SERVICING & STORMWATER MANAGEMENT REPORT
FIX AUTO ORLEANS – 1400 & 1410 YOUVILLE DRIVE

Project No.: CCO-23-0480

City File No.: D07-12-22-0130

Prepared for:

BBS Construction (Ontario) LTD.
1805 Woodward Drive
Ottawa, ON. K2C 0P9

Prepared by:

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July 07, 2023

McINTOSH PERRY

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1.0 PROJECT DESCRIPTION

1.1 Purpose

McIntosh Perry (MP) has been retained by BBS Construction (Ontario) LTD. to prepare this Servicing and Stormwater Management Report in support of the Site Plan Control process for the proposed automobile body shop, located at 1400 & 1410 Youville Drive within the City of Ottawa (City File No. D07-12-22-0130).

The main purpose of this report is to present a servicing design for the development in accordance with the recommendations and guidelines provided by the City of Ottawa (City), the Rideau Valley Conservation Authority (RVCA), and the Ministry of the Environment, Conservation and Parks (MECP). This report will address the water, sanitary and storm sewer servicing for the development, ensuring that existing and available services will adequately service the proposed development.

This report should be read in conjunction with the following drawings:

- CCO-23-0480, C101 – Site Grading, Drainage & Sediment and Erosion Control Plan, and
- CCO-23-0480, C102 – Site Servicing Plan,
- CCO-23-0480, PRE – Pre-Development Drainage Area Plan (*Appendix E*)
- CCO-23-0480, POST – Post-Development Drainage Area Plan (*Appendix F*)

1.2 Site Description

Figure 1: Site Map

The subject property, herein referred to as the site, is located at 1400 & 1410 Youville Drive within the Orleans ward in the City of Ottawa. It is described as Parts 1 and 3 on Plan 4R-6509. The land in question covers approximately 0.92 ha and is located north of the Youville Drive and St-Joseph Blvd intersection. The site is zoned for light industrial use (IL2). See Site Location Plan in *Appendix A* for more details.

1.3 Proposed Development and Statistics

The proposed development consists of a 2,115 m², one storey automobile body shop and service station complete with office space. Parking and drive aisles will be provided throughout the site along with access from Youville Drive. See *Appendix B* for further details.

1.4 Existing Conditions and Infrastructures

The existing site is currently developed with a car wash and Jim Keay Ford gravel parking areas. The existing car wash is serviced by a 50 mm diameter water service, a 150 mm diameter sanitary service, and a 250 mm diameter storm service all of which are serviced by the municipal infrastructure within Youville Drive.

Sewer and watermain mapping collected from the City of Ottawa indicate that the following services exist across the property frontages within the adjacent municipal rights-of-way(s):

- Youville Drive
    - 762 mm diameter concrete backbone watermain,
    - 305 mm diameter ductile iron watermain,
    - 50 mm concrete sanitary sewer tributary to the Orleans Collector, and a
    - 675 mm concrete storm sewer tributary to the West Bilberry Creek and ultimately tributary to the Ottawa River approximately 1.7 km downstream.

1.5 Approvals

The proposed development is subject to the City of Ottawa site plan control approval process. Site plan control requires the City to review, provided concurrence and approve the engineering design package. Permits to construct can be requested once the City has issued a site plan agreement.

An Environmental Compliance Approval (*ECA*) Amendment through the Ministry of Environment, Conservation and Parks (*MECP*) may be required due to the light industrial zoning. Requirements to be further discussed with City staff.

2.0 BACKROUND STUDIES

As-built drawings of existing services, provided by the City of Ottawa Information centre, within the vicinity of the proposed site were reviewed in order to identify infrastructure available to service the proposed development.

A topographic survey of the site was completed by Stantec Geomatics Ltd (Contract No. 161614550-111) dated March 29th, 2022.

The Site Plan (A010) was prepared by KWC Architects Inc and dated January 25, 2023 (*Site Plan*).

2.1 Applicable Guidelines and Standards

City of Ottawa:

- Ottawa Sewer Design Guidelines, City of Ottawa, SDG002, October 2012. (*Ottawa Sewer Guidelines*)
  - Technical Bulletin ISTB-2014-01 City of Ottawa, February 2014. *(ISTB-2014-01)*
  - Technical Bulletin PIEDTB-2016-01 City of Ottawa, September 2016. *(PIEDTB-2016-01)*
  - Technical Bulletin ISTB-2018-01 City of Ottawa, January 2018. *(ISTB-2018-01)*
  - Technical Bulletin ISTB-2018-03 City of Ottawa, March 2018. *(ISTB-2018-03)*
  - Technical Bulletin ISTB-2019-01 City of Ottawa, January 2019. *(ISTB-2019-01)*
  - Technical Bulletin ISTB-2019-02 City of Ottawa, February 2019. *(ISTB-2019-02)*
- Ottawa Design Guidelines – Water Distribution City of Ottawa, July 2010. (*Ottawa Water Guidelines*)
  - Technical Bulletin ISD-2010-2 City of Ottawa, December 15, 2010. *(ISD-2010-2)*
  - Technical Bulletin ISDTB-2014-02 City of Ottawa, May 2014. (ISDTB-2014-02)
  - Technical Bulletin ISTB-2018-02 City of Ottawa, March 2018. *(ISTB-2018-02)*

Ministry of Environment, Conservation and Parks:

- Stormwater Planning and Design Manual, Ministry of the Environment, March 2003. *(MECP Stormwater Design Manual)*
- Design Guidelines for Sewage Works, Ministry of the Environment, 2008. (*MECP Sewer Design Guidelines*)

Other:

- Water Supply for Public Fire Protection, Fire Underwriters Survey, 2020. (*FUS Guidelines*)

3.0 PRE-CONSULTATION SUMMARY

A pre-consultation meeting was conducted on September 29, 2021, regarding the proposed site. Specific design parameters to be incorporated within this design include the following:

- Pre-development and post-development flows shall be calculated using a maximum time of concentration (Tc) of 10 minutes.
- Control 5 through 100-year post-development flows to the 5-year flows with a combined C value of 0.50.
- Quality control is required to be provided for this site (80% TSS Removal) as per RVCA requirements.

The notes from the City of Ottawa can be found in *Appendix B*.

4.0 WATERMAIN

4.1 Existing Watermain

The site is located within the 1E pressure zone, as per the Water Distribution System Mapping included in *Appendix C*. There are existing 762 mm diameter C01 and 305 mm diameter DI watermains within Youville Drive. The 305 mm diameter watermain services the existing car wash as well as the fire hydrants along the east side of Youville Drive. There are three municipal hydrants along Youville drive available to service the development.

4.2 Proposed Watermain

A new 150 mm diameter PVC water service will service the proposed building complete with a water valve located at the property line. The service will extend from the existing 305 mm diameter watermain within Youville Drive. Refer to drawing *C102* for a detailed servicing layout.

The Fire Underwriters Survey 2020 (FUS) method was utilized to determine the required fire flow for the site. The 'C' factor (type of construction) for the FUS calculation was determined to be 0.8 (non-combustible type construction). The total floor area ('A' value) for the FUS calculation was determined to be 2,113.1 m^2. The results of the calculations yielded a required fire flow of 7,000 L/min. A fire flow of *9,000 L/min* was calculated using the Ontario Building Code (OBC) requirements. The detailed calculations for the FUS and OBC can be found in *Appendix C*.

The water demands for the proposed building have been calculated to adhere to the *Ottawa Design Guidelines – Water Distribution* manual and can be found in *Appendix C*. The results have been summarized below:

Table 1: Water Demands

Site Area	0.92 ha
Industrial - Light	35,000 L/ha/day
Average Day Demand (L/s)	0.37
Maximum Daily Demand (L/s)	0.56
Peak Hourly Demand (L/s)	1.00
OBC Fire Flow Requirement (L/s)	150.00
FUS Fire Flow Requirement (L/s)	116.67

The City provided the estimated water pressures at both for the average day scenario, peak hour scenario and the max day plus fire flow scenario for the demands indicated by the correspondence in *Appendix C*. The resulting pressures for the boundary conditions results are shown in *Table 2*, below.

Table 2: Boundary Conditions Results

Scenario	Proposed Demands (L/s)	Connection HGL (m H_2O)*/kPa
Average Day Demand	0.37	53.1 / 520.9
Maximum Daily + Fire Flow Demand	150.56	49.6 / 486.6
Peak Hourly Demand	1.00	50.3 / 493.4
**Adjusted for an estimated ground elevation of 61.50m above the connection point.*		

The normal operating pressure range is anticipated to be 487 kPa to 530 kPa and will not be less than 275 kPa (40 psi) or exceed 689 kPa (100 psi).

To confirm the adequacy of fire flow to protect the proposed development, public fire hydrants within 150 m of the proposed building were analysed per City of Ottawa *ISTB 2018-02* Appendix I Table 1. Based on City guidelines (*ISTB-2018-02*), the existing hydrants can provide adequate fire protection to the proposed development. The results are summarized below.

Table 3: Fire Protection Confirmation

Building	Fire Flow Demand (L/min.)	Fire Hydrant(s) within 75m	Fire Hydrant(s) within 150m	Combined Fire Flow (L/min.)
1400-1410 Youville Drive	7,000 (FUS) 9,000 (OBC)	2	1	15,200

5.0 SANITARY DESIGN

5.1 Existing Sanitary Sewer

There is a 450 mm diameter concrete sanitary sewer within Youville Drive. Sanitary flow from the sewer is tributary to the Orleans Collector Sewer per the City of Ottawa Trunk Sewer Map figure available in *Appendix D*.

5.2 Proposed Sanitary Sewer

The existing 100-150 mm diameter sanitary service is to be replaced with a new 150 mm diameter gravity service extending from the existing 450 mm concrete sewer within Youville Drive. The proposed sanitary service will connect existing maintenance structure before discharging to the municipal sewer. It is anticipated that monitoring would occur via the existing maintenance structure inside the property line as per the *City of Ottawa – Sewer Design Guidelines*, October 2012, Clause 4.4.4.7 and City of Ottawa Sewer-Use By-Law 2003-514 (14). The service extends from the existing 450 mm diameter sanitary sewer within Youville Drive.

The existing 100-150 mm diameter gravity service has undergone CCTV inspection. Based on the findings of the CCTV inspection, the existing maintenance structure is in acceptable condition and will be retained. As discussed above, the existing service extending from the maintenance structure will be replaced. Refer to *Appendix D* for the detailed of the CCTV inspection report and to drawing *C102* for a detailed servicing layout.

The proposed development consists of an automobile body shop and service station complete with office space. The peak design flows for the proposed buildings were calculated using criteria from the *Ottawa Sewer Guidelines* and are summarized in *Table 3,* below. Based on the unit occupancy statistics provided by the architect, the proposed site development will generate a flow of *2.84 L/s*. See *Appendix D* of this report for more details.

Table 4: Sanitary Design Criteria

Design Parameter	Value
Site Area	0.92 ha
Industrial Demand (Light)	35,000 L/gross ha/d
Industrial Peaking Factor	6.80
Extraneous Flow Allowance	0.33 L/s/ha

Table 5 below, summarizes the estimated wastewater flow from the proposed development. Refer to *Appendix D* for detailed calculations.

Table 5: Summary of Estimated Sanitary Flow

Design Parameter	Total Flow (L/s)
Total Estimated Average Dry Weather Flow	0.42
Total Estimated Peak Dry Weather Flow	2.58
Total Estimated Peak Wet Weather Flow	2.84

It is anticipated that the existing service has a minimum full flow target velocity (cleansing velocity) of 0.6 m/s and a full flow velocity of not more than 3.0 m/s. The estimated capacity of the service lateral is *15.89 L/s* based on an assumed slope of 1.0%. Refer to *Appendix D.*

Per further communication with City staff attached in *Appendix D*, the existing 450mm sanitary sewer within Youville Drive will have sufficient capacity to service the above proposed flows from the development.

6.0 STORM SEWER DESIGN

6.1 Existing Storm Sewers

The site is located within the Ottawa River East subwatershed. There is an existing 675 mm diameter concrete storm sewer within Youville Drive that outlets 0.3 Km downstream to Voyageur Creek. The site is currently serviced by a 250 mm diameter storm sewer network, which outlets to the existing 675 mm diameter storm sewer within Youville Drive.

6.2 Proposed Storm Sewers

A new 250-525 mm storm sewer network is proposed to extend from the existing 675mm sewer within Youville Drive in order to support the proposed development.

Runoff from the parking lot areas and drive aisles will be collected by existing and proposed catch basins. Based on architectural plans, drainage from the roof of the proposed building will be directed to the proposed sewer network within the parking lot area. Runoff collected from the site will be attenuated via an ICD on the outlet side of CBMH1.

Runoff collected by the storm sewer network will be treated by a proposed Hydro International Downstream Defender DD8 OGS unit or approved equivalent before stormwater is discharged to the existing storm outlet, as per drawing *C102*.

Foundation drainage for the proposed building will be conveyed via a 250 mm diameter storm service downstream of the on-site controls.

A maintenance structure (MH2) is proposed just inside the property line of the development to provide monitoring as per the *City of Ottawa – Sewer Design Guidelines*, October 2012, Clause 4.4.4.7 and City of Ottawa Sewer-Use By-Law 2003-514 (14). Refer to drawing *C102*.

See *CCO-23-0480 - POST* included in *Appendix F* of this report for more details. The Stormwater Management design for the subject property will be outlined in Section 7.0 of this report.

7.0 PROPOSED STORMWATER MANAGEMENT

7.1 Design Criteria and Methodology

Stormwater management for the proposed site will be maintained through positive drainage away from the proposed building and parking lot surface attenuation. Drainage from the roof of the building, the parking lot, and a landscaped external drainage area from the adjacent site will be collected by a series of catch basins. The collected parking lot flow will be restricted by a 200 mm diameter orifice before discharging towards a proposed OGS unit and finally an existing storm manhole within the site. Flow from the existing manhole will continue to convey stormwater to the 675 mm diameter storm sewer within Youville Drive. The quantitative and qualitative properties of the storm runoff for both the pre & post development flows are further detailed below.

In summary, the following design criteria have been employed in developing the stormwater management design for the site as directed by the RVCA and City:

Quality Control

- The site has been designed to achieve an 80% total suspended solids removal (*enhanced* level) using a proposed oil/grit separator.

Quantity Control

- Post-development flow 5/100-year is be restricted to match the 5-year pre-development flow with a maximum C value of 0.50.

7.2 Runoff Calculations

Runoff calculations presented in this report are derived using the Rational Method, given as:

$$Q = 2.78CIA \text{ (L/s)}$$

Where: C = Runoff coefficient
I = Rainfall intensity in mm/hr (City of Ottawa IDF curves)
A = Drainage area in hectares

It is recognized that the Rational Method tends to overestimate runoff rates. As a result, the conservative calculation of runoff ensures that any SWM facility sized using this method is expected to function as intended.

The following coefficients were used to develop an average C for each area:

Roofs/Concrete/Asphalt	0.90
Gravel	0.60
Undeveloped and Grass	0.20

As per the *City of Ottawa - Sewer Design Guidelines*, the 5-year balanced 'C' value must be increased by 25% for a 100-year storm event to a maximum of 1.0.

As per the pre-consultation meeting with the City of Ottawa the time of concentration (Tc) used for pre-development shall be determined using a calculated Tc of no less than 10 minutes and post-development flows shall be calculated using a Tc of 10 minutes.

7.3 Pre-Development Drainage

It has been assumed that the site contains no stormwater management controls for flow attenuation. The estimated pre-development peak flows for the 5, and 100-year events are summarized below in *Table 5*. See CCO-23-0480 - *PRE* in *Appendix E* and *Appendix G* for calculations.

Table 6: Pre-Development Runoff Summary

Drainage Area	Area (ha)	Q (L/s)	
		5-Year	100-Year
A1	0.92	188.01	376.59
A2 (External Drainage)	0.005	0.31	0.66
Total	0.92	188.31	377.25

7.4 Post-Development Drainage

The proposed site drainage limits are demonstrated on the Post-Development Drainage Area Plan. See CCO-23-0480 - *POST* in *Appendix F* of this report for more details. A summary of the Post-Development Runoff Calculations can be found below.

Table 7: Post-Development Runoff Summary

Drainage Area	Area (ha)	5-Year Peak Flow (L/s)	100-Year Peak Flow (L/s)	100-Year Storage Requirement (m^3)	100-Year Storage Available (m^3)
B1	0.82	114.29	116.07	173.3	189.3
B2	0.10	5.99	12.82	-	-
Total	0.92	120.27	128.90	173.3	189.3

Post development drainage will be restricted to a maximum release rate of *128.90 L/s* based on a maximum release rate requirement of *133.38 L/s*.

Runoff within Area B1 will be collected by the proposed catchbasin system and restricted by a 185 mm orifice installed on the outlet side of CBMH3. The flow will be restricted to a maximum release

rate of *116.07 L/S* with *189.3 m^3* of storage to be provided via surface ponding within the parking lot.

Runoff within Area B2 will sheet drain without flow attenuation towards the golf course to the west of the site and towards Youville Drive. A small, landscaped section of area B2 will be conveyed overland via an existing ditch along the northern property line. In existing conditions, storm runoff from the site of approximately *87.16 L/s* and *183.38 L/s* is tributary to the ditch during the 5 and 100-year storms, respectively. In post development conditions flows tributary to the existing ditch are to be *1.12 L/s* and *2.41 L/s* for the 5 and 100-year storms, respectively. As per drawing *C101* and the analysis conducted *Appendix G,* the proposed flows to the ditch are to be significantly reduced and will only direct landscaping runoff towards the neighbouring property. As a result, the development proposes to improve the existing condition.

7.5 Quality Control

Based on coordination with the RVCA an enhanced water quality target (80% TSS removal) is required for the site. This will be achieved by treating runoff collected from area B1 with a Hydro International Downstream Defender DD8 OGS unit or approved equivalent. Runoff within Area B2 is proposed to flow off-site without quality treatment.

8.0 EROSION AND SEDIMENT CONTROL

8.1 Temporary Measures

Before construction begins, temporary silt fence, straw bale or rock flow check dams will be installed at all natural runoff outlets from the property. It is crucial that these controls be maintained throughout construction and inspection of sediment and erosion control will be facilitated by the Contractor or Contract Administration staff throughout the construction period.

Silt fences will be installed where shown on the final engineering plans, specifically along the downstream property limits. The Contractor, at their discretion or at the instruction of the City, Conservation Authority or the Contract Administrator shall increase the quantity of sediment and erosion controls on-site to ensure that the site is operating as intended and no additional sediment finds its way off site. The rock flow, straw bale & silt fence check dams and barriers shall be inspected weekly and after rainfall events. Care shall be taken to properly remove sediment from the fences and check dams as required. Fibre roll barriers are to be installed at all existing curb inlet catchbasins and filter fabric is to be placed under the grates of all existing catchbasins and manholes along the frontage of the site and any new structures immediately upon installation. The measures for the existing/proposed structures is to be removed only after all areas have been paved. Care shall be taken at the removal stage to ensure that any silt that has accumulated is properly handled and disposed of. Removal of silt fences without prior removal of the sediments shall not be permitted.

Although not anticipated, work through winter months shall be closely monitored for erosion along sloped areas. Should erosion be noted, the Contractor shall be alerted and shall take all necessary steps to rectify the situation. Should the Contractor's efforts fail at remediating the eroded areas, the Contractor shall contact the City and/or Conservation Authority to review the site conditions and determine the appropriate course of action. As the ground begins to thaw, the Contractor shall place silt fencing at all required locations as soon as ground conditions warrant. Please see the *Site Grading, Drainage and Sediment & Erosion Control Plan* for additional details regarding the temporary measures to be installed and their appropriate OPSD references.

8.2 Permanent Measures

It is expected that the Contractor will promptly ensure that all disturbed areas receive topsoil and seed/sod and that grass be established as soon as possible. Any areas of excess fill shall be removed or levelled as soon as possible and must be located a sufficient distance from any watercourse to ensure that no sediment is washed out into the watercourse. As the vegetation growth within the site provides a key component to the control of sediment for the site, it must be properly maintained once established. Once the construction is complete, it will be up to the landowner to maintain the vegetation and ensure that the vegetation is not overgrown or impeded by foreign objects.

9.0 SUMMARY

- A new automobile body shop, service station, and office is proposed at 1400 & 1410 Youville Drive.
- A 150 mm diameter water service is proposed to service the development, extending from the existing 300 mm diameter watermain with Youville Drive.
- It is proposed to repurpose the existing 150 mm diameter sanitary service to service to the proposed building.
- The proposed storm sewer system, ranging in diameter from 250 mm to 525 mm, will service the site. The storm service will discharge stormwater into the 675 mm sewer within Youville drive.
- Storage for the 5- through 100-year storm events will be provided within the parking lot areas above the proposed storm structures via surface storage.
- Quality Control will be provided via an OGS unit.

10.0 RECOMMENDATION

Based on the information presented in this report, we recommend that City of Ottawa approve this Servicing and Stormwater Management Report in support of the proposed automobile body shop 1400 & 1410 Youville Drive

This report is respectfully being submitted for approval.

Regards,

McIntosh Perry Consulting Engineers Ltd.

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11.0 STATEMENT OF LIMITATIONS

This report was produced for the exclusive use of BBS Construction LTD. The purpose of the report is to assess the existing stormwater management system and provide recommendations and designs for the post-construction scenario that are in compliance with the guidelines and standards from the Ministry of the Environment, Conservation and Parks, City of Ottawa and local approval agencies. McIntosh Perry reviewed the site information and background documents listed in Section 2.0 of this report. While the previous data was reviewed by McIntosh Perry and site visits were performed, no field verification/measures of any information were conducted.

Any use of this review by a third party, or any reliance on decisions made based on it, without a reliance report is the responsibility of such third parties. McIntosh Perry accepts no responsibility for damages, if any, suffered by any third party as a result of decisions or actions made based on this review.

The findings, conclusions and/or recommendations of this report are only valid as of the date of this report. No assurance is made regarding any changes in conditions subsequent to this date. If additional information is discovered or becomes available at a future date, McIntosh Perry should be requested to re-evaluate the conclusions presented in this report, and provide amendments, if required.

APPENDIX A
KEY PLAN

McINTOSH PERRY

250 125 0 250

Scale 1:10,000 Metres

LEGEND

- Approximate Site Location
- Local Road
- Major Road
- Watercourse
- Wooded Area

REFERENCE

GIS data provided by the Ontario Ministry of Northern Development, Mines, Natural Resources and Forestry, 2022.

CLIENT: JIM KEAY FORD

PROJECT: 1400-1410 YOUVILLE

TITLE: SITE LOCATION PLAN

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www.mcintoshperry.com

PROJECT NO: CCO-23-0480	
Date	Aug., 22, 2022
GIS	MG
Checked By	AG

FIGURE: 1

APPENDIX B
BACKGROUND DOCUMENTS

McINTOSH PERRY

Pre- Application Consultation 1410 (1438) Youville Drive (PC2021-0330) – City of Ottawa Internal Department Comments

Transportation:

- Follow Transportation Impact Assessment Guidelines
  - Submit a Screening form to start, a full Transportation Impact Assessment if any of the triggers on the screening form are satisfied. The Screening Form can be sent directly to Josiane.Gervais@ottawa.ca
  - Start this process asap. The application will not be deemed complete until the submission of the draft step 1-4, including the functional draft RMA package (if applicable) and/or monitoring report (if applicable).
  - Request base mapping asap if RMA is required. Contact Engineering Services (https://ottawa.ca/en/city-hall/planning-and-development/engineering-services)
- Clear throat requirement on a collector is 8m.
- Ensure site access meets the City's Private Approach Bylaw.
- Ensure drive aisle meets the City's Part 4 - Parking, Queuing and Loading Provisions (Sections 100 to 114) Bylaw, i.e. minimum 6.7m width.
- The site falls just outside of the 600m radius from the existing Jeanne d'Arc transit station (and future Jeanne d'Arc LRT station).
- Include a new bus pad, as per City Standards.
- On site plan:
  - Show all details of the roads abutting the site up to and including the opposite curb; include such items as pavement markings, accesses and/or sidewalks.
  - Turning movement diagrams required for all accesses showing the largest vehicle to access/egress the site.
  - Turning movement diagrams required for internal movements (loading areas, garbage).
  - Show all curb radii measurements; ensure that all curb radii are reduced as much as possible and meet TAC Figure 8.5.1.
  - Show dimensions for site elements (i.e. lane/aisle widths, access width and throat length, parking stalls, sidewalks, pedestrian pathways, etc.)
- As the proposed site is for general public use, AODA legislation applies. Consider using the City's Accessibility Design Standards.
  - Access aisles are required next to the accessible parking spaces.
  - Ensure all crosswalks located internally on the site provide a TWSI at the depressed curb, per requirements of the Integrated Accessibility Standards Regulation under the AODA.

Environmental:

Tree Conservation Report Requirements:

- If there are trees within the area impacted, contact Mark Richardson mark.richardson@ottawa.ca for information on the City's TCR requirements

Urban Design:

- A Design Brief is required as part of the submission. The Terms of Reference is attached for convenience.
- With respect to the proposed design:
    - Please consult OC-Transpo to explore opportunities to improve the bus stop. Considerations should be given to improvements such as a concrete pad for people to stand, a seat for people to sit, or a glass bus shelter.
    - Please provide a pedestrian walkway from the building main entrance to the bus stop.
    - Provide large canopy trees along the front to the extent possible . Given the location of the hydro lines, such trees will likely have to set back from the property line substantially and be located approximately at where the parking spaces are. Considerations should be given to relocate and reduce some front yard parking to create room for tree planting. (see attached diagram)
    - Provide a landscape buffer at the back of the site, approximately minimum 3m to allow for some landscaping. (also see attached diagram)
    - The preliminary design shows a 7.5m area on the north side of the site for landscaping. Would it be beneficial to flip the site design so that the landscape area can be located on the sunny side of the site?

Policy Planning:

- The existing Official Plan designation is *General Urban Area*, which allows flexibility to permit the proposed use.
- The proposed New Official Plan designation is *Neighbourhood*, which allows flexibility to permit the proposed use.
- Advancing present and new Official Plans, the preliminary directions for the present Jeanne D'Arc Station Area study, part of the broader Orleans Corridor Secondary Plan study, envisions this south-west quadrant (south and west of Highway 174 and Jeannne D'Arc Boulevard, to St. Joseph Blvd.) as transitioning away from the largely light-industrial land use character to a character that is more transit-supportive based on primarily residential and commercial uses.
- While the envisioned vision will take many years to achieve, with the directions of the existing and future Official Plans in mind, the present proposal should advance site planning and design measures that will support and advance the transition to a more urban structure with more urban elements. A future application here should implement, for example, urban elements such as:
    - Building that is close to the street, with frontage that relates to people on the sidewalk, e.g. entrance that faces the street vs. a side parking lot
    - Items that support comfortable and inviting active transportation (walking or cycling), e.g. inclusion of medium to large street trees; support for transit infrastructure

- Site planning and design should anticipate the implementation of a municipal sidewalk in the future within the City right-of-way.
- Minimum and/or reduce large areas of asphalt (e.g. to transition from auto-oriented visual character of area to active transportation character; to reduce heat island effect; increase tree canopy)
- Refer to DRS Urban Design recommendations and for future ideas on how to best address these items.

Planning:

- **Official Plan:** The City's Official Plan (OP), Schedule B, designates the subject site "General Urban Area" for the entire depth of the property. General Urban Area designation permits many types and densities of housing, as well as employment, retail uses, service, industrial, cultural, leisure, greenspace, entertainment, and institutional uses. The General Urban Area permits uses that may generate traffic, noise or other impacts that have the potential to create conflicts with the surrounding residential community. More information can be found at: Section 3 - Designations and Land Use | City of Ottawa.

- **Zoning By-law 2008-250:** The site is zoned Light Industrial Zone (IL2 H(14)). It is understood that the lands will be rezoned. The details of the proposed zoning can be discussed.

- **Comments:**
  - It is recommended to relocate the proposed building closer to Youville Drive and remove front yard parking to create an enhanced street presence.
  - Consider increasing the landscape buffer along the rear yard property line.
  - Consider moving the location of the proposed loading zone further back from its current proposed location to reduce its visibility from the street.
  - It is encouraged to not have any vehicles displayed for sale at the front of the property.
  - Given the existing auto dominated nature of the Youville Drive Business Park, the proposed automotive related land use does not pose as a concern at this time.
  - There are no concerns of the proposed zoning change currently.

Engineering:

- Please find attached the engineering comments for the proposed development.

Application Type and Fees:

- The Application Fees (2021 Rates) for the applications are as follows:

Application Type	Planning/ Legal Fee	Initial Engineering Design Review & Inspection Fee	Conservation Authority Fee (Initial)	Total
Zoning By-law Amendment (Major)	21,722.94	n/a	390	22,112.94
Site Plan Control Approval (New – Complex)	48,298.80	$10,000 (incl. HST) services >$300,000	1,040	59,338.80

Submission Requirements:

- Documents required in support of this application are highlighted in the attached Study and Plan Identification List

Links to Design Guidelines And Relevant Policy:

As part of Planning staff's review, we will evaluate your proposal against the relevant Official Plan policies and applicable Council-approved design guidelines. I have provided links to some of the more critical ones for your information.

- City Official Plan: https://ottawa.ca/en/planning-development-and-construction/official-plan-and-master-plans/official-plan
- Guidelines: For the following design guidelines, reference the following link: https://ottawa.ca/en/planning-development-and-construction/community-design/design-and-planning-guidelines/completed-guidelines

Please refer to the links to Guide to preparing studies and plans and fees for further information. Additional information is available related to building permits, development charges, and the Accessibility Design Standards. Be aware that other fees and permits may be required, outside of the development review process. You may obtain background drawings by contacting informationcentre@ottawa.ca.

These pre-application consultation comments are valid for one year. If you submit a development application(s) after this time, you may be required to meet for another pre-consultation meeting and/or the submission requirements may change. You are as well encouraged to contact us for a follow-up meeting if the plan/concept will be further refined.

Alison Gosling

From: Jamie Batchelor <jamie.batchelor@rvca.ca>
Sent: August 15, 2022 11:23 AM
To: Ryan Robineau
Cc: Alison Gosling
Subject: RE: 1410 Youville Drive RVCA Requirement

Good Morning Ryan,

The water quality target would be enhanced (80% TSS removal). Given the erosive nature of Voyageur Creek, the stormwater from the site should demonstrate how the hydrology of the site is being maintained through the a water budget/balance. I will inquire further with our technical staff in this regard.

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: Ryan Robineau <r.robineau@mcintoshperry.com>
Sent: Monday, August 15, 2022 10:43 AM
To: Jamie Batchelor <jamie.batchelor@rvca.ca>
Cc: Alison Gosling <a.gosling@mcintoshperry.com>
Subject: 1410 Youville Drive RVCA Requirement

Good morning Jamie,

We wanted to touch base with you regarding a proposed development at 1410 Youville Drive.

The development involves the construction of a 1-storey automobile body shop and service station with surface parking. Drainage will be collected and conveyed to the 675mm dia storm sewer within Youville Drive. As shown by the attached figure, water travels approximately 0.30km to the Bilberry Creek (Outlet ID #09116). It is anticipated that drainage will be collected by catch basins.

We would like to know what SWM requirements the RVCA would have for the site.

Please let me know if you have any questions.

1 / A010 LOCATION PLAN
N.T.S.

LEGAL DESCRIPTION:

PARCELS WW-8 AND WW-11 ON SEC 4M-152

PART OF BLOCK WW ON REGISTERED PLAN 4M-152

PARTS 1 AND 3 ON PLAN 4R-6509, FORMER CITY OF GLOUCESTER, NOW IN CITY OF OTTAWA

AS PREPARED BY STANTEC GEOMATICS LTD., 29 MARCH 2022

Project Zoning Review/Statistics

Municipality: City of Ottawa
Municipal Address: 1400-1410 Youville Drive
Registered Owner: Jim Keay
Lot Area: 9,188 sq.m. (98,894 sq.ft. (2.27 acres))
Zoning By-law: 2008-250
Zone: IL2 H(14) - *Light Industrial*
Proposed Use: Automobile Body Shop & Automobile Service Station

Building Areas

	Gross (out-to-out) Sq.m.	Sq.ft
Proposed Development		
Ground Floor, Offices	291	3,130
Ground Floor, Body & Service Shop	1,596	17,177
Ground Floor, Parts	228	2,457
Total	**2,115**	**22,764**

Development Standards

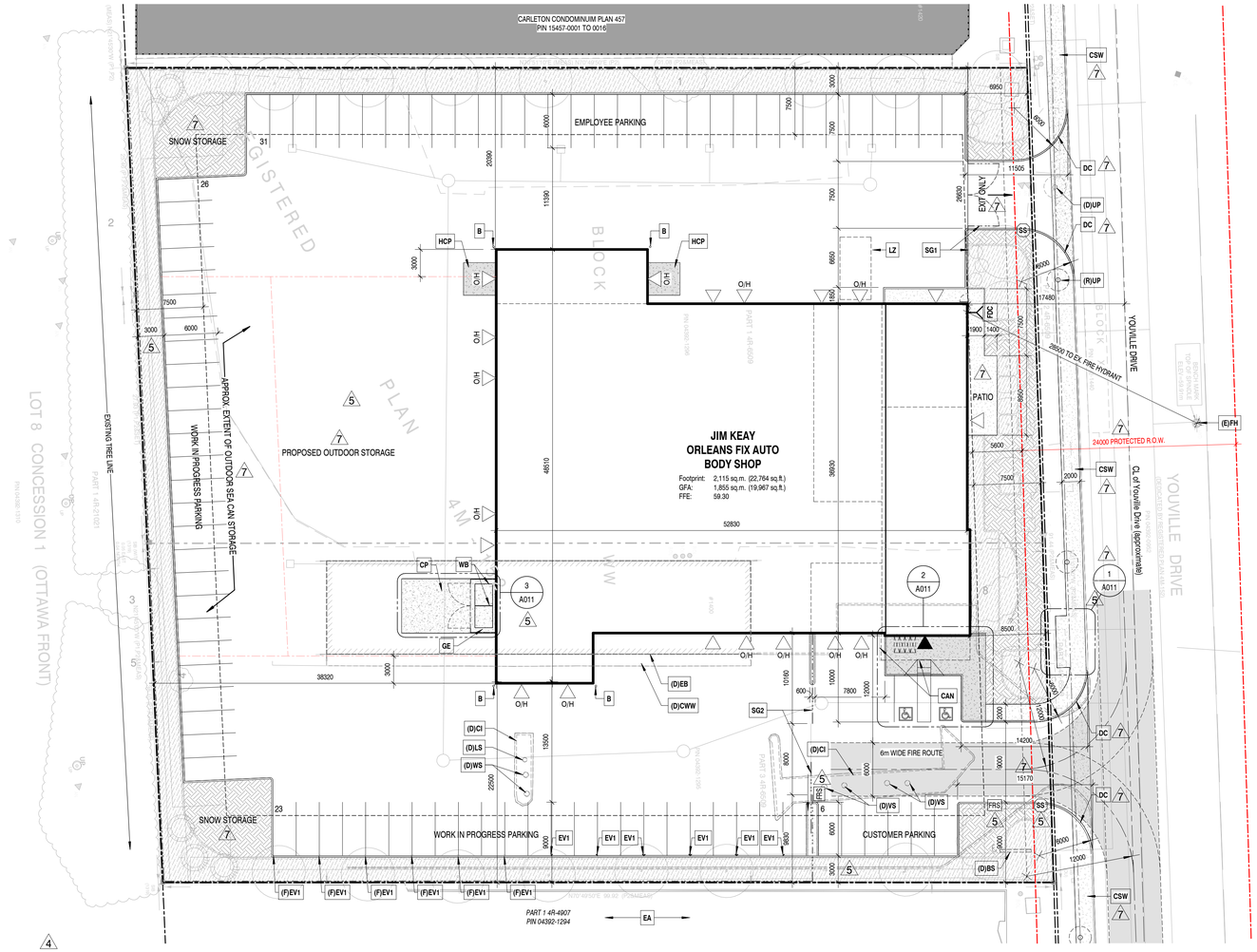
	Required	Provided
Minimum Lot Area	2,000 sq.m.	9,188 sq.m.
Minimum Lot Width	No min.	91.3m
Minimum Required Yard		
Front Yard (min.)	7.5m	7.5m
Interior Side Yard (min.)	7.5m	20.39m
Rear Yard (min.)	7.5m	38.32m
Maximum Building Height	14m	8.01m
Maximum Lot Coverage	65%	22%
Maximum Floor Space Index	2	±0.2
Minimum Width of Landscaped Area		
Abutting a street	3m	6.95m
All other cases	No min.	3m

Parking, Loading, Queuing

Existing Parking

Parking Spaces (Minimum 2.6m x 5.2m)

Offices (2.4 spaces / 100 sq.m.)	Required:	8	*Area C of Schedule 1A*
	Provided:	30	
Body Shop & Service Station (3 spaces per Service Bay @ 13 Service Bays)	Required:	39	
	Provided:	56	
Accessible Parking *Section 111 of By-law 2017-301*	Required:	2	
	Provided:	2	*1x Type A & 1x Type B*
Loading Spaces (3.5m x 9m)	Required:	1	
	Provided:	1	
Bicycle Parking (Offices: 1 space / 250 sq.m. ; All other: 1 space / 1,500 sq.m.)	Required:	2	*1x for Offices; 1x for Body Shop/Service Station*
	Provided:	4	*3x for Offices; 1x for Body Shop/Service Station*



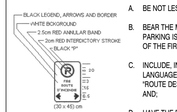
4 / 2 / A010 SITE PLAN
1 : 300

GENERAL NOTES:
1. ALL ARCHITECTURAL SITE PLAN DRAWINGS TO BE READ IN CONJUNCTION WITH THE LANDSCAPE, CIVIL AND ELECTRICAL SITE PLAN DRAWINGS.

0 1.5 3 6 9 12 15 18 21 24 27 30 METRES

FIRE ROUTE SIGNAGE:

1. FIRE ROUTE TO BE IDENTIFIED BY VERTICALLY MOUNTED SIGNS PROHIBITING PARKING, AND SHALL:
   - A. BE NOT LESS THAN 45cm IN HEIGHT AND NOT LESS THAN 30cm IN WIDTH;
   - B. BEAR THE MARKINGS AND MESSAGE THAT THE AREA IS A FIRE ROUTE WHERE PARKING IS PROHIBITED AND INCLUDE DOUBLE ARROWS, EXCEPT AT THE ENDS OF THE FIRE ROUTE WHERE A SINGLE ARROW SHALL BE INCLUDED;
   - C. INCLUDE, IN BLACK LETTERS OF A MINIMUM HEIGHT OF 3cm, THE ENGLISH LANGUAGE MESSAGE 'FIRE ROUTE' AND THE FRENCH LANGUAGE MESSAGE "ROUTE DES POMPIER' OR "ROUTE D'INCENDIE', BELOW THE ENGLISH MESSAGE, AND;
   - D. HAVE THE DESIGN AND DIMENSIONS DESCRIBED IN THE FOLLOWING FIGURE:



2. FIRE ROUTE SIGNS SHALL BE LOCATED NO MORE THAN 25m APART UNLESS OTHERWISE SPECIFICALLY APPROVED BECAUSE OF UNUSUAL SITE CONDITIONS OR THE FIRE ROUTE CONFIGURATION, AND THE LOWER EDGE OF EACH SIGN SHALL BE BETWEEN 2m AND 2.5m ABOVE THE GROUND.

SITE PLAN SYMBOLS

ICON	DESCRIPTION
	Existing Buildings
4	Existing Buildings to be Demolished
	Proposed Buildings
	Property Lines
5	Shared Property Lines
	Setback Lines
	Landscape Buffer
	Overhead Wires
	Fence
4	Existing Concrete Curb
4	Existing Concrete Curb to be Demolished
	Proposed Concrete Curb
	Depressed Concrete Curb
	Proposed Concrete Sidewalk
	Proposed Landscape Area
5 SS	Stop Sign
	Barrier Free Parking Space
	Principal Entrance Door
	Exterior Door ('O/H' indicates Overhead Door)
	Exterior 6m Wide Fire Route (12m centerline radius on all turns, TYP.)

SITE PLAN NOTES

NOTE#	NOTE
(D)BS	Existing Signage to be Demolished - Project/Construction Manager to coordinate.
(D)CI	Existing Concrete Island to be Demolished
(D)CWW	Existing Concrete Walkway to be Demolished
(D)EB	Existing Building to be Demolished
(D)LS	Existing Light Standard to be Demolished
(D)UP	Existing Utility Pole, to be relocated. Refer also to Civil.
(D)VS	Existing Vacuum Station to be Demolished - refer to Electrical
(D)WS	Existing Windshield Wash Station to be Demolished - refer to Electrical
(E)FH	Existing Fire Hydrant to remain.
(F)EV1	Future Electric Vehicle Charging Station
(R)UP	Proposed relocation of Existing Utility Pole. Refer also to Civil
B	Bollard
CAN	Outline of Carport/Canopy above
CP	Concrete Pad - refer to Structural
7 CSW	Concrete Sidewalk
7 DC	Depressed Curb
EA	Existing Ashpalt
EV1	Electric Vehicle Charging Station; post-mounted level 2 dual-charging station by Owner
GE	Prefinished Metal Panel on Galvanized Steel framing Garbage Enclosure
HCP	12'-0" x 12'-0" Concrete Pad c/w In-slab Heating - refer to Mechanical & Structural
LZ	Loading Zone, 3.5m W x 7.0m L
SG1	Steel post & chain linked swinging gate, c/w locking mechanism
SG2	Steel post & chain linked sliding gate, c/w locking mechanism
WB	Waste Bins, by Owner

REVISIONS

No.	DATE	DESCRIPTION
0	05 July 2022	Issued for Coordination
1	12 August 2022	Issued for Coordination
2	18 August 2022	Issued for Site Plan Control
3	15 September 2022	Issued for PCM/Consultant Coordination
4	23 December 2022	Issued for Coordination
5	25 January 2023	Response to Planning Comments
6	20 March 2023	Issued for Permit
7	20 April 2023	Response to Planning Comments

It is the responsibility of the appropriate contractor to check and verify all dimensions on site and report all errors and / or omissions to the Architect.
All contractors must comply with all pertinent codes and by-laws.
Do not scale drawings.
This drawing may not be used for construction until signed by KWC Architects Inc. and shall not be used without the Architect's consent.

north

architect's seal

383 Parkdale Avenue, Suite 201
Ottawa, Ontario, Canada, K1Y 4R4

KWC ARCHITECTS INC.

Phone: 613 238-2217
Fax: 613 238-6595
E-Mail: kwc@kwc-arch.com

owner
JIM KEAY

project
'FIX AUTO' ORLEANS - AUTOMOBILE BODY SHOP

drawing title
SITE PLAN

project no. **2255**
scale **As indicated**
drawn by **TC**
date **2023 JAN 31**

drawing no. **A010**

D07-12-22-0130

18194

March 29, 2022

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
V-21216

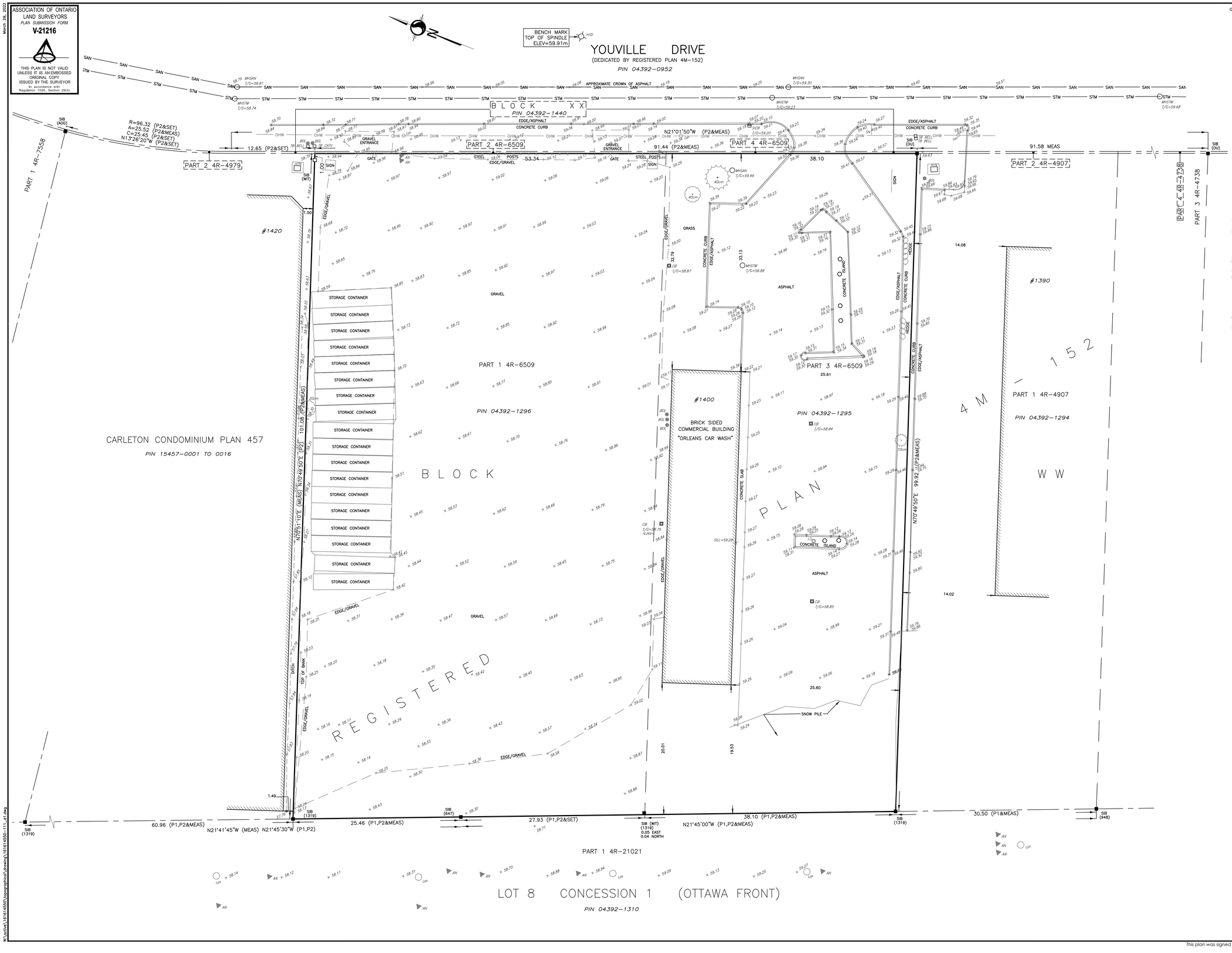
THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR In accordance with Regulation 1026, Section 29(3)

PLAN OF SURVEY

PART OF BLOCK WW REGISTERED PLAN 4M-152 CITY OF OTTAWA

Scale 1:250

5 0 5 10 15 METRES



METRIC CONVERSION

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

BEARING NOTE

BEARINGS ARE GRID, DERIVED FROM CAN-NET VRS NETWORK GPS OBSERVATIONS ON NCC HORIZONTAL CONTROL MONUMENTS 19773035 AND 19680191, CENTRAL MERIDIAN, 76° 30' WEST LONGITUDE MTM ZONE 9, NAD83 (ORIGINAL).

19773035 N:5006060.42 E:324888.04
19680191 N:5033564.26 E:388064.94

ELEVATION NOTE

ELEVATIONS SHOWN HEREON ARE GEODETIC (CGVD-1928:1978) AND ARE DERIVED FROM VERTICAL CONTROL MONUMENT NO. 0011985U505 HAVING AN ELEVATION OF 59.525m.

LEGEND

■	DENOTES	=	FOUND MONUMENTS
□	"	=	SET MONUMENTS
IB	"	=	IRON BAR
IB#	"	=	ROUND IRON BAR
SIB	"	=	STANDARD IRON BAR
SSIB	"	=	SHORT STANDARD IRON BAR
CC	"	=	CUT CROSS
CP	"	=	CONCRETE PIN
WIT	"	=	WITNESS
PIN	"	=	PROPERTY IDENTIFICATION NUMBER
MEAS	"	=	MEASURED
INST	"	=	INSTRUMENT
PROP	"	=	PROPORTIONED
OU	"	=	ORIGIN UNKNOWN
SG	"	=	STANTEC GEOMATICS LTD.
P1	"	=	PLAN 4R-6509
P2	"	=	PLAN 4R-21021
□ ACU	"	=	AIR CONDITIONING UNIT
◄ AN	"	=	ANCHOR
● BOL	"	=	BOLLARD
▣ CB	"	=	CATCH BASIN
▣ SICB	"	=	SIDE INLET CB
□ HTN	"	=	HYDRO TRANSFORMER
✧ HYD	"	=	FIRE HYDRANT
○ LS	"	=	LIGHT STANDARD
◯ MHSA	"	=	MAINTENANCE HOLE SANITARY
◯ MHST	"	=	MAINTENANCE HOLE STORM
⊸ SN	"	=	SIGN
□ TB BELL	"	=	TERMINAL BOX - BELL
□ TB CATV	"	=	TERMINAL BOX - CABLE
□ TCB	"	=	TRAFFIC CONTROL BOX
○ UP	"	=	UTILITY POLE
□ VB	"	=	VALVE BOX
VC	"	=	VALVE CHAMBER
⊖ WV	"	=	WATER VALVE
	"	=	TREE STUMP
	"	=	TREE CONIFEROUS (D.B.H. SHOWN)
	"	=	TREE DECIDUOUS (D.B.H. SHOWN)

OHW OHW — OVERHEAD UTILITY WIRES

STM STM — STORM SEWER

SAN SAN — SANITARY SEWER

SURVEYOR'S CERTIFICATE

I CERTIFY THAT :

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON THE 24th DAY OF MARCH, 2022.

Mar. 29, 2022
DATE

FRANCIS LAU
ONTARIO LAND SURVEYOR

SRO MAP COORD.= 5036353.18,379027.18

Stantec Geomatics Ltd.
CANADA LANDS SURVEYORS
ONTARIO LAND SURVEYORS
1331 CLYDE AVENUE, SUITE 300
OTTAWA, ONTARIO, K2C 3G4
TEL. 613.722.4420
stantec.com

DRAWN: ME	CHECKED: FL	PM: FL	FIELD: CA	PROJECT No.: 161614550-111

This plan was signed with a scanned signature as a result of the Emergency Order related to the COVID-19 pandemic.

W:\active\161614550\topographics\drawings\161614550-111_d1.dwg

May 18, 2023

Jim Keay Ford Lincoln Sales Ltd.
100 Argyle Avenue, Suite 200
Ottawa, ON K2P 1B6

E-mail: briananderson@jimkeayford.com

Attention: Brian Anderson

Re: Geotechnical Drawing Design Review
1400 and 1410 Youville Drive, Ottawa, Ontario
Pinchin File: 310936.001

1.0 INTRODUCTION

Pinchin Ltd. (Pinchin) is pleased to submit this Geotechnical Drawing Design Review Letter to Jim Keay Ford Lincoln Sales Ltd. (Client) for the proposed commercial development to be located at 1400 and 1410 Youville Drive, Ottawa, Ontario (Site).

Pinchin previously completed a Geotechnical Investigation for a proposed commercial development to be located at the Site. The results of this investigation were provided in the following report:

- *"REVISED Geotechnical Investigation, Proposed Commercial Development, 1400 and 1410 Youville Drive, Ottawa, Ontario",* dated November 10, 2022, Pinchin File: 310936.001 (Pinchin 2022 Report).

The Pinchin 2022 Report provided conventional shallow footing design recommendations for footings established on the natural subgrade soil located approximately 1.8 metres below existing ground surface (mbgs). It is noted that the bearing resistances provided within the Pinchin 2022 Report were limited to maximum 1.2 m wide strip footings and 2.0 x 2.0 m spread footings; however, the structural engineer has requested that isolated spread footings be increased in size up to a maximum of 3.1 x 3.1 m. In addition, the proposed development includes minor grade raises ranging from approximately 0.0 to 0.8 m within the vicinity of the proposed building footprint. As such, the Geotechnical Design Review was requested to determine if the proposed footing sizes and grade raises can be supported by the underlying natural subgrade soil.

The following drawings were reviewed by Pinchin:

- Drawing entitled *"Grading, Drainage, and Erosion & Sediment Control Plan*", prepared by McIntosh Perry, project number CCO-23-0480, drawing number C101, dated February 2, 2023;

- Drawing entitled *"Schedules"*, prepared by Cleland Jardine Engineering Ltd., project number 22-0196, drawing number S004, dated March 17, 2023; and
- Drawing entitled *"Foundation Plan"*, prepared by Cleland Jardine Engineering Ltd., project number 22-0196, drawing number S100, dated March 17, 2023.

The following table summarizes the various footing sizes for the proposed development, as well as the corresponding soil bearing resistance required for each footing size. It is noted that the required soil bearing resistance for footing sizes F5 and F6 are lower than the values indicated on the above referenced drawings and were provided to Pinchin by the Client via email correspondence on April 14, 2023. It is noted that the proposed strip footing sizes indicated on the above referenced drawings are all less than the maximum width indicated in the Pinchin 2022 Report; as such, the design review was limited to the spread footing sizes only.

Footing	Dimensions (LxWxH)	Minimum Soil Bearing Resistance Required
F1	1.2 x 1.2 x 0.4 m	SLS = 100 kPa ULS = 120 kPa
F2	1.6 x 1.6 x 0.4 m	SLS = 100 kPa ULS = 120 kPa
F3	2.0 x 2.0 x 0.4 m	SLS = 100 kPa ULS = 120 kPa
F4	2.3 x 2.3 x 0.5 m	SLS = 100 kPa ULS = 120 kPa
F5	2.6 x 2.6 x 0.5 m	SLS = 70 kPa ULS = 101.5 kPa
F6	3.1 x 3.1 x 0.6 m	SLS = 53 kPa ULS = 78 kPa

Based on Pinchin's review of the proposed footing sizes and associated soil bearing resistances required, the proposed footing sizes for the development are considered to be acceptable for the subsurface soil conditions encountered in the Pinchin 2022 Report. In addition, Pinchin has reviewed the proposed grade raises for the development and considers them to be acceptable.

We trust that the information provided in this letter report is sufficient for the Client's requirements. Should you have any questions or concerns regarding the contents of this letter, please contact the undersigned.

Yours truly,

Pinchin Ltd.

Prepared by:

Wesley Tabaczuk, P.Eng.
Project Manager, Geotechnical Services
613.592.3387
wtabaczuk@pinchin.com

Reviewed by:

Vanessa Marshall, M.Eng., P.Eng.
National Practice Leader, Geotechnical Services
519.904.4660
vmarshall@pinchin.com

\\pinchin.com\Ott\Job\310000s\0310936.000 JimKeay,1400&1410YouvilleDr,EDR,PhaseONE\0310936.001 JimKeay,1400&1410YouvilleDr,GEO,FID\Deliverables\Footing Design & Grade Raise Review\310936.001 Geotech Design Review 1400&1410 Youville Dr Ottawa JimKeay.docx

Template: Master Letter Template, October 1, 2019

APPENDIX C
WATERMAIN CALCULATIONS

McINTOSH PERRY

McINTOSH PERRY

CCO-22-0480 - Youville Drive - Water Demands

Project:	Youville Drive
Project No.:	CCO-22-0480
Designed By:	RRR
Checked By:	AJG
Date:	April 28, 2023
Site Area:	0.92 gross ha

Commercial		m2
Industrial - Light	9188	m2
Industrial - Heavy		m2

AVERAGE DAILY DEMAND

DEMAND TYPE	AMOUNT	UNITS
Residential	280	L/c/d
Industrial - Light	35,000	L/gross ha/d
Industrial - Heavy	55,000	L/gross ha/d
Shopping Centres	2,500	L/(1000m² /d
Hospital	900	L/(bed/day)
Schools	70	L/(Student/d)
Trailer Park with no Hook-Ups	340	L/(space/d)
Trailer Park with Hook-Ups	800	L/(space/d)
Campgrounds	225	L/(campsite/d)
Mobile Home Parks	1,000	L/(Space/d)
Motels	150	L/(bed-space/d)
Hotels	225	L/(bed-space/d)
Tourist Commercial	28,000	L/gross ha/d
Other Commercial	28,000	L/gross ha/d

AVERAGE DAILY DEMAND	Residential	0.00	L/s
	Commercial/Industrial/ Institutional	0.37	L/s

115 Walgreen Road, R.R.3. Carp, ON K0A 1L0 | T. 613-836-2184 | F. 613-836-3742
info@mcintoshperry.com | www.mcintoshperry.com

MAXIMUM DAILY DEMAND

DEMAND TYPE	AMOUNT		UNITS
Residential	9.5	x avg. day	L/c/d
Industrial	1.5	x avg. day	L/gross ha/d
Commercial	1.5	x avg. day	L/gross ha/d
Institutional	1.5	x avg. day	L/gross ha/d
MAXIMUM DAILY DEMAND	Residential	0.00	L/s
	Commercial/Industrial/ Institutional	0.56	L/s

MAXIMUM HOUR DEMAND

DEMAND TYPE	AMOUNT		UNITS
Residential	14.3	x avg. day	L/c/d
Industrial	1.8	x max. day	L/gross ha/d
Commercial	1.8	x max. day	L/gross ha/d
Institutional	1.8	x max. day	L/gross ha/d
MAXIMUM HOUR DEMAND	Residential	0.00	L/s
	Commercial/Industrial/ Institutional	1.00	L/s

WATER DEMAND DESIGN FLOWS PER UNIT COUNT
CITY OF OTTAWA - WATER DISTRIBUTION GUIDELINES, JULY 2010

AVERAGE DAILY DEMAND	0.37	L/s
MAXIMUM DAILY DEMAND	0.56	L/s
MAXIMUM HOUR DEMAND	1.00	L/s

McINTOSH PERRY

CCO-22-0480 - Youville Drive - Fire Underwriters Survey

Project:	Youville Drive
Project No.:	CCO-22-0480
Designed By:	RRR
Checked By:	AJG
Date:	April 28, 2023

From the Fire Underwriters Survey (2020)

From Part II – Guide for Determination of Required Fire Flow Copyright I.S.O.:
City of Ottawa Technical Bulletin ISTB-2018-02 Applied Where Applicable

A. BASE REQUIREMENT (Rounded to the nearest 1000 L/min)

F = 220 x C x √A Where: F = Required fire flow in liters per minute
C = Coefficient related to the type of construction.
A = The total floor area in square meters (including all storey's, but excluding basements at least 50 percent below grade) in the building being considered.

Construction Type Non-Combustible Construction

C 0.8 A 2,115.0 m^2

Total Floor Area (per the 2020 FUS Page 20 - Total Effective Area) 2,115.0 m^2 **Unprotected Vertical Openings*

Calculated Fire Flow	8,094.1 L/min
	8,000.0 L/min

B. REDUCTION FOR OCCUPANCY TYPE (No Rounding)

From Page 24 of the Fire Underwriters Survey:
Limited Combustible -15%

Fire Flow	6,800.0 L/min

C. REDUCTION FOR SPRINKLER TYPE (No Rounding)

Non-Sprinklered 0%

Reduction	0.0 L/min

D. INCREASE FOR EXPOSURE (No Rounding)

	Separation Distance (m)	Cons.of Exposed Wall	Length Exposed Adjacent Wall (m)	Height (Stories)	Length-Height Factor	
Exposure 1	20.1 to 30	Ordinary - Mass Timber (Unprotected)	93	2	186.0	5%
Exposure 2	Over 30 m	Ordinary - Mass Timber (Unprotected)	20	1	20.0	0%
Exposure 3	Over 30 m	Ordinary - Mass Timber (Unprotected)	50	2	100.0	0%
Exposure 4	Over 30 m	Ordinary - Mass Timber (Unprotected)	20	1	20.0	0%
					% Increase*	5%

Increase*	340.0 L/min

E. Total Fire Flow (Rounded to the Nearest 1000 L/min)

Fire Flow	7,140.0 L/min
Fire Flow Required**	7,000.0 L/min

*In accordance with Part II, Section 4, the Increase for separation distance is not to exceed 75%
**In accordance with Section 4 the Fire flow is not to exceed 45,000 L/min or be less than 2,000 L/min

McINTOSH PERRY

CCO-22-0480 - Youville Drive - Boundary Condition Unit Conversion

Project:	Youville Drive
Project No.:	CCO-22-0480
Designed By:	RRR
Checked By:	AJG
Date:	April 28, 2023

Boundary Conditions Unit Conversion

Youville Drive

Scenario	Height (m)	Elevation (m)	m H_2O	PSI	kPa
Avg. DD	114.6	61.5	53.1	75.6	520.9
Fire Flow (150L/s or 9,000 L/min)	111.1	61.5	49.6	70.6	486.6
Peak Hour	111.8	61.5	50.3	71.6	493.4

City of Ottawa
Water Distribution System Figure

ORLEANS P.S.

P.S

ORLEANS RES.

AD P.S.

SITE LOCATION

INNES RD ELEVATED TANK

Innes Rd/BearBrook Rd Backup P.S.

Innes Rd Backup P.S.

HURDMAN P.S.

BILLINGS BRIDGE P.S.

2E

1E

JEANNE D'ARC
REGIONAL ROAD 174
CHAMPLAIN
ST. JOSEPH
PRESTON
CHARLEMAGNE
TENTH LINE
ORCHARDVIEW
ESPRIT
PORTOBELLO
BRIAN COBURN
MER-BLEUE, CHEMIN DE LA
TRIM
NAVAN
INNES
BLAIR
OGILVIE
CUMMINGS
COVENTRY
TREMBLAY
INDUSTRIAL
ALTA VISTA
SMYTH
RUSSELL
RAMSAYVILLE
HAWTHORNE
MONTREAL, CHEMIN DE
MCARTHUR
VANIER
ST-LAURENT BOULEVARD
EMLOCK
JOSEPH

PS
BPS

1400-1410 Youville Drive
Hydrant Coverage Figure

Municipal Hydrants within 75m: 2

Municipal Hydrants within 150m: 1

Boundary Conditions
1400 & 1410 Youville Drive

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	22	0.37
Maximum Daily Demand	34	0.56
Peak Hour	60	1.00
Fire Flow Demand #1	9,000	150.00

Location

Results

Connection 1 – Youville Dr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	114.6	75.5
Peak Hour	111.1	70.6
Max Day plus Fire 1	111.8	71.5

Ground Elevation = 61.5 m

APPENDIX D
SANITARY CALCULATIONS

McINTOSH PERRY

McINTOSH PERRY

CCO-23-0480 - 1410 Youville Drive - Sanitary Demands

Project:	1410 Youville Drive
Project No.:	CCO-23-0480
Designed By:	RRR
Checked By:	AJG
Date:	August 26, 2022

Site Area	0.92	Gross ha

DESIGN PARAMETERS

Institutional/Commercial Peaking Factor	1.5	
Industrial Peaking Factor	6.8	
Residential Peaking Factor	3.80	* Using Harmon Formula = 1+(14/(4+P^0.5))*0.8 where P = population in thousands, Harmon's Correction Factor = 0.8
Mannings coefficient (n)	0.013	
Demand (per capita)	280	L/day
Infiltration allowance	0.33	L/s/Ha

EXTRANEOUS FLOW ALLOWANCES

Infiltration / Inflow	Flow (L/s)
Dry	0.05
Wet	0.26
Total	0.30

AVERAGE DAILY DEMAND

DEMAND TYPE	AMOUNT	UNITS	POPULATION / AREA	Flow (L/s)
Residential	280	L/c/d	0	0.00
Industrial - Light**	35,000	L/gross ha/d	0.92	0.37
Industrial - Heavy**	55,000	L/gross ha/d		0
Commercial / Amenity	2,800	L/(1000m² /d)	0.00	0.00
Hospital	900	L/(bed/day)		0
Schools	70	L/(Student/d)		0
Trailer Parks no Hook-Ups	340	L/(space/d)		0
Trailer Park with Hook-Ups	800	L/(space/d)		0
Campgrounds	225	L/(campsite/d)		0
Mobile Home Parks	1,000	L/(Space/d)		0
Motels	150	L/(bed-space/d)		0
Hotels	225	L/(bed-space/d)		0
Office	75	L/7.0m^2/d		0
Tourist Commercial	28,000	L/gross ha/d		0
Other Commercial	28,000	L/gross ha/d		0

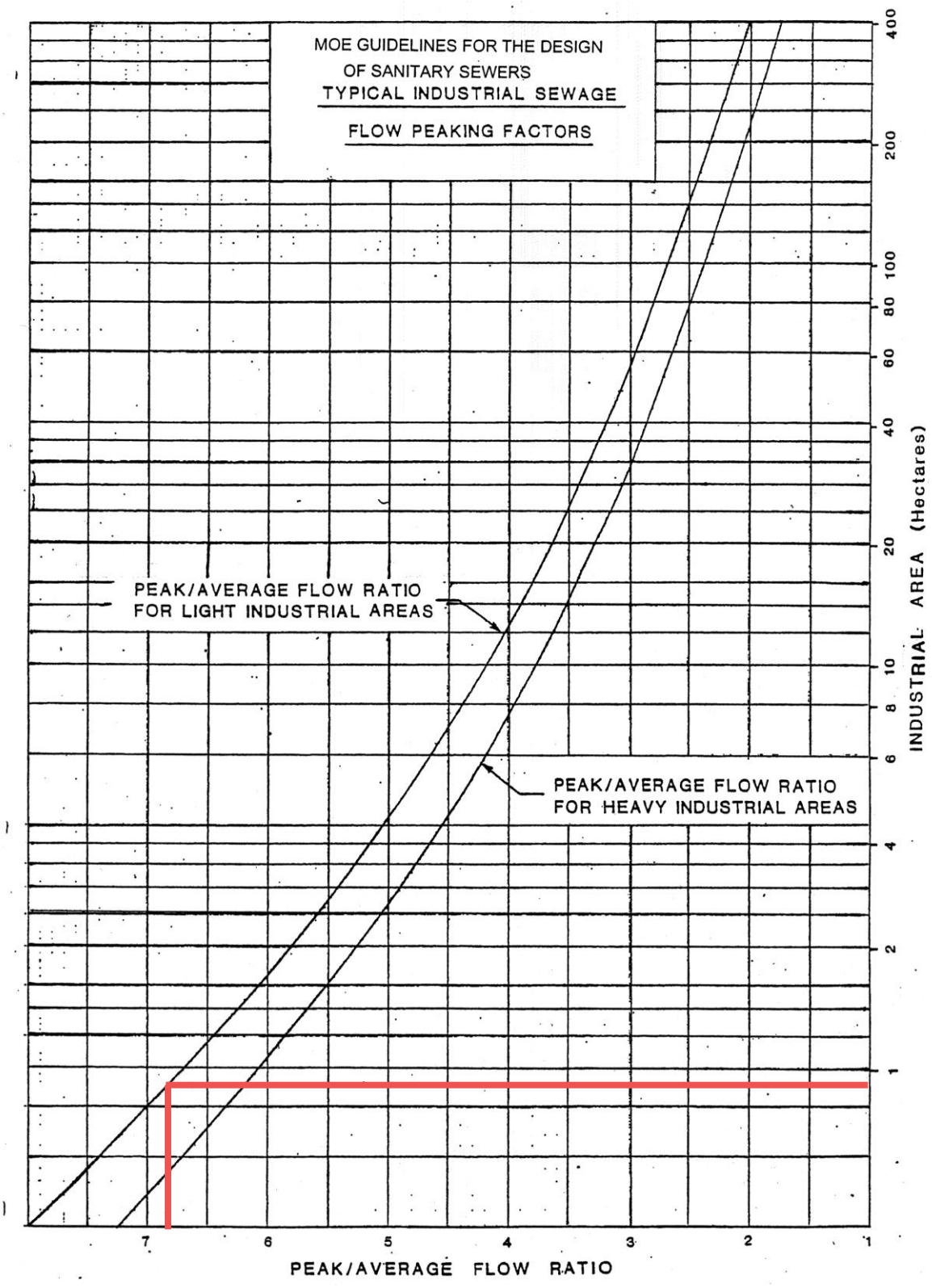
AVERAGE RESIDENTIAL FLOW	0.00	L/s
PEAK RESIDENTIAL FLOW	0.00	L/s
AVERAGE ICI FLOW	0.00	L/s
PEAK INSTITUTIONAL/COMMERCIAL FLOW	0.00	L/s
PEAK INDUSTRIAL FLOW	2.53	L/s
TOTAL PEAK ICI FLOW	2.53	L/s

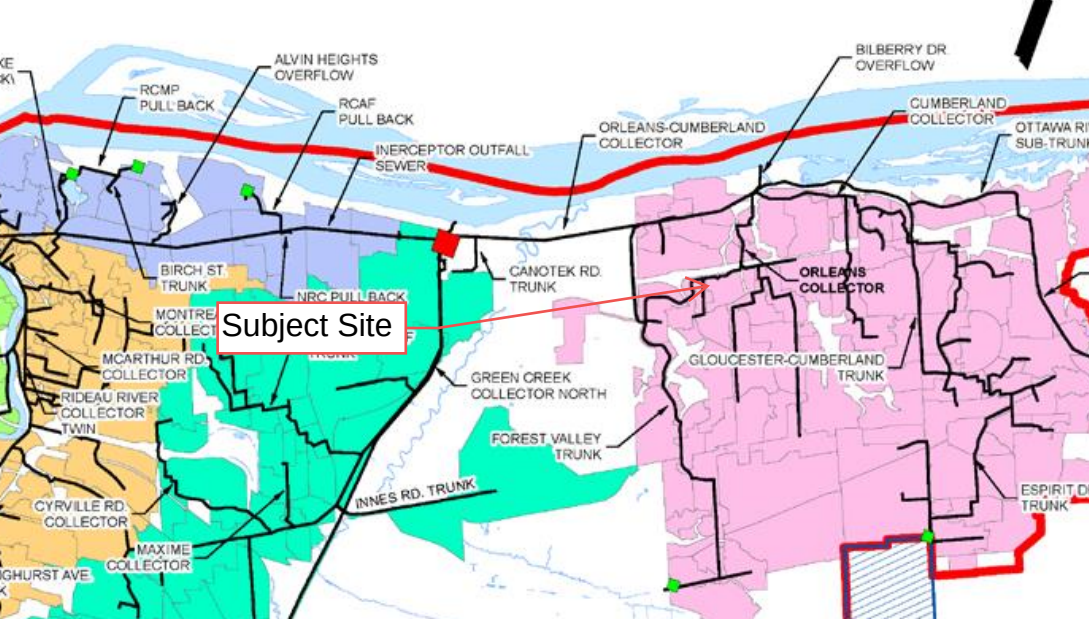
TOTAL SANITARY DEMAND

TOTAL ESTIMATED AVERAGE DRY WEATHER FLOW	0.42	L/s
TOTAL ESTIMATED PEAK DRY WEATHER FLOW	2.58	L/s
TOTAL ESTIMATED PEAK WET WEATHER FLOW	2.84	L/s

** PEAK INDUSTRIAL FLOW PER CITY OF OTTAWA SEWER DESIGN GUIDELINES APPENDIX 4B

APPENDIX 4-B PEAKING FACTOR FOR INDUSTRIAL AREAS




ALVIN HEIGHTS OVERFLOW
RCMP PULL BACK
RCAF PULL BACK
INTERCEPTOR OUTFALL SEWER
ORLEANS-CUMBERLAND COLLECTOR
BILBERRY DR OVERFLOW
CUMBERLAND COLLECTOR
BIRCH ST. TRUNK
NRC PULL BACK
CANOTEK RD. TRUNK
ORLEANS COLLECTOR
Subject Site
MCARTHUR RD. COLLECTOR
GREEN CREEK COLLECTOR NORTH
GLOUCESTER-CUMBERLAND TRUNK
RIDEAU RIVER COLLECTOR TWIN
FOREST VALLEY TRUNK
INNES RD. TRUNK
CYRVILLE RD. COLLECTOR
MAXIME COLLECTOR

Ryan Robineau

From: Tousignant, Eric <Eric.Tousignant@ottawa.ca>
Sent: June 30, 2023 9:39 AM
To: Elsby, Cam
Subject: RE: 1400 & 1410 Youville - D07-12-22-0130

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Cam

No concerns with this flow

Eric

Eric Tousignant, P.Eng.
Senior Water Resources Engineer/ Ingénieur principal en resources hydriques
Infrastructure and Water Services / *services d'infrastructure et d'eau*
City of Ottawa
613-580-2424 ext 25129

From: Elsby, Cam <Cam.Elsby@ottawa.ca>
Sent: June 26, 2023 4:52 PM
To: Tousignant, Eric <Eric.Tousignant@ottawa.ca>
Subject: FW: 1400 & 1410 Youville - D07-12-22-0130

Hey Eric,

The above noted application is for a new autobody shop at 1410 Youville, and the consultant is looking to confirm sanitary capacity based on proposed flows as seen in the below email. Would you be able to confirm if they have sufficient capacity? I've attached the proposed servicing plan for reference.

Thanks in advance Eric!

Kind regards,

Cam Elsby
Project Manager, Infrastructure Approvals
Planning, Real Estate and Economic Development Department | Services de la planification, des biens immobiliers et du développement économique
Development Review – East Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue Laurier Ouest. Ottawa (Ontario) K1P 1J1

613.580.2424 ext./poste 21443
cam.elsby@ottawa.ca

From: Curtis Melanson <c.melanson@mcintoshperry.com>
Sent: June 14, 2023 1:50 PM
To: Elsby, Cam <Cam.Elsby@ottawa.ca>
Subject: RE: 1400 & 1410 Youville

Hi Cam,
Thanks for the email!

The sanitary flow from the site is going to be:

- Total Estimated Average Dry Weather Flow: 0.42 L/s
- Total Estimated Peak Dry Weather Flow: 2.58 L/s
- Total Estimated Peak Wet Weather Flow: 2.84 L/s

Also, for the CCTV we are going to be fixing a section of the pipe that showed a sump so the pipe will function without issue.

Lastly, do you have time to discuss comment A3 – ensure no excess drainage is directed towards the neighbouring property? The existing grades show that approximately half of the site is directed towards the north (see below image), in our plan, only the small landscape area behind the curb is draining towards the north. Therefore, there'll be a significant decrease in the amount of flow going to the north. Can we agree that this reduction in area proves there's no excess drainage being directed towards the neighbouring property? Feel free to call me and we can go through the topo together to review the grades if you'd like (since I recognize the image will make it difficult to read the grades). I've also attached a PDF of the topo with the line if that makes things easier.

Sewerteks Inc.

Sewerteks Inc.
INDUSTRY LEADERS

McINTOSH PERRY

COMBINED SEWER LATERAL POST CLEANING AND CCTV CONDITION ASSESSMENT

JOB LOCATION:

140 YOUVILLE STREET
OTTAWA, ONTARIO

JOB DATE:

Thursday, May 4, 2023

Sewerteks Inc.

Sewerteks Inc.
INDUSTRY LEADERS

Sewerteks Inc.

Sewerteks Inc.
INDUSTRY LEADERS

TABLE OF CONTENT

Sewerteks Inc.

Sewerteks Inc.
INDUSTRY LEADERS

PROJECT SUMMARY

The following is the result from the camera inspections of the combined sewer lateral located at 140 Youville Street Ottawa, Ontario.

COMBINE SYSTEM

The sewer system is combine in the building. The first access point was a Roof Drain stack CO1. The line was labeled COMB1. When the camera was at 2.2 meters into the line, one of the washroom toilets was flushed and found out that the connection at 2.2 meters from the top of the stack CO1 connected to the toilet line.

CLEANING

The lines were flushed with high water jetted pressure prior to the CCTV condition assessment

PLR

Each inspected pipe segment has a unique identification ID. This unique ID is the Pipe Line Reference ID or PLR. All the IDs are labeled in the map.

REPORT NAVIGATION

The PLR is used to navigate this report online. It's a link to the video inspection and video file. You can jump from the Summary to the actual inspection details by clicking the PLR link. The report also has a table of contents that are also link to each section of the report.
In addition, the report has a link to re-direct you to the table of contents in every page.

DVD/USB DRIVE

The DVD or USB drive contains the digital report and videos.

STRUCTURAL AND OPERATIONAL DEFECTS

The following table#1 below describes the structural and operational defects of each individual pipe segment inspected identified by its unique ID or PipeLine Reference ID. The comments depict any additional information about each segment inspected.

Table#1 below describes the structural and operational defects of each individual combined pipe segment inspected identified by its unique ID or PipeLine Reference ID.

PIPELINE REF. ID (PLR)	STRUCTURAL DEFECTS	OPERATIONAL DEFETCS	COMMENTS
COMB1-POST	None	None	10% water level was observed aftert the line was flLushed with high water level pressure. Water level marks from 40 to 99 percent were also observed. The inspection ended at manhole MHSA at 37.2 meters from the top of the access point CO1.
COMB2-POST	None	None	The camera went under water from 6.6 to 10.0 meters indicating a sump in the line after it was fllushed with high water jetted pressure. The inspection ended at the city main line at 12.0 meters from manhole MHSA1.

Date	5/4/2023	**Sewer Type**	COMBINE	**Pipe Size (mm)**	100MM
Client	McINTOSH PERRY			**Work order**	531
Contact	CURTIS MELANSON			**Pipe Material**	ABS/PVC
Start	STACKCO (RD1)			**Camera Direction**	With Flow
End	MHSA			**DVD#/USB#**	1
Further Location Details	THE ACCESS STACK CO (RD1) IS LOCATED IN THE BUILDING AS SHOWN IN THE MAP OF THIS REPORT.			**Video name (PLR)**	COMB1-POST.mpg
				Report No	1
Job Address	140 YOUVILLE STREET OTTAWA, ONTARIO			**Operator**	Saul Cerna
Comments	10% water level was observed aftert the line was flsuhed with high water level pressure. Water level marks from 40 to 99 percent were also observed. The inspection ended at manhole MHSA at 37.2 meters from the top of the access point CO1.				

DISTANCE (m)	CODE DESCRIPTION	%	SIZE (mm)	LENGTH (m)	CLOCK FROM	CLOCK TO	REMARKS
0.0	Start of inspection						Start at access point STACKCO (RD1).
0.0	Line deviates down			0.6			Drop into the line.
0.6	Water Level	0					
1.0	Dimesion of Sewer Changes		150				
1.0	Line deviates down			2.6			Drop into the line.
1.6	Connection		100		12		
2.2	Connection		75		2		
2.6	Water Level	10					
5.6	Line Deviates Right						
6.0	Line Deviates Right						Slightly
6.0	Water Level		5				
7.2	General observation						40% water level mark
10.0	General observation						50% water level mark
15.8	Line Deviates Left						
16.6	Line Deviates Left						

Date	5/4/2023	**Sewer Type**	COMBINE	**Pipe Size (mm)**	100MM
Client	McINTOSH PERRY			**Work order**	531
Contact	CURTIS MELANSON			**Pipe Material**	ABS/PVC
Start	STACKCO (RD1)			**Camera Direction**	With Flow
End	MHSA			**DVD#/USB#**	1
Further Location Details	THE ACCESS STACK CO (RD1) IS LOCATED IN THE BUILDING AS SHOWN IN THE MAP OF THIS REPORT.			**Video name (PLR)**	COMB1-POST.mpg
				Report No	1
Job Address	140 YOUVILLE STREET OTTAWA, ONTARIO			**Operator**	Saul Cerna
Comments	10% water level was observed aftert the line was flsuhed with high water level pressure. Water level marks from 40 to 99 percent were also observed. The inspection ended at manhole MHSA at 37.2 meters from the top of the access point CO1.				

DISTANCE (m)	CODE DESCRIPTION	%	SIZE (mm)	LENGTH (m)	CLOCK FROM	CLOCK TO	REMARKS
17.4	General observation						99% water level mark
21.8	Water Level	10					
26.0	Water Level	5					
36.8	General observation						Manhole MHSA connection
37.2	Finish Survey						End at MHSA.

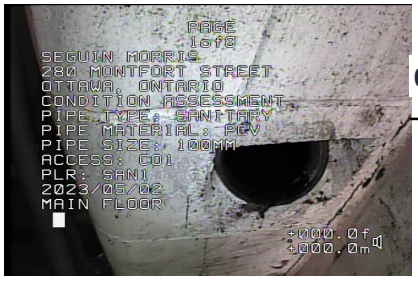
PROJECT NAME

SANITARY SEWER LATERAL CCTV CONDITION ASSESSMENT

VIDEO NAME

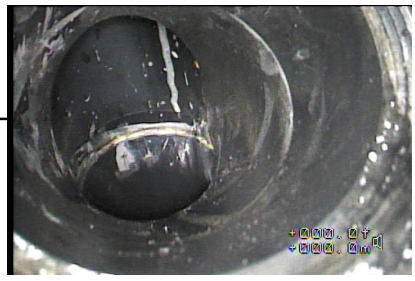
COMB1-POST

Figure#1: Start of inspection at access point STACKCO (RD1)



0.0 m

Figure#2: A view to the line deviation downwards at 0.0 meters from the top of STACKCO (RD1).

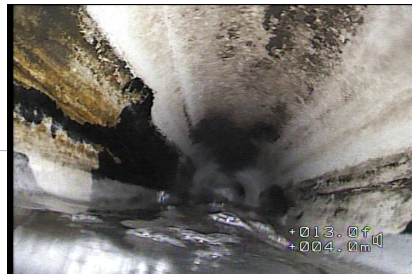


0.0 m

Figure#3: A view to the line deviation downwards and live connection at 1.4 meters from the top of STACKCO (RD1).

1.4 m

Figure#4: A view to the 10% water level at 2.6 meters from the top of STACKCO (RD1).

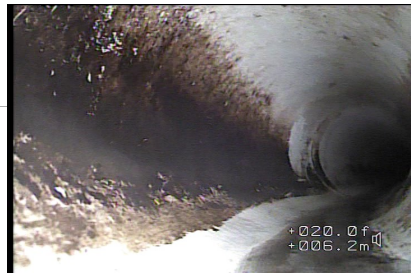


2.6 m

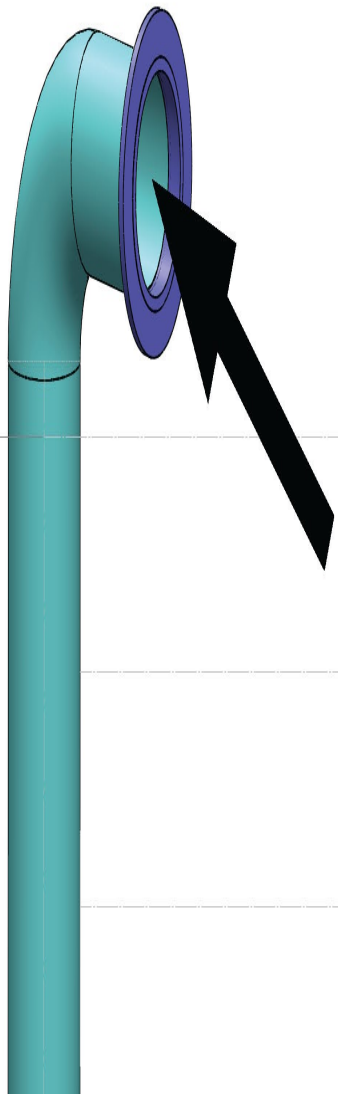
Figure#5: A view to the right line deviation at 5.2 meters from the top of STACKCO (RD1).

5.2 m

Figure#6: A view to the right line deviation at 6.2 meters from the top of STACKCO (RD1).



6.2 m



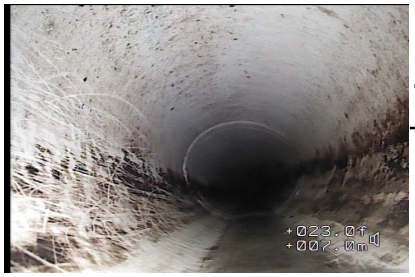
PROJECT NAME

SANITARY SEWER LATERAL CCTV CONDITION ASSESSMENT

VIDEO NAME

COMB1-POST

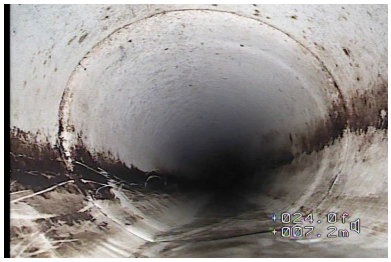
Figure#7: A view to the % water level at 7.0 meters from the top of STACKCO (RD1).



7.0 m

Figure#8: A view to the 40% water level mark at 7.2 meters from the top of STACKCO (RD1).

7.2 m

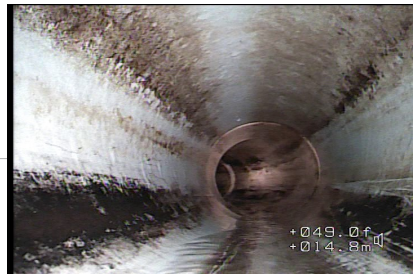


Figure#9: A view to the 50% water level mark at 10 meters from the top of STACKCO (RD1).

10.0 m

Figure#10: A view to the left line deviation and water mark shown pipe at full capacity at 15.8 meters from the top

15.8 m



Figure#11: A view to the left line deviation at 16.0 meters from the top of STACKCO (RD1).

16.0 m

Figure#12: A view to the 99% water level mark at 17.4 meters from the top of STACKCO (RD1).

17.4 m

PROJECT NAME

SANITARY SEWER LATERAL CCTV CONDITION ASSESSMENT

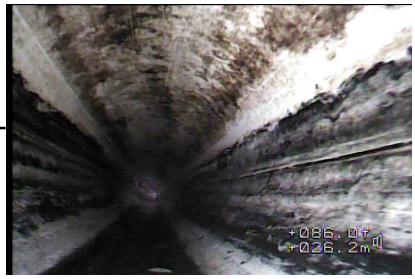
VIDEO NAME

COMB1-POST

Figure#13: A view to the 10% water level at 21.8 meters from the top of STACKCO (RD1).

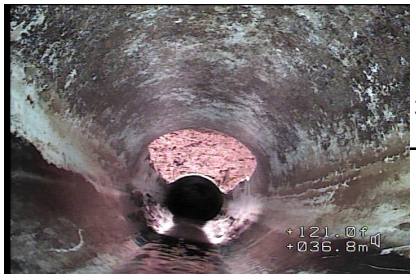
21.8 m

Figure#14: A view to the 5% water level at 26.2 meters from the top of STACKCO (RD1).



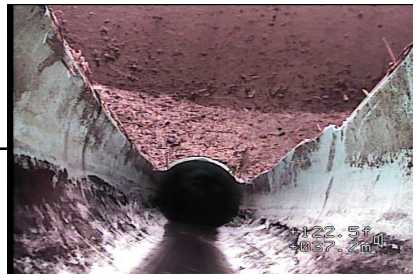
26.2 m

Figure#15: A view to the Manhole MHSA connection at 36.8 meters from the top of STACKCO (RD1).



36.8 m

Figure#16: A view to the end point MHSA at 37.2 meters from the top of STACKCO (RD1).



37.2 m

m

m

Date	5/4/2023	**Sewer Type**	COMBINE	**Pipe Size (mm)**	150MM
Client	McINTOSH PERRY			**Work order**	531
Contact	CURTIS MELANSON			**Pipe Material**	ABS/PVC
Start	MHSA1			**Camera Direction**	With Flow
End	CITY MAIN LINE			**DVD#/USB#**	1
Further Location Details	THE ACCESS MANHOLE MHSA1 IS LOCATED IN THE BUILDING AS SHOWN IN THE MAP OF THIS REPORT.			**Video name (PLR)**	COMB2-POST.mpg
				Report No	1
Job Address	140 YOUVILLE STREET OTTAWA, ONTARIO			**Operator**	Saul Cerna
Comments	The camera was under water a few pipe segments. And excessive pockets of debris sediment were found. The inspection ended at the city sewer main line at 12.6 meters from manhole MHSA. The sewer line needs to b e flushed and re-camera in order to determine the true condition of the pipe.				

DISTANCE (m)	CODE DESCRIPTION	%	SIZE (mm)	LENGTH (m)	CLOCK FROM	CLOCK TO	REMARKS
0.0	Start of inspection						Start at access point MHSA1.
0.0	Water Level	5					
2.0	General observation						60% water level mark
6.2	Water Level	20					
6.6	Water Level	30					
6.6	Camera Under Water						
10.0	Camera Above Water						
10.0	Water Level	5					
10.8	Line deviates down						To the city main line
11.6	Line deviates down						To the city main line
12.0	Finish Survey						End at CITY MAIN LINE.

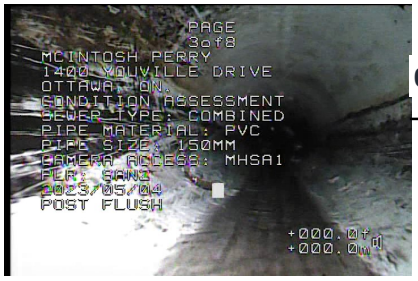
PROJECT NAME

SANITARY SEWER LATERAL CCTV CONDITION ASSESSMENT

VIDEO NAME

COMB2-POST

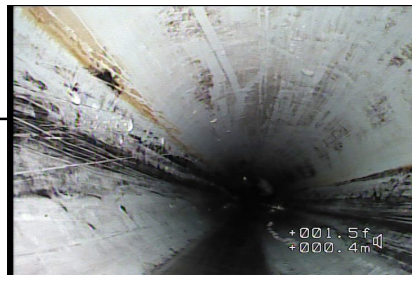
Figure#1: Start of inspection at access point MHSA1



0.0 m

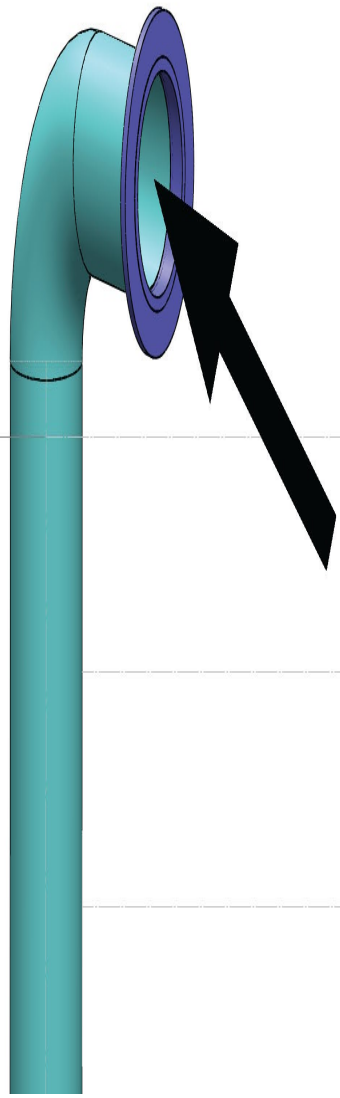
Figure#2: A view to the % water level at 0.4 meters from the top of MHSA1.

0.4 m



Figure#3: A view to the 60% water level mark at 2.2 meters from the top of MHSA1.

2.2 m



6.2 m

Figure#4: A view to the 20% water level at 6.2 meters from the top of MHSA1.

Figure#5: A view to the 30% water level at 6.6 meters from the top of MHSA1.

6.6 m

Figure#6: A view to the mm% of the pipe's surface area lost due to the deformed pipe at 6.6 meters from the

6.6 m

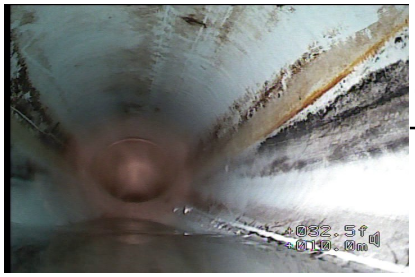
PROJECT NAME

SANITARY SEWER LATERAL CCTV CONDITION ASSESSMENT

VIDEO NAME

COMB2-POST

Figure#7: A view to the camera above water at 10.0 meters from the top of MHSA1.



10.0 m

Figure#8: A view to the line deviation downwards at 10.6 meters from the top of MHSA1.

10.6 m

Figure#9: A view to the line deviation downwards to the city main line at 11.6 meters from the top of MHSA1.

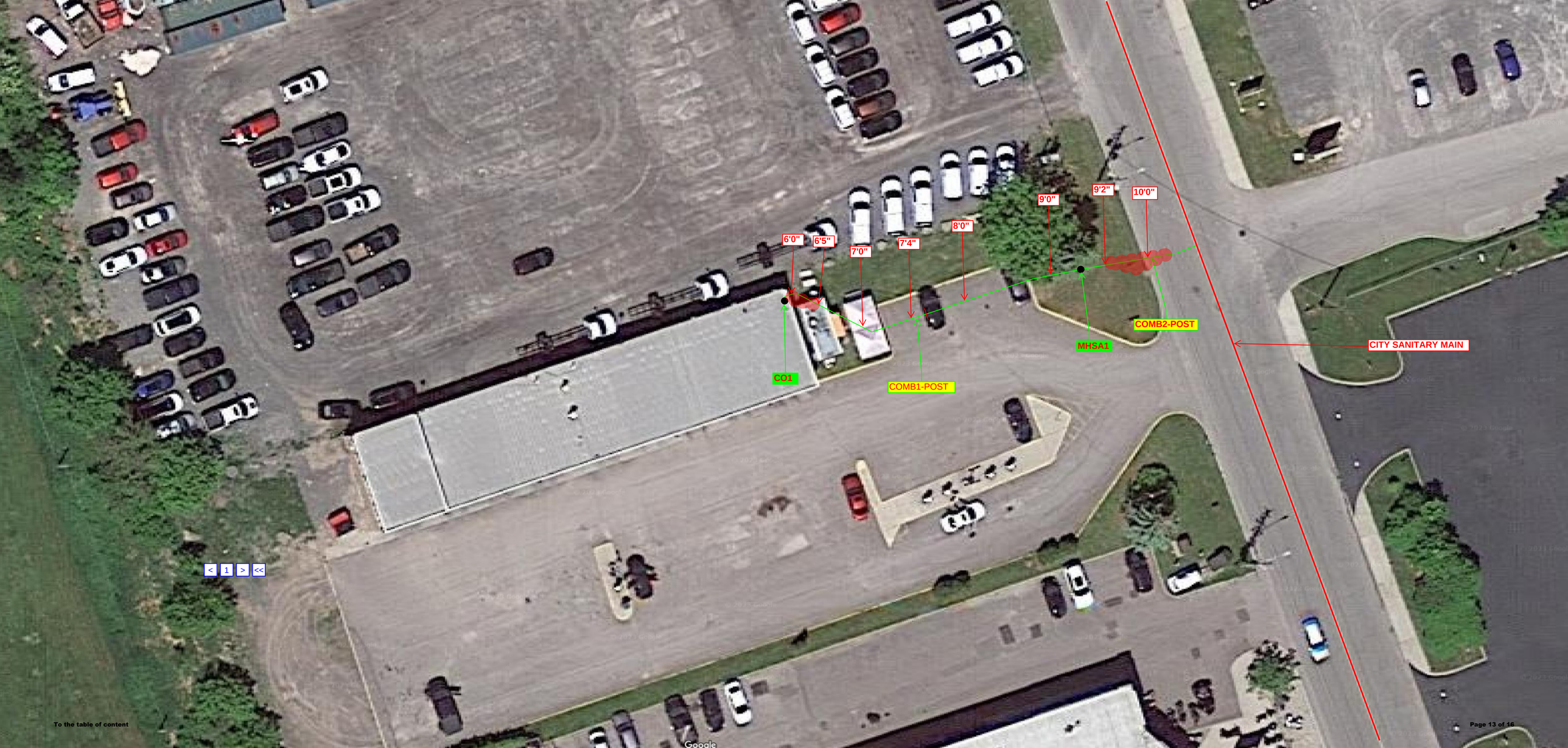
11.6 m

Figure#10: A view to the end point CITY MAIN LINE at 12 meters from the top of MHSA1.

12 m

m

m


6'0"
6'5"
7'0"
7'4"
8'0"
9'0"
9'2"
10'0"
CO1
COMB1-POST
MHSA1
COMB2-POST
CITY SANITARY MAIN
< 1 > <<
Google

Observations

Problem

Structural Condition - Brickwork

DB – Displaced Bricks
DI – Dropped Invert
MB – Missing Bricks

Structural Condition – Mortar Missing

MM - Mortar missing medium
MS – Mortar missing slight
MT – Mortar missing total

Structural Condition – Surface damage

SSL - Spalling large
SSM - Spalling medium
SSS – Spalling slight
SWL – Wear large
SWM – Wear medium
SWS – Wear slight

Structural Condition – Joint Displaced

JDL – Joint Displaced Large
JDM – Joint Displaced Medium

Structural Condition – Open Joint

OJL – Open Joint Large
OJM – Open Joint Medium

Structural Condition – Cracked

CC – Crack Circumferential
CL – Crack Longitudinal
CM – Crack multiple

Structural Condition – Fractured

FC – Fracture Circumferential
FL – Fracture Longitudinal
FM – Fracture Multiple

Structural Condition – Broken (pipe sewers)

B- Broken
H – Hole

Structural Condition – Deformed

D – Deformed Sewer

Structural Condition – Collapsed

X – Collapsed

Construction Features – Connection

CN – Connection
CNI – Connection intruding
CX – Connection defective
CXI – Connection defective intruding
WYE - End point connection / End of a line

Construction Features – Junction

JN – Junction
JX – Junction Defective

Construction Features – Lining defect

LN – Lining defect

Construction Features – Major branch

BR – Branch major

Construction Features – Manhole/node

MH – Manhole/Node

Miscellaneous Features

CU – Camera underwater
DC – Dimension of sewers changes
GO – General Observation
GP – General Photograph
LC – Lining Change
MC – Material change
PC – Pipe length change
SC – Shape change
V – Vermin (rats and/or mice)
WL – Water Level

Service Defects – Roots

RF – Roots fine
RFJ – Roots fine at joint
RM – Roots mass
RMJ – roots mass at joint
RT – Roots tap
RJ – Roots tap at joint

Service Defects – Infiltration

ID – Infiltration dripper
IDJ – Infiltration dripper at joint
IG – Infiltration gusher
IGJ – Infiltration gusher at joint
IR – Infiltration runner
IRJ – Infiltration runner at joint
IS – Infiltration seeper
ISJ – Infiltration seeper at joint

Service Defects – Encrustation

EH – Encrustation heavy
EHJ – Encrustation heavy at joint
EL – Encrustation light
ELJ – Encrustation light at joint
EM – Encrustation medium
EMJ – Encrustation medium at joint

Service Defects – Debris

DE – Debris
DEG – Debris grease
DES – Debris silt

Service Defects – Line

LD – Line deviates down
LL – Line deviates left
LR – Line deviates right
LU – Line deviates up

Service Defects – Obstruction

OB – Debris grease

Other Codes

Inspections

CID – Continue inspection downstream
CIU – Continue inspection upstream
FH – Finish Survey
SA – Survey abandoned
ST – Start of Survey

Weather

1- Dry
2- Heavy Rain
3- Light Rain
4- Showers
5- Snow

Reasons & Purpose

A- Structural or service condition defects
B- Infiltration
C- Assessment of complete remedial or renovation works
D- Pre-adoption
E- Pre-acceptance
F- Sample survey to determine asset condition
G- Associated with future capital scheme including drainage area planning
H- Resurvey for any reason
X- Other
Z- Not known

Surface Type & Location

A- Main road (urban)
B- Main road (suburban/rural)
C- Light road
D- Footpath or verge (within the highway boundary)
E- Fields (farmland and public open space)
F- Gardens (within private property)
G- Woodland
X- Difficult access (motorway, railway, watercourse, inside building)

Pipe Type

AC – Alkathene
AK – Alkathene
BR – Brick
CC – Concrete box culvert
CI – Cast Iron
CO – Concrete
CSB – Concrete segments (bolted)
CSU – Concrete segments (unbolted)
DI – Ductile Iron
GRC – Glass reinforced cement
GRP – Glass reinforced plastic
MAC – Masonry (in regular courses)
MAR – Masonry (randomly coursed)
PE – Polyethylene
PF – Pitch fibre
PP – Polypropylene
PSC – Plastic/steel composite
PVC – Polyvinyl chloride
RPM – Reinforced plastic matrix
SI – Spun (grey) iron
ST – Steel
TRA - Transite
VC – Vitrified clay
XXX – Other
ZZZ – Not known

Pipe Shape

A- Arched (with flat bottom)
B- Barrel
C- Circular
E- Egg shaped
H- Horseshoe
O- Oval
R- Rectangular
S- Square
T- Trapezoidal
U- U-shaped with flat top
X- Other

Use of Sewer

A- Combined
F- Foul
S- Surface water
T- Trade effluent
W- Watercourse (culverted)
X- Other
Z- Not known

Lining Method

BL – Bitumen
CL – Cement
CPP – Cured in place
IS – Soft inversion type liner
PL – Plastic
RL – Resin
XXX – Other
ZZ – Not known

Pre-Cleaning

N- No pre-cleaning
Y- Pre-cleaning was carried out
Z- Not known

APPENDIX E
PRE-DEVELOPMENT DRAINAGE PLAN

McINTOSH PERRY

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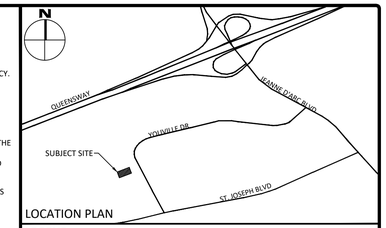

LOCATION PLAN

LEGEND

BARRIER CURB & CURB DEPRESSION		CENTRELINE OF SWALE	
PROPOSED DRIVEWAY ASPHALT AREA		CENTRELINE OF DITCH	
PROPOSED CONCRETE WALKWAY		SLOPING AT 3:1 UNLESS SPECIFIED	
MH# STORM MANHOLE		85.94 / 83.20 PROPOSED ELEVATION EXISTING ELEVATION	
CB / ICB / DI CATCHBASIN, CURB INLET OR DITCH INLET		85.94 (S) SWALE ELEVATION	
		TW/100.50 BW/90.50 TOP/BOTTOM WALL FACE ELEVATIONS	
MH#A SANITARY MANHOLE		EMERGENCY OVERLAND FLOW ROUTE	
PERFORATED PIPE		SILT FENCE BARRIER PER OPSD 219.110	
WATER VALVE/CHAMBER		O/H BUILDING ENTRANCE OVERHEAD DOOR	
FIRE HYDRANT		REDUCER	
PROPOSED WALL			
SEDIMENT CONTROL DEVICE PER DETAIL		DS DOWNSPOUT LOCATION REFER TO ARCHITECTURAL PLANS	
ROADCUT AND REINSTATEMENT PER CITY R10			
1 SERVICE CROSSING			
5-YEAR PONDING ELEV.			
100-YEAR PONDING ELEV.			

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Check and verify all dimensions before proceeding with the work — Do not scale drawings

SCALE 1 : 300
0 5 10 15 20 25 30 Metres

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Tel: 613-836-2184 Fax: 613-836-3742
www.mcintoshperry.com

Stamp: LICENSED PROFESSIONAL ENGINEER — C.D. HAMPEL — 100223712 — 2023/07/07 — PROVINCE OF ONTARIO

Client:
BBS CONSTRUCTION LTD
1805 WOODWARD DRIVE
OTTAWA, ON K2C 0P9

Project:
JIM KEAY FORD
1410 YOUVILLE DRIVE
OTTAWA ON

Drawing Title:
PRE-DEVELOPMENT DRAINAGE PLAN

Scale: 1:300	Project Number: CCO-23-0480
Drawn By: R.R.R.	
Checked By: A.J.G.	Drawing Number: PRE
Designed By: A.J.G.	

D07-12-22-0130

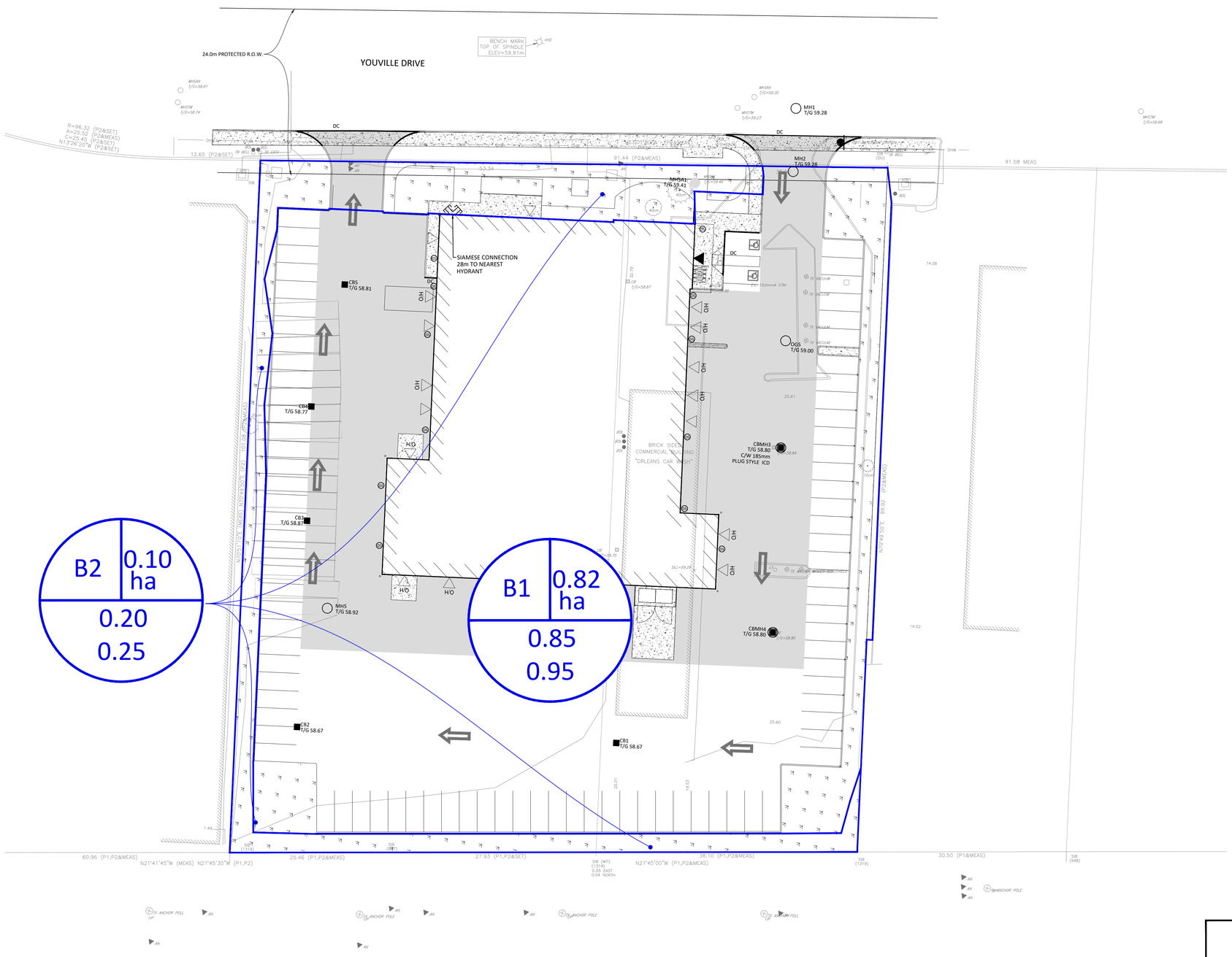
#XXXXX

DRAINAGE AREA B3 — AREA 0.07 ha — 0.79 — 0.88 — 5-YEAR RUNOFF COEFFICIENT — 100-YEAR RUNOFF COEFFICIENT

FILENAME: U:\Ottawa\01 Project - Proposals\2023 Jobs\CCO\CCO-23-0480 BBS_Jim Keay Ford_1410 Youville Drive\12 - Drawings\CCO-23-0480_PRESENTATION.dwg
LAST SAVED: Friday, July 07, 2023 LAST SAVED BY: r.robineau
LAST PLOTTED: Friday, July 07, 2023 BY: CTB FILE USED: —

APPENDIX F
POST-DEVELOPMENT DRAINAGE PLAN

McINTOSH PERRY



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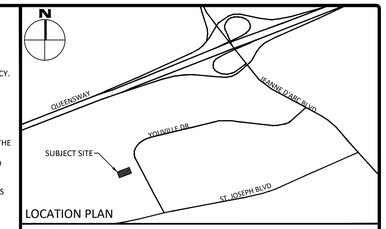

LOCATION PLAN

LEGEND

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	PROPOSED DRIVEWAY ASPHALT AREA		CENTRELINE OF DITCH
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MH#A	SANITARY MANHOLE		EMERGENCY OVERLAND FLOW ROUTE
	PERFORATED PIPE		SILT FENCE BARRIER PER OPSD 219.110
	WATER VALVE/CHAMBER	O/H	BUILDING ENTRANCE OVERHEAD DOOR
	FIRE HYDRANT		REDUCER
	PROPOSED WALL		
	SEDIMENT CONTROL DEVICE PER DETAIL	DS	DOWNSPOUT LOCATION REFER TO ARCHITECTURAL PLANS
	ROADCUT AND REINSTATEMENT PER CITY R10		
1	SERVICE CROSSING		
	5-YEAR PONDING ELEV.		
	100-YEAR PONDING ELEV.		

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SCALE 1 : 300
0 5 10 15 20 25 30 Metres

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115 Walgreen Road, RR3, Carp, ON K0A 1L0
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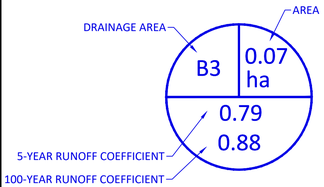
Project:
JIM KEAY FORD
1410 YOUVILLE DRIVE
OTTAWA ON

Drawing Title:
POST-DEVELOPMENT DRAINAGE PLAN



Scale: 1:300	Project Number: CCO-23-0480
Drawn By: R.R.R.	
Checked By: A.J.G.	Drawing Number: POST
Designed By: A.J.G.	

D07-12-22-0130
#XXXXX

FILENAME: I:\Ottawa\01 Project - Proposal\2023 Jobs\CCO\CCO-23-0480_BBS_Jim Keay Ford_1410 Youville Drive\12 - Drawings\CCO-23-0480_PRESENTATION.dwg
LAST SAVED: Friday, July 07, 2023 LAST SAVED BY: r robineau
LAST PLOTTED: Friday, July 07, 2023 4:18 PM EDT

APPENDIX G
STORMWATER MANAGEMENT CALCULATIONS

McINTOSH PERRY

CO-22-0480 - Youville Drive - SWM Calculations

Tc (min)	Intensity (mm/hr)		
	5-Year	100-Year	
10	104.2	178.6	PRE-DEVELOPMENT
10	104.2	178.6	POST-DEVELOPMENT

C-Values	
Impervious	0.90
Gravel	0.60
Pervious	0.20

Pre-Development Runoff Coefficient

Drainage Area	Impervious Area (m^2)	Gravel (m^2)	Pervious Area (m^2)	Average C (5-year)	Average C (100-year)
A1	4,214	4,258	716	0.71	0.83
A2	0	0	54	0.20	0.25

Pre-Development Runoff Calculations

Drainage Area	Area (ha)	C 5-Year	C 100-Year	Tc (min)	Q (L/s)		
					5-Year	100-Year	
A1	0.92	0.71	0.83	10	188.01	376.59	
A2	0.005	0.20	0.25	10	0.31	0.66	*External drainage
Total	0.92				188.31	377.25	

Post-Development Runoff Coefficient

Drainage Area	Impervious Area (m^2)	Gravel (m^2)	Pervious Area (m^2)	Average C (5-year)	Average C (100-year)
B1	7,610	0	598	0.85	0.95
B2	0	0	1,033	0.20	0.25

Post-Development Runoff Calculations

Drainage Area	Area (ha)	C 5-Year	C 100-Year	Tc (min)	Q (L/s)		
					5-Year	100-Year	
B1	0.82	0.85	0.95	10	201.86	385.20	*Restricted*
B2	0.10	0.20	0.25	10	5.99	12.82	*Unrestricted*
Total	0.92				207.85	398.03	

Required Restricted Flow

Drainage Area	Area (ha)	C 5-Year	Tc (min)	Q (L/s)	
				5-Year	
A1	0.92	0.50	10	133.07	
A2	0.005	0.20	10	0.31	*External Drainage area added to target flow rate
Total				133.38	

Post-Development Restricted Runoff Calculations

Drainage Area	Unrestricted Flow (L/S)		Restricted Flow (L/S)		Storage Required (m^3)		Storage Provided (m^3)	
	5-year	100-Year	5-Year	100-Year	5-Year	100-Year	5-Year	100-Year
B1	201.86	385.20	114.29	116.07	51.4	173.3	60.1	189.3
B2	5.99	12.82	5.99	12.82	-	-	-	-
Total	207.85	398.03	120.27	128.90				

Storage Requirements for Area B1

5-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B1	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m^3)
1	203.5	394.26	114.29	279.98	16.80
6	131.6	254.96	114.29	140.68	50.64
11	99.2	192.19	114.29	77.90	51.42
16	80.5	155.96	114.29	41.67	40.01
21	68.1	131.94	114.29	17.65	22.24

Maximum Storage Required 5-year =	51 m^3

100-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B1	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m^3)
1	351.4	758.07	116.07	642.00	38.52
6	226.0	487.55	116.07	371.47	133.73
11	169.9	366.52	116.07	250.45	165.30
16	137.5	296.63	116.07	180.55	173.33
21	116.3	250.89	116.07	134.82	169.87
26	101.2	218.32	116.07	102.24	159.50
31	89.8	193.73	116.07	77.65	144.43
36	81.0	174.74	116.07	58.67	126.72
41	73.8	159.21	116.07	43.13	106.11
46	68.0	146.70	116.07	30.62	84.51

Maximum Storage Required 100-year =	173 m^3

5-Year Storm Event Storage Summary

		Water Elev. (m) =		58.89	
Location	T/G	INV. (out)	Depth (m)	Head (m)	Volume (m^3)
CBMH3	58.80	56.26	0.09	2.54	60.1

Storage Available (m^3) =	60.1	*
Storage Required (m^3) =	51.4	

100-Year Storm Event Storage Summary

		Water Elev. (m) =		58.97	
Location	T/G	INV. (out)	Depth (m)	Head (m)	Volume (m^3)
CBMH3	58.80	56.26	0.17	2.62	189.3

Storage Available (m^3) =	189.3	*
Storage Required (m^3) =	173.3	

*Available Storage calculated from AutoCAD

For Orifice Flow, C= 0.60
For Weir Flow, C= 1.84

	Orifice 1	Orifice 2	Weir 1	Weir 2
invert elevation	56.26	X	X	X
center of crest elevation	56.35	X		X
orifice width / weir length	185 mm	X	X	X
weir height				X
orifice area (m^2)	0.027	X	x	X

Elevation Discharge Table - Storm Routing

Elevation	Orifice 1		Orifice 2		Weir 1		Weir 2		Total	
	H [m]	Q [m^3/s]	H [m]	Q [m^3/s]	H [m]	Q [m^3/s]	H [m]	Q [m^3/s]	Q [L/s]	
56.26	x	x	x	x	x	x	x	x	0.00	
56.27	x	x	x	x	x	x	x	x	0.00	
56.28	x	x	x	x	x	x	x	x	0.00	
56.29	x	x	x	x	x	x	x	x	0.00	
56.30	x	x	x	x	x	x	x	x	0.00	
56.31	x	x	x	x	x	x	x	x	0.00	
56.32	x	x	x	x	x	x	x	x	0.00	
56.33	x	x	x	x	x	x	x	x	0.00	
58.64	2.29	0.11	x	x	x	x	x	x	108.51	
58.65	2.30	0.11	x	x	x	x	x	x	108.75	
58.66	2.31	0.11	x	x	x	x	x	x	108.98	
58.67	2.32	0.11	x	x	x	x	x	x	109.22	
58.68	2.33	0.11	x	x	x	x	x	x	109.46	
58.69	2.34	0.11	x	x	x	x	x	x	109.69	
58.70	2.35	0.11	x	x	x	x	x	x	109.92	
58.71	2.36	0.11	x	x	x	x	x	x	110.16	
58.72	2.37	0.11	x	x	x	x	x	x	110.39	
58.73	2.38	0.11	x	x	x	x	x	x	110.62	
58.74	2.39	0.11	x	x	x	x	x	x	110.86	
58.75	2.40	0.11	x	x	x	x	x	x	111.09	
58.76	2.41	0.11	x	x	x	x	x	x	111.32	
58.77	2.42	0.11	x	x	x	x	x	x	111.55	
58.78	2.43	0.11	x	x	x	x	x	x	111.78	
58.79	2.44	0.11	x	x	x	x	x	x	112.01	
58.80	2.45	0.11	x	x	x	x	x	x	112.24	
58.81	2.46	0.11	x	x	x	x	x	x	112.47	
58.82	2.47	0.11	x	x	x	x	x	x	112.70	
58.83	2.48	0.11	x	x	x	x	x	x	112.93	
58.84	2.49	0.11	x	x	x	x	x	x	113.16	
58.85	2.50	0.11	x	x	x	x	x	x	113.38	
58.86	2.51	0.11	x	x	x	x	x	x	113.61	
58.87	2.52	0.11	x	x	x	x	x	x	113.84	
58.88	2.53	0.11	x	x	x	x	x	x	114.06	
58.89	2.54	0.11	x	x	x	x	x	x	114.29	5-Year
58.90	2.55	0.11	x	x	x	x	x	x	114.51	
58.91	2.56	0.11	x	x	x	x	x	x	114.74	
58.92	2.57	0.11	x	x	x	x	x	x	114.96	
58.93	2.58	0.12	x	x	x	x	x	x	115.18	
58.94	2.59	0.12	x	x	x	x	x	x	115.41	
58.95	2.60	0.12	x	x	x	x	x	x	115.63	
58.96	2.61	0.12	x	x	x	x	x	x	115.85	
58.97	2.62	0.12	x	x	x	x	x	x	116.07	100-Year

Notes:
1. For Orifice Flow, User is to Input an Elevation Higher than Crown of Orifice.
2. Orifice Equation: $Q = cA(2gh)^{1/2}$
3. Weir Equation: $Q = CLH^{3/2}$
4. These Computations Do Not Account for Submergence Effects Within the Pond Riser.
5. H for orifice equations is depth of water above the centroide of the orifice.
6. H for weir equations is depth of water above the weir crest.

Tc (min)	Intensity (mm/hr)		
	5-Year	100-Year	
10	104.2	178.6	PRE-DEVELOPMENT
10	104.2	178.6	POST-DEVELOPMENT

C-Values	
Impervious	0.90
Gravel	0.60
Pervious	0.20

Per the analyisis below, post development flows tributary to the existing ditch along the northern property line are to be reduced by 86.04 L/s and 180.97 L/s for the 5 and 100-year storms, respectively.

Pre-Development Runoff Coefficient

Drainage Area	Impervious Area (m^2)	Gravel (m^2)	Pervious Area (m^2)	Average C (5-year)	Average C (100-year)
A1*	536	4,106	315	0.61	0.75

*Area within A1 tributary to existing ditch at northern property line

Pre-Development Runoff Calculations

Drainage Area	Area (ha)	C 5-Year	C 100-Year	Tc (min)	Q (L/s)	
					*5-Year	*100-Year
A1	0.50	0.61	0.75	10	87.16	183.38

*Pre development runoff tributary to existing ditch at northern property line

Post-Development Runoff Coefficient

Drainage Area	Impervious Area (m^2)	Gravel (m^2)	Pervious Area (m^2)	Average C (5-year)	Average C (100-year)
*B2	0	0	194	0.20	0.25

*Post development area within area B2 tibutary to existing ditch at nothern property line

Post-Development Runoff Calculations

Drainage Area	Area (ha)	C 5-Year	C 100-Year	Tc (min)	Q (L/s)	
					*5-Year	*100-Year
B2	0.02	0.20	0.25	10	1.12	2.41

*Post development runoff within area B2 tibutary to existing ditch at northern property line

Time of Concentration Pre-Development

Drainage Area ID	Sheet Flow Distance (m)	Slope of Land (%)	Tc (min) (5-Year)	Tc (min) (100-Year)
A1	51	1.54	8	6

Therefore, a Tc of 10 can be used

Tc= (3.26(1.1-c)L^0.5/S^0.33)

c = Balanced Runoff Coefficient

L = Length of drainage area

S = Average slope of watershed

STORM SEWER DESIGN SHEET

PROJECT: Jim Keay Ford
LOCATION: 1400-1410 Youville Drive
CLIENT: BBS Construction

McINTOSH PERRY

LOCATION				CONTRIBUTING AREA (ha)				RATIONAL DESIGN FLOW										SEWER DATA									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
STREET	AREA ID	FROM MH	TO MH	C-VALUE	AREA	INDIV AC	CUMUL AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	FIXED FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm)			SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (5yr)	
																					DIA	W	H			(L/s)	(%)
	B1	CB5	MH5	0.85	0.45	0.38	0.38	10.00	0.99	10.99	104.19	122.14	178.56	110.70				110.70	131.34	47.31	450			0.20	0.800	20.65	15.72%
		MH5	CBMH4	0.85	0.21	0.18	0.56	10.99	1.09	12.08	99.26	116.33	170.02	155.25				155.25	162.91	65.07	450			0.30	0.992	7.67	4.71%
		CBMH4	CBMH3	0.85	0.16	0.14	1.08	12.08	0.33	12.41	94.36	110.56	161.56	283.51				283.51	300.97	26.97	525			0.45	1.347	17.46	5.80%
		CBMH3	OGS	-	-	-	1.08	12.41	0.19	12.61	92.97	108.93	159.15	279.33				279.33	300.97	15.62	525			0.45	1.347	21.64	7.19%
		OGS	MH2	-	-	-	1.08	12.61	0.30	12.91	92.19	108.00	157.80	276.98				276.98	300.97	24.27	525			0.45	1.347	23.99	7.97%
		MH2	MH1	-	-	-	1.08	12.91	0.08	12.98	91.00	106.60	155.74	273.40				273.40	448.66	9.22	525			1.00	2.008	175.26	39.06%

Definitions:
Q = 2.78CiA, where:
Q = Peak Flow in Litres per Second (L/s)
A = Area in Hectares (ha)
i = Rainfall intensity in millimeters per hour (mm/hr)
[i = 998.071 / (TC+6.053)^0.814] 5 YEAR
[i = 1174.184 / (TC+6.014)^0.816] 10 YEAR
[i = 1735.688 / (TC+6.014)^0.820] 100 YEAR

Notes:
1. Mannings coefficient (n) = 0.013

Designed: RRR
Checked: AJG
Project No.: CCO-23-0480

No.	Revision	Date

Date: 2023-07-05
Sheet No: 1 of 1

Hydro Downstream Defender®

Net Annual Water Quality Worksheet

Rev. 11.1

Hydro International

Project Name:	**1400-1410 Youville Drive**	*Report Date:*	Paste
Street:		*City:*	**Ottawa**
Province:	**Ontario**	*Country:*	**Canada**
Designer:		*email:*	

Treatment Parameters

Structure ID:		
TSS Goal:	80	% Removal
TSS Particle Size:	Fine	
Area:	0.82	ha
Percent Impervious:	93%	
Rational C value:	0.95	Calc Cn
Rainfall Station:	Ottawa, ONT	MAP
Peak Storm Flow:	116.68	L/s
Peak Storm Return:	100	yrs

RESULTS SUMMARY

Model	TSS	Volume
DD4	76.0%	97.5%
DD6	86.0%	99.5%
DD8	**91.0%**	**99.9%**
DD10	94.0%	100.0%
DD12	96.0%	99.9%

Model Specification

Select Model	**DD8**		
Diameter:	2400	mm	
Peak Flow Capacity:	425.00	L/s	OK
Sediment Storage:	3.56	m^3	
Oil Storage:	2044.00	L	

Installation Configuration

Placement:	Online		
Outlet Pipe Size:	525	mm	*600 to 525 matched invert coupler required*
Inlet Pipe 1 Size:	525	mm	*OK*
Inlet Pipe 2 Size:		mm	*OK*
Rim Level:	59.000	m	Calc Invs.
Outlet Pipe Invert:	56.170	m	*OK*
Invert Pipe 1:	56.190	m	*OK*
Invert Pipe 2:		m	

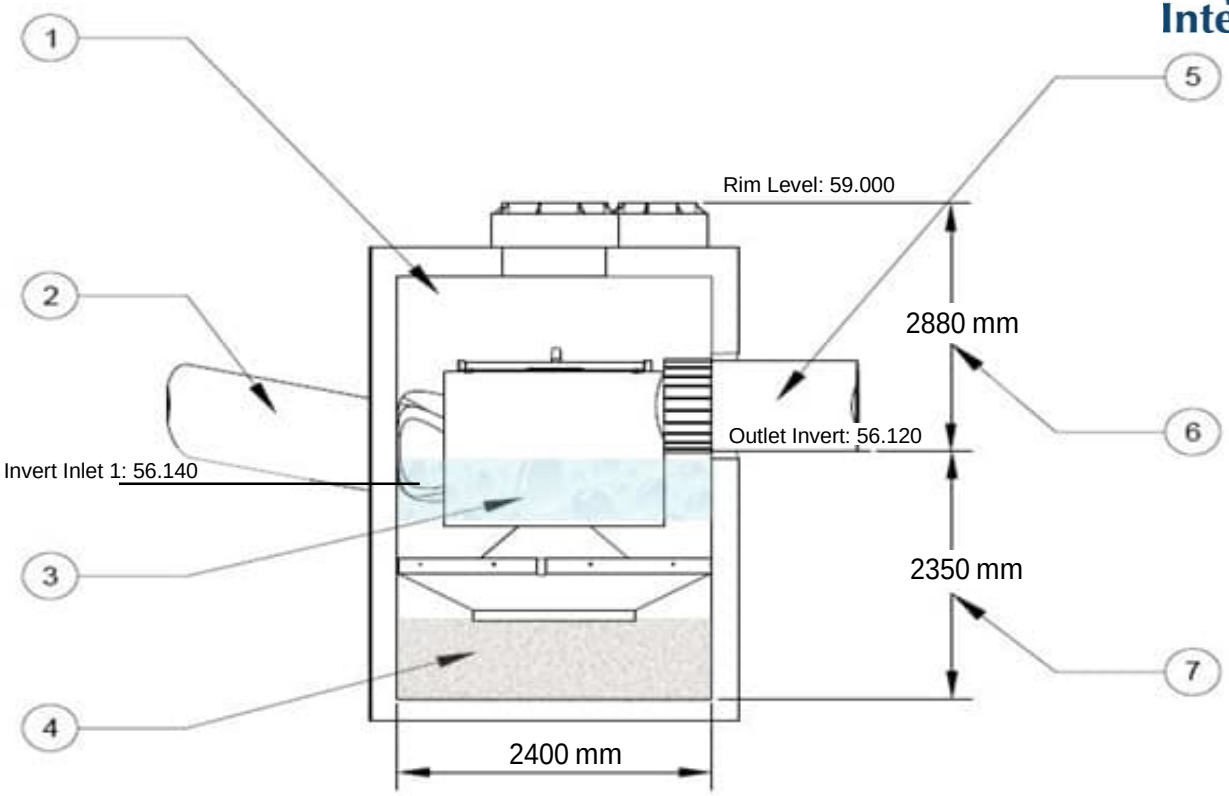
Net Annual Removal Model: DD8

Intensity[1]	Fraction of Rainfall[1]	DD8 Removal Efficiency[2]	Weighted Net Annual Efficiency[4]
(mm/hr)	(%)	(%)	(%)
0.50	0.1%	100.0%	0.09%
1.00	14.1%	100.0%	14.11%
1.50	14.2%	100.0%	14.20%
2.00	14.1%	100.0%	14.12%
2.50	4.2%	100.0%	4.16%
3.00	1.5%	97.3%	1.45%
3.50	8.5%	94.9%	8.11%
4.00	5.4%	92.9%	5.04%
4.50	1.2%	91.1%	1.06%
5.00	5.5%	89.5%	4.95%
6.00	4.3%	86.9%	3.76%
7.00	4.5%	84.8%	3.83%
8.00	3.1%	82.9%	2.56%
9.00	2.3%	81.4%	1.90%
10.00	2.6%	80.0%	2.05%
20.00	9.2%	71.4%	6.60%
30.00	2.6%	66.9%	1.75%
40.00	1.2%	63.9%	0.74%
50.00	0.5%	63.9%	0.34%
100.00	0.7%	63.9%	0.46%
150.00	0.1%	63.9%	0.04%
200.00	0.0%	63.9%	0.00%
Total Net Annual Removal Efficiency:			**91.0%**
Total Annual Runoff Volume Treated:			**99.9%**

1. Rainfall Data: 1960:2007, HLY03, Ottawa, ONT, 6105976 & 6105978.
2. Based on third party verified data and appoximating the removal of a PSD similar to the STC Fine distribution.
3. Rainfall adjusted to 5 min peak intensity based on hourly average.
4. Factored to account for bypass flow.

Designer Notes:

Hydro Downstream Defender®



All drawing elevations are metres.

DD8 Specification

1	Vortex Chamber Diameter	2400	mm
2	Inlet Pipe Diameter	525	mm
3	Oil Storage Capacity	2044	L
4	Min. Provided Sediment Storage Capacity	3.56	m^3
5	Outlet Pipe Diameter	525	mm
6	Rim to Outlet Invert	2880	mm
7	Outlet Invert to Sump	2350	m
	Total Depth	**5230**	**mm**

Notes:

The Downstream Defender is certified by Canada ETV

APPENDIX H
CITY OF OTTAWA DESIGN CHECKLIST

McINTOSH PERRY

City of Ottawa

4. Development Servicing Study Checklist

The following section describes the checklist of the required content of servicing studies. It is expected that the proponent will address each one of the following items for the study to be deemed complete and ready for review by City of Ottawa Infrastructure Approvals staff.

The level of required detail in the Servicing Study will increase depending on the type of application. For example, for Official Plan amendments and re-zoning applications, the main issues will be to determine the capacity requirements for the proposed change in land use and confirm this against the existing capacity constraint, and to define the solutions, phasing of works and the financing of works to address the capacity constraint. For subdivisions and site plans, the above will be required with additional detailed information supporting the servicing within the development boundary.

4.1 General Content

Criteria	Location (if applicable)
☐ Executive Summary (for larger reports only).	N/A
☐ Date and revision number of the report.	On Cover
☐ Location map and plan showing municipal address, boundary, and layout of proposed development.	Appendix A
☐ Plan showing the site and location of all existing services.	Site Servicing Plan (C102)
☐ Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	1.1 Purpose 1.2 Site Description 6.0 Stormwater Management
☐ Summary of pre-consultation meetings with City and other approval agencies.	Appendix B
☐ 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.	1.1 Purpose 1.2 Site Description 6.0 Stormwater Management
☐ Statement of objectives and servicing criteria.	3.0 Pre-Consultation Summary

☐ Identification of existing and proposed infrastructure available in the immediate area.	N/A
☐ 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).	Site Grading Plan (C101)
☐ 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.	Site Grading Plan (C101)
☐ 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 2.0 Background Studies, Standards and References
☐ All preliminary and formal site plan submissions should have the following information: o Metric scale o North arrow (including construction North) o Key plan o Name and contact information of applicant and property owner o Property limits including bearings and dimensions o Existing and proposed structures and parking areas o Easements, road widening and rights-of-way o Adjacent street names	Site Grading Plan (C101)

4.2 Development Servicing Report: Water

Criteria	Location (if applicable)
☐ Confirm consistency with Master Servicing Study, if available	N/A
☐ Availability of public infrastructure to service proposed development	N/A
☐ Identification of system constraints	N/A
☐ Identify boundary conditions	Appendix C
☐ Confirmation of adequate domestic supply and pressure	N/A
☐ 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.	Appendix C
☐ 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	Appendix C, Section 4.2

☐ 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.	Site Servicing Plan (C101)
☐ 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.	Appendix C
☐ Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	N/A

4.3 Development Servicing Report: Wastewater

Criteria	Location (if applicable)
☐ 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).	N/A
☐ 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 5.2 Proposed Sanitary Sewer

☐ 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 5.3 Proposed Sanitary Design
☐ Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	N/A
☐ Description of proposed sewer network including sewers, pumping stations, and forcemains.	Section 5.2 Proposed Sanitary Sewer
☐ 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
☐ 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

Criteria	Location (if applicable)
☐ Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)	Section 6.0 Stormwater Sewer Design & Section 7.0 Proposed Stormwater Management
☐ Analysis of available capacity in existing public infrastructure.	N/A
☐ A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Pre & Post-Development Plans
☐ 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 6.0 Stormwater Sewer Design & Section 7.0 Proposed Stormwater Management
☐ Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Section 6.0 Stormwater Sewer Design & Section 7.0 Proposed Stormwater Management
☐ Description of the stormwater management concept with facility locations and descriptions with references and supporting information.	Section 6.0 Stormwater Sewer Design & Section 7.0 Proposed Stormwater Management
☐ 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.	N/A
☐ Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	N/A
☐ Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5-year return period) and major events (1:100-year return period).	Appendix G

☐ Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	Site Grading Plan
☐ 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 7.0 Proposed Stormwater Management Appendix G
☐ Any proposed diversion of drainage catchment areas from one outlet to another.	Section 6.0 Stormwater Sewer Design & Section 7.0 Proposed Stormwater Management
☐ Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	Section 6.0 Stormwater Sewer Design & Section 7.0 Proposed Stormwater Management
☐ 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.	N/A
☐ Identification of potential impacts to receiving watercourses	N/A
☐ Identification of municipal drains and related approval requirements.	N/A
☐ Descriptions of how the conveyance and storage capacity will be achieved for the development.	Section 6.0 Stormwater Sewer Design & Section 7.0 Proposed Stormwater Management
☐ 100-year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	Site Grading Plan (C101)
☐ 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 8.0 Sediment & Erosion Control
☐ 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

The Servicing Study shall provide a list of applicable permits and regulatory approvals necessary for the proposed development as well as the relevant issues affecting each approval. The approval and permitting shall include but not be limited to the following:

Criteria	Location (if applicable)
☐ 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 Act. 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.	N/A
☐ 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

Criteria	Location (if applicable)
☐ Clearly stated conclusions and recommendations	Section 9.0 Summary Section 10.0 Recommendations
☐ 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 are stamped
☐ All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario	All are stamped