1012 Snyder's Road West
Baden, Ontario

Preliminary
Stormwater Management Report

Project Location:
1012 Snyder's Road West
Baden, Ontario

Prepared for:
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Engineers, Scientists, Surveyors.

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1.0 INTRODUCTION

1.1 Overview

MTE Consultants Inc. (MTE) was retained by Snyder's Road (Baden) GP Inc. to prepare the following revised Preliminary Stormwater Management (SWM) Report in support of a Draft Plan of Subdivision application and zoning by-law amendment. The lands that comprise the Draft Plan of Subdivision are within the property limits of 1012 Snyder's Road West, located in the community of Baden, Township of Wilmot, Region of Waterloo.

Zoning by-law amendment and plan of subdivision applications were formally submitted to the Township of Wilmot and the Region of Waterloo in May 2021. The subdivision application has been assigned Subdivision File 30T-21601. This report considers comments received to date through the circulation of the plan of subdivision.

The 1012 Snyder's Road West development, herein referred to as the 'Subject Lands', are located in the community of Baden. The lands are generally bounded by the existing Baden Subdivision to the northeast, additional lands owned by the applicant to the northwest, existing agricultural land to the west, and Snyder's Road West to the southeast. Refer to **Figure 1.1** for the location of the Subject Lands.

The Subject Lands comprise a total area of 26.54ha. Development plans include the construction of street-oriented residential units, multiple residential blocks, a potential school block, a park block, trail blocks, future development blocks, and a stormwater management block. A Draft Plan of Subdivision (dated August 11, 2023) for the proposed development has been prepared by MHBC Planning and forms the basis of this report. The reduced Draft Plan has been included in **Appendix A**.

This report presents stormwater quality and quantity measures that will be provided for the proposed development. This report should be read in conjunction with the following additional reports/information:

- 1012 Snyder's Road West – Functional Servicing Report – MTE Consultants Inc. (October 12, 2023).
- 1012 Snyder's Road West – Hydrogeological Assessment – MTE Consultants Inc. (October 4, 2023).

1.2 Background Information

The Subject Lands were originally assessed as part of the adjacent Baden Subdivision (Activa Holdings Inc.) and Baden West Subdivision (Baden West Developments Inc.) as undeveloped lands. The original primary outlet for the Subject Lands is the SWM Facility (SWMF) within the Baden West Subdivision and is described within the Final SWM Report dated January 2005 (Stantec).

The Baden West SWMF outlets to a tributary of the Baden Creek within the lands south of the CN Railway, herein referred to as the "Schmidt Lands". It should be noted that a current subwatershed management plan does not exist for Baden Creek.

1.2.1 Regional OPA Amendment No. 6

On April 11, 2023, Amendment 6 of the Region's Official Plan was adopted. The new Urban Boundary of Baden and New Hamburg, generally matching the previous Countryside Line. It officially expands the primary focus of future residential, employment, and commercial growth within the Township to that of the previous Countryside Line. This amendment was finalized within one month after the B/NH-WWSSR was submitted.

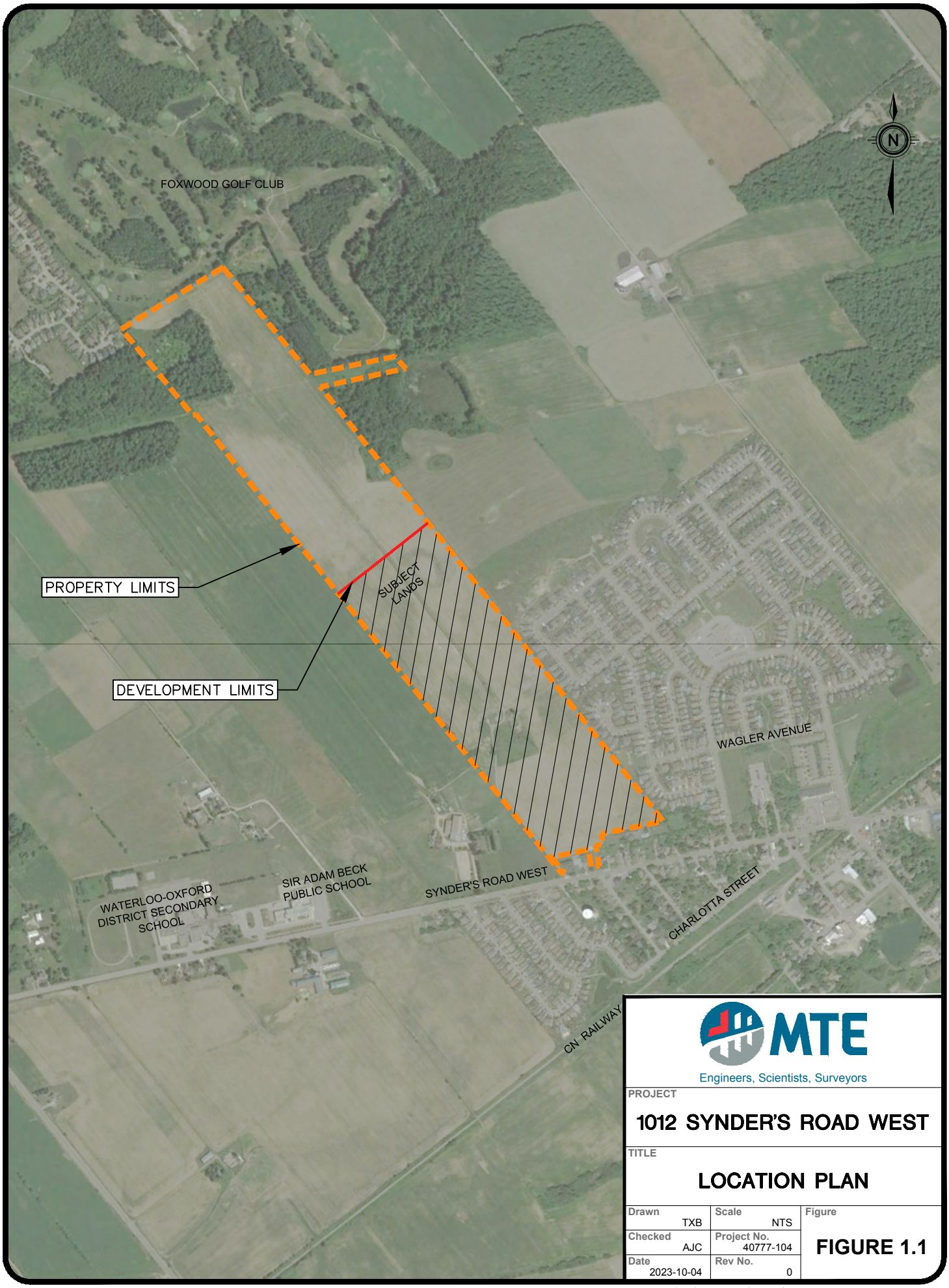
1.3 Purpose of Study

The purpose of this study is to develop a stormwater management strategy for the proposed development that is acceptable to the Township of Wilmot, the Region of Waterloo, the Grand River Conservation Authority (GRCA), and the Ministry of Environment, Conservation and Parks (MECP), taking into consideration the previous studies and municipal standards.

1.4 Objectives

The objective of this stormwater management plan is to ensure that the proposed development includes the necessary controls to protect the hydrology and water quality of the receiving water systems. Furthermore, this plan also ensures that the proposed Draft Plan of Subdivision provides the necessary blocks and corridors for stormwater management measures. Based on our pre-consultation with the agencies the primary objectives of this study are as follows:

- Document criteria for the management of stormwater runoff from the Subject Lands;
- Recommend a comprehensive plan for controlling the quality and quantity of stormwater runoff from the Subject Lands; and
- Prepare preliminary designs for the recommended stormwater management infrastructure.



MTE
Engineers, Scientists, Surveyors

PROJECT
1012 SYNDER'S ROAD WEST

TITLE
LOCATION PLAN

Drawn: TXB	Scale: NTS	Figure: **FIGURE 1.1**
Checked: AJC	Project No.: 40777-104	
Date: 2023-10-04	Rev No.: 0	

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Plot Date: October 5, 2023 - 10:26 AM

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2.0 EXISTING CONDITIONS AND BACKGROUND INFORMATION

2.1 Topographical Information

The development portion within the urban boundary for the Subject Lands are approximately 26.54 ha and is generally bounded by the existing Baden Subdivision to the northeast, additional lands owned by the applicant to the northwest, existing agricultural land to the west, and Snyder's Road West to the southeast. The Subject Lands are comprised of rolling agricultural land and remnant building foundations from recently demolished residential and agricultural buildings.

MTE conducted a detailed topographical survey of the property in 2019, and additional lands, primarily Christian Street, in 2020. The existing topography of the Subject Lands are shown in **MTE Drawing 40777-104-EC1.1**.

The Subject Lands generally consist of rolling topography with several low-lying areas, with slopes typically ranging from 1.0 % to 6.0 %. Existing elevations within the lands range from approximately 356.0 m to 364.3 m.

Under pre-development conditions, a majority of surface runoff from the northern portion of the Subject Lands (outside development limits) flow towards internal low-lying depressions, small unnamed tributaries of the Nith River, and the wetland located within the adjacent Activa Lands.

The southern portion of the Subject Lands (within the development limits) has surface runoff flow northeasterly towards a series of ditch inlets along the adjacent Baden Subdivision, or southwesterly towards a 1000 mm diameter CSP culvert crossing on the adjacent agricultural lands. This CSP culvert directs flows under Snyder's Road West, along Brenneman Drive, and to the existing SWMF within the Baden West subdivision.

2.2 Pre-Development Conditions / Baden Creek Tributary

The Subject Lands are located within the Nith River subwatershed, tributary to the Grand River watershed. As stated above, the northern portion of the lands are either flowing towards the Nith River directly, or towards internal depressions and an adjacent wetland within the adjacent Activa lands parcel.

The south portion of the lands (largely the focus of this analysis) are located within the Baden Creek subwatershed, a tributary of the Nith River. A majority of this southern portion of the lands are ultimately directed to the Baden Creek subwatershed via a tributary within the "Schmidt Lands" south of Charlotta Street and the CN Rail Corridor. The flows are conveyed to this tributary via an existing 1100 x 700mm vertical elliptical CMP culvert.

These southern drainage areas are generally directed towards three separate destinations prior to entering the Baden Creek: towards the adjacent Activa Baden Subdivision and associated SWMF, towards the Baden West SWMF prior to entering the existing CMP culvert, and directly to the existing CMP culvert under the CN railway corridor and into the Baden Creek tributary.

Based on the existing conditions, fifteen separate catchments were generated using the MIDUSS hydrologic modeling program, generally consisting of drainage areas within the Subject Lands development limits, and drainage areas directed towards the existing CMP culvert under the CN Rail Corridor. **Figure B1** in **Appendix B** provides an illustration of the pre-development catchment areas. Hydrologic modelling details and results are further

discussed in Section 5. A detailed copy of the pre-development catchment parameters and MIDUSS modelling output has been included in **Appendix B**.

The drainage areas within this analysis are as follows:

2.2.1 Areas to Internal Depressions with Overflow to Wetland

Areas 101 to 104

Catchments 101 to 104 consist of lands that are directed towards the internal depressions within the Subject Lands. These low-lying depressions have spillover points that are directed towards the wetland located within the adjacent Activa Lands (Parcel O1). Drainage Area 102 is lands within the adjacent Wiebe property (Parcel Y) that flow overland into the Subject Lands. These catchments contain a total area of 14.19ha.

2.2.2 Areas to the Activa Baden Subdivision (and ultimately the Baden Creek)

Area 105

Catchment 105 consists of an internal depression which overflows easterly towards the adjacent Activa Baden Subdivision. These flows are collected by a series of rear yard catchbasins (RYCBs) which directs flows to the subdivision's SWMF, and ultimately the Baden Creek. This catchment contains a total area of 2.20ha.

Area 106

Catchment 106 drains easterly towards the adjacent Activa Baden Subdivision. It is directed overland through existing backyards areas, as well as towards an existing ditch inlet catchbasin (DICB) located adjacent to the Subject Lands. This catchment contains a total area of 4.30ha.

In Stantec's *Activa Baden Subdivision Final SWM Report* (June, 2001), it was shown that a Drainage Area 203 had 2.63ha draining from the Subject Lands to the adjacent lands.

2.2.3 Areas to the CN Culvert and Baden Creek Tributary (via Baden West SWMF)

Areas 107 and 108

Catchments 107 and 108 consist of lands within the Subject Lands and adjacent Wiebe lands that drain south towards the existing 1000mm diameter CSP culvert. This culvert runs under Snyder's Road West to convey flows down Brenneman Drive to the Baden West SWMF. These catchments contain a total area of 27.78ha.

In the Stantec SWM Report (2001), it was shown that a Drainage Area 201 had 28.5ha draining towards this existing culvert.

Areas 109 to 111

Catchments 109 to 111 consist of lands within, and adjacent to, the Subject Lands that are directed to the existing storm sewer systems on Snyder's Road West and Christian Street. These flows are directed south through the existing Baden West subdivision to the Baden West SWMF. These catchments contain a total area of 4.02ha.

Areas 112 and 113

Catchments 112 and 113 consist of existing Snyder's Road West, the Baden West subdivision, and the Baden West SWMF. The SWMF outlets to the existing 1100 x 700mm vertical elliptical CMP culvert that direct flows under the CN rail corridor to the Baden Creek tributary. These catchments contain a total area of 11.45ha.

2.2.4 Areas to the CN Culvert Directly

Area 114

Catchment 114 consists of a portion of residential lots of Christian Street and Charlotta Street that is directed towards a ditch south of Charlotta Street. These flows run towards the existing CMP culvert under the CN rail corridor. This catchment contains a total area of 1.25ha.

Area 115

Catchment 115 consists of a portion of Parcel Q and the CN rail corridor that is directed along the rail corridor to the existing CMP culvert. This catchment contains a total area of 2.11ha.

2.3 Outlet Alternatives

2.3.1 Original Outlet - 1000mm CSP Culvert and Baden West SWMF

As stated above, under existing conditions, a portion of the Subject Lands (Drainage Area 105) drains towards the existing 1000mm CSP culvert under Snyder's Rd W that directs flows to the Baden West SWMF. The Baden West SWMF outlets to a swale north of the CN railway, ultimately directed to a tributary of Baden Creek via an existing 1100 x 700mm vertical elliptical CMP culvert.

The original SWM strategy for the Subject Lands was to utilize the Snyder's Road culvert outlet (described in the Baden West SWM report) which directed flows from the Subject Lands to the existing storm sewer system on Brenneman Drive.

Originally, MTE proposed that the attenuation of flows be to an allowable limit based on proportionate existing pre-development drainage area directed towards the culvert. However, due to the elevation of the existing culvert and storm sewers on Brenneman Drive, outletting to the storm sewer on Brenneman would require a reconstruction of over 60% its length.

Under the original strategy, the quality-controlled flow would be routed in series with the downstream SWMF. Although this is accepted by the MECP, it does not represent the preferred method where quality control measures are placed in parallel with each other.

2.3.2 New Storm Sewer along Christian Street and Charlotta Street

MTE's current proposed SWM strategy directs flows towards a proposed 1200mm diameter storm sewer system along Christian Street and Charlotta Street towards the Baden Creek tributary within the Schmidt Lands. The invert at the outlet structure to the tributary was designed such that the invert is above the anticipated 100-year flood level within the tributary. Refer to MTE Drawings **40777-104-MS7.1 to 7.3** for a plan and profile showing this proposed outlet pipe.

This outlet allows the Subject Lands to release additional flows towards Baden Creek such that post-development flows would be attenuated to pre-development levels, rather than having to restrict flows to what is defined within Stantec's *Baden West Final SWM Report* (January 2005). This revised storm outlet ~~also~~ allows the Subject Lands to be lowered by approximately 2.5m+/- and better match into surrounding lands.

The adjacent Wiebe Lands (southwest of the Subject Lands) are expected to flow towards the existing CSP culvert adjacent to Brenneman Drive and to the Baden West SWMF in both pre- and post-development conditions. In consideration of the future development of the Wiebe Lands, some storm flows maybe directed towards the proposed Christian Street trunk storm sewer outlet. The Township will determine which, if any, portion of these lands will be permitted

to direct flows towards the existing culvert outlet or the proposed Christian Street storm sewer outlet. The outlet sewer has been analyzed to determine adequate capacity and sized to accept these additional flows. The outlet is described further in Section 5.3.1.

2.4 Geotechnical Information

As part of a preliminary hydrogeological investigation, eight boreholes were advanced on-site between April 26 and May 3, 2019, under MTE coordination, by Aardvark Drilling Inc. of Guelph, Ontario. Three additional boreholes were advanced on June 10, 2020, under MTE coordination, by London Soil Test Ltd. of London, Ontario. The boreholes had depths varying from 3.7m-18.9m.

A supplementary geotechnical investigation was done by Peto MacCallum dated August 5, 2020, advancing 12 additional boreholes.

The Subject Lands are generally underlain by clayey silt till, sand, and sandy silt deposits. BHs 6 to 8 show pockets of in-situ fill and organic materials, representing a former agricultural pond present within the Subject Lands.

The geotechnical reports can be seen in **Appendix E**.

2.5 Hydrogeological Information

A hydrogeological investigation was conducted by MTE from April 2019 to November 2020. Monitoring wells were installed within eight boreholes advanced by Aardvark in 2019, and three additional monitoring wells were installed north of the site limits within three boreholes June 2020.

MTE has conducted continuous groundwater monitoring since May of 2019. Wet to saturated conditions were observed in both the clayey silt tills and sand, with typical high groundwater elevations ranging between approximately 351.75 m in the northeastern portion of the site (MW201-20) to 357.17 m at the northwestern portion of the site (MW202-20).

One mini-piezometer was installed within the wetland north of the Subject Lands on June 18, 2020.

The perched groundwater elevation during the June 20, 2020, collection of manual water levels was at an elevation of 359.1masl, recorded at MW106C-19 (installed in the upper sand unit). The groundwater elevations within monitoring locations MW106A-19 and MW106B-19 were 352.1masl. Monitoring well MW106B-19 is screened in the sand unit below the intervening clayey silt till. The groundwater elevation recorded at MW106B-19 coincides with the screened portion of this location, indicating the sediments above are dry. In addition, the sediments immediately below the upper sand unit and intervening silt unit were described as moist and the moisture content of a sand layer immediately below the silt layer reported a moisture content reduction from 25% to 13%.

Please refer to the attached **MTE Drawing 40777-104-MS9.0** for a cross section of the observed groundwater and surrounding soils conditions.

Through an area grading program, the silt layer responsible for the perched condition will be removed to dissipate the local groundwater conditions. This will allow sufficient groundwater separation from the underside of footing. The seasonal high groundwater elevations are shown in **MTE Drawing 40777-104-EC1.1**.

For further hydrogeological information, refer to MTE's *Development Hydrogeology Study*, dated October 4, 2023.

2.5.1 *In-situ infiltration testing*

In-situ infiltration testing was performed on the Subject Lands on August 10, 2023. A supplemental technical memo was prepared by MTE (dated September 2, 2023) describing the methodology utilized within the testing (see **Appendix H**). One test pit (TP101-23) was advanced in the vicinity of the proposed infiltration gallery.

To perform the infiltration test with the Guelph Permeameter, a Riverside/Bucket auger is used to auger an 80 mm diameter hole to the depth at which testing would be completed. The permeameter is subsequently filled with water and placed in the augered hole where the rate of fall (water exiting the permeameter) over time is recorded.

The average field saturated hydraulic conductivity value (Kfs) calculated was $6.0x10^{-5}$ and $2.6x10^{-6}$ m/sec for the Guelph Permeameter field test and grain size testing respectively. These values were converted into an infiltration rate using the supplementary guideline to the Ontario Building Code, Ontario Ministry of Municipal Affairs and Housing (OMMAH, 1997). A summary of the infiltration rates determined by MTE using the Guelph Permeameter and results from grain size testing from fieldwork conducted on August 10, 2023, have been provided in **Table 2.1**, below.

Table 2.1 – Summary of Calculated Infiltration Rates

Test Location	Test Depth (m bgs)	Dominant Sediment Type	Saturated Field Hydraulic Conductivity from Guelph Permeameter (m/sec)	Infiltration Rate Based on Guelph Permeameter (mm/hr)[1]	Saturated Field Hydraulic Conductivity from Grain Size (m/sec)	Infiltration Rate Based on Grain Size (mm/hr)[1]
TP101-23	5.3	Sand, some silt	$6.0x10^{-5}$	136	$2.6x10^{-6}$	60

Notes:
[1] No Factor of Safety included in the infiltration rate calculation.

It should be noted that the infiltration rates calculated by in-situ testing exceeded the infiltration rate (30mm/hr) calculated based on grain size analysis by Peto. Conservatively, the average infiltration rate between the Guelph Permeameter and grain size testing is found to be in the order of 98 mm/hr.

3.0 STORMWATER MANAGEMENT CRITERIA

New developments are required to provide stormwater management in accordance with provincial and municipal policies. Relevant documents have been referenced in the design of the stormwater management plan for the subject site; including:

- GRCA Policies for the Administration of Ontario Regulation 150/06 (GRCA, 2015);
- Stormwater Management Planning and Design Manual (MOE, 2003);
- Baden West Subdivision Final Stormwater Management Report (Stantec, 2015);
- Activa Baden Subdivision Final Stormwater Management Report (Stantec, 2001);

Based on the above policies and relevant documents, background reports, agency requirements, and site-specific considerations, the following stormwater management criteria have been established for this study area:

- **Water Quality –** Provide an Enhanced (MOE, 2003) level of stormwater quality treatment of the Subject Lands prior to discharge to the existing 1100 x 700mm vertical elliptical CMP culvert which outlets to the Baden Creek tributary.
- **Water Quantity -** Control the peak flow rates for all storms up to and including the 100-year storm event to the allowable flow rates prior to releasing the flows to the receiving Baden Creek tributary; preserve hydraulic and hydrologic functions.
- **Erosion Control -** Erosion protection will be provided through infiltrating the 25mm storm event of the Subject Lands within the SWM Facility.

A brief discussion of each of these criteria is included in the following subsections.

3.1 Water Quality Control

Through discussions between Stantec and the GRCA during the approval process of the Baden West subdivision, it was historically determined that a Normal Level (as defined in the MOE 2003 SWM Planning and Design Manual) of protection is required to discharge to the tributary of Baden Creek. The Baden West SWMF provides an Enhanced degree of protection “in recognition of the cool/coldwater nature of Baden Creek” (Stantec, 2005). Therefore, the proposed SWMF is designed to provide an Enhanced Level of water quality protection for the Subject Lands. The requirements for this level of quality control are established in Table 3.2 of the *Stormwater Management Planning and Design Manual* (MOE, 2003).

3.2 Water Quantity

Refer to **Table 3.1** – Summary of Pre-Development Flows **.**

Table 3.1 – Summary of Pre-Development Flows

	25mm-4hr	2yr	5yr	10yr	25yr	50yr	100yr
Flows not directed to CN Culvert/Baden Creek Tributary							
Flows to Internal Depressions							
101 to 104	0.038	0.120	0.319	0.518	0.825	1.097	1.443
Flows to Activa Baden Subdivision							
105 and 106	0.017	0.053	0.141	0.229	0.365	0.486	0.634
Flows directed to CN Culvert/Baden Creek Tributary							
Flows to CN Culvert via Baden West SWMF							
107 to 113 Inflows	0.991	1.562	2.270	2.913	3.524	4.125	4.843
107 to 113 Outflows	0.070	0.237	0.578	0.889	1.209	1.433	1.661
Flows to CN Culvert Downstream of Baden West SWMF							
114	0.074	0.115	0.161	0.204	0.247	0.286	0.329
115	0.003	0.010	0.026	0.042	0.068	0.091	0.120
Total Through CN Culvert	**0.087**	**0.254**	**0.617**	**0.949**	**1.297**	**1.541**	**1.787**

*Note: The sums may not add up algebraically. They are based on the timing and sum of hydrographs taken directly from MIDUSS.

3.2.1 Quantity Control to CN Culvert and Baden Creek Tributary

The proposed quantity control strategy has been based on the previously conducted studies of receiving watercourses and SWMFs, utilizing the allowable release rates based on pre-development flows to the surrounding SWMFs, culvert, and receiving creek tributary.

The proposed SWMF for the development will maintain post development peak flow release rates at existing levels for all storms from the 2 to 100-year storm. A sufficient outlet will be provided to convey the Regional event. As previously stated, the 25mm event to the proposed SWMF will be infiltrated.

Flows from the 2 to 100-year events will be released from the SWMF into a proposed conveyance pipe system in the development. The system runs towards Snyder's Road West, though Christian Street and Charlotta Street, and outlets to an existing swale utilized by the Baden West SWMF. This swale conveys flows to an existing 1100 x 700mm vertical CMP culvert under the CN railway corridor, and ultimately to the Baden Creek tributary within the Schmidt Lands.

In the unlikely event of a failure or blockage, an emergency overland flow route will be provided through the adjacent agricultural Wiebe lands and directed towards the existing CSP culvert and low point at Snyder's Road West. These flows are ultimately directed towards the existing Baden West SWMF and outlet to the Baden Creek tributary just upstream of the proposed primary SWM outlet. This is further discussed in Section 5.3.1.

A Plan and Profile drawing of the proposed outlet pipe to the CMP culvert is provided in **MTE Drawings 40777-104-MS7.1 to 7.3.**

3.2.2 Quantity Control to Activa Baden Subdivision

As stated in Section 2.2, Catchment Area 106 has 4.30 ha of the Subject Lands are directed towards the adjacent Activa Baden Subdivision under pre-development conditions. In accordance with the Post-Development Storm Drainage Area plan provided by Stantec for the existing subdivision, 0.49ha of the Subject Lands have the potential to drain towards the existing temporary DICB located within the adjacent development.

3.2.3 Quantity Control from DICB158 to Proposed Future Activa Development

The Township of Wilmot has identified an area of concern within the adjacent Activa Baden Subdivision bordering the Subject Lands. An easement within Lots 6 and 7 fronting Michael Myers Road contains DICB158. The Township has concerns about flows directed to this catch basin, and the emergency overland flow route associated with this catch basin under future development conditions.

The Township had identified this low-lying area and depression adjacent to Lots 6 and 7. Under the future development condition, the Township requires a conveyance solution to maintain a maximum ponding elevation of 358.80 m± under the 100-year storm event on the existing lots, as well as maintain positive drainage to an acceptable outlet.

Please refer to the Stantec technical memo *Re: Activa Baden North Subdivision: Dedicated Storm Sewer for Low Lying Areas near Existing DICB158* (dated July 25, 2022), which summarizes the analyses performed on the flows towards DICB158, looking at several potential options to accommodate these flows, and provide recommendations that allow the development of the Subject Lands. The technical memo is provided in **Appendix F.**

After discussions with the Township and Stantec, it was concluded that Stantec will provide a positive legal outlet from the low point towards a future SWMF in the adjacent development. DICB158 is proposed to be capped, and flows originally directed to DICB158 will be directed to the new outlet. This outlet will provide an outlet for all storm events up to and including the 100-year event, and MTE will direct a very small, largely pervious area of 0.27ha towards the depression under the post-development condition. Refer to **Figure 3.1** for the conceptual grading of the lots adjacent to the depression.

3.2.4 Quantity Control to Baden West Subdivision

As previously stated, the original stormwater management strategy for a majority of the Subject Lands was to direct flows to the existing Baden West SWMF. Under existing conditions, Drainage Areas 107 and 109 within the Subject Lands are ultimately flowing to the Baden West SWMF. Under post-development conditions, a majority of the Subject Lands are being attenuated in the proposed SWMF and being conveyed directly into the Baden Creek tributary. Due to grading constraints within the development, there are portions of the Subject Lands that will still have flows directed towards the existing Baden West SWMF. These flows are summarized in Section 5.4.

3.2.5 Erosion Control

Erosion control of the receiving Baden Creek tributary will be provided through the infiltration of the 25mm storm event. Development and grading erosion and sedimentation control measures will be provided during final design.

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LEGEND

- SITE BOUNDARY
- (325.93) PROPOSED ELEVATION
- 326 EXISTING CONTOURS
- (TOP) / 3:1 / (BOTTOM) PROPOSED EMBANKMENT
- DRAINAGE CATCHMENT AREA
- DRAINAGE SPLIT (RIDGE)
- LIMIT OF GRADING
- STAGE LIMIT
- OVERLAND FLOW ROUTE (MAJOR STORM)

MICHAEL MYERS ROAD

AREA TO LOW POINT
BACKYARD=0.13ha @ 25% IMP. (C=0.40)
TRAIL=0.14ha @ 67% IMP. (C=0.67)
TOTAL=0.27ha @ 46% IMP. (C=0.55)

36m RETAINING WALL

93m RETAINING WALL

12m RETAINING WALL

Blk. 28 Trail

Blk. 29 Trail

Blk. 30 Walkway

Blk. 31 0.3m Reserve (Stage 1)

Blk. 25

Blk. 33 Reserve (Stage 3)

24

Blk. 32 Reserve (Stage 3)

Blk. 26

Blk. 15

Blk. 16

Blk. 17

Blk. 18

STREET TWO

STREET SEVEN

APPROXIMATE BUILDING FOOTPRINT

STAGE 3

ROOF DRAINAGE OF LOTS BACKING TRAIL DRAIN TO FRONT YARD/PROPOSED STORM SEWER SYSTEM

Ex. 375mmø STM.
Ex. 200mmø WTM.
Ex. 200mmø SAN.
Ex. 525mmø STM.
Ex. 300mmø STM.
Ex. FH
Ex. WV
Ex. CB T/G=360.79
Ex. EP
Ex. CL Road
Ex. MH T/G=361.32
Ex. CBMH T/G=360.77
Ex. MH T/G=360.78
Ex. MH T/G=360.69
Ex. CBMH T/G=360.34
Ex. MH T/G=360.13
Ex. CBMH T/G=360.31
Ex. C&G
Ex. LS
Ex. CSW
Ex. Bell Ped
Ex. DI T/G=358.22 INV=357.821
Ex. GB T/G=359.76 INV=358.282
Ex. Wood Fence
Ex. WTM. Blow-off
Fd. SIB
Ex. Markers
Fd. IB (Bent)
Ex. Ret. Wall

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PROJECT
1012 SYNDER'S ROAD WEST

TITLE
LOTS TO ACTIVA DEVELOPMENT GRADING

Drawn	Scale	Figure
TXB	1:750	**FIGURE 3.1**
Checked AJC	Project No. 40777-104	
Date 2023-10-04	Rev No. 0	

Plot Date: October 5, 2023 - 11:00 AM

4.0 PROPOSED DEVELOPMENT AND SWM STRATEGY

4.1 Proposed Area Grading

The grading design of the Subject Lands was controlled by many factors, which include: servicing constraints (both sanitary and storm), matching existing boundary grades around the perimeter of the property, ensuring major storm event overland flows are directed towards the proposed SWMF, as well as minimizing the cut/fill deficit for the development. Preliminary area grading plans illustrating preliminary site grading **MTE Drawings 40777-104-AG1.1 to 1.3** is enclosed.

It should be noted that the Draft Plan of Subdivision includes several future development blocks for the purpose of future right-of-way connections and residential development. The preliminary grading has been designed with the potential to accept further drainage from adjacent future developments where possible.

4.2 Post Development Conditions

The proposed SWM strategy requires the implementation of a wet pond SWM facility designed to accommodate stormwater runoff from the majority of the developed portions of the Subject Lands. The plan has been designed to meet the criteria presented in Section 3.0 of this report. An overview of the stormwater management plan is discussed below.

The proposed Subject Lands are comprised of residential land uses, municipal road rights-of-way, trails, a school block, and a SWMF block.

The location of the proposed SWMF, along with contributing drainage areas, is illustrated in **Figure C1** in **Appendix C**. Minor system runoff from the contributing areas will be conveyed through the proposed storm sewer system to the proposed SWMF. Excess runoff from the major storms will flow overland to the SWMF via the proposed rights-of-way and designated overland flow routes. Refer to MTE's *1012 Snyder's Road West Functional Servicing Report*, dated October 12, 2023 for further details of the storm sewer network.

The proposed SWMF will utilize a wet pond design with a forebay and main cell, providing quantity and quality control of runoff prior to discharge from the Subject Lands to the conveyance system. The post development catchments are details in **Figure C1** and the post-development modelling and imperviousness calculations have been included in **Appendix C**.

Under post-development conditions, the analysis was delineated into twenty catchments. A detailed copy of the post development catchment parameters and MIDUSS modelling output logs have been included in **Appendix C**. The drainage areas within the post-development modelling area as follows:

4.2.1 Areas to Internal Depressions with Overflow to Wetland

Area 201

Catchment 201 consists of an area directed towards an internal depression adjacent to the development lands. This catchment contains an area of 0.64ha.

Area 204

Catchment 204 consists of the existing catchment within the Wiebe Lands (Area 102) that was initially directed towards an internal depression within the Subject Lands. In order to maintain a positive drainage path for the catchment, these lands are proposed to be collected by a

proposed swale adjacent to the Subject Lands, and outlet to surface within the Subject Lands towards the internal depressions. This catchment contains an area of 4.49ha.

4.2.2 Areas to the Activa Baden Subdivision (and ultimately the Baden Creek)

Area 202

Catchment 202 consists of proposed rear yards and a portion of the walkway that is proposed to be directed towards the DICB158 low point, as described within Section 3.2. This catchment contains an area of 0.27ha.

Area 203

Catchment 203 consists of a portion of the Wagler Avenue extension that is unable to be directed towards the proposed facility. It will be directed towards the existing Activa Baden Subdivision. This catchment contains an area of 0.09ha.

4.2.3 Areas to the Proposed SWMF

Areas 205 to 209, 211

These catchments consist of the proposed development within the Subject Lands that is directed towards the proposed SWMF. As previously stated, the outflows from the SWMF are conveyed south along Christian Street and Charlotta Street, and ultimately to the existing CMP culvert under the CN rail corridor. These catchments contain an area of 25.91ha.

Area 210

Catchment 210 consists of the rear yards of existing lots fronting Snyder's Road West. These lots partially drain towards the Subject Lands and will be conveyed to the proposed SWMF. This catchment contains a total area of 0.13ha.

4.2.4 Areas to the CN Culvert and Baden Creek Tributary (via Baden West SWMF)

Area 212

Catchment 212 consists of a portion of Wagler Avenue extension and proposed Trail Block 11 – Stage 1 unable to be directed towards the proposed SWM Facility. This catchment is directed towards the existing 1000mm diameter CSP culvert within the Wiebe lands. This culvert runs under Snyder's Road West to convey flows down Brenneman Drive to the Baden West SWMF. This catchment contains a total area of 0.16ha.

Area 213

Catchment 213 consists of land within the adjacent Wiebe lands that drain south towards the existing 1000mm diameter CSP culvert. This culvert runs under Snyder's Road West to convey flows down Brenneman Drive to the Baden West SWMF. This catchment contains a total area of 18.93ha.

Area 214

Catchment 214 consists of a portion of Street One unable to be directed towards the proposed SWM Facility. This catchment is directed towards the existing storm sewer infrastructure on Snyder's Road West. This catchment contains a total area of 0.10ha.

Areas 215 and 216

Catchments 215 and 216 consist of existing residential lands on Snyder's Road West and Christian Steet. These catchments are directed to the Baden West SWMF, and contain a total area of 3.11ha.

Areas 217 and 218

Catchments 217 and 218 consist of a portion of Snyder's Road West, the existing Baden West Subdivision and Baden West SWMF. These catchments contain a total area of 11.45ha.

4.2.5 Areas to the CN Culvert Directly

Area 219

Catchment 219 consists of a portion of residential lots of Christian Street and Charlotta Street that is directed towards a ditch south of Charlotta Street. These flows run towards the existing CMP culvert under the CN rail corridor. This catchment contains a total area of 1.25ha.

Area 220

Catchment 220 consists of a portion of Parcel Q and the CN rail corridor that is directed along the rail corridor to the existing CMP culvert. This catchment contains a total area of 2.11ha.

5.0 STORMWATER MANAGEMENT DESIGN

5.1 Hydrologic Modelling

As previously noted, a post-development hydrologic model was constructed, using the MIDUSS modelling software, to reflect the detailed drainage conditions proposed for the Subject Lands. This allows for the quantitative estimate of flows under the proposed development conditions. The proposed development conditions were modelled for the:

- Quality storm event (25mm depth, 4-hour Chicago distribution);
- 2, 5, 10, 25, 50, and 100-year return period rainfall events (3-hour Chicago distribution derived from the Township of Wilmot's Intensity-Duration-Frequency (IDF) parameters); and,

The IDF parameters, hydrologic parameters, and MIDUSS model output files for each of the pre- and post-development catchment areas are provided in **Appendix B** and **Appendix C**, respectively.

5.1.1 Macro Modelling Approach

In order to accurately analyze the flows directed towards the proposed storm sewer outlet – the existing 1100x700mm vertical elliptical CMP culvert – the pre- and post-development models were prepared taking into account the downstream SWM facility present within the adjacent Baden West Subdivision. Using the information present within the Baden West SWM Report (2005), the overall pre- and post-development model were prepared. The model present within the Baden West SWM Report also indicated that the swale upstream of the existing culvert provides additional storage prior to release through the culvert. These controls and storage nodes were considered within the developed model. Schematics for each model are provided in **Appendix B** and **Appendix C**.

5.2 Water Quality

The proposed SWMF has been designed as a wet pond with a permanent pool depth of 1.5m. The facility will also incorporate a sediment forebay with a depth of 1.8m which offers the benefits of dilution and settling of sediment. A planting scheme will be prepared that carefully selects plant species and their location in and around the basins to stabilize banks, mitigate temperature increases, deter waterfowl from nesting within the area, and provide aesthetics and safety benefits.

The forebay design is based on classic particle settling and flow dispersion equations, as presented in the MOE's 2003 *Stormwater Management Planning and Design Manual*. The methodology presented in that document suggests that the design flow for the forebay should be taken as the peak outflow from the facility. A forebay is typically designed to treat minor storm flows. Therefore, the main pond will essentially be empty (or at its permanent pool level) during minor storm events. As such, there will be no mass of water at the outlet of the forebay that would control the flow through the forebay to that of the main pond's discharge rate.

As such, the design of the forebay should be based on the notion that the flow into the forebay equals the flow through the forebay, which equals the flow out of the forebay. In using this approach, the recommended settling velocity of 0.0003 m/s (from MOE 2003) results in extremely large and unachievable forebay lengths. Therefore, the forebay is designed to satisfy the following four conditions:

- A settling length based on a settling velocity of 0.0003 m/s using the main pond's peak discharge from the 25mm storm event (as per MOE 2003);
- A settling length based on a settling velocity of 0.0055 m/s using the forebay inflow/outflow from the 25mm storm event;
- A dispersion length such that, based on flow and depth of water, the velocity through the forebay is less than 0.5m/s; and,
- That velocity, based on flow divided by cross-sectional area, is less than 0.15m/s to prevent scouring.

The 2003 MOE document suggests that the clean-out frequency for a stormwater management facility be based on the sediment loading within the entire pond, however, it is recommended that the clean-out frequency be based on the loading within the forebay only. While this typically results in more frequent clean-out, it is restricted to the forebay area only and eliminates disturbance of the main pond. The clean-out frequency for the proposed SWMF can be found in the forebay design calculations in **Appendix D**.

The total drainage area for the proposed SWMF is 26.04ha at 60.5% imperviousness. According to Table 3.2 from MOE's 2003 stormwater management guidelines, the constructed wet pond requires 202.80 m^3/ha of storage. As described in Section 3.1, 40m^3/ha of which is extended detention and the remainder of which is the permanent pool. As such, the required extended detention volume is 1041.6m^3.

The forebay will accept minor storm event flows via a splitter structure designed to split off flows in excess of the 25mm quality event. The large flows will be directed into the main cell, avoiding potential resuspension or washout of the forebay. Details for this splitter structure will be provided at the final design stage.

The SWMF will incorporate an end-of-pipe (EOP) infiltration gallery sized to infiltrate all runoff from storm events up to the 25mm event. The infiltration gallery was sized to allow for a drawdown of at least 24 hours for the 25mm storm event. The proposed EOP infiltration gallery

will be an Advanced Drainage Solutions (ADS) StormTech type system utilizing the SC-740 Chamber or approved equivalent. The gallery will be designed with an infiltration rate of 98mm/hr, equivalent to the field rates encountered during the in-situ infiltration testing described in Section 2.5.1.

The proposed SWMF design characteristics are summarized in **Table 5.1**. Refer to **Appendix D** for the relevant design sheets and calculations (e.g., catchment parameters, imperviousness calculations, stage-storage discharge relationships, drawdown calculations, etc.). Refer to **Figure 5.1 to Figure 5.3** for details of the proposed SWMF.

Table 5.1 – Water Quality Control Details

General	Facility Characteristics
Stormwater Management Facility Type	Wet Pond
Required MECP Water Quality Protection	Enhanced (Level 1)
Total Contributing Area	26.04ha
Imperviousness	60.4%
Bottom Elevation (Wet Pond)	353.20m
Storage	
Unit Area Storage Volume Requirements as per SWMMP (MOE 2003)	202.8m^3/ha
Required Total Volume	5281.01m^3
Permanent Pool	
Required Permanent Pool Volume	4239.4m^3
Permanent Pool Volume Provided	4933m^3
Permanent Pool Elevation	354.70m
Extended Detention (Infiltration Gallery)	
Required Volume (based on 40m^3/ha)	1041.6m^3
Required Extended Detention Elevation	354.76m
Peak Release Rate for Extended Detention (Quality)	0.033m^3/s
Approximate Drawdown Time	28.4 hours
Forebay	
Required Forebay Length	38.4m
Actual Forebay Length	57.0m
Permanent Pool Elevation	354.70m
Bottom Elevation	352.90m
Outlet Controls	
2400mm diameter Outlet Control Manhole	
Orifice Diameter (for events >25mm4hr)	230mm
Orifice Elevation	355.20m
Overflow Weir (Bottom Length)	2.4m
Overflow Weir Elevation	357.20m

CAD: P:\P\40777\104\40777-104-F5 - SWM1.DWG

STREET NINE

Blk. 24

A

A'

1.5m CSW

MAINTENACE ACCESS TO STRADDLE PROPERTY LINE, 2% CROSS SLOPE TO RIGHT-OF-WAY

CB55.1

45.8m-1350mmø STM. @ 0.35%

MH55

58.3m-1200mmø STM. @ 0.25%

DCBMH75.1

(357.67)LP

DCBMH75

52.9m-1200mmø STM. @ 0.25%

CB74.1

CBMH74

47.1m-1050mmø STM. @ 0.35%

MH73

MH70

MH104

CB70.1

WAGLER AVENUE

MH201

SPMH202

4.0m-1500mmø STM. @ 0.50%

43.4m-1200mmø STM. @ 0.35%

MH204

5.0m-1200mmø STM. @ 0.35%

HW203

HW205

8.0m-1050mmø STM. @ 0.50%

Blk. 26

Blk. 27 SWMF

10m FOREBAY WEIR

4.0m MAINTENANCE ACCESS

10% MAX.

HW206

12.5m-450mmø STM. @ -12.05% REVERSE SLOPE

MH207

10.0m-450mmø STM. @ -10.00% REVERSE SLOPE

HW100

MH101

MH102

MH103

7.0m-1200mmø STM. @ 0.40%

36.7m-600mmø STM. @ 0.50%

60.0m-1200mmø STM. @ 0.40%

CBMH72

MH71

22.0m-1200mmø STM. @ 0.40%

208.379m

N38° 45' 50"W

INFILTRATION GALLERY
360 CHAMBERS (STORMTECH SC-740 OR APPROVED EQUIVALENT)
STORAGE VOLUME: 779 cu.m
BOTTOM OF GALLERY: 354.00±
TOP OF GALLERY: 354.76±

CONTROL MH101 (SEE FIGURE 5.3)

FOR OUTLET PIPE CONVEYANCE SYSTEM, SEE 40777-104-MS7

NOTE:
THIS FIGURE TO BE READ IN CONJUNCTION WITH FIGURE 5.2 AND 5.3

LEGEND

- SITE BOUNDARY
- MUNICIPAL BOUNDARY
- SWM BLOCK BOUNDARY
- (383.30) PROPOSED SPOT ELEVATIONS
- 333 EXISTING GRADE CONTOURS
- 333 FINISHED GRADE CONTOURS
- ACCESS ROAD
- PERMANENT POOL ELEV=354.70
- GABION MAT
- CONCRETE BLOCK MAT

SWM FACILITY - PLAN VIEW

SCALE 1:500

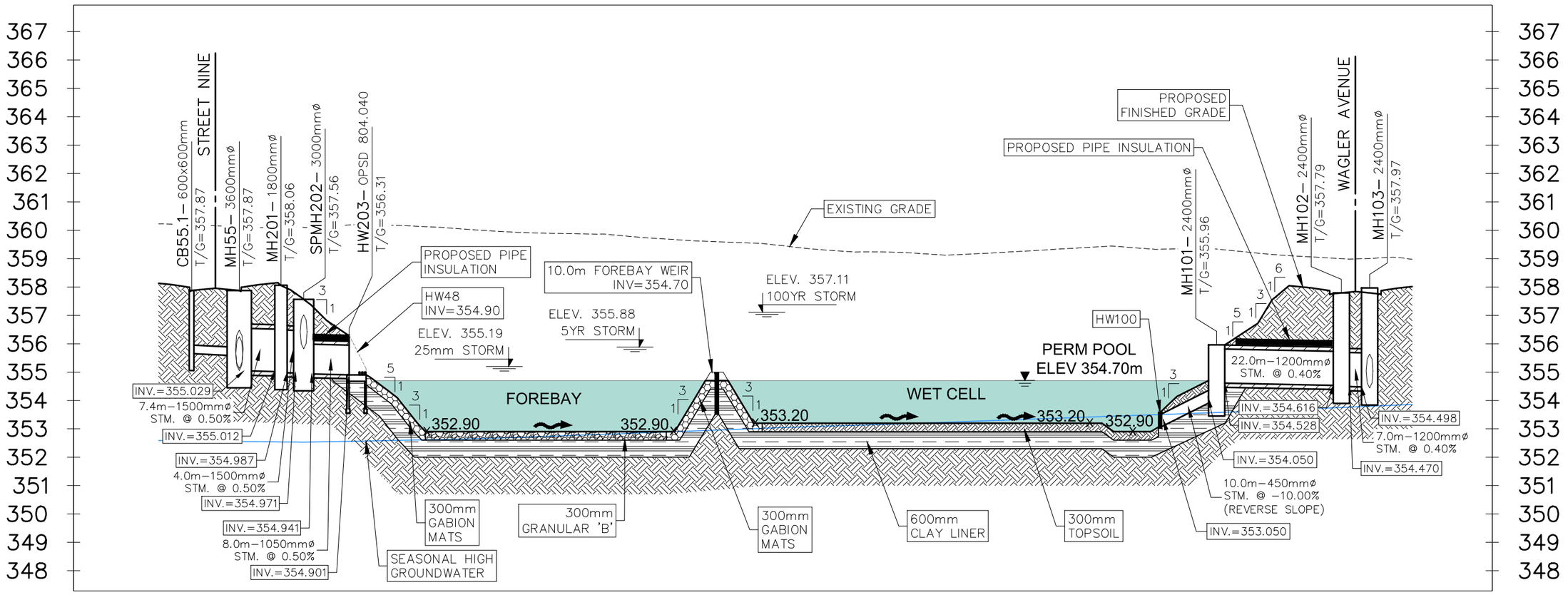
MTE
Engineers, Scientists, Surveyors

PROJECT
1012 SNYDER'S ROAD WEST

TITLE
SWM FACILITY PLAN VIEW

Drawn	Scale	Figure
AXH	1:500	**Figure 5.1**
Checked: AJC	Project No.: 40777-104	
Date: 2023-10-04	Rev No.: 1	

Plot Date: October 5, 2023 - 11:02 AM



SWM FACILITY 1 - CROSS SECTION A-A

SCALE H 1:750 V 1:150

STORM EVENT	WETPOND PONDING ELEVATIONS (m)
25mm/4hr STORM	355.19
2YR STORM	355.48
5YR STORM	355.88
10YR STORM	356.16
25YR STORM	356.53
50YR STORM	356.82
100YR STORM	357.11

0 7.5 15 22.5 30m

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PROJECT
1012 SNYDER'S ROAD WEST

TITLE
SWM FACILITY SECTION A-A

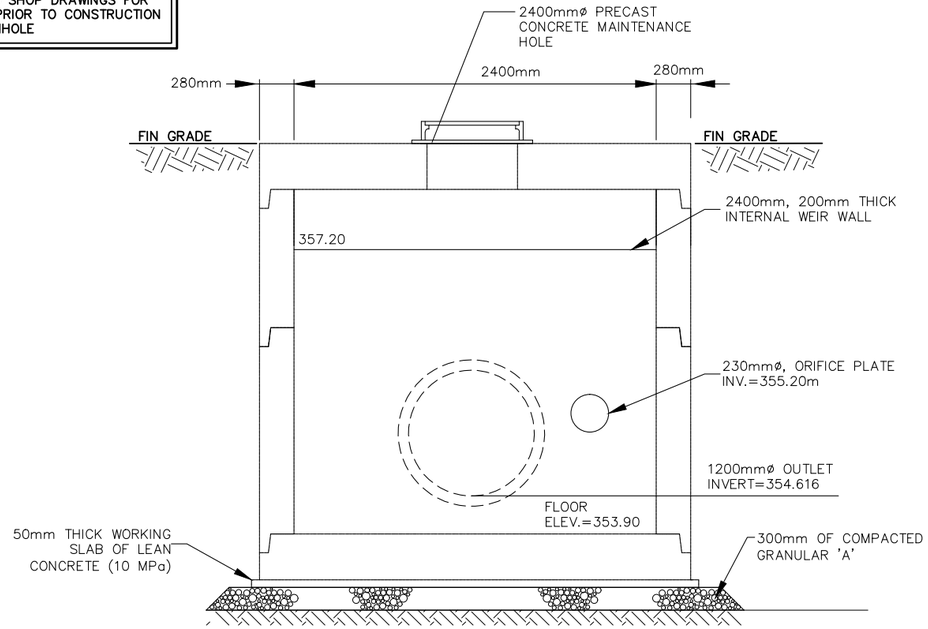
Drawn	Scale	Figure
AXH	1:750	**Figure 5.2**
Checked: AJC	Project No.: 40777-104	
Date: 2023-10-04	Rev No.: 1	

CAD: P:\P\40777\104\40777-104-F5 – SWM1.DWG
Plot Date: October 5, 2023 – 11:03 AM

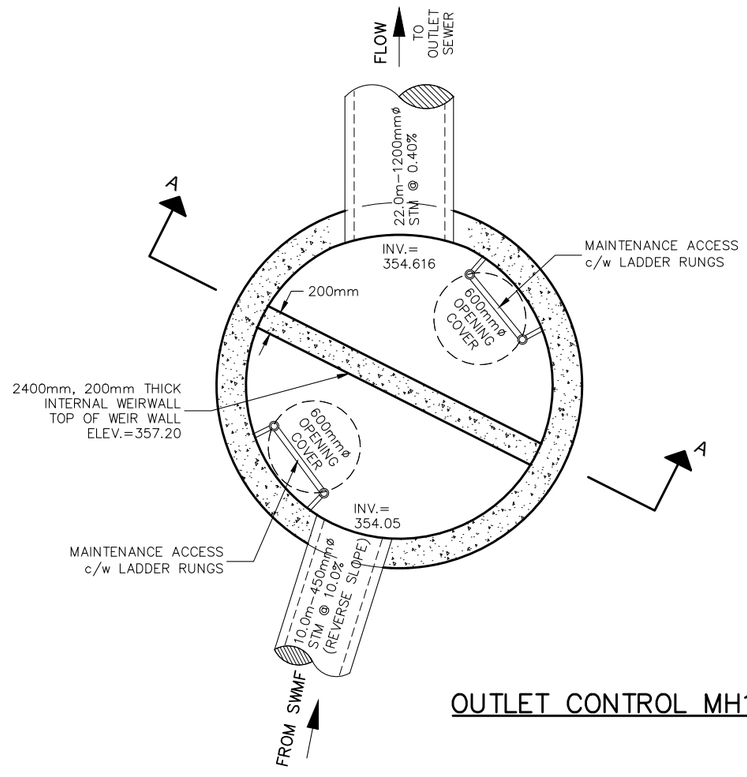
CAD: P:\40777\104\40777-104-F5 - SWM1.DWG

Plot Date: October 5, 2023 - 11:03 AM

NOTE: CONTRACTOR TO PROVIDE STAMPED SHOP DRAWINGS FOR REVIEW PRIOR TO CONSTRUCTION FOR MANHOLE



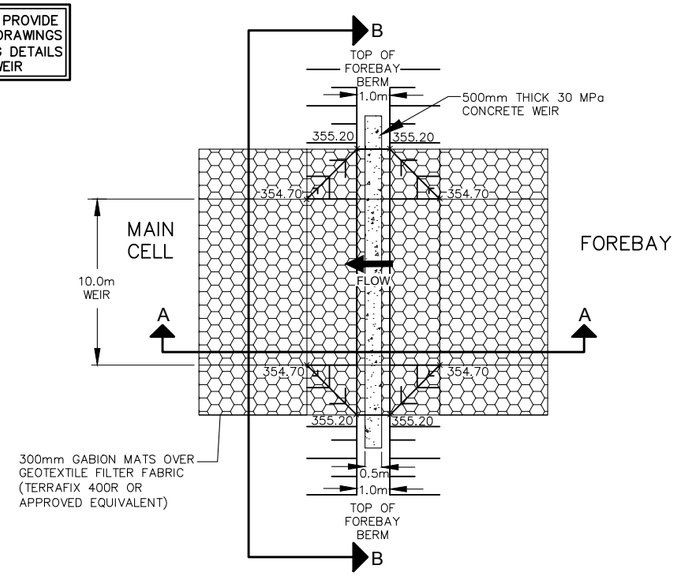
SECTION A–A



OUTLET CONTROL MH101 STRUCTURE

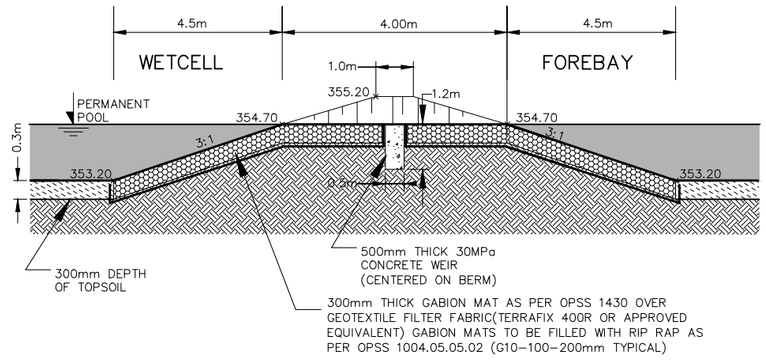
N.T.S.

CONTRACTOR TO PROVIDE STAMPED SHOP DRAWINGS c/w REINFORCING DETAILS FOR CONCRETE WEIR

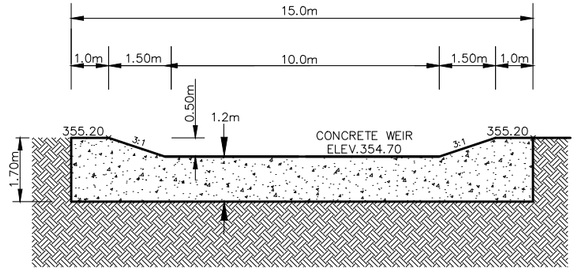


PLAN VIEW

N.T.S.



SECTION A–A



SECTION B–B

CONCRETE FOREBAY WEIR

N.T.S.

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PROJECT
1012 SNYDER'S ROAD WEST

TITLE
SWM FACILITY DETAILS

Drawn	Scale	Figure
AXH	N.T.S.	**Figure 5.3**
Checked: AJC	Project No.: 40777-104	
Date: 2023-10-04	Rev No.: 1	

5.3 Water Quantity

Flows for all storm events will be conveyed to the proposed SWMF by a combination of storm sewers and overland flow routes (road right-of-way and SWMF access roads). The post-development MIDUSS modelling output is included in **Appendix C**.

Discharge from the facility will be controlled via two systems: an infiltration gallery and a 2400mm diameter control manhole structure proposed within the wet pond cell.

As illustrated in **Figure 5.3**, flows are conveyed to the control manhole through a 450mm bottom-draw pipe, and into the outlet control manhole consisting of 1.15m internal weir wall at an elevation of 355.30. These flows are directed towards a 1200 mm diameter storm sewer system running along Christian Street and Charlotta Street, and outletting to the existing 1100 x 700mm vertical elliptical CMP culvert.

A summary of the preliminary stage-storage-discharge relationship of the proposed SWMF is shown in **Table 5.2** below.

Table 5.2 – Stage-Storage-Discharge Summary

Elevation (m)	Release Rates		Total Active Volume (m^3)	Remarks
	From Infiltration Gallery (m^3/s)	To STM Conveyance / Baden Creek (m^3/s)		
354.70	0.0000	0.000	0	Permanent Pool, 450mm diameter bottom draw pipe to infiltration gallery
354.90	0.033	0.000	1662	Contour
355.20	0.033	0.000	3125	230mm Orifice in Control Manhole
355.30	0.033	0.011	3655	Contour
355.50	0.033	0.050	4759	Contour
356.00	0.033	0.096	7727	Contour
356.50	0.033	0.126	10993	Contour
357.00	0.033	0.151	14565	Contour
357.20	0.033	0.159	16091	2.4m Overflow Weir in Control Manhole
357.50	0.033	0.754	18517	Top of SWMF

The above infiltration flow rates utilize an infiltration rate of 98mm/hr across the surface area of the infiltration cell, equivalent to the average observed hydraulic conductivity at TP101-23 per the in-situ infiltration testing described in Section 2.5.1.

A summary of the peak flows and associated maximum ponding elevations from the SWMF under the post-development conditions is provided in **Table 5.3** below. As previously mentioned, enough volume has been provided to store the 100-year storm event to maximum elevation of 357.11m.

Table 5.4 provides an overall summary of flows directed to the existing 1100x700mm CMP Culvert.

Table 5.3 – Summary of Peak Flows and Maximum Ponding Elevations

Storm Event	Release Rate from SWMF (m^3/s)		Maximum Ponding Volume (m^3)	Maximum Ponding Elevation (m)
	To Gallery	To CN Culvert		
25mm Storm Event	0.033	0.000	3077	355.19
2-Year Storm Event	0.033	0.046	4633	355.48
5-Year Storm Event	0.033	0.087	6985	356.88
10-Year Storm Event	0.033	0.106	8768	356.16
25-Year Storm Event	0.033	0.127	11205	356.53
50-Year Storm Event	0.033	0.142	13230	356.82
100-Year Storm Event	0.033	0.155	15397	357.11

Table 5.4 – Summary of Flows to the Existing Vertical Elliptical CMP Culvert

Storm Event	Post-Development Flow Rates				Allowable Pre-development Release Rate (m^3/s)
	Release Rate from SWMF to Culvert (m^3/s)	Release Rate from Baden West SWMF (m^3/s)	Flows from Unattenuated Areas 219+220 (m^3/s)	Total Peak Flow Release Rate to CMP Culvert (m^3/s)	
25mm Storm Event	0.000	0.061	0.077	**0.067**	0.087
2-Year Storm Event	0.046	0.187	0.125	**0.246**	0.254
5-Year Storm Event	0.087	0.465	0.187	**0.579**	0.617
10-Year Storm Event	0.106	0.731	0.246	**0.885**	0.949
25-Year Storm Event	0.127	1.027	0.313	**1.237**	1.297
50-Year Storm Event	0.142	1.221	0.377	**1.474**	1.541
100-Year Storm Event	0.155	1.420	0.449	**1.709**	1.787

As stated above, in the unlikely event of a failure or blockage, an emergency overland flow route will be provided through the adjacent agricultural lands and directed towards the existing low point within the Snyder's Road West at Brenneman Drive. These flows are ultimately directed towards the existing Baden West SWMF, and outlets to the Baden Creek tributary just upstream of the proposed primary SWM outlet. Refer to **Figure 5.4** for a plan showing the emergency overland flow route. The Subject Lands have been graded such that there is no ponding within the proposed rights-of-way prior to flowing over Snyder's Road West. This proposed emergency overland flow route follows the natural topography of the existing overland flow route for Drainage Area 108.

CAD: P:\P\40777\104\40777-104-F6.DWG

Plot Date: October 5, 2023 - 11:04 AM

Blk. 24

STREET NINE

STREET ONE

LP
(357.67)

Blk. 33
0.3m Reserve
(Stage 1)

Blk. 26
Park

Blk. 27
Stormwater Management Facility

Blk. 25
Multiple Residential

STAGE 1

(357.46)

Blk. 34
0.3m Reserve

Blk. 28
Trail

SNYDER'S ROAD WEST

PARCEL Y_1
(WIEBE LANDS)

0.7%

(357.00)

1.0%

(356.50)

0.6%

(357.77)
LP

EX. 1000mmø
CSP CULVERT
INV.=355.89±

CHARLOTTA STREET

BRENNEMAN STREET

SPILLOVER AT SNYDER'S ROAD WEST LOW POINT

TO EX. BADEN WEST SWM FACILITY

0 12.5 25 37.5 50m

LEGEND

- SITE BOUNDARY
- 326 — EXISTING CONTOURS
- 1.0% — MAJOR OVERLAND FLOW ROUTE DIRECTION
- PROPOSED EMERGENCY OVERLAND FLOW ROUTE AND PONDING LIMITS

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PROJECT
1012 SNYDER'S ROAD WEST

TITLE
EXISTING EMERGENCY OVERLAND FLOW ROUTE PLAN

Drawn	Scale	Figure
AXH	1:1,250	**Figure 5.4**
Checked: AJC	Project No.: 40777-104	
Date: 2023-10-04	Rev No.: 1	

5.3.1 SWMF Outlet Pipe Sizing and CN Culvert Capacity

As previously stated, the proposed SWM facility outlets to a 1200mm storm sewer system that conveys flows towards the existing 1100x700mm vertical elliptical culvert under the CN Rail corridor. The plan and profile of the outlet pipe is provided in **MTE Drawing 40777-104-MS7.1 to MS7.3.**

The outlet pipe has been sized to accommodate equivalent pre-development 100-year event flows from drainage areas north of Snyder's Road West that are directed towards the existing 1000mm culvert (i.e., Drainage Areas 107 and 108). Refer to **Figure 5.5** describing the potential distribution of flows towards the proposed outlet storm sewer. Catchment 107 has an allowable pre-development flow rate of 0.748cms, and the allowable flow rate for Catchment 108 is 1.146cms. The proposed 1200mm outlet storm sewer has adequate capacity to convey the sum of these flows (1.894cms). During final design, and in consultation with the Township, the outlet storm sewer may be reduced in size based on the future needs of a joint SWM facility for 1012 Snyder's Road and the Wiebe Lands.

When the adjacent Wiebe lands are developed, there is potential for the future SWM facility to be constructed adjacent to the proposed SWMF. The future SWMF can utilize this outlet pipe as an alternative to the existing storm sewer system on Brenneman Drive to the existing Baden West SWMF. At the time of these future developments, release rates and capacities within the outlet sewer are to be confirmed through their respective designs.

To ensure adequate capacity within the existing CMP culvert under the CN corridor in the post-development condition, the American Railway Engineering and Maintenance-of-way Association (AREMA) Manual for Railway Engineering (2023) guidelines are utilized. The guidelines state that a railway culvert, at minimum, should discharge the 25-year storm without static head, and the 100-year event should discharge with a maximum head of 1.5 times the culvert rise.

Flowmaster software was used to determine the tailwater effects within the downstream Baden Creek tributary, and Culvertmaster software was used to confirm that the culvert falls within AREMA standards. Refer to **Appendix D** for the calculations confirming adequate capacity within the existing culvert.

5.4 External Drainage Areas

5.4.1 Drainage Area 202 and 203 Draining to Activa Baden Subdivision

Drainage Area 202 represents a portion of rear yards and trail block that is directed towards the existing DICB158 in the adjacent Baden Subdivision. This is further discussed in **Section 5.5** of the revised FSR (October 12, 2023).

Drainage Area 203 represents a portion of Wagler Avenue that is unable to drain towards the proposed SWMF due to the grading constraints within the Subject Lands, as well as matching into the existing Wagler Avenue with proper vertical curvature. This area was previously considered to drain towards the existing Baden Subdivision as an external drainage area per the Baden Subdivision Drawing 12 – *Storm Drainage Area Plan (Rev. 3, 2008).* An external drainage area with an accumulated area and runoff coefficient (AC) of 0.34 with a time of concentration of 15 minutes is draining towards the existing temporary DICB and ultimately Wagler Avenue. Drainage Area 203 is a smaller portion of the previous area, meaning downstream capacity is available in the adjacent Baden Subdivision.

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Plot Date: October 5, 2023 - 11:06 AM

MICHAEL MYERS ROAD

GEIGER PLACE

McFADYEN STREET

EX. TEMP. DICB

STREET SIX

STREET SEVEN

STREET THREE

STREET TWO

STREET ONE

STREET EIGHT

WAGLER AVENUE

STREET FIVE

STREET FOUR

STREET NINE

MILLER STREET

CHRISTIAN STREET

SNYDERS ROAD WEST

CHARLOTTA STREET

BRENNEMAN DRIVE

BADEN WEST SUBDIVISION

STAGE 1

STAGE 2

STAGE 3

STAGE 4

107
8.85
100YR PRE-DEVELOPMENT
FLOW RATE: 0.748cms

108
18.93
100YR PRE-DEVELOPMENT
FLOW RATE: 1.146cms

1200mmØ STM OUTLET. @ 0.40%

PROPOSED 1200mm OUTLET PIPE

POTENTIAL FUTURE SWM FACILITY LOCATION

EX. 1000mmØ CSP CULVERT (100YR PRE-DEVELOPMENT FLOW RATE: 1.824cms)

PARCEL Y_2 (WIEBE LANDS)

PARCEL Y_1 (WIEBE LANDS)

PARCEL Z

PARCEL Q

0 30 60 90 120 150m

LEGEND

- SITE BOUNDARY
- EXISTING CONTOURS (326)
- DIRECTION OF EXISTING DRAINAGE
- EXISTING DRIPLINE
- 101 / 1.10 — CATCHMENT No. / AREA (Ha)
- DRAINAGE AREAS TO CN CULVERT VIA 1000mmØ CSP CULVERT

MTE
Engineers, Scientists, Surveyors

PROJECT
1012 SNYDER'S ROAD WEST

TITLE
1200mm STORM SEWER OUTLET FLOW SUMMARY

Drawn: AXB	Scale: 1:3,000	Figure: **FIGURE 5.5**
Checked: AJC	Project No.: 40777-104	
Date: 2023-10-04	Rev No.: 0	

5.4.2 Drainage Areas 212 and 214 Draining to Existing Baden West SWMF

Drainage Area 212 is a 0.16ha portion of the Wagler Avenue extension that is unable to drain towards the proposed SWMF. This is largely due to this portion of Wagler Avenue being the emergency overland flow route for the SWMF (as described in **Section 5.3**). These flows are directed to the adjacent Wiebe Lands and existing CSP culvert, and ultimately to the Baden West SWMF.

Drainage Area 214 is a 0.10 ha portion of Street One that is unable to drain towards the proposed SWMF due to having to match into existing Snyder's Road West. These flows are conveyed to the existing storm sewer system on Snyder's Road West, and ultimately to the Baden West SWMF.

These Drainage Areas are small relative to the assumed ultimate Drainage Areas directed towards the Baden West SWMF defined in the Baden West SWM Report (2005). Capacity is available within the Baden West SWMF as shown within the post-development modelling provided in **Appendix C**.

5.5 Erosion Threshold Analysis

An erosion threshold analysis was completed by Water's Edge for the Baden Creek tributary in which the proposed SWMF outlets south of the CN Railway to determine the threshold flow rate. Based on field investigations and assessments, a critical cross section was identified within the tributary. An erosion threshold flow of 1 L/s was established for this critical section based on shear stresses acting on the bed. A continuous hydrologic model was developed under pre- and post- development conditions to analyze erosion exceedance hours. The Erosion Threshold Assessment (ETA) is included in **Appendix I**.

The ETA concluded that:

1. The Baden Creek Tributary study area originates downstream of the CNR Railway (Schmidt Lands) and continues to the confluence with Baden Creek and is divided into two reaches (Reach 1 and 2) for analysis. The main channel of Baden Creek (Reach 3) was also evaluated immediately downstream of the confluence. The study reaches will receive flows from the proposed SWMF at 1012 Snyder's Road as well as the existing SWMF in the Baden West Subdivision.
2. An erosion threshold assessment was undertaken and the critical cross-section was determined to be located in Reach 2 of the Baden Creek Tributary, and the critical flow was determined to be 1 L/s.
3. Reaches 1 and 2 of the tributary show significant increases to the erosion metrics under the proposed conditions, while the main channel of Baden Creek shows no increases.
4. A continuous HEC-HMS model was developed to evaluate erosion metrics including erosion hours and the cumulative effective shear stress and work indices under existing and proposed conditions. The erosion metrics showed that the proposed development will result in about a 28% decrease in erosion metrics due to the instability of the channel.

5. To identify new or worsening erosion within the study area, geomorphic monitoring should be completed annually during construction and for 2 years following 90% buildout. Monitoring should include comparison of monumented cross-sections, erosion pins, analysis on substrate composition, and photographs at the critical locations.

It should be noted that under existing pre-development conditions, 0.106m^3/s are directed through the existing CMP culvert, exceeding the threshold flow. By infiltrating the 25mm event flows within the Subject Lands, the proposed development does not contribute to an increase in erosion hours over the erosion threshold flow rate under post-development conditions.

It should also be noted that the Baden Creek and associated culverts are undergoing enhancements on the downstream end of the tributary in which the Erosion Threshold Analysis was completed. A design brief has been completed by Walterfedy (dated June 26, 2023) identifying the downstream improvements. The armouring of the channel substrate of D50 = 20mm or larger is occurring within the Baden Creek realignment.

5.6 Landscape Design

A landscape design for the proposed SWMF will be completed during the final design stage of the development. The reasons for landscaping these types of facilities are aesthetics, erosion protection and long-term bank stability, temperature increase mitigation, deterring waterfowl from nesting along their banks, and to limit pedestrian access into the permanent pool components. To that end, the facility will be designed in accordance with the Township's stormwater management policies and guidelines for aesthetics, landscaping, and safety of stormwater management facilities.

6.0 MONITORING PROGRAM

A monitoring program will be implemented and will serve to ensure that the stormwater management plan proposed within this report is implemented and performing at an acceptable level. Refer to **Figures 6.1 and 6.2** for an illustration of the Pre-Construction, and the During and Post-Construction monitoring programs. A summary table outlining the monitoring program in provided in **Table G1**.

6.1 Pre-Construction Monitoring Program

This stage of the monitoring is intended to establish the detailed site background conditions and baseline data. The pre-construction monitoring includes the following parameters:

- **Groundwater** – monitoring includes water level (continuous via datalogger) and annual general chemistry. Groundwater monitoring has been on-going since May 2019.
- **Surface water** – continuous surface water monitoring including levels and temperature has been completed utilizing a pressure transducer in the adjacent Activa Lands wetland since February 2021. Additional surface water monitoring at the Baden Creek Tributary will occur. Grab samples will be taken 4 times a year on a seasonal basis, analysed for dissolved chlorides, nitrates, and total phosphorus.

6.2 During-Construction Monitoring Program

The purpose of this stage of the monitoring is to continue with the pre-construction monitoring program in order to monitor the effectiveness of erosion and sediment control measures, and to confirm that mitigative measures are functioning properly. Additional monitoring (over and above the pre-construction program) will include:

- **Stormwater Management Facility** – Total suspended solids samples captured seasonally following events >15mm at the outlet of SWMF1 and SWMF2. Standard inspection of vegetation, structures, and general operation of hydraulic controls (observations of drawdown) within the SWMFs. These inspections are to occur seasonally and typically after a significant rainfall event.
- Erosion and Sediment Control – per ESC plans.

This stage will begin at the commencement of area grading of the subdivision and will continue until 90% buildout of the subdivision.

6.3 Post-Development Monitoring Program

This period of the monitoring will begin following 90% buildout of the subdivision (buildings are constructed, lots are sodded/landscaped, and open spaces are stabilized). The purpose of this stage of the monitoring is to ensure that the SWMF continues to operate as designed. The post-construction monitoring period will extend for a 2-year period. Monitoring during this stage will include all components from the pre-construction and during-construction monitoring program.

It is recommended that, following completion of the developer's portion of the post-development monitoring program and assumption of the SWMF by the Township, the Township continues with a post-development inspection and maintenance program to ensure the long-term effectiveness of the proposed SWMFs.

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LEGEND

- SITE BOUNDARY
- EXISTING CONTOURS (GENERATED BY MTE) — 323
- EXISTING CONTOURS (PROVIDED BY REGION OF WATERLOO GIS) — 323
- EXISTING DRIPLINE
- EXISTING WATERCOURSE
- EXISTING RAILWAY
- PROPOSED RIGHT OF WAY

- SWL/C — SURFACE WATER LEVELS AND CHEMISTRY
- W — WETLAND WATER LEVEL/TEMP/QUALITY
- GWL — GROUNDWATER LEVELS/TEMPERATURE
- GWC — GROUNDWATER CHEMISTRY

MICHAEL MYERS ROAD
BETTSCHEN LANE
MICHAEL MYERS ROAD
HUNSBERGER DRIVE
GEIGER PLACE
WAGLER AVE
McFADYEN STREET
WAGLER AVENUE
SNYDER'S ROAD WEST
STREET ONE
STREET TWO
STREET THREE
STREET FOUR
STREET FIVE
STREET SIX
STREET SEVEN
STREET EIGHT
STREET NINE
CHRISTIAN STREET

GWL — MW 202-20 — GR Elev.=357.690 — PZ Elev.=358.560
GWL — MTE-MW-104-19 — GR Elev.=361.180 — PZ Elev.=361.961
GWL — MTE-MW-103-19 — GR Elev.=359.040 — PZ Elev.=359.879
GWL — MTE-MW-101-19 — GR Elev.=357.600 — PZ Elev.=358.487
GWL — MW-304 (2020) — GR Elev.=360.670 — PZ Elev.=361.672
GWL — MW 305B-20 — GR Elev.=360.60 — PZ Elev.=361.49
GWL — MW 301-20 — GR Elev.=360.520 — PZ Elev.=363.361
GWL — MTE-MW-106B-19 — GR Elev.=360.640 — PZ Elev.=361.449
GWL — MTE-MW-106C-19 — GR Elev.=360.610 — PZ Elev.=361.346
GWL — MTE-MW-106A-19 — GR Elev.=360.710 — PZ Elev.=361.584
GWL — MW 309-20 — GR Elev.=362.600 — PZ Elev.=363.549
GWL — MW 310-20 — GR Elev.=359.50 — PZ Elev.=359.39
GWL — MW 201-20 — GR Elev.=363.11 — PZ Elev.=364.00
GWL — MTE-MW-105-19 — GR Elev.=361.850 — PZ Elev.=362.752
GWL — MW 302-20 — GR Elev.=358.60 — PZ Elev.=359.48
GWL — MW 101-23 — GR Elev.=358.211 — PZ Elev.=359.094
GWL — MW 103-23 — GR Elev.=357.330 — PZ Elev.=357.184
GWL — MW 104-23 — GR Elev.=356.353 — PZ Elev.=356.674
GWL/C — MW 105-23 — GR Elev.=356.589 — PZ Elev.=356.
GWL/C — MW 106-23 — GR Elev.=351.470 — PZ Elev.=352.442
SWL
GWL — MW 302-20 — GR Elev.=358.60 — PZ Elev.=359.48
GWL — MW 101-23 — GR Elev.=358.211 — PZ Elev.=359.094
GWL — MW 103-23 — GR Elev.=357.330 — PZ Elev.=357.184
GWL — MW 103-23 — GR Elev.=356.60 — PZ Elev.=
GWL — MW 104-23 — GR Elev.=356.353 — PZ Elev.=356.674
GWL — MW 302-20 — GR Elev.=358.60 — PZ Elev.=359.48
GWL — MW 101-23 — GR Elev.=358.211 — PZ Elev.=359.094
GWL — MTE-MW-102-19 — GR Elev.=358.900 — PZ Elev.=359.785

SEE INSERT A–A

INSERT A–A

MTE
Engineers, Scientists, Surveyors

PROJECT
1012 SNYDER'S ROAD WEST

TITLE
PRE-CONSTRUCTION MONITORING PLAN

Drawn: TXB	Scale: 1:2500	Figure: **Figure 6.1**
Checked: AJC	Project No.: 40777-104	
Date: 2023-10-04	Rev No.: 0	

Plot Date: October 5, 2023 – 11:08 AM

CAD: P:\P\40777\104\40777-104-P-6.2.DWG

LEGEND

- SITE BOUNDARY
- EXISTING CONTOURS (GENERATED BY MTE) — 323
- EXISTING CONTOURS (PROVIDED BY REGION OF WATERLOO GIS) — 323
- EXISTING DRIPLINE
- EXISTING WATERCOURSE
- EXISTING RAILWAY
- PROPOSED RIGHT OF WAY
- SWL/C — SURFACE WATER LEVELS AND CHEMISTRY
- W — WETLAND WATER LEVEL/TEMP/QUALITY
- GWL — GROUNDWATER LEVELS/TEMPERATURE
- GWC — GROUNDWATER CHEMISTRY

MICHAEL MYERS ROAD
BETTSCHEN LANE
MICHAEL MYERS ROAD
HUNSBERGER DRIVE
WAGLER AVENUE
McFADYEN STREET
GEIGER PLACE
STREET SIX
STREET ONE
STREET TWO
STREET THREE
STREET FIVE
STREET FOUR
STREET SEVEN
STREET EIGHT
STREET NINE
WAGLER AVENUE
SNYDER'S ROAD WEST
CHRISTIAN STREET

GWL
MTE-MW-103-19
GR Elev.=359.040
PZ Elev.=359.879

GWL
MTE-MW-101-19
GR Elev.=357.600
PZ Elev.=358.487

SW1
SW2

GWL
MTE-MW-102-19
GR Elev.=358.900
PZ Elev.=359.785

GWL/C
MW 105-23
GR Elev.=356.589
PZ Elev.=356.458

GWL/C
MW 106-23
GR Elev.=351.470
PZ Elev.=352.942

SW3

INSERT A–A

SEE INSERT A–A

MTE
Engineers, Scientists, Surveyors

PROJECT
1012 SNYDER'S ROAD WEST

TITLE
DURING/POST-CONSTRUCTION MONITORING PLAN

Drawn	Scale	Figure
TXB	1:2500	**Figure 6.2**
Checked: AJC	Project No.: 40777-104	
Date: 2023-10-04	Rev No.: 0	

Plot Date: October 5, 2023 – 11:10 AM

7.0 EROSION AND SEDIMENT CONTROL MEASURES

The final design following Draft Plan approval will require erosion and sedimentation controls in accordance with the *Erosion and Sediment Control Guidelines for Urban Construction* (December 2006, Greater Golden Horseshoe Area Conservation Authorities).

Precautions will be taken during construction to limit erosion and sedimentation. Erosion and Sediment Control Plans will be prepared and provided during the detailed design stage. The plans will illustrate the erosion and sediment control measures to be implemented during construction, which will limit impacts associated with site development.

Typically, the recommended construction sequence for erosion and sediment control measures are as follows:

- Placement of all sediment control fencing where required;
- Stripping and strategic placement of topsoil stockpiles. Placement of sediment control fencing around all stockpile areas;
- Construction of temporary sediment control ponds, which will serve as sedimentation basins for the site during construction;
- Construction of temporary swales to direct runoff to sedimentation basins, with rock check dams as required to control velocities; and
- Re-vegetation of completed areas as soon as possible after construction, including those areas not slated for construction within 60 days.

Where rock check dams are proposed to promote sedimentation and reduce velocities, clean aggregate is to be placed perpendicular to the direction of flow in the swale, with a small volume of excavation on the upstream side to provide storage for accumulated sediment.

Sediment control fencing shall consist of filter fabric attached to page wire fencing and sealed at ground level. It will be installed at the perimeter of the work areas and intermittently on sloped areas where required. Sediment control fencing will be placed around all topsoil stockpiles.

Storage consistent with the GRCA's requirement of 125m^3/ha of live and dead storage respectively (total 250m^3/ha), will be provided. This storage will be provided to ensure that suspended material will have ample time to settle out. In addition, the sediment basin will be sized with sufficient capacity to allow flows to pass without breaching. Once the active construction and grading activities have been completed, the sedimentation basins can be cleaned out.

Access to topsoil or fill storage areas will be located on the upstream side of storage piles. This practice will ensure continuity of the sediment control fencing in the downslope direction; which is most vulnerable to erosion and sediment deposition. Further, topsoil and hydroseed will be placed on all exposed areas following the completion of grading activities.

It is recommended that during construction, monitoring and inspection of the erosion and sediment controls be conducted to ensure the satisfactory performance of these measures. Reporting of the inspection and monitoring results should be distributed to the Township and GRCA. If it is found that the erosion and sediment control measures are not working adequately, they shall be augmented to the satisfaction of the Township and the GRCA, based on field decisions.

8.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the foregoing analysis, it is concluded that:

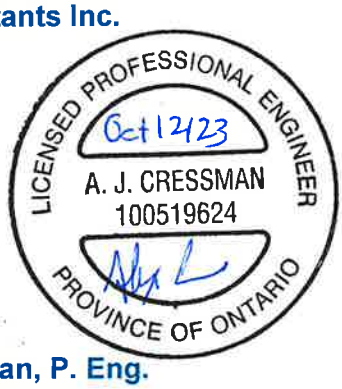
- 'Enhanced' quality control of stormwater runoff can be provided by the proposed stormwater management strategy through the implementation of a SWMF forebay, and a wet pond cell;
- Quantity control targets for post development peak flows rates attenuation to pre-development levels and directed to the Baden Creek Tributary can be achieved in the proposed SWMF for all storm events up to and including the 100-year event;
- Conveyance of the Regional storm flows through the SWMF to Baden Creek can be achieved; and
- The Subject Lands' contribution to downstream erosion of the Baden Creek tributary is mitigated through the infiltration of the 25mm event within the SWM Facility.

The findings of this report and the above conclusions lead to the following recommendations:

- Upon completion of detailed design, a quality/quantity control stormwater management facility be constructed to provide control of stormwater as described in Sections 4.0 and 5.0 of this report; and,
- That sediment and erosion controls during construction will be implemented as described in Section 7.0 of this report.

All of which is respectfully submitted,

MTE Consultants Inc.



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Jeff Martens, P.Eng.
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jmartens@mte85.com

AJC:sgd

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Appendix A

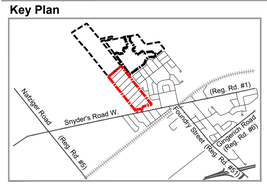
Draft Plan of Subdivision (Reduced)

CONSOLIDATED DRAFT PLANS OF SUBDIVISION

Legal Description

PART OF LOTS 14-16, CONCESSION NORTH OF SNYDER'S ROAD
TOWNSHIP OF WILMOT
REGION OF WATERLOO

Key Plan



30T-21601
30T-22602
Additional Lands Owned by Applicants

SCALE: NTS

Area Schedule - Snyder's Road (Baden) GP Inc. **30T-21601**

Description	Stage 1 Lot/ Block	Stage 1 Units* (min/max)	Stage 1 Area (ha)	Stage 2 Block	Stage 2 Units* (min/max)	Stage 2 Area (ha)
Residential	1-24	87-107	3.27			
Multiple Residential	25	72-108	1.30			
Park	26		0.70			
School				1	166-202	2.12
Stormwater Management Facility	27		1.10			
Trail	28,29		0.23			
Consolidation (Residential)	30		0.01			
0.3m Reserves	31-35		0.01			
Roads			2.72			
Sub-Total	**35**	**159-215**	**9.34**	**1**	**166-202**	**2.12**

Description	Stage 3 Block	Stage 3 Units* (min/max)	Stage 3 Area (ha)	Stage 4 Block	Stage 4 Units* (min/max)	Stage 4 Area (ha)
Residential	1-26	127-152	4.38	1-13	117-157	4.57
Multiple Residential	27	39-59	1.22			
Trail	28,29		0.15	14,15		0.07
Walkway	30		0.02			
Future Development				16-18	3	0.28
0.3m Reserves	31-33		0.01	19-21		0.01
Roads			2.33			2.04
Sub-Total	**33**	**166-211**	**8.11**	**21**	**120-160**	**6.97**

Description	Total Blocks	Total Units* (min/max)	Total Area (ha)
Residential	63	331-416	12.22
Multiple Residential	2	111-167	2.52
Park	1		0.70
School	1	166-202	2.12
Stormwater Management Facility	1		1.10
Trail	6		0.45
Consolidation (Residential)	1		0.01
Walkway	1		0.02
Future Development	3	3	0.28
0.3m Reserves	11		0.03
Roads			7.09
Total	**90**	**611-788**	**26.54**

Area Schedule - Snyder's Road (Baden) GP Inc. **30T-22602**

Description*	Blocks	Units (min/max)	% of Unit Total	Area (ha)
Residential (Singles)**	1-18	164-199	55-53	7.196
Multiple Residential (Townhomes)***	19,20	136-176	45-47	3.860
Stormwater Management Facility	21			2.414
Trail	22,23			0.112
Trail/Drainage Corridor	24			0.259
Drainage Corridor	25			0.321
Walkway	26			0.039
0.3m Reserves	27-32			0.006
Roads				3.766
Total	**32**	**300-375**	**100%**	**17.973**

*Blocks shown on Draft Plan are 'Residential' unless otherwise specified.
** For minimum unit yield 13.11m (43 ft) wide lots are assumed and for maximum unit yield, 10.973m (36 ft) wide lots are assumed.
*** For the Multiple Residential block the number of units assumes Concept Plans (Townhomes).

Minimum Total Number of Units
(Snyder's Road (Baden) GP Inc. & Activa Holdings Inc.): 911

Maximum Total Number of Units
(Snyder's Road (Baden) GP Inc. & Activa Holdings Inc.): 1,163
(not including accessory or secondary dwelling units)

MHBC PLANNING URBAN DESIGN & LANDSCAPE ARCHITECTURE
200-540 BINGEMANS CENTRE DR. KITCHENER, ON, N2B 3X9 | P: 519.576.3650 F: 519.576.0121 | WWW.MHBCPLAN.COM

Approval Stamp

Date August 11, 2023
File No. 1985A/8784BB
Plan Scale 1:1,500 (30x36)
Drawn By DGS
Checked By PC/PB

Project Baden Properties

Applicant

north

File Name **DRAFT PLAN OF SUBDIVISION**

Scale Bar 0 10 25 50 75 100 125 150m

K:\1985A-Snyders Road (Baden) Developments Inc-1012 Snyders Road-Baden\DP\Snyders Road Baden GP Inc and Activa Consolidated Plan August11 2023.dwg

Appendix B

Pre-Development Catchment Parameters and MIDUSS Modelling

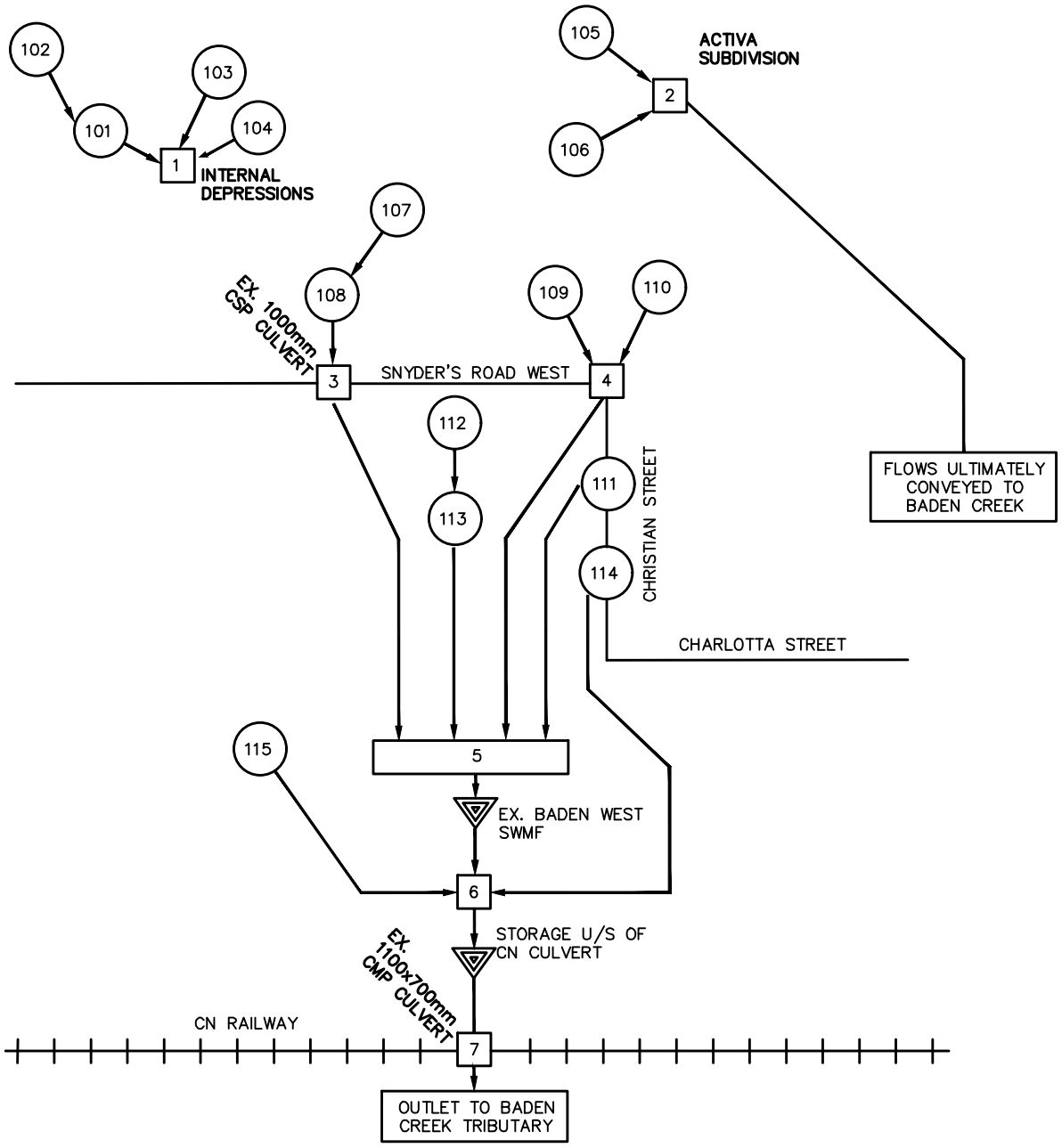
1012 SNYDER'S ROAD
STORMWATER MANAGEMENT
Baden, ONTARIO

Project Number: 40777-104
Date: 2023/08/24
Design By: AJC
File: Q:\40777\104\PRELIMINARY\SWM\2nd DP Sub\40777-104 Master SWM Facility Design Sheet.xlsx

HYDROLOGIC PARAMETERS
Pre-Development Conditions

Sub-Catchment Number	Area	Overland Slope	Overland Length	SCS Curve Number			Percent Impervious	Land Use	Comment
				Pervious (AMC II)	Pervious (AMC III)	Impervious			
	(ha)	*(%)*	*(m)*				*(%)*		
TO INTERNAL DEPRESSIONS (OVERFLOW TO WETLAND)									
101	6.50	2.1	260	78	89	98	0	Agricultural	To internal depression
102	4.49	1.8	205	78	89	98	0	Agricultural	Wiebe Lands To internal depression
103	2.28	3.3	180	78	89	98	0	Agricultural	To internal depression
104	0.92	4.7	75	78	89	98	0	Agricultural	To internal depression
	14.19						0		
TO BADEN CREEK VIA ACTIVA BADEN SUBDIVISION									
105	2.20	2.5	135	78	89	98	0	Agricultural	Internal depression, overflow To Activa Baden Subdivision
106	4.30	1.6	265	78	89	98	0	Agricultural	To Activa Baden Subdivision
	6.50						0		
TO CN CULVERT (THROUGH BADEN WEST SWMF)									
107	8.85	2.0	330	78	89	98	1	Agricultural	To ex. 1000mm CSP Culvert
108	18.93	1.6	570	78	89	98	2	Agricultural	To ex. 1000mm CSP Culvert
109	0.91	1.5	125	78	89	98	0	Agricultural	To Snyder's Road W
110	1.03	0.7	70	80	90	98	45	Residential	Ex. Residential fronting Snyder's Road W
111	2.08	2.0	80	80	90	98	45	Residential	Ex. Residential on Christian Street
112	10.20	3.0	60	80	90	98	55	Residential	Ex. Baden West Subdivision
113	1.25	20	20	78	89	98	50	SWMF	Ex. Baden West SWMF
	43.25						18.7		
TO BADEN CREEK TRIBUTARY VIA CN CULVERT (BYPASSES BADEN WEST SWMF)									
114	1.25	2.0	60	80	90	98	45	Residential	Ex. Residential on Christian Street
115	2.11	0.5	365	80	90	98	0	Agricultural/Rail	Portion of Parcel Q, CN Railway to Culvert
	3.36						16.7		
Total	**67.30**						**12.9**		

Project: 40777-104 CAD: 40777-104-MS14
August 24, 2023 - 3:08 p.m. - Plotted By: ACressman



LEGEND

- 112 — CATCHMENT
- REC — RESERVOIR (SWMF)
- 5 — ADD HYDROGRAPH (NODE)
- 7 — DIVERT HYDROGRAPH

FIGURE B-1 Scale N.T.S.

EXISTING CONDITIONS MODEL SCHEMATIC

MTE
Engineers, Scientists, Surveyors

```
"                MIDUSS Output ------------------------------------------------>"
"                MIDUSS version                          Version 2.25  rev. 473"
"                MIDUSS created                       Sunday, February 7, 2010"
"           10   Units used:                                        ie METRIC"
"                Job folder:           Q:\40777\104\PRELIMINARY\SWM\2nd DP Sub\"
"                                                                   MIDUSS\Pre"
"                Output filename:                                 25mm4hrPre2.in"
"                Licensee name:                                               A"
"                Company                                                      "
"                Date & Time last used:                9/11/2023 at 9:33:55 AM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      240.000   Max. Storm length"
"     3000.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"           1   Chicago storm"
"      509.000   Coefficient A"
"        6.000   Constant B"
"        0.799   Exponent C"
"        0.400   Fraction R"
"      240.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity           71.966    mm/hr"
"             Total depth                 25.028    mm"
"           5   25hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 101"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         101   101"
"        0.000   % Impervious"
"        6.500   Total Area"
"      260.000   Flow length"
"        2.100   Overland Slope"
"        6.500   Pervious Area"
"      260.000   Pervious length"
"        2.100   Pervious slope"
"        0.000   Impervious Area"
"      260.000   Impervious length"
"        2.100   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.142   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.016     0.000     0.000     0.000 c.m/sec"
"             Catchment 101          Pervious   Impervious Total Area "
"             Surface Area           6.500      0.000      6.500      hectare"
"             Time of concentration  119.624    9.532      119.623    minutes"
"             Time to Centroid       295.915    132.246    295.914    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        1626.80    0.00       1626.80    c.m"
"             Rainfall losses        21.463     4.903      21.463     mm"
"             Runoff depth           3.565      20.124     3.565      mm"
"             Runoff volume          231.73     0.00       231.73     c.m"
"             Runoff coefficient     0.142      0.000      0.142      "
"             Maximum flow           0.016      0.000      0.016      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.016     0.016     0.000     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.016     0.016     0.016     0.000"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"            Maximum flow                  0.016    c.m/sec"
"            Hydrograph volume           231.733    c.m"
"                  0.016     0.016     0.016     0.016"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                  0.016     0.000     0.016     0.016"
" 33          CATCHMENT 102"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         102   102"
"        0.000   % Impervious"
"        4.490   Total Area"
"      205.000   Flow length"
"        1.800   Overland Slope"
"        4.490   Pervious Area"
"      205.000   Pervious length"
"        1.800   Pervious slope"
"        0.000   Impervious Area"
"      205.000   Impervious length"
"        1.800   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.142   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.012     0.000     0.016     0.016 c.m/sec"
"             Catchment 102          Pervious   Impervious Total Area "
"             Surface Area           4.490      0.000      4.490      hectare"
"             Time of concentration  108.635    8.656      108.634    minutes"
"             Time to Centroid       281.382    130.811    281.381    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        1123.74    0.00       1123.74    c.m"
"             Rainfall losses        21.463     4.839      21.462     mm"
"             Runoff depth           3.565      20.189     3.565      mm"
"             Runoff volume          160.08     0.00       160.08     c.m"
"             Runoff coefficient     0.142      0.000      0.142      "
"             Maximum flow           0.012      0.000      0.012      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.012     0.012     0.016     0.016"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.012     0.012     0.012     0.016"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"            Maximum flow                  0.028    c.m/sec"
"            Hydrograph volume           391.810    c.m"
"                  0.012     0.012     0.012     0.028"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
```

```
"                   0.012     0.000     0.012     0.028"
" 33          CATCHMENT 103"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         103   103"
"       0.000   % Impervious"
"       2.280   Total Area"
"     180.000   Flow length"
"       3.300   Overland Slope"
"       2.280   Pervious Area"
"     180.000   Pervious length"
"       3.300   Pervious slope"
"       0.000   Impervious Area"
"     180.000   Impervious length"
"       3.300   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.142   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.008     0.000     0.012     0.028 c.m/sec"
"             Catchment 103          Pervious   Impervious Total Area "
"             Surface Area           2.280      0.000      2.280      hectare"
"             Time of concentration  83.774     6.675      83.773     minutes"
"             Time to Centroid       248.505    127.819    248.505    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        570.63     0.00       570.63     c.m"
"             Rainfall losses        21.463     5.023      21.463     mm"
"             Runoff depth           3.565      20.004     3.565      mm"
"             Runoff volume          81.28      0.00       81.28      c.m"
"             Runoff coefficient     0.142      0.000      0.142      "
"             Maximum flow           0.008      0.000      0.008      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.008     0.008     0.012     0.028"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.008     0.008     0.008     0.028"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"             Maximum flow                 0.035    c.m/sec"
"             Hydrograph volume          473.092    c.m"
"                   0.008     0.008     0.008     0.035"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.008     0.000     0.008     0.035"
" 33          CATCHMENT 104"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         104   104"
"       0.000   % Impervious"
"       0.920   Total Area"
"      75.000   Flow length"
"       4.700   Overland Slope"
"       0.920   Pervious Area"
"      75.000   Pervious length"
"       4.700   Pervious slope"
"       0.000   Impervious Area"
"      75.000   Impervious length"
"       4.700   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.142   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.005     0.000     0.008     0.035 c.m/sec"
"             Catchment 104          Pervious   Impervious Total Area "
"             Surface Area           0.920      0.000      0.920      hectare"
"             Time of concentration  44.556     3.550      44.556     minutes"
"             Time to Centroid       196.645    122.907    196.645    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        230.25     0.00       230.25     c.m"
"             Rainfall losses        21.463     5.188      21.463     mm"
"             Runoff depth           3.564      19.839     3.564      mm"
"             Runoff volume          32.79      0.00       32.79      c.m"
"             Runoff coefficient     0.142      0.000      0.142      "
"             Maximum flow           0.005      0.000      0.005      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.005     0.005     0.008     0.035"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.005     0.005     0.005     0.035"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"             Maximum flow                 0.038    c.m/sec"
"             Hydrograph volume          505.884    c.m"
"                   0.005     0.005     0.005     0.038"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.005     0.000     0.005     0.038"
" 33          CATCHMENT 105"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         105   105"
"       0.000   % Impervious"
"       2.200   Total Area"
"     135.000   Flow length"
"       2.500   Overland Slope"
"       2.200   Pervious Area"
"     135.000   Pervious length"
"       2.500   Pervious slope"
"       0.000   Impervious Area"
"     135.000   Impervious length"
"       2.500   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.142   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
```

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"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.008     0.000     0.005     0.038 c.m/sec"
"             Catchment 105          Pervious   Impervious Total Area "
"             Surface Area           2.200      0.000      2.200      hectare"
"             Time of concentration  76.616     6.105      76.615     minutes"
"             Time to Centroid       239.040    126.827    239.040    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        550.61     0.00       550.61     c.m"
"             Rainfall losses        21.463     4.906      21.463     mm"
"             Runoff depth           3.565      20.121     3.565      mm"
"             Runoff volume          78.43      0.00       78.43      c.m"
"             Runoff coefficient     0.142      0.000      0.142      "
"             Maximum flow           0.008      0.000      0.008      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.008     0.008     0.005     0.038"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.008     0.008     0.008     0.038"
" 40          HYDROGRAPH   Combine    2"
"             6   Combine "
"             2   Node #"
"                 Activa Baden Subdivision"
"             Maximum flow                  0.008    c.m/sec"
"             Hydrograph volume            78.433    c.m"
"                    0.008     0.008     0.008     0.008"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.008     0.000     0.008     0.008"
" 33          CATCHMENT 106"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           106   106"
"         0.000   % Impervious"
"         4.300   Total Area"
"       265.000   Flow length"
"         1.600   Overland Slope"
"         4.300   Pervious Area"
"       265.000   Pervious length"
"         1.600   Pervious slope"
"         0.000   Impervious Area"
"       265.000   Impervious length"
"         1.600   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.142   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.000   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.010     0.000     0.008     0.008 c.m/sec"
"             Catchment 106          Pervious   Impervious Total Area "
"             Surface Area           4.300      0.000      4.300      hectare"
"             Time of concentration  131.284    10.461     131.283    minutes"
"             Time to Centroid       311.334    133.706    311.333    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        1076.19    0.00       1076.19    c.m"
"             Rainfall losses        21.463     4.857      21.463     mm"
"             Runoff depth           3.565      20.171     3.565      mm"
"             Runoff volume          153.30     0.00       153.30     c.m"
"             Runoff coefficient     0.142      0.000      0.142      "
"             Maximum flow           0.010      0.000      0.010      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.010     0.010     0.008     0.008"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.010     0.010     0.010     0.008"
" 40          HYDROGRAPH   Combine    2"
"             6   Combine "
"             2   Node #"
"                 Activa Baden Subdivision"
"             Maximum flow                  0.017    c.m/sec"
"             Hydrograph volume           231.735    c.m"
"                    0.010     0.010     0.010     0.017"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.010     0.000     0.010     0.017"
" 33          CATCHMENT 107"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           107   107"
"         1.000   % Impervious"
"         8.850   Total Area"
"       330.000   Flow length"
"         2.000   Overland Slope"
"         8.762   Pervious Area"
"       330.000   Pervious length"
"         2.000   Pervious slope"
"         0.089   Impervious Area"
"       330.000   Impervious length"
"         2.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.142   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.807   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.020     0.000     0.010     0.017 c.m/sec"
"             Catchment 107          Pervious   Impervious Total Area "
"             Surface Area           8.762      0.089      8.850      hectare"
"             Time of concentration  140.055    11.159     133.080    minutes"
"             Time to Centroid       322.933    134.803    312.752    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        2192.80    22.15      2214.95    c.m"
"             Rainfall losses        21.463     4.835      21.296     mm"
"             Runoff depth           3.565      20.192     3.731      mm"
"             Runoff volume          312.36     17.87      330.23     c.m"
"             Runoff coefficient     0.142      0.807      0.149      "
"             Maximum flow           0.019      0.009      0.020      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.020     0.020     0.010     0.017"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.020     0.020     0.020     0.017"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Ex. 1000mm CSP Culvert"
```

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"             Maximum flow                  0.020    c.m/sec"
"             Hydrograph volume           330.231    c.m"
"                    0.020     0.020     0.020     0.020"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.020     0.000     0.020     0.020"
" 33          CATCHMENT 108"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          108   108"
"        2.000   % Impervious"
"       18.930   Total Area"
"      570.000   Flow length"
"        1.600   Overland Slope"
"       18.551   Pervious Area"
"      570.000   Pervious length"
"        1.600   Pervious slope"
"        0.379   Impervious Area"
"      570.000   Impervious length"
"        1.600   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.142   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.807   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.035     0.000     0.020     0.020 c.m/sec"
"             Catchment 108          Pervious   Impervious Total Area "
"             Surface Area           18.551     0.379      18.930     hectare"
"             Time of concentration  207.868    16.563     188.047    minutes"
"             Time to Centroid       412.610    143.409    384.718    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        4642.98    94.75      4737.74    c.m"
"             Rainfall losses        21.462     4.835      21.130     mm"
"             Runoff depth           3.565      20.193     3.898      mm"
"             Runoff volume          661.40     76.45      737.85     c.m"
"             Runoff coefficient     0.142      0.807      0.156      "
"             Maximum flow           0.029      0.033      0.035      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.035     0.035     0.020     0.020"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.035     0.035     0.035     0.020"
" 40          HYDROGRAPH   Combine    3"
"            6   Combine "
"            3   Node #"
"                Ex. 1000mm CSP Culvert"
"             Maximum flow                  0.049    c.m/sec"
"             Hydrograph volume          1068.081    c.m"
"                    0.035     0.035     0.035     0.049"
" 40          HYDROGRAPH   Confluence    3"
"            7   Confluence "
"            3   Node #"
"                Ex. 1000mm CSP Culvert"
"             Maximum flow                  0.049    c.m/sec"
"             Hydrograph volume          1068.081    c.m"
"                    0.035     0.049     0.035     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.035     0.049     0.049     0.000"
" 40          HYDROGRAPH   Combine    5"
"            6   Combine "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  0.049    c.m/sec"
"             Hydrograph volume          1068.081    c.m"
"                    0.035     0.049     0.049     0.049"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.035     0.000     0.049     0.049"
" 33          CATCHMENT 109"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          109   109"
"        0.000   % Impervious"
"        0.910   Total Area"
"      125.000   Flow length"
"        1.500   Overland Slope"
"        0.910   Pervious Area"
"      125.000   Pervious length"
"        1.500   Pervious slope"
"        0.000   Impervious Area"
"      125.000   Impervious length"
"        1.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.142   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.003     0.000     0.049     0.049 c.m/sec"
"             Catchment 109          Pervious   Impervious Total Area "
"             Surface Area           0.910      0.000      0.910      hectare"
"             Time of concentration  85.274     6.795      85.274     minutes"
"             Time to Centroid       250.490    128.025    250.489    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        227.75     0.00       227.75     c.m"
"             Rainfall losses        21.463     5.052      21.463     mm"
"             Runoff depth           3.565      19.976     3.565      mm"
"             Runoff volume          32.44      0.00       32.44      c.m"
"             Runoff coefficient     0.142      0.000      0.142      "
"             Maximum flow           0.003      0.000      0.003      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.003     0.003     0.049     0.049"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.003     0.003     0.003     0.049"
" 40          HYDROGRAPH   Combine    4"
"            6   Combine "
"            4   Node #"
"                Snyder's/Christian"
"             Maximum flow                  0.003    c.m/sec"
"             Hydrograph volume            32.441    c.m"
"                    0.003     0.003     0.003     0.003"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.003     0.000     0.003     0.003"
" 33          CATCHMENT 110"
```

```
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          110   110"
"       45.000   % Impervious"
"        1.030   Total Area"
"       70.000   Flow length"
"        0.700   Overland Slope"
"        0.566   Pervious Area"
"       70.000   Pervious length"
"        0.700   Pervious slope"
"        0.463   Impervious Area"
"       70.000   Impervious length"
"        0.700   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.170   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.805   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.065     0.000     0.003     0.003 c.m/sec"
"             Catchment 110          Pervious   Impervious Total Area "
"             Surface Area           0.566      0.463      1.030      hectare"
"             Time of concentration  68.039     6.031      18.734     minutes"
"             Time to Centroid       228.737    126.701    147.604    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        141.78     116.00     257.79     c.m"
"             Rainfall losses        20.783     4.891      13.632     mm"
"             Runoff depth           4.245      20.137     11.396     mm"
"             Runoff volume          24.05      93.33      117.38     c.m"
"             Runoff coefficient     0.170      0.805      0.455      "
"             Maximum flow           0.003      0.065      0.065      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.065     0.065     0.003     0.003"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.065     0.065     0.065     0.003"
" 40          HYDROGRAPH   Combine    4"
"            6   Combine "
"            4   Node #"
"                Snyder's/Christian"
"             Maximum flow                  0.065    c.m/sec"
"             Hydrograph volume           149.822    c.m"
"                    0.065     0.065     0.065     0.065"
" 40          HYDROGRAPH   Confluence    4"
"            7   Confluence "
"            4   Node #"
"                Snyder's/Christian"
"             Maximum flow                  0.065    c.m/sec"
"             Hydrograph volume           149.822    c.m"
"                    0.065     0.065     0.065     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.065     0.065     0.065     0.000"
" 40          HYDROGRAPH   Combine    5"
"            6   Combine "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  0.095    c.m/sec"
"             Hydrograph volume          1217.903    c.m"
"                    0.065     0.065     0.065     0.095"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.065     0.000     0.065     0.095"
" 33          CATCHMENT 111"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          111   111"
"       45.000   % Impervious"
"        2.080   Total Area"
"       80.000   Flow length"
"        2.000   Overland Slope"
"        1.144   Pervious Area"
"       80.000   Pervious length"
"        2.000   Pervious slope"
"        0.936   Impervious Area"
"       80.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.170   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.801   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.126     0.000     0.065     0.095 c.m/sec"
"             Catchment 111          Pervious   Impervious Total Area "
"             Surface Area           1.144      0.936      2.080      hectare"
"             Time of concentration  53.799     4.769      14.850     minutes"
"             Time to Centroid       209.308    124.751    142.138    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        286.32     234.26     520.58     c.m"
"             Rainfall losses        20.784     4.989      13.676     mm"
"             Runoff depth           4.244      20.039     11.352     mm"
"             Runoff volume          48.55      187.57     236.12     c.m"
"             Runoff coefficient     0.170      0.801      0.454      "
"             Maximum flow           0.006      0.125      0.126      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.126     0.126     0.065     0.095"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.126     0.126     0.126     0.095"
" 40          HYDROGRAPH   Combine    5"
"            6   Combine "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  0.222    c.m/sec"
"             Hydrograph volume          1454.021    c.m"
"                    0.126     0.126     0.126     0.222"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.126     0.000     0.126     0.222"
" 33          CATCHMENT 112"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          112   112"
"       55.000   % Impervious"
"       10.200   Total Area"
"       60.000   Flow length"
```

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"        3.000   Overland Slope"
"        4.590   Pervious Area"
"       60.000   Pervious length"
"        3.000   Pervious slope"
"        5.610   Impervious Area"
"       60.000   Impervious length"
"        3.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.170   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.793   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.729     0.000     0.126     0.222 c.m/sec"
"             Catchment 112          Pervious   Impervious Total Area "
"             Surface Area           4.590      5.610      10.200     hectare"
"             Time of concentration  40.085     3.553      8.995      minutes"
"             Time to Centroid       190.595    122.912    132.995    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        1148.77    1404.05    2552.82    c.m"
"             Rainfall losses        20.783     5.189      12.207     mm"
"             Runoff depth           4.244      19.838     12.821     mm"
"             Runoff volume          194.82     1112.93    1307.75    c.m"
"             Runoff coefficient     0.170      0.793      0.512      "
"             Maximum flow           0.032      0.727      0.729      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.729     0.729     0.126     0.222"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.729     0.729     0.729     0.222"
" 40          HYDROGRAPH   Combine    5"
"           6   Combine "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                0.928    c.m/sec"
"            Hydrograph volume        2761.773    c.m"
"                  0.729     0.729     0.729     0.928"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                  0.729     0.000     0.729     0.928"
" 33          CATCHMENT 113"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         113   113"
"      50.000   % Impervious"
"       1.250   Total Area"
"      20.000   Flow length"
"      20.000   Overland Slope"
"       0.625   Pervious Area"
"      20.000   Pervious length"
"      20.000   Pervious slope"
"       0.625   Impervious Area"
"      20.000   Impervious length"
"      20.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.142   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.784   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                  0.099     0.000     0.729     0.928 c.m/sec"
"             Catchment 113          Pervious   Impervious Total Area "
"             Surface Area           0.625      0.625      1.250      hectare"
"             Time of concentration  13.056     1.040      2.884      minutes"
"             Time to Centroid       155.049    118.686    124.264    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        156.42     156.42     312.85     c.m"
"             Rainfall losses        21.474     5.416      13.445     mm"
"             Runoff depth           3.554      19.612     11.583     mm"
"             Runoff volume          22.21      122.57     144.79     c.m"
"             Runoff coefficient     0.142      0.784      0.463      "
"             Maximum flow           0.007      0.097      0.099      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.099     0.099     0.729     0.928"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.099     0.099     0.099     0.928"
" 40          HYDROGRAPH   Combine    5"
"           6   Combine "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                0.991    c.m/sec"
"            Hydrograph volume        2906.559    c.m"
"                  0.099     0.099     0.099     0.991"
" 40          HYDROGRAPH   Confluence    5"
"           7   Confluence "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                0.991    c.m/sec"
"            Hydrograph volume        2906.559    c.m"
"                  0.099     0.991     0.099     0.000"
" 54          POND DESIGN"
"       0.991   Current peak flow    c.m/sec"
"       0.497   Target outflow    c.m/sec"
"      2906.6   Hydrograph volume    c.m"
"        33.    Number of stages"
"     351.500   Minimum water level    metre"
"     354.700   Maximum water level    metre"
"     351.500   Starting water level    metre"
"           0   Keep Design Data: 1 = True; 0 = False"
"                 Level Discharge    Volume"
"               351.500     0.000     0.000"
"               351.600   0.00600   400.000"
"               351.700   0.01900   824.000"
"               351.800   0.03100  1272.000"
"               351.900   0.07800  1744.000"
"               352.000    0.1930  2240.000"
"               352.100    0.3670  2760.000"
"               352.200    0.5970  3298.000"
"               352.300    0.8520  3849.000"
"               352.400     1.011  4412.000"
"               352.500     1.122  4988.000"
"               352.600     1.223  5576.000"
"               352.700     1.316  6176.000"
"               352.800     1.403  6789.000"
"               352.900     1.485  7415.000"
"               353.000     1.563  8053.000"
"               353.100     1.637  8704.000"
"               353.200     1.708  9368.000"
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"               353.300     1.776  10045.00"
"               353.400     1.841  10735.00"
"               353.500     1.904  11439.00"
"               353.600     1.965  12156.00"
"               353.700     2.025  12884.00"
"               353.800     2.082  13625.00"
"               353.900     2.138  14378.00"
"               354.000     2.193  15143.00"
"               354.100     2.246  15921.00"
"               354.200     2.298  16712.00"
"               354.300     2.349  17517.00"
"               354.400     2.399  18334.00"
"               354.500     2.473  19165.00"
"               354.600     2.708  20012.00"
"               354.700     3.177  20879.00"
"            Peak outflow                  0.070    c.m/sec"
"            Maximum level               351.884    metre"
"            Maximum storage            1666.889    c.m"
"            Centroidal lag               14.460   hours"
"                 0.099     0.991     0.070     0.000 c.m/sec"
" 40         HYDROGRAPH   Combine    6"
"            6   Combine "
"            6   Node #"
"               Swale Storage Prior to CMP Culvert"
"            Maximum flow                  0.070    c.m/sec"
"            Hydrograph volume          2792.578    c.m"
"                  0.099     0.991     0.070     0.070"
" 40         HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                  0.099     0.000     0.070     0.070"
" 33         CATCHMENT 114"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          114   114"
"       45.000   % Impervious"
"        1.250   Total Area"
"       60.000   Flow length"
"        2.000   Overland Slope"
"        0.688   Pervious Area"
"       60.000   Pervious length"
"        2.000   Pervious slope"
"        0.563   Impervious Area"
"       60.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.170   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.798   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.074     0.000     0.070     0.070 c.m/sec"
"             Catchment 114          Pervious   Impervious Total Area "
"             Surface Area           0.688      0.563      1.250      hectare"
"             Time of concentration  45.270     4.013      12.518     minutes"
"             Time to Centroid       197.667    123.573    138.847    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        172.07     140.78     312.85     c.m"
"             Rainfall losses        20.783     5.051      13.704     mm"
"             Runoff depth           4.244      19.977     11.324     mm"
"             Runoff volume          29.18      112.37     141.55     c.m"
"             Runoff coefficient     0.170      0.798      0.452      "
"             Maximum flow           0.004      0.073      0.074      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.074     0.074     0.070     0.070"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.074     0.074     0.074     0.070"
" 40          HYDROGRAPH   Combine    6"
"             6   Combine "
"             6   Node #"
"                 Swale Storage Prior to CMP Culvert"
"             Maximum flow                  0.087    c.m/sec"
"             Hydrograph volume          2934.127    c.m"
"                    0.074     0.074     0.074     0.087"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.074     0.000     0.074     0.087"
" 33          CATCHMENT 115"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           115   115"
"         0.000   % Impervious"
"         2.110   Total Area"
"       365.000   Flow length"
"         0.500   Overland Slope"
"         2.110   Pervious Area"
"       365.000   Pervious length"
"         0.500   Pervious slope"
"         0.000   Impervious Area"
"       365.000   Impervious length"
"         0.500   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.142   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.000   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.003     0.000     0.074     0.087 c.m/sec"
"             Catchment 115          Pervious   Impervious Total Area "
"             Surface Area           2.110      0.000      2.110      hectare"
"             Time of concentration  225.519    17.969     225.518    minutes"
"             Time to Centroid       435.951    145.592    435.950    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        528.08     0.00       528.08     c.m"
"             Rainfall losses        21.462     4.812      21.462     mm"
"             Runoff depth           3.565      20.216     3.565      mm"
"             Runoff volume          75.23      0.00       75.23      c.m"
"             Runoff coefficient     0.142      0.000      0.142      "
"             Maximum flow           0.003      0.000      0.003      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.003     0.003     0.074     0.087"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.003     0.003     0.003     0.087"
" 40          HYDROGRAPH   Combine    6"
"             6   Combine "
"             6   Node #"
"                 Swale Storage Prior to CMP Culvert"
```

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"             Maximum flow                  0.088    c.m/sec"
"             Hydrograph volume          3009.355    c.m"
"                    0.003     0.003     0.003     0.088"
" 40          HYDROGRAPH   Confluence    6"
"            7   Confluence "
"            6   Node #"
"                Swale Storage Prior to CMP Culvert"
"             Maximum flow                  0.088    c.m/sec"
"             Hydrograph volume          3009.355    c.m"
"                    0.003     0.088     0.003     0.000"
" 54          POND DESIGN"
"         0.088   Current peak flow    c.m/sec"
"         0.497   Target outflow    c.m/sec"
"        3009.4   Hydrograph volume    c.m"
"           37.   Number of stages"
"       351.100   Minimum water level    metre"
"       354.700   Maximum water level    metre"
"       351.100   Starting water level    metre"
"             0   Keep Design Data: 1 = True; 0 = False"
"                   Level Discharge    Volume"
"                 351.100     0.000     0.000"
"                 351.200   0.00900    0.1000"
"                 351.300   0.03600    0.6000"
"                 351.400   0.08100     1.000"
"                 351.500    0.1420     2.000"
"                 351.600    0.2180     5.000"
"                 351.700    0.3070     8.000"
"                 351.800    0.4210    14.000"
"                 351.900    0.5530    21.000"
"                 352.000    0.6750    29.000"
"                 352.100    0.8050    41.000"
"                 352.200    0.9380    57.000"
"                 352.300     1.066    76.000"
"                 352.400     1.191   100.000"
"                 352.500     1.307   128.000"
"                 352.600     1.410   160.000"
"                 352.700     1.507   197.000"
"                 352.800     1.596   239.000"
"                 352.900     1.684   286.000"
"                 353.000     1.768   337.000"
"                 353.100     1.849   393.000"
"                 353.200     1.928   455.000"
"                 353.300     2.005   526.000"
"                 353.400     2.080   596.000"
"                 353.500     2.153   676.000"
"                 353.600     2.224   761.000"
"                 353.700     2.293   854.000"
"                 353.800     2.361   953.000"
"                 353.900     2.427  1060.000"
"                 354.000     2.492  1174.000"
"                 354.100     2.556  1298.000"
"                 354.200     2.618  1435.000"
"                 354.300     2.689  1586.000"
"                 354.400     2.739  1751.000"
"                 354.500     2.797  1929.000"
"                 354.600     2.855  2121.000"
"                 354.700     2.911  2329.000"
"             Peak outflow                  0.087    c.m/sec"
"             Maximum level               351.410    metre"
"             Maximum storage               1.096    c.m"
"             Centroidal lag               11.900   hours"
"                  0.003     0.088     0.087     0.000 c.m/sec"
" 40          HYDROGRAPH   Combine    7"
"            6   Combine "
"            7   Node #"
"                Baden Creek Tributary"
"             Maximum flow                  0.087    c.m/sec"
"             Hydrograph volume          3009.331    c.m"
"                    0.003     0.088     0.087     0.087"
" 38          START/RE-START TOTALS 6"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                    67.300    hectare"
"             Total Impervious area                    8.664    hectare"
"             Total % impervious                      12.874"
" 19          EXIT"
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"               MIDUSS Output ----------------------------------------------->"
"               MIDUSS version                          Version 2.25  rev. 473"
"               MIDUSS created                      Sunday, February 7, 2010"
"          10   Units used:                                        ie METRIC"
"               Job folder:          Q:\40777\104\PRELIMINARY\SWM\2nd DP Sub\"
"                                                                  MIDUSS\Pre"
"               Output filename:                                   2yrPre2.in"
"               Licensee name:                                              A"
"               Company                                                     "
"               Date & Time last used:                 9/11/2023 at 1:03:43 PM"
" 31          TIME PARAMETERS"
"       5.000   Time Step"
"     180.000   Max. Storm length"
"    3000.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"           1   Chicago storm"
"     743.000   Coefficient A"
"       6.000   Constant B"
"       0.799   Exponent C"
"       0.400   Fraction R"
"     180.000   Duration"
"       1.000   Time step multiplier"
"             Maximum intensity          109.374    mm/hr"
"             Total depth                 34.259    mm"
"           4   2hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 101"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         101   101"
"       0.000   % Impervious"
"       6.500   Total Area"
"     260.000   Flow length"
"       2.100   Overland Slope"
"       6.500   Pervious Area"
"     260.000   Pervious length"
"       2.100   Pervious slope"
"       0.000   Impervious Area"
"     260.000   Impervious length"
"       2.100   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.217   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.051     0.000     0.000     0.000 c.m/sec"
"             Catchment 101          Pervious   Impervious Total Area "
"             Surface Area           6.500      0.000      6.500      hectare"
"             Time of concentration  83.356     7.955      83.356     minutes"
"             Time to Centroid       207.130    100.002    207.130    minutes"
"             Rainfall depth         34.259     34.259     34.259     mm"
"             Rainfall volume        2226.80    0.00       2226.81    c.m"
"             Rainfall losses        26.824     5.065      26.824     mm"
"             Runoff depth           7.435      29.194     7.435      mm"
"             Runoff volume          483.26     0.00       483.26     c.m"
"             Runoff coefficient     0.217      0.000      0.217      "
"             Maximum flow           0.051      0.000      0.051      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.051     0.051     0.000     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.051     0.051     0.051     0.000"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"            Maximum flow                  0.051    c.m/sec"
"            Hydrograph volume           483.260    c.m"
"                   0.051     0.051     0.051     0.051"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.051     0.000     0.051     0.051"
" 33          CATCHMENT 102"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         102   102"
"       0.000   % Impervious"
"       4.490   Total Area"
"     205.000   Flow length"
"       1.800   Overland Slope"
"       4.490   Pervious Area"
"     205.000   Pervious length"
"       1.800   Pervious slope"
"       0.000   Impervious Area"
"     205.000   Impervious length"
"       1.800   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.217   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.038     0.000     0.051     0.051 c.m/sec"
"             Catchment 102          Pervious   Impervious Total Area "
"             Surface Area           4.490      0.000      4.490      hectare"
"             Time of concentration  75.699     7.225      75.699     minutes"
"             Time to Centroid       197.444    98.906     197.444    minutes"
"             Rainfall depth         34.259     34.259     34.259     mm"
"             Rainfall volume        1538.21    0.00       1538.21    c.m"
"             Rainfall losses        26.825     5.245      26.825     mm"
"             Runoff depth           7.434      29.013     7.434      mm"
"             Runoff volume          333.79     0.00       333.79     c.m"
"             Runoff coefficient     0.217      0.000      0.217      "
"             Maximum flow           0.038      0.000      0.038      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.038     0.038     0.051     0.051"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.038     0.038     0.038     0.051"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"            Maximum flow                  0.089    c.m/sec"
"            Hydrograph volume           817.048    c.m"
"                   0.038     0.038     0.038     0.089"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
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"                   0.038     0.000     0.038     0.089"
" 33          CATCHMENT 103"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         103   103"
"       0.000   % Impervious"
"       2.280   Total Area"
"     180.000   Flow length"
"       3.300   Overland Slope"
"       2.280   Pervious Area"
"     180.000   Pervious length"
"       3.300   Pervious slope"
"       0.000   Impervious Area"
"     180.000   Impervious length"
"       3.300   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.217   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.024     0.000     0.038     0.089 c.m/sec"
"             Catchment 103          Pervious   Impervious Total Area "
"             Surface Area           2.280      0.000      2.280      hectare"
"             Time of concentration  58.375     5.571      58.375     minutes"
"             Time to Centroid       175.529    96.363     175.529    minutes"
"             Rainfall depth         34.259     34.259     34.259     mm"
"             Rainfall volume        781.09     0.00       781.10     c.m"
"             Rainfall losses        26.824     5.120      26.824     mm"
"             Runoff depth           7.434      29.138     7.434      mm"
"             Runoff volume          169.50     0.00       169.51     c.m"
"             Runoff coefficient     0.217      0.000      0.217      "
"             Maximum flow           0.024      0.000      0.024      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.024     0.024     0.038     0.089"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.024     0.024     0.024     0.089"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"             Maximum flow                 0.112    c.m/sec"
"             Hydrograph volume          986.554    c.m"
"                   0.024     0.024     0.024     0.112"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.024     0.000     0.024     0.112"
" 33          CATCHMENT 104"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         104   104"
"       0.000   % Impervious"
"       0.920   Total Area"
"      75.000   Flow length"
"       4.700   Overland Slope"
"       0.920   Pervious Area"
"      75.000   Pervious length"
"       4.700   Pervious slope"
"       0.000   Impervious Area"
"      75.000   Impervious length"
"       4.700   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.217   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.015     0.000     0.024     0.112 c.m/sec"
"             Catchment 104          Pervious   Impervious Total Area "
"             Surface Area           0.920      0.000      0.920      hectare"
"             Time of concentration  31.047     2.963      31.047     minutes"
"             Time to Centroid       140.968    92.448     140.968    minutes"
"             Rainfall depth         34.259     34.259     34.259     mm"
"             Rainfall volume        315.18     0.00       315.18     c.m"
"             Rainfall losses        26.826     5.456      26.826     mm"
"             Runoff depth           7.432      28.803     7.432      mm"
"             Runoff volume          68.38      0.00       68.38      c.m"
"             Runoff coefficient     0.217      0.000      0.217      "
"             Maximum flow           0.015      0.000      0.015      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.015     0.015     0.024     0.112"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.015     0.015     0.015     0.112"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"             Maximum flow                 0.120    c.m/sec"
"             Hydrograph volume          1054.930    c.m"
"                   0.015     0.015     0.015     0.120"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.015     0.000     0.015     0.120"
" 33          CATCHMENT 105"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         105   105"
"       0.000   % Impervious"
"       2.200   Total Area"
"     135.000   Flow length"
"       2.500   Overland Slope"
"       2.200   Pervious Area"
"     135.000   Pervious length"
"       2.500   Pervious slope"
"       0.000   Impervious Area"
"     135.000   Impervious length"
"       2.500   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.217   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
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"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.025     0.000     0.015     0.120 c.m/sec"
"             Catchment 105          Pervious   Impervious Total Area "
"             Surface Area           2.200      0.000      2.200      hectare"
"             Time of concentration  53.387     5.095      53.387     minutes"
"             Time to Centroid       169.223    95.667     169.223    minutes"
"             Rainfall depth         34.259     34.259     34.259     mm"
"             Rainfall volume        753.69     0.00       753.69     c.m"
"             Rainfall losses        26.825     5.138      26.825     mm"
"             Runoff depth           7.433      29.121     7.433      mm"
"             Runoff volume          163.53     0.00       163.53     c.m"
"             Runoff coefficient     0.217      0.000      0.217      "
"             Maximum flow           0.025      0.000      0.025      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.025     0.025     0.015     0.120"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.025     0.025     0.025     0.120"
" 40          HYDROGRAPH   Combine    2"
"             6   Combine "
"             2   Node #"
"                 Activa Baden Subdivision"
"             Maximum flow                  0.025    c.m/sec"
"             Hydrograph volume           163.534    c.m"
"                    0.025     0.025     0.025     0.025"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.025     0.000     0.025     0.025"
" 33          CATCHMENT 106"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           106   106"
"         0.000   % Impervious"
"         4.300   Total Area"
"       265.000   Flow length"
"         1.600   Overland Slope"
"         4.300   Pervious Area"
"       265.000   Pervious length"
"         1.600   Pervious slope"
"         0.000   Impervious Area"
"       265.000   Impervious length"
"         1.600   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.217   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.000   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.031     0.000     0.025     0.025 c.m/sec"
"             Catchment 106          Pervious   Impervious Total Area "
"             Surface Area           4.300      0.000      4.300      hectare"
"             Time of concentration  91.481     8.731      91.481     minutes"
"             Time to Centroid       217.410    101.072    217.409    minutes"
"             Rainfall depth         34.259     34.259     34.259     mm"
"             Rainfall volume        1473.12    0.00       1473.12    c.m"
"             Rainfall losses        26.824     5.079      26.824     mm"
"             Runoff depth           7.435      29.180     7.435      mm"
"             Runoff volume          319.68     0.00       319.69     c.m"
"             Runoff coefficient     0.217      0.000      0.217      "
"             Maximum flow           0.031      0.000      0.031      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.031     0.031     0.025     0.025"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.031     0.031     0.031     0.025"
" 40          HYDROGRAPH   Combine    2"
"             6   Combine "
"             2   Node #"
"                 Activa Baden Subdivision"
"             Maximum flow                  0.053    c.m/sec"
"             Hydrograph volume           483.220    c.m"
"                    0.031     0.031     0.031     0.053"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.031     0.000     0.031     0.053"
" 33          CATCHMENT 107"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           107   107"
"         1.000   % Impervious"
"         8.850   Total Area"
"       330.000   Flow length"
"         2.000   Overland Slope"
"         8.762   Pervious Area"
"       330.000   Pervious length"
"         2.000   Pervious slope"
"         0.089   Impervious Area"
"       330.000   Impervious length"
"         2.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.217   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.849   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.062     0.000     0.031     0.053 c.m/sec"
"             Catchment 107          Pervious   Impervious Total Area "
"             Surface Area           8.762      0.089      8.850      hectare"
"             Time of concentration  97.593     9.314      94.235     minutes"
"             Time to Centroid       225.140    101.958    220.455    minutes"
"             Rainfall depth         34.259     34.259     34.259     mm"
"             Rainfall volume        3001.56    30.32      3031.88    c.m"
"             Rainfall losses        26.824     5.159      26.607     mm"
"             Runoff depth           7.434      29.100     7.651      mm"
"             Runoff volume          651.37     25.75      677.13     c.m"
"             Runoff coefficient     0.217      0.849      0.223      "
"             Maximum flow           0.061      0.015      0.062      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.062     0.062     0.031     0.053"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.062     0.062     0.062     0.053"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Ex. 1000mm CSP Culvert"
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"             Maximum flow                  0.062    c.m/sec"
"             Hydrograph volume           677.126    c.m"
"                    0.062     0.062     0.062     0.062"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.062     0.000     0.062     0.062"
" 33          CATCHMENT 108"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          108   108"
"        2.000   % Impervious"
"       18.930   Total Area"
"      570.000   Flow length"
"        1.600   Overland Slope"
"       18.551   Pervious Area"
"      570.000   Pervious length"
"        1.600   Pervious slope"
"        0.379   Impervious Area"
"      570.000   Impervious length"
"        1.600   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.217   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.852   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.095     0.000     0.062     0.062 c.m/sec"
"             Catchment 108          Pervious   Impervious Total Area "
"             Surface Area           18.551     0.379      18.930     hectare"
"             Time of concentration  144.846    13.824     135.130    minutes"
"             Time to Centroid       284.912    108.731    271.847    minutes"
"             Rainfall depth         34.259     34.259     34.259     mm"
"             Rainfall volume        6355.44    129.70     6485.15    c.m"
"             Rainfall losses        26.824     5.080      26.389     mm"
"             Runoff depth           7.435      29.179     7.870      mm"
"             Runoff volume          1379.26    110.47     1489.73    c.m"
"             Runoff coefficient     0.217      0.852      0.230      "
"             Maximum flow           0.092      0.054      0.095      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.095     0.095     0.062     0.062"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.095     0.095     0.095     0.062"
" 40          HYDROGRAPH   Combine    3"
"            6   Combine "
"            3   Node #"
"                Ex. 1000mm CSP Culvert"
"             Maximum flow                  0.152    c.m/sec"
"             Hydrograph volume          2166.861    c.m"
"                    0.095     0.095     0.095     0.152"
" 40          HYDROGRAPH   Confluence    3"
"            7   Confluence "
"            3   Node #"
"                Ex. 1000mm CSP Culvert"
"             Maximum flow                  0.152    c.m/sec"
"             Hydrograph volume          2166.861    c.m"
"                    0.095     0.152     0.095     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.095     0.152     0.152     0.000"
" 40          HYDROGRAPH   Combine    5"
"            6   Combine "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  0.152    c.m/sec"
"             Hydrograph volume          2166.861    c.m"
"                    0.095     0.152     0.152     0.152"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.095     0.000     0.152     0.152"
" 33          CATCHMENT 109"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          109   109"
"        0.000   % Impervious"
"        0.910   Total Area"
"      125.000   Flow length"
"        1.500   Overland Slope"
"        0.910   Pervious Area"
"      125.000   Pervious length"
"        1.500   Pervious slope"
"        0.000   Impervious Area"
"      125.000   Impervious length"
"        1.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.217   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.009     0.000     0.152     0.152 c.m/sec"
"             Catchment 109          Pervious   Impervious Total Area "
"             Surface Area           0.910      0.000      0.910      hectare"
"             Time of concentration  59.421     5.671      59.420     minutes"
"             Time to Centroid       176.852    96.529     176.852    minutes"
"             Rainfall depth         34.259     34.259     34.259     mm"
"             Rainfall volume        311.75     0.00       311.75     c.m"
"             Rainfall losses        26.825     5.119      26.825     mm"
"             Runoff depth           7.434      29.139     7.434      mm"
"             Runoff volume          67.65      0.00       67.65      c.m"
"             Runoff coefficient     0.217      0.000      0.217      "
"             Maximum flow           0.009      0.000      0.009      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.009     0.009     0.152     0.152"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.009     0.009     0.009     0.152"
" 40          HYDROGRAPH   Combine    4"
"            6   Combine "
"            4   Node #"
"                Snyder's/Christian"
"             Maximum flow                  0.009    c.m/sec"
"             Hydrograph volume            67.647    c.m"
"                    0.009     0.009     0.009     0.009"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.009     0.000     0.009     0.009"
" 33          CATCHMENT 110"
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"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          110   110"
"       45.000   % Impervious"
"        1.030   Total Area"
"       70.000   Flow length"
"        0.700   Overland Slope"
"        0.566   Pervious Area"
"       70.000   Pervious length"
"        0.700   Pervious slope"
"        0.463   Impervious Area"
"       70.000   Impervious length"
"        0.700   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.249   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.850   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.098     0.000     0.009     0.009 c.m/sec"
"             Catchment 110          Pervious   Impervious Total Area "
"             Surface Area           0.566      0.463      1.030      hectare"
"             Time of concentration  48.872     5.033      16.585     minutes"
"             Time to Centroid       163.716    95.578     113.533    minutes"
"             Rainfall depth         34.259     34.259     34.259     mm"
"             Rainfall volume        194.07     158.79     352.86     c.m"
"             Rainfall losses        25.739     5.154      16.476     mm"
"             Runoff depth           8.520      29.104     17.783     mm"
"             Runoff volume          48.26      134.90     183.16     c.m"
"             Runoff coefficient     0.249      0.850      0.519      "
"             Maximum flow           0.008      0.097      0.098      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.098     0.098     0.009     0.009"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.098     0.098     0.098     0.009"
" 40          HYDROGRAPH   Combine    4"
"            6   Combine "
"            4   Node #"
"                Snyder's/Christian"
"             Maximum flow                  0.099    c.m/sec"
"             Hydrograph volume           250.811    c.m"
"                    0.098     0.098     0.098     0.099"
" 40          HYDROGRAPH   Confluence    4"
"            7   Confluence "
"            4   Node #"
"                Snyder's/Christian"
"             Maximum flow                  0.099    c.m/sec"
"             Hydrograph volume           250.811    c.m"
"                    0.098     0.099     0.098     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.098     0.099     0.099     0.000"
" 40          HYDROGRAPH   Combine    5"
"            6   Combine "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  0.166    c.m/sec"
"             Hydrograph volume          2417.671    c.m"
"                    0.098     0.099     0.099     0.166"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.098     0.000     0.099     0.166"
" 33          CATCHMENT 111"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          111   111"
"       45.000   % Impervious"
"        2.080   Total Area"
"       80.000   Flow length"
"        2.000   Overland Slope"
"        1.144   Pervious Area"
"       80.000   Pervious length"
"        2.000   Pervious slope"
"        0.936   Impervious Area"
"       80.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.249   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.841   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.197     0.000     0.099     0.166 c.m/sec"
"             Catchment 111          Pervious   Impervious Total Area "
"             Surface Area           1.144      0.936      2.080      hectare"
"             Time of concentration  38.643     3.980      13.183     minutes"
"             Time to Centroid       150.513    94.054     109.043    minutes"
"             Rainfall depth         34.259     34.259     34.259     mm"
"             Rainfall volume        391.92     320.66     712.58     c.m"
"             Rainfall losses        25.740     5.455      16.612     mm"
"             Runoff depth           8.518      28.804     17.647     mm"
"             Runoff volume          97.45      269.61     367.05     c.m"
"             Runoff coefficient     0.249      0.841      0.515      "
"             Maximum flow           0.019      0.193      0.197      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.197     0.197     0.099     0.166"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.197     0.197     0.197     0.166"
" 40          HYDROGRAPH   Combine    5"
"            6   Combine "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  0.359    c.m/sec"
"             Hydrograph volume          2784.721    c.m"
"                    0.197     0.197     0.197     0.359"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.197     0.000     0.197     0.359"
" 33          CATCHMENT 112"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          112   112"
"       55.000   % Impervious"
"       10.200   Total Area"
"       60.000   Flow length"
```

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"        3.000   Overland Slope"
"        4.590   Pervious Area"
"       60.000   Pervious length"
"        3.000   Pervious slope"
"        5.610   Impervious Area"
"       60.000   Impervious length"
"        3.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.248   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.841   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  1.129     0.000     0.197     0.359 c.m/sec"
"             Catchment 112          Pervious   Impervious Total Area "
"             Surface Area           4.590      5.610      10.200     hectare"
"             Time of concentration  28.793     2.965      7.995      minutes"
"             Time to Centroid       137.808    92.452     101.284    minutes"
"             Rainfall depth         34.259     34.259     34.259     mm"
"             Rainfall volume        1572.47    1921.91    3494.37    c.m"
"             Rainfall losses        25.746     5.456      14.587     mm"
"             Runoff depth           8.512      28.802     19.672     mm"
"             Runoff volume          390.71     1615.81    2006.52    c.m"
"             Runoff coefficient     0.248      0.841      0.574      "
"             Maximum flow           0.094      1.121      1.129      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  1.129     1.129     0.197     0.359"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  1.129     1.129     1.129     0.359"
" 40          HYDROGRAPH   Combine    5"
"           6   Combine "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                 1.466    c.m/sec"
"            Hydrograph volume          4791.238    c.m"
"                  1.129     1.129     1.129     1.466"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                  1.129     0.000     1.129     1.466"
" 33          CATCHMENT 113"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         113   113"
"       50.000   % Impervious"
"        1.250   Total Area"
"       20.000   Flow length"
"       20.000   Overland Slope"
"        0.625   Pervious Area"
"       20.000   Pervious length"
"       20.000   Pervious slope"
"        0.625   Impervious Area"
"       20.000   Impervious length"
"       20.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.216   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.817   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.156     0.000     1.129     1.466 c.m/sec"
"             Catchment 113          Pervious   Impervious Total Area "
"             Surface Area           0.625      0.625      1.250      hectare"
"             Time of concentration  9.098      0.868      2.590      minutes"
"             Time to Centroid       113.210    89.179     94.207     minutes"
"             Rainfall depth         34.259     34.259     34.259     mm"
"             Rainfall volume        214.12     214.12     428.23     c.m"
"             Rainfall losses        26.855     6.273      16.564     mm"
"             Runoff depth           7.404      27.985     17.695     mm"
"             Runoff volume          46.27      174.91     221.18     c.m"
"             Runoff coefficient     0.216      0.817      0.517      "
"             Maximum flow           0.021      0.151      0.156      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.156     0.156     1.129     1.466"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.156     0.156     0.156     1.466"
" 40          HYDROGRAPH   Combine    5"
"           6   Combine "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                 1.562    c.m/sec"
"            Hydrograph volume          5012.423    c.m"
"                  0.156     0.156     0.156     1.562"
" 40          HYDROGRAPH   Confluence    5"
"           7   Confluence "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                 1.562    c.m/sec"
"            Hydrograph volume          5012.423    c.m"
"                  0.156     1.562     0.156     0.000"
" 54          POND DESIGN"
"        1.562   Current peak flow    c.m/sec"
"        0.497   Target outflow    c.m/sec"
"       5012.4   Hydrograph volume    c.m"
"          33.   Number of stages"
"      351.500   Minimum water level    metre"
"      354.700   Maximum water level    metre"
"      351.500   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                351.500     0.000     0.000"
"                351.600   0.00600   400.000"
"                351.700   0.01900   824.000"
"                351.800   0.03100  1272.000"
"                351.900   0.07800  1744.000"
"                352.000    0.1930  2240.000"
"                352.100    0.3670  2760.000"
"                352.200    0.5970  3298.000"
"                352.300    0.8520  3849.000"
"                352.400     1.011  4412.000"
"                352.500     1.122  4988.000"
"                352.600     1.223  5576.000"
"                352.700     1.316  6176.000"
"                352.800     1.403  6789.000"
"                352.900     1.485  7415.000"
"                353.000     1.563  8053.000"
"                353.100     1.637  8704.000"
"                353.200     1.708  9368.000"
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"               353.300     1.776  10045.00"
"               353.400     1.841  10735.00"
"               353.500     1.904  11439.00"
"               353.600     1.965  12156.00"
"               353.700     2.025  12884.00"
"               353.800     2.082  13625.00"
"               353.900     2.138  14378.00"
"               354.000     2.193  15143.00"
"               354.100     2.246  15921.00"
"               354.200     2.298  16712.00"
"               354.300     2.349  17517.00"
"               354.400     2.399  18334.00"
"               354.500     2.473  19165.00"
"               354.600     2.708  20012.00"
"               354.700     3.177  20879.00"
"            Peak outflow                  0.237    c.m/sec"
"            Maximum level               352.025    metre"
"            Maximum storage            2371.301    c.m"
"            Centroidal lag                9.820   hours"
"                 0.156     1.562     0.237     0.000 c.m/sec"
" 40         HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
"            Maximum flow                  0.237    c.m/sec"
"            Hydrograph volume          4901.639    c.m"
"                    0.156     1.562     0.237     0.237"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                    0.156     0.000     0.237     0.237"
" 33         CATCHMENT 114"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         114   114"
"      45.000   % Impervious"
"       1.250   Total Area"
"      60.000   Flow length"
"       2.000   Overland Slope"
"       0.688   Pervious Area"
"      60.000   Pervious length"
"       2.000   Pervious slope"
"       0.563   Impervious Area"
"      60.000   Impervious length"
"       2.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      80.000   Pervious SCS Curve No."
"       0.249   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       6.350   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.839   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                    0.115     0.000     0.237     0.237 c.m/sec"
"            Catchment 114          Pervious   Impervious Total Area "
"            Surface Area           0.688      0.563      1.250      hectare"
"            Time of concentration  32.517     3.349      11.105     minutes"
"            Time to Centroid       142.617    93.076     106.249    minutes"
"            Rainfall depth         34.259     34.259     34.259     mm"
"            Rainfall volume        235.53     192.70     428.23     c.m"
"            Rainfall losses        25.743     5.525      16.644     mm"
"            Runoff depth           8.516      28.734     17.614     mm"
"            Runoff volume          58.55      161.63     220.18     c.m"
"            Runoff coefficient     0.249      0.839      0.514      "
"            Maximum flow           0.013      0.112      0.115      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    0.115     0.115     0.237     0.237"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                    0.115     0.115     0.115     0.237"
" 40         HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
"            Maximum flow                  0.244    c.m/sec"
"            Hydrograph volume          5121.819    c.m"
"                    0.115     0.115     0.115     0.244"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                    0.115     0.000     0.115     0.244"
" 33         CATCHMENT 115"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         115   115"
"       0.000   % Impervious"
"       2.110   Total Area"
"     365.000   Flow length"
"       0.500   Overland Slope"
"       2.110   Pervious Area"
"     365.000   Pervious length"
"       0.500   Pervious slope"
"       0.000   Impervious Area"
"     365.000   Impervious length"
"       0.500   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.217   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                    0.010     0.000     0.115     0.244 c.m/sec"
"            Catchment 115          Pervious   Impervious Total Area "
"            Surface Area           2.110      0.000      2.110      hectare"
"            Time of concentration  157.146    14.998     157.146    minutes"
"            Time to Centroid       300.471    110.507    300.470    minutes"
"            Rainfall depth         34.259     34.259     34.259     mm"
"            Rainfall volume        722.85     0.00       722.86     c.m"
"            Rainfall losses        26.824     5.030      26.824     mm"
"            Runoff depth           7.435      29.228     7.435      mm"
"            Runoff volume          156.88     0.00       156.88     c.m"
"            Runoff coefficient     0.217      0.000      0.217      "
"            Maximum flow           0.010      0.000      0.010      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    0.010     0.010     0.115     0.244"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                    0.010     0.010     0.010     0.244"
" 40         HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
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"             Maximum flow                  0.254    c.m/sec"
"             Hydrograph volume          5278.692    c.m"
"                    0.010     0.010     0.010     0.254"
" 40          HYDROGRAPH   Confluence    6"
"            7   Confluence "
"            6   Node #"
"                Swale Storage Prior to CMP Culvert"
"             Maximum flow                  0.254    c.m/sec"
"             Hydrograph volume          5278.692    c.m"
"                    0.010     0.254     0.010     0.000"
" 54          POND DESIGN"
"         0.254   Current peak flow    c.m/sec"
"         0.497   Target outflow    c.m/sec"
"        5278.7   Hydrograph volume    c.m"
"           37.   Number of stages"
"       351.100   Minimum water level    metre"
"       354.700   Maximum water level    metre"
"       351.100   Starting water level    metre"
"             0   Keep Design Data: 1 = True; 0 = False"
"                   Level Discharge    Volume"
"                 351.100     0.000     0.000"
"                 351.200   0.00900    0.1000"
"                 351.300   0.03600    0.6000"
"                 351.400   0.08100     1.000"
"                 351.500    0.1420     2.000"
"                 351.600    0.2180     5.000"
"                 351.700    0.3070     8.000"
"                 351.800    0.4210    14.000"
"                 351.900    0.5530    21.000"
"                 352.000    0.6750    29.000"
"                 352.100    0.8050    41.000"
"                 352.200    0.9380    57.000"
"                 352.300     1.066    76.000"
"                 352.400     1.191   100.000"
"                 352.500     1.307   128.000"
"                 352.600     1.410   160.000"
"                 352.700     1.507   197.000"
"                 352.800     1.596   239.000"
"                 352.900     1.684   286.000"
"                 353.000     1.768   337.000"
"                 353.100     1.849   393.000"
"                 353.200     1.928   455.000"
"                 353.300     2.005   526.000"
"                 353.400     2.080   596.000"
"                 353.500     2.153   676.000"
"                 353.600     2.224   761.000"
"                 353.700     2.293   854.000"
"                 353.800     2.361   953.000"
"                 353.900     2.427  1060.000"
"                 354.000     2.492  1174.000"
"                 354.100     2.556  1298.000"
"                 354.200     2.618  1435.000"
"                 354.300     2.689  1586.000"
"                 354.400     2.739  1751.000"
"                 354.500     2.797  1929.000"
"                 354.600     2.855  2121.000"
"                 354.700     2.911  2329.000"
"             Peak outflow                  0.254    c.m/sec"
"             Maximum level               351.640    metre"
"             Maximum storage               6.206    c.m"
"             Centroidal lag                8.250   hours"
"                  0.010     0.254     0.254     0.000 c.m/sec"
" 40          HYDROGRAPH   Combine    7"
"            6   Combine "
"            7   Node #"
"                Baden Creek Tributary"
"             Maximum flow                  0.254    c.m/sec"
"             Hydrograph volume          5278.105    c.m"
"                    0.010     0.254     0.254     0.254"
" 38          START/RE-START TOTALS 6"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                     67.300    hectare"
"             Total Impervious area                     8.664    hectare"
"             Total % impervious                       12.874"
" 19          EXIT"
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"               MIDUSS Output ----------------------------------------------->"
"               MIDUSS version                          Version 2.25  rev. 473"
"               MIDUSS created                       Sunday, February 7, 2010"
"          10   Units used:                                        ie METRIC"
"               Job folder:          Q:\40777\104\PRELIMINARY\SWM\2nd DP Sub\"
"                                                                  MIDUSS\Pre"
"               Output filename:                                   5yrPre2.in"
"               Licensee name:                                              A"
"               Company                                                     "
"               Date & Time last used:                9/11/2023 at 1:10:41 PM"
" 31          TIME PARAMETERS"
"       5.000   Time Step"
"     180.000   Max. Storm length"
"    3000.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"           1   Chicago storm"
"    1593.000   Coefficient A"
"      11.000   Constant B"
"       0.879   Exponent C"
"       0.400   Fraction R"
"     180.000   Duration"
"       1.000   Time step multiplier"
"               Maximum intensity          139.250    mm/hr"
"               Total depth                 47.240    mm"
"           4   5hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 101"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         101   101"
"       0.000   % Impervious"
"       6.500   Total Area"
"     260.000   Flow length"
"       2.100   Overland Slope"
"       6.500   Pervious Area"
"     260.000   Pervious length"
"       2.100   Pervious slope"
"       0.000   Impervious Area"
"     260.000   Impervious length"
"       2.100   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.304   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.137     0.000     0.000     0.000 c.m/sec"
"               Catchment 101          Pervious   Impervious Total Area "
"               Surface Area           6.500      0.000      6.500      hectare"
"               Time of concentration  63.115     7.131      63.115     minutes"
"               Time to Centroid       176.632    96.322     176.632    minutes"
"               Rainfall depth         47.240     47.240     47.240     mm"
"               Rainfall volume        3070.59    0.00       3070.59    c.m"
"               Rainfall losses        32.867     5.525      32.867     mm"
"               Runoff depth           14.373     41.715     14.373     mm"
"               Runoff volume          934.25     0.00       934.25     c.m"
"               Runoff coefficient     0.304      0.000      0.304      "
"               Maximum flow           0.137      0.000      0.137      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.137     0.137     0.000     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.137     0.137     0.137     0.000"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"               Maximum flow                  0.137    c.m/sec"
"               Hydrograph volume           934.250    c.m"
"                   0.137     0.137     0.137     0.137"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.137     0.000     0.137     0.137"
" 33          CATCHMENT 102"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         102   102"
"       0.000   % Impervious"
"       4.490   Total Area"
"     205.000   Flow length"
"       1.800   Overland Slope"
"       4.490   Pervious Area"
"     205.000   Pervious length"
"       1.800   Pervious slope"
"       0.000   Impervious Area"
"     205.000   Impervious length"
"       1.800   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.304   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.102     0.000     0.137     0.137 c.m/sec"
"               Catchment 102          Pervious   Impervious Total Area "
"               Surface Area           4.490      0.000      4.490      hectare"
"               Time of concentration  57.318     6.476      57.317     minutes"
"               Time to Centroid       169.320    95.365     169.319    minutes"
"               Rainfall depth         47.240     47.240     47.240     mm"
"               Rainfall volume        2121.07    0.00       2121.07    c.m"
"               Rainfall losses        32.866     5.557      32.866     mm"
"               Runoff depth           14.374     41.683     14.374     mm"
"               Runoff volume          645.40     0.00       645.40     c.m"
"               Runoff coefficient     0.304      0.000      0.304      "
"               Maximum flow           0.102      0.000      0.102      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.102     0.102     0.137     0.137"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.102     0.102     0.102     0.137"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"               Maximum flow                  0.238    c.m/sec"
"               Hydrograph volume          1579.648    c.m"
"                   0.102     0.102     0.102     0.238"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
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"                   0.102     0.000     0.102     0.238"
" 33          CATCHMENT 103"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         103   103"
"       0.000   % Impervious"
"       2.280   Total Area"
"     180.000   Flow length"
"       3.300   Overland Slope"
"       2.280   Pervious Area"
"     180.000   Pervious length"
"       3.300   Pervious slope"
"       0.000   Impervious Area"
"     180.000   Impervious length"
"       3.300   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.304   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.064     0.000     0.102     0.238 c.m/sec"
"             Catchment 103          Pervious   Impervious Total Area "
"             Surface Area           2.280      0.000      2.280      hectare"
"             Time of concentration  44.200     4.994      44.200     minutes"
"             Time to Centroid       152.765    93.256     152.765    minutes"
"             Rainfall depth         47.240     47.240     47.240     mm"
"             Rainfall volume        1077.07    0.00       1077.07    c.m"
"             Rainfall losses        32.872     5.527      32.872     mm"
"             Runoff depth           14.368     41.713     14.368     mm"
"             Runoff volume          327.59     0.00       327.59     c.m"
"             Runoff coefficient     0.304      0.000      0.304      "
"             Maximum flow           0.064      0.000      0.064      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.064     0.064     0.102     0.238"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.064     0.064     0.064     0.238"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"             Maximum flow                 0.298    c.m/sec"
"             Hydrograph volume          1907.236    c.m"
"                   0.064     0.064     0.064     0.298"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.064     0.000     0.064     0.298"
" 33          CATCHMENT 104"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         104   104"
"       0.000   % Impervious"
"       0.920   Total Area"
"      75.000   Flow length"
"       4.700   Overland Slope"
"       0.920   Pervious Area"
"      75.000   Pervious length"
"       4.700   Pervious slope"
"       0.000   Impervious Area"
"      75.000   Impervious length"
"       4.700   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.304   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.040     0.000     0.064     0.298 c.m/sec"
"             Catchment 104          Pervious   Impervious Total Area "
"             Surface Area           0.920      0.000      0.920      hectare"
"             Time of concentration  23.508     2.656      23.508     minutes"
"             Time to Centroid       126.668    89.851     126.668    minutes"
"             Rainfall depth         47.240     47.240     47.240     mm"
"             Rainfall volume        434.61     0.00       434.61     c.m"
"             Rainfall losses        32.874     6.030      32.874     mm"
"             Runoff depth           14.366     41.210     14.366     mm"
"             Runoff volume          132.17     0.00       132.17     c.m"
"             Runoff coefficient     0.304      0.000      0.304      "
"             Maximum flow           0.040      0.000      0.040      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.040     0.040     0.064     0.298"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.040     0.040     0.040     0.298"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"             Maximum flow                 0.319    c.m/sec"
"             Hydrograph volume          2039.406    c.m"
"                   0.040     0.040     0.040     0.319"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.040     0.000     0.040     0.319"
" 33          CATCHMENT 105"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         105   105"
"       0.000   % Impervious"
"       2.200   Total Area"
"     135.000   Flow length"
"       2.500   Overland Slope"
"       2.200   Pervious Area"
"     135.000   Pervious length"
"       2.500   Pervious slope"
"       0.000   Impervious Area"
"     135.000   Impervious length"
"       2.500   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.304   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
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"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.065     0.000     0.040     0.319 c.m/sec"
"             Catchment 105          Pervious   Impervious Total Area "
"             Surface Area           2.200      0.000      2.200      hectare"
"             Time of concentration  40.424     4.567      40.423     minutes"
"             Time to Centroid       148.007    92.629     148.007    minutes"
"             Rainfall depth         47.240     47.240     47.240     mm"
"             Rainfall volume        1039.28    0.00       1039.28    c.m"
"             Rainfall losses        32.867     5.534      32.867     mm"
"             Runoff depth           14.373     41.706     14.373     mm"
"             Runoff volume          316.20     0.00       316.20     c.m"
"             Runoff coefficient     0.304      0.000      0.304      "
"             Maximum flow           0.065      0.000      0.065      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.065     0.065     0.040     0.319"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.065     0.065     0.065     0.319"
" 40          HYDROGRAPH   Combine    2"
"            6   Combine "
"            2   Node #"
"                Activa Baden Subdivision"
"             Maximum flow                  0.065    c.m/sec"
"             Hydrograph volume           316.202    c.m"
"                    0.065     0.065     0.065     0.065"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.065     0.000     0.065     0.065"
" 33          CATCHMENT 106"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          106   106"
"        0.000   % Impervious"
"        4.300   Total Area"
"      265.000   Flow length"
"        1.600   Overland Slope"
"        4.300   Pervious Area"
"      265.000   Pervious length"
"        1.600   Pervious slope"
"        0.000   Impervious Area"
"      265.000   Impervious length"
"        1.600   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.304   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.084     0.000     0.065     0.065 c.m/sec"
"             Catchment 106          Pervious   Impervious Total Area "
"             Surface Area           4.300      0.000      4.300      hectare"
"             Time of concentration  69.267     7.826      69.267     minutes"
"             Time to Centroid       184.393    97.293     184.392    minutes"
"             Rainfall depth         47.240     47.240     47.240     mm"
"             Rainfall volume        2031.31    0.00       2031.31    c.m"
"             Rainfall losses        32.867     5.362      32.867     mm"
"             Runoff depth           14.373     41.877     14.373     mm"
"             Runoff volume          618.04     0.00       618.04     c.m"
"             Runoff coefficient     0.304      0.000      0.304      "
"             Maximum flow           0.084      0.000      0.084      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.084     0.084     0.065     0.065"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.084     0.084     0.084     0.065"
" 40          HYDROGRAPH   Combine    2"
"            6   Combine "
"            2   Node #"
"                Activa Baden Subdivision"
"             Maximum flow                  0.141    c.m/sec"
"             Hydrograph volume           934.244    c.m"
"                    0.084     0.084     0.084     0.141"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.084     0.000     0.084     0.141"
" 33          CATCHMENT 107"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          107   107"
"        1.000   % Impervious"
"        8.850   Total Area"
"      330.000   Flow length"
"        2.000   Overland Slope"
"        8.762   Pervious Area"
"      330.000   Pervious length"
"        2.000   Pervious slope"
"        0.089   Impervious Area"
"      330.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.304   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.889   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.164     0.000     0.084     0.141 c.m/sec"
"             Catchment 107          Pervious   Impervious Total Area "
"             Surface Area           8.762      0.089      8.850      hectare"
"             Time of concentration  73.895     8.349      72.017     minutes"
"             Time to Centroid       190.234    97.970     187.590    minutes"
"             Rainfall depth         47.240     47.240     47.240     mm"
"             Rainfall volume        4138.92    41.81      4180.73    c.m"
"             Rainfall losses        32.864     5.261      32.588     mm"
"             Runoff depth           14.376     41.979     14.652     mm"
"             Runoff volume          1259.52    37.15      1296.67    c.m"
"             Runoff coefficient     0.304      0.889      0.310      "
"             Maximum flow           0.163      0.023      0.164      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.164     0.164     0.084     0.141"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.164     0.164     0.164     0.141"
" 40          HYDROGRAPH   Combine    3"
"            6   Combine "
"            3   Node #"
"                Ex. 1000mm CSP Culvert"
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"             Maximum flow                  0.164    c.m/sec"
"             Hydrograph volume          1296.667    c.m"
"                    0.164     0.164     0.164     0.164"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.164     0.000     0.164     0.164"
" 33          CATCHMENT 108"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          108   108"
"        2.000   % Impervious"
"       18.930   Total Area"
"      570.000   Flow length"
"        1.600   Overland Slope"
"       18.551   Pervious Area"
"      570.000   Pervious length"
"        1.600   Pervious slope"
"        0.379   Impervious Area"
"      570.000   Impervious length"
"        1.600   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.304   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.888   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.250     0.000     0.164     0.164 c.m/sec"
"             Catchment 108          Pervious   Impervious Total Area "
"             Surface Area           18.551     0.379      18.930     hectare"
"             Time of concentration  109.675    12.391     104.208    minutes"
"             Time to Centroid       235.371    103.779    227.976    minutes"
"             Rainfall depth         47.240     47.240     47.240     mm"
"             Rainfall volume        8763.66    178.85     8942.51    c.m"
"             Rainfall losses        32.865     5.302      32.313     mm"
"             Runoff depth           14.375     41.938     14.926     mm"
"             Runoff volume          2666.81    158.78     2825.58    c.m"
"             Runoff coefficient     0.304      0.888      0.316      "
"             Maximum flow           0.245      0.081      0.250      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.250     0.250     0.164     0.164"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.250     0.250     0.250     0.164"
" 40          HYDROGRAPH   Combine    3"
"            6   Combine "
"            3   Node #"
"                Ex. 1000mm CSP Culvert"
"             Maximum flow                  0.399    c.m/sec"
"             Hydrograph volume          4122.250    c.m"
"                    0.250     0.250     0.250     0.399"
" 40          HYDROGRAPH   Confluence    3"
"            7   Confluence "
"            3   Node #"
"                Ex. 1000mm CSP Culvert"
"             Maximum flow                  0.399    c.m/sec"
"             Hydrograph volume          4122.250    c.m"
"                    0.250     0.399     0.250     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.250     0.399     0.399     0.000"
" 40          HYDROGRAPH   Combine    5"
"            6   Combine "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  0.399    c.m/sec"
"             Hydrograph volume          4122.250    c.m"
"                    0.250     0.399     0.399     0.399"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.250     0.000     0.399     0.399"
" 33          CATCHMENT 109"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          109   109"
"        0.000   % Impervious"
"        0.910   Total Area"
"      125.000   Flow length"
"        1.500   Overland Slope"
"        0.910   Pervious Area"
"      125.000   Pervious length"
"        1.500   Pervious slope"
"        0.000   Impervious Area"
"      125.000   Impervious length"
"        1.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.304   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.025     0.000     0.399     0.399 c.m/sec"
"             Catchment 109          Pervious   Impervious Total Area "
"             Surface Area           0.910      0.000      0.910      hectare"
"             Time of concentration  44.992     5.083      44.992     minutes"
"             Time to Centroid       153.766    93.356     153.765    minutes"
"             Rainfall depth         47.240     47.240     47.240     mm"
"             Rainfall volume        429.88     0.00       429.88     c.m"
"             Rainfall losses        32.869     5.522      32.869     mm"
"             Runoff depth           14.371     41.718     14.371     mm"
"             Runoff volume          130.78     0.00       130.78     c.m"
"             Runoff coefficient     0.304      0.000      0.304      "
"             Maximum flow           0.025      0.000      0.025      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.025     0.025     0.399     0.399"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.025     0.025     0.025     0.399"
" 40          HYDROGRAPH   Combine    4"
"            6   Combine "
"            4   Node #"
"                Snyder's/Christian"
"             Maximum flow                  0.025    c.m/sec"
"             Hydrograph volume           130.775    c.m"
"                    0.025     0.025     0.025     0.025"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.025     0.000     0.025     0.025"
" 33          CATCHMENT 110"
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"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          110   110"
"       45.000   % Impervious"
"        1.030   Total Area"
"       70.000   Flow length"
"        0.700   Overland Slope"
"        0.566   Pervious Area"
"       70.000   Pervious length"
"        0.700   Pervious slope"
"        0.463   Impervious Area"
"       70.000   Impervious length"
"        0.700   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.339   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.883   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.139     0.000     0.025     0.025 c.m/sec"
"             Catchment 110          Pervious   Impervious Total Area "
"             Surface Area           0.566      0.463      1.030      hectare"
"             Time of concentration  37.783     4.512      15.138     minutes"
"             Time to Centroid       144.501    92.547     109.139    minutes"
"             Rainfall depth         47.240     47.240     47.240     mm"
"             Rainfall volume        267.61     218.96     486.57     c.m"
"             Rainfall losses        31.231     5.539      19.670     mm"
"             Runoff depth           16.009     41.700     27.570     mm"
"             Runoff volume          90.69      193.28     283.97     c.m"
"             Runoff coefficient     0.339      0.883      0.584      "
"             Maximum flow           0.020      0.135      0.139      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.139     0.139     0.025     0.025"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.139     0.139     0.139     0.025"
" 40          HYDROGRAPH   Combine    4"
"            6   Combine "
"            4   Node #"
"                Snyder's/Christian"
"             Maximum flow                  0.143    c.m/sec"
"             Hydrograph volume           414.749    c.m"
"                    0.139     0.139     0.139     0.143"
" 40          HYDROGRAPH   Confluence    4"
"            7   Confluence "
"            4   Node #"
"                Snyder's/Christian"
"             Maximum flow                  0.143    c.m/sec"
"             Hydrograph volume           414.749    c.m"
"                    0.139     0.143     0.139     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.139     0.143     0.143     0.000"
" 40          HYDROGRAPH   Combine    5"
"            6   Combine "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  0.431    c.m/sec"
"             Hydrograph volume          4536.999    c.m"
"                    0.139     0.143     0.143     0.431"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.139     0.000     0.143     0.431"
" 33          CATCHMENT 111"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          111   111"
"       45.000   % Impervious"
"        2.080   Total Area"
"       80.000   Flow length"
"        2.000   Overland Slope"
"        1.144   Pervious Area"
"       80.000   Pervious length"
"        2.000   Pervious slope"
"        0.936   Impervious Area"
"       80.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.339   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.872   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.274     0.000     0.143     0.431 c.m/sec"
"             Catchment 111          Pervious   Impervious Total Area "
"             Surface Area           1.144      0.936      2.080      hectare"
"             Time of concentration  29.875     3.568      12.040     minutes"
"             Time to Centroid       134.391    91.229     105.130    minutes"
"             Rainfall depth         47.240     47.240     47.240     mm"
"             Rainfall volume        540.42     442.17     982.59     c.m"
"             Rainfall losses        31.232     6.054      19.901     mm"
"             Runoff depth           16.008     41.186     27.338     mm"
"             Runoff volume          183.13     385.50     568.64     c.m"
"             Runoff coefficient     0.339      0.872      0.579      "
"             Maximum flow           0.048      0.261      0.274      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.274     0.274     0.143     0.431"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.274     0.274     0.274     0.431"
" 40          HYDROGRAPH   Combine    5"
"            6   Combine "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  0.541    c.m/sec"
"             Hydrograph volume          5105.641    c.m"
"                    0.274     0.274     0.274     0.541"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.274     0.000     0.274     0.541"
" 33          CATCHMENT 112"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          112   112"
"       55.000   % Impervious"
"       10.200   Total Area"
"       60.000   Flow length"
```

```
"        3.000   Overland Slope"
"        4.590   Pervious Area"
"       60.000   Pervious length"
"        3.000   Pervious slope"
"        5.610   Impervious Area"
"       60.000   Impervious length"
"        3.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.338   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.872   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  1.635     0.000     0.274     0.541 c.m/sec"
"             Catchment 112          Pervious   Impervious Total Area "
"             Surface Area           4.590      5.610      10.200     hectare"
"             Time of concentration  22.260     2.658      7.380      minutes"
"             Time to Centroid       124.674    89.854     98.242     minutes"
"             Rainfall depth         47.240     47.240     47.240     mm"
"             Rainfall volume        2168.31    2650.16    4818.47    c.m"
"             Rainfall losses        31.255     6.030      17.382     mm"
"             Runoff depth           15.984     41.210     29.858     mm"
"             Runoff volume          733.69     2311.86    3045.55    c.m"
"             Runoff coefficient     0.338      0.872      0.632      "
"             Maximum flow           0.235      1.609      1.635      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  1.635     1.635     0.274     0.541"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  1.635     1.635     1.635     0.541"
" 40          HYDROGRAPH   Combine    5"
"           6   Combine "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                 2.066    c.m/sec"
"            Hydrograph volume          8151.189    c.m"
"                  1.635     1.635     1.635     2.066"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                  1.635     0.000     1.635     2.066"
" 33          CATCHMENT 113"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         113   113"
"       50.000   % Impervious"
"        1.250   Total Area"
"       20.000   Flow length"
"       20.000   Overland Slope"
"        0.625   Pervious Area"
"       20.000   Pervious length"
"       20.000   Pervious slope"
"        0.625   Impervious Area"
"       20.000   Impervious length"
"       20.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.301   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.843   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.216     0.000     1.635     2.066 c.m/sec"
"             Catchment 113          Pervious   Impervious Total Area "
"             Surface Area           0.625      0.625      1.250      hectare"
"             Time of concentration  6.889      0.778      2.388      minutes"
"             Time to Centroid       105.861    87.184     92.105     minutes"
"             Rainfall depth         47.240     47.240     47.240     mm"
"             Rainfall volume        295.25     295.25     590.50     c.m"
"             Rainfall losses        32.999     7.433      20.216     mm"
"             Runoff depth           14.241     39.806     27.024     mm"
"             Runoff volume          89.00      248.79     337.79     c.m"
"             Runoff coefficient     0.301      0.843      0.572      "
"             Maximum flow           0.051      0.201      0.216      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.216     0.216     1.635     2.066"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.216     0.216     0.216     2.066"
" 40          HYDROGRAPH   Combine    5"
"           6   Combine "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                 2.270    c.m/sec"
"            Hydrograph volume          8488.985    c.m"
"                  0.216     0.216     0.216     2.270"
" 40          HYDROGRAPH   Confluence    5"
"           7   Confluence "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                 2.270    c.m/sec"
"            Hydrograph volume          8488.984    c.m"
"                  0.216     2.270     0.216     0.000"
" 54          POND DESIGN"
"        2.270   Current peak flow    c.m/sec"
"        0.497   Target outflow    c.m/sec"
"       8489.0   Hydrograph volume    c.m"
"          33.   Number of stages"
"      351.500   Minimum water level    metre"
"      354.700   Maximum water level    metre"
"      351.500   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                351.500     0.000     0.000"
"                351.600   0.00600   400.000"
"                351.700   0.01900   824.000"
"                351.800   0.03100  1272.000"
"                351.900   0.07800  1744.000"
"                352.000    0.1930  2240.000"
"                352.100    0.3670  2760.000"
"                352.200    0.5970  3298.000"
"                352.300    0.8520  3849.000"
"                352.400     1.011  4412.000"
"                352.500     1.122  4988.000"
"                352.600     1.223  5576.000"
"                352.700     1.316  6176.000"
"                352.800     1.403  6789.000"
"                352.900     1.485  7415.000"
"                353.000     1.563  8053.000"
"                353.100     1.637  8704.000"
"                353.200     1.708  9368.000"
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"               353.300     1.776  10045.00"
"               353.400     1.841  10735.00"
"               353.500     1.904  11439.00"
"               353.600     1.965  12156.00"
"               353.700     2.025  12884.00"
"               353.800     2.082  13625.00"
"               353.900     2.138  14378.00"
"               354.000     2.193  15143.00"
"               354.100     2.246  15921.00"
"               354.200     2.298  16712.00"
"               354.300     2.349  17517.00"
"               354.400     2.399  18334.00"
"               354.500     2.473  19165.00"
"               354.600     2.708  20012.00"
"               354.700     3.177  20879.00"
"            Peak outflow                  0.578    c.m/sec"
"            Maximum level               352.192    metre"
"            Maximum storage            3252.814    c.m"
"            Centroidal lag                6.383   hours"
"                 0.216     2.270     0.578     0.000 c.m/sec"
" 40         HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
"            Maximum flow                  0.578    c.m/sec"
"            Hydrograph volume          8379.085    c.m"
"                    0.216     2.270     0.578     0.578"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                    0.216     0.000     0.578     0.578"
" 33         CATCHMENT 114"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         114   114"
"       45.000   % Impervious"
"        1.250   Total Area"
"       60.000   Flow length"
"        2.000   Overland Slope"
"        0.688   Pervious Area"
"       60.000   Pervious length"
"        2.000   Pervious slope"
"        0.563   Impervious Area"
"       60.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.339   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.874   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.161     0.000     0.578     0.578 c.m/sec"
"            Catchment 114          Pervious   Impervious Total Area "
"            Surface Area           0.688      0.563      1.250      hectare"
"            Time of concentration  25.139     3.002      10.115     minutes"
"            Time to Centroid       128.342    90.350     102.557    minutes"
"            Rainfall depth         47.240     47.240     47.240     mm"
"            Rainfall volume        324.77     265.72     590.50     c.m"
"            Rainfall losses        31.249     5.955      19.867     mm"
"            Runoff depth           15.991     41.285     27.373     mm"
"            Runoff volume          109.94     232.23     342.16     c.m"
"            Runoff coefficient     0.339      0.874      0.579      "
"            Maximum flow           0.032      0.157      0.161      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    0.161     0.161     0.578     0.578"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                    0.161     0.161     0.161     0.578"
" 40         HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
"            Maximum flow                  0.592    c.m/sec"
"            Hydrograph volume          8721.249    c.m"
"                    0.161     0.161     0.161     0.592"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                    0.161     0.000     0.161     0.592"
" 33         CATCHMENT 115"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         115   115"
"       0.000   % Impervious"
"       2.110   Total Area"
"     365.000   Flow length"
"       0.500   Overland Slope"
"       2.110   Pervious Area"
"     365.000   Pervious length"
"       0.500   Pervious slope"
"       0.000   Impervious Area"
"     365.000   Impervious length"
"       0.500   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.304   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                    0.026     0.000     0.161     0.592 c.m/sec"
"            Catchment 115          Pervious   Impervious Total Area "
"            Surface Area           2.110      0.000      2.110      hectare"
"            Time of concentration  118.988    13.444     118.987    minutes"
"            Time to Centroid       247.120    105.276    247.119    minutes"
"            Rainfall depth         47.240     47.240     47.240     mm"
"            Rainfall volume        996.76     0.00       996.76     c.m"
"            Rainfall losses        32.864     5.308      32.864     mm"
"            Runoff depth           14.375     41.932     14.376     mm"
"            Runoff volume          303.32     0.00       303.32     c.m"
"            Runoff coefficient     0.304      0.000      0.304      "
"            Maximum flow           0.026      0.000      0.026      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    0.026     0.026     0.161     0.592"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                    0.026     0.026     0.026     0.592"
" 40         HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
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"             Maximum flow                  0.617    c.m/sec"
"             Hydrograph volume          9024.571    c.m"
"                    0.026     0.026     0.026     0.617"
" 40          HYDROGRAPH   Confluence    6"
"            7   Confluence "
"            6   Node #"
"                Swale Storage Prior to CMP Culvert"
"             Maximum flow                  0.617    c.m/sec"
"             Hydrograph volume          9024.571    c.m"
"                    0.026     0.617     0.026     0.000"
" 54          POND DESIGN"
"         0.617   Current peak flow    c.m/sec"
"         0.497   Target outflow    c.m/sec"
"        9024.6   Hydrograph volume    c.m"
"           37.   Number of stages"
"       351.100   Minimum water level    metre"
"       354.700   Maximum water level    metre"
"       351.100   Starting water level    metre"
"             0   Keep Design Data: 1 = True; 0 = False"
"                   Level Discharge    Volume"
"                 351.100     0.000     0.000"
"                 351.200   0.00900    0.1000"
"                 351.300   0.03600    0.6000"
"                 351.400   0.08100     1.000"
"                 351.500    0.1420     2.000"
"                 351.600    0.2180     5.000"
"                 351.700    0.3070     8.000"
"                 351.800    0.4210    14.000"
"                 351.900    0.5530    21.000"
"                 352.000    0.6750    29.000"
"                 352.100    0.8050    41.000"
"                 352.200    0.9380    57.000"
"                 352.300     1.066    76.000"
"                 352.400     1.191   100.000"
"                 352.500     1.307   128.000"
"                 352.600     1.410   160.000"
"                 352.700     1.507   197.000"
"                 352.800     1.596   239.000"
"                 352.900     1.684   286.000"
"                 353.000     1.768   337.000"
"                 353.100     1.849   393.000"
"                 353.200     1.928   455.000"
"                 353.300     2.005   526.000"
"                 353.400     2.080   596.000"
"                 353.500     2.153   676.000"
"                 353.600     2.224   761.000"
"                 353.700     2.293   854.000"
"                 353.800     2.361   953.000"
"                 353.900     2.427  1060.000"
"                 354.000     2.492  1174.000"
"                 354.100     2.556  1298.000"
"                 354.200     2.618  1435.000"
"                 354.300     2.689  1586.000"
"                 354.400     2.739  1751.000"
"                 354.500     2.797  1929.000"
"                 354.600     2.855  2121.000"
"                 354.700     2.911  2329.000"
"             Peak outflow                  0.617    c.m/sec"
"             Maximum level               351.952    metre"
"             Maximum storage              25.180    c.m"
"             Centroidal lag                6.145   hours"
"                  0.026     0.617     0.617     0.000 c.m/sec"
" 40          HYDROGRAPH   Combine    7"
"            6   Combine "
"            7   Node #"
"                Baden Creek Tributary"
"             Maximum flow                  0.617    c.m/sec"
"             Hydrograph volume          9023.084    c.m"
"                    0.026     0.617     0.617     0.617"
" 38          START/RE-START TOTALS 6"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                      67.300    hectare"
"             Total Impervious area                      8.664    hectare"
"             Total % impervious                        12.874"
" 19          EXIT"
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"                MIDUSS Output ------------------------------------------------>"
"                MIDUSS version                          Version 2.25  rev. 473"
"                MIDUSS created                       Sunday, February 7, 2010"
"           10   Units used:                                        ie METRIC"
"                Job folder:           Q:\40777\104\PRELIMINARY\SWM\2nd DP Sub\"
"                                                                  MIDUSS\Pre"
"                Output filename:                                  10yrPre2.in"
"                Licensee name:                                              A"
"                Company                                                     "
"                Date & Time last used:                 9/11/2023 at 1:17:26 PM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      180.000   Max. Storm length"
"     3000.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"           1   Chicago storm"
"     2221.000   Coefficient A"
"       12.000   Constant B"
"        0.908   Exponent C"
"        0.400   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity           169.551    mm/hr"
"             Total depth                  56.290    mm"
"           5   10hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 101"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         101   101"
"        0.000   % Impervious"
"        6.500   Total Area"
"      260.000   Flow length"
"        2.100   Overland Slope"
"        6.500   Pervious Area"
"      260.000   Pervious length"
"        2.100   Pervious slope"
"        0.000   Impervious Area"
"      260.000   Impervious length"
"        2.100   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.355   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.222     0.000     0.000     0.000 c.m/sec"
"             Catchment 101          Pervious   Impervious Total Area "
"             Surface Area           6.500      0.000      6.500      hectare"
"             Time of concentration  53.908     6.559      53.908     minutes"
"             Time to Centroid       163.635    94.471     163.635    minutes"
"             Rainfall depth         56.290     56.290     56.290     mm"
"             Rainfall volume        3658.86    0.00       3658.86    c.m"
"             Rainfall losses        36.311     5.759      36.311     mm"
"             Runoff depth           19.979     50.531     19.979     mm"
"             Runoff volume          1298.61    0.00       1298.61    c.m"
"             Runoff coefficient     0.355      0.000      0.355      "
"             Maximum flow           0.222      0.000      0.222      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.222     0.222     0.000     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.222     0.222     0.222     0.000"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"             Maximum flow                  0.222    c.m/sec"
"             Hydrograph volume          1298.614    c.m"
"                  0.222     0.222     0.222     0.222"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                  0.222     0.000     0.222     0.222"
" 33          CATCHMENT 102"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         102   102"
"        0.000   % Impervious"
"        4.490   Total Area"
"      205.000   Flow length"
"        1.800   Overland Slope"
"        4.490   Pervious Area"
"      205.000   Pervious length"
"        1.800   Pervious slope"
"        0.000   Impervious Area"
"      205.000   Impervious length"
"        1.800   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.355   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.167     0.000     0.222     0.222 c.m/sec"
"             Catchment 102          Pervious   Impervious Total Area "
"             Surface Area           4.490      0.000      4.490      hectare"
"             Time of concentration  48.956     5.957      48.956     minutes"
"             Time to Centroid       157.310    93.596     157.310    minutes"
"             Rainfall depth         56.290     56.290     56.290     mm"
"             Rainfall volume        2527.43    0.00       2527.43    c.m"
"             Rainfall losses        36.309     5.521      36.309     mm"
"             Runoff depth           19.981     50.770     19.981     mm"
"             Runoff volume          897.16     0.00       897.17     c.m"
"             Runoff coefficient     0.355      0.000      0.355      "
"             Maximum flow           0.167      0.000      0.167      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.167     0.167     0.222     0.222"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.167     0.167     0.167     0.222"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"             Maximum flow                  0.389    c.m/sec"
"             Hydrograph volume          2195.780    c.m"
"                  0.167     0.167     0.167     0.389"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
```

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"                   0.167     0.000     0.167     0.389"
" 33          CATCHMENT 103"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         103   103"
"       0.000   % Impervious"
"       2.280   Total Area"
"     180.000   Flow length"
"       3.300   Overland Slope"
"       2.280   Pervious Area"
"     180.000   Pervious length"
"       3.300   Pervious slope"
"       0.000   Impervious Area"
"     180.000   Impervious length"
"       3.300   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.355   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.104     0.000     0.167     0.389 c.m/sec"
"             Catchment 103          Pervious   Impervious Total Area "
"             Surface Area           2.280      0.000      2.280      hectare"
"             Time of concentration  37.752     4.594      37.752     minutes"
"             Time to Centroid       142.997    91.673     142.997    minutes"
"             Rainfall depth         56.290     56.290     56.290     mm"
"             Rainfall volume        1283.41    0.00       1283.42    c.m"
"             Rainfall losses        36.316     5.670      36.316     mm"
"             Runoff depth           19.974     50.620     19.974     mm"
"             Runoff volume          455.41     0.00       455.41     c.m"
"             Runoff coefficient     0.355      0.000      0.355      "
"             Maximum flow           0.104      0.000      0.104      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.104     0.104     0.167     0.389"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.104     0.104     0.104     0.389"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"             Maximum flow                 0.487    c.m/sec"
"             Hydrograph volume          2651.191    c.m"
"                   0.104     0.104     0.104     0.487"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.104     0.000     0.104     0.487"
" 33          CATCHMENT 104"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         104   104"
"       0.000   % Impervious"
"       0.920   Total Area"
"      75.000   Flow length"
"       4.700   Overland Slope"
"       0.920   Pervious Area"
"      75.000   Pervious length"
"       4.700   Pervious slope"
"       0.000   Impervious Area"
"      75.000   Impervious length"
"       4.700   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.355   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.065     0.000     0.104     0.487 c.m/sec"
"             Catchment 104          Pervious   Impervious Total Area "
"             Surface Area           0.920      0.000      0.920      hectare"
"             Time of concentration  20.079     2.443      20.079     minutes"
"             Time to Centroid       120.426    88.523     120.426    minutes"
"             Rainfall depth         56.290     56.290     56.290     mm"
"             Rainfall volume        517.87     0.00       517.87     c.m"
"             Rainfall losses        36.330     6.157      36.330     mm"
"             Runoff depth           19.961     50.133     19.961     mm"
"             Runoff volume          183.64     0.00       183.64     c.m"
"             Runoff coefficient     0.355      0.000      0.355      "
"             Maximum flow           0.065      0.000      0.065      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.065     0.065     0.104     0.487"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.065     0.065     0.065     0.487"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"             Maximum flow                 0.518    c.m/sec"
"             Hydrograph volume          2834.829    c.m"
"                   0.065     0.065     0.065     0.518"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.065     0.000     0.065     0.518"
" 33          CATCHMENT 105"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         105   105"
"       0.000   % Impervious"
"       2.200   Total Area"
"     135.000   Flow length"
"       2.500   Overland Slope"
"       2.200   Pervious Area"
"     135.000   Pervious length"
"       2.500   Pervious slope"
"       0.000   Impervious Area"
"     135.000   Impervious length"
"       2.500   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.355   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
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"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.107     0.000     0.065     0.518 c.m/sec"
"             Catchment 105          Pervious   Impervious Total Area "
"             Surface Area           2.200      0.000      2.200      hectare"
"             Time of concentration  34.526     4.201      34.526     minutes"
"             Time to Centroid       138.878    91.127     138.877    minutes"
"             Rainfall depth         56.290     56.290     56.290     mm"
"             Rainfall volume        1238.38    0.00       1238.38    c.m"
"             Rainfall losses        36.317     5.813      36.317     mm"
"             Runoff depth           19.973     50.477     19.973     mm"
"             Runoff volume          439.40     0.00       439.40     c.m"
"             Runoff coefficient     0.355      0.000      0.355      "
"             Maximum flow           0.107      0.000      0.107      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.107     0.107     0.065     0.518"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.107     0.107     0.107     0.518"
" 40          HYDROGRAPH   Combine    2"
"            6   Combine "
"            2   Node #"
"                Activa Baden Subdivision"
"             Maximum flow                  0.107    c.m/sec"
"             Hydrograph volume           439.400    c.m"
"                    0.107     0.107     0.107     0.107"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.107     0.000     0.107     0.107"
" 33          CATCHMENT 106"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          106   106"
"        0.000   % Impervious"
"        4.300   Total Area"
"      265.000   Flow length"
"        1.600   Overland Slope"
"        4.300   Pervious Area"
"      265.000   Pervious length"
"        1.600   Pervious slope"
"        0.000   Impervious Area"
"      265.000   Impervious length"
"        1.600   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.355   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.137     0.000     0.107     0.107 c.m/sec"
"             Catchment 106          Pervious   Impervious Total Area "
"             Surface Area           4.300      0.000      4.300      hectare"
"             Time of concentration  59.162     7.199      59.162     minutes"
"             Time to Centroid       170.344    95.391     170.344    minutes"
"             Rainfall depth         56.290     56.290     56.290     mm"
"             Rainfall volume        2420.47    0.00       2420.48    c.m"
"             Rainfall losses        36.310     5.666      36.310     mm"
"             Runoff depth           19.980     50.624     19.980     mm"
"             Runoff volume          859.15     0.00       859.15     c.m"
"             Runoff coefficient     0.355      0.000      0.355      "
"             Maximum flow           0.137      0.000      0.137      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.137     0.137     0.107     0.107"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.137     0.137     0.137     0.107"
" 40          HYDROGRAPH   Combine    2"
"            6   Combine "
"            2   Node #"
"                Activa Baden Subdivision"
"             Maximum flow                  0.229    c.m/sec"
"             Hydrograph volume          1298.550    c.m"
"                    0.137     0.137     0.137     0.229"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.137     0.000     0.137     0.229"
" 33          CATCHMENT 107"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          107   107"
"        1.000   % Impervious"
"        8.850   Total Area"
"      330.000   Flow length"
"        2.000   Overland Slope"
"        8.762   Pervious Area"
"      330.000   Pervious length"
"        2.000   Pervious slope"
"        0.089   Impervious Area"
"      330.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.355   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.902   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.267     0.000     0.137     0.229 c.m/sec"
"             Catchment 107          Pervious   Impervious Total Area "
"             Surface Area           8.762      0.089      8.850      hectare"
"             Time of concentration  63.115     7.680      61.728     minutes"
"             Time to Centroid       175.395    96.061     173.410    minutes"
"             Rainfall depth         56.290     56.290     56.290     mm"
"             Rainfall volume        4931.86    49.82      4981.68    c.m"
"             Rainfall losses        36.312     5.542      36.004     mm"
"             Runoff depth           19.978     50.748     20.286     mm"
"             Runoff volume          1750.39    44.91      1795.30    c.m"
"             Runoff coefficient     0.355      0.902      0.360      "
"             Maximum flow           0.265      0.032      0.267      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.267     0.267     0.137     0.229"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.267     0.267     0.267     0.229"
" 40          HYDROGRAPH   Combine    3"
"            6   Combine "
"            3   Node #"
"                Ex. 1000mm CSP Culvert"
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"             Maximum flow                  0.267    c.m/sec"
"             Hydrograph volume          1795.300    c.m"
"                    0.267     0.267     0.267     0.267"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.267     0.000     0.267     0.267"
" 33          CATCHMENT 108"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          108   108"
"        2.000   % Impervious"
"       18.930   Total Area"
"      570.000   Flow length"
"        1.600   Overland Slope"
"       18.551   Pervious Area"
"      570.000   Pervious length"
"        1.600   Pervious slope"
"        0.379   Impervious Area"
"      570.000   Impervious length"
"        1.600   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.355   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.905   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.408     0.000     0.267     0.267 c.m/sec"
"             Catchment 108          Pervious   Impervious Total Area "
"             Surface Area           18.551     0.379      18.930     hectare"
"             Time of concentration  93.675     11.398     89.607     minutes"
"             Time to Centroid       214.430    101.294    208.836    minutes"
"             Rainfall depth         56.290     56.290     56.290     mm"
"             Rainfall volume        1.0443     0.0213     1.0656     ha-m"
"             Rainfall losses        36.309     5.361      35.690     mm"
"             Runoff depth           19.981     50.929     20.600     mm"
"             Runoff volume          3706.81    192.82     3899.63    c.m"
"             Runoff coefficient     0.355      0.905      0.366      "
"             Maximum flow           0.401      0.105      0.408      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.408     0.408     0.267     0.267"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.408     0.408     0.408     0.267"
" 40          HYDROGRAPH   Combine    3"
"            6   Combine "
"            3   Node #"
"                Ex. 1000mm CSP Culvert"
"             Maximum flow                  0.650    c.m/sec"
"             Hydrograph volume          5694.923    c.m"
"                    0.408     0.408     0.408     0.650"
" 40          HYDROGRAPH   Confluence    3"
"            7   Confluence "
"            3   Node #"
"                Ex. 1000mm CSP Culvert"
"             Maximum flow                  0.650    c.m/sec"
"             Hydrograph volume          5694.923    c.m"
"                    0.408     0.650     0.408     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.408     0.650     0.650     0.000"
" 40          HYDROGRAPH   Combine    5"
"            6   Combine "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  0.650    c.m/sec"
"             Hydrograph volume          5694.923    c.m"
"                    0.408     0.650     0.650     0.650"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.408     0.000     0.650     0.650"
" 33          CATCHMENT 109"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          109   109"
"        0.000   % Impervious"
"        0.910   Total Area"
"      125.000   Flow length"
"        1.500   Overland Slope"
"        0.910   Pervious Area"
"      125.000   Pervious length"
"        1.500   Pervious slope"
"        0.000   Impervious Area"
"      125.000   Impervious length"
"        1.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.355   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.041     0.000     0.650     0.650 c.m/sec"
"             Catchment 109          Pervious   Impervious Total Area "
"             Surface Area           0.910      0.000      0.910      hectare"
"             Time of concentration  38.428     4.676      38.428     minutes"
"             Time to Centroid       143.861    91.799     143.861    minutes"
"             Rainfall depth         56.290     56.290     56.290     mm"
"             Rainfall volume        512.24     0.00       512.24     c.m"
"             Rainfall losses        36.317     5.674      36.317     mm"
"             Runoff depth           19.973     50.617     19.973     mm"
"             Runoff volume          181.76     0.00       181.76     c.m"
"             Runoff coefficient     0.355      0.000      0.355      "
"             Maximum flow           0.041      0.000      0.041      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.041     0.041     0.650     0.650"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.041     0.041     0.041     0.650"
" 40          HYDROGRAPH   Combine    4"
"            6   Combine "
"            4   Node #"
"                Snyder's/Christian"
"             Maximum flow                  0.041    c.m/sec"
"             Hydrograph volume           181.756    c.m"
"                    0.041     0.041     0.041     0.041"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.041     0.000     0.041     0.041"
" 33          CATCHMENT 110"
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"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          110   110"
"       45.000   % Impervious"
"        1.030   Total Area"
"       70.000   Flow length"
"        0.700   Overland Slope"
"        0.566   Pervious Area"
"       70.000   Pervious length"
"        0.700   Pervious slope"
"        0.463   Impervious Area"
"       70.000   Impervious length"
"        0.700   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.390   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.896   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.172     0.000     0.041     0.041 c.m/sec"
"             Catchment 110          Pervious   Impervious Total Area "
"             Surface Area           0.566      0.463      1.030      hectare"
"             Time of concentration  32.523     4.150      14.009     minutes"
"             Time to Centroid       136.091    91.052     106.702    minutes"
"             Rainfall depth         56.290     56.290     56.290     mm"
"             Rainfall volume        318.88     260.90     579.79     c.m"
"             Rainfall losses        34.316     5.858      21.510     mm"
"             Runoff depth           21.974     50.432     34.780     mm"
"             Runoff volume          124.48     233.75     358.24     c.m"
"             Runoff coefficient     0.390      0.896      0.618      "
"             Maximum flow           0.032      0.165      0.172      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.172     0.172     0.041     0.041"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.172     0.172     0.172     0.041"
" 40          HYDROGRAPH   Combine    4"
"            6   Combine "
"            4   Node #"
"                Snyder's/Christian"
"             Maximum flow                  0.181    c.m/sec"
"             Hydrograph volume           539.992    c.m"
"                    0.172     0.172     0.172     0.181"
" 40          HYDROGRAPH   Confluence    4"
"            7   Confluence "
"            4   Node #"
"                Snyder's/Christian"
"             Maximum flow                  0.181    c.m/sec"
"             Hydrograph volume           539.992    c.m"
"                    0.172     0.181     0.172     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.172     0.181     0.181     0.000"
" 40          HYDROGRAPH   Combine    5"
"            6   Combine "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  0.698    c.m/sec"
"             Hydrograph volume          6234.907    c.m"
"                    0.172     0.181     0.181     0.698"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.172     0.000     0.181     0.698"
" 33          CATCHMENT 111"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          111   111"
"       45.000   % Impervious"
"        2.080   Total Area"
"       80.000   Flow length"
"        2.000   Overland Slope"
"        1.144   Pervious Area"
"       80.000   Pervious length"
"        2.000   Pervious slope"
"        0.936   Impervious Area"
"       80.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.390   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.890   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.340     0.000     0.181     0.698 c.m/sec"
"             Catchment 111          Pervious   Impervious Total Area "
"             Surface Area           1.144      0.936      2.080      hectare"
"             Time of concentration  25.717     3.282      11.111     minutes"
"             Time to Centroid       127.304    89.802     102.889    minutes"
"             Rainfall depth         56.290     56.290     56.290     mm"
"             Rainfall volume        643.96     526.88     1170.83    c.m"
"             Rainfall losses        34.329     6.216      21.678     mm"
"             Runoff depth           21.962     50.075     34.612     mm"
"             Runoff volume          251.24     468.70     719.94     c.m"
"             Runoff coefficient     0.390      0.890      0.615      "
"             Maximum flow           0.075      0.316      0.340      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.340     0.340     0.181     0.698"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.340     0.340     0.340     0.698"
" 40          HYDROGRAPH   Combine    5"
"            6   Combine "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  0.741    c.m/sec"
"             Hydrograph volume          6954.844    c.m"
"                    0.340     0.340     0.340     0.741"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.340     0.000     0.340     0.741"
" 33          CATCHMENT 112"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          112   112"
"       55.000   % Impervious"
"       10.200   Total Area"
"       60.000   Flow length"
```

```
"        3.000   Overland Slope"
"        4.590   Pervious Area"
"       60.000   Pervious length"
"        3.000   Pervious slope"
"        5.610   Impervious Area"
"       60.000   Impervious length"
"        3.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.390   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.891   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  2.082     0.000     0.340     0.741 c.m/sec"
"             Catchment 112          Pervious   Impervious Total Area "
"             Surface Area           4.590      5.610      10.200     hectare"
"             Time of concentration  19.161     2.445      6.851      minutes"
"             Time to Centroid       118.848    88.526     96.518     minutes"
"             Rainfall depth         56.290     56.290     56.290     mm"
"             Rainfall volume        2583.72    3157.88    5741.59    c.m"
"             Rainfall losses        34.360     6.159      18.849     mm"
"             Runoff depth           21.931     50.131     37.441     mm"
"             Runoff volume          1006.61    2812.35    3818.96    c.m"
"             Runoff coefficient     0.390      0.891      0.665      "
"             Maximum flow           0.364      2.032      2.082      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  2.082     2.082     0.340     0.741"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  2.082     2.082     2.082     0.741"
" 40          HYDROGRAPH   Combine    5"
"           6   Combine "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                 2.634    c.m/sec"
"            Hydrograph volume        10773.809    c.m"
"                  2.082     2.082     2.082     2.634"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                  2.082     0.000     2.082     2.634"
" 33          CATCHMENT 113"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         113   113"
"      50.000   % Impervious"
"       1.250   Total Area"
"      20.000   Flow length"
"      20.000   Overland Slope"
"       0.625   Pervious Area"
"      20.000   Pervious length"
"      20.000   Pervious slope"
"       0.625   Impervious Area"
"      20.000   Impervious length"
"      20.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.352   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.849   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                  0.279     0.000     2.082     2.634 c.m/sec"
"             Catchment 113          Pervious   Impervious Total Area "
"             Surface Area           0.625      0.625      1.250      hectare"
"             Time of concentration  5.884      0.716      2.229      minutes"
"             Time to Centroid       102.398    86.182     90.931     minutes"
"             Rainfall depth         56.290     56.290     56.290     mm"
"             Rainfall volume        351.81     351.81     703.63     c.m"
"             Rainfall losses        36.488     8.472      22.480     mm"
"             Runoff depth           19.803     47.818     33.810     mm"
"             Runoff volume          123.77     298.86     422.63     c.m"
"             Runoff coefficient     0.352      0.849      0.601      "
"             Maximum flow           0.074      0.247      0.279      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.279     0.279     2.082     2.634"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.279     0.279     0.279     2.634"
" 40          HYDROGRAPH   Combine    5"
"           6   Combine "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                 2.913    c.m/sec"
"            Hydrograph volume        11196.439    c.m"
"                  0.279     0.279     0.279     2.913"
" 40          HYDROGRAPH   Confluence    5"
"           7   Confluence "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                 2.913    c.m/sec"
"            Hydrograph volume        11196.440    c.m"
"                  0.279     2.913     0.279     0.000"
" 54          POND DESIGN"
"       2.913   Current peak flow    c.m/sec"
"       0.497   Target outflow    c.m/sec"
"     11196.4   Hydrograph volume    c.m"
"          33.  Number of stages"
"     351.500   Minimum water level    metre"
"     354.700   Maximum water level    metre"
"     351.500   Starting water level    metre"
"           0   Keep Design Data: 1 = True; 0 = False"
"                 Level Discharge    Volume"
"               351.500     0.000     0.000"
"               351.600   0.00600   400.000"
"               351.700   0.01900   824.000"
"               351.800   0.03100  1272.000"
"               351.900   0.07800  1744.000"
"               352.000    0.1930  2240.000"
"               352.100    0.3670  2760.000"
"               352.200    0.5970  3298.000"
"               352.300    0.8520  3849.000"
"               352.400     1.011  4412.000"
"               352.500     1.122  4988.000"
"               352.600     1.223  5576.000"
"               352.700     1.316  6176.000"
"               352.800     1.403  6789.000"
"               352.900     1.485  7415.000"
"               353.000     1.563  8053.000"
"               353.100     1.637  8704.000"
"               353.200     1.708  9368.000"
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"               353.300     1.776  10045.00"
"               353.400     1.841  10735.00"
"               353.500     1.904  11439.00"
"               353.600     1.965  12156.00"
"               353.700     2.025  12884.00"
"               353.800     2.082  13625.00"
"               353.900     2.138  14378.00"
"               354.000     2.193  15143.00"
"               354.100     2.246  15921.00"
"               354.200     2.298  16712.00"
"               354.300     2.349  17517.00"
"               354.400     2.399  18334.00"
"               354.500     2.473  19165.00"
"               354.600     2.708  20012.00"
"               354.700     3.177  20879.00"
"            Peak outflow                  0.889    c.m/sec"
"            Maximum level               352.323    metre"
"            Maximum storage            3980.999    c.m"
"            Centroidal lag                5.511   hours"
"                 0.279     2.913     0.889     0.000 c.m/sec"
" 40         HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
"            Maximum flow                  0.889    c.m/sec"
"            Hydrograph volume         11085.773    c.m"
"                   0.279     2.913     0.889     0.889"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.279     0.000     0.889     0.889"
" 33         CATCHMENT 114"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         114   114"
"       45.000   % Impervious"
"        1.250   Total Area"
"       60.000   Flow length"
"        2.000   Overland Slope"
"        0.688   Pervious Area"
"       60.000   Pervious length"
"        2.000   Pervious slope"
"        0.563   Impervious Area"
"       60.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.390   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.887   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                   0.204     0.000     0.889     0.889 c.m/sec"
"            Catchment 114          Pervious   Impervious Total Area "
"            Surface Area           0.688      0.563      1.250      hectare"
"            Time of concentration  21.640     2.761      9.362      minutes"
"            Time to Centroid       122.050    89.008     100.561    minutes"
"            Rainfall depth         56.290     56.290     56.290     mm"
"            Rainfall volume        386.99     316.63     703.63     c.m"
"            Rainfall losses        34.325     6.356      21.739     mm"
"            Runoff depth           21.965     49.935     34.551     mm"
"            Runoff volume          151.01     280.88     431.89     c.m"
"            Runoff coefficient     0.390      0.887      0.614      "
"            Maximum flow           0.053      0.198      0.204      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.204     0.204     0.889     0.889"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.204     0.204     0.204     0.889"
" 40         HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
"            Maximum flow                  0.909    c.m/sec"
"            Hydrograph volume         11517.669    c.m"
"                   0.204     0.204     0.204     0.909"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.204     0.000     0.204     0.909"
" 33         CATCHMENT 115"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         115   115"
"       0.000   % Impervious"
"       2.110   Total Area"
"     365.000   Flow length"
"       0.500   Overland Slope"
"       2.110   Pervious Area"
"     365.000   Pervious length"
"       0.500   Pervious slope"
"       0.000   Impervious Area"
"     365.000   Impervious length"
"       0.500   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.355   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.042     0.000     0.204     0.909 c.m/sec"
"            Catchment 115          Pervious   Impervious Total Area "
"            Surface Area           2.110      0.000      2.110      hectare"
"            Time of concentration  101.629    12.366     101.629    minutes"
"            Time to Centroid       224.588    102.681    224.588    minutes"
"            Rainfall depth         56.290     56.290     56.290     mm"
"            Rainfall volume        1187.72    0.00       1187.72    c.m"
"            Rainfall losses        36.308     5.397      36.308     mm"
"            Runoff depth           19.983     50.893     19.983     mm"
"            Runoff volume          421.63     0.00       421.63     c.m"
"            Runoff coefficient     0.355      0.000      0.355      "
"            Maximum flow           0.042      0.000      0.042      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.042     0.042     0.204     0.909"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.042     0.042     0.042     0.909"
" 40         HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
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"             Maximum flow                  0.950    c.m/sec"
"             Hydrograph volume         11939.290    c.m"
"                    0.042     0.042     0.042     0.950"
" 40          HYDROGRAPH   Confluence    6"
"            7   Confluence "
"            6   Node #"
"                Swale Storage Prior to CMP Culvert"
"             Maximum flow                  0.950    c.m/sec"
"             Hydrograph volume         11939.290    c.m"
"                    0.042     0.950     0.042     0.000"
" 54          POND DESIGN"
"         0.950   Current peak flow    c.m/sec"
"         0.497   Target outflow    c.m/sec"
"      11939.3   Hydrograph volume    c.m"
"           37.   Number of stages"
"       351.100   Minimum water level    metre"
"       354.700   Maximum water level    metre"
"       351.100   Starting water level    metre"
"             0   Keep Design Data: 1 = True; 0 = False"
"                   Level Discharge    Volume"
"                 351.100     0.000     0.000"
"                 351.200   0.00900    0.1000"
"                 351.300   0.03600    0.6000"
"                 351.400   0.08100     1.000"
"                 351.500    0.1420     2.000"
"                 351.600    0.2180     5.000"
"                 351.700    0.3070     8.000"
"                 351.800    0.4210    14.000"
"                 351.900    0.5530    21.000"
"                 352.000    0.6750    29.000"
"                 352.100    0.8050    41.000"
"                 352.200    0.9380    57.000"
"                 352.300     1.066    76.000"
"                 352.400     1.191   100.000"
"                 352.500     1.307   128.000"
"                 352.600     1.410   160.000"
"                 352.700     1.507   197.000"
"                 352.800     1.596   239.000"
"                 352.900     1.684   286.000"
"                 353.000     1.768   337.000"
"                 353.100     1.849   393.000"
"                 353.200     1.928   455.000"
"                 353.300     2.005   526.000"
"                 353.400     2.080   596.000"
"                 353.500     2.153   676.000"
"                 353.600     2.224   761.000"
"                 353.700     2.293   854.000"
"                 353.800     2.361   953.000"
"                 353.900     2.427  1060.000"
"                 354.000     2.492  1174.000"
"                 354.100     2.556  1298.000"
"                 354.200     2.618  1435.000"
"                 354.300     2.689  1586.000"
"                 354.400     2.739  1751.000"
"                 354.500     2.797  1929.000"
"                 354.600     2.855  2121.000"
"                 354.700     2.911  2329.000"
"             Peak outflow                  0.949    c.m/sec"
"             Maximum level               352.209    metre"
"             Maximum storage              58.664    c.m"
"             Centroidal lag                5.329   hours"
"                  0.042     0.950     0.949     0.000 c.m/sec"
" 40          HYDROGRAPH   Combine    7"
"            6   Combine "
"            7   Node #"
"                Baden Creek Tributary"
"             Maximum flow                  0.949    c.m/sec"
"             Hydrograph volume         11937.224    c.m"
"                    0.042     0.950     0.949     0.949"
" 38          START/RE-START TOTALS 6"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                     67.300    hectare"
"             Total Impervious area                     8.664    hectare"
"             Total % impervious                       12.874"
" 19          EXIT"
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"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                          Version 2.25  rev. 473"
"                MIDUSS created                       Sunday, February 7, 2010"
"           10   Units used:                                        ie METRIC"
"                Job folder:          Q:\40777\104\PRELIMINARY\SWM\2nd DP Sub\"
"                                                                  MIDUSS\Pre"
"                Output filename:                                  25yrPre2.in"
"                Licensee name:                                              A"
"                Company                                                     "
"                Date & Time last used:                9/11/2023 at 1:23:44 PM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      180.000   Max. Storm length"
"     3000.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"           1   Chicago storm"
"     3158.000   Coefficient A"
"       15.000   Constant B"
"        0.935   Exponent C"
"        0.400   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity          191.844    mm/hr"
"             Total depth                 68.446    mm"
"           5   25hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 101"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         101   101"
"        0.000   % Impervious"
"        6.500   Total Area"
"      260.000   Flow length"
"        2.100   Overland Slope"
"        6.500   Pervious Area"
"      260.000   Pervious length"
"        2.100   Pervious slope"
"        0.000   Impervious Area"
"      260.000   Impervious length"
"        2.100   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.413   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.356     0.000     0.000     0.000 c.m/sec"
"             Catchment 101          Pervious   Impervious Total Area "
"             Surface Area           6.500      0.000      6.500      hectare"
"             Time of concentration  47.649     6.218      47.648     minutes"
"             Time to Centroid       153.956    93.355     153.955    minutes"
"             Rainfall depth         68.446     68.446     68.446     mm"
"             Rainfall volume        4449.02    0.00       4449.02    c.m"
"             Rainfall losses        40.205     5.735      40.205     mm"
"             Runoff depth           28.241     62.712     28.241     mm"
"             Runoff volume          1835.67    0.00       1835.68    c.m"
"             Runoff coefficient     0.413      0.000      0.413      "
"             Maximum flow           0.356      0.000      0.356      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    0.356     0.356     0.000     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                    0.356     0.356     0.356     0.000"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"            Maximum flow                   0.356    c.m/sec"
"            Hydrograph volume           1835.679    c.m"
"                    0.356     0.356     0.356     0.356"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                    0.356     0.000     0.356     0.356"
" 33          CATCHMENT 102"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         102   102"
"        0.000   % Impervious"
"        4.490   Total Area"
"      205.000   Flow length"
"        1.800   Overland Slope"
"        4.490   Pervious Area"
"      205.000   Pervious length"
"        1.800   Pervious slope"
"        0.000   Impervious Area"
"      205.000   Impervious length"
"        1.800   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.413   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.268     0.000     0.356     0.356 c.m/sec"
"             Catchment 102          Pervious   Impervious Total Area "
"             Surface Area           4.490      0.000      4.490      hectare"
"             Time of concentration  43.271     5.647      43.271     minutes"
"             Time to Centroid       148.419    92.577     148.419    minutes"
"             Rainfall depth         68.446     68.446     68.446     mm"
"             Rainfall volume        3073.24    0.00       3073.25    c.m"
"             Rainfall losses        40.197     5.730      40.196     mm"
"             Runoff depth           28.250     62.717     28.250     mm"
"             Runoff volume          1268.42    0.00       1268.43    c.m"
"             Runoff coefficient     0.413      0.000      0.413      "
"             Maximum flow           0.268      0.000      0.268      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    0.268     0.268     0.356     0.356"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                    0.268     0.268     0.268     0.356"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"            Maximum flow                   0.618    c.m/sec"
"            Hydrograph volume           3104.104    c.m"
"                    0.268     0.268     0.268     0.618"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
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"                   0.268     0.000     0.268     0.618"
" 33          CATCHMENT 103"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         103   103"
"       0.000   % Impervious"
"       2.280   Total Area"
"     180.000   Flow length"
"       3.300   Overland Slope"
"       2.280   Pervious Area"
"     180.000   Pervious length"
"       3.300   Pervious slope"
"       0.000   Impervious Area"
"     180.000   Impervious length"
"       3.300   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.413   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.164     0.000     0.268     0.618 c.m/sec"
"             Catchment 103          Pervious   Impervious Total Area "
"             Surface Area           2.280      0.000      2.280      hectare"
"             Time of concentration  33.369     4.354      33.369     minutes"
"             Time to Centroid       135.890    90.773     135.890    minutes"
"             Rainfall depth         68.446     68.446     68.446     mm"
"             Rainfall volume        1560.58    0.00       1560.58    c.m"
"             Rainfall losses        40.203     5.912      40.203     mm"
"             Runoff depth           28.244     62.534     28.244     mm"
"             Runoff volume          643.95     0.00       643.95     c.m"
"             Runoff coefficient     0.413      0.000      0.413      "
"             Maximum flow           0.164      0.000      0.164      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.164     0.164     0.268     0.618"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.164     0.164     0.164     0.618"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"             Maximum flow                 0.775    c.m/sec"
"             Hydrograph volume         3748.056    c.m"
"                   0.164     0.164     0.164     0.775"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.164     0.000     0.164     0.775"
" 33          CATCHMENT 104"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         104   104"
"       0.000   % Impervious"
"       0.920   Total Area"
"      75.000   Flow length"
"       4.700   Overland Slope"
"       0.920   Pervious Area"
"      75.000   Pervious length"
"       4.700   Pervious slope"
"       0.000   Impervious Area"
"      75.000   Impervious length"
"       4.700   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.412   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.100     0.000     0.164     0.775 c.m/sec"
"             Catchment 104          Pervious   Impervious Total Area "
"             Surface Area           0.920      0.000      0.920      hectare"
"             Time of concentration  17.748     2.316      17.748     minutes"
"             Time to Centroid       116.120    87.805     116.120    minutes"
"             Rainfall depth         68.446     68.446     68.446     mm"
"             Rainfall volume        629.71     0.00       629.71     c.m"
"             Rainfall losses        40.214     6.399      40.214     mm"
"             Runoff depth           28.232     62.047     28.232     mm"
"             Runoff volume          259.74     0.00       259.74     c.m"
"             Runoff coefficient     0.412      0.000      0.412      "
"             Maximum flow           0.100      0.000      0.100      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.100     0.100     0.164     0.775"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.100     0.100     0.100     0.775"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"             Maximum flow                 0.825    c.m/sec"
"             Hydrograph volume         4007.793    c.m"
"                   0.100     0.100     0.100     0.825"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.100     0.000     0.100     0.825"
" 33          CATCHMENT 105"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         105   105"
"       0.000   % Impervious"
"       2.200   Total Area"
"     135.000   Flow length"
"       2.500   Overland Slope"
"       2.200   Pervious Area"
"     135.000   Pervious length"
"       2.500   Pervious slope"
"       0.000   Impervious Area"
"     135.000   Impervious length"
"       2.500   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.413   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
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"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.169     0.000     0.100     0.825 c.m/sec"
"             Catchment 105          Pervious   Impervious Total Area "
"             Surface Area           2.200      0.000      2.200      hectare"
"             Time of concentration  30.518     3.982      30.517     minutes"
"             Time to Centroid       132.278    90.258     132.278    minutes"
"             Rainfall depth         68.446     68.446     68.446     mm"
"             Rainfall volume        1505.82    0.00       1505.82    c.m"
"             Rainfall losses        40.210     6.152      40.210     mm"
"             Runoff depth           28.236     62.294     28.236     mm"
"             Runoff volume          621.20     0.00       621.20     c.m"
"             Runoff coefficient     0.413      0.000      0.413      "
"             Maximum flow           0.169      0.000      0.169      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.169     0.169     0.100     0.825"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.169     0.169     0.169     0.825"
" 40          HYDROGRAPH   Combine    2"
"             6   Combine "
"             2   Node #"
"                 Activa Baden Subdivision"
"             Maximum flow                  0.169    c.m/sec"
"             Hydrograph volume           621.196    c.m"
"                    0.169     0.169     0.169     0.169"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.169     0.000     0.169     0.169"
" 33          CATCHMENT 106"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           106   106"
"         0.000   % Impervious"
"         4.300   Total Area"
"       265.000   Flow length"
"         1.600   Overland Slope"
"         4.300   Pervious Area"
"       265.000   Pervious length"
"         1.600   Pervious slope"
"         0.000   Impervious Area"
"       265.000   Impervious length"
"         1.600   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.413   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.000   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.218     0.000     0.169     0.169 c.m/sec"
"             Catchment 106          Pervious   Impervious Total Area "
"             Surface Area           4.300      0.000      4.300      hectare"
"             Time of concentration  52.293     6.824      52.293     minutes"
"             Time to Centroid       159.829    94.209     159.829    minutes"
"             Rainfall depth         68.446     68.446     68.446     mm"
"             Rainfall volume        2943.20    0.00       2943.20    c.m"
"             Rainfall losses        40.196     5.989      40.196     mm"
"             Runoff depth           28.250     62.457     28.250     mm"
"             Runoff volume          1214.76    0.00       1214.76    c.m"
"             Runoff coefficient     0.413      0.000      0.413      "
"             Maximum flow           0.218      0.000      0.218      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.218     0.218     0.169     0.169"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.218     0.218     0.218     0.169"
" 40          HYDROGRAPH   Combine    2"
"             6   Combine "
"             2   Node #"
"                 Activa Baden Subdivision"
"             Maximum flow                  0.365    c.m/sec"
"             Hydrograph volume          1835.960    c.m"
"                    0.218     0.218     0.218     0.365"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.218     0.000     0.218     0.365"
" 33          CATCHMENT 107"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           107   107"
"         1.000   % Impervious"
"         8.850   Total Area"
"       330.000   Flow length"
"         2.000   Overland Slope"
"         8.762   Pervious Area"
"       330.000   Pervious length"
"         2.000   Pervious slope"
"         0.089   Impervious Area"
"       330.000   Impervious length"
"         2.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.413   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.915   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.426     0.000     0.218     0.365 c.m/sec"
"             Catchment 107          Pervious   Impervious Total Area "
"             Surface Area           8.762      0.089      8.850      hectare"
"             Time of concentration  55.787     7.280      54.724     minutes"
"             Time to Centroid       164.243    94.850     162.723    minutes"
"             Rainfall depth         68.446     68.446     68.446     mm"
"             Rainfall volume        5996.94    60.58      6057.51    c.m"
"             Rainfall losses        40.202     5.809      39.858     mm"
"             Runoff depth           28.245     62.637     28.589     mm"
"             Runoff volume          2474.67    55.43      2530.10    c.m"
"             Runoff coefficient     0.413      0.915      0.418      "
"             Maximum flow           0.423      0.038      0.426      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.426     0.426     0.218     0.365"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.426     0.426     0.426     0.365"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Ex. 1000mm CSP Culvert"
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"             Maximum flow                  0.426    c.m/sec"
"             Hydrograph volume          2530.105    c.m"
"                    0.426     0.426     0.426     0.426"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.426     0.000     0.426     0.426"
" 33          CATCHMENT 108"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          108   108"
"        2.000   % Impervious"
"       18.930   Total Area"
"      570.000   Flow length"
"        1.600   Overland Slope"
"       18.551   Pervious Area"
"      570.000   Pervious length"
"        1.600   Pervious slope"
"        0.379   Impervious Area"
"      570.000   Impervious length"
"        1.600   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.413   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.920   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.649     0.000     0.426     0.426 c.m/sec"
"             Catchment 108          Pervious   Impervious Total Area "
"             Surface Area           18.551     0.379      18.930     hectare"
"             Time of concentration  82.798     10.805     79.666     minutes"
"             Time to Centroid       198.419    99.671     194.123    minutes"
"             Rainfall depth         68.446     68.446     68.446     mm"
"             Rainfall volume        1.2698     0.0259     1.2957     ha-m"
"             Rainfall losses        40.195     5.477      39.500     mm"
"             Runoff depth           28.252     62.969     28.946     mm"
"             Runoff volume          5241.12    238.40     5479.52    c.m"
"             Runoff coefficient     0.413      0.920      0.423      "
"             Maximum flow           0.639      0.130      0.649      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.649     0.649     0.426     0.426"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.649     0.649     0.649     0.426"
" 40          HYDROGRAPH   Combine    3"
"            6   Combine "
"            3   Node #"
"                Ex. 1000mm CSP Culvert"
"             Maximum flow                  1.041    c.m/sec"
"             Hydrograph volume          8009.627    c.m"
"                    0.649     0.649     0.649     1.041"
" 40          HYDROGRAPH   Confluence    3"
"            7   Confluence "
"            3   Node #"
"                Ex. 1000mm CSP Culvert"
"             Maximum flow                  1.041    c.m/sec"
"             Hydrograph volume          8009.628    c.m"
"                    0.649     1.041     0.649     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.649     1.041     1.041     0.000"
" 40          HYDROGRAPH   Combine    5"
"            6   Combine "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  1.041    c.m/sec"
"             Hydrograph volume          8009.628    c.m"
"                    0.649     1.041     1.041     1.041"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.649     0.000     1.041     1.041"
" 33          CATCHMENT 109"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          109   109"
"        0.000   % Impervious"
"        0.910   Total Area"
"      125.000   Flow length"
"        1.500   Overland Slope"
"        0.910   Pervious Area"
"      125.000   Pervious length"
"        1.500   Pervious slope"
"        0.000   Impervious Area"
"      125.000   Impervious length"
"        1.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.413   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.065     0.000     1.041     1.041 c.m/sec"
"             Catchment 109          Pervious   Impervious Total Area "
"             Surface Area           0.910      0.000      0.910      hectare"
"             Time of concentration  33.966     4.432      33.966     minutes"
"             Time to Centroid       136.641    90.890     136.641    minutes"
"             Rainfall depth         68.446     68.446     68.446     mm"
"             Rainfall volume        622.86     0.00       622.86     c.m"
"             Rainfall losses        40.208     5.852      40.208     mm"
"             Runoff depth           28.239     62.594     28.239     mm"
"             Runoff volume          256.97     0.00       256.97     c.m"
"             Runoff coefficient     0.413      0.000      0.413      "
"             Maximum flow           0.065      0.000      0.065      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.065     0.065     1.041     1.041"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.065     0.065     0.065     1.041"
" 40          HYDROGRAPH   Combine    4"
"            6   Combine "
"            4   Node #"
"                Snyder's/Christian"
"             Maximum flow                  0.065    c.m/sec"
"             Hydrograph volume           256.974    c.m"
"                    0.065     0.065     0.065     0.065"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.065     0.000     0.065     0.065"
" 33          CATCHMENT 110"
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"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          110   110"
"       45.000   % Impervious"
"        1.030   Total Area"
"       70.000   Flow length"
"        0.700   Overland Slope"
"        0.566   Pervious Area"
"       70.000   Pervious length"
"        0.700   Pervious slope"
"        0.463   Impervious Area"
"       70.000   Impervious length"
"        0.700   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.448   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.909   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.204     0.000     0.065     0.065 c.m/sec"
"             Catchment 110          Pervious   Impervious Total Area "
"             Surface Area           0.566      0.463      1.030      hectare"
"             Time of concentration  28.946     3.934      13.338     minutes"
"             Time to Centroid       130.039    90.204     105.181    minutes"
"             Rainfall depth         68.446     68.446     68.446     mm"
"             Rainfall volume        387.75     317.25     705.00     c.m"
"             Rainfall losses        37.767     6.210      23.566     mm"
"             Runoff depth           30.680     62.236     44.880     mm"
"             Runoff volume          173.80     288.46     462.27     c.m"
"             Runoff coefficient     0.448      0.909      0.656      "
"             Maximum flow           0.050      0.190      0.204      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                  0.204     0.204     0.065     0.065"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                  0.204     0.204     0.204     0.065"
" 40          HYDROGRAPH   Combine    4"
"            6   Combine "
"            4   Node #"
"                Snyder's/Christian"
"             Maximum flow                  0.219    c.m/sec"
"             Hydrograph volume           719.239    c.m"
"                  0.204     0.204     0.204     0.219"
" 40          HYDROGRAPH   Confluence    4"
"            7   Confluence "
"            4   Node #"
"                Snyder's/Christian"
"             Maximum flow                  0.219    c.m/sec"
"             Hydrograph volume           719.239    c.m"
"                  0.204     0.219     0.204     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                  0.204     0.219     0.219     0.000"
" 40          HYDROGRAPH   Combine    5"
"            6   Combine "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  1.117    c.m/sec"
"             Hydrograph volume          8728.867    c.m"
"                  0.204     0.219     0.219     1.117"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                  0.204     0.000     0.219     1.117"
" 33          CATCHMENT 111"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          111   111"
"       45.000   % Impervious"
"        2.080   Total Area"
"       80.000   Flow length"
"        2.000   Overland Slope"
"        1.144   Pervious Area"
"       80.000   Pervious length"
"        2.000   Pervious slope"
"        0.936   Impervious Area"
"       80.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.448   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.904   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.407     0.000     0.219     1.117 c.m/sec"
"             Catchment 111          Pervious   Impervious Total Area "
"             Surface Area           1.144      0.936      2.080      hectare"
"             Time of concentration  22.888     3.111      10.571     minutes"
"             Time to Centroid       122.298    89.010     101.567    minutes"
"             Rainfall depth         68.446     68.446     68.446     mm"
"             Rainfall volume        783.03     640.66     1423.69    c.m"
"             Rainfall losses        37.785     6.582      23.744     mm"
"             Runoff depth           30.661     61.865     44.703     mm"
"             Runoff volume          350.77     579.05     929.82     c.m"
"             Runoff coefficient     0.448      0.904      0.653      "
"             Maximum flow           0.117      0.378      0.407      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                  0.407     0.407     0.219     1.117"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                  0.407     0.407     0.407     1.117"
" 40          HYDROGRAPH   Combine    5"
"            6   Combine "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  1.187    c.m/sec"
"             Hydrograph volume          9658.685    c.m"
"                  0.407     0.407     0.407     1.187"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                  0.407     0.000     0.407     1.187"
" 33          CATCHMENT 112"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          112   112"
"       55.000   % Impervious"
"       10.200   Total Area"
"       60.000   Flow length"
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"        3.000   Overland Slope"
"        4.590   Pervious Area"
"       60.000   Pervious length"
"        3.000   Pervious slope"
"        5.610   Impervious Area"
"       60.000   Impervious length"
"        3.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.448   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.906   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  2.485     0.000     0.407     1.187 c.m/sec"
"             Catchment 112          Pervious   Impervious Total Area "
"             Surface Area           4.590      5.610      10.200     hectare"
"             Time of concentration  17.054     2.318      6.560      minutes"
"             Time to Centroid       114.845    87.808     95.591     minutes"
"             Rainfall depth         68.446     68.446     68.446     mm"
"             Rainfall volume        3141.69    3839.85    6981.54    c.m"
"             Rainfall losses        37.792     6.402      20.528     mm"
"             Runoff depth           30.654     62.045     47.919     mm"
"             Runoff volume          1407.03    3480.70    4887.73    c.m"
"             Runoff coefficient     0.448      0.906      0.700      "
"             Maximum flow           0.560      2.393      2.485      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  2.485     2.485     0.407     1.187"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  2.485     2.485     2.485     1.187"
" 40          HYDROGRAPH   Combine    5"
"           6   Combine "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                 3.242    c.m/sec"
"            Hydrograph volume        14546.407    c.m"
"                  2.485     2.485     2.485     3.242"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                  2.485     0.000     2.485     3.242"
" 33          CATCHMENT 113"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         113   113"
"       50.000   % Impervious"
"        1.250   Total Area"
"       20.000   Flow length"
"       20.000   Overland Slope"
"        0.625   Pervious Area"
"       20.000   Pervious length"
"       20.000   Pervious slope"
"        0.625   Impervious Area"
"       20.000   Impervious length"
"       20.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.411   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.858   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.340     0.000     2.485     3.242 c.m/sec"
"             Catchment 113          Pervious   Impervious Total Area "
"             Surface Area           0.625      0.625      1.250      hectare"
"             Time of concentration  5.200      0.679      2.142      minutes"
"             Time to Centroid       100.306    85.743     90.455     minutes"
"             Rainfall depth         68.446     68.446     68.446     mm"
"             Rainfall volume        427.79     427.79     855.58     c.m"
"             Rainfall losses        40.345     9.698      25.021     mm"
"             Runoff depth           28.102     58.749     43.425     mm"
"             Runoff volume          175.64     367.18     542.82     c.m"
"             Runoff coefficient     0.411      0.858      0.634      "
"             Maximum flow           0.110      0.283      0.340      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.340     0.340     2.485     3.242"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.340     0.340     0.340     3.242"
" 40          HYDROGRAPH   Combine    5"
"           6   Combine "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                 3.524    c.m/sec"
"            Hydrograph volume        15089.225    c.m"
"                  0.340     0.340     0.340     3.524"
" 40          HYDROGRAPH   Confluence    5"
"           7   Confluence "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                 3.524    c.m/sec"
"            Hydrograph volume        15089.224    c.m"
"                  0.340     3.524     0.340     0.000"
" 54          POND DESIGN"
"        3.524   Current peak flow    c.m/sec"
"        0.497   Target outflow    c.m/sec"
"      15089.2   Hydrograph volume    c.m"
"           33.  Number of stages"
"      351.500   Minimum water level    metre"
"      354.700   Maximum water level    metre"
"      351.500   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                351.500     0.000     0.000"
"                351.600   0.00600   400.000"
"                351.700   0.01900   824.000"
"                351.800   0.03100  1272.000"
"                351.900   0.07800  1744.000"
"                352.000    0.1930  2240.000"
"                352.100    0.3670  2760.000"
"                352.200    0.5970  3298.000"
"                352.300    0.8520  3849.000"
"                352.400     1.011  4412.000"
"                352.500     1.122  4988.000"
"                352.600     1.223  5576.000"
"                352.700     1.316  6176.000"
"                352.800     1.403  6789.000"
"                352.900     1.485  7415.000"
"                353.000     1.563  8053.000"
"                353.100     1.637  8704.000"
"                353.200     1.708  9368.000"
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"               353.300     1.776  10045.00"
"               353.400     1.841  10735.00"
"               353.500     1.904  11439.00"
"               353.600     1.965  12156.00"
"               353.700     2.025  12884.00"
"               353.800     2.082  13625.00"
"               353.900     2.138  14378.00"
"               354.000     2.193  15143.00"
"               354.100     2.246  15921.00"
"               354.200     2.298  16712.00"
"               354.300     2.349  17517.00"
"               354.400     2.399  18334.00"
"               354.500     2.473  19165.00"
"               354.600     2.708  20012.00"
"               354.700     3.177  20879.00"
"            Peak outflow                  1.209    c.m/sec"
"            Maximum level               352.586    metre"
"            Maximum storage            5495.181    c.m"
"            Centroidal lag                4.888   hours"
"                 0.340     3.524     1.209     0.000 c.m/sec"
" 40         HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
"            Maximum flow                  1.209    c.m/sec"
"            Hydrograph volume         14978.439    c.m"
"                  0.340     3.524     1.209     1.209"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                  0.340     0.000     1.209     1.209"
" 33         CATCHMENT 114"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         114   114"
"       45.000   % Impervious"
"        1.250   Total Area"
"       60.000   Flow length"
"        2.000   Overland Slope"
"        0.688   Pervious Area"
"       60.000   Pervious length"
"        2.000   Pervious slope"
"        0.563   Impervious Area"
"       60.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.447   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.903   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.247     0.000     1.209     1.209 c.m/sec"
"            Catchment 114          Pervious   Impervious Total Area "
"            Surface Area           0.688      0.563      1.250      hectare"
"            Time of concentration  19.259     2.618      8.893      minutes"
"            Time to Centroid       117.664    88.275     99.357     minutes"
"            Rainfall depth         68.446     68.446     68.446     mm"
"            Rainfall volume        470.57     385.01     855.58     c.m"
"            Rainfall losses        37.827     6.621      23.785     mm"
"            Runoff depth           30.619     61.825     44.662     mm"
"            Runoff volume          210.51     347.77     558.27     c.m"
"            Runoff coefficient     0.447      0.903      0.653      "
"            Maximum flow           0.077      0.236      0.247      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.247     0.247     1.209     1.209"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.247     0.247     0.247     1.209"
" 40         HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
"            Maximum flow                  1.230    c.m/sec"
"            Hydrograph volume         15536.715    c.m"
"                  0.247     0.247     0.247     1.230"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                  0.247     0.000     0.247     1.230"
" 33         CATCHMENT 115"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         115   115"
"       0.000   % Impervious"
"       2.110   Total Area"
"     365.000   Flow length"
"       0.500   Overland Slope"
"       2.110   Pervious Area"
"     365.000   Pervious length"
"       0.500   Pervious slope"
"       0.000   Impervious Area"
"     365.000   Impervious length"
"       0.500   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.413   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                  0.068     0.000     0.247     1.230 c.m/sec"
"            Catchment 115          Pervious   Impervious Total Area "
"            Surface Area           2.110      0.000      2.110      hectare"
"            Time of concentration  89.829     11.722     89.829     minutes"
"            Time to Centroid       207.311    100.964    207.311    minutes"
"            Rainfall depth         68.446     68.446     68.446     mm"
"            Rainfall volume        1444.22    0.00       1444.22    c.m"
"            Rainfall losses        40.194     5.418      40.194     mm"
"            Runoff depth           28.252     63.028     28.252     mm"
"            Runoff volume          596.12     0.00       596.12     c.m"
"            Runoff coefficient     0.413      0.000      0.413      "
"            Maximum flow           0.068      0.000      0.068      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.068     0.068     0.247     1.230"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.068     0.068     0.068     1.230"
" 40         HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
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"             Maximum flow                  1.298    c.m/sec"
"             Hydrograph volume         16132.838    c.m"
"                    0.068     0.068     0.068     1.298"
" 40          HYDROGRAPH   Confluence    6"
"            7   Confluence "
"            6   Node #"
"                Swale Storage Prior to CMP Culvert"
"             Maximum flow                  1.298    c.m/sec"
"             Hydrograph volume         16132.839    c.m"
"                    0.068     1.298     0.068     0.000"
" 54          POND DESIGN"
"         1.298   Current peak flow    c.m/sec"
"         0.497   Target outflow    c.m/sec"
"       16132.8   Hydrograph volume    c.m"
"           37.   Number of stages"
"       351.100   Minimum water level    metre"
"       354.700   Maximum water level    metre"
"       351.100   Starting water level    metre"
"             0   Keep Design Data: 1 = True; 0 = False"
"                   Level Discharge    Volume"
"                 351.100     0.000     0.000"
"                 351.200   0.00900    0.1000"
"                 351.300   0.03600    0.6000"
"                 351.400   0.08100     1.000"
"                 351.500    0.1420     2.000"
"                 351.600    0.2180     5.000"
"                 351.700    0.3070     8.000"
"                 351.800    0.4210    14.000"
"                 351.900    0.5530    21.000"
"                 352.000    0.6750    29.000"
"                 352.100    0.8050    41.000"
"                 352.200    0.9380    57.000"
"                 352.300     1.066    76.000"
"                 352.400     1.191   100.000"
"                 352.500     1.307   128.000"
"                 352.600     1.410   160.000"
"                 352.700     1.507   197.000"
"                 352.800     1.596   239.000"
"                 352.900     1.684   286.000"
"                 353.000     1.768   337.000"
"                 353.100     1.849   393.000"
"                 353.200     1.928   455.000"
"                 353.300     2.005   526.000"
"                 353.400     2.080   596.000"
"                 353.500     2.153   676.000"
"                 353.600     2.224   761.000"
"                 353.700     2.293   854.000"
"                 353.800     2.361   953.000"
"                 353.900     2.427  1060.000"
"                 354.000     2.492  1174.000"
"                 354.100     2.556  1298.000"
"                 354.200     2.618  1435.000"
"                 354.300     2.689  1586.000"
"                 354.400     2.739  1751.000"
"                 354.500     2.797  1929.000"
"                 354.600     2.855  2121.000"
"                 354.700     2.911  2329.000"
"             Peak outflow                  1.297    c.m/sec"
"             Maximum level               352.491    metre"
"             Maximum storage             125.511    c.m"
"             Centroidal lag                4.747   hours"
"                  0.068     1.298     1.297     0.000 c.m/sec"
" 40          HYDROGRAPH   Combine    7"
"            6   Combine "
"            7   Node #"
"                Baden Creek Tributary"
"             Maximum flow                  1.297    c.m/sec"
"             Hydrograph volume         16130.665    c.m"
"                    0.068     1.298     1.297     1.297"
" 38          START/RE-START TOTALS 6"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                     67.300    hectare"
"             Total Impervious area                     8.664    hectare"
"             Total % impervious                       12.874"
" 19          EXIT"
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"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                          Version 2.25  rev. 473"
"                MIDUSS created                       Sunday, February 7, 2010"
"           10   Units used:                                        ie METRIC"
"                Job folder:          Q:\40777\104\PRELIMINARY\SWM\2nd DP Sub\"
"                                                                  MIDUSS\Pre"
"                Output filename:                                  50yrPre2.in"
"                Licensee name:                                              A"
"                Company                                                     "
"                Date & Time last used:                9/11/2023 at 1:28:02 PM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      180.000   Max. Storm length"
"     3000.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"           1   Chicago storm"
"     3886.000   Coefficient A"
"       16.000   Constant B"
"        0.950   Exponent C"
"        0.400   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity          215.474    mm/hr"
"             Total depth                 77.443    mm"
"           5   50hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 101"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         101   101"
"        0.000   % Impervious"
"        6.500   Total Area"
"      260.000   Flow length"
"        2.100   Overland Slope"
"        6.500   Pervious Area"
"      260.000   Pervious length"
"        2.100   Pervious slope"
"        0.000   Impervious Area"
"      260.000   Impervious length"
"        2.100   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.449   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.482     0.000     0.000     0.000 c.m/sec"
"             Catchment 101          Pervious   Impervious Total Area "
"             Surface Area           6.500      0.000      6.500      hectare"
"             Time of concentration  43.635     5.924      43.635     minutes"
"             Time to Centroid       148.083    92.543     148.083    minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        5033.77    0.01       5033.78    c.m"
"             Rainfall losses        42.650     5.774      42.650     mm"
"             Runoff depth           34.792     71.669     34.792     mm"
"             Runoff volume          2261.50    0.00       2261.51    c.m"
"             Runoff coefficient     0.449      0.000      0.449      "
"             Maximum flow           0.482      0.000      0.482      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.482     0.482     0.000     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.482     0.482     0.482     0.000"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"            Maximum flow                  0.482    c.m/sec"
"            Hydrograph volume          2261.506    c.m"
"                  0.482     0.482     0.482     0.482"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                  0.482     0.000     0.482     0.482"
" 33          CATCHMENT 102"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         102   102"
"        0.000   % Impervious"
"        4.490   Total Area"
"      205.000   Flow length"
"        1.800   Overland Slope"
"        4.490   Pervious Area"
"      205.000   Pervious length"
"        1.800   Pervious slope"
"        0.000   Impervious Area"
"      205.000   Impervious length"
"        1.800   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.449   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.354     0.000     0.482     0.482 c.m/sec"
"             Catchment 102          Pervious   Impervious Total Area "
"             Surface Area           4.490      0.000      4.490      hectare"
"             Time of concentration  39.627     5.380      39.627     minutes"
"             Time to Centroid       142.997    91.750     142.997    minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        3477.18    0.00       3477.18    c.m"
"             Rainfall losses        42.649     6.035      42.649     mm"
"             Runoff depth           34.793     71.408     34.793     mm"
"             Runoff volume          1562.22    0.00       1562.23    c.m"
"             Runoff coefficient     0.449      0.000      0.449      "
"             Maximum flow           0.354      0.000      0.354      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.354     0.354     0.482     0.482"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.354     0.354     0.354     0.482"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"            Maximum flow                  0.837    c.m/sec"
"            Hydrograph volume          3823.731    c.m"
"                  0.354     0.354     0.354     0.837"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
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"                   0.354     0.000     0.354     0.837"
" 33          CATCHMENT 103"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         103   103"
"       0.000   % Impervious"
"       2.280   Total Area"
"     180.000   Flow length"
"       3.300   Overland Slope"
"       2.280   Pervious Area"
"     180.000   Pervious length"
"       3.300   Pervious slope"
"       0.000   Impervious Area"
"     180.000   Impervious length"
"       3.300   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.449   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.220     0.000     0.354     0.837 c.m/sec"
"             Catchment 103          Pervious   Impervious Total Area "
"             Surface Area           2.280      0.000      2.280      hectare"
"             Time of concentration  30.558     4.149      30.558     minutes"
"             Time to Centroid       131.496    90.060     131.496    minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        1765.69    0.00       1765.69    c.m"
"             Rainfall losses        42.661     6.135      42.661     mm"
"             Runoff depth           34.781     71.308     34.781     mm"
"             Runoff volume          793.02     0.00       793.02     c.m"
"             Runoff coefficient     0.449      0.000      0.449      "
"             Maximum flow           0.220      0.000      0.220      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.220     0.220     0.354     0.837"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.220     0.220     0.220     0.837"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"             Maximum flow                  1.039    c.m/sec"
"             Hydrograph volume          4616.749    c.m"
"                   0.220     0.220     0.220     1.039"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.220     0.000     0.220     1.039"
" 33          CATCHMENT 104"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         104   104"
"       0.000   % Impervious"
"       0.920   Total Area"
"      75.000   Flow length"
"       4.700   Overland Slope"
"       0.920   Pervious Area"
"      75.000   Pervious length"
"       4.700   Pervious slope"
"       0.000   Impervious Area"
"      75.000   Impervious length"
"       4.700   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.448   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.132     0.000     0.220     1.039 c.m/sec"
"             Catchment 104          Pervious   Impervious Total Area "
"             Surface Area           0.920      0.000      0.920      hectare"
"             Time of concentration  16.253     2.206      16.253     minutes"
"             Time to Centroid       113.370    87.231     113.370    minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        712.47     0.00       712.47     c.m"
"             Rainfall losses        42.754     6.462      42.754     mm"
"             Runoff depth           34.688     70.981     34.688     mm"
"             Runoff volume          319.13     0.00       319.13     c.m"
"             Runoff coefficient     0.448      0.000      0.448      "
"             Maximum flow           0.132      0.000      0.132      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.132     0.132     0.220     1.039"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.132     0.132     0.132     1.039"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"             Maximum flow                  1.097    c.m/sec"
"             Hydrograph volume          4935.880    c.m"
"                   0.132     0.132     0.132     1.097"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.132     0.000     0.132     1.097"
" 33          CATCHMENT 105"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         105   105"
"       0.000   % Impervious"
"       2.200   Total Area"
"     135.000   Flow length"
"       2.500   Overland Slope"
"       2.200   Pervious Area"
"     135.000   Pervious length"
"       2.500   Pervious slope"
"       0.000   Impervious Area"
"     135.000   Impervious length"
"       2.500   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.449   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
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"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.227     0.000     0.132     1.097 c.m/sec"
"             Catchment 105          Pervious   Impervious Total Area "
"             Surface Area           2.200      0.000      2.200      hectare"
"             Time of concentration  27.947     3.794      27.947     minutes"
"             Time to Centroid       128.177    89.583     128.177    minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        1703.74    0.00       1703.74    c.m"
"             Rainfall losses        42.681     6.650      42.681     mm"
"             Runoff depth           34.762     70.793     34.762     mm"
"             Runoff volume          764.76     0.00       764.76     c.m"
"             Runoff coefficient     0.449      0.000      0.449      "
"             Maximum flow           0.227      0.000      0.227      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.227     0.227     0.132     1.097"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.227     0.227     0.227     1.097"
" 40          HYDROGRAPH   Combine    2"
"             6   Combine "
"             2   Node #"
"                 Activa Baden Subdivision"
"             Maximum flow                  0.227    c.m/sec"
"             Hydrograph volume           764.763    c.m"
"                    0.227     0.227     0.227     0.227"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.227     0.000     0.227     0.227"
" 33          CATCHMENT 106"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           106   106"
"         0.000   % Impervious"
"         4.300   Total Area"
"       265.000   Flow length"
"         1.600   Overland Slope"
"         4.300   Pervious Area"
"       265.000   Pervious length"
"         1.600   Pervious slope"
"         0.000   Impervious Area"
"       265.000   Impervious length"
"         1.600   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.449   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.000   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.294     0.000     0.227     0.227 c.m/sec"
"             Catchment 106          Pervious   Impervious Total Area "
"             Surface Area           4.300      0.000      4.300      hectare"
"             Time of concentration  47.888     6.501      47.888     minutes"
"             Time to Centroid       153.476    93.333     153.476    minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        3330.04    0.00       3330.04    c.m"
"             Rainfall losses        42.652     5.935      42.652     mm"
"             Runoff depth           34.791     71.508     34.791     mm"
"             Runoff volume          1495.99    0.00       1496.00    c.m"
"             Runoff coefficient     0.449      0.000      0.449      "
"             Maximum flow           0.294      0.000      0.294      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.294     0.294     0.227     0.227"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.294     0.294     0.294     0.227"
" 40          HYDROGRAPH   Combine    2"
"             6   Combine "
"             2   Node #"
"                 Activa Baden Subdivision"
"             Maximum flow                  0.486    c.m/sec"
"             Hydrograph volume          2260.759    c.m"
"                    0.294     0.294     0.294     0.486"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.294     0.000     0.294     0.486"
" 33          CATCHMENT 107"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           107   107"
"         1.000   % Impervious"
"         8.850   Total Area"
"       330.000   Flow length"
"         2.000   Overland Slope"
"         8.762   Pervious Area"
"       330.000   Pervious length"
"         2.000   Pervious slope"
"         0.089   Impervious Area"
"       330.000   Impervious length"
"         2.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.449   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.922   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.576     0.000     0.294     0.486 c.m/sec"
"             Catchment 107          Pervious   Impervious Total Area "
"             Surface Area           8.762      0.089      8.850      hectare"
"             Time of concentration  51.088     6.936      50.191     minutes"
"             Time to Centroid       157.536    93.912     156.244    minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        6785.15    68.54      6853.68    c.m"
"             Rainfall losses        42.649     6.047      42.283     mm"
"             Runoff depth           34.794     71.396     35.160     mm"
"             Runoff volume          3048.48    63.19      3111.67    c.m"
"             Runoff coefficient     0.449      0.922      0.454      "
"             Maximum flow           0.572      0.044      0.576      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.576     0.576     0.294     0.486"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.576     0.576     0.576     0.486"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Ex. 1000mm CSP Culvert"
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"             Maximum flow                  0.576    c.m/sec"
"             Hydrograph volume          3111.666    c.m"
"                    0.576     0.576     0.576     0.576"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.576     0.000     0.576     0.576"
" 33          CATCHMENT 108"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           108   108"
"         2.000   % Impervious"
"        18.930   Total Area"
"       570.000   Flow length"
"         1.600   Overland Slope"
"        18.551   Pervious Area"
"       570.000   Pervious length"
"         1.600   Pervious slope"
"         0.379   Impervious Area"
"       570.000   Impervious length"
"         1.600   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.449   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.925   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.872     0.000     0.576     0.576 c.m/sec"
"             Catchment 108          Pervious   Impervious Total Area "
"             Surface Area           18.551     0.379      18.930     hectare"
"             Time of concentration  75.824     10.294     73.181     minutes"
"             Time to Centroid       188.908    98.484     185.262    minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        1.4367     0.0293     1.4660     ha-m"
"             Rainfall losses        42.646     5.793      41.909     mm"
"             Runoff depth           34.797     71.650     35.534     mm"
"             Runoff volume          6455.32    271.27     6726.58    c.m"
"             Runoff coefficient     0.449      0.925      0.459      "
"             Maximum flow           0.860      0.150      0.872      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.872     0.872     0.576     0.576"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.872     0.872     0.872     0.576"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Ex. 1000mm CSP Culvert"
"             Maximum flow                  1.392    c.m/sec"
"             Hydrograph volume          9838.242    c.m"
"                    0.872     0.872     0.872     1.392"
" 40          HYDROGRAPH   Confluence    3"
"             7   Confluence "
"             3   Node #"
"                 Ex. 1000mm CSP Culvert"
"             Maximum flow                  1.392    c.m/sec"
"             Hydrograph volume          9838.242    c.m"
"                    0.872     1.392     0.872     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.872     1.392     1.392     0.000"
" 40          HYDROGRAPH   Combine    5"
"             6   Combine "
"             5   Node #"
"                 to Baden West SWMF"
"             Maximum flow                  1.392    c.m/sec"
"             Hydrograph volume          9838.242    c.m"
"                    0.872     1.392     1.392     1.392"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.872     0.000     1.392     1.392"
" 33          CATCHMENT 109"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           109   109"
"         0.000   % Impervious"
"         0.910   Total Area"
"       125.000   Flow length"
"         1.500   Overland Slope"
"         0.910   Pervious Area"
"       125.000   Pervious length"
"         1.500   Pervious slope"
"         0.000   Impervious Area"
"       125.000   Impervious length"
"         1.500   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.449   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.000   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.086     0.000     1.392     1.392 c.m/sec"
"             Catchment 109          Pervious   Impervious Total Area "
"             Surface Area           0.910      0.000      0.910      hectare"
"             Time of concentration  31.105     4.223      31.105     minutes"
"             Time to Centroid       132.194    90.158     132.194    minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        704.73     0.00       704.73     c.m"
"             Rainfall losses        42.661     6.096      42.661     mm"
"             Runoff depth           34.781     71.346     34.781     mm"
"             Runoff volume          316.51     0.00       316.51     c.m"
"             Runoff coefficient     0.449      0.000      0.449      "
"             Maximum flow           0.086      0.000      0.086      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.086     0.086     1.392     1.392"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.086     0.086     0.086     1.392"
" 40          HYDROGRAPH   Combine    4"
"             6   Combine "
"             4   Node #"
"                 Snyder's/Christian"
"             Maximum flow                  0.086    c.m/sec"
"             Hydrograph volume           316.510    c.m"
"                    0.086     0.086     0.086     0.086"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.086     0.000     0.086     0.086"
" 33          CATCHMENT 110"
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"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          110   110"
"       45.000   % Impervious"
"        1.030   Total Area"
"       70.000   Flow length"
"        0.700   Overland Slope"
"        0.566   Pervious Area"
"       70.000   Pervious length"
"        0.700   Pervious slope"
"        0.463   Impervious Area"
"       70.000   Impervious length"
"        0.700   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.485   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.913   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.233     0.000     0.086     0.086 c.m/sec"
"             Catchment 110          Pervious   Impervious Total Area "
"             Surface Area           0.566      0.463      1.030      hectare"
"             Time of concentration  26.610     3.748      12.747     minutes"
"             Time to Centroid       126.181    89.522     103.951    minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        438.71     358.95     797.66     c.m"
"             Rainfall losses        39.899     6.753      24.983     mm"
"             Runoff depth           37.544     70.690     52.459     mm"
"             Runoff volume          212.68     327.65     540.33     c.m"
"             Runoff coefficient     0.485      0.913      0.677      "
"             Maximum flow           0.065      0.213      0.233      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                  0.233     0.233     0.086     0.086"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                  0.233     0.233     0.233     0.086"
" 40          HYDROGRAPH   Combine    4"
"            6   Combine "
"            4   Node #"
"                Snyder's/Christian"
"             Maximum flow                  0.255    c.m/sec"
"             Hydrograph volume           856.842    c.m"
"                  0.233     0.233     0.233     0.255"
" 40          HYDROGRAPH   Confluence    4"
"            7   Confluence "
"            4   Node #"
"                Snyder's/Christian"
"             Maximum flow                  0.255    c.m/sec"
"             Hydrograph volume           856.842    c.m"
"                  0.233     0.255     0.233     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                  0.233     0.255     0.255     0.000"
" 40          HYDROGRAPH   Combine    5"
"            6   Combine "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  1.490    c.m/sec"
"             Hydrograph volume         10695.083    c.m"
"                  0.233     0.255     0.255     1.490"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                  0.233     0.000     0.255     1.490"
" 33          CATCHMENT 111"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          111   111"
"       45.000   % Impervious"
"        2.080   Total Area"
"       80.000   Flow length"
"        2.000   Overland Slope"
"        1.144   Pervious Area"
"       80.000   Pervious length"
"        2.000   Pervious slope"
"        0.936   Impervious Area"
"       80.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.485   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.910   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.468     0.000     0.255     1.490 c.m/sec"
"             Catchment 111          Pervious   Impervious Total Area "
"             Surface Area           1.144      0.936      2.080      hectare"
"             Time of concentration  21.041     2.964      10.093     minutes"
"             Time to Centroid       119.060    88.390     100.485    minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        885.95     724.86     1610.81    c.m"
"             Rainfall losses        39.908     6.993      25.097     mm"
"             Runoff depth           37.534     70.449     52.346     mm"
"             Runoff volume          429.39     659.41     1088.80    c.m"
"             Runoff coefficient     0.485      0.910      0.676      "
"             Maximum flow           0.155      0.434      0.468      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                  0.468     0.468     0.255     1.490"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                  0.468     0.468     0.468     1.490"
" 40          HYDROGRAPH   Combine    5"
"            6   Combine "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  1.583    c.m/sec"
"             Hydrograph volume         11783.888    c.m"
"                  0.468     0.468     0.468     1.583"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                  0.468     0.000     0.468     1.583"
" 33          CATCHMENT 112"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          112   112"
"       55.000   % Impervious"
"       10.200   Total Area"
"       60.000   Flow length"
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"        3.000   Overland Slope"
"        4.590   Pervious Area"
"       60.000   Pervious length"
"        3.000   Pervious slope"
"        5.610   Impervious Area"
"       60.000   Impervious length"
"        3.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.484   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.917   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  2.863     0.000     0.468     1.583 c.m/sec"
"             Catchment 112          Pervious   Impervious Total Area "
"             Surface Area           4.590      5.610      10.200     hectare"
"             Time of concentration  15.677     2.208      6.271      minutes"
"             Time to Centroid       112.211    87.233     94.768     minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        3554.62    4344.54    7899.16    c.m"
"             Rainfall losses        39.969     6.463      21.541     mm"
"             Runoff depth           37.473     70.979     55.902     mm"
"             Runoff volume          1720.03    3981.94    5701.96    c.m"
"             Runoff coefficient     0.484      0.917      0.722      "
"             Maximum flow           0.733      2.727      2.863      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  2.863     2.863     0.468     1.583"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  2.863     2.863     2.863     1.583"
" 40          HYDROGRAPH   Combine    5"
"           6   Combine "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                 3.801    c.m/sec"
"            Hydrograph volume        17485.850    c.m"
"                  2.863     2.863     2.863     3.801"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                  2.863     0.000     2.863     3.801"
" 33          CATCHMENT 113"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         113   113"
"       50.000   % Impervious"
"        1.250   Total Area"
"       20.000   Flow length"
"       20.000   Overland Slope"
"        0.625   Pervious Area"
"       20.000   Pervious length"
"       20.000   Pervious slope"
"        0.625   Impervious Area"
"       20.000   Impervious length"
"       20.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.447   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.860   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.403     0.000     2.863     3.801 c.m/sec"
"             Catchment 113          Pervious   Impervious Total Area "
"             Surface Area           0.625      0.625      1.250      hectare"
"             Time of concentration  4.762      0.647      2.053      minutes"
"             Time to Centroid       98.827     85.323     89.938     minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        484.02     484.02     968.03     c.m"
"             Rainfall losses        42.843     10.804     26.824     mm"
"             Runoff depth           34.599     66.639     50.619     mm"
"             Runoff volume          216.25     416.49     632.74     c.m"
"             Runoff coefficient     0.447      0.860      0.654      "
"             Maximum flow           0.142      0.318      0.403      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.403     0.403     2.863     3.801"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.403     0.403     0.403     3.801"
" 40          HYDROGRAPH   Combine    5"
"           6   Combine "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                 4.125    c.m/sec"
"            Hydrograph volume        18118.588    c.m"
"                  0.403     0.403     0.403     4.125"
" 40          HYDROGRAPH   Confluence    5"
"           7   Confluence "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                 4.125    c.m/sec"
"            Hydrograph volume        18118.586    c.m"
"                  0.403     4.125     0.403     0.000"
" 54          POND DESIGN"
"        4.125   Current peak flow    c.m/sec"
"        0.497   Target outflow    c.m/sec"
"      18118.6   Hydrograph volume    c.m"
"           33.  Number of stages"
"      351.500   Minimum water level    metre"
"      354.700   Maximum water level    metre"
"      351.500   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                351.500     0.000     0.000"
"                351.600   0.00600   400.000"
"                351.700   0.01900   824.000"
"                351.800   0.03100  1272.000"
"                351.900   0.07800  1744.000"
"                352.000    0.1930  2240.000"
"                352.100    0.3670  2760.000"
"                352.200    0.5970  3298.000"
"                352.300    0.8520  3849.000"
"                352.400     1.011  4412.000"
"                352.500     1.122  4988.000"
"                352.600     1.223  5576.000"
"                352.700     1.316  6176.000"
"                352.800     1.403  6789.000"
"                352.900     1.485  7415.000"
"                353.000     1.563  8053.000"
"                353.100     1.637  8704.000"
"                353.200     1.708  9368.000"
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"               353.300     1.776  10045.00"
"               353.400     1.841  10735.00"
"               353.500     1.904  11439.00"
"               353.600     1.965  12156.00"
"               353.700     2.025  12884.00"
"               353.800     2.082  13625.00"
"               353.900     2.138  14378.00"
"               354.000     2.193  15143.00"
"               354.100     2.246  15921.00"
"               354.200     2.298  16712.00"
"               354.300     2.349  17517.00"
"               354.400     2.399  18334.00"
"               354.500     2.473  19165.00"
"               354.600     2.708  20012.00"
"               354.700     3.177  20879.00"
"            Peak outflow                  1.433    c.m/sec"
"            Maximum level               352.838    metre"
"            Maximum storage            7023.963    c.m"
"            Centroidal lag                4.625   hours"
"                 0.403     4.125     1.433     0.000 c.m/sec"
" 40         HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
"            Maximum flow                  1.433    c.m/sec"
"            Hydrograph volume         18008.635    c.m"
"                    0.403     4.125     1.433     1.433"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                    0.403     0.000     1.433     1.433"
" 33         CATCHMENT 114"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         114   114"
"       45.000   % Impervious"
"        1.250   Total Area"
"       60.000   Flow length"
"        2.000   Overland Slope"
"        0.688   Pervious Area"
"       60.000   Pervious length"
"        2.000   Pervious slope"
"        0.563   Impervious Area"
"       60.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.485   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.913   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.286     0.000     1.433     1.433 c.m/sec"
"             Catchment 114          Pervious   Impervious Total Area "
"             Surface Area           0.688      0.563      1.250      hectare"
"             Time of concentration  17.705     2.494      8.477      minutes"
"             Time to Centroid       114.790    87.669     98.336     minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        532.42     435.62     968.03     c.m"
"             Rainfall losses        39.919     6.700      24.970     mm"
"             Runoff depth           37.524     70.743     52.473     mm"
"             Runoff volume          257.98     397.93     655.91     c.m"
"             Runoff coefficient     0.485      0.913      0.678      "
"             Maximum flow           0.102      0.270      0.286      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    0.286     0.286     1.433     1.433"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                    0.286     0.286     0.286     1.433"
" 40          HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
"            Maximum flow                  1.456    c.m/sec"
"            Hydrograph volume         18664.543    c.m"
"                    0.286     0.286     0.286     1.456"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                    0.286     0.000     0.286     1.456"
" 33          CATCHMENT 115"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         115   115"
"       0.000   % Impervious"
"       2.110   Total Area"
"     365.000   Flow length"
"       0.500   Overland Slope"
"       2.110   Pervious Area"
"     365.000   Pervious length"
"       0.500   Pervious slope"
"       0.000   Impervious Area"
"     365.000   Impervious length"
"       0.500   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.449   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                    0.091     0.000     0.286     1.456 c.m/sec"
"             Catchment 115          Pervious   Impervious Total Area "
"             Surface Area           2.110      0.000      2.110      hectare"
"             Time of concentration  82.262     11.168     82.262     minutes"
"             Time to Centroid       197.077    99.703     197.076    minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        1634.04    0.00       1634.04    c.m"
"             Rainfall losses        42.644     5.442      42.644     mm"
"             Runoff depth           34.799     72.001     34.799     mm"
"             Runoff volume          734.25     0.00       734.26     c.m"
"             Runoff coefficient     0.449      0.000      0.449      "
"             Maximum flow           0.091      0.000      0.091      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    0.091     0.091     0.286     1.456"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                    0.091     0.091     0.091     1.456"
" 40          HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
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"             Maximum flow                  1.546    c.m/sec"
"             Hydrograph volume         19398.803    c.m"
"                    0.091     0.091     0.091     1.546"
" 40          HYDROGRAPH   Confluence    6"
"            7   Confluence "
"            6   Node #"
"                Swale Storage Prior to CMP Culvert"
"             Maximum flow                  1.546    c.m/sec"
"             Hydrograph volume         19398.803    c.m"
"                    0.091     1.546     0.091     0.000"
" 54          POND DESIGN"
"         1.546   Current peak flow    c.m/sec"
"         0.497   Target outflow    c.m/sec"
"       19398.8   Hydrograph volume    c.m"
"           37.   Number of stages"
"       351.100   Minimum water level    metre"
"       354.700   Maximum water level    metre"
"       351.100   Starting water level    metre"
"             0   Keep Design Data: 1 = True; 0 = False"
"                   Level Discharge    Volume"
"                 351.100     0.000     0.000"
"                 351.200   0.00900    0.1000"
"                 351.300   0.03600    0.6000"
"                 351.400   0.08100     1.000"
"                 351.500    0.1420     2.000"
"                 351.600    0.2180     5.000"
"                 351.700    0.3070     8.000"
"                 351.800    0.4210    14.000"
"                 351.900    0.5530    21.000"
"                 352.000    0.6750    29.000"
"                 352.100    0.8050    41.000"
"                 352.200    0.9380    57.000"
"                 352.300     1.066    76.000"
"                 352.400     1.191   100.000"
"                 352.500     1.307   128.000"
"                 352.600     1.410   160.000"
"                 352.700     1.507   197.000"
"                 352.800     1.596   239.000"
"                 352.900     1.684   286.000"
"                 353.000     1.768   337.000"
"                 353.100     1.849   393.000"
"                 353.200     1.928   455.000"
"                 353.300     2.005   526.000"
"                 353.400     2.080   596.000"
"                 353.500     2.153   676.000"
"                 353.600     2.224   761.000"
"                 353.700     2.293   854.000"
"                 353.800     2.361   953.000"
"                 353.900     2.427  1060.000"
"                 354.000     2.492  1174.000"
"                 354.100     2.556  1298.000"
"                 354.200     2.618  1435.000"
"                 354.300     2.689  1586.000"
"                 354.400     2.739  1751.000"
"                 354.500     2.797  1929.000"
"                 354.600     2.855  2121.000"
"                 354.700     2.911  2329.000"
"             Peak outflow                  1.541    c.m/sec"
"             Maximum level               352.738    metre"
"             Maximum storage             212.879    c.m"
"             Centroidal lag                4.505   hours"
"                  0.091     1.546     1.541     0.000 c.m/sec"
" 40          HYDROGRAPH   Combine    7"
"            6   Combine "
"            7   Node #"
"                Baden Creek Tributary"
"             Maximum flow                  1.541    c.m/sec"
"             Hydrograph volume         19395.486    c.m"
"                    0.091     1.546     1.541     1.541"
" 38          START/RE-START TOTALS 6"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                     67.300    hectare"
"             Total Impervious area                     8.664    hectare"
"             Total % impervious                       12.874"
" 19          EXIT"
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"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                          Version 2.25  rev. 473"
"                MIDUSS created                       Sunday, February 7, 2010"
"           10   Units used:                                        ie METRIC"
"                Job folder:          Q:\40777\104\PRELIMINARY\SWM\2nd DP Sub\"
"                                                                  MIDUSS\Pre"
"                Output filename:                                 100yrPre2.in"
"                Licensee name:                                              A"
"                Company                                                     "
"                Date & Time last used:               9/11/2023 at 9:25:40 AM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      180.000   Max. Storm length"
"     3000.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"           1   Chicago storm"
"     4688.000   Coefficient A"
"       17.000   Constant B"
"        0.962   Exponent C"
"        0.400   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity          239.650    mm/hr"
"             Total depth                 87.263    mm"
"           6   100hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 101"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         101   101"
"        0.000   % Impervious"
"        6.500   Total Area"
"      260.000   Flow length"
"        2.100   Overland Slope"
"        6.500   Pervious Area"
"      260.000   Pervious length"
"        2.100   Pervious slope"
"        0.000   Impervious Area"
"      260.000   Impervious length"
"        2.100   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.484   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.623     0.000     0.000     0.000 c.m/sec"
"             Catchment 101          Pervious   Impervious Total Area "
"             Surface Area           6.500      0.000      6.500      hectare"
"             Time of concentration  40.324     5.668      40.324     minutes"
"             Time to Centroid       143.208    91.832     143.208    minutes"
"             Rainfall depth         87.263     87.263     87.263     mm"
"             Rainfall volume        5672.12    0.01       5672.12    c.m"
"             Rainfall losses        44.990     5.994      44.990     mm"
"             Runoff depth           42.274     81.270     42.274     mm"
"             Runoff volume          2747.80    0.01       2747.80    c.m"
"             Runoff coefficient     0.484      0.000      0.484      "
"             Maximum flow           0.623      0.000      0.623      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    0.623     0.623     0.000     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                    0.623     0.623     0.623     0.000"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"            Maximum flow                   0.623    c.m/sec"
"            Hydrograph volume           2747.804    c.m"
"                    0.623     0.623     0.623     0.623"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                    0.623     0.000     0.623     0.623"
" 33          CATCHMENT 102"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         102   102"
"        0.000   % Impervious"
"        4.490   Total Area"
"      205.000   Flow length"
"        1.800   Overland Slope"
"        4.490   Pervious Area"
"      205.000   Pervious length"
"        1.800   Pervious slope"
"        0.000   Impervious Area"
"      205.000   Impervious length"
"        1.800   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.484   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.472     0.000     0.623     0.623 c.m/sec"
"             Catchment 102          Pervious   Impervious Total Area "
"             Surface Area           4.490      0.000      4.490      hectare"
"             Time of concentration  36.620     5.148      36.620     minutes"
"             Time to Centroid       138.509    91.130     138.509    minutes"
"             Rainfall depth         87.263     87.263     87.263     mm"
"             Rainfall volume        3918.12    0.00       3918.13    c.m"
"             Rainfall losses        44.992     6.105      44.992     mm"
"             Runoff depth           42.271     81.158     42.271     mm"
"             Runoff volume          1897.97    0.00       1897.98    c.m"
"             Runoff coefficient     0.484      0.000      0.484      "
"             Maximum flow           0.472      0.000      0.472      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    0.472     0.472     0.623     0.623"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                    0.472     0.472     0.472     0.623"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"            Maximum flow                   1.085    c.m/sec"
"            Hydrograph volume           4645.779    c.m"
"                    0.472     0.472     0.472     1.085"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
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"                   0.472     0.000     0.472     1.085"
" 33          CATCHMENT 103"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         103   103"
"       0.000   % Impervious"
"       2.280   Total Area"
"     180.000   Flow length"
"       3.300   Overland Slope"
"       2.280   Pervious Area"
"     180.000   Pervious length"
"       3.300   Pervious slope"
"       0.000   Impervious Area"
"     180.000   Impervious length"
"       3.300   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.484   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.287     0.000     0.472     1.085 c.m/sec"
"             Catchment 103          Pervious   Impervious Total Area "
"             Surface Area           2.280      0.000      2.280      hectare"
"             Time of concentration  28.240     3.970      28.239     minutes"
"             Time to Centroid       127.857    89.507     127.857    minutes"
"             Rainfall depth         87.263     87.263     87.263     mm"
"             Rainfall volume        1989.60    0.00       1989.61    c.m"
"             Rainfall losses        45.029     6.496      45.029     mm"
"             Runoff depth           42.234     80.768     42.234     mm"
"             Runoff volume          962.94     0.00       962.95     c.m"
"             Runoff coefficient     0.484      0.000      0.484      "
"             Maximum flow           0.287      0.000      0.287      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.287     0.287     0.472     1.085"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.287     0.287     0.287     1.085"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"             Maximum flow                 1.355    c.m/sec"
"             Hydrograph volume          5608.730    c.m"
"                   0.287     0.287     0.287     1.355"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.287     0.000     0.287     1.355"
" 33          CATCHMENT 104"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         104   104"
"       0.000   % Impervious"
"       0.920   Total Area"
"      75.000   Flow length"
"       4.700   Overland Slope"
"       0.920   Pervious Area"
"      75.000   Pervious length"
"       4.700   Pervious slope"
"       0.000   Impervious Area"
"      75.000   Impervious length"
"       4.700   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.484   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.170     0.000     0.287     1.355 c.m/sec"
"             Catchment 104          Pervious   Impervious Total Area "
"             Surface Area           0.920      0.000      0.920      hectare"
"             Time of concentration  15.020     2.111      15.019     minutes"
"             Time to Centroid       111.095    86.784     111.095    minutes"
"             Rainfall depth         87.263     87.263     87.263     mm"
"             Rainfall volume        802.82     0.00       802.82     c.m"
"             Rainfall losses        45.007     6.630      45.007     mm"
"             Runoff depth           42.256     80.634     42.256     mm"
"             Runoff volume          388.76     0.00       388.76     c.m"
"             Runoff coefficient     0.484      0.000      0.484      "
"             Maximum flow           0.170      0.000      0.170      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.170     0.170     0.287     1.355"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.170     0.170     0.170     1.355"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"             Maximum flow                 1.443    c.m/sec"
"             Hydrograph volume          5997.486    c.m"
"                   0.170     0.170     0.170     1.443"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.170     0.000     0.170     1.443"
" 33          CATCHMENT 105"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         105   105"
"       0.000   % Impervious"
"       2.200   Total Area"
"     135.000   Flow length"
"       2.500   Overland Slope"
"       2.200   Pervious Area"
"     135.000   Pervious length"
"       2.500   Pervious slope"
"       0.000   Impervious Area"
"     135.000   Impervious length"
"       2.500   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.484   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
```

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"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.288     0.000     0.170     1.443 c.m/sec"
"             Catchment 105          Pervious   Impervious Total Area "
"             Surface Area           2.200      0.000      2.200      hectare"
"             Time of concentration  25.827     3.630      25.826     minutes"
"             Time to Centroid       124.796    89.044     124.796    minutes"
"             Rainfall depth         87.263     87.263     87.263     mm"
"             Rainfall volume        1919.79    0.00       1919.80    c.m"
"             Rainfall losses        45.035     7.165      45.035     mm"
"             Runoff depth           42.228     80.099     42.228     mm"
"             Runoff volume          929.02     0.00       929.03     c.m"
"             Runoff coefficient     0.484      0.000      0.484      "
"             Maximum flow           0.288      0.000      0.288      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.288     0.288     0.170     1.443"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.288     0.288     0.288     1.443"
" 40          HYDROGRAPH   Combine    2"
"            6   Combine "
"            2   Node #"
"                Activa Baden Subdivision"
"             Maximum flow                  0.288    c.m/sec"
"             Hydrograph volume           929.025    c.m"
"                    0.288     0.288     0.288     0.288"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.288     0.000     0.288     0.288"
" 33          CATCHMENT 106"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          106   106"
"        0.000   % Impervious"
"        4.300   Total Area"
"      265.000   Flow length"
"        1.600   Overland Slope"
"        4.300   Pervious Area"
"      265.000   Pervious length"
"        1.600   Pervious slope"
"        0.000   Impervious Area"
"      265.000   Impervious length"
"        1.600   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.484   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.384     0.000     0.288     0.288 c.m/sec"
"             Catchment 106          Pervious   Impervious Total Area "
"             Surface Area           4.300      0.000      4.300      hectare"
"             Time of concentration  44.255     6.221      44.255     minutes"
"             Time to Centroid       148.191    92.621     148.191    minutes"
"             Rainfall depth         87.263     87.263     87.263     mm"
"             Rainfall volume        3752.32    0.00       3752.33    c.m"
"             Rainfall losses        45.010     5.934      45.010     mm"
"             Runoff depth           42.254     81.330     42.254     mm"
"             Runoff volume          1816.91    0.00       1816.91    c.m"
"             Runoff coefficient     0.484      0.000      0.484      "
"             Maximum flow           0.384      0.000      0.384      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.384     0.384     0.288     0.288"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.384     0.384     0.384     0.288"
" 40          HYDROGRAPH   Combine    2"
"            6   Combine "
"            2   Node #"
"                Activa Baden Subdivision"
"             Maximum flow                  0.634    c.m/sec"
"             Hydrograph volume          2745.938    c.m"
"                    0.384     0.384     0.384     0.634"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.384     0.000     0.384     0.634"
" 33          CATCHMENT 107"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          107   107"
"        1.000   % Impervious"
"        8.850   Total Area"
"      330.000   Flow length"
"        2.000   Overland Slope"
"        8.762   Pervious Area"
"      330.000   Pervious length"
"        2.000   Pervious slope"
"        0.089   Impervious Area"
"      330.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.484   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.930   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.748     0.000     0.384     0.634 c.m/sec"
"             Catchment 107          Pervious   Impervious Total Area "
"             Surface Area           8.762      0.089      8.850      hectare"
"             Time of concentration  47.211     6.636      46.439     minutes"
"             Time to Centroid       151.947    93.188     150.829    minutes"
"             Rainfall depth         87.263     87.263     87.263     mm"
"             Rainfall volume        7645.59    77.23      7722.81    c.m"
"             Rainfall losses        45.004     6.113      44.615     mm"
"             Runoff depth           42.260     81.151     42.649     mm"
"             Runoff volume          3702.59    71.82      3774.41    c.m"
"             Runoff coefficient     0.484      0.930      0.489      "
"             Maximum flow           0.743      0.048      0.748      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.748     0.748     0.384     0.634"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.748     0.748     0.748     0.634"
" 40          HYDROGRAPH   Combine    3"
"            6   Combine "
"            3   Node #"
"                Ex. 1000mm CSP Culvert"
```

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"             Maximum flow                  0.748    c.m/sec"
"             Hydrograph volume          3774.407    c.m"
"                    0.748     0.748     0.748     0.748"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.748     0.000     0.748     0.748"
" 33          CATCHMENT 108"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           108   108"
"         2.000   % Impervious"
"        18.930   Total Area"
"       570.000   Flow length"
"         1.600   Overland Slope"
"        18.551   Pervious Area"
"       570.000   Pervious length"
"         1.600   Pervious slope"
"         0.379   Impervious Area"
"       570.000   Impervious length"
"         1.600   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.484   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.931   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    1.146     0.000     0.748     0.748 c.m/sec"
"              Catchment 108          Pervious   Impervious Total Area "
"              Surface Area           18.551     0.379      18.930     hectare"
"              Time of concentration  70.071     9.850      67.797     minutes"
"              Time to Centroid       180.974    97.518     177.824    minutes"
"              Rainfall depth         87.263     87.263     87.263     mm"
"              Rainfall volume        1.6189     0.0330     1.6519     ha-m"
"              Rainfall losses        44.985     5.989      44.205     mm"
"              Runoff depth           42.279     81.274     43.059     mm"
"              Runoff volume          7843.32    307.70     8151.02    c.m"
"              Runoff coefficient     0.484      0.931      0.493      "
"              Maximum flow           1.131      0.173      1.146      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    1.146     1.146     0.748     0.748"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    1.146     1.146     1.146     0.748"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Ex. 1000mm CSP Culvert"
"              Maximum flow                  1.824    c.m/sec"
"              Hydrograph volume         11925.436    c.m"
"                    1.146     1.146     1.146     1.824"
" 40          HYDROGRAPH   Confluence    3"
"             7   Confluence "
"             3   Node #"
"                 Ex. 1000mm CSP Culvert"
"              Maximum flow                  1.824    c.m/sec"
"              Hydrograph volume         11925.435    c.m"
"                    1.146     1.824     1.146     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    1.146     1.824     1.824     0.000"
" 40          HYDROGRAPH   Combine    5"
"             6   Combine "
"             5   Node #"
"                 to Baden West SWMF"
"              Maximum flow                  1.824    c.m/sec"
"              Hydrograph volume         11925.435    c.m"
"                    1.146     1.824     1.824     1.824"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    1.146     0.000     1.824     1.824"
" 33          CATCHMENT 109"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           109   109"
"         0.000   % Impervious"
"         0.910   Total Area"
"       125.000   Flow length"
"         1.500   Overland Slope"
"         0.910   Pervious Area"
"       125.000   Pervious length"
"         1.500   Pervious slope"
"         0.000   Impervious Area"
"       125.000   Impervious length"
"         1.500   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.484   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.000   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.114     0.000     1.824     1.824 c.m/sec"
"              Catchment 109          Pervious   Impervious Total Area "
"              Surface Area           0.910      0.000      0.910      hectare"
"              Time of concentration  28.745     4.041      28.745     minutes"
"              Time to Centroid       128.512    89.589     128.512    minutes"
"              Rainfall depth         87.263     87.263     87.263     mm"
"              Rainfall volume        794.10     0.00       794.10     c.m"
"              Rainfall losses        45.020     6.386      45.020     mm"
"              Runoff depth           42.243     80.877     42.244     mm"
"              Runoff volume          384.42     0.00       384.42     c.m"
"              Runoff coefficient     0.484      0.000      0.484      "
"              Maximum flow           0.114      0.000      0.114      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.114     0.114     1.824     1.824"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.114     0.114     0.114     1.824"
" 40          HYDROGRAPH   Combine    4"
"             6   Combine "
"             4   Node #"
"                 Snyder's/Christian"
"              Maximum flow                  0.114    c.m/sec"
"              Hydrograph volume           384.416    c.m"
"                    0.114     0.114     0.114     0.114"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.114     0.000     0.114     0.114"
" 33          CATCHMENT 110"
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"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          110   110"
"       45.000   % Impervious"
"        1.030   Total Area"
"       70.000   Flow length"
"        0.700   Overland Slope"
"        0.566   Pervious Area"
"       70.000   Pervious length"
"        0.700   Pervious slope"
"        0.463   Impervious Area"
"       70.000   Impervious length"
"        0.700   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.519   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.918   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.265     0.000     0.114     0.114 c.m/sec"
"             Catchment 110          Pervious   Impervious Total Area "
"             Surface Area           0.566      0.463      1.030      hectare"
"             Time of concentration  24.675     3.586      12.202     minutes"
"             Time to Centroid       123.030    88.986     102.895    minutes"
"             Rainfall depth         87.263     87.263     87.263     mm"
"             Rainfall volume        494.35     404.47     898.81     c.m"
"             Rainfall losses        41.969     7.120      26.287     mm"
"             Runoff depth           45.294     80.143     60.976     mm"
"             Runoff volume          256.59     371.46     628.06     c.m"
"             Runoff coefficient     0.519      0.918      0.699      "
"             Maximum flow           0.083      0.237      0.265      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                  0.265     0.265     0.114     0.114"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                  0.265     0.265     0.265     0.114"
" 40          HYDROGRAPH   Combine    4"
"            6   Combine "
"            4   Node #"
"                Snyder's/Christian"
"             Maximum flow                  0.297    c.m/sec"
"             Hydrograph volume          1012.472    c.m"
"                  0.265     0.265     0.265     0.297"
" 40          HYDROGRAPH   Confluence    4"
"            7   Confluence "
"            4   Node #"
"                Snyder's/Christian"
"             Maximum flow                  0.297    c.m/sec"
"             Hydrograph volume          1012.472    c.m"
"                  0.265     0.297     0.265     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                  0.265     0.297     0.297     0.000"
" 40          HYDROGRAPH   Combine    5"
"            6   Combine "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  1.949    c.m/sec"
"             Hydrograph volume         12937.898    c.m"
"                  0.265     0.297     0.297     1.949"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                  0.265     0.000     0.297     1.949"
" 33          CATCHMENT 111"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          111   111"
"       45.000   % Impervious"
"        2.080   Total Area"
"       80.000   Flow length"
"        2.000   Overland Slope"
"        1.144   Pervious Area"
"       80.000   Pervious length"
"        2.000   Pervious slope"
"        0.936   Impervious Area"
"       80.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.518   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.917   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.535     0.000     0.297     1.949 c.m/sec"
"             Catchment 111          Pervious   Impervious Total Area "
"             Surface Area           1.144      0.936      2.080      hectare"
"             Time of concentration  19.510     2.836      9.650      minutes"
"             Time to Centroid       116.415    87.884     99.544     minutes"
"             Rainfall depth         87.263     87.263     87.263     mm"
"             Rainfall volume        998.29     816.79     1815.08    c.m"
"             Rainfall losses        42.037     7.282      26.397     mm"
"             Runoff depth           45.226     79.981     60.866     mm"
"             Runoff volume          517.39     748.62     1266.01    c.m"
"             Runoff coefficient     0.518      0.917      0.697      "
"             Maximum flow           0.194      0.493      0.535      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                  0.535     0.535     0.297     1.949"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                  0.535     0.535     0.535     1.949"
" 40          HYDROGRAPH   Combine    5"
"            6   Combine "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  2.062    c.m/sec"
"             Hydrograph volume         14203.911    c.m"
"                  0.535     0.535     0.535     2.062"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                  0.535     0.000     0.535     2.062"
" 33          CATCHMENT 112"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          112   112"
"       55.000   % Impervious"
"       10.200   Total Area"
"       60.000   Flow length"
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```
"        3.000   Overland Slope"
"        4.590   Pervious Area"
"       60.000   Pervious length"
"        3.000   Pervious slope"
"        5.610   Impervious Area"
"       60.000   Impervious length"
"        3.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.519   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.924   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  3.261     0.000     0.535     2.062 c.m/sec"
"             Catchment 112          Pervious   Impervious Total Area "
"             Surface Area           4.590      5.610      10.200     hectare"
"             Time of concentration  14.537     2.113      6.024      minutes"
"             Time to Centroid       110.058    86.787     94.112     minutes"
"             Rainfall depth         87.263     87.263     87.263     mm"
"             Rainfall volume        4005.39    4895.48    8900.87    c.m"
"             Rainfall losses        41.994     6.630      22.544     mm"
"             Runoff depth           45.270     80.633     64.720     mm"
"             Runoff volume          2077.88    4523.53    6601.41    c.m"
"             Runoff coefficient     0.519      0.924      0.742      "
"             Maximum flow           0.926      3.064      3.261      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  3.261     3.261     0.535     2.062"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  3.261     3.261     3.261     2.062"
" 40          HYDROGRAPH   Combine    5"
"           6   Combine "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                 4.463    c.m/sec"
"            Hydrograph volume         20805.322    c.m"
"                  3.261     3.261     3.261     4.463"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                  3.261     0.000     3.261     4.463"
" 33          CATCHMENT 113"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         113   113"
"       50.000   % Impervious"
"        1.250   Total Area"
"       20.000   Flow length"
"       20.000   Overland Slope"
"        0.625   Pervious Area"
"       20.000   Pervious length"
"       20.000   Pervious slope"
"        0.625   Impervious Area"
"       20.000   Impervious length"
"       20.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.480   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.862   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.469     0.000     3.261     4.463 c.m/sec"
"             Catchment 113          Pervious   Impervious Total Area "
"             Surface Area           0.625      0.625      1.250      hectare"
"             Time of concentration  4.401      0.619      1.971      minutes"
"             Time to Centroid       97.675     85.004     89.535     minutes"
"             Rainfall depth         87.263     87.263     87.263     mm"
"             Rainfall volume        545.40     545.40     1090.79    c.m"
"             Rainfall losses        45.383     12.046     28.715     mm"
"             Runoff depth           41.880     75.217     58.549     mm"
"             Runoff volume          261.75     470.11     731.86     c.m"
"             Runoff coefficient     0.480      0.862      0.671      "
"             Maximum flow           0.176      0.355      0.469      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.469     0.469     3.261     4.463"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.469     0.469     0.469     4.463"
" 40          HYDROGRAPH   Combine    5"
"           6   Combine "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                 4.843    c.m/sec"
"            Hydrograph volume         21537.184    c.m"
"                  0.469     0.469     0.469     4.843"
" 40          HYDROGRAPH   Confluence    5"
"           7   Confluence "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                 4.843    c.m/sec"
"            Hydrograph volume         21537.184    c.m"
"                  0.469     4.843     0.469     0.000"
" 54          POND DESIGN"
"        4.843   Current peak flow    c.m/sec"
"        0.497   Target outflow    c.m/sec"
"      21537.2   Hydrograph volume    c.m"
"          33.   Number of stages"
"      351.500   Minimum water level    metre"
"      354.700   Maximum water level    metre"
"      351.500   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                351.500     0.000     0.000"
"                351.600   0.00600   400.000"
"                351.700   0.01900   824.000"
"                351.800   0.03100  1272.000"
"                351.900   0.07800  1744.000"
"                352.000    0.1930  2240.000"
"                352.100    0.3670  2760.000"
"                352.200    0.5970  3298.000"
"                352.300    0.8520  3849.000"
"                352.400     1.011  4412.000"
"                352.500     1.122  4988.000"
"                352.600     1.223  5576.000"
"                352.700     1.316  6176.000"
"                352.800     1.403  6789.000"
"                352.900     1.485  7415.000"
"                353.000     1.563  8053.000"
"                353.100     1.637  8704.000"
"                353.200     1.708  9368.000"
```

```
"               353.300     1.776  10045.00"
"               353.400     1.841  10735.00"
"               353.500     1.904  11439.00"
"               353.600     1.965  12156.00"
"               353.700     2.025  12884.00"
"               353.800     2.082  13625.00"
"               353.900     2.138  14378.00"
"               354.000     2.193  15143.00"
"               354.100     2.246  15921.00"
"               354.200     2.298  16712.00"
"               354.300     2.349  17517.00"
"               354.400     2.399  18334.00"
"               354.500     2.473  19165.00"
"               354.600     2.708  20012.00"
"               354.700     3.177  20879.00"
"            Peak outflow                  1.661    c.m/sec"
"            Maximum level               353.133    metre"
"            Maximum storage            8925.858    c.m"
"            Centroidal lag                4.453   hours"
"                 0.469     4.843     1.661     0.000 c.m/sec"
" 40         HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
"            Maximum flow                  1.661    c.m/sec"
"            Hydrograph volume         21424.074    c.m"
"                  0.469     4.843     1.661     1.661"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                  0.469     0.000     1.661     1.661"
" 33         CATCHMENT 114"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         114   114"
"       45.000   % Impervious"
"        1.250   Total Area"
"       60.000   Flow length"
"        2.000   Overland Slope"
"        0.688   Pervious Area"
"       60.000   Pervious length"
"        2.000   Pervious slope"
"        0.563   Impervious Area"
"       60.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.518   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.921   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.329     0.000     1.661     1.661 c.m/sec"
"            Catchment 114          Pervious   Impervious Total Area "
"            Surface Area           0.688      0.563      1.250      hectare"
"            Time of concentration  16.417     2.386      8.101      minutes"
"            Time to Centroid       112.491    87.187     97.493     minutes"
"            Rainfall depth         87.263     87.263     87.263     mm"
"            Rainfall volume        599.94     490.86     1090.79    c.m"
"            Rainfall losses        42.065     6.863      26.224     mm"
"            Runoff depth           45.199     80.401     61.040     mm"
"            Runoff volume          310.74     452.25     762.99     c.m"
"            Runoff coefficient     0.518      0.921      0.699      "
"            Maximum flow           0.131      0.304      0.329      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.329     0.329     1.661     1.661"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.329     0.329     0.329     1.661"
" 40         HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
"            Maximum flow                  1.685    c.m/sec"
"            Hydrograph volume         22187.066    c.m"
"                  0.329     0.329     0.329     1.685"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                  0.329     0.000     0.329     1.685"
" 33         CATCHMENT 115"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         115   115"
"       0.000   % Impervious"
"       2.110   Total Area"
"     365.000   Flow length"
"       0.500   Overland Slope"
"       2.110   Pervious Area"
"     365.000   Pervious length"
"       0.500   Pervious slope"
"       0.000   Impervious Area"
"     365.000   Impervious length"
"       0.500   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.484   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                  0.120     0.000     0.329     1.685 c.m/sec"
"            Catchment 115          Pervious   Impervious Total Area "
"            Surface Area           2.110      0.000      2.110      hectare"
"            Time of concentration  76.021     10.686     76.021     minutes"
"            Time to Centroid       188.528    98.650     188.528    minutes"
"            Rainfall depth         87.263     87.263     87.263     mm"
"            Rainfall volume        1841.26    0.00       1841.26    c.m"
"            Rainfall losses        44.986     5.728      44.986     mm"
"            Runoff depth           42.277     81.535     42.277     mm"
"            Runoff volume          892.05     0.00       892.05     c.m"
"            Runoff coefficient     0.484      0.000      0.484      "
"            Maximum flow           0.120      0.000      0.120      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.120     0.120     0.329     1.685"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.120     0.120     0.120     1.685"
" 40         HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
```

```
"             Maximum flow                  1.799    c.m/sec"
"             Hydrograph volume         23079.119    c.m"
"                    0.120     0.120     0.120     1.799"
" 40          HYDROGRAPH   Confluence    6"
"            7   Confluence "
"            6   Node #"
"                Swale Storage Prior to CMP Culvert"
"             Maximum flow                  1.799    c.m/sec"
"             Hydrograph volume         23079.119    c.m"
"                    0.120     1.799     0.120     0.000"
" 54          POND DESIGN"
"         1.799   Current peak flow    c.m/sec"
"         0.497   Target outflow    c.m/sec"
"       23079.1   Hydrograph volume    c.m"
"           37.   Number of stages"
"       351.100   Minimum water level    metre"
"       354.700   Maximum water level    metre"
"       351.100   Starting water level    metre"
"             0   Keep Design Data: 1 = True; 0 = False"
"                   Level Discharge    Volume"
"                 351.100     0.000     0.000"
"                 351.200   0.00900    0.1000"
"                 351.300   0.03600    0.6000"
"                 351.400   0.08100     1.000"
"                 351.500    0.1420     2.000"
"                 351.600    0.2180     5.000"
"                 351.700    0.3070     8.000"
"                 351.800    0.4210    14.000"
"                 351.900    0.5530    21.000"
"                 352.000    0.6750    29.000"
"                 352.100    0.8050    41.000"
"                 352.200    0.9380    57.000"
"                 352.300     1.066    76.000"
"                 352.400     1.191   100.000"
"                 352.500     1.307   128.000"
"                 352.600     1.410   160.000"
"                 352.700     1.507   197.000"
"                 352.800     1.596   239.000"
"                 352.900     1.684   286.000"
"                 353.000     1.768   337.000"
"                 353.100     1.849   393.000"
"                 353.200     1.928   455.000"
"                 353.300     2.005   526.000"
"                 353.400     2.080   596.000"
"                 353.500     2.153   676.000"
"                 353.600     2.224   761.000"
"                 353.700     2.293   854.000"
"                 353.800     2.361   953.000"
"                 353.900     2.427  1060.000"
"                 354.000     2.492  1174.000"
"                 354.100     2.556  1298.000"
"                 354.200     2.618  1435.000"
"                 354.300     2.689  1586.000"
"                 354.400     2.739  1751.000"
"                 354.500     2.797  1929.000"
"                 354.600     2.855  2121.000"
"                 354.700     2.911  2329.000"
"             Peak outflow                  1.787    c.m/sec"
"             Maximum level               353.024    metre"
"             Maximum storage             350.293    c.m"
"             Centroidal lag                4.343   hours"
"                  0.120     1.799     1.787     0.000 c.m/sec"
" 40          HYDROGRAPH   Combine    7"
"            6   Combine "
"            7   Node #"
"                Baden Creek Tributary"
"             Maximum flow                  1.787    c.m/sec"
"             Hydrograph volume         23072.061    c.m"
"                    0.120     1.799     1.787     1.787"
" 38          START/RE-START TOTALS 6"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                     67.300    hectare"
"             Total Impervious area                     8.664    hectare"
"             Total % impervious                       12.874"
" 19          EXIT"
```

CAD: P:\P\40777\104\40777-104-F3.DWG

Plot Date: August 31, 2023 - 4:04 PM

PARCEL 02 (WIEBE LANDS)

PARCEL 01 (WIEBE LANDS)

PARCEL Y2 (WIEBE LANDS)

PARCEL Y (WIEBE LANDS)

PARCEL Z

PARCEL Q

ACTIVA BADEN SUBDIVISION

BADEN WEST SUBDIVISION

GOLDSCHMIDT CRESCENT

GOLDSCHMIDT CRESCENT

JACOB CRESSMAN DRIVE

STUCKEY AVENUE

MICHAEL MYERS ROAD

MICHAEL MYERS ROAD

BETTSCHEN LANE

LIVINGSTON BOULEVARD

WAGLER AVE.

OESCH LANE

ROTH AVENUE

HUNSBERGER DRIVE

LIVINGSTON BOULEVARD

WAGLER AVE.

McPADYEN STREET

SNYDERS ROAD WEST

GEIGER PLACE

QUEEN STREET

CHARLOTTA STREET

MILLER STREET

CHRISTIAN STREET

SNYDERS ROAD WEST

CHARLOTTA STREET

BRENNEMAN DRIVE

BRENNEMAN DRIVE

SNYDERS ROAD WEST

CN RAILWAY

BADEN CREEK TRIBUTARY "A"

EX. SPILLOVER RIDGE TO WETLANDS

EX. DICB

EX. TEMP. DICB

EX. 1000mmø CSP CULVERT

EX. BADEN WEST SWMF

EX. 1100mm X 700mm CMP CULVERT

TO ADJACENT WETLANDS

DRAINS INTERNALLY

DRAINS INTERNALLY

TO ACTIVA BADEN SUBDIVISION

TO ACTIVA BADEN SUBDIVISION

TO CN CULVERT

TO ADJACENT WETLANDS

TO CN CULVERT

101	6.50
102	4.49
103	2.28
104	0.92
105	2.20
106	4.30
107	8.85
108	18.93
109	0.91
110	1.03
111	2.08
112	10.20
113	1.25
114	1.25
115	2.11

LEGEND

- SITE BOUNDARY
- EXISTING CONTOURS
- DIRECTION OF EXISTING DRAINAGE
- EXISTING DRIPLINE
- PRE-DEVELOPMENT CATCHMENT
- DRAINAGE SPLIT
- CATCHMENT No. / AREA (Ha) (e.g. 101 / 1.10)
- DRAINAGE AREAS TO INTERNAL DEPRESSIONS
- DRAINAGE AREAS TO ACTIVA BADEN SUBDIVISION
- DRAINAGE AREAS TO CN CULVERT VIA BADEN WEST SWM FACILITY
- DRAINAGE AREAS TO CN CULVERT DIRECTLY

MTE
Engineers, Scientists, Surveyors

PROJECT
1012 SNYDER'S ROAD WEST

TITLE
PRE-DEVELOPMENT DRAINAGE AREA PLAN

Drawn	JXK	Scale	1:2500
Checked	AJC	Project No.	40777-104
Date	2023-08-08	Rev No.	1

Figure
Figure B1

Appendix C

Post Development Catchment Parameters and MIDUSS Modelling

1012 SNYDER'S ROAD
STORMWATER MANAGEMENT
Baden, ONTARIO

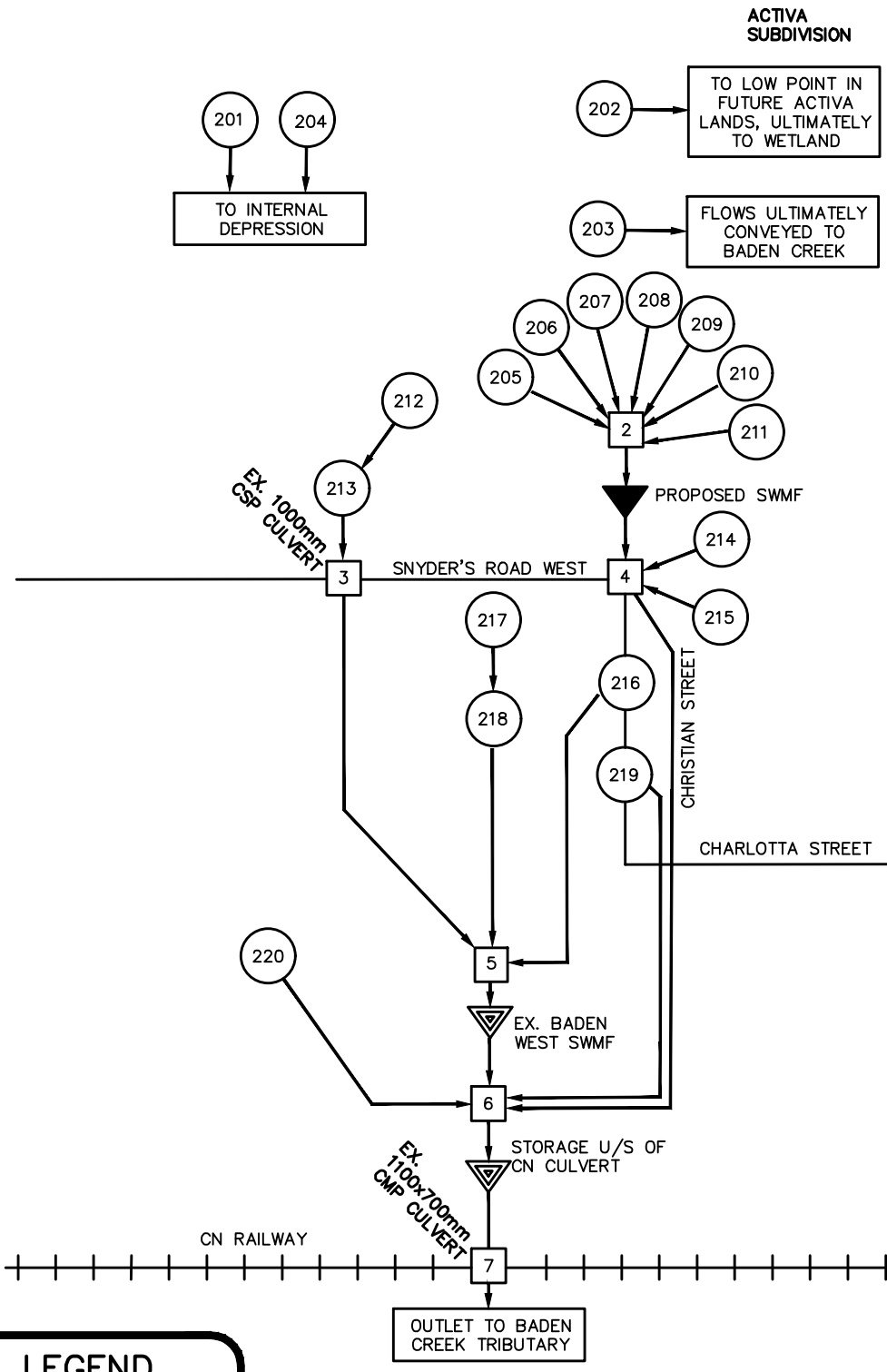
Project Number: 40777-104
Date: 2023/08/24
Design By: AJC
File: Q:\40777\104\PRELIMINARY\SWM\2nd DP Sub\40777-104 Master SWM Facility Design Sheet.xlsx

HYDROLOGIC PARAMETERS

Post-Development Conditions

Sub-Catchment Number	Area	Overland Slope	Overland Length	SCS Curve Number			Percent Impervious	Land Use	Comment
				Pervious (AMC II)	Pervious (AMC III)	Impervious			
	(ha)	*(%)*	*(m)*				*(%)*		
TO INTERNAL DEPRESSIONS (OVERFLOW TO WETLAND)									
201	0.64	2.0	80	78	89	98	0	Agricultural	To internal depression
204	4.49	1.8	205	78	89	98	0	Agricultural	Wiebe Lands to Internal Depression
	5.13						0		
TO ACTIVA BADEN SUBDIVISION									
202	0.27	4.0	30	78	89	98	45	Residential	Rear Yards to Low Point in Activa Subdivision
203	0.09	2.0	30	78	89	98	65	Right-of-way	Wagler Avenue draining to Activa Subdivision
	0.36						50.0		
TO PROPOSED SWMF									
205	19.47	0.5	90	78	89	98	61	Residential	Majority of Proposed Development to SWMF
206	1.22	4.0	70	78	89	98	75	Residential	Stage 3 - Block 15 to SWMF
207	0.70	4.0	70	78	89	98	0	Park	Stage 1- Block 9 Park to SWMF
208	2.12	1.5	60	78	89	98	70	MR/Inst	Stage 2 - Block 1 to SWMF
209	1.30	1.0	60	78	89	98	75	MR	Stage 1 - Block 8 MR to SWMF
210	0.13	2.0	15	78	89	98	4	Residential	Ex. Rear yeards conveyed through SWMF
211	1.10	20	20	78	89	98	45	SWMF	SWMF Block
	26.04						60.5		
TO CN CULVERT (THROUGH BADEN WEST SWMF)									
212	0.16	2.5	40	78	89	98	65	Right-of-way	
213	18.93	1.6	570	78	89	98	2	Agricultural	To ex. 1000mm CSP Culvert
214	0.10	2.5	50	78	89	98	65	Right-of-way	Street One to ex. Snyder's Road W
215	1.03	0.7	70	80	90	98	45	Residential	Ex. Residential fronting Snyder's Road W
216	2.08	2.0	80	80	90	98	45	Residential	Ex. Residential on Christian Street
217	10.20	3.0	60	80	90	98	55	Residential	Ex. Baden West Subdivision
218	1.25	20	20	78	89	98	50	SWMF	Ex. Baden West SWMF
	33.75						24.2		
TO BADEN CREEK TRIBUTARY VIA CN CULVERT (BYPASSES BADEN WEST SWMF)									
219	1.25	2.0	60	80	90	98	45	Residential	Ex. Residential on Christian Street
220	2.11	0.5	365	80	90	98	0	Agricultural/Rail	Portion of Parcel Q, CN Railway to Culvert
	3.36						16.7		
Total	**68.64**						**35.9**		

Project: 34896-100 CAD: 40777-104-MS14
August 31, 2023 - 12:18 p.m. - Plotted By: ACressman



LEGEND

- 212 — CATCHMENT
- REC — RESERVOIR (SWMF)
- 5 — ADD HYDROGRAPH (NODE)
- 7 — DIVERT HYDROGRAPH

FIGURE C-1 Scale N.T.S.

PROPOSED CONDITIONS MODEL SCHEMATIC

MTE
Engineers, Scientists, Surveyors

```
"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                          Version 2.25  rev. 473"
"                MIDUSS created                       Sunday, February 7, 2010"
"           10   Units used:                                        ie METRIC"
"                Job folder:          Q:\40777\104\PRELIMINARY\SWM\2nd DP Sub\"
"                                                                  MIDUSS\Post"
"                Output filename:                                25mm4hrPost2.in"
"                Licensee name:                                              A"
"                Company                                                     "
"                Date & Time last used:                9/11/2023 at 9:36:28 AM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      240.000   Max. Storm length"
"     3000.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"           1   Chicago storm"
"      509.000   Coefficient A"
"        6.000   Constant B"
"        0.799   Exponent C"
"        0.400   Fraction R"
"      240.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity           71.966    mm/hr"
"             Total depth                 25.028    mm"
"           6   25hhyd   Hydrograph extension used in this file"
" 33          CATCHMENT 201"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         201   201"
"        0.000   % Impervious"
"        0.640   Total Area"
"       80.000   Flow length"
"        2.000   Overland Slope"
"        0.640   Pervious Area"
"       80.000   Pervious length"
"        2.000   Pervious slope"
"        0.000   Impervious Area"
"       80.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.142   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.003     0.000     0.000     0.000 c.m/sec"
"             Catchment 201          Pervious   Impervious Total Area "
"             Surface Area           0.640      0.000      0.640      hectare"
"             Time of concentration  59.847     4.769      59.847     minutes"
"             Time to Centroid       216.865    124.751    216.865    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        160.18     0.00       160.18     c.m"
"             Rainfall losses        21.464     4.989      21.464     mm"
"             Runoff depth           3.564      20.039     3.564      mm"
"             Runoff volume          22.81      0.00       22.81      c.m"
"             Runoff coefficient     0.142      0.000      0.142      "
"             Maximum flow           0.003      0.000      0.003      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.003     0.003     0.000     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.003     0.003     0.003     0.000"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"            Maximum flow                  0.003    c.m/sec"
"            Hydrograph volume            22.811    c.m"
"                  0.003     0.003     0.003     0.003"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                  0.003     0.000     0.003     0.003"
" 33          CATCHMENT 202"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         202   202"
"       45.000   % Impervious"
"        0.270   Total Area"
"       30.000   Flow length"
"        4.000   Overland Slope"
"        0.148   Pervious Area"
"       30.000   Pervious length"
"        4.000   Pervious slope"
"        0.122   Impervious Area"
"       30.000   Impervious length"
"        4.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.142   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.798   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.018     0.000     0.003     0.003 c.m/sec"
"             Catchment 202          Pervious   Impervious Total Area "
"             Surface Area           0.148      0.122      0.270      hectare"
"             Time of concentration  26.987     2.150      6.598      minutes"
"             Time to Centroid       173.405    120.450    129.934    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        37.17      30.41      67.57      c.m"
"             Rainfall losses        21.464     5.065      14.085     mm"
"             Runoff depth           3.563      19.963     10.943     mm"
"             Runoff volume          5.29       24.25      29.55      c.m"
"             Runoff coefficient     0.142      0.798      0.437      "
"             Maximum flow           0.001      0.018      0.018      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.018     0.018     0.003     0.003"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.018     0.018     0.018     0.003"
" 40          HYDROGRAPH   Combine    2"
"           6   Combine "
"           2   Node #"
"               Activa Baden Subdivision"
"            Maximum flow                  0.018    c.m/sec"
"            Hydrograph volume            29.546    c.m"
"                  0.018     0.018     0.018     0.018"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
```

```
"                   0.018     0.000     0.018     0.018"
" 33          CATCHMENT 203"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         203   203"
"      65.000   % Impervious"
"       0.090   Total Area"
"      30.000   Flow length"
"       2.000   Overland Slope"
"       0.032   Pervious Area"
"      30.000   Pervious length"
"       2.000   Pervious slope"
"       0.059   Impervious Area"
"      30.000   Impervious length"
"       2.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.142   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.793   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.008     0.000     0.018     0.018 c.m/sec"
"             Catchment 203          Pervious   Impervious Total Area "
"             Surface Area           0.032      0.059      0.090      hectare"
"             Time of concentration  33.225     2.647      5.342      minutes"
"             Time to Centroid       181.661    121.411    126.721    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        7.88       14.64      22.52      c.m"
"             Rainfall losses        21.463     5.170      10.873     mm"
"             Runoff depth           3.564      19.858     14.155     mm"
"             Runoff volume          1.12       11.62      12.74      c.m"
"             Runoff coefficient     0.142      0.793      0.566      "
"             Maximum flow           0.000      0.008      0.008      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.008     0.008     0.018     0.018"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.008     0.008     0.008     0.018"
" 40          HYDROGRAPH   Combine    2"
"           6   Combine "
"           2   Node #"
"               Activa Baden Subdivision"
"             Maximum flow                 0.026    c.m/sec"
"             Hydrograph volume           42.286    c.m"
"                   0.008     0.008     0.008     0.026"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.008     0.000     0.008     0.026"
" 33          CATCHMENT 204"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         204   204"
"       0.000   % Impervious"
"       4.490   Total Area"
"     205.000   Flow length"
"       1.800   Overland Slope"
"       4.490   Pervious Area"
"     205.000   Pervious length"
"       1.800   Pervious slope"
"       0.000   Impervious Area"
"     205.000   Impervious length"
"       1.800   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.142   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.012     0.000     0.008     0.026 c.m/sec"
"             Catchment 204          Pervious   Impervious Total Area "
"             Surface Area           4.490      0.000      4.490      hectare"
"             Time of concentration  108.635    8.656      108.634    minutes"
"             Time to Centroid       281.382    130.811    281.381    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        1123.74    0.00       1123.74    c.m"
"             Rainfall losses        21.463     4.839      21.462     mm"
"             Runoff depth           3.565      20.189     3.565      mm"
"             Runoff volume          160.08     0.00       160.08     c.m"
"             Runoff coefficient     0.142      0.000      0.142      "
"             Maximum flow           0.012      0.000      0.012      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.012     0.012     0.008     0.026"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.012     0.012     0.012     0.026"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"             Maximum flow                 0.014    c.m/sec"
"             Hydrograph volume          182.887    c.m"
"                   0.012     0.012     0.012     0.014"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.012     0.000     0.012     0.014"
" 33          CATCHMENT 205"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         205   205"
"      61.000   % Impervious"
"      19.470   Total Area"
"      90.000   Flow length"
"       0.500   Overland Slope"
"       7.593   Pervious Area"
"      90.000   Pervious length"
"       0.500   Pervious slope"
"      11.877   Impervious Area"
"      90.000   Impervious length"
"       0.500   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.142   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.806   Impervious Runoff coefficient"
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"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  1.621     0.000     0.012     0.014 c.m/sec"
"             Catchment 205          Pervious   Impervious Total Area "
"             Surface Area           7.593      11.877     19.470     hectare"
"             Time of concentration  97.354     7.757      16.850     minutes"
"             Time to Centroid       266.466    129.478    143.380    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        1900.43    2972.46    4872.89    c.m"
"             Rainfall losses        21.463     4.849      11.328     mm"
"             Runoff depth           3.565      20.179     13.699     mm"
"             Runoff volume          270.69     2396.57    2667.26    c.m"
"             Runoff coefficient     0.142      0.806      0.547      "
"             Maximum flow           0.022      1.619      1.621      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    1.621     1.621     0.012     0.014"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    1.621     1.621     1.621     0.014"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Proposed SWMF"
"             Maximum flow                  1.621    c.m/sec"
"             Hydrograph volume          2667.264    c.m"
"                    1.621     1.621     1.621     1.621"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    1.621     0.000     1.621     1.621"
" 33          CATCHMENT 206"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           206   206"
"        75.000   % Impervious"
"         1.220   Total Area"
"        70.000   Flow length"
"         4.000   Overland Slope"
"         0.305   Pervious Area"
"        70.000   Pervious length"
"         4.000   Pervious slope"
"         0.915   Impervious Area"
"        70.000   Impervious length"
"         4.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.142   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.792   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.118     0.000     1.621     1.621 c.m/sec"
"             Catchment 206          Pervious   Impervious Total Area "
"             Surface Area           0.305      0.915      1.220      hectare"
"             Time of concentration  44.868     3.575      5.909      minutes"
"             Time to Centroid       197.056    122.954    127.143    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        76.33      229.00     305.34     c.m"
"             Rainfall losses        21.463     5.197      9.263      mm"
"             Runoff depth           3.565      19.831     15.764     mm"
"             Runoff volume          10.87      181.45     192.33     c.m"
"             Runoff coefficient     0.142      0.792      0.630      "
"             Maximum flow           0.002      0.118      0.118      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.118     0.118     1.621     1.621"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.118     0.118     0.118     1.621"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Proposed SWMF"
"             Maximum flow                  1.736    c.m/sec"
"             Hydrograph volume          2859.592    c.m"
"                    0.118     0.118     0.118     1.736"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.118     0.000     0.118     1.736"
" 33          CATCHMENT 207"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           207   207"
"         0.000   % Impervious"
"         0.700   Total Area"
"        70.000   Flow length"
"         4.000   Overland Slope"
"         0.700   Pervious Area"
"        70.000   Pervious length"
"         4.000   Pervious slope"
"         0.000   Impervious Area"
"        70.000   Impervious length"
"         4.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.142   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.000   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.004     0.000     0.118     1.736 c.m/sec"
"             Catchment 207          Pervious   Impervious Total Area "
"             Surface Area           0.700      0.000      0.700      hectare"
"             Time of concentration  44.868     3.575      44.868     minutes"
"             Time to Centroid       197.056    122.954    197.056    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        175.19     0.00       175.19     c.m"
"             Rainfall losses        21.463     5.197      21.463     mm"
"             Runoff depth           3.565      19.831     3.565      mm"
"             Runoff volume          24.95      0.00       24.95      c.m"
"             Runoff coefficient     0.142      0.000      0.142      "
"             Maximum flow           0.004      0.000      0.004      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.004     0.004     0.118     1.736"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.004     0.004     0.004     1.736"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Proposed SWMF"
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"             Maximum flow                  1.736    c.m/sec"
"             Hydrograph volume          2884.543    c.m"
"                    0.004     0.004     0.004     1.736"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.004     0.000     0.004     1.736"
" 33          CATCHMENT 208"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          208   208"
"       70.000   % Impervious"
"        2.120   Total Area"
"       60.000   Flow length"
"        1.500   Overland Slope"
"        0.636   Pervious Area"
"       60.000   Pervious length"
"        1.500   Pervious slope"
"        1.484   Impervious Area"
"       60.000   Impervious length"
"        1.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.142   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.801   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.196     0.000     0.004     1.736 c.m/sec"
"             Catchment 208          Pervious   Impervious Total Area "
"             Surface Area           0.636      1.484      2.120      hectare"
"             Time of concentration  54.899     4.374      7.953      minutes"
"             Time to Centroid       210.319    124.123    130.229    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        159.18     371.41     530.59     c.m"
"             Rainfall losses        21.463     4.989      9.931      mm"
"             Runoff depth           3.565      20.039     15.097     mm"
"             Runoff volume          22.67      297.38     320.05     c.m"
"             Runoff coefficient     0.142      0.801      0.603      "
"             Maximum flow           0.003      0.196      0.196      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.196     0.196     0.004     1.736"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.196     0.196     0.196     1.736"
" 40          HYDROGRAPH   Combine    3"
"            6   Combine "
"            3   Node #"
"                Proposed SWMF"
"             Maximum flow                  1.933    c.m/sec"
"             Hydrograph volume          3204.599    c.m"
"                    0.196     0.196     0.196     1.933"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.196     0.000     0.196     1.933"
" 33          CATCHMENT 209"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          209   209"
"       75.000   % Impervious"
"        1.300   Total Area"
"       60.000   Flow length"
"        1.000   Overland Slope"
"        0.325   Pervious Area"
"       60.000   Pervious length"
"        1.000   Pervious slope"
"        0.975   Impervious Area"
"       60.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.142   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.802   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.131     0.000     0.196     1.933 c.m/sec"
"             Catchment 209          Pervious   Impervious Total Area "
"             Surface Area           0.325      0.975      1.300      hectare"
"             Time of concentration  62.000     4.940      8.128      minutes"
"             Time to Centroid       219.709    125.018    130.308    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        81.34      244.02     325.36     c.m"
"             Rainfall losses        21.463     4.948      9.077      mm"
"             Runoff depth           3.565      20.079     15.951     mm"
"             Runoff volume          11.59      195.77     207.36     c.m"
"             Runoff coefficient     0.142      0.802      0.637      "
"             Maximum flow           0.001      0.131      0.131      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.131     0.131     0.196     1.933"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.131     0.131     0.131     1.933"
" 40          HYDROGRAPH   Combine    3"
"            6   Combine "
"            3   Node #"
"                Proposed SWMF"
"             Maximum flow                  2.064    c.m/sec"
"             Hydrograph volume          3411.957    c.m"
"                    0.131     0.131     0.131     2.064"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.131     0.000     0.131     2.064"
" 33          CATCHMENT 210"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          210   210"
"        4.000   % Impervious"
"        0.130   Total Area"
"       15.000   Flow length"
"        2.000   Overland Slope"
"        0.125   Pervious Area"
"       15.000   Pervious length"
"        2.000   Pervious slope"
"        0.005   Impervious Area"
"       15.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.142   Pervious Runoff coefficient"
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"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.797   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.001     0.000     0.131     2.064 c.m/sec"
"             Catchment 210          Pervious   Impervious Total Area "
"             Surface Area           0.125      0.005      0.130      hectare"
"             Time of concentration  21.920     1.747      18.103     minutes"
"             Time to Centroid       166.725    119.783    157.842    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        31.23      1.30       32.54      c.m"
"             Rainfall losses        21.467     5.082      20.812     mm"
"             Runoff depth           3.561      19.946     4.216      mm"
"             Runoff volume          4.44       1.04       5.48       c.m"
"             Runoff coefficient     0.142      0.797      0.168      "
"             Maximum flow           0.001      0.001      0.001      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                  0.001     0.001     0.131     2.064"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                  0.001     0.001     0.001     2.064"
" 40          HYDROGRAPH   Combine    3"
"            6   Combine "
"            3   Node #"
"                Proposed SWMF"
"             Maximum flow                 2.065    c.m/sec"
"             Hydrograph volume          3417.437    c.m"
"                  0.001     0.001     0.001     2.065"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                  0.001     0.000     0.001     2.065"
" 33          CATCHMENT 211"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          211   211"
"       50.000   % Impervious"
"        1.100   Total Area"
"       20.000   Flow length"
"       20.000   Overland Slope"
"        0.550   Pervious Area"
"       20.000   Pervious length"
"       20.000   Pervious slope"
"        0.550   Impervious Area"
"       20.000   Impervious length"
"       20.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.142   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.784   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.087     0.000     0.001     2.065 c.m/sec"
"             Catchment 211          Pervious   Impervious Total Area "
"             Surface Area           0.550      0.550      1.100      hectare"
"             Time of concentration  13.056     1.040      2.884      minutes"
"             Time to Centroid       155.049    118.686    124.264    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        137.65     137.65     275.30     c.m"
"             Rainfall losses        21.474     5.416      13.445     mm"
"             Runoff depth           3.554      19.612     11.583     mm"
"             Runoff volume          19.55      107.87     127.41     c.m"
"             Runoff coefficient     0.142      0.784      0.463      "
"             Maximum flow           0.006      0.086      0.087      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                  0.087     0.087     0.001     2.065"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                  0.087     0.087     0.087     2.065"
" 40          HYDROGRAPH   Combine    3"
"            6   Combine "
"            3   Node #"
"                Proposed SWMF"
"             Maximum flow                 2.113    c.m/sec"
"             Hydrograph volume          3544.848    c.m"
"                  0.087     0.087     0.087     2.113"
" 40          HYDROGRAPH   Confluence    3"
"            7   Confluence "
"            3   Node #"
"                Proposed SWMF"
"             Maximum flow                 2.113    c.m/sec"
"             Hydrograph volume          3544.848    c.m"
"                  0.087     2.113     0.087     0.000"
" 54          POND DESIGN"
"        2.113   Current peak flow    c.m/sec"
"        1.127   Target outflow    c.m/sec"
"       3544.8   Hydrograph volume    c.m"
"          29.   Number of stages"
"      354.700   Minimum water level    metre"
"      357.500   Maximum water level    metre"
"      354.700   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                354.700     0.000     0.000"
"                354.800   0.03251  1214.000"
"                354.900   0.03252  1662.000"
"                355.000   0.03253  2129.000"
"                355.100   0.03254  2617.000"
"                355.200   0.03255  3125.000"
"                355.300   0.04330  3655.000"
"                355.400   0.06630  4201.000"
"                355.500   0.08230  4759.000"
"                355.600   0.09440  5329.000"
"                355.700    0.1044  5911.000"
"                355.800    0.1132  6504.000"
"                355.900    0.1212  7109.000"
"                356.000    0.1284  7727.000"
"                356.100    0.1352  8356.000"
"                356.200    0.1415  8997.000"
"                356.300    0.1475  9650.000"
"                356.400    0.1532  10316.00"
"                356.500    0.1587  10993.00"
"                356.600    0.1639  11683.00"
"                356.700    0.1689  12385.00"
"                356.800    0.1738  13099.00"
"                356.900    0.1784  13826.00"
"                357.000    0.1830  14565.00"
"                357.100    0.1874  15319.00"
"                357.200    0.1917  16091.00"
"                357.300    0.3079  16881.00"
"                357.400    0.5168  17689.00"
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"               357.500    0.7861  18517.00"
"            Peak outflow                  0.033    c.m/sec"
"            Maximum level               355.190    metre"
"            Maximum storage            3076.505    c.m"
"            Centroidal lag               17.630   hours"
"                 0.087     2.113     0.033     0.000 c.m/sec"
" 40         HYDROGRAPH   Combine    9"
"           6   Combine "
"           9   Node #"
"               Conceyance Node"
"            Maximum flow                  0.033    c.m/sec"
"            Hydrograph volume          3466.701    c.m"
"                   0.087     2.113     0.033     0.033"
" 40         HYDROGRAPH   Confluence    9"
"           7   Confluence "
"           9   Node #"
"               Conceyance Node"
"            Maximum flow                  0.033    c.m/sec"
"            Hydrograph volume          3466.701    c.m"
"                   0.087     0.033     0.033     0.000"
" 51         PIPE DESIGN"
"       0.033   Current peak flow    c.m/sec"
"       0.013   Manning 'n'"
"       1.200   Diameter    metre"
"       0.400   Gradient   %"
"            Depth of flow                 0.097    metre"
"            Velocity                      0.761    m/sec"
"            Pipe capacity                 2.466    c.m/sec"
"            Critical depth                0.094    metre"
" 53         ROUTE    Pipe Route 730"
"      730.00      Pipe Route 730 Reach length   ( metre)"
"       0.472   X-factor <= 0.5"
"     239.659   K-lag   ( seconds)"
"       0.000   Default(0) or user spec.(1) values used"
"       0.500   X-factor <= 0.5"
"      30.000   K-lag   ( seconds)"
"       0.500   Beta weighting factor"
"     300.000   Routing time step   ( seconds)"
"           3   No. of sub-reaches"
"            Peak outflow                  0.033    c.m/sec"
"                   0.087     0.033     0.033     0.000 c.m/sec"
" 40         HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
"            Maximum flow                  0.033    c.m/sec"
"            Hydrograph volume          3465.186    c.m"
"                   0.087     0.033     0.033     0.033"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.087     0.000     0.033     0.033"
" 33         CATCHMENT 212"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         212   212"
"      65.000   % Impervious"
"       0.160   Total Area"
"      40.000   Flow length"
"       2.500   Overland Slope"
"       0.056   Pervious Area"
"      40.000   Pervious length"
"       2.500   Pervious slope"
"       0.104   Impervious Area"
"      40.000   Impervious length"
"       2.500   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.142   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.796   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.014     0.000     0.033     0.033 c.m/sec"
"            Catchment 212          Pervious   Impervious Total Area "
"            Surface Area           0.056      0.104      0.160      hectare"
"            Time of concentration  36.928     2.942      5.930      minutes"
"            Time to Centroid       186.549    121.833    127.521    minutes"
"            Rainfall depth         25.028     25.028     25.028     mm"
"            Rainfall volume        14.02      26.03      40.04      c.m"
"            Rainfall losses        21.463     5.113      10.835     mm"
"            Runoff depth           3.564      19.915     14.192     mm"
"            Runoff volume          2.00       20.71      22.71      c.m"
"            Runoff coefficient     0.142      0.796      0.567      "
"            Maximum flow           0.000      0.014      0.014      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.014     0.014     0.033     0.033"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.014     0.014     0.014     0.033"
" 40         HYDROGRAPH   Combine    3"
"           6   Combine "
"           3   Node #"
"               Ex. 1000mm CSP Culvert"
"            Maximum flow                  0.014    c.m/sec"
"            Hydrograph volume            22.707    c.m"
"                   0.014     0.014     0.014     0.014"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.014     0.000     0.014     0.014"
" 33         CATCHMENT 213"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         213   213"
"       2.000   % Impervious"
"      18.930   Total Area"
"     570.000   Flow length"
"       1.600   Overland Slope"
"      18.551   Pervious Area"
"     570.000   Pervious length"
"       1.600   Pervious slope"
"       0.379   Impervious Area"
"     570.000   Impervious length"
"       1.600   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.142   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.807   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.035     0.000     0.014     0.014 c.m/sec"
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"            Catchment 213          Pervious   Impervious Total Area "
"            Surface Area           18.551     0.379      18.930     hectare"
"            Time of concentration  207.868    16.563     188.047    minutes"
"            Time to Centroid       412.610    143.409    384.718    minutes"
"            Rainfall depth         25.028     25.028     25.028     mm"
"            Rainfall volume        4642.98    94.75      4737.74    c.m"
"            Rainfall losses        21.462     4.835      21.130     mm"
"            Runoff depth           3.565      20.193     3.898      mm"
"            Runoff volume          661.40     76.45      737.85     c.m"
"            Runoff coefficient     0.142      0.807      0.156      "
"            Maximum flow           0.029      0.033      0.035      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    0.035     0.035     0.014     0.014"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                    0.035     0.035     0.035     0.014"
" 40         HYDROGRAPH   Combine    3"
"           6   Combine "
"           3   Node #"
"               Ex. 1000mm CSP Culvert"
"            Maximum flow                  0.040    c.m/sec"
"            Hydrograph volume           760.558    c.m"
"                    0.035     0.035     0.035     0.040"
" 40         HYDROGRAPH   Confluence    3"
"           7   Confluence "
"           3   Node #"
"               Ex. 1000mm CSP Culvert"
"            Maximum flow                  0.040    c.m/sec"
"            Hydrograph volume           760.558    c.m"
"                    0.035     0.040     0.035     0.000"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                    0.035     0.040     0.040     0.000"
" 40         HYDROGRAPH   Combine    5"
"           6   Combine "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                  0.040    c.m/sec"
"            Hydrograph volume           760.558    c.m"
"                    0.035     0.040     0.040     0.040"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                    0.035     0.000     0.040     0.040"
" 33         CATCHMENT 214"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         214   214"
"      65.000   % Impervious"
"       0.100   Total Area"
"      50.000   Flow length"
"       2.500   Overland Slope"
"       0.035   Pervious Area"
"      50.000   Pervious length"
"       2.500   Pervious slope"
"       0.065   Impervious Area"
"      50.000   Impervious length"
"       2.500   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.142   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.794   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                    0.009     0.000     0.040     0.040 c.m/sec"
"            Catchment 214          Pervious   Impervious Total Area "
"            Surface Area           0.035      0.065      0.100      hectare"
"            Time of concentration  42.218     3.364      6.785      minutes"
"            Time to Centroid       193.553    122.576    128.824    minutes"
"            Rainfall depth         25.028     25.028     25.028     mm"
"            Rainfall volume        8.76       16.27      25.03      c.m"
"            Rainfall losses        21.463     5.144      10.856     mm"
"            Runoff depth           3.565      19.883     14.172     mm"
"            Runoff volume          1.25       12.92      14.17      c.m"
"            Runoff coefficient     0.142      0.794      0.566      "
"            Maximum flow           0.000      0.009      0.009      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    0.009     0.009     0.040     0.040"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                    0.009     0.009     0.009     0.040"
" 40         HYDROGRAPH   Combine    4"
"           6   Combine "
"           4   Node #"
"               Snyder's/Christian"
"            Maximum flow                  0.009    c.m/sec"
"            Hydrograph volume            14.172    c.m"
"                    0.009     0.009     0.009     0.009"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                    0.009     0.000     0.009     0.009"
" 33         CATCHMENT 215"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         215   215"
"      45.000   % Impervious"
"       1.030   Total Area"
"      70.000   Flow length"
"       0.700   Overland Slope"
"       0.566   Pervious Area"
"      70.000   Pervious length"
"       0.700   Pervious slope"
"       0.463   Impervious Area"
"      70.000   Impervious length"
"       0.700   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      80.000   Pervious SCS Curve No."
"       0.170   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       6.350   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.805   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                    0.065     0.000     0.009     0.009 c.m/sec"
"            Catchment 215          Pervious   Impervious Total Area "
"            Surface Area           0.566      0.463      1.030      hectare"
"            Time of concentration  68.039     6.031      18.734     minutes"
"            Time to Centroid       228.737    126.701    147.604    minutes"
"            Rainfall depth         25.028     25.028     25.028     mm"
"            Rainfall volume        141.78     116.00     257.79     c.m"
"            Rainfall losses        20.783     4.891      13.632     mm"
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"            Runoff depth           4.245      20.137     11.396     mm"
"            Runoff volume          24.05      93.33      117.38     c.m"
"            Runoff coefficient     0.170      0.805      0.455      "
"            Maximum flow           0.003      0.065      0.065      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.065     0.065     0.009     0.009"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.065     0.065     0.065     0.009"
" 40         HYDROGRAPH   Combine    4"
"           6   Combine "
"           4   Node #"
"               Snyder's/Christian"
"            Maximum flow                0.073    c.m/sec"
"            Hydrograph volume         131.552    c.m"
"                   0.065     0.065     0.065     0.073"
" 40         HYDROGRAPH   Confluence    4"
"           7   Confluence "
"           4   Node #"
"               Snyder's/Christian"
"            Maximum flow                0.073    c.m/sec"
"            Hydrograph volume         131.552    c.m"
"                   0.065     0.073     0.065     0.000"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.065     0.073     0.073     0.000"
" 40         HYDROGRAPH   Combine    5"
"           6   Combine "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                0.106    c.m/sec"
"            Hydrograph volume         892.110    c.m"
"                   0.065     0.073     0.073     0.106"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.065     0.000     0.073     0.106"
" 33         CATCHMENT 216"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         216   216"
"      45.000   % Impervious"
"       2.080   Total Area"
"      80.000   Flow length"
"       2.000   Overland Slope"
"       1.144   Pervious Area"
"      80.000   Pervious length"
"       2.000   Pervious slope"
"       0.936   Impervious Area"
"      80.000   Impervious length"
"       2.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      80.000   Pervious SCS Curve No."
"       0.170   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       6.350   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.801   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.126     0.000     0.073     0.106 c.m/sec"
"            Catchment 216          Pervious   Impervious Total Area "
"            Surface Area           1.144      0.936      2.080      hectare"
"            Time of concentration  53.799     4.769      14.850     minutes"
"            Time to Centroid       209.308    124.751    142.138    minutes"
"            Rainfall depth         25.028     25.028     25.028     mm"
"            Rainfall volume        286.32     234.26     520.58     c.m"
"            Rainfall losses        20.784     4.989      13.676     mm"
"            Runoff depth           4.244      20.039     11.352     mm"
"            Runoff volume          48.55      187.57     236.12     c.m"
"            Runoff coefficient     0.170      0.801      0.454      "
"            Maximum flow           0.006      0.125      0.126      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.126     0.126     0.073     0.106"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.126     0.126     0.126     0.106"
" 40         HYDROGRAPH   Combine    5"
"           6   Combine "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                0.232    c.m/sec"
"            Hydrograph volume        1128.229    c.m"
"                   0.126     0.126     0.126     0.232"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.126     0.000     0.126     0.232"
" 33         CATCHMENT 217"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         217   217"
"      55.000   % Impervious"
"      10.200   Total Area"
"      60.000   Flow length"
"       3.000   Overland Slope"
"       4.590   Pervious Area"
"      60.000   Pervious length"
"       3.000   Pervious slope"
"       5.610   Impervious Area"
"      60.000   Impervious length"
"       3.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      80.000   Pervious SCS Curve No."
"       0.170   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       6.350   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.793   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.729     0.000     0.126     0.232 c.m/sec"
"            Catchment 217          Pervious   Impervious Total Area "
"            Surface Area           4.590      5.610      10.200     hectare"
"            Time of concentration  40.085     3.553      8.995      minutes"
"            Time to Centroid       190.595    122.912    132.995    minutes"
"            Rainfall depth         25.028     25.028     25.028     mm"
"            Rainfall volume        1148.77    1404.05    2552.82    c.m"
"            Rainfall losses        20.783     5.189      12.207     mm"
"            Runoff depth           4.244      19.838     12.821     mm"
"            Runoff volume          194.82     1112.93    1307.75    c.m"
"            Runoff coefficient     0.170      0.793      0.512      "
"            Maximum flow           0.032      0.727      0.729      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.729     0.729     0.126     0.232"
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" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.729     0.729     0.729     0.232"
" 40          HYDROGRAPH   Combine    5"
"            6   Combine "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  0.939    c.m/sec"
"             Hydrograph volume          2435.979    c.m"
"                    0.729     0.729     0.729     0.939"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.729     0.000     0.729     0.939"
" 33          CATCHMENT 218"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          218   218"
"       50.000   % Impervious"
"        1.250   Total Area"
"       20.000   Flow length"
"       20.000   Overland Slope"
"        0.625   Pervious Area"
"       20.000   Pervious length"
"       20.000   Pervious slope"
"        0.625   Impervious Area"
"       20.000   Impervious length"
"       20.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.142   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.784   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.099     0.000     0.729     0.939 c.m/sec"
"             Catchment 218          Pervious   Impervious Total Area "
"             Surface Area           0.625      0.625      1.250      hectare"
"             Time of concentration  13.056     1.040      2.884      minutes"
"             Time to Centroid       155.049    118.686    124.264    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        156.42     156.42     312.85     c.m"
"             Rainfall losses        21.474     5.416      13.445     mm"
"             Runoff depth           3.554      19.612     11.583     mm"
"             Runoff volume          22.21      122.57     144.79     c.m"
"             Runoff coefficient     0.142      0.784      0.463      "
"             Maximum flow           0.007      0.097      0.099      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.099     0.099     0.729     0.939"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.099     0.099     0.099     0.939"
" 40          HYDROGRAPH   Combine    5"
"            6   Combine "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  1.009    c.m/sec"
"             Hydrograph volume          2580.765    c.m"
"                    0.099     0.099     0.099     1.009"
" 40          HYDROGRAPH   Confluence    5"
"            7   Confluence "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  1.009    c.m/sec"
"             Hydrograph volume          2580.766    c.m"
"                    0.099     1.009     0.099     0.000"
" 54          POND DESIGN"
"         1.009   Current peak flow    c.m/sec"
"         0.497   Target outflow    c.m/sec"
"        2580.8   Hydrograph volume    c.m"
"           33.   Number of stages"
"       351.500   Minimum water level    metre"
"       354.700   Maximum water level    metre"
"       351.500   Starting water level    metre"
"             0   Keep Design Data: 1 = True; 0 = False"
"                   Level Discharge    Volume"
"                 351.500     0.000     0.000"
"                 351.600   0.00600   400.000"
"                 351.700   0.01900   824.000"
"                 351.800   0.03100  1272.000"
"                 351.900   0.07800  1744.000"
"                 352.000    0.1930  2240.000"
"                 352.100    0.3670  2760.000"
"                 352.200    0.5970  3298.000"
"                 352.300    0.8520  3849.000"
"                 352.400     1.011  4412.000"
"                 352.500     1.122  4988.000"
"                 352.600     1.223  5576.000"
"                 352.700     1.316  6176.000"
"                 352.800     1.403  6789.000"
"                 352.900     1.485  7415.000"
"                 353.000     1.563  8053.000"
"                 353.100     1.637  8704.000"
"                 353.200     1.708  9368.000"
"                 353.300     1.776  10045.00"
"                 353.400     1.841  10735.00"
"                 353.500     1.904  11439.00"
"                 353.600     1.965  12156.00"
"                 353.700     2.025  12884.00"
"                 353.800     2.082  13625.00"
"                 353.900     2.138  14378.00"
"                 354.000     2.193  15143.00"
"                 354.100     2.246  15921.00"
"                 354.200     2.298  16712.00"
"                 354.300     2.349  17517.00"
"                 354.400     2.399  18334.00"
"                 354.500     2.473  19165.00"
"                 354.600     2.708  20012.00"
"                 354.700     3.177  20879.00"
"             Peak outflow                  0.061    c.m/sec"
"             Maximum level               351.864    metre"
"             Maximum storage            1574.597    c.m"
"             Centroidal lag               14.908   hours"
"                  0.099     1.009     0.061     0.000 c.m/sec"
" 40          HYDROGRAPH   Combine    6"
"            6   Combine "
"            6   Node #"
"                Swale Storage Prior to CMP Culvert"
"             Maximum flow                  0.094    c.m/sec"
"             Hydrograph volume          5937.047    c.m"
"                    0.099     1.009     0.061     0.094"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.099     0.000     0.061     0.094"
" 33          CATCHMENT 219"
"            1   Triangular SCS"
```

```
"           1   Equal length"
"           1   SCS method"
"         219   219"
"      45.000   % Impervious"
"       1.250   Total Area"
"      60.000   Flow length"
"       2.000   Overland Slope"
"       0.688   Pervious Area"
"      60.000   Pervious length"
"       2.000   Pervious slope"
"       0.563   Impervious Area"
"      60.000   Impervious length"
"       2.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      80.000   Pervious SCS Curve No."
"       0.170   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       6.350   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.798   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                0.074     0.000     0.061     0.094 c.m/sec"
"            Catchment 219          Pervious   Impervious Total Area "
"            Surface Area           0.688      0.563      1.250      hectare"
"            Time of concentration  45.270     4.013      12.518     minutes"
"            Time to Centroid       197.667    123.573    138.847    minutes"
"            Rainfall depth         25.028     25.028     25.028     mm"
"            Rainfall volume        172.07     140.78     312.85     c.m"
"            Rainfall losses        20.783     5.051      13.704     mm"
"            Runoff depth           4.244      19.977     11.324     mm"
"            Runoff volume          29.18      112.37     141.55     c.m"
"            Runoff coefficient     0.170      0.798      0.452      "
"            Maximum flow           0.004      0.073      0.074      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                0.074     0.074     0.061     0.094"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                0.074     0.074     0.074     0.094"
" 40         HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
"            Maximum flow                 0.097    c.m/sec"
"            Hydrograph volume          6078.598    c.m"
"                0.074     0.074     0.074     0.097"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                0.074     0.000     0.074     0.097"
" 33         CATCHMENT 220"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         220   220"
"       0.000   % Impervious"
"       2.110   Total Area"
"     365.000   Flow length"
"       0.500   Overland Slope"
"       2.110   Pervious Area"
"     365.000   Pervious length"
"       0.500   Pervious slope"
"       0.000   Impervious Area"
"     365.000   Impervious length"
"       0.500   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.142   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                0.003     0.000     0.074     0.097 c.m/sec"
"            Catchment 220          Pervious   Impervious Total Area "
"            Surface Area           2.110      0.000      2.110      hectare"
"            Time of concentration  225.519    17.969     225.518    minutes"
"            Time to Centroid       435.951    145.592    435.950    minutes"
"            Rainfall depth         25.028     25.028     25.028     mm"
"            Rainfall volume        528.08     0.00       528.08     c.m"
"            Rainfall losses        21.462     4.812      21.462     mm"
"            Runoff depth           3.565      20.216     3.565      mm"
"            Runoff volume          75.23      0.00       75.23      c.m"
"            Runoff coefficient     0.142      0.000      0.142      "
"            Maximum flow           0.003      0.000      0.003      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                0.003     0.003     0.074     0.097"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                0.003     0.003     0.003     0.097"
" 40         HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
"            Maximum flow                 0.100    c.m/sec"
"            Hydrograph volume          6153.825    c.m"
"                0.003     0.003     0.003     0.100"
" 40         HYDROGRAPH   Confluence    6"
"           7   Confluence "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
"            Maximum flow                 0.100    c.m/sec"
"            Hydrograph volume          6153.825    c.m"
"                0.003     0.100     0.003     0.000"
" 54         POND DESIGN"
"       0.100   Current peak flow    c.m/sec"
"       0.497   Target outflow    c.m/sec"
"      6153.8   Hydrograph volume    c.m"
"         37.   Number of stages"
"     351.100   Minimum water level    metre"
"     354.700   Maximum water level    metre"
"     351.100   Starting water level    metre"
"           0   Keep Design Data: 1 = True; 0 = False"
"                 Level Discharge    Volume"
"               351.100     0.000     0.000"
"               351.200   0.00900    0.1000"
"               351.300   0.03600    0.6000"
"               351.400   0.08100     1.000"
"               351.500    0.1420     2.000"
"               351.600    0.2180     5.000"
"               351.700    0.3070     8.000"
"               351.800    0.4210    14.000"
"               351.900    0.5530    21.000"
"               352.000    0.6750    29.000"
"               352.100    0.8050    41.000"
"               352.200    0.9380    57.000"
```

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"               352.300     1.066    76.000"
"               352.400     1.191   100.000"
"               352.500     1.307   128.000"
"               352.600     1.410   160.000"
"               352.700     1.507   197.000"
"               352.800     1.596   239.000"
"               352.900     1.684   286.000"
"               353.000     1.768   337.000"
"               353.100     1.849   393.000"
"               353.200     1.928   455.000"
"               353.300     2.005   526.000"
"               353.400     2.080   596.000"
"               353.500     2.153   676.000"
"               353.600     2.224   761.000"
"               353.700     2.293   854.000"
"               353.800     2.361   953.000"
"               353.900     2.427  1060.000"
"               354.000     2.492  1174.000"
"               354.100     2.556  1298.000"
"               354.200     2.618  1435.000"
"               354.300     2.689  1586.000"
"               354.400     2.739  1751.000"
"               354.500     2.797  1929.000"
"               354.600     2.855  2121.000"
"               354.700     2.911  2329.000"
"            Peak outflow                  0.100    c.m/sec"
"            Maximum level               351.431    metre"
"            Maximum storage               1.308    c.m"
"            Centroidal lag               15.327   hours"
"                 0.003     0.100     0.100     0.000 c.m/sec"
" 40         HYDROGRAPH   Combine    7"
"           6   Combine "
"           7   Node #"
"               Baden Creek Tributary"
"            Maximum flow                  0.100    c.m/sec"
"            Hydrograph volume          6153.735    c.m"
"                    0.003     0.100     0.100     0.100"
" 81         ADD COMMENT================================================="
"         4  Lines of comment"
"            **********************************************"
"            ACTUAL FLOW THROUGH CN CULVERT"
"            = 0.100-0.033(INFIL GALLERY) = 0.067cms"
"            **********************************************"
" 38         START/RE-START TOTALS 6"
"           3   Runoff Totals on EXIT"
"            Total Catchment area                    68.640    hectare"
"            Total Impervious area                   24.731    hectare"
"            Total % impervious                      36.029"
" 19         EXIT"
```

```
"               MIDUSS Output ----------------------------------------------->"
"               MIDUSS version                          Version 2.25  rev. 473"
"               MIDUSS created                        Sunday, February 7, 2010"
"          10   Units used:                                        ie METRIC"
"               Job folder:          Q:\40777\104\PRELIMINARY\SWM\2nd DP Sub\"
"                                                                  MIDUSS\Post"
"               Output filename:                                   2yrPost2.in"
"               Licensee name:                                               A"
"               Company                                                      "
"               Date & Time last used:                 9/11/2023 at 1:07:15 PM"
" 31         TIME PARAMETERS"
"       5.000   Time Step"
"     180.000   Max. Storm length"
"    3000.000   Max. Hydrograph"
" 32         STORM Chicago storm"
"           1   Chicago storm"
"     743.000   Coefficient A"
"       6.000   Constant B"
"       0.799   Exponent C"
"       0.400   Fraction R"
"     180.000   Duration"
"       1.000   Time step multiplier"
"            Maximum intensity          109.374    mm/hr"
"            Total depth                 34.259    mm"
"           4   2hyd   Hydrograph extension used in this file"
" 33         CATCHMENT 201"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         201   201"
"       0.000   % Impervious"
"       0.640   Total Area"
"      80.000   Flow length"
"       2.000   Overland Slope"
"       0.640   Pervious Area"
"      80.000   Pervious length"
"       2.000   Pervious slope"
"       0.000   Impervious Area"
"      80.000   Impervious length"
"       2.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.217   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.009     0.000     0.000     0.000 c.m/sec"
"            Catchment 201          Pervious   Impervious Total Area "
"            Surface Area           0.640      0.000      0.640      hectare"
"            Time of concentration  41.703     3.980      41.703     minutes"
"            Time to Centroid       154.443    94.054     154.443    minutes"
"            Rainfall depth         34.259     34.259     34.259     mm"
"            Rainfall volume        219.25     0.00       219.25     c.m"
"            Rainfall losses        26.826     5.455      26.826     mm"
"            Runoff depth           7.432      28.804     7.432      mm"
"            Runoff volume          47.57      0.00       47.57      c.m"
"            Runoff coefficient     0.217      0.000      0.217      "
"            Maximum flow           0.009      0.000      0.009      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.009     0.009     0.000     0.000"
```

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" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                     0.009     0.009     0.009     0.000"
" 40          HYDROGRAPH   Combine    1"
"             6   Combine "
"             1   Node #"
"                 Internal Depression"
"              Maximum flow                  0.009    c.m/sec"
"              Hydrograph volume            47.566    c.m"
"                     0.009     0.009     0.009     0.009"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                     0.009     0.000     0.009     0.009"
" 33          CATCHMENT 202"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           202   202"
"        45.000   % Impervious"
"         0.270   Total Area"
"        30.000   Flow length"
"         4.000   Overland Slope"
"         0.148   Pervious Area"
"        30.000   Pervious length"
"         4.000   Pervious slope"
"         0.122   Impervious Area"
"        30.000   Impervious length"
"         4.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.217   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.842   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                     0.028     0.000     0.009     0.009 c.m/sec"
"              Catchment 202          Pervious   Impervious Total Area "
"              Surface Area           0.148      0.122      0.270      hectare"
"              Time of concentration  18.805     1.795      5.865      minutes"
"              Time to Centroid       125.481    90.540     98.902     minutes"
"              Rainfall depth         34.259     34.259     34.259     mm"
"              Rainfall volume        50.87      41.62      92.50      c.m"
"              Rainfall losses        26.834     5.414      17.195     mm"
"              Runoff depth           7.424      28.845     17.064     mm"
"              Runoff volume          11.03      35.05      46.07      c.m"
"              Runoff coefficient     0.217      0.842      0.498      "
"              Maximum flow           0.003      0.027      0.028      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                     0.028     0.028     0.009     0.009"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                     0.028     0.028     0.028     0.009"
" 40          HYDROGRAPH   Combine    2"
"             6   Combine "
"             2   Node #"
"                 Activa Baden Subdivision"
"              Maximum flow                  0.028    c.m/sec"
"              Hydrograph volume            46.072    c.m"
"                     0.028     0.028     0.028     0.028"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                     0.028     0.000     0.028     0.028"
" 33          CATCHMENT 203"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           203   203"
"        65.000   % Impervious"
"         0.090   Total Area"
"        30.000   Flow length"
"         2.000   Overland Slope"
"         0.032   Pervious Area"
"        30.000   Pervious length"
"         2.000   Pervious slope"
"         0.059   Impervious Area"
"        30.000   Impervious length"
"         2.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.217   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.841   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                     0.013     0.000     0.028     0.028 c.m/sec"
"              Catchment 203          Pervious   Impervious Total Area "
"              Surface Area           0.032      0.059      0.090      hectare"
"              Time of concentration  23.152     2.210      4.763      minutes"
"              Time to Centroid       130.984    91.264     96.107     minutes"
"              Rainfall depth         34.259     34.259     34.259     mm"
"              Rainfall volume        10.79      20.04      30.83      c.m"
"              Rainfall losses        26.828     5.447      12.931     mm"
"              Runoff depth           7.430      28.811     21.328     mm"
"              Runoff volume          2.34       16.85      19.20      c.m"
"              Runoff coefficient     0.217      0.841      0.623      "
"              Maximum flow           0.001      0.013      0.013      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                     0.013     0.013     0.028     0.028"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                     0.013     0.013     0.013     0.028"
" 40          HYDROGRAPH   Combine    2"
"             6   Combine "
"             2   Node #"
"                 Activa Baden Subdivision"
"              Maximum flow                  0.040    c.m/sec"
"              Hydrograph volume            65.267    c.m"
"                     0.013     0.013     0.013     0.040"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                     0.013     0.000     0.013     0.040"
" 33          CATCHMENT 204"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           204   204"
"         0.000   % Impervious"
"         4.490   Total Area"
"       205.000   Flow length"
"         1.800   Overland Slope"
"         4.490   Pervious Area"
"       205.000   Pervious length"
```

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"        1.800   Pervious slope"
"        0.000   Impervious Area"
"      205.000   Impervious length"
"        1.800   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.217   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.038     0.000     0.013     0.040 c.m/sec"
"             Catchment 204          Pervious   Impervious Total Area "
"             Surface Area           4.490      0.000      4.490      hectare"
"             Time of concentration  75.699     7.225      75.699     minutes"
"             Time to Centroid       197.444    98.906     197.444    minutes"
"             Rainfall depth         34.259     34.259     34.259     mm"
"             Rainfall volume        1538.21    0.00       1538.21    c.m"
"             Rainfall losses        26.825     5.245      26.825     mm"
"             Runoff depth           7.434      29.013     7.434      mm"
"             Runoff volume          333.79     0.00       333.79     c.m"
"             Runoff coefficient     0.217      0.000      0.217      "
"             Maximum flow           0.038      0.000      0.038      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                  0.038     0.038     0.013     0.040"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                  0.038     0.038     0.038     0.040"
" 40          HYDROGRAPH   Combine    1"
"             6   Combine "
"             1   Node #"
"                 Internal Depression"
"             Maximum flow                0.045    c.m/sec"
"             Hydrograph volume         381.355    c.m"
"                  0.038     0.038     0.038     0.045"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                  0.038     0.000     0.038     0.045"
" 33          CATCHMENT 205"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           205   205"
"        61.000   % Impervious"
"        19.470   Total Area"
"        90.000   Flow length"
"         0.500   Overland Slope"
"         7.593   Pervious Area"
"        90.000   Pervious length"
"         0.500   Pervious slope"
"        11.877   Impervious Area"
"        90.000   Impervious length"
"         0.500   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.217   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.846   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                  2.527     0.000     0.038     0.045 c.m/sec"
"             Catchment 205          Pervious   Impervious Total Area "
"             Surface Area           7.593      11.877     19.470     hectare"
"             Time of concentration  67.838     6.474      15.122     minutes"
"             Time to Centroid       187.501    97.780     110.425    minutes"
"             Rainfall depth         34.259     34.259     34.259     mm"
"             Rainfall volume        2601.36    4068.79    6670.14    c.m"
"             Rainfall losses        26.824     5.284      13.685     mm"
"             Runoff depth           7.435      28.974     20.574     mm"
"             Runoff volume          564.53     3441.16    4005.69    c.m"
"             Runoff coefficient     0.217      0.846      0.601      "
"             Maximum flow           0.071      2.519      2.527      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                  2.527     2.527     0.038     0.045"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                  2.527     2.527     2.527     0.045"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Proposed SWMF"
"             Maximum flow                 2.527    c.m/sec"
"             Hydrograph volume         4005.691    c.m"
"                  2.527     2.527     2.527     2.527"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                  2.527     0.000     2.527     2.527"
" 33          CATCHMENT 206"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           206   206"
"        75.000   % Impervious"
"         1.220   Total Area"
"        70.000   Flow length"
"         4.000   Overland Slope"
"         0.305   Pervious Area"
"        70.000   Pervious length"
"         4.000   Pervious slope"
"         0.915   Impervious Area"
"        70.000   Impervious length"
"         4.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.217   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.841   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                  0.183     0.000     2.527     2.527 c.m/sec"
"             Catchment 206          Pervious   Impervious Total Area "
"             Surface Area           0.305      0.915      1.220      hectare"
"             Time of concentration  31.265     2.984      5.224      minutes"
"             Time to Centroid       141.244    92.481     96.343     minutes"
"             Rainfall depth         34.259     34.259     34.259     mm"
"             Rainfall volume        104.49     313.47     417.95     c.m"
"             Rainfall losses        26.827     5.459      10.801     mm"
"             Runoff depth           7.431      28.800     23.458     mm"
"             Runoff volume          22.67      263.52     286.18     c.m"
```

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"             Runoff coefficient     0.217      0.841      0.685      "
"             Maximum flow           0.005      0.183      0.183      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.183     0.183     2.527     2.527"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.183     0.183     0.183     2.527"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Proposed SWMF"
"             Maximum flow                  2.705    c.m/sec"
"             Hydrograph volume          4291.875    c.m"
"                    0.183     0.183     0.183     2.705"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.183     0.000     0.183     2.705"
" 33          CATCHMENT 207"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           207   207"
"         0.000   % Impervious"
"         0.700   Total Area"
"        70.000   Flow length"
"         4.000   Overland Slope"
"         0.700   Pervious Area"
"        70.000   Pervious length"
"         4.000   Pervious slope"
"         0.000   Impervious Area"
"        70.000   Impervious length"
"         4.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.217   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.000   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.012     0.000     0.183     2.705 c.m/sec"
"                Catchment 207          Pervious   Impervious Total Area "
"                Surface Area           0.700      0.000      0.700      hectare"
"                Time of concentration  31.265     2.984      31.265     minutes"
"                Time to Centroid       141.244    92.481     141.244    minutes"
"                Rainfall depth         34.259     34.259     34.259     mm"
"                Rainfall volume        239.81     0.00       239.81     c.m"
"                Rainfall losses        26.827     5.459      26.827     mm"
"                Runoff depth           7.431      28.800     7.431      mm"
"                Runoff volume          52.02      0.00       52.02      c.m"
"                Runoff coefficient     0.217      0.000      0.217      "
"                Maximum flow           0.012      0.000      0.012      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.012     0.012     0.183     2.705"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.012     0.012     0.012     2.705"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Proposed SWMF"
"             Maximum flow                  2.707    c.m/sec"
"             Hydrograph volume          4343.896    c.m"
"                    0.012     0.012     0.012     2.707"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.012     0.000     0.012     2.707"
" 33          CATCHMENT 208"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           208   208"
"        70.000   % Impervious"
"         2.120   Total Area"
"        60.000   Flow length"
"         1.500   Overland Slope"
"         0.636   Pervious Area"
"        60.000   Pervious length"
"         1.500   Pervious slope"
"         1.484   Impervious Area"
"        60.000   Impervious length"
"         1.500   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.217   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.835   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.303     0.000     0.012     2.707 c.m/sec"
"                Catchment 208          Pervious   Impervious Total Area "
"                Surface Area           0.636      1.484      2.120      hectare"
"                Time of concentration  38.254     3.651      7.119      minutes"
"                Time to Centroid       150.082    93.603     99.263     minutes"
"                Rainfall depth         34.259     34.259     34.259     mm"
"                Rainfall volume        217.88     508.40     726.28     c.m"
"                Rainfall losses        26.828     5.669      12.017     mm"
"                Runoff depth           7.430      28.589     22.242     mm"
"                Runoff volume          47.26      424.26     471.52     c.m"
"                Runoff coefficient     0.217      0.835      0.649      "
"                Maximum flow           0.009      0.301      0.303      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.303     0.303     0.012     2.707"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.303     0.303     0.303     2.707"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Proposed SWMF"
"             Maximum flow                  3.010    c.m/sec"
"             Hydrograph volume          4815.418    c.m"
"                    0.303     0.303     0.303     3.010"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.303     0.000     0.303     3.010"
" 33          CATCHMENT 209"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           209   209"
"        75.000   % Impervious"
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"        1.300   Total Area"
"       60.000   Flow length"
"        1.000   Overland Slope"
"        0.325   Pervious Area"
"       60.000   Pervious length"
"        1.000   Pervious slope"
"        0.975   Impervious Area"
"       60.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.217   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.843   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.203     0.000     0.303     3.010 c.m/sec"
"             Catchment 209          Pervious   Impervious Total Area "
"             Surface Area           0.325      0.975      1.300      hectare"
"             Time of concentration  43.203     4.123      7.213      minutes"
"             Time to Centroid       156.339    94.256     99.164     minutes"
"             Rainfall depth         34.259     34.259     34.259     mm"
"             Rainfall volume        111.34     334.02     445.36     c.m"
"             Rainfall losses        26.825     5.395      10.753     mm"
"             Runoff depth           7.434      28.863     23.506     mm"
"             Runoff volume          24.16      281.42     305.58     c.m"
"             Runoff coefficient     0.217      0.843      0.686      "
"             Maximum flow           0.004      0.202      0.203      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.203     0.203     0.303     3.010"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.203     0.203     0.203     3.010"
" 40          HYDROGRAPH   Combine    3"
"            6   Combine "
"            3   Node #"
"                Proposed SWMF"
"             Maximum flow                  3.213    c.m/sec"
"             Hydrograph volume          5120.993    c.m"
"                    0.203     0.203     0.203     3.213"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.203     0.000     0.203     3.213"
" 33          CATCHMENT 210"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          210   210"
"        4.000   % Impervious"
"        0.130   Total Area"
"       15.000   Flow length"
"        2.000   Overland Slope"
"        0.125   Pervious Area"
"       15.000   Pervious length"
"        2.000   Pervious slope"
"        0.005   Impervious Area"
"       15.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.217   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.840   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.003     0.000     0.203     3.213 c.m/sec"
"             Catchment 210          Pervious   Impervious Total Area "
"             Surface Area           0.125      0.005      0.130      hectare"
"             Time of concentration  15.274     1.458      13.354     minutes"
"             Time to Centroid       121.019    90.077     116.718    minutes"
"             Rainfall depth         34.259     34.259     34.259     mm"
"             Rainfall volume        42.75      1.78       44.54      c.m"
"             Rainfall losses        26.831     5.483      25.977     mm"
"             Runoff depth           7.428      28.775     8.282      mm"
"             Runoff volume          9.27       1.50       10.77      c.m"
"             Runoff coefficient     0.217      0.840      0.242      "
"             Maximum flow           0.003      0.001      0.003      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.003     0.003     0.203     3.213"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.003     0.003     0.003     3.213"
" 40          HYDROGRAPH   Combine    3"
"            6   Combine "
"            3   Node #"
"                Proposed SWMF"
"             Maximum flow                  3.216    c.m/sec"
"             Hydrograph volume          5131.759    c.m"
"                    0.003     0.003     0.003     3.216"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.003     0.000     0.003     3.216"
" 33          CATCHMENT 211"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          211   211"
"       50.000   % Impervious"
"        1.100   Total Area"
"       20.000   Flow length"
"       20.000   Overland Slope"
"        0.550   Pervious Area"
"       20.000   Pervious length"
"       20.000   Pervious slope"
"        0.550   Impervious Area"
"       20.000   Impervious length"
"       20.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.216   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.817   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.137     0.000     0.003     3.216 c.m/sec"
"             Catchment 211          Pervious   Impervious Total Area "
"             Surface Area           0.550      0.550      1.100      hectare"
"             Time of concentration  9.098      0.868      2.590      minutes"
"             Time to Centroid       113.210    89.179     94.207     minutes"
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"            Rainfall depth         34.259     34.259     34.259     mm"
"            Rainfall volume        188.42     188.42     376.84     c.m"
"            Rainfall losses        26.855     6.273      16.564     mm"
"            Runoff depth           7.404      27.985     17.695     mm"
"            Runoff volume          40.72      153.92     194.64     c.m"
"            Runoff coefficient     0.216      0.817      0.517      "
"            Maximum flow           0.018      0.133      0.137      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.137     0.137     0.003     3.216"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.137     0.137     0.137     3.216"
" 40         HYDROGRAPH   Combine    3"
"           6   Combine "
"           3   Node #"
"               Proposed SWMF"
"            Maximum flow                3.300    c.m/sec"
"            Hydrograph volume          5326.399    c.m"
"                   0.137     0.137     0.137     3.300"
" 40         HYDROGRAPH   Confluence    3"
"           7   Confluence "
"           3   Node #"
"               Proposed SWMF"
"            Maximum flow                3.300    c.m/sec"
"            Hydrograph volume          5326.399    c.m"
"                   0.137     3.300     0.137     0.000"
" 54         POND DESIGN"
"        3.300   Current peak flow    c.m/sec"
"        1.127   Target outflow    c.m/sec"
"       5326.4   Hydrograph volume    c.m"
"          29.   Number of stages"
"      354.700   Minimum water level    metre"
"      357.500   Maximum water level    metre"
"      354.700   Starting water level    metre"
"           0   Keep Design Data: 1 = True; 0 = False"
"                 Level Discharge    Volume"
"               354.700     0.000     0.000"
"               354.800   0.03251  1214.000"
"               354.900   0.03252  1662.000"
"               355.000   0.03253  2129.000"
"               355.100   0.03254  2617.000"
"               355.200   0.03255  3125.000"
"               355.300   0.04330  3655.000"
"               355.400   0.06630  4201.000"
"               355.500   0.08230  4759.000"
"               355.600   0.09440  5329.000"
"               355.700    0.1044  5911.000"
"               355.800    0.1132  6504.000"
"               355.900    0.1212  7109.000"
"               356.000    0.1284  7727.000"
"               356.100    0.1352  8356.000"
"               356.200    0.1415  8997.000"
"               356.300    0.1475  9650.000"
"               356.400    0.1532  10316.00"
"               356.500    0.1587  10993.00"
"               356.600    0.1639  11683.00"
"               356.700    0.1689  12385.00"
"               356.800    0.1738  13099.00"
"               356.900    0.1784  13826.00"
"               357.000    0.1830  14565.00"
"               357.100    0.1874  15319.00"
"               357.200    0.1917  16091.00"
"               357.300    0.3079  16881.00"
"               357.400    0.5168  17689.00"
"               357.500    0.7861  18517.00"
"            Peak outflow                0.079    c.m/sec"
"            Maximum level             355.477    metre"
"            Maximum storage          4633.158    c.m"
"            Centroidal lag             18.922   hours"
"                 0.137     3.300     0.079     0.000 c.m/sec"
" 40         HYDROGRAPH   Combine    9"
"           6   Combine "
"           9   Node #"
"               Conceyance Node"
"            Maximum flow                0.079    c.m/sec"
"            Hydrograph volume          5166.967    c.m"
"                   0.137     3.300     0.079     0.079"
" 40         HYDROGRAPH   Confluence    9"
"           7   Confluence "
"           9   Node #"
"               Conceyance Node"
"            Maximum flow                0.079    c.m/sec"
"            Hydrograph volume          5166.967    c.m"
"                   0.137     0.079     0.079     0.000"
" 51         PIPE DESIGN"
"       0.079   Current peak flow    c.m/sec"
"       0.013   Manning 'n'"
"       1.200   Diameter    metre"
"       0.400   Gradient   %"
"            Depth of flow               0.147    metre"
"            Velocity                    0.994    m/sec"
"            Pipe capacity               2.466    c.m/sec"
"            Critical depth              0.147    metre"
" 53         ROUTE    Pipe Route 730"
"      730.00      Pipe Route 730 Reach length   ( metre)"
"       0.475   X-factor <= 0.5"
"     275.514   K-lag   ( seconds)"
"       0.000   Default(0) or user spec.(1) values used"
"       0.500   X-factor <= 0.5"
"      30.000   K-lag   ( seconds)"
"       0.500   Beta weighting factor"
"     300.000   Routing time step   ( seconds)"
"           2   No. of sub-reaches"
"            Peak outflow                0.079    c.m/sec"
"                   0.137     0.079     0.079     0.000 c.m/sec"
" 40         HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
"            Maximum flow                0.079    c.m/sec"
"            Hydrograph volume          5164.597    c.m"
"                   0.137     0.079     0.079     0.079"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.137     0.000     0.079     0.079"
" 33         CATCHMENT 212"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         212   212"
"      65.000   % Impervious"
"       0.160   Total Area"
"      40.000   Flow length"
"       2.500   Overland Slope"
"       0.056   Pervious Area"
"      40.000   Pervious length"
"       2.500   Pervious slope"
"       0.104   Impervious Area"
"      40.000   Impervious length"
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"        2.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.217   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.839   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.022     0.000     0.079     0.079 c.m/sec"
"             Catchment 212          Pervious   Impervious Total Area "
"             Surface Area           0.056      0.104      0.160      hectare"
"             Time of concentration  25.732     2.456      5.298      minutes"
"             Time to Centroid       134.244    91.636     96.840     minutes"
"             Rainfall depth         34.259     34.259     34.259     mm"
"             Rainfall volume        19.18      35.63      54.81      c.m"
"             Rainfall losses        26.832     5.510      12.973     mm"
"             Runoff depth           7.427      28.748     21.286     mm"
"             Runoff volume          4.16       29.90      34.06      c.m"
"             Runoff coefficient     0.217      0.839      0.621      "
"             Maximum flow           0.001      0.022      0.022      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.022     0.022     0.079     0.079"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.022     0.022     0.022     0.079"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Ex. 1000mm CSP Culvert"
"              Maximum flow                  0.022    c.m/sec"
"              Hydrograph volume            34.057    c.m"
"                    0.022     0.022     0.022     0.022"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.022     0.000     0.022     0.022"
" 33          CATCHMENT 213"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           213   213"
"         2.000   % Impervious"
"        18.930   Total Area"
"       570.000   Flow length"
"         1.600   Overland Slope"
"        18.551   Pervious Area"
"       570.000   Pervious length"
"         1.600   Pervious slope"
"         0.379   Impervious Area"
"       570.000   Impervious length"
"         1.600   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.217   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.852   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.095     0.000     0.022     0.022 c.m/sec"
"             Catchment 213          Pervious   Impervious Total Area "
"             Surface Area           18.551     0.379      18.930     hectare"
"             Time of concentration  144.846    13.824     135.130    minutes"
"             Time to Centroid       284.912    108.731    271.847    minutes"
"             Rainfall depth         34.259     34.259     34.259     mm"
"             Rainfall volume        6355.44    129.70     6485.15    c.m"
"             Rainfall losses        26.824     5.080      26.389     mm"
"             Runoff depth           7.435      29.179     7.870      mm"
"             Runoff volume          1379.26    110.47     1489.73    c.m"
"             Runoff coefficient     0.217      0.852      0.230      "
"             Maximum flow           0.092      0.054      0.095      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.095     0.095     0.022     0.022"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.095     0.095     0.095     0.022"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Ex. 1000mm CSP Culvert"
"              Maximum flow                  0.096    c.m/sec"
"              Hydrograph volume          1523.792    c.m"
"                    0.095     0.095     0.095     0.096"
" 40          HYDROGRAPH   Confluence    3"
"             7   Confluence "
"             3   Node #"
"                 Ex. 1000mm CSP Culvert"
"              Maximum flow                  0.096    c.m/sec"
"              Hydrograph volume          1523.792    c.m"
"                    0.095     0.096     0.095     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.095     0.096     0.096     0.000"
" 40          HYDROGRAPH   Combine    5"
"             6   Combine "
"             5   Node #"
"                 to Baden West SWMF"
"              Maximum flow                  0.096    c.m/sec"
"              Hydrograph volume          1523.792    c.m"
"                    0.095     0.096     0.096     0.096"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.095     0.000     0.096     0.096"
" 33          CATCHMENT 214"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           214   214"
"        65.000   % Impervious"
"         0.100   Total Area"
"        50.000   Flow length"
"         2.500   Overland Slope"
"         0.035   Pervious Area"
"        50.000   Pervious length"
"         2.500   Pervious slope"
"         0.065   Impervious Area"
"        50.000   Impervious length"
"         2.500   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.217   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
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"       98.000   Impervious SCS Curve No."
"        0.841   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.013     0.000     0.096     0.096 c.m/sec"
"             Catchment 214          Pervious   Impervious Total Area "
"             Surface Area           0.035      0.065      0.100      hectare"
"             Time of concentration  29.418     2.808      6.054      minutes"
"             Time to Centroid       138.904    92.206     97.903     minutes"
"             Rainfall depth         34.259     34.259     34.259     mm"
"             Rainfall volume        11.99      22.27      34.26      c.m"
"             Rainfall losses        26.827     5.459      12.938     mm"
"             Runoff depth           7.432      28.800     21.321     mm"
"             Runoff volume          2.60       18.72      21.32      c.m"
"             Runoff coefficient     0.217      0.841      0.622      "
"             Maximum flow           0.001      0.013      0.013      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.013     0.013     0.096     0.096"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.013     0.013     0.013     0.096"
" 40          HYDROGRAPH   Combine    4"
"           6   Combine "
"           4   Node #"
"               Snyder's/Christian"
"            Maximum flow                  0.013    c.m/sec"
"            Hydrograph volume            21.321    c.m"
"                  0.013     0.013     0.013     0.013"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                  0.013     0.000     0.013     0.013"
" 33          CATCHMENT 215"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         215   215"
"       45.000   % Impervious"
"        1.030   Total Area"
"       70.000   Flow length"
"        0.700   Overland Slope"
"        0.566   Pervious Area"
"       70.000   Pervious length"
"        0.700   Pervious slope"
"        0.463   Impervious Area"
"       70.000   Impervious length"
"        0.700   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.249   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.850   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.098     0.000     0.013     0.013 c.m/sec"
"             Catchment 215          Pervious   Impervious Total Area "
"             Surface Area           0.566      0.463      1.030      hectare"
"             Time of concentration  48.872     5.033      16.585     minutes"
"             Time to Centroid       163.716    95.578     113.533    minutes"
"             Rainfall depth         34.259     34.259     34.259     mm"
"             Rainfall volume        194.07     158.79     352.86     c.m"
"             Rainfall losses        25.739     5.154      16.476     mm"
"             Runoff depth           8.520      29.104     17.783     mm"
"             Runoff volume          48.26      134.90     183.16     c.m"
"             Runoff coefficient     0.249      0.850      0.519      "
"             Maximum flow           0.008      0.097      0.098      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.098     0.098     0.013     0.013"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.098     0.098     0.098     0.013"
" 40          HYDROGRAPH   Combine    4"
"           6   Combine "
"           4   Node #"
"               Snyder's/Christian"
"            Maximum flow                  0.111    c.m/sec"
"            Hydrograph volume           204.484    c.m"
"                  0.098     0.098     0.098     0.111"
" 40          HYDROGRAPH   Confluence    4"
"           7   Confluence "
"           4   Node #"
"               Snyder's/Christian"
"            Maximum flow                  0.111    c.m/sec"
"            Hydrograph volume           204.484    c.m"
"                  0.098     0.111     0.098     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.098     0.111     0.111     0.000"
" 40          HYDROGRAPH   Combine    5"
"           6   Combine "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                  0.174    c.m/sec"
"            Hydrograph volume          1728.275    c.m"
"                  0.098     0.111     0.111     0.174"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                  0.098     0.000     0.111     0.174"
" 33          CATCHMENT 216"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         216   216"
"       45.000   % Impervious"
"        2.080   Total Area"
"       80.000   Flow length"
"        2.000   Overland Slope"
"        1.144   Pervious Area"
"       80.000   Pervious length"
"        2.000   Pervious slope"
"        0.936   Impervious Area"
"       80.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.249   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.841   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.197     0.000     0.111     0.174 c.m/sec"
"             Catchment 216          Pervious   Impervious Total Area "
"             Surface Area           1.144      0.936      2.080      hectare"
```

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"             Time of concentration  38.643     3.980      13.183     minutes"
"             Time to Centroid       150.513    94.054     109.043    minutes"
"             Rainfall depth         34.259     34.259     34.259     mm"
"             Rainfall volume        391.92     320.66     712.58     c.m"
"             Rainfall losses        25.740     5.455      16.612     mm"
"             Runoff depth           8.518      28.804     17.647     mm"
"             Runoff volume          97.45      269.61     367.05     c.m"
"             Runoff coefficient     0.249      0.841      0.515      "
"             Maximum flow           0.019      0.193      0.197      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.197     0.197     0.111     0.174"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.197     0.197     0.197     0.174"
" 40          HYDROGRAPH   Combine    5"
"             6   Combine "
"             5   Node #"
"                 to Baden West SWMF"
"             Maximum flow                  0.371    c.m/sec"
"             Hydrograph volume          2095.328    c.m"
"                    0.197     0.197     0.197     0.371"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.197     0.000     0.197     0.371"
" 33          CATCHMENT 217"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           217   217"
"        55.000   % Impervious"
"        10.200   Total Area"
"        60.000   Flow length"
"         3.000   Overland Slope"
"         4.590   Pervious Area"
"        60.000   Pervious length"
"         3.000   Pervious slope"
"         5.610   Impervious Area"
"        60.000   Impervious length"
"         3.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        80.000   Pervious SCS Curve No."
"         0.248   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         6.350   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.841   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    1.129     0.000     0.197     0.371 c.m/sec"
"                Catchment 217          Pervious   Impervious Total Area "
"                Surface Area           4.590      5.610      10.200     hectare"
"                Time of concentration  28.793     2.965      7.995      minutes"
"                Time to Centroid       137.808    92.452     101.284    minutes"
"                Rainfall depth         34.259     34.259     34.259     mm"
"                Rainfall volume        1572.47    1921.91    3494.37    c.m"
"                Rainfall losses        25.746     5.456      14.587     mm"
"                Runoff depth           8.512      28.802     19.672     mm"
"                Runoff volume          390.71     1615.81    2006.52    c.m"
"                Runoff coefficient     0.248      0.841      0.574      "
"                Maximum flow           0.094      1.121      1.129      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    1.129     1.129     0.197     0.371"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    1.129     1.129     1.129     0.371"
" 40          HYDROGRAPH   Combine    5"
"             6   Combine "
"             5   Node #"
"                 to Baden West SWMF"
"             Maximum flow                  1.478    c.m/sec"
"             Hydrograph volume          4101.843    c.m"
"                    1.129     1.129     1.129     1.478"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    1.129     0.000     1.129     1.478"
" 33          CATCHMENT 218"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           218   218"
"        50.000   % Impervious"
"         1.250   Total Area"
"        20.000   Flow length"
"        20.000   Overland Slope"
"         0.625   Pervious Area"
"        20.000   Pervious length"
"        20.000   Pervious slope"
"         0.625   Impervious Area"
"        20.000   Impervious length"
"        20.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.216   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.817   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.156     0.000     1.129     1.478 c.m/sec"
"                Catchment 218          Pervious   Impervious Total Area "
"                Surface Area           0.625      0.625      1.250      hectare"
"                Time of concentration  9.098      0.868      2.590      minutes"
"                Time to Centroid       113.210    89.179     94.207     minutes"
"                Rainfall depth         34.259     34.259     34.259     mm"
"                Rainfall volume        214.12     214.12     428.23     c.m"
"                Rainfall losses        26.855     6.273      16.564     mm"
"                Runoff depth           7.404      27.985     17.695     mm"
"                Runoff volume          46.27      174.91     221.18     c.m"
"                Runoff coefficient     0.216      0.817      0.517      "
"                Maximum flow           0.021      0.151      0.156      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.156     0.156     1.129     1.478"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.156     0.156     0.156     1.478"
" 40          HYDROGRAPH   Combine    5"
"             6   Combine "
"             5   Node #"
"                 to Baden West SWMF"
"             Maximum flow                  1.577    c.m/sec"
"             Hydrograph volume          4323.025    c.m"
"                    0.156     0.156     0.156     1.577"
" 40          HYDROGRAPH   Confluence    5"
"             7   Confluence "
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"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  1.577    c.m/sec"
"             Hydrograph volume          4323.026    c.m"
"                    0.156     1.577     0.156     0.000"
" 54          POND DESIGN"
"        1.577   Current peak flow    c.m/sec"
"        0.497   Target outflow    c.m/sec"
"       4323.0   Hydrograph volume    c.m"
"          33.   Number of stages"
"      351.500   Minimum water level    metre"
"      354.700   Maximum water level    metre"
"      351.500   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                351.500     0.000     0.000"
"                351.600   0.00600   400.000"
"                351.700   0.01900   824.000"
"                351.800   0.03100  1272.000"
"                351.900   0.07800  1744.000"
"                352.000    0.1930  2240.000"
"                352.100    0.3670  2760.000"
"                352.200    0.5970  3298.000"
"                352.300    0.8520  3849.000"
"                352.400     1.011  4412.000"
"                352.500     1.122  4988.000"
"                352.600     1.223  5576.000"
"                352.700     1.316  6176.000"
"                352.800     1.403  6789.000"
"                352.900     1.485  7415.000"
"                353.000     1.563  8053.000"
"                353.100     1.637  8704.000"
"                353.200     1.708  9368.000"
"                353.300     1.776  10045.00"
"                353.400     1.841  10735.00"
"                353.500     1.904  11439.00"
"                353.600     1.965  12156.00"
"                353.700     2.025  12884.00"
"                353.800     2.082  13625.00"
"                353.900     2.138  14378.00"
"                354.000     2.193  15143.00"
"                354.100     2.246  15921.00"
"                354.200     2.298  16712.00"
"                354.300     2.349  17517.00"
"                354.400     2.399  18334.00"
"                354.500     2.473  19165.00"
"                354.600     2.708  20012.00"
"                354.700     3.177  20879.00"
"             Peak outflow                  0.187    c.m/sec"
"             Maximum level               351.995    metre"
"             Maximum storage            2213.968    c.m"
"             Centroidal lag               10.464   hours"
"                  0.156     1.577     0.187     0.000 c.m/sec"
" 40          HYDROGRAPH   Combine    6"
"            6   Combine "
"            6   Node #"
"                Swale Storage Prior to CMP Culvert"
"             Maximum flow                  0.262    c.m/sec"
"             Hydrograph volume          9379.201    c.m"
"                    0.156     1.577     0.187     0.262"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.156     0.000     0.187     0.262"
" 33          CATCHMENT 219"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          219   219"
"       45.000   % Impervious"
"        1.250   Total Area"
"       60.000   Flow length"
"        2.000   Overland Slope"
"        0.688   Pervious Area"
"       60.000   Pervious length"
"        2.000   Pervious slope"
"        0.563   Impervious Area"
"       60.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.249   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.839   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.115     0.000     0.187     0.262 c.m/sec"
"             Catchment 219          Pervious   Impervious Total Area "
"             Surface Area           0.688      0.563      1.250      hectare"
"             Time of concentration  32.517     3.349      11.105     minutes"
"             Time to Centroid       142.617    93.076     106.249    minutes"
"             Rainfall depth         34.259     34.259     34.259     mm"
"             Rainfall volume        235.53     192.70     428.23     c.m"
"             Rainfall losses        25.743     5.525      16.644     mm"
"             Runoff depth           8.516      28.734     17.614     mm"
"             Runoff volume          58.55      161.63     220.18     c.m"
"             Runoff coefficient     0.249      0.839      0.514      "
"             Maximum flow           0.013      0.112      0.115      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.115     0.115     0.187     0.262"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.115     0.115     0.115     0.262"
" 40          HYDROGRAPH   Combine    6"
"            6   Combine "
"            6   Node #"
"                Swale Storage Prior to CMP Culvert"
"             Maximum flow                  0.269    c.m/sec"
"             Hydrograph volume          9599.377    c.m"
"                    0.115     0.115     0.115     0.269"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.115     0.000     0.115     0.269"
" 33          CATCHMENT 220"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          220   220"
"        0.000   % Impervious"
"        2.110   Total Area"
"      365.000   Flow length"
"        0.500   Overland Slope"
"        2.110   Pervious Area"
"      365.000   Pervious length"
"        0.500   Pervious slope"
"        0.000   Impervious Area"
"      365.000   Impervious length"
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"        0.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.217   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.010     0.000     0.115     0.269 c.m/sec"
"             Catchment 220          Pervious   Impervious Total Area "
"             Surface Area           2.110      0.000      2.110      hectare"
"             Time of concentration  157.146    14.998     157.146    minutes"
"             Time to Centroid       300.471    110.507    300.470    minutes"
"             Rainfall depth         34.259     34.259     34.259     mm"
"             Rainfall volume        722.85     0.00       722.86     c.m"
"             Rainfall losses        26.824     5.030      26.824     mm"
"             Runoff depth           7.435      29.228     7.435      mm"
"             Runoff volume          156.88     0.00       156.88     c.m"
"             Runoff coefficient     0.217      0.000      0.217      "
"             Maximum flow           0.010      0.000      0.010      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.010     0.010     0.115     0.269"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.010     0.010     0.010     0.269"
" 40          HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
"             Maximum flow                  0.279    c.m/sec"
"             Hydrograph volume          9756.252    c.m"
"                  0.010     0.010     0.010     0.279"
" 40          HYDROGRAPH   Confluence    6"
"           7   Confluence "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
"             Maximum flow                  0.279    c.m/sec"
"             Hydrograph volume          9756.252    c.m"
"                  0.010     0.279     0.010     0.000"
" 54          POND DESIGN"
"        0.279   Current peak flow    c.m/sec"
"        0.497   Target outflow    c.m/sec"
"       9756.3   Hydrograph volume    c.m"
"          37.   Number of stages"
"      351.100   Minimum water level    metre"
"      354.700   Maximum water level    metre"
"      351.100   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                351.100     0.000     0.000"
"                351.200   0.00900    0.1000"
"                351.300   0.03600    0.6000"
"                351.400   0.08100     1.000"
"                351.500    0.1420     2.000"
"                351.600    0.2180     5.000"
"                351.700    0.3070     8.000"
"                351.800    0.4210    14.000"
"                351.900    0.5530    21.000"
"                352.000    0.6750    29.000"
"                352.100    0.8050    41.000"
"                352.200    0.9380    57.000"
"                352.300     1.066    76.000"
"                352.400     1.191   100.000"
"                352.500     1.307   128.000"
"                352.600     1.410   160.000"
"                352.700     1.507   197.000"
"                352.800     1.596   239.000"
"                352.900     1.684   286.000"
"                353.000     1.768   337.000"
"                353.100     1.849   393.000"
"                353.200     1.928   455.000"
"                353.300     2.005   526.000"
"                353.400     2.080   596.000"
"                353.500     2.153   676.000"
"                353.600     2.224   761.000"
"                353.700     2.293   854.000"
"                353.800     2.361   953.000"
"                353.900     2.427  1060.000"
"                354.000     2.492  1174.000"
"                354.100     2.556  1298.000"
"                354.200     2.618  1435.000"
"                354.300     2.689  1586.000"
"                354.400     2.739  1751.000"
"                354.500     2.797  1929.000"
"                354.600     2.855  2121.000"
"                354.700     2.911  2329.000"
"             Peak outflow                  0.279    c.m/sec"
"             Maximum level               351.669    metre"
"             Maximum storage               7.059    c.m"
"             Centroidal lag               13.543   hours"
"                  0.010     0.279     0.279     0.000 c.m/sec"
" 40          HYDROGRAPH   Combine    7"
"           6   Combine "
"           7   Node #"
"               Baden Creek Tributary"
"             Maximum flow                  0.279    c.m/sec"
"             Hydrograph volume          9755.492    c.m"
"                  0.010     0.279     0.279     0.279"
" 81          ADD COMMENT================================================="
"           4  Lines of comment"
"              ************************************************"
"              ACTUAL FLOW THROUGH CN CULVERT"
"              = 0.279-0.033(INFIL GALLERY) = 0.246cms"
"              ************************************************"
" 38          START/RE-START TOTALS 6"
"           3   Runoff Totals on EXIT"
"             Total Catchment area                      68.640    hectare"
"             Total Impervious area                     24.731    hectare"
"             Total % impervious                        36.029"
" 19          EXIT"
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"               MIDUSS Output ----------------------------------------------->"
"               MIDUSS version                          Version 2.25  rev. 473"
"               MIDUSS created                       Sunday, February 7, 2010"
"          10   Units used:                                        ie METRIC"
"               Job folder:          Q:\40777\104\PRELIMINARY\SWM\2nd DP Sub\"
"                                                                  MIDUSS\Post"
"               Output filename:                                   5yrPost2.in"
"               Licensee name:                                               A"
"               Company                                                      "
"               Date & Time last used:                9/11/2023 at 1:13:06 PM"
" 31          TIME PARAMETERS"
"       5.000   Time Step"
"     180.000   Max. Storm length"
"    3000.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"           1   Chicago storm"
"    1593.000   Coefficient A"
"      11.000   Constant B"
"       0.879   Exponent C"
"       0.400   Fraction R"
"     180.000   Duration"
"       1.000   Time step multiplier"
"             Maximum intensity          139.250    mm/hr"
"             Total depth                 47.240    mm"
"           4   5hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 201"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         201   201"
"       0.000   % Impervious"
"       0.640   Total Area"
"      80.000   Flow length"
"       2.000   Overland Slope"
"       0.640   Pervious Area"
"      80.000   Pervious length"
"       2.000   Pervious slope"
"       0.000   Impervious Area"
"      80.000   Impervious length"
"       2.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.304   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.023     0.000     0.000     0.000 c.m/sec"
"             Catchment 201          Pervious   Impervious Total Area "
"             Surface Area           0.640      0.000      0.640      hectare"
"             Time of concentration  31.576     3.568      31.576     minutes"
"             Time to Centroid       136.847    91.229     136.847    minutes"
"             Rainfall depth         47.240     47.240     47.240     mm"
"             Rainfall volume        302.33     0.00       302.34     c.m"
"             Rainfall losses        32.875     6.054      32.875     mm"
"             Runoff depth           14.365     41.186     14.365     mm"
"             Runoff volume          91.94      0.00       91.94      c.m"
"             Runoff coefficient     0.304      0.000      0.304      "
"             Maximum flow           0.023      0.000      0.023      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.023     0.023     0.000     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.023     0.023     0.023     0.000"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"            Maximum flow                  0.023    c.m/sec"
"            Hydrograph volume            91.937    c.m"
"                   0.023     0.023     0.023     0.023"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.023     0.000     0.023     0.023"
" 33          CATCHMENT 202"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         202   202"
"      45.000   % Impervious"
"       0.270   Total Area"
"      30.000   Flow length"
"       4.000   Overland Slope"
"       0.148   Pervious Area"
"      30.000   Pervious length"
"       4.000   Pervious slope"
"       0.122   Impervious Area"
"      30.000   Impervious length"
"       4.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.303   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.878   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.039     0.000     0.023     0.023 c.m/sec"
"             Catchment 202          Pervious   Impervious Total Area "
"             Surface Area           0.148      0.122      0.270      hectare"
"             Time of concentration  14.239     1.609      5.359      minutes"
"             Time to Centroid       114.985    88.188     96.145     minutes"
"             Rainfall depth         47.240     47.240     47.240     mm"
"             Rainfall volume        70.15      57.40      127.55     c.m"
"             Rainfall losses        32.906     5.760      20.690     mm"
"             Runoff depth           14.334     41.480     26.549     mm"
"             Runoff volume          21.29      50.40      71.68      c.m"
"             Runoff coefficient     0.303      0.878      0.562      "
"             Maximum flow           0.009      0.038      0.039      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.039     0.039     0.023     0.023"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.039     0.039     0.039     0.023"
" 40          HYDROGRAPH   Combine    2"
"           6   Combine "
"           2   Node #"
"               Activa Baden Subdivision"
"            Maximum flow                  0.039    c.m/sec"
"            Hydrograph volume            71.684    c.m"
"                   0.039     0.039     0.039     0.039"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
```

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"                   0.039     0.000     0.039     0.039"
" 33          CATCHMENT 203"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         203   203"
"      65.000   % Impervious"
"       0.090   Total Area"
"      30.000   Flow length"
"       2.000   Overland Slope"
"       0.032   Pervious Area"
"      30.000   Pervious length"
"       2.000   Pervious slope"
"       0.059   Impervious Area"
"      30.000   Impervious length"
"       2.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.304   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.878   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.018     0.000     0.039     0.039 c.m/sec"
"             Catchment 203          Pervious   Impervious Total Area "
"             Surface Area           0.032      0.059      0.090      hectare"
"             Time of concentration  17.530     1.981      4.423      minutes"
"             Time to Centroid       119.121    88.783     93.549     minutes"
"             Rainfall depth         47.240     47.240     47.240     mm"
"             Rainfall volume        14.88      27.64      42.52      c.m"
"             Rainfall losses        32.876     5.741      15.238     mm"
"             Runoff depth           14.364     41.499     32.002     mm"
"             Runoff volume          4.52       24.28      28.80      c.m"
"             Runoff coefficient     0.304      0.878      0.677      "
"             Maximum flow           0.002      0.018      0.018      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.018     0.018     0.039     0.039"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.018     0.018     0.018     0.039"
" 40          HYDROGRAPH   Combine    2"
"           6   Combine "
"           2   Node #"
"               Activa Baden Subdivision"
"             Maximum flow                 0.057    c.m/sec"
"             Hydrograph volume          100.485    c.m"
"                   0.018     0.018     0.018     0.057"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.018     0.000     0.018     0.057"
" 33          CATCHMENT 204"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         204   204"
"       0.000   % Impervious"
"       4.490   Total Area"
"     205.000   Flow length"
"       1.800   Overland Slope"
"       4.490   Pervious Area"
"     205.000   Pervious length"
"       1.800   Pervious slope"
"       0.000   Impervious Area"
"     205.000   Impervious length"
"       1.800   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.304   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.102     0.000     0.018     0.057 c.m/sec"
"             Catchment 204          Pervious   Impervious Total Area "
"             Surface Area           4.490      0.000      4.490      hectare"
"             Time of concentration  57.318     6.476      57.317     minutes"
"             Time to Centroid       169.320    95.365     169.319    minutes"
"             Rainfall depth         47.240     47.240     47.240     mm"
"             Rainfall volume        2121.07    0.00       2121.07    c.m"
"             Rainfall losses        32.866     5.557      32.866     mm"
"             Runoff depth           14.374     41.683     14.374     mm"
"             Runoff volume          645.40     0.00       645.40     c.m"
"             Runoff coefficient     0.304      0.000      0.304      "
"             Maximum flow           0.102      0.000      0.102      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.102     0.102     0.018     0.057"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.102     0.102     0.102     0.057"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"             Maximum flow                 0.120    c.m/sec"
"             Hydrograph volume          737.334    c.m"
"                   0.102     0.102     0.102     0.120"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.102     0.000     0.102     0.120"
" 33          CATCHMENT 205"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         205   205"
"      61.000   % Impervious"
"      19.470   Total Area"
"      90.000   Flow length"
"       0.500   Overland Slope"
"       7.593   Pervious Area"
"      90.000   Pervious length"
"       0.500   Pervious slope"
"      11.877   Impervious Area"
"      90.000   Impervious length"
"       0.500   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.304   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.886   Impervious Runoff coefficient"
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"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    3.486     0.000     0.102     0.120 c.m/sec"
"             Catchment 205          Pervious   Impervious Total Area "
"             Surface Area           7.593      11.877     19.470     hectare"
"             Time of concentration  51.365     5.803      14.003     minutes"
"             Time to Centroid       161.810    94.417     106.545    minutes"
"             Rainfall depth         47.240     47.240     47.240     mm"
"             Rainfall volume        3587.06    5610.54    9197.60    c.m"
"             Rainfall losses        32.866     5.363      16.089     mm"
"             Runoff depth           14.374     41.877     31.151     mm"
"             Runoff volume          1091.46    4973.61    6065.07    c.m"
"             Runoff coefficient     0.304      0.886      0.659      "
"             Maximum flow           0.190      3.459      3.486      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    3.486     3.486     0.102     0.120"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    3.486     3.486     3.486     0.120"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Proposed SWMF"
"             Maximum flow                  3.486    c.m/sec"
"             Hydrograph volume          6065.071    c.m"
"                    3.486     3.486     3.486     3.486"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    3.486     0.000     3.486     3.486"
" 33          CATCHMENT 206"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           206   206"
"        75.000   % Impervious"
"         1.220   Total Area"
"        70.000   Flow length"
"         4.000   Overland Slope"
"         0.305   Pervious Area"
"        70.000   Pervious length"
"         4.000   Pervious slope"
"         0.915   Impervious Area"
"        70.000   Impervious length"
"         4.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.304   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.872   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.263     0.000     3.486     3.486 c.m/sec"
"             Catchment 206          Pervious   Impervious Total Area "
"             Surface Area           0.305      0.915      1.220      hectare"
"             Time of concentration  23.673     2.675      4.861      minutes"
"             Time to Centroid       126.879    89.878     93.731     minutes"
"             Rainfall depth         47.240     47.240     47.240     mm"
"             Rainfall volume        144.08     432.24     576.33     c.m"
"             Rainfall losses        32.871     6.035      12.744     mm"
"             Runoff depth           14.369     41.205     34.496     mm"
"             Runoff volume          43.83      377.03     420.85     c.m"
"             Runoff coefficient     0.304      0.872      0.730      "
"             Maximum flow           0.013      0.262      0.263      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.263     0.263     3.486     3.486"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.263     0.263     0.263     3.486"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Proposed SWMF"
"             Maximum flow                  3.726    c.m/sec"
"             Hydrograph volume          6485.925    c.m"
"                    0.263     0.263     0.263     3.726"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.263     0.000     0.263     3.726"
" 33          CATCHMENT 207"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           207   207"
"         0.000   % Impervious"
"         0.700   Total Area"
"        70.000   Flow length"
"         4.000   Overland Slope"
"         0.700   Pervious Area"
"        70.000   Pervious length"
"         4.000   Pervious slope"
"         0.000   Impervious Area"
"        70.000   Impervious length"
"         4.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.304   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.000   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.030     0.000     0.263     3.726 c.m/sec"
"             Catchment 207          Pervious   Impervious Total Area "
"             Surface Area           0.700      0.000      0.700      hectare"
"             Time of concentration  23.673     2.675      23.673     minutes"
"             Time to Centroid       126.879    89.878     126.879    minutes"
"             Rainfall depth         47.240     47.240     47.240     mm"
"             Rainfall volume        330.68     0.00       330.68     c.m"
"             Rainfall losses        32.871     6.035      32.871     mm"
"             Runoff depth           14.369     41.205     14.369     mm"
"             Runoff volume          100.59     0.00       100.59     c.m"
"             Runoff coefficient     0.304      0.000      0.304      "
"             Maximum flow           0.030      0.000      0.030      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.030     0.030     0.263     3.726"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.030     0.030     0.030     3.726"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Proposed SWMF"
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"            Maximum flow                 3.736    c.m/sec"
"            Hydrograph volume          6586.510    c.m"
"                   0.030     0.030     0.030     3.736"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.030     0.000     0.030     3.736"
" 33         CATCHMENT 208"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         208   208"
"       70.000   % Impervious"
"        2.120   Total Area"
"       60.000   Flow length"
"        1.500   Overland Slope"
"        0.636   Pervious Area"
"       60.000   Pervious length"
"        1.500   Pervious slope"
"        1.484   Impervious Area"
"       60.000   Impervious length"
"        1.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.304   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.874   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                   0.412     0.000     0.030     3.736 c.m/sec"
"            Catchment 208          Pervious   Impervious Total Area "
"            Surface Area           0.636      1.484      2.120      hectare"
"            Time of concentration  28.965     3.273      6.607      minutes"
"            Time to Centroid       133.555    90.783     96.333     minutes"
"            Rainfall depth         47.240     47.240     47.240     mm"
"            Rainfall volume        300.45     701.04     1001.49    c.m"
"            Rainfall losses        32.875     5.956      14.031     mm"
"            Runoff depth           14.365     41.284     33.208     mm"
"            Runoff volume          91.36      612.66     704.02     c.m"
"            Runoff coefficient     0.304      0.874      0.703      "
"            Maximum flow           0.024      0.406      0.412      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.412     0.412     0.030     3.736"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.412     0.412     0.412     3.736"
" 40         HYDROGRAPH   Combine    3"
"           6   Combine "
"           3   Node #"
"               Proposed SWMF"
"            Maximum flow                 4.148    c.m/sec"
"            Hydrograph volume          7290.531    c.m"
"                   0.412     0.412     0.412     4.148"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.412     0.000     0.412     4.148"
" 33         CATCHMENT 209"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         209   209"
"       75.000   % Impervious"
"        1.300   Total Area"
"       60.000   Flow length"
"        1.000   Overland Slope"
"        0.325   Pervious Area"
"       60.000   Pervious length"
"        1.000   Pervious slope"
"        0.975   Impervious Area"
"       60.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.304   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.873   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                   0.277     0.000     0.412     4.148 c.m/sec"
"            Catchment 209          Pervious   Impervious Total Area "
"            Surface Area           0.325      0.975      1.300      hectare"
"            Time of concentration  32.712     3.696      6.717      minutes"
"            Time to Centroid       138.273    91.427     96.304     minutes"
"            Rainfall depth         47.240     47.240     47.240     mm"
"            Rainfall volume        153.53     460.59     614.12     c.m"
"            Rainfall losses        32.870     6.018      12.731     mm"
"            Runoff depth           14.370     41.222     34.509     mm"
"            Runoff volume          46.70      401.91     448.61     c.m"
"            Runoff coefficient     0.304      0.873      0.730      "
"            Maximum flow           0.011      0.274      0.277      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.277     0.277     0.412     4.148"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.277     0.277     0.277     4.148"
" 40         HYDROGRAPH   Combine    3"
"           6   Combine "
"           3   Node #"
"               Proposed SWMF"
"            Maximum flow                 4.425    c.m/sec"
"            Hydrograph volume          7739.145    c.m"
"                   0.277     0.277     0.277     4.425"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.277     0.000     0.277     4.425"
" 33         CATCHMENT 210"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         210   210"
"        4.000   % Impervious"
"        0.130   Total Area"
"       15.000   Flow length"
"        2.000   Overland Slope"
"        0.125   Pervious Area"
"       15.000   Pervious length"
"        2.000   Pervious slope"
"        0.005   Impervious Area"
"       15.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.303   Pervious Runoff coefficient"
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"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.874   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.009     0.000     0.277     4.425 c.m/sec"
"             Catchment 210          Pervious   Impervious Total Area "
"             Surface Area           0.125      0.005      0.130      hectare"
"             Time of concentration  11.565     1.307      10.466     minutes"
"             Time to Centroid       111.599    87.817     109.049    minutes"
"             Rainfall depth         47.240     47.240     47.240     mm"
"             Rainfall volume        58.96      2.46       61.41      c.m"
"             Rainfall losses        32.912     5.949      31.834     mm"
"             Runoff depth           14.328     41.291     15.406     mm"
"             Runoff volume          17.88      2.15       20.03      c.m"
"             Runoff coefficient     0.303      0.874      0.326      "
"             Maximum flow           0.008      0.002      0.009      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                  0.009     0.009     0.277     4.425"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                  0.009     0.009     0.009     4.425"
" 40          HYDROGRAPH   Combine    3"
"            6   Combine "
"            3   Node #"
"                Proposed SWMF"
"             Maximum flow                  4.432    c.m/sec"
"             Hydrograph volume          7759.170    c.m"
"                  0.009     0.009     0.009     4.432"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                  0.009     0.000     0.009     4.432"
" 33          CATCHMENT 211"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          211   211"
"       50.000   % Impervious"
"        1.100   Total Area"
"       20.000   Flow length"
"       20.000   Overland Slope"
"        0.550   Pervious Area"
"       20.000   Pervious length"
"       20.000   Pervious slope"
"        0.550   Impervious Area"
"       20.000   Impervious length"
"       20.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.301   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.843   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.190     0.000     0.009     4.432 c.m/sec"
"             Catchment 211          Pervious   Impervious Total Area "
"             Surface Area           0.550      0.550      1.100      hectare"
"             Time of concentration  6.889      0.778      2.388      minutes"
"             Time to Centroid       105.861    87.184     92.105     minutes"
"             Rainfall depth         47.240     47.240     47.240     mm"
"             Rainfall volume        259.82     259.82     519.64     c.m"
"             Rainfall losses        32.999     7.433      20.216     mm"
"             Runoff depth           14.241     39.806     27.024     mm"
"             Runoff volume          78.32      218.94     297.26     c.m"
"             Runoff coefficient     0.301      0.843      0.572      "
"             Maximum flow           0.045      0.177      0.190      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                  0.190     0.190     0.009     4.432"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                  0.190     0.190     0.190     4.432"
" 40          HYDROGRAPH   Combine    3"
"            6   Combine "
"            3   Node #"
"                Proposed SWMF"
"             Maximum flow                  4.572    c.m/sec"
"             Hydrograph volume          8056.430    c.m"
"                  0.190     0.190     0.190     4.572"
" 40          HYDROGRAPH   Confluence    3"
"            7   Confluence "
"            3   Node #"
"                Proposed SWMF"
"             Maximum flow                  4.572    c.m/sec"
"             Hydrograph volume          8056.430    c.m"
"                  0.190     4.572     0.190     0.000"
" 54          POND DESIGN"
"         4.572   Current peak flow    c.m/sec"
"         1.127   Target outflow    c.m/sec"
"        8056.4   Hydrograph volume    c.m"
"           29.   Number of stages"
"       354.700   Minimum water level    metre"
"       357.500   Maximum water level    metre"
"       354.700   Starting water level    metre"
"             0   Keep Design Data: 1 = True; 0 = False"
"                   Level Discharge    Volume"
"                 354.700     0.000     0.000"
"                 354.800   0.03251  1214.000"
"                 354.900   0.03252  1662.000"
"                 355.000   0.03253  2129.000"
"                 355.100   0.03254  2617.000"
"                 355.200   0.03255  3125.000"
"                 355.300   0.04330  3655.000"
"                 355.400   0.06630  4201.000"
"                 355.500   0.08230  4759.000"
"                 355.600   0.09440  5329.000"
"                 355.700    0.1044  5911.000"
"                 355.800    0.1132  6504.000"
"                 355.900    0.1212  7109.000"
"                 356.000    0.1284  7727.000"
"                 356.100    0.1352  8356.000"
"                 356.200    0.1415  8997.000"
"                 356.300    0.1475  9650.000"
"                 356.400    0.1532  10316.00"
"                 356.500    0.1587  10993.00"
"                 356.600    0.1639  11683.00"
"                 356.700    0.1689  12385.00"
"                 356.800    0.1738  13099.00"
"                 356.900    0.1784  13826.00"
"                 357.000    0.1830  14565.00"
"                 357.100    0.1874  15319.00"
"                 357.200    0.1917  16091.00"
"                 357.300    0.3079  16881.00"
"                 357.400    0.5168  17689.00"
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"               357.500    0.7861  18517.00"
"            Peak outflow                  0.120    c.m/sec"
"            Maximum level               355.880    metre"
"            Maximum storage            6985.402    c.m"
"            Centroidal lag               18.249   hours"
"                 0.190     4.572     0.120     0.000 c.m/sec"
" 40         HYDROGRAPH   Combine    9"
"           6   Combine "
"           9   Node #"
"               Conceyance Node"
"            Maximum flow                  0.120    c.m/sec"
"            Hydrograph volume          7764.909    c.m"
"                   0.190     4.572     0.120     0.120"
" 40         HYDROGRAPH   Confluence    9"
"           7   Confluence "
"           9   Node #"
"               Conceyance Node"
"            Maximum flow                  0.120    c.m/sec"
"            Hydrograph volume          7764.909    c.m"
"                   0.190     0.120     0.120     0.000"
" 51         PIPE DESIGN"
"       0.120   Current peak flow    c.m/sec"
"       0.013   Manning 'n'"
"       1.200   Diameter    metre"
"       0.400   Gradient   %"
"            Depth of flow                 0.180    metre"
"            Velocity                      1.126    m/sec"
"            Pipe capacity                 2.466    c.m/sec"
"            Critical depth                0.182    metre"
" 53         ROUTE    Pipe Route 730"
"      730.00      Pipe Route 730 Reach length   ( metre)"
"       0.470   X-factor <= 0.5"
"     243.140   K-lag   ( seconds)"
"       0.000   Default(0) or user spec.(1) values used"
"       0.500   X-factor <= 0.5"
"      30.000   K-lag   ( seconds)"
"       0.500   Beta weighting factor"
"     300.000   Routing time step   ( seconds)"
"           2   No. of sub-reaches"
"            Peak outflow                  0.120    c.m/sec"
"                   0.190     0.120     0.120     0.000 c.m/sec"
" 40         HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
"            Maximum flow                  0.120    c.m/sec"
"            Hydrograph volume          7761.076    c.m"
"                   0.190     0.120     0.120     0.120"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.190     0.000     0.120     0.120"
" 33         CATCHMENT 212"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         212   212"
"      65.000   % Impervious"
"       0.160   Total Area"
"      40.000   Flow length"
"       2.500   Overland Slope"
"       0.056   Pervious Area"
"      40.000   Pervious length"
"       2.500   Pervious slope"
"       0.104   Impervious Area"
"      40.000   Impervious length"
"       2.500   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.304   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.876   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.031     0.000     0.120     0.120 c.m/sec"
"            Catchment 212          Pervious   Impervious Total Area "
"            Surface Area           0.056      0.104      0.160      hectare"
"            Time of concentration  19.484     2.201      4.919      minutes"
"            Time to Centroid       121.596    89.095     94.206     minutes"
"            Rainfall depth         47.240     47.240     47.240     mm"
"            Rainfall volume        26.45      49.13      75.58      c.m"
"            Rainfall losses        32.891     5.840      15.308     mm"
"            Runoff depth           14.349     41.400     31.932     mm"
"            Runoff volume          8.04       43.06      51.09      c.m"
"            Runoff coefficient     0.304      0.876      0.676      "
"            Maximum flow           0.003      0.031      0.031      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.031     0.031     0.120     0.120"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.031     0.031     0.031     0.120"
" 40         HYDROGRAPH   Combine    3"
"           6   Combine "
"           3   Node #"
"               Ex. 1000mm CSP Culvert"
"            Maximum flow                  0.031    c.m/sec"
"            Hydrograph volume            51.091    c.m"
"                   0.031     0.031     0.031     0.031"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.031     0.000     0.031     0.031"
" 33         CATCHMENT 213"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         213   213"
"       2.000   % Impervious"
"      18.930   Total Area"
"     570.000   Flow length"
"       1.600   Overland Slope"
"      18.551   Pervious Area"
"     570.000   Pervious length"
"       1.600   Pervious slope"
"       0.379   Impervious Area"
"     570.000   Impervious length"
"       1.600   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.304   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.888   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.250     0.000     0.031     0.031 c.m/sec"
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"            Catchment 213          Pervious   Impervious Total Area "
"            Surface Area           18.551     0.379      18.930     hectare"
"            Time of concentration  109.675    12.391     104.208    minutes"
"            Time to Centroid       235.371    103.779    227.976    minutes"
"            Rainfall depth         47.240     47.240     47.240     mm"
"            Rainfall volume        8763.66    178.85     8942.51    c.m"
"            Rainfall losses        32.865     5.302      32.313     mm"
"            Runoff depth           14.375     41.938     14.926     mm"
"            Runoff volume          2666.81    158.78     2825.58    c.m"
"            Runoff coefficient     0.304      0.888      0.316      "
"            Maximum flow           0.245      0.081      0.250      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.250     0.250     0.031     0.031"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.250     0.250     0.250     0.031"
" 40         HYDROGRAPH   Combine    3"
"           6   Combine "
"           3   Node #"
"               Ex. 1000mm CSP Culvert"
"            Maximum flow                  0.252    c.m/sec"
"            Hydrograph volume          2876.675    c.m"
"                   0.250     0.250     0.250     0.252"
" 40         HYDROGRAPH   Confluence    3"
"           7   Confluence "
"           3   Node #"
"               Ex. 1000mm CSP Culvert"
"            Maximum flow                  0.252    c.m/sec"
"            Hydrograph volume          2876.675    c.m"
"                   0.250     0.252     0.250     0.000"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.250     0.252     0.252     0.000"
" 40         HYDROGRAPH   Combine    5"
"           6   Combine "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                  0.252    c.m/sec"
"            Hydrograph volume          2876.675    c.m"
"                   0.250     0.252     0.252     0.252"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.250     0.000     0.252     0.252"
" 33         CATCHMENT 214"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         214   214"
"      65.000   % Impervious"
"       0.100   Total Area"
"      50.000   Flow length"
"       2.500   Overland Slope"
"       0.035   Pervious Area"
"      50.000   Pervious length"
"       2.500   Pervious slope"
"       0.065   Impervious Area"
"      50.000   Impervious length"
"       2.500   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.304   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.873   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.019     0.000     0.252     0.252 c.m/sec"
"            Catchment 214          Pervious   Impervious Total Area "
"            Surface Area           0.035      0.065      0.100      hectare"
"            Time of concentration  22.275     2.517      5.634      minutes"
"            Time to Centroid       125.118    89.631     95.229     minutes"
"            Rainfall depth         47.240     47.240     47.240     mm"
"            Rainfall volume        16.53      30.71      47.24      c.m"
"            Rainfall losses        32.889     5.981      15.399     mm"
"            Runoff depth           14.351     41.259     31.841     mm"
"            Runoff volume          5.02       26.82      31.84      c.m"
"            Runoff coefficient     0.304      0.873      0.674      "
"            Maximum flow           0.002      0.019      0.019      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.019     0.019     0.252     0.252"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.019     0.019     0.019     0.252"
" 40         HYDROGRAPH   Combine    4"
"           6   Combine "
"           4   Node #"
"               Snyder's/Christian"
"            Maximum flow                  0.019    c.m/sec"
"            Hydrograph volume            31.841    c.m"
"                   0.019     0.019     0.019     0.019"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.019     0.000     0.019     0.019"
" 33         CATCHMENT 215"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         215   215"
"      45.000   % Impervious"
"       1.030   Total Area"
"      70.000   Flow length"
"       0.700   Overland Slope"
"       0.566   Pervious Area"
"      70.000   Pervious length"
"       0.700   Pervious slope"
"       0.463   Impervious Area"
"      70.000   Impervious length"
"       0.700   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      80.000   Pervious SCS Curve No."
"       0.339   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       6.350   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.883   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.139     0.000     0.019     0.019 c.m/sec"
"            Catchment 215          Pervious   Impervious Total Area "
"            Surface Area           0.566      0.463      1.030      hectare"
"            Time of concentration  37.783     4.512      15.138     minutes"
"            Time to Centroid       144.501    92.547     109.139    minutes"
"            Rainfall depth         47.240     47.240     47.240     mm"
"            Rainfall volume        267.61     218.96     486.57     c.m"
"            Rainfall losses        31.231     5.539      19.670     mm"
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"            Runoff depth           16.009     41.700     27.570     mm"
"            Runoff volume          90.69      193.28     283.97     c.m"
"            Runoff coefficient     0.339      0.883      0.584      "
"            Maximum flow           0.020      0.135      0.139      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.139     0.139     0.019     0.019"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.139     0.139     0.139     0.019"
" 40         HYDROGRAPH   Combine    4"
"           6   Combine "
"           4   Node #"
"               Snyder's/Christian"
"            Maximum flow                0.156    c.m/sec"
"            Hydrograph volume         315.815    c.m"
"                   0.139     0.139     0.139     0.156"
" 40         HYDROGRAPH   Confluence    4"
"           7   Confluence "
"           4   Node #"
"               Snyder's/Christian"
"            Maximum flow                0.156    c.m/sec"
"            Hydrograph volume         315.815    c.m"
"                   0.139     0.156     0.139     0.000"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.139     0.156     0.156     0.000"
" 40         HYDROGRAPH   Combine    5"
"           6   Combine "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                0.269    c.m/sec"
"            Hydrograph volume         3192.489    c.m"
"                   0.139     0.156     0.156     0.269"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.139     0.000     0.156     0.269"
" 33         CATCHMENT 216"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         216   216"
"      45.000   % Impervious"
"       2.080   Total Area"
"      80.000   Flow length"
"       2.000   Overland Slope"
"       1.144   Pervious Area"
"      80.000   Pervious length"
"       2.000   Pervious slope"
"       0.936   Impervious Area"
"      80.000   Impervious length"
"       2.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      80.000   Pervious SCS Curve No."
"       0.339   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       6.350   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.872   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.274     0.000     0.156     0.269 c.m/sec"
"            Catchment 216          Pervious   Impervious Total Area "
"            Surface Area           1.144      0.936      2.080      hectare"
"            Time of concentration  29.875     3.568      12.040     minutes"
"            Time to Centroid       134.391    91.229     105.130    minutes"
"            Rainfall depth         47.240     47.240     47.240     mm"
"            Rainfall volume        540.42     442.17     982.59     c.m"
"            Rainfall losses        31.232     6.054      19.901     mm"
"            Runoff depth           16.008     41.186     27.338     mm"
"            Runoff volume          183.13     385.50     568.64     c.m"
"            Runoff coefficient     0.339      0.872      0.579      "
"            Maximum flow           0.048      0.261      0.274      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.274     0.274     0.156     0.269"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.274     0.274     0.274     0.269"
" 40         HYDROGRAPH   Combine    5"
"           6   Combine "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                0.542    c.m/sec"
"            Hydrograph volume        3761.128    c.m"
"                   0.274     0.274     0.274     0.542"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.274     0.000     0.274     0.542"
" 33         CATCHMENT 217"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         217   217"
"      55.000   % Impervious"
"      10.200   Total Area"
"      60.000   Flow length"
"       3.000   Overland Slope"
"       4.590   Pervious Area"
"      60.000   Pervious length"
"       3.000   Pervious slope"
"       5.610   Impervious Area"
"      60.000   Impervious length"
"       3.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      80.000   Pervious SCS Curve No."
"       0.338   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       6.350   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.872   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   1.635     0.000     0.274     0.542 c.m/sec"
"            Catchment 217          Pervious   Impervious Total Area "
"            Surface Area           4.590      5.610      10.200     hectare"
"            Time of concentration  22.260     2.658      7.380      minutes"
"            Time to Centroid       124.674    89.854     98.242     minutes"
"            Rainfall depth         47.240     47.240     47.240     mm"
"            Rainfall volume        2168.31    2650.16    4818.47    c.m"
"            Rainfall losses        31.255     6.030      17.382     mm"
"            Runoff depth           15.984     41.210     29.858     mm"
"            Runoff volume          733.69     2311.86    3045.55    c.m"
"            Runoff coefficient     0.338      0.872      0.632      "
"            Maximum flow           0.235      1.609      1.635      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   1.635     1.635     0.274     0.542"
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" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    1.635     1.635     1.635     0.542"
" 40          HYDROGRAPH   Combine    5"
"            6   Combine "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  2.086    c.m/sec"
"             Hydrograph volume          6806.685    c.m"
"                    1.635     1.635     1.635     2.086"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    1.635     0.000     1.635     2.086"
" 33          CATCHMENT 218"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          218   218"
"       50.000   % Impervious"
"        1.250   Total Area"
"       20.000   Flow length"
"       20.000   Overland Slope"
"        0.625   Pervious Area"
"       20.000   Pervious length"
"       20.000   Pervious slope"
"        0.625   Impervious Area"
"       20.000   Impervious length"
"       20.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.301   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.843   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.216     0.000     1.635     2.086 c.m/sec"
"             Catchment 218          Pervious   Impervious Total Area "
"             Surface Area           0.625      0.625      1.250      hectare"
"             Time of concentration  6.889      0.778      2.388      minutes"
"             Time to Centroid       105.861    87.184     92.105     minutes"
"             Rainfall depth         47.240     47.240     47.240     mm"
"             Rainfall volume        295.25     295.25     590.50     c.m"
"             Rainfall losses        32.999     7.433      20.216     mm"
"             Runoff depth           14.241     39.806     27.024     mm"
"             Runoff volume          89.00      248.79     337.79     c.m"
"             Runoff coefficient     0.301      0.843      0.572      "
"             Maximum flow           0.051      0.201      0.216      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.216     0.216     1.635     2.086"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.216     0.216     0.216     2.086"
" 40          HYDROGRAPH   Combine    5"
"            6   Combine "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  2.301    c.m/sec"
"             Hydrograph volume          7144.479    c.m"
"                    0.216     0.216     0.216     2.301"
" 40          HYDROGRAPH   Confluence    5"
"            7   Confluence "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  2.301    c.m/sec"
"             Hydrograph volume          7144.479    c.m"
"                    0.216     2.301     0.216     0.000"
" 54          POND DESIGN"
"         2.301   Current peak flow    c.m/sec"
"         0.497   Target outflow    c.m/sec"
"        7144.5   Hydrograph volume    c.m"
"           33.   Number of stages"
"       351.500   Minimum water level    metre"
"       354.700   Maximum water level    metre"
"       351.500   Starting water level    metre"
"             0   Keep Design Data: 1 = True; 0 = False"
"                   Level Discharge    Volume"
"                 351.500     0.000     0.000"
"                 351.600   0.00600   400.000"
"                 351.700   0.01900   824.000"
"                 351.800   0.03100  1272.000"
"                 351.900   0.07800  1744.000"
"                 352.000    0.1930  2240.000"
"                 352.100    0.3670  2760.000"
"                 352.200    0.5970  3298.000"
"                 352.300    0.8520  3849.000"
"                 352.400     1.011  4412.000"
"                 352.500     1.122  4988.000"
"                 352.600     1.223  5576.000"
"                 352.700     1.316  6176.000"
"                 352.800     1.403  6789.000"
"                 352.900     1.485  7415.000"
"                 353.000     1.563  8053.000"
"                 353.100     1.637  8704.000"
"                 353.200     1.708  9368.000"
"                 353.300     1.776  10045.00"
"                 353.400     1.841  10735.00"
"                 353.500     1.904  11439.00"
"                 353.600     1.965  12156.00"
"                 353.700     2.025  12884.00"
"                 353.800     2.082  13625.00"
"                 353.900     2.138  14378.00"
"                 354.000     2.193  15143.00"
"                 354.100     2.246  15921.00"
"                 354.200     2.298  16712.00"
"                 354.300     2.349  17517.00"
"                 354.400     2.399  18334.00"
"                 354.500     2.473  19165.00"
"                 354.600     2.708  20012.00"
"                 354.700     3.177  20879.00"
"             Peak outflow                  0.465    c.m/sec"
"             Maximum level               352.143    metre"
"             Maximum storage            2989.080    c.m"
"             Centroidal lag                6.797   hours"
"                  0.216     2.301     0.465     0.000 c.m/sec"
" 40          HYDROGRAPH   Combine    6"
"            6   Combine "
"            6   Node #"
"                Swale Storage Prior to CMP Culvert"
"             Maximum flow                  0.572    c.m/sec"
"             Hydrograph volume         14797.172    c.m"
"                    0.216     2.301     0.465     0.572"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.216     0.000     0.465     0.572"
" 33          CATCHMENT 219"
"            1   Triangular SCS"
```

```
"           1   Equal length"
"           1   SCS method"
"         219   219"
"      45.000   % Impervious"
"       1.250   Total Area"
"      60.000   Flow length"
"       2.000   Overland Slope"
"       0.688   Pervious Area"
"      60.000   Pervious length"
"       2.000   Pervious slope"
"       0.563   Impervious Area"
"      60.000   Impervious length"
"       2.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      80.000   Pervious SCS Curve No."
"       0.339   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       6.350   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.874   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                0.161     0.000     0.465     0.572 c.m/sec"
"            Catchment 219          Pervious   Impervious Total Area "
"            Surface Area           0.688      0.563      1.250      hectare"
"            Time of concentration  25.139     3.002      10.115     minutes"
"            Time to Centroid       128.342    90.350     102.557    minutes"
"            Rainfall depth         47.240     47.240     47.240     mm"
"            Rainfall volume        324.77     265.72     590.50     c.m"
"            Rainfall losses        31.249     5.955      19.867     mm"
"            Runoff depth           15.991     41.285     27.373     mm"
"            Runoff volume          109.94     232.23     342.16     c.m"
"            Runoff coefficient     0.339      0.874      0.579      "
"            Maximum flow           0.032      0.157      0.161      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                0.161     0.161     0.465     0.572"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                0.161     0.161     0.161     0.572"
" 40          HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
"            Maximum flow                 0.594    c.m/sec"
"            Hydrograph volume         15139.333    c.m"
"                0.161     0.161     0.161     0.594"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                0.161     0.000     0.161     0.594"
" 33          CATCHMENT 220"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         220   220"
"       0.000   % Impervious"
"       2.110   Total Area"
"     365.000   Flow length"
"       0.500   Overland Slope"
"       2.110   Pervious Area"
"     365.000   Pervious length"
"       0.500   Pervious slope"
"       0.000   Impervious Area"
"     365.000   Impervious length"
"       0.500   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.304   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                0.026     0.000     0.161     0.594 c.m/sec"
"            Catchment 220          Pervious   Impervious Total Area "
"            Surface Area           2.110      0.000      2.110      hectare"
"            Time of concentration  118.988    13.444     118.987    minutes"
"            Time to Centroid       247.120    105.276    247.119    minutes"
"            Rainfall depth         47.240     47.240     47.240     mm"
"            Rainfall volume        996.76     0.00       996.76     c.m"
"            Rainfall losses        32.864     5.308      32.864     mm"
"            Runoff depth           14.375     41.932     14.376     mm"
"            Runoff volume          303.32     0.00       303.32     c.m"
"            Runoff coefficient     0.304      0.000      0.304      "
"            Maximum flow           0.026      0.000      0.026      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                0.026     0.026     0.161     0.594"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                0.026     0.026     0.026     0.594"
" 40          HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
"            Maximum flow                 0.612    c.m/sec"
"            Hydrograph volume         15442.654    c.m"
"                0.026     0.026     0.026     0.612"
" 40          HYDROGRAPH   Confluence    6"
"           7   Confluence "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
"            Maximum flow                 0.612    c.m/sec"
"            Hydrograph volume         15442.654    c.m"
"                0.026     0.612     0.026     0.000"
" 54          POND DESIGN"
"       0.612   Current peak flow    c.m/sec"
"       0.497   Target outflow    c.m/sec"
"     15442.7   Hydrograph volume    c.m"
"         37.   Number of stages"
"     351.100   Minimum water level    metre"
"     354.700   Maximum water level    metre"
"     351.100   Starting water level    metre"
"           0   Keep Design Data: 1 = True; 0 = False"
"                 Level Discharge    Volume"
"               351.100     0.000     0.000"
"               351.200   0.00900    0.1000"
"               351.300   0.03600    0.6000"
"               351.400   0.08100     1.000"
"               351.500    0.1420     2.000"
"               351.600    0.2180     5.000"
"               351.700    0.3070     8.000"
"               351.800    0.4210    14.000"
"               351.900    0.5530    21.000"
"               352.000    0.6750    29.000"
"               352.100    0.8050    41.000"
"               352.200    0.9380    57.000"
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"               352.300     1.066    76.000"
"               352.400     1.191   100.000"
"               352.500     1.307   128.000"
"               352.600     1.410   160.000"
"               352.700     1.507   197.000"
"               352.800     1.596   239.000"
"               352.900     1.684   286.000"
"               353.000     1.768   337.000"
"               353.100     1.849   393.000"
"               353.200     1.928   455.000"
"               353.300     2.005   526.000"
"               353.400     2.080   596.000"
"               353.500     2.153   676.000"
"               353.600     2.224   761.000"
"               353.700     2.293   854.000"
"               353.800     2.361   953.000"
"               353.900     2.427  1060.000"
"               354.000     2.492  1174.000"
"               354.100     2.556  1298.000"
"               354.200     2.618  1435.000"
"               354.300     2.689  1586.000"
"               354.400     2.739  1751.000"
"               354.500     2.797  1929.000"
"               354.600     2.855  2121.000"
"               354.700     2.911  2329.000"
"            Peak outflow                  0.612    c.m/sec"
"            Maximum level               351.948    metre"
"            Maximum storage              24.849    c.m"
"            Centroidal lag               11.731   hours"
"                 0.026     0.612     0.612     0.000 c.m/sec"
" 40         HYDROGRAPH   Combine    7"
"           6   Combine "
"           7   Node #"
"               Baden Creek Tributary"
"            Maximum flow                  0.612    c.m/sec"
"            Hydrograph volume         15440.596    c.m"
"                    0.026     0.612     0.612     0.612"
" 81         ADD COMMENT================================================="
"         4  Lines of comment"
"            **********************************************"
"            ACTUAL FLOW THROUGH CN CULVERT"
"            = 0.612-0.033(INFIL GALLERY) = 0.579cms"
"            **********************************************"
" 38         START/RE-START TOTALS 6"
"           3   Runoff Totals on EXIT"
"            Total Catchment area                    68.640    hectare"
"            Total Impervious area                   24.731    hectare"
"            Total % impervious                      36.029"
" 19         EXIT"
```

```
"               MIDUSS Output ----------------------------------------------->"
"               MIDUSS version                          Version 2.25  rev. 473"
"               MIDUSS created                       Sunday, February 7, 2010"
"          10   Units used:                                        ie METRIC"
"               Job folder:          Q:\40777\104\PRELIMINARY\SWM\2nd DP Sub\"
"                                                                  MIDUSS\Post"
"               Output filename:                                  10yrPost2.in"
"               Licensee name:                                               A"
"               Company                                                      "
"               Date & Time last used:               9/11/2023 at 1:20:16 PM"
" 31         TIME PARAMETERS"
"       5.000   Time Step"
"     180.000   Max. Storm length"
"    3000.000   Max. Hydrograph"
" 32         STORM Chicago storm"
"           1   Chicago storm"
"    2221.000   Coefficient A"
"      12.000   Constant B"
"       0.908   Exponent C"
"       0.400   Fraction R"
"     180.000   Duration"
"       1.000   Time step multiplier"
"            Maximum intensity          169.551    mm/hr"
"            Total depth                 56.290    mm"
"           5   10hyd   Hydrograph extension used in this file"
" 33         CATCHMENT 201"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         201   201"
"       0.000   % Impervious"
"       0.640   Total Area"
"      80.000   Flow length"
"       2.000   Overland Slope"
"       0.640   Pervious Area"
"      80.000   Pervious length"
"       2.000   Pervious slope"
"       0.000   Impervious Area"
"      80.000   Impervious length"
"       2.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.355   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                    0.037     0.000     0.000     0.000 c.m/sec"
"            Catchment 201          Pervious   Impervious Total Area "
"            Surface Area           0.640      0.000      0.640      hectare"
"            Time of concentration  26.970     3.282      26.970     minutes"
"            Time to Centroid       129.219    89.802     129.219    minutes"
"            Rainfall depth         56.290     56.290     56.290     mm"
"            Rainfall volume        360.26     0.00       360.26     c.m"
"            Rainfall losses        36.312     6.216      36.312     mm"
"            Runoff depth           19.978     50.075     19.978     mm"
"            Runoff volume          127.86     0.00       127.86     c.m"
"            Runoff coefficient     0.355      0.000      0.355      "
"            Maximum flow           0.037      0.000      0.037      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    0.037     0.037     0.000     0.000"
```

```
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.037     0.037     0.037     0.000"
" 40          HYDROGRAPH   Combine    1"
"            6   Combine "
"            1   Node #"
"                Internal Depression"
"             Maximum flow                  0.037    c.m/sec"
"             Hydrograph volume           127.858    c.m"
"                    0.037     0.037     0.037     0.037"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.037     0.000     0.037     0.037"
" 33          CATCHMENT 202"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          202   202"
"       45.000   % Impervious"
"        0.270   Total Area"
"       30.000   Flow length"
"        4.000   Overland Slope"
"        0.148   Pervious Area"
"       30.000   Pervious length"
"        4.000   Pervious slope"
"        0.122   Impervious Area"
"       30.000   Impervious length"
"        4.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.354   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.893   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.050     0.000     0.037     0.037 c.m/sec"
"             Catchment 202          Pervious   Impervious Total Area "
"             Surface Area           0.148      0.122      0.270      hectare"
"             Time of concentration  12.162     1.480      4.968      minutes"
"             Time to Centroid       110.304    87.045     94.640     minutes"
"             Rainfall depth         56.290     56.290     56.290     mm"
"             Rainfall volume        83.59      68.39      151.98     c.m"
"             Rainfall losses        36.355     6.037      22.712     mm"
"             Runoff depth           19.935     50.253     33.578     mm"
"             Runoff volume          29.60      61.06      90.66      c.m"
"             Runoff coefficient     0.354      0.893      0.597      "
"             Maximum flow           0.013      0.047      0.050      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.050     0.050     0.037     0.037"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.050     0.050     0.050     0.037"
" 40          HYDROGRAPH   Combine    2"
"            6   Combine "
"            2   Node #"
"                Activa Baden Subdivision"
"             Maximum flow                  0.050    c.m/sec"
"             Hydrograph volume            90.660    c.m"
"                    0.050     0.050     0.050     0.050"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.050     0.000     0.050     0.050"
" 33          CATCHMENT 203"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          203   203"
"       65.000   % Impervious"
"        0.090   Total Area"
"       30.000   Flow length"
"        2.000   Overland Slope"
"        0.032   Pervious Area"
"       30.000   Pervious length"
"        2.000   Pervious slope"
"        0.059   Impervious Area"
"       30.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.355   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.894   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.022     0.000     0.050     0.050 c.m/sec"
"             Catchment 203          Pervious   Impervious Total Area "
"             Surface Area           0.032      0.059      0.090      hectare"
"             Time of concentration  14.973     1.822      4.136      minutes"
"             Time to Centroid       113.912    87.573     92.208     minutes"
"             Rainfall depth         56.290     56.290     56.290     mm"
"             Rainfall volume        17.73      32.93      50.66      c.m"
"             Rainfall losses        36.320     5.945      16.576     mm"
"             Runoff depth           19.970     50.345     39.714     mm"
"             Runoff volume          6.29       29.45      35.74      c.m"
"             Runoff coefficient     0.355      0.894      0.706      "
"             Maximum flow           0.003      0.022      0.022      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.022     0.022     0.050     0.050"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.022     0.022     0.022     0.050"
" 40          HYDROGRAPH   Combine    2"
"            6   Combine "
"            2   Node #"
"                Activa Baden Subdivision"
"             Maximum flow                  0.072    c.m/sec"
"             Hydrograph volume           126.403    c.m"
"                    0.022     0.022     0.022     0.072"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.022     0.000     0.022     0.072"
" 33          CATCHMENT 204"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          204   204"
"        0.000   % Impervious"
"        4.490   Total Area"
"      205.000   Flow length"
"        1.800   Overland Slope"
"        4.490   Pervious Area"
"      205.000   Pervious length"
```

```
"        1.800   Pervious slope"
"        0.000   Impervious Area"
"      205.000   Impervious length"
"        1.800   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.355   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.167     0.000     0.022     0.072 c.m/sec"
"             Catchment 204          Pervious   Impervious Total Area "
"             Surface Area           4.490      0.000      4.490      hectare"
"             Time of concentration  48.956     5.957      48.956     minutes"
"             Time to Centroid       157.310    93.596     157.310    minutes"
"             Rainfall depth         56.290     56.290     56.290     mm"
"             Rainfall volume        2527.43    0.00       2527.43    c.m"
"             Rainfall losses        36.309     5.521      36.309     mm"
"             Runoff depth           19.981     50.770     19.981     mm"
"             Runoff volume          897.16     0.00       897.17     c.m"
"             Runoff coefficient     0.355      0.000      0.355      "
"             Maximum flow           0.167      0.000      0.167      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                   0.167     0.167     0.022     0.072"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                   0.167     0.167     0.167     0.072"
" 40          HYDROGRAPH   Combine    1"
"             6   Combine "
"             1   Node #"
"                 Internal Depression"
"              Maximum flow                 0.194    c.m/sec"
"              Hydrograph volume         1025.023    c.m"
"                   0.167     0.167     0.167     0.194"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                   0.167     0.000     0.167     0.194"
" 33          CATCHMENT 205"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           205   205"
"        61.000   % Impervious"
"        19.470   Total Area"
"        90.000   Flow length"
"         0.500   Overland Slope"
"         7.593   Pervious Area"
"        90.000   Pervious length"
"         0.500   Pervious slope"
"        11.877   Impervious Area"
"        90.000   Impervious length"
"         0.500   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.355   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.901   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                   4.365     0.000     0.167     0.194 c.m/sec"
"              Catchment 205          Pervious   Impervious Total Area "
"              Surface Area           7.593      11.877     19.470     hectare"
"              Time of concentration  43.872     5.338      13.093     minutes"
"              Time to Centroid       150.816    92.732     104.421    minutes"
"              Rainfall depth         56.290     56.290     56.290     mm"
"              Rainfall volume        0.4274     0.6685     1.0960     ha-m"
"              Rainfall losses        36.315     5.600      17.578     mm"
"              Runoff depth           19.975     50.691     38.712     mm"
"              Runoff volume          1516.79    6020.37    7537.15    c.m"
"              Runoff coefficient     0.355      0.901      0.688      "
"              Maximum flow           0.311      4.311      4.365      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                   4.365     4.365     0.167     0.194"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                   4.365     4.365     4.365     0.194"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Proposed SWMF"
"              Maximum flow                   4.365    c.m/sec"
"              Hydrograph volume           7537.148    c.m"
"                   4.365     4.365     4.365     4.365"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                   4.365     0.000     4.365     4.365"
" 33          CATCHMENT 206"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           206   206"
"        75.000   % Impervious"
"         1.220   Total Area"
"        70.000   Flow length"
"         4.000   Overland Slope"
"         0.305   Pervious Area"
"        70.000   Pervious length"
"         4.000   Pervious slope"
"         0.915   Impervious Area"
"        70.000   Impervious length"
"         4.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.355   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.890   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                   0.334     0.000     4.365     4.365 c.m/sec"
"              Catchment 206          Pervious   Impervious Total Area "
"              Surface Area           0.305      0.915      1.220      hectare"
"              Time of concentration  20.220     2.460      4.542      minutes"
"              Time to Centroid       120.601    88.550     92.307     minutes"
"              Rainfall depth         56.290     56.290     56.290     mm"
"              Rainfall volume        171.68     515.05     686.74     c.m"
"              Rainfall losses        36.326     6.173      13.711     mm"
"              Runoff depth           19.964     50.118     42.579     mm"
"              Runoff volume          60.89      458.58     519.46     c.m"
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"             Runoff coefficient     0.355      0.890      0.756      "
"             Maximum flow           0.021      0.331      0.334      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.334     0.334     4.365     4.365"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.334     0.334     0.334     4.365"
" 40          HYDROGRAPH   Combine    3"
"           6   Combine "
"           3   Node #"
"               Proposed SWMF"
"             Maximum flow                  4.659    c.m/sec"
"             Hydrograph volume          8056.618    c.m"
"                   0.334     0.334     0.334     4.659"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.334     0.000     0.334     4.659"
" 33          CATCHMENT 207"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         207   207"
"       0.000   % Impervious"
"       0.700   Total Area"
"      70.000   Flow length"
"       4.000   Overland Slope"
"       0.700   Pervious Area"
"      70.000   Pervious length"
"       4.000   Pervious slope"
"       0.000   Impervious Area"
"      70.000   Impervious length"
"       4.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.355   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.049     0.000     0.334     4.659 c.m/sec"
"             Catchment 207          Pervious   Impervious Total Area "
"             Surface Area           0.700      0.000      0.700      hectare"
"             Time of concentration  20.220     2.460      20.220     minutes"
"             Time to Centroid       120.601    88.550     120.600    minutes"
"             Rainfall depth         56.290     56.290     56.290     mm"
"             Rainfall volume        394.03     0.00       394.03     c.m"
"             Rainfall losses        36.326     6.173      36.326     mm"
"             Runoff depth           19.964     50.118     19.964     mm"
"             Runoff volume          139.75     0.00       139.75     c.m"
"             Runoff coefficient     0.355      0.000      0.355      "
"             Maximum flow           0.049      0.000      0.049      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.049     0.049     0.334     4.659"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.049     0.049     0.049     4.659"
" 40          HYDROGRAPH   Combine    3"
"           6   Combine "
"           3   Node #"
"               Proposed SWMF"
"             Maximum flow                  4.679    c.m/sec"
"             Hydrograph volume          8196.364    c.m"
"                   0.049     0.049     0.049     4.679"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.049     0.000     0.049     4.679"
" 33          CATCHMENT 208"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         208   208"
"       70.000  % Impervious"
"       2.120   Total Area"
"       60.000  Flow length"
"       1.500   Overland Slope"
"       0.636   Pervious Area"
"       60.000  Pervious length"
"       1.500   Pervious slope"
"       1.484   Impervious Area"
"       60.000  Impervious length"
"       1.500   Impervious slope"
"       0.250   Pervious Manning 'n'"
"       78.000  Pervious SCS Curve No."
"       0.355   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"       98.000  Impervious SCS Curve No."
"       0.889   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.517     0.000     0.049     4.679 c.m/sec"
"             Catchment 208          Pervious   Impervious Total Area "
"             Surface Area           0.636      1.484      2.120      hectare"
"             Time of concentration  24.740     3.010      6.182      minutes"
"             Time to Centroid       126.387    89.379     94.781     minutes"
"             Rainfall depth         56.290     56.290     56.290     mm"
"             Rainfall volume        358.01     835.35     1193.35    c.m"
"             Rainfall losses        36.322     6.224      15.254     mm"
"             Runoff depth           19.968     50.066     41.036     mm"
"             Runoff volume          127.00     742.98     869.97     c.m"
"             Runoff coefficient     0.355      0.889      0.729      "
"             Maximum flow           0.039      0.513      0.517      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.517     0.517     0.049     4.679"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.517     0.517     0.517     4.679"
" 40          HYDROGRAPH   Combine    3"
"           6   Combine "
"           3   Node #"
"               Proposed SWMF"
"             Maximum flow                  5.182    c.m/sec"
"             Hydrograph volume          9066.345    c.m"
"                   0.517     0.517     0.517     5.182"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.517     0.000     0.517     5.182"
" 33          CATCHMENT 209"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         209   209"
"       75.000  % Impervious"
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"        1.300   Total Area"
"       60.000   Flow length"
"        1.000   Overland Slope"
"        0.325   Pervious Area"
"       60.000   Pervious length"
"        1.000   Pervious slope"
"        0.975   Impervious Area"
"       60.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.355   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.889   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.337     0.000     0.517     5.182 c.m/sec"
"             Catchment 209          Pervious   Impervious Total Area "
"             Surface Area           0.325      0.975      1.300      hectare"
"             Time of concentration  27.940     3.400      6.281      minutes"
"             Time to Centroid       130.459    89.968     94.722     minutes"
"             Rainfall depth         56.290     56.290     56.290     mm"
"             Rainfall volume        182.94     548.83     731.77     c.m"
"             Rainfall losses        36.327     6.275      13.788     mm"
"             Runoff depth           19.963     50.015     42.502     mm"
"             Runoff volume          64.88      487.64     552.52     c.m"
"             Runoff coefficient     0.355      0.889      0.755      "
"             Maximum flow           0.019      0.332      0.337      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                  0.337     0.337     0.517     5.182"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                  0.337     0.337     0.337     5.182"
" 40          HYDROGRAPH   Combine    3"
"            6   Combine "
"            3   Node #"
"                Proposed SWMF"
"             Maximum flow                  5.519    c.m/sec"
"             Hydrograph volume          9618.843    c.m"
"                  0.337     0.337     0.337     5.519"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                  0.337     0.000     0.337     5.519"
" 33          CATCHMENT 210"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          210   210"
"        4.000   % Impervious"
"        0.130   Total Area"
"       15.000   Flow length"
"        2.000   Overland Slope"
"        0.125   Pervious Area"
"       15.000   Pervious length"
"        2.000   Pervious slope"
"        0.005   Impervious Area"
"       15.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.353   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.887   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.014     0.000     0.337     5.519 c.m/sec"
"             Catchment 210          Pervious   Impervious Total Area "
"             Surface Area           0.125      0.005      0.130      hectare"
"             Time of concentration  9.878      1.202      9.056      minutes"
"             Time to Centroid       107.432    86.719     105.469    minutes"
"             Rainfall depth         56.290     56.290     56.290     mm"
"             Rainfall volume        70.25      2.93       73.18      c.m"
"             Rainfall losses        36.430     6.369      35.227     mm"
"             Runoff depth           19.861     49.921     21.063     mm"
"             Runoff volume          24.79      2.60       27.38      c.m"
"             Runoff coefficient     0.353      0.887      0.374      "
"             Maximum flow           0.013      0.002      0.014      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                  0.014     0.014     0.337     5.519"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                  0.014     0.014     0.014     5.519"
" 40          HYDROGRAPH   Combine    3"
"            6   Combine "
"            3   Node #"
"                Proposed SWMF"
"             Maximum flow                  5.530    c.m/sec"
"             Hydrograph volume          9646.223    c.m"
"                  0.014     0.014     0.014     5.530"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                  0.014     0.000     0.014     5.530"
" 33          CATCHMENT 211"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          211   211"
"       50.000   % Impervious"
"        1.100   Total Area"
"       20.000   Flow length"
"       20.000   Overland Slope"
"        0.550   Pervious Area"
"       20.000   Pervious length"
"       20.000   Pervious slope"
"        0.550   Impervious Area"
"       20.000   Impervious length"
"       20.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.352   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.849   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.245     0.000     0.014     5.530 c.m/sec"
"             Catchment 211          Pervious   Impervious Total Area "
"             Surface Area           0.550      0.550      1.100      hectare"
"             Time of concentration  5.884      0.716      2.229      minutes"
"             Time to Centroid       102.398    86.182     90.931     minutes"
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"            Rainfall depth         56.290     56.290     56.290     mm"
"            Rainfall volume        309.60     309.60     619.19     c.m"
"            Rainfall losses        36.488     8.472      22.480     mm"
"            Runoff depth           19.803     47.818     33.810     mm"
"            Runoff volume          108.91     263.00     371.92     c.m"
"            Runoff coefficient     0.352      0.849      0.601      "
"            Maximum flow           0.065      0.218      0.245      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.245     0.245     0.014     5.530"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.245     0.245     0.245     5.530"
" 40         HYDROGRAPH   Combine    3"
"           6   Combine "
"           3   Node #"
"               Proposed SWMF"
"            Maximum flow                5.715    c.m/sec"
"            Hydrograph volume         10018.140    c.m"
"                   0.245     0.245     0.245     5.715"
" 40         HYDROGRAPH   Confluence    3"
"           7   Confluence "
"           3   Node #"
"               Proposed SWMF"
"            Maximum flow                5.715    c.m/sec"
"            Hydrograph volume         10018.140    c.m"
"                   0.245     5.715     0.245     0.000"
" 54         POND DESIGN"
"        5.715   Current peak flow    c.m/sec"
"        1.127   Target outflow    c.m/sec"
"     10018.1    Hydrograph volume    c.m"
"          29.   Number of stages"
"      354.700   Minimum water level    metre"
"      357.500   Maximum water level    metre"
"      354.700   Starting water level    metre"
"           0    Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                354.700     0.000     0.000"
"                354.800   0.03251  1214.000"
"                354.900   0.03252  1662.000"
"                355.000   0.03253  2129.000"
"                355.100   0.03254  2617.000"
"                355.200   0.03255  3125.000"
"                355.300   0.04330  3655.000"
"                355.400   0.06630  4201.000"
"                355.500   0.08230  4759.000"
"                355.600   0.09440  5329.000"
"                355.700    0.1044  5911.000"
"                355.800    0.1132  6504.000"
"                355.900    0.1212  7109.000"
"                356.000    0.1284  7727.000"
"                356.100    0.1352  8356.000"
"                356.200    0.1415  8997.000"
"                356.300    0.1475  9650.000"
"                356.400    0.1532  10316.00"
"                356.500    0.1587  10993.00"
"                356.600    0.1639  11683.00"
"                356.700    0.1689  12385.00"
"                356.800    0.1738  13099.00"
"                356.900    0.1784  13826.00"
"                357.000    0.1830  14565.00"
"                357.100    0.1874  15319.00"
"                357.200    0.1917  16091.00"
"                357.300    0.3079  16881.00"
"                357.400    0.5168  17689.00"
"                357.500    0.7861  18517.00"
"            Peak outflow                0.139    c.m/sec"
"            Maximum level             356.164    metre"
"            Maximum storage          8768.159    c.m"
"            Centroidal lag             18.342   hours"
"                 0.245     5.715     0.139     0.000 c.m/sec"
" 40         HYDROGRAPH   Combine    9"
"           6   Combine "
"           9   Node #"
"               Conveyance Node"
"            Maximum flow                0.139    c.m/sec"
"            Hydrograph volume          9597.837    c.m"
"                   0.245     5.715     0.139     0.139"
" 40         HYDROGRAPH   Confluence    9"
"           7   Confluence "
"           9   Node #"
"               Conveyance Node"
"            Maximum flow                0.139    c.m/sec"
"            Hydrograph volume          9597.838    c.m"
"                   0.245     0.139     0.139     0.000"
" 51         PIPE DESIGN"
"       0.139   Current peak flow    c.m/sec"
"       0.013   Manning 'n'"
"       1.200   Diameter    metre"
"       0.400   Gradient   %"
"            Depth of flow               0.194    metre"
"            Velocity                    1.178    m/sec"
"            Pipe capacity               2.466    c.m/sec"
"            Critical depth              0.196    metre"
" 53         ROUTE    Pipe Route 730"
"      730.00      Pipe Route 730 Reach length   ( metre)"
"       0.468   X-factor <= 0.5"
"     232.371   K-lag   ( seconds)"
"       0.000   Default(0) or user spec.(1) values used"
"       0.500   X-factor <= 0.5"
"      30.000   K-lag   ( seconds)"
"       0.500   Beta weighting factor"
"     300.000   Routing time step   ( seconds)"
"           2   No. of sub-reaches"
"            Peak outflow                0.139    c.m/sec"
"                   0.245     0.139     0.139     0.000 c.m/sec"
" 40         HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
"            Maximum flow                0.139    c.m/sec"
"            Hydrograph volume          9592.581    c.m"
"                   0.245     0.139     0.139     0.139"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.245     0.000     0.139     0.139"
" 33         CATCHMENT 212"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         212   212"
"      65.000   % Impervious"
"       0.160   Total Area"
"      40.000   Flow length"
"       2.500   Overland Slope"
"       0.056   Pervious Area"
"      40.000   Pervious length"
"       2.500   Pervious slope"
"       0.104   Impervious Area"
"      40.000   Impervious length"
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"        2.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.354   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.894   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.039     0.000     0.139     0.139 c.m/sec"
"             Catchment 212          Pervious   Impervious Total Area "
"             Surface Area           0.056      0.104      0.160      hectare"
"             Time of concentration  16.641     2.025      4.594      minutes"
"             Time to Centroid       116.071    87.852     92.811     minutes"
"             Rainfall depth         56.290     56.290     56.290     mm"
"             Rainfall volume        31.52      58.54      90.06      c.m"
"             Rainfall losses        36.351     5.941      16.584     mm"
"             Runoff depth           19.939     50.349     39.706     mm"
"             Runoff volume          11.17      52.36      63.53      c.m"
"             Runoff coefficient     0.354      0.894      0.705      "
"             Maximum flow           0.004      0.039      0.039      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.039     0.039     0.139     0.139"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.039     0.039     0.039     0.139"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Ex. 1000mm CSP Culvert"
"              Maximum flow                 0.039    c.m/sec"
"              Hydrograph volume           63.529    c.m"
"                    0.039     0.039     0.039     0.039"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.039     0.000     0.039     0.039"
" 33          CATCHMENT 213"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           213   213"
"         2.000   % Impervious"
"        18.930   Total Area"
"       570.000   Flow length"
"         1.600   Overland Slope"
"        18.551   Pervious Area"
"       570.000   Pervious length"
"         1.600   Pervious slope"
"         0.379   Impervious Area"
"       570.000   Impervious length"
"         1.600   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.355   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.905   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.408     0.000     0.039     0.039 c.m/sec"
"             Catchment 213          Pervious   Impervious Total Area "
"             Surface Area           18.551     0.379      18.930     hectare"
"             Time of concentration  93.675     11.398     89.607     minutes"
"             Time to Centroid       214.430    101.294    208.836    minutes"
"             Rainfall depth         56.290     56.290     56.290     mm"
"             Rainfall volume        1.0443     0.0213     1.0656     ha-m"
"             Rainfall losses        36.309     5.361      35.690     mm"
"             Runoff depth           19.981     50.929     20.600     mm"
"             Runoff volume          3706.81    192.82     3899.63    c.m"
"             Runoff coefficient     0.355      0.905      0.366      "
"             Maximum flow           0.401      0.105      0.408      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.408     0.408     0.039     0.039"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.408     0.408     0.408     0.039"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Ex. 1000mm CSP Culvert"
"              Maximum flow                 0.410    c.m/sec"
"              Hydrograph volume         3963.160    c.m"
"                    0.408     0.408     0.408     0.410"
" 40          HYDROGRAPH   Confluence    3"
"             7   Confluence "
"             3   Node #"
"                 Ex. 1000mm CSP Culvert"
"              Maximum flow                 0.410    c.m/sec"
"              Hydrograph volume         3963.160    c.m"
"                    0.408     0.410     0.408     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.408     0.410     0.410     0.000"
" 40          HYDROGRAPH   Combine    5"
"             6   Combine "
"             5   Node #"
"                 to Baden West SWMF"
"              Maximum flow                 0.410    c.m/sec"
"              Hydrograph volume         3963.160    c.m"
"                    0.408     0.410     0.410     0.410"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.408     0.000     0.410     0.410"
" 33          CATCHMENT 214"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           214   214"
"        65.000   % Impervious"
"         0.100   Total Area"
"        50.000   Flow length"
"         2.500   Overland Slope"
"         0.035   Pervious Area"
"        50.000   Pervious length"
"         2.500   Pervious slope"
"         0.065   Impervious Area"
"        50.000   Impervious length"
"         2.500   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.354   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
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"       98.000   Impervious SCS Curve No."
"        0.892   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.024     0.000     0.410     0.410 c.m/sec"
"             Catchment 214          Pervious   Impervious Total Area "
"             Surface Area           0.035      0.065      0.100      hectare"
"             Time of concentration  19.025     2.315      5.259      minutes"
"             Time to Centroid       119.072    88.309     93.729     minutes"
"             Rainfall depth         56.290     56.290     56.290     mm"
"             Rainfall volume        19.70      36.59      56.29      c.m"
"             Rainfall losses        36.347     6.087      16.678     mm"
"             Runoff depth           19.943     50.203     39.612     mm"
"             Runoff volume          6.98       32.63      39.61      c.m"
"             Runoff coefficient     0.354      0.892      0.704      "
"             Maximum flow           0.003      0.024      0.024      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.024     0.024     0.410     0.410"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.024     0.024     0.024     0.410"
" 40          HYDROGRAPH   Combine    4"
"           6   Combine "
"           4   Node #"
"               Snyder's/Christian"
"            Maximum flow                 0.024    c.m/sec"
"            Hydrograph volume           39.612    c.m"
"                  0.024     0.024     0.024     0.024"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                  0.024     0.000     0.024     0.024"
" 33          CATCHMENT 215"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         215   215"
"       45.000   % Impervious"
"        1.030   Total Area"
"       70.000   Flow length"
"        0.700   Overland Slope"
"        0.566   Pervious Area"
"       70.000   Pervious length"
"        0.700   Pervious slope"
"        0.463   Impervious Area"
"       70.000   Impervious length"
"        0.700   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.390   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.896   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.172     0.000     0.024     0.024 c.m/sec"
"             Catchment 215          Pervious   Impervious Total Area "
"             Surface Area           0.566      0.463      1.030      hectare"
"             Time of concentration  32.523     4.150      14.009     minutes"
"             Time to Centroid       136.091    91.052     106.702    minutes"
"             Rainfall depth         56.290     56.290     56.290     mm"
"             Rainfall volume        318.88     260.90     579.79     c.m"
"             Rainfall losses        34.316     5.858      21.510     mm"
"             Runoff depth           21.974     50.432     34.780     mm"
"             Runoff volume          124.48     233.75     358.24     c.m"
"             Runoff coefficient     0.390      0.896      0.618      "
"             Maximum flow           0.032      0.165      0.172      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.172     0.172     0.024     0.024"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.172     0.172     0.172     0.024"
" 40          HYDROGRAPH   Combine    4"
"           6   Combine "
"           4   Node #"
"               Snyder's/Christian"
"            Maximum flow                 0.194    c.m/sec"
"            Hydrograph volume          397.849    c.m"
"                  0.172     0.172     0.172     0.194"
" 40          HYDROGRAPH   Confluence    4"
"           7   Confluence "
"           4   Node #"
"               Snyder's/Christian"
"            Maximum flow                 0.194    c.m/sec"
"            Hydrograph volume          397.849    c.m"
"                  0.172     0.194     0.172     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.172     0.194     0.194     0.000"
" 40          HYDROGRAPH   Combine    5"
"           6   Combine "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                 0.429    c.m/sec"
"            Hydrograph volume         4361.008    c.m"
"                  0.172     0.194     0.194     0.429"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                  0.172     0.000     0.194     0.429"
" 33          CATCHMENT 216"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         216   216"
"       45.000   % Impervious"
"        2.080   Total Area"
"       80.000   Flow length"
"        2.000   Overland Slope"
"        1.144   Pervious Area"
"       80.000   Pervious length"
"        2.000   Pervious slope"
"        0.936   Impervious Area"
"       80.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.390   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.890   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.340     0.000     0.194     0.429 c.m/sec"
"             Catchment 216          Pervious   Impervious Total Area "
"             Surface Area           1.144      0.936      2.080      hectare"
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"             Time of concentration  25.717     3.282      11.111     minutes"
"             Time to Centroid       127.304    89.802     102.889    minutes"
"             Rainfall depth         56.290     56.290     56.290     mm"
"             Rainfall volume        643.96     526.88     1170.83    c.m"
"             Rainfall losses        34.329     6.216      21.678     mm"
"             Runoff depth           21.962     50.075     34.612     mm"
"             Runoff volume          251.24     468.70     719.94     c.m"
"             Runoff coefficient     0.390      0.890      0.615      "
"             Maximum flow           0.075      0.316      0.340      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.340     0.340     0.194     0.429"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.340     0.340     0.340     0.429"
" 40          HYDROGRAPH   Combine    5"
"             6   Combine "
"             5   Node #"
"                 to Baden West SWMF"
"             Maximum flow                  0.697    c.m/sec"
"             Hydrograph volume          5080.944    c.m"
"                    0.340     0.340     0.340     0.697"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.340     0.000     0.340     0.697"
" 33          CATCHMENT 217"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           217   217"
"        55.000   % Impervious"
"        10.200   Total Area"
"        60.000   Flow length"
"         3.000   Overland Slope"
"         4.590   Pervious Area"
"        60.000   Pervious length"
"         3.000   Pervious slope"
"         5.610   Impervious Area"
"        60.000   Impervious length"
"         3.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        80.000   Pervious SCS Curve No."
"         0.390   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         6.350   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.891   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    2.082     0.000     0.340     0.697 c.m/sec"
"                Catchment 217          Pervious   Impervious Total Area "
"                Surface Area           4.590      5.610      10.200     hectare"
"                Time of concentration  19.161     2.445      6.851      minutes"
"                Time to Centroid       118.848    88.526     96.518     minutes"
"                Rainfall depth         56.290     56.290     56.290     mm"
"                Rainfall volume        2583.72    3157.88    5741.59    c.m"
"                Rainfall losses        34.360     6.159      18.849     mm"
"                Runoff depth           21.931     50.131     37.441     mm"
"                Runoff volume          1006.61    2812.35    3818.96    c.m"
"                Runoff coefficient     0.390      0.891      0.665      "
"                Maximum flow           0.364      2.032      2.082      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    2.082     2.082     0.340     0.697"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    2.082     2.082     2.082     0.697"
" 40          HYDROGRAPH   Combine    5"
"             6   Combine "
"             5   Node #"
"                 to Baden West SWMF"
"             Maximum flow                  2.082    c.m/sec"
"             Hydrograph volume          8899.908    c.m"
"                    2.082     2.082     2.082     2.670"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    2.082     0.000     2.082     2.670"
" 33          CATCHMENT 218"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           218   218"
"        50.000   % Impervious"
"         1.250   Total Area"
"        20.000   Flow length"
"        20.000   Overland Slope"
"         0.625   Pervious Area"
"        20.000   Pervious length"
"        20.000   Pervious slope"
"         0.625   Impervious Area"
"        20.000   Impervious length"
"        20.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.352   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.849   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.279     0.000     2.082     2.670 c.m/sec"
"                Catchment 218          Pervious   Impervious Total Area "
"                Surface Area           0.625      0.625      1.250      hectare"
"                Time of concentration  5.884      0.716      2.229      minutes"
"                Time to Centroid       102.398    86.182     90.931     minutes"
"                Rainfall depth         56.290     56.290     56.290     mm"
"                Rainfall volume        351.81     351.81     703.63     c.m"
"                Rainfall losses        36.488     8.472      22.480     mm"
"                Runoff depth           19.803     47.818     33.810     mm"
"                Runoff volume          123.77     298.86     422.63     c.m"
"                Runoff coefficient     0.352      0.849      0.601      "
"                Maximum flow           0.074      0.247      0.279      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.279     0.279     2.082     2.670"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.279     0.279     0.279     2.670"
" 40          HYDROGRAPH   Combine    5"
"             6   Combine "
"             5   Node #"
"                 to Baden West SWMF"
"             Maximum flow                  2.948    c.m/sec"
"             Hydrograph volume          9322.538    c.m"
"                    0.279     0.279     0.279     2.948"
" 40          HYDROGRAPH   Confluence    5"
"             7   Confluence "
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"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  2.948    c.m/sec"
"             Hydrograph volume          9322.538    c.m"
"                    0.279     2.948     0.279     0.000"
" 54          POND DESIGN"
"        2.948   Current peak flow    c.m/sec"
"        0.497   Target outflow    c.m/sec"
"       9322.5   Hydrograph volume    c.m"
"          33.   Number of stages"
"      351.500   Minimum water level    metre"
"      354.700   Maximum water level    metre"
"      351.500   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                351.500     0.000     0.000"
"                351.600   0.00600   400.000"
"                351.700   0.01900   824.000"
"                351.800   0.03100  1272.000"
"                351.900   0.07800  1744.000"
"                352.000    0.1930  2240.000"
"                352.100    0.3670  2760.000"
"                352.200    0.5970  3298.000"
"                352.300    0.8520  3849.000"
"                352.400     1.011  4412.000"
"                352.500     1.122  4988.000"
"                352.600     1.223  5576.000"
"                352.700     1.316  6176.000"
"                352.800     1.403  6789.000"
"                352.900     1.485  7415.000"
"                353.000     1.563  8053.000"
"                353.100     1.637  8704.000"
"                353.200     1.708  9368.000"
"                353.300     1.776  10045.00"
"                353.400     1.841  10735.00"
"                353.500     1.904  11439.00"
"                353.600     1.965  12156.00"
"                353.700     2.025  12884.00"
"                353.800     2.082  13625.00"
"                353.900     2.138  14378.00"
"                354.000     2.193  15143.00"
"                354.100     2.246  15921.00"
"                354.200     2.298  16712.00"
"                354.300     2.349  17517.00"
"                354.400     2.399  18334.00"
"                354.500     2.473  19165.00"
"                354.600     2.708  20012.00"
"                354.700     3.177  20879.00"
"             Peak outflow                  0.731    c.m/sec"
"             Maximum level               352.253    metre"
"             Maximum storage            3589.530    c.m"
"             Centroidal lag                5.858   hours"
"                  0.279     2.948     0.731     0.000 c.m/sec"
" 40          HYDROGRAPH   Combine    6"
"            6   Combine "
"            6   Node #"
"                Swale Storage Prior to CMP Culvert"
"             Maximum flow                  0.854    c.m/sec"
"             Hydrograph volume         18806.066    c.m"
"                    0.279     2.948     0.731     0.854"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.279     0.000     0.731     0.854"
" 33          CATCHMENT 219"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          219   219"
"       45.000   % Impervious"
"        1.250   Total Area"
"       60.000   Flow length"
"        2.000   Overland Slope"
"        0.688   Pervious Area"
"       60.000   Pervious length"
"        2.000   Pervious slope"
"        0.563   Impervious Area"
"       60.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.390   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.887   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.204     0.000     0.731     0.854 c.m/sec"
"             Catchment 219          Pervious   Impervious Total Area "
"             Surface Area           0.688      0.563      1.250      hectare"
"             Time of concentration  21.640     2.761      9.362      minutes"
"             Time to Centroid       122.050    89.008     100.561    minutes"
"             Rainfall depth         56.290     56.290     56.290     mm"
"             Rainfall volume        386.99     316.63     703.63     c.m"
"             Rainfall losses        34.325     6.356      21.739     mm"
"             Runoff depth           21.965     49.935     34.551     mm"
"             Runoff volume          151.01     280.88     431.89     c.m"
"             Runoff coefficient     0.390      0.887      0.614      "
"             Maximum flow           0.053      0.198      0.204      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.204     0.204     0.731     0.854"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.204     0.204     0.204     0.854"
" 40          HYDROGRAPH   Combine    6"
"            6   Combine "
"            6   Node #"
"                Swale Storage Prior to CMP Culvert"
"             Maximum flow                  0.893    c.m/sec"
"             Hydrograph volume         19237.955    c.m"
"                    0.204     0.204     0.204     0.893"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.204     0.000     0.204     0.893"
" 33          CATCHMENT 220"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          220   220"
"        0.000   % Impervious"
"        2.110   Total Area"
"      365.000   Flow length"
"        0.500   Overland Slope"
"        2.110   Pervious Area"
"      365.000   Pervious length"
"        0.500   Pervious slope"
"        0.000   Impervious Area"
"      365.000   Impervious length"
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"        0.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.355   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.042     0.000     0.204     0.893 c.m/sec"
"             Catchment 220          Pervious   Impervious Total Area "
"             Surface Area           2.110      0.000      2.110      hectare"
"             Time of concentration  101.629    12.366     101.629    minutes"
"             Time to Centroid       224.588    102.681    224.588    minutes"
"             Rainfall depth         56.290     56.290     56.290     mm"
"             Rainfall volume        1187.72    0.00       1187.72    c.m"
"             Rainfall losses        36.308     5.397      36.308     mm"
"             Runoff depth           19.983     50.893     19.983     mm"
"             Runoff volume          421.63     0.00       421.63     c.m"
"             Runoff coefficient     0.355      0.000      0.355      "
"             Maximum flow           0.042      0.000      0.042      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                   0.042     0.042     0.204     0.893"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                   0.042     0.042     0.042     0.893"
" 40          HYDROGRAPH   Combine    6"
"             6   Combine "
"             6   Node #"
"                 Swale Storage Prior to CMP Culvert"
"             Maximum flow                  0.919    c.m/sec"
"             Hydrograph volume         19659.600    c.m"
"                   0.042     0.042     0.042     0.919"
" 40          HYDROGRAPH   Confluence    6"
"             7   Confluence "
"             6   Node #"
"                 Swale Storage Prior to CMP Culvert"
"             Maximum flow                  0.919    c.m/sec"
"             Hydrograph volume         19659.598    c.m"
"                   0.042     0.919     0.042     0.000"
" 54          POND DESIGN"
"        0.919   Current peak flow    c.m/sec"
"        0.497   Target outflow    c.m/sec"
"      19659.6   Hydrograph volume    c.m"
"         37.    Number of stages"
"      351.100   Minimum water level    metre"
"      354.700   Maximum water level    metre"
"      351.100   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                351.100     0.000     0.000"
"                351.200   0.00900    0.1000"
"                351.300   0.03600    0.6000"
"                351.400   0.08100     1.000"
"                351.500    0.1420     2.000"
"                351.600    0.2180     5.000"
"                351.700    0.3070     8.000"
"                351.800    0.4210    14.000"
"                351.900    0.5530    21.000"
"                352.000    0.6750    29.000"
"                352.100    0.8050    41.000"
"                352.200    0.9380    57.000"
"                352.300     1.066    76.000"
"                352.400     1.191   100.000"
"                352.500     1.307   128.000"
"                352.600     1.410   160.000"
"                352.700     1.507   197.000"
"                352.800     1.596   239.000"
"                352.900     1.684   286.000"
"                353.000     1.768   337.000"
"                353.100     1.849   393.000"
"                353.200     1.928   455.000"
"                353.300     2.005   526.000"
"                353.400     2.080   596.000"
"                353.500     2.153   676.000"
"                353.600     2.224   761.000"
"                353.700     2.293   854.000"
"                353.800     2.361   953.000"
"                353.900     2.427  1060.000"
"                354.000     2.492  1174.000"
"                354.100     2.556  1298.000"
"                354.200     2.618  1435.000"
"                354.300     2.689  1586.000"
"                354.400     2.739  1751.000"
"                354.500     2.797  1929.000"
"                354.600     2.855  2121.000"
"                354.700     2.911  2329.000"
"             Peak outflow                  0.918    c.m/sec"
"             Maximum level               352.185    metre"
"             Maximum storage              54.630    c.m"
"             Centroidal lag               11.060   hours"
"                  0.042     0.919     0.918     0.000 c.m/sec"
" 40          HYDROGRAPH   Combine    7"
"             6   Combine "
"             7   Node #"
"                 Baden Creek Tributary"
"             Maximum flow                  0.918    c.m/sec"
"             Hydrograph volume         19655.969    c.m"
"                    0.042     0.919     0.918     0.918"
" 81          ADD COMMENT================================================="
"           4  Lines of comment"
"              ************************************************"
"              ACTUAL FLOW THROUGH CN CULVERT"
"              = 0.918-0.033(INFIL GALLERY) = 0.885cms"
"              ************************************************"
" 38          START/RE-START TOTALS 6"
"             3   Runoff Totals on EXIT"
"              Total Catchment area                      68.640    hectare"
"              Total Impervious area                     24.731    hectare"
"              Total % impervious                        36.029"
" 19          EXIT"
```

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"               MIDUSS Output ----------------------------------------------->"
"               MIDUSS version                          Version 2.25  rev. 473"
"               MIDUSS created                  Sunday, February 7, 2010"
"          10   Units used:                                    ie METRIC"
"               Job folder:          Q:\40777\104\PRELIMINARY\SWM\2nd DP Sub\"
"                                                            MIDUSS\Post"
"               Output filename:                             25yrPost2.in"
"               Licensee name:                                          A"
"               Company                                                 "
"               Date & Time last used:              9/11/2023 at 1:25:48 PM"
" 31          TIME PARAMETERS"
"       5.000   Time Step"
"     180.000   Max. Storm length"
"    3000.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"           1   Chicago storm"
"    3158.000   Coefficient A"
"      15.000   Constant B"
"       0.936   Exponent C"
"       0.400   Fraction R"
"     180.000   Duration"
"       1.000   Time step multiplier"
"             Maximum intensity          191.271    mm/hr"
"             Total depth                 68.087    mm"
"           5   25hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 201"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         201   201"
"       0.000   % Impervious"
"       0.640   Total Area"
"      80.000   Flow length"
"       2.000   Overland Slope"
"       0.640   Pervious Area"
"      80.000   Pervious length"
"       2.000   Pervious slope"
"       0.000   Impervious Area"
"      80.000   Impervious length"
"       2.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.411   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.058     0.000     0.000     0.000 c.m/sec"
"             Catchment 201          Pervious   Impervious Total Area "
"             Surface Area           0.640      0.000      0.640      hectare"
"             Time of concentration  23.911     3.115      23.911     minutes"
"             Time to Centroid       123.903    89.000     123.903    minutes"
"             Rainfall depth         68.087     68.087     68.087     mm"
"             Rainfall volume        435.75     0.00       435.75     c.m"
"             Rainfall losses        40.097     6.570      40.097     mm"
"             Runoff depth           27.989     61.516     27.989     mm"
"             Runoff volume          179.13     0.00       179.13     c.m"
"             Runoff coefficient     0.411      0.000      0.411      "
"             Maximum flow           0.058      0.000      0.058      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.058     0.058     0.000     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.058     0.058     0.058     0.000"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"            Maximum flow                  0.058    c.m/sec"
"            Hydrograph volume           179.130    c.m"
"                   0.058     0.058     0.058     0.058"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.058     0.000     0.058     0.058"
" 33          CATCHMENT 202"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         202   202"
"      45.000   % Impervious"
"       0.270   Total Area"
"      30.000   Flow length"
"       4.000   Overland Slope"
"       0.148   Pervious Area"
"      30.000   Pervious length"
"       4.000   Pervious slope"
"       0.122   Impervious Area"
"      30.000   Impervious length"
"       4.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.410   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.907   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.060     0.000     0.058     0.058 c.m/sec"
"             Catchment 202          Pervious   Impervious Total Area "
"             Surface Area           0.148      0.122      0.270      hectare"
"             Time of concentration  10.782     1.405      4.743      minutes"
"             Time to Centroid       107.289    86.456     93.873     minutes"
"             Rainfall depth         68.087     68.087     68.087     mm"
"             Rainfall volume        101.11     82.73      183.83     c.m"
"             Rainfall losses        40.147     6.318      24.924     mm"
"             Runoff depth           27.940     61.768     43.163     mm"
"             Runoff volume          41.49      75.05      116.54     c.m"
"             Runoff coefficient     0.410      0.907      0.634      "
"             Maximum flow           0.021      0.055      0.060      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.060     0.060     0.058     0.058"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.060     0.060     0.060     0.058"
" 40          HYDROGRAPH   Combine    2"
"           6   Combine "
"           2   Node #"
"               Activa Baden Subdivision"
"            Maximum flow                  0.060    c.m/sec"
"            Hydrograph volume           116.539    c.m"
"                   0.060     0.060     0.060     0.060"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
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"                   0.060     0.000     0.060     0.060"
" 33          CATCHMENT 203"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         203   203"
"      65.000   % Impervious"
"       0.090   Total Area"
"      30.000   Flow length"
"       2.000   Overland Slope"
"       0.032   Pervious Area"
"      30.000   Pervious length"
"       2.000   Pervious slope"
"       0.059   Impervious Area"
"      30.000   Impervious length"
"       2.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.410   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.910   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.027     0.000     0.060     0.060 c.m/sec"
"             Catchment 203          Pervious   Impervious Total Area "
"             Surface Area           0.032      0.059      0.090      hectare"
"             Time of concentration  13.274     1.729      3.984      minutes"
"             Time to Centroid       110.471    86.924     91.522     minutes"
"             Rainfall depth         68.087     68.087     68.087     mm"
"             Rainfall volume        21.45      39.83      61.28      c.m"
"             Rainfall losses        40.170     6.138      18.049     mm"
"             Runoff depth           27.916     61.949     50.037     mm"
"             Runoff volume          8.79       36.24      45.03      c.m"
"             Runoff coefficient     0.410      0.910      0.735      "
"             Maximum flow           0.004      0.026      0.027      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.027     0.027     0.060     0.060"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.027     0.027     0.027     0.060"
" 40          HYDROGRAPH   Combine    2"
"           6   Combine "
"           2   Node #"
"               Activa Baden Subdivision"
"             Maximum flow                 0.086    c.m/sec"
"             Hydrograph volume          161.573    c.m"
"                   0.027     0.027     0.027     0.086"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.027     0.000     0.027     0.086"
" 33          CATCHMENT 204"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         204   204"
"       0.000   % Impervious"
"       4.490   Total Area"
"     205.000   Flow length"
"       1.800   Overland Slope"
"       4.490   Pervious Area"
"     205.000   Pervious length"
"       1.800   Pervious slope"
"       0.000   Impervious Area"
"     205.000   Impervious length"
"       1.800   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.411   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.265     0.000     0.027     0.086 c.m/sec"
"             Catchment 204          Pervious   Impervious Total Area "
"             Surface Area           4.490      0.000      4.490      hectare"
"             Time of concentration  43.403     5.654      43.403     minutes"
"             Time to Centroid       148.552    92.572     148.552    minutes"
"             Rainfall depth         68.087     68.087     68.087     mm"
"             Rainfall volume        3057.08    0.00       3057.08    c.m"
"             Rainfall losses        40.092     5.720      40.092     mm"
"             Runoff depth           27.994     62.366     27.994     mm"
"             Runoff volume          1256.95    0.00       1256.95    c.m"
"             Runoff coefficient     0.411      0.000      0.411      "
"             Maximum flow           0.265      0.000      0.265      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.265     0.265     0.027     0.086"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.265     0.265     0.265     0.086"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"             Maximum flow                 0.309    c.m/sec"
"             Hydrograph volume          1436.083    c.m"
"                   0.265     0.265     0.265     0.309"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.265     0.000     0.265     0.309"
" 33          CATCHMENT 205"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         205   205"
"      61.000   % Impervious"
"      19.470   Total Area"
"      90.000   Flow length"
"       0.500   Overland Slope"
"       7.593   Pervious Area"
"      90.000   Pervious length"
"       0.500   Pervious slope"
"      11.877   Impervious Area"
"      90.000   Impervious length"
"       0.500   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.411   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.914   Impervious Runoff coefficient"
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"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    5.122     0.000     0.265     0.309 c.m/sec"
"             Catchment 205          Pervious   Impervious Total Area "
"             Surface Area           7.593      11.877     19.470     hectare"
"             Time of concentration  38.896     5.067      12.622     minutes"
"             Time to Centroid       142.849    91.762     103.171    minutes"
"             Rainfall depth         68.087     68.087     68.087     mm"
"             Rainfall volume        0.5170     0.8086     1.3256     ha-m"
"             Rainfall losses        40.098     5.858      19.212     mm"
"             Runoff depth           27.988     62.228     48.875     mm"
"             Runoff volume          2125.22    7390.67    9515.89    c.m"
"             Runoff coefficient     0.411      0.914      0.718      "
"             Maximum flow           0.481      5.027      5.122      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    5.122     5.122     0.265     0.309"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    5.122     5.122     5.122     0.309"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Proposed SWMF"
"             Maximum flow                  5.122    c.m/sec"
"             Hydrograph volume          9515.889    c.m"
"                    5.122     5.122     5.122     5.122"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    5.122     0.000     5.122     5.122"
" 33          CATCHMENT 206"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           206   206"
"        75.000   % Impervious"
"         1.220   Total Area"
"        70.000   Flow length"
"         4.000   Overland Slope"
"         0.305   Pervious Area"
"        70.000   Pervious length"
"         4.000   Pervious slope"
"         0.915   Impervious Area"
"        70.000   Impervious length"
"         4.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.411   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.906   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.393     0.000     5.122     5.122 c.m/sec"
"             Catchment 206          Pervious   Impervious Total Area "
"             Surface Area           0.305      0.915      1.220      hectare"
"             Time of concentration  17.926     2.335      4.383      minutes"
"             Time to Centroid       116.316    87.817     91.560     minutes"
"             Rainfall depth         68.087     68.087     68.087     mm"
"             Rainfall volume        207.66     622.99     830.66     c.m"
"             Rainfall losses        40.109     6.404      14.831     mm"
"             Runoff depth           27.977     61.682     53.256     mm"
"             Runoff volume          85.33      564.39     649.72     c.m"
"             Runoff coefficient     0.411      0.906      0.782      "
"             Maximum flow           0.033      0.389      0.393      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.393     0.393     5.122     5.122"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.393     0.393     0.393     5.122"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Proposed SWMF"
"             Maximum flow                  5.473    c.m/sec"
"             Hydrograph volume         10165.610    c.m"
"                    0.393     0.393     0.393     5.473"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.393     0.000     0.393     5.473"
" 33          CATCHMENT 207"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           207   207"
"         0.000   % Impervious"
"         0.700   Total Area"
"        70.000   Flow length"
"         4.000   Overland Slope"
"         0.700   Pervious Area"
"        70.000   Pervious length"
"         4.000   Pervious slope"
"         0.000   Impervious Area"
"        70.000   Impervious length"
"         4.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.411   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.000   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.075     0.000     0.393     5.473 c.m/sec"
"             Catchment 207          Pervious   Impervious Total Area "
"             Surface Area           0.700      0.000      0.700      hectare"
"             Time of concentration  17.926     2.335      17.926     minutes"
"             Time to Centroid       116.316    87.817     116.316    minutes"
"             Rainfall depth         68.087     68.087     68.087     mm"
"             Rainfall volume        476.61     0.00       476.61     c.m"
"             Rainfall losses        40.109     6.404      40.109     mm"
"             Runoff depth           27.977     61.682     27.977     mm"
"             Runoff volume          195.84     0.00       195.84     c.m"
"             Runoff coefficient     0.411      0.000      0.411      "
"             Maximum flow           0.075      0.000      0.075      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.075     0.075     0.393     5.473"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.075     0.075     0.075     5.473"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Proposed SWMF"
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"             Maximum flow                  5.507    c.m/sec"
"             Hydrograph volume         10361.448    c.m"
"                    0.075     0.075     0.075     5.507"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                    0.075     0.000     0.075     5.507"
" 33          CATCHMENT 208"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         208   208"
"      70.000   % Impervious"
"       2.120   Total Area"
"      60.000   Flow length"
"       1.500   Overland Slope"
"       0.636   Pervious Area"
"      60.000   Pervious length"
"       1.500   Pervious slope"
"       1.484   Impervious Area"
"      60.000   Impervious length"
"       1.500   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.411   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.901   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                    0.615     0.000     0.075     5.507 c.m/sec"
"             Catchment 208          Pervious   Impervious Total Area "
"             Surface Area           0.636      1.484      2.120      hectare"
"             Time of concentration  21.934     2.857      5.976      minutes"
"             Time to Centroid       121.406    88.625     93.985     minutes"
"             Rainfall depth         68.087     68.087     68.087     mm"
"             Rainfall volume        433.03     1010.40    1443.43    c.m"
"             Rainfall losses        40.120     6.760      16.768     mm"
"             Runoff depth           27.966     61.326     51.318     mm"
"             Runoff volume          177.86     910.08     1087.95    c.m"
"             Runoff coefficient     0.411      0.901      0.754      "
"             Maximum flow           0.062      0.608      0.615      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    0.615     0.615     0.075     5.507"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                    0.615     0.615     0.615     5.507"
" 40          HYDROGRAPH   Combine    3"
"           6   Combine "
"           3   Node #"
"               Proposed SWMF"
"             Maximum flow                  6.090    c.m/sec"
"             Hydrograph volume         11449.395    c.m"
"                    0.615     0.615     0.615     6.090"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                    0.615     0.000     0.615     6.090"
" 33          CATCHMENT 209"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         209   209"
"      75.000   % Impervious"
"       1.300   Total Area"
"      60.000   Flow length"
"       1.000   Overland Slope"
"       0.325   Pervious Area"
"      60.000   Pervious length"
"       1.000   Pervious slope"
"       0.975   Impervious Area"
"      60.000   Impervious length"
"       1.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.411   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.904   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                    0.392     0.000     0.615     6.090 c.m/sec"
"             Catchment 209          Pervious   Impervious Total Area "
"             Surface Area           0.325      0.975      1.300      hectare"
"             Time of concentration  24.771     3.227      6.062      minutes"
"             Time to Centroid       124.993    89.157     93.873     minutes"
"             Rainfall depth         68.087     68.087     68.087     mm"
"             Rainfall volume        221.28     663.84     885.12     c.m"
"             Rainfall losses        40.108     6.541      14.933     mm"
"             Runoff depth           27.978     61.545     53.154     mm"
"             Runoff volume          90.93      600.07     691.00     c.m"
"             Runoff coefficient     0.411      0.904      0.781      "
"             Maximum flow           0.028      0.389      0.392      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    0.392     0.392     0.615     6.090"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                    0.392     0.392     0.392     6.090"
" 40          HYDROGRAPH   Combine    3"
"           6   Combine "
"           3   Node #"
"               Proposed SWMF"
"             Maximum flow                  6.482    c.m/sec"
"             Hydrograph volume         12140.398    c.m"
"                    0.392     0.392     0.392     6.482"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                    0.392     0.000     0.392     6.482"
" 33          CATCHMENT 210"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         210   210"
"       4.000   % Impervious"
"       0.130   Total Area"
"      15.000   Flow length"
"       2.000   Overland Slope"
"       0.125   Pervious Area"
"      15.000   Pervious length"
"       2.000   Pervious slope"
"       0.005   Impervious Area"
"      15.000   Impervious length"
"       2.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.409   Pervious Runoff coefficient"
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"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.899   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.020     0.000     0.392     6.482 c.m/sec"
"             Catchment 210          Pervious   Impervious Total Area "
"             Surface Area           0.125      0.005      0.130      hectare"
"             Time of concentration  8.758      1.141      8.119      minutes"
"             Time to Centroid       104.734    86.165     103.177    minutes"
"             Rainfall depth         68.087     68.087     68.087     mm"
"             Rainfall volume        84.97      3.54       88.51      c.m"
"             Rainfall losses        40.221     6.843      38.886     mm"
"             Runoff depth           27.865     61.244     29.200     mm"
"             Runoff volume          34.78      3.18       37.96      c.m"
"             Runoff coefficient     0.409      0.899      0.429      "
"             Maximum flow           0.019      0.002      0.020      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                  0.020     0.020     0.392     6.482"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                  0.020     0.020     0.020     6.482"
" 40          HYDROGRAPH   Combine    3"
"            6   Combine "
"            3   Node #"
"                Proposed SWMF"
"             Maximum flow                  6.500    c.m/sec"
"             Hydrograph volume         12178.356    c.m"
"                  0.020     0.020     0.020     6.500"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                  0.020     0.000     0.020     6.500"
" 33          CATCHMENT 211"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          211   211"
"       50.000   % Impervious"
"        1.100   Total Area"
"       20.000   Flow length"
"       20.000   Overland Slope"
"        0.550   Pervious Area"
"       20.000   Pervious length"
"       20.000   Pervious slope"
"        0.550   Impervious Area"
"       20.000   Impervious length"
"       20.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.409   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.858   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.298     0.000     0.020     6.500 c.m/sec"
"             Catchment 211          Pervious   Impervious Total Area "
"             Surface Area           0.550      0.550      1.100      hectare"
"             Time of concentration  5.216      0.679      2.144      minutes"
"             Time to Centroid       100.301    85.725     90.431     minutes"
"             Rainfall depth         68.087     68.087     68.087     mm"
"             Rainfall volume        374.48     374.48     748.95     c.m"
"             Rainfall losses        40.239     9.668      24.954     mm"
"             Runoff depth           27.847     58.419     43.133     mm"
"             Runoff volume          153.16     321.30     474.46     c.m"
"             Runoff coefficient     0.409      0.858      0.634      "
"             Maximum flow           0.096      0.248      0.298      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                  0.298     0.298     0.020     6.500"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                  0.298     0.298     0.298     6.500"
" 40          HYDROGRAPH   Combine    3"
"            6   Combine "
"            3   Node #"
"                Proposed SWMF"
"             Maximum flow                  6.738    c.m/sec"
"             Hydrograph volume         12652.816    c.m"
"                  0.298     0.298     0.298     6.738"
" 40          HYDROGRAPH   Confluence    3"
"            7   Confluence "
"            3   Node #"
"                Proposed SWMF"
"             Maximum flow                  6.738    c.m/sec"
"             Hydrograph volume         12652.818    c.m"
"                  0.298     6.738     0.298     0.000"
" 54          POND DESIGN"
"         6.738   Current peak flow    c.m/sec"
"         1.127   Target outflow    c.m/sec"
"      12652.8    Hydrograph volume    c.m"
"          29.    Number of stages"
"       354.700   Minimum water level    metre"
"       357.500   Maximum water level    metre"
"       354.700   Starting water level    metre"
"             0   Keep Design Data: 1 = True; 0 = False"
"                   Level Discharge    Volume"
"                 354.700     0.000     0.000"
"                 354.800   0.03251  1214.000"
"                 354.900   0.03252  1662.000"
"                 355.000   0.03253  2129.000"
"                 355.100   0.03254  2617.000"
"                 355.200   0.03255  3125.000"
"                 355.300   0.04330  3655.000"
"                 355.400   0.06630  4201.000"
"                 355.500   0.08230  4759.000"
"                 355.600   0.09440  5329.000"
"                 355.700    0.1044  5911.000"
"                 355.800    0.1132  6504.000"
"                 355.900    0.1212  7109.000"
"                 356.000    0.1284  7727.000"
"                 356.100    0.1352  8356.000"
"                 356.200    0.1415  8997.000"
"                 356.300    0.1475  9650.000"
"                 356.400    0.1532  10316.00"
"                 356.500    0.1587  10993.00"
"                 356.600    0.1639  11683.00"
"                 356.700    0.1689  12385.00"
"                 356.800    0.1738  13099.00"
"                 356.900    0.1784  13826.00"
"                 357.000    0.1830  14565.00"
"                 357.100    0.1874  15319.00"
"                 357.200    0.1917  16091.00"
"                 357.300    0.3079  16881.00"
"                 357.400    0.5168  17689.00"
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"               357.500    0.7861  18517.00"
"            Peak outflow                  0.160    c.m/sec"
"            Maximum level               356.531    metre"
"            Maximum storage           11205.258    c.m"
"            Centroidal lag               18.788   hours"
"                 0.298     6.738     0.160     0.000 c.m/sec"
" 40         HYDROGRAPH   Combine    9"
"           6   Combine "
"           9   Node #"
"               Conceyance Node"
"            Maximum flow                  0.160    c.m/sec"
"            Hydrograph volume         12006.829    c.m"
"                  0.298     6.738     0.160     0.160"
" 40         HYDROGRAPH   Confluence    9"
"           7   Confluence "
"           9   Node #"
"               Conceyance Node"
"            Maximum flow                  0.160    c.m/sec"
"            Hydrograph volume         12006.827    c.m"
"                  0.298     0.160     0.160     0.000"
" 51         PIPE DESIGN"
"       0.160   Current peak flow    c.m/sec"
"       0.013   Manning 'n'"
"       1.200   Diameter    metre"
"       0.400   Gradient   %"
"            Depth of flow                 0.207    metre"
"            Velocity                      1.228    m/sec"
"            Pipe capacity                 2.466    c.m/sec"
"            Critical depth                0.211    metre"
" 53         ROUTE    Pipe Route 730"
"      730.00      Pipe Route 730 Reach length   ( metre)"
"       0.465   X-factor <= 0.5"
"     222.878   K-lag   ( seconds)"
"       0.000   Default(0) or user spec.(1) values used"
"       0.500   X-factor <= 0.5"
"      30.000   K-lag   ( seconds)"
"       0.500   Beta weighting factor"
"     300.000   Routing time step   ( seconds)"
"           2   No. of sub-reaches"
"            Peak outflow                  0.160    c.m/sec"
"                  0.298     0.160     0.160     0.000 c.m/sec"
" 40         HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
"            Maximum flow                  0.160    c.m/sec"
"            Hydrograph volume         11999.060    c.m"
"                  0.298     0.160     0.160     0.160"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                  0.298     0.000     0.160     0.160"
" 33         CATCHMENT 212"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         212   212"
"      65.000   % Impervious"
"       0.160   Total Area"
"      40.000   Flow length"
"       2.500   Overland Slope"
"       0.056   Pervious Area"
"      40.000   Pervious length"
"       2.500   Pervious slope"
"       0.104   Impervious Area"
"      40.000   Impervious length"
"       2.500   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.411   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.909   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                  0.046     0.000     0.160     0.160 c.m/sec"
"            Catchment 212          Pervious   Impervious Total Area "
"            Surface Area           0.056      0.104      0.160      hectare"
"            Time of concentration  14.754     1.922      4.433      minutes"
"            Time to Centroid       112.341    87.207     92.125     minutes"
"            Rainfall depth         68.087     68.087     68.087     mm"
"            Rainfall volume        38.13      70.81      108.94     c.m"
"            Rainfall losses        40.131     6.202      18.077     mm"
"            Runoff depth           27.956     61.885     50.010     mm"
"            Runoff volume          15.66      64.36      80.02      c.m"
"            Runoff coefficient     0.411      0.909      0.735      "
"            Maximum flow           0.007      0.045      0.046      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.046     0.046     0.160     0.160"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.046     0.046     0.046     0.160"
" 40         HYDROGRAPH   Combine    3"
"           6   Combine "
"           3   Node #"
"               Ex. 1000mm CSP Culvert"
"            Maximum flow                  0.046    c.m/sec"
"            Hydrograph volume            80.015    c.m"
"                  0.046     0.046     0.046     0.046"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                  0.046     0.000     0.046     0.046"
" 33         CATCHMENT 213"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         213   213"
"       2.000   % Impervious"
"      18.930   Total Area"
"     570.000   Flow length"
"       1.600   Overland Slope"
"      18.551   Pervious Area"
"     570.000   Pervious length"
"       1.600   Pervious slope"
"       0.379   Impervious Area"
"     570.000   Impervious length"
"       1.600   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.411   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.920   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                  0.642     0.000     0.046     0.046 c.m/sec"
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"            Catchment 213          Pervious   Impervious Total Area "
"            Surface Area           18.551     0.379      18.930     hectare"
"            Time of concentration  83.050     10.818     79.897     minutes"
"            Time to Centroid       198.691    99.674     194.369    minutes"
"            Rainfall depth         68.087     68.087     68.087     mm"
"            Rainfall volume        1.2631     0.0258     1.2889     ha-m"
"            Rainfall losses        40.090     5.469      39.398     mm"
"            Runoff depth           27.996     62.617     28.689     mm"
"            Runoff volume          5193.70    237.07     5430.77    c.m"
"            Runoff coefficient     0.411      0.920      0.421      "
"            Maximum flow           0.632      0.129      0.642      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    0.642     0.642     0.046     0.046"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                    0.642     0.642     0.642     0.046"
" 40         HYDROGRAPH   Combine    3"
"           6   Combine "
"           3   Node #"
"               Ex. 1000mm CSP Culvert"
"            Maximum flow                  0.645    c.m/sec"
"            Hydrograph volume          5510.789    c.m"
"                    0.642     0.642     0.642     0.645"
" 40         HYDROGRAPH   Confluence    3"
"           7   Confluence "
"           3   Node #"
"               Ex. 1000mm CSP Culvert"
"            Maximum flow                  0.645    c.m/sec"
"            Hydrograph volume          5510.789    c.m"
"                    0.642     0.645     0.642     0.000"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                    0.642     0.645     0.645     0.000"
" 40         HYDROGRAPH   Combine    5"
"           6   Combine "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                  0.645    c.m/sec"
"            Hydrograph volume          5510.789    c.m"
"                    0.642     0.645     0.645     0.645"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                    0.642     0.000     0.645     0.645"
" 33         CATCHMENT 214"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         214   214"
"      65.000   % Impervious"
"       0.100   Total Area"
"      50.000   Flow length"
"       2.500   Overland Slope"
"       0.035   Pervious Area"
"      50.000   Pervious length"
"       2.500   Pervious slope"
"       0.065   Impervious Area"
"      50.000   Impervious length"
"       2.500   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.410   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.908   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                    0.028     0.000     0.645     0.645 c.m/sec"
"            Catchment 214          Pervious   Impervious Total Area "
"            Surface Area           0.035      0.065      0.100      hectare"
"            Time of concentration  16.868     2.197      5.069      minutes"
"            Time to Centroid       114.991    87.611     92.971     minutes"
"            Rainfall depth         68.087     68.087     68.087     mm"
"            Rainfall volume        23.83      44.26      68.09      c.m"
"            Rainfall losses        40.148     6.270      18.128     mm"
"            Runoff depth           27.938     61.816     49.959     mm"
"            Runoff volume          9.78       40.18      49.96      c.m"
"            Runoff coefficient     0.410      0.908      0.734      "
"            Maximum flow           0.004      0.028      0.028      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    0.028     0.028     0.645     0.645"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                    0.028     0.028     0.028     0.645"
" 40         HYDROGRAPH   Combine    4"
"           6   Combine "
"           4   Node #"
"               Snyder's/Christian"
"            Maximum flow                  0.028    c.m/sec"
"            Hydrograph volume            49.959    c.m"
"                    0.028     0.028     0.028     0.028"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                    0.028     0.000     0.028     0.028"
" 33         CATCHMENT 215"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         215   215"
"      45.000   % Impervious"
"       1.030   Total Area"
"      70.000   Flow length"
"       0.700   Overland Slope"
"       0.566   Pervious Area"
"      70.000   Pervious length"
"       0.700   Pervious slope"
"       0.463   Impervious Area"
"      70.000   Impervious length"
"       0.700   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      80.000   Pervious SCS Curve No."
"       0.447   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       6.350   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.909   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                    0.203     0.000     0.028     0.028 c.m/sec"
"            Catchment 215          Pervious   Impervious Total Area "
"            Surface Area           0.566      0.463      1.030      hectare"
"            Time of concentration  29.029     3.939      13.355     minutes"
"            Time to Centroid       130.111    90.196     105.174    minutes"
"            Rainfall depth         68.087     68.087     68.087     mm"
"            Rainfall volume        385.71     315.58     701.29     c.m"
"            Rainfall losses        37.671     6.197      23.508     mm"
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"            Runoff depth           30.415     61.889     44.579     mm"
"            Runoff volume          172.30     286.86     459.16     c.m"
"            Runoff coefficient     0.447      0.909      0.655      "
"            Maximum flow           0.050      0.190      0.203      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.203     0.203     0.028     0.028"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.203     0.203     0.203     0.028"
" 40         HYDROGRAPH   Combine    4"
"           6   Combine "
"           4   Node #"
"               Snyder's/Christian"
"            Maximum flow                0.229    c.m/sec"
"            Hydrograph volume         509.117    c.m"
"                   0.203     0.203     0.203     0.229"
" 40         HYDROGRAPH   Confluence    4"
"           7   Confluence "
"           4   Node #"
"               Snyder's/Christian"
"            Maximum flow                0.229    c.m/sec"
"            Hydrograph volume         509.117    c.m"
"                   0.203     0.229     0.203     0.000"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.203     0.229     0.229     0.000"
" 40         HYDROGRAPH   Combine    5"
"           6   Combine "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                0.675    c.m/sec"
"            Hydrograph volume         6019.906    c.m"
"                   0.203     0.229     0.229     0.675"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.203     0.000     0.229     0.675"
" 33         CATCHMENT 216"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         216   216"
"       45.000   % Impervious"
"        2.080   Total Area"
"       80.000   Flow length"
"        2.000   Overland Slope"
"        1.144   Pervious Area"
"       80.000   Pervious length"
"        2.000   Pervious slope"
"        0.936   Impervious Area"
"       80.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.446   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.904   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                   0.405     0.000     0.229     0.675 c.m/sec"
"            Catchment 216          Pervious   Impervious Total Area "
"            Surface Area           1.144      0.936      2.080      hectare"
"            Time of concentration  22.954     3.115      10.585     minutes"
"            Time to Centroid       122.349    89.000     101.556    minutes"
"            Rainfall depth         68.087     68.087     68.087     mm"
"            Rainfall volume        778.91     637.29     1416.20    c.m"
"            Rainfall losses        37.691     6.570      23.687     mm"
"            Runoff depth           30.396     61.516     44.400     mm"
"            Runoff volume          347.73     575.79     923.52     c.m"
"            Runoff coefficient     0.446      0.904      0.652      "
"            Maximum flow           0.116      0.377      0.405      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.405     0.405     0.229     0.675"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.405     0.405     0.405     0.675"
" 40         HYDROGRAPH   Combine    5"
"           6   Combine "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                0.855    c.m/sec"
"            Hydrograph volume          6943.425    c.m"
"                   0.405     0.405     0.405     0.855"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.405     0.000     0.405     0.855"
" 33         CATCHMENT 217"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         217   217"
"       55.000   % Impervious"
"       10.200   Total Area"
"       60.000   Flow length"
"        3.000   Overland Slope"
"        4.590   Pervious Area"
"       60.000   Pervious length"
"        3.000   Pervious slope"
"        5.610   Impervious Area"
"       60.000   Impervious length"
"        3.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.446   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.906   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                   2.475     0.000     0.405     0.855 c.m/sec"
"            Catchment 217          Pervious   Impervious Total Area "
"            Surface Area           4.590      5.610      10.200     hectare"
"            Time of concentration  17.103     2.321      6.567      minutes"
"            Time to Centroid       114.877    87.797     95.576     minutes"
"            Rainfall depth         68.087     68.087     68.087     mm"
"            Rainfall volume        3125.17    3819.65    6944.82    c.m"
"            Rainfall losses        37.697     6.398      20.483     mm"
"            Runoff depth           30.389     61.688     47.604     mm"
"            Runoff volume          1394.87    3460.70    4855.57    c.m"
"            Runoff coefficient     0.446      0.906      0.699      "
"            Maximum flow           0.555      2.385      2.475      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   2.475     2.475     0.405     0.855"
```

```
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    2.475     2.475     2.475     0.855"
" 40          HYDROGRAPH   Combine    5"
"             6   Combine "
"             5   Node #"
"                 to Baden West SWMF"
"             Maximum flow                  3.200    c.m/sec"
"             Hydrograph volume         11799.006    c.m"
"                    2.475     2.475     2.475     3.200"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    2.475     0.000     2.475     3.200"
" 33          CATCHMENT 218"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           218   218"
"        50.000   % Impervious"
"         1.250   Total Area"
"        20.000   Flow length"
"        20.000   Overland Slope"
"         0.625   Pervious Area"
"        20.000   Pervious length"
"        20.000   Pervious slope"
"         0.625   Impervious Area"
"        20.000   Impervious length"
"        20.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.409   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.858   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.338     0.000     2.475     3.200 c.m/sec"
"             Catchment 218          Pervious   Impervious Total Area "
"             Surface Area           0.625      0.625      1.250      hectare"
"             Time of concentration  5.216      0.679      2.144      minutes"
"             Time to Centroid       100.301    85.725     90.430     minutes"
"             Rainfall depth         68.087     68.087     68.087     mm"
"             Rainfall volume        425.54     425.54     851.08     c.m"
"             Rainfall losses        40.239     9.668      24.954     mm"
"             Runoff depth           27.847     58.419     43.133     mm"
"             Runoff volume          174.04     365.12     539.16     c.m"
"             Runoff coefficient     0.409      0.858      0.634      "
"             Maximum flow           0.109      0.282      0.338      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.338     0.338     2.475     3.200"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.338     0.338     0.338     3.200"
" 40          HYDROGRAPH   Combine    5"
"             6   Combine "
"             5   Node #"
"                 to Baden West SWMF"
"             Maximum flow                  3.539    c.m/sec"
"             Hydrograph volume         12338.167    c.m"
"                    0.338     0.338     0.338     3.539"
" 40          HYDROGRAPH   Confluence    5"
"             7   Confluence "
"             5   Node #"
"                 to Baden West SWMF"
"             Maximum flow                  3.539    c.m/sec"
"             Hydrograph volume         12338.167    c.m"
"                    0.338     3.539     0.338     0.000"
" 54          POND DESIGN"
"          3.539   Current peak flow    c.m/sec"
"          0.497   Target outflow    c.m/sec"
"       12338.2    Hydrograph volume    c.m"
"            33.   Number of stages"
"       351.500    Minimum water level    metre"
"       354.700    Maximum water level    metre"
"       351.500    Starting water level    metre"
"             0    Keep Design Data: 1 = True; 0 = False"
"                    Level Discharge    Volume"
"                  351.500     0.000     0.000"
"                  351.600   0.00600   400.000"
"                  351.700   0.01900   824.000"
"                  351.800   0.03100  1272.000"
"                  351.900   0.07800  1744.000"
"                  352.000    0.1930  2240.000"
"                  352.100    0.3670  2760.000"
"                  352.200    0.5970  3298.000"
"                  352.300    0.8520  3849.000"
"                  352.400     1.011  4412.000"
"                  352.500     1.122  4988.000"
"                  352.600     1.223  5576.000"
"                  352.700     1.316  6176.000"
"                  352.800     1.403  6789.000"
"                  352.900     1.485  7415.000"
"                  353.000     1.563  8053.000"
"                  353.100     1.637  8704.000"
"                  353.200     1.708  9368.000"
"                  353.300     1.776  10045.00"
"                  353.400     1.841  10735.00"
"                  353.500     1.904  11439.00"
"                  353.600     1.965  12156.00"
"                  353.700     2.025  12884.00"
"                  353.800     2.082  13625.00"
"                  353.900     2.138  14378.00"
"                  354.000     2.193  15143.00"
"                  354.100     2.246  15921.00"
"                  354.200     2.298  16712.00"
"                  354.300     2.349  17517.00"
"                  354.400     2.399  18334.00"
"                  354.500     2.473  19165.00"
"                  354.600     2.708  20012.00"
"                  354.700     3.177  20879.00"
"             Peak outflow                  1.027    c.m/sec"
"             Maximum level               352.415    metre"
"             Maximum storage            4495.701    c.m"
"             Centroidal lag                5.128   hours"
"                  0.338     3.539     1.027     0.000 c.m/sec"
" 40          HYDROGRAPH   Combine    6"
"             6   Combine "
"             6   Node #"
"                 Swale Storage Prior to CMP Culvert"
"             Maximum flow                  1.176    c.m/sec"
"             Hydrograph volume         24227.014    c.m"
"                    0.338     3.539     1.027     1.176"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.338     0.000     1.027     1.176"
" 33          CATCHMENT 219"
"             1   Triangular SCS"
```

```
"           1   Equal length"
"           1   SCS method"
"         219   219"
"      45.000   % Impervious"
"       1.250   Total Area"
"      60.000   Flow length"
"       2.000   Overland Slope"
"       0.688   Pervious Area"
"      60.000   Pervious length"
"       2.000   Pervious slope"
"       0.563   Impervious Area"
"      60.000   Impervious length"
"       2.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      80.000   Pervious SCS Curve No."
"       0.446   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       6.350   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.903   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                0.246     0.000     1.027     1.176 c.m/sec"
"            Catchment 219          Pervious   Impervious Total Area "
"            Surface Area           0.688      0.563      1.250      hectare"
"            Time of concentration  19.315     2.621      8.904      minutes"
"            Time to Centroid       117.705    88.265     99.345     minutes"
"            Rainfall depth         68.087     68.087     68.087     mm"
"            Rainfall volume        468.09     382.99     851.08     c.m"
"            Rainfall losses        37.733     6.619      23.732     mm"
"            Runoff depth           30.353     61.467     44.355     mm"
"            Runoff volume          208.68     345.75     554.43     c.m"
"            Runoff coefficient     0.446      0.903      0.651      "
"            Maximum flow           0.077      0.235      0.246      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                0.246     0.246     1.027     1.176"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                0.246     0.246     0.246     1.176"
" 40          HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
"            Maximum flow                  1.218    c.m/sec"
"            Hydrograph volume         24781.439    c.m"
"                0.246     0.246     0.246     1.218"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                0.246     0.000     0.246     1.218"
" 33          CATCHMENT 220"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         220   220"
"       0.000   % Impervious"
"       2.110   Total Area"
"     365.000   Flow length"
"       0.500   Overland Slope"
"       2.110   Pervious Area"
"     365.000   Pervious length"
"       0.500   Pervious slope"
"       0.000   Impervious Area"
"     365.000   Impervious length"
"       0.500   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.411   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                0.067     0.000     0.246     1.218 c.m/sec"
"            Catchment 220          Pervious   Impervious Total Area "
"            Surface Area           2.110      0.000      2.110      hectare"
"            Time of concentration  90.103     11.737     90.102     minutes"
"            Time to Centroid       207.609    100.969    207.609    minutes"
"            Rainfall depth         68.087     68.087     68.087     mm"
"            Rainfall volume        1436.62    0.00       1436.63    c.m"
"            Rainfall losses        40.090     5.421      40.090     mm"
"            Runoff depth           27.997     62.665     27.997     mm"
"            Runoff volume          590.73     0.00       590.73     c.m"
"            Runoff coefficient     0.411      0.000      0.411      "
"            Maximum flow           0.067      0.000      0.067      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                0.067     0.067     0.246     1.218"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                0.067     0.067     0.067     1.218"
" 40          HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
"            Maximum flow                  1.271    c.m/sec"
"            Hydrograph volume         25372.174    c.m"
"                0.067     0.067     0.067     1.271"
" 40          HYDROGRAPH   Confluence    6"
"           7   Confluence "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
"            Maximum flow                  1.271    c.m/sec"
"            Hydrograph volume         25372.174    c.m"
"                0.067     1.271     0.067     0.000"
" 54          POND DESIGN"
"       1.271   Current peak flow    c.m/sec"
"       0.497   Target outflow    c.m/sec"
"     25372.2   Hydrograph volume    c.m"
"         37.   Number of stages"
"     351.100   Minimum water level    metre"
"     354.700   Maximum water level    metre"
"     351.100   Starting water level    metre"
"           0   Keep Design Data: 1 = True; 0 = False"
"                 Level Discharge    Volume"
"               351.100     0.000     0.000"
"               351.200   0.00900    0.1000"
"               351.300   0.03600    0.6000"
"               351.400   0.08100     1.000"
"               351.500    0.1420     2.000"
"               351.600    0.2180     5.000"
"               351.700    0.3070     8.000"
"               351.800    0.4210    14.000"
"               351.900    0.5530    21.000"
"               352.000    0.6750    29.000"
"               352.100    0.8050    41.000"
"               352.200    0.9380    57.000"
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"               352.300     1.066    76.000"
"               352.400     1.191   100.000"
"               352.500     1.307   128.000"
"               352.600     1.410   160.000"
"               352.700     1.507   197.000"
"               352.800     1.596   239.000"
"               352.900     1.684   286.000"
"               353.000     1.768   337.000"
"               353.100     1.849   393.000"
"               353.200     1.928   455.000"
"               353.300     2.005   526.000"
"               353.400     2.080   596.000"
"               353.500     2.153   676.000"
"               353.600     2.224   761.000"
"               353.700     2.293   854.000"
"               353.800     2.361   953.000"
"               353.900     2.427  1060.000"
"               354.000     2.492  1174.000"
"               354.100     2.556  1298.000"
"               354.200     2.618  1435.000"
"               354.300     2.689  1586.000"
"               354.400     2.739  1751.000"
"               354.500     2.797  1929.000"
"               354.600     2.855  2121.000"
"               354.700     2.911  2329.000"
"            Peak outflow                  1.270    c.m/sec"
"            Maximum level               352.468    metre"
"            Maximum storage             119.079    c.m"
"            Centroidal lag               10.567   hours"
"                 0.067     1.271     1.270     0.000 c.m/sec"
" 40         HYDROGRAPH   Combine    7"
"           6   Combine "
"           7   Node #"
"               Baden Creek Tributary"
"            Maximum flow                  1.270    c.m/sec"
"            Hydrograph volume         25370.570    c.m"
"                    0.067     1.271     1.270     1.270"
" 81         ADD COMMENT================================================="
"         4  Lines of comment"
"            **********************************************"
"            ACTUAL FLOW THROUGH CN CULVERT"
"            = 1.270-0.033(INFIL GALLERY) = 1.237cms"
"            **********************************************"
" 38         START/RE-START TOTALS 6"
"           3   Runoff Totals on EXIT"
"            Total Catchment area                      68.640    hectare"
"            Total Impervious area                     24.731    hectare"
"            Total % impervious                        36.029"
" 19         EXIT"
```

```
"               MIDUSS Output ----------------------------------------------->"
"               MIDUSS version                          Version 2.25  rev. 473"
"               MIDUSS created                        Sunday, February 7, 2010"
"          10   Units used:                                        ie METRIC"
"               Job folder:          Q:\40777\104\PRELIMINARY\SWM\2nd DP Sub\"
"                                                                  MIDUSS\Post"
"               Output filename:                                  50yrPost2.in"
"               Licensee name:                                               A"
"               Company                                                      "
"               Date & Time last used:                 9/11/2023 at 1:29:35 PM"
" 31         TIME PARAMETERS"
"       5.000   Time Step"
"     180.000   Max. Storm length"
"    3000.000   Max. Hydrograph"
" 32         STORM Chicago storm"
"           1   Chicago storm"
"    3886.000   Coefficient A"
"      16.000   Constant B"
"       0.950   Exponent C"
"       0.400   Fraction R"
"     180.000   Duration"
"       1.000   Time step multiplier"
"            Maximum intensity          215.474    mm/hr"
"            Total depth                 77.443    mm"
"           5   50hyd   Hydrograph extension used in this file"
" 33         CATCHMENT 201"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         201   201"
"       0.000   % Impervious"
"       0.640   Total Area"
"      80.000   Flow length"
"       2.000   Overland Slope"
"       0.640   Pervious Area"
"      80.000   Pervious length"
"       2.000   Pervious slope"
"       0.000   Impervious Area"
"      80.000   Impervious length"
"       2.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.449   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.079     0.000     0.000     0.000 c.m/sec"
"            Catchment 201          Pervious   Impervious Total Area "
"            Surface Area           0.640      0.000      0.640      hectare"
"            Time of concentration  21.830     2.964      21.830     minutes"
"            Time to Centroid       120.436    88.390     120.436    minutes"
"            Rainfall depth         77.443     77.443     77.443     mm"
"            Rainfall volume        495.63     0.00       495.63     c.m"
"            Rainfall losses        42.678     6.993      42.678     mm"
"            Runoff depth           34.765     70.449     34.765     mm"
"            Runoff volume          222.50     0.00       222.50     c.m"
"            Runoff coefficient     0.449      0.000      0.449      "
"            Maximum flow           0.079      0.000      0.079      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.079     0.079     0.000     0.000"
```

```
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                     0.079     0.079     0.079     0.000"
" 40          HYDROGRAPH   Combine    1"
"             6   Combine "
"             1   Node #"
"                 Internal Depression"
"              Maximum flow                  0.079    c.m/sec"
"              Hydrograph volume           222.497    c.m"
"                     0.079     0.079     0.079     0.079"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                     0.079     0.000     0.079     0.079"
" 33          CATCHMENT 202"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           202   202"
"        45.000   % Impervious"
"         0.270   Total Area"
"        30.000   Flow length"
"         4.000   Overland Slope"
"         0.148   Pervious Area"
"        30.000   Pervious length"
"         4.000   Pervious slope"
"         0.122   Impervious Area"
"        30.000   Impervious length"
"         4.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.446   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.915   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                     0.070     0.000     0.079     0.079 c.m/sec"
"              Catchment 202          Pervious   Impervious Total Area "
"              Surface Area           0.148      0.122      0.270      hectare"
"              Time of concentration  9.844      1.336      4.515      minutes"
"              Time to Centroid       105.262    85.995     93.194     minutes"
"              Rainfall depth         77.443     77.443     77.443     mm"
"              Rainfall volume        115.00     94.09      209.10     c.m"
"              Rainfall losses        42.869     6.612      26.553     mm"
"              Runoff depth           34.574     70.831     50.890     mm"
"              Runoff volume          51.34      86.06      137.40     c.m"
"              Runoff coefficient     0.446      0.915      0.657      "
"              Maximum flow           0.027      0.062      0.070      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                     0.070     0.070     0.079     0.079"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                     0.070     0.070     0.070     0.079"
" 40          HYDROGRAPH   Combine    2"
"             6   Combine "
"             2   Node #"
"                 Activa Baden Subdivision"
"              Maximum flow                  0.070    c.m/sec"
"              Hydrograph volume           137.402    c.m"
"                     0.070     0.070     0.070     0.070"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                     0.070     0.000     0.070     0.070"
" 33          CATCHMENT 203"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           203   203"
"        65.000   % Impervious"
"         0.090   Total Area"
"        30.000   Flow length"
"         2.000   Overland Slope"
"         0.032   Pervious Area"
"        30.000   Pervious length"
"         2.000   Pervious slope"
"         0.059   Impervious Area"
"        30.000   Impervious length"
"         2.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.448   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.919   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                     0.031     0.000     0.070     0.070 c.m/sec"
"              Catchment 203          Pervious   Impervious Total Area "
"              Surface Area           0.032      0.059      0.090      hectare"
"              Time of concentration  12.119     1.645      3.824      minutes"
"              Time to Centroid       108.113    86.425     90.937     minutes"
"              Rainfall depth         77.443     77.443     77.443     mm"
"              Rainfall volume        24.39      45.30      69.70      c.m"
"              Rainfall losses        42.738     6.300      19.054     mm"
"              Runoff depth           34.705     71.142     58.389     mm"
"              Runoff volume          10.93      41.62      52.55      c.m"
"              Runoff coefficient     0.448      0.919      0.754      "
"              Maximum flow           0.005      0.029      0.031      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                     0.031     0.031     0.070     0.070"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                     0.031     0.031     0.031     0.070"
" 40          HYDROGRAPH   Combine    2"
"             6   Combine "
"             2   Node #"
"                 Activa Baden Subdivision"
"              Maximum flow                  0.101    c.m/sec"
"              Hydrograph volume           189.952    c.m"
"                     0.031     0.031     0.031     0.101"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                     0.031     0.000     0.031     0.101"
" 33          CATCHMENT 204"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           204   204"
"         0.000   % Impervious"
"         4.490   Total Area"
"       205.000   Flow length"
"         1.800   Overland Slope"
"         4.490   Pervious Area"
"       205.000   Pervious length"
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"        1.800   Pervious slope"
"        0.000   Impervious Area"
"      205.000   Impervious length"
"        1.800   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.449   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.354     0.000     0.031     0.101 c.m/sec"
"             Catchment 204          Pervious   Impervious Total Area "
"             Surface Area           4.490      0.000      4.490      hectare"
"             Time of concentration  39.627     5.380      39.627     minutes"
"             Time to Centroid       142.997    91.750     142.997    minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        3477.18    0.00       3477.18    c.m"
"             Rainfall losses        42.649     6.035      42.649     mm"
"             Runoff depth           34.793     71.408     34.793     mm"
"             Runoff volume          1562.22    0.00       1562.23    c.m"
"             Runoff coefficient     0.449      0.000      0.449      "
"             Maximum flow           0.354      0.000      0.354      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                  0.354     0.354     0.031     0.101"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                  0.354     0.354     0.354     0.101"
" 40          HYDROGRAPH   Combine    1"
"             6   Combine "
"             1   Node #"
"                 Internal Depression"
"             Maximum flow                 0.415    c.m/sec"
"             Hydrograph volume         1784.722    c.m"
"                  0.354     0.354     0.354     0.415"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                  0.354     0.000     0.354     0.415"
" 33          CATCHMENT 205"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           205   205"
"        61.000   % Impervious"
"        19.470   Total Area"
"        90.000   Flow length"
"         0.500   Overland Slope"
"         7.593   Pervious Area"
"        90.000   Pervious length"
"         0.500   Pervious slope"
"        11.877   Impervious Area"
"        90.000   Impervious length"
"         0.500   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.449   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.924   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                  5.839     0.000     0.354     0.415 c.m/sec"
"             Catchment 205          Pervious   Impervious Total Area "
"             Surface Area           7.593      11.877     19.470     hectare"
"             Time of concentration  35.512     4.821      12.098     minutes"
"             Time to Centroid       137.784    90.987     102.083    minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        0.5880     0.9198     1.5078     ha-m"
"             Rainfall losses        42.654     5.879      20.221     mm"
"             Runoff depth           34.789     71.564     57.222     mm"
"             Runoff volume          0.2642     0.8499     1.1141     ha-m"
"             Runoff coefficient     0.449      0.924      0.739      "
"             Maximum flow           0.662      5.694      5.839      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                  5.839     5.839     0.354     0.415"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                  5.839     5.839     5.839     0.415"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Proposed SWMF"
"             Maximum flow                  5.839    c.m/sec"
"             Hydrograph volume         11141.028    c.m"
"                  5.839     5.839     5.839     5.839"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                  5.839     0.000     5.839     5.839"
" 33          CATCHMENT 206"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           206   206"
"        75.000   % Impervious"
"         1.220   Total Area"
"        70.000   Flow length"
"         4.000   Overland Slope"
"         0.305   Pervious Area"
"        70.000   Pervious length"
"         4.000   Pervious slope"
"         0.915   Impervious Area"
"        70.000   Impervious length"
"         4.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.448   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.916   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                  0.452     0.000     5.839     5.839 c.m/sec"
"             Catchment 206          Pervious   Impervious Total Area "
"             Surface Area           0.305      0.915      1.220      hectare"
"             Time of concentration  16.367     2.222      4.204      minutes"
"             Time to Centroid       113.518    87.254     90.934     minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        236.20     708.60     944.80     c.m"
"             Rainfall losses        42.745     6.475      15.543     mm"
"             Runoff depth           34.698     70.967     61.900     mm"
"             Runoff volume          105.83     649.35     755.18     c.m"
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"             Runoff coefficient     0.448      0.916      0.799      "
"             Maximum flow           0.044      0.444      0.452      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.452     0.452     5.839     5.839"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.452     0.452     0.452     5.839"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Proposed SWMF"
"             Maximum flow                  6.241    c.m/sec"
"             Hydrograph volume         11896.208    c.m"
"                    0.452     0.452     0.452     6.241"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.452     0.000     0.452     6.241"
" 33          CATCHMENT 207"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           207   207"
"         0.000   % Impervious"
"         0.700   Total Area"
"        70.000   Flow length"
"         4.000   Overland Slope"
"         0.700   Pervious Area"
"        70.000   Pervious length"
"         4.000   Pervious slope"
"         0.000   Impervious Area"
"        70.000   Impervious length"
"         4.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.448   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.000   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.100     0.000     0.452     6.241 c.m/sec"
"             Catchment 207          Pervious   Impervious Total Area "
"             Surface Area           0.700      0.000      0.700      hectare"
"             Time of concentration  16.367     2.222      16.367     minutes"
"             Time to Centroid       113.518    87.254     113.518    minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        542.10     0.00       542.10     c.m"
"             Rainfall losses        42.745     6.475      42.745     mm"
"             Runoff depth           34.698     70.967     34.698     mm"
"             Runoff volume          242.88     0.00       242.88     c.m"
"             Runoff coefficient     0.448      0.000      0.448      "
"             Maximum flow           0.100      0.000      0.100      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.100     0.100     0.452     6.241"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.100     0.100     0.100     6.241"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Proposed SWMF"
"             Maximum flow                  6.287    c.m/sec"
"             Hydrograph volume         12139.089    c.m"
"                    0.100     0.100     0.100     6.287"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.100     0.000     0.100     6.287"
" 33          CATCHMENT 208"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           208   208"
"         0.000   % Impervious"
"         2.120   Total Area"
"        60.000   Flow length"
"         1.500   Overland Slope"
"         0.636   Pervious Area"
"        60.000   Pervious length"
"         1.500   Pervious slope"
"         1.484   Impervious Area"
"        60.000   Impervious length"
"         1.500   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.449   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.910   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.712     0.000     0.100     6.287 c.m/sec"
"             Catchment 208          Pervious   Impervious Total Area "
"             Surface Area           0.636      1.484      2.120      hectare"
"             Time of concentration  20.025     2.719      5.738      minutes"
"             Time to Centroid       118.134    88.028     93.281     minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        492.54     1149.25    1641.79    c.m"
"             Rainfall losses        42.690     6.978      17.691     mm"
"             Runoff depth           34.753     70.465     59.751     mm"
"             Runoff volume          221.03     1045.70    1266.73    c.m"
"             Runoff coefficient     0.449      0.910      0.772      "
"             Maximum flow           0.081      0.701      0.712      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.712     0.712     0.100     6.287"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.712     0.712     0.712     6.287"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Proposed SWMF"
"             Maximum flow                  6.946    c.m/sec"
"             Hydrograph volume         13405.818    c.m"
"                    0.712     0.712     0.712     6.946"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.712     0.000     0.712     6.946"
" 33          CATCHMENT 209"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           209   209"
"        75.000   % Impervious"
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"        1.300   Total Area"
"       60.000   Flow length"
"        1.000   Overland Slope"
"        0.325   Pervious Area"
"       60.000   Pervious length"
"        1.000   Pervious slope"
"        0.975   Impervious Area"
"       60.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.449   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.911   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.453     0.000     0.712     6.946 c.m/sec"
"             Catchment 209          Pervious   Impervious Total Area "
"             Surface Area           0.325      0.975      1.300      hectare"
"             Time of concentration  22.616     3.070      5.825      minutes"
"             Time to Centroid       121.431    88.533     93.170     minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        251.69     755.07     1006.76    c.m"
"             Rainfall losses        42.702     6.874      15.831     mm"
"             Runoff depth           34.741     70.569     61.612     mm"
"             Runoff volume          112.91     688.05     800.95     c.m"
"             Runoff coefficient     0.449      0.911      0.796      "
"             Maximum flow           0.038      0.449      0.453      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.453     0.453     0.712     6.946"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.453     0.453     0.453     6.946"
" 40          HYDROGRAPH   Combine    3"
"            6   Combine "
"            3   Node #"
"                Proposed SWMF"
"             Maximum flow                  7.389    c.m/sec"
"             Hydrograph volume         14206.772    c.m"
"                    0.453     0.453     0.453     7.389"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.453     0.000     0.453     7.389"
" 33          CATCHMENT 210"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          210   210"
"        4.000   % Impervious"
"        0.130   Total Area"
"       15.000   Flow length"
"        2.000   Overland Slope"
"        0.125   Pervious Area"
"       15.000   Pervious length"
"        2.000   Pervious slope"
"        0.005   Impervious Area"
"       15.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.448   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.906   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.026     0.000     0.453     7.389 c.m/sec"
"             Catchment 210          Pervious   Impervious Total Area "
"             Surface Area           0.125      0.005      0.130      hectare"
"             Time of concentration  7.996      1.085      7.459      minutes"
"             Time to Centroid       102.940    85.713     101.602    minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        96.65      4.03       100.68     c.m"
"             Rainfall losses        42.763     7.314      41.345     mm"
"             Runoff depth           34.680     70.128     36.098     mm"
"             Runoff volume          43.28      3.65       46.93      c.m"
"             Runoff coefficient     0.448      0.906      0.466      "
"             Maximum flow           0.025      0.003      0.026      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.026     0.026     0.453     7.389"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.026     0.026     0.026     7.389"
" 40          HYDROGRAPH   Combine    3"
"            6   Combine "
"            3   Node #"
"                Proposed SWMF"
"             Maximum flow                  7.416    c.m/sec"
"             Hydrograph volume         14253.699    c.m"
"                    0.026     0.026     0.026     7.416"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.026     0.000     0.026     7.416"
" 33          CATCHMENT 211"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          211   211"
"       50.000   % Impervious"
"        1.100   Total Area"
"       20.000   Flow length"
"       20.000   Overland Slope"
"        0.550   Pervious Area"
"       20.000   Pervious length"
"       20.000   Pervious slope"
"        0.550   Impervious Area"
"       20.000   Impervious length"
"       20.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.447   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.860   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.355     0.000     0.026     7.416 c.m/sec"
"             Catchment 211          Pervious   Impervious Total Area "
"             Surface Area           0.550      0.550      1.100      hectare"
"             Time of concentration  4.762      0.647      2.053      minutes"
"             Time to Centroid       98.827     85.323     89.938     minutes"
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"            Rainfall depth         77.443     77.443     77.443     mm"
"            Rainfall volume        425.94     425.94     851.87     c.m"
"            Rainfall losses        42.843     10.804     26.824     mm"
"            Runoff depth           34.599     66.639     50.619     mm"
"            Runoff volume          190.30     366.51     556.81     c.m"
"            Runoff coefficient     0.447      0.860      0.654      "
"            Maximum flow           0.125      0.280      0.355      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.355     0.355     0.026     7.416"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.355     0.355     0.355     7.416"
" 40         HYDROGRAPH   Combine    3"
"           6   Combine "
"           3   Node #"
"               Proposed SWMF"
"            Maximum flow                7.701    c.m/sec"
"            Hydrograph volume         14810.509    c.m"
"                   0.355     0.355     0.355     7.701"
" 40         HYDROGRAPH   Confluence    3"
"           7   Confluence "
"           3   Node #"
"               Proposed SWMF"
"            Maximum flow                7.701    c.m/sec"
"            Hydrograph volume         14810.509    c.m"
"                   0.355     7.701     0.355     0.000"
" 54         POND DESIGN"
"       7.701   Current peak flow    c.m/sec"
"       1.127   Target outflow    c.m/sec"
"     14810.5   Hydrograph volume    c.m"
"         29.   Number of stages"
"     354.700   Minimum water level    metre"
"     357.500   Maximum water level    metre"
"     354.700   Starting water level    metre"
"           0   Keep Design Data: 1 = True; 0 = False"
"                 Level Discharge    Volume"
"               354.700     0.000     0.000"
"               354.800   0.03251  1214.000"
"               354.900   0.03252  1662.000"
"               355.000   0.03253  2129.000"
"               355.100   0.03254  2617.000"
"               355.200   0.03255  3125.000"
"               355.300   0.04330  3655.000"
"               355.400   0.06630  4201.000"
"               355.500   0.08230  4759.000"
"               355.600   0.09440  5329.000"
"               355.700    0.1044  5911.000"
"               355.800    0.1132  6504.000"
"               355.900    0.1212  7109.000"
"               356.000    0.1284  7727.000"
"               356.100    0.1352  8356.000"
"               356.200    0.1415  8997.000"
"               356.300    0.1475  9650.000"
"               356.400    0.1532  10316.00"
"               356.500    0.1587  10993.00"
"               356.600    0.1639  11683.00"
"               356.700    0.1689  12385.00"
"               356.800    0.1738  13099.00"
"               356.900    0.1784  13826.00"
"               357.000    0.1830  14565.00"
"               357.100    0.1874  15319.00"
"               357.200    0.1917  16091.00"
"               357.300    0.3079  16881.00"
"               357.400    0.5168  17689.00"
"               357.500    0.7861  18517.00"
"            Peak outflow                0.175    c.m/sec"
"            Maximum level             356.818    metre"
"            Maximum storage         13229.752    c.m"
"            Centroidal lag             19.303   hours"
"                 0.355     7.701     0.175     0.000 c.m/sec"
" 40         HYDROGRAPH   Combine    9"
"           6   Combine "
"           9   Node #"
"               Conveyance Node"
"            Maximum flow                0.175    c.m/sec"
"            Hydrograph volume         13919.170    c.m"
"                   0.355     7.701     0.175     0.175"
" 40         HYDROGRAPH   Confluence    9"
"           7   Confluence "
"           9   Node #"
"               Conveyance Node"
"            Maximum flow                0.175    c.m/sec"
"            Hydrograph volume         13919.170    c.m"
"                   0.355     0.175     0.175     0.000"
" 51         PIPE DESIGN"
"       0.175   Current peak flow    c.m/sec"
"       0.013   Manning 'n'"
"       1.200   Diameter    metre"
"       0.400   Gradient   %"
"            Depth of flow               0.216    metre"
"            Velocity                    1.260    m/sec"
"            Pipe capacity               2.466    c.m/sec"
"            Critical depth              0.220    metre"
" 53         ROUTE    Pipe Route 730"
"      730.00      Pipe Route 730 Reach length   ( metre)"
"       0.464   X-factor <= 0.5"
"     217.310   K-lag   ( seconds)"
"       0.000   Default(0) or user spec.(1) values used"
"       0.500   X-factor <= 0.5"
"      30.000   K-lag   ( seconds)"
"       0.500   Beta weighting factor"
"     300.000   Routing time step   ( seconds)"
"           2   No. of sub-reaches"
"            Peak outflow                0.175    c.m/sec"
"                   0.355     0.175     0.175     0.000 c.m/sec"
" 40         HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
"            Maximum flow                0.175    c.m/sec"
"            Hydrograph volume         13908.725    c.m"
"                   0.355     0.175     0.175     0.175"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.355     0.000     0.175     0.175"
" 33         CATCHMENT 212"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         212   212"
"      65.000   % Impervious"
"       0.160   Total Area"
"      40.000   Flow length"
"       2.500   Overland Slope"
"       0.056   Pervious Area"
"      40.000   Pervious length"
"       2.500   Pervious slope"
"       0.104   Impervious Area"
"      40.000   Impervious length"
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"        2.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.448   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.919   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.053     0.000     0.175     0.175 c.m/sec"
"             Catchment 212          Pervious   Impervious Total Area "
"             Surface Area           0.056      0.104      0.160      hectare"
"             Time of concentration  13.470     1.829      4.251      minutes"
"             Time to Centroid       109.847    86.684     91.503     minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        43.37      80.54      123.91     c.m"
"             Rainfall losses        42.726     6.291      19.043     mm"
"             Runoff depth           34.717     71.152     58.400     mm"
"             Runoff volume          19.44      74.00      93.44      c.m"
"             Runoff coefficient     0.448      0.919      0.754      "
"             Maximum flow           0.009      0.052      0.053      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.053     0.053     0.175     0.175"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.053     0.053     0.053     0.175"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Ex. 1000mm CSP Culvert"
"              Maximum flow                 0.053    c.m/sec"
"              Hydrograph volume           93.439    c.m"
"                    0.053     0.053     0.053     0.053"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.053     0.000     0.053     0.053"
" 33          CATCHMENT 213"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           213   213"
"         2.000   % Impervious"
"        18.930   Total Area"
"       570.000   Flow length"
"         1.600   Overland Slope"
"        18.551   Pervious Area"
"       570.000   Pervious length"
"         1.600   Pervious slope"
"         0.379   Impervious Area"
"       570.000   Impervious length"
"         1.600   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.449   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.925   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.872     0.000     0.053     0.053 c.m/sec"
"             Catchment 213          Pervious   Impervious Total Area "
"             Surface Area           18.551     0.379      18.930     hectare"
"             Time of concentration  75.824     10.294     73.181     minutes"
"             Time to Centroid       188.908    98.484     185.262    minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        1.4367     0.0293     1.4660     ha-m"
"             Rainfall losses        42.646     5.793      41.909     mm"
"             Runoff depth           34.797     71.650     35.534     mm"
"             Runoff volume          6455.32    271.27     6726.58    c.m"
"             Runoff coefficient     0.449      0.925      0.459      "
"             Maximum flow           0.860      0.150      0.872      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.872     0.872     0.053     0.053"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.872     0.872     0.872     0.053"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Ex. 1000mm CSP Culvert"
"              Maximum flow                 0.875    c.m/sec"
"              Hydrograph volume         6820.022    c.m"
"                    0.872     0.872     0.872     0.875"
" 40          HYDROGRAPH   Confluence    3"
"             7   Confluence "
"             3   Node #"
"                 Ex. 1000mm CSP Culvert"
"              Maximum flow                 0.875    c.m/sec"
"              Hydrograph volume         6820.022    c.m"
"                    0.872     0.875     0.872     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.872     0.875     0.875     0.000"
" 40          HYDROGRAPH   Combine    5"
"             6   Combine "
"             5   Node #"
"                 to Baden West SWMF"
"              Maximum flow                 0.875    c.m/sec"
"              Hydrograph volume         6820.022    c.m"
"                    0.872     0.875     0.875     0.875"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.872     0.000     0.875     0.875"
" 33          CATCHMENT 214"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           214   214"
"        65.000   % Impervious"
"         0.100   Total Area"
"        50.000   Flow length"
"         2.500   Overland Slope"
"         0.035   Pervious Area"
"        50.000   Pervious length"
"         2.500   Pervious slope"
"         0.065   Impervious Area"
"        50.000   Impervious length"
"         2.500   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.449   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
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"       98.000   Impervious SCS Curve No."
"        0.917   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.033     0.000     0.875     0.875 c.m/sec"
"             Catchment 214          Pervious   Impervious Total Area "
"             Surface Area           0.035      0.065      0.100      hectare"
"             Time of concentration  15.400     2.091      4.867      minutes"
"             Time to Centroid       112.292    87.061     92.325     minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        27.10      50.34      77.44      c.m"
"             Rainfall losses        42.676     6.427      19.114     mm"
"             Runoff depth           34.767     71.016     58.329     mm"
"             Runoff volume          12.17      46.16      58.33      c.m"
"             Runoff coefficient     0.449      0.917      0.753      "
"             Maximum flow           0.005      0.032      0.033      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.033     0.033     0.875     0.875"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.033     0.033     0.033     0.875"
" 40          HYDROGRAPH   Combine    4"
"           6   Combine "
"           4   Node #"
"               Snyder's/Christian"
"            Maximum flow                 0.033    c.m/sec"
"            Hydrograph volume           58.329    c.m"
"                  0.033     0.033     0.033     0.033"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                  0.033     0.000     0.033     0.033"
" 33          CATCHMENT 215"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         215   215"
"       45.000   % Impervious"
"        1.030   Total Area"
"       70.000   Flow length"
"        0.700   Overland Slope"
"        0.566   Pervious Area"
"       70.000   Pervious length"
"        0.700   Pervious slope"
"        0.463   Impervious Area"
"       70.000   Impervious length"
"        0.700   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.485   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.913   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.233     0.000     0.033     0.033 c.m/sec"
"             Catchment 215          Pervious   Impervious Total Area "
"             Surface Area           0.566      0.463      1.030      hectare"
"             Time of concentration  26.610     3.748      12.747     minutes"
"             Time to Centroid       126.181    89.522     103.951    minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        438.71     358.95     797.66     c.m"
"             Rainfall losses        39.899     6.753      24.983     mm"
"             Runoff depth           37.544     70.690     52.459     mm"
"             Runoff volume          212.68     327.65     540.33     c.m"
"             Runoff coefficient     0.485      0.913      0.677      "
"             Maximum flow           0.065      0.213      0.233      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.233     0.233     0.033     0.033"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.233     0.233     0.233     0.033"
" 40          HYDROGRAPH   Combine    4"
"           6   Combine "
"           4   Node #"
"               Snyder's/Christian"
"            Maximum flow                 0.262    c.m/sec"
"            Hydrograph volume          598.661    c.m"
"                  0.233     0.233     0.233     0.262"
" 40          HYDROGRAPH   Confluence    4"
"           7   Confluence "
"           4   Node #"
"               Snyder's/Christian"
"            Maximum flow                 0.262    c.m/sec"
"            Hydrograph volume          598.661    c.m"
"                  0.233     0.262     0.233     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.233     0.262     0.262     0.000"
" 40          HYDROGRAPH   Combine    5"
"           6   Combine "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                 0.914    c.m/sec"
"            Hydrograph volume         7418.681    c.m"
"                  0.233     0.262     0.262     0.914"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                  0.233     0.000     0.262     0.914"
" 33          CATCHMENT 216"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         216   216"
"       45.000   % Impervious"
"        2.080   Total Area"
"       80.000   Flow length"
"        2.000   Overland Slope"
"        1.144   Pervious Area"
"       80.000   Pervious length"
"        2.000   Pervious slope"
"        0.936   Impervious Area"
"       80.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.485   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.910   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.468     0.000     0.262     0.914 c.m/sec"
"             Catchment 216          Pervious   Impervious Total Area "
"             Surface Area           1.144      0.936      2.080      hectare"
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"             Time of concentration  21.041     2.964      10.093     minutes"
"             Time to Centroid       119.060    88.390     100.485    minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        885.95     724.86     1610.81    c.m"
"             Rainfall losses        39.908     6.993      25.097     mm"
"             Runoff depth           37.534     70.449     52.346     mm"
"             Runoff volume          429.39     659.41     1088.80    c.m"
"             Runoff coefficient     0.485      0.910      0.676      "
"             Maximum flow           0.155      0.434      0.468      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.468     0.468     0.262     0.914"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.468     0.468     0.468     0.914"
" 40          HYDROGRAPH   Combine    5"
"            6   Combine "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  1.012    c.m/sec"
"             Hydrograph volume          8507.482    c.m"
"                    0.468     0.468     0.468     1.012"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.468     0.000     0.468     1.012"
" 33          CATCHMENT 217"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          217   217"
"       55.000   % Impervious"
"       10.200   Total Area"
"       60.000   Flow length"
"        3.000   Overland Slope"
"        4.590   Pervious Area"
"       60.000   Pervious length"
"        3.000   Pervious slope"
"        5.610   Impervious Area"
"       60.000   Impervious length"
"        3.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.484   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.917   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    2.863     0.000     0.468     1.012 c.m/sec"
"             Catchment 217          Pervious   Impervious Total Area "
"             Surface Area           4.590      5.610      10.200     hectare"
"             Time of concentration  15.677     2.208      6.271      minutes"
"             Time to Centroid       112.211    87.233     94.768     minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        3554.62    4344.54    7899.16    c.m"
"             Rainfall losses        39.969     6.463      21.541     mm"
"             Runoff depth           37.473     70.979     55.902     mm"
"             Runoff volume          1720.03    3981.94    5701.96    c.m"
"             Runoff coefficient     0.484      0.917      0.722      "
"             Maximum flow           0.733      2.727      2.863      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    2.863     2.863     0.468     1.012"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    2.863     2.863     2.863     1.012"
" 40          HYDROGRAPH   Combine    5"
"            6   Combine "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  3.726    c.m/sec"
"             Hydrograph volume         14209.448    c.m"
"                    2.863     2.863     2.863     3.726"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    2.863     0.000     2.863     3.726"
" 33          CATCHMENT 218"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          218   218"
"       50.000   % Impervious"
"        1.250   Total Area"
"       20.000   Flow length"
"       20.000   Overland Slope"
"        0.625   Pervious Area"
"       20.000   Pervious length"
"       20.000   Pervious slope"
"        0.625   Impervious Area"
"       20.000   Impervious length"
"       20.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.447   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.860   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.403     0.000     2.863     3.726 c.m/sec"
"             Catchment 218          Pervious   Impervious Total Area "
"             Surface Area           0.625      0.625      1.250      hectare"
"             Time of concentration  4.762      0.647      2.053      minutes"
"             Time to Centroid       98.827     85.323     89.938     minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        484.02     484.02     968.03     c.m"
"             Rainfall losses        42.843     10.804     26.824     mm"
"             Runoff depth           34.599     66.639     50.619     mm"
"             Runoff volume          216.25     416.49     632.74     c.m"
"             Runoff coefficient     0.447      0.860      0.654      "
"             Maximum flow           0.142      0.318      0.403      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.403     0.403     2.863     3.726"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.403     0.403     0.403     3.726"
" 40          HYDROGRAPH   Combine    5"
"            6   Combine "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  4.125    c.m/sec"
"             Hydrograph volume         14842.182    c.m"
"                    0.403     0.403     0.403     4.125"
" 40          HYDROGRAPH   Confluence    5"
"            7   Confluence "
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"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  4.125    c.m/sec"
"             Hydrograph volume         14842.182    c.m"
"                    0.403     4.125     0.403     0.000"
" 54          POND DESIGN"
"         4.125   Current peak flow    c.m/sec"
"         0.497   Target outflow    c.m/sec"
"      14842.2   Hydrograph volume    c.m"
"          33.   Number of stages"
"       351.500   Minimum water level    metre"
"       354.700   Maximum water level    metre"
"       351.500   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                351.500     0.000     0.000"
"                351.600   0.00600   400.000"
"                351.700   0.01900   824.000"
"                351.800   0.03100  1272.000"
"                351.900   0.07800  1744.000"
"                352.000    0.1930  2240.000"
"                352.100    0.3670  2760.000"
"                352.200    0.5970  3298.000"
"                352.300    0.8520  3849.000"
"                352.400     1.011  4412.000"
"                352.500     1.122  4988.000"
"                352.600     1.223  5576.000"
"                352.700     1.316  6176.000"
"                352.800     1.403  6789.000"
"                352.900     1.485  7415.000"
"                353.000     1.563  8053.000"
"                353.100     1.637  8704.000"
"                353.200     1.708  9368.000"
"                353.300     1.776  10045.00"
"                353.400     1.841  10735.00"
"                353.500     1.904  11439.00"
"                353.600     1.965  12156.00"
"                353.700     2.025  12884.00"
"                353.800     2.082  13625.00"
"                353.900     2.138  14378.00"
"                354.000     2.193  15143.00"
"                354.100     2.246  15921.00"
"                354.200     2.298  16712.00"
"                354.300     2.349  17517.00"
"                354.400     2.399  18334.00"
"                354.500     2.473  19165.00"
"                354.600     2.708  20012.00"
"                354.700     3.177  20879.00"
"             Peak outflow                  1.221    c.m/sec"
"             Maximum level               352.598    metre"
"             Maximum storage            5567.093    c.m"
"             Centroidal lag                4.782   hours"
"                  0.403     4.125     1.221     0.000 c.m/sec"
" 40          HYDROGRAPH   Combine    6"
"            6   Combine "
"            6   Node #"
"                Swale Storage Prior to CMP Culvert"
"             Maximum flow                  1.388    c.m/sec"
"             Hydrograph volume         28641.959    c.m"
"                    0.403     4.125     1.221     1.388"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.403     0.000     1.221     1.388"
" 33          CATCHMENT 219"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          219   219"
"       45.000   % Impervious"
"        1.250   Total Area"
"       60.000   Flow length"
"        2.000   Overland Slope"
"        0.688   Pervious Area"
"       60.000   Pervious length"
"        2.000   Pervious slope"
"        0.563   Impervious Area"
"       60.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       80.000   Pervious SCS Curve No."
"        0.485   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        6.350   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.913   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.286     0.000     1.221     1.388 c.m/sec"
"             Catchment 219          Pervious   Impervious Total Area "
"             Surface Area           0.688      0.563      1.250      hectare"
"             Time of concentration  17.705     2.494      8.477      minutes"
"             Time to Centroid       114.790    87.669     98.336     minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        532.42     435.62     968.03     c.m"
"             Rainfall losses        39.919     6.700      24.970     mm"
"             Runoff depth           37.524     70.743     52.473     mm"
"             Runoff volume          257.98     397.93     655.91     c.m"
"             Runoff coefficient     0.485      0.913      0.678      "
"             Maximum flow           0.102      0.270      0.286      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.286     0.286     1.221     1.388"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.286     0.286     0.286     1.388"
" 40          HYDROGRAPH   Combine    6"
"            6   Combine "
"            6   Node #"
"                Swale Storage Prior to CMP Culvert"
"             Maximum flow                  1.420    c.m/sec"
"             Hydrograph volume         29297.869    c.m"
"                    0.286     0.286     0.286     1.420"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.286     0.000     0.286     1.420"
" 33          CATCHMENT 220"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          220   220"
"        0.000   % Impervious"
"        2.110   Total Area"
"      365.000   Flow length"
"        0.500   Overland Slope"
"        2.110   Pervious Area"
"      365.000   Pervious length"
"        0.500   Pervious slope"
"        0.000   Impervious Area"
"      365.000   Impervious length"
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"        0.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.449   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.091     0.000     0.286     1.420 c.m/sec"
"             Catchment 220          Pervious   Impervious Total Area "
"             Surface Area           2.110      0.000      2.110      hectare"
"             Time of concentration  82.262     11.168     82.262     minutes"
"             Time to Centroid       197.077    99.703     197.076    minutes"
"             Rainfall depth         77.443     77.443     77.443     mm"
"             Rainfall volume        1634.04    0.00       1634.04    c.m"
"             Rainfall losses        42.644     5.442      42.644     mm"
"             Runoff depth           34.799     72.001     34.799     mm"
"             Runoff volume          734.25     0.00       734.26     c.m"
"             Runoff coefficient     0.449      0.000      0.449      "
"             Maximum flow           0.091      0.000      0.091      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                   0.091     0.091     0.286     1.420"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                   0.091     0.091     0.091     1.420"
" 40          HYDROGRAPH   Combine    6"
"             6   Combine "
"             6   Node #"
"                 Swale Storage Prior to CMP Culvert"
"             Maximum flow                  1.511    c.m/sec"
"             Hydrograph volume         30032.146    c.m"
"                   0.091     0.091     0.091     1.511"
" 40          HYDROGRAPH   Confluence    6"
"             7   Confluence "
"             6   Node #"
"                 Swale Storage Prior to CMP Culvert"
"             Maximum flow                  1.511    c.m/sec"
"             Hydrograph volume         30032.146    c.m"
"                   0.091     1.511     0.091     0.000"
" 54          POND DESIGN"
"         1.511   Current peak flow    c.m/sec"
"         0.497   Target outflow    c.m/sec"
"      30032.1    Hydrograph volume    c.m"
"          37.    Number of stages"
"       351.100   Minimum water level    metre"
"       354.700   Maximum water level    metre"
"       351.100   Starting water level    metre"
"             0   Keep Design Data: 1 = True; 0 = False"
"                   Level Discharge    Volume"
"                 351.100     0.000     0.000"
"                 351.200   0.00900    0.1000"
"                 351.300   0.03600    0.6000"
"                 351.400   0.08100     1.000"
"                 351.500    0.1420     2.000"
"                 351.600    0.2180     5.000"
"                 351.700    0.3070     8.000"
"                 351.800    0.4210    14.000"
"                 351.900    0.5530    21.000"
"                 352.000    0.6750    29.000"
"                 352.100    0.8050    41.000"
"                 352.200    0.9380    57.000"
"                 352.300     1.066    76.000"
"                 352.400     1.191   100.000"
"                 352.500     1.307   128.000"
"                 352.600     1.410   160.000"
"                 352.700     1.507   197.000"
"                 352.800     1.596   239.000"
"                 352.900     1.684   286.000"
"                 353.000     1.768   337.000"
"                 353.100     1.849   393.000"
"                 353.200     1.928   455.000"
"                 353.300     2.005   526.000"
"                 353.400     2.080   596.000"
"                 353.500     2.153   676.000"
"                 353.600     2.224   761.000"
"                 353.700     2.293   854.000"
"                 353.800     2.361   953.000"
"                 353.900     2.427  1060.000"
"                 354.000     2.492  1174.000"
"                 354.100     2.556  1298.000"
"                 354.200     2.618  1435.000"
"                 354.300     2.689  1586.000"
"                 354.400     2.739  1751.000"
"                 354.500     2.797  1929.000"
"                 354.600     2.855  2121.000"
"                 354.700     2.911  2329.000"
"              Peak outflow                  1.507    c.m/sec"
"              Maximum level               352.700    metre"
"              Maximum storage             197.009    c.m"
"              Centroidal lag               10.354   hours"
"                   0.091     1.511     1.507     0.000 c.m/sec"
" 40          HYDROGRAPH   Combine    7"
"             6   Combine "
"             7   Node #"
"                 Baden Creek Tributary"
"             Maximum flow                  1.507    c.m/sec"
"             Hydrograph volume         30027.906    c.m"
"                   0.091     1.511     1.507     1.507"
" 81          ADD COMMENT================================================="
"           4  Lines of comment"
"              ************************************************"
"              ACTUAL FLOW THROUGH CN CULVERT"
"              = 1.507-0.033(INFIL GALLERY) = 1.474cms"
"              ************************************************"
" 38          START/RE-START TOTALS 6"
"             3   Runoff Totals on EXIT"
"              Total Catchment area                      68.640    hectare"
"              Total Impervious area                     24.731    hectare"
"              Total % impervious                        36.029"
" 19          EXIT"
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"               MIDUSS Output ----------------------------------------------->"
"               MIDUSS version                          Version 2.25  rev. 473"
"               MIDUSS created                       Sunday, February 7, 2010"
"          10   Units used:                                        ie METRIC"
"               Job folder:          Q:\40777\104\PRELIMINARY\SWM\2nd DP Sub\"
"                                                                 MIDUSS\Post"
"               Output filename:                                 100yrPost2.in"
"               Licensee name:                                               A"
"               Company                                                      "
"               Date & Time last used:                9/11/2023 at 1:32:53 PM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      180.000   Max. Storm length"
"     3000.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"           1   Chicago storm"
"     4688.000   Coefficient A"
"       17.000   Constant B"
"        0.962   Exponent C"
"        0.400   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity           239.650    mm/hr"
"             Total depth                  87.263    mm"
"           6   100hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 201"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         201   201"
"        0.000   % Impervious"
"        0.640   Total Area"
"       80.000   Flow length"
"        2.000   Overland Slope"
"        0.640   Pervious Area"
"       80.000   Pervious length"
"        2.000   Pervious slope"
"        0.000   Impervious Area"
"       80.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.484   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.099     0.000     0.000     0.000 c.m/sec"
"             Catchment 201          Pervious   Impervious Total Area "
"             Surface Area           0.640      0.000      0.640      hectare"
"             Time of concentration  20.174     2.836      20.174     minutes"
"             Time to Centroid       117.623    87.884     117.623    minutes"
"             Rainfall depth         87.263     87.263     87.263     mm"
"             Rainfall volume        558.49     0.00       558.49     c.m"
"             Rainfall losses        45.030     7.282      45.030     mm"
"             Runoff depth           42.234     79.981     42.234     mm"
"             Runoff volume          270.30     0.00       270.30     c.m"
"             Runoff coefficient     0.484      0.000      0.484      "
"             Maximum flow           0.099      0.000      0.099      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.099     0.099     0.000     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.099     0.099     0.099     0.000"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"            Maximum flow                  0.099    c.m/sec"
"            Hydrograph volume           270.296    c.m"
"                  0.099     0.099     0.099     0.099"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                  0.099     0.000     0.099     0.099"
" 33          CATCHMENT 202"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         202   202"
"       45.000   % Impervious"
"        0.270   Total Area"
"       30.000   Flow length"
"        4.000   Overland Slope"
"        0.148   Pervious Area"
"       30.000   Pervious length"
"        4.000   Pervious slope"
"        0.122   Impervious Area"
"       30.000   Impervious length"
"        4.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.483   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.921   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.081     0.000     0.099     0.099 c.m/sec"
"             Catchment 202          Pervious   Impervious Total Area "
"             Surface Area           0.148      0.122      0.270      hectare"
"             Time of concentration  9.097      1.279      4.331      minutes"
"             Time to Centroid       103.560    85.627     92.629     minutes"
"             Rainfall depth         87.263     87.263     87.263     mm"
"             Rainfall volume        129.59     106.03     235.61     c.m"
"             Rainfall losses        45.156     6.919      27.949     mm"
"             Runoff depth           42.108     80.344     59.314     mm"
"             Runoff volume          62.53      97.62      160.15     c.m"
"             Runoff coefficient     0.483      0.921      0.680      "
"             Maximum flow           0.034      0.070      0.081      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.081     0.081     0.099     0.099"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.081     0.081     0.081     0.099"
" 40          HYDROGRAPH   Combine    2"
"           6   Combine "
"           2   Node #"
"               Activa Baden Subdivision"
"            Maximum flow                  0.081    c.m/sec"
"            Hydrograph volume           160.148    c.m"
"                  0.081     0.081     0.081     0.081"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
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"                   0.081     0.000     0.081     0.081"
" 33          CATCHMENT 203"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         203   203"
"      65.000   % Impervious"
"       0.090   Total Area"
"      30.000   Flow length"
"       2.000   Overland Slope"
"       0.032   Pervious Area"
"      30.000   Pervious length"
"       2.000   Pervious slope"
"       0.059   Impervious Area"
"      30.000   Impervious length"
"       2.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.483   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.925   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.035     0.000     0.081     0.081 c.m/sec"
"             Catchment 203          Pervious   Impervious Total Area "
"             Surface Area           0.032      0.059      0.090      hectare"
"             Time of concentration  11.200     1.574      3.687      minutes"
"             Time to Centroid       106.221    86.019     90.453     minutes"
"             Rainfall depth         87.263     87.263     87.263     mm"
"             Rainfall volume        27.49      51.05      78.54      c.m"
"             Rainfall losses        45.082     6.508      20.009     mm"
"             Runoff depth           42.182     80.755     67.254     mm"
"             Runoff volume          13.29      47.24      60.53      c.m"
"             Runoff coefficient     0.483      0.925      0.771      "
"             Maximum flow           0.007      0.033      0.035      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.035     0.035     0.081     0.081"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.035     0.035     0.035     0.081"
" 40          HYDROGRAPH   Combine    2"
"           6   Combine "
"           2   Node #"
"               Activa Baden Subdivision"
"             Maximum flow                 0.116    c.m/sec"
"             Hydrograph volume          220.677    c.m"
"                   0.035     0.035     0.035     0.116"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.035     0.000     0.035     0.116"
" 33          CATCHMENT 204"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         204   204"
"       0.000   % Impervious"
"       4.490   Total Area"
"     205.000   Flow length"
"       1.800   Overland Slope"
"       4.490   Pervious Area"
"     205.000   Pervious length"
"       1.800   Pervious slope"
"       0.000   Impervious Area"
"     205.000   Impervious length"
"       1.800   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.484   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.472     0.000     0.035     0.116 c.m/sec"
"             Catchment 204          Pervious   Impervious Total Area "
"             Surface Area           4.490      0.000      4.490      hectare"
"             Time of concentration  36.620     5.148      36.620     minutes"
"             Time to Centroid       138.509    91.130     138.509    minutes"
"             Rainfall depth         87.263     87.263     87.263     mm"
"             Rainfall volume        3918.12    0.00       3918.13    c.m"
"             Rainfall losses        44.992     6.105      44.992     mm"
"             Runoff depth           42.271     81.158     42.271     mm"
"             Runoff volume          1897.97    0.00       1897.98    c.m"
"             Runoff coefficient     0.484      0.000      0.484      "
"             Maximum flow           0.472      0.000      0.472      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.472     0.472     0.035     0.116"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.472     0.472     0.472     0.116"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Internal Depression"
"             Maximum flow                   0.547    c.m/sec"
"             Hydrograph volume           2168.274    c.m"
"                   0.472     0.472     0.472     0.547"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.472     0.000     0.472     0.547"
" 33          CATCHMENT 205"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         205   205"
"      61.000   % Impervious"
"      19.470   Total Area"
"      90.000   Flow length"
"       0.500   Overland Slope"
"       7.593   Pervious Area"
"      90.000   Pervious length"
"       0.500   Pervious slope"
"      11.877   Impervious Area"
"      90.000   Impervious length"
"       0.500   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.484   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.931   Impervious Runoff coefficient"
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"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    6.562     0.000     0.472     0.547 c.m/sec"
"             Catchment 205          Pervious   Impervious Total Area "
"             Surface Area           7.593      11.877     19.470     hectare"
"             Time of concentration  32.817     4.613      11.651     minutes"
"             Time to Centroid       133.681    90.375     101.181    minutes"
"             Rainfall depth         87.263     87.263     87.263     mm"
"             Rainfall volume        0.6626     1.0364     1.6990     ha-m"
"             Rainfall losses        44.995     5.985      21.199     mm"
"             Runoff depth           42.269     81.278     66.064     mm"
"             Runoff volume          0.3210     0.9653     1.2863     ha-m"
"             Runoff coefficient     0.484      0.931      0.757      "
"             Maximum flow           0.843      6.353      6.562      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    6.562     6.562     0.472     0.547"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    6.562     6.562     6.562     0.547"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Proposed SWMF"
"             Maximum flow                  6.562    c.m/sec"
"             Hydrograph volume         12862.758    c.m"
"                    6.562     6.562     6.562     6.562"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    6.562     0.000     6.562     6.562"
" 33          CATCHMENT 206"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           206   206"
"        75.000   % Impervious"
"         1.220   Total Area"
"        70.000   Flow length"
"         4.000   Overland Slope"
"         0.305   Pervious Area"
"        70.000   Pervious length"
"         4.000   Pervious slope"
"         0.915   Impervious Area"
"        70.000   Impervious length"
"         4.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.484   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.924   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.510     0.000     6.562     6.562 c.m/sec"
"             Catchment 206          Pervious   Impervious Total Area "
"             Surface Area           0.305      0.915      1.220      hectare"
"             Time of concentration  15.125     2.126      4.059      minutes"
"             Time to Centroid       111.233    86.808     90.440     minutes"
"             Rainfall depth         87.263     87.263     87.263     mm"
"             Rainfall volume        266.15     798.46     1064.61    c.m"
"             Rainfall losses        45.006     6.629      16.224     mm"
"             Runoff depth           42.258     80.634     71.040     mm"
"             Runoff volume          128.89     737.80     866.69     c.m"
"             Runoff coefficient     0.484      0.924      0.814      "
"             Maximum flow           0.056      0.500      0.510      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.510     0.510     6.562     6.562"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.510     0.510     0.510     6.562"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Proposed SWMF"
"              Maximum flow                  7.019    c.m/sec"
"              Hydrograph volume         13729.449    c.m"
"                    0.510     0.510     0.510     7.019"
" 40          HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                    0.510     0.000     0.510     7.019"
" 33          CATCHMENT 207"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           207   207"
"         0.000   % Impervious"
"         0.700   Total Area"
"        70.000   Flow length"
"         4.000   Overland Slope"
"         0.700   Pervious Area"
"        70.000   Pervious length"
"         4.000   Pervious slope"
"         0.000   Impervious Area"
"        70.000   Impervious length"
"         4.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        78.000   Pervious SCS Curve No."
"         0.484   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         7.164   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.000   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.129     0.000     0.510     7.019 c.m/sec"
"             Catchment 207          Pervious   Impervious Total Area "
"             Surface Area           0.700      0.000      0.700      hectare"
"             Time of concentration  15.125     2.126      15.125     minutes"
"             Time to Centroid       111.233    86.808     111.233    minutes"
"             Rainfall depth         87.263     87.263     87.263     mm"
"             Rainfall volume        610.84     0.00       610.84     c.m"
"             Rainfall losses        45.006     6.629      45.006     mm"
"             Runoff depth           42.258     80.634     42.258     mm"
"             Runoff volume          295.80     0.00       295.80     c.m"
"             Runoff coefficient     0.484      0.000      0.484      "
"             Maximum flow           0.129      0.000      0.129      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.129     0.129     0.510     7.019"
" 40          HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.129     0.129     0.129     7.019"
" 40          HYDROGRAPH   Combine    3"
"             6   Combine "
"             3   Node #"
"                 Proposed SWMF"
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"             Maximum flow                  7.088    c.m/sec"
"             Hydrograph volume         14025.252    c.m"
"                    0.129     0.129     0.129     7.088"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.129     0.000     0.129     7.088"
" 33          CATCHMENT 208"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          208   208"
"       70.000   % Impervious"
"        2.120   Total Area"
"       60.000   Flow length"
"        1.500   Overland Slope"
"        0.636   Pervious Area"
"       60.000   Pervious length"
"        1.500   Pervious slope"
"        1.484   Impervious Area"
"       60.000   Impervious length"
"        1.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.484   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.919   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.810     0.000     0.129     7.088 c.m/sec"
"             Catchment 208          Pervious   Impervious Total Area "
"             Surface Area           0.636      1.484      2.120      hectare"
"             Time of concentration  18.506     2.601      5.529      minutes"
"             Time to Centroid       115.495    87.522     92.671     minutes"
"             Rainfall depth         87.263     87.263     87.263     mm"
"             Rainfall volume        555.00     1294.99    1849.98    c.m"
"             Rainfall losses        45.029     7.033      18.432     mm"
"             Runoff depth           42.234     80.230     68.832     mm"
"             Runoff volume          268.61     1190.62    1459.23    c.m"
"             Runoff coefficient     0.484      0.919      0.789      "
"             Maximum flow           0.103      0.794      0.810      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.810     0.810     0.129     7.088"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.810     0.810     0.810     7.088"
" 40          HYDROGRAPH   Combine    3"
"            6   Combine "
"            3   Node #"
"                Proposed SWMF"
"             Maximum flow                  7.839    c.m/sec"
"             Hydrograph volume         15484.479    c.m"
"                    0.810     0.810     0.810     7.839"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.810     0.000     0.810     7.839"
" 33          CATCHMENT 209"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          209   209"
"       75.000   % Impervious"
"        1.300   Total Area"
"       60.000   Flow length"
"        1.000   Overland Slope"
"        0.325   Pervious Area"
"       60.000   Pervious length"
"        1.000   Pervious slope"
"        0.975   Impervious Area"
"       60.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.484   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.916   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.516     0.000     0.810     7.839 c.m/sec"
"             Catchment 209          Pervious   Impervious Total Area "
"             Surface Area           0.325      0.975      1.300      hectare"
"             Time of concentration  20.900     2.938      5.629      minutes"
"             Time to Centroid       118.547    88.028     92.601     minutes"
"             Rainfall depth         87.263     87.263     87.263     mm"
"             Rainfall volume        283.61     850.82     1134.42    c.m"
"             Rainfall losses        45.003     7.335      16.752     mm"
"             Runoff depth           42.261     79.929     70.512     mm"
"             Runoff volume          137.35     779.31     916.65     c.m"
"             Runoff coefficient     0.484      0.916      0.808      "
"             Maximum flow           0.050      0.509      0.516      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.516     0.516     0.810     7.839"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.516     0.516     0.516     7.839"
" 40          HYDROGRAPH   Combine    3"
"            6   Combine "
"            3   Node #"
"                Proposed SWMF"
"             Maximum flow                  8.332    c.m/sec"
"             Hydrograph volume         16401.135    c.m"
"                    0.516     0.516     0.516     8.332"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.516     0.000     0.516     8.332"
" 33          CATCHMENT 210"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          210   210"
"        4.000   % Impervious"
"        0.130   Total Area"
"       15.000   Flow length"
"        2.000   Overland Slope"
"        0.125   Pervious Area"
"       15.000   Pervious length"
"        2.000   Pervious slope"
"        0.005   Impervious Area"
"       15.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.482   Pervious Runoff coefficient"
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"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.910   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.033     0.000     0.516     8.332 c.m/sec"
"             Catchment 210          Pervious   Impervious Total Area "
"             Surface Area           0.125      0.005      0.130      hectare"
"             Time of concentration  7.389      1.039      6.926      minutes"
"             Time to Centroid       101.444    85.361     100.271    minutes"
"             Rainfall depth         87.263     87.263     87.263     mm"
"             Rainfall volume        108.90     4.54       113.44     c.m"
"             Rainfall losses        45.208     7.853      43.714     mm"
"             Runoff depth           42.055     79.410     43.549     mm"
"             Runoff volume          52.48      4.13       56.61      c.m"
"             Runoff coefficient     0.482      0.910      0.499      "
"             Maximum flow           0.031      0.003      0.033      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.033     0.033     0.516     8.332"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.033     0.033     0.033     8.332"
" 40          HYDROGRAPH   Combine    3"
"           6   Combine "
"           3   Node #"
"               Proposed SWMF"
"            Maximum flow                  8.366    c.m/sec"
"            Hydrograph volume         16457.748    c.m"
"                  0.033     0.033     0.033     8.366"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                  0.033     0.000     0.033     8.366"
" 33          CATCHMENT 211"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         211   211"
"      50.000   % Impervious"
"       1.100   Total Area"
"      20.000   Flow length"
"      20.000   Overland Slope"
"       0.550   Pervious Area"
"      20.000   Pervious length"
"      20.000   Pervious slope"
"       0.550   Impervious Area"
"      20.000   Impervious length"
"      20.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.480   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.862   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                  0.412     0.000     0.033     8.366 c.m/sec"
"             Catchment 211          Pervious   Impervious Total Area "
"             Surface Area           0.550      0.550      1.100      hectare"
"             Time of concentration  4.401      0.619      1.971      minutes"
"             Time to Centroid       97.675     85.004     89.535     minutes"
"             Rainfall depth         87.263     87.263     87.263     mm"
"             Rainfall volume        479.95     479.95     959.90     c.m"
"             Rainfall losses        45.383     12.046     28.715     mm"
"             Runoff depth           41.880     75.217     58.549     mm"
"             Runoff volume          230.34     413.70     644.04     c.m"
"             Runoff coefficient     0.480      0.862      0.671      "
"             Maximum flow           0.155      0.312      0.412      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                  0.412     0.412     0.033     8.366"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                  0.412     0.412     0.412     8.366"
" 40          HYDROGRAPH   Combine    3"
"           6   Combine "
"           3   Node #"
"               Proposed SWMF"
"            Maximum flow                  8.700    c.m/sec"
"            Hydrograph volume         17101.789    c.m"
"                  0.412     0.412     0.412     8.700"
" 40          HYDROGRAPH   Confluence    3"
"           7   Confluence "
"           3   Node #"
"               Proposed SWMF"
"            Maximum flow                  8.700    c.m/sec"
"            Hydrograph volume         17101.789    c.m"
"                  0.412     8.700     0.412     0.000"
" 54          POND DESIGN"
"        8.700   Current peak flow    c.m/sec"
"        1.127   Target outflow    c.m/sec"
"     17101.8   Hydrograph volume    c.m"
"         29.   Number of stages"
"      354.700   Minimum water level    metre"
"      357.500   Maximum water level    metre"
"      354.700   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                354.700     0.000     0.000"
"                354.800   0.03251  1214.000"
"                354.900   0.03252  1662.000"
"                355.000   0.03253  2129.000"
"                355.100   0.03254  2617.000"
"                355.200   0.03255  3125.000"
"                355.300   0.04330  3655.000"
"                355.400   0.06630  4201.000"
"                355.500   0.08230  4759.000"
"                355.600   0.09440  5329.000"
"                355.700    0.1044  5911.000"
"                355.800    0.1132  6504.000"
"                355.900    0.1212  7109.000"
"                356.000    0.1284  7727.000"
"                356.100    0.1352  8356.000"
"                356.200    0.1415  8997.000"
"                356.300    0.1475  9650.000"
"                356.400    0.1532  10316.00"
"                356.500    0.1587  10993.00"
"                356.600    0.1639  11683.00"
"                356.700    0.1689  12385.00"
"                356.800    0.1738  13099.00"
"                356.900    0.1784  13826.00"
"                357.000    0.1830  14565.00"
"                357.100    0.1874  15319.00"
"                357.200    0.1917  16091.00"
"                357.300    0.3079  16881.00"
"                357.400    0.5168  17689.00"
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"               357.500    0.7861  18517.00"
"            Peak outflow                  0.188    c.m/sec"
"            Maximum level               357.110    metre"
"            Maximum storage           15396.978    c.m"
"            Centroidal lag               19.946   hours"
"                 0.412     8.700     0.188     0.000 c.m/sec"
" 40         HYDROGRAPH   Combine    9"
"           6   Combine "
"           9   Node #"
"               Conceyance Node"
"            Maximum flow                  0.188    c.m/sec"
"            Hydrograph volume         15872.872    c.m"
"                   0.412     8.700     0.188     0.188"
" 40         HYDROGRAPH   Confluence    9"
"           7   Confluence "
"           9   Node #"
"               Conceyance Node"
"            Maximum flow                  0.188    c.m/sec"
"            Hydrograph volume         15872.873    c.m"
"                   0.412     0.188     0.188     0.000"
" 51         PIPE DESIGN"
"       0.188   Current peak flow    c.m/sec"
"       0.013   Manning 'n'"
"       1.200   Diameter    metre"
"       0.400   Gradient   %"
"            Depth of flow                 0.224    metre"
"            Velocity                      1.287    m/sec"
"            Pipe capacity                 2.466    c.m/sec"
"            Critical depth                0.229    metre"
" 53         ROUTE    Pipe Route 730"
"      730.00      Pipe Route 730 Reach length   ( metre)"
"       0.462   X-factor <= 0.5"
"     212.687   K-lag   ( seconds)"
"       0.000   Default(0) or user spec.(1) values used"
"       0.500   X-factor <= 0.5"
"      30.000   K-lag   ( seconds)"
"       0.500   Beta weighting factor"
"     300.000   Routing time step   ( seconds)"
"           2   No. of sub-reaches"
"            Peak outflow                  0.188    c.m/sec"
"                   0.412     0.188     0.188     0.000 c.m/sec"
" 40         HYDROGRAPH   Combine    6"
"           6   Combine "
"           6   Node #"
"               Swale Storage Prior to CMP Culvert"
"            Maximum flow                  0.188    c.m/sec"
"            Hydrograph volume         15859.043    c.m"
"                   0.412     0.188     0.188     0.188"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.412     0.000     0.188     0.188"
" 33         CATCHMENT 212"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         212   212"
"      65.000   % Impervious"
"       0.160   Total Area"
"      40.000   Flow length"
"       2.500   Overland Slope"
"       0.056   Pervious Area"
"      40.000   Pervious length"
"       2.500   Pervious slope"
"       0.104   Impervious Area"
"      40.000   Impervious length"
"       2.500   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.483   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.926   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.061     0.000     0.188     0.188 c.m/sec"
"            Catchment 212          Pervious   Impervious Total Area "
"            Surface Area           0.056      0.104      0.160      hectare"
"            Time of concentration  12.448     1.750      4.096      minutes"
"            Time to Centroid       107.812    86.262     90.989     minutes"
"            Rainfall depth         87.263     87.263     87.263     mm"
"            Rainfall volume        48.87      90.75      139.62     c.m"
"            Rainfall losses        45.095     6.447      19.974     mm"
"            Runoff depth           42.168     80.816     67.290     mm"
"            Runoff volume          23.61      84.05      107.66     c.m"
"            Runoff coefficient     0.483      0.926      0.771      "
"            Maximum flow           0.011      0.058      0.061      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.061     0.061     0.188     0.188"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.061     0.061     0.061     0.188"
" 40         HYDROGRAPH   Combine    3"
"           6   Combine "
"           3   Node #"
"               Ex. 1000mm CSP Culvert"
"            Maximum flow                  0.061    c.m/sec"
"            Hydrograph volume           107.663    c.m"
"                   0.061     0.061     0.061     0.061"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.061     0.000     0.061     0.061"
" 33         CATCHMENT 213"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         213   213"
"       2.000   % Impervious"
"      18.930   Total Area"
"     570.000   Flow length"
"       1.600   Overland Slope"
"      18.551   Pervious Area"
"     570.000   Pervious length"
"       1.600   Pervious slope"
"       0.379   Impervious Area"
"     570.000   Impervious length"
"       1.600   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.484   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.931   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   1.146     0.000     0.061     0.061 c.m/sec"
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"            Catchment 213          Pervious   Impervious Total Area "
"            Surface Area           18.551     0.379      18.930     hectare"
"            Time of concentration  70.071     9.850      67.797     minutes"
"            Time to Centroid       180.974    97.518     177.824    minutes"
"            Rainfall depth         87.263     87.263     87.263     mm"
"            Rainfall volume        1.6189     0.0330     1.6519     ha-m"
"            Rainfall losses        44.985     5.989      44.205     mm"
"            Runoff depth           42.279     81.274     43.059     mm"
"            Runoff volume          7843.32    307.70     8151.02    c.m"
"            Runoff coefficient     0.484      0.931      0.493      "
"            Maximum flow           1.131      0.173      1.146      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   1.146     1.146     0.061     0.061"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   1.146     1.146     1.146     0.061"
" 40         HYDROGRAPH   Combine    3"
"           6   Combine "
"           3   Node #"
"               Ex. 1000mm CSP Culvert"
"            Maximum flow                  1.151    c.m/sec"
"            Hydrograph volume          8258.689    c.m"
"                   1.146     1.146     1.146     1.151"
" 40         HYDROGRAPH   Confluence    3"
"           7   Confluence "
"           3   Node #"
"               Ex. 1000mm CSP Culvert"
"            Maximum flow                  1.151    c.m/sec"
"            Hydrograph volume          8258.691    c.m"
"                   1.146     1.151     1.146     0.000"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   1.146     1.151     1.151     0.000"
" 40         HYDROGRAPH   Combine    5"
"           6   Combine "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                  1.151    c.m/sec"
"            Hydrograph volume          8258.691    c.m"
"                   1.146     1.151     1.151     1.151"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   1.146     0.000     1.151     1.151"
" 33         CATCHMENT 214"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         214   214"
"      65.000   % Impervious"
"       0.100   Total Area"
"      50.000   Flow length"
"       2.500   Overland Slope"
"       0.035   Pervious Area"
"      50.000   Pervious length"
"       2.500   Pervious slope"
"       0.065   Impervious Area"
"      50.000   Impervious length"
"       2.500   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"       0.483   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       7.164   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.924   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.037     0.000     1.151     1.151 c.m/sec"
"            Catchment 214          Pervious   Impervious Total Area "
"            Surface Area           0.035      0.065      0.100      hectare"
"            Time of concentration  14.231     2.000      4.686      minutes"
"            Time to Centroid       110.080    86.617     91.769     minutes"
"            Rainfall depth         87.263     87.263     87.263     mm"
"            Rainfall volume        30.54      56.72      87.26      c.m"
"            Rainfall losses        45.127     6.619      20.097     mm"
"            Runoff depth           42.136     80.644     67.166     mm"
"            Runoff volume          14.75      52.42      67.17      c.m"
"            Runoff coefficient     0.483      0.924      0.770      "
"            Maximum flow           0.007      0.036      0.037      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.037     0.037     1.151     1.151"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.037     0.037     0.037     1.151"
" 40         HYDROGRAPH   Combine    4"
"           6   Combine "
"           4   Node #"
"               Snyder's/Christian"
"            Maximum flow                  0.037    c.m/sec"
"            Hydrograph volume            67.166    c.m"
"                   0.037     0.037     0.037     0.037"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.037     0.000     0.037     0.037"
" 33         CATCHMENT 215"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         215   215"
"      45.000   % Impervious"
"       1.030   Total Area"
"      70.000   Flow length"
"       0.700   Overland Slope"
"       0.566   Pervious Area"
"      70.000   Pervious length"
"       0.700   Pervious slope"
"       0.463   Impervious Area"
"      70.000   Impervious length"
"       0.700   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      80.000   Pervious SCS Curve No."
"       0.519   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       6.350   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.918   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.265     0.000     0.037     0.037 c.m/sec"
"            Catchment 215          Pervious   Impervious Total Area "
"            Surface Area           0.566      0.463      1.030      hectare"
"            Time of concentration  24.675     3.586      12.202     minutes"
"            Time to Centroid       123.030    88.986     102.895    minutes"
"            Rainfall depth         87.263     87.263     87.263     mm"
"            Rainfall volume        494.35     404.47     898.81     c.m"
"            Rainfall losses        41.969     7.120      26.287     mm"
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"            Runoff depth           45.294     80.143     60.976     mm"
"            Runoff volume          256.59     371.46     628.06     c.m"
"            Runoff coefficient     0.519      0.918      0.699      "
"            Maximum flow           0.083      0.237      0.265      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.265     0.265     0.037     0.037"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.265     0.265     0.265     0.037"
" 40         HYDROGRAPH   Combine    4"
"           6   Combine "
"           4   Node #"
"               Snyder's/Christian"
"            Maximum flow                0.299    c.m/sec"
"            Hydrograph volume         695.223    c.m"
"                   0.265     0.265     0.265     0.299"
" 40         HYDROGRAPH   Confluence    4"
"           7   Confluence "
"           4   Node #"
"               Snyder's/Christian"
"            Maximum flow                0.299    c.m/sec"
"            Hydrograph volume         695.223    c.m"
"                   0.265     0.299     0.265     0.000"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.265     0.299     0.299     0.000"
" 40         HYDROGRAPH   Combine    5"
"           6   Combine "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                1.196    c.m/sec"
"            Hydrograph volume          8953.913    c.m"
"                   0.265     0.299     0.299     1.196"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.265     0.000     0.299     1.196"
" 33         CATCHMENT 216"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         216   216"
"      45.000   % Impervious"
"       2.080   Total Area"
"      80.000   Flow length"
"       2.000   Overland Slope"
"       1.144   Pervious Area"
"      80.000   Pervious length"
"       2.000   Pervious slope"
"       0.936   Impervious Area"
"      80.000   Impervious length"
"       2.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      80.000   Pervious SCS Curve No."
"       0.518   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       6.350   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.917   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   0.535     0.000     0.299     1.196 c.m/sec"
"            Catchment 216          Pervious   Impervious Total Area "
"            Surface Area           1.144      0.936      2.080      hectare"
"            Time of concentration  19.510     2.836      9.650      minutes"
"            Time to Centroid       116.415    87.884     99.544     minutes"
"            Rainfall depth         87.263     87.263     87.263     mm"
"            Rainfall volume        998.29     816.79     1815.08    c.m"
"            Rainfall losses        42.037     7.282      26.397     mm"
"            Runoff depth           45.226     79.981     60.866     mm"
"            Runoff volume          517.39     748.62     1266.01    c.m"
"            Runoff coefficient     0.518      0.917      0.697      "
"            Maximum flow           0.194      0.493      0.535      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   0.535     0.535     0.299     1.196"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                   0.535     0.535     0.535     1.196"
" 40         HYDROGRAPH   Combine    5"
"           6   Combine "
"           5   Node #"
"               to Baden West SWMF"
"            Maximum flow                1.279    c.m/sec"
"            Hydrograph volume         10219.926    c.m"
"                   0.535     0.535     0.535     1.279"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                   0.535     0.000     0.535     1.279"
" 33         CATCHMENT 217"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         217   217"
"      55.000   % Impervious"
"      10.200   Total Area"
"      60.000   Flow length"
"       3.000   Overland Slope"
"       4.590   Pervious Area"
"      60.000   Pervious length"
"       3.000   Pervious slope"
"       5.610   Impervious Area"
"      60.000   Impervious length"
"       3.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      80.000   Pervious SCS Curve No."
"       0.519   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       6.350   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.924   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                   3.261     0.000     0.535     1.279 c.m/sec"
"            Catchment 217          Pervious   Impervious Total Area "
"            Surface Area           4.590      5.610      10.200     hectare"
"            Time of concentration  14.537     2.113      6.024      minutes"
"            Time to Centroid       110.058    86.787     94.112     minutes"
"            Rainfall depth         87.263     87.263     87.263     mm"
"            Rainfall volume        4005.39    4895.48    8900.87    c.m"
"            Rainfall losses        41.994     6.630      22.544     mm"
"            Runoff depth           45.270     80.633     64.720     mm"
"            Runoff volume          2077.88    4523.53    6601.41    c.m"
"            Runoff coefficient     0.519      0.924      0.742      "
"            Maximum flow           0.926      3.064      3.261      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                   3.261     3.261     0.535     1.279"
```

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" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    3.261     3.261     3.261     1.279"
" 40          HYDROGRAPH   Combine    5"
"            6   Combine "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  4.349    c.m/sec"
"             Hydrograph volume         16821.330    c.m"
"                    3.261     3.261     3.261     4.349"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    3.261     0.000     3.261     4.349"
" 33          CATCHMENT 218"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          218   218"
"       50.000   % Impervious"
"        1.250   Total Area"
"       20.000   Flow length"
"       20.000   Overland Slope"
"        0.625   Pervious Area"
"       20.000   Pervious length"
"       20.000   Pervious slope"
"        0.625   Impervious Area"
"       20.000   Impervious length"
"       20.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       78.000   Pervious SCS Curve No."
"        0.480   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        7.164   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.862   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.469     0.000     3.261     4.349 c.m/sec"
"             Catchment 218          Pervious   Impervious Total Area "
"             Surface Area           0.625      0.625      1.250      hectare"
"             Time of concentration  4.401      0.619      1.971      minutes"
"             Time to Centroid       97.675     85.004     89.535     minutes"
"             Rainfall depth         87.263     87.263     87.263     mm"
"             Rainfall volume        545.40     545.40     1090.79    c.m"
"             Rainfall losses        45.383     12.046     28.715     mm"
"             Runoff depth           41.880     75.217     58.549     mm"
"             Runoff volume          261.75     470.11     731.86     c.m"
"             Runoff coefficient     0.480      0.862      0.671      "
"             Maximum flow           0.176      0.355      0.469      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.469     0.469     3.261     4.349"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.469     0.469     0.469     4.349"
" 40          HYDROGRAPH   Combine    5"
"            6   Combine "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  4.731    c.m/sec"
"             Hydrograph volume         17553.191    c.m"
"                    0.469     0.469     0.469     4.731"
" 40          HYDROGRAPH   Confluence    5"
"            7   Confluence "
"            5   Node #"
"                to Baden West SWMF"
"             Maximum flow                  4.731    c.m/sec"
"             Hydrograph volume         17553.191    c.m"
"                    0.469     4.731     0.469     0.000"
" 54          POND DESIGN"
"         4.731   Current peak flow    c.m/sec"
"         0.497   Target outflow    c.m/sec"
"       17553.2   Hydrograph volume    c.m"
"          33.    Number of stages"
"       351.500   Minimum water level    metre"
"       354.700   Maximum water level    metre"
"       351.500   Starting water level    metre"
"             0   Keep Design Data: 1 = True; 0 = False"
"                   Level Discharge    Volume"
"                 351.500     0.000     0.000"
"                 351.600   0.00600   400.000"
"                 351.700   0.01900   824.000"
"                 351.800   0.03100  1272.000"
"                 351.900   0.07800  1744.000"
"                 352.000    0.1930  2240.000"
"                 352.100    0.3670  2760.000"
"                 352.200    0.5970  3298.000"
"                 352.300    0.8520  3849.000"
"                 352.400     1.011  4412.000"
"                 352.500     1.122  4988.000"
"                 352.600     1.223  5576.000"
"                 352.700     1.316  6176.000"
"                 352.800     1.403  6789.000"
"                 352.900     1.485  7415.000"
"                 353.000     1.563  8053.000"
"                 353.100     1.637  8704.000"
"                 353.200     1.708  9368.000"
"                 353.300     1.776  10045.00"
"                 353.400     1.841  10735.00"
"                 353.500     1.904  11439.00"
"                 353.600     1.965  12156.00"
"                 353.700     2.025  12884.00"
"                 353.800     2.082  13625.00"
"                 353.900     2.138  14378.00"
"                 354.000     2.193  15143.00"
"                 354.100     2.246  15921.00"
"                 354.200     2.298  16712.00"
"                 354.300     2.349  17517.00"
"                 354.400     2.399  18334.00"
"                 354.500     2.473  19165.00"
"                 354.600     2.708  20012.00"
"                 354.700     3.177  20879.00"
"             Peak outflow                  1.420    c.m/sec"
"             Maximum level               352.820    metre"
"             Maximum storage            6916.429    c.m"
"             Centroidal lag                4.550   hours"
"                  0.469     4.731     1.420     0.000 c.m/sec"
" 40          HYDROGRAPH   Combine    6"
"            6   Combine "
"            6   Node #"
"                Swale Storage Prior to CMP Culvert"
"             Maximum flow                  1.602    c.m/sec"
"             Hydrograph volume         33300.930    c.m"
"                    0.469     4.731     1.420     1.602"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.469     0.000     1.420     1.602"
" 33          CATCHMENT 219"
"            1   Triangular SCS"
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```
"           1   Equal length"
"           1   SCS method"
"         219   219"
"      45.000   % Impervious"
"       1.250   Total Area"
"      60.000   Flow length"
"       2.000   Overland Slope"
"       0.688   Pervious Area"
"      60.000   Pervious length"
"       2.000   Pervious slope"
"       0.563   Impervious Area"
"      60.000   Impervious length"
"       2.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      80.000   Pervious SCS Curve No."
"       0.518   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       6.350   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.921   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"               0.329     0.000     1.420     1.602 c.m/sec"
"            Catchment 219          Pervious   Impervious Total Area "
"            Surface Area           0.688      0.563      1.250      hectare"
"            Time of concentration  16.417     2.386      8.101      minutes"
"            Time to Centroid       112.491    87.187     97.493     minutes"
"            Rainfall depth         87.263     87.263     87.263     mm"
"            Rainfall volume        599.94     490.86     1090.79    c.m"
"            Rainfall losses        42.065     6.863      26.224     mm"
"            Runoff depth           45.199     80.401     61.040     mm"
"            Runoff volume          310.74     452.25     762.99     c.m"
"            Runoff coefficient     0.518      0.921      0.699      "
"            Maximum flow           0.131      0.304      0.329      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"          4   Add Runoff "
"               0.329     0.329     1.420     1.602"
" 40         HYDROGRAPH Copy to Outflow"
"          8   Copy to Outflow"
"               0.329     0.329     0.329     1.602"
" 40         HYDROGRAPH   Combine    6"
"          6   Combine "
"          6   Node #"
"              Swale Storage Prior to CMP Culvert"
"           Maximum flow                 1.632    c.m/sec"
"           Hydrograph volume         34063.922    c.m"
"               0.329     0.329     0.329     1.632"
" 40         HYDROGRAPH Start - New Tributary"
"          2   Start - New Tributary"
"               0.329     0.000     0.329     1.632"
" 33         CATCHMENT 220"
"          1   Triangular SCS"
"          1   Equal length"
"          1   SCS method"
"        220   220"
"      0.000   % Impervious"
"      2.110   Total Area"
"    365.000   Flow length"
"      0.500   Overland Slope"
"      2.110   Pervious Area"
"    365.000   Pervious length"
"      0.500   Pervious slope"
"      0.000   Impervious Area"
"    365.000   Impervious length"
"      0.500   Impervious slope"
"      0.250   Pervious Manning 'n'"
"     78.000   Pervious SCS Curve No."
"      0.484   Pervious Runoff coefficient"
"      0.100   Pervious Ia/S coefficient"
"      7.164   Pervious Initial abstraction"
"      0.015   Impervious Manning 'n'"
"     98.000   Impervious SCS Curve No."
"      0.000   Impervious Runoff coefficient"
"      0.100   Impervious Ia/S coefficient"
"      0.518   Impervious Initial abstraction"
"               0.120     0.000     0.329     1.632 c.m/sec"
"            Catchment 220          Pervious   Impervious Total Area "
"            Surface Area           2.110      0.000      2.110      hectare"
"            Time of concentration  76.021     10.686     76.021     minutes"
"            Time to Centroid       188.528    98.650     188.528    minutes"
"            Rainfall depth         87.263     87.263     87.263     mm"
"            Rainfall volume        1841.26    0.00       1841.26    c.m"
"            Rainfall losses        44.986     5.728      44.986     mm"
"            Runoff depth           42.277     81.535     42.277     mm"
"            Runoff volume          892.05     0.00       892.05     c.m"
"            Runoff coefficient     0.484      0.000      0.484      "
"            Maximum flow           0.120      0.000      0.120      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"          4   Add Runoff "
"               0.120     0.120     0.329     1.632"
" 40         HYDROGRAPH Copy to Outflow"
"          8   Copy to Outflow"
"               0.120     0.120     0.120     1.632"
" 40         HYDROGRAPH   Combine    6"
"          6   Combine "
"          6   Node #"
"              Swale Storage Prior to CMP Culvert"
"           Maximum flow                 1.751    c.m/sec"
"           Hydrograph volume         34955.965    c.m"
"               0.120     0.120     0.120     1.751"
" 40         HYDROGRAPH   Confluence    6"
"          7   Confluence "
"          6   Node #"
"              Swale Storage Prior to CMP Culvert"
"           Maximum flow                 1.751    c.m/sec"
"           Hydrograph volume         34955.965    c.m"
"               0.120     1.751     0.120     0.000"
" 54         POND DESIGN"
"       1.751   Current peak flow    c.m/sec"
"       0.497   Target outflow    c.m/sec"
"    34956.0    Hydrograph volume    c.m"
"         37.   Number of stages"
"     351.100   Minimum water level    metre"
"     354.700   Maximum water level    metre"
"     351.100   Starting water level    metre"
"           0   Keep Design Data: 1 = True; 0 = False"
"                 Level Discharge    Volume"
"               351.100     0.000     0.000"
"               351.200   0.00900    0.1000"
"               351.300   0.03600    0.6000"
"               351.400   0.08100     1.000"
"               351.500    0.1420     2.000"
"               351.600    0.2180     5.000"
"               351.700    0.3070     8.000"
"               351.800    0.4210    14.000"
"               351.900    0.5530    21.000"
"               352.000    0.6750    29.000"
"               352.100    0.8050    41.000"
"               352.200    0.9380    57.000"
```

```
"               352.300     1.066    76.000"
"               352.400     1.191   100.000"
"               352.500     1.307   128.000"
"               352.600     1.410   160.000"
"               352.700     1.507   197.000"
"               352.800     1.596   239.000"
"               352.900     1.684   286.000"
"               353.000     1.768   337.000"
"               353.100     1.849   393.000"
"               353.200     1.928   455.000"
"               353.300     2.005   526.000"
"               353.400     2.080   596.000"
"               353.500     2.153   676.000"
"               353.600     2.224   761.000"
"               353.700     2.293   854.000"
"               353.800     2.361   953.000"
"               353.900     2.427  1060.000"
"               354.000     2.492  1174.000"
"               354.100     2.556  1298.000"
"               354.200     2.618  1435.000"
"               354.300     2.689  1586.000"
"               354.400     2.739  1751.000"
"               354.500     2.797  1929.000"
"               354.600     2.855  2121.000"
"               354.700     2.911  2329.000"
"            Peak outflow                  1.742    c.m/sec"
"            Maximum level               352.970    metre"
"            Maximum storage             321.552    c.m"
"            Centroidal lag               10.207   hours"
"                 0.120     1.751     1.742     0.000 c.m/sec"
" 40         HYDROGRAPH   Combine    7"
"           6   Combine "
"           7   Node #"
"               Baden Creek Tributary"
"            Maximum flow                  1.742    c.m/sec"
"            Hydrograph volume         34947.570    c.m"
"                    0.120     1.751     1.742     1.742"
" 81         ADD COMMENT================================================="
"         4  Lines of comment"
"            ***********************************************"
"            ACTUAL FLOW THROUGH CN CULVERT"
"            = 1.742-0.033(INFIL GALLERY) = 1.709cms"
"            ***********************************************"
" 38         START/RE-START TOTALS 6"
"           3   Runoff Totals on EXIT"
"            Total Catchment area                     68.640    hectare"
"            Total Impervious area                    24.731    hectare"
"            Total % impervious                       36.029"
" 19         EXIT"
```

CAD: P:\P\40777\104\40777-104-F4.DWG

PARCEL O_2
(ACTIVA LANDS)

PARCEL O_1
(ACTIVA LANDS)

PARCEL Y_2
(WIEBE LANDS)

PARCEL Y_1
(WIEBE LANDS)

PARCEL Z

PARCEL Q

GOLDSCHMIDT CRESCENT

STUCKEY AVENUE

JACOB CRESSMAN DRIVE

LIVINGSTON BOULEVARD

WAGLER AVE

OESCH LANE

SNYDERS ROAD WEST

ROTH AVENUE

HUNSBERGER DRIVE

MICHAEL MYERS ROAD

BETTSCHEN LANE

GEIGER PLACE

MEADOWVIEW STREET

QUEEN STREET

MILLER STREET

CHRISTIAN STREET

CHARLOTTA STREET

BRENNEMAN DRIVE

BADEN CREEK TRIBUTARY "A"

CN RAILWAY

PROPOSED SWMF

EX. 1000mmØ CSP CULVERT

EX. 1100mm X 700mm CMP CULVERT

EX. BADEN WEST SWMF

201 0.64

202 0.27

203 0.09

204 4.49

205 19.47

206 1.22

207 0.70

208 2.12

209 1.30

210 0.13

211 1.10

212 0.16

213 18.93

214 0.10

215 1.03

216 2.08

217 10.20

218 1.25

219 1.25

220 2.11

LEGEND

- SITE BOUNDARY
- EXISTING CONTOURS (326)
- PROPOSED FINISHED GRADE CONTOURS (312.0)
- POST-DEVELOPMENT CATCHMENT
- CATCHMENT No. (1000) / AREA (Ha) (1.10)
- DRAINAGE AREAS TO INTERNAL DEPRESSIONS
- DRAINAGE AREAS TO ACTIVA BADEN SUBDIVISION
- DRAINAGE AREAS TO PROPOSED SWM FACILITY OUTFLOW TO CN CULVERT
- DRAINAGE AREAS TO CN CULVERT VIA BADEN WEST SWM FACILITY
- DRAINAGE AREAS TO CN CULVERT DIRECTLY

MTE
Engineers, Scientists, Surveyors

PROJECT
1012 SNYDER'S ROAD WEST

TITLE
POST-DEVELOPMENT DRAINAGE AREA PLAN

Drawn	JXK	Scale	1:2500
Checked	AJC	Project No.	40777-104
Date	2023-08-08	Rev No.	1

Figure **FIGURE C1**

Plot Date: August 31, 2023 - 4:15 PM

Appendix D

Proposed SWMF Design Calculations

SWMF CALCULATIONS

1012 SNYDER'S ROAD
STORMWATER MANAGEMENT
Baden, ONTARIO

Project Number:	40777-104
Date:	2023/08/31
Design By:	AJC
File:	Q:\40777\104\PRELIMINARY\SWM\2nd DP Sub\40777-104 Master SWM Facility Design Sheet.xlsx

Step 1: Choose Level of Water Quality Control

Enhanced 80% long-term S.S. removal

Step 2: Choose Type of Facility

Wet Pond

Step 3: Define Catchment area and Imperviousness

Catchment Area (ha)	Imperviousness (%)
26.04	60.5

Interpolated Storage Volume Requirement (m^3/ha)

202.80

Permanent Pool Required (m^3)

4239.41

Extended Detention Volume Required (m^3)

1041.60

Table 3.2 Water Quality Storage Requirements based on Receiving Waters (from MOE Stormwater Management Planning and Design Manual, March 2003)

Protection Level	SWMP Type	Storage Volume (m^3/ha) for Impervious Level			
		35	55	70	85
Enhanced 80% long-term S.S. removal	*Wetlands*	80	105	120	140
	Hybrid Wet Pond/Wetland	110	150	175	195
	Wet Pond	140	190	225	250
Normal 70% long-term S.S. Removal	*Wetlands*	60	70	80	90
	Hybrid Wet Pond/Wetland	75	90	105	120
	Wet Pond	90	110	130	150
Basic 60% long-term S.S. Removal	*Wetlands*	60	60	60	60
	Hybrid Wet Pond/Wetland	60	70	75	80
	Wet Pond	60	75	85	95
	Dry Pond (Continuous Flow)	90	150	200	240

1012 SNYDER'S ROAD
STORMWATER MANAGEMENT
Baden, ONTARIO

Project Number: 40777-104
Date: 2023/08/31
Design By: AJC
File: Q:\40777\104\PRELIMINARY\SWM\2nd DP Sub\40777-104 Master SWM Facility Design Sheet.xlsx

STAGE-STORAGE RELATIONSHIP

Stage	Active Depth	Forebay			Main Pond			Total Pond Volume	Active Storage Volume	Infiltration Gallery Volume	Total Active Volume	Storm Events		Comments	Stage
		Area	Volume	Cumulative Volume	Area	Volume	Cumulative Volume					Volume Summary	Ponding Elevation		
m	*m*	m^2	m^3	m^3	m^2	m^3	m^3	m^3	m^3	m^3	m^3	m^3	*m*		*m*
352.90		667	0	0				0							
353.00		731	70	70				70							
353.10		803	77	147				147							
353.20		875	84	231	1355	0	0	231							353.20
353.30		919	90	320	1415	139	139	459							353.30
353.40		964	94	414	1477	145	283	697							353.40
353.50		1009	99	513	1540	151	434	947							353.50
353.60		1055	103	616	1604	157	591	1207							353.60
353.70		1102	108	724	1668	164	755	1479							353.70
353.80		1149	113	837	1734	170	925	1761							353.80
353.90		1196	117	954	1799	177	1102	2055							353.90
354.00		1245	122	1076	1866	183	1285	2361							354.00
354.10		1291	127	1203	1934	190	1475	2677							354.10
354.20		1366	133	1336	2032	198	1673	3009							354.20
354.30		1440	140	1476	2134	208	1881	3357							354.30
354.40		1516	148	1624	2238	219	2100	3724							354.40
354.50		1593	155	1779	2344	229	2329	4108							354.50
354.60		1673	163	1942	2452	240	2569	4511							354.60
354.70		1754	171	2114	2563	251	2820	4933							354.70
354.70	0.00				4317	0	4933	4933	0						354.70
354.80	0.10				4380	435	5368	5368	435	779	1214	1042	354.76	MOE Ext Det	354.80
354.90	0.20				4576	448	5816	5816	883	779	1662				354.90
355.00	0.30				4776	468	6284	6284	1350	779	2129				355.00
355.10	0.40				4978	488	6771	6771	1838	779	2617	3077	355.19	25mm-4hr	355.10
355.20	0.50				5184	508	7279	7279	2346	779	3125				355.20
355.30	0.60				5406	530	7809	7809	2876	779	3655				355.30
355.40	0.70				5523	546	8355	8355	3422	779	4201	4633	355.48	2yr	355.40
355.50	0.80				5640	558	8914	8914	3980	779	4759				355.50
355.60	0.90				5757	570	9483	9483	4550	779	5329				355.60
355.70	1.00				5875	582	10065	10065	5132	779	5911				355.70
355.80	1.10				5994	593	10658	10658	5725	779	6504	6985	355.88	5yr	355.80
355.90	1.20				6112	605	11264	11264	6330	779	7109				355.90
356.00	1.30				6232	617	11881	11881	6948	779	7727				356.00
356.10	1.40				6352	629	12510	12510	7577	779	8356	8768	356.16	10yr	356.10
356.20	1.50				6473	641	13151	13151	8218	779	8997				356.20
356.30	1.60				6593	653	13805	13805	8871	779	9650				356.30
356.40	1.70				6714	665	14470	14470	9537	779	10316				356.40
356.50	1.80				6836	678	15148	15148	10214	779	10993	11205	356.53	25yr	356.50
356.60	1.90				6958	690	15837	15837	10904	779	11683				356.60
356.70	2.00				7081	702	16539	16539	11606	779	12385				356.70
356.80	2.10				7204	714	17253	17253	12320	779	13099	13230	356.82	50yr	356.80
356.90	2.20				7328	727	17980	17980	13047	779	13826				356.90
357.00	2.30				7452	739	18719	18719	13786	779	14565				357.00
357.10	2.40				7630	754	19473	19473	14540	779	15319	15397	357.11	100yr	357.10
357.20	2.50				7810	772	20245	20245	15312	779	16091			Overflow Weir	357.20
357.30	2.60				7992	790	21035	21035	16102	779	16881				357.30
357.40	2.70				8177	808	21844	21844	16910	779	17689				357.40
357.50	2.80				8382	828	22672	22672	17738	779	18517			Top of Facility	357.50

1012 SNYDER'S ROAD
STORMWATER MANAGEMENT
Baden, ONTARIO

Project Number:	40777-104
Date:	2023/08/31
Design By:	AJC
File:	Q:\40777\104\PRELIMINARY\SWM\2nd DP Sub\40777-104 Master SWM Facility Design Sheet.xlsx

Orifice Calculations

$Q_o = C_d * A_o * (2 * g * H_o)^{0.5}$

	Orifice 1	Orifice 2	Orifice 3
C_d	0.63	0.63	0.63
Invert (m)	355.20	500.00	500.00
Width (m)			
Diameter/Height (m)	0.230	1.000	1.000
Type (H/V)	V	V	V

C_d	Description
0.63	Orifice Plate
0.80	Orifice Tube

Weir Calculations

$Q_w = 2/3 * C_d * (2g)^{1/2} * L * H_w^{3/2} + 8/15 * C_d * (2g)^{1/2} * \tan\theta * H_w^{5/2}$

C_d	0.50
Invert (m)	357.20
Length (m)	2.400
Side Slope (H:V)	0
Side Slope (rad)	0.000

STAGE-DISCHARGE RELATIONSHIP

			Orifice 1			Orifice 2			Orifice 3						Extended Detention			Erosion Control
Stage	Active Volume	Gallery Storage	Area	H_o	Flow	Area	H_o	Flow	Area	H_o	Flow	Infiltration Gallery (98 mm/hr)	Weir Flow	Total Flow		Average Discharge	Increment Volume	Increment Dewatering Time	Cumulative Dewatering Time	Cumulative Dewatering Time
m	m^3	m^3	m^2	*m*	m^3/s	m^2	*m*	m^3/s	m^2	*m*	m^3/s	m^3/s	m^3/s	m^3/s		m^3/s	m^3	*hours*	*hours*	*hours*
354.70	0	0	0.00	0.00	0.0000	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0000	0.0000	0.0000		0.0162	435	7.44	56.41	56.41
354.80	435	779	0.00	0.00	0.0000	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0325	0.0000	0.0325		0.0325	448	3.83	48.97	48.97
354.90	883	779	0.00	0.00	0.0000	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0325	0.0000	0.0325		0.0325	468	4.00	45.14	45.14
355.00	1350	779	0.00	0.00	0.0000	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0325	0.0000	0.0325		0.0325	488	4.17	41.14	41.14
355.10	1838	779	0.00	0.00	0.0000	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0325	0.0000	0.0325		0.0325	508	4.35	36.97	36.97
355.20	2346	779	0.00	0.00	0.0000	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0325	0.0000	0.0325		0.0379	530	3.88	32.62	32.62
355.30	2876	779	0.02	0.05	0.0108	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0325	0.0000	0.0433		0.0548	546	2.77	28.74	28.74
355.40	3422	779	0.04	0.10	0.0338	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0325	0.0000	0.0663		0.0743	558	2.09	25.97	25.97
355.50	3980	779	0.04	0.19	0.0499	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0325	0.0000	0.0823		0.0884	570	1.79	23.88	23.88
355.60	4550	779	0.04	0.29	0.0619	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0325	0.0000	0.0944		0.0994	582	1.63	22.09	22.09
355.70	5132	779	0.04	0.39	0.0719	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0325	0.0000	0.1044		0.1088	593	1.51	20.47	20.47
355.80	5725	779	0.04	0.49	0.0807	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0325	0.0000	0.1132		0.1172	605	1.43	18.95	18.95
355.90	6330	779	0.04	0.59	0.0887	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0325	0.0000	0.1212		0.1248	617	1.37	17.52	17.52
356.00	6948	779	0.04	0.69	0.0960	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0325	0.0000	0.1284		0.1318	629	1.33	16.14	16.14
356.10	7577	779	0.04	0.79	0.1027	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0325	0.0000	0.1352		0.1384	641	1.29	14.82	14.82
356.20	8218	779	0.04	0.89	0.1091	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0325	0.0000	0.1415		0.1445	653	1.26	13.53	13.53
356.30	8871	779	0.04	0.99	0.1151	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0325	0.0000	0.1475		0.1504	665	1.23	12.27	12.27
356.40	9537	779	0.04	1.09	0.1208	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0325	0.0000	0.1532		0.1560	678	1.21	11.05	11.05
356.50	10214	779	0.04	1.19	0.1262	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0325	0.0000	0.1587		0.1613	690	1.19	9.84	9.84
356.60	10904	779	0.04	1.29	0.1314	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0325	0.0000	0.1639		0.1664	702	1.17	8.65	8.65
356.70	11606	779	0.04	1.39	0.1364	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0325	0.0000	0.1689		0.1713	714	1.16	7.48	7.48
356.80	12320	779	0.04	1.49	0.1413	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0325	0.0000	0.1738		0.1761	727	1.15	6.32	6.32
356.90	13047	779	0.04	1.59	0.1460	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0325	0.0000	0.1784		0.1807	739	1.14	5.18	5.18
357.00	13786	779	0.04	1.69	0.1505	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0325	0.0000	0.1830		0.1852	754	1.13	4.04	4.04
357.10	14540	779	0.04	1.79	0.1549	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0325	0.0000	0.1874		0.1895	772	1.13	2.91	2.91
357.20	15312	779	0.04	1.89	0.1592	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0325	0.0000	0.1917		0.2498	790	0.88	1.78	1.78
357.30	16102	779	0.04	1.99	0.1633	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0325	0.1121	0.3079		0.4124	808	0.54	0.90	0.90
357.40	16910	779	0.04	2.09	0.1674	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0325	0.3169	0.5168		0.6515	828	0.35	0.35	0.35
357.50	17738	779	0.04	2.19	0.1714	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0325	0.5823	0.7861						

1012 SNYDER'S ROAD
STORMWATER MANAGEMENT
Baden, Ontario

Project Number: 40777-104
Date: 2023/08/30
Design By: AJC
File: Q:\40777\104\PRELIMINARY\SWM\2nd DP Sub\40777-104 Master SWM Facility Design Sheet.xlsx

STAGE DISCHARGE DRAWDOWN CALCULATION (MOE EXT DET)

Stage	Elevation *m*	Discharge m^3/s	Volume m^3	Comments
1	354.700	0.0000	0.0	
2	354.800	0.0325	1213.9	
3	354.900	0.0325	1661.7	
4	355.000	0.0325	2129.3	
5	355.100	0.0325	2617.0	
6	355.200	0.0325	3125.1	
7	355.300	0.0433	3654.6	
8	355.400	0.0663	4201.0	
9	355.500	0.0823	4759.2	
10	355.600	0.0944	5329.0	
11	355.700	0.1044	5910.6	
12	355.800	0.1132	6504.1	
13	355.900	0.1212	7109.4	
14	356.000	0.1284	7726.6	
15	356.100	0.1352	8355.8	
16	356.200	0.1415	8997.0	
17	356.300	0.1475	9650.3	

h_1 =	354.76	*m*	starting elevation
h_2 =	354.70	*m*	bottom elevation
V =	1042	m^3	starting volume
t =	5.0	*min*	time step

Drawdown Time = 28.42 *hrs*

5 *mm* remaining
66.2 m^3 remaining

Remaining after:	m^3	*mm*
12 *hrs*	325	27
24 *hrs*	102	8
36 *hrs*	32	3
48 *hrs*	11	1
72 *hrs*	#N/A	#N/A

1012 SNYDER'S ROAD
STORMWATER MANAGEMENT
Baden, ONTARIO

Project Number:	40777-104
Date:	2020/11/10
Design By:	AJC
File:	Q:\40777\104\PRELIMINARY\SWM\2nd DP Sub\40777-104 Master SWM Facility Design Sheet.xlsx

FOREBAY DESIGN CALCULATIONS
MOE SWM Planning and Design Manual, 2003

Forebay Design Flows

Flow into forebay during the 1:5-year return period event (STM Sewer Design)	4.145 m^3/s
Flow into forebay during the 25 mm - 4 hour design storm event (MIDUSS)	2.133 m^3/s
Peak flow from main pond outlet for the 25mm design storm (MIDUSS)	0.033 m^3/s

Forebay Characteristics

b =	20.0	*m*	bottom width
y =	1.8	*m*	depth
z =	4	:1	side slope (average)
w =	27.2	*m*	average width
R =	1.41	*m*	hydraulic radius
A =	48.96	m^2	cross-sectional area

1. Length Calculation Based on Settling Velocity

L = forebay flow length *(m)*
r = length-to-width ratio
Q_p = peak flow rate through forebay *(m^3/s)*
v_s = settling velocity *(m/s)*

Equation 4.5: Forebay Settling Length

a) Required Settling Length (assuming Q_p = forebay through-flow & v_s = 0.0055 m/s)

Q_p =	2.13	m^3/s	peak flow rate through forebay
v_s =	0.0055	*m/s*	settling velocity
r =	0.52		length-to-width ratio
L =	14.2	*m*	required settling length
L =	*14.2*	*m*	*trial length*

b) Required Settling Length (assuming Q_p = pond discharge & v_s = 0.0003 m/s)

Q_p =	0.033	m^3/s	peak flow rate through forebay
v_s =	0.0003	*m/s*	settling velocity
r =	0.15		length-to-width ratio
L =	4.0	*m*	required settling length
L =	*4*	*m*	*trial length*

Table 1: Average settling velocities

	Mass Removed	Particle Size Range	Average Settling Velocity
	%	μm	m/s
	80 - 100	x ≤ 20	0.00000254
Enhanced:	70 - 80	20 < x ≤ 40	0.00001300
Normal:	60 - 70	40 < x ≤ 60	0.00002540
Basic:	40 - 60	60 < x ≤ 130	0.00012700
Medium Sand:	20 - 40	130 < x ≤ 400	0.00059267
Gross Grit:	0 - 20	400 < x ≤ 4000	0.00550333

2. Length Calculation Based on Flow Dispersion Length

Q =	4.15	m^3/s	inlet flow rate
d =	1.8	*m*	depth of permanent pool in forebay
V_f =	0.50	*m/s*	desired velocity in forebay (typical value ≤ 0.50 *m/s*)
L =	36.8	m	required length of dispersion

Equation 4.6: Dispersion Length

3. Required Forebay Length

L =	**36.8**	***m***	**design length**
L (Actual) =	**57.0**	***m***	**Proposed Forebay Length**
r =	2.10		design length-to-width ratio (typical minimum of 2.0)

4. Scour Velocity

v_s =	0.15	*m/s*	scour velocity (typical value = 0.15 *m/s*)
v =	**0.08**	***m/s***	**actual velocity**

OK The actual velocity through the forebay is less than the scour velocity.

5. Weir Flow From Forebay

L =	10	*m*	length of crest of weir
α =	1.65		coefficient
H =	0.5	*m*	head
Q =	**5.83**	***m^3/s***	**discharge**

Equation 4.4: Weir Flow

OK The weir flow from the forebay exceeds the flow entering the forebay

6. Estimated Cleanout Frequencies

a) Forebay

Forebay volume	2114	m^3
Estimated TSS removal efficiency	50%	
Impervious level	61%	
Estimated annual sediment loading	2.2	m^3/ha
Contributing area	26.04	*ha*
Annual sediment volume	29	m^3/yr
Cleanout frequency for 33% volume reduction	**24.4**	***years***
Cleanout Volume	**697.5**	***m^3***

b) Stormwater Management Pond

Drypond volume (excluding forebay)	2820	m^3
Estimated TSS removal efficiency	30%	
Impervious level	61%	
Estimated annual sediment loading	2.2	m^3/ha
Contributing area	26.04	*ha*
Annual sediment volume	17	m^3/yr
Cleanout frequency for 33% volume reduction	**54.1**	***years***
Cleanout Volume	**930.5**	***m^3***

Table 2: Annual sediment loading

Impervious Level	Annual Loading
%	m^3/ha
35%	0.6
55%	1.9
70%	2.8
85%	3.8

1012 SNYDER'S RD W
STORMWATER MANAGEMENT
Baden, Ontario

Project Number:	40777-104
Date:	2023/08/31
Design By:	AJC
File:	Q:\40777\104\PRELIMINARY\SWM\2nd DP Sub\40777-104 Master SWM Facility Design Sheet.xlsx

SPLITTER MANHOLE DESIGN CALCULATION

	Forebay Inlet Pipe	Pond Inlet Pipe		Manhole Weir		
Number of pipes =	1	1				
Diameter =	1050	1200	mm	Weir Elevation =	356.146	m
Area =	0.866	1.131	m^2	Weir Length =	3.000	m
Orifice Coefficient =	0.820	0.820		Weir Coefficient =	1.65	
Invert Elevation =	354.940	355.820	m	**Weir Opening**		
Slope =	0.50%	0.35%				
Hydraulic Radius =	0.263	0.300	m	Area =	3.040	m^2
Manning's 'n' =	0.013	0.013		Coefficient =	0.63	
Velocity =	2.230	2.039	m/s			
Pipe Capacity =	1.931	2.307	m^3/s			

Q_{25mm} =	2.235	m^3/s	forebay design flow (lower limit)
Q =	4.899	m^3/s	maximum design flow in sewer pipes

Water Elevation	Head Above Invert	Forebay Inflow	Weir Head	Weir Flow	Weir Opening Flow	Pipe Orifice Head	Pipe Orifice Flow	Total Pond Flow
m	m	m^3/s	m	m^3/s	m^3/s	m	m^3/s	m^3/s
354.900	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
355.000	0.060	-0.012						-0.012
355.100	0.160	0.029						0.029
355.200	0.260	0.102						0.102
355.300	0.360	0.199						0.199
355.400	0.460	0.315						0.315
355.500	0.560	0.449						0.449
355.600	0.660	0.599						0.599
355.700	0.760	0.764						0.764
355.800	0.860	0.943						0.943
355.900	0.960	1.134						1.134
356.000	1.060	1.887						1.887
356.100	1.160	2.133						2.133
356.146	**1.206**	**2.237**						**2.237**
356.200	1.260	2.354	0.054	0.062	1.970	0.380	0.238	2.416
356.300	1.360	2.555	0.154	0.299	3.327	0.480	0.372	2.854
356.400	1.460	2.742	0.254	0.634	4.273	0.580	0.526	3.268
356.500	1.560	2.917	0.354	1.043	5.045	0.680	0.698	3.615

Water Elevation	Head Above Invert	Forebay Inflow	Weir Head	Weir Flow	Weir Opening Flow	Pipe Orifice Head	Pipe Orifice Flow	Total Pond Flow
m	*m*	m^3/s	*m*	m^3/s	m^3/s	*m*	m^3/s	m^3/s
356.600	1.660	3.082	0.454	1.514	5.713	0.780	0.887	3.969
356.700	1.760	3.238	0.554	2.041	6.311	0.880	1.091	4.329
356.800	1.860	3.387	0.654	2.618	6.857	0.980	1.310	4.697
356.854	**1.914**	**3.465**	**0.708**	**2.949**	**7.134**	**1.034**	**1.434**	**4.899**
356.900	1.960	3.530	0.754	3.241	7.363	1.080	1.543	5.073
357.000	2.060	3.668	0.854	3.907	7.836	1.180	1.789	5.456
357.100	2.160	3.800	0.954	4.612	8.282	1.280	2.846	6.646
357.200	2.260	3.928	1.054	5.356	8.705	1.380	3.128	7.057
357.300	2.360	4.052	1.154	6.136	9.108	1.480	3.387	7.440
357.400	2.460	4.172	1.254	6.951	9.495	1.580	3.628	7.800
357.500	2.560	4.289	1.354	7.799	9.866	1.680	3.854	8.143
357.600	2.660	4.403	1.454	8.679	10.224	1.780	4.067	8.470
357.700	2.760	4.514	1.554	9.589	10.570	1.880	4.269	8.783
357.800	2.860	4.622	1.654	10.530	10.905	1.980	4.462	9.085
357.900	2.960	4.728	1.754	11.499	11.229	2.080	4.648	9.376
358.000	3.060	4.832	1.854	12.496	11.545	2.180	4.826	9.657
358.100	3.160	4.933	1.954	13.520	11.852	2.280	4.997	9.930
358.200	3.260	5.032	2.054	14.572	12.152	2.380	5.163	10.196
358.300	3.360	5.129	2.154	15.649	12.444	2.480	5.324	10.454
358.400	3.460	5.225	2.254	16.751	12.730	2.580	5.481	10.706
358.500	3.560	5.319	2.354	17.878	13.009	2.680	5.632	10.951
358.600	3.660	5.411	2.454	19.029	13.282	2.780	5.780	11.191
358.700	3.760	5.502	2.554	20.204	13.550	2.880	5.924	11.426
358.800	3.860	5.591	2.654	21.402	13.813	2.980	6.065	11.656
358.900	3.960	5.679	2.754	22.623	14.071	3.080	6.203	11.881
359.000	4.060	5.765	2.854	23.866	14.324	3.180	6.337	12.102

Notes:

1. Forebay inflow calcuated as: $Q = C \cdot A_o \cdot \sqrt{2g \cdot \left(H - \frac{2}{3} d \right)}$ for H > d

$$Q = f \cdot \frac{H}{d} \cdot C \cdot \sqrt{g} \cdot d^{2.5}$$ for H < d, where

$$f \cdot \frac{H}{d} = 0.494 \left(\frac{H}{d} \right)^{1.57} - 0.04 \left(\frac{H}{d} \right)^{0.5}$$

2. Bypassing inflow calculated as the smallest of

$$Q = C_d \cdot L \cdot H^{1.5}$$ weir flow

$$Q = C \cdot A \cdot \sqrt{2g \cdot H}$$ weir opening (orifice) flow

$$Q = C \cdot A \cdot \sqrt{2g \cdot \left(H - \frac{2}{3} d \right)}$$ pipe opening (orifice) flow

CN CULVERT CALCULATIONS

Worksheet for Baden Creek Trib -25yr Tailwater = 351.04

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.025	
Channel Slope	0.021	m/m
Left Side Slope	4.000	H:V
Right Side Slope	4.000	H:V
Bottom Width	1.80	m
Discharge	1,237.00	L/s

Results		
Normal Depth	243.6	mm
Flow Area	0.7	m²
Wetted Perimeter	3.8	m
Hydraulic Radius	177.4	mm
Top Width	3.75	m
Critical Depth	291.3	mm
Critical Slope	0.011	m/m
Velocity	1.83	m/s
Velocity Head	0.17	m
Specific Energy	0.41	m
Froude Number	1.377	
Flow Type	Supercritical	

GVF Input Data		
Downstream Depth	0.0	mm
Length	0.0	m
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.0	mm
Profile Description		
Profile Headloss	0.00	m
Downstream Velocity	Infinity	m/s
Upstream Velocity	Infinity	m/s
Normal Depth	243.6	mm
Critical Depth	291.3	mm
Channel Slope	0.021	m/m
Critical Slope	0.011	m/m

Culvert Calculator Report
25yr Culvert

Comments: Headwater is at Obvert

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	352.20	m	Headwater Depth/Height	0.97	
Computed Headwater Elev	352.19	m	Discharge	1.2370	m³/s
Inlet Control HW Elev.	352.19	m	Tailwater Elevation	351.04	m
Outlet Control HW Elev.	352.19	m	Control Type	Outlet Control	

Grades					
Upstream Invert	351.07	m	Downstream Invert	350.98	m
Length	15.00	m	Constructed Slope	0.006000	m/m

Hydraulic Profile					
Profile	M2		Depth, Downstream	0.75	m
Slope Type	Mild		Normal Depth	0.78	m
Flow Regime	Subcritical		Critical Depth	0.75	m
Velocity Downstream	2.59	m/s	Critical Slope	0.006775	m/m

Section					
Section Shape	Vertical Ellipse		Mannings Coefficient	0.013	
Section Material	Concrete		Span	0.73	m
Section Size	1160 x 730 mm		Rise	1.16	m
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	352.19	m	Upstream Velocity Head	0.31	m
Ke	0.10		Entrance Loss	0.03	m

Inlet Control Properties					
Inlet Control HW Elev.	352.19	m	Flow Control	N/A	
Inlet Type	Grooved edge with headwall (vertical ellipse)		Area Full	0.7	m²
K	0.00180		HDS 5 Chart	30	
M	2.50000		HDS 5 Scale	2	
C	0.02920		Equation Form	1	
Y	0.74000				

Worksheet for Baden Creek Trib -100yr Tailwater = 351.09

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.025	
Channel Slope	0.021	m/m
Left Side Slope	4.000	H:V
Right Side Slope	4.000	H:V
Bottom Width	1.80	m
Discharge	1,709.00	L/s

Results		
Normal Depth	288.2	mm
Flow Area	0.9	m²
Wetted Perimeter	4.2	m
Hydraulic Radius	203.8	mm
Top Width	4.11	m
Critical Depth	347.6	mm
Critical Slope	0.010	m/m
Velocity	2.01	m/s
Velocity Head	0.21	m
Specific Energy	0.49	m
Froude Number	1.408	
Flow Type	Supercritical	

GVF Input Data		
Downstream Depth	0.0	mm
Length	0.0	m
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.0	mm
Profile Description		
Profile Headloss	0.00	m
Downstream Velocity	Infinity	m/s
Upstream Velocity	Infinity	m/s
Normal Depth	288.2	mm
Critical Depth	347.6	mm
Channel Slope	0.021	m/m
Critical Slope	0.010	m/m

Culvert Calculator Report
100yr Culvert

Comments: Headwater is less than 1.5x the rise of the culvert

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	352.71	m	Headwater Depth/Height	1.24	
Computed Headwater Elev	352.51	m	Discharge	1.7090	m³/s
Inlet Control HW Elev.	352.51	m	Tailwater Elevation	351.09	m
Outlet Control HW Elev.	352.48	m	Control Type	Inlet Control	

Grades					
Upstream Invert	351.07	m	Downstream Invert	350.98	m
Length	15.00	m	Constructed Slope	0.006000	m/m

Hydraulic Profile					
Profile	M2		Depth, Downstream	0.88	m
Slope Type	Mild		Normal Depth	N/A	m
Flow Regime	Subcritical		Critical Depth	0.88	m
Velocity Downstream	3.00	m/s	Critical Slope	0.008803	m/m

Section					
Section Shape	Vertical Ellipse		Mannings Coefficient	0.013	
Section Material	Concrete		Span	0.73	m
Section Size	1160 x 730 mm		Rise	1.16	m
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	352.48	m	Upstream Velocity Head	0.37	m
Ke	0.10		Entrance Loss	0.04	m

Inlet Control Properties					
Inlet Control HW Elev.	352.51	m	Flow Control	N/A	
Inlet Type	Groove end projecting (vertical ellipse)		Area Full	0.7	m²
K	0.00950		HDS 5 Chart	30	
M	2.00000		HDS 5 Scale	3	
C	0.03170		Equation Form	1	
Y	0.69000				

Appendix E

Geotechnical Report

ID Number: MW101-19

Project Name: 1012 Snyder's Rd. W. Development Hydrogeology Study

Project No: 40777-800

Client: Nideva Properties Inc.

Site Location: 1012 Snyder's Rd. W., Baden, ON

Date Completed: 5/3/2019

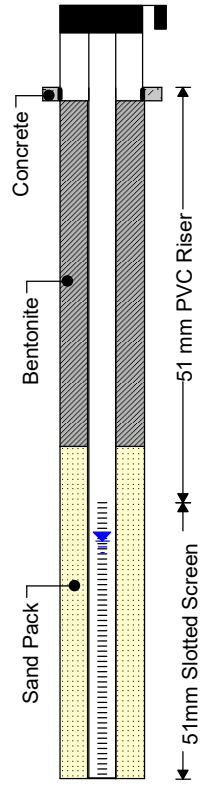
Drilling Contractor: Aardvark Drilling Inc.

Drill Rig: CME75 Track

Drill Method: Hollow Stem Auger

Protective Cover: Monument

Depth Scale (ft / m)	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Recovery (%)	N-Value (Blows/305mm)	Moisture Content (%)
0 / 0	Ground Surface	357.6					
	TOPSOIL dark brown, silty, clayey, moist	0.0	1	SS	30	8	23
	CLAYEY SILT brown, trace sand, moist		2	SS	75	9	27
		356.1					
6 / 2	**SANDY SILT** brown, trace clay, trace gravel, moist	1.5	3	SS	100	12	20
		355.3					
8 /	**SAND** brown, trace silt, moist	2.3	4	SS	75	17	16
10 /			5	SS	85	32	9
12 / 4							
14 /	saturated	353.0					
16 /		4.6	6	SS	70	39	19
18 /							
20 / 6			7	SS	90	28	19
22 /							
24 /							
26 / 8			8	SS	75	6	24
		349.4					
28 /	Drilling Terminated	8.2					
30 /							
32 / 10							
34 /							
36 /							
38 /							



Field Technician: TXG

Drafted by: TXG

Reviewed by: ATD

Sheet: 1 of 1

Notes:
Water level measured August 21, 2020.

ID Number: MW102-19

Project Name: 1012 Snyder's Rd. W. Development Hydrogeology Study

Project No: 40777-800

Client: Nideva Properties Inc.

Site Location: 1012 Snyder's Rd. W., Baden, ON

Date Completed: 5/3/2019

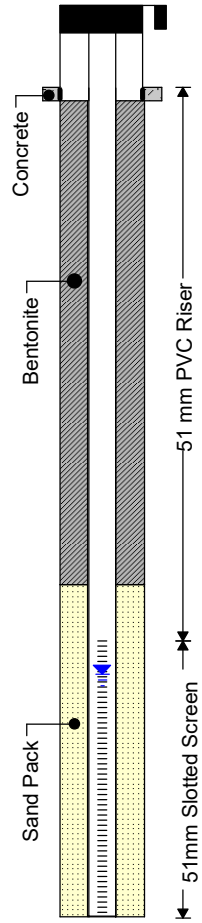
Drilling Contractor: Aardvark Drilling Inc.

Drill Rig: CME75 Track

Drill Method: Hollow Stem Auger

Protective Cover: Monument

Depth Scale (ft / m)	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	N-Value (Blows/305mm)	Moisture Content (%)
	Ground Surface	358.9 / 0.0					
0 / 0	**TOPSOIL** dark brown, silty, sandy, some clay, moist		1	ss	70	6	30
2	**SANDY SILT** brown, some clay, moist		2	ss	50	12	21
4			3	ss	100	15	23
6 / 2		356.6 / 2.3					
8	**CLAYEY SILT TILL** brown, trace sand, trace gravel, moist		4	ss	90	10	24
10			5	ss	100	11	23
12 / 4							
14	grey below 4.6m	354.3 / 4.6	6	ss	100	14	21
16							
18							
20 / 6			7	ss	100	12	18
22							
24							
26 / 8			8	ss	100	16	16
28							
30							
32 / 10		349.1 / 9.8	9	ss	100	16	14
34	Drilling Terminated						
36							
38							



Field Technician: TXG

Drafted by: TXG

Reviewed by: ATD

Sheet: 1 of 1

Notes:
Water level measured August 21, 2020.

ID Number: MW103-19

Project Name: 1012 Snyder's Rd. W. Development Hydrogeology Study

Project No: 40777-800

Client: Nideva Properties Inc.

Site Location: 1012 Snyder's Rd. W., Baden, ON

Date Completed: 5/2/2019

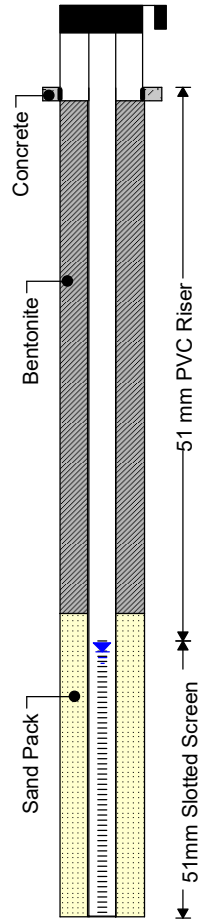
Drilling Contractor: Aardvark Drilling Inc.

Drill Rig: CME75 Track

Drill Method: Hollow Stem Auger

Protective Cover: Monument

Depth Scale (ft / m)	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Type	Recovery (%)	SPT N-Value (Blows/305mm)	Moisture Content (%)
	Ground Surface	359.0 / 0.0					
0 / 0	**TOPSOIL** dark brown,clayey silt, moist	0.0	1	ss	75	7	30
2 /	**SILTY CLAY** brown, some sand, moist	358.3 / 0.8	2	ss	85	18	19
4 /	**CLAYEY SILT TILL** brown, some sand, trace gravel, moist		3	ss	100	20	21
6 / 2			4	ss	100	13	21
8 /			5	ss	90	12	21
10 /		354.5 / 4.6	6	ss	100	12	16
12 / 4	**SANDY SILT TILL** grey, some clay, trace gravel, moist	352.9 / 6.1	7	ss	100	11	17
14 /	**CLAYEY SILT TILL** grey, some sand, trace gravel, moist	351.4 / 7.6	8	ss	90	5	18
16 /	wet below 7.6m						
18 / 6							
20 /							
22 /							
24 /							
26 / 8			9	ss	85	6	20
28 /		349.3 / 9.8					
30 /							
32 / 10	Drilling Terminated						
34 /							
36 /							
38 /							



Field Technician: TXG

Drafted by: TXG

Reviewed by: ATD

Sheet: 1 of 1

Notes:
Water level measured August 21, 2020.

ID Number: MW104-19

Project Name: 1012 Snyder's Rd. W. Development Hydrogeology Study

Project No: 40777-800

Client: Nideva Properties Inc.

Site Location: 1012 Snyder's Rd. W., Baden, ON

Date Completed: 5/2/2019

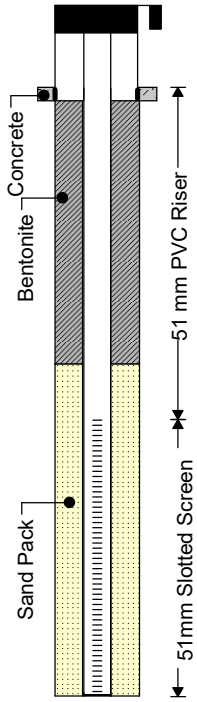
Drilling Contractor: Aardvark Drilling Inc.

Drill Rig: CME75 Track

Drill Method: Hollow Stem Auger

Protective Cover: Monument

Depth Scale (ft / m)	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Recovery (%)	N-Value (Blows/305mm)	Moisture Content (%)
	Ground Surface	361.2					
0 / 0	**TOPSOIL** dark brown, clayey silt, moist	0.0	1	ss	75	6	27
2	**CLAYEY SILT** brown, clayey, trace to some sand, moist	360.4 / 0.8	2	ss	100	19	14
4	**SILT** sandy, trace clay	359.6 / 1.5	3	ss	90	19	13
6 / 2	**SILTY SAND** brown, trace gravel, moist		4	ss	75	24	14
10		358.1					
12 / 4	**SILT** brown, some sand, trace clay, trace gravel, damp	3.0	5	ss	50	23	15
14		356.6					
16	grey, clayey, wet	4.6	6	ss	95	19	20
18		355.1					
20 / 6	**SILTY SAND** brown, saturated	6.1	7	ss	85	22	24
24		353.5					
26 / 8	trace silt, moist	7.6 / 352.9	8	ss	80	21	6
28	Drilling Terminated	8.2					
32 / 10							
34							
36							
38							



Field Technician: TXG

Drafted by: TXG

Reviewed by: ATD

Notes:
Well dry August 21, 2020.

ID Number: MW105-19

Project Name: 1012 Snyder's Rd. W. Development Hydrogeology Study

Project No: 40777-800

Client: Nideva Properties Inc.

Site Location: 1012 Snyder's Rd. W., Baden, ON

Date Completed: 5/2/2019

Drilling Contractor: Aardvark Drilling Inc.

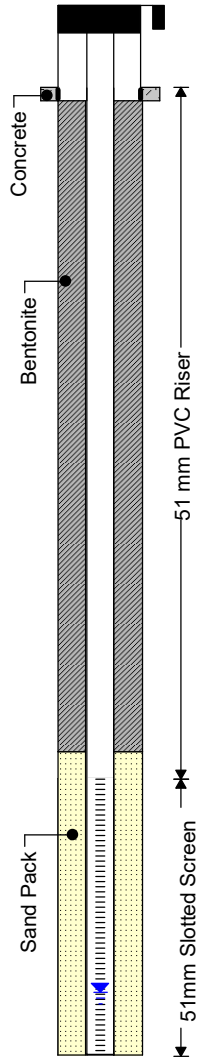
Drill Rig: CME 850 Track

Drill Method: Hollow Stem Auger

Protective Cover: Monument

Depth Scale (ft / m)	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Type	Recovery (%)	SPT N-Value (Blows/305mm)	Moisture Content (%)
	Ground Surface	361.8					
0 / 0	**TOPSOIL** dark brown, silty sand, moist	0.0	1	SS	70	3	21
		361.1					
2	**SAND** brown, some silt, moist	0.8	2	SS	65	5	24
4	silty, trace clay	360.3					
6 / 2	some silt, saturated	1.5	3	SS	80	3	26
8			4	SS	70	2	17
10		358.8					
	trace silt, moist	3.0	5	SS	70	10	
12 / 4							
14			6	SS	100	36	6
16							
18							
20 / 6			7	SS	95	39	3
22							
24		354.2					
	wet	7.6	8	SS	85	33	20
26 / 8							
28							
30			9	SS	90	32	18
32							
34 / 10		351.2					
	saturated	10.7	10	SS	85	20	20
36		350.6					
38	Drilling Terminated	11.3					

Well Completion Details



Field Technician: TXG

Drafted by: TXG

Reviewed by: ATD

Sheet: 1 of 1

Notes:
Water level measured August 21, 2020.

ID Number: MW106A-19

Project Name: 1012 Snyder's Rd. W. Development Hydrogeology Study

Project No: 40777-800

Client: Nideva Properties Inc.

Site Location: 1012 Snyder's Rd. W., Baden, ON

Date Completed: 4/29/2019

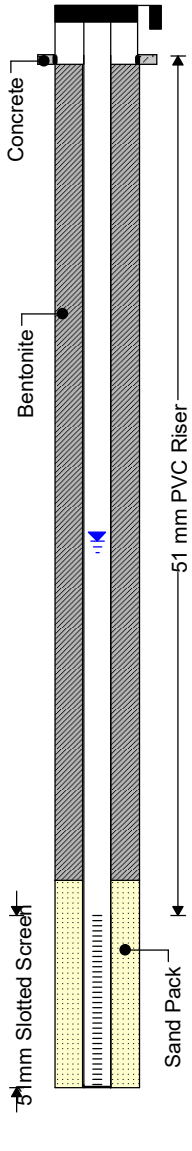
Drilling Contractor: Aardvark Drilling Inc.

Drill Rig: CME 850 Track

Drill Method: Hollow Stem Auger

Protective Cover: Monument

Depth Scale (ft / m)	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	N-Value (Blows/305mm)	Moisture Content (%)
	Ground Surface	360.7					
0 / 0	**TOPSOIL** dark brown, silty sand, moist	0.0 / 359.9	1	SS	90	5	14
2	**SAND** brown, some silt, trace gravel, moist	0.8 / 359.2	2	SS	60	2	20
4	trace silt, moist	1.5 / 358.4	3	SS	50	7	19
6 / 2	wet	2.3 / 357.6	4	SS	60	12	20
8	saturated						
10	**SILT** brown, trace sand, varying degrees of clay content, saturated	3.0 / 356.9	5	SS	75	14	20
12 / 4	trace gravel, moist	3.8 / 356.1	6	SS	75	11	20
14	grey	4.6 / 354.6	7	SS	100	12	24
16							
18							
20 / 6	**SAND** brown fine-grained sand, trace silt, moist	6.1 / 353.1	8	SS	50	32	13
22							
24							
26 / 8	**SANDY SILT** brown, trace clay, moist	7.6 / 351.6	9	SS	100	26	25
28							
30							
32 / 10	**SAND** brown, trace silt, saturated	9.1 / 350.0	10	SS	75	41	19
34							
36	coarse-grained sand, saturated	10.7 / 348.5	11	SS	90	13	16
38							
40 / 12	medium-grained sand	12.2	12	SS	65	32	19
42							
44							
46 / 14			13	SS	75	37	17
48							
50			14	SS	65	48	22
52 / 16							
54							
56			15	SS	65	42	18
58							
60 / 18			16	SS	50	48	16
62	Drilling Terminated	341.8 / 18.9					



Field Technician: TXG

Drafted by: TXG

Reviewed by:

Notes:
Water level measured August 21, 2020.

ID Number: MW106B-19

Project Name: 1012 Snyder's Rd. W. Development Hydrogeology Study

Project No: 40777-800

Client: Nideva Properties Inc.

Site Location: 1012 Snyder's Rd. W., Baden, ON

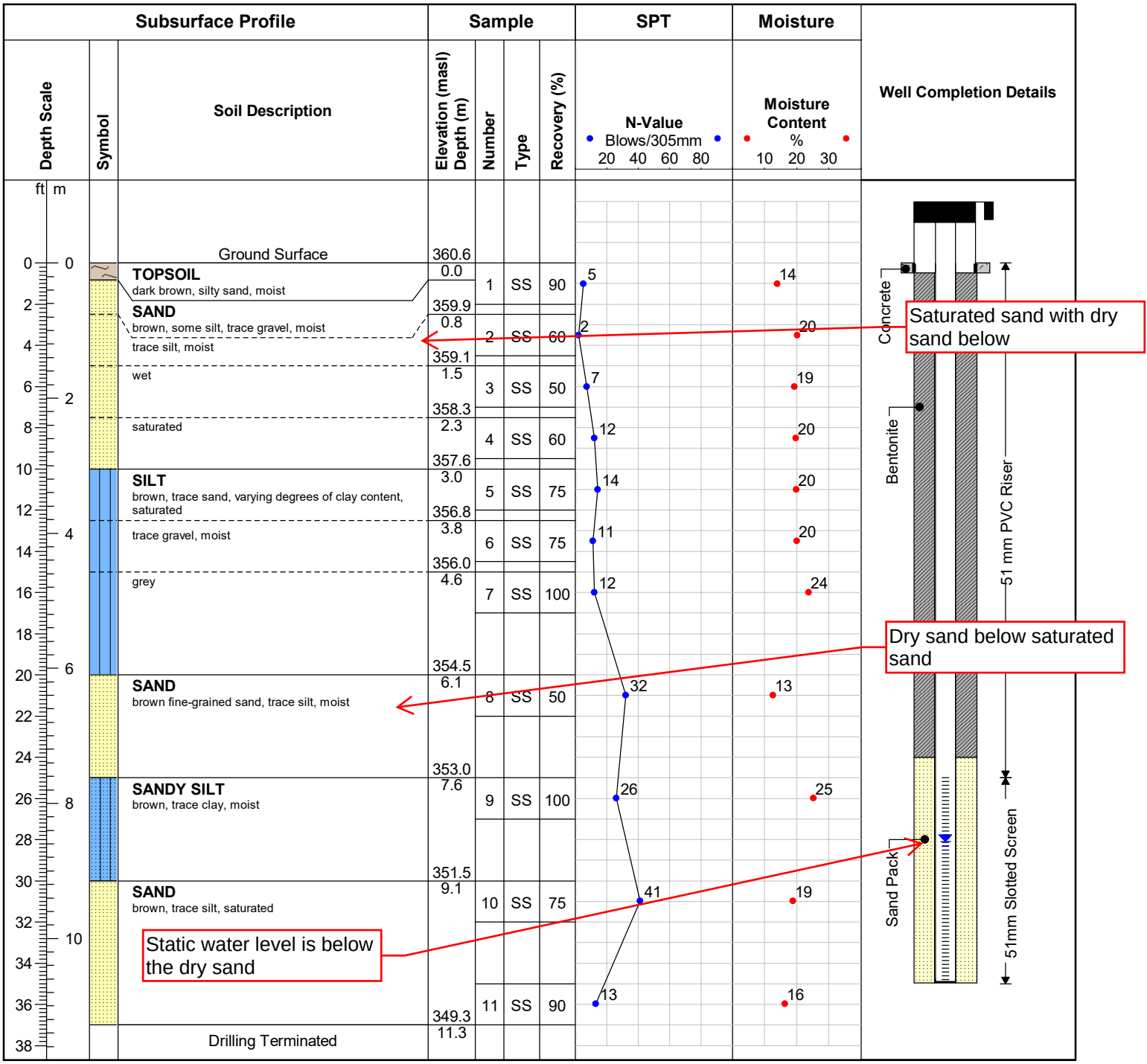
Date Completed: 4/26/2019

Drilling Contractor: Aardvark Drilling Inc.

Drill Rig: CME 850 Track

Drill Method: Hollow Stem Auger

Protective Cover: Monument



Field Technician: TXG

Drafted by: TXG

Reviewed by: ATD

Sheet: 1 of 1

Notes:
Borehole lithology, N-values and moisture contents inferred from MW106A-19.
Water level measured August 21, 2020.

ID Number: MW106C-19

Project Name: 1012 Snyder's Rd. W. Development Hydrogeology Study

Project No: 40777-800

Client: Nideva Properties Inc.

Site Location: 1012 Snyder's Rd. W., Baden, ON

Date Completed: 4/26/2019

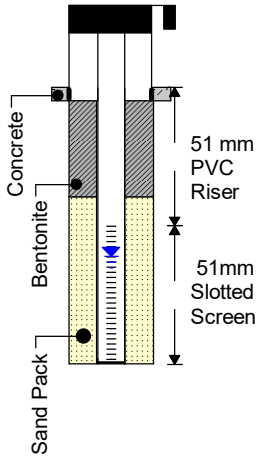
Drilling Contractor: Aardvark Drilling Inc.

Drill Rig: CME 850 Track

Drill Method: Hollow Stem Auger

Protective Cover: Monument

Subsurface Profile			Sample				SPT	Moisture	Well Completion Details
Depth Scale	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	N-Value Blows/305mm (20 40 60 80)	Moisture Content % (10 20 30)	
ft / m		Ground Surface	360.6						
0 / 0		**TOPSOIL** dark brown, silty sand, moist	0.0	1	SS	90	5	14	
			359.8						
2		**SAND** brown, some silt, trace gravel, moist	0.8	2	SS	60	2	20	
4		trace silt, moist	359.1						
6 / 2		wet	1.5	3	SS	50	7	19	
8		saturated	358.3						
			2.3	4	SS	60	12	20	
10			357.5						
		SILT brown, trace sand, varying degrees of clay content, saturated	3.0	5	SS	75	14	20	
12 / 4			356.9						
14		Drilling Terminated	3.7						
16									
18									
20 / 6									
22									
24									
26 / 8									
28									
30									
32 / 10									
34									
36									
38									



Field Technician: TXG

Drafted by: TXG

Reviewed by: ATD

Sheet: 1 of 1

Notes:
Borehole lithology, N-values and moisture contents inferred from MW106A-19.
Water level measured August 21, 2020.

ID Number: MW201-20

Project Name: 1012 Snyder's Rd. W. Development Hydrogeology Study

Project No: 40777-800

Client: Nideva Properties Inc.

Site Location: 1012 Snyder's Rd. W., Baden, ON

Date Completed: 6/10/2020

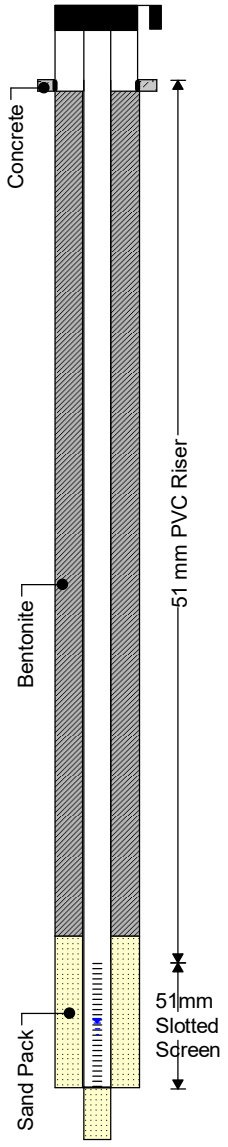
Drilling Contractor: London Soil Test Ltd.

Drill Rig: D-50 Turbo

Drill Method: Hollow Stem Auger

Protective Cover: Monument

Depth Scale (ft / m)	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	N-Value (Blows/305mm)	Moisture Content (%)
	Ground Surface	363.1					
0 / 0	**TOPSOIL** dark brown silt topsoil, moist	0.0	1	ss	79	3	13
2 /	**SAND** dark brown fine-grained sand, silty, trace gravel, moist	361.8	2	ss	83	5	3
4 /	light brown, trace to some silt, dry to moist	1.2					
6 / 2		360.9	3	ss	100	18	7
8 /	brown, silty wet seam at 2.6m (7.6cm)	2.1	4	ss	96	11	7
10 /			5	ss	100	18	7
12 / 4	light brown to brown, moist	359.4 3.7	6	ss	92	20	
14 /		358.5					
16 /	wet to saturated between 4.6-5.2m	4.6 357.9	7	ss	75	16	22
18 /		5.2	8	ss	92	21	
20 / 6			9	ss	100	15	5
22 /							
24 /		355.4					
26 / 8	dark brown, fine to medium-grained, trace to some silt, moist	7.6	10	ss	100	29	6
28 /							
30 /			11	ss	83	22	7
32 / 10							
34 /							
36 /	saturated	351.9 11.2	12	ss	88	31	6
38 /							
40 / 12	Drilling Terminated	350.3 12.8	13	ss	100	23	20
42 /							



Field Technician: KLW

Drafted by: KLW

Reviewed by: ATD

Sheet: 1 of 1

Notes:
Water level measured August 21, 2020.

ID Number: MW202-20

Project Name: 1012 Snyder's Rd. W. Development Hydrogeology Study

Project No: 40777-800

Client: Nideva Properties Inc.

Site Location: 1012 Snyder's Rd. W., Baden, ON

Date Completed: 6/10/2020

Drilling Contractor: London Soil Test Ltd.

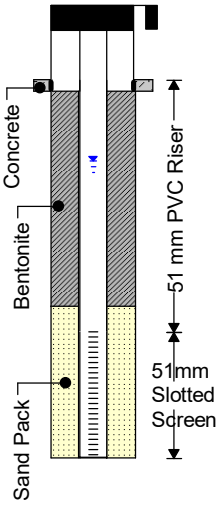
Drill Rig: D-50 Turbo

Drill Method: Hollow Stem Auger

Protective Cover: Monument

Depth Scale	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	SPT N-Value (Blows/305mm)	Moisture Content (%)
ft / m		Ground Surface	357.7					
		TOPSOIL brown silt topsoil, moist	0.0	1	ss	100	6	29
		SILT TILL brown silt till, some clay to clayey, minor gravel, mottled		2	ss	100	9	19
		trace to some gravel	356.2 1.5	3	ss	85	16	19
		brownish-grey, clayey, moist to wet	355.4 2.3	4	ss	100	7	25
		very moist to wet		5	ss	100	4	23
				6	ss	100	7	23
		Drilling Terminated	353.1 4.6					

Well Completion Details



Field Technician: KLW

Drafted by: KLW

Reviewed by: ATD

Sheet: 1 of 1

Notes:
Water level measured August 21, 2020.

ID Number: MW203-20

Project Name: 1012 Snyder's Rd. W. Development Hydrogeology Study

Project No: 40777-800

Client: Nideva Properties Inc.

Site Location: 1012 Snyder's Rd. W., Baden, ON

Date Completed: 6/10/2020

Drilling Contractor: London Soil Test Ltd.

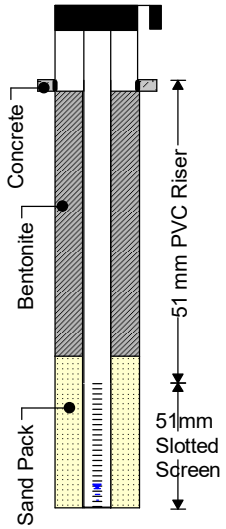
Drill Rig: D-50 Turbo

Drill Method: Hollow Stem Auger

Protective Cover: Monument

Depth Scale	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	SPT N-Value (Blows/305mm)	Moisture Content (%)
		Ground Surface	358.8					
		TOPSOIL brown silt topsoil, moist	0.0	1	ss	100	18	18
		SILT TILL brown silt till, some clay to clayey, trace gravel, mottled		2	ss	88	25	18
			357.3					
		greyish-brown, clayey, trace to some gravel	1.5	3	ss	100	28	17
			356.5					
		grey, trace gravel	2.3	4	ss	100	17	22
				5	ss	100	15	22
				6	ss	100	14	18
			353.6	7	ss	100	17	16
		Drilling Terminated	5.2					

Moisture Content (%): 10 20 30



Field Technician: KLW

Drafted by: KLW

Reviewed by: ATD

Sheet: 1 of 1

Notes:
Water level measured August 21, 2020.

ID Number: MP1-20

Project: 1012 Snyder's Rd. W. Development Hydrogeology Study

Project No: 40777-800

Client: Nideva Properties Inc.

Site Location: 1012 Snyder's Rd. W., Baden, ON

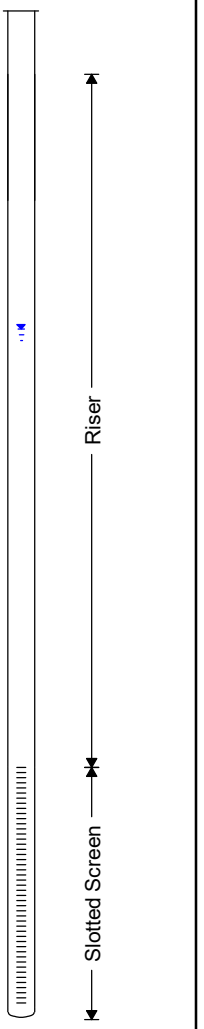
Date: 6/18/2020

Construction Materials: Stainless Steel

Installation Method: Drive Point

Subsurface Profile

Depth (ft)	Depth (m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Soil Sample Lab Analysis	Piezometer
0	0		Ground Surface	359.6		
			PEAT dark brownish-black muck/peat, saturated	0.0 359.5		
			SILT TILL brown silt till, some clay to clayey	0.1		
2						
			Excavation Terminated	358.5 1.1		
4						



Field Technician: KLW

Drafted by: KLW

Reviewed by: ATD

Sheet: 1 of 1

Notes:
Water level measured August 21, 2020.
Lithology below 0.3 mbgs inferred from MW203-20.

ID Number: BH303-20

Project: Phase II ESA

Project No: 40777-200

Client: Snyders Road (Baden) Developments Inc.

Site Location: 1012 Snyders Road West, Baden, ON

Drill Date: 10/19/2020

Drilling Contractor: Direct Environmental Drilling Ltd.

Drill Rig: Geoprobe

Drill Method: Direct Push

Protective Cover: None

Depth (ft)	Depth (m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	Headspace PID (ppm)	Headspace Hydrocarbon (ppm)	Well Completion Details
			Ground Surface	360.6							
0	0		**TOPSOIL** Dark brown topsoil with trace organics, moist.	0.0							
2				359.6	1	DP	100	See Notes	0		
4			**SAND** Medium brown coarse sand moist.	0.9							Bentonite
6	2										
8			Sand turns grey and is saturated.	358.1 / 2.4	2	DP	100				
10				357.5					0		
12	4		Drilling Terminated	3.0							
14											
16											
18											
20	6										

Field Technician: JMS

Drafted by: JMS

Reviewed by: RMR

MTE

Sheet: 1 of 1

No odour or staining unless otherwise noted.
Soil sample lab analysis at 1-2': Metals, As, Sb, Se, OCPs, PCBs,

ID Number: BH305-20

Project: Phase II ESA

Project No: 40777-200

Client: Snyders Road (Baden) Developments Inc.

Site Location: 1012 Snyders Road West, Baden, ON

Drill Date: 10/15/2020

Drilling Contractor: Direct Environmental Drilling Ltd.

Drill Rig: Geoprobe

Drill Method: Direct Push

Protective Cover: None

Depth (ft)	Depth (m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	Headspace: PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	Well Completion Details
			Ground Surface	360.6						
0	0		**TOPSOIL** Dark brown silty topsoil with trace organics, moist.	0.0 / 360.3						
			SAND AND GRAVEL Medium brown sand and gravel, dry.	0.3	1	DP	100	PHCs F1-F4, BTEX	0	
4			**CLAY TILL** Dark grey clay till, moist.	359.2 / 1.4						Bentonite
6	2		Slight hydrocarbon-like odour noted, clay till becomes wet to saturated.	358.7 / 1.8	2	DP	100	PHCs F1-F4, BTEX	0 10	
10			Drilling Terminated	357.5 / 3.0						
12	4									
16										
18										
20	6									

Field Technician: JMS

Drafted by: JMS

Reviewed by: RMR

No odour or staining unless otherwise noted.

ID Number: BH306-20

Project: Phase II ESA

Project No: 40777-200

Client: Snyders Road (Baden) Developments Inc.

Site Location: 1012 Snyders Road West, Baden, ON

Drill Date: 10/15/2020

Drilling Contractor: Direct Environmental Drilling Ltd.

Drill Rig: Geoprobe

Drill Method: Direct Push

Protective Cover: None

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Recovery (%)	Soil Sample Lab Analysis	Headspace: PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	Well Completion Details
0 ft / 0 m		Ground Surface	360.7						
0		**FILL** Sandy topsoil mixed with gravel fill, concrete, and demolition debris.	0.0 / 360.3				See Notes, pH	0	
2		**CLAY** Medium brown clay, moist.	0.5	1	DP	100	See Notes	0	
4									Bentonite
6 / 2				2	DP	100			
8			358.0						
		SAND Medium brown fine sand, moist.	2.7 / 357.7					0	
10		Drilling Terminated	3.0						
12 / 4									
14									
16									
18									
20 / 6									

Field Technician: JMS

Drafted by: JMS

Reviewed by: RMR

MTE

No odour or staining unless otherwise noted.

Soil sample lab analysis for 0.5-1.5' & 2-3': Metals, As, Sb, Se, PAHs, PHCs F1-F4, BTEX

ID Number: BH307-20

Project: Phase II ESA

Project No: 40777-200

Client: Snyders Road (Baden) Developments Inc.

Site Location: 1012 Snyders Road West, Baden, ON

Drill Date: 10/15/2020

Drilling Contractor: Direct Environmental Drilling Ltd.

Drill Rig: Geoprobe

Drill Method: Direct Push

Protective Cover: None

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Recovery (%)	Soil Sample Lab Analysis	Headspace: PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	Well Completion Details
0 ft / 0 m		Ground Surface	360.7						
0		**FILL** Silty topsoil mixed with gravel fill and demolition debris, trace organics.	0.0 / 360.4				See notes	0	
0.3		**CLAY** Medium brown clay, moist.		1	DP	100			
2 ft / 2 m									
4									
6				2	DP	100			
2			358.3						
8		**SAND** Medium brown fine sand, moist.	2.4						
			357.7				pH	0	
10		Drilling Terminated	3.0						
12 ft / 4 m									
14									
16									
18									
20 ft / 6 m									

Bentonite

Field Technician: JMS

Drafted by: JMS

Reviewed by: RMR

MTE

Sheet: 1 of 1

No odour or staining unless otherwise noted.
Soil analysis at 0-1': Metals, As, Sb, Se, PHCs F1-F4, PAHs, VOCs, pH

ID Number: BH308-20

Project: Phase II ESA

Project No: 40777-200

Client: Snyders Road (Baden) Developments Inc.

Site Location: 1012 Snyders Road West, Baden, ON

Drill Date: 10/15/2020

Drilling Contractor: Direct Environmental Drilling Ltd.

Drill Rig: Geoprobe

Drill Method: Direct Push

Protective Cover: None

Subsurface Profile			Sample					Headspace	
Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	Well Completion Details
0 ft / 0 m		Ground Surface	360.2						
		TOPSOIL Dark brown topsoil with trace organics, moist.	0.0 / 359.9						
		SAND Medium brown coarse sand, moist.	0.3	1	DP	100	PCBs, PHCs F1-F4, BTEX	0	
4 ft		Sand becomes wet.	359.0 / 1.2					0	
		Drilling Terminated	358.7 / 1.5						Bentonite
20 ft / 6 m									

Field Technician: JMS

Drafted by: JMS

Reviewed by: RMR

No odour or staining unless otherwise noted.

ID Number: MW301-20

Project: Phase II ESA

Project No: 40777-200

Client: Snyders Road (Baden) Developments Inc.

Site Location: 1012 Snyders Road West, Baden, ON

Drill Date: 10/15/2020

Drilling Contractor: Direct Environmental Drilling Ltd.

Drill Rig: Geoprobe

Drill Method: Direct Push

Protective Cover: Monument

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	Headspace: PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	Well Completion Details
0 ft / 0 m		Ground Surface	360.5						
0		**SAND** Medium brown sand with trace gravel, moist.	0.0	1	DP	75	Metals, As, Sb, Se, OCPs, PCBs, PAHs, PHCs F1-F4, VOCs	6	
4		**CLAYEY SILT TILL** Brown clayey silt till, moist.	359.2 1.2	2	DP	100			
8		Till becomes wet.	357.7 2.7						
10		**SAND** Medium brown fine sand, dry.	357.4 3.0	3	DP	95			
14				4	DP	95		0	
20									Concrete; Bentonite; 32mm PVC Riser

Field Technician: JMS

Drafted by: JMS

Reviewed by: RMR

No odour or staining unless otherwise noted.

ID Number: MW301-20

Project: Phase II ESA

Project No: 40777-200

Client: Snyders Road (Baden) Developments Inc.

Site Location: 1012 Snyders Road West, Baden, ON

Drill Date: 10/15/2020

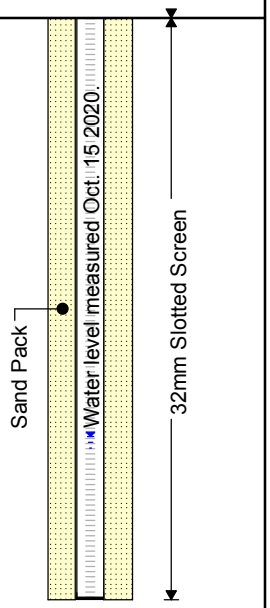
Drilling Contractor: Direct Environmental Drilling Ltd.

Drill Rig: Geoprobe

Drill Method: Direct Push

Protective Cover: Monument

Subsurface Profile			Sample					Headspace	Well Completion Details
Depth	Symbol	Soil Description	Elevation (masl) Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm 20 40 60 80 / Hydrocarbon ppm 100 200 300 400	
22				5	DP	100			
24		Sand becomes wet.	353.1 7.3				PHCs F1-F4, VOCs	0	
26	8			6	DP	100			
28									
30		Drilling Terminated	351.3 9.1						
32	10								
34									
36									
38									
40	12								



Field Technician: JMS

Drafted by: JMS

Reviewed by: RMR

MTE

No odour or staining unless otherwise noted.

ID Number: MW304-20

Project: Phase II ESA

Project No: 40777-200

Client: Snyders Road (Baden) Developments Inc.

Site Location: 1012 Snyders Road West, Baden, ON

Drill Date: 10/15/2020

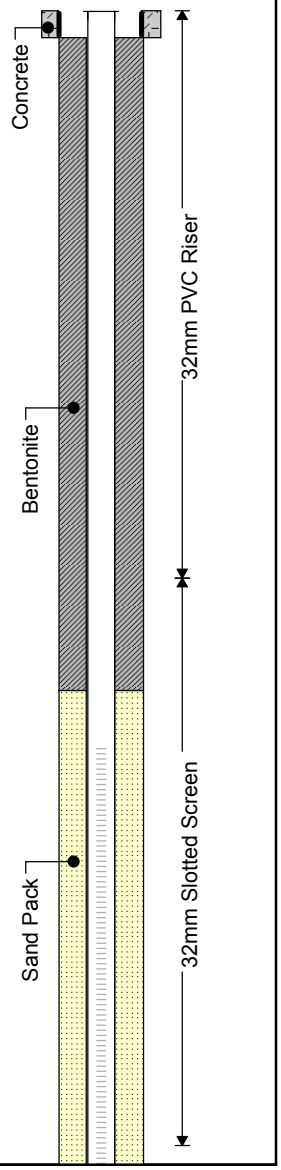
Drilling Contractor: Direct Environmental Drilling Ltd.

Drill Rig: Geoprobe

Drill Method: Direct Push

Protective Cover: Monument

Depth (ft)	Depth (m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	Headspace PID (ppm)	Headspace Hydrocarbon (ppm)
			Ground Surface	360.7						
0	0		**TOPSOIL** Dark brown silty topsoil with trace organics, moist.	0.0						
			CLAYEY SILT TILL Medium brown clayey silt till, moist.		1	DP	75	PHCs F1-F4, BTEX	0	
2										
4					2	DP	100			
6	2									
8			**SAND** Medium brown fine sand, moist.	358.3 / 2.4						
10					3	DP	100			
12										
14	4							PHCs F1-F4, VOCs, PAHs	0	
			Sand becomes slightly silty, wet.	356.2 / 4.6						
16					4	DP	75			
18										
			Medium brown coarse sand, moist.	355.0 / 5.8						
20	6									



Field Technician: JMS

Drafted by: JMS

Reviewed by: RMR

No odour or staining unless otherwise noted.

ID Number: MW304-20

Project: Phase II ESA

Project No: 40777-200

Client: Snyders Road (Baden) Developments Inc.

Site Location: 1012 Snyders Road West, Baden, ON

Drill Date: 10/15/2020

Drilling Contractor: Direct Environmental Drilling Ltd.

Drill Rig: Geoprobe

Drill Method: Direct Push

Protective Cover: Monument

Subsurface Profile			Sample					Headspace	
Depth	Symbol	Soil Description	Elevation (masl) Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm 20 40 60 80 / Hydrocarbon ppm 100 200 300 400	Well Completion Details
22				5	DP	100			Water level measured Oct. 15, 2020.
24									Cave
			353.1						
		Drilling Terminated	7.6						
26									
	8								
28									
30									
32									
	10								
34									
36									
38									
	12								
40									

Field Technician: JMS

Drafted by: JMS

Reviewed by: RMR

MTE

No odour or staining unless otherwise noted.

ID Number: MW309-20

Project: Phase II ESA

Project No: 40777-200

Client: Snyders Road (Baden) Developments Inc.

Site Location: 1012 Snyders Road West, Baden, ON

Drill Date: 10/19/2020

Drilling Contractor: Direct Environmental Drilling Ltd.

Drill Rig: Geoprobe

Drill Method: Direct Push, Hollow Stem Auger

Protective Cover: Monument

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	Headspace: PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	Well Completion Details
		Ground Surface	362.6						
0		**TOPSOIL** Dark brown silty topsoil with trace organics, most.	0.0						
2			361.7	1	DP	50	PHCs F1-F4, BTEX, PAHs	0	
		SAND Medium brown coarse sand, dry.	0.9						
4								0	
6				2	DP	90			
10				3	DP	100			
12									
14			358.2						
		SILTY SAND Medium brown silty sand lens, wet.	4.4						
16		**SAND** Medium brown coarse sand, dry.		4	DP	100			
18									
20									

Well Completion Details: Concrete; Bentonite; 32mm PVC Riser

Field Technician: JMS

Drafted by: JMS

Reviewed by: RMR

No odour or staining unless otherwise noted.

ID Number: MW309-20

Project: Phase II ESA

Project No: 40777-200

Client: Snyders Road (Baden) Developments Inc.

Site Location: 1012 Snyders Road West, Baden, ON

Drill Date: 10/19/2020

Drilling Contractor: Direct Environmental Drilling Ltd.

Drill Rig: Geoprobe

Drill Method: Direct Push, Hollow Stem Auger

Protective Cover: Monument

Subsurface Profile			Sample					Headspace	Well Completion Details
Depth	Symbol	Soil Description	Elevation (masl) Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm 20 40 60 80 / Hydrocarbon ppm 100 200 300 400	
22				5	DP	100		0	
24									
26	8								
28									
30				6	HSA	75			
32									
34	10								
36		Sand becomes saturated.	351.9 10.7	7	HSA	75	PHCs F1-F4, BTEX, PAHs	0	
38		Drilling Terminated	351.0 11.6						
40	12								

Sand Pack

Water level measured Oct. 19, 2020.

32mm Slotted Screen

Field Technician: JMS

Drafted by: JMS

Reviewed by: RMR

MTE

No odour or staining unless otherwise noted.

ID Number: MW310-20

Project: Phase II ESA

Project No: 40777-200

Client: Snyders Road (Baden) Developments Inc.

Site Location: 1012 Snyders Road West, Baden, ON

Drill Date: 10/19/2020

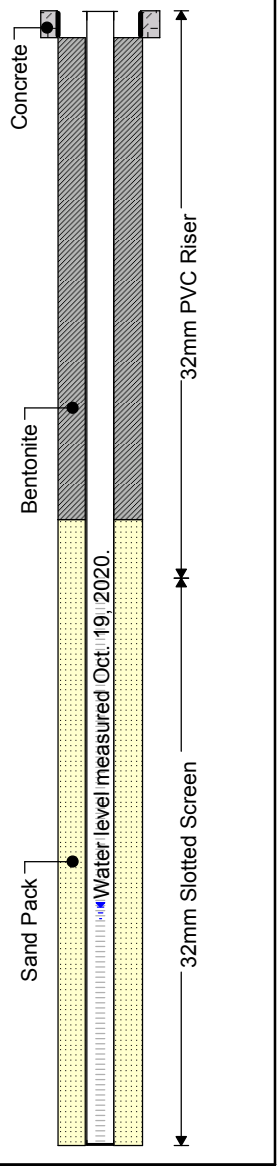
Drilling Contractor: Direct Environmental Drilling Ltd.

Drill Rig: Geoprobe

Drill Method: Direct Push

Protective Cover: Flushmount

Depth (ft)	Depth (m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	Headspace PID (ppm)	Headspace Hydrocarbon (ppm)
			Ground Surface	359.5						
0	0		**TOPSOIL** Dark brown silty topsoil with trace organics and some gravel, damp.	0.0						
					1	DP	100		0	
				358.5						
			CLAYEY SILT TILL Medium brown silty clay till, some trace gravel, damp.	1.1						
									0	
					2	DP	100			
	2			356.8						
			Till becomes slightly darker brown, moist.	2.7						
					3	DP	100			
	4			354.7						
			Till turns grey, wet.	4.9						
					4	DP	100	PHC F1-F4, BTEX	0	
	6			353.4						
				6.1						



Field Technician: JMS

Drafted by: JMS

Reviewed by: RMR

No odour or staining unless otherwise noted.

ID Number: BH305A-20

Project: Phase II ESA

Project No: 40777-200

Client: Snyders Road (Baden) Developments Inc.

Site Location: 1012 Snyders Road West, Baden, ON

Drill Date: 10/15/2020

Drilling Contractor: Direct Environmental Drilling Ltd.

Drill Rig: Geoprobe

Drill Method: Direct Push

Protective Cover: None

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Recovery (%)	Soil Sample Lab Analysis	Headspace: PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	Well Completion Details
0 ft / 0 m		Ground Surface	360.6						
		TOPSOIL Dark brown silty topsoil with trace organics, moist.	0.0 / 360.3						
		SAND AND GRAVEL Medium brown sand and gravel, dry.	0.3	1	DP	100	PHCs F1-F4, BTEX	0	
4		**CLAY TILL** Dark grey clay till, moist.	359.2 / 1.4						
6 / 2		Slight hydrocarbon-like odour noted, clay till becomes wet to saturated.	358.7 / 1.8	2	DP	100	PHCs F1-F4, BTEX	0	
10 / 4		Drilling Terminated	357.5 / 3.0						Bentonite
20 / 6									

Field Technician: JMS

Drafted by: JMS

Reviewed by: RMR

No odour or staining unless otherwise noted.

ID Number: MW302-20

Project: Phase II ESA

Project No: 40777-200

Client: Snyders Road (Baden) Developments Inc.

Site Location: 1012 Snyders Road West, Baden, ON

Drill Date: 11/9/2020

Drilling Contractor: Direct Environmental Drilling Ltd.

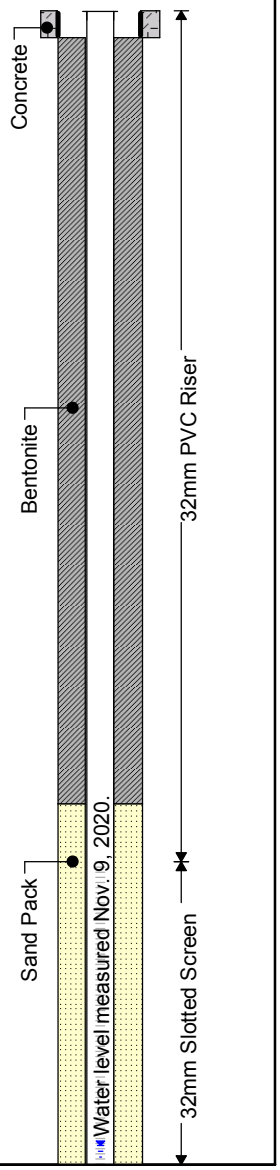
Drill Rig: Geoprobe

Drill Method: Direct Push

Protective Cover: Monument

Depth (ft)	Depth (m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	Headspace PID (ppm)	Headspace Hydrocarbon (ppm)
			Ground Surface	358.6						
0	0		**TOPSOIL** Dark brown silty topsoil with trace organics and some gravel, damp.	0.0 / 358.3 / 0.3					0	0
2			**SILTY CLAY TILL** Medium brown silty clay till, some trace gravel, damp.		1	DP	100			
4										
6	2				2	DP	100			
8										
10										
12	4				3	DP	100			
14										
16										
18					4	DP	100			
20	6		Till becomes grey, slightly wet.	352.7 / 5.9						

Well Completion Details



Field Technician: JMS

Drafted by: JMS

Reviewed by: RMR

No odour or staining unless otherwise noted.

ID Number: MW302-20

Project: Phase II ESA

Project No: 40777-200

Client: Snyders Road (Baden) Developments Inc.

Site Location: 1012 Snyders Road West, Baden, ON

Drill Date: 11/9/2020

Drilling Contractor: Direct Environmental Drilling Ltd.

Drill Rig: Geoprobe

Drill Method: Direct Push

Protective Cover: Monument

Subsurface Profile			Sample					Headspace	Well Completion Details
Depth	Symbol	Soil Description	Elevation (masl) Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm 20 40 60 80 / Hydrocarbon ppm 100 200 300 400	
22				5	DP	100	Metals, As, Sb, Se, PHC F1-F4, VOCs	0	
24			351.0						
		Drilling Terminated	7.6						
26	8								
28									
30									
32									
34	10								
36									
38									
40	12								

Field Technician: JMS

Drafted by: JMS

Reviewed by: RMR

No odour or staining unless otherwise noted.

ID Number: MW305B-20

Project: Phase II ESA

Project No: 40777-200

Client: Snyders Road (Baden) Developments Inc.

Site Location: 1012 Snyders Road West, Baden, ON

Drill Date: 11/9/2020

Drilling Contractor: Direct Environmental Drilling Ltd.

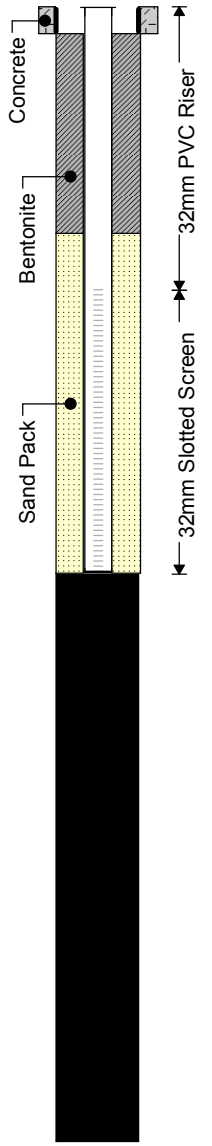
Drill Rig: Geoprobe

Drill Method: Direct Push

Protective Cover: Monument

Depth (ft)	Depth (m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	Headspace PID (ppm)	Headspace Hydrocarbon (ppm)
			Ground Surface	360.6						
0	0		**TOPSOIL** Dark brown silty topsoil with trace organics and some gravel, damp.	0.0 / 360.3					0	
2			**SAND AND GRAVEL** Medium brown sand and gravel, moist.	0.3	1	DP	50			
4				359.2						
6	2		**SILTY CLAY TILL** Medium brown silty clay till, moist.	1.4				PHCs F1-F4, BTEX	0	
8			Till becomes grey, wet.	358.4 / 2.1	2	DP	75			
10			Till becomes brown-grey, damp.	357.5 / 3.0	3	DP	90			
12	4									
14										
16					4	DP	90			
18			**SAND** Grey coarse sand, wet.	355.1 / 5.5						
20	6			354.5 / 6.1						

Well Completion Details



Field Technician: JMS

Drafted by: JMS

Reviewed by: RMR

No odour or staining unless otherwise noted.

Sheet: 1 of 1

GEOTECHNICAL INVESTIGATION
PROPOSED RESIDENTIAL SUBDIVISION
1012 SNYDER'S ROAD WEST
BADEN, ONTARIO

for

SNYDER'S ROAD (BADEN) DEVELOPMENTS INC.
c/o MTE CONSULTANTS INC.

PETO MacCALLUM LTD.
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1 cc: Snyder's Road (Baden) Developments Inc. (+email)
2 cc: MTE Consultants Inc. (+email)
1 cc: PML Kitchener

PML Ref.: 20KF006
Report: 1
August 5, 2020

Peto MacCallum Ltd.
CONSULTING ENGINEERS

August 5, 2020

PML Ref.: 20KF006
Report: 1

Snyder's Road (Baden) Developments Inc.
c/o Mr. Alex Cressman, E.I.T.
MTE Consultants Inc.
520 Bingemans Centre Drive
Kitchener, Ontario
N2B 3X9

Dear Mr. Cressman

Geotechnical Investigation
Proposed Residential Subdivision
1012 Snyder's Road West
Baden , Ontario

Peto MacCallum Ltd. (PML) is pleased to report the results of the geotechnical investigation recently completed at the above noted project site. Authorization to proceed with this assignment was provided by Mr. Gougoulias of Snyder's Road (Baden) Developments Inc. in an email dated February 3, 2020, with a signed engineering services agreement to be returned.

Project Description

The project involves the proposed development of an approximately 20.7 ha, rectangular parcel of land that is located on the north side of Snyder's Road West in Baden, Ontario. It is understood that development plans currently include approximately 10.34 ha of single-detached dwellings, 0.77 ha of multiple residential units, a school and a stormwater facility that will be located near the western property limit. The development will also include the construction of six new roads, and will be serviced with watermains, storm sewers and sanitary sewers, which are expected to be at a maximum of 3 to 4 m depth.

The purpose of the geotechnical investigation was to explore the subsurface soil and ground water conditions at the site. Based on the findings, we have prepared an engineering report with geotechnical recommendations pertaining to design and construction of the proposed works.

It is noted that a hydrogeological investigation was previously completed by MTE Consultants Inc. (MTE) in 2019. Reference is made to their Project No: 40777-800 for details. Borehole and monitoring well data from their investigation has been utilized during the geotechnical investigation; the MTE borehole / monitoring well logs are presented in Appendix A for ease of reference.

The comments and recommendations provided in this report are based on the site conditions at the time of the investigation, and are for preliminary design purposes only. Any changes in plans will require review by PML to assess the applicability of the report, and may require modified recommendations, additional analysis and / or investigation. When the project design is complete, the general recommendations given in this report should be reviewed to ensure their applicability.

Investigation Procedure

Fieldwork

The fieldwork for the current geotechnical investigation was completed between February 20 and February 24, 2020. Boreholes were drilled at twelve locations (BH1 to BH12) as shown on the appended Borehole Location Plan, Drawing 1. In addition, four dynamic cone penetration tests (DCPT) were conducted at locations where the previous MTE boreholes revealed soft / loose subgrade conditions.

The boreholes and dynamic cones were advanced using a CME 55 track mounted drill rig equipped with an automatic hammer and continuous flight hollow stem augers. The drilling equipment was supplied and operated by specialist contractors working under subcontract to PML. The fieldwork was supervised throughout by a member of PML's engineering staff who directed the drilling and sampling operation, prepared the stratigraphic logs, monitored ground water conditions, and processed the recovered samples.

Representative samples of the overburden were recovered at regular intervals throughout the depths explored. Standard penetration tests (SPT) were carried out during sampling operations of the boreholes using conventional split spoon equipment.

Ground water observations were made in the boreholes during and upon completion of drilling. The boreholes were backfilled and compacted in accordance with O.Reg.903 upon completion of drilling.

The borehole locations were established in the field by PML in order to supplement the borehole information previously obtained by MTE. The borehole locations and geodetic elevations were surveyed with a Sokkia GCX3 Real Time Kinematic receiver connected to the Global Navigation Satellite System.

Laboratory Testing

All soil samples collected during the investigation were returned to PML's laboratory for detailed visual examination and testing. The geotechnical testing program included natural moisture content determinations on all recovered split spoon samples. In addition, four particle size distribution analyses were completed on samples of the major subgrade soil types encountered.

Summarized Findings

The site is a 20.7 ha, rectangular shaped piece of land that is currently vacant, and was formerly occupied as agricultural land with associated buildings now demolished. In general, the site is relatively flat with gentle rolling hills. Geodetic elevations between 363.0 and 359.0 indicate that the surface topography slopes very slightly to the south; however, local hills and depressions were observed throughout the site.

Subsurface Conditions

Reference is made to the appended Log of Borehole sheets for details of the fieldwork including soil descriptions, inferred stratigraphy, standard penetration test (SPT) N values, ground water observations and laboratory moisture content determinations.

Due to the soil sampling procedures and the limited size of samples, the depth / elevation demarcations on the borehole logs must be viewed as "transitional" zones, and cannot be construed as exact geologic boundaries between layers.

In general, the subsurface conditions encountered at the borehole locations consisted of surficial topsoil overlying native clayey silt and / or sand deposits. Deep layers of fill and organics were contacted within a former pond area near the former site structures (BH6 to BH8). The findings were generally similar to MTE's findings, where discontinuous cohesive and cohesionless deposits were contacted.

Topsoil / Topsoil Fill

Between 140 and 360 mm of surficial clayey silt topsoil / topsoil fill (average topsoil depth of 265 mm) was typically contacted in the PML boreholes, with a local maximum depth of 600 mm contacted in BH6 (near the former pond). The topsoil was typically moist, or frozen with trace sand and trace gravel.

Fill

Underlying the topsoil, fill was contacted in BH6, BH7 and BH8, extending to depths of between 2.1 and 3.1 m below grade. Fill was not contacted elsewhere at the site, or in the MTE boreholes; however, it is noted that some debris piles were observed near the former structures. The fill material contacted was placed to fill a pond that was located near the former structures, and was typically comprised of dark brown to brown, or mottled brown and grey clayey silt. Organics and roots were observed within the fill contacted in BH7.

Within the fill, SPT N values typically between 0 (weight of hammer) to 7 blows per 0.3 m penetration of the split spoon sampler indicate that minimal compactive effort was used to place the fill soils. The moisture content of the fill deposit was typically observed to be about plastic limit (APL), with moisture contents typically in the range of 21 to 30%. Higher moisture contents of 32 to 61% within the fill deposit in BH7 are indicative of the presence of organic materials.

Native Clayey Silt / Clayey Silt Till

A major deposit of clayey silt / clayey silt till was contacted in 11 of the PML boreholes (other than BH1). Where contacted, the deposit was immediately underlying the surficial topsoil and fill deposits, extending to the borehole termination depths of 5.0 to 8.1 m below grade (Elevation

350.93 to 355.02 m) in seven of the boreholes, and extended to depths of 2.4 to 4.6 m (Elevation 356.06 to 360.51 m) in the other four boreholes. The layer was typically described as brown, becoming grey with depth, with trace sand and trace gravel observed. Wet sand seams and occasional silt lenses were observed throughout the deposit.

The clayey silt deposit was typically stiff to very stiff, based on SPT N values typically between 7 and 38 blows per 0.3 m penetration of the split spoon sampler. However, the deposit was observed to be very soft to soft under the fill in the boreholes located in the former pond area. Pocket penetrometer readings indicated that the estimated undrained shear strength of the deposit was between 50 and 225 kPa.

Moisture contents in the range of 10 to 27% were indicative of typically drier than plastic limit (DTPL) to APL conditions in the cohesive soils. Moisture contents of up to 33% under the fill are indicative of wetter conditions under the former pond. As noted, frequent water bearing sand seams or layered sand deposits were observed throughout the deposit.

Reference is given to the appended Figures 1 and 2 attached for the results of particle size distribution analyses conducted on representative samples of the native clayey silt soils contacted in the boreholes. Based on the results, the soil classification was generally consistent with those observed during the fieldwork as included in the appended Log of Borehole sheets.

Native Cohesionless Soil Deposits

Underlying the topsoil in BH1, and underlying the clayey silt in BH5, BH6, BH9 and BH11, a layer of cohesionless sand / silty sand was contacted, extending to the borehole termination depths of 8.1 m below grade (Elevation 351.94 to 355.41 m) in all five boreholes. The layer typically included trace to some silt, other than in BH1 below 4.6 m depth, where it was described as silty sand. Occasional silt / clayey silt seems were observed within the deposit.

The cohesionless sands were generally compact to very dense based on SPT N values typically between 10 and 74 blows per 0.3 m penetration of the split spoon sampler. However, isolated very loose to loose zones were observed in BH1, BH5 and BH6.

The deposit was typically observed to be moist to wet, as confirmed by moisture contents in the range of 2 to 22%. It is noted that higher moisture contents are likely indicative of the presence of silty seams in the deposit.

Reference is given to the appended Figures 3 to 4 attached for the results of particle size distribution analyses conducted on representative samples of the native sand soils contacted in the boreholes. Based on the results, the soil classification was generally consistent with those observed during the fieldwork as included in the appended Log of Borehole sheets.

Ground Water Conditions

Ground water observations carried out during and upon completion of drilling are fully summarized on the appended Log of Borehole Sheets.

Ground water was contacted during, or after drilling in five of the boreholes, with contact observed between 4.4 and 7.7 m, corresponding to elevations of between 351.83 and 360.06 (metric, geodetic). In general, the ground water was observed in the layered sands that were contacted in the clayey silt deposits, and likely exist in a perched condition. The long-term stabilized ground water level is likely below the explored borehole depths.

It is noted that MTE installed monitoring wells in all of their boreholes (with nested wells installed in BH106). Ground water measurements taken in the monitoring wells on May 13, 2019 revealed ground water depths typically between 4.5 and 9.9 m below grade, corresponding to Elevation 350.3 to 354.6 m.

The ground water levels at the site are subject to seasonal fluctuations and precipitation patterns.

Discussion and Recommendations

The project involves the proposed development of an approximately 20.7 ha, rectangular parcel of land that is located on the north side of Snyder's Road West in Baden, Ontario. It is understood that development plans currently include approximately 10.34 ha of single-detached dwellings, 0.77 ha of multiple residential units, a school and a stormwater facility that will be located near the

western property limit. The development will also include the construction of six new roads, and will be serviced with watermains, storm sewers and sanitary sewers, which are expected to be at a maximum of 3 to 4 m depth.

It is noted that at the time of this report, the proposed development details were preliminary only. Once the design details for the proposed development are finalized, the recommendations in this report should be revisited to confirm that they remain applicable.

In general, the subsurface conditions encountered at the borehole locations consist of surficial topsoil overlying native clayey silt / clayey silt till and / or sand. Ground water was occasionally contacted at variable depths, and is likely in a perched condition where contacted.

Site Grading

As noted, the site is relatively flat, with typical site grades ranging from Elevation 359.0 to 363.0 across the site. Due to the presence of gently rolling hills, some earthworks including cut and fills, will likely be required to facilitate the development.

Based on the subsurface soil and ground water conditions encountered in the boreholes, construction of a residential subdivision is generally considered feasible. However, the insitu fill contacted in BH6, BH7 and BH8 would not be considered suitable for the support of building foundations, floor slabs, pavements, or other settlement sensitive structures. In this regard, the insitu fill should be completely subexcavated from beneath any settlement sensitive structures or pavements and replaced with well compacted suitable engineered fill materials.

Following the stripping / removal of the surficial topsoil / topsoil fill, and subexcavation of the remaining insitu fill, where applicable, and any other deleterious material, and approval of the subgrade, the grades may then be raised where required. Surficial topsoil fill thicknesses across the site were typically between 140 and 360 mm thick, with a local maximum of 600 mm contacted in BH6. In calculating the approximate quantities of topsoil fill to be stripped, we recommend that the topsoil thickness on the individual borehole logs be increased by 50 mm to account for variations and some stripping of the underlying soils.

Prior to any fill placement, the exposed subgrade should be proofrolled with a heavy vibratory compactor under the full-time supervision of qualified geotechnical personnel. Any soft spots encountered during the proofrolling process should be subexcavated to the level of competent soils and backfilled with lean concrete or approved engineered fill.

Fill used to raise grades should comprise either on-site native inorganic cut soils (if available) or approved imported material. All engineered fill materials should be pre-approved by the geotechnical consultant prior to placement. Engineered fill material should be placed in maximum 300 mm thick lifts and compacted to at least 98% standard Proctor maximum dry density (SPMDD) below footings and 95% SPMDD below floors and pavements.

Further details pertaining to design, approvals, and construction and inspection requirements for engineered fill are presented in Appendix B of this report.

It is noted that materials generated from grade cuts will generally consist of insitu clayey silt materials, which will be reusable on a selective basis. The clayey silt soils contacted are frost susceptible and highly susceptible to moisture content variations, and compaction to 98% SPMDD may be difficult to achieve. However, these soils, should be acceptable for use as engineered fill where compaction to 95% SPMDD is specified providing that some drying of the clay soils can be accommodated. The sandy soils contacted in BH1 are expected to generally be reusable.

House Construction

Foundations

For preliminary design purposes, conventional strip/spread footings founded at least 0.30 m into the competent (compact to dense) native sand, firm to stiff native clayey silt, or on engineered structural fill placed on the competent soils and compacted to 98% SPMDD, may be designed for a net bearing resistance of 150 kPa at the serviceability limit state (SLS) and a factored bearing resistance of 225 kPa at the ultimate limit state (ULS).

Footings at shallower depths may be designed for a reduced net bearing resistance of 75 kPa at the SLS and 110 kPa at the ULS if footings are placed on the very loose to loose or very soft to soft soils, at the below depths.

Alternatively, consideration could be given to supporting structures on helical piers advanced into the competent soil substrata. Further commentary could be provided, if required.

The minimum founding depths for each option at each borehole location are presented in the following table:

BOREHOLE LOCATION	MINIMUM FOUNDING DEPTH (m) / ELEVATION	
	75 kPa SLS 110 kPa ULS	150 kPa SLS 225 kPa ULS
1	0.5 / 362.0	3.0 / 359.5
2	--	0.5 / 358.5
3	--	0.5 / 361.8
4	0.5 / 360.8	1.1 / 360.2
5	0.5 / 359.5	3.3 / 356.7
6	2.4 / 357.7	6.4 / 353.7
7	3.4 / 356.6	4.1 / 355.9
8	--	6.4 / 353.7
9	--	0.5 / 363.0
10	--	1.1 / 358.6
11	--	1.1 / 360.6
12	--	1.1 / 358.7
MTE 101-19	0.5 / 357.1	1.8 / 355.8
MTE 102-19	--	1.1 / 357.8
MTE 103-19	--	1.1 / 357.9
MTE 104-19	--	1.1 / 360.1
MTE 105-19	0.5 / 361.3	3.3 / 358.5
MTE 106-19	0.5 / 360.2	2.6 / 358.1

Where required, the footings may be supported on engineered structural fill, placed in accordance with the site grading recommendation above, and the general recommendations for engineered fill construction provided in Appendix B. Prior to placement of engineered fill, all existing deleterious soils and existing basements / foundations must be removed and the soils should be subexcavated to the level of competent native soils as described above. For engineered fill supporting footing loads, compaction to a minimum 98% of the materials SPMDD, should be specified as per recommendations outlined in the preceding 'Site Grading' section of this report and in Appendix B.

Total settlements of footings founded on the approved engineered fill or native deposits, designed as outlined above, are not expected to exceed 25 mm, with differential settlements between footings being no more than 75% of this value.

All exterior footings should be provided with a minimum 1.2 m of earth cover or the thermal insulation equivalent to provide adequate insulation against potential frost damage. A 25 mm thick layer of polystyrene insulation is thermally equivalent to 600 mm of soil cover.

Full time inspection of any structural fill placement by PML personnel is recommended to approve subgrade conditions, fill materials and to verify that the specified compaction levels are being achieved. Prior to concrete placement, all founding surfaces should be examined by PML personnel to check the competency of the founding surfaces.

For earthquake design, a site Class D seismic response classification may be assumed for the site, in accordance with the Ontario Building Code.

Basement / Slab-on-Grade Floors

Slab-on-grade floor construction is considered feasible on competent native deposits or approved structural fill compacted to 95%, provided the site grading recommendations above are followed.

Preparation of the floor slab subgrade should include stripping of the topsoil, and other deleterious material, followed by proofrolling of the exposed subgrade with a heavy roller to ensure uniform

adequate support. Excessively loose, soft or compressible materials revealed during the proofrolling operations should be subexcavated and replaced with well compacted, approved material.

Fill placed under the floor slab to achieve finished subgrade levels or as foundation excavation backfill should comprise approved inorganic material having a moisture content within 3% of the optimum value, placed in maximum 200 mm thick lifts, and compacted to at least 95% of SPMDD.

A minimum 150 mm thick layer of well compacted clear stone (or equivalent) is recommended directly beneath the slab-on-grade. A polyethylene vapour barrier should be placed at the surface of the stone if a moisture sensitive finish is to be placed on the floor.

For slab-on-grade (basementless) structures, exterior grades should be maintained at least 150 mm below the finished floor slab-on-grade level and sloped to promote drainage away from the building.

Foundation Drainage and Earth Pressure Parameters

Foundation drainage measures should be provided for units with basements.

A "free draining" granular material, or an equivalent, approved drainage board product must be provided for the basement walls, in accordance with the Ontario Building Code. In general, the on-site native soils will not be suitable for use as basement wall backfill, unless a drainage board product is provided. Backfilling should not take place until the ground floor has been constructed, in order to provide lateral support for the wall.

In conjunction with the granular material, a weeping tile system should be installed to minimize the build-up of hydrostatic pressure behind the wall. The weeping tile should be surrounded by a properly designed graded granular filter or wrapped with approved geotextile to prevent migration of fines into the system. The drainage pipe should be placed on a positive grade and lead to a frost-free sump or outlet.

The following earth pressure design parameters may be assumed for calculation of backfill materials compacted to 95% SPMDD.

PARAMETER	OPS GRANULAR B
Angle of Internal Friction (degrees)	32
Unit Weight (kN/m^3)	21
Coefficient of Active Earth Pressure (K_a)	0.30
Coefficient of Earth Pressure At Rest (K_o)	0.47
Coefficient of Passive Earth Pressure (K_p)	3.23

Note: Earth pressure coefficients assume Rankin analysis (wall friction ignored, non-sloping backfill)

Excavations

It is assumed that excavation for footings and service trenches will typically extend through the surficial topsoil and native soils (clayey silt and sand), which are classified as Type 3 materials as defined in the Occupational Health and Safety Act (OHSA). Subject to inspection and providing adequate ground water control is achieved, excavations within Type 3 soils that are to be entered by workers should be inclined from the base of the excavation at one horizontal to one vertical (1H:1V) or flatter.

It is noted that the very loose / very soft material in BH6, BH7 and BH8 would be classified as a Type 4 material. In this regard, subject to inspection and providing adequate ground water control is achieved, excavations within Type 4 soils that are to be entered by workers should be inclined from the base of the excavation at three horizontal to one vertical (3H:1V) or flatter.

Workers should not enter an unprotected excavation if there is evidence of ongoing ground water seepage in the banks.

Dewatering

Ground water was contacted during, or after drilling in five of the geotechnical boreholes, with contact observed between 4.4 and 7.7 m, corresponding to elevations of between 351.83 and 360.06 (metric, geodetic). Ground water was also contacted in the MTE monitoring wells, and ground water measurements taken on May 13, 2019 revealed ground water depths of between 4.5 and 9.9 m below grade, corresponding to Elevation 350.3 to 354.6 m. Much of the ground water is expected to be perched in wet or saturated sand seems within the clayey soils.

The extent of ground water control will depend on the depth of excavation below the ground water level. Shallow excavations extending less than 1.0 m below the ground water level can be dewatered using conventional sump pumping techniques. Deeper excavations, extending more than 1.0 m below the ground water level may require extensive ground water control measures.

The actual dewatering methods should be established at the contractor's discretion within the context of a performance specification for the project. Regardless of the dewatering method chosen, the hydraulic head and ground water inflow must be properly controlled to ensure a stable and safe excavation and to facilitate construction. The design of the dewatering system should be specified to maintain and control ground water at least 0.50 m below the excavation base level, in order to provide a stable excavation base throughout construction.

It should be noted that under the Ontario Water Resources Act, the Water Taking and Transfer Regulation 387/04, and in compliance with the Ministry of Environment, Conservation and Parks (MECP) policy and Permit to Take Water (PTTW) Manual (April 2005), an application should be filed to the MECP for the subject project construction dewatering PTTW, if the dewatering discharge is greater than 400,000 L/day, or about 4.6 L/s. If the dewatering discharge is between 50,000 L/day (or about 0.6 L/s) and 400,000 L/day (or about 4.6 L/s), dewatering activities need to be registered on the Environmental Activity and Sector Registry (EASR). The need for an EASR or a PTTW will depend on excavation depths, but it is not considered likely based on the preliminary assumptions. Reference is made to MTE's hydrogeological report for more information.

At the time of tendering, test pits should be excavated on site to allow prospective contractors to judge the ground water conditions and to determine the appropriate control methods required closer to the time of construction. Ground water conditions are subject to seasonal variations. In this regard, a later summer construction schedule would be preferable.

Pipe Bedding and Backfilling

In general, no bearing problems are anticipated for pipes founded in the native mineral soils encountered at the site, or on structural fill. Localized areas of very loose / soft or otherwise deleterious soils should be anticipated under the proposed roadways, and in these areas it will be necessary to subexcavate the deleterious soils and place additional bedding material below the pipe.

On stable subgrade, a minimum 150 mm thick bedding course of Granular A material compacted to 95% SPMDD is recommended beneath the pipes. The Granular A material should extend around the pipe to at least 300 mm above the pipe obvert or as set out by Ontario Provincial Standards (OPS), or the local authority. Material containing stones larger than 50 mm size should not be used in the bedding or cover layers.

Foundation backfill and backfill below pavements, floor slabs (interior backfill) and other settlement sensitive features, should be similarly compacted to 95% SPMDD. Backfill should be placed in 300 mm maximum lifts. Material that is too wet for compaction to a minimum of 95% SPMDD should be allocated for use in landscaped / non settlement sensitive locations, and compacted to at least 90% SPMDD.

It is noted that the on-site soils are predominantly silty and as such, are frost susceptible and should not be used at locations where frost heave movement could have adverse effects, such as at exterior doors and the like. In addition, it is noted that the clayey silt materials will tend to retain a voided structure when placed as fill. It will be particularly important to ensure that sufficient compaction is applied to break down all lumps / clods within the fill matrix to achieve a non-voided condition. Significant post-construction settlement could otherwise result.

Fill placed against structures should be brought up simultaneously on all sides of the structure to minimize the potential for movement and/or damage during construction. Furthermore, the use of heavy equipment adjacent to structures should be prohibited.

Should construction extend to the winter months, care must be taken to ensure that frozen material is not used as backfill.

The trenching and backfilling operations should be carried out in a manner which minimizes the length of trench left open yet accommodates efficient pipe laying and compaction activities.

Pavement Construction

Based on the anticipated traffic patterns, frost susceptibility, and strength of the expected subgrade soils, the following pavement component thicknesses are considered suitable for local residential / parking lots and minor collector traffic categories, provided all fills with organics or otherwise deleterious soils are removed.

PAVEMENT COMPONENT	**THICKNESS (mm)**	
	Residential Collector Streets	**Local Residential Streets or Parking Lots**
Asphalt	100	80
Granular A Base	150	150
Granular B Subbase	450	350

The flexible pavement designs provided above consider that construction will be carried out during the drier time of the year and the subgrade is stable, as determined by proofrolling inspected by PML personnel. If the subgrade is wet and unstable, additional granular subbase will be required.

The pavement materials should conform to current OPS specifications. The Granular A base and Granular B subbase courses should be placed in thin lifts and compacted to a minimum of

100% SPMDD, and asphalt should be placed to a minimum of 92% of the material's maximum relative density (MRD). Reference is made to OPS Specification 310, as revised.

During construction, testing should be conducted to confirm the gradation and compactibility characteristics of the granular base and subbase materials and the mix design properties of the asphalt.

Proofrolling procedures and the placement and compaction of all the fill and granular materials and asphalt for the pavement construction and backfilling at the site should be inspected on a continuous basis by PML technicians.

Longitudinal pavement subdrains should be provided to prevent water accumulation on the pavement subgrade surface. The subgrade should be graded so that water is directed to the subdrains. Subdrains should be discharged into the catch basins. The subdrains may consist of filter wrapped, 100 mm diameter perforated plastic pipe, set within the subbase layer at the subgrade surface.

Soil Permeability

For preliminary planning purposes, soil infiltration rates for storm water management (SWM) were determined for the major near surface soil units and are as follows:

SOIL TYPE	ESTIMATED COEFFICIENT OF PERMEABILITY (cm/sec)	STORM WATER INFILTRATION RATE (mm/hr)
Sand	1×10^{-3}	30
Clayey Silt	$< 1 \times 10^{-6}$	< 1

Any SWM ponds or infiltration galleries should be inspected by PML personnel during construction to verify the presence of a suitable subgrade. In general, the slopes of any storm water

management ponds should be constructed at 5H:1V or shallower and be provided with vegetation cover to minimize the potential for erosion and sloughing of the side slopes.

Ancillary Considerations

It is recommended that the design drawings be submitted to PML for general geotechnical review for compatibility with site conditions and recommendations of this report.

Earthworks operations should be carried out under the supervision of PML to approve subgrade preparation, backfill materials, placement and compaction procedures, and verify the specified degree of compaction is achieved uniformly throughout fill materials.

The comments and preliminary recommendations provided in this report are based on the information revealed in the boreholes. Conditions away from and between boreholes may vary. Geotechnical review during construction should be ongoing to confirm that the subsurface conditions are substantially similar to those encountered in the boreholes, which may otherwise require modifications to the original recommendations.

All soil samples obtained during this investigation will be stored at PML's laboratory for three months, after which time they will be discarded unless prior arrangements are made.

Closure

This assignment is subject to the Statement of Limitations that is included in Appendix C and must be read in conjunction with this report.

We trust this report has been completed within our terms of reference, and is sufficient for your immediate requirements. If you have any questions or require further information, please do not hesitate to contact our office.

Sincerely

Peto MacCallum Ltd.

Ken Hanes, P.Eng.
Project Engineer
Geotechnical and Geoenvironmental Services

Scott Jeffrey, P.Eng., $LEED_{GA}$
Associate
Regional Manager, Geotechnical Services

KH:kh

Enclosures:
Figures 1 to 4 – Particle Size Distribution Charts
List of Abbreviations
Log of Boreholes 1 to 12
Drawing 1 – Borehole Location Plan
Appendix A – MTE Consultants Inc. Borehole and Monitoring Well Logs
Appendix B – Engineered Fill
Appendix C – Statement of Limitations

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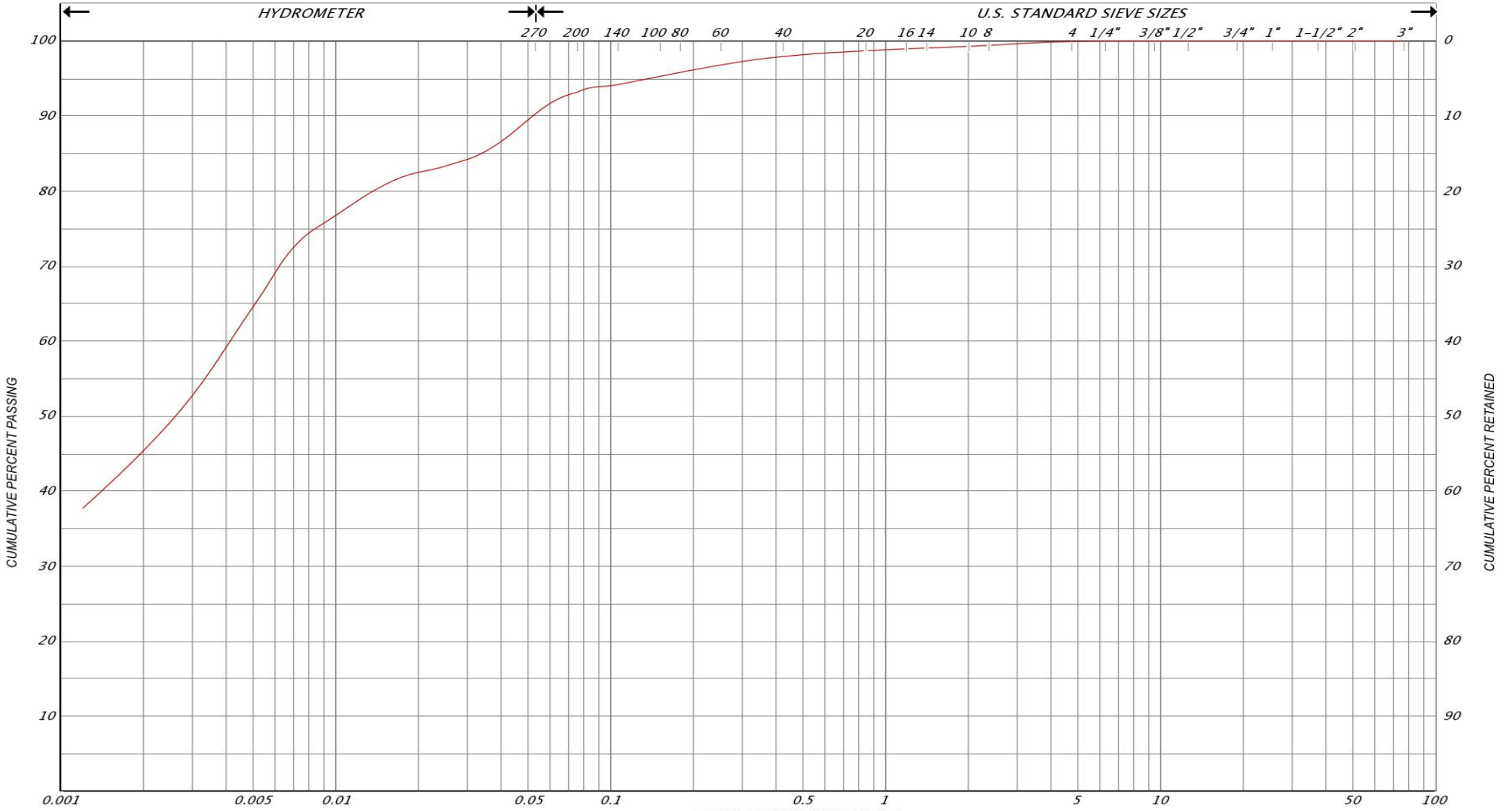
PROJECT NO.20KF006
FIGURE NO. 1

PARTICLE SIZE DISTRIBUTION CHART



REMARKS: Borehole 10, Sample SS3, Depth 1.5 to 2.0 m

CLAYEY SILT, TRACE SAND, TRACE GRAVEL

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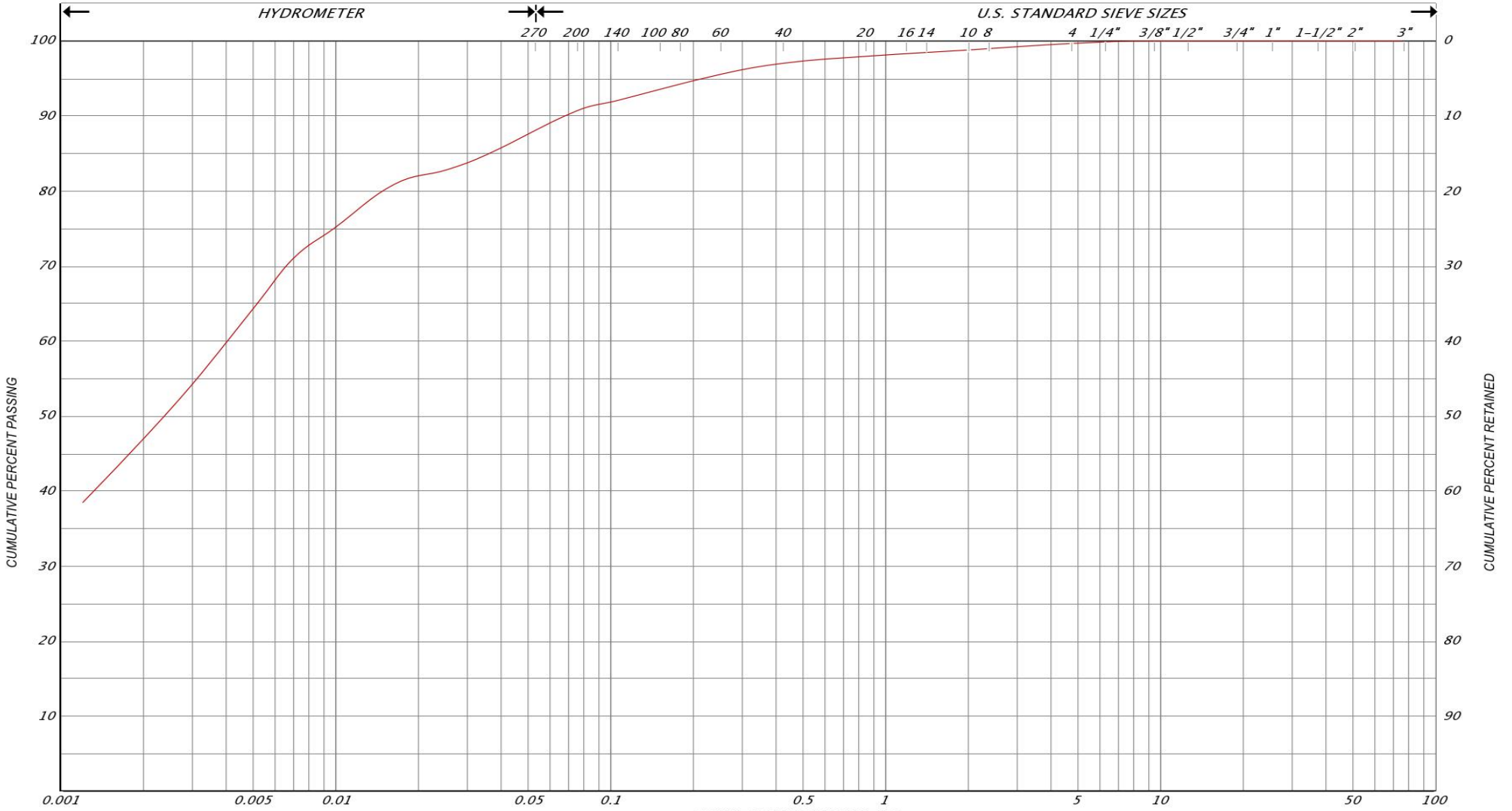
PROJECT NO.20KF006
FIGURE NO. 2

PARTICLE SIZE DISTRIBUTION CHART



SILT & CLAY				FINE	MEDIUM	COARSE	GRAVEL			COBBLES	UNIFIED
				SAND							
CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	GRAVEL			COBBLES	M.I.T
	SILT			SAND							
CLAY	SILT			V.FINE	FINE	MED.	COARSE	GRAVEL			US BUREAU
				SAND							

REMARKS: Borehole 12, Sample SS3, Depth 1.5 to 2.0 m

CLAYEY SILT, TRACE SAND, TRACE GRAVEL

PML Peto MacCallum Ltd.
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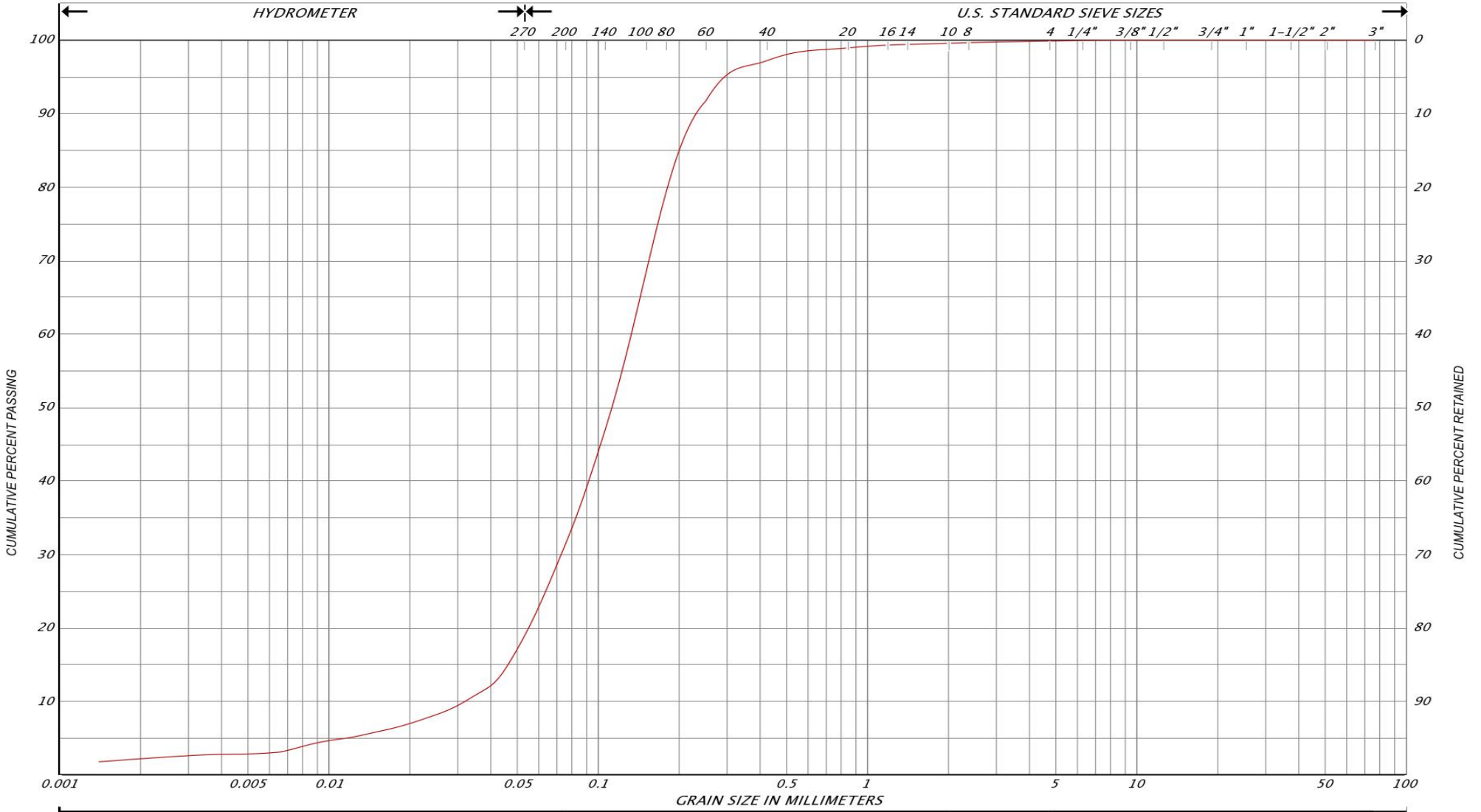
PROJECT NO.20KF006
FIGURE NO. 3

PARTICLE SIZE DISTRIBUTION CHART



REMARKS: Borehole 1, Sample SS3, Depth 1.5 to 2.0 m

SAND, SOME SILT, TRACE GRAVEL

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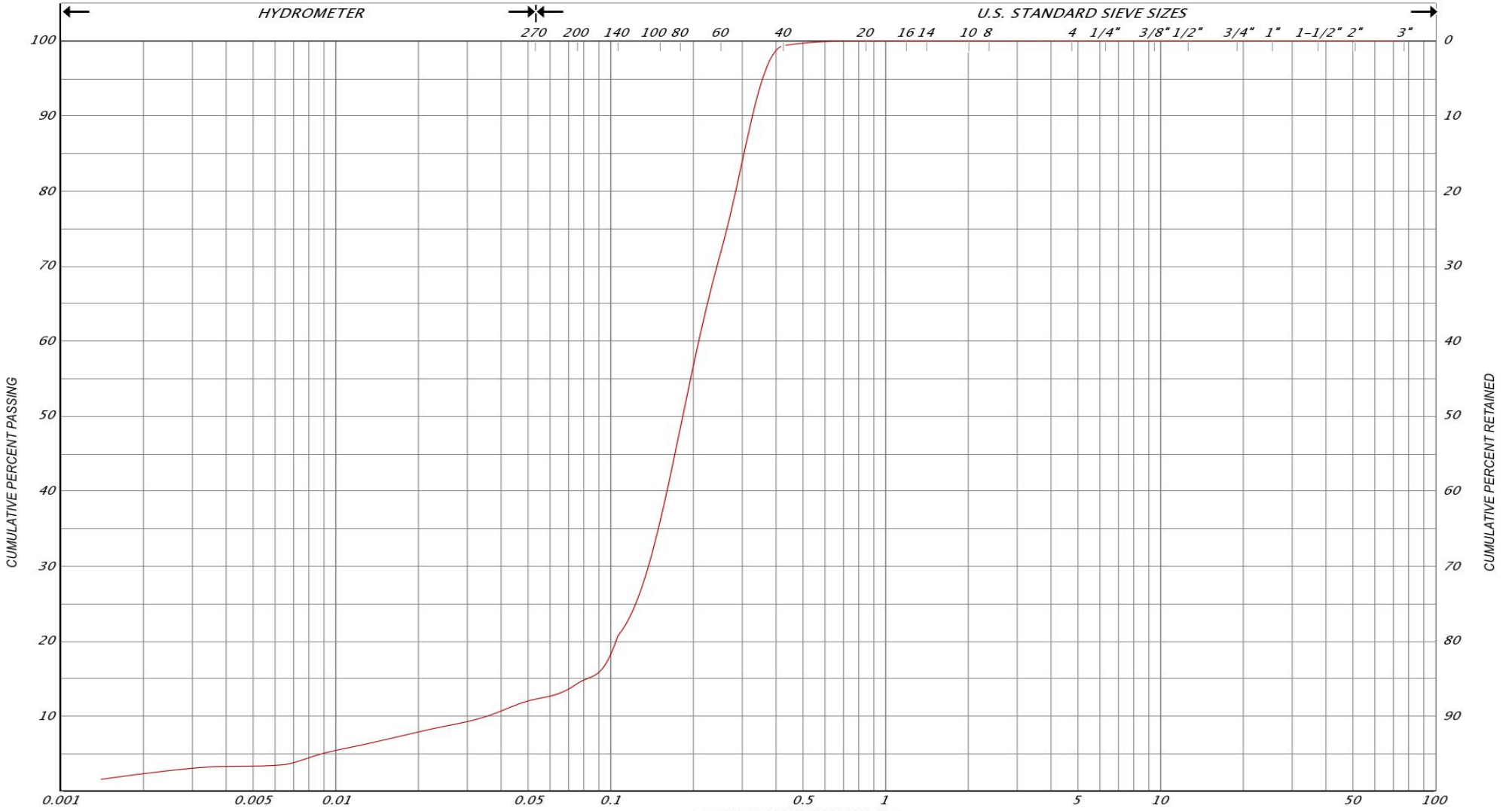
PROJECT NO.20KF006
FIGURE NO. 4

PARTICLE SIZE DISTRIBUTION CHART



REMARKS: Borehole 5, Sample SS5, Depth 3.05 to 3.5 m

SAND, SOME SILT

LIST OF ABBREVIATIONS

PENETRATION RESISTANCE

Standard Penetration Resistance N: - The number of blows required to advance a standard split spoon sampler 0.3 m into the subsoil. - Driven by means of a 63.5 kg hammer falling freely a distance of 0.76 m.

Dynamic Penetration Resistance: The number of blows required to advance a 51 mm, 60 degree cone, fitted to the end of drill rods, 0.3 m into the subsoil. The driving energy being 475 J per blow.

DESCRIPTION OF SOIL

The consistency of cohesive soils and the relative density or denseness of cohesionless soils are described in the following terms:

CONSISTENCY	N (blows/0.3 m)	c (kPa)	DENSENESS	N (blows/0.3 m)
Very Soft	0 - 2	0 - 12	Very Loose	0 - 4
Soft	2 - 4	12 - 25	Loose	4 - 10
Firm	4 - 8	25 - 50	Compact	10 - 30
Stiff	8 - 15	50 - 100	Dense	30 - 50
Very Stiff	15 - 30	100 - 200	Very Dense	> 50
Hard	> 30	> 200		

WTPL	Wetter Than Plastic Limit
APL	About Plastic Limit
DTPL	Drier Than Plastic Limit

TYPE OF SAMPLE

SS	Split Spoon	TW	Thinwall Open
WS	Washed Sample	TP	Thinwall Piston
SB	Scraper Bucket Sample	OS	Oesterberg Sample
AS	Auger Sample	FS	Foil Sample
CS	Chunk Sample	RC	Rock Core
ST	Slotted Tube Sample	USS	Undisturbed Shear Strength
PH	Sample Advanced Hydraulically	RSS	Remoulded Shear Strength
PM	Sample Advanced Manually		

SOIL TESTS

Qu	Unconfined Compression	LV	Laboratory Vane
Q	Undrained Triaxial	FV	Field Vane
Qcu	Consolidated Undrained Triaxial	C	Consolidation
Qd	Drained Triaxial		

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LOG OF BOREHOLE NO. 1

PROJECT Proposed Subdivision
PML REF. 20KF006
LOCATION 1012 Snyder's Road West, Baden, Ontario
BORING DATE February 20, 2020
ENGINEER K. Hanes
BORING METHOD Continuous Flight Hollow Stem Augers
TECHNICIAN D. Brice

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES
		SURFACE ELEVATION 362.53				
0.0	362.38	TOPSOIL: Dark brown silty sand, trace gravel, moist		1	SS	6
		SAND: Loose brown sand, some silt, moist		2	SS	9
1.5	361.0	becoming compact		3	SS	12
2.3	360.2	becoming very loose, occasional silt layers		4	SS	3
3.0	359.5	becoming loose		5	SS	7
4.6	357.9	SILTY SAND: Compact brown silty sand, moist		6	SS	10
				7	SS	16
				8	SS	20
8.1	354.4	BOREHOLE TERMINATED AT 8.1 m				

ELEVATION SCALE: 362, 361, 360, 359, 358, 357, 356, 355

SHEAR STRENGTH (kPa)
+FIELD VANE △TORVANE ○ Qu
▲POCKET PENETROMETER ○ Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

UNIT WEIGHT kN/m³

GROUND WATER OBSERVATIONS AND REMARKS
GRAIN SIZE DISTRIBUTION (%) GR SA SI&CL

Upon completion of augering
Open
No free water

NOTES

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LOG OF BOREHOLE NO. 2

PROJECT Proposed Subdivision
PML REF. 20KF006
LOCATION 1012 Snyder's Road West, Baden, Ontario
BORING DATE February 20, 2020
ENGINEER K. Hanes
BORING METHOD Continuous Flight Hollow Stem Augers
TECHNICIAN D. Brice

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE
		SURFACE ELEVATION 359.03					
0.18	358.85	TOPSOIL: Dark brown clayey silt, trace sand, frozen		1	SS	11	
		CLAYEY SILT TILL: Very stiff brown clayey silt, trace sand, DTPL		2	SS	24	358
				3	SS	24	357
				4	SS	25	356
4.6	354.4	becoming stiff, grey, occasional wet silt seams, APL		5	SS	14	355
				6	SS	13	354
8.1	350.9	BOREHOLE TERMINATED AT 8.1 m		7	SS	14	353
							352
							351

SHEAR STRENGTH (kPa)
+FIELD VANE △TORVANE ○ Qu
▲POCKET PENETROMETER ● Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

UNIT WEIGHT kN/m³

GROUND WATER OBSERVATIONS AND REMARKS
GRAIN SIZE DISTRIBUTION (%) GR SA SI&CL

Upon completion of augering
Open
Free water at 7.2 m

NOTES

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LOG OF BOREHOLE NO. 3

PROJECT Proposed Subdivision
PML REF. 20KF006
LOCATION 1012 Snyder's Road West, Baden, Ontario
BORING DATE February 20, 2020
ENGINEER K. Hanes
BORING METHOD Continuous Flight Hollow Stem Augers
TECHNICIAN D. Brice

DEPTH / ELEV (metres)	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE
	SURFACE ELEVATION 362.32					362
0.14 / 362.18	TOPSOIL: Dark brown clayey silt, trace sand, trace gravel, frozen		1	SS	12	
	CLAYEY SILT TILL: Very stiff brown clayey silt, trace sand, DTPL		2	SS	21	361
1.5 / 360.8	occasional wet sand seams		3	SS	29	
			4	SS	26	360
			5	SS	26	359
4.6 / 357.7	becoming grey, APL		6	SS	23	358
						357
6.1 / 356.2	becoming stiff		7	SS	14	356
						355
7.6 / 354.7	becoming very stiff		8	SS	18	
8.1 / 354.2	BOREHOLE TERMINATED AT 8.1 m					

SHEAR STRENGTH (kPa)
+FIELD VANE △TORVANE ○ Qu
▲POCKET PENETROMETER ● Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

UNIT WEIGHT kN/m³

GROUND WATER OBSERVATIONS AND REMARKS
GRAIN SIZE DISTRIBUTION (%) GR SA SI&CL

Upon completion of augering
Open
Free water at 7.6 m

NOTES

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LOG OF BOREHOLE NO. 4

PROJECT Proposed Subdivision
PML REF. 20KF006
LOCATION 1012 Snyder's Road West, Baden, Ontario
BORING DATE February 21, 2020
ENGINEER K. Hanes
BORING METHOD Continuous Flight Hollow Stem Augers
TECHNICIAN D. Brice

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	ELEVATION SCALE
		SURFACE ELEVATION 361.34					
0.0	361.34						361
0.20	361.14	TOPSOIL: Dark brown clayey silt, trace sand, trace gravel, frozen		1	SS	8	
		CLAYEY SILT TILL: Very stiff brown clayey silt, trace sand, trace gravel, DTPL, occasional silt partings		2	SS	23	360
2.0				3	SS	20	
2.3	359.0	becoming hard, occasional wet sand seams		4	SS	38	359
3.0	358.3	becoming very stiff, layered with wet sand		5	SS	29	358
3.8	357.5	becoming hard		6	SS	32	357
4.6	356.7	becoming very stiff, grey, DTPL, no sand seams		7	SS	22	
5.0							356
6.0				8	SS	18	355
7.0							354
7.6	353.7	becoming stiff, APL, occasional sand seams		9	SS	12	
8.1	353.2	BOREHOLE TERMINATED AT 8.1 m					
9.0							
10.0							
11.0							
12.0							
13.0							
14.0							
15.0							

SHEAR STRENGTH (kPa)
+FIELD VANE △TORVANE ○ Qu
▲POCKET PENETROMETER ○ Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

UNIT WEIGHT kN/m³

GROUND WATER OBSERVATIONS AND REMARKS
GRAIN SIZE DISTRIBUTION (%) GR SA SI&CL

Sampler wet at 3.0 m

Upon completion of augering
Open
Free water at 7.7 m

NOTES

Peto MacCallum Ltd.
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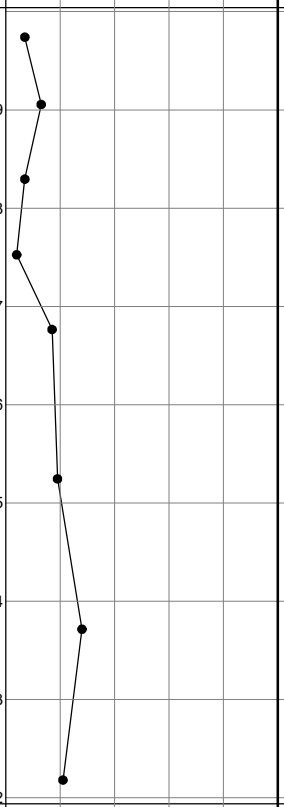
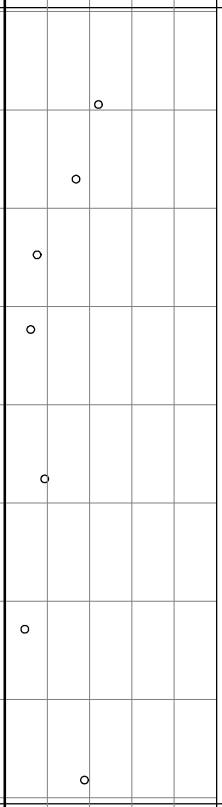
LOG OF BOREHOLE NO. 5

PROJECT Proposed Subdivision
PML REF. 20KF006
LOCATION 1012 Snyder's Road West, Baden, Ontario
BORING DATE February 24, 2020
ENGINEER K. Hanes
BORING METHOD Continuous Flight Hollow Stem Augers
TECHNICIAN D. Brice

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES
		SURFACE ELEVATION 360.04				
0.0	360.04					
0.24	359.80	TOPSOIL: Dark brown clayey silt, trace gravel, frozen		1	SS	7
1.0		CLAYEY SILT: Stiff brown clayey silt, trace to some sand, APL, occasional sand layers		2	SS	13
1.5	358.5	becoming firm		3	SS	7
2.0						
2.4	357.6	SAND: Compact brown sand, trace to some silt, moist, occasional clayey silt lenses		4	SS	4
3.0				5	SS	17
4.0						
5.0				6	SS	19
6.0						
7.0				7	SS	28
8.0						
8.1	351.9	BOREHOLE TERMINATED AT 8.1 m		8	SS	21
9.0						
10.0						
11.0						
12.0						
13.0						
14.0						
15.0						





UNIT WEIGHT kN/m³	GROUND WATER OBSERVATIONS AND REMARKS	GRAIN SIZE DISTRIBUTION (%) GR SA SI&CL
	Upon completion of augering Open No free water	

NOTES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. 6

PROJECT Proposed Subdivision
PML REF. 20KF006
LOCATION 1012 Snyder's Road West, Baden, Ontario
BORING DATE February 21, 2020
ENGINEER K. Hanes
BORING METHOD Continuous Flight Hollow Stem Augers
TECHNICIAN D. Brice

DEPTH (metres)	ELEV	DESCRIPTION	NUMBER	TYPE	"N" VALUES
	360.06	SURFACE ELEVATION 360.06			
0.0	360.06	FILL: Dark brown clayey silt topsoil, trace gravel, frozen	1	SS	1
0.60	359.46	becoming brown clayey silt, some sand, APL	2	SS	7
1.0			3	SS	6
2.0	2.1				
	358.0	CLAYEY SILT TILL: Stiff grey clayey silt, trace sand, DTPL	4	SS	13
3.0			5	SS	19
4.0	4.0				
	356.1	SAND: Very loose brown sand, trace silt, moist, occasional silt layers	6	SS	3
5.0			7	SS	1
6.0	6.1				
	354.0	becoming dense	8	SS	33
7.0	7.6				
	352.5	becoming wet	9	SS	31
8.0	8.1				
	352.0	BOREHOLE TERMINATED AT 8.1 m			

SHEAR STRENGTH (kPa)
+FIELD VANE △TORVANE ○ Qu
▲POCKET PENETROMETER ○ Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

UNIT WEIGHT kN/m³

51

GROUND WATER OBSERVATIONS AND REMARKS
GRAIN SIZE DISTRIBUTION (%) GR SA SI&CL

Upon completion of augering
Open
No free water

NOTES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. 7

PROJECT Proposed Subdivision
PML REF. 20KF006
LOCATION 1012 Snyder's Road West, Baden, Ontario
BORING DATE February 21, 2020
ENGINEER K. Hanes
BORING METHOD Continuous Flight Hollow Stem Augers
TECHNICIAN D. Brice

DEPTH (metres) / ELEV	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE
	SURFACE ELEVATION 360.02					
0.30 / 359.72	FILL: Dark brown clayey silt topsoil, trace gravel, frozen		1	SS	1	
	becoming brown and grey mottled clayey silt, trace sand, APL		2	SS	2	359
			3	SS	4	
2.1 / 357.9	becoming dark brown, some sand, trace organics, roots		4	SS	0	358
3.1 / 356.9	CLAYEY SILT: Stiff grey clayey silt, some sand, APL		5	SS	3	357
			6	SS	13	356
4.6 / 355.4	becoming very stiff, DTPL		7	SS	22	
5.0 / 355.0	BOREHOLE TERMINATED AT 5.0 m					

SHEAR STRENGTH (kPa)
+FIELD VANE △TORVANE ○ Qu
▲POCKET PENETROMETER ○ Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

61

UNIT WEIGHT kN/m³

GROUND WATER OBSERVATIONS AND REMARKS
GRAIN SIZE DISTRIBUTION (%) GR SA SI&CL

Upon completion of augering
Open
No free water

NOTES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. 8

PROJECT Proposed Subdivision
PML REF. 20KF006
LOCATION 1012 Snyder's Road West, Baden, Ontario
BORING DATE February 21, 2020
ENGINEER K. Hanes
BORING METHOD Continuous Flight Hollow Stem Augers
TECHNICIAN D. Brice

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER OBSERVATIONS AND REMARKS / GRAIN SIZE DISTRIBUTION (%) GR SA SI&CL
	360.13	SURFACE ELEVATION 360.13					
0.0							
0.25	359.88	FILL: Dark brown clayey silt topsoil, trace gravel, frozen		1	SS	1	
		becoming dark brown to brown clayey silt, trace sand, APL		2	SS	3	
1.0							
				3	SS	3	
2.0							
2.1	358.0	becoming mottled brown and grey		4	SS	7	
3.0							
	357.1	CLAYEY SILT: Stiff brown to grey clayey silt, trace sand, APL		5	SS	10	
3.7	356.4	becoming very soft		6	SS	0	
4.0							
				7	SS	0	
5.0							
6.1	354.0	becoming stiff, grey		8	SS	9	
7.0							
7.6	352.5	becoming very stiff, DTPL		9	SS	24	
8.0							
8.1	352.0	BOREHOLE TERMINATED AT 8.1 m					Upon completion of augering Wet cave at 4.4 m
9.0							
10.0							
11.0							
12.0							
13.0							
14.0							
15.0							

ELEVATION SCALE: 360, 359, 358, 357, 356, 355, 354, 353

SHEAR STRENGTH (kPa)
+FIELD VANE △TORVANE ○ Qu
▲POCKET PENETROMETER ○ Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

UNIT WEIGHT kN/m³

NOTES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. 9

PROJECT Proposed Subdivision
PML REF. 20KF006
LOCATION 1012 Snyder's Road West, Baden, Ontario
BORING DATE February 24, 2020
ENGINEER K. Hanes
BORING METHOD Continuous Flight Hollow Stem Augers
TECHNICIAN D. Brice

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES
		SURFACE ELEVATION 363.51				
0.0	363.51					
	0.25	TOPSOIL: Dark brown clayey silt, trace sand, moist		1	SS	7
	363.26	CLAYEY SILT TILL: Stiff brown clayey silt, trace sand, DTPL				
1.0				2	SS	8
				3	SS	8
2.0	2.1					
	361.4	becoming very stiff, numerous sand layers		4	SS	20
3.0	3.0					
	360.5	SAND: Dense brown sand, some silt, moist, numerous silt layers		5	SS	37
4.0						
	4.5					
	359.0	becoming compact		6	SS	29
5.0						
6.0	6.1					
	357.4	becoming dense		7	SS	36
7.0						
				8	SS	46
8.0	8.1					
	355.4	BOREHOLE TERMINATED AT 8.1 m				
9.0						
10.0						
11.0						
12.0						
13.0						
14.0						
15.0						

SHEAR STRENGTH (kPa)
+ FIELD VANE △ TORVANE ○ Qu
▲ POCKET PENETROMETER ● Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

ELEVATION SCALE: 363, 362, 361, 360, 359, 358, 357, 356

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

UNIT WEIGHT kN/m³

GROUND WATER OBSERVATIONS AND REMARKS
GRAIN SIZE DISTRIBUTION (%)
GR SA SI&CL

Upon completion of augering
Open
No free water

NOTES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. 10

PROJECT Proposed Subdivision
PML REF. 20KF006
LOCATION 1012 Snyder's Road West, Baden, Ontario
BORING DATE February 24, 2020
ENGINEER K. Hanes
BORING METHOD Continuous Flight Hollow Stem Augers
TECHNICIAN D. Brice

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES
		SURFACE ELEVATION 359.73				
0.0		TOPSOIL: Dark brown clayey silt, trace sand, trace gravel, frozen		1	SS	6
0.36	359.37	CLAYEY SILT TILL: Stiff brown clayey silt, trace sand, trace gravel, APL		2	SS	13
1.0						
1.5	358.2	becoming very stiff, DTPL		3	SS	17
2.0						
2.1	357.6	becoming stiff		4	SS	13
3.0						
3.0	356.7	becoming grey, APL		5	SS	12
4.0						
5.0				6	SS	15
6.0				7	SS	14
7.0						
8.0				8	SS	13
8.1	351.6	BOREHOLE TERMINATED AT 8.1 m				
9.0						
10.0						
11.0						
12.0						
13.0						
14.0						
15.0						

ELEVATION SCALE: 359, 358, 357, 356, 355, 354, 353, 352

SHEAR STRENGTH (kPa)
+FIELD VANE △TORVANE ○ Qu
▲POCKET PENETROMETER ○ Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

UNIT WEIGHT kN/m³

GROUND WATER OBSERVATIONS AND REMARKS
GRAIN SIZE DISTRIBUTION (%) GR SA SI&CL

Upon completion of augering
Open
No free water

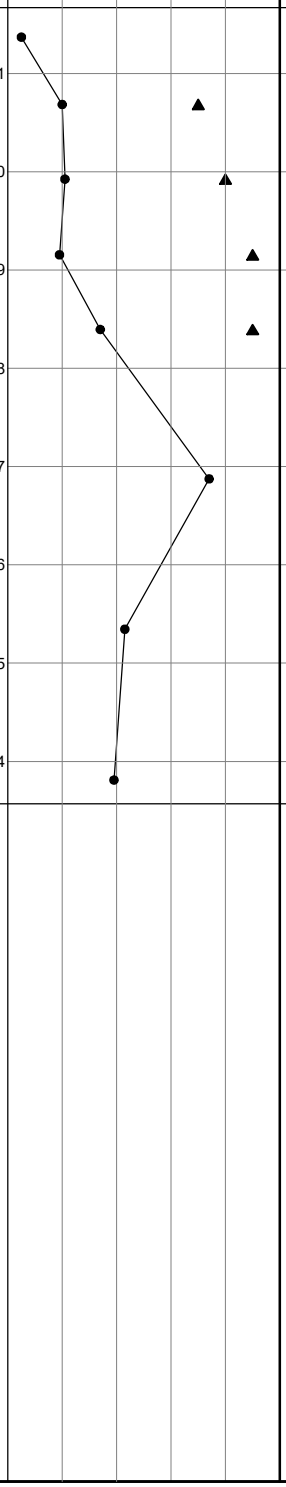
NOTES

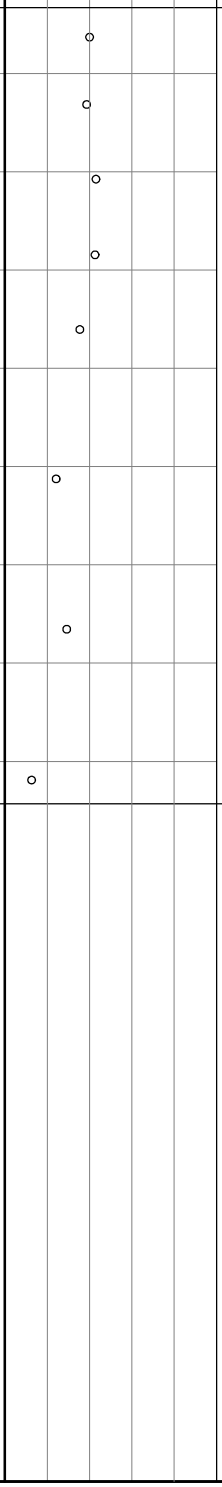
Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. 11

PROJECT Proposed Subdivision
PML REF. 20KF006
LOCATION 1012 Snyder's Road West, Baden, Ontario
BORING DATE February 24, 2020
ENGINEER K. Hanes
BORING METHOD Continuous Flight Hollow Stem Augers
TECHNICIAN D. Brice

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES
		SURFACE ELEVATION 361.67				
0.0	361.67					
0.26	361.41	TOPSOIL: Dark brown clayey silt, trace sand, frozen		1	SS	5
		CLAYEY SILT TILL: Very stiff brown clayey silt, trace sand, trace gravel, DTPL		2	SS	20
1.0						
				3	SS	21
2.0						
				4	SS	19
3.0	358.7	becoming hard		5	SS	34
4.0						
4.6	357.1	SAND: Very dense brown sand, trace silt, wet, numerous silt layers, moist		6	SS	74
5.0						
6.0						
6.1	355.6	becoming dense		7	SS	43
7.0						
8.0				8	SS	39
8.1	353.6	BOREHOLE TERMINATED AT 8.1 m				
9.0						
10.0						
11.0						
12.0						
13.0						
14.0						
15.0						





UNIT WEIGHT kN/m³

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%) GR SA SI&CL

Upon completion of augering
Open
No free water

NOTES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. 12

PROJECT Proposed Subdivision
PML REF. 20KF006
LOCATION 1012 Snyder's Road West, Baden, Ontario
BORING DATE February 25, 2020
ENGINEER K. Hanes
BORING METHOD Continuous Flight Hollow Stem Augers
TECHNICIAN D. Brice

DEPTH (metres) / ELEV	DESCRIPTION	NUMBER	TYPE	"N" VALUES
	SURFACE ELEVATION 359.82			
0.28 / 359.54	TOPSOIL: Dark brown clayey silt, trace sand, frozen	1	SS	3
	CLAYEY SILT TILL: Stiff brown clayey silt, trace sand, DTPL	2	SS	13
1.5 / 358.3	becoming very stiff	3	SS	16
2.1 / 357.7	becoming grey, occasional sand seams	4	SS	19
3.0 / 356.8	becoming stiff	5	SS	12
4.6 / 355.2	becoming very stiff	6	SS	18
		7	SS	27
7.6 / 352.2	becoming stiff, APL	8	SS	13
8.1 / 351.7	BOREHOLE TERMINATED AT 8.1 m			

SHEAR STRENGTH (kPa): + FIELD VANE △ TORVANE ○ Qu ▲ POCKET PENETROMETER ○ Q; 50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

UNIT WEIGHT kN/m³

GROUND WATER OBSERVATIONS AND REMARKS
GRAIN SIZE DISTRIBUTION (%) GR SA SI&CL

Upon completion of augering
Open
No free water

NOTES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. DC 101-19

PROJECT Proposed Subdivision
LOCATION 1012 Snyder's Road West, Baden, Ontario
BORING METHOD Dynamic Cone Penetration Test
BORING DATE February 24, 2020
PML REF. 20KF006
ENGINEER K. Hanes
TECHNICIAN D. Brice

DEPTH / ELEV (metres)	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH (kPa) + FIELD VANE △ TORVANE ○ Qu ▲ POCKET PENETROMETER ○ Q; DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ●	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT; WATER CONTENT (%)	UNIT WEIGHT kN/m³	GROUND WATER OBSERVATIONS AND REMARKS; GRAIN SIZE DISTRIBUTION (%) GR SA SI&CL
0.0 / 357.21	SURFACE ELEVATION 357.21					357	50 100 150 200; 20 40 60 80	w_P w w_L; 10 20 30 40		
1.0						356				
2.0										
3.0										
4.0										
5.0										
6.0										
7.0										
8.0										
9.0										
10.0										
11.0										
12.0										
13.0										
14.0										
15.0										

NOTES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. DC 103-19

PROJECT Proposed Subdivision
LOCATION 1012 Snyder's Road West, Baden, Ontario
BORING METHOD Dynamic Cone Penetration Test
BORING DATE February 24, 2020
PML REF. 20KF006
ENGINEER K. Hanes
TECHNICIAN D. Brice

SOIL PROFILE			SAMPLES				SHEAR STRENGTH (kPa)			UNIT WEIGHT	GROUND WATER OBSERVATIONS AND REMARKS
DEPTH / ELEV (metres)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	ELEVATION SCALE	+ FIELD VANE △ TORVANE ○ Qu ▲ POCKET PENETROMETER ○ Q 50 100 150 200 DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ● 20 40 60 80	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT w_P w w_L WATER CONTENT (%) 10 20 30 40	kN/m³	GRAIN SIZE DISTRIBUTION (%) GR SA SI&CL
SURFACE ELEVATION 359.02						358 357 356				

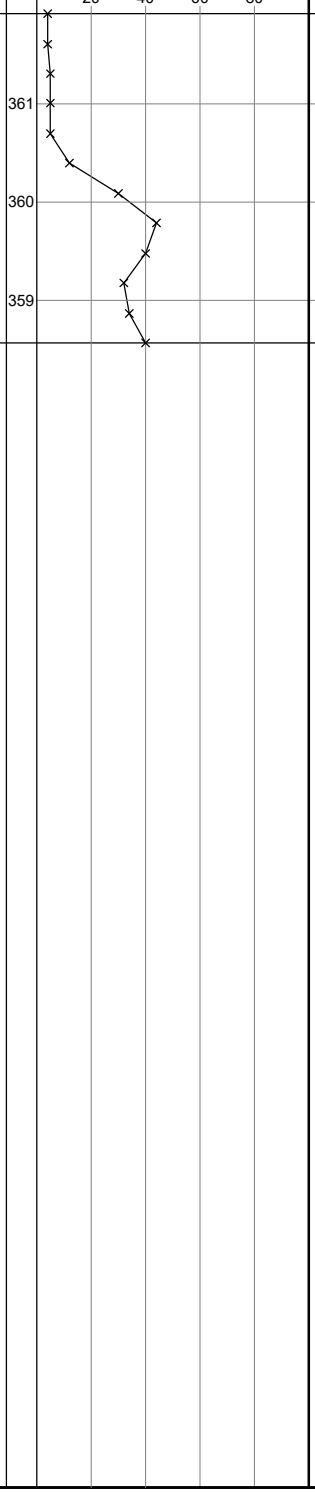
NOTES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. DC 105-19

PROJECT Proposed Subdivision
LOCATION 1012 Snyder's Road West, Baden, Ontario
BORING METHOD Dynamic Cone Penetration Test
BORING DATE February 20, 2020
PML REF. 20KF006
ENGINEER K. Hanes
TECHNICIAN D. Brice

DEPTH / ELEV (metres)	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH (kPa) + FIELD VANE △ TORVANE ○ Qu ▲ POCKET PENETROMETER ○ Q; DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ●	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT; WATER CONTENT (%)	UNIT WEIGHT kN/m³	GROUND WATER OBSERVATIONS AND REMARKS; GRAIN SIZE DISTRIBUTION (%) GR SA SI&CL
	SURFACE ELEVATION 361.92									



0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0

NOTES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. DC 106-19

PROJECT Proposed Subdivision
LOCATION 1012 Snyder's Road West, Baden, Ontario
BORING METHOD Dynamic Cone Penetration Test
BORING DATE February 20, 2020
PML REF. 20KF006
ENGINEER K. Hanes
TECHNICIAN D. Brice

SOIL PROFILE			SAMPLES				SHEAR STRENGTH (kPa)			UNIT WEIGHT	GROUND WATER OBSERVATIONS AND REMARKS
DEPTH / ELEV (metres)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	ELEVATION SCALE	+ FIELD VANE △ TORVANE ○ Qu ▲ POCKET PENETROMETER ● Q 50 100 150 200 DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ● 20 40 60 80	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT w_P w w_L WATER CONTENT (%) 10 20 30 40	kN/m³	GRAIN SIZE DISTRIBUTION (%) GR SA SI&CL
SURFACE ELEVATION 360.68						360 359 358 357				

NOTES

BH 1
EL. 362.53

BH 2
EL. 359.03

BH 3
EL. 362.32

BH 4
EL. 361.34

BH 5
EL. 360.04

BH 6
EL. 360.06

BH 7
EL. 360.02

BH 8
EL. 360.13

BH 9
EL. 363.51

BH 10
EL. 359.73

BH 11
EL. 361.67

BH 12
EL. 359.82

MTE 101-19
EL. 357.209

MTE 102-19
EL. 358.977

MTE 103-19
EL. 359.021

MTE 104-19
EL. 361.257

MTE 105-19
EL. 361.918

MTE 106-19
EL. 360.682

MTE 107-19
EL. 360.760

Agricultural

Residential

Baden Public School

Sir Adam Beck Public School

Baden Urban Area Boundary

Countryside Line

STREET ONE

STREET TWO

STREET THREE

STREET FOUR

STREET FIVE

STREET SIX

JACOB CRESSMAN DRIVE

STUCKEY AVENUE

MICHAEL MYERS ROAD

BETTSCHEN LANE

HUNSBERGER DRIVE

GEIGER PLACE

LIVINGSTON BOULEVARD

WAGLER AVENUE

MCADAM-EADVEN STREET

SNYDER'S ROAD WEST (Reg. Rd. #1)

QUEEN STREET

CHRISTIANSTAIN STREET

MILLER STREET

CHARLOTTA STREET

BRENNEMAN DRIVE

ELEV. = 347.919m

ELEV. = 347.919m

SCALE 0 m 40 m 80 m 120 m 160 m 200 m

KEY PLAN

LEGEND:

- BOREHOLE
- PREVIOUS INVESTIGATION BOREHOLE (BY OTHERS MTE REF: 40777-800)

REFERENCE:

BOREHOLE LOCATION PLAN REPRODUCED FROM DRAWING SUPPLIED BY MTE.

NOTES:

THE INFERRED STRATIGRAPHY REFERRED TO IN THE REPORT IS BASED ON THE DATA FROM THESE BOREHOLES SUPPLEMENTED BY GEOLOGICAL EVIDENCE. THE ACTUAL STRATIGRAPHY BETWEEN THE BOREHOLES MAY VARY.

THE BOREHOLE LOCATIONS AND GEODETIC ELEVATIONS WERE SURVEYED WITH A SOKKIA GCX3 REAL TIME KINEMATIC RECEIVER CONNECTED TO THE GLOBAL NAVIGATION SATELLITE SYSTEM.

SNYDER'S ROAD (BADEN) DEVELOPMENTS INC.
c/o
MTE CONSULTANTS INC.

PROPOSED SUBDIVISION
1012 SNYDER'S ROAD WEST
BADEN, ONTARIO

BOREHOLE LOCATION PLAN

Peto MacCallum Ltd.
CONSULTING ENGINEERS

DRAWN	D. BRICE	DATE	SCALE	PML REF.	DWG. NO.
CHECKED	K. HANES	AUGUST 2020	AS SHOWN	20KF006	1
APPROVED	S. JEFFREY				

APPENDIX A

MTE CONSULTANTS INC BOREHOLE AND MONITORING WELL LOGS

ID Number: MW101-19

Project Name: 1012 Snyder's Rd. W. Development Hydrogeology Study

Project No: 40777-800

Client: Nideva Properties Inc.

Site Location: 1012 Snyder's Rd. W., Baden, ON

Date Completed: 5/3/2019

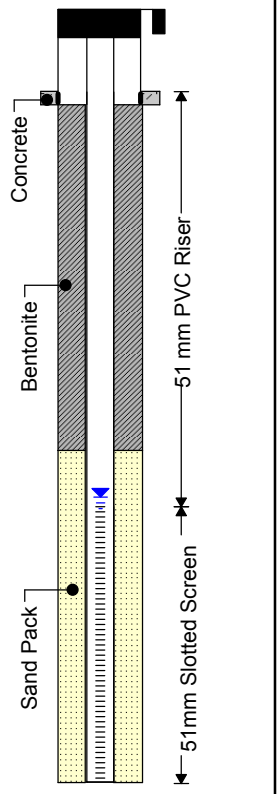
Drilling Contractor: Aardvark Drilling Inc.

Drill Rig: CME75 Track

Drill Method: Hollow Stem Auger

Protective Cover: Monument

Depth Scale (ft / m)	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	N-Value (Blows/305mm)	Moisture Content (%)
	Ground Surface	357.6					
0 / 0	**TOPSOIL** dark brown, silty, clayey, moist	0.0	1	SS	30	8	23
2	**CLAYEY SILT** brown, trace sand, moist	356.1	2	SS	75	9	27
6 / 2	**SANDY SILT** brown, trace clay, trace gravel, moist	1.5 / 355.3	3	SS	100	12	20
8	**SAND** brown, trace silt, moist	2.3	4	SS	75	17	16
10			5	SS	85	32	9
12 / 4		353.0					
14	saturated	4.6	6	SS	70	39	19
16							
18							
20 / 6			7	SS	90	28	19
22							
24							
26 / 8		349.4	8	SS	75	6	24
28	Drilling Terminated	8.2					
30							
32 / 10							
34							
36							
38							



Field Technician: TXG

Drafted by: TXG

Reviewed by: ATD

Sheet: 1 of 1

Notes:
Approximately 50L of water added at 7.6m.
Water level measured May 13, 2019.

ID Number: MW102-19

Project Name: 1012 Snyder's Rd. W. Development Hydrogeology Study

Project No: 40777-800

Client: Nideva Properties Inc.

Site Location: 1012 Snyder's Rd. W., Baden, ON

Date Completed: 5/3/2019

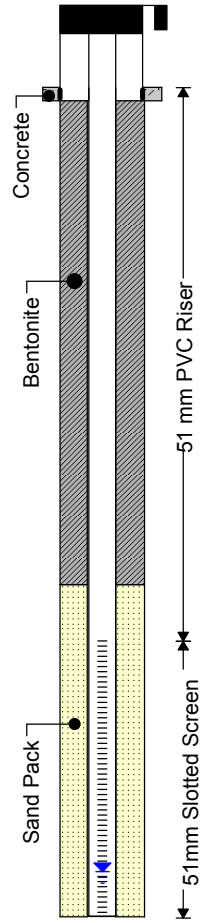
Drilling Contractor: Aardvark Drilling Inc.

Drill Rig: CME75 Track

Drill Method: Hollow Stem Auger

Protective Cover: Monument

Depth Scale (ft / m)	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	N-Value (Blows/305mm)	Moisture Content (%)
0 / 0	Ground Surface	358.9 / 0.0					
	TOPSOIL dark brown, silty, sandy, some clay, moist		1	ss	70	6	30
	SANDY SILT brown, some clay, moist		2	ss	50	12	21
6 / 2		356.6 / 2.3	3	ss	100	15	23
	CLAYEY SILT TILL brown, trace sand, trace gravel, moist		4	ss	90	10	24
			5	ss	100	11	23
	grey below 4.6m	354.3 / 4.6	6	ss	100	14	21
20 / 6			7	ss	100	12	18
26 / 8			8	ss	100	16	16
		349.1 / 9.8	9	ss	100	16	14
32 / 10	Drilling Terminated						



Field Technician: TXG

Drafted by: TXG

Reviewed by: ATD

MTE

Sheet: 1 of 1

Notes:
Water level measured May 13, 2019.

ID Number: MW103-19

Project Name: 1012 Snyder's Rd. W. Development Hydrogeology Study

Project No: 40777-800

Client: Nideva Properties Inc.

Site Location: 1012 Snyder's Rd. W., Baden, ON

Date Completed: 5/2/2019

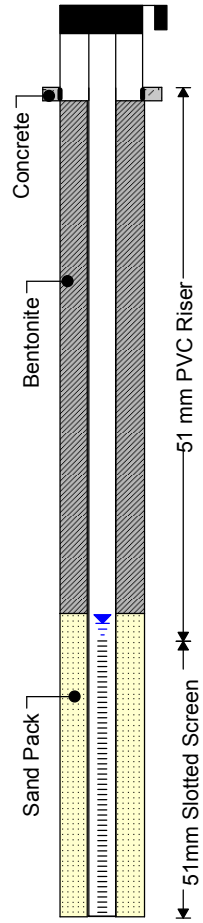
Drilling Contractor: Aardvark Drilling Inc.

Drill Rig: CME75 Track

Drill Method: Hollow Stem Auger

Protective Cover: Monument

SUBSURFACE PROFILE			SAMPLE				SPT	MOISTURE	
Depth Scale (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	N-Value (Blows/305mm)	Moisture Content (%)	Well Completion Details
0 / 0		Ground Surface	359.0						
		TOPSOIL dark brown,clayey silt, moist	0.0	1	ss	75	7	30	
		SILTY CLAY brown, some sand, moist	358.3 / 0.8	2	ss	85	18	19	
		CLAYEY SILT TILL brown, some sand, trace gravel, moist		3	ss	100	20	21	
				4	ss	100	13	21	
				5	ss	90	12	21	
4			354.5						
		SANDY SILT TILL grey, some clay, trace gravel, moist	4.6	6	ss	100	12	16	
			352.9						
6		**CLAYEY SILT TILL** grey, some sand, trace gravel, moist	6.1	7	ss	100	11	17	
			351.4						
		wet below 7.6m	7.6	8	ss	90	5	18	
				9	ss	85	6	20	
10		Drilling Terminated	349.3 / 9.8						



Field Technician: TXG

Drafted by: TXG

Reviewed by: ATD

MTE

Sheet: 1 of 1

Notes:
Water level measured May 13, 2019.

ID Number: MW104-19

Project Name: 1012 Snyder's Rd. W. Development Hydrogeology Study

Project No: 40777-800

Client: Nideva Properties Inc.

Site Location: 1012 Snyder's Rd. W., Baden, ON

Date Completed: 5/2/2019

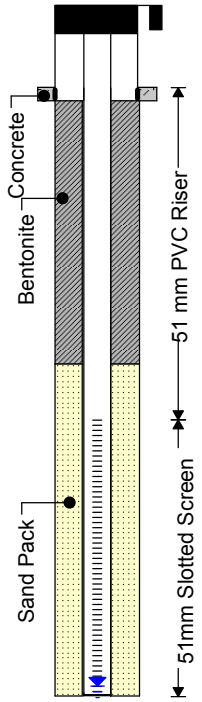
Drilling Contractor: Aardvark Drilling Inc.

Drill Rig: CME75 Track

Drill Method: Hollow Stem Auger

Protective Cover: Monument

Depth Scale (ft / m)	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Recovery (%)	N-Value (Blows/305mm)	Moisture Content (%)
	Ground Surface	361.2					
0 / 0	**TOPSOIL** dark brown, clayey silt, moist	0.0	1	ss	75	6	27
2	**CLAYEY SILT** brown, clayey, trace to some sand, moist	360.4 0.8	2	ss	100	19	14
4	**SILT** sandy, trace clay	359.6 1.5	3	ss	90	19	13
6 / 2	**SILTY SAND** brown, trace gravel, moist		4	ss	75	24	14
10		358.1 3.0	5	ss	50	23	15
12 / 4	**SILT** brown, some sand, trace clay, trace gravel, damp						
14		356.6 4.6	6	ss	95	19	20
16	grey, clayey, wet						
18		355.1 6.1	7	ss	85	22	24
20 / 6	**SILTY SAND** brown, saturated						
22		353.5 7.6	8	ss	80	21	6
24	trace silt, moist	352.9 8.2					
26 / 8	Drilling Terminated						
28							
30							
32 / 10							
34							
36							
38							



Field Technician: TXG

Drafted by: TXG

Reviewed by: ATD

MTE

Sheet: 1 of 1

Notes:
Water level measured May 13, 2019.

ID Number: MW105-19

Project Name: 1012 Snyder's Rd. W. Development Hydrogeology Study

Project No: 40777-800

Client: Nideva Properties Inc.

Site Location: 1012 Snyder's Rd. W., Baden, ON

Date Completed: 5/2/2019

Drilling Contractor: Aardvark Drilling Inc.

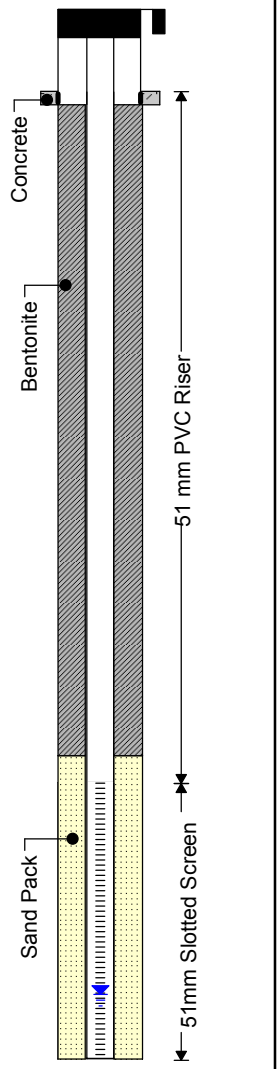
Drill Rig: CME 850 Track

Drill Method: Hollow Stem Auger

Protective Cover: Monument

Depth Scale (ft / m)	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Type	Recovery (%)	N-Value (Blows/305mm)	Moisture Content (%)
	Ground Surface	361.8					
0 / 0	**TOPSOIL** dark brown, silty sand, moist	0.0	1	SS	70	3	21
		361.1					
2	**SAND** brown, some silt, moist	0.8	2	SS	65	5	24
4	silty, trace clay	360.3					
6 / 2	some silt, saturated	1.5	3	SS	80	3	26
8			4	SS	70	2	17
		358.8					
10	trace silt, moist	3.0	5	SS	70	10	
12 / 4							
14							
16			6	SS	100	36	6
18							
20 / 6			7	SS	95	39	3
22							
24		354.2					
26 / 8	wet	7.6	8	SS	85	33	20
28							
30			9	SS	90	32	18
32 / 10							
34		351.2					
36	saturated	10.7	10	SS	85	20	20
		350.6					
38	Drilling Terminated	11.3					

Well Completion Details



Field Technician: TXG

Drafted by: TXG

Reviewed by: ATD

MTE

Sheet: 1 of 1

Notes:
Water level measured May 13, 2019.

ID Number: MW106A-19

Project Name: 1012 Snyder's Rd. W. Development Hydrogeology Study

Project No: 40777-800

Client: Nideva Properties Inc.

Site Location: 1012 Snyder's Rd. W., Baden, ON

Date Completed: 4/29/2019

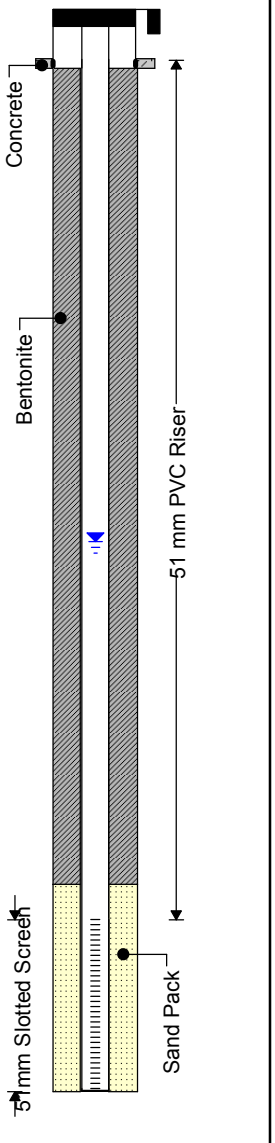
Drilling Contractor: Aardvark Drilling Inc.

Drill Rig: CME 850 Track

Drill Method: Hollow Stem Auger

Protective Cover: Monument

Depth Scale (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	N-Value (Blows/305mm)	Moisture Content (%)
		Ground Surface	360.7					
		TOPSOIL dark brown, silty sand, moist	0.0 / 359.9	1	SS	90	5	14
		SAND brown, some silt, trace gravel, moist	0.8 / 359.2	2	SS	60	2	20
		trace silt, moist	1.5 / 358.4	3	SS	50	7	19
		wet	2.3 / 357.6	4	SS	60	12	20
		saturated	3.0 / 356.9	5	SS	75	14	20
		SILT brown, trace sand, varying degrees of clay content, saturated	3.8 / 356.1	6	SS	75	11	20
		trace gravel, moist	4.6	7	SS	100	12	24
		grey	354.6					
		SAND brown fine-grained sand, trace silt, moist	6.1 / 353.1	8	SS	50	32	13
		SANDY SILT brown, trace clay, moist	7.6 / 351.6	9	SS	100	26	25
		SAND brown, trace silt, saturated	9.1 / 350.0	10	SS	75	41	19
		coarse-grained sand, saturated	10.7 / 348.5	11	SS	90	13	16
		medium-grained sand	12.2	12	SS	65	32	19
				13	SS	75	37	17
				14	SS	65	48	22
				15	SS	65	42	18
			341.8	16	SS	50	48	16
		Drilling Terminated	18.9					



Field Technician: TXG

Drafted by: TXG

Reviewed by:

Sheet: 1 of 1

Notes:
Drilling mud used, borehole was flushed with clean water prior to monitoring well install.
Water level measured May 13, 2019.

ID Number: MW106B-19

Project Name: 1012 Snyder's Rd. W. Development Hydrogeology Study

Project No: 40777-800

Client: Nideva Properties Inc.

Site Location: 1012 Snyder's Rd. W., Baden, ON

Date Completed: 4/26/2019

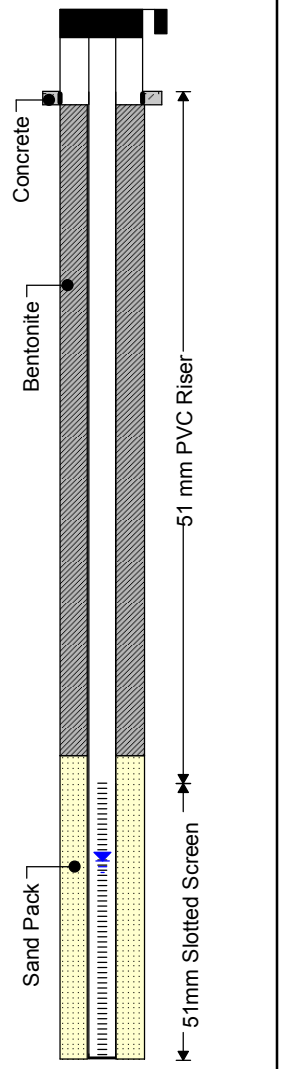
Drilling Contractor: Aardvark Drilling Inc.

Drill Rig: CME 850 Track

Drill Method: Hollow Stem Auger

Protective Cover: Monument

Depth Scale (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Recovery (%)	N-Value (Blows/305mm)	Moisture Content (%)
		Ground Surface	360.6					
		TOPSOIL dark brown, silty sand, moist	0.0	1	SS	90	5	14
		SAND brown, some silt, trace gravel, moist	359.9 0.8	2	SS	60	2	20
		trace silt, moist	359.1					
		wet	1.5	3	SS	50	7	19
		saturated	358.3 2.3	4	SS	60	12	20
		SILT brown, trace sand, varying degrees of clay content, saturated	357.6 3.0	5	SS	75	14	20
		trace gravel, moist	356.8 3.8	6	SS	75	11	20
		grey	356.0 4.6	7	SS	100	12	24
		SAND brown fine-grained sand, trace silt, moist	354.5 6.1	8	SS	50	32	13
		SANDY SILT brown, trace clay, moist	353.0 7.6	9	SS	100	26	25
		SAND brown, trace silt, saturated	351.5 9.1	10	SS	75	41	19
			349.3	11	SS	90	13	16
		Drilling Terminated	11.3					



Field Technician: TXG

Drafted by: TXG

Reviewed by: ATD

Sheet: 1 of 1

Notes:
Sand heave at 10.7m. Approximately 150L of water added to clean out borehole.
Borehole lithology, N-values and moisture contents inferred from MW106A-19.
Water level measured May 13, 2019.

ID Number: MW106C-19

Project Name: 1012 Snyder's Rd. W. Development Hydrogeology Study

Project No: 40777-800

Client: Nideva Properties Inc.

Site Location: 1012 Snyder's Rd. W., Baden, ON

Date Completed: 4/26/2019

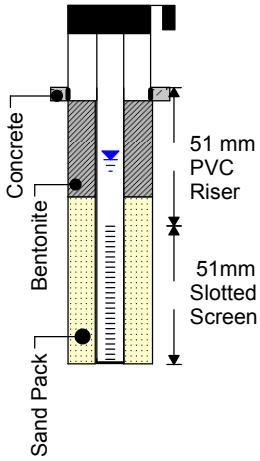
Drilling Contractor: Aardvark Drilling Inc.

Drill Rig: CME 850 Track

Drill Method: Hollow Stem Auger

Protective Cover: Monument

SUBSURFACE PROFILE			SAMPLE				SPT	MOISTURE	
Depth Scale	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	N-Value • Blows/305mm • 20 40 60 80	Moisture Content % 10 20 30	Well Completion Details
ft / m		Ground Surface	360.6						
0 / 0		**TOPSOIL** dark brown, silty sand, moist	0.0	1	SS	90	5	14	
			359.8						
2		**SAND** brown, some silt, trace gravel, moist	0.8	2	SS	60	2	20	
4		trace silt, moist	359.1						
6 / 2		wet	1.5	3	SS	50	7	19	
8		saturated	358.3						
			2.3	4	SS	60	12	20	
10		**SILT** brown, trace sand, varying degrees of clay content, saturated	357.5						
			3.0	5	SS	75	14	20	
12 / 4			356.9						
		Drilling Terminated	3.7						
14									
16									
18									
20 / 6									
22									
24									
26 / 8									
28									
30									
32 / 10									
34									
36									
38									



Field Technician: TXG

Drafted by: TXG

Reviewed by: ATD

MTE

Sheet: 1 of 1

Notes:
Borehole lithology, N-values and moisture contents inferred from MW106A-19.
Water level measured May 13, 2019.

APPENDIX B

ENGINEERED FILL

ENGINEERED FILL

The information presented in this appendix is intended for general guidance only. Site specific conditions and prevailing weather may require modification of compaction standards, backfill type or procedures. Each site must be discussed, and procedures agreed with Peto MacCallum Ltd. prior to the start of the earthworks and must be subject to ongoing review during construction. This appendix is not intended to apply to embankments. Steeply sloping ravine residential lots require special consideration.

For fill to be classified as engineered fill suitable for supporting structural loads, a number of conditions must be satisfied, including but not necessarily limited to the following:

1. Purpose

The site specific purpose of the engineered fill must be recognized. In advance of construction, all parties should discuss the project and its requirements and agree on an appropriate set of standards and procedures.

2. Minimum Extent

The engineered fill envelope must extend beyond the footprint of the structure to be supported. The minimum extent of the envelope should be defined from a geotechnical perspective by:

- at founding level, extend a minimum 1.0 m beyond the outer edge of the foundations, greater if adequate layout has not yet been completed as noted below; and
- extend downward and outward at a slope no greater than 45° to meet the subgrade

All fill within the envelope established above must meet the requirements of engineered fill in order to support the structure safely. Other considerations such as survey control, or construction methods may require an envelope that is larger, as noted in the following sections.

Once the minimum envelope has been established, structures must not be moved or extended without consultation with Peto MacCallum Ltd. Similarly, Peto MacCallum Ltd. should be consulted prior to any excavation within the minimum envelope.

3. Survey Control

Accurate survey control is essential to the success of an engineered fill project. The boundaries of the engineered fill must be laid out by a surveyor in consultation with engineering staff from Peto MacCallum Ltd. Careful consideration of the maximum building envelope is required.

During construction it is necessary to have a qualified surveyor provide total station control on the three dimensional extent of filling.

4. Subsurface Preparation

Prior to placement of fill, the subgrade must be prepared to the satisfaction of Peto MacCallum Ltd. All deleterious material must be removed and in some cases, excavation of native mineral soils may be required.

Particular attention must be paid to wet subgrades and possible additional measures required to achieve sufficient compaction. Where fill is placed against a slope, benching may be necessary and natural drainage paths must not be blocked.

5. Suitable Fill Materials

All material to be used as fill must be approved by Peto MacCallum Ltd. Such approval will be influenced by many factors and must be site and project specific. External fill sources must be sampled, tested and approved prior to material being hauled to site.

6. Test Section

In advance of the start of construction of the engineered fill pad, the Contractor should conduct a test section. The compaction criterion will be assessed in consultation with Peto MacCallum Ltd. for the various fill material types using different lift thicknesses and number of passes for the compaction equipment proposed by the Contractor.

Additional test sections may be required throughout the course of the project to reflect changes in fill sources, natural moisture content of the material and weather conditions.

The Contractor should be particularly aware of changes in the moisture content of fill material. Site review by Peto MacCallum Ltd. is required to ensure the desired lift thickness is maintained and that each lift is systematically compacted, tested and approved before a subsequent lift is commenced.

7. Inspection and Testing

Uniform, thorough compaction is crucial to the performance of the engineered fill and the supported structure. Hence, all subgrade preparation, filling and compacting must be carried out under the full time inspection by Peto MacCallum Ltd.

All founding surfaces for all buildings and residential dwellings or any part thereof (including but not limited to footings and floor slabs) on structural fill or native soils must be inspected and approved by PML engineering personnel prior to placement of the base/subbase granular material and/or concrete. The purpose of the inspection is to ensure the subgrade soils are capable of supporting the building/house foundation and floor slab loads and to confirm the building/house envelope does not extend beyond the limits of any structural fill pads.

8. Protection of Fill

Fill is generally more susceptible to the effects of weather than natural soil. Fill placed and approved to the level at which structural support is required must be protected from excessive wetting, drying, erosion or freezing. Where adequate protection has not been provided, it may be necessary to provide deeper footings or to strip and recompact some of the fill.

9. Construction Delay Time Considerations

The integrity of the fill pad can deteriorate due to the harsh effects of our Canadian weather. Hence, particular care must be taken if the fill pad is constructed over a long time period.

It is necessary therefore, that all fill sources are tested to ensure the material compactability prior to the soil arriving at site. When there has been a lengthy delay between construction periods of the fill pad, it is necessary to conduct subgrade proof rolling, test pits or boreholes to verify the adequacy of the exposed subgrade to accept new fill material.

When the fill pad will be constructed over a lengthy period of time, a field survey should be completed at the end of each construction season to verify the areal extent and the level at which the compacted fill has been brought up to, tested and approved.

In the following spring, subexcavation may be necessary if the fill pad has been softened attributable to ponded surface water or freeze/thaw cycles.

A new survey is required at the beginning of the next construction season to verify that random dumping and/or spreading of fill has not been carried out at the site.

10. Approved Fill Pad Surveillance

It should be appreciated that once the fill pad has been brought to final grade and documented by field survey, there must be ongoing surveillance to ensure that the integrity of the fill pad is not threatened.

Grading operations adjacent to fill pads can often take place several months or years after completion of the fill pad.

It is imperative that all site management and supervision staff, the staff of Contractors and earthwork operators be fully aware of the boundaries of all approved engineered fill pads.

Excavation into an approved engineered fill pad should never be contemplated without the full knowledge, approval and documentation by the geotechnical consultant.

If the fill pad is knowingly built several years in advance of ultimate construction, the areal limits of the fill pad should be substantially overbuilt laterally to allow for changes in possible structure location and elevation and other earthwork operations and competing interests on the site. The overbuilt distance required is project and/or site specified.

Iron bars should be placed at the corner/intermediate points of the fill pad as a permanent record of the approved limits of the work for record keeping purposes.

11. Unusual Working Conditions

Construction of fill pads may at times take place at night and/or during periods of freezing weather conditions because of the requirements of the project schedule. It should be appreciated therefore, that both situations present more difficult working conditions. The Owner, Contractor, Design Consultant and Geotechnical Engineer must be willing to work together to revise site construction procedures, enhance field testing and surveillance, and incorporate design modifications as necessary to suit site conditions.

When working at night there must be sufficient artificial light to properly illuminate the fill pad and borrow areas.

Placement of material to form an engineered fill pad during winter and freezing temperatures has its own special conditions that must be addressed. It is imperative that each day prior to placement of new fill, the exposed subgrade must be inspected and any overnight snow or frozen material removed. Particular attention should be given to the borrow source inspection to ensure only nonfrozen fill is brought to the site.

The Contractor must continually assess the work program and have the necessary spreading and compacting equipment to ensure that densification of the fill material takes place in a minimum amount of time. Changes may be required to the spreading methods, lift thickness, and compaction techniques to ensure the desired compaction is achieved uniformly throughout each fill lift.

The Contractor should adequately protect the subgrade at the end of each shift to minimize frost penetration overnight. Since water cannot be added to the fill material to facilitate compaction, it is imperative that densification of the fill be achieved by additional compaction effort and an appropriate reduced lift thickness. Once the fill pad has been completed, it must be properly protected from freezing temperatures and ponding of water during the spring thaw period.

If the pad is unusually thick or if the fill thickness varies dramatically across the width or length of the fill pad, Peto MacCallum Ltd. should be consulted for additional recommendations. In this case, alternative special provisions may be recommended, such as providing a surcharge preload for a limited time or increase the degree of compaction of the fill.

APPENDIX C

STATEMENT OF LIMITATIONS

STATEMENT OF LIMITATIONS

This report is prepared for and made available for the sole use of the client named. Peto MacCallum Ltd. (PML) hereby disclaims any liability or responsibility to any person or entity, other than those for whom this report is specifically issued, for any loss, damage, expenses, or penalties that may arise or result from the use of any information or recommendations contained in this report. The contents of this report may not be used or relied upon by any other person without the express written consent and authorization of PML.

This report shall not be relied upon for any purpose other than as agreed with the client named without the written consent of PML. It shall not be used to express or imply warranty as to the fitness of the property for a particular purpose. A portion of this report may not be used as a separate entity: that is to say the report is to be read in its entirety at all times.

The report is based solely on the scope of services which are specifically referred to in this report. No physical or intrusive testing has been performed, except as specifically referenced in this report. This report is not a certification of compliance with past or present regulations, codes, guidelines and policies.

The scope of services carried out by PML is based on details of the proposed development and land use to address certain issues, purposes and objectives with respect to the specific site as identified by the client. Services not expressly set forth in writing are expressly excluded from the services provided by PML. In other words, PML has not performed any observations, investigations, study analysis, engineering evaluation or testing that is not specifically listed in the scope of services in this report. PML assumes no responsibility or duty to the client for any such services and shall not be liable for failing to discover any condition, whose discovery would require the performance of services not specifically referred to in this report.

The findings and comments made by PML in this report are based on the conditions observed at the time of PML's site reconnaissance. No assurances can be made and no assurances are given with respect to any potential changes in site conditions following the time of completion of PML's field work. Furthermore, regulations, codes and guidelines may change at any time subsequent to the date of this report and these changes may effect the validity of the findings and recommendations given in this report.

STATEMENT OF LIMITATIONS

The results and conclusions with respect to site conditions are therefore in no way intended to be taken as a guarantee or representation, expressed or implied, that the site is free from any contaminants from past or current land use activities or that the conditions in all areas of the site and beneath or within structures are the same as those areas specifically sampled.

Any investigation, examination, measurements or sampling explorations at a particular location may not be representative of conditions between sampled locations. Soil, ground water, surface water, or building material conditions between and beyond the sampled locations may differ from those encountered at the sampling locations and conditions may become apparent during construction which could not be detected or anticipated at the time of the intrusive sampling investigation.

Budget estimates contained in this report are to be viewed as an engineering estimate of probable costs and provided solely for the purposes of assisting the client in its budgeting process. It is understood and agreed that PML will not in any way be held liable as a result of any budget figures provided by it.

The Client expressly waives its right to withhold PML's fees, either in whole or in part, or to make any claim or commence any action or bring any other proceedings, whether in contract, tort, or otherwise against PML in anyway connected with advice or information given by PML relating to the cost estimate or Environmental Remediation/Cleanup and Restoration or Soil and Ground Water Management Plan Cost Estimate.

Appendix F

Stantec Technical Memo Activa Baden North Subdivision Dedicated Storm Sewer System for Low Lying Areas near Existing DICB 158

Stantec Consulting Ltd.
100-300 Hagey Boulevard, Waterloo ON N2L 0A4

July 25, 2022
File: 603-05680/03

Attention: Mr. Jeff Molenhuis / Mr. Bryan Bishop
Township of Wilmot
60 Snyder's Road West
Baden ON N3A 1A1

Dear Sirs,

Reference: Activa Baden North Subdivision
Dedicated Storm Sewer System for Low Lying Areas near Existing DICB 158

This letter has been prepared to outline and evaluate various alternatives considered to drain the low areas at the rear of Michael Myers Road existing Lots 3 to 12 located within the Activa Baden Subdivision. It further recommends and provides design details for the preferred alternative that addresses the storm outlet required for these existing developed lands and the adjacent areas from the proposed Activa Baden North Subdivision.

Background

As per the Grading Plans and Storm Drainage Area Plans prepared for the existing Activa Baden Subdivision, rear yards of Lots 3 to 8 on Michael Myers Road drain to an existing DICB 158 located within an easement between Lots 6 and 7. Similarly, rear yards of Lots 9 to 12 on Michael Myers Road drain to an existing RLCB 159 located within an easement between Lots 8 and 9. Under the current conditions, existing DICB 158 and RLCB 159 convey 5-year storm flows to the existing storm sewers on Michel Myers Road. Storm flows, in excess of 5-year storm events, pond around DICB 158 within the existing low-lying area (with a bottom elevation of approximately 358.0 m and a corresponding spillover elevation of approximately 358.8 m) and drain towards the existing wetland located north of the existing Subdivision within the proposed Activa Baden North Subdivision lands; however, under the proposed development conditions (i.e., development of Activa Baden North Subdivision), an alternative conveyance solution is required to drain the 100-year storm events while maintaining a positive drainage to an acceptable outlet without impacting the adjacent existing homes.

Under the current conditions, DICB 158 and RLCB 159 also convey 5-year storm flows from some of the adjacent undeveloped lands to the west known as 1012 Snyder's Road West. MTE Consultant Inc., on behalf of the Owner of these lands, had prepared a Technical Memorandum in July 2020 summarizing the analyses of various options and recommended a preferred option that proposed a conveyance pipe system for the 100-year storm flows from the drainage areas currently allocated to DICB 158 and RLCB 159 through the proposed Activa Baden North Subdivision discharging to the proposed stormwater management (SWM) facility within the Activa Baden North Subdivision.

Please refer to the attached Storm Drainage Area Plan Drawing No. 11 prepared by Stantec for the existing Baden Subdivision for current areas draining to DICB 158 and RLCB 159 in the existing conditions.

Reference: Activa Baden North Subdivision
Dedicated Storm Sewer System for Low Lying Areas near Existing DICB 158

Storm Pipe System Alternatives

For the proposed conditions with Activa Baden North and 1012 Snyder's Road West Subdivisions being developed, the following two alternatives were evaluated for the proposed storm pipe system to convey 100-year design storm flows from the drainage areas currently allocated to DICB 158 and RLCB 159:

1. Alternative 1: Dedicated Storm Sewer to convey 100-year design flows from the subject drainage area under proposed conditions up to the proposed SWM Facility within Activa Baden North Subdivision.

2. Alternative 2: Combined Storm Sewer to convey 100-year flows from the subject drainage area under proposed conditions, and additional 5-year design flows from the proposed drainage area along the route of the storm sewer up to the proposed SWM Facility within Activa Baden North Subdivision.

Under proposed conditions during the 100-year event, it is understood that the existing storm sewer system conveying the drainage from the above noted DICB 158 would surcharge. That said, to ensure there is no backwater effect, it is proposed to plug the existing storm pipe from DICB 158 and that DICB 158 be decommissioned and removed. A new inlet structure would be installed to collect the flows and convey to the proposed SWM Facility within the Activa Baden North Subdivision via one of the alternatives noted above.

Preliminary Cost Estimates

A preliminary Opinion of Probable Cost (OPC) estimate was prepared for the two alternatives noted above. Based on these estimates included as an attachment to this letter, the following presents the estimated construction cost (excluding HST) for the two alternatives:

1. Alternative 1 (Dedicated Storm Sewer): Total construction cost is estimated at approximately $713,000 made up of approximately $304,000 for the dedicated storm sewer and $409,000 for the additional local storm sewers along the route of the dedicated storm sewer up to the proposed SWM Facility.

2. Alternative 2 (Combined Storm Sewer): Total construction cost is estimated at approximately $1,080,000 that includes an approximate $364,000 estimated for the additional fill required to raise the site by approximately 0.15 m for this alternative to be feasible.

Based on the OPC estimates noted above, Alternative 1 represents the least cost alternative. It is therefore recommended to proceed with Alternative 1 (Dedicated Storm Sewer).

The above noted alternatives and their respective cost estimates have previously been discussed with the Township staff, Owner of the adjacent 1012 Snyder's Road West Subdivision and their consultant MTE. It was further discussed that the cost would be shared between two developments based on respective drainage area contributions from these developments.

Reference: Activa Baden North Subdivision
Dedicated Storm Sewer System for Low Lying Areas near Existing DICB 158

Alternative Locations for Dedicated Storm Sewer

Based on proceeding with the preferred alternative of dedicated storm sewer for the subject drainage area as discussed above, Stantec had prepared and discussed the following three options, included as an attachment to this letter, for the road cross section where this dedicated storm sewer could be located in addition to other utilities such as watermain, sanitary sewer and local storm sewer, etc.:

1. Option 1: Dedicated storm sewer would be located between local storm sewer (underneath the curb line) and the sanitary sewer (underneath the centerline of road) – Dedicated storm sewer and local storm sewers would be located on the west side and north side of the right-of-way (ROWs).

2. Option 2: Dedicated storm sewer would be located underneath the curb line and the local storm sewer would be located between the dedicated storm sewer and sanitary sewer (underneath the centerline of road) - Dedicated storm sewer and local storm sewers would be located on the west side and north side of the ROWs.

3. Option 3: Dedicated Storm Sewer would be located between local storm sewer (underneath the curb line) and the sanitary sewer (underneath the centerline of road) - Dedicated storm sewer and local storm sewers would be located on the east side and south side of the ROWs.

Based on a review and analysis of the design details of the above-noted options, it was concluded that Option 2 is the preferred option for the location of the proposed dedicated storm sewer. The attached Drainage Area Plan shows the proposed locations of the sanitary sewers, storm sewers and watermains based on this preferred Option 2.

Design Details of Preferred Alternative

The preliminary design details of the preferred alternative are shown on the attached documents as noted below:

- Drainage Area Plan under proposed conditions for the dedicated storm sewer
- Design spreadsheet for the dedicated storm sewer
- Proposed Grading Plan near the inlet to the dedicated storm sewer pipe
- Drainage Area Plan Proposed Conditions Drawing No. C110
- Preliminary profile for the dedicated storm sewer pipe (Drawing No. TM100) from the inlet at the rear yards to the outlet at the SWM Facility. This profile also shows the local storm and sanitary sewers along this route.

Reference: Activa Baden North Subdivision
Dedicated Storm Sewer System for Low Lying Areas near Existing DICB 158

Should you have any questions or require any additional information, please do not hesitate to contact the undersigned.

Regards,

STANTEC CONSULTING LTD.

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Associate/Project Manager
Community Development
Mobile: (519) 498-2809
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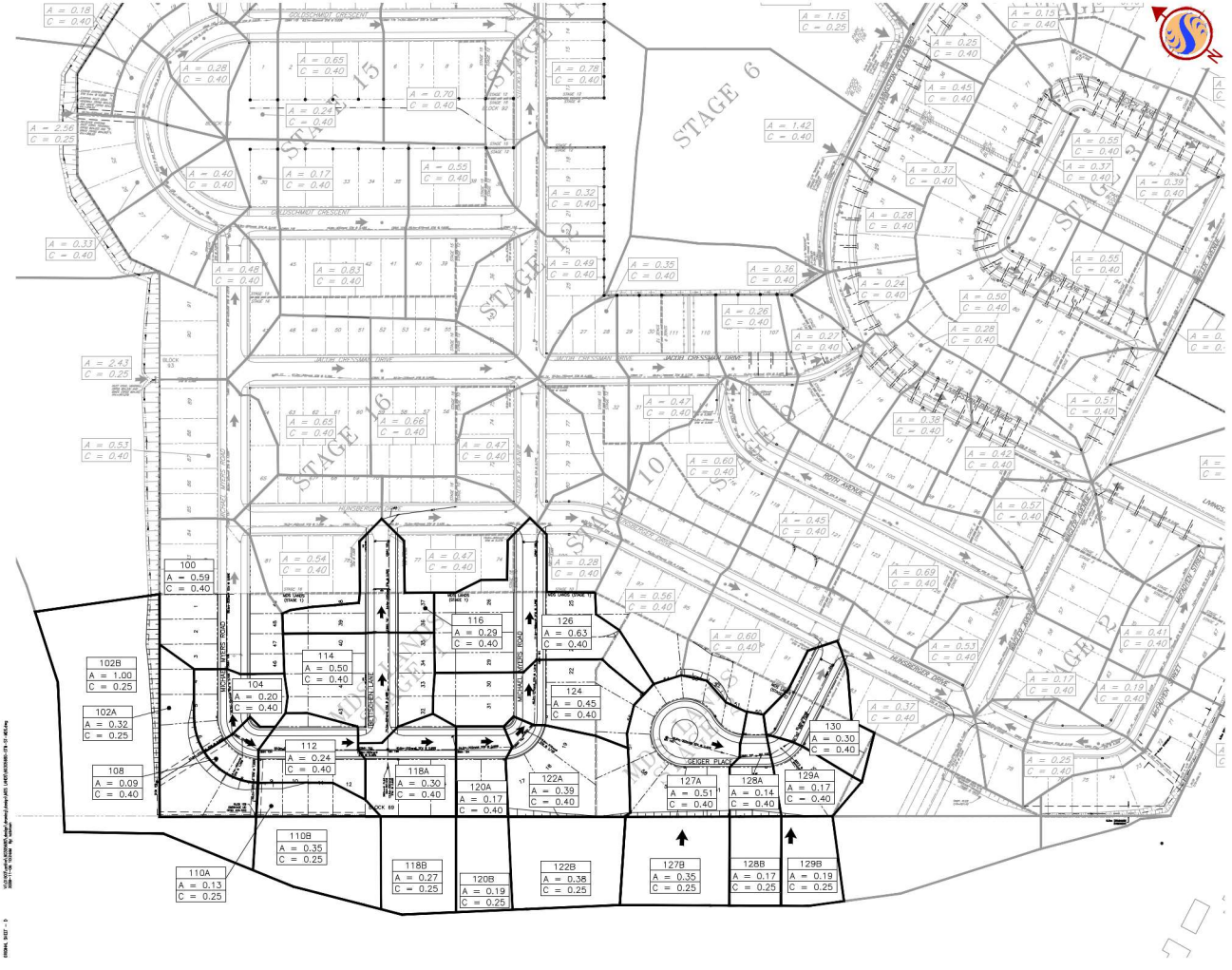
Attachments:
- Storm Drainage Area Plan Drawing # 11 for Existing Baden Subdivision
- Preliminary OPC Cost Estimates dated June 22, 2021 (3 pages)
- Drainage Catchments Proposed Areas for Dedicated Storm Sewer Pipe
- Preliminary Design Spreadsheet for Dedicated Storm Sewer Pipe
- Preliminary Proposed Grading Plan near Inlet to Dedicated Storm Sewer Pipe
- Proposed Road Cross Section Options Figures (4 Figures)
- Preliminary Drainage Area Plan for Proposed Conditions Drawing C110
- Preliminary Plan and Profile for Dedicated Storm Sewer Pipe Drawing TM100

c. Mr. Peter Armbruster, Activa Holdings Inc.
Mr. Steve Peterson, MTE



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Notes

1. BENCHMARK: #3 ELEV.=354.808m
BOLT & WASHERS IN NORTH FACE OF HYDRO LIGHT POLE LOCATED AT S.W. CORNER OF SNYDER ROAD (REG. ROAD #7) AND MILL STREET, "AS SUPPLIED BY REGION OF WATERLOO".
2. TOPOGRAPHICAL INFORMATION FROM FIELD SURVEY BY STANTEC CONSULTING LIMITED, COMPLETED JULY 2008.
3. LEGAL PLAN PROVIDED BY METZ & LORENTZ LTD.
PROJECT No. MS-117-11.

STAGING / PHASING LIMITS

110A	DRAINAGE AREA I.D.
A = 0.09	DRAINAGE AREA (ha)
C = 0.25	RUNOFF COEFFICIENT

DRAINAGE AREA BOUNDRY

EXTERNAL DRAINAGE

AC=0.34	ACCUMULATED AREA/RUNOFF COEFFICIENT
Tc=15.00	TIME OF CONCENTRATION

MAJOR OVERLAND FLOW

14. MOE LANDS – MOE COMMENTS	K.D.B.	P.D.F.	09.11.06
13. MOE STAGE 2 – FINAL LOTTING	K.D.B.	P.D.F.	09.10.26
12. MOE STAGE 1 – SECOND SUBMISSION	K.D.B.	P.D.F.	09.06.11
11. MOE STAGE 1 – FIRST SUBMISSION	K.D.B.	K.D.	09.07.07
10. THIRD SUBMISSION	K.D.B.	K.D.	08.05.06
9. SECOND SUBMISSION	J.C.M.	K.D.	08.01.18
8. STAGES 15 & 16 FINAL LOTTING	K.D.B.	V.E.R.	07.05.25
7. STAGES 10,11,13&14 LANDS EXCEPT FIRST SUBMISSION COMMENTS	D.F.H.	V.E.R.	06.03.01
6. STAGES 10,11,13&14 LANDS STG 2 FINAL LOTTING	D.F.H.	V.E.R.	05.12.16
5. STAGES 11,12,13&14 FIRST SUBMISSION COMMENTS	D.F.H.	V.E.R.	05.07.21
4. STAGES 11,12,13 & 14 FINAL LOTTING	D.F.H.	V.E.R.	05.03.18
3. AS RECORDED STAGES 2,7,8, & 9			
2. STAGES 2,7,8 & 9 FIRST SUBMISSION COMMENTS	K.D.H.	V.E.R.	04.03.04
1. STAGES 2,7,8 & 9 FINAL LOTTING	K.D.H.	V.E.R.	04.02.10
0. REGION OF WATERLOO COMMENTS	K.R.B.	VER	01.10.10
1. FIRST SUBMISSION COMMENTS	K.R.B.	V.E.R.	01.08.16
Revision	By	Appd.	Date
File Name:	K.R.B. Des.	V.E.R. Chkd.	V.E.R. Dapp.	01.08.01 Date

Seal

Client/Project
ACTIVA HOLDINGS INC.

BADEN SUBDIVISION
30T-04603
Township of Wilmot, ON Canada

Title
STORM DRAINAGE AREA PLAN

Project No.	Scale
60305680	1:1000
Drawing No.	Revision
11	16

Stantec

ACTIVA BADEN NORTH
ACTIVA HOLDINGS INC.

OPINION OF PROBABLE CONSTRUCTION COST
Option 1 - SW Corner Dedicated Storm Pipe

Stantec Project # 60305680
22-Jun-21

Item	Description	Unit	Quantity	Unit Price	Total
Option 1: Dedicated Storm Pipe c/w Outlet Headwall					
1.0	600 mm dia Storm Sewers	m	555.0	$ 375.00	$ 208,125.00
2.0	1200 mm dia Maintenance Holes	ea	6.0	$ 5,500.00	$ 33,000.00
3.0	1500 mm dia Maintenance Hole	ea	1.0	$ 8,000.00	$ 8,000.00
4.0	Headwall c/w Rodent Grate	ea	1.0	$ 15,000.00	$ 15,000.00
	Sub-Total				**$ 264,125.00**
	Contingency @ 15%				**$ 39,618.75**
	Total Construction Cost (excluding HST):				**$ 303,743.75**

Stantec

ACTIVA BADEN NORTH
ACTIVA HOLDINGS INC.

OPINION OF PROBABLE CONSTRUCTION COST
ROW Storm Pipe (In addition to Dedicated STM for Option 1)

Stantec Project # 60305680
22-Jun-21

Item	Description	Unit	Quantity	Unit Price	Total
ROW Storm Pipe c/w Outlet Headwall					
1.0	300 mm dia Storm Sewers	m	66.0	$ 150.00	$ 9,900.00
2.0	375 mm dia Storm Sewers	m	82.0	$ 190.00	$ 15,580.00
3.0	450 mm dia Storm Sewers	m	80.0	$ 225.00	$ 18,000.00
4.0	525 mm dia Storm Sewers	m	154.0	$ 300.00	$ 46,200.00
5.0	600 mm dia Storm Sewers	m	77.0	$ 375.00	$ 28,875.00
6.0	675 mm dia Storm Sewers	m	14.0	$ 450.00	$ 6,300.00
6.0	1350 mm dia Storm Sewers	m	38.0	$ 1,200.00	$ 45,600.00
6.0	1500 mm dia Storm Sewers	m	49.0	$ 1,350.00	$ 66,150.00
7.0	1200 mm dia Maintenance Holes	ea	3.0	$ 5,000.00	$ 15,000.00
7.0	1500 mm dia Maintenance Holes	ea	6.0	$ 6,500.00	$ 39,000.00
9.0	2400 mm dia Maintenance Holes	ea	2.0	$ 20,000.00	$ 40,000.00
10.0	Headwall c/w Rodent Grate	ea	1.0	$ 25,000.00	$ 25,000.00
	Sub-Total				**$ 355,605.00**
	Contingency @ 15%				**$ 53,340.75**
	Total Construction Cost (excluding HST):				**$ 408,945.75**

Stantec

ACTIVA BADEN NORTH
ACTIVA HOLDINGS INC.

OPINION OF PROBABLE CONSTRUCTION COST
Option 2 - SW Corner Combined Storm Pipe

Stantec Project # 60305680
22-Jun-21

Item	Description	Unit	Quantity	Unit Price	Total
Option 2: Combined Storm Pipe c/w Outlet Headwall					
1.0	600 mm dia Storm Sewers	m	54.0	$ 375.00	$ 20,250.00
1.0	675 mm dia Storm Sewers	m	48.0	$ 450.00	$ 21,600.00
3.0	750 mm dia Storm Sewers	m	160.0	$ 500.00	$ 80,000.00
4.0	825 mm dia Storm Sewers	m	230.0	$ 575.00	$ 132,250.00
5.0	900 mm dia Storm Sewers	m	14.0	$ 650.00	$ 9,100.00
6.0	1500 mm dia Storm Sewers	m	38.0	$ 1,350.00	$ 51,300.00
7.0	1800 mm dia Storm Sewers	m	49.0	$ 2,000.00	$ 98,000.00
8.0	1500 mm dia Maintenance Holes	ea	5.0	$ 6,500.00	$ 32,500.00
9.0	1800 mm dia Maintenance Holes	ea	4.0	$ 10,000.00	$ 40,000.00
10.0	3000 mm dia Maintenance Holes	ea	2.0	$ 30,000.00	$ 60,000.00
11.0	Headwall c/w Rodent Grate	ea	1.0	$ 30,000.00	$ 30,000.00
12.0	Additional fill required (~26ha x 0.14m)	cum	36,400.0	$ 10.00	$ 364,000.00
	Sub-Total				**$ 939,000.00**
	Contingency @ 15%				**$ 140,850.00**
	Total Construction Cost (excluding HST):				**$ 1,079,850.00**

STREET ONE

PROP.
REAR YARD
A=0.22
C=0.55

PROP.
REAR YARD
A=0.20
C=0.55

MTE
A=0.20
C=0.60

TRAIL
A=0.13
C=0.67

TRAIL
A=0.12
C=0.67

EX.
REAR YARD
A=0.33
C=0.55

EX.
REAR YARD
A=0.13
C=0.55

MICHAEL MYERS ROAD

MICHAEL MYERS ROAD

BELL

LS

BLOCK 69

1:1000 0 10 30 50m

V:\01603\active\60305680\design\drawing\civil\sheet_files\60305680_C-1105D-FSR_TOWNSHIP_AREA DRAINING SOUTH.dwg
7/22/2022 1:18:47 PM By: Miller, Jonathan

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100-300 Hagey Boulevard
Waterloo ON N2L 0A4
Tel: (519) 579-4410
www.stantec.com

Notes

A=0.33
C=0.55

RUNOFF COEFFICIENT

CONTRIBUTING AREA (ha)

MAJOR OVERLAND FLOOD ROUTE

DRAINAGE BOUNDARY

Client/Project
ACTIVA HOLDINGS INC.

ACTIVA BADEN NORTH

Project No.
60305680

Title
DRAINAGE CATCHMENTS
PROPOSED AREAS

Revision

Date
22.07.22

Reference Sheet

Figure No.

Stantec

SUBDIVISION
ACTIVA BADEN 60305680

Dedicated pipe from SW Corner to Proposed Pond

DATE: December 18, 2020
DESIGNED BY: JBM
CHECKED BY:
FILE NUMBER:

STORM SEWER DESIGN SHEET

DESIGN PARAMETERS

DESIGN STORM 1 IN 100 Years

I = a / ((tc + b) ^c)

a=	4688	MANNING'S n =	0.013		4688.000
b=	17	MINIMUM COVER:	1.500	m	17.000
c=	0.9620	TIME OF ENTRY	10	min	0.962

LOCATION			DRAINAGE AREA							PIPE SELECTION							
	BRA-NCH	FROM M.H.	TO M.H.	AREA I.D.	AREA (ha)	C	A x C (ha)	ACCUM. A x C (ha)	T of C (min)	I (mm/h)	Q (L/s)	LENGTH (m)	PIPE SIZE (mm)	SLOPE %	CAP. (FULL) (L/s)	VEL. (FULL) (m/S)	(ACT) (m/S)	TIME OF FLOW (min)	
Street Six Rear yard drainage and trail					0.35	0.60	0.21	0.21											
Existing area Draining to RLCB 159					0.13	0.55	0.07	0.07											
Existing area Draining to RLCB 158					0.33	0.55	0.18	0.18											
Adjacent Land to West	Inlet	CBMH 310			0.20	0.60	0.12	0.58	10.00	196.54	316.642	2.0	600	0.35	363.254	1.285	1.458	0.02	87%
	CBMH 310	MH309			0.00	0.50	0.00	0.58	10.02	196.38	316.384	36.5	600	0.35	363.254	1.285	1.458	0.42	87%
	MH309	MH308			0.00	0.50	0.00	0.58	10.44	193.50	311.754	84.9	600	0.35	363.254	1.285	1.452	0.97	86%
	MH308	MH307			0.00	0.50	0.00	0.58	11.41	187.11	301.455	75.4	600	0.35	363.254	1.285	1.445	0.87	83%
	MH307	MH306			0.00	0.50	0.00	0.58	12.28	181.76	292.837	90.0	600	0.35	363.254	1.285	1.439	1.04	81%
	MH306	MH305			0.00	0.50	0.00	0.58	13.33	175.74	283.143	66.8	600	0.35	363.254	1.285	1.426	0.78	78%
	MH305	MH304			0.00	0.50	0.00	0.58	14.11	171.50	276.301	90.0	600	0.35	363.254	1.285	1.426	1.05	76%
	MH304	MH303			0.00	0.50	0.00	0.58	15.16	166.10	267.598	90.0	600	0.35	363.254	1.285	1.413	1.06	74%
	MH303	HW			0.00	0.50	0.00	0.58	16.22	160.98	259.365	46.2	600	0.35	363.254	1.285	1.400	0.55	71%

STREET ONE

MICHAEL MYERS ROAD

MICHAEL MYERS ROAD

PROPOSED RETAINING WALL
LENGTH = 66.5m
MAX HEIGHT = 1.8m

BH/MW01-20
359.75
HGWL = 353.24

BH11-
358.13

1:750 0 7.5 22.5 37.5m

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Notes

Client/Project
ACTIVA HOLDINGS INC.

ACTIVA BADEN NORTH

Project No.
60305680

Title
PROPOSED GRADING PLAN FOR STREET ONE

Revision

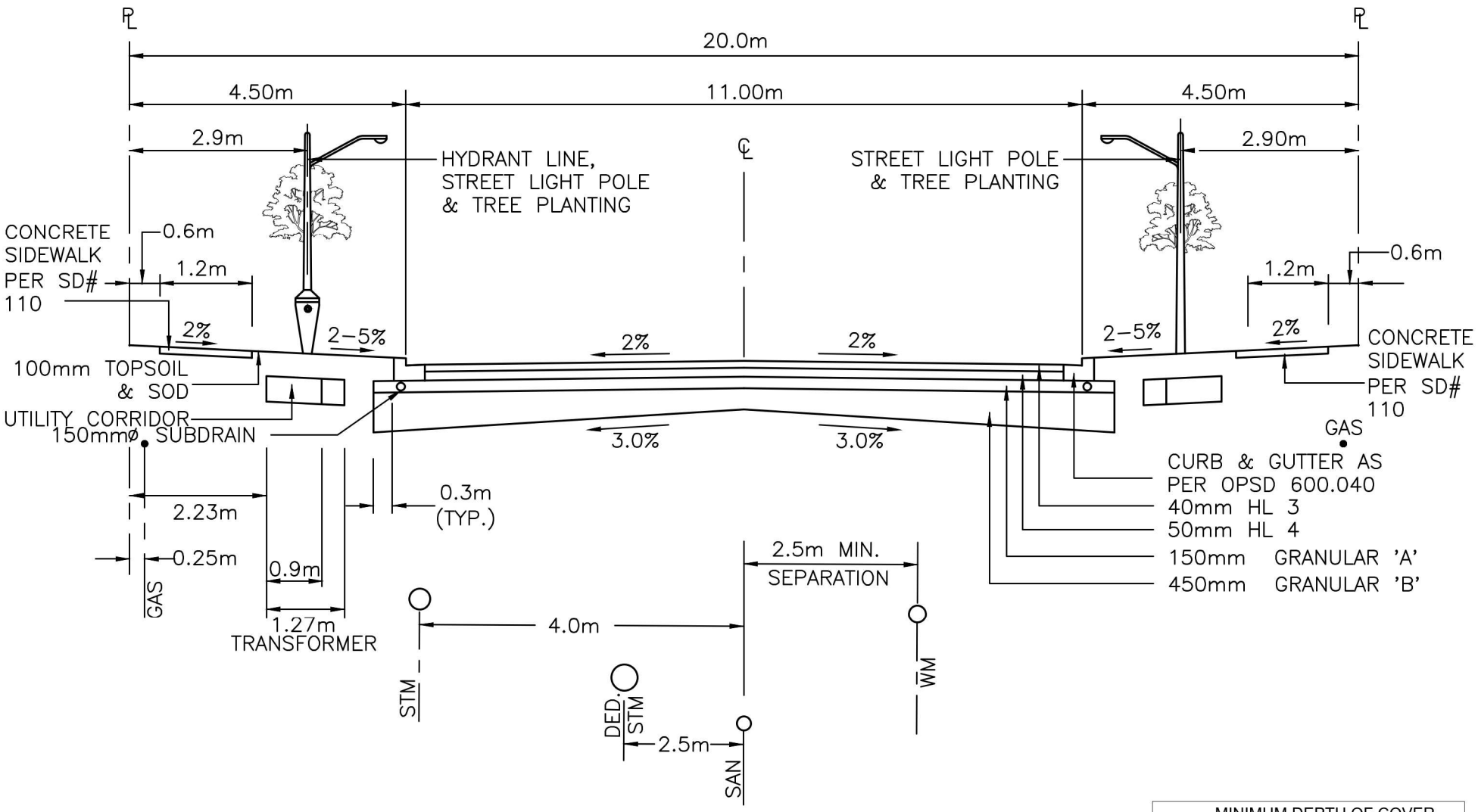
Date
22.07.22

Reference Sheet

Figure No.
400

V:\01603\active\60305680\design\drawing\civil\sheet_files\60305680_C-400GP-FSR-SW CORNER.dwg
7/22/2022 12:28:33 PM By: Miller, Jonathan

OPTION 1



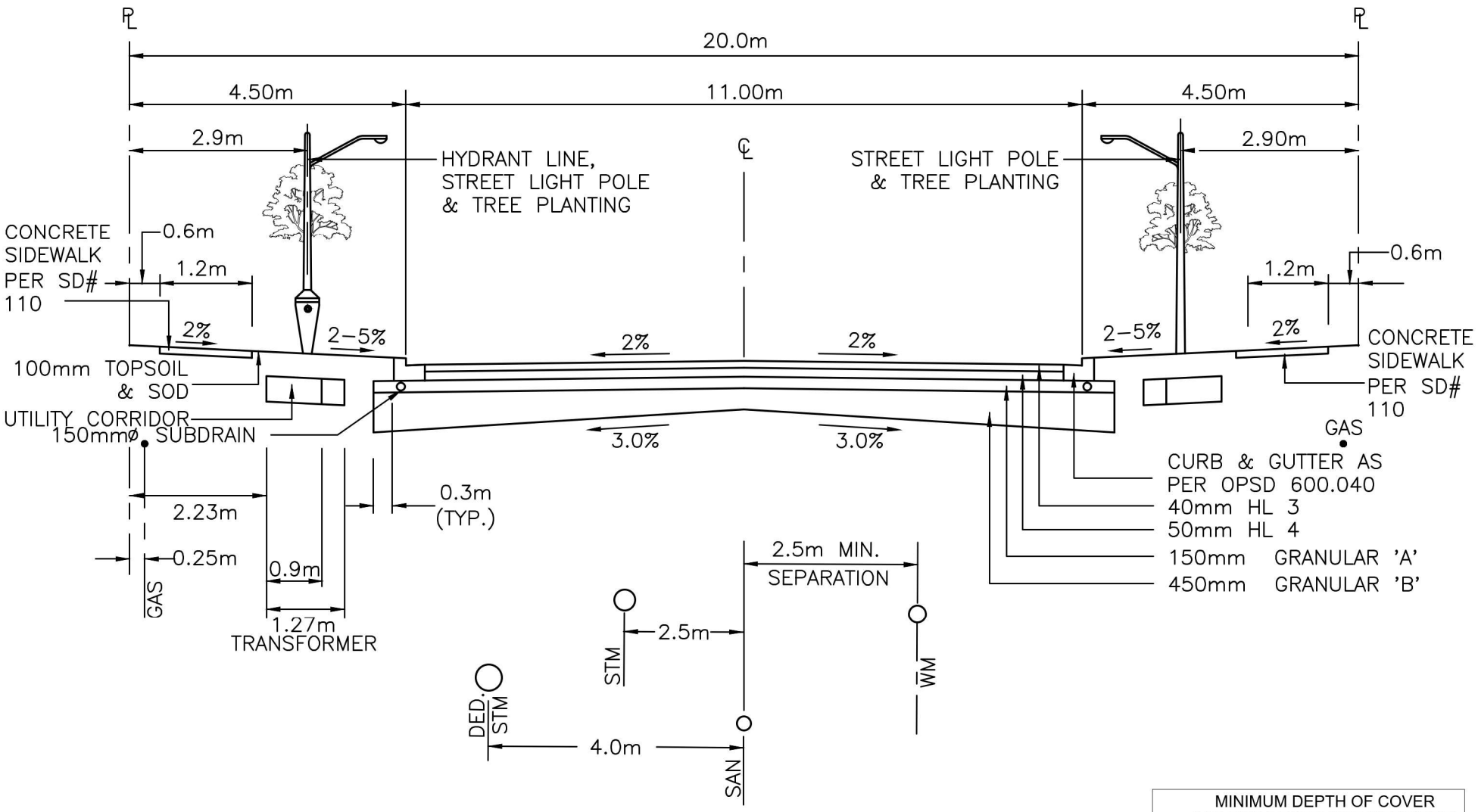
20.0m ROAD CROSS SECTION
STREET TWO

STA: 0+000 TO END

NTS

MINIMUM DEPTH OF COVER (UNLESS OTHERWISE SPECIFIED)	
SANITARY SEWER	2.80m
STORM SEWER	1.50m
WATERMAIN	2.00m
GAS MAIN	0.80m
UTILITY CORRIDOR	0.90m

OPTION 2



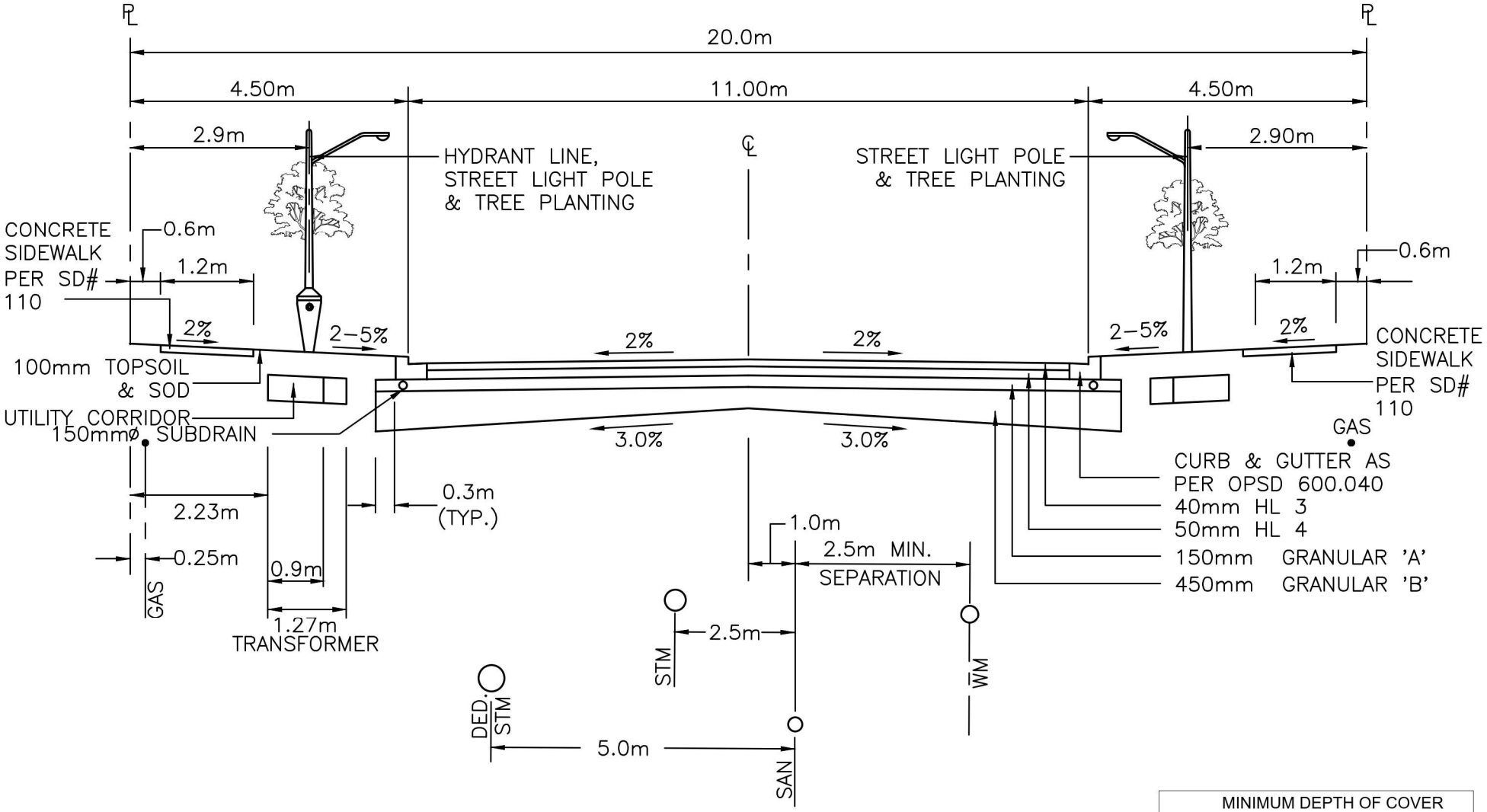
20.0m ROAD CROSS SECTION
STREET TWO

STA: 0+000 TO END

NTS

MINIMUM DEPTH OF COVER (UNLESS OTHERWISE SPECIFIED)	
SANITARY SEWER	2.80m
STORM SEWER	1.50m
WATERMAIN	2.00m
GAS MAIN	0.80m
UTILITY CORRIDOR	0.90m

OPTION 2



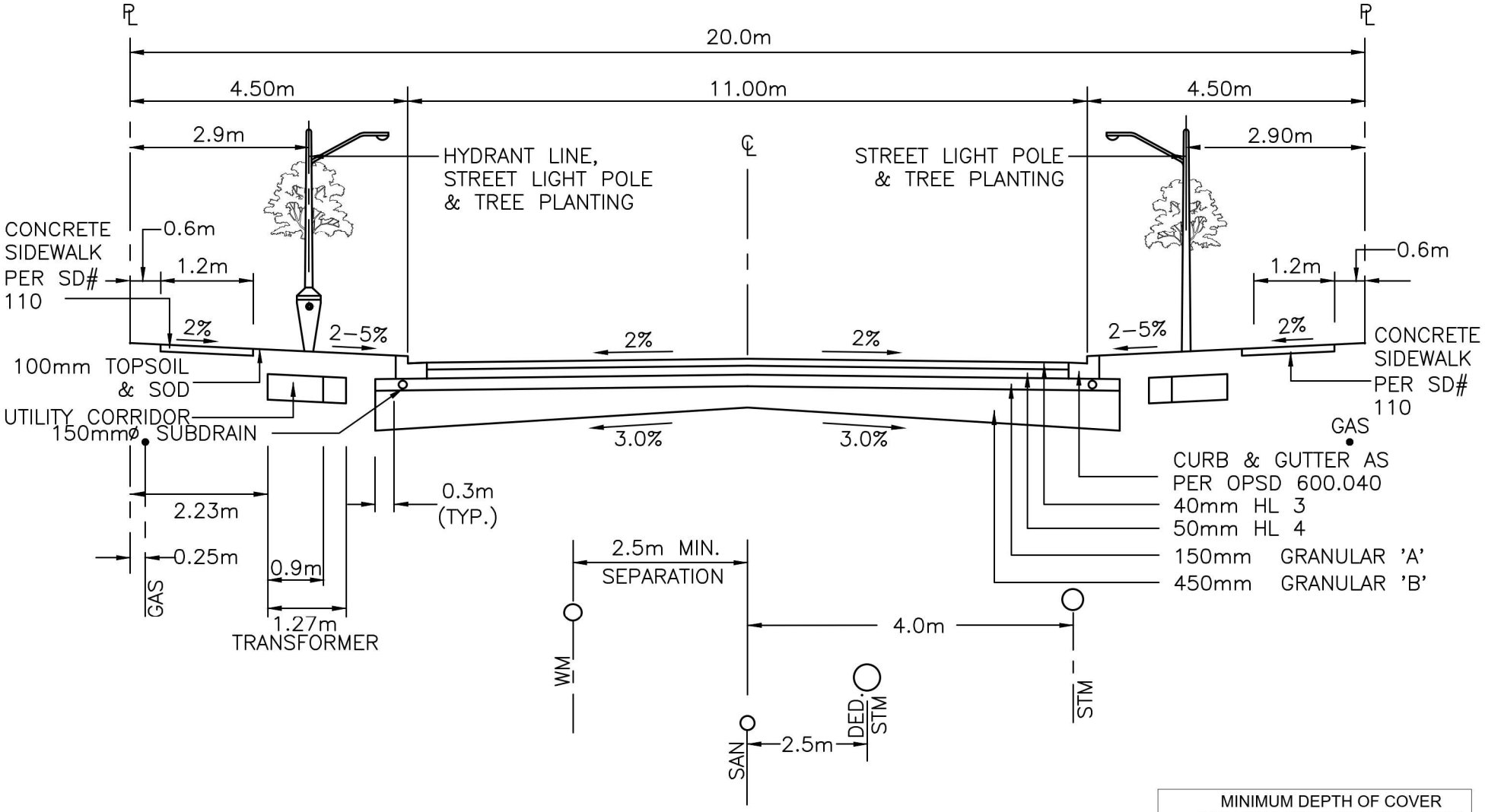
20.0m ROAD CROSS SECTION
STREET FIVE

STA: 0+000 TO END

NTS

MINIMUM DEPTH OF COVER (UNLESS OTHERWISE SPECIFIED)	
SANITARY SEWER	2.80m
STORM SEWER	1.50m
WATERMAIN	2.00m
GAS MAIN	0.80m
UTILITY CORRIDOR	0.90m

OPTION 3

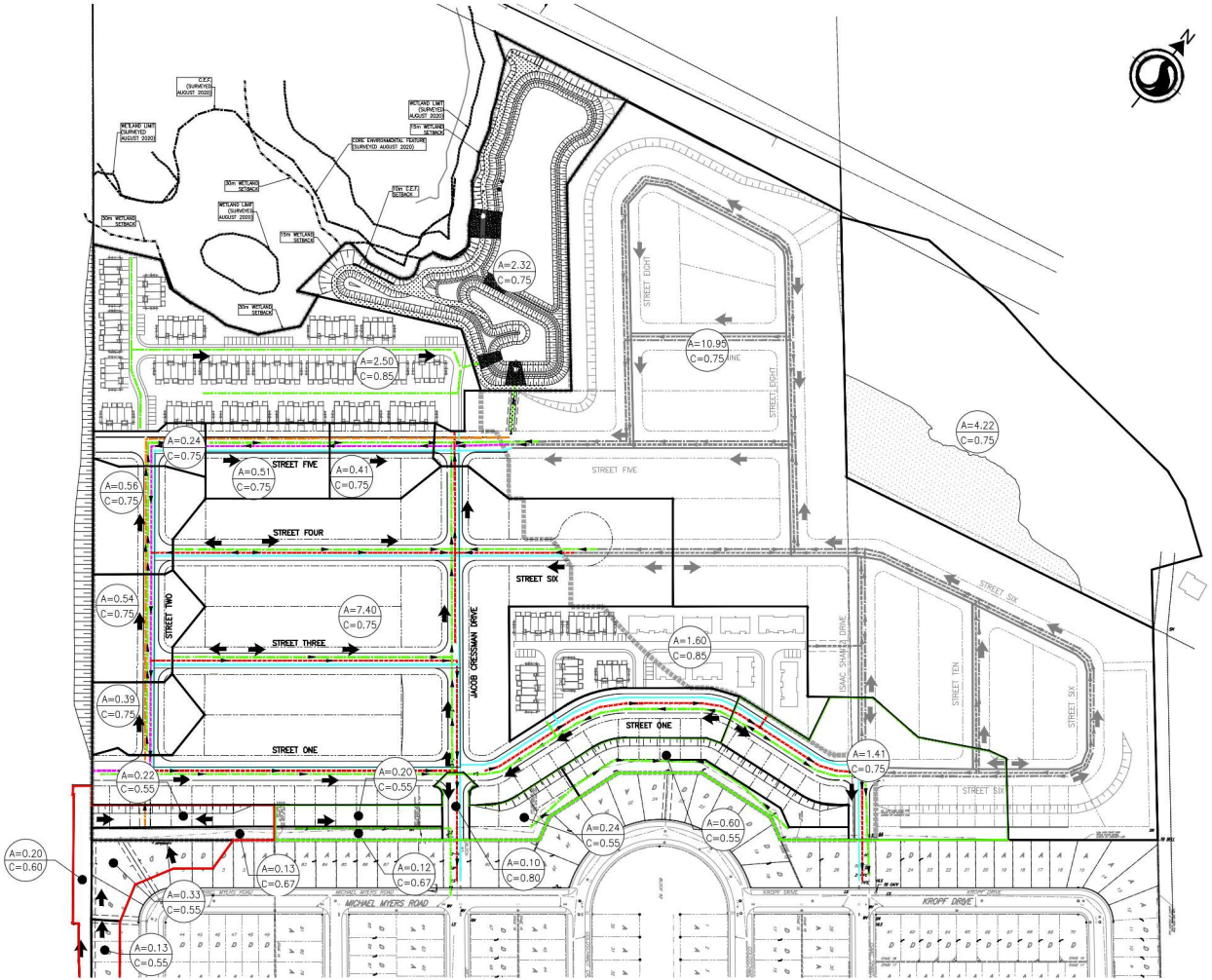


20.0m ROAD CROSS SECTION
STREET TWO

STA: 0+000 TO END

NTS

MINIMUM DEPTH OF COVER (UNLESS OTHERWISE SPECIFIED)	
SANITARY SEWER	2.80m
STORM SEWER	1.50m
WATERMAIN	2.00m
GAS MAIN	0.80m
UTILITY CORRIDOR	0.90m



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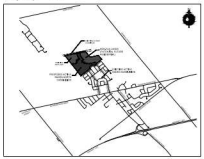
Notes
1. DRAFT PLAN PREPARED BY MHBC, DATED JULY 15, 2022.
2. TOPOGRAPHICAL SURVEY PREPARED BY STANTEC CONSULTING LTD., DATED JULY 22, 2019, JULY 6, 2020 AND JUNE 3, 2022. CONTOURS OUTSIDE OF THE PROPERTY LINE HAVE BEEN OBTAINED FROM ADAM POINT CLOUD (2014-LIDAR) LAND INFORMATION ONTARIO DATASET.

Key Map NTS.



Legend
- CURRENT DRAFT PLAN LIMIT
- PROPOSED STORM SEWER
- PROPOSED DEDICATED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY TRUNK SEWER
- PROPOSED WATERMAIN
- PROPOSED STORM DRAINAGE AREA CONVEYED SOUTH THROUGH EXISTING DEVELOPMENT
- PROPOSED STORM DRAINAGE AREA CONVEYED NORTH VIA DEDICATED STORM PIPE
- FUTURE STORM SEWER
- FUTURE SANITARY SEWER
- FUTURE WATERMAIN

Revision	By	Appd	YY.MM.DD
2 FSR-PRELIMINARY SUBMISSION	JMW	HL	2022.07.22
File Name: 6030568_C-110_DRAINAGE PLAN.dwg	Dsn'r	Chkd	Dsgn'r
	JMW	HL	2022.07.22

Permit-Seal

PRELIMINARY NOT FOR CONSTRUCTION

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Client/Project
ACTIVA HOLDINGS INC.

ACTIVA BADEN NORTH

Baden, Ontario

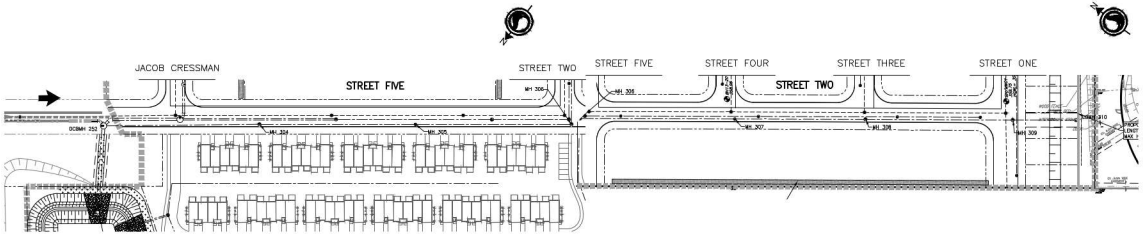
Title
PRELIMINARY DRAINAGE AREA PLAN FOR ULTIMATE CONDITIONS

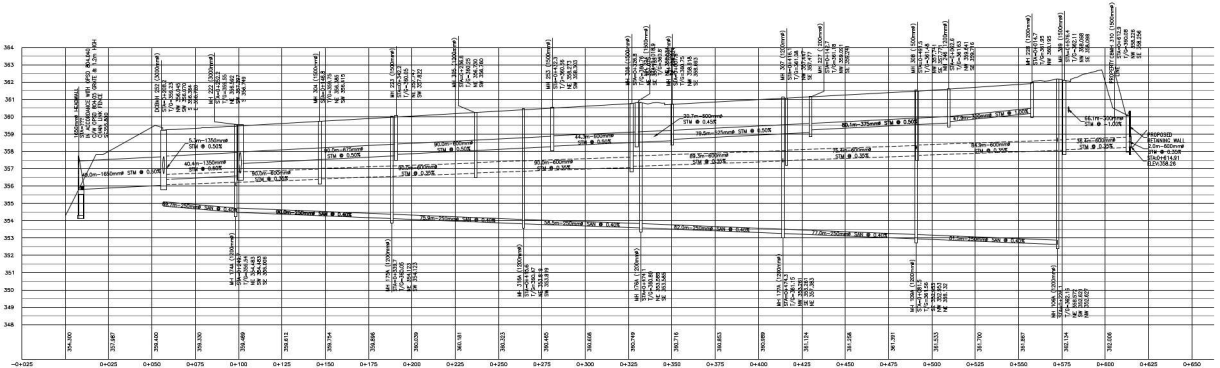
Project No. 60305680

Scale 1:1250 (0, 12.5, 25, 37.5, 50.0m)

Revision Sheet of

Drawing No. C110





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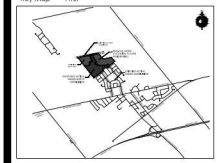
Notes

Key Map NTS.



Legend

Revision	By	Appd	YYYY.MM.DD
2	RSK-FIRST SUBMISSION	BM	HL	2022.07.22

File Name: 60305680_C-ENG_TECH v02.mcd	Dsn.	Chkd.	Dsgn.	YYYY.MM.DD
	BM	HL	BM	2022.07.22

Permit-Seal

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Client/Project

ACTIVA HOLDINGS INC.

ACTIVA BADEN NORTH

Baden, Ontario

Title

PLAN AND PROFILE
DEDICATED STORM PIPE
STREET SEVEN AND STREET THREE

Project No.	Scale	
60305680	1:1000H 1:100V	0 10 20 30 40m 0m

Revision	Sheet	Drawing No.
	of	TM100

C:\Users\brian.mcbride\Documents\60305680_C-ENG_TECH v02.mcd
ORIGINAL SHEET - ANSI D

Appendix G

Monitoring Program

TABLE G1 SURFACE AND GROUNDWATER MONITORING PROGRAM - 1012 SNYDER'S ROAD WEST

Monitoring Component	Type of Monitoring	Development Phase	Sampling Frequency	Location(s)	Methodology / Timing
SWM Facilities	Water Quality	During/Post-Construction	Event-based (>15mm rain events)	SW1, SW2, SW3 - Forebays and Outlet of the SWMF, Outlet of the STM outlet pipe in the Baden Creek tributary	TSS samples captured seasonally following significant rainfall events
Wetland Feature	Water Quality	All	4x per year (seasonally)	Wetland north of proposed development	Grab samples will be taken 4 times per year (once per season) under base flow conditions. Samples will be analyzed for chlorides, nitrates, total phosphorous, and TSS.
	Water Temperature	All	Continuous (6 hour interval)	Wetland north of proposed development	Water temperatures will be continuously measured with recordings taken every 1 hour.
	Water Levels	All	Continuous (6 hour interval)	Wetland north of proposed development	Water levels will be continuously measured with recordings taken every 1 hour.
Surface Water	Water Levels and Temperature	Pre-Construction	4x per year	Baden Creek Tributary.	Monitored on a quarterly basis (either with manual water level measurements or with electronic data loggers) for two continuous years.
		During/Post-Construction	4x per year	Baden Creek Tributary.	Monitored on a quarterly basis (either with manual water level measurements or with electronic data loggers).
	Water Quality	All	4x per year (seasonally)	Baden Creek Tributary.	Grab samples will be taken 4 times per year (once per season) under base flow conditions. Samples will be analyzed for chlorides, nitrates, total phosphorous, and TSS.
Groundwater	Water Levels	Pre-Construction	4x per year	Monitoring wells MW101-19, MW102-19, MW103-19, MW104-19 MW105-19, MW106A-19, MW106B-19, MW106C-19, MW201-20, MW202-20, MW203-20, MW301-20, MW302-20, MW304-20, MW305B-20, MW309-20, MW310-20, MW101-23, MW102-23, MW103-23, MW104-23, MW105-23, MW106-23, MP1-20	Monitored on a quarterly basis (either with manual water level measurements or with electronic data loggers) for two continuous years.
		During/Post-Construction	4x per year	Monitoring wells MW101-19, MW102-19, MW103-19, MW105-23, MW106-23	Monitored on a quarterly basis (either with manual water level measurements or with electronic data loggers). It is recognized that as development of a Phase progresses, some monitoring wells will be decommissioned (per O. Reg. 903) due to their locations. Monitoring wells identified are specifically for post-construction.
	Chemistry	During/Post-Construction	1x per year	MW106-23	Sampled on an annual basis and analyzed for general chemistry parameters (including major anions, cations, nutrients, metals, e-coli and fecal coliforms).

Appendix H

MTE Technical Memo
Results of Infiltration Testing for 1012 Snyders Road West, Ontario

MTE Consultants
520 Bingemans Centre Drive, Kitchener, Ontario N2B 3X9

September 1, 2023
MTE File No.: C40777-800

Mr. Nick Gougoulias
Snyder's Road (Baden) Developments Inc.
7050 Major Mackenzie Drive
Vaughan, ON L0J 1C0

Dear Mr. Gougoulias:

RE: Proposed Residential Development – Results of Infiltration Testing for 1012 Snyders Road West, Ontario

This letter represents the results of infiltration testing completed by MTE Consultants Inc. (MTE) on August 10, 2023, at 1012 Snyders Road West, ON (Hereby referred to as the "Site").

Infiltration testing was undertaken at one location on-Site identified as Infiltration Point TP101-23, as shown on **Figure 1** (attached). TP101-23 was completed in the vicinity of proposed infiltration feature which is to be constructed as part of the proposed residential development.

Field Program

MTE staff arrived on-Site to conduct infiltration testing on August 10, 2023. Infiltration testing was conducted beneath the overlying topsoil at approximately 5.3 metres below grade (m bgs) at TP101-23, using a Guelph Permeameter.

To perform the infiltration test with the Guelph Permeameter, a Riverside/Bucket auger is used to auger an 80mm diameter hole to the depth at which testing would be completed. The permeameter is subsequently filled with water and placed in the augered hole where the rate of fall (water exiting the permeameter) over time is recorded.

The unconsolidated sediments encountered were observed to be sand with trace silt. The geology sequence is similar to those found during a 2020 Hydrogeological Characterization Report completed by MTE Consultants Inc.

In addition to the infiltration testing, samples were collected from the test location and submitted for particle size distribution analysis.

Results

The sediments encountered by MTE staff were noted to consist of sand and some silt. A copy of the test pit log for TP101-23 is attached. Results of the in-situ infiltration testing were analyzed using a calculator provided by Soilmoisture Equipment Corporation to generate saturated field hydraulic conductivity (Kfs) values. Hydraulic conductivity values were averaged over three permeameter trials completed within the test pit.

The average field saturated hydraulic conductivity value (Kfs) calculated was 6.0×10^{-5} and 2.6×10^{-6}m/sec for the Guelph Permeameter field test and grain size testing respectively. These values were converted into an infiltration rate using the supplementary guideline to the Ontario Building Code, Ontario Ministry of Municipal Affairs and Housing (OMMAH, 1997). A summary of the infiltration rates determined by MTE using the Guelph Permeameter and results from

grain size testing from fieldwork conducted on August 10, 2023, have been provided in **Table 1**, below.

Table 1 – Summary of Calculated Infiltration Rates

Test Location	Test Depth (m bgs)	Dominant Sediment Type	Saturated Field Hydraulic Conductivity from Guelph Permeameter (m/sec)	Infiltration Rate Based on Guelph Permeameter (mm/hr)[1]	Saturated Field Hydraulic Conductivity from Grain Size (m/sec)	Infiltration Rate Based on Grain Size (mm/hr)[1]
TP101-23	5.3	Sand, some silt	$6.0x10^{-5}$	136	$2.6x10^{-6}$	60

Notes:
[1] No Factor of Safety included in the infiltration rate calculation.

Conclusion

Infiltration testing was completed in TP101-23 at 1012 Snyders Road West in Baden Ontario on August 10, 2023, in the vicinity of proposed infiltration facilities. Infiltration testing was completed at approximately 5.3 metres below grade. The calculated infiltration rates were found to be in the order of 136mm/hr using the Guelph Permeameter. This is consistent with published results for these sediment types (Freeze and Cherry, 1979). Conservatively, the average infiltration rate between the Guelph Permeameter and grain size testing is found to be in the order of 98mm/hr. The variance between the grain size testing and the Guelph Permeameter is likely attributed to varying sediment matrix.

Yours truly,

MTE Consultants Inc.

Kyle Reed, P.Geo.
Hydrogeologist
519-743-6500 ext. 1380
kreed@mte85.com

KNR: jmm
Attach.
M:\40777\800\05-Reports\MTE Reports\Infiltration Testing\40777-800_2023-09_1_ltr_Infiltration Testing.docx

SS-311 (2020)
Elev.=362.526

SS-312 (2020)
Elev.=362.526

SS-313 (2020)
Elev.=359.550

BH-11 (2018)
Elev.=361.67

BH-4 (2018)
Elev.=361.340

BH-306 (2020)
Elev.=360.715

BH-307 (2020)
Elev.=360.645

MW-304 (2020)
GR Elev.=360.670
PZ Elev.=361.672
MAX GW=_____
AVG GW=_____
MIN GW=_____

BH-8 (2018)
Elev.=360.130

BH-305 (2020)
Elev.=360.608

BH-303 (2020)
Elev.=360.612

BH-308 (2020)
Elev.=360.203

BH-12 (2018)
Elev.=359.820

BH-7 (2018)
Elev.=360.020

MW-301 (2020)
GR Elev.=360.520
PZ Elev.=363.361
MAX GW=_____
AVG GW=_____
MIN GW=_____

MTE-MW-106B-19
GR Elev.=360.640
PZ Elev.=361.449
MAX GW=352.190
AVG GW=352.060
MIN GW=351.920

N=4805852.729
E=525945.265

N=4805845.566
E=525950.933

BH-6 (2018)
Elev.=360.06

MTE-MW-106C-19
GR Elev.=360.610
PZ Elev.=361.346
MAX GW=360.520
AVG GW=359.060
MIN GW=358.340

MTE-MW-106A-19
GR Elev.=360.710
PZ Elev.=361.584
MAX GW=352.240
AVG GW=352.080
MIN GW=351.910

MW-309 (2020)
GR Elev.=362.600
PZ Elev.=363.549
MAX GW=_____
AVG GW=_____
MIN GW=_____

BH-10 (2018)
Elev.=359.730

N=4805819.390
E=525917.852

Stormwater Management Facility

N=4805745.352
E=525968.699

N=4805810.139
E=525916.671

MTE-MW-102-19
GR Elev.=358.900
PZ Elev.=359.785
MAX GW=354.650
AVG GW=354.110
MIN GW=352.880

N=4805824.242
E=525909.262

BH-5 (2018)
Elev.=360.240

INFILTRATION TEST LOCATION–TP101–23
N=4805815.304
E=525912.726

N=4805739.629
E=525961.572

N=4805807.443
E=525907.118

PROPOSED INFILTRATION GALLERY

BOTTOM OF GALLERY=354.00m±

SNYDER'S ROAD WEST

CHARLOTTA STREET

BRENNEMAN

Date: JUN.21/23
Scale: 1:1500

INFILTRATION TESTING (INFIL GALLERY LOCATION)

MTE
Engineers, Scientists, Surveyors

Project No. 40777-104

August 31, 2023 – 11:34 a.m. – Plotted By: TBerry

P:\P\40777\104\TEMP DWGS\AXH\40777-104-INFILTRATION TESTING.dwg

ID No.: TP101-23

Project Name: 1012 Snyder's Rd W. Development

MTE File No.: 40777-800

Client: Snyder's Road (Baden) GP Inc.

Site Location: Baden, ON

Date Completed: 8/10/2023

Contractor: J. Weber Contracting Ltd.

Excavation Method: Excavator

Subsurface Profile				Sample		
Depth (ft / m)	Symbol	Soil Description	Elevation (masl) Depth (m)	Soil Sample Lab Analysis	PID (ppm)	Hydrocarbon (ppm)
0 / 0		Ground Surface	359.2			
		TOPSOIL Brown sitly sand topsoil, some organics, moist	0.0 358.6			
2 /		**CLAYEY SILT** Brown clayey silt, trace to some sand, moist	0.6 357.5			
6 / 2		**SAND** Brown sand, trace to some silt, moist	1.7 353.8	GSA		
18 / 6		Excavation Terminated	5.3			

Field Technician: T. Greer

Drafted by: T. Greer

Reviewed by: A. Bingeman

MTE

Sheet: 1 of 1

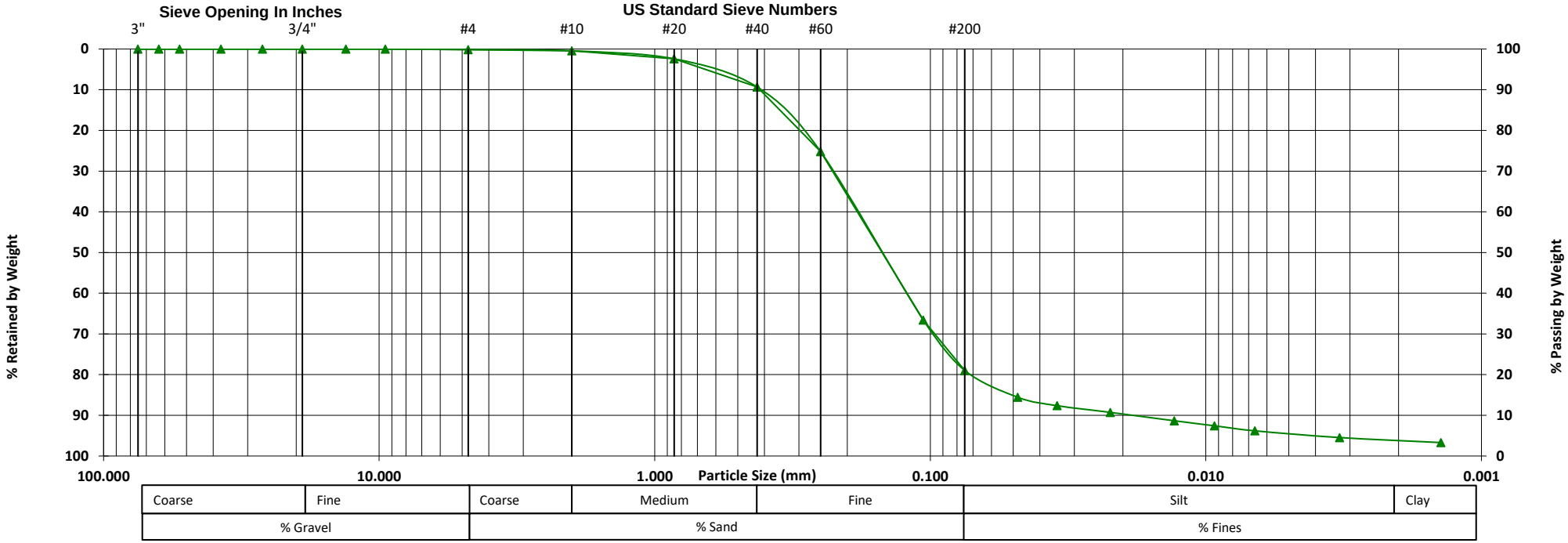
UTM: 525911.6E 4805818.6N

Infiltration test conducted at 353.9m amsl

Particle Size Distribution Analysis Test Results

Project Name:	**1012 Snyder's Road West Development**	**Date Received:**	**August 7, 2023**	**MTE File No.:**	**40777-800**
Client:	**Snyder's Road (Baden) GP Inc.**	**Date Tested:**	**August 17-24, 2023**	**Table No:**	**101**
Project Location:	**1012 Snyder's Road West, Baden, ON**				

Unified Soil Classification



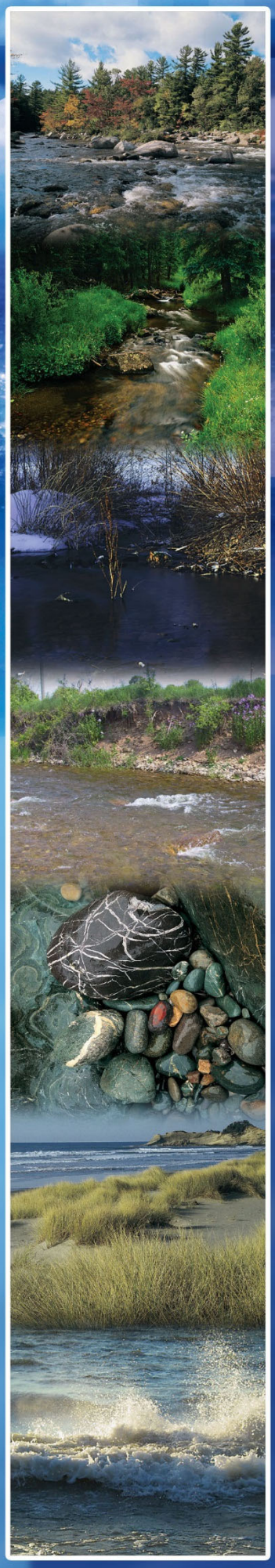
Symbol	Test Pit ID	Sample #	Sample Depth	Description
—▲—	TP101-23	GS-1	6.0 mbgs	SAND, some Silt, trace Clay

CERTIFIED BY CCIL Canadian Council of Independent Laboratories
For specific tests as listed on www.ccil.com

NOTES:

Appendix I

Erosion Threshold Assessment



waters edge
ENVIRONMENTAL SOLUTIONS TEAM LTD.

1012 Snyder's Rd.
Baden, ON
Wilmot Township

Fluvial Geomorphological and Erosion Threshold Assessment

October 4, 2023

October 4, 2023
WE 21038

Mr. Steve Peterson, CET
Director, Land Development
MTE Consultants, Inc.
520 Bingemans Centre Dr.,
Kitchener, ON
N2B 3X9

Dear Mr. Peterson:

RE: 1012 Snyder Rd., Baden, ON
Baden Creek Fluvial Geomorphological and Erosion Threshold Assessment

1. INTRODUCTION

Water's Edge Environmental Solutions Team (WEEST) was authorized by MTE to complete a geomorphic characterization on Baden Creek in the Township of Wilmot. This is to support the future development at 1012 Snyder's Rd. As part of the development the site will discharge controlled stormwater into Baden Creek. In order to establish the appropriate erosion controls, an erosion threshold analysis was undertaken for the downstream affected reaches of Baden Creek. This analysis supports and directs various control methods for land development to mitigate increased runoff that may adversely affect stream channel form and process.

This report will first characterize the existing watercourses that drain into the main branch of Baden Creek and the general watershed conditions within the study area. Relevant literature on the site was reviewed and confirmed and as necessary, updated based on a desktop analysis and synoptic geomorphic survey(s). Results from the desktop assessments were used to determine cross-sections to undertake detailed field surveys sufficient to determine channel characterization and erosion thresholds.

The subject area is located in the southwest section of the village of Baden. The main branch of Baden Creek originates the northeast corner of Baden, while one tributary collects drainage from a residential development to the north, and another one from the northwest corner. The main branch is dammed on the west side of Foundry St. but continues on as it drains generally in a southerly direction out of Baden. Downstream of Gingerich Road, Baden Creek eventually drains into the Nith River. **Figure 1** shows the Study Area as well as the subject reaches.

We have acquired data and background information as part of our assessment of the Study Area creeks, these data sources for the analysis include:

- Physiography of Southern Ontario by Chapman & Putnam (digital data from Ministry of Northern Development and Mines (MNDM));
- Site Survey and Field Assessments; and,
- Discussions with MTE staff.

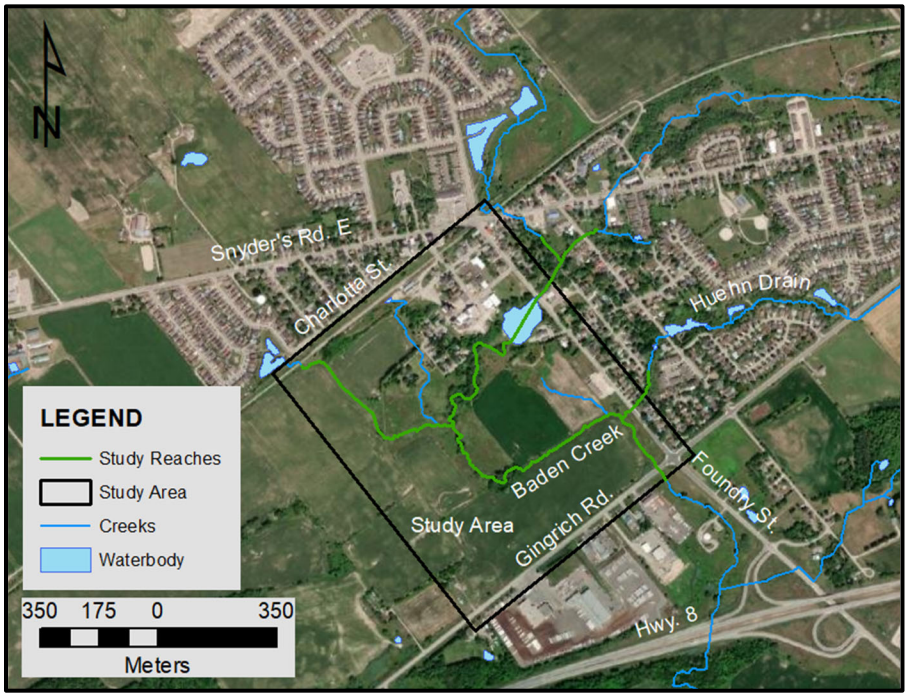


Figure 1: Study Reaches

2. BACKGROUND REVIEW

Physiography and Surficial Geology

Understanding the surficial and underlying geology for the study area provides insight into the geological influence on channel geometry, expected rates of erosion, and helps define the quantity and type of sediment available for watercourses to transport and deposit.

The studied watercourse is located within the Waterloo Hills physiographic region. This region is known to contain sandy hills, kames, and moraines. The areas around Baden are particularly known to have large kames that are made up of gravel and sand. The physical landform which the study site is located in is split between kame moraines and till plains (shown in **Figure 2**). The surficial geology of the site is mostly till that is clay to silt textured and is from glaciolacustrine deposits or shale.

General Stream Characteristics

The tributary of Baden Creek originates from a SWM facility on the north side of railway tracks (**Figure 1**). The SWM facility is for a residential development south of Snyder's Rd. The main branch of Baden Creek in the study area is a third order tributary to the Nith River, which it joins into roughly 5 km downstream of the site. Upstream of the study area along Baden Creek is a large pond that is controlled by a dam, this dam backwaters a large portion of Baden Creek.

Development Plans and Stormwater Management

Development of a subdivision is proposed north of Snyder's Rd. and the drainage from the site will be directed into the small Baden Creek tributary. First the flows will be piped south along Christian St. and into a SWM facility that includes an infiltration gallery. After the SWM pond the flows will outlet into a swale which directs them to the tributary. Because of this the receiving tributary needs to be assessed to determine the suitability for a change in the flows.

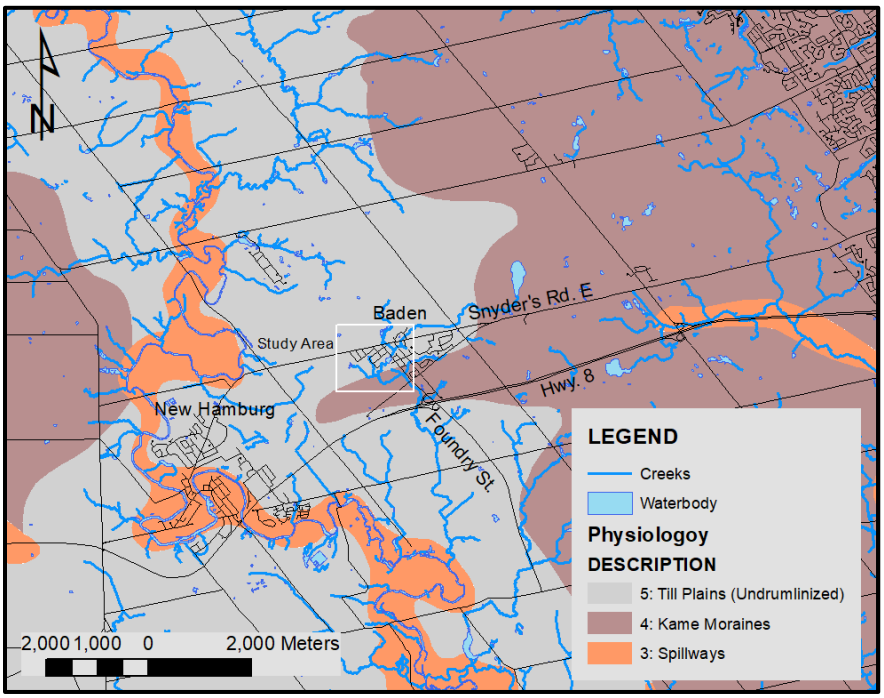


Figure 2: Local Surficial Geology (data from MNDM)

3. FIELD INVESTIGATIONS

A geomorphic assessment of Baden Creek including a tributary were completed within the Study Area. **Figure 3** shows the reach breakdown for the Study Area channels. A series of cross-sections were surveyed along with longitudinal profiles of the creeks. Bed and bank materials were recorded to come up with a general characterization of the channel. During the site visit conducted in January 2022, staff gathered a synoptic level understanding of the trends and channel condition through the application of rapid assessments. It is noted that the field investigations took place during the coldest time of the year and the site was partially obscured with ice and snow. However, a follow up investigation in June 2022 provided additional information such as substrate data. Rapid field assessments aid in determining the sensitive sections of the creek which are the focus of an erosion assessment. Locations for detailed surveys of profile, cross-section, and particle analysis were selected based at an appropriate location downstream from the SWM discharge based on distinguishing features observed within the reach.

Reach Delineation

Channel morphology and substrate characteristics can change along a watercourse. Hence, it becomes imperative to account for this variation by delineating lengths of a watercourse that exhibit similar planform, sediment substrate, land use, local geology, valley confinement, hydrology and gradient. For this study, three separate reaches have been identified, two in the west tributary to Baden Creek (Reach 1 and 2) and one along the main branch of Baden Creek (Reach 3). The west tributary is split into two reaches due to the slope change, channel size, substrate change, and entrenchment of the channel. The main branch of Baden Creek varied in the same ways from the other two reaches of the tributary. The results of the geomorphic survey and analysis are presented in **Table 3.3a-c.**

Figure 3: Reach Map

Reach 1 – Baden Creek Tributary A

Reach 1 extends from the railway track at the north end of the subject reach down to the farm lane crossing approximately 320 metres south. The reach runs between two row crop fields and collects runoff from the fields through tile drainage. The riparian zone along the tributary is exclusively grasses, which obscure the creek from view. The channel itself is small and generally straight, likely placed in this alignment for agricultural purposes. The tributary likely has intermittent flow although it was flowing at the time of the site visit, however it is likely dry for some of the summer months. The banks of the channel are loose soils but protected by shallow vegetation roots. The substrate of the channel is silty with some small sands and gravels. No large material was noted during the inspection. The channel characteristics from the geomorphic survey are listed in **Table 3.3a**.

Photograph 1: View of Reach 1

Table 3.3a: Bankfull (Bkf) channel characteristics

Parameter	XS1	XS2	XS3	XS4	XS5	Average
Bkf Width (m)	0.65	0.80	0.77	0.48	1.12	0.76
Bkf Mean Dep. (m)	0.22	0.20	0.19	0.18	0.12	0.18
Bkf Max Dep. (m)	0.31	0.27	0.24	0.28	0.20	0.26
Bkf Area (m^2)	0.15	0.16	0.14	0.09	0.14	0.14
Wetted Perim. (m)	1.00	1.07	1.02	0.78	1.27	1.03
Hyd. Rad. (m)	0.15	0.15	0.14	0.11	0.11	0.13
Width-Depth Ratio	2.95	4.00	4.05	2.67	9.33	4.60
Entrench. Ratio	76.9	62.5	64.9	104.2	44.6	70.6
Bankfull Slope (m/m)	0.012					
Riffle Slope (m/m)	0.025					
Substrate D_{50}	0.75					
Substrate D_{84}	7.08					

Reach 2 – Baden Creek Tributary A

Reach 2 is part of the tributary and is 220 m in length. It is located downstream of the farm lane crossing and ties into Baden Creek. The reach is separated from the upper portion of the tributary because it has a steeper slope, it is more entrenched, and the substrate particle size is larger. The riparian area along this reach is also exclusively grasses, however the adjacent fields are grazing fields, not row crops. The channel shows significant signs of bank erosion and lateral migration. Multiple steep outer banks with heights greater than 1 metre were noted. The section of the reach upstream of the confluence with Baden Creek is particularly unstable as it is actively scouring the bed of the creek and a few small knickpoints were present. The shallow rooting depth of the riparian grasses plays a part in this erosion susceptibility. The sinuosity of the channel also increased through this reach. Substrate found in the creek are silts, sands and gravels which are sourced from the eroding banks. The channel characteristics from the geomorphic survey are listed in **Table 3.3b**.

Photograph 2: View of Reach 2

Table 3.3b: Bankfull (Bkf) channel characteristics

Parameter	XS6	XS7	XS8	Average
Bkf Width (m)	1.18	2.08	0.74	1.33
Bkf Mean Dep. (m)	0.23	0.21	0.29	0.24
Bkf Max Dep. (m)	0.34	0.45	0.39	0.39
Bkf Area (m^2)	0.27	0.43	0.21	0.30
Wetted Perim. (m)	1.48	2.39	1.20	1.69
Hyd. Rad. (m)	0.18	0.18	0.18	0.18
Width-Depth Ratio	5.13	9.90	2.55	5.86
Entrench. Ratio	42.4	24.0	67.6	44.7
Bankfull Slope (m/m)	0.021			
Riffle Slope (m/m)	0.028			
Substrate D_{50}	1.60			
Substrate D_{84}	8.66			

Reach 3 – Baden Creek

Reach 3 is the main branch of Baden Creek and the study reach is 680 m long. The study reach starts at the confluence with the Baden Cr tributary and ends near Gingrich Rd. Two hundred and thirty metres of the creek were surveyed for the geomorphic and erosion assessment, although other sections such as downstream of the confluence with Huehn Award Drain were visually assessed as well. Approximately 400 m upstream from the start of the study reach is a large mill pond. The main channel of Baden Creek is approximately 4.5 m wide and meanders through agricultural grazing land. The alignment of the channel indicates historical modification for agricultural purposes. Even with those changes the current state of the creek is natural and the creek has generally re-established in its current alignment. The sinuosity of this reach is moderate at 1.25, with a straight channel being 1.0. The reach has sections that are lined with grasses similar to the tributary, but also has large pockets of wooded areas as well. The creek has many signs of active bank erosion and lateral migration, particularly in grassed areas where the root depth is not sufficient to protect the loose banks from eroding. The bed slope through the reach is very low. Substrate found within the reach ranges from silts to boulders. Typically, riffles are sands and gravels with some cobble, while pools are heavily silted.

Photograph 3: View of Reach 3 typical conditions

Table 3.3c: Bankfull (Bkf) channel characteristics

Parameter	XS9	XS10	XS11	Average
Bkf Width (m)	3.68	5.79	4.41	4.87
Bkf Mean Dep. (m)	0.45	0.70	0.51	0.57
Bkf Max Dep. (m)	0.57	1.06	0.79	0.88
Bkf Area (m^2)	1.66	4.03	2.27	2.86
Wetted Perim. (m)	4.07	6.53	4.83	5.40
Hyd. Rad. (m)	0.41	0.62	0.47	0.52
Width-Depth Ratio	8.18	8.27	8.65	8.52
Entrench. Ratio	13.6	8.64	11.3	10.4
Bankfull Slope (m/m)	0.004			
Riffle Slope (m/m)	0.006			
Substrate D_{50}	47.71			
Substrate D_{84}	103.16			

Rapid Assessments

Rapid field assessments provide an indication of the channel stability and ecological stream condition, while also identifying primary processes in action (e.g. widening). The Rapid Geomorphic Assessment (RGA) and the Rapid Stream Assessment Technique (RSAT) together provide a thorough description of the existing channel conditions.

The RGA is a check sheet that documents indicators of different modes of channel adjustment: widening, aggradation, degradation, and planform adjustment. These observations are quantified to produce a value that indicates the state of channel stability: “In Regime/Stable” (<0.20), “Transitional/Stressed” (0.21-0.40), or “In Adjustment/Unstable” (>0.40).

RSAT employs a semi-quantitative approach to characterize stream conditions whereby the user assigns a score to 6 different evaluation criteria (MOE, 2003). Abiotic and biotic indicators which influence overall stream quality have been streamlined and weighted appropriately within each of the evaluation criteria. The six criteria are:

1. Channel stability;
2. Channel scouring and sediment deposition;
3. Physical in-stream habitat;
4. Water quality;
5. Riparian habitat conditions; and
6. Biological conditions

The scores are then added to communicate the final index of the stream condition. These values can describe the stream quality as “Excellent” (42-50), “Good” (30-41), “Fair” (16-29), or “Poor” (<16).

Results for the RGA (**Table 3.4**) show that each reach is either stressed or unstable. Reach 1 had poor scores in Widening and Planform Adjustment, meaning there is considerable lateral changes occurring along the reach. Indicators such as basal scour are the prime reason for this. Reach 2 had poor scores in each category, however the Widening and Planform Adjustment were again very poor. Eroding banks, fracture lines along the top of banks, basal scour, and cut-off channels are common in the reach. Reach 3 is categorized as Stressed due to the poor scores in

Aggradation and Widening categories. Indicators such as accretion on point bars, siltation in pools, fallen trees, and exposed tree roots are common in this reach.

Table 3.4: **Reach-averaged RGA Results**

	Form of Adjustment				Stability Index	Condition
	Aggradation	Degradation	Widening	Planform Adjustment		
Reach 1 (Trib A U/S)	0	0.10	0.30	0.43	0.21	Transitional
Reach 2 (Trib A D/S)	0.29	0.30	0.40	0.43	0.35	Unstable
Reach 3 (Baden Cr. D/S)	0.57	0	0.60	0	0.29	Transitional

The RSAT revealed that stream condition in Reach 1 and 2 are Fair. These low scores are attributed to poor scores in Channel Stability, Riparian Conditions, and Biological Indicators. Since these channels are small and act more as drains than year-round creeks this can be expected. Reach 3 is described as in Good condition, with generally higher than average scores in all categories. Categories that were low are bank stability and biological indicators.

Table 3.5: **Reach-averaged RSAT Summary Results**

Reach	Score	Condition
1	24	Fair
2	22	Fair
3	32	Good

4. EROSION THRESHOLD ASSESSMENT

General

For the purposes of an erosion threshold assessment, bankfull cross-sections were surveyed at riffle or run locations because it can be expected that channel velocities and shear stresses on the bed are greatest through these sections therefore providing the most representative values. The longitudinal profile was also surveyed to determine the local energy gradient (slope). Substrate measurements were made in order to determine the typical D_{50} for each reach.

This detailed field data (cross-section, gradient, and particle distribution) is used to estimate the bankfull discharge, shear stress, and critical discharge values. Specifically, the critical discharge indicates the point at which sustained flows will tend to entrain and transport sediment. In this analysis, the median particle size (D_{50}) was used as an index size.

To determine the critical shear stress for particle entrainment, the methods presented by Komar (1987), Julien (1995) and Fischenich (2001) were used. These methods adapt and update the work of Shields (1936). The Komar method is most appropriate to gravel sized material, while Fischenich also incorporates finer material (sands). Based on the critical shear stress determined by each method, a critical depth is back-calculated and a critical discharge is determined. Then, if required, this critical discharge is applied as an erosion threshold target when controlling the flow rate and timing for stormwater releases for a range of design storm events. Otherwise, the critical discharge provides an understanding on the sensitivity of the channel to erosion.

Erosion Threshold Considerations and Discussion

Each cross section used in the analysis was selected to provide representative erosion thresholds. Attempts were made to locate naturally formed riffles or runs for cross-sectional surveys as these provide locations where flows are concentrated, and their composition is indicative of the type of material that becomes mobilized under frequent flow conditions below and up to the bankfull discharge - before spilling onto the floodplain.

Using the data collected during the field investigations and desktop analysis, bankfull characteristics for cross-sections were summarized. The bankfull energy gradient and bed materials are also summarized (**Table 3.3a-c**). Related hydraulic parameters were determined including stream power, unit stream power, bed shear stress at each riffle cross-section. Results are presented for all four reaches (**Table 4.1**).

Estimated bankfull hydraulics reveals that under bankfull conditions, available shear stresses are not great enough to entrain particles larger than the median grainsize in Reach 3 but they are great enough to entrain particles in Reaches 1 and 2. This suggests that bankfull conditions are highly favourable for channel erosion in Reaches 1 and 2 but not in 3.

Erosion threshold values were determined for representative cross-sections from each reach (**Table 4.2**). Essentially, flows are modeled through each cross-section until the critical depth to mobilize the median particle size (D_{50}) is achieved.

Table 4.1: Summary hydraulics

Parameter	Cross-Sections		
	Reach 1 (Trib A U/S)	**Reach 2** (Trib A D/S)	**Reach 3** (Baden Cr. D/S)
Relative Roughness (m)	169.6	103.4	8.7
Shear Velocity (m/s)	0.14	0.14	0.16
Velocity based on ff/RR (m/s)	2.1	1.99	1.27
Bankfull Discharge (m^3/s)	0.31	0.54	2.86
Froude #	1.55	1.32	0.57
Stream Power (W/m)	45.5	63.5	168.3
Unit Stream Power (W/m^2)	59.1	53.8	38.2
Mean Bed Shear (N/m^2)	18.7	19.5	24.4

Table 4.2: Threshold results

Method	Parameter	Cross-Sections		
		Reach 1 (Trib A U/S)	**Reach 2** (Trib A D/S)	**Reach 3** (Baden Cr. D/S)
Komar (1987)	Critical Shear (N/m2)	0.55	1.17	34.75
	Ratio of Critical Shear/Bed Shear	34.27	29.25	0.70
	Critical Depth (m)	0.004	0.006	0.59
	Critical Flow (m^3/s)	**0.001**	**0.001**	**6.89**
	Ratio of Critical Flow/Bankfull Flow	0.004	0.002	2.41
Julien (1995)	Critical Shear (N/m2)	0.40	0.75	38.61
	Ratio of Critical Shear/Bed Shear	46.73	45.39	0.63
	Critical Depth (m)	0.003	0.004	0.66
	Critical Flow (m^3/s)	**0.001**	**0.001**	**8.59**
	Ratio of Critical Flow/Bankfull Flow	0.003	0.001	3.01
Fischenich (2001)	Critical Shear (N/m2)	0.44	0.97	38.88
	Ratio of Critical Shear/Bed Shear	42.77	35.11	0.63
	Critical Depth (m)	0.003	0.005	0.66
	Critical Flow (m3/s)	**0.001**	**0.001**	**8.71**
	Ratio of Critical Flow/Bankfull Flow	0.003	0.002	3.045

Overall, the different methods (Komar, Julien, and Fischenich) produce nearly the same result. For both reaches in the tributary a value of 0.001 m^3/s or 1 L/s was calculated. For the main branch of Baden Creek, the average result is 8.06 m^3/s or 8,060 L/s. The very low critical flow of the tributaries reflects the sensitive nature of the reaches, particularly the sandy substrate. The larger particles found within the main branch of Baden Creek are large enough to protect the channel bed from constant erosion. However, the banks of the Baden Creek are still susceptible to erosion due to the bank composition and riparian vegetation. The provided critical flow values can be used as the target flow for any further erosion threshold assessments.

5. HYDROLOGIC MODELLING

A continuous hydrologic model was developed using HEC-HMS 4.11 to evaluate the erosion under existing and proposed conditions. The LIDAR-based 2017 Lake Erie DTM data (Package S) was used for the terrain, Ontario Soil Survey data was used to define the hydrologic runoff conditions of the soil, and SOLRIS v3.0 was used to define the landuse in the existing conditions model. The SCS Curve Number Method was used to define runoff conditions based on the soil and landuse data. The Clark Unit Hydrograph was used to define the hydrograph transforms from the subcatchment headwaters to the outlet and is based on the physical characteristics of the subcatchment including the longest flowpath, channel length, slope, and roughness characteristics. The Muskingum-Cunge method was used for channel routing based on the slope, channel cross section, and roughness for each reach for channels greater than 200m and the Lag Method was used for reaches less than 200m.

Subcatchments were delineated based on the LiDAR surface using HEC-GeoHMS. Several subcatchments were manually divided so their outlets would match key locations from the SWM Report and facilitate adjustments to represent proposed conditions. The proposed conditions are based on the Stormwater Management Report from MTE from April 2021. Existing Conditions

information including the storage-discharge relationships for the Baden West SWMF, the CNR culvert crossing and the Regional Road 1 culvert crossing were obtained from the Baden West Subdivision Stormwater Management Report from Stantec in January 2005.

Fifty-seven years of continuous daily precipitation data was obtained from 1959-2016 for the Stratford WWTP gauge, which is about 25 km from the site. The models were run for the entire period using 1-hour computation time-steps. Because of the time of concentration being less than 1 hour in some of the catchments, it is possible that some of the peaks were missed. This could not be controlled as the rainfall was in one hour increments and will not pragmatically make a difference when estimating erosion. The resulting hydrograph with hourly flow data was then analyzed to determine the number of erosion hours, cumulative effective shear stress, and cumulative effective work for existing and proposed conditions. The results of the analysis are shown in **Tables 6-8**.

Table 6: **Continuous Modelling Erosion Analysis Results – Baden Creek Tributary Reach 1**

Parameter	Existing	Proposed	Percent Reduction
Erosion Hours	184459	131073	28.94
Cumulative Effective Shear Stress Index (Ns/m^2)	1850230	1393891	24.66
Cumulative Effective Work Index (N/m)	380024	314227	17.31

Table 7: **Continuous Modelling Erosion Analysis Results – Baden Creek Tributary Reach 2**

Parameter	Existing	Proposed	Percent Reduction
Erosion Hours	184459	131073	28.94
Cumulative Effective Shear Stress Index (Ns/m^2)	1724429	1322711	23.30
Cumulative Effective Work Index (N/m)	363278	301733	16.94

Table 8: **Continuous Modelling Erosion Analysis Results – Baden Creek Tributary Reach 3**

Parameter	Existing	Proposed	Percent Reduction
Erosion Hours	0	0	-
Cumulative Effective Shear Stress Index (Ns/m^2)	124437	119622	3.87
Cumulative Effective Work Index (N/m)	301735	290292	3.79

The results show that the erosion metrics will be decreased under proposed conditions within the tributary reaches. The main channel (Reach 3) shows that there will be no erosion in the reach and the there is a slight decrease in cumulative effective work index, and a slight decrease to the cumulative effective shear stress index. The Baden Creek Tributary is predominantly a sand system and shows obvious signs of ongoing erosion initially. Sand and unconsolidated silt bed streams are typically the most prone to erosion as they have the lowest critical shear stress. The decreased runoff volume associated with the proposed development will mitigate this issue and lead to about 28% less erosion across the analyzed metrics through the tributary.

6. SUMMARY

In order to carry out an erosion threshold analysis for Baden Creek, a background review and rapid field assessments were completed to understand the proposed changes to the study area and characterize local watercourses. Detailed geomorphic field data was completed at appropriate sites downstream of the proposed SWM outlet. Data processing and assessment produced a flow target that can be used to inform the amount and timing of water that may be released to receiving watercourses. Continuous hydrologic modelling was performed to determine the hours of exceedance over the threshold target flow under both pre-existing and proposed conditions.

Based on our site investigations, assessments, and analyses, we conclude that:

1. The Baden Creek Tributary study area originates downstream of the CNR Railway (Schmidt Lands) and continues to the confluence with Baden Creek and is divided into two reaches for analysis. The main channel of Baden Creek was also evaluated immediately downstream of the confluence. The study reaches will receive flows from the proposed SWMF at 1012 Snyder's Road as well as the existing SWMF in the Baden West Subdivision.

2. An erosion threshold assessment was undertaken and the critical cross-section was determined to be located in Reach 1 and 2 of the Baden Creek Tributary, and the critical flow was determined to be 1 L/s.

3. Reaches 1 and 2 of the tributary show significant decrease to the erosion metrics under the proposed conditions, while the main channel of Baden Creek shows no increases.

4. A continuous HEC-HMS model was developed to evaluate erosion metrics including erosion hours and the cumulative effective shear stress and work indices under existing and proposed conditions. The erosion metrics showed that the proposed development will result in about a 28% decrease in erosion metrics due the attenuation from the proposed SWM facility, Infiltration Gallery, and Proposed Swale.

5. To identify new or worsening erosion within the study area, geomorphic monitoring should be completed annually during construction and for 2 years following 90% buildout. Monitoring should include comparison of monumented cross-sections, erosion pins, analysis on substrate composition, and photographs at the critical locations.

Respectfully submitted,

Ed Gazendam, Ph.D., P.Eng.,
President, Sr. Geomorphologist
Water's Edge Environmental Solutions Team Ltd.

Nik Gazendam, C.Tech. CAN-CISEC
Project Manager and Senior Technician

APPENDICES:

Appendix A: Photo Inventory
Appendix B: HEC HMS Modelling Summary Sheets

REFERENCES:

Fischenich, C. 2001. Stability Thresholds for Stream Restoration Materials. EMRRP Technical Notes Collection (ERDC TN-EMRRP-SR-29), U.S. Army Engineer Research and Development Center, Vicksburg, M.S. www.wes.army.mil/e/emrrp

Galli, J. 1996. *Development and Application of the Rapid Stream Assessment Technique (RSAT) in the Maryland Piedmont.* Paper presented at American Engineering Foundation Conference, Snow Bird, UT

Komar, Paul D. 1987 Selective grain entrainment and the empirical evaluation of flow competence. Sedimentology, 34: 1165-1176.

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http://www.giscoeapp.lrc.gov.on.ca/web/mnr/wrip/ofat/Viewer/viewer.html

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APPENDIX A:

Photo Inventory

BADEN CREEK - TRIBUTARY A – REACH 1

PHOTOGRAPH NO.: 1
FROM: Left side of creek at north end of Reach 1
LOOKING: Upstream towards railway tracks. Creek crosses to the left.

PHOTOGRAPH NO.:2
FROM: Left bank of creek at top end of Reach 1.
LOOKING: Downstream at Reach 1 which is well vegetated and is between two fields.

PHOTOGRAPH NO.: 3
FROM: Centre of creek, middle of Reach 1.
LOOKING: At uncovered portion of creek. Creek typically hidden by grasses.

PHOTOGRAPH NO.: 4
FROM: Centre of creek at lower end of Reach 1.
LOOKING: Downstream towards farm crossing. Bed slope has increased.

BADEN CREEK - TRIBUTARY A – REACH 2

PHOTOGRAPH NO.: 5
FROM: On top of farm crossing between Reach 1 and 2.
LOOKING: Downstream over Reach 2.

PHOTOGRAPH NO.: 6
FROM: Centre of creek, in middle of Reach 2.
LOOKING: At the substrate composition in Reach 2.

PHOTOGRAPH NO.: 7
FROM: Middle of Reach 2.
LOOKING: Channel knickpointing into undisturbed tills at a few locations.

PHOTOGRAPH NO.: 8
FROM: Left side of creek at lower end of Reach 2.
LOOKING: Downstream at heavily eroded bank.

PHOTOGRAPH NO.: 9
FROM: End of Reach 2.
LOOKING: Downstream at confluence with main channel of Baden Creek.

BADEN CREEK – REACH 3

PHOTOGRAPH NO.: 10
FROM: Right bank at top end of Reach 3.
LOOKING: Upstream at typical channel conditions.

PHOTOGRAPH NO.: 11
FROM: Middle of creek at upper portion of Reach 3.
LOOKING: At channel substrate composition. Mostly sands with some gravel/cobble.

PHOTOGRAPH NO.: 12
FROM: Right bank at upper portion of Reach 3.
LOOKING: Downstream at open section of creek, high right bank, low left bank.

PHOTOGRAPH NO.: 13
FROM: Left bank of creek in middle of Reach 3.
LOOKING: Upstream at typical channel conditions. Steep eroding right bank.

PHOTOGRAPH NO.: 14
FROM: Left bank near middle of Reach 3.
LOOKING: Downstream towards open section of channel, steep eroding banks throughout.

APPENDIX B:

HEC HMS Modelling Summary Table

Existing Conditions (Tributary Flow = R320, Main Channel = Outlet)

Hydrologic Element	Drainage Area (km2)	Peak Discharge (m3/s)	Time of Peak	Volume (mm)
W270	0	0.0683	27 July 1983, 24:00	59032.87
W250	0.2	0.2564	27 July 1983, 24:00	59045.76
W230	0	0.0399	27 July 1983, 24:00	59032.6
W210	0.1	0.1014	27 July 1983, 24:00	59050.47
W100	0.6	0.9829	27 July 1983, 24:00	59047.7
W90	0.5	0.8334	27 July 1983, 24:00	59032.28
W80	1.6	2.5634	27 July 1983, 24:00	59030.59
UserPoint3	0	0.0683	27 July 1983, 24:00	59032.87
UserPoint3_x	1.4	2.1808	27 July 1983, 24:00	59040.67
J151	3	4.8456	27 July 1983, 24:00	59035.82
J160	1.1	1.8163	27 July 1983, 24:00	59040.62
R50	3	4.8456	27 July 1983, 24:00	59041.99
R220	1.4	2.1808	27 July 1983, 24:00	59041.3
R240	1.1	1.8163	27 July 1983, 24:00	59040.62
R260	0	0.0683	27 July 1983, 24:00	59027.36
W470	0	0.0207	27 July 1983, 24:00	59033.48
W450	0	0.001	27 July 1983, 24:00	59033.48
W430	0.1	0.1004	27 July 1983, 24:00	59025.58
W410	0.2	0.2758	27 July 1983, 24:00	59031
W370	0	0.029	27 July 1983, 24:00	59033.48
W350	0	0.0199	27 July 1983, 24:00	59040.48
W180	0.1	0.0956	27 July 1983, 24:00	59027.68
UserPoint2	0.1	0.0956	27 July 1983, 24:00	59027.68
UserPoint5	0	0.029	27 July 1983, 24:00	59033.48
UserPoint5_x	0.3	0.5423	27 July 1983, 24:00	59027.01
UserPoint7	0	0.0207	27 July 1983, 24:00	59033.48
UserPoint7_x	0.1	0.2176	27 July 1983, 24:00	59027.29
R360	0	0.029	27 July 1983, 24:00	59033.48
R420	0.1	0.2176	27 July 1983, 24:00	59019.86
R440	0.1	0.0956	27 July 1983, 24:00	59027.68
R460	0	0.0207	27 July 1983, 24:00	59033.48
R530	0.3	0.5423	27 July 1983, 09:00	59023.79
Reg. Road 1 Culvert Crossing	0.3	0.5423	27 July 1983, 09:00	59027.05
W520	0.2	0.2736	27 July 1983, 24:00	59050.42
Baden West SWMF	0.2	0.2736	27 July 1983, 24:00	59048.8
UserPoint9	0.5	0.8159	27 July 1983, 13:00	59032.18
R320	0.5	0.8164	27 July 1983, 11:00	59031.45
CNR Culvert Crossing	0.5	0.8167	27 July 1983, 09:00	59032.19
W510	0.5	0.7445	27 July 1983, 24:00	59020.3

W120	0.2	0.2735	27 July 1983, 24:00	59045.92
J142	4.2	6.68	27 July 1983, 11:00	59038.44
R70	4.2	6.6798	27 July 1983, 11:00	59044.44
W130	0.3	0.5553	27 July 1983, 24:00	59026.6
Outlet1	4.5	7.2352	27 July 1983, 11:00	59043.07

Proposed Conditions (Tributary Flow = R320, Main Channel = Outlet)

Hydrologic Element	Drainage Area (km2)	Peak Discharge (m3/s)	Time of Peak	Volume (mm)
W250	0.2	0.2564	27 July 1983, 24:00	59045.76
W230	0	0.0399	27 July 1983, 24:00	59032.6
W210	0.1	0.1014	27 July 1983, 24:00	59050.47
W100	0.6	0.9829	27 July 1983, 24:00	59047.7
W90	0.5	0.8334	27 July 1983, 24:00	59032.28
W80	1.6	2.5634	27 July 1983, 24:00	59030.59
UserPoint3_x	1.3	2.1125	27 July 1983, 24:00	59041.1
R320	0.6	0.8672	27 July 1983, 09:00	45327.68
J151	3	4.7773	27 July 1983, 24:00	59035.93
J160	1.1	1.8163	27 July 1983, 24:00	59040.62
R50	3	4.7773	27 July 1983, 24:00	59041.91
R220	1.3	2.1125	27 July 1983, 24:00	59041.71
R240	1.1	1.8163	27 July 1983, 24:00	59040.62
W450	0	0.001	27 July 1983, 24:00	59033.48
W430	0.1	0.1004	27 July 1983, 24:00	59025.58
W410	0.2	0.2758	27 July 1983, 24:00	59031
W350	0	0.0199	27 July 1983, 24:00	59040.48
UserPoint5_x	0.2	0.397	27 July 1983, 24:00	59028.64
UserPoint7_x	0.1	0.1014	27 July 1983, 24:00	59025.66
R420	0.1	0.1014	27 July 1983, 24:00	59019.91
Reg. Road 1 Culvert Crossing	0.2	0.397	27 July 1983, 09:00	59028.67
R530	0.2	0.397	27 July 1983, 09:00	59024.09
W520	0.2	0.2736	27 July 1983, 24:00	59050.42
Baden West SWMF	0.2	0.2746	27 July 1983, 05:00	59051.01
W180	0.1	0.0956	27 July 1983, 24:00	59044.31
W270	0	0.0683	27 July 1983, 24:00	59048.69
W370	0	0.029	27 July 1983, 24:00	59044.31
W470	0	0.0207	27 July 1983, 24:00	59044.31
W520b	0	0.0145	27 July 1983, 24:00	59044.31
Proposed SWMF	0.1	0.2288	27 July 1983, 05:00	59046.32
Infiltration Diversion	0.1	0.1958	27 July 1983, 05:00	5028.47
SWMF Outflow Pipe	0.1	0.1957	27 July 1983, 05:00	5027.35
Proposed Swale	0.1	0.1958	27 July 1983, 05:00	5027.98
CNR Culvert Crossing	0.6	0.8677	27 July 1983, 09:00	45329.18
UserPoint9	0.6	0.8677	27 July 1983, 09:00	45329.18
W510	0.5	0.7445	27 July 1983, 24:00	59020.3
W120	0.2	0.2735	27 July 1983, 24:00	59045.92
J142	4.2	6.662	27 July 1983, 11:00	57198.57
R70	4.2	6.6617	27 July 1983, 11:00	57204.59
W130	0.3	0.5553	27 July 1983, 24:00	59026.6

Drawings

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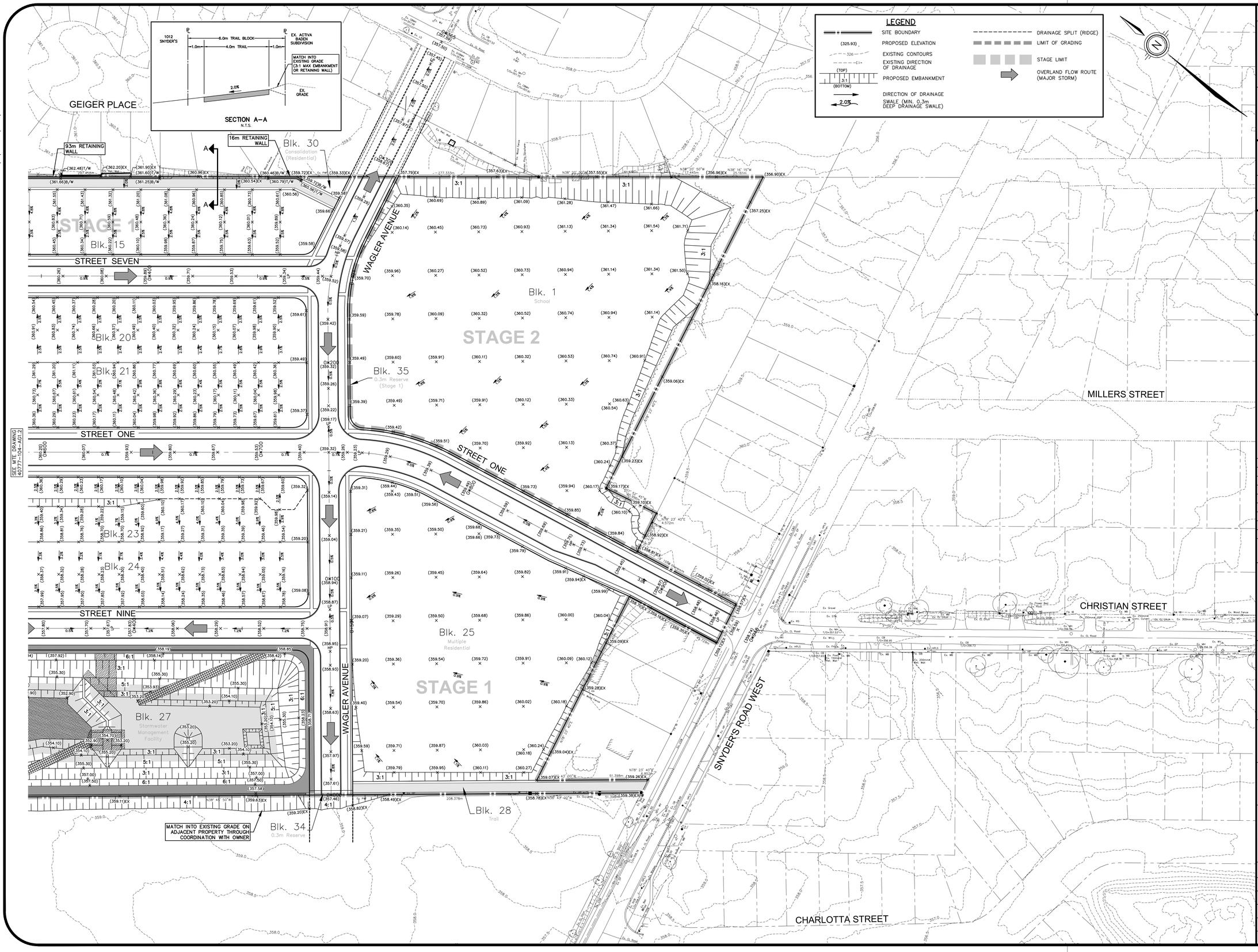

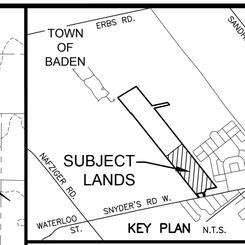

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SITE BENCHMARK ELEV. = 347.919m

SEE ABOVE

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No.	REVISION	BY	DATE
8.			
7.			
6.			
5.			
4.			
3.			
2.			
1.	RE-ISSUED FOR DRAFT PLAN APPROVAL	SKP	2023-10-12

TOWNSHIP of WILMOT

MTE
Engineers, Scientists, Surveyors

519-743-6500

OWNER
SNYDER'S ROAD (BADEN) GP INC.
91 CALDARI DRIVE, UNIT 1 CONCORD, ONT.

1012 SNYDER'S ROAD WEST

1012 SNYDER'S ROAD WEST BADEN, ONT.

DRAWING
AREA GRADING PLAN No. 1

Project Manager: S.PETERSON	Project No.: 40777-104
Design By: AJC	Checked By: JEM
Drawn By: KAT/AXH	Checked By: AJC
Surveyed By: MTE	Drawing No.: AG1.1
Date: Aug.19/20	
Scale: 1:750	Sheet of

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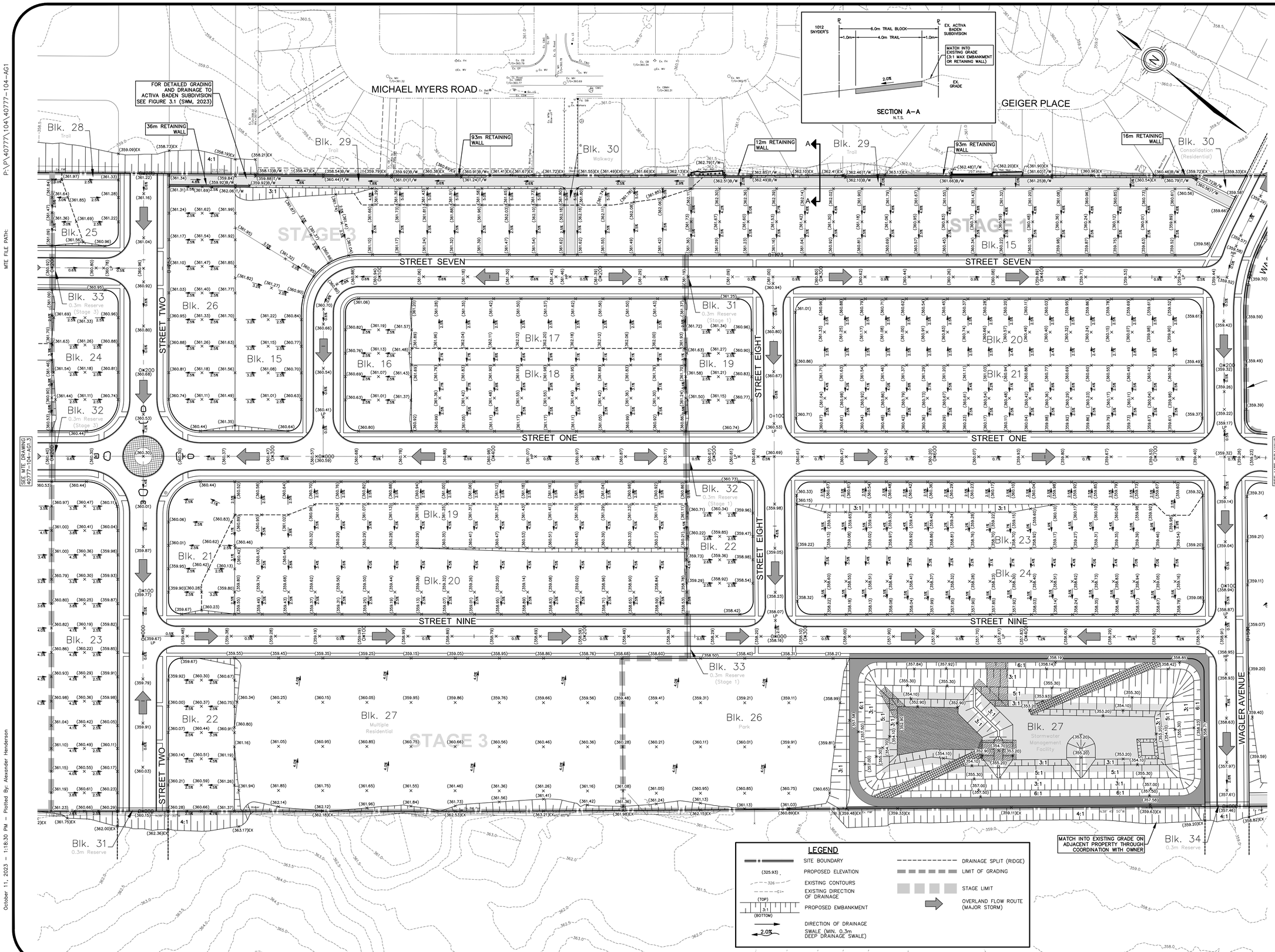
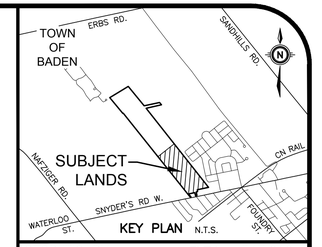


LEGEND

- SITE BOUNDARY
- (325.93) PROPOSED ELEVATION
- 326 EXISTING CONTOURS
- EXISTING DIRECTION OF DRAINAGE
- (TOP) 3:1 (BOTTOM) PROPOSED EMBANKMENT
- DIRECTION OF DRAINAGE
- 2.0% SWALE (MIN. 0.3m DEEP DRAINAGE SWALE)
- DRAINAGE SPLIT (RIDGE)
- LIMIT OF GRADING
- STAGE LIMIT
- OVERLAND FLOW ROUTE (MAJOR STORM)



GEODETIC BM ELEV. = 347.919m
BM # W1-13
CONC. CULVERT UNDER REG. RD. 6, BEING 1.2km W. FROM JUNCTION OF REG. RD. 6 & FOUNDRY ST., S. OF BADEN. TABLET SET HORIZ. IN N. END OF CULVERT, BEING 0.15m W. FROM NE. CORNER OF CULVERT, & 0.52m BELOW THE TOP.

SITE BENCHMARK ELEV. = 347.919m
SEE ABOVE

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No.	REVISION	BY	DATE
8.			
7.			
6.			
5.			
4.			
3.			
2.			
1.	RE-ISSUED FOR DRAFT PLAN APPROVAL	SKP	2023-10-12

TOWNSHIP of WILMOT

MTE
Engineers, Scientists, Surveyors
519-743-6500

OWNER
SNYDER'S ROAD (BADEN) GP INC.
91 CALDARI DRIVE, UNIT 1 CONCORD, ONT.

1012 SNYDER'S ROAD WEST

1012 SNYDER'S ROAD WEST BADEN, ONT.

DRAWING
AREA GRADING PLAN No. 2

Project Manager: S.PETERSON	Project No.: 40777-104
Design By: AJC	Checked By: JEM
Drawn By: KAT/AXH	Checked By: AJC
Surveyed By: MTE	Drawing No.: AG1.2
Date: Aug.19/20	
Scale: 1:750	Sheet of

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- (325.93) PROPOSED ELEVATION
- 326 EXISTING CONTOURS
- EXISTING DIRECTION OF DRAINAGE
- (TOP) 5:1 (BOTTOM) PROPOSED EMBANKMENT
- 2.0% DIRECTION OF DRAINAGE SWALE (MIN. 0.3m DEEP DRAINAGE SWALE)
- DRAINAGE SPLIT (RIDGE)
- LIMIT OF GRADING
- STAGE LIMIT
- OVERLAND FLOW ROUTE (MAJOR STORM)

MATCH INTO EXISTING GRADE ON ADJACENT PROPERTY THROUGH COORDINATION WITH OWNER

FOR DETAILED GRADING AND DRAINAGE TO ACTIVA BADEN SUBDIVISION SEE FIGURE 3.1 (SWM, 2023)

36m RETAINING WALL

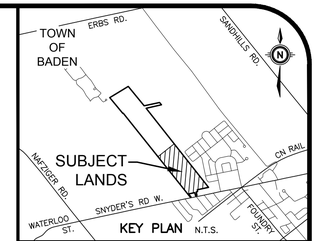
SWALE TO OUTLET TO SURFACE

PROPOSED DRAINAGE SWALE TO CONVEY FLOWS FROM WIEBE LANDS DRAINAGE AREA 204

MATCH INTO EXISTING GRADE ON ADJACENT PROPERTY THROUGH COORDINATION WITH OWNER

SEE MTE DRAWING 40777-104-AG1.2

October 11, 2023 – 1:17:10 PM – Plotted By: Alexander Henderson



GEODETIC BM ELEV. = 347.919m
BM # WI-13
CONC. CULVERT UNDER REG. RD. 6, BEING 1.2km W. FROM JUNCTION OF REG. RD. 6 & FOUNDRY ST., S. OF BADEN. TABLET SET HORIZ. IN N. END OF CULVERT, BEING 0.15m W. FROM NE. CORNER OF CULVERT, & 0.52m BELOW THE TOP.

SITE BENCHMARK ELEV. = 347.919m
SEE ABOVE

NOTE TO CONTRACTOR :

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CONTRACTORS MUST CHECK AND VERIFY ALL DIMENSIONS AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

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THE OWNER/ARCHITECT/CONTRACTOR IS ADVISED THAT M.T.E. CONSULTANTS INC. CANNOT CERTIFY ANY COMPONENT OF THE SITE WORKS NOT INSPECTED DURING CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO NOTIFY M.T.E. CONSULTANTS INC. PRIOR TO COMMENCEMENT OF CONSTRUCTION TO ARRANGE FOR INSPECTION.

No.	REVISION	BY	DATE
8.			
7.			
6.			
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2.			
1.	RE-ISSUED FOR DRAFT PLAN APPROVAL	SKP	2023-10-12

TOWNSHIP of WILMOT

MTE
Engineers, Scientists, Surveyors
519-743-6500

OWNER
SNYDER'S ROAD (BADEN) GP INC.
91 CALDARI DRIVE, UNIT 1 CONCORD, ONT.

1012 SNYDER'S ROAD WEST
1012 SNYDER'S ROAD WEST BADEN, ONT.

DRAWING
AREA GRADING PLAN No. 3

Project Manager: S.PETERSON	Project No.: 40777-104
Design By: AJC	Checked By: JEM
Drawn By: KAT/AXH	Checked By: AJC
Surveyed By: MTE	Drawing No.: AG1.3
Date: Aug.19/20	
Scale: 1:750	Sheet of

P:\P\40777\104\40777-104-EC1

MTE FILE PATH:

October 11, 2023 - 12:51:38 PM - Plotted By: Alexander Henderson

LEGEND

SITE BOUNDARY	EXISTING CURB
EXISTING CONTOURS (SURVEYED)	EXISTING FENCE
EXISTING CONTOURS (GRCA GIS/STANTEC)	EXISTING EMBANKMENT (SLOPE AS NOTED)
APPROX. SEASONAL HIGH GROUNDWATER CONTOURS	EXISTING DRIPLINE
EXISTING SANITARY SEWER	EXISTING MONITORING WELL
EXISTING WATERMAIN	EXISTING BOREHOLE
EXISTING STORM SEWER	EXISTING TEST PIT

BADEN SUBDIVISION

MICHAEL MYERS ROAD

BETTSCHEN LANE

ROTH AVENUE

HUNSBERGER DRIVE

WAGLER AVE.

LIVINGSTON BOULEVARD

McFADYEN STREET

GEIGER PLACE

SNYDER'S ROAD WEST

CHRISTIAN STREET

CHARLOTTA STREET

BRENNEMAN DRIVE

BADEN CREEK TRIBUTARY

BADEN WEST SUBDIVISION

SEE INSERT FOR CHRISTIAN STREET

MP-1 (2020)
GR Elev.=358.520
Metal Pipe=359.556
Rock PVC=360.040

MW203 (2020)
GR Elev.=358.84
PZ Elev.=359.85
MAX GW=357.320
AVG GW=355.970
MIN GW=353.94

MW202 (2020)
GR Elev.=357.690
PZ Elev.=358.560
MAX GW=357.170
AVG GW=356.140
MIN GW=353.630

MW201 (2020)
GR Elev.=363.11
PZ Elev.=364.00
MAX GW=351.750
AVG GW=351.340
MIN GW=351.060

MTE-MW-104-19
GR Elev.=361.180
PZ Elev.=361.967
MAX GW=354.520
AVG GW=354.510
MIN GW=354.500

MTE-MW-103-19
GR Elev.=359.040
PZ Elev.=359.879
MAX GW=353.070
AVG GW=352.600
MIN GW=352.130

MTE-MW-101-19
GR Elev.=357.630
PZ Elev.=358.487
MAX GW=353.160
AVG GW=352.510
MIN GW=352.010

MTE-MW-101-23
GR Elev.=358.211
PZ Elev.=359.094

MTE-MW-102-19
GR Elev.=358.900
PZ Elev.=359.785
MAX GW=354.820
AVG GW=354.120
MIN GW=352.880

MTE-MW-105-19
GR Elev.=361.850
PZ Elev.=362.752
MAX GW=352.200
AVG GW=351.650
MIN GW=351.460

MW-101-23
GR Elev.=358.211
PZ Elev.=359.094

MW-102-23
GR Elev.=357.530
PZ Elev.=357.184

MW-104-23
GR Elev.=356.353
PZ Elev.=356.274

MW-105-23
GR Elev.=356.559
PZ Elev.=356.442

MW-106-23
GR Elev.=351.410
PZ Elev.=350.442

BH-103-23
Elev.=356.353

BH-1 (2018) Elev.=362.530
BH-2 (2018) Elev.=359.030
BH-3 (2018) Elev.=362.320
BH-4 (2018) Elev.=361.340
BH-5 (2018) Elev.=360.540
BH-6 (2018) Elev.=360.06
BH-7 (2018) Elev.=360.020
BH-8 (2018) Elev.=360.130
BH-9 (2018) Elev.=363.510
BH-10 (2018) Elev.=359.730
BH-11 (2018) Elev.=361.67
BH-12 (2018) Elev.=359.820

SS-311 (2020) Elev.=362.526
SS-312 (2020) Elev.=362.526
SS-313 (2020) Elev.=359.550

EX. WELL ID NO. 6502440

BH-306 (2020) Elev.=360.715
BH-307 (2020) Elev.=360.645
BH-305 (2020) Elev.=360.608
BH-303 (2020) Elev.=360.612
BH-308 (2020) Elev.=360.203

MW-304 (2020)
GR Elev.=360.670
PZ Elev.=361.672

MTE-MW-106C-19
GR Elev.=360.610
PZ Elev.=361.346
MAX GW=360.520
AVG GW=359.100
MIN GW=358.100

MW-301 (2020)
GR Elev.=360.520
PZ Elev.=363.361

MTE-MW-106B-19
GR Elev.=360.640
PZ Elev.=361.449
MAX GW=352.190
AVG GW=351.760
MIN GW=351.460

MTE-MW-106A-19
GR Elev.=360.710
PZ Elev.=361.584
MAX GW=352.240
AVG GW=351.850
MIN GW=351.450

MW-309 (2020)
GR Elev.=362.600
PZ Elev.=363.549

TP-101(2023)

EX. 1100x700mmø VERTICAL ELLIPTICAL CSP CULVERT

CHRISTIAN STREET
SCALE 1:750

TOWN OF BADEN
ERBS RD.
SANDHILLS RD.
CN RAIL
SUBJECT LANDS
NAFZIGER RD.
SNYDER'S RD W.
WATERLOO ST.
FOUNDRY ST.
KEY PLAN N.T.S.

GEODETIC BM ELEV. = 347.919m
BM # WI-13
CONC. CULVERT UNDER REG. RD. 6, BEING 1.2km W. FROM JUNCTION OF REG. RD. 6 & FOUNDRY ST., S. OF BADEN. TABLET SET HORIZ. IN N. END OF CULVERT, BEING 0.15m W. FROM NE. CORNER OF CULVERT, & 0.52m BELOW THE TOP.

SITE BENCHMARK ELEV. = 347.919m
SEE ABOVE

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1.	RE-ISSUED FOR DRAFT PLAN APPROVAL	SKP	2023-10-12

TOWNSHIP of WILMOT

MTE
Engineers, Scientists, Surveyors
519-743-6500

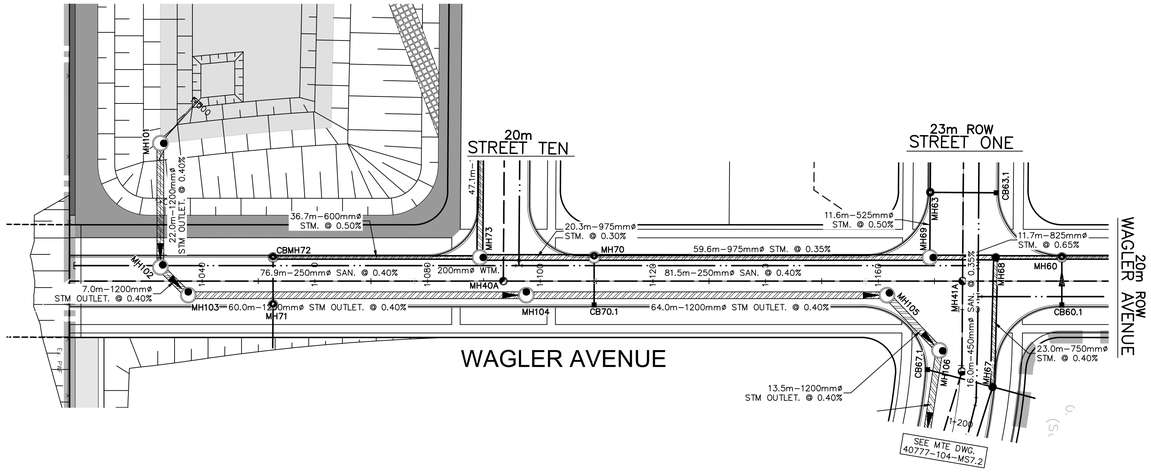
OWNER
SNYDER'S ROAD (BADEN) GP INC.
91 CALDARI DRIVE, UNIT 1 CONCORD, ONT.

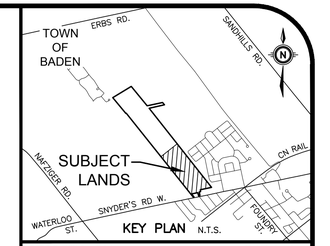
1012 SNYDER'S ROAD WEST

1012 SNYDER'S ROAD WEST BADEN, ONT.

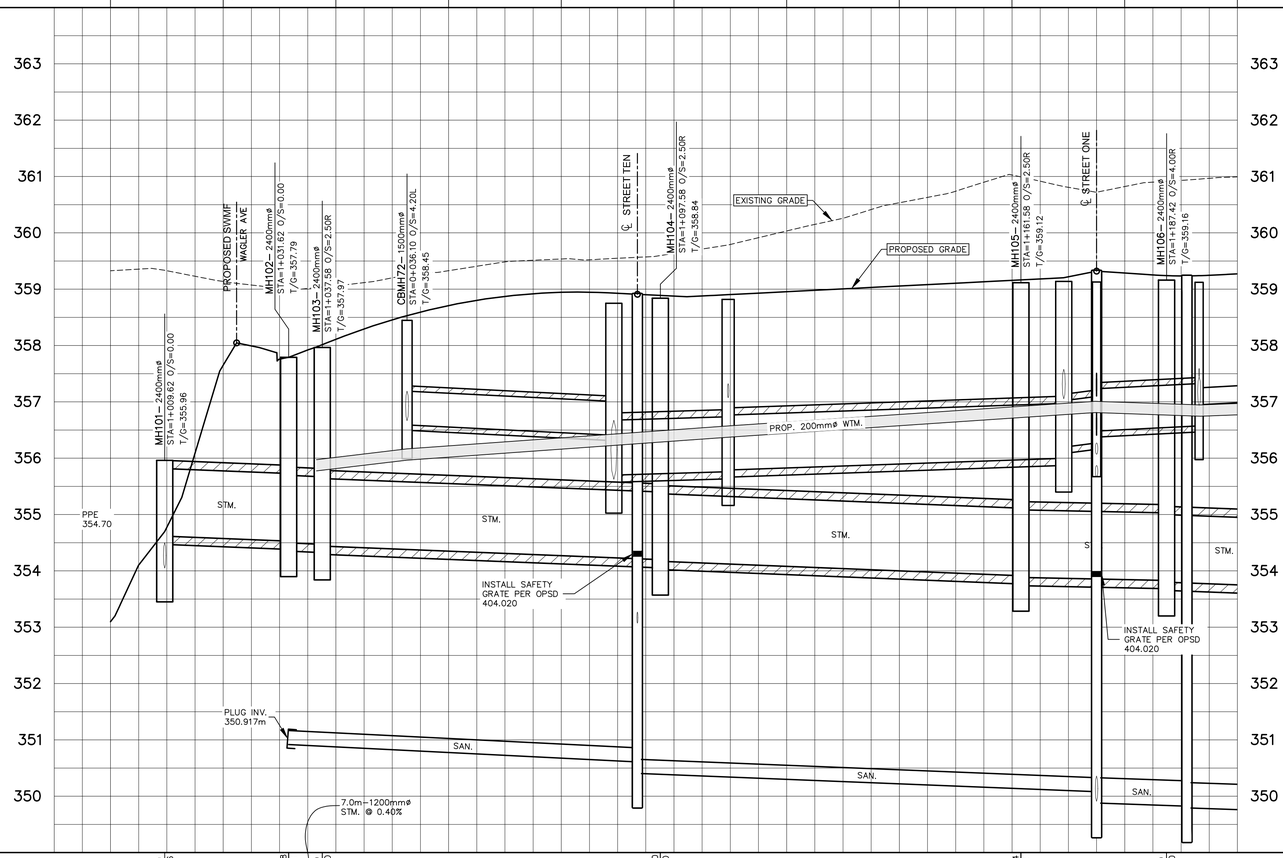
DRAWING
EXISTING CONDITIONS PLAN

Project Manager: S.PETERSON	Project No.: 40777-104
Design By: AJC	Checked By: JEM
Drawn By: KAT/AXH	Checked By: AJC
Surveyed By: MTE	Drawing No.: EC1.1
Date: Sep.28/18	
Scale: 1:1500	Sheet of





CHAINAGE	1+000	1+020	1+040	1+060	1+080	1+100	1+120	1+140	1+160	1+180	1+200
PROPOSED ℄ ROAD ELEVATIONS	353.10	357.65	358.11	358.71	358.95	358.88	358.96	359.06	359.16	359.29	359.27



STM. OUTLET INVERT	N:354.050 SE:354.616	22.0m–1200mmø STM. @ 0.40%	NW:354.528 E:354.498	W:354.470 NE:354.440	60.0m–1200mmø STM. @ 0.40%	SW:354.200 NE:354.170	64.0m–1200mmø STM. @ 0.40%	SW:353.914 E:353.884	13.5m–1200mmø STM. @ 0.40%	W:353.830 SE:353.800	19.5m–1200mmø STM. @ 0.40%
STM. SEWER INVERT											
SAN. SEWER INVERT		76.9m–250mmø SAN. @ 0.40%		NW:353.071 SW:350.630 NE:350.406		81.5m–250mmø SAN. @ 0.40%		NW:349.910 SW:350.080 NE:349.670	16.0m–450mmø SAN. @ 0.35% SE:349.880		NW:349.824 S:349.794

GEODETIC BM — ELEV. = 347.919m
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SITE BENCHMARK — ELEV. = 347.919m
SEE ABOVE

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91 CALDARI DRIVE, UNIT 1 — CONCORD, ONT.

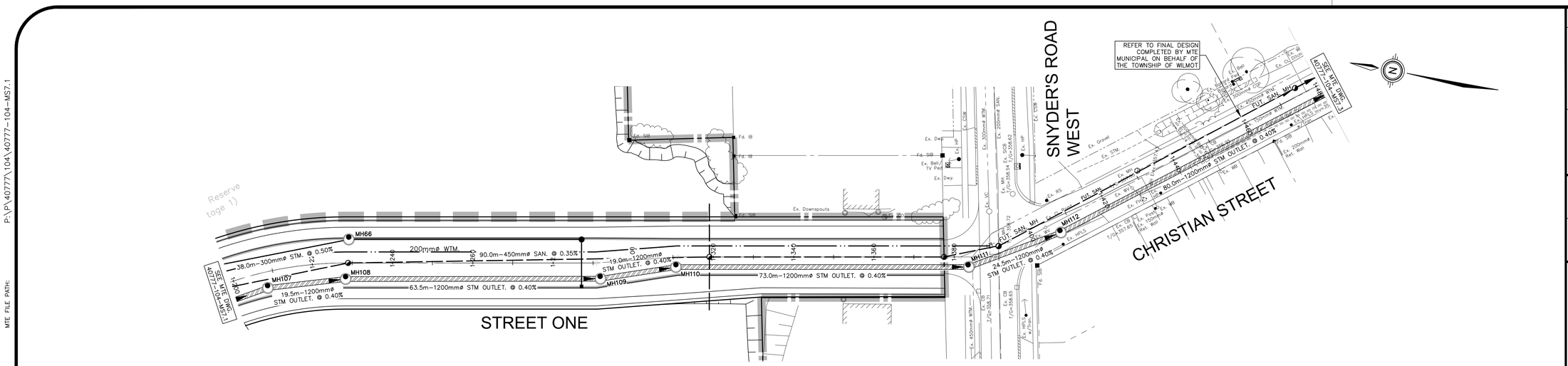
1012 SNYDER'S ROAD WEST
1012 SNYDER'S ROAD WEST — BADEN, ONT.

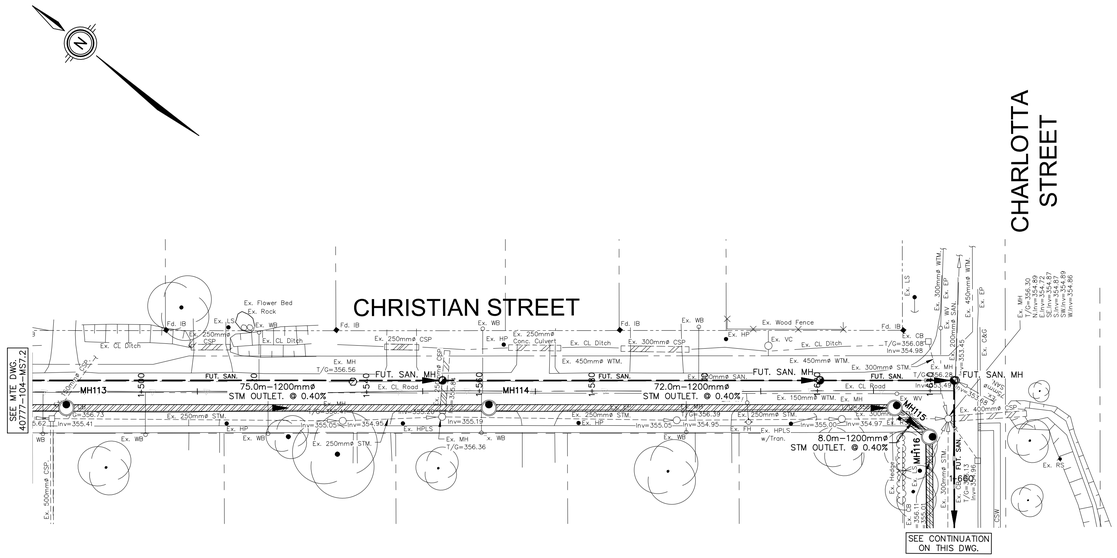
DRAWING
SWM OUTLET PLAN AND PROFILE 1
STA 1+000 to 1+200

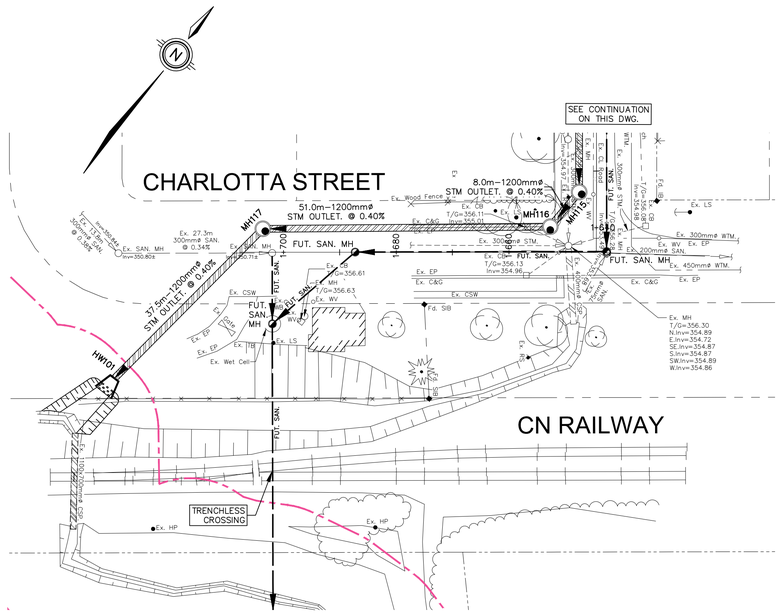
Project Manager	S.PETERSON	Project No.	40777-104
Design By	AJC	Checked By	JEM
Drawn By	KAT	Checked By	AJC
Surveyed By	MTE	Drawing No.	MS7.1
Date	Jul.20/23		
Scale	(H)1:500 (V)1:50	Sheet	of

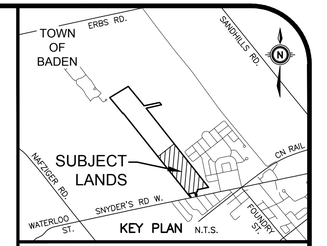
MTE FILE PATH: P:\P\40777\104\40777-104-MS7.1

October 11, 2023 – 3:38:01 PM – Plotted By: Alexander Henderson


Reserve tage 1)
MH66
MH107
MH108
MH109
MH110
MH111
MH112
38.0m–300mmø STM. @ 0.50%
200mmø WTM.
90.0m–450mmø SAN. @ 0.35%
19.5m–1200mmø STM OUTLET. @ 0.40%
63.5m–1200mmø STM OUTLET. @ 0.40%
19.0m–1200mmø STM OUTLET @ 0.40%
73.0m–1200mmø STM OUTLET. @ 0.40%
24.5m–1200mmø STM OUTLET @ 0.40%
80.0m–1200mmø STM OUTLET @ 0.40%
SEE MTE DWG. 40777-104-MS7.1
STREET ONE
SNYDER'S ROAD WEST
CHRISTIAN STREET
REFER TO FINAL DESIGN COMPLETED BY MTE MUNICIPAL ON BEHALF OF THE TOWNSHIP OF WILMOT
SEE MTE DWG. 40777-104-MS7.1
Ex. Downspouts
Fd. SIB
Fd. IB
Ex. Dwy.
Ex. Bell/TV Ped
Ex. HP
Ex. CatW
Ex. 300mmø STM
Ex. 200mmø SAN
Ex. SCB
Ex. MH T/G=358.45 INV.=354.62
Ex. Gravel
Ex. STM.
Ex. MH
Ex. WV
Ex. RS
Ex. WV
Ex. CB T/G=357.65
Ex. 150mmø WTM
Ex. 100mmø WTM
Ex. 450mmø WTM
Ex. 100mmø San. MH
EXT. SAN. MH
EXT. SAN.
Ex. CB T/G=358.15
Ex. MH T/G=358.72
Ex. 450mmø WTM







GEODETIC BM ELEV. = 347.919m
BM # WI–13
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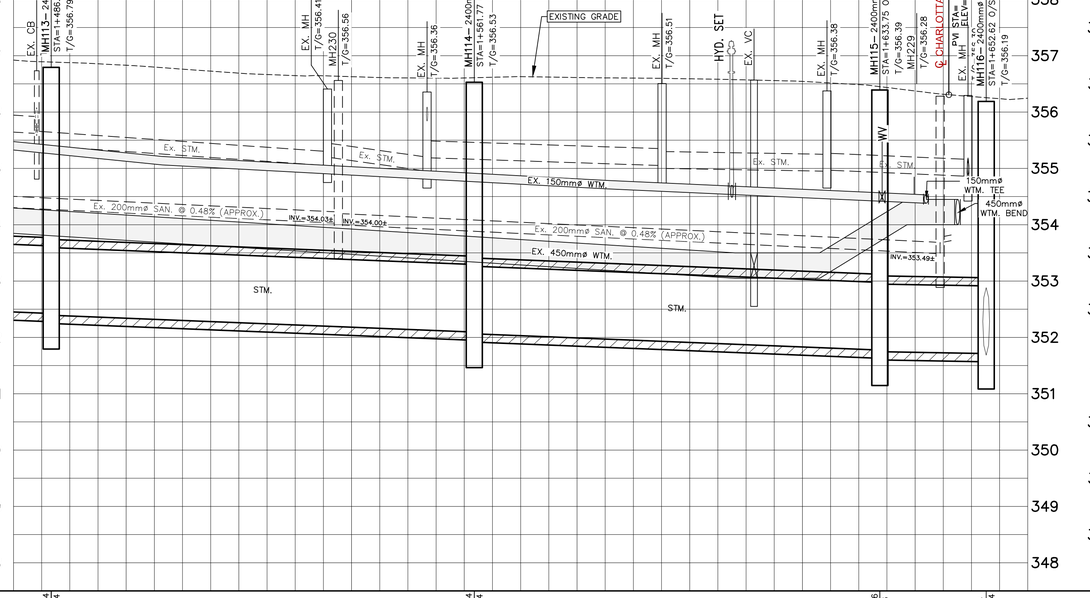
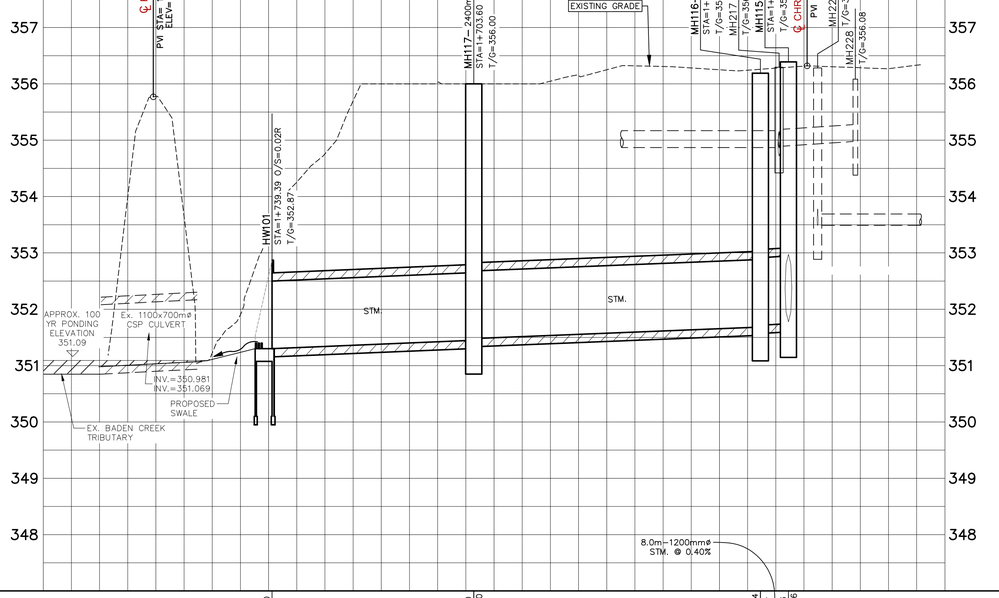
SITE BENCHMARK ELEV. = 347.919m
SEE ABOVE

NOTE: EXISTING SANITARY SEWER ON CHRISTIAN STREET FROM WALTER FEDY McCARGAR HACHBORN AS BUILT PLAN AND PROFILE (JAN.15,1973)

CHAINAGE: 1+500 | 1+520 | 1+540 | 1+560 | 1+580 | 1+600 | 1+620 | 1+640 | 1+660 | 1+680 | 1+700 | 1+720 | 1+740 | 1+760

PROPOSED ℄ ROAD ELEVATIONS: 356.6 | 356.7 | 356.6 | 356.6 | 356.6 | 356.6 | 356.6 | 356.4 | 356.2 | 355.78 | 353.34 | 356.00 | 356.00 | 356.25 | 356.25 | 356.30





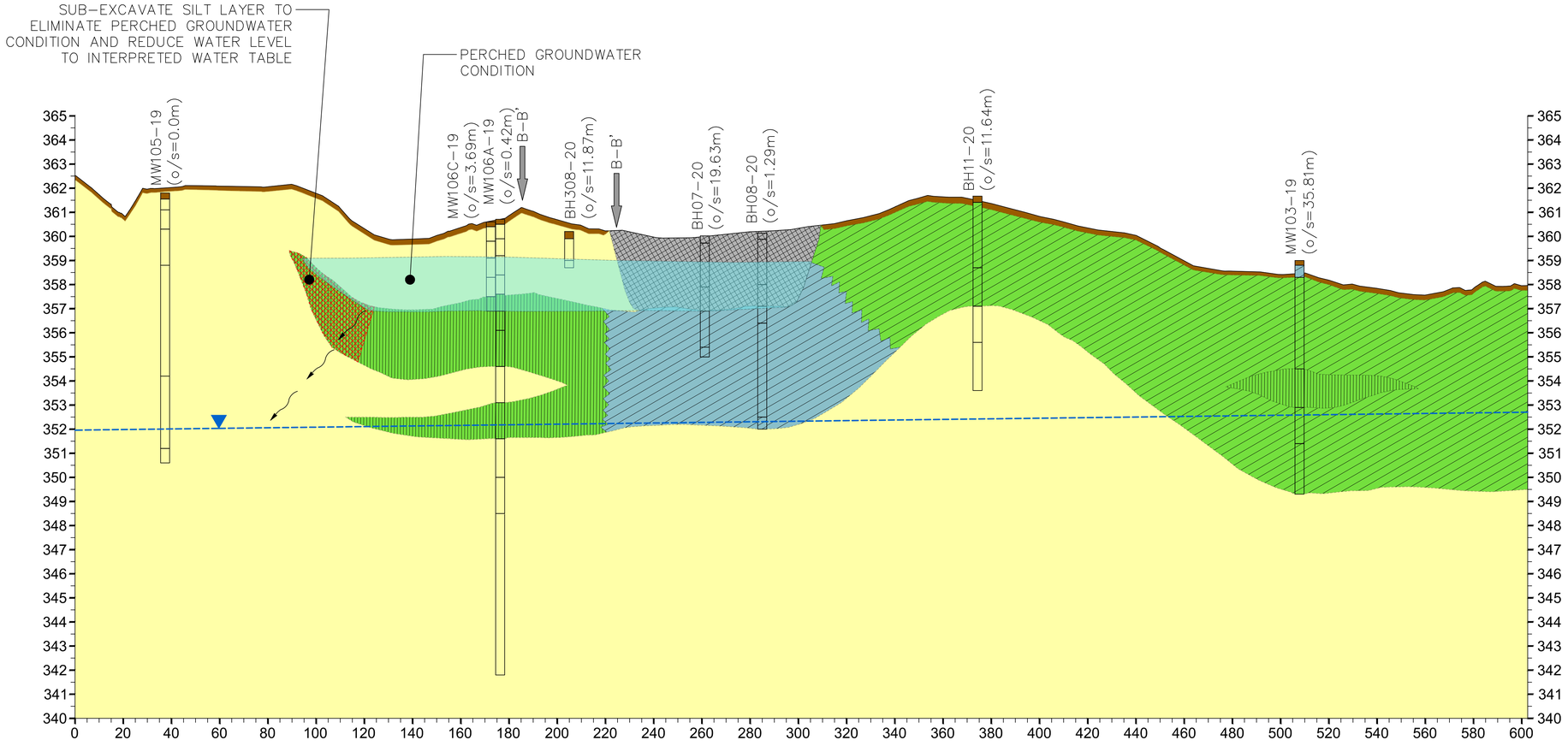
| | | |

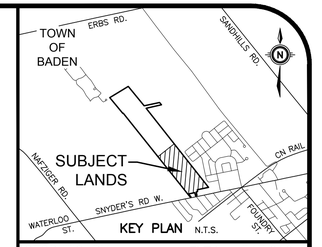
P:\P\40777\104\40777-104-MS9

MTE FILE PATH:

E West — Study Area — East E'

1012 Snyder's Road





GEODETIC BM — ELEV. = 347.919m
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SITE BENCHMARK — ELEV. = 347.919m
SEE ABOVE

Legend

- Ground Surface (2015/2020)
- Interpreted Groundwater Table

Borehole Lithology

- Topsoil
- Fill
- Sand / Silty Sand
- Silt
- Silty Clay
- Silt Till
- Removals

No.	REVISION	BY	DATE
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TOWNSHIP of WILMOT

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Engineers, Scientists, Surveyors
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91 CALDARI DRIVE, UNIT 1 — CONCORD, ONT.

1012 SNYDER'S ROAD WEST
1012 SNYDER'S ROAD WEST — BADEN, ONT.

DRAWING
SECTION E-E

Project Manager: S.PETERSON	Project No.: 40777-104
Design By: AJC	Checked By: JEM
Drawn By: AXH	Checked By: AJC
Surveyed By: MTE	Drawing No.: MS9.0
Date: Jan.25/21	
Scale: (H)1:1000 (V)1:100	Sheet of

October 11, 2023 - 11:59:22 AM - Plotted By: Alexander Henderson