ACTIVA BADEN NORTH SUBDIVISION
TOWNSHIP OF WILMOT
FUNCTIONAL SERVICING AND STORMWATER MANAGEMENT REPORT

Draft Plan Submission

Stantec

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FUNCTIONAL SERVICING AND
STORMWATER MANAGEMENT REPORT

This document entitled Functional Servicing and Stormwater Management Report was prepared by Stantec Consulting Ltd. ("Stantec") for the account of Activa Holdings Inc. (the "Client") to support the permitting process for Client's application for a Draft Plan Approval (the "Application") for the Activa Baden North Subdivision (the "Project"). In connection thereto, this document may be reviewed and used by the provincial and municipal government agencies participating in the permitting process in the normal course of their duties. Except as set forth in the previous sentence, any reliance on this document by any third party for any other purpose is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

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1.0 INTRODUCTION

1.1 SITE LOCATION

The proposed Activa Baden North Subdivision (Subdivision) is located immediately north of the existing Activa Baden Subdivision in the community of Baden in the Township of Wilmot (Township). The subject Subdivision lands are bounded by the existing wetland (forested area) and hydro corridor to the north, agricultural lands to the east, existing Activa Baden Subdivision to the south, and future residential lands to the west, as shown on Figure 1.0. Most of the lands within the proposed development are currently being utilized as active agricultural land.

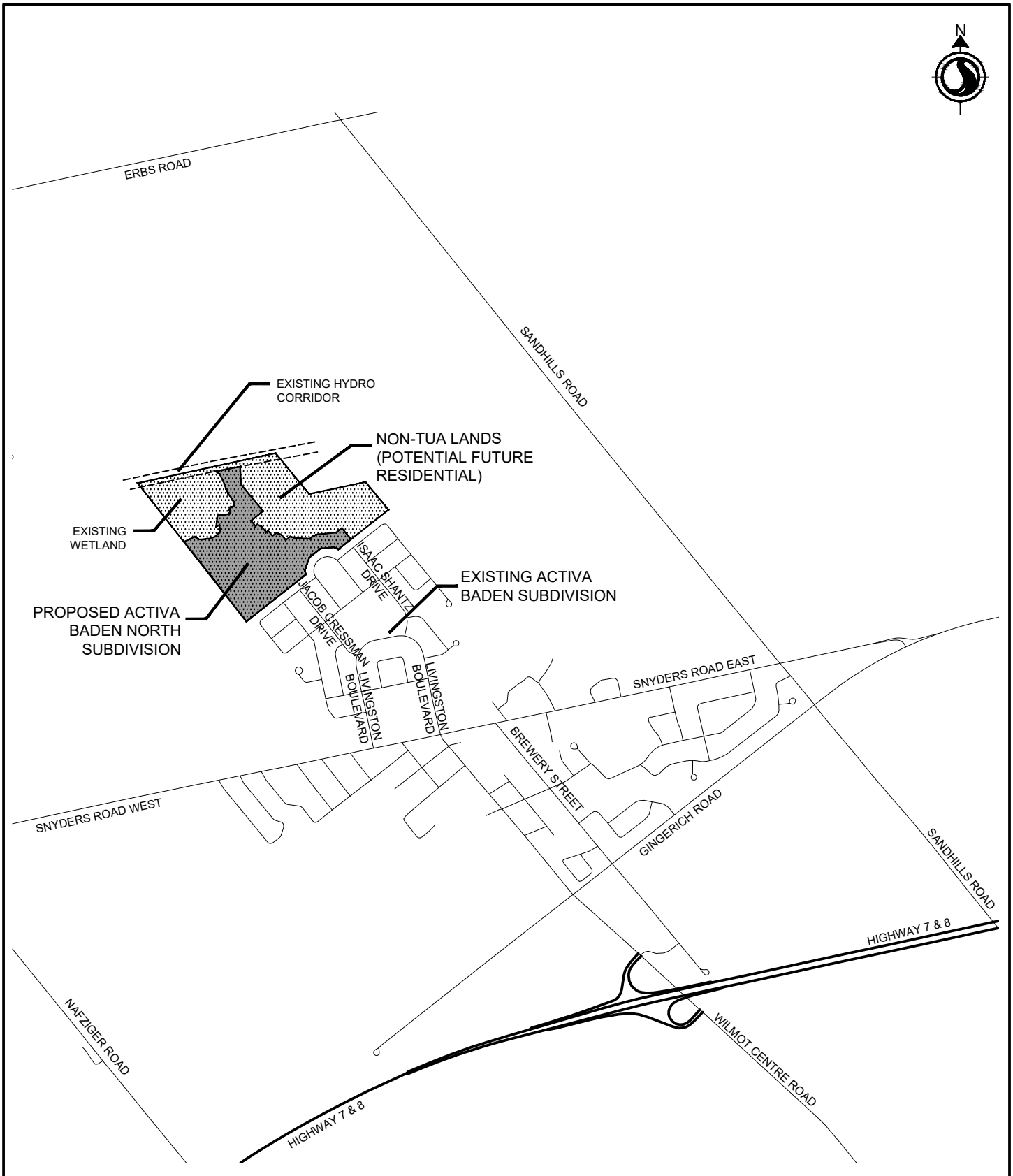
1.2 PURPOSE OF THE REPORT

The purpose of this Functional Servicing and Stormwater Management (FSSWM) Report is to generally outline the municipal servicing, area grading, stormwater management (SWM) and utilities strategies for the Subdivision in support of an Application for Draft Plan Approval.

A Draft Plan of Subdivision for the proposed development was prepared by MHBC Planning (included in Appendix A) and forms the basis for the proposed servicing and grading concepts. The current Draft Plan Application is being submitted for the lands owned by Activa within the established Township Urban Area (TUA) compromising approximately 17.2 hectares (ha) of land. Lands outside of the TUA are not proposed for development other than for related infrastructure (e.g., SWM Facility [SWMF]) that supports the development within the TUA. As illustrated on the Draft Plan, it is proposed to develop the proposed subdivision with a total of up to 426 residential units, private and municipal roadways, a municipal SWMF, and a municipal trail/drainage corridor.

This report documents the servicing requirements, including sanitary servicing, water distribution, storm drainage as well as area grading, SWM, roadworks and utility requirements for the proposed development. Supplementary reports that should be read in conjunction with this report include:

- Planning Justification Report, prepared by MHBC, July 2022
- Hydrogeological Assessment Report, prepared by Stantec Consulting Ltd., July 2022
- Environmental Impact Study (EIS), prepared by WSP Canada Inc., July 2022
- Geotechnical Investigation Report, prepared by Stantec Consulting Ltd., June 2021
- Traffic Impact Study (TIS), prepared by Paradigm Transportation Solutions Ltd., May 2021



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ACTIVA BADEN NORTH

Project No.
60305680

Title
SITE LOCATION PLAN

Revision

Date
2022.07.21

Reference Sheet

Figure No.
1

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ACTIVA BADEN NORTH SUBDIVISION
TOWNSHIP OF WILMOT
FUNCTIONAL SERVICING AND
STORMWATER MANAGEMENT REPORT

INTRODUCTION
July 2022

This report demonstrates that the subject lands can be developed with full municipal servicing, SWM, and utilities to the requirements of the various approval agencies.

The servicing strategies presented in this report are conceptual. Detailed engineering drawings will be submitted as part of the detailed engineering design process once the proposed Subdivision has received the Draft Plan Approval.

2.0 OVERALL GRADING AND DRAINAGE

2.1 EXISTING LAND USE AND SITE TOPOGRAPHY

The existing site conditions for the subject lands are illustrated on Drawing No. C-050, included in Appendix B.

Most of the lands within the proposed development are currently being utilized as active agricultural land. The southwestern portion of the subject lands are vacant with a reworked ground surface, including soil piles that are being used for local recreation. Construction debris, such as occasional concrete blocks, boulders, rebar, and bricks was observed in the southwestern portion of the site. A drainage trench extends north from Jacob Cressman Drive as well as north from Issac Shantz Drive. A Provincially Significant Wetland (PSW) is located just northwest of the subject lands. The proposed Draft Plan limits follow the 15 m wetland buffer (for municipal infrastructure, i.e., SWMF) or 30 m wetland buffer (for residential lots).

The site topography can be described as moderately rolling and generally slopes from northeast to northwest as well as towards the central portion of the site with a total elevation drop of approximately 6.5 m (2 – 10% slopes). The highest elevation within the site is approximately 362.0 mASL (Above Mean Sea Level) at the northeast portion of the site and the lowest elevation is approximately 355.5 mASL in the central portion of the site.

Under existing conditions, a portion of the site drains south towards the existing Baden Subdivision, where it is conveyed to the existing SWMF through the subdivision's storm system. Some external flows enter the site through the existing agricultural fields in the northeast corner, while flows from the external lands to the west of the site are generally contained in offsite depressions and do not contribute to the subject site as shown on Figure 3.0 included in Section 6.0.

2.2 DESIGN CONSTRAINTS AND PROCEDURES

Constraints in designing the road profiles and lot grading are as follows:

- Match existing grades around the perimeter of the site, and/or along the wetland setbacks to the north & northwest, and/or along the Hydro Corridor to the north
- Match existing grades, where possible, to minimize grading and cut/fill quantities and minimize changes to the surface hydrology and hydrogeology of the area
- Account for the existing sanitary and storm drainage areas directed to the existing Activa Baden Subdivision to the south

- Account for future development of the adjacent lands to the east owned by Activa, and to the west (1012 Snyder's Road West) owned by another developer including future road connections
- Match existing road elevations of Isaac Shantz Drive and Jacob Cressman Drive located within the existing Activa Baden Subdivision to the south
- Satisfy the Township of Wilmot guidelines for minimum and maximum road, driveway, and swale grades where possible
- Provide a major overland flow route for flows in excess of the storm sewer capacity
- Provide a positive outlet for low lying areas located within the existing Activa Baden Subdivision at the southwest corner of the proposed Draft Plan
- Maintain adequate cover over storm and sanitary sewers, and watermains

2.3 PROPOSED ROAD PROFILES AND OVERALL SITE GRADING

Preliminary road profiles within the subject lands were established based on the proposed street pattern, to satisfy the constraints outlined in Section 2.2. Most of the road profiles have been designed to follow the existing topography of the site with grades ranging from 0.5% to 6.0% to minimize cut/fill and match perimeter grades, as well as meet criteria and optimized grading for the proposed servicing solution. The design strategy for the perimeter road grades was to match existing elevations; however, the internal road grades of the proposed Subdivision are largely determined by requirements to maintain an overland flow drainage route to the proposed SWMF, while attempting to match the existing topography.

The proposed centerline road elevations are illustrated on the Conceptual Grading Plans (Drawing Nos. C-400 and C-401), and the Conceptual Road Profile Drawings (Drawing Nos. C-200 to C-202), all included in Appendix B.

Subdivision roadways will be constructed to a full urban cross-section including asphalt pavement, concrete curb and gutters, concrete sidewalk and ramps, roadway illumination and boulevard landscaping all in accordance with the Township of Wilmot Standards.

A 20.0 m or 23.0 m right-of-way (ROW) cross-section is proposed for the roadways within the Subdivision. A typical road cross-section with a width of 6.0 m, similar to the other multiple residential developments constructed in the Township, has been proposed for the multiple-residential block at this preliminary stage which will be further reviewed during the Site Plan process.

The proposed lot grading within the Subdivision ranges from 2.5% to a maximum of 5.0%, with maximum 3:1 transition slopes or retaining walls utilized to accommodate the various grade changes within the proposed Subdivision and at various perimeter locations. A combination of Type 'A' (back to front

drainage), Type 'D' (split drainage), or Type 'B' (walkout) lots are used in the proposed design. No Type 'C' (front walk-ins) lots are anticipated. The proposed lot grading is illustrated on the Conceptual Grading Plans (Drawing Nos. C-400 and C-401) prepared for the current Draft Plan area and for the entire area including potential future development of non-TUA lands.

Preliminary earthwork calculations have been performed separately for the current Draft Pan lands, and for the entire area including potential future development of non-TUA lands. Based on the Conceptual Cut/Fill Plans (Drawing Nos. C-650 and C-651) included in Appendix B, earthworks calculations have been summarized below:

- Current Draft Plan (TUA Lands) Grading with Interim Grading within non-TUA lands: Approximately 246,500 m^3 of fill shortage as shown on Drawing No. C-650. The interim grading within non-TUA area shown on this drawing is based on generating as much fill as possible from non-TUA area to minimize fill importing for the current Draft Plan lands.

- Future Conditions Grading within TUA lands and non-TUA lands: Approximately 577,000 m^3 of fill shortage as shown on Drawing No. C-651.

Where possible, topsoil will be used as fill within green spaces (i.e., parks, boulevards, and rear yards) to minimize importing of fill material. At detailed design, profiles and grading will be refined to minimize the requirement for exporting or importing of material.

3.0 SANITARY SERVICING

3.1 SANITARY SERVICING BACKGROUND

In 2014, Conestoga Rovers and Associates (CRA) completed a Wastewater Servicing Study for new growth areas in Baden and New Hamburg to assist the Township of Wilmot in evaluating sanitary infrastructure needs identified in the Baden and New Hamburg Water and Wastewater Master Plan Update completed by the Region of Waterloo in 2011. The 2014 CRA study divided the new growth areas into several land parcels identified as A to Z. The subject Activa Baden North Subdivision lands were identified as Parcel "O" in the CRA study. The CRA study further developed and evaluated four serving Alternatives (A, B, C and D) to determine a preferred servicing alternative for future growth areas within Baden and New Hamburg. Based on a detailed evaluation of the four servicing alternatives, Alternative 'D' was recommended by CRA as the preferred alternative and Alternative "C" was also deemed a reasonable alternative solution.

The preferred servicing Alternative "D" in the CRA Study recommended construction of a new sanitary pumping station (SPS) to service the land Parcel "O" (i.e., the subject Activa Baden North Subdivision lands). The new SPS would be located at the southeast corner of Parcel "O" and sanitary flows would be pumped by a new forcemain to the existing Foundry Road sanitary trunk sewer terminating at the existing Baden SPS. The existing Baden SPS currently pumps flows to the existing Morningside gravity trunk sewer up to the existing Morningside SPS in New Hamburg from where the sanitary wastewater flows are ultimately pumped to the New Hamburg Wastewater Treatment Plant. A copy of Figure 2-23 from 2014 CRA study depicting the preferred servicing Alternative "D" for new growth areas in Baden is included in Appendix C for reference.

Subsequently, the Township has initiated a Class Environmental Assessment (EA) study in 2020 to identify and address the sanitary servicing needs of the imminent development lands north of Snyder's Road West in Baden (i.e., Parcel "P"- 1012 Snyder's Road West Subdivision, and Parcel "O" – subject Activa Baden North Subdivision lands identified in the 2014 CRA study). The Township has retained MTE Consultants Inc. as the Class EA Study consultant who has recently provided a few preliminary alternatives for the proposed Baden Sanitary Trunk Sewer that would service the subject development lands. It has been preliminarily identified that a new SPS within the subject Activa Baden North Subdivision lands (as recommended in the CRA Study) would not be required as the proposed Baden Trunk Sewer would provide sufficient depth at the boundary between land Parcels "P" and "O" such that all of the subject Activa Baden North Subdivision lands including future development lands could be serviced by gravity to the proposed Baden Trunk Sewer located within 1012 Snyder's Road West Subdivision lands (Parcel "P"). The proposed Baden Sanitary Trunk Sewer would convey the flows by gravity to the existing Baden SPS. Further design details, cost estimates and construction timing for the proposed Baden Sanitary Trunk Sewer would be finalized as part of the Class EA Study expected to be completed in the next few months.

3.2 SERVICING OF SUBJECT LANDS

3.2.1 Sanitary Servicing through Existing Sewers in Activa Baden Subdivision

Based on a sanitary capacity analysis completed for the existing sanitary sewers within the existing Activa Baden Subdivision located to the south of the subject Activa Baden North Subdivision lands, there is currently a surplus theoretical capacity to service an approximate population of 580 people from the subject Activa Baden North Subdivision lands. Please refer to the residual capacity analysis for the existing sanitary sewers included in Appendix C that identifies the residual capacity available in the existing sanitary system. There are two sanitary sewer outlets available in the existing Activa Baden Subdivision (i.e., one each at the proposed road connections at Jacob Cressman Drive and Isaac Shantz Drive).

200 mm diameter local sanitary sewers will be extended along the proposed right-of-ways as shown on the Conceptual Servicing Plan Drawing No. C-100 included in Appendix B. Sanitary wastewater flows from an approximate drainage area of 6.86 ha of the proposed Subdivision will be conveyed through the proposed 200 mm diameter local sanitary sewers to the existing sewers at Jacob Cressman Drive and Isaac Shantz Drive in the existing Activa Baden Subdivision. The proposed sanitary sewers within the subject Activa Baden North Subdivision, discharging to the existing sewers, will be constructed at depths ranging from 2.8 to 3.5 m within the proposed roadways.

Based on the sanitary sewer design calculations included in Appendix C, the proposed areas of the subject Subdivision draining to the existing sewers are expected to generate a peak theoretical sanitary flow of approximately 9.34 L/s.

3.2.2 Sanitary Servicing through Proposed Baden Sanitary Trunk Sewer

As noted in Section 3.1 above, as part of the ongoing Class EA Study initiated by the Township for the proposed Baden Trunk Sewer, the trunk sewer would provide sufficient depth such that all of the subject Activa Baden North Subdivision lands could be serviced by gravity to the proposed outlet located within 1012 Snyder's Road West Subdivision lands (Parcel "P") located to the west of the subject Activa Baden North Subdivision; however, as noted in Section 3.2.1 above, it is proposed to discharge sanitary wastewater flows from an approximate drainage area of 6.86 ha of the proposed Subdivision to the existing sewers at Jacob Cressman Drive and Isaac Shantz Drive in the existing Activa Baden Subdivision. Accordingly, it is proposed to discharge the remaining drainage area of approximately 21.28 ha to the proposed Baden Trunk Sewer at the westerly end of Street One at the boundary with the adjacent Subdivision lands.

200 mm and 250 mm diameter sanitary sewers will be extended along the proposed rights-of-way as shown on the Conceptual Servicing Plan, Drawing No. C-100 included in Appendix B. The proposed sanitary sewers within the subject Activa Baden North Subdivision, discharging to the proposed Baden Trunk Sewer,

will be constructed at depths ranging from 2.8 to 7.5 m within the proposed roadways. Where the depth of the proposed sewers would be more than 5.0 m, local sanitary sewers at shallower depths would be required to service individual properties located along the proposed sewer alignment. The local sewers would be constructed at depths ranging from 2.8 to 5.0 m within the proposed roadways.

Based on the sanitary sewer design calculations included in Appendix C, the current Draft Plan lands and potential future development of non-TUA lands located east to the subject Subdivision draining to the proposed Baden Trunk Sewer, are expected to generate a peak theoretical sanitary flow of approximately 27.77 L/s. As noted, this includes the future sanitary flows from the easterly portion of the lands owned by Activa that would go through the Draft Plan approval process in future.

4.0 STORM SERVICING

4.1 STORM SERVICING BACKGROUND

As per the Grading Plans and Storm Drainage Area Plans prepared for the existing Activa Baden Subdivision located south of the subject Activa Baden North Subdivision lands, 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 North Subdivision lands; however, under the proposed development conditions (i.e., development of Activa 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. Please refer to the Storm Drainage Area Plan Drawing No. 11 prepared by Stantec, included in Appendix D, for the existing Baden Subdivision for current areas draining to DICB 158 and RLCB 159 in the existing conditions.

A design letter dated July 25, 2022, included in Appendix D, has been prepared to outline and evaluate various alternatives considered to drain the above-noted low areas at the rear of Michael Myers Road existing Lots 3 to 12. It further recommends and provides design details for the preferred alternative that addresses the storm outlet required for these existing developed lands and adjacent areas included in the subject Activa Baden North Subdivision.

4.2 SERVICING OF SUBJECT LANDS

The proposed storm sewers within the subject lands will be designed to convey all minor storm events (up to and including a 5-year storm) as per the Township of Wilmot design parameters. The major storm events (greater than a 5-year storm) will be conveyed by the road rights-of-way to low points for discharge into the appropriate outlets as described in the following sections.

4.2.1 Storm Servicing for Discharge to Existing Activa Baden Subdivision

Based on a review of the external drainage area included in the design of the existing storm sewers within the existing Activa Baden Subdivision located to the south of the subject Activa Baden North Subdivision lands, a pre-development external area with a combined AC value of 2.33 was included in the design of these existing storm sewers; however, a recent review completed by Stantec and the Township indicates that some of the existing storm sewers would theoretically be surcharging due to various reasons

(i.e., as-built storm sewers not built to design grades, revised Township design criteria for storm sewers that are more conservative etc.). That said, it is understood that the existing storm sewer system has been operating with no reported issues and that the private properties have not been impacted as there were no storm service laterals installed within the existing Activa Baden Subdivision.

Based on a further review and analysis of the opportunities and constraints in the design of the subject Activa Baden North Subdivision, it has been determined that a proposed drainage area equivalent to a reduced combined AC value of 1.79 (i.e., a reduction from the current pre-development external areas allowed in the existing storm system design) would be allowed to discharge from the subject Activa Baden North subdivision to the existing storm sewers in the existing Activa Baden Subdivision. As per the attached drainage area plan Figure 2.0, a total of 2.67 ha of the proposed drainage areas with a combined AC value of 1.79 that would drain to the south including the following 3 outlets:

- AC of 1.06 to the outlet on Isaac Shantz Drive (consisting of 1.41 ha with a C = 0.75)

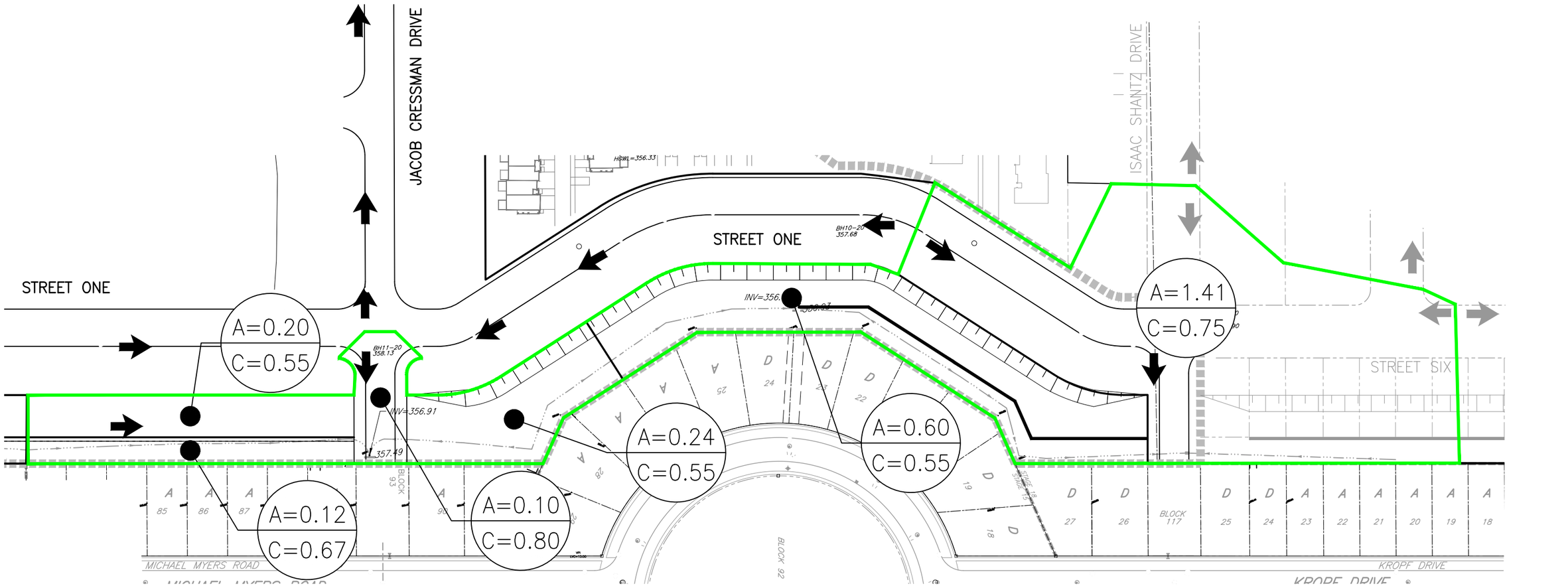
- AC of 0.33 to the outlet on Goldschmidt Crescent (consisting of 0.60 ha of backyards with a C =0.55)

- AC of 0.40 to the outlet on Jacob Cressman Drive (consisting of 4 drainage areas as noted below)
  - Trail area of 0.12 ha with a C=0.67
  - Backyard area of 0.20 ha with a C=0.55
  - Backyard area of 0.24 ha with a C=0.55
  - Street ROW area of 0.10 ha with a C=0.80

4.2.2 Storm Servicing for Discharge to Proposed SWM Facility

As noted in Section 4.2.1 above, it is proposed to discharge stormwater flows from an approximate drainage area of 2.67 ha of the proposed Subdivision to the existing storm sewers at Isaac Shantz Drive, Jacob Cressman Drive and Goldschmidt Crescent in the existing Activa Baden Subdivision. It is proposed to discharge the remaining drainage area of approximately 28.5 ha of the subject Activa lands to the proposed SWMF located at the north end of the subdivision.

Please refer to the enclosed Conceptual Servicing Plan, Drawing No. C-100 included in Appendix B, for an illustration of the proposed storm sewers within the subject subdivision, and Section 6.0 for the detailed SWM strategy for the Subdivision.



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Notes

A=0.20 / C=0.55 — CONTRIBUTING AREA (ha) / RUNOFF COEFFICIENT

MAJOR OVERLAND FLOOD ROUTE

DRAINAGE BOUNDARY

PROPOSED STORM DRAINAGE AREA CONVEYED SOUTH THROUGH EXISTING DEVELOPMENT

Client/Project
ACTIVA HOLDINGS INC.

ACTIVA BADEN NORTH

Project No.
60305680

Title
DRAINAGE CATCHMENTS
PROPOSED AREAS
TO EXISTING SUBDIVISION

Revision

Date
22.07.22

Reference Sheet

Figure No.
2.0

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5.0 WATER DISTRIBUTION SYSTEM ANALYSIS

5.1 INTRODUCTION

A water distribution analysis, including the fire flow analysis, has been undertaken for the proposed Subdivision. The primary intent of the analysis is to determine appropriate sizes for the proposed watermains within the Subdivision that will adequately distribute projected water demands including fire flow demands and to confirm that the required fire flow can be achieved through the proposed fire hydrants onsite under various domestic and fire demand scenarios, within the Ministry of the Environment Conservation and Parks (MECP) and Region of Waterloo Pressure and Distribution Guidelines.

The detailed analysis presented in the following sections covers the current Draft Pan lands as well as the potential future development of non-TUA lands. The ultimate water servicing strategy for the proposed subdivision will include three connection points to provide a looping system; 2 connections at the south end (i.e., on Jacob Cressman Drive and Isaac Shantz Drive); and the 3rd connection at the west end of Street One that will extend to the adjacent 1012 Snyder's Road West Subdivision Lands, as shown on the Conceptual Servicing Plan (Drawing No. C-100 included in Appendix B). The current analysis presented in the following sections is based on providing two connections at the south end at present.

5.2 METHODOLOGY

5.2.1 Model Development and Design Criteria

The water distribution analysis was performed using the Haestad Methods Hydraulic Modeling WaterCAD Software. The distribution network was created by assigning physical parameters to each node and pipe. The model was run under various demand scenarios and each was checked against the relevant guidelines for operating and residual pressures as well as fire flow availability. The parameters and criteria are outlined in the following sections.

Appendix E contains correspondence dated December 4, 2020 from the Region of Waterloo and the boundary conditions data they have provided for various nodes from the Region's water model. The data was provided by the Region to MTE in response to their request related to 1012 Snyder's Road West Subdivision located west to the subject Activa Baden North subdivision and included the estimated demands from both the subdivisions.

The water for the proposed distribution network within Activa Baden North Subdivision will be drawn from two connections at the south end as outlined in Section 5.1 above. The Region has provided the data pertaining to the corresponding nodes 'JCT_00385' located at the intersection of Jacob Cressman Drive and Michael Myers Road, and 'JCT_00386' located at the intersection of Isaac Shantz Drive and Kropf Drive within the existing Activa Baden Subdivision to the south. Hydraulic modeling results for these nodes under various demand scenarios were provided to establish the hydraulic grade line (HGL).

The fire flow analysis consists of the following components:

- Determine fire flow demand requirements
- Use the HGL data provided by the Region to undertake a fire flow simulation under maximum day plus fire flow demands
- Address velocities during fire flow conditions with respect to the recommendations of the Region
- Ensure adequate pressure and fire flow are available to satisfy the MECP and the Region criteria

5.2.2 Region of Waterloo Design Guidelines

The Region of Waterloo document entitled *Region of Waterloo and Area Municipal Design Guidelines and Supplemental Specifications for Municipal Service (DGSSMS)*, intended to provide a common regional and area-wide standardization for municipal water distribution and wastewater designs and installation, was used.

The general guidelines have been published to provide direction for water distribution system analysis and design, including:

- Pressure, demand, and velocity criteria
- Hydraulic modeling parameters (i.e., friction factors)
- Hydrant spacing and location
- Minimum watermain sizing criteria

The recommendations of these guidelines have been followed in completing this analysis.

5.2.3 Boundary Conditions

HGL information for the proposed Subdivision is based on the modeling results provided by the Region, included in Appendix E. The HGL's were obtained for the average day and maximum day as well as data pertaining to a range of fire flow scenarios. A reservoir was assigned the HGL determined from the

Region's model for each demand scenario. Fire flows were derived from the fire flow analysis flow curve provided by the Region. Table 1 provides a summary of the hydraulic grade lines used in the analysis:

Table 1: Hydraulic Grade Lines

Demand Scenario	Hydraulic Grade Line (m) Node JCT_00385	Hydraulic Grade Line (m) Node JCT_00386
Average Day	398.41	398.41
Maximum Day	398.10	398.10
Minimum Hour	399.02	399.02
Peak Hour	397.64	397.64
Max Day + 100 L/S Fire	391.30	388.10
Max Day + 133 L/S Fire *	386.95	381.54
• *HGL interpolated from the fire flow analysis data provided by the Region of Waterloo		

5.2.4 Peaking Factors

The peaking factors used in the model are based on the Region's DGSSMS document and *Table 3-1* of the *2008 MOE Design Guidelines for Drinking-Water Systems*, as outlined in Table 2.

Table 2: Peaking Factors

Demand Scenario	Factor
Average Day	1.00
Maximum Day	2.00
Peak Hour	3.00
Minimum Hour	0.50

5.2.5 System Demands

Population projections were used in conjunction with per capita rates and demand factors to calculate future water demands for the proposed development. A residential per capita rate of 225 L/cap/day was used based on the Region of Waterloo Water Supply and Distribution Optimization Master Plan, May 2015. Detailed demand calculations have been provided in Appendix E. Demand allocation was completed by assigning the demand from contributory areas to each applicable node.

5.2.6 Fire Flow Requirements

According to the DGSSMS document, the fire flow requirements for the proposed development shall be determined in accordance with the current issue of the *Water Supply for Public Fire Protection, Fire Underwriter's Survey (FUS).* The FUS manual outlines the following criteria for the fire flow requirements:

- Modern semi and detached homes >3 m separation – 4,000 L/min (67 L/S)
- Modern semi and detached homes <3 m separation – 6,000 L/min (100 L/S)
- High density, contiguous multi-block homes – 8,000 L/min (133 L/S)

Assuming a worst-case scenario where the majority of the proposed residences may be within a 3 m separation of each other, the larger 100 L/S fire flow was used in the modeling of single detached residential areas. The multi-residential blocks were modeled using the 133 L/S fire flow demand.

5.2.7 Pressure Requirements

The Region of Waterloo Pressure Guidelines are to be maintained for all demand scenarios and are consistent with the MECP requirements. The guidelines are shown in Table 3 below.

Table 3: Region of Waterloo Pressure Requirements

Demand Scenario	Pressure Guidelines (kPa)	
	Min.	Max.
Average Day	350	550
Maximum Day	350	550
Peak Hour	275	700
Minimum Hour	275	700
Max. Day + Fire	140	700

The Region requires the use of individual pressure reducing valves (PRV) on each water service where pressures exceed 550 kPa (80 psi) under any demand scenario.

5.2.8 Velocity Requirements

The Region and the MECP recommends that velocities throughout the distribution system not exceed a maximum of 5 m/s for non-regional watermains and 1.5 m/s for regional watermains during any demand scenario. Areas of concern are typically at long cul-de-sacs or dead-end stubs of smaller diameter (150 mm dia.). Large fire flow loads may cause the velocity in these mains to exceed 5 m/s.

5.2.9 Friction Factors

The following Hazen-Williams C-factors are commonly used to estimate frictional losses through the distribution system based on material type, as outlined in Table 4.

Table 4: Hazen-Williams C-Factors

Pipe Material	C
PVC	150
Ductile Iron (D.I.)	130
Concrete Pressure Pipe (CPP)	140
High-Density Polyethylene (HDPE)	140

All pipes were assumed to be PVC and a C value of 150 was applied.

5.3 RESULTS

The model was run to optimize pipe sizes in the proposed Subdivision according to the boundary conditions and demand criteria outlined in the previous sections. There are existing 200 mm diameter watermain stubs on Jacob Cressman Drive and Isaac Shantz Drive within the existing Activa Baden Subdivision for future extension to service the subject Activa Baden North subdivision. Accordingly, 200 mm diameter watermains have been assumed along these street extensions within the subject Subdivision. The pipe sizes within the remaining streets of the Subdivision were initially assumed as 150 mm dia. connecting to the proposed 200 mm dia. watermains on Jacob Cressman Drive or Isaac Shantz Drive. Pipes were then increased in diameter to achieve the aforementioned design criteria. Based on the analysis, the proposed network configuration included in Appendix E provides the adequate pressures and fire flow capacities required.

Appendix E provides the proposed water distribution network with the proposed two connections to the watermains on Jacob Cressman Drive and Isaac Shantz Drive south of the subject lands. A series of tables summarizing the output results of the WaterCAD analysis are also included in Appendix E. Tables 5 and 6 present a summary of the modeling results at select nodes within the development.

Table 5: Modeling Results – Fire Flow[1]

	Node	Node Elevation (m)	Required Fire Flow (L/S)	Available Fire Flow (L/S)	Required System Pressure (kPa)	Fire Node Pressure (kPa)	Residual System Pressure (kPa)
Connections to Existing Watermains on Jacob Cressman Drive and Isaac Shantz Drive	J-3	362.30	133	>138	140	251	281
	J-8	360.80	100	>105	140	285	295
	J-9	359.45	133	>138	140	272	261
	J-12	360.95	100	>105	140	291	300
	J-16	362.15	100	>105	140	256	280
	J-23	361.55	133	>105	140	160	258

1. Representative nodes shown. See Appendix E for remaining nodes and all pipe results

Based on the results shown in Table 5 and Appendix E, a fire flow of 100 L/s at each detached residential node, and a fire flow of 133 L/s at each multi-residential node can be provided with the MECP recommended minimum system pressure of 140 kPa as per the DGSSMS. Overall, the required fire flows can be achieved for the proposed land uses. Based on the results as indicated above, adequate pressure and fire flows can be provided to current Draft Plan lands and future areas.

The Region of Waterloo requires the use of individual PRVs on each water service where pressures exceed 550 kPa (80 psi) under any demand scenario. Table 6 provides a summary of pressures during normal operating conditions at select nodes within the Development. Based on the results shown in Table 6 and Appendix E, individual PRVs will not be required within the current Draft Plan lands and future areas.

Table 6: Modeling Results - Pressures[1]

	Node	Node Elevation (m)	Pressure (kPa)			
			Average Day Demand	Maximum Day Demand	Peak Hour Demand	Minimum Hour Demand
Connections to Existing Watermains on Jacob Cressman Drive and Isaac Shantz Drive	J-3	362.30	353	350	345	359
	J-8	360.80	368	365	360	374
	J-9	359.45	381	378	373	387
	J-12	360.95	367	363	358	373
	J-16	362.15	355	352	347	361
	J-23	361.55	361	357	352	367

1. Representative nodes shown. See Appendix E for remaining nodes.

The Region of Waterloo recommends maintaining the velocity in watermains below 5 m/s, where possible, to prevent transient pressures from damaging the pipe system. The watermain configuration for the proposed development can generally deliver the required fire flow to the onsite hydrants while maintaining velocities of less than or equal to 5 m/s.

5.4 SUMMARY

From the above analysis, the main findings can be summarized as follows:

- The proposed water distribution network within the Current Draft Plan will consist of:
  - 200 mm dia. watermains on Jacob Cressman Drive, Isaac Shantz Drive, Street One, Street Two, and Street Five
  - 150 mm dia. watermains on Street Three and Street Four
- 150 mm and 200 mm diameter watermain extensions from the Current Draft Plan watermains identified above would be required in future for the future development lands
- Velocities in all watermains are less than 5 m/s under fire flow conditions
- Individual PRVs will not be required within the proposed development

- All fire flow requirements are met including:
  - 100 L/S provided at all single detached residential units
  - 133 L/S provided at all multi-residential (townhome) blocks

Given the proposed water distribution network, the proposed Activa Baden North Subdivision can be serviced, in compliance with all requirements of the Township of Wilmot, Region of Waterloo and the Ministry of the Environment, with sufficient water supply available to the proposed development.

6.0 STORMWATER MANAGEMENT

6.1 STUDY APPROACH

A SWM strategy for the site has been developed to mitigate against potential offsite water quality and quantity impacts associated with the development of the subject lands.

The SWM design involved the following study components:

- Prepare an existing and proposed development condition hydrologic model using SWMHYMO to determine runoff volumes and peak flow rates to downstream areas
- Complete the preliminary design of the SWMF to provide sufficient water quality and water quantity control to achieve target rates to downstream receivers by mimicking existing conditions
- Summarize the study through preliminary design and recommendations

6.2 BACKGROUND

The following reports and primary guidance documents were referenced in the completion of the proposed SWM design:

- *Record of Pre-Submission Consultation for "Baden North",* Region of Waterloo, July 25, 2022
- *Final - Geotechnical Investigation – Proposed Residential Subdivision, Activa Baden Lands, Baden, Ontario*, Stantec Consulting Ltd., June 3, 2021
- *Final – Hydrogeological Investigation, Activa Baden North Subdivision, Township of Wilmot, Ontario, July 2022*
- *Low Impact Development Stormwater Management Planning and Design Guide,* Credit Valley Conservation Authority and Toronto and Region Conservation Authority, 2010
- *Stormwater Management Planning and Design (SWMPD) Manual,* Ministry of the Environment, Conservation and Parks (MECP), March 2003
- *Stormwater Management Facility Sediment Maintenance Guide,* Greenland International Consulting Ltd., August 1999

6.3 STORMWATER MANAGEMENT DESIGN CRITERIA

The SWM criteria for the subject lands were established through the above-mentioned documentation and pre-consultation with the Grand River Conservation Authority (GRCA) and the Township of Wilmot. The SWM criteria are as follows:

- **Water Quality** – Provide sufficient permanent pool and extended detention volume to meet the Ministry of the Environment, (MOE) *Normal* (70% Total Suspended Solids [TSS] Removal) criteria.
- **Water Quantity** – Provide sufficient water quantity control to maintain post-development peak flow rates to pre-development levels for all storms up to and including the 1:100-year storm event.
- **Infiltration** – Promote infiltration measures where possible and provide best efforts to match pre-development infiltration levels.
- **Erosion Control** – Provide sufficient extended detention for the 25 mm storm event with a minimum 24-hour drawdown period.
- **Erosion and Sediment Control** – Provide appropriate erosion and sediment control during construction/area grading to protect adjacent properties and downstream watercourses/wetlands from potential siltation.
- **Sediment Drying Area** – Provide adequate land area within the SWM Block for the Township's future Sediment Removal Maintenance Program.

6.4 EXISTING CONDITIONS

6.4.1 Topography and Surface Drainage

The ground surface is moderately rolling with elevations ranging between 355.00 and 360.00 m a mASL. The site slopes generally split between flows to the north and flows to the south with the majority of the site draining north to the onsite wetland features and the subsequent Phillipsburg Southeast Wetland Complex, which is considered a PSW. A portion of the site drains south towards the existing Baden Subdivision, where it is conveyed to the existing SWMF through the subdivision storm system. Some external flows enter the site through the existing agricultural fields in the northeast corner, while flows from the external lands to the west of the site are generally contained in offsite depressions and do not overflow to the subject site.

Existing conditions drainage information are presented on Figure 3.0.

6.4.2 Geotechnical Information

As identified in the *Geotechnical Investigation* (Stantec, 2021), the subsurface soils for the site are generally comprised of cohesive glacial tills (clay till and clayey silt till). Non-cohesive sands and silts were generally found in boreholes advanced in the north central portion of the site.

Bedrock was not encountered at the boreholes advanced for this site. Based on available bedrock mapping and data of the area, bedrock is anticipated at approximate depths of 40 m to more than 80 m below existing ground in the greater area of Baden.

Groundwater levels below the existing ground surface taken during the Geotechnical Investigation ranged from 0.7 m to 8.5 m (351.2 m mASL to 358.9 m mASL) in July, 2020. Groundwater levels from the Hydrogeology investigation between July 2020 and May 2021 showed water levels to range from 6.1 m below existing ground to slightly above ground surface (353.9 m AMSL to 358.6 m mASL).

The predominant cohesive soil conditions (clay and clay till) will generally be suitable for at-source infiltration of precipitation; however, due to the high silt content, lower infiltration rates should be expected. Sandy areas in the northern portion of the site have potential for higher infiltration rates, depending on where the bottom of infiltration facilities will be placed.

6.5 STORMWATER MANAGEMENT DESIGN

6.5.1 Hydrologic Modeling

A hydrologic model was prepared using Stormwater Management Hydrologic Model (SWMHYMO) to simulate drainage conditions for the subject development under existing and proposed development conditions. The model was employed to predict flows and design SWM systems to ensure the criteria are achieved.

Precipitation events were taken from the City of Kitchener's IDF curves, with parameters provided in Table 7. Model results were obtained for the existing and proposed conditions for the following events:

- The 25 mm, 4-hour Chicago Storm
- The 2-, 5-, 25-, 50-, and 100-year 3-hour Chicago distribution storms
- The Regional 48-hour storm event

Table 7: Rainfall Events - City of Kitchener IDF Parameters

Return Period	IDF Parameters			
	A	B	C	Depth (mm)
25 mm, 3-hr	508.5	6	0.7989	25.0
2-year, 3-hr	743	6	0.7989	34.3
5-year, 3-hr	1593	11	0.8789	47.2
25-year, 3-hr	3158	15	0.9355	68.1
50-year, 3-hr	3886	16	0.9495	77.2
100-year, 3-hr	4688	17	0.9624	87.3
Regional, 48-hr	-	-	-	285

6.5.2 Existing Conditions Hydrologic Model

An existing conditions hydrologic model was prepared to simulate existing conditions for the site using the software SWMHYMO. Input and output files for the SWMHYMO models are provided in Appendix F. Soil Conservation Service (SCS) Curve Numbers (CN) and catchment parameters were calculated for each existing catchment based on land use and soil type and are provided in Appendix F. Delineation of existing drainage catchments is provided on Figure 3.0 and is summarized below:

- Catchment 100: 11.55 ha of agricultural area in the western portion of the site draining north to the existing wetland feature onsite
- Catchment 101: 6.44 ha of agricultural area in the eastern portion of the site draining north through the hydro easement, just east of the existing wetland feature onsite. This area subsequently connects downstream to the PSW
- Catchment 102: 2.07 ha of external agricultural area to the northeast of the site draining onto the subject property and subsequently north through the hydro easement, just east of the existing wetland feature onsite
- Catchment 103: 2.15 ha of external agricultural area to the northeast of the site draining onto the subject property and subsequently south towards the existing Baden Subdivision
- Catchment 104: 12.66 ha of mostly agricultural area in the southern portion of the site draining south to the existing Baden Subdivision
- Catchment 105: 14.16 ha of external agricultural area to the west of the site draining to an external depression that overflows across the site to the wetland complex

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Legend

100 / A=11.55 — AREA I.D. / CONTRIBUTING AREA (ha)

MAJOR OVERLAND FLOOD ROUTE

DRAINAGE BOUNDARY

SITE BOUNDARY

1:3500 — 0 35 105 175m

Client/Project
ACTIVA HOLDINGS INC.

ACTIVA BADEN NORTH

Project No.
60305680

Title
PRE-DEVELOPMENT DRAINAGE PLAN

Revision

Date
2022.07.19

Reference Sheet

Figure No.
3

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7/19/2022 9:10:46 PM By: Miller, Jonathan

Although Catchments 101 and 102 connect to the PSW just downstream of the onsite wetland feature, peak flow targets were taken for flows only contributing directly to the onsite wetland feature to provide a conservative estimate. Additionally, through modelling it was determined that the 14.16 ha of external area in Catchment 105 is completely contained in the depression and does not spill to the subject property.

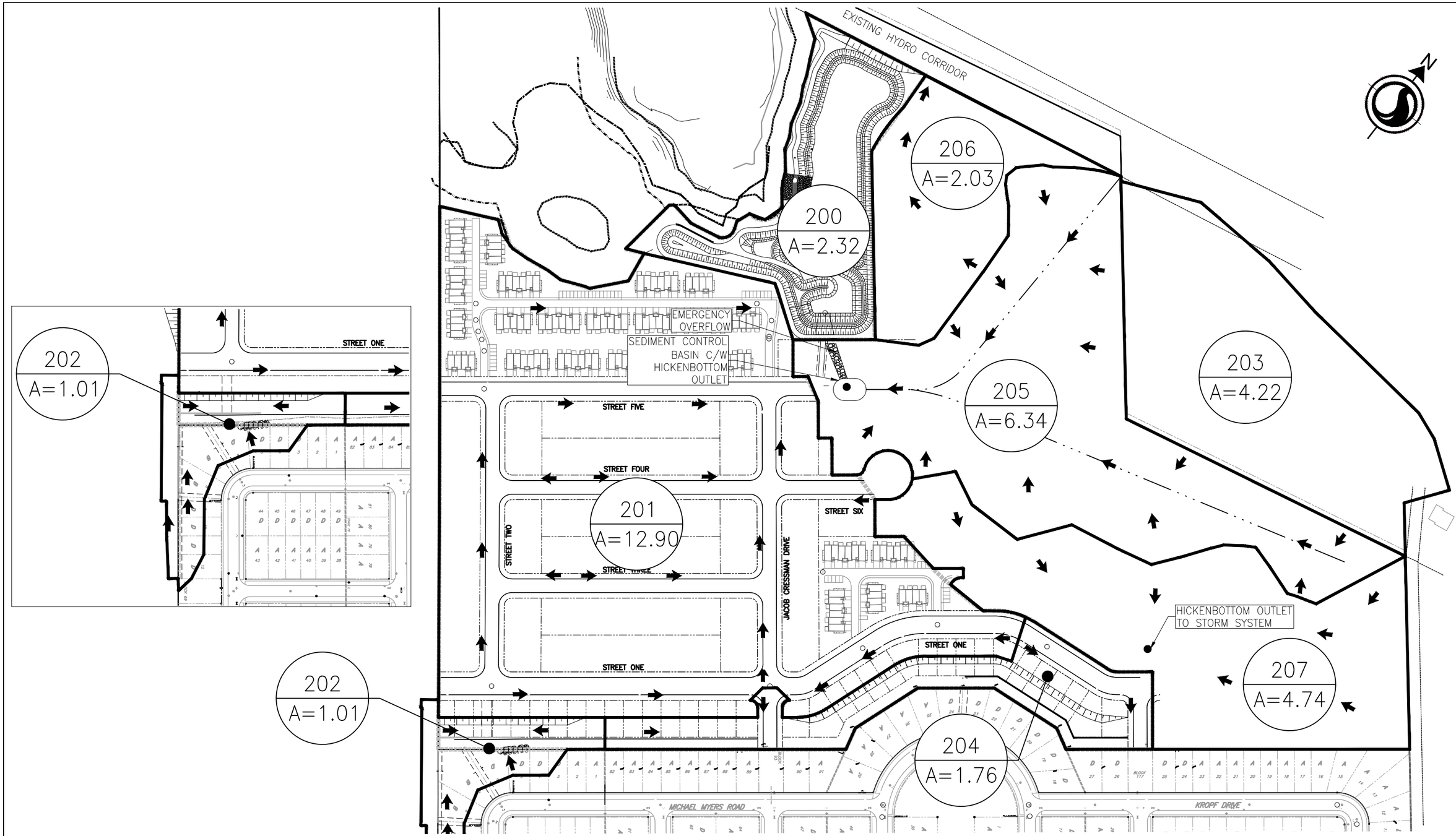
6.5.3 Current Draft Plan Conditions Hydrologic Model

As stated previously, the current Draft Plan Application is being submitted for the lands owned by Activa within the established TUA, while lands outside of the TUA are not proposed for development other than for related infrastructure (e.g., SWMF) that supports the development within the TUA. The SWMF design will need to account for both the current development application as well as future development within the non-TUA lands. As such, two separate development conditions models were created. The Current Draft Plan Conditions model accounts for the current application of development of the TUA lands and construction of the SWMF, while the Future Conditions model (discussed in the next section) accounts for development of the TUA lands as well as future development within the non-TUA lands.

Although the SWMF will be designed to accommodate the entire future subdivision in the designated SWM block, simulating just the current Draft Plan approved lands allows for optimization of the SWMF to maintain the water balance in both current and future scenarios. The proposed development incorporates a mixed residential development with mostly single-family residential units with two multi-block areas as well as the proposed SWMF. The proposed SWMF will be located adjacent to the existing onsite wetland that it will discharge directly to. This wetland then subsequently flows north through the Hydro corridor to the PSW. The SWMF is proposed to provide water quality and quantity control as well as infiltration for the majority of the proposed Baden North Subdivision. A small portion of the site drains south to the existing subdivision and subsequent SWMF.

SCS Curve Numbers were calculated for each of the proposed catchments based on land use and soil type and are provided in Appendix F. All input and output files are provided in Appendix F. The delineation of the proposed Current Draft Plan drainage catchments is provided on Figure 4.0 and is summarized as follows:

- Catchment 200: 2.32 ha of proposed SWMF
- Catchment 201: 12.90 ha of proposed residential development draining to onsite SWMF
- Catchment 202: 1.01 ha of rear yards from proposed development as well as existing development to the south draining in a dedicated storm pipe to the SWMF
- Catchment 203: 4.22 ha of external agricultural area to the northeast of the site draining onto the subject property and subsequently into the onsite SWMF



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Notes

201
A=12.90

AREA ID

CONTRIBUTING AREA (ha)

MAJOR OVERLAND FLOOD ROUTE

DRAINAGE BOUNDARY

1:3000 0 30 90 150m

Client/Project
ACTIVA HOLDINGS INC.

ACTIVA BADEN

Project No.
60305680

Title
POST-DEVELOPMENT DRAINAGE PLAN - CURRENT DRAFT PLAN CONDITIONS

Revision

Date
22.07.19

Reference Sheet

Figure No.
4

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- Catchment 204: 1.76 ha of proposed residential development draining south to the existing Baden Subdivision

- Catchment 205: 6.34 ha of existing agricultural land drainage that will be directed to the onsite SWMF

- Catchment 206: 2.03 ha of existing agricultural area in the eastern portion of the site draining north through the hydro easement, just east of the existing wetland feature onsite. This area subsequently connects downstream to the PSW

- Catchment 207: 4.74 ha of existing agricultural land draining south to the existing Baden subdivision

For further information on Catchment 202 and the dedicated storm pipe to the proposed SWMF, refer to the letter titled *Activa Baden North Subdivision, Dedicated Storm Sewer System for Low Lying Areas near Existing DICB 158,* prepared by Stantec on March 29, 2021.

6.5.4 Future Conditions Hydrologic Model

A Future Conditions model was created to simulate the complete build out of the subdivision (both TUA and non-TUA lands). The future development is assumed to expand on the current Draft Plan by adding further mixed residential areas with mostly single-family residential units and completion of the two multi-block areas. The single SWMF constructed in the current Draft Plan will be designed to provide sufficient storage and satisfy the required controls for the Future Conditions build out. The Future Conditions model will need to be confirmed and updated as necessary when this area goes to Draft Plan Approval.

SCS Curve Numbers were calculated for each of the proposed catchments based on land use and soil type and are provided in Appendix F. All input and output files are provided in Appendix F. The delineation of the proposed Future Conditions drainage catchments is provided on Figure 5.0 and is summarized as follows:

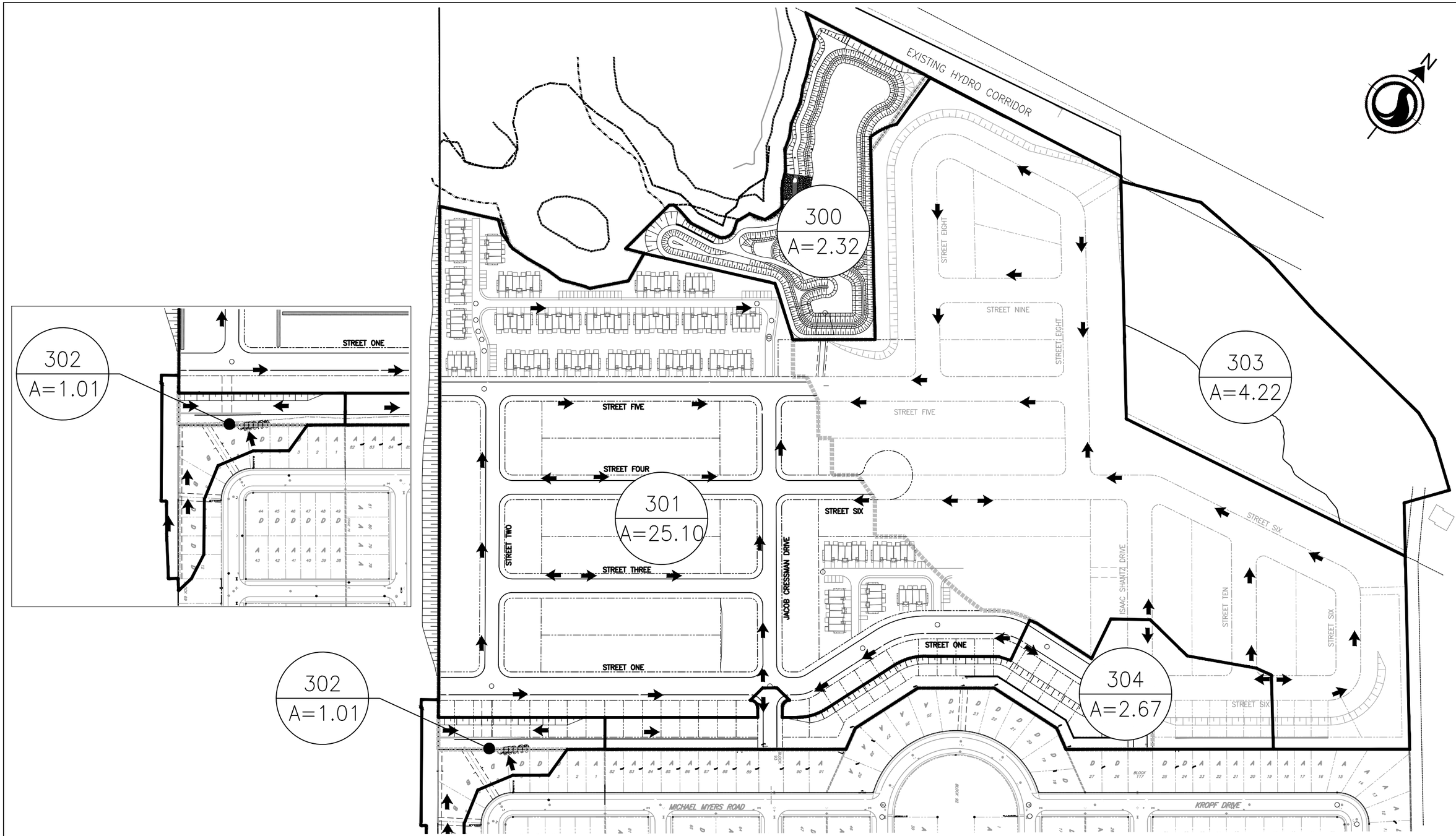
- Catchment 300: 2.32 ha of proposed SWMF

- Catchment 301: 25.10 ha of proposed residential development draining to onsite SWMF (including both TUA and non-TUA areas developed)

- Catchment 302: 1.01 ha of rear yards from proposed development as well as existing development to the south draining in a dedicated storm pipe to the SWMF

- Catchment 303: 4.22 ha of external agricultural area to the northeast of the site draining onto the subject property and subsequently into the onsite SWMF

- Catchment 304: 2.67 ha of proposed residential development draining south to the existing Baden Subdivision



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7/20/2022 10:22:04 AM By: Miller, Jonathan

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Notes

301
A=25.10

AREA ID

CONTRIBUTING AREA (ha)

MAJOR OVERLAND FLOOD ROUTE

DRAINAGE BOUNDARY

1:3000 0 30 90 150m

Client/Project
ACTIVA HOLDINGS INC.

ACTIVA BADEN

Project No.
60305680

Title
POST-DEVELOPMENT DRAINAGE PLAN FUTURE CONDITIONS

Revision

Date
22.07.20

Reference Sheet

Figure No.
5

As mentioned previously, for further information on Catchment 302 and the dedicated storm pipe to the proposed SWMF, refer to the letter titled *Activa Baden North Subdivision, Dedicated Storm Sewer System for Low Lying Areas near Existing DICB 158,* prepared by Stantec on March 29, 2021.

6.6 PROPOSED SWM STRATEGY

The proposed SWM strategy for the Activa Baden North Subdivision incorporates minor system conveyance via storm sewer networks to the proposed SWMF for water quality and quantity control while major storm runoff is generally conveyed via overland flow through the rights-of-way. Infiltration has been incorporated on a lot-level basis where possible, as well as within the end of pipe SWMF. The SWM strategy has been developed in accordance with the objectives and criteria previously listed.

6.6.1 SWM Facility Design

Runoff from the majority of the proposed development drains to an infiltration facility complete with a forebay located immediately east of the onsite wetland feature in the northwest portion of the site. The location of this proposed SWMF was selected for a variety of reasons including the following:

- This is the existing low point on the site where water drains to the onsite wetland feature.
- This area of the site contains a sandy soil region, making infiltration feasible to maintain infiltration rates and a runoff balance to the wetland. The remaining portions of the site has very low infiltration potential, meaning meeting the water balance may not be feasible in another location.
- This location is the most efficient use of land for the future build out of the site and minimizes the cut/fill impacts of development.

The proposed SWMF is designed to provide water quantity and quality control for 32.7 ha of development (including 4.2 ha of external agricultural land) as well as infiltration to maintain a runoff balance to the downstream wetland. As discussed in pre-consultation and outlined in the preliminary criteria provided by the GRCA, the SWMF is required to provide ‘normal’ water quality treatment prior to discharging to the downstream wetland; however, with the forebay and infiltration cell in series, an ‘Enhanced’ level of water quality treatment is provided.

The SWMF forebay will provide initial water quality treatment and isolation of sediment deposition for ease of cleanout as well as to minimize transport of fines from entering and clogging the infiltration cell. Additionally, a sediment drying area has been designed adjacent to the SWMF forebay and is set at least 0.2 m higher than the permanent pool elevation. The permanent pool in the forebay has been sized to provide a ‘normal’ level of water quality control and a forebay length to provide appropriate dispersion and settling. The SWMF forebay will also provide sufficient extended detention storage to achieve a 43-hour drawdown of the water quality control volume (detailed design calculations are provided in Appendix F and summarized in Table 8).

After the forebay, the infiltration cell will provide further water quality treatment through infiltration of most runoff events. Since the basin will be sized to infiltrate approximately the 25 mm retention volume, or 80% of annual precipitation, it can be assumed it will also provide over 80% TSS removal. Overall, the SWMF will provide an 'enhanced' level of water quality control through a wet forebay and subsequent infiltration cell.

In addition to the water quality benefit described above, the infiltration cell will provide water quantity storage as well as enhance groundwater recharge to maintain a runoff balance to the downstream wetland. The outlet to the downstream wetland will be raised from the bottom of the infiltration cell to promote ponding and subsequent infiltration. A 0.3 m deep amended soil layer will be placed below the infiltration cell bottom to help promote infiltration and reduce surface ponding with the bottom of the amended soil extending to 355.25 m to maintain 1 m of separation from the high groundwater elevation of 354.25 m. The composition of this amended soil mixture will be determined at detail design; however, in general it will constitute a mixture of sand, topsoil, and organics while providing a 0.35 void ratio.

To mimic the existing conditions and maintain a monthly runoff balance to the downstream wetland, a dual outlet system has been designed to provide more infiltration in the summer/fall months (less runoff) and less infiltration during the winter/spring months (more runoff). A shut off valve will be implemented at the lower (winter/spring) outlet to create more 'dead' storage and in turn increase infiltration volume during the summer/fall months. As shown on the SWMF Drawing No. C-800, the two outlets will be protected by CSP outlet risers with single orifice control placed in a downstream manhole to provide water quantity control of the smaller events, with a ditch inlet catchbasin (DICB) outlet providing higher flow conveyance/controls. The trapezoidal overflow spillway conveys flows only during the Regional Storm event or in the emergency circumstance of blockage of the remaining outlet structures. The outlet elevations within the dual outlet risers have been set to provide sufficient infiltration volumes to maintain a runoff balance to the wetland, while enhancing infiltration. An orifice plate is proposed to be used to set these elevations as it allows for easy adjustment between the Current Draft Plan and Future conditions as a larger infiltration volume is required in the future conditions as a result of increased impervious area. For further details on the infiltration cell, refer to Section 6.7.1

To provide a conservative estimate during the design of water quantity control infrastructure in the SWMF, all lot-level and SWMF infiltration was ignored in the modelling and summer operating level was assumed leading less active storage available. The preliminary design of the SWMF has a maximum 100-year return period ponding elevation of 357.41 mASL during the Future Conditions scenario, providing 0.39 m of freeboard to the top elevation of the facility. Details on the outlet structure sizes and elevations are summarized in Table 8 and the detailed stage-storage-discharge analysis for the proposed SWMF is provided in Appendix F. Additionally, a detailed drawing of the SWMF is included on Drawing No. C-800 (Appendix F).

Table 8: SWM Facility Design Characteristics

Parameter	Basin Characteristics
Total Contributing Area (quality and quantity)[1]	32.65 ha
Total Percent Impervious to SWMF[1]	53%
Quality Control	
Unit Area Storage Requirement – "Normal" Treatment	107 m^3/ha
Total Volume Required – "Normal" Treatment	3,488 m^3
Permanent Pool Volume Required – "Normal" Treatment (70 m^3/ha)	2,182 m^3
Permanent Pool Volume Provided in Forebay	2,277 m^3
Permanent Pool Depth in Forebay	1.5 m
Extended Detention Volume Required (40 m^3/ha)	1,306 m^3
Extended Detention Drawdown Time in Forebay	43 hrs
Forebay Parameters	
Required Forebay Length / Provided Forebay Length	70 m / 90 m
Sediment Storage Volume Provided / Cleanout Frequency	684 m^3 / 15 years
Infiltration Cell Details	
Infiltration Cell Surface Elevation	355.55 m
Amended Soil Bottom Elevation	356.25 m
Current Draft Plan Conditions	
Winter/Spring Surface Outlet Diameter / Invert Elevation	300 mm / 355.65 m
Summer/Fall Surface Outlet Diameter / Invert Elevation	300 mm / 355.90 m
Future Conditions	
Winter/Spring Surface Outlet Diameter / Invert Elevation	300 mm / 355.80 m
Summer/Fall Surface Outlet Diameter / Invert Elevation	300 mm / 356.05 m
Quantity Control	
Orifice #1 Invert / Diameter	355.60 m / 200 mm
DICB T/G Elevation (low side)	356.60 m
DICB Outlet Pipe Invert / Diameter (Within DICB)	355.60 m / 375 mm
Overflow Weir Crest Invert / Length / Side Slopes (H:V)	357.50 m / 15 m / 10:1

Notes:

1 Drainage area includes future conditions development as well as 4.2 ha external drainage area and SWMF block itself (in addition to developed areas).

Target peak flow rates as well as proposed conditions peak flow rates are summarized in Table 9 and Table 10, for Current Draft Plan and Future Conditions, respectively, while detailed modelling files are included in Appendix F. Water quantity targets have been met as the post-development peak flow rates are at or below target levels from the SWMF as well as to the existing subdivision to the south, with the exception of a marginal increase during the 25 mm event for flows to the south in Future Conditions. This marginal increase is not expected to have any impact on downstream infrastructure and, all storm events larger than this, produce a smaller peak flow than existing conditions (i.e., major and minor infrastructure not impacted). In addition, infiltration augmentation through rooftop galleries and SWMF infiltration has not been included in the analysis, which will significantly reduce the amount of runoff during this event.

Table 9: SWMF Operating Characteristics – Current Draft Plan Conditions

Storm Event	25 mm	2-year	5-year	50-year	100-year	Regional
Existing Peak Flow Rate from site directly to Wetland (m^3/s)	0.155	0.275	0.494	1.078	1.285	3.272
Proposed Peak Flow Rate to SWMF (m^3/s)	1.132	1.741	2.523	4.653	5.401	3.483
Proposed Peak Flow Rate from SWMF (m^3/s)	0.042	0.067	0.076	0.496	0.522	3.201
Maximum Active Storage Volume (m^3)	2,777	4,306	6,781	11,240	13,030	23,290
Maximum Active Ponding Elevation (m)	356.17	356.31	356.52	356.87	357.00	357.66
Drawdown Time (hrs)	65.1	72.1	81.8	90.0	90.9	95.2
Existing Peak Flow Rate South to Existing Baden Subdivision (m^3/s)	0.219	0.39	0.713	1.597	1.915	1.949
Proposed Peak Flow Rate South to Existing Baden Subdivision (m^3/s)	0.171	0.258	0.358	0.740	0.874	0.879

Table 10: SWMF Operating Characteristics - Future Conditions

Storm Event	25 mm	2-year	5-year	50-year	100-year	Regional
Existing Peak Flow Rate from site directly to Wetland (m^3/s)	0.155	0.275	0.494	1.078	1.285	3.272
Proposed Peak Flow Rate to SWMF (m^3/s)	1.878	2.993	4.346	8.076	9.399	4.592
Proposed Peak Flow Rate from SWMF (m^3/s)	0.070	0.079	0.379	0.571	0.605	4.297
Maximum Active Storage Volume (m^3)	3,996	6,229	8,325	15,060	17,650	22,920
Maximum Active Ponding Elevation (m)	356.41	356.60	356.76	357.24	357.41	357.73
Drawdown Time (hrs)	73.2	81.5	85.4	89.1	90.3	91.7
Existing Peak Flow Rate South to Existing Baden Subdivision (m^3/s)	0.219	0.39	0.713	1.597	1.915	1.949
Proposed Peak Flow Rate South to Existing Baden Subdivision (m^3/s)	0.228	0.358	0.487	0.85	0.972	0.382

6.7 ADDITIONAL DESIGN CONSIDERATIONS

6.7.1 Infiltration

The preliminary geotechnical work performed by Stantec identifies a predominant soil of clay and clay till across the site with smaller areas of sands and silts. The conclusion of the *Geotechnical Investigation* (Stantec, 2021) is that the soils are suitable for infiltration; however, due to the high silt content, lower infiltration rates should be expected. Non-cohesive sands and silts found in the northern portion of the site will likely have higher infiltration rates and present a better opportunity for infiltration, while infiltration

through the existing fill is not recommended. Further analysis provided in the *Hydrogeological Investigation* (Stantec, 2022) confirmed that most of the site consists of silty clays with low infiltration rates. The smaller sandy areas in the northwest portion of the site have higher infiltration potential; however, contain higher groundwater elevations.

In general, the soils identified clay soils onsite have coefficients of permeability of $<1.0x10^{-6}$ cm/sec. The infiltration rates for these soils are estimated to have an unfactored infiltration rate of 12 mm/hr. Applying a safety factor of 3 (LID Manual, 2010) leads to a preliminary infiltration rate of <5 mm/hr. Areas in sandier soils will have higher infiltration rates that can lead to quicker drawdown times and smaller infiltration measures. The suitability of existing soils should be assessed at the proposed elevation of any infiltration facility on a lot-by-lot basis following completion of site grading. Preliminary infiltration estimates from the Hydrogeology investigation showed rates ranging from 3-21 mm/hr in tight soils, up to 53-84 mm/hr in sandier soils. Applying a safety factor of 3 (LID Manual, 2010) to the sandier soils in the northwest portion of the site leads to a preliminary infiltration rate of 18 mm/hr.

Lot-Level Infiltration

Although most of the site contains clay and clay till, the proposed grades are generally much higher than existing, which will allow for infiltration through the new fill. To promote distributed infiltration through the site, it is proposed all single-family rooftops throughout the subdivision where there is greater than 2.7 m of proposed fill will be directed to clear stone infiltration galleries sized to retain runoff from the 25 mm event. The 2.7 m of fill will allow for approximately 1.2 m of cover over a 0.5 m high infiltration gallery while maintaining 1 m of separation to the existing clay silt soils. The proposed fill will be required to have a suitable infiltration rate, which will be finalized during detail design. No rooftop infiltration galleries are proposed for the multi-block areas on site.

Based on a preliminary analysis of the fill depths, it was determined that during the Draft Plan conditions approximately 115 single family lots could contribute to a rooftop infiltration gallery sized for the 25 mm rainfall event (8 of the 115 lots included in the catchment directed south). During Future Conditions, approximately 177 single-family lots can contain rooftop infiltration (with 13 lots in the catchment to the south). These locations will need to be confirmed at Detail Design.

End-of-Pipe Infiltration

As mentioned previously, the proposed SWMF will be designed as an infiltration cell complete with a forebay to provide initial water quality treatment and isolation of sediment. The proposed infiltration cell within the SWMF provides additional retention volume to increase the groundwater recharge and decrease the excess runoff volume to the wetland. This infiltration cell will be placed in an area of the site where the soils are sandier and present a greater infiltration capacity. The proposed system will be operational all year round; however, it will infiltrate more runoff in the summer/fall and less in the

winter/spring to mimic existing conditions. As this site is outside of any Well Head Protection Areas (WHPAs), infiltration of winter runoff is assumed to not pose a significant risk to any drinking water sources. Additionally, infiltration of the winter runoff as opposed to directing this downstream via surface flow will help reduce the impact of salt on the wetland vegetation.

The infiltration cell functions by setting the SWMF outlet to the downstream wetland above the base of the infiltration cell to provide a 'dead' ponding depth/volume that will then infiltrate through the amended soil and existing sandy soil layer. To determine this outlet elevation to the nearby wetland, the SWMF was modelled in SWMHYMO with infiltration as the only outflow value. The infiltration cell in the SWMF has a footprint of 5,916 m², which leads to an outflow rate of 0.029 m³/s using the factored infiltration rate of 18 mm/hr. Including the upstream rooftop infiltration galleries in the model to account for volume reduction to the SWMF, the 4-hour 25 mm event was run to determine the maximum storage volume for both Current Draft Plan and Future Conditions in the SWMF infiltration cell. As the 25 mm rainfall event represents approximately 80% of the annual precipitation volume, infiltration of this volume (or a percentage of this volume) can be used in separate water balance calculations to determine the required infiltration to maintain a runoff balance to the wetland (refer to Appendix G of the Stantec (2022) *Hydrogeological Assessment Report*).

Under existing conditions and as presented in the *Hydrogeological Assessment Report* (Stantec, 2022), the majority of site runoff enters the downstream wetland during the winter/spring months (November – April), with little to no runoff leaving the site during the summer/fall months (May – October). As discussed previously, to mimic these conditions, a dual outlet SWMF design will be utilized infiltrating more in the summer and less in the winter. The figure below presents an illustration of how the infiltration cell of the SWMF will function. Runoff to the SWMF during the winter/spring months will pond up to a specific elevation before flowing to the nearby wetland via surface flow. Below that surface outflow elevation, water will pond and infiltrate with no surface flow to the wetland. During the summer/fall months, the winter/spring outlet will be shut-off, meaning the higher summer/fall outlet will promote higher ponding levels and higher infiltration volumes prior to surface outflow to the wetland. Above these infiltration volumes or 'dead' storage volumes, water will be retained and released slowly to the wetland via orifice controls. This volume provides active storage to attenuate the large storm events.

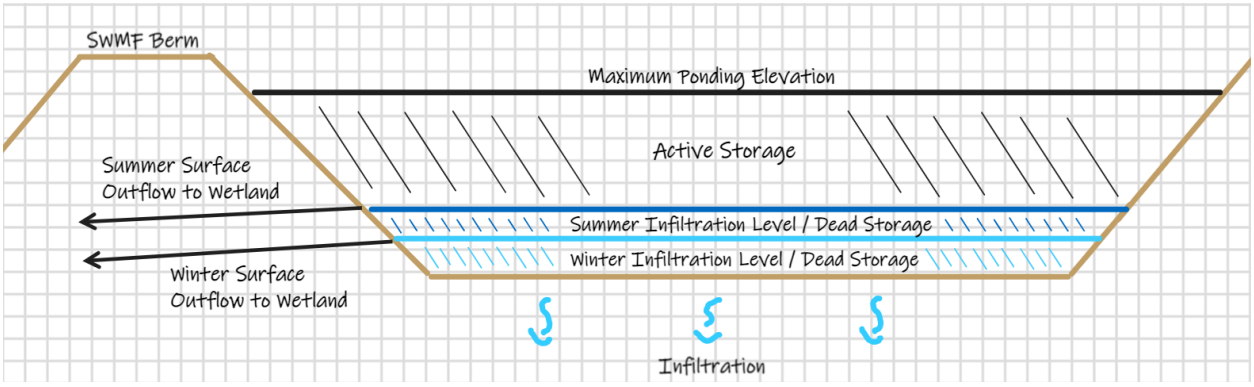


Figure 6.0: SWMF Infiltration Cell Cross Section

Table 11 presents the maximum storage volumes and subsequent outlet elevations during the winter/spring and summer/fall seasons. These volumes were determined through water balance calculations presented in the *Hydrogeological Assessment Report* (Stantec, 2022) based on a percentage of the 25 mm storage volume to maintain monthly as well as annual runoff volumes to the wetland. Drawdown times were maintained under 48 hours and a 1 m vertical separation from the bottom of the infiltration facility and the high groundwater table was established. As the Future Conditions water balance was not completed in detail at this stage, the outlet elevations and water balance calculations will need to be updated and confirmed when the non-TUA lands are to be developed.

Table 11: SWMF Infiltration Volumes and Elevations

Parameter	Current Draft Plan Conditions	Future Conditions
Maximum Volume in SWMF during 25 mm event (m^3)	2,428	3,701
Maximum Ponding Elevation in SWMF during 25 mm event (m)	355.83	355.96
Winter/Spring Surface Outlet Elevation (m)	355.65	355.85
Winter/Spring Maximum Infiltration Volume (m^3)	1,223	2,634
Winter/Spring % of 25 mm infiltration volume	50%	71%
Winter/Spring Drawdown time (hrs)	12	25
Summer/Fall Surface Outlet Elevation (m)	355.90	356.05
Summer/Fall Maximum Infiltration Volume (m^3)	3,114	4,606
Summer/Fall % of 25 mm infiltration volume	*128%	124%
Summer/Fall Drawdown time (hrs)	30	44

*125% used as maximum value in water balance calculations

With the proposed infiltration measures, pre-development infiltration rates for the site are met and exceeded during both the Current Draft Plan and Future Conditions. Under the Current Draft Plan conditions, there is an infiltration surplus of 74,953 m^3/year over the entire site area and a runoff surplus of 2,838 m^3/year to the wetland. The runoff balance to the wetland is generally maintained on a monthly basis due to the dual outlet structure and is within 6% of pre-development levels on an annual basis. Refer to the *Hydrogeological Assessment Report* (Stantec, 2022) for detailed water balance calculations. Future Water Balance calculations will need to be completed and finalized when the non-TUA lands go to development. Additionally, further investigation/analysis will be necessary at the detailed design and site plan stages to confirm infiltration rates and depth to high groundwater levels at the base of the any proposed infiltration facilities.

6.7.2 Sediment Drying Area

A sediment drying area has been designed adjacent to the forebay at least 0.2 m higher than that of the permanent pool to allow for easier sediment removal for future maintenance. This dedicated sediment drying area provides sufficient storage to allow drying for 0.5 m of sediment accumulation within the forebay.

As per the *Stormwater Management Facility Sediment Maintenance Guide* (Greenland, 1999), fine sediment dewatering can be achieved by spreading sediment to a maximum depth of 425 mm for a drying period of 6 days and course sediment dewatering can be achieved by spreading sediment to a maximum depth of 1 m for a drying period of 3 days. The volumes in the proposed sediment drying area have been approximated assuming the sediment can be placed at the maximum drying depth of 1 m, with lower depths along the 5:1 side slopes of the facility. If additional sediment drying area is needed due to finer sediment or additional depth in the forebay, the SWMF banks and maintenance pathway north of the forebay can be utilized.

6.7.3 SWM Facility Liner

As discussed in the *Geotechnical Investigation*, the soils within the proposed SWMF Block include silts and sands with the high groundwater level measured to be within 0.7 m below the existing ground surface at 354.20 m. To improve the extended detention time in the facility and prevent untreated runoff from infiltrating, it is recommended at this stage to provide a liner within the forebay of the facility; however, it is recommended to revisit this at the detailed design stage. The infiltration cell of the SWMF will not be lined to allow for infiltration.

6.8 STORMWATER MANAGEMENTSUMMARY

Based on the preceding, the following summary can be drawn for the site:

- The proposed SWMF achieves an ‘Enhanced’ level of water quality control for the Subdivision through sufficient forebay permanent pool volume and subsequent infiltration
- The proposed SWMF provides sufficient active storage to attenuate post-development discharge to the downstream wetland to maintain existing target flow rates
- A site water balance is achieved through end-of-pipe infiltration in the proposed SWMF as well as lot level rooftop infiltration galleries

7.0 EROSION AND SEDIMENT CONTROL PLAN

In order to control erosion and transportation of sediment offsite, an Erosion and Sediment Control Plan will be required during the construction process. This Plan will focus on the protection of downstream watercourses and lands.

7.1 EROSION POTENTIAL IMPACT

The "Greater Golden Horseshoe Area Conservation Authorities' Erosion and Sediment Control Guideline for Urban Construction" (2019) was used to determine the erosion potential of the site. The erosion potential is based on slope gradient, slope length and soil texture and is then used to determine the appropriate erosion control methods.

Site slope gradients for the development can be summarized as moderate slopes (2-10%) with an average slope in the order of 5%. The slope lengths are generally long (greater than 30 m). Site soils are comprised primarily of clay till and silty clay till which are considered to represent a moderate to high erodibility potential. Thus, the overall erosion potential for the site is considered to be "moderate" to "high", depending on the specific location on the site.

7.2 EROSION AND SEDIMENT CONTROL PLAN

The following approach to erosion and sediment control onsite has been prepared to minimize the potential impacts associated with onsite erosion and/or offsite transport of sediment to the downstream wetland complex.

Prior to any grading or servicing works commencing onsite, erosion and sedimentation control measures shall be implemented as detailed on the Pre-grading, Erosion and Sedimentation Control Plans. The proposed erosion and sedimentation controls include the following items:

- Steep slopes (>3:1) shall have erosion blankets

- Light and/or heavy-duty silt fencing will be erected on all site boundaries where there is potential for runoff to be discharged offsite, to protect adjacent and downstream lands from migration of sediment in overland flow. The location of this fencing will be adjacent to the limit of grading. Silt fence attached to paige wire fencing will be installed periodically throughout the site adjacent to sensitive areas. Silt fencing should be erected before grading begins to protect adjacent and downstream areas from migration of sediment in overland flow

- Erosion control berms/swales will be located in appropriate (critical) areas to divert flows to the sediment basins

- Storm service outlets will be installed during servicing and roadwork construction to provide lot level dead and live storage outlets

- A construction entrance feature ("mud mat") will be provided at all site entrances to minimize the offsite transport of sediment via construction vehicles

- Runoff will be directed to a temporary sedimentation facility via swales to minimize untreated runoff discharged from site

- The temporary sedimentation facility should not be sited in the location of the proposed permanent SWMF as it may inhibit the function of the final SWMF as an infiltration basin.

- Swales constructed onsite will have coir logs to help attenuate flows and encourage deposition of suspended sediment where appropriate

- All disturbed areas where construction is not expected for 30 days shall be re-vegetated with 50 mm of topsoil and hydro-seeded according to OPSS 572

- During construction, all catchbasins are to be sealed until roads are paved to prevent sediment deposition in the batch basin's sumps and conveyance of silt to the SWMF

- Following completion of construction, and site stabilization, all erosion and sediment control measures and accumulated sediment are to be removed

Infiltration facilities are particularly vulnerable to failure during the construction phase for two reasons. First, if the construction sequence is not followed correctly, construction sediment can clog the facility. In addition, heavy construction can result in compaction of the soil which can then reduce the soil's infiltration rate. For this reason, adequate erosion and sediment controls upstream of the infiltration cell and lot-level galleries as well as a careful construction sequence will need to be implemented. This will be developed at detail design prior to construction.

The erosion control measures shall be maintained in good repair during the entire construction period and shall only be removed as contributing drainage areas are restored and stabilized. In addition, the condition of erosion control works, their overall performance, and any repairs replacement or modifications to the installed item shall be noted in monitoring reports submitted to the GRCA and the Township. Monitoring Reports should be submitted bi-monthly (quarterly during periods of inactivity) and should be based on inspection completed bi-weekly or after any significant rainfall events (> 13 mm), whichever is more frequent.

8.0 MONITORING, MAINTENANCE, AND MITIGATION PROGRAM

Monitoring and maintenance activities are important parts of a SWM Plan to ensure that the designed features continue to operate as intended.

8.1 SWM FACILITY

Long-term monitoring and maintenance should involve annual inspections of the SWMF and downstream areas throughout its life span. A detailed Monitoring Program for the proposed SWMF will be outlined at the detailed design stage and will follow any requirements from the Township, GRCA, and MECP.

9.0 UTILITIES

9.1 HYDRO

Kitchener-Wilmot Hydro has stated that the existing hydro pole lines along Jacob Cressman Drive and Isaac Shantz Drive will need to be extended to service the proposed Activa Baden North subdivision and future Subdivision lands.

9.2 BELL CANADA

Bell Canada has indicated that it would not be in issue to service the subject Subdivision as planned.

9.3 ROGERS CABLE

Rogers has indicated that they will have no issues in servicing the subject Subdivision as planned.

9.4 GAS MAIN

It is anticipated that gas main services would be extended from the existing Activa Baden Subdivision located to the south of the subject Activa Baden North Subdivision lands. Utility provider has been contacted to confirm if they anticipate any capacity concerns related to their infrastructure.

Hydro, Bell, and Cable lines would be buried in a joint trench, and a gas main will be installed in a separate trench on the other side of the road within the proposed development.

Refer to Appendix G for copies of the correspondence with the above noted utilities.

10.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the finding of this report, it is concluded that:

- The proposed development lands can be adequately serviced by municipal sewage, storm drainage, water services and utilities

It is further recommended that:

- This report be circulated to the Municipalities and various approval agencies in support of Draft Plan Application for the subject lands

- Detailed grading and servicing design drawings be prepared and a final Stormwater Management Report and Erosion Sediment Control Plan be completed once the Draft Plan has been approved for the subject lands

APPENDIX A

DRAFT PLAN OF SUBDIVISION PREPARED BY MHBC

DRAFT PLAN OF SUBDIVISION

Legal Description

PART OF LOTS 14 AND 15,
CONCESSION NORTH OF SNIDER'S ROAD
TOWNSHIP OF WILMOT
REGION OF WATERLOO

Owner's Certificate

I HEREBY AUTHORIZE MACNAUGHTON HERMSEN BRITTON CLARKSON PLANNING LIMITED TO SUBMIT THIS PLAN FOR APPROVAL.

DATE:_____

Peter Armbruster
Vice President Community Development
(Activa Holdings Inc.)

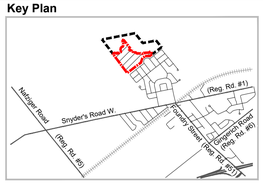
Surveyor's Certificate

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED ON THIS PLAN AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

DATE:_____

Brian Campbell, OLS
(Stantec Geomatics Ltd.)

Key Plan



Subject Lands

Additional Lands Owned by Applicant

SCALE: NTS

Additional Information Required Under Section 51(17) of the Planning Act R.S.O. 1990, c.P.13 as Amended

A. AS SHOWN B. AS SHOWN C. AS SHOWN
D. RESIDENTIAL, MULTIPLE RESIDENTIAL, STORMWATER MANAGEMENT E. AS SHOWN
F. AS SHOWN G. AS SHOWN H. MUNICIPAL WATER SUPPLY I. CLAY/SANDY LOAM
J. AS SHOWN K. ALL SERVICES AS REQUIRED L. AS SHOWN

Area Schedule **30T-_____**

Description*	Blocks	Units (min/max)	Area (ha)
Residential**	1-20	181-192	6.862
Multiple Residential***	21,22	128-234	3.343
Stormwater Management Facility	23		2.303
Trail	24		0.066
Trail/Drainage Corridor	25		0.259
Drainage Corridor	26		0.321
0.3m Reserves	27-32		0.011
Roads			4.004
Total	**32**	**309-426**	**17.169**

*Blocks shown on Draft Plan are 'Residential' unless otherwise specified.
** For minimum unit yield 11.582 m (38 ft) wide lots are assumed and for maximum unit yield, 10.973 m (36 ft) wide lots are assumed.
*** For the Multiple Residential block the max. number of units assumes 70 units/ha.

Notes

1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN.
2. A PORTION OF THE SITE BOUNDARY AND LEGAL BASE PLAN PREPARED BY STANTEC GEOMATICS LTD. WHERE THE BOUNDARY FOLLOWS THE 'BADEN URBAN AREA' THIS AREA IS APPROXIMATE AND SUBJECT TO FURTHER SURVEY WORK.
3. TOPOGRAPHIC AND EXISTING FEATURES SURVEY COMPLETED BY STANTEC.
4. ADJACENT PARCEL FABRIC IS FROM REGION OF WATERLOO OPEN DATA AND IS APPROXIMATE.
5. WETLAND AND CORE ENVIRONMENTAL FEATURE LIMITS FROM STANTEC. CONFIRMED/SURVEYED AUG.20, 2020.

Baden Urban Area Boundary Countryside Line

Revision No.	Date	Issued / Revision	By
6.	July 18, 2022	Revise Plan to address revised SWM area;	DGS
5.	June 8, 2022	Add 23 metre collector road and revised SWM area;	DGS
4.	May 28, 2021	Finalize wetland limits/setbacks and Draft Plan boundary;	DGS
3.	Feb.16, 2021	Revise stormwater management pond and adjacent area;	DGS
2.	Sept. 28, 2020	Revise wetland and dripline limits as per Stantec;	DGS
1.	Nov. 19, 2019	For Pre-application meeting with Region of Waterloo;	DGS

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 July 18, 2022

File No. 8784BB

Plan Scale 1:1,500 (24x36)

Drawn By DGS

Checked By PC

Project Baden Lands

Applicant

ACTIVA
Activa Holdings Inc.
55 Columbia Street East
Waterloo, ON. P:519-886-9400

north

File Name DRAFT PLAN OF SUBDIVISION

Scale Bar 0 10 25 50 75 100 125 150m

K:\8784BB-Activa Baden\DP\Draft Plan July18 2022.dwg

APPENDIX B

EXISTING CONDITIONS PLAN (DRAWING NO. C-050)

CONCEPTUAL SERVICING PLAN (DRAWING NO. C-100)

CONCEPTUAL ROAD PROFILES (DRAWING NOS. C-200 TO C-202)

CONCEPTUAL GRADING & EROSION CONTROL PLAN (DRAWING NOS. C-400 AND C-401)

CONCEPTUAL CUT/FILL PLAN (DRAWING NOS. C-650 AND C-651)

Stantec

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www.stantec.com

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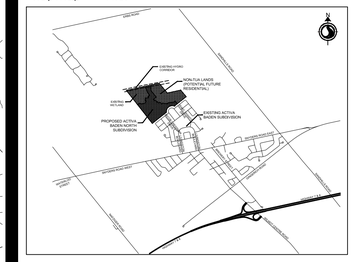
Notes

1. DRAFT PLAN PREPARED BY MHBC, DATED JULY 18, 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 LIDAR POINT CLOUD (2016-18) LAND INFORMATION ONTARIO DATASET.

Key Map NTS.



Legend

	EXISTING
	PROPERTY LINE
	CURRENT DRAFT PLAN LIMIT
SIB	STANDARD IRON BAR
CB	CATCHBASIN
MH	MANHOLE
HYD / BMV	HYDRANT SET
	STORM SEWER
	SANITARY SEWER
	WATERMAIN
	FENCE
	SLOPE
349.0	CONTOUR
POST	POST
BPED	BELL PEDESTAL
HP	HYDRO POLE
HGUY	GUY WIRE
TS	SIGN
	TREES
BH/MW06-20(S/D) 355.65 HGWL=354.25	BOREHOLE/ MONITORING WELL ELEVATION HIGH GROUND WATER LEVEL
	WETLAND LIMIT
	30m WETLAND SETBACK
	15m WETLAND SETBACK
	CORE ENVIRONMENTAL FEATURE (C.E.F.)
	10m CORE ENVIRONMENTAL FEATURE SETBACK

Revision	By	Appd	YYYY.MM.DD
0 FSR - FIRST SUBMISSION	JBM	HL	2022.07.22

File Name: 60305680_C-050DP-FSR	Dwn.	Chkd.	Dsgn.	YY.MM.DD
	JBM	HL	JBM	2022.07.21

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Client/Project
ACTIVA HOLDINGS INC.

ACTIVA BADEN NORTH

Baden, Ontario

Title
EXISTING CONDITIONS PLAN

Project No. 60305680

Scale 1:1250 (0, 12.5, 37.5, 62.5m)

Revision 0 Sheet of

Drawing No. **C-050**

V:\1\ENT\active\60305680\design\drawing\multi-sheet_files\60305680_C-050DP-FSR.dwg
[2022/07/22 9:52:43 PM] By: Mellor, Jonathon

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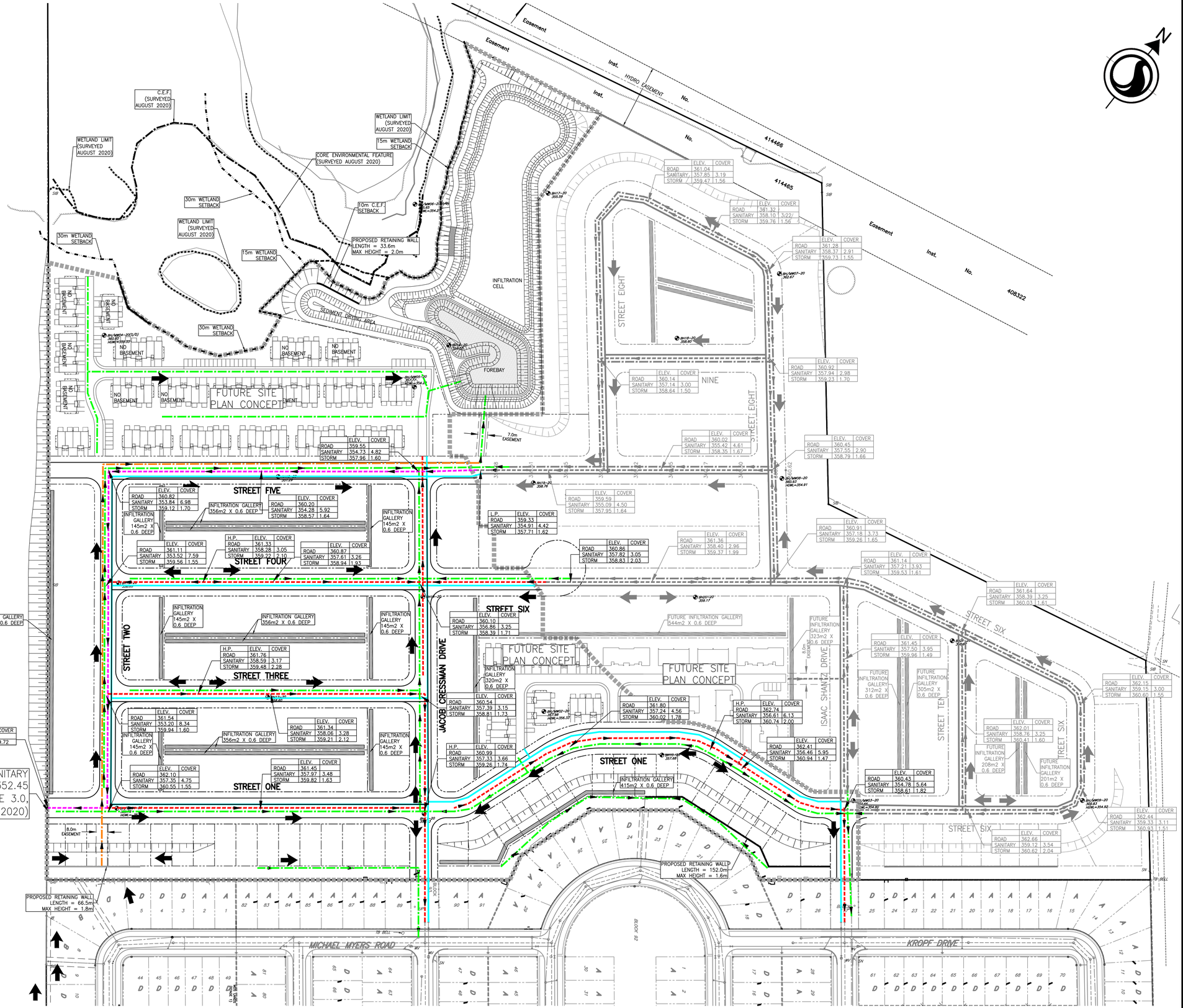

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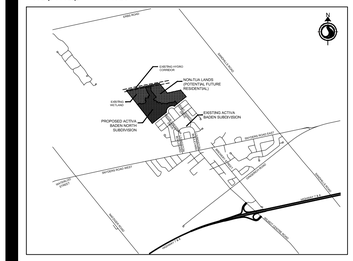
Key Map NTS.



Legend

- CURRENT DRAFT PLAN LIMIT
- PROPOSED STORM SEWER
- PROPOSED DEDICATED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY TRUNK SEWER
- PROPOSED WATERMAIN
- FUTURE STORM SEWER
- FUTURE SANITARY SEWER
- FUTURE WATERMAIN

ROAD STATUS (LP = LOW POINT, HP = HIGH POINT)

LP	ELEV.	COVER
ROAD	300.82	
STORM	297.88	2.8
SANITARY	297.11	3.4

ROAD ELEVATION
COVER OVER SEWER
SEWER OBVERT ELEVATION

- OVERLAND FLOW DIRECTION
- FUTURE OVERLAND FLOW DIRECTION
- BH/MW06-20(S/D) 355.63 HGWE=354.25 — BOREHOLE/ MONITORING WELL ELEVATION, HIGH GROUND WATER LEVEL
- WETLAND LIMIT
- 30m WETLAND SETBACK
- 15m WETLAND SETBACK
- CORE ENVIRONMENTAL FEATURE (C.E.F.)
- 10m CORE ENVIRONMENTAL FEATURE SETBACK
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- EXISTING WATERMAIN
- INFILTRATION GALLERY

0	FSR - FIRST SUBMISSION	JBM	HL	2022.07.22
Revision		By	Appd	YYYY.MM.DD

File Name: 60305680_C-100UG-FSR	JBM	HL	JBM	2022.07.21
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

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Client/Project
ACTIVA HOLDINGS INC.

ACTIVA BADEN NORTH

Baden, Ontario

Title
CONCEPTUAL SERVICING PLAN

Project No.	Scale	Revision	Sheet	Drawing No.
60305680	1:1250 (0 12.5 37.5 62.5m)	0	of	C-100

X:\ON\Waterloo\active\60305680\Design\Drawing\Civil\sheet_files\60305680_C-100UG-FSR.dwg
12/1/2022 3:57:35 PM By: Miller, Jonathon

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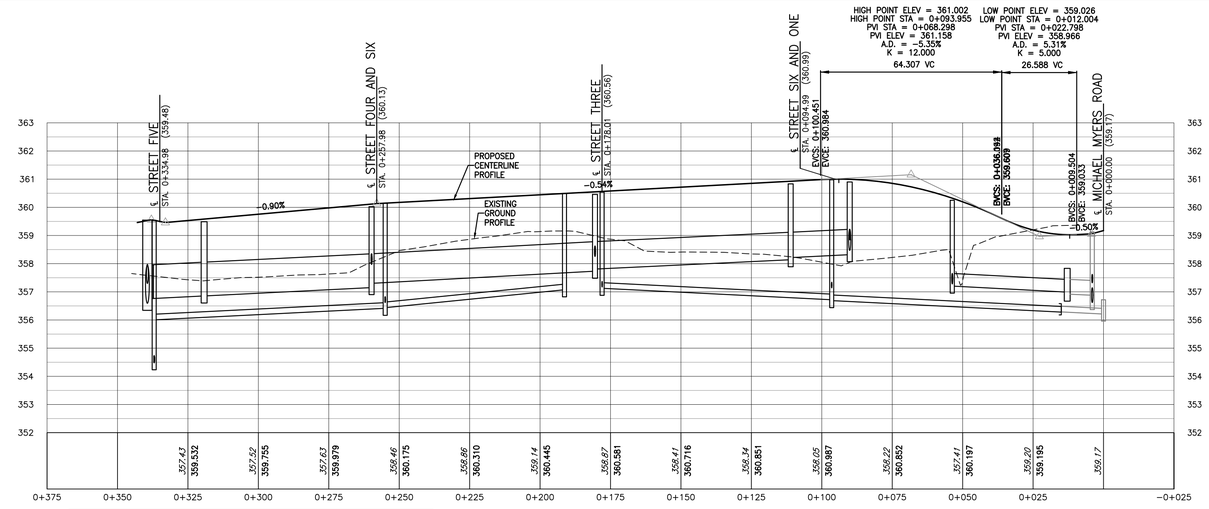
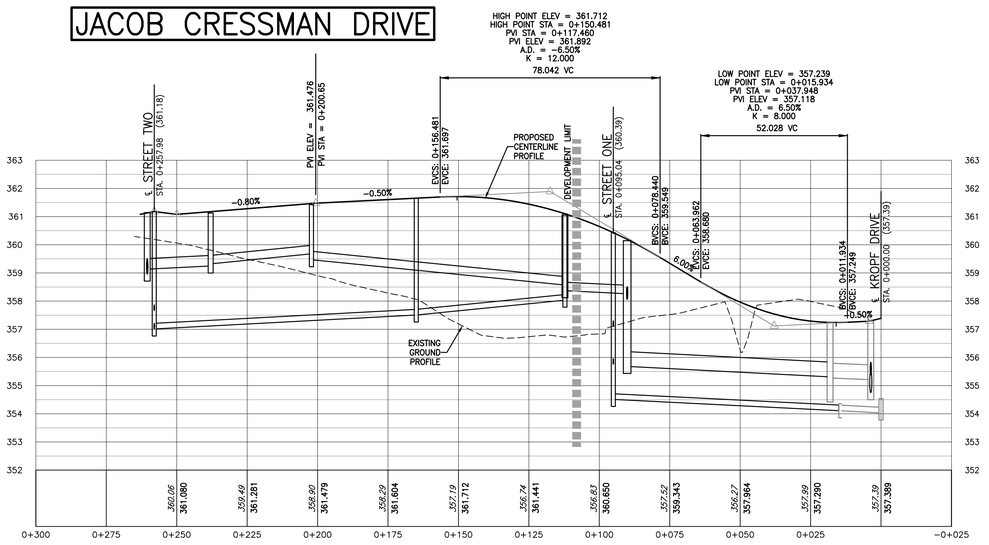
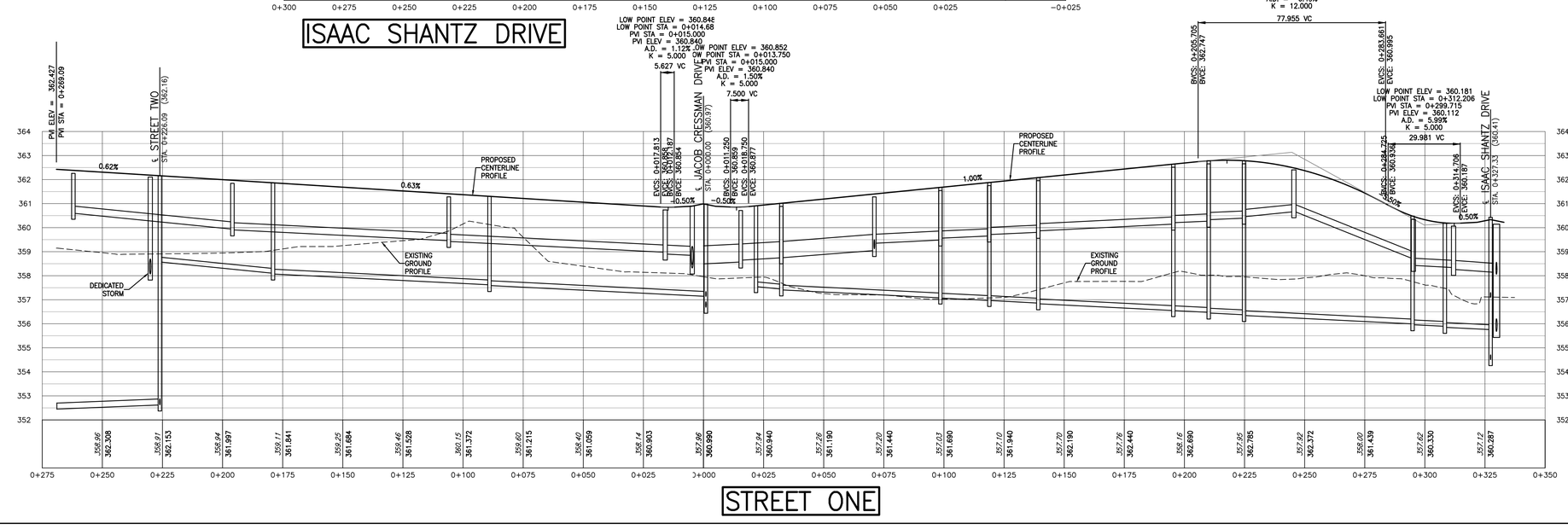


JACOB CRESSMAN DRIVE



ISAAC SHANTZ DRIVE



STREET ONE

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Notes

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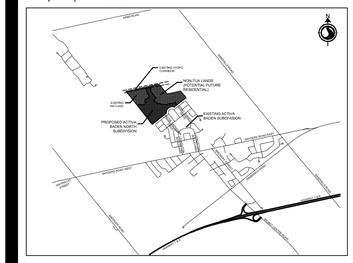
Key Map NTS.



Legend

0	FSR - FIRST SUBMISSION	JBM	HL	2022.07.22
Revision		By	Appd	YYYY.MM.DD

File Name: 60305680_C-200ST-FSR	JBM	HL	JBM	2022.07.21
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

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Client/Project
ACTIVA HOLDINGS INC.

ACTIVA BADEN NORTH

Baden, Ontario

Title
CONCEPTUAL ROAD PROFILES

Project No. 60305680

Scale 1:1000H 0 10 30 50m
1:100V 0 1 3 5m

Revision 0 Sheet of

Drawing No. **C-200**

V:\1607\active\60305680\Design\Drawing\Civil\Sheet_files\60305680_C-200ST-FSR.dwg
7/21/2022 9:12:07 PM By: Matter, Jonathon

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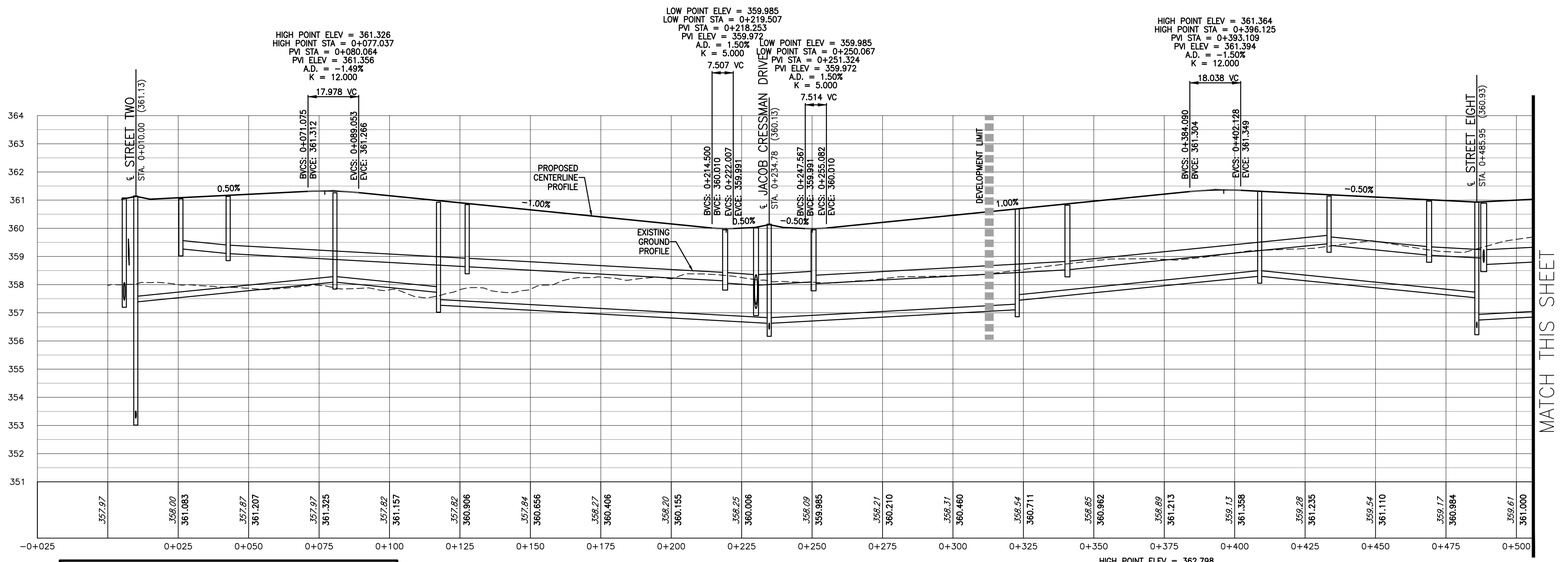
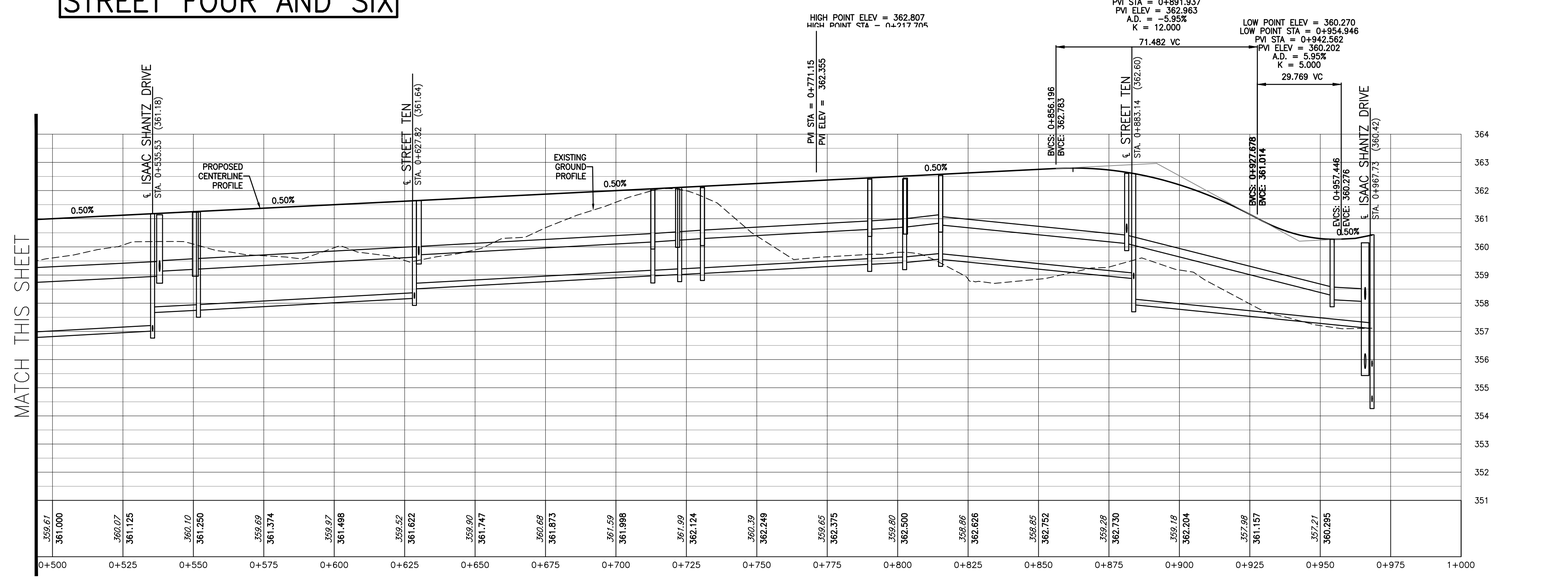


STREET FOUR AND SIX



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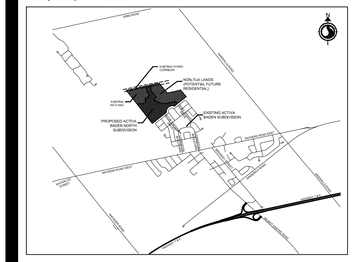
Key Map NTS.



Legend

Revision	By	Appd	
0 FSR - FIRST SUBMISSION	JBM	HL	2022.07.22

File Name: 60305680_C-200ST-FSR	Dwn.	Chkd.	Dsgn.	
	JBM	HL	JBM	2022.07.21

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Client/Project
ACTIVA HOLDINGS INC.

ACTIVA BADEN NORTH

Baden, Ontario

Title
CONCEPTUAL ROAD PROFILES

Project No. 60305680

Scale 1:1000H 1:100V

Revision 0 Sheet of

Drawing No. **C-201**

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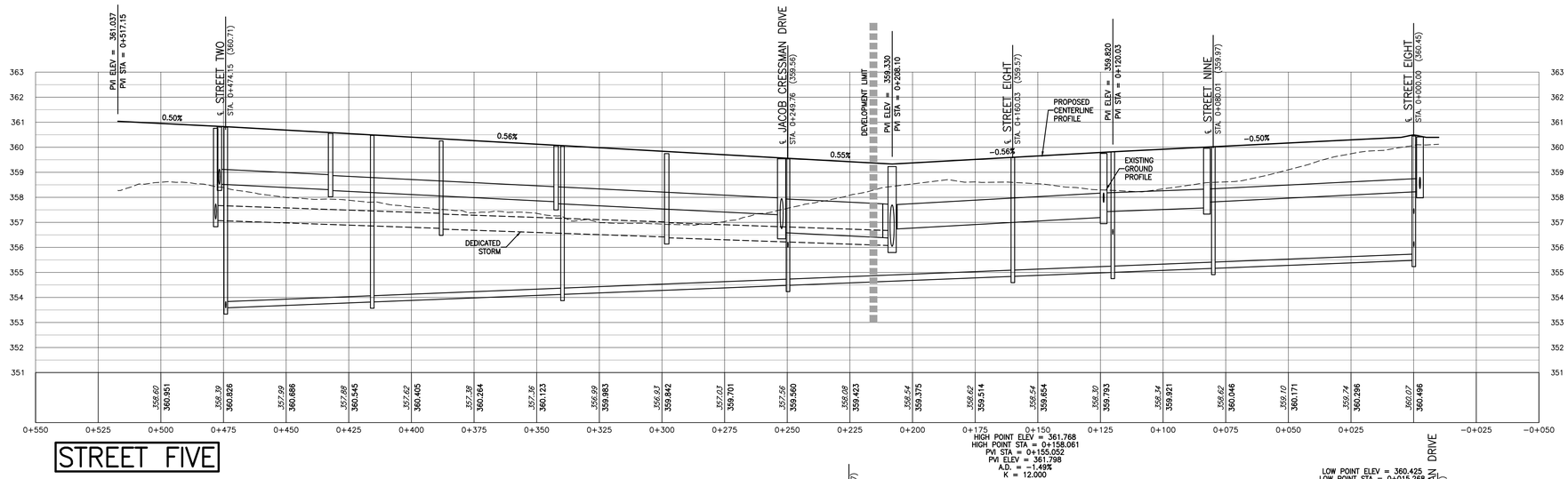
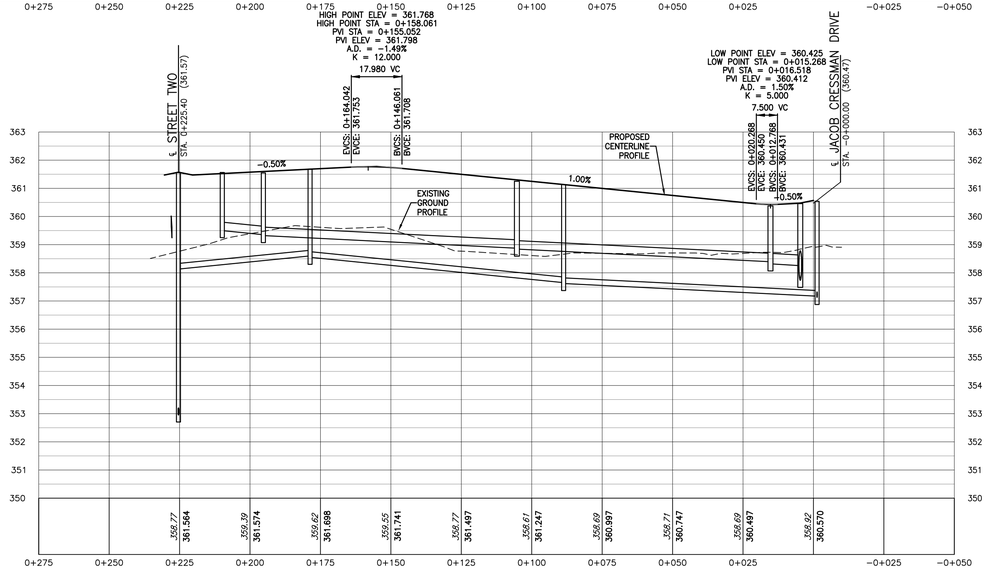
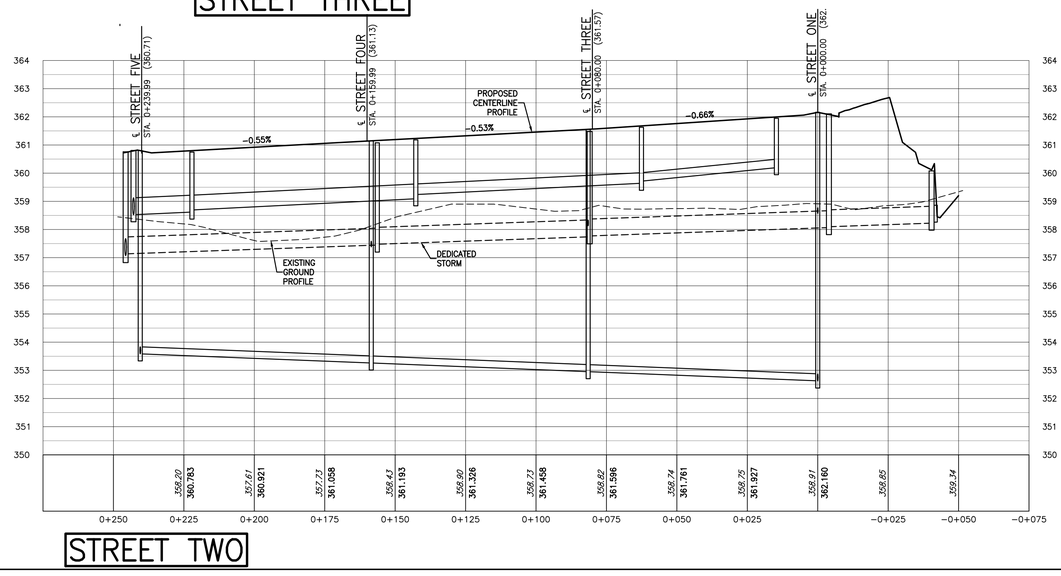


STREET FIVE



STREET THREE



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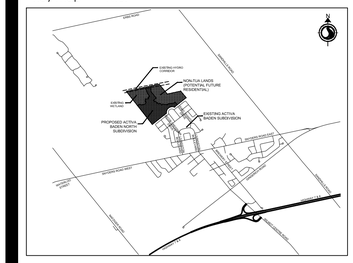
Key Map NTS.



Legend

Revision	By	Appd	
0 FSR - FIRST SUBMISSION	JBM	HL	2022.07.22
			YYYY.MM.DD

File Name: 60305680_C-200ST-FSR	Dwn.	Chkd.	Dsgn.	
	JBM	HL	JBM	2022.07.21
				YY.MM.DD

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Client/Project
ACTIVA HOLDINGS INC.

ACTIVA BADEN NORTH

Baden, Ontario

Title
CONCEPTUAL ROAD PROFILES

Project No. 60305680

Scale 1:1000H 0 10 30 50m
1:100V 0 1 3 5m

Revision 0 Sheet of

Drawing No. **C-202**

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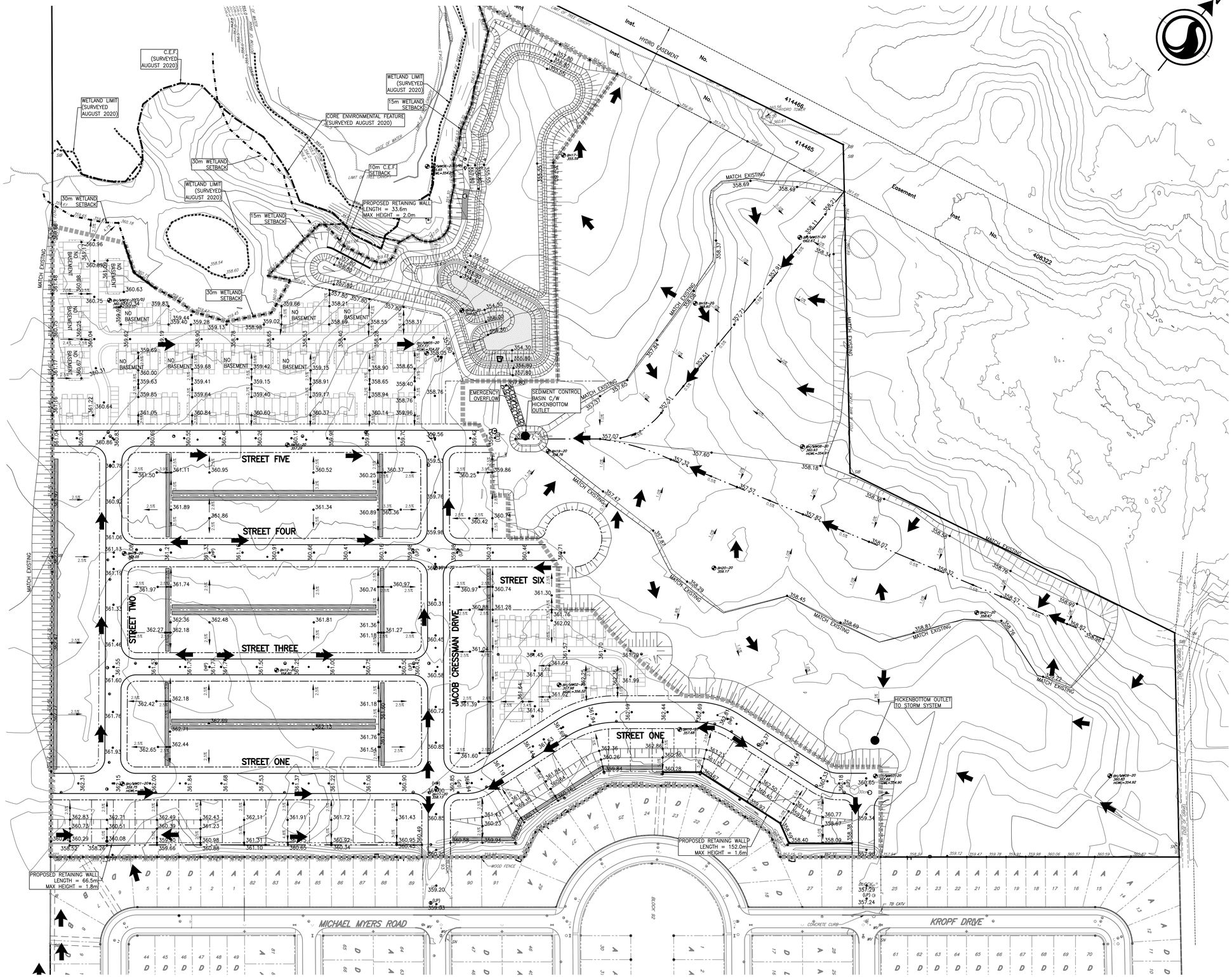

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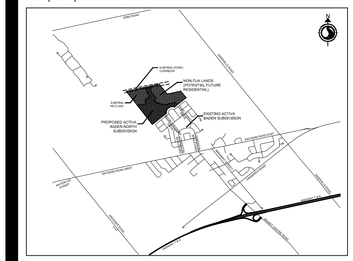

Legend

- CURRENT DRAFT PLAN LIMIT
- 352.82 EXISTING ELEVATION
- 352.92 PROPOSED ELEVATION
- 2.0% 2.0% FLOW DIRECTION
- PROPOSED DRAINAGE SWALE
- 349.00 EXISTING CONTOUR
- RETAINING WALL
- A LOT TYPE
- PROPOSED STORM MANHOLE
- PROPOSED STORM CATCHBASIN MANHOLE
- PROPOSED CATCHBASIN
- PROPOSED SANITARY MANHOLE
- PROPOSED VALVE & BOX
- PROPOSED HYDRANT
- PROPOSED SLOPE (3:1 UNLESS NOTED OTHERWISE)
- OVERLAND FLOW DIRECTION
- BH/MW06-20(S/D) 355.65 HGWL=354.25 BOREHOLE/ MONITORING WELL ELEVATION HIGH GROUND WATER LEVEL
- WETLAND LIMIT
- 30m WETLAND SETBACK
- 15m WETLAND SETBACK
- CORE ENVIRONMENTAL FEATURE (C.E.F.)
- 10m CORE ENVIRONMENTAL FEATURE SETBACK
- INFILTRATION GALLERY

0	FSR - FIRST SUBMISSION	JBM	HL	2022.07.22
Revision		By	Appd	YYYY.MM.DD

File Name: 60305680_C-400GP_PH1		JBM	HL	JBM	2022.07.21
		Dwn.	Chkd.	Dsgn.	YY.MM.DD

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Client/Project
ACTIVA HOLDINGS INC.

ACTIVA BADEN NORTH

Baden, Ontario

Title
CONCEPTUAL GRADING PLAN

Project No. 60305680	Scale 1:1250	0 12.5 37.5 62.5m
Revision 0	Sheet of	Drawing No. C-400

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7/21/2022 11:58:59 PM By: Miller, Jonathan
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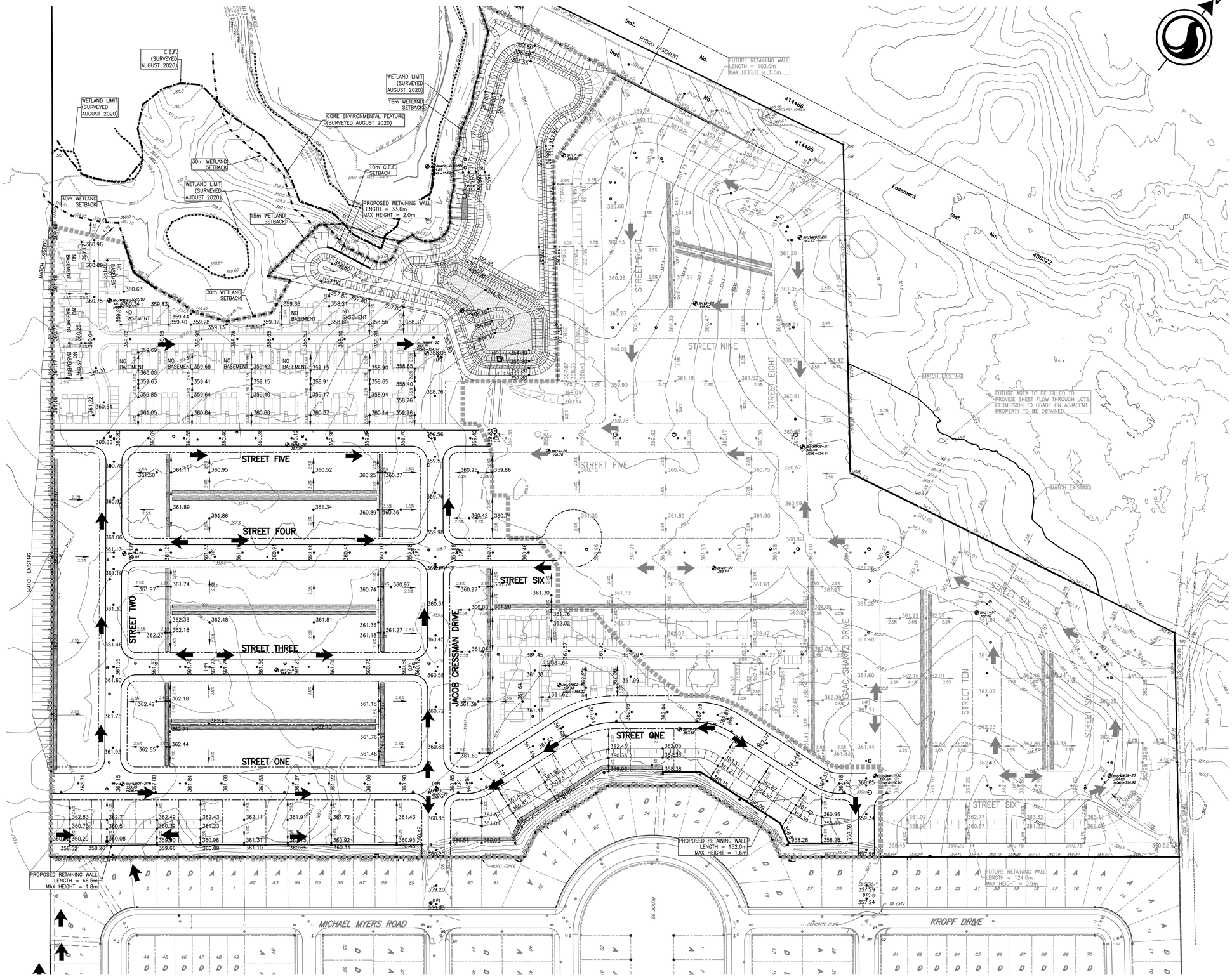

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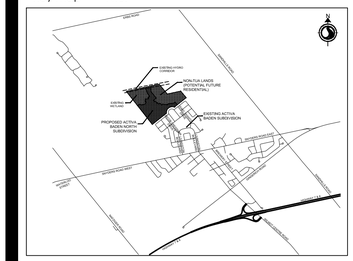
Key Map NTS.



Legend

- CURRENT DRAFT PLAN LIMIT
- 352.62 EXISTING ELEVATION
- 352.92 PROPOSED ELEVATION
- 2.0% 2.0% FLOW DIRECTION
- PROPOSED DRAINAGE SWALE
- 349.00 EXISTING CONTOUR
- RETAINING WALL
- A LOT TYPE
- PROPOSED STORM MANHOLE
- PROPOSED STORM CATCHBASIN MANHOLE
- PROPOSED CATCHBASIN
- PROPOSED SANITARY MANHOLE
- PROPOSED VALVE & BOX
- PROPOSED HYDRANT
- PROPOSED SLOPE (3:1 UNLESS NOTED OTHERWISE)
- OVERLAND FLOW DIRECTION
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- WETLAND LIMIT
- 30m WETLAND SETBACK
- 15m WETLAND SETBACK
- CORE ENVIRONMENTAL FEATURE (C.E.F.)
- 10m CORE ENVIRONMENTAL FEATURE SETBACK
- INFILTRATION GALLERY

Revision	By	Appd	YYYY.MM.DD
0 FSR - FIRST SUBMISSION	JBM	HL	2022.07.22
File Name: 60305680_C-400GP-FSR	JBM Dwn.	HL Chkd.	JBM Dsgn. 2022.07.21 YY.MM.DD

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Client/Project
ACTIVA HOLDINGS INC.

ACTIVA BADEN NORTH

Baden, Ontario

Title
CONCEPTUAL GRADING PLAN
FUTURE CONDITIONS

Project No. 60305680

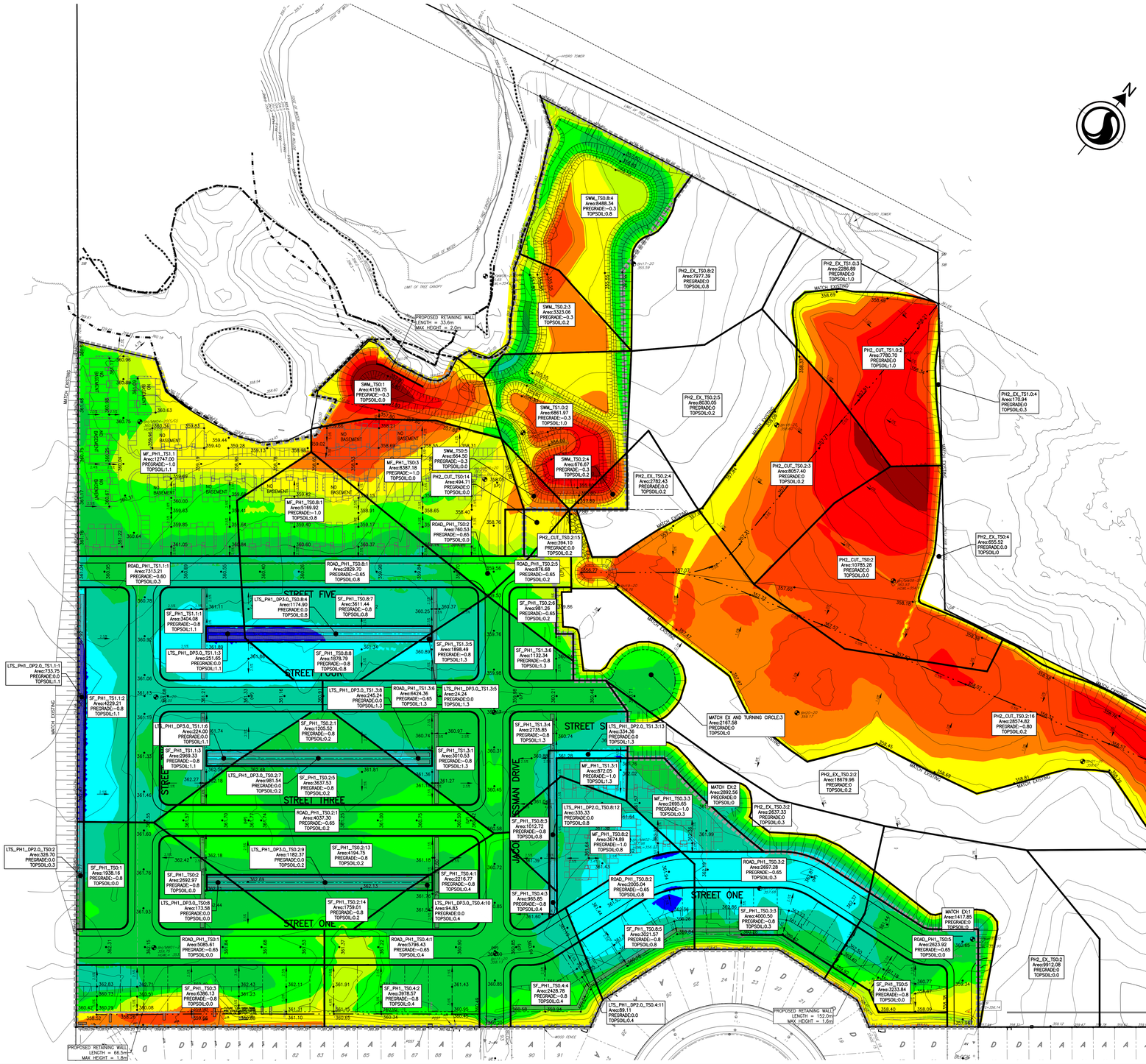
Scale 1:1250 0 12.5 37.5 62.5m

Revision 0 Sheet of

Drawing No. **C-401**

V:\1\active\cad\fsr\60305680\design\drawing\Civil\sheet files\400SWM_C-400GP-FSR.dwg
27/7/2022 9:18:54 PM By: Miller, Jonathan
ORIGINAL SHEET - ARCH D

Elevations Table				
Number	Minimum Elevation	Maximum Elevation	Area	Color
1	−4.46	−3.00	924.10	
2	−3.00	−2.00	2702.09	
3	−2.00	−1.00	7650.91	
4	−1.00	−0.50	10591.18	
5	−0.50	0.50	35604.08	
6	0.50	1.00	22896.93	
7	1.00	2.00	55798.37	
8	2.00	3.00	76376.05	
9	3.00	4.00	55028.49	
10	4.00	5.00	28172.70	
11	5.00	6.30	8571.15	



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EARTHWORKS

60305680 - Activa Baden North - CURRENT DRAFT PLAN

NOTES

1 Results from modeling dated July 21 2022
2 Negative number indicates shortage of material.

Allowance for Shrinkage on Compaction **10%**

Area ID	Area	Depth	TOPSOIL Stripping	TOPSOIL Restoration	TOPSOIL Balance	Pregrade Depth	EARTHWORKS Cut	EARTHWORKS Fill Earth	EARTHWORKS Fill Topsoil	EARTHWORKS Balance
	m2	m	m3	m3	m3	m	m3	m3	m3	m3
REMOVE ORGANICS AND UNSUITABLE FILL (POSSIBLE REUSE)										
ORGANICS	0	0.00	27,236	0	27,236	0.00	0	0		0
NON-STRUCTURAL FILL	0	0.00	0	0	0	0.00	72,072	0		72,072
CURRENT DRAFT PLAN										
SWM POND										
SWM_TS0.2-3	3,300	0.20	660	990	(330)	0.30	1,286	1,596	1,596	1,286
SWM_TS0.2-4	676	0.20	135	203	(68)	0.30	827	0	0	827
SWM_TS0.8-4	8,468	0.80	6,774	2,540	4,234	0.30	1,113	7,750	7,750	1,113
SWM_TS0.1	4,164	0.00	0	1,249	(1,249)	0.30	6,745	175	176	6,745
SWM_TS0.5	660	0.00	0	198	(198)	0.30	471	78	78	471
SWM_TS1.0-2	6,876	1.00	6,876	2,063	4,813	0.30	5,483	2,773	2,773	5,483
	24,144		14,446	7,243	7,202		15,924	12,374	12,374	15,924
ROADS										
ROAD_PH1_TS0.2-1	4,056	0.20	811	365	446	0.65	0	8,053		(8,053)
ROAD_PH1_TS0.2-5	868	0.20	174	78	95	0.65	0	823		(823)
ROAD_PH1_TS0.3-2	2,704	0.30	811	243	568	0.65	0	12,655		(12,655)
ROAD_PH1_TS0.4-1	5,796	0.40	2,318	522	1,797	0.65	0	14,201		(14,201)
ROAD_PH1_TS0.8-1	2,828	0.80	2,262	255	2,008	0.65	0	9,312		(9,312)
ROAD_PH1_TS0.8-2	2,012	0.80	1,610	181	1,429	0.65	0	10,242		(10,242)
ROAD_PH1_TS0.1	5,076	0.00	0	457	(457)	0.65	1	12,292		(12,291)
ROAD_PH1_TS0.2	764	0.00	0	69	(69)	0.65	0	1,234		(1,234)
ROAD_PH1_TS0.5	2,620	0.00	0	236	(236)	0.65	38	5,785		(5,747)
ROAD_PH1_TS1.1-1	7,320	1.10	8,052	659	7,393	0.65	0	27,150		(27,150)
ROAD_PH1_TS1.3-6	6,428	1.30	8,356	579	7,778	0.65	0	18,875		(18,875)
	40,472		24,395	3,642	20,752		39	120,622		(120,583)
MULTI FAMILY BLOCKS										
MF_PH1_TS0.33	2,696	0.30	809	243	566	1.00	0	9,964		(9,964)
MF_PH1_TS0.8-1	5,176	0.80	4,141	466	3,675	1.00	200	7,552		(7,352)
MF_PH1_TS0.8-2	3,676	0.80	2,941	331	2,610	1.00	0	15,370		(15,370)
MF_PH1_TS0.3	8,032	0.00	0	723	(723)	1.00	3,667	3,475		192
MF_PH1_TS1.1	12,748	1.10	14,023	1,147	12,875	1.00	150	18,662		(18,512)
MF_PH1_TS1.3-1	872	1.30	1,134	78	1,055	1.00	0	3,854		(3,854)
	33,200		23,047	2,988	20,059		4,017	56,877		(52,860)
SINGLE FAMILY BLOCKS										
SF_PH1_TS0.2-1	1,224	0.20	245	220	24	0.80	0	3,625		(3,625)
SF_PH1_TS0.2-13	4,188	0.20	838	754	84	0.80	0	9,611		(9,611)
SF_PH1_TS0.2-14	1,776	0.20	355	320	36	0.80	0	4,250		(4,250)
SF_PH1_TS0.2-5	3,624	0.20	725	652	72	0.80	0	9,248		(9,248)
SF_PH1_TS0.2-6	976	0.20	195	176	20	0.80	0	1,217		(1,217)
SF_PH1_TS0.3-3	3,984	0.30	1,195	717	478	0.80	36	13,487		(13,451)
SF_PH1_TS0.4-1	2,216	0.40	886	399	488	0.80	0	5,595		(5,595)
SF_PH1_TS0.4-2	3,980	0.40	1,592	716	876	0.80	115	6,565		(6,450)
SF_PH1_TS0.4-3	964	0.40	386	174	212	0.80	0	2,971		(2,971)
SF_PH1_TS0.4-4	2,416	0.40	966	435	532	0.80	55	4,696		(4,641)
SF_PH1_TS0.8-3	1,016	0.80	813	183	630	0.80	0	2,998		(2,998)
SF_PH1_TS0.8-5	2,992	0.80	2,394	539	1,855	0.80	4	11,028		(11,022)
SF_PH1_TS0.8-7	3,612	0.80	2,890	650	2,239	0.80	0	13,184		(13,184)
SF_PH1_TS0.8-8	1,628	0.80	1,302	293	1,009	0.80	0	7,175		(7,175)
SF_PH1_TS0.1	1,936	0.00	0	348	(348)	0.80	0	5,800		(5,800)
SF_PH1_TS0.2	2,664	0.00	0	483	(483)	0.80	0	6,959		(6,959)
SF_PH1_TS0.3	6,384	0.00	0	1,149	(1,149)	0.80	1,328	9,154		(7,826)
SF_PH1_TS0.5	3,220	0.00	0	580	(580)	0.80	124	4,910		(4,786)
SF_PH1_TS1.1-1	3,396	1.10	3,736	611	3,124	0.80	0	15,632		(15,632)
SF_PH1_TS1.1-2	4,232	1.10	4,655	762	3,893	0.80	0	18,492		(18,492)
SF_PH1_TS1.1-3	2,964	1.10	3,260	534	2,727	0.80	0	10,578		(10,578)
SF_PH1_TS1.3-1	2,996	1.30	3,895	539	3,356	0.80	0	8,964		(8,964)
SF_PH1_TS1.3-4	2,736	1.30	3,557	492	3,064	0.80	0	8,544		(8,544)
SF_PH1_TS1.3-5	1,900	1.30	2,470	342	2,128	0.80	0	7,510		(7,510)
SF_PH1_TS1.3-6	1,144	1.30	1,487	206	1,281	0.80	0	3,399		(3,399)
	68,188		37,842	12,274	25,568		1,663	195,591		(193,929)
LOSE TOPSOIL AREAS										
LTS_PH1_DP2.0_TS0.4-11	92	0.40	37	184	(147)	0.00	0	420	420	0
LTS_PH1_DP2.0_TS0.8-12	328	0.80	262	656	(394)	0.00	0	1,462	1,462	0
LTS_PH1_DP2.0_TS0.2	328	0.00	0	656	(656)	0.00	0	1,250	1,250	0
LTS_PH1_DP2.0_TS1.1-1	732	1.10	805	1,464	(659)	0.00	0	4,281	4,281	0
LTS_PH1_DP2.0_TS1.3-13	336	1.30	437	672	(235)	0.00	0	1,675	1,675	0
LTS_PH1_DP1.0_TS0.2-7	976	0.20	195	2,928	(2,733)	0.00	0	3,817	3,817	0
LTS_PH1_DP3.0_TS0.2-9	1,176	0.20	235	3,528	(3,293)	0.00	0	4,440	4,440	0
LTS_PH1_DP3.0_TS0.4-10	96	0.00	0	288	(288)	0.00	0	308	308	0
LTS_PH1_DP3.0_TS0.8-4	1,180	0.80	944	3,540	(2,596)	0.00	0	6,253	6,253	0
LTS_PH1_DP3.0_TS0.8	180	0.00	0	540	(540)	0.00	0	680	680	0
LTS_PH1_DP1.0_TS1.1-3	252	1.10	277	756	(479)	0.00	0	1,483	1,483	0
LTS_PH1_DP3.0_TS1.1-6	224	1.10	246	672	(426)	0.00	0	1,001	1,001	0
LTS_PH1_DP1.0_TS1.3-5	20	1.30	25	60	(34)	0.00	0	109	109	0
LTS_PH1_DP3.0_TS1.3-8	252	1.30	328	756	(428)	0.00	0	1,101	1,101	0
	6,172		3,793	18,516	(14,723)		0	28,281	28,281	0
CURRENT DRAFT PLAN TOTALS	172,176		103,522	44,664	58,858		93,715	455,120	40,655	(320,750)

Area ID	Area	Depth	TOPSOIL Stripping	TOPSOIL Restoration	TOPSOIL Balance	Pregrade Depth	EARTHWORKS Cut	EARTHWORKS Fill Earth	EARTHWORKS Fill Topsoil	EARTHWORKS Balance
	m2	m	m3	m3	m3	m	m3	m3	m3	m3
FUTURE LAND										
CUT										
PH2_CUT_TS0.2-15	392	0.20	78	106	(28)	0.00	7	272		(264)
PH2_CUT_TS0.2-16	28,816	0.20	5,763	7,819	(2,056)	0.00	34,259	135		34,125
PH2_CUT_TS0.2-3	8,044	0.20	1,609	2,183	(574)	0.00	11,479	8		11,472
PH2_CUT_TS0.14	488	0.00	0	132	(132)	0.00	69	138		(70)
PH2_CUT_TS0.2	7,836	0.00	0	2,126	(2,126)	0.00	15,324	0		15,324
PH2_CUT_TS1.0.2	7,776	1.00	7,776	2,110	5,666	0.00	13,779	198		13,581
	53,352		15,226	14,477	749		74,918	751		74,168
FILL										
MATCH EX AND TURNING CIRCLE:3	2,196	0.00	0	0	0	0.00	0	3,726	3,726	0
MATCH EX:1	1,428	0.00	0	0	0	0.00	0	2,584	2,584	0
MATCH EX:2	2,876	0.00	0	0	0	0.00	0	6,706	6,706	0
	6,500		0	0	0		0	13,015	13,015	0
					59,607				53,670	
OVERALL SITE TOTALS (CURRENT DRAFT PLAN (TUA LANDS) GRADING WITH INTERIM GRADING WITHIN NON-TUA LANDS)			**118,748**	**44,664**	**570**		**168,633**	**468,886**	**53,670**	(246,583)

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Notes

Revision	By	Appd	YYYY.MM.DD
0 FSR - FIRST SUBMISSION	JBM	HL	2022.07.22
File Name: 60305680_C-650C0_PH1	JBM Dwn.	JBM Dsgn.	HL Chkd. 2022.07.31 YYYY.MM.DD

Permit-Seal

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Client/Project
ACTIVA HOLDINGS INC.

ACTIVA BADEN NORTH

Baden, Ontario

Title
CONCEPTUAL EARTHWORKS PLAN

Project No. 60305680

Scale 1:1000 (0, 10, 30, 50m)

Revision 0 Sheet of

Drawing No. **C-650**

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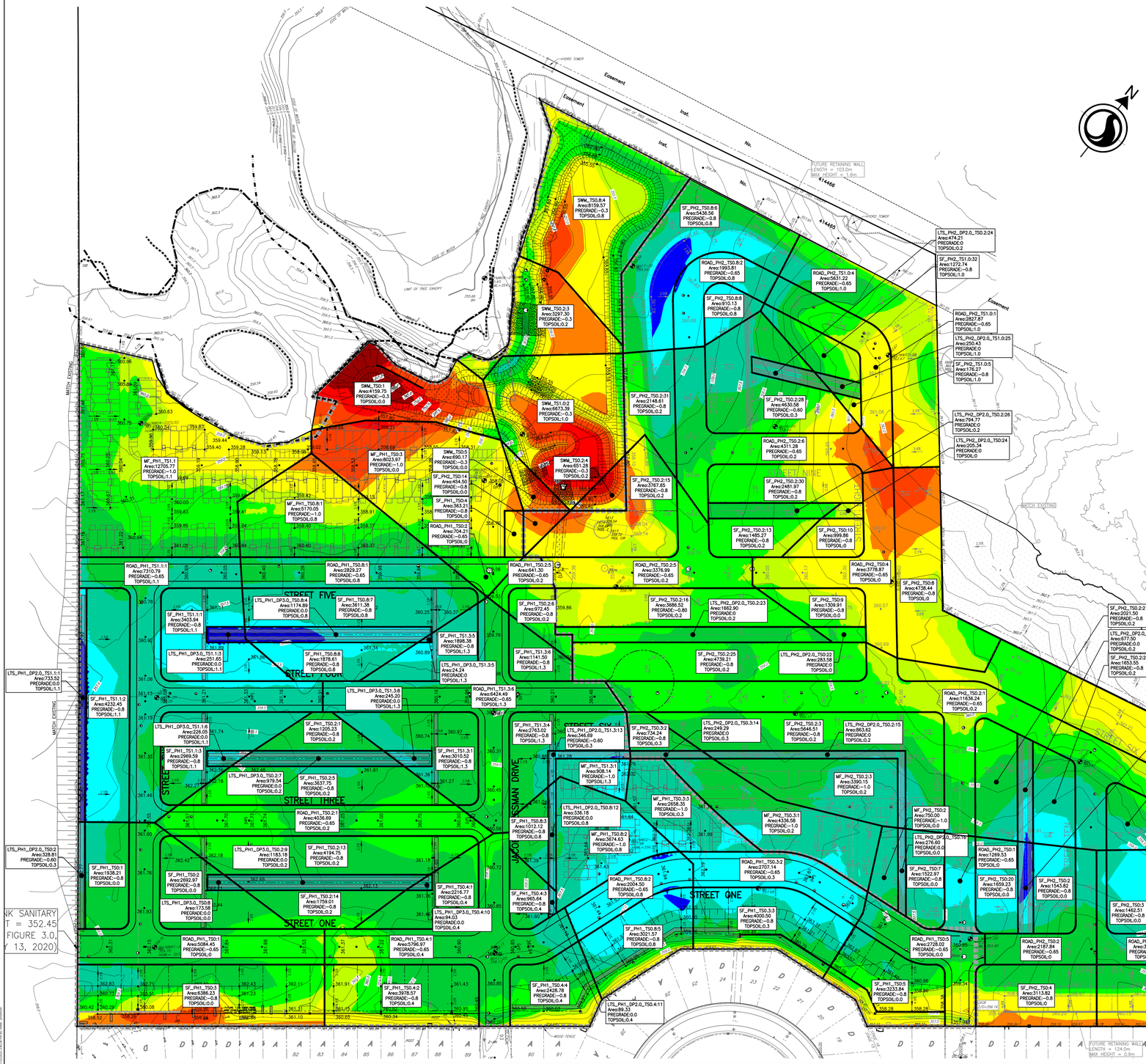
ORIGINAL SHEET - ARCH E

Elevations Table				
Number	Minimum Elevation	Maximum Elevation	Area	Color
1	−4.46	−3.00	924.10	
2	−3.00	−2.00	2702.09	
3	−2.00	−1.00	7650.91	
4	−1.00	−0.50	10591.18	
5	−0.50	0.50	35604.08	
6	0.50	1.00	22896.93	
7	1.00	2.00	55798.37	
8	2.00	3.00	76376.05	
9	3.00	4.00	55028.49	
10	4.00	5.00	28172.70	
11	5.00	6.30	8571.15	


SWM_T50.8:4
Area:8159.57
PREGRADE:−0.1
TOPSOIL:0.8
SF_PH2_T50.8:6
Area:5436.56
PREGRADE:−0.8
TOPSOIL:0.8
ROAD_PH2_T50.8:2
Area:1993.81
PREGRADE:−0.65
TOPSOIL:0.8
SF_PH2_T50.8:8
Area:910.13
PREGRADE:−0.8
TOPSOIL:0.8
ROAD_PH2_TS1.0:4
Area:5631.22
PREGRADE:−0.45
TOPSOIL:1.0
LTS_PH2_DP2.0_TS0.2:24
Area:474.21
PREGRADE:0
TOPSOIL:0.2
SF_PH2_TS1.0:32
Area:1272.74
PREGRADE:−0.8
TOPSOIL:1.0
ROAD_PH2_TS1.0:1
Area:2827.87
PREGRADE:−0.65
TOPSOIL:1.0
LTS_PH2_DP2.0_TS1.0:25
Area:250.43
PREGRADE:0
TOPSOIL:1.0
SF_PH2_TS1.0:5
Area:176.27
PREGRADE:−0.8
TOPSOIL:1.0
SWM_T50.2:3
Area:3297.30
PREGRADE:−0.3
TOPSOIL:0.2
SWM_TS0:1
Area:4159.75
PREGRADE:−0.3
TOPSOIL:0.0
SWM_TS0:2
Area:6673.39
PREGRADE:−0.3
TOPSOIL:1.0
SF_PH2_TS0.2:31
Area:2148.61
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH2_TS0.2:28
Area:4630.58
PREGRADE:−0.60
TOPSOIL:0.2
LTS_PH2_DP2.0_TS0.2:26
Area:794.77
PREGRADE:0
TOPSOIL:0.2
LTS_PH2_DP2.0_TS0.2:24
PREGRADE:0
TOPSOIL:0
ROAD_PH2_TS0.2:6
Area:4311.28
PREGRADE:−0.65
TOPSOIL:0.2
SWM_T50.2:4
Area:851.28
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH2_TS0.2:15
Area:3767.65
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH2_TS0.2:30
Area:2481.97
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH2_TS0.2:13
Area:1485.27
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH2_TS0:10
Area:999.86
PREGRADE:−0.8
TOPSOIL:0
SF_PH2_TS0:8
Area:4738.44
PREGRADE:−0.8
TOPSOIL:0
SF_PH2_TS0.2:21
Area:2021.50
PREGRADE:−0.8
TOPSOIL:0.2
LTS_PH2_DP2.0_TS0.2:20
Area:677.50
PREGRADE:0.0
TOPSOIL:0.2
SF_PH2_TS0.2:20
Area:1653.55
PREGRADE:−0.8
TOPSOIL:0.2
LTS_PH2_DP2.0_TS0:17
Area:593.5
PREGRADE:−0.80
TOPSOIL:0.0
SF_PH2_TS0.2:22
Area:1074.57
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH2_TS0.2:1
Area:307.51
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH2_TS0.2:23
Area:580.48
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH2_TS0.2:7
Area:7820.46
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH2_TS0:16
Area:1481.50
PREGRADE:−0.8
TOPSOIL:0.0
LTS_PH2_DP2.0_TS0:18
Area:542.05
PREGRADE:0.0
TOPSOIL:0.0
SF_PH2_TS0:3
Area:1462.51
PREGRADE:−0.8
TOPSOIL:0.0
ROAD_PH2_TS0:3
Area:3132.73
PREGRADE:−0.65
TOPSOIL:0.0
SF_PH2_TS0:5
Area:8220.53
PREGRADE:−0.8
TOPSOIL:0
SF_PH2_TS0:4
Area:3113.82
PREGRADE:−0.8
TOPSOIL:0
ROAD_PH2_TS0:2
Area:2187.84
PREGRADE:−0.65
TOPSOIL:0
SF_PH2_TS0:2
Area:1543.82
PREGRADE:−0.8
TOPSOIL:0.0
SF_PH2_TS0:20
Area:1659.23
PREGRADE:−0.8
TOPSOIL:0.0
SF_PH2_TS0:7
Area:1522.97
PREGRADE:−0.8
TOPSOIL:0.0
MF_PH2_TS0:2
Area:750.00
PREGRADE:−1.0
TOPSOIL:0.0
MF_PH2_TS0:3
Area:3390.15
PREGRADE:−1.0
TOPSOIL:0.2
MF_PH2_TS0.3:3
Area:2658.35
PREGRADE:−1.0
TOPSOIL:0.3
MF_PH2_TS0.3:1
Area:4336.58
PREGRADE:−1.0
TOPSOIL:0.2
MF_PH1_TS0.8:2
Area:3674.63
PREGRADE:−1.0
TOPSOIL:0.8
MF_PH1_TS0.3:1
Area:908.14
PREGRADE:−1.0
TOPSOIL:1.3
LTS_PH1_DP2.0_TS0.3:1
Area:346.69
PREGRADE:−0.60
TOPSOIL:0.3
SF_PH2_TS0.2:3
Area:5646.51
PREGRADE:−0.8
TOPSOIL:0.2
LTS_PH2_DP2.0_TS0.2:15
Area:863.62
PREGRADE:0
TOPSOIL:0.2
LTS_PH2_DP2.0_TS0.3:14
Area:249.29
PREGRADE:0
TOPSOIL:0.3
SF_PH2_TS0.3:2
Area:734.24
PREGRADE:−0.8
TOPSOIL:0.3
ROAD_PH2_TS0.2:5
Area:3376.99
PREGRADE:−0.65
TOPSOIL:0.2
SF_PH2_TS0.2:16
Area:3666.52
PREGRADE:−0.80
TOPSOIL:0.2
LTS_PH2_DP2.0_TS0.2:23
Area:1662.90
PREGRADE:0
TOPSOIL:0.2
SF_PH2_TS0.2:9
Area:1309.01
PREGRADE:−0.8
TOPSOIL:0.0
SF_PH2_TS0.2:25
Area:4739.21
PREGRADE:−0.8
TOPSOIL:0.2
LTS_PH2_DP2.0_TS0.2:22
Area:283.58
PREGRADE:0
TOPSOIL:0.0
ROAD_PH2_TS0.2:1
Area:1636.24
PREGRADE:−0.65
TOPSOIL:0.2
ROAD_PH2_TS0.2:4
Area:3778.87
PREGRADE:−0.65
TOPSOIL:0.2
ROAD_PH2_TS0.2:7
Area:1268.75
PREGRADE:−0.65
TOPSOIL:0.2
SF_PH2_TS0.2:2
Area:972.45
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH1_TS0.3:6
Area:1141.50
PREGRADE:−0.8
TOPSOIL:1.3
ROAD_PH1_TS0.2:5
Area:641.30
PREGRADE:−0.65
TOPSOIL:0.2
ROAD_PH1_TS0.8:1
Area:2829.27
PREGRADE:−0.65
TOPSOIL:0.8
SF_PH1_TS0.8:7
Area:3611.38
PREGRADE:−0.8
TOPSOIL:0.8
LTS_PH1_DP3.0_TS0.8:4
Area:1174.89
PREGRADE:0.0
TOPSOIL:0.8
SF_PH1_TS0.8:8
Area:1878.61
PREGRADE:−0.8
TOPSOIL:0.8
ROAD_PH1_TS0.2:2
Area:704.21
PREGRADE:−0.65
TOPSOIL:0
SF_PH1_TS0.4:1
Area:363.21
PREGRADE:0.0
TOPSOIL:0
SF_PH1_TS0.4:3
Area:1759.01
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH1_TS0.4:4
Area:3978.57
PREGRADE:−0.65
TOPSOIL:0.4
SF_PH1_TS0.4:2
Area:2428.78
PREGRADE:−0.8
TOPSOIL:0.4
LTS_PH1_DP2.0_TS0.4:11
Area:89.33
PREGRADE:0.0
TOPSOIL:0.4
SF_PH1_TS0.3:5
Area:1868.38
PREGRADE:−0.8
TOPSOIL:1.3
LTS_PH1_DP3.0_TS1.3:5
Area:24.24
PREGRADE:0
TOPSOIL:1.3
ROAD_PH1_TS1.3:6
Area:6424.49
PREGRADE:−0.65
TOPSOIL:1.3
LTS_PH1_DP3.0_TS1.3:8
Area:245.20
PREGRADE:0.0
TOPSOIL:1.3
SF_PH1_TS1.3:4
Area:2763.02
PREGRADE:−0.8
TOPSOIL:1.3
LTS_PH1_DP2.0_TS1.3:13
Area:346.69
PREGRADE:−0.60
TOPSOIL:0.3
SF_PH1_TS1.3:1
Area:3010.52
PREGRADE:−0.8
TOPSOIL:1.3
SF_PH1_TS0.2:1
Area:1205.23
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH1_TS0.2:5
Area:3637.75
PREGRADE:−0.8
TOPSOIL:0.2
ROAD_PH1_TS0.2:1
Area:4036.69
PREGRADE:−0.65
TOPSOIL:0.2
SF_PH1_TS0.2:13
Area:4194.75
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH1_TS0.2:14
Area:2665.64
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH1_TS0.4:1
Area:2216.77
PREGRADE:−0.8
TOPSOIL:0.4
LTS_PH1_DP3.0_TS0.4:10
Area:94.03
PREGRADE:0.0
TOPSOIL:0.4
ROAD_PH1_TS0.4:1
Area:5796.97
PREGRADE:−0.65
TOPSOIL:0.4
SF_PH1_TS0.8:5
Area:3021.57
PREGRADE:−0.8
TOPSOIL:0.8
SF_PH1_TS0.3:3
Area:4000.50
PREGRADE:−0.8
TOPSOIL:0.3
ROAD_PH1_TS0.3:2
Area:2707.14
PREGRADE:−0.65
TOPSOIL:0.3
ROAD_PH1_TS0.8:2
Area:2004.50
PREGRADE:−0.65
TOPSOIL:0.8
ROAD_PH1_TS0.2:1
Area:1269.53
PREGRADE:−0.65
TOPSOIL:0
ROAD_PH1_TS0.5:1
Area:2728.02
PREGRADE:−0.65
TOPSOIL:0.0
SF_PH1_TS0.5:5
Area:3233.84
PREGRADE:−0.8
TOPSOIL:0.0
SF_PH1_TS0.5:4
Area:3778.57
PREGRADE:−0.8
TOPSOIL:0.5
SF_PH1_TS0.5:3
Area:5366.23
PREGRADE:−0.8
TOPSOIL:0.0
SF_PH1_TS0.4:4
Area:3078.57
PREGRADE:−0.8
TOPSOIL:0.4
ROAD_PH1_TS0.4:2
Area:5084.45
PREGRADE:−0.65
TOPSOIL:0
SF_PH1_TS0.2:4
Area:3403.94
PREGRADE:−0.8
TOPSOIL:1.1
LTS_PH1_DP3.0_TS1.1:3
Area:251.65
PREGRADE:0.0
TOPSOIL:1.1
SF_PH1_TS1.1:2
Area:4232.45
PREGRADE:−0.8
TOPSOIL:1.1
LTS_PH1_DP2.0_TS1.1:1
Area:7310.79
PREGRADE:0.0
TOPSOIL:1.1
LTS_PH1_DP3.0_TS1.1:6
Area:226.05
PREGRADE:0.0
TOPSOIL:1.1
SF_PH1_TS1.1:3
Area:2969.59
PREGRADE:−0.8
TOPSOIL:1.1
LTS_PH1_DP3.0_TS0.2:7
Area:979.54
PREGRADE:0.0
TOPSOIL:0.2
LTS_PH1_DP3.0_TS0.2:9
Area:1183.18
PREGRADE:0.0
TOPSOIL:0.2
LTS_PH1_DP3.0_TS0.8:4
Area:173.58
PREGRADE:0.0
TOPSOIL:0.0
SF_PH1_TS0.2:2
Area:2692.97
PREGRADE:−0.8
TOPSOIL:0.0
SF_PH1_TS0:1
Area:1938.21
PREGRADE:−0.8
TOPSOIL:0.0
LTS_PH2_DP2.0_TS0.2
Area:328.81
PREGRADE:−0.60
TOPSOIL:0.3
LTS_PH1_DP2.0_TS1.1:1
Area:733.52
PREGRADE:0.0
TOPSOIL:1.1
ROAD_PH1_TS1.1:1
Area:7310.79
PREGRADE:−0.65
TOPSOIL:1.1
ROAD_PH1_TS0.8:1
Area:2829.27
PREGRADE:−0.65
TOPSOIL:0.8
ROAD_PH1_TS0.2:5
Area:641.30
PREGRADE:−0.65
TOPSOIL:0.2
ROAD_PH1_TS0.2:6
Area:4311.28
PREGRADE:−0.65
TOPSOIL:0.2
ROAD_PH2_TS0.2:5
Area:3376.99
PREGRADE:−0.65
TOPSOIL:0.2
ROAD_PH2_TS0.2:4
Area:3778.87
PREGRADE:−0.65
TOPSOIL:0.2
ROAD_PH2_TS0.2:1
Area:1636.24
PREGRADE:−0.65
TOPSOIL:0.2
ROAD_PH2_TS0.2:7
Area:1268.75
PREGRADE:−0.65
TOPSOIL:0.2
ROAD_PH2_TS0.2:2
Area:2827.87
PREGRADE:−0.65
TOPSOIL:1.0
ROAD_PH2_TS1.0:4
Area:5631.22
PREGRADE:−0.45
TOPSOIL:1.0
ROAD_PH2_TS1.0:1
Area:2827.87
PREGRADE:−0.65
TOPSOIL:1.0
ROAD_PH2_TS0.8:2
Area:1993.81
PREGRADE:−0.65
TOPSOIL:0.8
ROAD_PH1_TS0.4:1
Area:5796.97
PREGRADE:−0.65
TOPSOIL:0.4
ROAD_PH1_TS0.3:2
Area:2707.14
PREGRADE:−0.65
TOPSOIL:0.3
ROAD_PH1_TS0.8:2
Area:2004.50
PREGRADE:−0.65
TOPSOIL:0.8
ROAD_PH1_TS0.2:1
Area:1269.53
PREGRADE:−0.65
TOPSOIL:0
ROAD_PH1_TS0.5:1
Area:2728.02
PREGRADE:−0.65
TOPSOIL:0.0
ROAD_PH2_TS0.2
Area:2187.84
PREGRADE:−0.65
TOPSOIL:0
ROAD_PH2_TS0.3
Area:3132.73
PREGRADE:−0.65
TOPSOIL:0.0
ROAD_PH1_TS0.1
Area:5084.45
PREGRADE:−0.65
TOPSOIL:0
ROAD_PH1_TS0.4:1
Area:5796.97
PREGRADE:−0.65
TOPSOIL:0.4
ROAD_PH1_TS0.2:2
Area:704.21
PREGRADE:−0.65
TOPSOIL:0
ROAD_PH1_TS0.2:4
Area:363.21
PREGRADE:0.0
TOPSOIL:0
ROAD_PH1_TS0.2:2
Area:2829.27
PREGRADE:−0.65
TOPSOIL:0.8
ROAD_PH1_TS0.8:2
Area:1174.89
PREGRADE:0.0
TOPSOIL:0.8
ROAD_PH1_TS0.3:2
Area:734.24
PREGRADE:−0.8
TOPSOIL:0.3
ROAD_PH1_TS0.3:1
Area:3010.52
PREGRADE:−0.8
TOPSOIL:1.3
ROAD_PH1_TS0.2:1
Area:4036.69
PREGRADE:−0.65
TOPSOIL:0.2
ROAD_PH1_TS0.4:2
Area:5084.45
PREGRADE:−0.65
TOPSOIL:0
ROAD_PH1_TS0.4:1
Area:5796.97
PREGRADE:−0.65
TOPSOIL:0.4
ROAD_PH1_TS0.3:2
Area:2707.14
PREGRADE:−0.65
TOPSOIL:0.3
ROAD_PH1_TS0.8:2
Area:2004.50
PREGRADE:−0.65
TOPSOIL:0.8
ROAD_PH1_TS0.2:1
Area:1269.53
PREGRADE:−0.65
TOPSOIL:0
ROAD_PH1_TS0.5:1
Area:2728.02
PREGRADE:−0.65
TOPSOIL:0.0
ROAD_PH2_TS0.2
Area:2187.84
PREGRADE:−0.65
TOPSOIL:0
ROAD_PH2_TS0.3
Area:3132.73
PREGRADE:−0.65
TOPSOIL:0.0
SWM_TS0:1
Area:4159.75
PREGRADE:−0.3
TOPSOIL:0.0
SWM_TS0:2
Area:6673.39
PREGRADE:−0.3
TOPSOIL:1.0
SWM_T50.2:3
Area:3297.30
PREGRADE:−0.3
TOPSOIL:0.2
SWM_T50.2:4
Area:851.28
PREGRADE:−0.8
TOPSOIL:0.2
SWM_T50.8:4
Area:8159.57
PREGRADE:−0.1
TOPSOIL:0.8
SWM_T50.5
PREGRADE:−0.3
TOPSOIL:0.0
SF_PH2_TS0.2:31
Area:2148.61
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH2_TS0.2:15
Area:3767.65
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH2_TS0.2:30
Area:2481.97
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH2_TS0.2:13
Area:1485.27
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH2_TS0:10
Area:999.86
PREGRADE:−0.8
TOPSOIL:0
SF_PH2_TS0:8
Area:4738.44
PREGRADE:−0.8
TOPSOIL:0
SF_PH2_TS0.2:21
Area:2021.50
PREGRADE:−0.8
TOPSOIL:0.2
LTS_PH2_DP2.0_TS0.2:20
Area:677.50
PREGRADE:0.0
TOPSOIL:0.2
SF_PH2_TS0.2:20
Area:1653.55
PREGRADE:−0.8
TOPSOIL:0.2
LTS_PH2_DP2.0_TS0:17
Area:593.5
PREGRADE:−0.80
TOPSOIL:0.0
SF_PH2_TS0.2:22
Area:1074.57
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH2_TS0.2:1
Area:307.51
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH2_TS0.2:23
Area:580.48
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH2_TS0.2:7
Area:7820.46
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH2_TS0:16
Area:1481.50
PREGRADE:−0.8
TOPSOIL:0.0
LTS_PH2_DP2.0_TS0:18
Area:542.05
PREGRADE:0.0
TOPSOIL:0.0
SF_PH2_TS0:3
Area:1462.51
PREGRADE:−0.8
TOPSOIL:0.0
SF_PH2_TS0:5
Area:8220.53
PREGRADE:−0.8
TOPSOIL:0
SF_PH2_TS0:4
Area:3113.82
PREGRADE:−0.8
TOPSOIL:0
SF_PH2_TS0:2
Area:1543.82
PREGRADE:−0.8
TOPSOIL:0.0
SF_PH2_TS0:20
Area:1659.23
PREGRADE:−0.8
TOPSOIL:0.0
SF_PH2_TS0:7
Area:1522.97
PREGRADE:−0.8
TOPSOIL:0.0
MF_PH2_TS0:2
Area:750.00
PREGRADE:−1.0
TOPSOIL:0.0
MF_PH2_TS0:3
Area:3390.15
PREGRADE:−1.0
TOPSOIL:0.2
MF_PH2_TS0.3:3
Area:2658.35
PREGRADE:−1.0
TOPSOIL:0.3
MF_PH2_TS0.3:1
Area:4336.58
PREGRADE:−1.0
TOPSOIL:0.2
MF_PH1_TS0.8:2
Area:3674.63
PREGRADE:−1.0
TOPSOIL:0.8
MF_PH1_TS0.3:1
Area:908.14
PREGRADE:−1.0
TOPSOIL:1.3
LTS_PH1_DP2.0_TS0.3:1
Area:346.69
PREGRADE:−0.60
TOPSOIL:0.3
SF_PH2_TS0.3:2
Area:734.24
PREGRADE:−0.8
TOPSOIL:0.3
SF_PH2_TS0.2:3
Area:5646.51
PREGRADE:−0.8
TOPSOIL:0.2
LTS_PH2_DP2.0_TS0.2:15
Area:863.62
PREGRADE:0
TOPSOIL:0.2
LTS_PH2_DP2.0_TS0.3:14
Area:249.29
PREGRADE:0
TOPSOIL:0.3
LTS_PH2_DP2.0_TS0.2:23
Area:1662.90
PREGRADE:0
TOPSOIL:0.2
SF_PH2_TS0.2:16
Area:3666.52
PREGRADE:−0.80
TOPSOIL:0.2
SF_PH2_TS0.2:9
Area:1309.01
PREGRADE:−0.8
TOPSOIL:0.0
SF_PH2_TS0.2:25
Area:4739.21
PREGRADE:−0.8
TOPSOIL:0.2
LTS_PH2_DP2.0_TS0.2:22
Area:283.58
PREGRADE:0
TOPSOIL:0.0
SF_PH2_TS0.2:2
Area:972.45
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH1_TS0.3:6
Area:1141.50
PREGRADE:−0.8
TOPSOIL:1.3
ROAD_PH2_TS0.2:5
Area:3376.99
PREGRADE:−0.65
TOPSOIL:0.2
ROAD_PH2_TS0.2:2
Area:2827.87
PREGRADE:−0.65
TOPSOIL:1.0
ROAD_PH2_TS0.8:2
Area:1993.81
PREGRADE:−0.65
TOPSOIL:0.8
ROAD_PH2_TS1.0:4
Area:5631.22
PREGRADE:−0.45
TOPSOIL:1.0
ROAD_PH2_TS1.0:1
Area:2827.87
PREGRADE:−0.65
TOPSOIL:1.0
SF_PH2_TS1.0:5
Area:176.27
PREGRADE:−0.8
TOPSOIL:1.0
LTS_PH2_DP2.0_TS1.0:25
Area:250.43
PREGRADE:0
TOPSOIL:1.0
LTS_PH2_DP2.0_TS0.2:24
Area:474.21
PREGRADE:0
TOPSOIL:0.2
SF_PH2_TS1.0:32
Area:1272.74
PREGRADE:−0.8
TOPSOIL:1.0
LTS_PH2_DP2.0_TS0.2:26
Area:794.77
PREGRADE:0
TOPSOIL:0.2
LTS_PH2_DP2.0_TS0.2:24
PREGRADE:0
TOPSOIL:0
SF_PH2_TS0.2:28
Area:4630.58
PREGRADE:−0.60
TOPSOIL:0.2
SF_PH2_TS0.2:31
Area:2148.61
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH2_TS0.2:15
Area:3767.65
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH2_TS0.2:30
Area:2481.97
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH2_TS0.2:13
Area:1485.27
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH2_TS0:10
Area:999.86
PREGRADE:−0.8
TOPSOIL:0
SF_PH2_TS0:8
Area:4738.44
PREGRADE:−0.8
TOPSOIL:0
SF_PH2_TS0.2:21
Area:2021.50
PREGRADE:−0.8
TOPSOIL:0.2
LTS_PH2_DP2.0_TS0.2:20
Area:677.50
PREGRADE:0.0
TOPSOIL:0.2
SF_PH2_TS0.2:20
Area:1653.55
PREGRADE:−0.8
TOPSOIL:0.2
LTS_PH2_DP2.0_TS0:17
Area:593.5
PREGRADE:−0.80
TOPSOIL:0.0
SF_PH2_TS0.2:22
Area:1074.57
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH2_TS0.2:1
Area:307.51
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH2_TS0.2:23
Area:580.48
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH2_TS0.2:7
Area:7820.46
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH2_TS0:16
Area:1481.50
PREGRADE:−0.8
TOPSOIL:0.0
LTS_PH2_DP2.0_TS0:18
Area:542.05
PREGRADE:0.0
TOPSOIL:0.0
SF_PH2_TS0:3
Area:1462.51
PREGRADE:−0.8
TOPSOIL:0.0
ROAD_PH2_TS0:3
Area:3132.73
PREGRADE:−0.65
TOPSOIL:0.0
SF_PH2_TS0:5
Area:8220.53
PREGRADE:−0.8
TOPSOIL:0
SF_PH2_TS0:4
Area:3113.82
PREGRADE:−0.8
TOPSOIL:0
ROAD_PH2_TS0:2
Area:2187.84
PREGRADE:−0.65
TOPSOIL:0
SF_PH2_TS0:2
Area:1543.82
PREGRADE:−0.8
TOPSOIL:0.0
SF_PH2_TS0:20
Area:1659.23
PREGRADE:−0.8
TOPSOIL:0.0
SF_PH2_TS0:7
Area:1522.97
PREGRADE:−0.8
TOPSOIL:0.0
MF_PH2_TS0:2
Area:750.00
PREGRADE:−1.0
TOPSOIL:0.0
MF_PH2_TS0:3
Area:3390.15
PREGRADE:−1.0
TOPSOIL:0.2
MF_PH2_TS0.3:3
Area:2658.35
PREGRADE:−1.0
TOPSOIL:0.3
MF_PH2_TS0.3:1
Area:4336.58
PREGRADE:−1.0
TOPSOIL:0.2
MF_PH1_TS0.8:2
Area:3674.63
PREGRADE:−1.0
TOPSOIL:0.8
MF_PH1_TS0.3:1
Area:908.14
PREGRADE:−1.0
TOPSOIL:1.3
LTS_PH1_DP2.0_TS0.3:1
Area:346.69
PREGRADE:−0.60
TOPSOIL:0.3
SF_PH1_TS1.3:4
Area:2763.02
PREGRADE:−0.8
TOPSOIL:1.3
SF_PH1_TS0.3:6
Area:1141.50
PREGRADE:−0.8
TOPSOIL:1.3
SF_PH1_TS0.3:5
Area:1868.38
PREGRADE:−0.8
TOPSOIL:1.3
LTS_PH1_DP3.0_TS1.3:5
Area:24.24
PREGRADE:0
TOPSOIL:1.3
ROAD_PH1_TS1.3:6
Area:6424.49
PREGRADE:−0.65
TOPSOIL:1.3
LTS_PH1_DP3.0_TS1.3:8
Area:245.20
PREGRADE:0.0
TOPSOIL:1.3
SF_PH1_TS1.3:1
Area:3010.52
PREGRADE:−0.8
TOPSOIL:1.3
SF_PH1_TS0.2:1
Area:1205.23
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH1_TS0.2:5
Area:3637.75
PREGRADE:−0.8
TOPSOIL:0.2
ROAD_PH1_TS0.2:1
Area:4036.69
PREGRADE:−0.65
TOPSOIL:0.2
SF_PH1_TS0.2:13
Area:4194.75
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH1_TS0.2:14
Area:2665.64
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH1_TS0.4:1
Area:2216.77
PREGRADE:−0.8
TOPSOIL:0.4
LTS_PH1_DP3.0_TS0.4:10
Area:94.03
PREGRADE:0.0
TOPSOIL:0.4
ROAD_PH1_TS0.4:1
Area:5796.97
PREGRADE:−0.65
TOPSOIL:0.4
SF_PH1_TS0.8:5
Area:3021.57
PREGRADE:−0.8
TOPSOIL:0.8
SF_PH1_TS0.3:3
Area:4000.50
PREGRADE:−0.8
TOPSOIL:0.3
ROAD_PH1_TS0.3:2
Area:2707.14
PREGRADE:−0.65
TOPSOIL:0.3
ROAD_PH1_TS0.8:2
Area:2004.50
PREGRADE:−0.65
TOPSOIL:0.8
ROAD_PH1_TS0.2:1
Area:1269.53
PREGRADE:−0.65
TOPSOIL:0
ROAD_PH1_TS0.5:1
Area:2728.02
PREGRADE:−0.65
TOPSOIL:0.0
SF_PH1_TS0.5:5
Area:3233.84
PREGRADE:−0.8
TOPSOIL:0.0
SF_PH1_TS0.5:4
Area:3778.57
PREGRADE:−0.8
TOPSOIL:0.5
SF_PH1_TS0.5:3
Area:5366.23
PREGRADE:−0.8
TOPSOIL:0.0
SF_PH1_TS0.4:4
Area:3078.57
PREGRADE:−0.8
TOPSOIL:0.4
SF_PH1_TS0.4:2
Area:2428.78
PREGRADE:−0.8
TOPSOIL:0.4
LTS_PH1_DP2.0_TS0.4:11
Area:89.33
PREGRADE:0.0
TOPSOIL:0.4
SF_PH1_TS0.2:4
Area:3403.94
PREGRADE:−0.8
TOPSOIL:1.1
LTS_PH1_DP3.0_TS1.1:3
Area:251.65
PREGRADE:0.0
TOPSOIL:1.1
SF_PH1_TS1.1:2
Area:4232.45
PREGRADE:−0.8
TOPSOIL:1.1
LTS_PH1_DP2.0_TS1.1:1
Area:7310.79
PREGRADE:0.0
TOPSOIL:1.1
LTS_PH1_DP3.0_TS1.1:6
Area:226.05
PREGRADE:0.0
TOPSOIL:1.1
SF_PH1_TS1.1:3
Area:2969.59
PREGRADE:−0.8
TOPSOIL:1.1
LTS_PH1_DP3.0_TS0.2:7
Area:979.54
PREGRADE:0.0
TOPSOIL:0.2
LTS_PH1_DP3.0_TS0.2:9
Area:1183.18
PREGRADE:0.0
TOPSOIL:0.2
LTS_PH1_DP3.0_TS0.8:4
Area:173.58
PREGRADE:0.0
TOPSOIL:0.0
SF_PH1_TS0.2:2
Area:2692.97
PREGRADE:−0.8
TOPSOIL:0.0
SF_PH1_TS0:1
Area:1938.21
PREGRADE:−0.8
TOPSOIL:0.0
LTS_PH2_DP2.0_TS0.2
Area:328.81
PREGRADE:−0.60
TOPSOIL:0.3
SF_PH1_TS0.4:3
Area:1759.01
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH1_TS0.4:4
Area:3978.57
PREGRADE:−0.65
TOPSOIL:0.4
SF_PH1_TS0.4:2
Area:2428.78
PREGRADE:−0.8
TOPSOIL:0.4
SF_PH1_TS0.3:5
Area:5366.23
PREGRADE:−0.8
TOPSOIL:0.0
ROAD_PH1_TS0.1
Area:5084.45
PREGRADE:−0.65
TOPSOIL:0
ROAD_PH1_TS0.4:2
Area:5796.97
PREGRADE:−0.65
TOPSOIL:0.4
ROAD_PH1_TS0.2:2
Area:704.21
PREGRADE:−0.65
TOPSOIL:0
ROAD_PH1_TS0.2:4
Area:363.21
PREGRADE:0.0
TOPSOIL:0
ROAD_PH1_TS0.2:2
Area:2829.27
PREGRADE:−0.65
TOPSOIL:0.8
ROAD_PH1_TS0.8:2
Area:1174.89
PREGRADE:0.0
TOPSOIL:0.8
ROAD_PH1_TS0.3:2
Area:734.24
PREGRADE:−0.8
TOPSOIL:0.3
ROAD_PH1_TS0.3:1
Area:3010.52
PREGRADE:−0.8
TOPSOIL:1.3
ROAD_PH1_TS0.2:1
Area:4036.69
PREGRADE:−0.65
TOPSOIL:0.2
SF_PH1_TS0.2:4
Area:3403.94
PREGRADE:−0.8
TOPSOIL:1.1
LTS_PH1_DP3.0_TS1.1:3
Area:251.65
PREGRADE:0.0
TOPSOIL:1.1
SF_PH1_TS1.1:2
Area:4232.45
PREGRADE:−0.8
TOPSOIL:1.1
LTS_PH1_DP2.0_TS1.1:1
Area:733.52
PREGRADE:0.0
TOPSOIL:1.1
LTS_PH1_DP3.0_TS1.1:6
Area:226.05
PREGRADE:0.0
TOPSOIL:1.1
SF_PH1_TS1.1:3
Area:2969.59
PREGRADE:−0.8
TOPSOIL:1.1
LTS_PH1_DP3.0_TS0.2:7
Area:979.54
PREGRADE:0.0
TOPSOIL:0.2
LTS_PH1_DP3.0_TS0.2:9
Area:1183.18
PREGRADE:0.0
TOPSOIL:0.2
LTS_PH1_DP3.0_TS0.8:4
Area:173.58
PREGRADE:0.0
TOPSOIL:0.0
SF_PH1_TS0.2:2
Area:2692.97
PREGRADE:−0.8
TOPSOIL:0.0
SF_PH1_TS0:1
Area:1938.21
PREGRADE:−0.8
TOPSOIL:0.0
LTS_PH2_DP2.0_TS0.2
Area:328.81
PREGRADE:−0.60
TOPSOIL:0.3
SF_PH1_TS0.2:3
Area:1205.23
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH1_TS0.2:5
Area:3637.75
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH1_TS0.2:13
Area:4194.75
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH1_TS0.2:14
Area:2665.64
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH1_TS0.4:1
Area:2216.77
PREGRADE:−0.8
TOPSOIL:0.4
SF_PH1_TS0.4:3
Area:1759.01
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH1_TS0.4:4
Area:3978.57
PREGRADE:−0.65
TOPSOIL:0.4
SF_PH1_TS0.4:2
Area:2428.78
PREGRADE:−0.8
TOPSOIL:0.4
SF_PH1_TS0.3:5
Area:5366.23
PREGRADE:−0.8
TOPSOIL:0.0
SF_PH1_TS0.3:4
Area:3403.94
PREGRADE:−0.8
TOPSOIL:1.1
LTS_PH1_DP3.0_TS1.1:3
Area:251.65
PREGRADE:0.0
TOPSOIL:1.1
SF_PH1_TS1.1:2
Area:4232.45
PREGRADE:−0.8
TOPSOIL:1.1
LTS_PH1_DP2.0_TS1.1:1
Area:733.52
PREGRADE:0.0
TOPSOIL:1.1
LTS_PH1_DP3.0_TS1.1:6
Area:226.05
PREGRADE:0.0
TOPSOIL:1.1
SF_PH1_TS1.1:3
Area:2969.59
PREGRADE:−0.8
TOPSOIL:1.1
LTS_PH1_DP3.0_TS0.2:7
Area:979.54
PREGRADE:0.0
TOPSOIL:0.2
LTS_PH1_DP3.0_TS0.2:9
Area:1183.18
PREGRADE:0.0
TOPSOIL:0.2
LTS_PH1_DP3.0_TS0.8:4
Area:173.58
PREGRADE:0.0
TOPSOIL:0.0
SF_PH1_TS0.2:2
Area:2692.97
PREGRADE:−0.8
TOPSOIL:0.0
SF_PH1_TS0:1
Area:1938.21
PREGRADE:−0.8
TOPSOIL:0.0
LTS_PH2_DP2.0_TS0.2
Area:328.81
PREGRADE:−0.60
TOPSOIL:0.3
SF_PH1_TS0.2:3
Area:1205.23
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH1_TS0.2:5
Area:3637.75
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH1_TS0.2:13
Area:4194.75
PREGRADE:−0.8
TOPSOIL:0.2
SF_PH1_TS0.2:14
Area:2665.64
PREGRADE:−0.8
TOPSOIL

APPENDIX C

FIGURE 2-23 FROM 2014 WASTEWATER SERVICING STUDY BY CRA

RESIDUAL CAPACITY CALCULATION FOR EXISTING SEWERS

SANITARY SEWER DESIGN CALCULATIONS FOR AREAS DRAINING TO EXISTING SEWERS TO THE SOUTH

SANITARY SEWER DESIGN CALCULATIONS FOR AREAS DRAINING TO THE PROPOSED BADEN TRUNK SEWER TO THE WEST

CONCEPTUAL SANITARY DRAINAGE AREA PLAN (DRAWING NO. C-120)

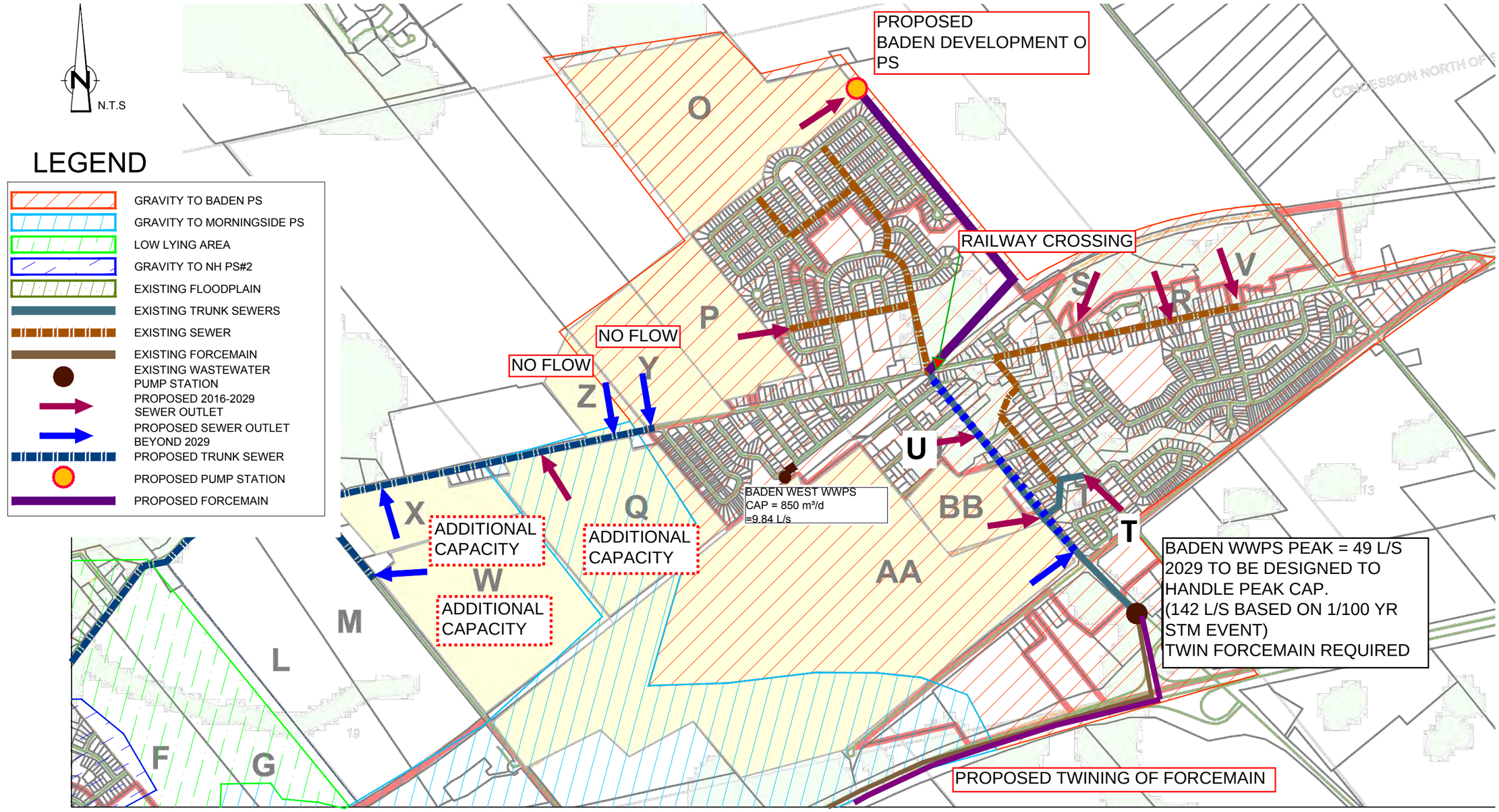


Figure 2-23 Alternative D - Proposed Sanitary Linear Infrastructure and Pump Stations - Baden

Wastewater Servicing Study for New Growth Areas in Baden and New Hamburg

Township of Wilmot

Activa Baden Subdivision

Residual Capacity Analysis for Existing Sanitary Sewers

Project # 60305680

21-Jun-21

		From	To	Existing Sewer Capacity	Existing Theoretical Peak Flow	Estimated Theoretical Peak Flow Including Additional 260 people on Jacob Cressman Drive (West Leg), and 320 people on Isaac Shantz Drive (East Leg)	
				L/s	L/s	L/s	% Capacity Used
WEST LEG	Wagler Avenue	MH15A	MH22A	**22.01**	12.0	**17.16**	78%
	Wagler Avenue	MH22A	MH21A	**22.94**	13.0	**17.83**	78%
	Wagler Avenue	MH21A	MH20A	**22.32**	13.0	**17.84**	80%
	Wagler Avenue	MH20A	MH4A	**22.32**	17.0	**19.04**	85%
EAST LEG	Isaac Shantz Drive	MH70A	MH69A	**22.63**	9.0	**13.97**	62%
	Isaac Shantz Drive	MH69A	MH68A	**21.08**	10.0	**14.74**	70%
	Isaac Shantz Drive	MH68A	MH67A	**23.56**	16.0	**18.44**	78%
	Isaac Shantz Drive	MH67A	MH66A	**21.70**	17.0	**18.98**	87%
	Isaac Shantz Drive	MH66A	MH9A	**23.87**	17.0	**19.13**	80%
BOTH LEGS CONVERGING	Livingston Boulevard	MH4A	MH3A	**51.12**	43.0	**45.73**	89%
	Livingston Boulevard	MH3A	MH2A	**49.70**	43.0	**45.76**	92%
	Livingston Boulevard	MH2A	MH2	**49.70**	45.0	**47.01**	95%
	Livingston Boulevard	MH2	MH1A	**59.64**	46.0	**47.18**	79%

Stantec

SUBDIVISION: **ACTIVA BADEN** **60305680**

SANITARY SEWER DESIGN SHEET

DATE: June 21, 2021
DESIGNED BY: JM
CHECKED BY: HL
FILE NUMBER: 30T-04603
MDS Lands - Third Submission

Township of Wilmot.

DESIGN PARAMETERS

AVERAGE DAILY FLOW PER PERSON = 305 l/p/day
MINIMUM FULL VELOCITY = 0.800 m/s
n = 0.013
MAX PEAK FAC.= 4.500
MIN PEAK FAC.= 1.500

RESIDENTIAL: 0.0000035 cums/p
COMMERCIAL: 0.00150 cums/Ha
INDUSTRIAL: 0.00100 cums/Ha
INSTITUTIONAL: 0.00250 cums/Ha
INFILTRATION: 0.00015 cums/Ha
RESIDENTIAL HARMON PEAKING FACTOR

LOCATION			RESIDENTIAL AREA AND POPULATION							COMM		INDUST		INSTIT		C+I+I	INFILTRATION			TOTAL	PIPE					
STREET	FROM M.H.	TO M.H.	AREA I.D.	AREA (ha)	POP. DENSITY (p/unit)	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (L/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (L/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (L/s)	FLOW (L/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (L/s)	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
HUNSBERGER DRIVE	*MH 52*	*MH 54*		*0.71*		*34*	*0.71*	*34*	*4.35*	*0.52*							*0.000*	*0.71*	*0.71*	*0.11*	*0.63*	*89.60*	*200*	*1.03*	*32.55*	*1.05*	*0.00*
MICHAEL MYERS	MH105	MH108	100	0.25		7	0.25	7	4.43	*0.11*							*0.000*	0.25	0.25	*0.04*	0.15	13.60	200	1.00	*31.93*	1.03	0.00
	MH108	MH107	102	0.50		17	0.75	24	4.37	*0.37*							*0.000*	0.50	0.75	*0.11*	0.48	76.70	200	0.50	*22.63*	0.73	0.29
BETTSCHEN LANE	MH107	MH106	104	0.31		13	1.06	37	4.34	*0.56*							*0.000*	0.31	1.06	*0.16*	0.72	72.30	200	2.50	*50.53*	1.63	0.00
	MH106	PLUG	106	0.52		27	1.58	64	4.29	*0.96*							*0.000*	0.52	1.58	*0.24*	1.20	72.20	200	0.60	*24.80*	0.80	0.38
	PLUG	*MH 54*		*0.00*		*0*	*1.58*	*64*	*4.29*	*0.96*							*0.000*	*0.00*	*1.58*	*0.24*	*1.20*	*17.10*	*200*	*0.60*	*24.80*	*0.80*	*0.38*
HUNSBERGER DRIVE	*MH 54*	*MH 49*		*0.55*		*24*	*2.84*	*122*	*4.22*	*1.80*							*0.000*	*0.55*	*2.84*	*0.43*	*2.23*	*90.00*	*200*	*0.50*	*22.63*	*0.73*	*0.42*
MICHAEL MYERS ROAD	MH107	MH111A	108	0.41		13	*0.41*	*13*	4.40	*0.20*							*0.000*	0.41	0.41	*0.06*	0.26	78.20	200	1.00	*31.93*	1.03	0.00
	MH111A	MH110	110	0.30		10	*0.71*	*23*	4.37	*0.35*							*0.000*	0.30	0.30	*0.05*	0.40	16.70	200	1.20	*35.03*	1.13	0.00
	MH110	MH109	112	0.36		20	*1.07*	*43*	4.33	*0.65*							*0.000*	0.36	0.36	*0.05*	0.70	38.70	200	1.20	*35.03*	1.13	0.00
	MH109	PLUG	114	0.46		20	*1.53*	*63*	4.29	*0.95*							*0.000*	0.46	0.46	*0.07*	1.02	71.20	200	0.52	*22.94*	0.74	0.35
	PLUG	*MH 49*		*0.00*		*0*	*1.53*	*63*	*4.29*	*0.95*							*0.000*	*0.00*	*0.00*		*0.95*	*17.40*	*200*	*0.52*	*22.94*	*0.74*	*0.35*
HUNSBERGER DRIVE	*MH 47*	*MH 47B*		*0.13*		*7*	*0.13*	*7*	*4.43*	*0.11*							*0.000*	*0.13*	*0.13*	*0.02*	*0.13*	*15.00*	*200*	*0.22*	*14.88*	*0.48*	*0.00*
	MH 47B	*MH 48*		*0.77*		*37*	*0.90*	*44*	*4.33*	*0.67*							*0.000*	*0.77*	*0.90*	*0.14*	*0.81*	*89.40*	*200*	*0.45*	*21.39*	*0.69*	*0.28*
	MH 48	*MH 49*		*0.14*		*4*	*1.04*	*48*	*4.32*	*0.73*							*0.000*	*0.14*	*1.04*	*0.16*	*0.89*	*38.70*	*200*	*0.52*	*22.94*	*0.74*	*0.30*
STUCKEY AVENUE	*MH 49*	*MH 44*		*0.65*		*34*	*6.06*	*267*	*4.10*	*3.83*							*0.000*	*0.65*	*4.53*	*0.68*	*4.51*	*90.00*	*200*	*0.40*	*20.15*	*0.65*	*0.51*
MICHAEL MYERS ROAD	MH105	MH104	116	0.29		13	0.29	13	4.40	*0.20*							*0.000*	0.29	0.29	*0.04*	0.24	39.00	200	1.00	*31.93*	1.03	0.00
	MH104	PLUG	118	0.42		23	0.71	36	4.34	*0.55*							*0.000*	0.42	0.71	*0.11*	0.66	45.00	200	1.08	*33.17*	1.07	0.00
	PLUG	*MH 52*		*0.25*		*10*	*0.96*	*46*	*4.32*	*0.70*							*0.000*	*0.25*	*0.96*	*0.14*	*0.84*	*45.00*	*200*	*1.08*	*33.17*	*1.07*	*0.43*
MICHAEL MYERS ROAD	*MH 52*	*MH 51*		*0.44*		*17*	*1.40*	*63*	*4.29*	*0.95*							*0.000*	*0.44*	*1.40*	*0.21*	*1.16*	*90.00*	*200*	*1.00*	*31.93*	*1.03*	*0.41*
					*72 People / Ha					*275 l/p/day										*0.00025 cums/Ha for infiltration							
Activa North Subdivision																											
	PLUG	*MH 51*		*3.64*		***262***	*3.64*	*262*	*4.10*	***3.44***							*0.000*	*3.64*	*3.64*	***0.91***	*4.35*	*15.00*	*200*	*0.60*	*24.80*	*0.80*	*0.58*
JACOB CRESSMAN DRIVE	*MH 51*	*MH 45*		*0.68*		*34*	*4.32*	*296*	*4.08*	*4.23*							*0.000*	*0.68*	*4.32*	*0.65*	*4.88*	*90.00*	*200*	*1.00*	*31.93*	*1.03*	*0.71*
	MH 45	*MH 44*		*0.54*		*27*	*4.86*	*323*	*4.07*	*4.60*							*0.000*	*0.54*	*4.86*	*0.73*	*5.33*	*90.00*	*200*	*0.59*	*24.49*	*0.79*	*0.60*
JACOB CRESSMAN DRIVE	*MH 44*	*MH 43*		0.37		17	*11.29*	*607*	*3.93*	*8.35*							*0.000*	*0.37*	*9.76*	*1.46*	*9.81*	*61.80*	*200*	*0.56*	*23.87*	*0.77*	*0.72*
	MH 43	*MH 42*		*0.52*		*27*	*11.81*	*634*	*3.92*	*8.70*							*0.000*	*0.52*	*10.28*	*1.54*	*10.24*	*61.60*	*200*	*0.53*	*23.25*	*0.75*	*0.72*
ROTH AVENUE	*MH 41*	*MH 40*		*0.70*		*40*	*0.70*	*40*	*4.33*	*0.61*							*0.000*	*0.70*	*0.70*	*0.11*	*0.72*	*83.10*	*200*	*1.19*	*34.72*	*1.12*	*0.45*
	MH 40	*MH 39*		*0.18*		*7*	*0.88*	*47*	*4.32*	*0.71*							*0.000*	*0.18*	*0.88*	*0.13*	*0.84*	*26.50*	*200*	*0.44*	*21.08*	*0.68*	*0.27*
	MH 39	*MH 38*		*0.17*		*3*	*1.05*	*50*	*4.32*	*0.76*							*0.000*	*0.17*	*1.05*	*0.16*	*0.92*	*21.40*	*200*	*0.54*	*23.56*	*0.76*	*0.30*
	MH 38	*MH 42*		*0.00*		*0*	*1.05*	*50*	*4.32*	*0.76*							*0.000*	*0.00*	*1.05*	*0.16*	*0.92*	*20.20*	*200*	*0.46*	*21.70*	*0.70*	*0.33*
JACOB CRESSMAN DRIVE	*MH 42*	*MH 37*		*0.16*		*7*	*13.02*	*691*	*3.90*	*9.43*							*0.000*	*0.16*	*11.49*	*1.72*	*11.15*	*35.90*	*200*	*0.52*	*22.94*	*0.74*	*0.73*
	MH 37	*MH 36*		*0.09*		*3*	*13.11*	*694*	*3.90*	*9.47*							*0.000*	*0.09*	*11.58*	*1.74*	*11.21*	*22.00*	*200*	*0.49*	*22.32*	*0.72*	*0.72*
	MH 36	*MH 14*		*0.12*		*3*	*13.23*	*697*	*3.90*	*9.51*							*0.000*	*0.12*	*11.70*	*1.76*	*11.27*	*27.80*	*200*	*0.68*	*26.35*	*0.85*	*0.81*
LIVINGSTON BOULEVARD	*MH 14*	*MH 17*		*0.26*		*10*	*13.49*	*707*	*3.89*	*9.63*							*0.000*	*0.26*	*11.96*	*1.79*	*11.42*	*42.22*	*200*	*0.66*	*26.04*	*0.84*	*0.80*
	MH 17	*MH 16*		*0.56*		*30*	*14.05*	*737*	*3.88*	*10.01*							*0.000*	*0.56*	*12.52*	*1.88*	*11.89*	*59.10*	*200*	*0.44*	*21.08*	*0.68*	*0.70*
	MH 16	*MH 15*		*0.20*		*7*	*14.25*	*744*	*3.88*	*10.10*							*0.000*	*0.20*	*12.72*	*1.91*	*12.01*	*59.90*	*200*	*0.48*	*22.01*	*0.71*	*0.72*
HUNSBERGER DRIVE	*MH 47*	*MH 46*		*0.47*		*24*	*0.47*	*24*	*4.37*	*0.37*							*0.000*	*0.47*	*0.47*	*0.07*	*0.44*	*62.20*	*200*	*0.98*	*31.62*	*1.02*	*0.00*
GEIGER PLACE	MH 100	MH 101	119	0.94		37	0.94	37	4.34	*0.56*							*0.000*	0.94	0.94	*0.14*	0.70	42.00	200	2.50	*50.53*	1.63	0.00
	MH 101	MH 102	120	0.20		10	1.14	47	4.32	*0.71*							*0.000*	0.20	1.14	*0.17*	0.88	23.10	200	2.50	*50.53*	1.63	0.00
	MH 102	MH 103	121	0.15		7	1.29	54	4.31	*0.81*							*0.000*	0.15	1.29	*0.19*	1.00	13.80	200	2.50	*50.53*	1.63	0.00
	MH 103	*MH 46*	122	0.24		7	1.53	61	4.30	*0.92*							*0.000*	0.24	1.53	*0.23*	1.15	66.60	200	0.60	*24.80*	0.80	0.38
HUNSBERGER DRIVE	*MH 46*	*MH 31*		*0.52*		*23*	*2.52*	*108*	*4.23*	*1.60*							*0.000*	*0.52*	*2.52*	*0.38*	*1.98*	*90.10*	*200*	*0.56*	*23.87*	*0.77*	*0.45*
MCFADYEN STREET	*MH 35*	*MH 33*		*0.10*		*3*	*0.10*	*3*	*4.45*	*0.05*							*0.000*	*0.10*	*0.10*	*0.02*	*0.00*	*16.30*	*200*	*1.13*	*33.79*	*1.09*	*0.00*
	MH 33	*MH 32*		*0.24*		*10*	*0.34*	*13*	*4.40*	*0.20*							*0.000*	*0.24*	*0.34*	*0.05*	*0.00*	*42.10*	*200*	*0.50*	*22.63*	*0.73*	*0.00*
	MH 32	*MH 31*		*0.19*		*7*	*0.53*	*20*	*4.38*	*0.31*							*0.000*	*0.19*	*0.53*	*0.08*	*0.00*	*40.20*	*200*	*0.67*	*26.04*	*0.84*	*0.00*
FUTURE	*PLUG*	*MH 31*		*0.74*		*37*	*0.74*	*37*	*4.34*	*0.56*							*0.000*	*0.74*	*0.74*	*0.11*	*0.67*	*15.00*	*200*	*0.60*	*24.80*	*0.80*	*0.32*
WAGLER AVENUE	*MH 31*	*MH 30*		*0.62*		*30*	*4.41*	*195*	*4.15*	*2.83*							*0.000*	*0.62*	*4.41*	*0.66*	*3.49*	*80.30*	*200*	*1.37*	*37.51*	*1.21*	*0.70*
ROTH AVENUE	*MH 41*	*MH 30*		*0.46*		*23*	*0.46*	*23*	*4.37*	*0.35*							*0.000*	*0.46*	*0.46*	*0.07*	*0.00*	*89.10*	*200*	*1.48*	*38.75*	*1.25*	*0.00*
WAGLER AVENUE	*MH 30*	*MH 15*		*0.46*		*20*	*5.33*	*238*	*4.12*	*3.43*							*0.000*	*0.46*	*5.33*	*0.80*	*4.23*	*80.00*	*200*	*1.45*	*38.44*	*1.24*	*0.77*
McFADYEN STREET	*MH 35*	*MH 34*		*0.75*		*30*	*0.75*	*30*	*4.36*	*0.46*							*0.000*	*0.75*	*0.75*	*0.11*	*0.57*	*64.70*	*200*	*0.88*	*30.07*	*0.97*	*0.00*
	MH 34	*MH 18*		*0.30*		*10*	*1.05*	*40*	*4.33*	*0.61*							*0.000*	*0.30*	*1.05*	*0.16*	*0.77*	*68.10*	*200*	*0.43*	*21.08*	*0.68*	*0.27*
LIVINGSTON BOULEVARD	*MH 19*	*MH 18*		*0.57*		*20*	*0.57*	*20*	*4.38*	*0.31*							*0.000*	*0.57*	*0.57*	*0.09*	*0.00*	*92.30*	*200*	*0.50*	*22.63*	*0.73*	*0.00*
LIVINGSTON BOULEVARD	*MH 18*	*MH 15*		*0.41*		*13*	*2.03*	*73*	*4.28*	*1.09*							*0.000*	*0.41*	*2.03*	*0.30*	*1.39*	*89.80*	*200*	*0.49*	*22.32*	*0.72*	*0.37*
WAGLER AVENUE	*MH 15*	*MH 22*		*0.41*		*13*	*22.02*	*1068*	*3.78*	*14.13*							*0.000*	*0.41*	*20.49*	*3.07*	*17.20*	*89.00*	*200*	*0.48*	*22.01*	*0.71*	*0.79*
OESCH LANE	*MH 29*	*MH 24*		*0.19*		*7*	*0.19*	*7*	*4.43*	*0.11*							*0.000*	*0.19*	*0.19*	*0.03*	*0.00*	*17.40*	*200*	*1.40*	*37.82*	*1.22*	*0.00*
	MH 24	*MH 23*		*0.50*		*20*	*0.69*	*27*	*4.36*	*0.41*							*0.000*	*0.50*	*0.69*	*0.10*	*0.00*	*51.00*	*200*	*0.71*	*26.97*	*0.87*	*0.00*
	MH 23	*MH 22*		*0.39*		*13*	*1.08*	*40*	*4.33*	*0.61*							*0.000*	*0.39*	*1.08*	*0.16*	*0.77*	*54.20*	*200*	*0.95*	*31.00*	*1.00*	*0.40*
WAGLER AVENUE	*MH 22*	*MH 21*		*0.11*		*0*	*23.21*	*1108*	*3.77*	*14.62*							*0.000*	*0.11*	*21.68*	*3.25*	*17.87*	*57.90*	*200*	*0.52*	*22.94*	*0.74*	*0.82*
	MH 21	*MH 20*		*0.11*		*0*	*23.32*	*1108*	*3.77*	*14.62*							*0.000*	*0.11*	*21.79*	*3.27*	*17.89*	*58.60*	*200*	*0.49*	*22.32*	*0.72*	*0.81*

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Stantec

SUBDIVISION: **ACTIVA BADEN** **60305680**

SANITARY SEWER DESIGN SHEET

DATE: June 21, 2021
DESIGNED BY: JM
CHECKED BY: HL
FILE NUMBER: 30T-04603
MDS Lands - Third Submission

Township of Wilmot.

AVERAGE DAILY FLOW PER PERSON = 305 l/p/day
MINIMUM FULL VELOCITY = 0.800 m/s
n = 0.013
MAX PEAK FAC.= 4.500
MIN PEAK FAC.= 1.500

DESIGN PARAMETERS
RESIDENTIAL: 0.0000035 cums/p
COMMERCIAL: 0.00150 cums/Ha
INDUSTRIAL: 0.00100 cums/Ha
INSTITUTIONAL: 0.00250 cums/Ha
INFILTRATION: 0.00015 cums/Ha
RESIDENTIAL HARMON PEAKING FACTOR

LOCATION			RESIDENTIAL AREA AND POPULATION								COMM		INDUST		INSTIT		C+I+I	INFILTRATION			TOTAL	PIPE					
STREET	FROM M.H.	TO M.H.	AREA I.D.	AREA (ha)	POP. DENSITY (p/unit)	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (L/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (L/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (L/s)	FLOW (L/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (L/s)	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
OESCH LANE	*MH 29*	*MH 28*		*0.33*		*10*	*0.33*	*10*	*4.42*	*0.15*							*0.000*	*0.33*	*0.33*	*0.05*	*0.00*	*46.00*	*200*	*0.87*	*29.76*	*0.96*	*0.00*
	MH 28	*MH 27*		*0.27*		*10*	*0.60*	*20*	*4.38*	*0.31*							*0.000*	*0.27*	*0.60*	*0.09*	*0.00*	*46.10*	*200*	*0.87*	*29.76*	*0.96*	*0.00*
	MH 27	*MH 26*		*0.19*		*7*	*0.79*	*27*	*4.36*	*0.41*							*0.000*	*0.19*	*0.79*	*0.12*	*0.00*	*16.50*	*200*	*0.88*	*30.07*	*0.97*	*0.00*
	MH 26	*MH 25*		*0.50*		*20*	*1.29*	*47*	*4.32*	*0.71*							*0.000*	*0.50*	*1.29*	*0.19*	*0.90*	*51.50*	*200*	*0.84*	*29.14*	*0.94*	*0.38*
	MH 25	*MH 20*		*0.41*		*13*	*1.70*	*60*	*4.30*	*0.90*							*0.000*	*0.41*	*1.70*	*0.26*	*1.16*	*54.20*	*200*	*0.88*	*30.07*	*0.97*	*0.39*
WAGLER AVENUE	*MH 20*	*MH 4*		*0.41*		*13*	*25.43*	*1181*	*3.75*	*15.50*							*0.000*	*0.41*	*23.90*	*3.59*	*19.09*	*89.80*	*200*	*0.49*	*22.32*	*0.72*	*0.81*
FUTURE	PLUG	MH 51		0.00		0											0.000	0.00	0.00		0.00	15.00	200	0.60	*24.80*	0.80	0.00
MICHAEL MYERS ROAD	*MH 51*	*MH 50*		*0.31*		*7*	*0.31*	*7*	*4.43*	*0.11*							*0.000*	*0.31*	*1.71*	*0.26*	*0.37*	*90.50*	*200*	*0.50*	*22.63*	*0.73*	*0.00*
GOLDSCHMIDT CRESCENT	*MH 62*	*MH 63*		*0.27*		*7*	*0.27*	*7*	*4.43*	*0.11*							*0.000*	*0.27*	*0.27*	*0.04*	*0.00*	*30.60*	*200*	*1.00*	*31.93*	*1.03*	*0.00*
	MH 63	*MH 50*		*0.18*		*4*	*0.45*	*11*	*4.41*	*0.17*							*0.000*	*0.18*	*0.45*	*0.07*	*0.00*	*17.00*	*200*	*0.50*	*22.63*	*0.73*	*0.00*
GOLDSCHMIDT CRESCENT	*MH 50*	*MH 65*		*0.86*		*34*	*1.62*	*52*	*4.31*	*0.78*							*0.000*	*0.86*	*3.02*	*0.45*	*1.23*	*90.00*	*200*	*0.50*	*22.63*	*0.73*	*0.34*
	MH 65	*MH 64*		*0.73*		*27*	*2.35*	*79*	*4.27*	*1.18*							*0.000*	*0.73*	*3.75*	*0.56*	*1.74*	*91.50*	*200*	*0.60*	*24.80*	*0.80*	*0.42*
GOLDSCHMIDT CRESCENT	*MH 62*	*MH 61*		*0.38*		*10*	*0.38*	*10*	*4.42*	*0.15*							*0.000*	*0.38*	*0.38*	*0.06*	*0.00*	*40.80*	*200*	*1.00*	*31.93*	*1.03*	*0.00*
	MH 61	*MH 60*		*0.34*		*10*	*0.72*	*20*	*4.38*	*0.31*							*0.000*	*0.34*	*0.72*	*0.11*	*0.00*	*36.30*	*200*	*0.80*	*28.52*	*0.92*	*0.00*
	MH 60	*MH 59*		*0.25*		*7*	*0.97*	*27*	*4.36*	*0.41*							*0.000*	*0.25*	*0.97*	*0.15*	*0.00*	*25.20*	*200*	*0.80*	*28.52*	*0.92*	*0.00*
	MH 59	*MH 58*		*0.17*		*4*	*1.14*	*31*	*4.35*	*0.47*							*0.000*	*0.17*	*1.14*	*0.17*	*0.64*	*19.60*	*200*	*0.80*	*28.52*	*0.92*	*0.37*
	MH 58	*MH 57*		*0.85*		*34*	*1.99*	*65*	*4.29*	*0.98*							*0.000*	*0.85*	*1.99*	*0.30*	*1.28*	*87.60*	*200*	*0.80*	*28.52*	*0.92*	*0.43*
	MH 57	*MH 56*		*0.73*		*27*	*2.72*	*92*	*4.25*	*1.37*							*0.000*	*0.73*	*2.72*	*0.41*	*1.78*	*92.40*	*200*	*0.58*	*24.18*	*0.78*	*0.41*
STUCKEY AVENUE	*MH 44*	*MH 64*		*0.56*		*30*	*0.56*	*30*	*4.36*	*0.46*							*0.000*	*0.56*	*0.56*	*0.08*	*0.54*	*90.00*	*200*	*1.00*	*31.93*	*1.03*	*0.00*
STUCKEY AVENUE	*MH 64*	*MH 96*		*0.28*		*14*	*3.19*	*123*	*4.22*	*1.82*							*0.000*	*0.28*	*4.59*	*0.69*	*2.51*	*60.00*	*200*	*0.50*	*22.63*	*0.73*	*0.45*
	MH 96	*MH 56*		*0.28*		*14*	*3.47*	*137*	*4.20*	*2.01*							*0.000*	*0.28*	*4.87*	*0.73*	*2.74*	*60.00*	*200*	*0.50*	*22.63*	*0.73*	*0.48*
STUCKEY AVENUE	*MH 56*	*MH 70*		*0.56*		*30*	*6.75*	*259*	*4.11*	*3.73*							*0.000*	*0.56*	*8.15*	*1.22*	*4.95*	*90.00*	*200*	*0.50*	*22.63*	*0.73*	*0.55*
KROPF DRIVE	*MH 85*	*MH 74*		*0.18*		*7*	*0.18*	*7*	*4.43*	*0.11*							*0.000*	*0.18*	*0.18*	*0.03*	*0.00*	*17.20*	*200*	*1.36*	*37.20*	*1.20*	*0.00*
	MH 74	*MH 73*		*0.80*		*37*	*0.98*	*44*	*4.33*	*0.67*							*0.000*	*0.80*	*0.98*	*0.15*	*0.82*	*74.90*	*200*	*1.32*	*36.58*	*1.18*	*0.47*
	MH 73	*MH 72*		*0.79*		*37*	*1.77*	*81*	*4.27*	*1.21*							*0.000*	*0.79*	*1.77*	*0.27*	*1.48*	*88.30*	*200*	*1.33*	*36.89*	*1.19*	*0.56*
KROPF DRIVE	*MH 97*	*MH 72*		*0.27*		*7*	*0.27*	*7*	*4.43*	*0.11*							*0.000*	*0.27*	*0.27*	*0.04*	*0.15*	*37.10*	*200*	*1.35*	*37.20*	*1.20*	*0.00*
					196 People/ Ha for Multi 72 People/ Ha for Single					***275 l/p/day***										***0.00025 cums/Ha for infiltration***							
Activa North Subdivision			Multi	0.72		**141**																					
	PLUG	MH 72	Single	2.50		**180**	*3.22*	*321*	*4.07*	***4.18***							*0.000*	*3.22*	*3.22*	***0.81***	*4.99*	16.10	200	0.50	*22.63*	0.73	0.57
ISAAC SHANTZ DRIVE	*MH 72*	*MH 71*		*0.42*		*17*	*5.68*	*426*	*4.01*	*5.98*							*0.000*	*0.42*	*5.68*	*0.85*	*6.83*	*90.10*	*200*	*0.46*	*21.70*	*0.70*	*0.61*
JOSEPH LICHTI LANE	*MH 84*	*MH 75*		*0.71*		*40*	*0.71*	*40*	*4.33*	*0.61*							*0.000*	*0.71*	*0.71*	*0.11*	*0.72*	*88.30*	*200*	*1.53*	*39.37*	*1.27*	*0.00*
	MH 75	*MH 71*		*0.72*		*40*	*1.43*	*80*	*4.27*	*1.20*							*0.000*	*0.72*	*1.43*	*0.21*	*1.41*	*88.40*	*200*	*0.57*	*24.18*	*0.78*	*0.37*
ISAAC SHANTZ DRIVE	*MH 71*	*MH 70*		0.35		10	7.46	516	3.97	7.17							*0.000*	0.35	7.46	*1.12*	8.29	89.70	200	0.64	*25.42*	0.82	0.73
STUCKEY AVENUE	*MH 83*	*MH 76*		*0.44*		*20*	*0.44*	*20*	*4.38*	*0.31*							*0.000*	*0.44*	*0.44*	*0.07*	*0.00*	*87.80*	*200*	*1.00*	*31.93*	*1.03*	*0.00*
	MH 76	*MH 70*		*0.44*		*20*	*0.88*	*40*	*4.33*	*0.61*							*0.000*	*0.44*	*0.88*	*0.13*	*0.74*	*90.00*	*200*	*0.50*	*22.63*	*0.73*	*0.29*
ISSAC SHANTZ DRIVE	*MH 70*	*MH 69*		*0.80*		*34*	*15.89*	*849*	*3.85*	*11.44*							*0.000*	*0.80*	*17.29*	*2.59*	14.03	*80.80*	*200*	*0.50*	*22.63*	*0.73*	*0.77*
	MH 69	*MH 68*		*1.31*		*47*	*17.20*	*896*	*3.83*	*12.01*							*0.000*	*1.31*	*18.60*	*2.79*	*14.80*	*82.10*	*200*	*0.44*	*21.08*	*0.68*	*0.74*
KROPF DRIVE	*MH 85*	*MH 84*		*0.38*		*17*	*0.38*	*17*	*4.39*	*0.26*							*0.000*	*0.38*	*0.38*	*0.06*	*0.00*	*78.60*	*200*	*1.58*	*39.99*	*1.29*	*0.00*
	MH 84	*MH 83*		*0.50*		*20*	*0.88*	*37*	*4.34*	*0.56*							*0.000*	*0.50*	*0.88*	*0.13*	*0.69*	*90.20*	*200*	*1.48*	*38.75*	*1.25*	*0.00*
ERHARDT WAGNER PLACE	*MH 83*	*MH 82*		*0.51*		*20*	*1.39*	*57*	*4.30*	*0.86*							*0.000*	*0.51*	*1.39*	*0.21*	*1.07*	*68.00*	*200*	*0.60*	*24.80*	*0.80*	*0.38*
	MH 82	*MH 81*		*0.63*		*30*	*2.02*	*87*	*4.26*	*1.30*							*0.000*	*0.63*	*2.02*	*0.30*	*1.60*	*69.60*	*200*	*0.50*	*22.63*	*0.73*	*0.38*
ERHARDT WAGNER PLACE	*MH 88*	*MH 87*		*0.80*		*27*	*0.80*	*27*	*4.36*	*0.41*							*0.000*	*0.80*	*0.80*	*0.12*	*0.00*	*30.20*	*200*	*1.00*	*31.93*	1.03	0.00
	MH 87	*MH 86*		*0.49*		*23*	*1.29*	*50*	*4.32*	*0.76*							*0.000*	*0.49*	*1.29*	*0.19*	*0.95*	*58.10*	*200*	*0.50*	*22.63*	0.73	0.34
	MH 86	*MH 81*		*0.27*		*10*	*1.56*	*60*	*4.30*	*0.90*							*0.000*	*0.27*	*1.56*	*0.23*	*1.13*	*58.10*	*200*	*0.50*	*22.63*	0.73	0.34
HAMMACHER STREET	*MH 81*	*MH 80*		*0.40*		*14*	*3.98*	*161*	*4.18*	*2.36*							*0.000*	*0.40*	*3.98*	*0.60*	*2.96*	*76.30*	*200*	*0.50*	*22.63*	0.73	0.48
	MH 80	*MH 77*		*0.11*		*3*	*4.09*	*164*	*4.18*	*2.40*							*0.000*	*0.11*	*4.09*	*0.61*	*3.01*	*13.30*	*200*	*0.50*	*22.63*	0.73	0.48
HAMMACHER STREET	*MH 79*	*MH 78*		*0.29*		*13*	*0.29*	*13*	*4.40*	*0.20*							*0.000*	*0.29*	*0.29*	*0.04*	*0.00*	*21.10*	*200*	*1.00*	*31.93*	1.03	0.00
	MH 78	*MH 77*		*0.92*		*44*	*1.21*	*57*	*4.30*	*0.86*							*0.000*	*0.92*	*1.21*	*0.18*	*1.04*	*90.00*	*200*	*0.50*	*22.63*	0.73	0.34
EASEMENT	*MH 77*	*MH 98*		*0.00*		*0*	*5.30*	*221*	*4.13*	*3.19*							*0.000*	*0.00*	*5.30*	*0.80*	*3.99*	*44.20*	200	0.50	*22.63*	0.73	0.53
	MH 98	*MH 68*		*0.00*		*0*	*5.30*	*221*	*4.13*	*3.19*							*0.000*	*0.00*	*5.30*	*0.80*	*3.99*	*60.90*	200	0.50	*22.63*	0.73	0.53
ISSAC SHANTZ DRIVE	*MH 68*	*MH 67*		*0.29*		*10*	*22.79*	*1127*	*3.77*	*14.87*							*0.000*	*0.29*	*24.19*	*3.63*	*18.50*	*43.20*	*200*	*0.55*	*23.56*	*0.76*	*0.85*
DITNER AVENUE	*MH 90*	*MH 89*		*0.41*		*17*	*0.41*	*17*	*4.39*	*0.26*							*0.000*	*0.41*	*0.41*	*0.06*	*0.00*	*35.30*	*200*	*1.06*	*32.86*	*1.06*	*0.00*
	MH 89	*MH 67*		*0.26*		*10*	*0.67*	*27*	*4.36*	*0.41*							*0.000*	*0.26*	*0.67*	*0.10*	*0.00*	*36.40*	*200*	*0.46*	*21.70*	*0.70*	*0.00*
ISSAC SHANTZ	*MH 67*	*MH 66*		*0.24*		*7*	*23.70*	*1161*	*3.76*	*15.28*							*0.000*	*0.24*	*25.10*	*3.77*	*19.05*	*40.00*	*200*	*0.46*	*21.70*	*0.70*	*0.79*
	MH 66	*MH 9*		*0.37*		*7*	*24.07*	*1168*	*3.76*	*15.37*							*0.000*	*0.37*	*25.47*	*3.82*	*19.19*	*42.40*	*200*	*0.56*	*23.87*	*0.77*	*0.86*
LIVINGSTON BOULEVARD	*MH 14*	*MH 13*		*0.23*		*10*	*0.23*	*10*	*4.42*	*0.15*							*0.000*	*0.23*	*0.23*	*0.03*	*0.00*	*43.30*	*200*	*0.81*	*28.83*	*0.93*	*0.00*
	MH 13	*MH 12*		*0.11*		*3*	*0.34*	*13*	*4.40*	*0.20*							*0.000*	*0.11*	*0.34*	*0.05*	*0.00*	*33.50*	*200*	*0.68*	*26.35*	*0.85*	*0.00*
	MH 12	*MH 11*		*0.17*		*7*	*0.51*	*20*	*4.38*	*0.31*							*0.000*	*0.17*	*0.51*	*0.08*	*0.00*	*36.20*	*200*	*0.73*	*27.28*	*0.88*	*0.00*
LIVINGSTON BOULEVARD	*PLUG*	*MH 11*		*0.00*		*0*	*0.00*	*0*	*0.00*	*0.00*					*2.25*	*2.25*	*5.625*	*2.25*	*2.25*	*0.34*	*5.97*	*15.00*	*200*	*0.71*	*26.97*	*0.87*	*0.68*

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SUBDIVISION: **ACTIVA BADEN** **60305680**

SANITARY SEWER DESIGN SHEET

DATE: June 21, 2021
DESIGNED BY: JM
CHECKED BY: HL
FILE NUMBER: 30T-04603
MDS Lands - Third Submission

Township of Wilmot.

DESIGN PARAMETERS

AVERAGE DAILY FLOW PER PERSON = 305 l/p/day
MINIMUM FULL VELOCITY = 0.800 m/s
n = 0.013
MAX PEAK FAC.= 4.500
MIN PEAK FAC.= 1.500

RESIDENTIAL: 0.0000035 cums/p
COMMERCIAL: 0.00150 cums/Ha
INDUSTRIAL: 0.00100 cums/Ha
INSTITUTIONAL: 0.00250 cums/Ha
INFILTRATION: 0.00015 cums/Ha
RESIDENTIAL HARMON PEAKING FACTOR

LOCATION			RESIDENTIAL AREA AND POPULATION							COMM		INDUST		INSTIT		C+I+I	INFILTRATION			TOTAL FLOW	PIPE					
STREET	FROM M.H.	TO M.H.	AREA I.D.	AREA (ha)	POP. DENSITY (p/unit)	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (L/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (L/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (L/s)	(L/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (L/s)	VEL. (FULL) (m/s)	(ACT.) (m/s)
LIVINGSTON BOULEVARD																										
	MH 11	MH 10		0.51		20	1.02	40	4.33	0.61					0.00	2.25	5.625	0.51	3.27	0.49	6.73	85.30	200	0.73	27.28	0.88	0.70
	MH 10	MH 9		0.17		7	1.19	47	4.32	0.71						2.25	5.625	0.17	3.44	0.52	6.86	37.60	200	0.69	26.66	0.86	0.69
LIVINGSTON BOULEVARD																										
	MH 9	MH 8		0.30		13	25.56	1228	3.74	16.07						2.25	5.625	0.30	29.21	4.38	26.08	39.40	250	0.42	38.22	0.78	0.85
	MH 8	MH 7		0.39		20	25.95	1248	3.74	16.34						2.25	5.625	0.39	29.60	4.44	26.41	38.70	250	0.42	38.22	0.78	0.85
	MH 7	MH 6		0.22		10	26.17	1258	3.73	16.42						2.25	5.625	0.22	29.82	4.47	26.52	33.00	250	0.40	37.24	0.76	0.83
	MH 6	MH 5		0.15		7	26.32	1265	3.73	16.51						2.25	5.625	0.15	29.97	4.50	26.64	26.00	250	0.50	41.65	0.85	0.90
DITNER AVENUE	MH 90	MH 94		0.70		33	0.70	33	4.35	0.50					0.00	0.00	0.000	0.70	0.70	0.11	0.61	87.40	200	0.70	26.66	0.86	0.34
	MH 94	MH 92		0.44		17	1.14	50	4.32	0.76							0.000	0.44	1.14	0.17	0.93	89.30	200	0.45	21.39	0.69	0.32
HONDERICH PLACE	MH 93	MH 92		0.95		33	0.95	33	4.35	0.50					0.00	0.00	0.000	0.95	0.95	0.14	0.64	56.60	200	0.94	31.00	1.00	0.40
HONDERICH PLACE	MH 92	MH 91		0.26		10	2.35	93	4.25	1.38					0.00	0.00	0.000	0.26	2.35	0.35	1.73	31.30	200	0.54	23.56	0.76	0.40
	MH 91	MH 5		0.67		30	3.02	123	4.22	1.82							0.000	0.67	3.02	0.45	2.27	82.50	200	0.64	25.42	0.82	0.48
LIVINGSTON BOULEVARD	MH 5	MH 4		0.31		10	29.65	1398	3.70	18.10					0.00	2.25	5.625	0.31	33.30	5.00	28.73	90.00	300	0.27	50.41	0.71	0.73
LIVINGSTON BOULEVARD																										
	MH 4	MH 3		0.17		0	55.25	2579	3.50	31.59					0.00	2.25	5.625	0.17	57.37	8.61	45.83	84.00	300	0.28	51.12	0.72	0.82
	MH 3	MH2A		0.25		0	55.50	2579	3.50	31.59						2.25	5.625	0.25	57.62	8.64	45.86	48.20	300	0.26	49.70	0.70	0.81
FUT. TH BLK	Plug	MH2A		1.23		102	1.23	102	4.24	1.51					0.00	0.00	0.000	1.23	1.23	0.18	1.69	20.00	200	0.68	26.35	0.85	0.44
LIVINGSTON BOULEVARD	MH2A	MH2		0.00		0	56.73	2681	3.48	32.65					0.00	2.25	5.625	0.00	58.85	8.83	47.11	36.50	300	0.26	49.70	0.70	0.81
LIVINGSTON BOULEVARD	PLUG	MH 2		0.00		0	0.00	0	0.00	0.00	0.91	0.91			0.00	0.00	0.001	0.91	0.91	0.14	0.14	20.00	200	0.51	22.94	0.74	0.00
LIVINGSTON BOULEVARD	MH 2	MH 1		0.22		0	56.95	2681	3.48	32.65	0.00	0.91			0.00	2.25	5.626	0.22	59.98	9.00	47.28	63.10	300	0.38	59.64	0.84	0.94

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Activa
Activa Baden North

DATE: July 20, 2022
DESIGNED BY: JBM
CHECKED BY: HL

SANITARY SEWER DESIGN SHEET

(Sewers Discharging to Proposed Baden Trunk Sewer)

FILE NUMBER: N/A
Project Number 60305680

Design Parameters

Mininum Velocity=	0.800 m/s		0.0032 L/s/Person
n=	0.013	Comercial:	1.500 L/s/Ha
Max Peak Factor=	4.500	Industrial:	1.000 L/s/Ha
Min Peak Factor=	1.500	Institutional:	0.375 L/s/Ha
		Infiltration:	0.250 L/s/Ha
		Residential:	275 L/day/Person

LOCATION			RESIDENTIAL AREA AND POPULATION								COMMERCIAL			INDUSTRIAL			INSTITUTIONAL				INFILTRATION				PIPE SELECTION						
Street	U/S	D/S	Area ID	Residential Area (ha)	Population Density (P/ha)	Population (P)	Cummulative Area (ha)	Cumulative Population (min)	Peak Factor	Peak Flow L/s	Area ID	Area (ha)	Accumulated Area (ha)	Area ID	Area (ha)	Accumulated Area (ha)	Area ID	Area (ha)	Accumulated Area (ha)	Total C+I+I Flow (L/s)	Total Area (ha)	Accumulated Area (ha)	Flow (L/s)	Total Flow (L/s)	Length Design (m)	Design Size (mm)	Slope Design (%)	Full Capacity (L/s)	Full Velocity (m/s)	Actual Velocity (m/s)	Q_A/Q_C (%)
Single Family Blocks	1	2	-	17.80	72	1282	17.80	1282	3.73	15.21			0.00			0.00			0.00	0.00	17.80	17.80	4.450	19.66	90.0	300	0.50	73.52	1.07	1.10	26.7%
Multi Famly Blocks	2	3	-	3.48	196	682	21.28	1964	3.59	22.45			0.00			0.00			0.00	0.00	3.48	21.28	5.320	27.77	90.0	300	0.50	73.52	1.07	1.10	37.8%

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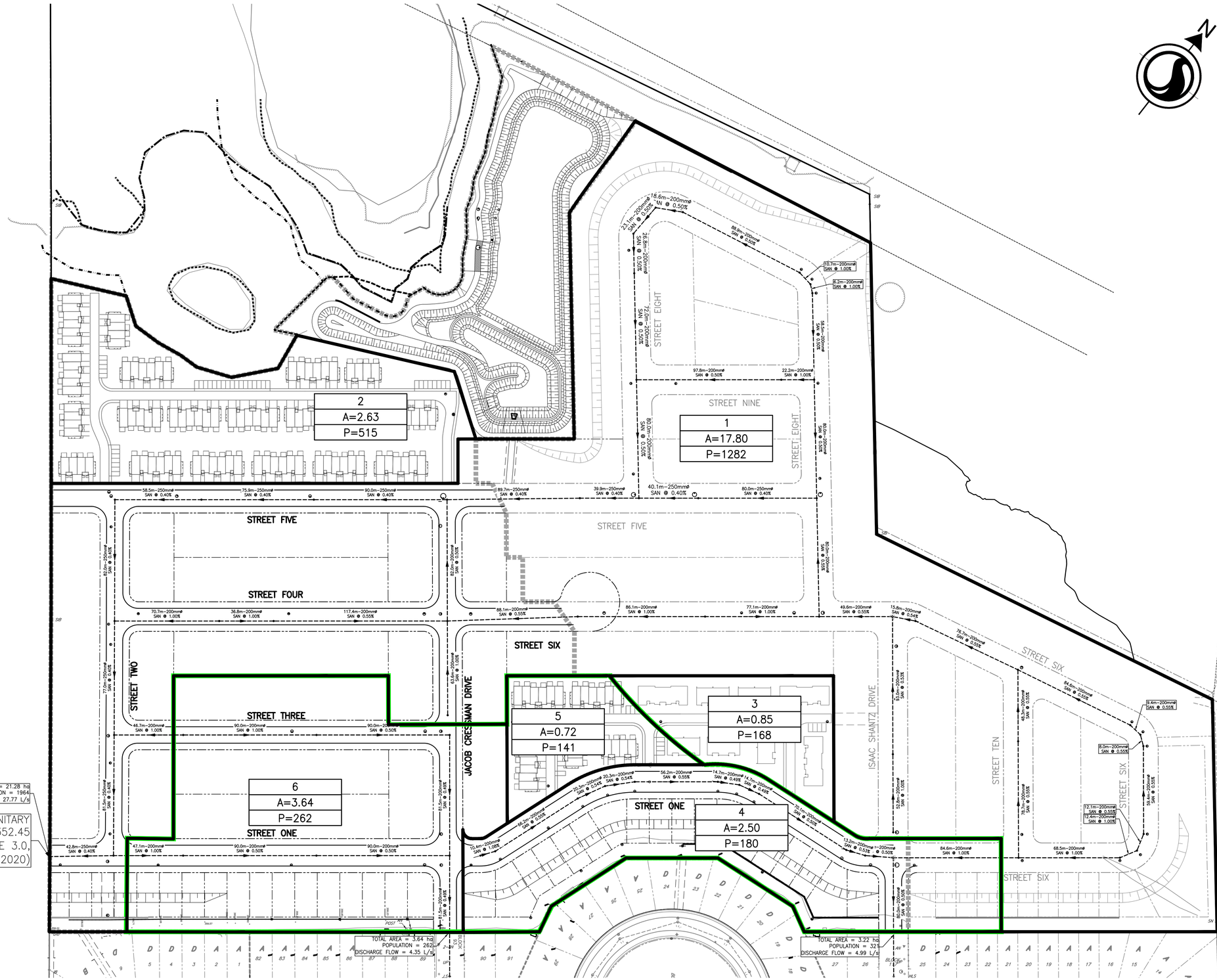

Stantec

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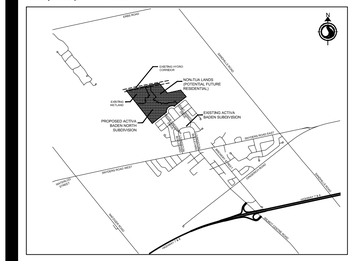
Notes

1. DRAFT PLAN PREPARED BY MHBC, DATED JULY 18, 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 LIDAR POINT CLOUD (2016-18) LAND INFORMATION ONTARIO DATASET.

Key Map NTS.



Legend

SERVICEABLE AREA FOR DISCHARGE TO EXISTING SEWERS

Revision	By	Appd	YYYY.MM.DD
0 FSR - FIRST SUBMISSION	JBM	HL	2022.07.22
File Name: 60305680_C-120SS-FSR_TOWNSHIP	JBM Dwn.	HL Chkd.	JBM Dsgn. 2022.07.20 YY.MM.DD

Permit-Seal

PRELIMINARY NOT FOR CONSTRUCTION

Not for permits, pricing or other official purposes. This document has not been completed or checked and is for general information or comment only.

Client/Project
ACTIVA HOLDINGS INC.

ACTIVA BADEN NORTH

Baden, Ontario

Title
CONCEPTUAL SANITARY DRAINAGE AREA PLAN

Project No. 60305680

Scale 1:1000 (0, 10, 30, 50m)

Revision 0 Sheet of

Drawing No. **C-120**

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7/22/2022 4:53:21 PM By: Miller, Jonathon

ORIGINAL SHEET - ARCH D

APPENDIX D

STORM DRAINAGE AREA PLAN DRAWING # 11 FOR
THE EXISTING ACTIVA BADEN SUBDIVISION

DEDICATED STORM SEWER DESIGN LETTER DATED JULY 2022

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
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Principal/Practice Leader
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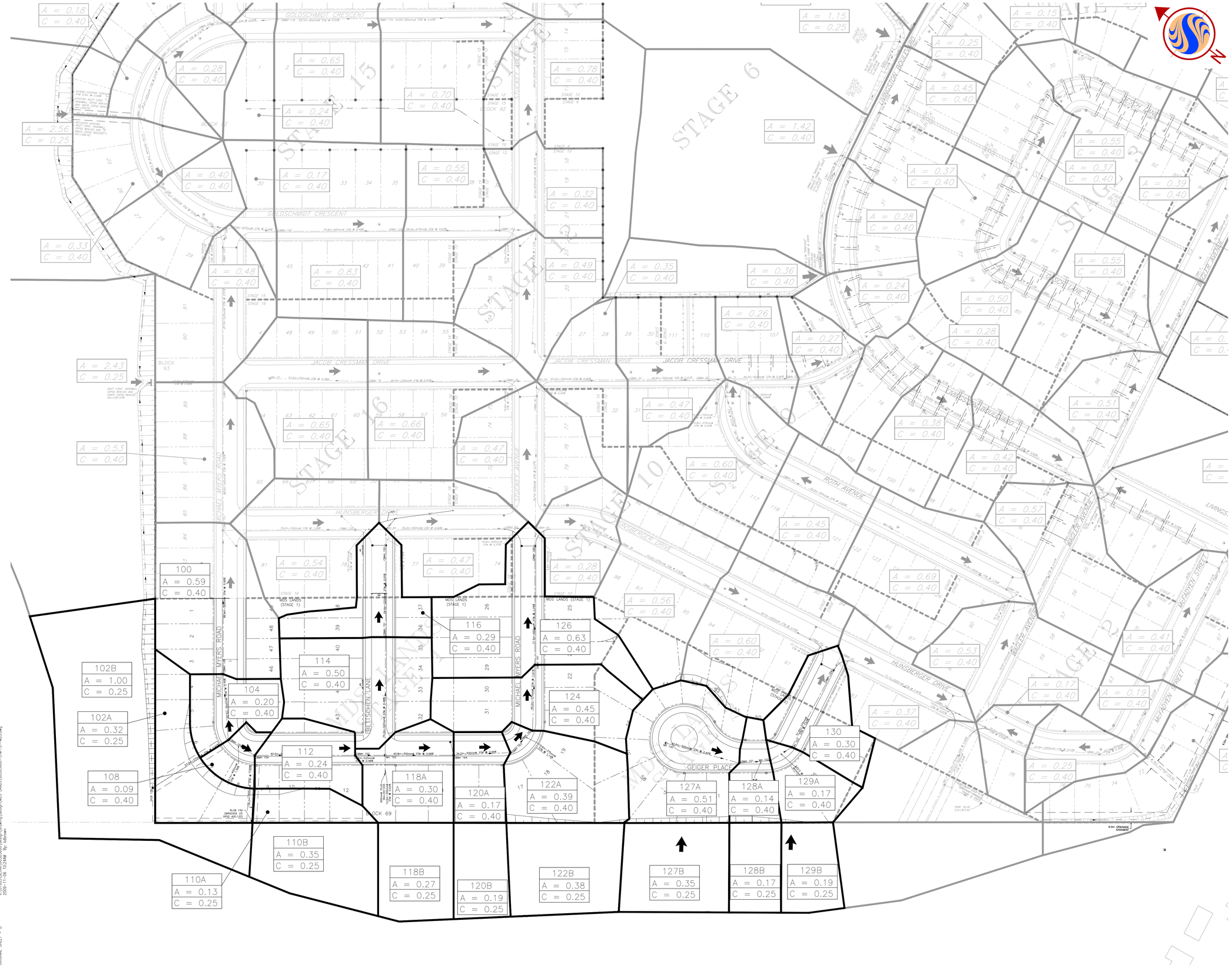
Attachments:
Storm Drainage Area Plan Drawing # 11 for Existing Baden Subdivision
Preliminary OPC Cost Estimates dated June 22, 2021 (3 pages)
Drainage Catchments Proposed Areas for Dedicated Storm Sewer Pipe
Preliminary Design Spreadsheet for Dedicated Storm Sewer Pipe
Preliminary Proposed Grading Plan 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 #1) 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. W5-117-11.

STAGING / PHASING LIMITS

110A
A = 0.09
C = 0.25

DRAINAGE AREA I.D.
DRAINAGE AREA (ha)
RUNOFF COEFFICIENT

DRAINAGE AREA BOUNDRY

EXTERNAL DRAINAGE

AC=0.34
Tc=15.00

ACCUMULATED AREAxRUNOFF COEFFICIENT
TIME OF CONCENTRATION

MAJOR OVERLAND FLOW

16. MDS LANDS – MOE COMMENTS	K.D.B.	P.D.F.	09.11.06
15. MDS STAGE 2 – FINAL LOTTING	K.D.B.	P.D.F.	09.10.26
14. MDS STAGE 1 – SECOND SUBMISSION	K.D.B.	P.D.F.	09.09.11
13. MDS STAGE 1 – FIRST SUBMISSION	K.D.B.	K.D.	09.07.07
12. THIRD SUBMISSION	K.D.B.	K.D.	08.05.09
11. SECOND SUBMISSION	J.C.M.	K.D.	08.01.16
10. STAGES 15 & 16 FINAL LOTTING	D.F.H.	V.E.R.	07.05.25
9. STAGES 10,17,18&MDS LANDS STG2 FIRST SUBMISSION COMMENTS	D.F.H.	V.E.R.	06.02.01
8. STAGES 10,17,18&MDS LANDS STG 2 FINAL LOTTING	D.F.H.	V.E.R.	05.12.16
7. STAGES 11,12,13&14 FIRST SUBMISSION COMMENTS	D.F.H.	V.E.R.	05.07.21
6. STAGES 11,12,13 & 14 FINAL LOTTING	D.F.H.	V.E.R.	05.03.18
5. AS RECORDED STAGES 2,7,8, & 9			
4. STAGES 2,7,8 & 9 FIRST SUBMISSION COMMENTS	M.D.H.	V.E.R.	04.03.04
3. STAGES 2,7,8 & 9 FINAL LOTTING	M.D.H.	V.E.R.	04.02.10
2. REGION OF WATERLOO COMMENTS	KRB	VER	01.10.10
1. FIRST SUBMISSION COMMENTS	KRB	VER	01.08.16
Revision	By	Appd.	Date
File Name:	K.R.B.	V.E.R.	01.06.01
	Dwn.	Chkd.	Dsgn.	Date

Seal

Client/Project
ACTIVA HOLDINGS INC.

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

Title
STORM DRAINAGE AREA PLAN

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

ORIGINAL SHEET - D
V:\01603\active\60305680\design\drawing\design\MDS_LANDS\60305680-STM-ST-MDS.dwg
2009-11-06 10:24AM By: kdorman

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**

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

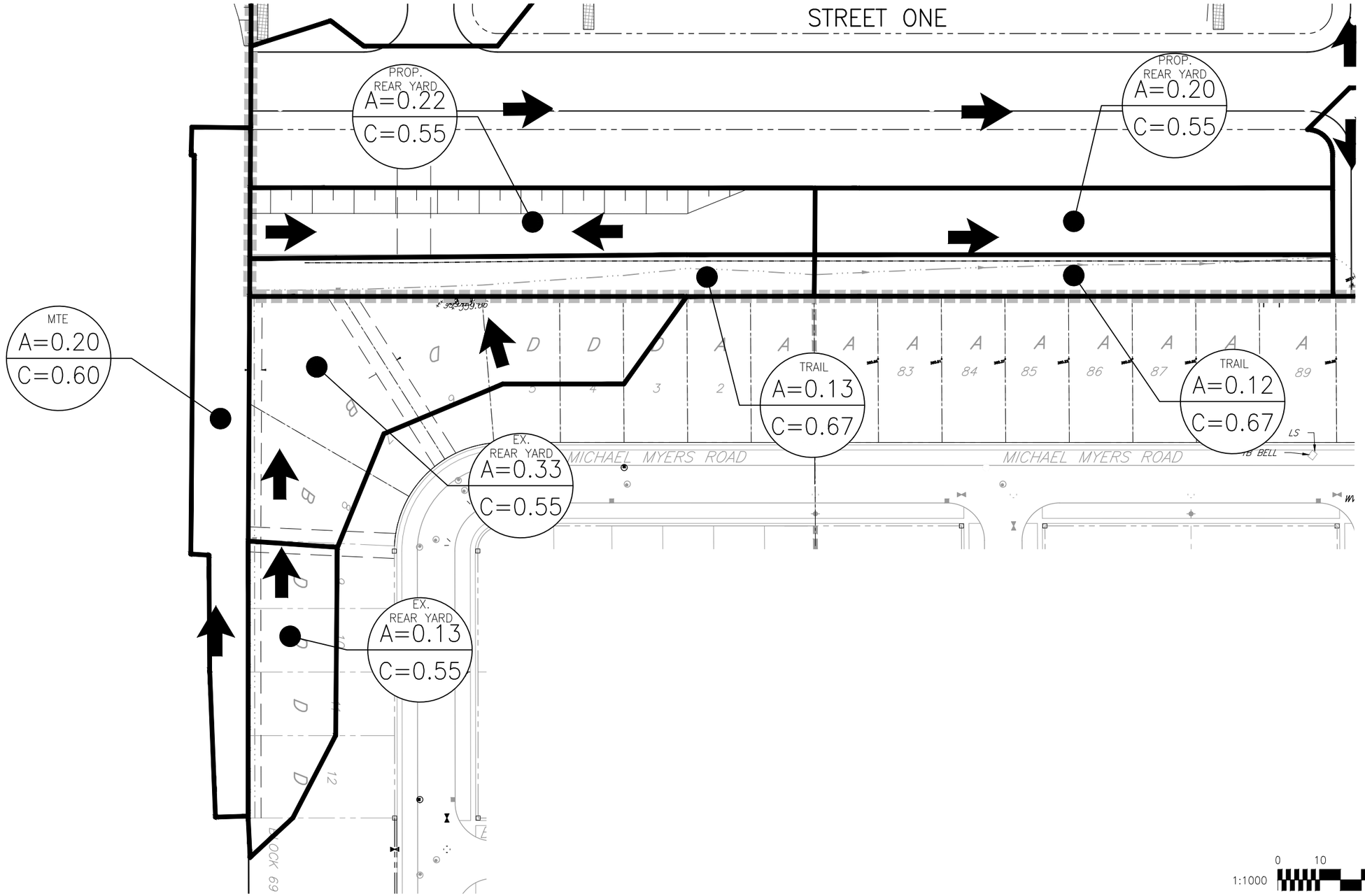
Item	Description	Unit	Quantity	Unit Price	Total
ROW Storm Pipe c/w Outlet Headwall					
1.0	300 mm dia Storm Sewers	m	66.0	$ 150.00	$ 9,900.00
2.0	375 mm dia Storm Sewers	m	82.0	$ 190.00	$ 15,580.00
3.0	450 mm dia Storm Sewers	m	80.0	$ 225.00	$ 18,000.00
4.0	525 mm dia Storm Sewers	m	154.0	$ 300.00	$ 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**

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**



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

V:\01603\active\60305680\design\drawing\civil\sheet_files\60305680_C-110SD-FSR_TOWNSHIP_AREA DRAINING SOUTH.dwg
7/22/2022 1:18:47 PM By: Miller, Jonathan

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

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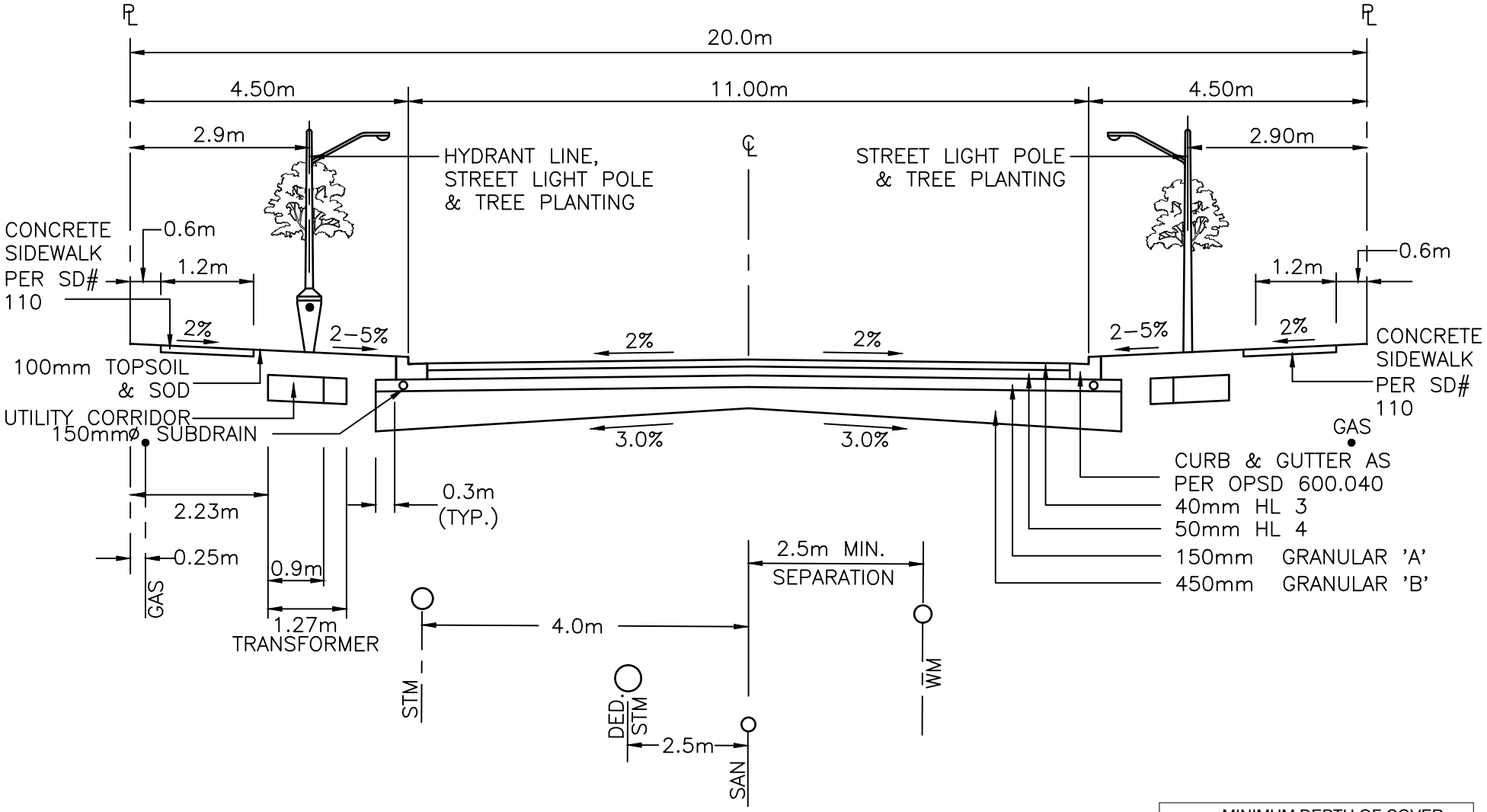


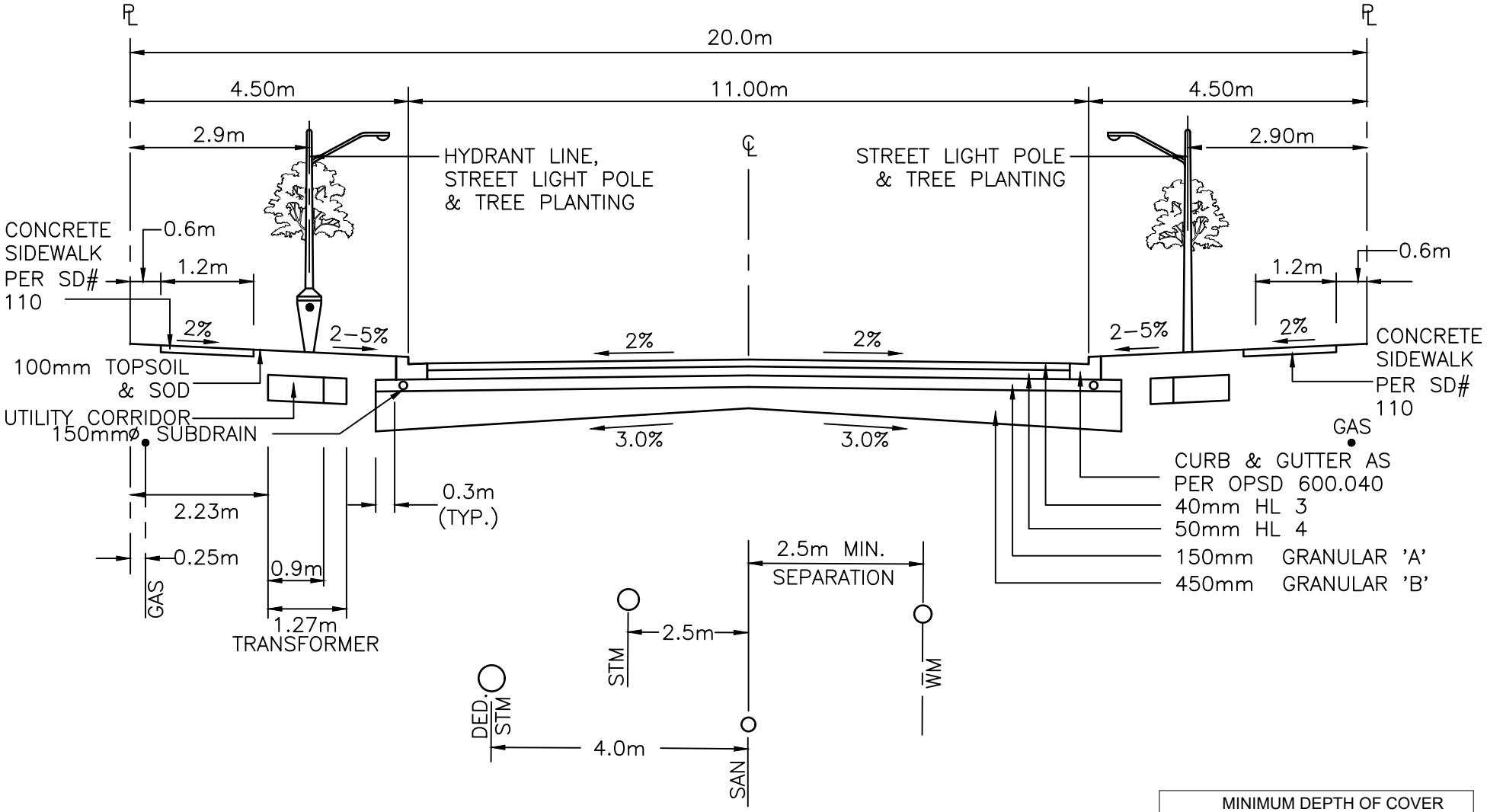
20.0m ROAD CROSS SECTION
STREET TWO

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



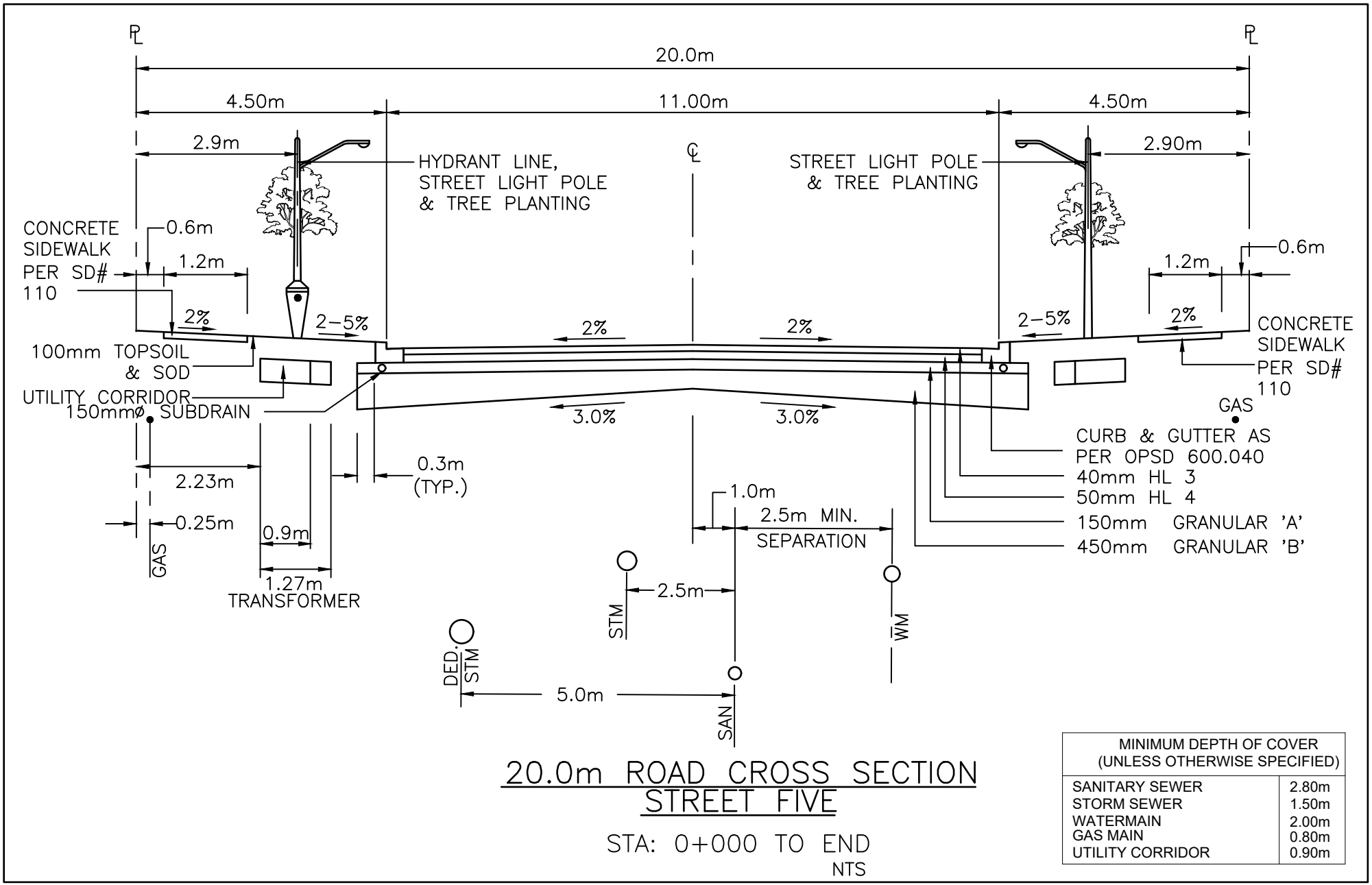
20.0m ROAD CROSS SECTION
STREET TWO

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



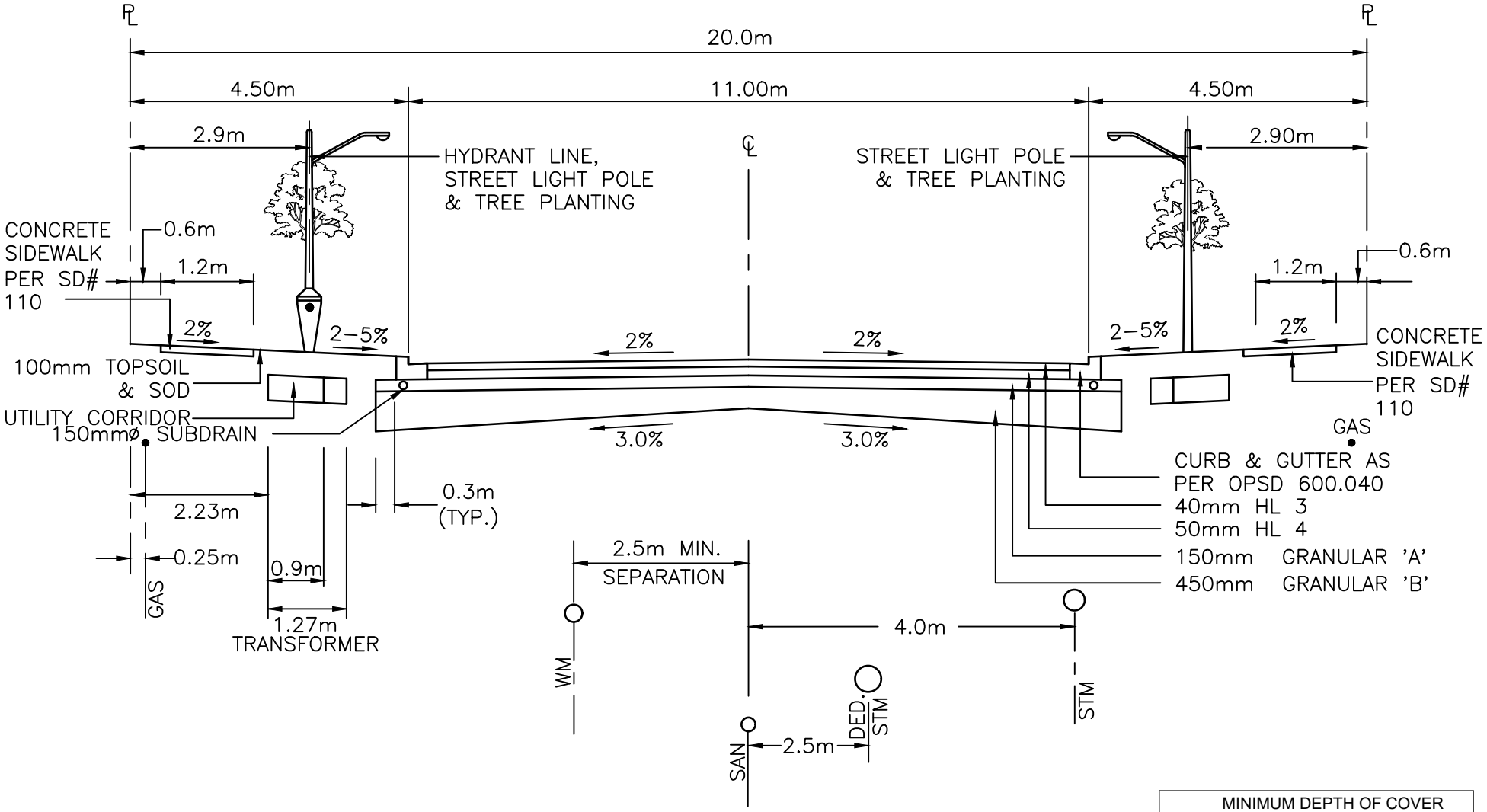
20.0m ROAD CROSS SECTION
STREET FIVE

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

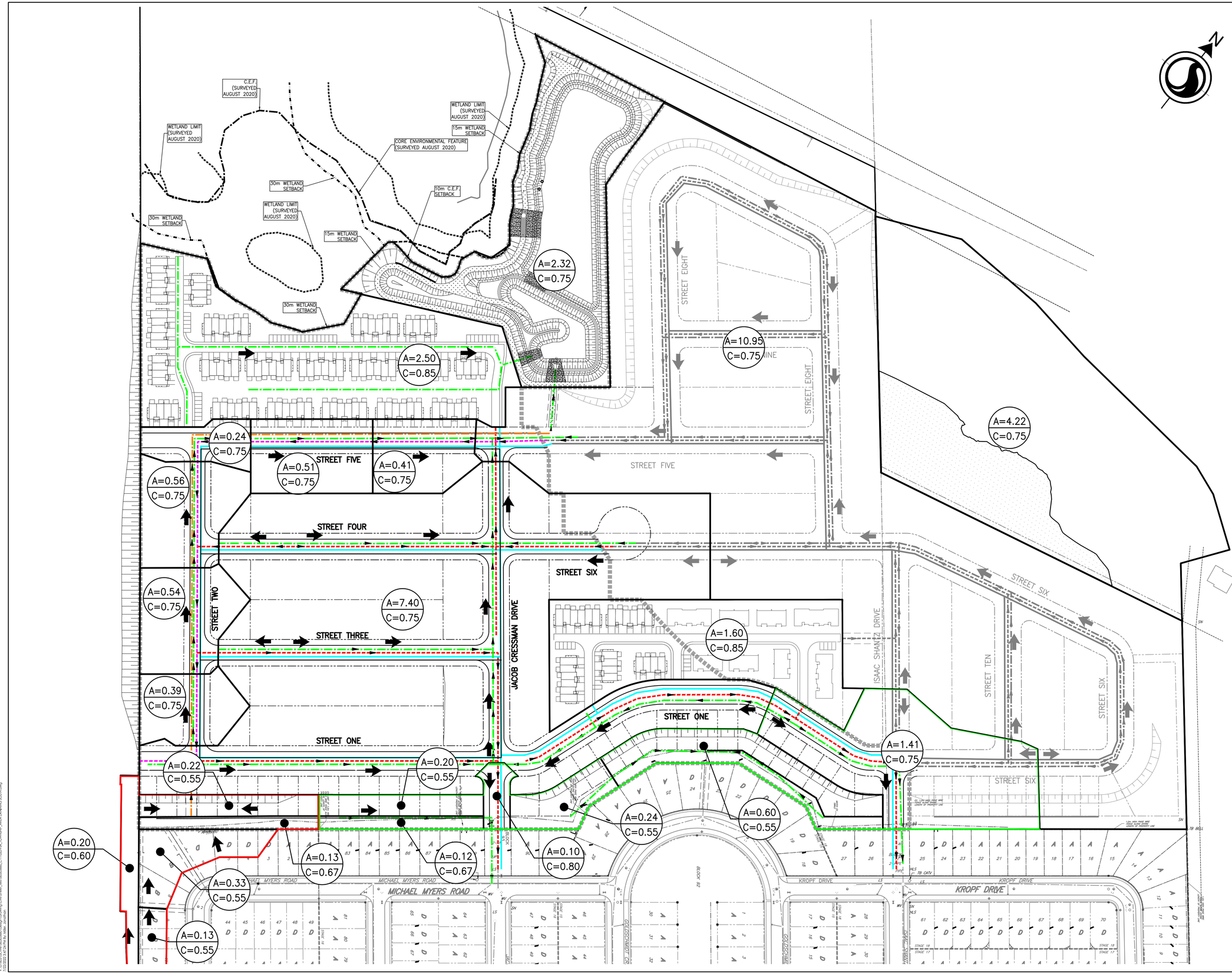


20.0m ROAD CROSS SECTION
STREET TWO

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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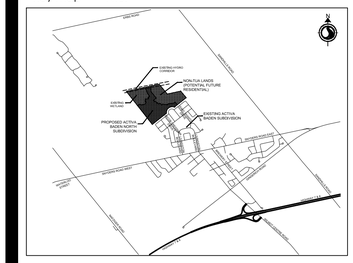
Notes

1. DRAFT PLAN PREPARED BY MHBC, DATED JULY 18, 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 LIDAR POINT CLOUD (2016-18) 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

0	FSR - FIRST SUBMISSION	JBM	HL	2022.07.22
Revision		By	Appd	YYYY.MM.DD

File Name: 60305680_C-110SD-FSR_TOWNSHIP_AREA DRAINING SOUTH — Dwn. JBM — Chkd. — Dsgn. JBM — 2022.07.22 YY.MM.DD

Permit-Seal

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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

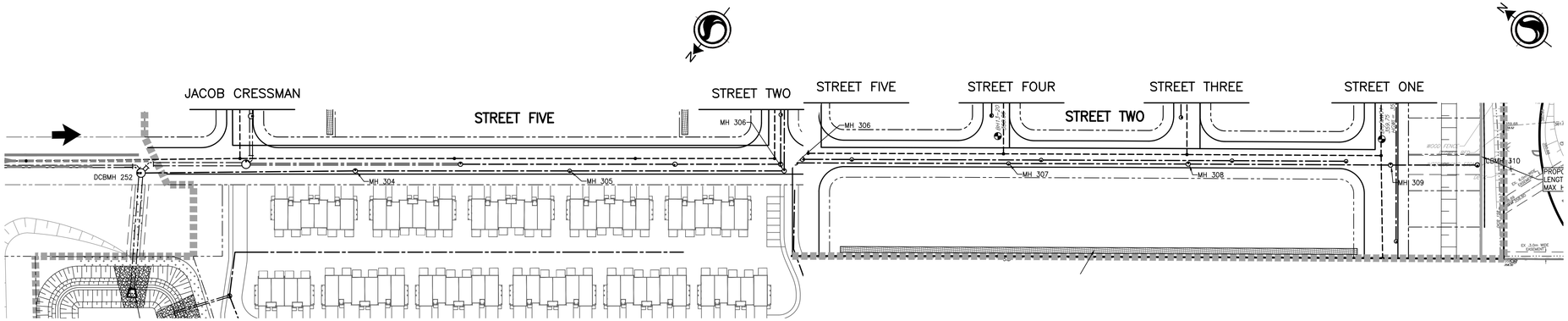
Scale 1:1250 (0, 12.5, 37.5, 62.5m)

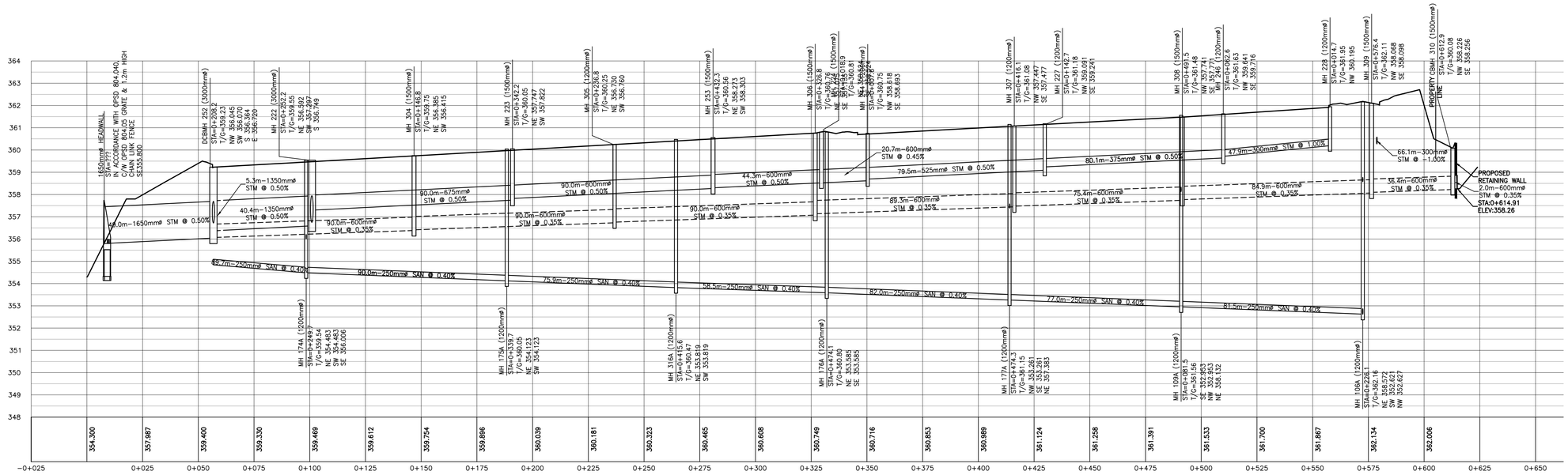
Revision — Sheet — of

Drawing No. **C110**

V:\01307\active\60305680\design\drawing\draft\dwg\C110-FSR_TOWNSHIP_AREA DRAINING SOUTH.dwg
7/22/2022 3:47:24 PM By: Miller, Jonathon

ORIGINAL SHEET - ARCH D





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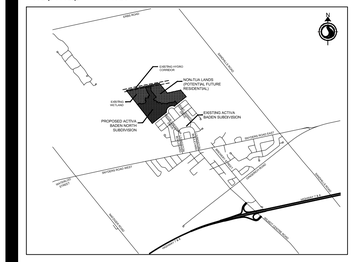
Notes

Key Map NTS.



Legend

0	FSR - FIRST SUBMISSION	JBM	HL	2022.07.22
Revision		By	Appd	YYYY.MM.DD
File Name: 60305680_C-FIG_TECH MEMO		JBM	HL	JBM 2022.07.22
		Dwn.	Chkd.	Dsgn. YY.MM.DD

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. 60305680

Scale 1:1000H 0 10 30 50m
1:100V 0 1 3 5m

Revision Sheet of

Drawing No. **TM100**

V:\2016\Active\60305680\design\drawing\civil\sheet_files\60305680_C-FIG_TECH MEMO.dwg 7/22/2022 3:52:01 PM By: Miller, Jonathon

ORIGINAL SHEET - ARCH D

APPENDIX E

WATER DISTRIBUTION

REGION OF WATERLOO CORRESPONDENCE

DETAILED DEMAND CALCULATIONS

PROPOSED WATERMAIN LAYOUT

DETAILED MODELING RESULTS

Region of Waterloo

TRANSPORTATION AND
ENVIRONMENTAL SERVICES
Water Services

150 Frederick Street
Kitchener ON Canada N2G 4J3
Telephone: (519) 575-4426
Fax: (519) 575-4452
www.region.waterloo.on.ca

Date: December 4, 2020
File #: E18-10/WI

Alex Cressman, E.I.T
Designer
MTE Consultants Inc.
520 Bingemans Centre Dr.
Kitchener, ON N2B 3X9
t. 519.743.6500 ext 1223
e. ACressman@mte85.com

Dear: Alex

Re: 1012 Snyder's Rd W., Baden

Please find the results of the modeling simulations for boundary conditions requested on Feb 5, 2020 and revised on Nov 9, 2020. Water Services resolved the issue that was draining the reservoir and causing questionable results.

The results included a figure showing the locations of the nodes from the Region's model. Attached are a series of spreadsheets containing results for Average Day, Maximum Day demands and available fire flows for nodes listed in Table 1 below as per your revised email of Nov 9, 2020.

There are two scenarios modelled 1B and 2B. They represent the scenarios with the higher demand with the institutional Block having demands located at Node 3 in your email. In addition, in Scenario 2B the demands assign to Node 4 were assigned to Node 5 as Node 4 does not exist in the existing Model.

Table 1 – Model Nodes

Location	Node	Description	Elev (mASL)
1	JCT_00365	Michael Myers Rd @ Bettschen Ln	360.8
2	JCT_00359	McFayden St @ Wagler Ave	357.6
3	JCT_00307	Street One @ Snyder's Rd W	358.7
5	JCT_00385	Michael Myers Rd @ Jacob Cressman Dr	359.2
6	JCT_00386	Kropf Dr @ Isaac Shantz Dr	357.4

The diurnal 24 hour demand distribution accounts for the minimum hour and peak hour peaking factors. The minimum hourly demand on the average day represents the minimum hour, and the maximum hourly demand on the maximum day represents the peak hour. Tables 2 and 3 below summarize the modeling results.

Table 2 – Modeling Results Scenario 1

Node	**Elevation** (mASL)	**Demand**		**Fire Flow Results**	
		Ave Day (L/s)	Max Day (L/s)	Design Flow (L/s)	Design Pressure (m)
JCT_00365	360.8	0.899	1.799	195.4	14.0
JCT_00359	357.6	0.737	1.473	287.4	15.1
JCT_00307	358.7	2.913	5.825	902.5	14.0

Table 3 – Modeling Results Scenario 2

Node	**Elevation** (mASL)	**Demand**		**Fire Flow Results**	
		Ave Day (L/s)	Max Day (L/s)	Design Flow (L/s)	Design Pressure (m)
JCT_00365	360.8	0.899	1.799	190.8	14.0
JCT_00359	357.6	0.737	1.473	281.0	15.3
JCT_00307	358.7	2.913	5.825	894.3	14.0
JCT_00385	359.2	2.116	4.234	210.1	14.0
JCT_00386	357.4	1.058	2.117	174.4	14.0

A fire flow analysis shows the maximum flow available at a node with an associated design pressure during the maximum day scenario while maintaining the minimum design pressure of 14 m (140 kPa) at all nodes within the pressure zone.

Please be advised the Region's Water Services will be about to undertake the Baden – New Hamburg Water and Wastewater Servicing Review (Review). Water Services will be engaging with all stakeholders as part of the Review. In previous studies, it was noted about a possibility for connecting the Foxboro Wastewater system to the Baden New Hamburg collection system. Should the Review determine recommendations to the collection and or distribution system, provisions within the draft plan would have to be made to accommodate those recommendations.

The Region's Project Manager for this Review is:

Kaoru Yajima, Senior Engineer
t: 519-575-4757 x 3349
e: kyajima@regionofwaterloo.ca

If you have any questions, please contact me.

Kevin Dolishny P.Eng.
Senior Engineer
t. 226.751.4551
e-mail: kdolishny@regionofwaterloo.ca

cc John Holowackyj - Region of Waterloo
Kaoru Yajima – Region of Waterloo
Steve Peterson - MTE

Baden New Hamburg Infowater Location :Michael Myers Road at Bettschen Lane

JCT_00365 Average Day 24 Hour Simulation

Time	Demand (L/s)	Head (m)	Pressure (m)
00:00 hrs	0.45	398.49	37.69
01:00 hrs	0.35	398.35	37.55
02:00 hrs	0.47	398.23	37.43
03:00 hrs	0.50	398.08	37.28
04:00 hrs	0.49	398.07	37.27
05:00 hrs	0.71	398.20	37.40
06:00 hrs	1.13	398.30	37.50
07:00 hrs	1.39	398.45	37.65
08:00 hrs	1.28	398.58	37.78
09:00 hrs	1.20	398.71	37.91
10:00 hrs	1.14	398.85	38.05
11:00 hrs	1.03	398.99	38.19
12:00 hrs	0.95	399.03	38.23
13:00 hrs	1.11	398.89	38.09
14:00 hrs	0.95	398.75	37.95
15:00 hrs	0.96	398.62	37.82
16:00 hrs	0.96	398.48	37.68
17:00 hrs	1.09	398.34	37.54
18:00 hrs	1.26	398.18	37.38
19:00 hrs	1.41	398.01	37.21
20:00 hrs	1.41	398.06	37.26
21:00 hrs	1.19	398.19	37.39
22:00 hrs	0.94	398.33	37.53
23:00 hrs	0.63	398.50	37.70

Average Day HGL:	398.44
Minimum Hour:	399.03

JCT_00365 Maximum Day 24 Hour Simulation

Time	Demand (L/s)	Head (m)	Pressure (m)
00:00 hrs	0.88	398.67	37.87
01:00 hrs	0.68	398.76	37.96
02:00 hrs	0.92	398.88	38.08
03:00 hrs	0.98	398.96	38.16
04:00 hrs	0.96	399.03	38.23
05:00 hrs	1.40	399.08	38.28
06:00 hrs	2.22	399.05	38.25
07:00 hrs	2.74	398.78	37.98
08:00 hrs	2.51	398.51	37.71
09:00 hrs	2.37	398.24	37.44
10:00 hrs	2.25	397.98	37.18
11:00 hrs	2.03	398.00	37.20
12:00 hrs	1.87	398.06	37.26
13:00 hrs	2.19	398.12	37.32
14:00 hrs	1.87	398.18	37.38
15:00 hrs	1.88	398.25	37.45
16:00 hrs	1.89	398.32	37.52
17:00 hrs	2.15	398.38	37.58
18:00 hrs	2.49	398.41	37.61
19:00 hrs	2.77	398.41	37.61
20:00 hrs	2.78	398.40	37.60
21:00 hrs	2.34	398.42	37.62
22:00 hrs	1.84	398.47	37.67
23:00 hrs	1.24	398.56	37.76

Maximum Day HGL:	398.50
Peak Hour:	397.98

Location :Michael Myers Road at Bettschen Lane

Available Flow (L/s)	Residual Pressure (m)
0.0	37.3
10.0	37.1
20.0	36.8
30.0	36.4
40.0	35.9
50.0	35.2
60.0	34.5
70.0	33.6
80.0	32.6
90.0	31.5
100.0	30.3
110.0	29.1
120.0	27.7
130.0	26.2
140.0	24.6
150.0	22.9
160.0	21.1
170.0	19.2
180.0	17.2
190.0	15.2
195.4	14.0

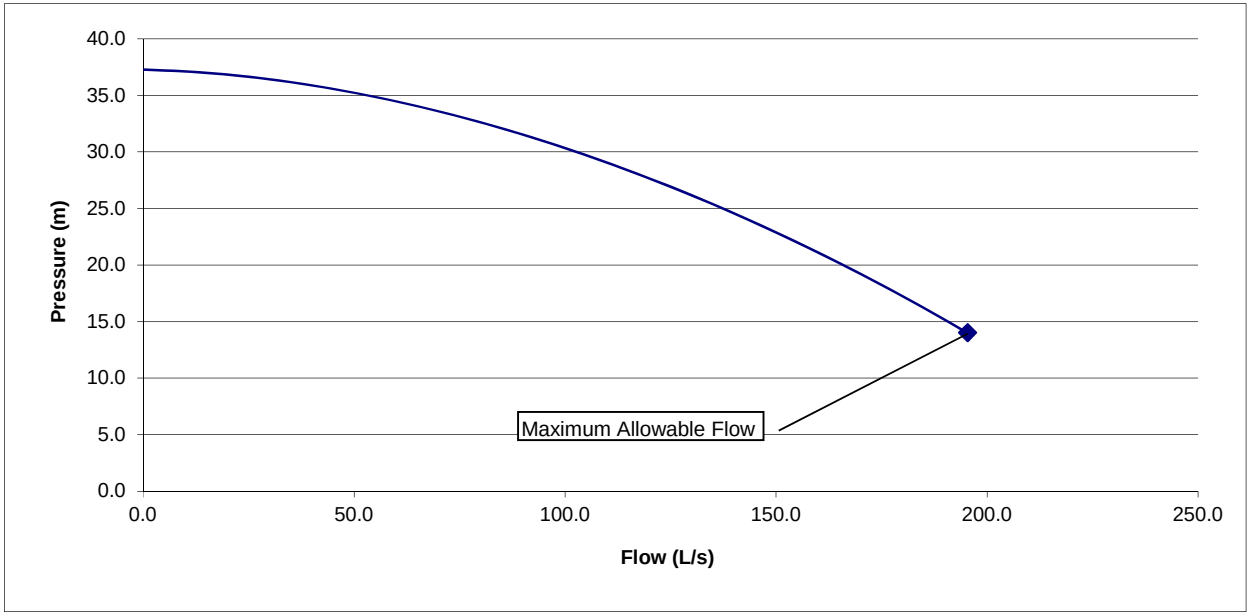
Fire Flow Analysis

Fire Flow Node:	JCT_00365
Design Flow (L/s):	195.4
Design Pressure (m)	14.0

The final adjusted flow at the node to maintain the minimum design pressure (14m (140 kPa)) at ALL locations within the pressure zone.

The lowest allowable pressure at the node to maintain the minimum design pressure (14m (140 kPa)) at ALL locations within the pressure zone.

The constraining node within the pressure zone that drops to the minimum design pressure of (14m (140 kPa)) during the design flow.



Baden New Hamburg Infowater Location :McFayden Street at Wagler Avenue

JCT_00359 Average Day 24 Hour Simulation

Time	Demand (L/s)	Head (m)	Pressure (m)
00:00 hrs	0.38	398.49	40.89
01:00 hrs	0.30	398.35	40.75
02:00 hrs	0.40	398.23	40.63
03:00 hrs	0.42	398.09	40.49
04:00 hrs	0.42	398.07	40.47
05:00 hrs	0.61	398.21	40.61
06:00 hrs	0.96	398.30	40.70
07:00 hrs	1.18	398.45	40.85
08:00 hrs	1.08	398.58	40.98
09:00 hrs	1.02	398.71	41.11
10:00 hrs	0.97	398.85	41.25
11:00 hrs	0.88	398.99	41.39
12:00 hrs	0.81	399.04	41.44
13:00 hrs	0.95	398.90	41.30
14:00 hrs	0.81	398.75	41.15
15:00 hrs	0.81	398.62	41.02
16:00 hrs	0.82	398.48	40.88
17:00 hrs	0.93	398.34	40.74
18:00 hrs	1.07	398.19	40.59
19:00 hrs	1.19	398.01	40.41
20:00 hrs	1.20	398.07	40.47
21:00 hrs	1.01	398.19	40.59
22:00 hrs	0.80	398.33	40.73
23:00 hrs	0.54	398.50	40.90

Average Day HGL:	398.45
Minimum Hour:	399.04

JCT_00359 Maximum Day 24 Hour Simulation

Time	Demand (L/s)	Head (m)	Pressure (m)
00:00 hrs	0.74	398.67	41.07
01:00 hrs	0.57	398.76	41.16
02:00 hrs	0.78	398.88	41.28
03:00 hrs	0.82	398.96	41.36
04:00 hrs	0.81	399.03	41.43
05:00 hrs	1.18	399.09	41.49
06:00 hrs	1.87	399.06	41.46
07:00 hrs	2.31	398.79	41.19
08:00 hrs	2.12	398.52	40.92
09:00 hrs	2.00	398.25	40.65
10:00 hrs	1.90	397.99	40.39
11:00 hrs	1.71	398.01	40.41
12:00 hrs	1.58	398.07	40.47
13:00 hrs	1.85	398.13	40.53
14:00 hrs	1.57	398.19	40.59
15:00 hrs	1.59	398.26	40.66
16:00 hrs	1.59	398.33	40.73
17:00 hrs	1.81	398.39	40.79
18:00 hrs	2.10	398.42	40.82
19:00 hrs	2.33	398.43	40.83
20:00 hrs	2.35	398.42	40.82
21:00 hrs	1.98	398.43	40.83
22:00 hrs	1.55	398.48	40.88
23:00 hrs	1.05	398.56	40.96

Maximum Day HGL:	398.50
Peak Hour:	397.99

Location :McFayden Street at Wagler Avenue

Fire Flow Analysis

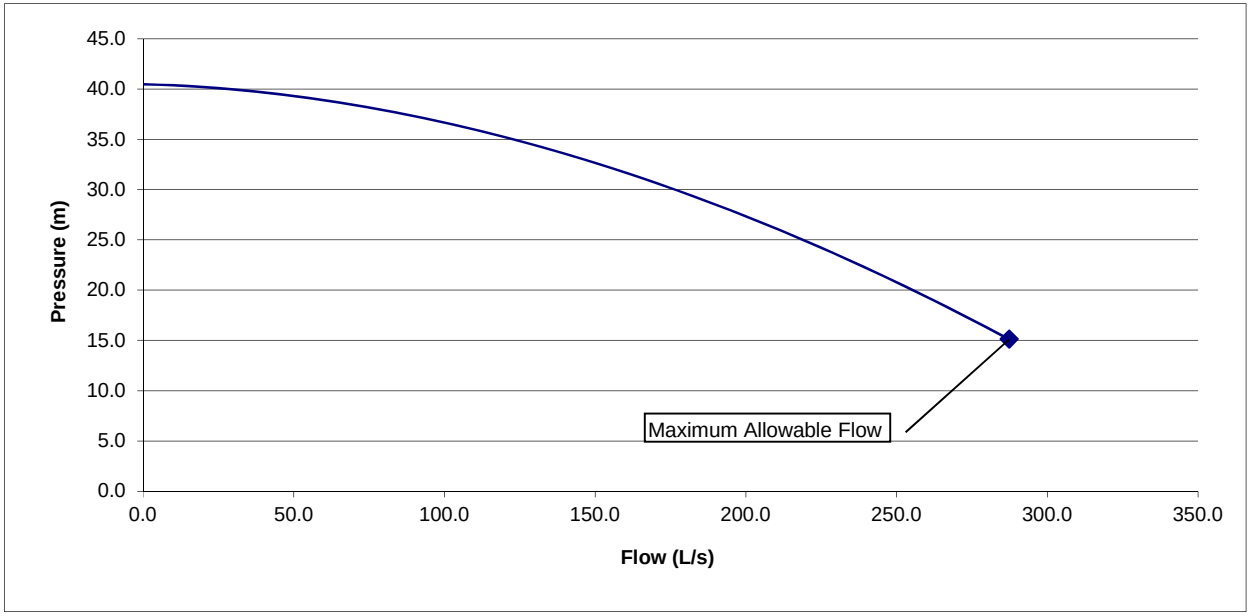
Fire Flow Node:	JCT_00359
Design Flow (L/s):	287.4
Design Pressure (m)	15.1

The final adjusted flow at the node to maintain the minimum design pressure (14m (140 kPa)) at ALL locations within the pressure zone.

The lowest allowable pressure at the node to maintain the minimum design pressure (14m (140 kPa)) at ALL locations within the pressure zone.

The constraining node within the pressure zone that drops to the minimum design pressure of (14m (140 kPa)) during the design flow.

Available Flow (L/s)	Residual Pressure (m)
0.0	40.5
10.0	40.4
20.0	40.2
30.0	40.0
40.0	39.7
50.0	39.3
60.0	38.9
70.0	38.4
80.0	37.9
90.0	37.3
100.0	36.7
110.0	36.0
120.0	35.2
130.0	34.4
140.0	33.6
150.0	32.7
160.0	31.7
170.0	30.7
180.0	29.6
190.0	28.5
200.0	27.3
210.0	26.1
220.0	24.9
230.0	23.6
240.0	22.2
250.0	20.8
260.0	19.3
270.0	17.8
280.0	16.3
287.4	15.1



Baden New Hamburg Infowater Location :Street One @ Snyder's Road West

JCT_00307 Average Day 24 Hour Simulation

Time	Demand (L/s)	Head (m)	Pressure (m)
00:00 hrs	1.37	398.50	39.80
01:00 hrs	1.06	398.36	39.66
02:00 hrs	1.44	398.24	39.54
03:00 hrs	1.53	398.10	39.40
04:00 hrs	1.50	398.05	39.35
05:00 hrs	2.20	398.20	39.50
06:00 hrs	3.50	398.30	39.60
07:00 hrs	4.31	398.46	39.76
08:00 hrs	3.96	398.59	39.89
09:00 hrs	3.73	398.72	40.02
10:00 hrs	3.54	398.85	40.15
11:00 hrs	3.20	399.00	40.30
12:00 hrs	2.94	399.05	40.35
13:00 hrs	3.45	398.92	40.22
14:00 hrs	2.93	398.77	40.07
15:00 hrs	2.96	398.63	39.93
16:00 hrs	2.97	398.50	39.80
17:00 hrs	3.38	398.36	39.66
18:00 hrs	3.92	398.21	39.51
19:00 hrs	4.36	398.04	39.34
20:00 hrs	4.38	398.08	39.38
21:00 hrs	3.69	398.19	39.49
22:00 hrs	2.90	398.33	39.63
23:00 hrs	1.95	398.49	39.79

Average Day HGL:	398.46
Minimum Hour:	399.05

JCT_00307 Maximum Day 24 Hour Simulation

Time	Demand (L/s)	Head (m)	Pressure (m)
00:00 hrs	2.73	398.66	39.96
01:00 hrs	2.11	398.75	40.05
02:00 hrs	2.86	398.87	40.17
03:00 hrs	3.04	398.95	40.25
04:00 hrs	2.98	399.02	40.32
05:00 hrs	4.38	399.09	40.39
06:00 hrs	6.95	399.08	40.38
07:00 hrs	8.56	398.87	40.17
08:00 hrs	7.87	398.59	39.89
09:00 hrs	7.41	398.31	39.61
10:00 hrs	7.04	398.05	39.35
11:00 hrs	6.35	398.03	39.33
12:00 hrs	5.85	398.09	39.39
13:00 hrs	6.86	398.16	39.46
14:00 hrs	5.83	398.20	39.50
15:00 hrs	5.88	398.28	39.58
16:00 hrs	5.91	398.35	39.65
17:00 hrs	6.73	398.42	39.72
18:00 hrs	7.80	398.46	39.76
19:00 hrs	8.67	398.47	39.77
20:00 hrs	8.71	398.46	39.76
21:00 hrs	7.33	398.46	39.76
22:00 hrs	5.76	398.49	39.79
23:00 hrs	3.88	398.57	39.87

Maximum Day HGL:	398.53
Peak Hour:	398.03

Location :Street One @ Snyder's Road West

Fire Flow Analysis

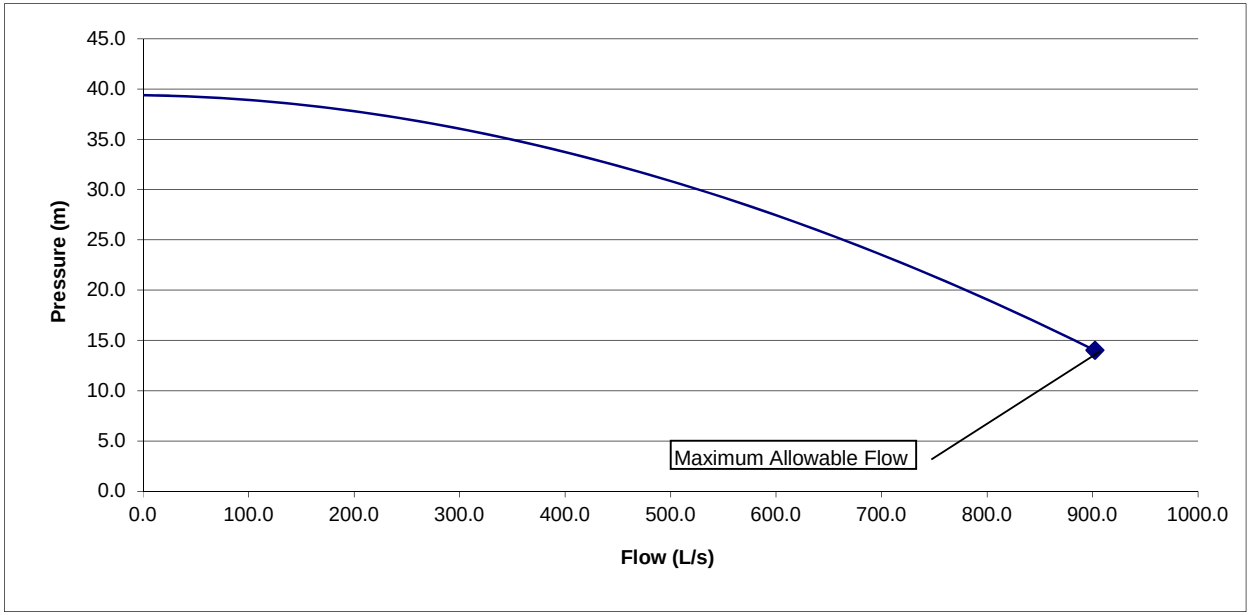
Fire Flow Node:	JCT_00307
Design Flow (L/s):	902.5
Design Pressure (m)	14.0

The final adjusted flow at the node to maintain the minimum design pressure (14m (140 kPa)) at ALL locations within the pressure zone.

The lowest allowable pressure at the node to maintain the minimum design pressure (14m (140 kPa)) at ALL locations within the pressure zone.

The constraining node within the pressure zone that drops to the minimum design pressure of (14m (140 kPa)) during the design flow.

Available Flow (L/s)	Residual Pressure (m)
0.0	39.4
25.0	39.4
50.0	39.3
75.0	39.1
100.0	38.9
125.0	38.7
150.0	38.5
175.0	38.1
200.0	37.8
225.0	37.4
250.0	37.0
275.0	36.6
300.0	36.1
325.0	35.5
350.0	35.0
375.0	34.4
400.0	33.7
425.0	33.1
450.0	32.4
475.0	31.6
500.0	30.9
525.0	30.1
550.0	29.2
575.0	28.4
600.0	27.5
625.0	26.5
650.0	25.6
675.0	24.6
700.0	23.5
725.0	22.5
750.0	21.4
775.0	20.2
800.0	19.1
825.0	17.9
850.0	16.7
875.0	15.4
900.0	14.1
902.5	14.0



Baden New Hamburg Infowater Location :Michael Myers Road at Bettschen Lane

JCT_00365 Average Day 24 Hour Simulation

Time	Demand (L/s)	Head (m)	Pressure (m)
00:00 hrs	0.45	398.48	37.68
01:00 hrs	0.35	398.33	37.53
02:00 hrs	0.47	398.20	37.40
03:00 hrs	0.50	398.04	37.24
04:00 hrs	0.49	398.09	37.29
05:00 hrs	0.71	398.21	37.41
06:00 hrs	1.13	398.27	37.47
07:00 hrs	1.39	398.38	37.58
08:00 hrs	1.28	398.49	37.69
09:00 hrs	1.20	398.59	37.79
10:00 hrs	1.14	398.70	37.90
11:00 hrs	1.03	398.82	38.02
12:00 hrs	0.95	398.96	38.16
13:00 hrs	1.11	399.02	38.22
14:00 hrs	0.95	398.86	38.06
15:00 hrs	0.96	398.70	37.90
16:00 hrs	0.96	398.54	37.74
17:00 hrs	1.09	398.37	37.57
18:00 hrs	1.26	398.18	37.38
19:00 hrs	1.41	397.96	37.16
20:00 hrs	1.41	398.00	37.20
21:00 hrs	1.19	398.10	37.30
22:00 hrs	0.94	398.23	37.43
23:00 hrs	0.63	398.38	37.58

Average Day HGL: 398.41
Minimum Hour: 399.02

JCT_00365 Maximum Day 24 Hour Simulation

Time	Demand (L/s)	Head (m)	Pressure (m)
00:00 hrs	0.88	398.67	37.87
01:00 hrs	0.68	398.76	37.96
02:00 hrs	0.92	398.88	38.08
03:00 hrs	0.98	398.96	38.16
04:00 hrs	0.96	399.03	38.23
05:00 hrs	1.40	399.08	38.28
06:00 hrs	2.22	399.05	38.25
07:00 hrs	2.74	398.78	37.98
08:00 hrs	2.51	398.51	37.71
09:00 hrs	2.37	398.24	37.44
10:00 hrs	2.25	397.98	37.18
11:00 hrs	2.03	398.00	37.20
12:00 hrs	1.87	398.06	37.26
13:00 hrs	2.19	398.12	37.32
14:00 hrs	1.87	398.18	37.38
15:00 hrs	1.88	398.25	37.45
16:00 hrs	1.89	398.32	37.52
17:00 hrs	2.15	398.38	37.58
18:00 hrs	2.49	398.41	37.61
19:00 hrs	2.77	398.41	37.61
20:00 hrs	2.78	398.40	37.60
21:00 hrs	2.34	398.42	37.62
22:00 hrs	1.84	398.47	37.67
23:00 hrs	1.24	398.56	37.76

Maximum Day HGL: 398.50
Peak Hour: 397.98

Location :Michael Myers Road at Bettschen Lane

Available Flow (L/s)	Residual Pressure (m)
0.0	37.0
10.0	36.8
20.0	36.5
30.0	36.0
40.0	35.5
50.0	34.8
60.0	34.0
70.0	33.0
80.0	32.0
90.0	30.9
100.0	29.7
110.0	28.3
120.0	26.9
130.0	25.4
140.0	23.8
150.0	22.0
160.0	20.2
170.0	18.3
180.0	16.3
190.0	14.2
190.8	14.0

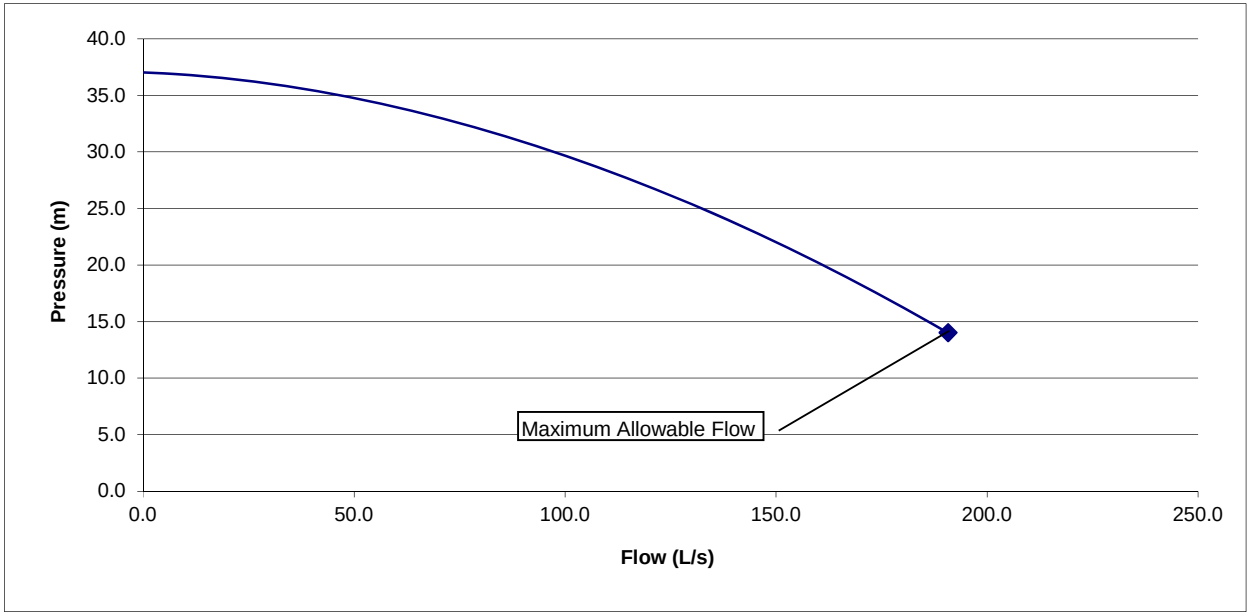
Fire Flow Analysis

Fire Flow Node:	JCT_00365
Design Flow (L/s):	190.8
Design Pressure (m)	14.0

The final adjusted flow at the node to maintain the minimum design pressure (14m (140 kPa)) at ALL locations within the pressure zone.

The lowest allowable pressure at the node to maintain the minimum design pressure (14m (140 kPa)) at ALL locations within the pressure zone.

The constraining node within the pressure zone that drops to the minimum design pressure of (14m (140 kPa)) during the design flow.



Baden New Hamburg Infowater Location :McFayden Street at Wagler Avenue

JCT_00359 Average Day 24 Hour Simulation

Time	Demand (L/s)	Head (m)	Pressure (m)
00:00 hrs	0.38	398.48	40.88
01:00 hrs	0.30	398.34	40.74
02:00 hrs	0.40	398.20	40.60
03:00 hrs	0.42	398.05	40.45
04:00 hrs	0.42	398.09	40.49
05:00 hrs	0.61	398.21	40.61
06:00 hrs	0.96	398.28	40.68
07:00 hrs	1.18	398.40	40.80
08:00 hrs	1.08	398.50	40.90
09:00 hrs	1.02	398.60	41.00
10:00 hrs	0.97	398.71	41.11
11:00 hrs	0.88	398.83	41.23
12:00 hrs	0.81	398.96	41.36
13:00 hrs	0.95	399.03	41.43
14:00 hrs	0.81	398.87	41.27
15:00 hrs	0.81	398.71	41.11
16:00 hrs	0.82	398.55	40.95
17:00 hrs	0.93	398.38	40.78
18:00 hrs	1.07	398.19	40.59
19:00 hrs	1.19	397.98	40.38
20:00 hrs	1.20	398.02	40.42
21:00 hrs	1.01	398.11	40.51
22:00 hrs	0.80	398.23	40.63
23:00 hrs	0.54	398.38	40.78

Average Day HGL:	398.42
Minimum Hour:	399.03

JCT_00359 Maximum Day 24 Hour Simulation

Time	Demand (L/s)	Head (m)	Pressure (m)
00:00 hrs	0.74	398.67	41.07
01:00 hrs	0.57	398.76	41.16
02:00 hrs	0.78	398.88	41.28
03:00 hrs	0.82	398.96	41.36
04:00 hrs	0.81	399.03	41.43
05:00 hrs	1.18	399.09	41.49
06:00 hrs	1.87	399.06	41.46
07:00 hrs	2.31	398.79	41.19
08:00 hrs	2.12	398.52	40.92
09:00 hrs	2.00	398.25	40.65
10:00 hrs	1.90	397.99	40.39
11:00 hrs	1.71	398.01	40.41
12:00 hrs	1.58	398.07	40.47
13:00 hrs	1.85	398.13	40.53
14:00 hrs	1.57	398.19	40.59
15:00 hrs	1.59	398.26	40.66
16:00 hrs	1.59	398.33	40.73
17:00 hrs	1.81	398.39	40.79
18:00 hrs	2.10	398.42	40.82
19:00 hrs	2.33	398.43	40.83
20:00 hrs	2.35	398.42	40.82
21:00 hrs	1.98	398.43	40.83
22:00 hrs	1.55	398.48	40.88
23:00 hrs	1.05	398.56	40.96

Maximum Day HGL:	398.50
Peak Hour:	397.99

Location :McFayden Street at Wagler Avenue

Fire Flow Analysis

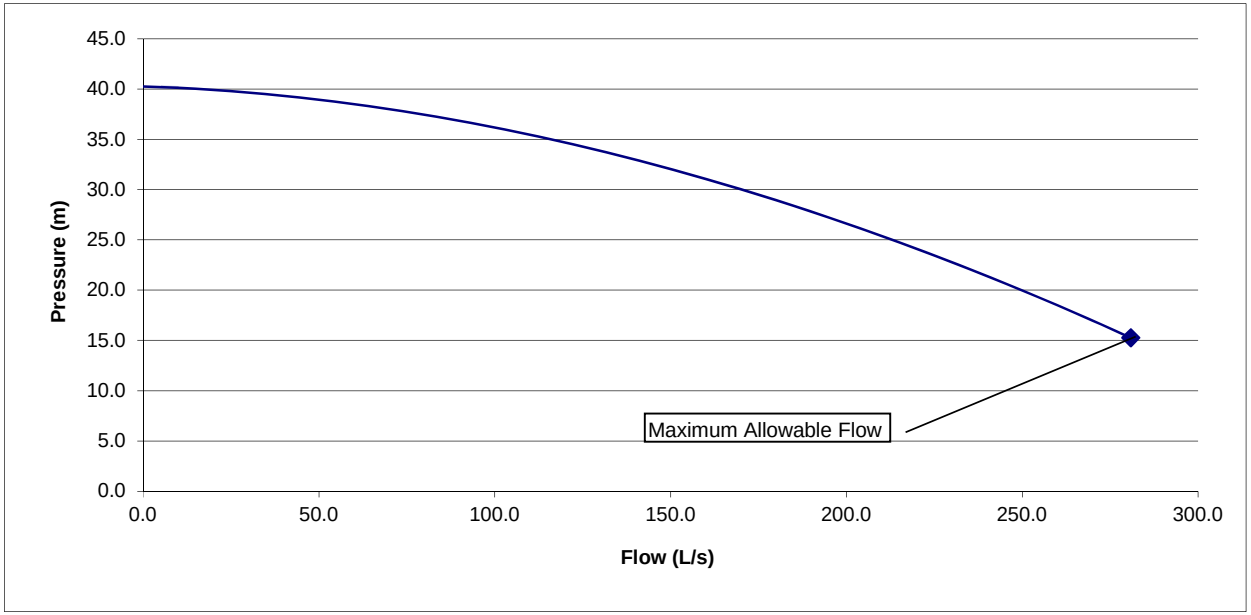
Fire Flow Node:	JCT_00359
Design Flow (L/s):	281.0
Design Pressure (m)	15.3

The final adjusted flow at the node to maintain the minimum design pressure (14m (140 kPa)) at ALL locations within the pressure zone.

The lowest allowable pressure at the node to maintain the minimum design pressure (14m (140 kPa)) at ALL locations within the pressure zone.

The constraining node within the pressure zone that drops to the minimum design pressure of (14m (140 kPa)) during the design flow.

Available Flow (L/s)	Residual Pressure (m)
0.0	40.3
10.0	40.1
20.0	39.9
30.0	39.7
40.0	39.3
50.0	39.0
60.0	38.5
70.0	38.0
80.0	37.5
90.0	36.8
100.0	36.2
110.0	35.5
120.0	34.7
130.0	33.9
140.0	33.0
150.0	32.1
160.0	31.1
170.0	30.0
180.0	29.0
190.0	27.8
200.0	26.6
210.0	25.4
220.0	24.1
230.0	22.8
240.0	21.4
250.0	20.0
260.0	18.5
270.0	17.0
280.0	15.4
281.0	15.3



Baden New Hamburg Infowater Location :Street One @ Snyder's Road West

JCT_00307 Average Day 24 Hour Simulation

Time	Demand (L/s)	Head (m)	Pressure (m)
00:00 hrs	1.37	398.49	39.79
01:00 hrs	1.06	398.34	39.64
02:00 hrs	1.44	398.22	39.52
03:00 hrs	1.53	398.06	39.36
04:00 hrs	1.50	398.08	39.38
05:00 hrs	2.20	398.22	39.52
06:00 hrs	3.50	398.30	39.60
07:00 hrs	4.31	398.43	39.73
08:00 hrs	3.96	398.53	39.83
09:00 hrs	3.73	398.62	39.92
10:00 hrs	3.54	398.73	40.03
11:00 hrs	3.20	398.85	40.15
12:00 hrs	2.94	398.98	40.28
13:00 hrs	3.45	399.07	40.37
14:00 hrs	2.93	398.90	40.20
15:00 hrs	2.96	398.74	40.04
16:00 hrs	2.97	398.58	39.88
17:00 hrs	3.38	398.42	39.72
18:00 hrs	3.92	398.24	39.54
19:00 hrs	4.36	398.04	39.34
20:00 hrs	4.38	398.05	39.35
21:00 hrs	3.69	398.13	39.43
22:00 hrs	2.90	398.25	39.55
23:00 hrs	1.95	398.38	39.68

Average Day HGL:	398.44
Minimum Hour:	399.07

JCT_00307 Maximum Day 24 Hour Simulation

Time	Demand (L/s)	Head (m)	Pressure (m)
00:00 hrs	2.73	398.66	39.96
01:00 hrs	2.11	398.75	40.05
02:00 hrs	2.86	398.87	40.17
03:00 hrs	3.04	398.95	40.25
04:00 hrs	2.98	399.02	40.32
05:00 hrs	4.38	399.09	40.39
06:00 hrs	6.95	399.08	40.38
07:00 hrs	8.56	398.87	40.17
08:00 hrs	7.87	398.59	39.89
09:00 hrs	7.41	398.31	39.61
10:00 hrs	7.04	398.05	39.35
11:00 hrs	6.35	398.03	39.33
12:00 hrs	5.85	398.09	39.39
13:00 hrs	6.86	398.16	39.46
14:00 hrs	5.83	398.20	39.50
15:00 hrs	5.88	398.28	39.58
16:00 hrs	5.91	398.35	39.65
17:00 hrs	6.73	398.42	39.72
18:00 hrs	7.80	398.46	39.76
19:00 hrs	8.67	398.47	39.77
20:00 hrs	8.71	398.46	39.76
21:00 hrs	7.33	398.46	39.76
22:00 hrs	5.76	398.49	39.79
23:00 hrs	3.88	398.57	39.87

Maximum Day HGL:	398.53
Peak Hour:	398.03

Location :Street One @ Snyder's Road West

Available Flow (L/s)	Residual Pressure (m)
0.0	39.2
25.0	39.2
50.0	39.1
75.0	38.9
100.0	38.7
125.0	38.5
150.0	38.2
175.0	37.9
200.0	37.6
225.0	37.2
250.0	36.7
275.0	36.3
300.0	35.8
325.0	35.3
350.0	34.7
375.0	34.1
400.0	33.4
425.0	32.8
450.0	32.1
475.0	31.3
500.0	30.5
525.0	29.7
550.0	28.9
575.0	28.0
600.0	27.1
625.0	26.2
650.0	25.2
675.0	24.2
700.0	23.1
725.0	22.1
750.0	21.0
775.0	19.8
800.0	18.7
825.0	17.5
850.0	16.3
875.0	15.0
894.3	14.0

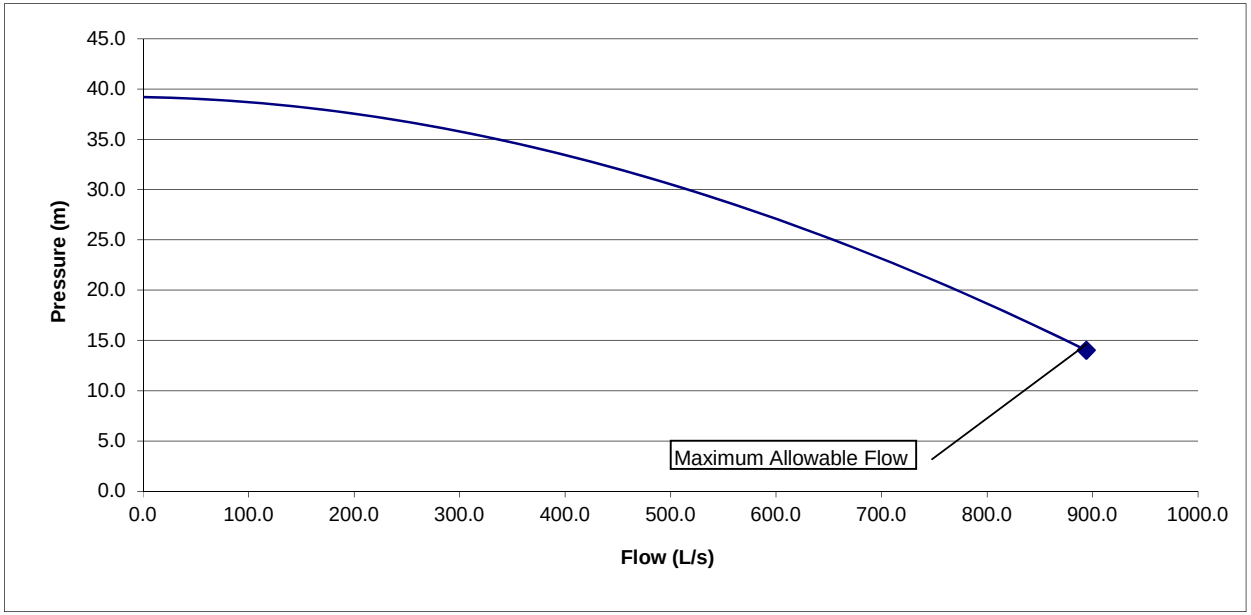
Fire Flow Analysis

Fire Flow Node:	JCT_00307
Design Flow (L/s):	894.3
Design Pressure (m)	14.0

The final adjusted flow at the node to maintain the minimum design pressure (14m (140 kPa)) at ALL locations within the pressure zone.

The lowest allowable pressure at the node to maintain the minimum design pressure (14m (140 kPa)) at ALL locations within the pressure zone.

The constraining node within the pressure zone that drops to the minimum design pressure of (14m (140 kPa)) during the design flow.



Baden New Hamburg Infowater Location :Michael Myers Rd @ Jacob Cressman Dr

JCT_00385 Average Day 24 Hour Simulation

Time	Demand (L/s)	Head (m)	Pressure (m)
00:00 hrs	0.98	398.48	39.28
01:00 hrs	0.76	398.33	39.13
02:00 hrs	1.03	398.20	39.00
03:00 hrs	1.10	398.04	38.84
04:00 hrs	1.08	398.09	38.89
05:00 hrs	1.58	398.21	39.01
06:00 hrs	2.51	398.27	39.07
07:00 hrs	3.09	398.38	39.18
08:00 hrs	2.84	398.48	39.28
09:00 hrs	2.68	398.59	39.39
10:00 hrs	2.54	398.70	39.50
11:00 hrs	2.29	398.82	39.62
12:00 hrs	2.11	398.95	39.75
13:00 hrs	2.48	399.02	39.82
14:00 hrs	2.10	398.86	39.66
15:00 hrs	2.12	398.70	39.50
16:00 hrs	2.13	398.54	39.34
17:00 hrs	2.43	398.37	39.17
18:00 hrs	2.81	398.18	38.98
19:00 hrs	3.13	397.96	38.76
20:00 hrs	3.14	398.00	38.80
21:00 hrs	2.65	398.10	38.90
22:00 hrs	2.08	398.23	39.03
23:00 hrs	1.40	398.38	39.18

Average Day HGL:	398.41
Minimum Hour:	399.02

JCT_00385 Maximum Day 24 Hour Simulation

Time	Demand (L/s)	Head (m)	Pressure (m)
00:00 hrs	1.96	398.79	39.59
01:00 hrs	1.52	398.87	39.67
02:00 hrs	2.06	398.96	39.76
03:00 hrs	2.19	399.02	39.82
04:00 hrs	2.15	399.06	39.86
05:00 hrs	3.15	398.80	39.60
06:00 hrs	5.00	398.39	39.19
07:00 hrs	6.17	398.02	38.82
08:00 hrs	5.66	397.81	38.61
09:00 hrs	5.34	397.79	38.59
10:00 hrs	5.07	397.77	38.57
11:00 hrs	4.57	397.79	38.59
12:00 hrs	4.21	397.81	38.61
13:00 hrs	4.94	397.80	38.60
14:00 hrs	4.20	397.83	38.63
15:00 hrs	4.23	397.86	38.66
16:00 hrs	4.25	397.88	38.68
17:00 hrs	4.84	397.87	38.67
18:00 hrs	5.61	397.82	38.62
19:00 hrs	6.24	397.72	38.52
20:00 hrs	6.27	397.64	38.44
21:00 hrs	5.28	397.64	38.44
22:00 hrs	4.15	397.68	38.48
23:00 hrs	2.79	397.76	38.56

Maximum Day HGL:	398.10
Peak Hour:	397.64

Location :Michael Myers Rd @ Jacob Cressman Dr

Available Flow (L/s)	Residual Pressure (m)
0.0	38.7
10.0	38.5
20.0	38.2
30.0	37.8
40.0	37.3
50.0	36.6
60.0	35.9
70.0	35.1
80.0	34.2
90.0	33.2
100.0	32.1
110.0	30.9
120.0	29.6
130.0	28.2
140.0	26.7
150.0	25.2
160.0	23.5
170.0	21.8
180.0	20.0
190.0	18.1
200.0	16.1
210.0	14.0
210.1	14.0

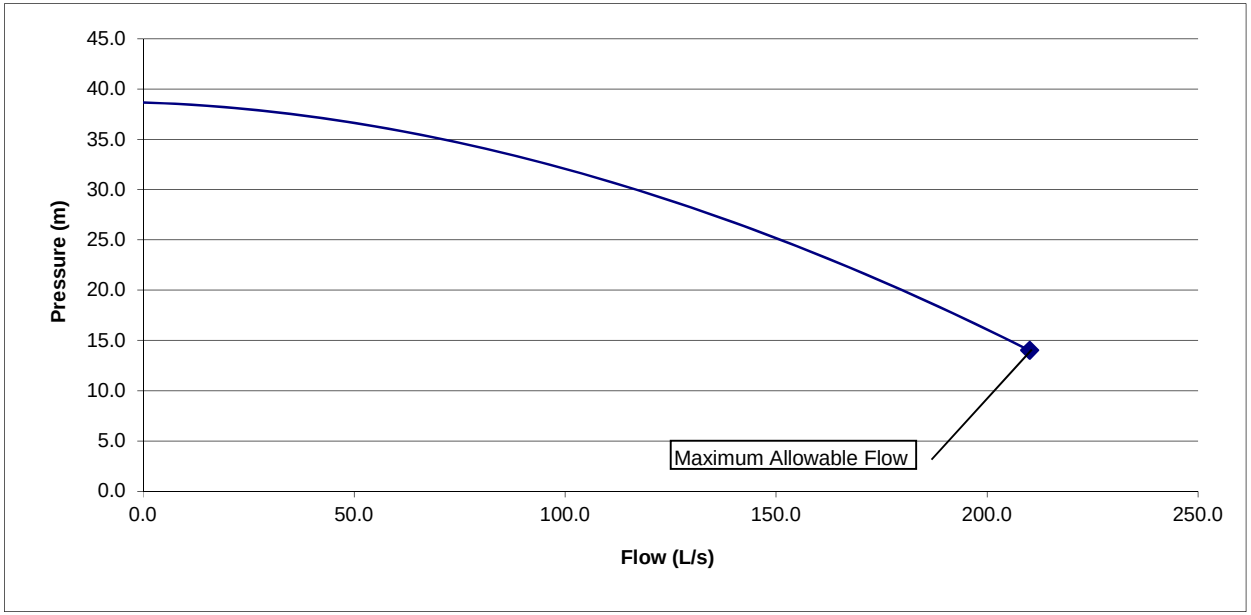
Fire Flow Analysis

Fire Flow Node:	JCT_00385
Design Flow (L/s):	210.1
Design Pressure (m)	14.0

The final adjusted flow at the node to maintain the minimum design pressure (14m (140 kPa)) at ALL locations within the pressure zone.

The lowest allowable pressure at the node to maintain the minimum design pressure (14m (140 kPa)) at ALL locations within the pressure zone.

The constraining node within the pressure zone that drops to the minimum design pressure of (14m (140 kPa)) during the design flow.



Baden New Hamburg Infowater Location :Kropf Dr @ Isaac Shantz Dr

JCT_00386 Average Day 24 Hour Simulation

Time	Demand (L/s)	Head (m)	Pressure (m)
00:00 hrs	0.52	398.48	41.08
01:00 hrs	0.40	398.33	40.93
02:00 hrs	0.55	398.20	40.80
03:00 hrs	0.58	398.04	40.64
04:00 hrs	0.57	398.09	40.69
05:00 hrs	0.83	398.21	40.81
06:00 hrs	1.32	398.27	40.87
07:00 hrs	1.62	398.38	40.98
08:00 hrs	1.49	398.48	41.08
09:00 hrs	1.41	398.59	41.19
10:00 hrs	1.33	398.70	41.30
11:00 hrs	1.20	398.82	41.42
12:00 hrs	1.11	398.95	41.55
13:00 hrs	1.30	399.02	41.62
14:00 hrs	1.11	398.86	41.46
15:00 hrs	1.12	398.70	41.30
16:00 hrs	1.12	398.54	41.14
17:00 hrs	1.28	398.37	40.97
18:00 hrs	1.48	398.18	40.78
19:00 hrs	1.64	397.96	40.56
20:00 hrs	1.65	398.00	40.60
21:00 hrs	1.39	398.10	40.70
22:00 hrs	1.09	398.23	40.83
23:00 hrs	0.74	398.38	40.98

Average Day HGL:	398.41
Minimum Hour:	399.02

JCT_00386 Maximum Day 24 Hour Simulation

Time	Demand (L/s)	Head (m)	Pressure (m)
00:00 hrs	1.02	398.79	41.39
01:00 hrs	0.79	398.87	41.47
02:00 hrs	1.07	398.96	41.56
03:00 hrs	1.14	399.02	41.62
04:00 hrs	1.12	399.06	41.66
05:00 hrs	1.64	398.80	41.40
06:00 hrs	2.60	398.39	40.99
07:00 hrs	3.20	398.03	40.63
08:00 hrs	2.94	397.81	40.41
09:00 hrs	2.77	397.79	40.39
10:00 hrs	2.63	397.78	40.38
11:00 hrs	2.38	397.79	40.39
12:00 hrs	2.19	397.82	40.42
13:00 hrs	2.57	397.80	40.40
14:00 hrs	2.18	397.83	40.43
15:00 hrs	2.20	397.86	40.46
16:00 hrs	2.21	397.88	40.48
17:00 hrs	2.52	397.87	40.47
18:00 hrs	2.92	397.82	40.42
19:00 hrs	3.24	397.73	40.33
20:00 hrs	3.26	397.65	40.25
21:00 hrs	2.74	397.64	40.24
22:00 hrs	2.16	397.68	40.28
23:00 hrs	1.45	397.76	40.36

Maximum Day HGL:	398.10
Peak Hour:	397.64

Location :Kropf Dr @ Isaac Shantz Dr

Fire Flow Analysis

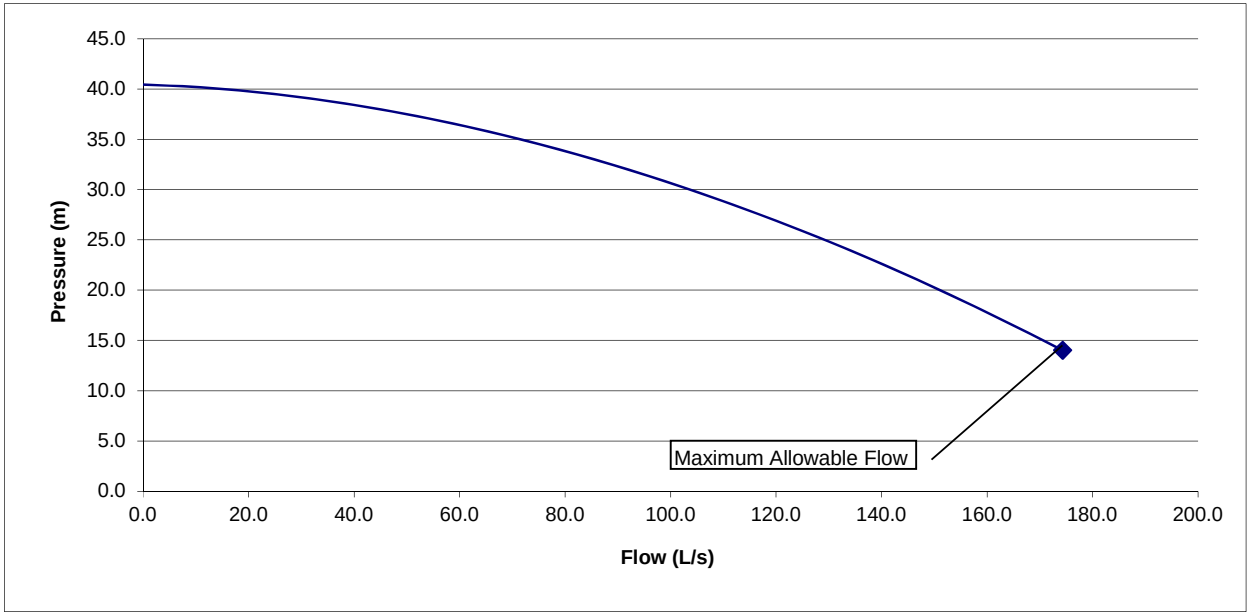
Fire Flow Node:	JCT_00386
Design Flow (L/s):	174.4
Design Pressure (m)	14.0

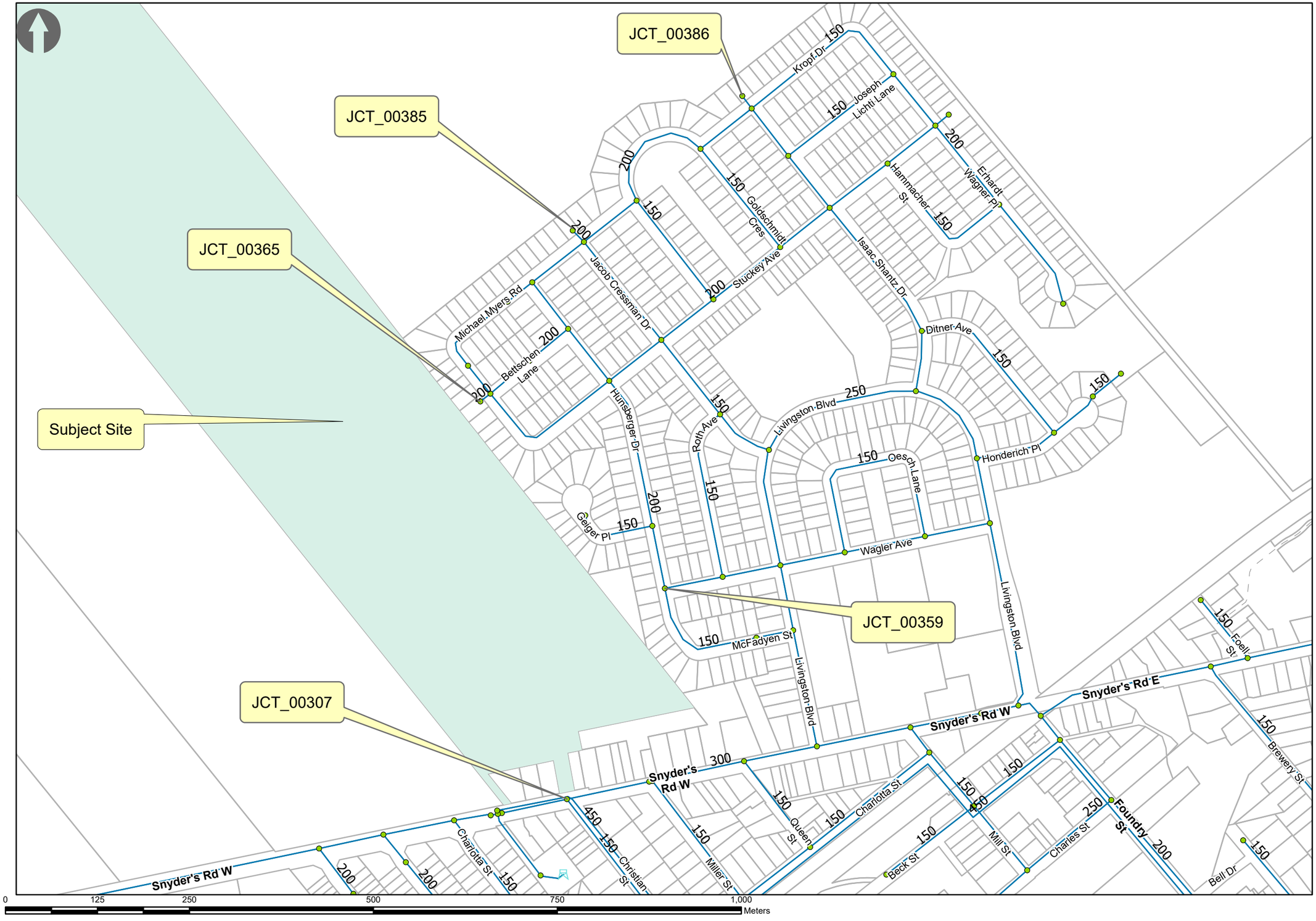
The final adjusted flow at the node to maintain the minimum design pressure (14m (140 kPa)) at ALL locations within the pressure zone.

The lowest allowable pressure at the node to maintain the minimum design pressure (14m (140 kPa)) at ALL locations within the pressure zone.

The constraining node within the pressure zone that drops to the minimum design pressure of (14m (140 kPa)) during the design flow.

Available Flow (L/s)	Residual Pressure (m)
0.0	40.4
10.0	40.2
20.0	39.8
30.0	39.2
40.0	38.4
50.0	37.5
60.0	36.4
70.0	35.2
80.0	33.8
90.0	32.3
100.0	30.7
110.0	28.9
120.0	26.9
130.0	24.8
140.0	22.6
150.0	20.3
160.0	17.8
170.0	15.2
174.4	14.0





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Region of Waterloo

TRANSPORTATION AND ENVIRONMENTAL SERVICES
Water Services
150 Frederick Street
Kitchener ON Canada N2G 4J3
Telephone: (519) 575-4426
Fax: (519) 575-4452
www.regionofwaterloo.ca

Legend

Junction
TYPE
- Active
- Domain

Tank
TYPE
- Active
- Domain

Reservoir
TYPE
- Active
- Domain

Pump
TYPE
- Active
- Domain

Valve
TYPE
- Active
- Domain

Pipe
TYPE
- Active
- Domain

Roads
- Highway
- Arterial/Collector
- Local
- Private

Layer2
- Assessment Parcels (MPAC)
- Subject Site

1012 Snyders Rd W, Baden

603-05680: Activa Baden North Subdivision, Baden

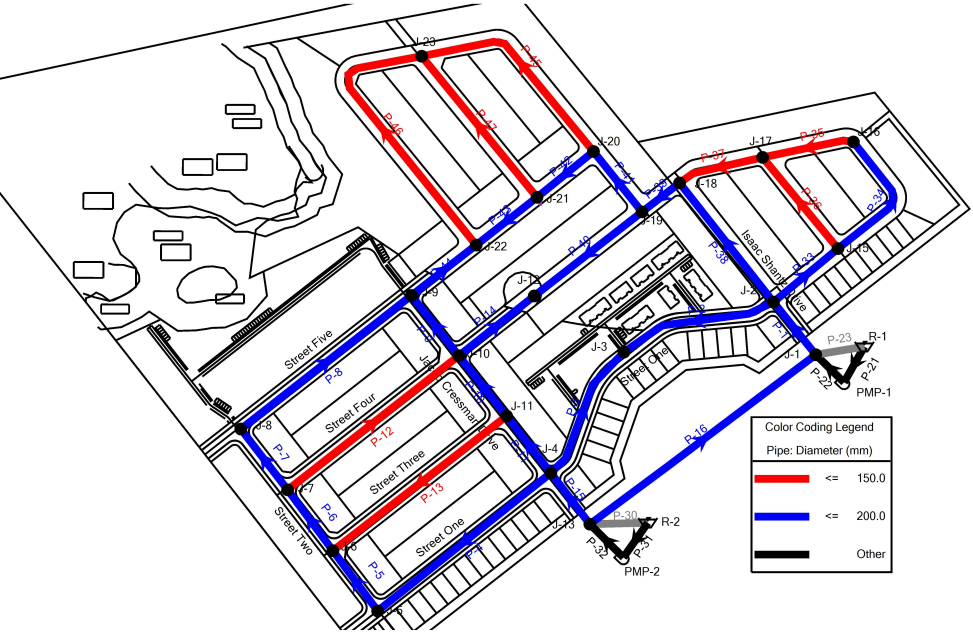
Nodal Data Input - Water Demand Calculation 17-Jan-22

Location	Node	Residential				ICI		External	Avg Day	Min. Hour	Max Day	Peak Hour	Fire Flow
	No.	Single Family		Multi Family				Demand	Demand	Demand	Demand	Demand	Demand
		Units	Demand	Units	Demand	Area	Demand						
			(L/s)	(ha)	(L/s)	(ha)	(L/s)	(L/s)	(L/s)	(L/s)	(L/s)	(L/s)	(L/s)
Supply Node	J1												
Single Family	J2	10	0.09						0.09	0.05	0.18	0.27	100
Single Family/Townhomes	J3	10	0.09	102	0.66				0.75	0.38	1.50	2.25	133
Single Family	J4	16	0.14						0.14	0.07	0.28	0.42	100
Single Family	J5	20	0.17						0.17	0.09	0.34	0.51	100
Single Family	J6	25	0.22						0.22	0.11	0.44	0.66	100
Single Family	J7	25	0.22						0.22	0.11	0.44	0.66	100
Single Family	J8	17	0.15						0.15	0.08	0.30	0.45	100
Single Family/Townhomes	J9	15	0.13	187	1.21				1.34	0.67	2.68	4.02	133
Single Family	J10	24	0.21						0.21	0.11	0.42	0.63	100
Single Family	J11	25	0.22						0.22	0.11	0.44	0.66	100
Single Family	J12	25	0.22						0.22	0.11	0.44	0.66	100
Supply Node	J13												
Single Family	J15	20	0.17						0.17	0.09	0.34	0.51	100
Single Family	J16	30	0.26						0.26	0.13	0.52	0.78	100
Single Family	J17	30	0.26						0.26	0.13	0.52	0.78	100
Single Family	J18	40	0.35						0.35	0.18	0.70	1.05	100
Single Family	J19	30	0.26						0.26	0.13	0.52	0.78	100
Single Family	J20	30	0.26						0.26	0.13	0.52	0.78	100
Single Family	J21	30	0.26						0.26	0.13	0.52	0.78	100
Single Family	J22	30	0.26						0.26	0.13	0.52	0.78	100
Single Family	J23	38	0.33	51	0.33				0.66	0.33	1.32	1.98	133
TOTAL		490	4.27	340	2.20				6.47	3.24	12.94	19.41	

Specific Usage Rates

Land Use	Average Day		Source
Residential	3.34	c/units	Region of Waterloo Water Supply and Distribution Optimization Master Plan, 2015
(Single Family)	225	L/c/d	
Residential	2.48	c/units	
(Multi-Unit Residential)	225	L/c/d	
Peaking Factors:			
Residential	min	0.50	Region of Waterloo Design Criteria (3,000-10,000 people)
	avg	1.00	
	max	2.00	
	peak	3.00	

Activa Baden North Subdivision, Baden
Scenario: Max Day + 133 L/s Fire Flow
Active Scenario: Max Day + 133 L/s Fire Flow



Activa Baden North Subdivision, Baden
FlexTable: Junction Table
Active Scenario: Avg Day

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-1	357.30	0.00	398.41	402
J-2	360.65	0.09	398.41	370
J-3	362.30	0.75	398.40	353
J-4	361.00	0.14	398.40	366
J-5	362.15	0.17	398.40	355
J-6	361.55	0.22	398.40	361
J-7	361.10	0.22	398.40	365
J-8	360.80	0.15	398.40	368
J-9	359.45	1.34	398.40	381
J-10	360.10	0.21	398.40	375
J-11	360.55	0.22	398.40	370
J-12	360.95	0.22	398.40	367
J-13	359.10	0.00	398.41	385
J-15	362.50	0.17	398.40	351
J-16	362.15	0.26	398.40	355
J-17	361.65	0.26	398.40	360
J-18	361.20	0.35	398.40	364
J-19	361.00	0.26	398.40	366
J-20	360.45	0.26	398.40	371
J-21	360.00	0.26	398.40	376
J-22	359.55	0.26	398.40	380
J-23	361.55	0.66	398.40	361

Activa Baden North Subdivision, Baden
FlexTable: Junction Table
Active Scenario: Max Day

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-1	357.30	0.00	398.10	399
J-2	360.65	0.18	398.08	366
J-3	362.30	1.50	398.08	350
J-4	361.00	0.28	398.08	363
J-5	362.15	0.34	398.07	352
J-6	361.55	0.44	398.07	357
J-7	361.10	0.44	398.07	362
J-8	360.80	0.30	398.07	365
J-9	359.45	2.68	398.07	378
J-10	360.10	0.42	398.07	372
J-11	360.55	0.44	398.07	367
J-12	360.95	0.44	398.07	363
J-13	359.10	0.00	398.10	382
J-15	362.50	0.34	398.08	348
J-16	362.15	0.52	398.08	352
J-17	361.65	0.52	398.08	356
J-18	361.20	0.70	398.07	361
J-19	361.00	0.52	398.07	363
J-20	360.45	0.52	398.07	368
J-21	360.00	0.52	398.07	373
J-22	359.55	0.52	398.07	377
J-23	361.55	1.32	398.07	357

Activa Baden North Subdivision, Baden
FlexTable: Junction Table
Active Scenario: Min Hour

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-1	357.30	0.00	399.02	408
J-2	360.65	0.05	399.02	376
J-3	362.30	0.38	399.02	359
J-4	361.00	0.07	399.02	372
J-5	362.15	0.09	399.02	361
J-6	361.55	0.11	399.02	367
J-7	361.10	0.11	399.02	371
J-8	360.80	0.08	399.02	374
J-9	359.45	0.67	399.02	387
J-10	360.10	0.11	399.02	381
J-11	360.55	0.11	399.02	376
J-12	360.95	0.11	399.02	373
J-13	359.10	0.00	399.02	391
J-15	362.50	0.09	399.02	357
J-16	362.15	0.13	399.02	361
J-17	361.65	0.13	399.02	366
J-18	361.20	0.18	399.02	370
J-19	361.00	0.13	399.02	372
J-20	360.45	0.13	399.02	377
J-21	360.00	0.13	399.02	382
J-22	359.55	0.13	399.02	386
J-23	361.55	0.33	399.02	367

Activa Baden North Subdivision, Baden
FlexTable: Junction Table
Active Scenario: Peak Hour

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-1	357.30	0.00	397.64	395
J-2	360.65	0.27	397.60	362
J-3	362.30	2.25	397.60	345
J-4	361.00	0.42	397.60	358
J-5	362.15	0.51	397.59	347
J-6	361.55	0.66	397.58	353
J-7	361.10	0.66	397.58	357
J-8	360.80	0.45	397.57	360
J-9	359.45	4.02	397.57	373
J-10	360.10	0.63	397.58	367
J-11	360.55	0.66	397.59	362
J-12	360.95	0.66	397.58	358
J-13	359.10	0.00	397.64	377
J-15	362.50	0.51	397.60	343
J-16	362.15	0.78	397.59	347
J-17	361.65	0.78	397.59	352
J-18	361.20	1.05	397.58	356
J-19	361.00	0.78	397.58	358
J-20	360.45	0.78	397.57	363
J-21	360.00	0.78	397.57	368
J-22	359.55	0.78	397.57	372
J-23	361.55	1.98	397.57	352

Activa Baden North Subdivision, Baden
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: Max Day + 100 L/s Fire Flow

Label	Satisfies Fire Flow Constraints?	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (System Lower Limit) (kPa)	Pressure (Calculated System Lower Limit) (kPa)	Junction w/ Minimum Pressure (System)
J-1	True	100.00	105.00	140	361	140	312	J-15
J-2	True	100.18	105.18	140	318	140	300	J-15
J-3	True	101.50	106.50	140	287	140	304	J-15
J-4	True	100.28	105.28	140	315	140	304	J-5
J-5	True	100.34	105.34	140	278	140	294	J-6
J-6	True	100.44	105.44	140	287	140	288	J-5
J-7	True	100.44	105.44	140	289	140	293	J-5
J-8	True	100.30	105.30	140	285	140	295	J-7
J-9	True	102.68	107.68	140	310	140	295	J-23
J-10	True	100.42	105.42	140	310	140	300	J-5
J-11	True	100.44	105.44	140	309	140	301	J-5
J-12	True	100.44	105.44	140	291	140	300	J-23
J-13	True	100.00	105.00	140	346	140	315	J-15
J-15	True	100.34	105.34	140	278	140	283	J-16
J-16	True	100.52	105.52	140	256	140	280	J-15
J-17	True	100.52	105.52	140	272	140	283	J-16
J-18	True	100.70	105.70	140	301	140	301	J-15
J-19	True	100.52	105.52	140	300	140	298	J-23
J-20	True	100.52	105.52	140	293	140	286	J-23
J-21	True	100.52	105.52	140	294	140	284	J-23
J-22	True	100.52	105.52	140	300	140	286	J-23
J-23	True	101.32	106.32	140	234	140	298	J-20

Activa Baden North Subdivision, Baden
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: Max Day + 133 L/s Fire Flow

Label	Satisfies Fire Flow Constraints?	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (System Lower Limit) (kPa)	Pressure (Calculated System Lower Limit) (kPa)	Junction w/ Minimum Pressure (System)
J-1	True	133.00	138.00	140	341	140	294	J-15
J-2	True	133.18	138.18	140	292	140	274	J-15
J-3	True	134.50	139.50	140	251	140	281	J-15
J-4	True	133.28	138.28	140	289	140	279	J-5
J-5	True	133.34	138.34	140	236	140	258	J-6
J-6	True	133.44	138.44	140	246	140	252	J-5
J-7	True	133.44	138.44	140	247	140	258	J-8
J-8	True	133.30	138.30	140	239	140	257	J-7
J-9	True	135.68	140.68	140	272	140	261	J-23
J-10	True	133.42	138.42	140	277	140	270	J-23
J-11	True	133.44	138.44	140	276	140	274	J-5
J-12	True	133.44	138.44	140	250	140	268	J-23
J-13	True	133.00	138.00	140	328	140	299	J-15
J-15	True	133.34	138.34	140	238	140	244	J-16
J-16	True	133.52	138.52	140	198	140	241	J-15
J-17	True	133.52	138.52	140	223	140	244	J-16
J-18	True	133.70	138.70	140	268	140	275	J-23
J-19	True	133.52	138.52	140	265	140	265	J-23
J-20	True	133.52	138.52	140	251	140	246	J-23
J-21	True	133.52	138.52	140	248	140	243	J-23
J-22	True	133.52	138.52	140	256	140	246	J-23
J-23	True	134.32	139.32	140	160	140	258	J-20

Activa Baden North Subdivision, Baden

FlexTable: Junction Table

Active Scenario: Max Day + 100 L/s Fire Flow to J-12

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-1	357.30	0.00	394.92	368
J-2	360.65	0.18	393.90	325
J-3	362.30	1.50	393.86	309
J-4	361.00	0.28	393.83	321
J-5	362.15	0.34	393.33	305
J-6	361.55	0.44	393.15	309
J-7	361.10	0.44	392.93	311
J-8	360.80	0.30	392.84	314
J-9	359.45	2.68	392.61	325
J-10	360.10	0.42	392.59	318
J-11	360.55	0.44	393.18	319
J-12	360.95	100.44	391.23	296
J-13	359.10	0.00	394.95	351
J-15	362.50	0.34	393.77	306
J-16	362.15	0.52	393.72	309
J-17	361.65	0.52	393.59	313
J-18	361.20	0.70	393.16	313
J-19	361.00	0.52	392.60	309
J-20	360.45	0.52	392.60	315
J-21	360.00	0.52	392.60	319
J-22	359.55	0.52	392.60	323
J-23	361.55	1.32	392.60	304

Activa Baden North Subdivision, Baden

FlexTable: Pipe Table

Active Scenario: Max Day + 100 L/s Fire Flow to J-12

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Hazen-Williams C	Minor Loss Coefficient (Local)	Flow (L/s)	Velocity (m/s)	Has User Defined Length?	Length (User Defined) (m)
P-1	71	J-1	J-2	200.0	150.0	1.330	54.56	1.74	False	0
P-2	169	J-2	J-3	200.0	150.0	1.330	6.46	0.21	False	0
P-3	151	J-3	J-4	200.0	150.0	1.330	4.96	0.16	False	0
P-4	232	J-4	J-5	200.0	150.0	1.330	21.33	0.68	False	0
P-5	78	J-5	J-6	200.0	150.0	1.330	20.99	0.67	False	0
P-6	79	J-6	J-7	200.0	150.0	1.330	23.01	0.73	False	0
P-7	80	J-7	J-8	200.0	150.0	1.330	14.26	0.45	False	0
P-8	227	J-8	J-9	200.0	150.0	1.330	13.96	0.44	False	0
P-9	80	J-9	J-10	200.0	150.0	1.330	7.47	0.24	False	0
P-10	80	J-10	J-11	200.0	150.0	1.330	-38.83	1.24	False	0
P-11	75	J-11	J-4	200.0	150.0	1.330	-41.74	1.33	False	0
P-12	227	J-7	J-10	150.0	150.0	1.330	8.31	0.47	False	0
P-13	230	J-6	J-11	150.0	150.0	1.330	-2.46	0.14	False	0
P-14	101	J-10	J-12	200.0	150.0	1.330	54.19	1.72	False	0
P-15	67	J-4	J-13	200.0	150.0	1.330	-58.38	1.86	False	0
P-16	295	J-13	J-1	200.0	150.0	1.330	4.38	0.14	False	0
P-21	43	R-1	PMP-1	1,000.0	150.0	0.100	50.18	0.06	True	1
P-22	41	PMP-1	J-1	1,000.0	150.0	0.100	50.18	0.06	True	1
P-23	51	J-1	R-1	1,000.0	150.0	0.100	(N/A)	(N/A)	True	1
P-30	61	R-2	J-13	1,000.0	150.0	0.100	(N/A)	(N/A)	True	1
P-31	44	R-2	PMP-2	1,000.0	150.0	0.100	62.76	0.08	True	1
P-32	49	PMP-2	J-13	1,000.0	150.0	0.100	62.76	0.08	True	1
P-33	88	J-2	J-15	200.0	150.0	1.330	16.23	0.52	False	0
P-34	152	J-15	J-16	200.0	150.0	1.330	7.93	0.25	False	0
P-35	97	J-16	J-17	150.0	150.0	1.330	7.41	0.42	False	0
P-36	124	J-17	J-15	150.0	150.0	1.330	-7.97	0.45	False	0
P-37	92	J-17	J-18	150.0	150.0	1.330	14.85	0.84	False	0
P-38	159	J-18	J-2	200.0	150.0	1.330	-31.69	1.01	False	0
P-39	50	J-18	J-19	200.0	150.0	1.330	45.84	1.46	False	0
P-40	143	J-19	J-12	200.0	150.0	1.330	46.25	1.47	False	0
P-41	81	J-19	J-20	200.0	150.0	1.330	-0.93	0.03	False	0
P-42	76	J-20	J-21	200.0	150.0	1.330	-1.55	0.05	False	0
P-43	81	J-21	J-22	200.0	150.0	1.330	-2.55	0.08	False	0
P-44	86	J-22	J-9	200.0	150.0	1.330	-3.81	0.12	False	0
P-45	234	J-20	J-23	150.0	150.0	1.330	0.10	0.01	False	0
P-46	305	J-23	J-22	150.0	150.0	1.330	-0.74	0.04	False	0
P-47	191	J-23	J-21	150.0	150.0	1.330	-0.48	0.03	False	0

Activa Baden North Subdivision, Baden

FlexTable: Junction Table

Active Scenario: Max Day+ 100 L/s Fire Flow to J-16

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-1	357.30	0.00	394.84	367
J-2	360.65	0.18	393.56	322
J-3	362.30	1.50	393.84	309
J-4	361.00	0.28	394.14	324
J-5	362.15	0.34	394.00	312
J-6	361.55	0.44	393.95	317
J-7	361.10	0.44	393.89	321
J-8	360.80	0.30	393.86	324
J-9	359.45	2.68	393.79	336
J-10	360.10	0.42	393.82	330
J-11	360.55	0.44	393.97	327
J-12	360.95	0.44	393.72	321
J-13	359.10	0.00	395.01	351
J-15	362.50	0.34	391.66	285
J-16	362.15	100.52	389.06	263
J-17	361.65	0.52	391.58	293
J-18	361.20	0.70	393.45	316
J-19	361.00	0.52	393.60	319
J-20	360.45	0.52	393.64	325
J-21	360.00	0.52	393.67	330
J-22	359.55	0.52	393.72	334
J-23	361.55	1.32	393.67	314

Activa Baden North Subdivision, Baden

FlexTable: Pipe Table

Active Scenario: Max Day+ 100 L/s Fire Flow to J-16

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Hazen-Williams C	Minor Loss Coefficient (Local)	Flow (L/s)	Velocity (m/s)	Has User Defined Length?	Length (User Defined) (m)
P-1	71	J-1	J-2	200.0	150.0	1.330	61.63	1.96	False	0
P-2	169	J-2	J-3	200.0	150.0	1.330	-18.44	0.59	False	0
P-3	151	J-3	J-4	200.0	150.0	1.330	-19.94	0.63	False	0
P-4	232	J-4	J-5	200.0	150.0	1.330	10.68	0.34	False	0
P-5	78	J-5	J-6	200.0	150.0	1.330	10.34	0.33	False	0
P-6	79	J-6	J-7	200.0	150.0	1.330	11.58	0.37	False	0
P-7	80	J-7	J-8	200.0	150.0	1.330	7.69	0.24	False	0
P-8	227	J-8	J-9	200.0	150.0	1.330	7.39	0.24	False	0
P-9	80	J-9	J-10	200.0	150.0	1.330	-7.90	0.25	False	0
P-10	80	J-10	J-11	200.0	150.0	1.330	-18.29	0.58	False	0
P-11	75	J-11	J-4	200.0	150.0	1.330	-20.41	0.65	False	0
P-12	227	J-7	J-10	150.0	150.0	1.330	3.45	0.20	False	0
P-13	230	J-6	J-11	150.0	150.0	1.330	-1.68	0.10	False	0
P-14	101	J-10	J-12	200.0	150.0	1.330	13.42	0.43	False	0
P-15	67	J-4	J-13	200.0	150.0	1.330	-51.31	1.63	False	0
P-16	295	J-13	J-1	200.0	150.0	1.330	10.68	0.34	False	0
P-21	43	R-1	PMP-1	1,000.0	150.0	0.100	50.95	0.06	True	1
P-22	41	PMP-1	J-1	1,000.0	150.0	0.100	50.95	0.06	True	1
P-23	51	J-1	R-1	1,000.0	150.0	0.100	(N/A)	(N/A)	True	1
P-30	61	R-2	J-13	1,000.0	150.0	0.100	(N/A)	(N/A)	True	1
P-31	44	R-2	PMP-2	1,000.0	150.0	0.100	61.99	0.08	True	1
P-32	49	PMP-2	J-13	1,000.0	150.0	0.100	61.99	0.08	True	1
P-33	88	J-2	J-15	200.0	150.0	1.330	68.99	2.20	False	0
P-34	152	J-15	J-16	200.0	150.0	1.330	63.42	2.02	False	0
P-35	97	J-16	J-17	150.0	150.0	1.330	-37.10	2.10	False	0
P-36	124	J-17	J-15	150.0	150.0	1.330	-5.23	0.30	False	0
P-37	92	J-17	J-18	150.0	150.0	1.330	-32.39	1.83	False	0
P-38	159	J-18	J-2	200.0	150.0	1.330	-10.90	0.35	False	0
P-39	50	J-18	J-19	200.0	150.0	1.330	-22.19	0.71	False	0
P-40	143	J-19	J-12	200.0	150.0	1.330	-12.98	0.41	False	0
P-41	81	J-19	J-20	200.0	150.0	1.330	-9.73	0.31	False	0
P-42	76	J-20	J-21	200.0	150.0	1.330	-8.18	0.26	False	0
P-43	81	J-21	J-22	200.0	150.0	1.330	-9.60	0.31	False	0
P-44	86	J-22	J-9	200.0	150.0	1.330	-12.61	0.40	False	0
P-45	234	J-20	J-23	150.0	150.0	1.330	-2.06	0.12	False	0
P-46	305	J-23	J-22	150.0	150.0	1.330	-2.48	0.14	False	0
P-47	191	J-23	J-21	150.0	150.0	1.330	-0.90	0.05	False	0

Activa Baden North Subdivision, Baden

FlexTable: Junction Table

Active Scenario: Max Day + 133 L/s Fire Flow to J-3

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-1	357.30	0.00	393.26	352
J-2	360.65	0.18	391.56	303
J-3	362.30	134.50	388.53	257
J-4	361.00	0.28	391.56	299
J-5	362.15	0.34	391.55	288
J-6	361.55	0.44	391.55	294
J-7	361.10	0.44	391.55	298
J-8	360.80	0.30	391.55	301
J-9	359.45	2.68	391.54	314
J-10	360.10	0.42	391.55	308
J-11	360.55	0.44	391.55	303
J-12	360.95	0.44	391.55	299
J-13	359.10	0.00	393.32	335
J-15	362.50	0.34	391.56	284
J-16	362.15	0.52	391.56	288
J-17	361.65	0.52	391.56	293
J-18	361.20	0.70	391.55	297
J-19	361.00	0.52	391.55	299
J-20	360.45	0.52	391.54	304
J-21	360.00	0.52	391.54	309
J-22	359.55	0.52	391.54	313
J-23	361.55	1.32	391.54	294

Activa Baden North Subdivision, Baden

FlexTable: Pipe Table

Active Scenario: Max Day + 133 L/s Fire Flow to J-3

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Hazen-Williams C	Minor Loss Coefficient (Local)	Flow (L/s)	Velocity (m/s)	Has User Defined Length?	Length (User Defined) (m)
P-1	71	J-1	J-2	200.0	150.0	1.330	71.41	2.27	False	0
P-2	169	J-2	J-3	200.0	150.0	1.330	65.51	2.09	False	0
P-3	151	J-3	J-4	200.0	150.0	1.330	-68.99	2.20	False	0
P-4	232	J-4	J-5	200.0	150.0	1.330	1.95	0.06	False	0
P-5	78	J-5	J-6	200.0	150.0	1.330	1.61	0.05	False	0
P-6	79	J-6	J-7	200.0	150.0	1.330	1.64	0.05	False	0
P-7	80	J-7	J-8	200.0	150.0	1.330	1.33	0.04	False	0
P-8	227	J-8	J-9	200.0	150.0	1.330	1.03	0.03	False	0
P-9	80	J-9	J-10	200.0	150.0	1.330	-2.24	0.07	False	0
P-10	80	J-10	J-11	200.0	150.0	1.330	-2.40	0.08	False	0
P-11	75	J-11	J-4	200.0	150.0	1.330	-3.32	0.11	False	0
P-12	227	J-7	J-10	150.0	150.0	1.330	-0.12	0.01	False	0
P-13	230	J-6	J-11	150.0	150.0	1.330	-0.48	0.03	False	0
P-14	101	J-10	J-12	200.0	150.0	1.330	-0.38	0.01	False	0
P-15	67	J-4	J-13	200.0	150.0	1.330	-74.53	2.37	False	0
P-16	295	J-13	J-1	200.0	150.0	1.330	6.41	0.20	False	0
P-21	43	R-1	PMP-1	1,000.0	150.0	0.100	65.00	0.08	True	1
P-22	41	PMP-1	J-1	1,000.0	150.0	0.100	65.00	0.08	True	1
P-23	51	J-1	R-1	1,000.0	150.0	0.100	(N/A)	(N/A)	True	1
P-30	61	R-2	J-13	1,000.0	150.0	0.100	(N/A)	(N/A)	True	1
P-31	44	R-2	PMP-2	1,000.0	150.0	0.100	80.94	0.10	True	1
P-32	49	PMP-2	J-13	1,000.0	150.0	0.100	80.94	0.10	True	1
P-33	88	J-2	J-15	200.0	150.0	1.330	2.49	0.08	False	0
P-34	152	J-15	J-16	200.0	150.0	1.330	1.23	0.04	False	0
P-35	97	J-16	J-17	150.0	150.0	1.330	0.71	0.04	False	0
P-36	124	J-17	J-15	150.0	150.0	1.330	-0.92	0.05	False	0
P-37	92	J-17	J-18	150.0	150.0	1.330	1.11	0.06	False	0
P-38	159	J-18	J-2	200.0	150.0	1.330	-3.23	0.10	False	0
P-39	50	J-18	J-19	200.0	150.0	1.330	3.64	0.12	False	0
P-40	143	J-19	J-12	200.0	150.0	1.330	0.82	0.03	False	0
P-41	81	J-19	J-20	200.0	150.0	1.330	2.29	0.07	False	0
P-42	76	J-20	J-21	200.0	150.0	1.330	1.24	0.04	False	0
P-43	81	J-21	J-22	200.0	150.0	1.330	0.28	0.01	False	0
P-44	86	J-22	J-9	200.0	150.0	1.330	-0.59	0.02	False	0
P-45	234	J-20	J-23	150.0	150.0	1.330	0.53	0.03	False	0
P-46	305	J-23	J-22	150.0	150.0	1.330	-0.34	0.02	False	0
P-47	191	J-23	J-21	150.0	150.0	1.330	-0.45	0.03	False	0

Activa Baden North Subdivision, Baden

FlexTable: Junction Table

Active Scenario: Max Day + 133 L/s Fire Flow to J-9

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-1	357.30	0.00	393.27	352
J-2	360.65	0.18	391.66	303
J-3	362.30	1.50	391.54	286
J-4	361.00	0.28	391.46	298
J-5	362.15	0.34	390.46	277
J-6	361.55	0.44	390.08	279
J-7	361.10	0.44	389.53	278
J-8	360.80	0.30	389.06	277
J-9	359.45	135.68	387.89	278
J-10	360.10	0.42	389.48	288
J-11	360.55	0.44	390.36	292
J-12	360.95	0.44	389.61	280
J-13	359.10	0.00	393.31	335
J-15	362.50	0.34	391.49	284
J-16	362.15	0.52	391.41	286
J-17	361.65	0.52	391.23	290
J-18	361.20	0.70	390.60	288
J-19	361.00	0.52	389.79	282
J-20	360.45	0.52	389.18	281
J-21	360.00	0.52	388.82	282
J-22	359.55	0.52	388.45	283
J-23	361.55	1.32	388.82	267

Activa Baden North Subdivision, Baden

FlexTable: Pipe Table

Active Scenario: Max Day + 133 L/s Fire Flow to J-9

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Hazen-Williams C	Minor Loss Coefficient (Local)	Flow (L/s)	Velocity (m/s)	Has User Defined Length?	Length (User Defined) (m)
P-1	71	J-1	J-2	200.0	150.0	1.330	69.55	2.21	False	0
P-2	169	J-2	J-3	200.0	150.0	1.330	11.57	0.37	False	0
P-3	151	J-3	J-4	200.0	150.0	1.330	10.07	0.32	False	0
P-4	232	J-4	J-5	200.0	150.0	1.330	30.92	0.98	False	0
P-5	78	J-5	J-6	200.0	150.0	1.330	30.58	0.97	False	0
P-6	79	J-6	J-7	200.0	150.0	1.330	37.48	1.19	False	0
P-7	80	J-7	J-8	200.0	150.0	1.330	34.19	1.09	False	0
P-8	227	J-8	J-9	200.0	150.0	1.330	33.89	1.08	False	0
P-9	80	J-9	J-10	200.0	150.0	1.330	-65.34	2.08	False	0
P-10	80	J-10	J-11	200.0	150.0	1.330	-47.48	1.51	False	0
P-11	75	J-11	J-4	200.0	150.0	1.330	-55.26	1.76	False	0
P-12	227	J-7	J-10	150.0	150.0	1.330	2.85	0.16	False	0
P-13	230	J-6	J-11	150.0	150.0	1.330	-7.33	0.42	False	0
P-14	101	J-10	J-12	200.0	150.0	1.330	-15.43	0.49	False	0
P-15	67	J-4	J-13	200.0	150.0	1.330	-76.39	2.43	False	0
P-16	295	J-13	J-1	200.0	150.0	1.330	4.69	0.15	False	0
P-21	43	R-1	PMP-1	1,000.0	150.0	0.100	64.86	0.08	True	1
P-22	41	PMP-1	J-1	1,000.0	150.0	0.100	64.86	0.08	True	1
P-23	51	J-1	R-1	1,000.0	150.0	0.100	(N/A)	(N/A)	True	1
P-30	61	R-2	J-13	1,000.0	150.0	0.100	(N/A)	(N/A)	True	1
P-31	44	R-2	PMP-2	1,000.0	150.0	0.100	81.08	0.10	True	1
P-32	49	PMP-2	J-13	1,000.0	150.0	0.100	81.08	0.10	True	1
P-33	88	J-2	J-15	200.0	150.0	1.330	19.44	0.62	False	0
P-34	152	J-15	J-16	200.0	150.0	1.330	9.49	0.30	False	0
P-35	97	J-16	J-17	150.0	150.0	1.330	8.97	0.51	False	0
P-36	124	J-17	J-15	150.0	150.0	1.330	-9.61	0.54	False	0
P-37	92	J-17	J-18	150.0	150.0	1.330	18.06	1.02	False	0
P-38	159	J-18	J-2	200.0	150.0	1.330	-38.36	1.22	False	0
P-39	50	J-18	J-19	200.0	150.0	1.330	55.72	1.77	False	0
P-40	143	J-19	J-12	200.0	150.0	1.330	15.87	0.51	False	0
P-41	81	J-19	J-20	200.0	150.0	1.330	39.33	1.25	False	0
P-42	76	J-20	J-21	200.0	150.0	1.330	30.39	0.97	False	0
P-43	81	J-21	J-22	200.0	150.0	1.330	29.62	0.94	False	0
P-44	86	J-22	J-9	200.0	150.0	1.330	36.45	1.16	False	0
P-45	234	J-20	J-23	150.0	150.0	1.330	8.42	0.48	False	0
P-46	305	J-23	J-22	150.0	150.0	1.330	7.35	0.42	False	0
P-47	191	J-23	J-21	150.0	150.0	1.330	-0.25	0.01	False	0

Activa Baden North Subdivision, Baden

FlexTable: Junction Table

Active Scenario: Max Day + 133 L/s Fire Flow to J-23

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-1	357.30	0.00	393.26	352
J-2	360.65	0.18	391.60	303
J-3	362.30	1.50	391.55	286
J-4	361.00	0.28	391.51	299
J-5	362.15	0.34	390.66	279
J-6	361.55	0.44	390.34	282
J-7	361.10	0.44	389.91	282
J-8	360.80	0.30	389.64	282
J-9	359.45	2.68	388.98	289
J-10	360.10	0.42	389.64	289
J-11	360.55	0.44	390.50	293
J-12	360.95	0.44	389.54	280
J-13	359.10	0.00	393.32	335
J-15	362.50	0.34	391.40	283
J-16	362.15	0.52	391.31	285
J-17	361.65	0.52	391.11	288
J-18	361.20	0.70	390.37	285
J-19	361.00	0.52	389.42	278
J-20	360.45	0.52	387.46	264
J-21	360.00	0.52	387.18	266
J-22	359.55	0.52	387.41	273
J-23	361.55	134.32	379.19	173

Activa Baden North Subdivision, Baden

FlexTable: Pipe Table

Active Scenario: Max Day + 133 L/s Fire Flow to J-23

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Hazen-Williams C	Minor Loss Coefficient (Local)	Flow (L/s)	Velocity (m/s)	Has User Defined Length?	Length (User Defined) (m)
P-1	71	J-1	J-2	200.0	150.0	1.330	70.62	2.25	False	0
P-2	169	J-2	J-3	200.0	150.0	1.330	7.75	0.25	False	0
P-3	151	J-3	J-4	200.0	150.0	1.330	6.25	0.20	False	0
P-4	232	J-4	J-5	200.0	150.0	1.330	28.37	0.90	False	0
P-5	78	J-5	J-6	200.0	150.0	1.330	28.03	0.89	False	0
P-6	79	J-6	J-7	200.0	150.0	1.330	33.00	1.05	False	0
P-7	80	J-7	J-8	200.0	150.0	1.330	25.27	0.80	False	0
P-8	227	J-8	J-9	200.0	150.0	1.330	24.97	0.79	False	0
P-9	80	J-9	J-10	200.0	150.0	1.330	-40.87	1.30	False	0
P-10	80	J-10	J-11	200.0	150.0	1.330	-47.06	1.50	False	0
P-11	75	J-11	J-4	200.0	150.0	1.330	-52.92	1.68	False	0
P-12	227	J-7	J-10	150.0	150.0	1.330	7.29	0.41	False	0
P-13	230	J-6	J-11	150.0	150.0	1.330	-5.41	0.31	False	0
P-14	101	J-10	J-12	200.0	150.0	1.330	13.06	0.42	False	0
P-15	67	J-4	J-13	200.0	150.0	1.330	-75.32	2.40	False	0
P-16	295	J-13	J-1	200.0	150.0	1.330	5.69	0.18	False	0
P-21	43	R-1	PMP-1	1,000.0	150.0	0.100	64.94	0.08	True	1
P-22	41	PMP-1	J-1	1,000.0	150.0	0.100	64.94	0.08	True	1
P-23	51	J-1	R-1	1,000.0	150.0	0.100	(N/A)	(N/A)	True	1
P-30	61	R-2	J-13	1,000.0	150.0	0.100	(N/A)	(N/A)	True	1
P-31	44	R-2	PMP-2	1,000.0	150.0	0.100	81.00	0.10	True	1
P-32	49	PMP-2	J-13	1,000.0	150.0	0.100	81.00	0.10	True	1
P-33	88	J-2	J-15	200.0	150.0	1.330	21.02	0.67	False	0
P-34	152	J-15	J-16	200.0	150.0	1.330	10.26	0.33	False	0
P-35	97	J-16	J-17	150.0	150.0	1.330	9.74	0.55	False	0
P-36	124	J-17	J-15	150.0	150.0	1.330	-10.43	0.59	False	0
P-37	92	J-17	J-18	150.0	150.0	1.330	19.64	1.11	False	0
P-38	159	J-18	J-2	200.0	150.0	1.330	-41.67	1.33	False	0
P-39	50	J-18	J-19	200.0	150.0	1.330	60.61	1.93	False	0
P-40	143	J-19	J-12	200.0	150.0	1.330	-12.62	0.40	False	0
P-41	81	J-19	J-20	200.0	150.0	1.330	72.72	2.31	False	0
P-42	76	J-20	J-21	200.0	150.0	1.330	26.83	0.85	False	0
P-43	81	J-21	J-22	200.0	150.0	1.330	-23.14	0.74	False	0
P-44	86	J-22	J-9	200.0	150.0	1.330	-63.16	2.01	False	0
P-45	234	J-20	J-23	150.0	150.0	1.330	45.37	2.57	False	0
P-46	305	J-23	J-22	150.0	150.0	1.330	-39.51	2.24	False	0
P-47	191	J-23	J-21	150.0	150.0	1.330	-49.44	2.80	False	0

APPENDIX F

STORMWATER MANAGEMENT

DESIGN CALCULATIONS

STORMWATER MANAGEMENT HYDROLOGIC MODEL (SWMHYMO) FILES

STORMWATER MANAGEMENT POND (DRAWING NO. C-800)

Baden North - 60305680
NRCS (SCS) Curve Number Determination

TABLE OF CURVE NUMBERS (CN's)									
		Hydrologic Soil Type							Manning's
Land Use		A	AB	B	BC	C	CD	D	'n'
Meadow	"Good"	30	44	58	64.5	71	74.5	78	0.40
Woodlot	"Fair"	36	48	60	66.5	73	76	79	0.40
Gravel		76	80.5	85	87	89	90	91	0.30
Lawns	"Good"	39	50	61	67.5	74	77	80	0.25
Pasture/Range		58	61.5	65	70.5	76	78.5	81	0.17
Crop		66	70	74	78	82	84	86	0.13
Fallow (Bare)		77	82	86	89	91	93	94	0.05
Impervious		98	98	98	98	98	98	98	0.01

1. MTO Drainage Manual (1997), Design Chart 1.09-Soil/Land Use Curve Numbers
2. Chin (2000), Water-Resources Engineering, Table 6.13-Curve Numbers for Various Urban Land Uses

HYDROLOGIC SOIL TYPE (%)								
	Hydrologic Soil Type							
Catchment	A	AB	B	BC	C	CD	D	TOTAL
Existing Conditions								
100						100		100
101						100		100
102						100		100
103						100		100
104						100		100
105						100		100
Current Draft Plan Conditions								
200						100		100
201						100		100
202						100		100
203						100		100
204						100		100
205						100		100
206						100		100
207						100		100
Future Conditions								
300						100		100
301						100		100
302						100		100
303						100		100
304						100		100

LAND USE (%)									
Catchment	Meadow	Woodlot	Gravel	Lawns	Pasture Range	Crop	Fallow (Bare)	Impervious (see note)	Total
Existing Conditions									
100						100			100
101						100			100
102						100			100
103						100			100
104					50	50			100
105						100			100
Current Draft Plan Conditions									
200	80							20	100
201				35				65	100
202				60				40	100
203						100			100
204				100				0	100
205						100			100
206						100			100
207						100			100
Future Conditions									
300	80							20	100
301				35				65	100
302				60				40	100
303						100			100
304				40				60	100

CURVE NUMBER (CN)										
Catchment	Meadow	Woodlot	Gravel	Lawns	Pasture Range	Crop	Fallow (Bare)	Impervious	Weighted CN	Pervious CN
Existing Conditions										
100	0	0	0	0	0	84	0	0	84	84
101	0	0	0	0	0	84	0	0	84	84
102	0	0	0	0	0	84	0	0	84	84
103	0	0	0	0	0	84	0	0	84	84
104	0	0	0	0	39	42	0	0	81	81
105	0	0	0	0	0	84	0	0	84	84
Current Draft Plan Conditions										
200	60	0	0	0	0	0	0	20	79	75
201	0	0	0	27	0	0	0	64	91	77
202	0	0	0	46	0	0	0	39	85	77
203	0	0	0	0	0	84	0	0	84	84
204	0	0	0	77	0	0	0	0	77	77
205	0	0	0	0	0	84	0	0	84	84
206	0	0	0	0	0	84	0	0	84	84
207	0	0	0	0	0	84	0	0	84	84
Future Conditions										
300	60	0	0	0	0	0	0	20	79	75
301	0	0	0	27	0	0	0	64	91	77
302	0	0	0	46	0	0	0	39	85	77
303	0	0	0	0	0	84	0	0	84	84
304	0	0	0	31	0	0	0	58	90	77

** AMC II assumed
** Hydrological Soil Group taken from MTO Drainage Manual for each soil type

Baden North - 60305680
SWMHYMO Parameters

Existing Conditions

Area Description	Catchment ID	SWMHYMO Command	Area (ha)	CN	TIMP	XIMP	Slope (%)	Length (m)	Tc (hrs)	Tp (hrs)
Agricultural area in the western portion of the site draining to wetland	100	DESIGN NASHYD	11.55	84	0.00		0.9%	450	0.90	0.54
Agricultural area in the eastern portion of the site draining to the north just east of wetland and connecting in downstream	101	DESIGN NASHYD	6.44	84	0.00		1.0%	430	0.83	0.50
External agricultural area to the north-east of site draining to site and subsequently to north just east of wetland	102	DESIGN NASHYD	2.07	84	0.00		2.5%	200	0.43	0.26
External agricultural area to the north-east of site draining to site and subsequently to the south towards existing Baden subdivision	103	DESIGN NASHYD	2.15	84	0.00		3.1%	160	0.35	0.21
Mostly agricultural area in southern portion of the site draining south to the existing Baden Subdivision	104	DESIGN NASHYD	12.66	81	0.00		1.1%	280	0.67	0.40
External agricultural area to the west of the site draining to a depression that overflows across the site to the northern wetland	105	DESIGN NASHYD	14.16	84	0.00		2.0%	450	0.69	0.41

Current Draft Plan Conditions

Area Description	Catchment ID	SWMHYMO Command	Area (ha)	CN	TIMP	XIMP	Slope (%)	Length (m)	Tc (hrs)	Tp (hrs)
SWM Facility	200	DESIGN STANDHYD	2.32	75	0.20	0.20	2.0%			0.00
Proposed residential development draining to on site SWM Facility	201	DESIGN STANDHYD	12.90	77	0.65	0.52	2.0%			
Rear yards from proposed development as well as existing development to the south draining in dedicated storm pipe to SWM Facility	202	DESIGN STANDHYD	1.01	77	0.40	0.00	2.0%			
Existing agricultrual land draining to site via sheet flow	203	DESIGN NASHYD	4.22	84			1.1%	280	0.67	0.40
Proposed residential development draining south to existing Baden Subdivision to the south	204	DESIGN STANDHYD	1.76	77	0.60	0.48	2.0%			
Existing agricultrual land draining to site via sheet flow	205	DESIGN NASHYD	6.34	84			0.5%	450	1.09	0.65
Existing agricultrual land draining north across the hydro cooridor	206	DESIGN NASHYD	2.03	84			1.4%	180	0.49	0.29
Existing agricultrual land draining south to the existing Baden Subdivision	207	DESIGN NASHYD	4.74	84			0.9%	220	0.62	0.37
		Total to SWM Pond	26.79		35%					
		Total developed area to SWM pond	16.23							

Future Conditions

Area Description	Catchment ID	SWMHYMO Command	Area (ha)	CN	TIMP	XIMP	Slope (%)	Length (m)	Tc (hrs)	Tp (hrs)
SWM Facility	300	DESIGN STANDHYD	2.32	75	0.20	0.20	2.0%			
Development draining to on site SWM Facility including current draft plan conditions as well as future development on non-TUA lands	301	DESIGN STANDHYD	25.10	77	0.65	0.52	2.0%			
Rear yards from proposed development as well as existing development to the south draining in dedicated storm pipe to SWM Facility	302	DESIGN STANDHYD	1.01	77	0.40	0.00	2.0%			
Existing agricultrual land draining to site via sheet flow	303	DESIGN NASHYD	4.22	84			1.1%	280	0.67	0.40
Proposed residential development draining south to existing Baden Subdivision to the south	304	DESIGN STANDHYD	2.67	77	0.60	0.48	2.0%			
		Total to SWM Pond	32.65		53%					
		Total developed area to SWM pond	28.43							

Notes:

CN calculated for pervious areas only for DESIGN STANDHYD. CN is a weighted average for DESIGN NASHYD

TIMP ..... *Total percent impervious*

XIMP ..... *Percent impervious directly connected*

Time of Concentration calculated using the Airport Method ..... $Tc = [\,3.26\,(1.1-C)\,L^{0.5}\,] / S^{0.33}$

Where: *C = Runoff Coefficient = 0.35 according to MTO Design chart 1.07 for 'cultivated' on silt loam soil*
L = Length of Overland Flow (m)
S = Slope (%)

Time to Peak (hr) ..... $Tp = 0.6Tc$

Baden North - 60305680

Stormwater Management Facility Design Calculations - CURRENT DRAFT PLAN CONDITIONS

	Rating Curve						Estimated	Volume Estimation												Outlet Structure Controls							
	Infiltration				Active to Wetland		Detention	Forebay					Infiltration Cell						Active Storage		Ext. Detention	Summer		DICB	DICB		Emergency	
	Elevation (m)	Infiltration (m³/s)	Volume	Infiltration Drawdown (hrs)	Surface Discharge (m³/s)	Active (m³)	Time (hrs)	Elevation (m)	Area (m²)	Total Volume (m³)	Total Active (m³)	Active to Surface (m³)	Area (m²)	Amended Soil Volume (m³)	Surface Infiltration (m³)	Total Infiltration (m³)	Total Volume (m³)	Active Volume (m³)	Volume (m³)	Elevation (m)	Orifice #1 (m³/s)	Outlet (m³/s)	Control (m³/s)	Inlet (m³/s)	Orifice (m³/s)	Control (m³/s)	Spillway (m³/s)	Total Flow
Forebay Invert	354.30							354.30	1,080											354.30								
	354.35							354.35	1,136	55										354.35								
	354.40							354.40	1,193	114										354.40								
	354.45							354.45	1,251	175										354.45								
	354.50							354.50	1,308	239										354.50								
	354.55							354.55	1,366	306										354.55								
	354.60							354.60	1,424	375										354.60								
	354.65							354.65	1,483	448										354.65								
	354.70							354.70	1,541	524										354.70								
	354.75							354.75	1,601	602										354.75								
Max. Sed. Storage	354.80							354.80	1,660	684										354.80								
	354.85							354.85	1,720	768										354.85								
	354.90							354.90	1,779	856										354.90								
	354.95							354.95	1,840	946										354.95								
	355.00							355.00	1,900	1,040										355.00								
	355.05							355.05	1,961	1,136										355.05								
	355.10							355.10	2,022	1,236										355.10								
	355.15							355.15	2,084	1,338										355.15								
	355.20							355.20	2,146	1,444										355.20								
Amended Soil Bottom	355.25							355.25	2,208	1,553			5,916							355.25								
n =	355.30	0.029	104	1.0				355.30	2,271	1,665			5,916	104		104	104			355.30								
0.35	355.35	0.029	207	2.0				355.35	2,334	1,780			5,916	207		207	207			355.35								
	355.40	0.029	311	3.0				355.40	2,398	1,898			5,916	311		311	311			355.40								
	355.45	0.029	414	4.0				355.45	2,462	2,020			5,916	414		414	414			355.45								
	355.50	0.029	518	4.9				355.50	2,526	2,144			5,916	518		518	518			355.50								
Infiltration Cell Bottom	355.55	0.029	621	5.9				355.55	2,591	2,272			5,916	621		621	621			355.55								
	355.60	0.029	919	8.8				355.60	2,656	2,404			6,016		298	919	919			355.60								
Winter Infiltration	355.65	0.029	1,223	11.7				355.65	2,721	2,538			6,117		602	1,223	1,223			355.65	0.002							
	355.70	0.029	1,531	14.6				355.70	2,787	2,676			6,218		910	1,531	1,531			355.70	0.009				0.013			
	355.75	0.029	1,845	17.6				355.75	2,853	2,817			6,319		1,223	1,845	1,845			355.75	0.019				0.028			
Forebay PP	355.80	0.029	2,163	20.7				355.80	2,920	2,961			6,421		1,542	2,163	2,163			355.80	0.026				0.044			
	355.85	0.029	2,634	25.2				355.85	2,987	3,109	148		6,523		1,865	2,634	2,487			355.85	0.032				0.098			
Summer Infiltration	355.90	0.029	3,114	29.7				355.90	3,054	3,260	299		6,625		2,194	3,114	2,815			355.90	0.037				0.131			
Surface Runoff	355.95				0.003	488		355.95	3,122	3,414	453	154	6,728		2,528		3,149	334	488	355.95	0.042	0.003	0.003		0.158			0.003
	356.00				0.011	985	48.7	356.00	3,212	3,572	611	312	6,832		2,867		3,488	673	985	356.00	0.046	0.011	0.011		0.180			0.011
	356.05				0.024	1,492	56.6	356.05	3,307	3,735	774	475	6,935		3,211		3,832	1,017	1,492	356.05	0.049	0.024	0.024		0.201			0.024
	356.10				0.042	2,009	61.0	356.10	3,411	3,903	942	643	7,039		3,561		4,182	1,366	2,009	356.10	0.053	0.042	0.042		0.219			0.042
	356.15				0.056	2,537	64.0	356.15	3,523	4,076	1,115	816	7,144		3,915		4,536	1,721	2,537	356.15	0.056	0.059	0.056		0.236			0.056
	356.20				0.059	3,076	66.6	356.20	3,640	4,255	1,294	995	7,249		4,275		4,896	2,081	3,076	356.20	0.059	0.073	0.059		0.251			0.059
	356.25				0.062	3,630	69.1	356.25	3,800	4,443	1,482	1,184	7,372		4,641		5,262	2,447	3,630	356.25	0.062	0.084	0.062		0.266			0.062
	356.30				0.065	4,193	71.6	356.30	3,870	4,635	1,674	1,375	7,476		5,012		5,633	2,818	4,193	356.30	0.065	0.094	0.065		0.280			0.065
	356.35				0.067	4,765	74.0	356.35	3,941	4,830	1,869	1,571	7,579		5,389		6,010	3,194	4,765	356.35	0.067	0.103	0.067		0.294			0.067
	356.40				0.070	5,345	76.3	356.40	4,012	5,029	2,068	1,769	7,682		5,770		6,391	3,576	5,345	356.40	0.070	0.111	0.070		0.306			0.070
	356.45				0.072	5,934	78.6	356.45	4,084	5,231	2,270	1,972	7,785		6,157		6,778	3,963	5,934	356.45	0.072	0.119	0.072		0.319			0.072
	356.50				0.075	6,532	80.9	356.50	4,175	5,437	2,476	2,178	7,908		6,549		7,170	4,354	6,532	356.50	0.075	0.126	0.075		0.330			0.075
	356.55				0.077	7,141	83.1	356.55	4,243	5,648	2,687	2,388	8,006		6,946		7,568	4,752	7,141	356.55	0.077	0.133	0.077		0.342			0.077
	356.60				0.079	7,757	85.3	356.60	4,310	5,862	2,901	2,602	8,105		7,349		7,970	5,155	7,757	356.60	0.079	0.139	0.079		0.353			0.079
	356.65				0.103	8,382	87.2	356.65	4,380	6,079	3,118	2,819	8,203		7,757		8,378	5,563	8,382	356.65	0.081	0.146	0.081	0.021	0.363	0.021		0.103
	356.70				0.216	9,016	88.3	356.70	4,451	6,300	3,339	3,040	8,303		8,170		8,791	5,975	9,016	356.70	0.083	0.151	0.083	0.133	0.374	0.133		0.216
	356.75				0.331	9,658	89.0	356.75	4,524	6,524	3,563	3,265	8,402		8,587		9,208	6,393	9,658	356.75	0.086	0.157	0.086	0.246	0.384	0.246		0.331
	356.80				0.478	10,308	89.4	356.80	4,889	6,752	3,791	3,493	8,501		9,010		9,631	6,816	10,308	356.80	0.088	0.163	0.088	0.390	0.394	0.390		0.478
	356.85				0.493	10,983	89.8	356.85	5,005	7,000	4,039	3,740	8,596		9,437		10,058	7,243	10,983	356.85	0.090	0.168	0.090	0.572	0.403	0.403		0.493
	356.90				0.504	11,668	90.2	356.90	5,113	7,253	4,292	3,993	8,690		9,869		10,491	7,675	11,668	356.90	0.091	0.173	0.091	0.819	0.413	0.413		0.504
	356.95				0.515	12,363	90.6	356.95	5,216	7,511	4,550	4,251	8,785		10,306		10,927	8,112	12,363	356.95	0.093	0.178	0.093	1.003	0.422	0.422		0.515
	357.00				0.526	13,068	90.9	357.00	5,317	7,774	4,813	4,515	8,879		10,748		11,369	8,554	13,068	357.00	0.095	0.183	0.095	1.425	0.431	0.431		0.526
	357.05				0.537	13,783	91.3	357.05	5,416	8,043	5,082	4,783	8,974		11,194		11,815	9,000	13,783	357.05	0.097	0.188	0.097	1.806	0.440	0.440		0.537
	357.10				0.547	14,507	91.7	357.10	5,513	8,316	5,355	5,056	9,069		11,645		12,266	9,451	14,507	357.10	0.099	0.192	0.099	2.002	0.448	0.448		0.547
	357.15				0.557	15,241	92.1	357.15	5,608	8,594	5,633	5,334	9,165		12,101		12,722	9,907	15,241	357.15	0.101	0.197	0.101	2.369	0.457	0.457		0.557
	357.20				0.567	15,985	92.4	357.20	5,701	8,877	5,916	5,617	9,261		12,562		13,183	10,368	15,985	357.20	0.102	0.201	0.102	2.469	0.465	0.465		0.567
	357.25				0.577	16,737	92.8	357.25	5,794	9,164	6,203	5,904	9,358		13,027		13,648	10,833	16,737	357.25	0.104	0.206	0.104	2.727	0.473	0.473		0.577
	357.30				0.587	17,500	93.2	357.30	5,886	9,456	6,495	6,196	9,455		13,497		14,119	11,303	17,500	357.30	0.106	0.210	0.106	2.986	0.481	0.481		0.587
	357.35				0.596	18,272	93.5	357.35	5,978	9,753	6,792	6,493	9,554		13,973		14,594	11,779	18,272	357.35	0.107	0.214	0.107	3.255	0.489	0.489		0.596
	357.40				0.606	19,053	93.9	357.40	6,071	10,054	7,093	6,794	9,655		14,453		15,074	12,259	19,053	357.40	0.109	0.218	0.109		0.497	0.497		0.606
	357.45				0.615	19,844	94.2	357.45	6,164	10,360	7,399	7,100	9,756		14,938		15,559	12,744	19,844	357.45	0.110	0.222	0.110		0.505	0.505		0.615
Overflow Weir	357.50				0.624	20,645	94.6	357.50	6,258	10,670	7,709	7,411	9,857		15,429		16,050	13,234	20,645	357.50	0.112	0.226	0.112		0.512	0.512	0.000	0.624
	357.55				0.926	21,456	94.9	357.55	6,352	10,985	8,024	7,726	9,960		15,924		16,545	13,730	21,456	357.55	0.114	0.230	0.114		0.520	0.520	0.292	0.926
	357.60				1.489	22,276	95.1	357.60	6,446	11,305	8,344	8,046	10,063		16,425		17,046	14,230	22,276	357.60	0.115	0.234	0.115		0.527	0.527	0.847	1.489
	357.65				2.245	23,107	95.2	357.65	6,540	11,630	8,669	8,370	10,168		16,930		17,551	14,736	23,107	357.65	0.117	0.238	0.117		0.534	0.534	1.595	2.245
	357.70				3.173	23,947	95.3	357.70	6,634	11,959	8,998	8,700	10,273		17,441		18,062	15,247	23,947	357.70	0.118	0.241	0.118		0.541	0.541	2.513	3.173
	357.75				4.262	24,797	95.4	357.75	6,728	12,293	9,332	9,034	10,379		17,958		18,579	15,763	24,797	357.75	0.120	0.245	0.120		0.548	0.548	3.594	4.262
	357.80				5.507	25,658	95.4	357.80	7,270	12,632	9,671	9,372	10,771		18,479		19,100	16,285	25,658	357.80	0.121	0.249	0.121		0.555	0.555	4.831	5.507

Parameters	
Water Quality Extended Detention Orifice #1	
Orifice #1 Elev (m)	Orifice Coeff.
355.60	0.600
Orifice #1-Midpoint (m)	Perimeter (m)
355.70	0.628
Orifice Diameter (mm)	Area (m²)
200	0.031
Weir Coeff. (Sharp)	Orientation
1.80	Vertical
Summer outlet	
Orifice Elev (m)	Orifice Coeff.
355.90	0.600
Orifice-Midpoint (m)	Perimeter (m)
356.05	1.178
Orifice Diameter (mm)	Area (m²)
300	0.071
Weir Coeff. (Sharp)	Orientation
1.80	Vertical
DICB Orifice	
Orifice Elev (m)	Orifice Coeff.
355.60	0.80
Orifice-Midpoint (m)	Perimeter (m)
355.79	1.178
Orifice Diameter (mm)	Area (m²)
375	0.110
Weir Coeff. (Sharp)	Orientation
1.80	Vertical
DICB invert (m)	356.60
Emergency Overflow Weir	
Spillway Invert (m)	Top of Berm (m)
357.50	359.00
Spillway Length @ Invert (m)	Max. Flow Depth (m)
15	1.50
Side Slopes (ratio of H:V)	Topwidth
10.00	45.00
Weir Coefficient (Rectangle)	Weir Coeff. (Triangle)
1.70	1.30
Infiltration Cell	
Infiltration Footprint (m²)	
5916	
Factored Infiltration Rate (mm/hr)	
17.7	
Infiltration Rate (m³/s)	
0.029	

Notes: Pond forebay volume is set to zero after a depth of 0.5 m (the maximum depth of permissible sediment accumulation)
to reflect the permanent pool volume when the forebay is full of sediment (worst case)

Drawdown Time Calculations Greater than 0.1 m above the permanent pool

$T=[v_2-v_1]/[(Q_2+Q_1)/2]/3600$

where

T=drawdown time in hours

v_2=starting pond volume

v_2=ending pond volume

Q_2=starting flow

Q_1=ending flow

From 0.0 to 0.1 m above the permanent pool

$T=[v_2-v_1]/[(Q_2)]/3600$

where

T=drawdown time in hours

v_2=starting pond volume

v_2=ending pond volume

Q_2=starting flow

Weir Equation Used: $Q = C_{sc}*L*H^{1.5} + C_{sc}*S*H^{2.5}$

where

L = bottom width of spillway

H = head above weir invert

S = side slopes (ratio of H:V)

C_{sc} = weir coefficient (triangular)

C_{sc} = weir coefficient (broad-crested)

Sharp crested semi-circular weir equation

Sharp crested semi-circular weir equation

$Q=C*D^{2.5}*(H/D)^{1.88}$

where

C = sharp crested semi-circular weir coefficient

D = diameter of orifice

H = head above orifice invert

Note: used when water elevation is below 3/4 of the orifice diameter

Orifice Flow Calculations: Orifice flow equation

$Q = C\text{-}A_r\text{-}[2\text{-}g\text{-}H]^{0.5}$

where

C = orifice coefficient

A = area of orifice

g = acceleration due to gravity

H = head above centre line of orifice

Note: used when water elevation is above 3/4 of the orifice diameter

Baden North - 60305680
Stormwater Management Facility Design Calculations - FUTURE CONDITIONS

	Rating Curve						Estimated	Volume Estimation												Outlet Structure Controls							
	Infiltration				Active to Wetland		Detention	Forebay					Infiltration Cell						Active Storage								
	Elevation (m)	Infiltration (m³/s)	Volume	Infiltration Drawdown (hrs)	Surface Discharge (m³/s)	Active (m³)	Time (hrs)	Elevation (m)	Area (m²)	Total Volume (m³)	Active to Infiltrate (m³)	Active to Surface (m³)	Area (m²)	Amended Soil Volume (m³)	Surface Infiltration (m³)	Total Infiltration (m³)	Total Volume (m³)	Active Volume (m³)	Volume (m³)	Elevation (m)	Ext. Detention Orifice #1 (m³/s)	Summer Outlet (m³/s)	Control (m³/s)	DICB Inlet (m³/s)	DICB Orifice (m³/s)	Control (m³/s)	Emergency Spillway (m³/s)	Total Flow
Forebay Invert	354.30							354.30	1,080											354.30								
	354.35							354.35	1,136	55										354.35								
	354.40							354.40	1,193	114										354.40								
	354.45							354.45	1,251	175										354.45								
	354.50							354.50	1,308	239										354.50								
	354.55							354.55	1,366	306										354.55								
	354.60							354.60	1,424	375										354.60								
	354.65							354.65	1,483	448										354.65								
	354.70							354.70	1,541	524										354.70								
	354.75							354.75	1,601	602										354.75								
Max. Sed. Storage	354.80							354.80	1,660	684										354.80								
	354.85							354.85	1,720	768										354.85								
	354.90							354.90	1,779	856										354.90								
	354.95							354.95	1,840	946										354.95								
	355.00							355.00	1,900	1,040										355.00								
	355.05							355.05	1,961	1,136										355.05								
	355.10							355.10	2,022	1,236										355.10								
	355.15							355.15	2,084	1,338										355.15								
	355.20							355.20	2,146	1,444										355.20								
Amended Soil Bottom	355.25							355.25	2,208	1,553			5,916							355.25								
n =	355.30	0.029	104	1.0				355.30	2,271	1,665			5,916	104		104	104			355.30								
0.35	355.35	0.029	207	2.0				355.35	2,334	1,780			5,916	207		207	207			355.35								
	355.40	0.029	311	3.0				355.40	2,398	1,898			5,916	311		311	311			355.40								
	355.45	0.029	414	4.0				355.45	2,462	2,020			5,916	414		414	414			355.45								
	355.50	0.029	518	4.9				355.50	2,526	2,144			5,916	518		518	518			355.50								
Infiltration Cell Bottom	355.55	0.029	621	5.9				355.55	2,591	2,272			5,916	621		621	621			355.55								
	355.60	0.029	919	8.8				355.60	2,656	2,404			6,016		298	919	919			355.60								
	355.65	0.029	1,223	11.7				355.65	2,721	2,538			6,117		602	1,223	1,223			355.65	0.002							
	355.70	0.029	1,531	14.6				355.70	2,787	2,676			6,218		910	1,531	1,531			355.70	0.009				0.013			
	355.75	0.029	1,845	17.6				355.75	2,853	2,817			6,319		1,223	1,845	1,845			355.75	0.019				0.028			
Forebay PP	355.80	0.029	2,163	20.7				355.80	2,920	2,961			6,421		1,542	2,163	2,163			355.80	0.026				0.044			
Winter Infiltration	355.85	0.029	2,634	25.2				355.85	2,987	3,109	148		6,523		1,865	2,634	2,487			355.85	0.032				0.098			
	355.90	0.029	3,114	29.7				355.90	3,054	3,260	299		6,625		2,194	3,114	2,815			355.90	0.037				0.131			
	355.95	0.029	3,602	34.4				355.95	3,122	3,414	453		6,728		2,528	3,602	3,149			355.95	0.042				0.158			
	356.00	0.029	4,099	39.1				356.00	3,212	3,572	611		6,832		2,867	4,099	3,488			356.00	0.046				0.180			
Summer Infiltration	356.05	0.029	4,606	44.0				356.05	3,307	3,735	774		6,935		3,211	4,606	3,832			356.05	0.049				0.201			
Surface Runoff	356.10				0.003	517		356.10	3,411	3,903	942	168	7,039		3,561		4,182	349	517	356.10	0.053	0.003	0.003		0.219			0.003
	356.15				0.011	1,045	51.6	356.15	3,523	4,076	1,115	341	7,144		3,915		4,536	704	1,045	356.15	0.056	0.011	0.011		0.236			0.011
	356.20				0.024	1,584	60.1	356.20	3,640	4,255	1,294	520	7,249		4,275		4,896	1,064	1,584	356.20	0.059	0.024	0.024		0.251			0.024
	356.25				0.042	2,138	64.7	356.25	3,800	4,443	1,482	708	7,372		4,641		5,262	1,430	2,138	356.25	0.062	0.042	0.042		0.266			0.042
	356.30				0.059	2,701	67.8	356.30	3,870	4,635	1,674	900	7,476		5,012		5,633	1,801	2,701	356.30	0.065	0.059	0.059		0.280			0.059
	356.35				0.067	3,273	70.3	356.35	3,941	4,830	1,869	1,096	7,579		5,389		6,010	2,177	3,273	356.35	0.067	0.073	0.067		0.294			0.067
	356.40				0.070	3,853	72.7	356.40	4,012	5,029	2,068	1,294	7,682		5,770		6,391	2,559	3,853	356.40	0.070	0.084	0.070		0.306			0.070
	356.45				0.072	4,442	75.0	356.45	4,084	5,231	2,270	1,497	7,785		6,157		6,778	2,946	4,442	356.45	0.072	0.094	0.072		0.319			0.072
	356.50				0.075	5,040	77.2	356.50	4,175	5,437	2,476	1,703	7,908		6,549		7,170	3,337	5,040	356.50	0.075	0.103	0.075		0.330			0.075
	356.55				0.077	5,648	79.5	356.55	4,243	5,648	2,687	1,913	8,006		6,946		7,568	3,735	5,648	356.55	0.077	0.111	0.077		0.342			0.077
	356.60				0.079	6,265	81.7	356.60	4,310	5,862	2,901	2,127	8,105		7,349		7,970	4,138	6,265	356.60	0.079	0.119	0.079		0.353			0.079
	356.65				0.103	6,890	83.6	356.65	4,380	6,079	3,118	2,344	8,203		7,757		8,378	4,546	6,890	356.65	0.081	0.126	0.081	0.021	0.363	0.021		0.103
	356.70				0.216	7,523	84.7	356.70	4,451	6,300	3,339	2,565	8,303		8,170		8,791	4,958	7,523	356.70	0.083	0.133	0.083	0.133	0.374	0.133		0.216
	356.75				0.331	8,165	85.3	356.75	4,524	6,524	3,563	2,789	8,402		8,587		9,208	5,376	8,165	356.75	0.086	0.139	0.086	0.246	0.384	0.246		0.331
	356.80				0.478	8,816	85.8	356.80	4,889	6,752	3,791	3,018	8,501		9,010		9,631	5,799	8,816	356.80	0.088	0.146	0.088	0.390	0.394	0.390		0.478
	356.85				0.493	9,491	86.2	356.85	5,005	7,000	4,039	3,265	8,596		9,437		10,058	6,226	9,491	356.85	0.090	0.151	0.090	0.572	0.403	0.403		0.493
	356.90				0.504	10,176	86.5	356.90	5,113	7,253	4,292	3,518	8,690		9,869		10,491	6,658	10,176	356.90	0.091	0.157	0.091	0.819	0.413	0.413		0.504
	356.95				0.515	10,871	86.9	356.95	5,216	7,511	4,550	3,776	8,785		10,306		10,927	7,095	10,871	356.95	0.093	0.163	0.093	1.003	0.422	0.422		0.515
	357.00				0.526	11,576	87.3	357.00	5,317	7,774	4,813	4,040	8,879		10,748		11,369	7,537	11,576	357.00	0.095	0.168	0.095	1.425	0.431	0.431		0.526
	357.05				0.537	12,291	87.7	357.05	5,416	8,043	5,082	4,308	8,974		11,194		11,815	7,983	12,291	357.05	0.097	0.173	0.097	1.806	0.440	0.440		0.537
	357.10				0.547	13,015	88.0	357.10	5,513	8,316	5,355	4,581	9,069		11,645		12,266	8,434	13,015	357.10	0.099	0.178	0.099	2.002	0.448	0.448		0.547
	357.15				0.557	13,749	88.4	357.15	5,608	8,594	5,633	4,859	9,165		12,101		12,722	8,890	13,749	357.15	0.101	0.183	0.101	2.369	0.457	0.457		0.557
	357.20				0.567	14,492	88.8	357.20	5,701	8,877	5,916	5,142	9,261		12,562		13,183	9,351	14,492	357.20	0.102	0.188	0.102	2.469	0.465	0.465		0.567
	357.25				0.577	15,245	89.1	357.25	5,794	9,164	6,203	5,429	9,358		13,027		13,648	9,816	15,245	357.25	0.104	0.192	0.104	2.727	0.473	0.473		0.577
	357.30				0.587	16,008	89.5	357.30	5,886	9,456	6,495	5,721	9,455		13,497		14,119	10,286	16,008	357.30	0.106	0.197	0.106	2.986	0.481	0.481		0.587
	357.35				0.596	16,779	89.9	357.35	5,978	9,753	6,792	6,018	9,554		13,973		14,594	10,762	16,779	357.35	0.107	0.201	0.107	3.255	0.489	0.489		0.596
	357.40				0.606	17,561	90.2	357.40	6,071	10,054	7,093	6,319	9,655		14,453		15,074	11,242	17,561	357.40	0.109	0.206	0.109		0.497	0.497		0.606
	357.45				0.615	18,352	90.6	357.45	6,164	10,360	7,399	6,625	9,756		14,938		15,559	11,727	18,352	357.45	0.110	0.210	0.110		0.505	0.505		0.615
Overflow Weir	357.50				0.624	19,153	91.0	357.50	6,258	10,670	7,709	6,935	9,857		15,429		16,050	12,217	19,153	357.50	0.112	0.214	0.112		0.512	0.512	0.000	0.624
	357.55				0.926	19,963	91.2	357.55	6,352	10,985	8,024	7,251	9,960		15,924		16,545	12,713	19,963	357.55	0.114	0.218	0.114		0.520	0.520	0.292	0.926
	357.60				1.489	20,784	91.4	357.60	6,446	11,305	8,344	7,571	10,063		16,425		17,046	13,213	20,784	357.60	0.115	0.222	0.115		0.527	0.527	0.847	1.489
	357.65				2.245	21,614	91.6	357.65	6,540	11,630	8,669	7,895	10,168		16,930		17,551	13,719	21,614	357.65	0.117	0.226	0.117		0.534	0.534	1.595	2.245
	357.70				3.173	22,455	91.6	357.70	6,634	11,959	8,998	8,225	10,273		17,441		18,062	14,230	22,455	357.70	0.118	0.230	0.118		0.541	0.541	2.513	3.173
	357.75				4.262	23,305	91.7	357.75	6,728	12,293	9,332	8,559	10,379		17,958		18,579	14,746	23,305	357.75	0.120	0.234	0.120		0.548	0.548	3.594	4.262
	357.80				5.386	24,165	91.8	357.80	7,270	12,632	9,671	8,897	10,771		18,479		19,100	15,268	24,165	357.80		0.238			0.555	0.555	4.831	5.386

Parameters	
Water Quality Extended Detention Orifice #1	
Orifice #1 Elev (m)	Orifice Coeff.
355.60	0.600
Orifice #1-Midpoint (m)	Perimeter (m)
355.70	0.628
Orifice Diameter (mm)	Area (m²)
200	0.031
Weir Coeff. (Sharp)	Orientation
1.80	Vertical
Summer outlet	
Orifice Elev (m)	Orifice Coeff.
356.05	0.600
Orifice-Midpoint (m)	Perimeter (m)
356.20	1.178
Orifice Diameter (mm)	Area (m²)
300	0.071
Weir Coeff. (Sharp)	Orientation
1.80	Vertical
DICB Orifice	
Orifice Elev (m)	Orifice Coeff.
355.60	0.800
Orifice-Midpoint (m)	Perimeter (m)
355.79	1.178
Orifice Diameter (mm)	Area (m²)
375	0.110
Weir Coeff. (Sharp)	Orientation
1.80	Vertical
DICB invert (m)	**356.60**
Emergency Overflow Weir	
Spillway Invert (m)	Top of Berm (m)
357.50	359.00
Spillway Length @ Invert (m)	Max. Flow Depth (m)
15	1.50
Side Slopes (ratio of H:V)	Topwidth
10.00	45.00
Weir Coefficient (Rectangle)	Weir Coeff. (Triangle)
1.70	1.30
Infiltration Cell	
Infiltration Footprint (m²)	
5916	
Factored Infiltration Rate (mm/hr)	
17.7	
Infiltration Rate (m³/s)	
0.029	

Notes: Pond forebay volume is set to zero after a depth of 0.5 m (the maximum depth of permissible sediment accumulation) to reflect the permanent pool volume when the forebay is full of sediment (worst case)

Drawdown Time Calculations Greater than 0.1 m above the permanent pool

$T=[v_2-v_1]/[(Q_2+Q_1)/2]/3600$

where

T=drawdown time in hours

v_2=starting pond volume

v_2=ending pond volume

Q_2=starting flow

Q_1=ending flow

From 0.0 to 0.1 m above the permanent pool

$T=[v_2-v_1]/[(Q_2)]/3600$

where

T=drawdown time in hours

v_2=starting pond volume

v_2=ending pond volume

Q_2=starting flow

Weir Equation Used: $Q = C_{ss}*L*H^{1.5} + C_{se}*S*H^{2.5}$

where

L = bottom width of spillway

H = head above weir invert

S = side slopes (ratio of H:V)

C_{se} = weir coefficient (triangular)

C_{ss} = weir coefficient (broad-crested)

Sharp crested semi-circular weir equation

Sharp crested semi-circular weir equation

$Q=C*D^{2.5}*(H/D)^{1.88}$

where

C = sharp crested semi-circular weir coefficient

D = diameter of orifice

H = head above orifice invert

Note: used when water elevation is below 3/4 of the orifice diameter

Orifice Flow Calculations: Orifice flow equation

$Q = C*A*[2*g*H]^{0.5}$

where

C = orifice coefficient

A = area of orifice

g = acceleration due to gravity

H = head above centre line of orifice

Note: used when water elevation is above 3/4 of the orifice diameter

Baden North - 60305680

Stormwater Quality Volumetric Requirements (Future Conditions)

Drainage Area (ha)[2]	Total % Imp.	Level	Facility Type	Water Quality Unit Volume Requirements [1]			Water Quality Volume Requirements		
				Total Unit Volume (m^3/ha)	Permanent Pool (m^3/ha)	Extended Detention (m^3/ha)	Permanent Pool (m^3)	Extended Detention (m^3)	Total MOE Volume
32.65	53%	Normal	Wetpond	107	67	40	2,182	1,306	3,488

[1] Water quality unit volume requirements based on Table 3.2, Stormwater Management Planning & Design Manual (MOE 2003)

[2] Drainage Area for Quality control represents total storm sewer drainage area to SWM Facility and includes the area of the SWM block itself and external area draining onto site

Baden North - 60305680
Sediment Forebay Sizing Calculations
Using MOE - SWMPD Manual (2003)

Settling

Dist = sqrt(r*Q_p/v_s)
= **30.2** **m**

r : 1 = l to w ratio	r =	3	
Q_p = peak SWM outflow during quality storm	Q_p =	0.091	Note 1.
v_s = settling velocity for 0.15 mm particles (m/s)	v_s =	0.0003	

Dispersion Length

Dist = 8Q/dv
= **70** **m**

y_s = total depth of sediment in forebay (m)	y_s =	0.5	
Q = inlet flow (m^3/s)	Q =	4.346	Note 2.
d = depth of perm pool in forebay above y_s (m)	d =	1.0	
v_f = desired vel in forebay (m/s)	v_f =	0.5	

Velocity Checks

v = Q/A
= **0.14** **m/s**

y = total depth above sediment storage	y =	1	Note 3.
b = bottom width of (avg) of forebay (m)	b =	25	
Q = inlet flow (m^3/s)	Q =	4.346	Note 2.
A = cross-sectional area (m^2)	A =	30.00	Note 3.
Target velocity (m/s)	V_{targ} =	0.15	

Therefore, **Velocity Target Satisfied**

Cleanout Frequency

Table 5.3 MOEE SWMPP Guidelines

cleanout = Vol/(load*A_{sew}*effic)
= **14.9** **years**

A_{sew} = Contributing Sewer Area (ha)	A_{sew} =	32.65	
Imp = Percent Impervious (%)	Imp =	53%	
load = Sediment Loading (m^3/ha)	load =	1.8	
effic = Removal Efficiency (%) - Level 1	effic =	80%	
Targ = Cleanout Frequency Target (years)	Targ =	7	
Vol = Sediment volume (m^3)	Vol =	684	Note 4.

Therefore, **Cleanout Frequency Satisfied**

Surface Area Check

SA_f/SA_{pp} = N/A

SA_f = Forebay Surface Area (m^2)	SA_f =	2,920	
SA_{pp} = Total Permanent Pool Surface Area (m^2)	SA_{pp} =	N/A	
Targ = Forebay size (as % of Permanent Pool Area)	Targ =	N/A	

Notes

1. Flow from forebay prior to infiltration cell through 250mm culvert.
2. Peak inlet flows to SWM facility based on SWMHYMO modelling (5-year storm)
3. Cross-sectional area based on depth above maximum sedimentation depth (0.5 m)
4. Volume of bottom 0.5 m depth, the maximum sediment accumulation depth

Baden North - 60305680
Forebay - Drawdown Calcs

MOECC Extended Detention Volume: 1,306 m³

Elevation (m)	Outflow (m³/s)	Volume (m³)	Drawdown (hrs)	Orifice Parameters	
355.80	0.000	0		Orifice Elev (m)	Orifice Coeff.
355.85	0.003	148	30	355.80	0.800
355.90	0.010	299	37	Orifice-Midpoint (m)	Perimeter (m)
355.95	0.028	453	39	355.93	0.000
356.00	0.048	611	40	Orifice Diameter (mm)	Area (m²)
356.05	0.061	774	41	250	0.049
356.10	0.073	942	42	Weir Coeff. (Sharp)	Orientation
356.15	0.083	1115	42	1.80	Vertical
356.20	0.091	1294	**43**		

Weir Equation Used: $Q = C_{wb}*L*H^{1.5} + C_{wt}*S*H^{2.5}$

where

L = bottom width of spillway
H = head above weir invert
S = side slopes (ratio of H:V)
C_{wt} = weir coefficient (triangular)
C_{wb} = weir coefficient (broad-crested)

Sharp crested semi-circular weir equation

Sharp crested semi-circular weir equation

$Q=C*D^{2.5}*(H/D)^{1.88}$

where

C = sharp crested semi-circular weir coefficient
D = diameter of orifice
H = head above orifice invert
Note: used when water elevation is below 3/4 of the orifice diameter

Drawdown Time Calculations Greater than 0.05 m above the permanent pool

$T=[v_2-v_1]/[(Q_2+Q_1)/2]/3600$

where

T=drawdown time in hours
v_2=starting pond volume
v_2=ending pond volume
Q_2=starting flow
Q_1=ending flow

From 0.0 to 0.05 m above the permanent pool

$T=[v_2-v_1]/[(Q_2)]/3600$

where

T=drawdown time in hours
v_2=starting pond volume
v_2=ending pond volume
Q_2=starting flow

```
00001> 2     Metric units
00002> *#*************************************************************************
00003> *#  Project Name: [Baden North] Project Number:[603-05680]
00004> *#  Date         : 2021-05-04
00005> *#  Company      : Stantec Consulting Ltd. (Waterloo)
00006> *#  Modeller     : Bryan Weersink, Water Resources Engineer
00007> *#  Revised      :  ()
00008> *#  Revision 2   :  ()
00009> *#  License #    :  4730904
00010> *#*************************************************************************
00011> *#
00012> *#  This model represents the hydologic characteristics of the Activa Baden Nort
00013> *#  proposed subdivision in Baden, Ontario.
00014> *#  Storm events modeled are:
00015> *#  25MM, 2, 5, 10, 25, 50 AND 100YR CHICAGO STORMS (City of Kitchener IDF)
00016> *#  and the Regional Event
00017> *#
00018> *#*************************************************************************
00019> START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[1]
00020> *%                  ["Kit25mm.4hr"] <--storm filename, one per line for NSTORM t
00021> *%-----------------|-------------------------------------------------------|
00022> READ STORM          STORM_FILENAME=["STORM.001"]
00023> *#-----------------|-------------------------------------------------------|
00024> *#
00025> *#           Total Existing Area draining directly to wetland
00026> *#
00027> *#-----------------|-------------------------------------------------------|
00028> DESIGN NASHYD       ID=[1], NHYD=["100"], DT=[1]min, AREA=[11.55](ha),
00029>                     DWF=[0](cms), CN/C=[84], TP=[0.54]hrs,
00030>                     RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
00031> *#-----------------|-------------------------------------------------------|
00032> *#-----------------|-------------------------------------------------------|
00033> *#
00034> *#           External Area draining depression with overflow to site
00035> *#
00036> *#-----------------|-------------------------------------------------------|
00037> DESIGN NASHYD       ID=[2], NHYD=["105"], DT=[1]min, AREA=[14.16](ha),
00038>                     DWF=[0](cms), CN/C=[84], TP=[0.41]hrs,
00039>                     RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
00040> *#-----------------|-------------------------------------------------------|
00041> ROUTE RESERVOIR     IDout=[3],   NHYD=["EXTDEP"],  IDin=[2],
00042>                     RDT=[1](min),
00043>                           TABLE of ( OUTFLOW-STORAGE ) values
00044>                                      (cms) - (ha-m)
00045>                                    [   0.0   ,  0.0 ]
00046>                                    [   0.00001 ,  0.8070 ]
00047>                                    [   0.00001 ,  1.1420 ]
00048>                                    [   -1  ,  -1  ]  (max twenty pts)
00049>                           IDovf=[9], NHYDovf=["OVR"]
00050> *#-----------------|-------------------------------------------------------|
00051> *#
00052> *#                              Total Flow to wetland
00053> *#
00054> *#-----------------|-------------------------------------------------------|
00055> ADD HYD             IDsum=[4], NHYD=["ToWet"], IDs to add=[1+9]
00056> *#-----------------|-------------------------------------------------------|
00057> *#
00058> *#           Existing Area draining just around wetland to north
00059> *#
00060> *#-----------------|-------------------------------------------------------|
00061> DESIGN NASHYD       ID=[5], NHYD=["101"], DT=[1]min, AREA=[6.44](ha),
00062>                     DWF=[0](cms), CN/C=[84], TP=[0.50]hrs,
00063>                     RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
00064> *#-----------------|-------------------------------------------------------|
00065> DESIGN NASHYD       ID=[6], NHYD=["102"], DT=[1]min, AREA=[2.07](ha),
00066>                     DWF=[0](cms), CN/C=[84], TP=[0.26]hrs,
00067>                     RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
00068> *#-----------------|-------------------------------------------------------|
00069> ADD HYD             IDsum=[7], NHYD=["ToDS"], IDs to add=[5+6]
00070> *#-----------------|-------------------------------------------------------|
00071> *#
00072> *#                     Total Existing Area draining north
00073> *#
00074> *#-----------------|-------------------------------------------------------|
00075> ADD HYD             IDsum=[8], NHYD=["ToNor"], IDs to add=[4+7]
00076> *#-----------------|-------------------------------------------------------|
00077> *#
00078> *#                     Total Existing Area draining south
00079> *#
00080> *#-----------------|-------------------------------------------------------|
00081> DESIGN NASHYD       ID=[1], NHYD=["103"], DT=[1]min, AREA=[2.15](ha),
00082>                     DWF=[0](cms), CN/C=[84], TP=[0.21]hrs,
00083>                     RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
00084> *#-----------------|-------------------------------------------------------|
00085> DESIGN NASHYD       ID=[2], NHYD=["104"], DT=[1]min, AREA=[12.66](ha),
00086>                     DWF=[0](cms), CN/C=[81], TP=[0.40]hrs,
00087>                     RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
00088> *#-----------------|-------------------------------------------------------|
00089> ADD HYD             IDsum=[3], NHYD=["ToSouth"], IDs to add=[1+2]
00090> *#-----------------|-------------------------------------------------------|
00091> START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[2]
00092> *                   ["Kit2yr.3hr"] <--storm filename, one per line for NSTORM ti
00093> *%-----------------|-------------------------------------------------------|
00094> START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[3]
00095> *                   ["Kit5yr.3hr"] <--storm filename, one per line for NSTORM ti
00096> *%-----------------|-------------------------------------------------------|
00097> START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[4]
00098> *                   ["Kit10yr.3hr"] <--storm filename, one per line for NSTORM t
00099> *%-----------------|-------------------------------------------------------|
00100> START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[5]
00101> *                   ["Kit25yr.3hr"] <--storm filename, one per line for NSTORM t
00102> *%-----------------|-------------------------------------------------------|
00103> START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[6]
00104> *                   ["Kit50yr.3hr"] <--storm filename, one per line for NSTORM t
00105> *%-----------------|-------------------------------------------------------|
00106> START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[7]
00107> *                   ["Kit100yr.3hr"] <--storm filename, one per line for NSTORM
00108> *%-----------------|-------------------------------------------------------|
00109> START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[8]
00110> *                   ["hurhaz48.stm"] <--storm filename, one per line for NSTORM
00111> *%-----------------|-------------------------------------------------------|
00112> FINISH
00113>
00114>
00115>
00116>
00117>
00118>
00119>
00120>
00121>
00122>
00123>
00124>
00125>
00126>
00127>
00128>
00129>
00130>
```

```
00001> ================================================================================
00002>
00003>    SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999    =========
00004>    S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
00005>    SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9   Ver  4.05
00006>        S  W W  M  M   M  H   H    Y    M   M  O   O       9999   9999   Sept 2011
00007>    SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      9    =========
00008>                                                          9   9  9   9   # 4730904
00009>          StormWater Management HYdrologic Model          999    999    =========
00010>
00011> ********************************************************************************
00012> ***************************** SWMHYMO Ver/4.05  ********************************
00013> *********  A single event and continuous hydrologic simulation model  *********
00014> *********      based on the principles of HYMO and its successors      *********
00015> *********                  OTTHYMO-83 and OTTHYMO-89.                  *********
00016> ********************************************************************************
00017> ********* Distributed by:  J.F. Sabourin and Associates Inc.           *********
00018> *********                  Ottawa,  Ontario: (613) 836-3884            *********
00019> *********                  Gatineau, Quebec: (819) 243-6858            *********
00020> *********                  E-Mail: swmhymo@jfsa.com                    *********
00021> ********************************************************************************
00022>
00023> ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
00024> +++++++++ Licensed user: Stantec Consulting Ltd. (Kitchener)          +++++++++
00025> +++++++++                 Kitchener            SERIAL#:4730904        +++++++++
00026> ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
00027>
00028> ********************************************************************************
00029> *********             ++++++ PROGRAM ARRAY DIMENSIONS ++++++             *********
00030> *********             Maximum value for ID numbers  :     10            *********
00031> *********             Max. number of rainfall points: 105408            *********
00032> *********             Max. number of flow points    : 105408            *********
00033> ********************************************************************************
00034>
00035> ***** DESCRIPTION SUMMARY TABLE HEADERS (units depend on METOUT in START) *****
00036> *****------------------------------------------------------------------------*****
00037> *****    ID:  Hydrograph IDentification numbers, (1-10).                  *****
00038> *****  NHYD:  Hydrograph reference numbers, (6 digits or characters).     *****
00039> *****  AREA:  Drainage area associated with hydrograph, (ac.) or (ha.).   *****
00040> ***** QPEAK:  Peak flow of simulated hydrograph, (ft^3/s) or (m^3/s).     *****
00041> ***** TpeakDate_hh:mm is the date and time of the peak flow.               *****
00042> *****  R.V.:  Runoff Volume of simulated hydrograph, (in) or (mm).        *****
00043> *****  R.C.:  Runoff Coefficient of simulated hydrograph, (ratio).        *****
00044> *****    *:  see WARNING or NOTE message printed at end of run.           *****
00045> *****   **:  see  ERROR  message printed at end of run.                   *****
00046> ********************************************************************************
00047> ********************************************************************************
00048>
00049> ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
00050>
00051> ********************************************************************************
00052>
00053> ***********************  S U M M A R Y   O U T P U T  ***********************
00054> ********************************************************************************
00055> *         DATE: 2021-05-04     TIME: 16:50:18     RUN COUNTER: 002688         *
00056> ********************************************************************************
00057> * Input   filename: C:\TEMP\Baden\BNex.dat                                      *
00058> * Output  filename: C:\TEMP\Baden\BNex.out                                     *
00059> * Summary filename: C:\TEMP\Baden\BNex.sum                                     *
00060> * User comments:                                                              *
00061> * 1:_____________________________________________________________________     *
00062> * 2:_____________________________________________________________________     *
00063> * 3:_____________________________________________________________________     *
00064> ********************************************************************************
00065>
00066>
00067> #*******************************************************************************
00068> #  Project Name: [Baden North] Project Number:[603-05680]
00069> #  Date       : 2021-05-04
00070> #  Company    : Stantec Consulting Ltd. (Waterloo)
00071> #  Modeller   : Bryan Weersink, Water Resources Engineer
00072> #  Revised    :  ()
00073> #  Revision 2 :  ()
00074> #  License #  :  4730904
00075> #*******************************************************************************
00076> #
00077> #  This model represents the hydologic characteristics of the Activa Baden Nort
00078> #  proposed subdivision in Baden, Ontario.
00079> #  Storm events modeled are:
00080> #  25MM, 2, 5, 10, 25, 50 AND 100YR CHICAGO STORMS (City of Kitchener IDF)
00081> #  and the Regional Event
00082> #
00083> #*******************************************************************************
00084>  RUN:COMMAND#
00085>  001:0001----------------------------------------------------------------------
00086>      START
00087>       [TZERO =    .00 hrs on        0]
00088>       [METOUT=   2    (1=imperial, 2=metric output)]
00089>       [NSTORM=   1 ]
00090>       [NRUN  =   1 ]
00091>  001:0002----------------------------------------------------------------------
00092>      READ STORM
00093>       Filename = STORM.001
00094>       Comment  =
00095>       [SDT= 5.00:SDUR=   4.00:PTOT=  25.00]
00096> #-----------------|------------------------------------------------------------|
00097> #                 |
00098> #           Total Existing Area draining directly to wetland
00099> #                 |
00100> #-----------------|------------------------------------------------------------|
00101>  001:0003---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00102>      DESIGN NASHYD      01:100           11.55     .155 No_date    2:16    7.68
00103>       [CN= 84.0: N= 3.00]
00104>       [Tp=  .54:DT= 1.00]
00105> #-----------------|------------------------------------------------------------|
00106> #-----------------|------------------------------------------------------------|
00107> #                 |
00108> #           External Area draining depression with overflow to site
00109> #                 |
00110> #-----------------|------------------------------------------------------------|
00111>  001:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00112>      DESIGN NASHYD      02:105           14.16     .231 No_date    2:06    7.68
00113>       [CN= 84.0: N= 3.00]
00114>       [Tp=  .41:DT= 1.00]
00115> #-----------------|------------------------------------------------------------|
00116>  001:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00117>      ROUTE RESERVOIR -> 02:105           14.16     .231 No_date    2:06    7.68
00118>    *   [RDT= 1.00] out<- 03:EXTDEP       14.16     .000 No_date    6:10     .06
00119>              overflow <= 09:OVR            .00     .000 No_date    0:00     .00
00120>      {MxStoUsed=.1088E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs
00121> #-----------------|------------------------------------------------------------|
00122> #                 |
00123> #                             Total Flow to wetland
00124> #                 |
00125> #-----------------|------------------------------------------------------------|
00126>  001:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00127>      ADD HYD            01:100           11.55     .155 No_date    2:16    7.68
00128>                       +  09:OVR            .00     .000 No_date    0:00     .00
00129>       [DT= 1.00]  SUM=  04:ToWet         11.55     .155 No_date    2:16    7.68
00130> #-----------------|------------------------------------------------------------|
00131> #
00132> #           Existing Area draining just around wetland to north
00133> #
00134> #-----------------|------------------------------------------------------------|
00135>  001:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00136>      DESIGN NASHYD      05:101            6.44     .091 No_date    2:13    7.68
00137>       [CN= 84.0: N= 3.00]
00138>       [Tp=  .50:DT= 1.00]
00139> #-----------------|------------------------------------------------------------|
00140>  001:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00141>      DESIGN NASHYD      06:102            2.07     .045 No_date    1:54    7.68
00142>       [CN= 84.0: N= 3.00]
00143>       [Tp=  .26:DT= 1.00]
00144> #-----------------|------------------------------------------------------------|
00145>  001:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00146>      ADD HYD            05:101            6.44     .091 No_date    2:13    7.68
00147>                       +  06:102            2.07     .045 No_date    1:54    7.68
00148>       [DT= 1.00]  SUM=  07:ToDS           8.51     .126 No_date    2:05    7.68
00149> #-----------------|------------------------------------------------------------|
00150> #
00151> #                       Total Existing Area draining north
00152> #
00153> #-----------------|------------------------------------------------------------|
00154>  001:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00155>      ADD HYD            04:ToWet         11.55     .155 No_date    2:16    7.68
00156>                       +  07:ToDS           8.51     .126 No_date    2:05    7.68
00157>       [DT= 1.00]  SUM=  08:ToNor         20.06     .277 No_date    2:11    7.68
00158> #-----------------|------------------------------------------------------------|
00159> #
00160> #                       Total Existing Area draining south
00161> #
00162> #-----------------|------------------------------------------------------------|
00163>  001:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00164>      DESIGN NASHYD      01:103            2.15     .054 No_date    1:50    7.68
00165>       [CN= 84.0: N= 3.00]
00166>       [Tp=  .21:DT= 1.00]
00167> #-----------------|------------------------------------------------------------|
00168>  001:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00169>      DESIGN NASHYD      02:104           12.66     .180 No_date    2:05    6.65
00170>       [CN= 81.0: N= 3.00]
00171>       [Tp=  .40:DT= 1.00]
00172> #-----------------|------------------------------------------------------------|
00173>  001:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00174>      ADD HYD            01:103            2.15     .054 No_date    1:50    7.68
00175>                       +  02:104           12.66     .180 No_date    2:05    6.65
00176>       [DT= 1.00]  SUM=  03:ToSouth        14.81     .219 No_date    2:01    6.80
00177> #-----------------|------------------------------------------------------------|
00178>   ** END OF RUN :   1
00179>
00180> ********************************************************************************
00181>
00182>
00183>
00184>
00185>
00186>  RUN:COMMAND#
00187>  002:0001----------------------------------------------------------------------
00188>      START
00189>       [TZERO =    .00 hrs on        0]
00190>       [METOUT=   2    (1=imperial, 2=metric output)]
00191>       [NSTORM=   1 ]
00192>       [NRUN  =   2 ]
00193> #*******************************************************************************
00194> #  Project Name: [Baden North] Project Number:[603-05680]
00195> #  Date       : 2021-05-04
00196> #  Company    : Stantec Consulting Ltd. (Waterloo)
00197> #  Modeller   : Bryan Weersink, Water Resources Engineer
00198> #  Revised    :  ()
00199> #  Revision 2 :  ()
00200> #  License #  :  4730904
00201> #*******************************************************************************
00202> #
00203> #  This model represents the hydologic characteristics of the Activa Baden Nort
00204> #  proposed subdivision in Baden, Ontario.
00205> #  Storm events modeled are:
00206> #  25MM, 2, 5, 10, 25, 50 AND 100YR CHICAGO STORMS (City of Kitchener IDF)
00207> #  and the Regional Event
00208> #
00209> #*******************************************************************************
00210>  002:0002----------------------------------------------------------------------
00211>      READ STORM
00212>       Filename = STORM.001
00213>       Comment  =
00214>       [SDT= 5.00:SDUR=   3.00:PTOT=  34.27]
00215> #-----------------|------------------------------------------------------------|
00216> #
00217> #           Total Existing Area draining directly to wetland
00218> #
00219> #-----------------|------------------------------------------------------------|
00220>  002:0003---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00221>      DESIGN NASHYD      01:100           11.55     .275 No_date    1:42   13.23
00222>       [CN= 84.0: N= 3.00]
00223>       [Tp=  .54:DT= 1.00]
00224> #-----------------|------------------------------------------------------------|
00225> #-----------------|------------------------------------------------------------|
00226> #
00227> #           External Area draining depression with overflow to site
00228> #
00229> #-----------------|------------------------------------------------------------|
00230>  002:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00231>      DESIGN NASHYD      02:105           14.16     .406 No_date    1:32   13.23
00232>       [CN= 84.0: N= 3.00]
00233>       [Tp=  .41:DT= 1.00]
00234> #-----------------|------------------------------------------------------------|
00235>  002:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00236>      ROUTE RESERVOIR -> 02:105           14.16     .406 No_date    1:32   13.23
00237>    *   [RDT= 1.00] out<- 03:EXTDEP       14.16     .000 No_date    5:12     .10
00238>              overflow <= 09:OVR            .00     .000 No_date    0:00     .00
00239>      {MxStoUsed=.1874E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs
00240> #-----------------|------------------------------------------------------------|
00241> #
00242> #                             Total Flow to wetland
00243> #
00244> #-----------------|------------------------------------------------------------|
00245>  002:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00246>      ADD HYD            01:100           11.55     .275 No_date    1:42   13.23
00247>                       +  09:OVR            .00     .000 No_date    0:00     .00
00248>       [DT= 1.00]  SUM=  04:ToWet         11.55     .275 No_date    1:42   13.23
00249> #-----------------|------------------------------------------------------------|
00250> #
00251> #           Existing Area draining just around wetland to north
00252> #
00253> #-----------------|------------------------------------------------------------|
00254>  002:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
```

```
00255>      DESIGN NASHYD      05:101            6.44     .162 No_date    1:39   13.23
00256>       [CN= 84.0: N= 3.00]
00257>       [Tp=  .50:DT= 1.00]
00258> #------------------|-------------------------------------------------------|
00259>  002:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00260>      DESIGN NASHYD      06:102            2.07     .080 No_date    1:20   13.23
00261>       [CN= 84.0: N= 3.00]
00262>       [Tp=  .26:DT= 1.00]
00263> #------------------|-------------------------------------------------------|
00264>  002:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00265>      ADD HYD            05:101            6.44     .162 No_date    1:39   13.23
00266>                       +  06:102            2.07     .080 No_date    1:20   13.23
00267>       [DT= 1.00]  SUM=  07:ToDS           8.51     .222 No_date    1:31   13.23
00268> #------------------|-------------------------------------------------------|
00269> #
00270> #                      Total Existing Area draining north
00271> #
00272> #------------------|-------------------------------------------------------|
00273>  002:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00274>      ADD HYD            04:ToWet         11.55     .275 No_date    1:42   13.23
00275>                       +  07:ToDS           8.51     .222 No_date    1:31   13.23
00276>       [DT= 1.00]  SUM=  08:ToNor         20.06     .489 No_date    1:38   13.23
00277> #------------------|-------------------------------------------------------|
00278> #
00279> #                      Total Existing Area draining south
00280> #
00281> #------------------|-------------------------------------------------------|
00282>  002:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00283>      DESIGN NASHYD      01:103            2.15     .094 No_date    1:16   13.23
00284>       [CN= 84.0: N= 3.00]
00285>       [Tp=  .21:DT= 1.00]
00286> #------------------|-------------------------------------------------------|
00287>  002:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00288>      DESIGN NASHYD      02:104           12.66     .321 No_date    1:31   11.63
00289>       [CN= 81.0: N= 3.00]
00290>       [Tp=  .40:DT= 1.00]
00291> #------------------|-------------------------------------------------------|
00292>  002:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00293>      ADD HYD            01:103            2.15     .094 No_date    1:16   13.23
00294>                       +  02:104           12.66     .321 No_date    1:31   11.63
00295>       [DT= 1.00]  SUM=  03:ToSouth       14.81     .390 No_date    1:27   11.86
00296> #------------------|-------------------------------------------------------|
00297>   ** END OF RUN :   2
00298>
00299> ****************************************************************************
00300>
00301>
00302>
00303>
00304>
00305>  RUN:COMMAND#
00306>  003:0001----------------------------------------------------------------------
00307>      START
00308>       [TZERO =    .00 hrs on        0]
00309>       [METOUT=   2    (1=imperial, 2=metric output)]
00310>       [NSTORM=   1 ]
00311>       [NRUN  =   3 ]
00312> #****************************************************************************
00313> #  Project Name: [Baden North] Project Number:[603-05680]
00314> #  Date        : 2021-05-04
00315> #  Company     : Stantec Consulting Ltd. (Waterloo)
00316> #  Modeller    : Bryan Weersink, Water Resources Engineer
00317> #  Revised     :  ()
00318> #  Revision 2  :  ()
00319> #  License #   :  4730904
00320> #****************************************************************************
00321> #
00322> #  This model represents the hydologic characteristics of the Activa Baden Nort
00323> #  proposed subdivision in Baden, Ontario.
00324> #  Storm events modeled are:
00325> #  25MM, 2, 5, 10, 25, 50 AND 100YR CHICAGO STORMS (City of Kitchener IDF)
00326> #  and the Regional Event
00327> #
00328> #****************************************************************************
00329>  003:0002----------------------------------------------------------------------
00330>      READ STORM
00331>       Filename = STORM.001
00332>       Comment  =
00333>       [SDT= 5.00:SDUR=   3.00:PTOT=  47.26]
00334> #------------------|-------------------------------------------------------|
00335> #
00336> #           Total Existing Area draining directly to wetland
00337> #
00338> #------------------|-------------------------------------------------------|
00339>  003:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00340>      DESIGN NASHYD      01:100           11.55     .494 No_date    1:42   22.24
00341>       [CN= 84.0: N= 3.00]
00342>       [Tp=  .54:DT= 1.00]
00343> #------------------|-------------------------------------------------------|
00344> #------------------|-------------------------------------------------------|
00345> #
00346> #           External Area draining depression with overflow to site
00347> #
00348> #------------------|-------------------------------------------------------|
00349>  003:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00350>      DESIGN NASHYD      02:105           14.16     .732 No_date    1:32   22.24
00351>       [CN= 84.0: N= 3.00]
00352>       [Tp=  .41:DT= 1.00]
00353> #------------------|-------------------------------------------------------|
00354>  003:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00355>      ROUTE RESERVOIR -> 02:105           14.16     .732 No_date    1:32   22.24
00356>   *   [RDT= 1.00] out<- 03:EXTDEP        14.16     .000 No_date    5:11     .17
00357>                 overflow <= 09:OVR          .00     .000 No_date    0:00     .00
00358>      (MxStoUsed=.3149E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs
00359> #------------------|-------------------------------------------------------|
00360> #
00361> #                              Total Flow to wetland
00362> #
00363> #------------------|-------------------------------------------------------|
00364>  003:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00365>      ADD HYD            01:100           11.55     .494 No_date    1:42   22.24
00366>                       +  09:OVR            .00     .000 No_date    0:00     .00
00367>       [DT= 1.00]  SUM=  04:ToWet         11.55     .494 No_date    1:42   22.24
00368> #------------------|-------------------------------------------------------|
00369> #
00370> #           Existing Area draining just around wetland to north
00371> #
00372> #------------------|-------------------------------------------------------|
00373>  003:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00374>      DESIGN NASHYD      05:101            6.44     .290 No_date    1:39   22.24
00375>       [CN= 84.0: N= 3.00]
00376>       [Tp=  .50:DT= 1.00]
00377> #------------------|-------------------------------------------------------|
00378>  003:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00379>      DESIGN NASHYD      06:102            2.07     .143 No_date    1:20   22.24
00380>       [CN= 84.0: N= 3.00]
00381>       [Tp=  .26:DT= 1.00]
00382> #------------------|-------------------------------------------------------|
00383>  003:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00384>      ADD HYD            05:101            6.44     .290 No_date    1:39   22.24
00385>                       +  06:102            2.07     .143 No_date    1:20   22.24
00386>       [DT= 1.00]  SUM=  07:ToDS           8.51     .400 No_date    1:31   22.24
00387> #------------------|-------------------------------------------------------|
00388> #
00389> #                      Total Existing Area draining north
00390> #
00391> #------------------|-------------------------------------------------------|
00392>  003:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00393>      ADD HYD            04:ToWet         11.55     .494 No_date    1:42   22.24
00394>                       +  07:ToDS           8.51     .400 No_date    1:31   22.24
00395>       [DT= 1.00]  SUM=  08:ToNor         20.06     .879 No_date    1:37   22.24
00396> #------------------|-------------------------------------------------------|
00397> #
00398> #                      Total Existing Area draining south
00399> #
00400> #------------------|-------------------------------------------------------|
00401>  003:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00402>      DESIGN NASHYD      01:103            2.15     .168 No_date    1:16   22.24
00403>       [CN= 84.0: N= 3.00]
00404>       [Tp=  .21:DT= 1.00]
00405> #------------------|-------------------------------------------------------|
00406>  003:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00407>      DESIGN NASHYD      02:104           12.66     .589 No_date    1:31   19.88
00408>       [CN= 81.0: N= 3.00]
00409>       [Tp=  .40:DT= 1.00]
00410> #------------------|-------------------------------------------------------|
00411>  003:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00412>      ADD HYD            01:103            2.15     .168 No_date    1:16   22.24
00413>                       +  02:104           12.66     .589 No_date    1:31   19.88
00414>       [DT= 1.00]  SUM=  03:ToSouth       14.81     .713 No_date    1:28   20.22
00415> #------------------|-------------------------------------------------------|
00416>   ** END OF RUN :   3
00417>
00418> ****************************************************************************
00419>
00420>
00421>
00422>
00423>
00424>  RUN:COMMAND#
00425>  004:0001----------------------------------------------------------------------
00426>      START
00427>       [TZERO =    .00 hrs on        0]
00428>       [METOUT=   2    (1=imperial, 2=metric output)]
00429>       [NSTORM=   1 ]
00430>       [NRUN  =   4 ]
00431> #****************************************************************************
00432> #  Project Name: [Baden North] Project Number:[603-05680]
00433> #  Date        : 2021-05-04
00434> #  Company     : Stantec Consulting Ltd. (Waterloo)
00435> #  Modeller    : Bryan Weersink, Water Resources Engineer
00436> #  Revised     :  ()
00437> #  Revision 2  :  ()
00438> #  License #   :  4730904
00439> #****************************************************************************
00440> #
00441> #  This model represents the hydologic characteristics of the Activa Baden Nort
00442> #  proposed subdivision in Baden, Ontario.
00443> #  Storm events modeled are:
00444> #  25MM, 2, 5, 10, 25, 50 AND 100YR CHICAGO STORMS (City of Kitchener IDF)
00445> #  and the Regional Event
00446> #
00447> #****************************************************************************
00448>  004:0002----------------------------------------------------------------------
00449>      READ STORM
00450>       Filename = STORM.001
00451>       Comment  =
00452>       [SDT= 5.00:SDUR=   3.00:PTOT=  56.28]
00453> #------------------|-------------------------------------------------------|
00454> #
00455> #           Total Existing Area draining directly to wetland
00456> #
00457> #------------------|-------------------------------------------------------|
00458>  004:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00459>      DESIGN NASHYD      01:100           11.55     .666 No_date    1:41   29.09
00460>       [CN= 84.0: N= 3.00]
00461>       [Tp=  .54:DT= 1.00]
00462> #------------------|-------------------------------------------------------|
00463> #------------------|-------------------------------------------------------|
00464> #
00465> #           External Area draining depression with overflow to site
00466> #
00467> #------------------|-------------------------------------------------------|
00468>  004:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00469>      DESIGN NASHYD      02:105           14.16     .992 No_date    1:31   29.09
00470>       [CN= 84.0: N= 3.00]
00471>       [Tp=  .41:DT= 1.00]
00472> #------------------|-------------------------------------------------------|
00473>  004:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00474>      ROUTE RESERVOIR -> 02:105           14.16     .992 No_date    1:31   29.09
00475>   *   [RDT= 1.00] out<- 03:EXTDEP        14.16     .000 No_date    5:11     .23
00476>                 overflow <= 09:OVR          .00     .000 No_date    0:00     .00
00477>      (MxStoUsed=.4119E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs
00478> #------------------|-------------------------------------------------------|
00479> #
00480> #                              Total Flow to wetland
00481> #
00482> #------------------|-------------------------------------------------------|
00483>  004:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00484>      ADD HYD            01:100           11.55     .666 No_date    1:41   29.09
00485>                       +  09:OVR            .00     .000 No_date    0:00     .00
00486>       [DT= 1.00]  SUM=  04:ToWet         11.55     .666 No_date    1:41   29.09
00487> #------------------|-------------------------------------------------------|
00488> #
00489> #           Existing Area draining just around wetland to north
00490> #
00491> #------------------|-------------------------------------------------------|
00492>  004:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00493>      DESIGN NASHYD      05:101            6.44     .393 No_date    1:38   29.09
00494>       [CN= 84.0: N= 3.00]
00495>       [Tp=  .50:DT= 1.00]
00496> #------------------|-------------------------------------------------------|
00497>  004:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00498>      DESIGN NASHYD      06:102            2.07     .195 No_date    1:20   29.09
00499>       [CN= 84.0: N= 3.00]
00500>       [Tp=  .26:DT= 1.00]
00501> #------------------|-------------------------------------------------------|
00502>  004:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00503>      ADD HYD            05:101            6.44     .393 No_date    1:38   29.09
00504>                       +  06:102            2.07     .195 No_date    1:20   29.09
00505>       [DT= 1.00]  SUM=  07:ToDS           8.51     .542 No_date    1:31   29.09
00506> #------------------|-------------------------------------------------------|
00507> #
00508> #                      Total Existing Area draining north
```

```
00509> #
00510> #------------------|---------------------------------------------------------------|
00511>  004:0010----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00512>      ADD HYD            04:ToWet         11.55     .666 No_date    1:41   29.09
00513>                       + 07:ToDS           8.51     .542 No_date    1:31   29.09
00514>       [DT= 1.00]  SUM=  08:ToNor         20.06    1.188 No_date    1:36   29.09
00515> #------------------|---------------------------------------------------------------|
00516> #
00517> #                     Total Existing Area draining south
00518> #
00519> #------------------|---------------------------------------------------------------|
00520>  004:0011----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00521>      DESIGN NASHYD      01:103            2.15     .230 No_date    1:16   29.09
00522>       [CN= 84.0: N= 3.00]
00523>       [Tp=  .21:DT= 1.00]
00524> #------------------|---------------------------------------------------------------|
00525>  004:0012----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00526>      DESIGN NASHYD      02:104           12.66     .806 No_date    1:31   26.24
00527>       [CN= 81.0: N= 3.00]
00528>       [Tp=  .40:DT= 1.00]
00529> #------------------|---------------------------------------------------------------|
00530>  004:0013----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00531>      ADD HYD            01:103            2.15     .230 No_date    1:16   29.09
00532>                       + 02:104           12.66     .806 No_date    1:31   26.24
00533>       [DT= 1.00]  SUM=  03:ToSouth       14.81     .975 No_date    1:27   26.66
00534> #------------------|---------------------------------------------------------------|
00535>   ** END OF RUN :   4
00536>
00537> ********************************************************************************
00538>
00539>
00540>
00541>
00542>
00543>  RUN:COMMAND#
00544>  005:0001----------------------------------------------------------------------------
00545>      START
00546>       [TZERO =    .00 hrs on        0]
00547>       [METOUT=   2    (1=imperial, 2=metric output)]
00548>       [NSTORM=   1 ]
00549>       [NRUN  =   5 ]
00550> #*******************************************************************************
00551> #  Project Name: [Baden North] Project Number:[603-05680]
00552> #  Date        : 2021-05-04
00553> #  Company     : Stantec Consulting Ltd. (Waterloo)
00554> #  Modeller    : Bryan Weersink, Water Resources Engineer
00555> #  Revised     :  ()
00556> #  Revision 2  :  ()
00557> #  License #   :  4730904
00558> #*******************************************************************************
00559> #
00560> #  This model represents the hydologic characteristics of the Activa Baden Nort
00561> #  proposed subdivision in Baden, Ontario.
00562> #  Storm events modeled are:
00563> #  25MM, 2, 5, 10, 25, 50 AND 100YR CHICAGO STORMS (City of Kitchener IDF)
00564> #  and the Regional Event
00565> #
00566> #*******************************************************************************
00567>  005:0002----------------------------------------------------------------------------
00568>      READ STORM
00569>       Filename = STORM.001
00570>       Comment  =
00571>       [SDT= 5.00:SDUR=   3.00:PTOT=  68.26]
00572> #------------------|---------------------------------------------------------------|
00573> #
00574> #           Total Existing Area draining directly to wetland
00575> #
00576> #------------------|---------------------------------------------------------------|
00577>  005:0003----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00578>      DESIGN NASHYD      01:100           11.55     .894 No_date    1:41   38.71
00579>       [CN= 84.0: N= 3.00]
00580>       [Tp=  .54:DT= 1.00]
00581> #------------------|---------------------------------------------------------------|
00582> #------------------|---------------------------------------------------------------|
00583> #
00584> #           External Area draining depression with overflow to site
00585> #
00586> #------------------|---------------------------------------------------------------|
00587>  005:0004----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00588>      DESIGN NASHYD      02:105           14.16    1.327 No_date    1:31   38.71
00589>       [CN= 84.0: N= 3.00]
00590>       [Tp=  .41:DT= 1.00]
00591> #------------------|---------------------------------------------------------------|
00592>  005:0005----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00593>      ROUTE RESERVOIR -> 02:105           14.16    1.327 No_date    1:31   38.71
00594>   *   [RDT= 1.00] out<- 03:EXTDEP        14.16     .000 No_date    5:11     .30
00595>                overflow <= 09:OVR          .00     .000 No_date    0:00     .00
00596>      {MxStoUsed=.5481E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs
00597> #------------------|---------------------------------------------------------------|
00598> #
00599> #                             Total Flow to wetland
00600> #
00601> #------------------|---------------------------------------------------------------|
00602>  005:0006----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00603>      ADD HYD            01:100           11.55     .894 No_date    1:41   38.71
00604>                       + 09:OVR            .00     .000 No_date    0:00     .00
00605>       [DT= 1.00]  SUM=  04:ToWet         11.55     .894 No_date    1:41   38.71
00606> #------------------|---------------------------------------------------------------|
00607> #
00608> #           Existing Area draining just around wetland to north
00609> #
00610> #------------------|---------------------------------------------------------------|
00611>  005:0007----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00612>      DESIGN NASHYD      05:101            6.44     .526 No_date    1:38   38.71
00613>       [CN= 84.0: N= 3.00]
00614>       [Tp=  .50:DT= 1.00]
00615> #------------------|---------------------------------------------------------------|
00616>  005:0008----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00617>      DESIGN NASHYD      06:102            2.07     .259 No_date    1:20   38.71
00618>       [CN= 84.0: N= 3.00]
00619>       [Tp=  .26:DT= 1.00]
00620> #------------------|---------------------------------------------------------------|
00621>  005:0009----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00622>      ADD HYD            05:101            6.44     .526 No_date    1:38   38.71
00623>                       + 06:102            2.07     .259 No_date    1:20   38.71
00624>       [DT= 1.00]  SUM=  07:ToDS           8.51     .726 No_date    1:31   38.71
00625> #------------------|---------------------------------------------------------------|
00626> #
00627> #                     Total Existing Area draining north
00628> #
00629> #------------------|---------------------------------------------------------------|
00630>  005:0010----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00631>      ADD HYD            04:ToWet         11.55     .894 No_date    1:41   38.71
00632>                       + 07:ToDS           8.51     .726 No_date    1:31   38.71
00633>       [DT= 1.00]  SUM=  08:ToNor         20.06    1.593 No_date    1:37   38.71
00634> #------------------|---------------------------------------------------------------|
00635> #
00636> #                     Total Existing Area draining south
00637> #
00638> #------------------|---------------------------------------------------------------|
00639>  005:0011----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00640>      DESIGN NASHYD      01:103            2.15     .304 No_date    1:16   38.71
00641>       [CN= 84.0: N= 3.00]
00642>       [Tp=  .21:DT= 1.00]
00643> #------------------|---------------------------------------------------------------|
00644>  005:0012----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00645>      DESIGN NASHYD      02:104           12.66    1.091 No_date    1:31   35.27
00646>       [CN= 81.0: N= 3.00]
00647>       [Tp=  .40:DT= 1.00]
00648> #------------------|---------------------------------------------------------------|
00649>  005:0013----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00650>      ADD HYD            01:103            2.15     .304 No_date    1:16   38.71
00651>                       + 02:104           12.66    1.091 No_date    1:31   35.27
00652>       [DT= 1.00]  SUM=  03:ToSouth       14.81    1.316 No_date    1:27   35.77
00653> #------------------|---------------------------------------------------------------|
00654>   ** END OF RUN :   5
00655>
00656> ********************************************************************************
00657>
00658>
00659>
00660>
00661>
00662>  RUN:COMMAND#
00663>  006:0001----------------------------------------------------------------------------
00664>      START
00665>       [TZERO =    .00 hrs on        0]
00666>       [METOUT=   2    (1=imperial, 2=metric output)]
00667>       [NSTORM=   1 ]
00668>       [NRUN  =   6 ]
00669> #*******************************************************************************
00670> #  Project Name: [Baden North] Project Number:[603-05680]
00671> #  Date        : 2021-05-04
00672> #  Company     : Stantec Consulting Ltd. (Waterloo)
00673> #  Modeller    : Bryan Weersink, Water Resources Engineer
00674> #  Revised     :  ()
00675> #  Revision 2  :  ()
00676> #  License #   :  4730904
00677> #*******************************************************************************
00678> #
00679> #  This model represents the hydologic characteristics of the Activa Baden Nort
00680> #  proposed subdivision in Baden, Ontario.
00681> #  Storm events modeled are:
00682> #  25MM, 2, 5, 10, 25, 50 AND 100YR CHICAGO STORMS (City of Kitchener IDF)
00683> #  and the Regional Event
00684> #
00685> #*******************************************************************************
00686>  006:0002----------------------------------------------------------------------------
00687>      READ STORM
00688>       Filename = STORM.001
00689>       Comment  =
00690>       [SDT= 5.00:SDUR=   3.00:PTOT=  77.24]
00691> #------------------|---------------------------------------------------------------|
00692> #
00693> #           Total Existing Area draining directly to wetland
00694> #
00695> #------------------|---------------------------------------------------------------|
00696>  006:0003----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00697>      DESIGN NASHYD      01:100           11.55    1.078 No_date    1:41   46.21
00698>       [CN= 84.0: N= 3.00]
00699>       [Tp=  .54:DT= 1.00]
00700> #------------------|---------------------------------------------------------------|
00701> #------------------|---------------------------------------------------------------|
00702> #
00703> #           External Area draining depression with overflow to site
00704> #
00705> #------------------|---------------------------------------------------------------|
00706>  006:0004----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00707>      DESIGN NASHYD      02:105           14.16    1.601 No_date    1:31   46.21
00708>       [CN= 84.0: N= 3.00]
00709>       [Tp=  .41:DT= 1.00]
00710> #------------------|---------------------------------------------------------------|
00711>  006:0005----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00712>      ROUTE RESERVOIR -> 02:105           14.16    1.601 No_date    1:31   46.21
00713>   *   [RDT= 1.00] out<- 03:EXTDEP        14.16     .000 No_date    5:12     .36
00714>                overflow <= 09:OVR          .00     .000 No_date    0:00     .00
00715>      {MxStoUsed=.6544E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs
00716> #------------------|---------------------------------------------------------------|
00717> #
00718> #                             Total Flow to wetland
00719> #
00720> #------------------|---------------------------------------------------------------|
00721>  006:0006----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00722>      ADD HYD            01:100           11.55    1.078 No_date    1:41   46.21
00723>                       + 09:OVR            .00     .000 No_date    0:00     .00
00724>       [DT= 1.00]  SUM=  04:ToWet         11.55    1.078 No_date    1:41   46.21
00725> #------------------|---------------------------------------------------------------|
00726> #
00727> #           Existing Area draining just around wetland to north
00728> #
00729> #------------------|---------------------------------------------------------------|
00730>  006:0007----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00731>      DESIGN NASHYD      05:101            6.44     .635 No_date    1:38   46.21
00732>       [CN= 84.0: N= 3.00]
00733>       [Tp=  .50:DT= 1.00]
00734> #------------------|---------------------------------------------------------------|
00735>  006:0008----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00736>      DESIGN NASHYD      06:102            2.07     .313 No_date    1:20   46.21
00737>       [CN= 84.0: N= 3.00]
00738>       [Tp=  .26:DT= 1.00]
00739> #------------------|---------------------------------------------------------------|
00740>  006:0009----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00741>      ADD HYD            05:101            6.44     .635 No_date    1:38   46.21
00742>                       + 06:102            2.07     .313 No_date    1:20   46.21
00743>       [DT= 1.00]  SUM=  07:ToDS           8.51     .876 No_date    1:31   46.21
00744> #------------------|---------------------------------------------------------------|
00745> #
00746> #                     Total Existing Area draining north
00747> #
00748> #------------------|---------------------------------------------------------------|
00749>  006:0010----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00750>      ADD HYD            04:ToWet         11.55    1.078 No_date    1:41   46.21
00751>                       + 07:ToDS           8.51     .876 No_date    1:31   46.21
00752>       [DT= 1.00]  SUM=  08:ToNor         20.06    1.922 No_date    1:36   46.21
00753> #------------------|---------------------------------------------------------------|
00754> #
00755> #                     Total Existing Area draining south
00756> #
00757> #------------------|---------------------------------------------------------------|
00758>  006:0011----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00759>      DESIGN NASHYD      01:103            2.15     .367 No_date    1:16   46.21
00760>       [CN= 84.0: N= 3.00]
00761>       [Tp=  .21:DT= 1.00]
00762> #------------------|---------------------------------------------------------------|
```

```
00763>  006:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00764>       DESIGN NASHYD      02:104           12.66    1.325 No_date    1:31   42.39
00765>        [CN= 81.0: N= 3.00]
00766>        [Tp=  .40:DT= 1.00]
00767> #-----------------|-------------------------------------------------------------|
00768>  006:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00769>       ADD HYD            01:103            2.15     .367 No_date    1:16   46.21
00770>                        +  02:104           12.66    1.325 No_date    1:31   42.39
00771>        [DT= 1.00]  SUM=  03:ToSouth       14.81    1.597 No_date    1:27   42.95
00772> #-----------------|-------------------------------------------------------------|
00773>    ** END OF RUN :   6
00774>
00775> ********************************************************************************
00776>
00777>
00778>
00779>
00780>
00781>  RUN:COMMAND#
00782>  007:0001---------------------------------------------------------------------------
00783>       START
00784>        [TZERO =    .00 hrs on        0]
00785>        [METOUT=   2    (1=imperial, 2=metric output)]
00786>        [NSTORM=   1 ]
00787>        [NRUN  =   7 ]
00788> #*****************************************************************************
00789> #  Project Name: [Baden North] Project Number:[603-05680]
00790> #  Date         : 2021-05-04
00791> #  Company      : Stantec Consulting Ltd. (Waterloo)
00792> #  Modeller     : Bryan Weersink, Water Resources Engineer
00793> #  Revised      :  ()
00794> #  Revision 2   :  ()
00795> #  License #    :  4730904
00796> #*****************************************************************************
00797> #
00798> #  This model represents the hydologic characteristics of the Activa Baden Nort
00799> #  proposed subdivision in Baden, Ontario.
00800> #  Storm events modeled are:
00801> #  25MM, 2, 5, 10, 25, 50 AND 100YR CHICAGO STORMS (City of Kitchener IDF)
00802> #  and the Regional Event
00803> #
00804> #*****************************************************************************
00805>  007:0002---------------------------------------------------------------------------
00806>       READ STORM
00807>        Filename = STORM.001
00808>        Comment  =
00809>        [SDT= 5.00:SDUR=   3.00:PTOT=  87.07]
00810> #-----------------|-------------------------------------------------------------|
00811> #
00812> #           Total Existing Area draining directly to wetland
00813> #
00814> #-----------------|-------------------------------------------------------------|
00815>  007:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00816>       DESIGN NASHYD      01:100           11.55    1.285 No_date    1:41   54.66
00817>        [CN= 84.0: N= 3.00]
00818>        [Tp=  .54:DT= 1.00]
00819> #-----------------|-------------------------------------------------------------|
00820> #-----------------|-------------------------------------------------------------|
00821> #
00822> #           External Area draining depression with overflow to site
00823> #
00824> #-----------------|-------------------------------------------------------------|
00825>  007:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00826>       DESIGN NASHYD      02:105           14.16    1.910 No_date    1:31   54.66
00827>        [CN= 84.0: N= 3.00]
00828>        [Tp=  .41:DT= 1.00]
00829> #-----------------|-------------------------------------------------------------|
00830>  007:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00831>       ROUTE RESERVOIR -> 02:105           14.16    1.910 No_date    1:31   54.66
00832>    *   [RDT= 1.00] out<- 03:EXTDEP        14.16     .000 No_date    5:11     .43
00833>                  overflow <= 09:OVR          .00     .000 No_date    0:00     .00
00834>       {MxStoUsed=.7740E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs
00835> #-----------------|-------------------------------------------------------------|
00836> #
00837> #                              Total Flow to wetland
00838> #
00839> #-----------------|-------------------------------------------------------------|
00840>  007:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00841>       ADD HYD            01:100           11.55    1.285 No_date    1:41   54.66
00842>                        +  09:OVR             .00     .000 No_date    0:00     .00
00843>        [DT= 1.00]  SUM=  04:ToWet         11.55    1.285 No_date    1:41   54.66
00844> #-----------------|-------------------------------------------------------------|
00845> #
00846> #           Existing Area draining just around wetland to north
00847> #
00848> #-----------------|-------------------------------------------------------------|
00849>  007:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00850>       DESIGN NASHYD      05:101            6.44     .757 No_date    1:38   54.66
00851>        [CN= 84.0: N= 3.00]
00852>        [Tp=  .50:DT= 1.00]
00853> #-----------------|-------------------------------------------------------------|
00854>  007:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00855>       DESIGN NASHYD      06:102            2.07     .373 No_date    1:20   54.66
00856>        [CN= 84.0: N= 3.00]
00857>        [Tp=  .26:DT= 1.00]
00858> #-----------------|-------------------------------------------------------------|
00859>  007:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00860>       ADD HYD            05:101            6.44     .757 No_date    1:38   54.66
00861>                        +  06:102            2.07     .373 No_date    1:20   54.66
00862>        [DT= 1.00]  SUM=  07:ToDS           8.51    1.045 No_date    1:30   54.66
00863> #-----------------|-------------------------------------------------------------|
00864> #
00865> #                       Total Existing Area draining north
00866> #
00867> #-----------------|-------------------------------------------------------------|
00868>  007:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00869>       ADD HYD            04:ToWet         11.55    1.285 No_date    1:41   54.66
00870>                        +  07:ToDS           8.51    1.045 No_date    1:30   54.66
00871>        [DT= 1.00]  SUM=  08:ToNor         20.06    2.292 No_date    1:36   54.66
00872> #-----------------|-------------------------------------------------------------|
00873> #
00874> #                       Total Existing Area draining south
00875> #
00876> #-----------------|-------------------------------------------------------------|
00877>  007:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00878>       DESIGN NASHYD      01:103            2.15     .437 No_date    1:16   54.66
00879>        [CN= 84.0: N= 3.00]
00880>        [Tp=  .21:DT= 1.00]
00881> #-----------------|-------------------------------------------------------------|
00882>  007:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00883>       DESIGN NASHYD      02:104           12.66    1.590 No_date    1:31   50.44
00884>        [CN= 81.0: N= 3.00]
00885>        [Tp=  .40:DT= 1.00]
00886> #-----------------|-------------------------------------------------------------|
00887>  007:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00888>       ADD HYD            01:103            2.15     .437 No_date    1:16   54.66
00889>                        +  02:104           12.66    1.590 No_date    1:31   50.44
00890>        [DT= 1.00]  SUM=  03:ToSouth       14.81    1.915 No_date    1:27   51.06
00891> #-----------------|-------------------------------------------------------------|
00892>    ** END OF RUN :   7
00893>
00894> ********************************************************************************
00895>
00896>
00897>
00898>
00899>
00900>  RUN:COMMAND#
00901>  008:0001---------------------------------------------------------------------------
00902>       START
00903>        [TZERO =    .00 hrs on        0]
00904>        [METOUT=   2    (1=imperial, 2=metric output)]
00905>        [NSTORM=   1 ]
00906>        [NRUN  =   8 ]
00907> #*****************************************************************************
00908> #  Project Name: [Baden North] Project Number:[603-05680]
00909> #  Date         : 2021-05-04
00910> #  Company      : Stantec Consulting Ltd. (Waterloo)
00911> #  Modeller     : Bryan Weersink, Water Resources Engineer
00912> #  Revised      :  ()
00913> #  Revision 2   :  ()
00914> #  License #    :  4730904
00915> #*****************************************************************************
00916> #
00917> #  This model represents the hydologic characteristics of the Activa Baden Nort
00918> #  proposed subdivision in Baden, Ontario.
00919> #  Storm events modeled are:
00920> #  25MM, 2, 5, 10, 25, 50 AND 100YR CHICAGO STORMS (City of Kitchener IDF)
00921> #  and the Regional Event
00922> #
00923> #*****************************************************************************
00924>  008:0002---------------------------------------------------------------------------
00925>       READ STORM
00926>        Filename = STORM.001
00927>        Comment  =
00928>        [SDT=15.00:SDUR=  48.00:PTOT= 285.00]
00929> #-----------------|-------------------------------------------------------------|
00930> #
00931> #           Total Existing Area draining directly to wetland
00932> #
00933> #-----------------|-------------------------------------------------------------|
00934>  008:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00935>       DESIGN NASHYD      01:100           11.55    1.423 No_date   46:21  242.17
00936>        [CN= 84.0: N= 3.00]
00937>        [Tp=  .54:DT= 1.00]
00938> #-----------------|-------------------------------------------------------------|
00939> #-----------------|-------------------------------------------------------------|
00940> #
00941> #           External Area draining depression with overflow to site
00942> #
00943> #-----------------|-------------------------------------------------------------|
00944>  008:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00945>       DESIGN NASHYD      02:105           14.16    1.868 No_date   46:10  242.17
00946>        [CN= 84.0: N= 3.00]
00947>        [Tp=  .41:DT= 1.00]
00948> #-----------------|-------------------------------------------------------------|
00949>  008:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00950>       ROUTE RESERVOIR -> 02:105           14.16    1.868 No_date   46:10  242.17
00951>    *   [RDT= 1.00] out<- 03:EXTDEP         4.72     .000 No_date   39:35    1.32
00952>                  overflow <= 09:OVR          9.44    1.868 No_date   46:10  242.17
00953>       {MxStoUsed=.1142E+01, TotOvfVol=.2287E+01, N-Ovf=    3, TotDurOvf=    9.hrs
00954> #-----------------|-------------------------------------------------------------|
00955> #
00956> #                              Total Flow to wetland
00957> #
00958> #-----------------|-------------------------------------------------------------|
00959>  008:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00960>       ADD HYD            01:100           11.55    1.423 No_date   46:21  242.17
00961>                        +  09:OVR            9.44    1.868 No_date   46:10  242.17
00962>        [DT= 1.00]  SUM=  04:ToWet         20.99    3.272 No_date   46:14  242.17
00963> #-----------------|-------------------------------------------------------------|
00964> #
00965> #           Existing Area draining just around wetland to north
00966> #
00967> #-----------------|-------------------------------------------------------------|
00968>  008:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00969>       DESIGN NASHYD      05:101            6.44     .810 No_date   46:17  242.17
00970>        [CN= 84.0: N= 3.00]
00971>        [Tp=  .50:DT= 1.00]
00972> #-----------------|-------------------------------------------------------------|
00973>  008:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00974>       DESIGN NASHYD      06:102            2.07     .291 No_date   46:02  242.17
00975>        [CN= 84.0: N= 3.00]
00976>        [Tp=  .26:DT= 1.00]
00977> #-----------------|-------------------------------------------------------------|
00978>  008:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00979>       ADD HYD            05:101            6.44     .810 No_date   46:17  242.17
00980>                        +  06:102            2.07     .291 No_date   46:02  242.17
00981>        [DT= 1.00]  SUM=  07:ToDS           8.51    1.082 No_date   46:11  242.17
00982> #-----------------|-------------------------------------------------------------|
00983> #
00984> #                       Total Existing Area draining north
00985> #
00986> #-----------------|-------------------------------------------------------------|
00987>  008:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00988>       ADD HYD            04:ToWet         20.99    3.272 No_date   46:14  242.17
00989>                        +  07:ToDS           8.51    1.082 No_date   46:11  242.17
00990>        [DT= 1.00]  SUM=  08:ToNor         29.50    4.351 No_date   46:13  242.17
00991> #-----------------|-------------------------------------------------------------|
00992> #
00993> #                       Total Existing Area draining south
00994> #
00995> #-----------------|-------------------------------------------------------------|
00996>  008:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00997>       DESIGN NASHYD      01:103            2.15     .305 No_date   46:01  242.17
00998>        [CN= 84.0: N= 3.00]
00999>        [Tp=  .21:DT= 1.00]
01000> #-----------------|-------------------------------------------------------------|
01001>  008:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
01002>       DESIGN NASHYD      02:104           12.66    1.655 No_date   46:09  234.27
01003>        [CN= 81.0: N= 3.00]
01004>        [Tp=  .40:DT= 1.00]
01005> #-----------------|-------------------------------------------------------------|
01006>  008:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
01007>       ADD HYD            01:103            2.15     .305 No_date   46:01  242.17
01008>                        +  02:104           12.66    1.655 No_date   46:09  234.27
01009>        [DT= 1.00]  SUM=  03:ToSouth       14.81    1.949 No_date   46:07  235.41
01010> #-----------------|-------------------------------------------------------------|
01011>  008:0002---------------------------------------------------------------------------
01012>       FINISH
01013> ---------------------------------------------------------------------------------
01014> ********************************************************************************
01015>       WARNINGS / ERRORS / NOTES
01016>       -------------------------
```

```
01017>  001:0005 ROUTE RESERVOIR
01018>       *** WARNING: Outflow volume is less than inflow volume.
01019>       *** WARNING: Outflow volume is less than inflow volume.
01020>       *** WARNING: Outflow volume is less than inflow volume.
01021>       *** WARNING: Outflow volume is less than inflow volume.
01022>       *** WARNING: Outflow volume is less than inflow volume.
01023>       *** WARNING: Outflow volume is less than inflow volume.
01024>       *** WARNING: Outflow volume is less than inflow volume.
01025>       *** WARNING: Outflow volume is less than inflow volume.
01026>    Simulation ended on 2021-05-04     at 16:50:26
01027> ================================================================================
01028>
01029>
```

```
2     Metric units
*#*************************************************************************
*#  Project Name: [Baden North] Project Number:[603-05680]
*#  Date        : 2022-06-16
*#  Company     : Stantec Consulting Ltd. (Waterloo)
*#  Modeller    : Bryan Weersink, Water Resources Engineer
*#  Revised     :  ()
*#  Revision 2  :  ()
*#  License #   :  4730904
*#*************************************************************************
*#
*#  This model represents the hydologic characteristics of the Activa Baden North
*#  proposed subdivision in Baden, Ontario.
*#
*#  CURRENT DRAFT PLAN CONDITIONS
*#
*#  Determination of maximum ponding in infiltration basin during 25mm event
*#
*#
*#*************************************************************************
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[001]
*%                  ["Kit25mm.4hr"] <--storm filename, one per line for NSTORM time
*%------------------|-------------------------------------------------------------|
READ STORM          STORM_FILENAME=["STORM.001"]
*#------------------|-------------------------------------------------------------|
*#
*#              Proposed Subdivision draining north to SWMF
*#
*#------------------|-------------------------------------------------------------|
DESIGN STANDHYD     ID=[1], NHYD=["201"], DT=[1]min, AREA=[12.90](ha),
                    XIMP=[0.52], TIMP=[0.65], DWF=[0](cms), LOSS=[2], CN=[77],
                    SLOPE=[2](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*%------------------|-------------------------------------------------------------|
*#
*#                  Rooftop Infiltration from Single Family lots
*#
*#------------------|-------------------------------------------------------------|
ROUTE RESERVOIR     IDout=[9],   NHYD=["Gal1"],  IDin=[1],
                    RDT=[1](min),
                          TABLE of ( OUTFLOW-STORAGE ) values
                                    (cms) ~ (ha-m)
                                   [   0.0    ,   0.0 ]
                                   [   0.0 ,   0.0385 ]
                                   [   -1  ,   -1  ]  (max twenty pts)
                          IDovf=[7], NHYDovf=["SWR"]
*#------------------|-------------------------------------------------------------|
*#------------------|-------------------------------------------------------------|
*#                 External agricultural area draining to site
*#------------------|-------------------------------------------------------------|
DESIGN NASHYD       ID=[2], NHYD=["203"], DT=[1]min, AREA=[4.22](ha),
                    DWF=[0](cms), CN/C=[84], TP=[0.40]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
*#------------------|-------------------------------------------------------------|
*#------------------|-------------------------------------------------------------|
*#              Non-TUA Lands: agricultural area draining to Pond
*#------------------|-------------------------------------------------------------|
DESIGN NASHYD       ID=[1], NHYD=["205"], DT=[1]min, AREA=[6.34](ha),
                    DWF=[0](cms), CN/C=[84], TP=[0.65]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
*#------------------|-------------------------------------------------------------|
*#              Rear Yards to dedicated pipe to SWMF
*#------------------|-------------------------------------------------------------|
DESIGN STANDHYD     ID=[3], NHYD=["202"], DT=[1]min, AREA=[1.01](ha),
                    XIMP=[0.01], TIMP=[0.40], DWF=[0](cms), LOSS=[2], CN=[77],
                    SLOPE=[2](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*#------------------|-------------------------------------------------------------|
*#                 SWMF Catchment
*#------------------|-------------------------------------------------------------|
DESIGN STANDHYD     ID=[4], NHYD=["200"], DT=[1]min, AREA=[2.32](ha),
                    XIMP=[0.20], TIMP=[0.20], DWF=[0](cms), LOSS=[2], CN=[75],
                    SLOPE=[2](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*#------------------|-------------------------------------------------------------|

ADD HYD             IDsum=[5], NHYD=["ToSWM"], IDs to add=[7+2+1+3+4]
*%------------------|-------------------------------------------------------------|
*#
*#                                SWMF
*#        ONLY THE INFILTRATION PORTION MODELLED (OUTFLOW = INFILTRATION)
*#
*#------------------|-------------------------------------------------------------|
ROUTE RESERVOIR     IDout=[6],   NHYD=["SWMF-INF"],  IDin=[5],
                    RDT=[1](min),
                          TABLE of ( OUTFLOW-STORAGE ) values
                                    (cms) ~ (ha-m)
                                   [   0.0    ,   0.0 ]
                                   [   0.029 ,   0.0100 ]
                                   [   0.029 ,   0.3114 ]
                                   [   0.029 ,   0.5651 ]
                                   [   -1  ,   -1  ]  (max twenty pts)
                          IDovf=[9], NHYDovf=["OVR"]
*#------------------|-------------------------------------------------------------|
FINISH
```

```
00001> ================================================================================
00002>
00003>    SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999    =========
00004>    S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
00005>    SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9   Ver  4.05
00006>        S  W W W  M   M  H   H    Y    M   M  O   O       9999   9999   Sept 2011
00007>    SSSSS   W W   M   M  H   H    Y    M   M   OOO            9      9   =========
00008>                                                            9   9  9   9   # 4730904
00009>          StormWater Management HYdrologic Model            999    999    =========
00010>
00011>  ********************************************************************************
00012>  ***************************** SWMHYMO Ver/4.05  ********************************
00013>  *********  A single event and continuous hydrologic simulation model  *********
00014>  *********     based on the principles of HYMO and its successors      *********
00015>  *********                  OTTHYMO-83 and OTTHYMO-89.                  *********
00016>  ********************************************************************************
00017>  *********  Distributed by:  J.F. Sabourin and Associates Inc.          *********
00018>  *********                   Ottawa,  Ontario: (613) 836-3884           *********
00019>  *********                   Gatineau, Quebec: (819) 243-6858           *********
00020>  *********                   E-Mail: swmhymo@jfsa.Com                   *********
00021>  ********************************************************************************
00022>
00023>  +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
00024>  +++++++++ Licensed user: Stantec Consulting Ltd. (Kitchener)          +++++++++
00025>  +++++++++                 Kitchener              SERIAL#:4730904     +++++++++
00026>  +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
00027>
00028>  ********************************************************************************
00029>  *********             ++++++ PROGRAM ARRAY DIMENSIONS ++++++             *********
00030>  *********             Maximum value for ID numbers  :    10             *********
00031>  *********             Max. number of rainfall points: 105408            *********
00032>  *********             Max. number of flow points    : 105408            *********
00033>  ********************************************************************************
00034>
00035>  ***** DESCRIPTION SUMMARY TABLE HEADERS (units depend on METOUT in START) *****
00036>  *****-------------------------------------------------------------------*****
00037>  *****     ID:  Hydrograph IDentification numbers, (1-10).               *****
00038>  *****  NHYD:  Hydrograph reference numbers, (6 digits or characters).   *****
00039>  *****  AREA:  Drainage area associated with hydrograph, (ac.) or (ha.).  *****
00040>  ***** QPEAK:  Peak flow of simulated hydrograph, (ft^3/s) or (m^3/s).   *****
00041>  ***** TpeakDate_hh:mm is the date and time of the peak flow.            *****
00042>  *****  R.V.:  Runoff Volume of simulated hydrograph, (in) or (mm).      *****
00043>  *****  R.C.:  Runoff Coefficient of simulated hydrograph, (ratio).      *****
00044>  *****    *:  see WARNING or NOTE message printed at end of run.         *****
00045>  *****   **:  see  ERROR  message printed at end of run.                 *****
00046>  ********************************************************************************
00047>  ********************************************************************************
00048>
00049> ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
00050>
00051>  ********************************************************************************
00052>
00053>  **********************  S U M M A R Y   O U T P U T  **********************
00054>  ********************************************************************************
00055>  *         DATE: 2022-07-18     TIME: 11:33:51     RUN COUNTER: 000048         *
00056>  ********************************************************************************
00057>  * Input   filename: C:\TEMP\Bad\02-INT~1\BNprPH1.dat                          *
00058>  * Output  filename: C:\TEMP\Bad\02-INT~1\BNprPH1.out                          *
00059>  * Summary filename: C:\TEMP\Bad\02-INT~1\BNprPH1.sum                          *
00060>  * User comments:                                                             *
00061>  * 1:_____________________________________________________________________    *
00062>  * 2:_____________________________________________________________________    *
00063>  * 3:_____________________________________________________________________    *
00064>  ********************************************************************************
00065>
00066>
00067> #*******************************************************************************
00068> #  Project Name: [Baden North] Project Number:[603-05680]
00069> #  Date        : 2022-06-16
00070> #  Company     : Stantec Consulting Ltd. (Waterloo)
00071> #  Modeller    : Bryan Weersink, Water Resources Engineer
00072> #  Revised     :  ()
00073> #  Revision 2  :  ()
00074> #  License #   :  4730904
00075> #*******************************************************************************
00076> #
00077> #  This model represents the hydologic characteristics of the Activa Baden Nort
00078> #  proposed subdivision in Baden, Ontario.
00079> #
00080> #  CURRENT DRAFT PLAN CONDITIONS
00081> #
00082> #  Determination of maximum ponding in infiltration basin during 25mm event
00083> #
00084> #
00085> #*******************************************************************************
00086>  RUN:COMMAND#
00087>  001:0001----------------------------------------------------------------------
00088>      START
00089>       [TZERO =    .00 hrs on        0]
00090>       [METOUT=   2    (1=imperial, 2=metric output)]
00091>       [NSTORM=   1 ]
00092>       [NRUN  =   1 ]
00093>  001:0002----------------------------------------------------------------------
00094>      READ STORM
00095>       Filename = STORM.001
00096>       Comment  =
00097>       [SDT= 5.00:SDUR=   4.00:PTOT=  25.00]
00098> #----------------|-------------------------------------------------------------|
00099> #
00100> #              Proposed Subdivision draining north to SWMF
00101> #
00102> #----------------|-------------------------------------------------------------|
00103>  001:0003--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
00104>      DESIGN STANDHYD    01:201          12.90    1.021 No_date    1:37   16.05 .642
00105>       [XIMP=.52:TIMP=.65]
00106>       [SLP=2.00:DT= 1.00]
00107>       [LOSS= 2 :CN= 77.0]
00108> #
00109> #                  Rooftop Infiltration from Single Family lots
00110> #
00111> #----------------|-------------------------------------------------------------|
00112>  001:0004--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
00113>      ROUTE RESERVOIR -> 01:201          12.90    1.021 No_date    1:37   16.05  n/a
00114>    *   [RDT= 1.00] out<- 09:Gall          2.40     .000 No_date    0:00    .00  n/a
00115>            overflow <= 07:SWM          10.50    1.011 No_date    1:37   16.05  n/a
00116>      {MxStoUsed=.3850E-01, TotOvfVol=.1685E+00, N-Ovf=    4, TotDurOvf=    6.hrs}
00117> #----------------|-------------------------------------------------------------|
00118> #----------------|-------------------------------------------------------------|
00119> #              External agricultural area draining to site
00120> #----------------|-------------------------------------------------------------|
00121>  001:0005--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
00122>      DESIGN NASHYD      02:203           4.22     .070 No_date    2:05    7.68 .307
00123>       [CN= 84.0: N= 3.00]
00124>       [Tp=  .40:DT= 1.00]
00125> #----------------|-------------------------------------------------------------|
00126> #----------------|-------------------------------------------------------------|
00127> #                Non-TUA Lands: agricultural area draining to Pond
00128> #----------------|-------------------------------------------------------------|
00129>  001:0006--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
00130>      DESIGN NASHYD      01:205           6.34     .075 No_date    2:24    7.68 .307
00131>       [CN= 84.0: N= 3.00]
00132>       [Tp=  .65:DT= 1.00]
00133> #----------------|-------------------------------------------------------------|
00134> #              Rear Yards to dedicated pipe to SWMF
00135> #----------------|-------------------------------------------------------------|
00136>  001:0007--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
00137>      DESIGN STANDHYD    03:202           1.01     .026 No_date    1:49    8.44 .338
00138>       [XIMP=.01:TIMP=.40]
00139>       [SLP=2.00:DT= 1.00]
00140>       [LOSS= 2 :CN= 77.0]
00141> #----------------|-------------------------------------------------------------|
00142> #                SWMF Catchment
00143> #----------------|-------------------------------------------------------------|
00144>  001:0008--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
00145>      DESIGN STANDHYD    04:200           2.32     .085 No_date    1:36    8.92 .357
00146>       [XIMP=.20:TIMP=.20]
00147>       [SLP=2.00:DT= 1.00]
00148>       [LOSS= 2 :CN= 75.0]
00149> #----------------|-------------------------------------------------------------|
00150>  001:0009--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
00151>      ADD HYD            07:SWR          10.50    1.011 No_date    1:37   16.05  n/a
00152>                       +  02:203           4.22     .070 No_date    2:05    7.68  n/a
00153>                       +  01:205           6.34     .075 No_date    2:24    7.68  n/a
00154>                       +  03:202           1.01     .026 No_date    1:49    8.44  n/a
00155>                       +  04:200           2.32     .085 No_date    1:36    8.92  n/a
00156>       [DT= 1.00]  SUM=  05:ToSWM         24.39    1.122 No_date    1:37   11.43  n/a
00157> #
00158> #                                    SWMF
00159> #        ONLY THE INFILTRATION PORTION MODELLED (OUTFLOW = INFILTRATION)
00160> #
00161> #----------------|-------------------------------------------------------------|
00162>  001:0010--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
00163>      ROUTE RESERVOIR -> 05:ToSWM         24.39    1.122 No_date    1:37   11.43  n/a
00164>       [RDT= 1.00] out<- 06:SWMF-INF      24.39     .029 No_date    1:35   11.43  n/a
00165>             overflow <= 09:OVR            .00     .000 No_date    0:00     .00  n/a
00166>      {MxStoUsed=.2428E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
00167> #----------------|-------------------------------------------------------------|
00168>  001:0011----------------------------------------------------------------------
00169>       FINISH
00170> --------------------------------------------------------------------------------
00171> ********************************************************************************
00172>      WARNINGS / ERRORS / NOTES
00173>      -------------------------
00174>  001:0004 ROUTE RESERVOIR
00175>        *** WARNING: Outflow volume is less than inflow volume.
00176>    Simulation ended on 2022-07-18     at 11:33:51
00177> ================================================================================
00178>
00179>
```

```
2     Metric units
*#************************************************************************
*#  Project Name: [Baden North] Project Number:[603-05680]
*#  Date        : 2022-06-16
*#  Company     : Stantec Consulting Ltd. (Waterloo)
*#  Modeller    : Bryan Weersink, Water Resources Engineer
*#  Revised     :  ()
*#  Revision 2  :  ()
*#  License #   :  4730904
*#************************************************************************
*#
*#  This model represents the hydologic characteristics of the Activa Baden North
*#  proposed subdivision in Baden, Ontario.
*#  Storm events modeled are:
*#  25MM, 2, 5, 10, 25, 50 AND 100YR CHICAGO STORMS (City of Kitchener IDF)
*#  and the Regional Event
*#
*#                CURRENT DRAFT PLAN CONDITIONS (no infiltration assumed)
*#
*#************************************************************************
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[001]
*%                   ["Kit25mm.4hr"] <--storm filename, one per line for NSTORM time
*%------------------|------------------------------------------------------------|
READ STORM          STORM_FILENAME=["STORM.001"]
*#------------------|------------------------------------------------------------|
*#
*#              Proposed Subdivision draining north to SWMF
*#
*#------------------|------------------------------------------------------------|
DESIGN STANDHYD     ID=[1], NHYD=["201"], DT=[1]min, AREA=[12.90](ha),
                    XIMP=[0.52], TIMP=[0.65], DWF=[0](cms), LOSS=[2], CN=[77],
                    SLOPE=[2](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*#------------------|------------------------------------------------------------|
*#              External agricultural area draining to site
*#------------------|------------------------------------------------------------|
DESIGN NASHYD       ID=[2], NHYD=["203"], DT=[1]min, AREA=[4.22](ha),
                    DWF=[0](cms), CN/C=[84], TP=[0.40]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
*#------------------|------------------------------------------------------------|
*#------------------|------------------------------------------------------------|
*#                Non-TUA Lands: agricultural area draining to Pond
*#------------------|------------------------------------------------------------|
DESIGN NASHYD       ID=[7], NHYD=["205"], DT=[1]min, AREA=[6.34](ha),
                    DWF=[0](cms), CN/C=[84], TP=[0.65]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
*#------------------|------------------------------------------------------------|
*#              Rear Yards to dedicated pipe to SWMF
*#------------------|------------------------------------------------------------|
DESIGN STANDHYD     ID=[3], NHYD=["202"], DT=[1]min, AREA=[1.01](ha),
                    XIMP=[0.01], TIMP=[0.40], DWF=[0](cms), LOSS=[2], CN=[77],
                    SLOPE=[2](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*#------------------|------------------------------------------------------------|
*#                SWMF Catchment
*#------------------|------------------------------------------------------------|
DESIGN STANDHYD     ID=[4], NHYD=["200"], DT=[1]min, AREA=[2.32](ha),
                    XIMP=[0.20], TIMP=[0.20], DWF=[0](cms), LOSS=[2], CN=[75],
                    SLOPE=[2](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*#------------------|------------------------------------------------------------|
ADD HYD             IDsum=[5], NHYD=["ToSWM"], IDs to add=[1+2+7+3+4]
*%------------------|------------------------------------------------------------|
*#
*#                SWMF Active storage only (infiltration ignored)
*#
*#------------------|------------------------------------------------------------|
ROUTE RESERVOIR     IDout=[6],    NHYD=["SWMF"],  IDin=[5],
                    RDT=[1](min),
                          TABLE of ( OUTFLOW-STORAGE ) values
                                      (cms) - (ha-m)
                                   [   0.0   ,  0.0 ]
                                   [   0.011 ,  0.0985 ]
                                   [   0.067 ,  0.4193 ]
                                   [   0.079 ,  0.7757 ]
                                   [   0.216 ,  0.9016 ]
                                   [   0.478 ,  1.0308 ]
                                   [   0.504 ,  1.1668 ]
                                   [   0.624 ,  2.0645 ]
                                   [   5.507 ,  2.5658 ]
                                   [   -1  ,  -1  ]  (max twenty pts)
                          IDovf=[], NHYDovf=[""]
*#------------------|------------------------------------------------------------|
*#              Non-TUA Lands: agricultural area draining North through Hydro Coor
*#------------------|------------------------------------------------------------|
DESIGN NASHYD       ID=[1], NHYD=["206"], DT=[1]min, AREA=[2.03](ha),
                    DWF=[0](cms), CN/C=[84], TP=[0.29]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
*#------------------|------------------------------------------------------------|
ADD HYD             IDsum=[2], NHYD=["ToNorth"], IDs to add=[6+1]
*%------------------|------------------------------------------------------------|
*#------------------|------------------------------------------------------------|
*#
*#              Proposed Subdivision draining south to existing subdivision
*#
*#------------------|------------------------------------------------------------|
DESIGN STANDHYD     ID=[1], NHYD=["204"], DT=[1]min, AREA=[1.76](ha),
                    XIMP=[0.48], TIMP=[0.6], DWF=[0](cms), LOSS=[2], CN=[77],
                    SLOPE=[2](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*#------------------|------------------------------------------------------------|
*#------------------|------------------------------------------------------------|
*#              Non-TUA Lands: agricultural area draining to south
*#------------------|------------------------------------------------------------|
DESIGN NASHYD       ID=[2], NHYD=["207"], DT=[1]min, AREA=[4.74](ha),
                    DWF=[0](cms), CN/C=[84], TP=[0.37]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
*#------------------|------------------------------------------------------------|
ADD HYD             IDsum=[3], NHYD=["ToSouth"], IDs to add=[1+2]
*%------------------|------------------------------------------------------------|
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[002]
*                   ["Kit2yr.3hr"] <--storm filename, one per line for NSTORM time
*%------------------|------------------------------------------------------------|
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[005]
*                   ["Kit5yr.3hr"] <--storm filename, one per line for NSTORM time
*%------------------|------------------------------------------------------------|
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[010]
*                   ["Kit10yr.3hr"] <--storm filename, one per line for NSTORM time
*%------------------|------------------------------------------------------------|
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[025]
*                   ["Kit25yr.3hr"] <--storm filename, one per line for NSTORM time
*%------------------|------------------------------------------------------------|
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[050]
*                   ["Kit50yr.3hr"] <--storm filename, one per line for NSTORM time
*%------------------|------------------------------------------------------------|
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[100]
*                   ["Kit100yr.3hr"] <--storm filename, one per line for NSTORM time
*%------------------|------------------------------------------------------------|
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[999]
*                   ["hurhaz48.stm"] <--storm filename, one per line for NSTORM time
*%------------------|------------------------------------------------------------|
FINISH
```

```
00001> ================================================================================
00002>
00003>    SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999    =========
00004>    S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
00005>    SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9   Ver  4.05
00006>        S  W W W  M   M  H   H    Y    M   M  O   O       9999   9999   Sept 2011
00007>    SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      9    =========
00008>                                                          9   9  9   9   # 4730904
00009>          StormWater Management HYdrologic Model           999    999    =========
00010>
00011>  ********************************************************************************
00012>  ************************** SWMHYMO Ver/4.05  ***************************
00013>  *********  A single event and continuous hydrologic simulation model  *********
00014>  *********     based on the principles of HYMO and its successors      *********
00015>  *********                 OTTHYMO-83 and OTTHYMO-89.                  *********
00016>  ********************************************************************************
00017>  ********* Distributed by:  J.F. Sabourin and Associates Inc.          *********
00018>  *********                  Ottawa,  Ontario: (613) 836-3884           *********
00019>  *********                  Gatineau, Quebec: (819) 243-6858           *********
00020>  *********                  E-Mail: swmhymo@jfsa.com                   *********
00021>  ********************************************************************************
00022>
00023>  ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
00024>  +++++++++ Licensed user: Stantec Consulting Ltd. (Kitchener)          +++++++++
00025>  +++++++++                 Kitchener          SERIAL#:4730904         +++++++++
00026>  ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
00027>
00028>  ********************************************************************************
00029>  *********           ++++++ PROGRAM ARRAY DIMENSIONS ++++++            *********
00030>  *********           Maximum value for ID numbers  :     10            *********
00031>  *********           Max. number of rainfall points: 105408            *********
00032>  *********           Max. number of flow points    : 105408            *********
00033>  ********************************************************************************
00034>
00035>  ***** DESCRIPTION SUMMARY TABLE HEADERS (units depend on METOUT in START) *****
00036>  *****------------------------------------------------------------------------*****
00037>  *****    ID:  Hydrograph IDentification numbers, (1-10).                    *****
00038>  *****  NHYD:  Hydrograph reference numbers, (6 digits or characters).       *****
00039>  *****  AREA:  Drainage area associated with hydrograph, (ac.) or (ha.).     *****
00040>  ***** QPEAK:  Peak flow of simulated hydrograph, (ft^3/s) or (m^3/s).       *****
00041>  ***** TpeakDate_hh:mm is the date and time of the peak flow.                 *****
00042>  *****  R.V.:  Runoff Volume of simulated hydrograph, (in) or (mm).         *****
00043>  *****  R.C.:  Runoff Coefficient of simulated hydrograph, (ratio).         *****
00044>  *****     *:  see WARNING or NOTE message printed at end of run.           *****
00045>  *****    **:  see  ERROR  message printed at end of run.                   *****
00046>  ********************************************************************************
00047>  ********************************************************************************
00048>
00049> ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
00050>
00051>  ********************************************************************************
00052>
00053>  **********************   S U M M A R Y   O U T P U T   **********************
00054>  ********************************************************************************
00055>  *         DATE: 2022-06-29     TIME: 16:21:28     RUN COUNTER: 002946         *
00056>  ********************************************************************************
00057>  * Input   filename: C:\TEMP\Baden\02-INT~1\PH1Ni.dat                           *
00058>  * Output  filename: C:\TEMP\Baden\02-INT~1\PH1Ni.out                           *
00059>  * Summary filename: C:\TEMP\Baden\02-INT~1\PH1Ni.sum                           *
00060>  * User comments:                                                              *
00061>  * 1:_____________________________________________________________________     *
00062>  * 2:_____________________________________________________________________     *
00063>  * 3:_____________________________________________________________________     *
00064>  ********************************************************************************
00065>
00066>
00067> #*******************************************************************************
00068> #  Project Name: [Baden North] Project Number:[603-05680]
00069> #  Date        : 2022-06-16
00070> #  Company     : Stantec Consulting Ltd. (Waterloo)
00071> #  Modeller    : Bryan Weersink, Water Resources Engineer
00072> #  Revised     :  ()
00073> #  Revision 2  :  ()
00074> #  License #   :  4730904
00075> #*******************************************************************************
00076> #
00077> #  This model represents the hydologic characteristics of the Activa Baden Nort
00078> #  proposed subdivision in Baden, Ontario.
00079> #  Storm events modeled are:
00080> #  25MM, 2, 5, 10, 25, 50 AND 100YR CHICAGO STORMS (City of Kitchener IDF)
00081> #  and the Regional Event
00082> #
00083> #                 CURRENT DRAFT PLAN CONDITIONS (no infiltration assumed)
00084> #
00085> #*******************************************************************************
00086>  RUN:COMMAND#
00087>  001:0001----------------------------------------------------------------------
00088>      START
00089>       [TZERO =    .00 hrs on        0]
00090>       [METOUT=   2    (1=imperial, 2=metric output)]
00091>       [NSTORM=   1 ]
00092>       [NRUN  =   1 ]
00093>  001:0002----------------------------------------------------------------------
00094>      READ STORM
00095>       Filename = STORM.001
00096>       Comment  =
00097>       [SDT= 5.00:SDUR=   4.00:PTOT=  25.00]
00098> #-----------------|-------------------------------------------------------|
00099> #                 |                                                       |
00100> #              Proposed Subdivision draining north to SWMF
00101> #                 |                                                       |
00102> #-----------------|-------------------------------------------------------|
00103>  001:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00104>      DESIGN STANDHYD    01:201           12.90    1.021 No_date    1:37   16.05 .642
00105>       [XIMP=.52:TIMP=.65]
00106>       [SLP=2.00:DT= 1.00]
00107>       [LOSS= 2 :CN= 77.0]
00108> #-----------------|-------------------------------------------------------|
00109> #                 |                                                       |
00110> #              External agricultural area draining to site
00111> #                 |                                                       |
00112> #-----------------|-------------------------------------------------------|
00113>  001:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00114>      DESIGN NASHYD      02:203            4.22     .070 No_date    2:05    7.68 .307
00115>       [CN= 84.0: N= 3.00]
00116>       [Tp=  .40:DT= 1.00]
00117> #-----------------|-------------------------------------------------------|
00118> #                 |                                                       |
00119> #              Non-TUA Lands: agricultural area draining to Pond
00120> #-----------------|-------------------------------------------------------|
00121>  001:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00122>      DESIGN NASHYD      07:205            6.34     .075 No_date    2:24    7.68 .307
00123>       [CN= 84.0: N= 3.00]
00124>       [Tp=  .65:DT= 1.00]
00125> #-----------------|-------------------------------------------------------|
00126> #                 |                                                       |
00127> #              Rear Yards to dedicated pipe to SWMF
00128> #-----------------|-------------------------------------------------------|
00129>  001:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00130>      DESIGN STANDHYD    03:202            1.01     .026 No_date    1:49    8.44 .338
00131>       [XIMP=.01:TIMP=.40]
00132>       [SLP=2.00:DT= 1.00]
00133>       [LOSS= 2 :CN= 77.0]
00134> #-----------------|-------------------------------------------------------|
00135> #                 |                                                       |
00136> #                  SWMF Catchment
00137> #-----------------|-------------------------------------------------------|
00138> #                 |                                                       |
00139> #-----------------|-------------------------------------------------------|
00140>  001:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00141>      ADD HYD            01:201           12.90    1.021 No_date    1:37   16.05  n/a
00142>                       +  02:203            4.22     .070 No_date    2:05    7.68  n/a
00143>                       +  07:205            6.34     .075 No_date    2:24    7.68  n/a
00144>                       +  03:202            1.01     .026 No_date    1:49    8.44  n/a
00145>                       +  04:200            2.32     .085 No_date    1:36    8.92  n/a
00146>       [DT= 1.00]  SUM=  05:ToSWM          26.79    1.132 No_date    1:37   11.85  n/a
00147> #
00148> #                 SWMF Active storage only (infiltration ignored)
00149> #
00150> #-----------------|-------------------------------------------------------|
00151>  001:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00152>      ROUTE RESERVOIR -> 05:ToSWM          26.79    1.132 No_date    1:37   11.85  n/a
00153>       [RDT= 1.00] out<- 06:SWMF           26.79     .042 No_date    4:17   11.85  n/a
00154>       {MxStoUsed=.2777E+00}
00155> #-----------------|-------------------------------------------------------|
00156> #                 |                                                       |
00157> #              Non-TUA Lands: agricultural area draining North through Hydro Co
00158> #-----------------|-------------------------------------------------------|
00159>  001:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00160>      DESIGN NASHYD      01:206            2.03     .042 No_date    1:56    7.68 .307
00161>       [CN= 84.0: N= 3.00]
00162>       [Tp=  .29:DT= 1.00]
00163> #-----------------|-------------------------------------------------------|
00164>  001:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00165>      ADD HYD            06:SWMF          26.79     .042 No_date    4:17   11.85  n/a
00166>                       +  01:206            2.03     .042 No_date    1:56    7.68  n/a
00167>       [DT= 1.00]  SUM=  02:ToNorth        28.82     .062 No_date    2:00   11.55  n/a
00168> #-----------------|-------------------------------------------------------|
00169> #                 |                                                       |
00170> #              Proposed Subdivision draining south to existing subdivision
00171> #-----------------|-------------------------------------------------------|
00172> #                 |                                                       |
00173>  001:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00174>      DESIGN STANDHYD    01:204            1.76     .160 No_date    1:35   15.21 .609
00175>       [XIMP=.48:TIMP=.60]
00176>       [SLP=2.00:DT= 1.00]
00177>       [LOSS= 2 :CN= 77.0]
00178> #-----------------|-------------------------------------------------------|
00179> #                 |                                                       |
00180> #              Non-TUA Lands: agricultural area draining to south
00181> #-----------------|-------------------------------------------------------|
00182>  001:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00183>      DESIGN NASHYD      02:207            4.74     .083 No_date    2:02    7.68 .307
00184>       [CN= 84.0: N= 3.00]
00185>       [Tp=  .37:DT= 1.00]
00186> #-----------------|-------------------------------------------------------|
00187>  001:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00188>      ADD HYD            01:204            1.76     .160 No_date    1:35   15.21  n/a
00189>                       +  02:207            4.74     .083 No_date    2:02    7.68  n/a
00190>       [DT= 1.00]  SUM=  03:ToSouth         6.50     .171 No_date    1:35    9.72  n/a
00191>   ** END OF RUN :   1
00192> ********************************************************************************
00193>
00194>
00195>
00196>
00197>
00198>  RUN:COMMAND#
00199>  002:0001----------------------------------------------------------------------
00200>      START
00201>       [TZERO =    .00 hrs on        0]
00202>       [METOUT=   2    (1=imperial, 2=metric output)]
00203>       [NSTORM=   1 ]
00204>       [NRUN  =   2 ]
00205> #*******************************************************************************
00206> #  Project Name: [Baden North] Project Number:[603-05680]
00207> #  Date        : 2022-06-16
00208> #  Company     : Stantec Consulting Ltd. (Waterloo)
00209> #  Modeller    : Bryan Weersink, Water Resources Engineer
00210> #  Revised     :  ()
00211> #  Revision 2  :  ()
00212> #  License #   :  4730904
00213> #*******************************************************************************
00214> #
00215> #  This model represents the hydologic characteristics of the Activa Baden Nort
00216> #  proposed subdivision in Baden, Ontario.
00217> #  Storm events modeled are:
00218> #  25MM, 2, 5, 10, 25, 50 AND 100YR CHICAGO STORMS (City of Kitchener IDF)
00219> #  and the Regional Event
00220> #
00221> #                 CURRENT DRAFT PLAN CONDITIONS (no infiltration assumed)
00222> #
00223> #*******************************************************************************
00224>  002:0002----------------------------------------------------------------------
00225>      READ STORM
00226>       Filename = STORM.001
00227>       Comment  =
00228>       [SDT= 5.00:SDUR=   3.00:PTOT=  34.27]
00229> #-----------------|-------------------------------------------------------|
00230> #                 |                                                       |
00231> #              Proposed Subdivision draining north to SWMF
00232> #                 |                                                       |
00233> #-----------------|-------------------------------------------------------|
00234>  002:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00235>      DESIGN STANDHYD    01:201           12.90    1.579 No_date    1:02   23.38 .682
00236>       [XIMP=.52:TIMP=.65]
00237>       [SLP=2.00:DT= 1.00]
00238>       [LOSS= 2 :CN= 77.0]
00239> #-----------------|-------------------------------------------------------|
00240> #                 |                                                       |
00241> #              External agricultural area draining to site
00242> #-----------------|-------------------------------------------------------|
00243>  002:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00244>      DESIGN NASHYD      02:203            4.22     .123 No_date    1:31   13.23 .386
00245>       [CN= 84.0: N= 3.00]
00246>       [Tp=  .40:DT= 1.00]
00247> #-----------------|-------------------------------------------------------|
00248> #                 |                                                       |
00249> #              Non-TUA Lands: agricultural area draining to Pond
00250> #-----------------|-------------------------------------------------------|
00251>  002:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00252>      DESIGN NASHYD      07:205            6.34     .133 No_date    1:51   13.23 .386
00253>       [CN= 84.0: N= 3.00]
00254>       [Tp=  .65:DT= 1.00]
00255> #-----------------|-------------------------------------------------------|
00256> #                 |                                                       |
00257> #              Rear Yards to dedicated pipe to SWMF
00258> #-----------------|-------------------------------------------------------|
00259>  002:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00260>      DESIGN STANDHYD    03:202            1.01     .051 No_date    1:11   14.22 .415
00261>       [XIMP=.01:TIMP=.40]
00262>       [SLP=2.00:DT= 1.00]
00263>       [LOSS= 2 :CN= 77.0]
00264> #-----------------|-------------------------------------------------------|
00265> #                 |                                                       |
00266> #                  SWMF Catchment
00267> #-----------------|-------------------------------------------------------|
00268> #                 |                                                       |
00269>  002:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00270>      DESIGN STANDHYD    04:200            2.32     .134 No_date    1:00   14.01 .409
00271>       [XIMP=.20:TIMP=.20]
00272>       [SLP=2.00:DT= 1.00]
00273>       [LOSS= 2 :CN= 75.0]
00274> #-----------------|-------------------------------------------------------|
00275> #                 |                                                       |
00276>  002:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00277>      ADD HYD            01:201           12.90    1.579 No_date    1:02   23.38  n/a
00278>                       +  02:203            4.22     .123 No_date    1:31   13.23  n/a
00279>                       +  07:205            6.34     .133 No_date    1:51   13.23  n/a
00280>                       +  03:202            1.01     .051 No_date    1:11   14.22  n/a
00281>                       +  04:200            2.32     .134 No_date    1:00   14.01  n/a
00282>       [DT= 1.00]  SUM=  05:ToSWM          26.79    1.741 No_date    1:02   18.22  n/a
00283> #
00284> #                 SWMF Active storage only (infiltration ignored)
00285> #
00286> #-----------------|-------------------------------------------------------|
00287>  002:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
```

```
      ROUTE RESERVOIR -> 05:ToSWM          26.79    1.741 No_date    1:02   18.22  n/a
       [RDT= 1.00] out<- 06:SWMF           26.79     .067 No_date    3:27   18.22  n/a
     {MxStoUsed=.4306E+00}
#------------------|---------------------------------------------------------|
#              Non-TUA Lands: agricultural area draining North through Hydro Co
#------------------|---------------------------------------------------------|
 002:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN NASHYD      01:206            2.03     .073 No_date    1:22   13.23 .386
       [CN= 84.0: N= 3.00]
       [Tp=  .29:DT= 1.00]
#------------------|---------------------------------------------------------|
 002:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD            06:SWMF           26.79     .067 No_date    3:27   18.22  n/a
                       +  01:206            2.03     .073 No_date    1:22   13.23  n/a
       [DT= 1.00]  SUM=  02:ToNorth        28.82     .107 No_date    1:26   17.87  n/a
#------------------|---------------------------------------------------------|
#
#              Proposed Subdivision draining south to existing subdivision
#
#------------------|---------------------------------------------------------|
 002:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN STANDHYD    01:204            1.76     .242 No_date    1:00   22.30 .651
       [XIMP=.48:TIMP=.60]
       [SLP=2.00:DT= 1.00]
       [LOSS= 2 :CN= 77.0]
#------------------|---------------------------------------------------------|
#------------------|---------------------------------------------------------|
#              Non-TUA Lands: agricultural area draining to south
#------------------|---------------------------------------------------------|
 002:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN NASHYD      02:207            4.74     .146 No_date    1:29   13.23 .386
       [CN= 84.0: N= 3.00]
       [Tp=  .37:DT= 1.00]
#------------------|---------------------------------------------------------|
 002:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD            01:204            1.76     .242 No_date    1:00   22.30  n/a
                       +  02:207            4.74     .146 No_date    1:29   13.23  n/a
       [DT= 1.00]  SUM=  03:ToSouth         6.50     .258 No_date    1:00   15.69  n/a
  ** END OF RUN :   4
 ***************************************************************************
 RUN:COMMAND#
 005:0001----------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =   5 ]
#***************************************************************************
#  Project Name: [Baden North] Project Number:[603-05680]
#  Date        : 2022-06-16
#  Company     : Stantec Consulting Ltd. (Waterloo)
#  Modeller    : Bryan Weersink, Water Resources Engineer
#  Revised     :  ()
#  Revision 2  :  ()
#  License #   :  4730904
#***************************************************************************
#
#  This model represents the hydologic characteristics of the Activa Baden Nort
#  proposed subdivision in Baden, Ontario.
#  Storm events modeled are:
#  25MM, 2, 5, 10, 25, 50 AND 100YR CHICAGO STORMS (City of Kitchener IDF)
#  and the Regional Event
#
#               CURRENT DRAFT PLAN CONDITIONS (no infiltration assumed)
#
#***************************************************************************
 005:0002----------------------------------------------------------------------------
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT= 5.00:SDUR=   3.00:PTOT=  47.26]
#------------------|---------------------------------------------------------|
#
#              Proposed Subdivision draining north to SWMF
#
#------------------|---------------------------------------------------------|
 005:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN STANDHYD    01:201           12.90    2.245 No_date    1:01   34.24 .724
       [XIMP=.52:TIMP=.65]
       [SLP=2.00:DT= 1.00]
       [LOSS= 2 :CN= 77.0]
#------------------|---------------------------------------------------------|
#              External agricultural area draining to site
#------------------|---------------------------------------------------------|
 005:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN NASHYD      02:203            4.22     .222 No_date    1:31   22.24 .471
       [CN= 84.0: N= 3.00]
       [Tp=  .40:DT= 1.00]
#------------------|---------------------------------------------------------|
#------------------|---------------------------------------------------------|
#              Non-TUA Lands: agricultural area draining to Pond
#------------------|---------------------------------------------------------|
 005:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN NASHYD      07:205            6.34     .237 No_date    1:50   22.24 .471
       [CN= 84.0: N= 3.00]
       [Tp=  .65:DT= 1.00]
#------------------|---------------------------------------------------------|
#              Rear Yards to dedicated pipe to SWMF
#------------------|---------------------------------------------------------|
 005:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN STANDHYD    03:202            1.01     .098 No_date    1:10   23.50 .497
       [XIMP=.01:TIMP=.40]
       [SLP=2.00:DT= 1.00]
       [LOSS= 2 :CN= 77.0]
#------------------|---------------------------------------------------------|
#               SWMF Catchment
#------------------|---------------------------------------------------------|
 005:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN STANDHYD    04:200            2.32     .189 No_date    1:00   22.13 .468
       [XIMP=.20:TIMP=.20]
       [SLP=2.00:DT= 1.00]
       [LOSS= 2 :CN= 75.0]
#------------------|---------------------------------------------------------|
 005:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD            01:201           12.90    2.245 No_date    1:01   34.24  n/a
                       +  02:203            4.22     .222 No_date    1:31   22.24  n/a
                       +  07:205            6.34     .237 No_date    1:50   22.24  n/a
                       +  03:202            1.01     .098 No_date    1:10   23.50  n/a
                       +  04:200            2.32     .189 No_date    1:00   22.13  n/a
       [DT= 1.00]  SUM=  05:ToSWM          26.79    2.523 No_date    1:01   28.06  n/a
#
#                SWMF Active storage only (infiltration ignored)
#
#------------------|---------------------------------------------------------|
 005:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ROUTE RESERVOIR -> 05:ToSWM          26.79    2.523 No_date    1:01   28.06  n/a
       [RDT= 1.00] out<- 06:SWMF           26.79     .076 No_date    3:30   28.05  n/a
     {MxStoUsed=.6781E+00}
#------------------|---------------------------------------------------------|
#              Non-TUA Lands: agricultural area draining North through Hydro Co
#------------------|---------------------------------------------------------|
 005:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN NASHYD      01:206            2.03     .131 No_date    1:22   22.24 .471
       [CN= 84.0: N= 3.00]
       [Tp=  .29:DT= 1.00]
#------------------|---------------------------------------------------------|
 005:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD            06:SWMF           26.79     .076 No_date    3:30   28.05  n/a
                       +  01:206            2.03     .131 No_date    1:22   22.24  n/a
       [DT= 1.00]  SUM=  02:ToNorth        28.82     .189 No_date    1:26   27.64  n/a
#------------------|---------------------------------------------------------|
#
#              Proposed Subdivision draining south to existing subdivision
#
#------------------|---------------------------------------------------------|
 005:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN STANDHYD    01:204            1.76     .328 No_date    1:00   32.88 .696
       [XIMP=.48:TIMP=.60]
       [SLP=2.00:DT= 1.00]
       [LOSS= 2 :CN= 77.0]
#------------------|---------------------------------------------------------|
#------------------|---------------------------------------------------------|
#              Non-TUA Lands: agricultural area draining to south
#------------------|---------------------------------------------------------|
 005:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN NASHYD      02:207            4.74     .262 No_date    1:29   22.24 .471
       [CN= 84.0: N= 3.00]
       [Tp=  .37:DT= 1.00]
#------------------|---------------------------------------------------------|
 005:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD            01:204            1.76     .328 No_date    1:00   32.88  n/a
                       +  02:207            4.74     .262 No_date    1:29   22.24  n/a
       [DT= 1.00]  SUM=  03:ToSouth         6.50     .358 No_date    1:00   25.12  n/a
  ** END OF RUN :   9
 ***************************************************************************
 RUN:COMMAND#
 010:0001----------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =  10 ]
#***************************************************************************
#  Project Name: [Baden North] Project Number:[603-05680]
#  Date        : 2022-06-16
#  Company     : Stantec Consulting Ltd. (Waterloo)
#  Modeller    : Bryan Weersink, Water Resources Engineer
#  Revised     :  ()
#  Revision 2  :  ()
#  License #   :  4730904
#***************************************************************************
#
#  This model represents the hydologic characteristics of the Activa Baden Nort
#  proposed subdivision in Baden, Ontario.
#  Storm events modeled are:
#  25MM, 2, 5, 10, 25, 50 AND 100YR CHICAGO STORMS (City of Kitchener IDF)
#  and the Regional Event
#
#               CURRENT DRAFT PLAN CONDITIONS (no infiltration assumed)
#
#***************************************************************************
 010:0002----------------------------------------------------------------------------
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT= 5.00:SDUR=   3.00:PTOT=  56.28]
#------------------|---------------------------------------------------------|
#
#              Proposed Subdivision draining north to SWMF
#
#------------------|---------------------------------------------------------|
 010:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN STANDHYD    01:201           12.90    2.858 No_date    1:01   42.08 .748
       [XIMP=.52:TIMP=.65]
       [SLP=2.00:DT= 1.00]
       [LOSS= 2 :CN= 77.0]
#------------------|---------------------------------------------------------|
#              External agricultural area draining to site
#------------------|---------------------------------------------------------|
 010:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN NASHYD      02:203            4.22     .301 No_date    1:31   29.09 .517
       [CN= 84.0: N= 3.00]
       [Tp=  .40:DT= 1.00]
#------------------|---------------------------------------------------------|
#------------------|---------------------------------------------------------|
#              Non-TUA Lands: agricultural area draining to Pond
#------------------|---------------------------------------------------------|
 010:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN NASHYD      07:205            6.34     .319 No_date    1:49   29.09 .517
       [CN= 84.0: N= 3.00]
       [Tp=  .65:DT= 1.00]
#------------------|---------------------------------------------------------|
#              Rear Yards to dedicated pipe to SWMF
#------------------|---------------------------------------------------------|
 010:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN STANDHYD    03:202            1.01     .141 No_date    1:08   30.50 .542
       [XIMP=.01:TIMP=.40]
       [SLP=2.00:DT= 1.00]
       [LOSS= 2 :CN= 77.0]
#------------------|---------------------------------------------------------|
#               SWMF Catchment
#------------------|---------------------------------------------------------|
 010:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN STANDHYD    04:200            2.32     .243 No_date    1:00   28.31 .503
       [XIMP=.20:TIMP=.20]
       [SLP=2.00:DT= 1.00]
       [LOSS= 2 :CN= 75.0]
#------------------|---------------------------------------------------------|
 010:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD            01:201           12.90    2.858 No_date    1:01   42.08  n/a
                       +  02:203            4.22     .301 No_date    1:31   29.09  n/a
                       +  07:205            6.34     .319 No_date    1:49   29.09  n/a
                       +  03:202            1.01     .141 No_date    1:08   30.50  n/a
                       +  04:200            2.32     .243 No_date    1:00   28.31  n/a
       [DT= 1.00]  SUM=  05:ToSWM          26.79    3.237 No_date    1:01   35.33  n/a
#
#                SWMF Active storage only (infiltration ignored)
#
#------------------|---------------------------------------------------------|
 010:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ROUTE RESERVOIR -> 05:ToSWM          26.79    3.237 No_date    1:01   35.33  n/a
       [RDT= 1.00] out<- 06:SWMF           26.79     .155 No_date    3:13   35.33  n/a
     {MxStoUsed=.8457E+00}
#------------------|---------------------------------------------------------|
#              Non-TUA Lands: agricultural area draining North through Hydro Co
#------------------|---------------------------------------------------------|
 010:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN NASHYD      01:206            2.03     .179 No_date    1:22   29.09 .517
       [CN= 84.0: N= 3.00]
       [Tp=  .29:DT= 1.00]
#------------------|---------------------------------------------------------|
 010:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD            06:SWMF           26.79     .155 No_date    3:13   35.33  n/a
                       +  01:206            2.03     .179 No_date    1:22   29.09  n/a
       [DT= 1.00]  SUM=  02:ToNorth        28.82     .247 No_date    1:23   34.89  n/a
#------------------|---------------------------------------------------------|
#
#              Proposed Subdivision draining south to existing subdivision
#
#------------------|---------------------------------------------------------|
```

```
00565>  010:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00566>      DESIGN STANDHYD    01:204           1.76     .417 No_date    1:00   40.56 .721
00567>       [XIMP=.48:TIMP=.60]
00568>       [SLP=2.00:DT= 1.00]
00569>       [LOSS= 2 :CN= 77.0]
00570> #-----------------|-------------------------------------------------------------|
00571> #-----------------|-------------------------------------------------------------|
00572> #              Non-TUA Lands: agricultural area draining to south
00573> #-----------------|-------------------------------------------------------------|
00574>  010:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00575>      DESIGN NASHYD      02:207           4.74     .356 No_date    1:28   29.09 .517
00576>       [CN= 84.0: N= 3.00]
00577>       [Tp=  .37:DT= 1.00]
00578> #-----------------|-------------------------------------------------------------|
00579>  010:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00580>      ADD HYD            01:204           1.76     .417 No_date    1:00   40.56  n/a
00581>                       +  02:207           4.74     .356 No_date    1:28   29.09  n/a
00582>       [DT= 1.00]  SUM=  03:ToSouth        6.50     .466 No_date    1:21   32.20  n/a
00583>    ** END OF RUN :  24
00584>
00585> ****************************************************************************
00586>
00587>
00588>
00589>
00590>
00591>  RUN:COMMAND#
00592>  025:0001----------------------------------------------------------------------------------
00593>      START
00594>       [TZERO =    .00 hrs on        0]
00595>       [METOUT=   2    (1=imperial, 2=metric output)]
00596>       [NSTORM=   1 ]
00597>       [NRUN  =  25 ]
00598> #*************************************************************************
00599> #  Project Name: [Baden North] Project Number:[603-05680]
00600> #  Date        : 2022-06-16
00601> #  Company     : Stantec Consulting Ltd. (Waterloo)
00602> #  Modeller    : Bryan Weersink, Water Resources Engineer
00603> #  Revised     :  ()
00604> #  Revision 2  :  ()
00605> #  License #   :  4730904
00606> #*************************************************************************
00607> #
00608> #  This model represents the hydologic characteristics of the Activa Baden Nort
00609> #  proposed subdivision in Baden, Ontario.
00610> #  Storm events modeled are:
00611> #  25MM, 2, 5, 10, 25, 50 AND 100YR CHICAGO STORMS (City of Kitchener IDF)
00612> #  and the Regional Event
00613> #
00614> #                  CURRENT DRAFT PLAN CONDITIONS (no infiltration assumed)
00615> #
00616> #*************************************************************************
00617>  025:0002----------------------------------------------------------------------------------
00618>      READ STORM
00619>       Filename = STORM.001
00620>       Comment  =
00621>       [SDT= 5.00:SDUR=   3.00:PTOT=  68.26]
00622> #-----------------|-------------------------------------------------------------|
00623> #-----------------|-------------------------------------------------------------|
00624> #              Proposed Subdivision draining north to SWMF
00625> #
00626> #-----------------|-------------------------------------------------------------|
00627>  025:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00628>      DESIGN STANDHYD    01:201          12.90    3.425 No_date    1:01   52.75 .773
00629>       [XIMP=.52:TIMP=.65]
00630>       [SLP=2.00:DT= 1.00]
00631>       [LOSS= 2 :CN= 77.0]
00632> #-----------------|-------------------------------------------------------------|
00633> #              External agricultural area draining to site
00634> #-----------------|-------------------------------------------------------------|
00635>  025:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00636>      DESIGN NASHYD      02:203           4.22     .402 No_date    1:31   38.71 .567
00637>       [CN= 84.0: N= 3.00]
00638>       [Tp=  .40:DT= 1.00]
00639> #-----------------|-------------------------------------------------------------|
00640> #-----------------|-------------------------------------------------------------|
00641> #              Non-TUA Lands: agricultural area draining to Pond
00642> #-----------------|-------------------------------------------------------------|
00643>  025:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00644>      DESIGN NASHYD      07:205           6.34     .429 No_date    1:49   38.71 .567
00645>       [CN= 84.0: N= 3.00]
00646>       [Tp=  .65:DT= 1.00]
00647> #-----------------|-------------------------------------------------------------|
00648> #              Rear Yards to dedicated pipe to SWMF
00649> #-----------------|-------------------------------------------------------------|
00650>  025:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00651>      DESIGN STANDHYD    03:202           1.01     .191 No_date    1:07   40.30 .590
00652>       [XIMP=.01:TIMP=.40]
00653>       [SLP=2.00:DT= 1.00]
00654>       [LOSS= 2 :CN= 77.0]
00655> #-----------------|-------------------------------------------------------------|
00656> #                  SWMF Catchment
00657> #-----------------|-------------------------------------------------------------|
00658>  025:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00659>      DESIGN STANDHYD    04:200           2.32     .310 No_date    1:06   37.04 .543
00660>       [XIMP=.20:TIMP=.20]
00661>       [SLP=2.00:DT= 1.00]
00662>       [LOSS= 2 :CN= 75.0]
00663> #-----------------|-------------------------------------------------------------|
00664>  025:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00665>      ADD HYD            01:201          12.90    3.425 No_date    1:01   52.75  n/a
00666>                       +  02:203           4.22     .402 No_date    1:31   38.71  n/a
00667>                       +  07:205           6.34     .429 No_date    1:49   38.71  n/a
00668>                       +  03:202           1.01     .191 No_date    1:07   40.30  n/a
00669>                       +  04:200           2.32     .310 No_date    1:06   37.04  n/a
00670>       [DT= 1.00]  SUM=  05:ToSWM         26.79    3.943 No_date    1:01   45.39  n/a
00671> #
00672> #                  SWMF Active storage only (infiltration ignored)
00673> #
00674> #-----------------|-------------------------------------------------------------|
00675>  025:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00676>      ROUTE RESERVOIR -> 05:ToSWM         26.79    3.943 No_date    1:01   45.39  n/a
00677>       [RDT= 1.00] out<- 06:SWMF          26.79     .412 No_date    2:50   45.38  n/a
00678>      {MxStoUsed=.9984E+00}
00679> #-----------------|-------------------------------------------------------------|
00680> #              Non-TUA Lands: agricultural area draining North through Hydro Co
00681> #-----------------|-------------------------------------------------------------|
00682>  025:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00683>      DESIGN NASHYD      01:206           2.03     .238 No_date    1:22   38.71 .567
00684>       [CN= 84.0: N= 3.00]
00685>       [Tp=  .29:DT= 1.00]
00686> #-----------------|-------------------------------------------------------------|
00687>  025:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00688>      ADD HYD            06:SWMF          26.79     .412 No_date    2:50   45.38  n/a
00689>                       +  01:206           2.03     .238 No_date    1:22   38.71  n/a
00690>       [DT= 1.00]  SUM=  02:ToNorth       28.82     .437 No_date    2:45   44.91  n/a
00691> #-----------------|-------------------------------------------------------------|
00692> #
00693> #              Proposed Subdivision draining south to existing subdivision
00694> #
00695> #-----------------|-------------------------------------------------------------|
00696>  025:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00697>      DESIGN STANDHYD    01:204           1.76     .489 No_date    1:00   51.04 .748
00698>       [XIMP=.48:TIMP=.60]
00699>       [SLP=2.00:DT= 1.00]
00700>       [LOSS= 2 :CN= 77.0]
00701> #-----------------|-------------------------------------------------------------|
00702> #-----------------|-------------------------------------------------------------|
00703> #              Non-TUA Lands: agricultural area draining to south
00704> #-----------------|-------------------------------------------------------------|
00705>  025:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00706>      DESIGN NASHYD      02:207           4.74     .476 No_date    1:28   38.71 .567
00707>       [CN= 84.0: N= 3.00]
00708>       [Tp=  .37:DT= 1.00]
00709> #-----------------|-------------------------------------------------------------|
00710>  025:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00711>      ADD HYD            01:204           1.76     .489 No_date    1:00   51.04  n/a
00712>                       +  02:207           4.74     .476 No_date    1:28   38.71  n/a
00713>       [DT= 1.00]  SUM=  03:ToSouth        6.50     .619 No_date    1:21   42.05  n/a
00714>    ** END OF RUN :  49
00715>
00716> ****************************************************************************
00717>
00718>
00719>
00720>
00721>
00722>  RUN:COMMAND#
00723>  050:0001----------------------------------------------------------------------------------
00724>      START
00725>       [TZERO =    .00 hrs on        0]
00726>       [METOUT=   2    (1=imperial, 2=metric output)]
00727>       [NSTORM=   1 ]
00728>       [NRUN  =  50 ]
00729> #*************************************************************************
00730> #  Project Name: [Baden North] Project Number:[603-05680]
00731> #  Date        : 2022-06-16
00732> #  Company     : Stantec Consulting Ltd. (Waterloo)
00733> #  Modeller    : Bryan Weersink, Water Resources Engineer
00734> #  Revised     :  ()
00735> #  Revision 2  :  ()
00736> #  License #   :  4730904
00737> #*************************************************************************
00738> #
00739> #  This model represents the hydologic characteristics of the Activa Baden Nort
00740> #  proposed subdivision in Baden, Ontario.
00741> #  Storm events modeled are:
00742> #  25MM, 2, 5, 10, 25, 50 AND 100YR CHICAGO STORMS (City of Kitchener IDF)
00743> #  and the Regional Event
00744> #
00745> #                  CURRENT DRAFT PLAN CONDITIONS (no infiltration assumed)
00746> #
00747> #*************************************************************************
00748>  050:0002----------------------------------------------------------------------------------
00749>      READ STORM
00750>       Filename = STORM.001
00751>       Comment  =
00752>       [SDT= 5.00:SDUR=   3.00:PTOT=  77.24]
00753> #-----------------|-------------------------------------------------------------|
00754> #
00755> #              Proposed Subdivision draining north to SWMF
00756> #
00757> #-----------------|-------------------------------------------------------------|
00758>  050:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00759>      DESIGN STANDHYD    01:201          12.90    4.001 No_date    1:01   60.92 .789
00760>       [XIMP=.52:TIMP=.65]
00761>       [SLP=2.00:DT= 1.00]
00762>       [LOSS= 2 :CN= 77.0]
00763> #-----------------|-------------------------------------------------------------|
00764> #              External agricultural area draining to site
00765> #-----------------|-------------------------------------------------------------|
00766>  050:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00767>      DESIGN NASHYD      02:203           4.22     .485 No_date    1:31   46.21 .598
00768>       [CN= 84.0: N= 3.00]
00769>       [Tp=  .40:DT= 1.00]
00770> #-----------------|-------------------------------------------------------------|
00771> #-----------------|-------------------------------------------------------------|
00772> #              Non-TUA Lands: agricultural area draining to Pond
00773> #-----------------|-------------------------------------------------------------|
00774>  050:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00775>      DESIGN NASHYD      07:205           6.34     .517 No_date    1:49   46.21 .598
00776>       [CN= 84.0: N= 3.00]
00777>       [Tp=  .65:DT= 1.00]
00778> #-----------------|-------------------------------------------------------------|
00779> #              Rear Yards to dedicated pipe to SWMF
00780> #-----------------|-------------------------------------------------------------|
00781>  050:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00782>      DESIGN STANDHYD    03:202           1.01     .235 No_date    1:06   47.92 .620
00783>       [XIMP=.01:TIMP=.40]
00784>       [SLP=2.00:DT= 1.00]
00785>       [LOSS= 2 :CN= 77.0]
00786> #-----------------|-------------------------------------------------------------|
00787> #                  SWMF Catchment
00788> #-----------------|-------------------------------------------------------------|
00789>  050:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00790>      DESIGN STANDHYD    04:200           2.32     .393 No_date    1:06   43.90 .568
00791>       [XIMP=.20:TIMP=.20]
00792>       [SLP=2.00:DT= 1.00]
00793>       [LOSS= 2 :CN= 75.0]
00794> #-----------------|-------------------------------------------------------------|
00795>  050:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00796>      ADD HYD            01:201          12.90    4.001 No_date    1:01   60.92  n/a
00797>                       +  02:203           4.22     .485 No_date    1:31   46.21  n/a
00798>                       +  07:205           6.34     .517 No_date    1:49   46.21  n/a
00799>                       +  03:202           1.01     .235 No_date    1:06   47.92  n/a
00800>                       +  04:200           2.32     .393 No_date    1:06   43.90  n/a
00801>       [DT= 1.00]  SUM=  05:ToSWM         26.79    4.653 No_date    1:02   53.16  n/a
00802> #
00803> #                  SWMF Active storage only (infiltration ignored)
00804> #
00805> #-----------------|-------------------------------------------------------------|
00806>  050:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00807>      ROUTE RESERVOIR -> 05:ToSWM         26.79    4.653 No_date    1:02   53.16  n/a
00808>       [RDT= 1.00] out<- 06:SWMF          26.79     .496 No_date    2:47   53.15  n/a
00809>      {MxStoUsed=.1124E+01}
00810> #-----------------|-------------------------------------------------------------|
00811> #              Non-TUA Lands: agricultural area draining North through Hydro Co
00812> #-----------------|-------------------------------------------------------------|
00813>  050:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00814>      DESIGN NASHYD      01:206           2.03     .287 No_date    1:22   46.21 .598
00815>       [CN= 84.0: N= 3.00]
00816>       [Tp=  .29:DT= 1.00]
00817> #-----------------|-------------------------------------------------------------|
00818>  050:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00819>      ADD HYD            06:SWMF          26.79     .496 No_date    2:47   53.15  n/a
00820>                       +  01:206           2.03     .287 No_date    1:22   46.21  n/a
00821>       [DT= 1.00]  SUM=  02:ToNorth       28.82     .586 No_date    1:59   52.67  n/a
00822> #-----------------|-------------------------------------------------------------|
00823> #
00824> #              Proposed Subdivision draining south to existing subdivision
00825> #
00826> #-----------------|-------------------------------------------------------------|
00827>  050:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00828>      DESIGN STANDHYD    01:204           1.76     .569 No_date    1:00   59.08 .765
00829>       [XIMP=.48:TIMP=.60]
00830>       [SLP=2.00:DT= 1.00]
00831>       [LOSS= 2 :CN= 77.0]
00832> #-----------------|-------------------------------------------------------------|
00833> #-----------------|-------------------------------------------------------------|
00834> #              Non-TUA Lands: agricultural area draining to south
00835> #-----------------|-------------------------------------------------------------|
00836>  050:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00837>      DESIGN NASHYD      02:207           4.74     .574 No_date    1:28   46.21 .598
00838>       [CN= 84.0: N= 3.00]
00839>       [Tp=  .37:DT= 1.00]
00840> #-----------------|-------------------------------------------------------------|
00841>  050:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00842>      ADD HYD            01:204           1.76     .569 No_date    1:00   59.08  n/a
00843>                       +  02:207           4.74     .574 No_date    1:28   46.21  n/a
00844>       [DT= 1.00]  SUM=  03:ToSouth        6.50     .740 No_date    1:21   49.70  n/a
00845>    ** END OF RUN :  99
00846>
```

```
00847> ********************************************************************************
00848>
00849>
00850>
00851>
00852>
00853>  RUN:COMMAND#
00854>  100:0001--------------------------------------------------------------------------
00855>       START
00856>       [TZERO =    .00 hrs on        0]
00857>       [METOUT=   2    (1=imperial, 2=metric output)]
00858>       [NSTORM=   1 ]
00859>       [NRUN  = 100 ]
00860> ********************************************************************************
00861> #  Project Name: [Baden North] Project Number:[603-05680]
00862> #  Date         : 2022-06-16
00863> #  Company      : Stantec Consulting Ltd. (Waterloo)
00864> #  Modeller     : Bryan Weersink, Water Resources Engineer
00865> #  Revised      :  ()
00866> #  Revision 2  :  ()
00867> #  License #    :  4730904
00868> ********************************************************************************
00869> #
00870> #  This model represents the hydologic characteristics of the Activa Baden Nort
00871> #  proposed subdivision in Baden, Ontario.
00872> #  Storm events modeled are:
00873> #  25MM, 2, 5, 10, 25, 50 AND 100YR CHICAGO STORMS (City of Kitchener IDF)
00874> #  and the Regional Event
00875> #
00876> #               CURRENT DRAFT PLAN CONDITIONS (no infiltration assumed)
00877> #
00878> ********************************************************************************
00879>  100:0002--------------------------------------------------------------------------
00880>       READ STORM
00881>        Filename = STORM.001
00882>        Comment  =
00883>       [SDT= 5.00:SDUR=   3.00:PTOT=  87.07]
00884> #-----------------|------------------------------------------------------------|
00885> #
00886> #              Proposed Subdivision draining north to SWMF
00887> #
00888> #-----------------|------------------------------------------------------------|
00889>  100:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00890>       DESIGN STANDHYD    01:201           12.90    4.590 No_date    1:01   69.97 .804
00891>        [XIMP=.52:TIMP=.65]
00892>        [SLP=2.00:DT= 1.00]
00893>        [LOSS= 2 :CN= 77.0]
00894> #-----------------|------------------------------------------------------------|
00895> #              External agricultural area draining to site
00896> #-----------------|------------------------------------------------------------|
00897>  100:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00898>       DESIGN NASHYD      02:203            4.22     .579 No_date    1:30   54.66 .628
00899>        [CN= 84.0: N= 3.00]
00900>        [Tp=  .40:DT= 1.00]
00901> #-----------------|------------------------------------------------------------|
00902> #-----------------|------------------------------------------------------------|
00903> #              Non-TUA Lands: agricultural area draining to Pond
00904> #-----------------|------------------------------------------------------------|
00905>  100:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00906>       DESIGN NASHYD      07:205            6.34     .616 No_date    1:49   54.66 .628
00907>        [CN= 84.0: N= 3.00]
00908>        [Tp=  .65:DT= 1.00]
00909> #-----------------|------------------------------------------------------------|
00910> #              Rear Yards to dedicated pipe to SWMF
00911> #-----------------|------------------------------------------------------------|
00912>  100:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00913>       DESIGN STANDHYD    03:202            1.01     .288 No_date    1:05   56.48 .649
00914>        [XIMP=.01:TIMP=.40]
00915>        [SLP=2.00:DT= 1.00]
00916>        [LOSS= 2 :CN= 77.0]
00917> #-----------------|------------------------------------------------------------|
00918> #                SWMF Catchment
00919> #-----------------|------------------------------------------------------------|
00920>  100:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00921>       DESIGN STANDHYD    04:200            2.32     .475 No_date    1:06   51.66 .593
00922>        [XIMP=.20:TIMP=.20]
00923>        [SLP=2.00:DT= 1.00]
00924>        [LOSS= 2 :CN= 75.0]
00925> #-----------------|------------------------------------------------------------|
00926>  100:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00927>       ADD HYD            01:201           12.90    4.590 No_date    1:01   69.97  n/a
00928>                        +  02:203            4.22     .579 No_date    1:30   54.66  n/a
00929>                        +  07:205            6.34     .616 No_date    1:49   54.66  n/a
00930>                        +  03:202            1.01     .288 No_date    1:05   56.48  n/a
00931>                        +  04:200            2.32     .475 No_date    1:06   51.66  n/a
00932>       [DT= 1.00]  SUM=  05:ToSWM         26.79    5.401 No_date    1:02   61.84  n/a
00933> #
00934> #                SWMF Active storage only (infiltration ignored)
00935> #
00936> #-----------------|------------------------------------------------------------|
00937>  100:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00938>       ROUTE RESERVOIR -> 05:ToSWM         26.79    5.401 No_date    1:02   61.84  n/a
00939>        [RDT= 1.00] out<- 06:SWMF          26.79     .522 No_date    2:51   61.84  n/a
00940>       {MxStoUsed=.1303E+01}
00941> #-----------------|------------------------------------------------------------|
00942> #             Non-TUA Lands: agricultural area draining North through Hydro Co
00943> #-----------------|------------------------------------------------------------|
00944>  100:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00945>       DESIGN NASHYD      01:206            2.03     .342 No_date    1:22   54.66 .628
00946>        [CN= 84.0: N= 3.00]
00947>        [Tp=  .29:DT= 1.00]
00948> #-----------------|------------------------------------------------------------|
00949>  100:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00950>       ADD HYD            06:SWMF          26.79     .522 No_date    2:51   61.84  n/a
00951>                        +  01:206            2.03     .342 No_date    1:22   54.66  n/a
00952>       [DT= 1.00]  SUM=  02:ToNorth        28.82     .725 No_date    1:39   61.33  n/a
00953> #-----------------|------------------------------------------------------------|
00954> #
00955> #              Proposed Subdivision draining south to existing subdivision
00956> #
00957> #-----------------|------------------------------------------------------------|
00958>  100:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00959>       DESIGN STANDHYD    01:204            1.76     .661 No_date    1:00   68.01 .781
00960>        [XIMP=.48:TIMP=.60]
00961>        [SLP=2.00:DT= 1.00]
00962>        [LOSS= 2 :CN= 77.0]
00963> #-----------------|------------------------------------------------------------|
00964> #-----------------|------------------------------------------------------------|
00965> #              Non-TUA Lands: agricultural area draining to south
00966> #-----------------|------------------------------------------------------------|
00967>  100:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00968>       DESIGN NASHYD      02:207            4.74     .685 No_date    1:28   54.66 .628
00969>        [CN= 84.0: N= 3.00]
00970>        [Tp=  .37:DT= 1.00]
00971> #-----------------|------------------------------------------------------------|
00972>  100:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00973>       ADD HYD            01:204            1.76     .661 No_date    1:00   68.01  n/a
00974>                        +  02:207            4.74     .685 No_date    1:28   54.66  n/a
00975>       [DT= 1.00]  SUM=  03:ToSouth         6.50     .874 No_date    1:21   58.28  n/a
00976>    ** END OF RUN : 998
00977>
00978> ********************************************************************************
00979>
00980>
00981>
00982>
00983>
00984>  RUN:COMMAND#
00985>  999:0001--------------------------------------------------------------------------
00986>       START
00987>       [TZERO =    .00 hrs on        0]
00988>       [METOUT=   2    (1=imperial, 2=metric output)]
00989>       [NSTORM=   1 ]
00990>       [NRUN  = 999 ]
00991> #********************************************************************************
00992> #  Project Name: [Baden North] Project Number:[603-05680]
00993> #  Date         : 2022-06-16
00994> #  Company      : Stantec Consulting Ltd. (Waterloo)
00995> #  Modeller     : Bryan Weersink, Water Resources Engineer
00996> #  Revised      :  ()
00997> #  Revision 2  :  ()
00998> #  License #    :  4730904
00999> #********************************************************************************
01000> #
01001> #  This model represents the hydologic characteristics of the Activa Baden Nort
01002> #  proposed subdivision in Baden, Ontario.
01003> #  Storm events modeled are:
01004> #  25MM, 2, 5, 10, 25, 50 AND 100YR CHICAGO STORMS (City of Kitchener IDF)
01005> #  and the Regional Event
01006> #
01007> #               CURRENT DRAFT PLAN CONDITIONS (no infiltration assumed)
01008> #
01009> #********************************************************************************
01010>  999:0002--------------------------------------------------------------------------
01011>       READ STORM
01012>        Filename = STORM.001
01013>        Comment  =
01014>       [SDT=15.00:SDUR=  48.00:PTOT= 285.00]
01015> #-----------------|------------------------------------------------------------|
01016> #
01017> #              Proposed Subdivision draining north to SWMF
01018> #
01019> #-----------------|------------------------------------------------------------|
01020>  999:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
01021>       DESIGN STANDHYD    01:201           12.90    1.849 No_date   46:00  261.84 .919
01022>        [XIMP=.52:TIMP=.65]
01023>        [SLP=2.00:DT= 1.00]
01024>        [LOSS= 2 :CN= 77.0]
01025> #-----------------|------------------------------------------------------------|
01026> #              External agricultural area draining to site
01027> #-----------------|------------------------------------------------------------|
01028>  999:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
01029>       DESIGN NASHYD      02:203            4.22     .560 No_date   46:09  242.17 .850
01030>        [CN= 84.0: N= 3.00]
01031>        [Tp=  .40:DT= 1.00]
01032> #-----------------|------------------------------------------------------------|
01033> #-----------------|------------------------------------------------------------|
01034> #              Non-TUA Lands: agricultural area draining to Pond
01035> #-----------------|------------------------------------------------------------|
01036>  999:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
01037>       DESIGN NASHYD      07:205            6.34     .742 No_date   46:33  242.17 .850
01038>        [CN= 84.0: N= 3.00]
01039>        [Tp=  .65:DT= 1.00]
01040> #-----------------|------------------------------------------------------------|
01041> #              Rear Yards to dedicated pipe to SWMF
01042> #-----------------|------------------------------------------------------------|
01043>  999:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
01044>       DESIGN STANDHYD    03:202            1.01     .144 No_date   46:00  244.91 .859
01045>        [XIMP=.01:TIMP=.40]
01046>        [SLP=2.00:DT= 1.00]
01047>        [LOSS= 2 :CN= 77.0]
01048> #-----------------|------------------------------------------------------------|
01049> #                SWMF Catchment
01050> #-----------------|------------------------------------------------------------|
01051>  999:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
01052>       DESIGN STANDHYD    04:200            2.32     .317 No_date   46:00  231.48 .812
01053>        [XIMP=.20:TIMP=.20]
01054>        [SLP=2.00:DT= 1.00]
01055>        [LOSS= 2 :CN= 75.0]
01056> #-----------------|------------------------------------------------------------|
01057>  999:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
01058>       ADD HYD            01:201           12.90    1.849 No_date   46:00  261.84  n/a
01059>                        +  02:203            4.22     .560 No_date   46:09  242.17  n/a
01060>                        +  07:205            6.34     .742 No_date   46:33  242.17  n/a
01061>                        +  03:202            1.01     .144 No_date   46:00  244.91  n/a
01062>                        +  04:200            2.32     .317 No_date   46:00  231.48  n/a
01063>       [DT= 1.00]  SUM=  05:ToSWM         26.79    3.483 No_date   46:01  250.82  n/a
01064> #
01065> #                SWMF Active storage only (infiltration ignored)
01066> #
01067> #-----------------|------------------------------------------------------------|
01068>  999:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
01069>       ROUTE RESERVOIR -> 05:ToSWM         26.79    3.483 No_date   46:01  250.82  n/a
01070>        [RDT= 1.00] out<- 06:SWMF          26.79    3.201 No_date   46:12  250.81  n/a
01071>       {MxStoUsed=.2329E+01}
01072> #-----------------|------------------------------------------------------------|
01073> #              Non-TUA Lands: agricultural area draining North through Hydro Co
01074> #-----------------|------------------------------------------------------------|
01075>  999:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
01076>       DESIGN NASHYD      01:206            2.03     .283 No_date   46:03  242.17 .850
01077>        [CN= 84.0: N= 3.00]
01078>        [Tp=  .29:DT= 1.00]
01079> #-----------------|------------------------------------------------------------|
01080>  999:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
01081>       ADD HYD            06:SWMF          26.79    3.201 No_date   46:12  250.81  n/a
01082>                        +  01:206            2.03     .283 No_date   46:03  242.17  n/a
01083>       [DT= 1.00]  SUM=  02:ToNorth        28.82    3.474 No_date   46:11  250.20  n/a
01084> #-----------------|------------------------------------------------------------|
01085> #
01086> #              Proposed Subdivision draining south to existing subdivision
01087> #
01088> #-----------------|------------------------------------------------------------|
01089>  999:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
01090>       DESIGN STANDHYD    01:204            1.76     .252 No_date   46:00  258.84 .908
01091>        [XIMP=.48:TIMP=.60]
01092>        [SLP=2.00:DT= 1.00]
01093>        [LOSS= 2 :CN= 77.0]
01094> #-----------------|------------------------------------------------------------|
01095> #-----------------|------------------------------------------------------------|
01096> #              Non-TUA Lands: agricultural area draining to south
01097> #-----------------|------------------------------------------------------------|
01098>  999:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
01099>       DESIGN NASHYD      02:207            4.74     .638 No_date   46:07  242.17 .850
01100>        [CN= 84.0: N= 3.00]
01101>        [Tp=  .37:DT= 1.00]
01102> #-----------------|------------------------------------------------------------|
01103>  999:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
01104>       ADD HYD            01:204            1.76     .252 No_date   46:00  258.84  n/a
01105>                        +  02:207            4.74     .638 No_date   46:07  242.17  n/a
01106>       [DT= 1.00]  SUM=  03:ToSouth         6.50     .879 No_date   46:01  246.69  n/a
01107>  999:0002--------------------------------------------------------------------------
01108>       FINISH
01109> --------------------------------------------------------------------------------
01110> ********************************************************************************
01111>       WARNINGS / ERRORS / NOTES
01112>       -------------------------
01113>    Simulation ended on 2022-06-29     at 16:21:36
01114> ================================================================================
01115>
01116>
```

```
00001> 2     Metric units
00002> *#************************************************************************
00003> *#  Project Name: [Baden North] Project Number:[603-05680]
00004> *#  Date        : 2022-06-16
00005> *#  Company     : Stantec Consulting Ltd. (Waterloo)
00006> *#  Modeller    : Bryan Weersink, Water Resources Engineer
00007> *#  Revised     :  ()
00008> *#  Revision 2  :  ()
00009> *#  License #   :  4730904
00010> *#************************************************************************
00011> *#
00012> *#  This model represents the hydologic characteristics of the Activa Baden North
00013> *#  proposed subdivision in Baden, Ontario.
00014> *#
00015> *#  FUTURE CONDITIONS
00016> *#
00017> *#  Determination of maximum ponding in infiltration basin during 25mm event
00018> *#
00019> *#
00020> *#************************************************************************
00021> START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[001]
00022> *%                  ["Kit25mm.4hr"] <--storm filename, one per line for NSTORM time
00023> *%-----------------|-------------------------------------------------------|
00024> READ STORM          STORM_FILENAME=["STORM.001"]
00025> *#-----------------|-------------------------------------------------------|
00026> *#
00027> *#              Proposed Subdivision (future developent) draining north to SWMF
00028> *#
00029> *#-----------------|-------------------------------------------------------|
00030> DESIGN STANDHYD     ID=[1], NHYD=["301"], DT=[1]min, AREA=[25.10](ha),
00031>                     XIMP=[0.52], TIMP=[0.65], DWF=[0](cms), LOSS=[2], CN=[77],
00032>                     SLOPE=[2](%), RAINFALL=[ , , , , ](mm/hr), END=-1
00033> *%-----------------|-------------------------------------------------------|
00034> *#
00035> *#                  Rooftop Infiltration from Single Family lots
00036> *#
00037> *#-----------------|-------------------------------------------------------|
00038> ROUTE RESERVOIR     IDout=[9],   NHYD=["Gal1"],  IDin=[1],
00039>                     RDT=[1](min),
00040>                          TABLE of ( OUTFLOW-STORAGE ) values
00041>                                   (cms) - (ha-m)
00042>                                  [   0.0   ,  0.0 ]
00043>                                  [   0.0 ,  0.0607 ]
00044>                                  [   -1  ,  -1  ]  (max twenty pts)
00045>                          IDovf=[7], NHYDovf=["SWR"]
00046> *#-----------------|-------------------------------------------------------|
00047> *#-----------------|-------------------------------------------------------|
00048> *#              External agricultural area draining to site
00049> *#-----------------|-------------------------------------------------------|
00050> DESIGN NASHYD       ID=[2], NHYD=["303"], DT=[1]min, AREA=[4.22](ha),
00051>                     DWF=[0](cms), CN/C=[84], TP=[0.40]hrs,
00052>                     RAINFALL=[ ,  ,  ,  ,](mm/hr), END=-1
00053> *#-----------------|-------------------------------------------------------|
00054> *#              Rear Yards to dedicated pipe to SWMF
00055> *#-----------------|-------------------------------------------------------|
00056> DESIGN STANDHYD     ID=[3], NHYD=["302"], DT=[1]min, AREA=[1.01](ha),
00057>                     XIMP=[0.01], TIMP=[0.40], DWF=[0](cms), LOSS=[2], CN=[77],
00058>                     SLOPE=[2](%), RAINFALL=[ , , , , ](mm/hr), END=-1
00059> *#-----------------|-------------------------------------------------------|
00060> *#                 SWMF Catchment
00061> *#-----------------|-------------------------------------------------------|
00062> DESIGN STANDHYD     ID=[4], NHYD=["300"], DT=[1]min, AREA=[2.32](ha),
00063>                     XIMP=[0.20], TIMP=[0.20], DWF=[0](cms), LOSS=[2], CN=[75],
00064>                     SLOPE=[2](%), RAINFALL=[ , , , , ](mm/hr), END=-1
00065> *#-----------------|-------------------------------------------------------|
00066>
00067> ADD HYD             IDsum=[5], NHYD=["ToSWM"], IDs to add=[7+2+3+4]
00068> *%-----------------|-------------------------------------------------------|
00069> *#
00070> *#                                SWMF
00071> *#       ONLY THE INFILTRATION PORTION MODELLED (OUTFLOW = INFILTRATION)
00072> *#
00073> *#-----------------|-------------------------------------------------------|
00074> ROUTE RESERVOIR     IDout=[6],   NHYD=["SWMF-INF"],  IDin=[5],
00075>                     RDT=[1](min),
00076>                          TABLE of ( OUTFLOW-STORAGE ) values
00077>                                    (cms) - (ha-m)
00078>                                  [   0.0   ,  0.0 ]
00079>                                  [   0.029 ,  0.0100 ]
00080>                                  [   0.029 ,  0.4606 ]
00081>                                  [   0.029 ,  0.8000 ]
00082>                                  [   -1    ,  -1  ]  (max twenty pts)
00083>                          IDovf=[9], NHYDovf=["OVR"]
00084> *#-----------------|-------------------------------------------------------|
00085> FINISH
00086>
00087>
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00001> ================================================================================
00002>
00003>    SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999    =========
00004>    S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
00005>    SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9   Ver  4.05
00006>        S   W W   M   M  H   H    Y    M   M  O   O       9999   9999   Sept 2011
00007>    SSSSS   W W   M   M  H   H    Y    M   M   OOO            9      9   =========
00008>                                                           9   9  9   9   # 4730904
00009>          StormWater Management HYdrologic Model            999    999    =========
00010>
00011>  ********************************************************************************
00012>  ************************** SWMHYMO Ver/4.05  ***************************
00013>  *********  A single event and continuous hydrologic simulation model  *********
00014>  *********     based on the principles of HYMO and its successors      *********
00015>  *********                 OTTHYMO-83 and OTTHYMO-89.                  *********
00016>  ********************************************************************************
00017>  ********* Distributed by:  J.F. Sabourin and Associates Inc.          *********
00018>  *********                  Ottawa,  Ontario: (613) 836-3884           *********
00019>  *********                  Gatineau, Quebec: (819) 243-6858           *********
00020>  *********                  E-Mail: swmhymo@jfsa.Com                   *********
00021>  ********************************************************************************
00022>
00023>  ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
00024>  +++++++++ Licensed user: Stantec Consulting Ltd. (Kitchener)          +++++++++
00025>  +++++++++                 Kitchener            SERIAL#:4730904       +++++++++
00026>  ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
00027>
00028>  ********************************************************************************
00029>  *********           ++++++ PROGRAM ARRAY DIMENSIONS ++++++            *********
00030>  *********           Maximum value for ID numbers  :     10            *********
00031>  *********           Max. number of rainfall points: 105408            *********
00032>  *********           Max. number of flow points    : 105408            *********
00033>  ********************************************************************************
00034>
00035>  ***** DESCRIPTION SUMMARY TABLE HEADERS (units depend on METOUT in START) *****
00036>  *****-------------------------------------------------------------------*****
00037>  *****    ID:  Hydrograph IDentification numbers, (1-10).                 *****
00038>  *****  NHYD:  Hydrograph reference numbers, (6 digits or characters).    *****
00039>  *****  AREA:  Drainage area associated with hydrograph, (ac.) or (ha.).  *****
00040>  ***** QPEAK:  Peak flow of simulated hydrograph, (ft^3/s) or (m^3/s).    *****
00041>  ***** TpeakDate_hh:mm is the date and time of the peak flow.             *****
00042>  *****  R.V.:  Runoff Volume of simulated hydrograph, (in) or (mm).      *****
00043>  *****  R.C.:  Runoff Coefficient of simulated hydrograph, (ratio).      *****
00044>  *****     *:  see WARNING or NOTE message printed at end of run.        *****
00045>  *****    **:  see  ERROR  message printed at end of run.                *****
00046>  ********************************************************************************
00047>  ********************************************************************************
00048>
00049> ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
00050>
00051>  ********************************************************************************
00052>
00053>  ************************   S U M M A R Y   O U T P U T   ************************
00054>  ********************************************************************************
00055>  *         DATE: 2022-06-29     TIME: 16:24:28     RUN COUNTER: 002948         *
00056>  ********************************************************************************
00057>  * Input   filename: C:\TEMP\Baden\03-ULT~1\BNprULT.dat                        *
00058>  * Output  filename: C:\TEMP\Baden\03-ULT~1\BNprULT.out                       *
00059>  * Summary filename: C:\TEMP\Baden\03-ULT~1\BNprULT.sum                       *
00060>  * User comments:                                                            *
00061>  * 1:_____________________________________________________________________*
00062>  * 2:_____________________________________________________________________*
00063>  * 3:_____________________________________________________________________*
00064>  ********************************************************************************
00065>
00066>
00067> #*******************************************************************************
00068> #  Project Name: [Baden North] Project Number:[603-05680]
00069> #  Date        : 2022-06-16
00070> #  Company     : Stantec Consulting Ltd. (Waterloo)
00071> #  Modeller    : Bryan Weersink, Water Resources Engineer
00072> #  Revised     :  ()
00073> #  Revision 2  :  ()
00074> #  License #   :  4730904
00075> #*******************************************************************************
00076> #
00077> #  This model represents the hydologic characteristics of the Activa Baden Nort
00078> #  proposed subdivision in Baden, Ontario.
00079> #
00080> #  FUTURE CONDITIONS
00081> #
00082> #  Determination of maximum ponding in infiltration basin during 25mm event
00083> #
00084> #
00085> #*******************************************************************************
00086>  RUN:COMMAND#
00087>  001:0001----------------------------------------------------------------------
00088>      START
00089>       [TZERO =    .00 hrs on        0]
00090>       [METOUT=   2    (1=imperial, 2=metric output)]
00091>       [NSTORM=   1 ]
00092>       [NRUN  =   1 ]
00093>  001:0002----------------------------------------------------------------------
00094>      READ STORM
00095>       Filename = STORM.001
00096>       Comment  =
00097>       [SDT= 5.00:SDUR=   4.00:PTOT=  25.00]
00098> #-----------------|-------------------------------------------------------|
00099> #
00100> #              Proposed Subdivision (future developent) draining north to SWMF
00101> #
00102> #-----------------|-------------------------------------------------------|
00103>  001:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00104>      DESIGN STANDHYD    01:301           25.10    1.783 No_date    1:39   16.05 .642
00105>       [XIMP=.52:TIMP=.65]
00106>       [SLP=2.00:DT= 1.00]
00107>       [LOSS= 2 :CN= 77.0]
00108> #
00109> #                 Rooftop Infiltration from Single Family lots
00110> #
00111> #-----------------|-------------------------------------------------------|
00112>  001:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00113>      ROUTE RESERVOIR -> 01:301           25.10    1.783 No_date    1:39   16.05  n/a
00114>   *   [RDT= 1.00] out<- 09:Gal1           3.78     .000 No_date    0:00     .00  n/a
00115>           overflow <= 07:SWR            21.32    1.772 No_date    1:39   16.05  n/a
00116>      {MxStoUsed=.6070E-01, TotOvfVol=.3421E+00, N-Ovf=    4, TotDurOvf=    6.hrs}
00117> #-----------------|-------------------------------------------------------|
00118> #-----------------|-------------------------------------------------------|
00119> #              External agricultural area draining to site
00120> #-----------------|-------------------------------------------------------|
00121>  001:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00122>      DESIGN NASHYD      02:303            4.22     .070 No_date    2:05    7.68 .307
00123>       [CN= 84.0: N= 3.00]
00124>       [Tp=  .40:DT= 1.00]
00125> #-----------------|-------------------------------------------------------|
00126> #              Rear Yards to dedicated pipe to SWMF
00127> #-----------------|-------------------------------------------------------|
00128>  001:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00129>      DESIGN STANDHYD    03:302            1.01     .026 No_date    1:49    8.44 .338
00130>       [XIMP=.01:TIMP=.40]
00131>       [SLP=2.00:DT= 1.00]
00132>       [LOSS= 2 :CN= 77.0]
00133> #-----------------|-------------------------------------------------------|
00134> #                  SWMF Catchment
00135> #-----------------|-------------------------------------------------------|
00136>  001:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00137>      DESIGN STANDHYD    04:300            2.32     .085 No_date    1:36    8.92 .357
00138>       [XIMP=.20:TIMP=.20]
00139>       [SLP=2.00:DT= 1.00]
00140>       [LOSS= 2 :CN= 75.0]
00141> #-----------------|-------------------------------------------------------|
00142>  001:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00143>      ADD HYD            07:SWR           21.32    1.772 No_date    1:39   16.05  n/a
00144>                     +  02:303            4.22     .070 No_date    2:05    7.68  n/a
00145>                     +  03:302            1.01     .026 No_date    1:49    8.44  n/a
00146>                     +  04:300            2.32     .085 No_date    1:36    8.92  n/a
00147>       [DT= 1.00]  SUM=  05:ToSWM         28.87    1.867 No_date    1:39   13.99  n/a
00148> #
00149> #                                SWMF
00150> #        ONLY THE INFILTRATION PORTION MODELLED (OUTFLOW = INFILTRATION)
00151> #
00152> #-----------------|-------------------------------------------------------|
00153>  001:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00154>      ROUTE RESERVOIR -> 05:ToSWM         28.87    1.867 No_date    1:39   13.99  n/a
00155>       [RDT= 1.00] out<- 06:SWMF-INF      28.87     .029 No_date    1:34   13.99  n/a
00156>              overflow <= 09:OVR            .00     .000 No_date    0:00     .00  n/a
00157>      {MxStoUsed=.3701E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
00158> #-----------------|-------------------------------------------------------|
00159>  001:0010----------------------------------------------------------------------
00160>       FINISH
00161> --------------------------------------------------------------------------------
00162> ********************************************************************************
00163>      WARNINGS / ERRORS / NOTES
00164>      -------------------------
00165>  001:0004 ROUTE RESERVOIR
00166>       *** WARNING: Outflow volume is less than inflow volume.
00167>    Simulation ended on 2022-06-29     at 16:24:28
00168> ================================================================================
00169>
00170>
```

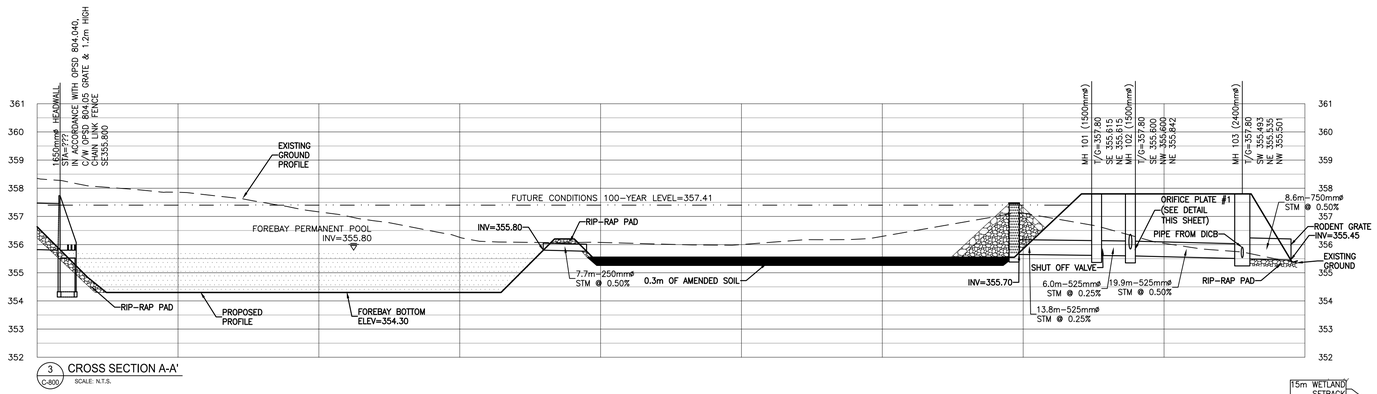
```
2     Metric units
*#*************************************************************************
*#  Project Name: [Baden North] Project Number:[603-05680]
*#  Date        : 2022-06-16
*#  Company     : Stantec Consulting Ltd. (Waterloo)
*#  Modeller    : Bryan Weersink, Water Resources Engineer
*#  Revised     :  ()
*#  Revision 2  :  ()
*#  License #   :  4730904
*#*************************************************************************
*#
*#  This model represents the hydologic characteristics of the Activa Baden North
*#  proposed subdivision in Baden, Ontario.
*#  Storm events modeled are:
*#  25MM, 2, 5, 10, 25, 50 AND 100YR CHICAGO STORMS (City of Kitchener IDF)
*#  and the Regional Event
*#
*#                FUTURE CONDITIONS (no infiltration assumed)
*#
*#*************************************************************************
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[001]
*%                  ["Kit25mm.4hr"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
READ STORM          STORM_FILENAME=["STORM.001"]
*#-----------------|-------------------------------------------------------------|
*#
*#              Proposed Subdivision (future development) draining north to SWMF
*#
*#-----------------|-------------------------------------------------------------|
DESIGN STANDHYD     ID=[1], NHYD=["301"], DT=[1]min, AREA=[25.10](ha),
                    XIMP=[0.52], TIMP=[0.65], DWF=[0](cms), LOSS=[2], CN=[77],
                    SLOPE=[2](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*#-----------------|-------------------------------------------------------------|
*#             External agricultural area draining to site
*#-----------------|-------------------------------------------------------------|
DESIGN NASHYD       ID=[2], NHYD=["303"], DT=[1]min, AREA=[4.22](ha),
                    DWF=[0](cms), CN/C=[84], TP=[0.40]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
*#-----------------|-------------------------------------------------------------|
*#               Rear Yards to dedicated pipe to SWMF
*#-----------------|-------------------------------------------------------------|
DESIGN STANDHYD     ID=[3], NHYD=["302"], DT=[1]min, AREA=[1.01](ha),
                    XIMP=[0.01], TIMP=[0.40], DWF=[0](cms), LOSS=[2], CN=[77],
                    SLOPE=[2](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*#-----------------|-------------------------------------------------------------|
*#                 SWMF Catchment
*#-----------------|-------------------------------------------------------------|
DESIGN STANDHYD     ID=[4], NHYD=["300"], DT=[1]min, AREA=[2.32](ha),
                    XIMP=[0.20], TIMP=[0.20], DWF=[0](cms), LOSS=[2], CN=[75],
                    SLOPE=[2](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*#-----------------|-------------------------------------------------------------|
ADD HYD             IDsum=[5], NHYD=["ToSWM"], IDs to add=[1+2+3+4]
*%-----------------|-------------------------------------------------------------|
*#
*#                 SWMF Active storage only (infiltration ignored)
*#
*#-----------------|-------------------------------------------------------------|
ROUTE RESERVOIR     IDout=[6],   NHYD=["SWMF"],  IDin=[5],
                    RDT=[1](min),
                          TABLE of ( OUTFLOW-STORAGE ) values
                                     (cms) - (ha-m)
                                  [   0.0   ,  0.0 ]
                                  [   0.011 ,  0.1045 ]
                                  [   0.067 ,  0.3273 ]
                                  [   0.079 ,  0.6265 ]
                                  [   0.216 ,  0.7523 ]
                                  [   0.478 ,  0.8816 ]
                                  [   0.526 ,  1.1576 ]
                                  [   0.624 ,  1.9153 ]
                                  [   5.507 ,  2.4165 ]
                                  [   -1  ,  -1  ]  (max twenty pts)
                    IDovf=[], NHYDovf=[""]
*#-----------------|-------------------------------------------------------------|
*#
*#              Proposed Subdivision draining south to existing subdivision
*#
*#-----------------|-------------------------------------------------------------|
DESIGN STANDHYD     ID=[1], NHYD=["304"], DT=[1]min, AREA=[2.67](ha),
                    XIMP=[0.48], TIMP=[0.6], DWF=[0](cms), LOSS=[2], CN=[77],
                    SLOPE=[2](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*#-----------------|-------------------------------------------------------------|
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[002]
*                   ["Kit2yr.3hr"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[005]
*                   ["Kit5yr.3hr"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[010]
*                   ["Kit10yr.3hr"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[025]
*                   ["Kit25yr.3hr"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[050]
*                   ["Kit50yr.3hr"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[100]
*                   ["Kit100yr.3hr"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[999]
*                   ["hurhaz48.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
FINISH
```

```
00001> ================================================================================
00002>
00003>    SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999    =========
00004>    S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
00005>    SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9   Ver  4.05
00006>        S  W W W  M   M  H   H    Y    M   M  O   O       9999   9999   Sept 2011
00007>    SSSSS   W W   M   M  H   H    Y    M   M   OOO            9      9   =========
00008>                                                          9   9  9   9   # 4730904
00009>          StormWater Management HYdrologic Model           999    999    =========
00010>
00011>  ********************************************************************************
00012>  ************************** SWMHYMO Ver/4.05  ***************************
00013>  *********  A single event and continuous hydrologic simulation model  *********
00014>  *********     based on the principles of HYMO and its successors      *********
00015>  *********                 OTTHYMO-83 and OTTHYMO-89.                  *********
00016>  ********************************************************************************
00017>  ********* Distributed by:  J.F. Sabourin and Associates Inc.           *********
00018>  *********                  Ottawa,  Ontario: (613) 836-3884           *********
00019>  *********                  Gatineau, Quebec: (819) 243-6858           *********
00020>  *********                  E-Mail: swmhymo@jfsa.com                   *********
00021>  ********************************************************************************
00022>
00023>  ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
00024>  +++++++++ Licensed user: Stantec Consulting Ltd. (Kitchener)          +++++++++
00025>  +++++++++                 Kitchener              SERIAL#:4730904     +++++++++
00026>  ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
00027>
00028>  ********************************************************************************
00029>  *********           ++++++ PROGRAM ARRAY DIMENSIONS ++++++             *********
00030>  *********           Maximum value for ID numbers  :     10             *********
00031>  *********           Max. number of rainfall points: 105408             *********
00032>  *********           Max. number of flow points    : 105408             *********
00033>  ********************************************************************************
00034>
00035>  ***** DESCRIPTION SUMMARY TABLE HEADERS (units depend on METOUT in START) *****
00036>  *****-------------------------------------------------------------------------*****
00037>  *****    ID:  Hydrograph IDentification numbers, (1-10).                     *****
00038>  *****  NHYD:  Hydrograph reference numbers, (6 digits or characters).        *****
00039>  *****  AREA:  Drainage area associated with hydrograph, (ac.) or (ha.).      *****
00040>  ***** QPEAK:  Peak flow of simulated hydrograph, (ft^3/s) or (m^3/s).        *****
00041>  ***** TpeakDate_hh:mm is the date and time of the peak flow.                 *****
00042>  *****  R.V.:  Runoff Volume of simulated hydrograph, (in) or (mm).          *****
00043>  *****  R.C.:  Runoff Coefficient of simulated hydrograph, (ratio).          *****
00044>  *****     *:  see WARNING or NOTE message printed at end of run.            *****
00045>  *****    **:  see  ERROR  message printed at end of run.                    *****
00046>  ********************************************************************************
00047>  ********************************************************************************
00048>
00049> ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
00050>
00051>  ********************************************************************************
00052>
00053>  **********************   S U M M A R Y   O U T P U T   **********************
00054>  ********************************************************************************
00055>  *          DATE: 2022-06-29     TIME: 16:22:24     RUN COUNTER: 002947         *
00056>  ********************************************************************************
00057>  * Input   filename: C:\TEMP\Baden\03-ULT~1\BpUltNi.dat                          *
00058>  * Output  filename: C:\TEMP\Baden\03-ULT~1\BpUltNi.out                          *
00059>  * Summary filename: C:\TEMP\Baden\03-ULT~1\BpUltNi.sum                          *
00060>  * User comments:                                                               *
00061>  * 1:_____________________________________________________________________     *
00062>  * 2:_____________________________________________________________________     *
00063>  * 3:_____________________________________________________________________     *
00064>  ********************************************************************************
00065>
00066>
00067> #*******************************************************************************
00068> #  Project Name: [Baden North] Project Number:[603-05680]
00069> #  Date        : 2022-06-16
00070> #  Company     : Stantec Consulting Ltd. (Waterloo)
00071> #  Modeller    : Bryan Weersink, Water Resources Engineer
00072> #  Revised     :  ()
00073> #  Revision 2  :  ()
00074> #  License #   :  4730904
00075> #*******************************************************************************
00076> #
00077> #  This model represents the hydologic characteristics of the Activa Baden Nort
00078> #  proposed subdivision in Baden, Ontario.
00079> #  Storm events modeled are:
00080> #  25MM, 2, 5, 10, 25, 50 AND 100YR CHICAGO STORMS (City of Kitchener IDF)
00081> #  and the Regional Event
00082> #
00083> #                 FUTURE CONDITIONS (no infiltration assumed)
00084> #
00085> #*******************************************************************************
00086>  RUN:COMMAND#
00087>  001:0001-------------------------------------------------------------------------
00088>      START
00089>       [TZERO =    .00 hrs on        0]
00090>       [METOUT=   2    (1=imperial, 2=metric output)]
00091>       [NSTORM=   1 ]
00092>       [NRUN  =   1 ]
00093>  001:0002-------------------------------------------------------------------------
00094>      READ STORM
00095>       Filename = STORM.001
00096>       Comment  =
00097>       [SDT= 5.00:SDUR=   4.00:PTOT=  25.00]
00098> #-----------------|---------------------------------------------------------|
00099> #                 |                                                         |
00100> #                 Proposed Subdivision (future development) draining north to SWMF
00101> #                 |                                                         |
00102> #-----------------|---------------------------------------------------------|
00103>  001:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00104>      DESIGN STANDHYD    01:301           25.10    1.783 No_date    1:39   16.05 .642
00105>       [XIMP=.52:TIMP=.65]
00106>       [SLP=2.00:DT= 1.00]
00107>       [LOSS= 2 :CN= 77.0]
00108> #-----------------|---------------------------------------------------------|
00109> #                 External agricultural area draining to site
00110> #-----------------|---------------------------------------------------------|
00111>  001:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00112>      DESIGN NASHYD      02:303            4.22     .070 No_date    2:05    7.68 .307
00113>       [CN= 84.0: N= 3.00]
00114>       [Tp=  .40:DT= 1.00]
00115> #-----------------|---------------------------------------------------------|
00116> #                 Rear Yards to dedicated pipe to SWMF
00117> #-----------------|---------------------------------------------------------|
00118>  001:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00119>      DESIGN STANDHYD    03:302            1.01     .026 No_date    1:49    8.44 .338
00120>       [XIMP=.01:TIMP=.40]
00121>       [SLP=2.00:DT= 1.00]
00122>       [LOSS= 2 :CN= 77.0]
00123> #-----------------|---------------------------------------------------------|
00124> #                 SWMF Catchment
00125> #-----------------|---------------------------------------------------------|
00126>  001:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00127>      DESIGN STANDHYD    04:300            2.32     .085 No_date    1:36    8.92 .357
00128>       [XIMP=.20:TIMP=.20]
00129>       [SLP=2.00:DT= 1.00]
00130>       [LOSS= 2 :CN= 75.0]
00131> #-----------------|---------------------------------------------------------|
00132>  001:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00133>      ADD HYD            01:301           25.10    1.783 No_date    1:39   16.05  n/a
00134>                       +  02:303            4.22     .070 No_date    2:05    7.68  n/a
00135>                       +  03:302            1.01     .026 No_date    1:49    8.44  n/a
00136>                       +  04:300            2.32     .085 No_date    1:36    8.92  n/a
00137>       [DT= 1.00]  SUM=  05:ToSWM         32.65    1.878 No_date    1:39   14.22  n/a
00138> #
00139> #                 SWMF Active storage only (infiltration ignored)
00140> #
00141> #-----------------|---------------------------------------------------------|
00142>  001:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00143>      ROUTE RESERVOIR -> 05:ToSWM         32.65    1.878 No_date    1:39   14.22  n/a
00144>       [RDT= 1.00] out<- 06:SWMF          32.65     .070 No_date    4:07   14.22  n/a
00145>      {MxStoUsed=.3996E+00}
00146> #-----------------|---------------------------------------------------------|
00147> #
00148> #                 Proposed Subdivision draining south to existing subdivision
00149> #
00150> #-----------------|---------------------------------------------------------|
00151>  001:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00152>      DESIGN STANDHYD    01:304            2.67     .228 No_date    1:36   15.21 .609
00153>       [XIMP=.48:TIMP=.60]
00154>       [SLP=2.00:DT= 1.00]
00155>       [LOSS= 2 :CN= 77.0]
00156> #-----------------|---------------------------------------------------------|
00157>   ** END OF RUN :   1
00158>
00159> ********************************************************************************
00160>
00161>
00162>
00163>
00164>
00165>  RUN:COMMAND#
00166>  002:0001-------------------------------------------------------------------------
00167>      START
00168>       [TZERO =    .00 hrs on        0]
00169>       [METOUT=   2    (1=imperial, 2=metric output)]
00170>       [NSTORM=   1 ]
00171>       [NRUN  =   2 ]
00172> #*******************************************************************************
00173> #  Project Name: [Baden North] Project Number:[603-05680]
00174> #  Date        : 2022-06-16
00175> #  Company     : Stantec Consulting Ltd. (Waterloo)
00176> #  Modeller    : Bryan Weersink, Water Resources Engineer
00177> #  Revised     :  ()
00178> #  Revision 2  :  ()
00179> #  License #   :  4730904
00180> #*******************************************************************************
00181> #
00182> #  This model represents the hydologic characteristics of the Activa Baden Nort
00183> #  proposed subdivision in Baden, Ontario.
00184> #  Storm events modeled are:
00185> #  25MM, 2, 5, 10, 25, 50 AND 100YR CHICAGO STORMS (City of Kitchener IDF)
00186> #  and the Regional Event
00187> #
00188> #                 FUTURE CONDITIONS (no infiltration assumed)
00189> #
00190> #*******************************************************************************
00191>  002:0002-------------------------------------------------------------------------
00192>      READ STORM
00193>       Filename = STORM.001
00194>       Comment  =
00195>       [SDT= 5.00:SDUR=   3.00:PTOT=  34.27]
00196> #-----------------|---------------------------------------------------------|
00197> #
00198> #                 Proposed Subdivision (future development) draining north to SWMF
00199> #
00200> #-----------------|---------------------------------------------------------|
00201>  002:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00202>      DESIGN STANDHYD    01:301           25.10    2.843 No_date    1:03   23.38 .682
00203>       [XIMP=.52:TIMP=.65]
00204>       [SLP=2.00:DT= 1.00]
00205>       [LOSS= 2 :CN= 77.0]
00206> #-----------------|---------------------------------------------------------|
00207> #                 External agricultural area draining to site
00208> #-----------------|---------------------------------------------------------|
00209>  002:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00210>      DESIGN NASHYD      02:303            4.22     .123 No_date    1:31   13.23 .386
00211>       [CN= 84.0: N= 3.00]
00212>       [Tp=  .40:DT= 1.00]
00213> #-----------------|---------------------------------------------------------|
00214> #                 Rear Yards to dedicated pipe to SWMF
00215> #-----------------|---------------------------------------------------------|
00216>  002:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00217>      DESIGN STANDHYD    03:302            1.01     .051 No_date    1:11   14.22 .415
00218>       [XIMP=.01:TIMP=.40]
00219>       [SLP=2.00:DT= 1.00]
00220>       [LOSS= 2 :CN= 77.0]
00221> #-----------------|---------------------------------------------------------|
00222> #                 SWMF Catchment
00223> #-----------------|---------------------------------------------------------|
00224>  002:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00225>      DESIGN STANDHYD    04:300            2.32     .134 No_date    1:00   14.01 .409
00226>       [XIMP=.20:TIMP=.20]
00227>       [SLP=2.00:DT= 1.00]
00228>       [LOSS= 2 :CN= 75.0]
00229> #-----------------|---------------------------------------------------------|
00230>  002:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00231>      ADD HYD            01:301           25.10    2.843 No_date    1:03   23.38  n/a
00232>                       +  02:303            4.22     .123 No_date    1:31   13.23  n/a
00233>                       +  03:302            1.01     .051 No_date    1:11   14.22  n/a
00234>                       +  04:300            2.32     .134 No_date    1:00   14.01  n/a
00235>       [DT= 1.00]  SUM=  05:ToSWM         32.65    2.993 No_date    1:03   21.12  n/a
00236> #
00237> #                 SWMF Active storage only (infiltration ignored)
00238> #
00239> #-----------------|---------------------------------------------------------|
00240>  002:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00241>      ROUTE RESERVOIR -> 05:ToSWM         32.65    2.993 No_date    1:03   21.12  n/a
00242>       [RDT= 1.00] out<- 06:SWMF          32.65     .079 No_date    3:14   21.12  n/a
00243>      {MxStoUsed=.6229E+00}
00244> #-----------------|---------------------------------------------------------|
00245> #
00246> #                 Proposed Subdivision draining south to existing subdivision
00247> #
00248> #-----------------|---------------------------------------------------------|
00249>  002:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00250>      DESIGN STANDHYD    01:304            2.67     .358 No_date    1:00   22.30 .651
00251>       [XIMP=.48:TIMP=.60]
00252>       [SLP=2.00:DT= 1.00]
00253>       [LOSS= 2 :CN= 77.0]
00254> #-----------------|---------------------------------------------------------|
00255>   ** END OF RUN :   4
00256>
00257> ********************************************************************************
00258>
00259>
00260>
00261>
00262>
00263>  RUN:COMMAND#
00264>  005:0001-------------------------------------------------------------------------
00265>      START
00266>       [TZERO =    .00 hrs on        0]
00267>       [METOUT=   2    (1=imperial, 2=metric output)]
00268>       [NSTORM=   1 ]
00269>       [NRUN  =   5 ]
00270> #*******************************************************************************
00271> #  Project Name: [Baden North] Project Number:[603-05680]
00272> #  Date        : 2022-06-16
00273> #  Company     : Stantec Consulting Ltd. (Waterloo)
00274> #  Modeller    : Bryan Weersink, Water Resources Engineer
00275> #  Revised     :  ()
00276> #  Revision 2  :  ()
00277> #  License #   :  4730904
00278> #*******************************************************************************
00279> #
00280> #  This model represents the hydologic characteristics of the Activa Baden Nort
00281> #  proposed subdivision in Baden, Ontario.
00282> #  Storm events modeled are:
```

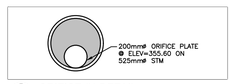
```
00283> #  25MM, 2, 5, 10, 25, 50 AND 100YR CHICAGO STORMS (City of Kitchener IDF)
00284> #  and the Regional Event
00285> #
00286> #                FUTURE CONDITIONS (no infiltration assumed)
00287> #
00288> #*************************************************************************
00289>  005:0002----------------------------------------------------------------------------
00290>      READ STORM
00291>       Filename = STORM.001
00292>       Comment  =
00293>       [SDT= 5.00:SDUR=   3.00:PTOT=  47.26]
00294> #-----------------|-------------------------------------------------------|
00295> #
00296> #              Proposed Subdivision (future development) draining north to SWMF
00297> #
00298> #-----------------|-------------------------------------------------------|
00299>  005:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00300>      DESIGN STANDHYD    01:301           25.10    4.085 No_date    1:02   34.24 .724
00301>       [XIMP=.52:TIMP=.65]
00302>       [SLP=2.00:DT= 1.00]
00303>       [LOSS= 2 :CN= 77.0]
00304> #-----------------|-------------------------------------------------------|
00305> #              External agricultural area draining to site
00306> #-----------------|-------------------------------------------------------|
00307>  005:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00308>      DESIGN NASHYD      02:303           4.22     .222 No_date    1:31   22.24 .471
00309>       [CN= 84.0: N= 3.00]
00310>       [Tp=  .40:DT= 1.00]
00311> #-----------------|-------------------------------------------------------|
00312> #              Rear Yards to dedicated pipe to SWMF
00313> #-----------------|-------------------------------------------------------|
00314>  005:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00315>      DESIGN STANDHYD    03:302           1.01     .098 No_date    1:10   23.50 .497
00316>       [XIMP=.01:TIMP=.40]
00317>       [SLP=2.00:DT= 1.00]
00318>       [LOSS= 2 :CN= 77.0]
00319> #-----------------|-------------------------------------------------------|
00320> #                 SWMF Catchment
00321> #-----------------|-------------------------------------------------------|
00322>  005:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00323>      DESIGN STANDHYD    04:300           2.32     .189 No_date    1:00   22.13 .468
00324>       [XIMP=.20:TIMP=.20]
00325>       [SLP=2.00:DT= 1.00]
00326>       [LOSS= 2 :CN= 75.0]
00327> #-----------------|-------------------------------------------------------|
00328>  005:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00329>      ADD HYD            01:301           25.10    4.085 No_date    1:02   34.24  n/a
00330>                       +  02:303            4.22     .222 No_date    1:31   22.24  n/a
00331>                       +  03:302            1.01     .098 No_date    1:10   23.50  n/a
00332>                       +  04:300            2.32     .189 No_date    1:00   22.13  n/a
00333>      [DT= 1.00]  SUM=  05:ToSWM         32.65    4.346 No_date    1:02   31.49  n/a
00334> #
00335> #                 SWMF Active storage only (infiltration ignored)
00336> #
00337> #-----------------|-------------------------------------------------------|
00338>  005:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00339>      ROUTE RESERVOIR -> 05:ToSWM         32.65    4.346 No_date    1:02   31.49  n/a
00340>       [RDT= 1.00] out<- 06:SWMF          32.65     .379 No_date    2:26   31.49  n/a
00341>      {MxStoUsed=.8325E+00}
00342> #-----------------|-------------------------------------------------------|
00343> #
00344> #              Proposed Subdivision draining south to existing subdivision
00345> #
00346> #-----------------|-------------------------------------------------------|
00347>  005:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00348>      DESIGN STANDHYD    01:304           2.67     .487 No_date    1:00   32.88 .696
00349>       [XIMP=.48:TIMP=.60]
00350>       [SLP=2.00:DT= 1.00]
00351>       [LOSS= 2 :CN= 77.0]
00352> #-----------------|-------------------------------------------------------|
00353>   ** END OF RUN :   9
00354>
00355> ****************************************************************************
00356>
00357>
00358>
00359>
00360>
00361>  RUN:COMMAND#
00362>  010:0001----------------------------------------------------------------------------
00363>      START
00364>       [TZERO =    .00 hrs on        0]
00365>       [METOUT=   2    (1=imperial, 2=metric output)]
00366>       [NSTORM=   1 ]
00367>       [NRUN  =  10 ]
00368> #*************************************************************************
00369> #  Project Name: [Baden North] Project Number:[603-05680]
00370> #  Date        : 2022-06-16
00371> #  Company     : Stantec Consulting Ltd. (Waterloo)
00372> #  Modeller    : Bryan Weersink, Water Resources Engineer
00373> #  Revised     :  ()
00374> #  Revision 2  :  ()
00375> #  License #   :  4730904
00376> #*************************************************************************
00377> #
00378> #  This model represents the hydologic characteristics of the Activa Baden Nort
00379> #  proposed subdivision in Baden, Ontario.
00380> #  Storm events modeled are:
00381> #  25MM, 2, 5, 10, 25, 50 AND 100YR CHICAGO STORMS (City of Kitchener IDF)
00382> #  and the Regional Event
00383> #
00384> #                FUTURE CONDITIONS (no infiltration assumed)
00385> #
00386> #*************************************************************************
00387>  010:0002----------------------------------------------------------------------------
00388>      READ STORM
00389>       Filename = STORM.001
00390>       Comment  =
00391>       [SDT= 5.00:SDUR=   3.00:PTOT=  56.28]
00392> #-----------------|-------------------------------------------------------|
00393> #
00394> #              Proposed Subdivision (future development) draining north to SWMF
00395> #
00396> #-----------------|-------------------------------------------------------|
00397>  010:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00398>      DESIGN STANDHYD    01:301           25.10    5.222 No_date    1:02   42.08 .748
00399>       [XIMP=.52:TIMP=.65]
00400>       [SLP=2.00:DT= 1.00]
00401>       [LOSS= 2 :CN= 77.0]
00402> #-----------------|-------------------------------------------------------|
00403> #              External agricultural area draining to site
00404> #-----------------|-------------------------------------------------------|
00405>  010:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00406>      DESIGN NASHYD      02:303           4.22     .301 No_date    1:31   29.09 .517
00407>       [CN= 84.0: N= 3.00]
00408>       [Tp=  .40:DT= 1.00]
00409> #-----------------|-------------------------------------------------------|
00410> #              Rear Yards to dedicated pipe to SWMF
00411> #-----------------|-------------------------------------------------------|
00412>  010:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00413>      DESIGN STANDHYD    03:302           1.01     .141 No_date    1:08   30.50 .542
00414>       [XIMP=.01:TIMP=.40]
00415>       [SLP=2.00:DT= 1.00]
00416>       [LOSS= 2 :CN= 77.0]
00417> #-----------------|-------------------------------------------------------|
00418> #                 SWMF Catchment
00419> #-----------------|-------------------------------------------------------|
00420>  010:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00421>      DESIGN STANDHYD    04:300           2.32     .243 No_date    1:00   28.31 .503
00422>       [XIMP=.20:TIMP=.20]
00423>       [SLP=2.00:DT= 1.00]
00424>       [LOSS= 2 :CN= 75.0]
00425> #-----------------|-------------------------------------------------------|
00426>  010:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00427>      ADD HYD            01:301           25.10    5.222 No_date    1:02   42.08  n/a
00428>                       +  02:303            4.22     .301 No_date    1:31   29.09  n/a
00429>                       +  03:302            1.01     .141 No_date    1:08   30.50  n/a
00430>                       +  04:300            2.32     .243 No_date    1:00   28.31  n/a
00431>      [DT= 1.00]  SUM=  05:ToSWM         32.65    5.583 No_date    1:02   39.06  n/a
00432> #
00433> #                 SWMF Active storage only (infiltration ignored)
00434> #
00435> #-----------------|-------------------------------------------------------|
00436>  010:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00437>      ROUTE RESERVOIR -> 05:ToSWM         32.65    5.583 No_date    1:02   39.06  n/a
00438>       [RDT= 1.00] out<- 06:SWMF          32.65     .498 No_date    2:18   39.06  n/a
00439>      {MxStoUsed=.9958E+00}
00440> #-----------------|-------------------------------------------------------|
00441> #
00442> #              Proposed Subdivision draining south to existing subdivision
00443> #
00444> #-----------------|-------------------------------------------------------|
00445>  010:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00446>      DESIGN STANDHYD    01:304           2.67     .616 No_date    1:00   40.56 .721
00447>       [XIMP=.48:TIMP=.60]
00448>       [SLP=2.00:DT= 1.00]
00449>       [LOSS= 2 :CN= 77.0]
00450> #-----------------|-------------------------------------------------------|
00451>   ** END OF RUN :  24
00452>
00453> ****************************************************************************
00454>
00455>
00456>
00457>
00458>
00459>  RUN:COMMAND#
00460>  025:0001----------------------------------------------------------------------------
00461>      START
00462>       [TZERO =    .00 hrs on        0]
00463>       [METOUT=   2    (1=imperial, 2=metric output)]
00464>       [NSTORM=   1 ]
00465>       [NRUN  =  25 ]
00466> #*************************************************************************
00467> #  Project Name: [Baden North] Project Number:[603-05680]
00468> #  Date        : 2022-06-16
00469> #  Company     : Stantec Consulting Ltd. (Waterloo)
00470> #  Modeller    : Bryan Weersink, Water Resources Engineer
00471> #  Revised     :  ()
00472> #  Revision 2  :  ()
00473> #  License #   :  4730904
00474> #*************************************************************************
00475> #
00476> #  This model represents the hydologic characteristics of the Activa Baden Nort
00477> #  proposed subdivision in Baden, Ontario.
00478> #  Storm events modeled are:
00479> #  25MM, 2, 5, 10, 25, 50 AND 100YR CHICAGO STORMS (City of Kitchener IDF)
00480> #  and the Regional Event
00481> #
00482> #                FUTURE CONDITIONS (no infiltration assumed)
00483> #
00484> #*************************************************************************
00485>  025:0002----------------------------------------------------------------------------
00486>      READ STORM
00487>       Filename = STORM.001
00488>       Comment  =
00489>       [SDT= 5.00:SDUR=   3.00:PTOT=  68.26]
00490> #-----------------|-------------------------------------------------------|
00491> #
00492> #              Proposed Subdivision (future development) draining north to SWMF
00493> #
00494> #-----------------|-------------------------------------------------------|
00495>  025:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00496>      DESIGN STANDHYD    01:301           25.10    6.398 No_date    1:03   52.75 .773
00497>       [XIMP=.52:TIMP=.65]
00498>       [SLP=2.00:DT= 1.00]
00499>       [LOSS= 2 :CN= 77.0]
00500> #-----------------|-------------------------------------------------------|
00501> #              External agricultural area draining to site
00502> #-----------------|-------------------------------------------------------|
00503>  025:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00504>      DESIGN NASHYD      02:303           4.22     .402 No_date    1:31   38.71 .567
00505>       [CN= 84.0: N= 3.00]
00506>       [Tp=  .40:DT= 1.00]
00507> #-----------------|-------------------------------------------------------|
00508> #              Rear Yards to dedicated pipe to SWMF
00509> #-----------------|-------------------------------------------------------|
00510>  025:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00511>      DESIGN STANDHYD    03:302           1.01     .191 No_date    1:07   40.30 .590
00512>       [XIMP=.01:TIMP=.40]
00513>       [SLP=2.00:DT= 1.00]
00514>       [LOSS= 2 :CN= 77.0]
00515> #-----------------|-------------------------------------------------------|
00516> #                 SWMF Catchment
00517> #-----------------|-------------------------------------------------------|
00518>  025:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00519>      DESIGN STANDHYD    04:300           2.32     .310 No_date    1:06   37.04 .543
00520>       [XIMP=.20:TIMP=.20]
00521>       [SLP=2.00:DT= 1.00]
00522>       [LOSS= 2 :CN= 75.0]
00523> #-----------------|-------------------------------------------------------|
00524>  025:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00525>      ADD HYD            01:301           25.10    6.398 No_date    1:03   52.75  n/a
00526>                       +  02:303            4.22     .402 No_date    1:31   38.71  n/a
00527>                       +  03:302            1.01     .191 No_date    1:07   40.30  n/a
00528>                       +  04:300            2.32     .310 No_date    1:06   37.04  n/a
00529>      [DT= 1.00]  SUM=  05:ToSWM         32.65    6.932 No_date    1:03   49.44  n/a
00530> #
00531> #                 SWMF Active storage only (infiltration ignored)
00532> #
00533> #-----------------|-------------------------------------------------------|
00534>  025:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00535>      ROUTE RESERVOIR -> 05:ToSWM         32.65    6.932 No_date    1:03   49.44  n/a
00536>       [RDT= 1.00] out<- 06:SWMF          32.65     .542 No_date    2:24   49.43  n/a
00537>      {MxStoUsed=.1277E+01}
00538> #-----------------|-------------------------------------------------------|
00539> #
00540> #              Proposed Subdivision draining south to existing subdivision
00541> #
00542> #-----------------|-------------------------------------------------------|
00543>  025:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00544>      DESIGN STANDHYD    01:304           2.67     .730 No_date    1:00   51.04 .748
00545>       [XIMP=.48:TIMP=.60]
00546>       [SLP=2.00:DT= 1.00]
00547>       [LOSS= 2 :CN= 77.0]
00548> #-----------------|-------------------------------------------------------|
00549>   ** END OF RUN :  49
00550>
00551> ****************************************************************************
00552>
00553>
00554>
00555>
00556>
00557>  RUN:COMMAND#
00558>  050:0001----------------------------------------------------------------------------
00559>      START
00560>       [TZERO =    .00 hrs on        0]
00561>       [METOUT=   2    (1=imperial, 2=metric output)]
00562>       [NSTORM=   1 ]
00563>       [NRUN  =  50 ]
00564> #*************************************************************************
```

```
#  Project Name: [Baden North] Project Number:[603-05680]
#  Date        : 2022-06-16
#  Company     : Stantec Consulting Ltd. (Waterloo)
#  Modeller    : Bryan Weersink, Water Resources Engineer
#  Revised     :  ()
#  Revision 2  :  ()
#  License #   :  4730904
#
#  This model represents the hydologic characteristics of the Activa Baden Nort
#  proposed subdivision in Baden, Ontario.
#  Storm events modeled are:
#  25MM, 2, 5, 10, 25, 50 AND 100YR CHICAGO STORMS (City of Kitchener IDF)
#  and the Regional Event
#
#                 FUTURE CONDITIONS (no infiltration assumed)
#
 050:0002----------------------------------------------------------------------
      READ STORM
       Filename = STORM.001
       Comment  =
       [SDT= 5.00:SDUR=   3.00:PTOT=  77.24]
#-----------------|-----------------------------------------------------------|
#
#              Proposed Subdivision (future development) draining north to SWMF
#
#-----------------|-----------------------------------------------------------|
 050:0003----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN STANDHYD    01:301           25.10    7.409 No_date    1:03   60.92 .789
       [XIMP=.52:TIMP=.65]
       [SLP=2.00:DT= 1.00]
       [LOSS= 2 :CN= 77.0]
#-----------------|-----------------------------------------------------------|
#              External agricultural area draining to site
#-----------------|-----------------------------------------------------------|
 050:0004----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN NASHYD      02:303            4.22     .485 No_date    1:31   46.21 .598
       [CN= 84.0: N= 3.00]
       [Tp=  .40:DT= 1.00]
#-----------------|-----------------------------------------------------------|
#               Rear Yards to dedicated pipe to SWMF
#-----------------|-----------------------------------------------------------|
 050:0005----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN STANDHYD    03:302            1.01     .235 No_date    1:06   47.92 .620
       [XIMP=.01:TIMP=.40]
       [SLP=2.00:DT= 1.00]
       [LOSS= 2 :CN= 77.0]
#-----------------|-----------------------------------------------------------|
#                SWMF Catchment
#-----------------|-----------------------------------------------------------|
 050:0006----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN STANDHYD    04:300            2.32     .393 No_date    1:06   43.90 .568
       [XIMP=.20:TIMP=.20]
       [SLP=2.00:DT= 1.00]
       [LOSS= 2 :CN= 75.0]
#-----------------|-----------------------------------------------------------|
 050:0007----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD            01:301           25.10    7.409 No_date    1:03   60.92  n/a
                       +  02:303            4.22     .485 No_date    1:31   46.21  n/a
                       +  03:302            1.01     .235 No_date    1:06   47.92  n/a
                       +  04:300            2.32     .393 No_date    1:06   43.90  n/a
      [DT= 1.00]  SUM=  05:ToSWM         32.65    8.076 No_date    1:03   57.40  n/a
#
#                SWMF Active storage only (infiltration ignored)
#
#-----------------|-----------------------------------------------------------|
 050:0008----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ROUTE RESERVOIR -> 05:ToSWM         32.65    8.076 No_date    1:03   57.40  n/a
       [RDT= 1.00] out<- 06:SWMF          32.65     .571 No_date    2:27   57.40  n/a
      {MxStoUsed=.1506E+01}
#-----------------|-----------------------------------------------------------|
#
#              Proposed Subdivision draining south to existing subdivision
#
#-----------------|-----------------------------------------------------------|
 050:0009----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN STANDHYD    01:304            2.67     .850 No_date    1:00   59.08 .765
       [XIMP=.48:TIMP=.60]
       [SLP=2.00:DT= 1.00]
       [LOSS= 2 :CN= 77.0]
#-----------------|-----------------------------------------------------------|
   ** END OF RUN :  99
********************************************************************************
RUN:COMMAND#
 100:0001----------------------------------------------------------------------
      START
       [TZERO =    .00 hrs on        0]
       [METOUT=   2    (1=imperial, 2=metric output)]
       [NSTORM=   1 ]
       [NRUN  = 100 ]
********************************************************************************
#  Project Name: [Baden North] Project Number:[603-05680]
#  Date        : 2022-06-16
#  Company     : Stantec Consulting Ltd. (Waterloo)
#  Modeller    : Bryan Weersink, Water Resources Engineer
#  Revised     :  ()
#  Revision 2  :  ()
#  License #   :  4730904
********************************************************************************
#
#  This model represents the hydologic characteristics of the Activa Baden Nort
#  proposed subdivision in Baden, Ontario.
#  Storm events modeled are:
#  25MM, 2, 5, 10, 25, 50 AND 100YR CHICAGO STORMS (City of Kitchener IDF)
#  and the Regional Event
#
#                 FUTURE CONDITIONS (no infiltration assumed)
#
********************************************************************************
 100:0002----------------------------------------------------------------------
      READ STORM
       Filename = STORM.001
       Comment  =
       [SDT= 5.00:SDUR=   3.00:PTOT=  87.07]
#-----------------|-----------------------------------------------------------|
#
#              Proposed Subdivision (future development) draining north to SWMF
#
#-----------------|-----------------------------------------------------------|
 100:0003----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN STANDHYD    01:301           25.10    8.622 No_date    1:02   69.97 .804
       [XIMP=.52:TIMP=.65]
       [SLP=2.00:DT= 1.00]
       [LOSS= 2 :CN= 77.0]
#-----------------|-----------------------------------------------------------|
#              External agricultural area draining to site
#-----------------|-----------------------------------------------------------|
 100:0004----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN NASHYD      02:303            4.22     .579 No_date    1:30   54.66 .628
       [CN= 84.0: N= 3.00]
       [Tp=  .40:DT= 1.00]
#-----------------|-----------------------------------------------------------|
#               Rear Yards to dedicated pipe to SWMF
#-----------------|-----------------------------------------------------------|
 100:0005----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN STANDHYD    03:302            1.01     .288 No_date    1:05   56.48 .649
       [XIMP=.01:TIMP=.40]
       [SLP=2.00:DT= 1.00]
       [LOSS= 2 :CN= 77.0]
#-----------------|-----------------------------------------------------------|
#                SWMF Catchment
#-----------------|-----------------------------------------------------------|
 100:0006----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN STANDHYD    04:300            2.32     .475 No_date    1:06   51.66 .593
       [XIMP=.20:TIMP=.20]
       [SLP=2.00:DT= 1.00]
       [LOSS= 2 :CN= 75.0]
#-----------------|-----------------------------------------------------------|
 100:0007----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD            01:301           25.10    8.622 No_date    1:02   69.97  n/a
                       +  02:303            4.22     .579 No_date    1:30   54.66  n/a
                       +  03:302            1.01     .288 No_date    1:05   56.48  n/a
                       +  04:300            2.32     .475 No_date    1:06   51.66  n/a
      [DT= 1.00]  SUM=  05:ToSWM         32.65    9.399 No_date    1:02   66.27  n/a
#
#                SWMF Active storage only (infiltration ignored)
#
#-----------------|-----------------------------------------------------------|
 100:0008----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ROUTE RESERVOIR -> 05:ToSWM         32.65    9.399 No_date    1:02   66.27  n/a
       [RDT= 1.00] out<- 06:SWMF          32.65     .605 No_date    2:29   66.27  n/a
      {MxStoUsed=.1765E+01}
#-----------------|-----------------------------------------------------------|
#
#              Proposed Subdivision draining south to existing subdivision
#
#-----------------|-----------------------------------------------------------|
 100:0009----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN STANDHYD    01:304            2.67     .972 No_date    1:00   68.01 .781
       [XIMP=.48:TIMP=.60]
       [SLP=2.00:DT= 1.00]
       [LOSS= 2 :CN= 77.0]
#-----------------|-----------------------------------------------------------|
   ** END OF RUN : 998
********************************************************************************
RUN:COMMAND#
 999:0001----------------------------------------------------------------------
      START
       [TZERO =    .00 hrs on        0]
       [METOUT=   2    (1=imperial, 2=metric output)]
       [NSTORM=   1 ]
       [NRUN  = 999 ]
********************************************************************************
#  Project Name: [Baden North] Project Number:[603-05680]
#  Date        : 2022-06-16
#  Company     : Stantec Consulting Ltd. (Waterloo)
#  Modeller    : Bryan Weersink, Water Resources Engineer
#  Revised     :  ()
#  Revision 2  :  ()
#  License #   :  4730904
********************************************************************************
#
#  This model represents the hydologic characteristics of the Activa Baden Nort
#  proposed subdivision in Baden, Ontario.
#  Storm events modeled are:
#  25MM, 2, 5, 10, 25, 50 AND 100YR CHICAGO STORMS (City of Kitchener IDF)
#  and the Regional Event
#
#                 FUTURE CONDITIONS (no infiltration assumed)
#
********************************************************************************
 999:0002----------------------------------------------------------------------
      READ STORM
       Filename = STORM.001
       Comment  =
       [SDT=15.00:SDUR=  48.00:PTOT= 285.00]
#-----------------|-----------------------------------------------------------|
#
#              Proposed Subdivision (future development) draining north to SWMF
#
#-----------------|-----------------------------------------------------------|
 999:0003----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN STANDHYD    01:301           25.10    3.586 No_date   46:00  261.84 .919
       [XIMP=.52:TIMP=.65]
       [SLP=2.00:DT= 1.00]
       [LOSS= 2 :CN= 77.0]
#-----------------|-----------------------------------------------------------|
#              External agricultural area draining to site
#-----------------|-----------------------------------------------------------|
 999:0004----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN NASHYD      02:303            4.22     .560 No_date   46:09  242.17 .850
       [CN= 84.0: N= 3.00]
       [Tp=  .40:DT= 1.00]
#-----------------|-----------------------------------------------------------|
#               Rear Yards to dedicated pipe to SWMF
#-----------------|-----------------------------------------------------------|
 999:0005----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN STANDHYD    03:302            1.01     .144 No_date   46:00  244.91 .859
       [XIMP=.01:TIMP=.40]
       [SLP=2.00:DT= 1.00]
       [LOSS= 2 :CN= 77.0]
#-----------------|-----------------------------------------------------------|
#                SWMF Catchment
#-----------------|-----------------------------------------------------------|
 999:0006----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN STANDHYD    04:300            2.32     .317 No_date   46:00  231.48 .812
       [XIMP=.20:TIMP=.20]
       [SLP=2.00:DT= 1.00]
       [LOSS= 2 :CN= 75.0]
#-----------------|-----------------------------------------------------------|
 999:0007----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD            01:301           25.10    3.586 No_date   46:00  261.84  n/a
                       +  02:303            4.22     .560 No_date   46:09  242.17  n/a
                       +  03:302            1.01     .144 No_date   46:00  244.91  n/a
                       +  04:300            2.32     .317 No_date   46:00  231.48  n/a
      [DT= 1.00]  SUM=  05:ToSWM         32.65    4.592 No_date   46:00  256.61  n/a
#
#                SWMF Active storage only (infiltration ignored)
#
#-----------------|-----------------------------------------------------------|
 999:0008----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ROUTE RESERVOIR -> 05:ToSWM         32.65    4.592 No_date   46:00  256.61  n/a
       [RDT= 1.00] out<- 06:SWMF          32.65    4.297 No_date   46:07  256.60  n/a
      {MxStoUsed=.2292E+01}
#-----------------|-----------------------------------------------------------|
#
#              Proposed Subdivision draining south to existing subdivision
#
#-----------------|-----------------------------------------------------------|
 999:0009----------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      DESIGN STANDHYD    01:304            2.67     .382 No_date   46:00  258.84 .908
       [XIMP=.48:TIMP=.60]
       [SLP=2.00:DT= 1.00]
       [LOSS= 2 :CN= 77.0]
#-----------------|-----------------------------------------------------------|
 999:0002----------------------------------------------------------------------
       FINISH
--------------------------------------------------------------------------------
********************************************************************************
```

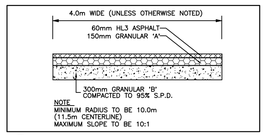
```
00847>      WARNINGS / ERRORS / NOTES
00848>      ------------------------
00849>    Simulation ended on 2022-06-29     at 16:22:30
00850> ================================================================================
00851>
00852>
```



3 CROSS SECTION A-A'
C-800 SCALE: N.T.S.

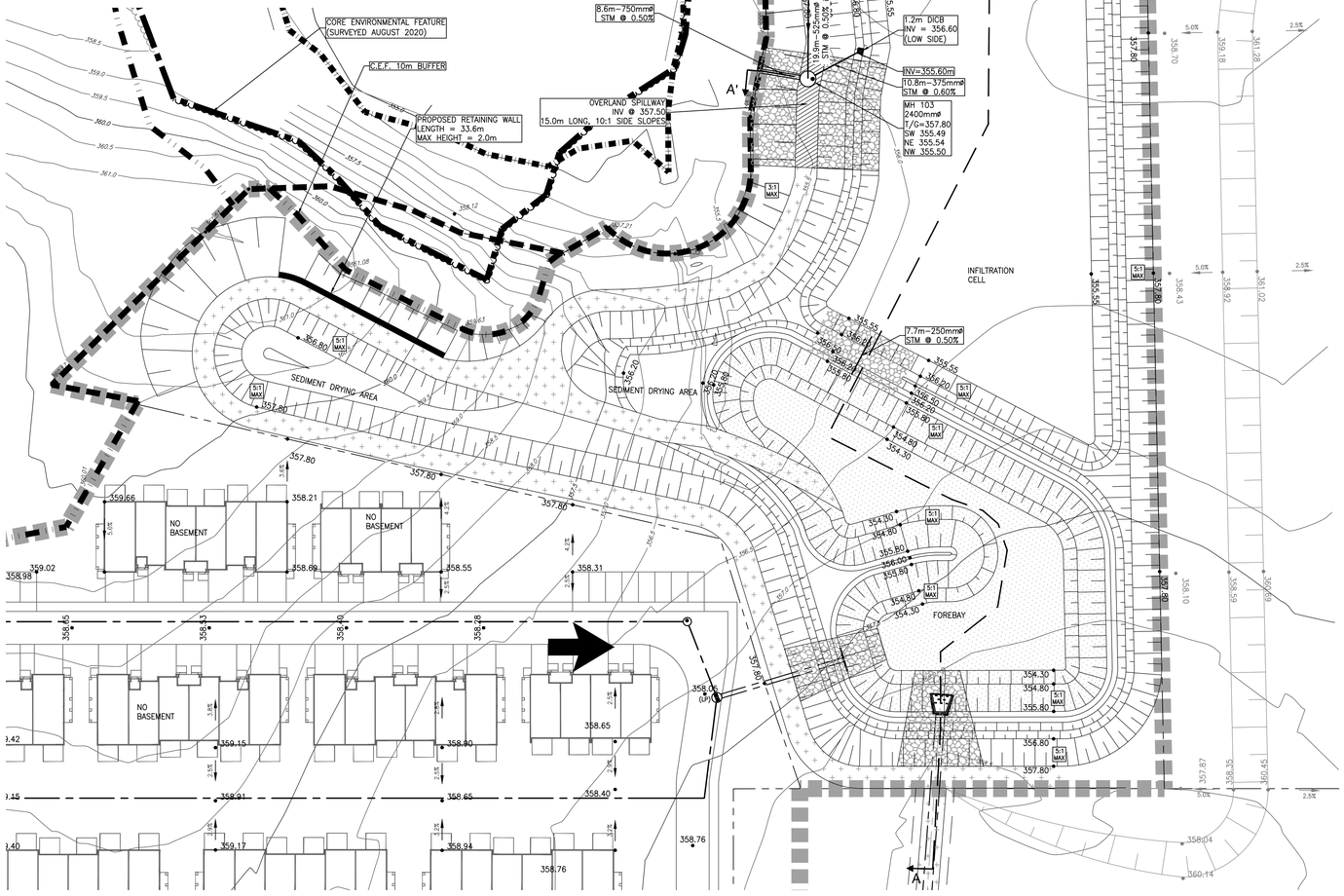


1 ORIFICE #1 DETAIL
C-800 SCALE: N.T.S.



2 ASPHALT MAINTENANCE ACCESS DETAIL
C-800 SCALE: N.T.S.

SWM FACILITY CHARACTERISTICS	
POND BOTTOM (FOREBAY)	354.30
FOREBAY PERMANENT POOL LEVEL	355.80
POND BOTTOM (INFILTRATION CELL)	355.55
TOP OF POND	357.80
DRAFT PLAN CONDITIONS	
5-YEAR WATER LEVEL	356.52
100-YEAR WATER LEVEL	357.00
REGIONAL WATER LEVEL	357.66
FUTURE CONDITIONS	
5-YEAR WATER LEVEL	356.76
100-YEAR WATER LEVEL	357.41
REGIONAL WATER LEVEL	357.73



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

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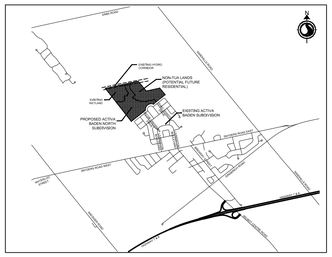
Notes

1. DRAFT PLAN PREPARED BY MHBC, DATED JULY 18, 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 LIDAR POINT CLOUD (2016-18) LAND INFORMATION ONTARIO DATASET.

Key Map NTS.



Legend

- STAGE LIMIT / PHASE LIMIT
- 352.82 EXISTING ELEVATION
- 352.92 PROPOSED ELEVATION
- 2.0% 2.0% FLOW DIRECTION
- 349.00 EXISTING CONTOUR
- RETAINING WALL
- PROPOSED STORM SEWER
- PROPOSED STORM MANHOLE
- PROPOSED STORM CATCHBASIN MANHOLE
- PROPOSED CATCHBASIN
- PROPOSED SANITARY MANHOLE
- PROPOSED VALVE & BOX
- PROPOSED HYDRANT
- PROPOSED SLOPE (3:1 UNLESS NOTED OTHERWISE)
- OVERLAND FLOW DIRECTION
- BH/MW06-20(S/D) 355.55 HGWL=354.25 BOREHOLE/ MONITORING WELL ELEVATION HIGH GROUND WATER LEVEL
- WETLAND LIMIT
- 30m WETLAND SETBACK
- 15m WETLAND SETBACK
- CORE ENVIRONMENTAL FEATURE (C.E.F.)
- 10m CORE ENVIRONMENTAL FEATURE SETBACK

Revision	By	Appd	YYYY.MM.DD
0 FSR - FIRST SUBMISSION	JBM	HL	2022.07.22
File Name: 60305680_C-800HX-FSR	JBM Dwn.	HL Chkd.	JBM Dsgn. 2022.07.21 YY.MM.DD

Permit-Seal

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Client/Project
ACTIVA HOLDINGS INC.

ACTIVA BADEN NORTH

Baden, Ontario

Title
STORM WATER MANAGEMENT POND

Project No.	Scale	Revision	Sheet	Drawing No.
60305680	1:500 0 5 15 25m	0	of	C-800

V:\2021\active\60305680\design\drawing\draft\sheet_files\60305680_C-800HX-FSR.dwg
7/21/2022 11:52:12 PM By: Miller, Jonathon

ORIGINAL SHEET - ARCH D

APPENDIX G

UTILITIES

CORRESPONDENCE WITH VARIOUS UTILITIES

From: Singh, Rupinder <RSingh@KWHydro.ca>
Sent: Tuesday, May 25, 2021 11:39 AM
To: Lad, Hitesh
Cc: Stewart, Gary; Wang, Shaun; Ruiz, Ricardo
Subject: RE: Activa Baden North Subdivision - Hydro Servicing

Hi Hitesh,

In response to your email below to Ricardo, please note that Kitchener-Wilmot Hydro Inc. reserve the right to extend existing poleline along Isaac Shantz Dr and Jacob Cressman Dr. This poleline is required to feed the proposed and future subdivision.

Thanks

Rupinder Singh, C.E.T.
Senior Distribution Design Technologist
Kitchener-Wilmot Hydro
519-745-4771 xt. 6222
rsingh@kwhydro.ca

From: Lad, Hitesh <Hitesh.Lad@stantec.com>
Sent: May 21, 2021 12:13 PM
To: Ruiz, Ricardo <RRuiz@KWHydro.ca>
Subject: Activa Baden North Subdivision - Hydro Servicing

Your attachments have been security checked by Mimecast Attachment Protection. Files where no threat or malware was detected are attached.

Hi Ricardo,

Activa has planned a residential subdivision at the north end of Baden as shown on the attached Draft Plan prepared by MHBC. We are looking to confirm that hydro servicing would not be an issue.

I am not sure if you look after the Baden area but if you do not, could you please forward this to the appropriate staff for review and respond please.

KW Hydro's response sometime next week would be greatly appreciated as we are working towards our Functional Servicing Report submission to the Township by the end of the next week.

Thanks and have a great long-weekend,

Hitesh Lad M.Eng., P.Eng.
Project Manager/Associate, Community Development

~~Direct: 519 585 7268~~
Mobile: 519-498-2809
Hitesh.Lad@stantec.com

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From: Ehgoetz, Kirk P <kirk.ehgoetz@bell.ca>
Sent: Monday, June 7, 2021 5:21 PM
To: Lad, Hitesh; Rioux, Karen
Cc: Ehgoetz, Kirk P
Subject: RE: Activa Baden North Subdivision - Bell Servicing

Hi Hitessh

It would not be an issue for Bell to service this Subd as planned .

Please forward any lot layouts and servicing plans when they are available .

Kirk Ehgoetz
Business Solutions Specialist | Directeur développement des affaires
T : 519 568 5783 M : 519-575-0242

From: Lad, Hitesh <Hitesh.Lad@stantec.com>
Sent: June-07-21 2:48 PM
To: Ehgoetz, Kirk P <kirk.ehgoetz@bell.ca>; Rioux, Karen <karen.rioux@bell.ca>
Subject: [EXT]RE: Activa Baden North Subdivision - Bell Servicing

Good afternoon Kirk and Karen – could you please confirm that a Bell servicing would not be an issue for the subject subdivision or advise otherwise.

Thank you,

Hitesh

From: Lad, Hitesh
Sent: Friday, May 21, 2021 1:22 PM
To: Howlett, Catherine <catherine.howlett@bell.ca>
Cc: Ehgoetz, Kirk P <kirk.ehgoetz@bell.ca>; Rioux, Karen <karen.rioux@bell.ca>
Subject: RE: Activa Baden North Subdivision - Bell Servicing

Thanks Cathy. Much appreciated.

Kirk and Karen – I look forward to your response when you can. Please advise if you require any additional information. Thanks to both of you.

Hitesh Lad M.Eng., P.Eng.
Project Manager/Associate, Community Development

~~Direct: 519-585-7268~~
Mobile: 519-498-2809
Hitesh.Lad@stantec.com

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From: Howlett, Catherine <catherine.howlett@bell.ca>
Sent: Friday, May 21, 2021 12:57 PM
To: Lad, Hitesh <Hitesh.Lad@stantec.com>
Cc: Ehgoetz, Kirk P <kirk.ehgoetz@bell.ca>; Rioux, Karen <karen.rioux@bell.ca>
Subject: FW: Activa Baden North Subdivision - Bell Servicing

Hello Hitesh,

I do not look after Baden, but I have cc'd Kirk and Karen on this email. They will be happy to help you.

I hope you also have an amazing long weekend!

Thanks,

Bell

Cathy Howlett
Access Network Coordinator
575 Riverbend Dr, Flr 1, Kitchener, Ont, N2K 3S3
M: 226-750-7882

From: Lad, Hitesh <Hitesh.Lad@stantec.com>
Sent: May-21-21 12:20 PM
To: Howlett, Catherine <catherine.howlett@bell.ca>
Subject: [EXT]Activa Baden North Subdivision - Bell Servicing

Good afternoon Cathy,

Activa has planned a residential subdivision at the north end of Baden as shown on the attached Draft Plan prepared by MHBC. We are looking to confirm that Bell servicing would not be an issue.

I am not sure if you look after the Baden area but if you do not, could you please forward this to the appropriate staff for review and response with a cc to me please .

Bell's response sometime next week would be greatly appreciated as we are working towards our Functional Servicing Report submission to the Township of Wilmot by the end of the next week.

Thanks and have a great long-weekend,

Hitesh Lad M.Eng., P.Eng.
Project Manager/Associate, Community Development

~~Direct: 519 585-7268~~
Mobile: 519-498-2809
Hitesh.Lad@stantec.com

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From: Cheryl Jacob
To: Lad, Hitesh
Subject: RE: Activa Baden North Subdivision - Rogers Servicing
Date: Tuesday, May 25, 2021 7:00:16 AM
Attachments: image001.jpg

Good morning Hitesh,

Rogers will have no issues in servicing this new area. I will be your contact for this area!

Please let me know once the hydro plans are available and I will begin our design.

Thank you,
Cheryl

From: Lad, Hitesh <Hitesh.Lad@stantec.com>
Sent: May 21, 2021 12:23 PM
To: Cheryl Jacob <Cheryl.Jacob@rci.rogers.com>
Subject: Activa Baden North Subdivision - Rogers Servicing

Good afternoon Cheryl,

Activa has planned a residential subdivision at the north end of Baden as shown on the attached Draft Plan prepared by MHBC. We are looking to confirm that Rogers servicing would not be an issue.

I am not sure if you look after the Baden area but if you do not, could you please forward this to the appropriate staff for review and response with a cc to me please .

Rogers' response sometime next week would be greatly appreciated as we are working towards our Functional Servicing Report submission to the Township of Wilmot by the end of the next week.

Thanks and have a great long-weekend,

Hitesh Lad M.Eng., P.Eng.
Project Manager/Associate, Community Development

~~Direct: 519 585-7268~~
Mobile: 519-498-2809
Hitesh.Lad@stantec.com

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