PARSONS

Site Servicing and Stormwater Management Report
473 Albert Street
Ottawa, Ontario
October 22, 2020

Prepared for :

InterRent No. 3 Limited Partnership

Submitted to :

City of Ottawa

Parsons Project # 477234

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1.0 INTRODUCTION

1.1 Site Description and Proposed Development

InterRent No. 3 Limited Partnership (InterRent) has retained Parsons Inc. to prepare a *Site Servicing and Stormwater Management Report* in support of the conversion of an existing high-rise office building into a residential rental building at 473 Albert Street. **Figure 1** shows the site location.

There is an existing access driveway from Albert Street at the west side of the property that is covered by the building. The driveway leads to a ramp for the existing two level underground parking garage as well as to a small open area behind the building, historically used as parking. The existing driving access to the surface parking at the back of the building will be converted to pedestrian only access. This open area behind the building will be converted to amenity space including outdoor workout space, bicycle storage, terrace space for residents and a fenced in dog area. The access to the underground parking garage will remain. The parking garage will provide 47 vehicle parking spaces. There will also be at 87 bicycle parking spots divided between interior and exterior spaces. The parking garage extends beyond the building footprint towards the back and side property lines. Therefore the open area at the back of the building at ground level is over the parking garage structure.

The proposed building breakdown is listed in the table below. There will be residential units on floors 1 through 11. There will be amenity space on Floor 12. There are partial floors on Levels 13 and 14 that are mechanical penthouse space.

Table 1: Proposed Building Breakdown

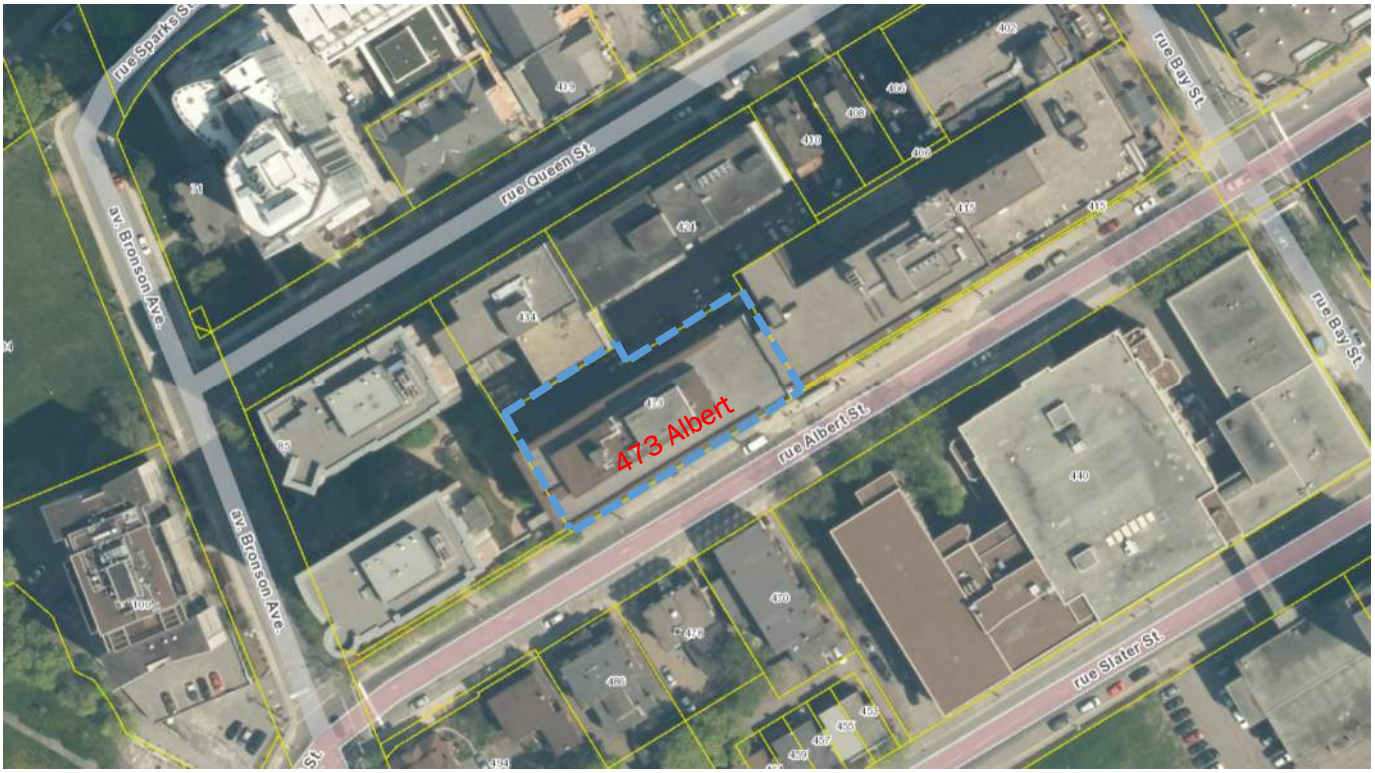
	473 ALBERT STREET (12 STOREYS)
Gross Floor Area (Below and Above Grade)	17,711.54 m^2
Gross Leasable Area (Residential)	9,311.50 m^2

The existing parcel is roughly 0.17 ha in size with a zoning of Residential Fifth Density Zone. The ground elevation behind the building varies between approximately 74.12 m and 73.20 m and drains west towards a parking drain. The driveway between the ramp and Albert Street drains towards Albert Street.

The 473 Albert Street property is surrounded by the features described below.

- North: High rise buildings (residential apartments and office space) facing Queen Street
- East: Albert at Bay Suite Hotel
- South: low rise residential buildings
- West: The Gardens Condo Development

Figure 1: 473 Albert Street, Ottawa Key Plan



1.2 Guidelines and Background Documents

The 473 Albert Street design is in accordance with the documents below.

- *Ottawa Design Guidelines – Water Distribution,* 1st Edition, July 2010 (OWG and technical bulletins)
  - *Technical Bulletin ISD-2010-2*, December 15, 2010
  - *Technical Bulletin ISDTB-2014-02*, May 27, 2014
  - *Technical Bulletin ISTB-2018-02*, March 21, 2018
- *Sewer Design Guidelines*, City of Ottawa, 2nd Edition, October 2012 (OSG and technical bulletins)
  - *Technical Bulletin ISDTB-2012-6,* October 31, 2012
  - *Technical Bulletin ISDTB-2014-01,* February 5, 2014
  - *Technical Bulletin PIEDTB-2016-01,* September 6, 2016
  - *Technical Bulletin ISTB-2018-01,* March 21, 2018
  - *Technical Bulletin ISTB-2019-02, July 8, 2019*
- *Water Supply for Public Fire Protection*, Fire Underwrites Survey, 1999 (FUS)
- *City of Ottawa Park and Pathway Development Manual (2017)*
- *City of Ottawa Accessibility Design Standards (2015)*
- *Ottawa Standard Tender Documents (2019)*
- *Ontario Provincial Standards for Roads & Public Works (2019)*
- *Ontario Building Code (2017)*

1.3 Existing Infrastructure

The site is currently developed and serviced by municipal infrastructure. The exiting municipal infrastructure surrounding the property is shown in **Figure 2**.

The existing municipal infrastructure on Albert Street consists of:

- A 152 mm UCI watermain (1933) (abandoned)
- A 203 mm UCI watermain (1933)
- A 300 mm CONC combined sewer (1935)

The building currently has a water service, a storm service and a sanitary service. The storm and sanitary services both drain to the City's combined sewer. The water service is supplied by the 203 mm diameter City watermain.

There is planned road, water and sewer renewal works identified for Slater Street, Albert Street and Bronson Avenue which is currently under design and planned for construction in the next 2 – 4 years. This work will include separation of the existing combined sewer and upgrades to the watermain network.

Figure 2: Existing Municipal Infrastructure Surrounding the Site

1.4 Consultation and Permits

The City of Ottawa and agencies were consulted for this project. A summary of the consultations is provided below; copies of the correspondences and/or minutes are provided in **Appendix A.**

CONSULTATIONS

City of Ottawa

The City of Ottawa provided the following criteria for the proposed development:

- The allowable release rate (storm and sanitary) will be the 2-year pre-development rate;
- Runoff coefficient will need to be determined based on existing conditions but be no more than 0.4;
- Time of concentration should be 20 minutes, or can be calculated, but should not be less than 10 minutes;

- Any storm events greater than 2-year, up to 100-year, and including the 100-year storm event must be detained on site;
- Two separate sewer laterals will be required;
- Foundation drains are to be independently connected to the sewer, unless being pumped with appropriate back up power, sufficient sized pump and backflow prevention;
- Roof drains are to be connected downstream of any incorporated ICD within the stormwater system or pumped with the lateral being appropriately sized;
- Surface water to be retained on property and conveyed to ROW, approved on-site storage or directly to City infrastructure;
- A second drinking water service to be provided where the average daily demand exceeds 50 m^3/day;
- FUS fire flow criteria to be used unless a low-rise building, where OBC requirements may be applicable;
- Above and below ground storage is permitted although uses ½ peak flow rate or is modeled; and
- There must be at least 15 cm of vertical clearance between the spill elevation and the ground elevation at the building envelope that is in proximity of the flow route or ponding area.

Rideau Valley Conservation Authority (RVCA)

Parsons contacted the RVCA who indicated that no water quality protections will be required as the site will remain rooftop drainage and the existing surface parking will be converted to open amenity space. The communication with the RVCA is included in **Appendix A**.

Ministry of the Environment, Conservation and Parks (MECP)

An Environmental Compliance Approval (ECA) is required for this site as the municipal infrastructure in the area is not fully separated, the two separate building service laterals drain to a combined sewer.

PERMITS AND APPROVALS

The City of Ottawa and the various agencies consulted require the approvals and permits listed below. The City of Ottawa Development Servicing Study Checklist is included in **Appendix B**.

City of Ottawa

- Road Cut Permit
- Commence Work Order
- Water permit
- Water Data Card
- Flow Control Roof Drainage Declaration (included in **Appendix J**)

Ontario Ministry of the Environment, Conservation and Parks

- Environmental Compliance Approval

2.0 WATER SERVICING

2.1 Proposed Water Servicing

The proposed drinking water servicing approach includes providing two 152 mm diameter water services. The existing 152 mm diameter service from the City's 203 mm diameter watermain will be maintained. A second 152 mm diameter water service will be provided to the City's 203 mm diameter watermain. A new 203 mm water valve chamber will be installed on the main line separating the two water services.

Drawing C101, in **Appendix C,** shows the existing and proposed water distribution network.

2.2 Design Criteria

The proposed water servicing network has been designed in general conformance with OWG as amended by the City of Ottawa by its technical bulletins.

The system pressure criteria under normal and various operating conditions are listed in the table below.

Table 2: Water System Pressure – Criteria

OPERATING CONDITIONS	PRESSURE CRITERIA	
	KPa	psi
Average Daily Demand		
minimum to maximum	276-552	40-80
Desirable range	350-480	50-70
Peak Hourly Demand		
minimum to maximum	276-552	40-80
Desirable range	350-480	50-70
Maximum Daily Demand + Fire Flow		
minimum	140	20

The City of Ottawa provided the watermain boundary conditions for the existing 203 mm diameter watermain, as shown in the table below. A copy of the correspondence is in **Appendix D**. The City noted that the watermains on Bronson, Albert and surrounding streets are planned to be upgraded but the planned sizes are not known yet so boundary conditions for these future conditions are not known at this time.

Table 3: 203mm Diameter Watermain Boundary Conditions

MINIMUM HGL	MAXIMUM HGL	MAXIMUM DAY + FIRE FLOW
106 m	115.5 m	87.8m
46 psi	60 psi	20 psi
318 KPa	411 KPa	140 KPa

*The available fire flow = 115 L/s assuming a residual of 20 psi and a ground elevation of 73.5 m.

The boundary conditions provided demonstrate that the available pressure ranges from approximately 46 psi to 60 psi during normal operating conditions but is limited during fire flow conditions.

The fire flow was calculated using the FUS with the following parameters:

Type of construction: non-combustible construction

Occupancy Type: limited combustible

Sprinkler Protection: fully monitored, automatic sprinkler system from standard water supply

The OWG requires that "Service areas with a basic day demand greater than 50 m^3/day (about 50 homes) shall be connected with a minimum of two watermains, separated by an isolation valve, to avoid the creation of a vulnerable service area. Individual residential facilities with a basic day demand greater than 50 m^3/day shall be connected with a minimum of two water services, separated by an isolation valve, to avoid the creation of a vulnerable service area." Therefore, a new 152 mm water service will be provided to the building, connected to the existing 203 mm watermain on Albert Street to provide redundancy to the existing 152 mm water service. An isolation valve and chamber will be installed on the City's 203 mm watermain to separate the two services.

The new water service will be installed with a minimum cover of 2.4 m where possible. Should there be less than 2.4 m cover or separation from an open structure, the pipes will be insulated as per City Standard Drawings W22 and W23.

2.3 Calculations and Simulation Results

The table below summarizes the anticipated maximum water demand for the proposed building conversion. Detailed calculations for the water demand and fire flow are in **Appendix E**.

Table 4: Water Demand Rates

BUILDING	AVERAGE DAY DEMAND (ADD) L/s	MAX DAILY DEMAND (MDD) L/s	PEAK HOURLY DEMAND (PHD) L/s	FIRE FLOW DEMAND (FF) L/s	MDD+FF L/s
473 Albert	1.09	5.08	7.71	182	186.6

High pressure is not an issue on this site as the boundary conditions are below 80 psi. Therefore, pressure reducing valves will not be required.

The required fire flow can be provided by five (5) nearby hydrants at the following locations:

- Two hydrants on Albert Street (within 75 m of the building)
- Two hydrants on Albert Street and one hydrant on Bronson, just north of Albert (within 150 m of the building)

Figure 3: Existing Hydrants

The OBC and Fire Marshal's Office method was used to calculate the fire protection water demand. As per the Office of the Fire Marshal OFT-TG-03-1999, for sprinklered buildings, an adequate fire protection water supply means a reliable water supply providing sufficient water flow for the sprinkler systems in terms of pressure, volume, and duration to limit fire growth until the fire department arrives to suppress the fire. This automatic protection is expected to provide time for the evacuation of buildings, assist the fire department in preventing fire spread to adjacent buildings, limit the environmental impact of fires, and provide significant property protection.

There are 5 fire hydrants within the vicinity of the site, 2 hydrants are within 75m and 3 hydrants within 150m. Due to the age of the watermains, the City completed a multi-hydrant analysis and determined the total available flow from the five hydrants is **215 L/s**. Therefore, the required fire flow per OBC plus max day demand of 187.2 L/s is available within the existing system. Please refer to **Appendix E** for the correspondence from the related correspondence from the City of Ottawa.

2.4 Summary and Conclusions

A second 152 mm water service will be provided from the existing 203 mm watermain on Albert Street.

The water pressures, under average day demand, peak hour demand, are within the allowable pressure range specified by the City of Ottawa.

As per the City's hydrant flow test data, the surrounding hydrants meet the required fire flow demands of the proposed building.

The proposed water service is shown on **Drawing C101** in **Appendix C.**

3.0 SANITARY SERVICING

3.1 Proposed Sanitary Servicing

The existing sanitary service was inspected by Clean Water Works. The internal plumbing was noted to be 150 mm diameter cast iron pipe. The service lateral to the sewer in the road is a 203 mm diameter transite pipe. The pipe was inspected before and after flushing. No deficiencies were noted. Therefore, the existing sanitary service will be maintained. It is likely that this service will be replaced to the property line/building face as part of the City's planned sewer and water upgrades in the next few years. The CCTV reports, including references to pipe materials and sizes, are included in **Appendix F**. It is noted that the interior plumbing is in poor condition and will be completely replaced.

3.2 Design Criteria

The proposed sanitary sewer flow has been designed in general conformance with the *OSG* and its technical bulletins.

The sanitary design flow rate is the peak flow plus the peak extraneous flow. The table below presents the values for the average flow, peak factor and peak extraneous flows used in the sanitary servicing calculations for the residential development.

Table 5: Sanitary Design Flows Criteria

DEVELOPMENT TYPE	AVERAGE SANITARY FLOW	UNIT	PEAK FACTOR	PEAK EXTRANEOUS FLOW
Residential	280	L/c/d	Harmon Equation	0.33 L/s/gross ha
Amenity Space	5	L/m²/d	1.0	

3.3 Calculations and Results

The sanitary design flows and sewer pipe design spreadsheets, included in **Appendix G**, shows the flows from the proposed converted building **(2.98 L/s)** as well as the estimated existing flows **(1.56 L/s)**. The sanitary flows increased due to the proposed residential use of the building. The increase in the sanitary flows will be considered as part of the total allowable

release rate from the site to the combined sewer. The existing sanitary service is sufficient to accommodate the proposed sanitary flows.

There will be additional sanitary flows from the parking garage sump which will collect the drainage collected within the garage from snow melt off cars, etc. The discharge rate from the sump pump is not known at this time but is expected to be negligible compared to the sanitary flows from the domestic use.

3.4 Summary and Conclusions

The existing 203 mm diameter sanitary lateral will be maintained for the proposed development.

4.0 STORM SERVICING AND STORMWATER MANAGEMENT

4.1 Existing Storm Servicing

The existing site has a parking drain at the northwest corner of the site which drains into the underground parking garage and plumbing system. The site generally drains northeast to southwest with the existing driveway access draining towards the City right-of-way. The topography differs with the northeastern parking portion and driveway access being fairly flat with slopes less than 2% and the northwestern parking portion being sloped around 4%. There is also a narrow strip of land between the west side of the building and the west property line. There is no storm infrastructure in this area, it drains through surface flow.

The existing storm service was inspected by Clean Water Works. The internal plumbing was noted to be 100 mm and 152 mm diameter cast iron. The storm service lateral to the City sewer is a 203 mm diameter transite pipe. No deficiencies were noted. Therefore, the existing storm service will be maintained. It is likely that this service will be replaced to the property line/building face as part of the City's planned sewer and water upgrades in the next few years. The CCTV reports, including references to pipe materials and sizes, are included in **Appendix F**. It is noted that the interior plumbing is in poor condition and will be completely replaced.

It is our understanding that the existing building has a foundation drain system that drains to a sump and pump. This configuration will remain.

The site existing drainage area is shown on **Figure A: Pre-development Drainage Plan** in **Appendix H.**

4.2 Proposed Storm Servicing

The storm system will maintain the existing parking drain and reuse the existing storm lateral that connects to the 300 mm diameter combined sewer on Albert Street.

The roof drains on Levels 12, 13 and 14 will have a combination of controlled and uncontrolled roof drains. The controlled roof drains will drain directly to the existing storm service. The uncontrolled roof drains and the existing parking drain will drain to a cistern, to be located within the underground parking garage. The narrow area on the west side of the building will continue to flow uncontrolled on the surface. **Drawing C102**, in **Appendix C** depicts the roof drains and their associated catchment areas.

The design approach for the stormwater management is to ensure that the post-development peak flows do not exceed the existing 2-year pre-development release rate flow.

Drawing C101, in **Appendix C** depicts the boundaries of the post-development drainage areas.

4.3 Design Criteria

The proposed storm sewer system has been designed in general conformance with the *OSG* and its technical bulletins, plus more specific requirements from the City of Ottawa.

The criteria below were provided in part by the City of Ottawa and RVCA. These agencies correspondence are located in **Appendix A**.

The design criteria for the site includes the following:

i. Stormwater management for the site shall be based on the 2-year storm event using the IDF information derived from the Meteorological Services of Canada rainfall data, taken from the MacDonald Cartier Airport, collected 1966 to 1997;
ii. The pre-development runoff coefficient or a maximum equivalent 'C' of 0.4, whichever is less (8.3.7.3);
iii. A calculated time of concentration (Cannot be less than 10 minutes);
iv. Flows to the storm sewer in excess of the 2-year storm release rate, up to and including the 100-year storm event, must be detained on site;
v. The Rational Method is used to calculate the allowable peak flow to discharge into the receiving combined sewer systems and the runoff volume to be retained on site;
vi. IDF curve equations used with the Rational formula:
    a. 2-year $=732.951/(Tc+6.199)^{0.810}$
    b. 100-year $= 1735.688/(Tc+6.014)^{0.820}$

The Rational Method uses runoff coefficients for various surfaces. The table below shows the runoff coefficients chosen in this study. The runoff coefficient for a 100-year storm event is increased by 25% per the OSG to a maximum of 1.0.

Table 6: Rational Method Runoff Coefficients

SURFACE	5-YEAR COEFFICIENT	100-YEAR COEFFICIENT
Asphalt/Building/Concrete	0.90	1.00

4.4 Allowable Release Rate

The allowable release rate for the 0.17 ha site developed was calculated using the rational method formula based on the 2-year flow and the existing runoff coefficient of 0.4.

$$Q = 2.78\ CiA$$

where

Q = Flow rate (L/s)

C = Runoff coefficient

i = Rainfall intensity (mm/hr)

A = Area (ha)

The resultant allowable release rate is **14.3 L/s**.

The allowable release rate is a combination of the sanitary and storm flows as the flows are conveyed to a combined sewer. As a result, the allowable release rate for the storm flows is decreased by the equivalent amount of sanitary flows that are additional compared to the flows associated with the existing usage. The existing building usage results in an estimated sanitary flow of 1.56 L/s. The proposed building usage results in an estimated sanitary flow of 2.98 L/s. This represents an increase of 1.42 L/s in the sanitary flows. Therefore, the allowable storm release rate is decreased by 1.42 L/s to a total of **12.9 L/s**.

4.5 Storm Sewer Design

Calculations showing the storm sewer design are included in **Appendix I**. The storm sewer design spreadsheet is based on the Rational Method and Manning formula and was used to calculate the design flow and required pipe size. Ottawa IDF information for the 2-year design storm was used to calculate the peak flows.

Drawing C101, in **Appendix C** shows the drainage areas.

4.6 Stormwater Management

The on-site storm water management has been designed to attenuate the 2-year and 100-year post-development flow rates to the allowable post-development flow rates as shown in **Appendix J**.

DRAINAGE AREA WS-01 (CONTROLLED ROOF DRAINS)

A portion of the roofs, generally the areas on the east side, will provide stormwater storage through the use of controlled roof drains, Watts Adjustable Accutrol roof drains. The drainage area per roof drain is shown in the table below. The roof drains, including the associated ponding areas, are shown on **Drawing C102**, in **Appendix C**.

Table 7: Roof Drain Controlled Flows and Storage

Roof Drain Number	Controlled Flow (L/s)		Max Ponding Depth (mm)		Storage Volume (m³)	
	1:5 Year	1:100 Year	1:5 Year	1:100 Year	1:5 Year	1:100 Year
CFRD 8	0.95	1.53	76.3	117.4	0.75	2.75
CFRD 10	0.99	1.51	79.6	121.9	1.03	3.71
CFRD 11	1.02	1.55	81.9	124.6	1.29	4.55
CFRD 12	1.02	1.49	81.9	123.3	1.04	3.54
Total	**3.98**	**6.08**				

The controlled flow from these sub-catchment areas will be **4.0 L/s** for the 2-year event and **6.1 L/s** for the 100-year event. The controlled roof drains will be connected directly to the storm service, inside the building.

DRAINAGE AREA WS-02 (UNCONTROLLED ROOF DRAINS)

The remaining portions of the roofs will drain through uncontrolled roof drains. These flows will be directed to the cistern within the underground parking garage.

DRAINAGE AREA WS-03 (GROUND LEVEL AMENITY SPACE BEHIND THE BUILDING)

The post-development flow for this sub-catchment area behind the building will be collected using the existing parking drain. The flows will be directed to the cistern within the underground parking garage.

The flows from drainage areas WS-02 and WS-03 will be directed to the cistern. The stormwater storage tank will be pumped to the existing storm service at a maximum allowable flow rate of **4.9 L/s.** The required storage volume of the storage tank is 11.6 m³ and 44.9 m³ during the 2-year and 100-year storms respectively. As per the OSG, the storage cistern is being sized to accommodate the 100-year storm + 20% stress test, as a result the required volume is **57.4 m³**. No ponding on the surface is planned for the site. All stormwater is being controlled at the roof level or within the cistern in the underground parking garage, including the volumes for the 100 year storm + 20% stress test.

DRAINAGE AREA WS-04 (GROUND LEVEL TO THE WEST OF THE BUILDING)

The narrow strip of land between the west side of the building and the west property limit will drain by sheet flow, uncontrolled to Albert Street. The uncontrolled flow from this area is **0.8 L/s** for the 2-year event and **2.0 L/s** for the 100-year event.

4.7 Stormwater Quality

The RVCA has indicated that onsite water quality treatment will not be required as the stormwater is all captured on the roof or in the open space behind and beside the building, there are no surface parking areas and driving isles.

4.8 Major Overland Flow

The major overland flow route generally flows to the southwest with most of the site exiting to the City right-of-way.

4.9 Summary and Conclusions

The existing storm service will be maintained and will convey the flows from the controlled roof drains as well as the pumped flows from the cistern. The narrow area along the west side of the property will continue to flow uncontrolled to Albert Street. The total flow from the site during the 100-year event will be controlled to 12.9 L/s which is equivalent to the pre-development 2-year event.

5.0 SEDIMENT AND EROSION CONTROL

To mitigate the impacts due to erosion and sedimentation during construction, erosion and sediment control measures shall be installed and maintained throughout the duration of construction. Measures shall only be removed once the construction activities are complete, and the site has stabilized.

The measures will include:

- Siltsack® shall be installed between the frame and cover of existing and new catchbasins and maintenance holes, to minimize sediments entering the storm drainage system. These shall remain in place until construction is complete.

6.0 CONCLUSIONS

This report outlines the proposed servicing and stormwater management design for the conversion of the existing building at 473 Albert Street, Ottawa, ON.

The proposed drinking water system will include the use of the existing 152 mm diameter water service as well as the construction of a second 152 mm diameter water service and the installation of a new line valve on the City watermain between these two connections.

The proposed sanitary sewer system will consist of the reuse of the existing sanitary service to convey flows to the existing combined sewer.

Stormwater runoff from the site will include a combination of controlled roof drains as well as uncontrolled roof drains and the ground level amenity space behind and to the west of the building. The uncontrolled flows from the roof and behind the building will be directed to a 57.4 m^3 cistern to be located within the underground parking garage. The flows in the cistern will be pumped to the existing storm service at a maximum allowable rate of 4.9 L/s. The existing narrow area to the west of the building will continue to flow uncontrolled to Albert Street.

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APPENDIX A | CORRESPONDENCE

473 Albert: Preconsultation Meeting
Conversion of existing high-rise office building into a mixed-use building (~126 dwelling units, office and restaurant uses)

Christopher Moise (Design) Comments:

- Consider fenestration / cladding / treatment at grade
- Consider location of loading area
- Re-consider 'dog area' at grade in rear yard
- Building & Façade
    - Clarify 'brutalist' characterization
    - How is the building 'residential' from the exterior
    - Consider balconies (juliette or otherwise)
    - Appropriateness of exposing concrete (especially as an <u>improvement)</u>
- UDRP for DPA not required

John Bernier (File Lead, Planner)

- Height limit is 37 metres: is 'amenity penthouse' a projection (**if no=Variance**)
- Restaurant terrace (outdoor comm. patio) is prohibited – (**MV or Minor ZBA**)
- Minor variances required for **existing** building setbacks
- Loading space (in ROW) not functional
    - Make reference to 'Downtown Moves'
        - Which considers 2 loading spaces
        - Considers tree plantings
        - 'DM' implementation **to be determined**
        - **J. Bernier to provide timeline for DM**
- Encroachment agreement for (**new**) canopy – must be reviewed
- Dog Run – is there a more appropriate use for those lands?
- **<u>Complex Site Plan Application:</u>**
    - **<u>Timeline: +4 months</u>**
    - **<u>ZBA v. MV different timelines</u>**
    - **<u>MV only after conclusion of first round of circulation/issue resolution</u>**

E. Johnson (CLV Group)

- Existing encroachment agreement

Wally Dubyk (Transportation)

- 1.25 metre right-of-way protection to be conveyed
- RE: **TIA Screening:** 2 triggers for step 2 guidelines
- Multimodal service must be analyzed
- Must address reduction of parking spaces on site

- Must review docking/ROW layby
- **C. Gordon (Applicants Transportation Consultant, In Response):**
    - Initial morning trip generation (ex. Office vs. residential), 200 v. ~80
    - Prefer to avoid **full TIA** process: proposes Supplement to 'Step 1'
- **Dubyk: Supplement to Step 1 as alternate 'works'**
- **Must submit a Construction Management Plan**

Shawn Wessel (Infrastructure)

- ECA required (combined sewer dates to 1935)
- Services on site, require CCTV Report
- SWM increase, SWM guidelines have changed
    - Rear yard may increase release rate
- Roof Drains: must see existing drain detail
- **Wind Study Required**
- Record of Site Condition Required
- Enbridge requires new pressure relief valve (to be shown on plans)
- Noise Study Req'd: Height and location of building
    - Must include stationary noise sources
    - Must include amenity areas
    - Fenestration – reference FDC Rating
- **Road & Sewer & Water Renewal Planned for Albert (likely sewer separation)**
- Contact RVCA RE: restrictions
- Existing restaurant: sanitary needs grease trap
- Oil & grit separator: TBD for parking garage
- S.W. to provide **boundary conditions** for SWM Consultant
- Fire hydrant analysis – Secondary water service required
- Trees: confirm appropriate species (in ROW) given services
- Must confirm if services **in surcharge condition**

Pre-Consul Meeting Notes to the File Lead – John Bernier **August 22, 2019**
Re: 473 Albert St. – Commercial Bld Re-Use

Infrastructure:

A 152 mm dia. UCI Watermain (c. 1933) is available on the North side of Albert St.

A 203 mm dia. UCI Watermain (c. 1933) is available on the South side of Albert St.

A 300 mm dia. Conc. Combined Sewer (c. 1935) is available on Albert St., which is conveyed to the Booth St. Trunk and then onto the Interceptor Sewer.

The following apply to this site and any development within a combined sewer area:

- **Total** (San & Stm) allowable release rate will be 2-year pre-development rate.
- Coefficient (C) of runoff will need to be determined **as per existing conditions** but in no case more than 0.4
- TC = 20 minutes or can be calculated
  TC should be not be less than 10 minutes, since IDF curves become unrealistic at less than 10 min.
- Any storm events greater than 2 year, up to 100 year, and including 100-year storm event must be detained on site.
- Two separate sewer laterals (one for sanitary and other for storm) will be required.

An MECP ECA will be required.

Please have applicant provide one copy of the following for our review:

MECP ECA Application Form - Direct Submission tied to SPC
Fees - Certified Cheque made out to “Ministry of Finance”
Proof of Applicant’s Identification (if no Certificate of Incorporation)
Certificate of Incorporation (if Applicable)
NAICS Code (If Applicable)
Plan & Profile
Grading and Servicing Plans
Survey Plan
Pipe Data Form
Draft ECA (City of Ottawa Expanded Works Form)
Source Protection Policy Screening & Significant Threat Report
Sewer Drainage Area Plan
SWM Report
Services Report
Geotechnical Report & any other supportive documentation
Correspondence: City of Ottawa including ROW, Water Resources Dept., ISD etc., MNR, Conservation Authority & MECP.

Please note that once the review has been completed and the Sr. Engineer is satisfied and ready to sign off on the application, after the PM recommendations 3 final bound copies

including 3 flash drives will be required to accompany the applications with MECP and for City of Ottawa records.

Footer of ECA Application should have reference #: 8551E (2019/05)

Please also note:

Foundation drains are to be independently connected to sewermain (separated or combined) unless being pumped with appropriate back up power, sufficient sized pump and back flow prevention. Water Resources Dept. to comment if connection is to a combined sewer.

Roof drains are to be connected downstream of any incorporated ICD within the SWM system or pumped with the lateral being appropriately sized.

RVCA:
Applicant to contact Rideau Valley Conservation Authority (RVCA) for possible restrictions due to quality control. Provide correspondence in Report.

Grease trap required for restaurant if not already installed.

Trees – please ensure proposed trees do not conflict with existing or proposed services. Deep root plantings not permitted. Services to be outside critical root zone (CRZ).

Surface water to be retained on property and conveyed to ROW, approved on-site storage or directly to City infrastructure. Refer to calculated allowable release rate and this sites SWM.

Existing or proposed canopy at front of building:
Please provide details on how this canopy will drain and if applicable, connect to City infrastructure. Show DS location on plans and speak to this in the SWM Report.

Provide roof plan showing drain and scupper locations including control information.

Provide all control information including manufacturing specifications in the SWM Report.

Water Supply Redundancy – Fire Flow:

Applicant to ensure that a second service with an inline valve chamber be provided where the average daily demand exceeds 50 m^3 / day (0.5787 l/s per day)
FUS Fire Flow Criteria to be used unless a low-rise building, where OBC requirements may be applicable.

Where underground storage (UG) and surface ponding are being considered:

Show all ponding for 5 and 100 year events

Above and below ground storage is permitted although uses ½ Peak Flow Rate or is modeled. Please confirm that this has been accounted for and/or revise.

Rationale:

The Modified Rational Method for storage computation in the Sewer Design Guidelines was originally intended to be used for above ground storage (i.e. parking lot) where the change in head over the orifice varied from 1.5 m to 1.2 m (assuming a 1.2 m deep CB and a max ponding depth of 0.3 m). This change in head was small and hence the release rate fluctuated little, therefore there was no need to use an average release rate.

When underground storage is used, the release rate fluctuates from a maximum peak flow based on maximum head down to a release rate of zero. This difference is large and has a significant impact on storage requirements. We therefore require that an average release rate be used to estimate the required volume. Alternatively, the consultant may choose to use a submersible pump in the design to ensure a constant release rate.

In the event that there is a disagreement from the designer regarding the required storage, The City will require that the designer demonstrate their rationale utilizing dynamic modelling, that will then be reviewed by City modellers in the Water Resources Group.

Note that the above will added to upcoming revised Sewer Design Guidelines to account for underground storage, which is now widely used.

Further to above, what will be the actual underground storage provided during the major (100 year) and minor (2 year) storm events?

Please provide information on UG storage pipe. Provide required cover over pipe and details, chart of storage values, capacity etc. How will this pipe be cleaned of sediment and debris?

Note - There must be at least 15cm of vertical clearance between the spill elevation and the ground elevation at the building envelope that is in proximity of the flow route or ponding area. The exception in this case would be at reverse sloped loading dock locations. At these locations, a minimum of 15cm of vertical clearance must be provided below loading dock openings. Ensure to provide discussion in report and ensure grading plan matches if applicable.

Provide information on type of underground storage system including product name and model, number of chambers, chamber configuration, confirm invert of chamber system, top of chamber system, required cover over system and details, interior bottom slope (for self-cleansing), chart of storage values, length, width and height, capacity, entry ports (maintenance) etc.

Provide a cross section of underground chamber system showing invert and obvert/top, major and minor HWLs, top of ground, system volume provided during major and minor events. UG storage to provide actual 2 and 100 year event storage requirements.

In regard to all proposed UG storage, ground water levels (and in particular HGW levels) will need to be reviewed to ensure that the proposed system does not become surcharged and thereby ineffective.

Modeling can be provided to ensure capacity for both storm and sanitary sewers for the proposed development by City's Water Distribution Dept. – Modeling Group, through Infrastructure PM and upon request.

For proposed depressed driveways or developments with private lanes, parking areas or with entrances etc. lower than roadway…

S18.pdf S18.1.pdf

Other:

Due to more sensitive use, a Record of Site Condition (RSC) is required. Ensure Phase I, and if applicable, Phase II ESA's speak to required RSC.

Environmental Noise Study is required due to Albert St. and within 100m proximity of Slater and Bronson Avenues.

Stationary Noise Study – consultant to speak to this in their report as per City NCG and NPC 300 Guidelines. Particularly regarding roof top units and amenity spaces.

Shadow Study required for this proposal.

Wind Study is required for this proposal.

Capital Projects:
Road, Water and Sewer renewal projects listed for Slater, Albert and Bronson in the next 3-5 years.

Environmental Source Information (Re: Phase I ESA):

City of Ottawa - Historical Land Use Inventory (HLUI) - Required

Rationale:

The HLUI database is currently undergoing an update. The updated HLUI will include additional sources beyond those included in the current database, making the inclusion of this record search even more important.
Although a municipal historic land use database is not specifically listed as required environmental record in O. Reg 153/04, Schedule D, Part II states the following:

The following are the specific objectives of a records review:

1. To obtain and review records that relate to the Phase I (One) property and to the current and past uses of and activities at or affecting the Phase I (One) property in order to determine if an area of potential environmental concern exists and to interpret any area of potential environmental concern.

2. To obtain and review records that relate to properties in the Phase I (One) study area other than the Phase I (One) property, in order to determine if an area of potential environmental concern exists and to interpret any area of potential environmental concern.

It is therefore reasonable to request that the HLUI search be included in the Phase I ESA to meet the above objectives.
Please submit.

Existing buildings require a CCTV inspection and report to ensure existing services to be re-used are in good working order and meet current minimum size requirements. Located services to be placed on site servicing plans.

CCTV Scan Guideline.pdf

All existing reports and plans will need to be revised if older than 2 years and must reflect current City Standards, Guidelines, By-laws and Policies.

Please refer to City of Ottawa website portal **for "Guide to preparing Studies and Plans"** at https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans.

Please ensure you are using the current guidelines, bylaws and standards including materials of construction, disinfection and all relevant reference to OPSS/D and AWWA guidelines - all current and as amended, such as:

City of Ottawa Sewer Design Guidelines (**CoOSDG**) complete with ISTDB 2012-01, 2014-01, 2016-01 & 2018-01 technical bulletin updates as well as current Sewer, Landscape & Road Standard Detail Drawings as well as Material Specifications (MS Docs).
Sewer Connection (2003-513) & Sewer Use (2003-514) By-Laws.

City of Ottawa Water Distribution Design Guidelines (**CoOWDDG**) complete with ISTDB 2010-02, 2014-02 & 2018-02 technical bulletin updates as well as current Watermain/ Services Material Specifications (MS Docs) as well as Water and Road Standard Detail Drawings.
FUS Fire Flow standards
Water (2018-167) By-Law

Ensure to include version date and add “(as amended)” when referencing all standards, detail drwaings, by-Laws and guidelines.

Please also note:
Regarding provided Information, please be advised that it is the responsibility of the applicant and their representatives/consultants to verify information provided by the City of Ottawa.
Please contact City View and Release Info Centre at Ext. 44455

Contact me at 613-580-2424, Ext. # 33017 or e-mail shawn.wessel@ottawa.ca if you have any questions.

Sincerely,

Shawn Wessel, A.Sc.T., rcji
Project Manager
Development Review, Central Branch


INTERCEPTOR SEWER
rue Slater St.

MacSween, Meghan

From: Eric Lalande <eric.lalande@rvca.ca>
Sent: Tuesday, November 05, 2019 9:52 AM
To: MacSween, Meghan
Subject: [EXTERNAL] RE: 473 Albert Street, Ottawa

Hi Meghan,

The RVCA will not require any additional water quality protections as the site will remain rooftop along with the conversion of parking spaces to open area.

Thank you,

Eric Lalande, MCIP, RPP
Planner, Rideau Valley Conservation Authority
613-692-3571 x1137

From: MacSween, Meghan <Meghan.Macsween@parsons.com>
Sent: Tuesday, October 29, 2019 11:29 AM
To: Eric Lalande <eric.lalande@rvca.ca>
Subject: 473 Albert Street, Ottawa

Hi Eric,

We would like to request any RVCA requirements or comments related to proposed work at 473 Albert Street in Ottawa.

We are working for the owner of this building (CLV Group) towards a Site Plan Approval from the City of Ottawa, to convert the existing building from office use to mixed-use (residential, office and restaurant). The existing building footprint will remain the same. As you can see from the existing aerial below, the building covers the majority of the property. Currently there is a driving aisle on the west side of the property, which is covered by the building, see picture below, that allows access to an underground parking garage as well as a small open area at the back of the property that has been used for parking a few cars in the past.

The proposed works include renovations inside the building and reuse of the existing underground parking garage. However, the vehicle access to the back of the property will be eliminated and replaced with pedestrian only access. The ground level at the back of the building will consist of amenity space including a restaurant terrace, bicycle storage and a basketball court – there will be no vehicle parking. I've attached a very preliminary site plan so you can see the building footprint and the amenity space behind the building. There will be a separate sanitary and storm outlet to the existing combined sewer in Albert Street. We are awaiting CCTV results to confirm if we'll be reusing existing service laterals or constructing new ones.

Please feel free to contact me if you have any questions or concerns.

Thanks,

Meghan

Meghan MacSween, M.Eng., P.Eng.
Municipal Engineer
1223 Michael St. North, Suite 100, Ottawa, ON K1J 7T2
meghan.macsween@parsons.com – P: +1 613.691.1540 M: +1 343.997.3895

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APPENDIX B | SERVICING CHECKLIST

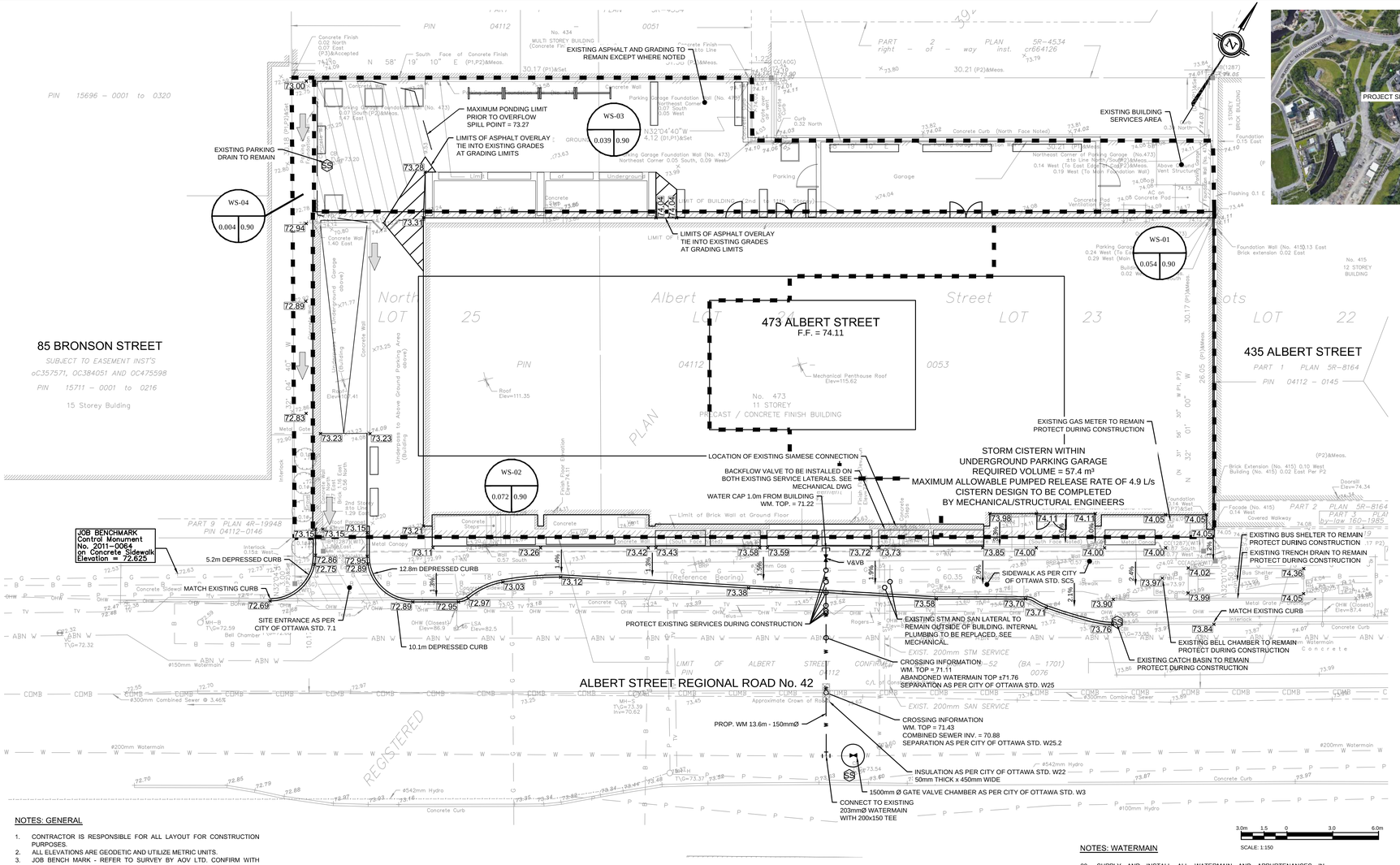
Development Servicing Study Checklist		
1 General Content		**Comments**
NA	Executive Summary (for larger reports only).	
Y	Date and revision number of the report.	Title page
Y	Location map and plan showing municipal address, boundary, and layout of proposed development.	Figure 1 and Drawing C101
Y	Plan showing the site and location of all existing services.	Drawing C101 and Figure 2
NA	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.	
Y	Summary of Pre-consultation Meetings with City and other approval agencies.	Section 1.4
NA	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.	
Y	Statement of objectives and servicing criteria.	Section 2.2/3.2/4.3
Y	Identification of existing and proposed infrastructure available in the immediate area.	Section 1.3
NA	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).	
Y	Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed storm water management and drainage, soil removal and fill constraints, and potential impacts to neighboring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	Drawing C101
NA	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.	
Y	Proposed phasing of the development, if applicable	Section 1.1
NA	Reference to geotechnical studies and recommendations concerning servicing.	
	All preliminary and formal site plans submissions should have the following information:	
Y	● Metric Scale	Drawings
Y	● North arrow (including construction North)	Drawings
Y	● Key Plan	Drawings
Y	● Name and contact information of applicant and property owner	Drawings
Y	● Property limits including bearing and dimensions	Drawings
Y	● Existing and proposed structures and parking areas	Drawings
Y	● Easement, road widening and right-of-way	Drawings
Y	● Adjacent street names	Drawings
2 Development Servicing Report : Water		**Comments**
NA	Confirm consistency with Master Servicing Study, if available.	
Y	Availability of public infrastructure to services proposed development.	Section 2.0
Y	Identification of system constraints.	Section 2.2
Y	Identification of boundary conditions.	Section 2.2
Y	Confirmation of adequate domestic supply and pressure	Section 2.2
Y	Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.	Section 2.2

Development Servicing Study Checklist		
NA	Provided a check of high pressure. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.	
NA	Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design.	
Y	Address reliability requirements such as appropriate location of shut-off valves.	Section 2.2
NA	Check on the necessity of a pressure zone boundary modification.	
NA	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 expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range.	Section 2.2
Y	Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.	Section 2.1
NA	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.	
Y	Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Section 2.2
Y	Provision of model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	Appendix D
3 Development Servicing Report: Wastewater		**Comments**
Y	Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitoring Flow data from relatively new infrastructure cannot be used to justify capacity requirements for	Section 3.0
NA	Confirm consistency with Master Servicing Study and/or justification for deviations.	
NA	Consideration of local conditions that may contribute to extraneous flow that are higher than the recommended flow in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.	
Y	Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Section 3.1
NA	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).	
Y	Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	Appendix F
NA	Description of proposed sewer network including sewers, pumping stations, and forcemains.	
NA	Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitation imposed on the development in order to preserve the physical condition of watercourse, vegetation, soil cover, as	
NA	Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to services development.	
NA	Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	

Development Servicing Study Checklist		
NA	Identification and implementation of the emergency overflow from sanitary pumping station in relation to the hydraulic grade line to protect against basement flooding.	
NA	Special considerations such as contamination, corrosive environment etc.	
4 Development Servicing Report: Stormwater Checklist		**Comments**
Y	Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)	Section 4.1
	Analysis of available capacity in existing public infrastructure.	
Y	A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage patterns.	Figure A and Figure B in Appendix G
Y	Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm event ranging from the 2 or 5 years event (dependent on the receiving sewer design) to 100 years return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatershed, taking into account long-term cumulative effects.	Section 4.3
NA	Water Quality control objectives (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	
Y	Description of the stormwater management concept with facility locations and descriptions with references and supporting information.	Section 4.6
NA	Set-back from private sewage disposal systems.	
NA	Watercourse and hazard lands setbacks.	
Y	Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	Appendix A
NA	Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	
Y	Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 years return period) and major events (1:100 years return period).	Section 4.6
NA	Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	
Y	Calculate pre and post development peak flow rates including a descriptions of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.	Section 4.6, Appendix I
NA	Any proposed diversion of drainage catchment areas from one outlet to another.	
Y	Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	Drawing C101
NA	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.	
NA	Identification of potential impacts to receiving watercourses.	
NA	Identification of municipal drains and related approvals requirements.	
Y	Descriptions of how the conveyance and storage capacity will be achieved for the development.	Sections 4.6
Y	100 years flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	Section 4.7
NA	Inclusion of hydraulic analysis including hydraulic grade line elevations.	

Development Servicing Study Checklist		
Y	Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Section 5.0
NA	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.	
NA	Identification of fill constraints related to floodplain and geotechnical investigation.	
5 Approval and Permit Requirements: Checklist		**Comments**
NA	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 Approvals under Lakes and Rivers Improvements Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvements Act. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvements Act is not required, except in cases of dams as defined in the Act.	
NA	Application for Certificate of Approvals (CofA) under the Ontario Water Resources Act.	
NA	Change to Municipal Drains	
NA	Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	
6 Conclusion Checklist		**Comments**
Y	Clearly stated conclusion and recommendations.	Section 6.0
Y	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.	Appendix A
Y	All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario.	Report

APPENDIX C | DRAWINGS C101, C102 AND C103



NOTES: GENERAL

1. CONTRACTOR IS RESPONSIBLE FOR ALL LAYOUT FOR CONSTRUCTION PURPOSES.
2. ALL ELEVATIONS ARE GEODETIC AND UTILIZE METRIC UNITS.
3. JOB BENCH MARK - REFER TO SURVEY BY AOV LTD. CONFIRM WITH CONTRACT ADMINISTRATOR PRIOR TO UTILIZATION OF BENCH MARK.
4. ALL GROUND SURFACES SHALL BE EVENLY GRADED WITHOUT PONDING AREAS AND WITHOUT LOW POINTS EXCEPT WHERE APPROVED SWALE OR CATCH BASIN OUTLETS ARE PROVIDED.
5. STRIP AND REMOVE ALL TOPSOIL FROM IMPROVED AREAS.
6. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
7. ALL EDGES OF DISTURBED PAVEMENT SHALL BE SAW CUT TO FORM A NEAT AND STRAIGHT LINE PRIOR TO PLACING NEW PAVEMENT. PAVEMENT REINSTATEMENT SHALL BE WITH STEP JOINTS OF 500mm WIDTH MINIMUM IN ACCORDANCE WITH D2 ON DRAWING C103.
8. CURBS TO BE CONCRETE BARRIER, CONSTRUCTED AS PER CITY OF OTTAWA DETAIL SC1.1. ELEVATIONS AT CURB INDICATE THE GRADE AT THE FINISHED ROAD SURFACE UNLESS NOTED OTHERWISE.
9. RESTORE PAVEMENT STRUCTURE AND SURFACES ON EXISTING ROADS TO A CONDITION AT LEAST EQUAL TO ORIGINAL AND TO THE SATISFACTION OF THE MUNICIPAL AUTHORITIES.
10. ALL MATERIAL SUPPLIED AND PLACED FOR PARKING LOT AND ACCESS ROAD CONSTRUCTION SHALL BE TO OPSS STANDARDS AND SPECIFICATIONS UNLESS OTHERWISE NOTED. CONSTRUCTION TO OPSS 206, 310 & 314. MATERIALS TO OPSS 1001, 1003 & 1010.
11. ABUTTING PROPERTY GRADE TO BE MATCHED.
12. OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND APPROVALS FROM THE MUNICIPAL AUTHORITIES PRIOR TO COMMENCING CONSTRUCTION.
13. MINIMIZE DISTURBANCE TO EXISTING VEGETATION DURING THE EXECUTION OF ALL WORKS.
14. FILTER FABRIC TO BE INSTALLED AND MAINTAINED BETWEEN THE FRAME AND COVER OF ALL CATCHBASINS AND CATCHBASIN MANHOLES DURING THE CONSTRUCTION PERIOD TO MINIMIZE SEDIMENTS ENTERING THE STORM SEWER SYSTEM. ALL GRASSED AREAS MUST BE COMPLETED PRIOR TO THE REMOVAL OF THE FILTER FABRIC IN THE CATCH BASINS.
15. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL UNLESS OTHERWISE DIRECTED FROM THE ENGINEER. EXCAVATE AND REMOVE ALL ORGANIC MATERIAL AND DEBRIS LOCATED WITHIN THE PROPOSED BUILDING, PARKING AND ROADWAY LOCATIONS. ANY CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
16. THE APPROVAL OF THIS PLAN DOES NOT EXEMPT THE CONTRACTOR FROM THE REQUIREMENTS TO OBTAIN THE VARIOUS PERMITS/APPROVALS REQUIRED TO COMPLETE A CONSTRUCTION PROJECT, SUCH AS BUT NOT LIMITED TO, ROAD CUT PERMITS, SEWER PERMITS, WATER PERMIT, ETC.
17. AT PROPOSED UTILITY CONNECTION POINTS AND CROSSINGS (I.E. STORM SEWER, SANITARY SEWER, WATER, ETC.) THE CONTRACTOR SHALL DETERMINE THE PRECISE LOCATION AND DEPTH AND SIZE OF EXISTING UTILITIES AND REPORT ANY DISCREPANCIES OR CONFLICTS TO THE ENGINEER BEFORE COMMENCING WORK. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES.
18. REFER TO ARCHITECT AND LANDSCAPE ARCHITECTS DRAWINGS FOR BUILDING, LANDSCAPE, AND HARD SURFACE AREAS AND DIMENSIONS.
19. CONTRACTOR IS RESPONSIBLE TO KEEP THE ROADS FREE AND CLEAN FROM MUD OR DEBRIS.

EROSION AND SEDIMENT CONTROL MEASURES:

- CONTRACTOR IS RESPONSIBLE FOR ALL INSTALLATION, MONITORING, REPAIR AND REMOVAL OF ALL EROSION AND SEDIMENT CONTROL FEATURES. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURE MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
- SEDIMENT AND EROSION CONTROL PLAN OBJECTIVES:
- PREVENT SOIL EROSION. THIS CAN RESULT FROM STREAMING RAIN WATER OR WIND EROSION DURING CONSTRUCTION.
- PREVENT SEDIMENT DEPOSITS IN THE SEWER PIPES AND NEARBY COLLECTING STREAMS (AS APPLICABLE).
- PREVENT AIR POLLUTION FROM PARTICULATE MATTER AND DUST.

1. PRIOR TO START OF CONSTRUCTION:

PRIOR TO THE REMOVAL OF ANY VEGETATIVE COVER, MOVING OF SOIL AND CONSTRUCTION:

- INSTALL FILTER CLOTH ON DOWNSTREAM MANHOLE COVERS,
- INSTALL SILTSACK FILTERS IN ALL CONCRETE CATCH BASINS STRUCTURES.
- INSPECT MEASURES IMMEDIATELY AFTER INSTALLATION,
- THE CONTRACTOR MUST SET UP THE MEASURES INDICATED ON THE PLAN, INSPECT THEM FREQUENTLY AND CLEAN AND REPAIR OR REPLACE THE DETERIORATED STRUCTURES. AT THE END OF THE CONSTRUCTION PERIOD, THE CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF THE TEMPORARY STRUCTURES AND RECONDITIONING THE AFFECTED AREAS

2. DURING CONSTRUCTION:

- SEDIMENT AND EROSION CONTROL MEASURES TO BE CONSTRUCTED AS PER OPSS 805.
- WHEN SEDIMENT AND EROSION CONTROL MEASURES MUST BE REMOVED TO COMPLETE A PORTION OF THE WORK, THE SAME MEASURES MUST BE REINSTATED UPON THE WORK'S COMPLETION,
- WORK TO BE DONE IN THE VICINITY OF MAJOR WATERWAYS TO BE CARRIED OUT FROM JULY AND SEPTEMBER ONLY.
- MINIMIZE THE EXTENT OF DISTURBED AREAS AND THE DURATION OF EXPOSURE.
- PROTECT DISTURBED AREAS FROM RUNOFF.
- PROVIDE TEMPORARY COVER SUCH AS SEEDING OR MULCHING IF DISTURBED AREA WILL NOT BE REHABILITATED SHORTLY.
- INSPECT STRAW BALE FLOW CHECK DAMS, SILT FENCES, SILT SACKS, AND CATCH BASIN SUMPS REGULARLY AND AFTER EVERY MAJOR STORM EVENT. CLEAN AND REPAIR WHEN NECESSARY.
- PLAN TO BE REVIEWED AND REVISED AS REQUIRED DURING CONSTRUCTION.
- EROSION CONTROL FENCING TO BE ALSO INSTALLED AROUND THE BASE OF ALL STOCKPILES.
- DO NOT LOCATE TOPSOIL PILES AND EXCAVATION MATERIAL CLOSER THAN 2.5m FROM ANY PAVED SURFACE, OR ONE WHICH IS TO BE PAVED BEFORE THE PILE IS REMOVED. ALL TOPSOIL PILES ARE TO BE SEEDED IF THEY ARE TO REMAIN ON SITE LONG ENOUGH FOR SEEDS TO GROW (LONGER THAN 30 DAYS), WHEN STORING SOIL ON SITE IN PILES THE CONTRACTOR MUST COVER EACH PILE WITH TARPS, STRAW OR A GEOTEXTILE FABRIC TO AVOID FINE PARTICLE TRANSPORT BY WIND AND/OR STREAMING RAIN WATER.
- CONTROL WIND-BLOWN DUST OFF SITE TO ACCEPTABLE LEVELS BY SEEDING TOPSOIL PILES AND OTHER AREAS TEMPORARILY (PROVIDE WATERING AS REQUIRED), FOR DUST CONTROL, CONTRACTOR TO APPLY CALCIUM CHLORIDE (TYPE I – OPSS 2501 AND CANCOSB-15-1) AND WATER WITH EQUIPMENT APPROVED BY THE OWNER'S REPRESENTATIVE AT RATE IN ACCORDANCE TO OPSS 506 WHEN DIRECTED BY OWNER'S REPRESENTATIVE.
- ALL EROSION CONTROL STRUCTURE TO REMAIN IN PLACE UNTIL ALL DISTURBED GROUND SURFACES HAVE BEEN DESTABILIZED EITHER BY PAVING OR RESTORATION OF VEGETATIVE GROUND COVER, SEDIMENT CAPTURE SILT SACKS MUST BE MAINTAINED AND CANNOT BE REMOVED UNTIL ALL LANDSCAPING AREAS ARE COMPLETED.
- NO ALTERNATE METHODS OF EROSION PROTECTION SHALL BE PERMITTED UNLESS APPROVES BY THIS CONSULTING ENGINEER AND THE TOWN DEPARTMENT OF PUBLIC WORKS.
- CONTRACTOR RESPONSIBLE FOR MUNICIPAL ROADWAY AND SIDEWALK TO BE CLEANED OF ALL SEDIMENT FROM VEHICULAR TRACKING ETC. AT THE END OF EACH WORK DAY.
- DURING WET CONDITIONS, TIRES OF ALL VEHICLES/EQUIPMENT LEAVING THE SITE ARE TO BE SCRAPED.
- ANY MUD/MATERIAL TRACKED ONTO THE ROAD SHALL BE REMOVED IMMEDIATELY BY HAND OR RUBBER TIRE LOADER.
- TAKE ALL NECESSARY STEPS TO PREVENT BUILDING MATERIAL, CONSTRUCTION DEBRIS OR WASTE BEING SPILLED OR TRACKED ONTO ABUTTING PROPERTIES OR PUBLIC STREETS DURING CONSTRUCTION AND PROCEED IMMEDIATELY TO CLEAN UP ANY AREAS SO AFFECTED.
- PROVIDE GRAVEL ENTRANCE WHEREVER EQUIPMENT LEAVES THE SITE TO PROVIDE MUD TRACKING ONTO PAVED SURFACES. GRAVEL BED SHALL BE A MMIMUM OF 10m LONG, 4m WIDE, AND 0.15m DEEP AND SHALL CONSIST OF COARSE MATERIAL. MAINTAIN GRAVEL ENTRANCE IN CLEAN CONDITION.

3. AFTER CONSTRUCTION:

- PROVIDE PERMANENT COVER CONSISTING OF TOPSOIL AND SEED TO DISTURBED AREAS.
- ALL SEDIMENT AND EROSION CONTROL MEASURES TO BE REMOVED BY THE CONTRACTOR FOLLOWING THE COMPLETION OF WORK AND AFTER DISTURBED AREAS HAVE BEEN REHABILITATED AND STABILIZED, THIS INCLUDES REMOVE STRAW BALE FLOW CHECK DAMS, SILT FENCES AND FILTER CLOTHS ON CATCH BASINS AND MANHOLE COVERS.
- INSPECT AND CLEAN CATCH BASIN SUMPS AND STORM SEWERS.

NOTES: WATERMAIN

20. SUPPLY AND INSTALL ALL WATERMAIN AND APPURTENANCES IN ACCORDANCE WITH MOST CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS.
21. ALL WATER MAIN TO BE INSTALLED AT MINIMUM COVER OF 2.4m BELOW FINISHED GRADE. WHERE REQUIRED, PROVIDE INSULATION IN ACCORDANCE WITH CITY OF OTTAWA STANDARDS W22 AND W23,
22. WATER MAIN BEDDING AS PER CITY OF OTTAWA STANDARD W17.
23. CONCRETE THRUST BLOCKS AND RESTRAINING AS PER DETAILS ON DRAWING C103.
24. CATHODIC PROTECTION REQUIRED FOR ALL IRON FITTINGS AS PER DETAILS ON DRAWING C103.
25. IF WATER MAIN MUST BE DEFLECTED TO MEET ALIGNMENT, ENSURE THAT THE AMOUNT OF DEFLECTION USED IS LESS THAN HALF THAT RECOMMENDED BY THE MANUFACTURER.
26. EXCAVATION, INSTALLATION, AND BACKFILL BY CONTRACTOR. CONNECTIONS AND SHUT-OFFS AT THE MAIN BY CITY.

LEGEND:

- EXISTING PROPERTY LINE
- EXISTING CONCRETE CURB
- PROPOSED CONCRETE CURB
- PROPOSED DEPRESSED CURB
- PROPOSED BUILDING OR STRUCTURE
- EXISTING WATERMAIN
- EXISTING ABANDONED WATERMAIN
- EXISTING V&VB
- EXISTING CURBSTOP
- EXISTING FIRE HYDRANT
- PROPOSED WATERMAIN
- PROPOSED V&VB
- PROPOSED FIRE HYDRANT
- EXISTING UNDERGROUND GAS
- EXISTING UNDERGROUND BELL
- EXISTING UNDERGROUND POWER
- EXISTING OVERHEAD WIRES
- EXISTING UNDERGROUND COMMUNICATIONS
- EXISTING COMBINED SEWER AND MANHOLE
- EXISTING SANITARY SEWER
- PROPOSED SANITARY SEWER AND MANHOLE
- EXISTING STORM SEWER
- PROPOSED STORM SEWER AND MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED PIPE INSULATION
- EXISTING GRADE
- PROPOSED GRADE
- PROPOSED SLOPE
- SILT SACKS IN CATCH BASIN GRATE PER DETAIL D1
- PROPOSED MAXIMUM PONDING LIMIT PRIOR TO OVERFLOW
- PROPOSED MAJOR OVERLAND FLOW
- PROPOSED WATERSHED BOUNDARY
- WS-03 — WATERSHED AREA NO.
- 0.039 0.90 — RUNOFF COEFFICIENT
- AREA (IN HECTARES)

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MEP engineers | ingénieur MEP

PARSONS
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Tel: 613-738-4160 Fax: 613-739-7105

general notes | note générale

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nord du projet project north | nord actuel true north

no	revisions	date
2	RE-ISSUED FOR SPA	10/22/2020
1	ISSUED FOR SITE PLAN APPLICATION	12/05/2019

stamp | timbre

REGISTERED PROFESSIONAL ENGINEER — M.E. MACSWEEN — 100104372 — OCT 22, 2020 — PROVINCE OF ONTARIO

architect | architecte
linebox STUDIO

project title

473 ALBERT

PROPOSED MIXED-USE RENOVATION

473 ALBERT STREET | OTTAWA | ONTARIO | CANADA

drawing title | titre du dessin

SITE SERVICING AND GRADING PLAN

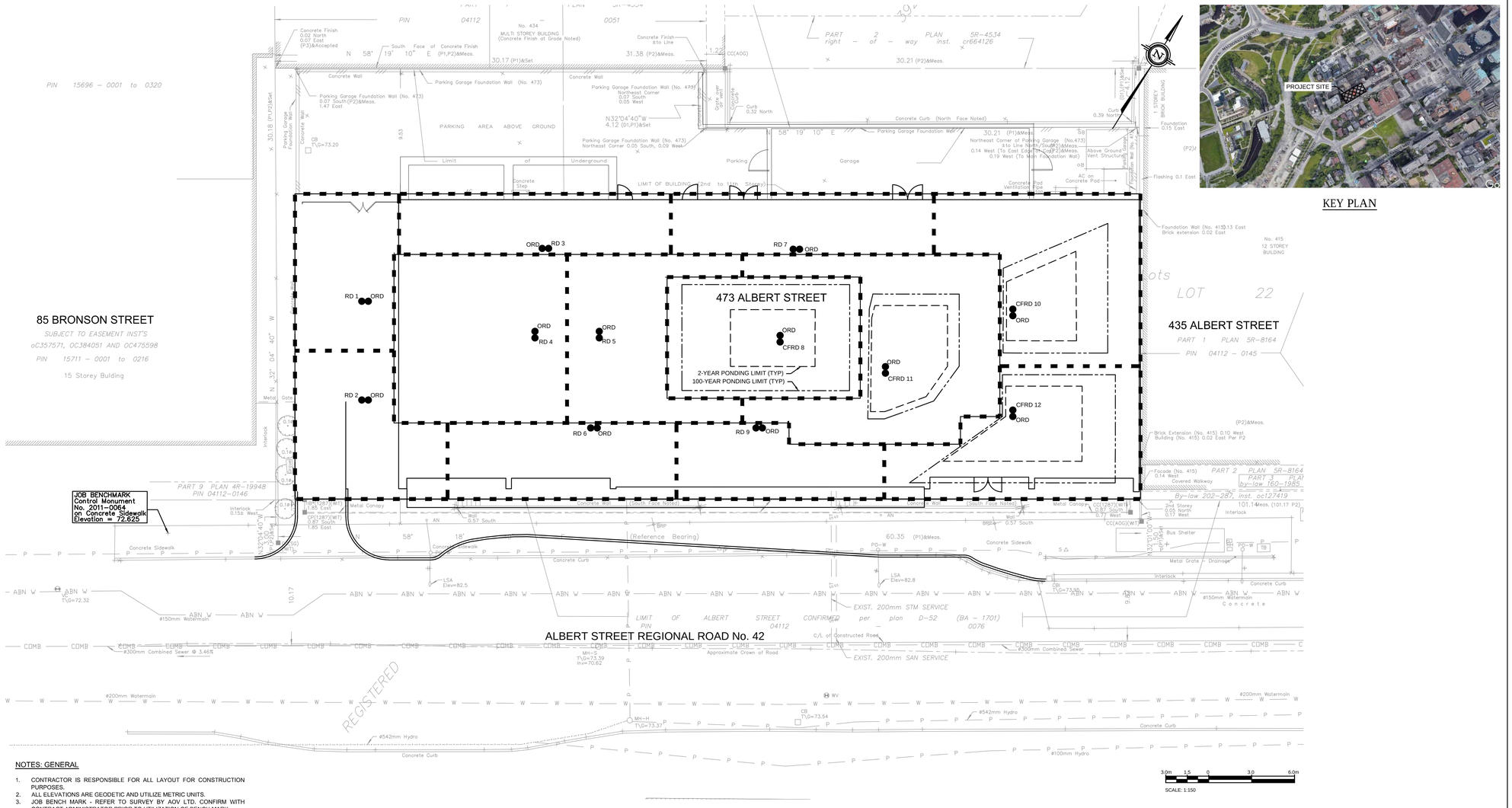
project number | numero du projet	477234
drawn | dessiné	SS
checked | verifié	MM / MT
date | date	11/29/19
scale | échelle	As indicated

drawing number | numéro du dessin

C-101

D07-12-19-0203

#18100



KEY PLAN

NOTES: GENERAL

1. CONTRACTOR IS RESPONSIBLE FOR ALL LAYOUT FOR CONSTRUCTION PURPOSES.
2. ALL ELEVATIONS ARE GEODETIC AND UTILIZE METRIC UNITS.
3. JOB BENCH MARK - REFER TO SURVEY BY AOV LTD. CONFIRM WITH CONTRACT ADMINISTRATOR PRIOR TO UTILIZATION OF BENCH MARK.
4. ALL GROUND SURFACES SHALL BE EVENLY GRADED WITHOUT PONDING AREAS AND WITHOUT LOW POINTS EXCEPT WHERE APPROVED SWALE OR CATCH BASIN OUTLETS ARE PROVIDED.
5. STRIP AND REMOVE ALL TOPSOIL FROM IMPROVED AREAS.
6. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
7. ALL EDGES OF DISTURBED PAVEMENT SHALL BE SAW CUT TO FORM A NEAT AND STRAIGHT LINE PRIOR TO PLACING NEW PAVEMENT. PAVEMENT REINSTATEMENT SHALL BE WITH STEP JOINTS OF 500mm WIDTH MINIMUM IN ACCORDANCE WITH D2 ON DRAWING C103.
8. CURBS TO BE CONCRETE BARRIER, CONSTRUCTED AS PER CITY OF OTTAWA DETAIL SC1.1. ELEVATIONS AT CURB INDICATE THE GRADE AT THE FINISHED ROAD SURFACE UNLESS NOTED OTHERWISE.
9. RESTORE PAVEMENT STRUCTURE AND SURFACES ON EXISTING ROADS TO A CONDITION AT LEAST EQUAL TO ORIGINAL AND TO THE SATISFACTION OF THE MUNICIPAL AUTHORITIES.
10. ALL MATERIAL SUPPLIED AND PLACED FOR PARKING LOT AND ACCESS ROAD CONSTRUCTION SHALL BE TO OPSS STANDARDS AND SPECIFICATIONS UNLESS OTHERWISE NOTED. CONSTRUCTION TO OPSS 206, 310 & 314. MATERIALS TO OPSS 1001, 1003 & 1010.
11. ABUTTING PROPERTY GRADE TO BE MATCHED.
12. OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND APPROVALS FROM THE MUNICIPAL AUTHORITIES PRIOR TO COMMENCING CONSTRUCTION.
13. MINIMIZE DISTURBANCE TO EXISTING VEGETATION DURING THE EXECUTION OF ALL WORKS.
14. FILTER FABRIC TO BE INSTALLED AND MAINTAINED BETWEEN THE FRAME AND COVER OF ALL CATCHBASINS AND CATCHBASIN MANHOLES DURING THE CONSTRUCTION PERIOD TO MINIMIZE SEDIMENTS ENTERING THE STORM SEWER SYSTEM. ALL GRASSED AREAS MUST BE COMPLETED PRIOR TO THE REMOVAL OF THE FILTER FABRIC IN THE CATCH BASINS.
15. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL UNLESS OTHERWISE DIRECTED FROM THE ENGINEER. EXCAVATE AND REMOVE ALL ORGANIC MATERIAL AND DEBRIS LOCATED WITHIN THE PROPOSED BUILDING, PARKING AND ROADWAY LOCATIONS. ANY CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
16. THE APPROVAL OF THIS PLAN DOES NOT EXEMPT THE CONTRACTOR FROM THE REQUIREMENTS TO OBTAIN THE VARIOUS PERMITS/APPROVALS REQUIRED TO COMPLETE A CONSTRUCTION PROJECT, SUCH AS BUT NOT LIMITED TO; ROAD CUT PERMITS, SEWER PERMITS, WATER PERMIT, ETC.
17. AT PROPOSED UTILITY CONNECTION POINTS AND CROSSINGS (I.E. STORM SEWER, SANITARY SEWER, WATER, ETC.) THE CONTRACTOR SHALL DETERMINE THE PRECISE LOCATION AND DEPTH AND SIZE OF EXISTING UTILITIES AND REPORT ANY DISCREPANCIES OR CONFLICTS TO THE ENGINEER BEFORE COMMENCING WORK. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES.
18. REFER TO ARCHITECT AND LANDSCAPE ARCHITECTS DRAWINGS FOR BUILDING, LANDSCAPE, AND HARD SURFACE AREAS AND DIMENSIONS.
19. CONTRACTOR IS RESPONSIBLE TO KEEP THE ROADS FREE AND CLEAN FROM MUD OR DEBRIS.

LEGEND:

- EXISTING PROPERTY LINE
- EXISTING CONCRETE CURB
- PROPOSED CONCRETE CURB
- PROPOSED DEPRESSED CURB
- PROPOSED BUILDING OR STRUCTURE
- EXISTING WATERMAIN
- EXISTING ABANDONED WATERMAIN
- EXISTING V&VB
- EXISTING CURBSTOP
- EXISTING FIRE HYDRANT
- EXISTING UNDERGROUND GAS
- EXISTING UNDERGROUND BELL
- EXISTING UNDERGROUND POWER
- EXISTING OVERHEAD WIRES
- EXISTING UNDERGROUND COMMUNICATIONS
- EXISTING COMBINED SEWER AND MANHOLE
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING ROOF DRAIN
- PROPOSED ROOF DRAIN
- PROPOSED OVERFLOW ROOF DRAIN
- PROPOSED CONTROLLED FLOW ROOF DRAIN
- PROPOSED WATERSHED BOUNDARY

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613.591.1904

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t 613 230 1186 smithandandersen.com

MEP engineers | ingénieur MEP

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Tel: 613-738-4160 Fax: 613-739-7105

general notes | note générale

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nord du projet project north

nord actuel true north

no	revisions	date
2	RE-ISSUED FOR SPA	10/22/2020
1	ISSUED FOR SITE PLAN APPLICATION	12/05/2019

stamp | timbre

REGISTERED PROFESSIONAL ENGINEER
M.E. MACSWEEN
100104372
OCT 22, 2020
PROVINCE OF ONTARIO

architect | architecte

linebox STUDIO

project title

473 ALBERT

PROPOSED MIXED-USE RENOVATION

473 ALBERT STREET | OTTAWA | ONTARIO | CANADA

drawing title | titre du dessin

ROOF DRAIN PLAN

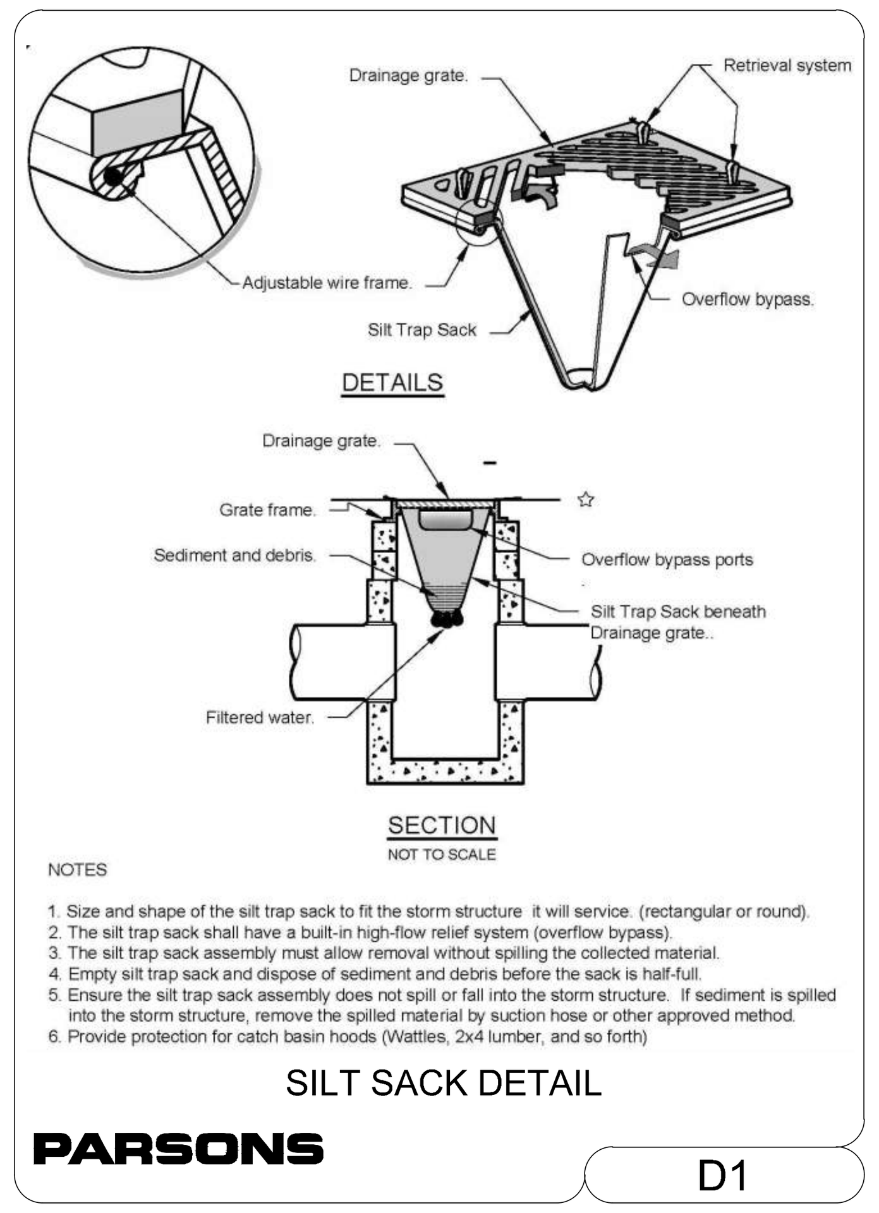
project number | numero du projet	477234
drawn | dessiné	SS
checked | verifié	MM / MT
date | date	29/11/19
scale | échelle	As indicated

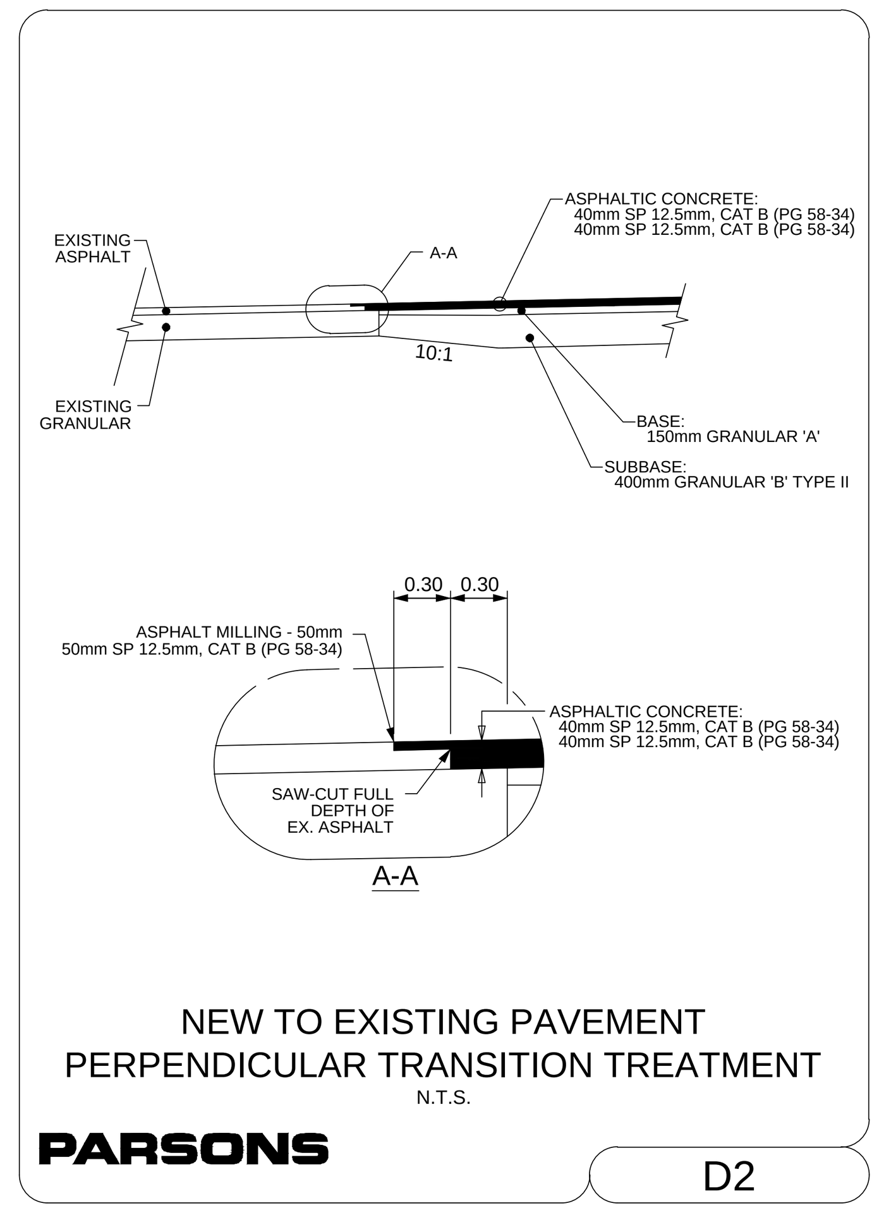
drawing number | numéro du dessin

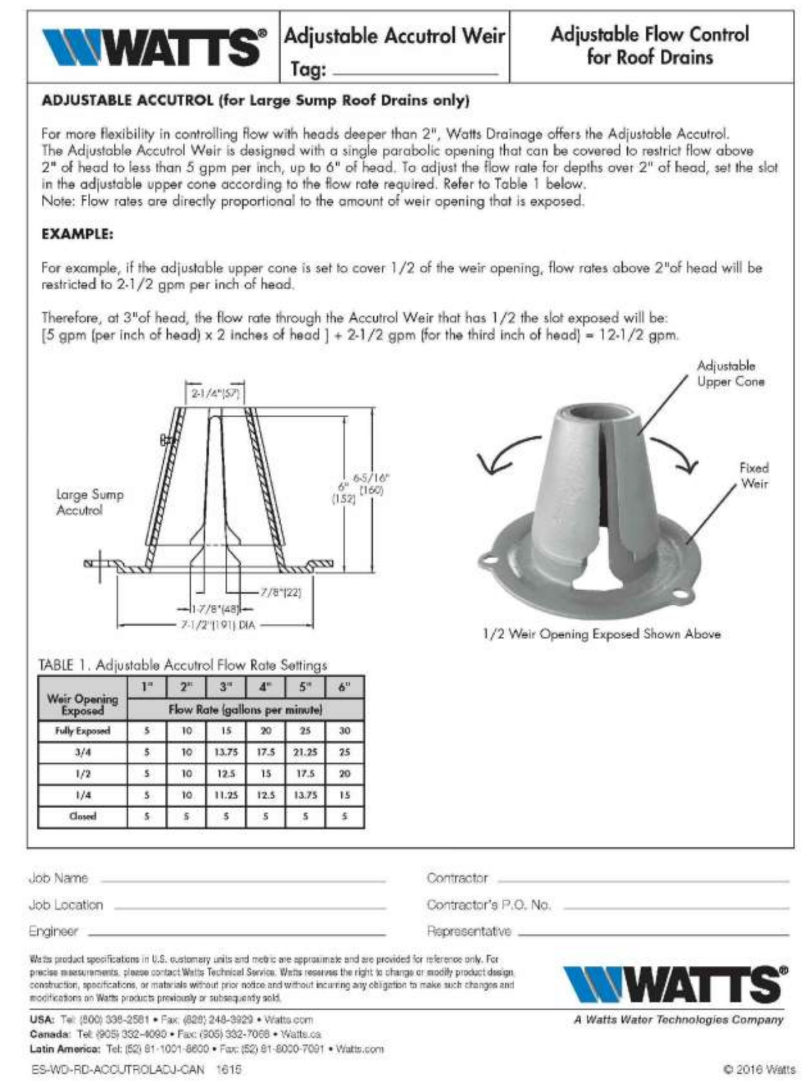
C-102

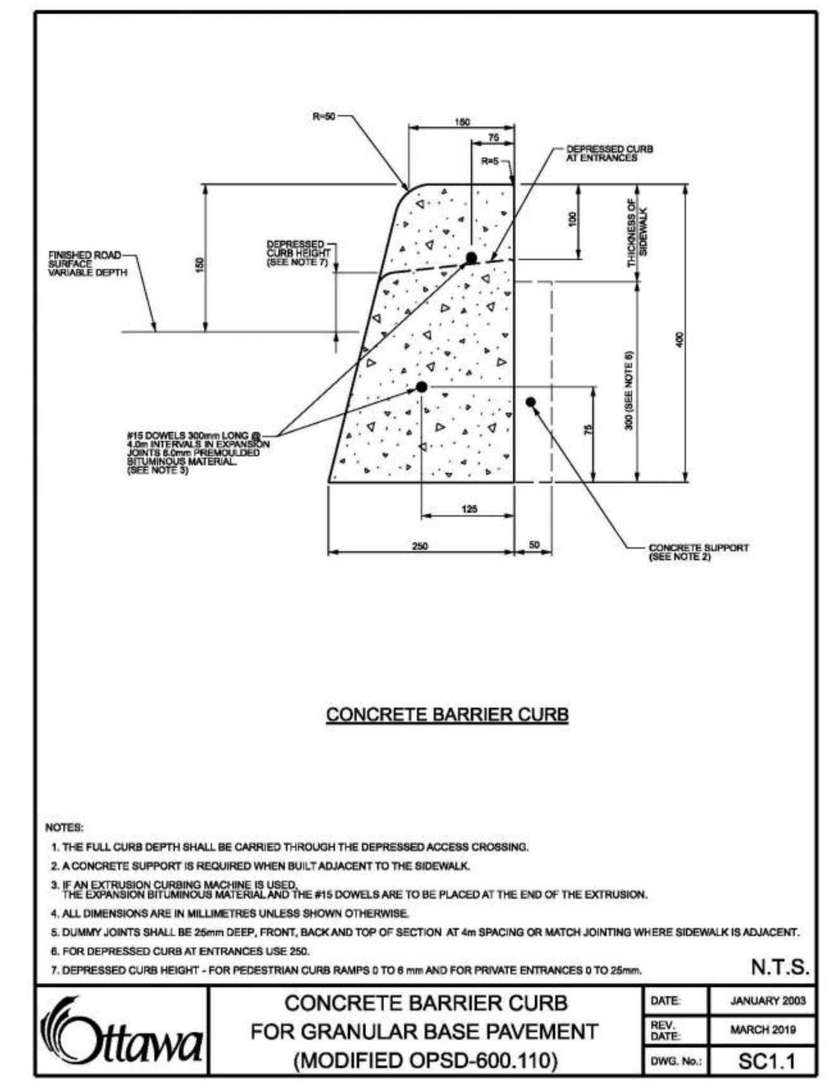
D07-12-19-0203

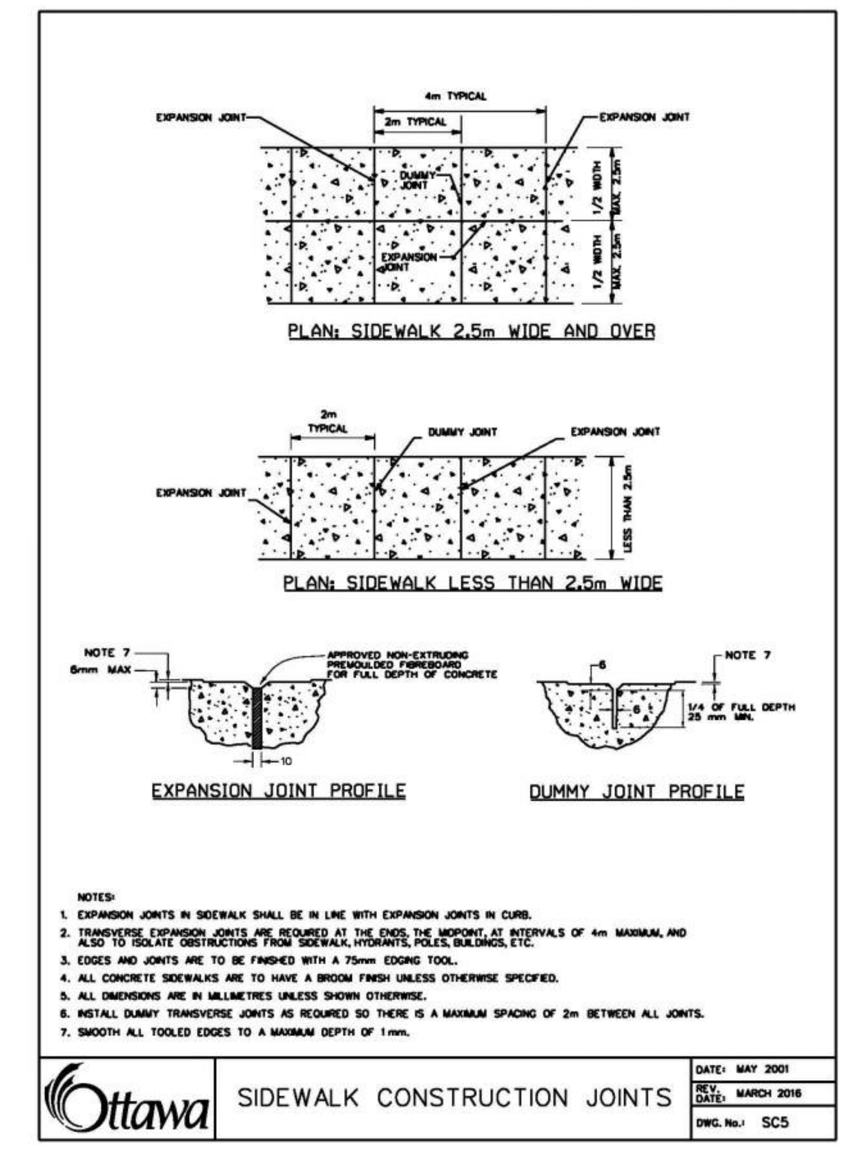
#18100

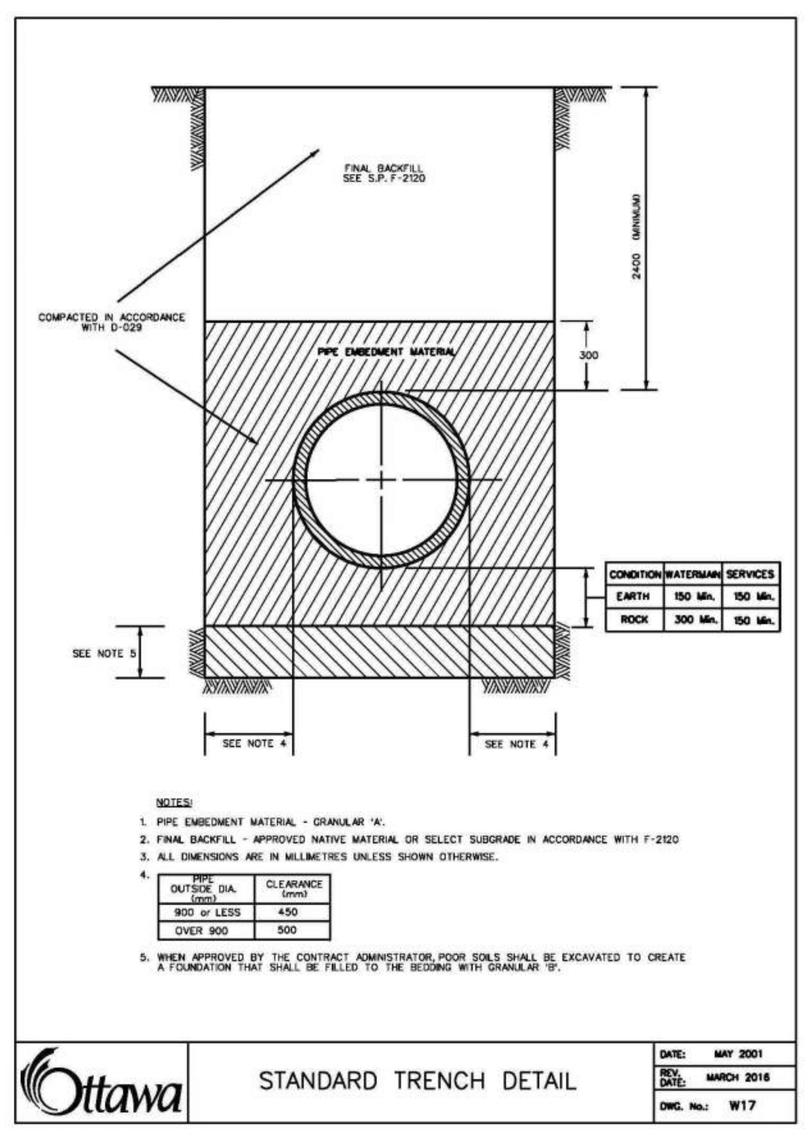


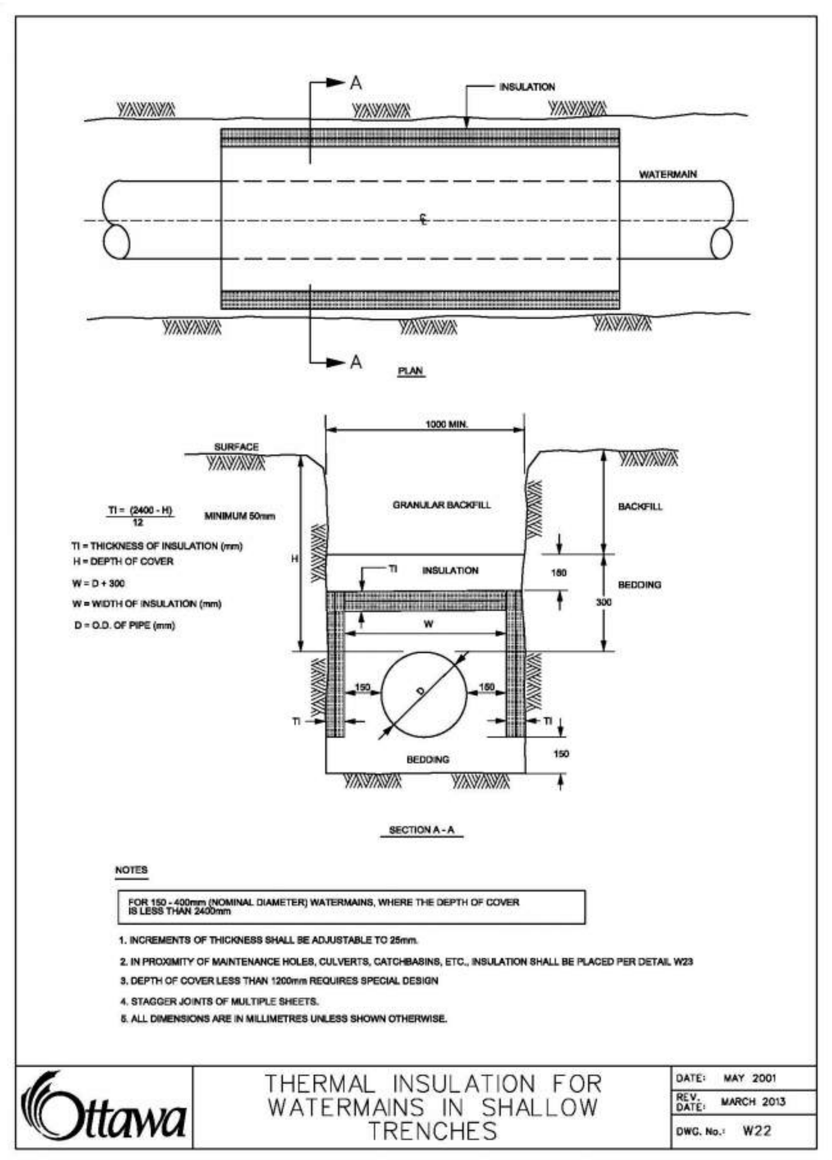


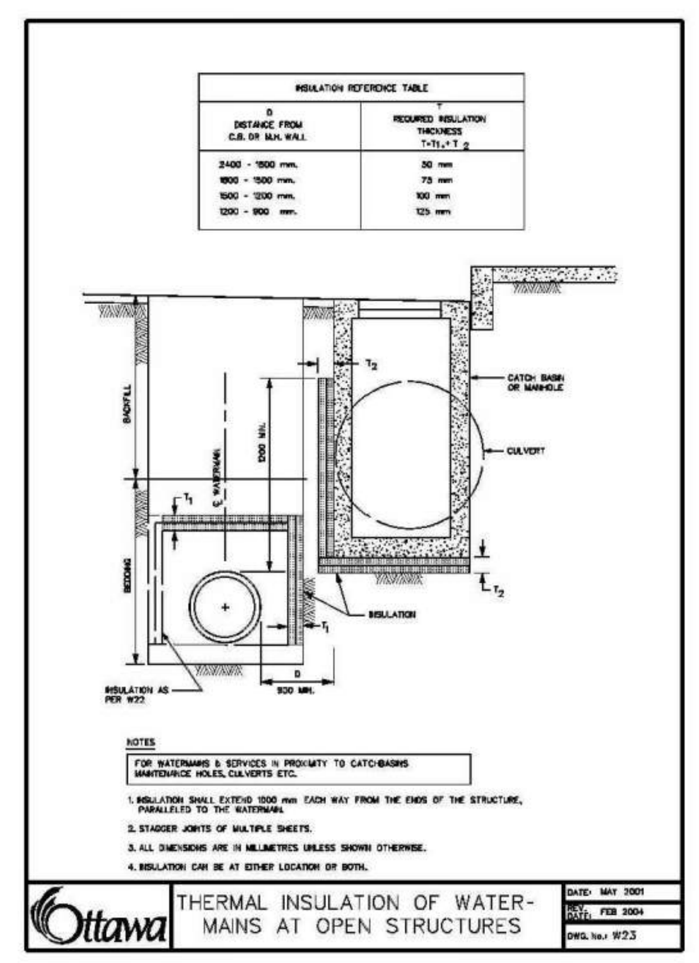


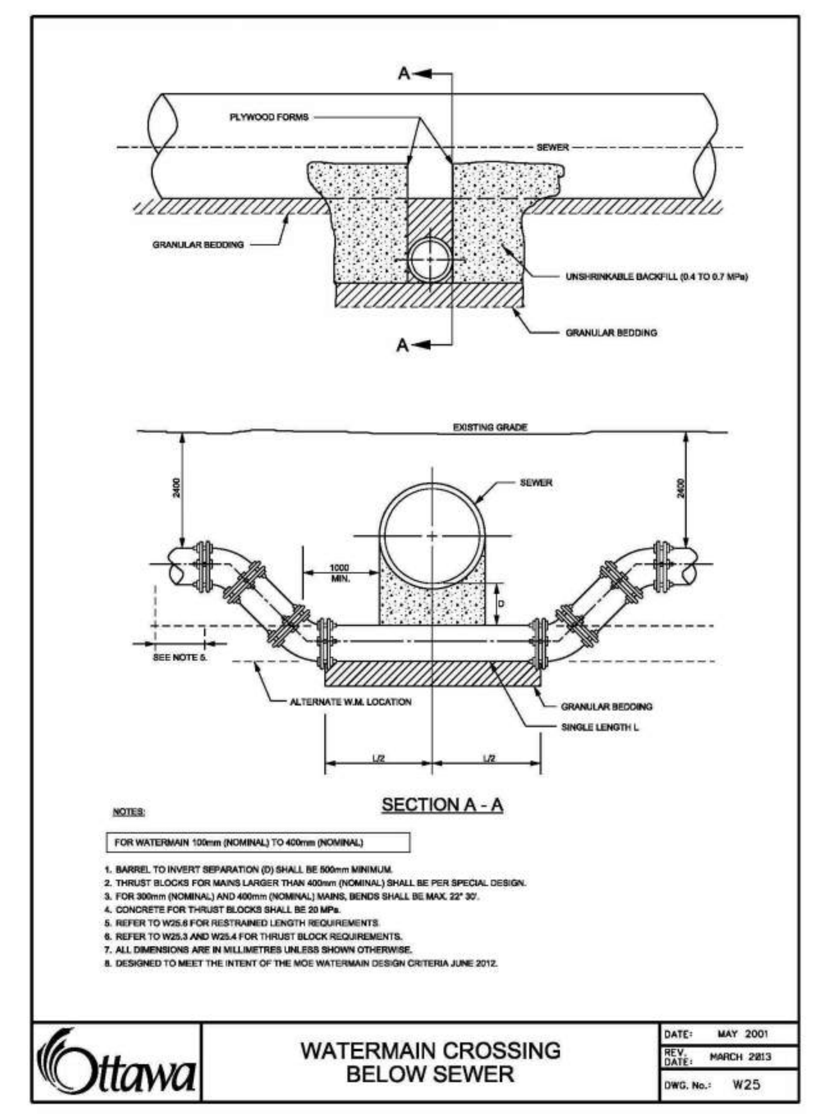


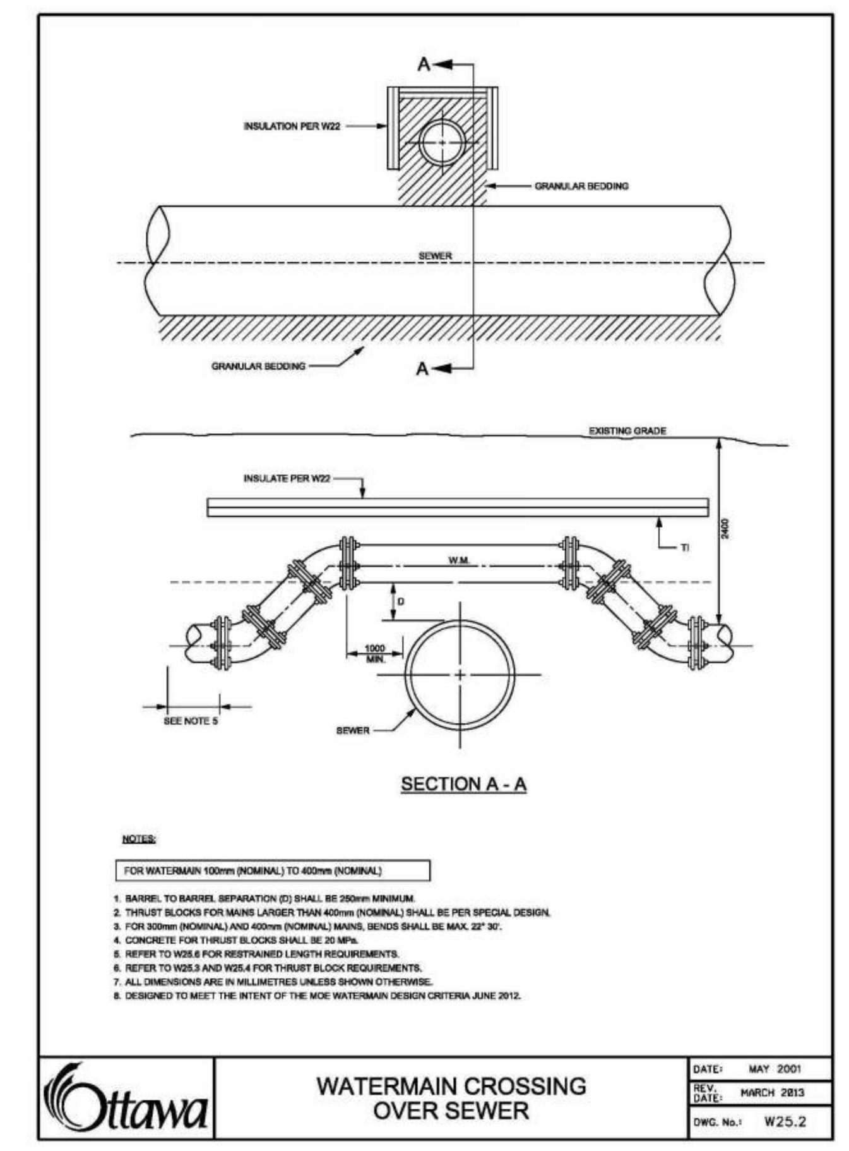


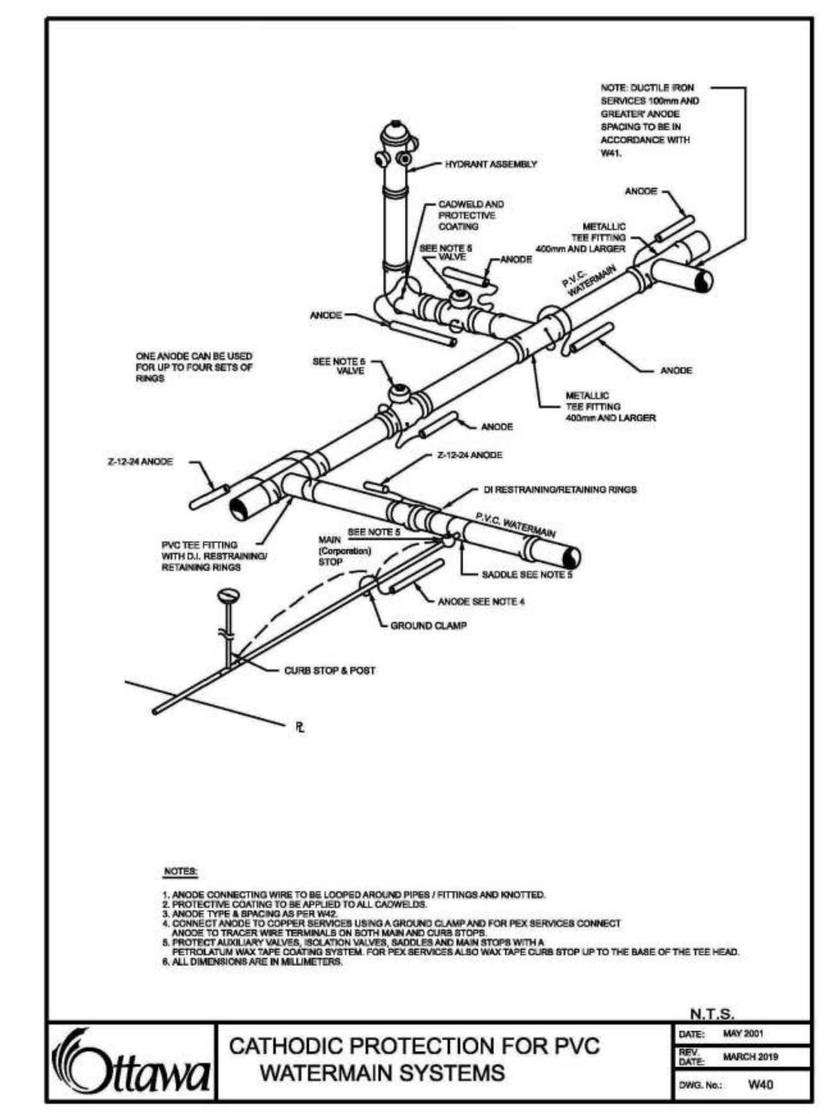


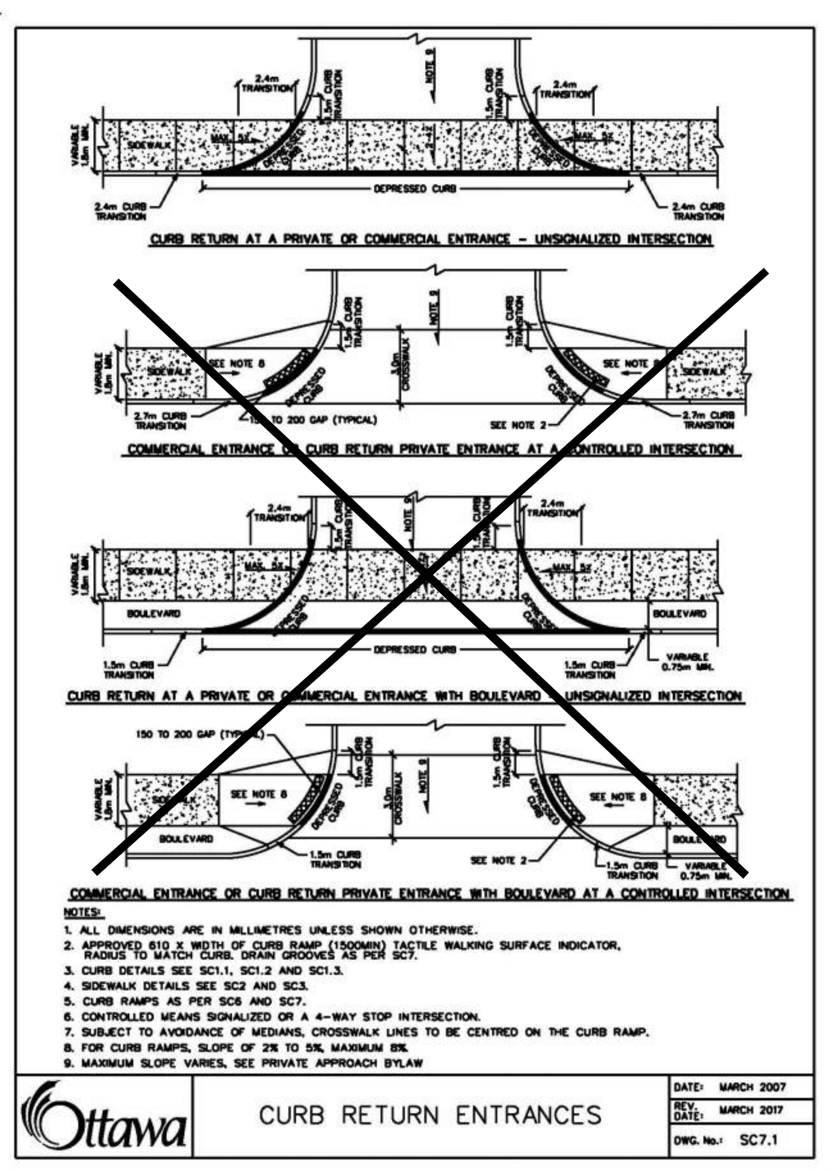


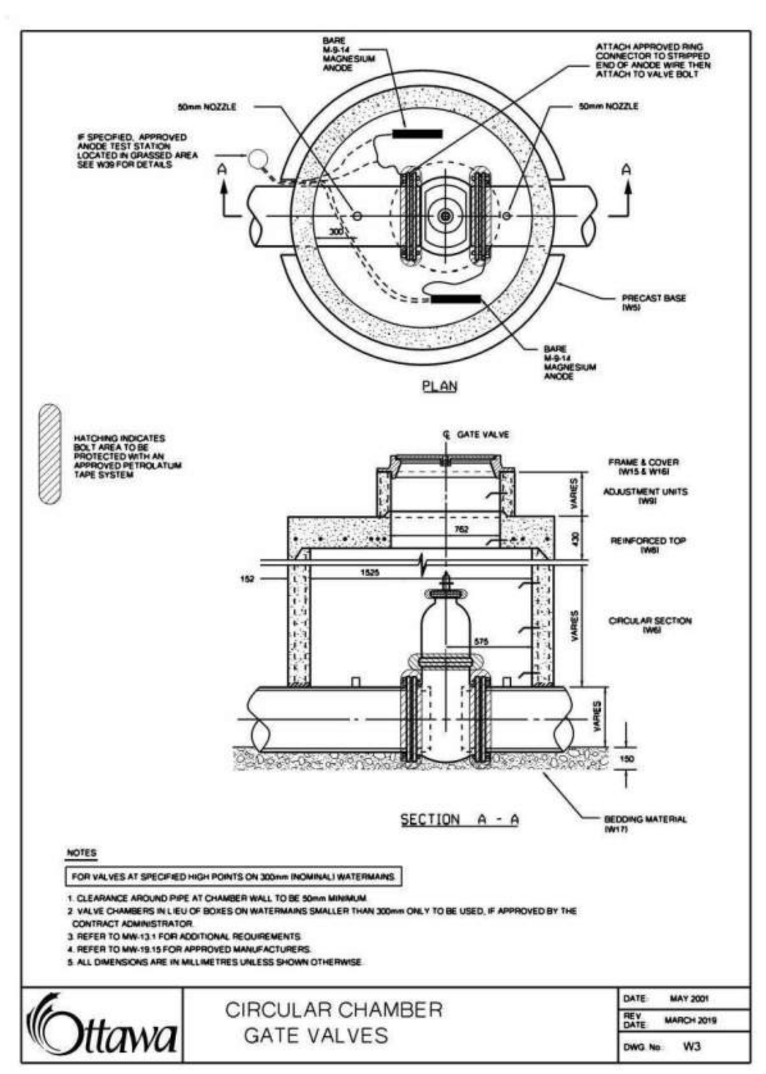


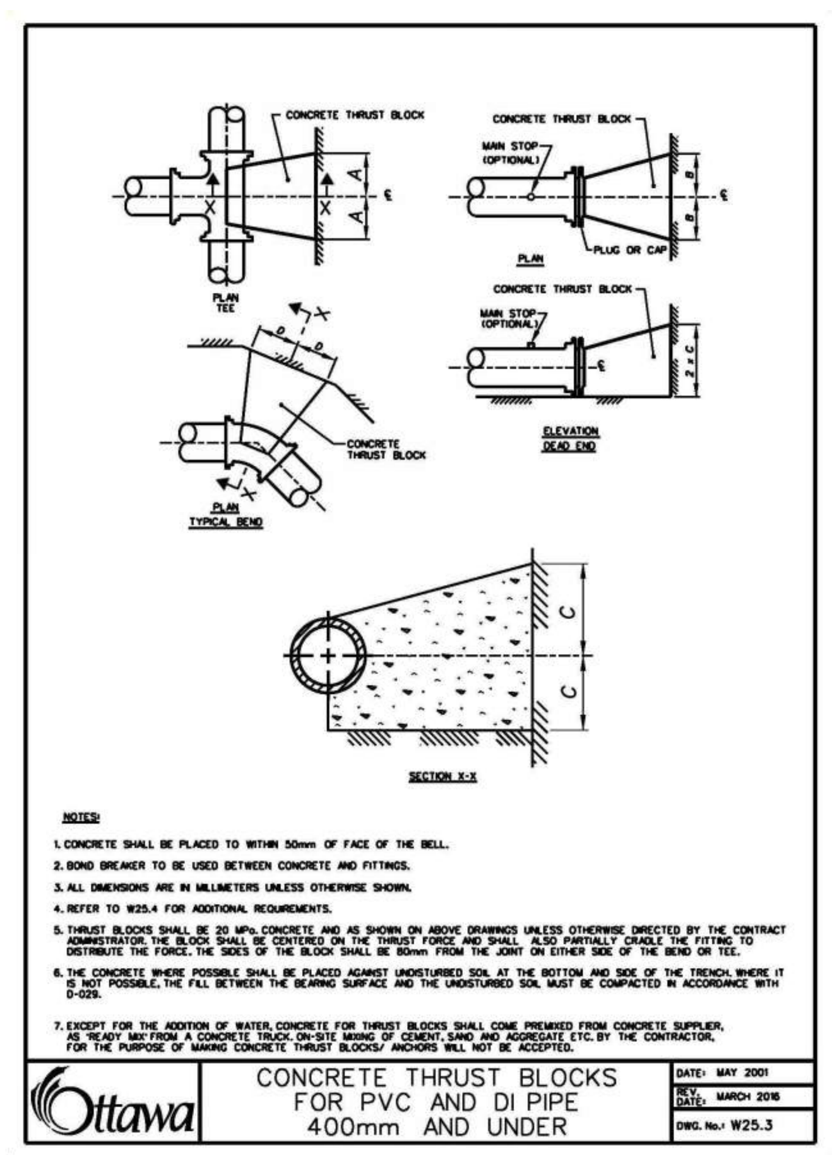


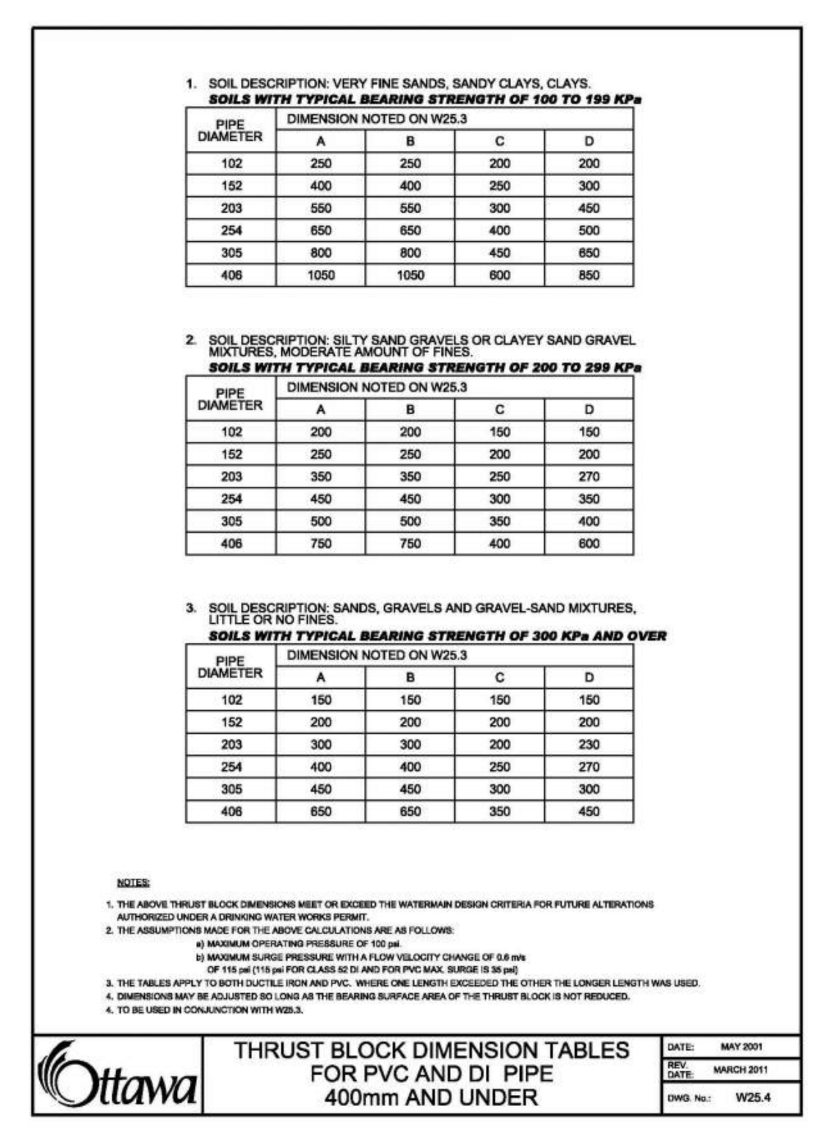


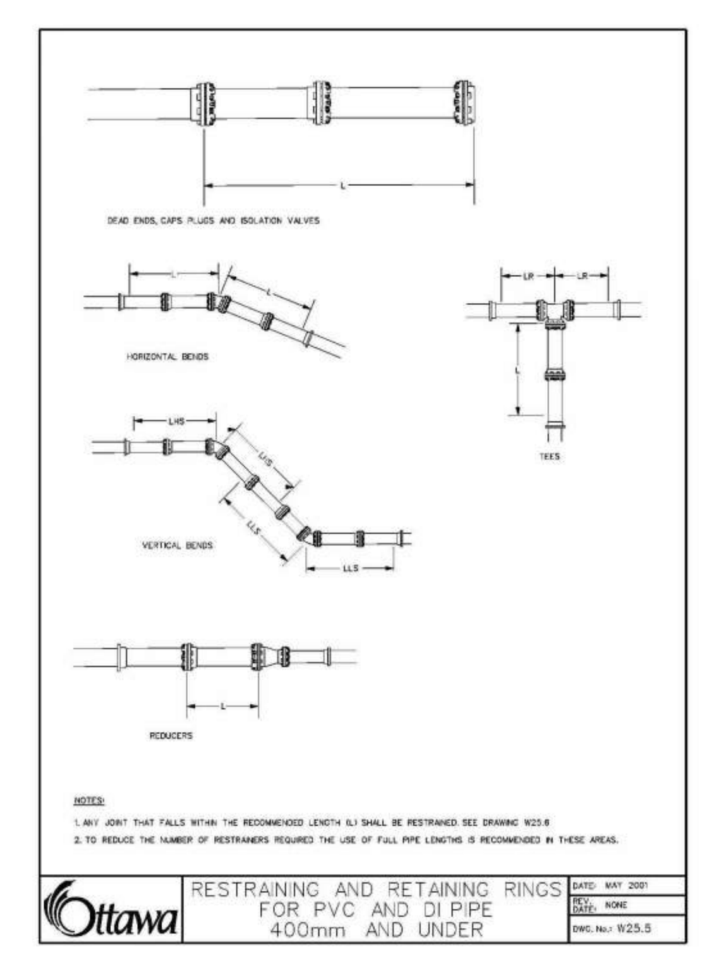


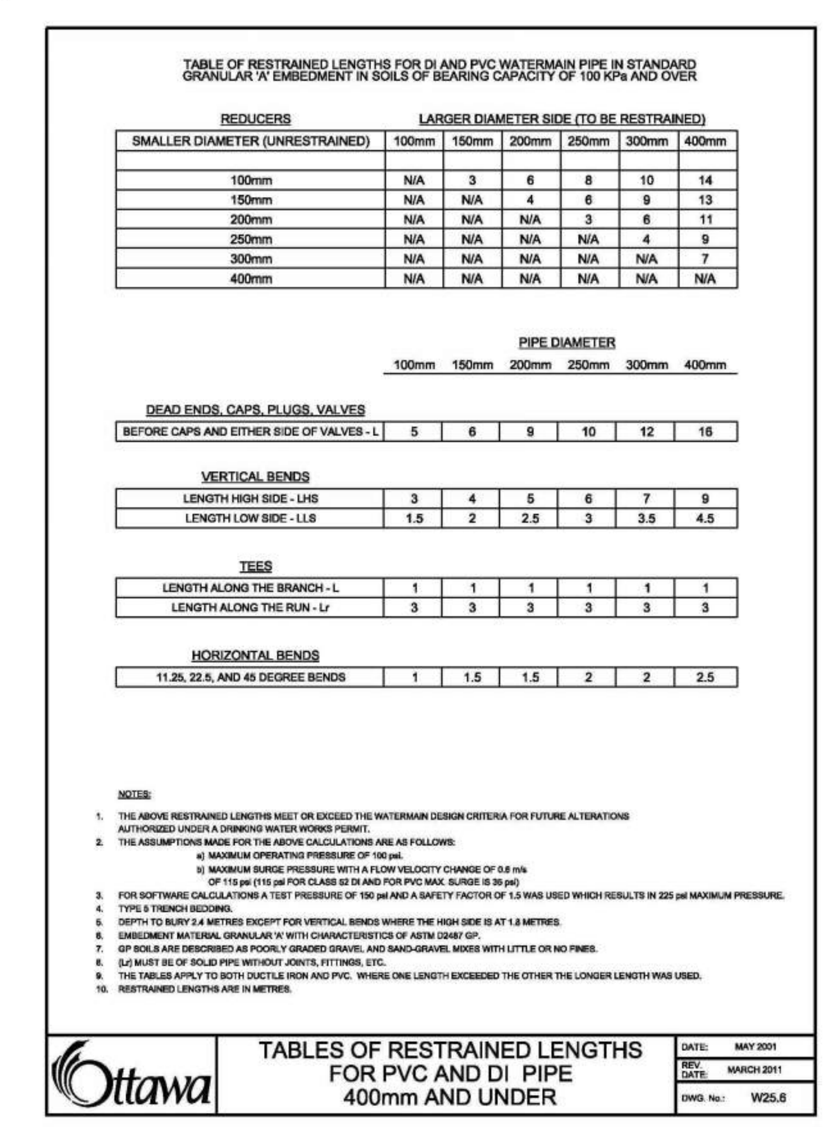












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general notes | note générale

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2. DO NOT SCALE THE DRAWINGS.
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nord du projet / project north — nord actuel / true north

no	revisions	date
2	RE-ISSUED FOR SPA	10/22/2020
1	ISSUED FOR SITE PLAN APPLICATION	12/05/2019

stamp | timbre

REGISTERED PROFESSIONAL ENGINEER
M.E. MACSWEEN
100104372
OCT 22, 2020
PROVINCE OF ONTARIO

architect | architecte

linebox STUDIO

project title

473 ALBERT

PROPOSED MIXED-USE RENOVATION

473 ALBERT STREET | OTTAWA | ONTARIO | CANADA

drawing title | titre du dessin

DETAILS PLAN

project number | numero du projet	477234
drawn | dessiné	SS
checked | verifié	MM / MT
date | date	29/11/19
scale | échelle	As indicated

drawing number | numéro du dessin

C-103

D07-12-19-0203

#18100

APPENDIX D | BOUNDARY CONDITIONS

Theiner, Mathew

From: Wessel, Shawn <shawn.wessel@ottawa.ca>
Sent: Thursday, November 21, 2019 8:52 AM
To: MacSween, Meghan
Cc: Deiaco, Simon; Theiner, Mathew
Subject: [EXTERNAL] RE: 473 Albert Street - Boundary Condition Request
Attachments: 473 Albert Nov 2019.pdf

Good morning Ms. MacSween / Mr. Theiner

As discussed, the existing 152mm on Albert will be abandoned and the existing 203mm will be replaced by a new 203mm PVC in the near future. We can provide boundary conditions for future conditions but we are still waiting to hear back on the planned watermain sizes for Bronson, Albert and surrounding streets.

The following are boundary conditions, HGL, for hydraulic analysis at 473 Albert (zone 1W) assumed to be connected to the 203 mm on Albert (see attached PDF for location).

Minimum HGL = 106.0 m

Maximum HGL = 115.5 m

Available fire flow = 115 L/s assuming a residual of 20 psi and a ground elevation of 73.5 m

These are for current conditions and are based on computer model simulation.

Disclaimer: The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation.

If you require additional information or clarification, please do not hesitate to contact me anytime.

Thank you

Regards,

Shawn Wessel, A.Sc.T.,rcji
Project Manager - Infrastructure Approvals

Gestionnaire de projet – Approbation des demandes d'infrastructures

Development Review Central Branch | Direction de l'examen des projets d'aménagement, Centrale
Planning, Infrastructure and Economic Development Department | Direction générale de la planification de l'infrastructure et du développement économique
City of Ottawa | Ville d'Ottawa
110 Laurier Ave. W. | 110, avenue Laurier Ouest, Ottawa ON K1P 1J1
(613) 580 2424 Ext. | Poste 33017
Int. Mail Code | Code de Courrier Interne 01-14
shawn.wessel@ottawa.ca

From: MacSween, Meghan <Meghan.Macsween@parsons.com>
Sent: November 13, 2019 1:29 PM
To: Wessel, Shawn <shawn.wessel@ottawa.ca>
Cc: Deiaco, Simon <Simon.Deiaco@ottawa.ca>; Theiner, Mathew <Mathew.Theiner@parsons.com>
Subject: RE: 473 Albert Street - Boundary Condition Request

Hi Shawn,

Thanks for the heads up, we'll await confirmation. If the 152mm watermain is out of service we will have to connect to the 203 mm diameter watermain and install a valve to separate the two services.

I am going to be out of the office for the next two weeks, can I ask that you include Mathew Theiner, cc'd, on any communication as he will be taking over in my absence.

Thanks,

Meghan

Meghan MacSween, M.Eng., P.Eng.
Municipal Engineer
1223 Michael St. North, Suite 100, Ottawa, ON K1J 7T2
meghan.macsween@parsons.com – P: +1 613.691.1540 M: +1 343.997.3895

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From: Wessel, Shawn <shawn.wessel@ottawa.ca>
Sent: Wednesday, November 13, 2019 10:52 AM
To: MacSween, Meghan <Meghan.Macsween@parsons.com>
Cc: Deiaco, Simon <Simon.Deiaco@ottawa.ca>
Subject: [EXTERNAL] 473 Albert Street - Boundary Condition Request

Good morning Ms. Macsween.

Further to your request, the Water Distribution Dept. has sent the following message:

The 152mm watermain on Albert that they're proposing to connect to seems to be out of service according to GIS. I'm just waiting to hear back from Distribution to find out if this is just temporary or permanent.

I will get back to you once I hear from our colleagues regarding this matter.

If you require additional information or clarification, please do not hesitate to contact me anytime.

Thank you

Regards,

Shawn Wessel, A.Sc.T.,rcji
Project Manager - Infrastructure Approvals
Gestionnaire de projet – Approbation des demandes d'infrastructures

Development Review Central Branch | Direction de l'examen des projets d'aménagement, Centrale
Planning, Infrastructure and Economic Development Department | Direction générale de la planification de l'infrastructure et du développement économique
City of Ottawa | Ville d'Ottawa
110 Laurier Ave. W. | 110, avenue Laurier Ouest, Ottawa ON K1P 1J1
(613) 580 2424 Ext. | Poste 33017
Int. Mail Code | Code de Courrier Interne 01-14
shawn.wessel@ottawa.ca

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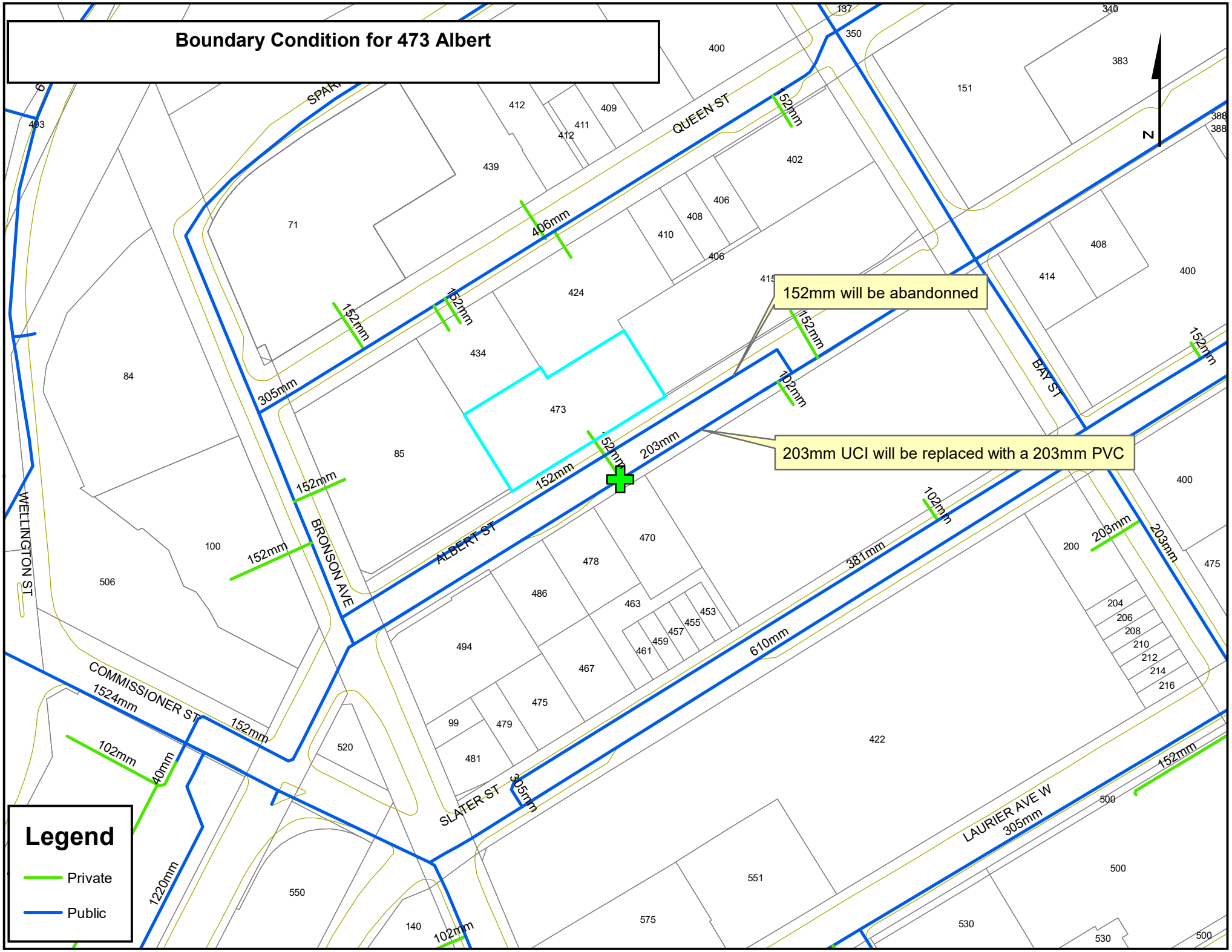

Boundary Condition for 473 Albert
152mm will be abandonned
203mm UCI will be replaced with a 203mm PVC
QUEEN ST
BAY ST
ALBERT ST
BRONSON AVE
WELLINGTON ST
COMMISSIONER ST
SLATER ST
LAURIER AVE W
N
Legend
Private
Public

November 27, 2019

Valves / Vannes

- Valve / Vanne
- TVS, A, D

Water Fittings / Raccords de conduite d'eau

- Cap / bouchon
- Reducer / réducteur
- Hydrants / Bornes-fontaines
- Hydrant Laterals / Branchements de borne-fontaine

Water Mains / Conduites d'eau principales

- Private / Branchement privé
- Public / Branchement public

Misc. Water Structures / Structures d'aqueduc - divers

- Pumping Station / Station de pompage des eaux
- Well Supply / Alimentation par puits
- Elevated Tank / Château d'eau
- In Ground Tank / Réservoir souterrain
- Water Treatment Plant / Usine d'épuration des eaux

1:2,839

0 0.0325 0.065 0.13 mi

0 0.05 0.1 0.2 km

City of Ottawa

APPENDIX E | WATER DEMAND

Table1 : Water Demand for 473 Albert Street

Building	Units	Population	Gross Floor Area (m2)	Average Daily Demand (ADD)*	Maximum Daily Demand (MDD)**	Peak Hourly Demand (PHD)**	Fire Flow (FF)	MDD + FF
					4.9*ADD 1.5*ADD (non-residential)	7.4*ADD 1.8*MDD (non-residential)		
				L/s	L/s	L/s	L/s	L/s
473 Albert Street				**1.09**	**5.08**	**7.71**	**182**	**186.6**
Residential	*158*	*251*		*1.02*	*4.97*	*7.51*		
Amenity Space (12th floor)			*1260*	*0.07*	*0.11*	*0.20*		

Average Daily Demands

Based on Ottawa Design Guidelines - Water Distribution, 2010 and MOE Design Guidelines for Drinking-Water Systems, 2008

Average Residential Daily Flow =	350	L/p/d		
Shopping Centres =	2,500	L/(1000m2/d)		
Restaurant (Ordinary not 24h)	125	L/seat/d		
Office Daily Flow =	75	L/empl/d	75L/9.3m2/d	1 seat per 9.3m2
Amenity Area Flow =	5	L/m2/d		

** Peaking factors as per MOE Guidelines for Drinking-Water Systems Table 3-3 for 0 to 500 persons

Table 2: Fire Demand Calculation (473 Albert Street)

OBC Division B - Appendix A - A-3.2.5.7

A) Buildings Not Requiring On-Site Water Supply - satisfy Item 3b (flow rates not less than that specified in Table 2)

Q = KVStot

K =	16	water supply coefficient Table 1			
V =	51660	total building volume in m3			
		A =	1260	m2	
		H =	41	m	
S tot =	1.6	total of spatial coefficient values from property line exposures on all side = 1+(S1+S2+…), does not exceed 2			
		0m	E		0.5
		9m	N		0.1
		16.7m	W		0
		20.7m	S		0
Q =	1,322,496.00	L			

Table 2 - if Q is greater than 270,000L, Min Water Supply Flow Rate is:

9000	L/min
150	L/s

B) Sprinklered Buildings: Sprinkler system plus firefighting demand
Sprinkler demand provided by Mechanical Engineers:

500	gpm
31.5	L/s

Therefore, total demand for 473 Albert Street is 181.5 L/s.

MacSween, Meghan

From: Wessel, Shawn <shawn.wessel@ottawa.ca>
Sent: Thursday, February 20, 2020 10:42 AM
To: MacSween, Meghan
Subject: [EXTERNAL] RE: 473 Albert Street - Hydrant Flow Test Request

Good morning Ms. MacSween.

I have received comments from Water Distribution, based on your SWM and Site Servicing Report review and their discussions with me on the available flows in the nearby FHs within 150 m of the property as well as your email sent yesterday, and their comments are as follows:

The consultant states that the five hydrants within 150m of the building can supply 380 L/s. This is incorrect.

Table 1 in Appendix I of tech bulletin ISTB-2018-02 assumes that the watermains can at minimum deliver the hydrant flow listed in the table . This is true in most cases but not always true on old watermains.

We have performed a multi-hydrant analysis and the total available flow from those five hydrants is 215 L/s assuming existing watermains.

We are looking into the status of the proposed Capital Works Project that would renew sewer and water infrastructure in the area, as mentioned, although this design must take into account the existing aged infrasturture.

If you require additional information or clarification, please do not hesitate to contact me anytime.

Thank you

Regards,

Shawn Wessel, A.Sc.T.,rcji
Project Manager - Infrastructure Approvals
Gestionnaire de projet – Approbation des demandes d'infrastructures

Development Review Central Branch | Direction de l'examen des projets d'aménagement, Centrale
Planning, Infrastructure and Economic Development Department | Direction générale de la planification de l'infrastructure et du développement économique

City of Ottawa | Ville d'Ottawa
110 Laurier Ave. W. | 110, avenue Laurier Ouest, Ottawa ON K1P 1J1
(613) 580 2424 Ext. | Poste 33017
Int. Mail Code | Code de Courrier Interne 01-14
shawn.wessel@ottawa.ca

Please consider the environment before printing this email

From: MacSween, Meghan <Meghan.Macsween@parsons.com>
Sent: February 19, 2020 8:54 AM
To: Wessel, Shawn <shawn.wessel@ottawa.ca>
Subject: 473 Albert Street - Hydrant Flow Test Request

Hi Shawn,

Thank you for your call yesterday regarding the SPA for 473 Albert Street.

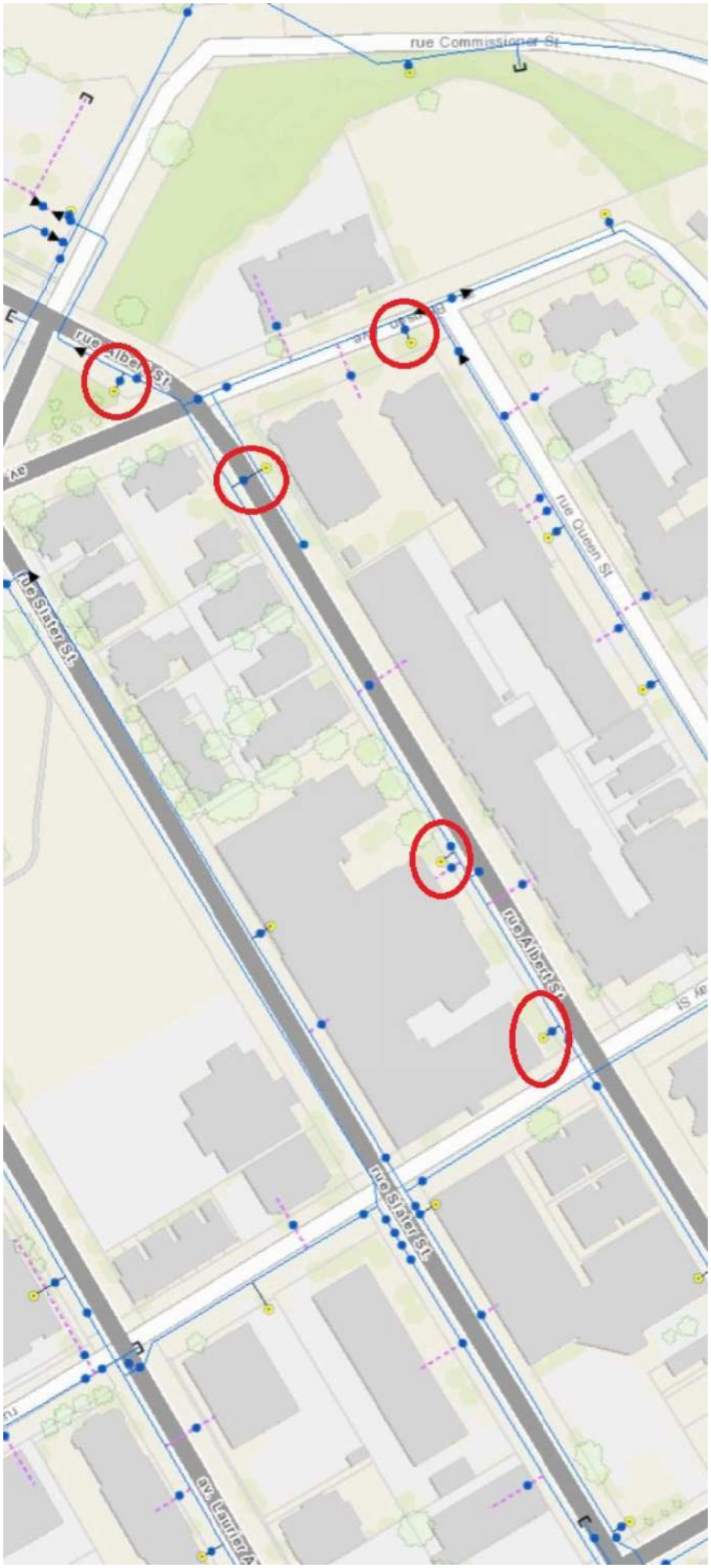
We've calculated the required fire demand using the OBC calculations and determined the demand would be 150 L/s.

We would like to request fire hydrant flow tests for the 5 hydrants within 150m of the building which are shown with red circles on the attached map.

Thanks,

Meghan

Meghan MacSween, M.Eng., P.Eng.
Municipal Engineer
1223 Michael St. North, Suite 100, Ottawa, ON K1J 7T2
meghan.macsween@parsons.com
P: +1 613.691.1540 M: +1 343.997.3895
Parsons [can01.safelinks.protection.outlook.com] / LinkedIn [can01.safelinks.protection.outlook.com] / Twitter [can01.safelinks.protection.outlook.com] / Facebook [can01.safelinks.protection.outlook.com] / Instagram [can01.safelinks.protection.outlook.com]


rue Commissioner St
rue Albert St
rue Slater St
rue Queen St
rue Albert St
rue Slater St

APPENDIX F | CCTV REPORTS

Ottawa (Head Office)
1800 Bantree Street
Ottawa, Ontario K1B 5L6
☎ 613.745.2444
613.745.9994

Montreal
2700 Sabourin Street
St-Laurent, Quebec H4S 1M2
☎ 514.738.2666
514.738.9762

www.cwwcanada.com
1.866.695.0155

CLEAN WATER WORKS INC.

INTEGRATED SEWER SOLUTIONS

InterRent No.3 Limited Partnership

473 Albert St.
Ottawa, Ontario
Job No.: 87892

Drain Use
Sanitary

Inspection Date
November 21st 2019

DRAIN CCTV INSPECTION REPORT

THE WAY IS CLEAR™

- CIPP Lateral Drain Lining
- Drain Inspection and Locating
- Preventative Maintenance Plumbing
- Frozen Pipe Thawing
- Backwater Valve Devices
- Sewer and Waterline Replacement and Repairs
- High Pressure Blasting
- Drain Cleaning and Flushing
- Plumbing Installation, Renovations and Repairs

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CLEAN WATER WORKS

InterRent No. 3 Limited Partnership

473 Albert Street

Ottawa, Ontario

Job No.: 88792

Inspection Date

November 21st 2019

Inspection Notes:

Water main was verbally confirmed as 6 inch plastic by David Seaman on site with Evan Johnson.

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1.866.695.0155

CLEAN WATER WORKS

MINI CAMERA CCTV INSPECTION REPORT

CUSTOMER:	InterRent No. 3 Limited Partnership	**START OF INSPECTION:**	BASEMENT MECH ROOM
JOB NO.:	87892	**END OF INSPECTION:**	CITY MAIN LINE
		SEWER USE:	SANITARY
LOCATION:	473 ALBERT STREET	**PIPE DIAMETER(S):**	150MM / 200MM
	OTTAWA, ONTARIO	**PIPE MATERIAL(S):**	CAST IRON / TRANSITE
		DIRECTION OF FLOW:	DOWNSTREAM
DATE:	NOVEMBER 21ST 2019	**VIDEO FILENAME:**	Video #1
OPERATOR:	DAVID S.	**REPORT NUMBER:**	**1 of 2**

DISTANCE (M)	CODE	INSPECTION COMMENTS
0.0	START	START OF INSPECTION – BASEMENT MECH ROOM
1.0	LBD	LINE BENDS DOWN
2.4	LBS	LINE BENDS STRAIGHT
2.4	DC	DIAMETER CHANGE: 150MM – 200MM
3.8	LBR	LINE BENDS RIGHT
3.8	MC	MATERIAL CHANGE: CAST IRON – TRANSITE
13.4	END	END OF INSPECTION – CITY MAIN LINE

CODE	DESCRIPTION
AIF	ACTIVE INFILTRATION
BKJ	BROKEN JOINT
BSG	START OF SAG
BWV	BACKWATER VALVE
C/O	CLEANOUT
CAL	CALCITE
CFL	COLLAPSE
CRC	CIRCULAR CRACK
DC	DIAMETER CHANGE
DEB	DEBRIS
DEF	PIPE DEFORMATION
EIF	EVIDENCE OF INFILTRATION
ESG	END OF SAG
EXG	EXPOSED GASKET
EXR	EXPOSED REBAR
F/D	FLOOR DRAIN
FRC	FRACTURE
GRS	GREASE
HOLE	HOLE IN PIPE
LBD	LINE BENDS DOWN
LBL	LINE BENDS LEFT
LBR	LINE BENDS RIGHT
LBS	LINE BENDS STRAIGHT
LGC	LONGITUDINAL CRACK
MAIN	MAIN SEWER IN BUILDING
MC	MATERIAL CHANGE
MH	MANHOLE
MSP	MISSING PIPE PIECE
OBS	OBSTRUCTION IN PIPE
OFJ	OFFSET JOINT
OPJ	OPEN JOINT
PFL	PARTIAL COLLAPSE
PSC	PROTRUDING CONNECTION
PUN	PUNCTURE
RTS	ROOTS
SC	SERVICE CONNECTION
WYE	WYE CONNECTION

COMMENTS:

Before Flushing
No deficiencies noted

Video #1

1800 Bantree Street
Ottawa, Ontario K1B 5L6
☎ 613.745.2444
613.745.9994
www.cwwcanada.com
1.866.695.0155

CLEAN WATER WORKS

MINI CAMERA CCTV INSPECTION REPORT

CUSTOMER:	InterRent No. 3 Limited Partnership	**START OF INSPECTION:**	BASEMENT MECH ROOM
JOB NO.:	87892	**END OF INSPECTION:**	CITY MAIN LINE
		SEWER USE:	SANITARY
LOCATION:	473 ALBERT STREET	**PIPE DIAMETER(S):**	150MM / 200MM
	OTTAWA, ONTARIO	**PIPE MATERIAL(S):**	CAST IRON / TRANSITE
		DIRECTION OF FLOW:	DOWNSTREAM
DATE:	NOVEMBER 21ST 2019	**VIDEO FILENAME:**	Video #2
OPERATOR:	DAVID S.	**REPORT NUMBER:**	**2 of 2**

DISTANCE (M)	CODE	INSPECTION COMMENTS
0.0	START	START OF INSPECTION – BASEMENT MECH ROOM
1.0	LBD	LINE BENDS DOWN
2.4	LBS	LINE BENDS STRAIGHT
2.4	DC	DIAMETER CHANGE: 150MM – 200MM
3.8	LBR	LINE BENDS RIGHT
3.8	MC	MATERIAL CHANGE: CAST IRON – TRANSITE
13.4	END	END OF INSPECTION – CITY MAIN LINE

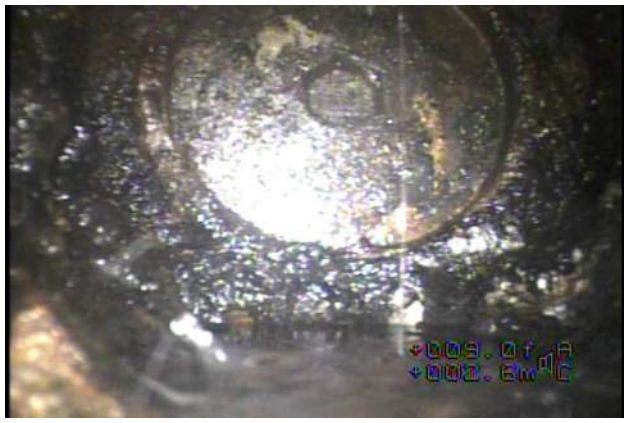
CODE	DESCRIPTION
AIF	ACTIVE INFILTRATION
BKJ	BROKEN JOINT
BSG	START OF SAG
BWV	BACKWATER VALVE
C/O	CLEANOUT
CAL	CALCITE
CFL	COLLAPSE
CRC	CIRCULAR CRACK
DC	DIAMETER CHANGE
DEB	DEBRIS
DEF	PIPE DEFORMATION
EIF	EVIDENCE OF INFILTRATION
ESG	END OF SAG
EXG	EXPOSED GASKET
EXR	EXPOSED REBAR
F/D	FLOOR DRAIN
FRC	FRACTURE
GRS	GREASE
HOLE	HOLE IN PIPE
LBD	LINE BENDS DOWN
LBL	LINE BENDS LEFT
LBR	LINE BENDS RIGHT
LBS	LINE BENDS STRAIGHT
LGC	LONGITUDINAL CRACK
MAIN	MAIN SEWER IN BUILDING
MC	MATERIAL CHANGE
MH	MANHOLE
MSP	MISSING PIPE PIECE
OBS	OBSTRUCTION IN PIPE
OFJ	OFFSET JOINT
OPJ	OPEN JOINT
PFL	PARTIAL COLLAPSE
PSC	PROTRUDING CONNECTION
PUN	PUNCTURE
RTS	ROOTS
SC	SERVICE CONNECTION
WYE	WYE CONNECTION

COMMENTS:

After Flushing
No deficiencies noted

Video #2


+000.0f
+000.0m


+003.0f
+002.6m


+008.0f
+002.8m


+014.5f
+004.4m


+041.0f
+012.4m


+043.5f
+013.2m

Ottawa (Head Office)
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2700 Sabourin Street
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☎ 514.738.2666
514.738.9762

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1.866.695.0155

CLEAN WATER WORKS INC.

INTEGRATED SEWER SOLUTIONS

InterRent No.3 Limited Partnership

473 Albert St.
Ottawa, Ontario
Job No.: 87892

Drain Use
Storm

Inspection Date
November 14th 2019

DRAIN CCTV INSPECTION REPORT

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613.745.9994
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CLEAN WATER WORKS

MINI CAMERA CCTV INSPECTION REPORT

CUSTOMER:	InterRent No. 3 Limited Partnership	**START OF INSPECTION:**	CLEANOUT
JOB NO.:	87892	**END OF INSPECTION:**	MAIN LINE
		SEWER USE:	STORM
LOCATION:	473 ALBERT	**PIPE DIAMETER(S):**	100MM / 150MM / 200MM
	OTTAWA, ONTARIO	**PIPE MATERIAL(S):**	CAST IRON / TRANSITE
		DIRECTION OF FLOW:	DOWNSTREAM
DATE:	NOVEMBER 14TH 2019	**VIDEO FILENAME:**	Video #1
OPERATOR:	TREVOR F.	**REPORT NUMBER:**	**1 of 1**

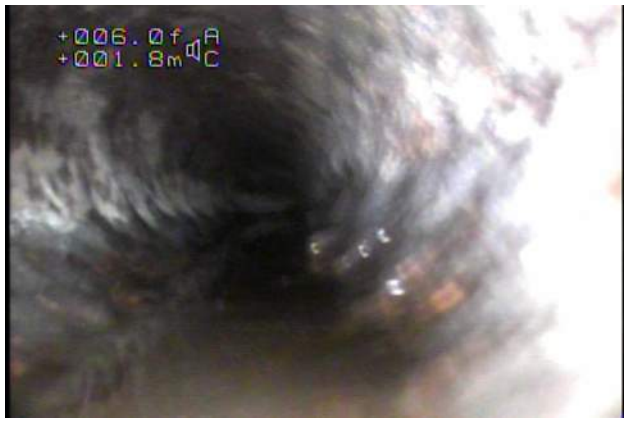
DISTANCE (M)	CODE	INSPECTION COMMENTS
0.0	C/O	START OF INSPECTION – CLEANOUT
2.8	LBR	LINE BENDS RIGHT
2.8	DC	DIAMETER CHANGE: 100MM – 150MM
4.8	LBD	LINE BENDS DOWN
6.0	LBS	LINE BENDS STRAIGHT
7.4	LBR	LINE BENDS RIGHT
8.2	LBL	LINE BENDS LEFT
8.2	DC	DIAMETER CHANGE: 150MM – 200MM
8.2	MC	MATERIAL CHANGE: CAST IRON – TRANSITE
17.8	END	END OF INSPECTION – MAIN LINE

CODE	DESCRIPTION
AIF	ACTIVE INFILTRATION
BKJ	BROKEN JOINT
BSG	START OF SAG
BWV	BACKWATER VALVE
C/O	CLEANOUT
CAL	CALCITE
CFL	COLLAPSE
CRC	CIRCULAR CRACK
DC	DIAMETER CHANGE
DEB	DEBRIS
DEF	PIPE DEFORMATION
EIF	EVIDENCE OF INFILTRATION
ESG	END OF SAG
EXG	EXPOSED GASKET
EXR	EXPOSED REBAR
F/D	FLOOR DRAIN
FRC	FRACTURE
GRS	GREASE
HOLE	HOLE IN PIPE
LBD	LINE BENDS DOWN
LBL	LINE BENDS LEFT
LBR	LINE BENDS RIGHT
LBS	LINE BENDS STRAIGHT
LGC	LONGITUDINAL CRACK
MAIN	MAIN SEWER IN BUILDING
MC	MATERIAL CHANGE
MH	MANHOLE
MSP	MISSING PIPE PIECE
OBS	OBSTRUCTION IN PIPE
OFJ	OFFSET JOINT
OPJ	OPEN JOINT
PFL	PARTIAL COLLAPSE
PSC	PROTRUDING CONNECTION
PUN	PUNCTURE
RTS	ROOTS
SC	SERVICE CONNECTION
WYE	WYE CONNECTION

COMMENTS:
No deficiencies noted

Video #1


+002.0f
+000.6m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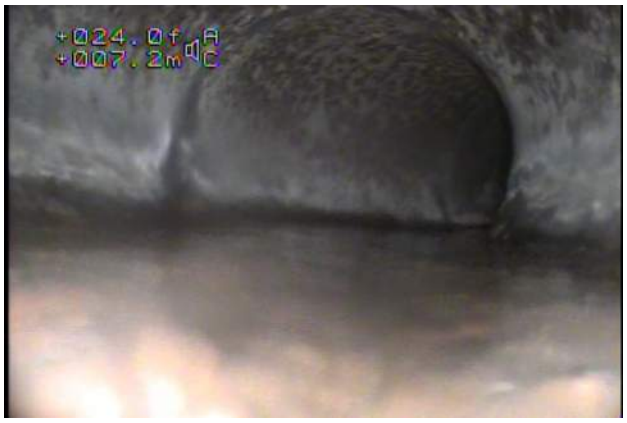
+024.0f
+007.2m


+030.5f
+009.2m


+044.5f
+013.4m


+056.5f
+017.2m

APPENDIX G | SANITARY FLOWS AND SEWER DESIGN SHEET

Table 1: SANITARY DESIGN FLOWS

Area	RESTAURANT					OFFICE				ROOFTOP AMENITY SPACE				RESIDENTIAL				TOTAL	INFILTRATION			Total
	Restaurant Area (m^2)	Seats assumed 1 seat per m^2	Flow/seat L/seat/d	Peak Factor	Peak Flow (L/s)	Office Area (m^2)	Capita ($1/25m^2$)	Peak Factor	Peak Flow (L/s)	Area (m^2)	Amenity Space L/m2/d	Peak Factor	Peak Flow (L/s)	Number of units	Capita	Peak Factor	Peak Flow (L/s)	Peak Flow (L/s)	Site Areas (ha)	Infiltration Allowance (L/s/ha)	Infilt. Flow (L/s)	Total Peak Flow (L/s)
Proposed Building																			0.20	0.33	0.07	0.07
Restaurant																						
Office																						
Residential														158	251	3.5	2.84	2.84				2.84
Amenity Space										1260	5	1.0	0.1					0.07				0.07
																					Total	**2.98**
Existing Building																			0.20	0.33	0.07	0.07
Office						12,647	506	1.5	0.66									0.66				0.66
Restaurant	385	385	125	1.5	0.84													0.84				0.84
																					Total	**1.56**

Design:	Benoit Villeneuve	**Project:**	473 Albert St. Ottawa, Ontario
Check :	Meghan MacSweer	**Location:**	473 Albert St. Ottawa, Ontario
		Project # :	477234
		Date:	24-Sep-20
		Sheet:	1 of 1

Average Daily Demands

(Based on City of Ottawa *Sewer Design Guidelines 2012* and *MOE Water Design Guidelines*)

Average Residential Daily Flow =	280	L/p/d
Institutional Flow =	28,000	L/ha/d
Commercial Flow =	28,000	L/ha/d
Light Industrial Flow =	35,000	L/ha/d
Heavy Industrial Flow =	55,000	L/ha/d
Hotel Daily Flow =	225	L/bed/d
Office/Warehouse Daily Flow =	75	L/empl/d
Restaurant (Ordinary not 24h)	125	L/seat/d
Shopping Centres =	2,500	L/(1000m^2/d)
Amenity Area =	5	L/m2/d

Population Densities

Average suburban residential dev.	60	p/ha
Single family	3.4	p./unit
Semi-detached	2.7	p./unit
Duplex	2.3	p./unit
Townhouse	2.7	p./unit
Appartment average	1.8	p./unit
Bachelor	1.4	p./unit
1 Bedroom	1.4	p./unit
2 Bedrooms	2.1	p./unit
Hotel room, 18 m2	1	p./unit
Restaurant, 1 m2	1	p./unit
Office	1	p/25m^2

Peak Factors

Commercial =	1.5	if commercial contribution > 20%, otherwise	1.0	
Institutional =	1.5	if institutional contribution > 20%, otherwise	1.0	
Industrial =		per Appendix 4-B.0 Graph		
Residential :		Harmon Equ 1 + (14/(4+(Capita/1000) ^ 0.5))*8		
		min = 2	max = 4	

Infiltration allowance (dry weather)	0.05	L/s/ha
Infiltration allowance (wet weather)	0.28	L/s/ha
I/I (total)	0.33	L/s/ha

Table 2: SANITARY SEWER COMPUTATIONS

Drainage Area	From	To	Peak Flow Q (L/sec)	Sewer Data										REMARKS
				Type of Pipe	Pipe Dia. nom. (mm)	Pipe Dia. actual (mm)	Slope* (%)	Length (m)	Capacity full (L/sec)	Velocity full (m/sec)	Velocity actual (m/sec)	Time of Flow (min)	Q(d) / Q(f)	
473 Albert Street	Building	Combined Sewer	2.98	Transite	200	200	1.5	13.4	40.1	1.28	0.68	0.33	0.07	

Manning's n = 0.013

* Min slope for cleansing velocities is 0.32%

Estimated invert at building wall = 71.4 m

Top of combined sewer at connection point is +/-71.2m

Design:	Mathew Theiner	**Project Name:**	473 Albert St.
Check:	Meghan MacSween	**Parsons Project #:**	477234
Date:	Sept 24 2020	**Client:**	InterRent

APPENDIX H | PRE-DEVELOPMENT DRAINAGE PLAN

LEGEND:

EXISTING MAJOR OVERLAND FLOW

EXISTING WATERSHED BOUNDARY

EWS-01 — WATERSHED AREA NO.

0.164 | 0.40 — RUNOFF COEFFICIENT / AREA (IN HECTARES)

EWS-B

0.004 | 0.40

EWS-A

0.164 | 0.40

85 BRONSON STREET

473 ALBERT STREET

435 ALBERT STREET

ALBERT STREET REGIONAL ROAD No. 42

South Queen Street Lots — LOT 25 LOT 24 LOT 23 LOT 22

North Albert Street Lots — LOT 25 LOT 24 LOT 23 LOT 22

PLAN

JOB BENCHMARK
Control Monument
No. 2011-0064
on Concrete Sidewalk
Elevation = 72.625

Concrete Wall
Concrete Curb
Concrete Step
Concrete Sidewalk
Metal Canopy
Wall 0.57 South
Concrete Wall (South Face Noted)
Vent
Above Ground Vent Structure
Concrete Pad Ventilation Pipe on top
AC on Concrete Pad
Bus Shelter
Metal Grate — Drainage
Interlock
Concrete Curb
Metal Gate
Telus
Rogers
ø300mm Gas
ø150mm Watermain
ø300mm Combined Sewer @ 3.46%
ø300mm Combined Sewer
EXIST. 200mm STM SERVICE
C/L of Constructed Road
Approximate Crown of Road
MH-B T\G=72.59 Bell Chamber T\G=72.65
MH-S T\G=73.39 Inv=70.62
MH-S T\G=74.06 Inv.=71.59
MH-B T\G=73.97 Bell Chamber
CB T\G=73.95
VC T\G=72.32
OHW (Closest) Elev=86.9
OHW (Closest) Elev=87.0
OHW (Closest) Elev=87.4
LSA Elev=82.5
LSA Elev=82.8
10.17
9.87

5m 0 5 10m

SCALE: 1:250

PARSONS

473 ALBERT STREET
OTTAWA, ON

PRE DRAINAGE PLAN

October, 2020
477234
FIGURE A

H:\(SD\477234\1000\DWGS\477234_473Albert_v12.dwg Oct 21, 2020 - 12:12pm

APPENDIX I | STORM SEWER DESIGN SHEET

STORM SEWER COMPUTATION FORM

Rational Method

Q = 2.78*A*I*R

Q = Flow (L/sec)
A = Area (ha)
I = Rainfall Intensity (mm/h)
R = Ave. Runoff Coefficient

Ottawa IDF Curve - 2-y

$I_5 = 732.951 / (Tc + 6.199)^{0.810}$

Minimum Time of Conc. Tc = **10 min**

Manning's n = **0.013**

Drainage Area	From	To	Area (ha)	Runoff Parameters: Runoff Coeff. R	Indiv. 2.78AR	Accum. 2.78AR	Time of Conc. (min)	Rainfall Intensity (mm/hr)	Roof Flow Q (L/sec)	Peak Flow Q (L/sec)	Pipe Dia. nom. (mm)	Pipe Dia. actual (mm)	Slope (%)	Length (m)	Capacity full (L/sec)	Velocity full (m/sec)	Velocity actual (m/sec)	Time of Flow (min)	Q(d) / Q(f)	REMARKS
473 Albert Street	Building	Sewer	0.170	0.90	0.43	0.43	10.00	104.19		10.90	200	200	1.12	17.8	34.77	1.11	0.82	0.27	0.31	

Note:

Allowable release rate

The minimum velocity when flowing full is 0.80 m/s
Estimated invert at builing wall = 71.4m
Top of combined sewer at connection point it +/-71.2m

Design: M. Theiner
Check: M. MacSween
Date: 24-Sep-20

Project: 473 Albert Street

APPENDIX J | STORMWATER MANAGEMENT CALCULATIONS

TABLE I - ALLOWABLE RUNOFF CALCULATIONS BASED ON PRE-EXISTING CONDITIONS

Area Description	Area (ha)	Time of Conc, Tc (min)	Minor Storm				Storm = 100 yr		
				I_2 (mm/hr)	C_{AVG}	Q_{ALLOW} (L/s)	I_{100} (mm/hr)	C_{AVG}	Q_{ALLOW} (L/sec)
EWS-A	0.164	10	Storm = 2 yr	76.81	0.40	14.0	178.56	0.90	73.2
EWS-B	0.004	10	Storm = 2 yr	76.81	0.40	0.3	178.56	0.90	1.8
Deduct additional proposed sanitary flows (2.98L/s-1.56L/s=1.42 L/s) due to combined sewer						**12.9**			

Allowable Capture Rate is based on the 2-year storm at T_c=10 mins, and a C_{avg} of 0.40

2-year Storm $C_{ASPH/ROOF/CONC}$ = 0.90 C_{GRAVEL} = 0.60 C_{GRASS} = 0.20
100-year Storm $C_{ASPH/ROOF/CONC}$ = 1.00 C_{GRAVEL} = 0.75 C_{GRASS} = 0.25

TABLE II- POST-DEVELOPMENT AVERAGE RUNOFF COEFFICIENTS

Watershed Area No.	Impervious Areas (m^2)	A * $C_{ASPH/ROOF}$	Pervious Areas (m^2)	A * C_{GRASS}	Sum AC	Total Area (m^2)	$C_{AVG\ (5yr)}$	$C_{AVG(100yr)}$
WS-01*	538.76	485	0.00	0	485	539	0.90	1.00
WS-02**	722.16	650	0.00	0	650	722	0.90	1.00
WS-03***	392.93	354	0.00	0	354	393	0.90	1.00
WS-04	39.62	36	0.00	0	36	40	0.90	1.00
Total	1693		0		1524	1693		
Total Controlled	1654		0		1488	1654		

* Controlled roof top area
** Uncontrolled roof area directed to cistern
*** Uncontrolled ground level amenity space directed to cistern

TABLE III- TOTAL RUNOFF COEFFICIENT FOR CONTROLLED AREAS

$C_{AVG(5yr)}$ = Sum AC / Total Area = **1,488 / 1,654** = **0.90**

$C_{AVG(100yr)}$ = **1.00**

TABLE IV- SUMMARY OF POST-DEVELOPMENT RUNOFF

Area No	Area (ha)	Storm = 2 yr				Storm = 100 yr			
		I_2 (mm/hr)	$C_{AVG(2yr)}$	Q_{GEN} (L/s)	Q_{CONT} (L/s)	I_{100} (mm/hr)	$C_{AVG(100yr)}$	Q_{GEN} (L/s)	Q_{CONT} (L/s)
WS-01*	0.054	76.81	0.90	10.4	4.0	178.56	1.00	26.7	6.1
WS-02**	0.072	76.81	0.90	13.9	4.9	178.56	1.00	35.8	4.9
WS-03***	0.039	76.81	0.90	7.6		178.56	1.00	19.5	
WS-04	0.004	76.81	0.90	0.8	0.8	178.56	1.00	2.0	2.0
Total	0.169			32.5	**9.6**			84.1	**12.9**

* Controlled roof top area
** Uncontrolled roof area directed to cistern
*** Uncontrolled ground level amenity space directed to cistern

$I_2 = 732.951 / (Tc + 6.199)^{0.810}$
$I_{100} = 1735.688 / (Tc + 6.014)^{0.820}$
Time of concentration (min), Tc = 10 mins

Table V - Storage Volumes (2-Year and 100-Year Storm Events)

Storage Requirement for RD-8

C_{AVG} = 0.90 (2-year)
C_{AVG} = 1.00 (100-year)
Time Interval = 5 (mins)
Drainage Area = 0.011 (hectares)
114.52 (sqm)

Watts Adjustable Accutrol Weir Roof Drain

	Release Rate = **0.95** (L/sec) per drain Return Period = 2 (years) IDF Parameters, A = 732.951 , B = 0.810 $I = A/(T_c+C)B$, C = 6.199					Release Rate = **1.53** (L/sec) per drain Return Period = 100 (years) IDF Parameters, A = 1735.688 , B = 0.820 $I = A/(Tc+C)B$, C = 6.014				
Duration (min)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
0	-	-	-	-	-	-	-	-	-	-
5	103.6	3.0	0.95	2.02	0.607	242.7	7.7	1.53	6.20	1.860
10	76.8	2.2	0.95	1.25	0.753	178.6	5.7	1.53	4.16	2.494
15	61.8	1.8	0.95	0.82	0.742	142.9	4.5	1.53	3.02	2.719
20	52.0	1.5	0.95	0.54	0.654	120.0	3.8	1.53	2.29	2.748
25	45.2	1.3	0.95	0.35	0.522	103.8	3.3	1.53	1.78	2.666
30	40.0	1.1	0.95	0.20	0.363	91.9	2.9	1.53	1.40	2.513
35	36.1	1.0	0.95	0.09	0.183	82.6	2.6	1.53	1.10	2.311
40	32.9	0.9	0.95	0.00	-0.010	75.1	2.4	1.53	0.86	2.073
45	30.2	0.9	0.95	-0.08	-0.215	69.1	2.2	1.53	0.67	1.808
50	28.0	0.8	0.95	-0.14	-0.427	64.0	2.0	1.53	0.51	1.523
55	26.2	0.7	0.95	-0.20	-0.647	59.6	1.9	1.53	0.37	1.220
60	24.6	0.7	0.95	-0.24	-0.872	55.9	1.8	1.53	0.25	0.903
65	23.2	0.7	0.95	-0.28	-1.102	52.6	1.7	1.53	0.15	0.575
70	21.9	0.6	0.95	-0.32	-1.336	49.8	1.6	1.53	0.06	0.238
75	20.8	0.6	0.95	-0.35	-1.573	47.3	1.5	1.53	-0.02	-0.108
80	19.8	0.6	0.95	-0.38	-1.813	45.0	1.4	1.53	-0.10	-0.462
85	18.9	0.5	0.95	-0.40	-2.056	43.0	1.4	1.53	-0.16	-0.821
90	18.1	0.5	0.95	-0.43	-2.301	41.1	1.3	1.53	-0.22	-1.186
95	17.4	0.5	0.95	-0.45	-2.548	39.4	1.3	1.53	-0.27	-1.556
100	16.7	0.5	0.95	-0.47	-2.797	37.9	1.2	1.53	-0.32	-1.931
105	16.1	0.5	0.95	-0.48	-3.047	36.5	1.2	1.53	-0.37	-2.309
110	15.6	0.4	0.95	-0.50	-3.299	35.2	1.1	1.53	-0.41	-2.691
115	15.0	0.4	0.95	-0.51	-3.552	34.0	1.1	1.53	-0.45	-3.077
120	14.6	0.4	0.95	-0.53	-3.806	32.9	1.0	1.53	-0.48	-3.465
Max Storage (m^3)=					**0.753**					**2.748**
Average Ponding Depth (mm)					**6.6**					**24.0**
Maximum Ponding Depth (mm)					**76.3**					**117.4**

Notes

1) Peak flow is equal to the product of 2.78 x C x I x A

2) Rainfall Intensity, $I = A/(Tc/60)^B$

3) Release Rate = LESSER of Min (Release Rate, Peak Flow) - Minus 100 Year Flow Of Uncontroled Areas OR Pipe Outlet Capacity

4) Storage Rate = Peak Flow - Release Rate

5) Storage = Duration x Storage Rate

6) Maximium Storage = Max Storage Over Duration

Table VI - Storage Volumes (2-Year and 100-Year Storm Events)

Storage Requirement for RD-10

C_{AVG} = 0.90 (2-year)
C_{AVG} = 1.00 (100-year)
Time Interval = 5 (mins)
Drainage Area = 0.014 (hectares)
137.93 (sqm)

Watts Adjustable Accutrol Weir Roof Drain

	Release Rate = **0.99** (L/sec) per drain Return Period = 2 (years) IDF Parameters, A = 732.951 , B = 0.810 $I = A/(T_c+C)B$, C = 6.199					Release Rate = **1.51** (L/sec) per drain Return Period = 100 (years) IDF Parameters, A = 1735.688 , B = 0.820 $I = A/(Tc+C)B$, C = 6.014				
Duration (min)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
0	-	-	-	-	-	-	-	-	-	-
5	103.6	3.6	0.99	2.59	0.776	242.7	9.3	1.51	7.79	2.338
10	76.8	2.7	0.99	1.66	0.998	178.6	6.8	1.51	5.33	3.201
15	61.8	2.1	0.99	1.14	1.030	142.9	5.5	1.51	3.97	3.570
20	52.0	1.8	0.99	0.81	0.970	120.0	4.6	1.51	3.09	3.705
25	45.2	1.6	0.99	0.57	0.858	103.8	4.0	1.51	2.47	3.705
30	40.0	1.4	0.99	0.39	0.711	91.9	3.5	1.51	2.01	3.619
35	36.1	1.2	0.99	0.26	0.540	82.6	3.2	1.51	1.65	3.474
40	32.9	1.1	0.99	0.15	0.353	75.1	2.9	1.51	1.37	3.286
45	30.2	1.0	0.99	0.06	0.153	69.1	2.6	1.51	1.14	3.066
50	28.0	1.0	0.99	-0.02	-0.058	64.0	2.5	1.51	0.94	2.820
55	26.2	0.9	0.99	-0.08	-0.277	59.6	2.3	1.51	0.77	2.554
60	24.6	0.8	0.99	-0.14	-0.502	55.9	2.1	1.51	0.63	2.272
65	23.2	0.8	0.99	-0.19	-0.733	52.6	2.0	1.51	0.51	1.975
70	21.9	0.8	0.99	-0.23	-0.969	49.8	1.9	1.51	0.40	1.667
75	20.8	0.7	0.99	-0.27	-1.209	47.3	1.8	1.51	0.30	1.349
80	19.8	0.7	0.99	-0.30	-1.453	45.0	1.7	1.51	0.21	1.022
85	18.9	0.7	0.99	-0.33	-1.700	43.0	1.6	1.51	0.13	0.688
90	18.1	0.6	0.99	-0.36	-1.949	41.1	1.6	1.51	0.06	0.346
95	17.4	0.6	0.99	-0.39	-2.201	39.4	1.5	1.51	0.00	-0.001
100	16.7	0.6	0.99	-0.41	-2.455	37.9	1.5	1.51	-0.06	-0.353
105	16.1	0.6	0.99	-0.43	-2.711	36.5	1.4	1.51	-0.11	-0.710
110	15.6	0.5	0.99	-0.45	-2.968	35.2	1.3	1.51	-0.16	-1.072
115	15.0	0.5	0.99	-0.47	-3.228	34.0	1.3	1.51	-0.21	-1.437
120	14.6	0.5	0.99	-0.48	-3.488	32.9	1.3	1.51	-0.25	-1.806
Max Storage (m^3)=					**1.030**					**3.705**
Average Ponding Depth (mm)					**7.5**					**26.9**
Maximum Ponding Depth (mm)					**79.6**					**121.9**

Notes

1) Peak flow is equal to the product of 2.78 x C x I x A

2) Rainfall Intensity, $I = A/(Tc/60)^B$

3) Release Rate = LESSER of Min (Release Rate, Peak Flow) - Minus 100 Year Flow Of Uncontroled Areas OR Pipe Outlet Capacity

4) Storage Rate = Peak Flow - Release Rate

5) Storage = Duration x Storage Rate

6) Maximium Storage = Max Storage Over Duration

Table VII - Storage Volumes (2-Year and 100-Year Storm Events)

Storage Requirement for RD-11

C_{AVG} = 0.90 (2-year)
C_{AVG} = 1.00 (100-year)
Time Interval = 5 (mins)
Drainage Area = 0.016 (hectares)
158.67 (sqm)

Watts Adjustable Accutrol Weir Roof Drain

	Release Rate = **1.02** (L/sec) per drain Return Period = 2 (years) IDF Parameters, A = 732.951 , B = 0.810 I = A/(T_c+C)B , C = 6.199					Release Rate = **1.55** (L/sec) per drain Return Period = 100 (years) IDF Parameters, A = 1735.688 , B = 0.820 I = A/(Tc+C)B , C = 6.014				
Duration (min)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
0	-	-	-	-	-	-	-	-	-	-
5	103.6	4.1	1.02	3.10	0.929	242.7	10.7	1.55	9.16	2.748
10	76.8	3.0	1.02	2.03	1.220	178.6	7.9	1.55	6.33	3.798
15	61.8	2.5	1.02	1.44	1.293	142.9	6.3	1.55	4.76	4.282
20	52.0	2.1	1.02	1.05	1.260	120.0	5.3	1.55	3.75	4.494
25	45.2	1.8	1.02	0.78	1.166	103.8	4.6	1.55	3.03	4.552
30	40.0	1.6	1.02	0.57	1.033	91.9	4.1	1.55	2.51	4.512
35	36.1	1.4	1.02	0.42	0.873	82.6	3.6	1.55	2.10	4.403
40	32.9	1.3	1.02	0.29	0.693	75.1	3.3	1.55	1.77	4.245
45	30.2	1.2	1.02	0.18	0.498	69.1	3.0	1.55	1.50	4.050
50	28.0	1.1	1.02	0.10	0.292	64.0	2.8	1.55	1.28	3.826
55	26.2	1.0	1.02	0.02	0.076	59.6	2.6	1.55	1.08	3.578
60	24.6	1.0	1.02	-0.04	-0.148	55.9	2.5	1.55	0.92	3.311
65	23.2	0.9	1.02	-0.10	-0.378	52.6	2.3	1.55	0.78	3.028
70	21.9	0.9	1.02	-0.15	-0.613	49.8	2.2	1.55	0.65	2.732
75	20.8	0.8	1.02	-0.19	-0.854	47.3	2.1	1.55	0.54	2.424
80	19.8	0.8	1.02	-0.23	-1.098	45.0	2.0	1.55	0.44	2.106
85	18.9	0.8	1.02	-0.26	-1.346	43.0	1.9	1.55	0.35	1.780
90	18.1	0.7	1.02	-0.30	-1.597	41.1	1.8	1.55	0.27	1.445
95	17.4	0.7	1.02	-0.32	-1.851	39.4	1.7	1.55	0.19	1.104
100	16.7	0.7	1.02	-0.35	-2.107	37.9	1.7	1.55	0.13	0.757
105	16.1	0.6	1.02	-0.38	-2.366	36.5	1.6	1.55	0.06	0.404
110	15.6	0.6	1.02	-0.40	-2.626	35.2	1.6	1.55	0.01	0.046
115	15.0	0.6	1.02	-0.42	-2.889	34.0	1.5	1.55	-0.05	-0.316
120	14.6	0.6	1.02	-0.44	-3.153	32.9	1.5	1.55	-0.09	-0.683
Max Storage (m^3)=					**1.293**					**4.552**
Average Ponding Depth (mm)					**8.1**					**28.7**
Maximum Ponding Depth (mm)					**81.9**					**124.6**

Notes

1) Peak flow is equal to the product of 2.78 x C x I x A

2) Rainfall Intensity, I = $A/(Tc/60)^B$

3) Release Rate = LESSER of Min (Release Rate, Peak Flow) - Minus 100 Year Flow Of Uncontroled Areas OR Pipe Outlet Capacity

4) Storage Rate = Peak Flow - Release Rate

5) Storage = Duration x Storage Rate

6) Maximium Storage = Max Storage Over Duration

Table VIII - Storage Volumes (2-Year and 100-Year Storm Events)

Storage Requirement for RD-12

C_{AVG} = 0.90 (2-year)
C_{AVG} = 1.00 (100-year)
Time Interval = 5 (mins)
Drainage Area = 0.013 (hectares)
127.64 (sqm)

Watts Adjustable Accutrol Weir Roof Drain

	Release Rate = **1.02** (L/sec) per drain Return Period = 2 (years) IDF Parameters, A = 732.951 , B = 0.810 $I = A/(T_c+C)B$, C = 6.199					Release Rate = **1.53** (L/sec) per drain Return Period = 100 (years) IDF Parameters, A = 1735.688 , B = 0.820 $I = A/(Tc+C)B$, C = 6.014				
Duration (min)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
0	-	-	-	-	-	-	-	-	-	-
5	103.6	3.3	0.82	2.49	0.747	242.7	8.6	1.32	7.29	2.186
10	76.8	2.5	0.82	1.64	0.981	178.6	6.3	1.32	5.01	3.007
15	61.8	2.0	0.82	1.15	1.039	142.9	5.1	1.32	3.75	3.371
20	52.0	1.7	0.82	0.84	1.013	120.0	4.3	1.32	2.93	3.518
25	45.2	1.4	0.82	0.62	0.937	103.8	3.7	1.32	2.36	3.540
30	40.0	1.3	0.82	0.46	0.830	91.9	3.3	1.32	1.94	3.483
35	36.1	1.2	0.82	0.33	0.701	82.6	2.9	1.32	1.61	3.372
40	32.9	1.0	0.82	0.23	0.557	75.1	2.7	1.32	1.34	3.221
45	30.2	1.0	0.82	0.15	0.400	69.1	2.5	1.32	1.13	3.039
50	28.0	0.9	0.82	0.08	0.234	64.0	2.3	1.32	0.94	2.834
55	26.2	0.8	0.82	0.02	0.060	59.6	2.1	1.32	0.79	2.611
60	24.6	0.8	0.82	-0.03	-0.120	55.9	2.0	1.32	0.66	2.372
65	23.2	0.7	0.82	-0.08	-0.305	52.6	1.9	1.32	0.54	2.120
70	21.9	0.7	0.82	-0.12	-0.495	49.8	1.8	1.32	0.44	1.857
75	20.8	0.7	0.82	-0.15	-0.688	47.3	1.7	1.32	0.35	1.585
80	19.8	0.6	0.82	-0.18	-0.885	45.0	1.6	1.32	0.27	1.305
85	18.9	0.6	0.82	-0.21	-1.084	43.0	1.5	1.32	0.20	1.018
90	18.1	0.6	0.82	-0.24	-1.286	41.1	1.5	1.32	0.13	0.725
95	17.4	0.6	0.82	-0.26	-1.490	39.4	1.4	1.32	0.07	0.426
100	16.7	0.5	0.82	-0.28	-1.697	37.9	1.3	1.32	0.02	0.122
105	16.1	0.5	0.82	-0.30	-1.905	36.5	1.3	1.32	-0.03	-0.186
110	15.6	0.5	0.82	-0.32	-2.114	35.2	1.2	1.32	-0.08	-0.498
115	15.0	0.5	0.82	-0.34	-2.326	34.0	1.2	1.32	-0.12	-0.813
120	14.6	0.5	0.82	-0.35	-2.538	32.9	1.2	1.32	-0.16	-1.133
Max Storage (m^3)=					**1.039**					**3.540**
Average Ponding Depth (mm)					**8.1**					**27.7**
Maximum Ponding Depth (mm)					**81.9**					**123.3**

Notes

1) Peak flow is equal to the product of 2.78 x C x I x A

2) Rainfall Intensity, $I = A/(Tc/60)^B$

3) Release Rate = LESSER of Min (Release Rate, Peak Flow) - Minus 100 Year Flow Of Uncontroled Areas OR Pipe Outlet Capacity

4) Storage Rate = Peak Flow - Release Rate

5) Storage = Duration x Storage Rate

6) Maximium Storage = Max Storage Over Duration

Table IX - Storage Volumes (2-Year and 100-Year Storm Events)

Storage Requirement for Uncontrolled Roof Drains and Ground Level Amenity Space Behind Building

C_{AVG} = 0.90 (2-year)
C_{AVG} = 1.00 (100-year)
Time Interval = 5 (mins)
Drainage Area = 0.112 (hectares)

	Release Rate = **4.9** (L/sec) Return Period = 2 (years) IDF Parameters, A = 732.951 , B = 0.810 $I = A/(T_c+C)B$, C = 6.199					Release Rate = **4.9** (L/sec) Return Period = 100 (years) IDF Parameters, A = 1735.688 , B = 0.820 $I = A/(Tc+C)B$, C = 6.014				
Duration (min)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
0	-	-	-	-	-	-	-	-	-	-
5	103.6	28.9	4.9	24.0	7.2	242.7	75.2	4.9	70.4	21.1
10	76.8	21.4	4.9	16.6	9.9	178.6	55.4	4.9	50.5	30.3
15	61.8	17.2	4.9	12.4	11.1	142.9	44.3	4.9	39.4	35.5
20	52.0	14.5	4.9	9.6	11.6	120.0	37.2	4.9	32.3	38.8
25	45.2	12.6	4.9	7.7	11.6	103.8	32.2	4.9	27.3	41.0
30	40.0	11.2	4.9	6.3	11.3	91.9	28.5	4.9	23.6	42.5
35	36.1	10.1	4.9	5.2	10.9	82.6	25.6	4.9	20.7	43.5
40	32.9	9.2	4.9	4.3	10.3	75.1	23.3	4.9	18.4	44.2
45	30.2	8.4	4.9	3.6	9.6	69.1	21.4	4.9	16.5	44.7
50	28.0	7.8	4.9	3.0	8.9	64.0	19.8	4.9	15.0	44.9
55	26.2	7.3	4.9	2.4	8.0	59.6	18.5	4.9	13.6	44.9
60	24.6	6.9	4.9	2.0	7.1	55.9	17.3	4.9	12.5	44.9
65	23.2	6.5	4.9	1.6	6.2	52.6	16.3	4.9	11.5	44.7
70	21.9	6.1	4.9	1.2	5.2	49.8	15.4	4.9	10.6	44.4
75	20.8	5.8	4.9	0.9	4.2	47.3	14.6	4.9	9.8	44.0
80	19.8	5.5	4.9	0.7	3.2	45.0	13.9	4.9	9.1	43.6
85	18.9	5.3	4.9	0.4	2.1	43.0	13.3	4.9	8.4	43.1
90	18.1	5.1	4.9	0.2	1.1	41.1	12.7	4.9	7.9	42.5
95	17.4	4.9	4.9	0.0	0.0	39.4	12.2	4.9	7.4	41.9
100	16.7	4.7	4.9	-0.2	-1.2	37.9	11.7	4.9	6.9	41.3
105	16.1	4.5	4.9	-0.4	-2.3	36.5	11.3	4.9	6.4	40.6
110	15.6	4.3	4.9	-0.5	-3.5	35.2	10.9	4.9	6.0	39.9
115	15.0	4.2	4.9	-0.7	-4.6	34.0	10.5	4.9	5.7	39.2
120	14.6	4.1	4.9	-0.8	-5.8	32.9	10.2	4.9	5.3	38.4
Max =					**11.6**					**44.9**

Notes

1) Peak flow is equal to the product of 2.78 x C x I x A

2) Rainfall Intensity, $I = A/(Tc/60)^B$

3) Release Rate = LESSER of Min (Release Rate, Peak Flow) - Minus 100 Year Flow Of Uncontroled Areas OR Pipe Outlet Capacity

4) Storage Rate = Peak Flow - Release Rate

5) Storage = Duration x Storage Rate

6) Maximium Storage = Max Storage Over Duration

Table X - Storage Volumes (2-Year and 100-Year Storm + 20% Stress Events)

Storage Requirement for Uncontrolled Roof Drains and Ground Level Amenity Space Behind Building

C_{AVG} = 0.90 (2-year)
C_{AVG} = 1.00 (100-year)
Time Interval = 5 (mins)
Drainage Area = 0.112 (hectares)

	Release Rate = **4.9** (L/sec) Return Period = 2 (years) IDF Parameters, A = 732.951 , B = 0.810 $I = A/(T_c+C)B$, C = 6.199					Release Rate = **4.9** (L/sec) Return Period = 100 (years) IDF Parameters, A = 1735.688 , B = 0.820 $I = A/(Tc+C)B$, C = 6.014				
Duration (min)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
0	-	-	-	-	-	-	-	-	-	-
5	103.6	34.7	4.9	29.8	8.9	242.7	90.3	4.9	85.4	25.6
10	76.8	25.7	4.9	20.8	12.5	178.6	66.4	4.9	61.6	36.9
15	61.8	20.7	4.9	15.8	14.2	142.9	53.2	4.9	48.3	43.5
20	52.0	17.4	4.9	12.6	15.1	120.0	44.6	4.9	39.8	47.7
25	45.2	15.1	4.9	10.3	15.4	103.8	38.6	4.9	33.8	50.6
30	40.0	13.4	4.9	8.5	15.4	91.9	34.2	4.9	29.3	52.8
35	36.1	12.1	4.9	7.2	15.1	82.6	30.7	4.9	25.9	54.3
40	32.9	11.0	4.9	6.1	14.7	75.1	28.0	4.9	23.1	55.4
45	30.2	10.1	4.9	5.3	14.2	69.1	25.7	4.9	20.8	56.2
50	28.0	9.4	4.9	4.5	13.6	64.0	23.8	4.9	18.9	56.8
55	26.2	8.8	4.9	3.9	12.9	59.6	22.2	4.9	17.3	57.1
60	24.6	8.2	4.9	3.4	12.1	55.9	20.8	4.9	15.9	57.3
65	23.2	7.8	4.9	2.9	11.2	52.6	19.6	4.9	14.7	57.4
70	21.9	7.3	4.9	2.5	10.4	49.8	18.5	4.9	13.7	57.4
75	20.8	7.0	4.9	2.1	9.5	47.3	17.6	4.9	12.7	57.2
80	19.8	6.6	4.9	1.8	8.5	45.0	16.7	4.9	11.9	57.0
85	18.9	6.3	4.9	1.5	7.5	43.0	16.0	4.9	11.1	56.7
90	18.1	6.1	4.9	1.2	6.5	41.1	15.3	4.9	10.4	56.3
95	17.4	5.8	4.9	1.0	5.5	39.4	14.7	4.9	9.8	55.9
100	16.7	5.6	4.9	0.7	4.4	37.9	14.1	4.9	9.2	55.4
105	16.1	5.4	4.9	0.5	3.4	36.5	13.6	4.9	8.7	54.9
110	15.6	5.2	4.9	0.3	2.3	35.2	13.1	4.9	8.2	54.3
115	15.0	5.0	4.9	0.2	1.2	34.0	12.6	4.9	7.8	53.7
120	14.6	4.9	4.9	0.0	0.1	32.9	12.2	4.9	7.4	53.1
Max =					**15.4**					**57.4**

Notes

1) Peak flow is equal to the product of 2.78 x C x I x A

2) Rainfall Intensity, $I = A/(Tc/60)^B$

3) Release Rate = LESSER of Min (Release Rate, Peak Flow) - Minus 100 Year Flow Of Uncontroled Areas OR Pipe Outlet Capacity

4) Storage Rate = Peak Flow - Release Rate

5) Storage = Duration x Storage Rate

6) Maximium Storage = Max Storage Over Duration

FLOW CONTROL ROOF DRAINAGE DECLARATION

THIS FORM TO BE COMPLETED BY THE MECHANICAL AND STRUCTURAL ENGINEERS RESPONSIBLE FOR DESIGN

Permit Application No.

Project Name: 473 Albert, Proposed Mixed Use Renovation

Building Location: 473 Albert, Ottawa, Ontario

Municipality: City of Ottawa

The roof drainage system has been designed in accordance with the following criteria: (please check one of the following).

M1. ☐ Conventionally drained roof (no flow control roof drains used).

M2. ☑ Flow control roof drains meeting the following conditions have been incorporated in this design:

(a) the maximum drain down time does not exceed 24h,
(b) one or more scuppers are installed so that the maximum depth of water on the roof cannot exceed 150mm,
(c) drains are located not more than 15m from the edge of roof and not more than 30m from adjacent drains, and
(d) there is at least one drain for each 900 sq.m.

M3. ☐ A flow control drainage system that does not meet the minimu
M2 has been incorporated in this design.

PROFESSIONAL SEAL APPLIED BY:

Practitioner's Name: Elaine Guenette

Firm: Smith and Andersen

Phone#: 613-552-8335

City: Ottawa Province: Ontario

Mechanical Engineer's Seal

S1. ☒ The design parameters incorporated into the overall structural design are consistent with the information provided by the Mechanical Engineer in M2. Loads due to rain are not considered to act simultaneously with loads due to snow as per Sentence 4.1.7.3 (3) OBC.

S2. ☐ The structure has been designed incorporating the additional structural loading due to rain acting simultaneously with the snow load. The design parameters are consistent with the control flow drainage system designed by the mechanical engineer.

PROFESSIONAL SEAL APPLIED BY:

Practitioner's Name: Colin Davies, P.Eng.

Firm: Cleland Jardine Engineering Ltd

Phone#: 613-591-1533

City: Ottawa Province: Ontario

Structural Engineer's Seal