

**SERVICING & STORMWATER
MANAGEMENT IMPLEMENTATION
REPORT**

AMRIZE COLLINGWOOD PLANT

**555 TENTH LINE
TOWN OF COLLINGWOOD
COUNTY OF SIMCOE**

**PREPARED FOR:
AMRIZE CANADA INC.**

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

MAY 2026

CFCA FILE NO. 2577-6904

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Revision Number	Date	Comments
Rev. 0	June 2025	Issued for First SPA Submission
Rev. 1	December 2025	Issued for Second SPA Submission
Rev. 2	May 2026	Issued for Third 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 C107: Encroachment Plan
Drawing T300: Vehicle Maneuvering Right-in Turns
Drawing T301: Vehicle Maneuvering Right-out Turns

1.0 Introduction

C.F. Crozier & Associates Inc. (Crozier) was retained by Amrize 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:

- 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 m²);
- Concrete plant with an upper area that contains bulk storage bins (133.7 m² 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 m²).

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 will act as the fire service and a 50 mm diameter domestic water service that will tee also off the proposed 100 mm fire service. A water meter at the proposed facility will also be required for the domestic service and is shown on the General Site Servicing Plan (**Drawing C101A**). A new hydrant will be proposed to be installed along Tenth Line to provide enhanced fire coverage. Refer to **Drawing C106** for the proposed water infrastructure.

3.3 Design Water Demand

The proposed new concrete plant will replace the existing plant; however, it is not anticipated that water usage will increase for the proposed plant operations.

To quantify water demand for the proposed development the actual water usage data was obtained from the Client's water bills from EPCOR for the years of 2022-2026 and is summarized in **Appendix B**. The usage will be used alongside the Town of Collingwood Engineering Standards to quantify peak water demands through the proposed watermain.

Water usage from the Client's EPCOR bills indicates the average daily demand was the highest in 2022 with an average of average daily demand of 26.04 m³/day or 0.3 L/s. Using the maximum day peaking factor of 1.77 and a maximum hour factor of 2.70 parameters from the Town engineering standards Section 4.4.3. This results in a maximum day demand of 0.53 L/s and peak hourly demand is 0.81 L/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 Line. A dedicated fire service to the plant is proposed to provide additional fire protection measures. 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 45 L/s. The Town of Collingwood requires a minimum fire flow of **136 L/s** for industrial subdivisions; therefore, this value governs rather than the calculated 45 L/s based on the OBC. The proposed system has a total peak water demand of 136.81 L/s.

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		
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 m³/ha (*Stormwater Management Planning and Design Manual*, Ministry of the Environment, 2003). The total water quality volume consists of 138 m³/ha for permanent pool and 40 m³/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	1018
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 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 C102** 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.

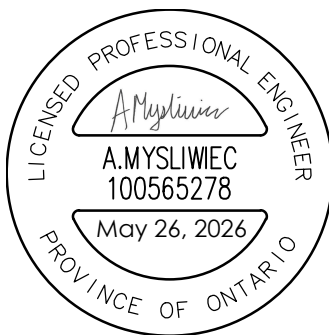
Based on the above conclusions, we recommend the approval of the Site Plan Application from the perspective of functional servicing and stormwater management.

Respectfully submitted,

C.F. CROZIER & ASSOCIATES INC.



Adrian Mysliwiec, P.Eng.
Project Engineer, Land Development



C.F. CROZIER & ASSOCIATES INC.

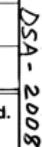


Jonathon Kerschbaumer, P.Eng.
Project Engineer, Land Development



APPENDIX A

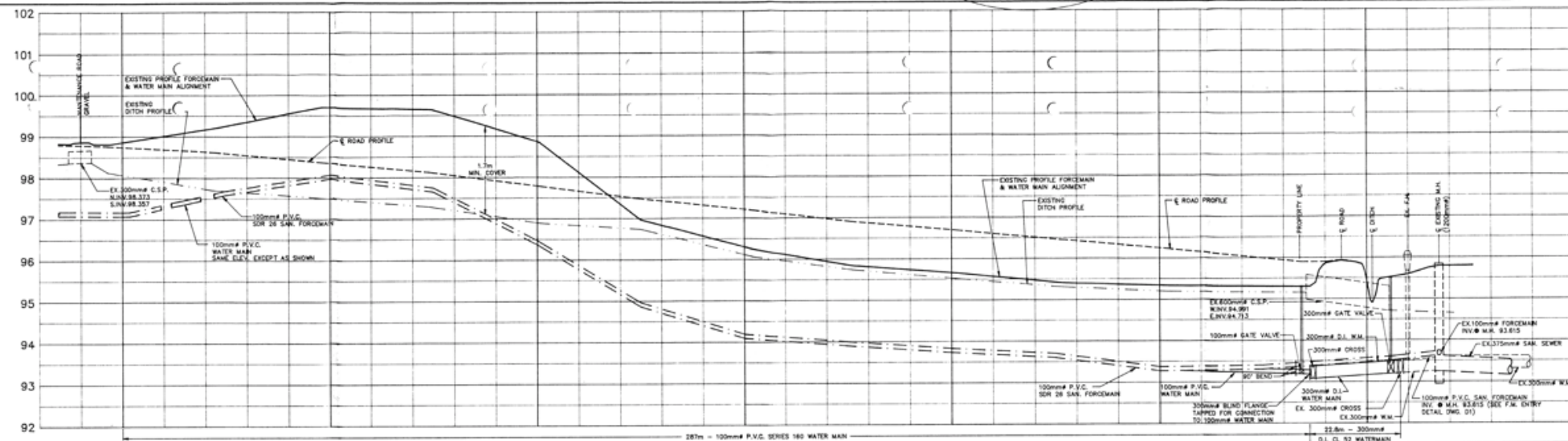
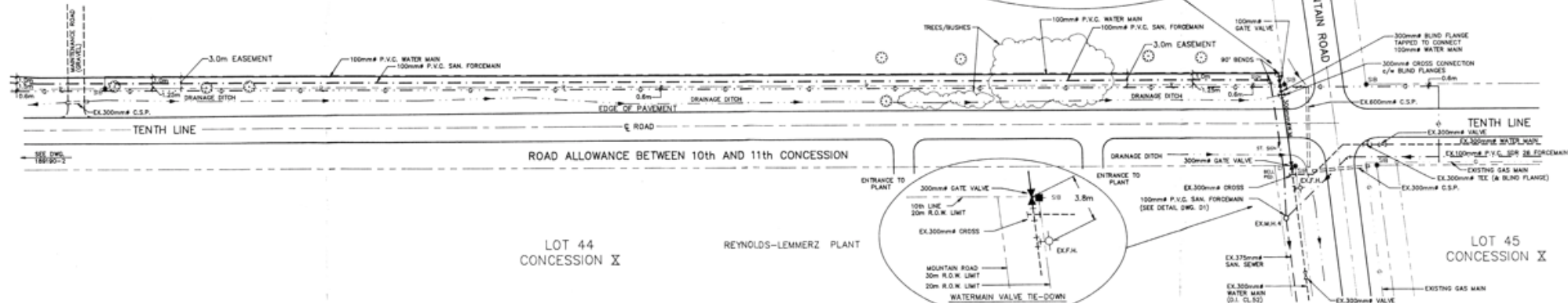
As Built Drawings





LOT 44
CONCESSION XI

LOT 45
CONCESSION XI



STATION	100mm P.V.C. WATER MAIN ELEVATION	100mm P.V.C. SAN. FOREMAIN ELEVATION	300mm CROSS CONNECTION ELEVATION
0+250	97.14	97.69	98.27
0+275	97.30	97.75	98.47
0+300	97.40	97.80	98.56
0+325	97.50	97.90	98.65
0+350	97.60	98.00	98.75
0+375	97.70	98.10	98.85
0+400	97.80	98.20	98.95
0+425	97.90	98.30	99.05
0+450	98.00	98.40	99.15
0+475	98.10	98.50	99.25
0+500	98.20	98.60	99.35
0+525	98.30	98.70	99.45
0+550	98.40	98.80	99.55
0+572	98.50	98.90	99.65

LEGEND

- PROPERTY LINE
- - - EXISTING DITCH
- - - GAS MAIN

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

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 FOREMAIN 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

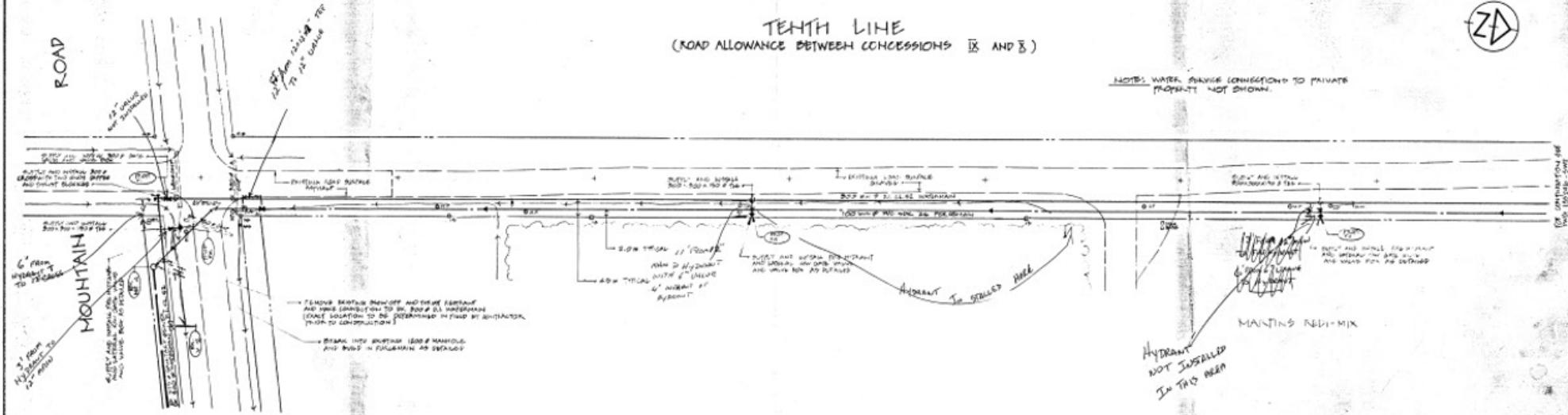
DESIGN: R.H.M. CHECKED: J.S.R.
DRAWN: D.E. DATE: JULY 1990

DWG. 189190-SW2AC

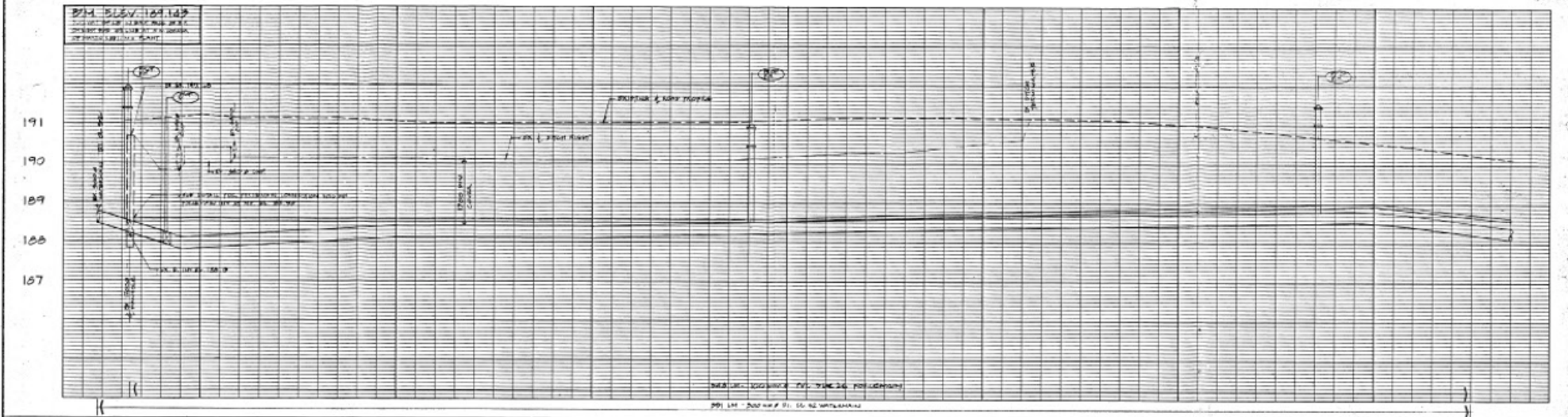
TENTH LINE (ROAD ALLOWANCE BETWEEN CONCESSIONS 18 AND 8)



NOTE: WATER SERVICE CONNECTIONS TO PRIVATE PROPERTY NOT SHOWN.



BM 51.5V 109.149
ELEVATION OF MANHOLE 200.00
CHECKED BY: [Signature]
DATE: [Date]



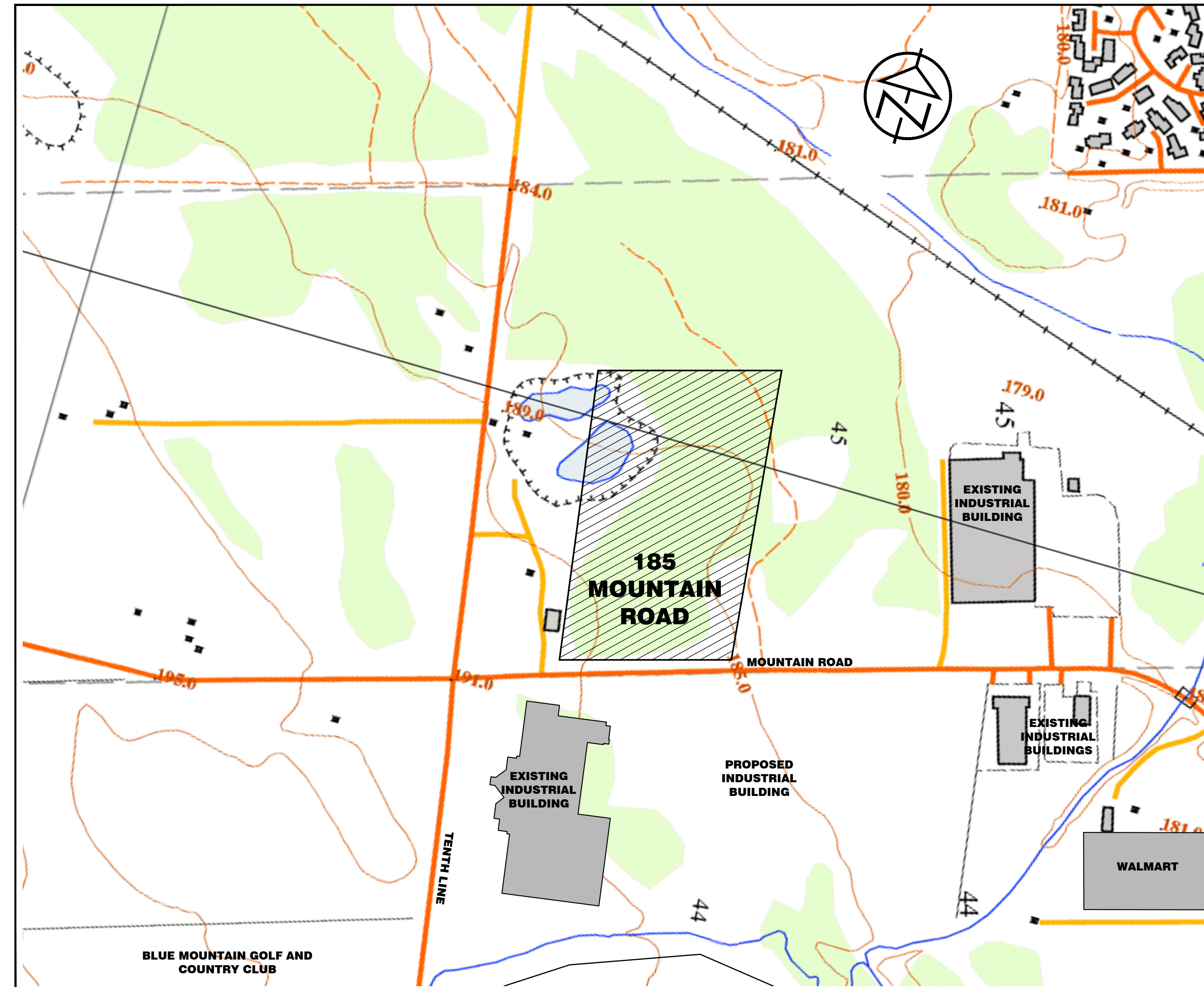
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ELEVATION	187.00	187.50	188.00	188.50	189.00	189.50	190.00	190.50	191.00	191.50	192.00	192.50	193.00	193.50	194.00	194.50

NO.	REVISIONS	DATE	INITIAL

Notes:	Approved: [Signature] C. K. KENT	TOWN of COLLINGWOOD PUBLIC WORKS GARAGE SEWER AND WATER SERVICING	Ainley and Associates Ltd. Consulting Engineers and Planners Collingwood - Barrie - Belleville
PLAN AND PROFILE TENTH LINE - STA. 0+00 TO 3+00		SCALE: HORIZ. 1"=50' VERT. 1"=10'	DESIGN: [Signature] CHECKED: [Signature] DATE: JULY, 1988

INDUSTRIAL SUBDIVISION

**185 MOUNTAIN ROAD
TOWN OF COLLINGWOOD**



KEY PLAN

INDEX

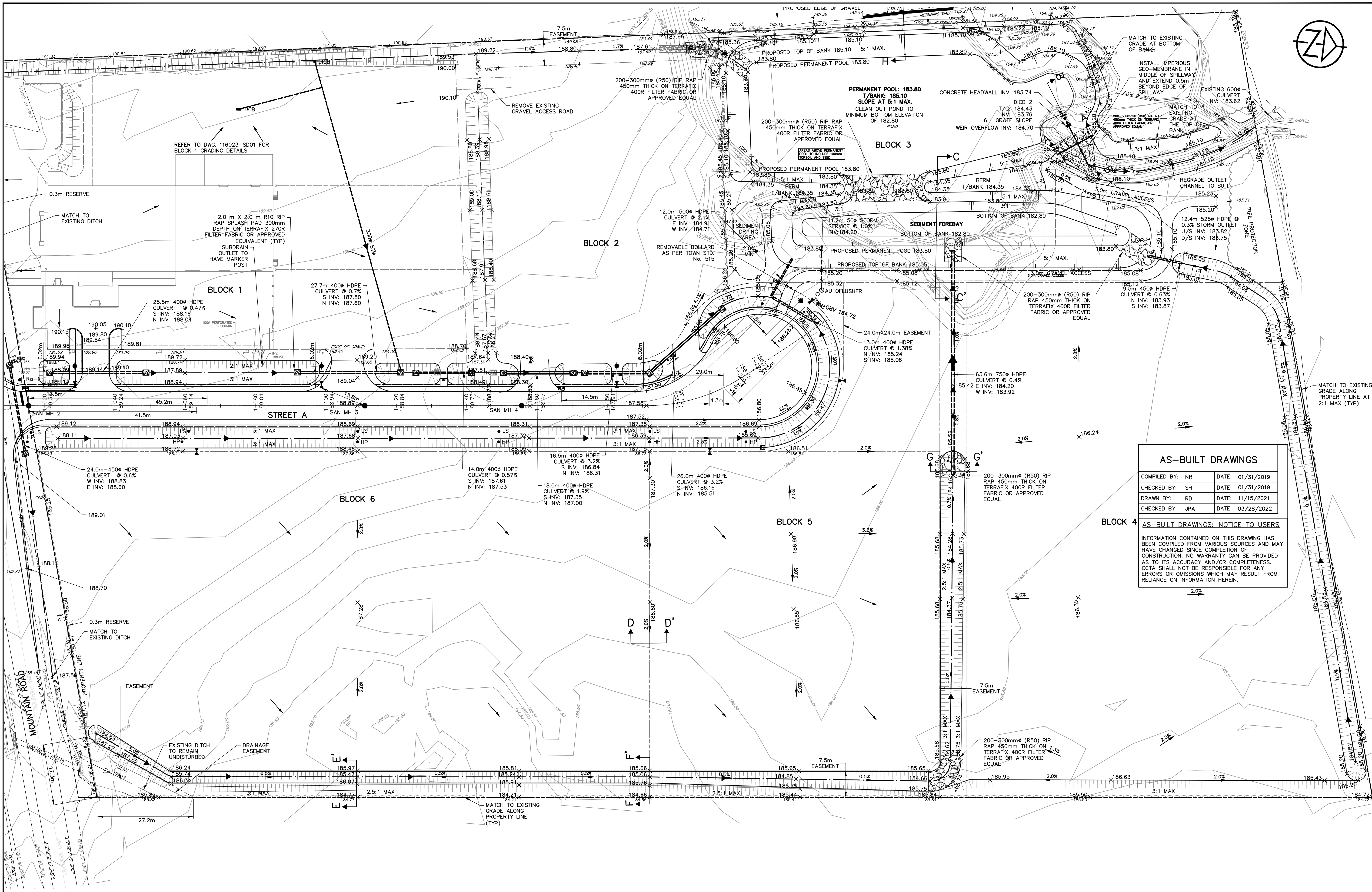
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116023-IN-1	DRAWING INDEX AND LEGEND
116023-LG-1	OVERALL GRADING PLAN
116023-PP-1	PLAN AND PROFILE – STREET A
116023-PND-1	POND LAYOUT AND DETAILS
116023-DE-1	DETAILS, SECTIONS AND NOTES – SHEET 1
116023-DE-2	DETAILS, SECTIONS AND NOTES – SHEET 2
17168P-E1	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
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17168P-E7	COLLUS POWERSTREAM STANDARDS

LEGEND

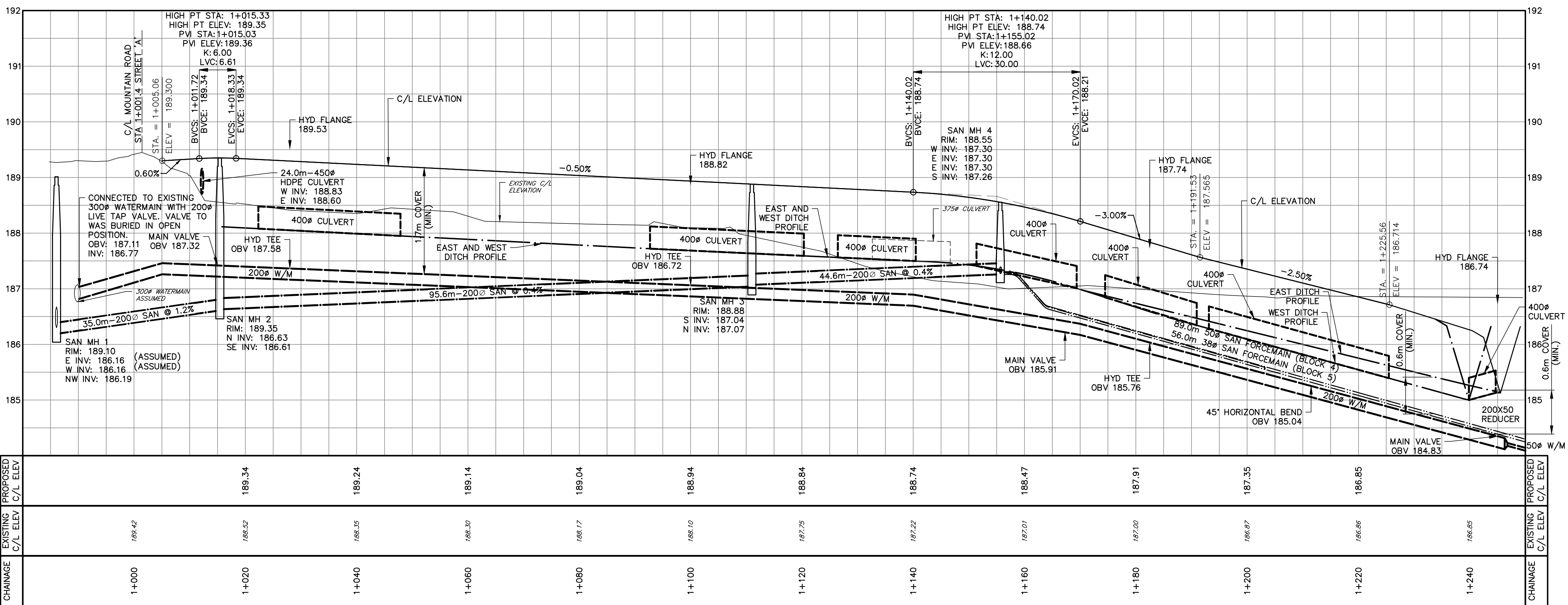
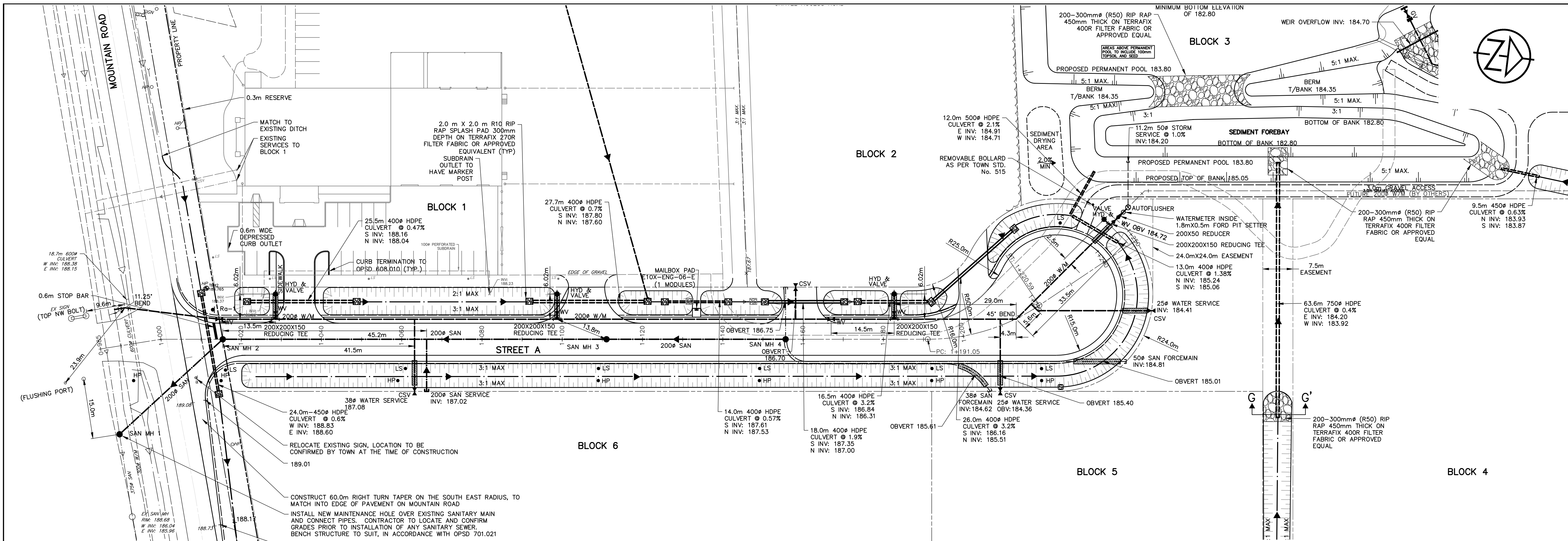
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EXISTING CENTERLINE		EXISTING BOREHOLE/NUMBER	
PROPOSED CENTRELINE		EXISTING GAS VALVE	
EXISTING EDGE OF ASPHALT		EXISTING HYDRO TRANSFORMER	
PROPOSED EDGE OF ASPHALT		EXISTING CABLE PEDESTAL	
EXISTING EDGE OF SHOULDER		EXISTING BELL PEDESTAL	
PROPOSED EDGE OF SHOULDER		EXISTING BELL MAINTENANCE HOLE	
EXISTING DITCH/DIRECTION OF FLOW		EXISTING BELL POLE	
PROPOSED DITCH/DIRECTION OF FLOW		EXISTING HYDRO POLE	
EXISTING SANITARY SEWER/SIZE/DIRECTION OF FLOW		EXISTING HYDRO GUY WIRE	
PROPOSED SANITARY SEWER/SIZE/DIRECTION OF FLOW		PROPOSED LIGHT STANDARD	
EXISTING SANITARY SERVICE		EXISTING TRAFFIC SIGN	
PROPOSED SANITARY SERVICE		PROPOSED TRAFFIC SIGN	
PROPOSED SANITARY FORCEMAIN/SIZE/DIRECTION OF FLOW		PROPOSED STOP SIGN	
EXISTING WATERMAIN/SIZE		PROPOSED STREET NAME SIGN	
PROPOSED WATERMAIN/SIZE		PROPOSED SIGN (MISCELLANEOUS)	
EXISTING WATER SERVICE		EXISTING DECIDUOUS TREE	
PROPOSED WATER SERVICE		EXISTING CONIFEROUS TREE	
EXISTING STORM SEWER/SIZE/DIRECTION OF FLOW		EXISTING SANITARY MAINTENANCE HOLE/NUMBER	
PROPOSED STORM SEWER/SIZE/DIRECTION OF FLOW		PROPOSED SANITARY MAINTENANCE HOLE/NUMBER	
EXISTING CULVERT		EXISTING BUSH	
PROPOSED CULVERT		EXISTING HYDRANT AND VALVE	
PROPOSED SWALE LOCATION		PROPOSED HYDRANT AND VALVE	
PROPOSED JOINT HYDRO, BELL AND ROGERS		EXISTING WATER VALVE	
EXISTING GAS MAIN		PROPOSED WATER VALVE	
PROPOSED GAS MAIN		PROPOSED CURB STOP VALVE	
EXISTING FENCELINE		EXISTING WATERMAIN PLUG AND THRUST BLOCK	
PROPOSED FENCELINE		PROPOSED WATERMAIN PLUG AND THRUST BLOCK	
EXISTING BUSHLINE		EXISTING STORM MAINTENANCE HOLE	
EXISTING CONTOUR		PROPOSED STORM MAINTENANCE HOLE/NUMBER	
EXISTING SPOT ELEVATION		EXISTING CATCH BASIN	
PROPOSED SPOT ELEVATION		PROPOSED CATCH BASIN	
EXISTING GRADING DIRECTION		PROPOSED CATCH BASIN MAINTENANCE HOLE/NUMBER	
PROPOSED GRADING DIRECTION		PROPOSED DOUBLE CATCH BASIN MAINTENANCE HOLE/NUMBER	
PROPOSED SWALE LOCATION		PROPOSED DOUBLE CATCH BASIN	
EXISTING TEMPORARY BENCHMARK		PROPOSED DITCH INLET CATCH BASIN	

AS-BUILT DRAWINGS	
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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.	

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			1.	AS-BUILT INFORMATION	MAR/2022					



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



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
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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	ENGINEER STAMP
1.	AS-BUILT INFORMATION	MAR/2022	

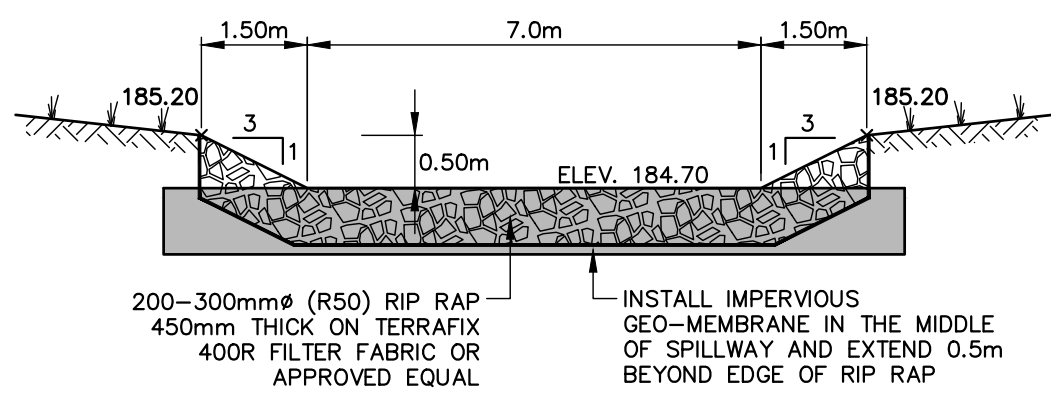
ORIGINAL STAMPED BY
M. J. CULLIP
JULY 31/18

INDUSTRIAL SUBDIVISION
185 MOUNTAIN ROAD
TOWN OF COLLINGWOOD

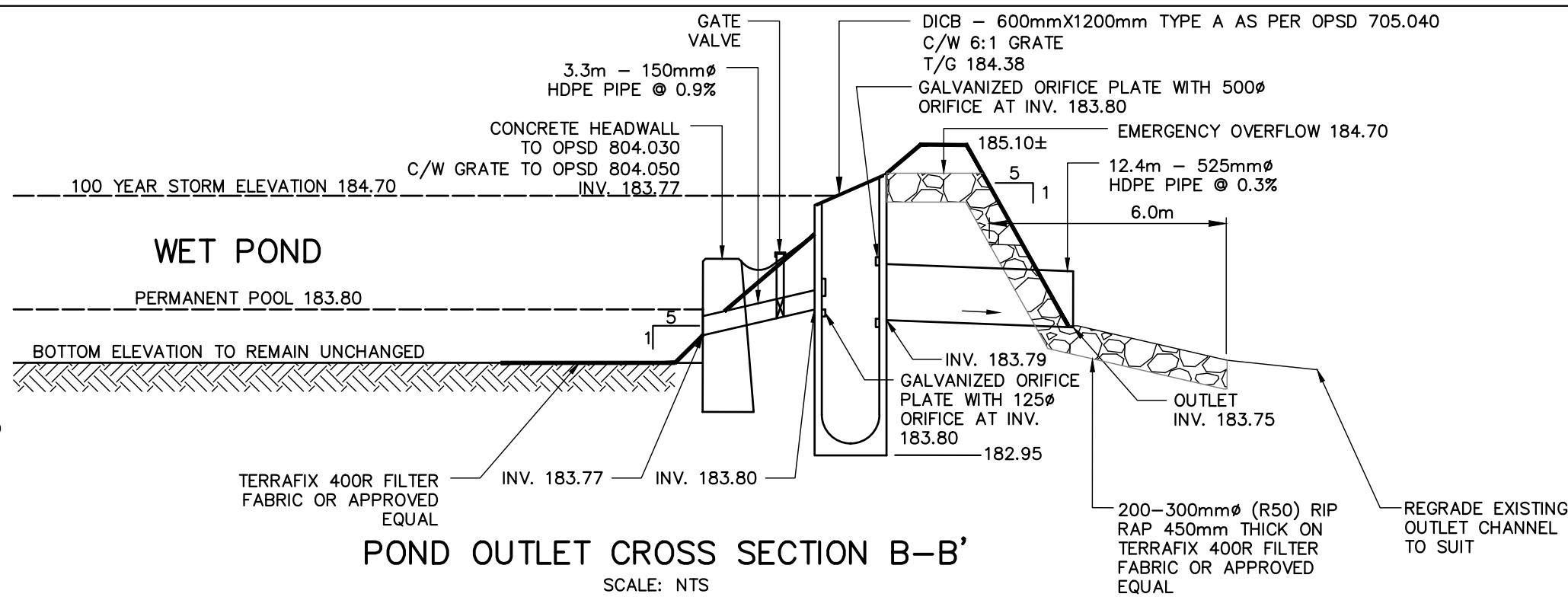
PLAN AND PROFILE
STREET A

TATHAM ENGINEERING

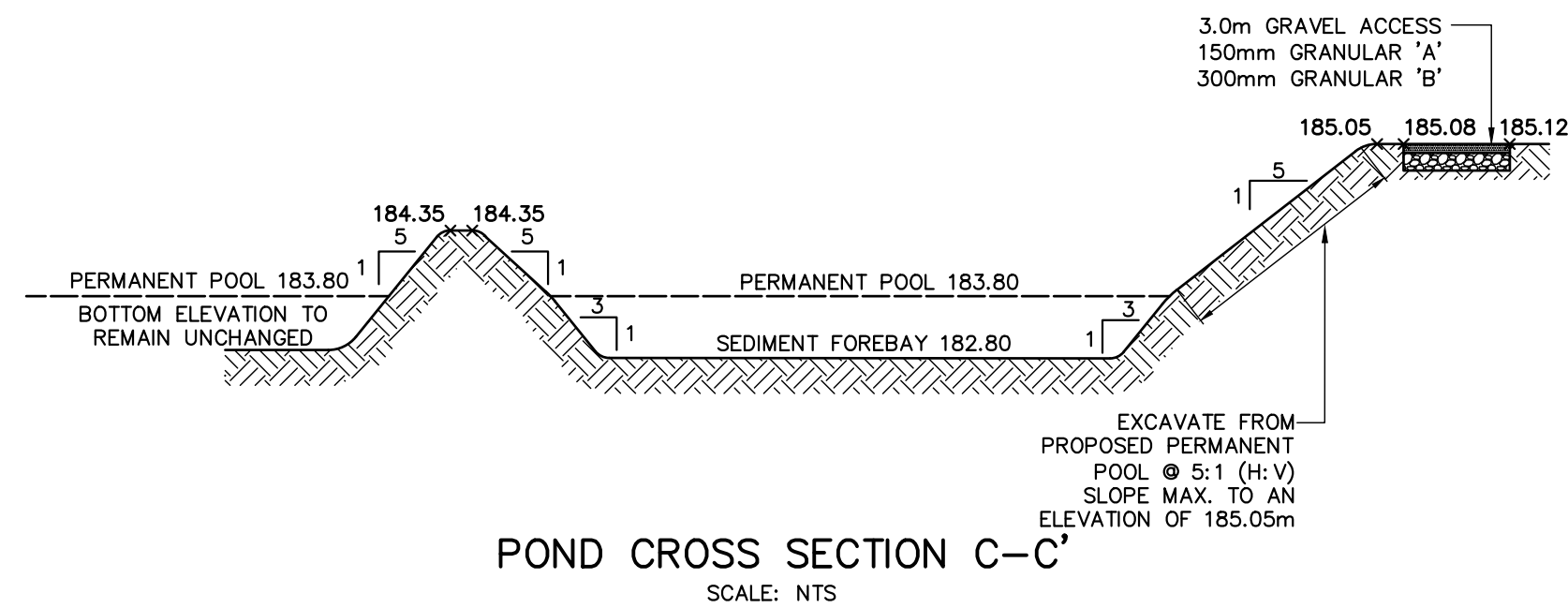
DESIGN: APR/DFM	FILE: 116023	DWG:
DRAWN: APR/DFM	DATE: DEC 2017	PP-1
CHECK: JPA/MJC	SCALE: H1:500, V1:50	



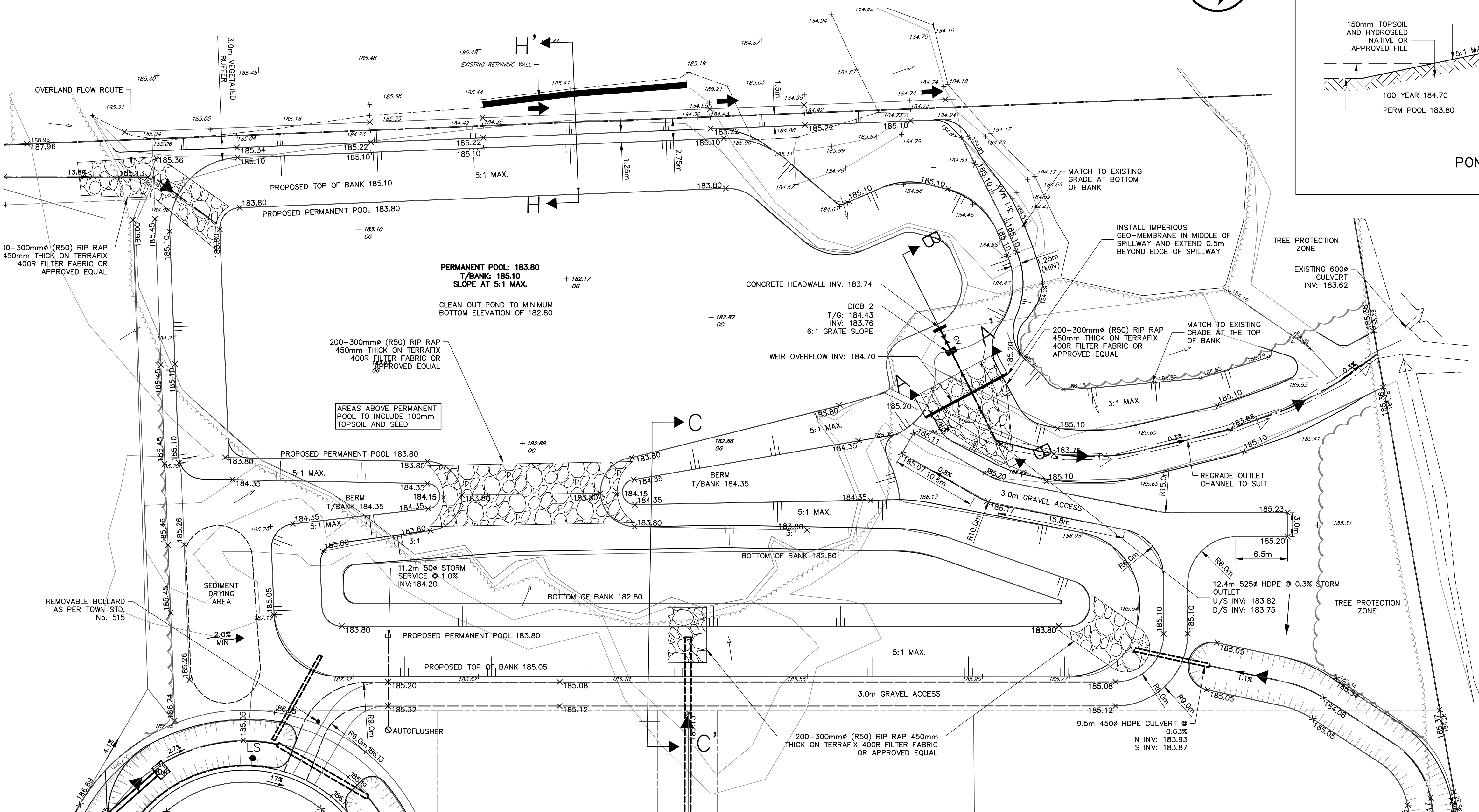
OVERFLOW WEIR CROSS SECTION A-A'
SCALE: NTS



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% 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% BEARDETONQUE
7% BLACKKEYED SUSAN
4% COMMON MILKWEED
1% EARL GOLDENROD
20% FOWL BLUEGRASS
20% INDIANGRASS
30% LITTLE BLUESTEM
1% NEW ENGLAND ASTER
1% SHONY TICK TREFOL
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

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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

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

INDUSTRIAL SUBDIVISION
185 MOUNTAIN ROAD
TOWN OF COLLINGWOOD

POND LAYOUT AND DETAILS

TATHAM
ENGINEERING

DESIGN: APR/DFM	FILE: 116023	DWG:
DRAWN: APR/DFM	DATE: DEC 2017	PND-1
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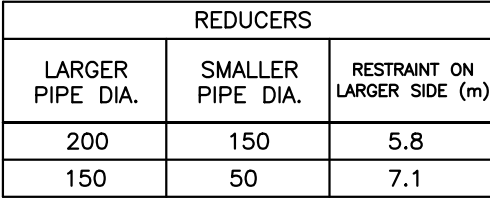


FIGURE 4
DEAD END

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°	1.2	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		

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.

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1. ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH TOWN OF COLLINGWOOD STANDARDS AND OPSS 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 S17 AND OPSS S18. MAINTAIN ALL TRENCHES IN A DRY CONDITION. A MOECR 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 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 OPSS 701-100.
12. PIPE SUPPORT AT ALL STRUCTURES IN ACCORDANCE WITH OPSS 708.020.
13. ALL MAINTENANCE HOLE AND CATCH BASIN FRAME AND GRATES TO BE SET TO BINDER COURSE ASPHALT ELEVATION IN ACCORDANCE WITH OPSS 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 OPSS 704.010.
14. TRENCH BACKFILL TO BE SELECT NATIVE MATERIAL OR IMPOSED 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 (SPMD0).
15. PIPE EMBEDMENT TO BE COMPACTED TO A DRY DENSITY OF AT LEAST 95% OF THE MATERIAL'S SPMD0. BACKFILL AND EMBEDMENT IN ACCORDANCE WITH OPSS 802.010 (FLEXIBLE PIPE), GRANULAR "A" EMBEDMENT OR OPSS 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 MOTIVATION 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, HLB: 50mm, HLB: 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. TATUM & 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, PIPE SHALL BE STORED UNDER COVERED AND 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 BY-LAW.
26. CLEARING, GRUBBING AND REMOVAL OF SURFACE BOULDERS TO OPSS 201.
27. GRADING TO OPSS:MUNI 206.
28. COMPACTING TO OPSS:MUNI 501.

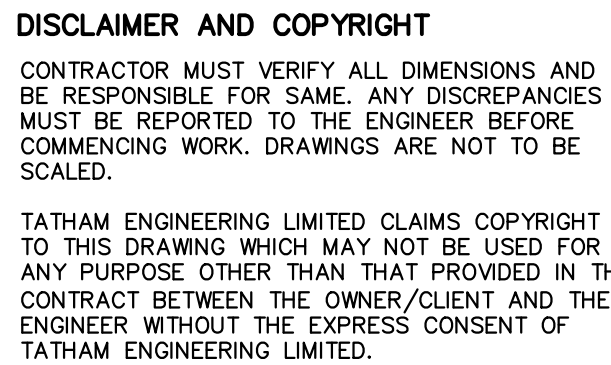
1. SUBGRADE AND BOULEVARD MATERIAL TO BE COMPACTED TO A DRY DENSITY OF AT LEAST 95% OF THE MATERIAL'S SPMD. SUBGRADE TO BE PROOF ROLLED AND CERTIFIED PRIOR TO PLACING GRANULAR 'B'.
2. GRANULAR 'A' AND 'B' TO BE COMPACTED TO A DRY DENSITY OF AT LEAST 100% OF THE MATERIAL'S RESPECTIVE SPMD.
3. ALL GRANULARS 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 HLB 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 THE SPMD 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 CARRIER CURB IN ACCORDANCE WITH OPSTD 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 BASED 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.

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.

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. GRAVEY 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 SERVICE 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.

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 TAP 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 FLOOD PROTECTION BACKFLOW PREVENTION DEVICES AS PER CSAB 110.01/2/3/4/5/6/7/8/9/10. FOR 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 PROTECTION IS NOT PROVIDED BY THE MANUFACTURER. RESTRAINING GLANDS SHALL BE INSTALLED 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 BETWEEN 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 NOT TO BE 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 WATERMAIN AND SERVICE TO BE TESTED FOR 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 OPSM2001 441 AND TOWN SPECIFICATIONS.
 - ALL WATERMAINS ARE TO BE SWABBED BY THE CONTRACTOR, ENGINEER AND THE TOWN TO BE PRESENT DURING TESTING.
 - ALL WATERMAINS SHALL NOT 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.

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 320kpo OR EQUAL).
4. SANITARY SERVICE CONNECTIONS (FORCEMAIN) - HDPE SDR 11.
5. PERFORATED SUBDRAIN - BIG 'O' WITH GEOTEXTILE FILTER SOCK.
6. AGGREGATE IN ACCORDANCE WITH ACSS-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 (ø/1), 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 (ø/1) CLOW OR MUELLER.
12. VALVE BOXES - 5 SL-42 FITTINGS.
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 300W.
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 - 30IN-43H, BALL STYLE COMPLETE WITH STAINLESS STEEL STEM, AWWA THREAD BY COMPRESSION CAMBRIDGE BRASS.
18. CULVERT SEWAGE WITH STAINLESS BALLSTYLE WITH DRAIN COMPLETE WITH STAINLESS STEEL STEM, COMPRESSION JOINT CAMBRIDGE BRASS.
19. SERVICE BOXES - NUMBER 7 D-1 CLOW OR MUELLER 24" BLACK ROPS STRAIGHT.
20. CULVERTS - SMOOTH WALL HDPE (MIN. PIPE STIFFNESS = 320 KPO).
21. RIP RAP TO OPSS-MUNI 1004.05.05.
22. SEDIMENT TRAPS - RECTANGLE CBST BY LAYFIELD OR APPROVED EQUAL.



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

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

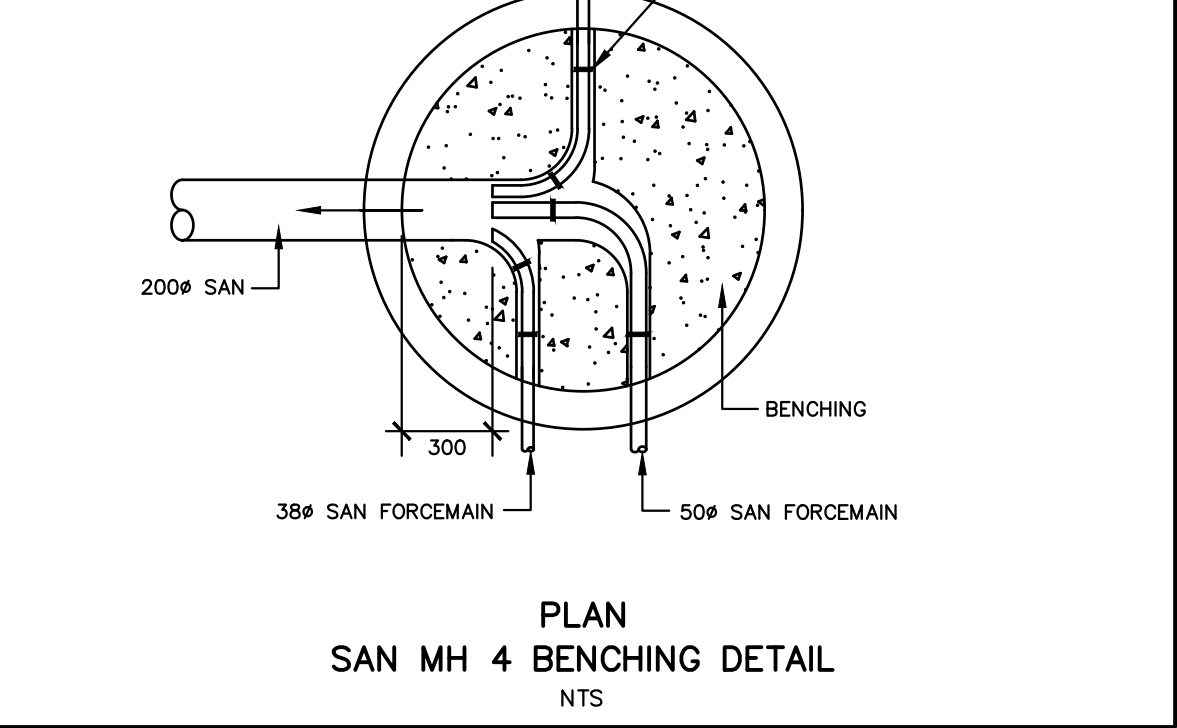
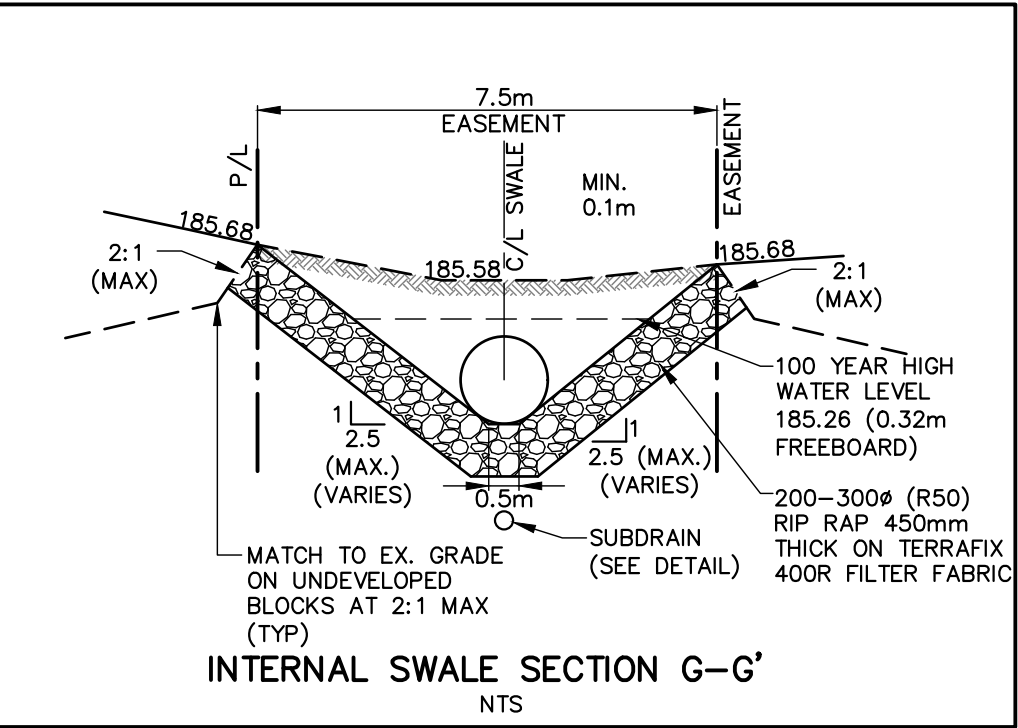
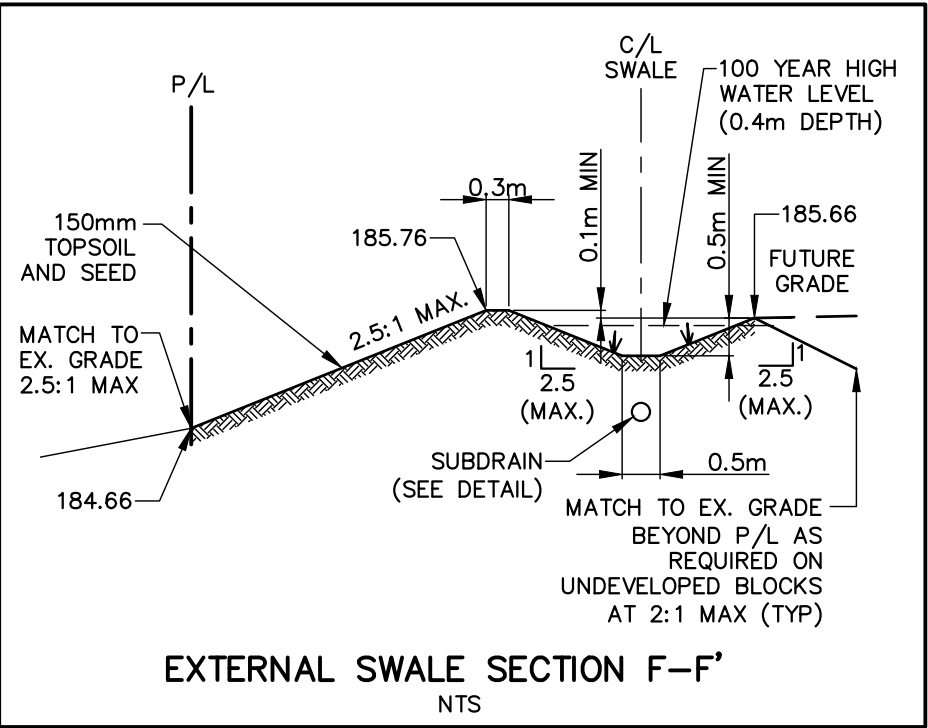
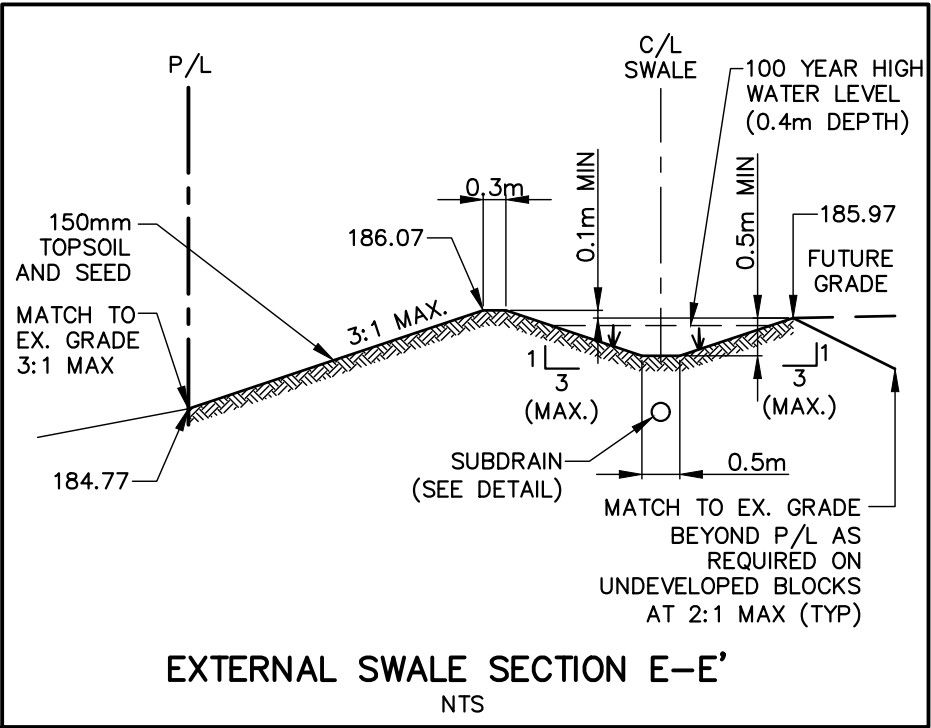
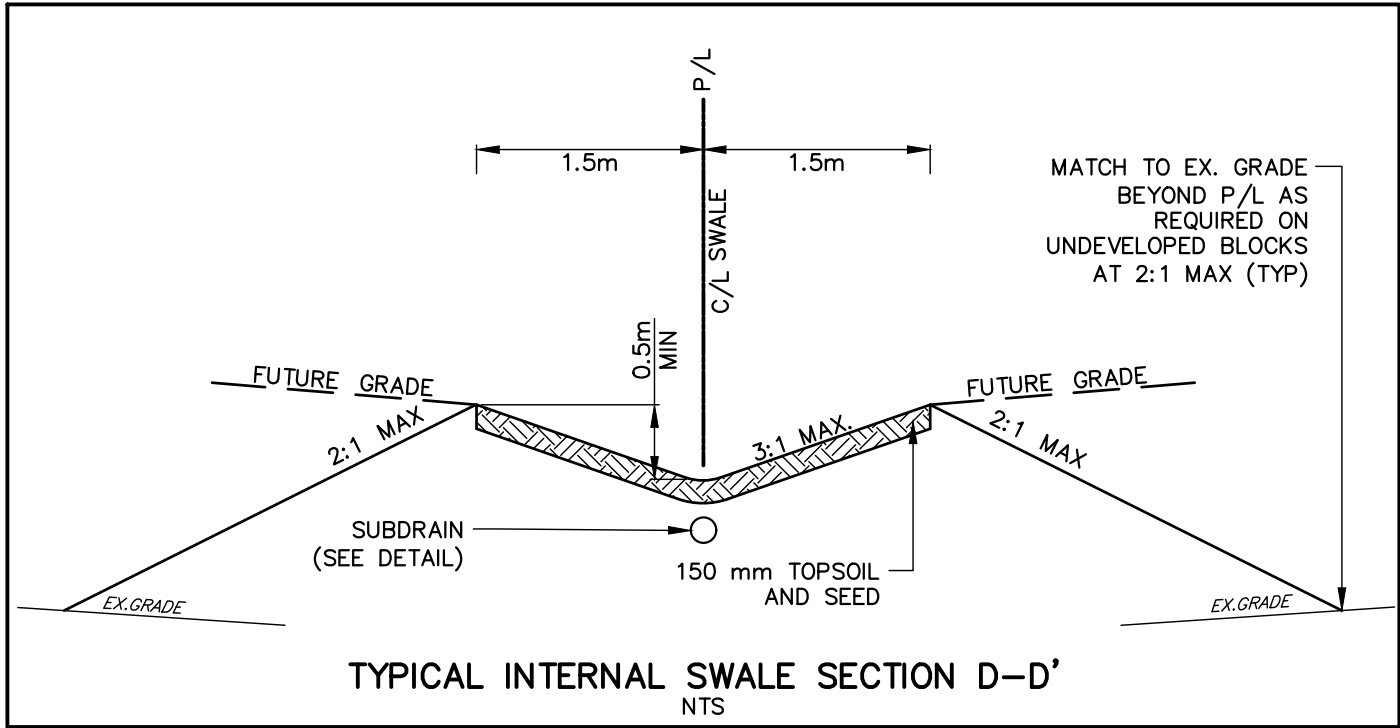
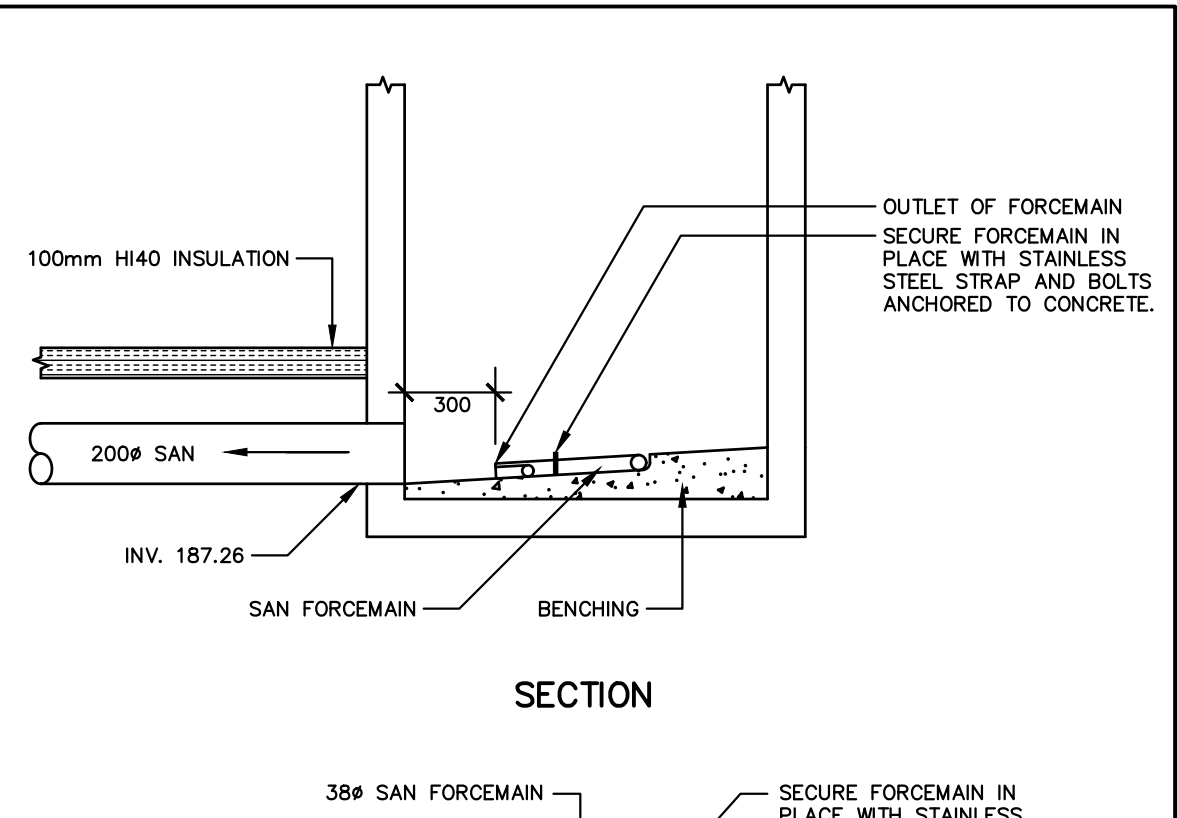
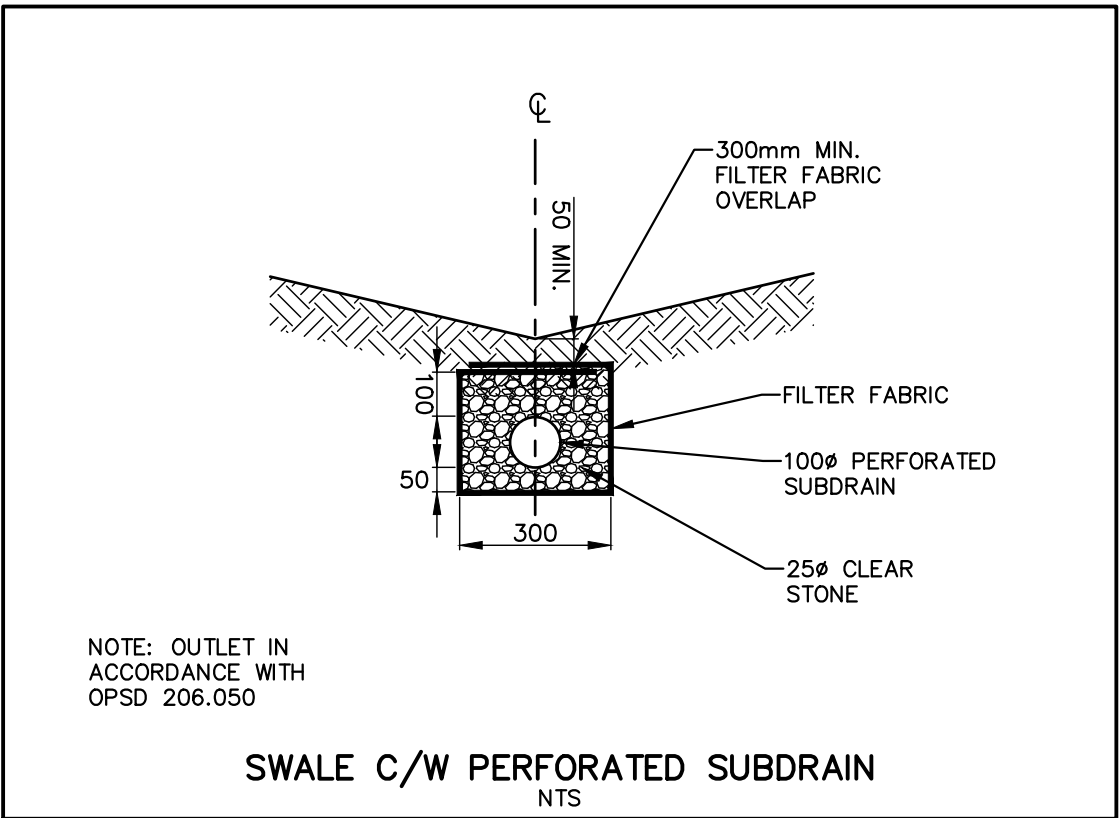
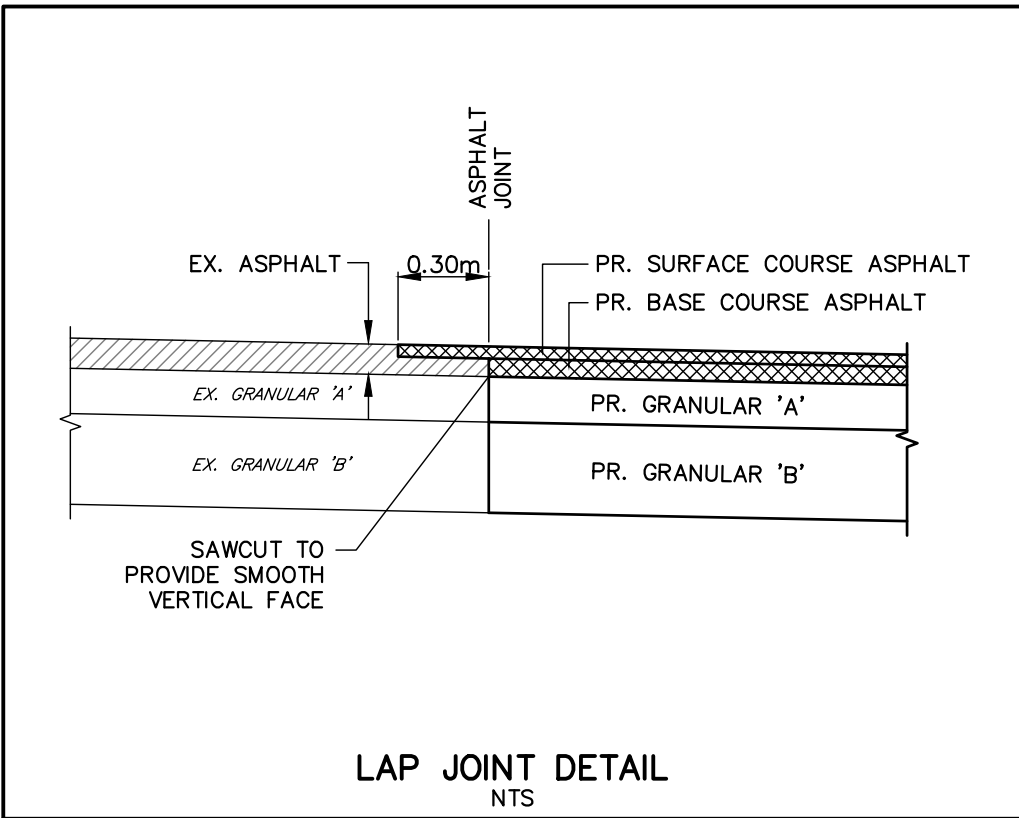
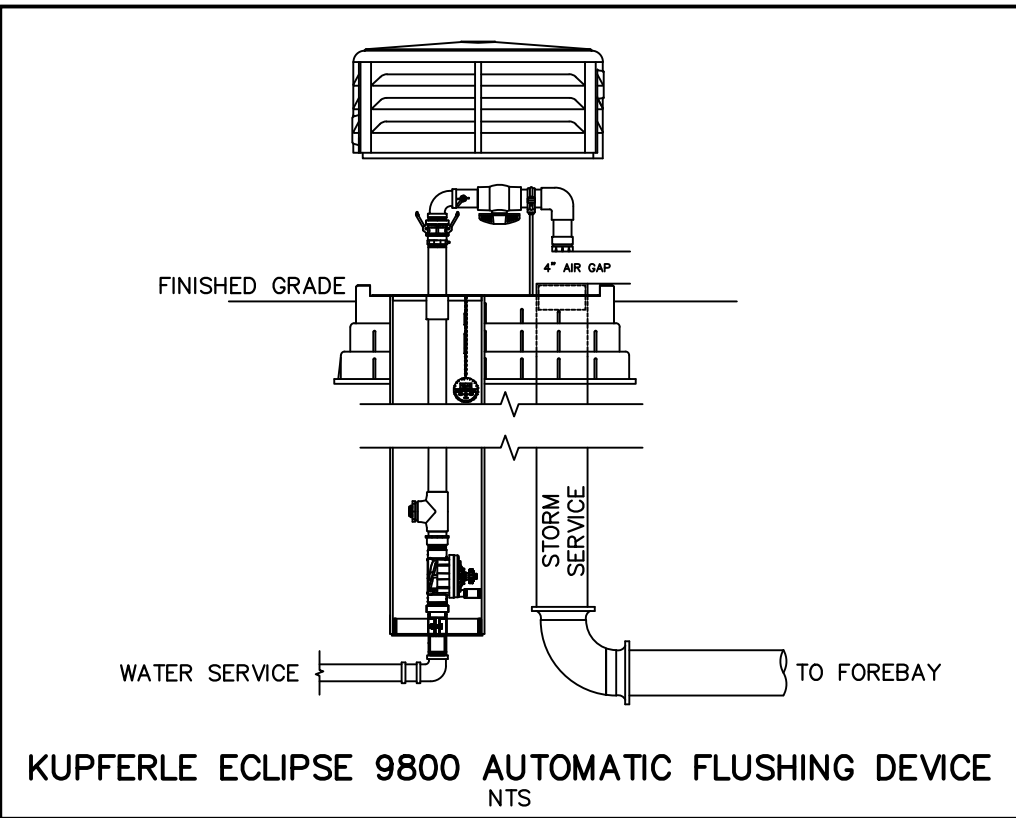
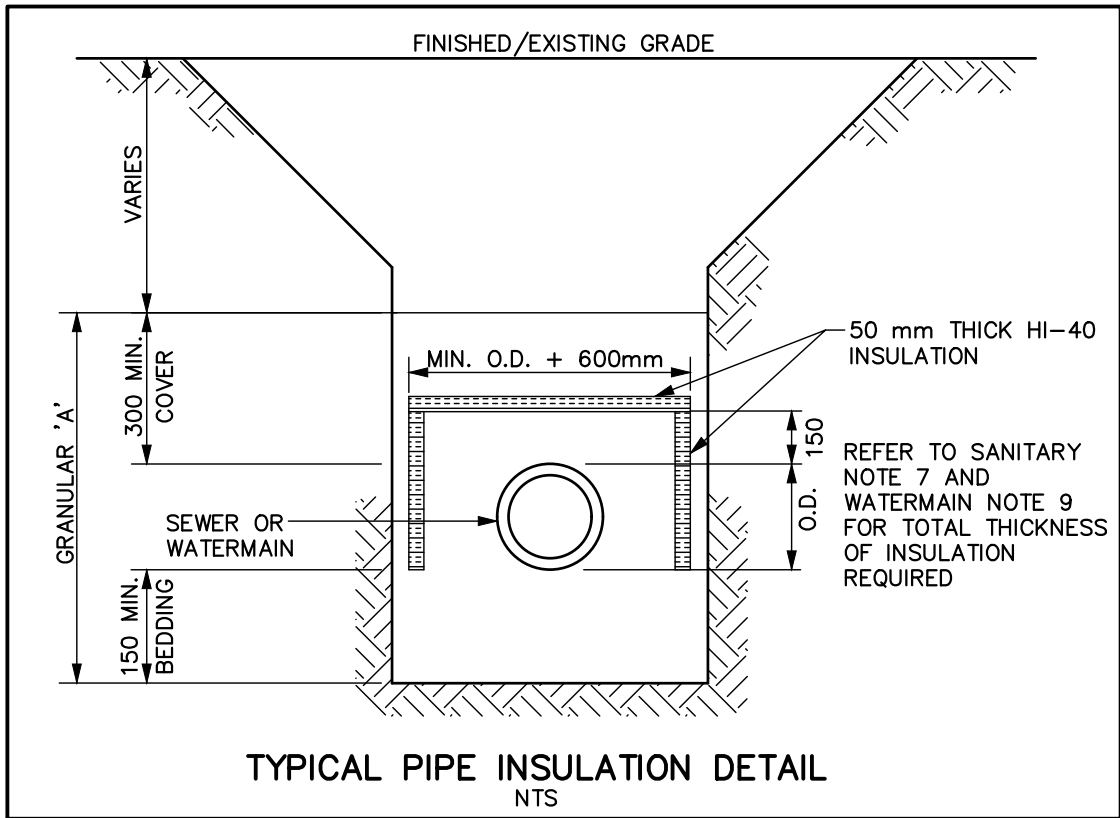
ORIGINAL
STAMPED
BY
M. J. CULLIP
JULY 31/18

DETAILS, SECTIONS AND NOTES
SHEET 1



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

DE-1



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. CTA 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	ENGINEER STAMP	INDUSTRIAL SUBDIVISION 185 MOUNTAIN ROAD TOWN OF COLLINGWOOD	TATHAM ENGINEERING	DESIGN: APR/DFM FILE: 116023 DWG: DE-2					
			1.	AS-BUILT INFORMATION	MAR/2022	ORIGINAL STAMPED BY M. J. CULLIP JULY 31/18						DESIGN: APR/DFM	FILE: 116023	DWG:
												DRAWN: APR/DFM	DATE: DEC 2017	
												CHECK: JPA/MJC	SCALE: AS SHOWN	
DETAILS, SECTIONS AND NOTES SHEET 2														

POLE ASSEMBLY REQUIREMENTS						RULING SPAN = 45m	
POLE TAG NUMBER	POLE HEIGHT	POLE CLASS	VOLTAGES		USF POLE STANDARD NUMBER		GROUND USF STD. NO.
			PRIMARY	SECONDARY	44kV	4.16/2.4kV	
GP01	40'	3					
P01	65'	2	44kV-4.16kV/2.4kV	240/120	01-300, 01-306	01-316, 01-332	09-100
P02	60'	3	44kV-4.16kV/2.4kV	240/120	01-308A	10-200A(2)	
P03	60'	3	44kV-4.16kV/2.4kV	240/120	01-300	10-200(1)	
P04	60'	3	44kV-4.16kV/2.4kV	240/120	01-300	10-200(1)	
P05	60'	3	44kV-4.16kV/2.4kV	240/120	01-300	10-200(1)	
P06	60'	3	44kV-4.16kV/2.4kV	240/120	01-306	10-200A(3), 10-400	09-100
EP04	65'	2	44kV-4.16kV/2.4kV	240/120	01-300	10-200(1)	
EP04A	65'	2	44kV-4.16kV/2.4kV	240/120	01-300	10-200(1)	

NOTES:

2

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

3

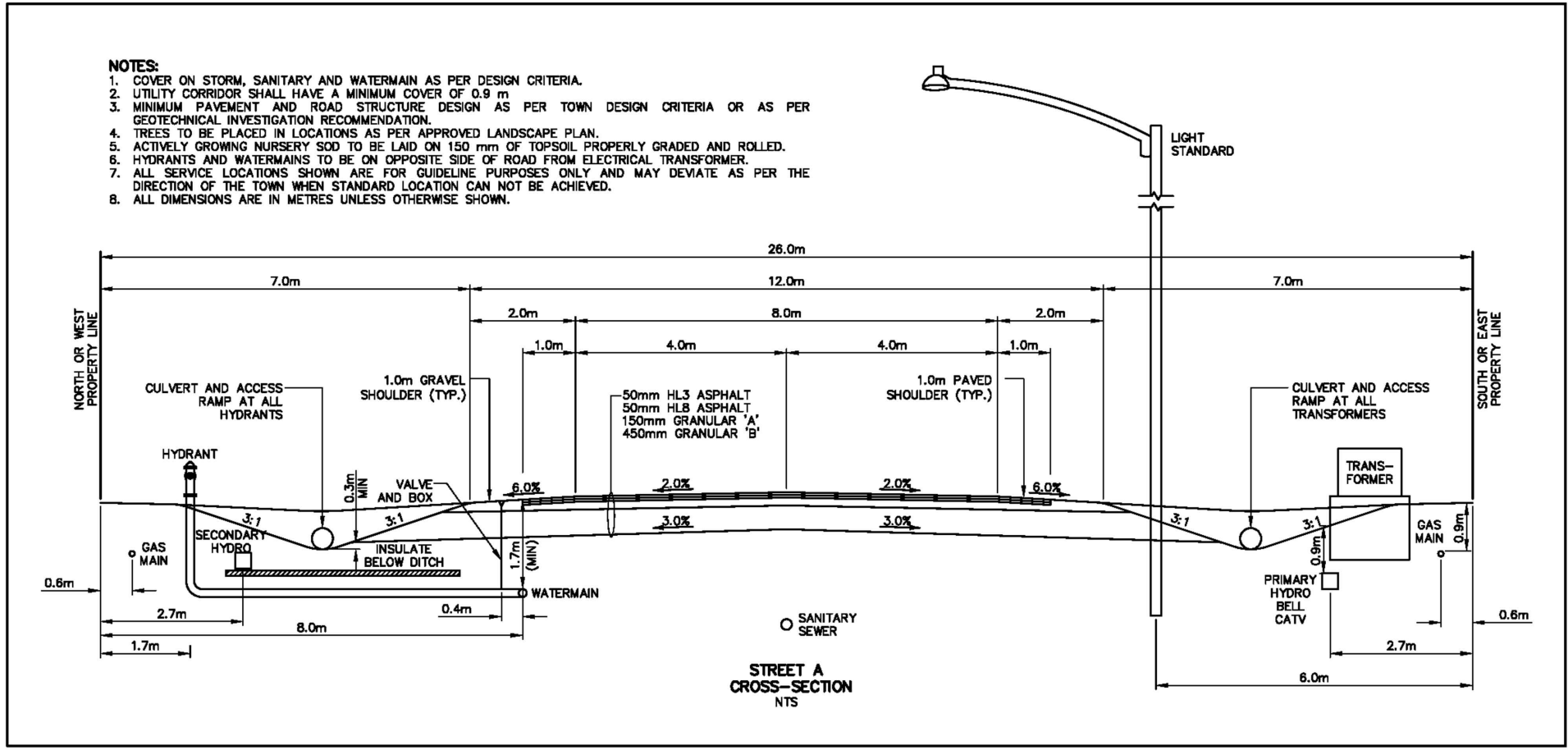
SOILS TESTING HAS NOT BEEN CONDUCTED FOR THIS PROJECT. THE DESIGN OF THE ANCHORS IS BASED ON SOIL CLASSIFICATION 4 AS DESCRIBED IN USF TABLE 06-12. THE SOIL CLASSIFICATION IS TO BE CONFIRMED BY THE INSTALLER/CONTRACTOR DURING CONSTRUCTION. IF SOIL OF A DIFFERENT CLASSIFICATION IS ENCOUNTERED, THE INSTALLER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

4

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

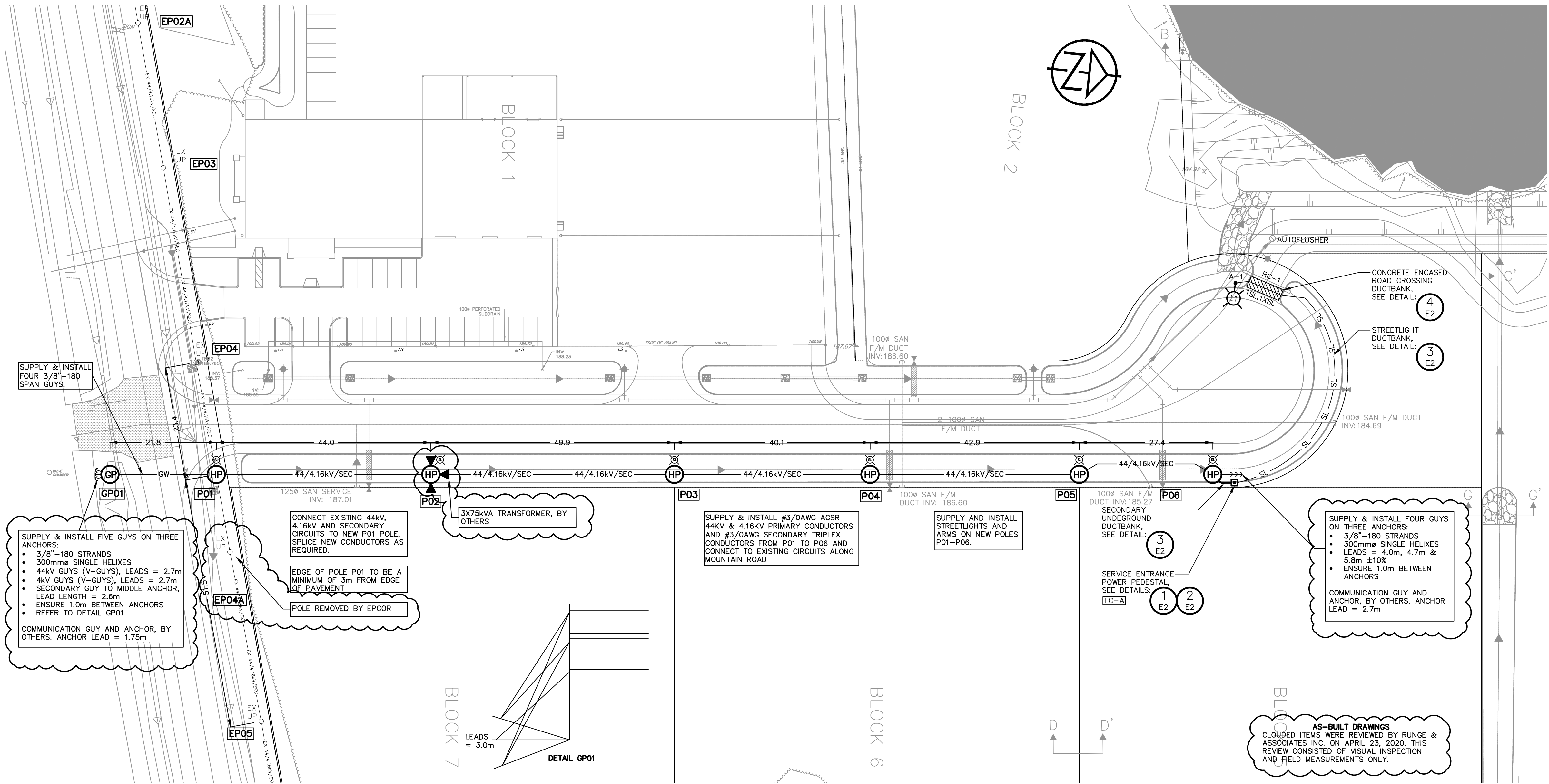
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TRANSFORMER INSTALLATION FRAMING AND GROUNDING SPECIFICATION BY OTHERS.



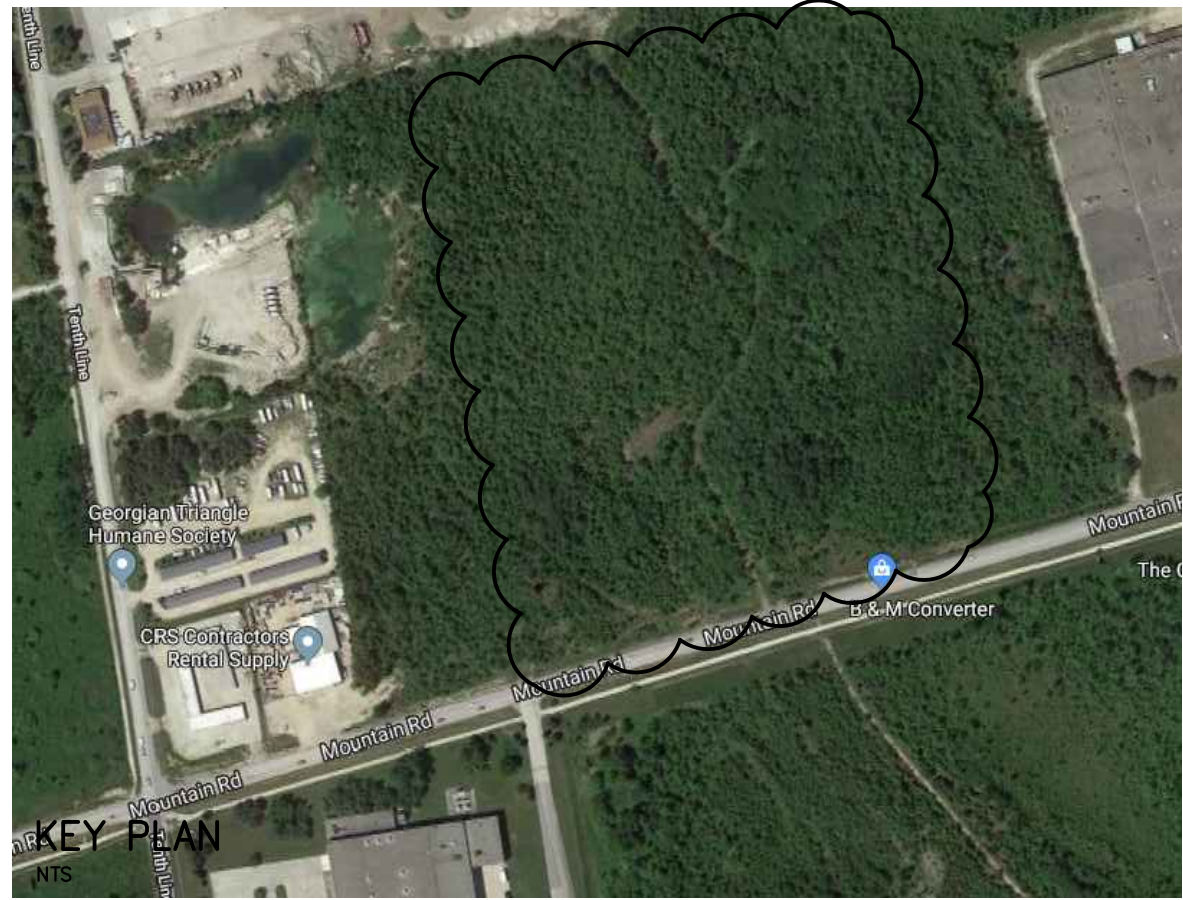
2 ROAD CROSS SECTION

- NTS



1 ELECTRICAL LAYOUT

NTS



STANDARD ELECTRICAL LEGEND

- EX 44/4.16kV/SEC EXISTING 44kV, 4.16kV & SECONDARY POWER LINE
- 44/4.16kV/SEC PROPOSED 44kV, 4.16kV & SECONDARY POWER LINE
- SECONDARY UNDERGROUND DUCTBANK
- SL SL SL SL SL PROPOSED STREET LIGHT DUCTBANK
- RC-# CONCRETE ENCASED DUCT BANK STRUCTURE FOR ROAD CROSSING AND TAG NUMBER. 1SL= 1 STREET LIGHT DUCT, 1XSL = SPARE STREET LIGHT DUCT.
- PO# HP PROPOSED POWER POLE WITH TAG NUMBER
- GPO# GP PROPOSED GUY POLE WITH TAG NUMBER
- PROPOSED GUY WIRE
- LC-A UNMETERED SERVICE ENTRANCE POWER PEDESTAL
- PROPOSED STREET LIGHT ON HYDRO POLE REFER TO SPECIFICATIONS ON E2.
- PROPOSED STREET LIGHT ON CONCRETE POLE REFER TO SPECIFICATIONS ON E2.
- NEW OR RELOCATED TRANSFORMER
- EX UP EP05 EXISTING UTILITY POLE WITH TAG NUMBER
- TYP. TYPICAL

NOTES:

- 1 CONTRACTOR TO COORDINATE WORK WITH COLLUS POWERSTREAM (COLLUS). THE FOLLOWING WORK WILL BE PROVIDED BY COLLUS:
- ALL OVERHEAD HYDRO POLE WORK INCLUDING BUT NOT LIMITED TO HYDRO POLES, PRIMARY CABLES, SECONDARY CABLES, POLES, STREETLIGHTS INCLUDING ARMS, SECONDARY TERMINATIONS, DOWN GUYS, ANCHORS, ETC. IN MUNICIPAL RIGHT OF WAY AT DEVELOPER'S EXPENSE. NOTE THAT COLLUS POWERSTREAM CAN SUPPLY A QUOTE FOR ALL WORK TO BE PAID BY CONTRACTOR/DEVELOPER.
- THE FOLLOWING WORK WILL BE PROVIDED BY THE ELECTRICAL CONTRACTOR:
- STREETLIGHT DUCTBANK FROM HYDRO POLE TO SERVICE ENTRANCE POWER PEDESTAL. REFER TO USF STANDARDS AND PROVIDE RISER TO COLLUS POWERSTREAM'S STANDARDS. PROVIDE 10m COIL OF STREETLIGHT CONDUCTOR AT BASE OF POLE FOR COLLUS CONNECTION.
 - RIGID PVC CONDUITS UP ALONG UTILITY POLE, FOR STREETLIGHT CABLE.
 - FIBER GUARDS COVERING CONDUIT (MIN. 3m LENGTH)
 - COORDINATE ALL WORK WITH COLLUS POWERSTREAM REPRESENTATIVE. REFER TO COLLUS POWERSTREAM GENERAL CONTRACTOR INFORMATION, AS PROVIDED ON THEIR WEBSITE: WWW.COLLUSPOWERSTREAM.CA

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 noted "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
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8	AS-BUILT	28/04/20	SRT

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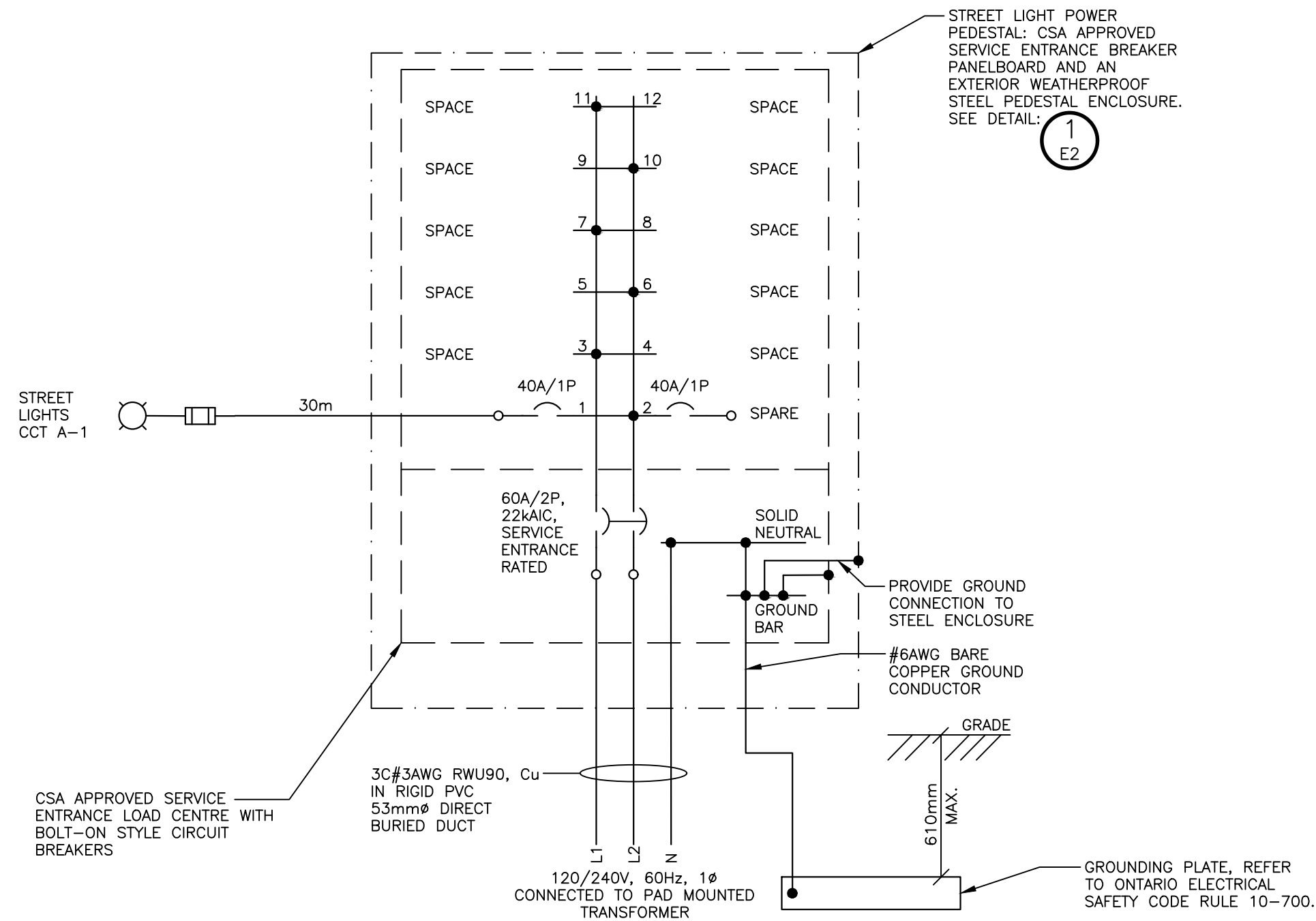
Client
VAN DOLDER'S HOME TEAM

20 BALSAM ST
COLLINGWOOD, ON L9Y 4H7

Project Name
185 MOUNTAIN RD
VAN DOLDER'S SUBDIVISION

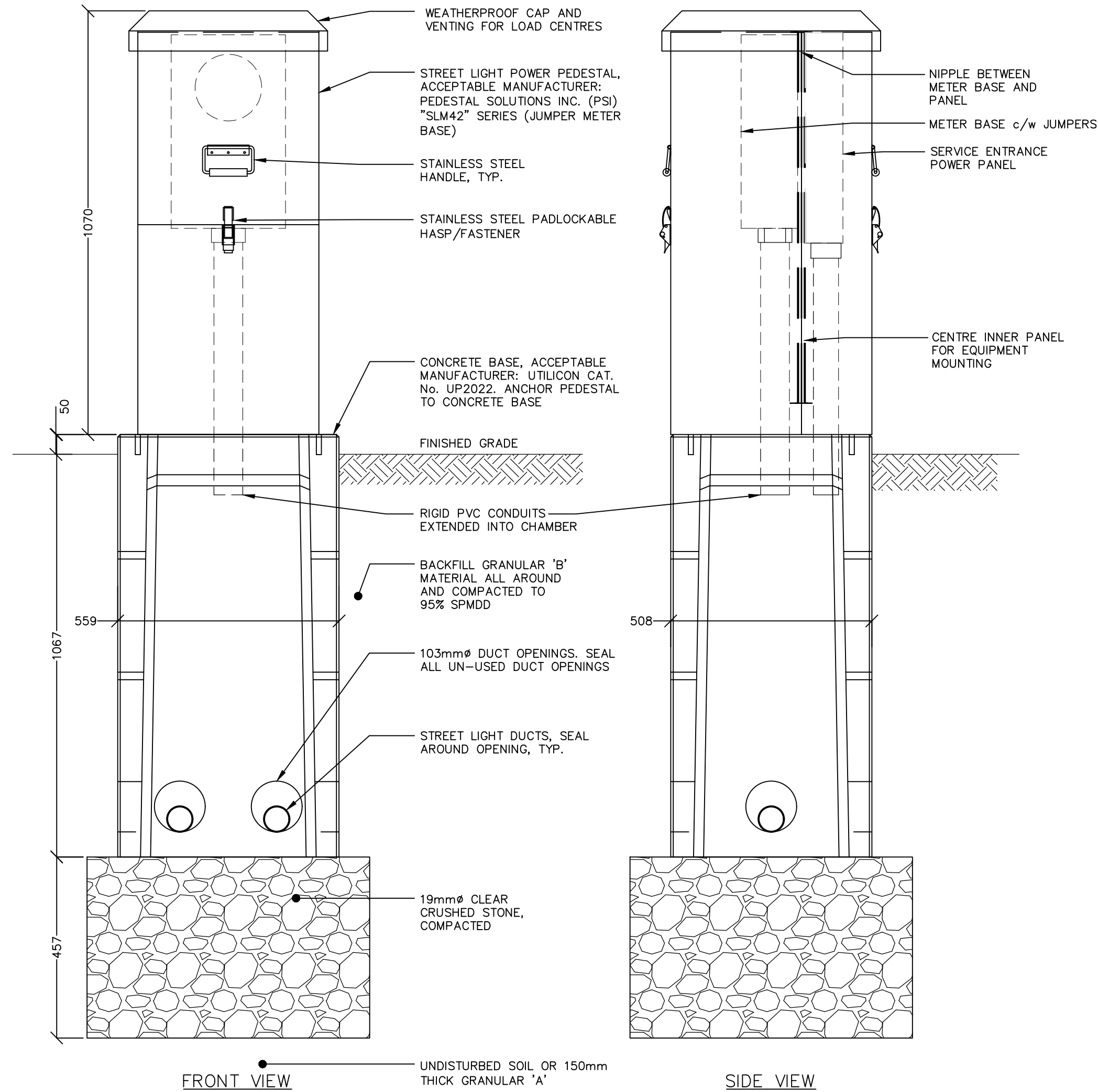
Drawing Title
POLE LINE AND STREETLIGHTING LAYOUT

Drawn By SRT	Checked By GGR	Drawing No. E1
Scale AS SHOWN	Project No. 17168P	



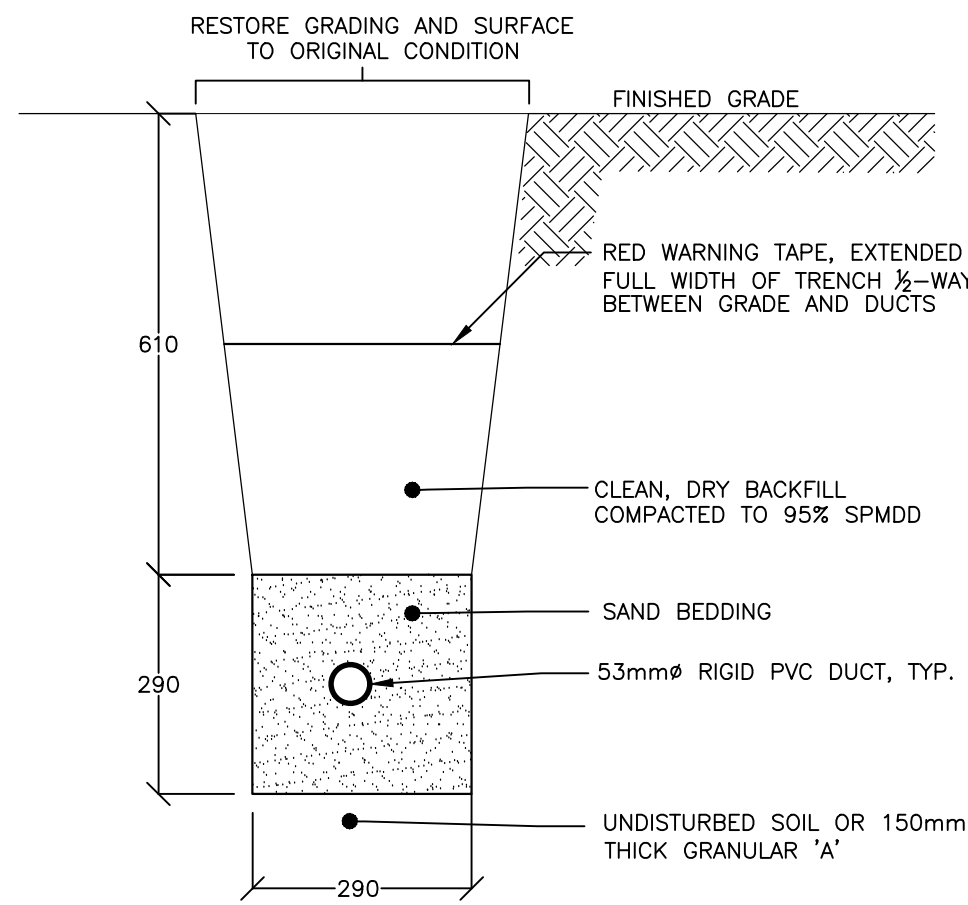
2 UNMETERED POWER PEDESTAL PANEL, LC-A WIRING DETAIL

- NTS



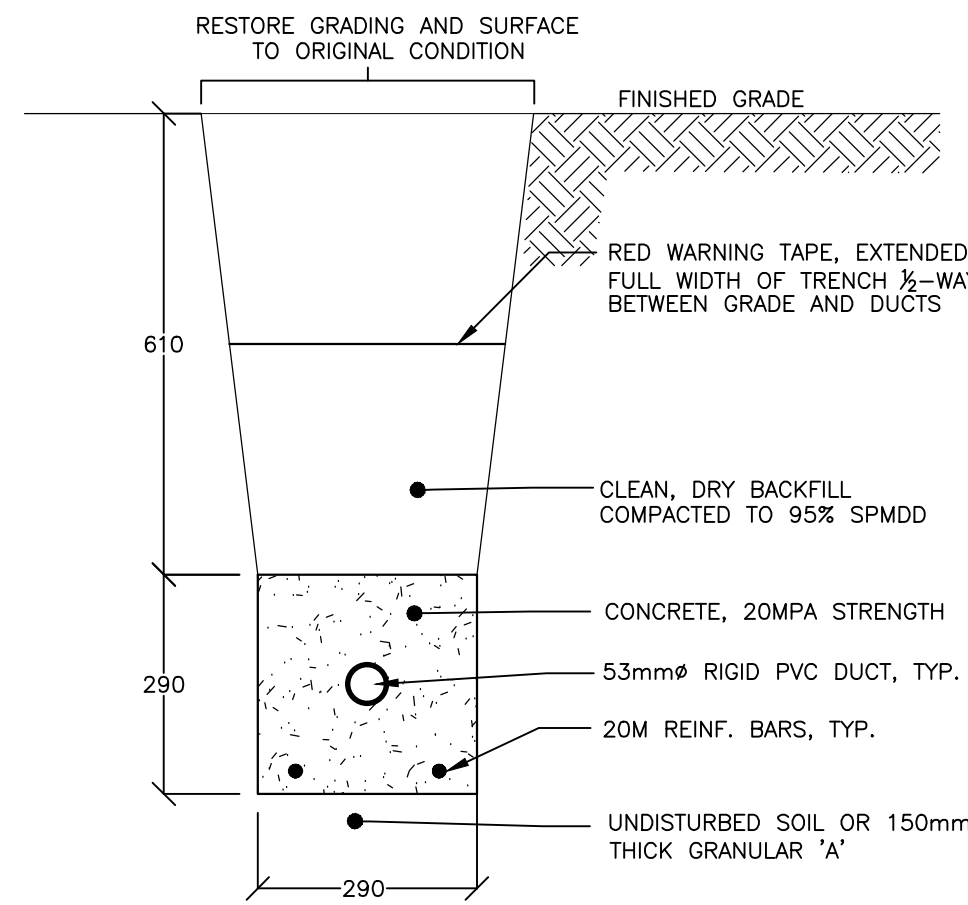
1 TYP. UNMETERED STREETLIGHT POWER PEDESTAL DETAIL

- NTS, DIMENSIONS SHOWN IN MILLIMETRES (mm)



3 TYP. SECONDARY AND STREET LIGHT DUCTBANK DETAIL

- NTS



4 ROAD CROSSING STREETLIGHT DUCTBANK

- NTS

NOTES

- 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 DUCTS IN CHAMBER OR WALLS
- B = BELL DUCTS; R = ROGERS DUCTS
- C = COMMUNICATION, S = SPARE

SPECIFICATIONS:

1.0 GENERAL SCOPE OF WORK

- 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.
- Perform all work in accordance with the latest edition and amendments (bulletins) of the Ontario Electrical Safety Code (latest Edition).
- Contractor to supply and install the following electrical services, as per contract drawings:
 - Supply and install complete streetlighting system including metered power pedestal (jumper meter base), concrete base, luminaire, pole, arm, conduit, wiring, etc.
 - Supply and install underground ductbank as indicated on contract drawings.
- COLLUS PowerStream will supply a quote to the owner/developer for the labour and material required to accommodate 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):
 - Complete overhead power line including but not limited to poles, primary and secondary conductors, street lights, guys & anchors.
- Cable Terminations: see sections 6.0
- 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.
- Contractor to supply and install underground road crossing concrete encased duct banks are shown on the Electrical Servicing Plans.
- Contractor to supply all necessary labour, equipment and materials to install a complete electrical system, as per the contract drawings and COLLUS' requirements.
- 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).
- System coordination with other services:
 - Contractor to assist in coordinating with the local telephone and cable television utilities.
 - 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

- 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

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

- Prior to any installation the site must be prepared to within 150mm of final grade. There will be no exceptions made to this requirement.
- SPECIFIC INSPECTION TIMES:
 - Once the trench has been excavated, sand padded and conduits/ducts installed, the COLLUS inspector must approve all works to date.
 - 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.
 - 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

- 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.
- 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

- A minimum separation of 2 metres must be maintained between all natural gas and electrical trenches.
- All equipment must meet COLLUS PowerStream Corp. and Electrical Safety Authority inspections requirements.

6.0 CABLE TERMINATION REQUIREMENTS

- COLLUS PowerStream Corp. will make the following terminations:
 - All high voltage terminations i.e.: stress cones at cubicles and riser poles and load break elbows at transformers and cubicles etc.
 - Low voltage terminations up to 250mm in size will be completed by COLLUS Power Corp. personnel on services to be assumed by COLLUS Powerstream.
- COLLUS shall also perform cable tagging for each cable.

7.0 SHOP DRAWING REVIEW

- 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.
- Show all details of construction, dimensions, capacities, weights, and electrical performance characteristics of equipment or material. Identify each shop drawing accordingly.
- 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.
- Owner's and COLLUS' Shop Drawing Review:
 - Review of shop drawings shall not relieve Contractor from responsibilities or results arising from any errors or omissions.
 - 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.
 - 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.
- 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.

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ACCEPTED FOR
CONSTRUCTION
COLLUS POWER CORP

per Ted Burrell
Date: Nov. 7, 2017

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7	RE-ISSUED FOR CONSTRUCTION	24/04/19	SRT
8	AS BUILT	28/04/20	SRT

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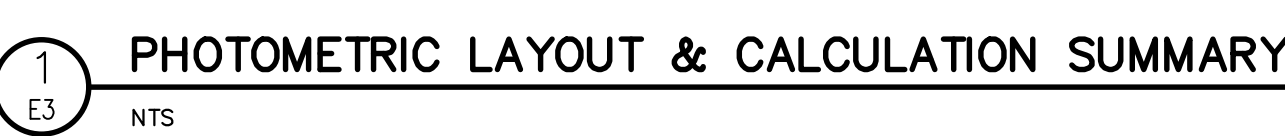
Client
VAN DOLDER'S HOME TEAM

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



PHOTOMETRIC CALCULATION SUMMARY

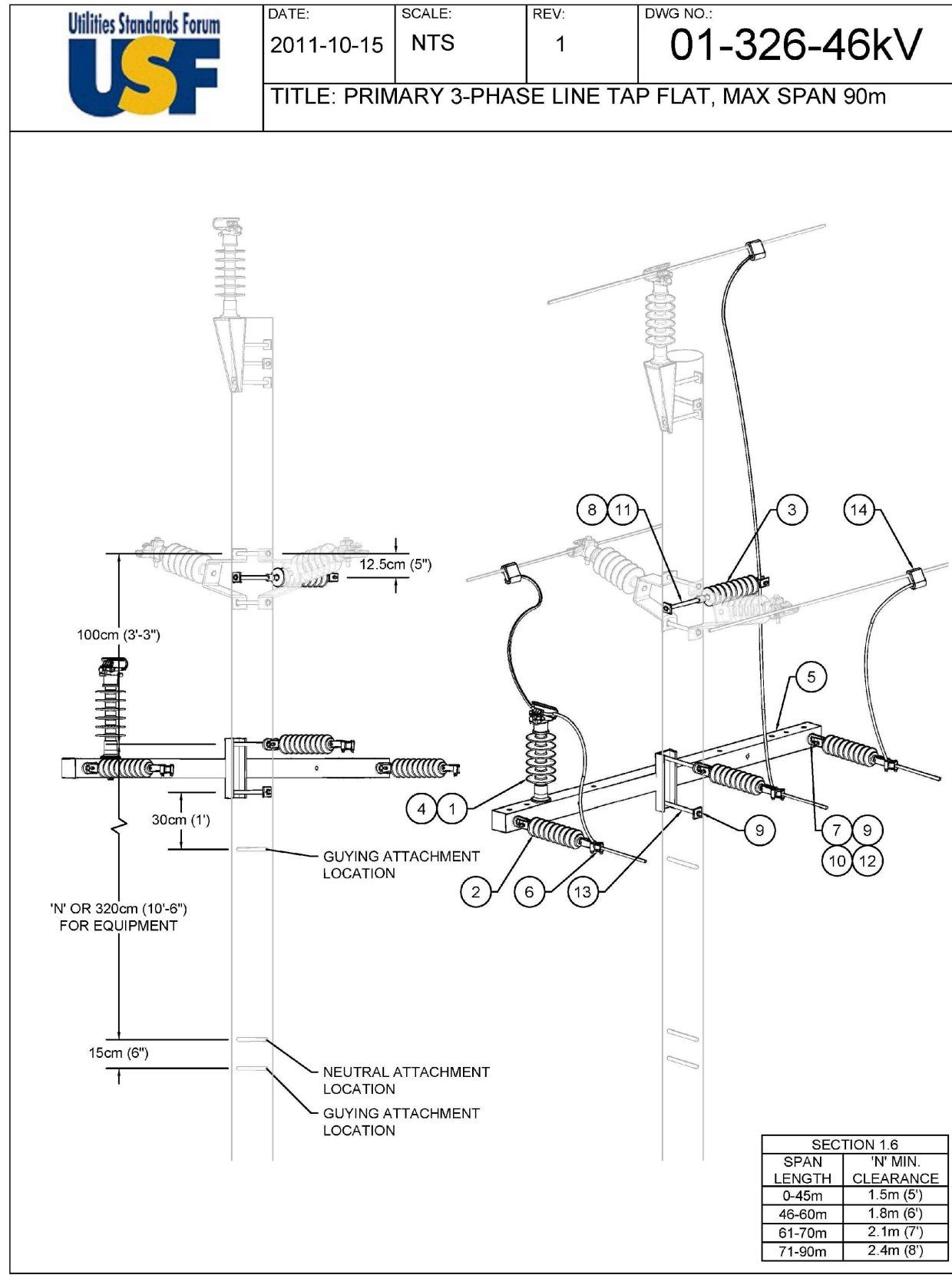
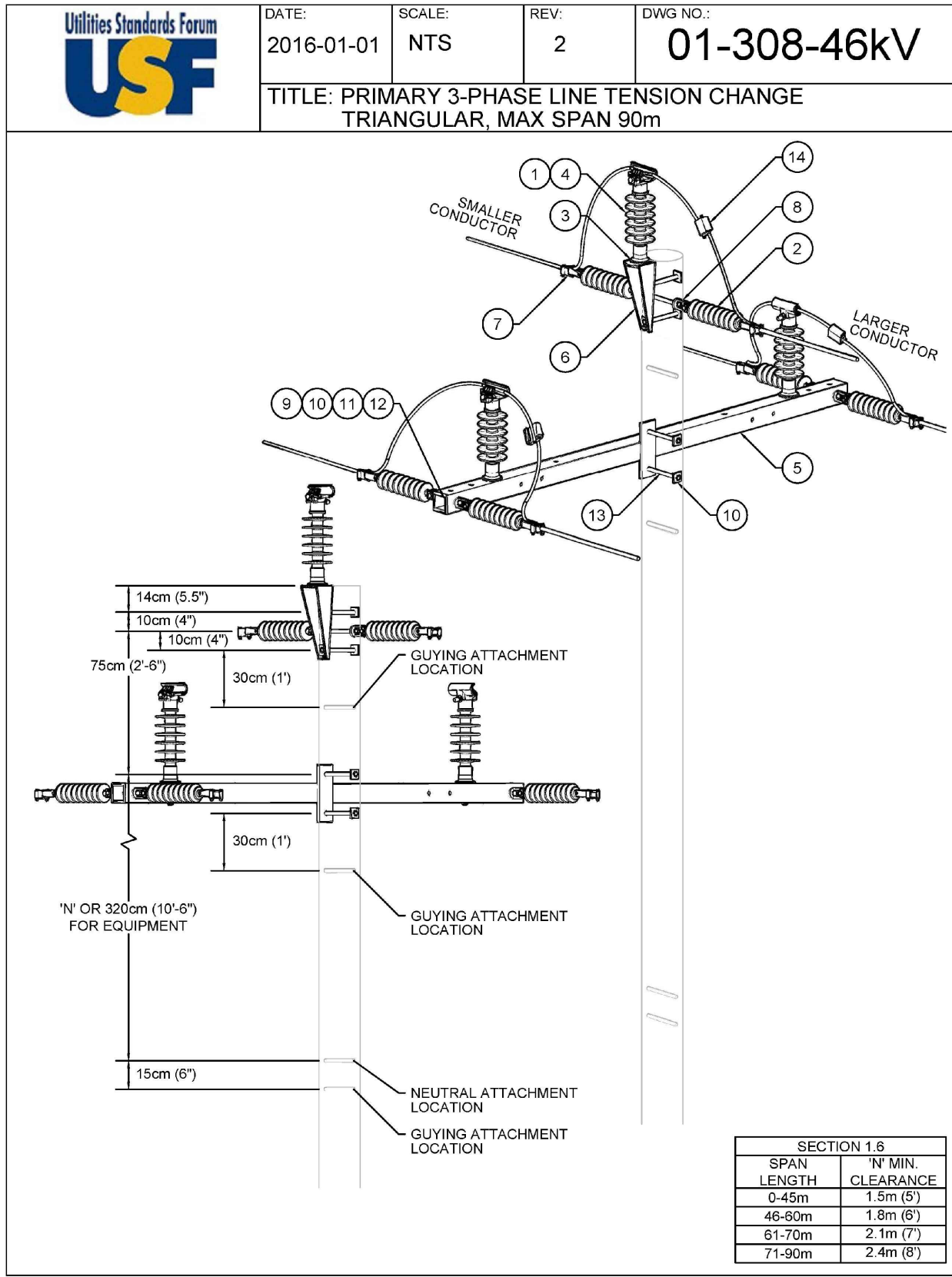
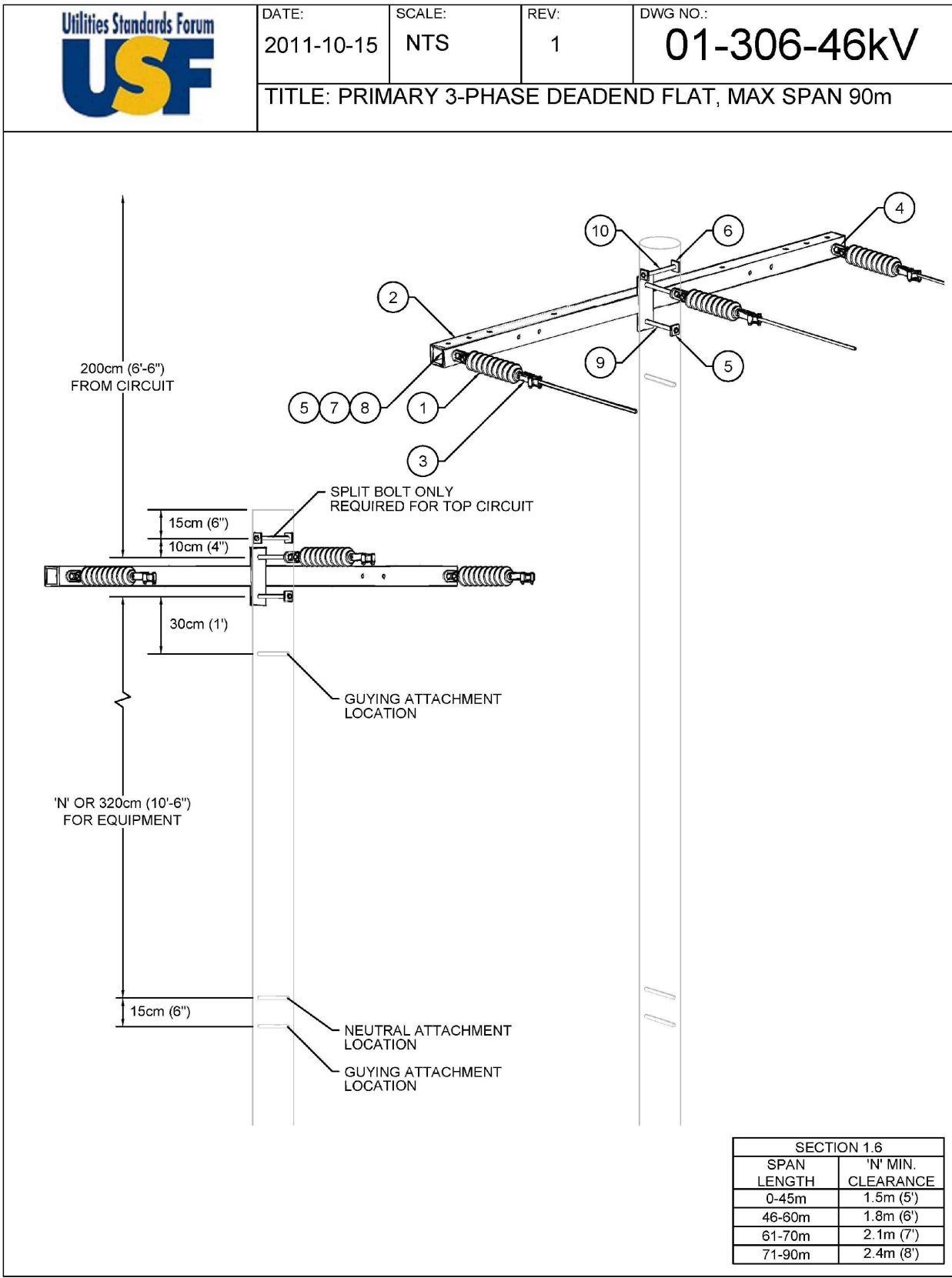
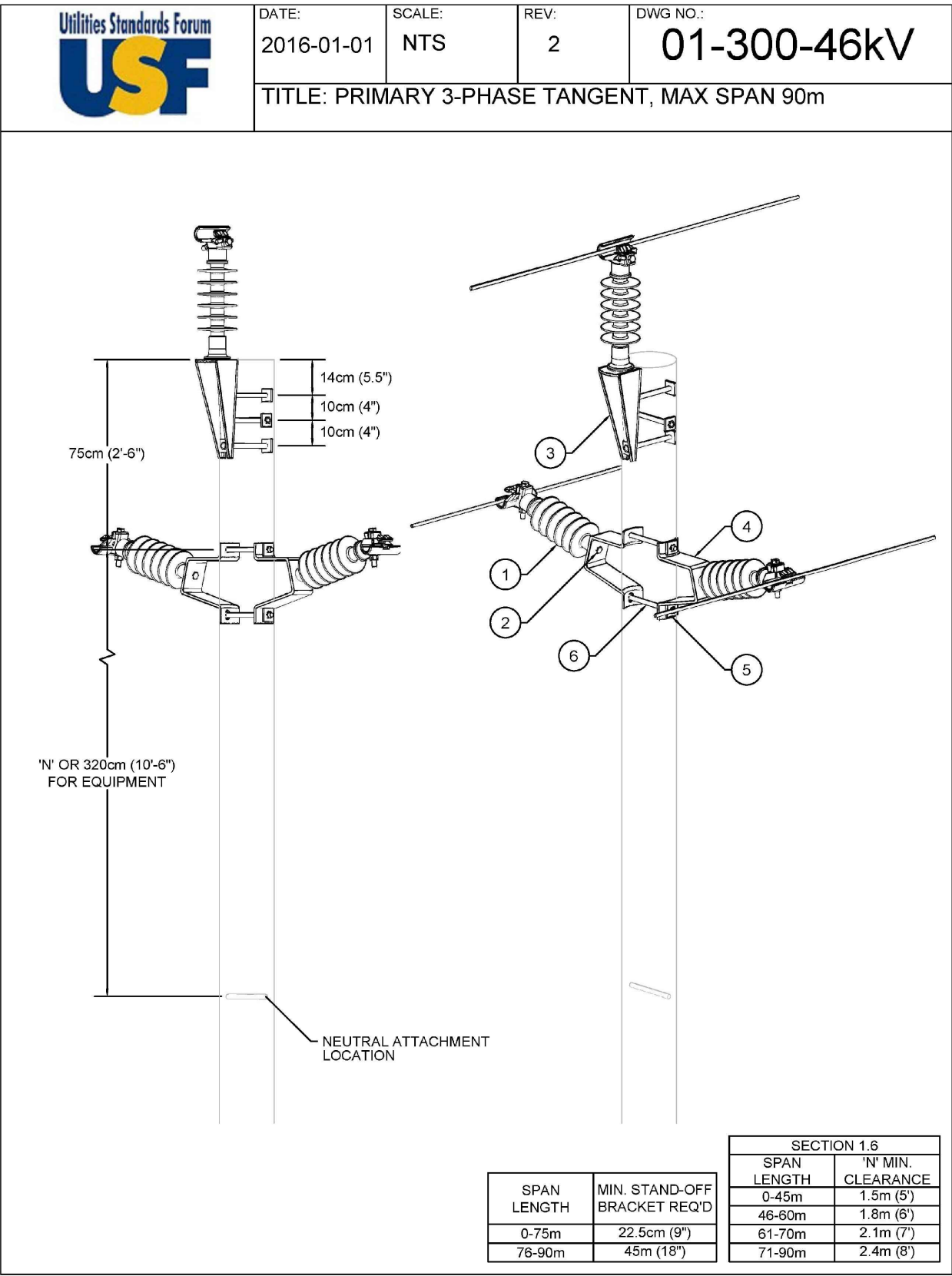
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www.roiengineers.ca

Project Name	185 MOUNTAIN RD VAN DOLDER'S SUBDIVISION
Drawing Title	PHOTOMETRICS AND STREET LIGHT DETAILS

Drawn By SRT	Checked By GGR	Drawing No. E3
Scale AS SHOWN	Project No. 17168P	



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 Aptlong 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 3/4"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 Aptlong 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.

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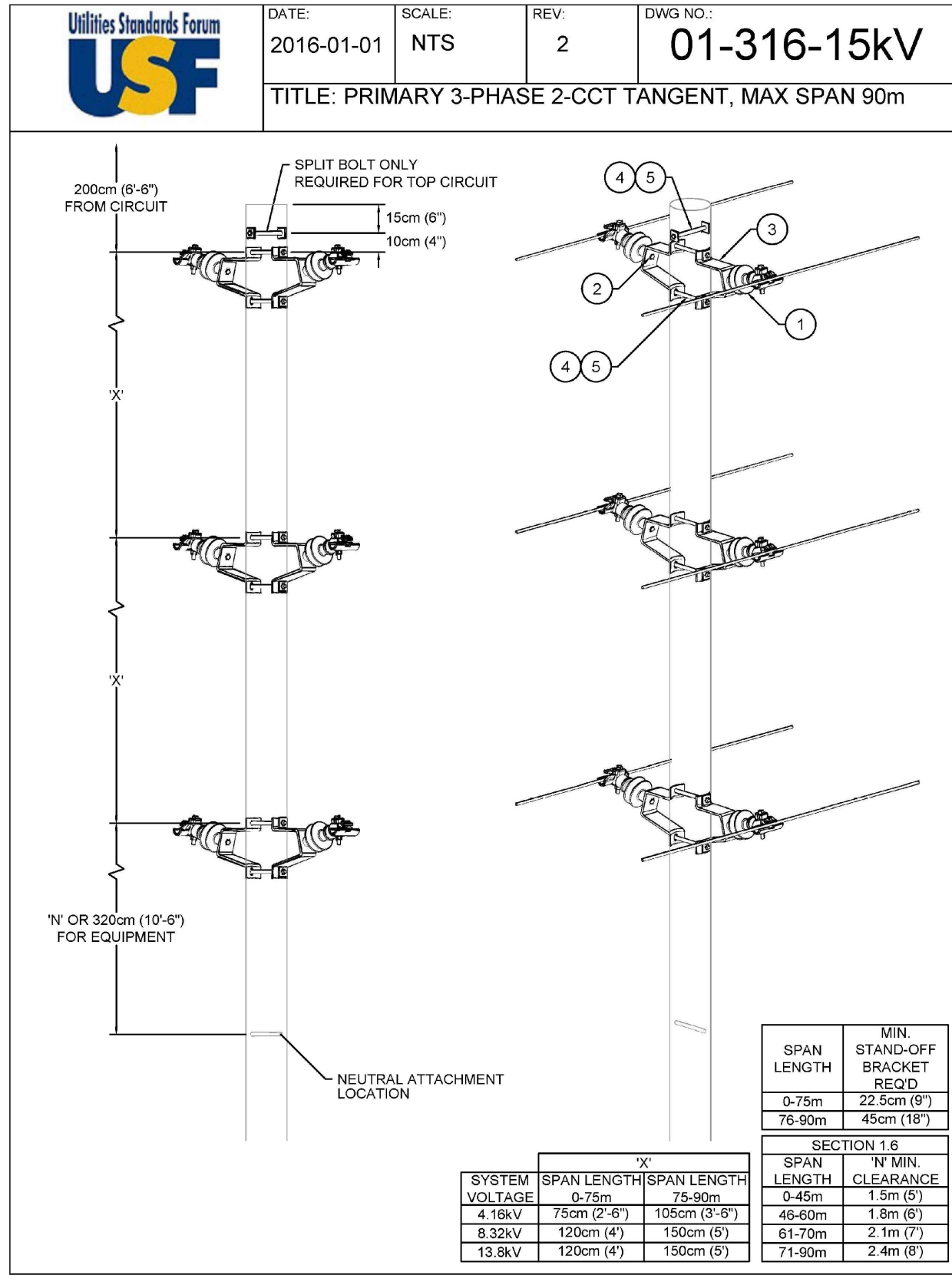
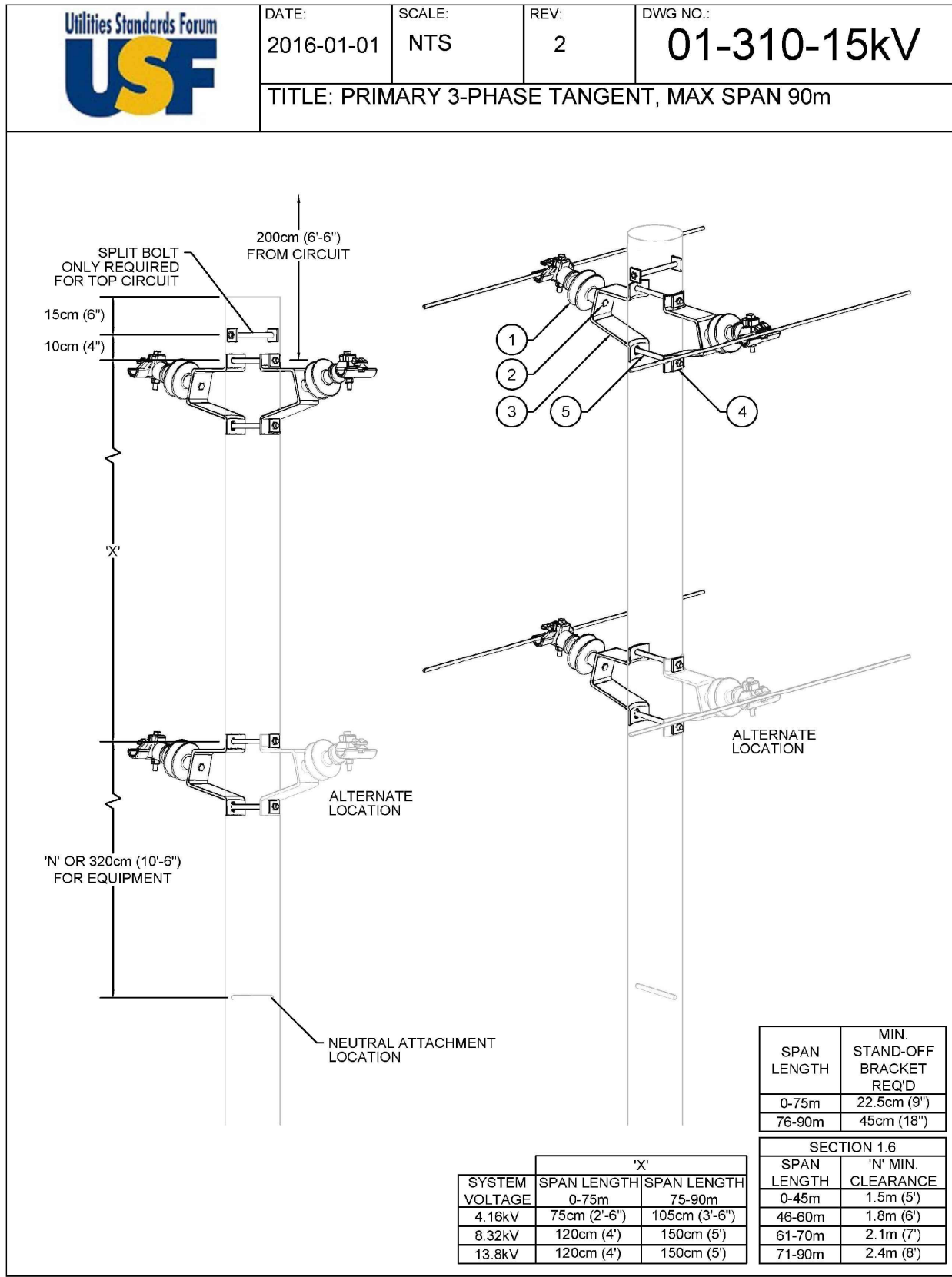
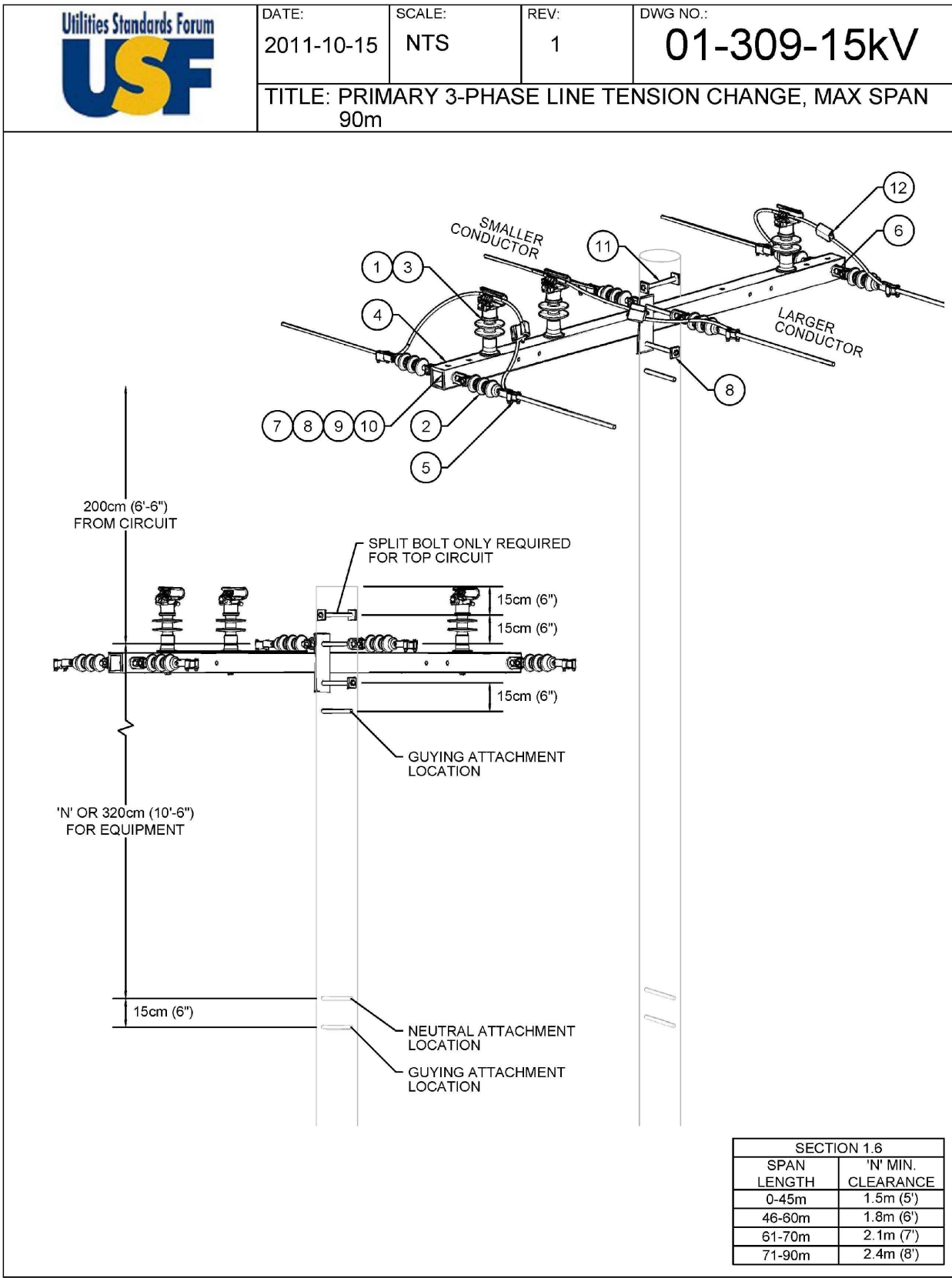
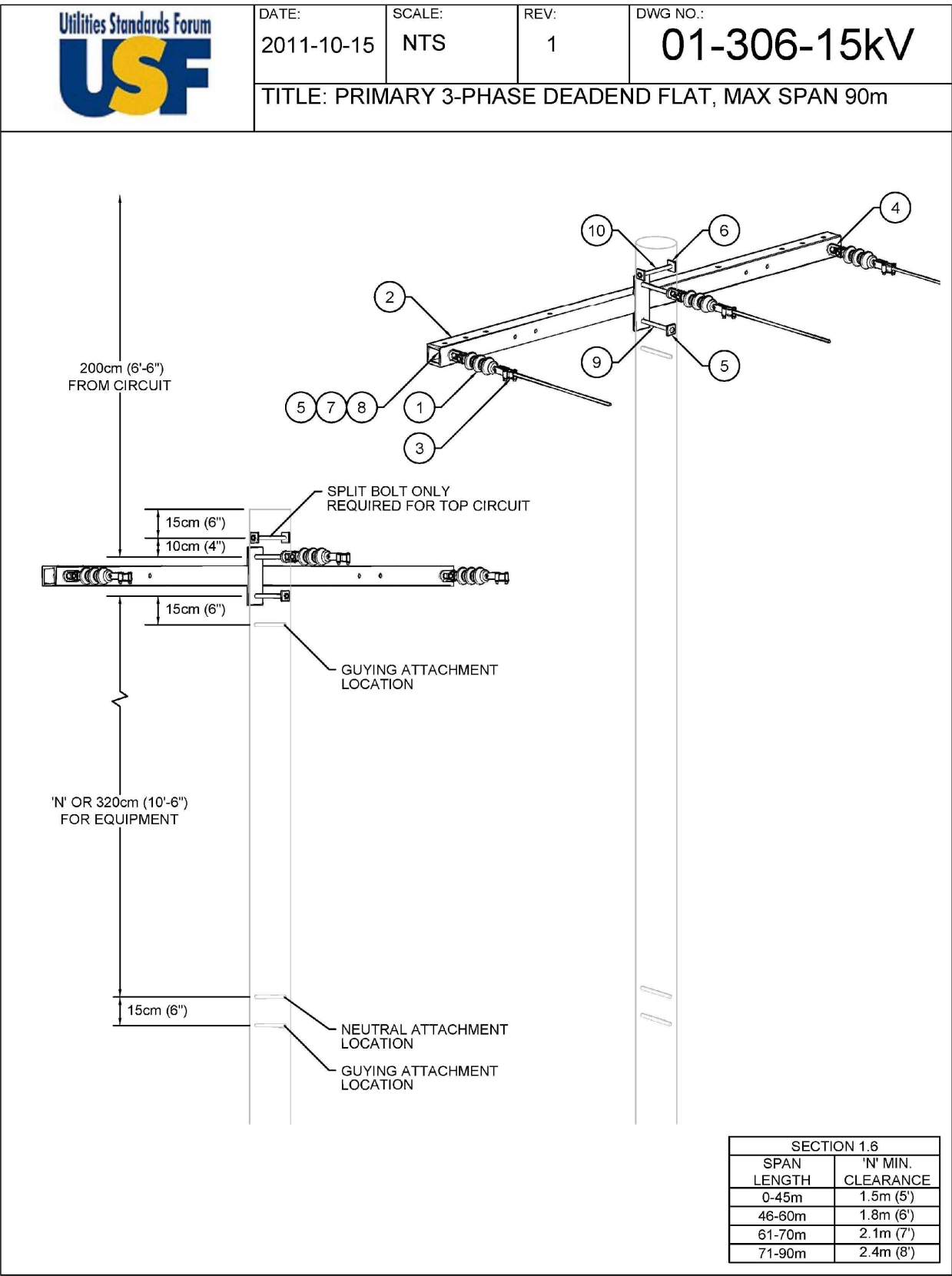
Client
VAN DOLDER'S HOME TEAM

20 BALSAM ST
COLLINGWOOD, ON L9Y 4H7

Project Name
185 MOUNTAIN RD
VAN DOLDER'S SUBDIVISION

Drawing Title
COLLUS POWERSTREAM STANDARDS

Drawn By SRT	Checked By GGR	Drawing No. E4
Scale AS SHOWN	Project No. 17168P	



MATERIAL LIST 01-306-15kV			
Part #	Qty.	Description	Part Number
1	3	Insulator Deadend 15kV	U00024
2	1	Crossarm Aptong 5'	U00875
2	1	Crossarm Aptong 7'	U00876
2	1	Crossarm Aptong 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 Ball 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 Ball 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.

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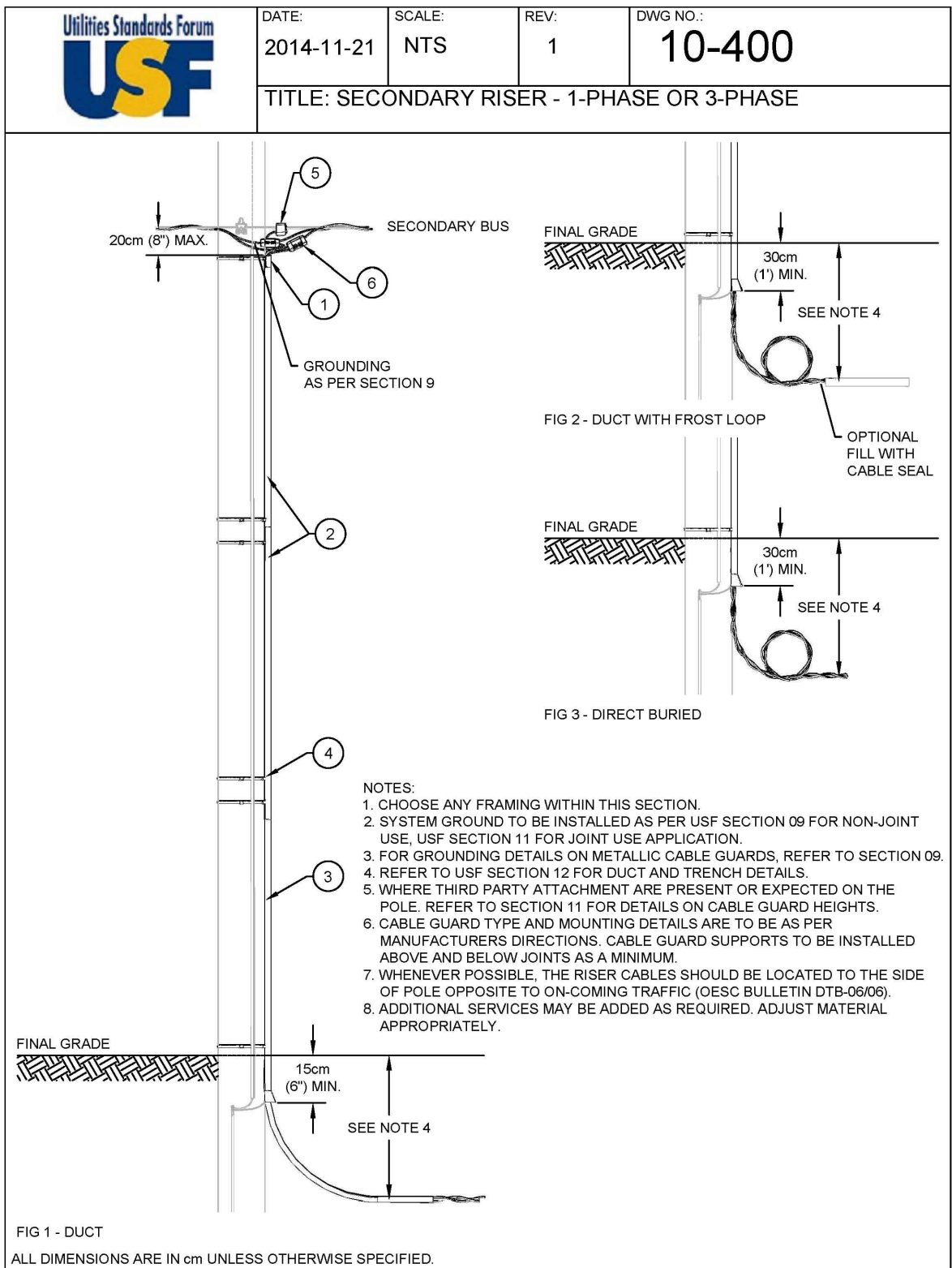
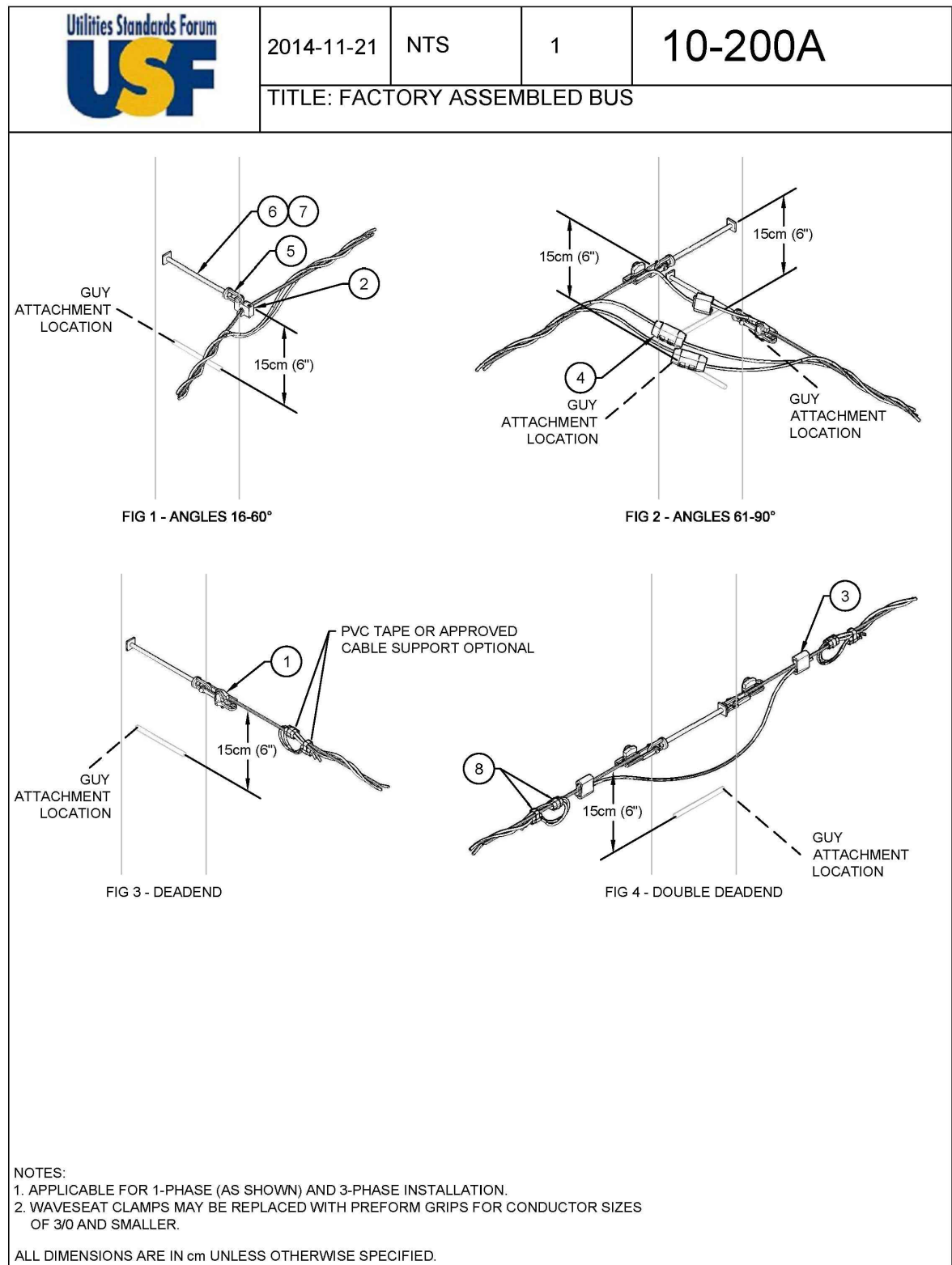
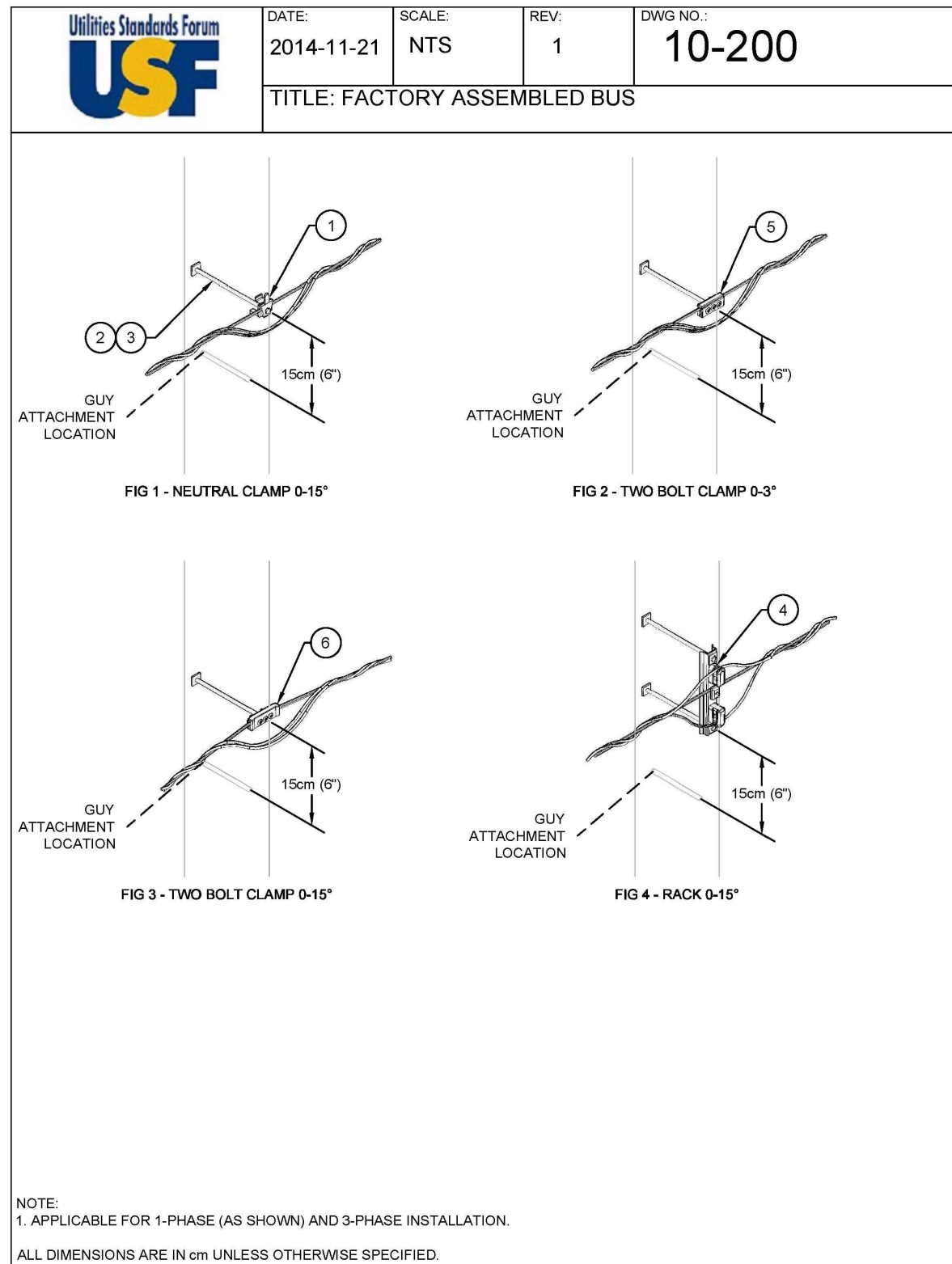
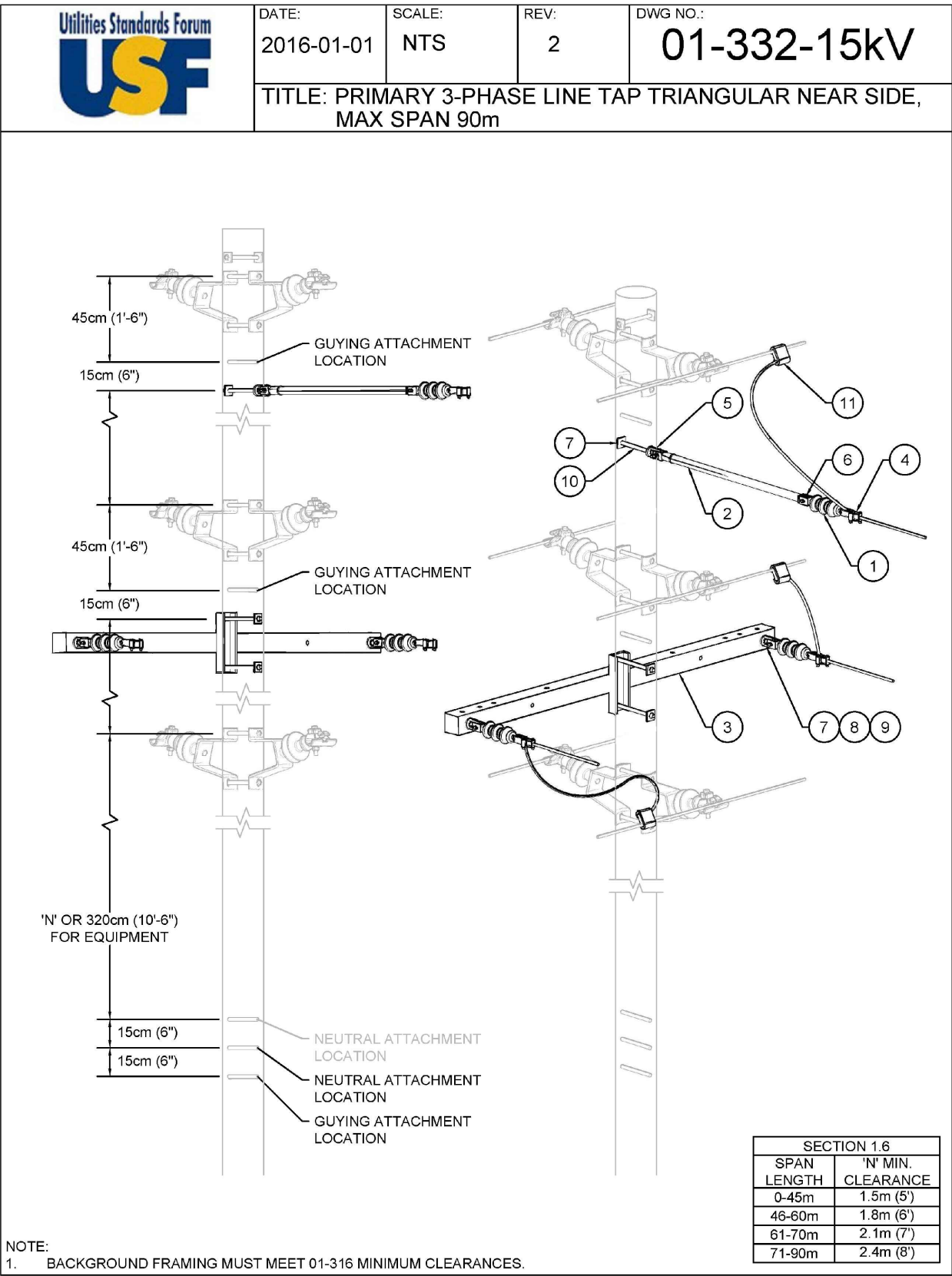
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VAN DOLDER'S HOME TEAM

20 BALSAM ST
COLLINGWOOD, ON L9Y 4H7

Project Name
185 MOUNTAIN RD
VAN DOLDER'S SUBDIVISION

Drawing Title
COLLUS POWERSTREAM STANDARDS

Drawn By SRT	Checked By GGR	Drawing No. E5
Scale AS SHOWN	Project No. 17168P	



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 Aptong 9'	U00875
3	1	Crossarm Aptong 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	U00640
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	U00250
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	U00005-U00006
2	As Req'd	Guard, Cable, Straight	U000372-U000374
3	1	Guard, Cable, Flared	U000369-U000371
4	6	Straps, Cable Guard	U000375-U000379
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

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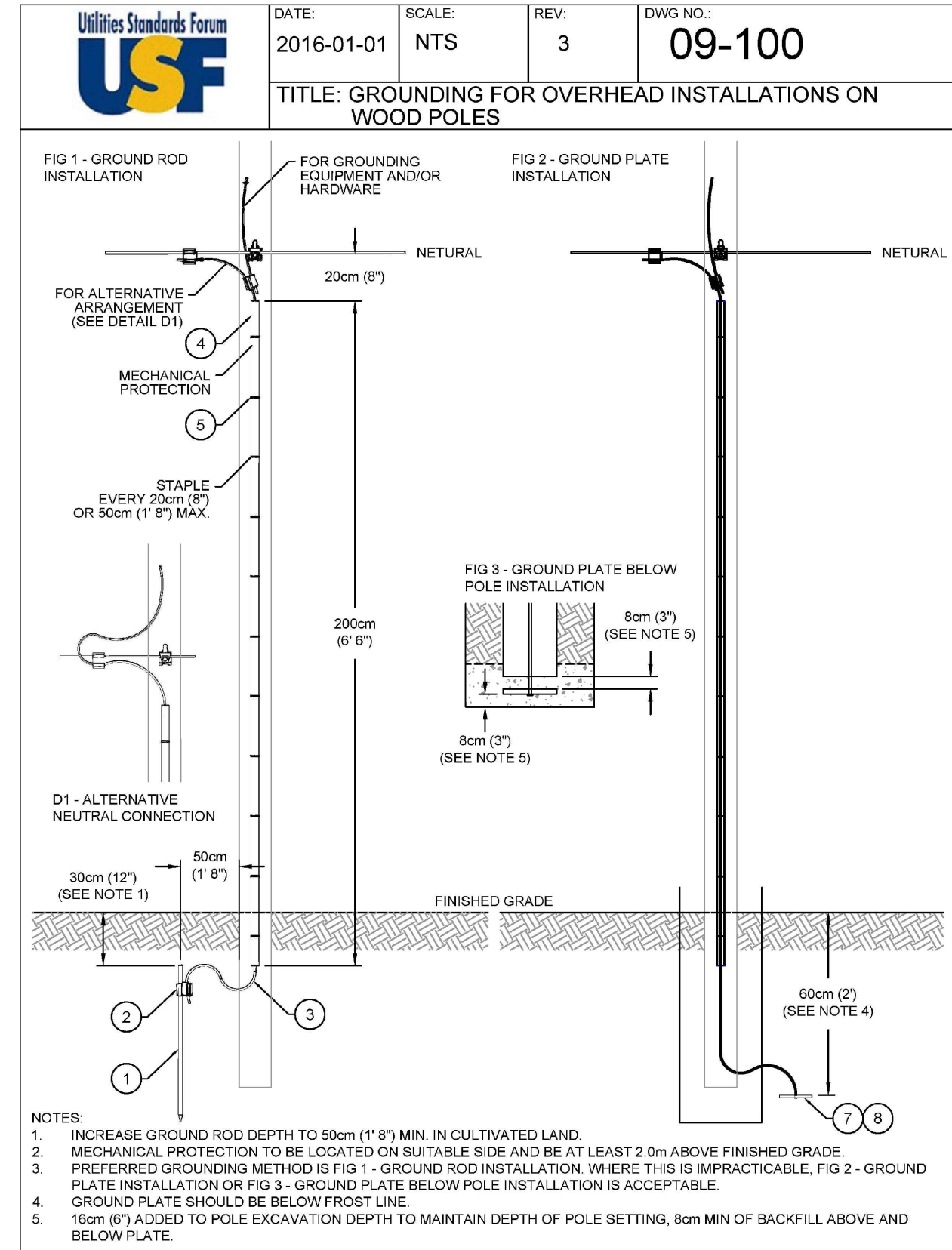
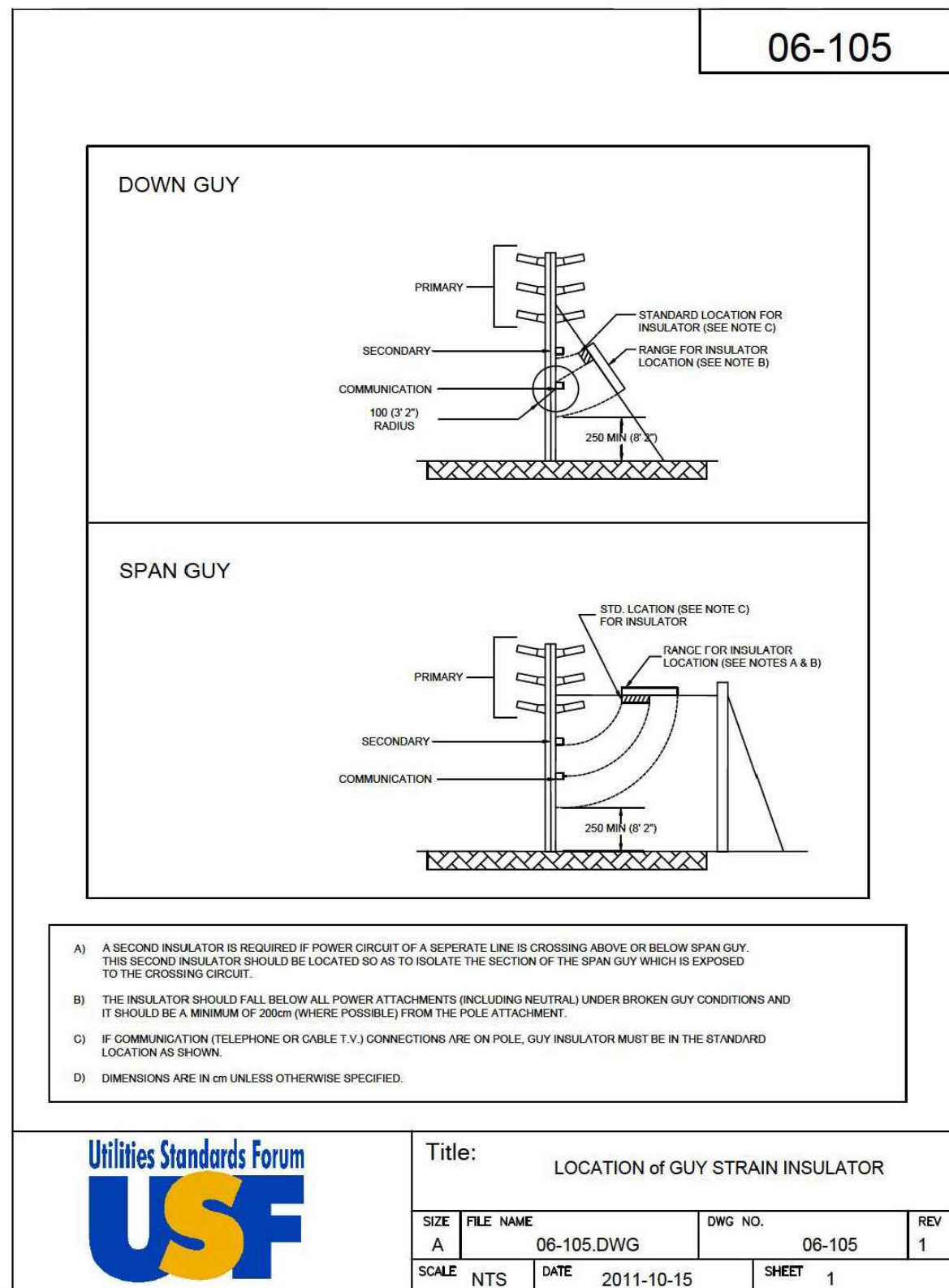
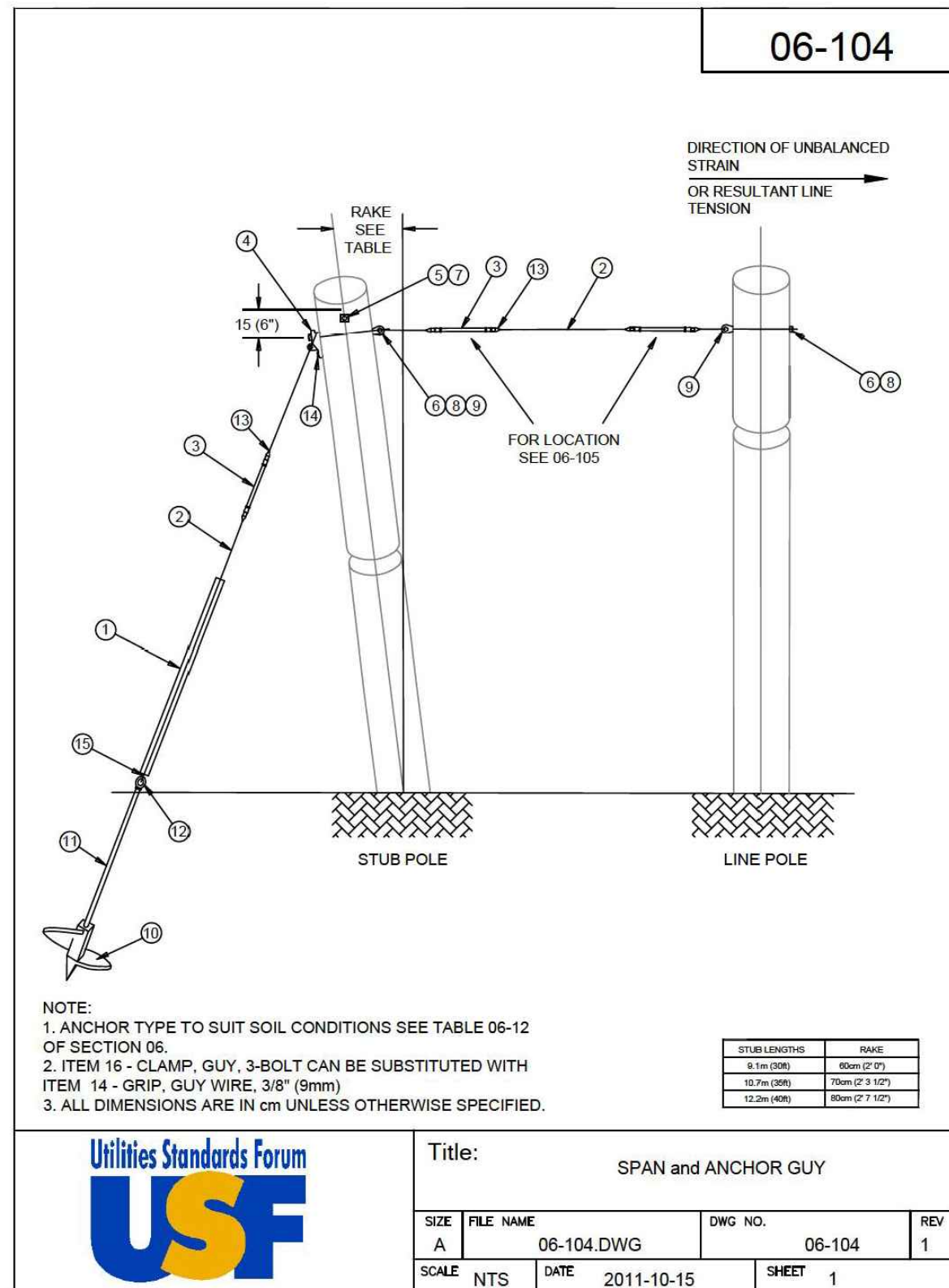
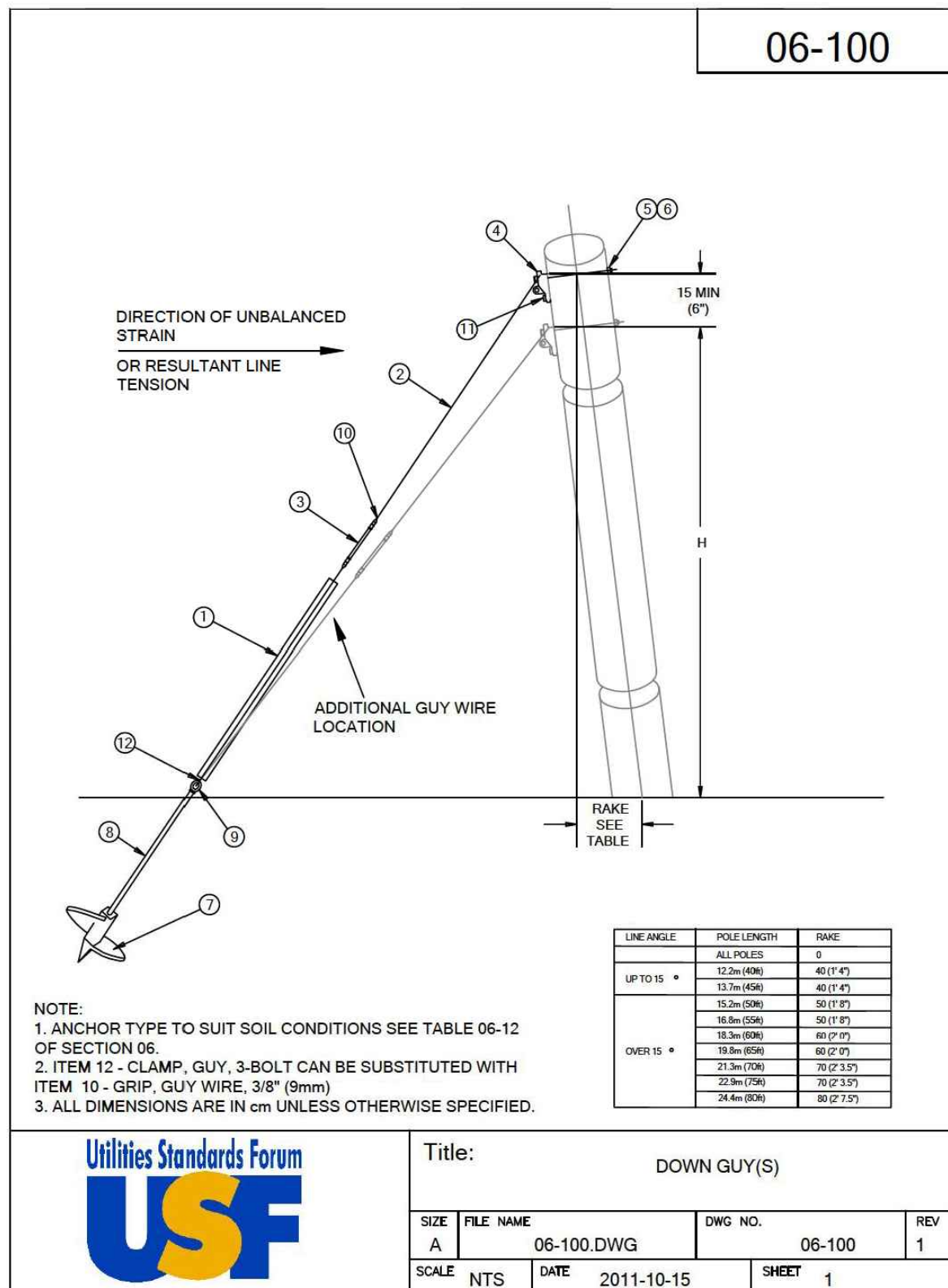
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Project Name
185 MOUNTAIN RD
VAN DOLDER'S SUBDIVISION

Drawing Title
COLLUS POWERSTREAM STANDARDS

Drawn By SRT	Checked By GGR	Drawing No. E6
Scale AS SHOWN	Project No. 17168P	



USF STANDARD 06-100

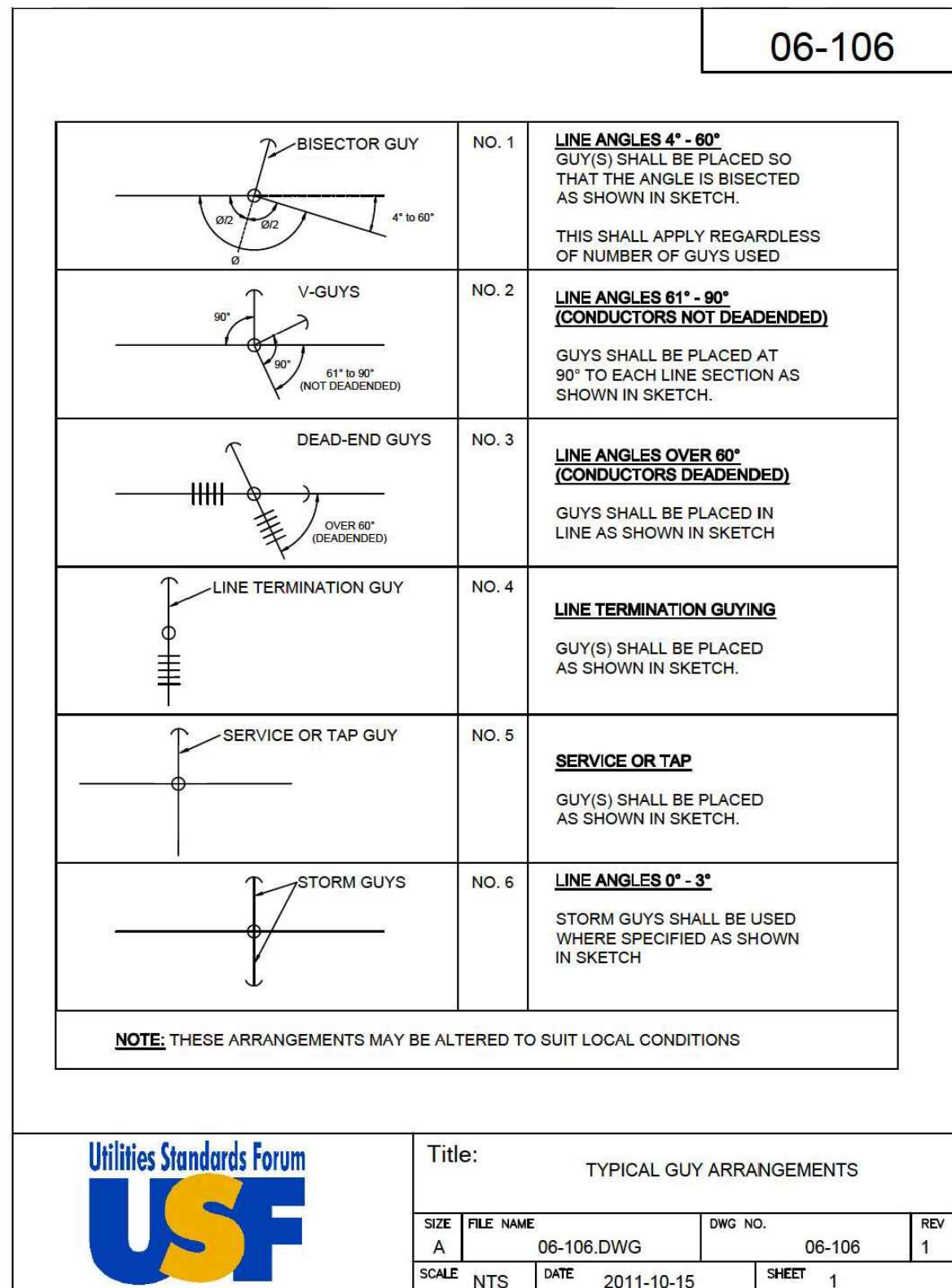
Material List				
Part #	Qty.	Description	4.16kV to 13.8kV	27.6kV 34.5kV 44kV
1	1	Guard, Guy	U01941	
2	As Req'd	Wire, Guy, 3/8" (9mm), Grade 180	U01890	
3**	1	Insulator, Guy	U01880-U01881	
4	1	Hook, Guy, Combination Type	U01900-U01903	
5	1	Bolt, 3/4" (6" to 24")	U00060-U00069	
6	1	Washer, 3/4"	U00110-U00111	
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, 3/4" (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.



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

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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 SRT	Checked By GGR	Drawing No. E7
Scale AS SHOWN	Project No. 17168P	

APPENDIX B

Water Demand Calculations



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
	Dec	581	18.75	31
Average		792	26.04	

*max month demand

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
	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	

*max month demand

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	523	17.44	30
	Dec	219	7.06	31
	Average	628	20.63	

*max month demand

Year	Month	Meter Usage (m3)	Usage Per Day (m3)	Days Billed
2025	Jan	21	0.67	31
	Feb	29	1.04	28
	March	20	0.66	31
	April	196	6.54	30
	May	349	11.25	31
	June	461	15.35	30
	July	527	16.99	31
	Aug	554	17.88	31
	Sept	415	13.84	30
	Oct	545	17.59	31
	Nov	452	15.07	30
	Dec	258	8.32	31
	Average	383	12.52	

*max month demand

Year	Month	Meter Usage (m3)	Usage Per Day (m3)	Days Billed
2026	Jan	322	10.38	31
	Feb	193	6.9	28
	March	184	5.93	31
	April			
	May			
	June			
	July			
	Aug			
	Sept			
	Oct			
	Nov			
	Dec			
	Average	70	2.32	



Project: 555 Tenth Line
Project No.: 2577-6904
Date: 26-May-26
By: AM
Check: JK

555 Tenth Line - Industrial Water Demand (Historical)

WATER DEMAND FLOWS

Average Daily Industrial Flow per Historical Water Usage (2022)	26,040 L/d
	0.30 L/s

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

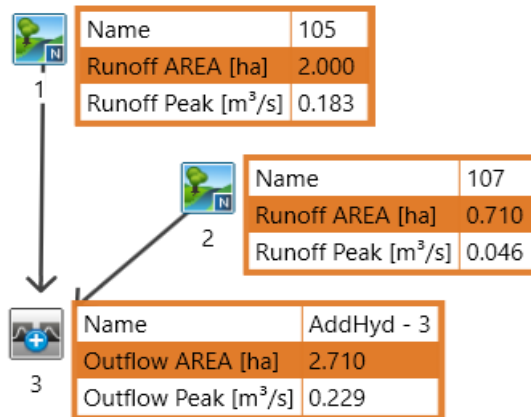
VO6 Modelling Files



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

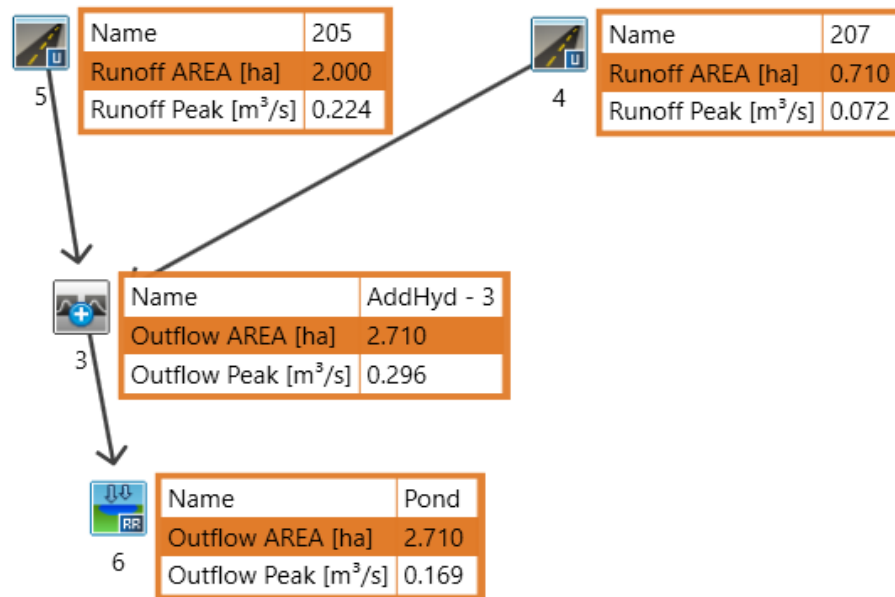
Visual OTTHYMO 6.2 Model Schematic

Pre-Development



Visual OTTHYMO 6.2 Model Schematic

Post-Development



Time to peak ratio = 0.33

Unit Hyd Qpeak (cms)= 1.091

(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 0.088 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)|
| 1 + 2 = 3 |
-----
          AREA    QPEAK    TPEAK    R.V.
          (ha)    (cms)    (hrs)    (mm)
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 |   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 |
| 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	2.59	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)|   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	2.59	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      |
|-----|
| 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) |
| 1 + 2 = 3 |

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (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	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	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)				
1 + 2 = 3				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
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 | 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
 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	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 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

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\AppData
| | ata\Local\Temp\
| | 719a532b-c862-417c-8729-d844365672f4\20b6dfc4
| Ptotal= 46.83 mm | Comments: 2yr 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	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 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	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	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	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 QPEAK TPEAK R.V.
| (ha) (cms) (hrs) (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\AppData

ata\Local\Temp\
719a532b-c862-417c-8729-d844365672f4\02eea314
Ptotal= 59.88 mm Comments: 5yr 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	1.09	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)
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	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	1.06	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	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	1.06	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)				
1 + 2 = 3				
ID1= 1 (0001):	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
+ ID2= 2 (0002):	2.00	0.165	12.25	22.15
	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\amysliwicz\AppData\Local\Temp\719a532b-c862-417c-8729-d844365672f4\0b95a0fa
Ptotal= 67.50 mm	Comments: 10yr 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	1.23	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)	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	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	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	1.20	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	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	1.43	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	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	1.39	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	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	1.39	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) |
| 1 + 2 = 3 |

	AREA	QPEAK	TPEAK	R.V.
	(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 |
Ptotal= 85.42 mm

Filename: C:\Users\amysliwiec\AppData\Local\Temp\
719a532b-c862-417c-8729-d844365672f4\d4b37525
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 |
| 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	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		

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	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		

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) |
1 + 2 = 3
ID1= 1 (0001): AREA (ha) QPEAK (cms) TPEAK (hrs) R.V. (mm)
+ ID2= 2 (0002): 2.00 0.290 12.25 39.24
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	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
 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	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		

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)	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	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 |
|-----|
| 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\AppData\Local\Temp\
| | 719a532b-c862-417c-8729-d844365672f4\6319d3a
| 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	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)= 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\AppData
| | 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 (ha) QPEAK (cms) TPEAK (hrs) R.V. (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)
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	0.388	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
Ptotal= 33.75 mm

IDF curve parameters: A= 807.440
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)
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	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

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

		TOTALS
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)
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	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

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

TOTALS
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)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (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)
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	0.421	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	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
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	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

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)
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	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

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

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 (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (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)
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 0.560 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
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
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	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	Area (ha)= 2.00
STANDHYD (0005)	Total Imp(%)= 80.00
ID= 1 DT= 5.0 min	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	2.59	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)	AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3	(ha)	(cms)	(hrs)	(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

PEAK FLOW (cms)= 0.14 0.02 *TOTALS*
TIME TO PEAK (hrs)= 1.33 1.50 0.144 (iii)
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)
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	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 (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (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)
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	0.776	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
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	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	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)
 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	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	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)
 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	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	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

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
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)
IN= 2---> OUT= 1
DT= 5.0 min
OVERFLOW IS OFF
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)
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 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 PVIOUS 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	PVIOUS (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	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 PVIOUS 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	0.180	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	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	0.959	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	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	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	Area (ha)= 0.71
STANDHYD (0004)	Total Imp(%)= 50.00 Dir. Conn.(%)= 50.00
ID= 1 DT= 5.0 min	

	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	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 PVIOUS 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	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	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(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 QPEAK TPEAK R.V.
(ha) (cms) (hrs) (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	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	1.09	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	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	1.06	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					
PEAK FLOW (cms)=	0.06	0.01					
TIME TO PEAK (hrs)=	12.25	12.42					
RUNOFF VOLUME (mm)=	58.88	17.82					
TOTAL RAINFALL (mm)=	59.88	59.88					
RUNOFF COEFFICIENT =	0.98	0.30					

***** 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	1.06	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 PVIOUS 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 (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (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)
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	0.379	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
Comments: 10yr 24hr 15min SCS Type II

Ptotal= 67.50 mm

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)
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	1.20	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	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	1.20	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 PVIOUS 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	0.087	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	Area (ha)=	2.00	
STANDHYD (0005)	Total Imp(%)=	80.00	Dir. Conn.(%)= 80.00
ID= 1 DT= 5.0 min			

	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	1.39	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)	AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3	(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)
IN= 2---> OUT= 1
DT= 5.0 min

OVERFLOW IS OFF

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
Ptotal= 85.42 mm

Filename: C:\Users\amysliwiec\AppData\Local\Temp\
1915adf3-1193-4333-b5c4-9f3f2a29696d\d4b37525
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)
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 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 PVIOUS 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) |
| 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	0.565	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\AppData
| | Local\Temp\
| | 1915adf3-1193-4333-b5c4-9f3f2a29696d\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
| 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	1.65	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	RAIN	TIME	RAIN	'	TIME	RAIN	TIME
hrs	mm/hr	hrs	mm/hr		hrs	mm/hr	hrs
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	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	
			TOTALS
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 PVIOUS 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) |
| 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 |
| |
| |
| Ptotal=193.00 mm |
-----
Filename: C:\Users\amysliwiec\AppData\Local\Temp\
1915adf3-1193-4333-b5c4-9f3f2a29696d\e6319d3a
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) |
| 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 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 20.00 | 5.083 5.00 | 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 PVIOUS 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	PVIOUS (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 PVIOUS 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)				
IN= 2---> OUT= 1				
DT= 5.0 min				

OVERFLOW IS OFF				
	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	



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, <i>hours in italics</i>)	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
 $t = 2 \cdot A_p \cdot (h^{0.5}) / (C \cdot A_o \cdot (g \cdot 2)^{0.5})$		
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
 $t = 2 \cdot A_p \cdot (h^{0.5}) / (C \cdot A_o \cdot (g \cdot 2)^{0.5})$	
t (hours)	28

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
V-notch 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

	Elev. (m)	Pond Dimensions		Storage Volume (cu.m)	Outlet Structure			Cell Spillway		Total Discharge (cu.m/s)	Storage (ha-m)
		Depth Above PP (m)	Area (sqm)		ED Orifice Discharge (cu.m/s)	V-notch Discharge (cu.m/s)	Rect. Weir Discharge (cu.m/s)	Emerg. Weir Ave. Width (m)	Emerg. Weir Discharge (cu.m/s)		
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.
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prepared for

Van Dolder's Home Team

August 29, 2016
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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
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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.

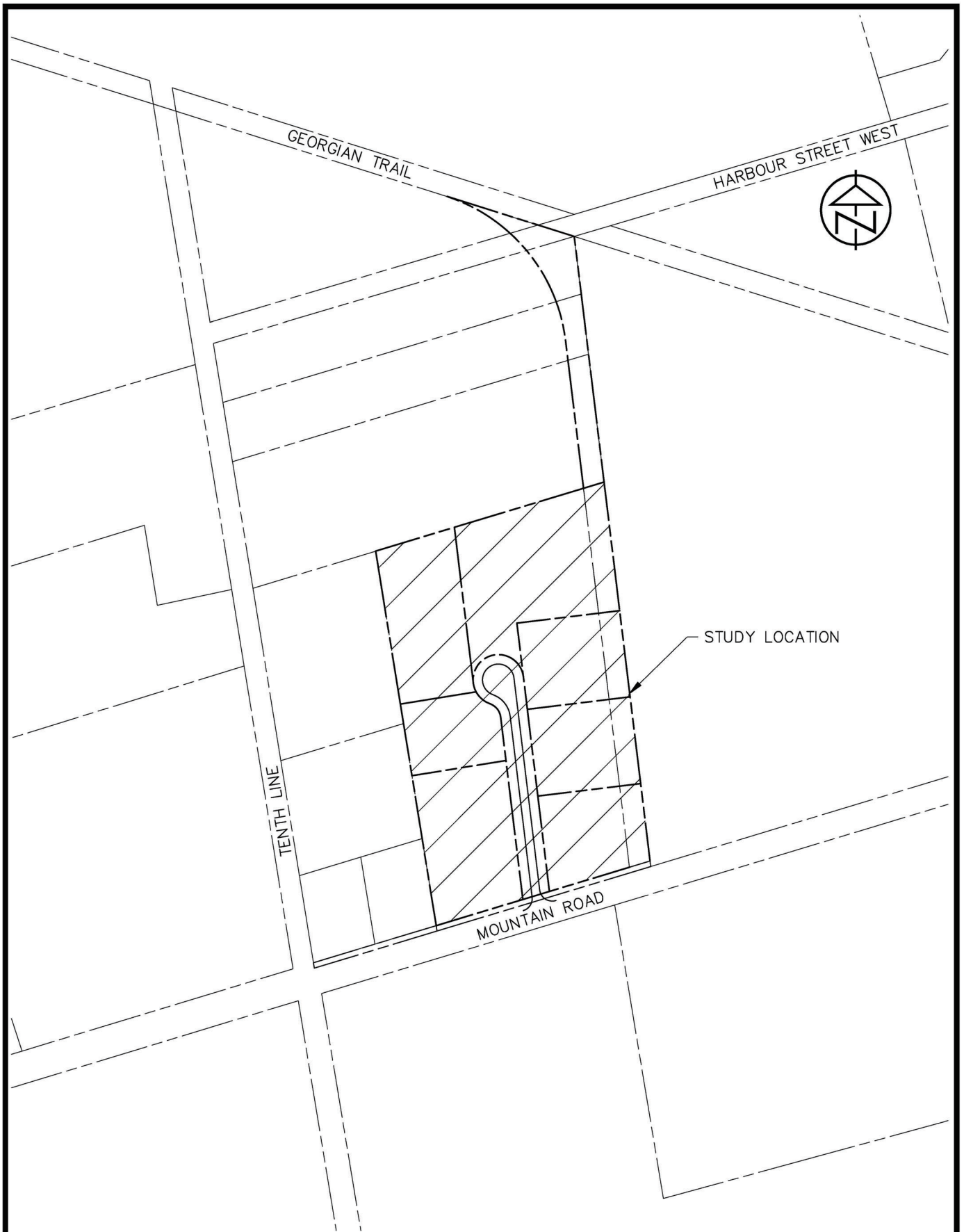
1.2 Objectives

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 m³ and 385 m³ respectively. The proposed permanent pool volume is approximately 2,175 m³ and the proposed extended detention volume is approximately 2,400 m³. The extended detention volume is equivalent to approximately 250 m³ 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.

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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/SWMP		Average CN for Soil Type	
					Area	Percent	Area	Percent	Area	Percent	Area	Percent	Area	Percent	Area	Percent	Area	Percent		Area
WI	WIARTON	B	Loam or Silt Loam	2	4.0906	1	4.0906	1	60	0	69	0	65	0	0	85	0	0	50	60
	#N/A	#N/A	#N/A	#N/A	0	0	0	#N/A	0	0	#N/A	0	#N/A	0	0	#N/A	0	0	#N/A	0
	#N/A	#N/A	#N/A	#N/A	0	0	0	#N/A	0	0	#N/A	0	#N/A	0	0	#N/A	0	0	#N/A	0
	#N/A	#N/A	#N/A	#N/A	0	0	0	#N/A	0	0	#N/A	0	#N/A	0	0	#N/A	0	0	#N/A	0
	#N/A	#N/A	#N/A	#N/A	0	0	0	#N/A	0	0	#N/A	0	#N/A	0	0	#N/A	0	0	#N/A	0
Totals					4.0906	1	4.0906	1	4.0906	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
Time to Peak	0.36 hrs

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

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
Forest/Woodland	2	#N/A	#N/A	#N/A
Gravel	0.25	#N/A	#N/A	#N/A
Pasture/Lawn	0.8	#N/A	#N/A	#N/A
Impervious	0.28	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.95	#N/A	#N/A	#N/A
Meadows	0.05	#N/A	#N/A	#N/A
Soil Series Total	0.27	#N/A	#N/A	#N/A
	0.25	#N/A	#N/A	#N/A



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Collingwood

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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/SWMP		Average CN for Soil Type	
					Area	Percent	Area	Percent	Area	Percent	Area	Percent	Area	Percent	Area	Percent	Area	Percent		Area
WI	WIARTON	B	Loam or Silt Loam	2	0.5487	1	0.5487	1	60	0	69	0	65	0	85	0	100	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	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	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	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	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	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	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	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
Time to Peak	0.31 hrs

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

Initial Abstraction	10 mm
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Woods	10
Meadows	8
Gravel	2
Lawns	5
Impervious	2

Runoff Coefficient 0.25

Landuse Type	Soil Series			
	WI	0	0	0
Forest/Woodland	0.25	#N/A	#N/A	#N/A
Gravel	0.8	#N/A	#N/A	#N/A
Pasture/Lawn	0.28	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A
Wetland/Lake/SWMP	0.05	#N/A	#N/A	#N/A
Meadows	0.27	#N/A	#N/A	#N/A
Soil Series Total	0.25	#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/SWMP		Average CN for Soil Type	
					Area	Percent	Area	Percent	Area	Percent	Area	Percent	Area	Percent	Area	Percent	Area	Percent		Area
WI	WIARTON	B	Loam or Silt Loam	2	1.9094	1	1.9094	1	60	0	69	0	65	0	85	0	100	0	50	60
		#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	0
		#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	0
		#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	0
		#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	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

Runoff Coefficient	0.25
--------------------	------

Landuse Type	Soil Series			
	WI	0	0	0
Forest/Woodland	2	#N/A	#N/A	#N/A
Gravel	0.25	#N/A	#N/A	#N/A
Pasture/Lawn	0.8	#N/A	#N/A	#N/A
Impervious	0.28	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.95	#N/A	#N/A	#N/A
Meadows	0.05	#N/A	#N/A	#N/A
Soil Series Total	0.27	#N/A	#N/A	#N/A
	0.25	#N/A	#N/A	#N/A



Collingwood	Bracebridge	Orillia	Barrie
-------------	-------------	---------	--------

1.96 ha

104

Time of Concentration Calculations

For Runoff Coefficients less than 0.4

Airport Method

191 m
190 m
120 m
1%

:entration)

on (Minutes)

on (Hours)

Time of Conco

12.82
0.21
0.14

Soil Series				
WI	0	0	0	0
2	#N/A	#N/A	#N/A	#N/A
0.25	#N/A	#N/A	#N/A	#N/A
0.8	#N/A	#N/A	#N/A	#N/A
0.28	#N/A	#N/A	#N/A	#N/A
0.95	#N/A	#N/A	#N/A	#N/A
0.05	#N/A	#N/A	#N/A	#N/A
0.27	#N/A	#N/A	#N/A	#N/A
0.762	#N/A	#N/A	#N/A	#N/A

Initial Abstraction	2.318 mm
---------------------	----------



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		Catchment Soil Characteristics		Forest/Woodland		Pasture/Lawns		Meadows		Gravel		Impervious		Wetland/Lakes/SWMP		Average CN for Soil Type
				Type		Area	Percent	Area	Percent	Area	Percent	Area	Percent	Area	Percent	Area	Percent	Area	Percent	
WI	WIARTON	B	Loam or Silt Loam	2	2.0032	1	0.3165	60	0.5298	69	0	65	1.0216	85	0.1352	100	0	0	50	77.8305
	#N/A	#N/A	#N/A	0	0	0	0	#N/A	0	#N/A	0	0	0	#N/A	0	0	0	0	#N/A	0
	#N/A	#N/A	#N/A	0	0	0	0	#N/A	0	#N/A	0	0	0	#N/A	0	0	0	0	#N/A	0
	#N/A	#N/A	#N/A	0	0	0	0	#N/A	0	#N/A	0	0	0	#N/A	0	0	0	0	#N/A	0
	#N/A	#N/A	#N/A	0	0	0	0	#N/A	0	#N/A	0	0	0	#N/A	0	0	0	0	#N/A	0
Totals					2.0032	1	0.3165	0.158	0.52985	0.2645	0	0	1.02163	0.51	0.13522	0.0675	0	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
Time to Peak	0.07 hrs

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

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
Forest/Woodland	2	#N/A	#N/A	#N/A
Gravel	0.25	#N/A	#N/A	#N/A
Pasture/Lawn	0.8	#N/A	#N/A	#N/A
Impervious	0.28	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.95	#N/A	#N/A	#N/A
Meadows	0.05	#N/A	#N/A	#N/A
Soil Series Total	0.27	#N/A	#N/A	#N/A
	0.5957	#N/A	#N/A	#N/A



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Barrie

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185 Mountain Road

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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/SWMP		Average CN for Soil Type	
					Area	Percent	Area	Percent	Area	Percent	Area	Percent	Area	Percent	Area	Percent	Area	Percent		Area
WI	WIARTON	B	Loam or Silt Loam	2	1.1179	1	0.6869	0.6145	60	0	69	0	85	0	100	0	0.431	0.3855	50	56.145
	#N/A	#N/A	#N/A	#N/A	0	0	0	#N/A	0	0	#N/A	0	#N/A	0	#N/A	0	0	#N/A	0	#N/A
	#N/A	#N/A	#N/A	#N/A	0	0	0	#N/A	0	0	#N/A	0	#N/A	0	#N/A	0	0	#N/A	0	#N/A
	#N/A	#N/A	#N/A	#N/A	0	0	0	#N/A	0	0	#N/A	0	#N/A	0	#N/A	0	0	#N/A	0	#N/A
	#N/A	#N/A	#N/A	#N/A	0	0	0	#N/A	0	0	#N/A	0	#N/A	0	#N/A	0	0	#N/A	0	#N/A
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)

Time of Concentration (Hours)

Time to Peak (23 x Time of Concentration)

Time to Peak	0.20 hrs
--------------	----------

For Runoff Coefficients less than 0.4

Alport 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)

Time of Concentration (Hours)

Time to Peak (23 x Time of Concentration)

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
Forest/Woodland	2	#N/A	#N/A	#N/A
Gravel	0.25	#N/A	#N/A	#N/A
Pasture/Lawn	0.8	#N/A	#N/A	#N/A
Impervious	0.28	#N/A	#N/A	#N/A
Wetland/Lake/SWMP	0.95	#N/A	#N/A	#N/A
Meadows	0.05	#N/A	#N/A	#N/A
Soil Series Total	0.1729	#N/A	#N/A	#N/A



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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	Area	Percent	Area	Percent	Area	Percent	Area	Percent	Area	Percent		Area
WI	WIARTON	B	Loam or Silt Loam	2	0.7133	1	0.3096	60	0	0	69	0	85	0	100	0.3338	0.468	50	57.77	
	#N/A	#N/A	#N/A	#N/A	0	0	0	#N/A	0	0	0	0	#N/A	0	#N/A	0	0	#N/A	0	
	#N/A	#N/A	#N/A	#N/A	0	0	0	#N/A	0	0	0	0	#N/A	0	#N/A	0	0	#N/A	0	
	#N/A	#N/A	#N/A	#N/A	0	0	0	#N/A	0	0	0	0	#N/A	0	#N/A	0	0	#N/A	0	
	#N/A	#N/A	#N/A	#N/A	0	0	0	#N/A	0	0	0	0	#N/A	0	#N/A	0	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

Alport 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

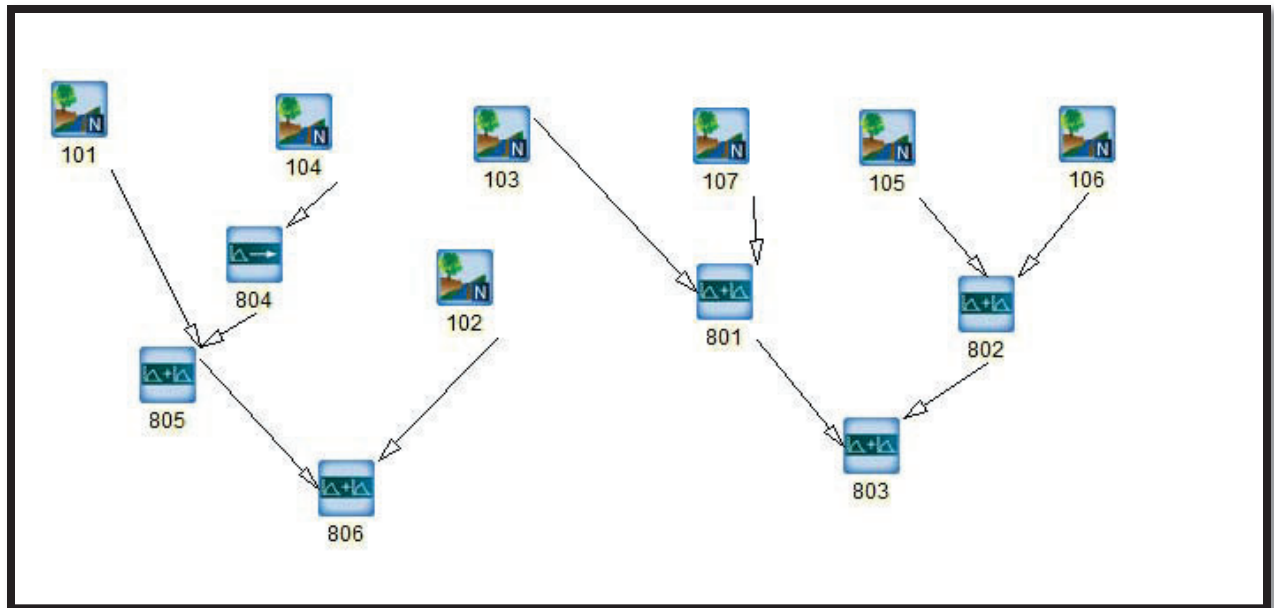
Initial Abstraction	10.152 mm
---------------------	-----------

Woods	10
Meadows	8
Gravel	2
Lawns	5
Wetland	12
Impervious	2

Runoff Coefficient	0.23
--------------------	------

Landuse Type	Soil Series			
	WI	0	0	0
Forest/Woodland	2	#N/A	#N/A	#N/A
Gravel	0.3	#N/A	#N/A	#N/A
Pasture/Lawn	0.8	#N/A	#N/A	#N/A
Impervious	0.35	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.95	#N/A	#N/A	#N/A
Meadows	0.05	#N/A	#N/A	#N/A
Soil Series Total	0.33	#N/A	#N/A	#N/A
	0.232	#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   Y   M   M  O   O
OOO    T   T   H   H   Y   Y   M   M   OOO

```

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***** D E T A I L E D O U T P U T *****

```

Input  filename: C:\Program Files (x86)\Visual OTTHYMO 2.3.2\voim.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	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	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	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	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 |
|-----|
| ID1= 1 (0106): | AREA QPEAK TPEAK R.V.
| | (ha) (cms) (hrs) (mm)
| + ID2= 2 (0105): | 1.12 .003 2.23 .94
| | 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 |
|-----|
| ID1= 1 (0107): | AREA QPEAK TPEAK R.V.
| | (ha) (cms) (hrs) (mm)
| + ID2= 2 (0103): | .71 .002 2.27 1.09
| | 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 |
|-----|
| ID= 2 (0104): | AREA QPEAK TPEAK R.V.
| | (ha) (cms) (hrs) (mm)
| SHIFT ID= 1 (0804): | 1.96 .10 1.93 7.58
| | 1.96 .10 2.27 7.58
|-----|
```

```
-----
| ADD HYD (0803) |
| 1 + 2 = 3 |
|-----|
| ID1= 1 (0802): | AREA QPEAK TPEAK R.V.
| | (ha) (cms) (hrs) (mm)
| + ID2= 2 (0801): | 3.12 .059 1.93 3.33
| | 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) |
| 1 + 2 = 3 |
-----
                AREA      QPEAK      TPEAK      R.V.
                (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) |
| 1 + 2 = 3 |
-----
                AREA      QPEAK      TPEAK      R.V.
                (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	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	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      RAIN | TIME      RAIN | TIME      RAIN | TIME      RAIN
hrs      mm/hr | hrs      mm/hr | hrs      mm/hr | hrs      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 |
|-----|
| ID1= 1 (0106): | AREA QPEAK TPEAK R.V.
| + ID2= 2 (0105): | (ha) (cms) (hrs) (mm)
|=====|
| 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 |
|-----|
| ID1= 1 (0107): | AREA QPEAK TPEAK R.V.
| + ID2= 2 (0103): | (ha) (cms) (hrs) (mm)
|=====|
| 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 |
|-----|
| ID= 2 (0104): | AREA QPEAK TPEAK R.V.
| SHIFT ID= 1 (0804): | (ha) (cms) (hrs) (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 |
|-----|
| ID1= 1 (0802): | AREA QPEAK TPEAK R.V.
| + ID2= 2 (0801): | (ha) (cms) (hrs) (mm)
|=====|
| 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 |
|-----|
| ID1= 1 (0101): | AREA QPEAK TPEAK R.V.
| + ID2= 2 (0804): | (ha) (cms) (hrs) (mm)
|=====|
| 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 |
|           |
|           |
| Ptotal= 44.07 mm |
-----
Filename: I:\2016 Projects\116023 - 185 Mountain Road\
          Design\Hydrologic Model\
          Owen Sound Design Storms\OSCHI5.4HR
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      (0106) |
| ID= 1 DT= 2.0 min |
-----
Area      (ha)= 1.12      Curve Number      (CN)= 56.1
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 |
|-----|
| ID1= 1 (0106): | AREA QPEAK TPEAK R.V.
| + ID2= 2 (0105): | (ha) (cms) (hrs) (mm)
|=====|
| 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 |
|-----|
| ID1= 1 (0107): | AREA QPEAK TPEAK R.V.
| + ID2= 2 (0103): | (ha) (cms) (hrs) (mm)
|=====|
| 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 |
|-----|
| ID= 2 (0104): | AREA QPEAK TPEAK R.V.
| SHIFT ID= 1 (0804): | (ha) (cms) (hrs) (mm)
|=====|
| ID = 3 (0804): | 1.96 .27 1.93 20.07
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| ADD HYD (0803) |
| 1 + 2 = 3 |
|-----|
| ID1= 1 (0802): | AREA QPEAK TPEAK R.V.
| + ID2= 2 (0801): | (ha) (cms) (hrs) (mm)
|=====|
| 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 |
|-----|
| ID1= 1 (0101): | AREA QPEAK TPEAK R.V.
| + ID2= 2 (0804): | (ha) (cms) (hrs) (mm)
|=====|
| 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 |
|-----|
| ID1= 1 (0102): | AREA QPEAK TPEAK R.V.
| + ID2= 2 (0805): | (ha) (cms) (hrs) (mm)
|=====|
| 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	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	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	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	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\
|            |
|            |
```

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	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	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	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	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(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	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(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	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(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	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(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	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(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	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	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	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	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 |
|-----|
| ID1= 1 (0106): AREA QPEAK TPEAK R.V.
|                   (ha) (cms) (hrs) (mm)
| + ID2= 2 (0105): 1.12 .050 2.13 11.86
|                   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 |
-----
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 |
-----
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 |
-----
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 |
-----
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 |
-----
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	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	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	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	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 |
-----
ID= 2 (0104): AREA QPEAK TPEAK R.V.
SHIFT ID= 1 (0804): (ha) (cms) (hrs) (mm)
1.96 .57 1.93 42.07
1.96 .57 2.27 42.07
-----

| ADD HYD (0803) |
| 1 + 2 = 3 |
-----
ID1= 1 (0802): AREA QPEAK TPEAK R.V.
+ ID2= 2 (0801): (ha) (cms) (hrs) (mm)
3.12 .478 1.93 26.05
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 |
-----
ID1= 1 (0101): AREA QPEAK TPEAK R.V.
+ ID2= 2 (0804): (ha) (cms) (hrs) (mm)
4.09 .178 2.33 16.51
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 |
-----
ID1= 1 (0102): AREA QPEAK TPEAK R.V.
+ ID2= 2 (0805): (ha) (cms) (hrs) (mm)
.55 .026 2.27 16.51
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 |
| |
| |
| Ptotal=193.00 mm |
-----
Filename: I:\2016 Projects\116023 - 185 Mountain Road\
Design\Hydrologic Model\
Owen Sound Design Storms\TIMMINS.12
Comments: TIMMINS REGIONAL 12 HOUR DURATION STORM

TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN
hrs mm/hr | hrs mm/hr | hrs mm/hr | hrs 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	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	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 |  
-----  
ID1= 1 (0106): AREA QPEAK TPEAK R.V.  
 (ha) (cms) (hrs) (mm)  
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 |  
-----  
ID1= 1 (0107): AREA QPEAK TPEAK R.V.  
 (ha) (cms) (hrs) (mm)  
.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 |  
-----  
ID= 2 (0104): AREA QPEAK TPEAK R.V.  
 (ha) (cms) (hrs) (mm)  
1.96 .21 7.00 153.89  
SHIFT ID= 1 (0804): 1.96 .21 7.33 153.89  
-----
```

```
-----  
| ADD HYD (0803) |  
| 1 + 2 = 3 |  
-----  
ID1= 1 (0802): AREA QPEAK TPEAK R.V.  
 (ha) (cms) (hrs) (mm)  
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 |  
-----  
ID1= 1 (0101): AREA QPEAK TPEAK R.V.  
 (ha) (cms) (hrs) (mm)  
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
		(ha)	(cms)	(hrs)
				R.V.
				(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
=====

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```
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
```

COMMENTS :

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

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	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			

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 |
|-----|
| ID1= 1 (0103): AREA QPEAK TPEAK R.V.
| + ID2= 2 (0107): (ha) (cms) (hrs) (mm)
|=====|
| ID = 3 (0801): 1.91 .012 12.27 5.83
| 2.62 .017 12.10 5.70
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| ADD HYD (0802) |
| 1 + 2 = 3 |
|-----|
| ID1= 1 (0105): AREA QPEAK TPEAK R.V.
| + ID2= 2 (0106): (ha) (cms) (hrs) (mm)
|=====|
| ID = 3 (0802): 2.00 .113 11.73 14.42
| 1.12 .012 11.87 4.88
| 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 |
|-----|
| ID= 2 (0104): AREA QPEAK TPEAK R.V.
| SHIFT ID= 1 (0804): (ha) (cms) (hrs) (mm)
|=====|
| 1.96 .16 11.73 20.36
| 1.96 .16 12.07 20.36
```

```
-----
| ADD HYD (0805) |
| 1 + 2 = 3 |
|-----|
| ID1= 1 (0804): AREA QPEAK TPEAK R.V.
| + ID2= 2 (0101): (ha) (cms) (hrs) (mm)
|=====|
| ID = 3 (0805): 1.96 .157 12.07 20.36
| 4.09 .035 12.03 5.83
| 6.05 .192 12.07 10.53
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| ADD HYD (0806) |
| 1 + 2 = 3 |
|-----|
| ID1= 1 (0805): AREA QPEAK TPEAK R.V.
| + ID2= 2 (0102): (ha) (cms) (hrs) (mm)
|=====|
| ID = 3 (0806): 6.05 .192 12.07 10.53
| .55 .005 12.00 5.83
| 6.60 .197 12.07 10.14
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

ADD HYD      (0803) |
| 1 + 2 = 3 |
-----
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 **
*****

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-----
| MASS STORM | | Filename: I:\2016 Projects\116023 - 185 Mountain Road\
| | | Design\Hydrologic Model\SCS 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	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	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) | | 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	.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 **
*****

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-----
| MASS STORM |
|           |
|           |
| Ptotal= 64.40 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 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

ID= 1 DT= 2.0 min

(0103)

Area (ha)= 1.91

Ia (mm)= 10.00

U.H. Tp(hrs)= .52

Curve Number (CN)= 60.0

of Linear Res.(N)= 3.00

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	.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)	AREA	QPEAK	TPEAK	R.V.
IN= 2---> OUT= 1	(ha)	(cms)	(hrs)	(mm)
SHIFT= 22.0 min				
ID= 2 (0104):	1.96	.28	11.73	35.78
SHIFT ID= 1 (0804):	1.96	.28	12.07	35.78

ADD HYD (0805)	AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3	(ha)	(cms)	(hrs)	(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)	AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3	(ha)	(cms)	(hrs)	(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)	AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3	(ha)	(cms)	(hrs)	(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	Filename: I:\2016 Projects\116023 - 185 Mountain Road\Design\Hydrologic Model\SCS 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	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	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		


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-----
| 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

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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 .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

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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 |
|-----|
| ID1= 1 (0103): | AREA QPEAK TPEAK R.V.
| | (ha) (cms) (hrs) (mm)
| + ID2= 2 (0107): | 1.91 .041 12.23 17.64
| | .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 |
|-----|
| ID1= 1 (0105): | AREA QPEAK TPEAK R.V.
| | (ha) (cms) (hrs) (mm)
| + ID2= 2 (0106): | 2.00 .272 11.73 34.37
| | 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 |
|-----|
| ID= 2 (0104): | AREA QPEAK TPEAK R.V.
| | (ha) (cms) (hrs) (mm)
| SHIFT ID= 1 (0804): | 1.96 .34 11.73 44.11
| | 1.96 .34 12.07 44.11
```

```
-----
| ADD HYD (0805) |
| 1 + 2 = 3 |
|-----|
| ID1= 1 (0804): | AREA QPEAK TPEAK R.V.
| | (ha) (cms) (hrs) (mm)
| + ID2= 2 (0101): | 1.96 .339 12.07 44.11
| | 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) |
| 1 + 2 = 3      |
|-----|
| ID1= 1 (0805):   AREA      QPEAK      TPEAK      R.V.
|                   (ha)      (cms)      (hrs)      (mm)
|                   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) |
| 1 + 2 = 3      |
|-----|
| ID1= 1 (0801):   AREA      QPEAK      TPEAK      R.V.
|                   (ha)      (cms)      (hrs)      (mm)
|                   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.

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*****
** SIMULATION NUMBER: 5 **
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| 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

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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	.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		

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| 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

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

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

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TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
.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
ID1= 1 (0103): AREA (ha) QPEAK (cms) TPEAK (hrs) R.V. (mm)
+ ID2= 2 (0107): 1.91 .050 12.23 21.25
+ .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
ID1= 1 (0105): AREA (ha) QPEAK (cms) TPEAK (hrs) R.V. (mm)
+ ID2= 2 (0106): 2.00 .316 11.73 39.91
+ 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
ID= 2 (0104): AREA (ha) QPEAK (cms) TPEAK (hrs) R.V. (mm)
SHIFT ID= 1 (0804): 1.96 .39 11.73 50.44
1.96 .39 12.07 50.44

| ADD HYD (0805) |
1 + 2 = 3
ID1= 1 (0804): AREA (ha) QPEAK (cms) TPEAK (hrs) R.V. (mm)
+ ID2= 2 (0101): 1.96 .387 12.07 50.44
+ 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
ID1= 1 (0805): AREA (ha) QPEAK (cms) TPEAK (hrs) R.V. (mm)
+ ID2= 2 (0102): 6.05 .527 12.07 30.70
+ .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
ID1= 1 (0801): AREA (ha) QPEAK (cms) TPEAK (hrs) R.V. (mm)
+ ID2= 2 (0802): 2.62 .072 12.03 20.87
+ 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 **

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| 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
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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		

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| 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
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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
ID1= 1 (0103): AREA QPEAK TPEAK R.V.
+ ID2= 2 (0107): (ha) (cms) (hrs) (mm)
=====

ID = 3 (0801):	2.62	.085	12.03	24.65
----------------	------	------	-------	-------

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| ADD HYD      (0802) |
| 1 + 2 = 3 |
|-----|
| ID1= 1 (0105):      | AREA   QPEAK   TPEAK   R.V.
|                   | (ha)   (cms)   (hrs)   (mm)
| + ID2= 2 (0106):      | 2.00   .361   11.73   45.63
|                   | 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 |
|-----|
| ID= 2 (0104):      | AREA   QPEAK   TPEAK   R.V.
|                   | (ha)   (cms)   (hrs)   (mm)
| SHIFT ID= 1 (0804):  | 1.96   .44    11.73   56.89
|                   | 1.96   .44    12.07   56.89
|-----|
```

```
-----
| ADD HYD      (0805) |
| 1 + 2 = 3 |
|-----|
| ID1= 1 (0804):      | AREA   QPEAK   TPEAK   R.V.
|                   | (ha)   (cms)   (hrs)   (mm)
| + ID2= 2 (0101):      | 1.96   .435   12.07   56.89
|                   | 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) |
| 1 + 2 = 3 |
|-----|
| ID1= 1 (0805):      | AREA   QPEAK   TPEAK   R.V.
|                   | (ha)   (cms)   (hrs)   (mm)
| + ID2= 2 (0102):      | 6.05   .601   12.07   35.39
|                   | .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) |
| 1 + 2 = 3 |
|-----|
| ID1= 1 (0801):      | AREA   QPEAK   TPEAK   R.V.
|                   | (ha)   (cms)   (hrs)   (mm)
| + ID2= 2 (0802):      | 2.62   .085   12.03   24.65
|                   | 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



Catchment 201 Overland Flow Route

Ditch in Block 7 must convey $0.25 \times 830 = 208$ L/s

Channel

Manning's <i>n</i>	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	m ²
Perimeter	3.030	m
Hydraulic Radius	0.224	m

Flow **394.62 L/s**

*Minimum depth minus 0.1m (required freeboard)

Ditch in Block 6 must convey $0.5 \times 830 = 415$ L/s

Channel

Manning's <i>n</i>	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	m ²
Perimeter	3.193	m
Hydraulic Radius	0.274	m

Flow **580.13 L/s**

*Minimum depth minus 0.1m (required freeboard)

Catchment 202 Overland Flow Route

Must Convey 265 L/s

Channel

Manning's <i>n</i>	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	m ²
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 4 must convey 830 L/s

Channel

Manning's <i>n</i>	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	m ²
Perimeter	3.731	m
Hydraulic Radius	0.322	m

Flow **885.15 L/s**

*Minimum depth minus 0.1m (required freeboard)

Catchment 203 Overland Flow Route

Must Convey 635 L/s

Channel

Manning's <i>n</i>	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	m ²
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

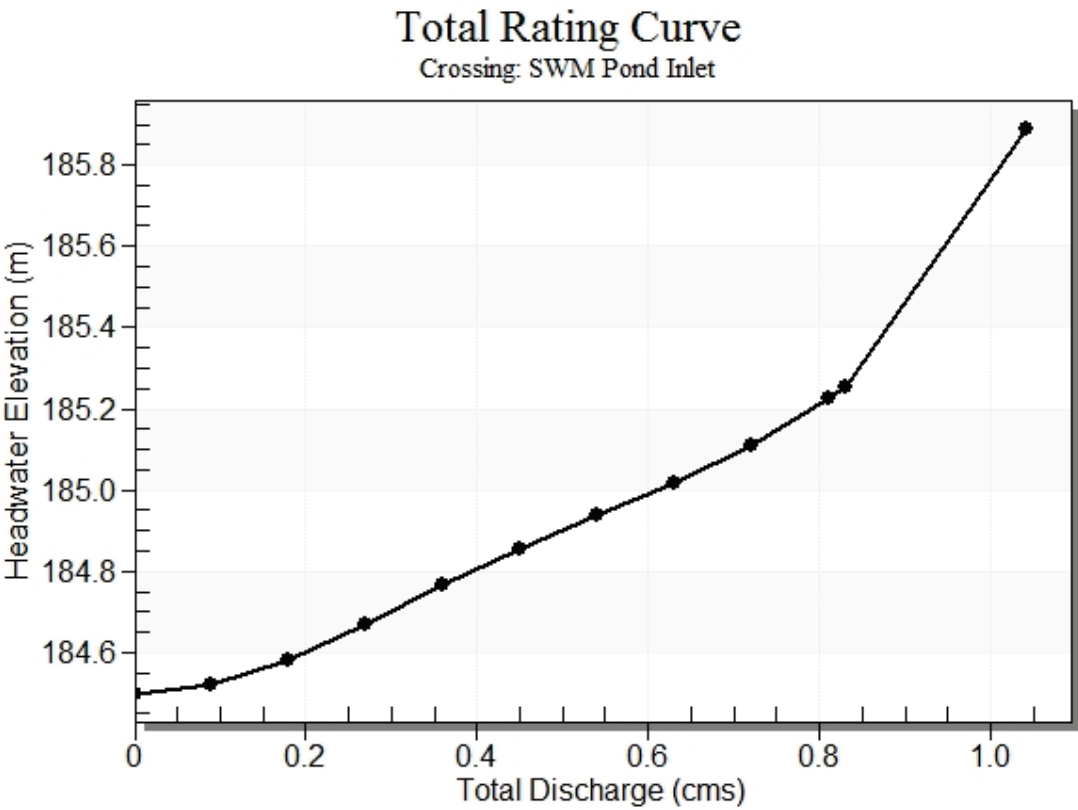


Table 2 - Culvert Summary Table: 750 mm HDPE

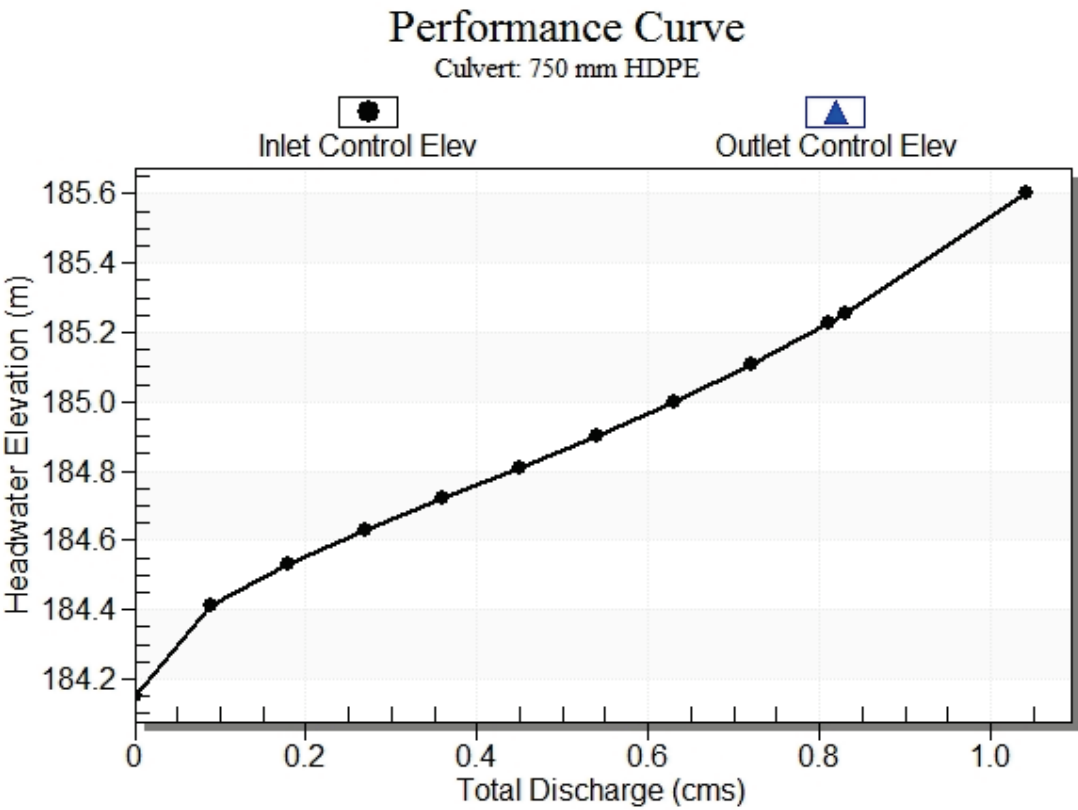
Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	184.50	0.000	0.350	0-NF	0.000	0.000	0.600	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

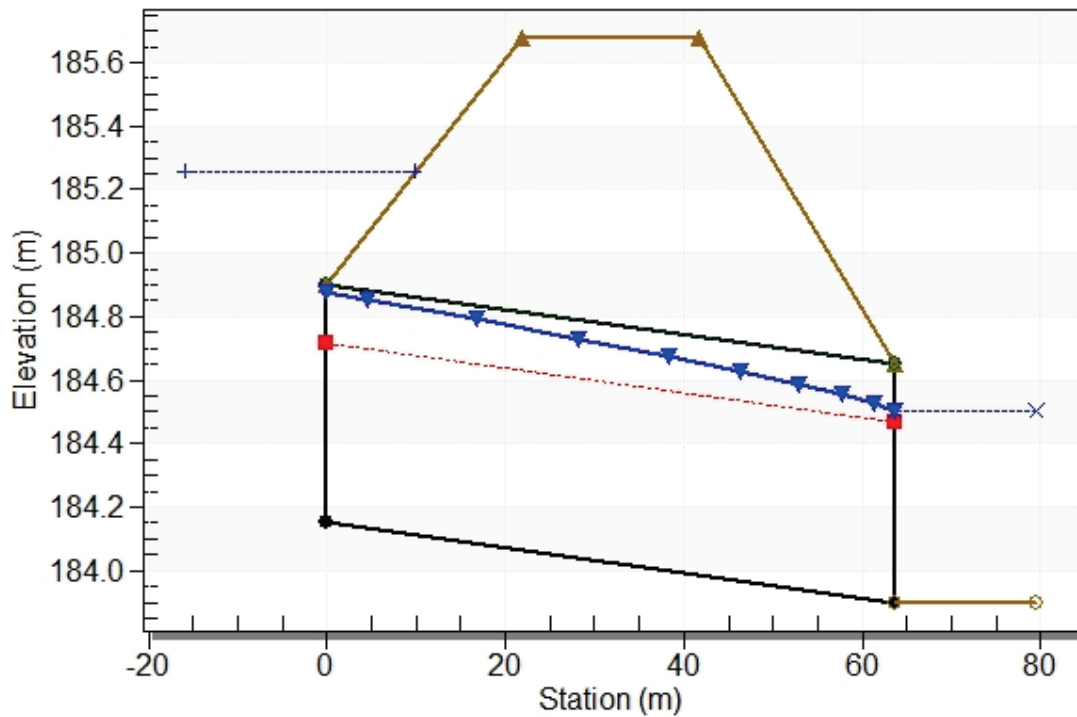
Culvert Performance Curve Plot: 750 mm HDPE



Water Surface Profile Plot for Culvert: 750 mm HDPE

Crossing - SWM Pond Inlet, Design Discharge - 0.83 cms

Culvert - 750 mm HDPE, Culvert Discharge - 0.83 cms



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

Coltingwood 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 (m)	Discharge (cms)	Head (m)	Discharge (cms)	Head (m)	Discharge (cms)	Head (m)	Discharge (cms)		
(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(n)	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					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/SWMP			Average CN for Soil Type
					Area	Percent	Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	
WI	WIARTON	B	Loam or Silt Loam	2	3.28	1	0	0	60	0.984	0.3	69	0	65	0	85	0	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	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	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	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	0	#N/A	0	
Totals					3.28	1	0	0	0	0.984	0.3	0	0	0	2,296	0	0	0	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
Time to Peak	0.25 hrs

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

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
Forest/Woodland	2	#N/A	#N/A	#N/A
Gravel	0.25	#N/A	#N/A	#N/A
Pasture/Lawn	0.8	#N/A	#N/A	#N/A
Impervious	0.28	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.95	#N/A	#N/A	#N/A
Meadows	0.05	#N/A	#N/A	#N/A
Soil Series Total	0.27	#N/A	#N/A	#N/A
	0.749	#N/A	#N/A	#N/A



Collingwood	Bracebridge	Orillia	Barrie
-------------	-------------	---------	--------

0.97 ha

0.97 ha

Time of Concentration Calculations

For Runoff Coefficients less than 0.4

Airport Method

189	m
184.7	m
185	m
2%	
0.97	ha

Time of Concentration (Minutes)
Time of Concentration (Hours)
Time to Peak ($2/3 \times$ Time of Concentration)

hrs

Woods	10
Meadows	8
Gravel	2
Lawns	5
Impervious	2

Runoff Coefficient	0.75
--------------------	------

Landuse Type	Soil Series			
	WI	0	0	0
Forest/Woodland	2	#N/A	#N/A	#N/A
Gravel	0.25	#N/A	#N/A	#N/A
Pasture/Lawn	0.8	#N/A	#N/A	#N/A
Pasture/Lawn	0.28	#N/A	#N/A	#N/A
Imperivous	0.95	#N/A	#N/A	#N/A
Wetland/Lake/SWMP	0.05	#N/A	#N/A	#N/A
Meadows	0.27	#N/A	#N/A	#N/A
Soil Series Total	0.749	#N/A	#N/A	#N/A



Collingwood	Bracebridge	Orillia	Barrie
-------------	-------------	---------	--------

Catchment	Area	ha
203	2.340	ha

Time of Concentration Calculations	For Runoff Coefficients greater than 0.4	Bransby-Williams Formula	185.7 184.25 250 1% 2.34 hrs
			Maximum Catchment Elevation Minimum Catchment Elevation Catchment length Catchment Slope Catchment Area Time of Concentration (Minutes) Time of Concentration (Hours) Time to Peak (2/3 x Time of Concentration)

Woods	10
Meadows	8
Gravel	2
Lawns	5
Impervious	2

Maximum Catchment Elevation	185.7 m
Minimum Catchment Elevation	184.25 m
Catchment length	250 m
Catchment Slope	1%
Catchment Area	2.34 ha

Catchment Area	250 m ²
Catchment length	1%
Catchment Slope	2.34 ha
Catchment Area	20.42
Time of Concentration (Minutes)	0.34
Time of Concentration (Hours)	0.23
Time to Peak (2/3 x Time of Concentration)	



C.C. Tatham & Associates Ltd.

Consulting Engineers

Collingwood

Bracebridge

Orillia

Barrie

Project:

185 Mountain Road

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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/SWMP		Average CN for Soil Type	
					Area	Percent	Area	Percent	Area	Percent	Area	Percent	Area	Percent	Area	Percent	Area	Percent		Area
WI	WIARTON	B	Loam or Silt Loam	2	2.0774	1	0	0	60	0.3272	0	0	65	1.5269	0	0	0	0	50	84.0925
	#N/A	#N/A	#N/A	#N/A	0	0	0	#N/A	0	0	0	#N/A	0	#N/A	0	0	0	#N/A	0	
	#N/A	#N/A	#N/A	#N/A	0	0	0	#N/A	0	0	0	#N/A	0	#N/A	0	0	0	#N/A	0	
	#N/A	#N/A	#N/A	#N/A	0	0	0	#N/A	0	0	0	#N/A	0	#N/A	0	0	0	#N/A	0	
	#N/A	#N/A	#N/A	#N/A	0	0	0	#N/A	0	0	0	#N/A	0	#N/A	0	0	0	#N/A	0	
Totals					2.0774	1	0	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
Time to Peak	0.13 hrs

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

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
Fores/Woodland	0.25	#N/A	#N/A	#N/A
Gravel	0.8	#N/A	#N/A	#N/A
Pasture/Lawn	0.28	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A
Wetland/Lake/SWMP	0.05	#N/A	#N/A	#N/A
Meadows	0.27	#N/A	#N/A	#N/A
Soil Series Total	0.7342	#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
WI	WIARTON	B	Loam or Silt Loam	2	2.0032	1	0.3165	60	0.5298	0.2645	69	0	65	1.0216	0.51	85	0.1352	0.0675	100	50	77.8305
	#N/A	#N/A	#N/A	#N/A	0	0	0	#N/A	0	#N/A	0	0	#N/A	0	#N/A	0	0	0	#N/A	0	#N/A
	#N/A	#N/A	#N/A	#N/A	0	0	0	#N/A	0	#N/A	0	0	#N/A	0	#N/A	0	0	0	#N/A	0	#N/A
	#N/A	#N/A	#N/A	#N/A	0	0	0	#N/A	0	#N/A	0	0	#N/A	0	#N/A	0	0	0	#N/A	0	#N/A
	#N/A	#N/A	#N/A	#N/A	0	0	0	#N/A	0	#N/A	0	0	#N/A	0	#N/A	0	0	0	#N/A	0	#N/A
Totals					2.0032	1	0.3165	0.158	0.52985	0.2645	0	0	0	1.02163	0.51	0	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
Time to Peak	0.07 hrs

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

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
Forest/Woodland	2	#N/A	#N/A	#N/A
Gravel	0.25	#N/A	#N/A	#N/A
Pasture/Lawn	0.8	#N/A	#N/A	#N/A
Impervious	0.28	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.95	#N/A	#N/A	#N/A
Meadows	0.05	#N/A	#N/A	#N/A
Soil Series Total	0.27	#N/A	#N/A	#N/A
	0.5957	#N/A	#N/A	#N/A



CURVE NUMBER, INITIAL ABSTRACTION & TIME TO PEAK CALCULATIONS

0.96 ha

Time of Concentration Calculations

For Runoff Coefficients less than 0.4

Woods	10
Meadows	8
Gravel	2
Lawns	5
Wetland	12
Impervious	2

Airport Method

185.3 m
183.9 m
90 m
2%
0.96 ha

Time of Concentration (Minutes)
Time of Concentration (Hours)
Time to Peak (2/3 x Time of Concentration)

Runoff Coefficient	0.16
--------------------	------

Landuse Type	Soil Series			
	WI	0	0	0
2	#N/A	#N/A	#N/A	#N/A
Forests/Woodland	0.25	#N/A	#N/A	#N/A
Gravel	0.8	#N/A	#N/A	#N/A
Pasture/Lawn	0.28	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A
Wetland/Lake/SWMP	0.05	#N/A	#N/A	#N/A
Meadows	0.27	#N/A	#N/A	#N/A
Soil Series Total	0.1568	#N/A	#N/A	#N/A



C.C. Tatham & Associates Ltd.

Consulting Engineers

Collingwood

Bracebridge

Orillia

Barrie

Project:

185 Mountain Road

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DAM

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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/SWMP		Average CN for Soil Type	
					Area	Percent	Area	Percent	Area	Percent	Area	Percent	Area	Percent	Area	Percent	Area	Percent		Area
WI	WIARTON	B	#VALUE!	2	0.7133	1	0.3096	0.434	60	0	69	0	0.070	0.098	85	0	100	0.3338	50	
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0	#N/A	0	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	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	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	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

Alport 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

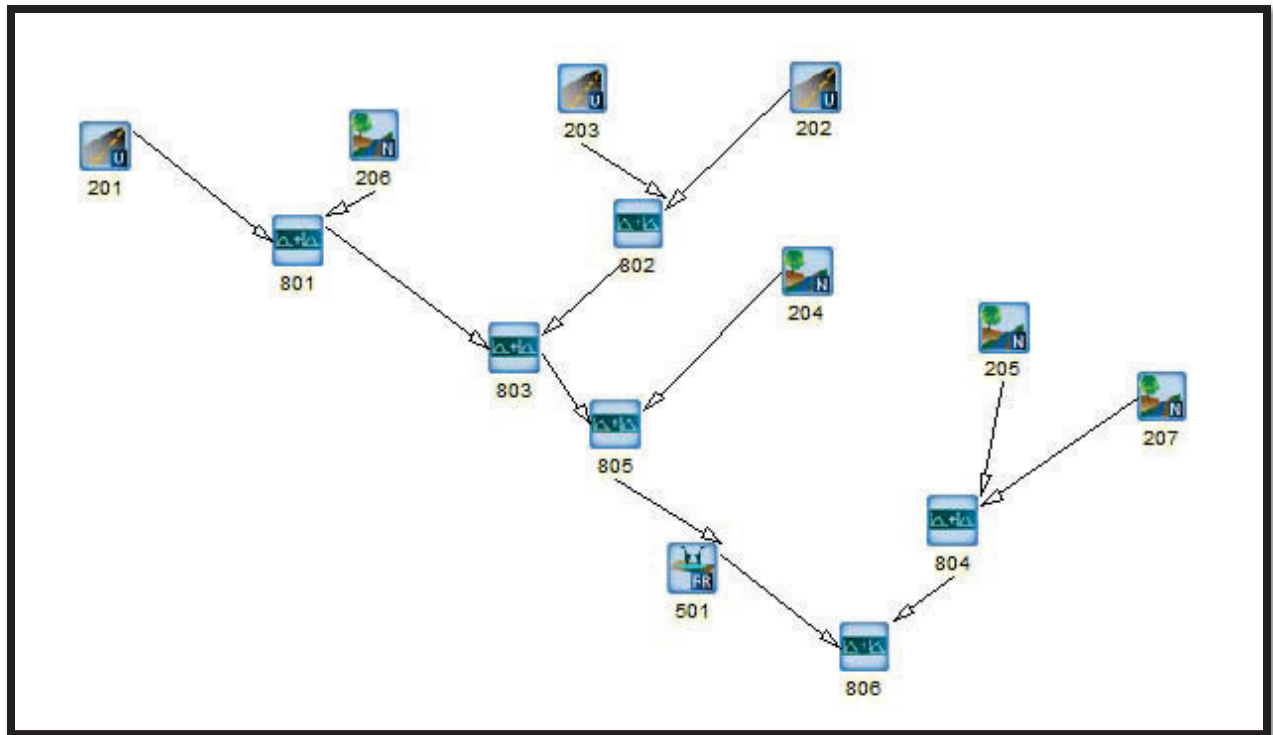
Initial Abstraction	10.152 mm
---------------------	-----------

Woods	10
Meadows	8
Gravel	2
Lawns	5
Wetland	12
Impervious	2

Runoff Coefficient	0.23
--------------------	------

Landuse Type	Soil Series			
	WI	0	0	0
Forest/Woodland	2	#N/A	#N/A	#N/A
Gravel	0.3	#N/A	#N/A	#N/A
Pasture/Lawn	0.8	#N/A	#N/A	#N/A
Impervious	0.35	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.95	#N/A	#N/A	#N/A
Meadows	0.05	#N/A	#N/A	#N/A
Soil Series Total	0.33	#N/A	#N/A	#N/A
	0.232	#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   Y   M   M  O   O
OOO   T   T   H   H   Y   Y   M   M   OOO

```

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***** D E T A I L E D O U T P U T *****

```

Input  filename: C:\Program Files (x86)\Visual OTTHYMO 2.3.2\voim.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	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	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	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	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      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (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      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (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      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (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      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (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      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (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      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      .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) |
| 1 + 2 = 3      |
-----
          AREA      QPEAK      TPEAK      R.V.
          (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      |
|                 |
|                 |
| Ptotal= 33.75 mm |
-----
Filename: I:\2016 Projects\116023 - 185 Mountain Road\
Design\185 Mtn Hydrologic Model\
Owen Sound Design Storms\OSCHI2.4HR
Comments: OWEN SOUND 2 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	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) |
| 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      RAIN | TIME      RAIN | TIME      RAIN | TIME      RAIN
hrs      mm/hr | hrs      mm/hr | hrs      mm/hr | hrs      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) |
| ID= 1 DT= 2.0 min |
|-----|
Area (ha)= .97
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) |
| ID= 1 DT= 2.0 min |
|-----|
Area (ha)= 2.34
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.
(ha) (cms) (hrs) (mm)
```

	(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	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	.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.

```

*****
| 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    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)= .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
		(ha)	(cms)	(hrs)
ID1= 1 (0207):		.71	.011	2.20
+ ID2= 2 (0205):		2.00	.188	1.93
ID = 3 (0804):		2.72	.192	1.93
				R.V.
				(mm)
				5.23
				14.18

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0801)				
1 + 2 = 3		AREA	QPEAK	TPEAK
		(ha)	(cms)	(hrs)
ID1= 1 (0206):		.96	.017	2.23
+ ID2= 2 (0201):		3.28	.357	2.03
ID = 3 (0801):		4.24	.368	2.03
				R.V.
				(mm)
				5.91
				23.73

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0802)				
1 + 2 = 3		AREA	QPEAK	TPEAK
		(ha)	(cms)	(hrs)
ID1= 1 (0202):		.97	.118	2.00
+ ID2= 2 (0203):		2.34	.281	2.03
ID = 3 (0802):		3.31	.395	2.00
				R.V.
				(mm)
				23.73
				24.93

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      .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) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (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      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      .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) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (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 |
|           |
|           |
| Ptotal= 50.59 mm |
-----
Filename: I:\2016 Projects\116023 - 185 Mountain Road\
          Design\185 Mtn Hydrologic Model\
          Owen Sound Design Storms\OSchi10.4hr
Comments: OWEN SOUND 10 YEAR 4 HOUR DURATION CHICA
```

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	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 RAIN | TIME RAIN | TIME RAIN | TIME RAIN
hrs mm/hr | hrs mm/hr | hrs mm/hr | hrs 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)				
ID= 1 DT= 2.0 min	Area (ha)=	2.34		
	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 |
-----
ID1= 1 (0204):   AREA   QPEAK   TPEAK   R.V.
                (ha)    (cms)   (hrs)   (mm)
+ ID2= 2 (0803):   2.08    .256    2.00   24.08
                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   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    1.222    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   QPEAK   TPEAK   R.V.
                (ha)    (cms)   (hrs)   (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   RAIN | TIME   RAIN | TIME   RAIN | TIME   RAIN
hrs   mm/hr | hrs   mm/hr | hrs   mm/hr | hrs   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   RAIN | TIME   RAIN | TIME   RAIN | TIME   RAIN
hrs   mm/hr | hrs   mm/hr | hrs   mm/hr | hrs   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.

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-----
| CALIB |
| STANDHYD (0201) | Area (ha)= 3.28
| ID= 1 DT= 2.0 min | Total Imp(%)= 70.00 Dir. Conn.(%)= 2.00
-----

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```

                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

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```

                *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.

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-----
| CALIB |
| STANDHYD (0202) | Area (ha)= .97
| ID= 1 DT= 2.0 min | Total Imp(%)= 70.00 Dir. Conn.(%)= 2.00
-----

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```

                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.

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-----
| CALIB |
| STANDHYD (0203) | Area (ha)= 2.34
| ID= 1 DT= 2.0 min | Total Imp(%)= 73.00 Dir. Conn.(%)= 2.00
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```

                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

.012	.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	1.596	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	QPEAK	TPEAK	R.V.
1 + 2 = 3	(ha)	(cms)	(hrs)	(mm)
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	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	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	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	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) |
| ID= 1 DT= 2.0 min |
-----
Area (ha)= .97
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) |
| ID= 1 DT= 2.0 min |
-----
Area (ha)= 2.34
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	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(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	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(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	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(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	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(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	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(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	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	1.906	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				

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-----
| ADD HYD      (0806) |
| 1 + 2 = 3      |
|-----|
| AREA      QPEAK      TPEAK      R.V.
| (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

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NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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*****
** SIMULATION NUMBER: 7 **
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-----
| 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

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-----
| 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.

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-----
|----- TRANSFORMED HYETOGRAPH -----|
| TIME      RAIN | TIME      RAIN | TIME      RAIN | TIME      RAIN |
| hrs      mm/hr | hrs      mm/hr | hrs      mm/hr | hrs      mm/hr |
| .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.

	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.

	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 .857 2.00 40.40

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      .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) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (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) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (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      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      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) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (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 **
*****
```


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	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	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)
ID= 1 DT= 2.0 min
Area (ha)= .71
Ia (mm)= 10.20
U.H. Tp(hrs)= .25
Curve Number (CN)= 57.8
of Linear Res.(N)= 3.00

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	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.

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-----
| 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	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(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	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(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	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(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	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(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	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(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 (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	1.022	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 (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (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
=====

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```
Input    filename: C:\Program Files (x86)\Visual OTTHYMO 2.3.2\voim.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
```

USER:

```
*****
** SIMULATION NUMBER:    1 **
*****
```

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

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	.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			

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.

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-----
| ADD HYD      (0801) |
| 1 + 2 = 3 |
-----
                AREA      QPEAK      TPEAK      R.V.
                (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) |
| 1 + 2 = 3 |
-----
                AREA      QPEAK      TPEAK      R.V.
                (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) |
| 1 + 2 = 3 |
-----
                AREA      QPEAK      TPEAK      R.V.
                (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) |
| 1 + 2 = 3 |
-----
                AREA      QPEAK      TPEAK      R.V.
                (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      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      .542      11.83      21.58
OUTFLOW: ID= 1 (0501)    9.627      .018      16.10      20.14

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PEAK FLOW REDUCTION [Qout/Qin](%)= 3.37
TIME SHIFT OF PEAK FLOW (min)=256.00
MAXIMUM STORAGE USED (ha.m.)= .1422

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-----
| ADD HYD      (0806) |
| 1 + 2 = 3 |
-----
                AREA      QPEAK      TPEAK      R.V.
                (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

```

 ** 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	.227 (iii)
TIME TO PEAK (hrs)=	11.73	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.

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*****
** SIMULATION NUMBER: 3 **
*****
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-----
| MASS STORM |
| |
| |
| Ptotal= 64.40 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      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)							
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	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	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) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (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) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (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) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (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) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (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) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (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      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	1.016	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) |
1 + 2 = 3
ID1= 1 (0501): AREA 9.63 QPEAK .034 TPEAK 15.93 R.V. 34.52
+ ID2= 2 (0804): AREA 2.72 QPEAK .226 TPEAK 11.73 R.V. 23.25
=====

ID = 3 (0806): AREA 12.34 QPEAK .240 TPEAK 11.73 R.V. 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	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	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) | 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	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	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	12.333	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.

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| 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
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***** 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.

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-----
| 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.

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| 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*
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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
		(ha)	(cms)	(hrs)
ID1= 1 (0203):		2.34	.355	11.80
+ ID2= 2 (0202):		.97	.153	11.77
=====				
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
		(ha)	(cms)	(hrs)
ID1= 1 (0201):		3.28	.463	11.80
+ ID2= 2 (0206):		.96	.033	11.93
=====				
ID = 3 (0801):		4.24	.490	11.80
				42.32

MASS STORM	Filename: I:\2016 Projects\116023 - 185 Mountain Road\Design\185 Mtn Hydrologic Model\
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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	.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)

ID= 1 DT= 2.0 min

Area (ha)= 2.08

Ia (mm)= 2.47

U.H. Tp(hrs)= .13

Curve Number (CN)= 84.1

of Linear Res.(N)= 3.00

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	.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	QPEAK	TPEAK	R.V.			
	(ha)	(cms)	(hrs)	(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	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	1.473	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	QPEAK	TPEAK	R.V.			
	(ha)	(cms)	(hrs)	(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	Filename: I:\2016 Projects\116023 - 185 Mountain Road\						
	Design\185 Mtn Hydrologic Model\						
	Owen Sound Design 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 (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	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)= .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

	ADD	HYD	(0806)	
	1	+	2 = 3	

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

C₂ = slope coefficient from the area-depth linear regression

5712

C₃ = intercept from the area-depth linear regression

3352.1

A_o = cross-sectional area of orifice (m²)

0.0122718 m²

125 mm diameter

h = maximum water elevation above the orifice (m)

0.19 m

t =	95,844.34 seconds
t =	26.62 hours

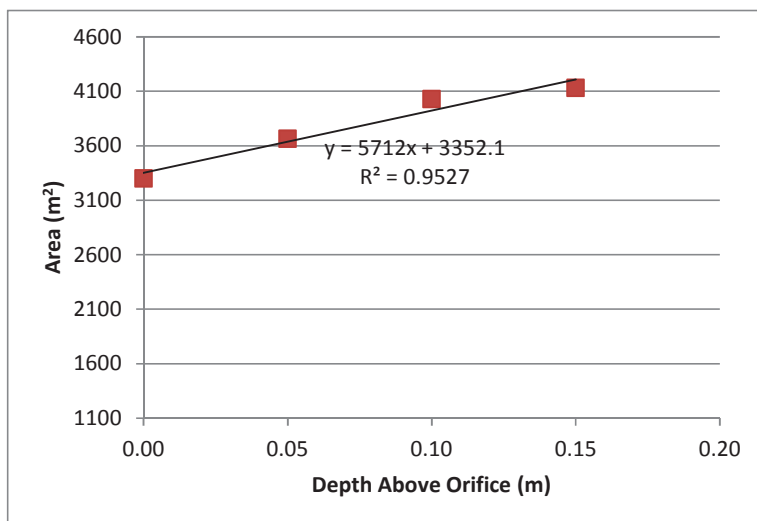
Water Quality Storage

726 m³

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

C₂ = slope coefficient from the area-depth linear regression

3059.5

C₃ = intercept from the area-depth linear regression

3540.3

A_o = cross-sectional area of orifice (m²)

0.0122718 m²

125 mm diameter

h = maximum water elevation above the orifice (m)

0.58 m

t =	186,216.80 seconds
t =	51.73 hours

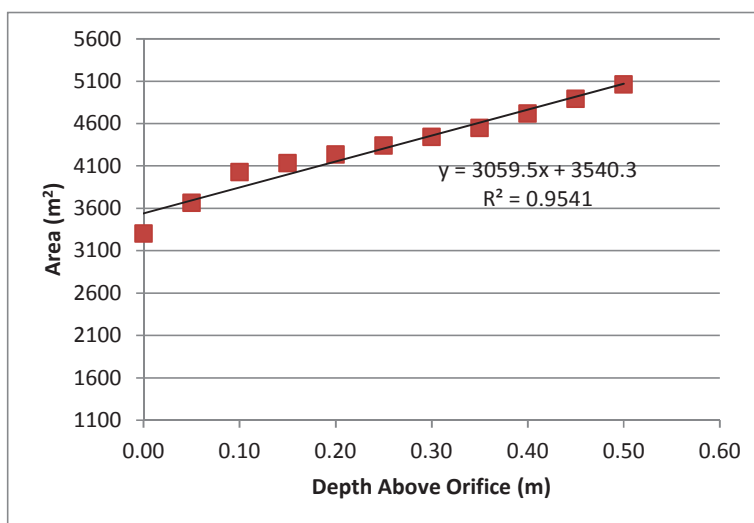
Extended Detention Storage

2572 m³

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	=	$\text{SQRT}(r \cdot Q_p / V_s)$	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			

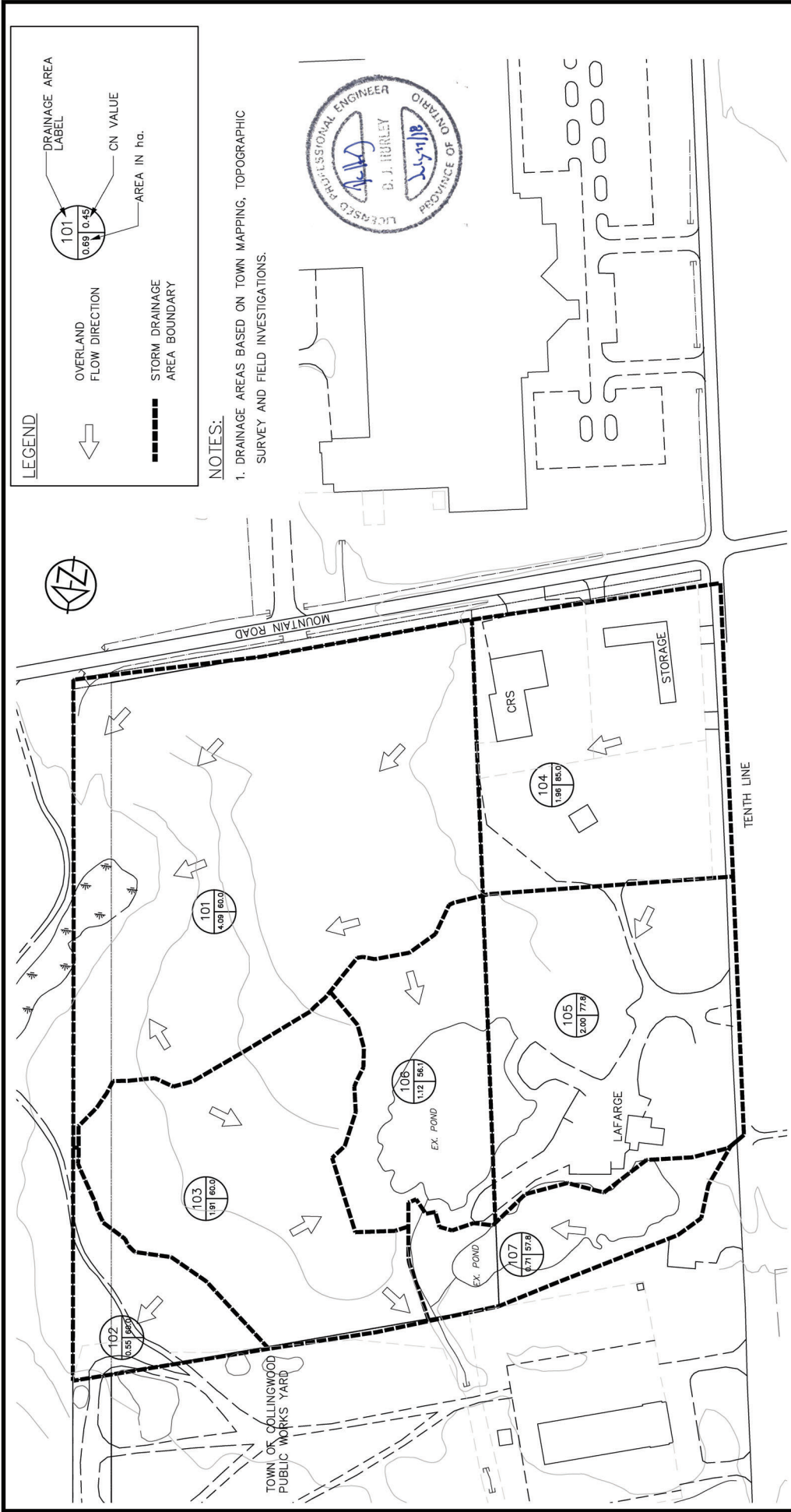
2) Dispersion Length

Dist	=	$8 \cdot Q / d \cdot V_f$	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			

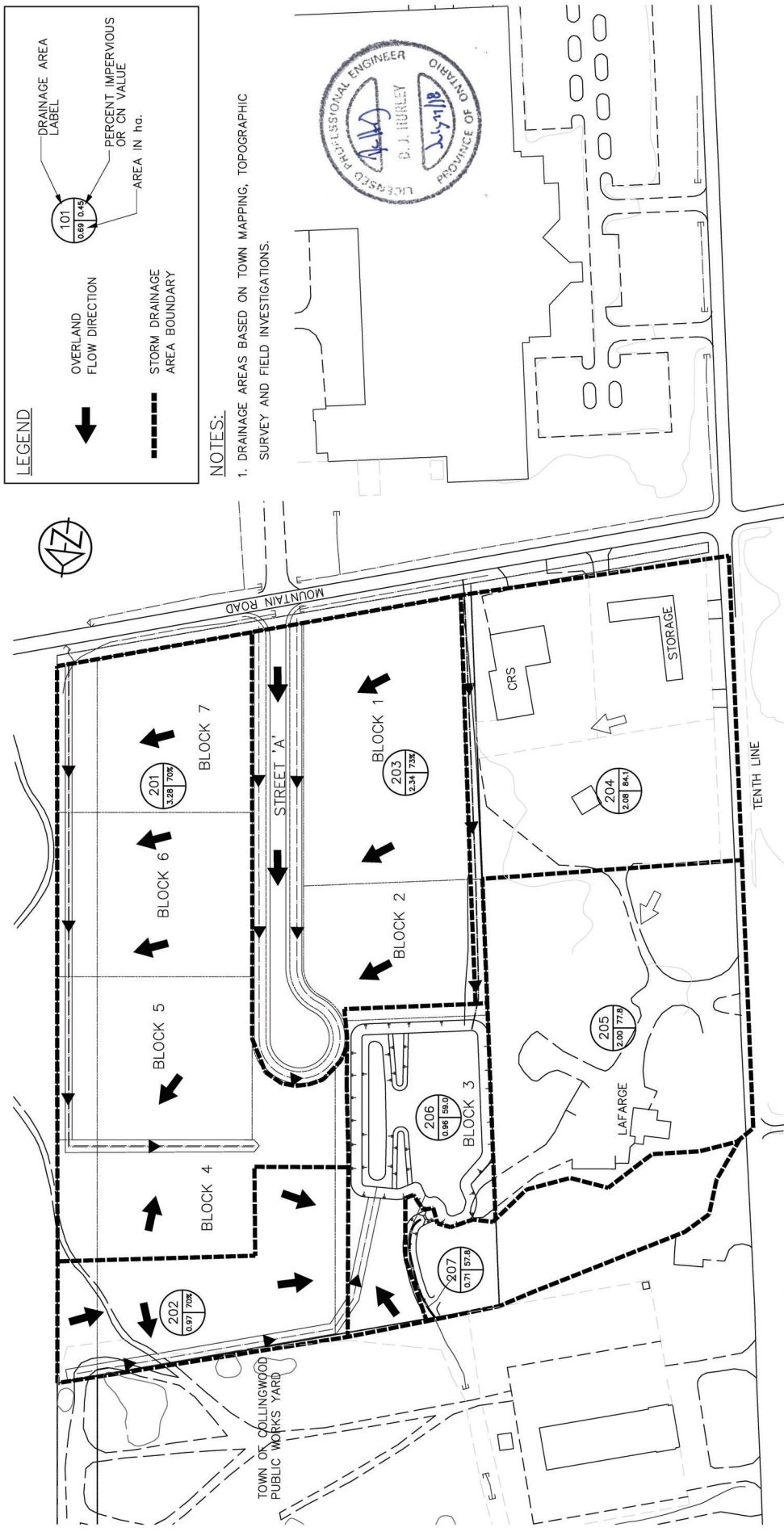
3) Cleanout Frequency

Table 6.3 MOE SWMPD Manual

Cleanout	=	$\text{Vol} / (\text{load} \cdot A \cdot \text{eff.})$	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 Frequency 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.		VAN DOLDER'S HOME TEAM 185 MOUNTAIN ROAD		C.C. Tatham & Associates Ltd. Consulting Engineers Collingwood Bracebridge Orillia Barrie Ottawa	
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NO.		REVISIONS		JOB NO. 116023 CHECKED: JPA DATE: AUG/16	
DATE		DWG. DP-1			

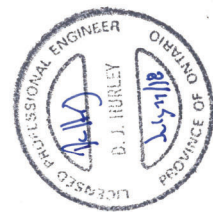


LEGEND

OVERLAND FLOW DIRECTION
 STORM DRAINAGE AREA BOUNDARY
 DRAINAGE AREA LABEL
 PERCENT IMPERVIOUS OR ON VALUE
 AREA IN ha.

NOTES:

1. DRAINAGE AREAS BASED ON TOWN MAPPING, TOPOGRAPHIC SURVEY AND FIELD INVESTIGATIONS.



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VAN DOLDER'S HOME TEAM
185 MOUNTAIN ROAD

POST-DEVELOPMENT
DRAINAGE PLAN

C.C. Tatham & Associates Ltd.
Consulting Engineers

Collingwood Bracebridge Orillia Barrie Ottawa

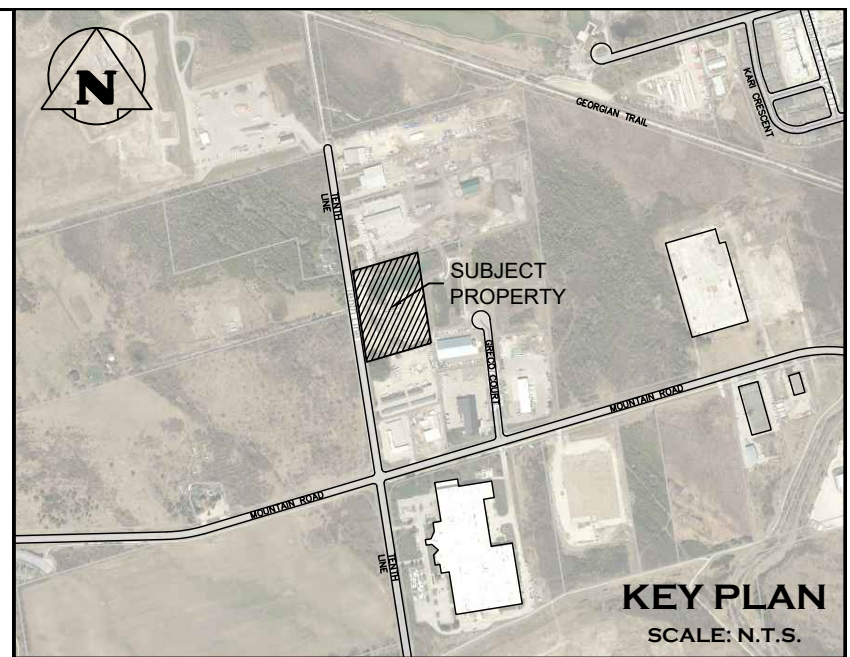
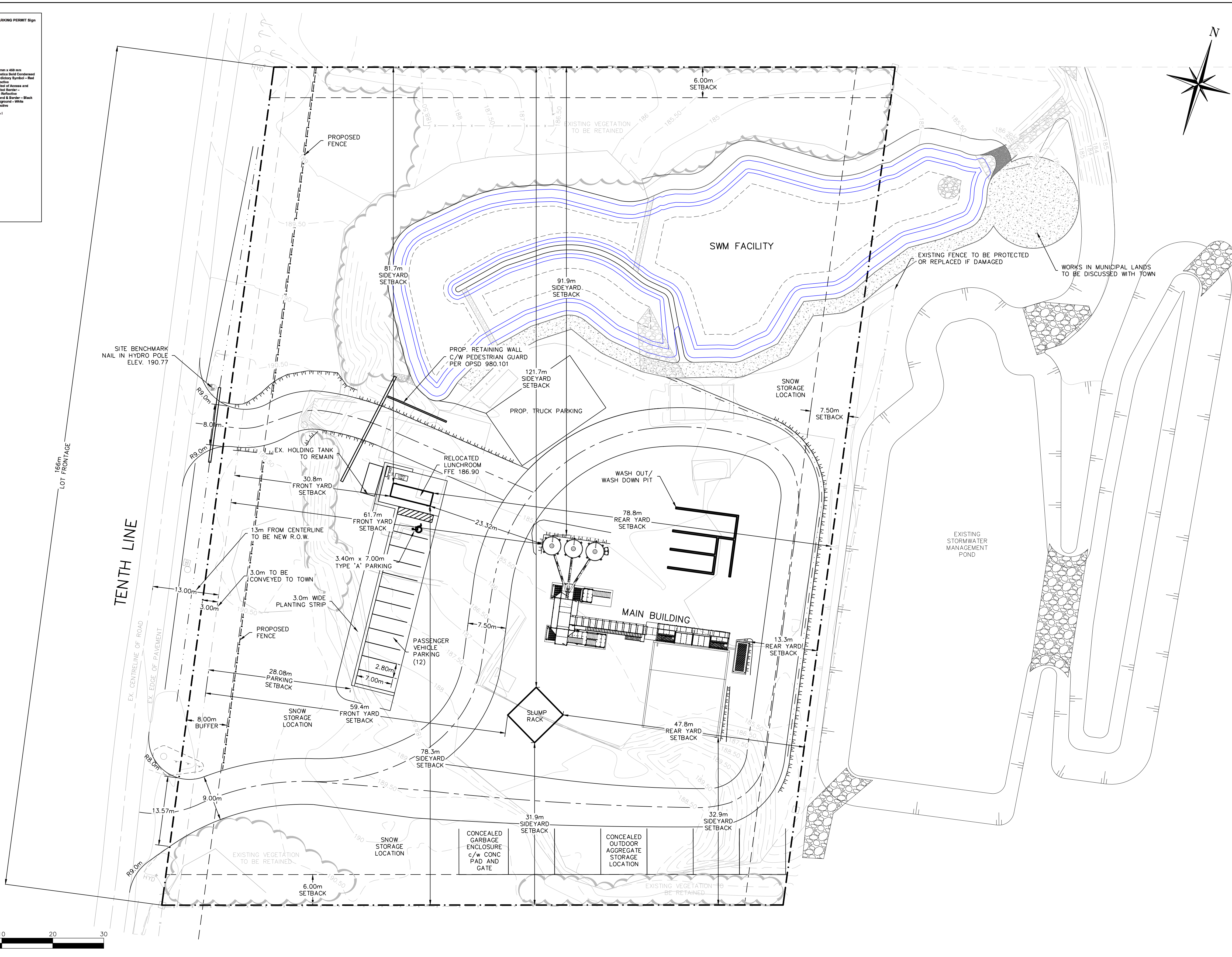
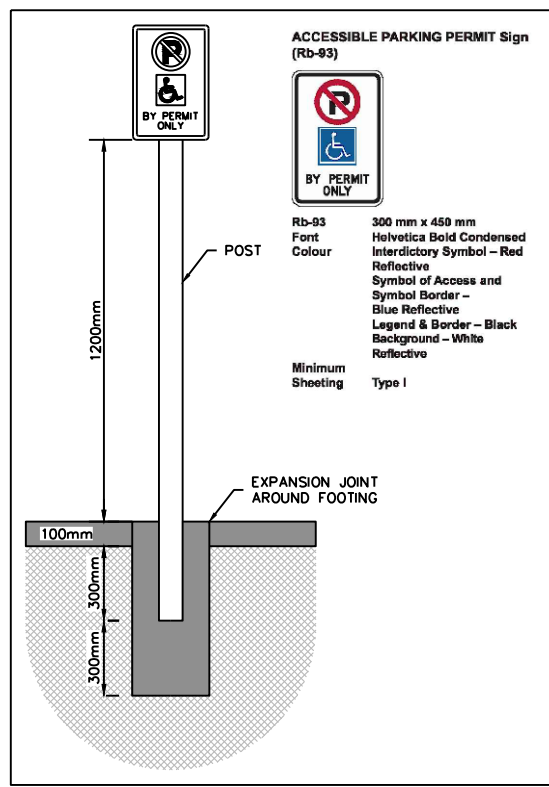
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DESIGN: DAM	CHECKED: JPA
DRAWN: APR	DATE: AUG/16

DWG. **DP-2**

NO.	REVISIONS	DATE

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 C107:	Encroachment Plan
Drawing T300:	Vehicle Maneuvering Right-in Turns
Drawing T301:	Vehicle Maneuvering Right-out Turns



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

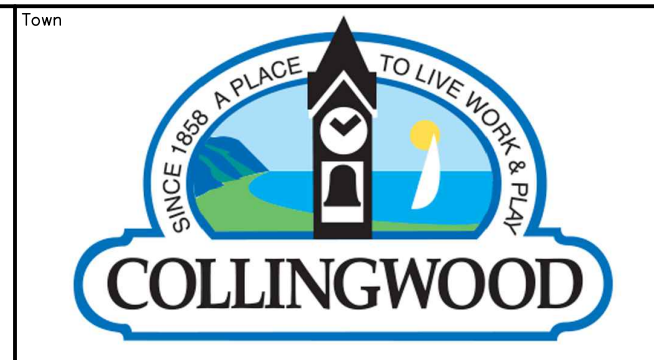
LUNCHROOM BUILDING		
M2 ZONE	REQUIRED	PROVIDED
FRONT YARD SETBACK	12 m	30.8 m
EXTERIOR SETBACK	12 m	N/A
INTERIOR SETBACK	6 m	78.3 m
REAR YARD	7.5 m	78.8 m
MAX HEIGHT	15 m	3.5 m
GROSS FLOOR AREA	--	21.3 m²

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

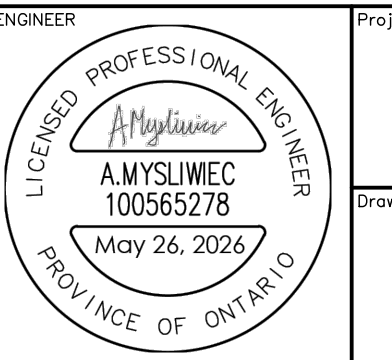
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- DO NOT SCALE DRAWINGS.

TEMPORARY BENCHMARKS
TBM#1-NAIL IN HYDRO POLE, 190.77

NOTE: ELEVATION DATA DERIVED USING NAD83(CSRS), UTM ZONE 17N



No.	ISSUE	DATE: YYYY/MM/DD
0	ISSUED FOR FIRST SUBMISSION	2025/06/24
1	ISSUED FOR SECOND SUBMISSION	2025/12/11
2	ISSUED FOR THIRD SUBMISSION	2026/05/29



Project: 555 TENTH LINE
TOWN OF COLLINGWOOD

Drawing: SITE PLAN



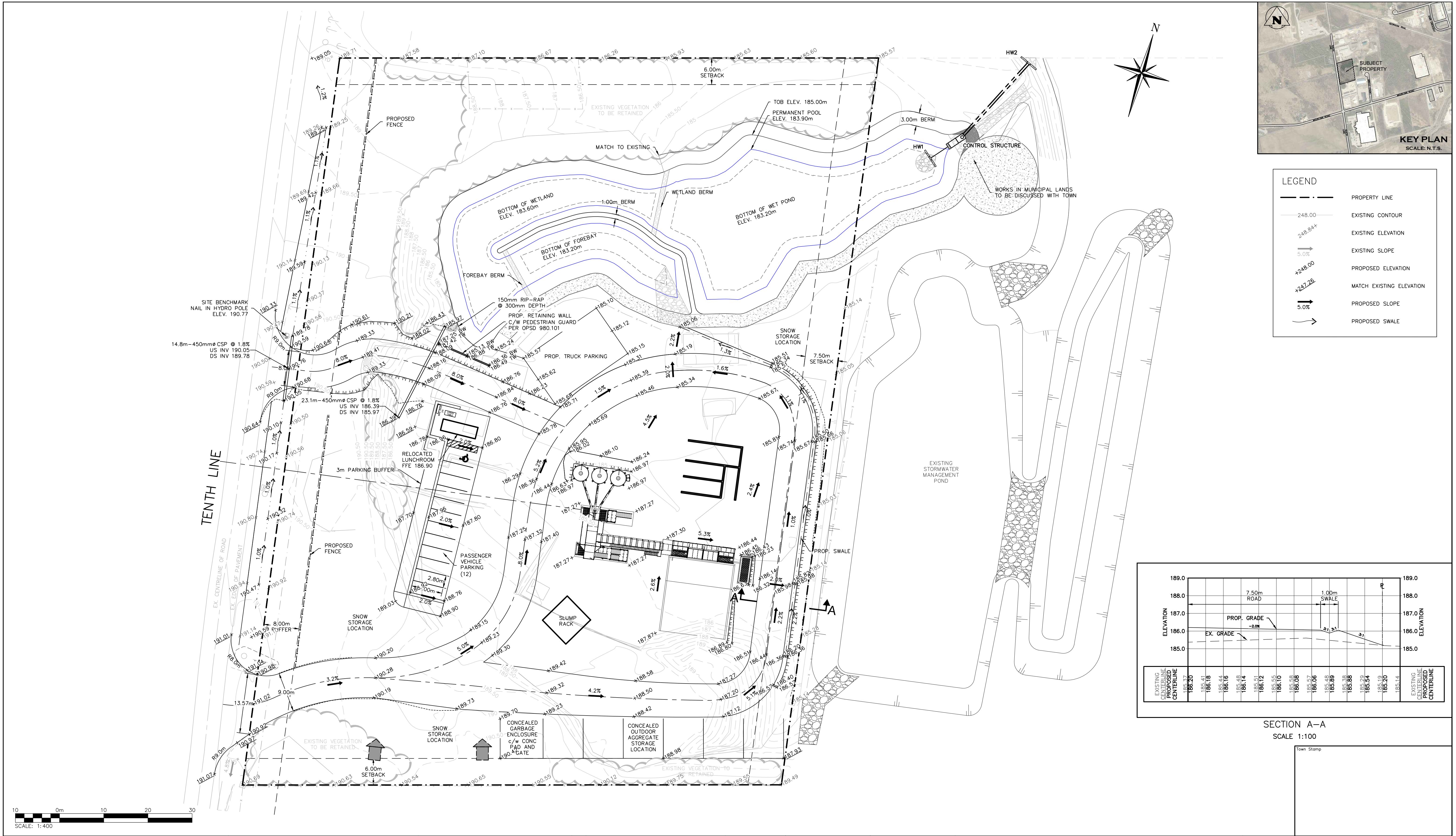
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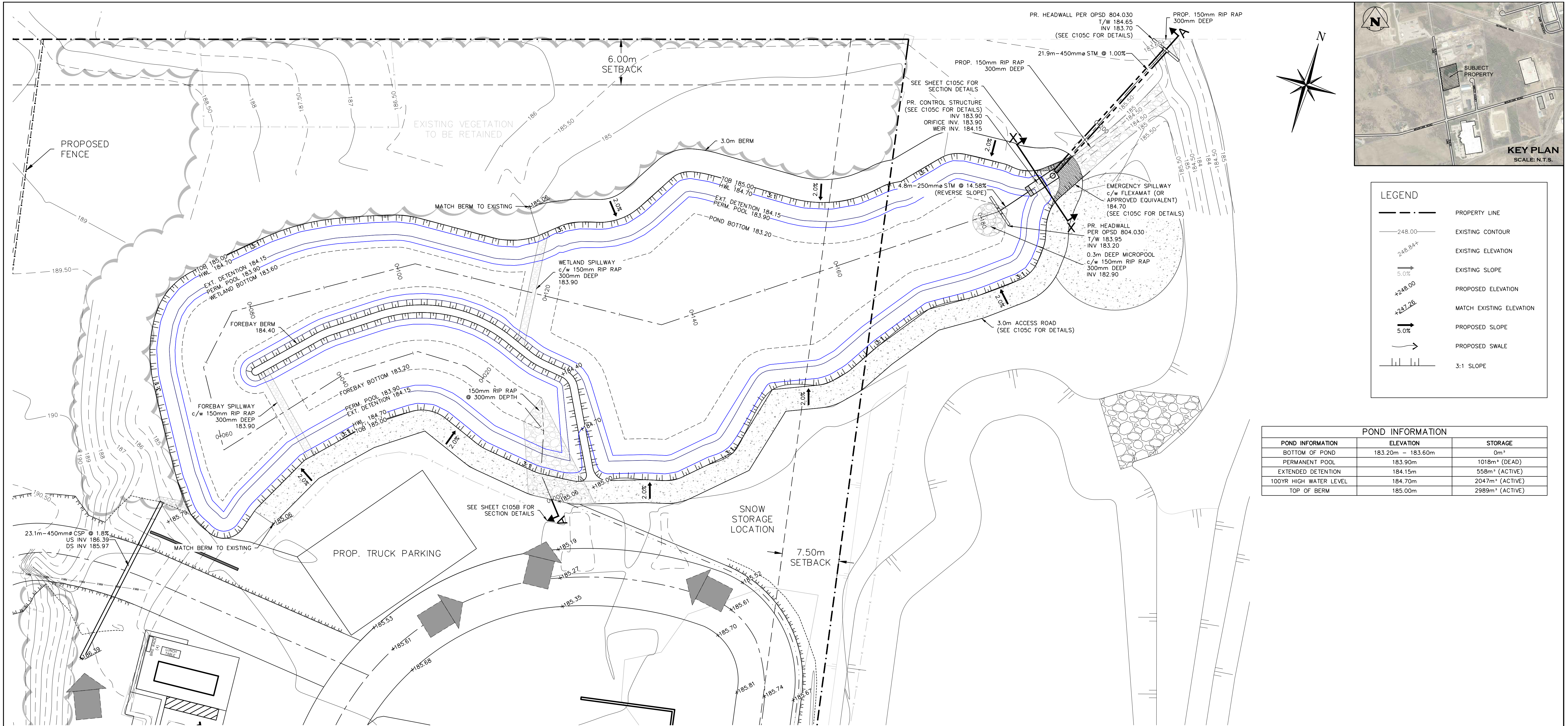
Drawn By: D.G. Design By: D.G. Project: 2577-6904

Check By: J.K. Check By: C.S. Drawing: C101









LEGEND	
	PROPERTY LINE
	EXISTING CONTOUR
	EXISTING ELEVATION
	EXISTING SLOPE
	PROPOSED ELEVATION
	MATCH EXISTING ELEVATION
	PROPOSED SLOPE
	PROPOSED SWALE
	3:1 SLOPE

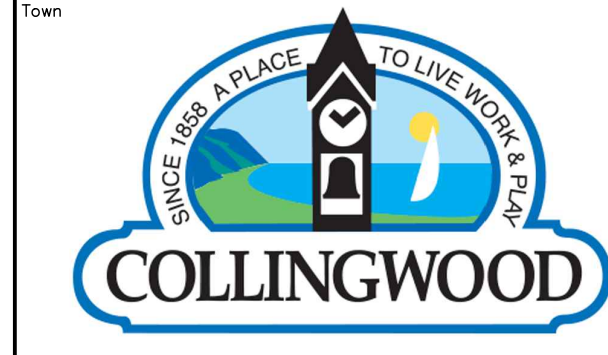
POND INFORMATION		
POND INFORMATION	ELEVATION	STORAGE
BOTTOM OF POND	183.20m - 183.60m	0m ³
PERMANENT POOL	183.90m	1018m ³ (DEAD)
EXTENDED DETENTION	184.15m	558m ³ (ACTIVE)
100YR HIGH WATER LEVEL	184.70m	2047m ³ (ACTIVE)
TOP OF BERM	185.00m	2989m ³ (ACTIVE)



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TEMPORARY BENCHMARKS
TBM#1-NAIL IN HYDRO POLE, 190.77

NOTE: ELEVATION DATA DERIVED USING NAD83(CSRS), UTM ZONE 17N



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Project
**555 TENTH LINE
TOWN OF COLLINGWOOD**

Drawing
STORMWATER MANAGEMENT FACILITY PLAN



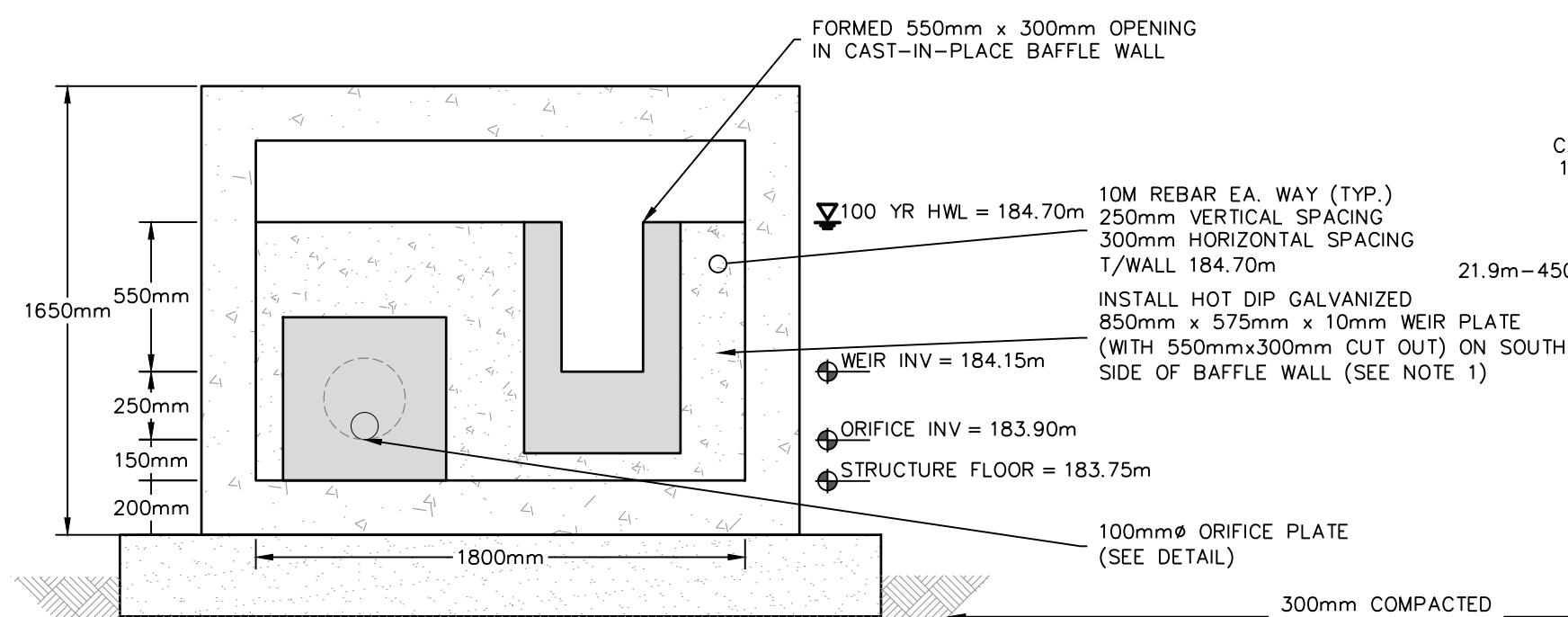
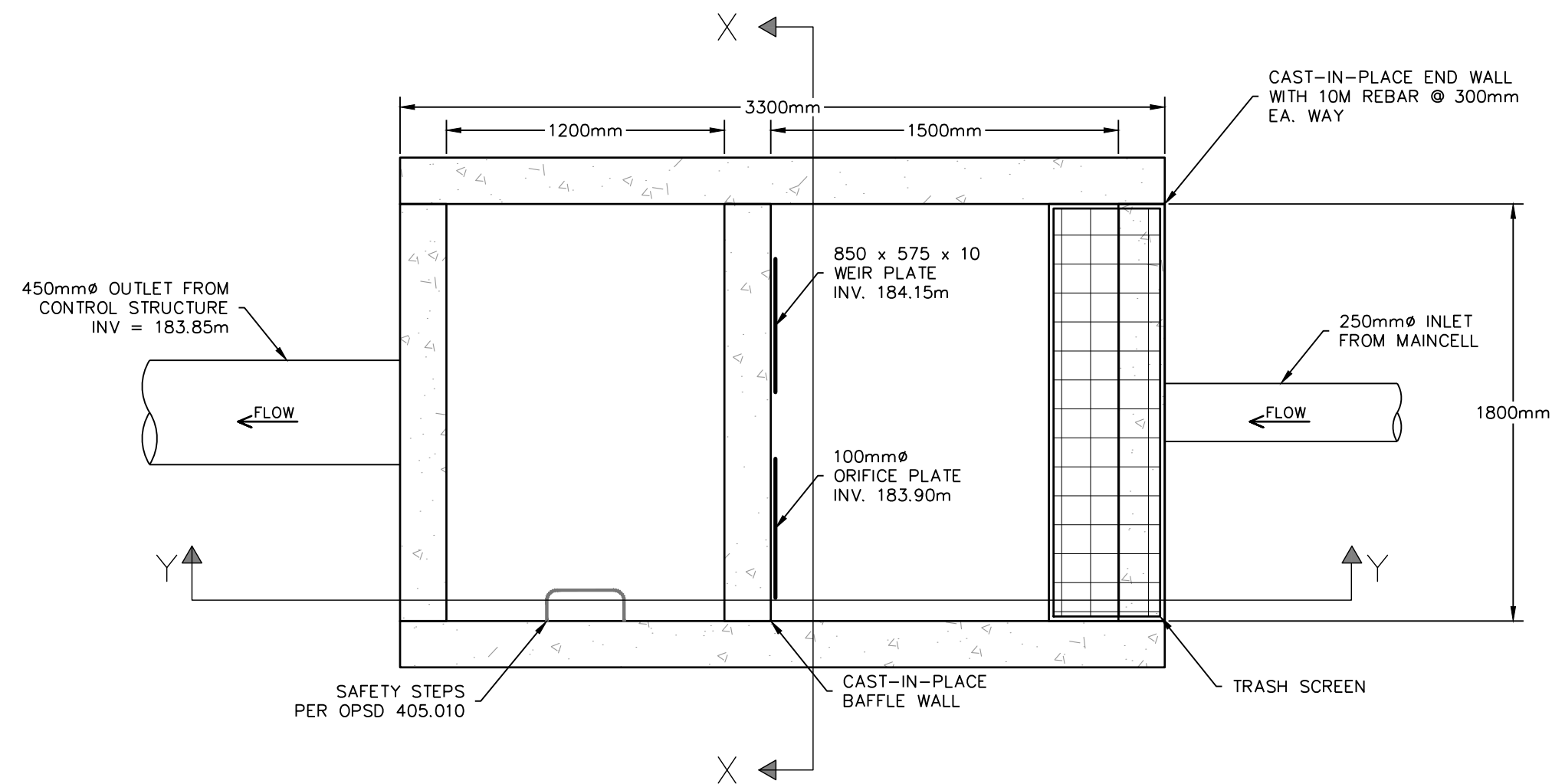
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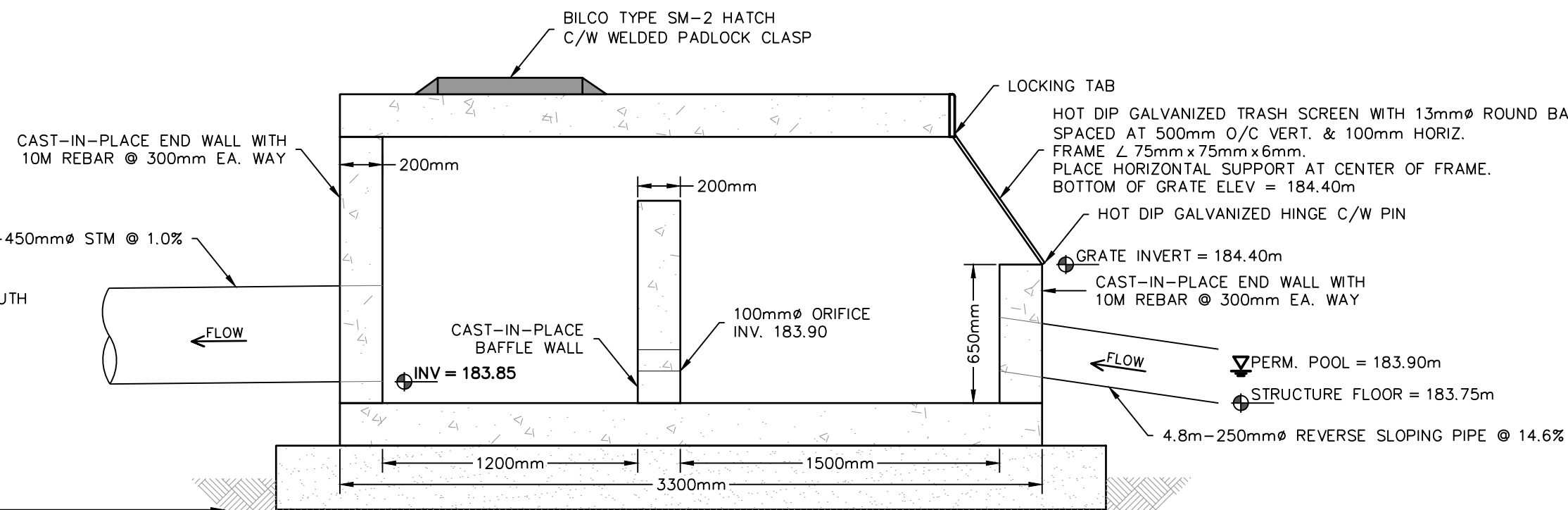
Drawn By	D.G.	Design By	D.G.	Project	2577-6904
Check By	J.K.	Check By	C.S.	Drawing	C105A

SCALE 1:25

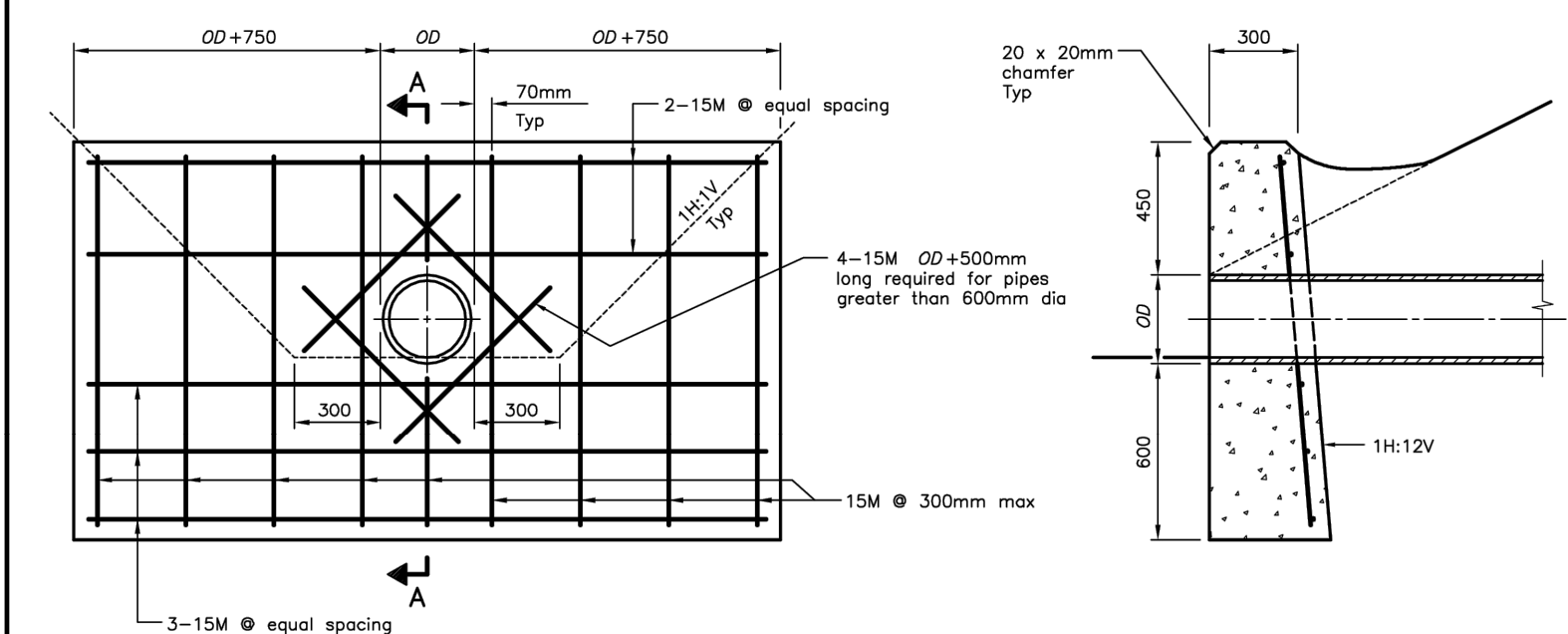
1. PLATE TO BE FASTENED TO CONCRETE WITH STAINLESS STEEL WEDGE ANCHOR BOLTS & WASHERS THROUGH PRE DRILLED 13mmø HOLES AS SHOWN. SILICONE OR PLASTIC SEAL SHALL BE PLACED BETWEEN WEIR PLATE AND CONCRETE WALL.
2. CONTRACTOR TO SUPPLY SHOP DRAWINGS FOR OUTLET STRUCTURE (INCLUDING TRASH SCREEN & CAST-IN-PLACE 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 M181, 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.

[illegible]

ONTARIO PROVINCIAL STANDARD DRAWING

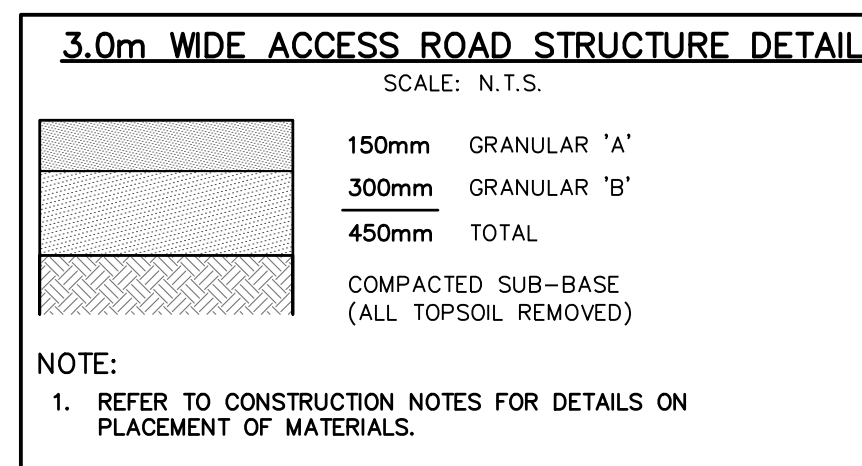
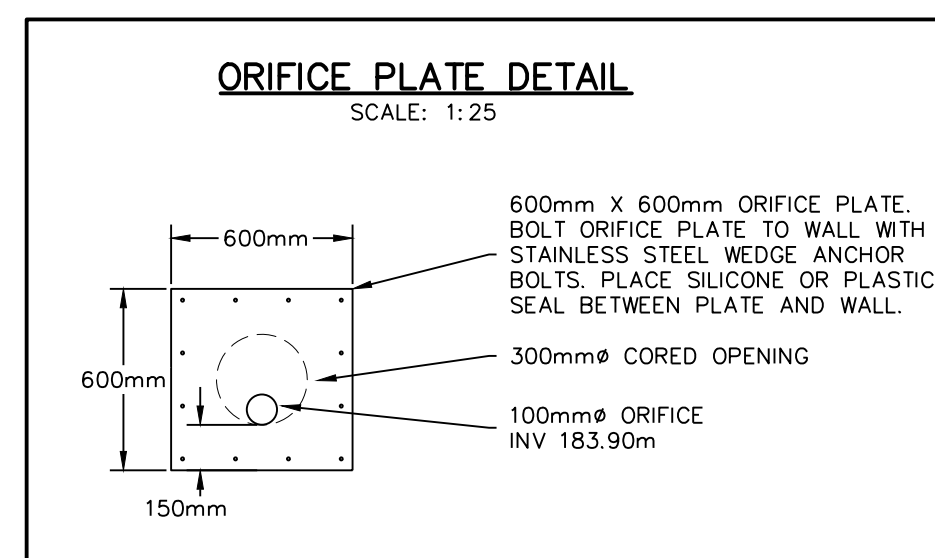
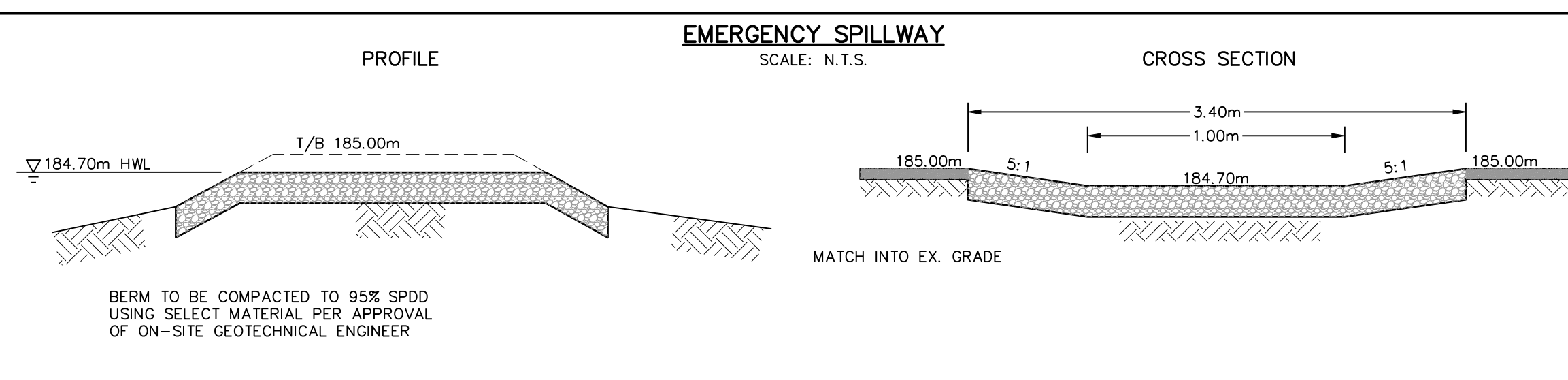
May 2017

Page 2

CONCRETE HEADWALL

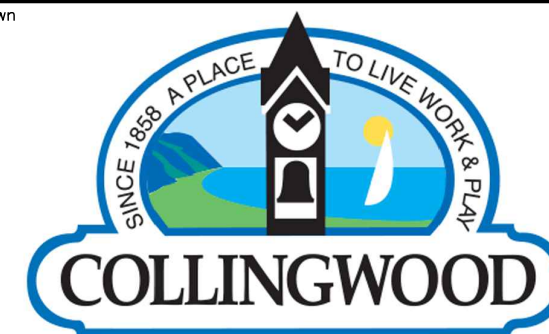
FOR PIPE LESS THAN 900mm DIAMETER

OPSD 804.030



TEMPORARY BENCHMARKS
TBM#1-NAIL IN HYDRO POLE, 190.77

NOTE: ELEVATION DATA DERIVED USING NAD83(CSR)
UTM ZONE 17N

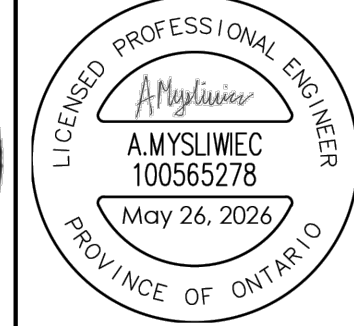


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ENGINEER



ENGINEER



Project	
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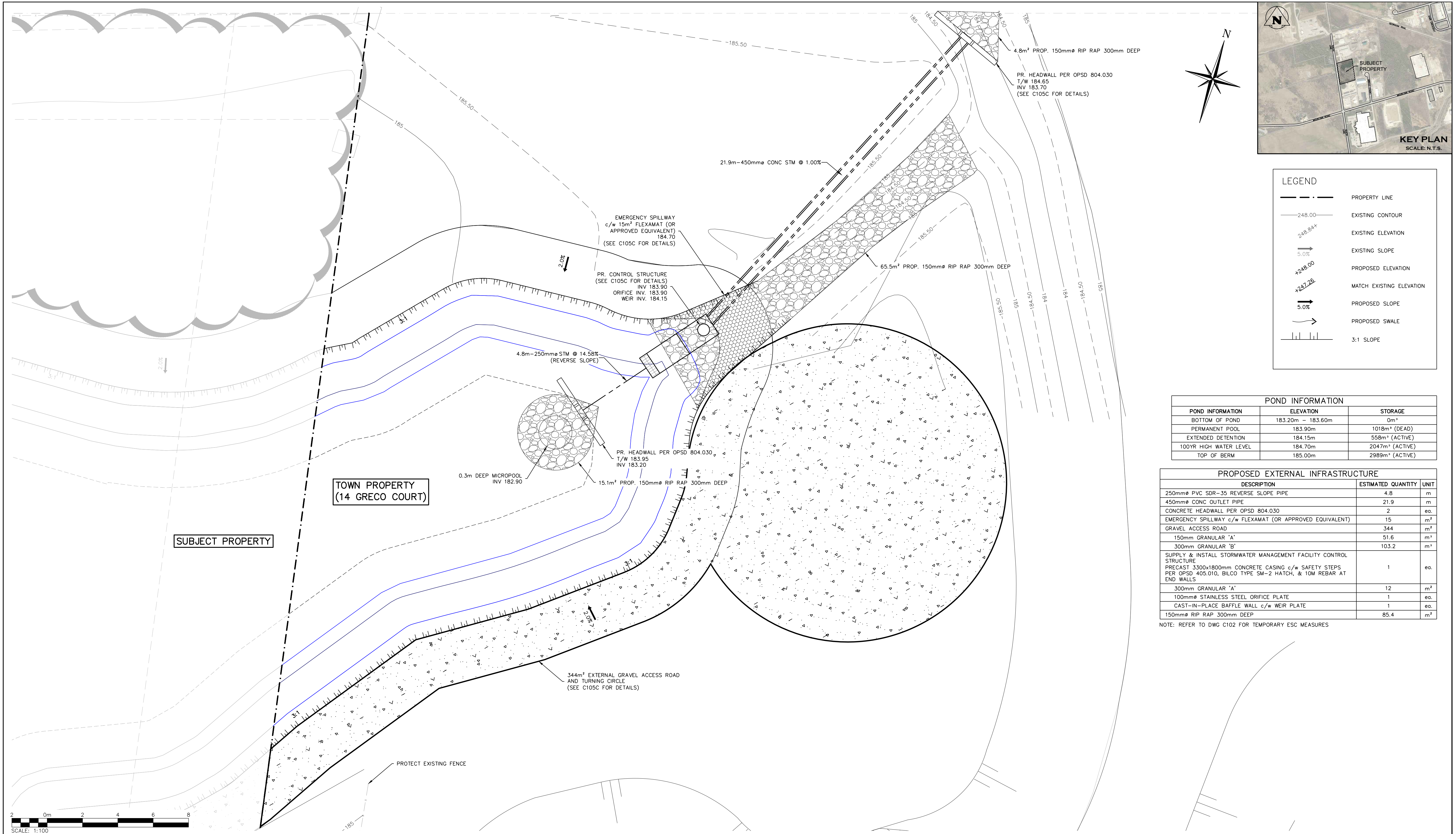
555 TENTH LINE
TOWN OF COLLINGWOOD

STORMWATER MANAGEMENT DETAILS



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



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)

PROPOSED EXTERNAL INFRASTRUCTURE		
DESCRIPTION	ESTIMATED QUANTITY	UNIT
250mmØ PVC SDR-35 REVERSE SLOPE PIPE	4.8	m
450mmØ CONC OUTLET PIPE	21.9	m
CONCRETE HEADWALL PER OPSD 804.030	2	eo.
EMERGENCY SPILLWAY c/w FLEXAMAT (OR APPROVED EQUIVALENT)	15	m²
GRAVEL ACCESS ROAD	344	m²
150mm GRANULAR 'A'	51.6	m³
300mm GRANULAR 'B'	103.2	m³
SUPPLY & INSTALL STORMWATER MANAGEMENT FACILITY CONTROL STRUCTURE	1	eo.
PRECAST 3300x1800mm CONCRETE CASING c/w SAFETY STEPS PER OPSD 405.010, BILCO TYPE 'SM'-2 HATCH, & 10M REBAR AT END WALLS	12	m²
300mm GRANULAR 'A'	1	eo.
100mmØ STAINLESS STEEL ORIFICE PLATE	1	eo.
CAST-IN-PLACE BAFFLE WALL c/w WEIR PLATE	1	eo.
150mmØ RIP RAP 300mm DEEP	85.4	m²

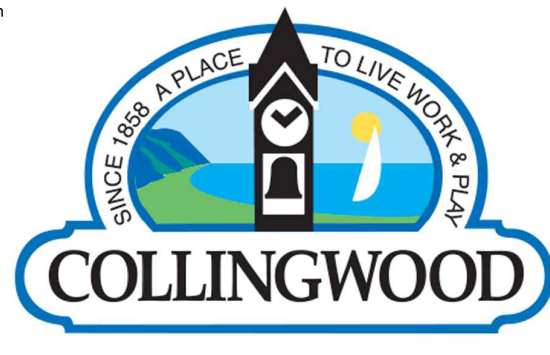
NOTE: REFER TO DWG C102 FOR TEMPORARY ESC MEASURES

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TEMPORARY BENCHMARKS

TEM#1--NAIL IN HYDRO POLE, 190.77

NOTE: ELEVATION DATA DERIVED USING NAD83(CSRS), UTM ZONE 17N



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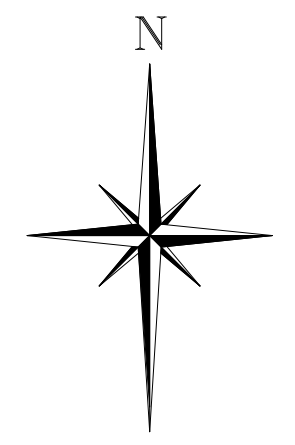
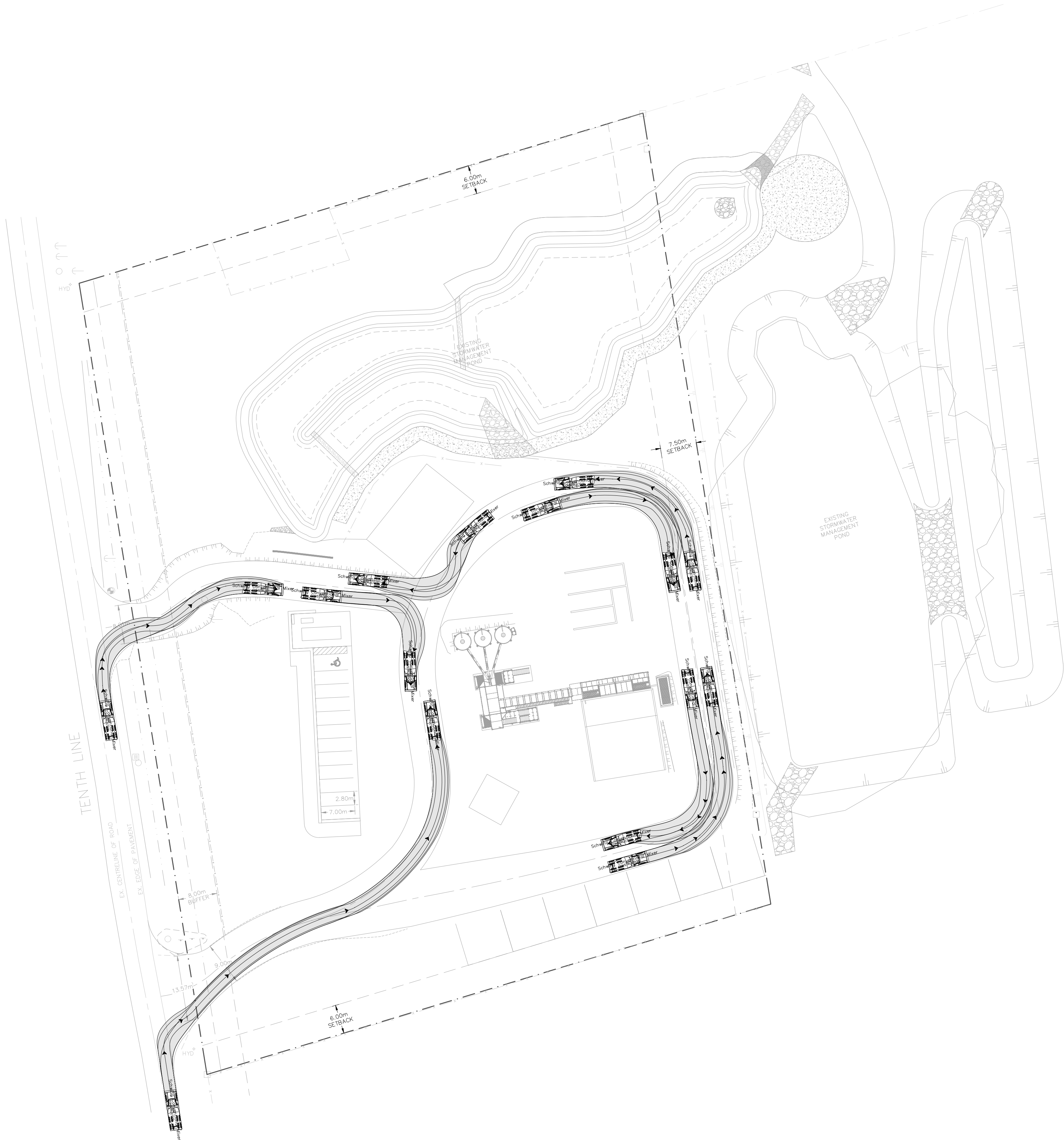
Project: 555 TENTH LINE
TOWN OF COLLINGWOOD

Drawing: ENCROACHMENT PLAN

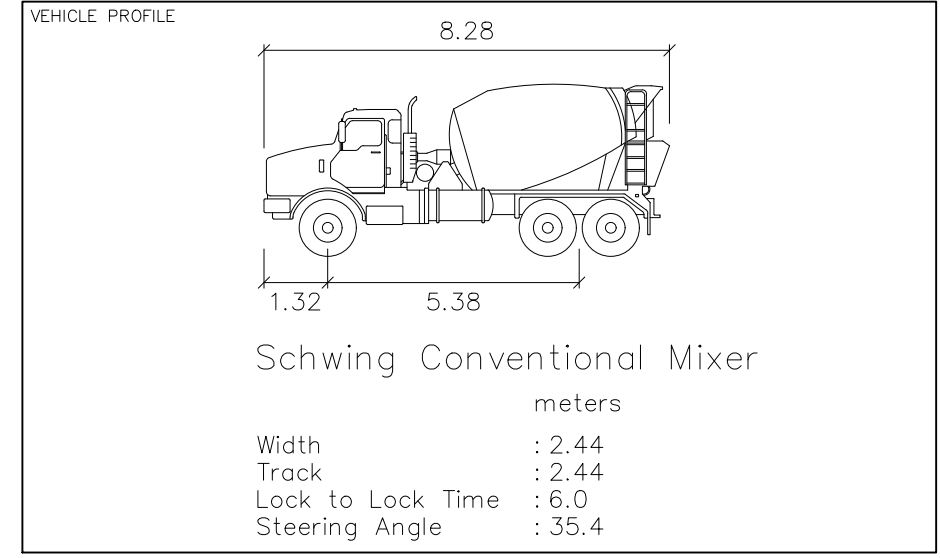
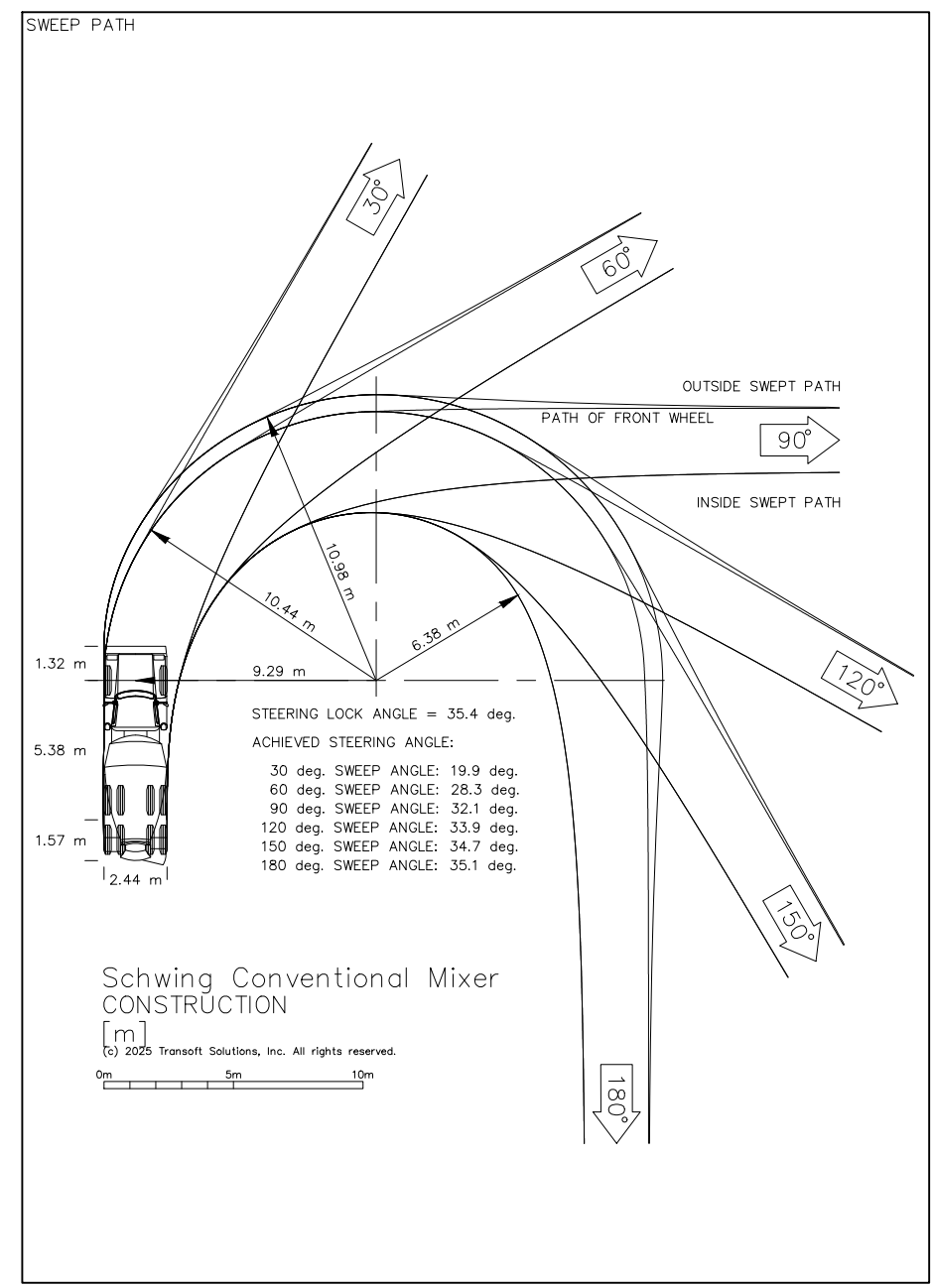


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Drawn By: D.G.	Design By: D.G.	Project: 2577-6904
Check By: J.K.	Check By: C.S.	Drawing: C107



FOR REVIEW
NOT TO BE USED FOR CONSTRUCTION



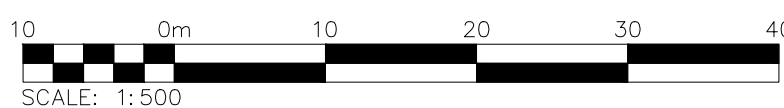
No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR INTERNAL REVIEW	08/28/2025
2	ISSUED FOR INTERNAL REVIEW	12/04/2025

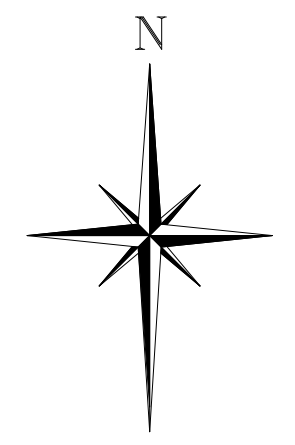
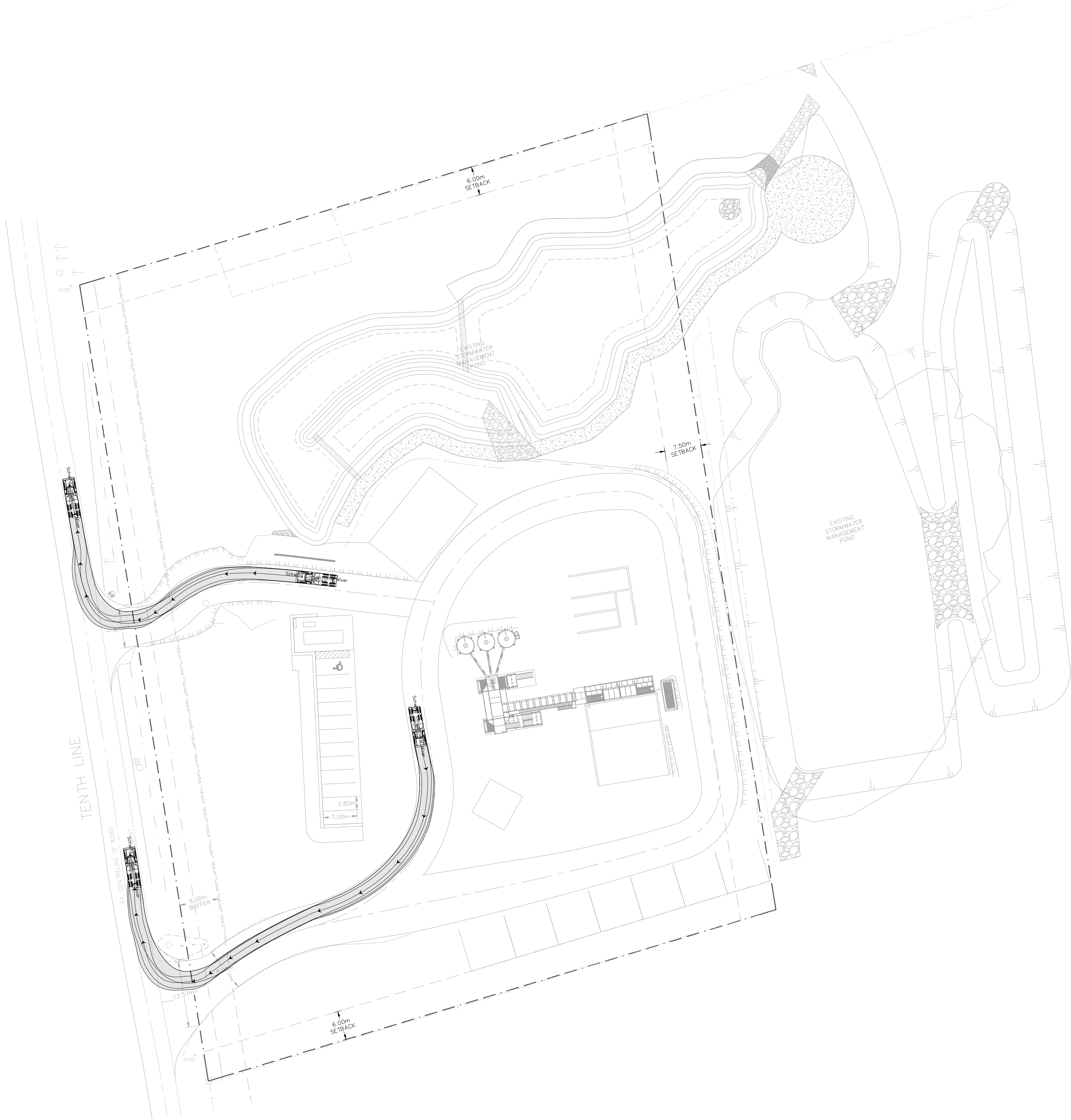
Project
555 TENTH LINE
TOWN OF COLLINGWOOD

Drawing
VEHICLE MANUEVERING
RIGHT-IN TURNS

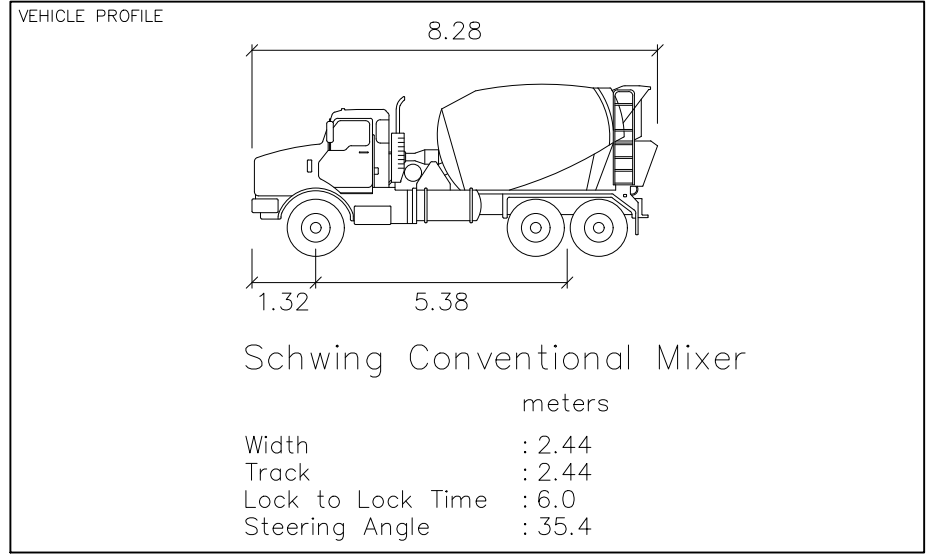
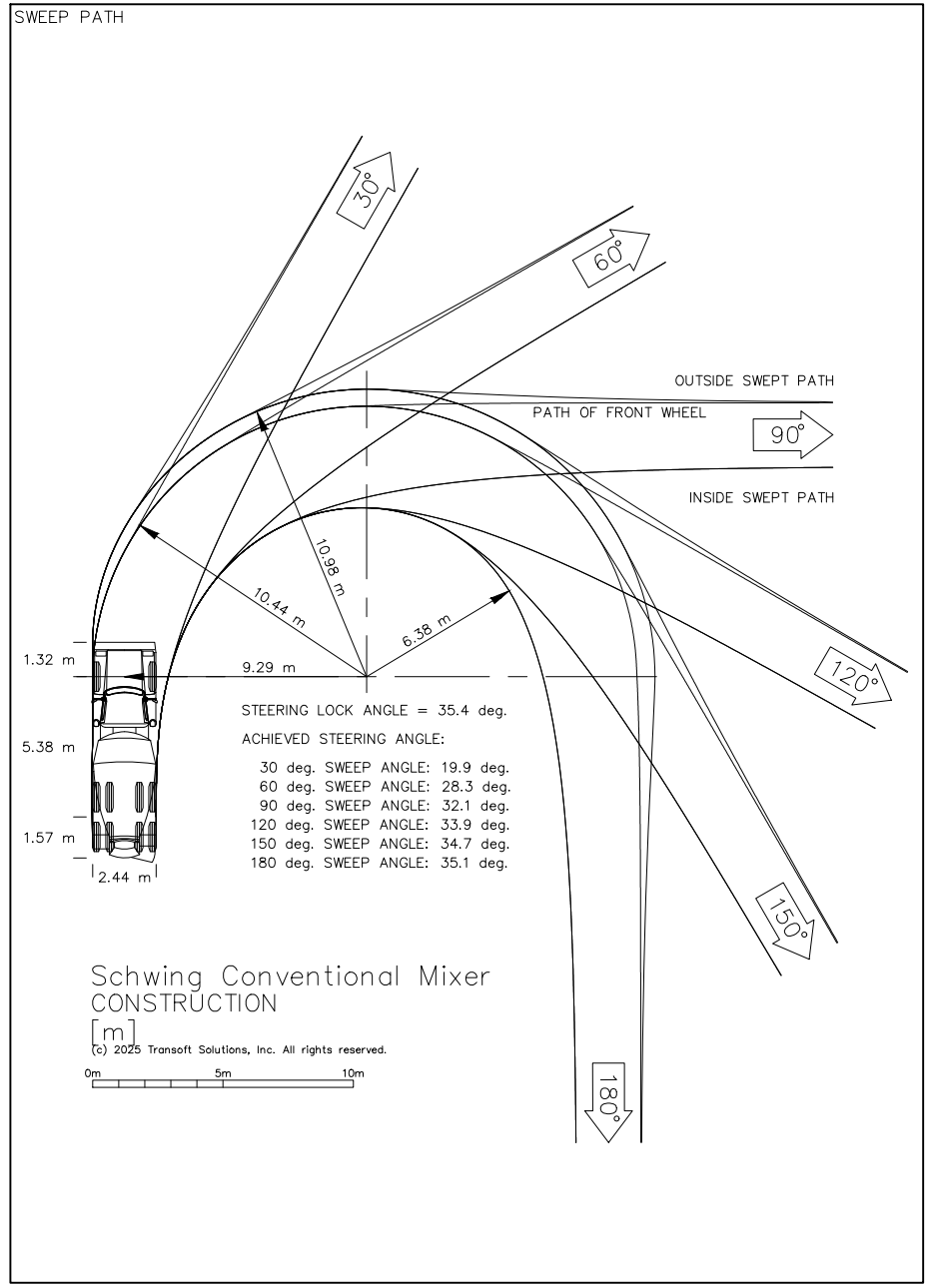


Drawn By R.L./J.M.	Design By	Project 2577-6904
Check By K.H.	Check By	Drawing T300





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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-OUT TURNS



Drawn By R.L./J.M.	Design By	Project 2577-6904
Check By K.H.	Check By	Drawing T301

