43	11.733	109.18	17.700	1.43	23.67	1.07
5.800	1.43	11.767	60.89	17.733	1.43	23.70	1.07
5.833	1.43	11.800	12.84	17.767	1.61	23.73	1.07
5.867	1.43	11.833	12.84	17.800	1.78	23.77	.54
5.900	1.43	11.867	12.84	17.833	1.78		
5.933	1.43	11.900	12.84	17.867	1.78		
5.967	1.43	11.933	12.84	17.900	1.78		

Unit Hyd Qpeak (cms)= .140

PEAK FLOW (cms)= .060 (i)
TIME TO PEAK (hrs)= 12.200
RUNOFF VOLUME (mm)= 25.095
TOTAL RAINFALL (mm)= 88.932
RUNOFF COEFFICIENT = .282

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

CALIB					
NASHYD (0107)	Area (ha)=	.71	Curve Number (CN)=	57.8
ID= 1 DT= 2.0 min	Ia (mm)=	10.20	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	.25		

Unit Hyd Qpeak (cms)= .109

PEAK FLOW (cms)= .035 (i)
TIME TO PEAK (hrs)= 11.900
RUNOFF VOLUME (mm)= 23.463
TOTAL RAINFALL (mm)= 88.932
RUNOFF COEFFICIENT = .264

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

CALIB					
NASHYD (0105)	Area (ha)=	2.00	Curve Number (CN)=	77.8
ID= 1 DT= 2.0 min	Ia (mm)=	4.06	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	.07		

```
     Unit Hyd Qpeak  (cms)=   1.093

     PEAK FLOW       (cms)=    .361 (i)
     TIME TO PEAK    (hrs)=  11.733
     RUNOFF VOLUME    (mm)=  45.632
     TOTAL RAINFALL   (mm)=  88.932
     RUNOFF COEFFICIENT   =    .513

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0106) |   Area    (ha)=   1.12   Curve Number   (CN)= 56.1
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.80   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .20

     Unit Hyd Qpeak  (cms)=    .213

     PEAK FLOW       (cms)=    .060 (i)
     TIME TO PEAK    (hrs)=  11.867
     RUNOFF VOLUME    (mm)=  22.045
     TOTAL RAINFALL   (mm)=  88.932
     RUNOFF COEFFICIENT   =    .248

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0104) |   Area    (ha)=   1.96   Curve Number   (CN)= 85.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   2.32   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .07

     Unit Hyd Qpeak  (cms)=   1.069

     PEAK FLOW       (cms)=    .435 (i)
     TIME TO PEAK    (hrs)=  11.733
     RUNOFF VOLUME    (mm)=  56.892
     TOTAL RAINFALL   (mm)=  88.932
     RUNOFF COEFFICIENT   =    .640

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0101) |   Area    (ha)=   4.09   Curve Number   (CN)= 60.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .36

     Unit Hyd Qpeak  (cms)=    .434

     PEAK FLOW       (cms)=    .168 (i)
     TIME TO PEAK    (hrs)=  12.033
     RUNOFF VOLUME    (mm)=  25.095
     TOTAL RAINFALL   (mm)=  88.932
     RUNOFF COEFFICIENT   =    .282

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0102) |   Area    (ha)=    .55   Curve Number   (CN)= 60.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .31

     Unit Hyd Qpeak  (cms)=    .068

     PEAK FLOW       (cms)=    .025 (i)
     TIME TO PEAK    (hrs)=  11.967
     RUNOFF VOLUME    (mm)=  25.094
     TOTAL RAINFALL   (mm)=  88.932
     RUNOFF COEFFICIENT   =    .282

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

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

--------------------
| ADD HYD   (0801) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0103):     1.91    .060    12.20    25.09
        + ID2= 2 (0107):      .71    .035    11.90    23.46
          ================================================
          ID = 3 (0801):     2.62    .085    12.03    24.65
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0802)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0105):	2.00	.361	11.73	45.63
	+ ID2= 2 (0106):	1.12	.060	11.87	22.05
	ID = 3 (0802):	3.12	.405	11.73	37.18

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

SHIFT HYD (0804)					
IN= 2---> OUT= 1					
SHIFT= 22.0 min		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
	ID= 2 (0104):	1.96	.44	11.73	56.89
SHIFT	ID= 1 (0804):	1.96	.44	12.07	56.89

ADD HYD (0805)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0804):	1.96	.435	12.07	56.89
	+ ID2= 2 (0101):	4.09	.168	12.03	25.09
	ID = 3 (0805):	6.05	.601	12.07	35.39

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0806)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0805):	6.05	.601	12.07	35.39
	+ ID2= 2 (0102):	.55	.025	11.97	25.09
	ID = 3 (0806):	6.60	.625	12.07	34.53

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0803)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0801):	2.62	.085	12.03	24.65
	+ ID2= 2 (0802):	3.12	.405	11.73	37.18
	ID = 3 (0803):	5.74	.451	11.77	31.46

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

FINISH

==========

APPENDIX B:
HYDRAULIC CALCULATIONS

C.C. Tatham & Associates Ltd. Consulting Engineers Collingwood Bracebridge Orillia Barrie Ottawa	Project: 185 Mountain Road	Date: 20-Jul-18
	File No.: 116023	Designed: ASB
	Subject: Overland Flow Route Calculations	Checked: DAM

Catchment 201 Overland Flow Route

Ditch in Block 7 must convey 0.25*830 = 208 L/s

Channel

Manning's n	0.045	
Slope	0.005	m/m
Bottom Width	0.500	m
Side Slopes	3.000	:1
*Depth**	0.400	m
Slope Width	1.200	
Area	0.680	m2
Perimeter	3.030	m
Hydraulic Radius	0.224	m

Flow **394.62** **L/s**

*Minimum depth minus 0.1m (required freeboard)

Manning's Equation

$$Q = \frac{1}{n} \cdot A \cdot R^{2/3} \cdot S^{1/2}$$

Manning's n = 0.045 for Kentucky Bluegrass, 0.1 to 0.15 m tall (MTO Drainage Management Manual)

Ditch in Block 6 must convey 0.5*830 = 415 L/s

Channel

Manning's n	0.045	
Slope	0.005	m/m
Bottom Width	0.500	m
Side Slopes	2.500	:1
*Depth**	0.500	m
Slope Width	1.250	
Area	0.875	m2
Perimeter	3.193	m
Hydraulic Radius	0.274	m

Flow **580.13** **L/s**

*Minimum depth minus 0.1m (required freeboard)

Ditch in Block 4 must convey 830 L/s

Channel

Manning's n	0.045	
Slope	0.005	m/m
Bottom Width	0.500	m
Side Slopes	2.500	:1
*Depth**	0.600	m
Slope Width	1.500	
Area	1.200	m2
Perimeter	3.731	m
Hydraulic Radius	0.322	m

Flow **885.15** **L/s**

*Minimum depth minus 0.1m (required freeboard)

Catchment 202 Overland Flow Route

Must Convey 265 L/s

Channel

Manning's n	0.045	
Slope	0.005	m/m
Bottom Width	0.500	m
Side Slopes	3.000	:1
*Depth**	0.400	m
Slope Width	1.200	
Area	0.680	m2
Perimeter	3.030	m
Hydraulic Radius	0.224	m

Flow **394.62** **L/s**

*Minimum depth minus 0.1m (required freeboard)

Catchment 203 Overland Flow Route

Must Convey 635 L/s

Channel

Manning's n	0.045	
Slope	0.005	m/m
Bottom Width	0.000	m
Side Slopes	3.000	:1
*Depth**	0.630	m
Slope Width	1.890	
Area	1.191	m2
Perimeter	3.984	m
Hydraulic Radius	0.299	m

Flow **836.30** **L/s**

*Minimum depth minus 0.1m (required freeboard)

HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0 cfs

Design Flow: 29.3112 cfs (830 l/s)

Maximum Flow: 31.7832 cfs

Table 1 - Summary of Culvert Flows at Crossing: SWM Pond Inlet

Headwater Elevation (m)	Total Discharge (cms)	750 mm HDPE Discharge (cms)	Roadway Discharge (cms)	Iterations
184.50	0.00	0.00	0.00	1
184.52	0.09	0.09	0.00	1
184.58	0.18	0.18	0.00	1
184.67	0.27	0.27	0.00	1
184.77	0.36	0.36	0.00	1
184.86	0.45	0.45	0.00	1
184.94	0.54	0.54	0.00	1
185.02	0.63	0.63	0.00	1
185.11	0.72	0.72	0.00	1
185.23	0.81	0.81	0.00	1
185.26	0.83	0.83	0.00	1
185.68	1.04	1.04	0.00	Overtopping

Rating Curve Plot for Crossing: SWM Pond Inlet

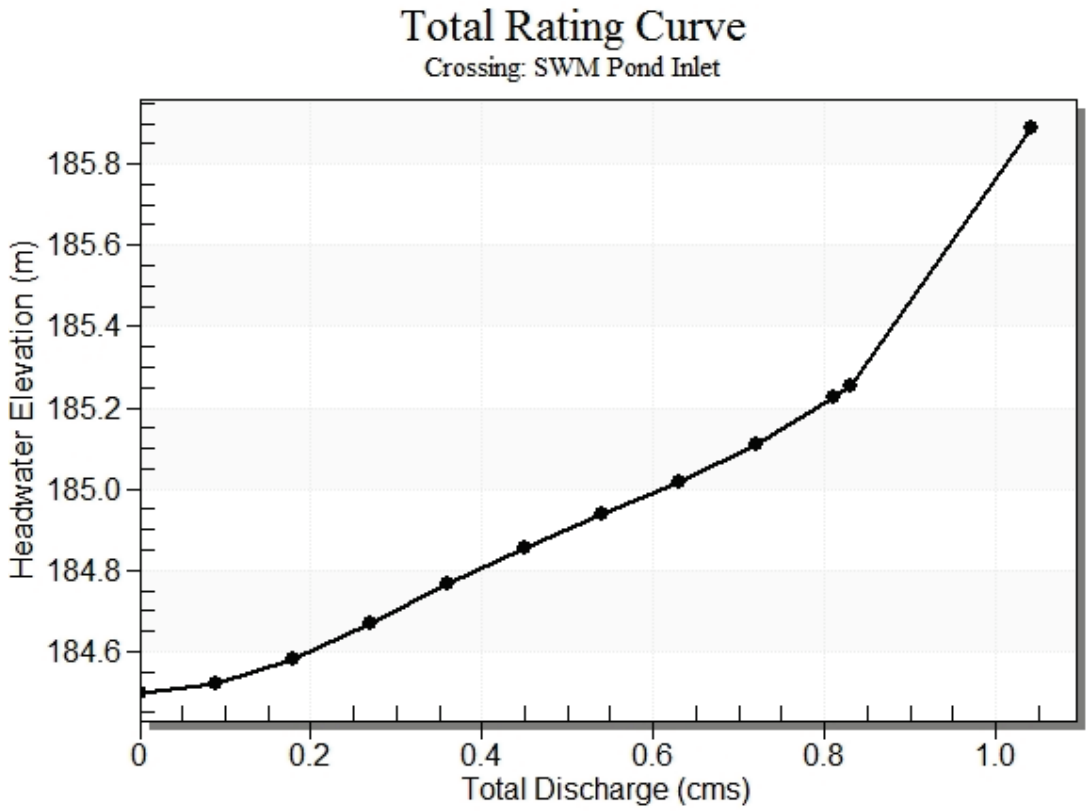


Table 2 - Culvert Summary Table: 750 mm HDPE

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	184.50	0.000	0.350	0-NF	0.000	0.000	0.600	0.600	0.000	0.000
0.09	0.09	184.52	0.263	0.371	3-M1t	0.179	0.178	0.600	0.600	0.238	0.000
0.18	0.18	184.58	0.381	0.431	3-M1t	0.258	0.255	0.600	0.600	0.475	0.000
0.27	0.27	184.67	0.480	0.520	3-M1t	0.323	0.315	0.600	0.600	0.713	0.000
0.36	0.36	184.77	0.571	0.617	3-M1t	0.381	0.367	0.600	0.600	0.950	0.000
0.45	0.45	184.86	0.660	0.706	3-M1t	0.438	0.411	0.600	0.600	1.188	0.000
0.54	0.54	184.94	0.752	0.787	7-M1t	0.495	0.452	0.600	0.600	1.425	0.000
0.63	0.63	185.02	0.850	0.867	7-M1t	0.558	0.490	0.600	0.600	1.663	0.000
0.72	0.72	185.11	0.958	0.950	3-M2t	0.643	0.524	0.600	0.600	1.900	0.000
0.81	0.81	185.23	1.077	1.048	3-M2t	0.750	0.557	0.600	0.600	2.138	0.000
0.83	0.83	185.26	1.105	1.075	3-M2t	0.750	0.564	0.600	0.600	2.191	0.000

****

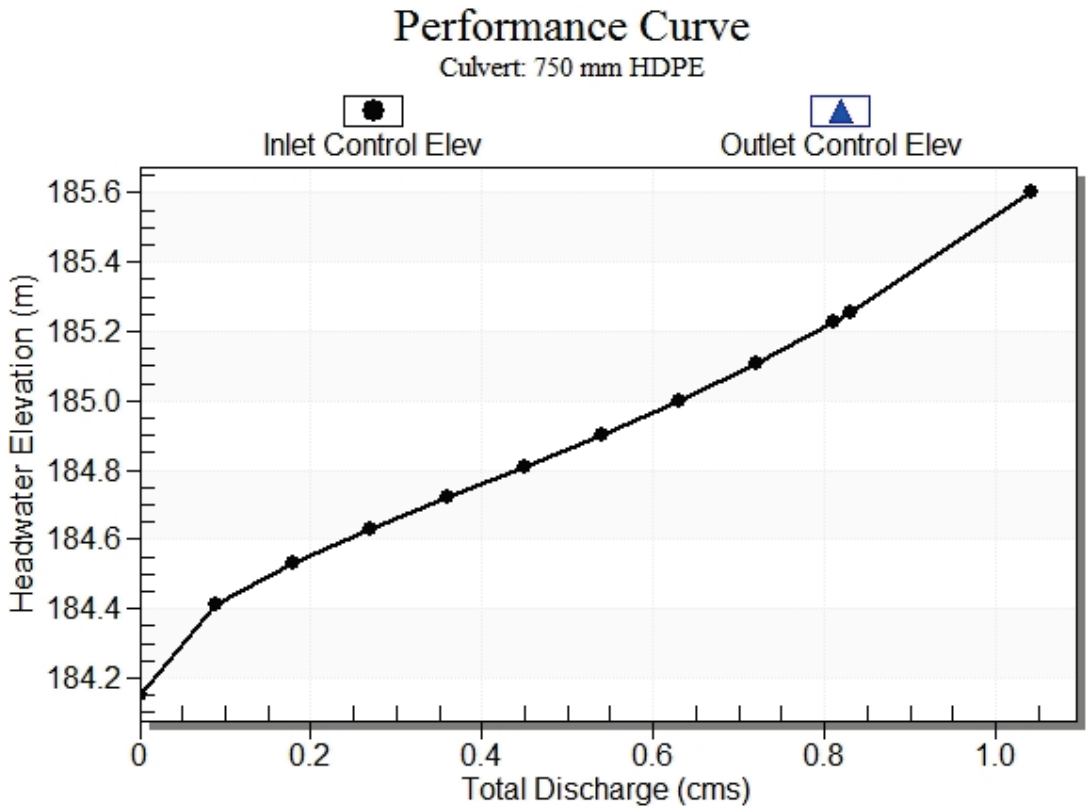
Straight Culvert

Inlet Elevation (invert): 184.15 m, Outlet Elevation (invert): 183.90 m

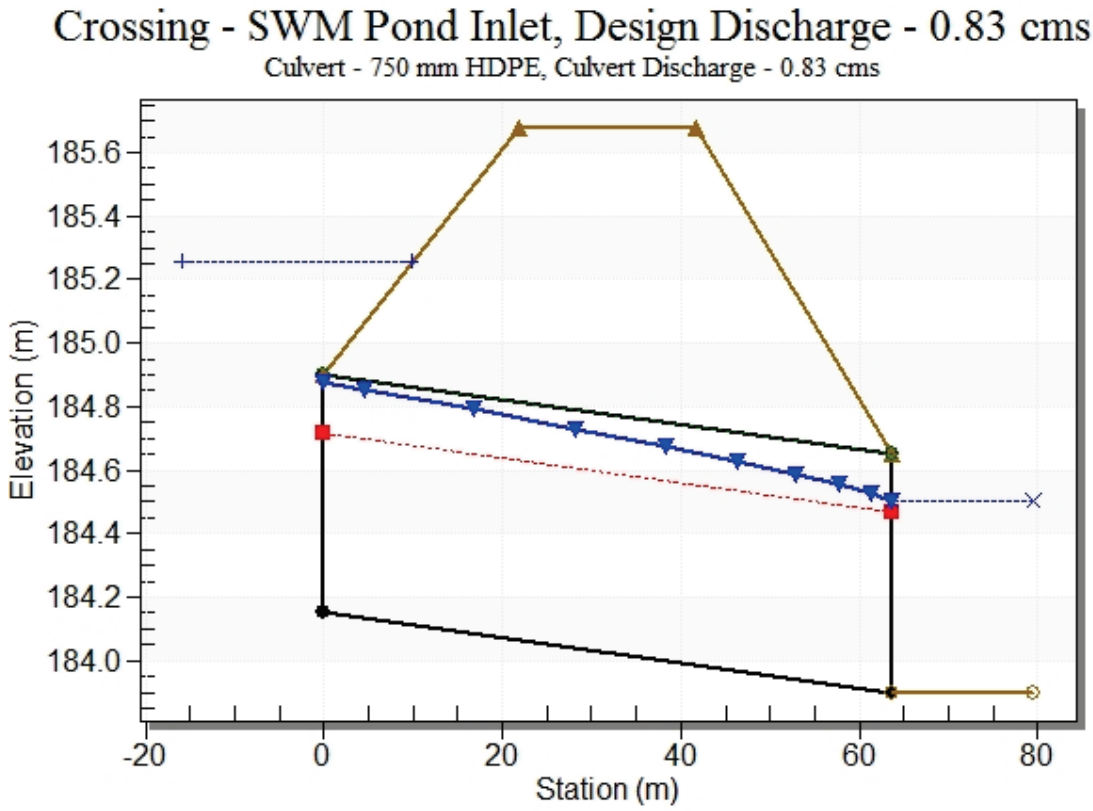
Culvert Length: 63.60 m, Culvert Slope: 0.0039

****

Culvert Performance Curve Plot: 750 mm HDPE



Water Surface Profile Plot for Culvert: 750 mm HDPE



Site Data - 750 mm HDPE

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 184.15 m

Outlet Station: 63.60 m

Outlet Elevation: 183.90 m

Number of Barrels: 1

Culvert Data Summary - 750 mm HDPE

Barrel Shape: Circular

Barrel Diameter: 750.00 mm

Barrel Material: Smooth HDPE

Embedment: 0.00 mm

Barrel Manning's n: 0.0130

Culvert Type: Straight

Inlet Configuration: Thin Edge Projecting

Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: SWM Pond Inlet)

Flow (cms)	Water Surface Elev (m)	Depth (m)
0.00	184.50	0.60
3.18	184.50	0.60
6.36	184.50	0.60
9.53	184.50	0.60
12.71	184.50	0.60
15.89	184.50	0.60
19.07	184.50	0.60
22.25	184.50	0.60
25.43	184.50	0.60
28.60	184.50	0.60
29.31	184.50	0.60

Tailwater Channel Data - SWM Pond Inlet

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 184.50 m

Roadway Data for Crossing: SWM Pond Inlet

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 50.00 m

Crest Elevation: 185.68 m

Roadway Surface: Paved

Roadway Top Width: 20.00 m

APPENDIX C:
STAGE-STORAGE-DISCHARGE CALCULATIONS

C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie

Project :	185 Mountain Road
File No.	116023
Date:	August 2018
Designed By:	DAM
Checked By:	DJH
Subject:	SWMF SSD Relationship

STAGE-STORAGE TABLE - REVISION NO. 1

Wet Cell

Side Slope	5	(H:V)
Bottom Elevation	182.80	m
Water Level	183.80	m
Stage	0.05	m

STAGE-STORAGE TABLE

Elevation	Pond Depth	Pond Area	Average Pond Area	Volume					
				Dead Storage	Accum. Dead Storage	Active Storage	Accum. Active Storage	Accum. Total Storage	Accum. Total Storage
(m)	(m)	(sq.m)	(sq.m)	(cu.m)	(cu.m)	(cu.m)	(cu.m)	(cu.m)	(ha-m)
182.80	0.00	**1050.00**	0.00	0.00	0.00	0.00	0.00	0.00	0.00
183.80	1.00	**3300.00**	2175.00	2175.00	2175.00	0.00	0.00	2175.00	0.22
183.85	1.05	3663.54	3481.77	-	2175.00	174.09	174.09	2349.09	0.23
183.90	1.10	**4027.07**	3845.30	-	2175.00	192.27	366.35	2541.35	0.25
183.95	1.15	4131.26	4079.16	-	2175.00	203.96	570.31	2745.31	0.27
184.00	1.20	4235.44	4183.35	-	2175.00	209.17	779.48	2954.48	0.30
184.05	1.25	4339.63	4287.54	-	2175.00	214.38	993.86	3168.86	0.32
184.10	1.30	4443.81	4391.72	-	2175.00	219.59	1213.44	3388.44	0.34
184.15	1.35	**4548.00**	4495.91	-	2175.00	224.80	1438.24	3613.24	0.36
184.20	1.40	4719.00	4633.50	-	2175.00	231.68	1669.91	3844.91	0.38
184.25	1.45	4890.00	4804.50	-	2175.00	240.23	1910.14	4085.14	0.41
184.30	1.50	5061.00	4975.50	-	2175.00	248.78	2158.91	4333.91	0.43
184.35	1.55	**5032.00**	5046.50	-	2175.00	252.33	2411.24	4586.24	0.46
184.40	1.60	**5403.00**	5360.50	-	2175.00	268.03	2679.26	4854.26	0.49
184.45	1.65	5489.38	5446.19	-	2175.00	272.31	2951.57	5126.57	0.51
184.50	1.70	5575.75	5532.56	-	2175.00	276.63	3228.20	5403.20	0.54
184.55	1.75	5662.13	5618.94	-	2175.00	280.95	3509.15	5684.15	0.57
184.60	1.80	5748.50	5705.31	-	2175.00	285.27	3794.41	5969.41	0.60
184.65	1.85	5834.88	5791.69	-	2175.00	289.58	4084.00	6259.00	0.63
184.70	1.90	5921.25	5878.06	-	2175.00	293.90	4377.90	6552.90	0.66
184.75	1.95	6007.63	5964.44	-	2175.00	298.22	4676.12	6851.12	0.69
184.80	2.00	**6094.00**	6050.81	-	2175.00	302.54	4978.66	7153.66	0.72
184.85	2.05	6182.60	6138.30	-	2175.00	306.92	5285.58	7460.58	0.75
184.90	2.10	6271.20	6226.90	-	2175.00	311.35	5596.92	7771.92	0.78
184.95	2.15	6359.80	6315.50	-	2175.00	315.78	5912.70	8087.70	0.81
185.00	2.20	6448.40	6404.10	-	2175.00	320.21	6232.90	8407.90	0.84
185.05	2.25	**6537.00**	6492.70	-	2175.00	324.64	6557.54	8732.54	0.87

C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie

Project:	185 Mountain Road
File No:	116023
Date:	August 2018
Designed By:	DAM
Checked By:	DJH
Subject:	SWMF SSD Relationship

STAGE-DISCHARGE TABLE - REVISION NO. 1

Primary Low Flow Outlets

Type	Orifice	Pipe
Diameter (mm)	125	525
Area (sq.m)	0.012272	0.21648
Coefficient	0.63	0.80
Invert (m)	183.8	183.8

Secondary Outlet/Overflow Spillway

Type	Ditch Inlet	Overflow
Weir Length (m)	1.2	6.5
Sill Elevation (m)	184.38	184.7
Coefficient	-	1.4
Side Slope (H:V)	6	3

STAGE-DISCHARGE TABLE

Pond Water Level	Primary Low Flow Outlets				Secondary Outlet/Overflow Spillway				Total Pond Discharge	OUTLET CONTROL
	Orifice		Pipe		Ditch Inlet		Overflow			
	Head	Discharge	Head	Discharge	Head	Discharge	Head	Discharge		
(m)	(m)	(cms)	(m)	(cms)	(m)	(cms)	(m)	(cms)	(cms)	
183.80	0.00	0.0000	0.00	0.0000	0.00	0.00	0.00	0.0000	0.0000	Orifice
183.85	0.05	0.0017	0.05	0.0039	0.00	0.00	0.00	0.0000	0.0017	Orifice
183.90	0.04	0.0066	0.10	0.0150	0.00	0.00	0.00	0.0000	0.0066	Orifice
183.95	0.09	0.0101	0.15	0.0326	0.00	0.00	0.00	0.0000	0.0101	Orifice
184.00	0.14	0.0127	0.20	0.0559	0.00	0.00	0.00	0.0000	0.0127	Orifice
184.05	0.19	0.0148	0.25	0.0839	0.00	0.00	0.00	0.0000	0.0148	Orifice
184.10	0.24	0.0167	0.04	0.1485	0.00	0.00	0.00	0.0000	0.0167	Orifice
184.15	0.29	0.0184	0.09	0.2268	0.00	0.00	0.00	0.0000	0.0184	Orifice
184.20	0.34	0.0199	0.14	0.2843	0.00	0.00	0.00	0.0000	0.0199	Orifice
184.25	0.39	0.0213	0.19	0.3320	0.00	0.00	0.00	0.0000	0.0213	Orifice
184.30	0.44	0.0227	0.24	0.3736	0.00	0.00	0.00	0.0000	0.0227	Orifice
184.35	0.49	0.0239	0.29	0.4111	0.00	0.00	0.00	0.0000	0.0239	Orifice
184.40	0.54	0.0251	0.34	0.4454	0.02	0.03	0.00	0.0000	0.0508	Orifice/Ditch Inlet
184.45	0.59	0.0262	0.39	0.4773	0.07	0.09	0.00	0.0000	0.1186	Orifice/Ditch Inlet
184.50	0.64	0.0273	0.44	0.5071	0.12	0.21	0.00	0.0000	0.2340	Orifice/Ditch Inlet
184.55	0.69	0.0284	0.49	0.5353	0.17	0.37	0.00	0.0000	0.3972	Orifice/Ditch Inlet
184.60	0.74	0.0294	0.54	0.5621	0.22	0.58	0.00	0.0000	0.5621	Pipe
184.65	0.79	0.0304	0.59	0.5877	0.27	0.84	0.00	0.0000	0.5877	Pipe
184.70	0.84	0.0313	0.64	0.6122	0.32	1.14	0.00	0.0000	0.6122	Pipe
184.75	0.89	0.0323	0.69	0.6357	0.37	1.49	0.05	0.1044	0.7402	Pipe/Weir
184.80	0.94	0.0332	0.74	0.6584	0.42	1.90	0.10	0.3215	0.9800	Pipe/Weir
184.85	0.99	0.0340	0.79	0.6804	0.47	2.34	0.15	0.6154	1.2958	Pipe/Weir
184.90	1.04	0.0349	0.84	0.7016	0.52	2.84	0.20	0.9764	1.6780	Pipe/Weir
184.95	1.09	0.0357	0.89	0.7223	0.57	3.38	0.25	1.3998	2.1220	Pipe/Weir
185.00	1.14	0.0365	0.94	0.7424	0.62	3.98	0.30	1.8830	2.6253	Pipe/Weir
185.05	1.19	0.0373	0.99	0.7619	0.67	4.62	0.35	2.4246	3.1865	Pipe/Weir

C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie

Project:	185 Mountain Road
File No:	116023
Date:	August 2018
Designed By:	DAM
Checked By:	DJH
Subject:	SWMF SSD Relationship

STAGE-STORAGE-DISCHARGE TABLE - REVISION NO. 1

Primary Low Flow Outlet

Type	Orifice	Pipe
Diameter (mm)	125.00	525.00
Invert(m)	183.80	183.80

Secondary Outlet/Overflow Spillway

Type	Ditch Inlet	Overflow
Length(m)	1.20	6.50
Sill Elevation(m	184.38	184.7

STAGE-STORAGE-DISCHARGE TABLE

Pond Water Level	Primary Low Flow Discharge		Ditch Inlet	Overflow	Total Pond	Outlet Control	Pond Storage Volume		
	Orifice Discharge	Pipe Discharge	Discharge	Discharge	Discharge		Dead Storage	Active Storage	Total Storage
(m)	(cms)	(cms)	(cms)	(cms)	(cms)		(cu.m)	(cu.m)	(cu.m)
183.80	0.0000	0.0000	0.0000	0.0000	0.0000	Orifice	2175	0	2175
183.85	0.0017	0.0039	0.0000	0.0000	0.0017	Orifice	2175	174	2349
183.90	0.0066	0.0150	0.0000	0.0000	0.0066	Orifice	2175	366	2541
183.95	0.0101	0.0326	0.0000	0.0000	0.0101	Orifice	2175	570	2745
184.00	0.0127	0.0559	0.0000	0.0000	0.0127	Orifice	2175	779	2954
184.05	0.0148	0.0839	0.0000	0.0000	0.0148	Orifice	2175	994	3169
184.10	0.0167	0.1485	0.0000	0.0000	0.0167	Orifice	2175	1213	3388
184.15	0.0184	0.2268	0.0000	0.0000	0.0184	Orifice	2175	1438	3613
184.20	0.0199	0.2843	0.0000	0.0000	0.0199	Orifice	2175	1670	3845
184.25	0.0213	0.3320	0.0000	0.0000	0.0213	Orifice	2175	1910	4085
184.30	0.0227	0.3736	0.0000	0.0000	0.0227	Orifice	2175	2159	4334
184.35	0.0239	0.4111	0.0000	0.0000	0.0239	Orifice	2175	2411	4586
184.40	0.0251	0.4454	0.0257	0.0000	0.0508	Orifice/Ditch Inlet	2175	2679	4854
184.45	0.0262	0.4773	0.0923	0.0000	0.1186	Orifice/Ditch Inlet	2175	2952	5127
184.50	0.0273	0.5071	0.2067	0.0000	0.2340	Orifice/Ditch Inlet	2175	3228	5403
184.55	0.0284	0.5353	0.3688	0.0000	0.3972	Orifice/Ditch Inlet	2175	3509	5684
184.60	0.0294	0.5621	0.5787	0.0000	0.5621	Pipe	2175	3794	5969
184.65	0.0304	0.5877	0.8363	0.0000	0.5877	Pipe	2175	4084	6259
184.70	0.0313	0.6122	1.1416	0.0000	0.6122	Pipe	2175	4378	6553
184.75	0.0323	0.6357	1.4947	0.1044	0.7402	Pipe/Weir	2175	4676	6851
184.80	0.0332	0.6584	1.8955	0.3215	0.9800	Pipe/Weir	2175	4979	7154
184.85	0.0340	0.6804	2.3441	0.6154	1.2958	Pipe/Weir	2175	5286	7461
184.90	0.0349	0.7016	2.8404	0.9764	1.6780	Pipe/Weir	2175	5597	7772
184.95	0.0357	0.7223	3.3844	1.3998	2.1220	Pipe/Weir	2175	5913	8088
185.00	0.0365	0.7424	3.9762	1.8830	2.6253	Pipe/Weir	2175	6233	8408
185.05	0.0373	0.7619	4.6157	2.4246	3.1865	Pipe/Weir	2175	6558	8733

APPENDIX D:
POST DEVELOPMENT HYDROLOGY

C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie

Project:	185 Mountain Road
File No.:	116023
Date:	25-Aug-16
Designed By:	DAM
Checked By:	DJH
Subject:	CN Calculation

CURVE NUMBER, INITIAL ABSTRACTION & TIME TO PEAK CALCULATIONS

Catchment 201 **Area** 3.28 ha

WEIGHTED CN VALUE

Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient Type	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Meadows			Gravel			Impervious			Wetland/Lakes/SWMF			Average CN for Soil Type
					Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
WI	WIARTON	B	Loam or Silt Loam	2	3.28	1	0		60	0.984	0.3	69	0		65	0		85	2.296	0.7	100	0		50	90.7
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	3.28	1	0	0		0.984	0.3		0	0		0	0		2.296	0.7		0	0		90.7

Time of Concentration Calculations

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	188.9	m
Minimum Catchment Elevation	183.9	m
Catchment length	460	m
Catchment Slope	1%	
Catchment Area	3.28	ha
Time of Concentration (Minutes)	**22.90**	
Time of Concentration (Hours)	**0.38**	
Time to Peak (2/3 x Time of Concentration)	**0.25**	

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	188.9	m
Minimum Catchment Elevation	183.9	m
Catchment length	460	m
Catchment Slope	1%	
Catchment Area	3.28	ha
Time of Concentration (Minutes)	**23.88**	
Time of Concentration (Hours)	**0.40**	
Time to Peak (2/3 x Time of Concentration)	**0.27**	

Time to Peak	**0.25 hrs**

Initial Abstraction	**2.9 mm**

Woods	10
Meadows	8
Gravel	2
Lawns	5
Impervious	2

Runoff Coefficient	**0.75**

Landuse Type	Soil Series				
	WI	0	0	0	0
	2	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.25	#N/A	#N/A	#N/A	#N/A
Gravel	0.8	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.28	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.27	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.749	#N/A	#N/A	#N/A	#N/A

C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie

Project:	185 Mountain Road
File No.:	116023
Date:	25-Aug-16
Designed By:	DAM
Checked By:	DJH
Subject:	CN Calculation

CURVE NUMBER, INITIAL ABSTRACTION & TIME TO PEAK CALCULATIONS

Catchment 202 **Area** 0.97 ha

WEIGHTED CN VALUE

Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient Type	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Meadows			Gravel			Impervious			Wetland/Lakes/SWMF			Average CN for Soil Type
					Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
WI	WIARTON	B	Loam or Silt Loam	2	0.97	1	0		60	0.291	0.3	69	0		65	0		85	0.679	0.7	100	0	0	50	90.7
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	0.97	1	0	0		0.291	0.3		0	0		0	0		0.679	0.7		0	0		90.7

Time of Concentration Calculations

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	189	m
Minimum Catchment Elevation	184.7	m
Catchment length	185	m
Catchment Slope	2%	
Catchment Area	0.97	ha
Time of Concentration (Minutes)	**8.94**	
Time of Concentration (Hours)	**0.15**	
Time to Peak (2/3 x Time of Concentration)	**0.10**	

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	189	m
Minimum Catchment Elevation	184.7	m
Catchment length	185	m
Catchment Slope	2%	
Catchment Area	0.97	ha
Time of Concentration (Minutes)	**11.78**	
Time of Concentration (Hours)	**0.20**	
Time to Peak (2/3 x Time of Concentration)	**0.13**	

Time to Peak	**0.10 hrs**

Initial Abstraction	**2.9 mm**

Woods	10
Meadows	8
Gravel	2
Lawns	5
Impervious	2

Runoff Coefficient	**0.75**

Landuse Type	Soil Series				
	WI	0	0	0	0
	2	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.25	#N/A	#N/A	#N/A	#N/A
Gravel	0.8	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.28	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.27	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.749	#N/A	#N/A	#N/A	#N/A

C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie

Project:	185 Mountain Road
File No.:	116023
Date:	25-Aug-16
Designed By:	DAM
Checked By:	DJH
Subject:	CN Calculation

CURVE NUMBER, INITIAL ABSTRACTION & TIME TO PEAK CALCULATIONS

Catchment 203 **Area** 2.340 ha

WEIGHTED CN VALUE

Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient Type	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Meadows			Gravel			Impervious			Wetland/Lakes/SWMF			Average CN for Soil Type
					Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
WI	WIARTON	B	Loam or Silt Loam	2	2.34	1	0		60	0.6318	0.27	69	0		65	0		85	1.7082	0.73	100	0	0	50	91.63
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	2.34	1	0	0		0.6318	0.27		0	0		0	0		1.7082	0.73		0	0		91.6

Time of Concentration Calculations

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	185.7	m
Minimum Catchment Elevation	184.25	m
Catchment length	250	m
Catchment Slope	1%	
Catchment Area	2.34	ha
Time of Concentration (Minutes)	**14.60**	
Time of Concentration (Hours)	**0.24**	
Time to Peak (2/3 x Time of Concentration)	**0.16**	

Time to Peak	**0.16 hrs**

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	185.7	m
Minimum Catchment Elevation	184.25	m
Catchment length	250	m
Catchment Slope	1%	
Catchment Area	2.34	ha
Time of Concentration (Minutes)	**20.42**	
Time of Concentration (Hours)	**0.34**	
Time to Peak (2/3 x Time of Concentration)	**0.23**	

Initial Abstraction	**2.81 mm**

Woods	10
Meadows	8
Gravel	2
Lawns	5
Impervious	2

Runoff Coefficient	**0.77**

Landuse Type	Soil Series				
	WI	0	0	0	0
	2	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.25	#N/A	#N/A	#N/A	#N/A
Gravel	0.8	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.28	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.27	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.7691	#N/A	#N/A	#N/A	#N/A

C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie

Project:	185 Mountain Road
File No.:	116023
Date:	25-Aug-16
Designed By:	DAM
Checked By:	DJH
Subject:	CN Calculation

CURVE NUMBER, INITIAL ABSTRACTION & TIME TO PEAK CALCULATIONS

Catchment 204 **Area** 2.08 ha

WEIGHTED CN VALUE

Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient Type	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Meadows			Gravel			Impervious			Wetland/Lakes/SWMF			Average CN for Soil Type
					Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
WI	WIARTON	B	Loam or Silt Loam	2	2.0774	1	0		60	0.3272	0.1575	69	0		65	1.5269	0.735	85	0.2233	0.1075	100	0	0	50	84.0925
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	2.0774	1	0	0		0.32719	0.1575		0	0		1.52689	0.735		0.22332	0.1075		0	0		84.1

Time of Concentration Calculations

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	191	m
Minimum Catchment Elevation	186	m
Catchment length	260	m
Catchment Slope	2%	
Catchment Area	2.08	ha
Time of Concentration (Minutes)	**12.09**	
Time of Concentration (Hours)	**0.20**	
Time to Peak (2/3 x Time of Concentration)	**0.13**	

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	191	m
Minimum Catchment Elevation	186	m
Catchment length	260	m
Catchment Slope	2%	
Catchment Area	2.08	ha
Time of Concentration (Minutes)	**15.50**	
Time of Concentration (Hours)	**0.26**	
Time to Peak (2/3 x Time of Concentration)	**0.17**	

Time to Peak	**0.13 hrs**

Initial Abstraction	**2.4725 mm**

Woods	10
Meadows	8
Gravel	2
Lawns	5
Impervious	2

Runoff Coefficient	**0.73**

Landuse Type	Soil Series				
	WI	0	0	0	0
	2	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.25	#N/A	#N/A	#N/A	#N/A
Gravel	0.8	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.28	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.27	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.7342	#N/A	#N/A	#N/A	#N/A

C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie

Project:	185 Mountain Road
File No.:	116023
Date:	25-Aug-16
Designed By:	DAM
Checked By:	DJH
Subject:	CN Calculation

CURVE NUMBER, INITIAL ABSTRACTION & TIME TO PEAK CALCULATIONS

Catchment 205 **Area** 2.00 ha

WEIGHTED CN VALUE

Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient Type	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Meadows			Gravel			Impervious			Wetland/Lakes/SWMF			Average CN for Soil Type
					Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
WI	WIARTON	B	Loam or Silt Loam	2	2.0032	1	0.3165	0.158	60	0.5298	0.2645	69	0		65	1.0216	0.51	85	0.1352	0.0675	100	0	0	50	77.8305
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	2.0032	1	0.31651	0.158		0.52985	0.2645		0	0		1.02163	0.51		0.13522	0.0675		0	0		77.8

Time of Concentration Calculations

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	191	m
Minimum Catchment Elevation	185	m
Catchment length	160	m
Catchment Slope	4%	
Catchment Area	2.00	ha
Time of Concentration (Minutes)	**6.53**	
Time of Concentration (Hours)	**0.11**	
Time to Peak (2/3 x Time of Concentration)	**0.07**	

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	191	m
Minimum Catchment Elevation	185	m
Catchment length	160	m
Catchment Slope	4%	
Catchment Area	2.00	ha
Time of Concentration (Minutes)	**13.71**	
Time of Concentration (Hours)	**0.23**	
Time to Peak (2/3 x Time of Concentration)	**0.15**	

Time to Peak	**0.07 hrs**

Initial Abstraction	**4.0575 mm**

Woods	10
Meadows	8
Gravel	2
Lawns	5
Impervious	2

Runoff Coefficient	**0.59**

Landuse Type	Soil Series				
	WI	0	0	0	0
	2	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.25	#N/A	#N/A	#N/A	#N/A
Gravel	0.8	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.28	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.27	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.5857	#N/A	#N/A	#N/A	#N/A

C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie

Project:	185 Mountain Road
File No.:	116023
Date:	25-Aug-16
Designed By:	DAM
Checked By:	DJH
Subject:	CN Calculation

CURVE NUMBER, INITIAL ABSTRACTION & TIME TO PEAK CALCULATIONS

Catchment 206 **Area** 0.96 ha

WEIGHTED CN VALUE

Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient Type	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Meadows			Gravel			Impervious			Wetland/Lakes/SWMF			Average CN for Soil Type
					Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
WI	WIARTON	B	Loam or Silt Loam	2	0.9617	1	0		60	0.4549	0.473	69	0		65	0	0	85	0	0	100	0.5068	0.527	50	58.987
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	0.9617	1	0	0		0.45488	0.473		0	0		0	0		0	0		0.50682	0.527		59.0

Time of Concentration Calculations

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	185.3	m
Minimum Catchment Elevation	183.9	m
Catchment length	90	m
Catchment Slope	2%	
Catchment Area	0.96	ha
Time of Concentration (Minutes)	**4.71**	
Time of Concentration (Hours)	**0.08**	
Time to Peak (2/3 x Time of Concentration)	**0.05**	

Time to Peak	**0.28 hrs**

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	185.3	m
Minimum Catchment Elevation	183.9	m
Catchment length	90	m
Catchment Slope	2%	
Catchment Area	0.96	ha
Time of Concentration (Minutes)	**25.16**	
Time of Concentration (Hours)	**0.42**	
Time to Peak (2/3 x Time of Concentration)	**0.28**	

Initial Abstraction	**8.689 mm**

Woods	10
Meadows	8
Gravel	2
Lawns	5
Wetland	12
Impervious	2

Runoff Coefficient	**0.16**

Landuse Type	Soil Series				
	WI	0	0	0	0
	2	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.25	#N/A	#N/A	#N/A	#N/A
Gravel	0.8	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.28	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.27	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.1588	#N/A	#N/A	#N/A	#N/A

C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie

Project:	185 Mountain Road
File No.:	116023
Date:	25-Aug-16
Designed By:	DAM
Checked By:	DJH
Subject:	CN Calculation

CURVE NUMBER, INITIAL ABSTRACTION & TIME TO PEAK CALCULATIONS

Catchment 207 **Area** 0.71 ha

WEIGHTED CN VALUE

Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient Type	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Meadows			Gravel			Impervious			Wetland/Lakes/SWMF			Average CN for Soil Type
					Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
WI	WIARTON	B	#VALUE!	2	0.7133	1	0.3096	0.434	60	0	0	69	0		65	0.070	0.098	85	0		100	0.3338	0.468	50	57.77
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0	0
				Totals	0.7133	1	0.30957	0.434		0	0		0	0		0.0699	0.098		0	0		0.33382	0.468		57.8

Time of Concentration Calculations

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	193	m
Minimum Catchment Elevation	183.7	m
Catchment length	180	m
Catchment Slope	5%	
Catchment Area	0.71	ha
Time of Concentration (Minutes)	**7.64**	
Time of Concentration (Hours)	**0.13**	
Time to Peak (2/3 x Time of Concentration)	**0.08**	

Time to Peak	**0.25 hrs**

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	193	m
Minimum Catchment Elevation	183.7	m
Catchment length	180	m
Catchment Slope	5%	
Catchment Area	0.71	ha
Time of Concentration (Minutes)	**22.08**	
Time of Concentration (Hours)	**0.37**	
Time to Peak (2/3 x Time of Concentration)	**0.25**	

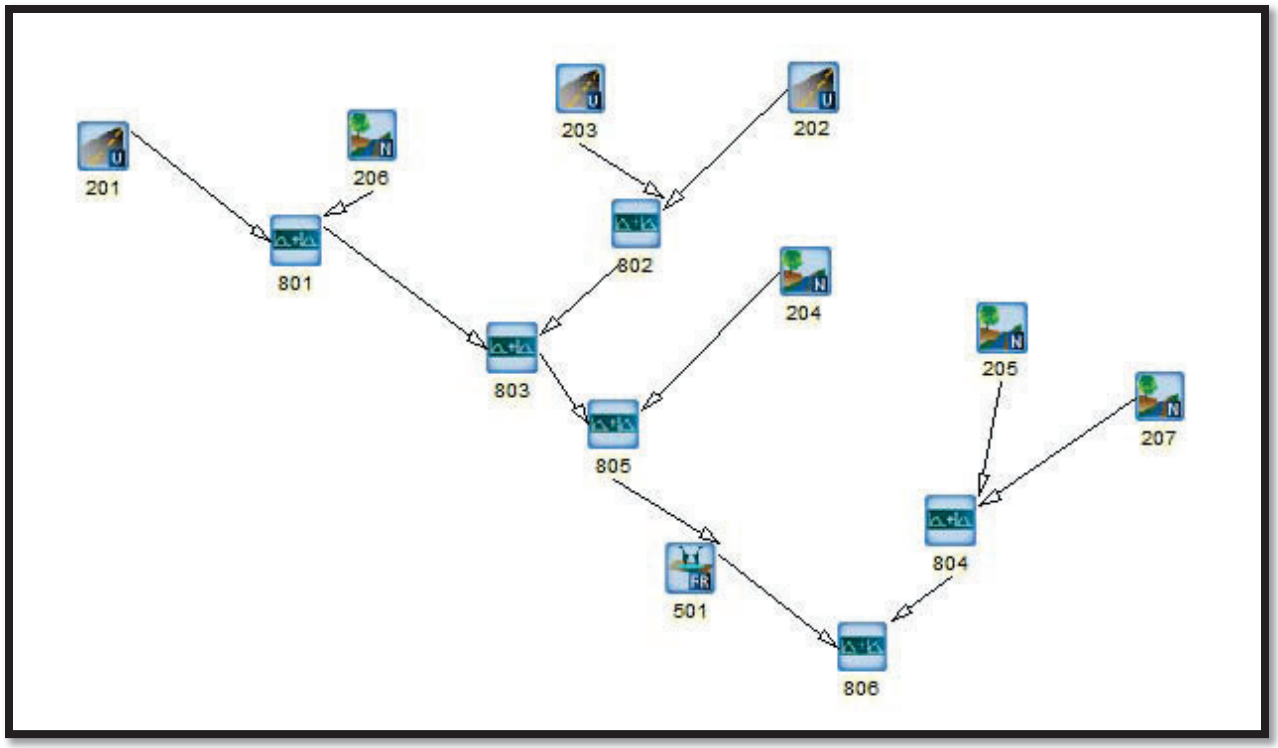
Initial Abstraction	**10.152 mm**

Woods	10
Meadows	8
Gravel	2
Lawns	5
Wetland	12
Impervious	2

Runoff Coefficient	**0.23**

Landuse Type	Soil Series				
	WI	0	0	0	0
	2	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.3	#N/A	#N/A	#N/A	#N/A
Gravel	0.8	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.35	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.33	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.232	#N/A	#N/A	#N/A	#N/A

Proposed Conditions OTTHYMO Model Schematic



```
       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
```

Developed and Distributed by Clarifica Inc.
Copyright 1996, 2007 Clarifica Inc.
All rights reserved.

***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 2.3.2\voin.dat
Output filename: I:\2016PR~1\116023~1\Design\185MTN~1\185MOU~2\Post-Development Chicago.out
Summary filename: I:\2016PR~1\116023~1\Design\185MTN~1\185MOU~2\Post-Development Chicago.sum

DATE: 7/24/2018 TIME: 2:45:50 PM

USER:

COMMENTS: _____

****
** SIMULATION NUMBER: 1 **
****

READ STORM	Filename: I:\2016 Projects\116023 - 185 Mountain Road\Design\185 Mtn Hydrologic Model\Owen Sound Design Storms\CHIC25MM.4HR
Ptotal= 24.97 mm	Comments: OWEN SOUND 25 mm (from a 2 year-4hr stor

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.10	1.29	1.10	2.81	2.10	13.05	3.10	2.04
.20	1.36	1.20	3.22	2.20	8.44	3.20	1.89
.30	1.44	1.30	3.77	2.30	6.21	3.30	1.76
.40	1.53	1.40	4.55	2.40	4.91	3.40	1.65
.50	1.63	1.50	5.77	2.50	4.06	3.50	1.55
.60	1.75	1.60	7.86	2.60	3.47	3.60	1.46
.70	1.89	1.70	12.27	2.70	3.03	3.70	1.39
.80	2.06	1.80	26.17	2.80	2.70	3.80	1.32
.90	2.26	1.90	72.58	2.90	2.43	3.90	1.26
1.00	2.50	2.00	26.96	3.00	2.22	4.00	1.20

CALIB	
NASHYD (0207)	Area (ha)= .71 Curve Number (CN)= 57.8
ID= 1 DT= 2.0 min	Ia (mm)= 10.20 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= .25

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.033	1.29	1.033	2.81	2.033	13.05	3.03	2.04
.067	1.29	1.067	2.81	2.067	13.05	3.07	2.04
.100	1.29	1.100	2.81	2.100	13.05	3.10	2.04
.133	1.36	1.133	3.22	2.133	8.44	3.13	1.89
.167	1.36	1.167	3.22	2.167	8.44	3.17	1.89
.200	1.36	1.200	3.22	2.200	8.44	3.20	1.89
.233	1.44	1.233	3.77	2.233	6.21	3.23	1.76
.267	1.44	1.267	3.77	2.267	6.21	3.27	1.76
.300	1.44	1.300	3.77	2.300	6.21	3.30	1.76
.333	1.53	1.333	4.55	2.333	4.91	3.33	1.65
.367	1.53	1.367	4.55	2.367	4.91	3.37	1.65
.400	1.53	1.400	4.55	2.400	4.91	3.40	1.65
.433	1.63	1.433	5.77	2.433	4.06	3.43	1.55
.467	1.63	1.467	5.77	2.467	4.06	3.47	1.55
.500	1.63	1.500	5.77	2.500	4.06	3.50	1.55

.533	1.75	1.533	7.86	2.533	3.47	3.53	1.46
.567	1.75	1.567	7.86	2.567	3.47	3.57	1.46
.600	1.75	1.600	7.86	2.600	3.47	3.60	1.46
.633	1.89	1.633	12.27	2.633	3.03	3.63	1.39
.667	1.89	1.667	12.27	2.667	3.03	3.67	1.39
.700	1.89	1.700	12.27	2.700	3.03	3.70	1.39
.733	2.06	1.733	26.17	2.733	2.70	3.73	1.32
.767	2.06	1.767	26.17	2.767	2.70	3.77	1.32
.800	2.06	1.800	26.17	2.800	2.70	3.80	1.32
.833	2.26	1.833	72.58	2.833	2.43	3.83	1.26
.867	2.26	1.867	72.58	2.867	2.43	3.87	1.26
.900	2.26	1.900	72.58	2.900	2.43	3.90	1.26
.933	2.50	1.933	26.96	2.933	2.22	3.93	1.20
.967	2.50	1.967	26.96	2.967	2.22	3.97	1.20
1.000	2.50	2.000	26.96	3.000	2.22	4.00	1.20

Unit Hyd Qpeak (cms)= .109

PEAK FLOW (cms)= .002 (i)
TIME TO PEAK (hrs)= 2.267
RUNOFF VOLUME (mm)= 1.089
TOTAL RAINFALL (mm)= 24.971
RUNOFF COEFFICIENT = .044

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

CALIB			
NASHYD (0205)	Area (ha)= 2.00	Curve Number (CN)= 77.8	
ID= 1 DT= 2.0 min	Ia (mm)= 4.06	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= .07		

Unit Hyd Qpeak (cms)= 1.093

PEAK FLOW (cms)= .059 (i)
TIME TO PEAK (hrs)= 1.933
RUNOFF VOLUME (mm)= 4.667
TOTAL RAINFALL (mm)= 24.971
RUNOFF COEFFICIENT = .187

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

CALIB			
NASHYD (0204)	Area (ha)= 2.08	Curve Number (CN)= 84.1	
ID= 1 DT= 2.0 min	Ia (mm)= 2.47	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= .13		

Unit Hyd Qpeak (cms)= .610

PEAK FLOW (cms)= .073 (i)
TIME TO PEAK (hrs)= 2.033
RUNOFF VOLUME (mm)= 7.177
TOTAL RAINFALL (mm)= 24.971
RUNOFF COEFFICIENT = .287

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

CALIB			
NASHYD (0206)	Area (ha)= .96	Curve Number (CN)= 59.0	
ID= 1 DT= 2.0 min	Ia (mm)= 8.69	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= .28		

Unit Hyd Qpeak (cms)= .131

PEAK FLOW (cms)= .003 (i)
TIME TO PEAK (hrs)= 2.300
RUNOFF VOLUME (mm)= 1.374
TOTAL RAINFALL (mm)= 24.971
RUNOFF COEFFICIENT = .055

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

CALIB			
STANDHYD (0201)	Area (ha)= 3.28		
ID= 1 DT= 2.0 min	Total Imp(%)= 70.00	Dir. Conn.(%)= 2.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.30	.98
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	2.00	2.00
Length	(m)=	380.00	40.00
Mannings n	=	.013	.250

```
     Max.Eff.Inten.(mm/hr)=      72.58        75.67
               over (min)         6.00        14.00
     Storage Coeff.  (min)=       5.26 (ii)   13.15 (ii)
     Unit Hyd. Tpeak (min)=       6.00        14.00
     Unit Hyd. peak  (cms)=        .20          .08
                                                        *TOTALS*
     PEAK FLOW       (cms)=        .01          .11          .118 (iii)
     TIME TO PEAK    (hrs)=       1.93         2.10         2.10
     RUNOFF VOLUME    (mm)=      22.97         9.41         9.68
     TOTAL RAINFALL   (mm)=      24.97        24.97        24.97
     RUNOFF COEFFICIENT   =        .92          .38          .39

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  69.0    Ia = Dep. 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  (0202) |   Area    (ha)=    .97
|ID= 1 DT= 2.0 min |   Total Imp(%)=  70.00   Dir. Conn.(%)=   2.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .68          .29
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       2.00         2.00
     Length            (m)=     140.00        40.00
     Mannings n           =       .013         .250

     Max.Eff.Inten.(mm/hr)=      72.58        75.67
               over (min)         5.00        12.00
     Storage Coeff.  (min)=       2.89 (ii)   10.78 (ii)
     Unit Hyd. Tpeak (min)=       4.00        12.00
     Unit Hyd. peak  (cms)=        .34          .10
                                                        *TOTALS*
     PEAK FLOW       (cms)=        .00          .04          .039 (iii)
     TIME TO PEAK    (hrs)=       1.90         2.07         2.07
     RUNOFF VOLUME    (mm)=      22.97         9.41         9.68
     TOTAL RAINFALL   (mm)=      24.97        24.97        24.97
     RUNOFF COEFFICIENT   =        .92          .38          .39

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  69.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0203) |   Area    (ha)=   2.34
|ID= 1 DT= 2.0 min |   Total Imp(%)=  73.00   Dir. Conn.(%)=   2.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.71          .63
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       2.00         2.00
     Length            (m)=     280.00        40.00
     Mannings n           =       .013         .250

     Max.Eff.Inten.(mm/hr)=      72.58        90.61
               over (min)         5.00        12.00
     Storage Coeff.  (min)=       4.38 (ii)   11.72 (ii)
     Unit Hyd. Tpeak (min)=       4.00        12.00
     Unit Hyd. peak  (cms)=        .26          .10
                                                        *TOTALS*
     PEAK FLOW       (cms)=        .01          .09          .097 (iii)
     TIME TO PEAK    (hrs)=       1.90         2.07         2.07
     RUNOFF VOLUME    (mm)=      22.97        10.11        10.37
     TOTAL RAINFALL   (mm)=      24.97        24.97        24.97
     RUNOFF COEFFICIENT   =        .92          .41          .42

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  69.0    Ia = Dep. 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 (0804)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0207):	.71	.002	2.27	1.09
+ ID2= 2 (0205):	2.00	.059	1.93	4.67
ID = 3 (0804):	2.72	.059	1.93	3.73

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0801)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0206):	.96	.003	2.30	1.37
+ ID2= 2 (0201):	3.28	.118	2.10	9.68
ID = 3 (0801):	4.24	.121	2.10	7.80

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0802)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0202):	.97	.039	2.07	9.68
+ ID2= 2 (0203):	2.34	.097	2.07	10.37
ID = 3 (0802):	3.31	.136	2.07	10.17

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0803)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0801):	4.24	.121	2.10	7.80
+ ID2= 2 (0802):	3.31	.136	2.07	10.17
ID = 3 (0803):	7.55	.253	2.07	8.84

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0805)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0204):	2.08	.073	2.03	7.18
+ ID2= 2 (0803):	7.55	.253	2.07	8.84
ID = 3 (0805):	9.63	.323	2.07	8.48

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0501)				
IN= 2---> OUT= 1				
DT= 2.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	.0000	.0000	.0227	.2159
	.0017	.0174	.0239	.2411
	.0066	.0366	.0508	.2679
	.0101	.0570	.1186	.2952
	.0127	.0779	.2340	.3228
	.0148	.0994	.3972	.3509
	.0167	.1213	.5621	.3794
	.0184	.1438	.5877	.4084
	.0199	.1670	.6122	.4378
	.0213	.1910	.7402	.4676

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0805)	9.627	.323	2.07	8.48
OUTFLOW: ID= 1 (0501)	9.627	.012	4.20	7.98

PEAK FLOW REDUCTION [Qout/Qin](%)= 3.73

TIME SHIFT OF PEAK FLOW (min)=128.00
MAXIMUM STORAGE USED (ha.m.)= .0726

ADD HYD (0806)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0804):	2.72	.059	1.93	3.73
	+ ID2= 2 (0501):	9.63	.012	4.20	7.98
	ID = 3 (0806):	12.34	.060	1.93	7.05

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

READ STORM	Filename: I:\2016 Projects\116023 - 185 Mountain Road\Design\185 Mtn Hydrologic Model\Owen Sound Design Storms\OSCHI2.4HR
Ptotal= 33.75 mm	Comments: OWEN SOUND 2 YEAR 4 HOUR DURATION CHICAG

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.10	1.75	1.10	3.80	2.10	17.64	3.10	2.75
.20	1.84	1.20	4.35	2.20	11.41	3.20	2.55
.30	1.95	1.30	5.09	2.30	8.39	3.30	2.38
.40	2.07	1.40	6.16	2.40	6.63	3.40	2.23
.50	2.21	1.50	7.80	2.50	5.49	3.50	2.09
.60	2.37	1.60	10.63	2.60	4.69	3.60	1.98
.70	2.56	1.70	16.59	2.70	4.10	3.70	1.88
.80	2.78	1.80	35.38	2.80	3.65	3.80	1.78
.90	3.05	1.90	98.09	2.90	3.29	3.90	1.70
1.00	3.38	2.00	36.45	3.00	2.99	4.00	1.63

CALIB			
NASHYD (0207)	Area (ha)= .71	Curve Number (CN)= 57.8	
ID= 1 DT= 2.0 min	Ia (mm)= 10.20	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= .25		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.033	1.75	1.033	3.80	2.033	17.64	3.03	2.75
.067	1.75	1.067	3.80	2.067	17.64	3.07	2.75
.100	1.75	1.100	3.80	2.100	17.64	3.10	2.75
.133	1.84	1.133	4.35	2.133	11.41	3.13	2.55
.167	1.84	1.167	4.35	2.167	11.41	3.17	2.55
.200	1.84	1.200	4.35	2.200	11.41	3.20	2.55
.233	1.95	1.233	5.09	2.233	8.39	3.23	2.38
.267	1.95	1.267	5.09	2.267	8.39	3.27	2.38
.300	1.95	1.300	5.09	2.300	8.39	3.30	2.38
.333	2.07	1.333	6.16	2.333	6.63	3.33	2.23
.367	2.07	1.367	6.16	2.367	6.63	3.37	2.23
.400	2.07	1.400	6.16	2.400	6.63	3.40	2.23
.433	2.21	1.433	7.80	2.433	5.49	3.43	2.09
.467	2.21	1.467	7.80	2.467	5.49	3.47	2.09
.500	2.21	1.500	7.80	2.500	5.49	3.50	2.09
.533	2.37	1.533	10.63	2.533	4.69	3.53	1.98
.567	2.37	1.567	10.63	2.567	4.69	3.57	1.98
.600	2.37	1.600	10.63	2.600	4.69	3.60	1.98
.633	2.56	1.633	16.59	2.633	4.10	3.63	1.88
.667	2.56	1.667	16.59	2.667	4.10	3.67	1.88
.700	2.56	1.700	16.59	2.700	4.10	3.70	1.88
.733	2.78	1.733	35.38	2.733	3.65	3.73	1.78
.767	2.78	1.767	35.38	2.767	3.65	3.77	1.78
.800	2.78	1.800	35.38	2.800	3.65	3.80	1.78
.833	3.05	1.833	98.09	2.833	3.29	3.83	1.70
.867	3.05	1.867	98.09	2.867	3.29	3.87	1.70
.900	3.05	1.900	98.09	2.900	3.29	3.90	1.70
.933	3.38	1.933	36.45	2.933	2.99	3.93	1.63
.967	3.38	1.967	36.45	2.967	2.99	3.97	1.63
1.000	3.38	2.000	36.45	3.000	2.99	4.00	1.63

Unit Hyd Qpeak (cms)= .109

PEAK FLOW (cms)= .005 (i)

```
     TIME TO PEAK    (hrs)=   2.233
     RUNOFF VOLUME    (mm)=   2.654
     TOTAL RAINFALL   (mm)=  33.755
     RUNOFF COEFFICIENT   =    .079

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD    (0205) |   Area    (ha)=   2.00   Curve Number   (CN)= 77.8
|ID= 1 DT= 2.0 min |   Ia      (mm)=   4.06   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .07

     Unit Hyd Qpeak  (cms)=   1.093

     PEAK FLOW       (cms)=    .112 (i)
     TIME TO PEAK    (hrs)=   1.933
     RUNOFF VOLUME    (mm)=   8.603
     TOTAL RAINFALL   (mm)=  33.755
     RUNOFF COEFFICIENT   =    .255

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD    (0204) |   Area    (ha)=   2.08   Curve Number   (CN)= 84.1
|ID= 1 DT= 2.0 min |   Ia      (mm)=   2.47   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .13

     Unit Hyd Qpeak  (cms)=    .610

     PEAK FLOW       (cms)=    .127 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=  12.338
     TOTAL RAINFALL   (mm)=  33.755
     RUNOFF COEFFICIENT   =    .366

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD    (0206) |   Area    (ha)=    .96   Curve Number   (CN)= 59.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   8.69   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .28

     Unit Hyd Qpeak  (cms)=    .131

     PEAK FLOW       (cms)=    .008 (i)
     TIME TO PEAK    (hrs)=   2.267
     RUNOFF VOLUME    (mm)=   3.116
     TOTAL RAINFALL   (mm)=  33.755
     RUNOFF COEFFICIENT   =    .092

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| STANDHYD  (0201) |   Area    (ha)=   3.28
|ID= 1 DT= 2.0 min |   Total Imp(%)=  70.00   Dir. Conn.(%)=   2.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.30          .98
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       2.00         2.00
     Length            (m)=     380.00        40.00
     Mannings n           =       .013         .250

     Max.Eff.Inten.(mm/hr)=      98.09       125.23
               over (min)        5.00        12.00
     Storage Coeff.  (min)=       4.66 (ii)   11.11 (ii)
     Unit Hyd. Tpeak (min)=       4.00        12.00
     Unit Hyd. peak  (cms)=        .25          .10
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .01          .21          .215 (iii)
     TIME TO PEAK    (hrs)=       1.90         2.07          2.07
     RUNOFF VOLUME    (mm)=      31.75        15.46         15.79
     TOTAL RAINFALL   (mm)=      33.76        33.76         33.76
     RUNOFF COEFFICIENT   =        .94          .46           .47

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  69.0    Ia = Dep. 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 (0202)	Area (ha)= .97
ID= 1 DT= 2.0 min	Total Imp(%)= 70.00 Dir. Conn.(%)= 2.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	.68	.29	
Dep. Storage	(mm)=	2.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	140.00	40.00	
Mannings n	=	.013	.250	
Max.Eff.Inten.	(mm/hr)=	98.09	125.23	
over	(min)	5.00	10.00	
Storage Coeff.	(min)=	2.56 (ii)	9.01 (ii)	
Unit Hyd. Tpeak	(min)=	4.00	10.00	
Unit Hyd. peak	(cms)=	.36	.12	
				TOTALS
PEAK FLOW	(cms)=	.00	.07	.071 (iii)
TIME TO PEAK	(hrs)=	1.90	2.03	2.03
RUNOFF VOLUME	(mm)=	31.76	15.46	15.78
TOTAL RAINFALL	(mm)=	33.76	33.76	33.76
RUNOFF COEFFICIENT	=	.94	.46	.47

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (0203)	Area (ha)= 2.34
ID= 1 DT= 2.0 min	Total Imp(%)= 73.00 Dir. Conn.(%)= 2.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.71	.63	
Dep. Storage	(mm)=	2.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	280.00	40.00	
Mannings n	=	.013	.250	
Max.Eff.Inten.	(mm/hr)=	98.09	148.09	
over	(min)	5.00	10.00	
Storage Coeff.	(min)=	3.88 (ii)	9.91 (ii)	
Unit Hyd. Tpeak	(min)=	4.00	10.00	
Unit Hyd. peak	(cms)=	.28	.11	
				TOTALS
PEAK FLOW	(cms)=	.01	.17	.176 (iii)
TIME TO PEAK	(hrs)=	1.90	2.03	2.03
RUNOFF VOLUME	(mm)=	31.76	16.43	16.73
TOTAL RAINFALL	(mm)=	33.76	33.76	33.76
RUNOFF COEFFICIENT	=	.94	.49	.50

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. 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 (0804)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0207):		.71	.005	2.23	2.65
+ ID2= 2 (0205):		2.00	.112	1.93	8.60
ID = 3 (0804):		2.72	.113	1.93	7.04

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0801)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0206):	.96	.008	2.27	3.12
+ ID2= 2 (0201):	3.28	.215	2.07	15.79
ID = 3 (0801):	4.24	.221	2.07	12.92

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0802)
1 + 2 = 3

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0202):	.97	.071	2.03	15.78
+ ID2= 2 (0203):	2.34	.176	2.03	16.73
ID = 3 (0802):	3.31	.247	2.03	16.45

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0803)
1 + 2 = 3

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0801):	4.24	.221	2.07	12.92
+ ID2= 2 (0802):	3.31	.247	2.03	16.45
ID = 3 (0803):	7.55	.463	2.03	14.47

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0805)
1 + 2 = 3

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0204):	2.08	.127	2.00	12.34
+ ID2= 2 (0803):	7.55	.463	2.03	14.47
ID = 3 (0805):	9.63	.589	2.03	14.01

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0501)
IN= 2---> OUT= 1
DT= 2.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
.0000	.0000	.0227	.2159
.0017	.0174	.0239	.2411
.0066	.0366	.0508	.2679
.0101	.0570	.1186	.2952
.0127	.0779	.2340	.3228
.0148	.0994	.3972	.3509
.0167	.1213	.5621	.3794
.0184	.1438	.5877	.4084
.0199	.1670	.6122	.4378
.0213	.1910	.7402	.4676

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0805)	9.627	.589	2.03	14.01
OUTFLOW: ID= 1 (0501)	9.627	.017	4.20	13.31

PEAK FLOW REDUCTION [Qout/Qin](%)= 2.84
TIME SHIFT OF PEAK FLOW (min)=130.00
MAXIMUM STORAGE USED (ha.m.)= .1219

ADD HYD (0806)
1 + 2 = 3

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0804):	2.72	.113	1.93	7.04
+ ID2= 2 (0501):	9.63	.017	4.20	13.31
ID = 3 (0806):	12.34	.115	1.93	11.93

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION NUMBER: 3 **

****

READ STORM	Filename: I:\2016 Projects\116023 - 185 Mountain Road\Design\185 Mtn Hydrologic Model\Owen Sound Design Storms\OSCHI5.4HR
Ptotal= 44.07 mm	Comments: OWEN SOUND 5 YEAR 4 HOUR DURATION CHICAG

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.10	2.16	1.10	4.86	2.10	23.63	3.10	3.47
.20	2.29	1.20	5.59	2.20	15.14	3.20	3.21
.30	2.42	1.30	6.58	2.30	11.03	3.30	2.98
.40	2.58	1.40	8.01	2.40	8.65	3.40	2.78
.50	2.76	1.50	10.23	2.50	7.11	3.50	2.61
.60	2.97	1.60	14.08	2.60	6.04	3.60	2.46
.70	3.22	1.70	22.20	2.70	5.25	3.70	2.33
.80	3.51	1.80	47.44	2.80	4.65	3.80	2.21
.90	3.86	1.90	127.12	2.90	4.17	3.90	2.11
1.00	4.30	2.00	48.87	3.00	3.79	4.00	2.01

CALIB			
NASHYD (0207)	Area (ha)=	.71	Curve Number (CN)= 57.8
ID= 1 DT= 2.0 min	Ia (mm)=	10.20	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	.25	

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.033	2.16	1.033	4.86	2.033	23.63	3.03	3.47
.067	2.16	1.067	4.86	2.067	23.63	3.07	3.47
.100	2.16	1.100	4.86	2.100	23.63	3.10	3.47
.133	2.29	1.133	5.59	2.133	15.14	3.13	3.21
.167	2.29	1.167	5.59	2.167	15.14	3.17	3.21
.200	2.29	1.200	5.59	2.200	15.14	3.20	3.21
.233	2.42	1.233	6.58	2.233	11.03	3.23	2.98
.267	2.42	1.267	6.58	2.267	11.03	3.27	2.98
.300	2.42	1.300	6.58	2.300	11.03	3.30	2.98
.333	2.58	1.333	8.01	2.333	8.65	3.33	2.78
.367	2.58	1.367	8.01	2.367	8.65	3.37	2.78
.400	2.58	1.400	8.01	2.400	8.65	3.40	2.78
.433	2.76	1.433	10.23	2.433	7.11	3.43	2.61
.467	2.76	1.467	10.23	2.467	7.11	3.47	2.61
.500	2.76	1.500	10.23	2.500	7.11	3.50	2.61
.533	2.97	1.533	14.08	2.533	6.04	3.53	2.46
.567	2.97	1.567	14.08	2.567	6.04	3.57	2.46
.600	2.97	1.600	14.08	2.600	6.04	3.60	2.46
.633	3.22	1.633	22.20	2.633	5.25	3.63	2.33
.667	3.22	1.667	22.20	2.667	5.25	3.67	2.33
.700	3.22	1.700	22.20	2.700	5.25	3.70	2.33
.733	3.51	1.733	47.44	2.733	4.65	3.73	2.21
.767	3.51	1.767	47.44	2.767	4.65	3.77	2.21
.800	3.51	1.800	47.44	2.800	4.65	3.80	2.21
.833	3.86	1.833	127.12	2.833	4.17	3.83	2.11
.867	3.86	1.867	127.12	2.867	4.17	3.87	2.11
.900	3.86	1.900	127.12	2.900	4.17	3.90	2.11
.933	4.30	1.933	48.87	2.933	3.79	3.93	2.01
.967	4.30	1.967	48.87	2.967	3.79	3.97	2.01
1.000	4.30	2.000	48.87	3.000	3.79	4.00	2.01

Unit Hyd Qpeak (cms)= .109

PEAK FLOW (cms)= .011 (i)
TIME TO PEAK (hrs)= 2.200
RUNOFF VOLUME (mm)= 5.229
TOTAL RAINFALL (mm)= 44.068
RUNOFF COEFFICIENT = .119

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

CALIB			
NASHYD (0205)	Area (ha)=	2.00	Curve Number (CN)= 77.8
ID= 1 DT= 2.0 min	Ia (mm)=	4.06	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	.07	

Unit Hyd Qpeak (cms)= 1.093

PEAK FLOW (cms)= .188 (i)
TIME TO PEAK (hrs)= 1.933
RUNOFF VOLUME (mm)= 14.184

```
     TOTAL RAINFALL   (mm)=  44.068
     RUNOFF COEFFICIENT   =    .322

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0204) |   Area    (ha)=   2.08   Curve Number   (CN)= 84.1
|ID= 1 DT= 2.0 min |   Ia      (mm)=   2.47   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .13

     Unit Hyd Qpeak  (cms)=    .610

     PEAK FLOW       (cms)=    .202 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=  19.303
     TOTAL RAINFALL   (mm)=  44.068
     RUNOFF COEFFICIENT   =    .438

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0206) |   Area    (ha)=    .96   Curve Number   (CN)= 59.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   8.69   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .28

     Unit Hyd Qpeak  (cms)=    .131

     PEAK FLOW       (cms)=    .017 (i)
     TIME TO PEAK    (hrs)=   2.233
     RUNOFF VOLUME    (mm)=   5.906
     TOTAL RAINFALL   (mm)=  44.068
     RUNOFF COEFFICIENT   =    .134

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0201) |   Area    (ha)=   3.28
|ID= 1 DT= 2.0 min |   Total Imp(%)=  70.00   Dir. Conn.(%)=   2.00
--------------------

                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.30          .98
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       2.00         2.00
     Length            (m)=     380.00        40.00
     Mannings n           =       .013         .250

     Max.Eff.Inten.(mm/hr)=     127.12       190.00
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       4.20 (ii)    9.66 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=        .27          .12
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .02          .35          .357 (iii)
     TIME TO PEAK    (hrs)=       1.90         2.03          2.03
     RUNOFF VOLUME    (mm)=      42.07        23.36         23.73
     TOTAL RAINFALL   (mm)=      44.07        44.07         44.07
     RUNOFF COEFFICIENT   =        .95          .53           .54

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  69.0    Ia = Dep. 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  (0202) |   Area    (ha)=    .97
|ID= 1 DT= 2.0 min |   Total Imp(%)=  70.00   Dir. Conn.(%)=   2.00
--------------------

                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .68          .29
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       2.00         2.00
     Length            (m)=     140.00        40.00
     Mannings n           =       .013         .250

     Max.Eff.Inten.(mm/hr)=     127.12       190.00
               over (min)        5.00         8.00
     Storage Coeff.  (min)=       2.31 (ii)    7.77 (ii)
```

```
     Unit Hyd. Tpeak (min)=       4.00         8.00
     Unit Hyd. peak  (cms)=        .38          .14
                                                          *TOTALS*
     PEAK FLOW       (cms)=        .01          .12          .118 (iii)
     TIME TO PEAK    (hrs)=       1.90         2.00          2.00
     RUNOFF VOLUME    (mm)=      42.07        23.36         23.73
     TOTAL RAINFALL   (mm)=      44.07        44.07         44.07
     RUNOFF COEFFICIENT   =        .95          .53           .54

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  69.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0203) |   Area    (ha)=   2.34
|ID= 1 DT= 2.0 min |   Total Imp(%)=  73.00   Dir. Conn.(%)=   2.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.71          .63
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       2.00         2.00
     Length            (m)=     280.00        40.00
     Mannings n           =       .013         .250

     Max.Eff.Inten.(mm/hr)=     127.12       222.34
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       3.50 (ii)    8.62 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=        .30          .12
                                                          *TOTALS*
     PEAK FLOW       (cms)=        .01          .27          .281 (iii)
     TIME TO PEAK    (hrs)=       1.90         2.03          2.03
     RUNOFF VOLUME    (mm)=      42.07        24.58         24.93
     TOTAL RAINFALL   (mm)=      44.07        44.07         44.07
     RUNOFF COEFFICIENT   =        .95          .56           .57

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  69.0    Ia = Dep. 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   (0804) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0207):       .71    .011     2.20     5.23
        + ID2= 2 (0205):     2.00    .188     1.93    14.18
          ================================================
          ID = 3 (0804):     2.72    .192     1.93    11.83

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0801) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0206):       .96    .017     2.23     5.91
        + ID2= 2 (0201):     3.28    .357     2.03    23.73
          ================================================
          ID = 3 (0801):     4.24    .368     2.03    19.69

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0802) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0202):       .97    .118     2.00    23.73
        + ID2= 2 (0203):     2.34    .281     2.03    24.93
          ================================================
          ID = 3 (0802):     3.31    .395     2.00    24.58
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0803)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0801):	4.24	.368	2.03	19.69
+	ID2= 2 (0802):	3.31	.395	2.00	24.58
	ID = 3 (0803):	7.55	.759	2.03	21.84

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0805)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0204):	2.08	.202	2.00	19.30
+	ID2= 2 (0803):	7.55	.759	2.03	21.84
	ID = 3 (0805):	9.63	.959	2.03	21.29

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0501)
IN= 2---> OUT= 1
DT= 2.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
.0000	.0000	.0227	.2159
.0017	.0174	.0239	.2411
.0066	.0366	.0508	.2679
.0101	.0570	.1186	.2952
.0127	.0779	.2340	.3228
.0148	.0994	.3972	.3509
.0167	.1213	.5621	.3794
.0184	.1438	.5877	.4084
.0199	.1670	.6122	.4378
.0213	.1910	.7402	.4676

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0805)	9.627	.959	2.03	21.29
OUTFLOW: ID= 1 (0501)	9.627	.021	4.17	20.31

PEAK FLOW REDUCTION [Qout/Qin](%)= 2.20
TIME SHIFT OF PEAK FLOW (min)=128.00
MAXIMUM STORAGE USED (ha.m.)= .1882

ADD HYD (0806)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0804):	2.72	.192	1.93	11.83
+	ID2= 2 (0501):	9.63	.021	4.17	20.31
	ID = 3 (0806):	12.34	.197	1.93	18.45

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION NUMBER: 4 **
****

READ STORM	Filename: I:\2016 Projects\116023 - 185 Mountain Road\Design\185 Mtn Hydrologic Model\Owen Sound Design Storms\OSchi10.4hr
Ptotal= 50.59 mm	Comments: OWEN SOUND 10 YEAR 4 HOUR DURATION CHICA

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.10	2.37	1.10	5.44	2.10	27.54	3.10	3.85
.20	2.50	1.20	6.28	2.20	17.50	3.20	3.54
.30	2.66	1.30	7.44	2.30	12.66	3.30	3.29
.40	2.84	1.40	9.10	2.40	9.86	3.40	3.06
.50	3.04	1.50	11.71	2.50	8.06	3.50	2.87
.60	3.28	1.60	16.26	2.60	6.81	3.60	2.70
.70	3.56	1.70	25.85	2.70	5.89	3.70	2.55
.80	3.89	1.80	55.53	2.80	5.20	3.80	2.42

.90	4.29	1.90	146.69	2.90	4.65	3.90	2.30
1.00	4.80	2.00	57.21	3.00	4.21	4.00	2.20

CALIB					
NASHYD (0207)	Area (ha)=	.71	Curve Number (CN)=	57.8	
ID= 1 DT= 2.0 min	Ia (mm)=	10.20	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	.25			

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.033	2.37	1.033	5.44	2.033	27.54	3.03	3.85
.067	2.37	1.067	5.44	2.067	27.54	3.07	3.85
.100	2.37	1.100	5.44	2.100	27.54	3.10	3.85
.133	2.50	1.133	6.28	2.133	17.50	3.13	3.54
.167	2.50	1.167	6.28	2.167	17.50	3.17	3.54
.200	2.50	1.200	6.28	2.200	17.50	3.20	3.54
.233	2.66	1.233	7.44	2.233	12.66	3.23	3.29
.267	2.66	1.267	7.44	2.267	12.66	3.27	3.29
.300	2.66	1.300	7.44	2.300	12.66	3.30	3.29
.333	2.84	1.333	9.10	2.333	9.86	3.33	3.06
.367	2.84	1.367	9.10	2.367	9.86	3.37	3.06
.400	2.84	1.400	9.10	2.400	9.86	3.40	3.06
.433	3.04	1.433	11.71	2.433	8.06	3.43	2.87
.467	3.04	1.467	11.71	2.467	8.06	3.47	2.87
.500	3.04	1.500	11.71	2.500	8.06	3.50	2.87
.533	3.28	1.533	16.26	2.533	6.81	3.53	2.70
.567	3.28	1.567	16.26	2.567	6.81	3.57	2.70
.600	3.28	1.600	16.26	2.600	6.81	3.60	2.70
.633	3.56	1.633	25.85	2.633	5.89	3.63	2.55
.667	3.56	1.667	25.85	2.667	5.89	3.67	2.55
.700	3.56	1.700	25.85	2.700	5.89	3.70	2.55
.733	3.89	1.733	55.53	2.733	5.20	3.73	2.42
.767	3.89	1.767	55.53	2.767	5.20	3.77	2.42
.800	3.89	1.800	55.53	2.800	5.20	3.80	2.42
.833	4.29	1.833	146.69	2.833	4.65	3.83	2.30
.867	4.29	1.867	146.69	2.867	4.65	3.87	2.30
.900	4.29	1.900	146.69	2.900	4.65	3.90	2.30
.933	4.80	1.933	57.21	2.933	4.21	3.93	2.20
.967	4.80	1.967	57.21	2.967	4.21	3.97	2.20
1.000	4.80	2.000	57.21	3.000	4.21	4.00	2.20

Unit Hyd Qpeak (cms)= .109

PEAK FLOW (cms)= .016 (i)
TIME TO PEAK (hrs)= 2.200
RUNOFF VOLUME (mm)= 7.223
TOTAL RAINFALL (mm)= 50.590
RUNOFF COEFFICIENT = .143

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

CALIB					
NASHYD (0205)	Area (ha)=	2.00	Curve Number (CN)=	77.8	
ID= 1 DT= 2.0 min	Ia (mm)=	4.06	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	.07			

Unit Hyd Qpeak (cms)= 1.093

PEAK FLOW (cms)= .245 (i)
TIME TO PEAK (hrs)= 1.933
RUNOFF VOLUME (mm)= 18.134
TOTAL RAINFALL (mm)= 50.590
RUNOFF COEFFICIENT = .358

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

CALIB					
NASHYD (0204)	Area (ha)=	2.08	Curve Number (CN)=	84.1	
ID= 1 DT= 2.0 min	Ia (mm)=	2.47	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	.13			

Unit Hyd Qpeak (cms)= .610

PEAK FLOW (cms)= .256 (i)
TIME TO PEAK (hrs)= 2.000
RUNOFF VOLUME (mm)= 24.078
TOTAL RAINFALL (mm)= 50.590
RUNOFF COEFFICIENT = .476

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

CALIB			
NASHYD (0206)	Area (ha)= .96	Curve Number (CN)= 59.0	
ID= 1 DT= 2.0 min	Ia (mm)= 8.69	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= .28		

Unit Hyd Qpeak (cms)= .131

PEAK FLOW (cms)= .023 (i)
TIME TO PEAK (hrs)= 2.233
RUNOFF VOLUME (mm)= 8.037
TOTAL RAINFALL (mm)= 50.590
RUNOFF COEFFICIENT = .159

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

CALIB			
STANDHYD (0201)	Area (ha)= 3.28		
ID= 1 DT= 2.0 min	Total Imp(%)= 70.00	Dir. Conn.(%)= 2.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	2.30	.98	
Dep. Storage	(mm)=	2.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	380.00	40.00	
Mannings n	=	.013	.250	
Max.Eff.Inten.(mm/hr)	=	146.69	235.30	
over (min)		5.00	10.00	
Storage Coeff.	(min)=	3.97 (ii)	8.98 (ii)	
Unit Hyd. Tpeak	(min)=	4.00	10.00	
Unit Hyd. peak	(cms)=	.28	.12	
				TOTALS
PEAK FLOW	(cms)=	.02	.44	.456 (iii)
TIME TO PEAK	(hrs)=	1.90	2.03	2.03
RUNOFF VOLUME	(mm)=	48.59	28.65	29.05
TOTAL RAINFALL	(mm)=	50.59	50.59	50.59
RUNOFF COEFFICIENT	=	.96	.57	.57

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. 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 (0202)	Area (ha)= .97		
ID= 1 DT= 2.0 min	Total Imp(%)= 70.00	Dir. Conn.(%)= 2.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	.68	.29	
Dep. Storage	(mm)=	2.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	140.00	40.00	
Mannings n	=	.013	.250	
Max.Eff.Inten.(mm/hr)	=	146.69	235.30	
over (min)		5.00	8.00	
Storage Coeff.	(min)=	2.18 (ii)	7.19 (ii)	
Unit Hyd. Tpeak	(min)=	4.00	8.00	
Unit Hyd. peak	(cms)=	.39	.15	
				TOTALS
PEAK FLOW	(cms)=	.01	.15	.151 (iii)
TIME TO PEAK	(hrs)=	1.90	2.00	2.00
RUNOFF VOLUME	(mm)=	48.59	28.66	29.05
TOTAL RAINFALL	(mm)=	50.59	50.59	50.59
RUNOFF COEFFICIENT	=	.96	.57	.57

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
--------------------
| CALIB            |
| STANDHYD  (0203) |   Area    (ha)=   2.34
|ID= 1 DT= 2.0 min |   Total Imp(%)=  73.00   Dir. Conn.(%)=   2.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.71          .63
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       2.00         2.00
     Length            (m)=     280.00        40.00
     Mannings n           =       .013         .250

     Max.Eff.Inten.(mm/hr)=     146.69       273.93
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       3.30 (ii)    8.02 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=        .31          .13
                                                          *TOTALS*
     PEAK FLOW       (cms)=        .02          .35          .356 (iii)
     TIME TO PEAK    (hrs)=       1.90         2.03          2.03
     RUNOFF VOLUME    (mm)=      48.59        30.03         30.40
     TOTAL RAINFALL   (mm)=      50.59        50.59         50.59
     RUNOFF COEFFICIENT   =        .96          .59           .60

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  69.0    Ia = Dep. 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   (0804) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0207):      .71    .016     2.20     7.22
        + ID2= 2 (0205):     2.00    .245     1.93    18.13
          ================================================
          ID = 3 (0804):     2.72    .250     1.93    15.27

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0801) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0206):      .96    .023     2.23     8.04
        + ID2= 2 (0201):     3.28    .456     2.03    29.05
          ================================================
          ID = 3 (0801):     4.24    .472     2.03    24.29

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0802) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0202):      .97    .151     2.00    29.05
        + ID2= 2 (0203):     2.34    .356     2.03    30.40
          ================================================
          ID = 3 (0802):     3.31    .504     2.00    30.00

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0803) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0801):     4.24    .472     2.03    24.29
        + ID2= 2 (0802):     3.31    .504     2.00    30.00
          ================================================
          ID = 3 (0803):     7.55    .966     2.03    26.80

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0805) |
```

1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0204):	2.08	.256	2.00	24.08
+ ID2= 2 (0803):	7.55	.966	2.03	26.80
ID = 3 (0805):	9.63	1.222	2.00	26.21

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0501)
IN= 2---> OUT= 1
DT= 2.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
.0000	.0000	.0227	.2159
.0017	.0174	.0239	.2411
.0066	.0366	.0508	.2679
.0101	.0570	.1186	.2952
.0127	.0779	.2340	.3228
.0148	.0994	.3972	.3509
.0167	.1213	.5621	.3794
.0184	.1438	.5877	.4084
.0199	.1670	.6122	.4378
.0213	.1910	.7402	.4676

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0805)	9.627	1.222	2.00	26.21
OUTFLOW: ID= 1 (0501)	9.627	.024	4.17	25.02

PEAK FLOW REDUCTION [Qout/Qin](%)= 1.93
TIME SHIFT OF PEAK FLOW (min)=130.00
MAXIMUM STORAGE USED (ha.m.)= .2335

ADD HYD (0806)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0804):	2.72	.250	1.93	15.27
+ ID2= 2 (0501):	9.63	.024	4.17	25.02
ID = 3 (0806):	12.34	.257	1.93	22.87

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION NUMBER: 5 **
****

READ STORM
Ptotal= 59.08 mm

Filename: I:\2016 Projects\116023 - 185 Mountain Road\Design\185 Mtn Hydrologic Model\Owen Sound Design Storms\OSCHI25.4HR
Comments: OWEN SOUND 25 YEAR 4 HOUR DURATION CHICA

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.10	2.69	1.10	6.28	2.10	32.51	3.10	4.41
.20	2.85	1.20	7.27	2.20	20.58	3.20	4.06
.30	3.03	1.30	8.63	2.30	14.82	3.30	3.76
.40	3.24	1.40	10.61	2.40	11.50	3.40	3.50
.50	3.47	1.50	13.69	2.50	9.37	3.50	3.28
.60	3.75	1.60	19.10	2.60	7.89	3.60	3.08
.70	4.07	1.70	30.50	2.70	6.82	3.70	2.91
.80	4.46	1.80	65.56	2.80	6.00	3.80	2.76
.90	4.94	1.90	170.99	2.90	5.35	3.90	2.62
1.00	5.53	2.00	67.54	3.00	4.84	4.00	2.50

CALIB
NASHYD (0207)
ID= 1 DT= 2.0 min

Area (ha)= .71 Curve Number (CN)= 57.8
Ia (mm)= 10.20 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= .25

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.033	2.69	1.033	6.28	2.033	32.51	3.03	4.41
.067	2.69	1.067	6.28	2.067	32.51	3.07	4.41

.100	2.69	1.100	6.28	2.100	32.51	3.10	4.41
.133	2.85	1.133	7.27	2.133	20.58	3.13	4.06
.167	2.85	1.167	7.27	2.167	20.58	3.17	4.06
.200	2.85	1.200	7.27	2.200	20.58	3.20	4.06
.233	3.03	1.233	8.63	2.233	14.82	3.23	3.76
.267	3.03	1.267	8.63	2.267	14.82	3.27	3.76
.300	3.03	1.300	8.63	2.300	14.82	3.30	3.76
.333	3.24	1.333	10.61	2.333	11.50	3.33	3.50
.367	3.24	1.367	10.61	2.367	11.50	3.37	3.50
.400	3.24	1.400	10.61	2.400	11.50	3.40	3.50
.433	3.47	1.433	13.69	2.433	9.37	3.43	3.28
.467	3.47	1.467	13.69	2.467	9.37	3.47	3.28
.500	3.47	1.500	13.69	2.500	9.37	3.50	3.28
.533	3.75	1.533	19.10	2.533	7.89	3.53	3.08
.567	3.75	1.567	19.10	2.567	7.89	3.57	3.08
.600	3.75	1.600	19.10	2.600	7.89	3.60	3.08
.633	4.07	1.633	30.50	2.633	6.82	3.63	2.91
.667	4.07	1.667	30.50	2.667	6.82	3.67	2.91
.700	4.07	1.700	30.50	2.700	6.82	3.70	2.91
.733	4.46	1.733	65.56	2.733	6.00	3.73	2.76
.767	4.46	1.767	65.56	2.767	6.00	3.77	2.76
.800	4.46	1.800	65.56	2.800	6.00	3.80	2.76
.833	4.94	1.833	170.99	2.833	5.35	3.83	2.62
.867	4.94	1.867	170.99	2.867	5.35	3.87	2.62
.900	4.94	1.900	170.99	2.900	5.35	3.90	2.62
.933	5.53	1.933	67.54	2.933	4.84	3.93	2.50
.967	5.53	1.967	67.54	2.967	4.84	3.97	2.50
1.000	5.53	2.000	67.54	3.000	4.84	4.00	2.50

Unit Hyd Qpeak (cms)= .109

PEAK FLOW (cms)= .024 (i)
TIME TO PEAK (hrs)= 2.200
RUNOFF VOLUME (mm)= 10.194
TOTAL RAINFALL (mm)= 59.076
RUNOFF COEFFICIENT = .173

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

CALIB					
NASHYD (0205)	Area (ha)=	2.00	Curve Number (CN)=	77.8	
ID= 1 DT= 2.0 min	Ia (mm)=	4.06	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	.07			

Unit Hyd Qpeak (cms)= 1.093

PEAK FLOW (cms)= .322 (i)
TIME TO PEAK (hrs)= 1.933
RUNOFF VOLUME (mm)= 23.665
TOTAL RAINFALL (mm)= 59.076
RUNOFF COEFFICIENT = .401

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

CALIB					
NASHYD (0204)	Area (ha)=	2.08	Curve Number (CN)=	84.1	
ID= 1 DT= 2.0 min	Ia (mm)=	2.47	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	.13			

Unit Hyd Qpeak (cms)= .610

PEAK FLOW (cms)= .328 (i)
TIME TO PEAK (hrs)= 2.000
RUNOFF VOLUME (mm)= 30.616
TOTAL RAINFALL (mm)= 59.076
RUNOFF COEFFICIENT = .518

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

CALIB					
NASHYD (0206)	Area (ha)=	.96	Curve Number (CN)=	59.0	
ID= 1 DT= 2.0 min	Ia (mm)=	8.69	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	.28			

Unit Hyd Qpeak (cms)= .131

PEAK FLOW (cms)= .033 (i)
TIME TO PEAK (hrs)= 2.233
RUNOFF VOLUME (mm)= 11.188
TOTAL RAINFALL (mm)= 59.076
RUNOFF COEFFICIENT = .189

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

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0201) |   Area    (ha)=   3.28
|ID= 1 DT= 2.0 min |   Total Imp(%)=  70.00   Dir. Conn.(%)=   2.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.30          .98
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       2.00         2.00
     Length            (m)=     380.00        40.00
     Mannings n           =       .013         .250

     Max.Eff.Inten.(mm/hr)=     170.99       294.26
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       3.73 (ii)    8.31 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=        .29          .13
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .03          .58          .589 (iii)
     TIME TO PEAK    (hrs)=       1.90         2.03          2.03
     RUNOFF VOLUME    (mm)=      57.08        35.81         36.23
     TOTAL RAINFALL   (mm)=      59.08        59.08         59.08
     RUNOFF COEFFICIENT   =        .97          .61           .61

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  69.0    Ia = Dep. 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  (0202) |   Area    (ha)=    .97
|ID= 1 DT= 2.0 min |   Total Imp(%)=  70.00   Dir. Conn.(%)=   2.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .68          .29
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       2.00         2.00
     Length            (m)=     140.00        40.00
     Mannings n           =       .013         .250

     Max.Eff.Inten.(mm/hr)=     170.99       294.26
               over (min)        5.00         8.00
     Storage Coeff.  (min)=       2.05 (ii)    6.63 (ii)
     Unit Hyd. Tpeak (min)=       4.00         8.00
     Unit Hyd. peak  (cms)=        .40          .16
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .01          .19          .194 (iii)
     TIME TO PEAK    (hrs)=       1.90         2.00          2.00
     RUNOFF VOLUME    (mm)=      57.08        35.81         36.23
     TOTAL RAINFALL   (mm)=      59.08        59.08         59.08
     RUNOFF COEFFICIENT   =        .97          .61           .61

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  69.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0203) |   Area    (ha)=   2.34
|ID= 1 DT= 2.0 min |   Total Imp(%)=  73.00   Dir. Conn.(%)=   2.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.71          .63
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       2.00         2.00
     Length            (m)=     280.00        40.00
     Mannings n           =       .013         .250

     Max.Eff.Inten.(mm/hr)=     170.99       340.68
               over (min)        5.00         8.00
     Storage Coeff.  (min)=       3.11 (ii)    7.43 (ii)
     Unit Hyd. Tpeak (min)=       4.00         8.00
     Unit Hyd. peak  (cms)=        .33          .15
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .02          .46          .471 (iii)
```

```
     TIME TO PEAK    (hrs)=       1.90         2.00          2.00
     RUNOFF VOLUME    (mm)=      57.08        37.35         37.74
     TOTAL RAINFALL   (mm)=      59.08        59.08         59.08
     RUNOFF COEFFICIENT   =        .97          .63           .64

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  69.0    Ia = Dep. 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   (0804) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0207):       .71    .024     2.20    10.19
       + ID2= 2 (0205):     2.00    .322     1.93    23.66
         ================================================
         ID = 3 (0804):     2.72    .330     1.93    20.13

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0801) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0206):       .96    .033     2.23    11.19
       + ID2= 2 (0201):     3.28    .589     2.03    36.23
         ================================================
         ID = 3 (0801):     4.24    .611     2.03    30.56

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0802) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0202):       .97    .194     2.00    36.23
       + ID2= 2 (0203):     2.34    .471     2.00    37.74
         ================================================
         ID = 3 (0802):     3.31    .666     2.00    37.30

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0803) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0801):     4.24    .611     2.03    30.56
       + ID2= 2 (0802):     3.31    .666     2.00    37.30
         ================================================
         ID = 3 (0803):     7.55   1.268     2.00    33.51

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0805) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0204):     2.08    .328     2.00    30.62
       + ID2= 2 (0803):     7.55   1.268     2.00    33.51
         ================================================
         ID = 3 (0805):     9.63   1.596     2.00    32.89

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0501) |
| IN= 2---> OUT= 1 |
| DT=  2.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          .0000      .0000    |    .0227       .2159
                          .0017      .0174    |    .0239       .2411
                          .0066      .0366    |    .0508       .2679
                          .0101      .0570    |    .1186       .2952
```

.0127	.0779	.2340	.3228
.0148	.0994	.3972	.3509
.0167	.1213	.5621	.3794
.0184	.1438	.5877	.4084
.0199	.1670	.6122	.4378
.0213	.1910	.7402	.4676

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0805)	9.627	1.596	2.00	32.89
OUTFLOW: ID= 1 (0501)	9.627	.072	3.63	31.56

PEAK FLOW REDUCTION [Qout/Qin](%)= 4.50
TIME SHIFT OF PEAK FLOW (min)= 98.00
MAXIMUM STORAGE USED (ha.m.)= .2764

ADD HYD (0806)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0804):	2.72	.330	1.93	20.13
	+ ID2= 2 (0501):	9.63	.072	3.63	31.56
	ID = 3 (0806):	12.34	.341	1.93	29.04

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION NUMBER: 6 **
****

READ STORM	Filename: I:\2016 Projects\116023 - 185 Mountain Road\Design\185 Mtn Hydrologic Model\Owen Sound Design Storms\OSchi50.4hr
Ptotal= 65.65 mm	Comments: OWEN SOUND 50 YEAR 4 HOUR DURATION CHICA

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.10	2.87	1.10	6.88	2.10	36.93	3.10	4.78
.20	3.04	1.20	8.01	2.20	23.25	3.20	4.39
.30	3.24	1.30	9.55	2.30	16.64	3.30	4.05
.40	3.47	1.40	11.81	2.40	12.83	3.40	3.76
.50	3.73	1.50	15.34	2.50	10.39	3.50	3.52
.60	4.04	1.60	21.55	2.60	8.71	3.60	3.30
.70	4.40	1.70	34.62	2.70	7.49	3.70	3.11
.80	4.84	1.80	74.20	2.80	6.56	3.80	2.94
.90	5.37	1.90	187.94	2.90	5.84	3.90	2.79
1.00	6.03	2.00	76.42	3.00	5.26	4.00	2.65

CALIB			
NASHYD (0207)	Area (ha)= .71	Curve Number (CN)= 57.8
ID= 1 DT= 2.0 min	Ia (mm)= 10.20	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= .25	

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.033	2.87	1.033	6.88	2.033	36.93	3.03	4.78
.067	2.87	1.067	6.88	2.067	36.93	3.07	4.78
.100	2.87	1.100	6.88	2.100	36.93	3.10	4.78
.133	3.04	1.133	8.01	2.133	23.25	3.13	4.39
.167	3.04	1.167	8.01	2.167	23.25	3.17	4.39
.200	3.04	1.200	8.01	2.200	23.25	3.20	4.39
.233	3.24	1.233	9.55	2.233	16.64	3.23	4.05
.267	3.24	1.267	9.55	2.267	16.64	3.27	4.05
.300	3.24	1.300	9.55	2.300	16.64	3.30	4.05
.333	3.47	1.333	11.81	2.333	12.83	3.33	3.76
.367	3.47	1.367	11.81	2.367	12.83	3.37	3.76
.400	3.47	1.400	11.81	2.400	12.83	3.40	3.76
.433	3.73	1.433	15.34	2.433	10.39	3.43	3.52
.467	3.73	1.467	15.34	2.467	10.39	3.47	3.52
.500	3.73	1.500	15.34	2.500	10.39	3.50	3.52
.533	4.04	1.533	21.55	2.533	8.71	3.53	3.30
.567	4.04	1.567	21.55	2.567	8.71	3.57	3.30
.600	4.04	1.600	21.55	2.600	8.71	3.60	3.30
.633	4.40	1.633	34.62	2.633	7.49	3.63	3.11
.667	4.40	1.667	34.62	2.667	7.49	3.67	3.11
.700	4.40	1.700	34.62	2.700	7.49	3.70	3.11

.733	4.84	1.733	74.20	2.733	6.56	3.73	2.94
.767	4.84	1.767	74.20	2.767	6.56	3.77	2.94
.800	4.84	1.800	74.20	2.800	6.56	3.80	2.94
.833	5.37	1.833	187.94	2.833	5.84	3.83	2.79
.867	5.37	1.867	187.94	2.867	5.84	3.87	2.79
.900	5.37	1.900	187.94	2.900	5.84	3.90	2.79
.933	6.03	1.933	76.42	2.933	5.26	3.93	2.65
.967	6.03	1.967	76.42	2.967	5.26	3.97	2.65
1.000	6.03	2.000	76.42	3.000	5.26	4.00	2.65

Unit Hyd Qpeak (cms)= .109

PEAK FLOW (cms)= .030 (i)
TIME TO PEAK (hrs)= 2.200
RUNOFF VOLUME (mm)= 12.764
TOTAL RAINFALL (mm)= 65.654
RUNOFF COEFFICIENT = .194

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

CALIB			
NASHYD (0205)	Area (ha)= 2.00	Curve Number (CN)= 77.8	
ID= 1 DT= 2.0 min	Ia (mm)= 4.06	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= .07		

Unit Hyd Qpeak (cms)= 1.093

PEAK FLOW (cms)= .384 (i)
TIME TO PEAK (hrs)= 1.933
RUNOFF VOLUME (mm)= 28.206
TOTAL RAINFALL (mm)= 65.654
RUNOFF COEFFICIENT = .430

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

CALIB			
NASHYD (0204)	Area (ha)= 2.08	Curve Number (CN)= 84.1	
ID= 1 DT= 2.0 min	Ia (mm)= 2.47	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= .13		

Unit Hyd Qpeak (cms)= .610

PEAK FLOW (cms)= .385 (i)
TIME TO PEAK (hrs)= 2.000
RUNOFF VOLUME (mm)= 35.889
TOTAL RAINFALL (mm)= 65.654
RUNOFF COEFFICIENT = .547

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

CALIB			
NASHYD (0206)	Area (ha)= .96	Curve Number (CN)= 59.0	
ID= 1 DT= 2.0 min	Ia (mm)= 8.69	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= .28		

Unit Hyd Qpeak (cms)= .131

PEAK FLOW (cms)= .041 (i)
TIME TO PEAK (hrs)= 2.233
RUNOFF VOLUME (mm)= 13.898
TOTAL RAINFALL (mm)= 65.654
RUNOFF COEFFICIENT = .212

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

CALIB			
STANDHYD (0201)	Area (ha)= 3.28		
ID= 1 DT= 2.0 min	Total Imp(%)= 70.00	Dir. Conn.(%)= 2.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.30	.98
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	2.00	2.00
Length	(m)=	380.00	40.00
Mannings n	=	.013	.250
Max.Eff.Inten.(mm/hr)=		187.94	339.33
over (min)		5.00	8.00
Storage Coeff. (min)=		3.59 (ii)	7.92 (ii)
Unit Hyd. Tpeak (min)=		4.00	8.00
Unit Hyd. peak (cms)=		.30	.14

				TOTALS
PEAK FLOW	(cms)=	.03	.70	.717 (iii)
TIME TO PEAK	(hrs)=	1.90	2.00	2.00
RUNOFF VOLUME	(mm)=	63.65	41.51	41.95
TOTAL RAINFALL	(mm)=	65.65	65.65	65.65
RUNOFF COEFFICIENT	=	.97	.63	.64

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. 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 (0202)	Area (ha)=	.97	
ID= 1 DT= 2.0 min	Total Imp(%)=	70.00	Dir. Conn.(%)= 2.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	.68	.29
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	2.00	2.00
Length	(m)=	140.00	40.00
Mannings n	=	.013	.250
Max.Eff.Inten.	(mm/hr)=	187.94	339.33
over	(min)	5.00	8.00
Storage Coeff.	(min)=	1.97 (ii)	6.30 (ii)
Unit Hyd. Tpeak	(min)=	4.00	8.00
Unit Hyd. peak	(cms)=	.41	.16

				TOTALS
PEAK FLOW	(cms)=	.01	.22	.228 (iii)
TIME TO PEAK	(hrs)=	1.90	2.00	2.00
RUNOFF VOLUME	(mm)=	63.65	41.51	41.95
TOTAL RAINFALL	(mm)=	65.65	65.65	65.65
RUNOFF COEFFICIENT	=	.97	.63	.64

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0203)	Area (ha)=	2.34	
ID= 1 DT= 2.0 min	Total Imp(%)=	73.00	Dir. Conn.(%)= 2.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.71	.63
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	2.00	2.00
Length	(m)=	280.00	40.00
Mannings n	=	.013	.250
Max.Eff.Inten.	(mm/hr)=	187.94	391.44
over	(min)	5.00	8.00
Storage Coeff.	(min)=	2.99 (ii)	7.08 (ii)
Unit Hyd. Tpeak	(min)=	4.00	8.00
Unit Hyd. peak	(cms)=	.33	.15

				TOTALS
PEAK FLOW	(cms)=	.02	.54	.552 (iii)
TIME TO PEAK	(hrs)=	1.90	2.00	2.00
RUNOFF VOLUME	(mm)=	63.65	43.16	43.57
TOTAL RAINFALL	(mm)=	65.65	65.65	65.65
RUNOFF COEFFICIENT	=	.97	.66	.66

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. 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 (0804)

1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0207):	.71	.030	2.20	12.76
+ ID2= 2 (0205):	2.00	.384	1.93	28.21
ID = 3 (0804):	2.72	.395	1.93	24.15

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0801)

1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0206):	.96	.041	2.23	13.90
+ ID2= 2 (0201):	3.28	.717	2.00	41.95
ID = 3 (0801):	4.24	.741	2.00	35.60

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0802)

1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0202):	.97	.228	2.00	41.95
+ ID2= 2 (0203):	2.34	.552	2.00	43.57
ID = 3 (0802):	3.31	.781	2.00	43.10

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0803)

1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0801):	4.24	.741	2.00	35.60
+ ID2= 2 (0802):	3.31	.781	2.00	43.10
ID = 3 (0803):	7.55	1.521	2.00	38.89

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0805)

1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0204):	2.08	.385	2.00	35.89
+ ID2= 2 (0803):	7.55	1.521	2.00	38.89
ID = 3 (0805):	9.63	1.906	2.00	38.24

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0501)

IN= 2---> OUT= 1

DT= 2.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
.0000	.0000	.0227	.2159
.0017	.0174	.0239	.2411
.0066	.0366	.0508	.2679
.0101	.0570	.1186	.2952
.0127	.0779	.2340	.3228
.0148	.0994	.3972	.3509
.0167	.1213	.5621	.3794
.0184	.1438	.5877	.4084
.0199	.1670	.6122	.4378
.0213	.1910	.7402	.4676

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0805)	9.627	1.906	2.00	38.24
OUTFLOW: ID= 1 (0501)	9.627	.142	3.00	36.89

PEAK FLOW REDUCTION [Qout/Qin](%)= 7.45
TIME SHIFT OF PEAK FLOW (min)= 60.00
MAXIMUM STORAGE USED (ha.m.)= .3008

ADD HYD (0806)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0804):	2.72	.395	1.93	24.15
	+ ID2= 2 (0501):	9.63	.142	3.00	36.89
	ID = 3 (0806):	12.34	.407	1.93	34.09

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION NUMBER: 7 **
****

READ STORM	Filename: I:\2016 Projects\116023 - 185 Mountain Road\Design\185 Mtn Hydrologic Model\Owen Sound Design Storms\OSCHI100.4HR
Ptotal= 71.77 mm	Comments: OWEN SOUND 100 YEAR 4 HOUR DURATION CHIC

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.10	3.08	1.10	7.44	2.10	40.41	3.10	5.16
.20	3.27	1.20	8.67	2.20	25.38	3.20	4.73
.30	3.49	1.30	10.36	2.30	18.12	3.30	4.37
.40	3.73	1.40	12.83	2.40	13.95	3.40	4.05
.50	4.02	1.50	16.70	2.50	11.28	3.50	3.79
.60	4.35	1.60	23.51	2.60	9.44	3.60	3.55
.70	4.75	1.70	37.88	2.70	8.10	3.70	3.35
.80	5.22	1.80	81.47	2.80	7.09	3.80	3.16
.90	5.80	1.90	206.92	2.90	6.31	3.90	3.00
1.00	6.52	2.00	83.92	3.00	5.67	4.00	2.85

CALIB NASHYD (0207) ID= 1 DT= 2.0 min	Area (ha)= .71	Curve Number (CN)= 57.8
	Ia (mm)= 10.20	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= .25	

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.033	3.08	1.033	7.44	2.033	40.41	3.03	5.16
.067	3.08	1.067	7.44	2.067	40.41	3.07	5.16
.100	3.08	1.100	7.44	2.100	40.41	3.10	5.16
.133	3.27	1.133	8.67	2.133	25.38	3.13	4.73
.167	3.27	1.167	8.67	2.167	25.38	3.17	4.73
.200	3.27	1.200	8.67	2.200	25.38	3.20	4.73
.233	3.49	1.233	10.36	2.233	18.12	3.23	4.37
.267	3.49	1.267	10.36	2.267	18.12	3.27	4.37
.300	3.49	1.300	10.36	2.300	18.12	3.30	4.37
.333	3.73	1.333	12.83	2.333	13.95	3.33	4.05
.367	3.73	1.367	12.83	2.367	13.95	3.37	4.05
.400	3.73	1.400	12.83	2.400	13.95	3.40	4.05
.433	4.02	1.433	16.70	2.433	11.28	3.43	3.79
.467	4.02	1.467	16.70	2.467	11.28	3.47	3.79
.500	4.02	1.500	16.70	2.500	11.28	3.50	3.79
.533	4.35	1.533	23.51	2.533	9.44	3.53	3.55
.567	4.35	1.567	23.51	2.567	9.44	3.57	3.55
.600	4.35	1.600	23.51	2.600	9.44	3.60	3.55
.633	4.75	1.633	37.88	2.633	8.10	3.63	3.35
.667	4.75	1.667	37.88	2.667	8.10	3.67	3.35
.700	4.75	1.700	37.88	2.700	8.10	3.70	3.35
.733	5.22	1.733	81.47	2.733	7.09	3.73	3.16
.767	5.22	1.767	81.47	2.767	7.09	3.77	3.16
.800	5.22	1.800	81.47	2.800	7.09	3.80	3.16
.833	5.80	1.833	206.92	2.833	6.31	3.83	3.00
.867	5.80	1.867	206.92	2.867	6.31	3.87	3.00
.900	5.80	1.900	206.92	2.900	6.31	3.90	3.00
.933	6.52	1.933	83.92	2.933	5.67	3.93	2.85
.967	6.52	1.967	83.92	2.967	5.67	3.97	2.85
1.000	6.52	2.000	83.92	3.000	5.67	4.00	2.85

Unit Hyd Qpeak (cms)= .109

PEAK FLOW (cms)= .037 (i)
TIME TO PEAK (hrs)= 2.200
RUNOFF VOLUME (mm)= 15.345
TOTAL RAINFALL (mm)= 71.769
RUNOFF COEFFICIENT = .214

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

CALIB					
NASHYD (0205)	Area (ha)=	2.00	Curve Number (CN)=	77.8	
ID= 1 DT= 2.0 min	Ia (mm)=	4.06	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	.07			

Unit Hyd Qpeak (cms)= 1.093

PEAK FLOW (cms)= .448 (i)
TIME TO PEAK (hrs)= 1.933
RUNOFF VOLUME (mm)= 32.598
TOTAL RAINFALL (mm)= 71.769
RUNOFF COEFFICIENT = .454

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

CALIB					
NASHYD (0204)	Area (ha)=	2.08	Curve Number (CN)=	84.1	
ID= 1 DT= 2.0 min	Ia (mm)=	2.47	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	.13			

Unit Hyd Qpeak (cms)= .610

PEAK FLOW (cms)= .443 (i)
TIME TO PEAK (hrs)= 2.000
RUNOFF VOLUME (mm)= 40.922
TOTAL RAINFALL (mm)= 71.769
RUNOFF COEFFICIENT = .570

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

CALIB					
NASHYD (0206)	Area (ha)=	.96	Curve Number (CN)=	59.0	
ID= 1 DT= 2.0 min	Ia (mm)=	8.69	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	.28			

Unit Hyd Qpeak (cms)= .131

PEAK FLOW (cms)= .050 (i)
TIME TO PEAK (hrs)= 2.233
RUNOFF VOLUME (mm)= 16.607
TOTAL RAINFALL (mm)= 71.769
RUNOFF COEFFICIENT = .231

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

CALIB					
STANDHYD (0201)	Area (ha)=	3.28			
ID= 1 DT= 2.0 min	Total Imp(%)=	70.00	Dir. Conn.(%)=	2.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	2.30	.98	
Dep. Storage	(mm)=	2.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	380.00	40.00	
Mannings n	=	.013	.250	
Max.Eff.Inten.(mm/hr)=		206.92	385.52	
over (min)		5.00	8.00	
Storage Coeff. (min)=		3.46 (ii)	7.57 (ii)	
Unit Hyd. Tpeak (min)=		4.00	8.00	
Unit Hyd. peak (cms)=		.31	.15	
				TOTALS
PEAK FLOW	(cms)=	.03	.81	.828 (iii)
TIME TO PEAK	(hrs)=	1.90	2.00	2.00
RUNOFF VOLUME	(mm)=	69.77	46.91	47.36
TOTAL RAINFALL	(mm)=	71.77	71.77	71.77
RUNOFF COEFFICIENT	=	.97	.65	.66

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. 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 (0202)	Area (ha)= .97
ID= 1 DT= 2.0 min	Total Imp(%)= 70.00 Dir. Conn.(%)= 2.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	.68	.29	
Dep. Storage	(mm)=	2.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	140.00	40.00	
Mannings n	=	.013	.250	
Max.Eff.Inten.(mm/hr)	=	206.92	385.52	
over (min)		5.00	8.00	
Storage Coeff. (min)	=	1.90 (ii)	6.01 (ii)	
Unit Hyd. Tpeak (min)	=	4.00	8.00	
Unit Hyd. peak (cms)	=	.42	.17	
				TOTALS
PEAK FLOW	(cms)=	.01	.26	.263 (iii)
TIME TO PEAK	(hrs)=	1.90	2.00	2.00
RUNOFF VOLUME	(mm)=	69.77	46.91	47.36
TOTAL RAINFALL	(mm)=	71.77	71.77	71.77
RUNOFF COEFFICIENT	=	.97	.65	.66

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (0203)	Area (ha)= 2.34
ID= 1 DT= 2.0 min	Total Imp(%)= 73.00 Dir. Conn.(%)= 2.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.71	.63	
Dep. Storage	(mm)=	2.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	280.00	40.00	
Mannings n	=	.013	.250	
Max.Eff.Inten.(mm/hr)	=	206.92	443.43	
over (min)		5.00	8.00	
Storage Coeff. (min)	=	2.88 (ii)	6.77 (ii)	
Unit Hyd. Tpeak (min)	=	4.00	8.00	
Unit Hyd. peak (cms)	=	.34	.16	
				TOTALS
PEAK FLOW	(cms)=	.02	.62	.635 (iii)
TIME TO PEAK	(hrs)=	1.90	2.00	2.00
RUNOFF VOLUME	(mm)=	69.77	48.66	49.08
TOTAL RAINFALL	(mm)=	71.77	71.77	71.77
RUNOFF COEFFICIENT	=	.97	.68	.68

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. 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 (0804)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0207):	.71	.037	2.20	15.35
+	ID2= 2 (0205):	2.00	.448	1.93	32.60
	ID = 3 (0804):	2.72	.462	1.93	28.07

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0801)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0206):	.96	.050	2.23	16.61
+	ID2= 2 (0201):	3.28	.828	2.00	47.36
	ID = 3 (0801):	4.24	.878	2.00	39.61

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0802)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0208):	.97	.263	2.00	47.36
+	ID2= 2 (0203):	2.34	.635	2.00	49.08
	ID = 3 (0802):	3.31	.898	2.00	48.62

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0803)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0801):	4.24	.878	2.00	39.61
+	ID2= 2 (0802):	3.31	.898	2.00	48.62
	ID = 3 (0803):	7.55	1.776	2.00	43.70

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0805)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0804):	2.72	.462	1.93	28.07
+	ID2= 2 (0803):	7.55	1.776	2.00	43.70
	ID = 3 (0805):	10.27	2.238	2.00	39.44

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0806)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0805):	10.27	2.238	2.00	39.44
+	ID2= 2 (0209):	1.00	.000	0.00	0.00
	ID = 3 (0806):	11.27	2.238	2.00	35.64

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID = 3 (0801):	4.24	.857	2.00	40.40

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0802)

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0202):	.97	.263	2.00	47.36
+ ID2= 2 (0203):	2.34	.635	2.00	49.08
ID = 3 (0802):	3.31	.898	2.00	48.58

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0803)

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0801):	4.24	.857	2.00	40.40
+ ID2= 2 (0802):	3.31	.898	2.00	48.58
ID = 3 (0803):	7.55	1.755	2.00	43.98

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0805)

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0204):	2.08	.443	2.00	40.92
+ ID2= 2 (0803):	7.55	1.755	2.00	43.98
ID = 3 (0805):	9.63	2.198	2.00	43.32

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0501)
IN= 2---> OUT= 1
DT= 2.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
.0000	.0000	.0227	.2159
.0017	.0174	.0239	.2411
.0066	.0366	.0508	.2679
.0101	.0570	.1186	.2952
.0127	.0779	.2340	.3228
.0148	.0994	.3972	.3509
.0167	.1213	.5621	.3794
.0184	.1438	.5877	.4084
.0199	.1670	.6122	.4378
.0213	.1910	.7402	.4676

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0805)	9.627	2.198	2.00	43.32
OUTFLOW: ID= 1 (0501)	9.627	.234	2.73	41.97

PEAK FLOW REDUCTION [Qout/Qin](%)= 10.65
TIME SHIFT OF PEAK FLOW (min)= 44.00
MAXIMUM STORAGE USED (ha.m.)= .3229

ADD HYD (0806)

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0804):	2.72	.462	1.93	28.07
+ ID2= 2 (0501):	9.63	.234	2.73	41.97
ID = 3 (0806):	12.34	.475	1.93	38.91

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION NUMBER: 8 **
****

ADD HYD

| READ STORM | Filename: I:\2016 Projects\116023 - 185 Mountain Road\ Design\185 Mtn Hydrologic Model\ Owen Sound Design Storms\TIMMINS.12
| Ptotal=193.00 mm | Comments: TIMMINS REGIONAL 12 HOUR DURATION STORM

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.20	15.00	3.20	3.00	6.20	43.00	9.20	13.00
.40	15.00	3.40	3.00	6.40	43.00	9.40	13.00
.60	15.00	3.60	3.00	6.60	43.00	9.60	13.00
.80	15.00	3.80	3.00	6.80	43.00	9.80	13.00
1.00	15.00	4.00	3.00	7.00	43.00	10.00	13.00
1.20	20.00	4.20	5.00	7.20	20.00	10.20	13.00
1.40	20.00	4.40	5.00	7.40	20.00	10.40	13.00
1.60	20.00	4.60	5.00	7.60	20.00	10.60	13.00
1.80	20.00	4.80	5.00	7.80	20.00	10.80	13.00
2.00	20.00	5.00	5.00	8.00	20.00	11.00	13.00
2.20	10.00	5.20	20.00	8.20	23.00	11.20	8.00
2.40	10.00	5.40	20.00	8.40	23.00	11.40	8.00
2.60	10.00	5.60	20.00	8.60	23.00	11.60	8.00
2.80	10.00	5.80	20.00	8.80	23.00	11.80	8.00
3.00	10.00	6.00	20.00	9.00	23.00	12.00	8.00

CALIB	
NASHYD (0207)	Area (ha)= .71 Curve Number (CN)= 57.8
ID= 1 DT= 2.0 min	Ia (mm)= 10.20 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= .25

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.033	15.00	3.033	3.00	6.033	43.00	9.03	13.00
.067	15.00	3.067	3.00	6.067	43.00	9.07	13.00
.100	15.00	3.100	3.00	6.100	43.00	9.10	13.00
.133	15.00	3.133	3.00	6.133	43.00	9.13	13.00
.167	15.00	3.167	3.00	6.167	43.00	9.17	13.00
.200	15.00	3.200	3.00	6.200	43.00	9.20	13.00
.233	15.00	3.233	3.00	6.233	43.00	9.23	13.00
.267	15.00	3.267	3.00	6.267	43.00	9.27	13.00
.300	15.00	3.300	3.00	6.300	43.00	9.30	13.00
.333	15.00	3.333	3.00	6.333	43.00	9.33	13.00
.367	15.00	3.367	3.00	6.367	43.00	9.37	13.00
.400	15.00	3.400	3.00	6.400	43.00	9.40	13.00
.433	15.00	3.433	3.00	6.433	43.00	9.43	13.00
.467	15.00	3.467	3.00	6.467	43.00	9.47	13.00
.500	15.00	3.500	3.00	6.500	43.00	9.50	13.00
.533	15.00	3.533	3.00	6.533	43.00	9.53	13.00
.567	15.00	3.567	3.00	6.567	43.00	9.57	13.00
.600	15.00	3.600	3.00	6.600	43.00	9.60	13.00
.633	15.00	3.633	3.00	6.633	43.00	9.63	13.00
.667	15.00	3.667	3.00	6.667	43.00	9.67	13.00
.700	15.00	3.700	3.00	6.700	43.00	9.70	13.00
.733	15.00	3.733	3.00	6.733	43.00	9.73	13.00
.767	15.00	3.767	3.00	6.767	43.00	9.77	13.00
.800	15.00	3.800	3.00	6.800	43.00	9.80	13.00
.833	15.00	3.833	3.00	6.833	43.00	9.83	13.00
.867	15.00	3.867	3.00	6.867	43.00	9.87	13.00
.900	15.00	3.900	3.00	6.900	43.00	9.90	13.00
.933	15.00	3.933	3.00	6.933	43.00	9.93	13.00
.967	15.00	3.967	3.00	6.967	43.00	9.97	13.00
1.000	15.00	4.000	3.00	7.000	43.00	10.00	13.00
1.033	20.00	4.033	5.00	7.033	20.00	10.03	13.00
1.067	20.00	4.067	5.00	7.067	20.00	10.07	13.00
1.100	20.00	4.100	5.00	7.100	20.00	10.10	13.00
1.133	20.00	4.133	5.00	7.133	20.00	10.13	13.00
1.167	20.00	4.167	5.00	7.167	20.00	10.17	13.00
1.200	20.00	4.200	5.00	7.200	20.00	10.20	13.00
1.233	20.00	4.233	5.00	7.233	20.00	10.23	13.00
1.267	20.00	4.267	5.00	7.267	20.00	10.27	13.00
1.300	20.00	4.300	5.00	7.300	20.00	10.30	13.00
1.333	20.00	4.333	5.00	7.333	20.00	10.33	13.00
1.367	20.00	4.367	5.00	7.367	20.00	10.37	13.00
1.400	20.00	4.400	5.00	7.400	20.00	10.40	13.00
1.433	20.00	4.433	5.00	7.433	20.00	10.43	13.00
1.467	20.00	4.467	5.00	7.467	20.00	10.47	13.00
1.500	20.00	4.500	5.00	7.500	20.00	10.50	13.00
1.533	20.00	4.533	5.00	7.533	20.00	10.53	13.00
1.567	20.00	4.567	5.00	7.567	20.00	10.57	13.00
1.600	20.00	4.600	5.00	7.600	20.00	10.60	13.00
1.633	20.00	4.633	5.00	7.633	20.00	10.63	13.00
1.667	20.00	4.667	5.00	7.667	20.00	10.67	13.00
1.700	20.00	4.700	5.00	7.700	20.00	10.70	13.00
1.733	20.00	4.733	5.00	7.733	20.00	10.73	13.00

1.767	20.00	4.767	5.00	7.767	20.00	10.77	13.00
1.800	20.00	4.800	5.00	7.800	20.00	10.80	13.00
1.833	20.00	4.833	5.00	7.833	20.00	10.83	13.00
1.867	20.00	4.867	5.00	7.867	20.00	10.87	13.00
1.900	20.00	4.900	5.00	7.900	20.00	10.90	13.00
1.933	20.00	4.933	5.00	7.933	20.00	10.93	13.00
1.967	20.00	4.967	5.00	7.967	20.00	10.97	13.00
2.000	20.00	5.000	5.00	8.000	20.00	11.00	13.00
2.033	10.00	5.033	20.00	8.033	23.00	11.03	8.00
2.067	10.00	5.067	20.00	8.067	23.00	11.07	8.00
2.100	10.00	5.100	20.00	8.100	23.00	11.10	8.00
2.133	10.00	5.133	20.00	8.133	23.00	11.13	8.00
2.167	10.00	5.167	20.00	8.167	23.00	11.17	8.00
2.200	10.00	5.200	20.00	8.200	23.00	11.20	8.00
2.233	10.00	5.233	20.00	8.233	23.00	11.23	8.00
2.267	10.00	5.267	20.00	8.267	23.00	11.27	8.00
2.300	10.00	5.300	20.00	8.300	23.00	11.30	8.00
2.333	10.00	5.333	20.00	8.333	23.00	11.33	8.00
2.367	10.00	5.367	20.00	8.367	23.00	11.37	8.00
2.400	10.00	5.400	20.00	8.400	23.00	11.40	8.00
2.433	10.00	5.433	20.00	8.433	23.00	11.43	8.00
2.467	10.00	5.467	20.00	8.467	23.00	11.47	8.00
2.500	10.00	5.500	20.00	8.500	23.00	11.50	8.00
2.533	10.00	5.533	20.00	8.533	23.00	11.53	8.00
2.567	10.00	5.567	20.00	8.567	23.00	11.57	8.00
2.600	10.00	5.600	20.00	8.600	23.00	11.60	8.00
2.633	10.00	5.633	20.00	8.633	23.00	11.63	8.00
2.667	10.00	5.667	20.00	8.667	23.00	11.67	8.00
2.700	10.00	5.700	20.00	8.700	23.00	11.70	8.00
2.733	10.00	5.733	20.00	8.733	23.00	11.73	8.00
2.767	10.00	5.767	20.00	8.767	23.00	11.77	8.00
2.800	10.00	5.800	20.00	8.800	23.00	11.80	8.00
2.833	10.00	5.833	20.00	8.833	23.00	11.83	8.00
2.867	10.00	5.867	20.00	8.867	23.00	11.87	8.00
2.900	10.00	5.900	20.00	8.900	23.00	11.90	8.00
2.933	10.00	5.933	20.00	8.933	23.00	11.93	8.00
2.967	10.00	5.967	20.00	8.967	23.00	11.97	8.00
3.000	10.00	6.000	20.00	9.000	23.00	12.00	7.99

Unit Hyd Qpeak (cms)= .109

PEAK FLOW (cms)= .047 (i)
TIME TO PEAK (hrs)= 7.033
RUNOFF VOLUME (mm)= 90.740
TOTAL RAINFALL (mm)= 192.999
RUNOFF COEFFICIENT = .470

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

CALIB					
NASHYD (0205)	Area (ha)=	2.00	Curve Number (CN)=	77.8	
ID= 1 DT= 2.0 min	Ia (mm)=	4.06	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	.07			

Unit Hyd Qpeak (cms)= 1.093

PEAK FLOW (cms)= .200 (i)
TIME TO PEAK (hrs)= 7.000
RUNOFF VOLUME (mm)= 136.119
TOTAL RAINFALL (mm)= 192.999
RUNOFF COEFFICIENT = .705

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

CALIB					
NASHYD (0204)	Area (ha)=	2.08	Curve Number (CN)=	84.1	
ID= 1 DT= 2.0 min	Ia (mm)=	2.47	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	.13			

Unit Hyd Qpeak (cms)= .610

PEAK FLOW (cms)= .224 (i)
TIME TO PEAK (hrs)= 7.000
RUNOFF VOLUME (mm)= 152.131
TOTAL RAINFALL (mm)= 192.999
RUNOFF COEFFICIENT = .788

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

CALIB					
NASHYD (0206)	Area (ha)=	.96	Curve Number (CN)=	59.0	
ID= 1 DT= 2.0 min	Ia (mm)=	8.69	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	.28			

```
     Unit Hyd Qpeak  (cms)=    .131

     PEAK FLOW       (cms)=    .064 (i)
     TIME TO PEAK    (hrs)=   7.033
     RUNOFF VOLUME    (mm)=  94.145
     TOTAL RAINFALL   (mm)= 192.999
     RUNOFF COEFFICIENT   =    .488

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0201) |   Area    (ha)=   3.28
|ID= 1 DT= 2.0 min |   Total Imp(%)=  70.00   Dir. Conn.(%)=   2.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.30          .98
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       2.00         2.00
     Length            (m)=     380.00        40.00
     Mannings n           =       .013         .250

     Max.Eff.Inten.(mm/hr)=      43.00       132.40
               over (min)        6.00        14.00
     Storage Coeff.  (min)=       6.48 (ii)   12.79 (ii)
     Unit Hyd. Tpeak (min)=       6.00        14.00
     Unit Hyd. peak  (cms)=        .18          .09
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .01          .36          .363 (iii)
     TIME TO PEAK    (hrs)=       7.00         7.00          7.00
     RUNOFF VOLUME    (mm)=     191.00       161.92        162.50
     TOTAL RAINFALL   (mm)=     193.00       193.00        193.00
     RUNOFF COEFFICIENT   =        .99          .84           .84

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  69.0    Ia = Dep. 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  (0202) |   Area    (ha)=    .97
|ID= 1 DT= 2.0 min |   Total Imp(%)=  70.00   Dir. Conn.(%)=   2.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .68          .29
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       2.00         2.00
     Length            (m)=     140.00        40.00
     Mannings n           =       .013         .250

     Max.Eff.Inten.(mm/hr)=      43.00       132.40
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       3.56 (ii)    9.87 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=        .30          .11
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .00          .11          .108 (iii)
     TIME TO PEAK    (hrs)=       6.63         7.00          7.00
     RUNOFF VOLUME    (mm)=     191.00       161.92        162.50
     TOTAL RAINFALL   (mm)=     193.00       193.00        193.00
     RUNOFF COEFFICIENT   =        .99          .84           .84

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  69.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0203) |   Area    (ha)=   2.34
|ID= 1 DT= 2.0 min |   Total Imp(%)=  73.00   Dir. Conn.(%)=   2.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.71          .63
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       2.00         2.00
```

Length (m)=	280.00	40.00	
Mannings n =	.013	.250	
Max.Eff.Inten.(mm/hr)=	43.00	148.47	
over (min)	6.00	12.00	
Storage Coeff. (min)=	5.39 (ii)	11.42 (ii)	
Unit Hyd. Tpeak (min)=	6.00	12.00	
Unit Hyd. peak (cms)=	.20	.10	
			TOTALS
PEAK FLOW (cms)=	.01	.26	.263 (iii)
TIME TO PEAK (hrs)=	7.00	7.00	7.00
RUNOFF VOLUME (mm)=	191.00	164.61	165.14
TOTAL RAINFALL (mm)=	193.00	193.00	193.00
RUNOFF COEFFICIENT =	.99	.85	.86

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. 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 (0804)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0207):	.71	.047	7.03	90.74
+ ID2= 2 (0205):	2.00	.200	7.00	136.12
ID = 3 (0804):	2.72	.246	7.00	124.20

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0801)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0206):	.96	.064	7.03	94.14
+ ID2= 2 (0201):	3.28	.363	7.00	162.50
ID = 3 (0801):	4.24	.426	7.00	147.03

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0802)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0202):	.97	.108	7.00	162.50
+ ID2= 2 (0203):	2.34	.263	7.00	165.14
ID = 3 (0802):	3.31	.371	7.00	164.37

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0803)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0801):	4.24	.426	7.00	147.03
+ ID2= 2 (0802):	3.31	.371	7.00	164.37
ID = 3 (0803):	7.55	.798	7.00	154.63

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0805)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0204):	2.08	.224	7.00	152.13
+ ID2= 2 (0803):	7.55	.798	7.00	154.63
ID = 3 (0805):	9.63	1.022	7.00	154.09

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0501) |
| IN= 2---> OUT= 1 |
| DT=  2.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          .0000      .0000    |    .0227       .2159
                          .0017      .0174    |    .0239       .2411
                          .0066      .0366    |    .0508       .2679
                          .0101      .0570    |    .1186       .2952
                          .0127      .0779    |    .2340       .3228
                          .0148      .0994    |    .3972       .3509
                          .0167      .1213    |    .5621       .3794
                          .0184      .1438    |    .5877       .4084
                          .0199      .1670    |    .6122       .4378
                          .0213      .1910    |    .7402       .4676

                                 AREA      QPEAK       TPEAK       R.V.
                                 (ha)      (cms)       (hrs)       (mm)
     INFLOW : ID= 2 (0805)      9.627      1.022        7.00      154.09
     OUTFLOW: ID= 1 (0501)      9.627       .741        7.23      152.25

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 72.56
                  TIME SHIFT OF PEAK FLOW         (min)= 14.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=   .4679

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

--------------------
| ADD HYD   (0806) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0804):     2.72    .246     7.00   124.20
        + ID2= 2 (0501):     9.63    .741     7.23   152.25
          ================================================
          ID = 3 (0806):    12.34    .917     7.03   146.08

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

 FINISH
================================================================================================================================
```

```
       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
```

Developed and Distributed by Clarifica Inc.
Copyright 1996, 2007 Clarifica Inc.
All rights reserved.

***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 2.3.2\voin.dat
Output filename: I:\2016PR~1\116023~1\Design\185MTN~1\185MOU~2\Post-Development SCS.out
Summary filename: I:\2016PR~1\116023~1\Design\185MTN~1\185MOU~2\Post-Development SCS.sum

DATE: 7/24/2018 TIME: 3:32:37 PM

USER:

COMMENTS: _____

****
** SIMULATION NUMBER: 1 **
****

MASS STORM	Filename: I:\2016 Projects\116023 - 185 Mountain Road\ Design\185 Mtn Hydrologic Model\ Owen Sound Design Storms\SCS24H.MST
Ptotal= 44.60 mm	Comments: SCS Type II 24 HR MASS CURVE

Duration of storm = 23.75 hrs
Mass curve time step = 15.00 min

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.25	.54	6.25	.89	12.25	6.42	18.25	.71
.50	.36	6.50	.71	12.50	3.39	18.50	.89
.75	.54	6.75	.89	12.75	3.21	18.75	.71
1.00	.54	7.00	.89	13.00	2.50	19.00	.89
1.25	.54	7.25	1.07	13.25	2.32	19.25	.71
1.50	.36	7.50	.89	13.50	1.96	19.50	.89
1.75	.54	7.75	1.07	13.75	1.78	19.75	.71
2.00	.54	8.00	1.07	14.00	1.43	20.00	.54
2.25	.71	8.25	1.25	14.25	1.25	20.25	.54
2.50	.54	8.50	1.25	14.50	1.43	20.50	.54
2.75	.54	8.75	1.25	14.75	1.25	20.75	.54
3.00	.54	9.00	1.43	15.00	1.43	21.00	.54
3.25	.71	9.25	1.43	15.25	1.25	21.25	.54
3.50	.54	9.50	1.61	15.50	1.43	21.50	.54
3.75	.54	9.75	1.61	15.75	1.25	21.75	.54
4.00	.71	10.00	1.96	16.00	.89	22.00	.54
4.25	.71	10.25	2.14	16.25	.71	22.25	.54
4.50	.71	10.50	2.68	16.50	.89	22.50	.54
4.75	.71	10.75	2.85	16.75	.71	22.75	.54
5.00	.71	11.00	4.28	17.00	.89	23.00	.54
5.25	.71	11.25	4.28	17.25	.71	23.25	.54
5.50	.71	11.50	13.20	17.50	.89	23.50	.54
5.75	.71	11.75	54.59	17.75	.71	23.75	.54
6.00	.71	12.00	6.42	18.00	.89		

CALIB	
NASHYD (0204)	Area (ha)= 2.08 Curve Number (CN)= 84.1
ID= 1 DT= 2.0 min	Ia (mm)= 2.47 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= .13

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr

.033	.54	6.000	.71	11.967	6.42	17.93	.89
.067	.54	6.033	.89	12.000	6.42	17.97	.89
.100	.54	6.067	.89	12.033	6.42	18.00	.89
.133	.54	6.100	.89	12.067	6.42	18.03	.71
.167	.54	6.133	.89	12.100	6.42	18.07	.71
.200	.54	6.167	.89	12.133	6.42	18.10	.71
.233	.54	6.200	.89	12.167	6.42	18.13	.71
.267	.45	6.233	.89	12.200	6.42	18.17	.71
.300	.36	6.267	.80	12.233	6.42	18.20	.71
.333	.36	6.300	.71	12.267	4.90	18.23	.71
.367	.36	6.333	.71	12.300	3.39	18.27	.80
.400	.36	6.367	.71	12.333	3.39	18.30	.89
.433	.36	6.400	.71	12.367	3.39	18.33	.89
.467	.36	6.433	.71	12.400	3.39	18.37	.89
.500	.36	6.467	.71	12.433	3.39	18.40	.89
.533	.54	6.500	.71	12.467	3.39	18.43	.89
.567	.54	6.533	.89	12.500	3.39	18.47	.89
.600	.54	6.567	.89	12.533	3.21	18.50	.89
.633	.54	6.600	.89	12.567	3.21	18.53	.71
.667	.54	6.633	.89	12.600	3.21	18.57	.71
.700	.54	6.667	.89	12.633	3.21	18.60	.71
.733	.54	6.700	.89	12.667	3.21	18.63	.71
.767	.54	6.733	.89	12.700	3.21	18.67	.71
.800	.54	6.767	.89	12.733	3.21	18.70	.71
.833	.54	6.800	.89	12.767	2.85	18.73	.71
.867	.54	6.833	.89	12.800	2.50	18.77	.80
.900	.54	6.867	.89	12.833	2.50	18.80	.89
.933	.54	6.900	.89	12.867	2.50	18.83	.89
.967	.54	6.933	.89	12.900	2.50	18.87	.89
1.000	.54	6.967	.89	12.933	2.50	18.90	.89
1.033	.54	7.000	.89	12.967	2.50	18.93	.89
1.067	.54	7.033	1.07	13.000	2.50	18.97	.89
1.100	.54	7.067	1.07	13.033	2.32	19.00	.89
1.133	.54	7.100	1.07	13.067	2.32	19.03	.71
1.167	.54	7.133	1.07	13.100	2.32	19.07	.71
1.200	.54	7.167	1.07	13.133	2.32	19.10	.71
1.233	.54	7.200	1.07	13.167	2.32	19.13	.71
1.267	.45	7.233	1.07	13.200	2.32	19.17	.71
1.300	.36	7.267	.98	13.233	2.32	19.20	.71
1.333	.36	7.300	.89	13.267	2.14	19.23	.71
1.367	.36	7.333	.89	13.300	1.96	19.27	.80
1.400	.36	7.367	.89	13.333	1.96	19.30	.89
1.433	.36	7.400	.89	13.367	1.96	19.33	.89
1.467	.36	7.433	.89	13.400	1.96	19.37	.89
1.500	.36	7.467	.89	13.433	1.96	19.40	.89
1.533	.54	7.500	.89	13.467	1.96	19.43	.89
1.567	.54	7.533	1.07	13.500	1.96	19.47	.89
1.600	.54	7.567	1.07	13.533	1.78	19.50	.89
1.633	.54	7.600	1.07	13.567	1.78	19.53	.71
1.667	.54	7.633	1.07	13.600	1.78	19.57	.71
1.700	.54	7.667	1.07	13.633	1.78	19.60	.71
1.733	.54	7.700	1.07	13.667	1.78	19.63	.71
1.767	.54	7.733	1.07	13.700	1.78	19.67	.71
1.800	.54	7.767	1.07	13.733	1.78	19.70	.71
1.833	.54	7.800	1.07	13.767	1.60	19.73	.71
1.867	.54	7.833	1.07	13.800	1.43	19.77	.62
1.900	.54	7.867	1.07	13.833	1.43	19.80	.54
1.933	.54	7.900	1.07	13.867	1.43	19.83	.54
1.967	.54	7.933	1.07	13.900	1.43	19.87	.54
2.000	.54	7.967	1.07	13.933	1.43	19.90	.54
2.033	.71	8.000	1.07	13.967	1.43	19.93	.54
2.067	.71	8.033	1.25	14.000	1.43	19.97	.54
2.100	.71	8.067	1.25	14.033	1.25	20.00	.54
2.133	.71	8.100	1.25	14.067	1.25	20.03	.54
2.167	.71	8.133	1.25	14.100	1.25	20.07	.54
2.200	.71	8.167	1.25	14.133	1.25	20.10	.54
2.233	.71	8.200	1.25	14.167	1.25	20.13	.54
2.267	.62	8.233	1.25	14.200	1.25	20.17	.54
2.300	.54	8.267	1.25	14.233	1.25	20.20	.54
2.333	.54	8.300	1.25	14.267	1.34	20.23	.54
2.367	.54	8.333	1.25	14.300	1.43	20.27	.54
2.400	.54	8.367	1.25	14.333	1.43	20.30	.54
2.433	.54	8.400	1.25	14.367	1.43	20.33	.54
2.467	.54	8.433	1.25	14.400	1.43	20.37	.54
2.500	.54	8.467	1.25	14.433	1.43	20.40	.54
2.533	.54	8.500	1.25	14.467	1.43	20.43	.54
2.567	.54	8.533	1.25	14.500	1.43	20.47	.54
2.600	.54	8.567	1.25	14.533	1.25	20.50	.54
2.633	.54	8.600	1.25	14.567	1.25	20.53	.54
2.667	.54	8.633	1.25	14.600	1.25	20.57	.54
2.700	.54	8.667	1.25	14.633	1.25	20.60	.54
2.733	.54	8.700	1.25	14.667	1.25	20.63	.54
2.767	.54	8.733	1.25	14.700	1.25	20.67	.54
2.800	.54	8.767	1.34	14.733	1.25	20.70	.54
2.833	.54	8.800	1.43	14.767	1.34	20.73	.54
2.867	.54	8.833	1.43	14.800	1.43	20.77	.54
2.900	.54	8.867	1.43	14.833	1.43	20.80	.54
2.933	.54	8.900	1.43	14.867	1.43	20.83	.54
2.967	.54	8.933	1.43	14.900	1.43	20.87	.54

3.000	.54	8.967	1.43	14.933	1.43	20.90	.54
3.033	.71	9.000	1.43	14.967	1.43	20.93	.54
3.067	.71	9.033	1.43	15.000	1.43	20.97	.54
3.100	.71	9.067	1.43	15.033	1.25	21.00	.54
3.133	.71	9.100	1.43	15.067	1.25	21.03	.54
3.167	.71	9.133	1.43	15.100	1.25	21.07	.54
3.200	.71	9.167	1.43	15.133	1.25	21.10	.54
3.233	.71	9.200	1.43	15.167	1.25	21.13	.54
3.267	.62	9.233	1.43	15.200	1.25	21.17	.54
3.300	.54	9.267	1.52	15.233	1.25	21.20	.54
3.333	.54	9.300	1.61	15.267	1.34	21.23	.54
3.367	.54	9.333	1.61	15.300	1.43	21.27	.54
3.400	.54	9.367	1.61	15.333	1.43	21.30	.54
3.433	.54	9.400	1.61	15.367	1.43	21.33	.54
3.467	.54	9.433	1.61	15.400	1.43	21.37	.54
3.500	.54	9.467	1.61	15.433	1.43	21.40	.54
3.533	.54	9.500	1.61	15.467	1.43	21.43	.54
3.567	.54	9.533	1.61	15.500	1.43	21.47	.54
3.600	.54	9.567	1.61	15.533	1.25	21.50	.54
3.633	.54	9.600	1.61	15.567	1.25	21.53	.54
3.667	.54	9.633	1.61	15.600	1.25	21.57	.54
3.700	.54	9.667	1.61	15.633	1.25	21.60	.54
3.733	.54	9.700	1.61	15.667	1.25	21.63	.54
3.767	.62	9.733	1.61	15.700	1.25	21.67	.54
3.800	.71	9.767	1.78	15.733	1.25	21.70	.54
3.833	.71	9.800	1.96	15.767	1.07	21.73	.54
3.867	.71	9.833	1.96	15.800	.89	21.77	.54
3.900	.71	9.867	1.96	15.833	.89	21.80	.54
3.933	.71	9.900	1.96	15.867	.89	21.83	.54
3.967	.71	9.933	1.96	15.900	.89	21.87	.54
4.000	.71	9.967	1.96	15.933	.89	21.90	.54
4.033	.71	10.000	1.96	15.967	.89	21.93	.54
4.067	.71	10.033	2.14	16.000	.89	21.97	.54
4.100	.71	10.067	2.14	16.033	.71	22.00	.54
4.133	.71	10.100	2.14	16.067	.71	22.03	.54
4.167	.71	10.133	2.14	16.100	.71	22.07	.54
4.200	.71	10.167	2.14	16.133	.71	22.10	.54
4.233	.71	10.200	2.14	16.167	.71	22.13	.54
4.267	.71	10.233	2.14	16.200	.71	22.17	.54
4.300	.71	10.267	2.41	16.233	.71	22.20	.54
4.333	.71	10.300	2.68	16.267	.80	22.23	.54
4.367	.71	10.333	2.68	16.300	.89	22.27	.54
4.400	.71	10.367	2.68	16.333	.89	22.30	.54
4.433	.71	10.400	2.68	16.367	.89	22.33	.54
4.467	.71	10.433	2.68	16.400	.89	22.37	.54
4.500	.71	10.467	2.68	16.433	.89	22.40	.54
4.533	.71	10.500	2.68	16.467	.89	22.43	.54
4.567	.71	10.533	2.85	16.500	.89	22.47	.54
4.600	.71	10.567	2.85	16.533	.71	22.50	.54
4.633	.71	10.600	2.85	16.567	.71	22.53	.54
4.667	.71	10.633	2.85	16.600	.71	22.57	.54
4.700	.71	10.667	2.85	16.633	.71	22.60	.54
4.733	.71	10.700	2.85	16.667	.71	22.63	.54
4.767	.71	10.733	2.85	16.700	.71	22.67	.54
4.800	.71	10.767	3.57	16.733	.71	22.70	.54
4.833	.71	10.800	4.28	16.767	.80	22.73	.54
4.867	.71	10.833	4.28	16.800	.89	22.77	.54
4.900	.71	10.867	4.28	16.833	.89	22.80	.54
4.933	.71	10.900	4.28	16.867	.89	22.83	.54
4.967	.71	10.933	4.28	16.900	.89	22.87	.54
5.000	.71	10.967	4.28	16.933	.89	22.90	.54
5.033	.71	11.000	4.28	16.967	.89	22.93	.54
5.067	.71	11.033	4.28	17.000	.89	22.97	.54
5.100	.71	11.067	4.28	17.033	.71	23.00	.54
5.133	.71	11.100	4.28	17.067	.71	23.03	.54
5.167	.71	11.133	4.28	17.100	.71	23.07	.54
5.200	.71	11.167	4.28	17.133	.71	23.10	.54
5.233	.71	11.200	4.28	17.167	.71	23.13	.54
5.267	.71	11.233	4.28	17.200	.71	23.17	.54
5.300	.71	11.267	8.75	17.233	.71	23.20	.54
5.333	.71	11.300	13.20	17.267	.80	23.23	.54
5.367	.71	11.333	13.20	17.300	.89	23.27	.54
5.400	.71	11.367	13.20	17.333	.89	23.30	.54
5.433	.71	11.400	13.20	17.367	.89	23.33	.54
5.467	.71	11.433	13.20	17.400	.89	23.37	.54
5.500	.71	11.467	13.20	17.433	.89	23.40	.54
5.533	.71	11.500	13.25	17.467	.89	23.43	.54
5.567	.71	11.533	54.59	17.500	.89	23.47	.54
5.600	.71	11.567	54.59	17.533	.71	23.50	.54
5.633	.71	11.600	54.59	17.567	.71	23.53	.54
5.667	.71	11.633	54.59	17.600	.71	23.57	.54
5.700	.71	11.667	54.59	17.633	.71	23.60	.54
5.733	.71	11.700	54.59	17.667	.71	23.63	.54
5.767	.71	11.733	54.59	17.700	.71	23.67	.54
5.800	.71	11.767	30.44	17.733	.71	23.70	.54
5.833	.71	11.800	6.42	17.767	.80	23.73	.54
5.867	.71	11.833	6.42	17.800	.89	23.77	.27
5.900	.71	11.867	6.42	17.833	.89		
5.933	.71	11.900	6.42	17.867	.89		

```
             5.967     .71 |11.933    6.42 |17.900     .89 |

     Unit Hyd Qpeak  (cms)=    .610

     PEAK FLOW       (cms)=    .131 (i)
     TIME TO PEAK    (hrs)=  11.800
     RUNOFF VOLUME    (mm)=  19.587
     TOTAL RAINFALL   (mm)=  44.466
     RUNOFF COEFFICIENT   =    .440

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| STANDHYD  (0203) |   Area    (ha)=   2.34
|ID= 1 DT= 2.0 min |   Total Imp(%)=  73.00   Dir. Conn.(%)=   2.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.71          .63
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       2.00         2.00
     Length            (m)=     280.00        40.00
     Mannings n           =       .013         .250

     Max.Eff.Inten.(mm/hr)=      54.59       130.60
               over (min)        5.00        12.00
     Storage Coeff.  (min)=       4.90 (ii)   11.25 (ii)
     Unit Hyd. Tpeak (min)=       4.00        12.00
     Unit Hyd. peak  (cms)=        .24          .10
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .01          .15          .155 (iii)
     TIME TO PEAK    (hrs)=      11.73        11.83         11.83
     RUNOFF VOLUME    (mm)=      42.47        24.91         25.26
     TOTAL RAINFALL   (mm)=      44.47        44.47         44.47
     RUNOFF COEFFICIENT   =        .96          .56           .57

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  69.0    Ia = Dep. 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  (0202) |   Area    (ha)=    .97
|ID= 1 DT= 2.0 min |   Total Imp(%)=  70.00   Dir. Conn.(%)=   2.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .68          .29
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       2.00         2.00
     Length            (m)=     140.00        40.00
     Mannings n           =       .013         .250

     Max.Eff.Inten.(mm/hr)=      54.59       111.82
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       3.23 (ii)    9.98 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=        .32          .11
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .00          .06          .066 (iii)
     TIME TO PEAK    (hrs)=      11.73        11.80         11.80
     RUNOFF VOLUME    (mm)=      42.47        23.67         24.04
     TOTAL RAINFALL   (mm)=      44.47        44.47         44.47
     RUNOFF COEFFICIENT   =        .96          .53           .54

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  69.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| STANDHYD  (0201) |   Area    (ha)=   3.28
|ID= 1 DT= 2.0 min |   Total Imp(%)=  70.00   Dir. Conn.(%)=   2.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.30          .98
     Dep. Storage     (mm)=       2.00         5.00
```

```
     Average Slope     (%)=       2.00         2.00
     Length            (m)=     380.00        40.00
     Mannings n           =       .013         .250

     Max.Eff.Inten.(mm/hr)=      54.59       111.82
               over (min)        6.00        14.00
     Storage Coeff.  (min)=       5.89 (ii)   12.64 (ii)
     Unit Hyd. Tpeak (min)=       6.00        14.00
     Unit Hyd. peak  (cms)=        .19          .09
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .01          .19          .192 (iii)
     TIME TO PEAK    (hrs)=      11.73        11.87         11.87
     RUNOFF VOLUME    (mm)=      42.47        23.67         24.05
     TOTAL RAINFALL   (mm)=      44.47        44.47         44.47
     RUNOFF COEFFICIENT   =        .96          .53           .54

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  69.0    Ia = Dep. 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            |
| NASHYD    (0206) |   Area    (ha)=    .96   Curve Number   (CN)= 59.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   8.69   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .28

     Unit Hyd Qpeak  (cms)=    .131

     PEAK FLOW       (cms)=    .010 (i)
     TIME TO PEAK    (hrs)=  11.933
     RUNOFF VOLUME    (mm)=   6.028
     TOTAL RAINFALL   (mm)=  44.466
     RUNOFF COEFFICIENT   =    .136

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0207) |   Area    (ha)=    .71   Curve Number   (CN)= 57.8
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.20   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .25

     Unit Hyd Qpeak  (cms)=    .109

     PEAK FLOW       (cms)=    .007 (i)
     TIME TO PEAK    (hrs)=  11.933
     RUNOFF VOLUME    (mm)=   5.343
     TOTAL RAINFALL   (mm)=  44.466
     RUNOFF COEFFICIENT   =    .120

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0205) |   Area    (ha)=   2.00   Curve Number   (CN)= 77.8
|ID= 1 DT= 2.0 min |   Ia      (mm)=   4.06   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .07

     Unit Hyd Qpeak  (cms)=   1.093

     PEAK FLOW       (cms)=    .113 (i)
     TIME TO PEAK    (hrs)=  11.733
     RUNOFF VOLUME    (mm)=  14.417
     TOTAL RAINFALL   (mm)=  44.466
     RUNOFF COEFFICIENT   =    .324

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

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

--------------------
| ADD HYD   (0802) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0203):     2.34    .155    11.83    25.26
        + ID2= 2 (0202):      .97    .066    11.80    24.04
          ================================================
          ID = 3 (0802):     3.31    .220    11.83    24.90

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

ADD HYD (0801)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0201):	3.28	.192	11.87	24.05
	+ ID2= 2 (0206):	.96	.010	11.93	6.03
	ID = 3 (0801):	4.24	.202	11.87	19.97

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0804)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0207):	.71	.007	11.93	5.34
	+ ID2= 2 (0205):	2.00	.113	11.73	14.42
	ID = 3 (0804):	2.72	.117	11.73	12.03

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0803)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0802):	3.31	.220	11.83	24.90
	+ ID2= 2 (0801):	4.24	.202	11.87	19.97
	ID = 3 (0803):	7.55	.420	11.83	22.13

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0805)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0204):	2.08	.131	11.80	19.59
	+ ID2= 2 (0803):	7.55	.420	11.83	22.13
	ID = 3 (0805):	9.63	.542	11.83	21.58

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0501)				
IN= 2---> OUT= 1				
DT= 2.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	.0000	.0000	.0227	.2159
	.0017	.0174	.0239	.2411
	.0066	.0366	.0508	.2679
	.0101	.0570	.1186	.2952
	.0127	.0779	.2340	.3228
	.0148	.0994	.3972	.3509
	.0167	.1213	.5621	.3794
	.0184	.1438	.5877	.4084
	.0199	.1670	.6122	.4378
	.0213	.1910	.7402	.4676

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0805)	9.627	.542	11.83	21.58
OUTFLOW: ID= 1 (0501)	9.627	.018	16.10	20.14

PEAK FLOW REDUCTION [Qout/Qin](%)= 3.37
TIME SHIFT OF PEAK FLOW (min)=256.00
MAXIMUM STORAGE USED (ha.m.)= .1422

ADD HYD (0806)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0501):	9.63	.018	16.10	20.14
	+ ID2= 2 (0804):	2.72	.117	11.73	12.03
	ID = 3 (0806):	12.34	.125	11.73	18.36

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

MASS STORM	Filename: I:\2016 Projects\116023 - 185 Mountain Road\Design\185 Mtn Hydrologic Model\Owen Sound Design Storms\SCS24H.MST
Ptotal= 56.50 mm	Comments: SCS Type II 24 HR MASS CURVE

Duration of storm = 23.75 hrs
Mass curve time step = 15.00 min

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.25	.68	6.25	1.13	12.25	8.14	18.25	.90
.50	.45	6.50	.90	12.50	4.29	18.50	1.13
.75	.68	6.75	1.13	12.75	4.07	18.75	.90
1.00	.68	7.00	1.13	13.00	3.16	19.00	1.13
1.25	.68	7.25	1.36	13.25	2.94	19.25	.90
1.50	.45	7.50	1.13	13.50	2.49	19.50	1.13
1.75	.68	7.75	1.36	13.75	2.26	19.75	.90
2.00	.68	8.00	1.36	14.00	1.81	20.00	.68
2.25	.90	8.25	1.58	14.25	1.58	20.25	.68
2.50	.68	8.50	1.58	14.50	1.81	20.50	.68
2.75	.68	8.75	1.58	14.75	1.58	20.75	.68
3.00	.68	9.00	1.81	15.00	1.81	21.00	.68
3.25	.90	9.25	1.81	15.25	1.58	21.25	.68
3.50	.68	9.50	2.03	15.50	1.81	21.50	.68
3.75	.68	9.75	2.03	15.75	1.58	21.75	.68
4.00	.90	10.00	2.49	16.00	1.13	22.00	.68
4.25	.90	10.25	2.71	16.25	.90	22.25	.68
4.50	.90	10.50	3.39	16.50	1.13	22.50	.68
4.75	.90	10.75	3.62	16.75	.90	22.75	.68
5.00	.90	11.00	5.42	17.00	1.13	23.00	.68
5.25	.90	11.25	5.42	17.25	.90	23.25	.68
5.50	.90	11.50	16.72	17.50	1.13	23.50	.68
5.75	.90	11.75	69.16	17.75	.90	23.75	.68
6.00	.90	12.00	8.14	18.00	1.13		

CALIB	
NASHYD (0204)	Area (ha)= 2.08 Curve Number (CN)= 84.1
ID= 1 DT= 2.0 min	Ia (mm)= 2.47 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= .13

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.033	.68	6.000	.90	11.967	8.14	17.93	1.13
.067	.68	6.033	1.13	12.000	8.14	17.97	1.13
.100	.68	6.067	1.13	12.033	8.14	18.00	1.13
.133	.68	6.100	1.13	12.067	8.14	18.03	.90
.167	.68	6.133	1.13	12.100	8.14	18.07	.90
.200	.68	6.167	1.13	12.133	8.14	18.10	.90
.233	.68	6.200	1.13	12.167	8.14	18.13	.90
.267	.56	6.233	1.13	12.200	8.14	18.17	.90
.300	.45	6.267	1.02	12.233	8.14	18.20	.90
.333	.45	6.300	.90	12.267	6.21	18.23	.90
.367	.45	6.333	.90	12.300	4.29	18.27	1.02
.400	.45	6.367	.90	12.333	4.29	18.30	1.13
.433	.45	6.400	.90	12.367	4.29	18.33	1.13
.467	.45	6.433	.90	12.400	4.29	18.37	1.13
.500	.45	6.467	.90	12.433	4.29	18.40	1.13
.533	.68	6.500	.90	12.467	4.29	18.43	1.13
.567	.68	6.533	1.13	12.500	4.29	18.47	1.13
.600	.68	6.567	1.13	12.533	4.07	18.50	1.13
.633	.68	6.600	1.13	12.567	4.07	18.53	.90
.667	.68	6.633	1.13	12.600	4.07	18.57	.90
.700	.68	6.667	1.13	12.633	4.07	18.60	.90
.733	.68	6.700	1.13	12.667	4.07	18.63	.90
.767	.68	6.733	1.13	12.700	4.07	18.67	.90
.800	.68	6.767	1.13	12.733	4.07	18.70	.90
.833	.68	6.800	1.13	12.767	3.61	18.73	.90
.867	.68	6.833	1.13	12.800	3.16	18.77	1.02
.900	.68	6.867	1.13	12.833	3.16	18.80	1.13
.933	.68	6.900	1.13	12.867	3.16	18.83	1.13
.967	.68	6.933	1.13	12.900	3.16	18.87	1.13
1.000	.68	6.967	1.13	12.933	3.16	18.90	1.13
1.033	.68	7.000	1.13	12.967	3.16	18.93	1.13
1.067	.68	7.033	1.36	13.000	3.16	18.97	1.13
1.100	.68	7.067	1.36	13.033	2.94	19.00	1.13

1.133	.68	7.100	1.36	13.067	2.94	19.03	.90
1.167	.68	7.133	1.36	13.100	2.94	19.07	.90
1.200	.68	7.167	1.36	13.133	2.94	19.10	.90
1.233	.68	7.200	1.36	13.167	2.94	19.13	.90
1.267	.56	7.233	1.36	13.200	2.94	19.17	.90
1.300	.45	7.267	1.24	13.233	2.94	19.20	.90
1.333	.45	7.300	1.13	13.267	2.71	19.23	.90
1.367	.45	7.333	1.13	13.300	2.49	19.27	1.02
1.400	.45	7.367	1.13	13.333	2.49	19.30	1.13
1.433	.45	7.400	1.13	13.367	2.49	19.33	1.13
1.467	.45	7.433	1.13	13.400	2.49	19.37	1.13
1.500	.45	7.467	1.13	13.433	2.49	19.40	1.13
1.533	.68	7.500	1.13	13.467	2.49	19.43	1.13
1.567	.68	7.533	1.36	13.500	2.49	19.47	1.13
1.600	.68	7.567	1.36	13.533	2.26	19.50	1.13
1.633	.68	7.600	1.36	13.567	2.26	19.53	.90
1.667	.68	7.633	1.36	13.600	2.26	19.57	.90
1.700	.68	7.667	1.36	13.633	2.26	19.60	.90
1.733	.68	7.700	1.36	13.667	2.26	19.63	.90
1.767	.68	7.733	1.36	13.700	2.26	19.67	.90
1.800	.68	7.767	1.36	13.733	2.26	19.70	.90
1.833	.68	7.800	1.36	13.767	2.03	19.73	.90
1.867	.68	7.833	1.36	13.800	1.81	19.77	.79
1.900	.68	7.867	1.36	13.833	1.81	19.80	.68
1.933	.68	7.900	1.36	13.867	1.81	19.83	.68
1.967	.68	7.933	1.36	13.900	1.81	19.87	.68
2.000	.68	7.967	1.36	13.933	1.81	19.90	.68
2.033	.90	8.000	1.36	13.967	1.81	19.93	.68
2.067	.90	8.033	1.58	14.000	1.81	19.97	.68
2.100	.90	8.067	1.58	14.033	1.58	20.00	.68
2.133	.90	8.100	1.58	14.067	1.58	20.03	.68
2.167	.90	8.133	1.58	14.100	1.58	20.07	.68
2.200	.90	8.167	1.58	14.133	1.58	20.10	.68
2.233	.90	8.200	1.58	14.167	1.58	20.13	.68
2.267	.79	8.233	1.58	14.200	1.58	20.17	.68
2.300	.68	8.267	1.58	14.233	1.58	20.20	.68
2.333	.68	8.300	1.58	14.267	1.70	20.23	.68
2.367	.68	8.333	1.58	14.300	1.81	20.27	.68
2.400	.68	8.367	1.58	14.333	1.81	20.30	.68
2.433	.68	8.400	1.58	14.367	1.81	20.33	.68
2.467	.68	8.433	1.58	14.400	1.81	20.37	.68
2.500	.68	8.467	1.58	14.433	1.81	20.40	.68
2.533	.68	8.500	1.58	14.467	1.81	20.43	.68
2.567	.68	8.533	1.58	14.500	1.81	20.47	.68
2.600	.68	8.567	1.58	14.533	1.58	20.50	.68
2.633	.68	8.600	1.58	14.567	1.58	20.53	.68
2.667	.68	8.633	1.58	14.600	1.58	20.57	.68
2.700	.68	8.667	1.58	14.633	1.58	20.60	.68
2.733	.68	8.700	1.58	14.667	1.58	20.63	.68
2.767	.68	8.733	1.58	14.700	1.58	20.67	.68
2.800	.68	8.767	1.70	14.733	1.58	20.70	.68
2.833	.68	8.800	1.81	14.767	1.70	20.73	.68
2.867	.68	8.833	1.81	14.800	1.81	20.77	.68
2.900	.68	8.867	1.81	14.833	1.81	20.80	.68
2.933	.68	8.900	1.81	14.867	1.81	20.83	.68
2.967	.68	8.933	1.81	14.900	1.81	20.87	.68
3.000	.68	8.967	1.81	14.933	1.81	20.90	.68
3.033	.90	9.000	1.81	14.967	1.81	20.93	.68
3.067	.90	9.033	1.81	15.000	1.81	20.97	.68
3.100	.90	9.067	1.81	15.033	1.58	21.00	.68
3.133	.90	9.100	1.81	15.067	1.58	21.03	.68
3.167	.90	9.133	1.81	15.100	1.58	21.07	.68
3.200	.90	9.167	1.81	15.133	1.58	21.10	.68
3.233	.90	9.200	1.81	15.167	1.58	21.13	.68
3.267	.79	9.233	1.81	15.200	1.58	21.17	.68
3.300	.68	9.267	1.92	15.233	1.58	21.20	.68
3.333	.68	9.300	2.03	15.267	1.70	21.23	.68
3.367	.68	9.333	2.03	15.300	1.81	21.27	.68
3.400	.68	9.367	2.03	15.333	1.81	21.30	.68
3.433	.68	9.400	2.03	15.367	1.81	21.33	.68
3.467	.68	9.433	2.03	15.400	1.81	21.37	.68
3.500	.68	9.467	2.03	15.433	1.81	21.40	.68
3.533	.68	9.500	2.03	15.467	1.81	21.43	.68
3.567	.68	9.533	2.03	15.500	1.81	21.47	.68
3.600	.68	9.567	2.03	15.533	1.58	21.50	.68
3.633	.68	9.600	2.03	15.567	1.58	21.53	.68
3.667	.68	9.633	2.03	15.600	1.58	21.57	.68
3.700	.68	9.667	2.03	15.633	1.58	21.60	.68
3.733	.68	9.700	2.03	15.667	1.58	21.63	.68
3.767	.79	9.733	2.03	15.700	1.58	21.67	.68
3.800	.90	9.767	2.26	15.733	1.58	21.70	.68
3.833	.90	9.800	2.49	15.767	1.35	21.73	.68
3.867	.90	9.833	2.49	15.800	1.13	21.77	.68
3.900	.90	9.867	2.49	15.833	1.13	21.80	.68
3.933	.90	9.900	2.49	15.867	1.13	21.83	.68
3.967	.90	9.933	2.49	15.900	1.13	21.87	.68
4.000	.90	9.967	2.49	15.933	1.13	21.90	.68
4.033	.90	10.000	2.49	15.967	1.13	21.93	.68
4.067	.90	10.033	2.71	16.000	1.13	21.97	.68

4.100	.90	10.067	2.71	16.033	.90	22.00	.68
4.133	.90	10.100	2.71	16.067	.90	22.03	.68
4.167	.90	10.133	2.71	16.100	.90	22.07	.68
4.200	.90	10.167	2.71	16.133	.90	22.10	.68
4.233	.90	10.200	2.71	16.167	.90	22.13	.68
4.267	.90	10.233	2.71	16.200	.90	22.17	.68
4.300	.90	10.267	3.05	16.233	.90	22.20	.68
4.333	.90	10.300	3.39	16.267	1.02	22.23	.68
4.367	.90	10.333	3.39	16.300	1.13	22.27	.68
4.400	.90	10.367	3.39	16.333	1.13	22.30	.68
4.433	.90	10.400	3.39	16.367	1.13	22.33	.68
4.467	.90	10.433	3.39	16.400	1.13	22.37	.68
4.500	.90	10.467	3.39	16.433	1.13	22.40	.68
4.533	.90	10.500	3.39	16.467	1.13	22.43	.68
4.567	.90	10.533	3.62	16.500	1.13	22.47	.68
4.600	.90	10.567	3.62	16.533	.90	22.50	.68
4.633	.90	10.600	3.62	16.567	.90	22.53	.68
4.667	.90	10.633	3.62	16.600	.90	22.57	.68
4.700	.90	10.667	3.62	16.633	.90	22.60	.68
4.733	.90	10.700	3.62	16.667	.90	22.63	.68
4.767	.90	10.733	3.62	16.700	.90	22.67	.68
4.800	.90	10.767	4.52	16.733	.90	22.70	.68
4.833	.90	10.800	5.42	16.767	1.02	22.73	.68
4.867	.90	10.833	5.42	16.800	1.13	22.77	.68
4.900	.90	10.867	5.42	16.833	1.13	22.80	.68
4.933	.90	10.900	5.42	16.867	1.13	22.83	.68
4.967	.90	10.933	5.42	16.900	1.13	22.87	.68
5.000	.90	10.967	5.42	16.933	1.13	22.90	.68
5.033	.90	11.000	5.42	16.967	1.13	22.93	.68
5.067	.90	11.033	5.42	17.000	1.13	22.97	.68
5.100	.90	11.067	5.42	17.033	.90	23.00	.68
5.133	.90	11.100	5.42	17.067	.90	23.03	.68
5.167	.90	11.133	5.42	17.100	.90	23.07	.68
5.200	.90	11.167	5.42	17.133	.90	23.10	.68
5.233	.90	11.200	5.42	17.167	.90	23.13	.68
5.267	.90	11.233	5.42	17.200	.90	23.17	.68
5.300	.90	11.267	11.09	17.233	.90	23.20	.68
5.333	.90	11.300	16.72	17.267	1.02	23.23	.68
5.367	.90	11.333	16.72	17.300	1.13	23.27	.68
5.400	.90	11.367	16.72	17.333	1.13	23.30	.68
5.433	.90	11.400	16.72	17.367	1.13	23.33	.68
5.467	.90	11.433	16.72	17.400	1.13	23.37	.68
5.500	.90	11.467	16.72	17.433	1.13	23.40	.68
5.533	.90	11.500	16.79	17.467	1.13	23.43	.68
5.567	.90	11.533	69.16	17.500	1.13	23.47	.68
5.600	.90	11.567	69.16	17.533	.90	23.50	.68
5.633	.90	11.600	69.16	17.567	.90	23.53	.68
5.667	.90	11.633	69.16	17.600	.90	23.57	.68
5.700	.90	11.667	69.16	17.633	.90	23.60	.68
5.733	.90	11.700	69.16	17.667	.90	23.63	.68
5.767	.90	11.733	69.16	17.700	.90	23.67	.68
5.800	.90	11.767	38.57	17.733	.90	23.70	.68
5.833	.90	11.800	8.14	17.767	1.02	23.73	.68
5.867	.90	11.833	8.14	17.800	1.13	23.77	.34
5.900	.90	11.867	8.14	17.833	1.13		
5.933	.90	11.900	8.14	17.867	1.13		
5.967	.90	11.933	8.14	17.900	1.13		

Unit Hyd Qpeak (cms)= .610

PEAK FLOW (cms)= .191 (i)
TIME TO PEAK (hrs)= 11.767
RUNOFF VOLUME (mm)= 28.465
TOTAL RAINFALL (mm)= 56.330
RUNOFF COEFFICIENT = .505

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

CALIB	
STANDHYD (0203)	Area (ha)= 2.34
ID= 1 DT= 2.0 min	Total Imp(%)= 73.00 Dir. Conn.(%)= 2.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.71	.63	
Dep. Storage	(mm)=	2.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	280.00	40.00	
Mannings n	=	.013	.250	
Max.Eff.Inten.(mm/hr)=		69.16	182.46	
over (min)		5.00	12.00	
Storage Coeff.	(min)=	4.46 (ii)	10.01 (ii)	
Unit Hyd. Tpeak	(min)=	4.00	12.00	
Unit Hyd. peak	(cms)=	.26	.11	
				TOTALS
PEAK FLOW	(cms)=	.01	.22	.227 (iii)
TIME TO PEAK	(hrs)=	11.73	11.83	11.83

```
     RUNOFF VOLUME    (mm)=      54.33        34.95          35.34
     TOTAL RAINFALL   (mm)=      56.33        56.33          56.33
     RUNOFF COEFFICIENT   =        .96          .62            .63

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  69.0    Ia = Dep. 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  (0202) |   Area    (ha)=    .97
|ID= 1 DT= 2.0 min |   Total Imp(%)=  70.00   Dir. Conn.(%)=   2.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .68          .29
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       2.00         2.00
     Length            (m)=     140.00        40.00
     Mannings n           =       .013         .250

     Max.Eff.Inten.(mm/hr)=      69.16       157.58
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       2.94 (ii)    8.83 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=        .34          .12
                                                        *TOTALS*
     PEAK FLOW       (cms)=        .00          .09          .097 (iii)
     TIME TO PEAK    (hrs)=      11.73        11.80         11.80
     RUNOFF VOLUME    (mm)=      54.33        33.46         33.88
     TOTAL RAINFALL   (mm)=      56.33        56.33         56.33
     RUNOFF COEFFICIENT   =        .96          .59           .60

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  69.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0201) |   Area    (ha)=   3.28
|ID= 1 DT= 2.0 min |   Total Imp(%)=  70.00   Dir. Conn.(%)=   2.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.30          .98
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       2.00         2.00
     Length            (m)=     380.00        40.00
     Mannings n           =       .013         .250

     Max.Eff.Inten.(mm/hr)=      69.16       157.58
               over (min)         6.00        12.00
     Storage Coeff.  (min)=       5.36 (ii)   11.24 (ii)
     Unit Hyd. Tpeak (min)=       6.00        12.00
     Unit Hyd. peak  (cms)=        .20          .10
                                                        *TOTALS*
     PEAK FLOW       (cms)=        .01          .29          .294 (iii)
     TIME TO PEAK    (hrs)=      11.73        11.83         11.83
     RUNOFF VOLUME    (mm)=      54.33        33.46         33.88
     TOTAL RAINFALL   (mm)=      56.33        56.33         56.33
     RUNOFF COEFFICIENT   =        .96          .59           .60

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  69.0    Ia = Dep. 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            |
| NASHYD    (0206) |   Area    (ha)=    .96   Curve Number   (CN)= 59.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   8.69   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .28

     Unit Hyd Qpeak  (cms)=    .131
```

```
     PEAK FLOW       (cms)=    .018 (i)
     TIME TO PEAK    (hrs)=  11.933
     RUNOFF VOLUME    (mm)=  10.125
     TOTAL RAINFALL   (mm)=  56.330
     RUNOFF COEFFICIENT   =    .180

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0207) |   Area    (ha)=    .71   Curve Number   (CN)= 57.8
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.20   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .25

     Unit Hyd Qpeak  (cms)=    .109

     PEAK FLOW       (cms)=    .013 (i)
     TIME TO PEAK    (hrs)=  11.900
     RUNOFF VOLUME    (mm)=   9.188
     TOTAL RAINFALL   (mm)=  56.330
     RUNOFF COEFFICIENT   =    .163

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0205) |   Area    (ha)=   2.00   Curve Number   (CN)= 77.8
|ID= 1 DT= 2.0 min |   Ia      (mm)=   4.06   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .07

     Unit Hyd Qpeak  (cms)=   1.093

     PEAK FLOW       (cms)=    .172 (i)
     TIME TO PEAK    (hrs)=  11.733
     RUNOFF VOLUME    (mm)=  21.832
     TOTAL RAINFALL   (mm)=  56.330
     RUNOFF COEFFICIENT   =    .388

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

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

--------------------
| ADD HYD   (0802) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0203):     2.34    .227    11.83    35.34
       + ID2= 2 (0202):      .97    .097    11.80    33.88
         ================================================
         ID = 3 (0802):     3.31    .323    11.80    34.91

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0801) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0201):     3.28    .294    11.83    33.88
       + ID2= 2 (0206):      .96    .018    11.93    10.12
         ================================================
         ID = 3 (0801):     4.24    .310    11.83    28.50

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0804) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0207):      .71    .013    11.90     9.19
       + ID2= 2 (0205):     2.00    .172    11.73    21.83
         ================================================
         ID = 3 (0804):     2.72    .180    11.73    18.51

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0803) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0802):     3.31    .323    11.80    34.91
```

```
       + ID2= 2 (0801):     4.24    .310    11.83    28.50
         ================================================
         ID = 3 (0803):     7.55    .631    11.83    31.31

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0805) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0204):     2.08    .191    11.77    28.47
       + ID2= 2 (0803):     7.55    .631    11.83    31.31
         ================================================
         ID = 3 (0805):     9.63    .818    11.80    30.70

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0501) |
| IN= 2---> OUT= 1 |
| DT=  2.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          .0000      .0000    |    .0227       .2159
                          .0017      .0174    |    .0239       .2411
                          .0066      .0366    |    .0508       .2679
                          .0101      .0570    |    .1186       .2952
                          .0127      .0779    |    .2340       .3228
                          .0148      .0994    |    .3972       .3509
                          .0167      .1213    |    .5621       .3794
                          .0184      .1438    |    .5877       .4084
                          .0199      .1670    |    .6122       .4378
                          .0213      .1910    |    .7402       .4676

                               AREA      QPEAK       TPEAK       R.V.
                               (ha)      (cms)       (hrs)       (mm)
    INFLOW : ID= 2 (0805)     9.627       .818       11.80       30.70
    OUTFLOW: ID= 1 (0501)     9.627       .022       16.20       28.65

                PEAK   FLOW   REDUCTION [Qout/Qin](%)=  2.73
                TIME SHIFT OF PEAK FLOW         (min)=264.00
                MAXIMUM  STORAGE   USED       (ha.m.)=   .2090

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

--------------------
| ADD HYD   (0806) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0501):     9.63    .022    16.20    28.65
       + ID2= 2 (0804):     2.72    .180    11.73    18.51
         ================================================
         ID = 3 (0806):    12.34    .192    11.73    26.42

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
  ****************************
  ** SIMULATION NUMBER:   3 **
  ****************************

--------------------
| MASS STORM       |    Filename: I:\2016 Projects\116023 - 185 Mountain Road\
|                  |              Design\185 Mtn Hydrologic Model\
|                  |              Owen Sound Design Storms\SCS24H.MST
| Ptotal= 64.40 mm |    Comments: SCS Type II 24 HR MASS CURVE
--------------------
                       Duration of storm    = 23.75 hrs
                       Mass curve time step = 15.00 min

               TIME    RAIN |  TIME    RAIN |  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr
                .25     .77 |  6.25    1.29 | 12.25    9.27 | 18.25    1.03
                .50     .52 |  6.50    1.03 | 12.50    4.89 | 18.50    1.29
                .75     .77 |  6.75    1.29 | 12.75    4.64 | 18.75    1.03
               1.00     .77 |  7.00    1.29 | 13.00    3.61 | 19.00    1.29
               1.25     .77 |  7.25    1.55 | 13.25    3.35 | 19.25    1.03
               1.50     .52 |  7.50    1.29 | 13.50    2.83 | 19.50    1.29
               1.75     .77 |  7.75    1.55 | 13.75    2.58 | 19.75    1.03
               2.00     .77 |  8.00    1.55 | 14.00    2.06 | 20.00     .77
               2.25    1.03 |  8.25    1.80 | 14.25    1.80 | 20.25     .77
               2.50     .77 |  8.50    1.80 | 14.50    2.06 | 20.50     .77
               2.75     .77 |  8.75    1.80 | 14.75    1.80 | 20.75     .77
               3.00     .77 |  9.00    2.06 | 15.00    2.06 | 21.00     .77
               3.25    1.03 |  9.25    2.06 | 15.25    1.80 | 21.25     .77
               3.50     .77 |  9.50    2.32 | 15.50    2.06 | 21.50     .77
               3.75     .77 |  9.75    2.32 | 15.75    1.80 | 21.75     .77
```

4.00	1.03	10.00	2.83	16.00	1.29	22.00	.77
4.25	1.03	10.25	3.09	16.25	1.03	22.25	.77
4.50	1.03	10.50	3.86	16.50	1.29	22.50	.77
4.75	1.03	10.75	4.12	16.75	1.03	22.75	.77
5.00	1.03	11.00	6.18	17.00	1.29	23.00	.77
5.25	1.03	11.25	6.18	17.25	1.03	23.25	.77
5.50	1.03	11.50	19.06	17.50	1.29	23.50	.77
5.75	1.03	11.75	78.83	17.75	1.03	23.75	.77
6.00	1.03	12.00	9.27	18.00	1.29		

CALIB			
NASHYD (0204)	Area (ha)= 2.08	Curve Number (CN)= 84.1	
ID= 1 DT= 2.0 min	Ia (mm)= 2.47	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= .13		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.033	.77	6.000	1.03	11.967	9.27	17.93	1.29
.067	.77	6.033	1.29	12.000	9.27	17.97	1.29
.100	.77	6.067	1.29	12.033	9.27	18.00	1.29
.133	.77	6.100	1.29	12.067	9.27	18.03	1.03
.167	.77	6.133	1.29	12.100	9.27	18.07	1.03
.200	.77	6.167	1.29	12.133	9.27	18.10	1.03
.233	.77	6.200	1.29	12.167	9.27	18.13	1.03
.267	.64	6.233	1.29	12.200	9.27	18.17	1.03
.300	.52	6.267	1.16	12.233	9.27	18.20	1.03
.333	.52	6.300	1.03	12.267	7.08	18.23	1.03
.367	.52	6.333	1.03	12.300	4.89	18.27	1.16
.400	.52	6.367	1.03	12.333	4.89	18.30	1.29
.433	.52	6.400	1.03	12.367	4.89	18.33	1.29
.467	.52	6.433	1.03	12.400	4.89	18.37	1.29
.500	.52	6.467	1.03	12.433	4.89	18.40	1.29
.533	.77	6.500	1.03	12.467	4.89	18.43	1.29
.567	.77	6.533	1.29	12.500	4.89	18.47	1.29
.600	.77	6.567	1.29	12.533	4.64	18.50	1.29
.633	.77	6.600	1.29	12.567	4.64	18.53	1.03
.667	.77	6.633	1.29	12.600	4.64	18.57	1.03
.700	.77	6.667	1.29	12.633	4.64	18.60	1.03
.733	.77	6.700	1.29	12.667	4.64	18.63	1.03
.767	.77	6.733	1.29	12.700	4.64	18.67	1.03
.800	.77	6.767	1.29	12.733	4.64	18.70	1.03
.833	.77	6.800	1.29	12.767	4.12	18.73	1.03
.867	.77	6.833	1.29	12.800	3.61	18.77	1.16
.900	.77	6.867	1.29	12.833	3.61	18.80	1.29
.933	.77	6.900	1.29	12.867	3.61	18.83	1.29
.967	.77	6.933	1.29	12.900	3.61	18.87	1.29
1.000	.77	6.967	1.29	12.933	3.61	18.90	1.29
1.033	.77	7.000	1.29	12.967	3.61	18.93	1.29
1.067	.77	7.033	1.55	13.000	3.61	18.97	1.29
1.100	.77	7.067	1.55	13.033	3.35	19.00	1.29
1.133	.77	7.100	1.55	13.067	3.35	19.03	1.03
1.167	.77	7.133	1.55	13.100	3.35	19.07	1.03
1.200	.77	7.167	1.55	13.133	3.35	19.10	1.03
1.233	.77	7.200	1.55	13.167	3.35	19.13	1.03
1.267	.64	7.233	1.55	13.200	3.35	19.17	1.03
1.300	.52	7.267	1.42	13.233	3.35	19.20	1.03
1.333	.52	7.300	1.29	13.267	3.09	19.23	1.03
1.367	.52	7.333	1.29	13.300	2.83	19.27	1.16
1.400	.52	7.367	1.29	13.333	2.83	19.30	1.29
1.433	.52	7.400	1.29	13.367	2.83	19.33	1.29
1.467	.52	7.433	1.29	13.400	2.83	19.37	1.29
1.500	.52	7.467	1.29	13.433	2.83	19.40	1.29
1.533	.77	7.500	1.29	13.467	2.83	19.43	1.29
1.567	.77	7.533	1.55	13.500	2.83	19.47	1.29
1.600	.77	7.567	1.55	13.533	2.58	19.50	1.29
1.633	.77	7.600	1.55	13.567	2.58	19.53	1.03
1.667	.77	7.633	1.55	13.600	2.58	19.57	1.03
1.700	.77	7.667	1.55	13.633	2.58	19.60	1.03
1.733	.77	7.700	1.55	13.667	2.58	19.63	1.03
1.767	.77	7.733	1.55	13.700	2.58	19.67	1.03
1.800	.77	7.767	1.55	13.733	2.58	19.70	1.03
1.833	.77	7.800	1.55	13.767	2.32	19.73	1.03
1.867	.77	7.833	1.55	13.800	2.06	19.77	.90
1.900	.77	7.867	1.55	13.833	2.06	19.80	.77
1.933	.77	7.900	1.55	13.867	2.06	19.83	.77
1.967	.77	7.933	1.55	13.900	2.06	19.87	.77
2.000	.77	7.967	1.55	13.933	2.06	19.90	.77
2.033	1.03	8.000	1.55	13.967	2.06	19.93	.77
2.067	1.03	8.033	1.80	14.000	2.06	19.97	.77
2.100	1.03	8.067	1.80	14.033	1.80	20.00	.77
2.133	1.03	8.100	1.80	14.067	1.80	20.03	.77
2.167	1.03	8.133	1.80	14.100	1.80	20.07	.77
2.200	1.03	8.167	1.80	14.133	1.80	20.10	.77

2.233	1.03	8.200	1.80	14.167	1.80	20.13	.77
2.267	.90	8.233	1.80	14.200	1.80	20.17	.77
2.300	.77	8.267	1.80	14.233	1.80	20.20	.77
2.333	.77	8.300	1.80	14.267	1.93	20.23	.77
2.367	.77	8.333	1.80	14.300	2.06	20.27	.77
2.400	.77	8.367	1.80	14.333	2.06	20.30	.77
2.433	.77	8.400	1.80	14.367	2.06	20.33	.77
2.467	.77	8.433	1.80	14.400	2.06	20.37	.77
2.500	.77	8.467	1.80	14.433	2.06	20.40	.77
2.533	.77	8.500	1.80	14.467	2.06	20.43	.77
2.567	.77	8.533	1.80	14.500	2.06	20.47	.77
2.600	.77	8.567	1.80	14.533	1.80	20.50	.77
2.633	.77	8.600	1.80	14.567	1.80	20.53	.77
2.667	.77	8.633	1.80	14.600	1.80	20.57	.77
2.700	.77	8.667	1.80	14.633	1.80	20.60	.77
2.733	.77	8.700	1.80	14.667	1.80	20.63	.77
2.767	.77	8.733	1.80	14.700	1.80	20.67	.77
2.800	.77	8.767	1.93	14.733	1.80	20.70	.77
2.833	.77	8.800	2.06	14.767	1.93	20.73	.77
2.867	.77	8.833	2.06	14.800	2.06	20.77	.77
2.900	.77	8.867	2.06	14.833	2.06	20.80	.77
2.933	.77	8.900	2.06	14.867	2.06	20.83	.77
2.967	.77	8.933	2.06	14.900	2.06	20.87	.77
3.000	.77	8.967	2.06	14.933	2.06	20.90	.77
3.033	1.03	9.000	2.06	14.967	2.06	20.93	.77
3.067	1.03	9.033	2.06	15.000	2.06	20.97	.77
3.100	1.03	9.067	2.06	15.033	1.80	21.00	.77
3.133	1.03	9.100	2.06	15.067	1.80	21.03	.77
3.167	1.03	9.133	2.06	15.100	1.80	21.07	.77
3.200	1.03	9.167	2.06	15.133	1.80	21.10	.77
3.233	1.03	9.200	2.06	15.167	1.80	21.13	.77
3.267	.90	9.233	2.06	15.200	1.80	21.17	.77
3.300	.77	9.267	2.19	15.233	1.80	21.20	.77
3.333	.77	9.300	2.32	15.267	1.93	21.23	.77
3.367	.77	9.333	2.32	15.300	2.06	21.27	.77
3.400	.77	9.367	2.32	15.333	2.06	21.30	.77
3.433	.77	9.400	2.32	15.367	2.06	21.33	.77
3.467	.77	9.433	2.32	15.400	2.06	21.37	.77
3.500	.77	9.467	2.32	15.433	2.06	21.40	.77
3.533	.77	9.500	2.32	15.467	2.06	21.43	.77
3.567	.77	9.533	2.32	15.500	2.06	21.47	.77
3.600	.77	9.567	2.32	15.533	1.80	21.50	.77
3.633	.77	9.600	2.32	15.567	1.80	21.53	.77
3.667	.77	9.633	2.32	15.600	1.80	21.57	.77
3.700	.77	9.667	2.32	15.633	1.80	21.60	.77
3.733	.77	9.700	2.32	15.667	1.80	21.63	.77
3.767	.90	9.733	2.32	15.700	1.80	21.67	.77
3.800	1.03	9.767	2.58	15.733	1.80	21.70	.77
3.833	1.03	9.800	2.83	15.767	1.54	21.73	.77
3.867	1.03	9.833	2.83	15.800	1.29	21.77	.77
3.900	1.03	9.867	2.83	15.833	1.29	21.80	.77
3.933	1.03	9.900	2.83	15.867	1.29	21.83	.77
3.967	1.03	9.933	2.83	15.900	1.29	21.87	.77
4.000	1.03	9.967	2.83	15.933	1.29	21.90	.77
4.033	1.03	10.000	2.83	15.967	1.29	21.93	.77
4.067	1.03	10.033	3.09	16.000	1.29	21.97	.77
4.100	1.03	10.067	3.09	16.033	1.03	22.00	.77
4.133	1.03	10.100	3.09	16.067	1.03	22.03	.77
4.167	1.03	10.133	3.09	16.100	1.03	22.07	.77
4.200	1.03	10.167	3.09	16.133	1.03	22.10	.77
4.233	1.03	10.200	3.09	16.167	1.03	22.13	.77
4.267	1.03	10.233	3.09	16.200	1.03	22.17	.77
4.300	1.03	10.267	3.48	16.233	1.03	22.20	.77
4.333	1.03	10.300	3.86	16.267	1.16	22.23	.77
4.367	1.03	10.333	3.86	16.300	1.29	22.27	.77
4.400	1.03	10.367	3.86	16.333	1.29	22.30	.77
4.433	1.03	10.400	3.86	16.367	1.29	22.33	.77
4.467	1.03	10.433	3.86	16.400	1.29	22.37	.77
4.500	1.03	10.467	3.86	16.433	1.29	22.40	.77
4.533	1.03	10.500	3.86	16.467	1.29	22.43	.77
4.567	1.03	10.533	4.12	16.500	1.29	22.47	.77
4.600	1.03	10.567	4.12	16.533	1.03	22.50	.77
4.633	1.03	10.600	4.12	16.567	1.03	22.53	.77
4.667	1.03	10.633	4.12	16.600	1.03	22.57	.77
4.700	1.03	10.667	4.12	16.633	1.03	22.60	.77
4.733	1.03	10.700	4.12	16.667	1.03	22.63	.77
4.767	1.03	10.733	4.12	16.700	1.03	22.67	.77
4.800	1.03	10.767	5.15	16.733	1.03	22.70	.77
4.833	1.03	10.800	6.18	16.767	1.16	22.73	.77
4.867	1.03	10.833	6.18	16.800	1.29	22.77	.77
4.900	1.03	10.867	6.18	16.833	1.29	22.80	.77
4.933	1.03	10.900	6.18	16.867	1.29	22.83	.77
4.967	1.03	10.933	6.18	16.900	1.29	22.87	.77
5.000	1.03	10.967	6.18	16.933	1.29	22.90	.77
5.033	1.03	11.000	6.18	16.967	1.29	22.93	.77
5.067	1.03	11.033	6.18	17.000	1.29	22.97	.77
5.100	1.03	11.067	6.18	17.033	1.03	23.00	.77
5.133	1.03	11.100	6.18	17.067	1.03	23.03	.77
5.167	1.03	11.133	6.18	17.100	1.03	23.07	.77

5.200	1.03	11.167	6.18	17.133	1.03	23.10	.77		
5.233	1.03	11.200	6.18	17.167	1.03	23.13	.77		
5.267	1.03	11.233	6.18	17.200	1.03	23.17	.77		
5.300	1.03	11.267	12.64	17.233	1.03	23.20	.77		
5.333	1.03	11.300	19.06	17.267	1.16	23.23	.77		
5.367	1.03	11.333	19.06	17.300	1.29	23.27	.77		
5.400	1.03	11.367	19.06	17.333	1.29	23.30	.77		
5.433	1.03	11.400	19.06	17.367	1.29	23.33	.77		
5.467	1.03	11.433	19.06	17.400	1.29	23.37	.77		
5.500	1.03	11.467	19.06	17.433	1.29	23.40	.77		
5.533	1.03	11.500	19.13	17.467	1.29	23.43	.77		
5.567	1.03	11.533	78.83	17.500	1.29	23.47	.77		
5.600	1.03	11.567	78.83	17.533	1.03	23.50	.77		
5.633	1.03	11.600	78.83	17.567	1.03	23.53	.77		
5.667	1.03	11.633	78.83	17.600	1.03	23.57	.77		
5.700	1.03	11.667	78.83	17.633	1.03	23.60	.77		
5.733	1.03	11.700	78.83	17.667	1.03	23.63	.77		
5.767	1.03	11.733	78.83	17.700	1.03	23.67	.77		
5.800	1.03	11.767	43.96	17.733	1.03	23.70	.77		
5.833	1.03	11.800	9.27	17.767	1.16	23.73	.77		
5.867	1.03	11.833	9.27	17.800	1.29	23.77	.39		
5.900	1.03	11.867	9.27	17.833	1.29				
5.933	1.03	11.900	9.27	17.867	1.29				
5.967	1.03	11.933	9.27	17.900	1.29				

Unit Hyd Qpeak (cms)= .610

PEAK FLOW (cms)= .233 (i)
TIME TO PEAK (hrs)= 11.767
RUNOFF VOLUME (mm)= 34.716
TOTAL RAINFALL (mm)= 64.206
RUNOFF COEFFICIENT = .541

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

CALIB		
STANDHYD (0203)	Area (ha)=	2.34
ID= 1 DT= 2.0 min	Total Imp(%)=	73.00 Dir. Conn.(%)= 2.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.71	.63	
Dep. Storage	(mm)=	2.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	280.00	40.00	
Mannings n	=	.013	.250	
Max.Eff.Inten.(mm/hr)=		78.83	217.82	
over (min)		5.00	10.00	
Storage Coeff. (min)=		4.23 (ii)	9.40 (ii)	
Unit Hyd. Tpeak (min)=		4.00	10.00	
Unit Hyd. peak (cms)=		.27	.12	
				TOTALS
PEAK FLOW (cms)=		.01	.28	.287 (iii)
TIME TO PEAK (hrs)=		11.73	11.80	11.80
RUNOFF VOLUME (mm)=		62.21	41.87	42.28
TOTAL RAINFALL (mm)=		64.21	64.21	64.21
RUNOFF COEFFICIENT =		.97	.65	.66

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. 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 (0202)	Area (ha)=	.97
ID= 1 DT= 2.0 min	Total Imp(%)=	70.00 Dir. Conn.(%)= 2.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	.68	.29	
Dep. Storage	(mm)=	2.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	140.00	40.00	
Mannings n	=	.013	.250	
Max.Eff.Inten.(mm/hr)=		78.83	188.95	
over (min)		5.00	10.00	
Storage Coeff. (min)=		2.79 (ii)	8.26 (ii)	
Unit Hyd. Tpeak (min)=		4.00	10.00	
Unit Hyd. peak (cms)=		.35	.13	
				TOTALS
PEAK FLOW (cms)=		.00	.12	.119 (iii)

```
     TIME TO PEAK    (hrs)=      11.73        11.80          11.80
     RUNOFF VOLUME    (mm)=      62.21        40.24          40.68
     TOTAL RAINFALL   (mm)=      64.21        64.21          64.21
     RUNOFF COEFFICIENT   =        .97          .63            .63

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  69.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0201) |   Area    (ha)=   3.28
|ID= 1 DT= 2.0 min |   Total Imp(%)=  70.00   Dir. Conn.(%)=   2.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.30          .98
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       2.00         2.00
     Length             (m)=     380.00        40.00
     Mannings n            =       .013         .250

     Max.Eff.Inten.(mm/hr)=      78.83       188.95
               over (min)        6.00        12.00
     Storage Coeff.  (min)=       5.08 (ii)   10.56 (ii)
     Unit Hyd. Tpeak (min)=       6.00        12.00
     Unit Hyd. peak  (cms)=        .21          .10
                                                        *TOTALS*
     PEAK FLOW       (cms)=        .01          .35          .361 (iii)
     TIME TO PEAK    (hrs)=      11.73        11.83          11.83
     RUNOFF VOLUME    (mm)=      62.21        40.24          40.68
     TOTAL RAINFALL   (mm)=      64.21        64.21          64.21
     RUNOFF COEFFICIENT   =        .97          .63            .63

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  69.0    Ia = Dep. 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            |
| NASHYD    (0206) |   Area    (ha)=    .96   Curve Number   (CN)= 59.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   8.69   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .28

     Unit Hyd Qpeak  (cms)=    .131

     PEAK FLOW       (cms)=    .024 (i)
     TIME TO PEAK    (hrs)=  11.933
     RUNOFF VOLUME    (mm)=  13.283
     TOTAL RAINFALL   (mm)=  64.206
     RUNOFF COEFFICIENT   =    .207

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0207) |   Area    (ha)=    .71   Curve Number   (CN)= 57.8
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.20   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .25

     Unit Hyd Qpeak  (cms)=    .109

     PEAK FLOW       (cms)=    .018 (i)
     TIME TO PEAK    (hrs)=  11.900
     RUNOFF VOLUME    (mm)=  12.180
     TOTAL RAINFALL   (mm)=  64.206
     RUNOFF COEFFICIENT   =    .190

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0205) |   Area    (ha)=   2.00   Curve Number   (CN)= 77.8
|ID= 1 DT= 2.0 min |   Ia      (mm)=   4.06   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .07
```

Unit Hyd Qpeak (cms)= 1.093

PEAK FLOW (cms)= .215 (i)
TIME TO PEAK (hrs)= 11.733
RUNOFF VOLUME (mm)= 27.190
TOTAL RAINFALL (mm)= 64.206
RUNOFF COEFFICIENT = .423

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

ADD HYD (0802)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0203):	2.34	.287	11.80	42.28
	+ ID2= 2 (0202):	.97	.119	11.80	40.68
	ID = 3 (0802):	3.31	.406	11.80	41.81

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0801)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0201):	3.28	.361	11.83	40.68
	+ ID2= 2 (0206):	.96	.024	11.93	13.28
	ID = 3 (0801):	4.24	.383	11.83	34.48

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0804)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0207):	.71	.018	11.90	12.18
	+ ID2= 2 (0205):	2.00	.215	11.73	27.19
	ID = 3 (0804):	2.72	.226	11.73	23.25

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0803)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0802):	3.31	.406	11.80	41.81
	+ ID2= 2 (0801):	4.24	.383	11.83	34.48
	ID = 3 (0803):	7.55	.783	11.80	37.69

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0805)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0204):	2.08	.233	11.77	34.72
	+ ID2= 2 (0803):	7.55	.783	11.80	37.69
	ID = 3 (0805):	9.63	1.016	11.80	37.05

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0501)					
IN= 2---> OUT= 1					
DT= 2.0 min	OUTFLOW (cms)	STORAGE (ha.m.)		OUTFLOW (cms)	STORAGE (ha.m.)
	.0000	.0000		.0227	.2159
	.0017	.0174		.0239	.2411
	.0066	.0366		.0508	.2679
	.0101	.0570		.1186	.2952
	.0127	.0779		.2340	.3228
	.0148	.0994		.3972	.3509
	.0167	.1213		.5621	.3794
	.0184	.1438		.5877	.4084

.0199	.1670	|	.6122	.4378
.0213	.1910	|	.7402	.4676

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0805)	9.627	1.016	11.80	37.05
OUTFLOW: ID= 1 (0501)	9.627	.034	15.93	34.52

PEAK FLOW REDUCTION [Qout/Qin](%)= 3.34
TIME SHIFT OF PEAK FLOW (min)=248.00
MAXIMUM STORAGE USED (ha.m.)= .2511

ADD HYD (0806)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0501):	9.63	.034	15.93	34.52
	+ ID2= 2 (0804):	2.72	.226	11.73	23.25
	ID = 3 (0806):	12.34	.240	11.73	32.04

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION NUMBER: 4 **
****

MASS STORM	Filename: I:\2016 Projects\116023 - 185 Mountain Road\Design\185 Mtn Hydrologic Model\Owen Sound Design Storms\SCS24H.MST
Ptotal= 74.40 mm	Comments: SCS Type II 24 HR MASS CURVE

Duration of storm = 23.75 hrs
Mass curve time step = 15.00 min

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.25	.89	6.25	1.49	12.25	10.71	18.25	1.19
.50	.60	6.50	1.19	12.50	5.65	18.50	1.49
.75	.89	6.75	1.49	12.75	5.36	18.75	1.19
1.00	.89	7.00	1.49	13.00	4.17	19.00	1.49
1.25	.89	7.25	1.79	13.25	3.87	19.25	1.19
1.50	.60	7.50	1.49	13.50	3.27	19.50	1.49
1.75	.89	7.75	1.79	13.75	2.98	19.75	1.19
2.00	.89	8.00	1.79	14.00	2.38	20.00	.89
2.25	1.19	8.25	2.08	14.25	2.08	20.25	.89
2.50	.89	8.50	2.08	14.50	2.38	20.50	.89
2.75	.89	8.75	2.08	14.75	2.08	20.75	.89
3.00	.89	9.00	2.38	15.00	2.38	21.00	.89
3.25	1.19	9.25	2.38	15.25	2.08	21.25	.89
3.50	.89	9.50	2.68	15.50	2.38	21.50	.89
3.75	.89	9.75	2.68	15.75	2.08	21.75	.89
4.00	1.19	10.00	3.27	16.00	1.49	22.00	.89
4.25	1.19	10.25	3.57	16.25	1.19	22.25	.89
4.50	1.19	10.50	4.46	16.50	1.49	22.50	.89
4.75	1.19	10.75	4.76	16.75	1.19	22.75	.89
5.00	1.19	11.00	7.14	17.00	1.49	23.00	.89
5.25	1.19	11.25	7.14	17.25	1.19	23.25	.89
5.50	1.19	11.50	22.02	17.50	1.49	23.50	.89
5.75	1.19	11.75	91.07	17.75	1.19	23.75	.89
6.00	1.19	12.00	10.71	18.00	1.49		

CALIB			
NASHYD (0204) |ID= 1 DT= 2.0 min	Area (ha)= 2.08	Curve Number (CN)= 84.1	
	Ia (mm)= 2.47	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= .13		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.033	.89	6.000	1.19	11.967	10.71	17.93	1.49
.067	.89	6.033	1.49	12.000	10.71	17.97	1.49
.100	.89	6.067	1.49	12.033	10.71	18.00	1.49
.133	.89	6.100	1.49	12.067	10.71	18.03	1.19
.167	.89	6.133	1.49	12.100	10.71	18.07	1.19
.200	.89	6.167	1.49	12.133	10.71	18.10	1.19
.233	.89	6.200	1.49	12.167	10.71	18.13	1.19
.267	.74	6.233	1.49	12.200	10.71	18.17	1.19
.300	.60	6.267	1.34	12.233	10.71	18.20	1.19
.333	.60	6.300	1.19	12.267	8.18	18.23	1.19

.367	.60	6.333	1.19	12.300	5.65	18.27	1.34
.400	.60	6.367	1.19	12.333	5.65	18.30	1.49
.433	.60	6.400	1.19	12.367	5.65	18.33	1.49
.467	.60	6.433	1.19	12.400	5.65	18.37	1.49
.500	.60	6.467	1.19	12.433	5.65	18.40	1.49
.533	.89	6.500	1.19	12.467	5.65	18.43	1.49
.567	.89	6.533	1.49	12.500	5.65	18.47	1.49
.600	.89	6.567	1.49	12.533	5.36	18.50	1.49
.633	.89	6.600	1.49	12.567	5.36	18.53	1.19
.667	.89	6.633	1.49	12.600	5.36	18.57	1.19
.700	.89	6.667	1.49	12.633	5.36	18.60	1.19
.733	.89	6.700	1.49	12.667	5.36	18.63	1.19
.767	.89	6.733	1.49	12.700	5.36	18.67	1.19
.800	.89	6.767	1.49	12.733	5.36	18.70	1.19
.833	.89	6.800	1.49	12.767	4.76	18.73	1.19
.867	.89	6.833	1.49	12.800	4.17	18.77	1.34
.900	.89	6.867	1.49	12.833	4.17	18.80	1.49
.933	.89	6.900	1.49	12.867	4.17	18.83	1.49
.967	.89	6.933	1.49	12.900	4.17	18.87	1.49
1.000	.89	6.967	1.49	12.933	4.17	18.90	1.49
1.033	.89	7.000	1.49	12.967	4.17	18.93	1.49
1.067	.89	7.033	1.79	13.000	4.17	18.97	1.49
1.100	.89	7.067	1.79	13.033	3.87	19.00	1.49
1.133	.89	7.100	1.79	13.067	3.87	19.03	1.19
1.167	.89	7.133	1.79	13.100	3.87	19.07	1.19
1.200	.89	7.167	1.79	13.133	3.87	19.10	1.19
1.233	.89	7.200	1.79	13.167	3.87	19.13	1.19
1.267	.74	7.233	1.79	13.200	3.87	19.17	1.19
1.300	.60	7.267	1.64	13.233	3.87	19.20	1.19
1.333	.60	7.300	1.49	13.267	3.57	19.23	1.19
1.367	.60	7.333	1.49	13.300	3.27	19.27	1.34
1.400	.60	7.367	1.49	13.333	3.27	19.30	1.49
1.433	.60	7.400	1.49	13.367	3.27	19.33	1.49
1.467	.60	7.433	1.49	13.400	3.27	19.37	1.49
1.500	.60	7.467	1.49	13.433	3.27	19.40	1.49
1.533	.89	7.500	1.49	13.467	3.27	19.43	1.49
1.567	.89	7.533	1.79	13.500	3.27	19.47	1.49
1.600	.89	7.567	1.79	13.533	2.98	19.50	1.49
1.633	.89	7.600	1.79	13.567	2.98	19.53	1.19
1.667	.89	7.633	1.79	13.600	2.98	19.57	1.19
1.700	.89	7.667	1.79	13.633	2.98	19.60	1.19
1.733	.89	7.700	1.79	13.667	2.98	19.63	1.19
1.767	.89	7.733	1.79	13.700	2.98	19.67	1.19
1.800	.89	7.767	1.79	13.733	2.98	19.70	1.19
1.833	.89	7.800	1.79	13.767	2.68	19.73	1.19
1.867	.89	7.833	1.79	13.800	2.38	19.77	1.04
1.900	.89	7.867	1.79	13.833	2.38	19.80	.89
1.933	.89	7.900	1.79	13.867	2.38	19.83	.89
1.967	.89	7.933	1.79	13.900	2.38	19.87	.89
2.000	.89	7.967	1.79	13.933	2.38	19.90	.89
2.033	1.19	8.000	1.79	13.967	2.38	19.93	.89
2.067	1.19	8.033	2.08	14.000	2.38	19.97	.89
2.100	1.19	8.067	2.08	14.033	2.08	20.00	.89
2.133	1.19	8.100	2.08	14.067	2.08	20.03	.89
2.167	1.19	8.133	2.08	14.100	2.08	20.07	.89
2.200	1.19	8.167	2.08	14.133	2.08	20.10	.89
2.233	1.19	8.200	2.08	14.167	2.08	20.13	.89
2.267	1.04	8.233	2.08	14.200	2.08	20.17	.89
2.300	.89	8.267	2.08	14.233	2.08	20.20	.89
2.333	.89	8.300	2.08	14.267	2.23	20.23	.89
2.367	.89	8.333	2.08	14.300	2.38	20.27	.89
2.400	.89	8.367	2.08	14.333	2.38	20.30	.89
2.433	.89	8.400	2.08	14.367	2.38	20.33	.89
2.467	.89	8.433	2.08	14.400	2.38	20.37	.89
2.500	.89	8.467	2.08	14.433	2.38	20.40	.89
2.533	.89	8.500	2.08	14.467	2.38	20.43	.89
2.567	.89	8.533	2.08	14.500	2.38	20.47	.89
2.600	.89	8.567	2.08	14.533	2.08	20.50	.89
2.633	.89	8.600	2.08	14.567	2.08	20.53	.89
2.667	.89	8.633	2.08	14.600	2.08	20.57	.89
2.700	.89	8.667	2.08	14.633	2.08	20.60	.89
2.733	.89	8.700	2.08	14.667	2.08	20.63	.89
2.767	.89	8.733	2.08	14.700	2.08	20.67	.89
2.800	.89	8.767	2.23	14.733	2.08	20.70	.89
2.833	.89	8.800	2.38	14.767	2.23	20.73	.89
2.867	.89	8.833	2.38	14.800	2.38	20.77	.89
2.900	.89	8.867	2.38	14.833	2.38	20.80	.89
2.933	.89	8.900	2.38	14.867	2.38	20.83	.89
2.967	.89	8.933	2.38	14.900	2.38	20.87	.89
3.000	.89	8.967	2.38	14.933	2.38	20.90	.89
3.033	1.19	9.000	2.38	14.967	2.38	20.93	.89
3.067	1.19	9.033	2.38	15.000	2.38	20.97	.89
3.100	1.19	9.067	2.38	15.033	2.08	21.00	.89
3.133	1.19	9.100	2.38	15.067	2.08	21.03	.89
3.167	1.19	9.133	2.38	15.100	2.08	21.07	.89
3.200	1.19	9.167	2.38	15.133	2.08	21.10	.89
3.233	1.19	9.200	2.38	15.167	2.08	21.13	.89
3.267	1.04	9.233	2.38	15.200	2.08	21.17	.89
3.300	.89	9.267	2.53	15.233	2.08	21.20	.89

3.333	.89	9.300	2.68	15.267	2.23	21.23	.89
3.367	.89	9.333	2.68	15.300	2.38	21.27	.89
3.400	.89	9.367	2.68	15.333	2.38	21.30	.89
3.433	.89	9.400	2.68	15.367	2.38	21.33	.89
3.467	.89	9.433	2.68	15.400	2.38	21.37	.89
3.500	.89	9.467	2.68	15.433	2.38	21.40	.89
3.533	.89	9.500	2.68	15.467	2.38	21.43	.89
3.567	.89	9.533	2.68	15.500	2.38	21.47	.89
3.600	.89	9.567	2.68	15.533	2.08	21.50	.89
3.633	.89	9.600	2.68	15.567	2.08	21.53	.89
3.667	.89	9.633	2.68	15.600	2.08	21.57	.89
3.700	.89	9.667	2.68	15.633	2.08	21.60	.89
3.733	.89	9.700	2.68	15.667	2.08	21.63	.89
3.767	1.04	9.733	2.68	15.700	2.08	21.67	.89
3.800	1.19	9.767	2.98	15.733	2.08	21.70	.89
3.833	1.19	9.800	3.27	15.767	1.78	21.73	.89
3.867	1.19	9.833	3.27	15.800	1.49	21.77	.89
3.900	1.19	9.867	3.27	15.833	1.49	21.80	.89
3.933	1.19	9.900	3.27	15.867	1.49	21.83	.89
3.967	1.19	9.933	3.27	15.900	1.49	21.87	.89
4.000	1.19	9.967	3.27	15.933	1.49	21.90	.89
4.033	1.19	10.000	3.27	15.967	1.49	21.93	.89
4.067	1.19	10.033	3.57	16.000	1.49	21.97	.89
4.100	1.19	10.067	3.57	16.033	1.19	22.00	.89
4.133	1.19	10.100	3.57	16.067	1.19	22.03	.89
4.167	1.19	10.133	3.57	16.100	1.19	22.07	.89
4.200	1.19	10.167	3.57	16.133	1.19	22.10	.89
4.233	1.19	10.200	3.57	16.167	1.19	22.13	.89
4.267	1.19	10.233	3.57	16.200	1.19	22.17	.89
4.300	1.19	10.267	4.02	16.233	1.19	22.20	.89
4.333	1.19	10.300	4.46	16.267	1.34	22.23	.89
4.367	1.19	10.333	4.46	16.300	1.49	22.27	.89
4.400	1.19	10.367	4.46	16.333	1.49	22.30	.89
4.433	1.19	10.400	4.46	16.367	1.49	22.33	.89
4.467	1.19	10.433	4.46	16.400	1.49	22.37	.89
4.500	1.19	10.467	4.46	16.433	1.49	22.40	.89
4.533	1.19	10.500	4.46	16.467	1.49	22.43	.89
4.567	1.19	10.533	4.76	16.500	1.49	22.47	.89
4.600	1.19	10.567	4.76	16.533	1.19	22.50	.89
4.633	1.19	10.600	4.76	16.567	1.19	22.53	.89
4.667	1.19	10.633	4.76	16.600	1.19	22.57	.89
4.700	1.19	10.667	4.76	16.633	1.19	22.60	.89
4.733	1.19	10.700	4.76	16.667	1.19	22.63	.89
4.767	1.19	10.733	4.76	16.700	1.19	22.67	.89
4.800	1.19	10.767	5.95	16.733	1.19	22.70	.89
4.833	1.19	10.800	7.14	16.767	1.34	22.73	.89
4.867	1.19	10.833	7.14	16.800	1.49	22.77	.89
4.900	1.19	10.867	7.14	16.833	1.49	22.80	.89
4.933	1.19	10.900	7.14	16.867	1.49	22.83	.89
4.967	1.19	10.933	7.14	16.900	1.49	22.87	.89
5.000	1.19	10.967	7.14	16.933	1.49	22.90	.89
5.033	1.19	11.000	7.14	16.967	1.49	22.93	.89
5.067	1.19	11.033	7.14	17.000	1.49	22.97	.89
5.100	1.19	11.067	7.14	17.033	1.19	23.00	.89
5.133	1.19	11.100	7.14	17.067	1.19	23.03	.89
5.167	1.19	11.133	7.14	17.100	1.19	23.07	.89
5.200	1.19	11.167	7.14	17.133	1.19	23.10	.89
5.233	1.19	11.200	7.14	17.167	1.19	23.13	.89
5.267	1.19	11.233	7.14	17.200	1.19	23.17	.89
5.300	1.19	11.267	14.60	17.233	1.19	23.20	.89
5.333	1.19	11.300	22.02	17.267	1.34	23.23	.89
5.367	1.19	11.333	22.02	17.300	1.49	23.27	.89
5.400	1.19	11.367	22.02	17.333	1.49	23.30	.89
5.433	1.19	11.400	22.02	17.367	1.49	23.33	.89
5.467	1.19	11.433	22.02	17.400	1.49	23.37	.89
5.500	1.19	11.467	22.02	17.433	1.49	23.40	.89
5.533	1.19	11.500	22.11	17.467	1.49	23.43	.89
5.567	1.19	11.533	91.07	17.500	1.49	23.47	.89
5.600	1.19	11.567	91.07	17.533	1.19	23.50	.89
5.633	1.19	11.600	91.07	17.567	1.19	23.53	.89
5.667	1.19	11.633	91.07	17.600	1.19	23.57	.89
5.700	1.19	11.667	91.07	17.633	1.19	23.60	.89
5.733	1.19	11.700	91.07	17.667	1.19	23.63	.89
5.767	1.19	11.733	91.07	17.700	1.19	23.67	.89
5.800	1.19	11.767	50.78	17.733	1.19	23.70	.89
5.833	1.19	11.800	10.71	17.767	1.34	23.73	.89
5.867	1.19	11.833	10.71	17.800	1.49	23.77	.45
5.900	1.19	11.867	10.71	17.833	1.49		
5.933	1.19	11.900	10.71	17.867	1.49		
5.967	1.19	11.933	10.71	17.900	1.49		

Unit Hyd Qpeak (cms)= .610

PEAK FLOW (cms)= .289 (i)
TIME TO PEAK (hrs)= 11.767
RUNOFF VOLUME (mm)= 42.933
TOTAL RAINFALL (mm)= 74.176
RUNOFF COEFFICIENT = .579

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

CALIB			
STANDHYD (0203)	Area (ha)= 2.34		
ID= 1 DT= 2.0 min	Total Imp(%)= 73.00	Dir. Conn.(%)= 2.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.71	.63	
Dep. Storage	(mm)=	2.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	280.00	40.00	
Mannings n	=	.013	.250	
Max.Eff.Inten.	(mm/hr)=	91.07	263.19	
over	(min)	5.00	10.00	
Storage Coeff.	(min)=	4.00 (ii)	8.79 (ii)	
Unit Hyd. Tpeak	(min)=	4.00	10.00	
Unit Hyd. peak	(cms)=	.28	.12	
				TOTALS
PEAK FLOW	(cms)=	.01	.35	.355 (iii)
TIME TO PEAK	(hrs)=	11.73	11.80	11.80
RUNOFF VOLUME	(mm)=	72.18	50.84	51.27
TOTAL RAINFALL	(mm)=	74.18	74.18	74.18
RUNOFF COEFFICIENT	=	.97	.69	.69

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. 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 (0202)	Area (ha)= .97		
ID= 1 DT= 2.0 min	Total Imp(%)= 70.00	Dir. Conn.(%)= 2.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	.68	.29	
Dep. Storage	(mm)=	2.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	140.00	40.00	
Mannings n	=	.013	.250	
Max.Eff.Inten.	(mm/hr)=	91.07	229.38	
over	(min)	5.00	8.00	
Storage Coeff.	(min)=	2.64 (ii)	7.70 (ii)	
Unit Hyd. Tpeak	(min)=	4.00	8.00	
Unit Hyd. peak	(cms)=	.36	.14	
				TOTALS
PEAK FLOW	(cms)=	.00	.15	.153 (iii)
TIME TO PEAK	(hrs)=	11.73	11.77	11.77
RUNOFF VOLUME	(mm)=	72.18	49.06	49.51
TOTAL RAINFALL	(mm)=	74.18	74.18	74.18
RUNOFF COEFFICIENT	=	.97	.66	.67

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0201)	Area (ha)= 3.28		
ID= 1 DT= 2.0 min	Total Imp(%)= 70.00	Dir. Conn.(%)= 2.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	2.30	.98	
Dep. Storage	(mm)=	2.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	380.00	40.00	
Mannings n	=	.013	.250	
Max.Eff.Inten.	(mm/hr)=	91.07	229.38	
over	(min)	5.00	10.00	
Storage Coeff.	(min)=	4.80 (ii)	9.86 (ii)	
Unit Hyd. Tpeak	(min)=	4.00	10.00	
Unit Hyd. peak	(cms)=	.25	.11	
				TOTALS

```
     PEAK FLOW       (cms)=        .02          .45          .463 (iii)
     TIME TO PEAK    (hrs)=      11.73        11.80         11.80
     RUNOFF VOLUME    (mm)=      72.17        49.05         49.52
     TOTAL RAINFALL   (mm)=      74.18        74.18         74.18
     RUNOFF COEFFICIENT   =        .97          .66           .67

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  69.0    Ia = Dep. 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            |
| NASHYD    (0206) |   Area    (ha)=    .96   Curve Number   (CN)= 59.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   8.69   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .28

     Unit Hyd Qpeak  (cms)=    .131

     PEAK FLOW       (cms)=    .033 (i)
     TIME TO PEAK    (hrs)=  11.933
     RUNOFF VOLUME    (mm)=  17.720
     TOTAL RAINFALL   (mm)=  74.176
     RUNOFF COEFFICIENT   =    .239

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0207) |   Area    (ha)=    .71   Curve Number   (CN)= 57.8
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.20   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .25

     Unit Hyd Qpeak  (cms)=    .109

     PEAK FLOW       (cms)=    .024 (i)
     TIME TO PEAK    (hrs)=  11.900
     RUNOFF VOLUME    (mm)=  16.408
     TOTAL RAINFALL   (mm)=  74.176
     RUNOFF COEFFICIENT   =    .221

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0205) |   Area    (ha)=   2.00   Curve Number   (CN)= 77.8
|ID= 1 DT= 2.0 min |   Ia      (mm)=   4.06   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .07

     Unit Hyd Qpeak  (cms)=   1.093

     PEAK FLOW       (cms)=    .272 (i)
     TIME TO PEAK    (hrs)=  11.733
     RUNOFF VOLUME    (mm)=  34.367
     TOTAL RAINFALL   (mm)=  74.176
     RUNOFF COEFFICIENT   =    .463

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

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

--------------------
| ADD HYD   (0802) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
          ID1= 1 (0203):      2.34    .355    11.80    51.27
        + ID2= 2 (0202):       .97    .153    11.77    49.51
          ================================================
          ID = 3 (0802):      3.31    .505    11.80    50.75

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0801) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
          ID1= 1 (0201):      3.28    .463    11.80    49.52
        + ID2= 2 (0206):       .96    .033    11.93    17.72
          ================================================
          ID = 3 (0801):      4.24    .490    11.80    42.32
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0804)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0207):		.71	.024	11.90	16.41
+ ID2= 2 (0205):		2.00	.272	11.73	34.37
ID = 3 (0804):		2.72	.287	11.73	29.65

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0803)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0802):		3.31	.505	11.80	50.75
+ ID2= 2 (0801):		4.24	.490	11.80	42.32
ID = 3 (0803):		7.55	.995	11.80	46.02

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0805)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0204):		2.08	.289	11.77	42.93
+ ID2= 2 (0803):		7.55	.995	11.80	46.02
ID = 3 (0805):		9.63	1.283	11.80	45.35

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0501)				
IN= 2---> OUT= 1				
DT= 2.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	.0000	.0000	.0227	.2159
	.0017	.0174	.0239	.2411
	.0066	.0366	.0508	.2679
	.0101	.0570	.1186	.2952
	.0127	.0779	.2340	.3228
	.0148	.0994	.3972	.3509
	.0167	.1213	.5621	.3794
	.0184	.1438	.5877	.4084
	.0199	.1670	.6122	.4378
	.0213	.1910	.7402	.4676

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0805)	9.627	1.283	11.80	45.35
OUTFLOW: ID= 1 (0501)	9.627	.078	13.43	42.71

PEAK FLOW REDUCTION [Qout/Qin](%)= 6.09
TIME SHIFT OF PEAK FLOW (min)= 98.00
MAXIMUM STORAGE USED (ha.m.)= .2789

ADD HYD (0806)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0501):		9.63	.078	13.43	42.71
+ ID2= 2 (0804):		2.72	.287	11.73	29.65
ID = 3 (0806):		12.34	.303	11.73	39.84

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION NUMBER: 5 **
****

MASS STORM	Filename: I:\2016 Projects\116023 - 185 Mountain Road\
	Design\185 Mtn Hydrologic Model\

| | Owen Sound Design Storms\SCS24H.MST
| Ptotal= 81.80 mm | Comments: SCS Type II 24 HR MASS CURVE

Duration of storm = 23.75 hrs
Mass curve time step = 15.00 min

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.25	.98	6.25	1.64	12.25	11.78	18.25	1.31
.50	.65	6.50	1.31	12.50	6.22	18.50	1.64
.75	.98	6.75	1.64	12.75	5.89	18.75	1.31
1.00	.98	7.00	1.64	13.00	4.58	19.00	1.64
1.25	.98	7.25	1.96	13.25	4.25	19.25	1.31
1.50	.65	7.50	1.64	13.50	3.60	19.50	1.64
1.75	.98	7.75	1.96	13.75	3.27	19.75	1.31
2.00	.98	8.00	1.96	14.00	2.62	20.00	.98
2.25	1.31	8.25	2.29	14.25	2.29	20.25	.98
2.50	.98	8.50	2.29	14.50	2.62	20.50	.98
2.75	.98	8.75	2.29	14.75	2.29	20.75	.98
3.00	.98	9.00	2.62	15.00	2.62	21.00	.98
3.25	1.31	9.25	2.62	15.25	2.29	21.25	.98
3.50	.98	9.50	2.94	15.50	2.62	21.50	.98
3.75	.98	9.75	2.94	15.75	2.29	21.75	.98
4.00	1.31	10.00	3.60	16.00	1.64	22.00	.98
4.25	1.31	10.25	3.93	16.25	1.31	22.25	.98
4.50	1.31	10.50	4.91	16.50	1.64	22.50	.98
4.75	1.31	10.75	5.24	16.75	1.31	22.75	.98
5.00	1.31	11.00	7.85	17.00	1.64	23.00	.98
5.25	1.31	11.25	7.85	17.25	1.31	23.25	.98
5.50	1.31	11.50	24.21	17.50	1.64	23.50	.98
5.75	1.31	11.75	100.12	17.75	1.31	23.75	.98
6.00	1.31	12.00	11.78	18.00	1.64		

CALIB	
NASHYD (0204)	Area (ha)= 2.08 Curve Number (CN)= 84.1
ID= 1 DT= 2.0 min	Ia (mm)= 2.47 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= .13

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.033	.98	6.000	1.31	11.967	11.78	17.93	1.64
.067	.98	6.033	1.64	12.000	11.78	17.97	1.64
.100	.98	6.067	1.64	12.033	11.78	18.00	1.64
.133	.98	6.100	1.64	12.067	11.78	18.03	1.31
.167	.98	6.133	1.64	12.100	11.78	18.07	1.31
.200	.98	6.167	1.64	12.133	11.78	18.10	1.31
.233	.98	6.200	1.64	12.167	11.78	18.13	1.31
.267	.82	6.233	1.64	12.200	11.78	18.17	1.31
.300	.65	6.267	1.47	12.233	11.78	18.20	1.31
.333	.65	6.300	1.31	12.267	8.99	18.23	1.31
.367	.65	6.333	1.31	12.300	6.22	18.27	1.47
.400	.65	6.367	1.31	12.333	6.22	18.30	1.64
.433	.65	6.400	1.31	12.367	6.22	18.33	1.64
.467	.65	6.433	1.31	12.400	6.22	18.37	1.64
.500	.65	6.467	1.31	12.433	6.22	18.40	1.64
.533	.98	6.500	1.31	12.467	6.22	18.43	1.64
.567	.98	6.533	1.64	12.500	6.22	18.47	1.64
.600	.98	6.567	1.64	12.533	5.89	18.50	1.64
.633	.98	6.600	1.64	12.567	5.89	18.53	1.31
.667	.98	6.633	1.64	12.600	5.89	18.57	1.31
.700	.98	6.667	1.64	12.633	5.89	18.60	1.31
.733	.98	6.700	1.64	12.667	5.89	18.63	1.31
.767	.98	6.733	1.64	12.700	5.89	18.67	1.31
.800	.98	6.767	1.64	12.733	5.89	18.70	1.31
.833	.98	6.800	1.64	12.767	5.23	18.73	1.31
.867	.98	6.833	1.64	12.800	4.58	18.77	1.47
.900	.98	6.867	1.64	12.833	4.58	18.80	1.64
.933	.98	6.900	1.64	12.867	4.58	18.83	1.64
.967	.98	6.933	1.64	12.900	4.58	18.87	1.64
1.000	.98	6.967	1.64	12.933	4.58	18.90	1.64
1.033	.98	7.000	1.64	12.967	4.58	18.93	1.64
1.067	.98	7.033	1.96	13.000	4.58	18.97	1.64
1.100	.98	7.067	1.96	13.033	4.25	19.00	1.64
1.133	.98	7.100	1.96	13.067	4.25	19.03	1.31
1.167	.98	7.133	1.96	13.100	4.25	19.07	1.31
1.200	.98	7.167	1.96	13.133	4.25	19.10	1.31
1.233	.98	7.200	1.96	13.167	4.25	19.13	1.31
1.267	.82	7.233	1.96	13.200	4.25	19.17	1.31
1.300	.65	7.267	1.80	13.233	4.25	19.20	1.31
1.333	.65	7.300	1.64	13.267	3.93	19.23	1.31
1.367	.65	7.333	1.64	13.300	3.60	19.27	1.47
1.400	.65	7.367	1.64	13.333	3.60	19.30	1.64
1.433	.65	7.400	1.64	13.367	3.60	19.33	1.64

1.467	.65	7.433	1.64	13.400	3.60	19.37	1.64
1.500	.65	7.467	1.64	13.433	3.60	19.40	1.64
1.533	.98	7.500	1.64	13.467	3.60	19.43	1.64
1.567	.98	7.533	1.96	13.500	3.60	19.47	1.64
1.600	.98	7.567	1.96	13.533	3.27	19.50	1.64
1.633	.98	7.600	1.96	13.567	3.27	19.53	1.31
1.667	.98	7.633	1.96	13.600	3.27	19.57	1.31
1.700	.98	7.667	1.96	13.633	3.27	19.60	1.31
1.733	.98	7.700	1.96	13.667	3.27	19.63	1.31
1.767	.98	7.733	1.96	13.700	3.27	19.67	1.31
1.800	.98	7.767	1.96	13.733	3.27	19.70	1.31
1.833	.98	7.800	1.96	13.767	2.94	19.73	1.31
1.867	.98	7.833	1.96	13.800	2.62	19.77	1.14
1.900	.98	7.867	1.96	13.833	2.62	19.80	.98
1.933	.98	7.900	1.96	13.867	2.62	19.83	.98
1.967	.98	7.933	1.96	13.900	2.62	19.87	.98
2.000	.98	7.967	1.96	13.933	2.62	19.90	.98
2.033	1.31	8.000	1.96	13.967	2.62	19.93	.98
2.067	1.31	8.033	2.29	14.000	2.62	19.97	.98
2.100	1.31	8.067	2.29	14.033	2.29	20.00	.98
2.133	1.31	8.100	2.29	14.067	2.29	20.03	.98
2.167	1.31	8.133	2.29	14.100	2.29	20.07	.98
2.200	1.31	8.167	2.29	14.133	2.29	20.10	.98
2.233	1.31	8.200	2.29	14.167	2.29	20.13	.98
2.267	1.15	8.233	2.29	14.200	2.29	20.17	.98
2.300	.98	8.267	2.29	14.233	2.29	20.20	.98
2.333	.98	8.300	2.29	14.267	2.45	20.23	.98
2.367	.98	8.333	2.29	14.300	2.62	20.27	.98
2.400	.98	8.367	2.29	14.333	2.62	20.30	.98
2.433	.98	8.400	2.29	14.367	2.62	20.33	.98
2.467	.98	8.433	2.29	14.400	2.62	20.37	.98
2.500	.98	8.467	2.29	14.433	2.62	20.40	.98
2.533	.98	8.500	2.29	14.467	2.62	20.43	.98
2.567	.98	8.533	2.29	14.500	2.62	20.47	.98
2.600	.98	8.567	2.29	14.533	2.29	20.50	.98
2.633	.98	8.600	2.29	14.567	2.29	20.53	.98
2.667	.98	8.633	2.29	14.600	2.29	20.57	.98
2.700	.98	8.667	2.29	14.633	2.29	20.60	.98
2.733	.98	8.700	2.29	14.667	2.29	20.63	.98
2.767	.98	8.733	2.29	14.700	2.29	20.67	.98
2.800	.98	8.767	2.45	14.733	2.29	20.70	.98
2.833	.98	8.800	2.62	14.767	2.45	20.73	.98
2.867	.98	8.833	2.62	14.800	2.62	20.77	.98
2.900	.98	8.867	2.62	14.833	2.62	20.80	.98
2.933	.98	8.900	2.62	14.867	2.62	20.83	.98
2.967	.98	8.933	2.62	14.900	2.62	20.87	.98
3.000	.98	8.967	2.62	14.933	2.62	20.90	.98
3.033	1.31	9.000	2.62	14.967	2.62	20.93	.98
3.067	1.31	9.033	2.62	15.000	2.62	20.97	.98
3.100	1.31	9.067	2.62	15.033	2.29	21.00	.98
3.133	1.31	9.100	2.62	15.067	2.29	21.03	.98
3.167	1.31	9.133	2.62	15.100	2.29	21.07	.98
3.200	1.31	9.167	2.62	15.133	2.29	21.10	.98
3.233	1.31	9.200	2.62	15.167	2.29	21.13	.98
3.267	1.15	9.233	2.62	15.200	2.29	21.17	.98
3.300	.98	9.267	2.78	15.233	2.29	21.20	.98
3.333	.98	9.300	2.94	15.267	2.45	21.23	.98
3.367	.98	9.333	2.94	15.300	2.62	21.27	.98
3.400	.98	9.367	2.94	15.333	2.62	21.30	.98
3.433	.98	9.400	2.94	15.367	2.62	21.33	.98
3.467	.98	9.433	2.94	15.400	2.62	21.37	.98
3.500	.98	9.467	2.94	15.433	2.62	21.40	.98
3.533	.98	9.500	2.94	15.467	2.62	21.43	.98
3.567	.98	9.533	2.94	15.500	2.62	21.47	.98
3.600	.98	9.567	2.94	15.533	2.29	21.50	.98
3.633	.98	9.600	2.94	15.567	2.29	21.53	.98
3.667	.98	9.633	2.94	15.600	2.29	21.57	.98
3.700	.98	9.667	2.94	15.633	2.29	21.60	.98
3.733	.98	9.700	2.94	15.667	2.29	21.63	.98
3.767	1.15	9.733	2.94	15.700	2.29	21.67	.98
3.800	1.31	9.767	3.27	15.733	2.29	21.70	.98
3.833	1.31	9.800	3.60	15.767	1.96	21.73	.98
3.867	1.31	9.833	3.60	15.800	1.64	21.77	.98
3.900	1.31	9.867	3.60	15.833	1.64	21.80	.98
3.933	1.31	9.900	3.60	15.867	1.64	21.83	.98
3.967	1.31	9.933	3.60	15.900	1.64	21.87	.98
4.000	1.31	9.967	3.60	15.933	1.64	21.90	.98
4.033	1.31	10.000	3.60	15.967	1.64	21.93	.98
4.067	1.31	10.033	3.93	16.000	1.64	21.97	.98
4.100	1.31	10.067	3.93	16.033	1.31	22.00	.98
4.133	1.31	10.100	3.93	16.067	1.31	22.03	.98
4.167	1.31	10.133	3.93	16.100	1.31	22.07	.98
4.200	1.31	10.167	3.93	16.133	1.31	22.10	.98
4.233	1.31	10.200	3.93	16.167	1.31	22.13	.98
4.267	1.31	10.233	3.93	16.200	1.31	22.17	.98
4.300	1.31	10.267	4.42	16.233	1.31	22.20	.98
4.333	1.31	10.300	4.91	16.267	1.47	22.23	.98
4.367	1.31	10.333	4.91	16.300	1.64	22.27	.98
4.400	1.31	10.367	4.91	16.333	1.64	22.30	.98

4.433	1.31	10.400	4.91	16.367	1.64	22.33	.98	
4.467	1.31	10.433	4.91	16.400	1.64	22.37	.98	
4.500	1.31	10.467	4.91	16.433	1.64	22.40	.98	
4.533	1.31	10.500	4.91	16.467	1.64	22.43	.98	
4.567	1.31	10.533	5.24	16.500	1.64	22.47	.98	
4.600	1.31	10.567	5.24	16.533	1.31	22.50	.98	
4.633	1.31	10.600	5.24	16.567	1.31	22.53	.98	
4.667	1.31	10.633	5.24	16.600	1.31	22.57	.98	
4.700	1.31	10.667	5.24	16.633	1.31	22.60	.98	
4.733	1.31	10.700	5.24	16.667	1.31	22.63	.98	
4.767	1.31	10.733	5.24	16.700	1.31	22.67	.98	
4.800	1.31	10.767	6.55	16.733	1.31	22.70	.98	
4.833	1.31	10.800	7.85	16.767	1.47	22.73	.98	
4.867	1.31	10.833	7.85	16.800	1.64	22.77	.98	
4.900	1.31	10.867	7.85	16.833	1.64	22.80	.98	
4.933	1.31	10.900	7.85	16.867	1.64	22.83	.98	
4.967	1.31	10.933	7.85	16.900	1.64	22.87	.98	
5.000	1.31	10.967	7.85	16.933	1.64	22.90	.98	
5.033	1.31	11.000	7.85	16.967	1.64	22.93	.98	
5.067	1.31	11.033	7.85	17.000	1.64	22.97	.98	
5.100	1.31	11.067	7.85	17.033	1.31	23.00	.98	
5.133	1.31	11.100	7.85	17.067	1.31	23.03	.98	
5.167	1.31	11.133	7.85	17.100	1.31	23.07	.98	
5.200	1.31	11.167	7.85	17.133	1.31	23.10	.98	
5.233	1.31	11.200	7.85	17.167	1.31	23.13	.98	
5.267	1.31	11.233	7.85	17.200	1.31	23.17	.98	
5.300	1.31	11.267	16.05	17.233	1.31	23.20	.98	
5.333	1.31	11.300	24.21	17.267	1.47	23.23	.98	
5.367	1.31	11.333	24.21	17.300	1.64	23.27	.98	
5.400	1.31	11.367	24.21	17.333	1.64	23.30	.98	
5.433	1.31	11.400	24.21	17.367	1.64	23.33	.98	
5.467	1.31	11.433	24.21	17.400	1.64	23.37	.98	
5.500	1.31	11.467	24.21	17.433	1.64	23.40	.98	
5.533	1.31	11.500	24.30	17.467	1.64	23.43	.98	
5.567	1.31	11.533	100.12	17.500	1.64	23.47	.98	
5.600	1.31	11.567	100.12	17.533	1.31	23.50	.98	
5.633	1.31	11.600	100.12	17.567	1.31	23.53	.98	
5.667	1.31	11.633	100.12	17.600	1.31	23.57	.98	
5.700	1.31	11.667	100.12	17.633	1.31	23.60	.98	
5.733	1.31	11.700	100.12	17.667	1.31	23.63	.98	
5.767	1.31	11.733	100.12	17.700	1.31	23.67	.98	
5.800	1.31	11.767	55.84	17.733	1.31	23.70	.98	
5.833	1.31	11.800	11.78	17.767	1.47	23.73	.98	
5.867	1.31	11.833	11.78	17.800	1.64	23.77	.49	
5.900	1.31	11.867	11.78	17.833	1.64			
5.933	1.31	11.900	11.78	17.867	1.64			
5.967	1.31	11.933	11.78	17.900	1.64			

Unit Hyd Qpeak (cms)= .610

PEAK FLOW (cms)= .331 (i)
TIME TO PEAK (hrs)= 11.767
RUNOFF VOLUME (mm)= 49.191
TOTAL RAINFALL (mm)= 81.554
RUNOFF COEFFICIENT = .603

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

CALIB	
STANDHYD (0203)	Area (ha)= 2.34
ID= 1 DT= 2.0 min	Total Imp(%)= 73.00 Dir. Conn.(%)= 2.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.71	.63	
Dep. Storage	(mm)=	2.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	280.00	40.00	
Mannings n	=	.013	.250	
Max.Eff.Inten.	(mm/hr)=	100.12	297.04	
over	(min)	5.00	10.00	
Storage Coeff.	(min)=	3.85 (ii)	8.41 (ii)	
Unit Hyd. Tpeak	(min)=	4.00	10.00	
Unit Hyd. peak	(cms)=	.29	.13	
				TOTALS
PEAK FLOW	(cms)=	.01	.40	.407 (iii)
TIME TO PEAK	(hrs)=	11.73	11.80	11.80
RUNOFF VOLUME	(mm)=	79.55	57.59	58.03
TOTAL RAINFALL	(mm)=	81.55	81.55	81.55
RUNOFF COEFFICIENT	=	.98	.71	.71

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. 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 (0202)	Area (ha)= .97		
ID= 1 DT= 2.0 min	Total Imp(%)= 70.00	Dir. Conn.(%)= 2.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	.68	.29	
Dep. Storage	(mm)=	2.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	140.00	40.00	
Mannings n	=	.013	.250	
Max.Eff.Inten.	(mm/hr)=	100.12	259.63	
over	(min)	5.00	8.00	
Storage Coeff.	(min)=	2.54 (ii)	7.36 (ii)	
Unit Hyd. Tpeak	(min)=	4.00	8.00	
Unit Hyd. peak	(cms)=	.36	.15	
				TOTALS
PEAK FLOW	(cms)=	.01	.17	.176 (iii)
TIME TO PEAK	(hrs)=	11.73	11.77	11.77
RUNOFF VOLUME	(mm)=	79.55	55.70	56.18
TOTAL RAINFALL	(mm)=	81.55	81.55	81.55
RUNOFF COEFFICIENT	=	.98	.68	.69

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0201)	Area (ha)= 3.28		
ID= 1 DT= 2.0 min	Total Imp(%)= 70.00	Dir. Conn.(%)= 2.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	2.30	.98	
Dep. Storage	(mm)=	2.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	380.00	40.00	
Mannings n	=	.013	.250	
Max.Eff.Inten.	(mm/hr)=	100.12	259.63	
over	(min)	5.00	10.00	
Storage Coeff.	(min)=	4.62 (ii)	9.44 (ii)	
Unit Hyd. Tpeak	(min)=	4.00	10.00	
Unit Hyd. peak	(cms)=	.25	.12	
				TOTALS
PEAK FLOW	(cms)=	.02	.52	.533 (iii)
TIME TO PEAK	(hrs)=	11.73	11.80	11.80
RUNOFF VOLUME	(mm)=	79.55	55.70	56.18
TOTAL RAINFALL	(mm)=	81.55	81.55	81.55
RUNOFF COEFFICIENT	=	.98	.68	.69

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. 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			
NASHYD (0206)	Area (ha)= .96	Curve Number (CN)= 59.0	
ID= 1 DT= 2.0 min	Ia (mm)= 8.69	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= .28		

Unit Hyd Qpeak	(cms)=	.131
PEAK FLOW	(cms)=	.040 (i)
TIME TO PEAK	(hrs)=	11.933
RUNOFF VOLUME	(mm)=	21.289
TOTAL RAINFALL	(mm)=	81.554
RUNOFF COEFFICIENT	=	.261

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

```
--------------------
| CALIB            |
| NASHYD    (0207) |   Area    (ha)=    .71   Curve Number   (CN)= 57.8
|ID= 1 DT= 2.0 min |   Ia      (mm)=  10.20   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .25

     Unit Hyd Qpeak  (cms)=    .109

     PEAK FLOW       (cms)=    .030 (i)
     TIME TO PEAK    (hrs)=  11.900
     RUNOFF VOLUME    (mm)=  19.825
     TOTAL RAINFALL   (mm)=  81.554
     RUNOFF COEFFICIENT   =    .243

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0205) |   Area    (ha)=   2.00   Curve Number   (CN)= 77.8
|ID= 1 DT= 2.0 min |   Ia      (mm)=   4.06   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .07

     Unit Hyd Qpeak  (cms)=   1.093

     PEAK FLOW       (cms)=    .316 (i)
     TIME TO PEAK    (hrs)=  11.733
     RUNOFF VOLUME    (mm)=  39.915
     TOTAL RAINFALL   (mm)=  81.554
     RUNOFF COEFFICIENT   =    .489

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

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

--------------------
| ADD HYD   (0802) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0203):      2.34    .407    11.80    58.03
       + ID2= 2 (0202):       .97    .176    11.77    56.18
         ================================================
         ID = 3 (0802):      3.31    .578    11.80    57.49

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0801) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0201):      3.28    .533    11.80    56.18
       + ID2= 2 (0206):       .96    .040    11.93    21.29
         ================================================
         ID = 3 (0801):      4.24    .566    11.80    48.28

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0804) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0207):       .71    .030    11.90    19.83
       + ID2= 2 (0205):      2.00    .316    11.73    39.91
         ================================================
         ID = 3 (0804):      2.72    .335    11.73    34.64

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0803) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0802):      3.31    .578    11.80    57.49
       + ID2= 2 (0801):      4.24    .566    11.80    48.28
         ================================================
         ID = 3 (0803):      7.55   1.144    11.80    52.32

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0805) |
```

1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0204):	2.08	.331	11.77	49.19
+ ID2= 2 (0803):	7.55	1.144	11.80	52.32
ID = 3 (0805):	9.63	1.473	11.80	51.64

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0501)
IN= 2---> OUT= 1
DT= 2.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
.0000	.0000	.0227	.2159
.0017	.0174	.0239	.2411
.0066	.0366	.0508	.2679
.0101	.0570	.1186	.2952
.0127	.0779	.2340	.3228
.0148	.0994	.3972	.3509
.0167	.1213	.5621	.3794
.0184	.1438	.5877	.4084
.0199	.1670	.6122	.4378
.0213	.1910	.7402	.4676

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0805)	9.627	1.473	11.80	51.64
OUTFLOW: ID= 1 (0501)	9.627	.134	12.80	48.96

PEAK FLOW REDUCTION [Qout/Qin](%)= 9.12
TIME SHIFT OF PEAK FLOW (min)= 60.00
MAXIMUM STORAGE USED (ha.m.)= .2989

ADD HYD (0806)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0501):	9.63	.134	12.80	48.96
+ ID2= 2 (0804):	2.72	.335	11.73	34.64
ID = 3 (0806):	12.34	.352	11.73	45.81

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION NUMBER: 6 **
****

MASS STORM
Ptotal= 89.20 mm

Filename: I:\2016 Projects\116023 - 185 Mountain Road\Design\185 Mtn Hydrologic Model\Owen Sound Design Storms\SCS24H.MST
Comments: SCS Type II 24 HR MASS CURVE

Duration of storm = 23.75 hrs
Mass curve time step = 15.00 min

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.25	1.07	6.25	1.78	12.25	12.84	18.25	1.43
.50	.71	6.50	1.43	12.50	6.78	18.50	1.78
.75	1.07	6.75	1.78	12.75	6.42	18.75	1.43
1.00	1.07	7.00	1.78	13.00	5.00	19.00	1.78
1.25	1.07	7.25	2.14	13.25	4.64	19.25	1.43
1.50	.71	7.50	1.78	13.50	3.92	19.50	1.78
1.75	1.07	7.75	2.14	13.75	3.57	19.75	1.43
2.00	1.07	8.00	2.14	14.00	2.85	20.00	1.07
2.25	1.43	8.25	2.50	14.25	2.50	20.25	1.07
2.50	1.07	8.50	2.50	14.50	2.85	20.50	1.07
2.75	1.07	8.75	2.50	14.75	2.50	20.75	1.07
3.00	1.07	9.00	2.85	15.00	2.85	21.00	1.07
3.25	1.43	9.25	2.85	15.25	2.50	21.25	1.07
3.50	1.07	9.50	3.21	15.50	2.85	21.50	1.07
3.75	1.07	9.75	3.21	15.75	2.50	21.75	1.07
4.00	1.43	10.00	3.92	16.00	1.78	22.00	1.07
4.25	1.43	10.25	4.28	16.25	1.43	22.25	1.07
4.50	1.43	10.50	5.35	16.50	1.78	22.50	1.07
4.75	1.43	10.75	5.71	16.75	1.43	22.75	1.07
5.00	1.43	11.00	8.56	17.00	1.78	23.00	1.07
5.25	1.43	11.25	8.56	17.25	1.43	23.25	1.07
5.50	1.43	11.50	26.40	17.50	1.78	23.50	1.07
5.75	1.43	11.75	109.18	17.75	1.43	23.75	1.07
6.00	1.43	12.00	12.84	18.00	1.78		

CALIB					
NASHYD (0204)	Area (ha)= 2.08	Curve Number (CN)= 84.1			
ID= 1 DT= 2.0 min	Ia (mm)= 2.47	# of Linear Res.(N)= 3.00			
	U.H. Tp(hrs)= .13				

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.033	1.07	6.000	1.43	11.967	12.84	17.93	1.78
.067	1.07	6.033	1.78	12.000	12.84	17.97	1.78
.100	1.07	6.067	1.78	12.033	12.84	18.00	1.78
.133	1.07	6.100	1.78	12.067	12.84	18.03	1.43
.167	1.07	6.133	1.78	12.100	12.84	18.07	1.43
.200	1.07	6.167	1.78	12.133	12.84	18.10	1.43
.233	1.07	6.200	1.78	12.167	12.84	18.13	1.43
.267	.89	6.233	1.78	12.200	12.84	18.17	1.43
.300	.71	6.267	1.61	12.233	12.84	18.20	1.43
.333	.71	6.300	1.43	12.267	9.80	18.23	1.43
.367	.71	6.333	1.43	12.300	6.78	18.27	1.61
.400	.71	6.367	1.43	12.333	6.78	18.30	1.78
.433	.71	6.400	1.43	12.367	6.78	18.33	1.78
.467	.71	6.433	1.43	12.400	6.78	18.37	1.78
.500	.71	6.467	1.43	12.433	6.78	18.40	1.78
.533	1.07	6.500	1.43	12.467	6.78	18.43	1.78
.567	1.07	6.533	1.78	12.500	6.78	18.47	1.78
.600	1.07	6.567	1.78	12.533	6.42	18.50	1.78
.633	1.07	6.600	1.78	12.567	6.42	18.53	1.43
.667	1.07	6.633	1.78	12.600	6.42	18.57	1.43
.700	1.07	6.667	1.78	12.633	6.42	18.60	1.43
.733	1.07	6.700	1.78	12.667	6.42	18.63	1.43
.767	1.07	6.733	1.78	12.700	6.42	18.67	1.43
.800	1.07	6.767	1.78	12.733	6.42	18.70	1.43
.833	1.07	6.800	1.78	12.767	5.71	18.73	1.43
.867	1.07	6.833	1.78	12.800	5.00	18.77	1.61
.900	1.07	6.867	1.78	12.833	5.00	18.80	1.78
.933	1.07	6.900	1.78	12.867	5.00	18.83	1.78
.967	1.07	6.933	1.78	12.900	5.00	18.87	1.78
1.000	1.07	6.967	1.78	12.933	5.00	18.90	1.78
1.033	1.07	7.000	1.78	12.967	5.00	18.93	1.78
1.067	1.07	7.033	2.14	13.000	4.99	18.97	1.78
1.100	1.07	7.067	2.14	13.033	4.64	19.00	1.78
1.133	1.07	7.100	2.14	13.067	4.64	19.03	1.43
1.167	1.07	7.133	2.14	13.100	4.64	19.07	1.43
1.200	1.07	7.167	2.14	13.133	4.64	19.10	1.43
1.233	1.07	7.200	2.14	13.167	4.64	19.13	1.43
1.267	.89	7.233	2.14	13.200	4.64	19.17	1.43
1.300	.71	7.267	1.96	13.233	4.64	19.20	1.43
1.333	.71	7.300	1.78	13.267	4.28	19.23	1.43
1.367	.71	7.333	1.78	13.300	3.92	19.27	1.61
1.400	.71	7.367	1.78	13.333	3.92	19.30	1.78
1.433	.71	7.400	1.78	13.367	3.92	19.33	1.78
1.467	.71	7.433	1.78	13.400	3.92	19.37	1.78
1.500	.71	7.467	1.78	13.433	3.92	19.40	1.78
1.533	1.07	7.500	1.78	13.467	3.92	19.43	1.78
1.567	1.07	7.533	2.14	13.500	3.92	19.47	1.78
1.600	1.07	7.567	2.14	13.533	3.57	19.50	1.78
1.633	1.07	7.600	2.14	13.567	3.57	19.53	1.43
1.667	1.07	7.633	2.14	13.600	3.57	19.57	1.43
1.700	1.07	7.667	2.14	13.633	3.57	19.60	1.43
1.733	1.07	7.700	2.14	13.667	3.57	19.63	1.43
1.767	1.07	7.733	2.14	13.700	3.57	19.67	1.43
1.800	1.07	7.767	2.14	13.733	3.57	19.70	1.43
1.833	1.07	7.800	2.14	13.767	3.21	19.73	1.43
1.867	1.07	7.833	2.14	13.800	2.85	19.77	1.25
1.900	1.07	7.867	2.14	13.833	2.85	19.80	1.07
1.933	1.07	7.900	2.14	13.867	2.85	19.83	1.07
1.967	1.07	7.933	2.14	13.900	2.85	19.87	1.07
2.000	1.07	7.967	2.14	13.933	2.85	19.90	1.07
2.033	1.43	8.000	2.14	13.967	2.85	19.93	1.07
2.067	1.43	8.033	2.50	14.000	2.85	19.97	1.07
2.100	1.43	8.067	2.50	14.033	2.50	20.00	1.07
2.133	1.43	8.100	2.50	14.067	2.50	20.03	1.07
2.167	1.43	8.133	2.50	14.100	2.50	20.07	1.07
2.200	1.43	8.167	2.50	14.133	2.50	20.10	1.07
2.233	1.43	8.200	2.50	14.167	2.50	20.13	1.07
2.267	1.25	8.233	2.50	14.200	2.50	20.17	1.07
2.300	1.07	8.267	2.50	14.233	2.50	20.20	1.07
2.333	1.07	8.300	2.50	14.267	2.68	20.23	1.07
2.367	1.07	8.333	2.50	14.300	2.85	20.27	1.07
2.400	1.07	8.367	2.50	14.333	2.85	20.30	1.07
2.433	1.07	8.400	2.50	14.367	2.85	20.33	1.07
2.467	1.07	8.433	2.50	14.400	2.85	20.37	1.07
2.500	1.07	8.467	2.50	14.433	2.85	20.40	1.07
2.533	1.07	8.500	2.50	14.467	2.85	20.43	1.07

2.567	1.07	8.533	2.50	14.500	2.85	20.47	1.07
2.600	1.07	8.567	2.50	14.533	2.50	20.50	1.07
2.633	1.07	8.600	2.50	14.567	2.50	20.53	1.07
2.667	1.07	8.633	2.50	14.600	2.50	20.57	1.07
2.700	1.07	8.667	2.50	14.633	2.50	20.60	1.07
2.733	1.07	8.700	2.50	14.667	2.50	20.63	1.07
2.767	1.07	8.733	2.50	14.700	2.50	20.67	1.07
2.800	1.07	8.767	2.68	14.733	2.50	20.70	1.07
2.833	1.07	8.800	2.85	14.767	2.68	20.73	1.07
2.867	1.07	8.833	2.85	14.800	2.85	20.77	1.07
2.900	1.07	8.867	2.85	14.833	2.85	20.80	1.07
2.933	1.07	8.900	2.85	14.867	2.85	20.83	1.07
2.967	1.07	8.933	2.85	14.900	2.85	20.87	1.07
3.000	1.07	8.967	2.85	14.933	2.85	20.90	1.07
3.033	1.43	9.000	2.85	14.967	2.85	20.93	1.07
3.067	1.43	9.033	2.85	15.000	2.85	20.97	1.07
3.100	1.43	9.067	2.85	15.033	2.50	21.00	1.07
3.133	1.43	9.100	2.85	15.067	2.50	21.03	1.07
3.167	1.43	9.133	2.85	15.100	2.50	21.07	1.07
3.200	1.43	9.167	2.85	15.133	2.50	21.10	1.07
3.233	1.43	9.200	2.85	15.167	2.50	21.13	1.07
3.267	1.25	9.233	2.85	15.200	2.50	21.17	1.07
3.300	1.07	9.267	3.03	15.233	2.50	21.20	1.07
3.333	1.07	9.300	3.21	15.267	2.68	21.23	1.07
3.367	1.07	9.333	3.21	15.300	2.85	21.27	1.07
3.400	1.07	9.367	3.21	15.333	2.85	21.30	1.07
3.433	1.07	9.400	3.21	15.367	2.85	21.33	1.07
3.467	1.07	9.433	3.21	15.400	2.85	21.37	1.07
3.500	1.07	9.467	3.21	15.433	2.85	21.40	1.07
3.533	1.07	9.500	3.21	15.467	2.85	21.43	1.07
3.567	1.07	9.533	3.21	15.500	2.85	21.47	1.07
3.600	1.07	9.567	3.21	15.533	2.50	21.50	1.07
3.633	1.07	9.600	3.21	15.567	2.50	21.53	1.07
3.667	1.07	9.633	3.21	15.600	2.50	21.57	1.07
3.700	1.07	9.667	3.21	15.633	2.50	21.60	1.07
3.733	1.07	9.700	3.21	15.667	2.50	21.63	1.07
3.767	1.25	9.733	3.21	15.700	2.50	21.67	1.07
3.800	1.43	9.767	3.57	15.733	2.50	21.70	1.07
3.833	1.43	9.800	3.92	15.767	2.14	21.73	1.07
3.867	1.43	9.833	3.92	15.800	1.78	21.77	1.07
3.900	1.43	9.867	3.92	15.833	1.78	21.80	1.07
3.933	1.43	9.900	3.92	15.867	1.78	21.83	1.07
3.967	1.43	9.933	3.92	15.900	1.78	21.87	1.07
4.000	1.43	9.967	3.92	15.933	1.78	21.90	1.07
4.033	1.43	10.000	3.93	15.967	1.78	21.93	1.07
4.067	1.43	10.033	4.28	16.000	1.78	21.97	1.07
4.100	1.43	10.067	4.28	16.033	1.43	22.00	1.07
4.133	1.43	10.100	4.28	16.067	1.43	22.03	1.07
4.167	1.43	10.133	4.28	16.100	1.43	22.07	1.07
4.200	1.43	10.167	4.28	16.133	1.43	22.10	1.07
4.233	1.43	10.200	4.28	16.167	1.43	22.13	1.07
4.267	1.43	10.233	4.28	16.200	1.43	22.17	1.07
4.300	1.43	10.267	4.82	16.233	1.43	22.20	1.07
4.333	1.43	10.300	5.35	16.267	1.61	22.23	1.07
4.367	1.43	10.333	5.35	16.300	1.78	22.27	1.07
4.400	1.43	10.367	5.35	16.333	1.78	22.30	1.07
4.433	1.43	10.400	5.35	16.367	1.78	22.33	1.07
4.467	1.43	10.433	5.35	16.400	1.78	22.37	1.07
4.500	1.43	10.467	5.35	16.433	1.78	22.40	1.07
4.533	1.43	10.500	5.35	16.467	1.78	22.43	1.07
4.567	1.43	10.533	5.71	16.500	1.78	22.47	1.07
4.600	1.43	10.567	5.71	16.533	1.43	22.50	1.07
4.633	1.43	10.600	5.71	16.567	1.43	22.53	1.07
4.667	1.43	10.633	5.71	16.600	1.43	22.57	1.07
4.700	1.43	10.667	5.71	16.633	1.43	22.60	1.07
4.733	1.43	10.700	5.71	16.667	1.43	22.63	1.07
4.767	1.43	10.733	5.71	16.700	1.43	22.67	1.07
4.800	1.43	10.767	7.14	16.733	1.43	22.70	1.07
4.833	1.43	10.800	8.56	16.767	1.61	22.73	1.07
4.867	1.43	10.833	8.56	16.800	1.78	22.77	1.07
4.900	1.43	10.867	8.56	16.833	1.78	22.80	1.07
4.933	1.43	10.900	8.56	16.867	1.78	22.83	1.07
4.967	1.43	10.933	8.56	16.900	1.78	22.87	1.07
5.000	1.43	10.967	8.56	16.933	1.78	22.90	1.07
5.033	1.43	11.000	8.56	16.967	1.78	22.93	1.07
5.067	1.43	11.033	8.56	17.000	1.78	22.97	1.07
5.100	1.43	11.067	8.56	17.033	1.43	23.00	1.07
5.133	1.43	11.100	8.56	17.067	1.43	23.03	1.07
5.167	1.43	11.133	8.56	17.100	1.43	23.07	1.07
5.200	1.43	11.167	8.56	17.133	1.43	23.10	1.07
5.233	1.43	11.200	8.56	17.167	1.43	23.13	1.07
5.267	1.43	11.233	8.56	17.200	1.43	23.17	1.07
5.300	1.43	11.267	17.50	17.233	1.43	23.20	1.07
5.333	1.43	11.300	26.40	17.267	1.61	23.23	1.07
5.367	1.43	11.333	26.40	17.300	1.78	23.27	1.07
5.400	1.43	11.367	26.40	17.333	1.78	23.30	1.07
5.433	1.43	11.400	26.40	17.367	1.78	23.33	1.07
5.467	1.43	11.433	26.40	17.400	1.78	23.37	1.07
5.500	1.43	11.467	26.40	17.433	1.78	23.40	1.07

5.533	1.43	11.500	26.50	17.467	1.78	23.43	1.07
5.567	1.43	11.533	109.18	17.500	1.78	23.47	1.07
5.600	1.43	11.567	109.18	17.533	1.43	23.50	1.07
5.633	1.43	11.600	109.18	17.567	1.43	23.53	1.07
5.667	1.43	11.633	109.18	17.600	1.43	23.57	1.07
5.700	1.43	11.667	109.18	17.633	1.43	23.60	1.07
5.733	1.43	11.700	109.18	17.667	1.43	23.63	1.07
5.767	1.43	11.733	109.18	17.700	1.43	23.67	1.07
5.800	1.43	11.767	60.89	17.733	1.43	23.70	1.07
5.833	1.43	11.800	12.84	17.767	1.61	23.73	1.07
5.867	1.43	11.833	12.84	17.800	1.78	23.77	.54
5.900	1.43	11.867	12.84	17.833	1.78		
5.933	1.43	11.900	12.84	17.867	1.78		
5.967	1.43	11.933	12.84	17.900	1.78		

Unit Hyd Qpeak (cms)= .610

PEAK FLOW (cms)= .374 (i)
TIME TO PEAK (hrs)= 11.767
RUNOFF VOLUME (mm)= 55.572
TOTAL RAINFALL (mm)= 88.932
RUNOFF COEFFICIENT = .625

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

CALIB			
STANDHYD (0203)	Area (ha)= 2.34		
ID= 1 DT= 2.0 min	Total Imp(%)= 73.00	Dir. Conn.(%)= 2.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.71	.63	
Dep. Storage	(mm)=	2.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	280.00	40.00	
Mannings n	=	.013	.250	
Max.Eff.Inten.	(mm/hr)=	109.18	331.05	
over	(min)	5.00	10.00	
Storage Coeff.	(min)=	3.72 (ii)	8.09 (ii)	
Unit Hyd. Tpeak	(min)=	4.00	10.00	
Unit Hyd. peak	(cms)=	.29	.13	
				TOTALS
PEAK FLOW	(cms)=	.01	.45	.459 (iii)
TIME TO PEAK	(hrs)=	11.73	11.80	11.80
RUNOFF VOLUME	(mm)=	86.93	64.42	64.87
TOTAL RAINFALL	(mm)=	88.93	88.93	88.93
RUNOFF COEFFICIENT	=	.98	.72	.73

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. 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 (0202)	Area (ha)= .97		
ID= 1 DT= 2.0 min	Total Imp(%)= 70.00	Dir. Conn.(%)= 2.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	.68	.29	
Dep. Storage	(mm)=	2.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	140.00	40.00	
Mannings n	=	.013	.250	
Max.Eff.Inten.	(mm/hr)=	109.18	290.07	
over	(min)	5.00	8.00	
Storage Coeff.	(min)=	2.45 (ii)	7.06 (ii)	
Unit Hyd. Tpeak	(min)=	4.00	8.00	
Unit Hyd. peak	(cms)=	.37	.15	
				TOTALS
PEAK FLOW	(cms)=	.01	.19	.199 (iii)
TIME TO PEAK	(hrs)=	11.73	11.77	11.77
RUNOFF VOLUME	(mm)=	86.93	62.44	62.93
TOTAL RAINFALL	(mm)=	88.93	88.93	88.93
RUNOFF COEFFICIENT	=	.98	.70	.71

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. Storage (Above)

(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
STANDHYD (0201)	Area (ha)= 3.28				
ID= 1 DT= 2.0 min	Total Imp(%)= 70.00	Dir. Conn.(%)= 2.00			
		IMPERVIOUS	PERVIOUS (i)		
Surface Area	(ha)=	2.30	.98		
Dep. Storage	(mm)=	2.00	5.00		
Average Slope	(%)=	2.00	2.00		
Length	(m)=	380.00	40.00		
Mannings n	=	.013	.250		
Max.Eff.Inten.(mm/hr)=		109.18	290.07		
over (min)		5.00	10.00		
Storage Coeff.	(min)=	4.46 (ii)	9.07 (ii)		
Unit Hyd. Tpeak	(min)=	4.00	10.00		
Unit Hyd. peak	(cms)=	.26	.12		
				TOTALS	
PEAK FLOW	(cms)=	.02	.59	.604 (iii)	
TIME TO PEAK	(hrs)=	11.73	11.80	11.80	
RUNOFF VOLUME	(mm)=	86.93	62.44	62.93	
TOTAL RAINFALL	(mm)=	88.93	88.93	88.93	
RUNOFF COEFFICIENT	=	.98	.70	.71	

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 Ia = Dep. 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					
NASHYD (0206)	Area (ha)= .96	Curve Number (CN)= 59.0			
ID= 1 DT= 2.0 min	Ia (mm)= 8.69	# of Linear Res.(N)= 3.00			
	U.H. Tp(hrs)= .28				
Unit Hyd Qpeak	(cms)= .131				
PEAK FLOW	(cms)= .047 (i)				
TIME TO PEAK	(hrs)= 11.933				
RUNOFF VOLUME	(mm)= 25.077				
TOTAL RAINFALL	(mm)= 88.932				
RUNOFF COEFFICIENT	= .282				

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

CALIB					
NASHYD (0207)	Area (ha)= .71	Curve Number (CN)= 57.8			
ID= 1 DT= 2.0 min	Ia (mm)= 10.20	# of Linear Res.(N)= 3.00			
	U.H. Tp(hrs)= .25				
Unit Hyd Qpeak	(cms)= .109				
PEAK FLOW	(cms)= .035 (i)				
TIME TO PEAK	(hrs)= 11.900				
RUNOFF VOLUME	(mm)= 23.463				
TOTAL RAINFALL	(mm)= 88.932				
RUNOFF COEFFICIENT	= .264				

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

CALIB					
NASHYD (0205)	Area (ha)= 2.00	Curve Number (CN)= 77.8			
ID= 1 DT= 2.0 min	Ia (mm)= 4.06	# of Linear Res.(N)= 3.00			
	U.H. Tp(hrs)= .07				
Unit Hyd Qpeak	(cms)= 1.093				
PEAK FLOW	(cms)= .361 (i)				
TIME TO PEAK	(hrs)= 11.733				
RUNOFF VOLUME	(mm)= 45.632				
TOTAL RAINFALL	(mm)= 88.932				
RUNOFF COEFFICIENT	= .513				

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

```
--------------------
| ADD HYD   (0802) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0203):     2.34    .459    11.80    64.87
        + ID2= 2 (0202):      .97    .199    11.77    62.93
          ================================================
          ID = 3 (0802):     3.31    .653    11.77    64.30

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------
| ADD HYD   (0801) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0201):     3.28    .604    11.80    62.93
        + ID2= 2 (0206):      .96    .047    11.93    25.08
          ================================================
          ID = 3 (0801):     4.24    .643    11.80    54.36

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------
| ADD HYD   (0804) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0207):      .71    .035    11.90    23.46
        + ID2= 2 (0205):     2.00    .361    11.73    45.63
          ================================================
          ID = 3 (0804):     2.72    .384    11.73    39.81

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------
| ADD HYD   (0803) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0802):     3.31    .653    11.77    64.30
        + ID2= 2 (0801):     4.24    .643    11.80    54.36
          ================================================
          ID = 3 (0803):     7.55   1.296    11.80    58.72

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------
| ADD HYD   (0805) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0204):     2.08    .374    11.77    55.57
        + ID2= 2 (0803):     7.55   1.296    11.80    58.72
          ================================================
          ID = 3 (0805):     9.63   1.667    11.80    58.04

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------
| RESERVOIR (0501) |
| IN= 2---> OUT= 1 |
| DT=  2.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          .0000      .0000    |    .0227       .2159
                          .0017      .0174    |    .0239       .2411
                          .0066      .0366    |    .0508       .2679
                          .0101      .0570    |    .1186       .2952
                          .0127      .0779    |    .2340       .3228
                          .0148      .0994    |    .3972       .3509
                          .0167      .1213    |    .5621       .3794
                          .0184      .1438    |    .5877       .4084
                          .0199      .1670    |    .6122       .4378
                          .0213      .1910    |    .7402       .4676

                               AREA      QPEAK       TPEAK       R.V.
                               (ha)      (cms)       (hrs)       (mm)
     INFLOW : ID= 2 (0805)     9.627     1.667       11.80       58.04
     OUTFLOW: ID= 1 (0501)     9.627      .219       12.47       55.32

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 13.16
                TIME SHIFT OF PEAK FLOW         (min)= 40.00
```

MAXIMUM STORAGE USED (ha.m.)= .3193

ADD HYD (0806)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0501):	9.63	.219	12.47	55.32
+	ID2= 2 (0804):	2.72	.384	11.73	39.81
	ID = 3 (0806):	12.34	.403	11.73	51.91

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

FINISH

==========

APPENDIX E:
WATER QUALITY CALCULATIONS

C.C.Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie

Project:	185 Mountain Road
File No.:	116023
Date:	Jul-18
Design:	DAM
Check:	DJH
Subject:	SWMF Drawdown Calculation
Condition:	25 mm Storm

DRAWDOWN TIME FOR POND - WATER QUALITY STORM

(Using the falling head orifice equation)

$$t = \frac{0.66\, C_2\, h^{1.5} + 2\, C_3\, h^{0.5}}{2.75\, A_o}$$

where t = drawdown time in seconds

C_2 =	slope coefficient from the area-depth linear regression	5712	
C_3 =	intercept from the area-depth linear regression	3352.1	
A_o =	cross-sectional area of orifice (m^2)	0.0122718 m^2	125 mm diameter
h =	maximum water elevation above the orifice (m)	0.19 m	

t =	95,844.34 seconds
t =	26.62 hours

Water Quality Storage

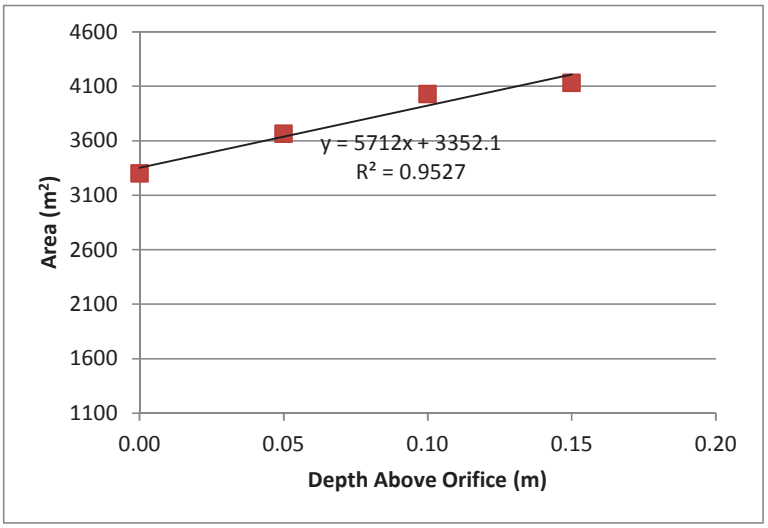
726 m^3

Associated Pond Elevation:

183.99 m

Area Depth Relationship

Area (m^2)	Depth Above Orifice Invert (m)
3300	0.00
3664	0.05
4027	0.10
4131	0.15
4235	0.20
4339	0.25



C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie

Project:	185 Mountain Road
File No.:	116023
Date:	Jul-18
Design:	DAM
Check:	DJH
Subject:	SWMF Drawdown Calculation
Condition:	Extended Detention Water Level

DRAWDOWN TIME FOR POND - EXTENDED DETENTION

(Using the falling head orifice equation)

$$t = \frac{0.66\, C_2\, h^{1.5} + 2\, C_3\, h^{0.5}}{2.75\, A_o}$$

where t = drawdown time in seconds

C_2 =	slope coefficient from the area-depth linear regression	3059.5	
C_3 =	intercept from the area-depth linear regression	3540.3	
A_o =	cross-sectional area of orifice (m^2)	0.0122718 m^2	125 mm diameter
h =	maximum water elevation above the orifice (m)	0.58 m	

t =	186,216.80 seconds
t =	51.73 hours

Extended Detention Storage

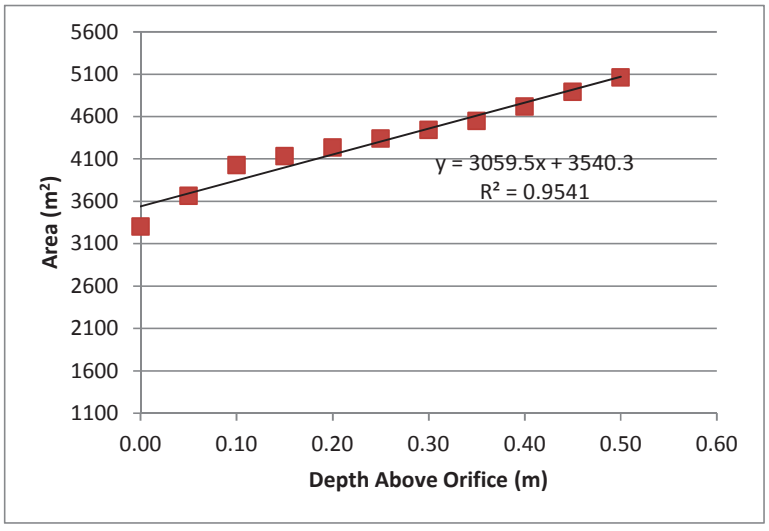
2572 m^3

Associated Pond Elevation:

184.38 m

Area Depth Relationship

Area (m^2)	Depth Above Orifice Invert (m)
3300	0.00
3664	0.05
4027	0.10
4131	0.15
4235	0.20
4339	0.25
4443	0.30
4548	0.35
4719	0.40
4890	0.45
5061	0.50



C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie

Project:	185 Mountain Road
File No.:	116023
Date:	Jul-18
Design:	DAM
Check:	DJH
Subject:	Forebay Sizing Calculations
Condition:	MOE SWMPD Manual

1) Settling

Dist = SQRT(r*Qp/Vs)

Dist = Forebay length (m)
r = Length to width ratio — r = 5
Qp = 5yr SWM outflow - water quality (cms) — Qp = 0.0210 cms
Vs = settling velocity for 0.15 mm particles (m/s) — Vs = 0.0003 m/s

Dist = 18.71 m Actual forebay length = 25 m

2) Dispersion Length

Dist = 8*Q/d*Vf

Dist = Length of dispersion (m)
Q = Inlet flow rate of water quality storm (cms) — Q = 0.3230 cms
d = depth of permanent pool in forebay (m) — d = 1.0000 m
Vf= desired velocity in forebay (m/s) — Vf = 0.5000 m/s

Dist = 5.17 m Actual forebay length = 25 m

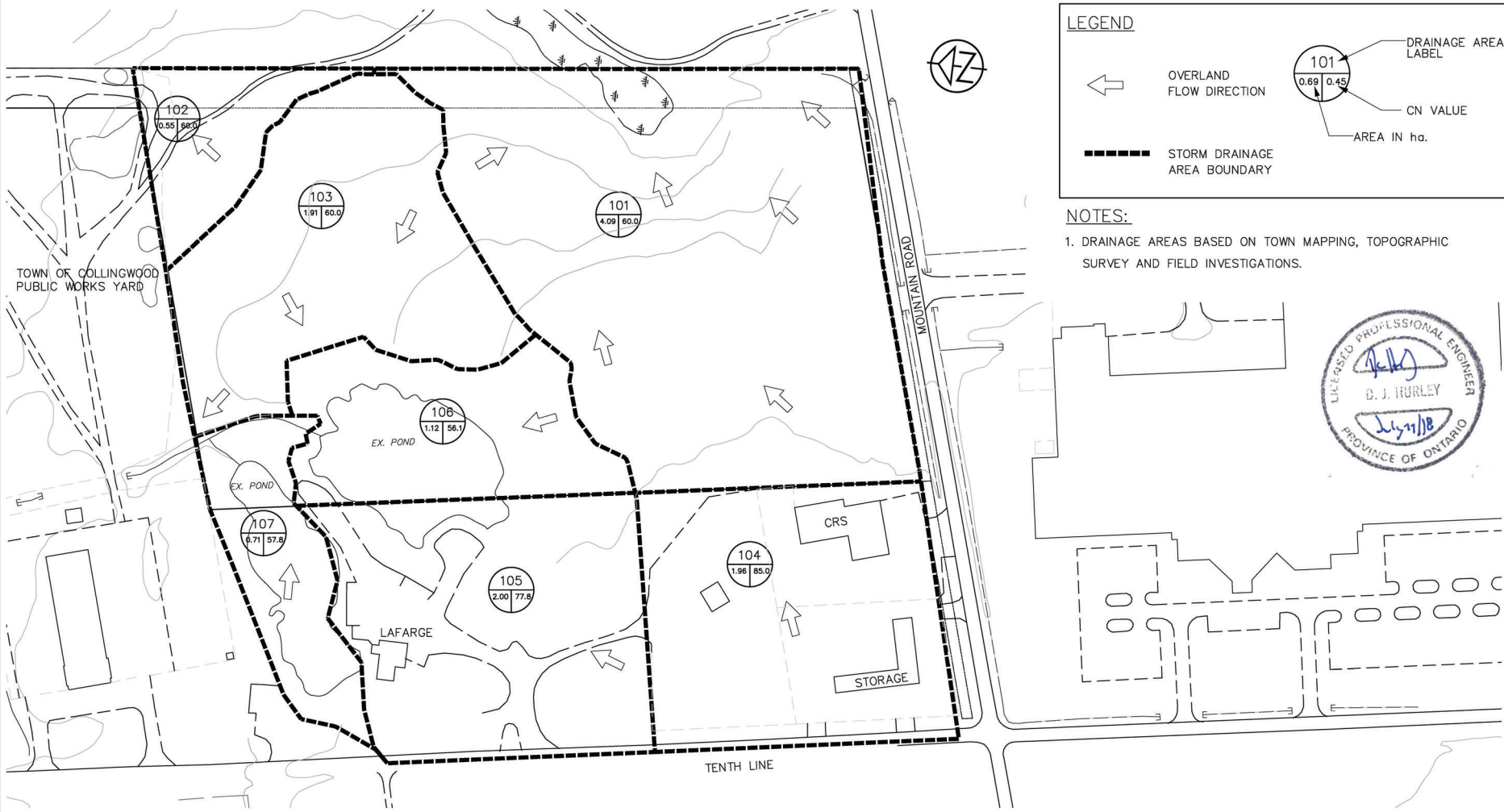
3) Cleanout Frequency

Table 6.3 MOE SWMPD Manual

Cleanout = Vol/(load*A*eff.)

A = contributing area (ha) — Asew = 10 ha
Actual Forebay Length — Alength = 25.00 m
Imp = avg. percent Impervious (%) — Imp = 67 %
load = sediment loading (cu.m/ha) — load = 2.62 cu.m/ha
eff, = removal efficiency (%) — eff. = 80%
Targ = cleanout Freqency Target (Years) — Targ = 10 years
Vol = bottom 0.5 m volume (cu.m) — Vol = 318 cu.m

Cleanout = 16 years



CONTRACT DRAWINGS

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.

C.C. TATHAM & ASSOCIATES LTD. CLAIMS COPYRIGHT TO THIS DOCUMENT WHICH MAY NOT BE USED FOR ANY PURPOSE OTHER THAN THAT PROVIDED IN THE CONTRACT BETWEEN THE OWNER/CLIENT AND THE ENGINEER WITHOUT THE EXPRESS CONSENT OF C.C. TATHAM & ASSOCIATES LTD.

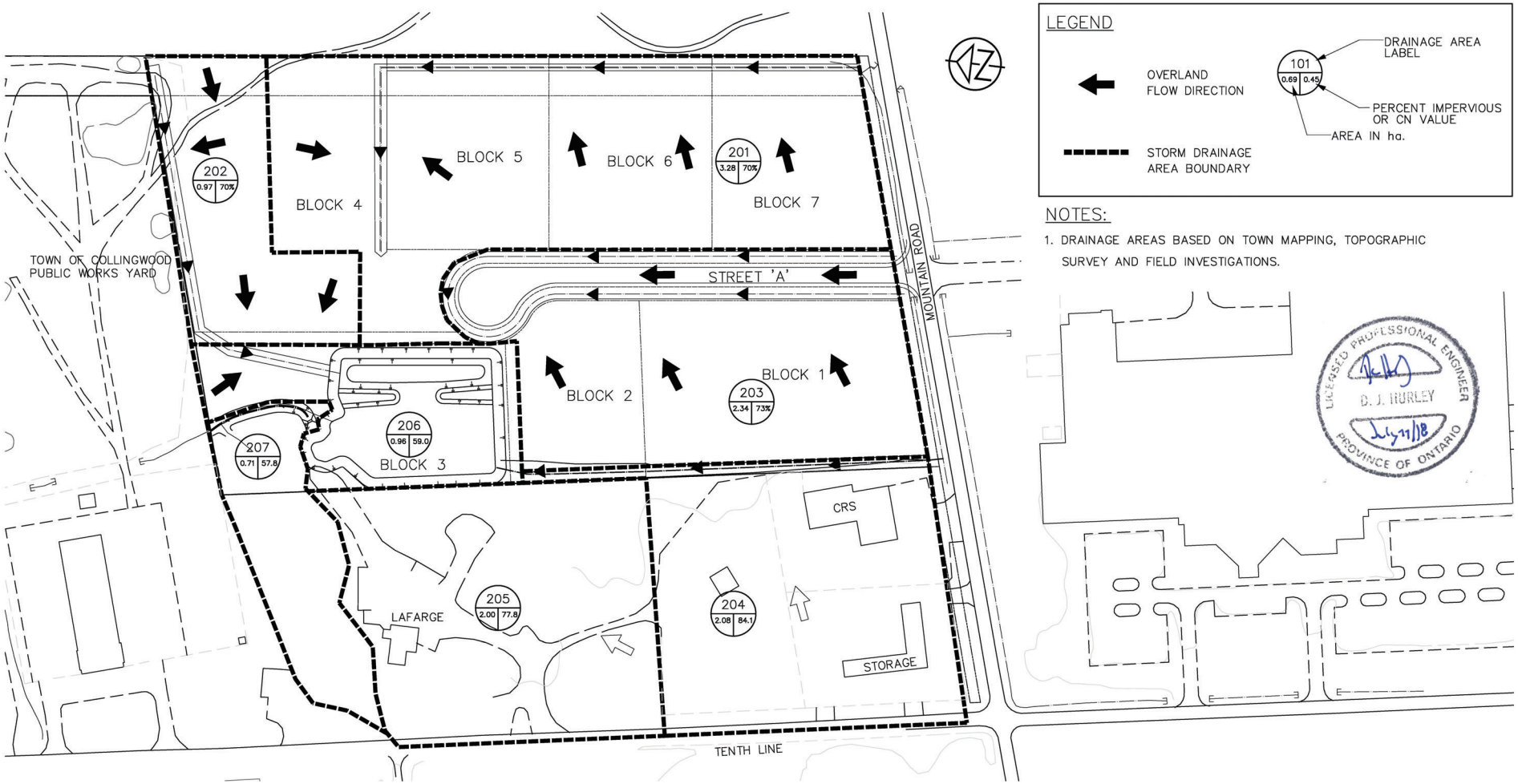
NO.	REVISIONS	DATE

VAN DOLDER'S HOME TEAM
185 MOUNTAIN ROAD

PRE–DEVELOPMENT DRAINAGE PLAN

C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie Ottawa

SCALE: 1: 2000		JOB NO. 116023
DESIGN: DAM	CHECKED: JPA	DWG. **DP-1**
DRAWN: APR	DATE: AUG/16	



CONTRACT DRAWINGS

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.

C.C. TATHAM & ASSOCIATES LTD. CLAIMS COPYRIGHT TO THIS DOCUMENT WHICH MAY NOT BE USED FOR ANY PURPOSE OTHER THAN THAT PROVIDED IN THE CONTRACT BETWEEN THE OWNER/CLIENT AND THE ENGINEER WITHOUT THE EXPRESS CONSENT OF C.C. TATHAM & ASSOCIATES LTD.

NO.	REVISIONS	DATE

VAN DOLDER'S HOME TEAM
185 MOUNTAIN ROAD

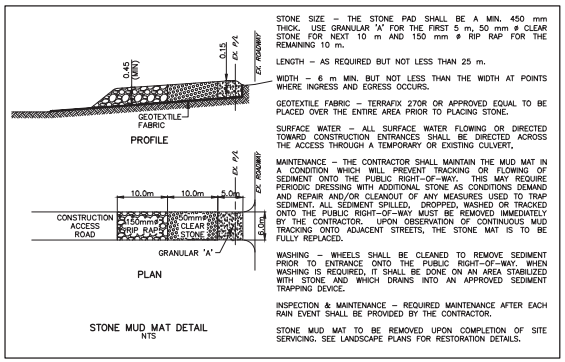
POST–DEVELOPMENT DRAINAGE PLAN

C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie Ottawa

SCALE: 1:2000		JOB NO. 116023
DESIGN: DAM	CHECKED: JPA	DWG. **DP-2**
DRAWN: APR	DATE: AUG/16	

SILTATION AND EROSION CONTROL

1. THE STORMWATER MANAGEMENT FACILITY AND ALL ASSOCIATED WORKS TO BE CONSTRUCTED AND ALL SILTATION AND EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND SHALL REMAIN IN PLACE UNTIL ALL DISTURBED AREAS HAVE BEEN STABILIZED. SILTATION AND EROSION CONTROL MEASURES THAT ARE DESIGNED TO CONTROL RUNOFF FROM SPECIFIC AREAS MUST BE INSTALLED PRIOR TO ANY DISTURBANCE OF THAT PART OF THE SITE. THE LOCATION OF ALL SILTATION AND EROSION CONTROL WORKS TO BE REVIEWED ON SITE BY THE ENGINEER. THE LOCATION OF SILTATION AND EROSION CONTROL WORKS MAY BE REVISED AS DIRECTED BY THE ENGINEER.
2. THE CONTRACTOR MAY CONSIDER ALTERNATIVE SILTATION AND EROSION CONTROL MEASURES. SUCH MEASURES MUST BE PRESENTED IN WRITING TO THE ENGINEER FOR APPROVAL OF THE TOWN AND NOTTAWASAGA CONSERVATION AUTHORITY (NVCA).
3. THE CONTRACTOR SHALL HAVE MATERIALS AVAILABLE ON-SITE TO REPAIR SILTATION AND EROSION CONTROL DEVICES IN THE EVENT OF UNFORESEEN CONDITIONS SUCH AS HIGH WATER, EXTREME RAINFALL EVENTS, ETC.
4. ALL EROSION AND SILTATION CONTROL DEVICES MUST BE INSPECTED, CLEANED AND MAINTAINED BY THE CONTRACTOR AFTER EACH STORM EVENT. ALL WORKS WILL BE INSPECTED BY THE ENGINEER BI-WEEKLY AND AFTER EACH MAJOR STORM EVENT.
5. CONSTRUCTION OF ALL SILTATION AND EROSION CONTROL WORKS ARE TO BE IN ACCORDANCE WITH THE FOLLOWING STEPS:
   1. INSTALL SILT FENCE AS PER NVCA BSD-23.
   2. INSTALL ROCK FLOW CHECK DAM (RFCD) AS PER OPSD 219.210.
   3. INSTALL STRAW BALE FLOW CHECK (SBFC) AS PER OPSD 219.180.
6. ALL CONSTRUCTION VEHICLES TO ACCESS SITE USING THE DESIGNATED CONSTRUCTION ACCESS.
7. EROSION AND SILTATION CONTROL MEASURES TO BE REMOVED BY THE CONTRACTOR ONCE GROUND COVER IS ESTABLISHED AND LANDSCAPING IS COMPLETE AND APPROVED BY THE ENGINEER.
8. STOCKPILE LOCATIONS ARE TO BE APPROVED BY THE ENGINEER. INTERNAL HAUL ROADS TO BE APPROVED BY THE ENGINEER.
9. PROVIDE SNOW FENCE OR APPROVED EQUAL ACROSS ALL CONSTRUCTION ACCESS POINTS DURING PERIODS OF INACTIVITY.
10. CONSTRUCTION AREAS THAT EXCEED 30 DAYS OF INACTIVITY SHALL BE STABILIZED BY TOPSOIL AND SEED.
11. THE ROUGH GRADED STORMWATER MANAGEMENT FACILITY, INCLUDING OUTLET STRUCTURE, SHALL BE USED AS THE TEMPORARY SILTATION CONTROL BASIN DURING THE COURSE OF CONSTRUCTION.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SWEEPING ADJACENT ROADS AS REQUIRED THROUGHOUT CONSTRUCTION OR AS DIRECTED BY THE TOWN, THE ENGINEER, OR THE NOTTAWASAGA VALLEY CONSERVATION AUTHORITY (NVCA).
13. WHERE ADJACENT TO TREE PROTECTION ZONES (TPZ'S) THE HEAVY DUTY SILT FENCING DESCRIBED ON DRAWING SC-1 SHALL ALSO FULFILL TREE PROTECTION OBJECTIVES IN ACCORDANCE WITH THE FOLLOWING ADDITIONAL LAYOUT REQUIREMENTS AND CONSTRUCTION RESTRICTIONS:
    1. TPZ LIMITS SHALL BE STAKED BY THE CONTRACTOR AND CONFIRMED ON-SITE BY THE LANDSCAPE ARCHITECT PRIOR TO THE INSTALLATION OF THE FENCE. WHERE POSSIBLE, TPZ'S SHALL BE LOCATED AT OR OUTSIDE THE DRIPLINE OF PROTECTED TREES, WHICH IS DEFINED AS THE CIRCLE THAT COULD BE DRAW ON THE SOIL AROUND A TREE DIRECTLY UNDER THE TIPS OF ITS OUTERMOST AND WIDEST BRANCHES.
    2. INSTALL THE PROTECTIVE FENCE BARRIER OUTSIDE OR TO THE LIMITS OF THE TPZ'S AND OBTAIN APPROVAL FROM THE LANDSCAPE ARCHITECT PRIOR TO COMMENCING CLEARING AND GRUBBING OPERATIONS.
    3. NO CONSTRUCTION ACTIVITY, INCLUDING GRADE CHANGES, EXCAVATIONS, ROOT CUTTING, STORAGE OF MATERIALS OR FILL, MOVEMENT/STORAGE OF VEHICLES, OR SURFACE TREATMENTS OF ANY KIND ARE PERMITTED WITHIN THE TPZ'S, UNLESS OTHERWISE INDICATED.
    4. PROTECT VEGETATION AND ROOT SYSTEMS FROM ANY DAMAGE, COMPACTION, AND CONTAMINATION RESULTING FROM CONSTRUCTION AND KEEP FREE OF CONSTRUCTION MATERIAL AND DEBRIS.
    5. CLEANLY CUT ALL ROOTS OUTSIDE THE TPZ'S THAT BECOME EXPOSED DURING CONSTRUCTION.
    6. NO DISCHARGE OF SITE/STORM WATER IS PERMITTED THROUGH OR INTO THE TPZ.
    7. NO ATTACHMENTS, FENCES OR WIRES, OTHER THEN THOSE APPROVED FOR TREE SUPPORT SYSTEMS, SHALL BE ATTACHED TO ANY PROTECTED TREE DURING CONSTRUCTION.
    8. PROTECTIVE FENCE BARRIERS MUST REMAIN IN EFFECTIVE CONDITION UNTIL ALL SITE ACTIVITIES INCLUDING LANDSCAPING ARE COMPLETED.
    9. THE CONTRACTOR SHALL REMOVE PROTECTIVE FENCING AT THE COMPLETION OF THE SITE WORKS FOLLOWING WRITTEN APPROVAL BY THE LANDSCAPE ARCHITECT.



STONE MUD MAT DETAIL
NTS

STONE SIZE – THE STONE PAD SHALL BE A MIN. 450 mm THICK. USE GRANULAR 'A' FOR THE FIRST 5 m, 50 mm ø CLEAR STONE FOR NEXT 10 m AND 150 mm ø RIP RAP FOR THE REMAINING 10 m.

LENGTH – AS REQUIRED BUT NOT LESS THAN 25 m.

WIDTH – 6 m MIN. BUT NOT LESS THAN THE WIDTH AT POINTS WHERE INGRESS AND EGRESS OCCURS.

GEOTEXTILE FABRIC – TERRAFIX 270R OR APPROVED EQUAL TO BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING STONE.

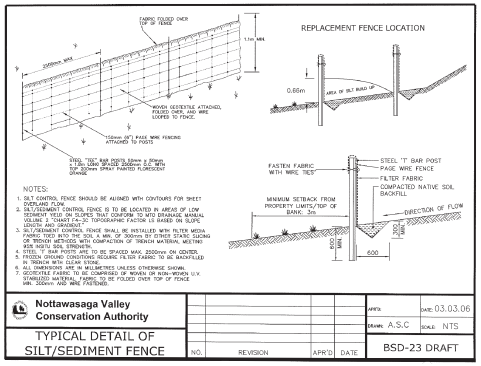
SURFACE WATER – ALL SURFACE WATER FLOWING OR DIRECTED TOWARD CONSTRUCTION ENTRANCES SHALL BE DIRECTED ACROSS THE ACCESS THROUGH A TEMPORARY OR EXISTING CULVERT.

MAINTENANCE – THE CONTRACTOR SHALL MAINTAIN THE MUD MAT IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO THE PUBLIC RIGHT-OF-WAY. THIS MAY REQUIRE PERIODIC DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO THE PUBLIC RIGHT-OF-WAY MUST BE REMOVED IMMEDIATELY BY THE CONTRACTOR. UPON OBSERVATION OF CONTINUOUS MUD TRACKING ONTO ADJACENT STREETS, THE STONE MAT IS TO BE FULLY REPLACED.

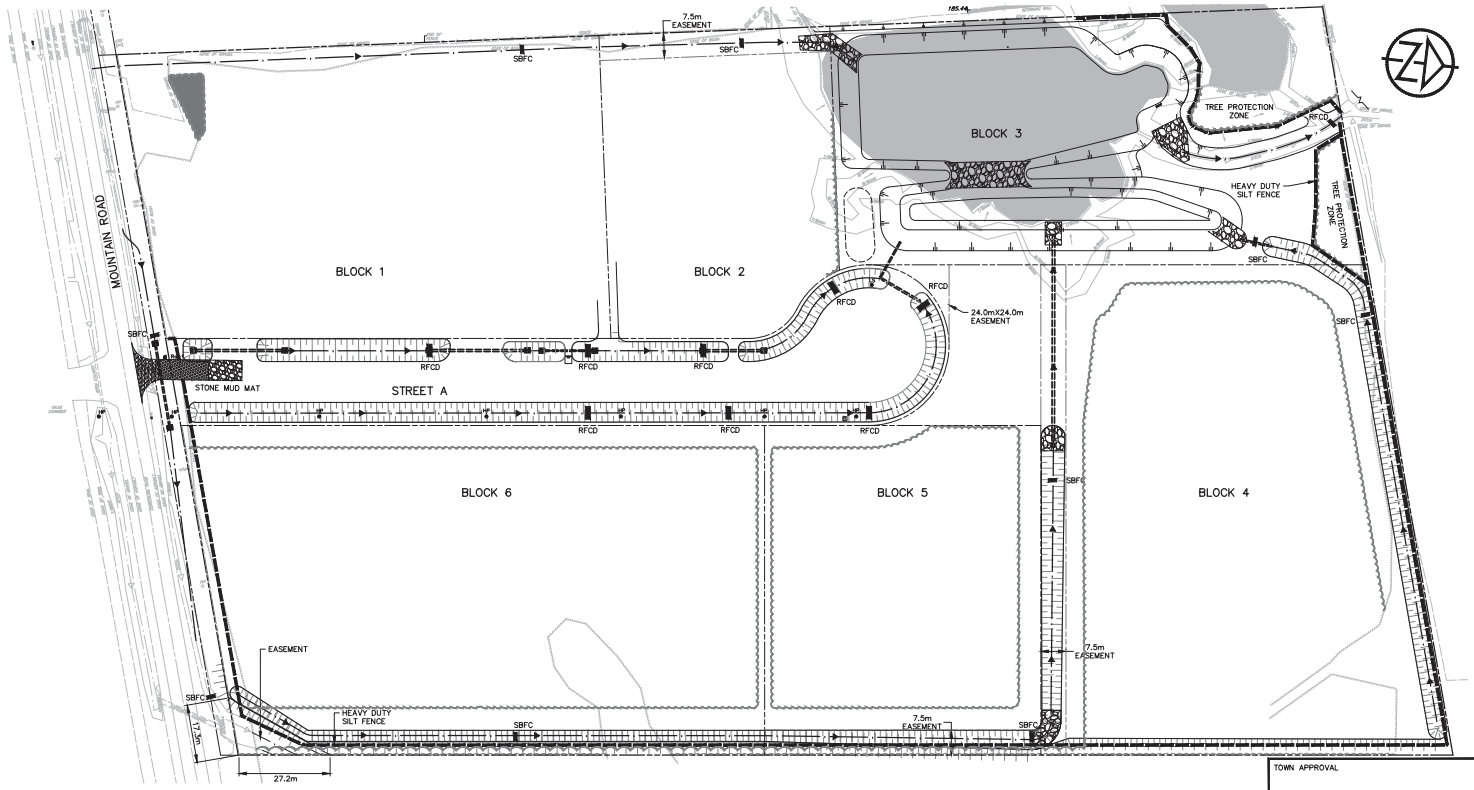
WASHING – WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO THE PUBLIC RIGHT-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.

INSPECTION & MAINTENANCE – REQUIRED MAINTENANCE AFTER EACH RAIN EVENT SHALL BE PROVIDED BY THE CONTRACTOR.

STONE MUD MAT TO BE REMOVED UPON COMPLETION OF SITE SERVICING. SEE LANDSCAPE PLANS FOR RESTORATION DETAILS.



Nottawasaga Valley Conservation Authority		APP'D	DATE: 03.03.06
		DRAWN: A.S.C	SCALE: NTS
TYPICAL DETAIL OF SILT/SEDIMENT FENCE	NO.	REVISION	APR'D DATE	BSD-23 DRAFT



LEGEND:

LIMIT OF TREE CLEARING	
HEAVY DUTY SILT FENCE	
ROCK FLOW CHECK DAM	RFCD
STRAW BALE FLOW CHECK DAM	SBFC

TOWN APPROVAL

CONTRACT DRAWINGS

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.

C.C. TATHAM & ASSOCIATES LTD. CLAIMS COPYRIGHT TO THIS DOCUMENT WHICH MAY NOT BE USED FOR ANY PURPOSE OTHER THAN THAT PROVIDED IN THE CONTRACT BETWEEN THE OWNER/CLIENT AND THE ENGINEER WITHOUT THE EXPRESS CONSENT OF C.C. TATHAM & ASSOCIATES LTD.

BENCHMARK INFORMATION

TBM 2 – 189.765m
NAIL & WASHER ON NORTH FACE OF HYDRO POLE LOCATED ON NORTH SIDE OF MOUNTAIN ROAD JUST WEST OF EXISTING ACCESS TO SITE.

NO.	REVISIONS	DATE	INITIAL
3.	THIRD ENGINEERING SUBMISSION	AUG 1/18	JPA
2.	SECOND ENGINEERING SUBMISSION	APR 10/18	JPA
1.	FIRST ENGINEERING SUBMISSION	DEC 22/17	JPA

ENGINEER APPROVAL

LICENSED PROFESSIONAL ENGINEER M. J. CUCLIP 90512207 PROVINCE OF ONTARIO

INDUSTRIAL SUBDIVISION
185 MOUNTAIN ROAD
TOWN OF COLLINGWOOD

SILTATION AND EROSION CONTROL PLAN

C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie Ottawa

SCALE: 1:750		JOB NO.	116023
DESIGN: APR/DFM	CHECKED: JPA/MJC	DWG.	SC-1
DRAWN: APR/DFM	DATE: DEC/17		

OVERFLOW WEIR CROSS SECTION A–A'

SCALE: NTS

POND OUTLET CROSS SECTION B–B'

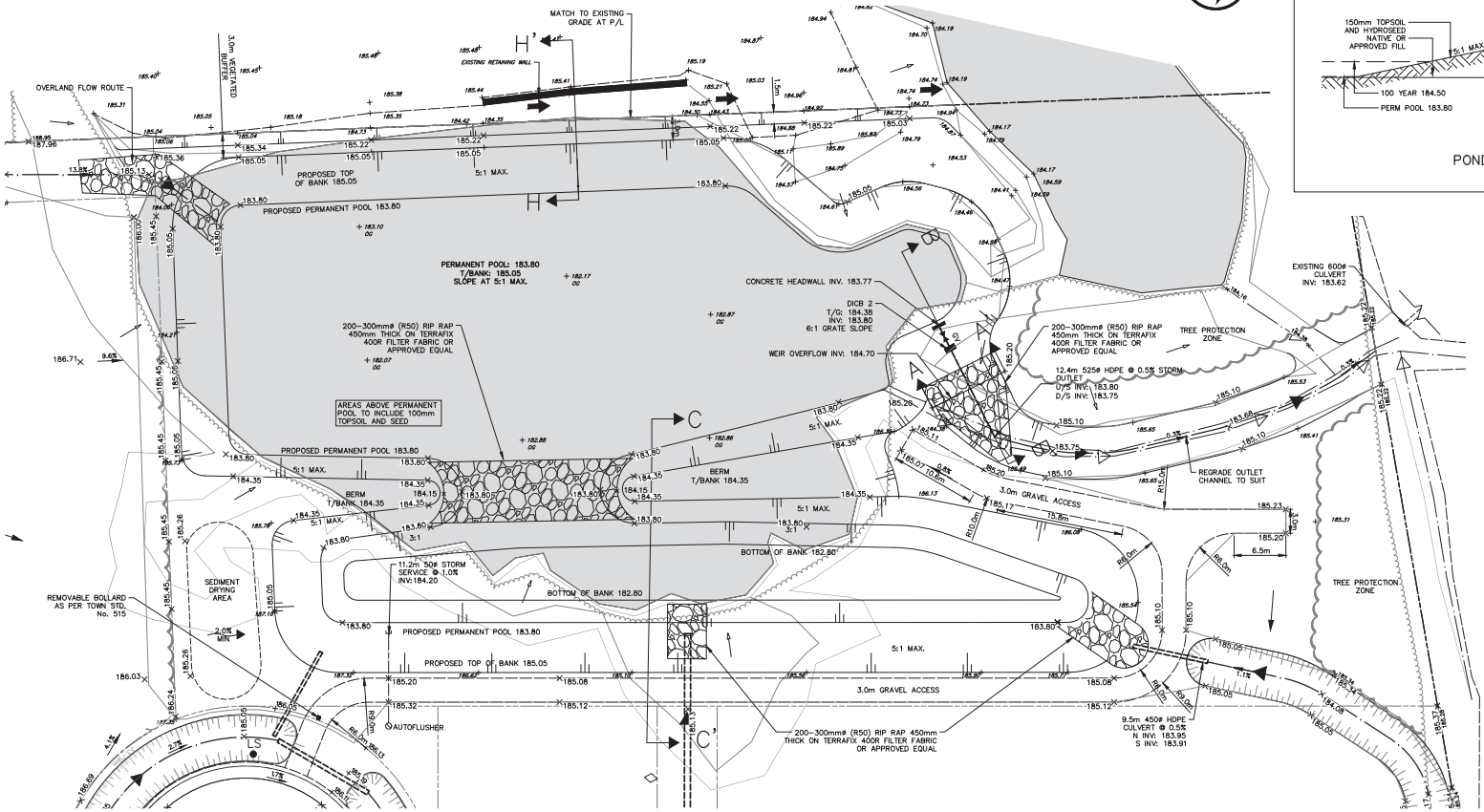
SCALE: NTS

POND CROSS SECTION C–C'

SCALE: NTS

POND CROSS SECTION H–H'

SCALE: NTS



SEED MIX NOTES

1. SEED MIX 'A' TO BE USED AT ALL DISTURBED AREAS WITHIN 2.0 m OF THE WATER'S EDGE.

SEED MIX 'A' – FACW WETLAND MEADOW MIXTURE

10% NEW ENGLAND ASTER
1% HEATH ASTER
1% ZIG ZAG ASTER
5% LURID SEDGE
25% FOX SLEDGE
25% VIRGINIA WILD RYE
1% SPOTTED JOE PYE WEED
1% BONSET
1% CANADA GOLDENROD
5% FOWL MANAGRASS
1% BLUE LOBELIA
24% BLUE VERVAIN

SEED AT 125 g / 45 m²

- SEEDING RATE FOR ABOVE: PACKAGE OF 125 GRAMS COVERS 45 M² (5,000 ft²)
- NURSE CROP FOR ABOVE: OATS (AVENA SATIVA) – APPLY HYDROSEED USING A MULCH SLURRY WITH ADHESIVE AT A RATE OF 34 kg/ha (30 lbs/acre).

2. SEED MIX 'B' TO BE USED AT ALL DISTURBED AREAS OUTSIDE OF 2.0 m OF THE WATER'S EDGE.

SEED MIX 'B' – NATIVE PRARIE MEADOW MIXTURE

2% BEARDTONGUE
7% BLACKEYED SUSAN
4% COMMON MILKWEED
1% EARL GOLDENROD
20% FOWL BLUEGRASS
20% INDIANGRASS
30% LITTLE BLUESTEM
1% NEW ENGLAND ASTER
1% SHOWY TICK TREFOIL
12% SWITCHGRASS
1% WHITE VERVAIN
1% WILD BERGAMOT

SEED AT 125 g / 45 m²

- SEEDING RATE FOR ABOVE: 20 – 25 kg/ha (18 – 22 lbs/acre)
- NURSE CROP FOR ABOVE: OATS (AVENA SATIVA) – APPLY HYDROSEED USING A MULCH SLURRY WITH ADHESIVE AT A RATE OF 34 kg/ha (30 lbs/acre).

TOWN APPROVAL

CONTRACT DRAWINGS

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.

C.C. TATHAM & ASSOCIATES LTD. CLAIMS COPYRIGHT TO THIS DOCUMENT WHICH MAY NOT BE USED FOR ANY PURPOSE OTHER THAN THAT PROVIDED IN THE CONTRACT BETWEEN THE OWNER/CLIENT AND THE ENGINEER WITHOUT THE EXPRESS CONSENT OF C.C. TATHAM & ASSOCIATES LTD.

BENCHMARK INFORMATION

TBM 2 – 189.765m
NAIL & WASHER ON NORTH FACE OF HYDRO POLE LOCATED ON NORTH SIDE OF MOUNTAIN ROAD JUST WEST OF EXISTING ACCESS TO SITE.

NO.	REVISIONS	DATE	INITIAL
3.	THIRD ENGINEERING SUBMISSION	AUG 1/18	JPA
2.	SECOND ENGINEERING SUBMISSION	APR 10/18	JPA
1.	FIRST ENGINEERING SUBMISSION	DEC 22/17	JPA

ENGINEER APPROVAL

LICENSED PROFESSIONAL ENGINEER
G. J. HURLEY
PROVINCE OF ONTARIO

INDUSTRIAL SUBDIVISION
185 MOUNTAIN ROAD
TOWN OF COLLINGWOOD

POND LAYOUT AND DETAILS

C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie Ottawa

SCALE: 1:300		JOB NO.	116023
DESIGN: APR/DFM	CHECKED: JPA/MJC	DWG.	PND-1
DRAWN: APR/DFM	DATE: DEC/17		

Drawing Name: 116023-PND01.dwg, Plotted: Aug 01, 2018

LIST OF DRAWINGS

Drawing C101: Site Plan

Drawing C101A: General Site Servicing Plan

Drawing C102: Removals Erosion and Sediment Control Plan

Drawing C103: Grading Plan

Drawing C104: Post Development Storm Drainage Plan

Drawing C105A: Stormwater Management Facility Plan

Drawing C105B: Stormwater Management Facility Profile

Drawing C105C: Stormwater Management Details

Drawing C106: Water Service Connection Profile

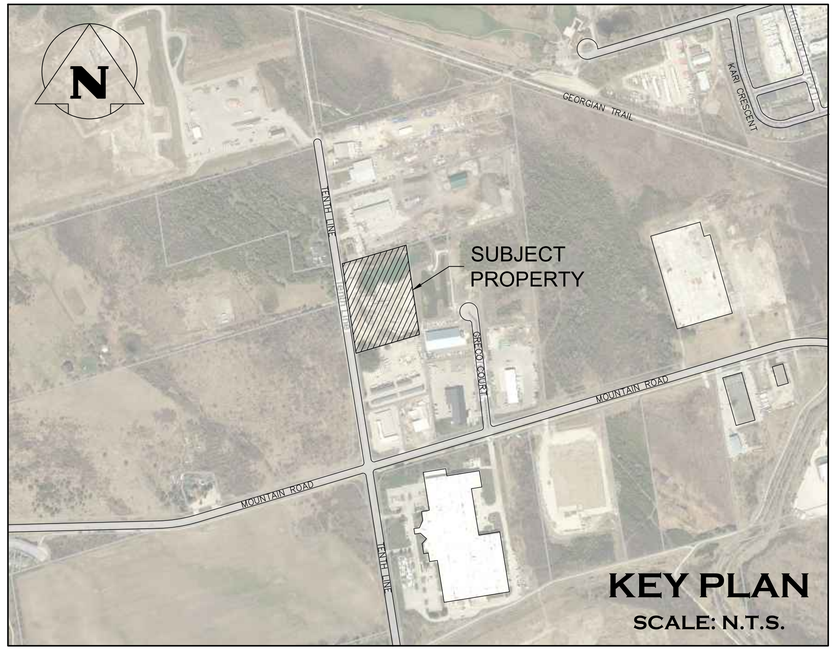
Drawing T300: Vehicle Maneuvering Analysis

555 TENTH LINE

TOWN OF COLLINGWOOD

COUNTY OF SIMCOE

SHEET LIST TABLE	
SHEET DESCRIPTION	SHEET TITLE
C100	COVER
C101	SITE PLAN
C101A	GENERAL SITE SERVICING PLAN
C102	REMOVALS & EROSION AND SEDIMENT CONTROL PLAN
C103	GRADING PLAN
C104	POST DEVELOPMENT STORM DRAINAGE PLAN
C105A	STORMWATER MANAGEMENT FACILITY PLAN
C105B	STORMWATER MANAGEMENT FACILITY PROFILE
C105C	STORMWATER MANAGEMENT DETAILS
C106	WATER SERVICE CONNECTION PROFILE
T300	VEHICLE MANEUVERING ANALYSIS



MUNICIPALITY

TOWN OF COLLINGWOOD
97 HURONTARIO STREET
COLLINGWOOD, ONTARIO, L9Y 3Z5

COUNTY

COUNTY OF SIMCOE
1110 HIGHWAY 26
MIDHURST, ONTARIO, L0L 1X0

DEVELOPER

AMRIZE CANADA INC.
9–1940 OXFORD ST. E
LONDON, ONTARIO, N5V 2Z8

DEVELOPER'S ENGINEER & LANDSCAPE ARCHITECT

CROZIER
CONSULTING ENGINEERS
70 HURON STREET, SUITE 100
COLLINGWOOD, ON, L9Y 4L4
705-446-3510
WWW.CFCROZIER.CA

MASTER LEGEND

EXISTING FEATURES (EX.)

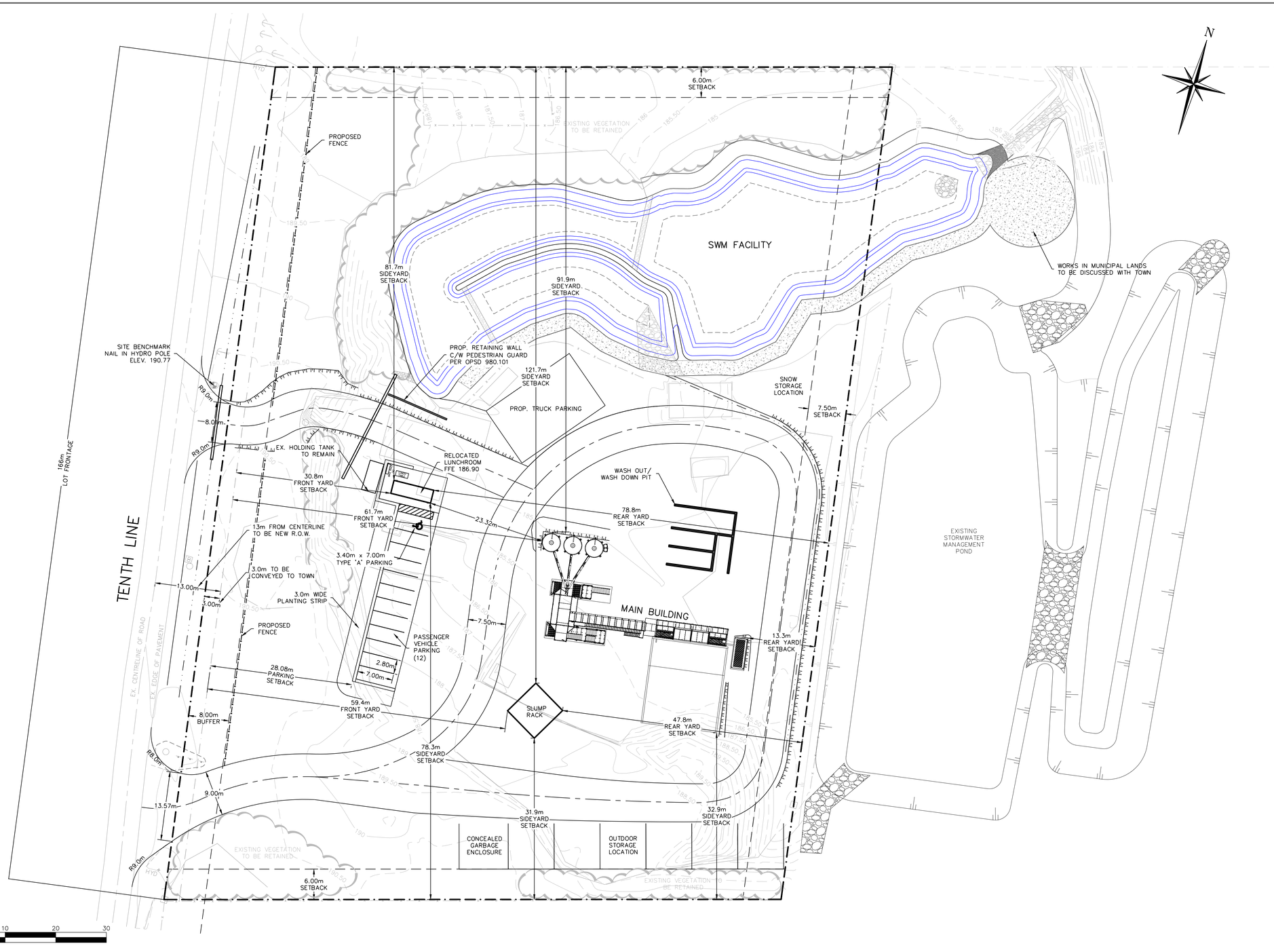
- EX. CONTOUR
- EX. GRADE
- EX. TREELINE
- EX. WATERCOURSE
- EX. DITCH
- EX. WATERMAIN
- EX. WATER SERVICE
- EX. FIRE HYDRANT & VALVE
- EX. SANITARY SEWER & MANHOLE
- EX. SANITARY FORCEMAIN
- EX. SANITARY SERVICE
- EX. STORM SEWER & MANHOLE
- EX. STORM CATCHBASIN
- EX. STORM DOUBLE CATCHBASIN
- EX. STORM CATCHBASIN MANHOLE
- EX. STORM DOUBLE CATCHBASIN MANHOLE
- EX. GAS MAIN
- EX. BELL LINE
- EX. BELL PEDESTAL
- EX. CABLE TELEVISION PEDESTAL
- EX. HYDRO POLE
- EX. LIGHT STANDARD
- EX. SIGN
- EX. BUILDING
- EX. BENCHMARK NUMBER & LOCATION
- EX. BOREHOLE NUMBER & LOCATION

PROPOSED FEATURES (PR.)

- PR. PROPERTY LIMITS
- PR. ELEVATION
- PR. ELEVATION (MATCH EX. ELEVATION)
- PR. SWALE & SLOPE
- PR. DITCH DRAINAGE
- PR. WATERMAIN & VALVE
- PR. WATER SERVICE
- PR. FIRE HYDRANT & VALVE
- PR. WATER VALVE CHAMBER
- PR. WATER QUALITY TESTING STATION
- PR. SANITARY SEWER & MANHOLE
- PR. SANITARY FORCEMAIN
- PR. SANITARY SERVICE
- PR. SANITARY CATCHMENT
  - CATCHMENT AREA ID
  - AREA (ha)
  - POPULATION (3.5 p.p.u.)
- PR. STORM SEWER & MANHOLE
- PR. CATCHBASIN
- PR. DOUBLE CATCHBASIN
- PR. CATCHBASIN MANHOLE
- PR. DOUBLE CATCHBASIN MANHOLE
- PR. STORM CATCHMENT
  - CATCHMENT AREA ID
  - RUNOFF COEFFICIENT
  - DRAINAGE AREA (ha)
- PR. CURB CUT
- PR. CANADA POST COMMUNITY MAIL BOX
- PR. TRANSFORMER
- PR. STOP SIGN
- PR. NAME SIGN
- PR. NO PARKING SIGN
- PR. FENCE
- PR. BUILDING ENVELOPE
- PR. LIGHT DUTY SILT FENCE
- PR. HEAVY DUTY SILT FENCE
- PR. STRAW BALE CHECK FLOW
- PR. ROCK CHECK DAM
- PR. SLOPE (3:1 MAX.)
- PR. TREE PRESERVATION AREA
- PR. TOPSOIL STOCKPILE LOCATION

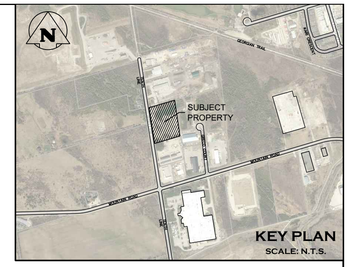
PROJECT No.: 2577-6904

SECOND SUBMISSION



10 0m 10 20 30

SCALE: 1:400



LEGEND

- PROPERTY LINE
- PROP. FENCE
- EX. WATERMAIN
- EX. FENCE

SITE STATISTICS		
M2 ZONE	REQUIRED	PROVIDED
LOT AREA	3000 sq.m.	20060 sq.m.
LOT FRONTAGE	30 m	166 m
MAX LOT COVERAGE	50%	4.36%
LANDSCAPE OPEN SPACE	15%	40%
PARKING	3	12

MAIN BUILDING		
M2 ZONE	REQUIRED	PROVIDED
FRONT YARD SETBACK	12 m	61.7 m
EXTERIOR SETBACK	12 m	N/A
INTERIOR SETBACK	6 m	32.9 m
REAR YARD	7.5 m	13.3 m
MAX HEIGHT	15 m	14.6 m
GROSS FLOOR AREA	--	173.7 m²

LUNCHROOM BUILDING		
M2 ZONE	REQUIRED	PROVIDED
FRONT YARD SETBACK	12 m	30.8 m
EXTERIOR SETBACK	12 m	N/A
INTERIOR SETBACK	6 m	78.3 m
REAR YARD	7.5 m	78.8 m
MAX HEIGHT	15 m	3.5 m
GROSS FLOOR AREA	--	21.3 m²

SLUMP RACK		
M2 ZONE	REQUIRED	PROVIDED
FRONT YARD SETBACK	12 m	59.4 m
EXTERIOR SETBACK	12 m	N/A
INTERIOR SETBACK	6 m	31.9 m
REAR YARD	7.5 m	47.8 m
MAX HEIGHT	15 m	N/A

City Stamp

1. THIS DRAWING IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC. AND THE MODIFICATION AND/OR REPRODUCTION OF ANY PART OF THIS DRAWING IS STRICTLY PROHIBITED WITHOUT WRITTEN AUTHORIZATION FROM THIS OFFICE.
2. THE DIGITAL FILES CONTAIN INTELLECTUAL AND DIGITAL DATA PROPERTY THAT IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC.
3. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO C.F. CROZIER & ASSOCIATES INC. PRIOR TO CONSTRUCTION.
4. THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT.
5. ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
6. DO NOT SCALE DRAWINGS.

TEMPORARY BENCHMARKS

TBM#1-NAIL IN HYDRO POLE, 190.77

NOTE: ELEVATION DATA DERIVED USING NAD83(CSRS), UTM ZONE 17N

Town

SINCE 1858, A PLACE TO LIVE, WORK & PLAY
COLLINGWOOD

No.	ISSUE	DATE: YYYY/MM/DD
0	ISSUED FOR FIRST SUBMISSION	2025/06/24
1	ISSUED FOR SECOND SUBMISSION	2025/12/11

ENGINEER

LICENSED PROFESSIONAL ENGINEER
C.A. SCOBIE
100513418
Dec. 11, 2025
PROVINCE OF ONTARIO

ENGINEER

LICENSED PROFESSIONAL ENGINEER
J.T. KERSCHBAUMER
100532793
DEC 11, 2025
PROVINCE OF ONTARIO

Project

555 TENTH LINE
TOWN OF COLLINGWOOD

Drawing

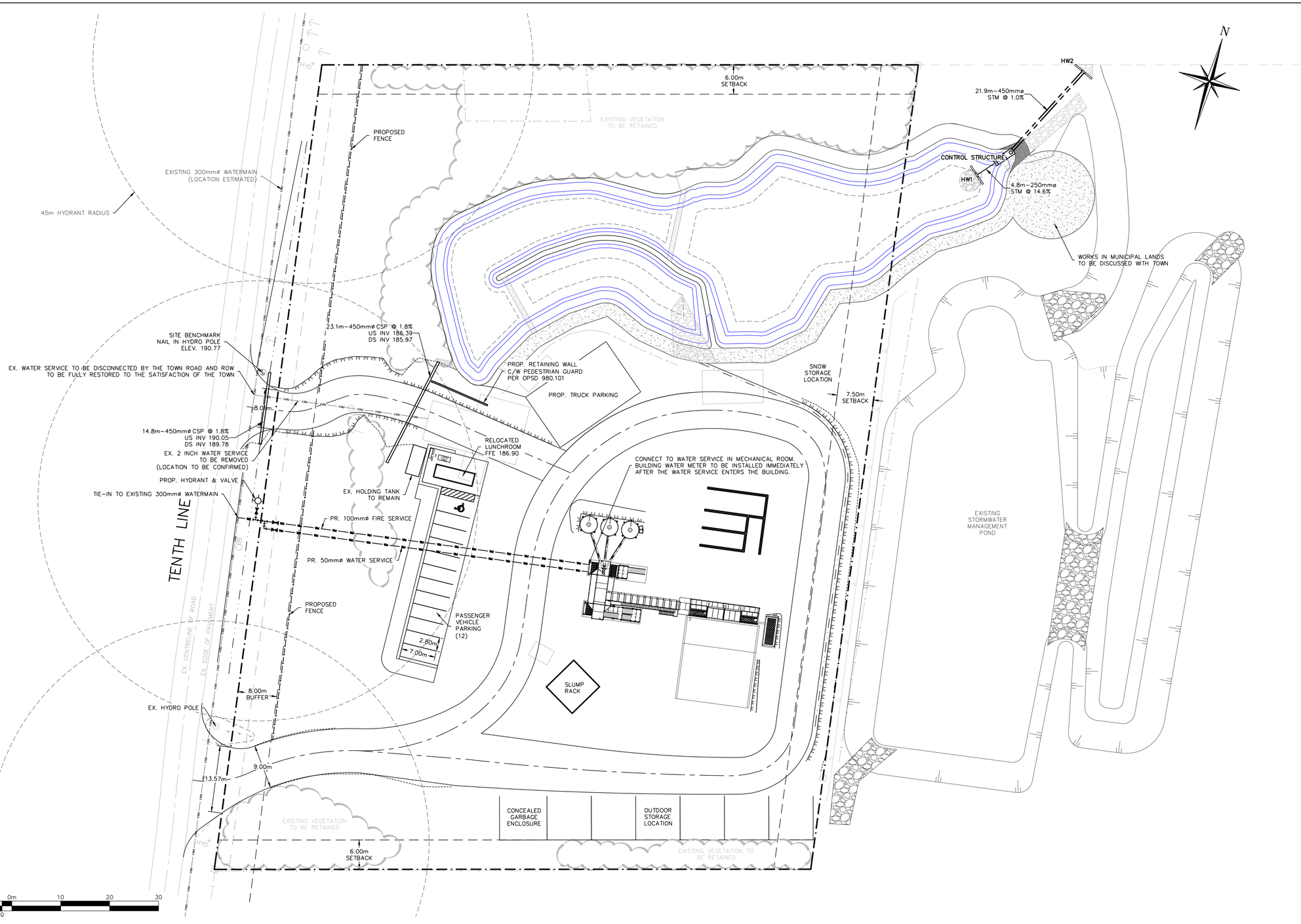
SITE PLAN

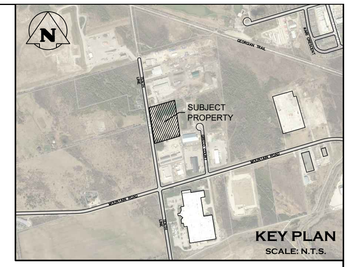
CROZIER CONSULTING ENGINEERS
70 HURON STREET, SUITE 100
COLLINGWOOD, ON, L9Y 4L4
705-446-3510
WWW.CFCROZIER.CA

Drawn By	D.G.	Design By	D.G.
Check By	J.K.	Check By	C.S.

Project 2577-6904

Drawing C101





LEGEND

- PROPERTY LINE
- PROP. WATERMAIN
- PROP. FENCE
- EX. WATERMAIN
- EX. FENCE

1. THIS DRAWING IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC. AND THE MODIFICATION AND/OR REPRODUCTION OF ANY PART OF THIS DRAWING IS STRICTLY PROHIBITED WITHOUT WRITTEN AUTHORIZATION FROM THIS OFFICE.
2. THE DIGITAL FILES CONTAIN INTELLECTUAL AND DIGITAL DATA PROPERTY THAT IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC.
3. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO C.F. CROZIER & ASSOCIATES INC. PRIOR TO CONSTRUCTION.
4. THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT.
5. ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
6. DO NOT SCALE DRAWINGS.

TEMPORARY BENCHMARKS

TBM#1–NAIL IN HYDRO POLE, 190.77

NOTE: ELEVATION DATA DERIVED USING NAD83(CSRS), UTM ZONE 17N

Town

SINCE 1858 A PLACE TO LIVE WORK & PLAY
COLLINGWOOD

No.	ISSUE	DATE: YYYY/MM/DD
0	ISSUED FOR FIRST SUBMISSION	2025/06/24
1	ISSUED FOR SECOND SUBMISSION	2025/12/11

ENGINEER

LICENSED PROFESSIONAL ENGINEER
C.A. SCOBIE
100513418
PROVINCE OF ONTARIO
Dec. 4, 2025

ENGINEER

LICENSED PROFESSIONAL ENGINEER
J.T. KERSCHBAUMER
100532793
PROVINCE OF ONTARIO
DEC 11, 2025

City Stamp

Project

555 TENTH LINE
TOWN OF COLLINGWOOD

Drawing

GENERAL SITE SERVICING PLAN

CROZIER CONSULTING ENGINEERS
70 HURON STREET, SUITE 100
COLLINGWOOD, ON, L9Y 4L4
705.446.3510
WWW.CFCROZIER.CA

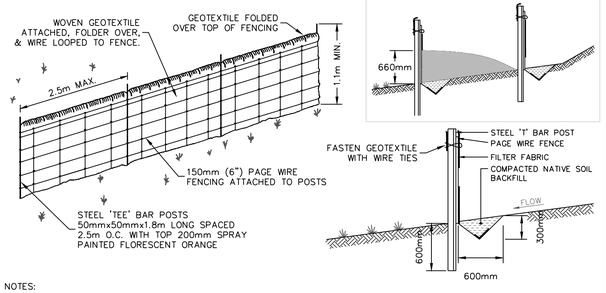
Drawn By	D.G.	Design By	D.G.
Check By	J.K.	Check By	C.S.

Project 2577–6904

Drawing C101A

TYPICAL HEAVY DUTY SILT FENCE

SCALE: N.T.S.

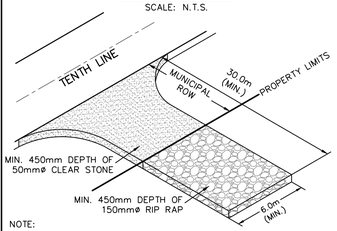


REPLACEMENT FENCE LOCATION

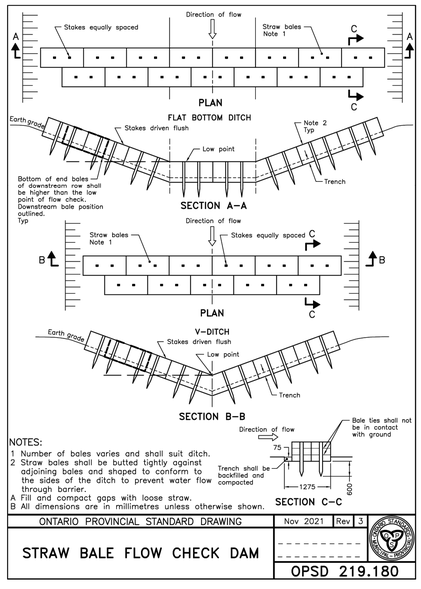
NOTES:
1. SILT CONTROL FENCE SHOULD BE ALIGNED WITH CONTOURS FOR SHEET OVERLAND FLOW.
2. SILT CONTROL FENCE IS TO BE LOCATED IN AREAS OF LOW SEDIMENT YIELD ON SLOPES THAT CONFORM TO MTO DRAINAGE MANUAL VOLUME 2 "CHART F4–3C TOPOGRAPHIC FACTOR LS BASED ON SLOPE LENGTH AND GRADIENT."
3. SILT CONTROL FENCE SHALL BE INSTALLED WITH FILTER MEDIA FABRIC TOED INTO THE SOIL A MIN. OF 300mm BY EITHER STATIC SLICING OR TRENCH METHODS WITH COMPACTION OF TRENCH MATERIAL MEETING 95% INSITU SOIL STRENGTH.
4. STEEL 'TEE' BAR POSTS ARE TO BE SPACED MAX. 2.5m ON CENTER WITH A MIN. HEIGHT OF 1.1m.
5. FROZEN GROUND CONDITIONS REQUIRE FILTER FABRIC TO BE BACKFILLED IN TRENCH WITH CLEAR STONE.
6. GEOTEXTILE FABRIC TO BE COMPRISED OF WOVEN OR NON–WOVEN U.V. STABILIZED MATERIAL. FABRIC TO BE FOLDED OVER TOP OF FENCE MIN. 300mm AND WIRE FASTENED.

MUD MAT DETAIL

SCALE: N.T.S.



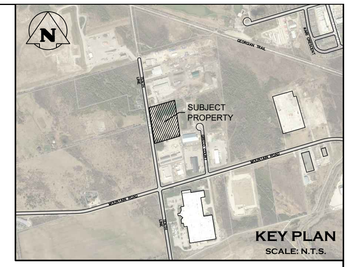
NOTE:
GEOTEXTILE (TERRAFIX 270R OR APPROVED EQUAL) TO BE PLACED AS SEPARATION BARRIER BETWEEN EXISTING GROUND AND CLEAR STONE.



NOTES:
1 Number of bales varies and shall suit ditch.
2 Straw bales shall be butted tightly against adjoining bales and shaped to conform to the sides of the ditch to prevent water flow through barrier.
A Fill and compact gaps with loose straw.
B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2021	Rev 3
STRAW BALE FLOW CHECK DAM	OPSD 219.180	

10 0m 10 20 30
SCALE: 1:400



LEGEND

- PROPERTY LINE
- PROP. HEAVY DUTY SILT FENCE
- PROP. STRAW BALE FLOW CHECK DAM
- X — OBJECT REMOVAL
- // — LINEAR REMOVAL

CONSTRUCTION NOTES:

GENERAL

1. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND SHALL REMAIN IN PLACE UNTIL ALL DISTURBED AREAS HAVE BEEN STABILIZED. SEDIMENT AND EROSION.
2. THE CONTRACTOR MAY CONSIDER ALTERNATIVE SEDIMENT AND EROSION CONTROL MEASURES. SUCH MEASURES MUST BE PRESENTED IN WRITING FOR APPROVAL OF THE CONTRACT ADMINISTRATOR AND TOWN STAFF.
3. THE CONTRACTOR SHALL HAVE MATERIALS AVAILABLE ON–SITE TO REPAIR SEDIMENT AND EROSION CONTROL MEASURES IN THE EVENT OF UNFORESEEN CONDITIONS: HIGHWATER, EXTREME RAINFALL EVENTS, ETC.
4. CONTRACTOR TO ENSURE POSITIVE DRAINAGE THROUGH SITE SUCH THAT NO UPSTREAM OR DOWNSTREAM IMPACT OCCURS DURING CONSTRUCTION ACTIVITIES.
5. THE CONTRACTOR WILL BE RESPONSIBLE TO CLEAN ALL ADJACENT ROADWAYS AS REQUIRED OR AS DIRECTED BY SITE ENGINEER OR TOWN STAFF.
6. DURING EARTHWORK ACTIVITIES THE CONTRACTOR WILL ENSURE THE MEASURES FOR DUST SUPPRESSION ARE PROVIDED AS REQUIRED OR AS DIRECTED BY THE TOWN OR ENGINEER.

MAINTENANCE & OPERATION OF SEDIMENT CONTROLS

A) SILT FENCE

1. SILT FENCE TO BE INSTALLED ALONG PROPERTY LINE AND ALONG LIMITS OF PROTECTED AREAS.
2. SILT FENCE MUST BE INSPECTED WEEKLY FOR RIPS OR TEARS, BROKEN STAKES, BLOW–OUTS AND ACCUMULATION OF SEDIMENT.
3. SILT FENCE MUST BE INSPECTED IMMEDIATELY AFTER EVERY RAIN STORM EVENT OR AS DIRECTED BY SITE ENGINEER.
4. SEDIMENT DEPOSITS MUST BE REMOVED FROM SILT FENCE WHEN ACCUMULATION REACHES 50% OF THE HEIGHT OF THE FENCE.
5. ALL SILT FENCES MUST BE REMOVED ONLY WHEN THE ENTIRE SITE IS STABILIZED AND AS DIRECTED BY THE SITE ENGINEER.

City Stamp

1. THIS DRAWING IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC. AND THE MODIFICATION AND/OR REPRODUCTION OF ANY PART OF THIS DRAWING IS STRICTLY PROHIBITED WITHOUT WRITTEN AUTHORIZATION FROM THIS OFFICE.
2. THE DIGITAL FILES CONTAIN INTELLECTUAL AND DIGITAL DATA PROPERTY THAT IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC.
3. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO C.F. CROZIER & ASSOCIATES INC. PRIOR TO CONSTRUCTION.
4. THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT.
5. ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
6. DO NOT SCALE DRAWINGS.

TEMPORARY BENCHMARKS

TBM#1–NAIL IN HYDRO POLE, 190.77

NOTE: ELEVATION DATA DERIVED USING NAD83(CSRS), UTM ZONE 17N

Town: SINCE 1858 A PLACE TO LIVE WORK & PLAY — COLLINGWOOD

No.	ISSUE	DATE: YYYY/MM/DD
0	ISSUED FOR FIRST SUBMISSION	2025/06/24
1	ISSUED FOR SECOND SUBMISSION	2025/12/11

ENGINEER: LICENSED PROFESSIONAL ENGINEER — C.A. SCOBIE — 100513418 — PROVINCE OF ONTARIO — Dec. 11, 2025

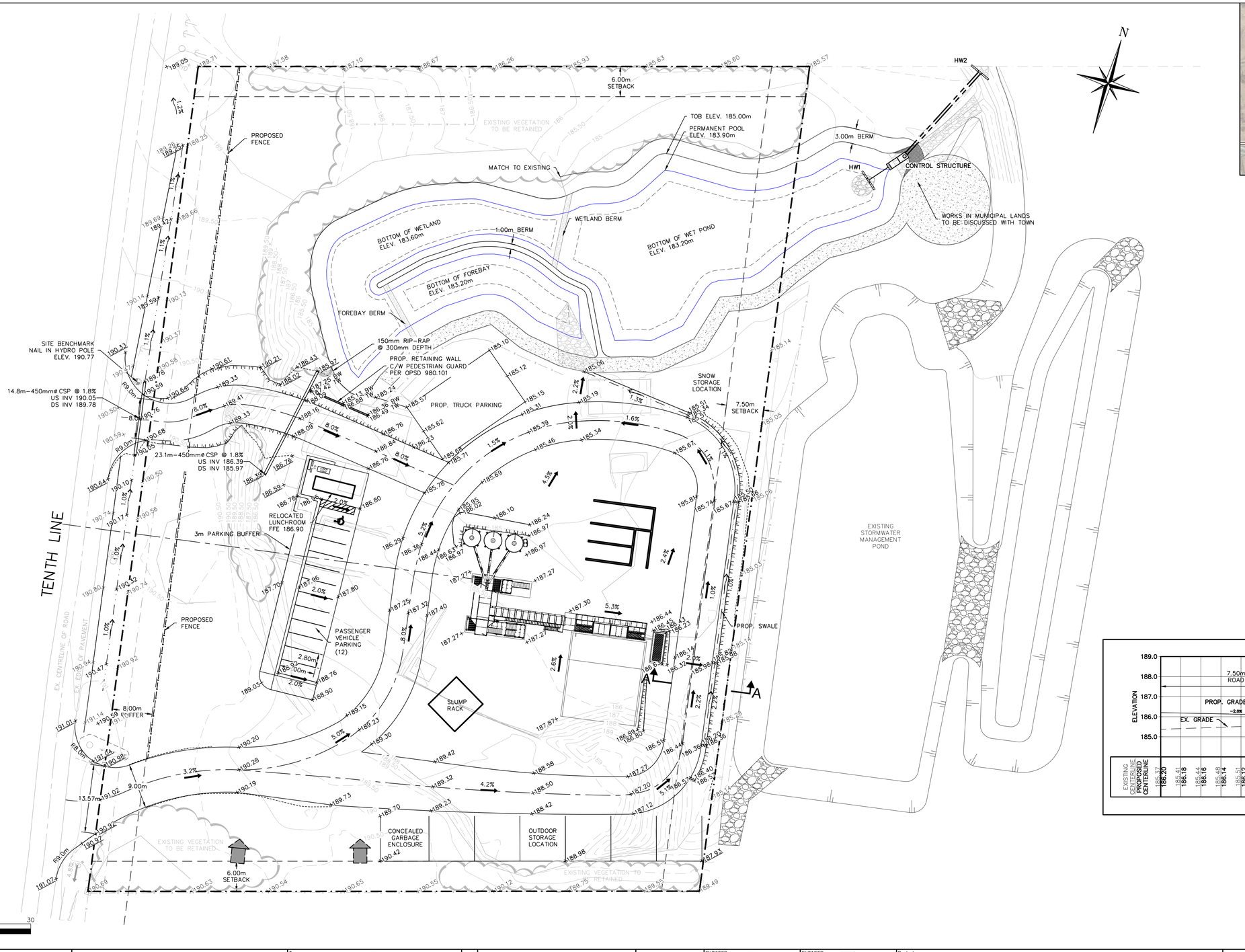
ENGINEER: LICENSED PROFESSIONAL ENGINEER — J.T. KERSCHBAUMER — 100532793 — PROVINCE OF ONTARIO — Dec 11, 2025

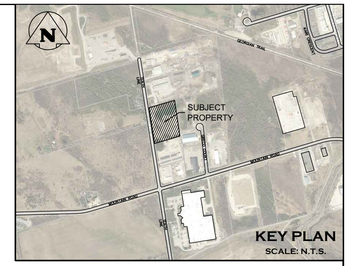
Project: 555 TENTH LINE
TOWN OF COLLINGWOOD

Drawing: REMOVALS & EROSION AND SEDIMENT CONTROL PLAN

CROZIER CONSULTING ENGINEERS
70 HURON STREET, SUITE 100
COLLINGWOOD, ON, L9Y 4L4
705-446-3510
WWW.CFCROZIER.CA

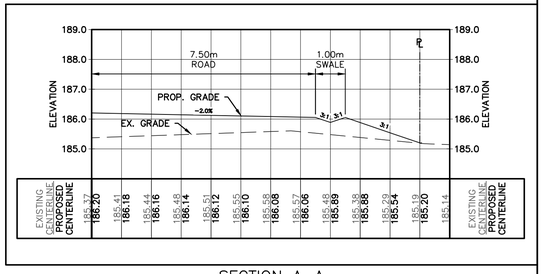
Drawn By	D.G.	Design By	D.G.	Project	2577–6904
Check By	J.K.	Check By	C.S.	Drawing	C102





LEGEND

- PROPERTY LINE
- 248.00 EXISTING CONTOUR
- 248.84+ EXISTING ELEVATION
- 5.0% EXISTING SLOPE
- +248.00 PROPOSED ELEVATION
- +247.26 MATCH EXISTING ELEVATION
- 5.0% PROPOSED SLOPE
- PROPOSED SWALE



SECTION A–A
SCALE 1:100

City Stamp

1. THIS DRAWING IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC. AND THE MODIFICATION AND/OR REPRODUCTION OF ANY PART OF THIS DRAWING IS STRICTLY PROHIBITED WITHOUT WRITTEN AUTHORIZATION FROM THIS OFFICE.
2. THE DIGITAL FILES CONTAIN INTELLECTUAL AND DIGITAL DATA PROPERTY THAT IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC.
3. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO C.F. CROZIER & ASSOCIATES INC. PRIOR TO CONSTRUCTION.
4. THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT.
5. ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
6. DO NOT SCALE DRAWINGS.

TEMPORARY BENCHMARKS

TBM#1–NAIL IN HYDRO POLE, 190.77

NOTE: ELEVATION DATA DERIVED USING NAD83(CSRS), UTM ZONE 17N

Town

SINCE 1858 A PLACE TO LIVE WORK & PLAY
COLLINGWOOD

No.	ISSUE	DATE: YYYY/MM/DD
0	ISSUED FOR FIRST SUBMISSION	2025/06/24
1	ISSUED FOR SECOND SUBMISSION	2025/12/11

ENGINEER

LICENSED PROFESSIONAL ENGINEER
C.A. SCOBIE
100513418
Dec. 11, 2025
PROVINCE OF ONTARIO

ENGINEER

LICENSED PROFESSIONAL ENGINEER
J.T. KERSCHBAUMER
100532793
DEC 11, 2025
PROVINCE OF ONTARIO

Project

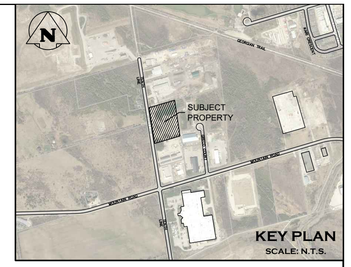
555 TENTH LINE
TOWN OF COLLINGWOOD

Drawing

GRADING PLAN

CROZIER CONSULTING ENGINEERS
70 HURON STREET, SUITE 100
COLLINGWOOD, ON, L9Y 4L4
705-446-3510
WWW.CFCROZIER.CA

Drawn By	D.G.	Design By	D.G.	Project	2577–6904
Check By	J.K.	Check By	C.S.	Drawing	C103



LEGEND

- PROPERTY LINE
- STORM CATCHMENT AREA
- CATCHMENT NUMBER
- RUNOFF VALUE
- CATCHMENT AREA (ha)

City Stamp

1. THIS DRAWING IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC. AND THE MODIFICATION AND/OR REPRODUCTION OF ANY PART OF THIS DRAWING IS STRICTLY PROHIBITED WITHOUT WRITTEN AUTHORIZATION FROM THIS OFFICE.
2. THE DIGITAL FILES CONTAIN INTELLECTUAL AND DIGITAL DATA PROPERTY THAT IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC.
3. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO C.F. CROZIER & ASSOCIATES INC. PRIOR TO CONSTRUCTION.
4. THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT.
5. ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
6. DO NOT SCALE DRAWINGS.

TEMPORARY BENCHMARKS

TBM#1–NAIL IN HYDRO POLE, 190.77

NOTE: ELEVATION DATA DERIVED USING NAD83(CSRS), UTM ZONE 17N

Town

SINCE 1858 A PLACE TO LIVE WORK & PLAY
COLLINGWOOD

No.	ISSUE	DATE: YYYY/MM/DD
0	ISSUED FOR FIRST SUBMISSION	2025/06/24
1	ISSUED FOR SECOND SUBMISSION	2025/12/11

ENGINEER

LICENSED PROFESSIONAL ENGINEER
C.A. SCOBIE
100513418
Dec. 11, 2025
PROVINCE OF ONTARIO

ENGINEER

LICENSED PROFESSIONAL ENGINEER
J.T. KERSCHBAUMER
100532793
DEC 11, 2025
PROVINCE OF ONTARIO

Project

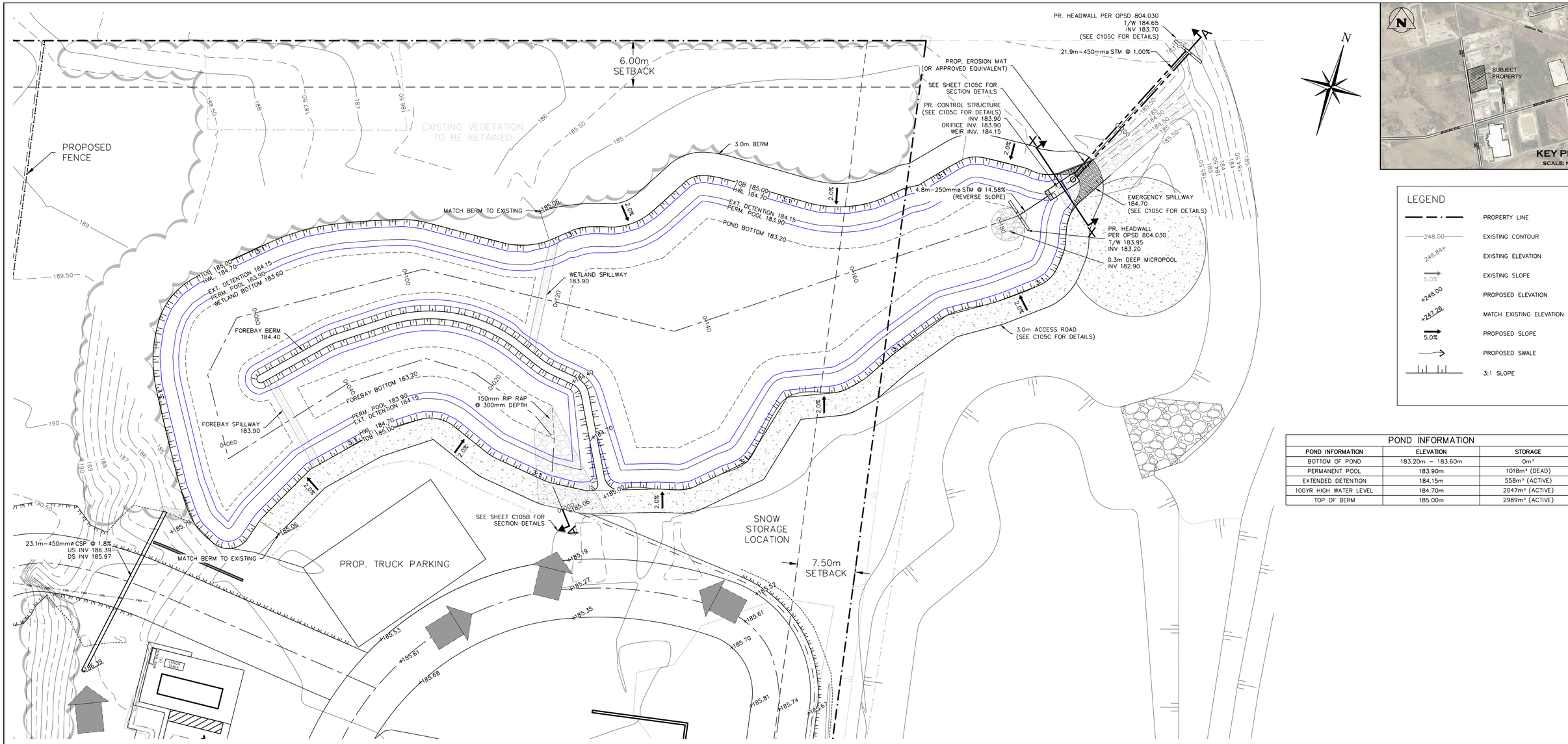
555 TENTH LINE
TOWN OF COLLINGWOOD

Drawing

POST DEVELOPMENT STORM DRAINAGE PLAN

CROZIER CONSULTING ENGINEERS
70 HURON STREET, SUITE 100
COLLINGWOOD, ON, L9Y 4L4
705-446-3510
WWW.CFCROZIER.CA

Drawn By	D.G.	Design By	D.G.	Project	2577–6904
Check By	J.K.	Check By	C.S.	Drawing	C104



LEGEND

- PROPERTY LINE
- 248.00 EXISTING CONTOUR
- 248.84+ EXISTING ELEVATION
- 5.0% EXISTING SLOPE
- +248.00 PROPOSED ELEVATION
- +247.26 MATCH EXISTING ELEVATION
- 5.0% PROPOSED SLOPE
- PROPOSED SWALE
- 3:1 SLOPE

POND INFORMATION

POND INFORMATION	ELEVATION	STORAGE
BOTTOM OF POND	183.20m – 183.60m	0m³
PERMANENT POOL	183.90m	1018m³ (DEAD)
EXTENDED DETENTION	184.15m	558m³ (ACTIVE)
100YR HIGH WATER LEVEL	184.70m	2047m³ (ACTIVE)
TOP OF BERM	185.00m	2989m³ (ACTIVE)

5 0m 5 10 15 20
SCALE: 1:250

City Stamp

1. THIS DRAWING IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC. AND THE MODIFICATION AND/OR REPRODUCTION OF ANY PART OF THIS DRAWING IS STRICTLY PROHIBITED WITHOUT WRITTEN AUTHORIZATION FROM THIS OFFICE.
2. THE DIGITAL FILES CONTAIN INTELLECTUAL AND DIGITAL DATA PROPERTY THAT IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC.
3. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO C.F. CROZIER & ASSOCIATES INC. PRIOR TO CONSTRUCTION.
4. THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT.
5. ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
6. DO NOT SCALE DRAWINGS.

TEMPORARY BENCHMARKS

TBM#1–NAIL IN HYDRO POLE, 190.77

NOTE: ELEVATION DATA DERIVED USING NAD83(CSRS), UTM ZONE 17N

Town: COLLINGWOOD (SINCE 1858 A PLACE TO LIVE WORK & PLAY)

No.	ISSUE	DATE: YYYY/MM/DD
0	ISSUED FOR FIRST SUBMISSION	2025/06/24
1	ISSUED FOR SECOND SUBMISSION	2025/12/11

ENGINEER: LICENSED PROFESSIONAL ENGINEER — C.A. SCOBIE — 100513418 — Dec. 11, 2025 — PROVINCE OF ONTARIO

ENGINEER: LICENSED PROFESSIONAL ENGINEER — J.T. KERSCHBAUMER — 100532793 — Dec 11, 2025 — PROVINCE OF ONTARIO

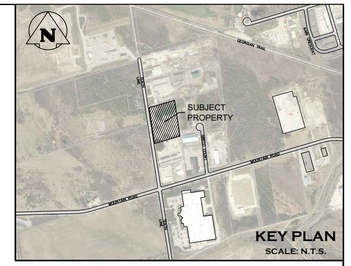
Project: 555 TENTH LINE
TOWN OF COLLINGWOOD

Drawing: STORMWATER MANAGEMENT FACILITY PLAN

CROZIER CONSULTING ENGINEERS
70 HURON STREET, SUITE 100
COLLINGWOOD, ON, L9Y 4L4
705-446-3510
WWW.CFCROZIER.CA

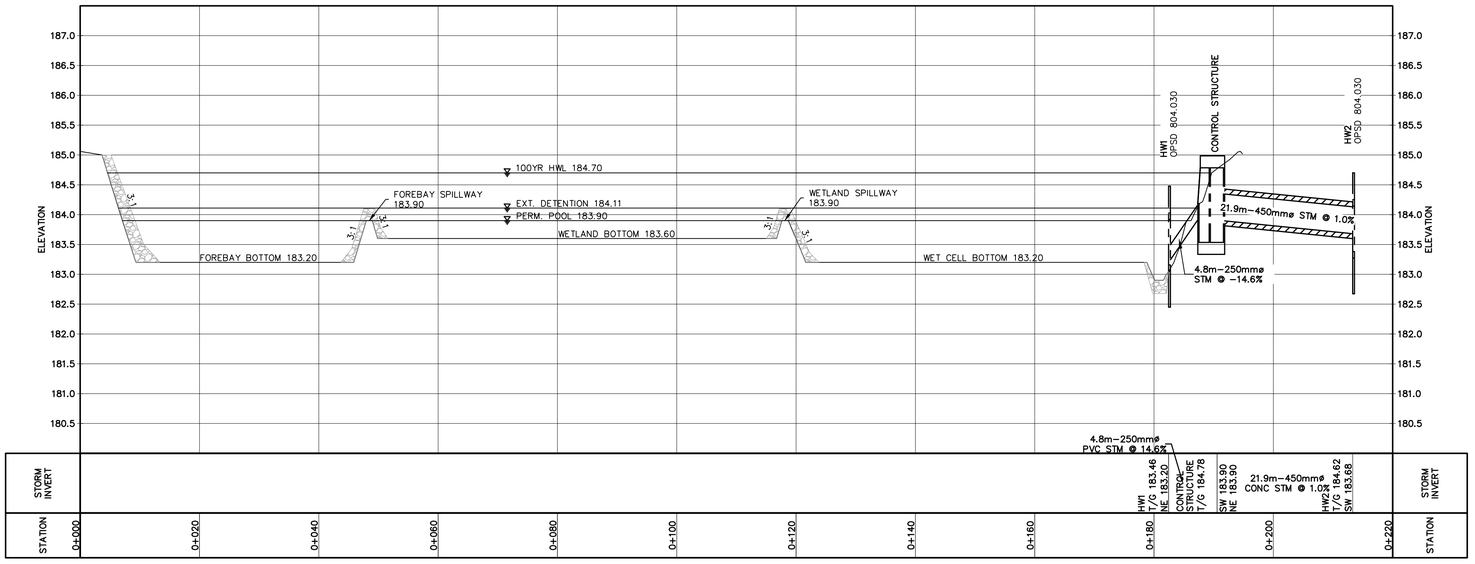
Drawn By	D.G.	Design By	D.G.
Check By	J.K.	Check By	C.S.

Project: 2577–6904
Drawing: C105A



LEGEND

- PROPERTY LINE
- 248.00 EXISTING CONTOUR
- 248.84+ EXISTING ELEVATION
- 5.0% EXISTING SLOPE
- +248.00 PROPOSED ELEVATION
- +247.26 MATCH EXISTING ELEVATION
- 5.0% PROPOSED SLOPE
- PROPOSED SWALE
- 3:1 SLOPE



SECTION A–A
(SEE SHEET C105A)

SCALE: 1:50 VERTICAL

SCALE: 1:500 HORIZONTAL

City Stamp

1. THIS DRAWING IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC. AND THE MODIFICATION AND/OR REPRODUCTION OF ANY PART OF THIS DRAWING IS STRICTLY PROHIBITED WITHOUT WRITTEN AUTHORIZATION FROM THIS OFFICE.
2. THE DIGITAL FILES CONTAIN INTELLECTUAL AND DIGITAL DATA PROPERTY THAT IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC.
3. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO C.F. CROZIER & ASSOCIATES INC. PRIOR TO CONSTRUCTION.
4. THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT.
5. ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
6. DO NOT SCALE DRAWINGS.

TEMPORARY BENCHMARKS

TBM#1–NAIL IN HYDRO POLE, 190.77

NOTE: ELEVATION DATA DERIVED USING NAD83(CSRS), UTM ZONE 17N

Town

SINCE 1858 A PLACE TO LIVE WORK & PLAY
COLLINGWOOD

No.	ISSUE	DATE: YYYY/MM/DD
0	ISSUED FOR FIRST SUBMISSION	2025/06/24
1	ISSUED FOR SECOND SUBMISSION	2025/12/11

ENGINEER

LICENSED PROFESSIONAL ENGINEER
C.A. SCOBIE
100513418
Dec. 4, 2025
PROVINCE OF ONTARIO

ENGINEER

LICENSED PROFESSIONAL ENGINEER
J.T. KERSCHBAUMER
100532793
DEC 11, 2025
PROVINCE OF ONTARIO

Project

555 TENTH LINE
TOWN OF COLLINGWOOD

Drawing

STORMWATER MANAGEMENT FACILITY PROFILE

CROZIER CONSULTING ENGINEERS
70 HURON STREET, SUITE 100
COLLINGWOOD, ON, L9Y 4L4
705.446.3510
WWW.CFCROZIER.CA

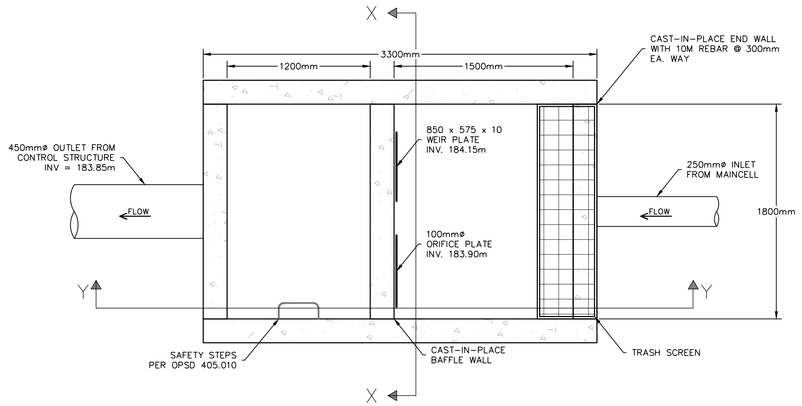
Drawn By	D.G.	Design By	D.G.	Project	2577–6904
Check By	J.K.	Check By	C.S.	Drawing	C105B

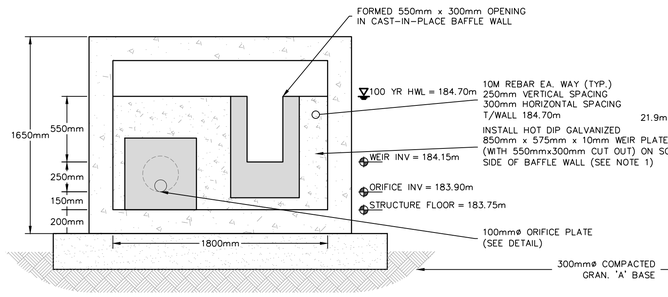
SWM OUTLET CONTROL STRUCTURE DETAIL

SCALE 1:25

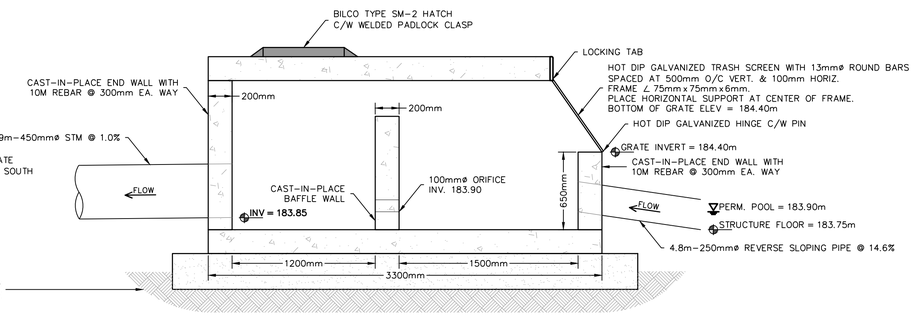
NOTES:

1. PLATE TO BE FASTENED TO CONCRETE WITH STAINLESS STEEL WEDGE ANCHOR BOLTS & WASHERS THROUGH PRE DRILLED 13mmø HOLES AS SHOWN. SILICONE OR PLASTIC SEAL SHALL BE PLACED BETWEEN WEIR PLATE AND CONCRETE WALL.
2. CONTRACTOR TO SUPPLY SHOP DRAWINGS FOR OUTLET STRUCTURE (INCLUDING TRASH SCREEN & CAST-IN-PLACE WALLS) FOR ENGINEER'S REVIEW.
3. INLET GRATE SHALL BE WELDED PER CSA W59-M1989.
4. ALL STEEL TO BE HOT DIP GALVANIZED PER G-164, POST FABRICATION.
5. ALL STEEL SHALL CONFORM TO CSA-CAN-G40.21 M81, GRADE 300.

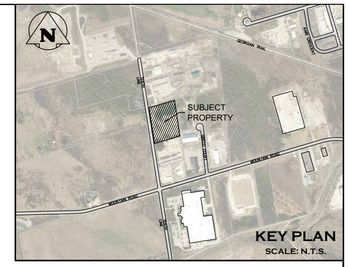


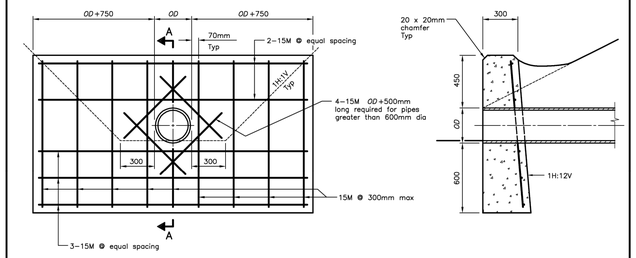


SECTION 'X'



SECTION 'Y'





FRONT ELEVATION

SECTION A-A

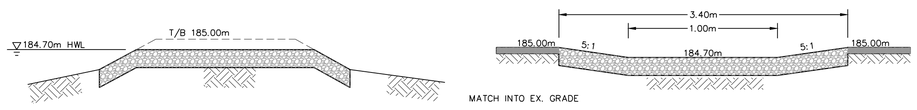
LEGEND:
OD – Outside diameter of pipe

NOTES:
A This OPSD to be read in conjunction with OPSD 3940.150.
B If a steel grate is required, refer to OPSD 804.05.
C Class of concrete: 30MPa.
D Cover to reinforcing bars 70mm ± 20mm.
E All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2017	Rev	2
CONCRETE HEADWALL FOR PIPE LESS THAN 900mm DIAMETER			
	OPSD 804.030		

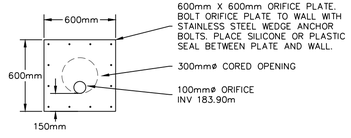
EMERGENCY SPILLWAY

SCALE: N.T.S.



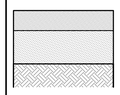
ORIFICE PLATE DETAIL

SCALE: 1:25



3.0m WIDE ACCESS ROAD STRUCTURE DETAIL

SCALE: N.T.S.



150mm	GRANULAR 'A'
300mm	GRANULAR 'B'
450mm	TOTAL

COMPACTED SUB-BASE (ALL TOPSOIL REMOVED)

NOTE:
1. REFER TO CONSTRUCTION NOTES FOR DETAILS ON PLACEMENT OF MATERIALS.

City Stamp

1. THIS DRAWING IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC. AND THE MODIFICATION AND/OR REPRODUCTION OF ANY PART OF THIS DRAWING IS STRICTLY PROHIBITED WITHOUT WRITTEN AUTHORIZATION FROM THIS OFFICE.
2. THE DIGITAL FILES CONTAIN INTELLECTUAL AND DIGITAL DATA PROPERTY THAT IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC.
3. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO C.F. CROZIER & ASSOCIATES INC. PRIOR TO CONSTRUCTION.
4. THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT.
5. ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
6. DO NOT SCALE DRAWINGS.

TEMPORARY BENCHMARKS

TBM#1-NAIL IN HYDRO POLE, 190.77

NOTE: ELEVATION DATA DERIVED USING NAD83(CSRS), UTM ZONE 17N

Town of COLLINGWOOD – SINCE 1858 A PLACE TO LIVE WORK & PLAY

No.	ISSUE	DATE: YYYY/MM/DD
0	ISSUED FOR FIRST SUBMISSION	2025/06/24
1	ISSUED FOR SECOND SUBMISSION	2025/12/11

ENGINEER: LICENSED PROFESSIONAL ENGINEER – C.A. SCOBIE – 100513418 – Dec. 4, 2025 – PROVINCE OF ONTARIO

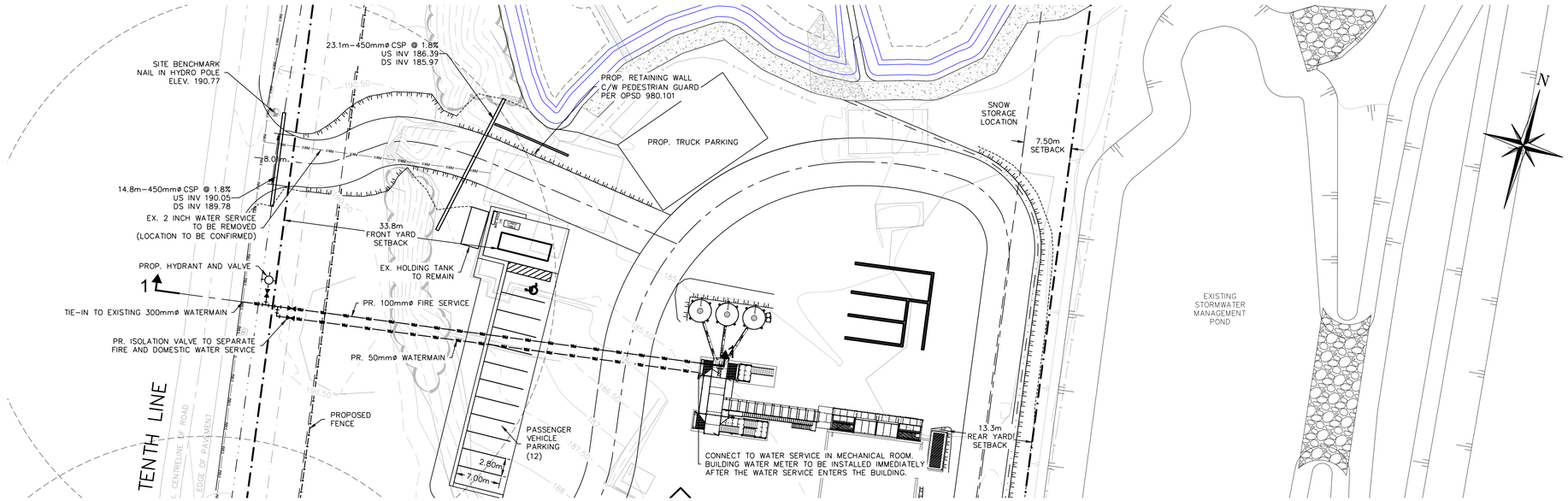
ENGINEER: LICENSED PROFESSIONAL ENGINEER – J.T. KERSCHBAUMER – 100532793 – Dec 11, 2025 – PROVINCE OF ONTARIO

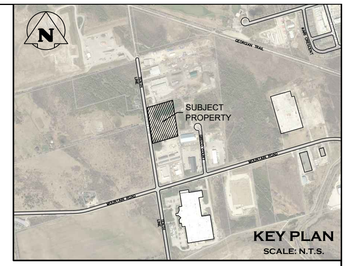
Project: 555 TENTH LINE, TOWN OF COLLINGWOOD

Drawing: STORMWATER MANAGEMENT DETAILS

CROZIER CONSULTING ENGINEERS
70 HURON STREET, SUITE 100
COLLINGWOOD, ON, L9Y 4L4
705-446-3510
WWW.CFCROZIER.CA

Drawn By	D.G.	Design By	D.G.	Project	2577-6904
Check By	J.K.	Check By	C.S.	Drawing	C105C

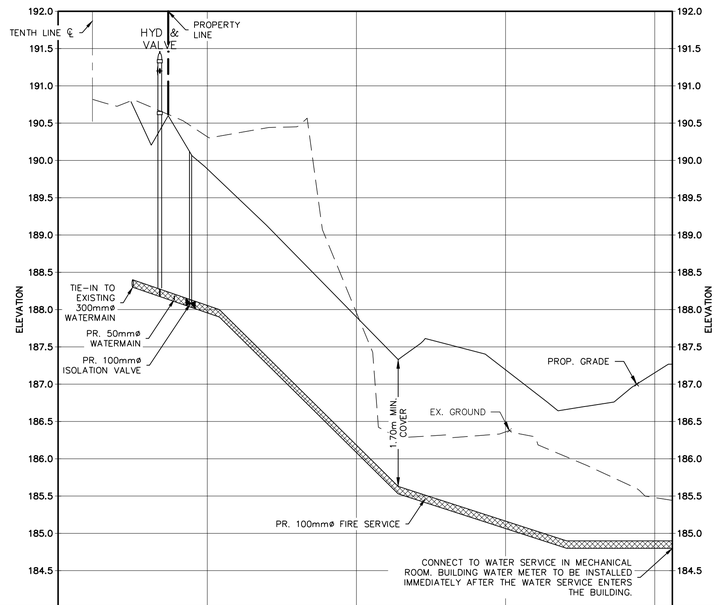




LEGEND

- PROPERTY LINE
- PROP. WATERMAIN
- PROP. FENCE
- EX. WATERMAIN
- EX. FENCE

PROFILE 1–1



10 0m 10 20 30

SCALE: HOR. 1:400
VERT 1:40

1. THIS DRAWING IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC. AND THE MODIFICATION AND/OR REPRODUCTION OF ANY PART OF THIS DRAWING IS STRICTLY PROHIBITED WITHOUT WRITTEN AUTHORIZATION FROM THIS OFFICE.
2. THE DIGITAL FILES CONTAIN INTELLECTUAL AND DIGITAL DATA PROPERTY THAT IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC.
3. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO C.F. CROZIER & ASSOCIATES INC. PRIOR TO CONSTRUCTION.
4. THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT.
5. ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
6. DO NOT SCALE DRAWINGS.

TEMPORARY BENCHMARKS

TBM#1–NAIL IN HYDRO POLE, 190.77

NOTE: ELEVATION DATA DERIVED USING NAD83(CSRS), UTM ZONE 17N

Town

SINCE 1856 A PLACE TO LIVE WORK & PLAY
COLLINGWOOD

No.	ISSUE	DATE: YYYY/MM/DD
0	ISSUED FOR SECOND SUBMISSION	2025/XX/XX

ENGINEER

LICENSED PROFESSIONAL ENGINEER
C.A. SCOBIE
100513418
Dec. 4, 2025
PROVINCE OF ONTARIO

ENGINEER

LICENSED PROFESSIONAL ENGINEER
J.T. KERSCHBAUMER
100532793
Dec 11, 2025
PROVINCE OF ONTARIO

City Stamp

Project

555 TENTH LINE
TOWN OF COLLINGWOOD

Drawing

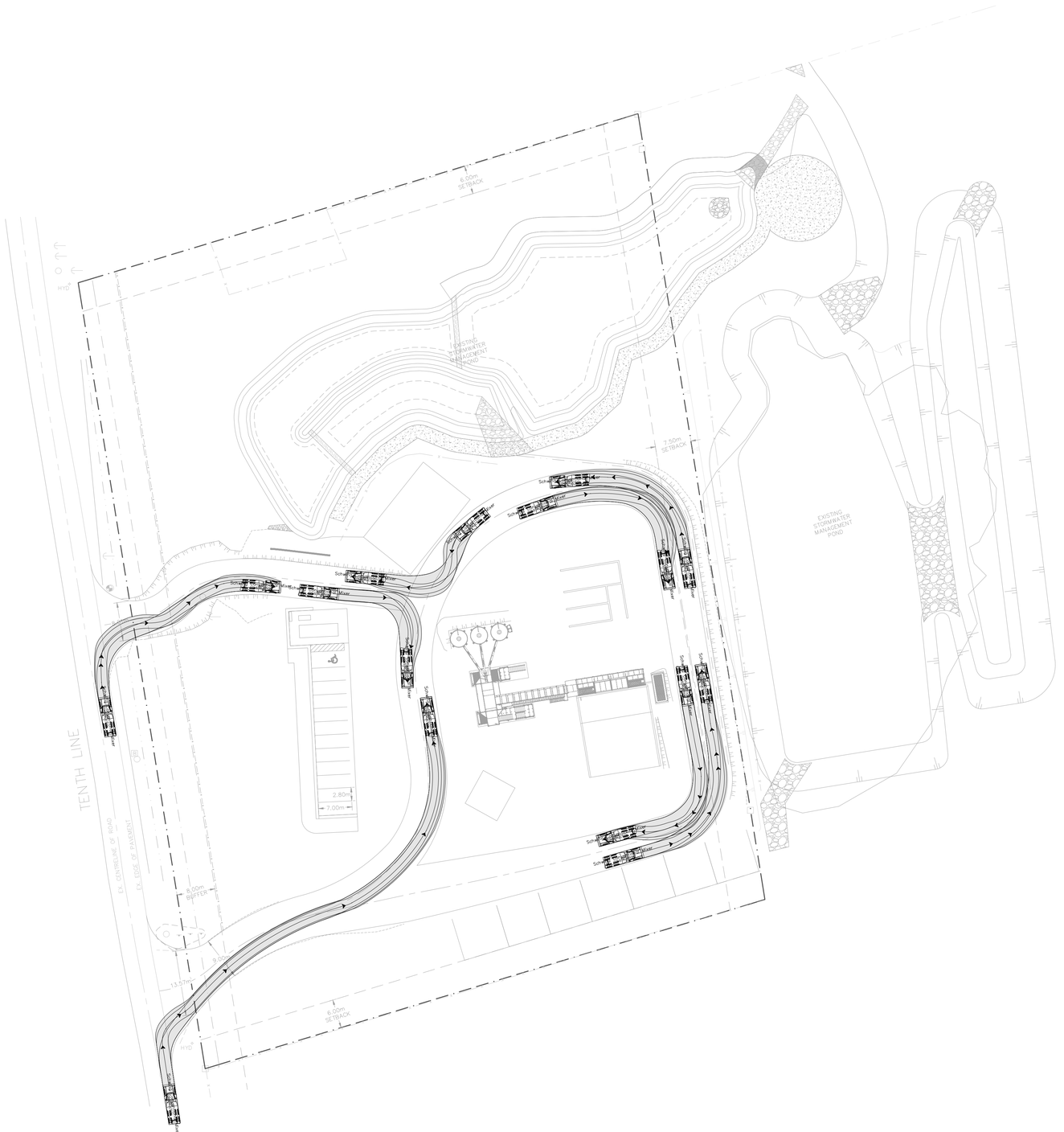
WATER SERVICE CONNECTION PROFILE

CROZIER
CONSULTING ENGINEERS
70 HURON STREET, SUITE 100
COLLINGWOOD, ON, L9Y 4L4
705-445-3510
WWW.CFCROZIER.CA

Drawn By	D.G.	Design By	D.G.
Check By	J.K.	Check By	C.S.

Project 2577–6904

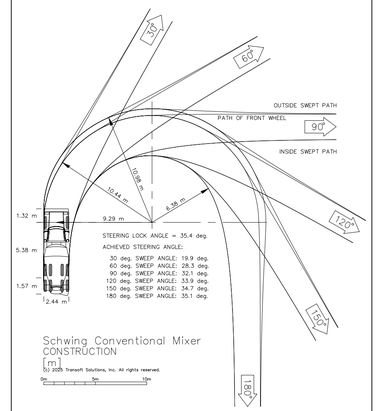
Drawing C106



N

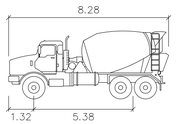
FOR REVIEW
NOT TO BE USED FOR CONSTRUCTION

SWEEP PATH



(c) 2025 Transoft Solutions, Inc. All rights reserved.

VEHICLE PROFILE



Schwing Conventional Mixer

	meters
Width	: 2.44
Track	: 2.44
Lock to Lock Time	: 6.0
Steering Angle	: 35.4

No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR INTERNAL REVIEW	08/28/2025
2	ISSUED FOR INTERNAL REVIEW	12/04/2025

Project

555 TENTH LINE
TOWN OF COLLINGWOOD

Drawing

VEHICLE MANUEVERING
RIGHT-IN TURNS

CROZIER
CONSULTING ENGINEERS

Drawn By	Design By	Project
R.L./I.M.		2577-6904
Check By	Check By	Drawing
K.H.		T300

10 0m 10 20 30 40
SCALE: 1:500