

**FUNCTIONAL SERVICING &
STORMWATER MANAGEMENT REPORT**

**PARKBRIDGE CRAIGLEITH
RESIDENTIAL DEVELOPMENT
TOWN OF THE BLUE MOUNTAINS**

PARKBRIDGE LIFESTYLE COMMUNITIES INC.

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DECEMBER 2016

CFCA FILE NO. 1046-4031

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1.0 INTRODUCTION

CF Crozier & Associates Inc. (Crozier) was retained by Parkbridge Lifestyle Communities Inc. (Parkbridge) to complete a Functional Servicing & Stormwater Management Report for the proposed Parkbridge Craigeleith Residential Development. Located within the Village of Craigeleith south of Highway 26, the property is bounded by Lakeshore Road to the north, adjacent privately owned lands to the south and east, and Grey Road 19 to the west. Refer to **Figure 1** for the site location plan.

The proposed development is comprised of two separate property parcels. The larger 25 ha (62 acre) property is located south of Lakeshore Road and is legally described as Plan 529, Part Lot 161, Town of The Blue Mountains, County of Grey. The smaller 1.2 ha (3 acre) property is located south of Lakeshore Road and is legally described as Plan 529, Lot 172 and Part Lot 173 as Part 2 RP 16R-6640, Town of The Blue Mountains, County of Grey.

The development concept plan is included as **Figure 2**. The development concept reflects a total of 208 residential units comprised of a mixture of single detached, townhome and loft townhome units as well as a series of private roads, environmental, open space and stormwater management facility areas. Parkbridge proposes the subject community be developed as a land lease community geared towards the adult lifestyle and recreation markets.

This report has been prepared to provide information concerning the servicing (water, sewer, and utilities) and stormwater management to support the planning applications for the proposed development.

2.0 BACKGROUND

Crozier historically provided engineering services with respect to the subject property for a previous owner (Mr. Oelbaum). Although our work was not formally finalized to support planning applications, we have substantially completed natural hazards assessments, functional servicing and stormwater management designs for a previous concept plan on the property. The results of the natural hazards assessments were presented and refined with the Town and the Grey Sauble Conservation Authority (GSCA). Through this process, a settlement was reached with the Town and the GSCA that confirmed the hazard land limits for the subject lands. The hazard limits are to be respected in the current development application.

An additional 1.2 ha property south of Lakeshore Road, as described in **Section 1.0**, has also been obtained and included in the development concept. These lands were formerly referred to as the Keith lands.

Existing on-site archeological features and environmental constraints (including butternut trees) are present and therefore have been accorded appropriate buffer zones in the updated development concept plan. Reports supporting these findings have been prepared and submitted by others under separate cover.

3.0 EXISTING SITE DESCRIPTION & NATURAL HAZARDS

The subject lands lie within the upper and lower terrace physiographic region situated between the Niagara Escarpment toe and the Georgian Bay shoreline. The upper terrace lands are located east of Grey Road 19 and above the Nipissing Ridge and are underlain by Kemble Silty Clay and Waterloo Sandy Loam soils (Soil Survey of Grey County, 1954). The lower terrace lands are bounded by the toe of the Nipissing Ridge to the south, the existing "Bannerman" subdivision to the west, Lakeshore Road to the north and adjacent private properties to the east. These lands are underlain by Waterloo Sandy Loam and Granby Sand soils.

Existing vegetation across the subject lands consists of cultural meadows and clusters of trees. The Watercourse corridors and the Nipissing Ridge are densely treed.

The Nipissing Ridge possesses slopes of approximately 25-50%, save and except a portion of the Ridge immediately to the east of the Watercourse 9 valley corridor in the central portion of the site. Previous excavation works have lessened the slope of the Ridge in this area. Consequently, the Nipissing Ridge within the altered portion is generally open and vegetated with clusters of younger trees as compared to the balance of the ridge, which is more densely forested.

The site is located within the study area of the Craigeleith Camperdown Subwatershed Study (prepared for GSCA by Gore & Storrie, November 1993) and the watercourse naming in this report has been adopted to be consistent with that study. Watercourses 7, 8, 9 and 10 traverse the subject lands in varying fashions as described below. Refer to **Figures 6 & 7** for pre-development drainage patterns and existing site topography.

Watercourse 7 traverses the subject lands along the east edge of the property through the former Keith parcel. This watercourse is located in a defined channel and passes between a number of existing residential units adjacent to Lakeshore Road. The outlet of this watercourse is downstream of Highway 26 and has been identified as a potential flood damage area in the original Gore & Storrie report, due to channel constrictions imposed by existing residences. Watercourse 7 was previously studied by Crozier as part of the "Eden Oak" development, and the appropriate watercourse setbacks have been respected in the concept plan of the subject site.

Watercourse 8 is a relatively small subwatershed which originates in the central portion of the site above the Nipissing Ridge. Flow from Watercourse 8 becomes diffuse below the ridge and infiltrates into the native soil structure and shallow fissured bedrock. No defined channel exists between the bottom of the Watercourse 8 ridge and Lakeshore Road.

The *Watercourse 9* valley corridor bisects the upper and lower terrace lands into west and east portions. Watercourse 9 is located within a deeply incised ravine across the upper terrace lands and within a defined channel but unconfined valley setting across the lower terrace lands. Watercourse 9 has an upstream drainage area exceeding 100 ha. Regulatory floodlines were established for this watercourse (Crozier, 2006) which were subsequently incorporated into natural hazard mapping by the GSCA on behalf of the former client Mr. Oelbaum.

An existing man made pond is located in the central portion of the site adjacent to the bottom of the ridge. This pond intercepts sheet flow from the ridge and stores the water with a historic outlet

structure discharging to *Watercourse 9*.

The *Watercourse 10* valley corridor is located along the western limits of the lower terrace lands of the subject property. Along the lower terrace lands, *Watercourse 10* is located within a defined channel but unconfined valley setting. An incised drainage draw, located in the western portion of the upper terrace lands, connects into the *Watercourse 10* valley corridor. The drainage shed for the watercourse is relatively small, however regulatory setbacks of 15m (min) will be maintained consistent with the requirements of the GSCA and Town for *Watercourse 9*.

Due to the presence of the watercourses and deeply incised valley corridors, the natural hazards and the resulting setbacks have been previously studied as discussed previously in **Section 2.0**.

Slope stability is a consideration with respect to the Nipissing Ridge. In 2006, Top of Bank staking occurred with the GSCA and Town. Stable slope assessment has also been completed by Parkbridge and will be submitted by others under separate cover.

To support both the floodline work and slope stability work, detailed topographic survey was undertaken by Patten Thomsen Ontario Land Surveyors and utilized in the subject assessment.

Finally, a geological investigation was performed by Peto MacCallum Ltd. (Peto) through test pit exploration on August 19, 2015, which Crozier observed on site. Sixteen (16) test pits were advanced across both of the northern quadrants of the site (north of the Nipissing Ridge). Refer to **Appendix E** for the investigation data. Both bedrock and groundwater were observed during the test pit investigation, with bedrock being observed in a portion of the site's northwest quadrant approximately 0.8m to 0.9m below existing grade. Groundwater was found in both the northwest and northeast quadrants of the proposed development, ranging from 2.2m to 2.5m below existing grade. Shale, boulders and cobbles were also observed during the test pit investigation with a variety of overburden soil types across the site. A site specific geotechnical investigation report is pending and preliminary design has been performed based on field observations by Crozier staff at the time of the test pit program.

4.0 ROAD STANDARD

Access to the property is proposed to be provided via Grey Road 19 and Lakeshore Road, with three (3) entrance locations as shown on **Figures 2 & 8**. The nature and suitability of these access locations are further discussed in the Traffic Impact Study (TIS) Report prepared by Crozier (December, 2016), submitted in conjunction with this report. The internal roadway and entrances within the property are proposed to be privately owned and maintained.

The upper and lower portions of the site will be connected by a road that will traverse the Nipissing Ridge and cross *Watercourse 9*. Based on the current concept plan, three (3) watercourse crossings are to be constructed in order to cross *Watercourse 9* both above and below the ridge. The crossings, culverts and road profiles will be designed to convey all minor and major storm events (up to 100-year and Regional Timmins storms), with preliminary culvert calculations provided in **Appendix D**.

The proposed internal roads are proposed to be private, consisting of a 12.0 m road allowance containing a minimum 6.0 m wide, super elevated paved asphalt platform, sanitary sewers, storm sewers, watermain, utilities and streetlights. Subject to geotechnical confirmation, the road structure is

proposed to consist of 300mm granular B, 150mm granular A, and a single 65mm lift of HL4 asphalt.

5.0 SANITARY SERVICING

The Craigeith Wastewater Treatment Plant (WWTP) can accommodate wastewater flows from the proposed development. **Figure 4** reflects the recommended sanitary servicing scheme for the development. Based on this information the proposed sanitary sewer systems will likely consist of two (2) connections to an existing 525mm trunk sanitary sewer along Lakeshore Road, as shown on **Figure 4**. This will drain to the existing Lakeshore Road Sewage Pumping Station, pumping wastewater to the Craigeith WWTP. Existing capacity is available in the system and was confirmed by the Town of Blue Mountain during the pre-consultation meeting. The Craigeith WWTP currently has approximately 4,704 units free for allocation (2013 TOBM Water & Wastewater Capacity Assessment).

Internally, sanitary flows are proposed to be conveyed via gravity sewers in the subject site, with the exception of a small section above the ridge that will likely utilize a low pressure forcemain system due to natural grading constraints. Internal sewers will follow the alignment of the proposed roadways per municipal standard. Each residential unit fronting onto the private roadways will have service laterals connected to this local sewer. Preliminary sanitary servicing flow calculations are provided in **Appendix A**. As shown in the calculations, the total peak daily flow has been determined to be 77.36 L/sec.

Rock breaking may be required to install sanitary sewers and services in a portion of the main site due to high bedrock levels. To balance rock removal requirements and associated cost, provision for full basements will be assessed with the client at the detailed design stage. More detailed review of bedrock elevations and the implications for sanitary servicing will be completed at the detailed design stage.

6.0 WATER SERVICING

Water supply for the subject development will be provided by way of connection to the existing TOBM water distribution network. The Town of Blue Mountain has commented on water supply capacity, confirming that end-of-pipe capacity exists for the proposed development. Similar to the sewage servicing, connection to the existing water distribution system is straightforward and feasible.

Figure 3 reflects the recommended water servicing scheme for the development. Based on the above information, the proposed internal water distribution system will likely consist of connections to the existing watermain located along Grey County Road 19 (primary connection - 350mm dia.) and Lakeshore Road (secondary connection - 200mm dia.). With these watermains surrounding the property, it will be possible to provide at least two dedicated connections to the municipal distribution network and "loop" through the development to provide system redundancy and avoid dead-end mains, as required by the Municipality and MOECC. A Pressure Reducing Valve (PRV) will likely be required given the range of elevation across the Nipissing Ridge. Likewise suitable backflow prevention will be required at site entrances given the anticipated private nature of the internal water system.

Local watermain with individual service connections for each unit will follow the alignment of the

proposed internal roadway. The size of this watermain will be confirmed with the TOBM; however, the minimum diameter is 150 mm. Fire hydrants will be spaced as required to provide the necessary fire protection. Preliminary water servicing flow calculations are provided in **Appendix A**. As shown in the calculations, the max day demand flow has been determined to be 4.98 L/sec and the peak hour flow has been determined to be 11.21 L/sec. Fire flow demand calculations will be provided at the detailed design stage in conjunction with final Architectural and detailed modeling designs.

7.0 UTILITIES

The proposed development will be serviced with natural gas, telephone, cable TV and hydro. All such utilities are currently available on the boundary roadways. Given the development is proposed as a land lease community, potential exists to service many units through rear yard utility connections.

8.0 STORMWATER MANAGEMENT & DRAINAGE

Stormwater management (SWM) for the proposed development will follow the policies and standards of the various agencies including: Town of The Blue Mountains (TOBM), Ministry of Transportation (MTO), Ministry of Environment and Climate Change (MOECC), and Grey Sauble Conservation Authority (GSCA).

The stormwater management criteria that will be met with the development are listed below:

- Water Quantity Control
 - "Post-to-Pre" rainfall/runoff peak flow control to maintain or reduce pre-development peak flows in post-development conditions at site outlets
- Water Quality Control
 - MOECC "Enhanced Protection" 80% long-term S.S. Removal given Georgian Bay as ultimate receiver
- Erosion Control
 - Source control and extended detention required to respect natural geomorphic characteristics of receiving watercourses
- Development Standard
 - Urban cross section complete with 5-year storm sewer system
 - Lot grading at 2% optimum
 - Minor and major drainage system to convey frequent and infrequent rainfall/runoff events

Watercourse 9 has been identified as the primary outlet for the subject lands considering the majority of the site drains to this watercourse, the associated large upstream drainage area and lack of historic flooding downstream. As such, the sections on Stormwater Management and Drainage below explore this scheme in detail.

8.1 Pre-Development Drainage

The site lies within multiple subwatersheds as identified in the Craigleith Camperdown Subwatershed Study prepared by Gore & Storrie (1993) for the GSCA. Refer to **Figures 6 & 7** for the pre-development drainage plans, which include existing storm catchments, sub-watershed delineations, existing culvert locations and sizes.

As shown on **Figures 6 & 7**, Watercourse 9 collects and conveys flow from approximately 145 ha upstream of Lakeshore Road and Highway 26. The 25 ha subject property is located at the downstream end near the ultimate receiving body, Georgian Bay. Given its downstream location within the subwatershed, it is reasonable to assume that site runoff enters the Watercourse 9 system and discharges to Georgian Bay in advance of the hydrograph peak of the entire subwatershed.

Watercourse 9 originates above the Niagara Escarpment. Upon traversing the escarpment, the watercourse bisects a number of ski hills before crossing Grey Road 19 just south of Craigleith Road. The watercourse makes its way through private lands prior to traversing the subject lands.

Drainage in subwatershed 9 within the subject property is generally by way of overland sheet flow in a northeast direction. Watercourse 9 drainage is conveyed under Lakeshore Road, Georgian Trail and Highway 26 by a series of existing culverts as depicted on **Figure 6**. An existing pond is located on-site as shown on **Figure 6**, which has an existing contributing drainage area of approximately 1.9 ha.

The original subwatershed delineations in the site area were developed as part of the Craigleith Camperdown Subwatershed Study. As shown on **Figure 7**, an existing residential development exists west of Grey Road 19 and south of Craigleith Road. This development is known as the "Orchards" development and was designed by Higgins Engineering, which included the construction of a SWM facility.

Crozier obtained a copy of the final Function Servicing and Stormwater Management Report (Higgins Engineering, January 2005) for the "Orchards" development. The 116.6 ha external drainage area west of Grey Road 19 was studied and modeled in the aforementioned report, of which 101.8 ha was considered external drainage and 14.8 ha was considered the "Orchards" development site area. Accordingly, this external drainage area and modeling has been implemented for the Parkbridge Craigleith study area in both pre and post-development conditions, which accounts for the existing SWM facility that services the "Orchards" development.

8.1.1. Hydrologic Evaluation

Pre-development hydrologic parameters and soils mapping is included in **Appendix B**. Pre-development hydrologic modeling was completed using the latest version of the Stormwater Management Hydrologic Model (SWMHYMO) and is included in **Appendix C**. A summary and comparison of pre and post-development peak flows is provided later in this report.

For both pre and post-development modeling and consistent with the Craigleith Camperdown Subwatershed Study, rainfall distributions for the array of design storms (i.e. 25mm and 2 to 100-Year) were simulated using a 6 hour Kiefer-Chu distribution; rainfall depths were based on Owen Sound IDF curves. The Timmins 12-hour rainfall event was used as the Regional storm for the study area.

Existing residential dwellings exist in proximity of Watercourse 9 downstream of Highway 26. Accordingly an assessment of pre and post-development flood conditions was deemed necessary in support of the proposed development to ensure flood levels were not increased. As later discussed in **Section 8.2**, the proposed development (including 3 proposed SWM facilities) will be designed to reduce all storm event peak flows including the 100-year and Regional events, thereby improving existing flood conditions downstream of the subject site.

8.1.2. Hydraulic Flood Model

Pre-development hydraulic flooding conditions of Watercourse 9 were assessed to establish baseline conditions of the watercourse and flooding conditions downstream of the site between Lakeshore Road and Georgian Bay. Hydraulic flood modeling was completed using the latest version of the U.S. Army Corps of Engineers Hydrologic Engineering Center software HEC-RAS and is included in **Appendix D**. The HEC-RAS cross-section location plan and tabular output including pre-development flood water surface elevations is also included in **Appendix D**. A summary and comparison of pre and post-development flood water surface elevations is provided later in this report.

8.2 Post-Development Drainage

Proposed post-development drainage conditions are depicted on **Figures 8 & 9**, which include proposed storm catchments, sub-watershed delineations, preliminary grading, swales, existing and proposed culvert locations and sizes.

The development has been designed to respect Watercourse 9 by implementing a 15m buffer setback from both sides of the watercourse as agreed upon with the Town and GSCA through previous studies as previously discussed in this report. No residential buildings will be placed within this buffer.

8.2.1. Major / Minor Drainage Systems

The development will incorporate an urban cross section consisting of a 12m road allowance containing a paved asphalt platform, storm sewer system, sanitary sewers, watermain, utilities and streetlights. The roadway will be privately owned and maintained.

Following the requirements of the TOBM, the development will incorporate a “dual” drainage system. Minor system flows will be collected by a series of catchbasins and lot drainage swales and conveyed to the SWM facilities through a storm sewer system sized to convey up to the 5 year return rainfall event. Major system flows will be conveyed overland via the internal roadway network to a low point in the roadway and into the proposed SWM Facilities. The preliminary site drainage and stormwater management concept has been illustrated on **Figure 8**.

8.2.2. Stormwater Management Facilities

Runoff generated from the proposed development will be collected, attenuated and treated by three (3) stormwater management (SWM) “end-of-pipe” facilities. The location of the SWM facilities is shown on **Figure 8**.

The two (2) SWM facilities located on the lower terrace lands, one on each side of Watercourse 9, have

been designed as wet pond facilities. The existing constructed pond located at the base of the Nipissing Ridge is proposed to be converted to a wetland SWM facility with half of the existing pond area being used as SWM facility and half remaining as-is as recommended by Azimuth Environmental. This configuration will involve constructing a berm as shown on **Figure 8** to split the existing pond into two half cells.

8.2.3. Flood Proofing & Grading

The proposed development grading design has been developed to account for 100-year and Regional storm event flood water levels and to ensure all developed lands (i.e. roads, residential lots) will be graded to be above the post-development 100-year and Regional water levels with 0.3m of freeboard provided at a minimum, as per previously submitted flood modeling by Crozier.

8.3 Stormwater Quality Control

The facilities will all feature permanent pools and extended detention capabilities, meeting the water quality and erosion control criteria. MOECC "Enhanced Protection" 80% long-term S.S. removal will be provided in all SWM facilities treating all developed areas of the proposed development, prior to discharge to Watercourse 9 as shown on **Figure 8**.

Integrating the wet pond and wetland SWM facilities into the site plan layout is an attractive and very practical way of addressing the stormwater quality control requirements. SWM facility design sheets and calculations are included in **Appendix C** for each facility, which include permanent pool and extended detention volumes, quality control and stage-storage-discharge design calculations.

In addition to the required extended detention component, the runoff volume from a short duration 25 mm storm event was also used to determine the minimum required extended detention volumes for each SWM facility. An extended detention orifice will be designed to provide between 24 and 48 hours of drawdown time for the runoff produced from a short duration 25 mm storm event. Preliminary SWM facility designs were completed as part of this report, and are illustrated on **Figure 8**. The SWM facility designs have been confirmed to meet, and in fact exceed, the required water quality volumes as detailed on the design sheets in **Appendix C**.

A summary of the proposed SWM facilities operating characteristics is provided below in **Table 1**.

Table 1: SWM Facility Operating Characteristics Summary

SWM Facility Number, Type & Drainage Area	Operating Characteristics				
	Pond Bottom Elev. (masl)	Pond Top Elev. (masl)	Provided Permanent Pool Volume (m³) / Elev. (masl)	Provided Extended Detention Volume (m³) / Elev. (masl)	Regional / 100-year Storm Event High Water Level Volume (m³) / Elev. (masl)
#1 <i>Upper Existing Pond converted to Proposed Wetland Facility (13.14 ha)</i>	187.70 – Forebay 188.70 – Main Cell	191.40	348 m³ / 189.00 (216 m³ required)	583 m³ / 189.30 (416 m³ required)	12,120 m³ / 191.32 (Regional)
#2 <i>Lower West Wet Pond (3.88 ha)</i>	180.00	182.40	704 m³ / 181.70 (644 m³ required)	488 m³ / 182.20 (407 m³ required)	628 m³ / 182.31 (100-year) *
#3 <i>Lower East Wet Pond (5.39 ha)</i>	180.00	182.80	892 m³ / 181.50 (703 m³ required)	532 m³ / 181.80 (494 m³ required)	2662 m³ / 182.63 (Regional)

* Note: For SWM Facility #2, 100-year High Water Level governs over Regional.

It is noted that all design details with respect to the operation of the SWM facilities including specific inverts, detailed grading, sediment forebays, control structures and maintenance access roads will be specified during the next stage of the project, that being the detailed engineering design. Likewise, permits/instruments such as an MOECC Environmental Compliance Approval and Fill Permit (GSCA) will be secured.

8.4 Stormwater Quantity Control

The proposed SWM facilities have been designed to provide the amount of peak flow quantity control needed in order to maintain or reduce peak flows based on pre-development conditions, with evaluation and results discussed below.

8.4.1. Hydrologic Evaluation

Post-development hydrologic parameters and soils mapping is included in **Appendix B**. Post-development hydrologic modeling was completed using the latest version of the Stormwater Management Hydrologic Model (SWMHYMO), consistent with industry standard, and is included in **Appendix C**. A summary and comparison of pre and post-development peak flows is provided below in **Table 2**.

Table 2: Summary of Peak Flows for Pre and Post-Development Conditions

Total Peak Flow Location		Storm Event Peak Flow (m^3/s)			
		2-Yr	10-Yr	100-Yr	Timmins (Regional)
Watercourse 9 Lakeshore Road Crossing	Pre 144.8 ha	1.37	4.01	7.32	9.07
	Post 148.8 ha	1.33	3.79	6.90	8.70
	% Diff	-2.9	-5.5	-5.7	-4.1

As shown above in **Table 2**, post-development peak flows at the Watercourse 9 crossing (and downstream) will in fact be reduced from pre-development levels thereby improving the flood conditions downstream of the subject site, between Lakeshore Road and Georgian Bay. Comparing the pre and post-development drainage plans (**Figures 6 & 7 and 8 & 9**) confirms that the drainage areas to Watercourses 7, 8 and 10 will also be reduced in the post-development conditions, due to proposed on-site re-grading and the resulting drainage patterns. Therefore the flood conditions of Watercourses 7, 8 and 10 will also be improved by the proposed development.

8.4.2. Hydraulic Flood Model

Post-development hydraulic flooding conditions of Watercourse 9 were assessed to compare pre and post-development flooding conditions of the watercourse downstream of the site between Lakeshore Road and Georgian Bay. Hydraulic flood modeling was completed using the latest version of the U.S. Army Corps of Engineers Hydrologic Engineering Center software HEC-RAS and is included in **Appendix D**. The HEC-RAS cross-section location plan and tabular output including post-development flood water surface elevations is also included in **Appendix D**. A summary and comparison of pre and post-development flood water surface elevations is provided below in **Table 3**.

Table 3: Summary of Flood Water Levels for Pre and Post-Development Conditions

Site Condition & Total Drainage Area	Regional Water Surface Elevation (masl)			
	HEC-RAS Hydraulic Flood Model Cross-Sections (XS)			
	XS 162 (Downstream of Lakeshore Road)	XS 104.5 (Downstream of Hwy-26)	XS 98 (Downstream of Hwy-26)	XS 38.5 (D/S of Hwy-26 – 38m U/S of Bay)
Pre-Development 144.8 ha	181.47	179.54	179.40	178.77
Post-Development 148.8 ha	181.46	179.36	179.35	178.74

As shown above in **Tables 2 and 3**, the proposed development (including 3 proposed SWM facilities) will reduce all storm event peak flows including the 100-year and Regional events, thereby improving existing flood conditions downstream of the subject site. The post-development water surface elevations downstream of the subject site and Lakeshore Road will be reduced as shown above in **Table 3**.

9.0 CONCLUSIONS

Based on the foregoing we conclude that the proposed Parkbridge Craileith development can be adequately serviced.

1. The servicing and stormwater management strategy presented herein is consistent with the design criteria of the Town, GSCA, NEC, MTO and MOECC.
2. Access to the site will be provided from Lakeshore Road and Grey Road 19 into the proposed development.
3. The development will be serviced by a private sanitary sewer system. Connection to the existing municipal sewer system in the Lakeshore Road right-of-way will be made, into the existing 525mm dia. sewer upstream of the Craileith sanitary sewage pumping station.
4. Domestic water supply is available through connections to the existing municipal system at Grey Road 19 and Lakeshore Road. Confirmation of required pressures and flows will be confirmed with the Town as detailed design proceeds.
5. Stormwater Management will be accomplished via the use of three (3) SWM Facilities which will reduce peak flows at the Lakeshore Road site outlet from pre-development conditions. The SWM Facilities will provide the required quantity and quality control of storm runoff. The development will be serviced by a private storm sewer system which will route minor storm flows (i.e. up to 5-year event) into the SWM Facilities. Major storm flows will be routed to the SWM Facilities via the proposed road corridors which provide positive drainage to each SWM Facility.
6. The development grading design has been developed to account for 100-year and Regional storm event flood water levels and to ensure all developed lands (i.e. roads, residential lots) will be graded to be above the post-development 100-year and Regional water levels with 0.3m of freeboard provided at a minimum. Flood levels downstream of the subject lands will be reduced as a result of the proposed development.
7. All major utilities are available to the development, located in the boundary roadways.

Therefore, we recommend approval of the Planning Applications for the subject lands from the perspective of engineering service requirements.

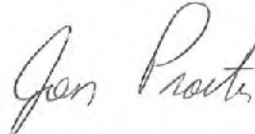
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APPENDIX A

Water and Sanitary Design Flow Servicing Calculations



File: 1046-4031
Date: 8-Dec-16
Updated: 8-Dec-16
By: OD
Check By: JP

Parkbridge Craigleith - Water Design Criteria

Developed Site Area	7.15	ha
Number of Residential Units	208	units
Person Per Residential Unit	2.3	persons/unit
Residential Population	478	persons

Domestic Water Design Flows

Residential (per MOE Design Guidelines 2008 and Town Standards)	450	L/C-day
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Total Domestic Water Design Flows

Average Residential Daily Flow (per MOE Design Guidelines 2008 and Town Standards)	2.49	L/sec
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Max Day Peak Factor (per Town Standards)	2.00	
Max Day Demand Flow	4.98	L/sec

Peak Hour Factor (per Town Standards)	4.50	
Peak Hour Flow	11.21	L/sec

Parkbridge Craigleith - Sanitary Design Criteria

Developed Site Area		7.15 ha
Number of Residential Units		208 units
Person Per Residential Unit	(as per Town Standards)	2.30 persons/unit
Residential Population		478 persons
<u>Unit Sewage flows</u>		
Residential	(as per Town Standards)	450 L/C-day
Infiltration (typical)		0.2 L/s/ha
<u>Total Design Sewage Flows</u>		
Infiltration/Inflow Residential		1.43 L/sec
Average Daily Residential Flow		2.49 L/sec
Residential Peak Factor	(Harmon Formula)	4.0
Total Peak Daily Flow		11.36 L/sec

APPENDIX B

Hydrologic Parameters and Soils Map

Soils Map - Aerial Imagery



Legend

Parcels	Administrative	Live Data	Drain Classification - DFO Class Authorization Type
Alluvial/Point	City/Township	City/Township	A
Farm Taxation Parcel - Current Year	City/Township	City/Township	B
Farm Taxation Parcel - Previous Year	City/Township	City/Township	C
Farm Taxation Parcel - Previous Year	City/Township	City/Township	D
Farm Taxation Parcel - Previous Year	City/Township	City/Township	E
Farm Taxation Parcel - Previous Year	City/Township	City/Township	F
Administrative	Drain Classification - DFO Class Authorization Type	Drain Classification - DFO Class Authorization Type	Drain Classification - DFO Class Authorization Type
City/Township	A	A	A
City/Township	B	B	B
City/Township	C	C	C
City/Township	D	D	D
City/Township	E	E	E
City/Township	F	F	F
Drain Classification - DFO Class Authorization Type	Drain Classification - DFO Class Authorization Type	Drain Classification - DFO Class Authorization Type	Drain Classification - DFO Class Authorization Type
A	A	A	A
B	B	B	B
C	C	C	C
D	D	D	D
E	E	E	E
F	F	F	F
Drain Classification - DFO Class Authorization Type	Drain Classification - DFO Class Authorization Type	Drain Classification - DFO Class Authorization Type	Drain Classification - DFO Class Authorization Type
A	A	A	A
B	B	B	B
C	C	C	C
D	D	D	D
E	E	E	E
F	F	F	F
Drain Classification - DFO Class Authorization Type	Drain Classification - DFO Class Authorization Type	Drain Classification - DFO Class Authorization Type	Drain Classification - DFO Class Authorization Type
A	A	A	A
B	B	B	B
C	C	C	C
D	D	D	D
E	E	E	E
F	F	F	F
Drain Classification - DFO Class Authorization Type	Drain Classification - DFO Class Authorization Type	Drain Classification - DFO Class Authorization Type	Drain Classification - DFO Class Authorization Type
A	A	A	A
B	B	B	B
C	C	C	C
D	D	D	D
E	E	E	E
F	F	F	F

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Map Created: November 4, 2016
Map Center: 44.52089 N, -80.31925 W



The map shows a topographic view of a region. A prominent road, Lakeview Rd E, runs diagonally from the top left towards the bottom right. To the left of this road is a large blue area representing a body of water. To the right of the road is a large, irregularly shaped area shaded in orange, which appears to be a wetland or a specific land use zone. Several smaller water bodies and streams are depicted in light blue. The map includes labels for 'Lot 21', 'Lot 22', and 'Lot 23'. A road labeled 'Hollow Rd' is visible at the bottom left. A road with a '2' shield is at the top. The map is oriented with North at the top.

Porcels

- Assessment Parcels
- Key: No Effect Review - Current Use
- Future Use Review - Production Use

Live Data

Administrative

- Conservation Authority
- Geographic Township
- Lot
- County
- Province
- Region

Drain-Classification - DFC Class Automation Type

- A
- B
- C
- D
- E
- F
- G
- H
- I
- J
- K
- L
- M
- N
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- UT
- UU
- UV
- UW

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FORT LAUDERDALE, FL 33304
(305) 761-1111

HYDROLOGIC PARAMETERS

Project: Parkbridge Craighleith
Project No.: 1046-4031
Design by: DT / CD
Date: 12 Dec 16

D.A.
Area

PRE-9A
2.58 ha

Pre-9A

CURVE NUMBER

Soil Series	Hydrologic Soil Group	Soil Texture	Soil Area Composition		Woodland			Meadow		
			Area(ha)	Percent	Area	GN	GN/A	Area	GN	GN/A
Vincent	C	silty clay loam		0.0		73			76	0
Duneclm	D	clay		0.0		79			81	0
Kennelbe	A	silty clay	0.8	30.0	0.156	73	11.5	0.62	70	47.424
Waterloo	C	sandy loam	1.82	70.0	0.36	32	11.6	1.5	38	55.328
Granby	B	sandy sand		0.0		60	0.0	0	65	0
Totals			2.6	100.0	0.52		23.036	2.1		102.752

Wetlands			Lawn			Cultivated			Impervious		
Area	CN	CN*A	Area	CN	CN*A	Area	CN	CN*A	Land Use	Area (ha)	
50				75			82		Roadway		
50				94	0		86		Sidewalk		
50				79	0		82		Driveway	0.00	
50				49	0		62		Building	0.00	
50				89			74		rip-rap char	0	
		0		0.0			0.0				

Ximg	<u>0</u>	%
------	----------	---

Composite Curve Number

48.8

Time	Ω	%
------	----------	---

Land Use	Initial Absorption (mm)	Area (ha)	IA *A
Wood and	10	0.52	5.2
Meadow	8	2.08	16.6
Lawn	5	0.00	0.0
Cultivated	7		0.0
Impervious	2	0.00	0.0
		2.60	

Total Property Area	2.58	ha
----------------------------	-------------	-----------

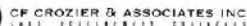
8.4 mm - Composite IA

TIME OF CONCENTRATION

UPLANDS METHOD

Area Description	Area	Travel Length	Slope	Inlet time	Land Cover	Velocity(m/s)	Travel Time (Tc)(hr)	Tp (hr)
Pre-9A		150	4	0.25	meadow	0.15	0.273	0.35
		100	9.0		Forest	0.23	0.122	0.12
		150	8.00		Grassed Waterway	1.14	0.036	0.04

Total Tp (hr) : 0.46



Project: Parkbridge Craigleith
Project No.: 1046-4031
Design by: DT / OD
Date: 21-Dec-16

PRE-9C
0.96 ha

CURVE NUMBER

Wetlands			Lawn			Cultivated			Impervious	
Area	CN	CN*A	Area	CN	CN*A	Area	CN	CN*A	Land Use	Area (ha)
	50			79			82		Roadway	
	50			84	0		85		Sidewalk	
	50			79	0		82		Driveway	
	50			40	0		62		Building	
	50			89			74		rip-rap channel	
		0		0.0	0.0					

33.2

Temp	0	%
------	---	---

Total Property Area	0.96	ha
----------------------------	-------------	-----------

TIME OF CONCENTRATION

UPLANDS METHOD

[illegible]



HYDROLOGIC PARAMETERS

Project: Parkbridge Craigleith
Project No.: 1046-4031
Design by: DT / OD
Date: 12-Dec-16

D.A.	PRE-9D
Area	1.87 ha

Pre-9D

CURVE NUMBER

Soil Series	Hydrologic Soil Group	Soil Texture	Soil Area Composition		Woodland			Meadow		
			Area(a)	Percent	Area	CN	CN*A	Area	CN	CN*A
Vincent	C	silty clay loam		0.0		73			76	0
Duneclon	D	clay		0.0		76			81	0
Kemble	C	silty clay		0.0		73			76	0
Waterloo	A	sandy loam	1.87	100.0	1.26	32	40.12	0.3	11.932	38
Granby	B	sand		0.0		60	0.0	0	65	0
Totals				1.8	100.0	1.26	40.192	0.3	11.932	

Wetlands			Lawn			Cultivated			Impervious	
Area	CN	CN*A	Area	CN	CN*A	Area	CN	CN*A	Land Use	Area (ha)
	50			79			82		Roadway	
	50			84	0		89		Sidewalk	
	50			78	0		82		Driveway	
	50			48	0		62		Building	
	50			68			74		pond	0.3
		0		0.0	0.0					0.30

Ximp	16	%	Composite Curve Number	
Timp	16	%		43.6

Land Use	Initial Absorption (mm)	Area (ha)	I/A *A
Woodland	10	1.26	12.6
Meadow	8	0.31	2.5
Lawn	5	0.00	0.0
Cultivated	7		0.0
Impervious	2	0.30	0.6
		1.87	8.4 mm - Composite I/A

Total Property Area	1.87	ha
----------------------------	-------------	-----------

TIME OF CONCENTRATION

UPLANDS METHOD

[illegible]



PRE-9E
7.73 ha

CURVE NUMBER

Total Property Area	7.73	ha
----------------------------	-------------	-----------

TIME OF CONCENTRATION

UPLANDS METHOD

[illegible]

Project: Parkbridge Craigleith
Project No.: 1046-4031
Design by: DT / OD
Date: 12-Dec-16

D.A. PRE-9F
Area 3.44 ha

Pre-9F

CURVE NUMBER

Soil Series	Hydrologic Soil Group	Soil Texture	Soil Area Composition		Woodland			Meadow		
			Area(ha)	Percent	Area	CN	CN'A	Area	CN	CN'A
Vincent	C	silly clay loam		0.0		73			76	0
Dundelin	D	clay		0.0		79			81	0
Kerrille	C	silly clay		0.0		72			76	0
Waterloo	A	sandy loam		0.0		32	0.0		38	0
Granby	B	sand				60	41.3	2.752	65	178.88
Totals			3.4	100.0	0.69		41.28	2.8		178.88

Wetlands			Lawn			Cultivated			Impervious	
Area	CN	CN*A	Area	CN	CN*A	Area	CN	CN*A	Land Use	Area (ha)
50				79			82		Roadway	
50				84	0		86		Sidewalk	
50				79	0		82		Driveway	0.00
50			0.00	49	0		62		Building	0.00
50				69			74		rip-rap channel	0
		0			0.0			0.0		

Xmp	<u>0</u>	%	<u>Composite Curve Number</u> <u>(for previous areas)</u>
-----	----------	---	--

Temp	$\bar{Q}$	%
------	-----------	---

Land Use	Initial Abstraction (mm)	Area (ha)	IA* Δ
Woodland	10	0.69	6.9
Meadow	8	2.75	22.0
Lowm	5	0.00	0.0
Cultivated	7		0.0
Impervious	2	0.00	0.0
		3.44	8.4

Total Property Area	3.44	ha
---------------------	------	----

TIME OF CONCENTRATION

UPLANDS METHOD

Area Description	Area	Travel Length	Slope	Inlet time	Land Cover	Velocity(mi/hr)	Travel Time (Tc)(hr)	Tp (hr)
Pre-9F			200	4.0	0.25 meadow	0.15	0.365	0.61
			270	0.50	Grassed Ditch	0.34	0.224	0.22
							Total Tp (hr) :	0.66

POST - DEVELOPMENT



Project Name: PARKBRIDGE CRAIGLEITH
Project Number: 1046-4031
Date: 7/11/2016
By: OD

D.A. NAME POST 9B
D.A. AREA (ha) 2.35

Hydrologic Parameters: STANDHYD Command Post Development Drainage Area

Curve Number Calculation

Soil Types Present:				
Type	ID	Hydrologic Group	% Area	Area
Kemble Silty Clay	Ksc	C	100	2.35
				0.00
				0.00
				0.00
Total Area Check				2.35

Impervious Landuses Present:												
Soils	Roadway		Sidewalk		Driveway		Building		SWMF		Subtotals	
	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area	A*CN
		98		98	1.030	98	0.498	98		98	1.5275	149.695
		98		98		98		98		98	0	0
		98		98		98		98		98	0	0
		98		98		98		98		98	0	0
Subtotal Area	0		0		1.030		0.498		0			
Pervious Landuses Present:												
Soils	Woodland		Meadow		Wetland		Lawn		Cultivated		Subtotals	
	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area	A*CN
C	0		0		0		0.823	79	0		0.8225	64.98
	0		0		0		0.000		0		0	0.00
	0		0		0		0		0		0	0.00
	0		0		0		0		0		0	0.00
Subtotal Area	0		0		0		0.823		0			
					Pervious Area Calculations		Total Pervious Area				0.82	
							Composite Pervious Curve Number				79.0	
					Impervious Area Calculations		Total Directly Connected Area				1.03	
							Total Indirectly Connected Area				0.4975	
							Total Impervious Area				1.53	
							% X imp				43.8	
							% T imp				65.0	
							Total Area Check				2.35	

Initial Abstraction and Hydraulics Calculations

Landuse	IA (mm)	Area (ha)	A * IA
Woodland	10	0	0
Meadow	8	0	0
Wetland	16	0	0
Lawn	5	0.8225	4.1125
Cultivated	7	0	0

Land Use	IA (mm)	Slope (%)	Travel Length (m)	Manning's n
Pervious	5.0	3.0	30	0.250
Impervious	2.0	6.0	110	0.013



Project Name: PARKBRIDGE CRAIGLEITH
 Project Number: 1046-4031
 Date: 7/11/2016
 By: OD

D.A. NAME POST 9F
 D.A. AREA (ha) 0.35

**Hydrologic Parameters: STANDHYD Command
 Post Development Drainage Area**

Curve Number Calculation

Soil Types Present:				
Type	ID	Hydrologic Group	% Area	Area
Kemble Silty Clay	Ksc	C	100	0.35
				0.00
				0.00
				0.00
Total Area Check				0.35

Impervious Landuses Present:													
Roadway			Sidewalk		Driveway		Building		SWMF		Subtotals		
Soils	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area	A*CN	
	0.343	98		98		98		98		98	0.343	33.614	
		98		98		98		98		98	0	0	
		98		98		98		98		98	0	0	
		98		98		98		98		98	0	0	
Subtotal Area	0.343		0		0.000		0.000		0				
Pervious Landuses Present:													
Woodland			Meadow		Wetland		Lawn		Cultivated		Subtotals		
Soils	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area	A*CN	
C	0		0		0		0.007	69	0		0.007	0.48	
	0		0		0		0.000		0		0	0.00	
	0		0		0		0		0		0	0.00	
	0		0		0		0		0		0	0.00	
Subtotal Area	0		0		0		0.007		0				
					Pervious Area Calculations		Total Pervious Area				0.01		
							Composite Pervious Curve Number				69.0		
					Impervious Area Calculations		Total Directly Connected Area				0.343		
							Total Indirectly Connected Area				0		
							Total Impervious Area				0.34		
							% X imp				98.0		
							% T imp				98.0		
Total Area Check											0.35		

Initial Abstraction and Hydraulics Calculations

Landuse	IA (mm)	Area (ha)	A * IA
Woodland	10	0	0
Meadow	8	0	0
Wetland	16	0	0
Lawn	5	0.007	0.035
Cultivated	7	0	0

Land Use	IA (mm)	Slope (%)	Travel Length (m)	Manning's n
Pervious	5.0	2.0	10	0.250
Impervious	2.0	4.0	98	0.013



Project Name: PARKBRIDGE CRAIGLEITH
 Project Number: 1046-4031
 Date: 7/11/2016
 By: OD

D.A. NAME POST 91
 D.A. AREA (ha) 3.88

Hydrologic Parameters: STANDHYD Command Post Development Drainage Area

Curve Number Calculation

Soil Types Present:				
Type	ID	Hydrologic Group	% Area	Area
Kemble Silty Clay	Ksc	C	60	2.33
Waterloo sandy loam	Wsl	A	40	1.55
				0.00
				0.00
Total Area Check				3.88

Impervious Landuses Present:												
Soils	Roadway		Sidewalk		Driveway		Building		SWMF		Subtotals	
	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area	A*CN
		98		98	1.560	98	0.768	98		98	2.328	228.144
		98		98		98		98		98	0	0
		98		98		98		98		98	0	0
		98		98		98		98		98	0	0
Subtotal Area	0		0		1.560		0.768		0			
Pervious Landuses Present:												
Soils	Woodland		Meadow		Wetland		Lawn		Cultivated		Subtotals	
	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area	A*CN
C	0		0		0		0.931	69	0		0.9312	64.25
A	0		0		0		0.621	49	0		0.6208	30.42
0	0		0		0		0		0		0	0.00
0	0		0		0		0		0		0	0.00
Subtotal Area	0		0		0		1.552		0			
					Pervious Area Calculations		Total Pervious Area				1.55	
					Impervious Area Calculations		Composite Pervious Curve Number				61.0	
							Total Directly Connected Area				1.56	
							Total Indirectly Connected Area				0.768	
							Total Impervious Area				2.33	
							% X imp				40.2	
							% T imp				60.0	
							Total Area Check				3.88	

Initial Abstraction and Hydraulics Calculations

Landuse	IA (mm)	Area (ha)	A * IA
Woodland	10	0	0
Meadow	8	0	0
Wetland	16	0	0
Lawn	5	1.552	7.76
Cultivated	7	0	0

Land Use	IA (mm)	Slope (%)	Travel Length (m)	Manning's n
Pervious	5.0	2.0	30	0.250
Impervious	2.0	2.0	245	0.013



Project Name: PARKBRIDGE CRAIGLEITH
 Project Number: 1046-4031
 Date: 7/11/2016
 By: OD

D.A. NAME POST 9M
 D.A. AREA (ha) 3.80

**Hydrologic Parameters: STANDHYD Command
 Post Development Drainage Area**

Curve Number Calculation

Soil Types Present:				
Type	ID	Hydrologic Group	% Area	Area
Granby sand	Gs	B	100	3.80
				0.00
				0.00
				0.00
Total Area Check				3.80

Impervious Landuses Present:												
Roadway			Sidewalk		Driveway		Building		SWMF		Subtotals	
Soils	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area	A*CN
		98		98	1.660	98	0.810	98		98	2.47	242.06
		98		98		98		98		98	0	0
		98		98		98		98		98	0	0
		98		98		98		98		98	0	0
Subtotal Area	0		0		1.660		0.810		0			
Pervious Landuses Present:												
Woodland			Meadow		Wetland		Lawn		Cultivated		Subtotals	
Soils	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area	A*CN
B	0		0		0		1.330	69	0		1.33	91.77
	0		0		0		0.000		0		0	0.00
	0		0		0		0		0		0	0.00
	0		0		0		0		0		0	0.00
Subtotal Area	0		0		0		1.330		0			
					Pervious Area Calculations		Total Pervious Area				1.33	
							Composite Pervious Curve Number				69.0	
					Impervious Area Calculations		Total Directly Connected Area				1.66	
							Total Indirectly Connected Area				0.81	
							Total Impervious Area				2.47	
							% X imp				43.7	
							% T imp				65.0	
							Total Area Check				3.80	

Initial Abstraction and Hydraulics Calculations

Landuse	IA (mm)	Area (ha)	A * IA
Woodland	10	0	0
Meadow	8	0	0
Wetland	16	0	0
Lawn	5	1.33	6.65
Cultivated	7	0	0

Land Use	IA (mm)	Slope (%)	Travel Length (m)	Manning's n
Pervious	5.0	2.0	30	0.250
Impervious	2.0	2.0	155	0.013

Hydrologic Parameters: NASHYD Command
Post Development Drainage Area

Curve Number Calculation

Soil Types Present:				
Type	ID	Hydrologic Group	% Area	Area
Kemble silty clay	Ksc	C	100	0.53
				0
				0
				0
Total Area				0.53

Impervious Landuses Present:													
Soils	Roadway		Sidewalk		Driveway		Building		SWMP		Subtotals		
	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area	A*CN	
C		98		98		98		98		98	0.00	0.00	
0		98		98		98		98		98	0	0	
0		98		98		98		98		98	0	0	
0		98		98		98		98		98	0	0	
Subtotal Area	0.00		0.00		0.00		0.00		0.00				
Pervious Landuses Present:													
Soils	Woodland		Meadow		Wetland		Lawn		Cultivated		Subtotals		
	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area	A*CN	
C	0.00	32	0.53	76	0.00		0.00		0.00		0.53	40.28	
0	0.00		0.00		0.00		0.00		0.00		0.00	0.00	
0	0.00		0.00		0.00		0.00		0.00		0.00	0.00	
0	0.00		0.00		0.00		0.00		0.00		0.00	0.00	
Subtotal Area	0.00		0.53		0.00		0.00		0.00				
					Composite Area Calculations		Total Pervious Area				0.53		
							Total Impervious Area				0.00		
							% Impervious				0.0		
							Composite Curve Number				76.0		
							Total Area Check				0.53		

Initial Abstraction and Hydraulics Calculations

Initial Abstraction				Composite Runoff Coefficient							
Landuse	IA (mm)	Area (ha)	A * IA	Kemble silty clay							
				RC	Area	RC	Area	RC	Area	RC	Area
Woodland	10	0.00	0.00	0.12	0.00		0		0		0
Meadow	8	0.53	4.24	0.10	0.53		0		0		0
Wetland	12	0.00	0.00	0.05	0.00		0		0		0
Lawn	5	0.00	0.00		0.00		0		0		0
Cultivated	7	0.00	0.00		0.00		0		0		0
Impervious	2	0.00	0.00	0.95	0.00		0		0		0
Composite IA		0.53	8.00	Composite Runoff Coefficient							

Time to Peak Inputs						Uplands		Bransby Williams		Airport	
Flow Path Description	Length (m)	Drop (m)	Slope (%)	V/S ^{0.5}	Velocity (m/s)	Tc (hr)	Tp (hr)	Tc (hr)	Tp (hr)	Tc (hr)	Tp (hr)
	152	6.6	4.34%					0.11	0.08	0.41	0.28

Appropriate calculated time to peak: **0.28** Appropriate Method: **Airport**



Project Name: PARKBRIDGE CRAIGLEITH
 Project Number: 1046-4031
 Date: 7/11/2016
 By: OD

D.A. NAME POST 9C & 9D
D.A. AREA (ha) 2.74
 Note: 9C & 9D catchments lumped.

**Hydrologic Parameters: NASHYD Command
 Post Development Drainage Area**

Curve Number Calculation

Soil Types Present:				
Type	ID	Hydrologic Group	% Area	Area
Waterloo Sandy Loam	Wsl	A	100	2.74
				0
				0
				0
Total Area				2.74

Impervious Landuses Present:												Subtotals	
Roadway		Sidewalk		Driveway		Building		SWMF				Area	A*CN
Soils	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area	A*CN
A												0.00	0.00
	0											0	0
	0											0	0
	0											0	0
Subtotal Area	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Pervious Landuses Present:													
Woodland		Meadow		Wetland		Lawn		Cultivated				Area	A*CN
Soils	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area	A*CN
A	1.23	1.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.74	96.72
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Subtotal Area	1.23	1.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Composite Area Calculations												Total Pervious Area	2.74
												Total Impervious Area	0.00
												% Impervious	0.0
												Composite Curve Number	35.3
												Total Area Check	2.74

Initial Abstraction and Hydraulics Calculations

Initial Abstraction				Composite Runoff Coefficient								
Landuse	IA (mm)	Area (ha)	A * IA	Waterloo Sandy		0		0		0		A*RC
				RC	Area	RC	Area	RC	Area	RC	Area	
Woodland	10	1.23	12.33	0.12	1.23		0		0		0	0.15
Meadow	8	1.51	12.06	0.15	1.51		0		0		0	0.23
Wetland	12	0.00	0.00	0.05	0.00		0		0		0	0.00
Lawn	5	0.00	0.00		0.00		0		0		0	0.00
Cultivated	7	0.00	0.00		0.00		0		0		0	0.00
Impervious	2	0.00	0.00	0.95	0.00		0		0		0	0.00
Composite IA		2.74	8.90	Composite Runoff Coefficient								0.14

Time to Peak Inputs						Uplands			Bransby Williams		Airport	
Flow Path Description	Length (m)	Drop (m)	Slope (%)	V/S ^{0.5}	Velocity (m/s)	Tc (hr)	Tp (hr)	TOTAL Tp (hr)	Tc (hr)	Tp (hr)	Tc (hr)	Tp (hr)
	155	15	9.68%						0.08	0.06	0.31	0.21

Appropriate calculated time to peak: **0.21** Appropriate Method: Airport



Project Name: PARKBRIDGE CRAIGLEITH
 Project Number: 1046-4031
 Date: 7/11/2016
 By: OD

D.A. NAME POST 9E
 D.A. AREA (ha) 2.04

**Hydrologic Parameters: NASHYD Command
 Post Development Drainage Area**

Curve Number Calculation

Soil Types Present:				
Type	ID	Hydrologic Group	% Area	Area
Waterloo Sandy Loam	Wsl	A	100	2.04
				0
				0
				0
Total Area				2.04

Impervious Landuses Present:											
Roadway		Sidewalk		Driveway		Building		SWMF		Subtotals	
Soils	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area A*CN
A	0.10	98		98		98		98		98	0.10 9.80
	0	98		98		98		98		98	0 0
	0	98		98		98		98		98	0 0
	0	98		98		98		98		98	0 0
Subtotal Area		0.10	0.00		0.00		0.00		0.00		
Pervious Landuses Present:											
Woodland		Meadow		Welland/SWMF		Lawn		Cultivated		Subtotals	
Soils	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area A*CN
A	1.02	32	0.00	38	0.72	50	0.20	49	0.00		1.94 78.44
0	0.00		0.00		0.00		0.00		0.00		0.00 0.00
0	0.00		0.00		0.00		0.00		0.00		0.00 0.00
0	0.00		0.00		0.00		0.00		0.00		0.00 0.00
Subtotal Area		1.02	0.00		0.72		0.20		0.00		
				Composite Area Calculations		Total Pervious Area				1.94	
						Total Impervious Area				0.10	
						% Impervious				0.0	
						Composite Curve Number				43.3	
						Total Area Check				2.04	

Initial Abstraction and Hydraulics Calculations

Initial Abstraction				Composite Runoff Coefficient							
Landuse	IA (mm)	Area (ha)	A * IA	Waterloo Sandy		0		0		0	
				RC	Area	RC	Area	RC	Area	RC	Area
Woodland	10	1.02	10.20	0.12	1.02		0		0		0
Meadow	8	0.00	0.00		0.00		0		0		0
Welland/SWMF	12	0.72	8.59	0.05	0.72		0		0		0
Lawn	5	0.20	1.02	0.25	0.20		0		0		0
Cultivated	7	0.00	0.00		0.00		0		0		0
Impervious	2	0.10	0.20	0.95	0.10		0		0		0
Composite IA		2.04	9.81	Composite Runoff Coefficient							0.15

Time to Peak Inputs					Uplands		Bransby Williams		Airport	
Flow Path Description	Length (m)	Drop (m)	Slope (%)	V/S ^{0.5}	Velocity (m/s)	Tc (hr)	Tp (hr)	TOTAL Tp (hr)	Tc (hr)	Tp (hr)
	95	19.8	20.84%						0.05	0.03
									0.18	0.12

Appropriate calculated time to peak: **0.12** Appropriate Method: Airport

Hydrologic Parameters: NASHYD Command
Post Development Drainage Area

Curve Number Calculation

Soil Types Present:				
Type	ID	Hydrologic Group	% Area	Area
Waterloo Sandy Loam	Wsl	A	100	1.16
				0
				0
				0
Total Area				1.16

Impervious Landuses Present:											
Roadway		Sidewalk		Driveway		Building		SWMF		Subtotals	
Soils	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area A*CN
A		98		98		98		98		98	0.00 0.00
0	0	98		98		98		98		98	0 0
0	0	98		98		98		98		98	0 0
0	0	98		98		98		98		98	0 0
Subtotal Area	0.00		0.00		0.00		0.00		0.00		
Pervious Landuses Present:											
Woodland		Meadow		Wetland		Lawn		Cultivated		Subtotals	
Soils	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area A*CN
A	0.93	32	0.23	38	0.00		0.00		0.00		1.16 38.51
0	0.00		0.00		0.00		0.00		0.00		0.00 0.00
0	0.00		0.00		0.00		0.00		0.00		0.00 0.00
0	0.00		0.00		0.00		0.00		0.00		0.00 0.00
Subtotal Area	0.93		0.23		0.00		0.00		0.00		
Composite Area Calculations										Total Pervious Area	1.16
										Total Impervious Area	0.00
										% Impervious	0.0
										Composite Curve Number	33.2
										Total Area Check	1.16

Initial Abstraction and Hydraulics Calculations

Initial Abstraction				Composite Runoff Coefficient							
Landuse	IA (mm)	Area (ha)	A * IA	Waterloo Sandy		0		0		0	
				RC	Area	RC	Area	RC	Area	RC	Area
Woodland	10	0.93	9.28	0.12	0.93		0		0		0
Meadow	8	0.23	1.86	0.10	0.23		0		0		0
Wetland	12	0.00	0.00	0.05	0.00		0		0		0
Lawn	5	0.00	0.00		0.00		0		0		0
Cultivated	7	0.00	0.00		0.00		0		0		0
Impervious	2	0.00	0.00	0.95	0.00		0		0		0
Composite IA		1.16	9.60	Composite Runoff Coefficient							0.12

Time to Peak Inputs						Uplands		Bransby Williams		Airport	
Flow Path Description	Length (m)	Drop (m)	Slope (%)	V/s ^{0.5}	Velocity (m/s)	Tc (hr)	Tp (hr)	Tc (hr)	Tp (hr)	Tc (hr)	Tp (hr)
	101	18.9	18.71%					0.05	0.04	0.20	0.14

Appropriate calculated time to peak: **0.14** Appropriate Method: **Airport**

**Hydrologic Parameters: NASHYD Command
Post Development Drainage Area**

Curve Number Calculation

Soil Types Present:				
Type	ID	Hydrologic Group	% Area	Area
Waterloo Sandy Loam	Wsl	A	40	0.472
Granby Sand	Gs	B	60	0.708
				0
				0
Total Area				1.18

Impervious Landuses Present:													
		Roadway		Sidewalk		Driveway		Building		SWMF		Subtotals	
Soils	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area	A*CN	
A		98		98		98		98		98	0.00	0.00	
B		98		98		98		98		98	0	0	
	0	98		98		98		98		98	0	0	
	0	98		98		98		98		98	0	0	
Subtotal Area	0.00		0.00		0.00		0.00		0.00				
Pervious Landuses Present:													
		Woodland		Meadow		Wetland/SWMF		Lawn		Cultivated		Subtotals	
Soils	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area	A*CN	
A	0.33	32	0.14	38	0.00	50	0.00	49	0.00		0.47	15.95	
B	0.50	60	0.21	65	0.00		0.00		0.00		0.71	43.54	
0	0.00		0.00		0.00		0.00		0.00		0.00	0.00	
0	0.00		0.00		0.00		0.00		0.00		0.00	0.00	
Subtotal Area	0.83		0.35		0.00		0.00		0.00				
				Composite Area Calculations		Total Pervious Area				1.18			
						Total Impervious Area				0.00			
						% Impervious				0.0			
						Composite Curve Number				50.4			
Total Area Check												1.18	

Initial Abstraction and Hydraulics Calculations

Initial Abstraction				Composite Runoff Coefficient							
Landuse	IA (mm)	Area (ha)	A * IA	Waterloo Sandy		Granby Sand		0		0	
				RC	Area	RC	Area	RC	Area	RC	Area
Woodland	10	0.83	8.26	0.08	0.33	0.25	0.50		0		0
Meadow	8	0.35	2.83	0.10	0.14	0.28	0.21		0		0
Wetland/SWMF	12	0.00	0.00	0.05	0.00		0.00		0		0
Lawn	5	0.00	0.00		0.00		0.00		0		0
Cultivated	7	0.00	0.00		0.00		0.00		0		0
Impervious	2	0.00	0.00	0.95	0.00		0.00		0		0
Composite IA		1.18	9.40	Composite Runoff Coefficient							

Time to Peak Inputs						Uplands			Bransby Williams		Airport	
Flow Path Description	Length (m)	Drop (m)	Slope (%)	V/S ^{0.5}	Velocity (m/s)	Tc (hr)	Tp (hr)	TOTAL Tp (hr)	Tc (hr)	Tp (hr)	Tc (hr)	Tp (hr)
	279	10.8	3.87%						0.20	0.13	0.53	0.35

Appropriate calculated time to peak: **0.35** Appropriate Method: **Airport**

**Hydrologic Parameters: NASHYD Command
Post Development Drainage Area**

Curve Number Calculation

Soil Types Present:				
Type	ID	Hydrologic Group	% Area	Area
Waterloo Sandy Loam	Wsl	A	100	2.14
				0
				0
				0
Total Area				2.14

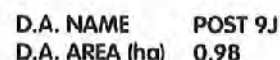
Impervious Landuses Present:													
Roadway		Sidewalk		Driveway		Building		SWMF		Subtotals			
Soils	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area	A*CN	
A		98		98		98		98		98	0.00	0.00	
	0	98		98		98		98		98	0	0	
	0	98		98		98		98		98	0	0	
	0	98		98		98		98		98	0	0	
Subtotal Area	0.00		0.00		0.00		0.00		0.00				
Pervious Landuses Present:													
Woodland		Meadow		Wetland		Lawn		Cultivated		Subtotals			
Soils	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area	A*CN	
A	1.18	32	0.96	38	0.00		0.00		0.00		2.14	74.26	
0	0.00		0.00		0.00		0.00		0.00		0.00	0.00	
0	0.00		0.00		0.00		0.00		0.00		0.00	0.00	
0	0.00		0.00		0.00		0.00		0.00		0.00	0.00	
Subtotal Area	1.18		0.96		0.00		0.00		0.00				
Composite Area Calculations											Total Pervious Area	2.14	
											Total Impervious Area	0.00	
											% Impervious	0.0	
											Composite Curve Number	34.7	
											Total Area Check	2.14	

Initial Abstraction and Hydraulics Calculations

Initial Abstraction				Composite Runoff Coefficient									
Landuse	IA (mm)	Area (ha)	A * IA	Waterloo Sandy		0		0		0			
				RC	Area	RC	Area	RC	Area	RC	Area	A*RC	
Woodland	10	1.18	11.77	0.12	1.18		0		0		0	0.14	
Meadow	8	0.96	7.70	0.10	0.96		0		0		0	0.10	
Wetland	12	0.00	0.00	0.05	0.00		0		0		0	0.00	
Lawn	5	0.00	0.00		0.00		0		0		0	0.00	
Cultivated	7	0.00	0.00		0.00		0		0		0	0.00	
Impervious	2	0.00	0.00	0.95	0.00		0		0		0	0.00	
Composite IA		2.14	9.10	Composite Runoff Coefficient								0.11	

Time to Peak Inputs						Uplands			Bransby Williams		Airport	
Flow Path Description	Length (m)	Drop (m)	Slope (%)	V/S ^{0.5}	Velocity (m/s)	Tc (hr)	Tp (hr)	TOTAL Tp (hr)	Tc (hr)	Tp (hr)	Tc (hr)	Tp (hr)
	117	3.6	3.08%						0.08	0.06	0.40	0.27

Appropriate calculated time to peak: **0.27** Appropriate Method: Airport



Hydrologic Parameters: NASHYD Command
Post Development Drainage Area

Curve Number Calculation

Soil Types Present:				
Type	ID	Hydrologic Group	% Area	Area
Granby Sand	Gs	B	100	0.45
				0
				0
				0
Total Area				0.45

Impervious Landuses Present:											
Roadway		Sidewalk		Driveway		Building		SWMF		Subtotals	
Soils	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area
B		98		98		98		98		98	0.00
0		98		98		98		98		98	0
0		98		98		98		98		98	0
0		98		98		98		98		98	0
Subtotal Area	0.00		0.00		0.00		0.00		0.00		
Pervious Landuses Present:											
Woodland		Meadow		Wetland/SWMF		Lawn		Cultivated		Subtotals	
Soils	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area
B	0.00	60	0.45	65	0.00	50	0.00		0.00		0.45
0	0.00		0.00		0.00		0.00		0.00		0.00
0	0.00		0.00		0.00		0.00		0.00		0.00
0	0.00		0.00		0.00		0.00		0.00		0.00
Subtotal Area	0.00		0.45		0.00		0.00		0.00		
Composite Area Calculations										Total Pervious Area	0.45
										Total Impervious Area	0.00
										% Impervious	0.0
										Composite Curve Number	65.0
										Total Area Check	0.45

Initial Abstraction and Hydraulics Calculations

Initial Abstraction				Composite Runoff Coefficient							
Landuse	IA (mm)	Area (ha)	A * IA	Granby Sand		0		0		0	
				RC	Area	RC	Area	RC	Area	RC	Area
Woodland	10	0.00	0.00		0.00		0		0		0
Meadow	8	0.45	3.60	0.28	0.45		0		0		0
Wetland/SWMF	12	0.00	0.00	0.05	0.00		0		0		0
Lawn	5	0.00	0.00		0.00		0		0		0
Cultivated	7	0.00	0.00		0.00		0		0		0
Impervious	2	0.00	0.00	0.95	0.00		0		0		0
Composite IA		0.45	8.00	Composite Runoff Coefficient							0.28

Time to Peak Inputs					Uplands			Bransby Williams		Airport	
Flow Path Description	Length (m)	Drop (m)	Slope (%)	V/S ^{0.5}	Tc (hr)	Tp (hr)	TOTAL Tp (hr)	Tc (hr)	Tp (hr)	Tc (hr)	Tp (hr)
	134	3.3	2.46%					0.12	0.08	0.38	0.26

Appropriate calculated time to peak: **0.26** Appropriate Method: **Airport**

Hydrologic Parameters: NASHYD Command Post Development Drainage Area

Curve Number Calculation

Soil Types Present:				
Type	ID	Hydrologic Group	% Area	Area
Granby Sand	Gs	B	100	1.59
				0
				0
				0
Total Area				1.59

Impervious Landuses Present:											
Roadway		Sidewalk		Driveway		Building		SWMF		Subtotals	
Soils	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area A*CN
B		98		98		98		98		98	0.00 0.00
0		98		98		98		98		98	0 0
0		98		98		98		98		98	0 0
0		98		98		98		98		98	0 0
Subtotal Area	0.00		0.00		0.00		0.00		0.00		
Pervious Landuses Present:											
Woodland		Meadow		Wetland/SWMF		Lawn		Cultivated		Subtotals	
Soils	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area A*CN
B	0.00	60	0.99	65	0.60	50	0.00		0.00		1.59 94.35
0	0.00		0.00		0.00		0.00		0.00		0.00 0.00
0	0.00		0.00		0.00		0.00		0.00		0.00 0.00
0	0.00		0.00		0.00		0.00		0.00		0.00 0.00
Subtotal Area	0.00		0.99		0.60		0.00		0.00		
				Composite Area Calculations		Total Pervious Area				1.59	
						Total Impervious Area				0.00	
						% Impervious				0.0	
						Composite Curve Number				59.3	
						Total Area Check				1.59	

Initial Abstraction and Hydraulics Calculations

Initial Abstraction				Composite Runoff Coefficient							
Landuse	IA (mm)	Area (ha)	A * IA	Granby Sand		0		0		0	
				RC	Area	RC	Area	RC	Area	RC	Area
Woodland	10	0.00	0.00		0.00		0		0		0
Meadow	8	0.99	7.92	0.28	0.99		0		0		0
Wetland/SWMF	12	0.60	7.20	0.05	0.60		0		0		0
Lawn	5	0.00	0.00		0.00		0		0		0
Cultivated	7	0.00	0.00		0.00		0		0		0
Impervious	2	0.00	0.00	0.95	0.00		0		0		0
Composite IA		1.59	9.51	Composite Runoff Coefficient				0.19			

Time to Peak Inputs					Uplands			Bransby Williams		Airport	
Flow Path Description	Length (m)	Drop (m)	Slope (%)	V/S ^{0.5} Velocity (m/s)	Tc (hr)	Tp (hr)	TOTAL Tp (hr)	Tc (hr)	Tp (hr)	Tc (hr)	Tp (hr)
	93	4.1	4.41%					0.06	0.04	0.29	0.20

Appropriate calculated time to peak: **0.20** Appropriate Method: **Airport**



Project Name: PARKBRIDGE CRAIGLEITH
 Project Number: 1046-4031
 Date: 7/11/2016
 By: OD

D.A. NAME POST 8-i
 D.A. AREA (ha) 2.50

**Hydrologic Parameters: NASHYD Command
 Post Development Drainage Area**

Curve Number Calculation

Soil Types Present:				
Type	ID	Hydrologic Group	% Area	Area
Granby Sand	Gs	B	100	2.5
				0
				0
				0
Total Area				2.5

Impervious Landuses Present:													
		Roadway		Sidewalk		Driveway		Building		SWMF		Subtotals	
Soils	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	Area	A*CN
B		98		98		98		98		98		0.00	0.00
0		98		98		98		98		98		0	0
0		98		98		98		98		98		0	0
0		98		98		98		98		98		0	0
Subtotal Area	0.00		0.00		0.00		0.00		0.00		0.00		
Pervious Landuses Present:													
		Woodland		Meadow		Wetland/SWMF		Lawn		Cultivated		Subtotals	
Soils	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	Area	A*CN
B	0.75	60	1.75	65	0.00	50	0.00		0.00			2.50	158.75
0	0.00		0.00		0.00		0.00		0.00			0.00	0.00
0	0.00		0.00		0.00		0.00		0.00			0.00	0.00
0	0.00		0.00		0.00		0.00		0.00			0.00	0.00
Subtotal Area	0.75		1.75		0.00		0.00		0.00		0.00		
											Composite Area Calculations		
											Total Pervious Area		
											Total Impervious Area		
											% Impervious		
											Composite Curve Number		
											63.5		
											Total Area Check		
											2.50		

Initial Abstraction and Hydraulics Calculations

Initial Abstraction				Composite Runoff Coefficient								
Landuse	IA (mm)	Area (ha)	A * IA	Granby Sand		0		0		0		A*RC
				RC	Area	RC	Area	RC	Area	RC	Area	
Woodland	10	0.75	7.50	0.27	0.75		0		0		0	0.20
Meadow	8	1.75	14.00	0.30	1.75		0		0		0	0.53
Wetland/SWMF	12	0.00	0.00	0.05	0.00		0		0		0	0.00
Lawn	5	0.00	0.00		0.00		0		0		0	0.00
Cultivated	7	0.00	0.00		0.00		0		0		0	0.00
Impervious	2	0.00	0.00	0.95	0.00		0		0		0	0.00
Composite IA		2.50	8.60	Composite Runoff Coefficient								0.29

Time to Peak Inputs					Uplands			Bransby Williams		Airport	
Flow Path Description	Length (m)	Drop (m)	Slope (%)	V/S ^{0.5}	Velocity (m/s)	Tc (hr)	Tp (hr)	TOTAL Tp (hr)	Tc (hr)	Tp (hr)	Tc (hr)
	219	8.4	3.84%						0.15	0.10	0.42
											0.28

Appropriate calculated time to peak: **0.28** Appropriate Method: **Airport**

Hydrologic Parameters: NASHYD Command Post Development Drainage Area

Curve Number Calculation

Soil Types Present:				
Type	ID	Hydrologic Group	% Area	Area
Waterloo sandy loam	Wsl	A	30	2.28
Kemble silty clay	Ksc	C	70	5.32
				0
				0
Total Area				7.6

Impervious Landuses Present:											
Roadway		Sidewalk		Driveway		Building		SWMF		Subtotals	
Soils	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	
A		98		98		98		98		98	0.00 0.00
C		98		98		98		98		98	0 0
0		98		98		98		98		98	0 0
0		98		98		98		98		98	0 0
Subtotal Area		0.00		0.00		0.00		0.00		0.00	
Pervious Landuses Present:											
Woodland		Meadow		Wetland/SWMF		Lawn		Cultivated		Subtotals	
Soils	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	
A	0.91	32	1.37	38	0.00	50	0.00		0.00		2.28 81.17
C	2.13	73	3.19	76	0.00		0.00		0.00		5.32 397.94
0	0.00		0.00		0.00		0.00		0.00		0.00 0.00
0	0.00		0.00		0.00		0.00		0.00		0.00 0.00
Subtotal Area		3.04		4.56		0.00		0.00		0.00	
				Composite Area Calculations		Total Pervious Area				7.60	
						Total Impervious Area				0.00	
						% Impervious				0.0	
						Composite Curve Number				63.0	
						Total Area Check				7.60	

Initial Abstraction and Hydraulics Calculations

Initial Abstraction				Composite Runoff Coefficient								
Landuse	IA (mm)	Area (ha)	A * IA	Waterloo sandy		Kemble silty clay		0		0		A*RC
				RC	Area	RC	Area	RC	Area	RC	Area	
Woodland	10	3.04	30.40	0.08	0.91	0.35	2.13		0		0	0.82
Meadow	8	4.56	36.48	0.10	1.37	0.40	3.19		0		0	1.41
Wetland/SWMF	12	0.00	0.00	0.05	0.00		0.00		0		0	0.00
Lawn	5	0.00	0.00		0.00		0.00		0		0	0.00
Cultivated	7	0.00	0.00		0.00		0.00		0		0	0.00
Impervious	2	0.00	0.00	0.95	0.00		0.00		0		0	0.00
Composite IA		7.60	8.80	Composite Runoff Coefficient								0.29

APPENDIX C

SWMHYMO Modeling

SWM Facility Design Sheets

Existing Pond (Upper Lands) Stage - Storage - Discharge (Used in Pre-Development SWMHYMO Model)

Elevation	Area	Volume (m3)	Cumm. Volume (m3)	Discharge (m3/s)*
189	2912	0		0
190	6670	4791		0
191	8726	12489		0

dead storage

* Note: As shown in Pre-Dev. SWMHYMO model, 100-year (344 m3) and Regional (1242 m3) event volumes are significantly below existing top of berm elevations. Therefore, no flow spills overtop of the existing berms and pond outflow discharge is 0 m3/s.

```

00001: 2      Metric units
00002: *****
00003: # Project Name: [PARKBRIDGE CRAIGLEITH] Project Number: [1046-1331]
00004: # Date : 2016-12-03
00005: # Modeler: [G]
00006: # Company : C.F. Crozier & Associates Inc.
00007: # License #: 373701
00008: *****
00009: START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[1]
00010: # ["2yr.stm"] <- storm filename, one per line for NSTORM time
00011: *****
00012: #
00013: READ STORM STORM_FILENAME=["STORM.001"]
00014: #
00015: *****
00016: #
00017: # PRE-DEVELOPMENT
00018: #
00019: #
00020: # Subwatershed & External Drainage Area
00021: # Per "The Orchards" FFSM Report
00022: # Prepared by Higglins Engineering [Jan. 2005]
00023: # "EXT-9A" Total Area 116.6 ha less "Orchards" 14.8 ha equals 101.8 ha
00024: #
00025: #
00026: CALIB NASHVD ID=[1], NHVD=["EXT-9A"], DT=[1]min, AREA=[101.8] (ha),
00027: DWF=[0] (cms), CR/C=[80], LA=[5.0] (mm),
00028: N=[1], TP=[1.00] hrs,
00029: RAINFALL=[ , , , ] (mm/hr), END=-1
00030: #
00031: ROUTE CHANNEL IDOUT=[2], NHVD=["Channel"], IDIN=[1],
00032: ID=[1] (m),
00033: CHLGTH=[550] (m), CHSLOPE=[2] (%),
00034: FTSLOPE=[2] (%),
00035: SRCOND=[1], NSPD=[1]
00036: # SEGMENT, SEGDEST (m)=[0.035, 0 -0.035, 12 0.035, 20]
00037: # DISTANCE (m), ELEVATION (m)=[ [0.102]
00038: [6.100]
00039: [12.100]
00040: [20.102]
00041: #
00042: CALIB STANDHYD ID=[3], NHVD=["EXT-9B"], DT=[1]min, AREA=[14.8] (ha),
00043: XMP=[0.35], TIMP=[0.35], DWF=[0] (cms), LOES=[1],
00044: Horton: P=[50] (mm/hr), P=[7.5] (mm/hr),
00045: DCAY=[2] (hr), P=[0] (mm),
00046: #
00047: Previous surfaces: IADP=[1] (mm), SLDP=[2] (mm),
00048: LDP=[4] (mm), MDP=[0.25], RCP=[0] (min)
00049: Imperious surfaces: IADP=[1] (mm), SLDP=[1] (mm),
00050: LDI=[14.1] (m), MHI=[0.01], SCL=[0] (mm)
00051: #
00052: RAINFALL=[ , , , ] (mm/hr), END=-1
00053: #
00054: ROUTE RESERVOIR IDOUT=[4], NHVD=["Orchards"], IDIN=[3],
00055: RET=[1] (min),
00056: #
00057: TABLE of ( OUTFLOW-STORAGE ) values
00058: # (cms) - (ha-m)
00059: # [ 0.0 , 0.0 ]
00060: # [ 0.0100 , 0.0610 ]
00061: # [ 0.0400 , 0.1210 ]
00062: # [ 0.0700 , 0.2110 ]
00063: # [ 0.2600 , 0.3000 ]
00064: # [ 0.6200 , 0.3040 ]
00065: # [ 1.0200 , 0.4950 ]
00066: # [ 1.5200 , 0.6020 ]
00067: # [ 2.0800 , 0.7160 ]
00068: # [ 2.4900 , 0.8370 ]
00069: # IDOUT=[ , , , ] (max twenty pts)
00070: # NHVDOUT=[ , , , ]
00071: #
00072: #
00073: # TOTAL FLOW at Watercourse 9 Grey Road 19 Crossing
00074: #
00075: #
00076: # Parkbridge Craigleith - Upper Terrace Lands
00077: #
00078: #
00079: ADD HYD IDsum=[5], NHVD=["RD19"], IDto add=[2,4]
00080: #
00081: #
00082: # Parkbridge Craigleith - Upper Terrace Lands
00083: #
00084: #
00085: CALIB NASHVD ID=[1], NHVD=["9A"], DT=[1]min, AREA=[2.6] (ha),
00086: DWF=[0] (cms), CR/C=[48.2], LA=[8.1] (mm),
00087: N=[1], TP=[2.46] hrs,
00088: RAINFALL=[ , , , ] (mm/hr), END=-1
00089: #
00090: #
00091: CALIB NASHVD ID=[2], NHVD=["9B"], DT=[1]min, AREA=[11.6] (ha),
00092: DWF=[0] (cms), CR/C=[68.0], LA=[8.0] (mm),
00093: N=[1], TP=[1.43] hrs,
00094: RAINFALL=[ , , , ] (mm/hr), END=-1
00095: #
00096: #
00097: ADD HYD IDsum=[10], NHVD=["9A9B"], IDto add=[1,2]
00098: #
00099: #
00100: CALIB NASHVD ID=[1], NHVD=["9C"], DT=[1]min, AREA=[10.96] (ha),
00101: DWF=[0] (cms), CR/C=[31.2], LA=[9.6] (mm),
00102: N=[3], TP=[2.3] hrs,
00103: RAINFALL=[ , , , ] (mm/hr), END=-1
00104: #
00105: #
00106: CALIB NASHVD ID=[2], NHVD=["9D"], DT=[1]min, AREA=[11.87] (ha),
00107: DWF=[0] (cms), CR/C=[45.6], LA=[8.4] (mm),
00108: N=[3], TP=[2.30] hrs,
00109: RAINFALL=[ , , , ] (mm/hr), END=-1
00110: #
00111: #
00112: # EXISTING POND ON PARKBRIDGE CRAIGLEITH SITE UPPER LANDS
00113: # REFER TO STAGE-STORAGE-DISCHARGE SHEET PROVIDED IN
00114: # PARKBRIDGE CRAIGLEITH FFSM REPORT FOR EXISTING POND
00115: #
00116: #
00117: ROUTE RESERVOIR IDOUT=[4], NHVD=["EXPOND"], IDIN=[2],
00118: RET=[1] (min),
00119: #
00120: #
00121: TABLE of ( OUTFLOW-STORAGE ) values
00122: # (cms) - (ha-m)
00123: # [ 0.0 , 0.0 ]
00124: # [ 0.00 , 0.479 ]
00125: # [ 0.00 , 1.249 ]
00126: # IDOUT=[ , , , ] (max twenty pts)
00127: # NHVDOUT=[ , , , ]
00128: #
00129: #
00130: ADD HYD IDsum=[9], NHVD=["9C9D"], IDto add=[1,4]
00131: #
00132: #
00133: # Parkbridge Craigleith - Lower Terrace Lands
00134: #
00135: #
00136: CALIB NASHVD ID=[7], NHVD=["9E"], DT=[1]min, AREA=[7.7] (ha),
00137: DWF=[0] (cms), CR/C=[63.0], LA=[7.7] (mm),
00138: N=[3], TP=[2.44] hrs,
00139: RAINFALL=[ , , , ] (mm/hr), END=-1
00140: #
00141: #
00142: CALIB NASHVD ID=[8], NHVD=["9F"], DT=[1]min, AREA=[13.44] (ha),
00143: DWF=[0] (cms), CR/C=[64.0], LA=[8.4] (mm),
00144: N=[3], TP=[2.56] hrs,
00145: RAINFALL=[ , , , ] (mm/hr), END=-1
00146: #
00147: #
00148: # WATERCOURSE 9 TOTAL FLOW AT OLD LAKESHORE ROAD
00149: #
00150: #

```

```

00136: # IDsum=[1], NHVD=["WC9E"], IDto add=[5,10,9,7,9]
00137: #
00138: #
00139: #
00140: START TZERO=[0.0]hrs or date, METOUT=[2], NSTORM=[1], NRUN=[2]
00141: # ["5yr.stm"] <- storm filename, one per line for NSTORM time
00142: #
00143: #
00144: EVANT TZERO=[0.0]hrs or date, METOUT=[2], NSTORM=[1], NRUN=[3]
00145: # ["10yr.stm"] <- storm filename, one per line for NSTORM time
00146: #
00147: #
00148: START TZERO=[0.0]hrs or date, METOUT=[2], NSTORM=[1], NRUN=[4]
00149: # ["25yr.stm"] <- storm filename, one per line for NSTORM time
00150: #
00151: #
00152: START TZERO=[0.0]hrs or date, METOUT=[2], NSTORM=[1], NRUN=[5]
00153: # ["50yr.stm"] <- storm filename, one per line for NSTORM time
00154: #
00155: #
00156: START TZERO=[0.0]hrs or date, METOUT=[2], NSTORM=[1], NRUN=[6]
00157: # ["100yr.stm"] <- storm filename, one per line for NSTORM time
00158: #
00159: #
00160: START TZERO=[0.0]hrs or date, METOUT=[2], NSTORM=[1], NRUN=[7]
00161: # ["tim.stm"] <- storm filename, one per line for NSTORM time
00162: #
00163: FINISH

```

```

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Stormwater Management Hydrologic Model

***** SUMMARY OUTPUT *****

DATE: 2016-12-08 TIME: 10:25:20 RUN COUNTER: 000178

Input filenames: C:\HYDRO\PARKEER-1\PRS.dat

Output filenames: C:\HYDRO\PARKEER-1\PRS.out

Summary filenames: C:\HYDRO\PARKEER-1\PRS.sum

User comments:

1: *****

2: *****

3: *****

4: *****

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***** SUMMARY OUTPUT *****

DATE: 2016-12-08 TIME: 10:25:20 RUN COUNTER: 000178

Input filenames: C:\HYDRO\PARKEER-1\PRS.dat

Output filenames: C:\HYDRO\PARKEER-1\PRS.out

Summary filenames: C:\HYDRO\PARKEER-1\PRS.sum

User comments:

1: *****

2: *****

3: *****

4: *****

5: *****

6: *****

7: *****

8: *****

9: *****

10: *****

11: *****

12: *****

13: *****

14: *****

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99: *****

100: *****

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00271> ROUTE RESERVOIR -> Q2:9D 1.87 .021 No_date 3:07 5.28
00272> * [RUT=1.00] outc= 04:EXFond 1.87 .000 No_date 0:00 .00
00273> [MaxColUsed= 98428-01]
00274> 002:0014 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00275> ADD HYD 01:9C 2.0 .006 No_date 1:04 3.25
00276> * 04:EXFond 1.87 .000 No_date 0:00 .00
00277> [DT=1.00] SUM= 09:9C9D 2.83 .006 No_date 3:04 1.13
00278>
00279> Parkbridge Craigleith - Lower Terrace Lands--
00280>
00281> 002:0015 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00282> CALIB NASHYD 07:9E 7.70 .142 No_date 3:14 10.43
00283> [CN= 63.0: N= 3.00]
00284> [Tp= 44.07: 1.00]
00285> 002:0016 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00286> CALIB NASHYD 08:9F 3.44 .055 No_date 3:21 10.48
00287> [CN= 64.0: N= 3.00]
00288> [Tp= 56.07: 1.00]
00289>
00290> WATERCOURSE 9 TOTAL FLOW AT OLD LAKESHORE ROAD--
00291>
00292> 003:0017 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00293> ADD HYD 05:RD19 116.60 2.304 No_date 3:51 21.25
00294> * 10:9A9B 14.20 .181 No_date 4:14 17.35
00295> * 09:9C9D 2.83 .011 No_date 3:23 1.90
00296> * 07:9E 7.70 .142 No_date 3:14 10.43
00297> * 08:9F 3.44 .055 No_date 3:21 10.48
00298> [DT=1.00] SUM= 01:MC9LS 141.77 2.620 No_date 3:49 19.43
00299> ** END OF RUN 2
00300>
00301>
00302>
00303>
00304>
00305>
00306> RUN COMMAND
00307> 003:0001
00308> STORM
00309> [TZERO = 00 hrs on 0]
00310> [METOUT= 2 (1=imperial, 2=metric output)]
00311> [INSTORM= 1]
00312> [NRUN = 1]
00313>
00314>
00315> Project Name [PARKBRIDGE CRAIGLEITH] Project Number: [0466-4031]
00316> Date 2016-12-08
00317> Modeler [00]
00318> Company C.F. Crozier & Associates Inc.
00319> License # 3737016
00320>
00321>
00322> 003:0002
00323> READ STORM
00324> Filename = STORM.001
00325> Comment
00326> [EDT=60.00:SDUR= 6.00:POT= 66.00]
00327>
00328> PRE-DEVELOPMENT
00329>
00330>
00331> Subwatershed 9 External Drainage Area
00332> Per 'The Orchards' FSSWM Report
00333> Prepared by Higgins Engineering (Jan. 2005)
00334> * EXT-2A Total Area 116.6 ha less 'Orchards' 14.8 ha equals 101.8 ha
00335>
00336> 003:0003 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00337> CALIB NASHYD 01:EXT-2A 101.80 3.221 No_date 3:47 29.89
00338> [CN= 80.0: N= 3.00]
00339> [Tp= 1.00:DT= 1.00]
00340> 003:0004 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00341> ROUTE CHANNEL -> 01:EXT-2A 101.80 3.221 No_date 3:47 29.89
00342> [RUT=1.00] outc= 02:Channel 101.80 3.210 No_date 3:51 29.89
00343> [U/S/m= 550.72:0007.035]
00344> [Vmax= 1.755:Dmax= 335]
00345> 003:0005 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00346> CALIB STANDHYD 03:EXT-2B 14.80 1.268 No_date 3:01 37.69
00347> [XIMP= 15:TIMP= 35]
00348> [Horton parameters: Fw= 50.00:Fw= 7.50:DCAT=2.00: Fw= 0.0]
00349> [Impervious area: IArea= 1.50:SLIP=2.00:LDI= 40.0:VMI= 250:SCP= 0]
00350> [Impervious area: IArea= 1.00:SLIP=1.00:LDI= 314.0:VMI= 013:SCI= 0]
00351> 003:0006 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00352> ROUTE RESERVOIR -> 03:EXT-2B 14.80 1.268 No_date 3:01 37.69
00353> [RUT=1.00] outc= 04:Orchards 14.80 .515 No_date 3:22 37.69
00354> [MaxColUsed= 37045-00]
00355>
00356> TOTAL FLOW at Watercourse 9 Grey Road 19 Crossing--
00357>
00358> 003:0007 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00359> ADD HYD 02:Channel 101.80 3.210 No_date 3:51 29.89
00360> * 04:Orchards 14.80 .515 No_date 3:22 37.69
00361> [DT=1.00] SUM= 05:RD19 116.60 2.324 No_date 3:48 30.88
00362>
00363> Parkbridge Craigleith - Upper Terrace Lands--
00364>
00365> 003:0008 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00366> CALIB NASHYD 01:9A 2.80 .066 No_date 3:15 10.24
00367> [CN= 48.8: N= 3.00]
00368> [Tp= 46.07: 1.00]
00369> 003:0009 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00370> CALIB NASHYD 02:9B 11.60 .175 No_date 3:23 18.95
00371> [CN= 68.0: N= 3.00]
00372> [Tp= 1.43:DT= 1.00]
00373> 003:0010 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00374> ADD HYD 01:9A 2.80 .066 No_date 3:15 10.24
00375> * 02:9B 11.60 .175 No_date 3:23 18.95
00376> [DT=1.00] SUM= 10:9A9B 14.20 .181 No_date 4:14 17.35
00377> 003:0011 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00378> CALIB NASHYD 01:9C .96 .013 No_date 3:03 5.61
00379> [CN= 32.2: N= 3.00]
00380> [Tp= 20.07: 1.00]
00381> 003:0012 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00382> CALIB NASHYD 02:9D 1.87 .034 No_date 3:07 8.59
00383> [CN= 43.6: N= 3.00]
00384> [Tp= 30.07: 1.00]
00385>
00386> EXISTING POND ON PARKBRIDGE CRAIGLEITH SITE UPPER LANDS--
00387> REFER TO STAGE-STORAGE-DISCHARGE SHEET PROVIDED IN--
00388> PARKBRIDGE CRAIGLEITH FSSWM REPORT FOR EXISTING POND--
00389>
00390> 003:0013 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00391> ROUTE RESERVOIR -> 02:9D 1.87 .034 No_date 3:07 8.59
00392> * [RUT=1.00] outc= 04:EXFond 1.87 .000 No_date 0:00 .00
00393> [MaxColUsed= 10076-01]
00394> 003:0014 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00395> ADD HYD 01:9C .96 .013 No_date 3:03 5.61
00396> * 04:EXFond 1.87 .000 No_date 0:00 .00
00397> [DT=1.00] SUM= 09:9C9D 2.83 .013 No_date 3:03 1.90
00398>
00399> Parkbridge Craigleith - Lower Terrace Lands--
00400>
00401> 003:0015 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00402> CALIB NASHYD 07:9E 7.70 .226 No_date 3:13 16.38
00403> [CN= 63.0: N= 3.00]
00404> [Tp= 44.07: 1.00]
00405> 003:0016 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00406> CALIB NASHYD 08:9F 3.44 .055 No_date 3:20 16.55
00407> [CN= 64.0: N= 3.00]
00408> [Tp= 56.07: 1.00]
00409>
00410> WATERCOURSE 9 TOTAL FLOW AT OLD LAKESHORE ROAD--
00411>
00412> 003:0017 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00413> ADD HYD 05:RD19 116.60 2.324 No_date 3:48 30.88
00414> * 10:9A9B 14.20 .181 No_date 4:14 17.35
00415> * 09:9C9D 2.83 .011 No_date 3:23 1.90
00416> * 07:9E 7.70 .142 No_date 3:13 16.38
00417> * 08:9F 3.44 .055 No_date 3:20 16.55
00418> [DT=1.00] SUM= 01:MC9LS 141.77 2.623 No_date 3:44 27.07
00419> ** END OF RUN 1
00420>
00421>
00422>
00423>
00424>
00425>
00426>
00427> RUN COMMAND
00428> 004:0001
00429> STORM
00430> [TZERO = 00 hrs on 0]
00431> [METOUT= 2 (1=imperial, 2=metric output)]
00432> [INSTORM= 1]
00433> [NRUN = 1]
00434>
00435>
00436> Project Name [PARKBRIDGE CRAIGLEITH] Project Number: [0466-4031]
00437> Date 2016-12-08
00438> Modeler [00]
00439> Company C.F. Crozier & Associates Inc.
00440> License # 3737016
00441>
00442>
00443> 004:0002
00444> READ STORM
00445> Filename = STORM.001
00446> Comment
00447> [EDT=60.00:SDUR= 6.00:POT= 77.00]
00448>
00449> PRE-DEVELOPMENT
00450>
00451>
00452> Subwatershed 9 External Drainage Area
00453> Per 'The Orchards' FSSWM Report
00454> Prepared by Higgins Engineering (Jan. 2005)
00455> * EXT-2A Total Area 116.6 ha less 'Orchards' 14.8 ha equals 101.8 ha
00456>
00457> 004:0003 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00458> CALIB NASHYD 01:EXT-2A 101.80 4.153 No_date 3:46 39.96
00459> [CN= 80.0: N= 3.00]
00460> [Tp= 1.00:DT= 1.00]
00461> 004:0004 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00462> ROUTE CHANNEL -> 01:EXT-2A 101.80 4.153 No_date 3:46 39.96
00463> [RUT=1.00] outc= 02:Channel 101.80 4.142 No_date 3:50 39.96
00464> [U/S/m= 550.72:0007.035]
00465> [Vmax= 1.497:Dmax= 86]
00466> 004:0005 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00467> CALIB STANDHYD 03:EXT-2B 14.80 1.607 No_date 3:00 47.92
00468> [XIMP= 15:TIMP= 35]
00469> [Horton parameters: Fw= 50.00:Fw= 7.50:DCAT=2.00: Fw= 0.0]
00470> [Impervious area: IArea= 1.50:SLIP=2.00:LDI= 40.0:VMI= 250:SCP= 0]
00471> [Impervious area: IArea= 1.00:SLIP=1.00:LDI= 314.0:VMI= 013:SCI= 0]
00472> 004:0006 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00473> ROUTE RESERVOIR -> 03:EXT-2B 14.80 1.607 No_date 3:00 47.92
00474> [RUT=1.00] outc= 04:Orchards 14.80 .796 No_date 3:17 47.91
00475> [MaxColUsed= 44115-00]
00476>
00477> TOTAL FLOW at Watercourse 9 Grey Road 19 Crossing--
00478>
00479> 004:0007 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00480> ADD HYD 02:Channel 101.80 4.142 No_date 3:50 39.96
00481> * 04:Orchards 14.80 .796 No_date 3:17 47.91
00482> [DT=1.00] SUM= 05:RD19 116.60 4.727 No_date 3:46 40.10
00483>
00484> Parkbridge Craigleith - Upper Terrace Lands--
00485>
00486> 004:0008 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00487> CALIB NASHYD 01:9A 2.60 .063 No_date 3:14 14.38
00488> [CN= 48.8: N= 3.00]
00489> [Tp= 46.07: 1.00]
00490> 004:0009 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00491> CALIB NASHYD 02:9B 11.60 .237 No_date 4:23 26.79
00492> [CN= 68.0: N= 3.00]
00493> [Tp= 1.43:DT= 1.00]
00494> 004:0010 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00495> ADD HYD 01:9A 2.60 .063 No_date 3:14 14.38
00496> * 02:9B 11.60 .237 No_date 4:23 26.79
00497> [DT=1.00] SUM= 10:9A9B 14.20 .260 No_date 4:14 20.70
00498> 004:0011 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00499> CALIB NASHYD 01:9C .96 .018 No_date 3:03 6.05
00500> [CN= 32.2: N= 3.00]
00501> [Tp= 20.07: 1.00]
00502> 004:0012 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00503> CALIB NASHYD 02:9D 1.87 .047 No_date 3:07 12.13
00504> [CN= 43.6: N= 3.00]
00505> [Tp= 30.07: 1.00]
00506>
00507> EXISTING POND ON PARKBRIDGE CRAIGLEITH SITE UPPER LANDS--
00508> REFER TO STAGE-STORAGE-DISCHARGE SHEET PROVIDED IN--
00509> PARKBRIDGE CRAIGLEITH FSSWM REPORT FOR EXISTING POND--
00510>
00511> 004:0013 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00512> ROUTE RESERVOIR -> 02:9D 1.87 .047 No_date 3:07 12.13
00513> * [RUT=1.00] outc= 04:EXFond 1.87 .000 No_date 0:00 .00
00514> [MaxColUsed= 22698-01]
00515> 004:0014 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00516> ADD HYD 01:9C .96 .018 No_date 3:03 6.05
00517> * 04:EXFond 1.87 .000 No_date 0:00 .00
00518> [DT=1.00] SUM= 09:9C9D 2.83 .018 No_date 3:03 2.73
00519>
00520> Parkbridge Craigleith - Lower Terrace Lands--
00521>
00522> 004:0015 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00523> CALIB NASHYD 07:9E 7.70 .303 No_date 3:13 22.46
00524> [CN= 63.0: N= 3.00]
00525> [Tp= 44.07: 1.00]
00526> 004:0016 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00527> CALIB NASHYD 08:9F 3.44 .119 No_date 3:20 22.74
00528> [CN= 64.0: N= 3.00]
00529> [Tp= 56.07: 1.00]
00530>
00531> WATERCOURSE 9 TOTAL FLOW AT OLD LAKESHORE ROAD--
00532>
00533> 004:0017 ID:RHYD AREA OPEAK-TpeakDate hh:mm--R.V.
00534> ADD HYD 05:RD19 116.60 4.727 No_date 3:46 40.10
00535> * 10:9A9B 14.20 .260 No_date 4:14 23.70
00536> * 09:9C9D 2.83 .018 No_date 3:03 2.73
00537> * 07:9E 7.70 .303 No_date 3:13 22.46
00538> * 08:9F 3.44 .119 No_date 3:20 22.74
00539> [DT=1.00] SUM= 01:MC9LS 141.77 5.243 No_date 3:42 36.41
00540> ** END OF RUN 4

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```
006763 # Date 2016-12-08
006764 # Modeler [00]
006765 # Company C.F. Crozier & Associates Inc.
006795 # License # 37372165
006800 *****
006801 *****
006802 *****
006803 READ STORM
006813 Filename = STORM.001
006815 Comment
006816 [SDT=60.00 SDUR= 6.00 PTOT= 96.00]
006817 #
006818 # -PRF-DEVELOPMENT-#
006819 #
006820 #
006821 # Subwatershed 5 External Drainage Area
006822 # Pub 'The Orchards' FSSM Report
006823 # Prepared by Higgins Engineering (Jan. 2005)
006824 # 'EXT-9A' Total Area 116.6 ha less 'Orchards' 14.8 ha equals 101.8 ha
006825 #
006826 #
006827 # ID=HYD AREA OPEAK TpeakDate hh:mm --R-V-
006828 CALIB WASHYD 01:EXT-9A 101.80 5.716 No date 3:45 53.60
006829 [CN= 80.0: N= 3.00]
006830 [Tp= 1.00 DT= 1.00]
006831 ID=HYD AREA OPEAK TpeakDate hh:mm --R-V-
006832 006:0008 01:EXT-9A 101.80 5.716 No date 3:45 53.60
006833 SCHE CHANNEL --R-V-
006834 [ID= 1.00] SUM= 01:EXT-9A 101.80 5.716 No date 3:45 53.60
006835 [L/R=N= 550 /2.00( / 0.35)]
006836 [Vmax= 2.102 Dmax= .458]
006837 ID=HYD AREA OPEAK TpeakDate hh:mm --R-V-
006838 006:0008 CALIB STANDHYD 01:EXT-9B 14.80 2.157 No date 3:00 63.33
006839 [XIMP=.35 TIME=.35]
006840 [Horton parameters: Pn= 50.00 Pc= 7.50 DCWY=2.00 F= .50]
006841 [Previous Areas: Imper= 1.50 GLPP=2.00 LGP= .40 MNP= 250.00P= .0]
006842 [Impervious Areas: Imper= 1.00 SLIP=1.00 LSI= 314. RMF= 013:SCI= .0]
006843 006:0008 ID=HYD AREA OPEAK TpeakDate hh:mm --R-V-
006844 ROUTE RESERVOIR --> 01:EXT-9B 14.80 2.157 No date 3:00 63.33
006845 [RDT= 1.00] OutC= 04:Orchards 14.80 1.233 No date 3:13 63.33
006846 [MaxStoDec= 3436.01]
006847 #
006848 # TOTAL FLOW at Watercourse 5 Grey Road 19 Crossing--#
006849 #
006850 # ID=HYD AREA OPEAK TpeakDate hh:mm --R-V-
006851 006:0007 ADD HYD 02:Channel 101.80 5.701 No date 3:48 53.60
006852 [CN= 80.0: N= 3.00]
006853 [ID= 1.00] SUM= 01:EXT-9B 116.60 6.556 No date 3:47 54.03
006854 #
006855 # Parkbridge Craigleith - Upper Terrace Lands--#
006856 #
006857 # ID=HYD AREA OPEAK TpeakDate hh:mm --R-V-
006858 006:0008 CALIB WASHYD 01:SA 2.60 .094 No date 3:15 21.67
006859 [CN= 80.0: N= 3.00]
006860 [Tp= .46 DT= 1.00]
006861 ID=HYD AREA OPEAK TpeakDate hh:mm --R-V-
006862 006:0009 02:9F 11.60 .343 No date 4:21 37.32
006863 [CN= 68.0: N= 3.00]
006864 [Tp= 1.43 DT= 1.00]
006865 ID=HYD AREA OPEAK TpeakDate hh:mm --R-V-
006866 006:0010 ADD HYD 01:SA 2.60 .094 No date 3:14 21.67
006867 [CN= 80.0: N= 3.00]
006868 [Tp= .46 DT= 1.00]
006869 ID=HYD AREA OPEAK TpeakDate hh:mm --R-V-
006870 006:0011 01:SA 11.20 .378 No date 4:11 34.45
006871 [CN= 68.0: N= 3.00]
006872 [Tp= 1.43 DT= 1.00]
006873 ID=HYD AREA OPEAK TpeakDate hh:mm --R-V-
006874 006:0012 CALIB WASHYD 01:SC .96 .028 No date 3:03 12.49
006875 [CN= 33.0: N= 3.00]
006876 [Tp= .20 DT= 1.00]
006877 ID=HYD AREA OPEAK TpeakDate hh:mm --R-V-
006878 006:0013 CALIB WASHYD 02:9F 1.37 .071 No date 3:08 18.44
006879 [CN= 43.0: N= 3.00]
006880 [Tp= .30 DT= 1.00]
006881 #
006882 # EXISTING POND ON PARKBRIDGE CRAIGLEITH SITE UPPER LANDS--#
006883 # REFERR TO STAGE-STORAGE-DISCHARGE SHEET PROVIDED IN--#
006884 # PARKBRIDGE CRAIGLEITH ES&M REPORT FOR EXISTING POND--#
006885 #
006886 # ID=HYD AREA OPEAK TpeakDate hh:mm --R-V-
006887 006:0013 ROUTE RESERVOIR --> 02:9F 1.87 .071 No date 3:08 19.44
006888 [RDT= 1.00] OutC= 04:EXPOND 1.87 .080 No date 0:00 .00
006889 [MaxStoDec= 3448.01]
006890 ID=HYD AREA OPEAK TpeakDate hh:mm --R-V-
006891 006:0014 ADD HYD 01:SC .96 .028 No date 3:03 12.49
006892 [CN= 33.0: N= 3.00]
006893 [Tp= .20 DT= 1.00]
006894 ID=HYD AREA OPEAK TpeakDate hh:mm --R-V-
006895 006:0015 01:SC 1.87 .080 No date 0:00 .00
006896 [CN= 43.0: N= 3.00]
006897 [Tp= .30 DT= 1.00]
006898 #
006899 # Parkbridge Craigleith - Lower Terrace Lands--#
006900 #
006901 # ID=HYD AREA OPEAK TpeakDate hh:mm --R-V-
006902 006:0015 CALIB WASHYD 07:9F 7.70 .441 No date 3:12 32.83
006903 [CN= 63.0: N= 3.00]
006904 [Tp= .44 DT= 1.00]
006905 ID=HYD AREA OPEAK TpeakDate hh:mm --R-V-
006906 006:0016 CALIB WASHYD 08:9F 3.44 .174 No date 3:19 33.20
006907 [CN= 44.0: N= 3.00]
006908 [Tp= .56 DT= 1.00]
006909 #
006910 # WATERCOURSE 9 TOTAL FLOW AT OLD LAKESHORE ROAD--#
006911 #
006912 # ID=HYD AREA OPEAK TpeakDate hh:mm --R-V-
006913 006:0017 ADD HYD 05:RD 19 116.60 6.526 No date 3:43 53.63
006914 [CN= 80.0: N= 3.00]
006915 [Tp= .46 DT= 1.00]
006916 ID=HYD AREA OPEAK TpeakDate hh:mm --R-V-
006917 006:0018 05:RD 19 116.60 6.526 No date 3:43 53.63
006918 [CN= 80.0: N= 3.00]
006919 [Tp= .46 DT= 1.00]
006920 ID=HYD AREA OPEAK TpeakDate hh:mm --R-V-
006921 006:0019 05:RD 19 116.60 6.526 No date 3:43 53.63
006922 [CN= 80.0: N= 3.00]
006923 [Tp= .46 DT= 1.00]
006924 ID=HYD AREA OPEAK TpeakDate hh:mm --R-V-
006925 006:0020 05:RD 19 116.60 6.526 No date 3:43 53.63
006926 [CN= 80.0: N= 3.00]
006927 [Tp= .46 DT= 1.00]
006928 #
006929 # END OF RUN = 6
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00811#-----Subwatershed 5 External Drainage Area-----
00812#-----Per 'The Orchards' FSSM Report-----
00813#-----Prepared by Higgins Engineering (Jan. 2005)-----
00814#-----EXT-9A Total Area 116.6 ha less 'Orchards' 14.8 ha equals 101.8 ha-----
00815#-----
00816# 007.0003-----ID:MHYD-----AREA-----OPEAK-TpeakDate_hh:mm-----R.V.-----
00817# CALIB NASHYD 01-EXT-9A 101.80 6.917 No_date 7:46 140.53
00818# [CN= 60.0; N= 3.00]
00819# [Tp= 1.00;DT= 1.00]
00820# 007.0004-----ID:MHYD-----AREA-----OPEAK-TpeakDate_hh:mm-----R.V.-----
00821# ROUTE CHANNEL -> 01-EXT-9A 101.80 6.917 No_date 7:46 140.53
00822# [RDT= 1.00] out= 02-Channel 101.30 6.911 No_date 7:49 140.53
00823# [W8/n= 550 /2.000/ 035]
00824# [W9/n= 2.235 /DNAX= 508]
00825# 007.0005-----ID:MHYD-----AREA-----OPEAK-TpeakDate_hh:mm-----R.V.-----
00826# CALIB STANDHYD 03-EXT-9B 14.80 1.528 No_date 7:00 127.41
00827# [XIMP=.15;TIMP=.35]
00828# Horton parameters: P= 50.00;P= 7.50;PCAT=2.00; P= .00]
00829# [Revisions area: IAlp= 1.50;SLP=2.00;LSP= 40;IMP= 250;SCP= .0]
00830# [Impervious area: IAlp= 1.00;SLP=1.00;LSP= 114;IMP= 011;SCI= .0]
00831# 007.0006-----ID:MHYD-----AREA-----OPEAK-TpeakDate_hh:mm-----R.V.-----
00832# ROUTE RESERVOIR -> 03-EXT-9B 14.80 1.528 No_date 7:00 127.41
00833# [RDT= 1.00] out= 04-Orchards 14.80 1.186 No_date 7:13 127.40
00834# [N45CUsed= 52028.00]
00835#-----
00836#-----TOTAL FLOW at Watercourse 9 Grey Road 19 Crossing-----
00837#-----
00838# 007.0007-----ID:MHYD-----AREA-----OPEAK-TpeakDate_hh:mm-----R.V.-----
00839# ADD HYD 02-Channel 101.80 6.911 No_date 7:49 140.53
00840# * 04-Orchards 14.80 1.186 No_date 7:13 127.40
00841# [DT= 1.00] SUM= 05-RD19 116.60 7.896 No_date 7:44 138.86
00842#-----
00843#-----Parkbridge Craigleith Upper Terrace Lands-----
00844#-----
00845# 007.0008-----ID:MHYD-----AREA-----OPEAK-TpeakDate_hh:mm-----R.V.-----
00846# CALIB NASHYD 01-9A 2.60 .123 No_date 7:11 75.54
00847# [CN= 40.0; N= 3.00]
00848# [Tp= 46;DT= 1.00]
00849# 007.0009-----ID:MHYD-----AREA-----OPEAK-TpeakDate_hh:mm-----R.V.-----
00850# CALIB NASHYD 02-9B 11.60 .566 No_date 9:15 112.39
00851# [CN= 68.0; N= 3.00]
00852# [Tp= 1.43;DT= 1.00]
00853# 007.0010-----ID:MHYD-----AREA-----OPEAK-TpeakDate_hh:mm-----R.V.-----
00854# ADD HYD 01-9A 2.60 .123 No_date 7:11 75.54
00855# * 02-9B 11.60 .566 No_date 9:15 112.39
00856# [DT= 1.00] SUM= 10-9A9B 14.20 .657 No_date 9:09 105.64
00857# 007.0011-----ID:MHYD-----AREA-----OPEAK-TpeakDate_hh:mm-----R.V.-----
00858# CALIB NASHYD 01-9C .96 .033 No_date 7:02 48.43
00859# [CN= 34.2; N= 3.00]
00860# [Tp= 20;DT= 1.00]
00861# 007.0012-----ID:MHYD-----AREA-----OPEAK-TpeakDate_hh:mm-----R.V.-----
00862# CALIB NASHYD 02-9D 1.87 .085 No_date 7:05 66.41
00863# [CN= 43.6; N= 3.00]
00864# [Tp= 30;DT= 1.00]
00865#-----
00866#-----EXISTING POND ON PARKBRIDGE CRAIGLEITH SITE UPPER LANDS-----
00867#-----REFER TO STAGE-STORAGE-DISCHARGE SHEET PROVIDED IN-----
00868#-----PARKBRIDGE CRAIGLEITH FSSM REPORT FOR EXISTING POND-----
00869#-----
00870# 007.0013-----ID:MHYD-----AREA-----OPEAK-TpeakDate_hh:mm-----R.V.-----
00871# ROUTE RESERVOIR -> 02-9D 1.87 .085 No_date 7:05 66.41
00872# * [RDT= 1.00] out= 04-ExPond 1.87 .000 No_date 0:00 .00
00873# [N45CUsed= 12428.00]
00874# 007.0014-----ID:MHYD-----AREA-----OPEAK-TpeakDate_hh:mm-----R.V.-----
00875# ADD HYD 01-9C .96 .033 No_date 7:02 48.43
00876# * 04-ExPond 1.87 .000 No_date 0:00 .00
00877# [DT= 1.00] SUM= 09-9C9D 2.83 .033 No_date 7:02 16.43
00878#-----
00879#-----Parkbridge Craigleith Lower Terrace Lands-----
00880#-----
00881# 007.0015-----ID:MHYD-----AREA-----OPEAK-TpeakDate_hh:mm-----R.V.-----
00882# CALIB NASHYD 07-9E 7.70 .513 No_date 7:09 102.66
00883# [CN= 61.0; N= 3.00]
00884# [Tp= 44;DT= 1.00]
00885# 007.0016-----ID:MHYD-----AREA-----OPEAK-TpeakDate_hh:mm-----R.V.-----
00886# CALIB NASHYD 08-9F 3.44 .216 No_date 7:16 104.06
00887# [CN= 64.0; N= 3.00]
00888# [Tp= 58;DT= 1.00]
00889#-----
00890#-----WATERCOURSE 9 TOTAL FLOW AT OLD LAKESHORE ROAD-----
00891#-----
00892# 007.0017-----ID:MHYD-----AREA-----OPEAK-TpeakDate_hh:mm-----R.V.-----
00893# ADD HYD 05-RD19 116.60 7.896 No_date 7:44 138.86
00894# * 10-9A9B 14.20 .657 No_date 9:09 105.64
00895# * 09-9C9D 2.83 .033 No_date 7:02 16.43
00896# * 07-9E 7.70 .513 No_date 7:09 102.66
00897# * 08-9F 3.44 .216 No_date 7:16 104.06
00898# [DT= 1.00] SUM= 01-WC9LE 144.77 9.072 No_date 7:38 130.46
00899# 007.0002-----
00900# FINISH
00901#-----
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000010 2 Metric units
000020 *****
000030 *# Project Name: [PARKBRIDGE CRAIGLEITH] Project Number: [1046-4031]
000040 *# Date : 2016-12-08
000050 *# Modeler: [C]
000060 *# Company : C.F. Crozier & Associates Inc.
000070 *# License #: 1737016
000080 *****
000090 *# START 12500(0.0), METOUT(2), NSTORM(1), NHDUN(1)
000100 *# [25mm.stm] <- storm filename, one per line for NSTORM tim
000110 *****
000120 *# READ STORM STORM_FILENAME="STORM.001"
000130 *****
000140 *#
000150 *#
000160 *#
000170 *#
000180 *#
000190 *#
000200 *# Subwatershed 9 External Drainage Area
000210 *# Per The Orchard's P&SWN Report
000220 *# Prepared by Higgins Engineering (Jan. 2005)
000230 *# "EXT-9A" Total Area 116.6 ha Less "Orchards" 14.3 ha equals 101.8 ha
000240 *#
000250 *#
000260 *# CALIB NASHYD ID=[1], NHYD="EXT-9A", DT=[1]min, AREA=[101.8] [ha],
000270 *# DWF=[0] (cms), CN/C=[80], LA=[5.0] (mm),
000280 *# N=[1], TP=[1.00] hrs,
000290 *# RAINFALL=[ , , ] (mm/hr), END=-1
000300 *#
000310 *# ROUTE CHANNEL IDout=[2], NHYD="Channel", IDin=[1],
000320 *# RDT=[1] (min)
000330 *# CHLSTH=[50] (m), CHSLOPE=[2] (%),
000340 *# FGSLOPE=[2] (%),
000350 *# SECTION=[1], NSEG=[3]
000360 *# ( SEGROUT, SEGDIST (m)=[0.035, 8, -0.035, 12, 0.035, 20] NSEG t
000370 *# ( DISTANCE (m), ELEVATION (m)=[10.102
000380 *# [12.100]
000390 *# [20.102]
000400 *#
000410 *#
000420 *# CALIB STANDHYD ID=[3], NHYD="EXT-9A", DT=[1]min, AREA=[14.8] (ha),
000430 *# KIMP=[0.44], TIMP=[0.65], DWF=[0] (cms), LOSS=[2],
000440 *# Permeable surfaces: IAPER=[5.0] (mm), SLP=[2.0] (%),
000450 *# DCA=[2] (hr), F=[0] (mm),
000460 *# (Various outfalls: IAPER=[1.5] (mm), SLP=[2] (%),
000470 *# IAPER=[4.0] (mm), MNP=[0.25], SCP=[0] (min),
000480 *# Impervious surfaces: IAPER=[2.0] (mm), SLP=[4.0] (%),
000490 *# LGI=[12.5] (m), MWI=[0.013], SCL=[0] (min)
000500 *# RAINFALL=[ , , ] (mm/hr), END=-1
000510 *#
000520 *# ROUTE RESERVOIR IDout=[4], NHYD="Orchards", IDin=[3],
000530 *# RDT=[1] (min)
000540 *#
000550 *# TABLE of [ OUTFLOW-STORAGE ] values
000560 *# (cms) - (ha-m)
000570 *#
000580 *# 0.0 0.0
000590 *# 0.0100 0.0510
000600 *# 0.0400 0.1340
000610 *# 0.0700 0.2110
000620 *# 0.2600 0.3000
000630 *# 0.6000 0.3940
000640 *# 1.0200 0.4520
000650 *# 1.5200 0.6020
000660 *# 2.0800 0.7160
000670 *# 2.5000 0.8770
000680 *#
000690 *# IDout=[1], NHYDout=[1]
000700 *#
000710 *#
000720 *#
000730 *#
000740 *#
000750 *#
000760 *#
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00271> CALIB NASHYD ID= [2], RHYD= ["EXT-8"], DT= [1]min, AREA= [7.60]tha),
00272> DWP= [0]cms), CN/C= [65.0], LA= [8.8]mm),
00273> N= [3], TP= [0.55]hrs,
00274> RAINFALL= [ , , , ]mm/hr), ENDS= 1
00275> *$-----
00276> *$-----
00277> *$-----
00278> *$-----
00279> *$-----
00280> ADJ HYD IDJUE= [3], RHYD= ["WCS"], IDa to add= [1,2]
00281> *$-----
00282> *$-----
00283> START TZERO= [0.0]hrs or date, METOUT= [2], NSTORM= [1], NRUN= [2]
00284> *$-----
00285> *$-----
00286> *$-----
00287> START TZERO= [0.0]hrs or date, METOUT= [2], NSTORM= [1], NRUN= [3]
00288> *$-----
00289> *$-----
00290> *$-----
00291> START TZERO= [0.0]hrs or date, METOUT= [2], NSTORM= [1], NRUN= [4]
00292> *$-----
00293> *$-----
00294> *$-----
00295> START TZERO= [0.0]hrs or date, METOUT= [2], NSTORM= [1], NRUN= [5]
00296> *$-----
00297> *$-----
00298> *$-----
00299> START TZERO= [0.0]hrs or date, METOUT= [2], NSTORM= [1], NRUN= [6]
00300> *$-----
00301> *$-----
00302> *$-----
00303> START TZERO= [0.0]hrs or date, METOUT= [2], NSTORM= [1], NRUN= [7]
00304> *$-----
00305> *$-----
00306> *$-----
00307> START TZERO= [0.0]hrs or date, METOUT= [2], NSTORM= [1], NRUN= [8]
00308> *$-----
00309> *$-----
00310> *$-----
00311> FINISH

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00275 001:0033-----ID:NMFD-----AREA-----OPEAK-TpeakDate hh:mm-----R.V.-----
00276 ADD HYD 01:81 2.50 009 No_date 3:09 1.66
00277 [INTOUT= 2 (1= Imperial, 2= metric output)]
00278 [INTORM= 1]
00279 [NRUN = 3]
00280 ** END OF RUN : 1
00281
00282
00283 RUN-COMMANDS
00284 002:0001-----
00285 START
00286 (TZERO = .00 hrs on 0)
00287 [METOUT= 2 (1= Imperial, 2= metric output)]
00288 [INTORM= 1]
00289 [NRUN = 3]
00290 *****
00291 # Project Name: [PARKBRIDGE CRAWGLITH] Project Number: [1046-1031]
00292 # Date: 2016-12-08
00293 # Modeler: [C.F. Crozier & Associates Inc.]
00294 # License #: 3737016
00295 *****
00296 002:0002-----
00297 READ STORM
00298 Filename = STORM.001
00299 Comment =
00300 [SDT=60.00 SDUR= 6.00 PTOT= 37.90]
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00312 002:0003-----ID:NMFD-----AREA-----OPEAK-TpeakDate hh:mm-----R.V.-----
00313 CALIB NASHYD 01:EXT-9A 101.80 1.204 No_date 3:51 11.23
00314 [CN= 80.0; N= 3.00]
00315 [T= 1.00; DT= 1.00]
00316
00317 002:0004-----ID:NMFD-----AREA-----OPEAK-TpeakDate hh:mm-----R.V.-----
00318 ROUTE CHANNEL --> 01:EXT-9A 101.80 1.204 No_date 3:51 11.23
00319 [L/S= 550.72; Q= 0.05]
00320 [Vmax= 1.227; Dmax= .19]
00321
00322 002:0005-----ID:NMFD-----AREA-----OPEAK-TpeakDate hh:mm-----R.V.-----
00323 CALIB STANDHYD 02:EXT-9B 14.80 4.18 No_date 3:01 15.55
00324 [KIMP= 15; TIMP= .15]
00325 [Horton parameters: F= 50.00; P= 7.50; DCAV= 2.00; F= .00]
00326 [PerVIOUS area: Iap= 1.00; SLPP= 2.00; LGP= 40.0; MNP= 250; SCP= .0]
00327 [ImVIOUS area: Iap= 1.00; SLPI= 1.00; LGI= 34.0; MNI= 013; SCI= .0]
00328
00329 002:0006-----ID:NMFD-----AREA-----OPEAK-TpeakDate hh:mm-----R.V.-----
00330 ROUTE RESERVOIR --> 02:EXT-9B 14.80 4.18 No_date 3:01 15.55
00331 [RDT= 1.00; out= 04:Orchards 14.80 .059 No_date 4:13 15.55]
00332 [MXSLUsed= 1406E+20]
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005415 [Previous area: Iapex: 1.00:SLPP:2.00:LGP: 40.0:WNP:250:SCP: .0]
005420 [Impervious area: Iapex: 1.00:SLPP:2.00:LGP: 40.0:WNP:250:SCP: .0]
005425 003-0008 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
005430 ROUTE RESERVOIR -> 01:EXT-9B 14.60 866 No date 3:01 26.49
005435 [RDT=1.00] outc: 04:Orchards 14.60 226 No date 3:13 26.69
005440 [Mxst0000:28426:00]
005445 -----
005450 TOTAL FLOW at Watercourse 8 Grey Road 19 Crossing-----
005455 003-0007 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
005460 ADD HYD 01:Channel 101.60 2167 No date 3:53 20.46
005465 01:Orchards 14.60 226 No date 3:13 26.69
005470 [DT=1.00] SUM 01:RD19 116.60 2384 No date 3:51 21.25
005475 003-0008 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
005480 CALIB NASHVD 01:EXT-9D .63 1921 No date 3:03 13.34
005485 [CN: 74.0: N= 3.00]
005490 [Tpe: .20:DT= 1.00]
005495 -----
005500 Parkbridge Craigleith - Upper Terrace Lands-----
005505 003-0009 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
005510 CALIB NASHVD 01:9A .51 1019 No date 3:06 16.00
005515 [CN: 74.0: N= 3.00]
005520 [Tpe: .20:DT= 1.00]
005525 003-0010 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
005530 CALIB NASHVD 01:9C9D 2.74 1025 No date 3:04 3.77
005535 [CN: 35.0: N= 3.00]
005540 [Tpe: .21:DT= 1.00]
005545 003-0011 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
005550 ADD HYD 01:EXT-9D .63 1021 No date 3:03 13.34
005555 01:9A .51 1019 No date 3:06 16.00
005560 01:9C9D 2.74 1025 No date 3:04 3.77
005565 003-0012 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
005570 [RDT=1.00] SUM 01:WCD9 120.50 2400 No date 3:51 20.79
005575 [DT= 1.00]
005580 -----
005585 CATCHMENT EXT-9C DIRECTED TO SWM FACILITY 1 POST-DEVELOPMENT-----
005590 CATCHMENT EXT-9C TO BE CONTROLLED BY SWM FACILITY 1-----
005595 003-0012 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
005600 CALIB NASHVD 01:EXT-9C 8.40 220 No date 3:15 15.16
005605 [CN: 74.0: N= 3.00]
005610 [Tpe: .47:DT= 1.00]
005615 003-0013 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
005620 CALIB STANDHYD 01:9F .35 1033 No date 3:00 49.97
005625 [XIMP=.90:TIMP=.98]
005630 [LOSS= 2 :CN= 69.0]
005635 [Previous area: Iapex: 5.00:SLPP:3.00:LGP: 30.0:WNP:250:SCP: .0]
005640 [Impervious area: Iapex: 2.00:SLPP:2.00:LGP: 150.0:WNP:013:SCI: .0]
005645 003-0014 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
005650 CALIB STANDHYD 01:9B 2.15 182 No date 3:00 37.30
005655 [XIMP=.44:TIMP=.65]
005660 [LOSS= 2 :CN= 79.0]
005665 [Previous area: Iapex: 5.00:SLPP:3.00:LGP: 30.0:WNP:250:SCP: .0]
005670 [Impervious area: Iapex: 2.00:SLPP:2.00:LGP: 110.0:WNP:013:SCI: .0]
005675 003-0015 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
005680 CALIB NASHVD 01:9E 2.04 1028 No date 3:01 4.90
005685 [CN: 43.0: N= 3.00]
005690 [Tpe: .12:DT= 1.00]
005695 003-0016 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
005700 ADD HYD 01:EXT-9C 8.40 220 No date 3:15 15.16
005705 01:9F .35 1033 No date 3:00 49.97
005710 01:9B 2.15 182 No date 3:00 37.30
005715 01:9E 2.04 1028 No date 3:01 4.90
005720 [DT= 1.00] SUM 01:CNMF1 11.14 418 No date 3:00 18.46
005725 -----
005730 EXISTING POND ON PARKBRIDGE CRAIGLEITH SUBJECT SITE-----
005735 CONVERTED TO SWM FACILITY 1 POST-DEVELOPMENT-----
005740 003-0017 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
005745 ROUTE RESERVOIR -> 01:CNMF1 13.14 418 No date 3:00 18.46
005750 [RDT=1.00] outc: 01:CNMF1 13.14 420 No date 3:12 18.46
005755 [Mxst0000:13108:00]
005760 003-0018 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
005765 CALIB NASHVD 01:9G 1.16 1011 No date 3:02 3.35
005770 [CN: 33.0: N= 3.00]
005775 [Tpe: .14:DT= 1.00]
005780 003-0019 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
005785 ADD HYD 01:9G 1.16 1011 No date 3:02 3.35
005790 01:CNMF1 13.14 420 No date 3:12 18.46
005795 01:WCD9 120.50 2400 No date 3:51 20.79
005800 01:WCD9 134.80 2420 No date 3:51 20.41
005805 [DT= 1.00] SUM 01:CNMF1 13.14 418 No date 3:00 18.46
005810 -----
005815 Parkbridge Craigleith - Lower Terrace Lands-----
005820 003-0020 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
005825 CALIB NASHVD 01:2H 2.14 117 No date 3:06 3.63
005830 [CN: 34.0: N= 3.00]
005835 [Tpe: .21:DT= 1.00]
005840 003-0021 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
005845 CALIB STANDHYD 01:9I 3.88 223 No date 3:00 29.56
005850 [XIMP=.40:TIMP=.60]
005855 [LOSS= 2 :CN= 52.0]
005860 [Previous area: Iapex: 5.00:SLPP:3.00:LGP: 30.0:WNP:250:SCP: .0]
005865 [Impervious area: Iapex: 2.00:SLPP:2.00:LGP: 145.0:WNP:013:SCI: .0]
005870 003-0022 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
005875 ROUTE RESERVOIR -> 01:9I 3.88 223 No date 3:00 29.56
005880 [RDT=1.00] outc: 01:CNMF2 3.88 228 No date 3:03 29.56
005885 [Mxst0000:35448:01]
005890 003-0023 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
005895 CALIB NASHVD 01:9J .98 1031 No date 3:03 12.65
005900 [CN: 66.0: N= 3.00]
005905 [Tpe: .17:DT= 1.00]
005910 003-0024 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
005915 CALIB NASHVD 01:9J .98 1031 No date 3:03 12.65
005920 [CN: 66.0: N= 3.00]
005925 [Tpe: .17:DT= 1.00]
005930 003-0025 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
005935 CALIB NASHVD 01:9K9L 1.10 1015 No date 3:11 6.39
005940 [CN: 50.0: N= 3.00]
005945 [Tpe: .18:DT= 1.00]
005950 003-0026 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
005955 CALIB NASHVD 01:9N 1.59 1034 No date 3:03 8.58
005960 [CN: 59.0: N= 3.00]
005965 [Tpe: .20:DT= 1.00]
005970 003-0027 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
005975 CALIB STANDHYD 01:9M 3.80 256 No date 3:00 33.69
005980 [XIMP=.44:TIMP=.65]
005985 [LOSS= 2 :CN= 69.0]
005990 [Previous area: Iapex: 5.00:SLPP:3.00:LGP: 30.0:WNP:250:SCP: .0]
005995 [Impervious area: Iapex: 2.00:SLPP:2.00:LGP: 150.0:WNP:013:SCI: .0]
006000 003-0028 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
006005 ADD HYD 01:9N 1.59 1034 No date 3:03 8.58
006010 01:9M 3.80 256 No date 3:00 33.69
006015 01:WCD9 120.50 2400 No date 3:51 20.79
006020 [DT= 1.00] SUM 01:WCD9 120.50 2400 No date 3:51 20.79
006025 -----
006030 POST-DEVELOPMENT SWM FACILITY 3 (LOWER EAST POND)-----
006035 003-0029 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
006040 ROUTE RESERVOIR -> 01:WCD3 5.13 289 No date 3:00 26.28
006045 [RDT=1.00] outc: 01:WCD3 5.13 289 No date 3:00 26.28
006050 [Mxst0000:12358:00]
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006060 WATERCOURSE 9 TOTAL FLOW AT LAKESHORE RD-----
006065 003-0030 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
006070 ADD HYD 01:WCD9 3.88 226 No date 3:03 29.56
006075 01:WCD9 3.88 226 No date 3:03 29.56
006080 01:9I .45 1011 No date 3:05 11.01
006085 01:9J .98 1031 No date 3:03 12.65
006090 01:9K9L 1.10 1015 No date 3:10 6.39
006095 01:9M 3.80 256 No date 3:00 33.69
006100 01:WCD9 120.50 2400 No date 3:51 20.79
006105 01:9N 1.59 1034 No date 3:03 8.58
006110 [DT= 1.00] SUM 01:WCD9 124.82 2401 No date 3:50 20.43
006115 -----
006120 WATERCOURSE 8 CATCHMENTS-----
006125 WC 8 CATCHMENTS TO BE DIRECTED TO NCA-----
006130 EQUIVALENT TO EXISTING CONDITIONS OF WC 8-----
006135 003-0031 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
006140 CALIB NASHVD 01:8I 2.50 1057 No date 3:06 10.23
006145 [CN: 63.5: N= 3.00]
006150 [Tpe: .28:DT= 1.00]
006155 003-0032 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
006160 CALIB NASHVD 01:EXT-9 7.60 115 No date 3:21 9.95
006165 [CN: 63.0: N= 3.00]
006170 [Tpe: .55:DT= 1.00]
006175 -----
006180 WATERCOURSE 8 TOTAL FLOW OF CATCHMENTS EXT-6 AND 8-----
006185 003-0033 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
006190 ADD HYD 01:8I 2.50 1057 No date 3:06 10.23
006195 01:EXT-9 7.60 115 No date 3:21 9.95
006200 [DT= 1.00] SUM 01:WCD8 10.10 114 No date 3:13 10.04
006205 -----
006210 RUN:COMMANDS-----
006215 004-0001 START-----
006220 004-0002 FLOWED = 99 hrs on 0]
006225 004-0003 INPUT = 2 (1=Imperial, 2=Metric output)
006230 004-0004 INSTORM = 1
006235 004-0005 INRUN = 4
006240 004-0006 Project Name: [PARKBRIDGE CRAIGLEITH] Project Number: [1046-0031]
006245 004-0007 Date = 2015-12-08
006250 004-0008 Modeler = [OD]
006255 004-0009 Company = C.F. Crozier & Associates Inc.
006260 004-0010 License # = 3737916
006265 004-0011 READ STORM
006270 004-0012 File name = STORM.001
006275 004-0013 Comment
006280 004-0014 [SDT=60.00:SEUR= 6.00:TOT= 66.00]
006285 004-0015 POST-DEVELOPMENT-----
006290 004-0016 Subwatershed 9 External Drainage Area-----
006295 004-0017 Per 'The Orchards' FDSWM Report-----
006300 004-0018 Prepared by Higgins Engineering (Jan. 2005)-----
006305 004-0019 "EXT-9A" Total Area 116.6 ha less 'Orchards' 14.8 ha equals 101.8 ha-----
006310 004-0020 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
006315 CALIB NASHVD 01:EXT-9A 101.80 3221 No date 3:47 29.89
006320 [CN: 80.0: N= 3.00]
006325 [Tpe: 1.60:DT= 1.00]
006330 004-0021 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
006335 ROUTE CHANNEL -> 01:EXT-9A 101.80 3221 No date 3:47 29.89
006340 [RDT=1.00] outc: 02:Channel 101.80 3210 No date 3:51 29.89
006345 [C/S/N= 550.0/3.000/0.05]
006350 [Wpeak= 2.755:Wmax= .07]
006355 004-0022 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
006360 CALIB STANDHYD 01:EXT-9B 14.60 1268 No date 3:01 37.69
006365 [XIMP=.35:TIMP=.35]
006370 004-0023 Horton parameters: P= 60.00:Pc= 7.50:OCV=2.00:Pc= .00]
006375 [Previous area: Iapex: 1.00:SLPP:2.00:LGP: 40.0:WNP:250:SCP: .0]
006380 [Impervious area: Iapex: 1.00:SLPP:2.00:LGP: 33.0:WNP:013:SCI: .0]
006385 004-0024 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
006390 ROUTE RESERVOIR -> 01:EXT-9B 14.60 1268 No date 3:01 37.69
006395 [RDT=1.00] outc: 04:Orchards 14.60 1515 No date 3:22 37.69
006400 [Mxst0000:37045:00]
006405 -----
006410 TOTAL FLOW at Watercourse 9 Grey Road 19 Crossing-----
006415 004-0025 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
006420 ADD HYD 01:Channel 101.80 3210 No date 3:51 29.89
006425 01:Orchards 14.60 1515 No date 3:22 37.69
006430 [RDT= 1.00] SUM 01:RD19 116.60 3264 No date 3:48 35.88
006435 004-0026 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
006440 CALIB NASHVD 01:EXT-9D .63 1033 No date 3:03 20.91
006445 [CN: 33.0: N= 3.00]
006450 [Tpe: .20:DT= 1.00]
006455 004-0027 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
006460 CALIB NASHVD 01:9A .51 1019 No date 3:06 16.00
006465 [CN: 35.0: N= 3.00]
006470 [Tpe: .21:DT= 1.00]
006475 004-0028 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
006480 ADD HYD 01:EXT-9D .63 1033 No date 3:03 20.91
006485 01:9A .51 1019 No date 3:06 16.00
006490 01:9C9D 2.74 1025 No date 3:04 3.77
006495 01:RD19 116.60 3264 No date 3:48 35.88
006500 [DT= 1.00] SUM 01:WCD9 120.50 3449 No date 3:46 30.34
006505 -----
006510 CATCHMENT EXT-9C DIRECTED TO SWM FACILITY 1 POST-DEVELOPMENT-----
006515 CATCHMENT EXT-9C TO BE CONTROLLED BY SWM FACILITY 1-----
006520 004-0029 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
006525 CALIB NASHVD 01:EXT-9C 8.40 342 No date 3:14 23.25
006530 [CN: 74.0: N= 3.00]
006535 [Tpe: .47:DT= 1.00]
006540 004-0030 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
006545 CALIB STANDHYD 01:9F .35 1042 No date 3:00 63.14
006550 [XIMP=.90:TIMP=.98]
006555 [LOSS= 2 :CN= 69.0]
006560 [Previous area: Iapex: 5.00:SLPP:3.00:LGP: 30.0:WNP:250:SCP: .0]
006565 [Impervious area: Iapex: 2.00:SLPP:2.00:LGP: 150.0:WNP:013:SCI: .0]
006570 004-0031 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
006575 CALIB STANDHYD 01:9B 2.15 241 No date 3:00 49.23
006580 [XIMP=.44:TIMP=.65]
006585 [LOSS= 2 :CN= 79.0]
006590 [Previous area: Iapex: 5.00:SLPP:3.00:LGP: 30.0:WNP:250:SCP: .0]
006595 [Impervious area: Iapex: 2.00:SLPP:2.00:LGP: 110.0:WNP:013:SCI: .0]
006600 004-0032 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
006605 CALIB NASHVD 01:9E 2.04 1028 No date 3:01 4.90
006610 [CN: 43.0: N= 3.00]
006615 [Tpe: .12:DT= 1.00]
006620 004-0033 ID:HYND AREA: QPEAK-TpeakDate_hh:mm--R.V.
006625 ADD HYD 01:EXT-9C 8.40 220 No date 3:15 15.16
006630 01:9F .35 1033 No date 3:00 49.97
006635 01:9B 2.15 182 No date 3:00 37.30
006640 01:9E 2.04 1028 No date 3:01 4.90
006645 [DT= 1.00] SUM 01:WCD9 120.50 2400 No date 3:51 20.79
006650 -----

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00011 00410015 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00012 CALIB NASHVD 04:59 2.04 046 No_date 3:01 8.12
00013 [CN= 43.3; N= 3.00]
00014 [TP= 12:DT= 1.00]
00015 00410015 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00016 ADD HYD 01:EXT-9C 8.40 342 No_date 3:14 23.25
00017 + 02:9F .35 042 No_date 3:00 43.24
00018 + 03:9B 9.35 241 No_date 3:00 49.23
00019 + 04:9B 3.04 046 No_date 3:01 8.12
00020 [DT= 1.00] SUM= 04:SNMP1 13.14 510 No_date 3:00 26.62
00021 #
00022 # EXISTING POND ON PARKBRIDGE CRAIGLEITH SUBJECT SITE
00023 # CONVERTED TO SWM FACILITY 1 POST-DEVELOPMENT
00024 #
00025 00410017 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00026 ROUTE RESERVOIR -> 04:SNMP1 13.14 510 No_date 3:00 26.62
00027 [MxSLoad= 3134E+00]
00028 + 04:9B 3.04 046 No_date 3:01 8.12
00029 00410017 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00030 CALIB NASHVD 01:30 1.16 018 No_date 3:02 5.61
00031 [CN= 13.2; N= 3.00]
00032 [TP= 14:DT= 1.00]
00033 00410019 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00034 ADD HYD 01:9G 1.16 018 No_date 3:02 5.62
00035 + 05:SNMP1 13.14 510 No_date 3:00 26.62
00036 + 09:WCSa 120.50 3.649 No_date 3:46 30.24
00037 [DT= 1.00] SUM= 07:WCSb 134.80 3.673 No_date 3:46 29.67
00038 #
00039 # Parkbridge Craigleith - Lower Terrace Lands
00040 #
00041 00410020 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00042 CALIB NASHVD 02:31 2.14 029 No_date 3:06 6.05
00043 [CN= 34.7; N= 3.00]
00044 [TP= 27:DT= 1.00]
00045 00410021 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00046 CALIB STANDHYD 02:31 3.88 304 No_date 3:00 39.39
00047 [XIMP= 40:TIMP= 60]
00048 [LOSS= 2; CN= 61.0]
00049 [Impervious area: IArea= 5.00;SLPP= 2.00;LGP= 30;MNP= 250;SCP= .0]
00050 [Imperious area: IArea= 3.00;SLPP= 2.00;LGP= 245;MNP= 013;SCP= .0]
00051 #
00052 # POST-DEVELOPMENT SWM FACILITY 2 (LOWER WEST BOND)
00053 #
00054 00410022 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00055 ROUTE RESERVOIR -> 02:31 3.88 304 No_date 3:00 39.39
00056 [RDT= 1.00] out= 04:SNMP2 3.88 293 No_date 3:02 39.38
00057 [MxSLoad= 5859E+01]
00058 00410023 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00059 CALIB NASHVD 02:33 .98 048 No_date 3:02 19.59
00060 [CN= 66.7; N= 3.00]
00061 [TP= 10:DT= 1.00]
00062 00410024 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00063 CALIB NASHVD 03:30 .45 018 No_date 3:05 17.27
00064 [CN= 65.5; N= 3.00]
00065 [TP= 26:DT= 1.00]
00066 00410025 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00067 CALIB NASHVD 04:09 1.18 025 No_date 3:09 10.45
00068 [CN= 55.4; N= 3.00]
00069 [TP= 39:DT= 1.00]
00070 00410026 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00071 CALIB NASHVD 05:33 1.59 055 No_date 3:03 13.83
00072 [CN= 59.3; N= 3.00]
00073 [TP= 20:DT= 1.00]
00074 00410027 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00075 CALIB STANDHYD 06:39 3.80 344 No_date 3:00 44.66
00076 [XIMP= 44:TIMP= 65]
00077 [LOSS= 2; CN= 69.0]
00078 [Impervious area: IArea= 5.00;SLPP= 2.00;LGP= 30;MNP= 250;SCP= .0]
00079 [Imperious area: IArea= 2.00;SLPP= 2.00;LGP= 155;MNP= 013;SCP= .0]
00080 00410028 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00081 ADD HYD 01:9G 1.16 018 No_date 3:02 5.62
00082 + 05:SNMP1 13.14 510 No_date 3:00 26.62
00083 [DT= 1.00] SUM= 06:SNMP1 5.39 398 No_date 3:00 35.56
00084 #
00085 # POST-DEVELOPMENT SWM FACILITY 3 (LOWER EAST BOND)
00086 #
00087 00410029 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00088 ROUTE RESERVOIR -> 05:SNMP1 5.39 398 No_date 3:00 35.56
00089 [RDT= 1.00] out= 05:SNMP1 5.39 398 No_date 3:00 35.56
00090 [MxSLoad= 1499E+00]
00091 #
00092 # WATERCOURSE 4 TOTAL FLOW AT LAKESHORE RD.
00093 #
00094 00410030 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00095 ADD HYD 01:WCSa 3.88 293 No_date 3:02 39.38
00096 + 02:9G .98 048 No_date 3:02 19.59
00097 + 03:9B .45 018 No_date 3:05 17.27
00098 + 04:9B 1.18 025 No_date 3:09 10.45
00099 + 05:SNMP1 5.39 398 No_date 3:00 35.56
00100 + 07:WCSb 134.80 3.673 No_date 3:46 29.67
00101 + 10:SH 2.14 020 No_date 3:06 6.05
00102 [DT= 1.00] SUM= 04:WCSa 148.82 3.787 No_date 3:44 28.54
00103 #
00104 # WATERCOURSE 5 CATCHMENTS
00105 #
00106 # WC 6 CATCHMENTS TO BE DIRECTED TO WCS
00107 # EQUIVALENT TO EXISTING CONDITIONS OF WC 6
00108 #
00109 00410031 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00110 CALIB NASHVD 01:31 2.50 590 No_date 3:06 14.20
00111 [CN= 53.2; N= 3.00]
00112 [TP= 28:DT= 1.00]
00113 00410032 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00114 CALIB NASHVD 02:EXT-B 7.60 130 No_date 3:20 15.55
00115 [CN= 63.0; N= 3.00]
00116 [TP= 88:DT= 1.00]
00117 #
00118 # WATERCOURSE 6 TOTAL FLOW OF CATCHMENTS EXT-B AND 8:
00119 #
00120 00410033 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00121 ADD HYD 01:81 2.50 590 No_date 3:06 14.20
00122 + 02:EXT-B 7.60 130 No_date 3:20 15.55
00123 [DT= 1.00] SUM= 04:WCSa 10.10 254 No_date 3:12 15.55
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00915 0050002 READ STORM
00916 File Name = STORM.001
00917 Comment
00918 [RDT= 60.00; SDR= 6.00; PTD= 77.90]
00919 #
00920 # POST-DEVELOPMENT
00921 #
00922 # Subwatershed 9 External Drainage Area
00923 # Per 'The Orchard' PRRM Report
00924 # Prepared by Higgins Engineering (Jan. 2005)
00925 # EXT-9A Total Area 116.6 ha less 'Orchards' 14.8 ha equals 101.8 ha
00926 #
00927 0050003 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00928 CALIB NASHVD 01:EXT-9A 101.80 4.153 No_date 3:46 38.36
00929 [CN= 80.0; N= 3.00]
00930 [TP= 1.00; DT= 1.00]
00931 0050004 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00932 ROUTE RESERVOIR -> 01:EXT-9A 101.80 4.153 No_date 3:46 38.36
00933 [RDT= 1.00] out= 02:Channel 101.80 4.142 No_date 3:50 38.36
00934 [Loss= 550; 2.000; 0.05]
00935 [Imperious area: IArea= 2.00;SLPP= 2.00;LGP= 30;MNP= 250;SCP= .0]
00936 [Imperious area: IArea= 2.00;SLPP= 2.00;LGP= 245;MNP= 013;SCP= .0]
00937 0050005 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00938 CALIB STANDHYD 03:EXT-9B 14.80 1.607 No_date 3:00 47.32
00939 [XIMP= 35;TIMP= 35]
00940 [Loss= 550; 2.000; 0.05]
00941 [Imperious area: IArea= 2.00;SLPP= 2.00;LGP= 30;MNP= 250;SCP= .0]
00942 [Imperious area: IArea= 2.00;SLPP= 2.00;LGP= 245;MNP= 013;SCP= .0]
00943 0050006 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00944 ROUTE RESERVOIR -> 03:EXT-9B 14.80 1.607 No_date 3:00 47.32
00945 [RDT= 1.00] out= 04:Orchards 14.80 .796 No_date 3:17 47.31
00946 [MxSLoad= 4411E+00]
00947 #
00948 # TOTAL FLOW at Watercourse 9 Grey Road 19 Crossing
00949 #
00950 0050007 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00951 ADD HYD 02:Channel 101.80 4.142 No_date 3:50 38.36
00952 + 04:Orchards 14.80 .796 No_date 3:17 47.31
00953 [DT= 1.00] SUM= 05:RDI9 116.60 4.727 No_date 3:46 40.10
00954 0050008 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00955 CALIB NASHVD 01:EXT-9D 63 .043 No_date 3:03 26.49
00956 [CN= 73.0; N= 3.00]
00957 [TP= 20:DT= 1.00]
00958 #
00959 # Parkbridge Craigleith - Upper Terrace Lands
00960 #
00961 0050009 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00962 CALIB NASHVD 03:9A 53 .037 No_date 3:05 32.55
00963 [CN= 75.0; N= 3.00]
00964 [TP= 28:DT= 1.00]
00965 0050010 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00966 CALIB NASHVD 03:99 2.74 .057 No_date 3:03 8.01
00967 [CN= 15.3; N= 3.00]
00968 [TP= 21:DT= 1.00]
00969 0050011 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00970 ADD HYD 01:EXT-9D 63 .043 No_date 3:03 26.49
00971 + 03:9A .53 .037 No_date 3:05 32.55
00972 + 04:99 2.74 .057 No_date 3:03 8.01
00973 + 05:RDI9 116.60 4.727 No_date 3:46 40.10
00974 [DT= 1.00] SUM= 08:NC9A 120.50 4.763 No_date 3:42 39.29
00975 #
00976 # CATCHMENT EXT-9C DIRECTED TO SWM FACILITY 1 POST-DEVELOPMENT
00977 #
00978 # CATCHMENT EXT-9C TO BE CONTROLLED BY SWM FACILITY 1
00979 #
00980 0050012 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00981 CALIB NASHVD 03:EXT-9C 8.40 .451 No_date 3:14 31.24
00982 [CN= 74.9; N= 3.00]
00983 [TP= 42:DT= 1.00]
00984 0050013 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00985 CALIB STANDHYD 02:9F .35 .019 No_date 3:00 74.95
00986 [XIMP= 20;TIMP= 30]
00987 [Loss= 2; CN= 69.0]
00988 [Impervious area: IArea= 5.00;SLPP= 2.00;LGP= 30;MNP= 250;SCP= .0]
00989 [Imperious area: IArea= 2.00;SLPP= 2.00;LGP= 155;MNP= 013;SCP= .0]
00990 0050014 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00991 CALIB STANDHYD 03:98 2.35 .287 No_date 3:00 60.16
00992 [LOSS= 2; CN= 79.0]
00993 [Impervious area: IArea= 5.00;SLPP= 2.00;LGP= 30;MNP= 250;SCP= .0]
00994 [Imperious area: IArea= 2.00;SLPP= 2.00;LGP= 110;MNP= 013;SCP= .0]
00995 0050015 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
00996 CALIB NASHVD 06:9E 2.04 .063 No_date 3:01 11.57
00997 [CN= 52.3; N= 3.00]
00998 [TP= 12:DT= 1.00]
00999 0050016 ID:NIHYD AREA CPEAK-TpeakDate hh:mm R.V.
01000 ADD HYD 01:EXT-9C 8.40 .451 No_date 3:14 31.24
01001 + 03:9F .35 .019 No_date 3:00 74.95
01002 + 03:9B 2.35 .287 No_date 3:00 60.16
01003 + 06:9E 2.04 .063 No_date 3:01 11.57
01004 [DT= 1.00] SUM= 04:SNMP1 13.14 .778 No_date 3:00 34.52
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01081# (Tpe .25:DT= 1.00)
01082# 005 000001 ID:NNHYD AREA OPEAK-TpeakDate_hh:mm--R.V.
01083# CALIB NASHVD 04:9K9L 1.18 044 No date 3:09 54.72
01084# (CN= 50.4; N= 3.00)
01085# (Tpe .33:DT= 1.00)
01086# 005 000002 ID:NNHYD AREA OPEAK-TpeakDate_hh:mm--R.V.
01087# CALIB NASHVD 05:9N 1.55 074 No date 3:04 59.27
01088# (CN= 50.3; N= 3.00)
01089# (Tpe .30:DT= 1.00)
01090# 005 000007 ID:NNHYD AREA OPEAK-TpeakDate_hh:mm--R.V.
01091# CALIB STANDHYD 06:9M 3.80 416 No date 3:00 54.83
01092# (XIMP= 15:TIMP= 65)
01093# (LOSS= 2 :CN= 69.0)
01094# [Previous area: Iapex= 5.00:SLPP=2.00:LGP= 30.0:MNP=250:SCP= .0]
01095# [Impervious area: IAlmp= 3.00:SLPI=2.00:LGI= 155.0:MNI= 013:SCI= .0]
01096# 005 000008 ID:NNHYD AREA OPEAK-TpeakDate_hh:mm--R.V.
01097# ADD HYD 05:9N 1.55 074 No date 3:03 59.27
01098# + 06:9M 3.80 416 No date 3:00 54.83
01099# (DT= 1.00) SUM= 08:SNMF3 5.39 488 No date 3:00 44.34
01100# #-----
01101# # POST-DEVELOPMENT SWM FACILITY 1 (LOWER EAST POND)
01102# #-----
01103# 005 000009 ID:NNHYD AREA OPEAK-TpeakDate_hh:mm--R.V.
01104# ROUTE RESERVOIR -> 08:SNMF3 5.39 488 No date 3:00 44.34
01105# (RDT= 1.00) out= 09:SNMF-2 5.39 018 No date 3:03 44.34
01106# (XStoUsed= 21468+00)
01107# #-----
01108# # WATERCOURSE 3 TOTAL FLOW AT LAKESHORE RD
01109# #-----
01110# 005 000010 ID:NNHYD AREA OPEAK-TpeakDate_hh:mm--R.V.
01111# ADD HYD 01:WC9B 3.88 164 No date 3:01 48.61
01112# + 02:9J 1.88 062 No date 3:02 26.57
01113# + 03:9Q 1.15 024 No date 3:05 22.64
01114# + 04:9K9L 1.18 074 No date 3:03 54.72
01115# + 05:SNMF-3 5.39 016 No date 3:05 44.34
01116# + 07:WC9B 134.80 4.792 No date 3:42 38.56
01117# + 10:9H 2.14 040 No date 3:00 8.66
01118# (DT= 1.00) SUM= 04:WC9B 148.62 4.942 No date 3:42 38.56
01119# #-----
01120# # WATERCOURSE 3 CATCHMENTS
01121# #-----
01122# # NO CATCHMENTS TO BE DIRECTED TO WCS
01123# # EQUIVALENT TO EXISTING CONDITIONS OF WC #
01124# #-----
01125# 005 000011 ID:NNHYD AREA OPEAK-TpeakDate_hh:mm--R.V.
01126# CALIB NASHVD 01:81 2.80 121 No date 3:03 22.31
01127# (CN= 63.5; N= 3.00)
01128# (Tpe .28:DT= 1.00)
01129# 005 000012 ID:NNHYD AREA OPEAK-TpeakDate_hh:mm--R.V.
01130# CALIB NASHVD 02:EXT-8 7.60 255 No date 3:13 21.88
01131# (CN= 63.0; N= 3.00)
01132# (Tpe .55:DT= 1.00)
01133# #-----
01134# # WATERCOURSE 3 TOTAL FLOW OF CATCHMENTS EXT-8 AND 81
01135# #-----
01136# 005 000013 ID:NNHYD AREA OPEAK-TpeakDate_hh:mm--R.V.
01137# ADD HYD 01:81 2.80 121 No date 3:03 22.31
01138# + 02:EXT-8 7.60 255 No date 3:13 21.88
01139# (DT= 1.00) SUM= 03:WC9B 10.10 358 No date 3:12 21.96
01140# ** END OF RUN **
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01216# (Tpe .21:DT= 1.00)
01217# 006 00011 ID:NNHYD AREA OPEAK-TpeakDate_hh:mm--R.V.
01218# ADD HYD 01:EXT-9B 4.83 049 No date 3:02 32.99
01219# + 03:9A 1.33 042 No date 3:05 36.90
01220# + 04:9C9D 3.74 046 No date 3:03 17.41
01221# + 05:RD19 116.60 5.304 No date 3:42 44.36
01222# (DT= 1.00) SUM= 09:WC9B 126.50 5.346 No date 3:43 47.99
01223# #-----
01224# # CATCHMENT EXT-9C DIRECTED TO SWM FACILITY 1 POST-DEVELOPMENT
01225# # CATCHMENT EXT-9C TO BE CONTROLLED BY SWM FACILITY 1
01226# #-----
01227# 006 00012 ID:NNHYD AREA OPEAK-TpeakDate_hh:mm--R.V.
01228# CALIB NASHVD 01:EXT-9C 5.40 050 No date 3:13 35.49
01229# (CN= 74.9; N= 3.00)
01230# (Tpe .47:DT= 1.00)
01231# 006 00013 ID:NNHYD AREA OPEAK-TpeakDate_hh:mm--R.V.
01232# CALIB STANDHYD 02:9F 1.35 052 No date 3:00 60.91
01233# (XIMP= 95:TIMP= 98)
01234# (LOSS= 2 :CN= 69.0)
01235# [Previous area: Iapex= 5.00:SLPP=2.00:LGP= 30.0:MNP=250:SCP= .0]
01236# [Impervious area: IAlmp= 2.00:SLPI=4.00:LGI= 98.0:MNI= 013:SCI= .0]
01237# 006 00014 ID:NNHYD AREA OPEAK-TpeakDate_hh:mm--R.V.
01238# CALIB STANDHYD 03:9B 2.35 052 No date 3:00 66.75
01239# (XIMP= 44:TIMP= 65)
01240# (LOSS= 2 :CN= 79.0)
01241# [Previous area: Iapex= 5.00:SLPP=2.00:LGP= 30.0:MNP=250:SCP= .0]
01242# [Impervious area: IAlmp= 2.00:SLPI=4.00:LGI= 110.0:MNI= 013:SCI= .0]
01243# 006 00015 ID:NNHYD AREA OPEAK-TpeakDate_hh:mm--R.V.
01244# CALIB NASHVD 04:9E 2.04 072 No date 3:02 33.50
01245# (CN= 43.3; N= 3.00)
01246# (Tpe .12:DT= 1.00)
01247# 006 00016 ID:NNHYD AREA OPEAK-TpeakDate_hh:mm--R.V.
01248# ADD HYD 01:EXT-9C 1.35 052 No date 3:00 60.91
01249# + 02:9F 1.35 052 No date 3:00 60.91
01250# + 03:9B 2.35 052 No date 3:00 66.75
01251# + 06:9E 2.04 072 No date 3:01 36.70
01252# (DT= 1.00) SUM= 04:SNMF1 15.14 068 No date 3:00 36.70
01253# #-----
01254# # EXISTING POND ON PARKBRIDGE CRAIGLEITH SUBSIST SITE
01255# # CONVERTED TO SWM FACILITY 1 POST-DEVELOPMENT
01256# #-----
01257# 006 00017 ID:NNHYD AREA OPEAK-TpeakDate_hh:mm--R.V.
01258# ROUTE RESERVOIR -> 04:SNMF3 5.39 488 No date 3:00 44.34
01259# (RDT= 1.00) out= 05:SNMF-1 5.39 024 No date 3:19 38.70
01260# (XStoUsed= 46478+00)
01261# 006 00018 ID:NNHYD AREA OPEAK-TpeakDate_hh:mm--R.V.
01262# CALIB NASHVD 01:9Q 1.16 028 No date 3:01 54.33
01263# (CN= 33.2; N= 3.00)
01264# (Tpe .14:DT= 1.00)
01265# 006 00019 ID:NNHYD AREA OPEAK-TpeakDate_hh:mm--R.V.
01266# ADD HYD 01:9Q 1.16 028 No date 3:01 54.33
01267# + 05:SNMF-1 5.39 024 No date 3:19 38.70
01268# + 09:WC9B 120.50 5.346 No date 3:41 45.98
01269# (DT= 1.00) SUM= 07:WC9B 134.80 5.377 No date 3:41 42.16
01270# #-----
01271# # Parkbridge Craigleith - Lower Terrace Lands
01272# #-----
01273# 006 00020 ID:NNHYD AREA OPEAK-TpeakDate_hh:mm--R.V.
01274# CALIB NASHVD 10:9H 2.14 046 No date 3:06 10.12
01275# (CN= 44.7; N= 3.00)
01276# (Tpe .27:DT= 1.00)
01277# 006 00021 ID:NNHYD AREA OPEAK-TpeakDate_hh:mm--R.V.
01278# CALIB STANDHYD 02:9T 3.88 406 No date 3:00 52.38
01279# (XIMP= 40:TIMP= 65)
01280# (LOSS= 2 :CN= 61.0)
01281# [Previous area: Iapex= 5.00:SLPP=2.00:LGP= 30.0:MNP=250:SCP= .0]
01282# [Impervious area: IAlmp= 2.00:SLPI=2.00:LGI= 245.0:MNI= 013:SCI= .0]
01283# 006 00022 ID:NNHYD AREA OPEAK-TpeakDate_hh:mm--R.V.
01284# ROUTE RESERVOIR -> 07:91 3.88 406 No date 3:00 53.38
01285# (RDT= 1.00) out= 08:SNMF-2 3.88 406 No date 3:01 53.38
01286# (XStoUsed= 61208+01)
01287# 006 00023 ID:NNHYD AREA OPEAK-TpeakDate_hh:mm--R.V.
01288# CALIB NASHVD 02:9J 1.88 062 No date 3:02 26.57
01289# (CN= 60.7; N= 3.00)
01290# (Tpe .18:DT= 1.00)
01291# 006 00024 ID:NNHYD AREA OPEAK-TpeakDate_hh:mm--R.V.
01292# CALIB NASHVD 03:9C 4.5 027 No date 3:04 27.09
01293# (CN= 65.0; N= 3.00)
01294# (Tpe .28:DT= 1.00)
01295# 006 00025 ID:NNHYD AREA OPEAK-TpeakDate_hh:mm--R.V.
01296# CALIB NASHVD 04:9K9L 1.18 074 No date 3:03 54.72
01297# (CN= 60.4; N= 3.00)
01298# (Tpe .35:DT= 1.00)
01299# 006 00026 ID:NNHYD AREA OPEAK-TpeakDate_hh:mm--R.V.
01300# CALIB NASHVD 05:9N 1.55 074 No date 3:03 59.27
01301# (CN= 59.3; N= 3.00)
01302# (Tpe .20:DT= 1.00)
01303# 006 00027 ID:NNHYD AREA OPEAK-TpeakDate_hh:mm--R.V.
01304# CALIB STANDHYD 06:9M 3.80 416 No date 3:00 54.83
01305# (XIMP= 44:TIMP= 65)
01306# (LOSS= 2 :CN= 69.0)
01307# [Previous area: Iapex= 5.00:SLPP=2.00:LGP= 30.0:MNP=250:SCP= .0]
01308# [Impervious area: IAlmp= 2.00:SLPI=2.00:LGI= 155.0:MNI= 013:SCI= .0]
01309# 006 00028 ID:NNHYD AREA OPEAK-TpeakDate_hh:mm--R.V.
01310# ADD HYD 05:9N 1.55 074 No date 3:03 59.27
01311# + 06:9M 3.80 416 No date 3:00 54.83
01312# (DT= 1.00) SUM= 08:SNMF3 5.39 488 No date 3:00 44.34
01313# #-----
01314# # POST-DEVELOPMENT SWM FACILITY 1 (LOWER EAST POND)
01315# #-----
01316# 006 00029 ID:NNHYD AREA OPEAK-TpeakDate_hh:mm--R.V.
01317# ROUTE RESERVOIR -> 08:SNMF3 5.39 488 No date 3:00 44.34
01318# (RDT= 1.00) out= 09:SNMF-2 5.39 018 No date 3:03 44.34
01319# (XStoUsed= 23018+00)
01320# #-----
01321# # WATERCOURSE 3 TOTAL FLOW AT LAKESHORE RD
01322# #-----
01323# 006 00030 ID:NNHYD AREA OPEAK-TpeakDate_hh:mm--R.V.
01324# ADD HYD 01:WC9B 3.88 164 No date 3:01 48.61
01325# + 02:9J 1.88 062 No date 3:02 26.57
01326# + 03:9Q 1.15 024 No date 3:05 22.64
01327# + 04:9K9
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01352 0060003 ID:HYD AREA--OPEAK-TpeakDate_hh:mm--R.V.
01353 ADD HYD 01:81 2.50 137 No date 3:05 25.62
01354 2:EXT-8 7.60 292 No date 3:19 25.15
01355 2:WCB 10.10 410 No date 3:12 25.27
01356 ** END OF RUN = 8
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01364 RUN COMMAND#
01365 003:0001
01366 START
01367 [TZERO = .00 hrs on 0]
01368 [METOUT= 2 [1=Imperial, 2=metric output]]
01369 [INFORM= 1]
01370 [NRUN = 8]
01371
01372 # Project Name: [PARKBRIDGE CRAIGLEITH] Project Number: [1046-1031]
01373 # Date : 2016-12-08
01374 # Modeler : [00]
01375 # Company : C.F. Crozier & Associates Inc.
01376 # License # : 3737026
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01378 007:0002
01379 READ STORM
01380 Filename = STORM.001
01381 Comment =
01382 [SDT=60.00:SDUR= 5.00:PTOT= 96.00]
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01621> [Previous area: IArea= 1.50:SLPP=2.00:LGP= 40.1MMP= 250:SCP= 0]
01622> [Impervious area: IArea= 1.00:SLPI=1.00:LGI= 214.1MNI= 013:SCI= 0]
01623> 008-0006-----ID:HHVD-----AREA-----CPEAK-TpeakDate hh:mm-----R.V.-----
01624> ROUTE RESERVOIR -> 01:EXT-9B 14.80 1.529 No_date 7:00 127.41
01625> [DIT= 1.00] outc= 04:Orcharda 14.80 1.106 No_date 7:13 127.40
01626> [MxStoUsed= 5306E+00]
01627> #-----
01628> #-----TOTAL FLOW at Watercourse 9 Grey Road 19 Crossing-----
01629> #-----
01630> #-----
01631> 008-0007-----ID:HHVD-----AREA-----CPEAK-TpeakDate hh:mm-----R.V.-----
01632> ADD HYD 02:Channel 101.30 6.911 No_date 7:49 140.53
01633> * 04:Orcharda 14.80 1.168 No_date 7:13 127.40
01634> [DIT= 1.00] SUM= 05:RD19 116.50 7.826 No_date 7:44 148.88
01635> 008-0008-----ID:HHVD-----AREA-----CPEAK-TpeakDate hh:mm-----R.V.-----
01636> CALIB NASHYD 01:EXT-9D 83 0.56 No_date 7:01 120.82
01637> [CN= 73.0: N= 3.00]
01638> [Tp= 20.0DT= 1.00]
01639> #-----
01640> #-----Parkbridge Craigleith - Upper Terrace Lands-----
01641> #-----
01642> 008-0009-----ID:HHVD-----AREA-----CPEAK-TpeakDate hh:mm-----R.V.-----
01643> CALIB NASHYD 01:9A 53 0.019 No_date 7:03 129.05
01644> [CN= 76.0: N= 3.00]
01645> [Tp= 28.0DT= 1.00]
01646> #-----
01647> 008-0010-----ID:HHVD-----AREA-----CPEAK-TpeakDate hh:mm-----R.V.-----
01648> CALIB NASHYD 04:QCD 2.74 1.01 No_date 7:02 52.17
01649> [CN= 35.3: N= 3.00]
01650> [Tp= 21.0DT= 1.00]
01651> 008-0011-----ID:HHVD-----AREA-----CPEAK-TpeakDate hh:mm-----R.V.-----
01652> ADD HYD 01:EXT-3D 63 0.58 No_date 7:01 120.82
01653> * 01:9A 53 0.019 No_date 7:03 129.05
01654> * 04:QCD 2.74 1.01 No_date 7:02 52.17
01655> * 05:RD19 116.50 7.826 No_date 7:44 148.88
01656> [DIT= 1.00] SUM= 09:MCB 126.50 8.029 No_date 7:44 146.75
01657> #-----
01658> #-----CATCHMENT EXT-9C DIRECTED TO SWM FACILITY 1 POST-DEVELOPMENT-----
01659> #-----CATCHMENT EXT-9C TO BE CONTROLLED BY SWM FACILITY 1-----
01660> #-----
01661> 008-0012-----ID:HHVD-----AREA-----CPEAK-TpeakDate hh:mm-----R.V.-----
01662> CALIB NASHYD 01:EXT-9C 8.40 0.63 No_date 7:10 126.34
01663> [CN= 74.9: N= 3.00]
01664> [Tp= 47.0DT= 1.00]
01665> #-----
01666> 008-0013-----ID:HHVD-----AREA-----CPEAK-TpeakDate hh:mm-----R.V.-----
01667> CALIB NASHYD 02:9F 35 0.042 No_date 7:00 189.52
01668> [MIMP= 98:TIMP= 60]
01669> [LOSS= 2:CN= 69.0]
01670> [Previous area: IArea= 5.00:SLPP=2.00:LGP= 10.1MMP= 250:SCP= 0]
01671> [Impervious area: IArea= 2.00:SLPI=4.00:LGI= 98.1MNI= 013:SCI= 0]
01672> 008-0014-----ID:HHVD-----AREA-----CPEAK-TpeakDate hh:mm-----R.V.-----
01673> CALIB STANDHYD 01:9B 2.35 0.267 No_date 7:00 171.04
01674> [MIMP= 44:TIMP= 65]
01675> [LOSS= 2:CN= 79.0]
01676> [Previous area: IArea= 5.00:SLPP=3.00:LGP= 10.1MMP= 250:SCP= 0]
01677> [Impervious area: IArea= 2.00:SLPI=5.00:LGI= 111.1MNI= 013:SCI= 0]
01678> 008-0015-----ID:HHVD-----AREA-----CPEAK-TpeakDate hh:mm-----R.V.-----
01679> CALIB NASHYD 06:18 2.04 0.099 No_date 7:01 65.06
01680> [CN= 43.3: N= 3.00]
01681> [Tp= 12.0DT= 1.00]
01682> 008-0016-----ID:HHVD-----AREA-----CPEAK-TpeakDate hh:mm-----R.V.-----
01683> ADD HYD 01:EXT-9C 3.40 0.657 No_date 7:10 126.34
01684> * 02:9F 35 0.042 No_date 7:00 189.52
01685> * 03:19B 2.35 0.267 No_date 7:00 171.04
01686> * 06:18 2.04 0.099 No_date 7:01 65.06
01687> [DIT= 1.00] SUM= 04:SWMP1 13.14 1.066 No_date 7:00 126.51
01688> #-----
01689> #-----EXISTING POND ON PARKBRIDGE CRAIGLEITH SUBJECT SITE-----
01690> #-----CONVERTED TO SWM FACILITY 1 POST-DEVELOPMENT-----
01691> #-----
01692> 008-0017-----ID:HHVD-----AREA-----CPEAK-TpeakDate hh:mm-----R.V.-----
01693> ROUTE RESERVOIR -> 06:SWMP1 11.14 1.066 No_date 7:00 126.51
01694> [RET= 1.00] outc= 05:SWMP1 13.14 1.428 No_date 10:09 126.50
01695> [MxStoUsed= 1212E+01]
01696> #-----
01697> 008-0018-----ID:HHVD-----AREA-----CPEAK-TpeakDate hh:mm-----R.V.-----
01698> CALIB NASHYD 01:9G 1.16 0.041 No_date 7:01 48.43
01699> [CN= 32.2: N= 3.00]
01700> [Tp= 14.0DT= 1.00]
01701> 008-0019-----ID:HHVD-----AREA-----CPEAK-TpeakDate hh:mm-----R.V.-----
01702> ADD HYD 01:9G 1.16 0.041 No_date 7:01 48.43
01703> * 05:SWMP1 13.14 1.428 No_date 10:09 126.50
01704> * 09:MCB 126.50 8.008 No_date 7:44 146.75
01705> [DIT= 1.00] SUM= 07:MCB 134.30 8.061 No_date 7:44 135.00
01706> #-----
01707> #-----Parkbridge Craigleith - Lower Terrace Lands-----
01708> #-----
01709> 008-0020-----ID:HHVD-----AREA-----CPEAK-TpeakDate hh:mm-----R.V.-----
01710> CALIB NASHYD 10:9H 2.14 0.075 No_date 7:04 51.10
01711> [CN= 34.7: N= 3.00]
01712> [Tp= 27.0DT= 1.00]
01713> 008-0021-----ID:HHVD-----AREA-----CPEAK-TpeakDate hh:mm-----R.V.-----
01714> CALIB STANDHYD 02:9I 3.30 0.385 No_date 7:00 148.85
01715> [MIMP= 40:TIMP= 60]
01716> [LOSS= 2:CN= 61.0]
01717> [Previous area: IArea= 5.00:SLPP=2.00:LGP= 30.1MNI= 250:SCP= 0]
01718> [Impervious area: IArea= 2.00:SLPI=2.00:LGI= 245.1MNI= 013:SCI= 0]
01719> #-----
01720> #-----POST-DEVELOPMENT SWM FACILITY 2 (LOWER WEST POND)-----
01721> #-----
01722> 008-0022-----ID:HHVD-----AREA-----CPEAK-TpeakDate hh:mm-----R.V.-----
01723> ROUTE RESERVOIR -> 02:9I 3.88 0.385 No_date 7:00 148.85
01724> [RET= 3.00] outc= 01:SWMP2 3.88 0.381 No_date 7:01 148.85
01725> [MxStoUsed= 6095E+01]
01726> #-----
01727> 008-0023-----ID:HHVD-----AREA-----CPEAK-TpeakDate hh:mm-----R.V.-----
01728> CALIB NASHYD 02:9J 3.88 0.082 No_date 7:01 114.15
01729> [CN= 68.7: N= 3.00]
01730> [Tp= 19.0DT= 1.00]
01731> 008-0024-----ID:HHVD-----AREA-----CPEAK-TpeakDate hh:mm-----R.V.-----
01732> CALIB NASHYD 03:9O 45 0.034 No_date 7:03 106.36
01733> [CN= 65.0: N= 3.00]
01734> [Tp= 26.0DT= 1.00]
01735> 008-0025-----ID:HHVD-----AREA-----CPEAK-TpeakDate hh:mm-----R.V.-----
01736> CALIB NASHYD 04:9K9L 1.18 0.062 No_date 7:06 77.75
01737> [CN= 50.4: N= 3.00]
01738> [Tp= 35.0DT= 1.00]
01739> 008-0026-----ID:HHVD-----AREA-----CPEAK-TpeakDate hh:mm-----R.V.-----
01740> CALIB NASHYD 05:9N 1.52 0.110 No_date 7:02 54.09
01741> [CN= 59.3: N= 3.00]
01742> [Tp= 20.0DT= 1.00]
01743> 008-0027-----ID:HHVD-----AREA-----CPEAK-TpeakDate hh:mm-----R.V.-----
01744> CALIB STANDHYD 06:9M 3.80 0.409 No_date 7:00 161.34
01745> [MIMP= 44:TIMP= 65]
01746> [LOSS= 2:CN= 59.0]
01747> [Previous area: IArea= 5.00:SLPP=2.00:LGP= 30.1MNI= 250:SCP= 0]
01748> [Impervious area: IArea= 2.00:SLPI=2.00:LGI= 155.1MNI= 013:SCI= 0]
01749> 008-0028-----ID:HHVD-----AREA-----CPEAK-TpeakDate hh:mm-----R.V.-----
01750> ADD HYD 05:9M 3.80 0.559 No_date 7:00 84.09
01751> * 06:9M 3.80 0.409 No_date 7:00 161.34
01752> [DIT= 1.00] SUM= 08:SWMP3 5.20 0.519 No_date 7:00 141.50
01753> #-----
01754> #-----POST-DEVELOPMENT SWM FACILITY 3 (LOWER EAST POND)-----
01755> #-----
01756> 008-0029-----ID:HHVD-----AREA-----CPEAK-TpeakDate hh:mm-----R.V.-----
01757> ROUTE RESERVOIR -> 08:SWMP3 5.29 0.519 No_date 7:00 141.50
01758> [DIT= 1.00] outc= 09:SWMP3 5.29 0.501 No_date 7:02 141.50
01759> [MxStoUsed= 2662E+00]
01760> #-----

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01756> #-----WATERCOURSE 9 TOTAL FLOW AT LAKESHORE RD-----
01757> #-----
01758> 008-0030-----ID:HHVD-----AREA-----CPEAK-TpeakDate hh:mm-----R.V.-----
01759> ADD HYD 01:MCB 3.88 0.381 No_date 7:01 148.85
01760> * 02:9I 3.88 0.082 No_date 7:03 114.15
01761> * 03:9O 45 0.034 No_date 7:03 106.36
01762> * 04:9K9L 1.18 0.062 No_date 7:06 77.75
01763> * 05:SWMP3 5.20 0.501 No_date 7:02 141.50
01764> * 07:MCB 134.85 8.061 No_date 7:44 146.75
01765> * 10:9H 2.14 0.075 No_date 7:04 51.10
01766> [DIT= 1.00] SUM= 01:MCB 145.82 8.700 No_date 7:38 135.71
01767> #-----
01768> #-----WATERCOURSE 8 CATCHMENTS-----
01769> #-----WC 8 CATCHMENTS TO BE DIRECTED TO WC# 9-----
01770> #-----EQUIVALENT TO EXISTING CONDITIONS OF WC# 9-----
01771> #-----
01772> 008-0031-----ID:HHVD-----AREA-----CPEAK-TpeakDate hh:mm-----R.V.-----
01773> CALIB NASHYD 01:8J 2.50 0.183 No_date 7:03 102.92
01774> [CN= 63.5: N= 3.00]
01775> [Tp= 20.0DT= 1.00]
01776> 008-0032-----ID:HHVD-----AREA-----CPEAK-TpeakDate hh:mm-----R.V.-----
01777> CALIB NASHYD 02:EXT-9 7.60 0.470 No_date 7:16 101.78
01778> [CN= 63.0: N= 3.00]
01779> [Tp= 55.0DT= 1.00]
01780> #-----
01781> #-----WATERCOURSE 8 TOTAL FLOW OF CATCHMENTS EXT-9 AND 8A-----
01782> #-----
01783> 008-0033-----ID:HHVD-----AREA-----CPEAK-TpeakDate hh:mm-----R.V.-----
01784> ADD HYD 01:8J 2.50 0.183 No_date 7:01 102.92
01785> * 02:EXT-8 7.60 0.470 No_date 7:16 101.78
01786> [DIT= 1.00] SUM= 03:MCB 10.10 0.640 No_date 7:09 102.06
01787> 008-0034-----
01788> FINISH
01789> #-----
01790> #-----
01791> #-----WARNINGS / ERRORS / NOTES-----
01792> #-----
01793> 001-0005 CALIB STANDHYD
01794> *** NOTE: The previous area has no runoff.
01795> Simulation ended on 2016-12-15 at 16:32:02
01796> #-----
01797> #-----
01798> #-----
01799> #-----

```



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Consulting Engineers

Water Quality Requirements

Project #: 1046-4031
Project: Parkbridge Craigleith
Date: November 17, 2016
By: OD

Post-Development Scenario Water Quality Requirements

SWM Facility #1 - Existing Pond converted to Proposed Wetland

Areas Contributing	Area (ha)	% Imp	25mm Runoff Volume (RV) per SWMHYMO Model	
			25mm RV (mm)	25mm RV (m ³)
9B & 9F	2.70	65	15.40	416
MOE Total Water Quality (WQ) Volume (m ³ /ha)				120
MOE Extended Detention (ED) Volume (m ³ /ha)				40
MOE ED Volume (m ³)				108
MOE Permanent Pool (PP) Volume (m ³ /ha)				80
MOE PP Volume (m ³)				216
Pond Required ED Volume (m ³) - 25mm RV governs				416
Pond Required PP Volume (m ³)				216
Pond Required Total WQ Volume - ED + PP (m ³)				632
Provided ED Volume (m ³)				583
Provided PP Volume (m ³)*				348



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Project: 1046-4061
Project No.: Parkbridge Craighleith
File: Extended Detention
Design by: OD
Date: November 17, 2016

EXTENDED DETENTION SPECIFICATIONS - SWM FACILITY #1
(Per MOECC)

Extended Detention Volume (Area x runoff from 25mm event)	583
t (drawdown time - seconds, <i>hours in italics</i>)	24.0 86400
Ao (cross section area of orifice - sqm)	0.0079
h (maximum water elevation above orifice for extended detention- m)	0.30
C (discharge coefficient)	0.64
Ap (average surface area for extended detention - sqm)	2010

$$t = 2 \cdot A_p \cdot (h^{0.5}) / (C \cdot A_o \cdot (g \cdot 2)^{0.5})$$

$$A_o = 0.00898966 \text{ sqm} \quad d = 107 \text{ mm}$$

$$\text{Extended Detention Orifice Diameter (as designed)} \quad d = 100 \text{ mm}$$



**Proposed SWM Facility #1 - Stage Storage Discharge Calculations
& Extended Detention Calculations**

Outlet Structure Dimensions

E.D. Orifice Diameter: 0.1 m
E.D. Orifice Invert Elevation: 189 m
Spillway Elev. 191.20 m
Spillway Bot. Width 5 m
Trap. Side Slopes 6:1

Pond Dimensions				Outlet Structure Discharge					Total		
Elev. (m)	Depth Above PP (m)	Area (sqm)	Storage Volume (cu.m)	ED Orifice Discharge (cu.m/s)	Rect. Weir Discharge (cu.m/s)	Spillway Ave. Weir Width (m)	Spillway Discharge (cu.m/s)	Total Discharge (cu.m/s)	ED Draw- down time (hrs)	Total Discharge (cu.m/s)	Storage (ha-m)
189.00	0.00	1750	0	0.000		0.00	0.000	0.000	0.0	0.000	0.000
189.10	0.10	1880	181	0.005		0.00	0.000	0.005	20.3	0.005	0.018
189.20	0.20	2010	376	0.009		0.00	0.000	0.009	7.9	0.009	0.038
189.30	0.30	2140	583	0.011		0.00	0.000	0.011	5.8	0.011	0.058
189.40	0.40	2270	804	0.013		0.00	0.000	0.013		0.013	0.080
189.50	0.50	2400	1037	0.015		0.00	0.000	0.015		0.015	0.104
189.60	0.60	2530	1284	0.017		0.00	0.000	0.017		0.017	0.128
189.65	0.65	2595	1412	0.017		0.00	0.000	0.017		0.017	0.141
189.70	0.70	2660	1543	0.018		0.00	0.000	0.018		0.018	0.154
189.80	0.80	2790	1816	0.019		0.00	0.000	0.019		0.019	0.182
189.90	0.90	2920	2101	0.021		0.00	0.000	0.021		0.021	0.210
190.00	1.00	3050	2400	0.022		0.00	0.000	0.022		0.022	0.240
190.10	1.10	3162	2711	0.023		0.00	0.000	0.023		0.023	0.271
190.20	1.20	3274	3032	0.024		0.00	0.000	0.024		0.024	0.303
190.30	1.30	3366	3365	0.025		0.00	0.000	0.025		0.025	0.337
190.40	1.40	3498	3710	0.026		0.00	0.000	0.026		0.026	0.371
190.50	1.50	3610	4065	0.027		0.00	0.000	0.027		0.027	0.406
190.60	1.60	3722	4431	0.028		0.00	0.000	0.028		0.028	0.443
190.70	1.70	3833	4809	0.029		0.00	0.000	0.029		0.029	0.481
190.80	1.80	3945	5198	0.029		0.00	0.000	0.029		0.029	0.520
190.90	1.90	4057	5598	0.030		0.00	0.000	0.030		0.030	0.560
191.00	2.00	4169	6010	0.031		0.00	0.000	0.031		0.031	0.601
191.10	2.10	4281	6432	0.032		0.00	0.000	0.032		0.032	1.119
191.20	2.20	4393	6866	0.033		5.00	0.000	0.033		0.033	1.163
191.30	2.30	4505	7311	0.033		5.60	0.326	0.359		0.359	1.207
191.40	2.40	4610	7767	0.034		6.20	1.020	1.054		1.054	1.253

Total ED Draw Down Time (hrs) 34.0

Pond designed to spill into East pond half during Regional event. Additional 4760 m3 or 0.476 ha-m (other pond half) volume is available after berm elev. 191.00



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Consulting Engineers

Water Quality Requirements

Project #: 1046-4031
Project: Parkbridge Craigleith
Date: November 17, 2016
By: OD

Post-Development Scenario Water Quality Requirements

SWM Facility #2 - Proposed Water Quality Wet Pond (Lower West Pond)

			25mm Runoff Volume (RV) per SWMHYMO Model	
<i>Areas Contributing</i>	<i>Area (ha)</i>	<i>% Imp</i>	<i>25mm RV (mm)</i>	<i>25mm RV (m³)</i>
9i (3.88 ha)	3.58	60	11.37	407
* Note: 0.3 ha subtracted from Catchment 9i (3.88 ha) to account for SWM Facility.				
MOE Total Water Quality (WQ) Volume (m ³ /ha)				220
MOE Extended Detention (ED) Volume (m ³ /ha)				40
MOE ED Volume (m ³)				143
MOE Permanent Pool (PP) Volume (m ³ /ha)				180
MOE PP Volume (m ³)				644
Pond Required ED Volume (m ³) - 25mm RV governs				407
Pond Required PP Volume (m ³)				644
Pond Required Total WQ Volume - ED + PP (m ³)				1051
Provided ED Volume (m ³)				488
Provided PP Volume (m ³)*				704

* $PP\ Vol = (Avg. PP\ Area\ in\ Forebay \times Forebay\ Depth)$

$$PP\ Vol = \left(\frac{4m^2 + 825m^2}{2} \times 1m \right) = 704\ m^3$$



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Consulting Engineers

Project: 1046-4061
Project No.: Parkbridge Craighleith
File: Extended Detention
Design by: OD
Date: November 17, 2016

EXTENDED DETENTION SPECIFICATIONS - SWM FACILITY #2
(Per MOECC)

Extended Detention Volume (Area x runoff from 25mm event)	488
t (drawdown time - seconds, <i>hours in italics</i>)	24.0 86400
Ao (cross section area of orifice - sqm)	0.0044
h (maximum water elevation above orifice for extended detention- m)	0.30
C (discharge coefficient)	0.64
Ap (average surface area for extended detention - sqm)	946

$$t = 2 \cdot A_p \cdot (h^{0.5}) / (C \cdot A_o \cdot (g \cdot 2)^{0.5})$$

$$A_o = 0.00423287 \text{ sqm} \quad d = 73 \text{ mm}$$

$$\text{Extended Detention Orifice Diameter (as designed)} \quad d = 75 \text{ mm}$$



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Project: 1046-4031
Project No.: Parkbridge Craigleith
File: Stage Storage Discharge
Design by: OD
Date: November 17, 2016

**Proposed SWM Facility #2 - Stage Storage Discharge Calculations
& Extended Detention Calculations**

Outlet Structure Dimensions

E.D. Orifice Diameter: 0.075 m
E.D. Orifice Invert Elevation: 181.7 m
Spillway Elev: 182.20 m
Spillway Bot. Width: 5 m
Trap. Side Slopes: 6:1

Pond Dimensions				Outlet Structure Discharge					Total		
Elev. (m)	Depth Above PP (m)	Area (sqm)	Storage Volume (cu.m)	ED Orifice Discharge (cu.m/s)	Rect. Weir Discharge (cu.m/s)	Spillway Ave. Weir Width (m)	Spillway Discharge (cu.m/s)	Total Discharge (cu.m/s)	ED Draw- down time (hrs)	Total Discharge (cu.m/s)	Storage (ha-m)
181.70	0.00	825	0	0.000		0.00	0.000	0.000	0.0	0.000	0.000
181.80	0.10	886	86	0.003		0.00	0.000	0.003	15.2	0.003	0.009
181.90	0.20	946	177	0.005		0.00	0.000	0.005	6.2	0.005	0.018
182.00	0.30	1007	275	0.006		0.00	0.000	0.006	4.7	0.006	0.027
182.10	0.40	1068	379	0.008		0.00	0.000	0.008	4.1	0.008	0.038
182.20	0.50	1129	488	0.009		0.00	0.000	0.009	3.8	0.009	0.049
182.30	0.60	1189	604	0.009		5.60	0.326	0.335		0.335	0.060
182.35	0.65	1220	665	0.010		5.90	0.631	0.640		0.640	0.066
182.40	0.70	1250	726	0.010		6.20	1.020	1.031		1.031	0.073

Total ED Draw Down Time (hrs) 26.1



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Water Quality Requirements

Project #: 1046-4031
Project: Parkbridge Craighleith
Date: November 17, 2016
By: OD

Post-Development Scenario Water Quality Requirements

SWM Facility #3 - Proposed Water Quality Wet Pond (Lower East Pond)

Areas Contributing	Area (ha)	% Imp	25mm Runoff Volume (RV) per SWMHYMO Model	
			25mm RV (mm)	25mm RV (m³)
9M	3.80	65	13.00	494
MOE Total Water Quality (WQ) Volume (m ³ /ha)				225
MOE Extended Detention (ED) Volume (m ³ /ha)				40
MOE ED Volume (m ³)				152
MOE Permanent Pool (PP) Volume (m ³ /ha)				185
MOE PP Volume (m ³)				703
Pond Required ED Volume (m ³) - 25mm RV governs				494
Pond Required PP Volume (m ³)				703
Pond Required Total WQ Volume - ED + PP (m ³)				1197
Provided ED Volume (m ³)				532
Provided PP Volume (m ³)*				1338

* $PP\ Vol = (Avg.\ PP\ Area\ in\ Forebay \times Forebay\ Depth)$

$$PP\ Vol = \left(\frac{230m^2 + 1554m^2}{2} \times 1.5m \right) = 1338m^3$$



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Project: 1046-4061
Project No.: Parkbridge Craigleith
File: Extended Detention
Design by: OD
Date: November 17, 2016

EXTENDED DETENTION SPECIFICATIONS - SWM FACILITY #3
(Per MOECC)

Extended Detention Volume (Area x runoff from 25mm event)		532
t (drawdown time - seconds, <i>hours in italics</i>)	24.0	86400
Ao (cross section area of orifice - sqm)		0.0064
h (maximum water elevation above orifice for extended detention- m)		0.30
C (discharge coefficient)		0.64
Ap (average surface area for extended detention - sqm)		1846
$t = 2 \cdot Ap \cdot (h^{0.5}) / (C \cdot Ao \cdot (g \cdot 2)^{0.5})$		
Ao =	0.0082548 sqm	d = 103 mm
Extended Detention Orifice Diameter (as designed)	d =	90 mm



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Project: 1046-4031
Project No.: Parkbridge Craigleith
File: Stage Storage Discharge
Design by: OD
Date: November 17, 2016

**Proposed SWM Facility #3 - Stage Storage Discharge Calculations
& Extended Detention Calculations**

Outlet Structure Dimensions

E.D. Orifice Diameter: 0.09 m
E.D. Orifice Invert Elevation: 181.5 m
Spillway Elev. 182.50 m
Spillway Bot. Width 5 m
Trap. Side Slopes 6:1

Pond Dimensions				Outlet Structure Discharge					Total		
Elev. (m)	Depth Above PP (m)	Area (sqm)	Storage Volume (cu.m)	ED Orifice Discharge (cu.m/s)	Rect. Weir Discharge (cu.m/s)	Spillway Ave. Weir Width (m)	Spillway Discharge (cu.m/s)	Total Discharge (cu.m/s)	ED Draw- down time (hrs)	Total Discharge (cu.m/s)	Storage (ha-m)
181.50	0.00	1554	0	0.000		0.00	0.000	0.000	0.0	0.000	0.000
181.60	0.10	1700	163	0.004		0.00	0.000	0.004	21.4	0.004	0.016
181.70	0.20	1846	340	0.007		0.00	0.000	0.007	8.7	0.007	0.034
181.80	0.30	1992	532	0.009		0.00	0.000	0.009	6.6	0.009	0.053
181.90	0.40	2137	738	0.011		0.00	0.000	0.011		0.011	0.074
182.00	0.50	2283	959	0.012		0.00	0.000	0.012		0.012	0.096
182.10	0.60	2429	1195	0.013		0.00	0.000	0.013		0.013	0.119
182.15	0.65	2502	1318	0.014		0.00	0.000	0.014		0.014	0.132
182.20	0.70	2575	1445	0.015		0.00	0.000	0.015		0.015	0.145
182.30	0.80	2721	1710	0.016		0.00	0.000	0.016		0.016	0.171
182.40	0.90	2867	1989	0.017		0.00	0.000	0.017		0.017	0.199
182.50	1.00	3012	2283	0.018		0.00	0.000	0.018		0.018	0.228
182.60	1.10	3158	2592	0.019		5.60	0.326	0.344		0.344	0.259
182.70	1.20	3304	2915	0.019		6.20	1.020	1.040		1.040	0.291
182.80	1.30	3450	3253	0.020		6.80	2.056	2.076		2.076	0.325

Total ED Draw Down Time (hrs) 36.6

APPENDIX D

Hydraulic Modeling of Watercourse 9

HEC-RAS FLOOD MODEL CROSS-SECTION SCHEMATIC

WATERCOURSE #9
OUTLETS TO
GEORGIAN BAY

EX.
HYDRO
SUBSTATION

162

177

0

38.5

EXISTING 2.45m BY 0.9m
CONCRETE BOX CULVERT

EXISTING 1.5m $\varnothing$ CSP CULVERT

104.5

126.5

141.5

WATERCOURSE 9
EXISTING 1.55m x 1.05m
CONCRETE BOX CULVERT

HWY 26

GEORGIAN TRAIL

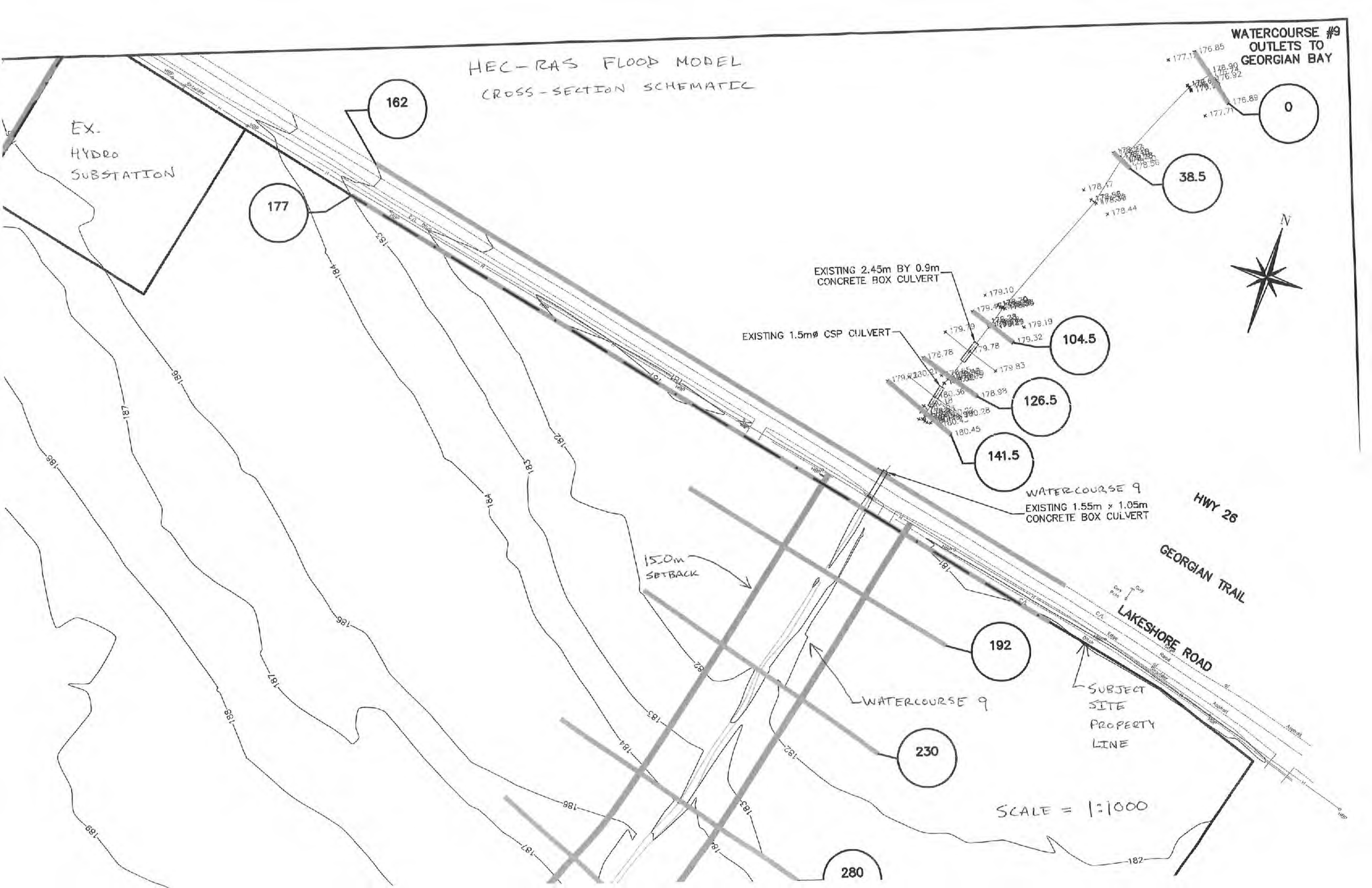
LAKESHORE ROAD

SUBJECT
SITE
PROPERTY
LINE

230

SCALE = 1:1000

280

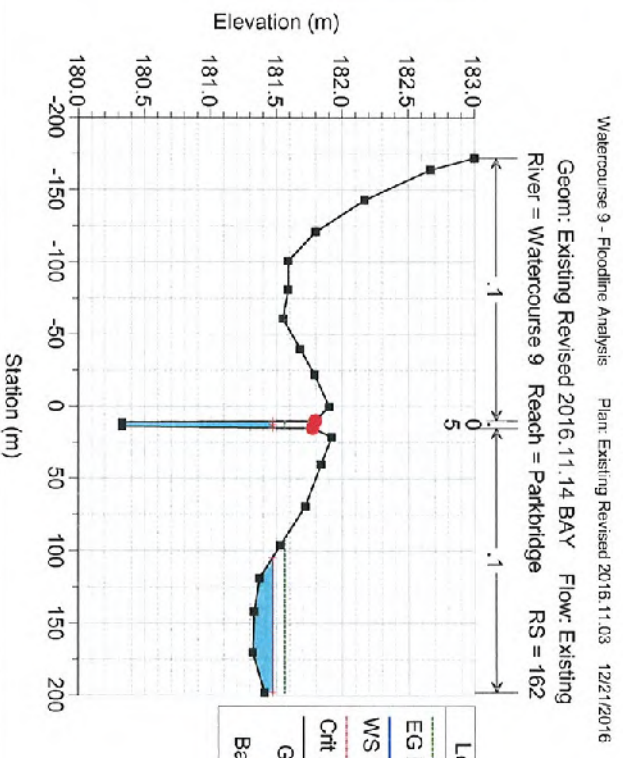
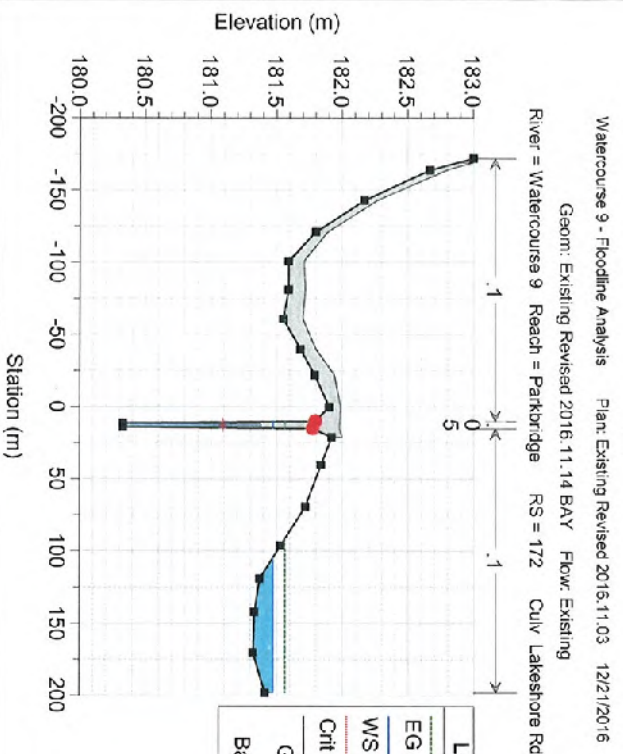
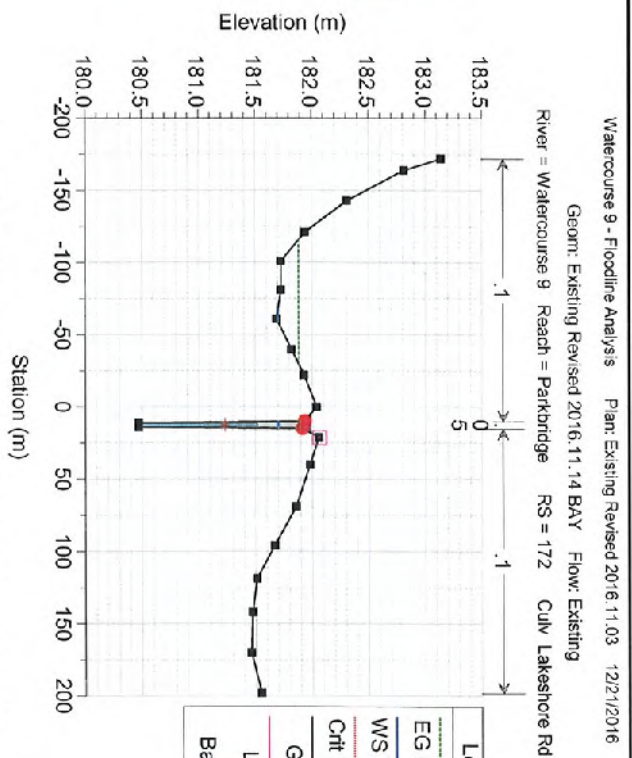
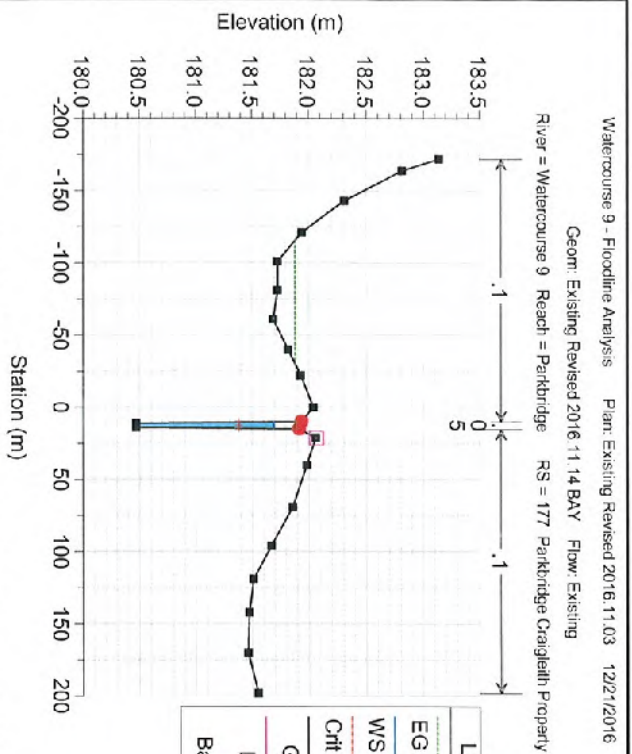


PRE-DEVELOPMENT - REGIONAL EVENT (TIMMINS STORM)

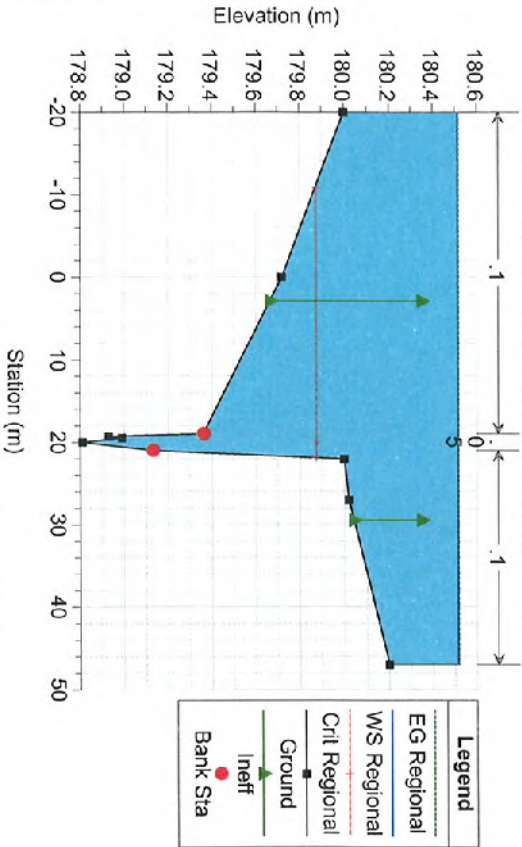
HEC-RAS Plan: Ex 2016.11.03 Locations: User Defined Profile: Regional

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vol Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Watercourse 9	Parkbridge	172		Culvert									
Watercourse 9	Parkbridge	182	Regional	9.07	180.33	181.47	181.47	181.56	0.000139	1.57	14.65	97.74	0.52
Watercourse 9	Parkbridge	141.5	Regional	9.07	178.81	180.51	179.87	180.52	0.000485	0.53	46.16	67.00	0.14
Watercourse 9	Parkbridge	134		Culvert									
Watercourse 9	Parkbridge	126.5	Regional	9.07	178.02	179.84	178.77	179.84	0.000031	0.15	87.16	101.00	0.04
Watercourse 9	Parkbridge	115.5		Culvert									
Watercourse 9	Parkbridge	104.5	Regional	9.07	178.18	179.54	179.54	179.66	0.005109	1.78	9.54	46.53	0.51
Watercourse 9	Parkbridge	98	Regional	9.07	177.81	179.40		179.47	0.004537	1.70	19.34	65.00	0.48
Watercourse 9	Parkbridge	53.5	Regional	9.07	177.30	179.20		179.30	0.003305	1.66	10.85	11.00	0.41
Watercourse 9	Parkbridge	38.5	Regional	9.07	177.10	178.77	178.77	179.17	0.014624	2.63	4.28	7.50	0.78
Watercourse 9	Parkbridge	8.5	Regional	9.07	176.73	178.02		178.03	0.001180	0.79	30.95	51.00	0.24
Watercourse 9	Parkbridge	0	Regional	9.07	176.74	178.00	177.26	178.02	0.000555	0.53	22.39	20.00	0.27

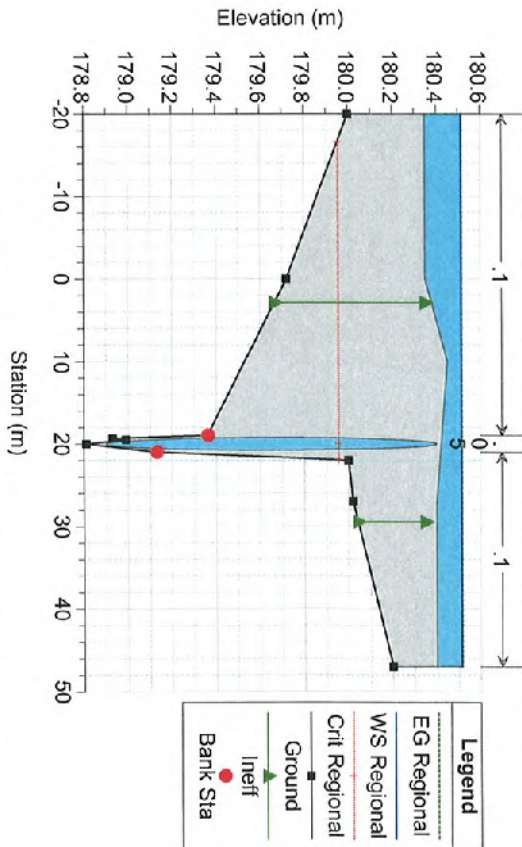
PRE-DEVELOPMENT REGIONAL TIMMINS



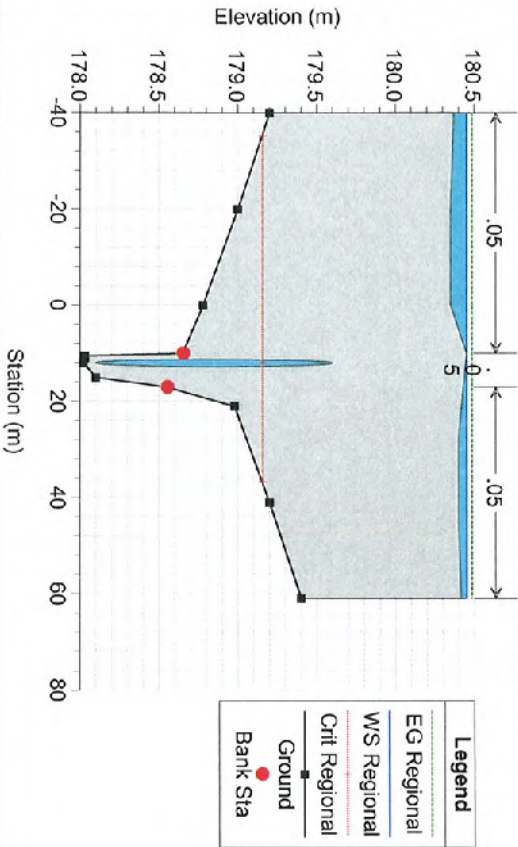
Geom: Existing Revised 2016.11.14 BAY Flow: Existing
River = Watercourse 9 Reach = Parkbridge RS = 141.5



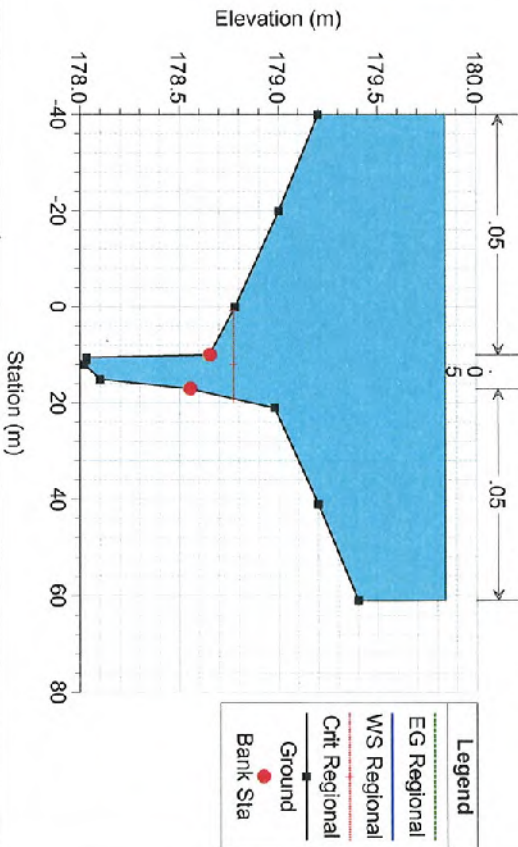
Geom: Existing Revised 2016.11.14 BAY Flow: Existing
River = Watercourse 9 Reach = Parkbridge RS = 134 Culv Georgian Trail



Geom: Existing Revised 2016.11.14 BAY Flow: Existing
River = Watercourse 9 Reach = Parkbridge RS = 134 Culv Georgian Trail

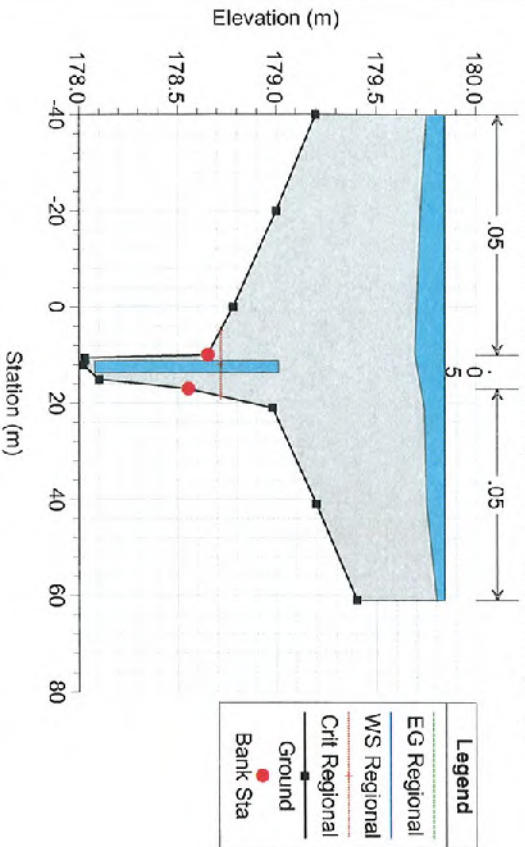


Geom: Existing Revised 2016.11.14 BAY Flow: Existing
River = Watercourse 9 Reach = Parkbridge RS = 126.5



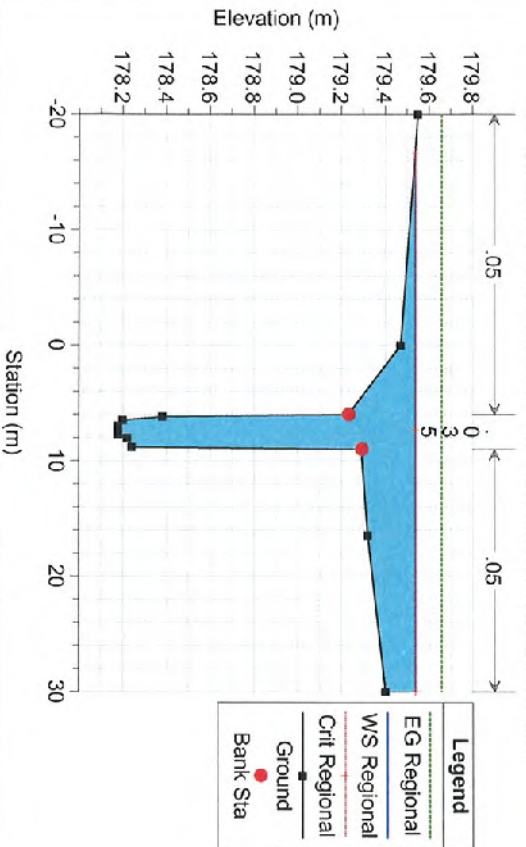
Geom: Existing Revised 2016.11.14 BAY Flow: Existing

River = Watercourse 9 Reach = Parkbridge RS = 115.5 Culv Highway 26



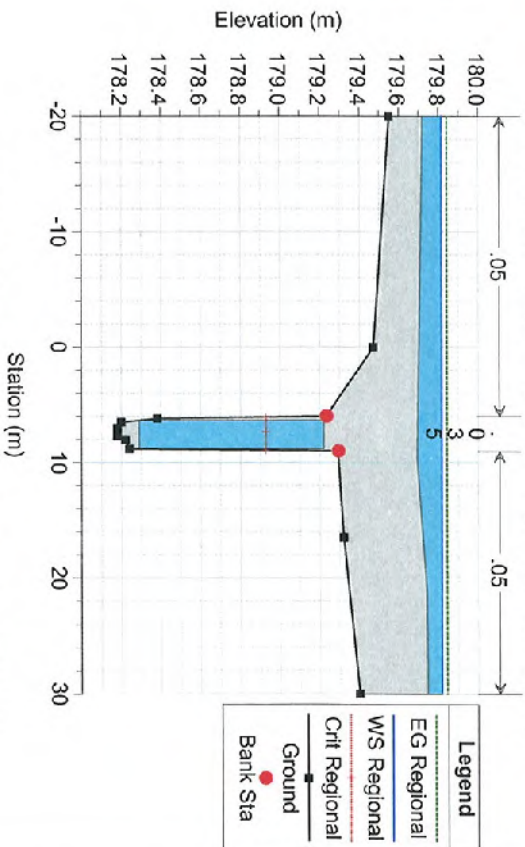
Geom: Existing Revised 2016.11.14 BAY Flow: Existing

River = Watercourse 9 Reach = Parkbridge RS = 104.5 Immediately downstream of Hwy 26



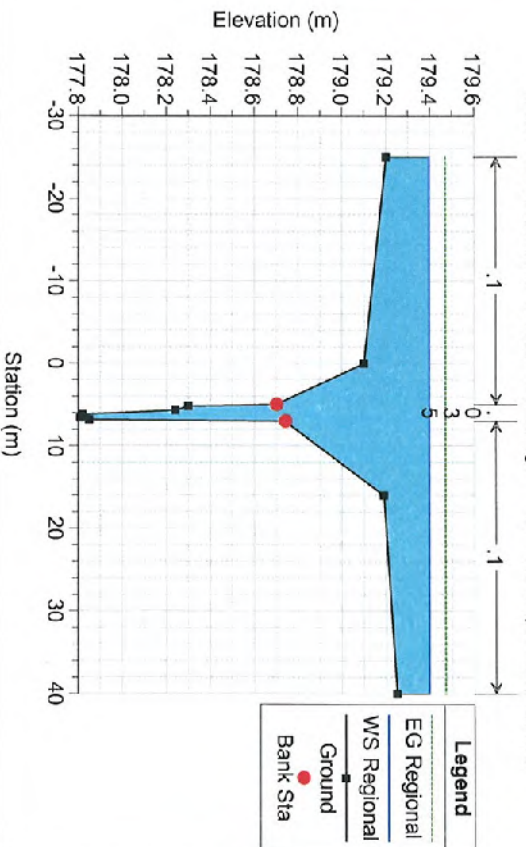
Geom: Existing Revised 2016.11.14 BAY Flow: Existing

River = Watercourse 9 Reach = Parkbridge RS = 115.5 Culv Highway 26

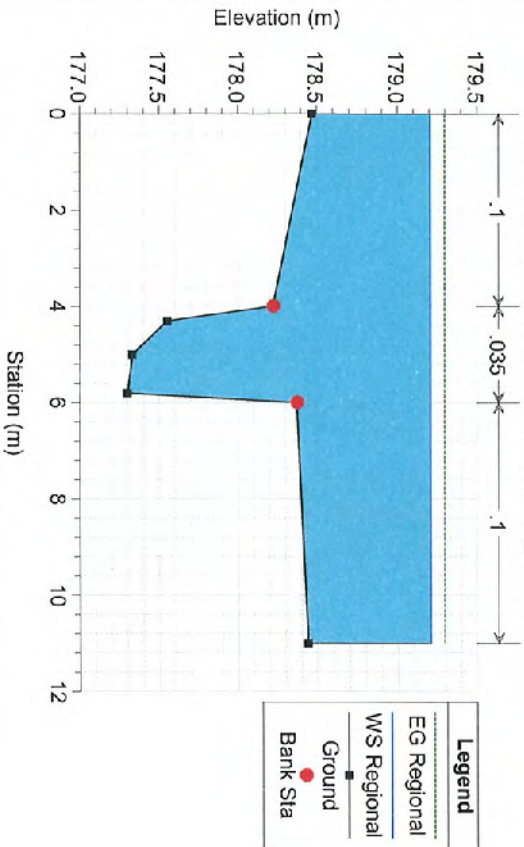


Geom: Existing Revised 2016.11.14 BAY Flow: Existing

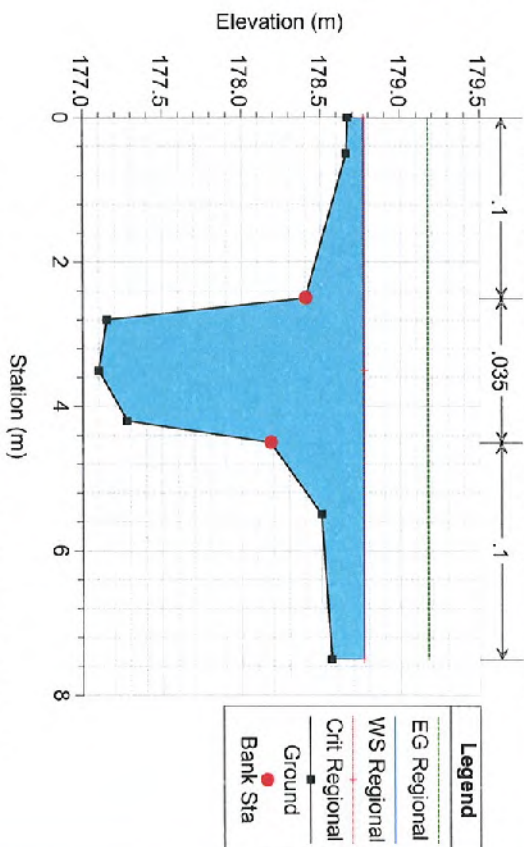
River = Watercourse 9 Reach = Parkbridge RS = 98 Hwy 26 Downstream



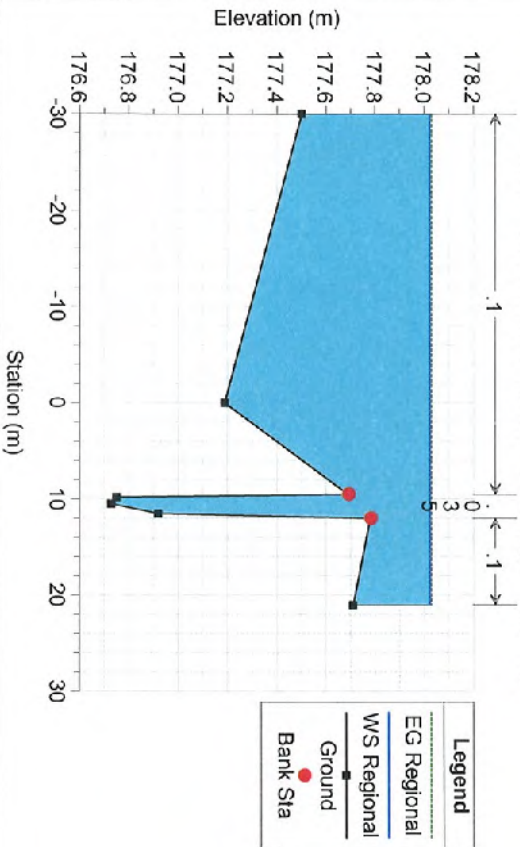
Geom: Existing Revised 2016.11.14 BAY Flow: Existing
River = Watercourse 9 Reach = Parkbridge RS = 53.5



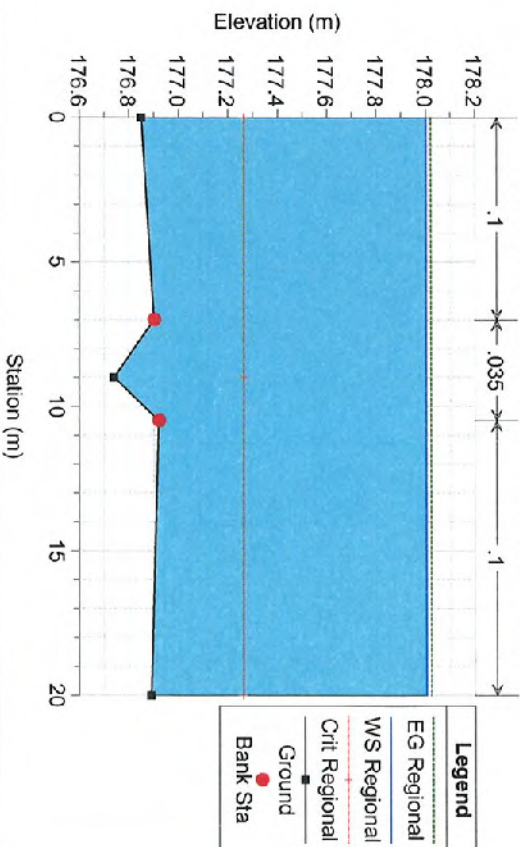
Geom: Existing Revised 2016.11.14 BAY Flow: Existing
River = Watercourse 9 Reach = Parkbridge RS = 38.5



Geom: Existing Revised 2016.11.14 BAY Flow: Existing
River = Watercourse 9 Reach = Parkbridge RS = 8.5



Geom: Existing Revised 2016.11.14 BAY Flow: Existing
River = Watercourse 9 Reach = Parkbridge RS = 0



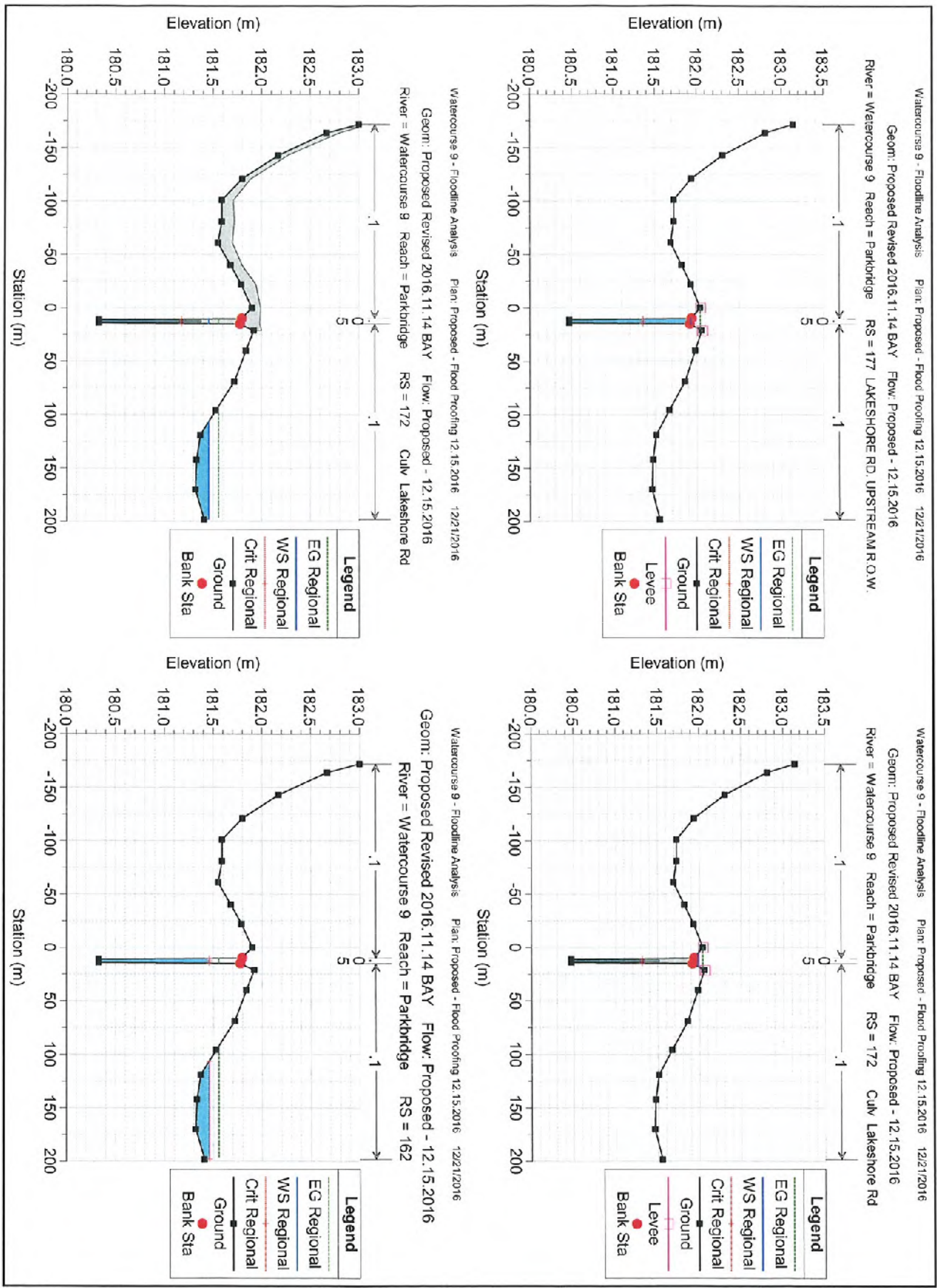
NOTE: Boundary condition set to lake level = 178.00m

POST-DEVELOPMENT - REGIONAL EVENT (TIMMINS STORM)

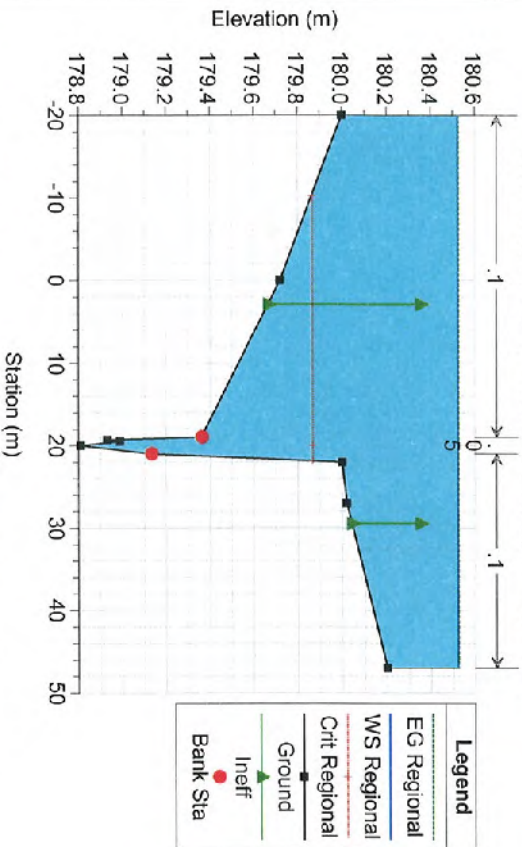
HEC-RAS Plan: PR-FP-F Locations: User Defined Profile: Regional

River	Reach	River Sta	Profile	Q Total (m ³ /s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude # Chl
Watercourse 9	Parkbridge	172											
			Culvert										
Watercourse 9	Parkbridge	162	Regional	8.68	180.33	181.46	181.46	181.56	0.009436	1.59	13.40	95.86	0.53
Watercourse 9	Parkbridge	141.5	Regional	8.68	178.81	180.52	179.56	180.53	0.000429	0.50	46.72	67.00	0.13
Watercourse 9	Parkbridge	134											
			Culvert										
Watercourse 9	Parkbridge	126.5	Regional	8.68	178.02	179.84	178.74	179.84	0.000029	0.15	86.75	101.00	0.04
Watercourse 9	Parkbridge	115.5											
			Culvert										
Watercourse 9	Parkbridge	104.5	Regional	8.68	178.18	179.35	179.22	179.71	0.013926	2.65	3.89	19.65	0.82
Watercourse 9	Parkbridge	98	Regional	8.68	177.81	179.35	179.35	179.45	0.005896	1.89	16.47	65.00	0.54
Watercourse 9	Parkbridge	53.5	Regional	8.68	177.30	179.19		179.20	0.000433	0.50	44.31	60.00	0.15
Watercourse 9	Parkbridge	38.5	Regional	8.68	177.10	178.74	178.74	179.14	0.014707	2.90	4.06	7.50	0.78
Watercourse 9	Parkbridge	8.5	Regional	8.68	176.73	178.02		178.03	0.001090	0.75	30.86	51.00	0.23
Watercourse 9	Parkbridge	0	Regional	8.68	176.74	178.00	177.25	178.02	0.000783	0.89	22.39	20.00	0.26

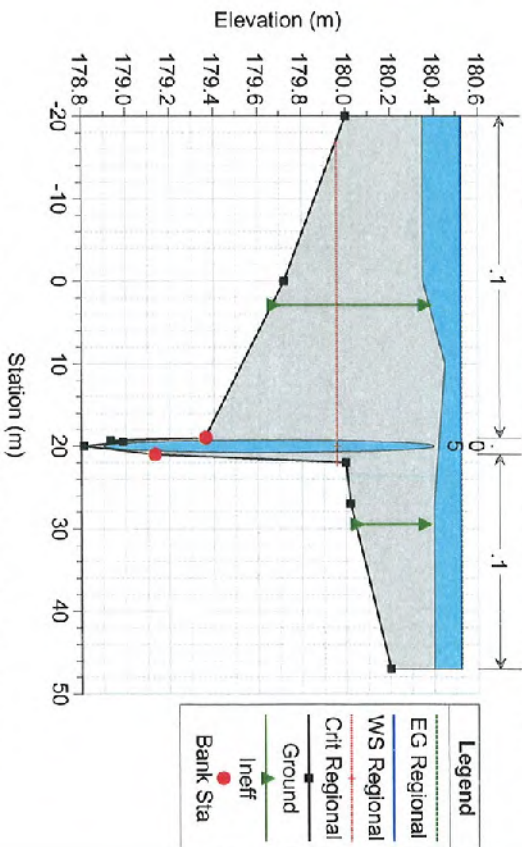
POST-DEVELOPMENT REGIONAL TIMMINS



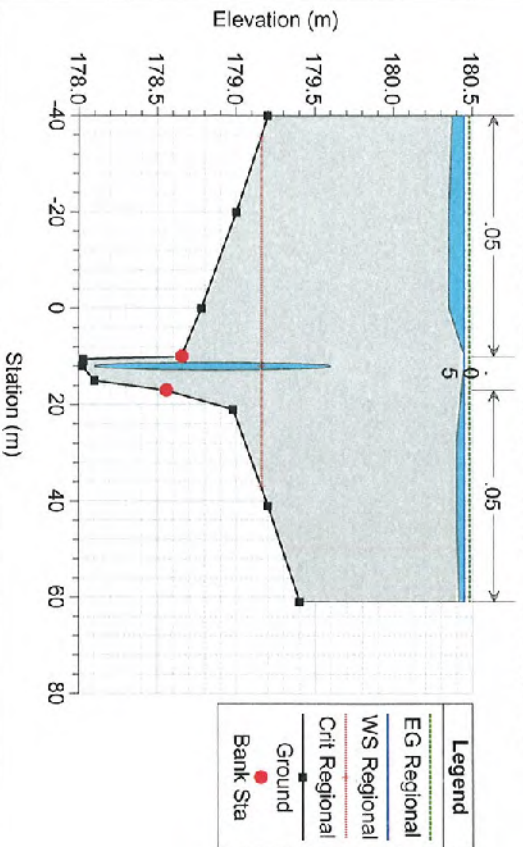
Geom: Proposed Revised 2016.11.14 BAY Flow: Proposed - 12.15.2016
River = Watercourse 9 Reach = Parkbridge RS = 141.5



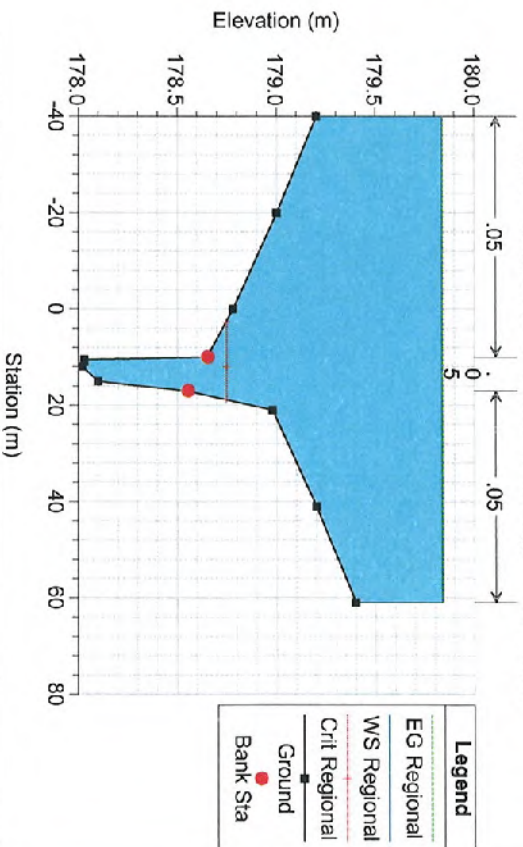
Geom: Proposed Revised 2016.11.14 BAY Flow: Proposed - 12.15.2016
River = Watercourse 9 Reach = Parkbridge RS = 134 Culv Georgian Trail



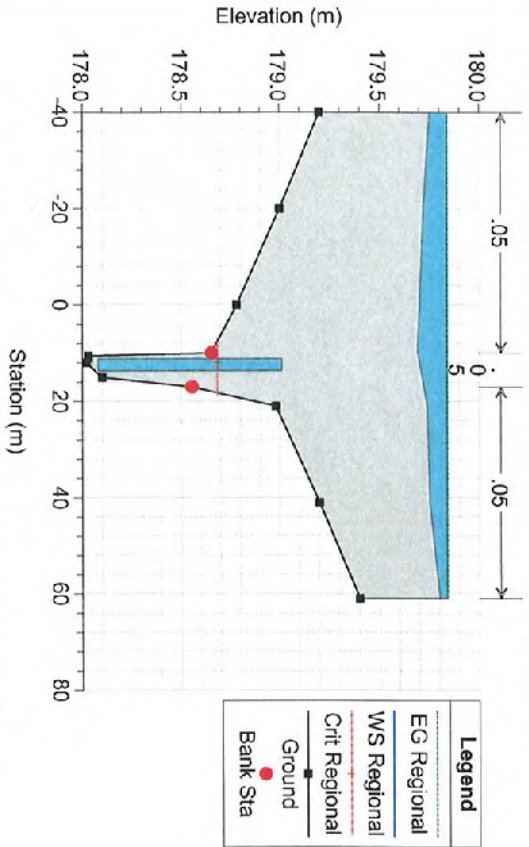
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River = Watercourse 9 Reach = Parkbridge RS = 134 Culv Georgian Trail



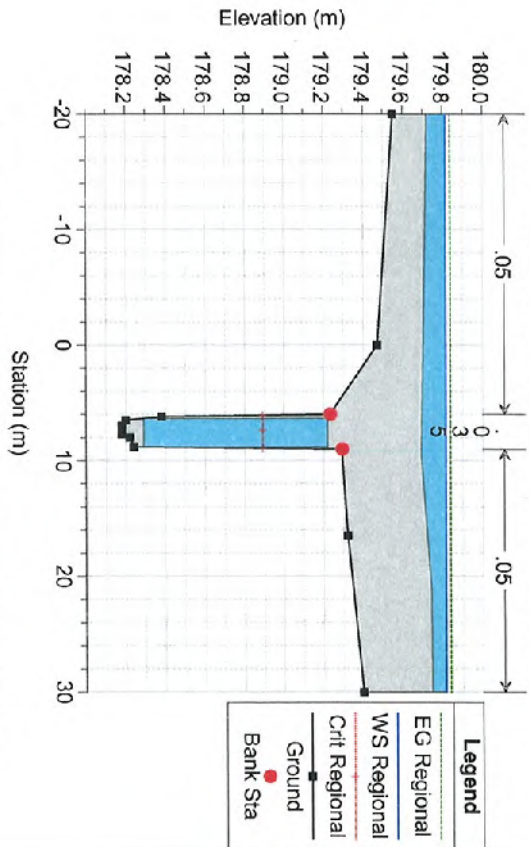
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River = Watercourse 9 Reach = Parkbridge RS = 126.5



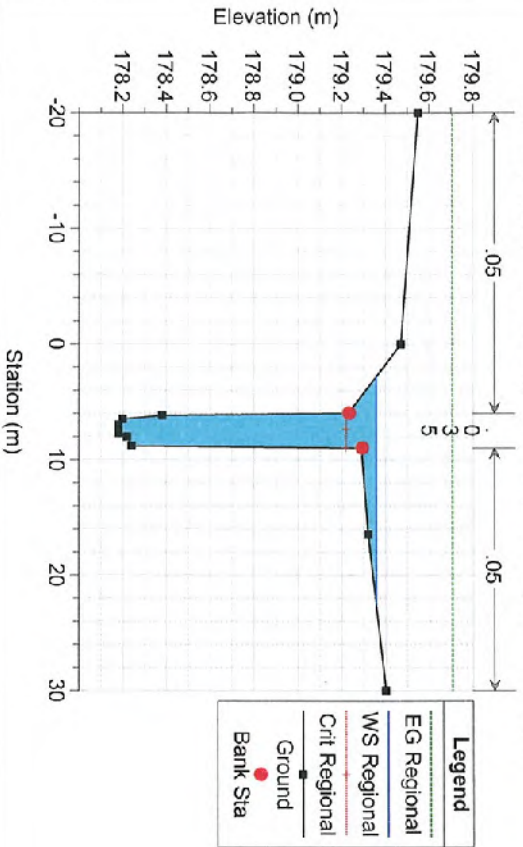
Geom: Proposed Revised 2016.11.14 BAY Flow: Proposed - 12.15.2016
River = Watercourse 9 Reach = Parkbridge RS = 115.5 Culiv Highway 26



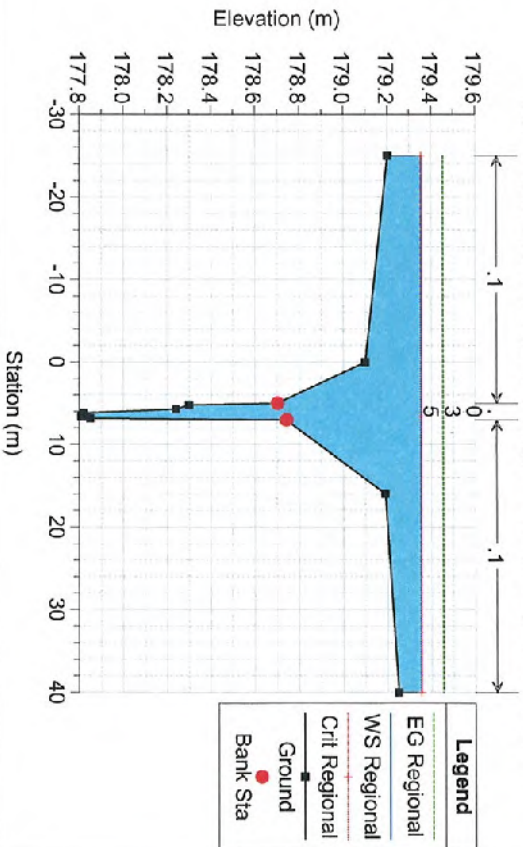
Geom: Proposed Revised 2016.11.14 BAY Flow: Proposed - 12.15.2016
River = Watercourse 9 Reach = Parkbridge RS = 115.5 Culiv Highway 26



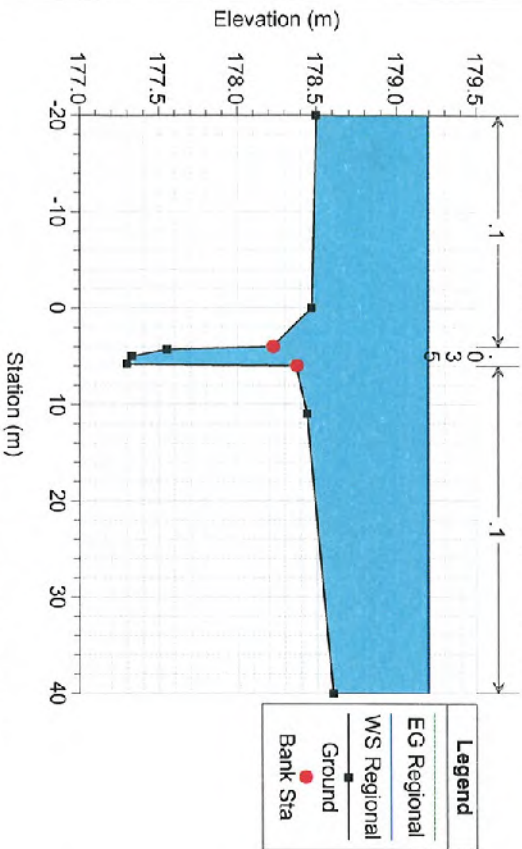
Geom: Proposed Revised 2016.11.14 BAY Flow: Proposed - 12.15.2016
River = Watercourse 9 Reach = Parkbridge RS = 104.5 Immediately downstream of Hwy 26



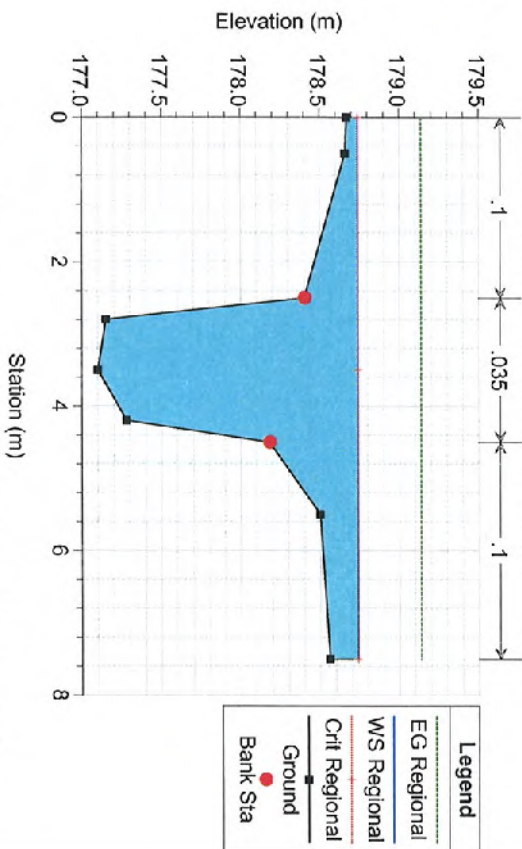
Geom: Proposed Revised 2016.11.14 BAY Flow: Proposed - 12.15.2016
River = Watercourse 9 Reach = Parkbridge RS = 98 Hwy 26 Downstream



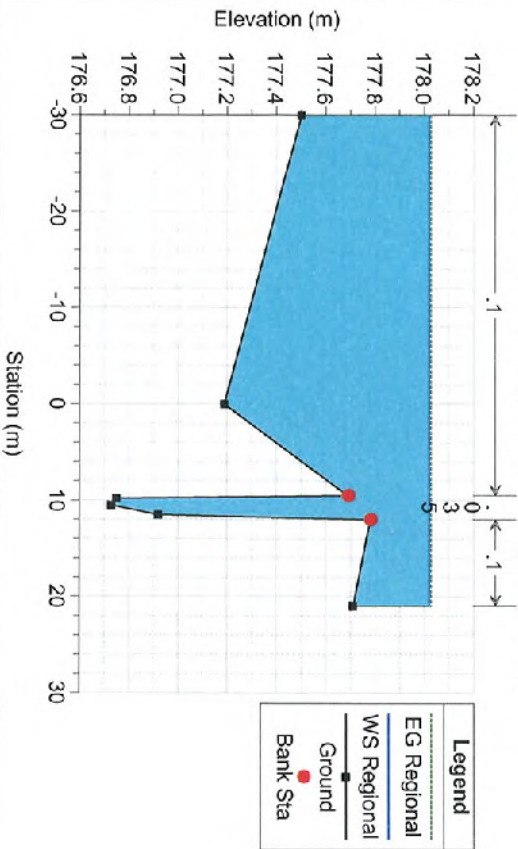
Geom: Proposed Revised 2016.11.14 BAY Flow: Proposed - 12.15.2016
River = Watercourse 9 Reach = Parkbridge RS = 53.5



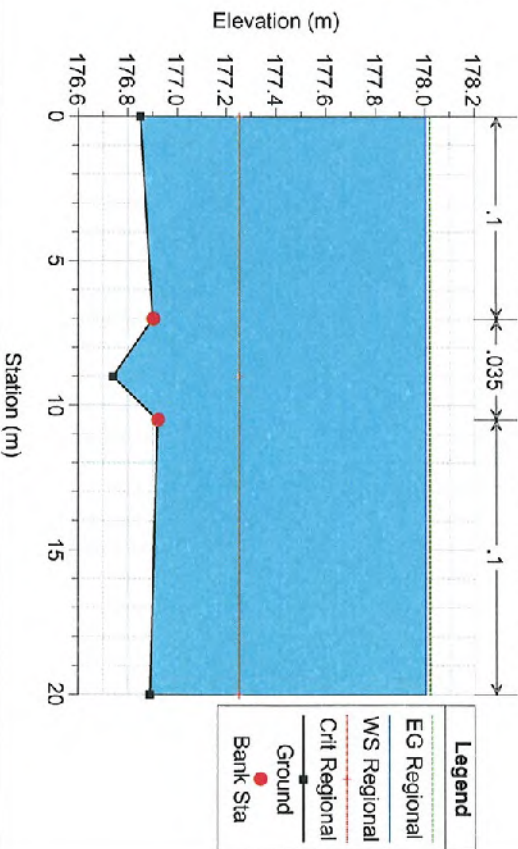
Geom: Proposed Revised 2016.11.14 BAY Flow: Proposed - 12.15.2016
River = Watercourse 9 Reach = Parkbridge RS = 38.5



Geom: Proposed Revised 2016.11.14 BAY Flow: Proposed - 12.15.2016
River = Watercourse 9 Reach = Parkbridge RS = 8.5



Geom: Proposed Revised 2016.11.14 BAY Flow: Proposed - 12.15.2016
River = Watercourse 9 Reach = Parkbridge RS = 0



Note: Boundary condition set to Lake Level = 178.00 m

Culvert Calculator Report

PR. 2-1650mm dia. Culverts (PR. North Internal Road Crossing) - Regional Timmins Report

Comments: Proposed Culverts location is internal to site at proposed North road crossing (refer to Post-Development Drainage Plan figures)

As shown below, culverts have been designed to convey the Regional Timmins flow to prevent flooding of the proposed surrounding development lands.

Solve For: Discharge

Culvert Summary			
Allowable HW Elevation	188.89 m	Headwater Depth/Height	1.19
Computed Headwater Elev.	188.89 m	Discharge	8.8109 m³/s
Inlet Control HW Elev.	188.65 m	Tailwater Elevation	188.39 m
Outlet Control HW Elev.	188.89 m	Control Type	Outlet Control
Grades			
Upstream Invert	186.89 m	Downstream Invert	186.39 m
Length	15.00 m	Constructed Slope	0.033333 m/m
Hydraulic Profile			
Profile	CompositePressureProfileS1	Depth, Downstream	2.00 m
Slope Type	N/A	Normal Depth	0.81 m
Flow Regime	Subcritical	Critical Depth	1.06 m
Velocity Downstream	2.00 m/s	Critical Slope	0.013797 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	1.68 m
Section Size	1650 mm	Rise	1.68 m
Number Sections	2		
Outlet Control Properties			
Outlet Control HW Elev.	188.89 m	Upstream Velocity Head	0.21 m
Ke	0.90	Entrance Loss	0.19 m
Inlet Control Properties			
Inlet Control HW Elev.	188.65 m	Flow Control	Unsubmerged
Inlet Type	Projecting	Area Full	4.4 m²
K	0.03400	HDS 5 Chart	2
M	1.50000	HDS 5 Scale	3
C	0.05530	Equation Form	1
Y	0.54000		

Culvert Calculator Report

PR. 2-1650mm dia. Culverts (PR. Central Internal Road Crossing) - Regional Timmins Report

Comments: Proposed Culverts location is internal to site at proposed Central road crossing (refer to Post-Development Drainage Plan figures)

As shown below, culverts have been designed to convey the Regional Timmins flow to prevent flooding of the proposed surrounding development lands.

Solve For: Discharge

Culvert Summary			
Allowable HW Elevation	193.96 m	Headwater Depth/Height	1.19
Computed Headwater Elev.	193.96 m	Discharge	8.8109 m³/s
Inlet Control HW Elev.	193.72 m	Tailwater Elevation	193.46 m
Outlet Control HW Elev.	193.96 m	Control Type	Outlet Control
Grades			
Upstream Invert	191.96 m	Downstream Invert	191.46 m
Length	15.00 m	Constructed Slope	0.033333 m/m
Hydraulic Profile			
Profile	CompositePressureProfileS1	Depth, Downstream	2.00 m
Slope Type	N/A	Normal Depth	0.81 m
Flow Regime	Subcritical	Critical Depth	1.06 m
Velocity Downstream	2.00 m/s	Critical Slope	0.013797 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	1.68 m
Section Size	1650 mm	Rise	1.68 m
Number Sections	2		
Outlet Control Properties			
Outlet Control HW Elev.	193.96 m	Upstream Velocity Head	0.21 m
Ke	0.90	Entrance Loss	0.19 m
Inlet Control Properties			
Inlet Control HW Elev.	193.72 m	Flow Control	Unsubmerged
Inlet Type	Projecting	Area Full	4.4 m²
K	0.03400	HDS 5 Chart	2
M	1.50000	HDS 5 Scale	3
C	0.05530	Equation Form	1
Y	0.54000		

Culvert Calculator Report

PR. 2-1500mm dia. Culverts (PR. South Internal Road Crossing) - Regional Timmins Report

Comments: Proposed Culverts location is internal to site at proposed South road crossing (refer to Post-Development Drainage Plan figures)

As shown below, culverts have been designed to convey the Regional Timmins flow to prevent flooding of the proposed surrounding development lands.

Solve For: Discharge

Culvert Summary			
Allowable HW Elevation	214.05 m	Headwater Depth/Height	1.38
Computed Headwater Elev.	214.05 m	Discharge	9.0892 m³/s
Inlet Control HW Elev.	213.93 m	Tailwater Elevation	212.95 m
Outlet Control HW Elev.	214.05 m	Control Type	Entrance Control
Grades			
Upstream Invert	211.95 m	Downstream Invert	211.45 m
Length	15.00 m	Constructed Slope	0.033333 m/m
Hydraulic Profile			
Profile	CompositeS1S2	Depth, Downstream	1.50 m
Slope Type	Steep	Normal Depth	0.87 m
Flow Regime	N/A	Critical Depth	1.11 m
Velocity Downstream	2.50 m/s	Critical Slope	0.016798 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	1.52 m
Section Size	1500 mm	Rise	1.52 m
Number Sections	2		
Outlet Control Properties			
Outlet Control HW Elev.	214.05 m	Upstream Velocity Head	0.52 m
Ke	0.90	Entrance Loss	0.47 m
Inlet Control Properties			
Inlet Control HW Elev.	213.93 m	Flow Control	Transition
Inlet Type	Projecting	Area Full	3.6 m²
K	0.03400	HDS 5 Chart	2
M	1.50000	HDS 5 Scale	3
C	0.05530	Equation Form	1
Y	0.54000		

APPENDIX E

Geotechnical Data



**CROZIER
& ASSOCIATES**
Consulting Engineers

Project: 1046-4031
Date: August 21, 2015
Name: A. Spencer

Test Pit	Soils	Depth of Dig (m)	GWL Initial (m below existing) or Not Found (NF)	GWL Final* (m below existing) or Not Found (NF)	Bedrock (m) or Not Found (NF)	Notes for GWL & Bedrock
1	Till with highly compacted silty clay at 2 m depth	2.8	NF	2.5	NF	N/A
2	Till with shale and cobble followed by sandy soil with large boulders and cobble	2.5	NF	NF	NF	Large Density of boulders near the bottom of dig
3	Till with shale, large boulders and cobble	2.2	NF	NF	NF	Large Density of boulders near the bottom of dig
4	Till with shale, large boulders and cobble followed by sandy soil near the bottom of the dig	2.9	NF	NF	NF	N/A
5	Sandy soil with large boulders and cobble	3	3	2.8	NF	Seepage of GW initially occurring at 3 m (stable), stabilized at 2.8 m
6	Organic soil (Topsoil)	0.8	NF	NF	0.8	Bedrock very close to surface, limestone
7	Organic soil (Topsoil) with shale and some cobble	0.92	NF	NF	0.92	Bedrock very close to surface, limestone
8	Till with large boulders and shale followed by stiff silty clay at 1.5 m	2.2	NF	2.2	NF	GWL approximately at depth of dig
9	Dominantly sandy soil (beach sand like) with some cobble	3.3	3.3	2.4	NF	Seepage of GW initially occurring at 3.3 m (stable), initial sloughing at 2.5 m with sidewall sloughing continuously occurring
10	Till with shale, small to medium boulders and cobble followed by sandy gravel with stiff silty clay as the last layer	3.2	NF	NF	NF	N/A
11	Till with shale, small to medium boulders and cobble followed by sandy soil (beach sand like)	3.4	NF	NF	NF	N/A
12	Till with small to medium boulders and cobble	2.6	NF	NF	NF	N/A
13	Location was not explored due to accessibility issues					
14	Till with shale, small to medium boulders and cobble, large boulders occurring near the bottom of the dig	2	NF	NF	NF	Large Density of boulders near the bottom of dig
15	Till with shale, small boulders and cobble followed by coarse sandy gravel	2.8	2.8	2.2	NF	Seepage of GW initially occurring at 2.8 m (stable), initial sloughing at 2.0 m
16	Till with shale, some boulders and cobble followed by sandy soil (beach sand like) at 1.6 m	2.9	2.7	2.3	NF	Seepage of GW initially occurring at 2.7 m, trickling in from 2.5m with final level settling below sloughing depth of 2.3 m
17	Till with shale, boulders and cobble followed by sandy gravel with large boulders	2.3	NF	NF	NF	N/A

* Elapsed over 2 hrs +/-



Test Pits



Legend

- Parcels
- Contours (Metres ASL)
 - 180-250m
 - 255-300m
 - 305-350m
 - 355-400m
 - 405-450m
 - 455-500m
 - 505-540m
- Roads 125k
 - Provincial Highway
 - County Road
 - Township Road
 - Seasonal Road

0.16 0 0.08 0.16 Kilometers

WGS_1984_Web_Mercator_Auxiliary_Sphere
© County of Grey



This map is a user generated static output from an Internet mapping site and is for reference only.
Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

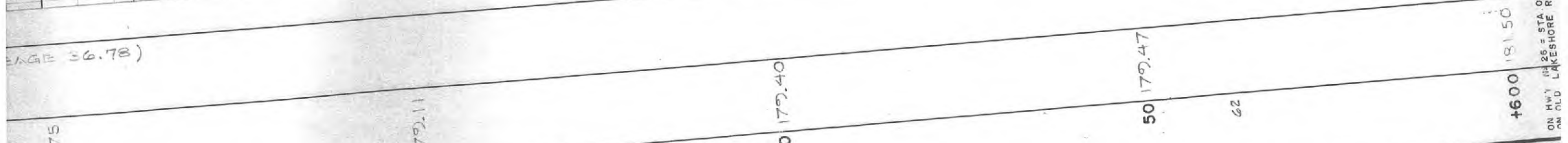
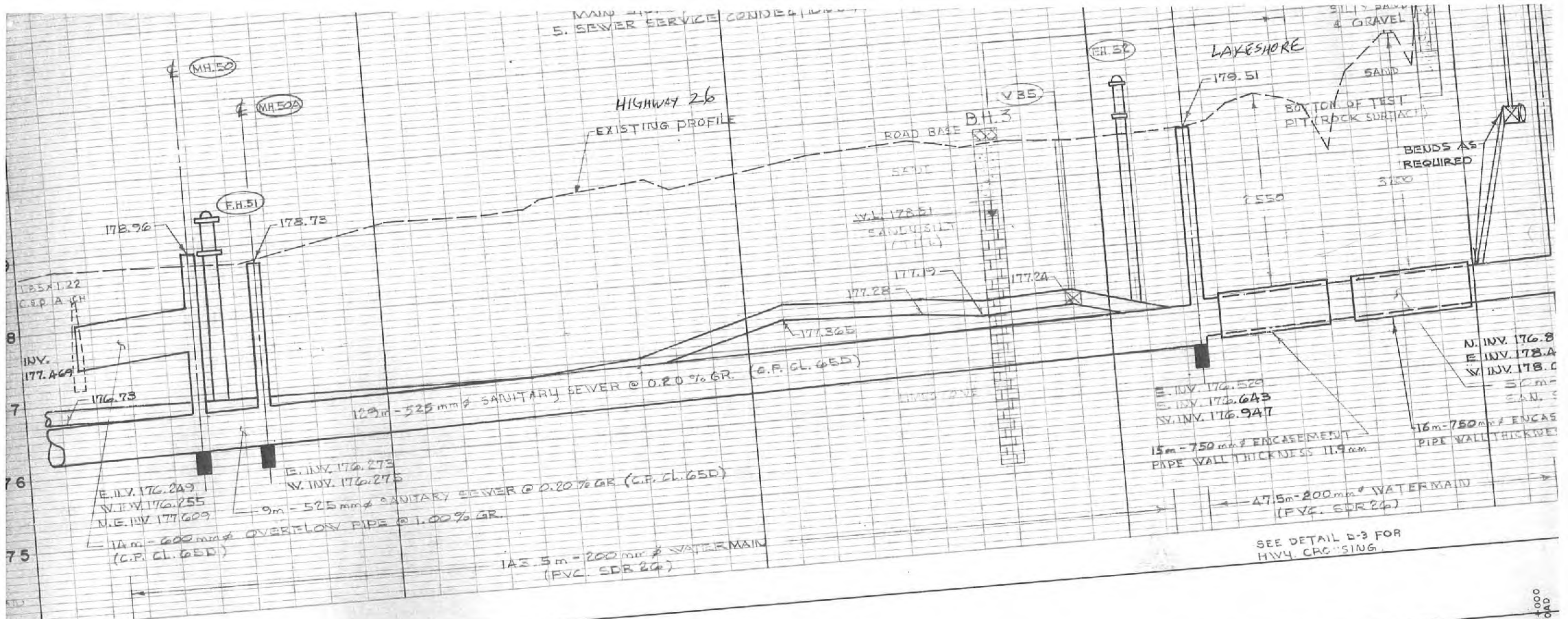
Printed: September 14, 2015

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Notes

APPENDIX F

As-Constructed Drawings



REVISION	DATE	INITIAL
3	AS CONSTRUCTED	SEPT. 1985 C.K.K.
2	PRE - TENDER REVISIONS	JUNE 1984 C.K.K.
1	DRAWING REDRAFTED	MAR 1984 C.K.K.

Approved

REGISTERED PROFESSIONAL ENGINEER
C. K. KENT
PROVINCE OF ONTARIO

TOWNSHIP OF COLLINGWOOD
(CRAIGLEITH CAMPERDOWN)
ONTARIO MINISTRY OF THE
DIRECT GRANT PROJECTS N°

PLAN AND PROFILE
HIGHWAY N° 26 - STA. 0+41
OLD LAKESHORE ROAD -

FIGURES

Figure 1: Site Location Plan

Figure 2: Development Concept Plan

Figure 3: Proposed Water Distribution Plan

Figure 4: Proposed Sanitary Servicing Plan

Figure 5: Regional Drainage Plan - Sub-Watershed 9

Figure 6: Pre-Development Drainage Plan (North)

Figure 7: Pre-Development Drainage Plan (South)

Figure 8: Post-Development Site Drainage & Stormwater Management Plan (North)

Figure 9: Post-Development Drainage Plan (South)



Legend = SUBJECT PROPERTY	Project PARKBRIDGE CRAIGLEITH TOWN OF THE BLUE MOUNTAINS Drawing SITE LOCATION	CROZIER & ASSOCIATES Consulting Engineers THE HARBOUREDGE BUILDING, 40 HURON STREET, SUITE 301, COLLINGWOOD, ON L9Y 4R3 705 446-3510 T 705 446-3520 F WWW.CFCROZIER.CA INFO@CFCROZIER.CA Drawn By C.W. Design By C.W./O.D. Project 1046-4031 Scale As Shown Date 12/22/2016 Check By McNeill FIG. 1
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CRAIGLEITH SITE PLAN

DRAWING / MAP:
CRAIGLEITH: PARKBRIDGE LIFESTYLE COMMUNITIES INC.
TOWN OF THE BLUE MOUNTAINS

SCHEDULE OF LAND USE			
PROPOSED LAND USE	Blocks	Ha	Acres
1 Residential Singles	32-36	2.20	5.44
2 Residential Multiples	21, 23-31	4.95	12.23
3 Open Space - Landscaped and SWM	1-9, 11-14, 22	11.56	28.56
4 Open Space - Hazard Lands	10, 15-20	4.96	12.26
5 Open Space - Trail	37-38	0.24	0.59
Roads		2.77	6.84
TOTAL SITE AREA		26.68	65.92

OPEN SPACE	ha	%
Open Space (Incl. Landscaped and SWM)	12	44
Open Space (Undisturbed Area)	4.96	19
TOTAL	17	63

PROPOSED RESIDENTIAL UNITS		Total Units	Population
15x30m - Singles		40	84
5.5x30m - Towns		144	259
7x30m - Towns		24	43
TOTAL		208	386

RIGHT OF WAY (ROW)		m	ft.
i	12m ROW Local	1,843	6,047
i	6m Lanes	253	830
ii	min 6m Courts	272	892
TOTAL PROPOSED ROW		2,368	7,769

DENSITY		%
Units / Developable Area		9.6

NO	ISSUANCE	DATE
01	DRAFT FOR SUBMISSION	Dec 15, 2016

SURVEYOR'S CERTIFICATION
I certify that the boundaries of the lands to be subdivided and their relationship to adjacent lands are accurately and correctly shown.

DATE

CONSULTANT

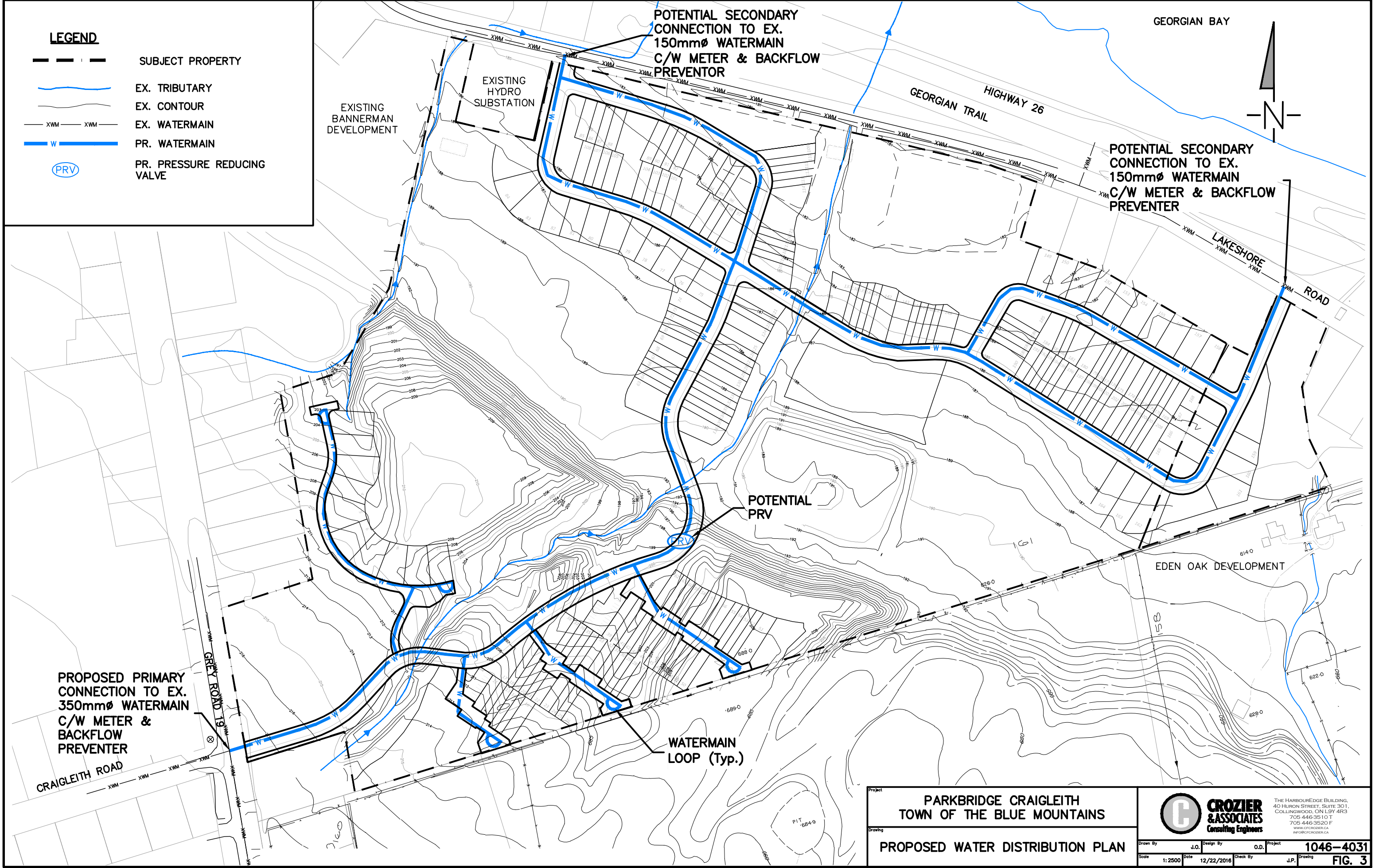
Svn
110 Adelaide Street East
Toronto, Ontario M5C 1K9
t 416 593 6499
f 416 593 4911
info@planningalliance.com

DESIGNER'S CERTIFICATE
Plan designed and prepared by **SvN**

Drew Sinclair
M Arch, OAA, MAA, SAA, MRAIC

Note:
All measurements are in metres and can be converted to feet by dividing by 0.3048

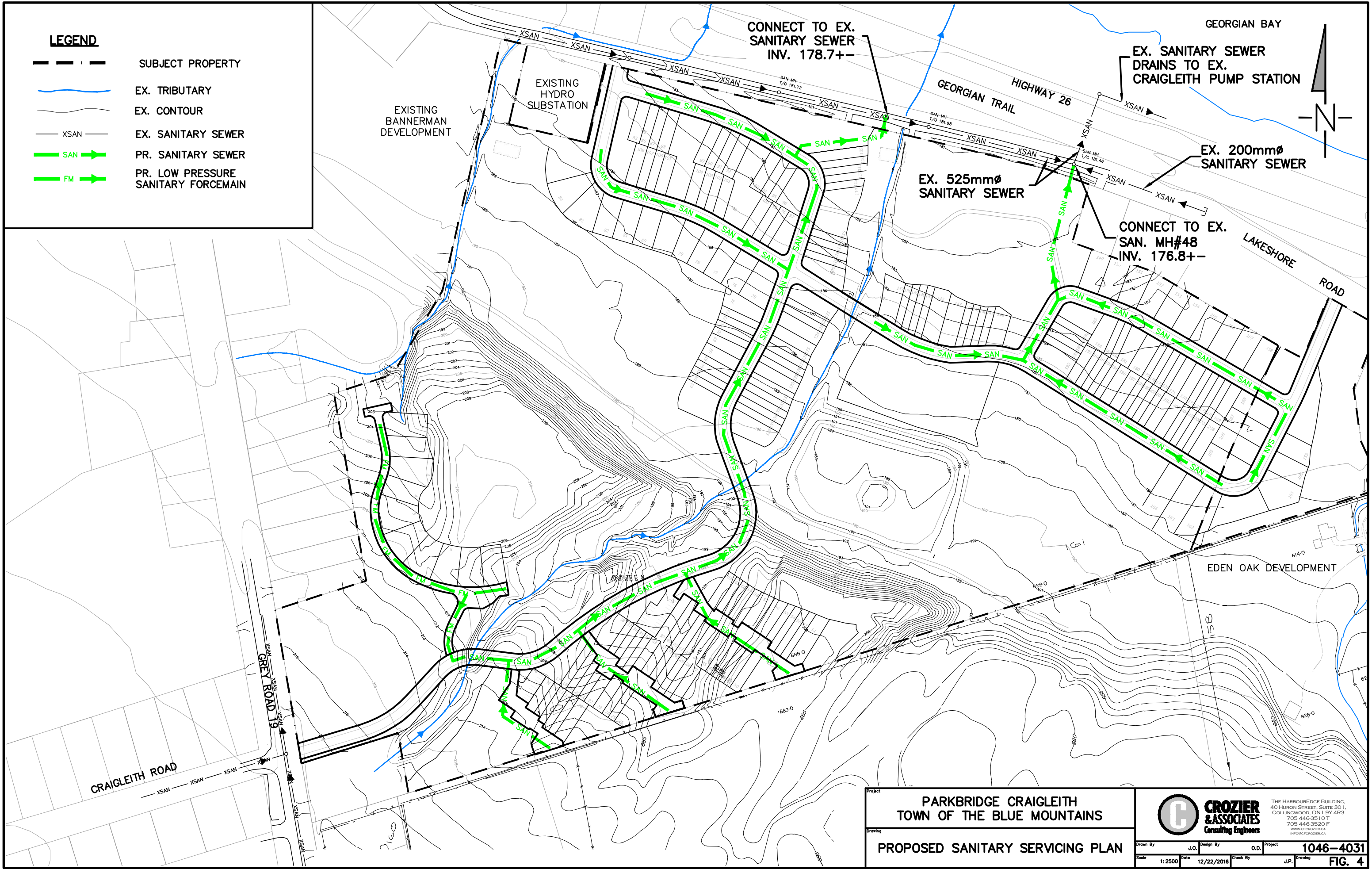
DATE:	DRAWN BY:	CHECKED BY:	SCALE:	DRAWING NO:
Dec 15, 2016	MB	TP	1:1250	D-02



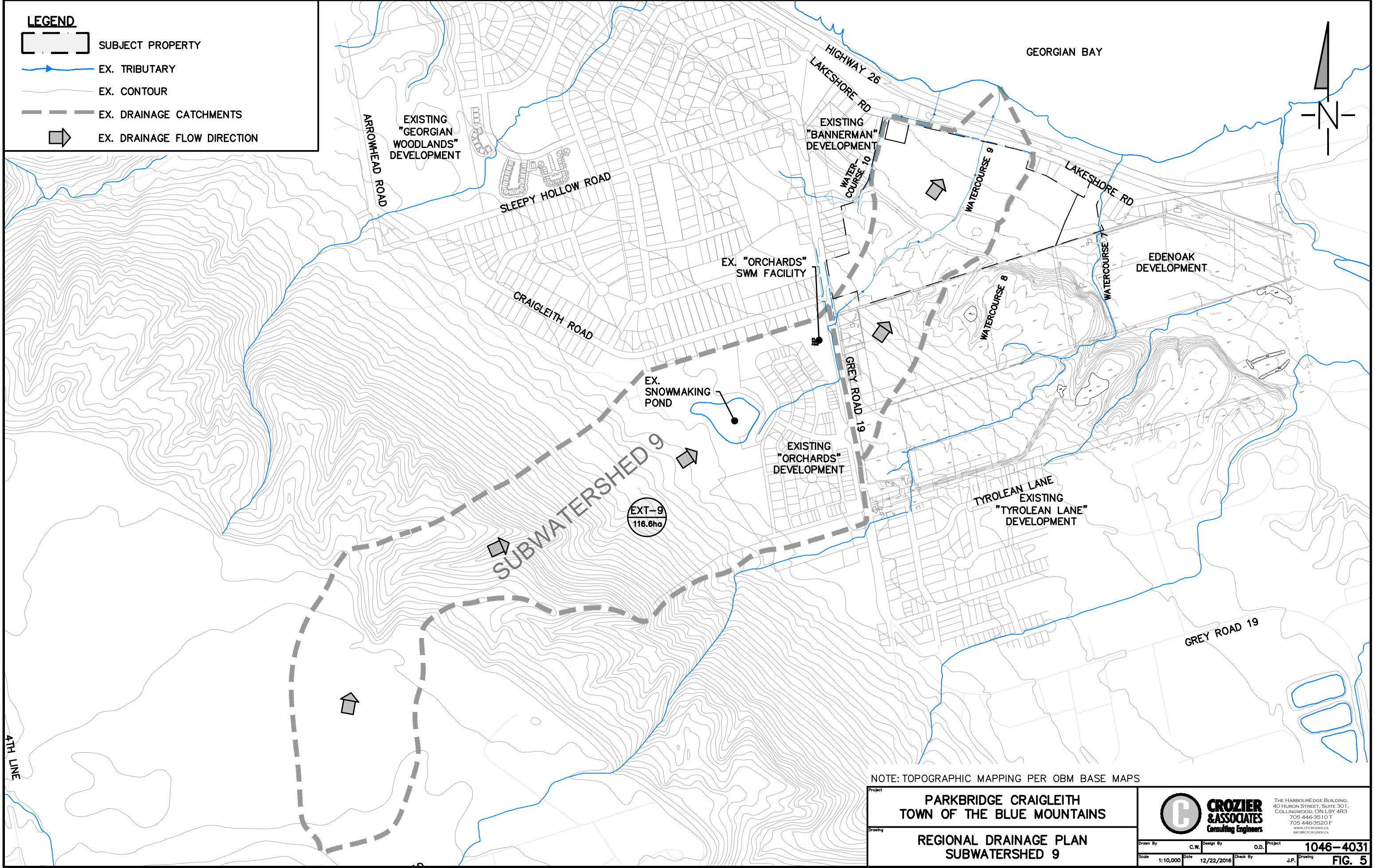
LEGEND

- SUBJECT PROPERTY
- EX. TRIBUTARY
- EX. CONTOUR
- EX. WATERMAIN
- PR. WATERMAIN
- PR. PRESSURE REDUCING VALVE

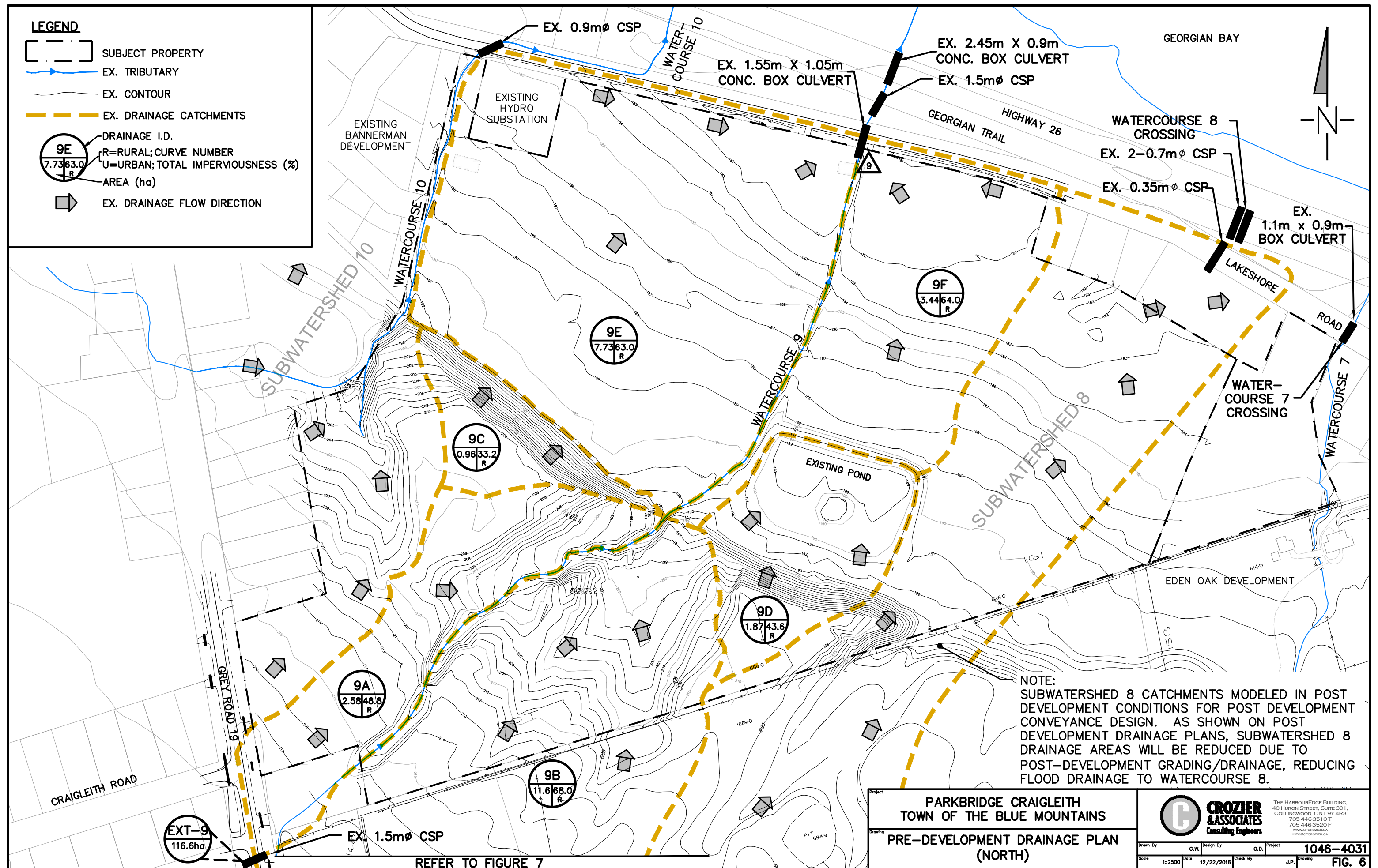
PARKBRIDGE CRAIGLEITH TOWN OF THE BLUE MOUNTAINS		 CROZIER & ASSOCIATES Consulting Engineers THE HARBOUREDGE BUILDING, 40 HURON STREET, SUITE 301, COLLINGWOOD, ON L9Y 4R3 705 446-3510 T 705 446-3520 F WWW.CROZIER.CA INFO@CROZIER.CA			
PROPOSED WATER DISTRIBUTION PLAN					
Drawn By	J.O.	Design By	O.D.	Project	1046-4031
Scale	1:2500	Date	12/22/2016	Check By	J.P.
					FIG. 3

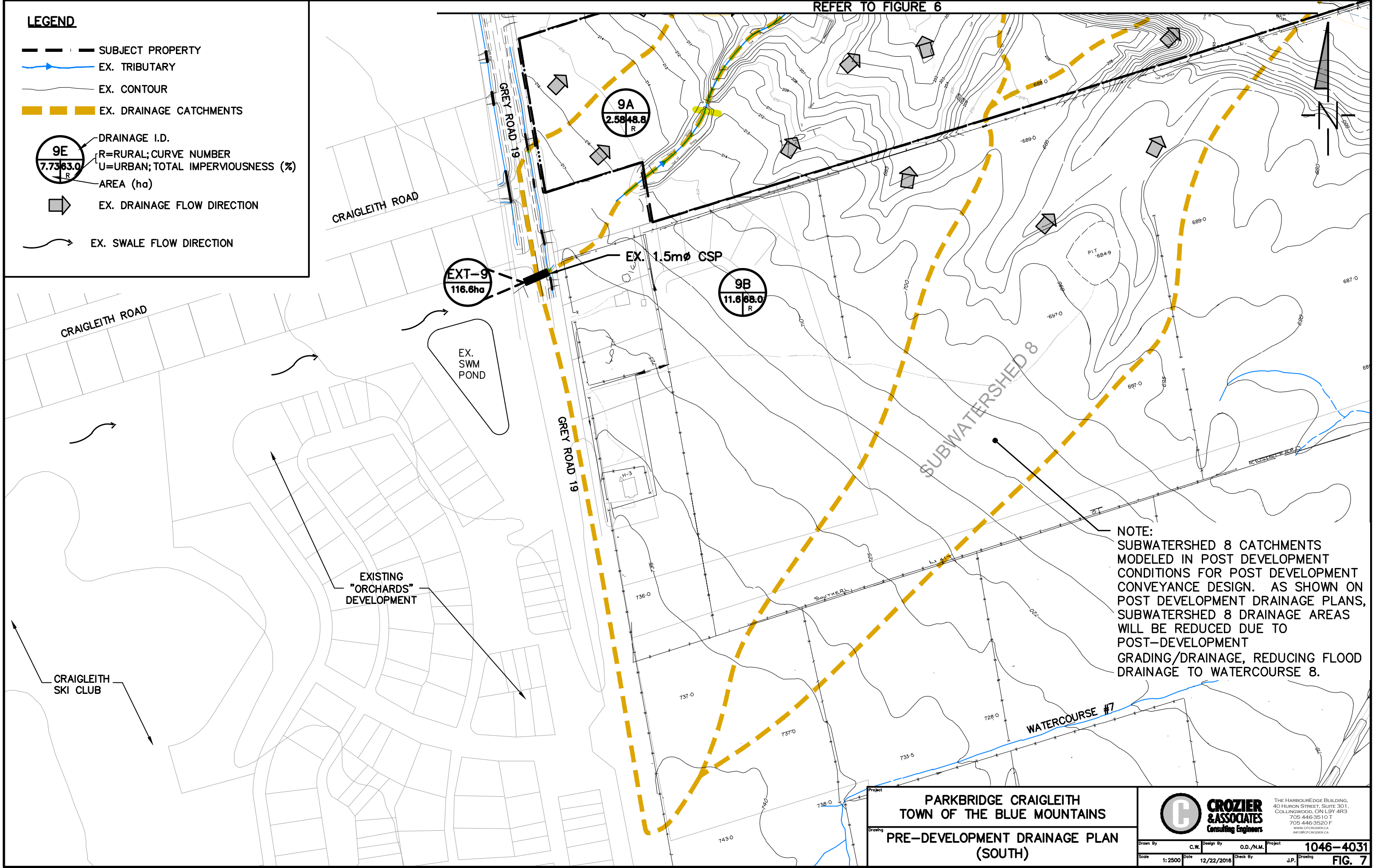


Project PARKBRIDGE CRAIGLEITH TOWN OF THE BLUE MOUNTAINS		 CROZIER & ASSOCIATES Consulting Engineers THE HARBOUREDGE BUILDING, 40 HURON STREET, SUITE 301, COLLINGWOOD, ON L9Y 4R3 705 446-3510 T 705 446-3520 F WWW.CROZIER.CA INFO@CROZIER.CA			
Drawing PROPOSED SANITARY SERVICING PLAN					
Drawn By	J.O.	Design By	O.D.	Project	1046-4031
Scale	1:2500	Date	12/22/2016	Check By	J.P.
					FIG. 4



Project		PARKBRIDGE CRAIGLEITH TOWN OF THE BLUE MOUNTAINS		 CROZIER & ASSOCIATES Consulting Engineers	THE HARBOUREDGE BUILDING, 40 HURON STREET, SUITE 301, COLLINGWOOD, ON L9Y 4R3 705 446-3510 T 705 446-3520 F WWW.CROZIER.CA INFO@CROZIER.CA	
Drawing		REGIONAL DRAINAGE PLAN SUBWATERSHED 9			Drawn By C.W. Design By O.D. Project 1046-4031	Scale 1:10,000 Date 12/22/2016 Check By J.P. Drawing FIG. 5





LEGEND

SUBJECT PROPERTY

PR. DRAINAGE CATCHMENTS

PR. DRAINAGE FLOW DIRECTION

PR. SWALE

x 182.45

PR. ELEVATION

1.5%

PR. GRADE & DIRECTION

LP

PR. LOW POINT ELEVATION

HP

PR. HIGH POINT ELEVATION

STM

PR. STORM SEWER SYSTEM

CULVERT

EX. TRIBUTARY

EX. CONTOUR

9G

DRAINAGE I.D.

3.6

AREA (ha)

NOTE: FOR POST-DEVELOPMENT HYDROLOGIC PARAMETERS (ie. % IMPERVIOUS) REFER TO APPENDIX B IN CROZIER FUNCTIONAL SERVICING & STORMWATER MANAGEMENT REPORT

PR. CULVERT CROSSINGS

- C#1 - TWIN 1500mmØ CSP
- C#2 - TWIN 1650mmØ CSP
- C#3 - TWIN 1650mmØ CSP
- C#4 - 525mmØ CSP
- C#5 - 450mmØ CSP
- C#6 - 450mmØ CSP
- C#7 - REPLACE EQUIVALENT

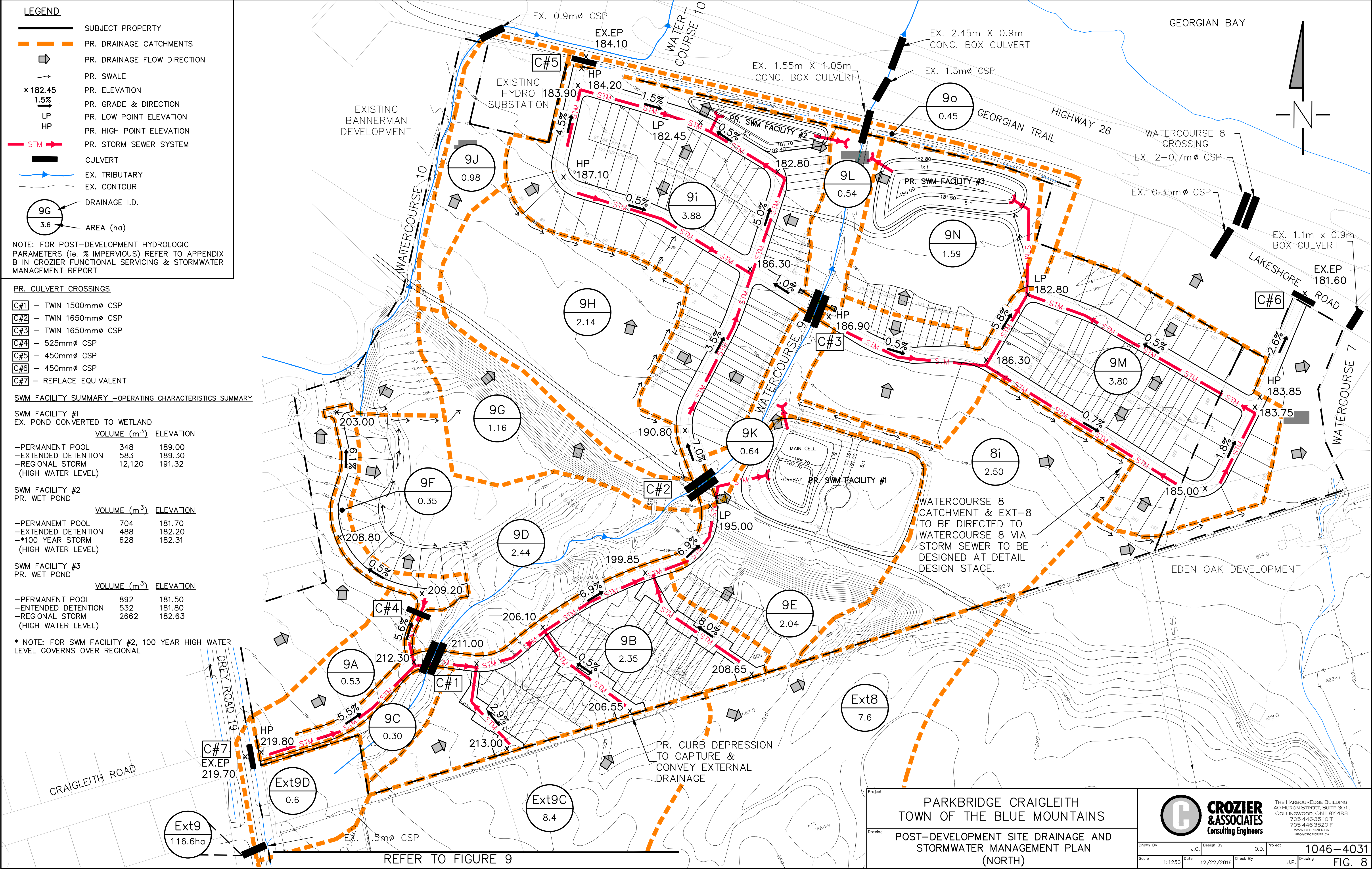
SWM FACILITY SUMMARY –OPERATING CHARACTERISTICS SUMMARY

SWM FACILITY #1		
EX. POND CONVERTED TO WETLAND		
	VOLUME (m ³)	ELEVATION
-PERMANENT POOL	348	189.00
-EXTENDED DETENTION	583	189.30
-REGIONAL STORM (HIGH WATER LEVEL)	12,120	191.32

SWM FACILITY #2		
PR. WET POND		
	VOLUME (m ³)	ELEVATION
-PERMANENT POOL	704	181.70
-EXTENDED DETENTION	488	182.20
-*100 YEAR STORM (HIGH WATER LEVEL)	628	182.31

SWM FACILITY #3		
PR. WET POND		
	VOLUME (m ³)	ELEVATION
-PERMANENT POOL	892	181.50
-EXTENDED DETENTION	532	181.80
-REGIONAL STORM (HIGH WATER LEVEL)	2662	182.63

* NOTE: FOR SWM FACILITY #2, 100 YEAR HIGH WATER LEVEL GOVERNS OVER REGIONAL



REFER TO FIGURE 9

Project

Drawing

PARKBRIDGE CRAIGLEITH

TOWN OF THE BLUE MOUNTAINS

POST-DEVELOPMENT SITE DRAINAGE AND

STORMWATER MANAGEMENT PLAN

(NORTH)

C

CROZIER & ASSOCIATES

Consulting Engineers

THE HARBOUREDGE BUILDING,

40 HURON STREET, SUITE 301,

COLLINGWOOD, ON L9Y 4R3

705 446-3510 T

705 446-3520 F

WWW.CROZIER.CA

INFO@CROZIER.CA

Drawn By

J.O.

Design By

O.D.

Project

1046-4031

Scale

1:1250

Date

12/22/2016

Check By

J.P.

Drawing

FIG. 8

