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FUNCTIONAL SERVICING REPORT

FOR

1830 TRIM ROAD

MATTAMY HOMES

CITY OF OTTAWA

PROJECT NO.: 19-1137

MARCH 20, 2020
1ST SUBMISSION

FUNCTIONAL SERVICING REPORT
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1.0 INTRODUCTION

David Schaeffer Engineering Limited (DSEL) has been retained by Mattamy Homes to prepare a Functional Servicing Report (FSR) in support of their application for draft plan approval and zoning by-law amendment for 1830 Trim Road (PIN 14531-0715). This FSR has been prepared in accordance with City of Ottawa's *Servicing Study Guidelines for Development Applications*, as demonstrated by the checklist included in ***Appendix A***.

The lands currently consist of an existing vacant school bus storage center and are generally located west of Trim Road, east of Valin Street / Winsome Terrace, north of Brasseur Crescent / Destiny Private and south of an existing Hydro One easement. The FSR study area boundary is shown in ***Figure 1 – Key Plan*** and includes vacant lots fronting onto existing Brasseur Crescent that were contemplated in Valecraft's Cardinal Trail 4 subdivision. The lands are described as Part of Lot A, Concession 9, within the former Geographic Township of Cumberland within the City of Ottawa.

The FSR study area:

- Measures approximately 4.38 ha;
- Is located within the City of Ottawa urban boundary in the Cumberland ward;
- Is under the jurisdiction of the Rideau Valley Conservation Authority (RVCA);
- Includes an existing Hydro One easement, running through the site (multiple PINs, including PIN 14531-2399) that is zoned as Open Space and contains existing high voltage power lines;
- Abuts additional City-owned land which includes the former Trim Road right-of-way (ROW) (PIN 14526-0095), east of the site, that is zoned as Development Reserve and is currently an unopened road allowance; and,
- Abuts existing developments on Winsome Terrace, Brasseur Crescent and Destiny Private.

The neighbouring properties and site location can be seen in ***Figure 1 – Key Plan*** and existing legal plans included in ***Appendix B.***

This FSR is prepared to demonstrate conformance with the design criteria of the City of Ottawa, background studies, and general industry practice.

1.1 Existing Conditions

Under existing conditions, the study area is currently vacant but was previously used as a commercial property to store school buses, complete with a parking lot and building containing a dispatch center and offices. There is an existing Hydro One easement that crosses the north portion of the site.

There is an existing underground well and septic tank on site which will have to be decommissioned and removed prior to construction. This will happen through a separate process as noted in the ***Phase Two Environmental Site Assessment*** (Arcadis, August 1, 2019). A fuel island, diesel fuel underground storage tank and waste oil underground storage tank were removed in 2015 as noted in the ***Phase Two Environmental Site Assessment***.

There is an existing pile of contaminated topsoil located in the northeast corner of the site. During construction, monitoring of any on-site and off-site soil and groundwater movement will be required and an annual report is to be prepared and submitted to the MECP as discussed in the ***Environmental Review*** (Paterson, January 27, 2020).

It should also be noted that there is an existing 10 m-wide drainage easement and an existing 10 m-wide working easement bisecting the site. The existing ditch within the drainage easement outlets to existing roadside ditches in Safari Court. Existing drainage conveyed through the site via the existing ditch is to be maintained until such a time that all necessary approvals are in place and it has been confirmed through detailed design that the flows can be conveyed accordingly.

The study area is generally flat with existing elevations ranging from 87.5 m to 89 m, with the exception of an existing pile of topsoil located at the north east corner of the property. There is an existing ditch currently bisecting the study area. The existing ditch and study area drain northeast to a series of existing road side ditches.

Existing conditions for the site can be seen in ***Drawing 1 – Existing Conditions Plan***.

Geotechnical, subsurface, groundwater, archaeological, and environmental conditions and constraints for the study area are defined in documents under separate cover, prepared in support of the development applications. In the sections that follow, key information from these documents is referenced as required.

1.2 Development Concept

The proposed development concept can be seen in ***Drawing 2 – Servicing Plan***. Within the study area, the proposed land uses include townhomes, walkway blocks and a park block accessed via local roads (Street 1 and Street 2) with 18.0 m ROW widths and a window street with a 14.75 m ROW width. There are 10 proposed townhomes that front

onto existing Brasseur Crescent. Off-site storm sewers and watermains are required to service the site (as described further in ***Sections 3.0*** and ***5.0***), and Mattamy Homes will be responsible for securing planning and construction approvals to construct this off-site infrastructure.

The predicted populations associated with the development concept are described in ***Table 1***:

- Townhomes – 111 units; and
- Park Block – Approximately 0.38 ha.

Table 1: Development Statistic Projections Derived from Concept Plan

Land Use	Total Area (ha)	Projected Residential Units	Residential Population per Unit	Projected Population
Townhomes	2.27	111	2.7	300
Park	0.38			
Walkways / Servicing Blocks	0.03			
Local Streets	0.96			
Hydro One Corridor	0.74			
Total	**4.38 ha**	**111**		**300**

Please note that the *Geotechnical Investigation, Proposed Residential Development 1830 Trim Road* (Paterson Group, March 12, 2020) found that "the site is generally covered with a thin layer of granular crushed stone or topsoil which in turn is overlying a relatively thick layer of inorganic native silty clay. The thickness of the silty clay deposit is estimated to extend to a depth of 30 m overlying inferred bedrock". The geotechnical investigation recommends permissible grade raise restrictions above the undisturbed silty clay (ignoring existing fill). A permissible grade raise of 2.0 m is proposed for buildings and a permissible grade raise of 2.5 m is proposed for roads.

1.3 Summary of Pre-consultation

The following provides a summary of the pre-consultation to date:

1.3.1 City of Ottawa

Pre-application consultation was conducted with City of Ottawa development review staff in a meeting held on December 9, 2019. Pre-consultation correspondence from the City of Ottawa (e-mail from Julie Lebrun dated January 10, 2020 and e-mail from Charles Warnock dated February 6, 2020), along with the City of Ottawa servicing guidelines checklist, is provided in ***Appendix A***.

1.3.2 Rideau Valley Conservation Authority

Pre-application consultation was conducted with RVCA staff in February 2020 to determine stormwater quality control requirements. Pre-consultation correspondence (e-mail from Jamie Batchelor dated February 28, 2020) is provided in ***Appendix A***.

1.4 Existing Permits / Approvals

The existing permits and approvals relating to the FSR study area are presented in ***Table 2***.

Table 2: Existing Permits / Approvals

Agency	Approval Type	Approval Number	Remarks
MECP	Environmental Compliance Approval (ECA)	#8208-4TRRJF (February 14, 2001)	The existing storm trunk and Cardinal Creek Online SWM Facility provide the storm outlet for the FSR study area. A copy of the ECA is enclosed in ***Appendix B***.

1.5 Required Permits / Approvals

The required approvals and permits relating to the FSR study area are presented in ***Table 3.***

Table 3: Required Permits / Approvals

Agency	Permit/Approval Required	Trigger	Remarks
MECP	Environmental Compliance Approval (ECA)	Construction of new sanitary and storm sewers.	The City of Ottawa will review the storm and sanitary sewers on behalf of the MECP through the MECP's Transfer of Review process.
MECP	Permit to Take Water (PTTW)	If pumping for construction of proposed land uses (e.g. basements for residential homes) exceeds 400,000 L/day of ground and/or surface water.	Pumping of groundwater or surface water may be required during construction. (Paterson Group, November 2019)
MECP	Environmental Activity and Sector Registry (EASR)	If pumping for construction of proposed land uses (e.g. basements for residential homes) ranges between 50,000 to 400,000 L/day of ground and/or surface water.	Pumping of groundwater or surface water may be required during construction. (Paterson Group, November 2019)
City of Ottawa	MECP Form 1 – Record of Watermains Authorized as a Future Alteration.	Construction of watermains.	The City of Ottawa is expected to review the watermains on behalf of the MECP through the Form 1 – Record of Watermains Authorized as a Future Alteration.
City of Ottawa / Private Landowners	Permission/license to access/occupation and/or legal property instruments.	Construction of servicing infrastructure (e.g. storm sewer, watermain) beyond the FSR study area.	Construction activities and permanent infrastructure beyond the FSR study area may trigger legal agreements.

2.0 GUIDELINES, PREVIOUS STUDIES, AND REPORTS

2.1 Existing Studies, Guidelines, and Reports

The following documents informed the preparation of this FSR report:

- **Ottawa Sewer Design Guidelines**
  City of Ottawa, October 2012
  (City Standards)
  - **Technical Bulletin ISDTB-2014-01**
    City of Ottawa, February 5, 2014
    (ITSB-2014-01)
  - **Technical Bulletin PIEDTB-2016-01**
    City of Ottawa, September 6, 2016
    (PIEDTB-2016-01)
  - **Technical Bulletin ISTB-2018-01**
    City of Ottawa, March 21, 2018
    (ISTB-2018-01)
  - **Technical Bulletin ISTB-2019-02**
    City of Ottawa, July 18, 2019
    (ISTB-2019-02)
- **Ottawa Design Guidelines – Water Distribution**
  City of Ottawa, July 2010
  (Water Supply Guidelines)
  - **Technical Bulletin ISD-2010-2**
    City of Ottawa, December 15, 2010
    (ISDTB-2010-2)
  - **Technical Bulletin ISDTB-2014-02**
    City of Ottawa, May 27, 2014
    (ISDTB-2014-02)
  - **Technical Bulletin ISDTB-2018-02**
    City of Ottawa, March 21, 2018
    (ISTB-2018-02)
- **Stormwater Management Planning and Design Manual**
  Ministry of Environment, March 2003
  (*SWMP Design Manual)*
- **Erosion & Sediment Control Guidelines for Urban Construction**
  Greater Golden Horseshoe Area Conservation Authorities, December 2006
  (E&S Guidelines)

- **Greater Cardinal Creek Subwatershed Management Plan**
  Aecom, August 2014
  (*GCCSMP)*
- **Greater Cardinal Creek Subwatershed Study XPSWMM Model Calibration and Verification Report**
  Aecom, August 2009
  (*GCC Model Report)*
- **Tank Excavation Monitoring**
  Strata Environmental, October 29, 2015
  (*Tank Excavation)*
- **Phase Two Environmental Site Assessment**
  Arcadis, August 10, 2016
  (*Phase 2 ESA)*
- **Record of Site Condition**
  MECP, January 20, 2020
  (*RSC)*
- **Environmental Review**, 1830 Trim Road (PE4732-MEMO.01)
  Paterson Group, January 27, 2020
  (*Environmental Review)*
- **Geotechnical Investigation, Proposed Residential Development**, 1830 Trim Road (PG5083-1)
  Paterson Group, March 12, 2020
  (*Geotechnical Investigation*)
- **Hydraulic Capacity and Modeling Analysis – 1830 Trim Road Development**
  GeoAdvice Engineering, March 20, 2020
  (*Watermain Analysis*)
- **Impact on Existing 3000 mm Storm Sewer Trunk and Cardinal Creek Watercourse**
  J.F. Sabourin and Associates, March 20, 2020
  (*SWM Analysis*)

3.0 WATER SUPPLY SERVICING

3.1 Existing Water Supply Services

The FSR study area is located within Zone 2E of the City's water distribution system, per the Water Distribution Mapping excerpt in ***Appendix C,*** which is fed by two booster pumping stations and the Innes Road elevated storage tank at Belcourt Boulevard, providing balancing, fire and emergency storage.

In the vicinity of the site, there is an existing 400 mm diameter waterman on Trim Road, and an existing 200 mm diameter watermain on Winsome Terrace. There is an existing 200 mm diameter watermain to the south on Brasseur Crescent. The existing watermains are depicted on ***Drawing 1 – Existing Conditions Plan***.

3.2 Proposed Water Supply

Water supply to the site will be provided by connection to the municipal water system at Trim Road and Winsome Terrace as depicted on ***Drawing 2 – Servicing Plan***. The proposed connection to Trim Road will be provided through a 6 m servicing block in order to minimize the amount of infrastructure through the adjacent property.

The 10 proposed townhouse units fronting onto Brasseur Crescent will be serviced by the existing 200 mm diameter watermain within the street, but have been included in the demands for the FSR study area to be conservative.

A hydraulic analysis of the existing and proposed watermain network has been prepared by GeoAdvice Engineering (***Watermain Analysis,*** March 20, 2020) and is included in ***Appendix C***.

The proposed development will be serviced internally by 200 mm diameter watermains designed in accordance with the ***Water Supply Guidelines*** as summarized in ***Table 4***. The proposed watermains are depicted on ***Drawing 2 – Servicing Plan***.

Table 4: Water Supply Design Criteria

Design Parameter	Value
Residential - Townhome	2.7 p/unit
Residential – Average Daily Demand	280 L/p/day
Residential - Maximum Daily Demand*	3.6 x Average Daily Demand
Residential - Maximum Hourly Demand*	1.5 x Maximum Daily Demand
Residential - Minimum Hourly Demand*	0.2 x Average Daily Demand
Park Average Daily Demand	28,000 L/ha/day
Park Maximum Daily Demand	1.5 x Average Daily Demand
Park Maximum Hour Demand	1.8 x Maximum Daily Demand
Park Minimum Hourly Demand	0.5 x Average Daily Demand
Minimum Watermain Size	150 mm diameter
Minimum Depth of Cover	2.4 m from top of watermain to finished grade
Peak hourly demand operating pressure	276 kPa and 552 kPa
Fire flow operating pressure minimum	140 kPa
Extracted from Section 4: Ottawa Design Guidelines, Water Distribution (July 2010) ** For Peaking Factors below pop 501 MECP Design Guidelines for Drinking Water Systems*	

Based on the existing hydraulic grade line (HGL) in Zone 2E, operating pressures in the development are not anticipated to drop below 276 kPa (40 psi) or exceed 552 kPa (80 psi).

A hydraulic analysis has been prepared for the proposed water distribution network to confirm that water supply is available within the required pressure range under the anticipated demand during average day, peak hour and fire flow conditions. The proposed development will connect to the existing 200 mm diameter watermain on Winsome Terrace and to the existing 400 mm watermain on Trim Road. Refer to the ***Watermain Analysis*** provided in ***Appendix C***.

3.2.1 Fire Flow Demand

The City of Ottawa's cap of 10,000 L/min (167 L/s) as outlined in ISDTB-2018-02 will be applied to townhomes. Based on previous projects, a fire flow of 10,000 L/min (167 L/s) is proposed for the park, which is considered a typical, conservative value for a parkette.

The existing and proposed watermains are presented in ***Drawing 2 – Servicing Plan***.

3.2.2 Boundary Conditions

Boundary conditions have been requested for specific locations and demands. Boundary conditions in the form of Hydraulic Grade Line (HGL) have been provided by the City of Ottawa for Peak Hour, Maximum Day Plus Fire Flow and Maximum HGL (high pressure check). Refer to the boundary condition request located in ***Appendix C***.

3.2.3 Water Demand Calculations

A summary of preliminary water demands for the FSR study area is presented in ***Table 4.1.*** A 10% contingency was added to demands in the boundary condition request to account for any future minor changes to the development concept plan.

Table 4.1: Summary of Water Demands

Dwelling Type	Number of Units	**Population**		**Demand** (L/cap/day)	**Avg Day** (L/s)	**Max Day** 3.6 x Avg Day (L/s)	**Peak Hour** 1.5 x Max Day (L/s)	**Min Hour** 0.5 x Avg Day (L/s)
		Persons per unit	Population per dwelling type					
Townhomes	111*	2.7	300	280	0.97	3.50	5.25	0.19
10% Contingency					1.07	3.85	5.78	0.21

*Includes 10 townhouse units fronting onto Brasseur Crescent.

Land Use Type	**Area** (ha)	**Demand** (L/ha/day)	**Avg Day** (L/s)	**Max Day** 1.5 x Avg Day (L/s)	**Peak Hour** 1.8 x Max Day (L/s)	**Min Hour** 0.5 x Avg Day (L/s)
Park	0.38	28,000	0.12	0.18	0.33	0.06
10% Contingency			0.13	0.20	0.36	0.07

3.3 Water Supply Conclusion

The FSR study area will be serviced internally by 200 mm watermains, which will be looped to the existing 400 mm diameter watermain in Trim Road and to the existing 200 mm diameter watermain in Winsome Terrace.

The 10 proposed townhouse units fronting onto Brasseur Crescent will be serviced by the existing 200 mm diameter watermain within the street, but have been included in the demands for the FSR study area to be conservative.

A detailed hydraulic analysis has been completed to confirm that the proposed water network can deliver all domestic and fire flows as per the Ministry of the Environment, Conservation and Parks, City of Ottawa and Fire Underwriters criteria.

The proposed water supply network has been designed in accordance with City of Ottawa standards.

4.0 WASTEWATER SERVICING

4.1 Existing Wastewater Services

The proposed sanitary outlet for the FSR study area is the existing 200 mm diameter sanitary sewer within Winsome Terrace, which in turn outlets to an existing 375 mm sanitary sewer within Valin Street to an existing sanitary trunk sewer within Liberty Way, west of the site. See ***Appendix D*** for as-built drawings.

The existing 450 mm diameter sanitary trunk sewer in Liberty Way has capacity for an additional 29.7 L/s of flow as indicated in an e-mail from the City of Ottawa dated February 3, 2020, included in ***Appendix D.***

There is an existing 250 mm diameter sanitary sewer within Brasseur Crescent which will service the 10 proposed townhouse units fronting onto Brasseur Crescent. The existing 250 mm diameter sanitary sewer ultimately outlet to the existing 375 mm sanitary sewer within Valin Street and existing 450 mm diameter sanitary trunk sewer within Liberty Way, west of the site. See ***Appendix D*** for as-built drawings.

Refer to ***Drawing 1 – Existing Conditions Plan*** for a depiction of the existing sewers. The drainage area plan and design sheet for the FSR study area are enclosed in ***Appendix D***.

4.2 Wastewater Design

The FSR study area will be serviced by new gravity sewers designed in accordance with City of Ottawa design criteria and will outlet through existing sanitary sewers in Winsome Terrace to the existing sanitary sewer within Valin Street and sanitary trunk sewer within Liberty Way.

The 10 proposed townhouse units fronting onto Brasseur Crescent will be serviced by the existing 250 mm diameter sanitary sewer within the street. As-built drawings for Valecraft's Cardinal Trail 4 subdivision (Stantec, 2010) show 10 total proposed townhouse units in the same location as the current proposal, so it is anticipated that the sanitary flows from these units have been accounted for in Stantec's sanitary sewer design. As-built drawings are located in ***Appendix D***.

It should also be noted that sanitary design guidelines have changed since the design of Valecraft's Cardinal Trail 4 subdivision and sanitary peak flows are lower than accounted for in previous designs, further confirming sufficient capacity.

The proposed sanitary sewer layout and drainage areas are depicted on ***Figure 3 – Sanitary Drainage Plan*** in ***Appendix D***.

Table 5 summarizes the ***City Standards*** which have been used in the design of the proposed wastewater sewer system.

Table 5: Wastewater Design Criteria

Design Parameter	Value
Medium Density Residential	2.7 p/unit
Peak Wastewater Generation per Person	280 L/p/d
Peaking Factor Applied	Harmon's Equation (2.0 min, 4.0 max)
Harmon – Correction Factor	0.80
Commercial / Institutional Flows	28,000 L/ha/day
Commercial / Institutional Peak Factor	1.5 (ICI in contributing area is > 20%)
Infiltration and Inflow Allowance	0.33 L/s/ha
Park Flows	9,300 L/ha/day
Park Peaking Factor	1.5
Sanitary sewers are to be sized employing the Manning's Equation	$Q = \frac{1}{n} A R^{2/3} S^{1/2}$
Minimum Sewer Size	200 mm diameter
Minimum Manning's 'n'	0.013
Minimum Depth of Cover	2.5 m from crown of sewer to grade
Minimum Full Flowing Velocity	0.6 m/s
Maximum Full Flowing Velocity	3.0 m/s
Extracted from Sections 4 and 6 of the City of Ottawa Sewer Design Guidelines (October 2012) and ISTB-2018-01 (March 21, 2018)	

The sanitary drainage area plans and design sheets for the FSR study area are enclosed in ***Appendix D***.

The peak sanitary flow from the FSR study area to the existing sanitary sewer system on Winsome Terrace is 4.26 L/s. As shown on the sanitary design sheet for the existing sanitary sewer system in ***Appendix D***, the downstream sanitary sewers have a residual capacity of 27.09 L/s, which is more than the additional flow from the proposed development.

The City of Ottawa has confirmed that the existing 450 mm diameter sanitary trunk sewer on Liberty Way has capacity for an additional 29.7 L/s of flow, which is more than the additional flow from the proposed development.

See ***Drawing 3 – Profiles*** for preliminary profiles of the proposed road and sanitary sewer network.

4.3 Wastewater Servicing Conclusion

The FSR study area outlets to the existing 375 mm sanitary sewer in Valin Street and existing sanitary trunk sewer in Liberty Way, via existing sanitary sewers in Winsome Terrace and Brasseur Crescent.

There is sufficient residual capacity in the downstream sewers for the proposed development. The sanitary sewers have been designed in accordance with City of Ottawa standards.

5.0 STORMWATER CONVEYANCE

5.1 Existing Conditions

The FSR study area is comprised of approximately 4.38 ha of vacant land with grades between 87.5 m and 89 m, slightly above the elevation of Trim Road. The site is located within the Greater Cardinal Creek Subwatershed and is subject to regulations of the Rideau Valley Conservation Authority (RVCA).

There is an existing 300 mm diameter storm sewer and downstream 675 mm storm sewer within Winsome Terrace, but it has been determined that the existing pipes do not have sufficient capacity to convey stormwater flows from the FSR study area. As such, an alternative strategy involving connecting the development directly to a nearby storm trunk sewer was discussed with the City of Ottawa per the January 24, 2020 and February 6, 2020 pre-consultation e-mails included in ***Appendix A.***

There is an existing 3000 mm diameter storm trunk sewer within the Hydro One easement, north of the FSR study area, which outlets to the existing Cardinal Creek Online SWM Facility, approximately 425 m downstream (to the east) from the site. See ***Appendix E*** for as-built drawings.

Several shallow drainage ditches exist across the perimeter of the site, discharging to a bisecting ditch within a 10 m-wide drainage easement and 10 m-wide working easement. Existing ditches outlet to existing roadside ditches within Safari Court and the former Trim Road ROW / unopened road allowance. Existing drainage conveyed through the site via the existing ditches is to be maintained until such a time that all necessary approvals are in place and it has been confirmed through detailed design that the flows can be conveyed accordingly.

There is an existing 675 mm diameter storm sewer within Brasseur Crescent, which ultimately outlets to the existing 3000 mm diameter storm trunk sewer within the Hydro One easement via Winsome Terrace and Valin Street. This existing storm sewer will service the 10 proposed townhouse units fronting onto Brasseur Crescent. See ***Appendix D*** for as-built drawings.

5.2 Proposed Stormwater Management Strategy

- The current design proposes to have stormwater flows conveyed through the FSR study area by way of an underground sewer network connecting to the existing 3000 mm storm trunk sewer via a 6 m servicing block. The stormwater runoff will be treated by the Cardinal Creek Online SWM Facility before ultimately being released into Cardinal Creek.
- The 10 proposed townhouse units fronting onto Brasseur Crescent will be serviced by the existing 675 mm diameter storm sewer within the street. The existing storm sewer ultimately discharges to the existing 3000 mm storm trunk

sewer within the Hydro One corridor; therefore, stormwater will be treated in a similar way to the rest of the subdivision.

- As-built drawings for Valecraft's Cardinal Trail 4 subdivision (Stantec, 2010) show 10 total proposed townhouse units in the same location as the current proposal, so it is anticipated that the storm flows from these units has already been accounted for in Stantec's storm sewer design. As-built drawings are located in ***Appendix E***.
- The proposed stormwater management design is shown on ***Figure 4 – Storm Drainage Plan***.
- See ***Drawing 3 – Profiles*** for preliminary profiles of the proposed road and storm sewer network.

The stormwater management design consists of:

- A storm sewer system designed to capture at least the minimum design capture events required under PIEDTB-2016-01;
- An on-site road network designed to maximize the available storage in the on-site road network for the 100-year design event, where possible, with controlled release of stormwater to the minor storm system; and,
- An overland flow route designed to safely convey stormwater runoff flows in excess of the on-site road storage.
- The minor storm sewer system is sized as follows:
- 2-year event for local streets;
- 5-year event for park;
- 100-year event for rear yards adjacent to existing residential developments.

5.3 Post-Development Stormwater Management Targets

Stormwater management requirements for the stormwater management scheme have been adopted from the ***GCCSMP***, ***City Standards***, and the ***MECP SWMP Manual***.

Given the general criteria mentioned above, the following specific standards are expected to be required for stormwater management within the subject property:

- Quality control is not required on site and will be provided through the existing Cardinal Creek Online SWM Facility.
- Storm sewers on local roads are to be designed to provide at least a 2-year level of service without any ponding per the City's latest Technical Bulletin PIEDTB-2016-01.
- Minor system capture from the park is limited to the 5-year storm event.

- Based on existing grades and drainage patterns, catch basins installed in rear yards adjacent to the existing residential developments are to capture flows up to the 100-year event, with emergency spill points to convey flows in excess of the 100-year event.
- For less frequent storms, the minor system sewer capture will be restricted with the use of inlet control devices to prevent excessive hydraulic surcharges.
- Under full flow conditions, the allowable velocity in storm sewers is to be no less than 0.80 m/s. The preferred maximum velocity is 3.0 m/s, with an allowance of up to 6.0 m/s on an exceptional basis only.
- For the 100-year storm and for all roads, the maximum depth of water (static and/or dynamic) on streets, rear yards, public space and parking areas shall not exceed 0.35 m at the gutter.
- The major system shall be designed with sufficient capacity to allow the excess runoff of a 100-year storm to be conveyed within the public ROW or adjacent to the right-of-way provided that the water level must not touch any part of the building envelope, must remain below all building openings during the stress test event (100-year + 20%), and must maintain 15 cm vertical clearance between spill elevation on the street and the ground elevation at the nearest building envelope.
- When catch basins are installed in rear yards, safe overland flow routes are to be provided to allow the release of excess flows from such areas. A minimum of 30 cm of vertical clearance is required between the rear yard spill elevation and the ground elevation at the adjacent building envelope.
- The product of the maximum flow depths on streets and maximum flow velocity must be less than 0.60 m^2/s on all roads.

5.3.1 Quality Control Targets

Per the ***GCCSMP***, an Enhanced Level of Protection, or 80% removal of Total Suspended Solids (TSS) in accordance with the MECP Stormwater Management Planning and Design Manual (March, 2003) is recommended for infill and redevelopment areas. Per the February 28, 2020 pre-consultation e-mail from the RVCA located in ***Appendix A***, quality control for the site will be provided by the Cardinal Creek Online SWM Facility, with no additional water quality treatment required on site (with the exception of best management practices).

5.3.2 Quantity Control Targets

The City of Ottawa has confirmed that the connection to the existing 3000 mm storm trunk sewer can be considered, provided there are no impacts to the downstream HGL. Per the ***GCCSMP***, infill and redevelopment areas are only required to control post development peak flows to the capacity of downstream stormwater / storm drainage infrastructure for all storms up to and including the 100-year storm. Modelling has shown that the existing

downstream infrastructure including the 3000 mm storm trunk sewer and Cardinal Creek watercourse are not impacted by the FSR study area if it were to discharge without any quantity controls as described in the ***SWM Analysis*** included in ***Appendix E.***

5.4 Stormwater Management Design

- The stormwater runoff from the FSR study area is proposed to be captured by the existing 3000 mm diameter storm trunk sewer and treated by the Cardinal Creek Online SWM Facility, which will provide an Enhanced Level of Protection (80% TSS removal) and discharges to Cardinal Creek.
- The stormwater runoff from the 10 proposed townhouses fronting onto Brasseur Crescent is proposed to be captured by the existing 675 mm storm, discharging to the existing 3000 mm diameter storm trunk sewer and treated by the Cardinal Creek Online SWM Facility, which will provide an Enhanced Level of Protection (80% TSS removal) and discharges to Cardinal Creek.
- The proposed stormwater management design is shown in ***Figure 4 – Storm Drainage Plan***.

5.5 Proposed Minor System

The FSR study area will be serviced by a conventional storm sewer system designed in accordance with City of Ottawa standards that is to generally follow the local road network and proposed servicing easements. Part of the drainage will be conveyed within the underground piped sewer system directly to the existing 3000 mm diameter storm trunk sewer and existing Cardinal Creek Online SWM Facility. The 10 proposed townhouse units fronting onto Brasseur Crescent will be serviced by the existing 675 mm diameter storm sewer within the street, which ultimately discharges to the existing 3000 mm diameter storm trunk sewer. Refer to ***Figure 4 – Storm Drainage Plan***.

Street catchbasins will collect drainage from the streets and front yards, while rear yard catchbasins will capture drainage from backyards. Perforated catch basin leads will be provided in rear yards, except the last segment where it connects to the right-of-way which will be solid pipe, per current City standards.

The preliminary rational method design of the minor system captures drainage for storm events up to the 2-year event for local roads, with minor system capture limited to the 5-year event for the park. There is also 100-year capture for the rear yards adjacent to existing residences. Inlet control devices (ICDs) will be used in catchbasins within the subject property to limit the flows accordingly.

Table 6 summarizes the standards that will be employed in the detailed design of the storm sewer network.

Table 6: Storm Sewer Design Criteria

Design Parameter	Value
Minor System Design Return Period	1:2 year (PIEDTB-2016-01) for local roads, without ponding
Minor System Capture for Park	1:5 year
Minor System Capture for Rear Yards Adjacent to Existing Residential	1:100 year
Major System Design Return Period	100-Year
Intensity Duration Frequency Curve (IDF) 2-year storm event: A = 723.951, B = 6.199, C = 0.810 5-year storm event: A = 998.071, B = 6.053, C = 0.814 100-year storm event: A = 1735.688, B = 6.014, C = 0.820	$i = \frac{A}{(t_c + B)^C}$
Initial Time of Concentration	10 minutes
Rational Method	$Q = CiA$
Runoff coefficient for paved and roof areas	0.9
Runoff coefficient for landscaped areas	0.2
Storm sewers are to be sized employing the Manning's Equation	$Q = \frac{1}{n} AR^{2/3} S^{1/2}$
Minimum Sewer Size	250 mm diameter
Minimum Manning's 'n'	0.013
Minimum Depth of Cover	2.0 m from crown of sewer to grade
Minimum Full Flowing Velocity	0.8 m/s
Maximum Full Flowing Velocity	3.0 m/s
Extracted from Sections 5 and 6 of the City of Ottawa Sewer Design Guidelines (October 2012) and PIEDTB-2016-01 (September 6, 2016)	

The paved area and grassed area runoff coefficients of 0.9 and 0.2, respectively, were used to calculate average runoff coefficients that were applied across the site.

The peak flow based on the Rational Method from the FSR study area to the existing 3000 mm diameter storm trunk sewer is 444 L/s. The flows are to be conveyed by a proposed 825 mm diameter storm sewer through the servicing block and Hydro One easement. The peak flow based on the Rational Method from the FSR study area to the existing 675 mm diameter storm sewer in Brasseur Crescent is 17.8 L/s. This flow represents only 4% of the capacity of the most restricting existing storm sewer in Brasseur Crescent. Refer to the ***SWM Analysis*** in ***Appendix E*** confirming that there are minimal impacts on the existing 3000 mm diameter storm trunk sewer and Cardinal Creek watercourse from the FSR study area. Refer to the storm drainage area plan and storm sewer design sheets enclosed in ***Appendix E*** for reference.

Inlet control devices (ICDs) will be employed to ensure that storm flows entering the minor system are limited to the appropriate peak storm flow. At the time of detailed design, a hydraulic grade line (HGL) analysis will be completed and underside of footing elevations will be set at a minimum of 0.30 m above the HGL elevation.

5.6 Hydraulic Grade Line Analysis

A detailed hydraulic grade line (HGL) modelling analysis will be completed for the proposed system at the detailed design level, based on the 100-year 3-hour Chicago, 12-hour SCS, and 24-hour SCS design storms at the time of detailed design. Detailed grading design and storm sewer design will be modified as required to achieve the freeboard requirements set out in ***Section 5.3*** (per PIEDTB-2016-01).

5.7 Proposed Major System

Major system conveyance, or overland flow (OLF), will be provided to accommodate flows in excess of the minor system capacity. OLF is accommodated by generally storing stormwater up to the 100-year design event in road sags then routing additional surface flow along the road network and service easements towards the proposed outlets, as shown in ***Figure 4 – Storm Drainage Plan***. A composite servicing plan is shown on ***Drawing 2 – Servicing Plan***.

The preliminary grading design shown in ***Figure 2 – Grading Plan***.

Given the elements above and the minor storm system described in ***Section 5.5***, the proposed drainage systems are expected to safely capture and convey all storms up to and including the 100-year event in accordance with the requirements of the City standards.

The overland flows from the FSR study area are conveyed to Brasseur Crescent and Winsome Terrace. The overland flows from the existing subdivision are directed west towards Valin Street and then north via Valin Street. Refer to ***Appendix E*** for the as-built grading plan for the existing subdivision.

Based on existing grades and drainage patterns, rear yard catchbasins adjacent to existing residential developments will capture and convey the 100-year event to the minor system. Emergency spill points for storms in excess of the 100-year event will be provided at the existing parking lot at the corner of Brasseur Crescent / Destiny Private and at the existing roadside ditches in the Safari Court ROW / Trim Road unopened road allowance. See ***Figure 4 – Storm Drainage Plan*** for reference.

5.8 Master Servicing Study

The FSR study area was considered to be serviced by the existing 3000 mm storm trunk sewer in the ***GCCSMP***, but it should be noted that it was modeled based on the existing condition of the site. The model has been revised to account for the proposed change in imperviousness as discussed in the ***SWM Analysis*** in ***Appendix E.*** The stormwater conveyance design generally conforms to the stormwater design included in the ***GCCSMP***. The peak flow based on the Rational Method from the FSR study area to the existing 3000 mm diameter storm trunk sewer is 444 L/s. The flows are to be conveyed by a proposed 825 mm diameter storm sewer through the servicing block and Hydro One

easement. The peak flow based on the Rational Method from the FSR study area to the existing 675 mm diameter storm sewer in Brasseur Crescent is 17.8 L/s. Refer to the ***SWM Analysis*** in ***Appendix E*** confirming that there are minimal impacts on the existing 3000 mm diameter storm trunk sewer and Cardinal Creek watercourse from the FSR study area.

5.9 Stormwater Conclusions

The minor flows from the majority of the FSR study area are conveyed directly to the existing 3000 mm diameter storm trunk sewer, which outlets to the Cardinal Creek Online SWM Facility. Minor flows from the 10 proposed townhouse units fronting onto Brasseur Crescent will be directed to the existing 675 mm diameter storm sewer within the street, which ultimately discharges to the existing 3000 mm diameter storm trunk sewer.

The major flows from the FSR study area are conveyed to Valin Street via Brasseur Crescent and Winsome Terrace. Emergency spill points are provided at the existing parking lot at the corner of Brasseur Crescent / Destiny Private and at the existing roadside ditches in the Safari Court ROW / Trim Road unopened road allowance.

The stormwater design has been completed with conformance to the MECP and City of Ottawa Guidelines. The preliminary rational method design of the minor system captures drainage for storm events up to the 2-year event for local roads, with minor system capture limited to the 5-year event for the park. There is also 100-year capture for the rear yards adjacent to existing residences. Inlet control devices (ICDs) will be used in catchbasins within the subject property to limit the flows accordingly.

Quality control is not required on site, but an Enhanced Level of Protection (80% TSS removal) will be provided by the Cardinal Creek Online SWM Facility for stormwater runoff from the subject property before being discharged to Cardinal Creek.

The storm sewers have been designed in accordance with the ***GCCSMP*** and City of Ottawa standards.

6.0 SITE GRADING

6.1 Master Grading

The FSR study area is constrained by grade raise restrictions, downstream infrastructure (outlets), existing grades on surrounding properties and roads.

The site is subject to grade raise restrictions of 2.0 m for buildings and 2.5 m for roads based on the information provided in the ***Geotechnical Investigation*** by Paterson Group, dated March 12, 2020.

Proposed grades for the site have been designed to be as low as possible based on grade raise restrictions, servicing constraints and existing surrounding properties. Refer to ***Figure 2 – Grading Plan*** for proposed centerline of road grades.

Detailed grading plans will be forwarded to the geotechnical consultant for review and recommendations at the time of detailed design. Final signoff for detailed grading plans will be provided by the Geotechnical Engineer.

6.2 Grading Criteria

The following grading criteria and guidelines will be applied at the time of detailed design as per City of Ottawa Guidelines:

- Driveway slopes will have a maximum slope of 6%;
- Grading in grassed / landscaped areas to range from 2% to 3:1, with terracing required for flops larger than 7%;
- Swales are to be 0.15 m deep with 3:1 side slopes unless otherwise indicated on the drawings;
- Perforated pipe will be required for drainage swales if they are less than 1.5% in slope; and
- Swales are to be 0.15 m deep with 3:1 side slopes unless otherwise indicated on the drawings.

7.0 EROSION AND SEDIMENT CONTROL

Soil erosion occurs naturally and is a function of soil type, climate and topography. The extent of erosions losses is exaggerated during construction where the vegetation has been removed and the top layer of soil is disturbed.

Prior to topsoil stripping, earthworks or underground construction, erosion and sediment controls will be implemented and will be maintained throughout construction

The following recommendations to the contractor will be included in contract documents:

- Limit extent of exposed soils at any given time.
- Re-vegetate exposed areas as soon as possible.
- Minimize the area to be cleared and grubbed.
- Protect exposed slopes with plastic or synthetic mulches.
- Install silt fence to prevent sediment from entering existing ditches.
- No refueling or cleaning of equipment near existing watercourses.
- Provide sediment traps and basins during dewatering.
- Install filter cloth between catch basins and frames.
- Installation of mud mats at construction accesses.
- Construction of temporary sedimentation ponds to treat water prior to outletting to existing wetlands and watercourses.
- Plan construction at proper time to avoid flooding.

8.0 UTILITIES

Utility servicing will be coordinated with individual utility companies prior to site development.

9.0 CONCLUSION AND RECOMMENDATIONS

A summary of the Functional Servicing Report for 1830 Trim Road as follows:

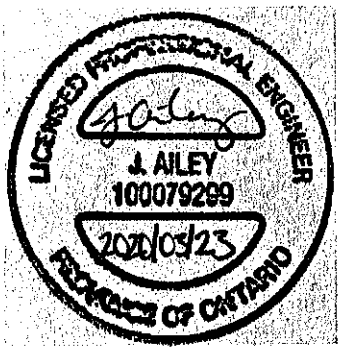
- Approvals will be required from the City of Ottawa and MECP.
- Watermains are designed as per the City of Ottawa guidelines and connect to existing watermains on Trim Road and Winsome Terrace. The 10 proposed townhouses fronting onto Brasseur Crescent will connect to the existing watermain in Brasseur Crescent. A detailed hydraulic analysis has been completed to confirm that the proposed water network can deliver all domestic and fire flows as per the MECP, City of Ottawa and Fire Underwriters criteria.
- Sanitary sewers are designed as per the City of Ottawa guidelines. Sanitary sewers will discharge to the existing sanitary sewer on Winsome Terrace and ultimately to the sanitary trunk sewer on Valin Street and existing sanitary trunk sewer in Liberty Way. The 10 proposed townhouses fronting onto Brasseur Crescent will connect to the existing sanitary sewer in Brasseur Crescent.
- Storm sewers are designed as per the City of Ottawa guidelines and will outlet to the existing 3000 mm diameter storm trunk sewer and Cardinal Creek Online SWM Facility prior to discharge to Cardinal Creek. The 10 proposed townhouses fronting onto Brasseur Crescent will connect to the existing storm sewer in Brasseur Crescent. The major overland flows will be directed to Valin Street via Brasseur Crescent and Winsome Terrace. An analysis has been completed confirming that there are minimal impacts on the existing 3000 mm diameter storm trunk sewer and Cardinal Creek watercourse from the FSR study area.
- Quality control is not required on site, but an Enhanced Level of Protection (80% TSS removal) will be provided by the Cardinal Creek Online SWM Facility for stormwater runoff from the subject property before being discharged to Cardinal Creek.
- The preliminary rational method design of the minor system captures drainage for storm events up to the 2-year event for local roads, with minor system capture limited to the 5-year event for the park. There is also 100-year capture for the rear yards adjacent to existing residences. Inlet control devices (ICDs) will be used in catchbasins within the subject property to limit the flows accordingly.
- The site is subject to a grade raise restriction of 2.0 m for buildings and 2.5 m for roads. Detailed grading plans will be reviewed by a geotechnical engineer and recommendations will be made, as required.
- Erosion and sediment control measures will be implemented and maintained throughout construction. Adjacent properties and watercourses will be protected from any negative impacts from construction.

The design for 1830 Trim Road will be completed in general conformance with the City of Ottawa Design Guidelines and criteria presented in other background study documents.

Prepared by,
David Schaeffer Engineering Ltd.

Per: Anthony Temelini, P.Eng.

Reviewed by,
David Schaeffer Engineering Ltd.



Per: Jennifer Ailey, P.Eng.

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Figures

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LEGEND

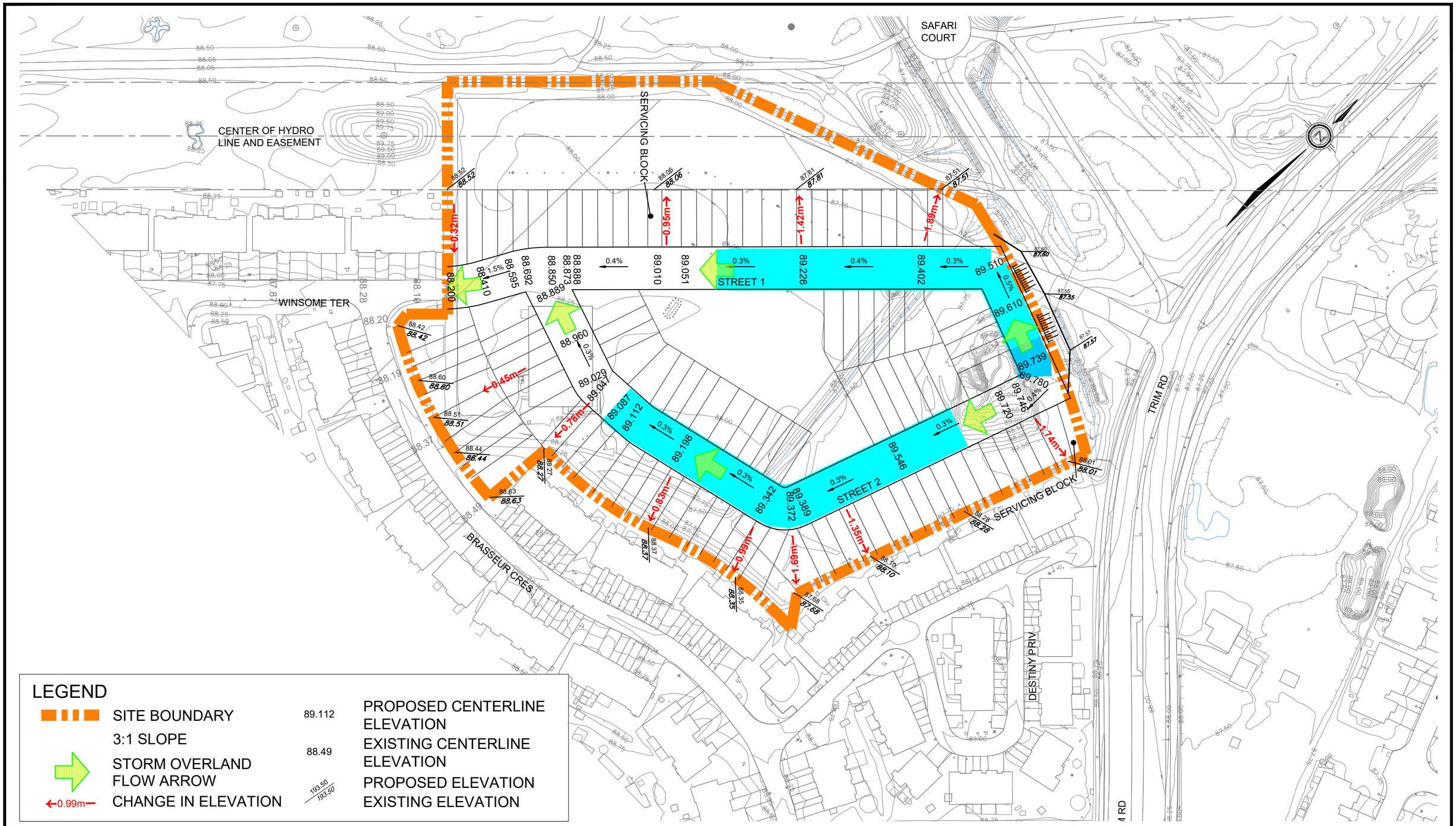
SUBJECT PROPERTY

1830 TRIM ROAD

CITY OF OTTAWA

KEY PLAN

SCALE:	1:20000	PROJECT No.:	19-1137
DATE:	MARCH 2020	FIGURE:	1



LEGEND

- SITE BOUNDARY
- 3:1 SLOPE
- STORM OVERLAND FLOW ARROW
- ←0.99m— CHANGE IN ELEVATION
- 89.112 PROPOSED CENTERLINE ELEVATION
- 88.49 EXISTING CENTERLINE ELEVATION
- 193.50 / 193.50 PROPOSED ELEVATION / EXISTING ELEVATION

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CUT-FILL DEPTH ALONG CENTER LINE:

CUT DEPTH (m)	FILL DEPTH (m)
0 - 1.0	0 - 1.0
1.0 - 2.0	1.0 - 2.0
2.0 - 3.0	2.0 - 3.0
> 3.0	> 3.0

1830 TRIM ROAD

CITY OF OTTAWA

GRADING PLAN

SCALE:	1:1500	PROJECT No.:	19-1137
DATE:	MARCH 2020	FIGURE:	2

Drawings

Drawing 1 – Existing Conditions Plan

Drawing 2 – Servicing Plan

Drawing 3 – Profiles


DEMETER ST
SAFARI COURT
CENTER OF HYDRO LINE AND EASEMENT
WINSOME TER
EXISTING BUILDING
EX. WELL
EX. SEPTIC TANK
10m WORKING EASEMENT PER EXISTING SITE PLAN
PART 6 INST. 12862 PLAN 50R-5951
EX. DITCH
EXISTIING CONTAMINATED TOPSOIL PILE
TRIM RD
BRASSEUR CRES
DESTINY PRIV
BREEZEWOOD ST
LEGEND
SUBJECT LANDS
EXISTING STORM SEWER
EXISTING SANITARY SEWER
EXISTING WATERMAIN
EXISTING STORM MANHOLE
EXISTING SANITARY MANHOLE
EXISTING FIRE HYDRANT
DSEL
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1830 TRIM ROAD
CITY OF OTTAWA
EXISTING CONDITIONS PLAN
SCALE: 1:750
PROJECT No.: 19-1137
DATE: MARCH 2020
DRAWING: 1

SAFARI COURT
SERVICING BLOCK
STREET 1
STREET 2
WINSOME TER
BRASSEUR CRES
TRIM RD
SERVICING BLOCK
R OF HYDRO
D EASEMENT
EX. 3000Ø STM
EX. 900Ø STM STUB
EX. TEEMH 2 (1500mmØ) T/G=88.00
EX. STMMH 2 (1800mmØ) T/G=88.00 N.INV=81.128 STUB S.INV=81.700
EX. 600X600 DITCH INLET OPSD 705.300 WITH 2:1 SLOPE
EX. 3000Ø STM INV=79.008 OBV=82.008 EX. 900Ø STM INV=81.108
S.INV=80.815 STUB N.INV=81.350 EX. 900Ø STM STUB
EX. 3000Ø STM INV=78.804 OBV=81.804 EX. 900Ø STM INV=80.788
EX. TEEMH 3 (1500mmØ) T/G=87.50
EX. 3000Ø STM E INV.=78.330 W INV.=78.330
EX. STMMH 4 (1800mmØ) T/G=87.50 S.INV=80.250 STUB N.INV=81.100
EX. 900Ø STM STUB
EX. 3000Ø STM INV=78.120 OBV=81.120 EX. 900Ø STM INV=80.220
EX. 200Ø WATERMAIN
EX. 675Ø STM
EX. 200Ø SAN
EX. 300Ø STM
EX. SANMH SW INV.=85.31
EX. STMMH NE INV.=82.40 SW INV.=82.40
EX. SANMH NE INV.=84.98 SW INV.=84.88 SE INV.=84.89
EX. STMMH NE INV.=83.15 SW INV.=82.57 SE INV.=82.61
EX. STMMH SW INV.=83.39
EX. STMMH NW INV.=82.74 SE INV.=82.75
EX. SANMH NW INV.=85.02 SE INV.=85.03
EX. STMMH NW INV.=82.89 SE INV.=82.89
EX. SANMH NW INV.=85.11 SE INV.=85.15
EX. STMMH W INV.=83.01 E INV.=83.04
EX. SANMH W INV.=85.25 E INV.=85.26
EX. STMMH W INV.=83.14 E INV.=83.20
EX. SANMH W INV.=85.32 E INV.=85.33
EX. STMMH W INV.=83.30 E INV.=83.37
EX. SANMH W INV.=85.43 E INV.=85.44
EX. STMMH W INV.=83.62 E INV.=83.63
200Ø PVC SAN 93.50 @ 0.35%
525Ø CONC STM 70.50 @ 0.35%
675Ø CONC STM 42.50 @ 0.20%
375Ø PVC STM 70.50 @ 0.35%
525Ø CONC STM 71.00 @ 0.35%
200Ø PVC SAN 71.00 @ 0.35%
450Ø CONC STM 107.50 @ 0.35%
200Ø PVC SAN 108.00 @ 0.65%
EX. 400Ø WATERMAIN
EX. 600Ø SAN
EX. 600Ø STM
LEGEND
SUBJECT LANDS
STORM TRUNK
SANITARY TRUNK
LOCAL WATERMAIN
STORM MANHOLE
SANITARY MANHOLE
EXISTING STORM SEWER
EXISTING SANITARY SEWER
EXISTING WATERMAIN
EXISTING FIRE HYDRANT
EXISTING STORM MANHOLE
EXISTING SANITARY MANHOLE
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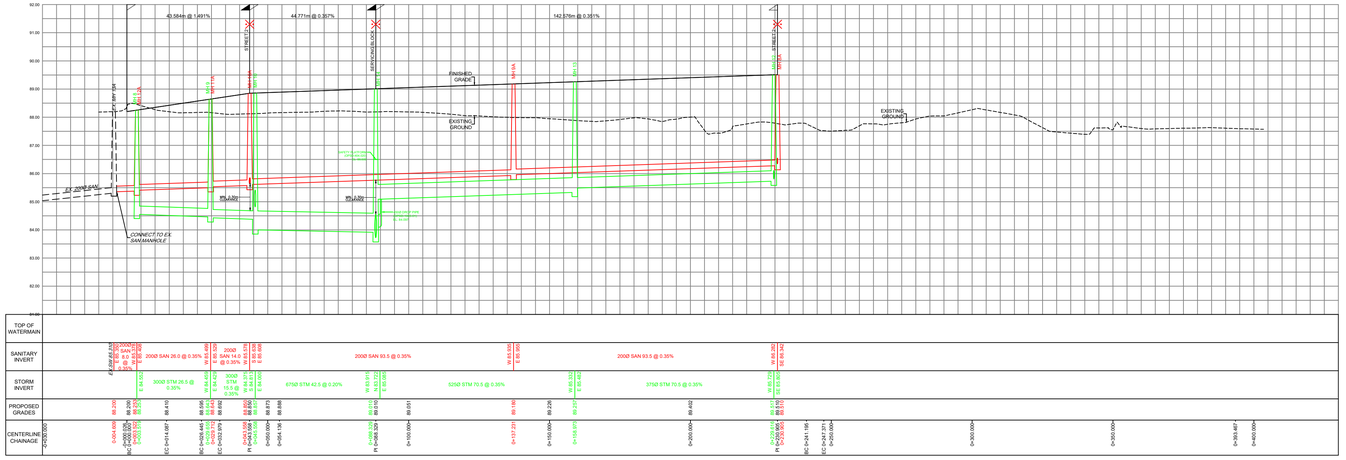
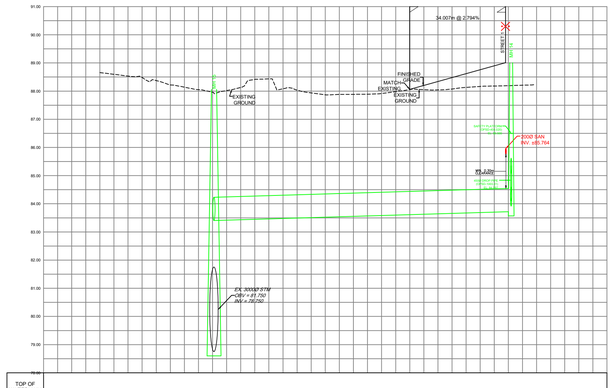
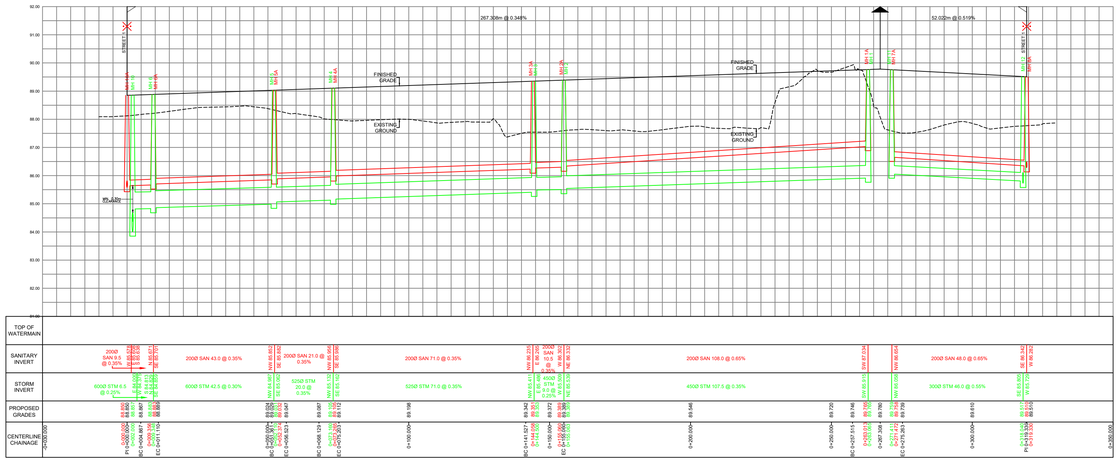
1830 TRIM ROAD
CITY OF OTTAWA
SERVICING PLAN
SCALE: 1:500
PROJECT No.: 19-1137
DATE: MARCH 2020
DRAWING: 2



STREET 1



SERVICING BLOCK



STREET 2

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1830 TRIM ROAD

CITY OF OTTAWA

PROFILES

SCALE:	1:100	PROJECT No.:	19-1137
DATE:	MARCH 2020	DRAWING:	3

APPENDIX A

Pre-Consultation

Development Servicing Study Checklist

Pre-consultation e-mail from City of Ottawa
(Julie Lebrun, January 10, 2020)

Pre-consultation e-mail from City of Ottawa
(Charles Warnock, February 6, 2020)

Pre-consultation e-mail from Rideau Valley Conservation Authority
(Jamie Batchelor, February 28, 2020)

DEVELOPMENT SERVICING STUDY CHECKLIST

19-1137 13/03/2020

4.1 General Content		
☐	Executive Summary (for larger reports only).	N/A
☒	Date and revision number of the report.	Report Cover Sheet
☒	Location map and plan showing municipal address, boundary, and layout of proposed development.	Drawings/Figures
☒	Plan showing the site and location of all existing services.	Drawing 1
☒	Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	Section 1.0
☒	Summary of Pre-consultation Meetings with City and other approval agencies.	Section 1.3
☒	Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.	Section 2.1
☒	Statement of objectives and servicing criteria.	Section 1.0
☒	Identification of existing and proposed infrastructure available in the immediate area.	Sections 3.1, 4.1, 5.1
☐	Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).	N/A
☒	Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	Figure 2
☐	Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	N/A
☐	Proposed phasing of the development, if applicable.	N/A
☒	Reference to geotechnical studies and recommendations concerning servicing.	Section 1.2
☒	All preliminary and formal site plan submissions should have the following information: -Metric scale -North arrow (including construction North) -Key plan -Name and contact information of applicant and property owner -Property limits including bearings and dimensions -Existing and proposed structures and parking areas -Easements, road widening and rights-of-way -Adjacent street names	Drawing 2

4.2 Development Servicing Report: Water		
☐	Confirm consistency with Master Servicing Study, if available	N/A
☒	Availability of public infrastructure to service proposed development	Section 3.1
☒	Identification of system constraints	Section 3.1
☒	Identify boundary conditions	Section 3.1, 3.2
☒	Confirmation of adequate domestic supply and pressure	Section 3.3

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☒	Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.	Section 3.2
☐	Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.	N/A
☐	Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design	N/A
☐	Address reliability requirements such as appropriate location of shut-off valves	N/A
☐	Check on the necessity of a pressure zone boundary modification	N/A
☒	Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range	Section 3.2, 3.3
☒	Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.	Section 3.2
☐	Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.	N/A
☒	Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Section 3.2
☒	Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	Appendix C

4.3 Development Servicing Report: Wastewater

☒	Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).	Section 4.2
☐	Confirm consistency with Master Servicing Study and/or justifications for deviations.	N/A
☐	Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.	N/A
☒	Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Section 4.1
☒	Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)	Section 4.2
☒	Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	Section 4.2, Appendix D
☒	Description of proposed sewer network including sewers, pumping stations, and forcemains.	Section 4.2
☐	Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).	N/A

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☐	Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	N/A
☐	Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	N/A
☐	Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	N/A
☐	Special considerations such as contamination, corrosive environment etc.	N/A

4.4 Development Servicing Report: Stormwater Checklist

☒	Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)	Section 5.1
☒	Analysis of available capacity in existing public infrastructure.	Section 5.1, Appendix E
☒	A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Drawings/Figures
☒	Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.	Section 5.2
☒	Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Section 5.2
☒	Description of the stormwater management concept with facility locations and descriptions with references and supporting information	Section 5.3
☐	Set-back from private sewage disposal systems.	N/A
☐	Watercourse and hazard lands setbacks.	N/A
☒	Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	Appendix A
☒	Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	Section 5.7
☒	Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).	Section 5.3
☐	Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	N/A
☒	Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.	Section 5.1, 5.3
☐	Any proposed diversion of drainage catchment areas from one outlet to another.	N/A
☒	Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	Section 5.1, 5.2, 5.5, 5.6
☒	If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event.	Section 5.5
☐	Identification of potential impacts to receiving watercourses	N/A
☐	Identification of municipal drains and related approval requirements.	N/A

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☒	Descriptions of how the conveyance and storage capacity will be achieved for the development.	Section 5.5, 5.6, 5.7
☐	100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	N/A
☐	Inclusion of hydraulic analysis including hydraulic grade line elevations.	N/A
☒	Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Section 6.0
☐	Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.	N/A
☐	Identification of fill constraints related to floodplain and geotechnical investigation.	N/A

4.5 Approval and Permit Requirements: Checklist

☒	Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement ct. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act.	Section 1.2
☐	Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.	N/A
☐	Changes to Municipal Drains.	N/A
☐	Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	N/A

4.6 Conclusion Checklist

☒	Clearly stated conclusions and recommendations	Section 9.0
☐	Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.	
☒	All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario	

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

Anthony Temelini

From: Lebrun, Julie (Planning) <Julie.Lebrun@ottawa.ca>
Sent: January 10, 2020 9:32 AM
To: Jillian Normand; Emilie Coyle; Carl Furney
Cc: McEwen, Jeff; Curry, William; Giampa, Mike; Wood, Mary Ellen; Ippersiel, Matthew; Mongeon, Lynda; Andrew Harte; Matt Wingate; mdarcy@Patersongroup.ca; Jennifer Ailey
Subject: RE: 1830 Trim Road
Attachments: 1830 Trim Rd_Preliminary Concept7_ 2019dec17.pdf

Good morning all,

We have done a preliminary review of the latest attached plan and find the proposed concept more acceptable as a plan of subdivision. Generally, the City is trying to move away from 18-metre wide local right of ways so we would prefer the continuation of the existing 20-metre right of way within these lands. As you are likely aware, the City is also working towards local streets being 30 km/h, therefore some form of traffic calming should be described in your Transportation Impact Assessment, particularly on the extension of Winsome Terrace. We would also like to see a pedestrian connection from this development to the realigned Trim Road and will work with you to determine its location.

Parks is agreeable to the centrally located park block as shown on the revised concept plan. The walkway block provides connectivity to the hydro corridor pathway which is good, however the City will not consider the walkway block or the small triangular block as parkland dedication. With 109 units, the required parkland dedication is 0.363ha (3,633m2). Through the draft plan of subdivision, if the central park block is under size, any difference will be collected through cash-in-lieu of parkland.

We have provided below a list of submission requirements for a Zoning By-law Amendment and Plan of Subdivision. Further comments regarding the plan will be provided through the approval process, therefore revisions or additional information may be required.

Zoning & Subdivision submission requirements: (3 hard copies and electronic copies on USB of plans and reports)

Engineering and Planning:

Topographical Plan of Survey with a published bench mark
Draft Plan of Subdivision / Concept Plan
Phasing Plan
Planning Rationale (including Design Statement and Integrated Environmental Review Statement)
Building Elevations
Design Brief/Stormwater Management Report (SWM Criteria: 70 l/s/ha with 150 m3/ha ponding in a 100-yr)
Geotechnical Study
Phase 1 and Phase 2 Environmental Site Assessment (with Record of Site Condition)
Archaeological Assessment Stage 1 (and Stage 2 if required)
Transportation Impact Study
Road Modification Plan
Noise and Vibration Study
Tree Conservation Report
Environmental Impact Assessment (including species at risk evaluation)

Additional Engineering:
Functional Servicing Report

Site Plan
Phase Plan
Macro Servicing
Macro Grading
Macro Drainage Plan
Road Cross Sections
Erosion & Sediment Control Plan
Road design

Submission Requirements

Water Boundary condition requests must include the location of the service and the expected loads required by the proposed development. Please provide the following information:

Location of service connections (MAP)
Type of development and the amount of fire flow required (as per FUS).
Average daily demand: ___ l/s.
Maximum daily demand: ___l/s.
Maximum hourly daily demand: ___ l/s.

Technical Requirements:

Minimum Drawing and File Requirements- All Plans

Plans are to be submitted on standard **A1 size** (594mm x 841mm) sheets, utilizing an appropriate Metric scale (1:200, 1:250, 1:300, 1:400, or 1:500) and folded.
With all submitted plans provide an individual PDF of the plans

Many of the plans and studies collected in support of this application must be signed, sealed and dated by a qualified engineer, architect, surveyor, planner or designated specialist. The City will not review a plan or study if it is missing this information. Electronic copies of all required studies and the Draft Plan of Subdivision must be supplied in Adobe .pdf format and accompany your application submission.

Electronic document names should match the study/plan names contained in the above list. These documents will be made publicly available on the City's Development Applications Search Tool.

The Draft Plan of Subdivision must be referenced to the Horizontal Control Network and signed by the property owner.

The Draft Plan of Subdivision, and any subsequent revisions must be supplied in AutoCad or MicroStation CAD (computer aided design) format, in metric units, with reference bearing identified and labelled. If possible, the Plan must also be georeferenced and provided in grid format ie. coordinated in MTM zone 9, NAD83. Linework must clearly indicate perimeter of subdivision and each lot, block or part internal to the subdivision with clear text labels.

****** Note that all reports and studies must be less than 5 years old and the above-noted list of requirements is preliminary and may change if further information is provided by the applicant prior to submission.***

Regards,

Julie Lebrun, MCIP, RPP (MICU, UPC)
Planner / Urbaniste
Development Review, Suburban Services East /
Examen des demandes d'aménagement, Services suburbains est

Planning, Infrastructure and Economic Development /
Services de planification, d'infrastructure et de développement économique
City of Ottawa | Ville d'Ottawa
613.580.2424 ext./poste 27816
ottawa.ca/planning / ottawa.ca/urbanisme

From: Jillian Normand <Jillian.Normand@mattamycorp.com>
Sent: January 06, 2020 10:44 AM
To: Lebrun, Julie (Planning) <Julie.Lebrun@ottawa.ca>; Emilie Coyle <coyle@fotenn.com>; 'Julie Carrara' <carrara@fotenn.com>
Cc: McEwen, Jeff <Jeff.McEwen@ottawa.ca>; Curry, William <William.Curry@ottawa.ca>; Giampa, Mike <Mike.Giampa@ottawa.ca>; Wood, Mary Ellen <MaryEllen.Wood@ottawa.ca>; Ippersiel, Matthew <Matthew.Ippersiel@ottawa.ca>; Mongeon, Lynda <Lynda.Mongeon@ottawa.ca>; Andrew Harte <andrew.harte@cghtransportation.com>; MWingate@dsel.ca; mdarcy@Patersongroup.ca; jailey@dsel.ca
Subject: RE: 1830 Trim Road

Hi Julie,

Happy New Year, I hope you had a restful holiday. Thank you for your comments regarding the initial Site Plan that we submitted for pre-consultation. Please note that Julie Carrara from FoTenn will be our planner on this file moving forward.

Further to our meeting, I have redesigned the Site Plan to remove the City lands from the property, and amend the dwelling type to reduce the density. Additionally, the ROW now includes 18m ROW throughout the plan so that they can be municipally owned, which can accommodate on-street parking, street trees, snow clearing, emergency services and municipal waste pick up. Parkland dedication has been provided as a central park with a pedestrian connection to the Hydro corridor and MUP.

If you would like to have another meeting, I hope one can be accommodated later this week as we must finalize our due diligence period with the Vendor. If a meeting is not required, could you please provide the checklist for application requirements so we can progress with the applications?

Thank you,
Jillian

mattamyHOMES
Jillian Normand, MCIP, RPP
Senior Land Development Manager
T (613) 831-5144 (direct). **C** (613) 415-7786. **F** (613) 831-9060
Jillian.Normand@mattamycorp.com
Ottawa Office: 50 Hines Road, Suite 100, Ottawa, ON Canada K2K 2M5

From: Lebrun, Julie (Planning) <Julie.Lebrun@ottawa.ca>
Sent: December 20, 2019 9:32 AM
To: Jillian Normand <Jillian.Normand@mattamycorp.com>; Emilie Coyle <coyle@fotenn.com>; Carl Furney <furney@fotenn.com>
Cc: McEwen, Jeff <Jeff.McEwen@ottawa.ca>; Curry, William <William.Curry@ottawa.ca>; Giampa, Mike <Mike.Giampa@ottawa.ca>; Wood, Mary Ellen <MaryEllen.Wood@ottawa.ca>; Ippersiel, Matthew <Matthew.Ippersiel@ottawa.ca>; Mongeon, Lynda <Lynda.Mongeon@ottawa.ca>; Andrew Harte <andrew.harte@cghtransportation.com>; MWingate@dsel.ca; mdarcy@Patersongroup.ca; jailey@dsel.ca
Subject: 1830 Trim Road

Good morning,

Following our pre-application consultation meeting on December 9th, 2019, staff have had an opportunity to further discuss your proposal internally. We also understand that the City's Real Estate Office will not be disposing the property adjacent to 1830 Trim Road.

As per our discussions, Planning is unable to support the density you have presented in your proposal or the concept of the entire site being reviewed as a site plan on private streets. These lands should be developed as a plan of subdivision. The continuation of the existing right of way width of 20 metres on Winsome Terrace is reasonable and this is where the service connections will be. A "P" loop public street accessed from the existing neighbourhood showing low to medium density would be appropriate. This would also provide more space for tree planting, on-street parking, snow clearing and waste pick-up.The approach of having townhomes backing onto existing townhomes is encouraged. In accordance with the "Cumberland Neighbourhoods 5, 6 and 7 - Fallingbrook South Development Plan" from 1996, this area was always intended to be developed with low to medium density residential. Pedestrian connections to the existing MUP network must be included. A park block reflecting the required dedication should also be incorporated into the subdivision design outside of the Hydro corridor.

No access to Trim Road can be contemplated at this time since the future of the City block is unknown.

It was noted that Phase 1 and 2 ESA's are likely to be required for this site along with a record of site condition due to the previous land use.

It is understood that you will need to go back and review options for the development of these lands incorporating the above and therefore we will be happy to hold a follow-up meeting once you have prepared a new conceptual plan. It would be good to know the status of the adjacent lands in separate ownership if they are included in the design. The City will provide you with the required submission requirements once we have confirmed what applications will be necessary for your development.

Happy Holidays to all!

Regards,

Julie Lebrun, MCIP, RPP (MICU, UPC)
Planner / Urbaniste
Development Review, Suburban Services East /
Examen des demandes d'aménagement, Services suburbains est
Planning, Infrastructure and Economic Development /
Services de planification, d'infrastructure et de développement économique
City of Ottawa | Ville d'Ottawa
613.580.2424 ext./poste 27816
ottawa.ca/planning / ottawa.ca/urbanisme

Absence Alert / Alerte d'absence:

I will be on annual leave from December 23rd to January 3rd inclusively.
Je serai en congé annuel du 23 décembre au 3 janvier inclusivement.

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This e-mail originates from the City of Ottawa e-mail system. Any distribution, use or copying of this e-mail or the information it contains by other than the intended recipient(s) is unauthorized. Thank you.

Le présent courriel a été expédié par le système de courriels de la Ville d'Ottawa. Toute distribution, utilisation ou reproduction du courriel ou des renseignements qui s'y trouvent par une personne autre que son destinataire prévu est interdite. Je vous remercie de votre collaboration.

'

Anthony Temelini

From: Anthony Temelini
Sent: March 11, 2020 4:57 PM
To: Anthony Temelini
Subject: FW: 1830 Trim Rd - Cardinal Creek subwatershed model

---

From: Warnock, Charles <Charles.Warnock@ottawa.ca>
Sent: Thursday, February 6, 2020 5:09 PM
To: Curry, William <William.Curry@ottawa.ca>
Subject: 1830 Trim Rd - Cardinal Creek subwatershed model

Hi Will, I did have a discussion with Steve Pichette on this piece of land in advance of the pre-consult.
I provided him with the AECOM model.
Steve spoke about connecting to the 3000 mm pipe as opposed to the one on the street nearby (300 then 675 mm).
I told him if he gets the water to the 3000 mm pipe and it did not have adverse effect on the HGL then I don't see a problem.
In fact it could be a better solution.
Apparently if they go to the street connection they need to control to 70 L/s/ha.
If they go to the 3000 mm pipe they can release at the 2 year rate with little effect on the HGL.
Of course they would have to provide us the modeling to confirm their proposal.

I think the confusing thing in the email below is they say release uncontrolled to the 3000 mm pipe.
What they meant was not controlling to 70 L/s/ha.
The flow would still be controlled to the 2 year storm for local roads.
This would make the major overland flow more manageable.
Let me know if you have any questions or if you disagree with this approach.

The one thing they will have to do if they go to the 3000 mm pipe is get permissions from Hydro One.
Thanks.
Charles

From: Curry, William <William.Curry@ottawa.ca>
Sent: January 24, 2020 10:51 AM
To: Warnock, Charles <Charles.Warnock@ottawa.ca>
Subject: FW: 1830 Trim Rd - Cardinal Creek subwatershed model

Charles,

RE: 1830 Trim New Subdivision

Looks like they want **you** to chime in.

Will Curry, C.E.T.

Planning, Infrastructure and Economic Development /
Planification, d'infrastructure et de développement économique
City of Ottawa | Ville d'Ottawa
613.580.2424 ext./poste 16214
110 Laurier Ave., 4th Fl East;
Ottawa ON K1P 1J1

William.Curry@Ottawa.ca

From: Jennifer Ailey <JAiley@dsel.ca>
Sent: January 24, 2020 10:05 AM
To: Curry, William <William.Curry@ottawa.ca>
Cc: Jillian Normand <Jillian.Normand@mattamycorp.com>; Steve Pichette <SPichette@dsel.ca>; Matt Wingate <MWingate@dsel.ca>; Kevin Murphy (Mattamy Homes) <Kevin.Murphy@mattamycorp.com>
Subject: 1830 Trim Rd - Cardinal Creek subwatershed model

Good morning Will,

We have completed an analysis of the subject site at 1830 Trim Road being released uncontrolled to the 3000 mm diameter trunk sewer. Steve Pichette has previously discussed this approach with Charles Warnock and we kindly request you forward this analysis to him for review.

The subject site (1830 Trim Road) is included in the Cardinal Creek subwatershed model as part of sub-catchment CS, which has a drainage area of 22.18 ha at 37.5% imperviousness. The subject site location is circled in magenta in the attached excerpt from the report provided with the Cardinal Creek model. As may be seen from the attached and by comparison to Google Earth images, the subject site has been modelled under existing conditions. We have estimated the percent imperviousness of the existing subject site as roughly 50% based on Google Earth and the property line provided in the concept plan (including the hydro and open space corridor).

Area CS is modelled as having the following stage-area-storage-outflow relationship:

Elevation (m)	Depth (m)	Area (m^2)	Volume (m^3)	Outflow (m^3/s)
95.00	0.00	10	0	0
96.10	1.10	10	11	0
96.20	1.20	10	12	1.43
96.25	1.25	1000	31	1.45
96.30	1.30	4000	147	1.46
96.35	1.35	8700	457	1.48
96.40	1.40	14500	1031	1.50
96.45	1.45	21900	1935	1.52
96.50	1.50	24900	3104	1.55
96.55	1.55	27400	4411	1.55

Where the maximum outflow of 1.55 cms is equal to 70 L/s/ha.

We would like to note that we have previously raised some concerns with this AECOM model in April 2013. The identified issues are summarized as follows:

- It appears that they have not used the City's default parameters for Ia (pervious and impervious) and Horton's infiltration values.
- Their detail model includes various storage nodes that we believe are to represent available major system storage in various built up areas, but no details were provided on how this information was derived. Many of these storage nodes are exceeded for frequent events, which should not be the case.
- Their hydraulic model surcharges to ground level at various locations where water is lost.
- Our own model (SWMHYMO) produces higher (+20% at the outlet of the creek) design flows on the Creek than theirs, partly because of the above issues but mainly because we simulate higher flows from natural and undeveloped areas. We believe that SWMHYMO is better suited to simulate flows from rural areas than XPSWMM.

It is noted that one item in particular that we don't think could be explained away as a modelling / calibration choice by AECOM is that the model output files provided show water levels reaching the top of ground elevation and spilling out of the model at several locations (i.e. volume is lost to the system).

We have preliminarily checked the outcome if the subject site is developed and allowed to drain to the creek without on-site controls by separating the site area (approximately 4.96 ha in Google Earth) from subcatchment CS. The subject site was modelled with an assumed percent imperviousness of 75% under proposed conditions. Related to the identified issues with the existing model, we used values considered appropriate for the subject site, rather than try to match AECOM's parameters. Additionally, we ran both the original model and the "proposed conditions" test model with the manholes "sealed" to avoid losing volumes to spilling. The peak 100-year flows and water levels downstream of the subject site compare as follows:

Link	100-Year Flow (m^3/s)		
	Existing	Proposed	Difference
P-(C-B)	24.77	24.85	0.08
P-(B-A)	25.97	25.95	-0.02
CH(F-G)	21.77	21.66	-0.11
CH(G-H)	21.95	21.89	-0.07
CH(H-I)	27.38	27.29	-0.09
CH(I-O)	27.49	27.41	-0.08
CH(I-O).2	27.70	27.62	-0.09
CH(I-O).1	31.24	31.17	-0.07
Dummy Sg	31.04	30.98	-0.06
watters rd	17.10	17.10	0.00
CAVES OUT	7.31	7.30	0.00
Quality.1	4.25	4.25	0.00

Node	100-Year Water Level (m)		
	Existing	Proposed	Difference
MH-C	83.43	83.31	-0.11
MH-B	81.96	81.89	-0.06
F-OUT	57.31	57.31	-0.01
G	55.60	55.60	0.00
H	51.95	51.95	0.00
I	44.74	44.74	0.00
IO1	43.86	43.86	0.00
IO2	43.09	43.09	0.00

O	41.67	41.67	0.00
Dummy Mh	41.50	41.50	0.00
F-IN	80.83	80.82	-0.01
Dummy-1	71.39	71.39	0.00

Based on the results presented above, there is minimal impact on the system when releasing the flows uncontrolled from our site to the downstream system. We would like to propose this connection to the 3000 mm trunk sewer in the forthcoming design of the subdivision and would appreciate your concurrence.

Thanks,
Jennifer Ailey, P.Eng.
Project Manager

DSEL

david schaeffer engineering ltd.
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Phone: (613) 836-0856 ext. 526
Cell: (613) 222-6476
Email: jailey@dsel.ca

Anthony Temelini

From: Jamie Batchelor <jamie.batchelor@rvca.ca>
Sent: February 28, 2020 9:02 AM
To: Anthony Temelini
Cc: Eric Lalande; Jennifer Ailey
Subject: RE: 1137 - 1830 Trim Road - Quality Control Targets

Good Morning Anthony,

If the proposed servicing for this site will ultimately discharge to the existing Cardinal Creek stormwater management facility, then the RVCA accepts that no further onsite water quality treatment would be required save and except best management practices. We would strongly encourage you to look at any LID measures where possible to incorporate into your stormwater management strategy for the site.

Jamie Batchelor, MCIP, RPP
Planner, ext. 1191
Jamie.batchelor@rvca.ca

Rideau Valley Conservation Authority
3889 Rideau Valley Drive
PO Box 599, Manotick ON K4M 1A5
T 613-692-3571 | 1-800-267-3504 F 613-692-0831 | www.rvca.ca

From: Anthony Temelini <ATemelini@dsel.ca>
Sent: Thursday, February 27, 2020 4:18 PM
To: Jamie Batchelor <jamie.batchelor@rvca.ca>
Cc: Eric Lalande <eric.lalande@rvca.ca>; Jennifer Ailey <JAiley@dsel.ca>
Subject: 1137 - 1830 Trim Road - Quality Control Targets

Hi Jamie,

We are currently working on the preliminary design for a proposed residential development located at 1830 Trim Road – see attached markup for reference. The existing site is currently a vacant bus depot with all existing structures and services to be decommissioned as part of the proposed development.

The proposed development contemplates 110 townhouse units and a park on municipal roads. The current servicing strategy contemplates having the storm sewers for the proposed site connect to the existing 3000 mm storm trunk sewer to the north, ultimately discharging to the existing Cardinal Creek Online SWM Facility, located approximately 425 m downstream from the site.

It should be noted that 10 townhouse units are proposed to be serviced by the existing storm sewer in Brasseur Crescent, which also ultimately discharges to the existing 3000 mm storm trunk sewer and Cardinal Creek Online SWM Facility.

Can you please comment on the stormwater quality objectives for the proposed development?

Please let me know if you have any questions.

Thank you,

Anthony Temelini, P.Eng.
Junior Project Manager

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

phone: (613) 836-0856 ext.524
email: atemelini@dsel.ca

APPENDIX B

Existing Approvals and Legal Plans

Plan 50R-5951 (July 19, 1988)

City of Ottawa land parcels (July 11, 2017)

Service Ontario Property Index Map (September 12, 2019)

MECP ECA #8208-4TRRJF (February 14, 2001)

SCHEDULE				
PART	DESCRIPTION	INST. NO.	REMARKS	AREA sq.m.
1	Part of Lot A Concession 9 Township of Cumberland.	110278	Subject to Easements in Inst.No. 16002.	7315.825
2	"	"		58.532
3	"	"		0.929
4	"	"		86.216
5	"	"		19306.617
6	"	"		1742.391
7	"	"		1696.406
8	"	"		10443.538
9	"	"		442.126

I REQUIRE THIS PLAN TO BE DEPOSITED UNDER THE REGISTRY ACT.
DATE July 18, 1988
Brian J. Lynch
BRIAN J. LYNCH
Ontario Land Surveyor

PLAN 50R-5951
RECEIVED AND DEPOSITED
DATE July 19, 1988
Morinville Dep.
LAND REGISTRAR FOR THE REGISTRY DIVISION OF RUSSELL NO. 50

CAUTION : THIS PLAN IS NOT A PLAN OF SUBDIVISION WITHIN THE MEANING OF THE PLANNING ACT.

PLAN OF SURVEY OF

PART OF LOT A CONCESSION 9
TOWNSHIP OF CUMBERLAND
(Formerly County of Russell)

REGIONAL MUNICIPALITY OF
OTTAWA - CARLETON

SCALE : 1:1250
50 37.5 25 12.5 0 25 50 METRES

METRIC
DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

SURVEYED BY
ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
1988.

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT AND THE REGISTRY ACT AND THE REGULATIONS MADE THEREUNDER.
2. THE SURVEY WAS COMPLETED ON THE 6th DAY OF JULY, 1988.

July 18, 1988 Date
Brian J. Lynch
BRIAN J. LYNCH
Ontario Land Surveyor

NOTES & LEGEND

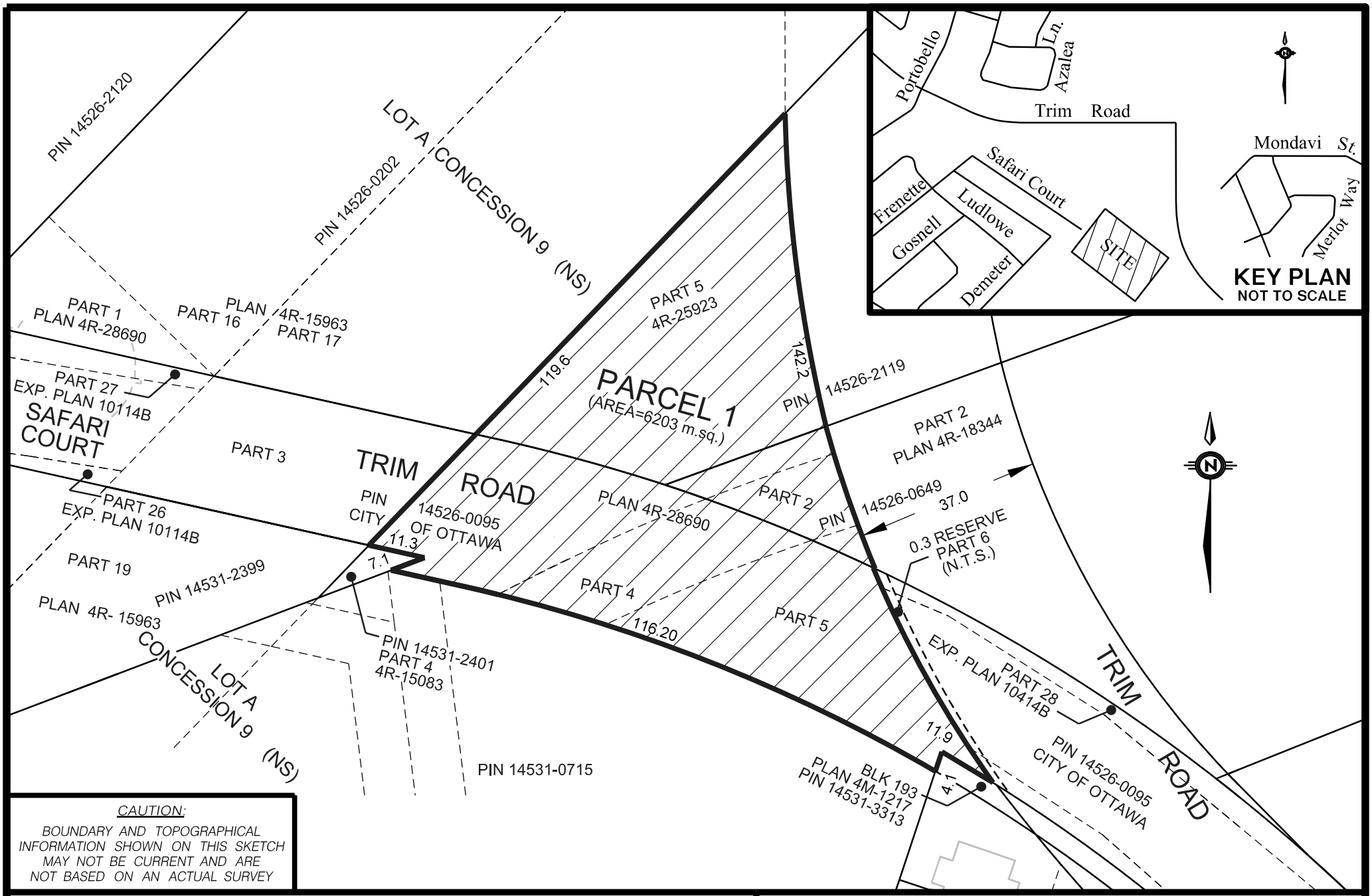
SURVEY MONUMENT PLANTED shown thus
SURVEY MONUMENT FOUND shown thus

S.I.B.	denotes	STANDARD IRON BAR (0.025sq X 0.61)
S.S.I.B.	"	SHORT STANDARD IRON BAR (0.025 sq. X 0.61)
I.B.Ø	"	IRON BAR ROUND (0.019Ø X 0.61)
I.B.	"	IRON BAR (0.016sq. X 0.61)
R.I.B.	"	ROUND IRON BAR
C.C.	"	CUT CROSS
I.P.	"	IRON PIPE
Fd.	"	FOUND
Acc.	"	ACCEPTED
Wit.	"	WITNESS
P&W	"	POST AND WIRE

BEARINGS ARE ASTRONOMIC DERIVED FROM THE NORTHERLY LIMIT OF PART 13 PLAN 50R-4052 SHOWN TO BE N 44° 39' 10" E .

FROM THE OFFICE OF
ANNIS, O'SULLIVAN, VOLLEBEKK LTD
ONTARIO LAND SURVEYORS
NEPEAN (OTTAWA) EMBRUN, ONTARIO.

JOB N° 255-88



CAUTION:
BOUNDARY AND TOPOGRAPHICAL INFORMATION SHOWN ON THIS SKETCH MAY NOT BE CURRENT AND ARE NOT BASED ON AN ACTUAL SURVEY

TRIM ROAD - EAST OF PORTOBELLO BLVD.

OWNER: CITY OF OTTAWA		CAD BY: A. KING	
		CHECKED BY: G. HARTWICK	
SCALE 1:1000 (METRIC)	DATE JULY 11, 2017	AREA AS NOTED	MS No. 17757P002-6D.dgn

Ottawa

INFRASTRUCTURE SERVICES DEPARTMENT
SURVEYS & MAPPING UNIT

ServiceOntario

PRINTED ON 12 SEP, 2019 AT 07:21:44
FOR MATTHEW01

SCALE

0 30 60 90 120 meters

PROPERTY INDEX MAP

OTTAWA-CARLETON(No. 04)

LEGEND

FREEHOLD PROPERTY	
LEASEHOLD PROPERTY	
LIMITED INTEREST PROPERTY	
CONDOMINIUM PROPERTY	
RETIRED PIN (MAP UPDATE PENDING)	
PROPERTY NUMBER	*0449*
BLOCK NUMBER	08050
GEOGRAPHIC FABRIC	——
EASEMENT	- - - -

THIS IS NOT A PLAN OF SURVEY

NOTES

REVIEW THE TITLE RECORDS FOR COMPLETE PROPERTY INFORMATION AS THIS MAP MAY NOT REFLECT RECENT REGISTRATIONS

THIS MAP WAS COMPILED FROM PLANS AND DOCUMENTS RECORDED IN THE LAND REGISTRATION SYSTEM AND HAS BEEN PREPARED FOR PROPERTY INDEXING PURPOSES ONLY

FOR DIMENSIONS OF PROPERTIES BOUNDARIES SEE RECORDED PLANS AND DOCUMENTS

ONLY MAJOR EASEMENTS ARE SHOWN

REFERENCE PLANS UNDERLYING MORE RECENT REFERENCE PLANS ARE NOT ILLUSTRATED

Ontario

Ontario

Ministry of the Environment **Ministère de l'Environnement**

CERTIFICATE OF APPROVAL
MUNICIPAL AND PRIVATE SEWAGE WORKS
NUMBER 8208-4TRRJF

Corporation of the City of Cumberland
255 Centrum Blvd., Suite 100
Cumberland, Ontario
K1E 3V8

Site Location: Lot B, Conc. 8&9, East Urban Community Expansion Area
Cumberland Township, Regional Municipality of Ottawa-Carleton

You have applied in accordance with Section 53 of the Ontario Water Resources Act for approval of:

Construction of a trunk storm sewer, with a length of 1,240 metres and diameter ranging from 2,400 mm to 3,000 mm, to service approximately 454 ha drainage area located at the eastern portion of the East Urban Community Expansion Area in the City of Cumberland, consisting of the following:

STREET	FROM	TO
STORM SEWER		
Ontario Hydro Easement	Portobello Boulevard	Cardinal Creek Tributary

all in accordance with the Application for Approval of Private and Municipal Sewage Works submitted by City of Cumberland dated December 5, 2000 and final plans and specifications prepared by Cumming Cockburn Limited, Consulting Engineers and Planners, Ottawa, Ontario.

In accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, as amended, you may by written notice served upon me and the Environmental Appeal Board within 15 days after receipt of this Notice, require a hearing by the Board. Section 101 of the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the works are located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Appeal Board
2300 Yonge St., 12th Floor
P.O. Box 2382
Toronto, Ontario
M4P 1E4

AND

The Director
Section 53, *Ontario Water Resources Act*
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Appeal Board's requirements for an appeal can be obtained directly from the Board at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca**

The above noted sewage works are approved under Section 53 of the Ontario Water Resources Act.

DATED AT TORONTO this 14th day of February, 2001

Mohamed Dhalla, P.Eng.
Director
Section 53, *Ontario Water Resources Act*

SH/
c: District Manager, MOE Ottawa
Peter Spal, Cumming Cockburn Limited

APPENDIX C

Water Supply

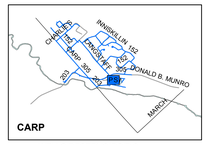
City of Ottawa – Water Distribution System Facilities and Feedermains

Boundary Condition Request (March 5, 2020)

Boundary Conditions from City of Ottawa

Hydraulic Capacity and Modeling Analysis – 1830 Trim Road, GeoAdvice Engineering (March 20, 2020)

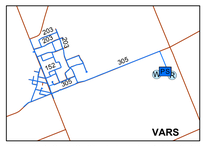
City of Ottawa - Water Distribution System
Facilities & Feedermains



WELLS/RESERVOIRS/P.S

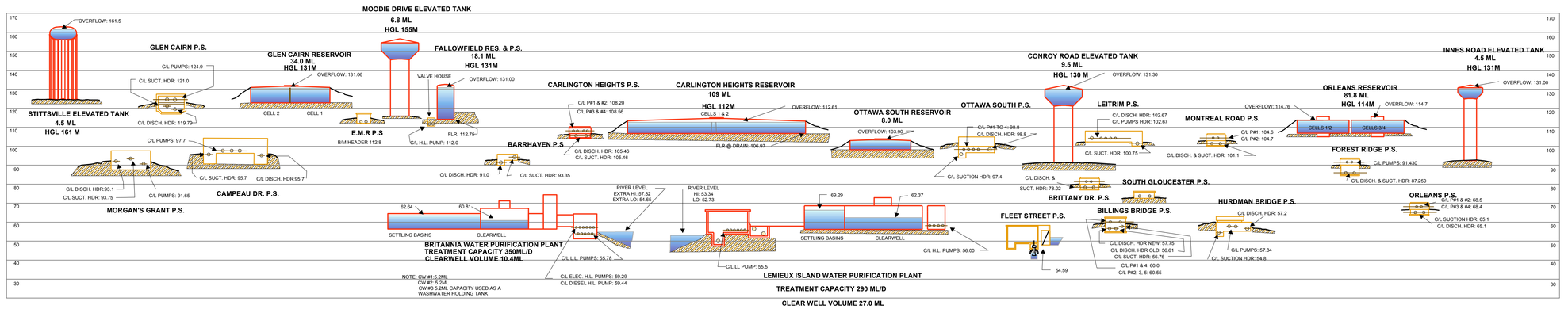
WELLS

WELLS/RESERVOIRS/P.S



WELLS/RESERVOIRS/TREATMENT PLANT & P.S

ORLEANS P.S.
FOREST RIDGE P.S
Ogilvie Rd. Backup P.S.
ORLEANS RES.
MONTREAL ROAD P.S.
BRITTANY DRIVE P.S.
SUBJECT SITE
INNES RD ELEVATED TANK
FLEET STREET P.S.
LEMIEUX ISLAND PURIFICATION PLANT & P.S. & RES.
HURDMAN P.S.
Innes Rd Backup P.S.
Innes Rd/BearBrook Rd Backup P.S.
BRITANNIA PURIFICATION PLANT & P.S. & RES.
BILLINGS BRIDGE P.S.
MORGAN'S GRANT P.S.
CARLINGTON HEIGHTS P.S. & RES.
CONROY RD ELEVATED TANK
CAMPEAU DR. P.S.
ENERGY MINES & RESOURCES P.S.
SOUTH GLOUCESTER P.S.
LEITRIM P.S.
GLEN CAIRN P.S. & RES
BARRHAVEN P.S.
Merivale Rd. Backup P.S.
OTTAWA SOUTH P.S & RES.
FALLOWFIELD RD. RES. & P.S.
STITTSVILLE ELEVATED TANK
Abbott/Iber St. Backup P.S.
MOODIE ELEVATED TANK
SHADOW RIDGE P.S. & WELLS
1E
1W
2E
2W2C
3C
3W
4C
ME
EMR
BARR
MG
MONT



Legend

Water System Structure

- Pump Station
- Backup Pump Station
- Water Treatment Plant
- Well
- Elevated Tank
- Reservoir

WATERMAINS

Priority, Internal Diameter

- Backbone 1524mm - 1981mm
- Backbone 1067mm - 1372mm
- Backbone 610mm - 914mm
- Backbone 406mm - 508mm
- Backbone 152mm - 305mm
- Distribution 1676mm - 1981mm
- Distribution 1067mm - 1372mm
- Distribution 610mm - 914mm
- Distribution 406mm - 508mm
- Distribution 305mm - 381mm

PRESSURE ZONES

- 1E
- 1W
- 2E
- 2W2C
- 3C
- 3W
- 4C
- BARR
- EMR
- ME
- MG
- MONT
- SHADOW RIDGE

N
W E
S

Ottawa

Planning, Infrastructure and Economic Development Department
Right of Way, Heritage & Urban Design Services
Infrastructure Services

0 1,000 2,000 4,000 6,000
Meters

FIGURE 1-1

Drawn By: Gis & Data Management Date:23- Oct- 2017

Anthony Temelini

From: Anthony Temelini
Sent: March 5, 2020 2:36 PM
To: 'Curry, William'
Cc: Jennifer Ailey; Jillian Normand; Conor Sutherland (Conor.Sutherland@mattamycorp.com); Lebrun, Julie (Planning)
Subject: RE: 1830 Trim Road
Attachments: 1830 Trim Rd_Preliminary Concept concept8C_without templates_Mar 5 20_ec.pdf; wtr-2020-03-05_1137_ajt.pdf

Hi Will,

Please note that Mattamy has revised the concept plan to show a 6 m servicing block with the intention to have a pathway and watermain connection to Trim Road.

As such, we are proceeding with the boundary request as follows:

1. Location of Service / Street Number: 1830 Trim Road.

2. Type of development and the amount of fire flow required for the proposed development:

- Proposed residential development with 111 townhouse units and 1 park.
- Of the 111 proposed townhouse units, 10 are proposed to front onto Brasseur Crescent and will be serviced by the existing watermain. These units have been included in the demands to be conservative.
- It is anticipated that the development will have two (2) connection points (see attached markup):
    - Connection 1 to the existing 400 mm diameter watermain on Trim Road;
    - Connection 2 to the existing 200 mm diameter watermain on Winsome Terrace;
- It is anticipated that the proposed townhouse units will meet the City's fire flow cap of 167 L/s. A fire flow of 250 L/s is anticipated for the park, similar to previous projects.

3. Anticipated demands for the development have been calculated per the attached spreadsheet, with an additional 10% contingency to be conservative:

	L/min	L/s	L/s (+10%)
Avg. Daily	65.6	1.09	1.20
Max Day	220.9	3.68	4.05
Peak Hour	334.5	5.58	6.13
Min Hour	32.8	0.55	0.60

Can you please forward the boundary condition request to the City's water modelling group and confirm once it has been submitted?

Thank you,

Anthony Temelini, P.Eng.
Junior Project Manager

DSEL
david schaeffer engineering ltd.

Mattamy Homes
1830 Trim Road
Proposed Site Conditions

Water Demand Design Flows per Unit Count
City of Ottawa - Water Distribution Guidelines, July 2010

Domestic Demand

Type of Housing	Per / Unit	Units	Pop
Single Family	3.4	-	0
Semi-detached	2.7	-	0
Townhouse	2.7	111	300
Apartment			0
Bachelor	1.4	-	0
1 Bedroom	1.4	-	0
2 Bedroom	2.1	-	0
3 Bedroom	3.1	-	0
Average	1.8	-	0

	Pop	Avg. Daily		Max Day		Peak Hour	
		m^3/d	L/min	m^3/d	L/min	m^3/d	L/min
Total Domestic Demand	300	84.0	58.3	302.4	210.0	453.6	315.0

Institutional / Commercial / Industrial Demand

Property Type	Unit Rate	Units	Avg. Daily		Max Day		Peak Hour	
			m^3/d	L/min	m^3/d	L/min	m^3/d	L/min
Commercial floor space	2.5 L/m^2/d	-	0.00	0.0	0.0	0.0	0.0	0.0
Office	75 L/9.3m^2/d	-	0.00	0.0	0.0	0.0	0.0	0.0
Restaurant	125 L/seat/d	-	0.00	0.0	0.0	0.0	0.0	0.0
Park*	28,000 L/gross ha/d	0.372	10.42	7.2	15.6	10.9	28.1	19.5
Industrial - Light	35,000 L/gross ha/d	-	0.00	0.0	0.0	0.0	0.0	0.0
Industrial - Heavy	55,000 L/gross ha/d	-	0.00	0.0	0.0	0.0	0.0	0.0
Total I/CI Demand			10.4	7.2	15.6	10.9	28.1	19.5
Total Demand			**94.4**	**65.6**	**318.0**	**220.9**	**481.7**	**334.5**

* Park is treated as institutional per previous DSEL projects and discussions with GeoAdvice Engineering

Boundary Conditions
1830 Trim Road

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	72	1.20
Maximum Daily Demand	243	4.05
Peak Hour	368	6.13
Fire Flow Demand #1	10,020	167.00
Fire Flow Demand #2	15,000	250.00

Location

Results

Connection 1 – Trim Rd.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.2	60.9
Peak Hour	125.8	54.7
Max Day plus Fire 1	127.2	56.7
Max Day plus Fire 2	125.4	54.1

[1] Ground Elevation = 87.4 m

Connection 2 – Winsome Terr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.2	59.7
Peak Hour	125.8	53.5
Max Day plus Fire 1	120.4	45.8
Max Day plus Fire 2	111.7	33.4

[1] Ground Elevation = 88.2 m

Notes:

1. To meet Fire Flow pressure requirements, a pipe connection is required between connection points 1 and 2. Exact connection points to be reviewed and confirmed with detail designs.

Disclaimer

The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation. Fire Flow analysis is a reflection of available flow in the watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.

Hydraulic Capacity and Modeling Analysis 1830 Trim Road Development

Final Report

Prepared for:
David Schaeffer Engineering Ltd.
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

Prepared by:
GeoAdvice Engineering Inc.
Unit 203, 2502 St. John's Street
Port Moody, BC V3H 2B4

Submission Date: March 20, 2020

Contact: Mr. Werner de Schaetzen, Ph.D., P.Eng.
Project: 2020-019-DSE

Document History and Version Control

Revision No.	Date	Document Description	Revised By	Reviewed By
R0	March 20, 2020	Draft	Ferdinand de Schoutheete	Werner de Schaetzen
R1	March 20, 2020	Final	Ferdinand de Schoutheete	Werner de Schaetzen

Statement of Qualifications and Limitations

This document represents GeoAdvice Engineering Inc. best professional judgment based on the information available at the time of its completion and as appropriate for the project scope of work. Services performed in developing the content of this document have been conducted in a manner consistent with that level and skill ordinarily exercised by a member of the engineering profession currently practicing under similar conditions. No warranty, express or implied is made.

Contents

1 Introduction

GeoAdvice Engineering Inc. ("GeoAdvice") was retained by David Schaeffer Engineering Ltd. ("DSEL") to size the water main network for the 1830 Trim Road development ("Development") in the City of Ottawa, ON ("City").

The development is located at 1830 Trim Road between Trim Road and Brasseur Crescent, west of Destiny Private. To the north-east of the development there is an existing 400 mm trunk main on Trim Road, and to the south-west there is an existing 200 mm trunk main on Winsome Terrace.

The development consists of 111 townhouse units. Within the development there are 10 townhouse units that will serviced by an existing watermain on Brasseur Crescent.

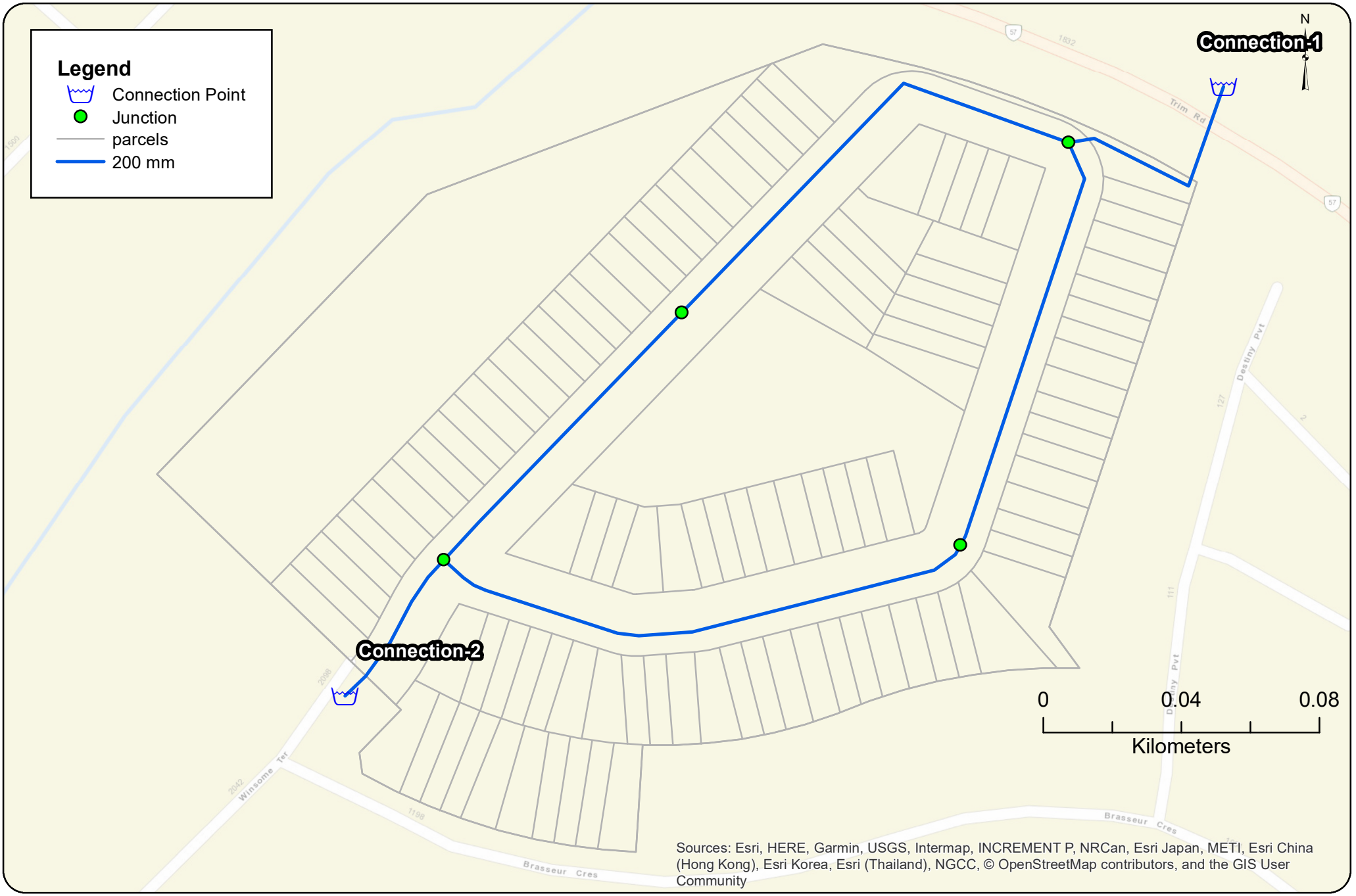
The development model will have two (2) connections to the City water distribution system:

- Connection 1: Existing 400 mm diameter watermain on Trim Road; and
- Connection 2: Existing 200 mm diameter watermain on Winsome Terrace.

The development site is shown in **Figure 1.1** with the final recommended pipe diameters.

This report describes the assumptions and results of the hydraulic modeling and capacity analysis using InfoWater (Innovyze), a GIS water distribution system modeling and management software application.

The results presented in this report are based on the analysis of steady state simulations. The predicted available fire flows, as calculated by the hydraulic model, represent the flow available in the water main while maintaining a residual pressure of 20 psi. No extended period simulations were completed in this analysis to assess the water quality or to assess the hydraulic impact on storage and pumping.



GeoAdvice Engineering Inc.

Project: **Hydraulic Capacity and Modeling Analysis**
Trim Road Development
Client: **David Schaeffer Engineering Ltd.**
Date: **March 2020**
Created by: **FdS**
Reviewed by: **WdS**

Site Layout and Connection Points

Figure 1.1

2 Modeling Considerations

2.1 Water Main Configuration

The water main network was modeled based on development layout provided by DSEL to GeoAdvice on March 6, 2020.

2.2 Elevations

Elevations of the modeled junctions were assigned based on the grading plan of the development provided by DSEL to GeoAdvice on March 6, 2020.

2.3 Consumer Demands

The residential demand rate of 280 L/cap/d was used as per City of Ottawa technical bulletin ISTB 2018-01. Peaking factors were taken from the Ministry of Environment (MOE) Design Guidelines for Drinking-Water Systems *Table 3-3: Peaking Factors for Drinking-Water Systems Serving Fewer than 500 People*. A 10% buffer was applied to population estimates to account for any minor changes that may occur during the detailed design of the development as requested by DSEL. A summary of the rates and peaking factors relevant for this 300 people development is shown in **Table 2.1** below.

Table 2.1: City of Ottawa Demand Rate and MOE Peaking Factors

Demand Type	Amount	Unit
Average Day Demand		
Residential	280	L/c/d
Parkette	28,000	L/ha/d
Maximum Daily Demand		
Residential	3.6 x avg. day	L/c/d
Parkette	1.5 x avg. day	L/ha/d
Peak Hour Demand		
Residential	5.4 x avg. day	L/c/d
Parkette	2.7 x avg. day	L/ha/d
Minimum Hour Demand		
Residential	0.2 x avg. day	L/c/d
Parkette	0.5 x avg. day	L/c/d

Table 2.2 summarizes the water demand calculations for the Trim Road Development.

Table 2.2: Development Demand Calculations

Dwelling Type	Number of Units	Unit Rate*	Pop	Average Day Demand (L/s)	Maximum Day Demand (L/s)	Peak Hour Demand (L/s)	Minimum Hour Demand (L/s)
Townhouse	111	2.7 cap/unit	300	0.97	3.50	5.24	0.19
Parkette	0.39 ha	28,000 L/ha/day	-	0.13	0.19	0.34	0.06
Total (+ 10 %)				**1.21**	**4.05**	**6.14**	**0.28**

***City of Ottawa Design Guidelines**

Demands were grouped into demand polygons then distributed to model nodes located within each polygon. Detailed calculations of demands as well as the illustrated allocation areas are shown in **Appendix A**.

2.4 Fire Flow Demand

Fire flow demands are typically determined in accordance with the Fire Underwriters Survey's Water Supply for Public fire Protection guideline (1999). FUS calculations are based on the types of building, floor area, number of storeys, construction class, occupancy class and exposure facture. At this time, there is not enough information about the building construction details. The townhomes are anticipated to meet the City of Ottawa's cap of 10,000 L/min (167 L/s) as outlined in ISDTB-2018-02, which will be confirmed at the time of the detailed design. Therefore, typical fire flow requirements for various types of developments were assumed as shown in the table below as confirmed with DSEL.

Table 2.3: Typical Fire Flow Requirements at 140 kPa (20 psi)

Development Type	Fire Flow (L/s)
Townhouse	167
Parkette	167

As more information about the building design becomes available, the fire flow requirements should be recalculated using the Fire Underwriters Survey.

2.5 Boundary Conditions

The boundary conditions were provided by the City of Ottawa in the form of Hydraulic Grade Line (HGL) at the following locations:

- Connection 1: Existing 400 mm diameter watermain on Trim Road; and
- Connection 2: Existing 200 mm diameter watermain on Winsome Terrace.

The above connection points are illustrated in **Figure 1.1**.

The table below summarizes the boundary conditions used to size the Trim Road development water network.

Table 2.4: Boundary Conditions (Provided by DSEL on March 16, 2020)

Condition	Connection 1 HGL (m)	Connection 2 HGL (m)
Min Hour (maximum pressure)	130.2	130.2
Peak Hour (minimum pressure)	125.8	125.8
Max Day + Fire Flow (167 L/s)	127.2	120.4

3 Hydraulic Capacity Design Criteria

3.1 Pipe Characteristics

Pipe characteristics of internal diameter (ID) and Hazen-Williams C factors were assigned in the model according to the City of Ottawa Design Guidelines for PVC water main material. Pipe characteristics used for the development are outlined in **Table 3.1** below.

Table 3.1: Model Pipe Characteristics

Nominal Diameter (mm)	ID PVC (mm)	Hazen Williams C-Factor (/)
200	204	110

3.2 Pressure Requirements

As outlined in the City of Ottawa Design Guidelines, the generally accepted best practice is to design new water distribution systems to operate between 350 kPa (50 psi) and 480 kPa (70 psi). The maximum pressure at any point in the distribution system in occupied areas outside of the public right-of-way shall not exceed 552 kPa (80 psi). Pressure requirements are outlined in **Table 3.2.**

Table 3.2: Pressure Requirements

Demand Condition	Minimum Pressure		Maximum Pressure	
	(kPa)	(psi)	(kPa)	(psi)
Normal Operating Pressure (maximum daily flow)	350	50	480	70
Peak Hour Demand (minimum allowable pressure)	276	40	-	-
Maximum Fixture Pressure (Ontario Building Code)	-	-	552	80
Maximum Distribution Pressure (minimum hour check)	-	-	552	80
Maximum Day Plus Fire	140	20	-	-

4 Hydraulic Capacity Analysis

The proposed water mains within the development were sized to the minimum diameter which would satisfy the greater of maximum day plus fire and peak hour demand. Modeling was carried out for minimum hour, peak hour and maximum day plus fire flow using InfoWater. The boundary conditions provide by DSEL on March 16, 2020 were used to size the network, and the results are presented in the following sections.

Detailed pipe and junction model input data can be found in **Appendix C**.

4.1 Development Pressure Analysis

The modeling results indicate that the development can be adequately serviced by the proposed water main layout shown in **Figure 1.1**. Modeled service pressures for the development are summarized in **Table 4.1**.

Table 4.1: Summary of Available Service Pressures

Minimum Hour Demand Maximum Pressure	Peak Hour Demand Minimum Pressure
59 psi	51 psi

As outlined in the City of Ottawa Design Guidelines, the generally accepted best practice is to design new water distribution systems to operate between 50 psi and 70 psi. The maximum pressure at any point in the distribution system in occupied areas outside of the public right-of-way shall not exceed 80 psi.

Detailed pipe and junction result tables and maps can be found in **Appendix D**.

4.2 Development Fire Flow Analysis

A summary of the minimum available fire flows in the development is shown below.

Table 4.2: Summary of Minimum Available Fire Flows

Required Fire Flow	Minimum Available Flow**	Junction ID
167 L/s*	269 L/s	J-02

*The townhomes are anticipated to meet the City of Ottawa's cap of 10,000 L/min (167 L/s) as outlined in ISDTB-2018-02, which will be confirmed at the time of the detailed design.
**The predicted available fire flows, as calculated by the hydraulic model, represent the flow available in the water main while maintaining a residual pressure of 20 psi at the hydrant.

As shown in **Table 4.2**, the model predicts that the fire flow requirements can be met throughout the Trim Road development with the proposed water main layout shown in **Figure 1.1**.

A summary of the residual pressures in the Trim Road development is shown below in **Table 4.3**. The minimum allowable pressure under fire flow conditions is 20 psi at the location of the fire.

Table 4.3: Summary of Residual Pressures (MDD + FF)

Maximum Residual Pressure (psi)	Average Residual Pressure (psi)	Minimum Residual Pressure (psi)
42	39	36

As show in **Table 4.3**, the model predicts that the residual pressure requirements can be met throughout the Trim Road development with the proposed water main layout shown in **Figure 1.1**.

Detailed fire flow results and figures illustrating the fire flow results can be found in **Appendix E**.

5 Other Servicing Considerations

5.1 Water Supply Security

The City of Ottawa Design Guidelines allow single feed systems for developments up to a total average day demand of 50 m^3/day and require two (2) feeds if the development exceeds 50 m^3/day for supply security, according to Technical Bulletin ISDTB-2014-02.

The Trim Road development services a total average day demand of 104 m^3/day; as such, at least two (2) feeds are required.

5.2 Valves

No comment has been made in this report with respect to exact placement of isolation valves within the distribution network for the Trim Road development other than to summarize the City of Ottawa Design Guidelines for number, location, and spacing of isolation valves:

- Tee intersection – two (2) valves
- Cross intersection – three (3) valves
- Valves shall be located 2 m away from the intersection
- 300 m spacing for 150 mm to 400 mm diameter valves
- Gate valves for 100 mm to 300 mm diameter mains
- Butterfly valves for 400 mm and larger diameter mains

Drain valves are not strictly required under the City of Ottawa Design Guidelines for water mains under 600 mm in diameter. The Guidelines indicate that “small diameter water mains shall be drained through hydrant via pumping if needed.”

Air valves are not strictly required under the City of Ottawa Design Guidelines for water mains up to and including 400 mm in diameter. The Guidelines indicate that air removal “can be accomplished by the strategic positioning of hydrant at the high points to remove the air or by installing or utilizing available 50 mm chlorination nozzles in 300 mm and 400 mm chambers.”

The detailed engineering drawings for the Trim Road development are expected to identify valves in accordance with the requirements noted above.

5.3 Hydrants

No comment has been made in this report with respect to exact placement of hydrants within the distribution network for the Trim Road development other than to summarize the City of Ottawa Design Guidelines for maximum hydrant spacing:

- 125 m for single family unit residential areas on lots where frontage at the street line is 15 m or longer
- 110 m for single family unit residential areas on lots where frontage at the street line is less than 15 m and for residential areas zoned for row housing, doubles or duplexes
- 90 m for institutional, commercial, industrial, apartments and high-density areas

The detailed engineering drawings for the Trim Road development are expected to identify hydrants in accordance with the requirements noted above or to meet required fire flows.

6 Conclusions

The hydraulic capacity and modeling analysis of the Trim Road development yielded the following conclusions:

- The proposed water main network can deliver all required domestic and fire flows under the provided boundary conditions.
- Domestic pressures expected to range between 51 psi and 59 psi.
- Residual pressures expected to range between 36 psi and 42 psi.

Submission

Prepared by:

Ferdinand de Schoutheete
Hydraulic Modeler

Approved by:

LICENSED PROFESSIONAL ENGINEER
W. B. F. de Schaetzen
100116349
PROVINCE OF ONTARIO

Werner de Schaetzen, Ph.D., P.Eng.
Senior Modeling Review / Project Manager

OQM | Organizational Quality Management Program

GeoADVICE

Appendix A Demand Calculation and Allocation

Consumer Water Demands

Residential Demands

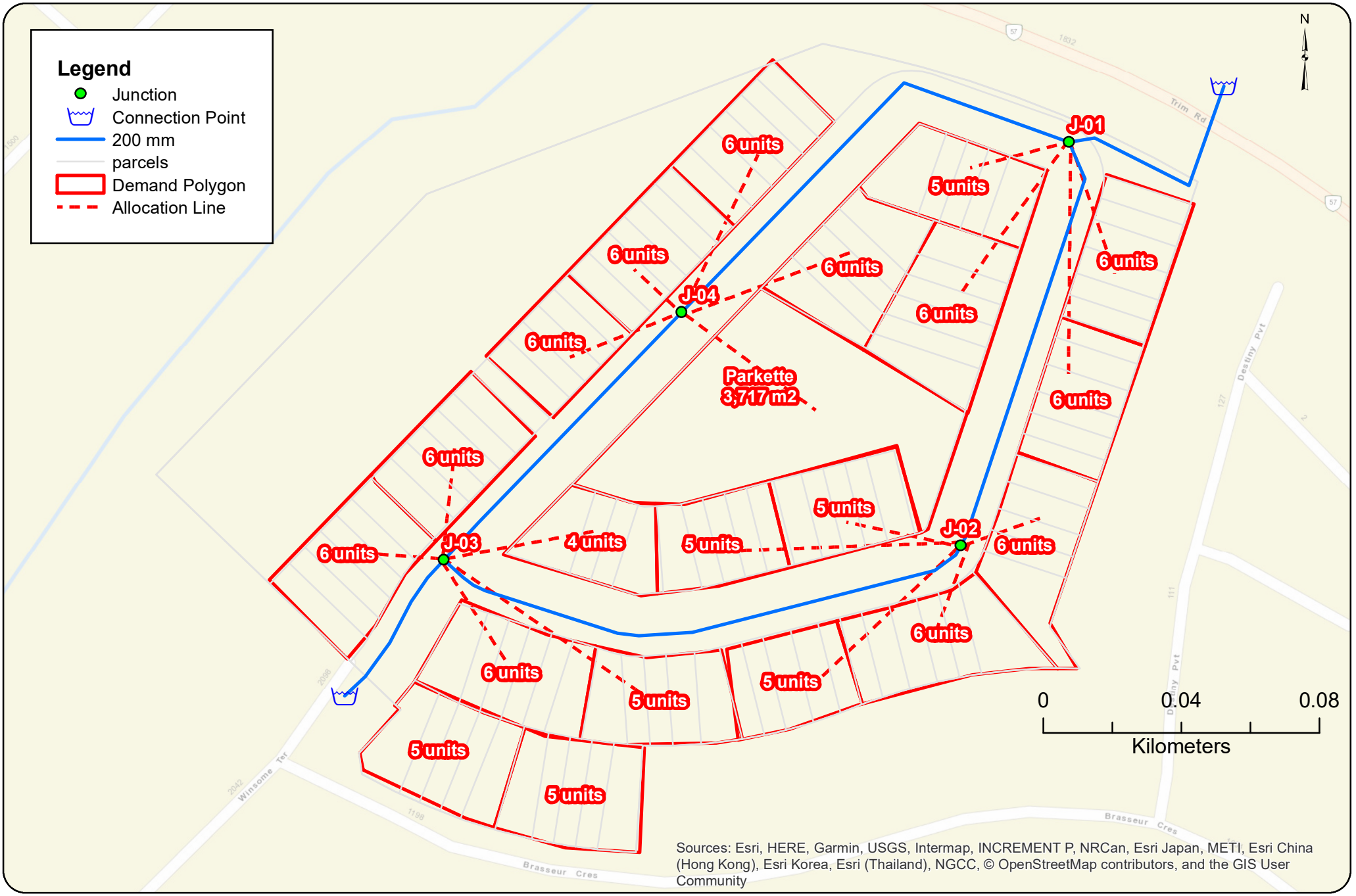
Dwelling Type	Number of Units	Population		Average Day Demand			Max Day 3.6 x Avg. Day (L/s)	Fire Flow (L/s)	Peak Hour 5.4 x Avg Day (L/s)	Min Hour 0.2 x Avg. Day (L/s)
		Persons per Unit	Population Per Dwelling Type	(L/c/d)	(L/d)	(L/s)				
Single Detached	-	3.4	-	280	-	-	-	-	-	-
Traditional Townhome	111	2.7	300		84,000	0.97	3.50	167	5.25	0.19
Back-to-Back Townhome	-	2.7	-		-	-	-	-	-	-
Apartment†	-		-		-	-	-	283	-	-
Subtotal	**111**		**300**		**84,000**	**0.97**	**3.50**		**5.25**	**0.19**

Non-Residential Demands

Property Type	Area (ha)		Average Day Demand*			Max Day 1.5 x Avg. Day (L/s)	Fire Flow (L/s)	Peak Hour 1.8 x Max Day (L/s)	Min Hour 0.5 x Avg. Day (L/s)
			(L/ha/d)	(L/d)	(L/s)				
Commercial and Employment	-		50,000	-	-	-	-	-	-
High School***	-		50,000	-	-	-	-	-	-
Park	-		50,000	-	-	-	-	-	-
Parkette	0.39		28,000	10,920	0.13	0.19	167	0.34	0.06
MTO Lands†††	-		9,120	-	-	-	-	-	-
Subtotal	**0.39**			**10,920**	**0.13**	**0.19**		**0.34**	**0.06**

Total*					**1.21**	**4.06**		**6.15**	**0.26**

*10% increase applied to account for refinements in concept plan



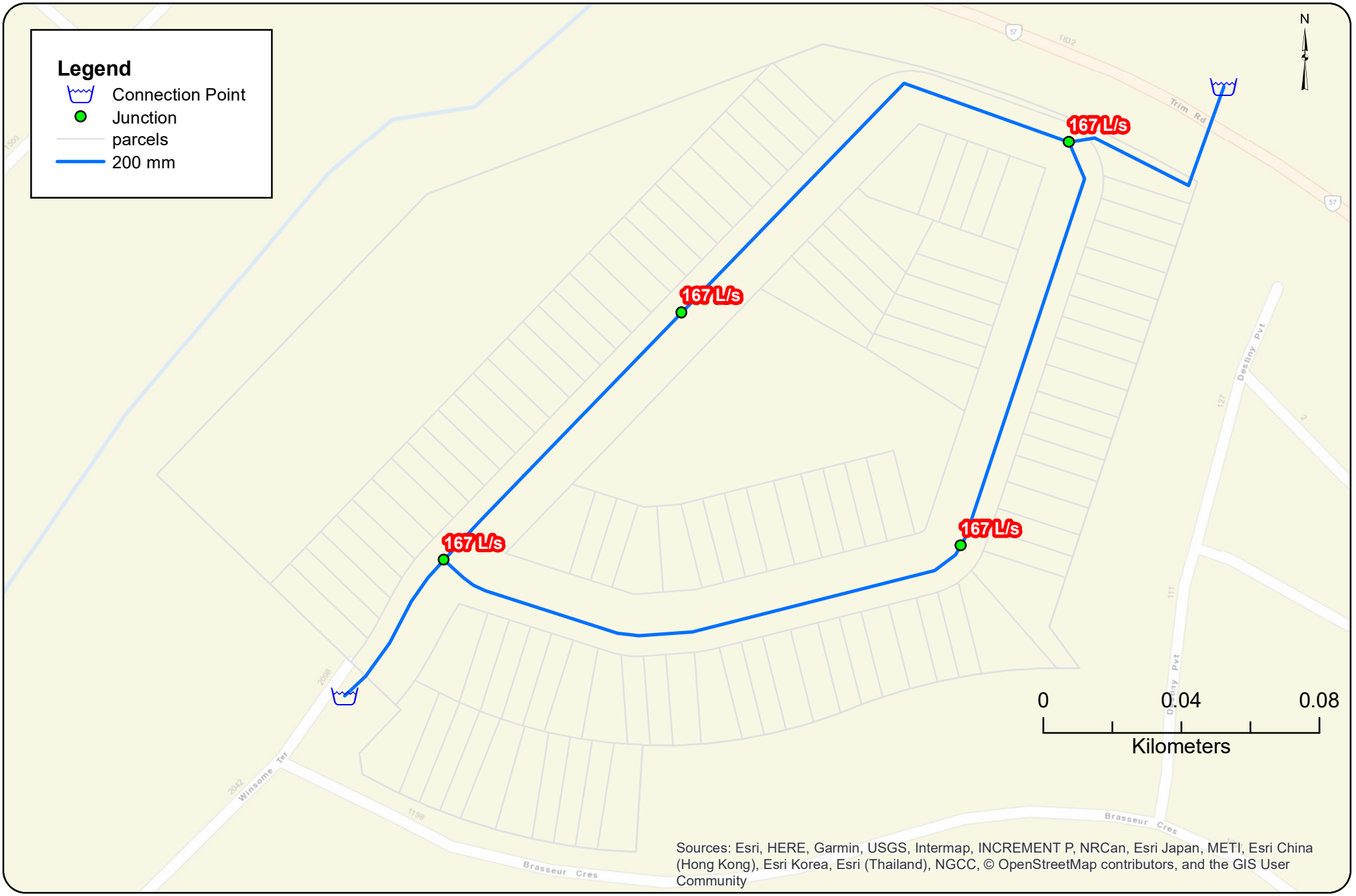
GeoAdvice Engineering Inc.

Project: **Hydraulic Capacity and Modeling Analysis**
Trim Road Development
Client: **David Schaeffer Engineering Ltd.**
Date: **March 2020**
Created by: **FdS**
Reviewed by: **WdS**

Demand Allocation

Figure A.1

Appendix B Required Fire Flows



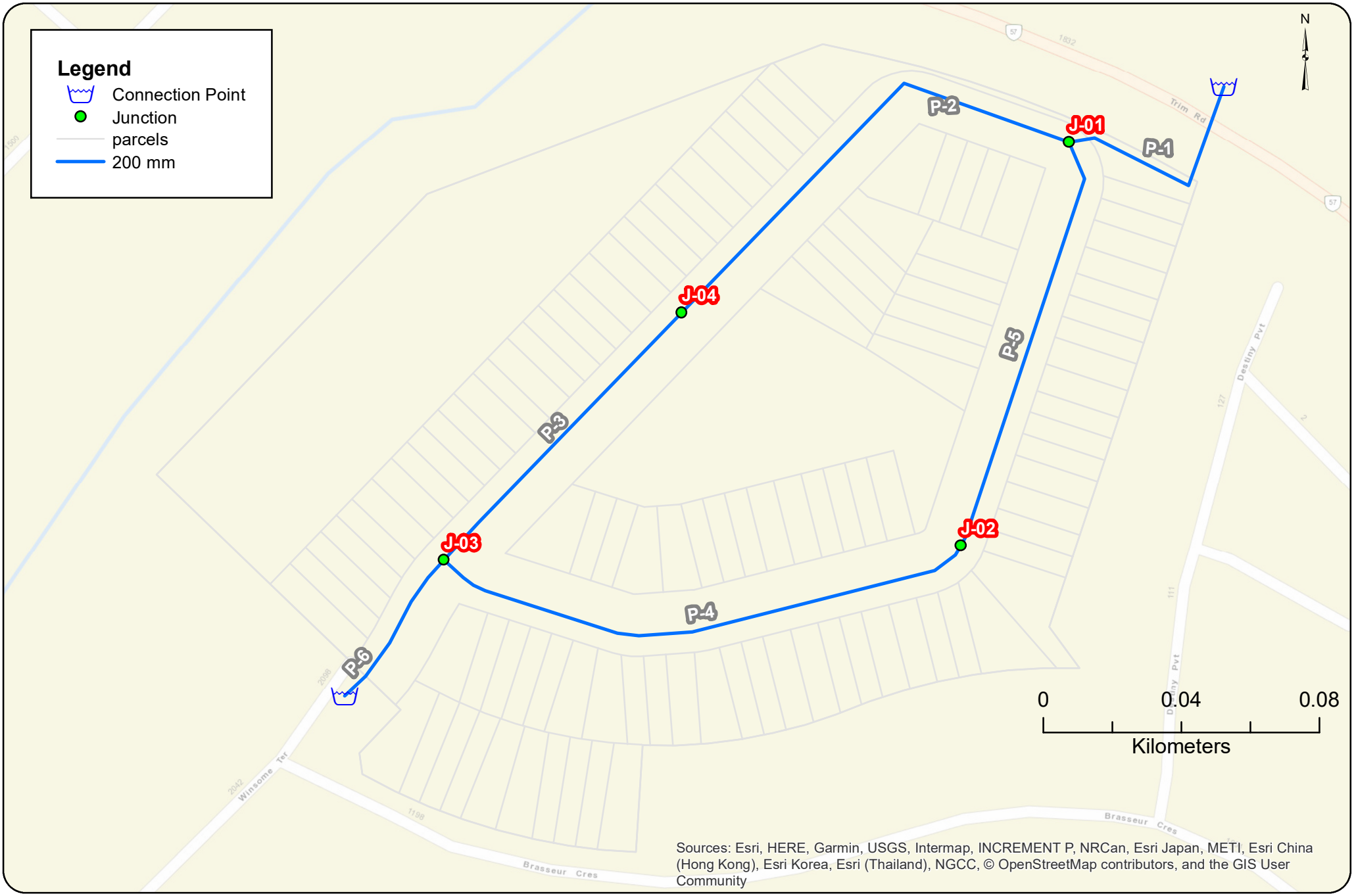
GeoAdvice Engineering Inc.

Project: **Hydraulic Capacity and Modeling Analysis**
Trim Road Development
Client: **David Schaeffer Engineering Ltd.**
Date: **March 2020**
Created by: **FdS**
Reviewed by: **WdS**

Required Fire Flow

Figure B.1

Appendix C Pipe and Junction Model Inputs



GeoAdvice Engineering Inc.

Project: **Hydraulic Capacity and Modeling Analysis**
Trim Road Development
Client: **David Schaeffer Engineering Ltd.**
Date: **March 2020**
Created by: **FdS**
Reviewed by: **WdS**

System Layout

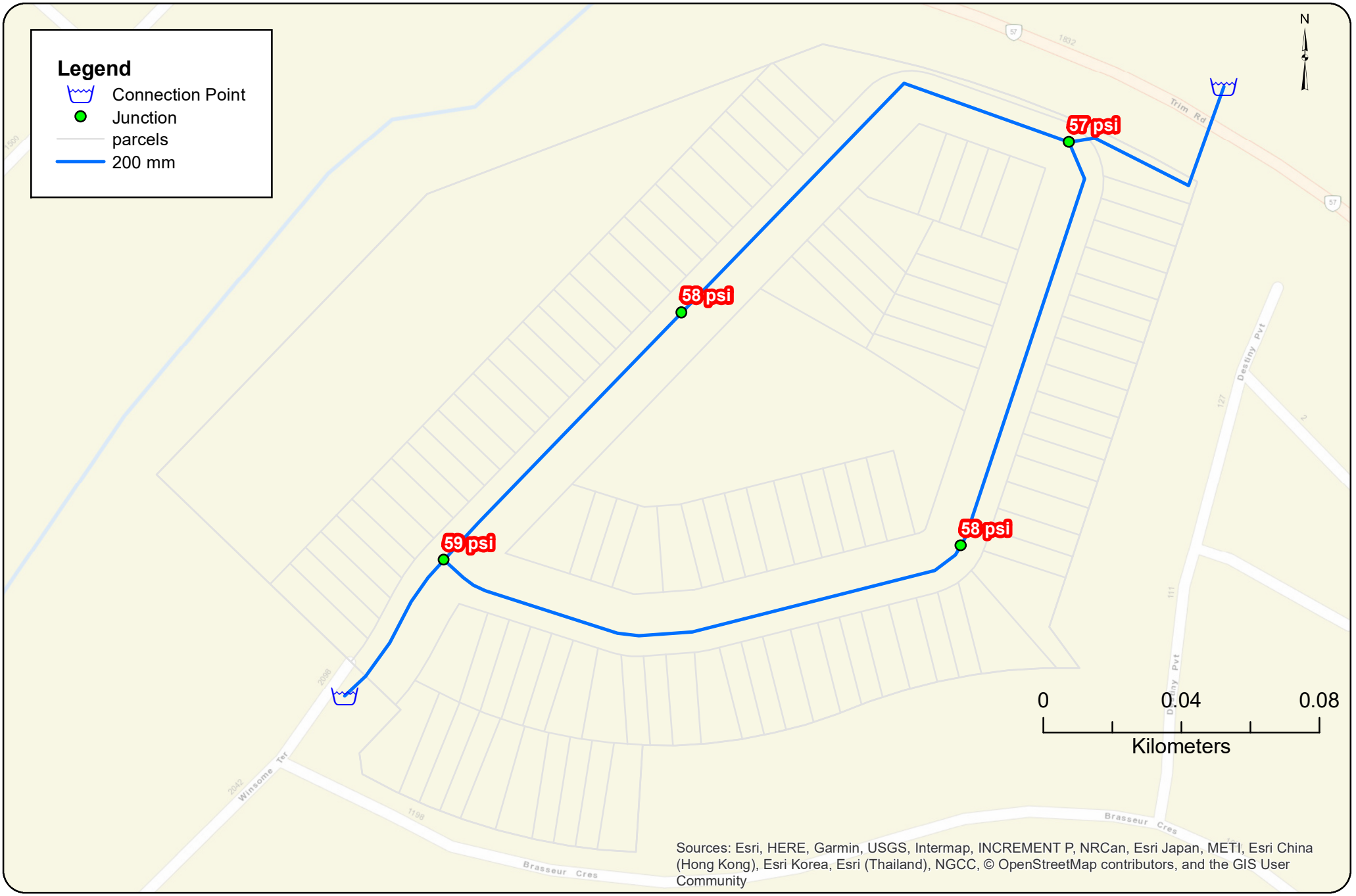
Figure C.1

Model Inputs

ID	From Node	To Node	Length (m)	Diameter (mm)	Roughness
P-1	RES-1	J-01	68.51	204	110
P-2	J-01	J-04	143.21	204	110
P-3	J-04	J-03	99.50	204	110
P-4	J-02	J-03	160.09	204	110
P-5	J-02	J-01	123.80	204	110
P-6	RES-2	J-03	49.13	204	110

ID	Elevation (m)	ADD (L/s)
J-01	89.78	0.24
J-02	89.38	0.29
J-03	88.85	0.29
J-04	89.10	0.39

Appendix D MHD and PHD Model Results



GeoAdvice Engineering Inc.

Project: **Hydraulic Capacity and Modeling Analysis**
Trim Road Development
Client: **David Schaeffer Engineering Ltd.**
Date: **March 2020**
Created by: **FdS**
Reviewed by: **WdS**

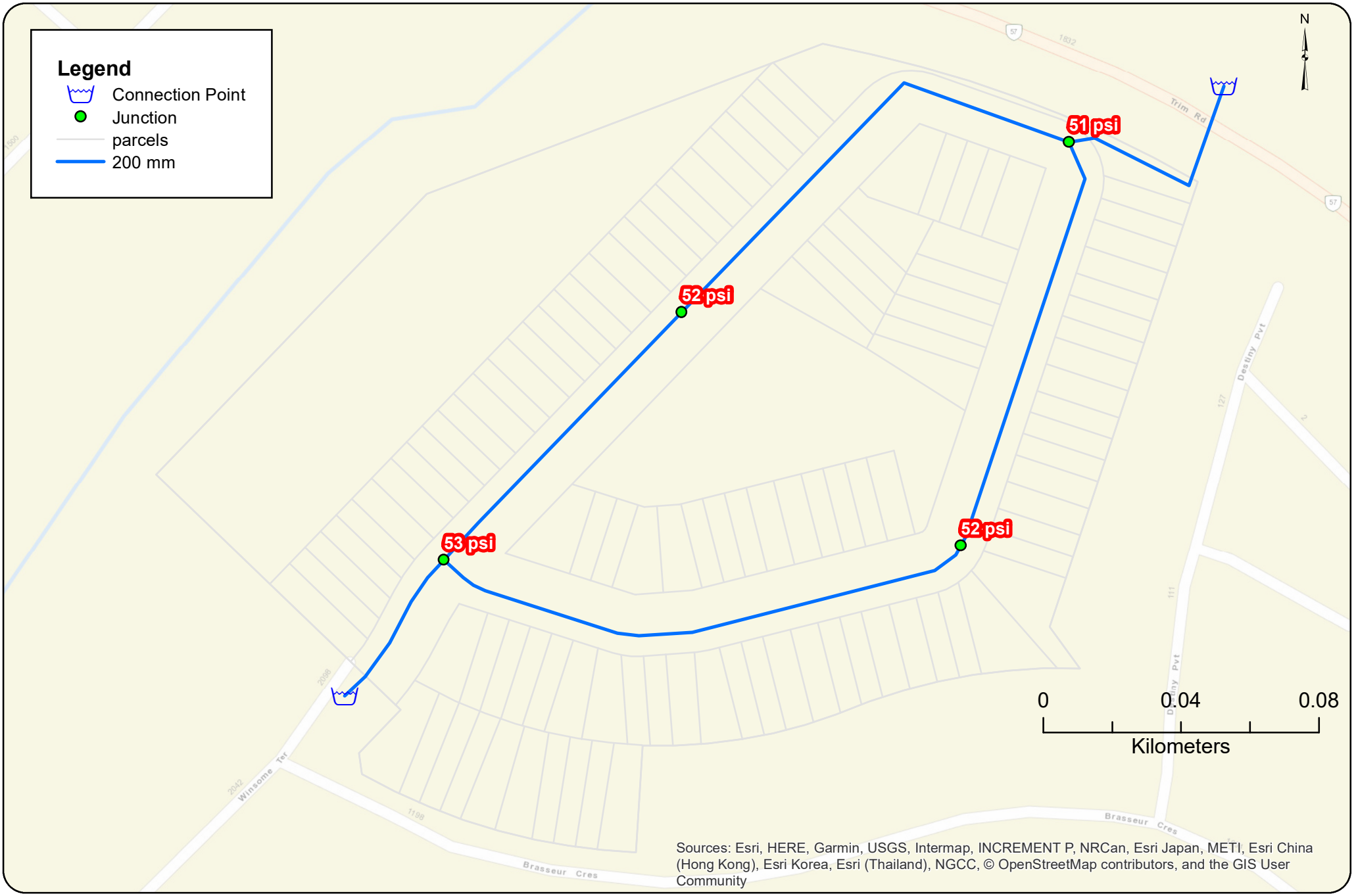
MHD Results

Figure D.1

Minimum Hour Demand Modeling Results

ID	From Node	To Node	Length (m)	Diameter (mm)	Roughness	Flow (L/s)	Velocity (m/s)	Headloss (m)	HL/1000 (m/k-m)
P-1	RES-1	J-01	68.51	204	110	0.13	0.00	0.00	0.00
P-2	J-01	J-04	143.21	204	110	0.05	0.00	0.00	0.00
P-3	J-04	J-03	99.50	204	110	-0.07	0.00	0.00	0.00
P-4	J-02	J-03	160.09	204	110	-0.03	0.00	0.00	0.00
P-5	J-02	J-01	123.80	204	110	-0.03	0.00	0.00	0.00
P-6	RES-2	J-03	49.13	204	110	0.15	0.00	0.00	0.00

ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (psi)
J-01	0.05	89.78	130	57
J-02	0.06	89.38	130	58
J-03	0.06	88.85	130	59
J-04	0.12	89.10	130	58



GeoAdvice Engineering Inc.

Project: **Hydraulic Capacity and Modeling Analysis**
Trim Road Development
Client: **David Schaeffer Engineering Ltd.**
Date: **March 2020**
Created by: **FdS**
Reviewed by: **WdS**

PHD Results

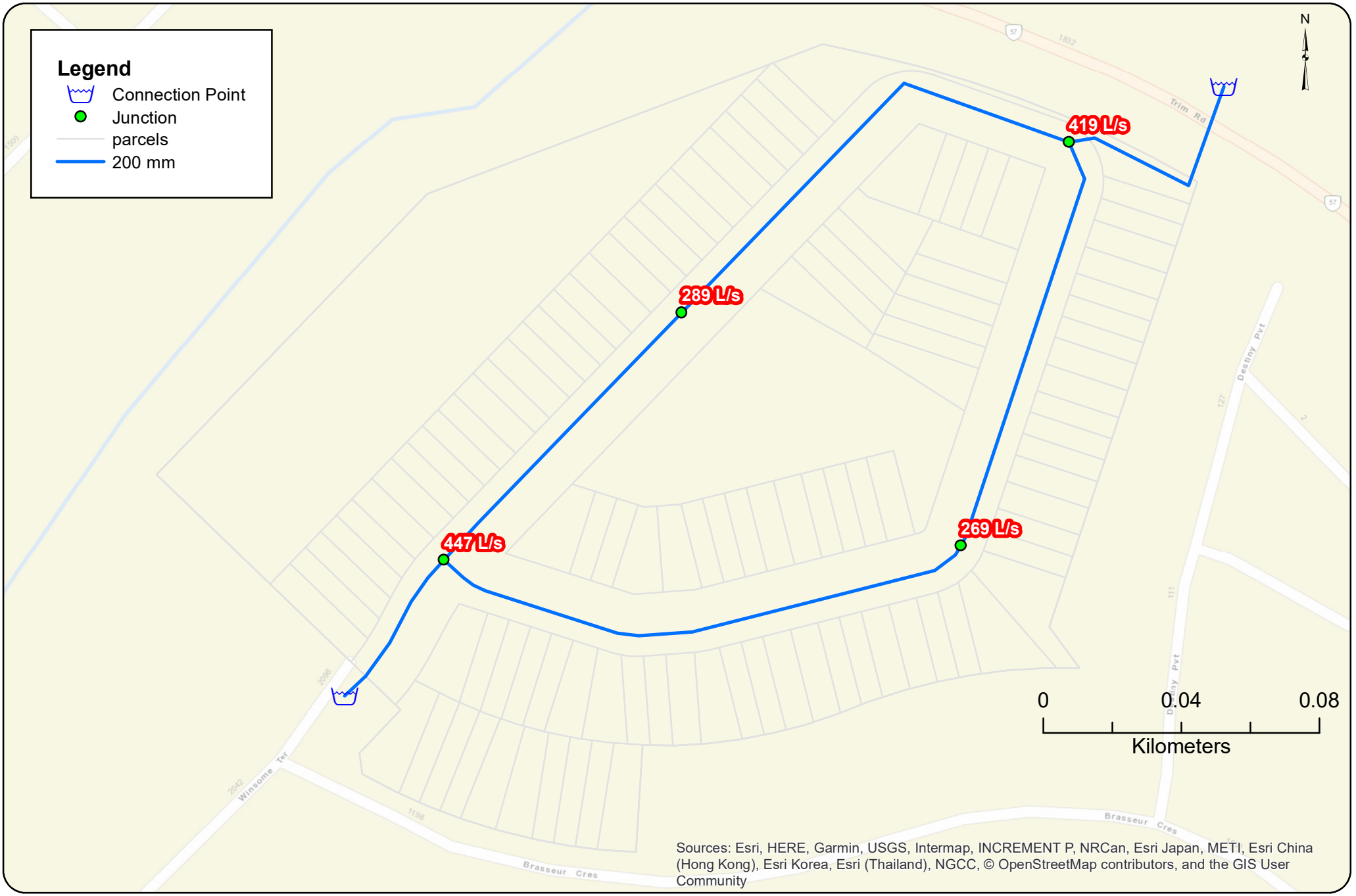
Figure D.2

Peak Hour Demand Modeling Results

ID	From Node	To Node	Length (m)	Diameter (mm)	Roughness	Flow (L/s)	Velocity (m/s)	Headloss (m)	HL/1000 (m/k-m)
P-1	RES-1	J-01	68.51	204	110	2.83	0.09	0.01	0.08
P-2	J-01	J-04	143.21	204	110	0.74	0.02	0.00	0.01
P-3	J-04	J-03	99.50	204	110	-1.01	0.03	0.00	0.01
P-4	J-02	J-03	160.09	204	110	-0.76	0.02	0.00	0.01
P-5	J-02	J-01	123.80	204	110	-0.78	0.02	0.00	0.01
P-6	RES-2	J-03	49.13	204	110	3.31	0.10	0.01	0.10

ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (psi)
J-01	1.31	89.78	126	51
J-02	1.54	89.38	126	52
J-03	1.54	88.85	126	53
J-04	1.75	89.10	126	52

Appendix E MDD+FF Model Results

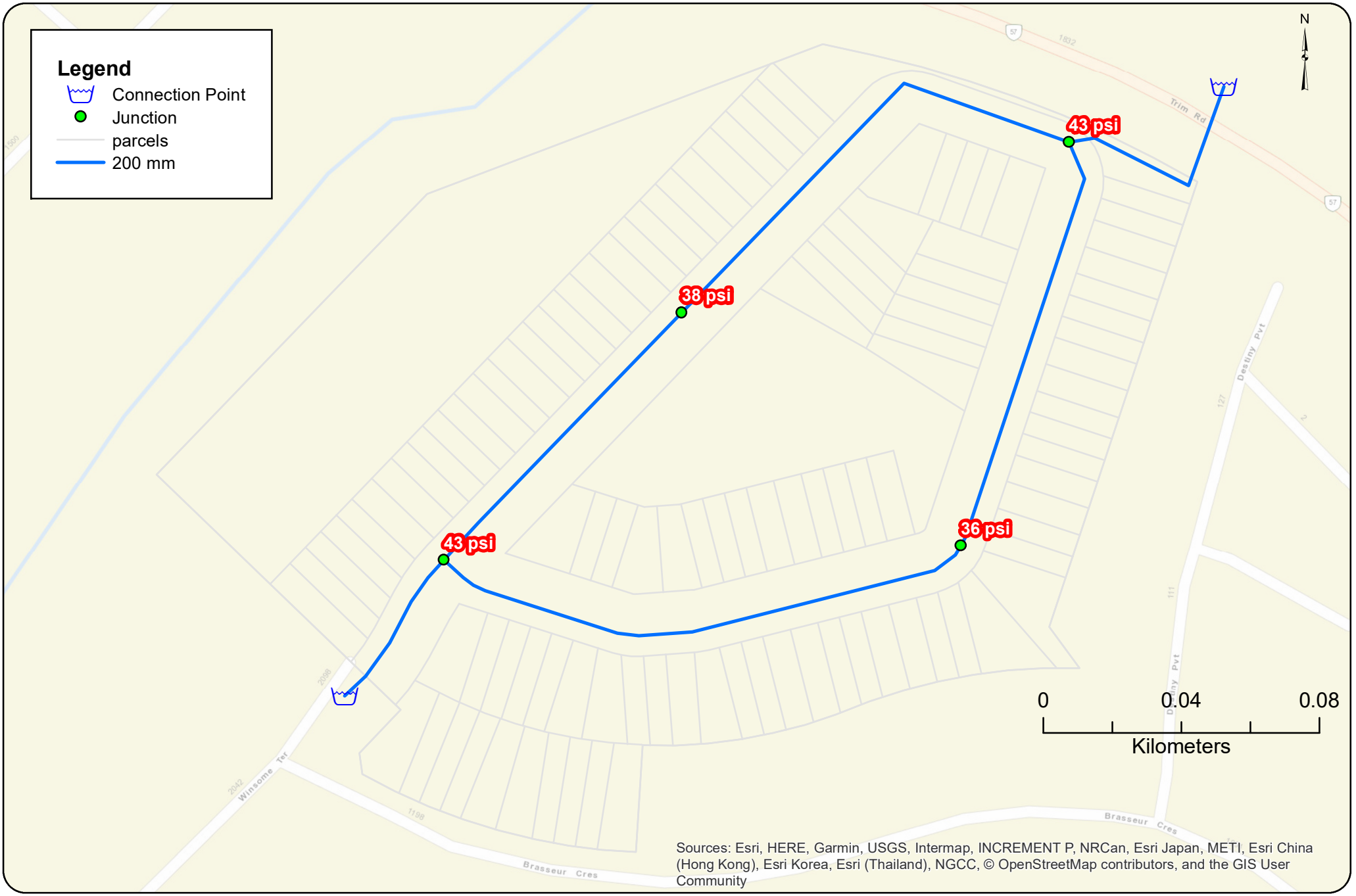


GeoAdvice Engineering Inc.

Project: **Hydraulic Capacity and Modeling Analysis**
Trim Road Development
Client: **David Schaeffer Engineering Ltd.**
Date: **March 2020**
Created by: **FdS**
Reviewed by: **WdS**

Available Fire Flow

Figure E.1



GeoAdvice Engineering Inc.

Project: **Hydraulic Capacity and Modeling Analysis**
Trim Road Development
Client: **David Schaeffer Engineering Ltd.**
Date: **March 2020**
Created by: **FdS**
Reviewed by: **WdS**

Residual Pressure

Figure E.2

Fire Flow Modeling Results

ID	Static Demand (L/s)	Fire-Flow Demand (L/s)	Residual Pressure (psi)	Available Flow at Hydrant (L/s)	Available Flow Pressure (psi)
J-01	0.88	167	43	419	20
J-02	1.03	167	36	269	20
J-03	1.03	167	43	447	20
J-04	1.12	167	38	289	20

APPENDIX D

Wastewater Collection

E-mail from City of Ottawa (Lyndsey Simard) confirming capacity in Liberty Way trunk sewer (February 3, 2020)

Existing Conditions Sanitary Drainage Plans

Existing Conditions Sanitary Design Sheet (February 5, 2020)

Figure 3 – Sanitary Drainage Plan

Sanitary Sewer Calculation Sheet

Record Drawing – Winsome Terrace STA. 0+000 TO STA. 0+234.8, Stantec Engineering (Revision 7, November 4, 2010)

Record Drawing – Brasseur Crescent STA. 0+000 TO STA. 0+300, Stantec Engineering (Revision 8, November 4, 2010)

Record Drawing – Site Servicing, East Half, Stantec Engineering
(Revision 7, November 4, 2010)

Anthony Temelini

From: Simard, Lyndsey <lyndsey.simard@ottawa.ca>
Sent: February 3, 2020 3:35 PM
To: Bougadis, John
Subject: RE: 1830 Trim Road
Attachments: 1830 Trim Road.jpg

Hi John,

I have attached a map outlining the pipe trunk on Liberty Way, the closest to 1830 Trim Road. Based on this trunk, there is enough downstream sanitary capacity for the estimated 29.7 L/s. The capacity information for Winsome Terrace is not available, but I have provided infrastructure information below, along with the sewer shed area as outlined in yellow on the map.

Structure ID	Width (mm)	Slope	Invert Upstream	Invert Downstream	As-Built Length
SAN08510	200	1.08	85.27	84.93	30.6
SAN08509	300	0.23	84.83	84.62	81.9
SAN08508	300	0.22	84.62	84.51	46.9
SAN08507	300	0.26	84.51	84.4	45.2

Cheers,

Lyndsey

From: Bougadis, John <John.Bougadis@ottawa.ca>
Sent: January 21, 2020 12:21
To: Simard, Lyndsey <lyndsey.simard@ottawa.ca>
Subject: FW: 1830 Trim Road

First step

- find the development in your Arcgis workspace.
- Copy the following folder to your C drive: S:\Development Services\Planning Env. & Infrastructure Policy\PDUD\IPU\Wastewater\MODELLING\IMPModel_Rebuild\SOC_Model_LP\PCSWMM models\00_Final models\
- We can review capacity at the nearest trunk together.

John
x14990

From: Curry, William <William.Curry@ottawa.ca>
Sent: January 21, 2020 12:04
To: Bougadis, John <John.Bougadis@ottawa.ca>
Subject: FW: 1830 Trim Road

John

I appreciate your help on several items……I feel I am all alone up here and could really use a Senior P. Eng who knows their stuff.

They are asking for modeling……How would I obtain that?

I get asked about downstream capacities frequently. I tell them it is the proponents responsibility to determine.

thanks

Will Curry, C.E.T.

Planning, Infrastructure and Economic Development /
Planification, d'infrastructure et de développement économique
City of Ottawa | Ville d'Ottawa
613.580.2424 ext./poste 16214
110 Laurier Ave., 4th Fl East;
Ottawa ON K1P 1J1

William.Curry@Ottawa.ca

From: Jennifer Ailey <JAiley@dsel.ca>
Sent: January 21, 2020 11:09 AM
To: Curry, William <William.Curry@ottawa.ca>
Cc: Matt Wingate <MWingate@dsel.ca>; Jillian Normand <Jillian.Normand@mattamycorp.com>; Lebrun, Julie (Planning) <Julie.Lebrun@ottawa.ca>; Alison Gosling <AGosling@dsel.ca>
Subject: FW: 1830 Trim Road

Will,

I'm following up for additional information / confirmation as we proceed with the engineering submission described below.

Sanitary:

For 109 townhouse units, the peak flow is estimated to be 29.7 L/s. Are you able to confirm if there is downstream sanitary capacity in existing infrastructure on Winsome Terrace?

Storm:

I understand that the criteria was noted in the email from the City. The City provided the following – Greater Cardinal Creek Subwatershed Study XPSWMM Model Calibration and Verification Report (AECOM, August 2009). It is noted in the Greater Cardinal Creek Subwatershed Management Plan (AECOM, August 2014) that the 2009 AECOM XPSWMM Model was further updated by AECOM in November 2012. Can we please request a copy of that model?

Thanks,

Jennifer Ailey, P.Eng.
Project Manager

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

Phone: (613) 836-0856 ext. 526
Cell: (613) 222-6476
Email: jailey@dsel.ca

From: Lebrun, Julie (Planning) [mailto:Julie.Lebrun@ottawa.ca]
Sent: January 10, 2020 9:32 AM
To: Jillian Normand <Jillian.Normand@mattamycorp.com>; Emilie Coyle <coyle@fotenn.com>; Carl Furney <furney@fotenn.com>
Cc: McEwen, Jeff <Jeff.McEwen@ottawa.ca>; Curry, William <William.Curry@ottawa.ca>; Giampa, Mike <Mike.Giampa@ottawa.ca>; Wood, Mary Ellen <MaryEllen.Wood@ottawa.ca>; Ippersiel, Matthew <Matthew.Ippersiel@ottawa.ca>; Mongeon, Lynda <Lynda.Mongeon@ottawa.ca>; Andrew Harte <andrew.harte@cghtransportation.com>; Matt Wingate <MWingate@dsel.ca>; mdarcy@Patersongroup.ca; Jennifer Ailey <JAiley@dsel.ca>
Subject: RE: 1830 Trim Road

Good morning all,

We have done a preliminary review of the latest attached plan and find the proposed concept more acceptable as a plan of subdivision. Generally, the City is trying to move away from 18-metre wide local right of ways so

we would prefer the continuation of the existing 20-metre right of way within these lands. As you are likely aware, the City is also working towards local streets being 30 km/h, therefore some form of traffic calming should be described in your Transportation Impact Assessment, particularly on the extension of Winsome Terrace. We would also like to see a pedestrian connection from this development to the realigned Trim Road and will work with you to determine its location.

Parks is agreeable to the centrally located park block as shown on the revised concept plan. The walkway block provides connectivity to the hydro corridor pathway which is good, however the City will not consider the walkway block or the small triangular block as parkland dedication. With 109 units, the required parkland dedication is 0.363ha (3,633m2). Through the draft plan of subdivision, if the central park block is under size, any difference will be collected through cash-in-lieu of parkland.

We have provided below a list of submission requirements for a Zoning By-law Amendment and Plan of Subdivision. Further comments regarding the plan will be provided through the approval process, therefore revisions or additional information may be required.

Zoning & Subdivision submission requirements: (3 hard copies and electronic copies on USB of plans and reports)

Engineering and Planning:

Topographical Plan of Survey with a published bench mark
Draft Plan of Subdivision / Concept Plan
Phasing Plan
Planning Rationale (including Design Statement and Integrated Environmental Review Statement)
Building Elevations
Design Brief/Stormwater Management Report (SWM Criteria: 70 l/s/ha with 150 m3/ha ponding in a 100-yr)
Geotechnical Study
Phase 1 and Phase 2 Environmental Site Assessment (with Record of Site Condition)
Archaeological Assessment Stage 1 (and Stage 2 if required)
Transportation Impact Study
Road Modification Plan
Noise and Vibration Study
Tree Conservation Report
Environmental Impact Assessment (including species at risk evaluation)

Additional Engineering:
Functional Servicing Report
Site Plan
Phase Plan
Macro Servicing
Macro Grading
Macro Drainage Plan
Road Cross Sections
Erosion & Sediment Control Plan
Road design

Submission Requirements

Water Boundary condition requests must include the location of the service and the expected loads required by the proposed development. Please provide the following information:

Location of service connections (MAP)
Type of development and the amount of fire flow required (as per FUS).

Average daily demand: ___ l/s.
Maximum daily demand: ___l/s.
Maximum hourly daily demand: ___ l/s.

Technical Requirements:

Minimum Drawing and File Requirements- All Plans

Plans are to be submitted on standard **A1 size** (594mm x 841mm) sheets, utilizing an appropriate Metric scale (1:200, 1:250, 1:300, 1:400, or 1:500) and folded.
With all submitted plans provide an individual PDF of the plans

Many of the plans and studies collected in support of this application must be signed, sealed and dated by a qualified engineer, architect, surveyor, planner or designated specialist. The City will not review a plan or study if it is missing this information. Electronic copies of all required studies and the Draft Plan of Subdivision must be supplied in Adobe .pdf format and accompany your application submission.

Electronic document names should match the study/plan names contained in the above list. These documents will be made publicly available on the City's Development Applications Search Tool.

The Draft Plan of Subdivision must be referenced to the Horizontal Control Network and signed by the property owner.

The Draft Plan of Subdivision, and any subsequent revisions must be supplied in AutoCad or MicroStation CAD (computer aided design) format, in metric units, with reference bearing identified and labelled. If possible, the Plan must also be georeferenced and provided in grid format ie. coordinated in MTM zone 9, NAD83. Linework must clearly indicate perimeter of subdivision and each lot, block or part internal to the subdivision with clear text labels.

****** Note that all reports and studies must be less than 5 years old and the above-noted list of requirements is preliminary and may change if further information is provided by the applicant prior to submission.***

Regards,

Julie Lebrun, MCIP, RPP (MICU, UPC)
Planner / Urbaniste
Development Review, Suburban Services East /
Examen des demandes d'aménagement, Services suburbains est
Planning, Infrastructure and Economic Development /
Services de planification, d'infrastructure et de développement économique
City of Ottawa | Ville d'Ottawa
613.580.2424 ext./poste 27816
ottawa.ca/planning / ottawa.ca/urbanisme

From: Jillian Normand <Jillian.Normand@mattamycorp.com>
Sent: January 06, 2020 10:44 AM
To: Lebrun, Julie (Planning) <Julie.Lebrun@ottawa.ca>; Emilie Coyle <coyle@fotenn.com>; 'Julie Carrara' <carrara@fotenn.com>
Cc: McEwen, Jeff <Jeff.McEwen@ottawa.ca>; Curry, William <William.Curry@ottawa.ca>; Giampa, Mike <Mike.Giampa@ottawa.ca>; Wood, Mary Ellen <MaryEllen.Wood@ottawa.ca>; Ippersiel, Matthew <Matthew.Ippersiel@ottawa.ca>; Mongeon, Lynda <Lynda.Mongeon@ottawa.ca>; Andrew Harte

<andrew.harte@cghtransportation.com>; MWingate@dsel.ca; mdarcy@Patersongroup.ca; jailey@dsel.ca
Subject: RE: 1830 Trim Road

Hi Julie,

Happy New Year, I hope you had a restful holiday. Thank you for your comments regarding the initial Site Plan that we submitted for pre-consultation. Please note that Julie Carrara from FoTenn will be our planner on this file moving forward.

Further to our meeting, I have redesigned the Site Plan to remove the City lands from the property, and amend the dwelling type to reduce the density. Additionally, the ROW now includes 18m ROW throughout the plan so that they can be municipally owned, which can accommodate on-street parking, street trees, snow clearing, emergency services and municipal waste pick up. Parkland dedication has been provided as a central park with a pedestrian connection to the Hydro corridor and MUP.

If you would like to have another meeting, I hope one can be accommodated later this week as we must finalize our due diligence period with the Vendor. If a meeting is not required, could you please provide the checklist for application requirements so we can progress with the applications?

Thank you,
Jillian

mattamyHOMES

Jillian Normand, MCIP, RPP
Senior Land Development Manager
T (613) 831-5144 (direct). **C** (613) 415-7786. **F** (613) 831-9060
Jillian.Normand@mattamycorp.com
Ottawa Office: 50 Hines Road, Suite 100, Ottawa, ON Canada K2K 2M5

From: Lebrun, Julie (Planning) <Julie.Lebrun@ottawa.ca>
Sent: December 20, 2019 9:32 AM
To: Jillian Normand <Jillian.Normand@mattamycorp.com>; Emilie Coyle <coyle@fotenn.com>; Carl Furney <furney@fotenn.com>
Cc: McEwen, Jeff <Jeff.McEwen@ottawa.ca>; Curry, William <William.Curry@ottawa.ca>; Giampa, Mike <Mike.Giampa@ottawa.ca>; Wood, Mary Ellen <MaryEllen.Wood@ottawa.ca>; Ippersiel, Matthew <Matthew.Ippersiel@ottawa.ca>; Mongeon, Lynda <Lynda.Mongeon@ottawa.ca>; Andrew Harte <andrew.harte@cghtransportation.com>; MWingate@dsel.ca; mdarcy@Patersongroup.ca; jailey@dsel.ca
Subject: 1830 Trim Road

Good morning,

Following our pre-application consultation meeting on December 9th, 2019, staff have had an opportunity to further discuss your proposal internally. We also understand that the City's Real Estate Office will not be disposing the property adjacent to 1830 Trim Road.

As per our discussions, Planning is unable to support the density you have presented in your proposal or the concept of the entire site being reviewed as a site plan on private streets. These lands should be developed as a plan of subdivision. The continuation of the existing right of way width of 20 metres on Winsome Terrace is reasonable and this is where the service connections will be. A “P” loop public street accessed from the existing neighbourhood showing low to medium density would be appropriate. This would also provide more space for tree planting, on-street parking, snow clearing and waste pick-up.The approach of having townhomes backing onto existing townhomes is encouraged. In accordance with the “Cumberland Neighbourhoods 5, 6 and 7 - Fallingbrook South Development Plan” from 1996, this area was always intended to be developed with low to medium density residential. Pedestrian connections to the existing MUP network must be included. A park block reflecting the required dedication should also be incorporated into the subdivision design outside of the Hydro corridor.

No access to Trim Road can be contemplated at this time since the future of the City block is unknown.

It was noted that Phase 1 and 2 ESA’s are likely to be required for this site along with a record of site condition due to the previous land use.

It is understood that you will need to go back and review options for the development of these lands incorporating the above and therefore we will be happy to hold a follow-up meeting once you have prepared a new conceptual plan. It would be good to know the status of the adjacent lands in separate ownership if they are included in the design. The City will provide you with the required submission requirements once we have confirmed what applications will be necessary for your development.

Happy Holidays to all!

Regards,

Julie Lebrun, MCIP, RPP (MICU, UPC)
Planner / Urbaniste
Development Review, Suburban Services East /
Examen des demandes d'aménagement, Services suburbains est
Planning, Infrastructure and Economic Development /
Services de planification, d'infrastructure et de développement économique
City of Ottawa | Ville d'Ottawa
613.580.2424 ext./poste 27816
ottawa.ca/planning / ottawa.ca/urbanisme

Absence Alert / Alerte d’absence:
I will be on annual leave from December 23rd to January 3rd inclusively.
Je serai en congé annuel du 23 décembre au 3 janvier inclusivement.

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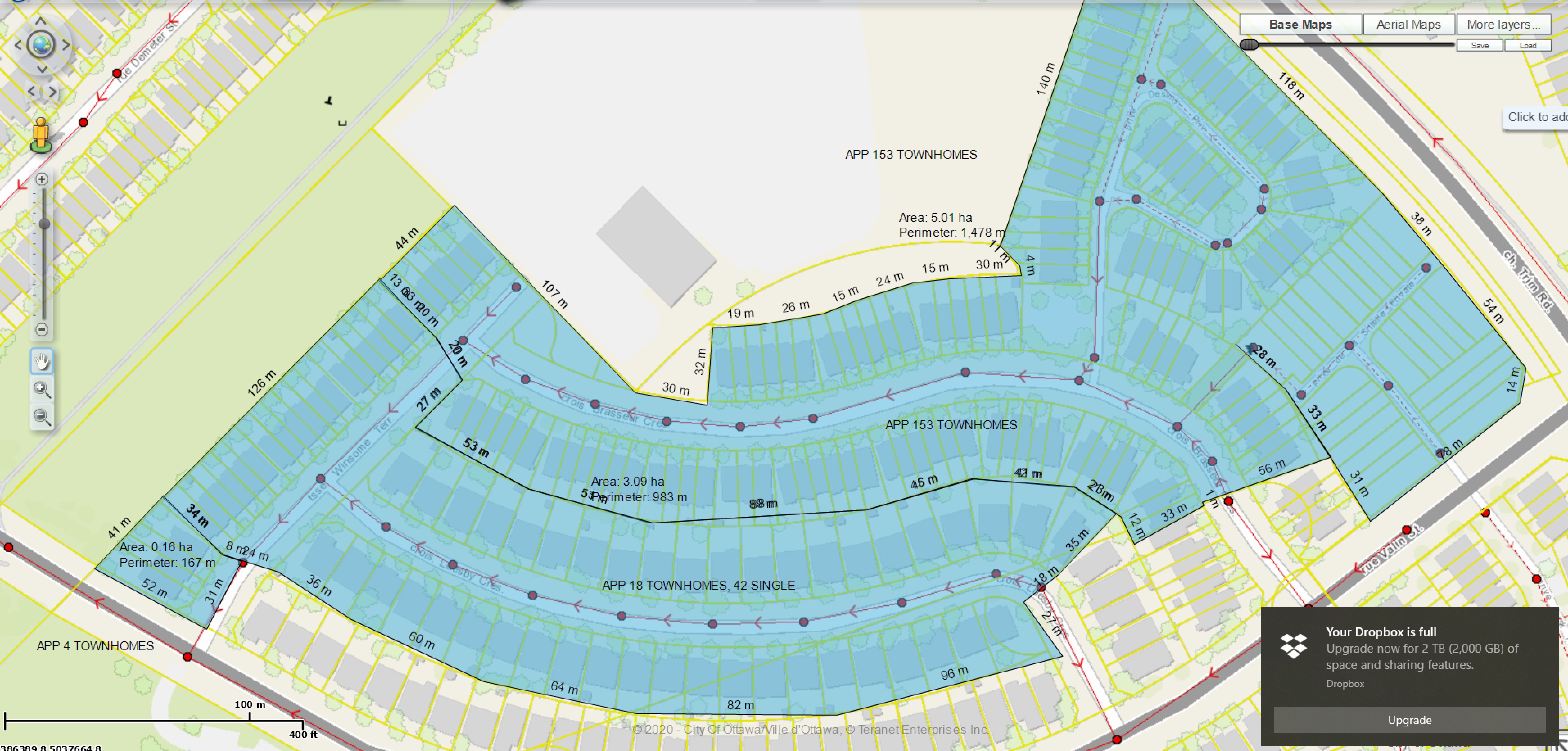

Base Maps
Aerial Maps
More layers...
Save
Load
Click to add
APP 153 TOWNHOMES
Area: 5.01 ha
Perimeter: 1,478 m
APP 153 TOWNHOMES
Area: 3.09 ha
Perimeter: 983 m
Area: 0.16 ha
Perimeter: 167 m
APP 18 TOWNHOMES, 42 SINGLE
APP 4 TOWNHOMES
140 m
118 m
38 m
54 m
14 m
31 m
56 m
33 m
12 m
35 m
18 m
27 m
96 m
82 m
64 m
60 m
36 m
24 m
8 m
31 m
52 m
41 m
34 m
126 m
44 m
107 m
27 m
53 m
20 m
30 m
32 m
19 m
26 m
15 m
24 m
15 m
30 m
11 m
4 m
28 m
33 m
28 m
45 m
41 m
20 m
ch. Trim Rd
rue Valin St
rue Demeter St
Crois Brasseur Cres
Crois Lamsby Cres
Winsome Terr
100 m
400 ft
386389.8 5037664.8
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Dropbox
Upgrade


Legend
Sanitary Pump Station
Sanitary
Private
Trunk Pipe
1830 Trim Road
Liberty Way Trunk
cour Safari Court
rue Ludlowe St.
Voie Denton Way
rue Demeter St.
Issac Gosnell Terr.
rue Valin St.
Voie Liberty Way
rue Jersey St.
Voie Celeste Way
Issac Winsome Terr.
crois. Luesby Cres.
crois. Brasseur Cres.
av. Provence Ave.
av. Mulder Ave.
Voie Scully Way
prive Destiny Priv.
prive de Smallville Private
Priv. Dusk Priv.
ch. Trim Rd.
rue Brezewood St.
rue Ilendale St.
0 30 60 90 120
Meters

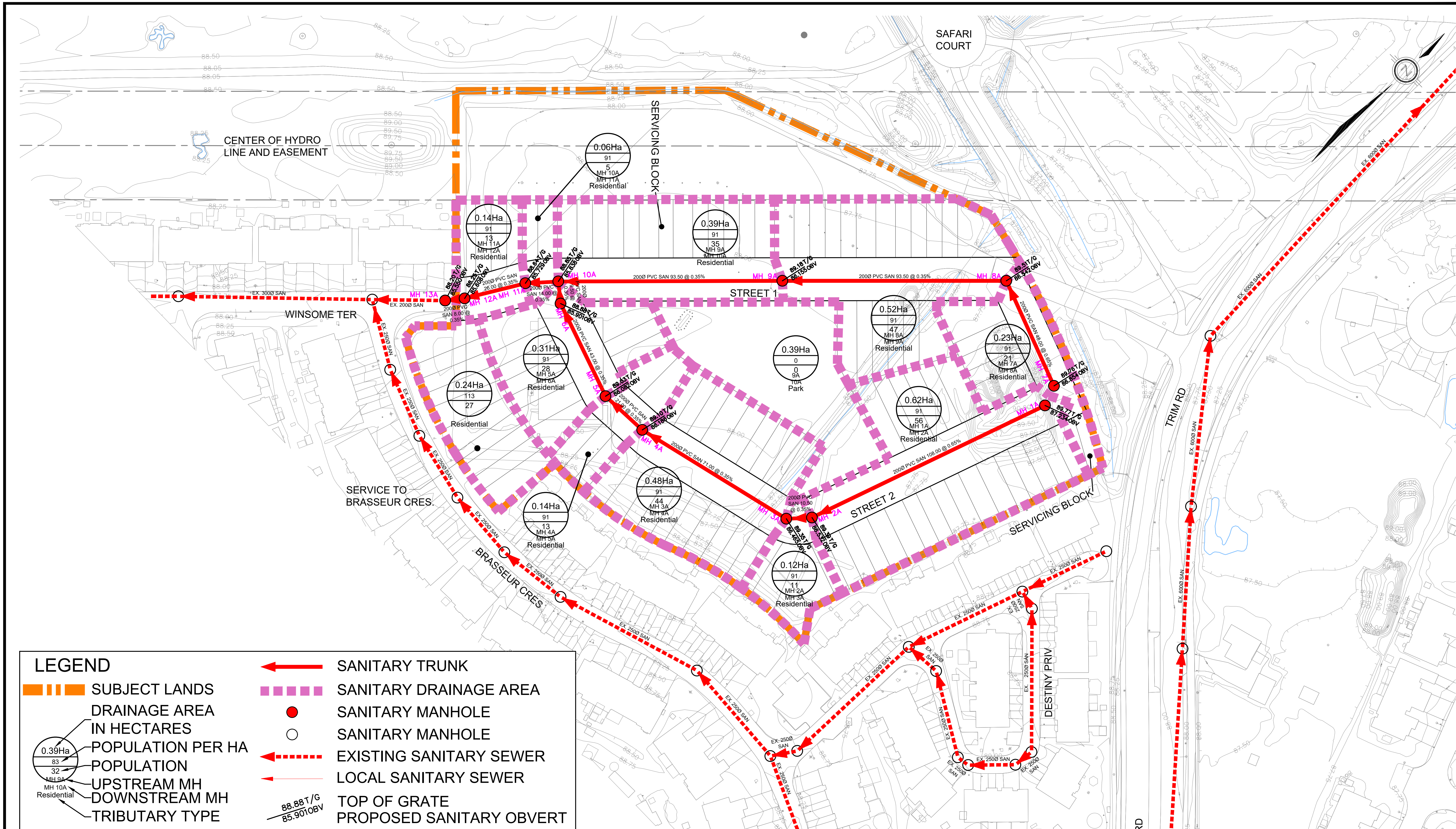
SANITARY SEWER CALCULATION SHEET

CLIENT: **Mattamy**
LOCATION: **1830 Trim Rd**
FILE REF: **19-1137**
DATE: **05-Feb-20**

DESIGN PARAMETERS

Avg. Daily Flow Res.	280	L/p/d	Peak Fact Res. Per Harmons: Min = 2.0, Max =4.0		Infiltration / Inflow	0.33	L/s/ha
Avg. Daily Flow Comm.	28,000	L/ha/d	Peak Fact. Comm.	1.5	Min. Pipe Velocity	0.60	m/s full flowing
Avg. Daily Flow Instit.	28,000	L/ha/d	Peak Fact. Instit.	1.5	Max. Pipe Velocity	3.00	m/s full flowing
Avg. Daily Flow Indust.	35,000	L/ha/d	Peak Fact. Indust. per MOE graph		Mannings N	0.013	

Location			Residential Area and Population									Commercial		Institutional		Industrial			Infiltration				Pipe Data							
Area ID	Up	Down	Area	Number of Units by type				Pop.	Cumulative Area	Cumulative Pop.	Peak. Fact.	Q_{res}	Area	Accu. Area	Area	Accu. Area	Area	Accu. Area	Q_{C+I+I}	Total Area	Accu. Area	Infiltration Flow	Total Flow	DIA	Slope	Length	$A_{hydraulic}$	R	Velocity	Q_{cap}	Q / Q full
			(ha)	Singles	Semi's	Town's	Apt's		(ha)		(-)	(L/s)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(L/s)	(ha)	(ha)	(L/s)	(L/s)	(mm)	(%)	(m)	(m^2)	(m)	(m/s)	(L/s)	(-)
Winsome Terrace	SAN08510	SAN08509	5.010			153		413.0	5.010	413.0	4.00	5.35		0.00		0.00		0.00	0.0	5.010	5.010	1.653	7.01	200	1.08	30.6	0.031	0.050	1.08	34.1	0.21
	SAN08509	SAN08508	3.090	42		18		191.0	8.100	604.0	3.93	7.69		0.00		0.00		0.00	0.0	3.090	8.100	2.673	10.37	300	0.23	81.9	0.071	0.075	0.66	46.4	0.22
	SAN08507	SAN08507	0.160			4		11.0	8.260	615.0	3.93	7.83		0.00		0.00		0.00	0.0	0.160	8.260	2.726	10.55	300	0.22	46.9	0.071	0.075	0.64	45.4	0.23
Valin	SAN08507	SAN08539	0.000					0.0	8.260	615.0	3.93	7.83		0.00		0.00		0.00	0.0	0.000	8.260	2.726	10.55	300	0.26	45.2	0.071	0.075	0.70	49.3	0.21



DSEL
david schaeffer engineering ltd

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Stittsville, Ontario, K2S 1E9
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1830 TRIM ROAD

CITY OF OTTAWA

SANITARY DRAINAGE PLAN

SCALE:	1:1500	PROJECT No.:	19-1137
DATE:	MARCH 2020	FIGURE:	3

SANITARY SEWER CALCULATION SHEET

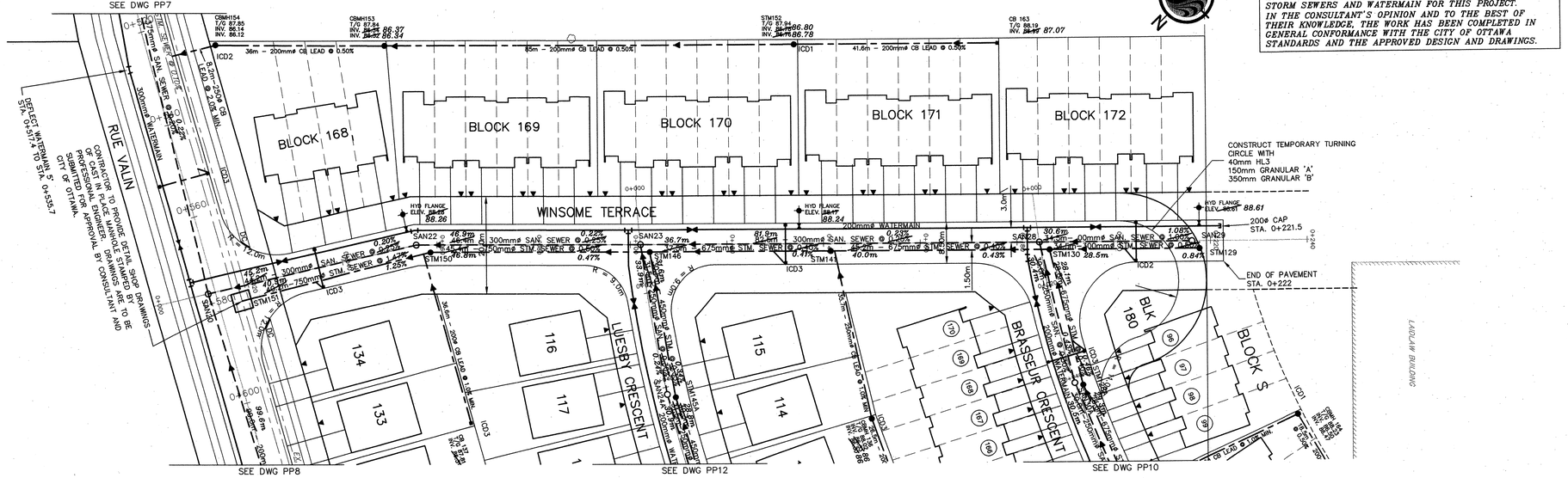
Manning's n=0.013

LOCATION			RESIDENTIAL AREA AND POPULATION							COMM		INSTIT		PARK		C+I+I	INFILTRATION				PIPE						
STREET	FROM M.H.	TO M.H.	AREA (ha)	UNITS	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
Street 2 - 03																											
	7A	8A	0.23		21	0.23	21	3.7	0.25		0.00		0.00		0.00	0.00	0.23	0.23	0.08	0.33	48.0	200	0.65	26.44	0.01	0.84	0.28
To Street 1 - 01, Pipe 8A - 9A						0.23	21				0.00		0.00		0.00			0.23									
	1A	2A	0.62		56	0.62	56	3.6	0.66		0.00		0.00		0.00	0.00	0.62	0.62	0.20	0.87	108.0	200	0.65	26.44	0.03	0.84	0.38
	2A	3A	0.12		11	0.74	67	3.6	0.79		0.00		0.00		0.00	0.00	0.12	0.74	0.24	1.03	10.5	200	0.35	19.40	0.05	0.62	0.33
	3A	4A	0.48		44	1.22	111	3.6	1.29		0.00		0.00		0.00	0.00	0.48	1.22	0.40	1.69	71.0	200	0.35	19.40	0.09	0.62	0.37
	4A	5A	0.14		13	1.36	124	3.6	1.44		0.00		0.00		0.00	0.00	0.14	1.36	0.45	1.88	21.0	200	0.35	19.40	0.10	0.62	0.39
	5A	6A	0.31		28	1.67	152	3.6	1.75		0.00		0.00		0.00	0.00	0.31	1.67	0.55	2.30	43.0	200	0.35	19.40	0.12	0.62	0.41
	6A	10A				1.67	152	3.6	1.75		0.00		0.00		0.00	0.00	0.00	1.67	0.55	2.30	9.5	200	0.35	19.40	0.12	0.62	0.41
To Street 1 - 01, Pipe 10A - 11A						1.67	152				0.00		0.00		0.00			1.67									
Street 1 - 01																											
Contribution Street 2 - 03, Pipe 7A - 8A						0.23	21				0.00		0.00		0.00		0.23	0.23									
	8A	9A	0.52		47	0.75	68	3.6	0.80		0.00		0.00		0.00	0.00	0.52	0.75	0.25	1.05	93.5	200	0.35	19.40	0.05	0.62	0.33
	9A	10A	0.39		35	1.14	103	3.6	1.20		0.00		0.00	0.39	0.39	0.06	0.78	1.53	0.50	1.77	93.5	200	0.35	19.40	0.09	0.62	0.38
Contribution From Street 2 - 03, Pipe 6A - 10A						1.67	152				0.00		0.00		0.00		1.67	3.20									
	10A	11A	0.06		5	2.87	260	3.5	2.94		0.00		0.00		0.39	0.06	0.06	3.26	1.08	4.07	14.0	200	0.35	19.40	0.21	0.62	0.49
	11A	12A	0.14		13	3.01	273	3.5	3.08		0.00		0.00		0.39	0.06	0.14	3.40	1.12	4.26	26.0	200	0.35	19.40	0.22	0.62	0.49
	12A	13A				3.01	273	3.5	3.08		0.00		0.00		0.39	0.06	0.00	3.40	1.12	4.26	8.0	200	0.35	19.40	0.22	0.62	0.49

DESIGN PARAMETERS

Park Flow =	9300	L/ha/da	0.10764	l/s/Ha			
Average Daily Flow =	280	l/p/day			Industrial Peak Factor = as per MOE Graph		
Comm/Inst Flow =	28000	L/ha/da	0.3241	l/s/Ha	Extraneous Flow =	0.330	L/s/ha
Industrial Flow =	35000	L/ha/da	0.40509	l/s/Ha	Minimum Velocity =	0.600	m/s
Max Res. Peak Factor =	4.00				Manning's n = (Conc)	0.013	(Pvc) 0.013
Commercial/Inst./Park Peak Factor =	1.50				Townhouse coeff=	2.7	
Institutional =	0.32	l/s/Ha			Single house coeff=	3.4	

Designed: CB	PROJECT: **1830 TRIM ROAD**		
Checked: SM	LOCATION: **City of Ottawa**		
Dwg. Reference: Figure-3	File Ref: 19-1137	Date: **10 Mar 2020**	Sheet No. 1 of 1



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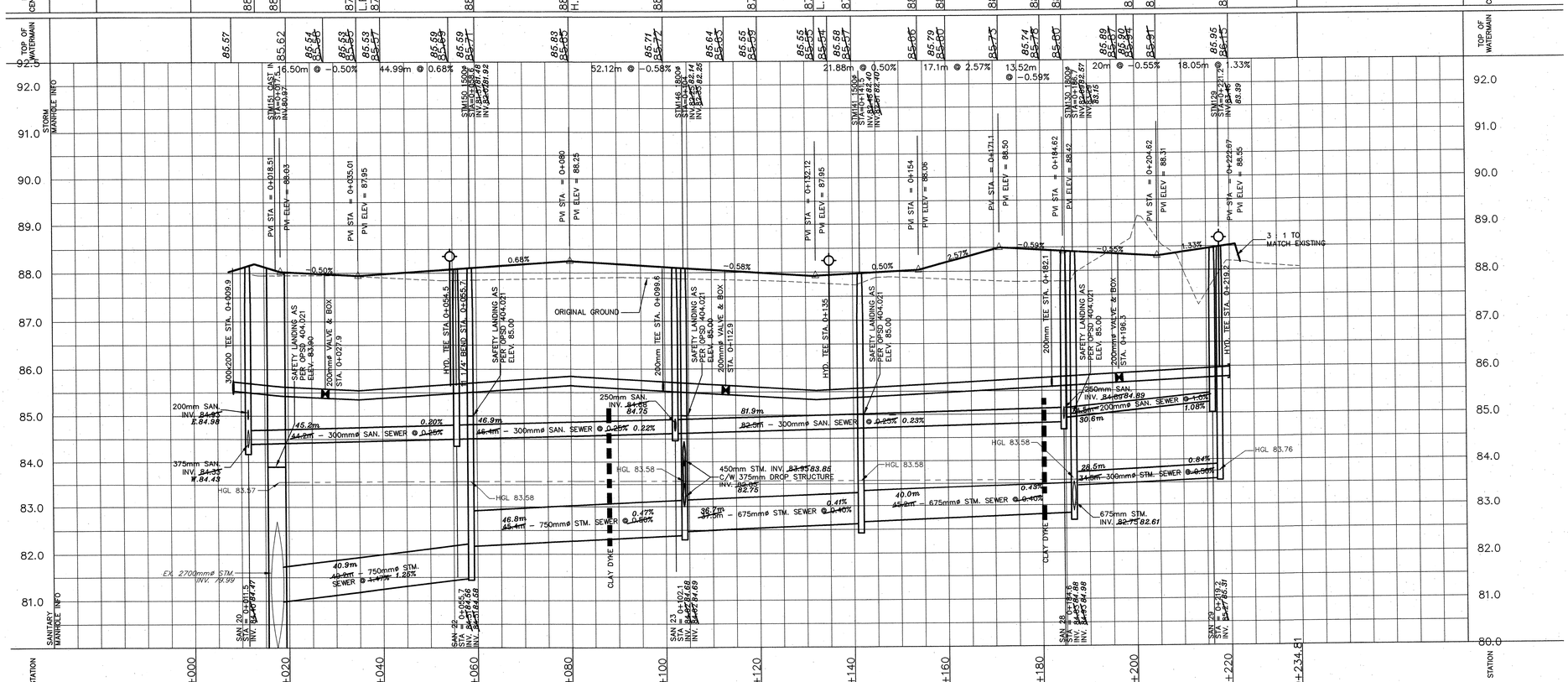

12078

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Notes

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24. SERVICE LATERALS TO BE INSTALLED 0.3m BELOW USF GRADE SPECIFIED ON THE GRADING PLANS.

Revision	By	Appd.	Date
7 AS RECORDED	GBU	TM	2010.11.04
6 LOWERED STORM SEWER	SK	DRP	JUN.30/04
5 REVISED LOT NUMBERS	DRP	DRP	SEPT.11/03
4 REVISED AS PER CITY COMMENTS	LKH	SJP	APR.15/03
3 REVISED EASEMENTS AS PER MUNICIPALITY	LKH	SJP	APR.11/03
2 REVISED AS PER CITY COMMENTS	LKH	SJP	MAR.20/03
1 REVISED AS PER CITY COMMENTS	LKH	SJP	MAR 05/03
File Name: 60400219–BASE–REV	LKH Dwn.	DRP Chkd.	SJP Dsgn.	JAN. 2003 Date

Seals

RECORD DRAWING
DATE NOV.04/10

Client/Project
VALECRAFT

CARDINAL TRAIL 4 SUBDIVISION

Ottawa, Ontario

Title
WINSOME TERRACE
STA. 0+000 TO STA. 0+234.8

Project No.	Scale
60400219	HOR 1 : 500 VER 1: 50
Drawing No.	Sheet / Revision
PP9	12 of 40 / 7

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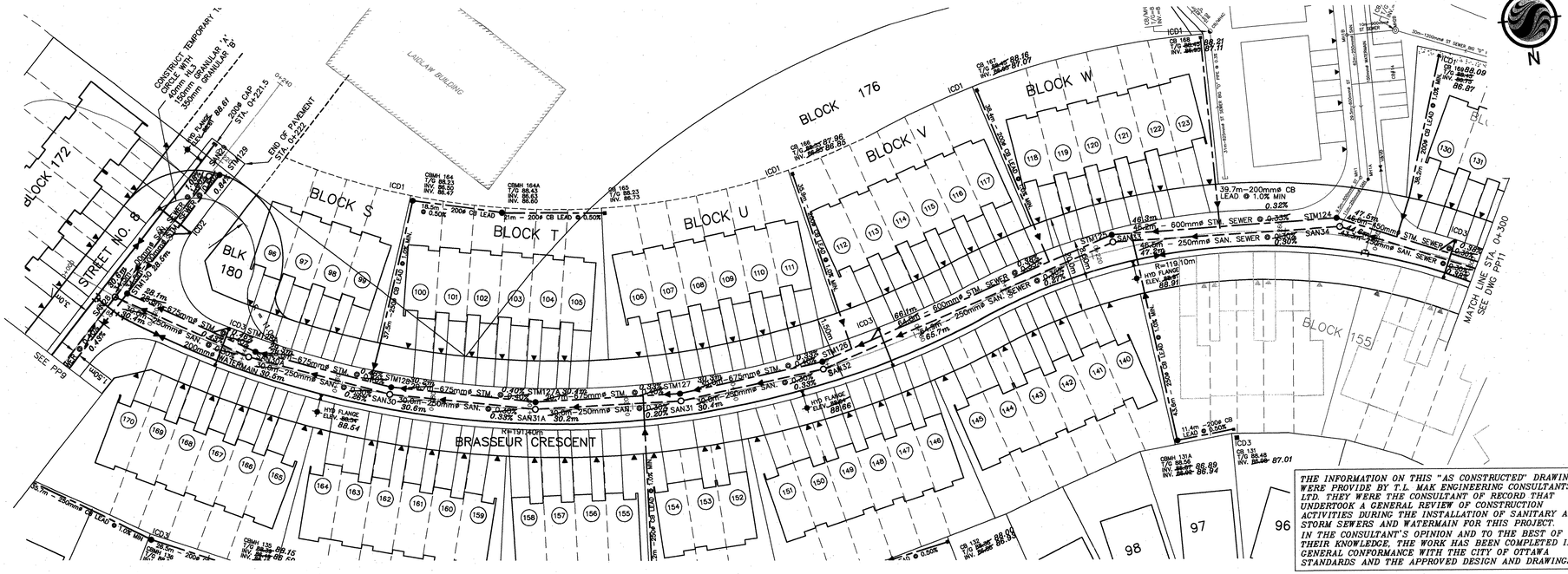

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8	*AS RECORDED*	*GBU*	*TM*	*2010.11.04*
7	REVISED HYDRANT LOCATIONS ON BRASSEUR	DRP	DRP	OCT.13/04
6	REVISED SITE PLAN	SK	DRP	APR.19/04
5	REVISED LOT NUMBERS	DRP	DRP	SEPT.11/03
4	REVISED AS PER CITY COMMENTS	LKH	SJP	APR.15/03
3	REVISED EASEMENTS AS PER MUNICIPALITY	LKH	SJP	APR.11/03
2	REVISED AS PER CITY COMMENTS	LKH	SJP	MAR.20/03
1	REVISED AS PER CITY COMMENTS	LKH	SJP	MAR.05/03
Revision		By	Appd.	Date

File Name: 60400219–BASE–REV | LKH Dwn. | DRP Chkd. | SJP Dsgn. | JAN. 2003 Date

Seals

RECORD DRAWING
DATE NOV.04/10

Client/Project
VALECRAFT

CARDINAL TRAIL 4 SUBDIVISION

Ottawa, Ontario

Title
BRASSEUR CRESCENT
STA. 0+000 TO STA. 0+300

Project No.	Scale
60400219	HOR 1 : 500 VER 1: 50
Drawing No.	**Sheet**	**Revision**
PP10	13 of 40	8

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Stantec

Legend

- PROPOSED WATERMAIN
- PROPOSED VALVE BOX
- PROPOSED VALVE & CHAMBER
- PROPOSED FIRE HYDRANT
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED CATCH BASIN
- PROPOSED CURB INLET CATCH BASIN
- PROPOSED SERVICE LOCATION
- PP-3 — PLAN & PROFILE DRAWING NUMBER
- ICD1 — PROPOSED CATCHBASIN AND CACTHBASIN MANHOLE WITH INLET CONTROL DEVICE (ICD) TO LEAD CONNECTING TO MAIN STORM SEWER

ICD1 = 13.4 L/S
ICD2 = 20.0 L/S
ICD3 = 28.0 L/S
— REFER TO STORM WATER MANAGEMENT REPORT FOR DETAILS

Notes

Revision		By	Appd.	Date
7	*AS RECORDED*	*GBU*	*TM*	*2010.11.04*
8	REVISED HYDRANT LOCATIONS ON BRASSEUR	DRP	DRP	OCT.13/04
7	ADDED SERVICES TO BLOCKS 149 – 41	DRP	DRP	SEPT.21/04
6	REVISED SITE PLAN	SK	DRP	APR.19/04
5	REVISED LOT NUMBERS	DRP	DRP	SEPT.11/03
4	REVISED AS PER CITY COMMENTS	LKH	SJP	APR.15/03
3	REVISED EASEMENTS AS PER MUNICIPALITY	LKH	SJP	APR.11/03
2	REVISED AS PER CITY COMMENTS	LKH	SJP	MAR.20/03
1	REVISED AS PER CITY COMMENTS	LKH	SJP	MAR.05/03

File Name: 60400219–BASE–REV

Dwn.	Chkd.	Dsgn.	Date
LKH	DRP	SJP	JAN. 2003

Seals

RECORD DRAWING
DATE NOV.04/10

Client/Project
VALECRAFT

CARDINAL TRAIL 4 SUBDIVISION

Ottawa, Ontario

Title
SITE SERVICING
EAST HALF

Project No. 60400219
Scale 1:750 (0, 7.5, 22.5, 41.25m)
Drawing No. SP-3
Sheet 3 of 40
Revision 9

12078

12078

APPENDIX E

Stormwater Management

Figure 4 – Storm Drainage Plan

Storm Sewer Calculation Sheet

Storm Sewer Calculation Sheet – Brasseur Crescent

Record Drawing – Cardinal Creek Trunk Storm Sewer STA. 0+000 TO STA. 0+300, CCL (Revision 5, February 14, 2002)

Record Drawing – Cardinal Creek Trunk Storm Sewer STA. 0+300 TO STA. 0+600, CCL (Revision 5, February 14, 2002)

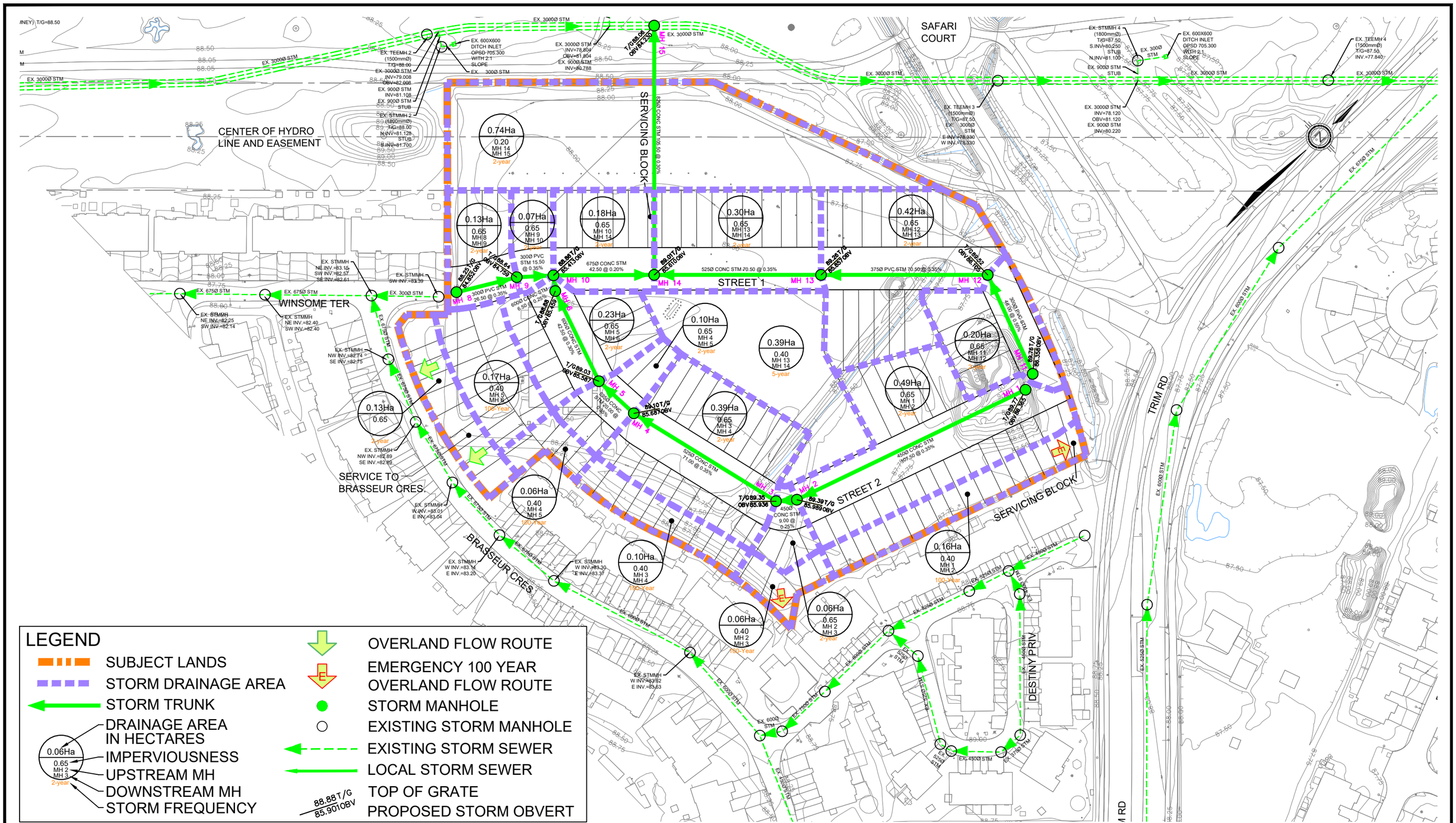
Record Drawing – Cardinal Creek Trunk Storm Sewer STA. 0+600 TO STA. 0+900, CCL (Revision 5, February 14, 2002)

Record Drawing – Cardinal Creek Trunk Storm Sewer STA. 0+900 TO STA. 1+200, CCL (Revision 5, February 14, 2002)

Record Drawing – Cardinal Creek Trunk Storm Sewer STA. 1+200 TO STA. 1+350, CCL (Revision 6, February 14, 2002)

Record Drawing – Grading Plan, Stantec Engineering (February 4, 2011)

Impact on Existing 3000 mm Storm Sewer Trunk and Cardinal Creek Watercourse, JFSA (March 20, 2020)



david schaeffer engineering ltd
120 Iber Road, Unit 103
Stittsville, Ontario, K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

1830 TRIM ROAD

CITY OF OTTAWA

STORM DRAINAGE PLAN

SCALE:	1:1500	PROJECT No.:	19-1137
DATE:	MARCH 2020	FIGURE:	4

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

Local Roads Return Frequency = 2 years
Collector Roads Return Frequency = 5 years
Manning 0.013 Arterial Roads Return Frequency = 10 years

	LOCATION		AREA (Ha) 2 YEAR				AREA (Ha) 5 YEAR				AREA (Ha) 10 YEAR				AREA (Ha) 100 YEAR				FLOW Time of	Intensity	Intensity	Intensity	Intensity	Peak Flow	SEWER DATA DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF	RATIO
			AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	Conc.	2 Year	5 Year	10 Year	100 Year										
Location	From Node	To Node	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(min)	(mm/h)	(mm/h)	(mm/h)	(mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	LOW (min	Q/Q full
Street 2 - 03																																
	11	12	0.20	0.65	0.36	0.36			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	28	300	300	PVC	0.55	46.0	71.7152	1.0146	0.7557	0.387
To Street 1 - 01, Pipe 12 - 13						0.36				0.00				0.00				0.00	10.76														
					0.00	0.00			0.00	0.00			0.00	0.00	0.16	0.40	0.18	0.18														
	1	2	0.49	0.65	0.89	0.89			0.00	0.00			0.00	0.00			0.00	0.18	10.00	76.81	104.19	122.14	178.56	100	450	450	CONC	0.35	107.5	168.6711	1.0605	1.6894	0.592
					0.00	0.89			0.00	0.00			0.00	0.00	0.06	0.40	0.07	0.24														
	2	3	0.06	0.65	0.11	0.99			0.00	0.00			0.00	0.00			0.00	0.24	11.69	70.87	96.04	112.54	164.46	111	450	450	CONC	0.25	9.0	142.5531	0.8963	0.1674	0.776
					0.00	0.99			0.00	0.00			0.00	0.00	0.10	0.40	0.11	0.36														
	3	4	0.39	0.65	0.70	1.70			0.00	0.00			0.00	0.00			0.00	0.36	11.86	70.34	95.31	111.68	163.20	178	525	525	CONC	0.35	71.0	254.4283	1.1753	1.0068	0.698
					0.00	1.70			0.00	0.00			0.00	0.00	0.06	0.40	0.07	0.42														
	4	5	0.10	0.65	0.18	1.88			0.00	0.00			0.00	0.00			0.00	0.42	12.86	67.32	91.16	106.80	156.03	192	525	525	CONC	0.35	20.0	254.4283	1.1753	0.2836	0.756
					0.00	1.88			0.00	0.00			0.00	0.00	0.17	0.40	0.19	0.61														
	5	6	0.23	0.65	0.42	2.29			0.00	0.00			0.00	0.00			0.00	0.61	13.15	66.52	90.06	105.51	154.13	247	600	600	CONC	0.30	42.5	336.3080	1.1894	0.5955	0.734
	6	10			0.00	2.29			0.00	0.00			0.00	0.00			0.00	0.61	13.74	64.90	87.85	102.90	150.31	241	600	600	CONC	0.25	6.5	307.0058	1.0858	0.0998	0.785
To Street 1 - 01, Pipe 10 - 14						2.29				0.00				0.00				0.61	13.84														
Street 1 - 01																																
Contribution From Street 2 - 03, Pipe 11 - 12						0.36				0.00				0.00				0.00	10.76														
	12	13	0.42	0.65	0.76	1.12			0.00	0.00			0.00	0.00			0.00	0.00	10.76	74.02	100.36	117.63	171.93	83	375	375	PVC	0.35	70.5	103.7267	0.9392	1.2511	0.799
			0.30	0.65	0.54	1.66			0.00	0.00			0.00	0.00			0.00	0.00														
	13	14			0.00	1.66	0.39	0.40	0.43	0.43			0.00	0.00			0.00	0.00	12.01	69.87	94.67	110.92	162.08	157	525	525	CONC	0.35	70.5	254.4283	1.1753	0.9997	0.618
To Servicing Block - 02, Pipe 14 - 15						1.66				0.43				0.00				0.00	13.01														
	8	9	0.13	0.65	0.23	0.23			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	18	300	300	PVC	0.35	26.5	57.2089	0.8093	0.5457	0.315
	9	10	0.07	0.65	0.13	0.36			0.00	0.00			0.00	0.00			0.00	0.00	10.55	74.77	101.40	118.85	173.72	27	300	300	PVC	0.35	15.5	57.2089	0.8093	0.3192	0.472
Contribution From Street 2 - 03, Pipe 6 - 10						2.29				0.00				0.00				0.61	13.84														
	10	14	0.18	0.65	0.33	2.98			0.00	0.00			0.00	0.00			0.00	0.61	13.84	64.64	87.49	102.48	149.69	284	675	675	CONC	0.20	42.5	375.9224	1.0505	0.6743	0.756
To Servicing Block - 02, Pipe 14 - 15						2.98				0.00				0.00				0.61	14.52														
Servicing Block - 02																																
Contribution From Street 1 - 01, Pipe 10 - 14						2.98				0.00				0.00				0.61	14.52														
Contribution From Street 1 - 01, Pipe 13 - 14						1.66				0.43				0.00				0.00	13.01														
	14	15	0.74	0.20	0.41	5.06			0.00	0.43			0.00	0.00			0.00	0.61	14.52	62.93	85.15	99.73	145.65	444	825	825	CONC	0.30	105.5	786.2205	1.4708	1.1955	0.565

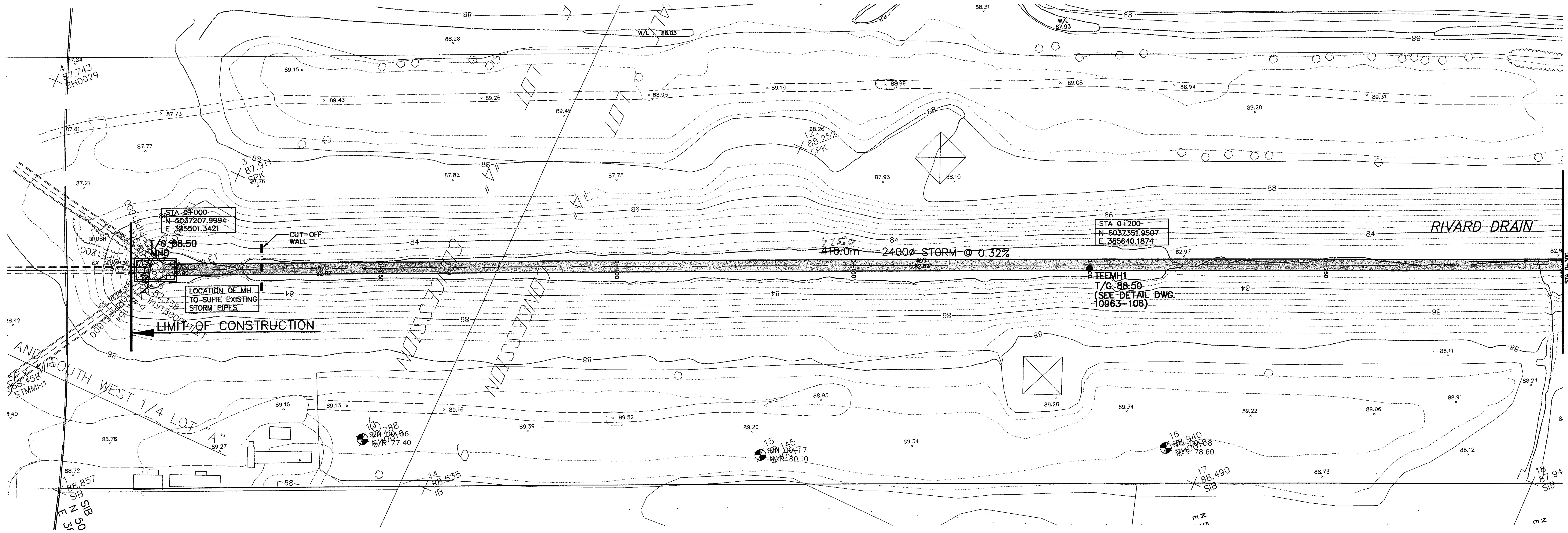
Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Notes:
1) Ottawa Rainfall-Intensity Curve
2) Min. Velocity = 0.80 m/s

Designed: CB	PROJECT: 1830 TRIM ROAD	
Checked: SM	LOCATION: City of Ottawa	
Dwg. Reference: Figure-4	File Ref: 19-1137	Date: 06-Mar-20
		Sheet No. SHEET 1 OF 1

Storm Sewer Calculation Sheet
1830 Trim Road

										Sewer Data								
Area ID	**Up**	**Down**	**Area**	**C**	**Indiv AxC**	**Acc AxC**	**T_C**	**i (2-YR)**	**Q**	**DIA**	**Slope**	**Length**	**$A_{hydraulic}$**	**R**	**Velocity**	**Qcap**	**Time Flow**	**Q / Q full**
			(ha)	**(-)**			**(min)**	**(mm/hr)**	**(L/s)**	**(mm)**	**(%)**	**(m)**	**(m^2)**	**(m)**	**(m/s)**	**(L/s)**	**(min)**	**(-)**
Brasseur			0.130	0.65	0.08	0.08	10.0	75.9	17.8	675	0.33	30.4	0.358	0.169	1.35	482.9	0.4	0.04
Crescent																		



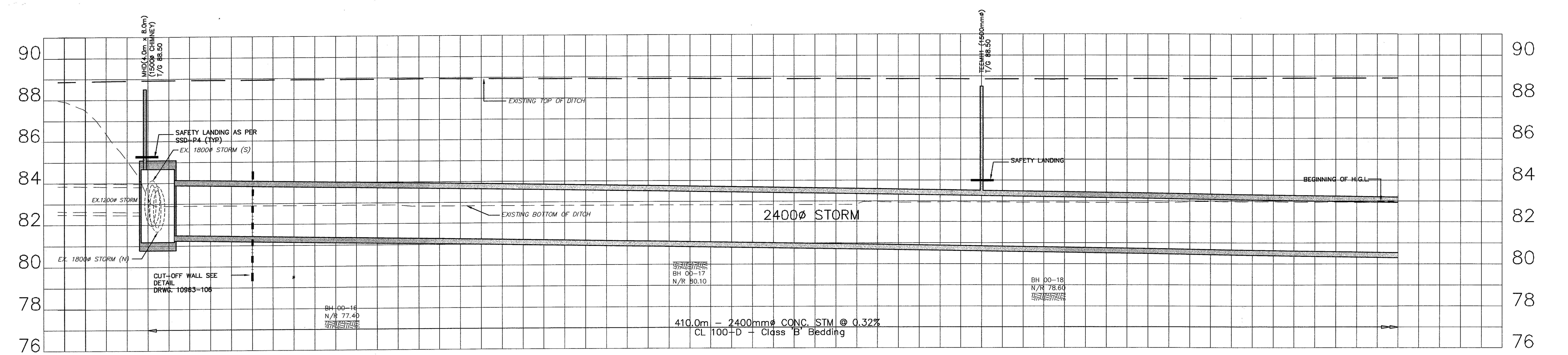
LEGEND:

- – – – – H.G.L. (HYDRAULIC GRADE LINE)
- BH00-16 N/R 77.40 BOREHOLE NUMBER AND ELEVATION
- — · · — CUT-OFF WALLS SEE DETAIL DRAWING 10963-106

NOTES:

- BACKFILL TO BE GRADED TO ~~MATCH EXISTING AND~~ PROVIDE POSITIVE DRAINAGE.
- MANHOLE CHIMNEYS 1500mmø. AS PER SSD-S4

Contractor placed additional fill at varying depths over ROW to suit existing conditions subject to: (1) 7.0 m height restriction over the pipe, and (2) maintaining required clearances to transmission lines (Hydro One approval)



	0+000	0+025	0+050	0+075	0+100	0+125	0+150	0+175	0+200	0+225	0+250	0+275	0+300
DESIGN PROFILE ELEVATIONS													
TOP OF WATERMAIN ELEVATION													
STORM SEWER INV. ELEVATION	82.610 W (1200ø) 81.930 N (1800ø) 82.140 S (1800ø) 81.500 E (2400ø)		81.340		81.180		81.020		80.860		80.700		80.540
SANITARY SEWER INV. ELEVATION													
C.L. ROADWAY STATION	0+000	0+025	0+050	0+075	0+100	0+125	0+150	0+175	0+200	0+225	0+250	0+275	0+300

REGISTERED PROFESSIONAL ENGINEER — R.W. WINGATE — PROVINCE OF ONTARIO

NO.	REVISIONS	DATE	INITIAL
5.	ISSUED FOR CONSTRUCTION	02/02/14	
4.	REVISE AS PER CITY COMMENTS	01/11/08	
3.	REVISE STANDARDS NOTATIONS	01/10/05	
2.	UPDATE DRAWING	01/09/27	
1.	ISSUED FOR TENDER	00/12/05	
0.	ISSUED FOR APPROVAL	00/12/01	

Ottawa

CARDINAL CREEK TRUNK STORM SEWER

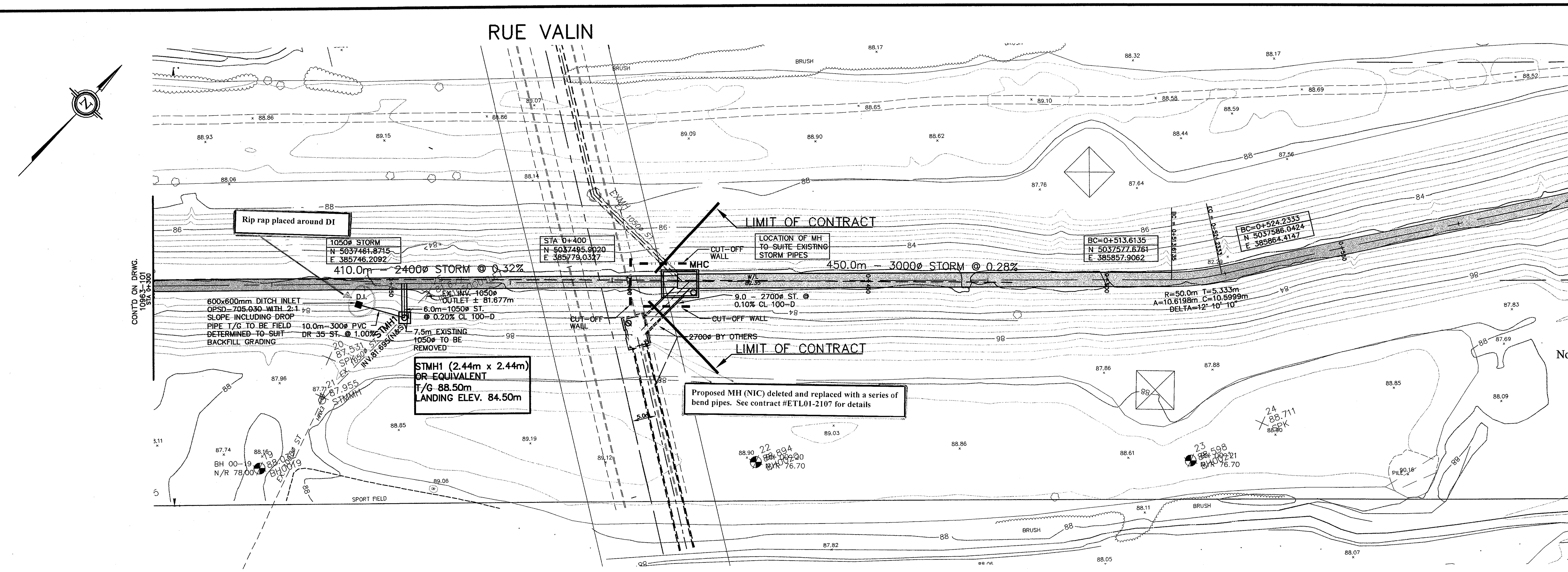
STA. 0+000 TO STA. 0+300

Cumming Cockburn Limited
Consulting Engineers and Planners
Ottawa, Kingston, Toronto, Waterloo, London

CCL

SCALE:	1 : 500 H 1 : 100 V
DRAWN BY:	D.S.
DESIGN:	R.W.W.
CHECKED:	R.W.W.
DATE:	DEC. 2000
DRWG No.:	10963-101

10963



LEGEND:

- – – – – H.G.L. (HYDRAULIC GRADE LINE)
- BH00–16 N/R 77.40 BOREHOLE NUMBER AND ELEVATION
- – · – · – CUT–OFF WALLS SEE DETAIL DRAWING 10963–106

NOTES:

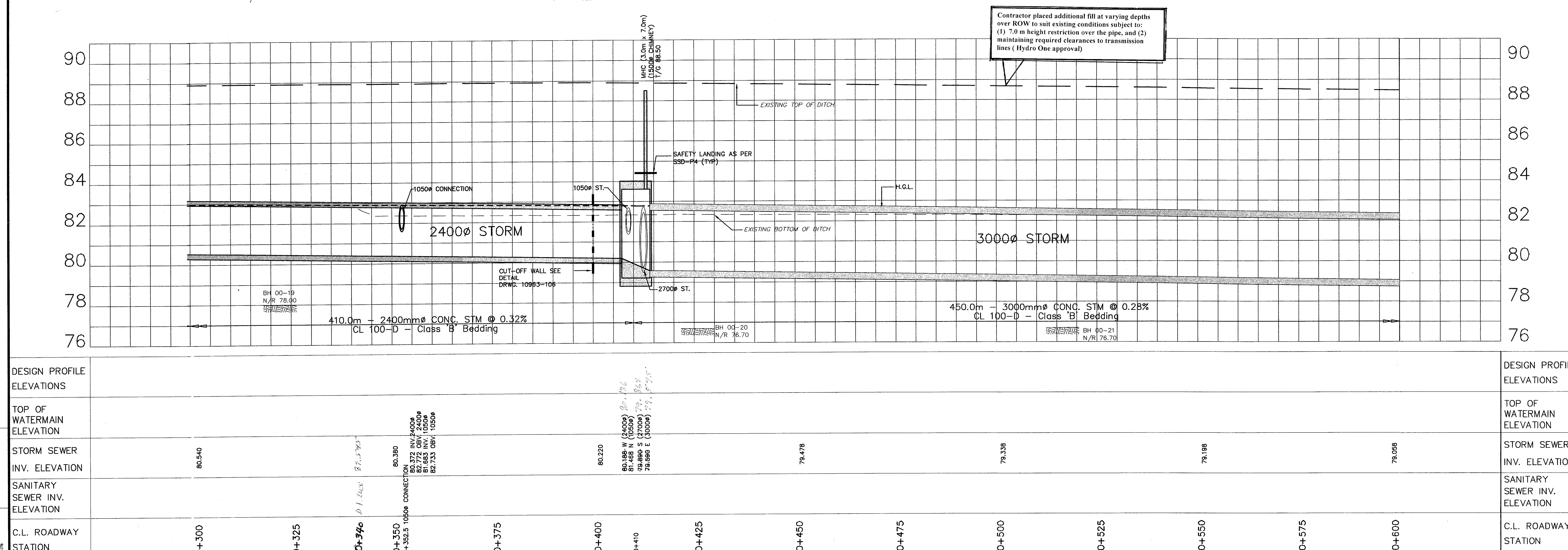
- BACKFILL TO BE GRADED TO ~~MATCH EXISTING AND~~ PROVIDE POSITIVE DRAINAGE.
- MANHOLE CHIMNEYS 1500mmø. AS PER SSD–S4

Note: 2400mm dia. Storm 4.88m west of MHC, Station +/- 0+405 joint pipe gasket eliminated, and replaced with condor plastic cement, then parged joint

MHC Coordinates Revised:

North West Corner N – 5037507.285 E – 385786.437	North East Corner N – 5037501.947 E – 385781.340
South West Corner N – 50374981.173 E – 385785.191	South East Corner N – 5037501.947 E – 385790.225

Contractor placed additional fill at varying depths over ROW to suit existing conditions subject to: (1) 7.0 m height restriction over the pipe, and (2) maintaining required clearances to transmission lines (Hydro One approval)



NO.	REVISIONS	DATE	INITIAL
5.	ISSUED FOR CONSTRUCTION	02/02/14	
4.	REVISE AS PER CITY COMMENTS	01/11/08	
3.	REVISE STANDARDS NOTATIONS	01/10/05	
2.	UPDATE DRAWING	01/09/27	
1.	ISSUED FOR TENDER	00/12/05	
0.	ISSUED FOR APPROVAL	00/12/01	

REGISTERED PROFESSIONAL ENGINEER R.W. WINGATE PROVINCE OF ONTARIO

Ottawa

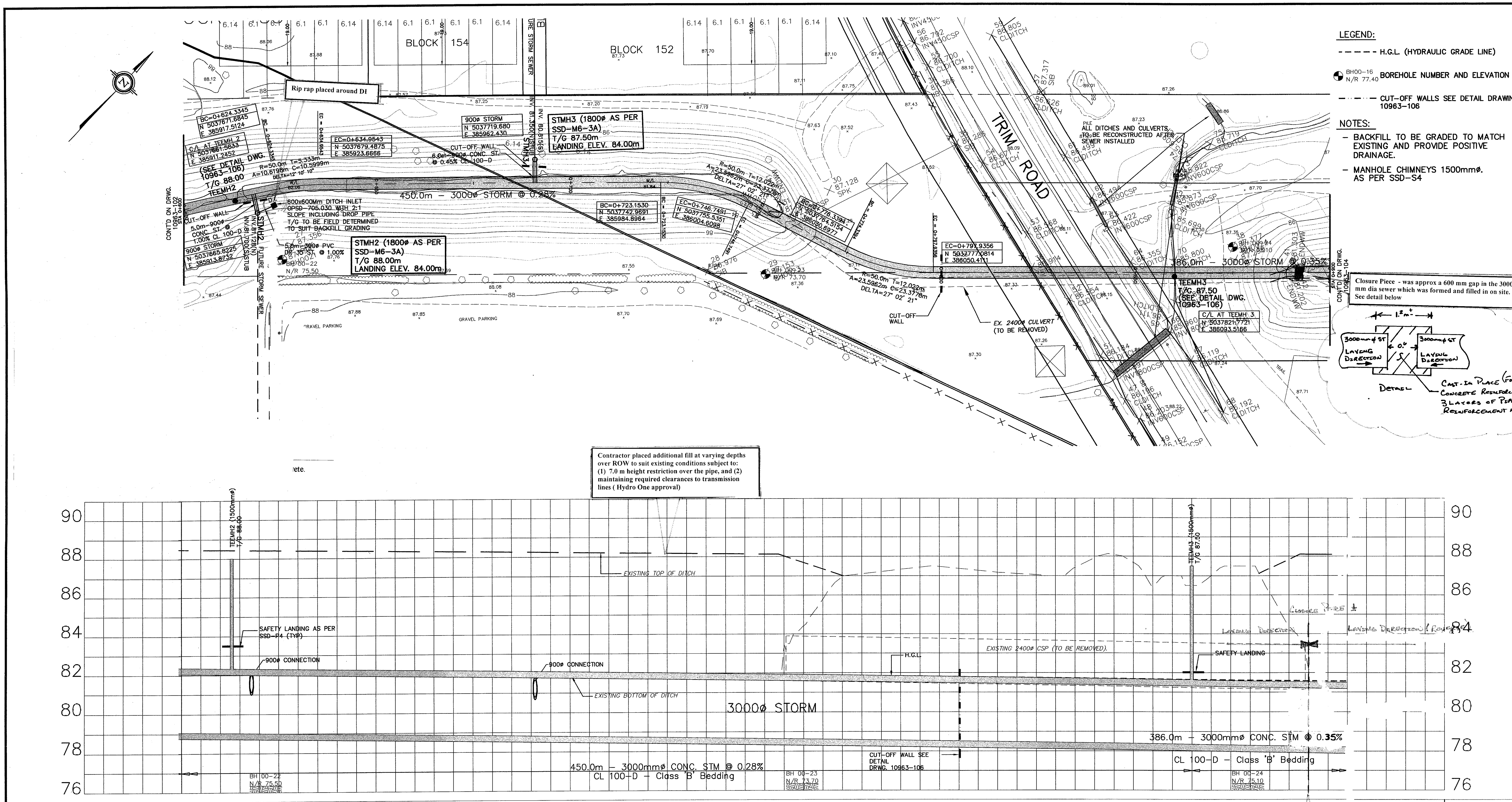
CARDINAL CREEK TRUNK STORM SEWER

STA. 0+300 TO STA. 0+600

Cumming Cockburn Limited
Consulting Engineers and Planners
Ottawa, Kingston, Toronto, Waterloo, London

SCALE:	1 : 500 H 1 : 100 V
DRAWN BY:	D.S.
DESIGN:	R.W.W.
CHECKED:	R.W.W.
DATE:	DEC. 2000
DRWG No.:	10963–102

10963



LEGEND:

- – – – – H.G.L. (HYDRAULIC GRADE LINE)
- BH00-16 N/R 77.40 BOREHOLE NUMBER AND ELEVATION
- – · – · – CUT-OFF WALLS SEE DETAIL DRAWING 10963-106

NOTES:

- BACKFILL TO BE GRADED TO MATCH EXISTING AND PROVIDE POSITIVE DRAINAGE.
- MANHOLE CHIMNEYS 1500mmø. AS PER SSD-S4

DESIGN PROFILE ELEVATIONS													
TOP OF WATERMAIN ELEVATION													
STORM SEWER INV. ELEVATION	79.058	79.008 INV. 3000ø 82.008 OBV. 3000ø 81.108 INV. 900ø	78.918	78.804 INV. 3000ø 81.804 OBV. 3000ø 80.788 INV. 900ø	78.778	78.638	78.498	78.358	78.330 E&W (3000ø)	78.190			
SANITARY SEWER INV. ELEVATION													
C.L. ROADWAY STATION	0+600	0+613	0+618 900ø CONNECTION	0+625	0+650	0+675	0+691 900ø CONNECTION	0+700	0+725	0+750	0+775	0+800	0+825	0+850	0+860	0+875	0+900

NO.	REVISIONS	DATE	INITIAL
5.	ISSUED FOR CONSTRUCTION	02/02/14	
4.	REVISE AS PER CITY COMMENTS	01/11/08	
3.	REVISE STANDARDS NOTATIONS	01/10/05	
2.	UPDATE DRAWING	01/09/27	
1.	ISSUED FOR TENDER	00/12/05	
0.	ISSUED FOR APPROVAL	00/12/01	

REGISTERED PROFESSIONAL ENGINEER R.W. WINGATE PROVINCE OF ONTARIO

Ottawa

CARDINAL CREEK TRUNK STORM SEWER

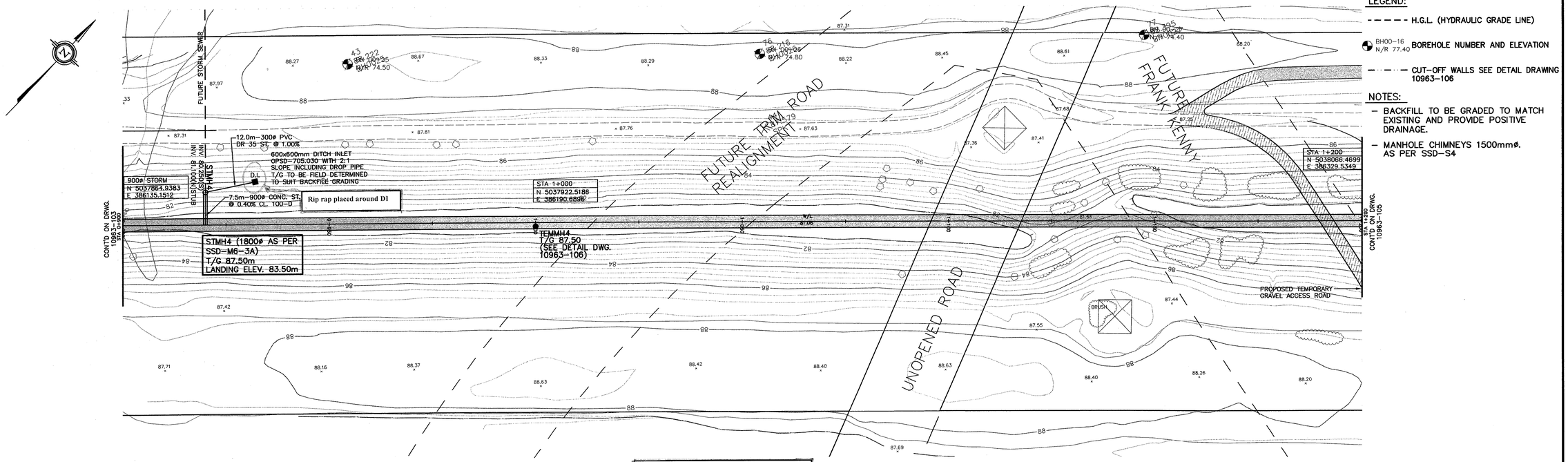
STA. 0+600 TO STA. 0+900

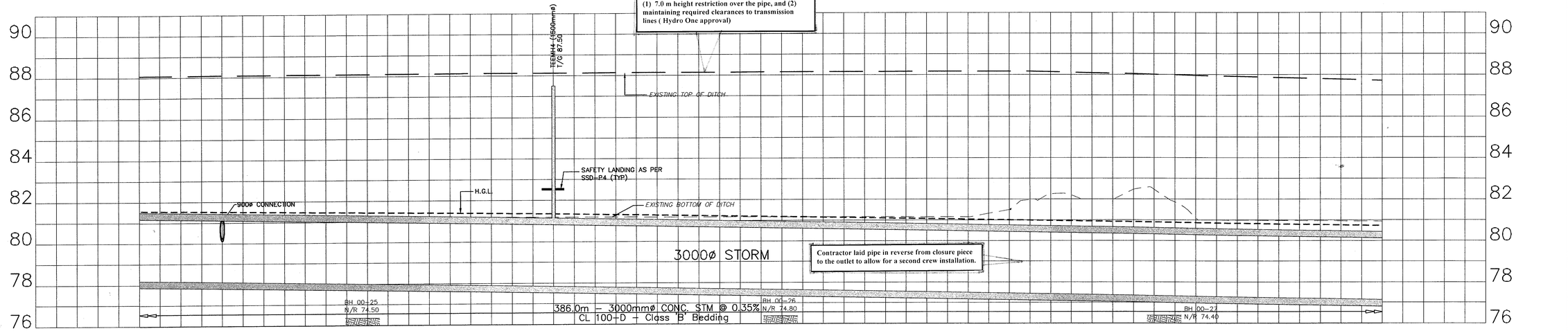
Cumming Cockburn Limited
Consulting Engineers and Planners
Ottawa, Kingston, Toronto, Waterloo, London

CCL

SCALE:	1 : 500 H 1 : 100 V
DRAWN BY:	D.S.
DESIGN:	R.W.W.
CHECKED:	R.W.W.
DATE:	NOV. 2000
DRWG No.:	10963-103

10963





DESIGN PROFILE ELEVATIONS														DESIGN PROFILE ELEVATIONS
TOP OF WATERMAIN ELEVATION														TOP OF WATERMAIN ELEVATION
STORM SEWER INV. ELEVATION	78.190	78.120 INV.3000ø 80.120 INV. 1800ø 80.220 INV. 900ø	78.015	77.840	77.665	77.490	77.315	77.140						STORM SEWER INV. ELEVATION
SANITARY SEWER INV. ELEVATION														SANITARY SEWER INV. ELEVATION
C.L. ROADWAY STATION	0+900	0+920 900ø CONNECTION	0+925	0+950	0+975	1+000	1+025	1+050	1+075	1+100	1+125	1+150	1+175	1+200	C.L. ROADWAY STATION

NO.	REVISIONS	DATE	INITIAL
5.	ISSUED FOR CONSTRUCTION	02/02/14	
4.	REVISE AS PER CITY COMMENTS	01/11/08	
3.	REVISE STANDARDS NOTATIONS	01/10/05	
2.	UPDATE DRAWING	01/09/27	
1.	ISSUED FOR TENDER	00/12/05	
0.	ISSUED FOR APPROVAL	00/12/01	

REGISTERED PROFESSIONAL ENGINEER R.W.WINGATE DEC. 01/00 PROVINCE OF ONTARIO

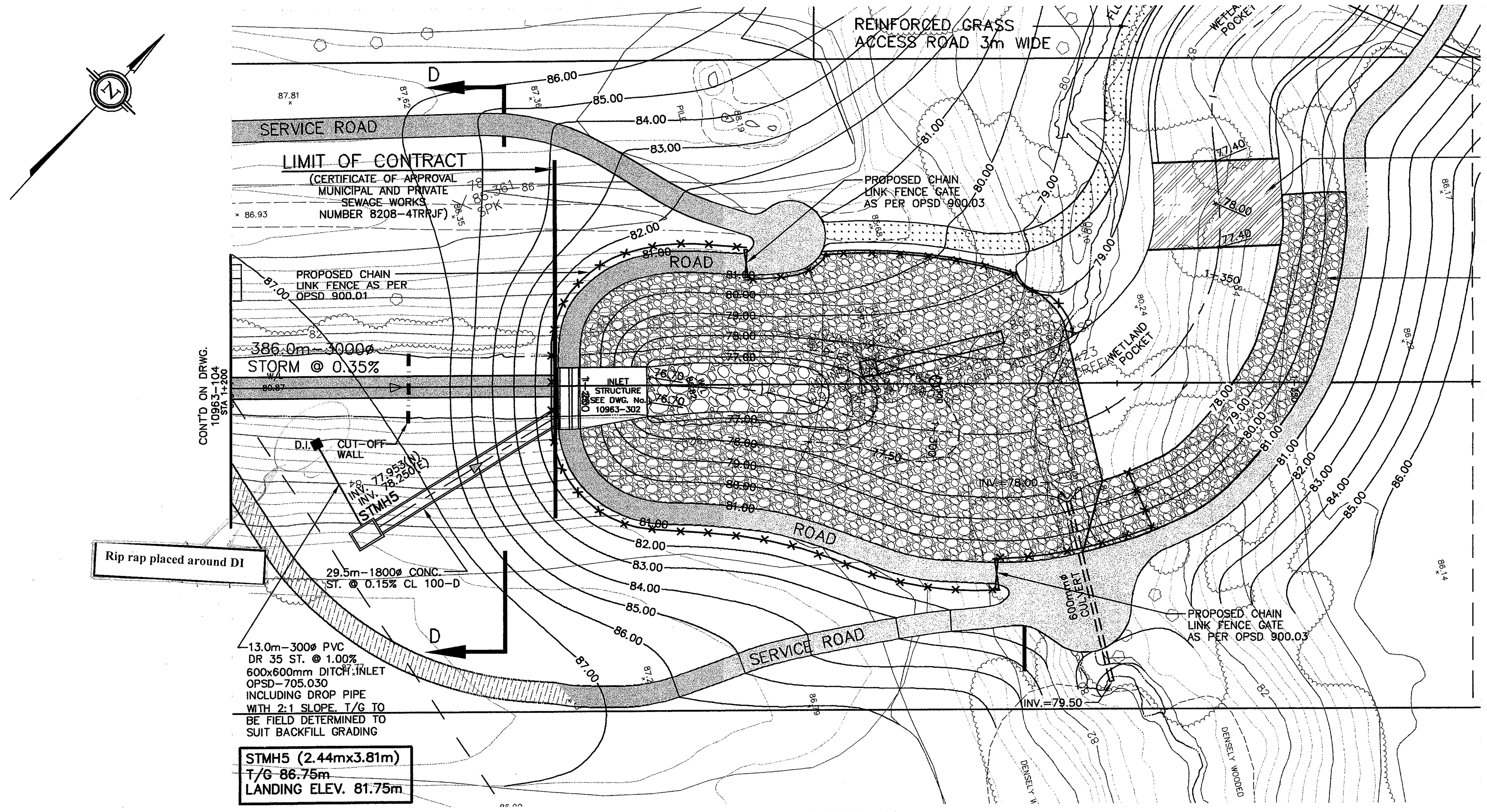
Ottawa
CARDINAL CREEK TRUNK STORM SEWER
STA. 0+900 TO STA. 1+200

Cumming Cockburn Limited
Consulting Engineers and Planners
Ottawa, Kingston, Toronto, Waterloo, London

SCALE: 1 : 500 H, 1 : 100 V
DRAWN BY: D.S.
DESIGN: R.W.W.
CHECKED: R.W.W.
DATE: DEC. 2000
DRWG No.: 10963-104

10963

PLOT SCALE: 1 : 1
DWG NAME: 3330-10\PLANS\10-105
PAPER SPACE: YES
POP FILE: 03.2000.078
USER: NONE
COMMENTS: PLOT LAYOUT 104



FOR SECTION D-D SEE DRAWING 10963-106

SOUTHERN SEDIMENT FOREBAY
SEE DWG'S 10963-300, 301, 302

LEGEND:

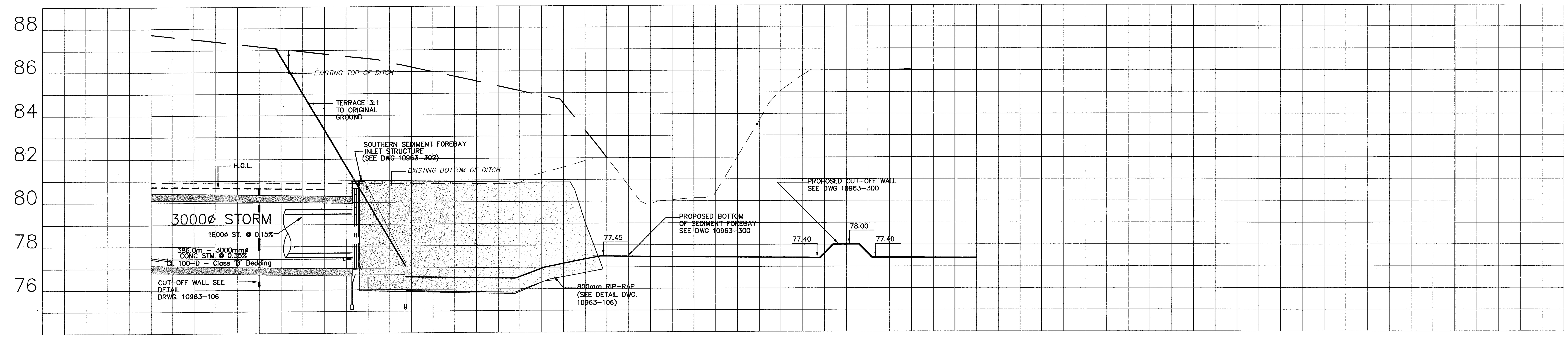
- – – – – H.G.L. (HYDRAULIC GRADE LINE)
- BH00-16 N/R 77.40 BOREHOLE NUMBER AND ELEVATION
- – · – · – CUT-OFF WALLS SEE DETAIL DRAWING 10963-106

NOTES:

- BACKFILL TO BE GRADED TO MATCH EXISTING AND PROVIDE POSITIVE DRAINAGE.
- MANHOLE CHIMNEYS 1500mmø. AS PER SSD-S4

HATCH LEGEND

- ASPHALT ACCESS ROAD
- REINFORCED GRASS ACCESS ROAD
- TEMPORARY GRAVEL ACCESS ROAD
- RIP-RAP



DESIGN PROFILE ELEVATIONS									DESIGN PROFILE ELEVATIONS
TOP OF WATERMAIN ELEVATION									TOP OF WATERMAIN ELEVATION
STORM SEWER INV. ELEVATION	77.140		77.000 (3000ø)						STORM SEWER INV. ELEVATION
SANITARY SEWER INV. ELEVATION									SANITARY SEWER INV. ELEVATION
C.L. ROADWAY STATION	1+200	1+225	1+250	1+275	1+300	1+325	1+350	1+375	C.L. ROADWAY STATION

NO.	REVISIONS	DATE	INITIAL
6.	ISSUED FOR CONSTRUCTION	02/02/14	

REGISTERED PROFESSIONAL ENGINEER R.W. WINGATE 01/00 PROVINCE OF ONTARIO

NO.	REVISIONS	DATE	INITIAL
6.	REVISE AS PER CITY COMMENTS	01/11/08	
5.	REVISE STANDARDS NOTATIONS	01/10/05	
4.	UPDATE DRAWING	01/09/27	
3.	REVISE SLOPE 1800ø STORM	01/01/12	
2.	REVISE SEDIMENT POND	00/12/15	
1.	ISSUED FOR TENDER	00/12/05	
0.	ISSUED FOR APPROVAL	00/12/01	

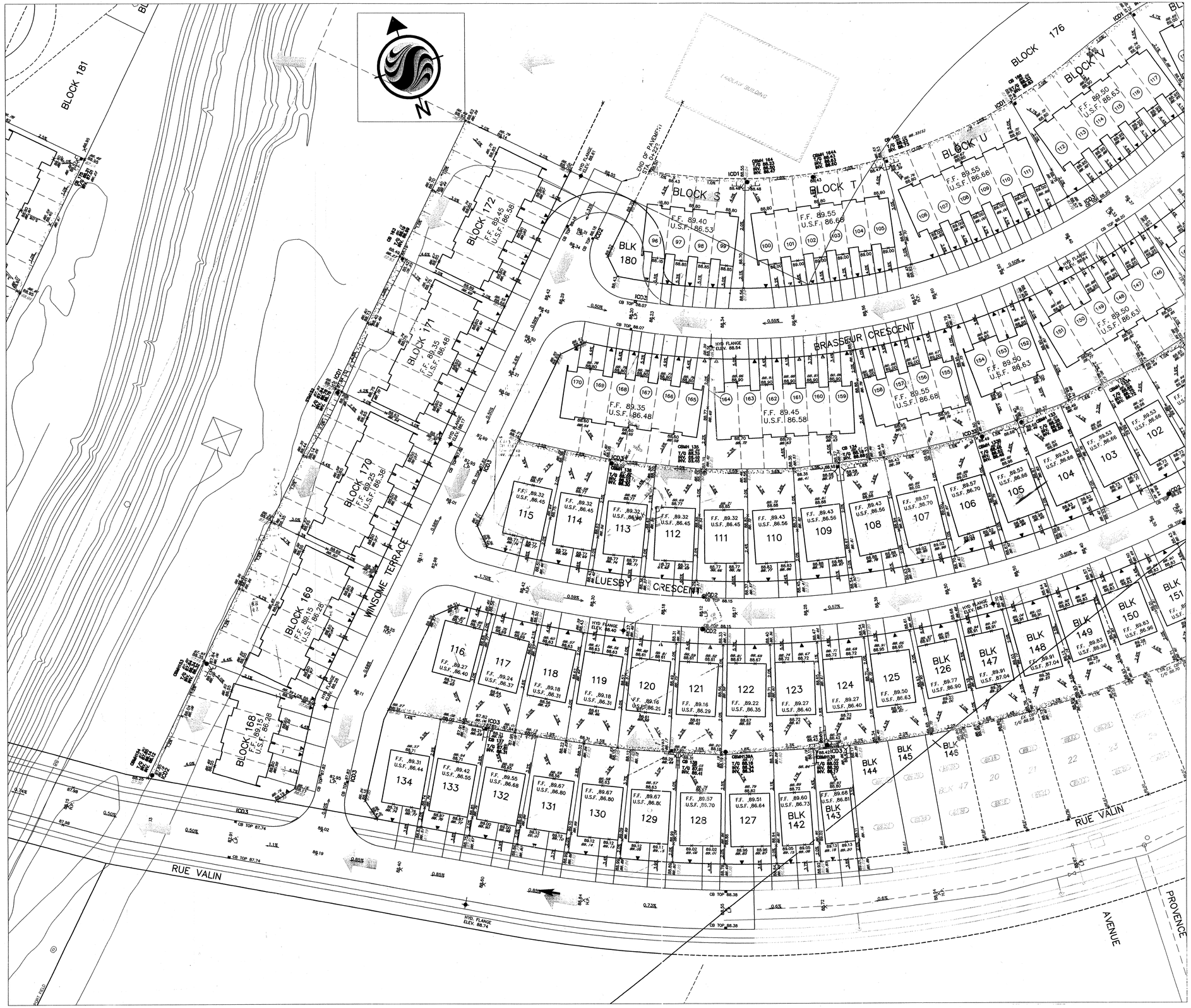
Ottawa
CARDINAL CREEK TRUNK STORM SEWER

STA. 1+200 TO STA. 1+350

Cumming Cockburn Limited
Consulting Engineers and Planners
Ottawa, Kingston, Toronto, Waterloo, London

SCALE:	1 : 500 H 1 : 100 V
DRAWN BY:	D.S.
DESIGN:	R.W.W.
CHECKED:	R.W.W.
DATE:	DEC. 2000
DRWG No.:	10963-105

10963



Stantec Consulting Ltd.
400-1505 Laperriere Avenue
Ottawa ON Canada
K1Z 7T1
Tel. 613.722.4420
Fax. 613.722.2799
www.stantec.com

Stantec

Legend

1.60%	DIRECTION & PERCENT FLOW
x 79.79	PROPOSED ELEVATION
70.09 x	PROPOSED LOT CORNER ELEVATION EXISTING ELEVATION AT LOT CORNER
FF=80.85	FINISHED FIRST FLOOR ELEVATION T.F. TYPICALLY IS 0.3m BELOW FF
3R	NUMBER OF RISERS
	TERRACING 3:1 SLOPE MINIMUM (UNLESS OTHERWISE SHOWN)
	PROPOSED CATCH BASIN
	EXISTING CATCH BASIN
	MAJOR STORM FLOW DIRECTION

SUBRAIN SEE DETAIL L9 DWG D-2

SURVEYOR'S CERTIFICATE:

I HEREBY CERTIFY THAT THE "AS BUILT" GRADES SHOWN THUS: 95.45 ON THIS PLAN ARE CORRECT.

DATE: _____ BRIAN J. WEBSTER ONTARIO LAND SURVEYOR

REVISION NOTE:

REVISED TO ILLUSTRATE LOTS 36, 37, 54, 59, 60, 93 TO 125 (BOTH INCLUSIVE) AND 127 TO 134 (BOTH INCLUSIVE), BLOCKS 126, 147 TO 152 (BOTH INCLUSIVE) AND 168 TO 175 (BOTH INCLUSIVE) AND PART OF BLOCK 156 REGISTERED PLAN 4M-1217 AND BLOCKS 41 TO 49 (BOTH INCLUSIVE), 59, 60, 61 AND 62 REGISTERED PLAN 4M-1217

DATE: _____ BRIAN J. WEBSTER ONTARIO LAND SURVEYOR

Notes

REVISION NOTE:

REVISED TO ILLUSTRATE BLOCKS 142 AND 143 REGISTERED PLAN 4M-1217

DATE: Feb 9/11 BRIAN J. WEBSTER ONTARIO LAND SURVEYOR

8	REVISED LOT GRADING FRONTING RUE VALIN	DRP	DRP	OCT. 19/04
7	DETAILED GRADING FOR BLOCKS 149 – 41	DRP	DRP	SEPT.21/04
6	REVISED SITE PLAN	SK	DRP	SEPT.17/04
5	REVISED LOT NUMBERS	DRP	DRP	SEPT.11/03
4	REVISED AS PER CITY COMMENTS	LKH	SJP	NOV. 15/03
3	REVISED EASEMENTS AS PER MUNICIPALITY	LKH	SJP	NOV. 11/03
2	REVISED AS PER CITY COMMENTS	LKH	SJP	MAR. 20/03
1	REVISED STORM WATER MANAGEMENT	LKH	SJP	MAR. 5/03
Revision		By	Appd.	Date

File Name: 60400219-BASE-REV	LKH	DRP	SJP	JAN. 2003
	Dwn.	Chkd.	Dsgn.	Date

Seals

Client/Project

VALECRAFT

CARDINAL TRAIL 4 SUBDIVISION

Ottawa, Ontario

Title

GRADING PLAN

Project No.	Scale	Revision
60400219	1 : 500 (0 5 15 25m)	
Drawing No.	Sheet	
GP-3	22 of 40	8

12078

12078

J.F. Sabourin and Associates Inc.
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS

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March 20, 2020

David Schaeffer Engineering Ltd.
120 Iber Road, Unit 103
Ottawa, Ontario K2S 1E9

Attention: **Jennifer Ailey, P.Eng.**

Subject: **1830 Trim Road / Impact on Existing 3000 mm Storm Sewer Trunk and Cardinal Creek Watercourse** *our file: 1895-19*

As requested by your office, we have evaluated, based on the provided information as described below, the impact of the proposed 1830 Trim Road development on 100-year 24-hour SCS Type II design storm flows and water levels in the existing 3000 mm trunk storm sewer and the downstream Cardinal Creek watercourse.

A storm drainage plan of the proposed development is included in Attachment A, as provided by DSEL. The site has a drainage area of 4.38 ha with an average runoff coefficient (C) of 0.52, the majority of which discharges directly to the existing 3000 mm diameter trunk storm sewer, and 0.13 ha (C = 0.65) of which drains to an existing 675 mm diameter local pipe upstream of the trunk sewer. An average percent imperviousness of 46% has been calculated for the 4.38 ha drainage area based on the runoff coefficients (C) provided by DSEL and the formula C = 0.7 x imperviousness ratio + 0.2.

The subject site is modelled under existing conditions as part of subcatchment CS (22.18 ha, 37.5% imperviousness) in the July 5, 2013 version of the XPSWMM model of the Cardinal Creek watershed by AECOM, updated from the August 2009 *Greater Cardinal Creek Subwatershed Study XPSWMM Model Calibration and Verification Report*. Note that the existing subject site is partly developed with a gravel parking lot and building; a percent imperviousness of 56% for the existing 4.38 ha area was estimated based on Google Maps satellite imagery. An XPSWMM model schematic is presented in Attachment B. A drainage plan from the August 2009 report showing the location and extents of area CS is included in Attachment A. Subcatchment CS is modelled with on-site storage and outflow restrictions based on the relationship summarized in Table 1.

Table 1: Existing Conditions Stage-Area-Storage-Outflow Relationship for Area CS

Elevation (m)	Depth (m)	Area (m^2)	Volume (m^3)	Outflow (m^3/s)
95.00	0.00	10	0	0
96.10	1.10	10	11	0
96.20	1.20	10	12	1.43
96.25	1.25	1000	31	1.45
96.30	1.30	4000	147	1.46
96.35	1.35	8700	457	1.48
96.40	1.40	14500	1031	1.50
96.45	1.45	21900	1935	1.52
96.50	1.50	24900	3104	1.55
96.55	1.55	27400	4411	1.55

The maximum outflow of 1.55 m^3/s for area CS is equal to 70 L/s/ha. It should be noted that the hydraulic gradeline in the July 5, 2013 model reach ground elevation at multiple nodes in the XPSWMM model, resulting in storm runoff volume "spilling" out of the node and being lost to the system. We believe this spilling to be unintentional, and have therefore re-run the existing conditions XPSWMM model with the nodes "sealed", to allow the hydraulic gradeline to rise above ground level without losing volume from the system. This should not be taken as an indication that we have fully reviewed the model; we have only corrected this likely error and otherwise proceeded with the model as is based on the City's direction.

We understand that it is preferred that the proposed 1830 Trim Road site be developed without on-site controls, such that the peak flows discharge to the trunk storm sewer and ultimately to the Cardinal Creek watercourse without quantity control or on-site storage requirements. In order to test the impact of this proposed on water levels in the trunk sewer and watercourse, the 4.38 ha subject site was removed from subcatchment CS in the XPSWMM model and modelled separately at node MH-C along the trunk sewer. Note that some on-site control may result from the minor and major system design (e.g. 2-year level of service provided in minor system, major system storage resulting from proposed grading), but have not been accounted for in proposed conditions modelling in order to be conservative.

To prepare a proposed conditions XPSWMM model, area CS was adjusted to reduce the drainage area to 17.80 ha (22.18 ha existing area - 4.38 ha subject site), the percent imperviousness to 26.4% (37.5% existing imperviousness less 56% existing imperviousness of subject site, weighted by area), and the width to 1602 m (1996 m existing, re-calculated as 17.80 ha area x 90 m/ha, as per the August 2009 *Greater Cardinal Creek Subwatershed Study XPSWMM Model Calibration and Verification Report*). As the source of the existing conditions on-site storage and outflow control of area CS in Table 1 is unclear, it has been left as is under proposed conditions.

The subject site under proposed conditions was modelled as 4.38 ha at 46% imperviousness, with depression storage and infiltration parameters are as per the October 2012 *City of Ottawa Sewer Design Guidelines*. The width parameter was calculated as Area / LGI, where LGI is a length parameter commonly used in SWMHYMO and similar modelling programs, equal to $(Area / 1.5)^{0.5}$. Note that these values are not necessarily consistent with the subcatchment CS values in the existing conditions XPSWMM model, but were selected to best represent the subject site under proposed conditions and to be consistent with City of Ottawa standards.

Existing and proposed conditions flows and water levels in the XPSWMM model storm sewer trunk and watercourse at and downstream of the subject site are summarized in Tables 2 and 3, respectively.

Table 2: Existing and Proposed Conditions Flows

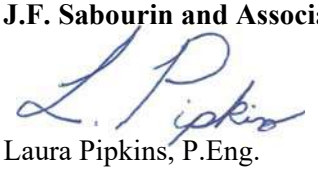
Link	100-Year Flow (m^3/s)		
	Existing	Proposed	Difference
P-(C-B)	24.77	25.00	0.23
P-(B-A)	25.97	26.00	0.03
CH(F-G)	21.77	21.74	-0.03
CH(G-H)	21.95	21.90	-0.05
CH(H-I)	27.38	27.31	-0.07
CH(I-O)	27.49	27.42	-0.07
CH(I-O).2	27.70	27.63	-0.07
CH(I-O).1	31.24	31.18	-0.06
Dummy Sg	31.04	30.98	-0.05
watters rd	17.10	17.10	0.00
CAVES OUT	7.31	7.38	0.08
Quality.1	4.25	4.25	0.00

Table 3: Existing and Proposed Conditions Water Levels

Node	100-Year Water Level (m)		
	Existing	Proposed	Difference
MH-C	83.43	83.39	-0.04
MH-B	81.96	81.94	-0.02
F-OUT	57.31	57.31	0.00
G	55.60	55.60	0.00
H	51.95	51.95	0.00
I	44.74	44.74	0.00
IO1	43.86	43.86	0.00
IO2	43.09	43.09	0.00
O	41.67	41.67	0.00
Dummy Mh	41.50	41.50	0.00
F-IN	80.83	80.82	-0.01
Dummy-1	71.39	71.39	0.00

As may be seen above, simulated 100-year proposed conditions flows in the trunk storm sewer and Cardinal Creek increase by 1% or less from existing flows in links P-(C-B), P-(B-A) and CAVES OUT. Regardless of these 1% or less increases in flow, the 100-year proposed conditions water levels remain equal or less than existing levels.

Yours truly,
J.F. Sabourin and Associates Inc.



Laura Pipkins, P.Eng.

cc: J.F. Sabourin, M.Eng, P.Eng.
Director of Water Resources Projects

Attachment A: Storm Drainage Plan (DSEL, March 2020); Cardinal Creek Subwatershed Study Figure 17 (AECOM, August 2009)
Attachment B: XPSWMM Model Schematic

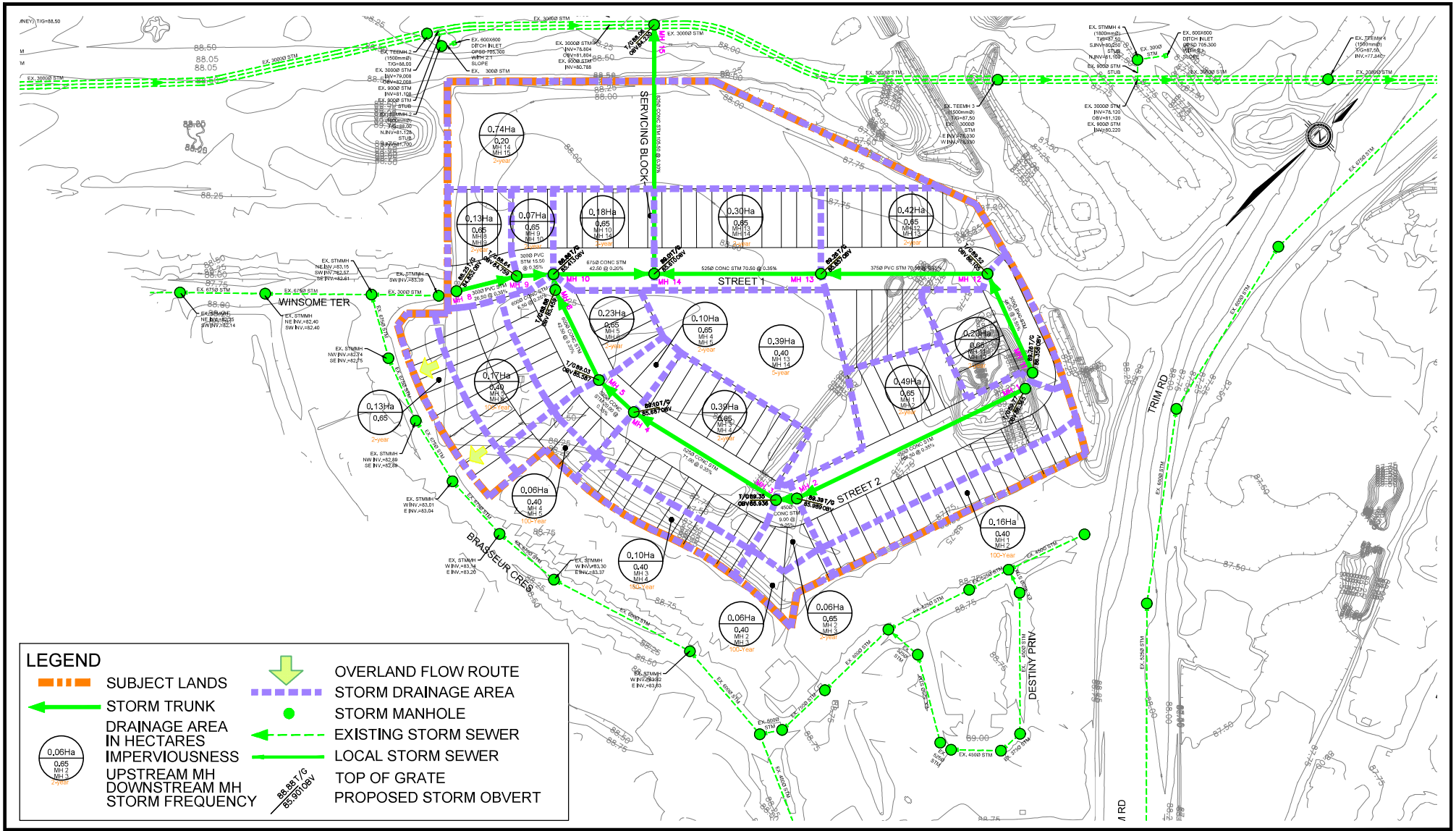
ATTACHMENT

A

Storm Drainage Plan
(DSEL, March 2020)

Cardinal Creek Subwatershed Study Figure 17
(AECOM, August 2009)

JFSA Water Resources and Environmental Consultants



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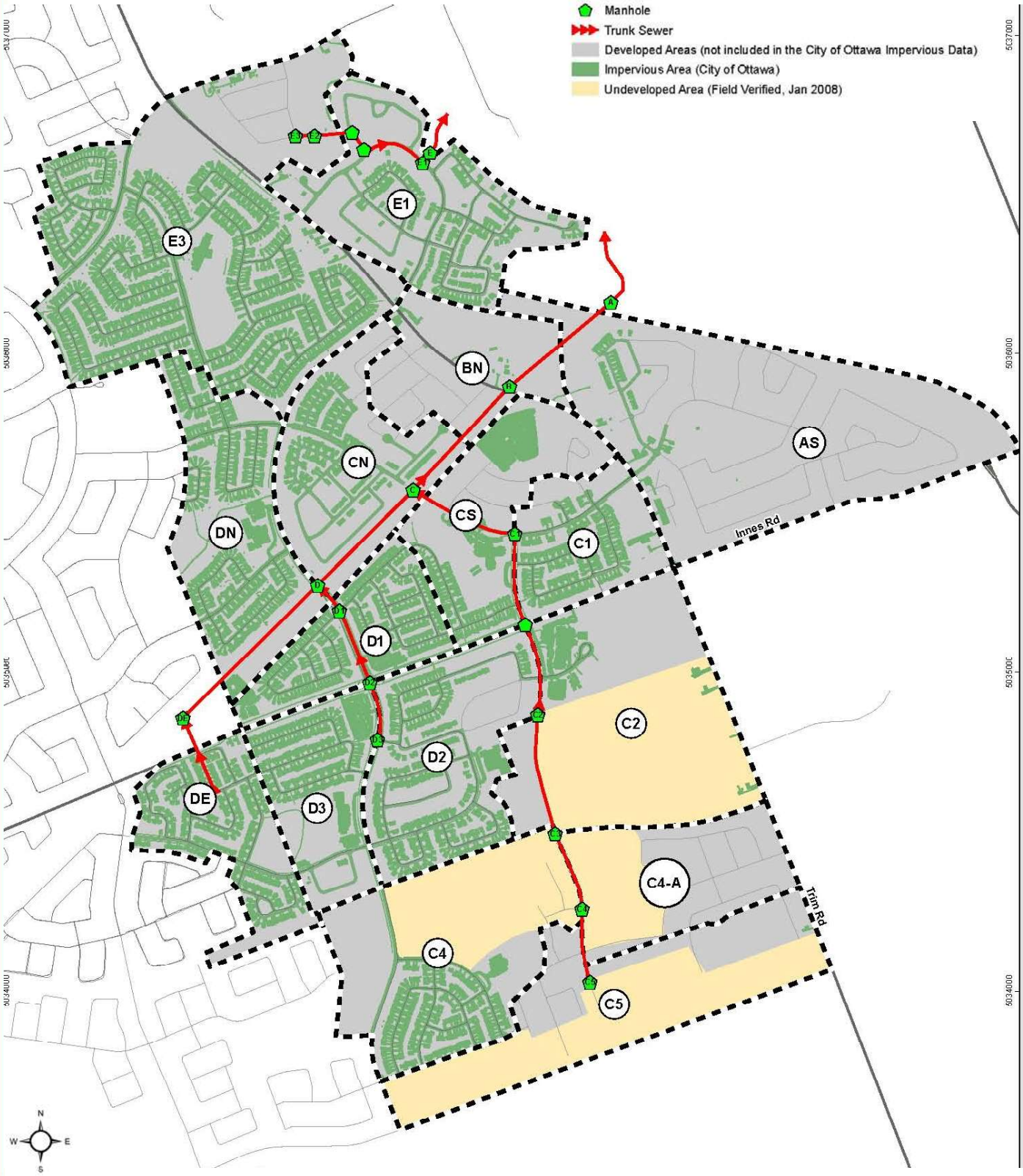
1830 TRIM ROAD

CITY OF OTTAWA

STORM DRAINAGE PLAN

SCALE:	1:1500	PROJECT No.:	19-1137
DATE:	MARCH 2020	FIGURE:	2



DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

AECOM

City of Ottawa
Greater Cardinal Creek Subwatershed Study
Extent of Urban Development

Legend

PROJECT NUMBER
107689-70728

DATE
August, 2009

FIGURE NUMBER
17

ATTACHMENT

B

XPSWMM Model Schematic

JFSA Water Resources and Environmental Consultants

Figure B-1: XPSWMM MODEL SCHEMATIC