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Hidden Ridge Subdivision

FUNCTIONAL SERVICING AND PRELIMINARY STORMWATER MANAGEMENT REPORT

EcoVue Consulting Services Inc.

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Issue	Date	Description
1	May 19, 2017	Functional Servicing and Preliminary SWM Report
2	December 6, 2019	Functional Servicing and Preliminary SWM Report
3	July 8, 2020	Functional Servicing and Preliminary SWM Report

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1 Introduction

Tatham Engineering Limited (Tatham) has been retained by EcoVue Consulting Services Inc. to prepare a Functional Servicing and Preliminary Stormwater Management (SWM) Report in support of a Draft Plan of Subdivision for a seven-lot rural residential development located in the Township of Uxbridge.

1.1 SITE DESCRIPTION

The Draft Plan of Subdivision is proposed for land which is occupied by the Hidden Ridge Golf Course. The site consists of three storage/maintenance sheds (which are utilized for golf course operations) and a mix of gravel, asphalt, manicured lawn, grass/scrub, and agricultural fields. The site is legally described as Part of Lot 25, Concession 3 Township of Uxbridge (Geographic Township of Scott), Regional Municipality of Durham. The site is 3.14 ha of land bounded by Zephyr Road and existing residential dwellings fronting onto Zephyr Road to the north, existing residential dwellings fronting onto Dafoe Street to the west, and the existing Hidden Ridge Golf Course to the south and east. The Draft Plan of Subdivision, Drawing P-1, prepared by EcoVue Consulting Services Inc. dated May 18, 2017 is attached.

A Key Plan illustrating the site location is shown on the Preliminary Grading and Servicing Plan (Drawing GS-1) included at the back of this report.

1.2 OBJECTIVES

The primary objectives of this report are to assess the feasibility of the proposed development with respect to servicing and stormwater management (SWM) and to ensure satisfactory information on these items is presented in support of the proposed Draft Plan of Subdivision. This will involve an evaluation of potable water supply, sanitary sewage treatment and disposal and drainage and SWM. Opportunities and constraints will be evaluated, and a preferred plan recommended.

1.3 GUIDELINES AND BACKGROUND REPORTS

This report was prepared recognizing provincial guidelines on water resources and the environment, and studies including the following publications:

- Township of Uxbridge Design Criteria and Standard Detail Drawings for Subdivision Developments and Site Plans (2016);
- LSRCA Technical Guidelines for Stormwater Management Submissions (LSRCA, September 1, 2016);

- Low Impact Development Stormwater Management Planning and Design Guide (CVC and TRCA, 2010);
- Lake Simcoe Protection Plan (MECP 2009);
- Erosion and Sediment Control Guideline for Urban Construction (GGHACA, 2006);
- The Ministry of Environment Stormwater Management Practices Planning and Design Manual (2003); and
- Ontario Ministry of the Environment Procedure D-5-4, Technical Guideline for Individual On-Site Sewage Systems: Water Quality Impact Risk Assessment.

The following reports pertaining to the site were previously submitted in support of a previous Draft Plan proposed for the site (E.R. Garden Limited, December 17, 2012) and have been referenced throughout as a portion of this background information is relevant to the updated Draft Plan:

- Responses to WSP comments to Hydrogeological Assessment & Private Servicing Report dated August 19, 2013 and July 28, 2015 (R.J. Burnside & Associates, April 27, 2015 and May 25, 2016);
- Phosphorus Loading Assessment, Oakridge Environmental Ltd. (August 13, 2013);
- Stormwater Management Report, Dobri Engineering Ltd. (August 7, 2012, rev. August 12, 2013); and
- Hydrogeological Assessment & Private Servicing Report (Grace & Associates Inc., August 7, 2012).

A USB containing these background reports is included at the back of this report.

1.4 PROPOSED DEVELOPMENT SUMMARY

The proposed rural residential development consists of seven lots located on the south side Zephyr Road in the Hamlet of Zephyr, Township of Uxbridge. The Draft Plan of Subdivision has been prepared by EcoVue Consulting Services Ltd. dated May 2017 and is included at the back of this report.

Potable water will be drawn from individual wells located on each lot.

Wastewater will be collected and treated via individual septic systems on each lot.

Both wells and septic systems will be developed by individual lot owners and will be approved through the building permit process.

The information contained in the Hydrogeological Assessment Report prepared by Grace and Associates and further expanded on by R.J. Burnside & Associates in their response letter to agency comments provides further detail on the proposed well and septic system designs.

2 Background Information

Information regarding the existing topography, ground cover and drainage patterns was obtained through a review of relevant background studies, detailed topographic survey, base mapping and was confirmed during site visits.

2.1 TOPOGRAPHY AND EXISITING DRAINAGE CONDITIONS

The site is located in the upper headwaters of Zephyr Creek. A detailed topographic survey was completed by E.R. Garden Ltd. OLS in September 2012. The survey indicates surface runoff sheet flows across the site from south to north into the Zephyr Road south ditch and from west to east towards an existing wetland located west of the main branch of Zephyr Creek, with grades ranging between 2 and 11%. The Zephyr Road south ditch drains from east to west, across the frontage of the site, to a tributary to Zephyr Creek located near the intersection of Concession Road 3 and Zephyr Road. The main branch of Zephyr Creek flows from south to north east of the site and discharges to the Black River and ultimately Lake Simcoe. A 0.07 ha external drainage area, located south of the site, sheet flows across the site from south to north into the Zephyr Road south ditch.

Existing drainage patterns are depicted on the appended Existing Conditions and External Drainage Plans (Drawings DP-1 and EX-1).

2.2 HYDROGEOLOGICAL INVESTIGATIONS

Subsurface soil investigations were completed by Grace and Associates on October 12, 2011 and documented in their report dated August 7, 2012.

The investigation included a subsurface exploration program by means of excavating six test pits across the site to depths ranging from 2.7 to 3.0 metres below ground. The test pits were systematically logged, and representative soil samples were collected for laboratory analysis. Five of the six test pits were equipped with a slotted PVC standpipe to monitor the shallow groundwater flow zone. Soil conditions were found to be generally uniform across the site. A thin layer of organic rich soil was observed in test pits in close proximity to the existing buildings. The remaining test pits, which are located in active agricultural fields revealed 0.3 to 0.5 metres of dark brown to grey sandy topsoil. The topsoil and peat layers were underlain by brown to grey silty sand till with localized gravel to cobbles. Generally, the soil conditions are representative of a loose to locally compact silty sand till with gravel and occasional cobble. Grain size distribution analyses revealed hydraulic conductivities ranging from 1.3×10^{-3} – $7.7 \times$

10^{-3} cm/s (T times ranging from 10-15 min/cm) at depths ranging from 1.1 to 1.8 metres below grade.

Groundwater monitoring was conducted throughout the fall of 2011 and spring of 2012 to determine seasonal variations within the shallow water table. Shallow water table levels were reported to be highest in the spring, with levels as shallow as 0.70 metres below grade in one standpipe. Seasonal fluctuations ranged from 0.15 to a maximum of 0.43 metres below grade. Two of the six standpipes were reported to be dry during the test pit excavations and during the groundwater monitoring periods. Bedrock was not encountered in any of the test pits.

Cambium Inc. completed a scoped Soil Characterization report to characterize the type of soil in the locations of the proposed road ditches exceeding 3.5% and to assess its potential for erosion. The soil investigation revealed percolation rates at six additional locations across the site ranging from 12 - > 50 min/cm).

Additional details are available in the Grace and Associates and Cambium Inc. reports.

3 Grading

Existing drainage patterns will be maintained to the extent possible. A rural cross section having a maximum slope of 5.5 % is proposed. This is a slight increase from the maximum 5.0% slope recommended in the Township standards, but is recommended in this case, in order to match the existing ground profile as closely as possible and to reduce the scale of earthworks required during construction. We note that maximum slopes up to 6.0%, for roads having a rural cross section, are considered to be safe and are widely accepted in municipalities across Ontario. 0.5m high earth berms within the 0.5 m wide dry grassed flat-bottom road ditches are specified on either side of the road wherever ditch slope is greater than 3.5% to reduce velocities and promote filtering of runoff as part of an overall treatment train approach to SWM. The dry grassed road ditches are also proposed to be lined with Nilex SC250 turf reinforcement.

The west portion of the site will be graded to direct runoff to the road ditches directly via individual lot grading and side/rear lot swales. The road ditches will drain from south to north and discharge into the Zephyr Road south ditch thereby matching the existing drainage patterns. The east portion of the site will be graded to direct surface runoff to the road ditches and into a 9.0 m wide drainage easement, extending from the end of the road cul-de-sac, along the shared property line between lots 4 & 5, along the back of lot 4, and across the adjacent golf course lands (which will be protected as a nitrate attenuation area for the site), and discharging into a wetland area west of the main branch of Zephyr Creek. The drainage easement will consist of a 1.0 m wide flat-bottomed grassed ditch and a 3.0 m wide maintenance access/walking trail.

Preliminary road and ditch elevations are shown on Drawing GS-1 attached at the back of this report.

4 Servicing

Since municipal services are not available to service the site, and because the proposed seven lots are of sufficient size, each dwelling will be serviced by an individual well and septic system. The proposed wells, septic systems and lot grading will be developed by individual lot owners in conjunction with their specific site development and will be approved through the building permit process. The drilled wells and septic systems will be privately owned, operated, and maintained. Individual water treatment systems in compliance with Ontario Regulation 170 are required to treat raw well water. Septic systems are required to be in accordance with Part 8 of the Ontario Building Code.

The report prepared by Grace and Associates provides an account of the observed hydrogeological conditions related to water supply and sewage treatment. Subsequent to this work, R.J. Burnside & Associates provided additional hydrogeological information in support of the proposed development. Details of the serviceability of the proposed lots, as it relates to potable water supply and sewage treatment based on the above reports, are summarized as follows:

- Pumping tests completed at three test wells on the site were shown to provide a peak water supply ranging from 30.0 - 37.2 L/min. thereby meeting Durham Region's Drilled Wells and Lot Sizing Policies which are based on the MECP Procedure D-5-5 for sufficient quantity of drinking water for residential use. Open loop groundwater heat pumps will not be permitted. Closed loop geothermal heat pumps will be permitted;
- Water quality sampling conducted during the 2012 water supply well testing reported 9 CFU in one of the three test wells. This was believed to have been caused by incomplete chlorination of a newly drilled well. This test well was re-chlorinated on August 21, 2015 and re-tested on August 26, 2015. There was no detection of total coliform or Escherichia coli suggesting the original detection was due to incomplete chlorination of the new well or pumping equipment. New water samples collected on August 26, 2015 showed colour and total coliform below ODWS in all the wells. The concentrations of hardness, iron and manganese were above the ODWS and are to be treated using a water softener;
- The on-site dug well shall be abandoned in accordance with O.Reg. 903;
- Percolation rates (T-times) for tested soil samples ranged between 10 and 15 min/cm which generally requires a sewage system area of 600 m^2 (prime and reserve). A combination of in-ground and partially raised beds are anticipated based on the static water levels recorded across the site. Lots 1,2,3 and 7 all reported static water levels greater than 0.9 metres

below grade, suggesting that these lots could support in-ground sewage disposal systems. Partially raised beds may be required for lots 4,5 and 6. All sewage disposal systems shall be designed in accordance with the OBC;

- A nitrate attenuation zone is provided downgradient of the future lots to ensure the nitrate concentration is reduced to less than 10 mg/L; and
- Negligible interference or impact to the groundwater resources or the natural environment is anticipated as a result of the proposed development.

The conceptual septic system footprint, 600 m^2 (prime and reserve) as recommended in the hydrogeological report, and well locations are shown on Drawing GS-1 attached at the back of this report.

4.1 ROADWAYS AND TRANSPORTATION

A proposed municipal road having a 23.0 m wide right-of-way (Township Standard Dwg. No. US-201) will provide access to and through the proposed subdivision. It is noted that the ditches on either side of the road have been modified slightly to allow for a 0.5 m bottom width since the ditches are intended to function as part of the overall SWM plan for the site. A permanent cul-de-sac (modified Township Standard Dwg. No. US-218) has been specified at the east limit of the site and a temporary cul-de-sac (modified Township Standard Dwg. No. US-220) at the south limit of the site.

The proposed road will consist of a 6.7 m wide asphalt surface over a granular sub-base, constructed in accordance with the Township standards, as shown on Drawing GS-1. The minimum Township standard for depth of asphalt and granulars are summarized in Table 1. These will be confirmed by the geotechnical engineer at the detailed design stage.

Table 1: Proposed Road Construction Details

	DEPTH (mm)	TYPE
Hot Mix Asphalt (Surface Course)	45	HL-3
Hot Mix Asphalt (Base Course)	50	HL-8
Granular Base	150	OPSS Granular 'A'
Granular Sub-Base	350	OPSS Granular 'B'

In the future, the road will be assumed by the Township which will undertake routine maintenance and snow plowing.

4.2 UTILITIES

Zephyr Road is currently serviced with overhead hydro on the north side. Hydro One confirmed adequate plant is available on Zephyr Road to service the proposed development.

Enbridge was contacted and confirmed the there is no gas on Zephyr Road. However, gas is not an essential service and the lack of service will not jeopardize the proposed development.

Bell was contacted but was not able to confirm, as of the date of this report, what communications plant (telephone, cable TV, coaxial cable etc.) is available to service the future development. However, based on the adjacent residential dwellings it is assumed communications plant exists and will be available to service the proposed development. This will be confirmed again in the future at the final design stage.

Service availability correspondence from Hydro One and Enbridge is attached in Appendix A.

5 Proposed Drainage Conditions

5.1 DESIGN CRITERIA

Issues to be addressed and criteria to be met regarding drainage and stormwater management on the site are summarized as follows:

- The site will be developed in accordance with Township, Region, LSRCA and MECP guidelines and criteria;
- Post to pre-development peak flow control for all design storms up to and including the 100-year storm;
- MECP "Enhanced" level water quality control, to ensure the development will have no negative impacts on the downstream receivers;
- No net increases in phosphorus loading from the site in post-development phosphorus loading in accordance with the Lake Simcoe Protection Plan and discussions with LSRCA staff;
- Runoff volume control consisting of retaining the runoff volume from a 25 mm storm event from all impervious surfaces if possible (nonlinear redevelopment with restrictions consisting of high groundwater and poor soils, on a site having more than 0.5 ha of impervious area);
- Maintain pre-development annual infiltration volume in the post-development condition; and
- Safe conveyance of storm flows from all storms up to and including the Regional (Timmins) Storm event.

5.2 PROPOSED DEVELOPMENT

The proposed development includes seven rural residential lots. A slight increase in impervious cover is expected from the road, driveways, and rooftops, compared to existing, and is expected to increase the overall runoff volume generated at the site.

The existing condition drainage areas, patterns and outlets will generally be maintained, with the west portion of the site draining north to the Zephyr Road south ditch (Outlet 1) and the east portion of the site draining east towards the main branch of Zephyr Creek (Outlet 2). Minor and major flows from the site will drain to the internal road ditches and/or the ditch in the drainage easement, which will be designed as dry grassed ditches. The east portion of the site will drain to a 9.0 m wide drainage easement from the cul-de-sac to the east limit of the site, eventually discharging to an existing wetland. Side yard swales will intercept runoff from the lots and direct it to the road ditches or drainage easements for water quality and quantity control. The building

rooftops will drain to individual soakaway pits located on each lot to promote at-source infiltration.

5.3 EXISTING CONDITION HYDROLOGIC ANALYSIS

A Visual OTTHYMO hydrologic model has been developed to quantify existing condition peak flows from the site.

The catchment delineations were completed based on detailed topographic survey for the site. Land uses were established based on field reconnaissance and review of online aerial photography. The land uses and soil information were used to establish the curve numbers (CN*) and other catchment parameters used in the hydrologic model. The time to peak values for the catchment areas were calculated using the Bransby Williams and Airport Methods for runoff coefficients “C” greater than and less than 0.4, respectively.

A summary of all catchment parameters established for the existing condition hydrologic model have been included in Appendix B.

Peak flows for storms up to and including the 100-year storm events were calculated for the 4-hour Chicago, 12-hour, and 24-hour SCS design storms generated using Township of Uxbridge Intensity-Duration-Frequency (IDF) Data (dwg. No. US-600) as well as for the Regional (Timmins) storm. Detailed calculations and Visual Otthymo modeling output are included in Appendix B with the results summarized below in Table 2. The digital hydrologic model files are included on the USB at the back of this report.

Table 2: Existing Conditions Peak Flow Summary

DESIGN STORM	CATCHMENT 101 1.18 ha (m^3/s)			CATCHMENT EX 0.07 ha (m^3/s)			OUTLET 1 ZEPHYR ROAD DITCH (101 + EX) 1.25 ha (m^3/s)			OUTLET 2 ZEPHYR CREEK CATCHMENT 102 1.96 ha (m^3/s)		
	4 hr CHI	24hr SCS	12hr SCS	4 hr CHI	24hr SCS	12hr SCS	4 hr CHI	24hr SCS	12hr SCS	4 hr CHI	24hr SCS	12hr SCS
25 mm	0.058	-	-	0.001	-	-	0.058	-	-	0.016	-	-
2-Year	0.064	0.066	0.060	0.001	0.002	0.002	0.064	0.068	0.062	0.036	0.074	0.063
5-Year	0.094	0.112	0.102	0.002	0.004	0.004	0.096	0.116	0.105	0.076	0.136	0.119
10-Year	0.120	0.143	0.129	0.003	0.005	0.005	0.122	0.149	0.133	0.106	0.181	0.160
25-Year	0.155	0.179	0.164	0.004	0.007	0.006	0.158	0.186	0.171	0.148	0.235	0.213
100-Year	0.250	0.269	0.248	0.007	0.010	0.009	0.255	0.279	0.257	0.241	0.330	0.306
Regional (Timmins)	0.110	-	-	0.007	-	-	0.117	-	-	0.213	-	-

6 Proposed SWM Plan

An understanding of specific issues, constraints and opportunities pertaining to the site was gained through an analysis of relevant background information.

Opportunities for maximizing the effective use of the control measures are discussed in this section.

6.1 LOT LEVEL SOURCE CONTROLS

Potential lot level control measures include roof leaders directed to grassed areas or soakaway pits. These measures provide both quality and quantity benefits, including filtration enhancement and provision of peak flow reductions, as well as partial pollutant removal.

The use of lot level controls is recommended for the site and will be considered at the detailed design stage as deemed appropriate.

6.2 CONVEYANCE CONTROLS

Conveyance controls include low-sloped dry grass swales/road ditches and pervious pipe systems. These systems can be very effective for reducing runoff volumes and improving water quality.

The use of conveyance controls is recommended for the site and will be considered at the detailed design stage as deemed appropriate.

6.3 END-OF-PIPE CONTROLS

Potential end-of-pipe facilities include extended detention wet ponds, dry ponds, constructed wetlands, and oil/grit separators. End-of-pipe facilities are typically recommended for larger sites and for sites where underground piped systems are proposed.

End-of-pipe facilities were considered for the site but are not a practical means of achieving the SWM objectives.

6.4 PREFERRED SWM STRATEGY

A multi-stage approach to providing water quality and quantity control is proposed including the use of at-source and conveyance type controls. Roof leaders directed to soakaway pits and pervious front and rear lot areas (where the total rooftop area cannot be directed to a soakaway pit) combined with dry grassed flat-bottom road ditches and the drainage easement from the cul-de-sac to the wetland east of the site are proposed. The SWM strategy will also provide appropriate erosion control as necessary at each outlet.

6.4.1 Water Quantity Control

A hydrologic analysis of the post development condition was completed utilizing the single event Visual OTTHYMO Hydrologic Model. Peak flow rates for the 100-year storm events were calculated for the 4-hour Chicago, 12- hour and 24-hour SCS design storms generated using Township of Uxbridge IDF Data as well as for the Regional (Timmins) storm.

A summary of all catchment parameters established for the post development hydrologic model have been included in Appendix B.

Peak runoff rates at each outlet are shown in Tables 3 and 4 and the results of the modelling are attached in Appendix B. The digital hydrologic model files are included on the USB at the back of this report.

Table 3: Proposed Conditions Peak Flow Summary – Outlet 1

DESIGN STORM	CATCHMENT 201 UNCONTROLLED 1.12 ha (m^3/s)			OUTLET 1 ZEPHYR ROAD DITCH (201 + EX) 1.19 ha (m^3/s)		
	4 hr CHI	24 hr SCS	12 hr SCS	4 hr CHI	24 hr SCS	12 hr SCS
25 mm	0.057	-	-	0.057 (0.058)	-	-
2-Year	0.063	0.064	0.057	0.064 (0.064)	0.066 (0.068)	0.059 (0.062)
5-Year	0.093	0.107	0.097	0.094 (0.096)	0.111 (0.116)	0.101 (0.105)
10-Year	0.117	0.136	0.123	0.119 (0.122)	0.142 (0.149)	0.127 (0.133)
25-Year	0.150	0.170	0.156	0.153 (0.158)	0.177 (0.186)	0.163 (0.171)
100-Year	0.239	0.254	0.234	0.244 (0.255)	0.264 (0.279)	0.243 (0.257)
Regional (Timmins)	0.104	-	-	0.111 (0.117)	-	-

Notes: (0.477) refers to existing condition peak flow rate.

Table 4: Proposed Conditions Peak Flow Summary – Outlet 2

DESIGN STORM	OUTLET 2 ZEPHYR CREEK (202 + 203) 2.02 ha UNCONTROLLED PEAK FLOW (m^3/s)			OUTLET 2 ZEPHYR CREEK (202 + 203) 2.02 ha CONTROLLED PEAK FLOW (m^3/s)			OUTLET 2 ZEPHYR CREEK (202 + 203) 2.02 ha CONTROLLED STORAGE REQUIREMENT (m^3)		
	CHI	24hr SCS	12hr SCS	CHI	24hr SCS	12hr SCS	CHI	24hr SCS	12hr SCS
25 mm	0.037	-	-	0.019 (0.016)	-	-	16	-	-
2-Year	0.045	0.064	0.057	0.034 (0.036)	0.060 (0.074)	0.053 (0.063)	21	24	23
5-Year	0.070	0.111	0.101	0.065 (0.076)	0.108 (0.136)	0.098 (0.119)	27	28	28
10-Year	0.091	0.145	0.131	0.089 (0.106)	0.143 (0.181)	0.128 (0.160)	30	30	29
25-Year	0.120	0.184	0.170	0.120 (0.148)	0.186 (0.235)	0.170 (0.213)	32	33	32
100-Year	0.189	0.266	0.250	0.195 (0.241)	0.263 (0.330)	0.247 (0.306)	39	39	38
Regional (Timmins)	0.204	-	-	0.173 (0.213)	-	-	-	-	-

Notes: (0.477) refers to existing condition peak flow rate.

As shown in Table 3, the proposed condition uncontrolled peak flows directed to Outlet 1 are less than existing condition peak flow rates. It is noted that the storage contained in the proposed soakaway pits and held behind the permanent earth berms located in the dry grass ditches was not included in the hydrologic model. On this basis, water quantity controls are not required at Outlet 1. This will be confirmed again at the detailed design stage.

At Outlet 2, proposed condition peak flows during frequent design storms including the 25 mm storm and the 2-year 4 hr Chicago design storm are shown to increase compared to existing and will require water quantity controls. A small diameter culvert/storm pipe located at the upstream end of the 9.0 m wide drainage easement is proposed to attenuate peak flows using the available flood storage located in the road ditch. The culvert will otherwise function as a typical culvert during normal runoff conditions. Preliminary ditch storage calculations upstream of the drainage

easement (in each direction around the cul-de-sac) are provided in Appendix B and confirm 50 m^3 of storage at the outlet of the ditch and at a depth of 0.5 m (corresponding to the height of the overflow weir) and 83m^3 at a depth of 0.6m. Culvert sizing details will be provided at the detailed design stage. As an alternative to providing flood storage in the road ditch, considering the storage contained in the proposed soakaway pits and held behind the permanent earth berms located in the drainage easement can be considered as this can be expected to provide peak flow attenuation also during frequent design storms. This will be reviewed and discussed in greater detail with the Township and LSRCA at the detailed design stage.

The minor differences in the uncontrolled post to pre development peak flows are primarily due to the proposed changes in land use (i.e. redeveloping existing impervious surfaces to proposed impervious surfaces, conversion from cultivated lands to manicured lawn etc.) and providing longer flow paths in the post development condition (i.e. larger time of concentrations). It is noted that the post development modeling also does not include water quality storage provided in the soakaway pits and dry grassed road ditches and therefore is conservative. The hydrologic modeling will be confirmed again at the detailed design stage to confirm the ultimate design will not increase peak flows from the site compared to existing.

6.4.2 Water Quality Control

Water quality control for the development will be provided in the dry grassed flat bottom ditches located in the road and drainage easement and via individual lot soakaway pits.

Dry Grassed Flat-Bottom Ditches

Runoff from the road and lot areas will be directed to the road ditches and the drainage easement. Enhancement of the road ditches as flat-bottom dry swales is proposed by reducing the ditch velocities using permanent 0.5 m high earth berms and 0.5 m wide flat-bottoms to promote filtering and settling of sediment and pollutants.

Dry grassed swales are effective at providing water quality treatment provided the maximum flow velocity does not exceed 0.5 m/s during a 4-hour, 25 mm storm event. Typically, dry grass swales are effective for drainage areas up to 2.0 ha and therefore are appropriate for use at the site.

The dry grassed swales/ditches located near the site entrance are sloped at 5.5% and during the peak of the 25 mm storm event ditch flows have a maximum velocity of approximately 0.91 m/s (depth of 0.06 m) which is greater than the recommended 0.5 m/s velocity threshold for water quality treatment. Therefore 0.5 m high permanent earth berms have been specified to reduce the effective slope of the ditch and to provide sufficient infiltration storage to achieve MECP enhanced level water quality treatment. The maximum ditch velocity at the peak of the 100-year

storm in the east and west dry grassed road ditches is approximately 1.48 m/s (not including the effects of the permanent rock check dams) and therefore will remain stable from erosion during all design storms.

The dry grassed road ditches along the east cul-de-sac have maximum slopes up to 1.0% and during the peak of the 25 mm storm event have a maximum velocity of 0.39 m/s (depth of 0.24 m) thus meeting MECP criteria for water quality treatment. Within the drainage easement, the dry grassed ditch has a longitudinal slope of 11.0%. Permanent 0.5 m high earth berms combined with a 1.0 m wide channel bottom width have been specified within the drainage easement to reduce the effective slope of the ditch and provide opportunities for filtering. The maximum ditch velocity at the peak of the 100-year storm in the drainage easement is approximately 1.60 m/s which does not consider the effects of the permanent earth berms, and therefore, erosion protection is proposed.

A 100 mm diameter perforated subdrain will be specified below each dry grassed ditch section where permanent earth berms are specified, to provide for filtration and to reduce the potential for nuisance ponding.

Safe conveyance of stormwater runoff is provided overtop of the permanent rock check dams during all storm events. The dry grassed ditch and rock check dam locations are shown schematically on Drawing GS-1.

Dry grassed ditch velocity and storage calculations are included in Appendix B.

Soakaway Pits

Building roof leaders will be connected to underground soakaway pits which are appropriate based on the physical suitability and constraints described in the Low Impact Development SWM Planning and Design Guide (CVC & TRCA, 2010). For example, the site is not located in a wellhead protection area, the natural topography of land and proposed site grading does not exceed 15%, the native soil is conducive to filtration practices in most areas across the site (hydrology soil group B), and the approximate impervious drainage area to treatment facility area ratio is estimated to be 12:1 which is within the acceptable range of 5:1 – 20:1. The above physical suitability and constraints will be reviewed again at the detailed design stage. 50% of the total rooftop area has been assumed to drain to the proposed soakaway pits whereas any building rooftop areas which are unable to drain to the soakaway pits (assumed as 50% of the rooftop area) will drain to pervious front/rear lot areas. The soakaway pits will be designed to capture 20 mm of runoff in accordance with section 4.5.6 of the MECP manual and LID design guide. The soakaway pits will be located a minimum of 4.0 m away from building foundations as shown conceptually on Drawing GS-1. The soakaway pit will be equipped with an overflow pipe that discharges to a pervious area. Based on 50% of an average rooftop area of 200m^2, the

required soakaway pit storage volume is 2 m^3. A soakaway pit with minimum dimensions of 2.9 m long by 2.9 m wide by 0.6 m deep would therefore be required (assuming a stone void ratio of 0.4). Managing "clean" roof runoff in this manner promotes at-source filtration and will assist with maintaining the existing water balance for the site. Detailed soakaway pit sizing calculations will be confirmed at the final detailed stage.

The weighted level of imperviousness for each catchment area requiring water quality treatment was calculated and the MECP water quality volume requirements (m^3/ha) applicable to filtration type practices was determined as per Table 3.2 of the MOE SWM manual.

The number and locations of permanent earth berms (as shown on Drawing GS-1) was determined based on the proximity to the outlet, the ditch slope, and the required storage volume. Further filtration storage was accounted for in the dry grassed swales/ditches and calculated using the BMP sizing equations provided in the CVC/TRCA LID manual.

A summary of the filtration volumes for each catchment requiring water quality treatment are summarized in Table 5.

Table 5: Water Quality Storage Requirement Summary

CATCHMENT ID	MECP WATER QUALITY STORAGE REQUIREMENT		REQUIRED FILTER AREA[1] (m^2)	FILTER AREA PROVIDED[2] (m^2)
	m^3/ha	m^3		
Total Site (Outlet 1 and Outlet 2)	21.4	25.5	97.6	148.9

Note: 1. The required filter area equation $A=WQV/(d_b * V_r)$ is as per section 4.9.2 of the CVC/LID manual. See attached water quality calculations spreadsheet in Appendix B.

2. The effective filter area has been calculated as an average and assumes only half of the total filter area provided when water is ponded up to the maximum height of the permanent earth berm.

Based on the proposed grading concept of maintaining existing grades wherever possible throughout the site, the MECP Enhanced water quality volumes will be filtered through the filter media beneath the road ditches. As shown in Table 5, the required site filter area is exceeded by approximately 52% and includes a conservative factor of safety of 0.5.

In summary, the proposed water quality SWM plan for the site consisting of a combination of dry grassed flat bottom ditches equipped with permanent earth berms as well as individual lot soakaway pits is well suited for the site. Based on the above calculations, the water quality SWM plan for the site will exceed the MECP requirements for enhanced level water quality control.

6.5 STORMWATER CONVEYANCE

Minor and major system drainage will be conveyed in the road ditches and drainage easement ditches to the intended outlets. The dry grassed flat bottom ditch capacity calculations in the road section and in the drainage easement channel are included in Appendix B and confirm each have sufficient capacity to safely convey all storms up to and including the Regulatory Storm event.

Road cross culverts will be sized to convey the peak runoff rate from storms up to and including the 25-year storm in accordance with the Township Design Criteria (2016) for local roads. Driveway culverts will be designed with minimum 5-year storm peak flow capacity and will be minimum 300 mm diameter CSP culverts.

Runoff from the small external drainage area to the south will be maintained through the site, unchanged from the existing condition.

Culvert sizing calculations will be provided at the detailed design stage.

6.6 WATER BALANCE

The proposed condition of the water balance previously prepared by R.J. Burnside & Associates has been revised based on the revised Draft Plan, percent imperviousness and SWM plan for the site. The existing condition water balance has generally remained unchanged. A summary of the water balance results is shown in Tables 6 and 7 below. The previous water balance calculations (by R.J. Burnside & Associates) and the revised water balance calculations are included in Appendix B.

Table 6: Water Balance Calculations

SOIL TYPE	AVERAGE ANNUAL PRECIPITATION	ACTUAL EVAPOTRANSPIRATION	WATER SURPLUS	TOTAL INFILTRATION	TOTAL RUNOFF
Silty Sand Till	886	547	338	220	118

Notes: All values in mm/yr

Table 7: Water Balance Summary

		OUTLET 1 ZEPHYR ROAD			OUTLET 2 ZEPHYR CREEK		
		EXISTING	PROPOSED		EXISTING	PROPOSED	
			Without Mitigation	With Mitigation		Without Mitigation	With Mitigation
Infiltration	m^3	1958	1925 (-33)	2113 (+155)	4204	3935 (-269)	4274 (+70)
Runoff	m^3	3235	3406 (+171)	3218 (-17)	2625	3852 (+1227)	3513 (+888)

As summarized in Table 7, the site post development infiltration is increased by 8% at Outlets 1 and by 2% at outlet 2, by means of the individual lot soakaway pits.

6.7 PHOSPHORUS LOADING

The phosphorus loading assessment is based on phosphorus loading coefficients for different land uses and phosphorus removal rates that are recommended in the MECP's Lake Simcoe Phosphorus Loading Development Tool document (January 2012). The phosphorus loading coefficients are summarized in Table 8.

Table 8: Existing and Proposed Land Use Areas and Phosphorus Loading Coefficients

SWM LAND USE CATEGORIES	MECP PHOSPHORUS TOOL LAND USE	P LOADING COEFFICIENT (kg/ha/yr)
Existing Condition		
Impervious	High Intensity – Comm/Industrial	1.82
Gravel	Unpaved Road	0.83
Grass/Pasture	Transition	0.06
	Low Intensity Residential	0.17
Cultivated	Cropland	0.23
Proposed Condition		
Impervious	High Intensity – Residential	1.32
Grass	Low Intensity – Residential	0.19

The post development land uses, and phosphorus loading coefficients were selected based on the information contained in the background report. However, phosphorus loading removal efficiencies were selected from the Phosphorus Loading Development Tool document to reflect the revised SWM plan for the site. The proposed SWM plan has been designed to provide MECP enhanced level water quality control including the goal of no net increase in phosphorus loading from the site.

The phosphorus removal efficiencies which are applicable to the proposed SWM plan are summarized in Table 9.

Table 9: Phosphorus Removal Efficiencies

SWM CONTROL	REMOVAL EFFICIENCY (%)
Dry Grass Swales (Road Ditches)	45[1]
Soakaways – Infiltration Trenches	70

Notes: 1. Removal efficiency of 45% based on Table 4.10.3 in the CVC/TRCA low impact development stormwater management planning and design guide for a grass swale with perforated pipe system. The phosphorus removal efficiency of 45% is also in the middle of the range (34%-55%), as reported in Table 11 of the Hutchinson Environmental Sciences Ltd. Managing New Urban Development in Phosphorus-Sensitive Watersheds report, October 31, 2014.

In order to assess the impact of the proposed SWM plan on reducing phosphorus loading, a comparison showing phosphorus loading with and without the proposed best management practices has been completed and is summarized in Table 10. The desktop phosphorus loading calculations and analysis are attached in Appendix B.

Table 10: Existing and Proposed Condition Phosphorus Loading

MECP PHOSPHORUS TOOL LAND USE	EXISTING CONDITIONS		PROPOSED CONDITIONS		
	Area (ha)	P Loading (kg/yr)	Area (ha)	P Loading Without Mitigation (kg/yr)	P Loading With Mitigation (kg/yr)
High Intensity – Comm/Industrial (1.82 kg/ha/yr)	0.11	0.20	-	-	-
Low Intensity Residential (0.17 kg/ha/yr)	1.47	0.25	2.59	0.44	0.28
Cropland (0.23 kg/ha/yr)	0.83	0.19	-	-	-
Transition (0.06 kg/ha/yr)	0.57	0.03	-	-	-
Unpaved Road (0.83 kg/ha/yr)	0.16	0.13	-	-	-
High Intensity – Residential (1.32 kg/ha/yr)	-	-	0.55	0.72	0.14
Total	**3.14**	**0.81**	**3.14**	**1.16**	**0.42**

As discussed with LSRCA staff, proposed developments are to reduce post-development phosphorus loading to pre-development conditions whenever possible. Table 10 above confirms a post-development phosphorous loading of 0.42 kg/yr as compared to the existing condition phosphorous loading of 0.81 kg/yr thus meeting the LSRCA's minimum criteria.

The phosphorus loading assessment will be confirmed again at the detailed design stage.

6.8 RUNOFF VOLUME CONTROL

In accordance with Section 2.2.2 of the LSRCA Technical Guidelines for Stormwater Submissions new major developments are to provide volume control if possible. As discussed with LSRCA staff, runoff volume control is not practical at the site due to high groundwater and poor soil conditions for infiltration practices. On this basis stormwater filters located below grass swales, as opposed to infiltration trenches, are proposed throughout the site. The stormwater filters

have been designed in accordance with the TRCA/CVC LID manual for water quality control including phosphorus removal.

7 Siltation and Erosion Plan

Siltation and erosion controls will be implemented for all construction activities, including topsoil stripping, material stockpiling, road construction and grading operations. A detailed erosion and sediment control plan for the site will be prepared with the detailed design and will include the following:

- All erosion control devices will be specified in accordance with Township of Uxbridge standards and the Erosion and Sediment Control Guideline for Urban Construction (Greater Golden Horseshoe Area Conservation Authorities, December 2006) and the Lake Simcoe Region Conservation Authority Technical Guidelines for Stormwater management Submissions;
- Silt control fences will be erected before any grading operations to control sediment movement and sediment control fence will be consistent with the Conservation Authority standard details;
- A construction vehicle entrance will be constructed for the proposed road with a stone mud mat to reduce off-site tracking of material. Construction access mats will be installed at all construction entrances and exits in accordance with the Conservation Authority standard details;
- Regular inspection of control measures will be instituted, and repairs will be made as necessary;
- Temporary swales and check dams will be constructed to control runoff during construction by lowering velocities and promoting settling of particulates; and
- Long term siltation and erosion control will be enhanced with a revegetation strategy for disturbed areas.

8 Summary

The proposed development will consist of seven rural residential lots. Existing drainage patterns will be maintained, with stormwater conveyed via dry grass ditches to the existing outlets. A treatment train approach to water quality control is proposed consisting of directing rooftop runoff to individual soakaway pits (50% of rooftop area) and to pervious front and rear lot areas and dry grass flat bottom ditches fitted with stormwater filters along the internal roads and in the drainage easement. Permanent 0.5 m high earth berms have also been incorporated to further reduce velocities and to mitigate the potential for erosion. Water quantity controls are not required at the outlet to the Zephyr Road ditch (Outlet 1) since proposed condition peak flows are less than existing. Water quantity controls are proposed upstream of the east outlet (Outlet 2) to control post development peak flows to existing condition peak flow rates.

The proposed development will be serviced with private individual septic systems. Water supply will be provided by individual drilled wells. The proposed wells, septic systems and lot grading will be developed by individual lot owners in conjunction with their specific site development and will be approved through the building permit process.

Existing overhead hydro is available on the north side of Zephyr Road and has sufficient capacity to service the proposed subdivision. Natural gas is not available in Zephyr The availability of communications plant (i.e. telephone, cable TV, coaxial cable etc.) will be confirmed during final design.

Siltation and erosion control will be provided with the proper construction mitigation efforts. Long-term erosion control will be enhanced with an effective revegetation strategy.

Detailed design of these systems will be provided at the final design stage, but the work completed to date confirms that appropriate site servicing and stormwater management can be provided.

Foot Street (public travelled)

Zephyr Road (public travelled)

Dafoe Street (public travelled)

Residential

Residential

Residential

Residential

PSW

PSW

Rural

Golf Course

Golf Course

Golf Course

Golf Course

Ex. Laneway

Street "A"

Street "B"

Ex. Bldg.

Ex. Bldg.

Ex. Bldg.

9.0m Wide Drainage Easement

0.27ha

0.35ha

0.46ha

0.42ha

0.27ha

0.39ha

0.38ha

N74°00'00"E 23.06

N74°00'E 36.90

N74°00'00"E 34.59

N74°01'00"E 72.0

N74°00'E

N16°11'W

N16°14'W

N16°14'00"W

N16°28'W

N14°45'00"W

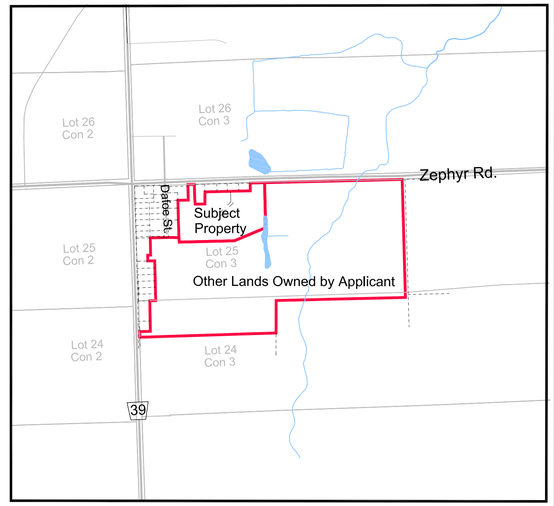
161.35

195.78

Area Subject to Easement

Other Lands Owned by the Applicant

GRAPHIC SCALE
(IN METERS)
15 0 30 60
1:750



Key Plan
Scale 1:10,000

Legend

- Boundary of Subject Property
- Boundary of Easement Area
- Overhead Transmission Line
- Topographic Contours
- Water Course
- Water Body
- Provincially Significant Wetland
- Wooded Area

OWNERS CERTIFICATE
Hidden Ridge Golf Course

I hereby authorize EcoVue to prepare and submit this plan to the Regional Municipality of Durham

China Canada Jing Bei Xin Min International Co. Ltd. Date

SURVEYORS CERTIFICATE

This Draft Plan accurately shows the boundaries of all lands proposed to be subdivided.
Certified by:

E.R. Garden Date
Ontario Land Surveyor

Submission Requirements

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51-17 (A-L) OF THE PLANNING ACT

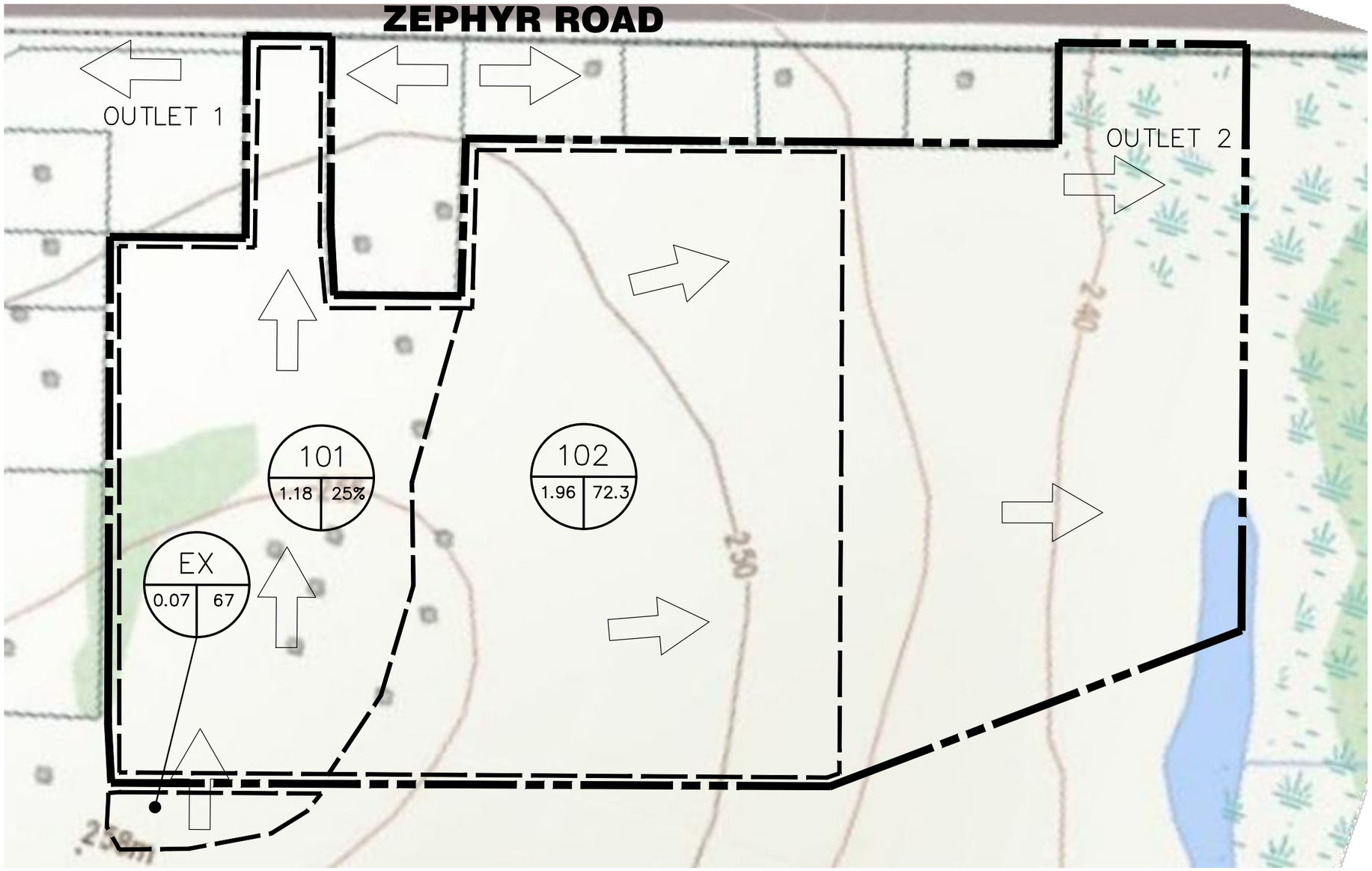
a) As shown on this Draft Plan
b) As shown on this Draft Plan
c) As shown on this Draft Plan
d) Residential
e) As shown on this Draft Plan
f) As shown on this Draft Plan
g) As shown on this Draft Plan
h) Refer to report by Grace & Assoc. (2012 as amended) and CC Tatham 2017
i) Refer to report by Grace & Assoc. 2012 with addendum by Burnside 2016 and CC Tatham 2017
j) As shown on this Draft Plan
K) Hydro, Telephone, Private Services, Drainage ditches
l) As shown on this Draft Plan

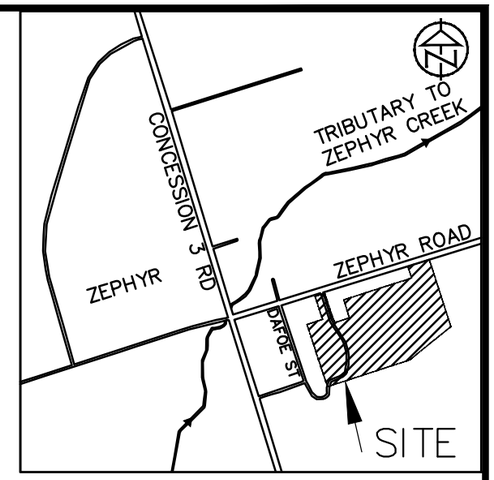
EcoVue Consulting Services Inc.
311 George St. N., Suite 200
Peterborough ON K9J 3H3
Tel: 705-876-8340 Fax: 705-742-8343
www.ecovueconsulting.com

DRAWN BY: PM	PROJECT No.: 17-1672
APPROVED BY: HS	HORIZ. SCALE: as shown
REVISION DATE:	PLOT DATE: May 18 2017

Zephyr Property
Lot 25 Concession 3
Township of Uxbridge - Regional Municipality of Durham

Draft Plan of Subdivision | P1





KEY PLAN
N.T.S

LEGEND

- EXISTING OVERLAND FLOW DIRECTION
- PROPERTY BOUNDARY
- EXISTING CONDITION CATCHMENT BOUNDARY
- 201 (1.97 | 71.5) — DRAINAGE AREA ID; CURVE NUMBER (CN*) / % IMPERVIOUS; AREA (ha.)

CONTRACT DRAWINGS

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

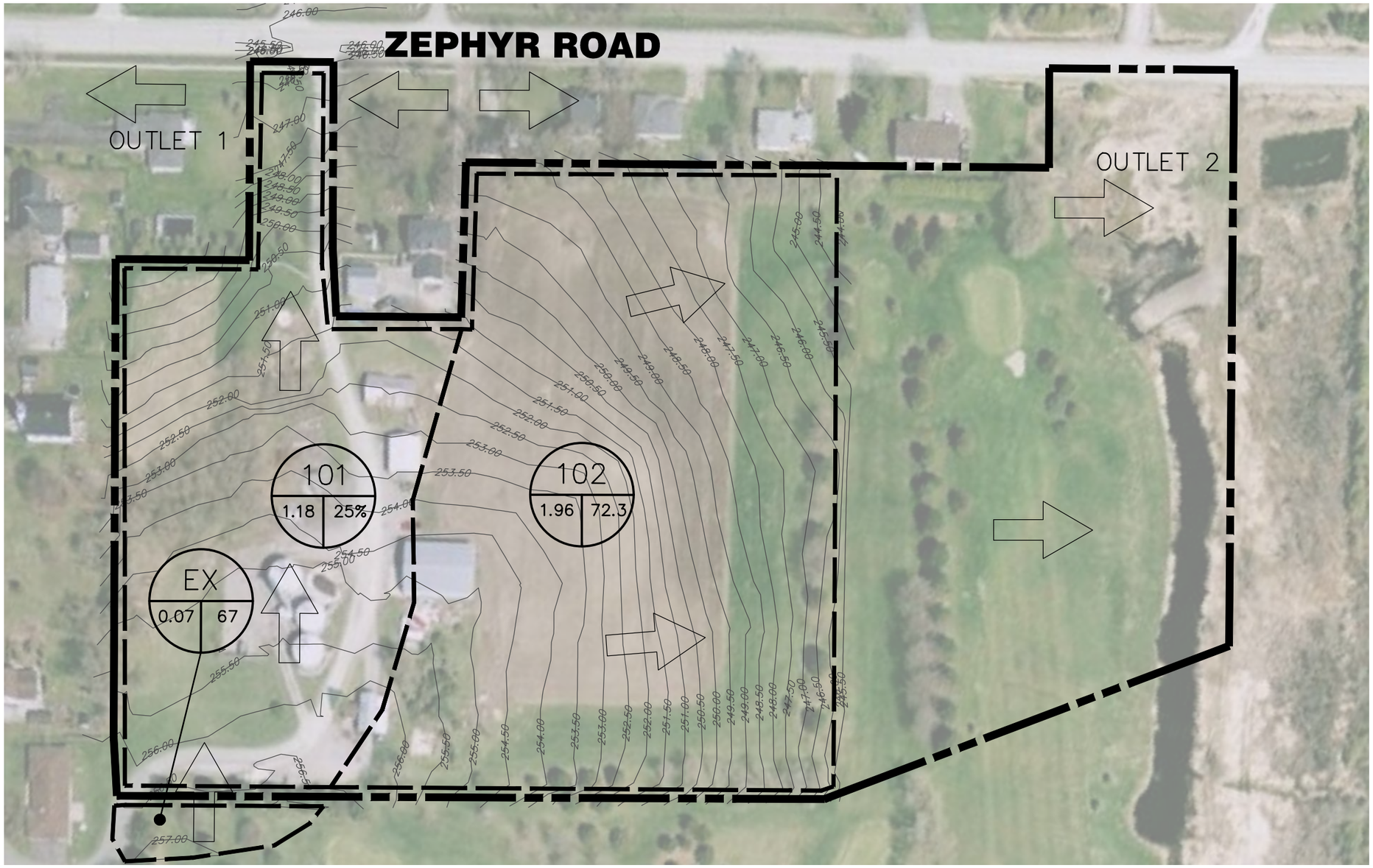
NOTES: CONTOUR INFORMATION FROM REGIONAL MUNICIPALITY OF DURHAM ONLINE GIS MAPPING.

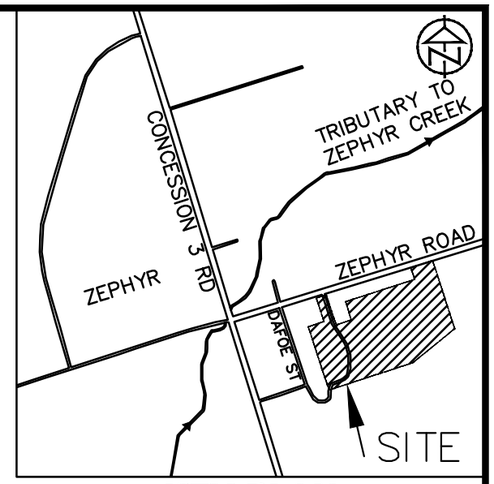
C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie Ottawa

HIDDEN RIDGE SUBDIVISION
TOWNSHIP OF UXBRIDGE
EXTERNAL DRAINAGE PLAN

DWG. No. **EX-1**

SCALE: 1:1250	DRAWN: HY	DATE: MARCH 2017	JOB NO. 516655





KEY PLAN
N.T.S

LEGEND

- EXISTING OVERLAND FLOW DIRECTION
- PROPERTY BOUNDARY
- EXISTING CONDITION CATCHMENT BOUNDARY
- 201 / 1.97 / 71.5 — DRAINAGE AREA ID; CURVE NUMBER (CN*) / % IMPERVIOUS; AREA (ha.)

CONTRACT DRAWINGS

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

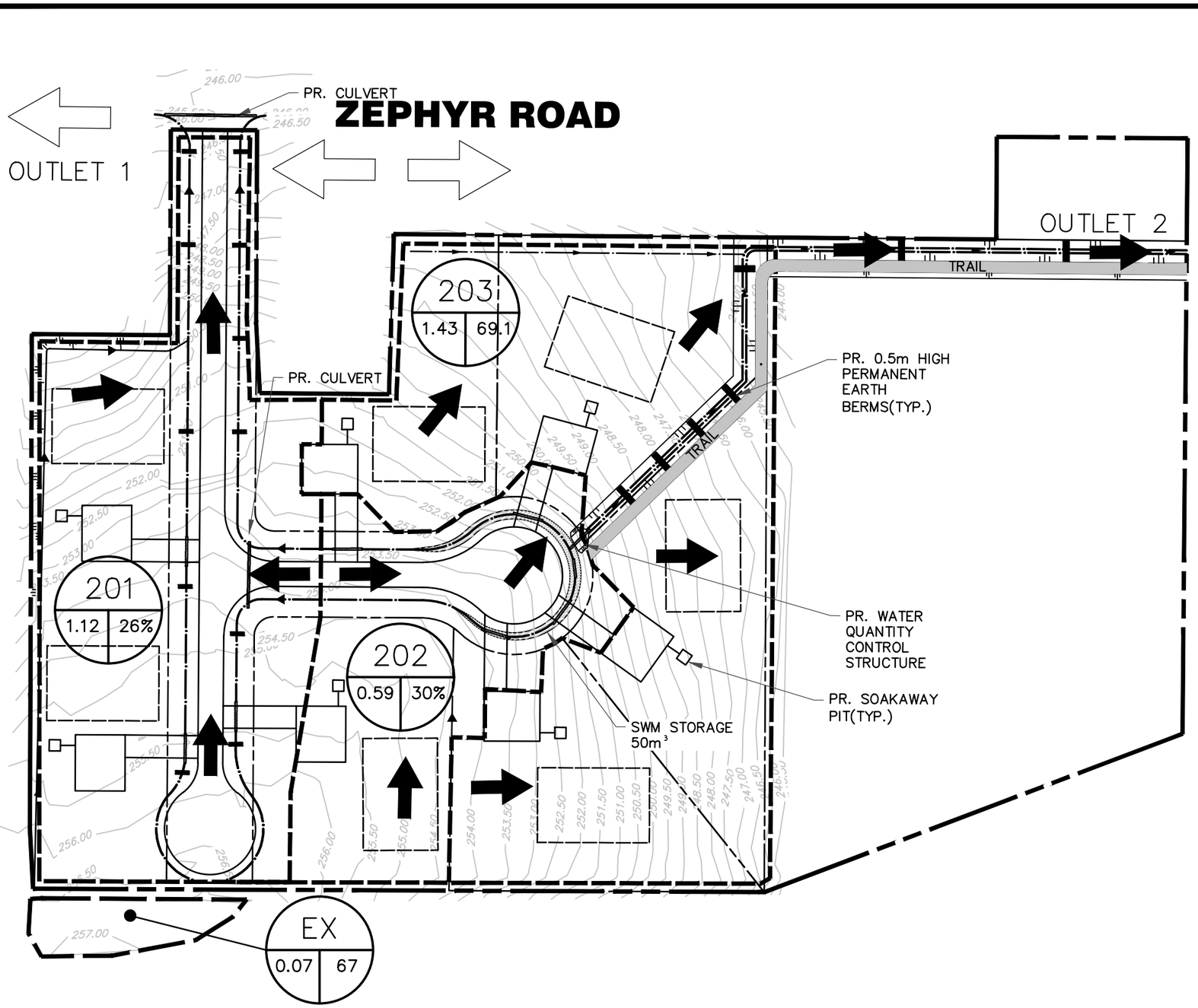
NOTES: AERIAL IMAGE FROM GOOGLE.CA

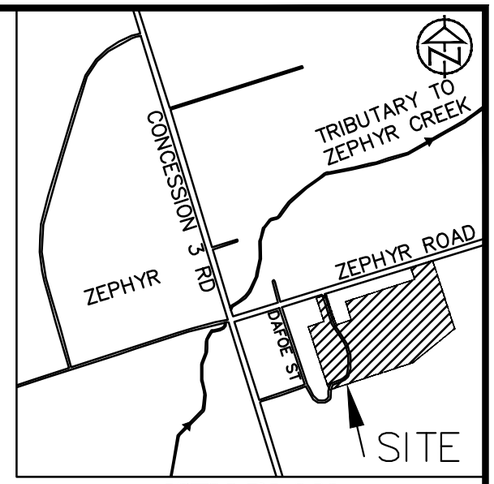
TATHAM ENGINEERING

HIDDEN RIDGE SUBDIVISION
TOWNSHIP OF UXBRIDGE
EXISTING CONDITION DRAINAGE PLAN

DWG. No. **DP-1**

SCALE: 1:1250	DRAWN: HY	DATE: MARCH 2017	JOB NO. 516655





KEY PLAN
N.T.S

LEGEND

- EXISTING OVERLAND FLOW DIRECTION
- PROPOSED OVERLAND FLOW DIRECTION
- PROPERTY BOUNDARY
- PROPOSED CONDITION CATCHMENT BOUNDARY
- PROPOSED SWALE
- DRAINAGE AREA ID
- CURVE NUMBER (CN*) / % IMPERVIOUS
- AREA (ha.)

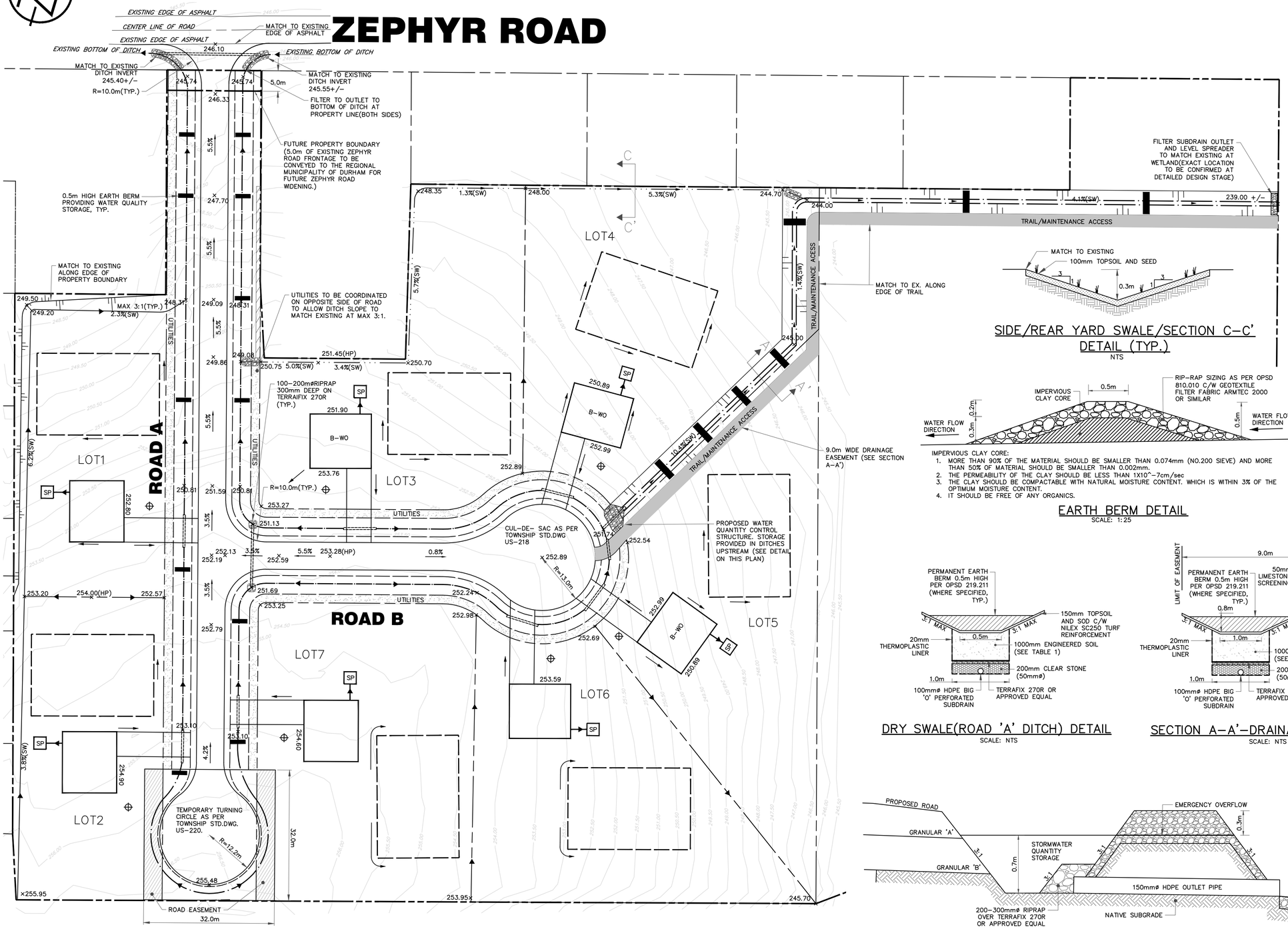
TATHAM ENGINEERING

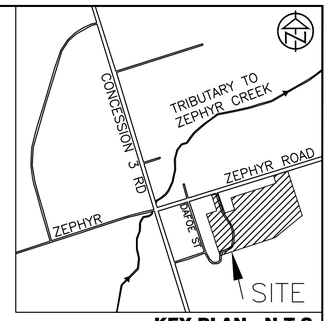
HIDDEN RIDGE SUBDIVISION
TOWNSHIP OF UXBRIDGE
PROPOSED CONDITION DRAINAGE PLAN

DWG. No. **DP-2**

SCALE: 1:1250	DRAWN: HY	DATE: MARCH 2017	JOB NO. 516655

ZEPHYR ROAD





KEY PLAN - N.T.S.

SIDE/REAR YARD SWALE/SECTION C-C' DETAIL (TYP.)

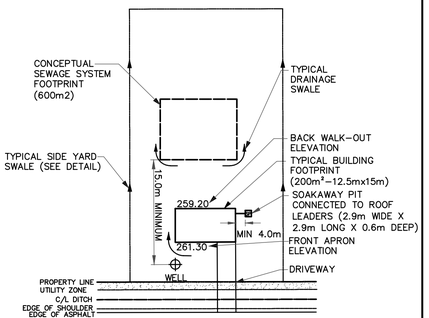
NTS

IMPERVIOUS CLAY CORE:

1. MORE THAN 90% OF THE MATERIAL SHOULD BE SMALLER THAN 0.074mm (NO.200 SIEVE) AND MORE THAN 50% OF MATERIAL SHOULD BE SMALLER THAN 0.002mm.
2. THE PERMEABILITY OF THE CLAY SHOULD BE LESS THAN 1X10^-7cm/sec
3. THE CLAY SHOULD BE COMPACTABLE WITH NATURAL MOISTURE CONTENT. WHICH IS WITHIN 3% OF THE OPTIMUM MOISTURE CONTENT.
4. IT SHOULD BE FREE OF ANY ORGANICS.

EARTH BERM DETAIL

SCALE: 1:25



TYPICAL GRADING DETAILS

SCALE: NTS

NOTE: WALK-OUTS REQUIRE 2.1m ELEVATION DIFFERENCE FROM FRONT TO BACK OF HOUSE.

DRY SWALE(ROAD 'A' DITCH) DETAIL

SCALE: NTS

SECTION A-A'-DRAINAGE EASEMENT

SCALE: NTS

ENGINEERED SOIL - TABLE 1	
COMPONENT	PERCENT BY WEIGHT
SAND (2.0 TO 0.05mmDIA)	85% TO 88%
FINES (<0.05mm DIA.)	8% TO 12%
ORGANIC MATTER	3% TO 5%

WATER QUANTITY CONTROL STRUCTURE DETAIL

NTS

LEGEND

- ×221.35 PROPOSED GRADE
- PROPERTY BOUNDARY
- 221.35 EXISTING CONTOUR
- PROPOSED CULVERT
- 1.0%(SW) PROPOSED SWALE SLOPE
- PROPOSED 0.5m HIGH EARTH BERM
- SIDE/REAR YARD SWALE
- WELL
- SP SOAKAWAY PIT

No.	REVISION DESCRIPTION	DATE
1.	REV. FOR TOWNSHIP STANDARD DEVIATION	JUNE 2018
2.	REV. PER TOWNSHIP & AGENCY COMMENTS	NOV 2019
3.	REV. PER LSRCA COMMENTS	JULY 2020

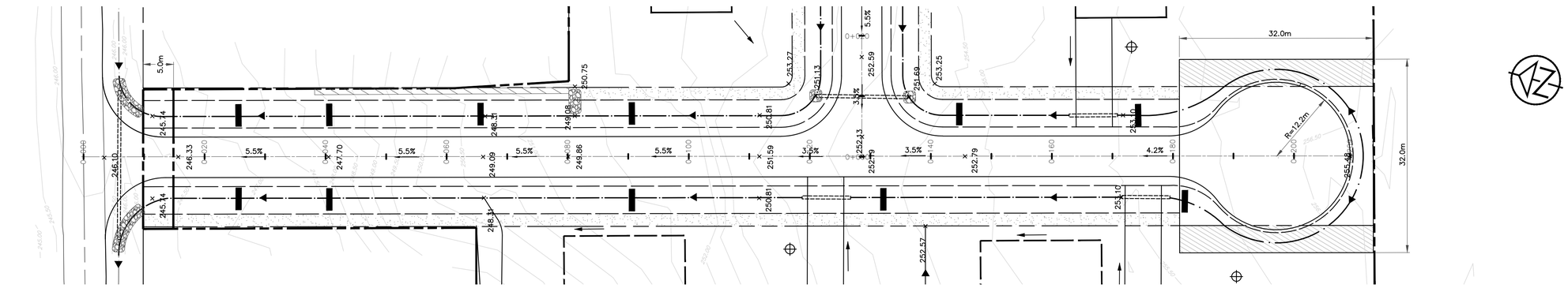
ENGINEER STAMP

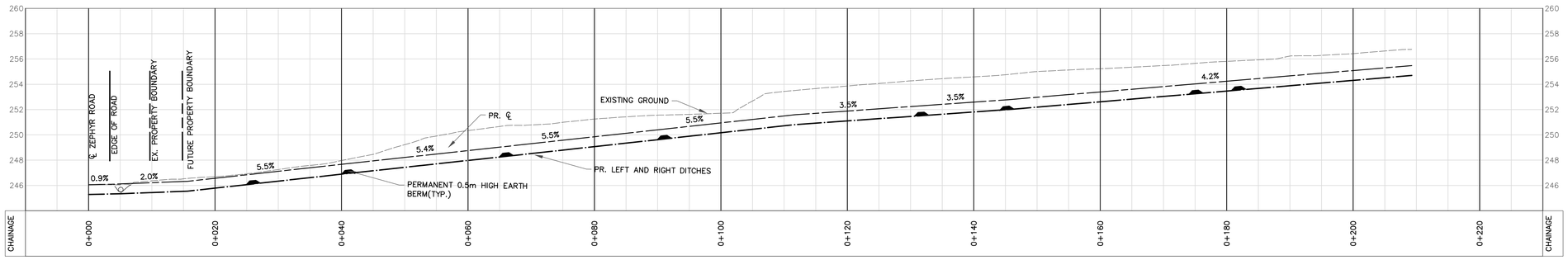
HIDDEN RIDGE SUBDIVISION
TOWNSHIP OF UXBRIDGE

PRELIMINARY GRADING AND SERVICING PLAN

TATHAM ENGINEERING

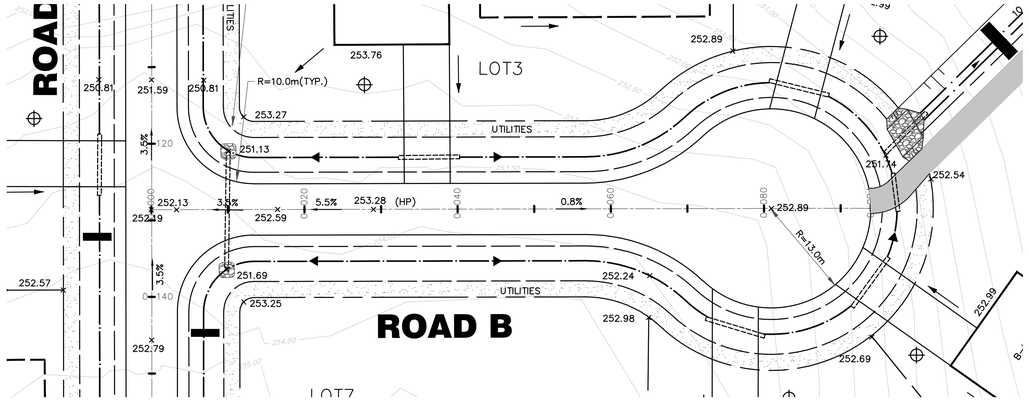
DESIGN: JA/HY	FILE: 516655	DWG: GS-1
DRAWN: HY	DATE: APRIL 2017	
CHECK: JA	SCALE: 1:500	

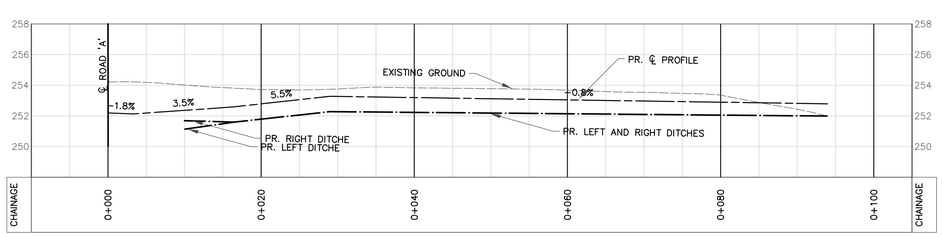




ROAD 'A' PROFILE

H 1:400
V 1:200





ROAD 'B' PROFILE

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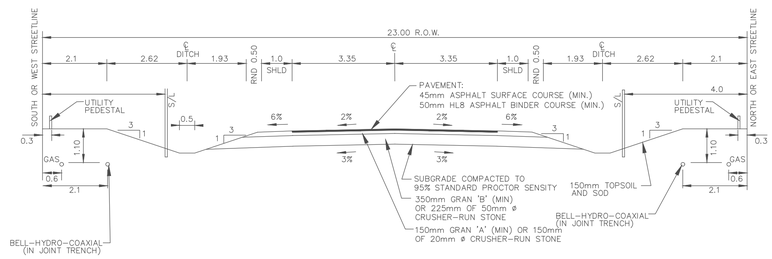
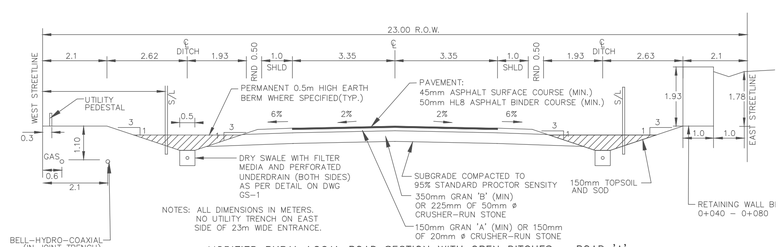
V: 1:200



NOTES: ALL DIMENSIONS IN METERS.

MODIFIED RURAL LOCAL ROAD SECTION WITH OPEN DITCHES – ROAD 'B'
SCALE: 1:100



NOTES: ALL DIMENSIONS IN METERS.
NO UTILITY TRENCH ON EAST SIDE OF 23m WIDE ENTRANCE.

MODIFIED RURAL LOCAL ROAD SECTION WITH OPEN DITCHES – ROAD 'A'
SCALE: 1:100

LEGEND

- ×221.35 — PROPOSED GRADE
- PROPERTY BOUNDARY
- 221.35 — EXISTING CONTOUR
- PROPOSED CULVERT
- 1.0% (SW) — PROPOSED SWALE SLOPE
- PROPOSED 0.5m HIGH EARTH BERM
- SIDE/REAR YARD SWALE
- WELL
- SP — SOAKAWAY PIT

No.	REVISION DESCRIPTION	DATE
1.	REV. FOR TOWNSHIP STANDARD DEVIATION	JUNE 2018
2.	REV. PER TOWNSHIP & AGENCY COMMENTS	NOV 2019
3.	REV. PER LSRCA COMMENTS	JULY 2020

ENGINEER STAMP

HIDDEN RIDGE SUBDIVISION
TOWNSHIP OF UXBRIDGE

TATHAM ENGINEERING

PRELIMINARY PLAN & PROFILE

DESIGN: JA/HY	FILE: 516655	DWG: **PP1**
DRAWN: HY	DATE: APRIL 2017	
CHECK: JA	SCALE: 1:500	

Appendix A:
Utility Availability Confirmation

Jeremy Ash - RE: Hidden Ridge Subdivision FW: Zephyr utilities (Zone 3A)

From: <Corey.MacNamara@HydroOne.com>
To: <HYU@cctatham.com>
Date: 5/5/2017 8:19 AM
Subject: RE: Hidden Ridge Subdivision FW: Zephyr utilities (Zone 3A)
Cc: <subdivision@HydroOne.com>

Good Morning,

We do have an a 8.32kV line on Zephyr that can service the 7 Lots.

Thanks

Corey MacNamara
Supervisor Planning Technician
Provincial Lines|Subdivisions|BAF

Hydro One Networks Inc.
Bus: 1-866-272-3330 Ext. 5712
Desk: 705-719-5712
Cell: 705-241-5262
Mail: 420 Welham Road
Barrie, ON L4N 8Z2
Email: corey.macnamara@hydroone.com

www.HydroOne.com

From: WEBSTER Dale **On Behalf Of** PROV LINE SUBDIVISION
Sent: Wednesday, May 03, 2017 10:30 AM
To: MACNAMARA Corey
Cc: DOCKRILL Donovan
Subject: Hidden Ridge Subdivision FW: Zephyr utilities (Zone 3A)

Hello Corey,

Please review above attachment and respond to CC Tatham confirming if Hydro One have plant available to service the proposed development.

Thank you,
Dale

From: Haoran Yu [mailto:HYU@cctatham.com]
Sent: Monday, May 01, 2017 11:37 AM

To: PROV LINE SUBDIVISION
Subject: RE: Zephyr utilities

Hello

Please find the subdivision key plan attached, contact me if you have any question.

Thanks

Haoran Yu
Engineering Technologist
C.C. Tatham & Associates Ltd.
5335 Canotek Road, Unit 102
Ottawa, Ontario K1J 9L4
Tel: (613) 747-3636
HYU@cctatham.com
www.cctatham.com

>>> <subdivision@HydroOne.com> 01/05/2017 11:16 AM >>>
Hello,

Was not able to access the image? Please resend.

Sincerely,

Dale Webster
Engineering Support Assistant

Hydro One Networks Inc.
420 Welham Road
Barrie ON
L4N 8Z2

Telephone: (705) 719-5701
Toll Free: 1 866 272-3330 (Ext 5701)
Fax: (705) 719-0716

www.HydroOne.com

From: Haoran Yu [mailto:HYU@cctatham.com]
Sent: Wednesday, April 26, 2017 2:58 PM
To: PROV LINE SUBDIVISION
Subject: Zephyr utilities

Good Afternoon,

We are completing the preliminary engineering design for a new 7-lot residential subdivision located south of Zephyr Road (Regional Road 13), east of Concession 3, in the Hamlet of Zephyr, Township of Uxbridge. The proposed site entrance will be from Zephyr Road. Can you confirm if you have plant available to service the proposed development?

The site location is shown below.

If you have any question, please call.

Sincerely

Haoran Yu
Engineering Technologist
C.C. Tatham & Associates Ltd.
5335 Canotek Road, Unit 102
Ottawa, Ontario K1J 9L4
Tel: (613) 747-3636
HYU@cctatham.com
www.cctatham.com

Jeremy Ash - FW: Zephyr utilities

From: Elke Grafner <Elke.Grafner@enbridge.com>
To: "HYU@cctatham.com" <HYU@cctatham.com>
Date: 4/28/2017 8:17 AM
Subject: FW: Zephyr utilities
Cc: Vince Manzo <Vince.Manzo@enbridge.com>

Good morning Haoran,

Unfortunately there is no gas main located on Conc3 between Meyers Rd and Zephyr Rd.
The closest community serviced by gas is Mount Albert.

Elke Grafner
Field Representative Customer Connections
—

ENBRIDGE GAS DISTRIBUTION
TEL: 905-927-3290 | FAX: 905-927-3292 |
101 Honda Blvd Markham, Ontario L6C 0M6

enbridgegas.com
Integrity. Safety. Respect

From: Haoran Yu [mailto:HYU@cctatham.com]
Sent: Tuesday, April 11, 2017 3:18 PM
To: Vince Manzo
Cc: Jeremy Ash
Subject: Zephyr utilities

Good Afternoon Vince,

We are completing the preliminary engineering design for a new 7-lot residential subdivision located south of Zephyr Road (Regional Road 13), east of Concession 3, in the Hamlet of Zephyr, Township of Uxbridge. The proposed site entrance will be from Zephyr Road. Can you confirm if

you have plant available to service the proposed development? The site location is shown below.

If you have any question, please call.

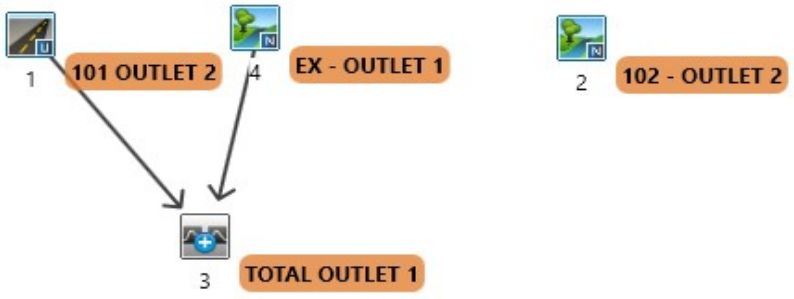
Sincerely

Haoran Yu
Engineering Technologist
C.C. Tatham & Associates Ltd.
5335 Canotek Road, Unit 102
Ottawa, Ontario K1J 9L4
Tel: (613) 747-3636
HYU@cctatham.com
www.cctatham.com

Appendix B:
SWM Calculations

Project:	Hidden Ridge Subdivision
File No.:	516655
Date:	Jul-2020
Designed By:	OP
Checked By:	JA
Subject:	Hydrologic Model Schematic

HIDDEN RIDGE SUBDIVISION
EXISTING HYDROLOGIC MODEL SCHEMATIC



Nashyd		Route Pipe		Duhyd	
Standhyd		Route Channel		Diverthyd	
Addhyd		Route Reservoir			

Project:	Hidden Ridge Subdivision
File No.:	516655
Date:	Jul-2020
Designed By:	HY
Checked By:	JA
Subject:	Hydrologic Parameters

HIDDEN RIDGE SUBDIVISION (PHASE 1)

EXISITING CONDITION

Catchment EX **Area** 0.07 ha

Rain Gauge: Township of Uxbridge IDF
100-yr 24hr SCS Rainfall Depth: 119.04 mm

WEIGHTED CN VALUE																									
Soil Series	**Soil Series**	**Hydrologic Soil Group**	**Soil Texture**	**Runoff Coefficient Type**	**Catchment Soil Characteristics**		**Forest/Woodland**			**Pasture/Lawns**			**Meadows**			**Cultivated**			**Impervious**			**Wetland/Lakes/SWMF**			**Average CN for Soil Type**
					Area	**Percent**	**Area**	**Percent**	**CN**	**Area**	**Percent**	**CN**	**Area**	**Percent**	**CN**	**Area**	**Percent**	**CN**	**Area**	**Percent**	**CN**	**Area**	**Percent**	**CN**	
FI	FARMINGTON	B	Loam or Silt Loam	2	0.07	1	0	0	60	0.07	1	69	0		65	0		74	0		100	0		50	69
	#N/A	#N/A	#N/A	#N/A	0		0	0.5	#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0	0.5	#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0	0.5	#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0	0.5	#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	**0.07**	**1**	**0**	**0**		**0.07**	**1**		**0**	**0**		**0**	**0**		**0**	**0**		**0**	**0**		**69.0**
																								CN*(AMC II)	**67.0**
																								CN*(AMC III)	**82.4**

Initial Abstraction	**5.0 mm**

Woods	10
Meadows	8
Cultivated	7
Lawns	5
Impervious	2

Time of Concentration Calculations

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	258.00	m
Minimum Catchment Elevation	256.97	m
Catchment length	56	m
Catchment Slope	2%	
Catchment Area	0.07	ha
Time of Concentration (Minutes)	**3.69**	
Time of Concentration (Hours)	**0.06**	
Time to Peak (2/3 x Time of Concentration)	**0.04**	

Time to Peak	**0.18 hrs**

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	258.00	m
Minimum Catchment Elevation	256.97	m
Catchment length	56	m
Catchment Slope	2%	
Catchment Area	0.07	ha
Time of Concentration (Minutes)	**16.36**	
Time of Concentration (Hours)	**0.27**	
Time to Peak (2/3 x Time of Concentration)	**0.18**	

Runoff Coefficient	**0.28**

Landuse Type	Soil Series				
	FI	0	0	0	0
	2	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.25	#N/A	#N/A	#N/A	#N/A
Cultivated	0.35	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.28	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.27	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.28	#N/A	#N/A	#N/A	#N/A

TATHAM ENGINEERING

Project:	Hidden Ridge Subdivision
File No.:	516655
Date:	Jul-2020
Designed By:	HY
Checked By:	JA
Subject:	Hydrologic Parameters

HIDDEN RIDGE SUBDIVISION (PHASE 1)

EXISITING CONDITION

Catchment 101 **Area** 1.18 ha

Rain Gauge: Township of Uxbridge IDF
100-yr 24hr SCS Rainfall Depth: 119.04 mm

WEIGHTED CN VALUE

Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient Type	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Meadows			Cultivated			Impervious			Wetland/Lakes/SWMF			Average CN for Soil Type
					Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
FL	FARMINGTON	B	Loam or Silt Loam	2	1.18	1		0	60	0.77	0.65	69	0		65	0.12	0.10	74	0.29	0.25	100	0		50	77.1
	#N/A	#N/A	#N/A	#N/A					#N/A			#N/A	0		#N/A	0		#N/A			#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	**1.18**	**1**	**0**	**0**		**0.77**	**0.6525**		**0**	**0**		**0.12**	**0.1017**		**0.29**	**0.2458**		**0**	**0**		**77.1**
																								CN*(AMC II)	**76.8**
																								CN*(AMC III)	**88.4**

Time of Concentration Calculations

Initial Abstraction **4.5 mm**

Woods	10
Meadows	8
Cultivated	7
Lawns	5
Impervious	2

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	256.97	m
Minimum Catchment Elevation	246.34	m
Catchment length	204	m
Catchment Slope	5%	
Catchment Area	1.18	ha
Time of Concentration (Minutes)	**8.22**	
Time of Concentration (Hours)	**0.14**	
Time to Peak (2/3 x Time of Concentration)	**0.09**	

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	256.97	m
Minimum Catchment Elevation	246.34	m
Catchment length	204	m
Catchment Slope	5%	
Catchment Area	1.18	ha
Time of Concentration (Minutes)	**16.00**	
Time of Concentration (Hours)	**0.27**	
Time to Peak (2/3 x Time of Concentration)	**0.18**	

Runoff Coefficient **0.51**

Landuse Type	Soil Series				
	FL	0	0	0	0
	2	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.3	#N/A	#N/A	#N/A	#N/A
Cultivated	0.45	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.35	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.33	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.51	#N/A	#N/A	#N/A	#N/A

Time to Peak **0.09 hrs**

TATHAM ENGINEERING		
	Project:	Hidden Ridge Subdivision
	File No.:	516655
	Date:	Jul-2020
	Designed By:	HY
	Checked By:	JA
	Subject:	Hydrologic Parameters

HIDDEN RIDGE SUBDIVISION (PHASE 1)

EXISITING CONDITION

Rain Gauge: Township of Uxbridge IDF

Catchment 102 **Area** 1.96 ha 100-yr 24hr SCS Rainfall Depth: 119.04 mm

WEIGHTED CN VALUE																								
Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient Type	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Meadows			Cultivated			Impervious			Wetland/Lakes/SWMF			Average CN for Soil Type
					Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
FI	FARMINGTON	B	Loam or Silt Loam	2	1.96	1		0	60	0.85	0.43	69	0		65	1.06	0.54	74	0.05	0.03	100	0		50	72.5
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	**1.96**	**1**	**0**	**0**		**0.85**	**0.43357**		**0**	**0**		**1.06**	**0.5413**		**0.05**	**0.0251**		**0**	**0**		**72.5**
																								CN*(AMC II)	**72.3**
																								CN*(AMC III)	**85.7**

Time of Concentration Calculations

Initial Abstraction	**6.0 mm**

Woods	10
Meadows	8
Cultivated	7
Lawns	5
Impervious	2

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	256.50	m
Minimum Catchment Elevation	246.50	m
Catchment length	134	m
Catchment Slope	7%	
Catchment Area	1.96	ha

Time of Concentration (Minutes) **4.78**
Time of Concentration (Hours) **0.08**
Time to Peak (2/3 x Time of Concentration) **0.05**

Time to Peak	**0.05 hrs**

(use min. 10 minutes)

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	256.50	m
Minimum Catchment Elevation	246.50	m
Catchment length	134	m
Catchment Slope	7%	
Catchment Area	1.96	ha

Time of Concentration (Minutes) **13.24**
Time of Concentration (Hours) **0.22**
Time to Peak (2/3 x Time of Concentration) **0.15**

Runoff Coefficient	**0.42**

Landuse Type	Soil Series				
	FI	0	0	0	0
	2	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.3	#N/A	#N/A	#N/A	#N/A
Cultivated	0.45	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.35	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWM	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.33	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.42	#N/A	#N/A	#N/A	#N/A

```
================================================================================
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         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
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        OOO     T      T    H   H    Y    M   M   OOO
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DATE: 12-06-2019                          TIME: 01:43:47

USER:


COMMENTS: _____________________________________________________________


  ***********************************************
  ** SIMULATION : Run 01                       **
  ***********************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                5.0
    [ Ptot= 25.00 mm ]
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dac5-4479-bde6-c60
    remark: 25mm

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 ** CALIB NASHYD         0002  1  5.0    1.96    0.02  1.58   3.09 0.12   0.000
    [CN=72.3         ]
    [ N = 3.0:Tp 0.17]
*
    READ STORM                5.0
    [ Ptot= 25.00 mm ]
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dac5-4479-bde6-c60
    remark: 25mm

*
 ** CALIB NASHYD         0004  1  5.0    0.07    0.00  1.58   2.74 0.11   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                5.0
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dac5-4479-bde6-c60
    remark: 25mm

*
 *  CALIB STANDHYD       0001  1  5.0    1.18    0.06  1.33   8.31 0.33   0.000
    [I%=25.0:S%= 2.00]
*
    ADD [  0001+  0004]  0003  3  5.0    1.25    0.06  1.33   8.00  n/a   0.000
*
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       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
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        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


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  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\8e7
257dd-dd4f-48c9-a3ef-16c42f254abb\scen


DATE: 12-06-2019                          TIME: 01:43:47

USER:


COMMENTS: _____________________________________________________________


  ************************************************
  ** SIMULATION : Run 02                        **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

     START @  0.00 hrs
     --------------------
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66a1-4ac7-a118-06a
    remark: 2yr 4hr CHI

*
 ** CALIB NASHYD         0002  1  5.0    1.96    0.04  1.50   6.30 0.18   0.000
    [CN=72.3         ]
    [ N = 3.0:Tp 0.17]
*
    READ STORM                10.0
    [ Ptot= 34.17 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\9c1bb5f6-
66a1-4ac7-a118-06a
    remark: 2yr 4hr CHI

*
 ** CALIB NASHYD         0004  1  5.0    0.07    0.00  1.50   5.49 0.16   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                10.0
    [ Ptot= 34.17 mm ]
    fname :
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66a1-4ac7-a118-06a
    remark: 2yr 4hr CHI

*
 *  CALIB STANDHYD       0001  1  5.0    1.18    0.06  1.33  12.90 0.38   0.000
    [I%=25.0:S%= 2.00]
*
    ADD [  0001+  0004]  0003  3  5.0    1.25    0.06  1.33  12.49  n/a   0.000
*
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       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\762
8d3b0-0b92-435c-919c-10260c2b0138\scen
  Summary filename:
```

C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\762
8d3b0-0b92-435c-919c-10260c2b0138\scen

DATE: 12-06-2019 TIME: 01:43:47

USER:

COMMENTS: _____

```
  ***********************************************
  ** SIMULATION : Run 03                       **
  ***********************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                 10.0
    [ Ptot= 47.36 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\e4053b51-
dfb0-41ff-9bfe-37d
    remark: 5yr 4hr CHI

*
 ** CALIB NASHYD         0002  1  5.0    1.96    0.08  1.50  12.29 0.26   0.000
    [CN=72.3         ]
    [ N = 3.0:Tp 0.17]
*
    READ STORM                 10.0
    [ Ptot= 47.36 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\e4053b51-
dfb0-41ff-9bfe-37d
    remark: 5yr 4hr CHI

*
 ** CALIB NASHYD         0004  1  5.0    0.07    0.00  1.50  10.68 0.23   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                 10.0
    [ Ptot= 47.36 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\e4053b51-
dfb0-41ff-9bfe-37d
    remark: 5yr 4hr CHI

*
 *  CALIB STANDHYD       0001  1  5.0    1.18    0.09  1.33  20.48 0.43   0.000
    [I%=25.0:S%= 2.00]
*
    ADD [  0001+  0004]  0003  3  5.0    1.25    0.10  1.33  19.93  n/a   0.000
*
================================================================================
========================


       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\733
6bf96-3e97-47e7-8106-774c7f41209b\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\733
6bf96-3e97-47e7-8106-774c7f41209b\scen


DATE: 12-06-2019                          TIME: 01:43:47

USER:


COMMENTS: _____________________________________________________________


  ***********************************************
  ** SIMULATION : Run 04                       **
```

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

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                10.0
    [ Ptot= 55.80 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\6d0b5a5e-
5c8e-4ccb-aa01-28e
    remark: 10yr 4hr CHI

*
 ** CALIB NASHYD         0002  1  5.0    1.96    0.11  1.50  16.80 0.30   0.000
    [CN=72.3         ]
    [ N = 3.0:Tp 0.17]
*
    READ STORM                10.0
    [ Ptot= 55.80 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\6d0b5a5e-
5c8e-4ccb-aa01-28e
    remark: 10yr 4hr CHI

*
 ** CALIB NASHYD         0004  1  5.0    0.07    0.00  1.50  14.62 0.26   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                10.0
    [ Ptot= 55.80 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\6d0b5a5e-
5c8e-4ccb-aa01-28e
    remark: 10yr 4hr CHI

*
 *  CALIB STANDHYD       0001  1  5.0    1.18    0.12  1.33  25.81 0.46   0.000
    [I%=25.0:S%= 2.00]
*
    ADD [  0001+  0004]  0003  3  5.0    1.25    0.12  1.33  25.19  n/a   0.000
*
================================================================================
========================


       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\34f
0bdac-1a6a-4589-80e2-faca15186c96\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\34f
0bdac-1a6a-4589-80e2-faca15186c96\scen


DATE: 12-06-2019                          TIME: 01:43:47

USER:


COMMENTS: _____________________________________________________


  ***********************************************
  ** SIMULATION : Run 05                       **
  ***********************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

     START @  0.00 hrs
     --------------------
    READ STORM                10.0
    [ Ptot= 65.22 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\58795a66-
57fa-4c18-9d5b-c76
    remark: 25yr 4hr CHI
```

```
*
 ** CALIB NASHYD         0002  1  5.0    1.96    0.15  1.50  22.32 0.34   0.000
    [CN=72.3         ]
    [ N = 3.0:Tp 0.17]
*
    READ STORM                 10.0
    [ Ptot= 65.22 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\58795a66-
57fa-4c18-9d5b-c76
    remark: 25yr 4hr CHI

*
 ** CALIB NASHYD         0004  1  5.0    0.07    0.00  1.50  19.50 0.30   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                 10.0
    [ Ptot= 65.22 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\58795a66-
57fa-4c18-9d5b-c76
    remark: 25yr 4hr CHI

*
 *  CALIB STANDHYD       0001  1  5.0    1.18    0.15  1.33  32.13 0.49   0.000
    [I%=25.0:S%= 2.00]
*
    ADD [  0001+  0004]  0003  3  5.0    1.25    0.16  1.33  31.43  n/a   0.000
*
================================================================================
========================


       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****
```

```
  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\a81
cdcf1-66f6-4b92-bad9-635ba9fd5f78\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\a81
cdcf1-66f6-4b92-bad9-635ba9fd5f78\scen


DATE: 12-06-2019                          TIME: 01:43:47

USER:


COMMENTS: _____________________________________________________________


  ************************************************
  ** SIMULATION : Run 06                         **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                 10.0
    [ Ptot= 83.51 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\9c520b38-
f138-47d6-a306-442
    remark: 100yr 4hr CHI

*
 ** CALIB NASHYD         0002  1  5.0    1.96    0.24  1.42  34.24 0.41   0.000
    [CN=72.3         ]
    [ N = 3.0:Tp 0.17]
*
    READ STORM                 10.0
    [ Ptot= 83.51 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\9c520b38-
f138-47d6-a306-442
    remark: 100yr 4hr CHI

*
 ** CALIB NASHYD         0004  1  5.0    0.07    0.01  1.50  30.18 0.36   0.000
```

```
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                10.0
    [ Ptot= 83.51 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\9c520b38-
f138-47d6-a306-442
    remark: 100yr 4hr CHI

*
 *  CALIB STANDHYD       0001  1  5.0    1.18    0.25  1.33  45.30 0.54   0.000
    [I%=25.0:S%= 2.00]
*
    ADD [  0001+  0004]  0003  3  5.0    1.25    0.26  1.33  44.45  n/a   0.000
*
================================================================================
========================


       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\dfd
ef3c8-bda0-492b-b2d4-70d97680e42e\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\dfd
ef3c8-bda0-492b-b2d4-70d97680e42e\scen


DATE: 12-06-2019                          TIME: 01:43:48
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USER:


COMMENTS: _____________________________________________________


  ************************************************
  ** SIMULATION : Run 07                        **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                    min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                  5.0
    [ Ptot= 43.70 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\f154648f-
d6dc-42fd-b206-8a9
    remark: 2yr 12hr SCS

*
 ** CALIB NASHYD         0002  1  5.0    1.96    0.06  6.17  10.49 0.24   0.000
    [CN=72.3         ]
    [ N = 3.0:Tp 0.17]
*
    READ STORM                  5.0
    [ Ptot= 43.70 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\f154648f-
d6dc-42fd-b206-8a9
    remark: 2yr 12hr SCS

*
 ** CALIB NASHYD         0004  1  5.0    0.07    0.00  6.17   9.11 0.21   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                  5.0
    [ Ptot= 43.70 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\f154648f-
d6dc-42fd-b206-8a9
    remark: 2yr 12hr SCS

*
 *  CALIB STANDHYD       0001  1  5.0    1.18    0.06  6.08  18.28 0.42   0.000
    [I%=25.0:S%= 2.00]
*
```

```
    ADD [  0001+  0004]  0003  3  5.0    1.25    0.06  6.08  17.77  n/a   0.000
*
================================================================================
========================


       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\e24
708c4-063c-4423-8f17-6f5b1ecb4efe\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\e24
708c4-063c-4423-8f17-6f5b1ecb4efe\scen


DATE: 12-06-2019                          TIME: 01:43:48

USER:


COMMENTS: _____________________________________________________________


  ***********************************************
  ** SIMULATION : Run 08                       **
  ***********************************************

  W/E COMMAND            HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                 min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
```

```
      --------------------
    READ STORM                  5.0
    [ Ptot= 60.50 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\af1dd4e8-
0e28-4a0e-81e8-9cb
    remark: 5yr 12hr SCS

*
 ** CALIB NASHYD         0002  1  5.0    1.96    0.12  6.17  19.50 0.32   0.000
    [CN=72.3         ]
    [ N = 3.0:Tp 0.17]
*
    READ STORM                  5.0
    [ Ptot= 60.50 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\af1dd4e8-
0e28-4a0e-81e8-9cb
    remark: 5yr 12hr SCS

*
 ** CALIB NASHYD         0004  1  5.0    0.07    0.00  6.17  17.00 0.28   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                  5.0
    [ Ptot= 60.50 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\af1dd4e8-
0e28-4a0e-81e8-9cb
    remark: 5yr 12hr SCS

*
 *  CALIB STANDHYD       0001  1  5.0    1.18    0.10  6.08  28.92 0.48   0.000
    [I%=25.0:S%= 2.00]
*
    ADD [  0001+  0004]  0003  3  5.0    1.25    0.10  6.08  28.26  n/a   0.000
*
================================================================================
========================


       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
```

```
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\7b9
cce46-0c12-406a-827b-4f5dc1502a7a\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\7b9
cce46-0c12-406a-827b-4f5dc1502a7a\scen


DATE: 12-06-2019                          TIME: 01:43:47

USER:


COMMENTS: _____________________________________________________


  ************************************************
  ** SIMULATION : Run 09                        **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

     START @  0.00 hrs
     --------------------
    READ STORM                 5.0
    [ Ptot= 71.20 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\3e87cb3c-
c368-4709-82bb-904
    remark: 10yr 12hr SCS

*
 ** CALIB NASHYD         0002  1  5.0    1.96    0.16  6.08  26.06 0.37   0.000
    [CN=72.3         ]
    [ N = 3.0:Tp 0.17]
*
    READ STORM                 5.0
    [ Ptot= 71.20 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\3e87cb3c-
c368-4709-82bb-904
    remark: 10yr 12hr SCS

*
 ** CALIB NASHYD         0004  1  5.0    0.07    0.00  6.17  22.83 0.32   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                 5.0
    [ Ptot= 71.20 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\3e87cb3c-
c368-4709-82bb-904
    remark: 10yr 12hr SCS

*
 *  CALIB STANDHYD       0001  1  5.0    1.18    0.13  6.08  36.32 0.51   0.000
    [I%=25.0:S%= 2.00]
*
    ADD [  0001+  0004]  0003  3  5.0    1.25    0.13  6.08  35.56  n/a   0.000
*
================================================================================
========================


       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\430
```

```
de815-19a1-4b6f-a48f-97bb05973ec2\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\430
de815-19a1-4b6f-a48f-97bb05973ec2\scen


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  ***********************************************
  ** SIMULATION : Run 10                       **
  ***********************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                  5.0
    [ Ptot= 83.80 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\6d7aa051-
e460-4620-9151-71c
    remark: 25yr 12hr SCS

*
 ** CALIB NASHYD         0002  1  5.0    1.96    0.21  6.08  34.44 0.41   0.000
    [CN=72.3         ]
    [ N = 3.0:Tp 0.17]
*
    READ STORM                  5.0
    [ Ptot= 83.80 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\6d7aa051-
e460-4620-9151-71c
    remark: 25yr 12hr SCS

*
 ** CALIB NASHYD         0004  1  5.0    0.07    0.01  6.17  30.36 0.36   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                  5.0
    [ Ptot= 83.80 mm ]
    fname :
```

```
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\6d7aa051-
e460-4620-9151-71c
    remark: 25yr 12hr SCS

*
 *  CALIB STANDHYD       0001  1  5.0    1.18    0.16  6.08  45.51 0.54   0.000
    [I%=25.0:S%= 2.00]
*
    ADD [  0001+  0004]  0003  3  5.0    1.25    0.17  6.08  44.66  n/a   0.000
*
================================================================================
========================


       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\856
d3646-7817-4057-b05a-75a4138d7708\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\856
d3646-7817-4057-b05a-75a4138d7708\scen


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```

```
  ************************************************
  ** SIMULATION : Run 11                        **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                 5.0
    [ Ptot=104.10 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\7b117713-
0d86-4039-a916-18a
    remark: 100yr 12hr SCS

*
 ** CALIB NASHYD         0002  1  5.0    1.96    0.31  6.08  49.07 0.47   0.000
    [CN=72.3         ]
    [ N = 3.0:Tp 0.17]
*
    READ STORM                 5.0
    [ Ptot=104.10 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\7b117713-
0d86-4039-a916-18a
    remark: 100yr 12hr SCS

*
 ** CALIB NASHYD         0004  1  5.0    0.07    0.01  6.17  43.67 0.42   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                 5.0
    [ Ptot=104.10 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\7b117713-
0d86-4039-a916-18a
    remark: 100yr 12hr SCS

*
 *  CALIB STANDHYD       0001  1  5.0    1.18    0.25  6.08  61.19 0.59   0.000
    [I%=25.0:S%= 2.00]
*
    ADD [  0001+  0004]  0003  3  5.0    1.25    0.26  6.08  60.21  n/a   0.000
*
================================================================================
========================
```

```
       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\e19
1203a-d50c-47a5-97df-8f5aeea9a14b\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\e19
1203a-d50c-47a5-97df-8f5aeea9a14b\scen


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  ************************************************
  ** SIMULATION : Run 12                        **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

     START @  0.00 hrs
     --------------------
   READ STORM                15.0
   [ Ptot= 50.73 mm ]
   fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\f16d20f6-
7be4-410f-bac3-a28
```

```
    remark: 2yr 24hr SCS

*
 ** CALIB NASHYD         0002  1  5.0    1.96    0.07 12.08  14.03 0.28   0.000
    [CN=72.3         ]
    [ N = 3.0:Tp 0.17]
*
    READ STORM                 15.0
    [ Ptot= 50.73 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\f16d20f6-
7be4-410f-bac3-a28
    remark: 2yr 24hr SCS

*
 ** CALIB NASHYD         0004  1  5.0    0.07    0.00 12.08  12.20 0.24   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                 15.0
    [ Ptot= 50.73 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\f16d20f6-
7be4-410f-bac3-a28
    remark: 2yr 24hr SCS

*
 *  CALIB STANDHYD       0001  1  5.0    1.18    0.07 12.00  22.57 0.44   0.000
    [I%=25.0:S%= 2.00]
*
    ADD [  0001+  0004]  0003  3  5.0    1.25    0.07 12.00  21.99  n/a   0.000
*
================================================================================
========================


       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```

```
                    *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\82f
a5615-7254-4540-937c-92ad066f556d\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\82f
a5615-7254-4540-937c-92ad066f556d\scen


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  ************************************************
  ** SIMULATION : Run 13                        **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                   min     ha   '  cms   hrs     mm          cms

     START @  0.00 hrs
     --------------------
    READ STORM                 15.0
    [ Ptot= 70.11 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\62e099ad-
7b0a-44a0-927c-76f
    remark: 5yr 24hr SCS

*
 ** CALIB NASHYD         0002  1  5.0    1.96    0.14 12.08  25.37 0.36   0.000
    [CN=72.3         ]
    [ N = 3.0:Tp 0.17]
*
    READ STORM                 15.0
    [ Ptot= 70.11 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\62e099ad-
7b0a-44a0-927c-76f
    remark: 5yr 24hr SCS
```

```
*
 ** CALIB NASHYD         0004  1  5.0    0.07    0.00 12.08  22.22 0.32   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                 15.0
    [ Ptot= 70.11 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\62e099ad-
7b0a-44a0-927c-76f
    remark: 5yr 24hr SCS

*
 *  CALIB STANDHYD       0001  1  5.0    1.18    0.11 12.00  35.55 0.51   0.000
    [I%=25.0:S%= 2.00]
*
    ADD [  0001+  0004]  0003  3  5.0    1.25    0.12 12.00  34.80  n/a   0.000
*
================================================================================
========================


       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\d42
53166-7bea-4fc8-8e14-16c8b5b9bad8\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\d42
53166-7bea-4fc8-8e14-16c8b5b9bad8\scen
```

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  ************************************************
  ** SIMULATION : Run 14                         **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                    min     ha   '  cms   hrs     mm          cms

     START @  0.00 hrs
     --------------------
    READ STORM                 15.0
    [ Ptot= 82.55 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\76727b81-
65ef-4036-af3e-cc2
    remark: 10yr 24hr SCS

*
 ** CALIB NASHYD         0002  1  5.0    1.96    0.18 12.00  33.58 0.41   0.000
    [CN=72.3         ]
    [ N = 3.0:Tp 0.17]
*
    READ STORM                 15.0
    [ Ptot= 82.55 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\76727b81-
65ef-4036-af3e-cc2
    remark: 10yr 24hr SCS

*
 ** CALIB NASHYD         0004  1  5.0    0.07    0.01 12.08  29.59 0.36   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                 15.0
    [ Ptot= 82.55 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\76727b81-
65ef-4036-af3e-cc2
    remark: 10yr 24hr SCS

*
 *  CALIB STANDHYD       0001  1  5.0    1.18    0.14 12.00  44.58 0.54   0.000
```

```
    [I%=25.0:S%= 2.00]
*
    ADD [  0001+  0004]  0003  3  5.0    1.25    0.15 12.00  43.74  n/a   0.000
*
================================================================================
========================


       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\836
c30dc-e51e-4ff3-afc7-5c4a152f1c83\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\836
c30dc-e51e-4ff3-afc7-5c4a152f1c83\scen


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  ***********************************************
  ** SIMULATION : Run 15                       **
  ***********************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms
```

```
      START @  0.00 hrs
      --------------------
    READ STORM                 15.0
    [ Ptot= 96.19 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\7fc6ee65-
9b89-4625-8cea-56b
    remark: 25yr 24hr SCS

*
 ** CALIB NASHYD         0002  1  5.0    1.96    0.23 12.00  43.23 0.45   0.000
    [CN=72.3         ]
    [ N = 3.0:Tp 0.17]
*
    READ STORM                 15.0
    [ Ptot= 96.19 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\7fc6ee65-
9b89-4625-8cea-56b
    remark: 25yr 24hr SCS

*
 ** CALIB NASHYD         0004  1  5.0    0.07    0.01 12.08  38.33 0.40   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                 15.0
    [ Ptot= 96.19 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\7fc6ee65-
9b89-4625-8cea-56b
    remark: 25yr 24hr SCS

*
 *  CALIB STANDHYD       0001  1  5.0    1.18    0.18 12.00  54.97 0.57   0.000
    [I%=25.0:S%= 2.00]
*
    ADD [  0001+  0004]  0003  3  5.0    1.25    0.19 12.00  54.04  n/a   0.000
*
================================================================================
========================


       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL
```

```
        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\89d
823bf-009a-4d67-b12c-385025688bb0\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\89d
823bf-009a-4d67-b12c-385025688bb0\scen


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  ************************************************
  ** SIMULATION : Run 16                         **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                15.0
    [ Ptot=118.68 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\c31e0960-
3f0a-427b-a72f-146
    remark: 100yr 24hr SCS

*
 ** CALIB NASHYD         0002  1  5.0    1.96    0.33 12.00  60.25 0.51   0.000
    [CN=72.3         ]
    [ N = 3.0:Tp 0.17]
*
    READ STORM                15.0
    [ Ptot=118.68 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\c31e0960-
3f0a-427b-a72f-146
    remark: 100yr 24hr SCS

*
 ** CALIB NASHYD         0004  1  5.0    0.07    0.01 12.08  53.96 0.45   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                15.0
    [ Ptot=118.68 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\c31e0960-
3f0a-427b-a72f-146
    remark: 100yr 24hr SCS

*
 *  CALIB STANDHYD       0001  1  5.0    1.18    0.27 12.00  72.97 0.61   0.000
    [I%=25.0:S%= 2.00]
*
    ADD [  0001+  0004]  0003  3  5.0    1.25    0.28 12.00  71.91  n/a   0.000
*
================================================================================
========================


       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.0\VO2\voin.dat
```

```
  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\fc4
16b02-cb0c-43f6-98d0-f06ff22f5eaf\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\fc4
16b02-cb0c-43f6-98d0-f06ff22f5eaf\scen


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USER:


COMMENTS: _____________________________________________________________


  ***********************************************
  ** SIMULATION : Run 17                       **
  ***********************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

     START @  0.00 hrs
     --------------------
    READ STORM                  6.0
    [ Ptot=193.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\670127cc-4c41-4a64-b301-0e6757d734e2\0a563640-
f9ce-42bd-85a5-398
    remark: Timmins

*
 ** CALIB NASHYD         0002  1  5.0    1.96    0.18  7.00 122.55 0.64   0.000
    [CN=72.3         ]
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*
    READ STORM                  6.0
    [ Ptot=193.00 mm ]
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f9ce-42bd-85a5-398
    remark: Timmins

*
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    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                  6.0
    [ Ptot=193.00 mm ]
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f9ce-42bd-85a5-398
    remark: Timmins

*
 *  CALIB STANDHYD       0001  1  5.0    1.18    0.11  7.00 137.29 0.71   0.000
    [I%=25.0:S%= 2.00]
*
    ADD [  0001+  0004]  0003  3  5.0    1.25    0.12  7.00 135.90  n/a   0.000
*
 FINISH

================================================================================
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```

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       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\20a
09a0c-f66f-48d3-8bbe-a9f79b9bdc99\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\20a
09a0c-f66f-48d3-8bbe-a9f79b9bdc99\scen


DATE: 12-05-2019                          TIME: 06:02:23

USER:


COMMENTS: _____________________________________________________________


  ***********************************************
  ** SIMULATION : Run 01                       **
  ***********************************************

  W/E COMMAND            HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                 min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                 6.0
    [ Ptot=193.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\5bf8acf0-c3e0-4efb-aa28-0a7ad60f4aad\0a563640-
f9ce-42bd-85a5-398
    remark: Timmins

*
 ** CALIB NASHYD         0002  1  5.0    1.96    0.21  7.00 151.90 0.79   0.000
    [CN=85.7         ]
    [ N = 3.0:Tp 0.17]
*
    READ STORM                 6.0
    [ Ptot=193.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\5bf8acf0-c3e0-4efb-aa28-0a7ad60f4aad\0a563640-
f9ce-42bd-85a5-398
    remark: Timmins

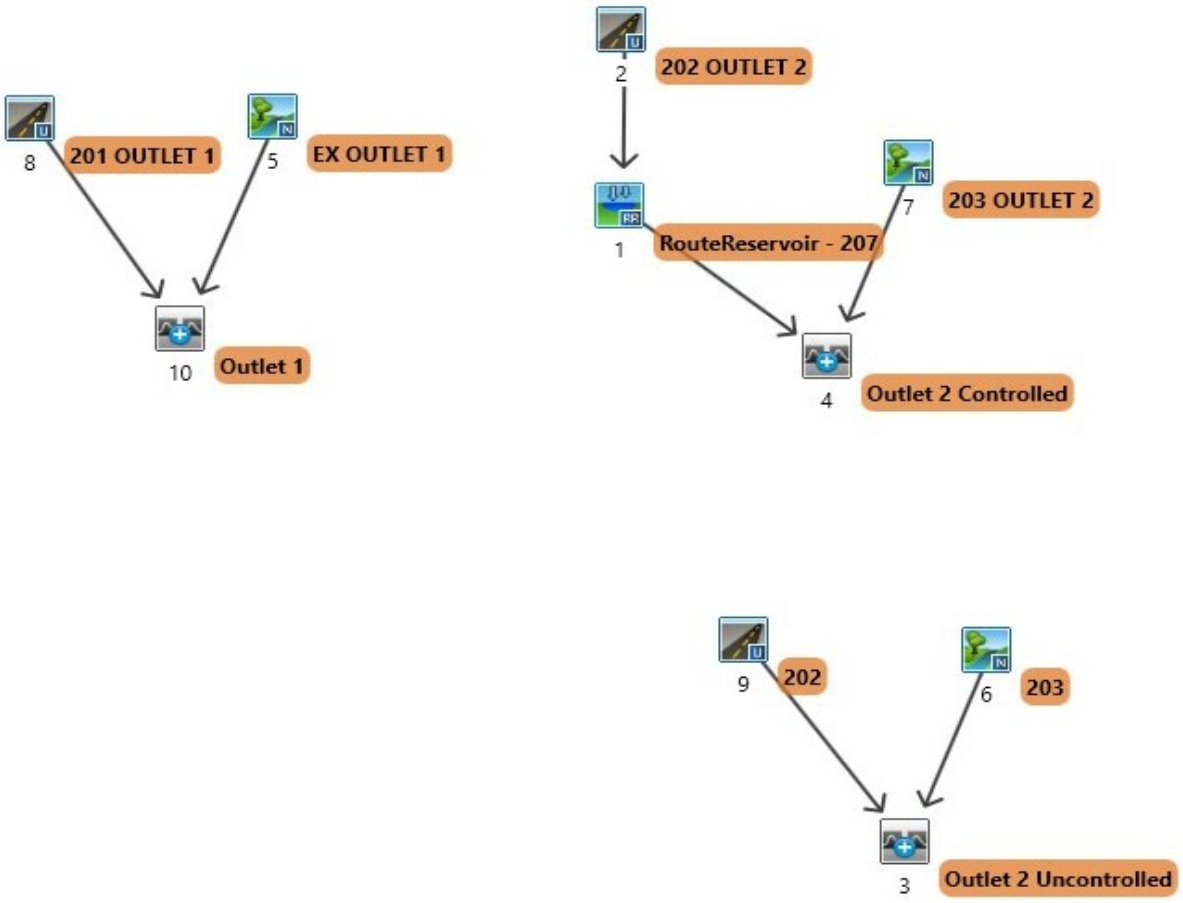
*
 ** CALIB NASHYD         0003  1  5.0    0.07    0.01  7.00 145.47 0.75   0.000
    [CN=82.4         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                 6.0
    [ Ptot=193.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\5bf8acf0-c3e0-4efb-aa28-0a7ad60f4aad\0a563640-
f9ce-42bd-85a5-398
    remark: Timmins

*
 *  CALIB STANDHYD       0001  1  5.0    1.18    0.11  7.00 137.29 0.71   0.000
    [I%=25.0:S%= 2.00]
*
    ADD [  0001+  0003]  0004  3  5.0    1.25    0.12  7.00 137.75  n/a   0.000
*
 FINISH

================================================================================
=========================
```

Project:	Hidden Ridge Subdivision
File No.:	516655
Date:	Jul-2020
Designed By:	OP
Checked By:	JA
Subject:	Hydrologic Model Schematic

HIDDEN RIDGE SUBDIVISION
PROPOSED HYDROLOGIC MODEL SCHEMATIC



Nashyd	Route Pipe	Duhyd
Standhyd	Route Channel	Diverthyd
Addhyd	Route Reservoir	

Project:	Hidden Ridge Subdivision
File No.:	516655
Date:	Jul-2020
Designed By:	HY
Checked By:	JA
Subject:	Hydrologic Parameters

HIDDEN RIDGE SUBDIVISION (PHASE 1)

PROPOSED CONDITION

Rain Gauge: Township of Uxbridge IDF
100-yr 24hr SCS Rainfall Depth: 119.04 mm

Catchment 201 **Area** 1.12 ha

WEIGHTED CN VALUE																									
Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient Type	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Meadows			Cultivated			Impervious			Wetland/Lakes/SWMF			Average CN for Soil
					Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
FI	FARMINGTON	B	Loam or Silt Loam	2	1.12	1			60	0.83	0.74	69	0		65	0	0	74	0.29	0.26	100	0		50	77.0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	**1.12**	**1**	**0**	**0**		**0.8294**	**0.7405**		**0**	**0**		**0**	**0**		**0.29**	**0.2595**		**0**	**0**		**77.0**
																								CN*(AMC II)	**76.4**
																								CN*(AMC III)	**88.2**

Time of Concentration Calculations

Initial Abstraction	**4.2 mm**

Woods	10
Meadows	8
Cultivated	7
Lawns	5
Impervious	2
Wetland	12

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	256.97	m
Minimum Catchment Elevation	246.34	m
Catchment length	200	m
Catchment Slope	5%	
Catchment Area	1.12	ha
Time of Concentration (Minutes)	**8.07**	
Time of Concentration (Hours)	**0.13**	
Time to Peak (2/3 x Time of Concentration)	**0.09**	

Time to Peak	**0.09 hrs**

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	256.97	m
Minimum Catchment Elevation	246.34	m
Catchment length	200	m
Catchment Slope	5%	
Catchment Area	1.12	ha
Time of Concentration (Minutes)	**15.79**	
Time of Concentration (Hours)	**0.26**	
Time to Peak (2/3 x Time of Concentration)	**0.18**	

Runoff Coefficient	**0.51**

Landuse Type	Soil Series				
	FI	0	0	0	0
	2	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.3	#N/A	#N/A	#N/A	#N/A
Cultivated	0.45	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.35	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.33	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.51	#N/A	#N/A	#N/A	#N/A

Project:	Hidden Ridge Subdivision
File No.:	516655
Date:	Jul-2020
Designed By:	HY
Checked By:	JA
Subject:	Hydrologic Parameters

HIDDEN RIDGE SUBDIVISION (PHASE 1)

PROPOSED CONDITION

Catchment 202 **Area** 0.59 ha

Rain Gauge: Township of Uxbridge IDF
100-yr 24hr SCS Rainfall Depth: 119.04 mm

WEIGHTED CN VALUE

Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient Type	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Meadows			Cultivated			Impervious			Wetland/Lakes/SWMF			Average CN for Soil Type
					Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
FI	FARMINGTON	B	Loam or Silt Loam	2	0.59	1		0	60	0.41	0.70	69	0		65		0	74	0.18	0.30	100		0	50	78.2
	#N/A	#N/A	#N/A	#N/A		0	0		#N/A			#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	**0.59**	**1**	**0**	**0**		**0.4142**	**0.7021**		**0**	**0**		**0**	**0**		**0.18**	**0.2979**		**0**	**0**		**78.2**
																								CN*(AMC II)	**77.8**
																								CN*(AMC III)	**89.0**

Time of Concentration Calculations

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	256.000	m
Minimum Catchment Elevation	249.83	m
Catchment length	174	m
Catchment Slope	4%	
Catchment Area	0.59	ha
Time of Concentration (Minutes)	**8.12**	
Time of Concentration (Hours)	**0.14**	
Time to Peak (2/3 x Time of Concentration)	**0.09**	

Time to Peak	**0.09 hrs**

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	256	m
Minimum Catchment Elevation	249.83	m
Catchment length	174	m
Catchment Slope	4%	
Catchment Area	0.59	ha
Time of Concentration (Minutes)	**17.57**	
Time of Concentration (Hours)	**0.29**	
Time to Peak (2/3 x Time of Concentration)	**0.20**	

Initial Abstraction	**4.1 mm**

Woods	10
Meadows	8
Cultivated	7
Lawns	5
Impervious	2
Wetland	12

Runoff Coefficient	**0.48**

Landuse Type	Soil Series				
	FI	0	0	0	0
	2	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.25	#N/A	#N/A	#N/A	#N/A
Cultivated	0.35	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.28	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.27	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.48	#N/A	#N/A	#N/A	#N/A

Project:	Hidden Ridge Subdivision
File No.:	516655
Date:	Jul-2020
Designed By:	HY
Checked By:	JA
Subject:	Hydrologic Parameters

HIDDEN RIDGE SUBDIVISION (PHASE 1)

PROPOSED CONDITION

Catchment 203 **Area** 1.43 ha

Rain Gauge: Township of Uxbridge IDF
100-yr 24hr SCS Rainfall Depth: 119.04 mm

WEIGHTED CN VALUE

Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient Type	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Meadows			Cultivated			Impervious			Wetland/Lakes/SWMF			Average CN for Soil
					Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
FI	FARMINGTON	B	Loam or Silt Loam	2	1.43	1		0	60	1.35	0.94	69	0		65	0	0	74	0.08	0.06	100	0		50	70.7343
	#N/A	#N/A	#N/A	#N/A					#N/A	0		#N/A	0		#N/A	0		#N/A			#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	**1.43**	**1**	**0**	**0**		**1.35**	**0.9441**		**0**	**0**		**0**	**0**		**0.08**	**0.0559**		**0**	**0**		**70.7**
																								CN*(AMC II)	**69.1**
																								CN*(AMC III)	**83.7**

Time of Concentration Calculations

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	254.250	m
Minimum Catchment Elevation	243.98	m
Catchment length	255	m
Catchment Slope	4%	
Catchment Area	1.43	ha
Time of Concentration (Minutes)	**10.61**	
Time of Concentration (Hours)	**0.18**	
Time to Peak (2/3 x Time of Concentration)	**0.12**	

Time to Peak	**0.29 hrs**

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	254.25	m
Minimum Catchment Elevation	243.98	m
Catchment length	255	m
Catchment Slope	4%	
Catchment Area	1.43	ha
Time of Concentration (Minutes)	**25.72**	
Time of Concentration (Hours)	**0.43**	
Time to Peak (2/3 x Time of Concentration)	**0.29**	

Initial Abstraction	**4.8 mm**

Woods	10
Meadows	8
Cultivated	7
Lawns	5
Impervious	2
Wetland	12

Runoff Coefficient	**0.32**

Landuse Type	Soil Series				
	FI	0	0	0	0
	2	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.25	#N/A	#N/A	#N/A	#N/A
Cultivated	0.35	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.28	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.27	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.32	#N/A	#N/A	#N/A	#N/A

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       V    V   I    SSSSS  U   U    A    L             (v 6.0.2010)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.0\VO2\voin.dat

  Output  filename:
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  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\755
03f7d-bc3d-47ce-a471-1253cdaf2d73\scen


DATE: 07-03-2020                          TIME: 12:31:05

USER:


COMMENTS: _____________________________________________________________


  ***********************************************
  ** SIMULATION : Run 01                       **
  ***********************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                6.0
    [ Ptot=193.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\a191fa3d-1ea5-4707-a9ac-a9e129be1c05\0a563640-
f9ce-42bd-85a5-398
    remark: Timmins

*
 ** CALIB NASHYD         0002  1  5.0    0.07    0.01  7.00 145.47 0.75   0.000
    [CN=82.4         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                6.0
    [ Ptot=193.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\a191fa3d-1ea5-4707-a9ac-a9e129be1c05\0a563640-
f9ce-42bd-85a5-398
    remark: Timmins

*
 *  CALIB STANDHYD       0001  1  5.0    1.12    0.10  7.00 136.48 0.71   0.000
    [I%=26.0:S%= 2.00]
*
    ADD [  0001+  0002]  0005  3  5.0    1.19    0.11  7.00 137.01  n/a   0.000
*
    READ STORM                6.0
    [ Ptot=193.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\a191fa3d-1ea5-4707-a9ac-a9e129be1c05\0a563640-
f9ce-42bd-85a5-398
    remark: Timmins

*
 *  CALIB NASHYD         0004  1  5.0    1.43    0.15  7.00 148.96 0.77   0.000
    [CN=83.7         ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                6.0
    [ Ptot=193.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\a191fa3d-1ea5-4707-a9ac-a9e129be1c05\0a563640-
f9ce-42bd-85a5-398
    remark: Timmins

*
 *  CALIB STANDHYD       0003  1  5.0    0.59    0.06  7.00 139.48 0.72   0.000
    [I%=30.0:S%= 2.00]
*
    ADD [  0003+  0004]  0006  3  5.0    2.02    0.20  7.00 146.19  n/a   0.000
*
 FINISH
```

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================================================================================
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       V    V   I    SSSSS  U   U    A    L             (v 6.0.2010)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\c0e
84c9e-f40f-4039-b2ed-ac335b49e427\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\c0e
84c9e-f40f-4039-b2ed-ac335b49e427\scen


DATE: 07-03-2020                          TIME: 10:19:36

USER:


COMMENTS: _____________________________________________________________


  ***********************************************
  ** SIMULATION : Run 01                       **
  ***********************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                 5.0
```

```
    [ Ptot= 25.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\db5f4eda-
dac5-4479-bde6-c60
    remark: 25mm

*
 *  CALIB STANDHYD       0011  1  5.0    0.59    0.04  1.33   9.26 0.37   0.000
    [I%=30.0:S%= 2.00]
*
    READ STORM                 5.0
    [ Ptot= 25.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\db5f4eda-
dac5-4479-bde6-c60
    remark: 25mm

*
 *  CALIB NASHYD         0012  1  5.0    1.43    0.01  1.75   3.05 0.12   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    ADD [  0011+  0012]  0003  3  5.0    2.02    0.04  1.33   4.86  n/a   0.000
*
    READ STORM                 5.0
    [ Ptot= 25.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\db5f4eda-
dac5-4479-bde6-c60
    remark: 25mm

*
 *  CALIB NASHYD         0007  1  5.0    1.43    0.01  1.75   3.05 0.12   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                 5.0
    [ Ptot= 25.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\db5f4eda-
dac5-4479-bde6-c60
    remark: 25mm

*
 *  CALIB STANDHYD       0002  1  5.0    0.59    0.04  1.33   9.26 0.37   0.000
    [I%=30.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0001  1  5.0    0.59    0.01  1.50   9.22  n/a   0.000
*
```

```
    ADD [  0001+  0007]  0004  3  5.0    2.02    0.02  1.58   4.85  n/a   0.000
*
    READ STORM                 5.0
    [ Ptot= 25.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\db5f4eda-
dac5-4479-bde6-c60
    remark: 25mm

*
 *  CALIB NASHYD         0005  1  5.0    0.07    0.00  1.58   2.74 0.11   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                 5.0
    [ Ptot= 25.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\db5f4eda-
dac5-4479-bde6-c60
    remark: 25mm

*
 *  CALIB STANDHYD       0008  1  5.0    1.12    0.06  1.33   8.43 0.34   0.000
    [I%=26.0:S%= 2.00]
*
    ADD [  0005+  0008]  0010  3  5.0    1.19    0.06  1.33   8.10  n/a   0.000
*
================================================================================
=========================


       V    V   I    SSSSS  U   U    A    L             (v 6.0.2010)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.0\VO2\voin.dat
  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\ffc
4e61d-56dc-49d1-b518-c777bf53ce50\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\ffc
4e61d-56dc-49d1-b518-c777bf53ce50\scen


DATE: 07-03-2020                          TIME: 10:19:36

USER:


COMMENTS: _____________________________________________________________


  ************************************************
  ** SIMULATION : Run 02                        **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                   min     ha   '  cms   hrs     mm          cms

     START @  0.00 hrs
     --------------------
    READ STORM                 10.0
    [ Ptot= 34.17 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\9c1bb5f6-
66a1-4ac7-a118-06a
    remark: 2yr 4hr CHI

*
 *  CALIB STANDHYD       0011  1  5.0    0.59    0.04  1.33  14.09 0.41   0.000
    [I%=30.0:S%= 2.00]
*
    READ STORM                 10.0
    [ Ptot= 34.17 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\9c1bb5f6-
66a1-4ac7-a118-06a
    remark: 2yr 4hr CHI

*
 *  CALIB NASHYD         0012  1  5.0    1.43    0.02  1.67   6.03 0.18   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    ADD [  0011+  0012]  0003  3  5.0    2.02    0.04  1.33   8.38  n/a   0.000
```

```
*
    READ STORM                 10.0
    [ Ptot= 34.17 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\9c1bb5f6-
66a1-4ac7-a118-06a
    remark: 2yr 4hr CHI

*
 *  CALIB NASHYD         0007  1  5.0    1.43    0.02  1.67   6.03 0.18   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                 10.0
    [ Ptot= 34.17 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\9c1bb5f6-
66a1-4ac7-a118-06a
    remark: 2yr 4hr CHI

*
 *  CALIB STANDHYD       0002  1  5.0    0.59    0.04  1.33  14.09 0.41   0.000
    [I%=30.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0001  1  5.0    0.59    0.02  1.42  14.04  n/a   0.000
*
    ADD [  0001+  0007]  0004  3  5.0    2.02    0.03  1.58   8.37  n/a   0.000
*
    READ STORM                 10.0
    [ Ptot= 34.17 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\9c1bb5f6-
66a1-4ac7-a118-06a
    remark: 2yr 4hr CHI

*
 *  CALIB NASHYD         0005  1  5.0    0.07    0.00  1.50   5.49 0.16   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                 10.0
    [ Ptot= 34.17 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\9c1bb5f6-
66a1-4ac7-a118-06a
    remark: 2yr 4hr CHI

*
 *  CALIB STANDHYD       0008  1  5.0    1.12    0.06  1.33  13.00 0.38   0.000
    [I%=26.0:S%= 2.00]
*
    ADD [  0005+  0008]  0010  3  5.0    1.19    0.06  1.33  12.56  n/a   0.000
*
================================================================================
========================


       V    V   I    SSSSS  U   U    A    L              (v 6.0.2010)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\6d5
cba00-615f-4130-8273-86be1e299f43\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\6d5
cba00-615f-4130-8273-86be1e299f43\scen


DATE: 07-03-2020                          TIME: 10:19:36

USER:


COMMENTS: _____________________________________________________________


  ************************************************
  ** SIMULATION : Run 03                         **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms
```

```
      START @  0.00 hrs
      --------------------
    READ STORM                 10.0
    [ Ptot= 47.36 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\e4053b51-
dfb0-41ff-9bfe-37d
    remark: 5yr 4hr CHI

*
 *  CALIB STANDHYD       0011  1  5.0    0.59    0.06  1.33  21.92 0.46   0.000
    [I%=30.0:S%= 2.00]
*
    READ STORM                 10.0
    [ Ptot= 47.36 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\e4053b51-
dfb0-41ff-9bfe-37d
    remark: 5yr 4hr CHI

*
 *  CALIB NASHYD         0012  1  5.0    1.43    0.04  1.67  11.60 0.24   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    ADD [  0011+  0012]  0003  3  5.0    2.02    0.07  1.33  14.61  n/a   0.000
*
    READ STORM                 10.0
    [ Ptot= 47.36 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\e4053b51-
dfb0-41ff-9bfe-37d
    remark: 5yr 4hr CHI

*
 *  CALIB NASHYD         0007  1  5.0    1.43    0.04  1.67  11.60 0.24   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                 10.0
    [ Ptot= 47.36 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\e4053b51-
dfb0-41ff-9bfe-37d
    remark: 5yr 4hr CHI

*
 *  CALIB STANDHYD       0002  1  5.0    0.59    0.06  1.33  21.92 0.46   0.000
    [I%=30.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0001  1  5.0    0.59    0.04  1.42  21.88  n/a   0.000
*
    ADD [  0001+  0007]  0004  3  5.0    2.02    0.06  1.42  14.60  n/a   0.000
*
    READ STORM                 10.0
    [ Ptot= 47.36 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\e4053b51-
dfb0-41ff-9bfe-37d
    remark: 5yr 4hr CHI

*
 *  CALIB NASHYD         0005  1  5.0    0.07    0.00  1.50  10.68 0.23   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                 10.0
    [ Ptot= 47.36 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\e4053b51-
dfb0-41ff-9bfe-37d
    remark: 5yr 4hr CHI

*
 *  CALIB STANDHYD       0008  1  5.0    1.12    0.09  1.33  20.53 0.43   0.000
    [I%=26.0:S%= 2.00]
*
    ADD [  0005+  0008]  0010  3  5.0    1.19    0.09  1.33  19.95  n/a   0.000
*
================================================================================
=========================


       V    V   I    SSSSS  U   U    A    L              (v 6.0.2010)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```

```
                ***** S U M M A R Y   O U T P U T *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\c83
75f72-4e89-4010-8417-4ab31e56d60d\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\c83
75f72-4e89-4010-8417-4ab31e56d60d\scen


DATE: 07-03-2020                          TIME: 10:19:36

USER:


COMMENTS: _____________________________________________________


  ************************************************
  ** SIMULATION : Run 04                        **
  ************************************************

  W/E COMMAND            HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                 min     ha   '  cms   hrs     mm          cms

     START @  0.00 hrs
     --------------------
    READ STORM                10.0
    [ Ptot= 55.80 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\6d0b5a5e-
5c8e-4ccb-aa01-28e
    remark: 10yr 4hr CHI

*
 *  CALIB STANDHYD       0011  1  5.0    0.59    0.07  1.33  27.38 0.49   0.000
    [I%=30.0:S%= 2.00]
*
    READ STORM                10.0
    [ Ptot= 55.80 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\6d0b5a5e-
5c8e-4ccb-aa01-28e
    remark: 10yr 4hr CHI

*
 *  CALIB NASHYD         0012  1  5.0    1.43    0.05  1.67  15.79 0.28   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    ADD [  0011+  0012]  0003  3  5.0    2.02    0.09  1.33  19.18  n/a   0.000
*
    READ STORM                10.0
    [ Ptot= 55.80 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\6d0b5a5e-
5c8e-4ccb-aa01-28e
    remark: 10yr 4hr CHI

*
 *  CALIB NASHYD         0007  1  5.0    1.43    0.05  1.67  15.79 0.28   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                10.0
    [ Ptot= 55.80 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\6d0b5a5e-
5c8e-4ccb-aa01-28e
    remark: 10yr 4hr CHI

*
 *  CALIB STANDHYD       0002  1  5.0    0.59    0.07  1.33  27.38 0.49   0.000
    [I%=30.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0001  1  5.0    0.59    0.05  1.42  27.33  n/a   0.000
*
    ADD [  0001+  0007]  0004  3  5.0    2.02    0.09  1.42  19.16  n/a   0.000
*
    READ STORM                10.0
    [ Ptot= 55.80 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\6d0b5a5e-
5c8e-4ccb-aa01-28e
    remark: 10yr 4hr CHI

*
 *  CALIB NASHYD         0005  1  5.0    0.07    0.00  1.50  14.62 0.26   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                10.0
    [ Ptot= 55.80 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\6d0b5a5e-
5c8e-4ccb-aa01-28e
```

```
    remark: 10yr 4hr CHI

*
 *  CALIB STANDHYD       0008  1  5.0    1.12    0.12  1.33  25.82 0.46   0.000
    [I%=26.0:S%= 2.00]
*
    ADD [  0005+  0008]  0010  3  5.0    1.19    0.12  1.33  25.16  n/a   0.000
*
================================================================================
========================


       V    V   I    SSSSS  U   U    A    L             (v 6.0.2010)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\e06
850e4-6d44-46c7-ada4-40aef90efc51\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\e06
850e4-6d44-46c7-ada4-40aef90efc51\scen


DATE: 07-03-2020                          TIME: 10:19:36

USER:


COMMENTS: _____________________________________________________________


  ************************************************
  ** SIMULATION : Run 05                        **
```

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

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                 10.0
    [ Ptot= 65.22 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\58795a66-
57fa-4c18-9d5b-c76
    remark: 25yr 4hr CHI

*
 *  CALIB STANDHYD       0011  1  5.0    0.59    0.09  1.33  33.81 0.52   0.000
    [I%=30.0:S%= 2.00]
*
    READ STORM                 10.0
    [ Ptot= 65.22 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\58795a66-
57fa-4c18-9d5b-c76
    remark: 25yr 4hr CHI

*
 *  CALIB NASHYD         0012  1  5.0    1.43    0.07  1.58  20.97 0.32   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    ADD [  0011+  0012]  0003  3  5.0    2.02    0.12  1.33  24.72  n/a   0.000
*
    READ STORM                 10.0
    [ Ptot= 65.22 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\58795a66-
57fa-4c18-9d5b-c76
    remark: 25yr 4hr CHI

*
 *  CALIB NASHYD         0007  1  5.0    1.43    0.07  1.58  20.97 0.32   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                 10.0
    [ Ptot= 65.22 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\58795a66-
57fa-4c18-9d5b-c76
    remark: 25yr 4hr CHI
```

```
*
 *  CALIB STANDHYD       0002  1  5.0    0.59    0.09  1.33  33.81 0.52   0.000
    [I%=30.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0001  1  5.0    0.59    0.08  1.33  33.76  n/a   0.000
*
    ADD [  0001+  0007]  0004  3  5.0    2.02    0.12  1.42  24.71  n/a   0.000
*
    READ STORM                10.0
    [ Ptot= 65.22 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\58795a66-
57fa-4c18-9d5b-c76
    remark: 25yr 4hr CHI

*
 *  CALIB NASHYD         0005  1  5.0    0.07    0.00  1.50  19.50 0.30   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                10.0
    [ Ptot= 65.22 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\58795a66-
57fa-4c18-9d5b-c76
    remark: 25yr 4hr CHI

*
 *  CALIB STANDHYD       0008  1  5.0    1.12    0.15  1.33  32.08 0.49   0.000
    [I%=26.0:S%= 2.00]
*
    ADD [  0005+  0008]  0010  3  5.0    1.19    0.15  1.33  31.34  n/a   0.000
*
================================================================================
========================


       V    V   I    SSSSS  U   U    A    L             (v 6.0.2010)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```



```
                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\5cc
a0253-69e8-4df4-8abe-f9a8502fe96a\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\5cc
a0253-69e8-4df4-8abe-f9a8502fe96a\scen


DATE: 07-03-2020                          TIME: 10:19:36

USER:


COMMENTS: _____________________________________________________________


  ************************************************
  ** SIMULATION : Run 06                        **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha    '  cms   hrs     mm          cms

     START @  0.00 hrs
     --------------------
    READ STORM                10.0
    [ Ptot= 83.51 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\9c520b38-
f138-47d6-a306-442
    remark: 100yr 4hr CHI

*
 *  CALIB STANDHYD       0011  1  5.0    0.59    0.14  1.33  47.14 0.56   0.000
    [I%=30.0:S%= 2.00]
*
    READ STORM                10.0
    [ Ptot= 83.51 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\9c520b38-
f138-47d6-a306-442
```

```
    remark: 100yr 4hr CHI

*
 *  CALIB NASHYD         0012  1  5.0    1.43    0.12  1.58  32.20 0.39   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    ADD [  0011+  0012]  0003  3  5.0    2.02    0.19  1.33  36.57  n/a   0.000
*
    READ STORM                10.0
    [ Ptot= 83.51 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\9c520b38-
f138-47d6-a306-442
    remark: 100yr 4hr CHI

*
 *  CALIB NASHYD         0007  1  5.0    1.43    0.12  1.58  32.20 0.39   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                10.0
    [ Ptot= 83.51 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\9c520b38-
f138-47d6-a306-442
    remark: 100yr 4hr CHI

*
 *  CALIB STANDHYD       0002  1  5.0    0.59    0.14  1.33  47.14 0.56   0.000
    [I%=30.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0001  1  5.0    0.59    0.13  1.33  47.10  n/a   0.000
*
    ADD [  0001+  0007]  0004  3  5.0    2.02    0.19  1.42  36.55  n/a   0.000
*
    READ STORM                10.0
    [ Ptot= 83.51 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\9c520b38-
f138-47d6-a306-442
    remark: 100yr 4hr CHI

*
 *  CALIB NASHYD         0005  1  5.0    0.07    0.01  1.50  30.18 0.36   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                10.0
    [ Ptot= 83.51 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\9c520b38-
f138-47d6-a306-442
    remark: 100yr 4hr CHI

*
 *  CALIB STANDHYD       0008  1  5.0    1.12    0.24  1.33  45.12 0.54   0.000
    [I%=26.0:S%= 2.00]
*
    ADD [  0005+  0008]  0010  3  5.0    1.19    0.24  1.33  44.24  n/a   0.000
*
================================================================================
=========================


       V    V   I    SSSSS  U   U    A    L              (v 6.0.2010)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\47d
63840-48d8-4092-8479-6e19f6fa687b\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\47d
63840-48d8-4092-8479-6e19f6fa687b\scen


DATE: 07-03-2020                          TIME: 10:19:37

USER:


COMMENTS: _____________________________________________________________
```

```
  ***********************************************
  ** SIMULATION : Run 07                       **
  ***********************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                 5.0
    [ Ptot= 43.70 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\f154648f-
d6dc-42fd-b206-8a9
    remark: 2yr 12hr SCS

*
 *  CALIB STANDHYD       0011  1  5.0    0.59    0.03  6.08  19.65 0.45   0.000
    [I%=30.0:S%= 2.00]
*
    READ STORM                 5.0
    [ Ptot= 43.70 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\f154648f-
d6dc-42fd-b206-8a9
    remark: 2yr 12hr SCS

*
 *  CALIB NASHYD         0012  1  5.0    1.43    0.03  6.25   9.92 0.23   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    ADD [  0011+  0012]  0003  3  5.0    2.02    0.06  6.08  12.76  n/a   0.000
*
    READ STORM                 5.0
    [ Ptot= 43.70 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\f154648f-
d6dc-42fd-b206-8a9
    remark: 2yr 12hr SCS

*
 *  CALIB NASHYD         0007  1  5.0    1.43    0.03  6.25   9.92 0.23   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                 5.0
    [ Ptot= 43.70 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\f154648f-
d6dc-42fd-b206-8a9
    remark: 2yr 12hr SCS

*
 *  CALIB STANDHYD       0002  1  5.0    0.59    0.03  6.08  19.65 0.45   0.000
    [I%=30.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0001  1  5.0    0.59    0.02  6.17  19.61  n/a   0.000
*
    ADD [  0001+  0007]  0004  3  5.0    2.02    0.05  6.17  12.75  n/a   0.000
*
    READ STORM                 5.0
    [ Ptot= 43.70 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\f154648f-
d6dc-42fd-b206-8a9
    remark: 2yr 12hr SCS

*
 *  CALIB NASHYD         0005  1  5.0    0.07    0.00  6.17   9.11 0.21   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                 5.0
    [ Ptot= 43.70 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\f154648f-
d6dc-42fd-b206-8a9
    remark: 2yr 12hr SCS

*
 *  CALIB STANDHYD       0008  1  5.0    1.12    0.06  6.08  18.34 0.42   0.000
    [I%=26.0:S%= 2.00]
*
    ADD [  0005+  0008]  0010  3  5.0    1.19    0.06  6.08  17.80  n/a   0.000
*
================================================================================
========================


       V    V   I    SSSSS  U   U    A    L              (v 6.0.2010)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
```

```
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\0a8
93649-0824-417f-ba41-5cbff3a2f202\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\0a8
93649-0824-417f-ba41-5cbff3a2f202\scen


DATE: 07-03-2020                          TIME: 10:19:36

USER:


COMMENTS: _____________________________________________________________


  ************************************************
  ** SIMULATION : Run 08                        **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                  5.0
    [ Ptot= 60.50 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\af1dd4e8-
0e28-4a0e-81e8-9cb
    remark: 5yr 12hr SCS

*
 *  CALIB STANDHYD       0011  1  5.0    0.59    0.06  6.08  30.55 0.50   0.000
    [I%=30.0:S%= 2.00]
*
    READ STORM                  5.0
    [ Ptot= 60.50 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\af1dd4e8-
0e28-4a0e-81e8-9cb
    remark: 5yr 12hr SCS

*
 *  CALIB NASHYD         0012  1  5.0    1.43    0.06  6.25  18.32 0.30   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    ADD [  0011+  0012]  0003  3  5.0    2.02    0.10  6.08  21.89  n/a   0.000
*
    READ STORM                  5.0
    [ Ptot= 60.50 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\af1dd4e8-
0e28-4a0e-81e8-9cb
    remark: 5yr 12hr SCS

*
 *  CALIB NASHYD         0007  1  5.0    1.43    0.06  6.25  18.32 0.30   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                  5.0
    [ Ptot= 60.50 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\af1dd4e8-
0e28-4a0e-81e8-9cb
    remark: 5yr 12hr SCS

*
 *  CALIB STANDHYD       0002  1  5.0    0.59    0.06  6.08  30.55 0.50   0.000
    [I%=30.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0001  1  5.0    0.59    0.05  6.08  30.50  n/a   0.000
*
    ADD [  0001+  0007]  0004  3  5.0    2.02    0.10  6.08  21.88  n/a   0.000
*
    READ STORM                  5.0
    [ Ptot= 60.50 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\af1dd4e8-
0e28-4a0e-81e8-9cb
    remark: 5yr 12hr SCS

*
 *  CALIB NASHYD         0005  1  5.0    0.07    0.00  6.17  17.00 0.28   0.000
```

```
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                 5.0
    [ Ptot= 60.50 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\af1dd4e8-
0e28-4a0e-81e8-9cb
    remark: 5yr 12hr SCS

*
 *  CALIB STANDHYD       0008  1  5.0    1.12    0.10  6.08  28.90 0.48   0.000
    [I%=26.0:S%= 2.00]
*
    ADD [  0005+  0008]  0010  3  5.0    1.19    0.10  6.08  28.20  n/a   0.000
*
================================================================================
========================


       V    V   I    SSSSS  U   U    A    L             (v 6.0.2010)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\15f
4a000-fa7e-4a60-937b-a763cc3ee8e7\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\15f
4a000-fa7e-4a60-937b-a763cc3ee8e7\scen


DATE: 07-03-2020                          TIME: 10:19:36
```

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USER:


COMMENTS: _____________________________________________________


  ************************************************
  ** SIMULATION : Run 09                        **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                    min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                 5.0
    [ Ptot= 71.20 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\3e87cb3c-
c368-4709-82bb-904
    remark: 10yr 12hr SCS

*
 *  CALIB STANDHYD       0011  1  5.0    0.59    0.07  6.08  38.06 0.53   0.000
    [I%=30.0:S%= 2.00]
*
    READ STORM                 5.0
    [ Ptot= 71.20 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\3e87cb3c-
c368-4709-82bb-904
    remark: 10yr 12hr SCS

*
 *  CALIB NASHYD         0012  1  5.0    1.43    0.08  6.25  24.49 0.34   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    ADD [  0011+  0012]  0003  3  5.0    2.02    0.13  6.08  28.45  n/a   0.000
*
    READ STORM                 5.0
    [ Ptot= 71.20 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\3e87cb3c-
c368-4709-82bb-904
    remark: 10yr 12hr SCS

*
 *  CALIB NASHYD         0007  1  5.0    1.43    0.08  6.25  24.49 0.34   0.000
    [CN=69.1         ]
```

```
    [ N = 3.0:Tp 0.29]
*
    READ STORM                  5.0
    [ Ptot= 71.20 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\3e87cb3c-
c368-4709-82bb-904
    remark: 10yr 12hr SCS

*
 *  CALIB STANDHYD       0002  1  5.0    0.59    0.07  6.08  38.06 0.53   0.000
    [I%=30.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0001  1  5.0    0.59    0.07  6.08  38.01  n/a   0.000
*
    ADD [  0001+  0007]  0004  3  5.0    2.02    0.13  6.17  28.44  n/a   0.000
*
    READ STORM                  5.0
    [ Ptot= 71.20 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\3e87cb3c-
c368-4709-82bb-904
    remark: 10yr 12hr SCS

*
 *  CALIB NASHYD         0005  1  5.0    0.07    0.00  6.17  22.83 0.32   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                  5.0
    [ Ptot= 71.20 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\3e87cb3c-
c368-4709-82bb-904
    remark: 10yr 12hr SCS

*
 *  CALIB STANDHYD       0008  1  5.0    1.12    0.12  6.08  36.23 0.51   0.000
    [I%=26.0:S%= 2.00]
*
    ADD [  0005+  0008]  0010  3  5.0    1.19    0.13  6.08  35.44  n/a   0.000
*
================================================================================
========================


       V    V   I    SSSSS  U   U    A    L             (v 6.0.2010)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
```

```
       V  V    I      SS   U   U  A   A  L
        VV     I    SSSSS  UUUUU  A   A  LLLLL

       OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
      O   O    T      T    H   H   Y Y   MM MM  O   O
      O   O    T      T    H   H    Y    M   M  O   O
       OOO     T      T    H   H    Y    M   M   OOO
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                *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\026
7e1f7-365a-46de-b120-b820e16ad2bc\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\026
7e1f7-365a-46de-b120-b820e16ad2bc\scen


DATE: 07-03-2020                          TIME: 10:19:36

USER:


COMMENTS: _____________________________________________________________


  ************************************************
  ** SIMULATION : Run 10                         **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                   min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                  5.0
    [ Ptot= 83.80 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\6d7aa051-
e460-4620-9151-71c
    remark: 25yr 12hr SCS

*
```

```
 *  CALIB STANDHYD       0011  1  5.0    0.59    0.09  6.08  47.36 0.57   0.000
    [I%=30.0:S%= 2.00]
*
    READ STORM                 5.0
    [ Ptot= 83.80 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\6d7aa051-
e460-4620-9151-71c
    remark: 25yr 12hr SCS

*
 *  CALIB NASHYD         0012  1  5.0    1.43    0.11  6.25  32.39 0.39   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    ADD [  0011+  0012]  0003  3  5.0    2.02    0.17  6.08  36.76  n/a   0.000
*
    READ STORM                 5.0
    [ Ptot= 83.80 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\6d7aa051-
e460-4620-9151-71c
    remark: 25yr 12hr SCS

*
 *  CALIB NASHYD         0007  1  5.0    1.43    0.11  6.25  32.39 0.39   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                 5.0
    [ Ptot= 83.80 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\6d7aa051-
e460-4620-9151-71c
    remark: 25yr 12hr SCS

*
 *  CALIB STANDHYD       0002  1  5.0    0.59    0.09  6.08  47.36 0.57   0.000
    [I%=30.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0001  1  5.0    0.59    0.08  6.08  47.32  n/a   0.000
*
    ADD [  0001+  0007]  0004  3  5.0    2.02    0.17  6.17  36.75  n/a   0.000
*
    READ STORM                 5.0
    [ Ptot= 83.80 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\6d7aa051-
e460-4620-9151-71c
    remark: 25yr 12hr SCS

*
 *  CALIB NASHYD         0005  1  5.0    0.07    0.01  6.17  30.36 0.36   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                 5.0
    [ Ptot= 83.80 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\6d7aa051-
e460-4620-9151-71c
    remark: 25yr 12hr SCS

*
 *  CALIB STANDHYD       0008  1  5.0    1.12    0.16  6.08  45.34 0.54   0.000
    [I%=26.0:S%= 2.00]
*
    ADD [  0005+  0008]  0010  3  5.0    1.19    0.16  6.08  44.46  n/a   0.000
*
================================================================================
=========================


       V    V   I    SSSSS  U   U    A    L              (v 6.0.2010)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\ca3
3b8f7-f136-421d-baf6-826661c2577a\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\ca3
3b8f7-f136-421d-baf6-826661c2577a\scen
```

```
DATE: 07-03-2020                          TIME: 10:19:37

USER:


COMMENTS: _____________________________________________________


  ***********************************************
  ** SIMULATION : Run 11                       **
  ***********************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

     START @  0.00 hrs
     --------------------
    READ STORM                 5.0
    [ Ptot=104.10 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\7b117713-
0d86-4039-a916-18a
    remark: 100yr 12hr SCS

*
 *  CALIB STANDHYD       0011  1  5.0    0.59    0.13  6.08  63.16 0.61   0.000
    [I%=30.0:S%= 2.00]
*
    READ STORM                 5.0
    [ Ptot=104.10 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\7b117713-
0d86-4039-a916-18a
    remark: 100yr 12hr SCS

*
 *  CALIB NASHYD         0012  1  5.0    1.43    0.15  6.25  46.30 0.44   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    ADD [  0011+  0012]  0003  3  5.0    2.02    0.25  6.08  51.22  n/a   0.000
*
    READ STORM                 5.0
    [ Ptot=104.10 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\7b117713-
0d86-4039-a916-18a
    remark: 100yr 12hr SCS

*
 *  CALIB NASHYD         0007  1  5.0    1.43    0.15  6.25  46.30 0.44   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                 5.0
    [ Ptot=104.10 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\7b117713-
0d86-4039-a916-18a
    remark: 100yr 12hr SCS

*
 *  CALIB STANDHYD       0002  1  5.0    0.59    0.13  6.08  63.16 0.61   0.000
    [I%=30.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0001  1  5.0    0.59    0.12  6.08  63.12  n/a   0.000
*
    ADD [  0001+  0007]  0004  3  5.0    2.02    0.25  6.17  51.21  n/a   0.000
*
    READ STORM                 5.0
    [ Ptot=104.10 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\7b117713-
0d86-4039-a916-18a
    remark: 100yr 12hr SCS

*
 *  CALIB NASHYD         0005  1  5.0    0.07    0.01  6.17  43.67 0.42   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                 5.0
    [ Ptot=104.10 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\7b117713-
0d86-4039-a916-18a
    remark: 100yr 12hr SCS

*
 *  CALIB STANDHYD       0008  1  5.0    1.12    0.23  6.08  60.88 0.58   0.000
    [I%=26.0:S%= 2.00]
*
    ADD [  0005+  0008]  0010  3  5.0    1.19    0.24  6.08  59.87  n/a   0.000
*
================================================================================
========================
```

```
       V    V   I    SSSSS  U   U    A    L              (v 6.0.2010)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\a1e
2df38-35d5-43f0-b162-6248d4015aae\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\a1e
2df38-35d5-43f0-b162-6248d4015aae\scen


DATE: 07-03-2020                          TIME: 10:19:37

USER:


COMMENTS: _____________________________________________________


  ************************************************
  ** SIMULATION : Run 12                         **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                15.0
    [ Ptot= 50.73 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\f16d20f6-
7be4-410f-bac3-a28
    remark: 2yr 24hr SCS

*
 *  CALIB STANDHYD       0011  1  5.0    0.59    0.04 12.00  24.06 0.47   0.000
    [I%=30.0:S%= 2.00]
*
    READ STORM                15.0
    [ Ptot= 50.73 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\f16d20f6-
7be4-410f-bac3-a28
    remark: 2yr 24hr SCS

*
 *  CALIB NASHYD         0012  1  5.0    1.43    0.04 12.17  13.22 0.26   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    ADD [  0011+  0012]  0003  3  5.0    2.02    0.06 12.00  16.38  n/a   0.000
*
    READ STORM                15.0
    [ Ptot= 50.73 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\f16d20f6-
7be4-410f-bac3-a28
    remark: 2yr 24hr SCS

*
 *  CALIB NASHYD         0007  1  5.0    1.43    0.04 12.17  13.22 0.26   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                15.0
    [ Ptot= 50.73 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\f16d20f6-
7be4-410f-bac3-a28
    remark: 2yr 24hr SCS

*
 *  CALIB STANDHYD       0002  1  5.0    0.59    0.04 12.00  24.06 0.47   0.000
    [I%=30.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0001  1  5.0    0.59    0.03 12.08  24.01  n/a   0.000
*
    ADD [  0001+  0007]  0004  3  5.0    2.02    0.06 12.08  16.37  n/a   0.000
*
    READ STORM                15.0
```

```
    [ Ptot= 50.73 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\f16d20f6-
7be4-410f-bac3-a28
    remark: 2yr 24hr SCS

*
 *  CALIB NASHYD         0005  1  5.0    0.07    0.00 12.08  12.20 0.24   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                 15.0
    [ Ptot= 50.73 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\f16d20f6-
7be4-410f-bac3-a28
    remark: 2yr 24hr SCS

*
 *  CALIB STANDHYD       0008  1  5.0    1.12    0.06 12.00  22.60 0.45   0.000
    [I%=26.0:S%= 2.00]
*
    ADD [  0005+  0008]  0010  3  5.0    1.19    0.07 12.00  21.99  n/a   0.000
*
================================================================================
========================


       V    V   I    SSSSS  U   U    A    L             (v 6.0.2010)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\2e8
d4f36-f03a-48c4-aa10-6c1ab5454782\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\2e8
d4f36-f03a-48c4-aa10-6c1ab5454782\scen


DATE: 07-03-2020                          TIME: 10:19:36

USER:


COMMENTS: _____________________________________________________


  ************************************************
  ** SIMULATION : Run 13                        **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

     START @  0.00 hrs
     --------------------
    READ STORM                 15.0
    [ Ptot= 70.11 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\62e099ad-
7b0a-44a0-927c-76f
    remark: 5yr 24hr SCS

*
 *  CALIB STANDHYD       0011  1  5.0    0.59    0.06 12.00  37.27 0.53   0.000
    [I%=30.0:S%= 2.00]
*
    READ STORM                 15.0
    [ Ptot= 70.11 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\62e099ad-
7b0a-44a0-927c-76f
    remark: 5yr 24hr SCS

*
 *  CALIB NASHYD         0012  1  5.0    1.43    0.07 12.17  23.83 0.34   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    ADD [  0011+  0012]  0003  3  5.0    2.02    0.11 12.00  27.76  n/a   0.000
*
    READ STORM                 15.0
    [ Ptot= 70.11 mm ]
```

```
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\62e099ad-
7b0a-44a0-927c-76f
    remark: 5yr 24hr SCS

*
 *  CALIB NASHYD         0007  1  5.0    1.43    0.07 12.17  23.83 0.34   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                 15.0
    [ Ptot= 70.11 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\62e099ad-
7b0a-44a0-927c-76f
    remark: 5yr 24hr SCS

*
 *  CALIB STANDHYD       0002  1  5.0    0.59    0.06 12.00  37.27 0.53   0.000
    [I%=30.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0001  1  5.0    0.59    0.06 12.00  37.23  n/a   0.000
*
    ADD [  0001+  0007]  0004  3  5.0    2.02    0.11 12.08  27.75  n/a   0.000
*
    READ STORM                 15.0
    [ Ptot= 70.11 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\62e099ad-
7b0a-44a0-927c-76f
    remark: 5yr 24hr SCS

*
 *  CALIB NASHYD         0005  1  5.0    0.07    0.00 12.08  22.22 0.32   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                 15.0
    [ Ptot= 70.11 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\62e099ad-
7b0a-44a0-927c-76f
    remark: 5yr 24hr SCS

*
 *  CALIB STANDHYD       0008  1  5.0    1.12    0.11 12.00  35.46 0.51   0.000
    [I%=26.0:S%= 2.00]
*
    ADD [  0005+  0008]  0010  3  5.0    1.19    0.11 12.00  34.68  n/a   0.000
```

```
*
================================================================================
=========================


       V    V   I    SSSSS  U   U    A    L             (v 6.0.2010)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\475
0a5f1-2b3e-4bff-af0f-81a214636f9f\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\475
0a5f1-2b3e-4bff-af0f-81a214636f9f\scen


DATE: 07-03-2020                          TIME: 10:19:36

USER:


COMMENTS: _____________________________________________________


  ************************************************
  ** SIMULATION : Run 14                         **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
```

```
    READ STORM                15.0
    [ Ptot= 82.55 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\76727b81-
65ef-4036-af3e-cc2
    remark: 10yr 24hr SCS

*
 *  CALIB STANDHYD       0011  1  5.0    0.59    0.08 12.00  46.42 0.56   0.000
    [I%=30.0:S%= 2.00]
*
    READ STORM                15.0
    [ Ptot= 82.55 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\76727b81-
65ef-4036-af3e-cc2
    remark: 10yr 24hr SCS

*
 *  CALIB NASHYD         0012  1  5.0    1.43    0.09 12.17  31.58 0.38   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    ADD [  0011+  0012]  0003  3  5.0    2.02    0.14 12.00  35.91  n/a   0.000
*
    READ STORM                15.0
    [ Ptot= 82.55 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\76727b81-
65ef-4036-af3e-cc2
    remark: 10yr 24hr SCS

*
 *  CALIB NASHYD         0007  1  5.0    1.43    0.09 12.17  31.58 0.38   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                15.0
    [ Ptot= 82.55 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\76727b81-
65ef-4036-af3e-cc2
    remark: 10yr 24hr SCS

*
 *  CALIB STANDHYD       0002  1  5.0    0.59    0.08 12.00  46.42 0.56   0.000
    [I%=30.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0001  1  5.0    0.59    0.07 12.00  46.38  n/a   0.000
*
    ADD [  0001+  0007]  0004  3  5.0    2.02    0.14 12.08  35.90  n/a   0.000
*
    READ STORM                15.0
    [ Ptot= 82.55 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\76727b81-
65ef-4036-af3e-cc2
    remark: 10yr 24hr SCS

*
 *  CALIB NASHYD         0005  1  5.0    0.07    0.01 12.08  29.59 0.36   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                15.0
    [ Ptot= 82.55 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\76727b81-
65ef-4036-af3e-cc2
    remark: 10yr 24hr SCS

*
 *  CALIB STANDHYD       0008  1  5.0    1.12    0.14 12.00  44.42 0.54   0.000
    [I%=26.0:S%= 2.00]
*
    ADD [  0005+  0008]  0010  3  5.0    1.19    0.14 12.00  43.54  n/a   0.000
*
================================================================================
========================


       V    V   I    SSSSS  U   U    A    L              (v 6.0.2010)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****
```

```
  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\982
8f700-3538-4e6b-936f-09e1611ec7ac\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\982
8f700-3538-4e6b-936f-09e1611ec7ac\scen


DATE: 07-03-2020                          TIME: 10:19:37

USER:


COMMENTS: _____________________________________________________________


  ************************************************
  ** SIMULATION : Run 15                         **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                15.0
    [ Ptot= 96.19 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\7fc6ee65-
9b89-4625-8cea-56b
    remark: 25yr 24hr SCS

*
 *  CALIB STANDHYD       0011  1  5.0    0.59    0.10 12.00  56.90 0.59   0.000
    [I%=30.0:S%= 2.00]
*
    READ STORM                15.0
    [ Ptot= 96.19 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\7fc6ee65-
9b89-4625-8cea-56b
    remark: 25yr 24hr SCS

*
 *  CALIB NASHYD         0012  1  5.0    1.43    0.12 12.17  40.73 0.42   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    ADD [  0011+  0012]  0003  3  5.0    2.02    0.18 12.00  45.45  n/a   0.000
*
    READ STORM                15.0
    [ Ptot= 96.19 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\7fc6ee65-
9b89-4625-8cea-56b
    remark: 25yr 24hr SCS

*
 *  CALIB NASHYD         0007  1  5.0    1.43    0.12 12.17  40.73 0.42   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                15.0
    [ Ptot= 96.19 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\7fc6ee65-
9b89-4625-8cea-56b
    remark: 25yr 24hr SCS

*
 *  CALIB STANDHYD       0002  1  5.0    0.59    0.10 12.00  56.90 0.59   0.000
    [I%=30.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0001  1  5.0    0.59    0.09 12.00  56.85  n/a   0.000
*
    ADD [  0001+  0007]  0004  3  5.0    2.02    0.19 12.08  45.44  n/a   0.000
*
    READ STORM                15.0
    [ Ptot= 96.19 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\7fc6ee65-
9b89-4625-8cea-56b
    remark: 25yr 24hr SCS

*
 *  CALIB NASHYD         0005  1  5.0    0.07    0.01 12.08  38.33 0.40   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                15.0
    [ Ptot= 96.19 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\7fc6ee65-
9b89-4625-8cea-56b
    remark: 25yr 24hr SCS

*
```

```
 *  CALIB STANDHYD       0008  1  5.0    1.12    0.17 12.00  54.72 0.57   0.000
    [I%=26.0:S%= 2.00]
*
    ADD [  0005+  0008]  0010  3  5.0    1.19    0.18 12.00  53.75  n/a   0.000
*
================================================================================
========================


       V    V   I    SSSSS  U   U    A    L             (v 6.0.2010)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\f79
f8515-2156-4c6c-8708-9d7fd6aba8f8\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\f79
f8515-2156-4c6c-8708-9d7fd6aba8f8\scen


DATE: 07-03-2020                          TIME: 10:19:37

USER:


COMMENTS: _____________________________________________________


  ***********************************************
  ** SIMULATION : Run 16                       **
  ***********************************************

  W/E COMMAND            HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                                  min     ha    '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                 15.0
    [ Ptot=118.68 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\c31e0960-
3f0a-427b-a72f-146
    remark: 100yr 24hr SCS

*
 *  CALIB STANDHYD       0011  1  5.0    0.59    0.14 12.00  75.01 0.63   0.000
    [I%=30.0:S%= 2.00]
*
    READ STORM                 15.0
    [ Ptot=118.68 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\c31e0960-
3f0a-427b-a72f-146
    remark: 100yr 24hr SCS

*
 *  CALIB NASHYD         0012  1  5.0    1.43    0.16 12.17  56.99 0.48   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    ADD [  0011+  0012]  0003  3  5.0    2.02    0.27 12.00  62.25  n/a   0.000
*
    READ STORM                 15.0
    [ Ptot=118.68 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\c31e0960-
3f0a-427b-a72f-146
    remark: 100yr 24hr SCS

*
 *  CALIB NASHYD         0007  1  5.0    1.43    0.16 12.17  56.99 0.48   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                 15.0
    [ Ptot=118.68 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\c31e0960-
3f0a-427b-a72f-146
    remark: 100yr 24hr SCS

*
 *  CALIB STANDHYD       0002  1  5.0    0.59    0.14 12.00  75.01 0.63   0.000
```

```
    [I%=30.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0001  1  5.0    0.59    0.13 12.00  74.97  n/a   0.000
*
    ADD [  0001+  0007]  0004  3  5.0    2.02    0.26 12.08  62.24  n/a   0.000
*
    READ STORM                15.0
    [ Ptot=118.68 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\c31e0960-
3f0a-427b-a72f-146
    remark: 100yr 24hr SCS

*
 *  CALIB NASHYD         0005  1  5.0    0.07    0.01 12.08  53.96 0.45   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                15.0
    [ Ptot=118.68 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\c31e0960-
3f0a-427b-a72f-146
    remark: 100yr 24hr SCS

*
 *  CALIB STANDHYD       0008  1  5.0    1.12    0.25 12.00  72.57 0.61   0.000
    [I%=26.0:S%= 2.00]
*
    ADD [  0005+  0008]  0010  3  5.0    1.19    0.26 12.00  71.48  n/a   0.000
*
================================================================================
========================


       V    V   I    SSSSS  U   U    A    L              (v 6.0.2010)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```

```
                    *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\1b1
92a00-171d-4b3c-86c8-f1897d1d11fd\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\1b1
92a00-171d-4b3c-86c8-f1897d1d11fd\scen


DATE: 07-03-2020                          TIME: 10:19:36

USER:


COMMENTS: _____________________________________________________________


  ************************************************
  ** SIMULATION : Run 17                        **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

     START @  0.00 hrs
     --------------------
    READ STORM                 6.0
    [ Ptot=193.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\0a563640-
f9ce-42bd-85a5-398
    remark: Timmins

*
 *  CALIB STANDHYD       0011  1  5.0    0.59    0.06  7.00 139.48 0.72   0.000
    [I%=30.0:S%= 2.00]
*
    READ STORM                 6.0
    [ Ptot=193.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\0a563640-
f9ce-42bd-85a5-398
    remark: Timmins

*
```

```
 *  CALIB NASHYD         0012  1  5.0    1.43    0.12  7.00 117.31 0.61   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    ADD [  0011+  0012]  0003  3  5.0    2.02    0.17  7.00 123.79  n/a   0.000
*
    READ STORM                  6.0
    [ Ptot=193.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\0a563640-
f9ce-42bd-85a5-398
    remark: Timmins

*
 *  CALIB NASHYD         0007  1  5.0    1.43    0.12  7.00 117.31 0.61   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                  6.0
    [ Ptot=193.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\0a563640-
f9ce-42bd-85a5-398
    remark: Timmins

*
 *  CALIB STANDHYD       0002  1  5.0    0.59    0.06  7.00 139.48 0.72   0.000
    [I%=30.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0001  1  5.0    0.59    0.06  7.00 139.44  n/a   0.000
*
    ADD [  0001+  0007]  0004  3  5.0    2.02    0.17  7.00 123.78  n/a   0.000
*
    READ STORM                  6.0
    [ Ptot=193.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\0a563640-
f9ce-42bd-85a5-398
    remark: Timmins

*
 *  CALIB NASHYD         0005  1  5.0    0.07    0.01  7.00 112.55 0.58   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                  6.0
    [ Ptot=193.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\0a563640-
f9ce-42bd-85a5-398
    remark: Timmins

*
 *  CALIB STANDHYD       0008  1  5.0    1.12    0.10  7.00 136.48 0.71   0.000
    [I%=26.0:S%= 2.00]
*
    ADD [  0005+  0008]  0010  3  5.0    1.19    0.11  7.00 135.07  n/a   0.000
*
================================================================================
========================


       V    V   I    SSSSS  U   U    A    L             (v 6.0.2010)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\3cb
190fa-2cda-4fb4-9fc2-10acd92ad4e8\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\3cb
190fa-2cda-4fb4-9fc2-10acd92ad4e8\scen


DATE: 07-03-2020                          TIME: 10:19:37

USER:


COMMENTS: _____________________________________________________


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

```
  ** SIMULATION : Run 18                        **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                  5.0
    [ Ptot= 15.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\79465dfc-
e505-4446-a59f-61c
    remark: 15mm

*
 *  CALIB STANDHYD       0011  1  5.0    0.59    0.02  1.42   4.70 0.31   0.000
    [I%=30.0:S%= 2.00]
*
    READ STORM                  5.0
    [ Ptot= 15.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\79465dfc-
e505-4446-a59f-61c
    remark: 15mm

*
 *  CALIB NASHYD         0012  1  5.0    1.43    0.00  1.92   0.84 0.06   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    ADD [  0011+  0012]  0003  3  5.0    2.02    0.02  1.42   1.97  n/a   0.000
*
    READ STORM                  5.0
    [ Ptot= 15.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\79465dfc-
e505-4446-a59f-61c
    remark: 15mm

*
 *  CALIB NASHYD         0007  1  5.0    1.43    0.00  1.92   0.84 0.06   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                  5.0
    [ Ptot= 15.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\79465dfc-
e505-4446-a59f-61c
    remark: 15mm

*
 *  CALIB STANDHYD       0002  1  5.0    0.59    0.02  1.42   4.70 0.31   0.000
    [I%=30.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0001  1  5.0    0.59    0.01  1.58   4.68  n/a   0.000
*
    ADD [  0001+  0007]  0004  3  5.0    2.02    0.01  1.67   1.96  n/a   0.000
*
    READ STORM                  5.0
    [ Ptot= 15.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\79465dfc-
e505-4446-a59f-61c
    remark: 15mm

*
 *  CALIB NASHYD         0005  1  5.0    0.07    0.00  1.75   0.73 0.05   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                  5.0
    [ Ptot= 15.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\79465dfc-
e505-4446-a59f-61c
    remark: 15mm

*
 *  CALIB STANDHYD       0008  1  5.0    1.12    0.03  1.42   4.20 0.28   0.000
    [I%=26.0:S%= 2.00]
*
    ADD [  0005+  0008]  0010  3  5.0    1.19    0.03  1.42   4.00  n/a   0.000
*
================================================================================
=========================


       V    V   I    SSSSS  U   U    A    L             (v 6.0.2010)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
```

***** S U M M A R Y O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.0\VO2\voin.dat

Output filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\c364f216-2c67-4bea-808d-0dbe3292406b\scen
Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\c364f216-2c67-4bea-808d-0dbe3292406b\scen

DATE: 07-03-2020 TIME: 10:19:37

USER:

COMMENTS: _____

****
** SIMULATION : Run 19 **
****

W/E COMMAND HYD ID DT AREA ' Qpeak Tpeak R.V. R.C. Qbase
min ha ' cms hrs mm cms

START @ 0.00 hrs

READ STORM 5.0
[Ptot= 10.00 mm]
fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\be6e9e57-d721-437e-ba08-3b3
remark: 10mm

*
* CALIB STANDHYD 0011 1 5.0 0.59 0.01 1.42 2.75 0.27 0.000
[I%=30.0:S%= 2.00]
*
READ STORM 5.0
[Ptot= 10.00 mm]
fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\be6e9e57-d721-437e-ba08-3b3
remark: 10mm

*
* CALIB NASHYD 0012 1 5.0 1.43 0.00 2.08 0.23 0.02 0.000
[CN=69.1]
[N = 3.0:Tp 0.29]
*
ADD [0011+ 0012] 0003 3 5.0 2.02 0.01 1.42 0.96 n/a 0.000
*
READ STORM 5.0
[Ptot= 10.00 mm]
fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\be6e9e57-d721-437e-ba08-3b3
remark: 10mm

*
* CALIB NASHYD 0007 1 5.0 1.43 0.00 2.08 0.23 0.02 0.000
[CN=69.1]
[N = 3.0:Tp 0.29]
*
READ STORM 5.0
[Ptot= 10.00 mm]
fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\be6e9e57-d721-437e-ba08-3b3
remark: 10mm

*
* CALIB STANDHYD 0002 1 5.0 0.59 0.01 1.42 2.75 0.27 0.000
[I%=30.0:S%= 2.00]
*
** Reservoir
OUTFLOW: 0001 1 5.0 0.59 0.00 1.58 2.71 n/a 0.000
*
ADD [0001+ 0007] 0004 3 5.0 2.02 0.00 1.58 0.95 n/a 0.000
*
READ STORM 5.0
[Ptot= 10.00 mm]
fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\be6e9e57-d721-437e-ba08-3b3
remark: 10mm

*
* CALIB NASHYD 0005 1 5.0 0.07 0.00 1.92 0.14 0.01 0.000
[CN=67.0]
[N = 3.0:Tp 0.18]
*

```
    READ STORM                 5.0
    [ Ptot= 10.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\be6e9e57-
d721-437e-ba08-3b3
    remark: 10mm

*
 *  CALIB STANDHYD       0008  1  5.0    1.12    0.02  1.42   2.43 0.24   0.000
    [I%=26.0:S%= 2.00]
*
    ADD [  0005+  0008]  0010  3  5.0    1.19    0.02  1.42   2.30  n/a   0.000
*
================================================================================
========================


       V    V   I    SSSSS  U   U    A    L             (v 6.0.2010)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\c72
430ec-4763-4bff-8a2d-18658a8f5a9e\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\c72
430ec-4763-4bff-8a2d-18658a8f5a9e\scen


DATE: 07-03-2020                          TIME: 10:19:37

USER:
```

COMMENTS: _____

```
  ************************************************
  ** SIMULATION : Run 20                        **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha    '  cms   hrs     mm          cms

     START @  0.00 hrs
     --------------------
    READ STORM                  5.0
    [ Ptot= 12.50 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\107ffe31-
1b3d-4b49-a570-daa
    remark: 12.5mm

*
 *  CALIB STANDHYD       0011  1  5.0    0.59    0.02  1.42   3.69 0.30   0.000
    [I%=30.0:S%= 2.00]
*
    READ STORM                  5.0
    [ Ptot= 12.50 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\107ffe31-
1b3d-4b49-a570-daa
    remark: 12.5mm

*
 *  CALIB NASHYD         0012  1  5.0    1.43    0.00  2.00   0.49 0.04   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    ADD [  0011+  0012]  0003  3  5.0    2.02    0.02  1.42   1.42  n/a   0.000
*
    READ STORM                  5.0
    [ Ptot= 12.50 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\107ffe31-
1b3d-4b49-a570-daa
    remark: 12.5mm

*
 *  CALIB NASHYD         0007  1  5.0    1.43    0.00  2.00   0.49 0.04   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                  5.0
```

```
    [ Ptot= 12.50 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\107ffe31-
1b3d-4b49-a570-daa
    remark: 12.5mm

*
 *  CALIB STANDHYD       0002  1  5.0    0.59    0.02  1.42   3.69 0.30   0.000
    [I%=30.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0001  1  5.0    0.59    0.01  1.58   3.67  n/a   0.000
*
    ADD [  0001+  0007]  0004  3  5.0    2.02    0.01  1.58   1.42  n/a   0.000
*
    READ STORM                 5.0
    [ Ptot= 12.50 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\107ffe31-
1b3d-4b49-a570-daa
    remark: 12.5mm

*
 *  CALIB NASHYD         0005  1  5.0    0.07    0.00  1.75   0.41 0.03   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                 5.0
    [ Ptot= 12.50 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\107ffe31-
1b3d-4b49-a570-daa
    remark: 12.5mm

*
 *  CALIB STANDHYD       0008  1  5.0    1.12    0.03  1.42   3.29 0.26   0.000
    [I%=26.0:S%= 2.00]
*
    ADD [  0005+  0008]  0010  3  5.0    1.19    0.03  1.42   3.12  n/a   0.000
*
================================================================================
=========================


       V    V   I    SSSSS  U   U    A    L             (v 6.0.2010)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL
```

```
        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.0\VO2\voin.dat

  Output  filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\6e4
ba76b-bddc-4e65-96ae-69c06f23de92\scen
  Summary filename:
C:\Users\opolyak\AppData\Local\Civica\VH5\c5f4e9d2-cf43-4fbd-a5d2-816693ef7366\6e4
ba76b-bddc-4e65-96ae-69c06f23de92\scen


DATE: 07-03-2020                          TIME: 10:19:37

USER:


COMMENTS: _____________________________________________________


  ************************************************
  ** SIMULATION : Run 21                        **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                   min     ha   '  cms   hrs     mm          cms

     START @  0.00 hrs
     --------------------
    READ STORM                 5.0
    [ Ptot= 20.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\fc5b04ad-
27a4-4a5f-98ef-5f0
    remark: 20mm

*
 *  CALIB STANDHYD       0011  1  5.0    0.59    0.03  1.42   6.88 0.34   0.000
    [I%=30.0:S%= 2.00]
*
```

```
    READ STORM                 5.0
    [ Ptot= 20.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\fc5b04ad-
27a4-4a5f-98ef-5f0
    remark: 20mm

*
 *  CALIB NASHYD         0012  1  5.0    1.43    0.01  1.83   1.79 0.09   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    ADD [  0011+  0012]  0003  3  5.0    2.02    0.03  1.42   3.28  n/a   0.000
*
    READ STORM                 5.0
    [ Ptot= 20.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\fc5b04ad-
27a4-4a5f-98ef-5f0
    remark: 20mm

*
 *  CALIB NASHYD         0007  1  5.0    1.43    0.01  1.83   1.79 0.09   0.000
    [CN=69.1         ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                 5.0
    [ Ptot= 20.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\fc5b04ad-
27a4-4a5f-98ef-5f0
    remark: 20mm

*
 *  CALIB STANDHYD       0002  1  5.0    0.59    0.03  1.42   6.88 0.34   0.000
    [I%=30.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0001  1  5.0    0.59    0.01  1.58   6.85  n/a   0.000
*
    ADD [  0001+  0007]  0004  3  5.0    2.02    0.01  1.67   3.27  n/a   0.000
*
    READ STORM                 5.0
    [ Ptot= 20.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\fc5b04ad-
27a4-4a5f-98ef-5f0
    remark: 20mm

*
```

```
 *  CALIB NASHYD         0005  1  5.0    0.07    0.00  1.67   1.59 0.08   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.18]
*
    READ STORM                 5.0
    [ Ptot= 20.00 mm ]
    fname :
C:\Users\opolyak\AppData\Local\Temp\f4fc5045-0805-43e8-b9c9-5c7f7a84b0be\fc5b04ad-
27a4-4a5f-98ef-5f0
    remark: 20mm

*
 *  CALIB STANDHYD       0008  1  5.0    1.12    0.04  1.42   6.21 0.31   0.000
    [I%=26.0:S%= 2.00]
*
    ADD [  0005+  0008]  0010  3  5.0    1.19    0.04  1.42   5.94  n/a   0.000
*
 FINISH

================================================================================
========================
```

Project :	Hidden Ridge Subdivision
File No.	516655
Date:	Jul-20
Designed By:	HY
Checked By:	JA
Subject:	Water Quantity Calculations

EAST CUL-DE-SAC DITCH STORAGE CALCULATIONS

Assumed berm height:	0.5	m
Ditch Slopes upstream of berm:	1.0%	
Ditch Bottom Width:	0.5	m
Ditch Side Slopes:	3	:1
Length of Ponding upstream of berm	50.0	m
Total Storage Available at max. depth:	50.0	m^3

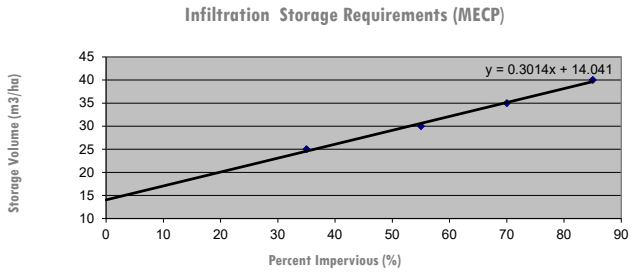
Therefore, 50 m^3 of flood storage exists upstream of the Drainage Easement at a maximum depth of 0.5 m.

Conceptual Outlet Control Configuration

Orifice/Pipe Size (mm)	150	Weir Length (m)	2
Cross-sectional Area (sq.m)	0.02	Sill elevation (m)	0.50
Orifice Coefficient	0.80	Weir Coefficient	1.65
Invert Elevation (m)	0.00	Weir Side Slopes (H:V)	3:1
		Downstream Weir Length (m)	1

Water Level	Tube Orifice #1		Overflow Weir		Total Flow	Storage
	Head	Discharge	Head	Discharge		
(m)	(m)	(m^3/s)	(m)	(m^3/s)	(m^3/s)	(m^3)
0.00	0.00	0.000	0.00	0.000	0.000	0.0
0.10	0.03	0.010	0.00	0.000	0.010	0.8
0.20	0.13	0.022	0.00	0.000	0.022	4.4
0.30	0.23	0.030	0.00	0.000	0.030	12.6
0.40	0.33	0.036	0.00	0.000	0.036	27.2
0.50	0.43	0.041	0.00	0.000	0.041	50.0
0.60	0.53	0.045	0.10	0.105	0.150	82.8

TATHAM ENGINEERING	Project:	Hidden Ridge Subdivision	Date:	Jul-2020
	File No.:	516655	Designed By:	HY
	Subject:	Enhanced Swale Water Quality Calcs	Checked By:	JA



MECP Water Quality Storage Volumes

Table 3.2 Values

% imp	storage (m^3/ha)
35	25
55	30
70	35
85	40

Catchment Post 201 + EX - Water Quality Storage Calculation

Catchment imperviousness:	24.4%	
Storage volume:	21.4	m^3/ha
Contributing area:	1.19	ha
Required MECP Water Quality Storage Volume:	25.5	m^3

Catchment Post 202 - Water Quality Storage Calculation

Catchment imperviousness:	30%	
Storage volume:	23.0	m^3/ha
Contributing area:	0.59	ha
Required MECP Water Quality Storage Volume:	13.6	m^3

Total Required MECP Water Quality Storage Volume: **39.1** m^3

TATHAM ENGINEERING	**Project:**	Hiden Ridge Subdivision	**Date:**	Jul-2020
	File number:	516655	**Designed by:**	OP
	Subject:	Water Quality Calculations	**Checked by:**	JA

Soakaway Pit Volume Calculations

Catchment 201

Assumed Rooftop Area:	200	m^2
Assuming Rooftop Capture:	50%	
Rainfall Depth to be Captured:	20	mm
Number of Houses:	2	
Void Ratio:	0.4	
Soakaway Pit Length:	2.9	m
Soakaway Pit Width:	2.9	m
Soakaway Pit Depth:	0.6	m
Stone Volume per Soakaway Pit:	5.0	m^3
Runoff Volume per Soakaway Pit:	2	m^3
Total Soakaway Pit Volume:	**4**	**m^3**

Catchment 202

Assumed Rooftop Area:	200	m^2
Assuming Rooftop Capture:	50%	
Rainfall Depth to be Captured:	20	mm
Number of Houses:	1	
Void Ratio:	0.4	
Soakaway Pit Length:	2.9	m
Soakaway Pit Width:	2.9	m
Soakaway Pit Depth:	0.6	m
Stone Volume per Soakaway Pit:	5.0	m^3
Runoff Volume per Soakaway Pit:	2	m^3
Total Soakaway Pit Volume:	**2**	**m^3**

Catchment 203

Assumed Rooftop Area:	200	m^2
Assuming Rooftop Capture:	50%	
Rainfall Depth to be Captured:	20	mm
Number of Houses:	4	
Void Ratio:	0.4	
Soakaway Pit Length:	2.9	m
Soakaway Pit Width:	2.9	m
Soakaway Pit Height:	0.6	m
Stone Volume per Soakaway Pit:	5.0	m^3
Runoff Volume per Soakaway Pit:	2	m^3
Total Soakaway Pit Volume:	**8**	**m^3**

Total Site Soakaway Pit Volume Provided: **14 m^3**

Filter Area Calculations

Catchment 201 - 5.5% Road Ditch

Swale Slope:	5.5%	
Filter media Width:	1	m
Minimum Length Between EBs:	9.1	m
Factor of Safety	0.5	
Filter Area behind 1 EB:	4.5	m^2
Total EB proposed :	7	
Filter Area Provided:	**31.8**	**m^2**

Catchment 201 - 4.2% Road Ditch

Swale Slope:	4.2%	
Filter media Width:	1	m
Minimum Length Between EBs:	11.9	m
Factor of Safety	0.5	
Filter Area behind 1 EB:	6.0	m^2
Total EB proposed :	4	
Filter Area Provided:	**23.8**	**m^2**

Catchment 203 - 4.1% Drainage Easement Ditch

Swale Slope:	4.1%	
Filter media Width:	1	m
Minimum Length Between EBs:	12.2	m
Factor of Safety	0.5	
Filter Area behind 1 EB:	6.1	m^2
Total EB proposed :	2	
Filter Area Provided:	**12.2**	**m^2**

Catchment 203 - 4.1% Drainage Easement Ditch

Swale Slope:	10.4%	
Filter media Width:	1	m
Minimum Length Between EBs:	4.8	m
Factor of Safety	0.5	
Filter Area behind 1 EB:	2.4	m^2
Total EB proposed :	4	
Filter Area Provided:	**9.6**	**m^2**

Catchment 203 - 4.1% Drainage Easement Ditch

Swale Slope:	1.4%	
Filter media Width:	1	m
Minimum Length Between EBs:	35.7	m
Factor of Safety	0.5	
Filter Area behind 1 EB:	17.9	m^2
Total EB proposed :	4	
Filter Area Provided:	**71.4**	**m^2**

Required MECP Infiltration Volume:	39.1	m^3
Filter Media Bed Depth:	1.00	m
Void Ratio for filter bed and gravel layer:	0.4	
Total Filter Area Required[1]:	**97.6**	**m^2**
Total Filter Area Provided[2]:	**148.9**	**m^2**

Note:
1. The required filter area equation A=WQV/(db * Vr) is as per section 4.9.2 of the CVC/LID manual.
2. The total filter area provided is double the required filter area however only half the filter area was considered in the calculations for a conservative factor of safety of 0.5.

TATHAM ENGINEERING	Project:	Hidden Ridge Subdivision	Date:	Jul-2020
	File No.:	516655	Designed:	JA
	Subject:	Enhanced Road Ditch Calcs.	Checked	JA

Ditch Description - **Dry grassed Road Ditch at Site Entrance - 5.5%**

Ditch Characteristics

Channel Depth	Channel Type	Manning's N	Base Width	Side Slopes	Min. Slope
0.80 m	Grass Ditch	0.030	0.50 m	3H : 1V	5.50%

Storm Conditions		Ditch Flow Conditions					
Return Period	Peak Flow (m^3/s)	Flow Depth	Area (m^2)	WP	R	Q (m^3/s)	V (m/s)
25 mm storm	0.029	0.05	0.03	0.82	0.04	0.030	0.91
100 Year	0.132	0.12	0.10	1.26	0.08	0.152	1.48

Comments:

1. **0.057 m^3/s is combined 25 mm storm peak flow. 0.029 m3/s is the approximate peak flow in each ditch.**
2. **Velocity is > 0.5 m/s therefore permanent 0.5 m high earth berms are proposed to protect the ditches from erosion.**
3. **0.264 m^3/s is combined 100-year storm peak flow. 0.132 m3/s is the approximate peak flow in each ditch.**
4. **Nilex SC 250 Turf reinforcement is proposed to reduce the potential for erosion in the ditches.**

Ditch Description - **Dry grassed Road Ditch at the Intersection - 3.5%**

Channel Depth	Channel Type	Manning's N	Base Width	Side Slopes	Min. Slope
0.80 m	Grass Ditch	0.030	0.50 m	3H : 1V	3.50%

Storm Conditions		Ditch Flow Conditions					
Return Period	Peak Flow (m^3/s)	Flow Depth	Area (m^2)	WP	R	Q (m^3/s)	V (m/s)
100 Year	0.132	0.13	0.12	1.32	0.09	0.142	1.23

Comments:

1. **0.264 m^3/s is combined 100-year storm peak flow. 0.132 m3/s is the approximate peak flow in each ditch.**
2. **Max. 100-year peak flow occurs as a depth of approximately 0.13 m and has a velocity of approximately 1.23 m/s.**

$Q = (1.00/n)AR^{2/3}S^{1/2}$ Where Q = Peak Flow (m^3)

n = Roughness Coefficient

A = Cross Sectional Area (m^2)

R = Hydraulic Radius

S = Channel Slope (m/m)

TATHAM ENGINEERING	**Project:**	Hidden Ridge Subdivision	**Date:**	Jul-2020
	File No.:	516655	**Designed:**	JA
	Subject:	Enhanced Road Ditch Calcs.	**Checked:**	JA

Ditch Description - **Dry grassed Road Ditch at East Cul-De-Sac - 1.0%**

Ditch Characteristics

Channel Depth	Channel Type	Manning's N	Base Width	Side Slopes	Min. Slope
0.80 m	Grass Ditch	0.030	0.50 m	3H : 1V	1.00%

Storm Conditions		Ditch Flow Conditions					
Return Period	**Peak Flow (m^3/s)**	**Flow Depth**	**Area (m^2)**	**WP**	**R**	**Q (m^3/s)**	**V (m/s)**
100 Year	**0.263**	**0.24**	**0.29**	**2.02**	**0.15**	**0.270**	**0.92**
25 mm storm	**0.012**	**0.05**	**0.03**	**0.82**	**0.04**	**0.013**	**0.39**

Comments:

1. **0.019 m^3/s is combined 25 mm storm peak flow. 0.012 m^3/s is the approximate peak flow in each ditch approaching the drainage easement.**
2. **Velocity is < 0.5 m/s and therefore Enhanced level MOECC water quality control can be achieved.**
3. **0.263 m^3/s is combined 100-year storm peak flow. 0.134 m3/s is the approximate peak flow in each ditch.**
4. **Velocity is < 1.5 m/s and therefore grass will remain stable and erosion protection is not required.**

Ditch Description - **Dry grassed Swale in Drainage Easement at 11.0%**

Ditch Characteristics

Channel Depth	Channel Type	Manning's N	Base Width	Side Slopes	Min. Slope
0.80 m	Grass Ditch	0.030	2.00 m	3H : 1V	11.00%

Storm Conditions		Ditch Flow Conditions					
Return Period	**Peak Flow (m^3/s)**	**Flow Depth**	**Area (m^2)**	**WP**	**R**	**Q (m^3/s)**	**V (m/s)**
100 Year	**0.242**	**0.07**	**0.13**	**2.38**	**0.05**	**0.209**	**1.60**

Comments:

1. **0.242 m^3/s is the 100 year storm peak flow directed to the drainage easement.**
2. **Max. 100-year peak flow occurs at a depth of approximately 0.07 m and has a velocity of approximately 1.60 m/s.**
3. **Permanent rock check dams and Nilex SC 250 are proposed to reduce the potential for erosion.**

$Q = (1.00/n)AR^{2/3}S^{1/2}$ Where Q = Peak Flow (m^3)

n = Roughness Coefficient

A = Cross Sectional Area (m^2)

R = Hydraulic Radius

S = Channel Slope (m/m)

Project :	Hidden Ridge Subdivision
File No.	516655
Date:	Jul-2020
Designed By:	HY
Checked By:	JA
Subject:	Post Dev. Impervious Area Calculations

Impervious Area Calculations

101	**Area (ha)**	
Asphalt/Concrete/Gravel	0.275	
Building	0.015	
Total Impervious Area (ha)	**0.290**	

102	**Area (ha)**	
Asphalt/Concrete/Gravel	0.021	
Building	0.028	
Total Impervious Area (ha)	**0.049**	

201	**Area (ha)**	
ROW	0.22	(225 m road, 9.7 m wide asphalt/gravel)
Driveway	0.03	3 Driveways, 6 m x 18 m
House	0.04	2 houses, assume 200 m^2
Total Impervious Area (ha)	**0.29**	

202	**Area (ha)**	
ROW	0.07	(14.5 m radius cul-de-sac)
	0.05	(48 m road, 9.7 m wide asphalt/gravel)
Driveway	0.04	4 Driveways, 6 m x 18 m
House	0.02	1 houses, assume 200 m^2
Total Impervious Area (ha)	**0.18**	

203	**Area (ha)**	
Driveway	0.00	0 Driveways, 6 m x 18 m
House	0.08	4 houses, assume 200 m^2
Total Impervious Area (ha)	**0.08**	

TATHAM ENGINEERING	**Project:**	Hidden Ridge Subdivision	**Date:**	Jul-2020
	File No.:	516655	**Designed:**	OP
	Subject:	Phosphorus Calculations	**Checked:**	JA

Existing Phosphorus Loading Calculations

Impervious Area Assumed as **High Intensity – Comm/Industrial** (1.82 kg/ha/yr):	**1.82**	x	**0.11** ha	=	**0.20**	**kg/yr**
Pervious Area Assumed as **Low-Intensity** Residential **(0.17 kg/ha/yr)**:	**0.17**	x	**1.47** ha	=	**0.25**	**kg/yr**
Pervious Area Assumed as **Cropland (0.23 kg/ha/yr)**:	**0.23**	x	**0.83** ha	=	**0.19**	**kg/yr**
Pervious Area Assumed as **Transition (0.06 kg/ha/yr)**:	**0.06**	x	**0.57** ha	=	**0.03**	**kg/yr**
Gravel Area Assumed as **Unpaved Road (0.83 kg/ha/yr)**:	**0.83**	x	**0.16** ha	=	**0.13**	**kg/yr**

Total Phosphorous Loading: **0.81** **kg/yr**

TATHAM ENGINEERING	**Project:**	Hidden Ridge Subdivision	**Date:**	Jul-2020
	File No.:	516655	**Designed by:**	OP/AB
	Subject:	Phosphorus Calculations	**Checked by:**	JA

Proposed Phosphorus Loading Calculations

Phosphorus Removal Efficiencies

Soakaway Pits:	**70%**
Enhanced Grassed Swales:	**45%**
Vegetated Filter Strip:	**65%**

Notes:
Removal efficiency of dry grass swales is based on on middle of the range (34%-55%).
Removal efficiency of soakaway pits are based on end of the range (50%-70%).
As reported in Table 11 of the Hutchinson Environmental Sciences Ltd. Managing New Urban Development in Phosphorus-Sensitive Watersheds report, October 31, 2014.

Soakaway Pits

Total number of Buildings w Soakaway Pits:	7	
Total Rooftop Area:	1400	m^2
Assumed Rooftop Capture Area:	1400	m^2
Assumed P Loading Coefficient for Rooftop Area:	1.32	kg/ha/yr

Enhanced Road and Drainage Easement Ditches

Catchment 201

Impervious Area Assumed as **High-Intensity** Residential (**1.32 kg/ha/yr**):	**0.29**	ha
Pervious Area Assumed as **Low-Intensity** Residential **(0.17 kg/ha/yr)**:	**0.83**	ha
Total Unmitigated Loading:	**0.52**	**kg/yr**
Impervious Area excluding 50% rooftop area= 0.32 ha - 200 m^2/roof x 50% x 2.5 roofs:	**0.27**	ha
P Loading Reduction via **Dry Swales** (Excluding 50% rooftop area) (assuming 45% P Loading reduction) (1.32 kg/ha/yr) x (0.29 ha) x 45%=	**0.16**	kg/yr
Impervious Area of 50% rooftop area = 200 m^2/roof x 50% x 2.5 roofs:	**0.03**	ha
P Loading Reduction of 50% Roof Area via Proposed **Soakaway Pits**: (assuming 70% P Loading reduction) (1.32 kg/ha/yr) x (0.03 ha) x 70%=	**0.02**	kg/yr
P Loading Reduction of 50% Roof Area via **Dry Swales** (assuming 45% P Loading reduction) [(1.32 kg/ha/yr) x (0.03 ha)-(0.02 kg/yr)] x 45%=	**0.00**	kg/yr
Pervious Area =	**0.83**	ha
P Loading Reduction of Pervious Area via **Dry Swales** (assuming 45% P Loading reduction) (0.17 kg/ha/yr) x (0.87 ha) x 45%=	**0.06**	kg/yr

Total Mitigated Phosphorous:	**0.25**	**kg/yr**
	47	**%**
Total Phosphorous Loading w Mitigation:	**0.28**	**kg/yr**

Catchment 202

Impervious Area Assumed as **High-Intensity** Residential (**1.32 kg/ha/yr**):	**0.18**	ha
Pervious Area Assumed as **Low-Intensity** Residential **(0.17 kg/ha/yr)**:	**0.41**	ha
Total Unmitigated Loading:	**0.30**	**kg/yr**
Impervious Area excluding 50% rooftop area= 0.18 ha - 200 m^2/roof x 50% x 1 roof:	**0.17**	ha
P Loading Reduction via **Dry Swales** (Excluding 50% rooftop area) (assuming 45% P Loading reduction) (1.32 kg/ha/yr) x (0.15 ha) x 45%=	**0.10**	kg/yr
Impervious Area of 50% rooftop area = 200 m^2/roof x 50% x 1 roofs:	**0.010**	ha
P Loading Reduction of 50% Roof Area via Proposed **Soakaway Pits**: (assuming 70% P Loading reduction) (1.32 kg/ha/yr) x (0.02 ha) x 70%=	**0.01**	kg/yr
P Loading Reduction of 50% Roof Area via **Enhanced Ditches** (assuming 77% P Loading reduction) [(1.32 kg/ha/yr) x (0.01 ha)-(0.01 kg/yr)] x 77%=	**0.00**	kg/yr
Pervious Area =	**0.41**	ha
P Loading Reduction of Pervious Area via **Dry Swales** (assuming 45% P Loading reduction) (0.17 kg/ha/yr) x (0.38 ha) x 45%=	**0.03**	kg/yr
P Loading Reduction of Pervious Area via **Vegetated Filter Strip** (assuming 65% P Loading reduction) (0.17 kg/ha/yr) x (0.38 ha) x 65%=	**0.03**	kg/yr
P Loading Reduction of Impervious Area via **Vegetated Filter Strip** (assuming 65% P Loading reduction) (1.32 kg/ha/yr) x (0.16 ha) x 65%=	**0.08**	kg/yr
Total Mitigated Phosphorous:	**0.24**	**kg/yr**
	79	**%**
Total Phosphorous Loading w Mitigation:	**0.06**	**kg/yr**

Catchment 203

Impervious Area Assumed as **High-Intensity** Residential (**1.32 kg/ha/yr**):	**0.08**	ha
Pervious Area Assumed as **Low-Intensity** Residential **(0.17 kg/ha/yr)**:	**1.35**	ha
Total Unmitigated Loading:	**0.34**	**kg/yr**
Impervious Area excluding 50% rooftop area= 0.06 ha - 200 m^2/roof x 50% x 3.5 roofs:	**0.01**	ha
P Loading Reduction via **Dry Swales** (Excluding 50% rooftop area and 70% of uncontrolled) (assuming 45% P Loading reduction) (1.32 kg/ha/yr) x (0.01 ha) x 45%=	**0.01**	kg/yr
Impervious Area of 50% rooftop area = 200 m^2/roof x 50% x 3.5 roofs:	**0.07**	ha
P Loading Reduction of 50% Roof Area via Proposed **Soakaway Pits**: (assuming 70% P Loading reduction) (1.32 kg/ha/yr) x (0.04 ha) x 70%=	**0.03**	kg/yr
P Loading Reduction of 50% Roof Area via **Dry Swales** (assuming 45% P Loading reduction) [(1.32 kg/ha/yr) x (0.06 ha)-(0.03 kg/yr)] x 45%=	**0.012**	kg/yr
Pervious Area =	**0.61**	ha
P Loading Reduction of Pervious Area via **Dry Swales** (assuming 45% P Loading reduction) (0.17 kg/ha/yr) x (1.35 ha) x 45%=	**0.046**	kg/yr
P Loading Reduction of Pervious Area via **Vegetated Filter Strip** (assuming 65% P Loading reduction) (0.17 kg/ha/yr) x (1.34 ha) x 65%=	**0.12**	kg/yr
P Loading Reduction of Impervious Area via **Vegetated Filter Strip** (assuming 65% P Loading reduction) (1.32 kg/ha/yr) x (0.07 ha) x 65%=	**0.04**	kg/yr
Total Mitigated Phosphorous:	**0.25**	**kg/yr**
	75	**%**
Total Phosphorous Loading w Mitigation:	**0.08**	**kg/yr**

Summary

Total Site P Loading without mitigation	**1.16**	kg/yr
Total Site P Loading Reduction	**0.74**	kg/yr
	64	**%**
Total Site P Loading with mitigation	**0.42**	kg/yr

TATHAM ENGINEERING	**Project:**	Hidden Ridge Subdivision	**Date:**	Jul-2020
	File No.:	516655	**Designed:**	JA
	Subject:	Water Budget	**Checked:**	JA

Soil Type	Average Annual Precipitation	Actual Evapotranspiration	Water Surplus	Total Infiltration	Total Runoff
Silty Sand Till	886	547	338	220	118

Notes:
1. Water balance calculations completed by RJBA in their letter dated April 27, 2015.
2. All values in mm/yr.
3. Infiltration factor calculated by RJBA to be 0.65.
4. Runoff and evapotranspiration from impervious surfaces assumed to be 85% and 15% respectively.

Pre and Post-Development Water Budget - Outlet 1

Land Use Description	Area (m^2)	Runoff		Infiltration		Mitigation: 50% Roof to Infiltration			
		Runoff Rate	Runoff Volume	Infiltration Rate	Infiltration Volume	Runoff Rate	Runoff Volume	Infiltration Rate	Infiltration Volume
		(m/year)	(m^3/year)	(m/year)	(m^3/year)	(m/year)	(m^3/year)	(m/year)	(m^3/year)
Pre Development									
Catchment 101									
Grass/Agricultural Field	8,899	0	0	0.220	1958				
Buildings/gravel/asphalt/concrete	2,901	0.753	2185	0	0				
Total Outlet 1	**11,800**		**2185**		**1958**				
Post Development									
Catchment 201									
Landscaped/grass	8,748	0.118	1032	0.220	1925	0.118	1032	0.220	1925
Buildings	500	0.753	377	0	0	0.377	188	0.377	188
Gravel/asphalt/concrete	2,652	0.753	1997	0	0	0.753	1997	0	0
Total Outlet 1	**11,900**		**3406**		**1925**		**3218**		**2113**
Change Pre to Post									
Volume			1221		-33		1033		155
Percent			56%		-2%		47%		8%

Notes: The above calculations exclude the infiltration in the enhanced road ditches.

Pre and Post-Development Water Budget - Outlet 2

Land Use Description	Area (m^2)	Runoff		Infiltration		Mitigation:			
		Runoff Rate	Runoff Volume	Infiltration Rate	Infiltration Volume	Runoff Rate	Runoff Volume	Infiltration Rate	Infiltration Volume
		(m/year)	(m^3/year)	(m/year)	(m^3/year)	(m/year)	(m^3/year)	(m/year)	(m^3/year)
Pre Development									
Catchment 102									
Grass/Agricultural Field	19,108	0	0	0.220	4204				
Buildings/gravel/asphalt/concrete	492	0.753	371	0	0				
Total Outlet 2	**19,600**		**371**		**4204**				
Post Development									
Catchment 202									
Landscaped/grass	4,288	0.118	506	0.220	943	0.118	506	0.220	943
Buildings	200	0.753	151	0	0	0.377	75	0.377	75
Gravel/asphalt/concrete	1,412	0.753	1063	0	0	0.753	1063	0	0
Total Catchment 202	**5,900**		**1720**		**943**		**1645**		**1019**
Catchment 203									
Landscaped/grass	13,600	0.118	1605	0.220	2992	0.118	1605	0.220	2992
Buildings	700	0.753	527	0	0	0.377	264	0.377	264
Gravel/asphalt/concrete	0	0.753	0	0	0	0.753	0	0	0
Total Catchment 203	**14,300**		**2132**		**2992**		**1868**		**3256**
Total Outlet 2	**20,200**		**3852**		**3935**		**3513**		**4274**
Change Pre to Post									
Volume			3481		-268		3143		70
Percent			940%		-6%		848%		2%

Notes: The above calculations assume that a 1m separation may be achieved from the high groundwater found at the site.

Appendix C:
Soil Characterization (6199-002) (June 25, 2019) Report

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June 25, 2019

China Canada Jing Bei Xin Min International Co. Ltd.
118 Gemini Crescent
Richmond Hill, ON. L4S 2K7

Attn: Zheng Li c/o Greg Wells (EcoVue Consulting Services Inc.)

Re: Hidden Ridge Development – Soil Characterization (6199-002)

Dear, Mr. Li,

Cambium Inc. (Cambium) is pleased to provide China Canada Jing Bei Xin Min International Co. Ltd. (Client) with this letter report outlining the results of the soil sampling and characterization at the proposed development of Hidden Ridge Subdivision in Zephyr, Ontario (Site). If is Cambium's understanding that the Client requires soil analysis in the form of particle size distribution in order to characterize the type of soil and assess it's potential for erosion along ditches at the proposed grades on site. Soil samples are to be evaluated based on the December 2006 Erosion and Sediment Control Guidelines for Urban Construction (The Guidelines).

FIELD INVESTIGATION

A field investigation that was completed on June 4, 2019, included soil sampling from proposed final grades, via six (6) test pits, spaced evenly along the portion of roads with anticipated grades exceeding 3.5%, as shown in Figure 1. Site plans showing the areas with grades exceeding 3.5% are provided in Appendix A. The field investigation work is summarized below.

As part of the sampling program, six (6) test pits identified as TP101-19 through TP106-19 were completed in selected representative locations shown in Figure 1. Test pits were advanced to predetermined depths ranging from 0.9 m below ground surface (mbgs) to 4.3 mbgs, outlined in Table 1, based on the proposed final grades. The test pit was excavated using a backhoe, under the supervision of a Cambium technician. Dynamic Probe Penetration Test (DPT) values were recorded for the sampled intervals as the number of blows required to drive a 19 mm diameter steel rod 150 mm into the soil with an 8 kg hammer falling 750 mm.

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The DPT values are used in this report to assess consistency of cohesive soils and relative density of non-cohesive materials. The encountered soil units were logged in the field using visual and tactile methods, and samples were placed in labelled plastic bags for transport, future reference, possible laboratory testing, and storage. The open test pit was checked for groundwater and general stability prior to backfilling. The test pit was backfilled with the excavated material and compacted with the backhoe bucket and the Site was restored as close to pre-investigation conditions as possible.

PHYSICAL LABORATORY SOIL ANALYSIS

Physical laboratory testing, including six (6) particle size distribution analyses (LS-702,705), was completed on selected soil samples to confirm textural classification under both the Unified Soil Classification System (USCS) and United States Department of Agriculture (USDA) soil classification system. USCS is the most common classification system for the purposes of geotechnical engineering. The results are presented in Appendix B and summarized in Table 1, providing evidence that soils were extremely variable on site ranging from Clayey Silt to Silty Gravelly Sand. Soils at the sample depths were found to be moist or drier than the plastic limit, with the exception of sample GS1 from test pit TP101-19, where the soil was moist to wet. Based on DPT results from test pits TP101-19 and TP104-19 throughTP106-19, the soil encountered at the predetermined depth was found to have a compact relative density, or firm consistency in the case of test pit TP106-19. DPT testing was not completed for soils in test pits TP102-19 and TP103-19 due to the inaccessibility of pits at that depth.

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Table 1 USCS Particle Size Distribution Analysis

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)							
Sample	Depth (mbgs)	Soil	% Gravel	% Sand	% Silt	% Clay	% Moisture Content
TP101-19 GS1	0.8	SILT, trace Sand, Clay and Gravel	1	8	84	7	17.2
TP102-19 GS2A	4.25	Clayey SILT, some Sand, trace Gravel	2	16	48	34	12.4
TP103-19 GS1	3.5	Silty Gravelly SAND, trace Clay	29	43	23	5	5.8
TP104-19 GS1	1.5	Sandy SILT, trace Clay and Gravel	5	31	58	6	13.9
TP105-19 GS1	2.0	Silty SAND, some Gravel, trace Clay	18	50	28	4	8.0
TP106-19 GS1	1.75	Clayey Sandy SILT, trace Gravel	9	30	34	27	14.1

The USDA classification system is a separate system that classifies the soil based on material passing the number 10 sieve (particles less than 2 mm in diameter). USDA results are presented in Appendix C and summarized in Table 2 and Table 3. Three samples are considered Sandy Loams, while each of the other samples is different from the other and are considered a Clay Loam, Silty Clay Loam, and Silt Loam. Based on Table A1 of The Guidelines provided in Appendix D, all soil samples are considered to have a medium soil erodibility rating, with the exception of Sample TP101-19 GS1, which is considered to have a high soil erodibility rating.

Table 2 USDA Soil Classification

United States Department of Agriculture (USDA) Soil Classification						
Sample	Depth (mbgs)	% Particles < 2mm Φ	Portion Sand	Potion Silt	Portion Clay	USDA Soil Characterization
TP101-19 GS1	0.8	99	27	66	7	Silt Loam
TP102-19 GS2A	4.25	97	17	48	35	Silty Clay Loam
TP103-19 GS1	3.5	65	63	29	8	Sandy Loam
TP104-19 GS1	1.5	93	51	43	6	Sandy Loam
TP105-19 GS1	2.0	74	69	26	5	Sandy Loam
TP106-19 GS1	1.75	88	34	35	31	Clay Loam

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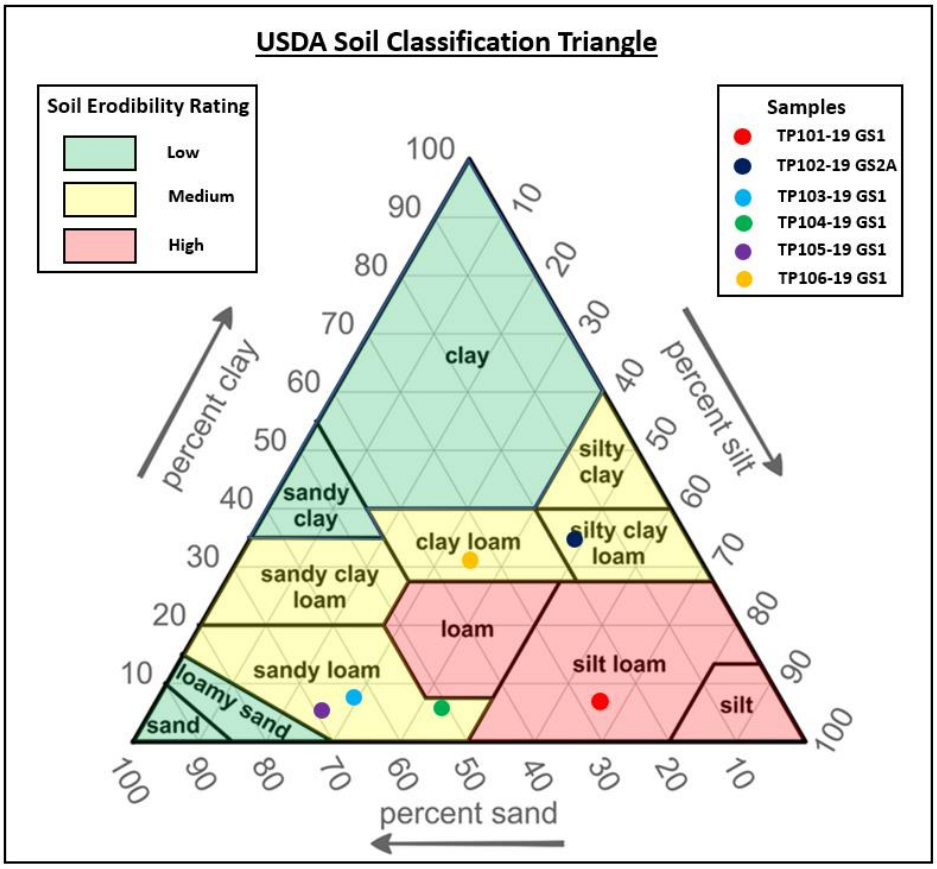
Table 3 USDA Soil Classification Triangle



It is understood that the proposed grades of the ditching on either side of the road are to have moderate slopes between 3.5% and 10%, and will on average have ditches sloping for greater than 30 m lengths. Based on this understanding, and Table A3 of The Guideline provided in Appendix D, each location is considered to have high potential for erosion. These results are summarized in Table 4.

Table 4 Erosion Potential for Graded Conveyance Channels

Sample	Soil Erodibility	Channel Gradient	Slope Length	Erosion Potential
TP101-19 GS1	High	Moderate slope	>30m	High
TP102-19 GS2A	Medium	Moderate slope	>30m	High
TP103-19 GS1	Medium	Moderate slope	>30m	High
TP104-19 GS1	Medium	Moderate slope	>30m	High
TP105-19 GS1	Medium	Moderate slope	>30m	High
TP106-19 GS1	Medium	Moderate slope	>30m	High

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PERCOLATION RATES

Additionally, percolation rates (T-times) were estimated for each soil sample based on the particle size distribution. Results in minutes per centimeter are presented in Appendix B and summarized in Table 4.

Table 5 Percolation Rates

Sample	Percolation Rate (min/cm)
TP101-19 GS1	20
TP102-19 GS2A	>50
TP103-19 GS1	20
TP104-19 GS1	20
TP105-19 GS1	12
TP106-19 GS1	50

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June 25, 2019

CLOSING

It is Cambium's understanding that the Client requires the provided soil classifications in order to aid in classification of erodibility of the soil at the proposed grade elevations.

We trust the information in this report is sufficient for your current needs. If you have questions or comments regarding this document, please do not hesitate to contact Mr. Baird at (705) 742-7900 ext. 332 or Mr. Peterkin at ext. 301.

Respectfully submitted,

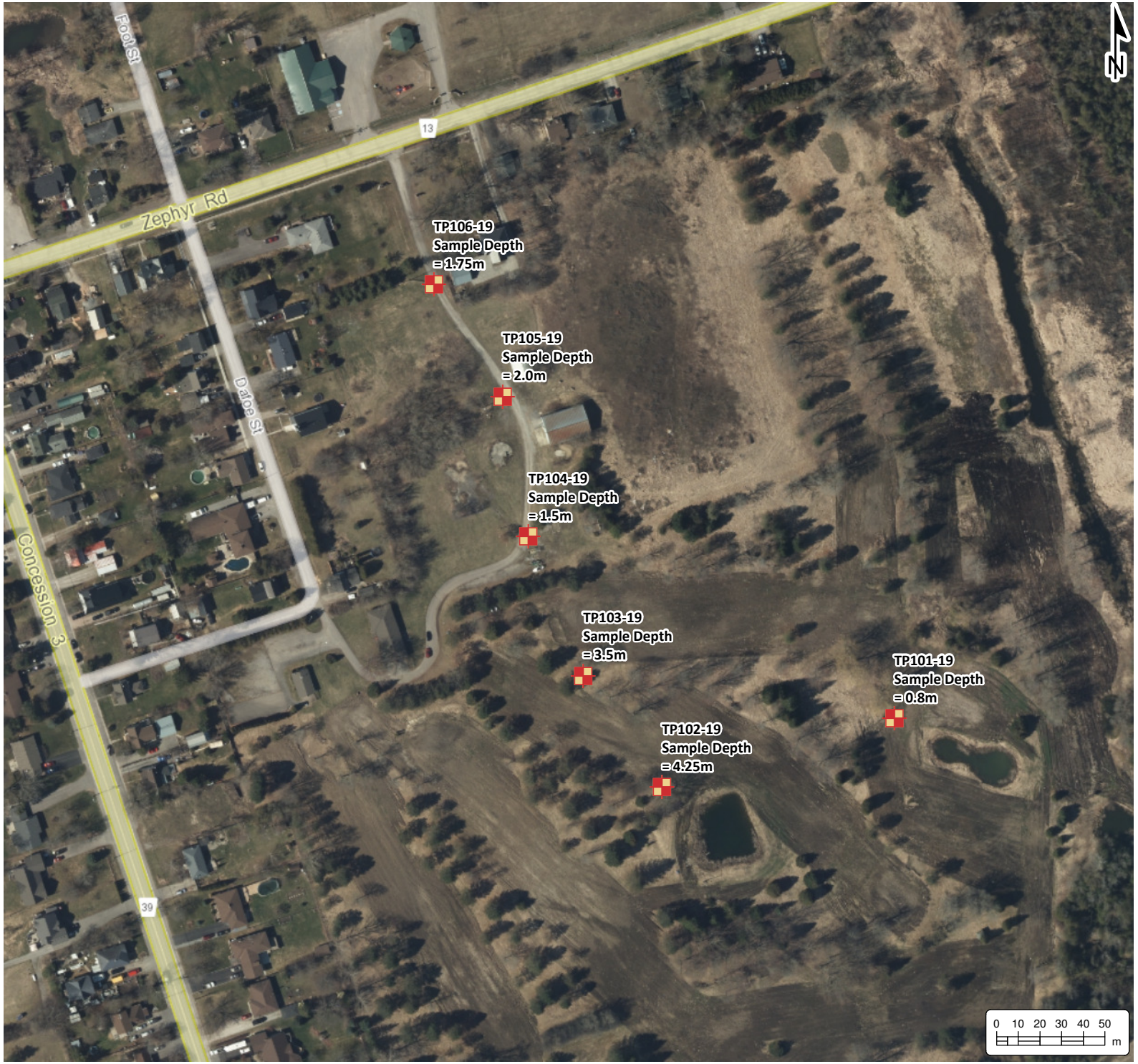
Cambium Inc.

Stuart Baird, P.Eng.
General Manager - Geotechnical

Brian Peterkin, M.Eng., P.Geo.
Senior Project Manager.

SEB/bjp
P:\9200 to 9299\9291-001 Adam Dragisic - Bow Lake Slope Stability\Deliverables\2019-06-17 - RPT - Ida Ho Lane Slope Stability Report.docx

Encl:
Figure 1 – Test Pit & Sample Locations
Appendix A – Site Plans
Appendix B – USCS Soil Characterization
Appendix C – USDA Soil Characterization
Appendix C – Tables from Erosion and Sedimentation Control Guidelines for Urban Construction (December 2006)



HIDDEN RIDGE
SOIL CHARACTERIZATION

CHINA CANADA JING
BEI XIN MIN INTL
Hidden Ridge Subdivision,
Zephyr, Ontario

LEGEND

Test Pit Location

Notes:
- Service Layer Credits: © 2017 Regional Municipality of Durham; 2016 Orthophotography provided by © First Base Solutions Inc.; © Queen's Printer for Ontario, 2017.
- Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.
- Cambium Inc. makes every effort to ensure this map is free from errors but cannot be held responsible for any damages due to error or omissions. This map should not be used for navigation or legal purposes. It is intended for general reference use only.

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SOIL SAMPLE LOCATIONS

Project No.:	6199-002	Date:	June 2019
		Rev.:	
Scale:	1:2,500	Projection:	NAD 1983 UTM Zone 17N
Created by:	TLC	Checked by:	BPT
Figure:	1		

O:\GIS\project_MXDs\6100-6199\6199-002 EcoVue Consulting Services Inc. - Hidden Ridge - Soil Characterization\2019-06-21 FIG 1 - Soil Sample Locations.mxd

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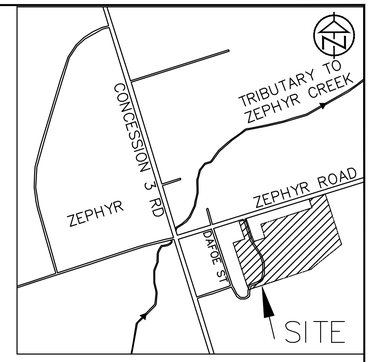
Appendix A
Site Plans

ZEPHYR ROAD



Road grading of 3.5% or greater

EXISTING EDGE OF ASPHALT
CENTER LINE OF ROAD
EXISTING EDGE OF ASPHALT
EXISTING BOTTOM OF DITCH
MATCH TO EXISTING EDGE OF ASPHALT
EXISTING BOTTOM OF DITCH
MATCH TO EXISTING DITCH INVERT 245.40+/- R=10.0m(TYP.)
MATCH TO EXISTING DITCH INVERT 245.55+/-
5.0m
FUTURE PROPERTY BOUNDARY (5.0m OF EXISTING ZEPHYR ROAD FRONTAGE TO BE CONVEYED TO THE REGIONAL MUNICIPALITY OF DURHAM FOR FUTURE ZEPHYR ROAD WIDENING.)
MATCH TO EXISTING ALONG EDGE OF PROPERTY BOUNDARY
UTILITIES TO BE COORDINATED ON OPPOSITE SIDE OF ROAD TO ALLOW DITCH SLOPE TO MATCH EXISTING AT MAX 3:1.
100-200mmØRIPRAP 300mm DEEP ON TERRAFIX 270R (TYP.)
MAX 3:1(TYP.)
1.1%(SW)
UTILITIES
LOT1
LOT2
LOT3
LOT4
LOT5
LOT6
LOT7
B-WO
SP
R=10.0m(TYP.)
CUL-DE-SAC AS PER TOWNSHIP STD.DWG US-218
R=13.0m
TEMPORARY TURNING CIRCLE AS PER TOWNSHIP STD.DWG. US-220.
R=12.2m
32.0m
ROAD EASEMENT
32.0m
LEVEL SPREADER OUTLET TO MATCH EXISTING AT WETLAND(EXACT LOCATION TO BE CONFIRMED AT DETAILED DESIGN STAGE)
TRAIL/MAINTENANCE ACCESS
MATCH TO EX. ALONG EDGE OF TRAIL
9.0m WIDE DRAINAGE EASEMENT (SEE SECTION A-A')
1.3%(SW)
5.3%(SW)
4.1%(SW)
1.4%(SW)
5.7%(SW)
10.6%(SW)
6.2%(SW)
3.8%(SW)
1.8%(SW)
3.4%(SW)
4.5%
2.0%
1.0%
5.6%
5.4%
5.9%
5.5%
3.5%
4.2%

GEND

21.35	PROPOSED GRADE
	PROPERTY BOUNDARY
21.35	EXISTING CONTOUR
	PROPOSED CULVERT
1.0%(SW)	PROPOSED SWALE SLOPE
	PROPOSED 0.5m HIGH EARTH BERM
	SIDE/REAR YARD SWALE
	WELL
SP	SOAKAWAY PIT

LEGEND

CONTRACT DRAWINGS

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

NO.	REVISIONS	DATE	INITIAL
2.	REV. FOR TOWNSHIP STANDARD DEVIATION	JUNE 2018	JA

APPROVED

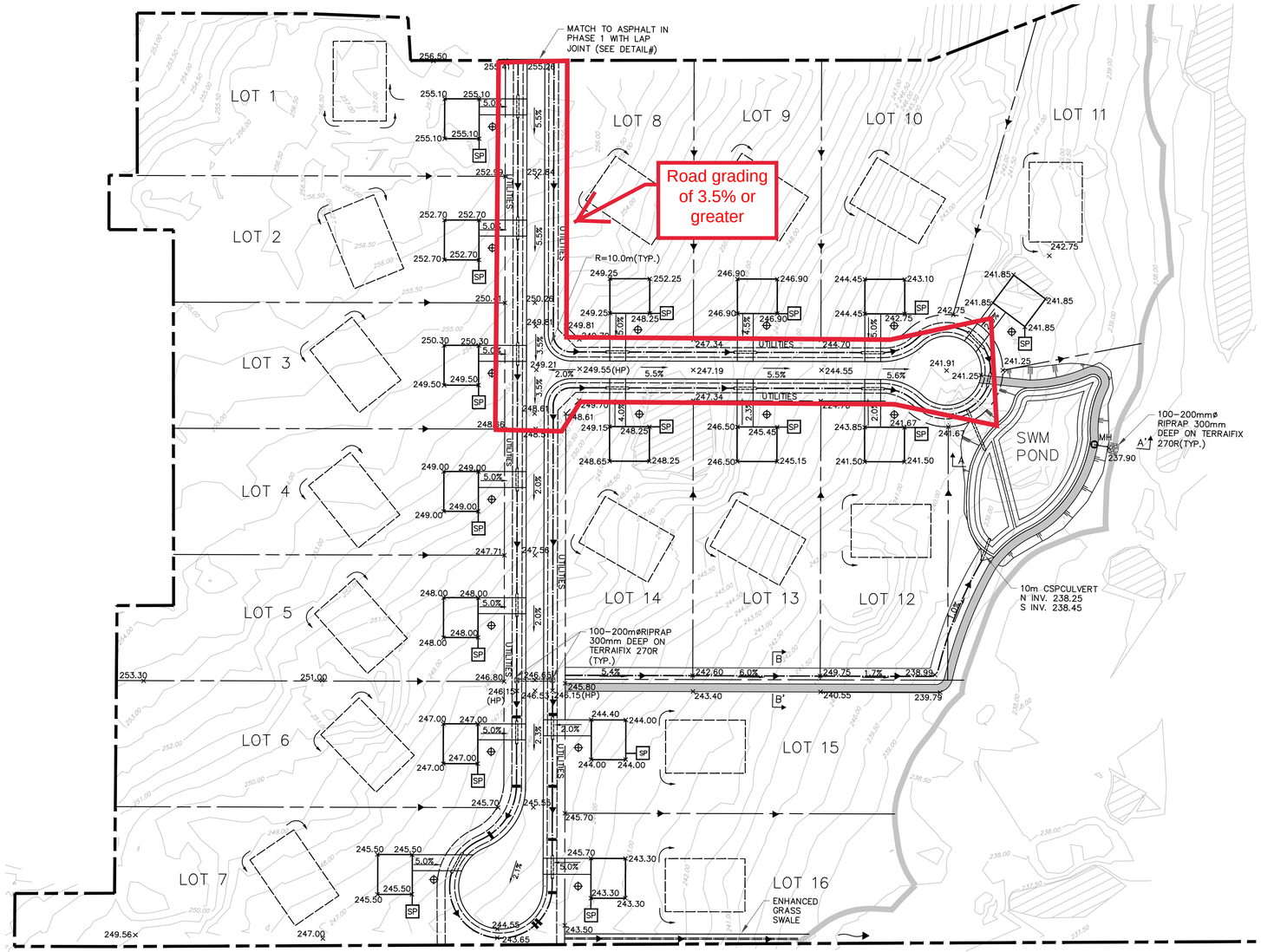
DRAFT FOR DISCUSSION PURPOSES ONLY

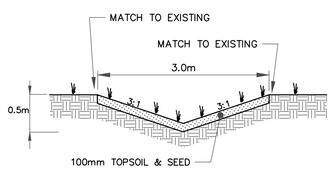
HIDDEN RIDGE SUBDIVISION
TOWNSHIP OF UXBRIDGE

PRELIMINARY GRADING AND SERVICING PLAN

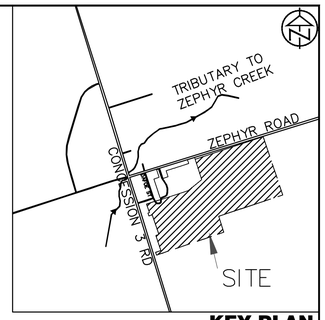
C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie Ottawa

SCALE: 1:500		JOB NO. 516655
DESIGN: JA/HY	CHECKED: JA	DWG. **GS-1**
DRAWN: HY	DATE: APRIL 2017	

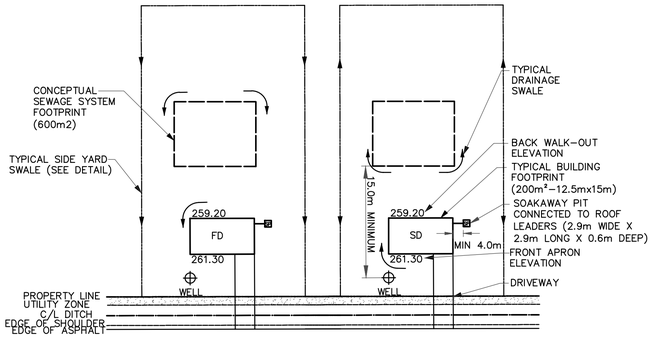




TYPICAL GRASSED SWALE SECTION
SCALE: NTS

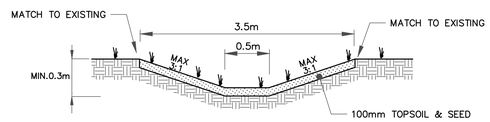


KEY PLAN
N.T.S



TYPICAL GRADING DETAILS
SCALE: NTS

NOTE: WALK–OUTS REQUIRE 2.4m ELEVATION DIFFERENCE FROM FRONT TO BACK OF HOUSE.



ENHANCED GRASSED SWALE SECTION
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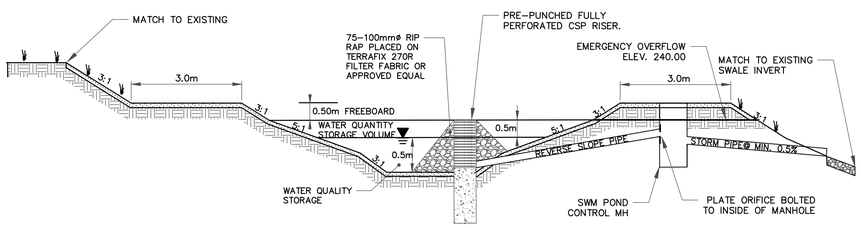
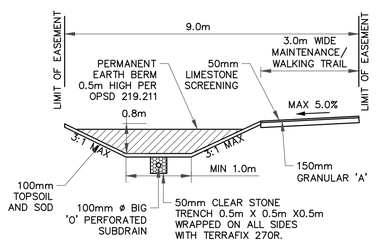
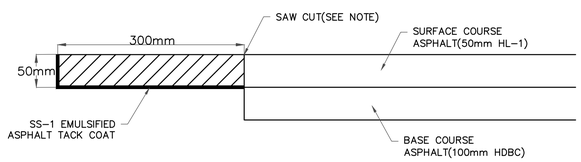


POND SECTION A–A'
SCALE: NTS



SECTION B–B'–DRAINAGE EASEMENT
SCALE: NTS



DETAIL 1– LAP JOINT DETAIL
SCALE: NTS

NOTES: ADD FROM ENGAGE NOTES, EDIT #1 AS FOLLOW:
1. TRANSITION TREATMENT (LAP JOINT) REQUIRED AT ALL LOCATIONS WHERE MATCHING TO AN EXISTING ASPHALT SURFACE. THE EXISTING PAVEMENT EDGES SHALL BE"SAW CUT" TO FORM A STRAIGHT, CLEAN VERTICAL FACE.
2. APPLY UNIFORM COATING OF SS–1 EMULSIFIED TACK COAT TO EXISTING ASPHALT AT THE TRANSITION TREATMENT AREA.

LEGEND

×221.35	PROPOSED GRADE
	PROPERTY BOUNDARY
221.35	EXISTING CONTOUR
	PROPOSED CULVERT
1.0%(SW)	PROPOSED SWALE SLOPE
	SIDE/REAR YARD SWALE
⊕	WELL
SP	SOAKAWAY PIT

LEGEND

CONTRACT DRAWINGS

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

NO.	REVISIONS	DATE	INITIAL

APPROVED

DRAFT FOR DISCUSSION PURPOSES ONLY

HIDDEN RIDGE SUBDIVISION
TOWNSHIP OF UXBRIDGE

PHASE 2 PRELIMINARY GRADING AND SERVICING PLAN

C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie Ottawa

SCALE: 1:1000		JOB NO. 516655–02	
DESIGN: BC/HY	CHECKED: JA	DWG. **GS-1**	
DRAWN: HY	DATE: APRIL 2017		

CAMBIUM

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Locations
Peterborough
Kingston
Barrie
Oshawa

Laboratory
Peterborough

Appendix B

USCS Soil Characterization

Grain Size Distribution Chart

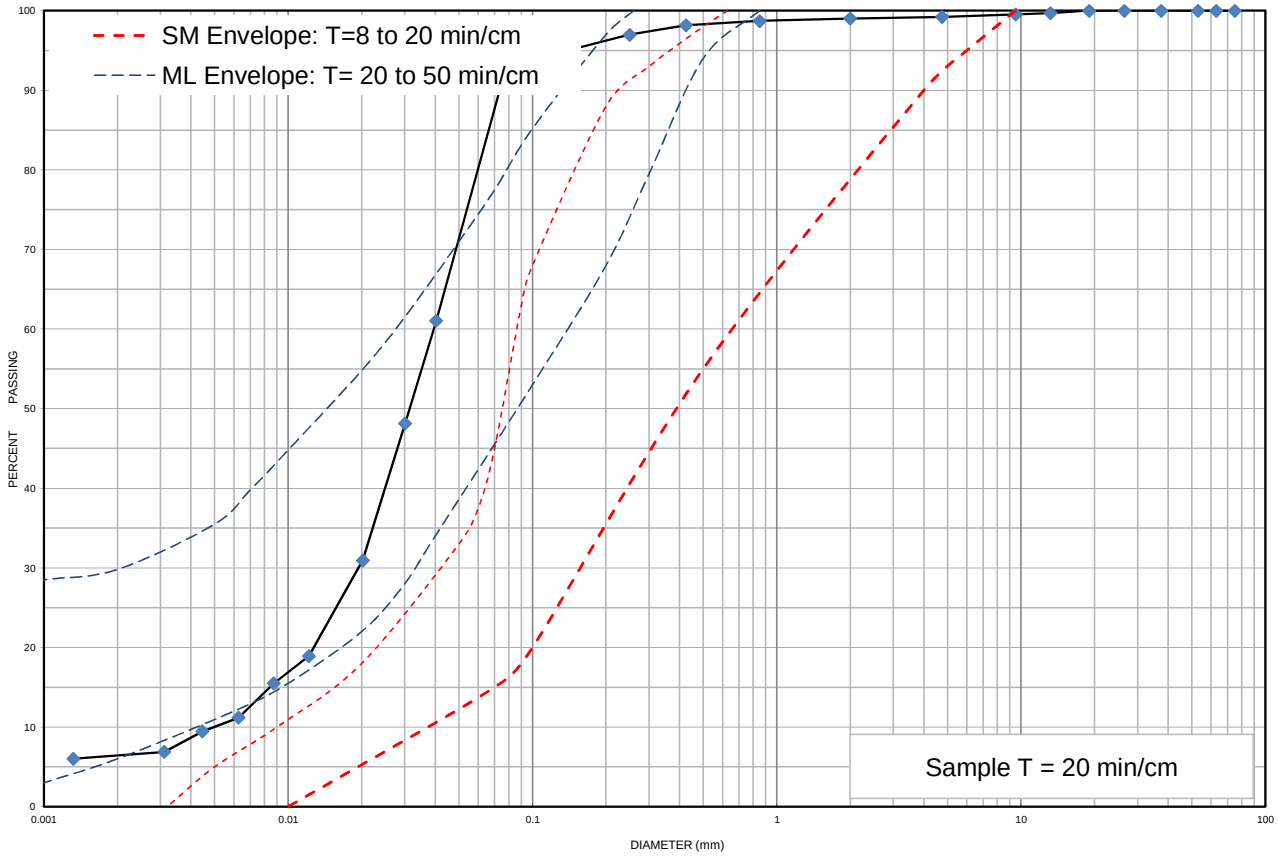
Project Number: *6199-002* **Client:** *EcoVue Consulting Services Inc.*

Project Name: *Hidden Ridge - Soil Characterization*

Sample Date: *June 4, 2019* **Sampled By:** *Luke Jenkins - Cambium Inc.*

Location: *TP 101-19 GS 1* **Depth:** *0.8 m* **Lab Sample No:** *S-19-0367*

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 101-19	GS 1	0.8 m	1	8	91		17.2

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Silt trace Sand trace Clay trace Gravel	ML	0.040	0.019	0.005	8.00	1.81

Issued By: _____ *Date Issued:* *June 18, 2019*

(Senior Project Manager)

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Grain Size Distribution Chart

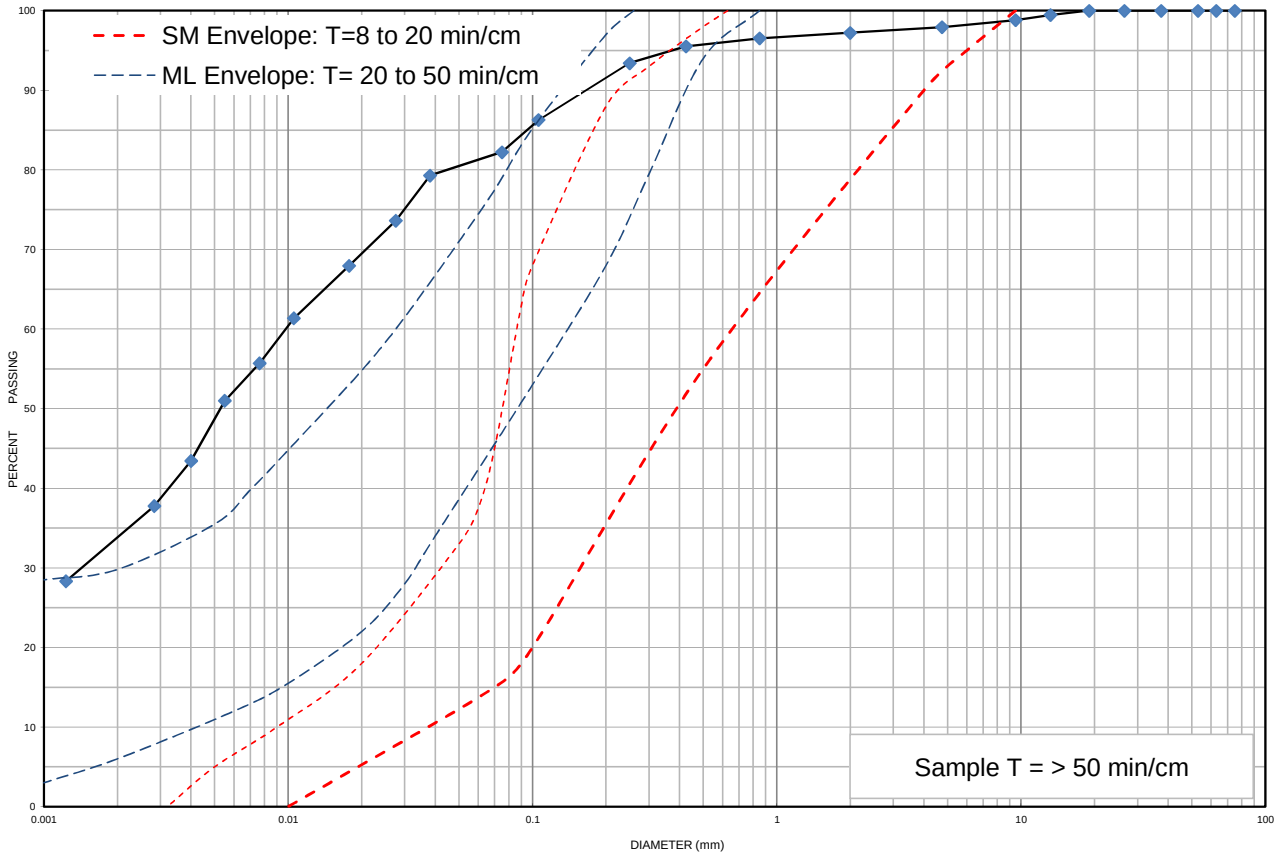
Project Number: *6199-002* **Client:** *EcoVue Consulting Services Inc.*

Project Name: *Hidden Ridge - Soil Characterization*

Sample Date: *June 4, 2019* **Sampled By:** *Luke Jenkins - Cambium Inc.*

Location: *TP 102-19 GS 2A* **Depth:** *4.3 m* **Lab Sample No:** *S-19-0368*

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 102-19	GS 2A	4.3 m	2	16	82		12.4

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Clayey Silt some Sand trace Gravel	ML	0.0098	0.0015	-	-	-

Issued By: _____ *Date Issued:* *June 18, 2019*

(Senior Project Manager)

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Grain Size Distribution Chart

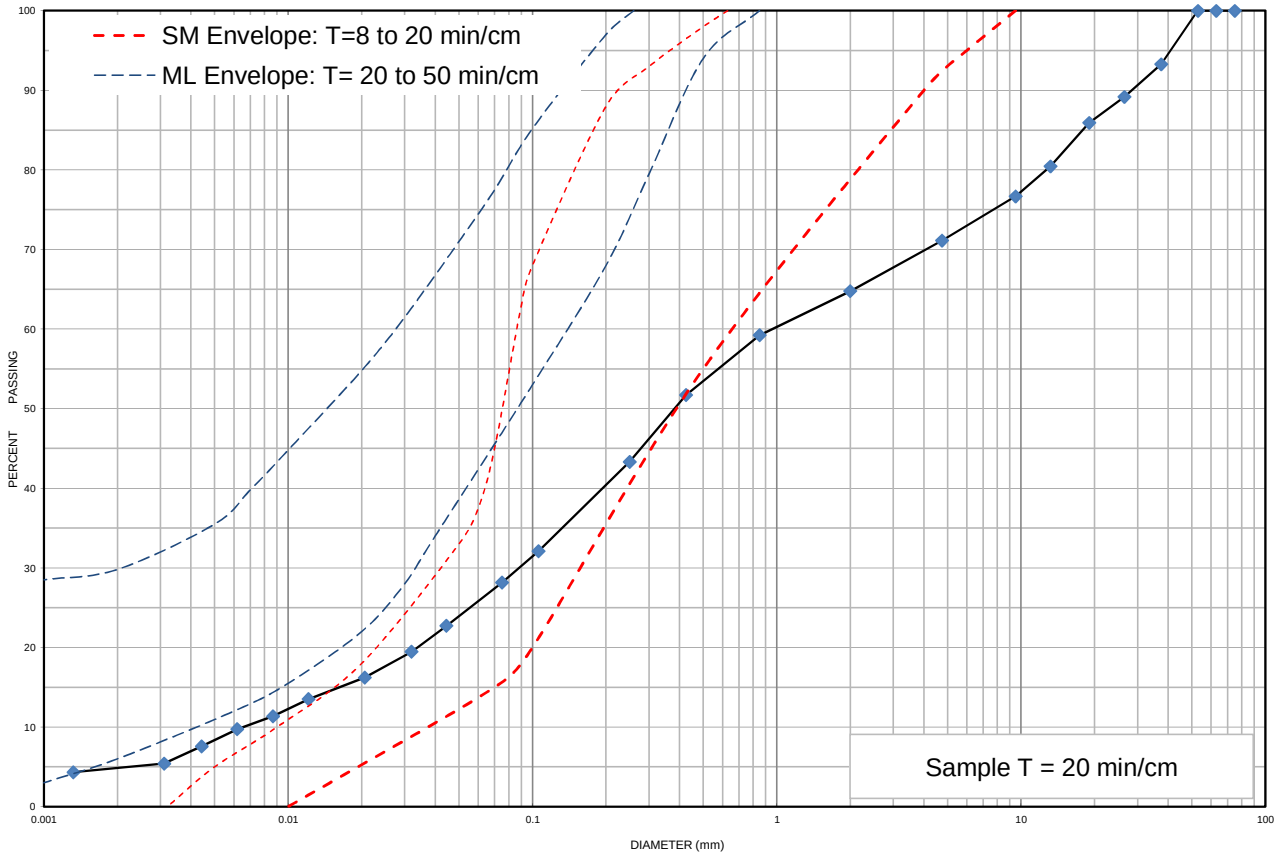
Project Number: *6199-002* **Client:** *EcoVue Consulting Services Inc.*

Project Name: *Hidden Ridge - Soil Characterization*

Sample Date: *June 4, 2019* **Sampled By:** *Luke Jenkins - Cambium Inc.*

Location: *TP 103-19 GS 1* **Depth:** *3.5 m* **Lab Sample No:** *S-19-0369*

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 103-19	GS 1	3.5 m	29	43	28		5.8

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Silty Gravelly Sand trace Clay	SW	0.970	0.088	0.0062	156.45	1.29

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Grain Size Distribution Chart

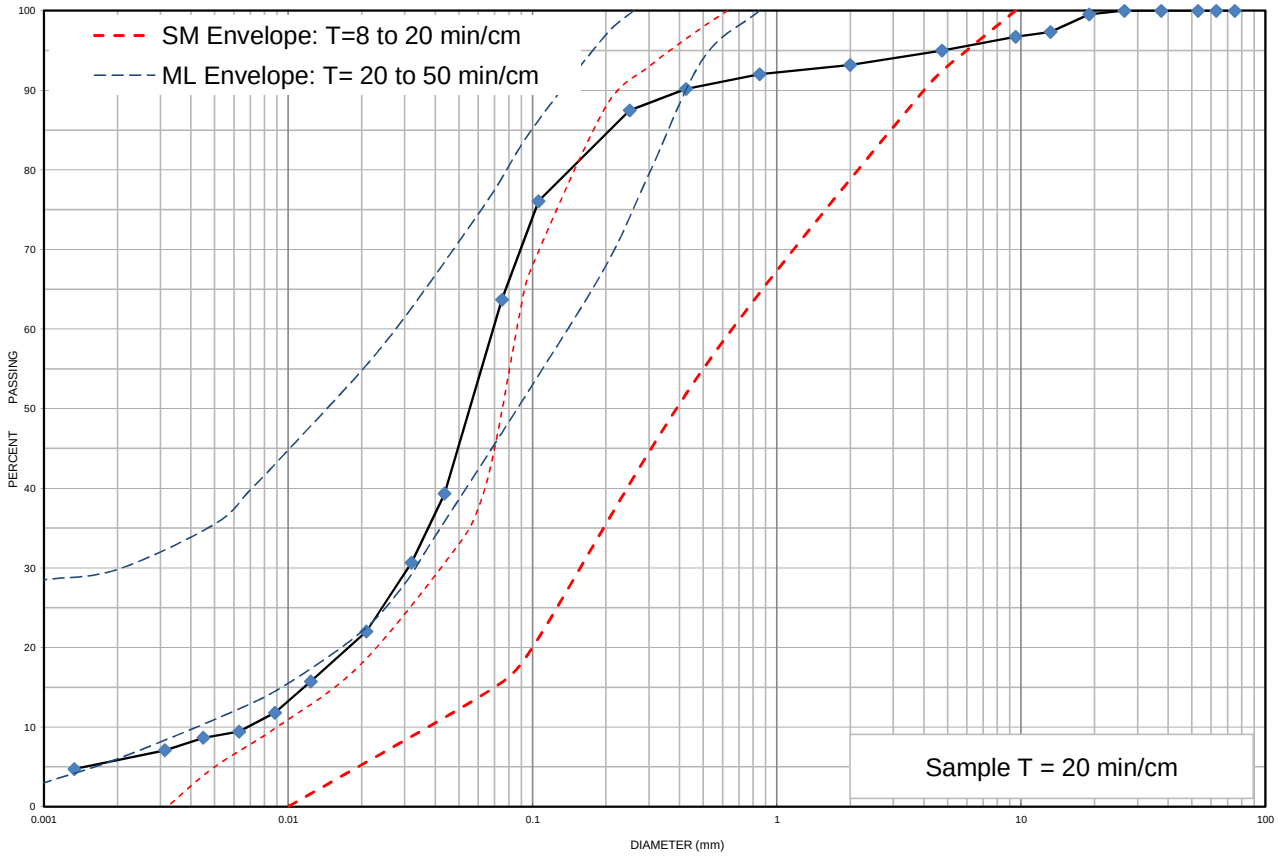
Project Number: *6199-002* **Client:** *EcoVue Consulting Services Inc.*

Project Name: *Hidden Ridge - Soil Characterization*

Sample Date: *June 4, 2019* **Sampled By:** *Luke Jenkins - Cambium Inc.*

Location: *TP 104-19 GS 1* **Depth:** *1.5 m* **Lab Sample No:** *S-19-0370*

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 104-19	GS 1	1.5 m	5	31	64		13.9

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Sandy Silt trace Clay trace Gravel	ML	0.069	0.031	0.0068	10.15	2.05

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Grain Size Distribution Chart

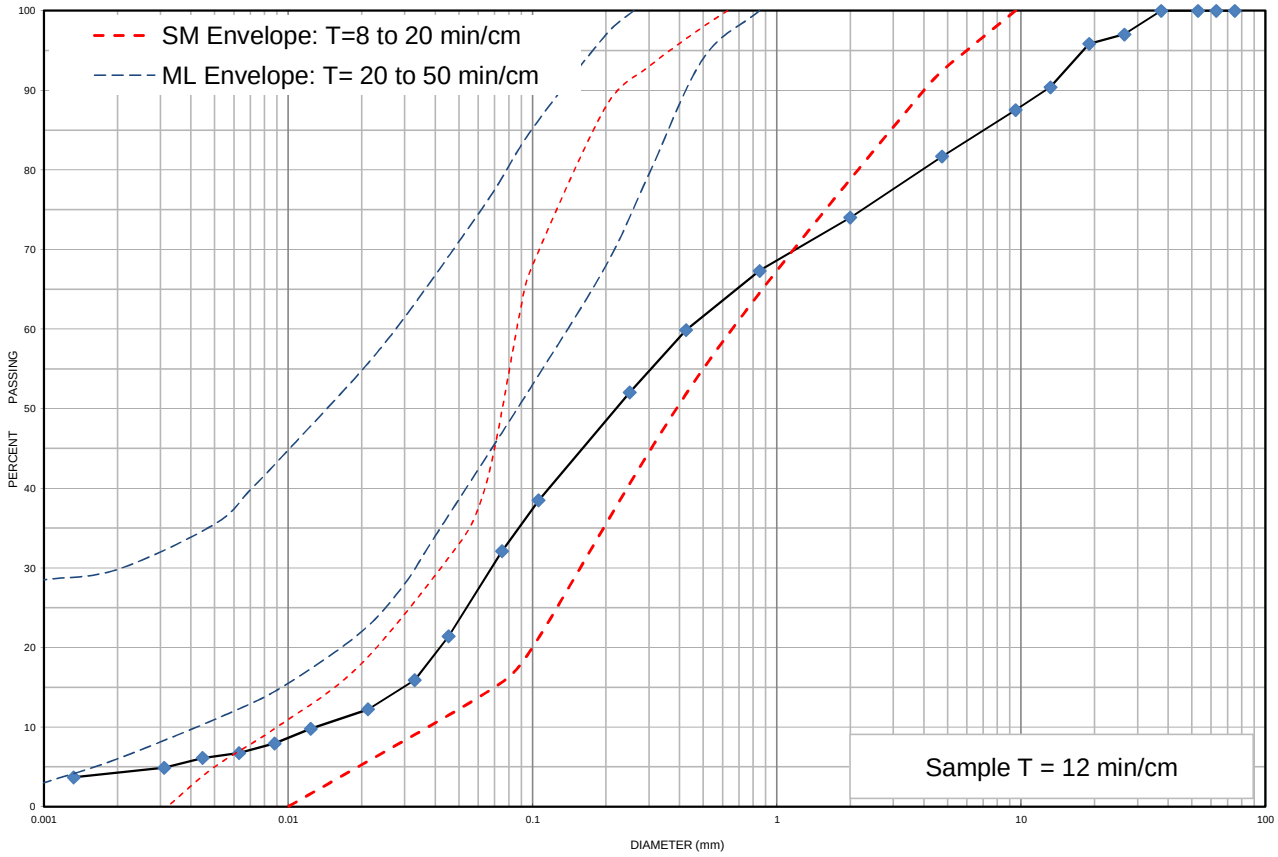
Project Number: *6199-002* **Client:** *EcoVue Consulting Services Inc.*

Project Name: *Hidden Ridge - Soil Characterization*

Sample Date: *June 4, 2019* **Sampled By:** *Luke Jenkins - Cambium Inc.*

Location: *TP 105-19 GS 1* **Depth:** *2 m* **Lab Sample No:** *S-19-0371*

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 105-19	GS 1	2 m	18	50	32		8.0

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Silty Sand some Gravel trace Clay	SM	0.430	0.068	0.014	30.71	0.77

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Grain Size Distribution Chart

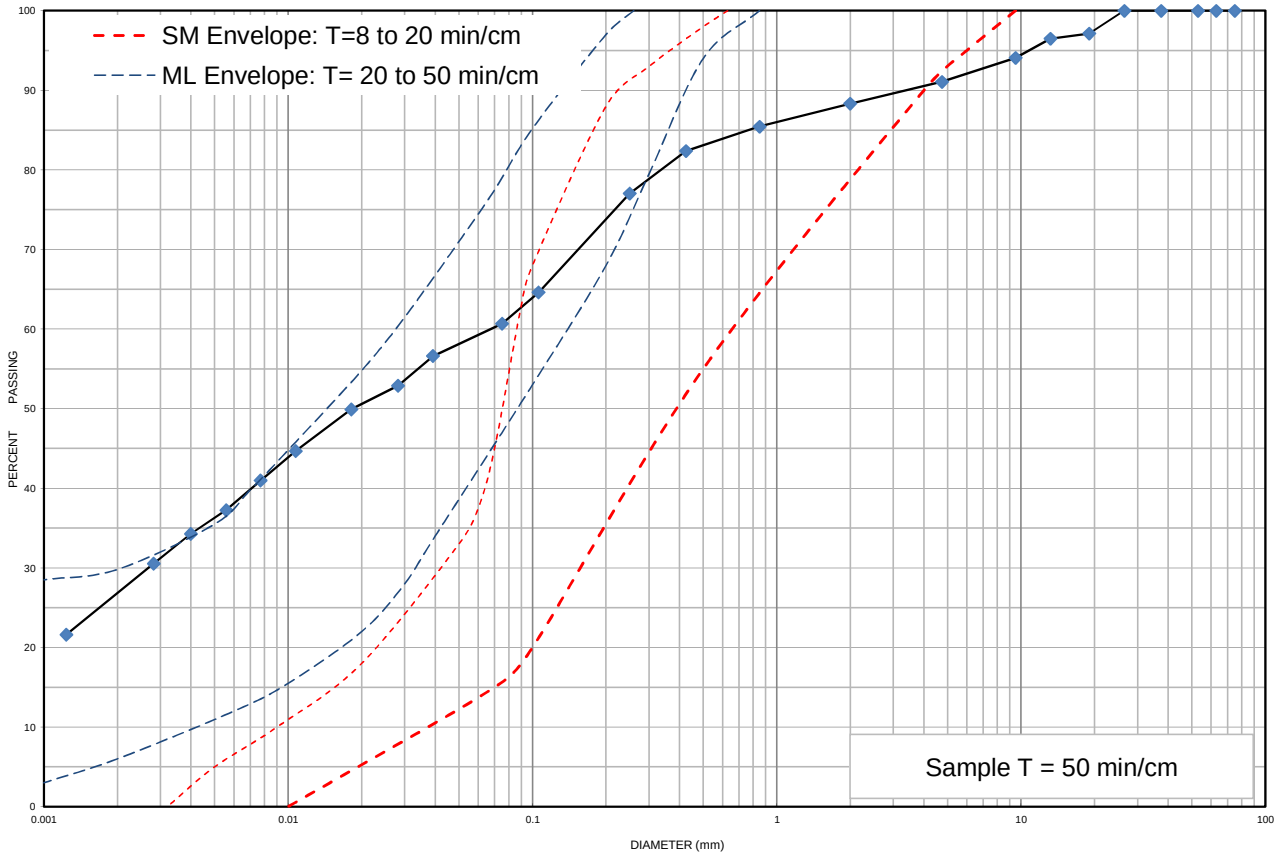
Project Number: *6199-002* **Client:** *EcoVue Consulting Services Inc.*

Project Name: *Hidden Ridge - Soil Characterization*

Sample Date: *June 4, 2019* **Sampled By:** *Luke Jenkins - Cambium Inc.*

Location: *TP 106-19 GS 1* **Depth:** *1.8 m* **Lab Sample No:** *S-19-0372*

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 106-19	GS 1	1.8 m	9	30	61		14.1

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Clayey Sandy Silt trace Gravel	ML	0.068	0.0027	-	-	-

Issued By: _____ *Date Issued:* *June 18, 2019*

(Senior Project Manager)

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Locations
Peterborough
Kingston
Barrie
Oshawa

Laboratory
Peterborough

Appendix C

USDA Soil Characterization

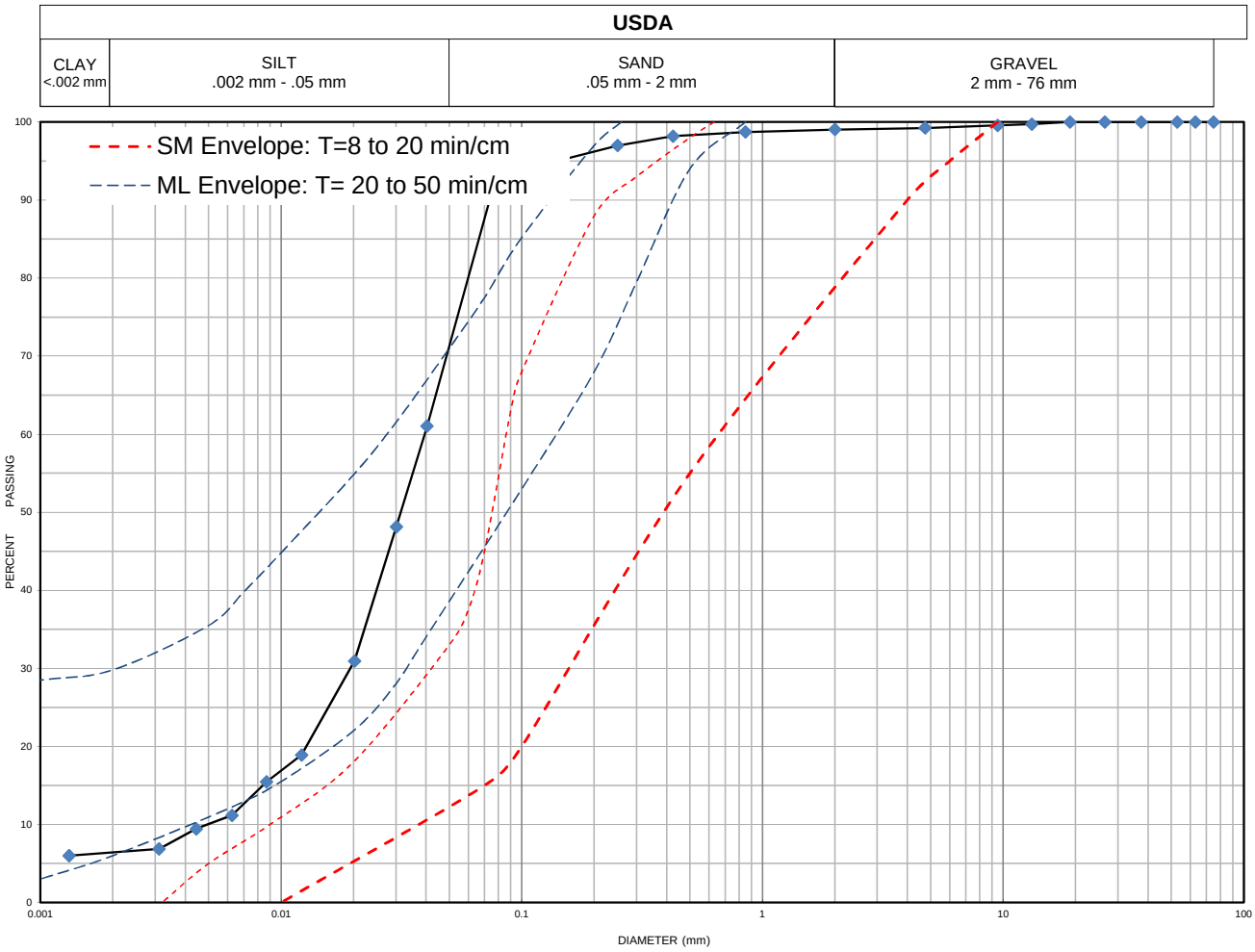
Grain Size Distribution Chart

Project Number: *6199-002* **Client:** *EcoVue Consulting Services Inc.*

Project Name: *Hidden Ridge - Soil Characterization*

Sample Date: *June 4, 2019* **Sampled By:** *Luke Jenkins - Cambium Inc.*

Location: *TP 101-19 GS 1* **Depth:** *0.8 m* **Lab Sample No:** *S-19-0367*



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 101-19	GS 1	0.8 m	1	27	65	7	17.2

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Silt Loam	-	0.040	0.019	0.005	8.00	1.81

Issued By: (Senior Project Manager) *Date Issued:* *June 20, 2019*

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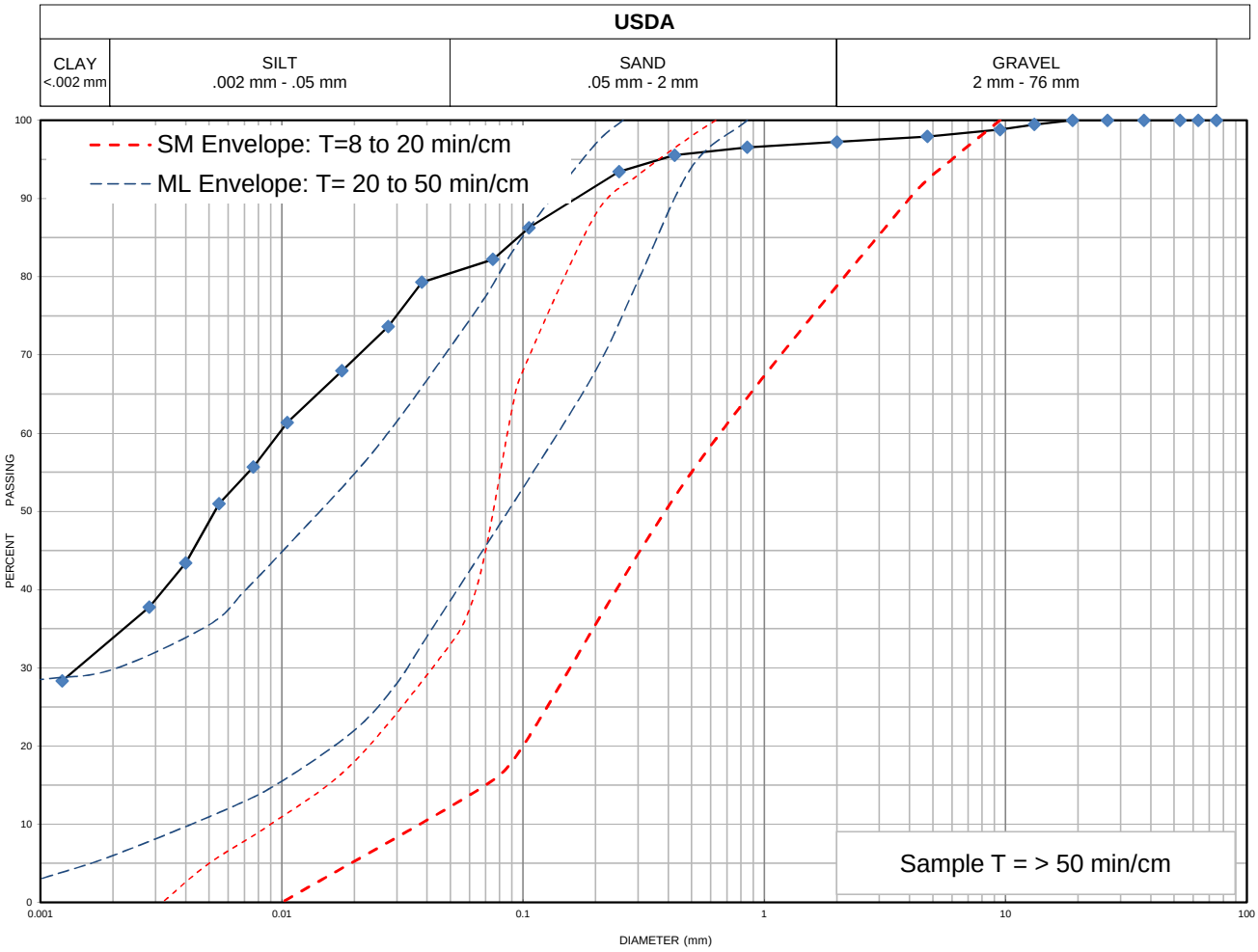
Grain Size Distribution Chart

Project Number: *6199-002* **Client:** *EcoVue Consulting Services Inc.*

Project Name: *Hidden Ridge - Soil Characterization*

Sample Date: *June 4, 2019* **Sampled By:** *Luke Jenkins - Cambium Inc.*

Location: *TP 102-19 GS 2A* **Depth:** *4.3 m* **Lab Sample No:** *S-19-0368*



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 102-19	GS 2A	4.3 m	3	16	47	31	12.4

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Silty Clay Loam	-	0.0098	0.0015	-	-	-

Issued By: (Senior Project Manager) *Date Issued:* *June 20, 2019*

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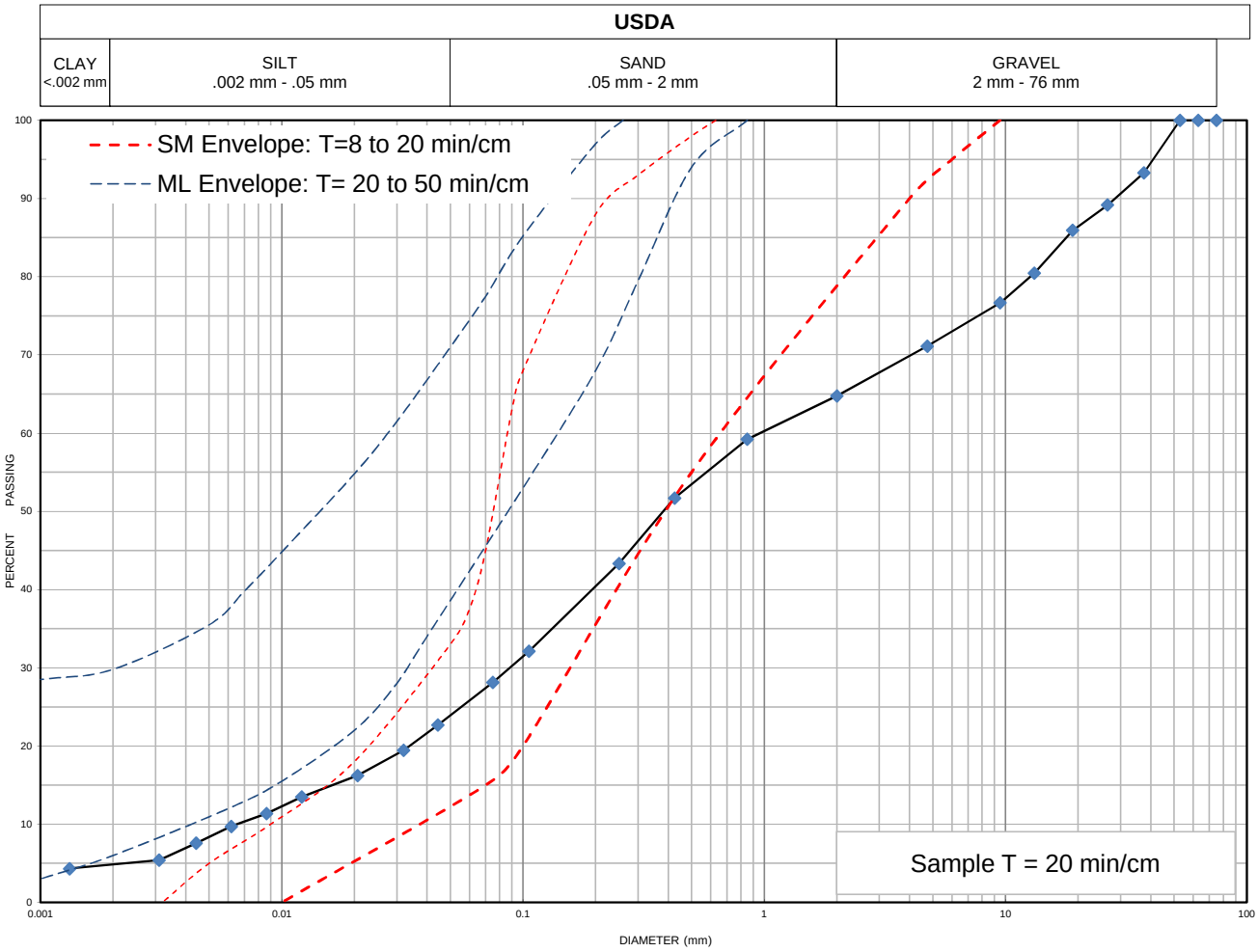
Grain Size Distribution Chart

Project Number: *6199-002* **Client:** *EcoVue Consulting Services Inc.*

Project Name: *Hidden Ridge - Soil Characterization*

Sample Date: *June 4, 2019* **Sampled By:** *Luke Jenkins - Cambium Inc.*

Location: *TP 103-19 GS 1* **Depth:** *3.5 m* **Lab Sample No:** *S-19-0369*



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 103-19	GS 1	3.5 m	35	41	19	5	5.8

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Sandy Loam	-	0.970	0.088	0.0062	156.45	1.29

Issued By: _____ *Date Issued:* *June 20, 2019*

(Senior Project Manager)

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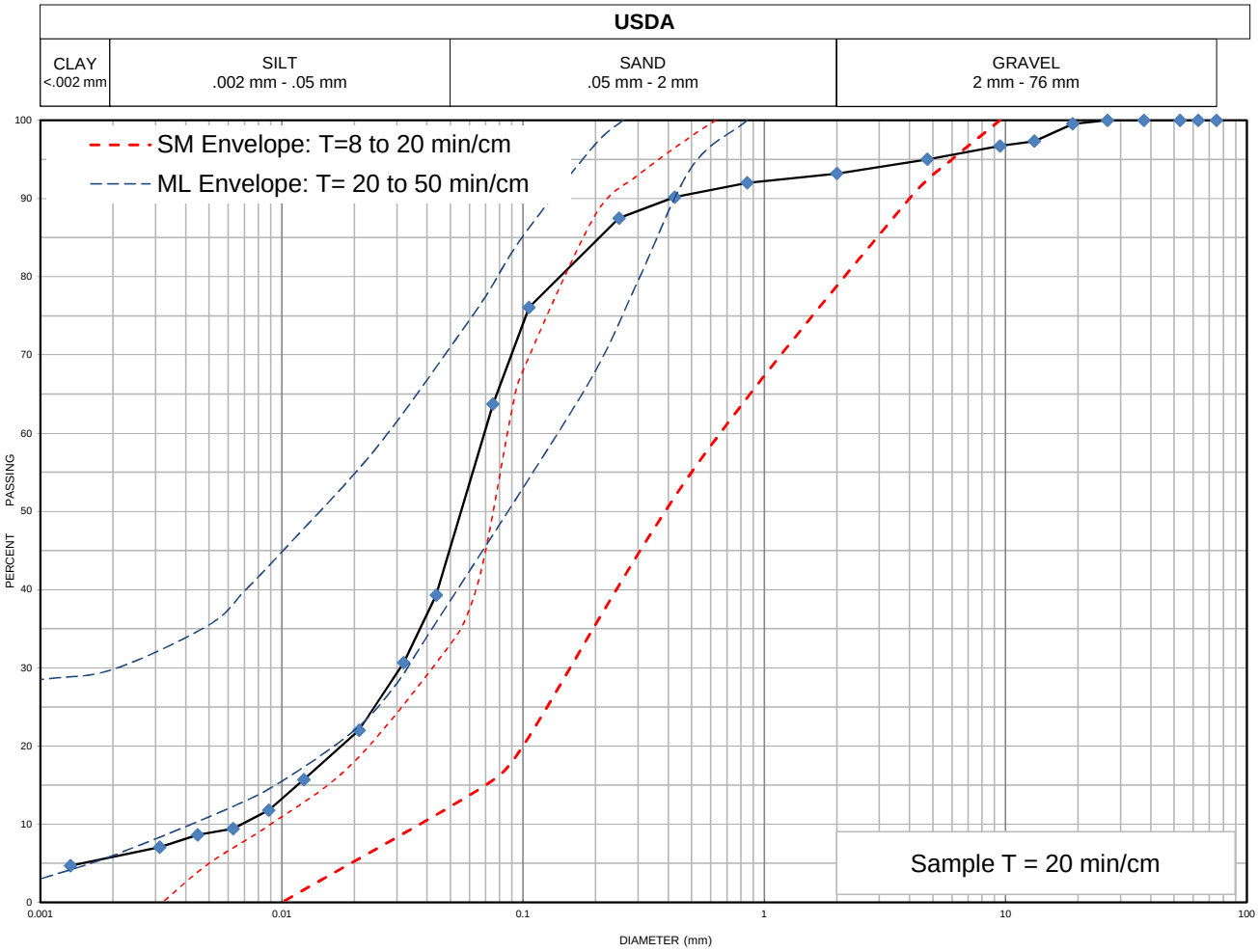
Grain Size Distribution Chart

Project Number: *6199-002* **Client:** *EcoVue Consulting Services Inc.*

Project Name: *Hidden Ridge - Soil Characterization*

Sample Date: *June 4, 2019* **Sampled By:** *Luke Jenkins - Cambium Inc.*

Location: *TP 104-19 GS 1* **Depth:** *1.5 m* **Lab Sample No:** *S-19-0370*



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 104-19	GS 1	1.5 m	7	47	40	6	13.9

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Sandy Loam	-	0.069	0.031	0.0068	10.15	2.05

Issued By: _____ (Senior Project Manager) *Date Issued:* *June 20, 2019*

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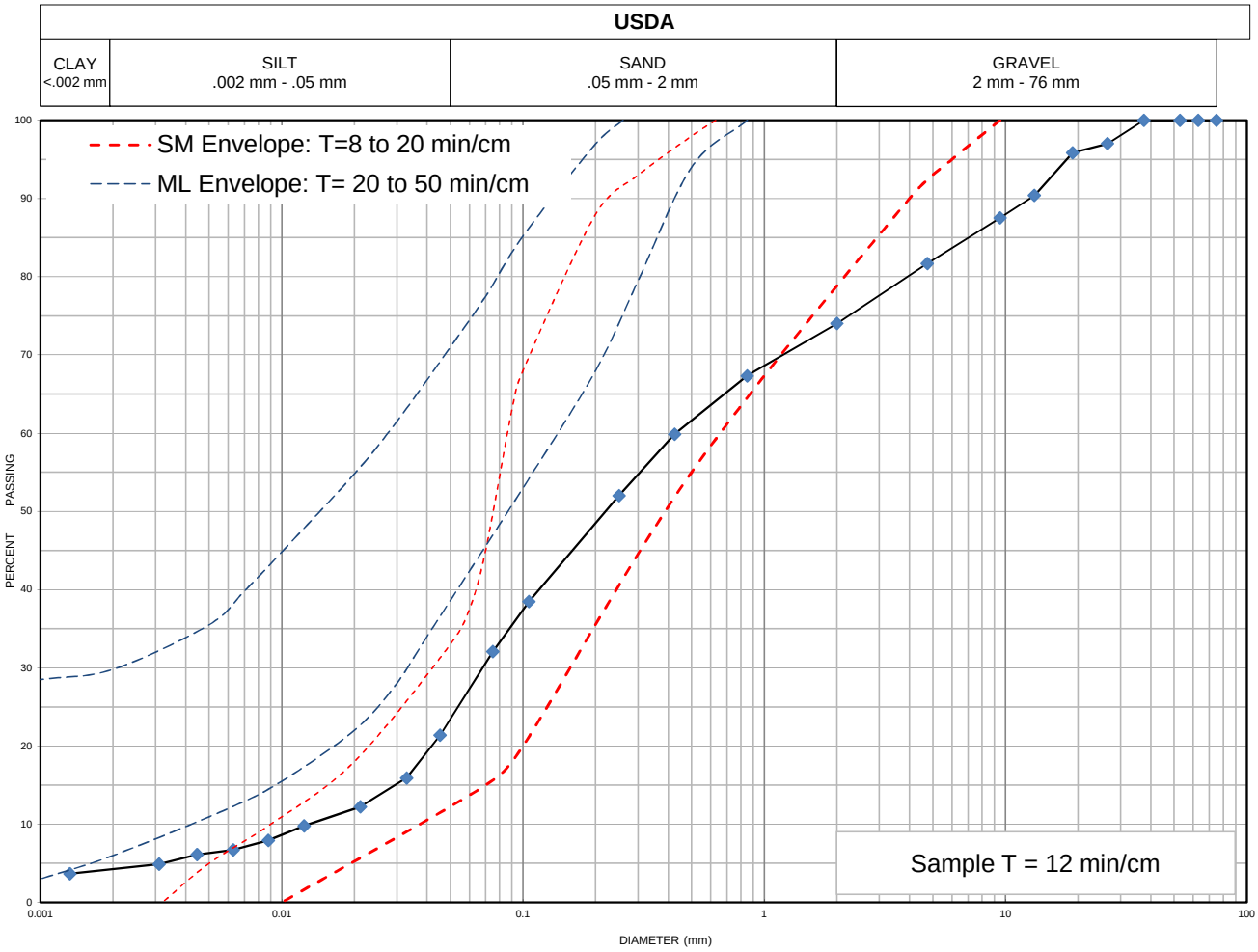
Grain Size Distribution Chart

Project Number: *6199-002* **Client:** *EcoVue Consulting Services Inc.*

Project Name: *Hidden Ridge - Soil Characterization*

Sample Date: *June 4, 2019* **Sampled By:** *Luke Jenkins - Cambium Inc.*

Location: *TP 105-19 GS 1* **Depth:** *2 m* **Lab Sample No:** *S-19-0371*



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 105-19	GS 1	2 m	26	51	19	4	8.0

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Sandy Loam	-	0.430	0.068	0.014	30.71	0.77

Issued By: _____ *Date Issued:* *June 20, 2019*

(Senior Project Manager)

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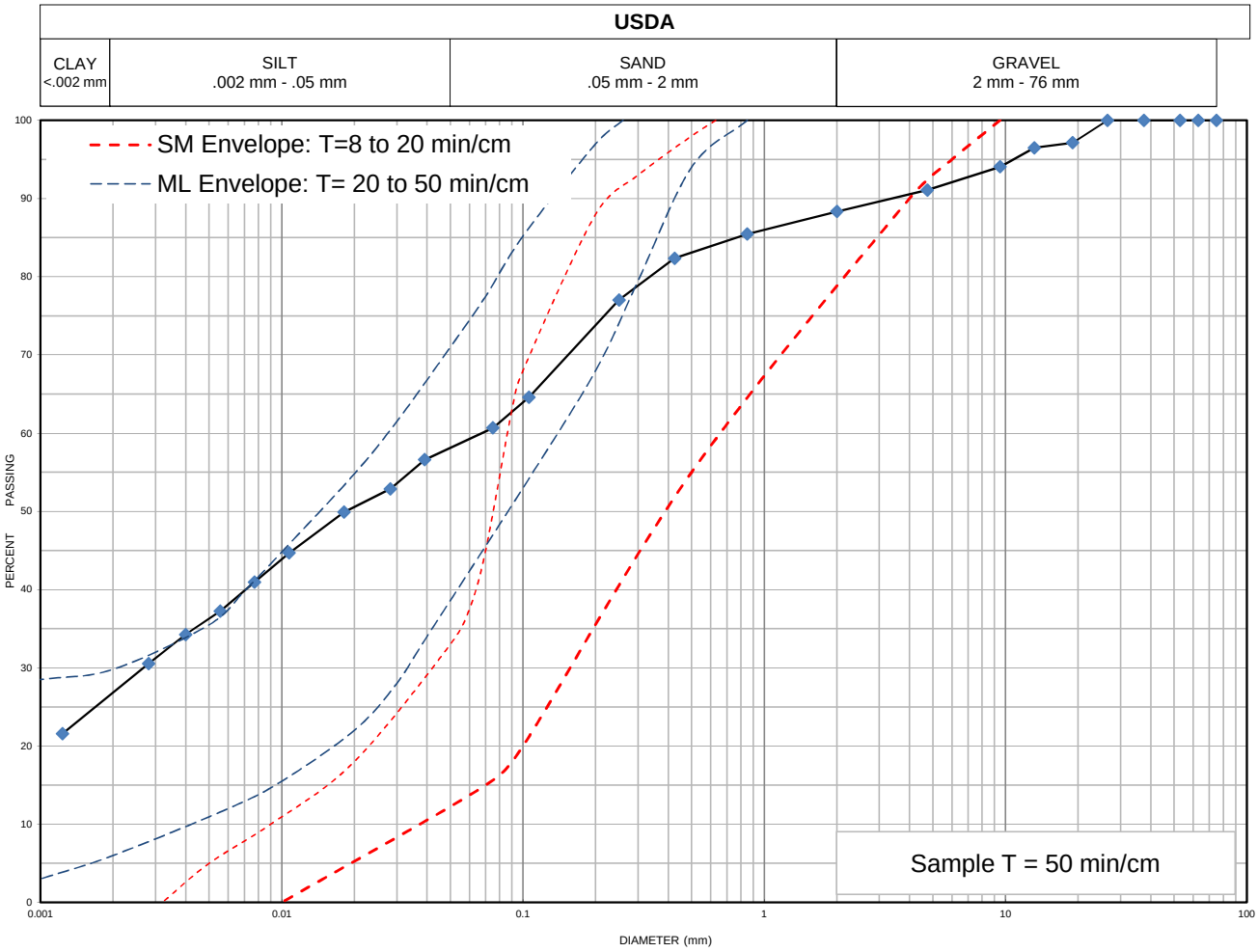
Grain Size Distribution Chart

Project Number: *6199-002* **Client:** *EcoVue Consulting Services Inc.*

Project Name: *Hidden Ridge - Soil Characterization*

Sample Date: *June 4, 2019* **Sampled By:** *Luke Jenkins - Cambium Inc.*

Location: *TP 106-19 GS 1* **Depth:** *1.8 m* **Lab Sample No:** *S-19-0372*



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 106-19	GS 1	1.8 m	12	30	31	27	14.1

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Clay Loam	-	0.068	0.0027	-	-	-

Issued By: (Senior Project Manager) *Date Issued:* *June 20, 2019*

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Oshawa

Laboratory
Peterborough

June 25, 2019

Appendix D

Tables from Erosion and Sedimentation Control Guidelines for Urban Construction (December 2006)

Table A1 classifies erodibility for the various soil types. The texture and drainage of the soil are considered when estimating its erodibility.

Table A1: Hierarchy of Soil Erodibility

Soil Type	Erodibility Classification	Soil Erodibibility Rating
Silt	Most	High
Silt Loam		High
Loam		High
Silty Sand		High
Sandy Loam		Medium
Silty Clay Loam		Medium
Sany Clay Loam		Medium
Silty Clay		Medium
Sandy Clay		Low
Clay		Low
Heavy Clay		Low
Loamy Sand		Low
Sand		Low
Poorly Graded Gravel		Low
Well Graded Gravel	Least	Low

Source: Adapted from Guidelines on Erosion and Sediment Control for Urban Construction Sites (MNR *et al.*,1987)

Table A3 shows erosion potential based on soil erodibility, channel slope, and slope length of channel.

Table A3: Erosion Potential for Graded Conveyance Channels

Channel Gradient	Soil Erodibility	Slope Length	
		< 30 m	> 30 m
< 2 % Gentle Slope	Low	Low	Moderate
	Medium	Moderate	Moderate
	High	Moderate	High
2 – 10 % Moderate Slope	Low	Low	Moderate
	Medium	Moderate	High
	High	High	High
> 10 % Steep Slope	Low	Low	Moderate
	Medium	High	High
	High	High	High

Source: Adapted from Guidelines on Erosion and Sediment Control for Urban Construction Sites (MNR *et al.*,1987)