Stormwater Management Report and Site Servicing Brief

Proposed 3-Storey Apartment Building
1465 Morisset Avenue
Ottawa, Ontario

Prepared for:

Concorde Properties
408 Tweedsmuir Ave
Ottawa, ON
K1Z 5N5

Attention: Mr. Jordan Tannis

LRL File No.: 200572

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5430 Canotek Road | Ottawa, ON, K1J 9G2 | info@lrl.ca | www.lrl.ca | (613) 842-3434

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1 INTRODUCTION AND SITE DESCRIPTION

LRL Associates Ltd. was retained by Concorde Properties to complete a Stormwater Management Analysis and Site Servicing Study for a proposed three (3) storey residential development located at 1465 Morisset Avenue in Ottawa, Ontario. The property is legally described as Lot 230-238, Registered Plan 327, City of Ottawa, refer to Survey included in Appendix F. The location of the proposed development can be viewed in Figure 1 below.

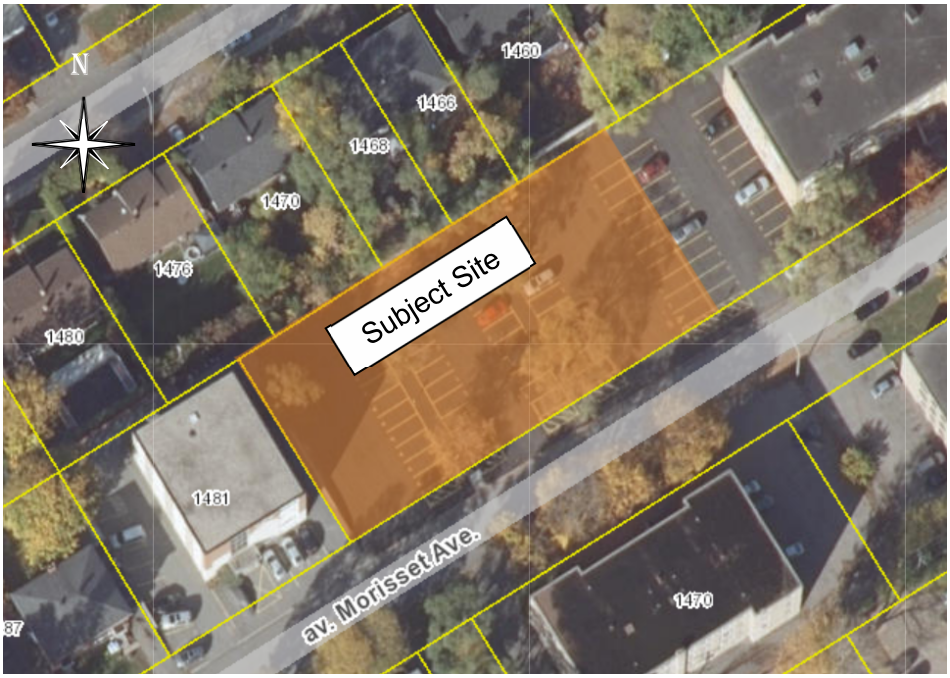


Figure 1: Aerial View of Proposed Development

The proposed development has been previously submitted for Site Plan Control (Application file number: D07-12-21-0091 & Plan No:18532) and it is understood that a Site Plan Application was previously approved. However, a notable revision to the architectural Site Plan has occurred. As a result, the stormwater management report and site servicing design has been revised accordingly and now being submitted for a Site Plan Amendment application.

The proposed new apartment building will have a footprint of 563 m^2 and consist of 31 units (16x1-bedroom and 15x2-bedroom apartments). The site will also encompass a paved parking area in the eastern portion of the lot. The proposed development will have one vehicular entrance with a depressed sidewalk on Morisset Avenue and one pedestrian main entrance via a pathway to Morisset Ave.

This report has been prepared in consideration of the terms and conditions noted above and with the civil drawings prepared for the proposed new development. Should there be any changes in the design features, which may relate to the stormwater management and servicing design considerations, LRL Associates Ltd. should be advised to review the report recommendations.

2 Existing Site and Drainage Description

The portion of land to be developed has a rectangular shape with a frontage of approximately 61 m along Morisset Avenue and a depth of approximately 30.7 m. With these dimensions, the property has a surface area of approximately 0.19 ha. The property is surrounded with residential buildings to the west and north, parking lot in the east, and Morisset Ave in the south. Currently, the proposed site is a parking lot which is being used by the apartment building in the east of the site. The existing parking lot will be demolished prior to development.
Along the west face of the existing site is an impervious asphalt pavement driveway with a retaining wall. Along the north side of the existing site is a small landscape area separated by a fence. Overland stormwater from the existing parking lot generally flow uncontrolled towards the low-lying area in the north and in the eastern portion of the parking lot which will eventually drains onto Morisset Ave.

3 Scope of Work

As per applicable guidelines, the scope of work includes the following:

Stormwater management

- Calculate the allowable stormwater release rate.
- Calculate the anticipated post-development stormwater release rates.
- Demonstrate how the target quantity objectives will be achieved.

Water services

- Calculate the expected water supply demand at average and peak conditions.
- Calculate the required fire flow as per the Ontario Building Code (OBC) method.
- Confirm the adequacy of water supply and pressure during peak flow and fire flow.
- Describe the proposed water distribution network and connection to the existing system.

Sanitary services

- Describe the existing sanitary sewers available to receive wastewater from the building.
- Calculate peak flow rates from the proposed development.
- Describe the proposed sanitary sewer system.
- Review impact of increased sanitary flow on downstream sanitary sewer.

4 Regulatory Approvals

An MECP Environmental Compliance Approval is not expected to be required for installation of the proposed storm and sanitary sewers within the site. A Permit to Take Water is not anticipated to be required for pumping requirements for sewer installation. No other approval requirements from other regulatory agencies are anticipated.

5 STORMWATER MANAGEMENT

5.1 Existing Stormwater Infrastructure

The topography of the site in pre-development conditions was reviewed to determine the direction of flow from overland runoff. In pre-development conditions, majority of the stormwater appears to flow uncontrolled overland towards Morisset Ave. The balance, at the rear of the property, appears to flow uncontrolled overland into the neighbouring property along the north property border. Refer to Pre-development Watershed Plan (C701) in Appendix E.

As previously discussed, the south end of the subject property is bordered by Morisset Avenue. Hence, the proposed storm service connection will be located at Morisset Ave. At this location, a dedicated 375 mm diameter storm sewer, flowing east, is available on the north side of the street for a potential connection.

5.2 Design Criteria

The stormwater management criteria for this development were based on the initial pre-consultation with City of Ottawa officials, the City of Ottawa Sewer Design Guidelines, 2012 (City Standards), as well as the Ministry of the Environment's Stormwater Management Planning and Design Manual, 2003 (SWMPD Manual).

5.2.1 Water Quality

Based on correspondence with Rideau Valley Conservation Authority (RVCA), the distance to the downstream outlet is greater than 2 km, therefore, the stormwater runoff from the site does not require any additional on-site water quality controls. Refer to Appendix B for the RVCA's opinion on water quality controls.

5.2.2 Water Quantity

All storm events up to and including the 100-year event will be controlled to the 2-year pre-development level. The sites major overland flow route has been designed to ensure that storm events beyond the 100-year design storm can be safely conveyed overland towards the Morisset Ave-Right of Way (ROW). The minor systems (storm sewers) within the site are sized to convey the 2-year storm event flow from the site to the municipal storm sewer on Morisset Ave.

Based on the pre-development catchment area calculations, the pre-development weighted runoff was found to be C=0.9. Detailed calculations can be found in Appendix B.

Though post-development conditions are not introducing a large increase in impervious surfaces, quantity control will still have to be implemented. The allowable release rate is calculated using the maximum runoff coefficient of C=0.5, as per the City of Ottawa requirement. The 100-year and 2-year post development flows will be controlled to the 2-year allowable flow rate of the site. Events greater than the 100-year storm are permitted to flow overland to the ROW.

5.3 Method of Analysis

The modified Rational Method has been used to calculate the runoff rate from the site, and to quantify the detention storage required for quantity control of the development. Refer to Appendix B for allowable release rate as well as storage calculations.

5.4 Allowable Release Rate

The maximum allowable release rate was calculated using the Rational method for the 2-year pre-development runoff value. Runoff from post-development conditions must be controlled to the 2-year pre-development level using a maximum of C=0.5 for the runoff coefficient, for both minor and major storms (2-year up to 100-year storms), using a time of concentration not less than 10 minutes.

The Rational method runoff coefficients (C) for each catchment have been calculated based on appropriately assigned coefficients weighted by area of land cover within the drainage area. A summary of catchment areas with calculated C values is included in Appendix B.

Below is the allowable release rate calculation (2-year storm, C=0.5)

$$Q = 2.78CIA = 2.78 \times 0.5 \times 76.80 \times 0.185 = 19.70 \text{ L/s}$$

i.e. the allowable release rate for this site is 19.70 L/s.

5.5 Proposed Stormwater Quantity Controls

The proposed stormwater management quantity control for this development will be accomplished using a flow restrictor in the storm sewer, as well as roof drains restricting the flow leaving the rooftop. Ponding required as a result of quantity control will be accomplished through a combination of rooftop storage and parking lot surface storage.
The proposed site storm sewer and stormwater management system are shown on Site Servicing Plan C-401 (Appendix E) and detailed calculations including the design sheet can be found in Appendix B.
The existing site is delineated by catchment EWS-01 (see drawing C701 in Appendix E) which currently drains uncontrolled off the site towards Morisset Ave ROW and towards the rear of the property.

The site has been analyzed and post-development watersheds have been allocated, see drawing C701 in Appendix E. Watershed WS-01consists of the landscape grassed area at the north of the building. Stormwater from this watershed will be drained to the Landscape catch-basin through overland grass swale. The catch-basin will eventually drain the stormwater to the storm sewer network within the site. Watersheds WS-02 and WS-03 consisting of asphalt parking areas will drain to their respective manholes upstream of the ICD and will be drained at a controlled release rate. Stormwater captured on the roof in the Watershed WS-04 will be controlled by the roof drains, and conveyed to the storm sewer network, downstream of the ICD. Watersheds WS-05 and WS-06, consisting of mostly grass area will flow uncontrolled towards Morisset Ave ROW. Stormwater from Watershed WS-07, consisting of the exterior landscape boundary (along south property line) and interlocking pavers (along west property line) will drain off to the proposed landscape catch-basin located at the south of the building through a grass swale. Stormwater captured within this landscape catch-basin will be drain to the storm sewer pipe, downstream of the ICD and as a result will flow uncontrolled to the city storm sewer.

Grading proposed will provide positive overland drainage to the proposed storm water management systems.

All overland stormwater captured using catch basin and catch basin manholes will ultimately be conveyed, via underground storm sewers, to the City storm sewer running along Morisset Ave. Table 1 summarizes the drainage areas, calculations can be found in Appendix B.

Table 1: Post-Development Drainage Areas

Drainage Area	Area (ha)	Weighted Runoff Coefficient	100-year Weighted Runoff Coefficient (25% increase)
WS-01 (controlled)	0.015	0.32	0.40
WS-02 (controlled)	0.049	0.82	1.00
WS-03 (controlled)	0.043	0.87	1.00
WS-04 (controlled)	0.055	0.90	1.00
WS-05 (uncontrolled)	0.003	0.22	0.28
WS-06 (uncontrolled)	0.005	0.38	0.48
WS-07 (uncontrolled)	0.014	0.51	0.64
Total	**0.185**	**0.78**	**0.97**

Tables 2 summarizes the release rates and storage volumes required to meet the allowable release rate for 100-year storm.

Table 2: Summary of Stormwater Release Rate & Storage Volume (100-Year)

Description	Area (ha)	Release Rate (L/s)	Storage Required (m^3)	Storage Provided (m^3)
WS-01 to WS-03 (ICD Controlled)	0.107	9.71	27.80	34.24
WS-04 (Roof Controlled)	0.055	3.78	18.77	27.03
WS-05 to WS-07 (Uncontrolled)	0.023	6.20	N/A	N/A
Total	**0.185**	**19.70**	**46.57**	**61.27**

The project runoff exceeding the allowable release rate will be stored on-site via surficial ponding and the building rooftop storage. The 100-year maximum ponding elevation and depths can be found on drawing “C601 – Stormwater Management Plan” of Appendix E.

5.5.1 Proposed Stormwater Quantity Controls

To throttle the 100-year storm flows, the stormwater will be controlled at CBMH03 using an Inlet Control Device (ICD), Hydrovex Vortex Flow Regulator 100VHV-1 (or approved equivalent). This ICD will control the stormwater runoff quantity during the storm events greater than 2-year. The site is graded to have a high-water level (HWL) of 97.82 m while providing storage as required with a maximum controlled release rate of 9.71 L/s (H=1.61 m) from the parking lot portion of the site. The storage created by this ICD can be seen on drawing C601 (Appendix E). Greater details on select ICD can be found in Appendix B.

While the storage required for 100- and 5-year storm events is proposed to be accommodated in the parking lot surface. The storage associated with 2-year storm event will be accommodated underground within the STM sewer (oversized pipes) and two (2) CBMHs which will provide a total storage of 9.03 m^3, see calculations included in Appendix B.

5.5.2 Rooftop Storage & Release Rates

Rooftop detention of stormwater will be achieved through outlet control with the use of six (6) proposed roof drains (Watts roof drains or approved equivalent). These Watts drains are appropriately selected with an adjustable flow control set to “closed” position which will allow a maximum discharge of 0.63 L/s at a maximum flow depth of 0.15 m. Refer to Appendix B for additional detail on rooftop release rate and storage calculations and drawing C601 (Appendix E) for the extent of roof top storage. The flow through these drains is dependent on the height of water above the drains (head) and the type & setting of the drain. The rooftop has been assumed to be low sloping providing six separate ponding areas, each with a single roof drain restricting the discharge rate to 0.63 L/s per roof drain (at a maximum head of 150mm during the 100-year storm event). This results in a total release rate of 3.78 L/s from the roof.

6 WATER SUPPLY AND FIRE PROTECTION

6.1 Existing Water Supply Services and Fire Hydrant Coverage

The subject property is located to the north of an existing 150 mm dia. water main running in the east-west direction on the south side of Morisset Avenue.
There are three (3) existing fire hydrant (FH) along Morisset Ave in proximity to the proposed site: one (1) within 76 m and two (2) additional within 305 m. A schematic summarizing the locations of each FH can be seen in Appendix C.

6.2 Water Supply Demand and Fire Flow

According to the City of Ottawa Design Guidelines, the average daily water consumption rate for residential developments is 350 L/c/d.

The interior layout and architectural floor plans (Appendix F) have been reviewed, and it was determined that the building will house sixteen (16) 1-bedroom apartments and fifteen (15) 2-bedroom apartments. Based on the City of Ottawa Design guidelines for population projection, this translates to approximately 53.9 residents. Table 3 summarizes the population count of the proposed development as interpreted using Table 4.1 of the City of Ottawa Design Guidelines-Water Distribution, 2010.

Table 3: Residential Population Estimate

Proposed Unit type	Persons Per Unit	Number of Units	Population
1-Bedroom	1.4	16	22.4
2-Bedroom	2.1	15	31.5
	Total	**31**	**53.9**

The water supply requirements for the residential units in the proposed building are calculated using the following formula:

$$Q = (q \times P \times M)$$

Where,
q = Average water consumption (L/capita/day)
P = Design population (capita)
M = Peak factor

Calculated domestic water demands are summarized below, see Appendix C for calculation details.

- Average day demand = 0.22 L/s
- Maximum daily demand = 1.63 L/s
- Peak hour demand = 18.27 L/s

The fire flow requirements were estimated using the method prescribed by Ontario Building Code (OBC). This method is based on the volume of the building to be protected, the type of construction and the separation distances with adjoining building units.

Table 4 summarize the input parameters used for the fire flow calculations. A minimum fire flow demand of 75 L/s was calculated, refer to Appendix C for the fire flow calculation sheets.

Table 4: Input Parameters for Fire Flow Calculations

Type of Construction	Total Building Volume (m^3)	Exposure Distance (Spatial Coefficient)			
		North	East	South	West
Group C-Combustible Construction (K=18)	6788	> 10 m (0.00)	> 10 m (0.00)	> 10 m (0.00)	7.8 m (0.25)

Based on the boundary condition information provided by the City (refer to Appendix C), the available pressure at the proposed connection during maximum day + fire flow condition is 256.35 kPa (37.18 psi). This exceeds the required pressure of minimum 140kPa (20 psi) ensuring compliance with the City guidelines.

6.3 Water Supply Servicing Design

The proposed development falls under the provisions of Part 9 of the Ontario Building Code and is not required to be equipped with a sprinkler system. The proposed building will be serviced by a new 100 mm dia. water service lateral. The proposed service will be connected to the existing watermain on Morisset Ave to the south-east corner of the proposed building. Refer to servicing plan C401 for the layout of the proposed water services.
Table 5 below summarizes the design criteria which have been respected during the design of the water service connections at this development.

Table 5: Water Supply Design Criteria

Design Parameter	Value
Minimum cover	2.4 m
Desired pressure range under maximum daily flow condition	350 and 480 kPa
Minimum pressure under peak hourly flow condition	275 kPa
Minimum pressure under the maximum day plus fire flow condition	140 kPa

The boundary conditions provided by the City at the Morisset Avenue connection expressed as the level of hydraulic grade line (HGL) are summarized in Table 6.

Table 6: Boundary Conditions

Water Pressure at Morisset Ave			
HGL (m)		Pressure*	
		kPa	psi
Minimum	146.9	474.05	68.76
Maximum	158.3	585.85	84.97
Max Day + Fire Flow	124.7	256.35	37.18
**Assumed ground elevation at the connection point = 98.56 m*			

Given the size and length of the proposed water service (15m-100 mm dia.), a negligible pressure loss is anticipated from the connection point to the service entry point at the proposed building. As such, the maximum pressure is anticipated to be more than 80 psi, therefore a pressure reducing valve is required as the residual pressure is not to exceed 80 psi. The required minimum pressure during peak hour and maximum day + fire flow scenarios corroborate with the design values mentioned in Table 5.

7 SANITARY SERVICE

7.1 Existing Sanitary Sewer Services

Existing infrastructure surrounding the proposed development were reviewed. It was determined that there is an existing 225 mm dia. sanitary sewer running east along Morisset Ave. Since the existing site is a parking lot, pre-development conditions did not generate sanitary flow. The post-development total peak flow was calculated to be 0.76 L/s as a result of residential population and a small portion of infiltration.

The City of Ottawa official was contacted regarding the remaining capacity of sanitary sewer along Morisset Ave. Based on the information received from the City (see Appendix D), it was confirmed that there is sufficient capacity in the sanitary sewer to accommodate the flow from this development.

7.2 Sanitary Sewer Servicing Design

The parameters used to calculate the anticipated sanitary flows are; residential average population per unit of 1.4 persons for 1-bedroom units and 2.1 persons for 2-bedroom units, a residential peaking factor of 4.0 and an infiltration rate of 0.33 L/s/ha. Based on these parameters and the total site area of 0.185 ha, the total anticipated sanitary flow was estimated to 0.76 L/s. Refer to Appendix D for the site sanitary sewer design sheet.

The proposed new building will be serviced with a new 150 mm dia. sanitary service which will connect to the existing 225 mm dia. sanitary sewer along Morisset Ave. The new service will be located at the south-east corner of the proposed building. The proposed 150mm dia. PVC sanitary service will be installed at a slope of 3% which will result calculated actual flow velocity greater than self-cleansing velocity during peak flow condition. Refer to Servicing Plan (C401) for the proposed sanitary servicing.

8 EROSION AND SEDIMENT CONTROL

During construction, erosion and sediment controls will be provided primarily via a sediment control fence to be erected along the perimeter of the site where runoff has the potential of leaving the site. Inlet sediment control devices are also to be provided in any catch basin and/or manholes in and around the site that may be impacted by the site construction. Construction and maintenance requirements for erosion and sediment controls are to comply with Ontario Provincial Standard Specification OPSS. MUNI 805. For additional details, refer to Erosion and Sediment Control Plan (C101).

9 CONCLUSION

This Stormwater Management Report and Servicing Brief for the proposed development at 1465 Morisset Avenue presents the rationale and details for the servicing requirements for the subject property.

In accordance with the report objectives, the servicing requirements for the development are summarized below:

Stormwater Management

- The storm water release rates from the proposed development will meet the pre-development allowable release rate of 19.70 L/s onto Morisset Ave.
- Stormwater quantity control will be achieved via an ICD proposed at CBMH03, which will limit the flow draining to the municipal sewer to the allowable release rate.
- Stormwater quantity control objectives will be met through on-site stormwater ponding on the roof and parking lot surface storage.

Water Service

- The anticipated maximum hour demand of the proposed development, based on estimated population & calculated peak factor, is 18.27 L/s.
- The maximum required fire flow was calculated at 75 L/s using the OBC method.
- For fire protection, there are three (3) existing fire hydrant along Morisset Ave in proximity to the proposed building.
- The proposed building will be serviced by a new 100 mm dia. water service to be connected to the existing 150 mm dia. watermain on Morisset Ave.

Sanitary Service

- The anticipated sanitary peak design flow from the proposed development is 0.76 L/s.
- The proposed building will be serviced by a new 150 mm dia. sanitary service to be connected to the existing 225 mm dia. sanitary sewer on Morisset Ave.

10 Report Conditions and Limitations

The report conclusions are applicable only to this specific project described in the preceding pages. Any changes, modifications or additions will require a subsequent review by LRL Associates Ltd. to ensure the compatibility with the recommendations contained in this document. If you have any questions or comments, please contact the undersigned.

Prepared by:
LRL Associates Ltd.

Sarthak Vora
Civil E.I.T

Mohan Basnet, P.Eng.
Civil Engineer

APPENDIX A

Pre-consultation/Correspondence

Site Plan Pre - Application Consultation Notes

Date: August 28, 2020
Site Location: 1435 Morisset
Type of Development: ☒ **Residential (**☐ **townhomes,** ☐ **stacked,** ☐ **singles,** ☐ **apartments),** ☐ **Office Space,** ☐ **Commercial,** ☐ **Retail,** ☐ **Institutional,** ☐ **Industrial, Other:** N/A
Owner/Agent: Firm Capital Properties/FOTENN Consultants
Project Manager: Adam Baker
Assigned Planner: Kelby Lodoen Unseth

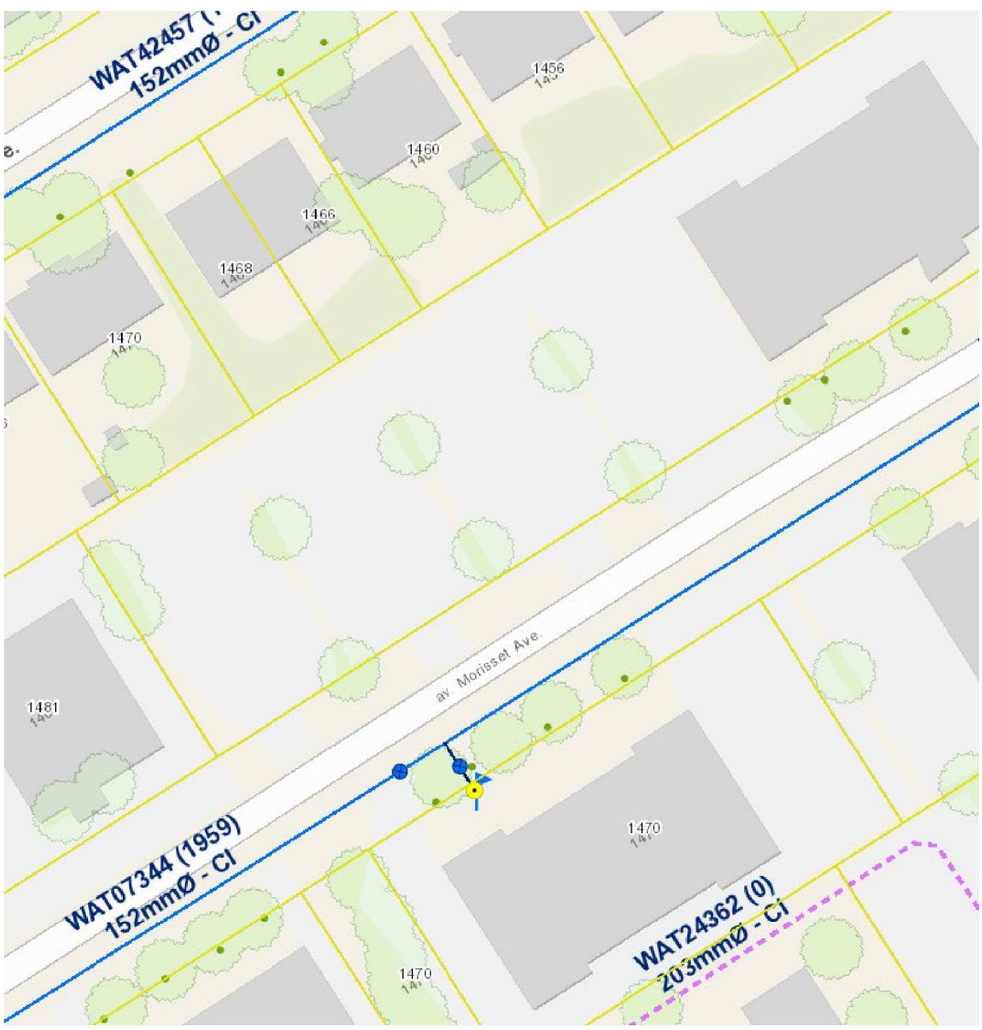
Infrastructure

Water

Please note that watermains in this area may experience lower than average pressures within the acceptable pressure range. Please submit your water boundary request to confirm these details.

Existing nearest public services:

- Morisset – 152mm Cast Iron



Watermain Frontage Fees to be paid ($190.00 per metre) ☐ **Yes** ☒ **No**

- Service areas with a basic demand greater than 50 m^3/day shall be connected with a minimum of two water services, separated by an isolation valve, to avoid creation of vulnerable service area.
- A District Metering Area Chamber (DMA) is required for services 150mm or greater in diameter.

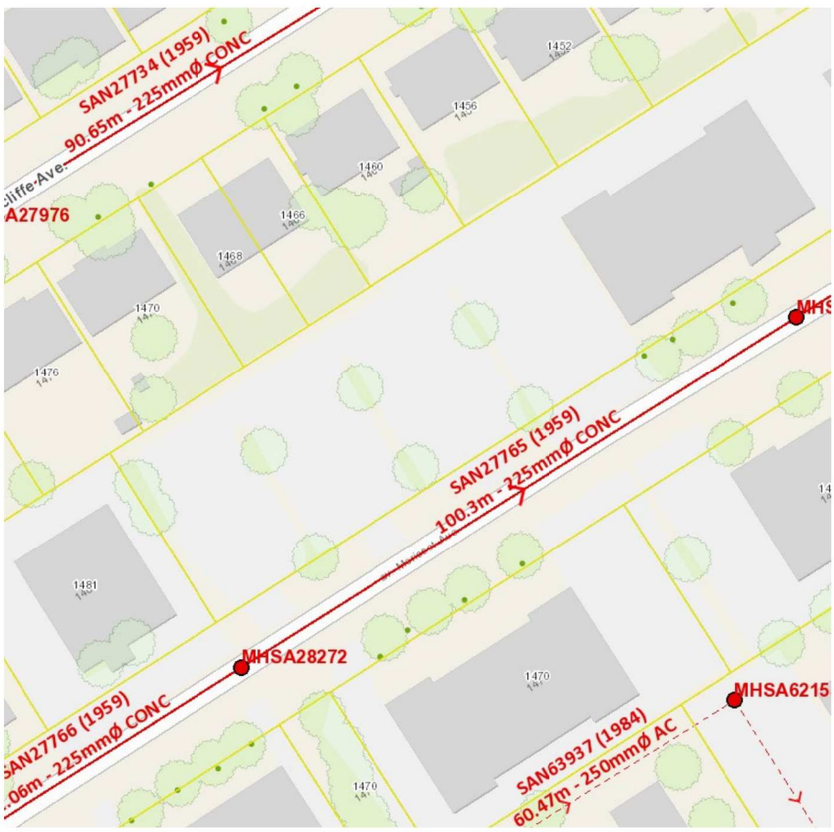
Boundary conditions:
Civil consultant must request boundary conditions from the City's assigned Project Manager prior to first submission.

- Water boundary condition requests must include the location of the service(s) and the expected loads required by the proposed developments. Please provide all the following information:
    - Location of service(s)
    - Type of development and the amount of fire flow required (as per FUS, 1999).
    - Average daily demand: ___ l/s.
    - Maximum daily demand: ___l/s.
    - Maximum hourly daily demand: ___ l/s.
- Fire protection (Fire demand, Hydrant Locations)
- A water meter sizing questionnaire [water card] will have to be completed prior to receiving a water permit (water card will be provided post approval)

Sanitary Sewer

Existing public services:

- Morisset – 225mm Conc.



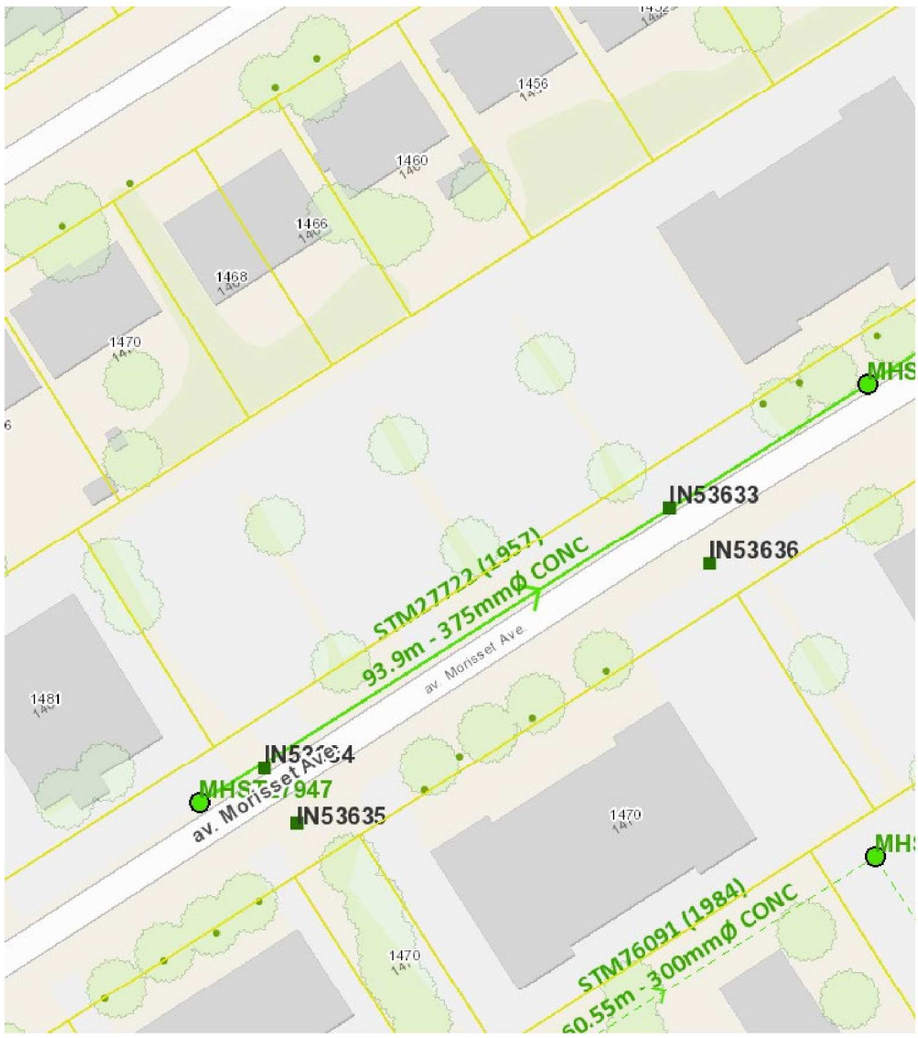
- The designer should be aware there may be limited capacity in the downstream sanitary sewer system. The sanitary demand needs to be coordinated with the City Planning Dept. to determine if the existing sanitary sewer system has sufficient capacity to support the proposed rezoning. Provide sanitary demands to the City project manager for coordination.

- Any premise in which there is commercial or institutional food preparation shall install a grease and oil inceptor on all fixtures.

Storm Sewer

Existing public services:

- Morisset – 375mm Conc.



Storm Sewer Notes:

- For concrete sewer pipe, maintenance holes shall be installed when the service is greater than 50% of the diameter of the mainline concrete pipe
- The Environmental Site Assessment (ESA) may provide recommendations where site contamination may be present. The recommendations from the ESA need to be coordinated with the servicing report to ensure compliance with the Sewer Use By-Law.

Stormwater Management

Quantity Control:

- Stormwater quantity controls will depend upon which outlet is chosen for the site. Once an outlet has been chosen, please confirm with the Project Manager the SWM criteria for the property. For the nearby public services, the criteria is as follows –
    - The pre-development runoff coefficient or a maximum equivalent 'C' of 0.5, whichever is less (§ 8.3.7.3).
    - A calculated time of concentration (Cannot be less than 10 minutes).
    - 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.

Ministry of Environment, Conservation and Parks (MECP)

All development applications should be considered for an Environmental Compliance Approval, under MECP regulations.

a. The consultants determine if an approval for sewage works under Section 53 of OWRA is required and determines what type of application. The City's project manager may help confirm and coordinate with the MECP as required.
b. The project will be either transfer of review (standard), transfer of review (additional), direct submission, or exempt as per O. Reg. 525/98.
c. Pre-consultation is not required if applying for standard or additional works (Schedule A of the Agreement) under Transfer Review.
d. Pre-consultation with local District office of MECP is recommended for direct submission.
e. Consultant completes an MECP request form for a pre-consultation. Sends request to moeccottawasewage@ontario.ca
f. ECA applications are required to be submitted online through the MECP portal. A business account required to submit ECA application. For more information visit https://www.ontario.ca/page/environmental-compliance-approval
g. It is unclear if the proposed development will remain as one property. An ECA will be required where the stormwater management services more than one property parcel.

NOTE: Site Plan Approval, or Draft Approval, is required before any Ministry of the Environment and Climate Change (MOECC) application is sent

General Service Design Comments

- The City of Ottawa requests that all new services be located within the existing service trench to minimize necessary road cuts.
- Monitoring manholes should be located within the property near the property line in an accessible location to City forces and free from obstruction (i.e. not a parking).
- Where service length is greater than 30 m between the building and the first maintenance hole / connection, a cleanout is required.
- The City of Ottawa Standard Detail Drawings should be referenced where possible for all work within the Public Right-of-Way.
- The upstream and downstream manhole top of grate and invert elevations are required for all new sewer connections.
- Services crossing the existing watermain or sewers need to clearly provide the obvert/invert elevations to demonstration minimum separation distances. A watermain crossing table may be provided.

Other

Are there are Capital Works Projects scheduled that will impact the application? ☐ **Yes** ☒ **No**

References and Resources

- As per section 53 of the Professional Engineers Act, O. Reg 941/40, R.S.O. 1990, all documents prepared by engineers must be signed and dated on the seal.
- All required plans are to be submitted on standard A1 size sheets (594mm x 841mm) sheets, utilizing a reasonable and appropriate metric scale as per City of Ottawa Servicing and Grading Plan Requirements: title blocks are to be placed on the right of the sheets and not along the bottom. Engineering plans may be combined, but the Site Plans must be provided separately. Plans shall include the survey monument used to confirm datum. Information shall be provided to enable a non-surveyor to locate the survey monument presented by the consultant.
- All required plans & reports are to be provided in *.pdf format (at application submission and for any, and all, re-submissions)
- Please find relevant City of Ottawa Links to Preparing Studies and Plans below: https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans#standards-policies-and-guidelines
- To request City of Ottawa plan(s) or report information please contact the City of Ottawa Information Centre: InformationCentre@ottawa.ca<mailto:InformationCentre@ottawa.ca> (613) 580-2424 ext. 44455
- geoOttawa http://maps.ottawa.ca/geoOttawa/

SITE PLAN APPLICATION – Municipal servicing

For information on preparing required studies and plans refer to:

http://ottawa.ca/en/development-application-review-process-0/guide-preparing-studies-and-plans

S/A	Number of copies	ENGINEERING		S/A	Number of copies
S		1. Site Servicing Plan	2. Site Servicing Study	S	
S		3. Grade Control and Drainage Plan	4. Geotechnical Study	S	
		5. Composite Utility Plan	6. Groundwater Impact Study		
		7. Servicing Options Report	8. Wellhead Protection Study		
		9. Community Transportation Study and/or Transportation Impact Study / Brief	10. Erosion and Sediment Control Plan / Brief	S	
S		11. Storm water Management Report	12. Hydro-geological and Terrain Analysis		
		13. Water main Analysis	14. Noise Study	S	
		15. Roadway Modification Design Plan	16. Confederation Line Proximity Study		

It is important to note that the need for additional studies and plans may result during application review. If following the submission of your application, it is determined that material that is not identified in this checklist is required to achieve complete application status, in accordance with the Planning Act and Official Plan requirements, City Planning will notify you of outstanding material required within the required 30 day period. Mandatory pre-application consultation will not shorten the City's standard processing timelines, or guarantee that an application will be approved. It is intended to help educate and inform the applicant about submission requirements as well as municipal processes, policies, and key issues in advance of submitting a formal development application. This list is valid for one year following the meeting date. If the application is not submitted within this timeframe the applicant must again pre-consult with the City.

Notes:

4. Geotechnical Study / Slope Stability Study – required as per Official Plan section 4.8.3. All site plan applications need to demonstrate the soils are suitable for development. A Slope Stability Study may be required with unique circumstances (Schedule K or topography may define slope stability concerns).

10. Erosion and Sediment Control Plan – required with all site plan applications as per Official Plan section 4.7.3.

11. Stormwater Management Report/Brief - required with all site plan applications as per Official Plan section 4.7.6.

14. Noise and Vibration Study – a Noise Study will be required if the noise sensitive development is proposed within 250 metres of an existing or proposed highway or a railway right-of-way, or 100 metres of an arterial or collector roadway or rapid-transit corridor. A Vibration Study will be required if the proposed development is within 75 metres of either an existing or proposed railway ROW. A Noise Study may also be required if the proposed development is adjacent to an existing or proposed stationary noise source..

APPENDIX B

Stormwater Management Calculations

Mohan Basnet

From: Baker, Adam <adam.baker@ottawa.ca>
Sent: May 27, 2021 8:22 AM
To: Mohan Basnet
Subject: RE: 200572-1435 Morisset Ave-Proposed Service Connection/SWM criteria

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Mohan,

Please accept the following information with regards to the servicing criteria –

- SWM criteria for an outlet on Morisset Avenue:
  - The 2-yr storm or 5-yr 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.
  - The pre-development runoff coefficient or a maximum equivalent 'C' of 0.5, whichever is less (§ 8.3.7.3).
  - A calculated time of concentration (Cannot be less than 10 minutes).
  - 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.
  - Please confirm any stormwater quality requirements with the relevant Conservation Authority.

- Sanitary Constraints:
  - Please confirm if the anticipated sanitary flow provided (0.76 L/s) is peak or average. From an average flow of 0.76 L/s, a resulting peak sanitary flow of 3.24 L/s is acceptable for this system. If the peak sanitary flows will exceed this, please let me know and I will re-confirm for you.

Thank you,
Adam

Adam Baker, EIT
Project Manager
Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique
Development Review - South Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 26552, Adam.Baker@ottawa.ca

From: Mohan Basnet <mbasnet@lrl.ca>
Sent: May 12, 2021 2:09 PM
To: Baker, Adam <adam.baker@ottawa.ca>
Subject: 200572-1435 Morisset Ave-Proposed Service Connection/SWM criteria

Good afternoon Adam,

At LRL, we are working for STM and servicing study for a proposed 3-storey residential apartment building at 1435 Morisset Ave.

As a follow-up from the pre-consultation notes (Aug 28, 2020):

- Can you please advise SWM criteria of the subject site with a proposed STM outlet at Morisset Ave?
- Can you also advise remaining capacity of SAN sewer along Morisset Ave? Anticipated SAN flow from the proposed building is 0.76 L/s

For your reference I have also attached schematic of proposed service connections.

Please let me know if you have any question.

Thank you,

Mohan Basnet, P.Eng.
Civil Engineering Services
LRL Associates Ltd.
5430 Canotek Road
Ottawa, Ontario K1J 9G2
T (613) 842-3434 or (877) 632-5664 ext 213
F (613) 842-4338
E mbasnet@lrl.ca
W www.lrl.ca

Given the current COVID-19 situation, please be aware that LRL has implemented alternative working conditions for our team. Many of us have now transitioned to working from home; however, communication and workability remains one of our top priorities.
We will continue to be reachable by cell phone or by calling LRL at 613-842-3434 which will prompt you to enter the extension of the person you are trying to reach.
In addition, we will continue to have access to all e-mail correspondence and do our best to return all inquiries in a timely manner.

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Mohan Basnet

From: Jamie Batchelor <jamie.batchelor@rvca.ca>
Sent: April 29, 2021 9:25 PM
To: Mohan Basnet
Cc: Eric Lalande
Subject: RE: 200572-1435/1455 Morisset Ave Proposed Residential Development - Stormwater Quality Control

Follow Up Flag: Follow up
Flag Status: Flagged

Good Evening Mohan,

Based on the distance of the downstream outlet being more than 2km from the site, the RVCA accepts that no additional on-site water quality treatment measures are required save and except best management practices. The RVCA strongly encourages that you explore the opportunity to incorporate LID measures in the stormwater management plan.

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

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

From: Mohan Basnet <mbasnet@lrl.ca>
Sent: Wednesday, April 28, 2021 4:00 PM
To: Jamie Batchelor <jamie.batchelor@rvca.ca>
Subject: 200572-1435/1455 Morisset Ave Proposed Residential Development - Stormwater Quality Control

Hello Jamie,

We are working for a proposed 4-Storey Residential Development at 1435/1455 Morisset Ave, Ottawa. The existing site is a paved surface parking lot. The proposed development will also include paved parking lot providing 28 parking spots.

For stormwater management, we are planning to discharge controlled stormwater in a municipal storm sewer along Morisset Ave. Could you please advise stormwater quality control requirement for this site?

Thank you.

Mohan

Mohan Basnet, P.Eng.

Civil Engineering Services

LRL Associates Ltd.

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In addition, we will continue to have access to all e-mail correspondence and do our best to return all inquiries in a timely manner.

LRL Associates Ltd.

Storm Watershed Summary

LRL File No. 200572
Project: Proposed 3-Storey Apartment Building
Location: 1465 Morisset Ave, Ottawa
Date: December 18, 2024
Designed: Sarthak Vora
Checked: Mohan Basnet
Dwg Reference: C701, C702

Pre-Development Catchments

Watershed	C = 0.20	C = 0.80	C = 0.90	Total Area (ha)	Combined C
EWS-01 (uncontrolled)	0.000	0.000	0.185	0.185	0.90
Total	**0.000**	**0.000**	**0.185**	**0.185**	**0.90**

Post-Development Catchments

Watershed	C = 0.20	C = 0.8	C = 0.90	Total Area (ha)	Combined C
WS-01 (controlled)	0.012	0.003	0.000	0.015	0.32
WS-02 (controlled)	0.005	0.000	0.044	0.049	0.82
WS-03 (controlled)	0.002	0.000	0.041	0.043	0.87
WS-04 (controlled)	0.000	0.000	0.055	0.055	0.90
WS-05 (uncontrolled)	0.003	0.000	0.0001	0.003	0.22
WS-06 (uncontrolled)	0.004	0.000	0.001	0.005	0.38
WS-07 (uncontrolled)	0.008	0.000	0.006	0.014	0.51
Total	**0.034**	**0.003**	**0.148**	**0.185**	**0.77**

LRL File No. 200572
Project: Proposed 3-Storey Apartment Building
Location: 1465 Morisset Ave, Ottawa
Date: December 18, 2024
Designed: M. Basnet
Drawing Ref.: C601

Stormwater Management

STORM - 100 YEAR + "Stress Test"

Runoff Equation

Q = 2.78CIA (L/s)
C = Runoff coefficient
I = Rainfall intensity (mm/hr) = A / (Td + C)^{B}
A = Area (ha)
Td = Time of duration (min)

Pre-Development Catchments within Development Area

	Total Area =	**0.185**	**ha**	**∑R =**	**0.90**
	EWS-01 (uncontrolled)	0.185	ha	R =	0.90
	Total Un-controlled =	**0.185**	**ha**	**∑R =**	**0.90**

Pre-Development Release Rate

IDF Curve Equations

100-Year, I_{100} = $1735.688 / (Td + 6.014)^{0.820}$ A = 1735.688 B = 0.820 C = 6.014

5-Year, I_5 = $998.071 / (Td + 6.053)^{0.814}$ A = 998.071 B = 0.814 C = 6.053

2-Year, I_2 = $732.951 / (Td + 6.199)^{0.810}$ A = 732.951 B = 0.810 C = 6.199

C =	0.50	(max 0.5 as per City Guidelines-Sewer)
I_{100} =	178.6	mm/hr
I_5 =	104.2	mm/hr
I_2 =	76.8	mm/hr
Td =	10	min
100-year Release Rate =	45.79	L/s
5-year Release Rate =	26.72	L/s
2-year Release Rate =	19.70	L/s
Allowable Release Rate =	**19.70**	L/s
(2-year pre-development level)		

Post-development Stormwater Management

					$\sum R_{2\&5}$	$\sum R_{100}$
	Total Site Area =	**0.185**	**ha**	**∑R =**	**0.77**	**0.96**
	WS-01 (controlled)	0.015	ha	R =	0.32	0.40
	WS-02 (controlled)	0.049	ha	R =	0.82	1.00
	WS-03 (controlled)	0.043	ha	R =	0.87	1.00
Roof	WS-04 (controlled)	0.055	ha	R =	0.90	1.00
	Total (Controlled)	**0.162**	**ha**	**R =**	**0.82**	**1.00**
	WS-05 (uncontrolled)	0.003	ha	R =	0.22	0.27
	WS-06 (uncontrolled)	0.005	ha	R =	0.38	0.48
	WS-07 (uncontrolled)	0.014	ha	R =	0.51	0.64
	Total (Uncontrolled)	**0.023**	**ha**	**R =**	**0.44**	**0.55**
	Total	**0.185**	**ha**	**R =**	**0.77**	**0.96**

LRL File No. 200572
Project: Proposed 3-Storey Apartment Building
Location: 1465 Morisset Ave, Ottawa
Date: December 18, 2024
Designed: M. Basnet
Drawing Ref.: C601

Stormwater Management

100-Year Post-development Stormwater Management (WS-04 Roof)

Time (min)	*Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m^3)	Controlled Release Rate (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	214.27	33.00	17.53	3.78	0.00	3.78
15	171.47	26.41	20.37	3.78	0.00	3.78
20	143.94	22.17	22.07	3.78	0.00	3.78
25	124.62	19.19	23.12	3.78	0.00	3.78
30	110.24	16.98	23.76	3.78	0.00	3.78
35	99.09	15.26	24.11	3.78	0.00	3.78
40	90.17	13.89	24.26	3.78	0.00	3.78
45	82.86	12.76	24.25	3.78	0.00	3.78
50	76.74	11.82	24.12	3.78	0.00	3.78
55	71.55	11.02	23.89	3.78	0.00	3.78
60	67.07	10.33	23.58	3.78	0.00	3.78
65	63.18	9.73	23.20	3.78	0.00	3.78
70	59.75	9.20	22.77	3.78	0.00	3.78
75	56.71	8.73	22.29	3.78	0.00	3.78
80	53.99	8.31	21.77	3.78	0.00	3.78
85	51.54	7.94	21.21	3.78	0.00	3.78
90	49.33	7.60	20.62	3.78	0.00	3.78
95	47.32	7.29	20.00	3.78	0.00	3.78
100	45.48	7.01	19.35	3.78	0.00	3.78
105	43.80	6.75	18.68	3.78	0.00	3.78
110	42.24	6.51	17.99	3.78	0.00	3.78
115	40.81	6.28	17.28	3.78	0.00	3.78
120	39.47	6.08	16.56	3.78	0.00	3.78

Note: *20% increase in rainfall values

On-site stormwater detention

Storage required = 24.26 m^3

Storage provided

Avaiable roof surface for storage = 540.60 m^2
Maximum ponding depth = 150 mm — Overflow scuppers to be installed at this height
Avaialbe roof storage = 27.03 m^3
Proposed roof drains: WATTS adjustable roof drain w/ weir opening-closed
Maximum flow per roof drain = 0.63 L/s
Number of roof drain = 6
Total flow from roof drains = 3.79 L/s

100-Year Post-development Stormwater Management (except WS-04 Roof)

Time (min)	*Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m^3)	Controlled Release Rate (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	214.27	58.28	29.14	9.71	7.44	17.16
15	171.47	46.64	33.23	9.71	5.96	15.67
20	143.94	39.15	35.32	9.71	5.00	14.71
25	124.62	33.89	36.27	9.71	4.33	14.04
30	110.24	29.98	36.49	9.71	3.83	13.54
35	99.09	26.95	36.20	9.71	3.44	13.16
40	90.17	24.53	35.55	9.71	3.13	12.85
45	82.86	22.54	34.62	9.71	2.88	12.59
50	76.74	20.87	33.48	9.71	2.67	12.38
55	71.55	19.46	32.16	9.71	2.49	12.20
60	67.07	18.24	30.71	9.71	2.33	12.04
65	63.18	17.18	29.13	9.71	2.20	11.91
70	59.75	16.25	27.46	9.71	2.08	11.79
75	56.71	15.42	25.69	9.71	1.97	11.68
80	53.99	14.68	23.86	9.71	1.88	11.59
85	51.54	14.02	21.96	9.71	1.79	11.50
90	49.33	13.42	20.00	9.71	1.71	11.43
95	47.32	12.87	18.00	9.71	1.64	11.36
100	45.48	12.37	15.95	9.71	1.58	11.29
105	43.80	11.91	13.85	9.71	1.52	11.23
110	42.24	11.49	11.72	9.71	1.47	11.18
115	40.81	11.10	9.56	9.71	1.42	11.13
120	39.47	10.74	7.37	9.71	1.37	11.08

Note: *20% increase in rainfall values

On-site stormwater detention

Storage required = 36.49 m^3
Storage provided = 36.37 m^3 — (Parking lot surface storage)

LRL File No. 200572
Project: Proposed 3-Storey Apartment Building
Location: 1465 Morisset Ave, Ottawa
Date: December 18, 2024
Designed: M. Basnet
Drawing Ref.: C601

Stormwater Management

STORM - 100 YEAR

Runoff Equation

Q = 2.78CIA (L/s)
C = Runoff coefficient
I = Rainfall intensity (mm/hr) = A / (Td + C)^{B}
A = Area (ha)
Td = Time of duration (min)

Pre-Development Catchments within Development Area

	Total Area =	**0.185**	**ha**	**∑R =**	**0.90**
	EWS-01 (uncontrolled)	0.185	ha	R =	0.90
	Total Uncontrolled =	**0.185**	**ha**	**∑R =**	**0.90**

Pre-Development Release Rate

IDF Curve Equations

100-Year, I_{100} = $1735.688 / (Td + 6.014)^{0.820}$ A = 1735.688 B = 0.820 C = 6.014

5-Year, I_5 = $998.071 / (Td + 6.053)^{0.814}$ A = 998.071 B = 0.814 C = 6.053

2-Year, I_2 = $732.951 / (Td + 6.199)^{0.810}$ A = 732.951 B = 0.810 C = 6.199

C =	0.50	(max 0.5 as per City Guidelines-Sewer)
I_{100} =	178.6	mm/hr
I_5 =	104.2	mm/hr
I_2 =	76.8	mm/hr
Td =	10	min
100-year Release Rate =	45.79	L/s
5-year Release Rate =	26.72	L/s
2-year Release Rate =	19.70	L/s
Allowable Release Rate =	**19.70**	L/s
(2-year pre-development level)		

Post-development Stormwater Management

					$\sum R_{2\&5}$	$\sum R_{100}$
	Total Site Area =	**0.185**	**ha**	**∑R =**	**0.77**	**0.96**
	WS-01 (controlled)	0.015	ha	R =	0.32	0.40
	WS-02 (controlled)	0.049	ha	R =	0.82	1.00
	WS-03 (controlled)	0.043	ha	R =	0.87	1.00
Roof	WS-04 (controlled)	0.055	ha	R =	0.90	1.00
	Total (Controlled)	**0.162**	**ha**	**R =**	**0.82**	**1.00**
	WS-05 (uncontrolled)	0.003	ha	R =	0.22	0.27
	WS-06 (uncontrolled)	0.005	ha	R =	0.38	0.48
	WS-07 (uncontrolled)	0.014	ha	R =	0.51	0.64
	Total (Uncontrolled)	**0.023**	**ha**	**R =**	**0.44**	**0.55**
	Total	**0.185**	**ha**	**R =**	**0.77**	**0.96**

LRL File No. 200572
Project: Proposed 3-Storey Apartment Building
Location: 1465 Morisset Ave, Ottawa
Date: December 18, 2024
Designed: M. Basnet
Drawing Ref.: C601

Stormwater Management

100-Year Post-development Stormwater Management (WS-04 Roof)

Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m^3)	Controlled Release Rate (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	178.56	27.50	14.23	3.78	0.00	3.78
15	142.89	22.01	16.40	3.78	0.00	3.78
20	119.95	18.47	17.63	3.78	0.00	3.78
25	103.85	15.99	18.32	3.78	0.00	3.78
30	91.87	14.15	18.66	3.78	0.00	3.78
35	82.58	12.72	18.77	3.78	0.00	3.78
40	75.15	11.57	18.70	3.78	0.00	3.78
45	69.05	10.63	18.51	3.78	0.00	3.78
50	63.95	9.85	18.21	3.78	0.00	3.78
55	59.62	9.18	17.83	3.78	0.00	3.78
60	55.89	8.61	17.38	3.78	0.00	3.78
65	52.65	8.11	16.88	3.78	0.00	3.78
70	49.79	7.67	16.33	3.78	0.00	3.78
75	47.26	7.28	15.74	3.78	0.00	3.78
80	44.99	6.93	15.12	3.78	0.00	3.78
85	42.95	6.62	14.46	3.78	0.00	3.78
90	41.11	6.33	13.78	3.78	0.00	3.78
95	39.43	6.07	13.07	3.78	0.00	3.78
100	37.90	5.84	12.35	3.78	0.00	3.78
105	36.50	5.62	11.60	3.78	0.00	3.78
110	35.20	5.42	10.83	3.78	0.00	3.78
115	34.01	5.24	10.05	3.78	0.00	3.78
120	32.89	5.07	9.26	3.78	0.00	3.78

On-site stormwater detention

Storage required = **18.77** **m^3**

Storage provided

Avaiable roof surface for storage = 540.60 m^2
Maximum ponding depth = 150 mm
Avaialbe roof storage = **27.03** **m^3**
Proposed roof drains: WATTS adjustable roof drain w/ weir opening-closed
Maximum flow per roof drain = 0.63 L/s
Number of roof drain = 6
Total flow from roof drains = 3.78 L/s

100-Year Post-development Stormwater Management (except WS-04 Roof)

Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m^3)	Controlled Release Rate (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	178.56	48.56	23.31	9.71	6.20	15.92
15	142.89	38.86	26.24	9.71	4.96	14.68
20	119.95	32.62	27.49	9.71	4.17	13.88
25	103.85	28.24	27.80	9.71	3.61	13.32
30	91.87	24.99	27.49	9.71	3.19	12.90
35	82.58	22.46	26.77	9.71	2.87	12.58
40	75.15	20.44	25.74	9.71	2.61	12.32
45	69.05	18.78	24.48	9.71	2.40	12.11
50	63.95	17.39	23.04	9.71	2.22	11.93
55	59.62	16.22	21.46	9.71	2.07	11.78
60	55.89	15.20	19.76	9.71	1.94	11.65
65	52.65	14.32	17.96	9.71	1.83	11.54
70	49.79	13.54	16.08	9.71	1.73	11.44
75	47.26	12.85	14.13	9.71	1.64	11.35
80	44.99	12.24	12.11	9.71	1.56	11.28
85	42.95	11.68	10.04	9.71	1.49	11.21
90	41.11	11.18	7.93	9.71	1.43	11.14
95	39.43	10.73	5.77	9.71	1.37	11.08
100	37.90	10.31	3.57	9.71	1.32	11.03
105	36.50	9.93	1.35	9.71	1.27	10.98
110	35.20	9.57	0.00	9.71	1.22	10.94
115	34.01	9.25	0.00	9.71	1.18	10.89
120	32.89	8.95	0.00	9.71	1.14	10.86

On-site stormwater detention

Storage required = **27.80** **m^3**
Storage provided = **34.24** **m^3** (Parking lot surface storage)

LRL File No. 200572
Project: Proposed 3-Storey Apartment Building
Location: 1465 Morisset Ave, Ottawa
Date: December 18, 2024
Designed: M. Basnet
Drawing Ref.: C601

Stormwater Management

STORM - 5 YEAR

Runoff Equation

Q = 2.78CIA (L/s)
C = Runoff coefficient
I = Rainfall intensity (mm/hr) = $A / (Td + C)^B$
A = Area (ha)
Td = Time of duration (min)

Pre-Development Catchments within Development Area

	Total Area =	**0.185**	**ha**	**∑R =**	**0.90**
	EWS-01 (uncontrolled)	0.185	ha	R =	0.90
	Total Un-controlled =	**0.185**	**ha**	**∑R =**	**0.90**

Pre-Development Release Rate

IDF Curve Equations

100-Year, $I_{100} = 1735.688 / (Td + 6.014)^{0.820}$ A = 1735.688 B = 0.820 C = 6.014

5-Year, $I_5 = 998.071 / (Td + 6.053)^{0.814}$ A = 998.071 B = 0.814 C = 6.053

2-Year, $I_2 = 732.951 / (Td + 6.199)^{0.810}$ A = 732.951 B = 0.810 C = 6.199

C =	0.50	(max 0.5 as per City Guidelines-Sewer)
I_{100} =	178.6	mm/hr
I_5 =	104.2	mm/hr
I_2 =	76.8	mm/hr
Td =	10	min
100-year Release Rate =	45.79	L/s
5-year Release Rate =	26.72	L/s
2-year Release Rate =	19.70	L/s
Allowable Release Rate = (2-year pre-development level)	**19.70**	L/s

Post-development Stormwater Management

					$∑R_{2\&5}$	$∑R_{100}$
	Total Site Area =	**0.185**	**ha**	**∑R =**	**0.77**	**0.96**
	WS-01 (controlled)	0.015	ha	R =	0.32	0.40
	WS-02 (controlled)	0.049	ha	R =	0.82	1.00
	WS-03 (controlled)	0.043	ha	R =	0.87	1.00
Roof	WS-04 (controlled)	0.055	ha	R =	0.90	1.00
	Total (Controlled)	**0.162**	**ha**	**R =**	**0.82**	**1.00**
	WS-05 (uncontrolled)	0.003	ha	R =	0.22	0.27
	WS-06 (uncontrolled)	0.005	ha	R =	0.38	0.48
	WS-07 (uncontrolled)	0.014	ha	R =	0.51	0.64
	Total (Uncontrolled)	**0.023**	**ha**	**R =**	**0.44**	**0.55**
	Total (Controlled+Uncontrolled)	**0.185**	**ha**	**R =**	**0.77**	**0.96**

LRL File No. 200572
Project: Proposed 3-Storey Apartment Building
Location: 1465 Morisset Ave, Ottawa
Date: December 18, 2024
Designed: M. Basnet
Drawing Ref.: C601

Stormwater Management

5-Year Post-development Stormwater Management (WS-04 Roof)

Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m^3)	Controlled Release Rate (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	104.19	14.44	6.40	3.78	0.00	3.78
15	83.56	11.58	7.02	3.78	0.00	3.78
20	70.25	9.74	7.15	3.78	0.00	3.78
25	60.90	8.44	6.99	3.78	0.00	3.78
30	53.93	7.47	6.65	3.78	0.00	3.78
35	48.52	6.73	6.18	3.78	0.00	3.78
40	44.18	6.12	5.63	3.78	0.00	3.78
45	40.63	5.63	5.00	3.78	0.00	3.78
50	37.65	5.22	4.32	3.78	0.00	3.78
55	35.12	4.87	3.59	3.78	0.00	3.78
60	32.94	4.57	2.83	3.78	0.00	3.78
65	31.04	4.30	2.04	3.78	0.00	3.78
70	29.37	4.07	1.22	3.78	0.00	3.78
75	27.89	3.87	0.39	3.78	0.00	3.78
80	26.56	3.68	0.00	3.78	0.00	3.78
85	25.37	3.52	0.00	3.78	0.00	3.78
90	24.29	3.37	0.00	3.78	0.00	3.78
95	23.31	3.23	0.00	3.78	0.00	3.78
100	22.41	3.11	0.00	3.78	0.00	3.78
105	21.58	2.99	0.00	3.78	0.00	3.78
110	20.82	2.89	0.00	3.78	0.00	3.78
115	20.12	2.79	0.00	3.78	0.00	3.78
120	19.47	2.70	0.00	3.78	0.00	3.78

On-site stormwater detention

Storage required = 7.15 m^3

Storage provided

Avaiable roof surface for storage = 540.60 m^2

Maximum ponding depth = 150 mm

Avaialbe roof storage = 27.03 m^3

Proposed roof drains = Six (6) WATTS adjustable roof drain w/ weir opening-closed

5-Year Post-development Stormwater Management (except WS-04 Roof)

Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m^3)	Controlled Release Rate (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	104.19	23.93	8.53	9.71	2.90	12.61
15	83.56	19.19	8.53	9.71	2.32	12.04
20	70.25	16.13	7.70	9.71	1.95	11.67
25	60.90	13.98	6.41	9.71	1.69	11.41
30	53.93	12.38	4.81	9.71	1.50	11.21
35	48.52	11.14	3.00	9.71	1.35	11.06
40	44.18	10.15	1.04	9.71	1.23	10.94
45	40.63	9.33	0.00	9.71	1.13	10.84
50	37.65	8.65	0.00	9.71	1.05	10.76
55	35.12	8.07	0.00	9.71	0.98	10.69
60	32.94	7.57	0.00	9.71	0.92	10.63
65	31.04	7.13	0.00	9.71	0.86	10.58
70	29.37	6.75	0.00	9.71	0.82	10.53
75	27.89	6.40	0.00	9.71	0.78	10.49
80	26.56	6.10	0.00	9.71	0.74	10.45
85	25.37	5.83	0.00	9.71	0.71	10.42
90	24.29	5.58	0.00	9.71	0.68	10.39
95	23.31	5.35	0.00	9.71	0.65	10.36
100	22.41	5.15	0.00	9.71	0.62	10.34
105	21.58	4.96	0.00	9.71	0.60	10.31
110	20.82	4.78	0.00	9.71	0.58	10.29
115	20.12	4.62	0.00	9.71	0.56	10.27
120	19.47	4.47	0.00	9.71	0.54	10.25

On-site stormwater detention

Storage required = 8.53 m^3

Storage provided = 34.24 m^3 (Parking lot surface storage)

LRL File No. 200572
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Designed: M. Basnet
Drawing Ref.: C601

Stormwater Management

STORM - 2 YEAR

Runoff Equation

Q = 2.78CIA (L/s)
C = Runoff coefficient
I = Rainfall intensity (mm/hr) = A / (Td + C)^{B}
A = Area (ha)
Td = Time of duration (min)

Pre-Development Catchments within Development Area

	Total Area =	**0.185**	**ha**	**∑R =**	**0.90**
	EWS-01 (uncontrolled)	0.185	ha	R =	0.90
	Total Un-controlled =	**0.185**	**ha**	**∑R =**	**0.90**

Pre-Development Release Rate

IDF Curve Equations

100-Year, I_{100} = $1735.688 / (Td + 6.014)^{0.820}$ A = 1735.688 B = 0.820 C = 6.014

5-Year, I_5 = $998.071 / (Td + 6.053)^{0.814}$ A = 998.071 B = 0.814 C = 6.053

2-Year, I_2 = $732.951 / (Td + 6.199)^{0.810}$ A = 732.951 B = 0.810 C = 6.199

C =	0.50	(max 0.5 as per City Guidelines-Sewer)
I_{100} =	178.6	mm/hr
I_5 =	104.2	mm/hr
I_2 =	76.8	mm/hr
Td =	10	min
100-year Release Rate =	45.79	L/s
5-year Release Rate =	26.72	L/s
2-year Release Rate =	19.70	L/s
Allowable Release Rate =	**19.70**	L/s
(2-year pre-development level)		

Post-development Stormwater Management

					$\sum R_{2\&5}$	$\sum R_{100}$
	Total Site Area =	**0.185**	**ha**	**∑R =**	**0.77**	**0.96**
	WS-01 (controlled)	0.015	ha	R =	0.32	0.40
	WS-02 (controlled)	0.049	ha	R =	0.82	1.00
	WS-03 (controlled)	0.043	ha	R =	0.87	1.00
Roof	WS-04 (controlled)	0.055	ha	R =	0.90	1.00
	Total (Controlled)	**0.162**	**ha**	**R =**	**0.82**	**1.00**
	WS-05 (uncontrolled)	0.003	ha	R =	0.22	0.27
	WS-06 (uncontrolled)	0.005	ha	R =	0.38	0.48
	WS-07 (uncontrolled)	0.014	ha	R =	0.51	0.64
	Total (Uncontrolled)	**0.023**	**ha**	**R =**	**0.44**	**0.55**
	Total	**0.185**	**ha**	**R =**	**0.77**	**0.96**

LRL File No. 200572
Project: Proposed 3-Storey Apartment Building
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Designed: M. Basnet
Drawing Ref.: C601

Stormwater Management

2-Year Post-development Stormwater Management (WS-04 Roof)

Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m^3)	Controlled Release Rate (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	76.81	10.65	4.12	3.78	0.00	3.78
15	61.77	8.56	4.30	3.78	0.00	3.78
20	52.03	7.21	4.12	3.78	0.00	3.78
25	45.17	6.26	3.72	3.78	0.00	3.78
30	40.04	5.55	3.19	3.78	0.00	3.78
35	36.06	5.00	2.56	3.78	0.00	3.78
40	32.86	4.56	1.86	3.78	0.00	3.78
45	30.24	4.19	1.11	3.78	0.00	3.78
50	28.04	3.89	0.32	3.78	0.00	3.78
55	26.17	3.63	0.00	3.78	0.00	3.78
60	24.56	3.40	0.00	3.78	0.00	3.78
65	23.15	3.21	0.00	3.78	0.00	3.78
70	21.91	3.04	0.00	3.78	0.00	3.78
75	20.81	2.88	0.00	3.78	0.00	3.78
80	19.83	2.75	0.00	3.78	0.00	3.78
85	18.94	2.63	0.00	3.78	0.00	3.78
90	18.14	2.51	0.00	3.78	0.00	3.78
95	17.41	2.41	0.00	3.78	0.00	3.78
100	16.75	2.32	0.00	3.78	0.00	3.78
105	16.13	2.24	0.00	3.78	0.00	3.78
110	15.57	2.16	0.00	3.78	0.00	3.78
115	15.05	2.09	0.00	3.78	0.00	3.78
120	14.56	2.02	0.00	3.78	0.00	3.78

On-site stormwater detention

Storage required = 4.30 m^3

Storage provided

Avaiable roof surface for storage = 540.60 m^2
Maximum ponding depth = 150 mm
Avaialbe roof storage = 27.03 m^3
Proposed roof drains = Six (6) WATTS adjustable roof drain w/ weir opening-closed

2-Year Post-development Stormwater Management (except WS-04 Roof)-surface storage consideration

Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m^3)	Controlled Release Rate (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	76.81	17.64	4.76	9.71	2.13	11.85
15	61.77	14.18	4.02	9.71	1.72	11.43
20	52.03	11.95	2.68	9.71	1.45	11.16
25	45.17	10.37	0.99	9.71	1.26	10.97
30	40.04	9.20	0.00	9.71	1.11	10.83
35	36.06	8.28	0.00	9.71	1.00	10.72
40	32.86	7.55	0.00	9.71	0.91	10.63
45	30.24	6.94	0.00	9.71	0.84	10.55
50	28.04	6.44	0.00	9.71	0.78	10.49
55	26.17	6.01	0.00	9.71	0.73	10.44
60	24.56	5.64	0.00	9.71	0.68	10.40
65	23.15	5.32	0.00	9.71	0.64	10.36
70	21.91	5.03	0.00	9.71	0.61	10.32
75	20.81	4.78	0.00	9.71	0.58	10.29
80	19.83	4.55	0.00	9.71	0.55	10.26
85	18.94	4.35	0.00	9.71	0.53	10.24
90	18.14	4.17	0.00	9.71	0.50	10.22
95	17.41	4.00	0.00	9.71	0.48	10.20
100	16.75	3.85	0.00	9.71	0.47	10.18
105	16.13	3.71	0.00	9.71	0.45	10.16
110	15.57	3.58	0.00	9.71	0.43	10.15
115	15.05	3.46	0.00	9.71	0.42	10.13
120	14.56	3.34	0.00	9.71	0.40	10.12

On-site stormwater detention **Storage required = 4.76 m^3**

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Designed: M. Basnet
Drawing Ref.: C601

Stormwater Management

2-Year Post-development Stormwater Management (except WS-04 Roof)-underground storage consideration

Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m^3)	*Controlled Release Rate (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	76.81	17.64	7.67	4.86	2.13	6.99
15	61.77	14.18	8.40	4.86	1.72	6.57
20	52.03	11.95	8.51	4.86	1.45	6.30
25	45.17	10.37	8.27	4.86	1.26	6.11
30	40.04	9.20	7.81	4.86	1.11	5.97
35	36.06	8.28	7.19	4.86	1.00	5.86
40	32.86	7.55	6.46	4.86	0.91	5.77
45	30.24	6.94	5.64	4.86	0.84	5.70
50	28.04	6.44	4.75	4.86	0.78	5.64
55	26.17	6.01	3.81	4.86	0.73	5.58
60	24.56	5.64	2.82	4.86	0.68	5.54
65	23.15	5.32	1.79	4.86	0.64	5.50
70	21.91	5.03	0.74	4.86	0.61	5.47
75	20.81	4.78	0.00	4.86	0.58	5.43
80	19.83	4.55	0.00	4.86	0.55	5.41
85	18.94	4.35	0.00	4.86	0.53	5.38
90	18.14	4.17	0.00	4.86	0.50	5.36
95	17.41	4.00	0.00	4.86	0.48	5.34
100	16.75	3.85	0.00	4.86	0.47	5.32
105	16.13	3.71	0.00	4.86	0.45	5.30
110	15.57	3.58	0.00	4.86	0.43	5.29
115	15.05	3.46	0.00	4.86	0.42	5.27
120	14.56	3.34	0.00	4.86	0.40	5.26

Note: *50% of controlled release rate for underground storage consideration

On-site stormwater detention

Storage required = 8.51 m^3

Available Storage

Pipe Storage

STM Pipe Length = 38.4 m

STM Pipe dia. = 0.45 m

Storage Volume = 6.11 m^3

CBMH Storage

	dia. (m)	Depth (T/G -Inv) (m)	Storage Volume (m^3)
CBMH02	1.2	1.27	1.44
CBMH03	1.2	1.31	1.48
		Total	**2.92**

Total Available Underground Storage = 9.03 m^3

LRL File No. 200572
Project: Proposed 3-Storey Apartment Building
Location: 1465 Morisset Ave, Ottawa
Date: December 18, 2024
Designed: M. Basnet
Dwg. Reference: C401,C702

Rational Method
Q = 2.78CIA
Q = Peak flow (L/s)
A = Drainage area (ha)
C = Runoff coefficient
I = Rainfall intensity (mm/hr)

Runoff coefficient (C)
Grass = 0.2
Gravel = 0.8
Asphalt / rooftop = 0.9

IDF curve
Ottawa Macdonald-Cartier International Airport
Storm event: 2 Years
Intensity equation:
$I_2 = 732.951 / (Td + 6.199)^{0.810}$ (mm/hr)

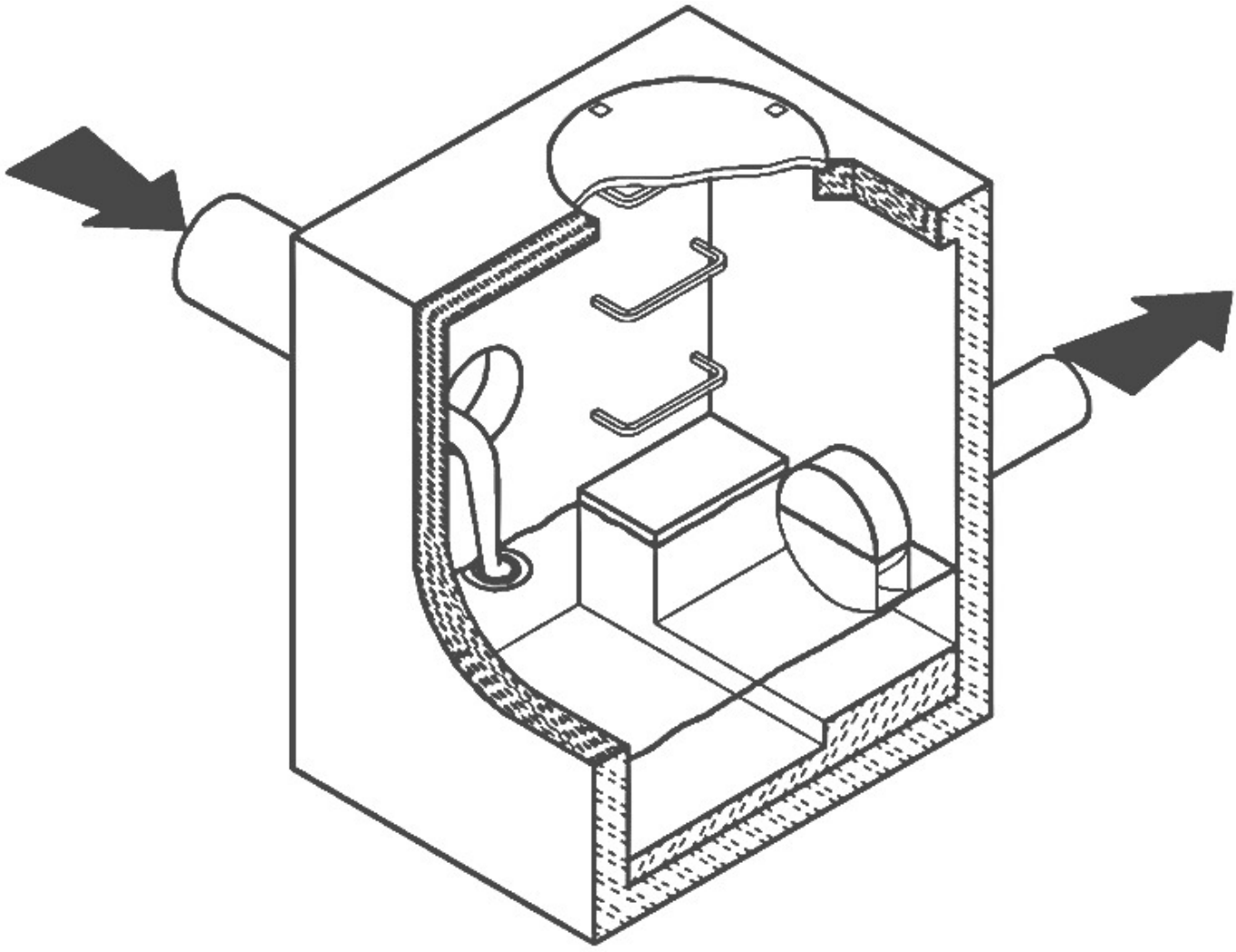
Pipe Design Parameters
Minimum velocity = 0.80 m/s
Manning's "n" = 0.013

LOCATION			AREA (ha)			FLOW						STORM SEWER							
WATERSHED / STREET	From MH	To MH	C = 0.20	C = 0.80	C = 0.90	Indiv. 2.78AC	Accum. 2.78AC	Time of Conc.	Rainfall Intensity	Peak Flow (Q)	Controlled Flow (Q)	Pipe Dia.	Type	Slope	Length	Capacity Full (Q_{FULL})	Velocity Full	Time of Flow	Ratio Q /Q_{FULL}
								(min)	(mm/hr)	(L/s)	(L/s)	(mm)		(%)	(m)	(L/s)	(m/s)	(min)	
WS-01	CB01	CBMH02	0.012	0.003	0.000	0.01	0.01	10.00	76.81	1.01		450	CONC	0.34%	24.2	166.24	1.05	0.39	0.01
WS-02	CBMH02	CBMH03	0.005	0.000	0.044	0.11	0.13	10.39	75.35	9.51		450	CONC	0.30%	14.2	156.16	0.98	0.24	0.06
WS-07	CB 04	STM Connection*	0.008	0.000	0.006	0.02	0.02	10.00	76.81	1.55		200	PVC	3.00%	22.7	56.81	1.81	0.21	0.03
WS-03	CBMH03**	MH05	0.002	0.000	0.041	0.10	0.23	10.63	74.48	17.10	9.71	300	PVC	1.00%	14.2	96.70	1.37	0.17	0.18

Note:
* STM connection downstream of CBMH03
**An ICD to be installed at CBMH03 will control flow at 9.71 L/s

CSO/STORMWATER MANAGEMENT

HYDROVEX® VHV / SVHV
Vertical Vortex Flow Regulator



JOHN MEUNIER

HYDROVEX® VHV / SVHV VERTICAL VORTEX FLOW REGULATOR

APPLICATIONS

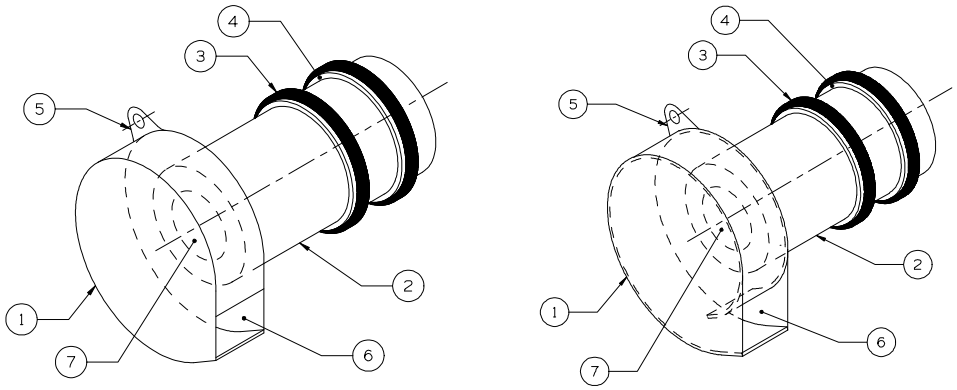
One of the major problems of urban wet weather flow management is the runoff generated after a heavy rainfall. During a storm, uncontrolled flows may overload the drainage system and cause flooding. Due to increased velocities, sewer pipe wear is increased dramatically and results in network deterioration. In a combined sewer system, the wastewater treatment plant may also experience significant increases in flows during storms, thereby losing its treatment efficiency.

A simple means of controlling excessive water runoff is by controlling excessive flows at their origin (manholes). **John Meunier Inc.** manufactures the **HYDROVEX® VHV / SVHV** line of vortex flow regulators to control stormwater flows in sewer networks, as well as manholes.

The vortex flow regulator design is based on the fluid mechanics principle of the forced vortex. This grants flow regulation without any moving parts, thus reducing maintenance. The operation of the regulator, depending on the upstream head and discharge, switches between orifice flow (gravity flow) and vortex flow. Although the concept is quite simple, over 12 years of research have been carried out in order to get a high performance.

The **HYDROVEX® VHV / SVHV** Vertical Vortex Flow Regulators **(refer to Figure 1)** are manufactured entirely of stainless steel, and consist of a hollow body (**1**) (in which flow control takes place) and an outlet orifice (**7**). Two rubber "O" rings (**3**) seal and retain the unit inside the outlet pipe. Two stainless steel retaining rings (**4**) are welded on the outlet sleeve to ensure that there is no shifting of the "O" rings during installation and use.

1. BODY
2. SLEEVE
3. O-RING
4. RETAINING RINGS (SQUARE BAR)
5. ANCHOR PLATE
6. INLET
7. OUTLET ORIFICE



VHV *SVHV*

FIGURE 1: HYDROVEX® VHV-SVHV VERTICAL VORTREX FLOW REGULATORS

ADVANTAGES

- The **HYDROVEX® VHV / SVHV** line of flow regulators are manufactured entirely of stainless steel, making them durable and corrosion resistant.
- Having no moving parts, they require minimal maintenance.
- The geometry of the **HYDROVEX® VHV / SVHV** flow regulators allows a control equal to an orifice plate, having a cross section area 4 to 6 times smaller. This decreases the chance of blockage of the regulator, due to sediments and debris found in stormwater flows. **Figure 2** illustrates the comparison between a regulator model 100 SVHV-2 and an equivalent orifice plate. One can see that for the same height of water, the regulator controls a flow approximately four times smaller than an equivalent orifice plate.
- Installation of the **HYDROVEX® VHV / SVHV** flow regulators is quick and straightforward and is performed after all civil works are completed.
- Installation requires no special tools or equipment and may be carried out by any contractor.
- Installation may be carried out in existing structures.

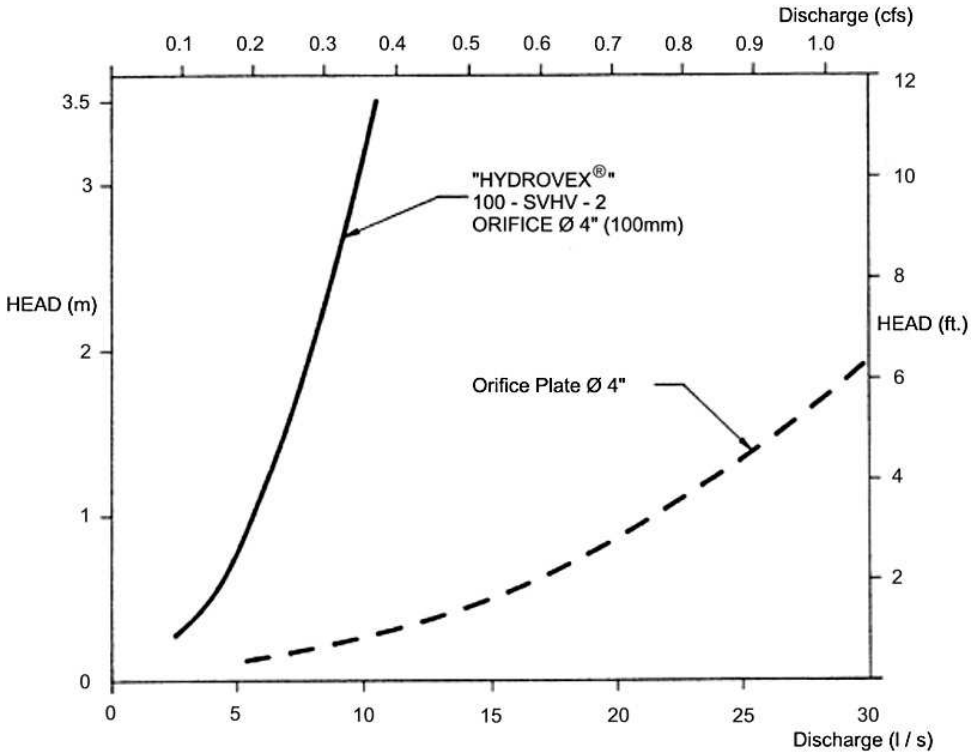


FIGURE 2: DISCHARGE CURVE SHOWING A HYDROVEX® FLOW REGULATOR VS AN ORIFICE PLATE

SELECTION

Selection of a **VHV or SVHV** regulator can be easily made using the selection charts found at the back of this brochure (see **Figure 3)**. These charts are a graphical representation of the maximum upstream water pressure (head) and the maximum discharge at the manhole outlet. The maximum design head is the difference between the maximum upstream water level and the invert of the outlet pipe. All selections should be verified by John Meunier Inc. personnel prior to fabrication.

Example:

✓ Maximum design head	2m (6.56 ft.)
✓ Maximum discharge	6 L/s (0.2 cfs)
✓ Using **Figure 3** - VHV	model required is a **75 VHV-1**

INSTALLATION REQUIREMENTS

All **HYDROVEX® VHV / SVHV** flow regulators can be installed in circular or square manholes. **Figure 4** gives the various minimum dimensions required for a given regulator. ***It is imperative to respect the minimum clearances shown to ensure easy installation and proper functioning of the regulator.***

SPECIFICATIONS

In order to specify a **HYDROVEX®** regulator, the following parameters must be defined:

- The model number (ex: 75-VHV-1)
- The diameter and type of outlet pipe (ex: 6" diam. SDR 35)
- The desired discharge (ex: 6 l/s or 0.21 CFS)
- The upstream head (ex: 2 m or 6.56 ft.) *
- The manhole diameter (ex: 36" diam.)
- The minimum clearance "H" (ex: 10 inches)
- The material type (ex: 304 s/s, 11 Ga. standard)

* ***Upstream head is defined as the difference in elevation between the maximum upstream water level and the invert of the outlet pipe where the HYDROVEX® flow regulator is to be installed.***

PLEASE NOTE THAT WHEN REQUESTING A PROPOSAL, WE SIMPLY REQUIRE THAT YOU PROVIDE US WITH THE FOLLOWING:

- ***project design flow rate***
- ***pressure head***
- ***chamber's outlet pipe diameter and type***

Typical VHV model in factory

OPTIONS

FV – SVHV (mounted on sliding plate)

VHV-1-O (standard model with odour control inlet)

FV – VHV-O (mounted on sliding plate with odour control inlet)

VHV with Gooseneck assembly in existing chamber without minimum release at the bottom

VHV with air vent for minimal slopes

HYDROVEX®

VHV Vertical Vortex Flow Regulator

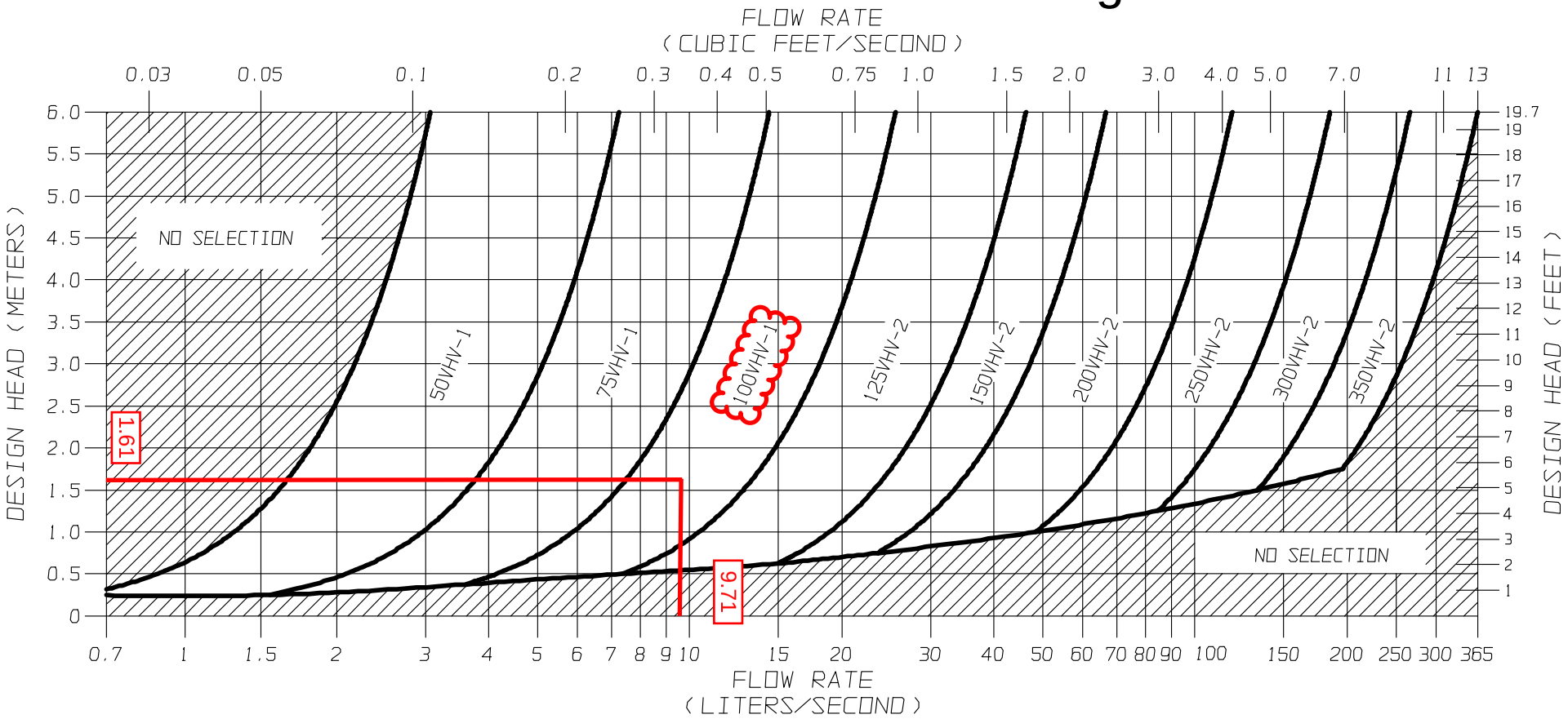
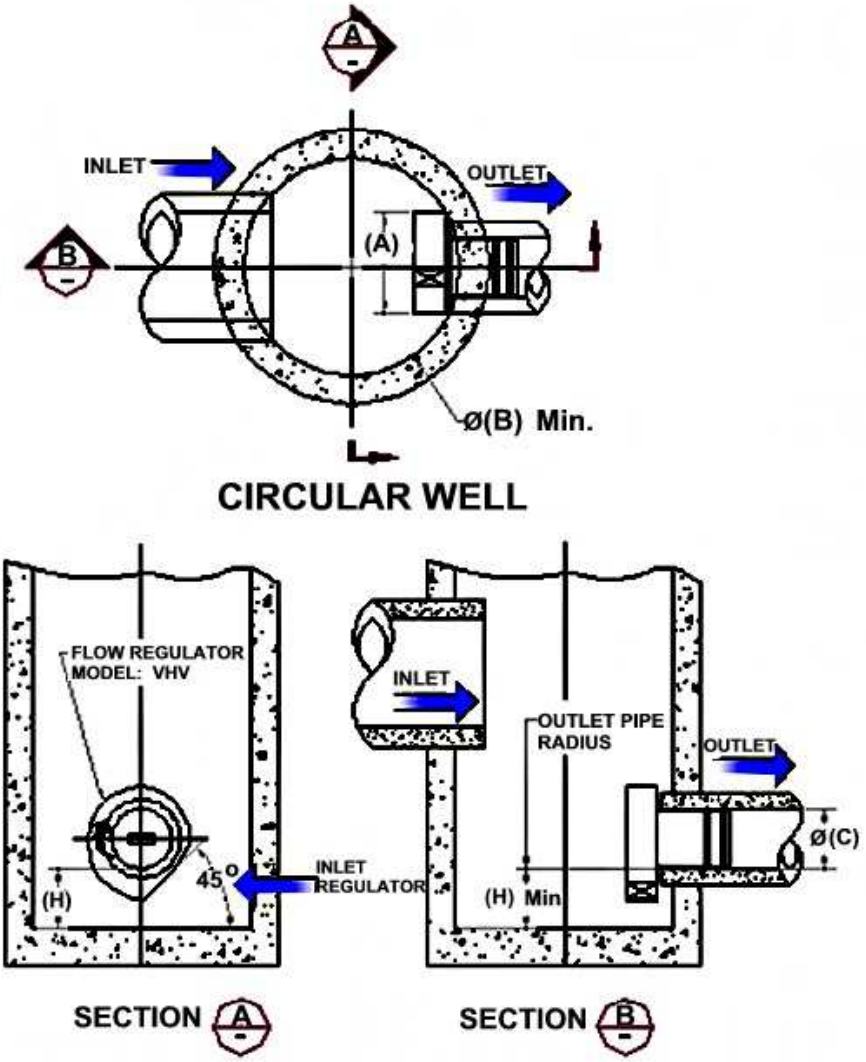


FIGURE 3 - VHV

JOHN MEUNIER

FLOW REGULATOR TYPICAL INSTALLATION IN CIRCULAR MANHOLE
FIGURE 4 (MODEL VHV)

Model Number	Regulator Diameter		Minimum Manhole Diameter		Minimum Outlet Pipe Diameter		Minimum Clearance	
	A (mm)	**A** (in.)	**B** (mm)	**B** (in.)	**C** (mm)	**C** (in.)	**H** (mm)	**H** (in.)
50VHV-1	150	6	600	24	150	6	150	6
75VHV-1	250	10	600	24	150	6	150	6
100VHV-1	325	13	900	36	150	6	200	8
125VHV-2	275	11	900	36	150	6	200	8
150VHV-2	350	14	900	36	150	6	225	9
200VHV-2	450	18	1200	48	200	8	300	12
250VHV-2	575	23	1200	48	250	10	350	14
300VHV-2	675	27	1600	64	250	10	400	16
350VHV-2	800	32	1800	72	300	12	500	20



INSTALLATION

The installation of a **HYDROVEX®** regulator may be undertaken once the manhole and piping is in place. Installation consists of simply fitting the regulator into the outlet pipe of the manhole. **John Meunier Inc.** recommends the use of a lubricant on the outlet pipe, in order to facilitate the insertion and orientation of the flow controller.

MAINTENANCE

HYDROVEX® regulators are manufactured in such a way as to be maintenance free; however, a periodic inspection (every 3-6 months) is suggested in order to ensure that neither the inlet nor the outlet has become blocked with debris. The manhole should undergo periodically, particularly after major storms, inspection and cleaning as established by the municipality

GUARANTY

The **HYDROVEX®** line of **VHV / SVHV** regulators are guaranteed against both design and manufacturing defects for a period of 5 years. Should a unit be defective, **John Meunier Inc.** is solely responsible for either modification or replacement of the unit.

John Meunier Inc.
ISO 9001 : 2008

Head Office
4105 Sartelon
Saint-Laurent (Quebec) Canada H4S 2B3
Tel.: 514-334-7230 www.johnmeunier.com
Fax: 514-334-5070 cso@johnmeunier.com

Ontario Office
2000 Argentia Road, Plaza 4, Unit 430
Mississauga (Ontario) Canada L5N 1W1
Tel.: 905-286-4846 www.johnmeunier.com
Fax: 905-286-0488 ontario@johnmeunier.com

USA Office
2209 Menlo Avenue
Glenside, PA USA 19038
Tel.: 412- 417-6614 www.johnmeunier.com
Fax: 215-885-4741 asteele@johnmeunier.com

Revised: 2011-05-03

WATTS®	Adjustable Accutrol Weir Tag: _____	Adjustable Flow Control for Roof Drains

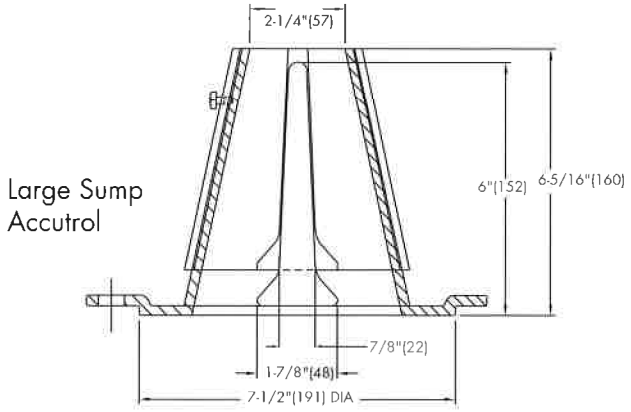
ADJUSTABLE ACCUTROL (for Large Sump Roof Drains only)

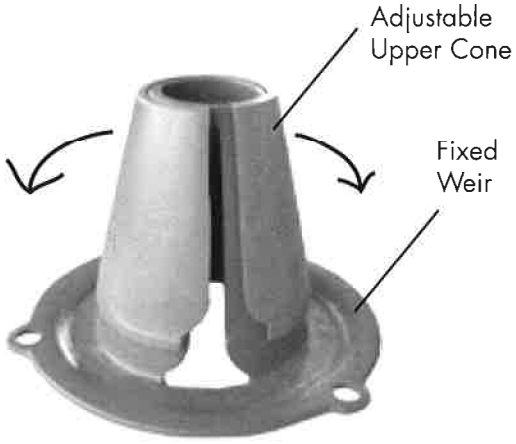
For more flexibility in controlling flow with heads deeper than 2", Watts Drainage offers the Adjustable Accutrol. The Adjustable Accutrol Weir is designed with a single parabolic opening that can be covered to restrict flow above 2" of head to less than 5 gpm per inch, up to 6" of head. To adjust the flow rate for depths over 2" of head, set the slot in the adjustable upper cone according to the flow rate required. Refer to Table 1 below.
Note: Flow rates are directly proportional to the amount of weir opening that is exposed.

EXAMPLE:

For example, if the adjustable upper cone is set to cover 1/2 of the weir opening, flow rates above 2" of head will be restricted to 2-1/2 gpm per inch of head.

Therefore, at 3" of head, the flow rate through the Accutrol Weir that has 1/2 the slot exposed will be:
[5 gpm(per inch of head) x 2 inches of head] + 2-1/2 gpm(for the third inch of head) = 12-1/2 gpm.





1/2 Weir Opening Exposed Shown Above

TABLE 1. Adjustable Accutrol Flow Rate Settings

Weir Opening Exposed	Head of Water					
	1"	2"	3"	4"	5"	6"
	Flow Rate (gallons per minute)					
Fully Exposed	5	10	15	20	25	30
3/4	5	10	13.75	17.5	21.25	25
1/2	5	10	12.5	15	17.5	20
1/4	5	10	11.25	12.5	13.75	15
Closed	5	10	10	10	10	10

Job Name _____ **Model No.** _____

Job Location _____ Contractor _____

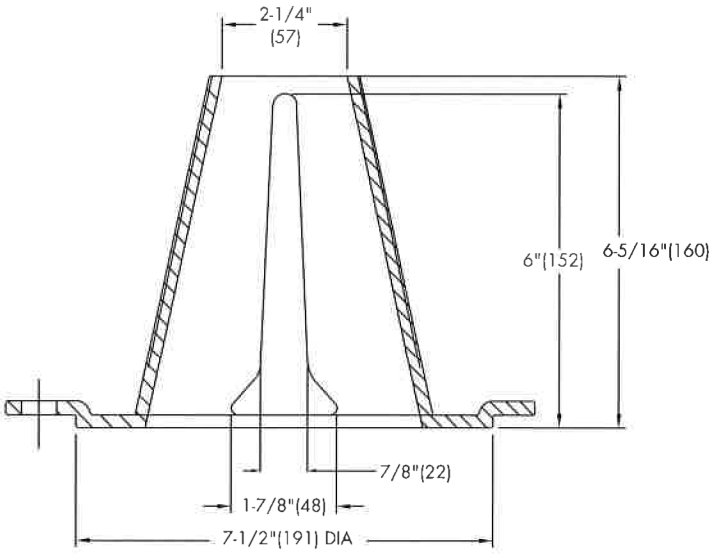
Engineer _____ Representative _____

CANADA: 5435 North Service Road, Burlington, ON, L7L 5H7 TEL: 905-332-6718 TOLL-FREE: 1-888-208-8927 Website: www.wattscanada.ca

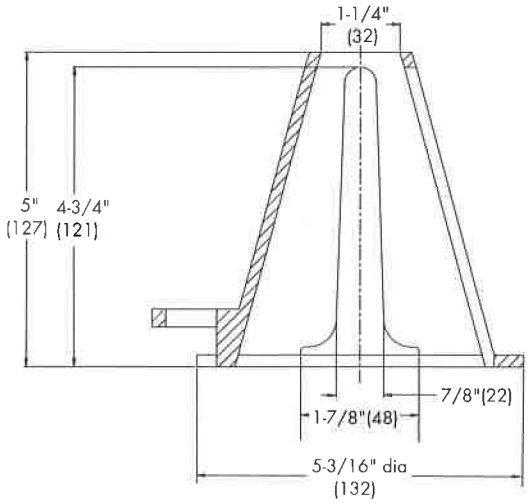
ACCUTROL WEIR FLOW CONTROL

SPECIFICATION: Watts Drainage Products epoxy coated cast iron Accutrol Weir is designed with parabolic openings which limit the flow of rain water off a roof. Each weir slot controls flow to 5 gpm per inch of head to a maximum of 30 gpm at 6" head(for large sump), 25 gpm at 5" head(for small sump) . The Accutrol Weir is secured to the flashing clamp of the roof drain. The Accutrol Weir is available with 1 to 4 slots for the large sump drain and up to 3 slots for the small sump drain.

For Large Sump Roof Drains Specify the "-A" option and number of slots required. (ie. "RD-100-A2" for two slot weir)
For Small Sump Roof Drains Specify the "-A" option and number of slots required. (ie. "RD-200-A1" for one slot weir)



LARGE SUMP ACCUTROL WEIR



SMALL SUMP ACCUTROL WEIR

Job Name _____ **Model No.** _____

Job Location _____ Contractor _____

Engineer _____ Representative _____

APPENDIX C

Water Supply Calculations

Sarthak Vora

From: Cassidy, Tyler <tyler.cassidy@ottawa.ca>
Sent: Friday, December 13, 2024 11:08 AM
To: Sarthak Vora
Cc: Mohan Basnet; Lodoen Unseth, Kelby
Subject: Boundary Conditions: 1435 Morisset Avenue
Attachments: 1435 Morisset Ave November 2024.pdf

Good Morning,

Please find below the boundary conditions for 1435 Morisset Avenue.

******The following information may be passed on to the consultant, but do NOT forward this e-mail directly.******

The following are boundary conditions, HGL, for hydraulic analysis at 1435 Morisset Avenue (zone ME) assumed to be connected to the 152mm watermain on Morisset Avenue. (see attached PDF for location).

Minimum HGL = 146.9 m
Maximum HGL = 158.3 m
Max Day + Fire Flow (75 L/s) = 124.7 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. Fire Flow analysis is a reflection of available flow in the watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.

Thank you,

I will be away on leave from December 16th, 2024, returning January 27th, 2025. Please contact Roshni Thakur at roshni.thakur@ottawa.ca for all inquiries and submissions.

Tyler Cassidy, P.Eng
Infrastructure Project Manager,
Planning, Development and Building Services department (PDBS)/ Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB) - South Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 12977, Tyler.Cassidy@ottawa.ca

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'

Water Supply Calculations
LRL File No. 200572
Project: Proposed 3-Storey Apartment Building
Location: 1465 Morisset Ave, Ottawa, ON
Date: December 5, 2024
Prepared by: M. Basnet

Residential Demand based on the City of Ottawa Design Guidelines-Water Distribution, 2010

Unit Type	Persons Per Unit	Number of Units	Population
1-Bedroom Apartment	1.4	16	22.4
2-Bedroom Apartment	2.1	15	31.5
	Total	**31**	**53.9**

Average Water Consumption Rate	350	L/c/d		
Average Day Demand	**18,865**	**L/d**	**0.22**	**L/s**
Maximum Day Factor	7.5		(MOE Table 3-3)	
Maximum Daily Demand	**140,721**	**L/d**	**1.63**	**L/s**
Peak Hour Factor	11.2		(MOE Table 3-3)	
Maximum Hour Demand	**1,578,953**	**L/d**	**18.27**	**L/s**

Water Service Pipe Sizing

Q = VA

Where:
V = velocity
A = area of pipe
Q = flow rate

Assuming a maximum velocity of 1.8m/s, the diameter of pipe is calculated as:

Minimum pipe diameter (d) = $(4Q/\pi V)^{1/2}$
= 0.114 m
= 114 mm

Proposed pipe diameter (d) = 100 mm

Fire Flow Calculations as per Ontario Building Code (OBC)

LRL File No. : 200572
Project : Proposed 3-Storey Low-Rise Apartment
Location : 1465 Morisset Ave, Ottawa, ON
Date : December 5, 2024
Prepared by : S. Vora

Fire Protection Water Supply Calculations

$Q = KVS_{Tot}$

where

Q = minimum supply of water (L)
K = water supply coefficient from Table 1 of the OFM guidelines
V = total building volume (m^3)
S_{Tot} = total of spatial coefficient values from property line exposures on all sides

$S_{Tot} = 1.0 + (S_{side1} + S_{side2} + S_{side3} + S_{side4})$

		Exposure Distance (m)	
S_{Side1} =	0.00	>10	(North)
S_{Side2} =	0.00	>10	(East)
S_{Side3} =	0.00	>10	(South)
S_{Side4} =	0.25	7.8	(West)
S_{Tot} =	**1.25**		

K = 18 (Group C-combustible construction with fire separations and fire resistance ratings)

Building Information based on Architectural Drawing

Floor Area = 561 m^2
Prop Bldg Height = 12.10 m
V = 6788 m^3

Q = 152732 L

Required Minimum Water Supply Flow Rate = 4500 L / min (as per OFM Table 2)
75 L/s


Fire Hydrant Distance to Bldg.
≤ 76 m
≥ 152 ≤ 305 m
SUBJECT SITE
av. Edgecliffe Ave
av. Morisset Ave
av. Mayview Ave
av. Rosenthal Ave

APPENDIX D

Sanitary Calculations

From: Cassidy, Tyler <tyler.cassidy@ottawa.ca>
Sent: Wednesday, November 27, 2024 3:29 PM
To: Sarthak Vora
Cc: Mohan Basnet; Lodoen Unseth, Kelby
Subject: RE: 1435 &1455 Morisset_Boundary Condition & Sanitary Sewer capacity req

Hi Sarthak,

There is sufficient capacity in the sanitary sewer to accommodate this proposal.

I have submitted the boundary conditions to our Water Resources group, please allow for up to 10 business days for the results to be provided.

Thank you,

I will be away on leave from December 16th, 2024, returning January 23rd, 2025.

Tyler Cassidy, P.Eng
Infrastructure Project Manager,
Planning, Development and Building Services department (PDBS)/ Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB) - South Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 12977, Tyler.Cassidy@ottawa.ca

From: Sarthak Vora <svora@lrl.ca>
Sent: November 26, 2024 3:54 PM
To: Cassidy, Tyler <tyler.cassidy@ottawa.ca>
Cc: Mohan Basnet <mbasnet@lrl.ca>; Lodoen Unseth, Kelby <Kelby.LodoenUnseth@ottawa.ca>
Subject: RE: 1435 &1455 Morisset_Boundary Condition & Sanitary Sewer capacity req

Hi Tyler,

Please find attached the correspondence email from Adam Baker dated June 14, 2021, regarding the OBC fire flow calculation, in pdf format.

Regarding the sanitary demand, the total flow from the site is calculated as 0.76L/s, which includes:

- Peak flow - 0.70L/s
- Infiltration flow - 0.06L/s

This brings the total flow to 0.76L/s.

Please let me know if any additional clarification/ details are required.

Regards,

Sarthak Vora, Civil E.I.T

LRL ENGINEERING | INGÉNIERIE
Head Office – 5430 Canotek Rd., Ottawa, ON
T +1 613-842-3434 **C** +1 613-915-7633 **E** svora@lrl.ca
Ottawa | Pembroke | Moncton
www.lrl.ca

From: Cassidy, Tyler <tyler.cassidy@ottawa.ca>
Sent: Tuesday, November 26, 2024 3:31 PM
To: Sarthak Vora <svora@lrl.ca>
Cc: Mohan Basnet <mbasnet@lrl.ca>; Lodoen Unseth, Kelby <Kelby.LodoenUnseth@ottawa.ca>
Subject: RE: 1435 &1455 Morisset_Boundary Condition & Sanitary Sewer capacity req

Hi Sarthak,

Are you able to provide the correspondence that indicated you should be using the OBC method to calculate fire flow? We don't typically allow that and always request the FUS 2020 calculations per our technical bulletins/guidelines. If not, could you please provide the FUS calculations for required fire flow? I will then be able to proceed with the request to our water resources and fire protection services groups.

For the sanitary demand, is the 0.76 L/s peak flow or average flow? Please confirm.

Thank you,

I will be away on leave from December 16th, 2024, returning January 23rd, 2025.

Tyler Cassidy, P.Eng
Infrastructure Project Manager,
Planning, Development and Building Services department (PDBS)/ Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB) - South Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 12977, Tyler.Cassidy@ottawa.ca

From: Sarthak Vora <svora@lrl.ca>
Sent: November 26, 2024 2:25 PM
To: Cassidy, Tyler <tyler.cassidy@ottawa.ca>
Cc: Mohan Basnet <mbasnet@lrl.ca>; Lodoen Unseth, Kelby <Kelby.LodoenUnseth@ottawa.ca>
Subject: RE: 1435 &1455 Morisset_Boundary Condition & Sanitary Sewer capacity req

Good Afternoon Tyler,

Thankyou for assisting us with the confirmation.

I would like to confirm the boundary conditions and sanitary sewer capacity for the proposed development at 1435 Morisset Avenue. The project involves the construction of a 3-storey building with a total of 31 units. We are proposing a 150mm diameter service connection to the 150mm diameter municipal watermain on Morisset Avenue.

We previously requested boundary conditions on May 11, 2021 (see attached email PDF) and received the following results:

Minimum HGL = 143.7 m

Maximum HGL = 158.2 m

Available Flow at 20 psi = 85 L/s, assuming ground elevation of 97.6 m

The water demand for the proposed development has not changed since the last request and remains consistent. Could you kindly provide the current boundary conditions? For your reference, I have included the proposed development demands below, along with the domestic demand and OBC fire flow calculations. Please note that we were advised to use OBC fire flow calcs due to lower than average pressure in the watermain and the required fire flow rate is less than 9000L/min.

	Demand (L/s)
Avg. Daily	0.22
Max. Day + OBC	1.63 + 75
Peak Hour	18.27

Sanitary Connection

We also determined that the sanitary sewer discharge from the site would stay constant to be **0.76L/s**. We are proposing to tie into the 225mm Conc Sanitary Sewer located within Morisset Avenue. The previous Sanitary Sewer confirmation is attached. Please re-confirm if the existing sanitary sewer will have sufficient capacity to accommodate our site.

I am currently working towards a pressing submission deadline and would greatly appreciate your prompt response. Please let me know if any additional information is required.

Regards,

Sarthak Vora, Civil E.I.T

LRL ENGINEERING | INGÉNIERIE
Head Office – 5430 Canotek Rd., Ottawa, ON
T +1 613-842-3434 **C** +1 613-915-7633 **E** svora@lrl.ca
Ottawa | Pembroke | Moncton
www.lrl.ca

From: Cassidy, Tyler <tyler.cassidy@ottawa.ca>
Sent: Tuesday, November 26, 2024 11:10 AM
To: Sarthak Vora <svora@lrl.ca>

Cc: Mohan Basnet <mbasnet@lrl.ca>; Lodoen Unseth, Kelby <Kelby.LodoenUnseth@ottawa.ca>
Subject: RE: 1435 &1455 Morisset_Boundary Condition & Sanitary Sewer capacity req

Hi Sarthak,

I can help you with your request. If you could please provide your proposed sanitary peak flows, as well as the following information for boundary conditions, then I will confirm capacity/pressure for you:

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

Thank you,

I will be away on leave from December 16th, 2024, returning January 23rd, 2025.

Tyler Cassidy, P.Eng
Infrastructure Project Manager,
Planning, Development and Building Services department (PDBS)/ Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB) - South Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 12977, Tyler.Cassidy@ottawa.ca

From: Sarthak Vora <svora@lrl.ca>
Sent: November 25, 2024 3:40 PM
To: Shillington, Jeffrey <jeff.shillington@ottawa.ca>; Sharif, Golam <sharif.sharif@ottawa.ca>
Cc: Mohan Basnet <mbasnet@lrl.ca>
Subject: Re: 1435 &1455 Morisset_Boundary Condition & Sanitary Sewer capacity req

Good Afternoon, Jeff/ Sharif,

We are working on a proposed development at 1435 &1455 Morisset Avenue and would like to confirm the **boundary conditions and sanitary sewer capacity** for the project. The development includes the construction of a 3-storey building with a total of 31 units.
A full SPC package was previously completed, and we had requested and received boundary conditions from Adam Baker (adam.baker@ottawa.ca) on May 11, 2021. However, due to a revision in the site plan, the civil drawings and calculations now need to be updated for the SPC amendment. I re-requested the boundary conditions from Adam

last week but have not yet received a response.

Would you be able to assist me with this request, or should I reach out to someone else for further support?

Thank you for your time and assistance.

Sarthak Vora, Civil E.I.T

LRL ENGINEERING | INGÉNIERIE
Head Office – 5430 Canotek Rd., Ottawa, ON
T +1 613-842-3434 **C** +1 613-915-7633 **E** svora@lrl.ca
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LRL File No.: 200572
Project: Proposed Low Rise Apartment
Location: 1465 Morisset Ave, Ottawa, ON
Date: 2024/12/05
Designed: M. Basnet

Sanitary Design Parameters

Average Daily Flow = 280 L/p/day
Commercial & Institutional Flow = 28000 L/ha/day
Light Industrial Flow = 35000 L/ha/day
Heavy Industrial Flow = 55000 L/ha/day
Maximum Residential Peak Factor = 4.0
Commercial & Institutional Peak Factor = 1.5
Industrial Peak Factor = as per Appendix 4-B
Extraneous Flow = 0.33 L/s/gross ha
(as Per Tech Bulletin ISTB-2018-01)

Pipe Design Parameters

Minimum Velocity = 0.60 m/s
Manning's n = 0.013

LOCATION			RESIDENTIAL AREA AND POPULATION						COMMERCIAL		INDUSTRIAL			INSTITUTIONAL		C+I+I	INFILTRATION			TOTAL FLOW (l/s)	PIPE						
STREET/ SITE	FROM MH	TO MH	AREA (Ha)	POP.	CUMMULATIVE AREA (Ha)	CUMMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (Ha)	ACCU. AREA (Ha)	AREA (Ha)	ACCU. AREA (Ha)	PEAK FACT.	AREA (Ha)	ACCU. AREA (Ha)	PEAK FLOW (l/s)	TOTAL AREA (Ha)	ACCU. AREA (Ha)	INFILT. FLOW (l/s)		LENGTH (m)	DIA. (mm)	SLOPE (%)	MATERIAL	CAP. (FULL) (l/s)	VEL. (FULL) (m/s)	*VEL. (ACTUAL) (m/s)
	Bldg.	SAN MH01	0.185	53.9	0.19	53.9	4.0	0.70									0.19	0.19	0.06	0.76	13.7	150	3.00%	PVC	26.38	1.49	0.66

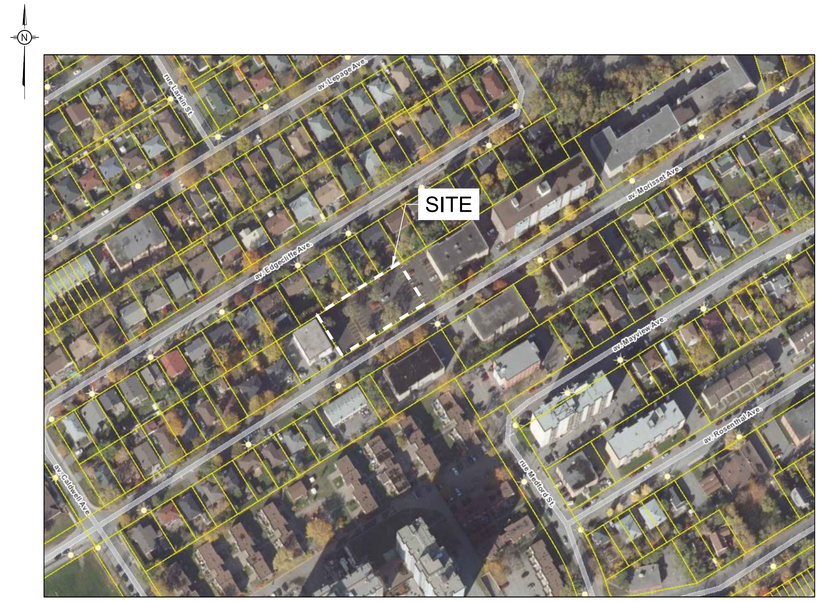
Note:
* Actual velocity > self-cleansing velocity

APPENDIX E

Civil Engineering Drawings

PROPOSED 3-STOREY APARTMENT BUILDING
1465 MORISSET AVE, OTTAWA, ON

REVISION 02



KEY PLAN (N.T.S.)

DRAWING INDEX

TITLE PAGE	
GENERAL NOTES	C001
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DEMOLITION PLAN	C102
GRADING AND DRAINAGE PLAN	C301
SERVICING PLAN	C401
STORMWATER MANAGEMENT PLAN	C601
PRE-DEVELOPMENT WATERSHED PLAN	C701
POST-DEVELOPMENT WATERSHED PLAN	C702
CONSTRUCTION DETAIL PLAN	C901

LRL
ENGINEERING | INGÉNIERIE
5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

PROPOSED 3-STOREY APARTMENT BUILDING
1465 MORISSET AVE, OTTAWA, ON
REV.02 - ISSUED FOR SPC AMENDMENT - JANUARY 27, 2025
LRL PROJECT no: 200572

LICENSED PROFESSIONAL ENGINEER
M. BASNET
100501996
2025/01/27
PROVINCE OF ONTARIO
NOT AUTHENTIC UNLESS SIGNED AND DATED

GENERAL NOTES

1. ALL WORKS MATERIALS SHALL CONFIRM TO THE LAST REVISION OF THE STANDARDS AND SPECIFICATIONS FOR THE CITY OF OTTAWA, ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS), WHERE APPLICABLE. LOCAL UTILITY STANDARDS AND MINISTRY OF TRANSPORTATION STANDARDS WILL APPLY WHERE REQUIRED.
2. THE CONTRACTORS SHALL CONFIRM THE LOCATION OF ALL EXISTING UTILITIES WITHIN THE SITE AND ADJACENT WORK AREAS. THE CONTRACTORS SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITIES TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OR REPLACEMENT OF ANY SERVICES OR UTILITIES DISTURBED DURING CONSTRUCTION , TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION.
3. ALL DIMENSIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION, ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER. LOST TIME DUE TO FAILURE OF THE CONTRACTORS TO CONFIRM UTILITY LOCATIONS AND NOTIFY ENGINEER OF POSSIBLE CONFLICTS PRIOR TO CONSTRUCTION WILL BE AT CONTRACTORS EXPENSE.
4. ANY AREA BEYOND THE LIMIT OF THE SITE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION AT THE CONTRACTOR'S EXPENSE.
   RELOCATING OF EXISTING SERVICES AND/OR UTILITIES SHALL BE AS SHOWN ON THE DRAWINGS OR DETECTED BY THE ENGINEER AT THE EXPENSE OF DEVELOPERS.
5. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE 'OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS'. THE GENERAL CONTRACTORS SHALL BE DEEMED TO BE THE 'CONTRACTOR' AS DEFINED IN THE ACT.
6. ALL THE CONSTRUCTION SIGNAGE MUST CONFIRM TO THE MINISTRY OF TRANSPORTATION OF ONTARIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES PER LATEST AMENDMENT.
7. THE CONTRACTOR IS ADVISED THAT WORKS BY OTHERS MAY BE ONGOING DURING THE PERIOD OF THE CONTRACT. THE CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES TO PREVENT CONFLICTS.
8. ALL DIMENSIONS ARE IN METERS UNLESS SPECIFIED OTHERWISE.
9. THERE WILL BE NO SUBSTITUTION OF MATERIALS UNLESS PRIOR WRITTEN APPROVAL IS RECEIVED FROM THE ENGINEER.
10. ALL CONSTRUCTION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE RECOMMENDATIONS MADE IN THE GEOTECHNICAL REPORT.
11. FOR DETAILS RELATING TO STORMWATER MANAGEMENT AND ROOF DRAINAGE REFER TO THE SITE SERVICING AND STORMWATER MANAGEMENT REPORT.
12. ALL SEWERS CONSTRUCTED WITH GRADES LESS THAN 1.0% SHALL BE INSTALLED USING LASER ALIGNMENT AND CHECKED WITH LEVEL INSTRUMENT PRIOR TO BACKFILLING.
13. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED AND TO BEAR THE COST OF THE SAME.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADDITIONAL BEDDING, OR ADDITIONAL STRENGTH PIPE IF THE MAXIMUM TRENCH WIDTH AS SPECIFIED BY OPSD IS EXCEEDED.
15. ALL PIPE/CULVERT SECTION SIZES REFER TO INSIDE DIMENSIONS.
16. SHOULD DEEPLY BURIED ARCHAEOLOGICAL REMAINS BE FOUND ON THE PROPERTY DURING CONSTRUCTION ACTIVITIES, THE HERITAGE OPERATIONS UNIT OF THE ONTARIO MINISTRY OF CULTURE MUST BE NOTIFIED IMMEDIATELY.
17. ALL NECESSARY CLEARING AND GRUBBING SHALL BE COMPLETED BY THE CONTRACTOR. REVIEW WITH CONTRACT ADMINISTRATOR AND THE CITY OF OTTAWA PRIOR TO ANY TREE CUTTING/REMOVAL.
18. DRAWINGS SHALL BE READ ON CONJUNCTION WITH ARCHITECTURAL SITE PLAN.
19. THE CONTRACTOR SHALL PROVIDE THE PROJECT ENGINEER ON SET OF AS CONSTRUCTED SITE SERVICING AND GRADING DRAWINGS.
20. BENCHMARKS: IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THAT THE SITE BENCHMARK(S) HAS NOT BEEN ALTERED OR DISTURBED AND THAT ITS RELATIVE ELEVATION AND DESCRIPTION AGREES WITH THE INFORMATION DEPICTED ON THIS PLAN.

EROSION AND SEDIMENT CONTROL NOTES

GENERAL

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 MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.

THE CONTRACTOR ACKNOWLEDGES THAT SURFACE EROSION AND SEDIMENT RUNOFF RESULTING FROM THEIR CONSTRUCTION OPERATIONS HAS POTENTIAL TO CAUSE A DETRIMENTAL IMPACT TO ANY DOWNSTREAM WATERCOURSE OR SEWER, AND THAT ALL CONSTRUCTION OPERATIONS THAT MAY IMPACT UPON WATER QUALITY SHALL BE CARRIED OUT IN MANNER THAT STRICTLY MEETS THE REQUIREMENT OF ALL APPLICABLE LEGISLATION AND REGULATIONS.

AS SUCH, THE CONTRACTOR SHALL BE RESPONSIBLE FOR CARRYING OUT THEIR OPERATIONS, AND SUPPLYING AND INSTALLING ANY APPROPRIATE CONTROL MEASURES, SO AS TO PREVENT SEDIMENT LADEN RUNOFF ENTERING ANY SEWER OR WATERCOURSE WITHIN OR DOWNSTREAM OF THE WORKING AREA.

THE CONTRACTOR ACKNOWLEDGES THAT NO ONE MEASURE IS LIKELY TO BE 100% EFFECTIVELY FOR EROSION PROTECTION AND CONTROLLING SEDIMENT RUNOFF AND DISCHARGES FROM THE SITE. THEREFORE, WHERE NECESSARY THE CONTRACTOR SHALL IMPLEMENT ADDITIONAL MEASURES ARRANGED IN SUCH MANNER AS TO MITIGATE SEDIMENT RELEASE FROM THE CONSTRUCTION OPERATIONS AND ACHIEVE SPECIFIC MAXIMUM PERMITTED CRITERIA WHERE APPLICABLE. SUGGESTED ON-SITE MEASURES MAY INCLUDE, BUT SHALL NOT BE LIMITED TO, THE FOLLOWING METHODS: SEDIMENT PONDS, FILTER BAGS, PUMP FILTERS, SETTLING TANKS, SILT FENCE, STRAW BALES, FILTER CLOTHS, CATCH BASIN FILTERS, CHECK DAMS AND/OR OTHER RECOGNIZED TECHNOLOGIES AND METHOD AVAILABLE AT THE TIME OF CONSTRUCTION. SPECIFIC MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH REQUIREMENTS OF OPSS 577 WHERE APPROPRIATE, OR IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

WHERE, IN THE OPINION OF THE CONTRACT ADMINISTRATOR OR REGULATORY AGENCY, THE INSTALLED CONTROL MEASURES FAIL TO PERFORM ADEQUATELY, THE CONTRACTOR SHALL SUPPLY AND INSTALL ADDITIONAL OR ALTERNATIVE MEASURES AS DIRECTED BY THE CONTRACT ADMINISTRATOR OR REGULATORY AGENCY, AS SUCH, THE CONTRACTOR SHALL HAVE ADDITIONAL CONTROL MATERIALS ON SITE AT ALL TIME WHICH ARE EASILY ACCESSIBLE AND MAY BE IMPLEMENTED BY HIM AT THE MOMENT'S NOTICE.

PRIOR TO COMMENCING WORK, THE CONTRACTOR SHALL SUBMIT TO THE CONTRACT ADMINISTRATOR SIX COPIES OF A DETAILED EROSION AND SEDIMENT CONTROL PLAN (ESCP). THE ESCP WILL CONSIST OF WRITTEN DESCRIPTION AND DETAILED DRAWINGS INDICATING THE ON-SITE ACTIVITIES AND MEASURES TO BE USED TO CONTROL EROSION AND SEDIMENT MOVEMENT FOR EACH STEP OF THE WORK.

CONTRACTOR'S RESPONSIBILITIES

THE CONTRACTOR SHALL ENSURE THAT ALL WORKERS, INCLUDING SUB-CONTRACTOR, IN THE WORKING ARE AWARE OF THE IMPORTANCE OF THE EROSION AND SEDIMENT CONTROL MEASURES AND INFORMED OF THE CONSEQUENCES OF THE FAILURE TO COMPLY WITH THE REQUIREMENTS OF ALL REGULATORY AGENCIES.

THE CONTRACTOR SHALL PERIODICALLY, AND WHEN REQUESTED BY THE CONTRACT ADMINISTRATOR, CLEAN OUT ACCUMULATED SEDIMENT DEPOSITS AS REQUIRED AT THE SEDIMENT CONTROL DEVICES, INCLUDING THOSE DEPOSITS THAT MAY ORIGINATE FROM OUTSIDE THE CONSTRUCTION AREA. ACCUMULATED SEDIMENT SHALL BE REMOVED IN SUCH A MANNER THAT PREVENTS THE DEPOSITION OF THIS MATERIAL INTO THE SEWER WATERCOURSE AND AVOIDS DAMAGE TO CONTROL MEASURES. THE SEDIMENT SHALL BE REMOVED FROM THE SITE AT THE CONTRACTOR'S EXPENSE AND MANAGED IN COMPLIANCE WITH REQUIREMENTS FOR EXCESS EARTH MATERIAL, AS SPECIFIED ELSEWHERE IN THE CONTRACT.

THE CONTRACTOR SHALL IMMEDIATELY REPORT TO THE CONTRACT ADMINISTRATOR ANY ACCIDENTAL DISCHARGES OF SEDIMENT MATERIAL INTO EITHER THE WATERCOURSE OR THE STORM SEWER SYSTEM. FAILURE TO REPORT WILL BE CONSTITUTE A BRACH OF THIS SPECIFICATION AND THE CONTRACTOR MAY ALSO BE SUBJECT TO THE PENALTIES IMPOSED BY THE APPLICABLE REGULATORY AGENCY. APPROPRIATE RESPONSE MEASURES, INCLUDING ANY REPAIRS TO EXISTING CONTROL MEASURES OR THE IMPLEMENTATION OF ADDITIONAL CONTROL MEASURES, SHALL BE CARRIED OUT BY THE CONTRACTOR WITHOUT DELAY.

THE SEDIMENT CONTROL MEASURES SHALL ONLY BE REMOVED WHEN, IN THE OPINION OF THE CONTRACT ADMINISTRATOR, THE MEASURE OR MEASURES, IS NO LONGER REQUIRED. NO CONTROL MEASURE MAY BE PERMANENTLY REMOVED WITHOUT PRIOR AUTHORIZATION FROM THE CONTRACT ADMINISTRATOR. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE REMOVED IN A MANNER THAT AVOIDS THE ENTRY OF ANY EQUIPMENT, OTHER THAN HAND-HELD EQUIPMENT, INTO ANY WATERCOURSE, AND PREVENTS THE RELEASE OF ANY SEDIMENT OR DEBRIS INTO ANY SEWER OR WATERCOURSE WITHIN OR DOWNSTREAM OF THE WORKING AREA. ALL ACCUMULATED SEDIMENT SHALL BE REMOVED FROM THE WORKING AREA AT THE CONTRACTOR'S EXPENSE AND MANAGED IN COMPLIANCE WITH THE REQUIREMENTS FOR EXCESS EARTH MATERIAL

WHERE, IN THE OPINION OF EITHER THE CONTRACT ADMINISTRATOR OR A REGULATORY AGENCY, ANY OF THE TERMS SPECIFIED HEREIN HAVE NOT BEEN COMPLIED WITH OR PERFORMED IN A SUITABLE MANNER, OR TAT ALL, THE CONTRACTOR ADMINISTRATOR OR A REGULATORY AGENCY HAS THE RIGHT TO IMMEDIATELY WITHDRAW ITS PERMISSION TO CONTINUE THE WORK BUT MAY RENEW ITS PERMISSION UPON BEING SATISFIED THAT THE DEFAULTS OR DEFICIENCIES IN THE PERFORMANCE OF THIS SPECIFICATION BY THE CONTRACTOR HAVE BEEN REMEDIED.

SPILL CONTROL NOTES

1. ALL CONSTRUCTION EQUIPMENT SHALL BE RE-FUELED, MAINTAINED, AND STORED NO LESS THAN 30 METERS FROM WATERCOURSE, STEAMS, CREEKS, WOODLOTS, AND ANY ENVIRONMENTALLY SENSITIVE AREAS, OR AS OTHERWISE SPECIFIED.
2. THE CONTRACTOR MUST IMPLEMENT ALL NECESSARY MEASURES IN ORDER TO PREVENT LEAKS, DISCHARGES OR SPILLS OF POLLUTANTS, DELETERIOUS MATERIALS, OR OTHER SUCH MATERIALS OR SUBSTANCES WHICH WOULD OR COULD CAUSE AN ADVERSE IMPACT TO THE NATURAL ENVIRONMENT.
3. IN THE EVENT OF A LEAK, DISCHARGE OR SPILL OF POLLUTANT, DELETERIOUS MATERIAL OR OTHER SUCH MATERIAL OR SUBSTANCE WHICH WOULD OR COULD CAUSE AN ADVERSE IMPACT TO THE NATURAL ENVIRONMENT, THE CONTRACTOR SHALL:
   - 3.1. IMMEDIATELY NOTIFY APPROPRIATE FEDERAL, PROVINCIAL, AND LOCAL GOVERNMENT MINISTRIES, DEPARTMENTS, AGENCIES, AND AUTHORITIES OF THE INCIDENT IN ACCORDANCE WITH ALL CURRENT LAWS, LEGISLATION, ACTS, BY-LAWS, PERMITS, APPROVALS, ETC.
   - 3.2. TAKE IMMEDIATE MEASURES TO CONTAIN THE MATERIAL OR SUBSTANCE, AND TO TAKE SUCH MEASURES TO MITIGATE AGAINST ADVERSE IMPACTS TO THE NATURAL ENVIRONMENT.
   - 3.3. RESTORE THE AFFECTED AREA TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION.

MUD MAT NOTES

1. THE GRANULAR MATERIAL WILL REQUIRE PERIODIC REPLACEMENT AS IT BECOMES CONTAMINATED BY VEHICLE TRAFFIC.
2. SEDIMENT SHALL BE CLEANED FROM PUBLIC ROADS AT THE END OF EACH DAY.
3. SEDIMENT SHALL BE REMOVED FROM PUBLIC ROADS BY SHOVELING OR SWEEPING AND DISPOSED OR PROPERLY IN A CONTROLLED SEDIMENT DISPOSAL AREA.

SITE GRADING NOTES

1. PRIOR TO THE COMMENCEMENT OF THE SITE GRADING WORKS, ALL SILTATION CONTROL DEVICES SHALL BE INSTALLED AND OPERATIONAL PER EROSION CONTROL PLAN.
2. ALL GRANULAR AND PAVEMENT FOR ROADS/PARKING AREAS SHALL BE CONSTRUCTED IN ACCORDANCE WITH GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.
3. ALL TOPSOIL AND ORGANIC MATERIAL SHALL BE STRIPPED WITHIN THE ROAD AND PARKING AREAS ALLOWANCE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
4. CONCRETE CURB SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. SC1.1 PROVISION SHALL BE MADE OR CURB DEPRESSIONS AS INDICATED ON ARCHITECTURAL SITE PLAN. CONCRETE SIDEWALK SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD SC1.4. ALL CURBS, CONCRETE ISLANDS, AND SIDEWALKS SHOWN O THIS DRAWING ARE TO BR PRICED IN SITE WORKS PORTION OF THE CONTRACT.
5. PAVEMENT REINSTATEMENT FOR SERVICE AND UTILITY CUTS SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. R10 AND OPSD 509.010 AND OPSS 310.
6. GRANULAR 'A' SHALL BE PLACED TO A MINIMUM THICKNESS OF 30MM AROUND ALL STRUCTURES WITHIN THE PAVEMENT AREA.
7. SUB-EXCAVATE SOFT AREAS AND FILL WITH GRANULAR 'B' COMPACTED IN MAXIMUM 30MM LIFTS.
8. ALL WORK ON THE MUNICIPAL RIGHT OF WAY AND EASEMENTS TO BE INSPECTED BY THE MUNICIPALITY PRIOR BACKFILLING.
9. CONTRACTOR TO OBTAIN A ROAD OCCUPANCY PERMIT 48 HOURS PRIOR TO COMMENCING ANY WORK WITHIN THE MUNICIPAL ROAD ALLOWANCE, IF REQUIRED BY THE MUNICIPALITY.
10. ALL PAVEMENT MARKING FEATURES AND SITE SIGNAGE SHALL BE PLACED PER ARCHITECTURAL SITE PLAN. LINE PAINTING AND DIRECTIONAL SYMBOLS SHALL BE APPLIED WITH A MINIMUM OF TWO COATS OF ORGANIC SOLVENT PAINT.
11. REFER TO ARCHITECTURAL SITE PLAN FOR DIMENSIONS AND SITE DETAILS.
12. STEP JOINTS ARE TO BE USED WHERE PROPOSED ASPHALT MEETS EXISTING ASPHALT. ALL JOINTS MUST BE SEALED.
13. SIDEWALKS TO BE 13MM & BEVELED AT 2:1 OR 6MM WITH NO BEVEL REQUIRED BELOW THE FINISHED FLOOR SLAB ELEVATION AT ENTRANCES REQUIRED TO BE BARRIER-FREE, UNLESS OTHERWISE NOTED. ALL IN ACCORDANCE WITH OBC 3.8.1.3 & OTTAWA ACCESSIBILITY DESIGN STANDARDS.
14. WHERE APPLICABLE THE CONTRACTOR IS TO SUBMIT SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION. SHOP DRAWINGS MUST BE SITE SPECIFIC, SIGNED AND SEALED BY A LICENSED STRUCTURAL ENGINEER. THE CONTRACTOR WILL ALSO BE REQUIRED TO SUPPLY AND GEOTECHNICAL CERTIFICATION OF THE AS-CONSTRUCTED RETAINING WALL TO THE ENGINEER PRIOR TO FINAL ACCEPTANCE.
15. ROADWORK TO BE COMPLETED IN ACCORDANCE WITH GEOTECHNICAL REPORT.
16. ALL TOPSOIL AND ORGANIC MATERIAL SHALL BE STRIPPED WITHIN THE ROAD ALLOWANCE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND STOCK PILLED ON SITE AS DIRECTED BY NATIONAL MUNICIPALITY.
17. SUB-EXCAVATE SOFT AREAS AND FILL WITH GRANULAR 'A', TYPE II COMPACTED IN MAXIMUM 300MM LIFTS.
18. ALL GRANULAR FOR ROADS SHALL BE COMPACTED TO MINIMUM OF 100% STANDARD PROCTOR DENSITY MAXIMUM DRY DENSITY (SPMDD).

SANITARY, FOUNDATION DRAIN, STORM SEWER AND WATERMAIN NOTES

GENERAL

1. LASER ALIGNMENT CONTROL TO BE UTILIZED ON ALL SEWER INSTALLATIONS.
2. CLAY SEALS TO BE INSTALLED AS PER CITY STANDARD DRAWING S8. THE SEALS SHOULD BE AT LEAST 1.5M LONG (IN THE TRENCH DIRECTION) AND SHOULD EXTEND FROM TRENCH WALL TO TRENCH WALL. THE SEALS SHOULD EXTEND FROM THE FROST LINE AND FULLY PENETRATE THE BEDDING, SUB-BEDDING, AND COVER MATERIAL. THE BARRIERS SHOULD CONSIST OF RELATIVELY DRY AND COMPATIBLE BROWN SILTY CLAY PLACED IN MAXIMUM 225MM LIFTS AND COMPACTED TO A MINIMUM OF 95% SPMDD. THE CLAY SEALS SHOULD BE PLACED AT THE SITE BOUNDARIES AND AT 60M INTERVALS IN THE SERVICE TRENCHES.
3. SERVICES TO BUILDING TO BE TERMINATED 1.0M FROM THE OUTSIDE FACE OF BUILDING UNLESS OTHERWISE NOTED.
4. ALL MAINTENANCE STRUCTURE AND CATCH BASIN EXCAVATIONS TO BE BACKFILLED WITH GRANULAR MATERIAL COMPACTED TO 98% STANDARD PROCTOR DENSITY. A MINIMUM OF 300MM AROUND STRUCTURES.
5. "MODULOC" OR APPROVED PRE-CAST MAINTENANCE STRUCTURE AND CATCH BASIN ADJUSTERS TO BE USED IN LIEU OF BRICKING. PARGE ADJUSTING UNITS ON THE OUTSIDE ONLY.
6. SAFETY PLATFORMS SHALL BE PER OPSD 404.02.
7. DROP STRUCTURES SHALL BE IN ACCORDANCE WITH OPSD 1003.01, IF APPLICABLE.
8. THE CONTRACTOR IS TO PROVIDE CCTV CAMERA INSPECTIONS OF ALL SEWERS, INCLUDING PICTORIAL REPORT, ONE (1) CD COPY AND TWO (2) VIDEO RECORDING IN A FORMAT ACCEPTABLE TO ENGINEER. ALL SEWER ARE TO BE FLUSHED PRIOR TO CAMERA INSPECTION. ASPHALT WEAR COURSE SHALL NOT BE PLACED UNTIL THE VIDEO INSPECTION OF SEWERS AND NECESSARY REPAIRS HAVE BEEN COMPLETED TO THE SATISFACTION OF THE ENGINEER.
9. CONTRACTOR SHALL PERFORM LEAKAGE TESTING, IN THE PRESENCE OF THE CONSULTANT, FOR SANITARY SEWERS IN ACCORDANCE WITH OPSS 407. CONTRACTOR SHALL PERFORM VIDEO INSPECTION OF ALL SEWERS. A COPY OF THE VIDEO AND INSPECTION REPORT SHALL BE SUBMITTED TO THE CONSULTANT FOR REVIEW AND APPROVAL PRIOR TO PLACEMENT OF WEAR COURSE ASPHALT.

SANITARY

10. ALL SANITARY SEWER INSTALLATION SHALL CONFORM TO THE LATEST REVISIONS OF THE CITY OF OTTAWA AND THE ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD). AND SPECIFICATIONS (OPSS).
11. ALL SANITARY GRAVITY SEWER SHALL BE PVC SDR 35, IPEX 'RING-TITE' (OR APPROVED EQUIVALENT) PER CSA STANDARD B182.2 OR LATEST AMENDMENT, UNLESS SPECIFIED OTHERWISE.
12. EXISTING MAINTENANCE STRUCTURES TO BE RE-BENCHED WHERE A NEW CONNECTION IS MADE.
13. SANITARY GRAVITY SEWER TRENCH AND BEDDING SHALL BE PER CITY OF OTTAWA STD. S6 AND S7 CLASS 'B' BEDDING, UNLESS SPECIFIED OTHERWISE.
14. SANITARY MAINTENANCE STRUCTURE FRAME AND COVERS SHALL BE PER CITY OF OTTAWA STD. S24 AND S25.
15. SANITARY MAINTENANCE STRUCTURES SHALL BE BENCHED PER OPSD 701.021.
16. 100MM THICK HIGH-DENSITY GRADE 'A' POLYSTYRENE INSULATION TO BE INSTALLED IN ACCORDANCE WITH CITY STD W22 WHERE INDICATED ON DRAWING.

STORM

17. ALL REINFORCED CONCRETE STORM SEWER PIPE SHALL BE IN ACCORDANCE WITH CSA A257.2, OR LATEST AMENDMENT. ALL NON-REINFORCED CONCRETE STORM SEWER PIPE SHALL BE IN ACCORDANCE WITH CSA A257.1, OR LATEST AMENDMENT. PIPE SHALL BE JOINED WITH STD. RUBBER GASKETS AS PER CSA A257.3, OR LATEST AMENDMENT.
18. ALL STORM SEWER TRENCH AND BEDDING SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. S6 AND S7 CLASS 'B' UNLESS OTHERWISE SPECIFIED. BEDDING AND COVER MATERIAL SHALL BE SPECIFIED BY PROJECT GEOTECHNICAL ENGINEER.
19. ALL PVC STORM SEWERS ARE TO BE SDR 35 APPROVED PER C.S.A. B182.2 OR LATEST AMENDMENT, UNLESS OTHERWISE SPECIFIED.
20. CATCH BASIN SHALL BE IN ACCORDANCE WITH OPSD 705.010.
21. CATCH BASIN LEADS SHALL BE IN 200MM DIA. AT 1% SLOPE (MIN) UNLESS SPECIFIED OTHERWISE.
22. ALL CATCH BASINS SHALL HAVE 600MM SUMPS, UNLESS SPECIFIED OTHERWISE.
23. ALL CATCH BASIN LEAD INVERTS TO BE 1.5M BELOW FINISHED GRADE UNLESS SPECIFIED OTHERWISE.
24. THE STORM SEWER CLASSES HAVE BEEN DESIGNED BASED ON BEDDING CONDITIONS SPECIFIED ABOVE. WHERE THE SPECIFIED TRENCH WIDTH IS EXCEEDED , THE CONTRACTOR IS REQUIRED TO PROVIDE AND SHALL BE RESPONSIBLE FOR EXTRA TEMPORARY AND/OR PERMANENT REPAIRS MADE NECESSARY BY THE WIDENED TRENCH.
25. ALL ROAD AND PARKING LOT CATCH BASINS TO BE INSTALLED WITH ORTHOGONALLY PLACED SUBDRAINS IN ACCORDANCE WITH DETAIL. PERFORATED SUBDRAIN FOR ROAD AND PARKING LOT CATCH BASIN SHALL BE INSTALLED PER CITY STD R1 UNLESS OTHERWISE NOTED.
26. PERFORATED SUBDRAIN FOR REAR YARD AND LANDSCAPING APPLICATIONS SHALL BE INSTALLED PER CITY STD S29, S30 AND S31, WHERE APPLICABLE.
27. RIP-RAP TREATMENT SEWER AND CULVERT OUTLETS PER OPSD 810.010.
28. ALL STORM SEWER/ CULVERTS TO BE INSTALLED WITH FROST TREATMENT PER OPSD 803.031 WHERE APPLICABLE.
29. ALL STORM MANHOLES WITH PIPE LESS THAN 900MM IN DIAMETER SHALL BE CONSTRUCTED WITH A 300MM SUMP AS PER SDG, CLAUSE 6.2.6.

WATERMAIN

30. ALL WATERMAIN INSTALLATION SHALL CONFORM TO THE LATEST REVISIONS OF THE CITY OF OTTAWA AND THE ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS).
31. ALL PVC WATERMAINS SHALL BE AWWA C-900 CLASS 150, SDR 18 OR APPROVED EQUIVALENT.
32. ALL WATER SERVICES LESS THAN OR EQUAL TO 50MM IN DIAMETER TO BE TYPE 'K' COPPER.
33. WATERMAIN TRENCH AND BEDDING SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STANDARD W17. UNLESS SPECIFIED OTHERWISE. BEDDING AND COVER MATERIAL SHALL BE SPECIFIED BY THE PROJECT GEOTECHNICAL ENGINEER.
34. ALL PVC WATERMAINS, SHALL BE INSTALLED WITH A 10 GAUGE STRANDED COPPER TWU OR RWU TRACER WIRE IN ACCORDANCE WITH CITY OF OTTAWA STD. W.36.
35. CATHODIC PROTECTION IS REQUIRED ON ALL METALLIC FITTINGS PER CITY OF OTTAWA STD.25.5 AND W25.6.
36. VALVE BOXES SHALL BE INSTALLED PER CITY OF OTTAWA STD W24.
37. WATERMAIN IN FILL AREAS TO BE INSTALLED WITH RESTRAINED JOINTS PER CITY OF OTTAWA STD.25.5 AND W25.6.
38. THRUST BLOCKING OF WATERMAINS TO BE INSTALLED PER CITY OF OTTAWA STD. W25.3 AND W25.4.
39. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY CAPS, PLUGS, BLOW-OFFS, AND NOZZLES REQUIRED FOR TESTING AND DISINFECTION OF THE WATERMAIN.
40. WATERMAIN CROSSING OVER AND BELOW SEWERS SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. W25,2 AND W25, RESPECTIVELY.
41. WATER SERVICES ARE TO BE INSULATED PER CITY STD. W23 WHERE SEPARATION BETWEEN SERVICES AND MAINTENANCE HOLES ARE LESS THAN 2.4M.
42. THE MINIMUM VERTICAL CLEARANCE BETWEEN WATERMAIN AND SEWER/UTILITY IS 0.5M PER MOE GUIDELINES. FOR CROSSING UNDER SEWERS, ADEQUATE STRUCTURAL SUPPORT FOR THE SEWER IS REQUIRED TO PREVENT EXCESSIVE DEFLECTION OF JOINTS AND SETTLING. THE LENGTH OF WATER PIPE SHALL BE CENTERED AT THE POINT OF CROSSING TO ENSURE THAT THE JOINTS WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE SEWER.
43. ALL WATERMAINS SHALL HAVE A MINIMUM COVER OF 2.4M, OTHERWISE THERMAL INSULATION IS REQUIRED AS PER STD DWG W22.
44. GENERAL WATER PLANT TO UTILITY CLEARANCE AS PER STD DWG R20.
45. FIRE HYDRANT INSTALLATION AS PER STD DWG W19, ALL BOTTOM OF HYDRANT FLANGE ELEVATIONS TO BE INSTALLED 0.10M ABOVE PROPOSED FINISHED GRADE AT HYDRANT; FIRE HYDRANT LOCATION AS PER STD DWG W18.
46. BUILDING SERVICE TO BE CAPPED 1.0M OFF THE FACE OF THE BUILDING UNLESS OTHERWISE NOTED AND MUST BE RESTRAINED A MINIMUM OF 12M BACK FROM STUB.
47. ALL WATERMAINS SHALL BE HYDROSTATICALLY TESTED IN ACCORDANCE WITH THE CITY OF OTTAWA AND ONTARIO GUIDELINES UNLESS OTHERWISE DIRECTED. PROVISIONS FOR FLUSHING WATER LINE PRIOR TO TESTING, ETC. MUST BE PROVIDED.
48. ALL WATERMAINS SHALL BE BACTERIOLOGICALLY TESTED IN ACCORDANCE WITH THE CITY OF OTTAWA AND ONTARIO GUIDELINES. ALL CHLORINATED WATER TO BE DISCHARGED AND PRETREATED TO ACCEPTABLE LEVELS PRIOR TO DISCHARGE. ALL DISCHARGED WATER MUST BE CONTROLLED AND TREATED SO AS NOT TO ADVERSELY EFFECT ENVIRONMENT. IT IS RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL MUNICIPAL AND/OR PROVINCIAL REQUIREMENTS ARE FOLLOWED.
49. ALL WATERMAIN STUBS SHALL BE TERMINATED WITH A PLUG AND 50MM BLOW OFF UNLESS OTHERWISE NOTED.

USE AND INTERPRETATION OF DRAWINGS

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION ARE PART OF THE CONTRACT DOCUMENTS AND DESCRIBE USE AND INTENT OF THE DRAWING. THE CONTRACT DOCUMENTS INCLUDE NOT ONLY THE DRAWINGS, BUT ALSO THE OWNER-CONTRACTOR AGREEMENTS, CONDITIONS OF THE CONTRACT, THE SPECIFICATIONS, ADDENDA, AND MODIFICATIONS ISSUED AFTER EXECUTION OF THE CONTRACT. THESE CONTRACT DOCUMENTS ARE COMPLEMENTARY, AND WHAT IS REQUIRED BY ANY ONE SHALL BE BINDING AS IF REQUIRED BY ALL. WORK NOT COMPLETELY DELINEATED HEREON SHALL BE CONSTRUCTED OF THE SAME MATERIALS AND DETAILED SIMILARLY AS WORK SHOWN MORE COMPLETELY ELSEWHERE IN THE CONTRACT DOCUMENTS.

BY USE OF THE DRAWINGS FOR CONSTRUCTION OF THE PROJECT, THE OWNER CONFIRMS THAT HE HAS REVIEWED AND APPROVED THE DRAWINGS. THE CONTRACTOR CONFIRMS THAT HE HAS VISITED THE SITE, FAMILIARIZED HIMSELF WITH THE LOCAL CONDITIONS, VERIFIED FIELD DIMENSIONS AND CORRELATED HIS OBSERVATIONS WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

AS INSTRUMENTS OF SERVICE, ALL DRAWINGS, SPECIFICATIONS, CADD FILES OR OTHER ELECTRONIC MEDIA AND COPIED THERE OF FURNISHED BY THE ENGINEER ARE HIS PROPERTY. THEY ARE TO BE USED ONLY FOR THIS PROJECT AND ARE NOT TO BE USED ON ANY OTHER PROJECT, INCLUDING REPEATS OF THE PROJECT. CHANGES TO THE DRAWINGS MAY ONLY BE MADE BY THE ENGINEER.

UNLESS THE REVISION TITLE IS "ISSUED FOR CONSTRUCTION", THESE DRAWINGS SHALL BE CONSIDERED PRELIMINARY AND SHALL NOT BE USED AS A CONSTRUCTION DOCUMENT.

THESE DRAWINGS ILLUSTRATES THE WORK TO BE DONE. THE ENGINEER IS NOT RESPONSIBLE FOR THE MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES USED TO DO THE WORK, OR THE SAFETY ASPECTS OF CONSTRUCTION, AND NOTHING ON THESE DRAWINGS EXPRESSED OR IMPLIED CHANGES THIS CONDITION. CONTRACTOR SHALL DETERMINE ALL CONDITIONS AT THE SITE AND SHALL BE RESPONSIBLE FOR KNOWING HOW THEY AFFECT THE WORK. SUBMITTAL OF A BID TO PERFORM THIS WORK IS ACKNOWLEDGEMENT OF THE RESPONSIBILITIES, AND THAT THEY HAVE BEEN FULLY CONSIDERED IN PLANNING OF THE WORK, AND THE BID PRICE. NO CLAIMS FOR EXTRA CHARGES DUE TO THESE CONDITIONS WILL BE FORTHCOMING.

UNAUTHORIZED CHANGES:

IN THE EVENT THE CLIENT, THE CLIENT'S CONTRACTORS OR SUBCONTRACTORS, OR ANYONE FOR WHOM THE CLIENT IS LEGALLY LIABLE MAKES OR PERMITS TO BE MADE ANY CHANGES TO ANY REPORTS, PLANS, SPECIFICATIONS OR OTHER CONSTRUCTION DOCUMENTS PREPARED BY LRL ASSOCIATES LTD. (LRL) WITHOUT OBTAINING LRL'S PRIOR WRITTEN CONSENT, THE CLIENT SHALL ASSUME FULL RESPONSIBILITY FOR THE RESULTS OF SUCH CHANGES. THEREFORE THE CLIENT AGREES TO WAIVE ANY CLAIM AGAINST LRL AND TO RELEASE LRL FROM ANY LIABILITY ARISING DIRECTLY OR INDIRECTLY FROM SUCH UNAUTHORIZED CHANGES.

IN ADDITION, THE CLIENT AGREES, TO THE FULLEST EXTENT PERMITTED BY LAW, TO INDEMNIFY AND HOLD HARMLESS LRL FROM ANY DAMAGES, LIABILITIES OR COST, INCLUDING REASONABLE ATTORNEY'S FEES AND COST OF DEFENSE, ARISING FROM SUCH CHANGES.

IN ADDITION, THE CLIENT AGREES TO INCLUDE IN ANY CONTRACTS FOR CONSTRUCTION APPROPRIATE LANGUAGE THAT PROHIBITS THE CONTRACTOR OR ANY SUBCONTRACTORS OF ANY TIER FROM MAKING ANY CHANGES OR MODIFICATIONS TO LRL'S CONSTRUCTION DOCUMENTS WITHOUT THE PRIOR WRITTEN APPROVAL OF LRL AND THAT FURTHER REQUIRES THE CONTRACTOR TO INDEMNIFY BOTH LRL AND THE CLIENT FROM ANY LIABILITY OR COST ARISING FROM SUCH CHANGES MADE WITHOUT SUCH PROPER AUTHORIZATION.

GENERAL NOTES:

EXISTING SERVICES AND UTILITIES SHOWN ON THESE DRAWINGS ARE TAKEN FROM THE BEST AVAILABLE RECORDS, BUT MAY NOT BE COMPLETE OR TO DATE. CONTRACTOR SHALL VERIFY IN FIELD FOR LOCATION AND ELEVATION OF PIPES AND CHECK WITH THE UTILITY COMPANIES BEFORE DIGGING OR PERFORMING WORK.

CONTRACTOR IS ADVISED TO COLLECT INFORMATION ON SOIL CONDITIONS BEFORE START OF CONSTRUCTION.

THE ENGINEER WAIVES ANY AND ALL RESPONSIBILITY AND LIABILITY FOR PROBLEMS WHICH ARISE FROM FAILURE TO FOLLOW THESE PLANS, SPECIFICATIONS AND THE DESIGN INTENT THEY CONVEY, OR FOR PROBLEMS WHICH ARISE FROM OTHERS' FAILURE TO OBTAIN AND/OR FOLLOW THE ENGINEER'S GUIDANCE WITH RESPECT TO ANY ERRORS, OMISSIONS, INCONSISTENCIES AMBIGUITIES OR CONFLICTS WHICH ARE ALLEGED.

CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES BEFORE WORK COMMENCES. DO NOT SCALE DRAWINGS.

No.	REVISIONS	BY	DATE
02	ISSUED FOR SPC AMENDMENT	M.S.	27 JAN 2025
01	ISSUED FOR SPC AMENDMENT	S.V.	18 DEC 2024

M. BASNET
100501996
2025/01/27

NOT AUTHENTIC UNLESS SIGNED AND DATED

LRL
ENGINEERING I INGÉNIERIE
5430 Canotek Road I Ottawa, ON, K1J 9G2
www.lrl.ca I (613) 842-3434

CLIENT
CONCORDE PROPERTIES

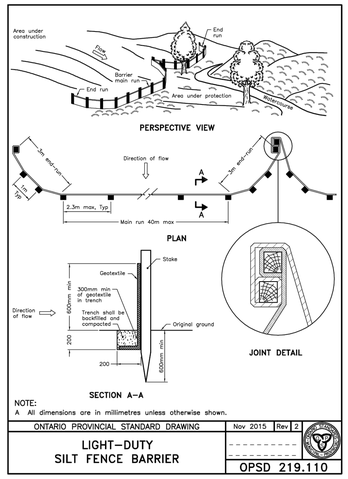
DESIGNED BY: M.B.
DRAWN BY: S.V.
APPROVED BY: M.B.

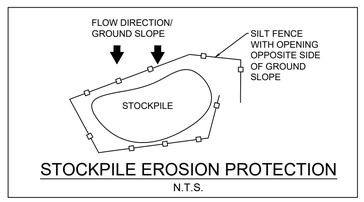
PROJECT
PROPOSED 3-STOREY APARTMENT BUILDING
1465 MORISSET AVE, OTTAWA (ON)

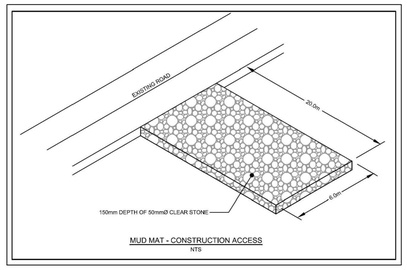
DRAWING TITLE
GENERAL NOTES

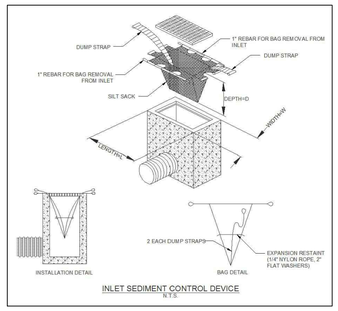
PROJECT NO.
200572
DATE
DECEMBER 2024

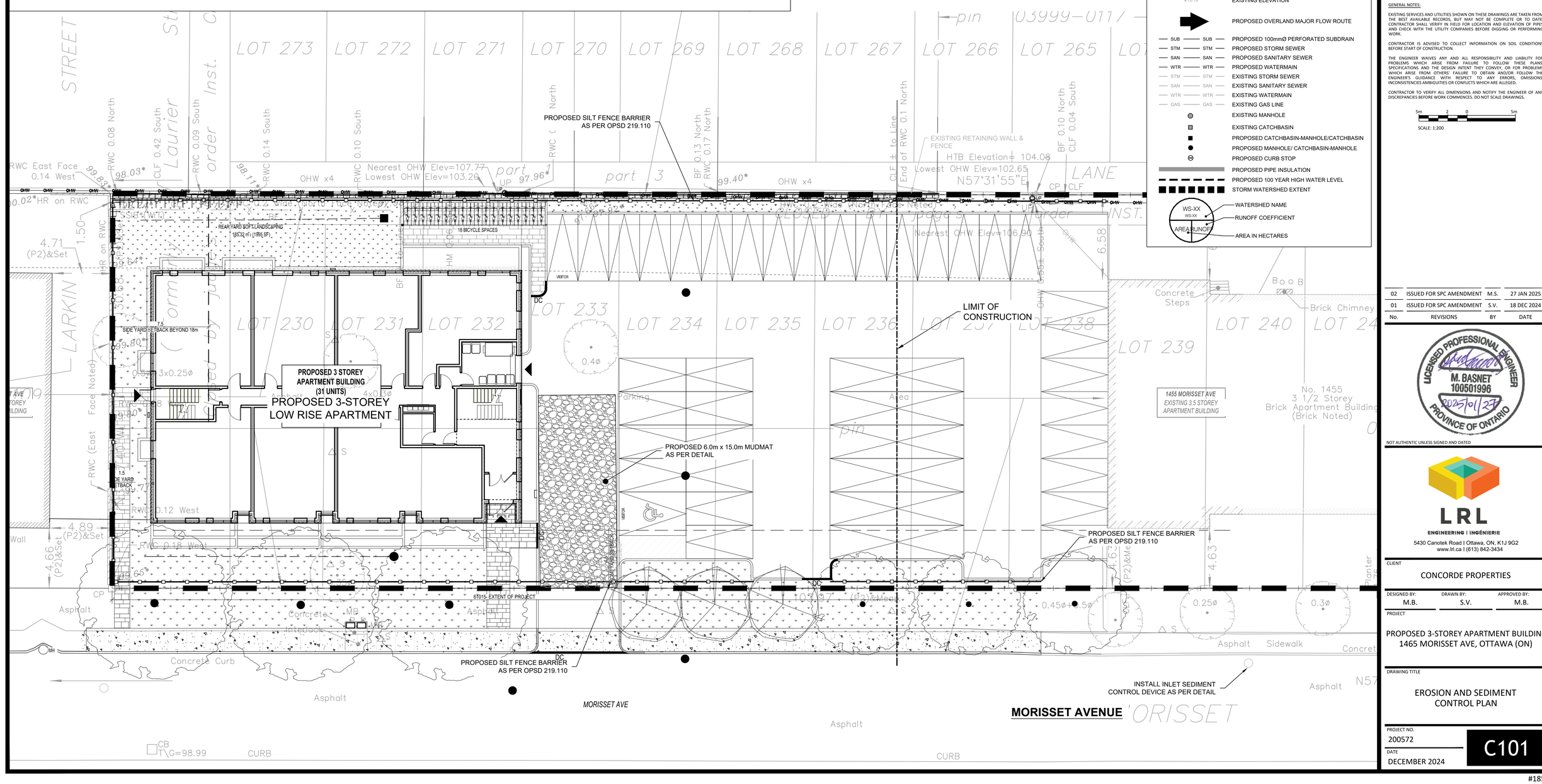
C001











LEGEND:

- EXISTING PROPERTY LINE TO REMAIN
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5m 2 0 5m
SCALE: 1:200

No.	REVISIONS	BY	DATE
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01	ISSUED FOR SPC AMENDMENT	S.V.	18 DEC 2024

LICENSED PROFESSIONAL ENGINEER
M. BASNET
100501996
2025/01/27
PROVINCE OF ONTARIO
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PROJECT
PROPOSED 3-STOREY APARTMENT BUILDING
1465 MORISSET AVE, OTTAWA (ON)

DRAWING TITLE
EROSION AND SEDIMENT CONTROL PLAN

PROJECT NO.
200572
DATE
DECEMBER 2024

C101

D07-12-21-0091

#18532

EXISTING RETAINING WALL TO BE DEMOLISHED AND REPLACED WITH NEW RETAINING WALL

EXISTING WOOD FENCE TO BE REMOVED

LIMIT OF CONSTRUCTION

EXISTING ASPHALT TO BE REMOVED

LEGEND:

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3.0m 1.5 0 3.0 6.0m
SCALE: 1:150

No.	REVISIONS	BY	DATE
02	ISSUED FOR SPC AMENDMENT	M.S.	27 JAN 2025
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LICENSED PROFESSIONAL ENGINEER
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PROJECT
PROPOSED 3-STOREY APARTMENT BUILDING
1465 MORISSET AVE, OTTAWA (ON)

DRAWING TITLE
DEMOLITION PLAN

PROJECT NO.
200572
DATE
DECEMBER 2024

C102

D07-12-21-0091

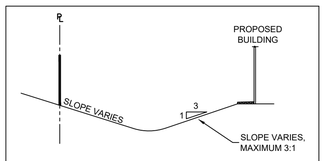
#18532

PAVEMENT STRUCTURE

COURSE	MATERIAL	THICKNESS (mm) AUTOMOBILE PARKING	THICKNESS (mm) TRUCK ROUTE (HEAVY TRAFFIC)
SURFACE	HL.3 A/C	50	40
BINDER	HL.8 A/C	-	50
BASECOURSE	OPSS GRANULAR "A"	150	150
SUBBASE	OPSS GRANULAR "B"	300	400

NOTE:
IN PREPARATION FOR PAVEMENT CONSTRUCTION AT THIS SITE, ANY SURFICIAL OR NEAR SURFACE/SUBGRADE LEVEL TOPSOIL AND ANY SOFT, WET OR DELETERIOUS MATERIALS SHOULD BE REMOVED FROM THE PROPOSED PAVED AREAS. THE EXPOSED SUBGRADE SHOULD BE INSPECTED AND APPROVED BY GEOTECHNICAL PERSONNEL AND ANY SOFT AREAS EVIDENT SHOULD BE SUBEXCAVATED AND REPLACED WITH SUITABLE EARTH BORROW APPROVED BY THE GEOTECHNICAL ENGINEER. THE SUBGRADE SHOULD BE SHAPED AND CROWNED TO PROMOTE DRAINAGE OF THE SITE DRAINAGE STRUCTURES. FOLLOWING APPROVAL OF THE PREPARATION OF THE SUBGRADE, THE PAVEMENT GRANULARS MAY BE PLACED.

RECOMMENDED PAVEMENT STRUCTURE AS PER GEOTECHNICAL REPORT PREPARED BY LRL ASSOCIATES INC., APRIL 8, 2021



SWALE - TYPICAL SECTION
(N.T.S.)

Bearings are grid, derived from Can-Net 2016 Real Time Network GPS observations and are referred to the Central Meridian of MTM Zone 9 (76°30' West Longitude) NAD-83 (original).

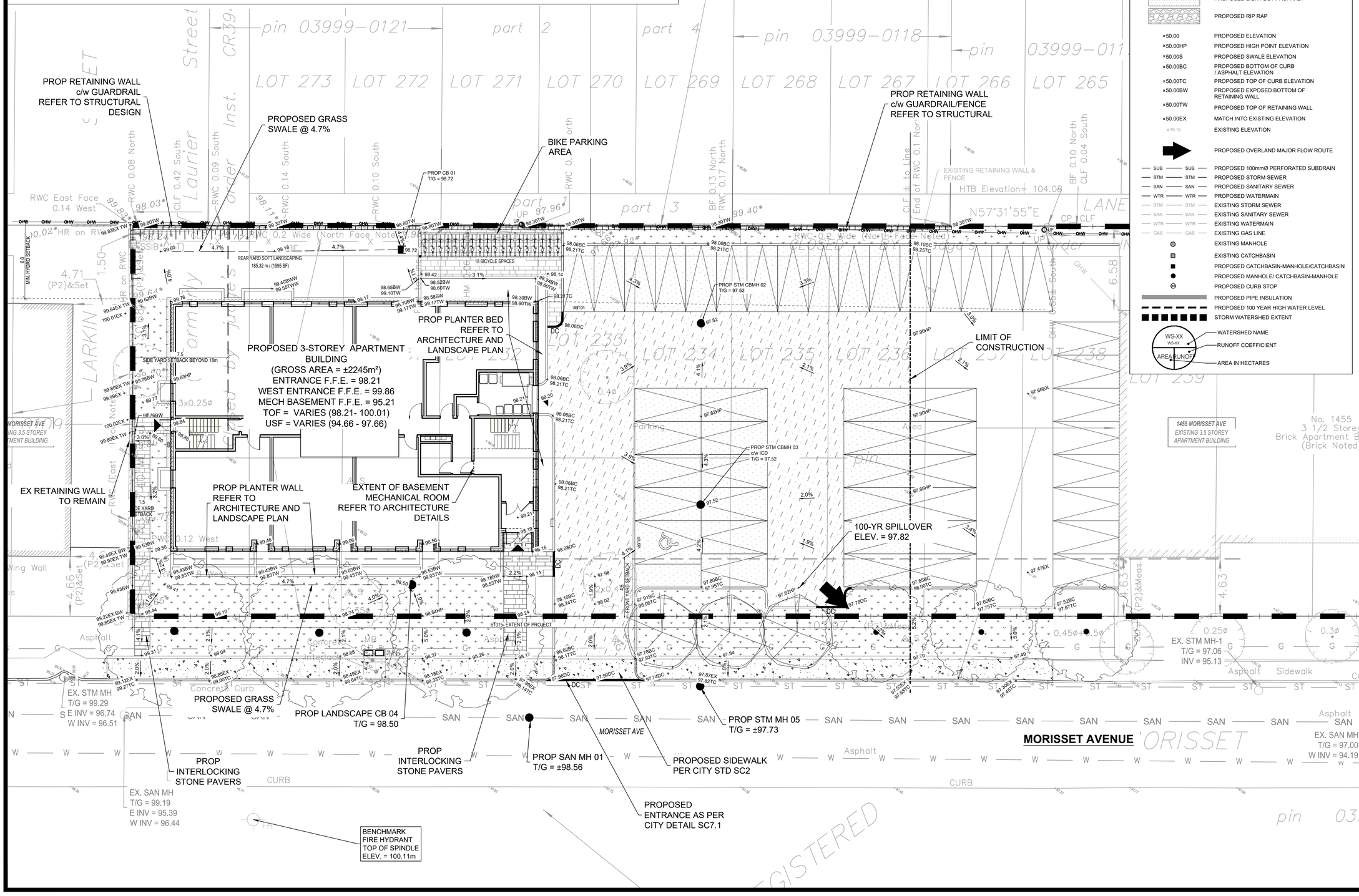
For comparison purposes, a rotation of 0°30'50" counter-clockwise was applied to bearings on P2.

ELEVATION NOTES

1. Elevations shown are geodetic and are referred to the CGVD28 geodetic datum, derived from City of Ottawa Benchmark No. N-29, having an elevation of 77.347.
2. It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and that it's relative elevation and description agrees with the information shown on this drawing.

UTILITY NOTES

1. This drawing cannot be accepted as acknowledging all of the utilities and it will be the responsibility of the user to contact the respective utility authorities for confirmation.
2. Only visible surface utilities were located.
3. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.
4. Underground utility locations derived by City of Ottawa Utility Coordinate Committee Sheets numbers H-05-12 and H-05-17, and utility inverts provided by City of Ottawa Engineering Department plans dated July 2, 1999, April 4, 1963 (Storm Sewer), and April 4, 1963 (Sewer).



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3.0m 1.5 0 3.0 6.0m
SCALE: 1:150

No.	REVISIONS	BY	DATE
02	ISSUED FOR SPC AMENDMENT	M.S.	27 JAN 2025
01	ISSUED FOR SPC AMENDMENT	S.V.	18 DEC 2024

LICENSED PROFESSIONAL ENGINEER
M. BASNET
100501996
2025/01/27
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

LRL
ENGINEERING | INGÉNIERIE
5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

CLIENT
CONCORDE PROPERTIES

DESIGNED BY:	DRAWN BY:	APPROVED BY:
M.B.	S.V.	M.B.

PROJECT
PROPOSED 3-STOREY APARTMENT BUILDING
1465 MORISSET AVE, OTTAWA (ON)

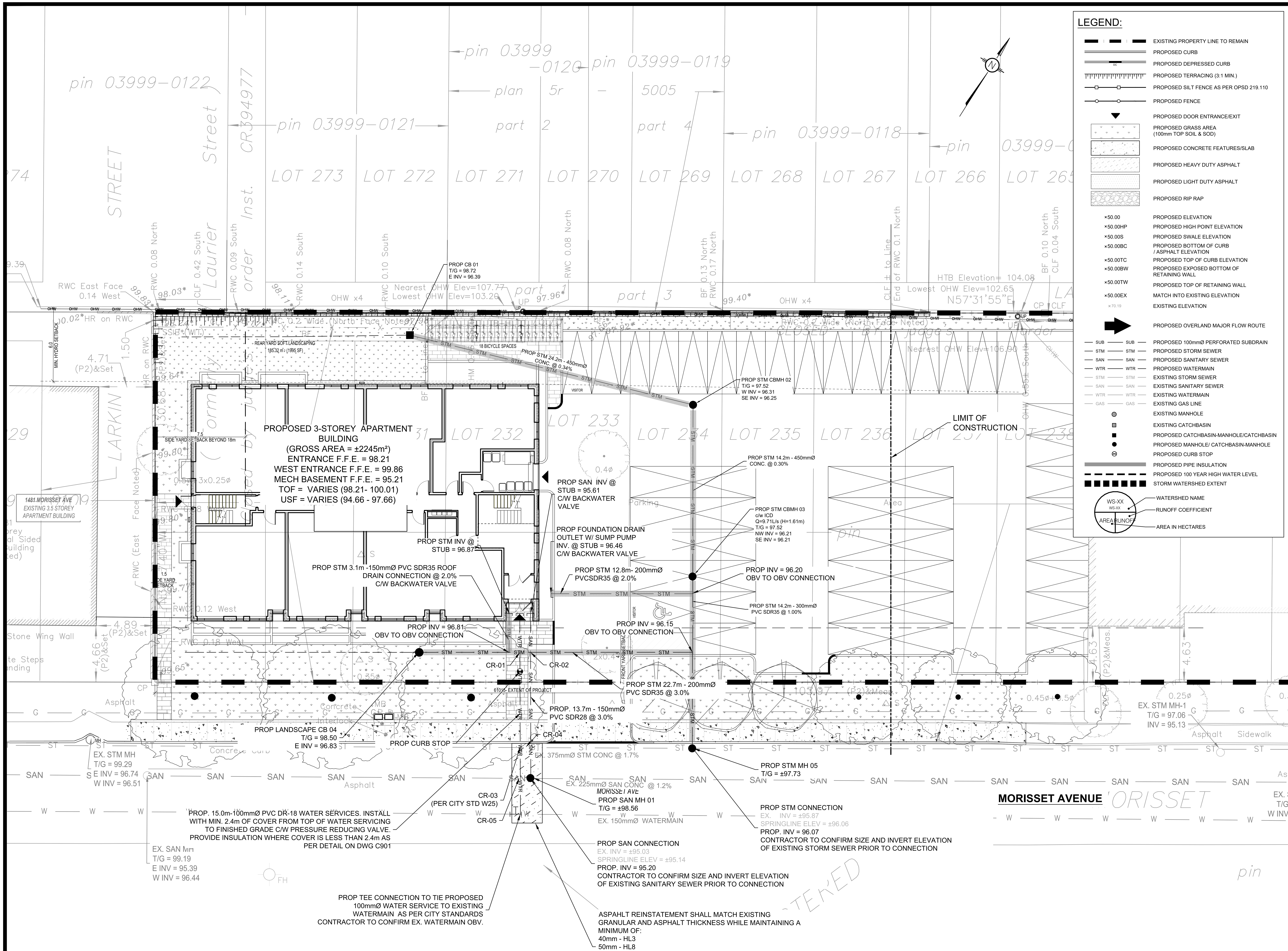
DRAWING TITLE
GRADING AND DRAINAGE PLAN

PROJECT NO. 200572
DATE DECEMBER 2024

C301

D07-12-21-0091

#18532



Crossing #	PROP. SAN	PROP. WM	PROP. STM	EX. STM (375mm)	EX. SAN (225mm)	Depth Separation (m)
CR-01	N/A	95.76 (obv.)	96.59 (inv.)	N/A	N/A	±0.83
CR-02	95.68(obv.)	N/A	96.56 (inv.)	N/A	N/A	±0.88
CR-03	N/A	95.62 (obv.)	N/A	±96.12 (inv.)	N/A	±0.50
CR-04	95.38(obv.)	N/A	N/A	±96.10 (inv.)	N/A	±0.72
CR-05	N/A	95.75 (inv.)	N/A	N/A	±95.25 (obv.)	±0.50

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3.0m 1.5 0 3.0 6.0m

SCALE: 1:150

No.	REVISIONS	BY	DATE
02	ISSUED FOR SPC AMENDMENT	M.S.	27 JAN 2025
01	ISSUED FOR SPC AMENDMENT	S.V.	18 DEC 2024

LICENSED PROFESSIONAL ENGINEER M. BASNET 100501996 2025/01/27 PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

LRL ENGINEERING | INGÉNIERIE

5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

CLIENT
CONCORDE PROPERTIES

DESIGNED BY:	DRAWN BY:	APPROVED BY:
M.B.	S.V.	M.B.

PROJECT
PROPOSED 3-STOREY APARTMENT BUILDING
1465 MORISSET AVE, OTTAWA (ON)

DRAWING TITLE
SERVICING PLAN

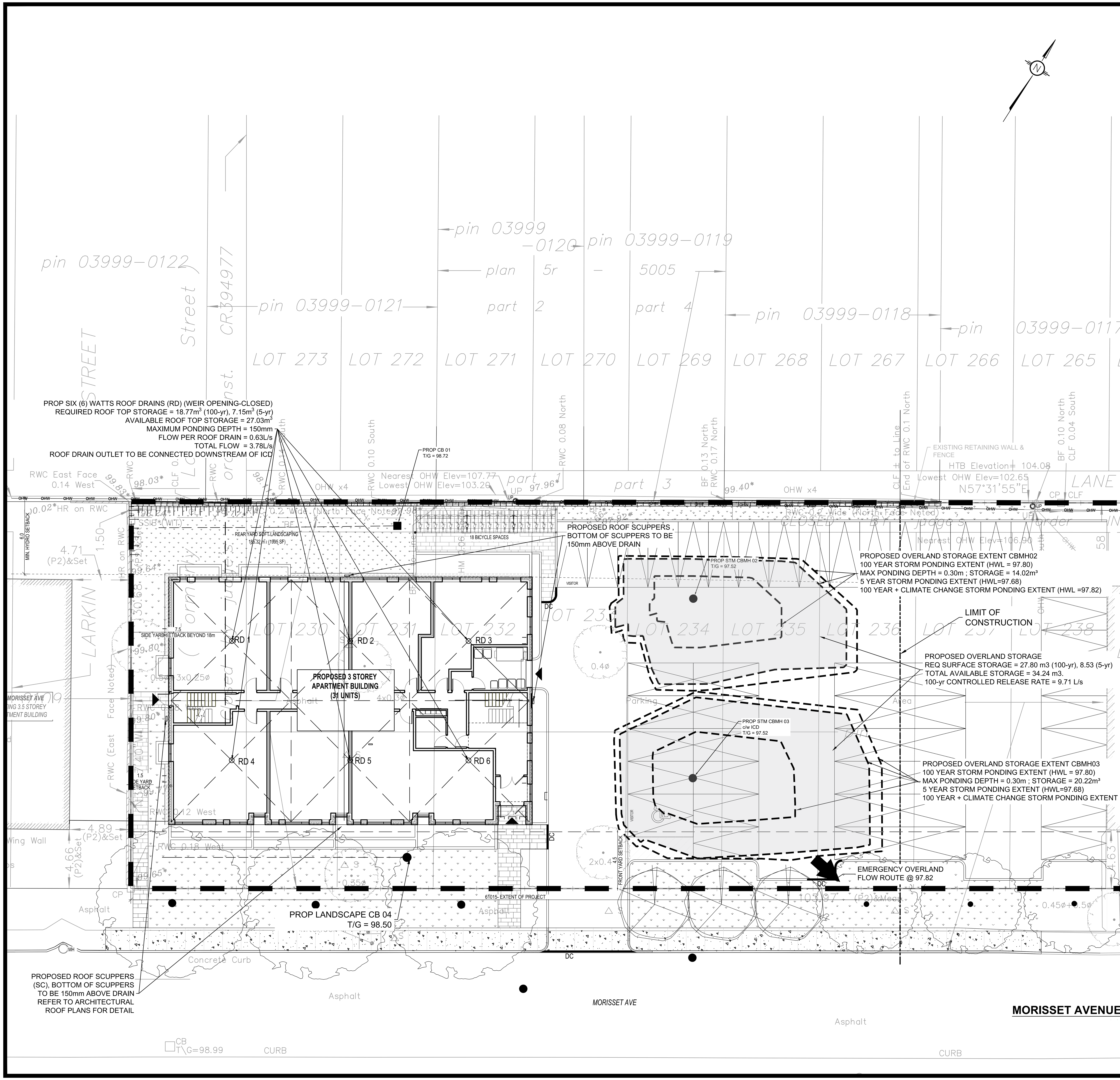
PROJECT NO.
200572

DATE
DECEMBER 2024

C401

D07-12-21-0091

#18532



LEGEND:

- EXISTING PROPERTY LINE TO REMAIN
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- PROPOSED TERRACING (3:1 MIN.)
- PROPOSED SILT FENCE AS PER OPSD 219.110
- PROPOSED FENCE
- PROPOSED DOOR ENTRANCE/EXIT
- PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
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- EXISTING CATCHBASIN
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3.0m 1.5 0 3.0 6.0m

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02	ISSUED FOR SPC AMENDMENT	M.S.	27 JAN 2025
01	ISSUED FOR SPC AMENDMENT	S.V.	18 DEC 2024

LICENSED PROFESSIONAL ENGINEER
M. BASNET
100501996
2025/01/27
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

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5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

CLIENT
CONCORDE PROPERTIES

DESIGNED BY:	DRAWN BY:	APPROVED BY:
M.B.	S.V.	M.B.

PROJECT
PROPOSED 3-STOREY APARTMENT BUILDING
1465 MORISSET AVE, OTTAWA (ON)

DRAWING TITLE
STORMWATER MANAGEMENT PLAN

PROJECT NO.
200572

DATE
DECEMBER 2024

C601

D07-12-21-0091

#18532

LEGEND:

- EXISTING PROPERTY LINE TO REMAIN
- PROPOSED CURB
- PROPOSED DEPRESSED CURB
- PROPOSED TERRACING (3:1 MIN.)
- PROPOSED SILT FENCE AS PER OPSD 219.110
- PROPOSED FENCE
- PROPOSED DOOR ENTRANCE/EXIT
- PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
- PROPOSED CONCRETE FEATURES/SLAB
- PROPOSED HEAVY DUTY ASPHALT
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- PROPOSED RIP RAP
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- PROPOSED 100 YEAR HIGH WATER LEVEL
- STORM WATERSHED EXTENT
- WS-XX / WS-XX / AREA / RUNOFF — WATERSHED NAME; RUNOFF COEFFICIENT; AREA IN HECTARES

LIMIT OF CONSTRUCTION

PROPOSED 3 STOREY APARTMENT BUILDING (31 UNITS)

EWS-01 UN-CONTROLLED 0.185 0.90

REAR YARD SOFT LANDSCAPING 1853.2 m² (1995 SF)

18 BICYCLE SPACES

61015- EXTENT OF PROJECT

MORISSET AVE

1455 MORISSET AVE EXISTING 3.5 STOREY APARTMENT BUILDING

1481 MORISSET AVE EXISTING 3.5 STOREY APARTMENT BUILDING

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3.0m 1.5 0 3.0 6.0m

SCALE: 1:150

No.	REVISIONS	BY	DATE
02	ISSUED FOR SPC AMENDMENT	M.S.	27 JAN 2025
01	ISSUED FOR SPC AMENDMENT	S.V.	18 DEC 2024

LICENSED PROFESSIONAL ENGINEER — M. BASNET 100501996 — 2025/01/27 — PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

LRL
ENGINEERING | INGÉNIERIE
5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

CLIENT: CONCORDE PROPERTIES

DESIGNED BY:	DRAWN BY:	APPROVED BY:
M.B.	S.V.	M.B.

PROJECT: PROPOSED 3-STOREY APARTMENT BUILDING
1465 MORISSET AVE, OTTAWA (ON)

DRAWING TITLE: PRE-DEVELOPMENT WATERSHED PLAN

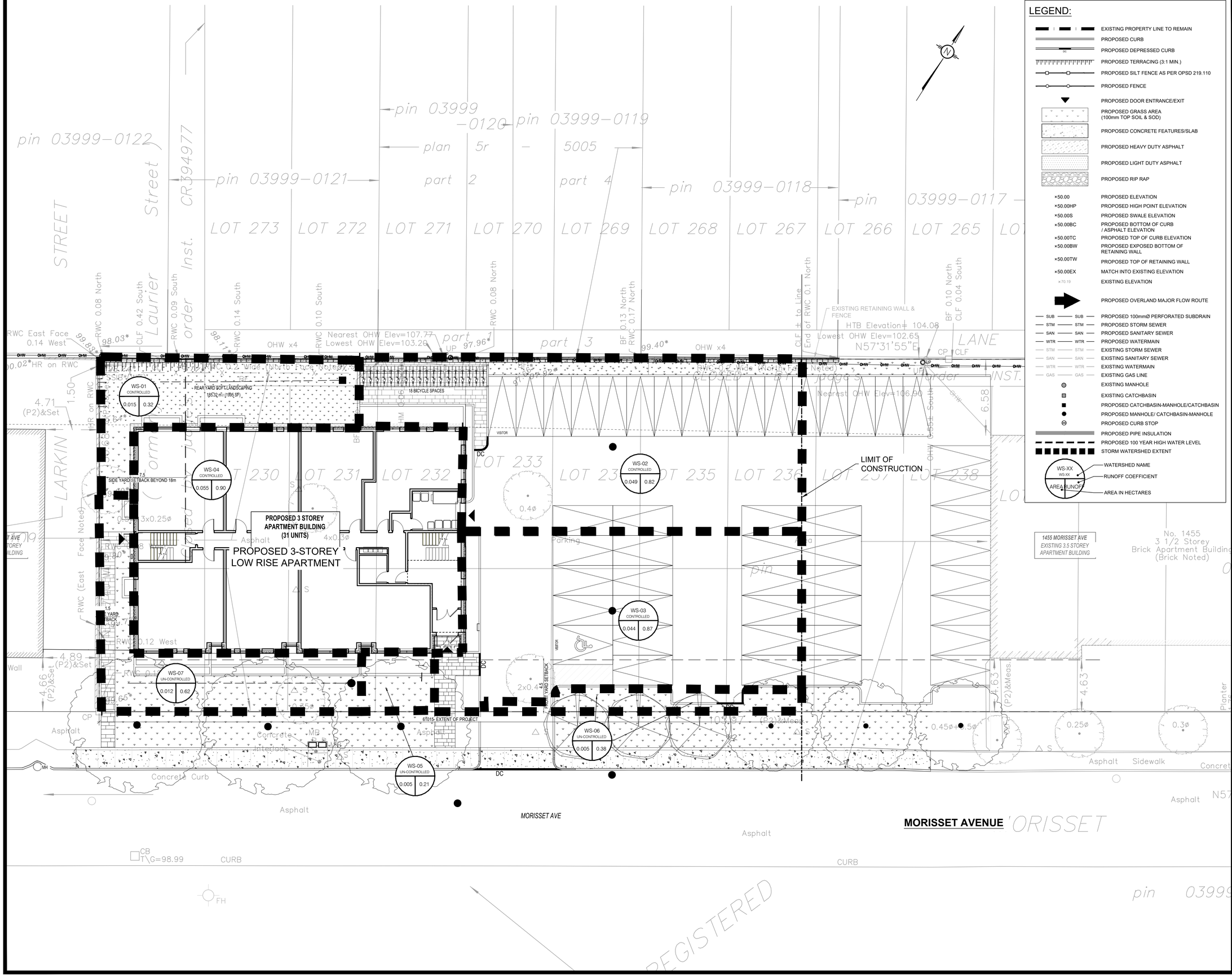
PROJECT NO. 200572

DATE: DECEMBER 2024

C701

D07-12-21-0091

#18532



LEGEND:

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WS-XX / WS-XX / AREA/RUNOFF
- WATERSHED NAME
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- AREA IN HECTARES

USE AND INTERPRETATION OF DRAWINGS

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BY USE OF THE DRAWINGS FOR CONSTRUCTION OF THE PROJECT, THE OWNER CONFIRMS THAT HE HAS REVIEWED AND APPROVED THE DRAWINGS. THE CONTRACTOR CONFIRMS THAT HE HAS VISITED THE SITE, FAMILIARIZED HIMSELF WITH THE LOCAL CONDITIONS, VERIFIED FIELD DIMENSIONS AND CORRELATED HIS OBSERVATIONS WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

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CONTRACTOR IS ADVISED TO COLLECT INFORMATION ON SOIL CONDITIONS BEFORE START OF CONSTRUCTION.

THE ENGINEER WAIVES ANY AND ALL RESPONSIBILITY AND LIABILITY FOR PROBLEMS WHICH ARISE FROM FAILURE TO FOLLOW THESE PLANS, SPECIFICATIONS AND THE DESIGN INTENT THEY CONVEY, OR FOR PROBLEMS WHICH ARISE FROM OTHERS' FAILURE TO OBTAIN AND/OR FOLLOW THE ENGINEER'S GUIDANCE WITH RESPECT TO ANY ERRORS, OMISSIONS, INCONSISTENCIES AMBIGUITIES OR CONFLICTS WHICH ARE ALLEGED.

CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES BEFORE WORK COMMENCES. DO NOT SCALE DRAWINGS.

3.0m 1.5 0 3.0 6.0m

SCALE: 1:150

No.	REVISIONS	BY	DATE
02	ISSUED FOR SPC AMENDMENT	M.S.	27 JAN 2025
01	ISSUED FOR SPC AMENDMENT	S.V.	18 DEC 2024

LICENSED PROFESSIONAL ENGINEER
M. BASNET
100501996
2025/01/27
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

LRL
ENGINEERING | INGÉNIERIE
5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

CLIENT
CONCORDE PROPERTIES

DESIGNED BY:	DRAWN BY:	APPROVED BY:
M.B.	S.V.	M.B.

PROJECT
PROPOSED 3-STOREY APARTMENT BUILDING
1465 MORISSET AVE, OTTAWA (ON)

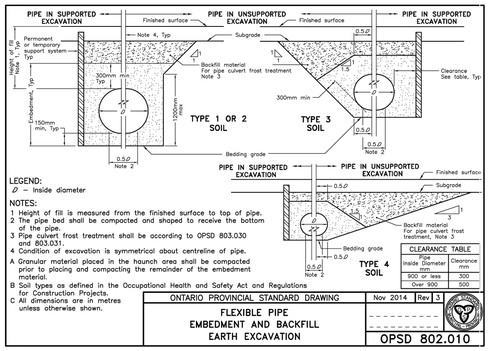
DRAWING TITLE
POST-DEVELOPMENT
WATERSHED PLAN

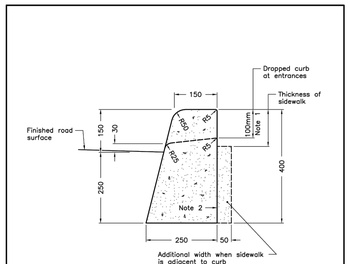
PROJECT NO. 200572
DATE DECEMBER 2024

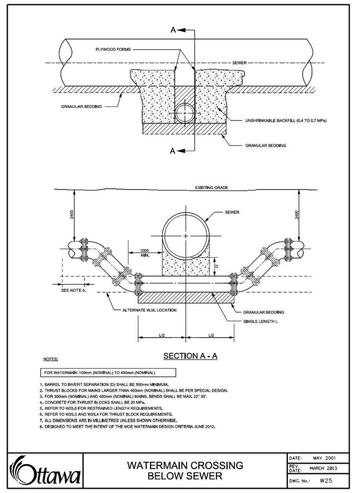
C702

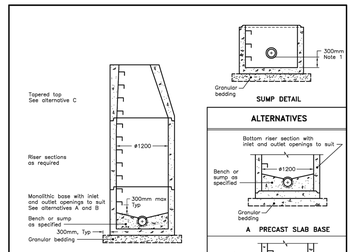
D07-12-21-0091

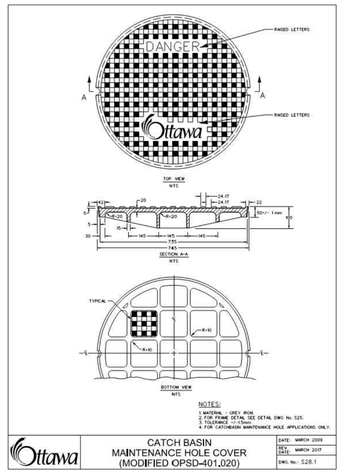
#18532

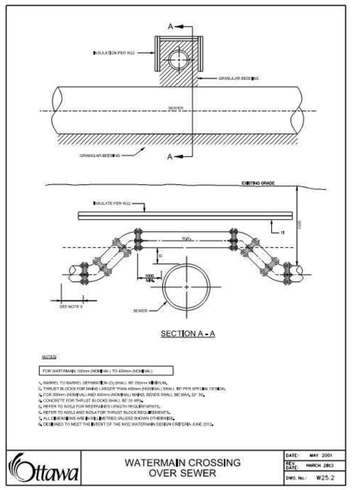


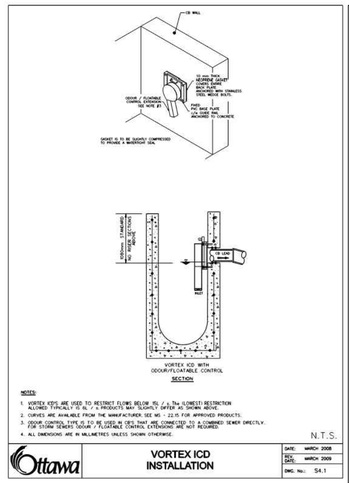


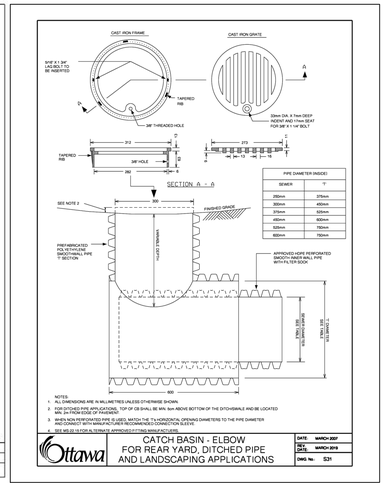


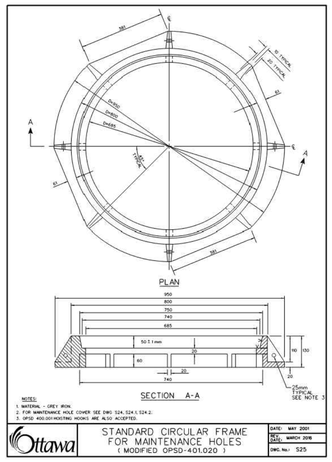


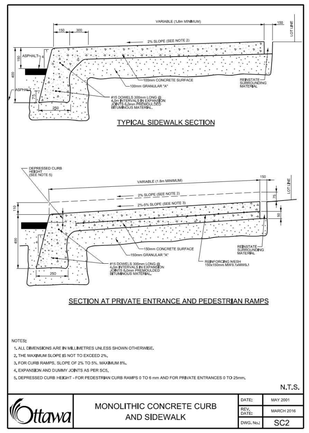


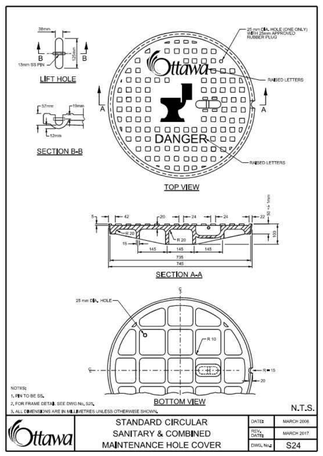


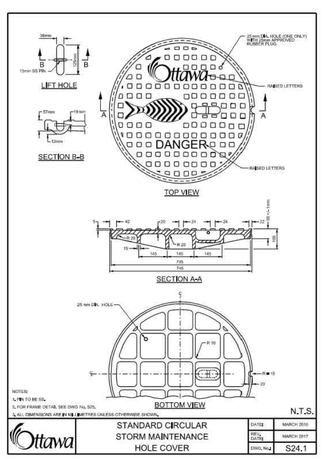


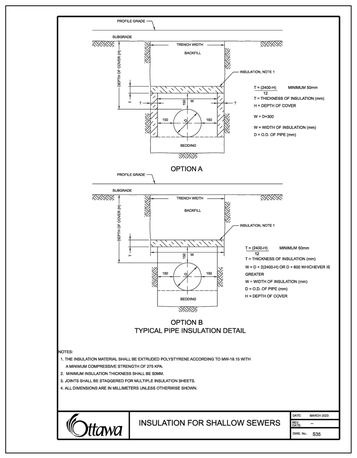


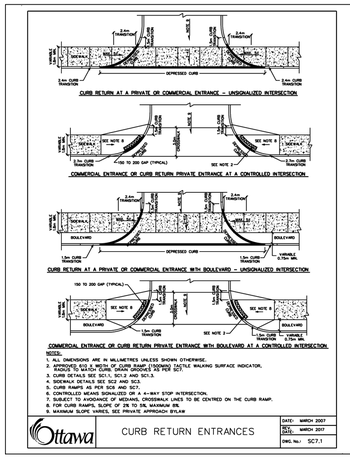


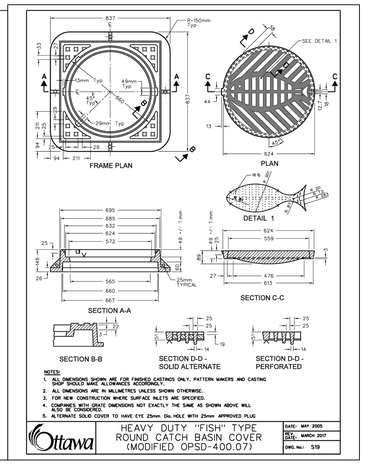


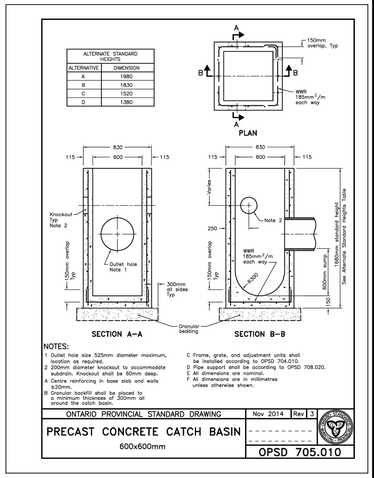












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No.	REVISIONS	BY	DATE
02	ISSUED FOR SPC AMENDMENT	M.S.	27 JAN 2025
01	ISSUED FOR SPC AMENDMENT	S.V.	18 DEC 2024

NOT AUTHENTIC UNLESS SIGNED AND DATED

LRL
ENGINEERING | INGÉNIERIE
5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

CLIENT

CONCORDE PROPERTIES

DESIGNED BY:	DRAWN BY:	APPROVED BY:
M.B.	S.V.	M.B.

PROJECT

PROPOSED 3-STOREY APARTMENT BUILDING
1465 MORISSET AVE, OTTAWA (ON)

DRAWING TITLE

CONSTRUCTION DETAIL PLAN

PROJECT NO.
200572

DATE
DECEMBER 2024

C901

D07-12-21-0091

#18532

APPENDIX F

Survey
As-Built
Architectural Drawings

Bearings are grid, derived from Can-Net 2016 Real Time Network GPS observations and are referred to the Central Meridian of MTM Zone 9 (76°30' West Longitude) NAD-83 (original).

For comparison purposes, a rotation of 0°30'50" counter-clockwise was applied to bearings on P2.

ELEVATION NOTES

1. Elevations shown are geodetic and are referred to the CGVD28 geodetic datum, derived from City of Ottawa Benchmark No. N-29, having an elevation of 77.347.
2. It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and that it's relative elevation and description agrees with the information shown on this drawing.

UTILITY NOTES

1. This drawing cannot be accepted as acknowledging all of the utilities and it will be the responsibility of the user to contact the respective utility authorities for confirmation.
2. Only visible surface utilities were located.
3. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.
4. Underground utility locations derived by City of Ottawa Utility Coordinate Committee Sheets numbers H-05-12 and H-05-17; and utility inverts provided by City of Ottawa Engineering Department plans dated July 2, 1999, April 4, 1963 (Storm Sewer), and April 4, 1963 (Sewer).

Notes & Legend

Symbol	Denotes	
—□—	"	Survey Monument Planted
—■—	"	Survey Monument Found
SIB	"	Standard Iron Bar
SSIB	"	Short Standard Iron Bar
*	"	Survey Monument 0.3 Long
CP	"	Concrete Pin
(WIT)	"	Witness
Meas.	"	Measured
(AOG)	"	Annis, O'Sullivan, Vollebekk Ltd.
(P1)	"	Registered Plan 327
(P2)	"	(1473) Plan dated January 11, 1996
(D1)	"	Inst. N633820
(tree symbol)	"	Deciduous Tree
FH	"	Fire Hydrant
MH-ST	"	Maintenance Hole (Storm Sewer)
MH-S	"	Maintenance Hole (Sanitary)
— ST —	"	Underground Storm Sewer
— S —	"	Underground Sanitary Sewer
— W —	"	Underground Water
— G —	"	Underground Gas
— R —	"	Underground Rogers
— OHW —	"	Overhead Wires
□ CB	"	Catch Basin
T\G	"	Top of Grate
Inv.	"	Invert
GM	"	Gas Meter
HM	"	Hydro Meter
TB-C	"	Cable Terminal Box
TB-H	"	Hydro Terminal Box
B	"	Bollard
△ S	"	Sign
CLF	"	Chain Link Fence
BF	"	Board Fence
HR	"	Handrail
RWC	"	Concrete Retaining Wall
UP	"	Utility Pole
AN	"	Anchor
HTB	"	Hydro Transformer Bolt
LS	"	Light Standard
MB	"	Mail Box
Ø	"	Diameter
+ 65.00	"	Location of Elevations
+ 65.00*	"	Top of Concrete Curb and Retaining Wall Elevation
Elev	"	Elevation
C/L	"	Centreline

PLAN OF SURVEY OF

LOTS 230 TO 251 (BOTH INCLUSIVE) AND PART OF CAVAN STREET (Closed by Judge's Order Inst. CR394977) AND PART OF LARKIN STREET (Closed by Judge's Order Inst. CR394977) AND PART OF THE LANE (Closed by Judge's Order Inst. CR404252) REGISTERED PLAN 327 CITY OF OTTAWA

Surveyed by Annis, O'Sullivan, Vollebekk Ltd.

Scale 1 : 300

12 9 6 3 0 6 12 Metres

Metric

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

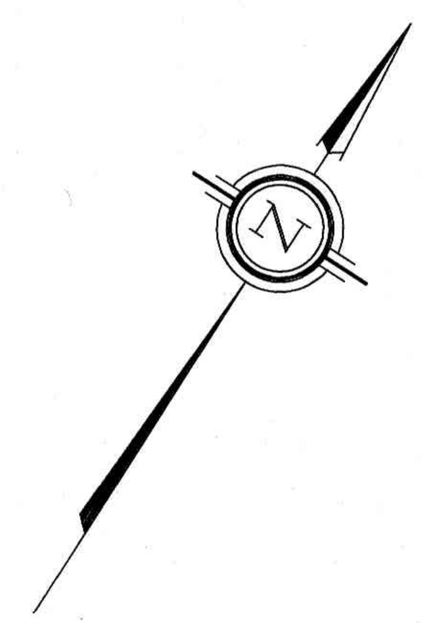
Surveyor's Certificate

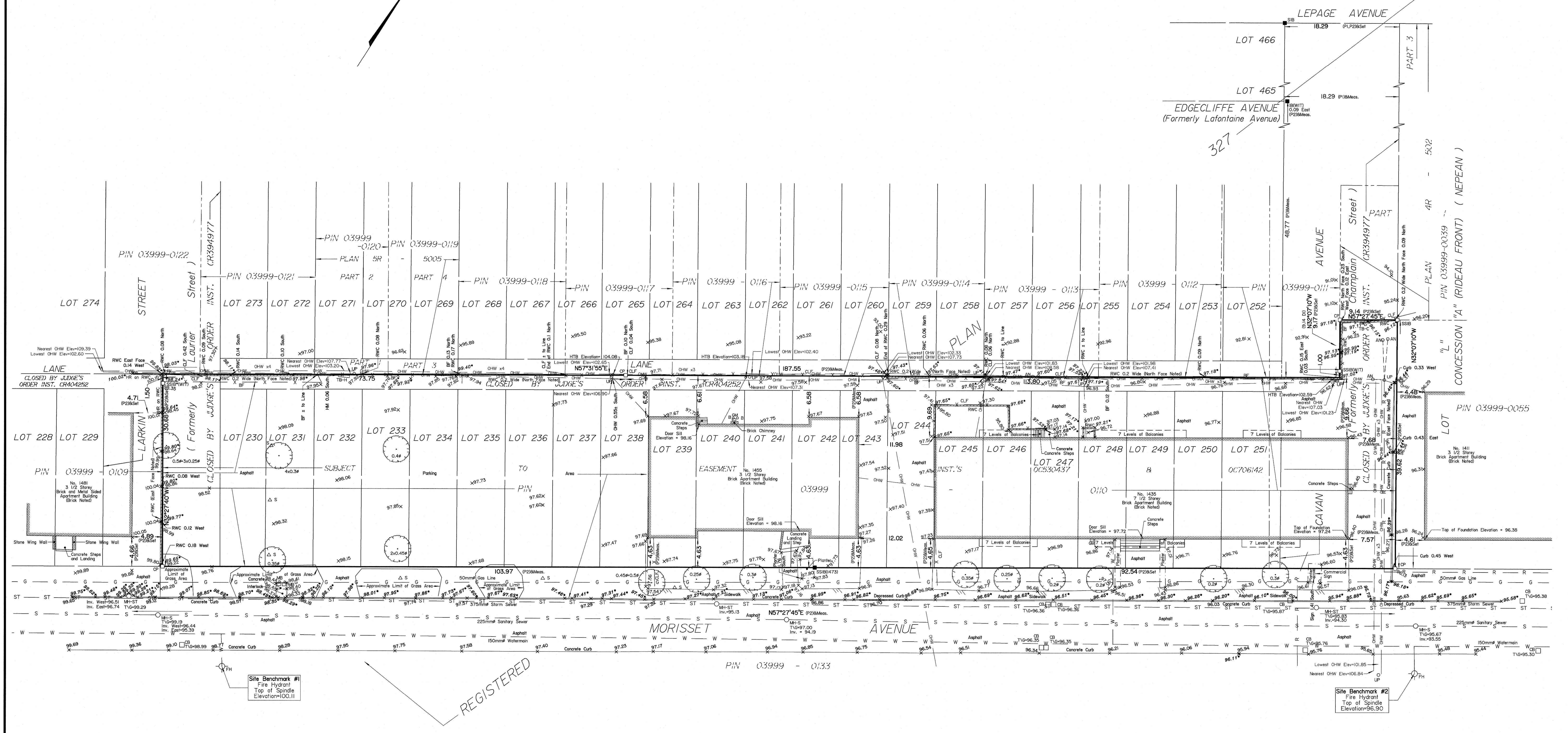
I CERTIFY THAT :

1. This survey and plan are correct and in accordance with the Surveys Act, the Surveyors Act and the Land Titles Act and the regulations made under them.
2. The survey was completed on the 12th day of February, 2021.

Feb. 26, 2021 — Date

E. H. Herweyer
Ontario Land Surveyor





ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
2165226
THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR In accordance with Regulation 1026, Section 29 (3).

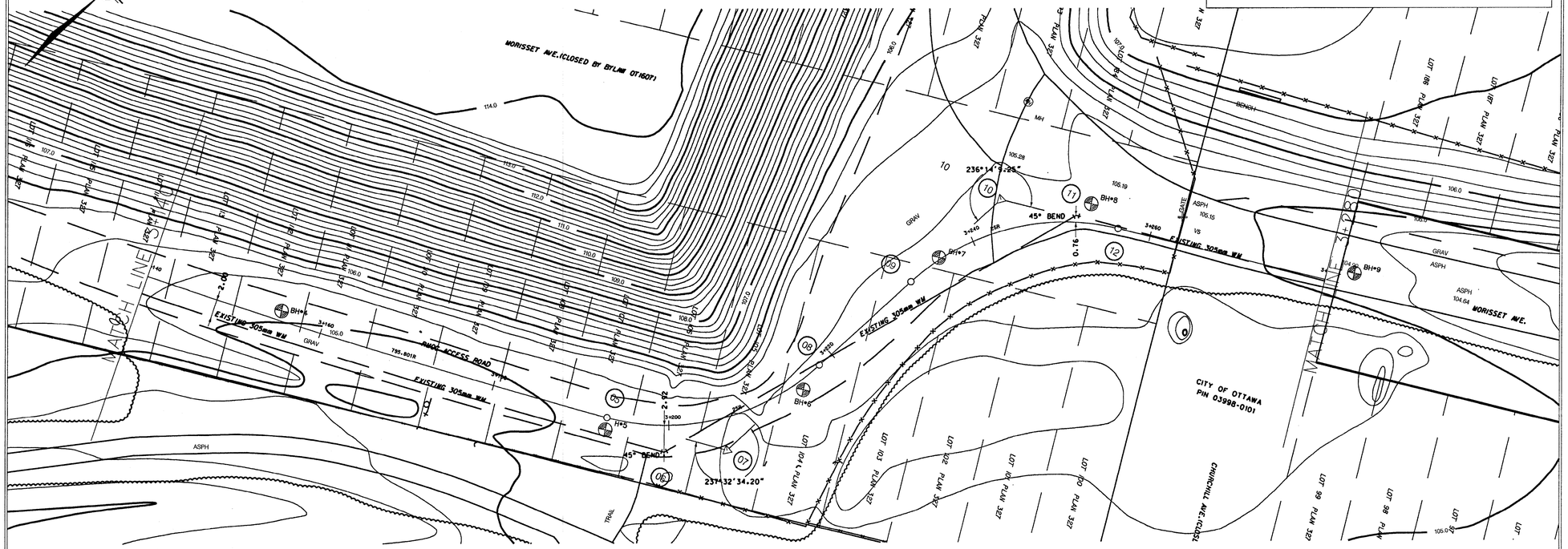
Ontario Land Surveyors
ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 Concourse Gate, Suite 500
Nepean, Ont. K2E 7S6
Phone: (613) 727-0850 / Fax: (613) 727-1079
Email: Nepean@aovltd.com

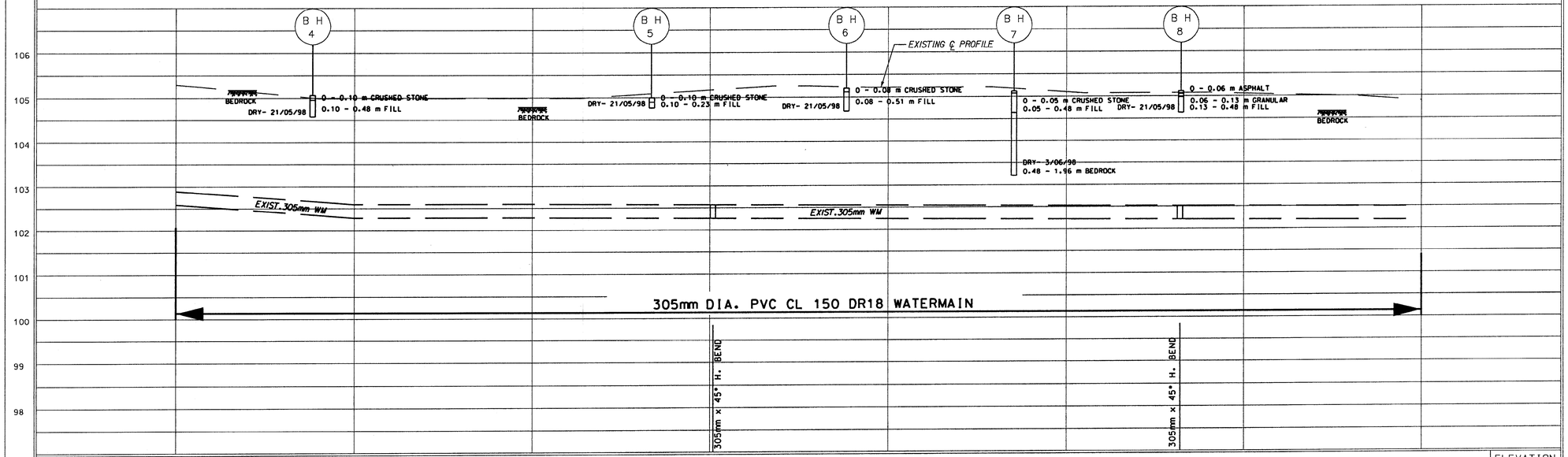
Job No. 21193-21 Firm Capital Lts230-251 PL327 T DI | AR

RMOC ACCESS ROAD AND MORISSET AVENUE

CAUTION

THE INFORMATION SHOWN ON THE AS-BUILT DRAWINGS WAS COLLECTED BY CITY STAFF DURING CONSTRUCTION. R.V. ANDERSON ASSOCIATES LIMITED CONVERTED THE HARD COPY INFORMATION INTO THE ELECTRONIC VERSION AS DEPICTED ON THESE DRAWINGS. AS SUCH, R.V. ANDERSON ASSOCIATES LIMITED CANNOT VERIFY THE ACCURACY OF INFORMATION AS PROVIDED BY THE CITY AND ASSUMES NO RESPONSIBILITY FOR ANY INACCURACIES.





STATION	AS BUILT TOP WATERMAIN	ELEVATION AT ℄ ROAD
3+140	102.90	105.30
3+160	102.55	104.95
3+180	102.51	104.99
3+200	102.57	105.16
3+200.56	102.58	105.16
3+220	102.52	105.21
3+240	102.53	105.10
3+252.80	102.58	105.07
3+260	102.41	105.05
3+270	102.35	
3+280	102.47	104.89

Ottawa-Carleton

ENVIRONMENT and TRANSPORTATION DEPARTMENT

M.J.E. SHEFLIN P.Eng.
ENVIRONMENT and TRANSPORTATION COMMISSIONER

Approved by:

Environmental Projects Branch

Date:

Project Manager: Ziad A. Ghadban		Date
Drawn by: W. Curry	Sokkia #	Date
Survey details by:	Book #	Date
"As Built" Inspection by:		Date

NOTES ARE TYPICAL FROM SHEET 01

R.V.Anderson Associates Limited
consulting engineers, architects, technology managers
RVA 4925
1750 Courtwood Crescent, Suite 220, Ottawa, Ontario, Canada, K2C 2B5
Telephone: (613)226-1844 Fax: (613) 226-9530, E-mail: ottawa@rvanders.com

By	Description	Date
KPT	AS BUILT RECORD	MARCH 10 2003
GAB	ISSUED FOR TENDER	MARCH 02 1999

Scales: HORIZ. 1:250
VERT. 1:50

Project Title:

PART A
RMOC ACCESS ROAD AND MORISSET AVENUE
AS BUILT
305mm WATERMAIN

STA. 3+140.000
to
STA. 3+280.000

Drawing No.: 98-3292 | Sheet No.: 02

98-3292.dgn 2007-Aug-01 07:33:39 AM

9236

MORISSET AVENUE

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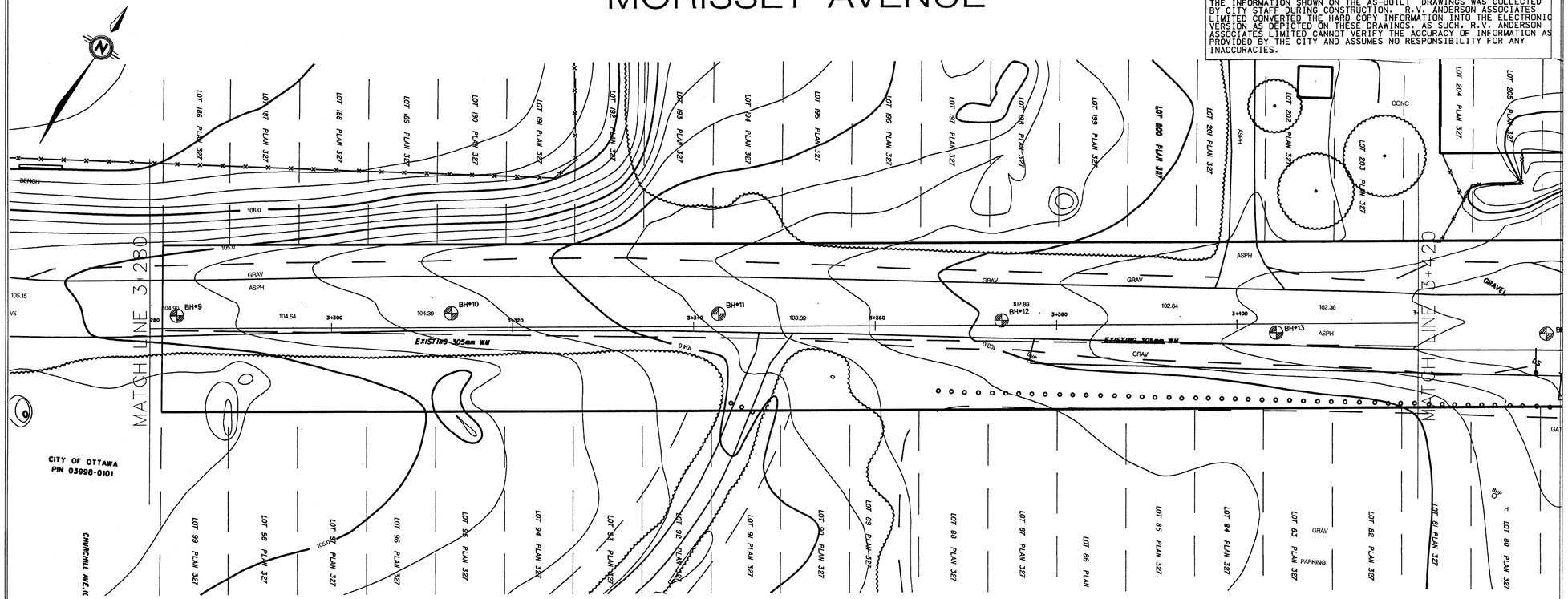
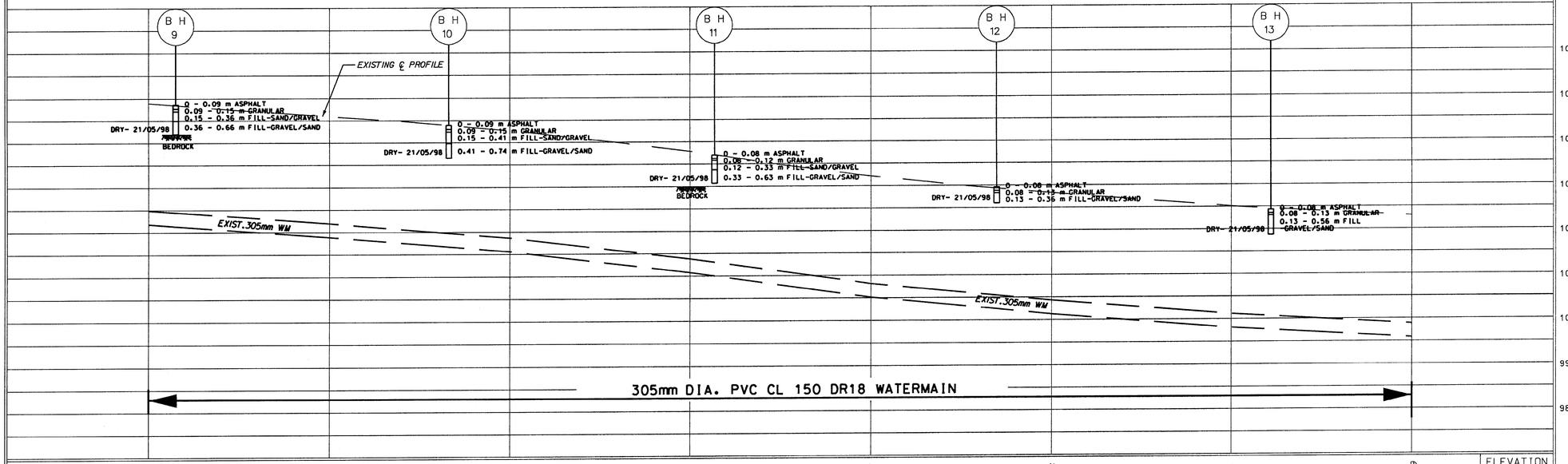
THE INFORMATION SHOWN ON THE AS-BUILT DRAWINGS WAS COLLECTED BY CITY STAFF DURING CONSTRUCTION. R.V. ANDERSON ASSOCIATES LIMITED CONVERTED THE HARD COPY INFORMATION INTO THE ELECTRONIC VERSION AS DEPICTED ON THESE DRAWINGS. AS SUCH, R.V. ANDERSON ASSOCIATES LIMITED CANNOT VERIFY THE ACCURACY OF INFORMATION AS PROVIDED BY THE CITY AND ASSUMES NO RESPONSIBILITY FOR ANY INACCURACIES.





STATION	AS BUILT TOP WATERMAIN	ELEVATION AT ℄ ROAD
3+280	102.49	104.89
3+290	102.34	
3+300	102.20	104.60
3+310	102.02	
3+320	101.79	104.27
3+340	101.37	103.79
3+360	100.81	103.23
3+380	100.43	102.83
3+385	100.45	
3+400	100.14	102.51
3+420	99.95	102.29

98-3293.dgn 2007-Aug-01 07:48:05 AM

Ottawa-Carleton

ENVIRONMENT and TRANSPORTATION DEPARTMENT

M.J.E. SHEFLIN P.Eng.
ENVIRONMENT and TRANSPORTATION COMMISSIONER

Approved by:

Environmental Projects Branch

Date:

Project Manager — Date

Ziad A. Ghadban

Drawn by: — Sokkia # — Date

W. Curry

Survey details by: — Book # — Date

"As Built" Inspection by: — Date

NOTES ARE TYPICAL FROM SHEET 01

R.V. Anderson Associates Limited
consulting engineers, architects, technology managers
RVA 4925
1750 Courtwood Crescent, Suite 220, Ottawa, Ontario, Canada, K2C 2B5
Telephone: (613)225-1844 Fax: (613) 225-6530, E-mail: ottawa@rvanderson.com

By	Description	Date
KPT	AS BUILT RECORD	MARCH 10 2003
GAB	ISSUED FOR TENDER	MARCH 02 1999

Scales: HORIZ. 1:250
VERT. 1:50

Project Title:

PART A
MORISSET AVENUE

AS BUILT
305mm WATERMAIN

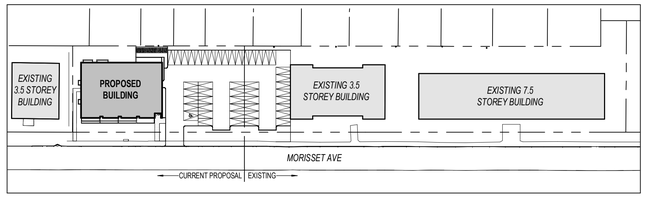
STA. 3+280.000
to
STA. 3+420.000

Drawing No.: 98-3293 | Sheet No.: 03

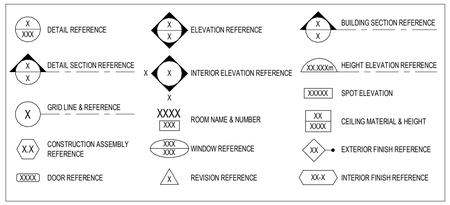
9236

T A V E.
LARKIN ST.
CAVAN ST.
MERIVALE ROAD
LANE
LOT LETTER "L"
CONCESSION "A"
R.F. TOWNSHIP OF NEPEAN
Edge of Quarry
PROPOSED 15" STORM SEWER
9" CONCRETE PIPE SANITARY SEWER
6" WATER MAIN
PIPE SANITARY SEWER
CLOSED BY CITY BY-LAW 334-60
CLOSED BY CITY BY-LAW 431-60
NOTE: SANITARY SEWER LARKIN TO LOTS 201-76
Work commenced: Oct. 1/59
Work completed: Oct. 15/59
Contractor: Purcell
Inspector: Z. Gusewski
Final Measurements: Book: 478 Page: 21 Date: Oct. 28/59
Note: Rock Elevation same as ground profile.
WORK COMMENCED: AUG. 1957
WORK COMPLETED: SEPT. 1957
CONTRACTOR: H.P. HEAFEY.
INSPECTOR: K. HAY.
FINAL MEASUREMENTS: BOOK 331 Pg.10 DATE: SEPT. 6 1957.
MORISSET AVENUE
MERIVALE RD TO LARKIN AVE.
STORM SEWER
F. E. AYERS P. Eng.
G.L.P.
C.R.W.
APR. 4/63
Survey:- Book 503 page 9-10
Levels: Book 501 - 68-69-70-71-72
QUANTITIES
592 lin ft 9" dia conc pipe
2 only manholes
Commenced April/64
Completed April/64
Final Measurements April/64 Book 266 Page 11
Inspector: E. Charron
Contractor: Taggart Const.
Rock Elevations
Note: Rock elevation is same as ground profile
Work commenced: Oct. 1/59
Contractor: Purcell
Inspector: Z. Gusewski
Final Measurements
Rock from surface
Flat Bed of Limestone Exposed across ℄
Rock exposed on ℄
15" ASTM C14 STANDARD STRENGTH CONCRETE PIPE STORM SEWER
9" CONCRETE PIPE SANITARY SEWER
9 INCH DIA CONCRETE PIPE SANITARY SEWER
ALL PIPES BEDDED ON CONCRETE AS DRAWING
GRADIENT 1 in 83.3 OR 1.20%
GRADIENT 1 in 58.4 OR 1.71%
GRADIENT 1 in 60 OR 1.7%
STATION
INVERT
CITY OF OTTAWA
ENGINEERING DEPARTMENT
MORISSET AVE.
MERIVALE RD.
Commissioner of Works
Asst Commissioner of Works
Designing Engineer

3 SP-01 **LOCATION PLAN**
SCALE: N.T.S.



2 SP-01 **KEY PLAN**
SCALE: 1 : 1000



4 SP-01 **NOTATION LEGEND**
SCALE: NTS

GROSS AREA

LEVEL	AREA	AREA (SF)
LEVEL 00	561.13 m²	6040 SF
LEVEL 01	563.15 m²	6062 SF
LEVEL 02	559.99 m²	6028 SF
LEVEL 03	556.47 m²	5990 SF
TOTAL	2,240.74 m²	24119 SF

RENTABLE AREA (RESIDENTIAL)

LEVEL	AREA	AREA (SF)
LEVEL 00	461.23 m²	4,965 SF
LEVEL 01	520.94 m²	5,607 SF
LEVEL 02	517.20 m²	5,567 SF
LEVEL 03	517.30 m²	5,568 SF
TOTAL	2,016.67 m²	21,707 SF

UNIT COUNT

BEDS	LVL 00	LVL 01	LVL 02	LVL 03	TOTAL	%
1-BED	1	2	2	2	8	23%
1-BED + DEN	0	2	2	2	6	20%
1-BED BF	2	0	0	0	2	7%
2-BED	1	4	4	4	13	43%
2-BED BF	2	0	0	0	2	7%
TOTAL	**6**	**8**	**8**	**8**	**31**	**100%**

RESIDENTIAL UNIT SCHEDULE

NUMBER	UNIT TYPE	BEDS	AREA
LEVEL 00			
001	TYPE E-BF	2-BED BF	86.62 m²
002	TYPE F-BF	1-BED BF	59.08 m²
003	TYPE G	2-BED	67.48 m²
004	TYPE A-BF	2-BED BF	73.94 m²
005	TYPE B-BF	1-BED BF	60.12 m²
006	TYPE C	1-BED	55.67 m²
007	TYPE D	1-BED	58.32 m²
LEVEL 01			
101	TYPE K	2-BED	67.15 m²
102	TYPE L	1-BED	59.10 m²
103	TYPE L	1-BED	59.08 m²
104	TYPE K1	2-BED	67.48 m²
105	TYPE H	2-BED	73.94 m²
106	TYPE I	1-BED + DEN	60.12 m²
107	TYPE I (MIR)	1-BED + DEN	60.12 m²
108	TYPE J	2-BED	73.95 m²
LEVEL 02			
201	TYPE K	2-BED	66.47 m²
202	TYPE L	1-BED	58.22 m²
203	TYPE L	1-BED	58.01 m²
204	TYPE K2	2-BED	66.38 m²
205	TYPE H	2-BED	73.94 m²
206	TYPE I	1-BED + DEN	60.12 m²
207	TYPE I (MIR)	1-BED + DEN	60.12 m²
208	TYPE J	2-BED	73.95 m²
LEVEL 03			
301	TYPE K	2-BED	66.56 m²
302	TYPE L	1-BED	58.22 m²
303	TYPE L	1-BED	58.01 m²
304	TYPE K2	2-BED	66.38 m²
305	TYPE H	2-BED	73.94 m²
306	TYPE I	1-BED + DEN	60.12 m²
307	TYPE I (MIR)	1-BED + DEN	60.12 m²
308	TYPE J	2-BED	73.95 m²

SITE STATISTICS

Current Zoning Designation:	R4 - UC
Lot Width:	61.0 m
Total Lot Area:	6,092 m²
Average Existing Grade:	98.44 m
Gross Floor Area:	2,245.36 m²
Building Area	561.54 m²
Floor Space Index:	0.37

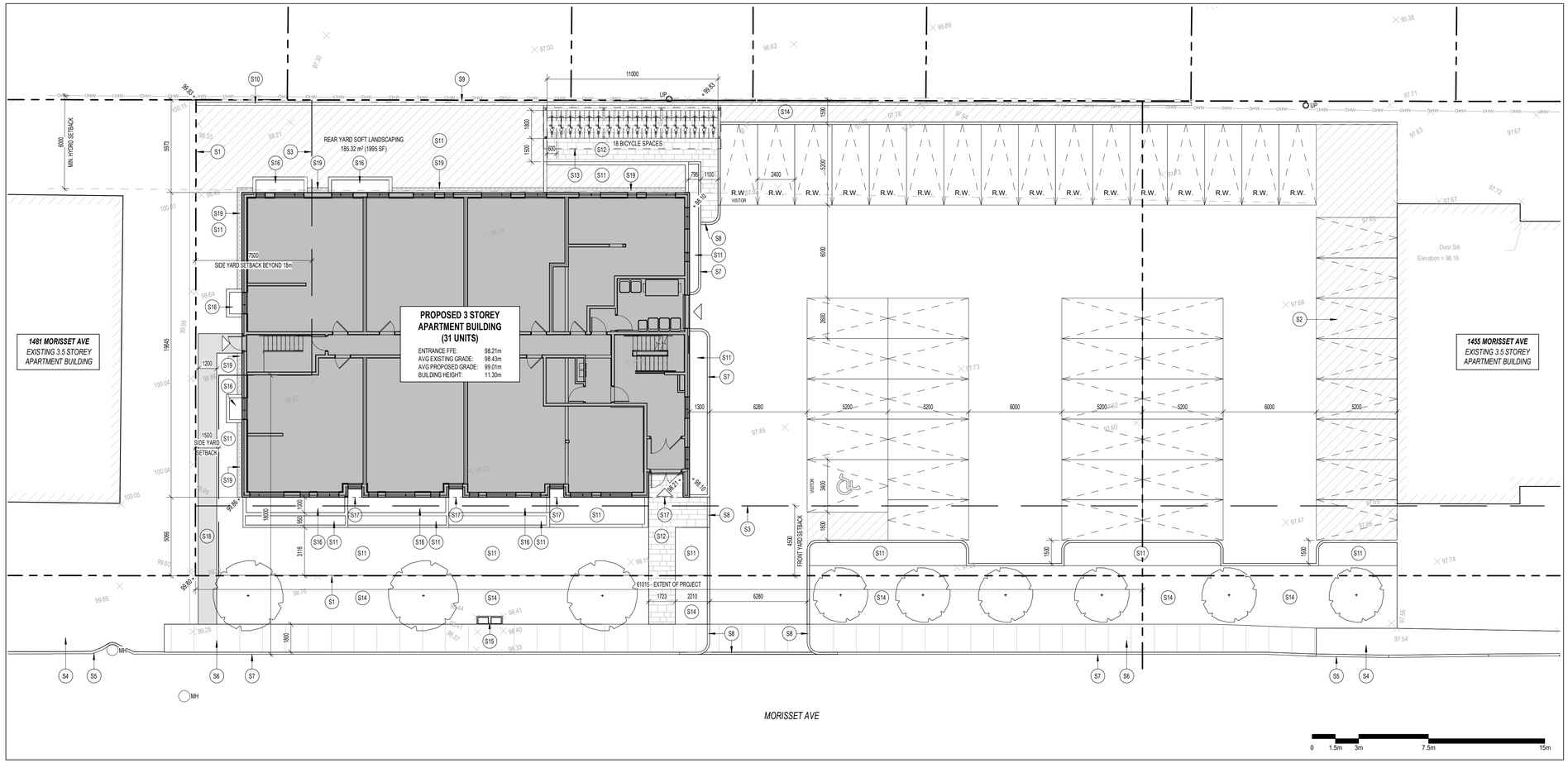
PROPOSED DEVELOPMENT - 3 STOREY LOW-RISE APARTMENT BUILDING

Existing 7.5 Storey Mid-Rise Apartment Building - 1435 Morisset Ave &
Existing 3.5 Storey Low-Rise Apartment Building - 1455 Morisset Ave (135 Units Combined)
Proposed 3 Storey Low-Rise Apartment Building - (31 Units)

Zoning Mechanism	Required	Provided
Minimum Lot Width *162A*	N/A	EXISTING - 196.5 m PROPOSED SCOPE - 61 m
Minimum Lot Area *162A*	1,400 m²	6,092 m²
Min. Front Yard Setback *162A*	4.5 m	5.06m
Min. Interior Side Yard Setback *162B(1)(b)*	1.5 m *(first 18m from street)* 7.5 m *(beyond 18m)*	3 m
Min. Rear Yard Setback *162B(4)*	7.5 m	5.97 m
Maximum Building Height *162A*	11 m	11.3 m
Hydro Setback	6 m	6 m
Parking Space Rates *101 (Sch. 1A - Area Y)*	10 Spaces *0 spaces for the first 12 units - Section 101(3)* *0.5 spaces / unit for 19 units - Table 101(R1S)* + 67 spaces *required for existing units* = 77 spaces total	45 Spaces within area of work + 19 existing spaces = 64 spaces total
Minimum Visitor Parking Rates *101 (Sch. 1A - Area Y)*	2 Spaces *0 spaces for first 12 units - Section 102(2)* *0.1 spaces / unit for 19 units - Table 102* + *13 spaces required for existing units* = 15 spaces total	2 Spaces within area of work + 13 existing spaces = 15 spaces total
Bicycle Parking Rates *Table 111A (Sch. 1 - Area X)*	16 Spaces *0.5 spaces / unit for 31 units [111A(b)(ii)]*	18 Spaces
Landscaped Areas	560.78 m² *(30% of Lot Area)* 180.98 m² *(50% of Rear Yard)* 109.82 m² *(40% of Front Yard)* *(Taken from area within current proposal)*	436.83 m² *(23% of Lot Area)* 185.44 m² *(52% of Rear Yard)* 167.99 m² *(61% of Front Yard)* *(Taken from area within current proposal)*

GENERAL ARCHITECTURAL NOTES:

1. This drawing is the property of the Architect and may not be reproduced or used without the expressed consent of the Architect.
2. Drawings are not to be scaled. The Contractor is responsible for checking and verifying all levels and dimensions and shall report all discrepancies to the Architect and obtain clarification prior to commencing work.
3. Upon notice in writing, the Architect will provide written/graphic clarification or supplementary information regarding the intent of the Contract Documents.
4. The Architectural drawings are to be read in conjuction with all other Contract Documents including Project Manuals and the Structural, Mechanical and Electrical Drawings.
5. Positions of exposed or finished Mechanical or Electrical devices, fittings and fixtures are indicated on the Architectural Drawings. Locations shown on the Architectural Drawings shall govern over Mechanical and Electrical Drawings. Mechanical and Electrical items not clearly located will be located as directed by the Architect.
6. These documents are not to be used for construction unless specifically noted for such purpose.



1 SP-01 **SITE PLAN**
SCALE: 1 : 150

PLAN OF SURVEY OF
LOTS 230 TO 251 (BOTH INCLUSIVE)
AND PART OF CAVAN STREET
AND PART OF LARKIN STREET
AND PART OF THE LANE
REGISTERED PLAN 327
CITY OF OTTAWA

ANNIS, O'SULLIVAN, VOLLEBEKK LTD. 2021

SURVEY INFO
SCALE: N.T.S.

SITE PLAN NOTES

S1	PROPERTY LINE
S2	HATCH DENOTES EXTENT OF EXISTING ASPHALT TO REMAIN
S3	LINE DENOTES LOCATION OF SETBACK
S4	EXISTING ASPHALT SIDEWALK
S5	EXISTING CONCRETE CURB
S6	PROPOSED CONCRETE SIDEWALK
S7	CONCRETE CURB
S8	DEPRESSED CURB
S9	EXISTING RETAINING WALL AND FENCE TO BE REMOVED AND REPLACED
S10	NEW RETAINING WALL AND FENCE, REFER TO CIVIL
S11	PLANTING BED
S12	INTERLOCKING STONE PAVERS
S13	LINE DENOTES EXTENT OF COVERED BIKE STORAGE
S14	SOFT LANDSCAPING
S15	EXISTING MAILBOXES TO REMAIN
S16	WINDOW WELL
S17	LINE OF BUILDING ABOVE
S18	ASPHALT WALKWAY
S19	MAINTENANCE STRIP, REFER TO LANDSCAPE

SITE PLAN SYMBOLS LEGEND

- BUILDING ENTRANCE
- BUILDING EXIT
- BICYCLE PARKING
- INTERLOCKING STONE PAVERS
- PROPERTY LINE
- SETBACK LINE
- OHW — OVERHEAD WIRE
- FDC — FIRE DEPARTMENT CONNECTION
- FH — FIRE HYDRANT
- UP — EXISTING UTILITY POLE TO REMAIN
- MH — EXISTING MANHOLE

9	ISSUED FOR BUILDING PERMIT	24-12-06
8	ISSUED FOR COORDINATION	24-12-05
5	ISSUED FOR COORDINATION	24-11-22
4	ISSUED FOR COORDINATION	24-11-19
3	ISSUED FOR COORDINATION	24-10-24
2	ISSUED FOR COORDINATION	24-10-18
1	ISSUED FOR COORDINATION	24-10-08

ISSUE RECORD

ONTARIO ASSOCIATION OF ARCHITECTS
RYAN M. KOOLWINE
LICENCE
7370

project1 studio
Project1 Studio Incorporated
| 613.884.3939 | mail@project1studio.ca

1465 MORISSET

1465 Morisset Avenue
Ottawa, ON K1Z 8H4

PROJ	SCALE	DRAWN	REVIEWED
2412	NOTED	JDH/BH	RMK

SITE PLAN

SP-01