Stormwater Management Report and Servicing Brief

8-Storey Apartment Building Conversion
1600 James Naismith Drive
Ottawa, Ontario

Prepared for:

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Attention: 1600 James Naismith LP

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1 INTRODUCTION AND SITE DESCRIPTION

LRL Associates Ltd. was retained by 1600 James Naismith LP to complete a Stormwater Management Analysis and Servicing Brief for the development of a proposed 8-storey apartment building conversion with surface parking area within the site boundary, located at 1600 James Naismith Drive.

The subject property measures approximately **3.80 Ha** and consists of a single lot that is legally described part of Lots 21 & 22, concession 2 (Ottawa Front), in the township of Gloucester. The subject lots are currently zoned TD1[2087] and TD2[2087]; Transit Oriental Development Zones.

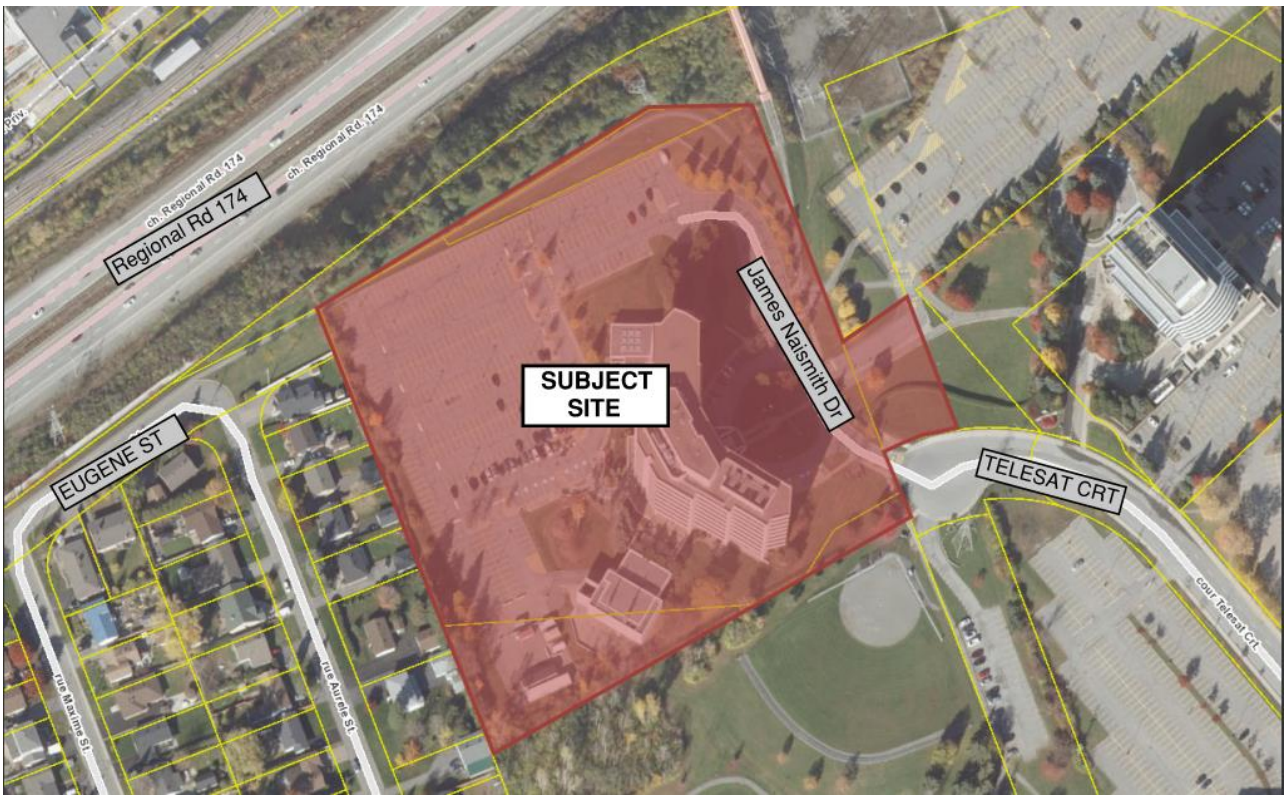

Figure 1: Arial View of Proposed Development

The proposed development includes the conversion of the existing 8-storey office building into an apartment building consisting of a total of **218 units,** as well as an additional paved parking lot east of the building is proposed to accommodate parking demands from the residential units. As a part of the redevelopment, the existing 3-storey power plant southwest of the existing 8-storey building is proposed to be demolished. The extents of proposed redevelopment for this site plan application only encompasses the eastern half of the subject property, while the western half is to remain as-is for future development. Refer to ***Site Plan*** included in ***Appendix F*** for more details on extents of proposed re-development and statistics***.***

This report has been prepared in consideration of the terms and conditions noted above and with the civil drawings prepared for the new development. Should there be any changes in the design

features, which may relate to the stormwater and servicing considerations, LRL Associates Ltd. should be advised to review the report recommendations.

2 Existing Site and Drainage Description

The subject site measures ***3.80ha*** and currently consists of an 8-storey office building and a neighboring 3-storey power plant building, with large paved surface parking covering the majority of the remaining site. Elevations of existing site vary between 74.50 m at the existing building to 72.50 m at various low points locates at existing catchbasins that collect runoff and covey it through a storm network to municipal storm sewer within Telesat Crescent.

Sewer and watermain mapping, along with as-built information collected from the City of Ottawa indicate the following existing infrastructure located within the adjacent right-of-ways:

Within existing easement:

- 1200mm diameter sanitary trunk
- 1200mm diameter watermain

Within James Naismith Drive and subject site:

- 1200 mm diameter sanitary trunk
- 300mm diameter watermain
- 450mm – 600 mm network of storm sewers

Within Telesat Crescent:

- 1200 mm diameter sanitary trunk
- 300mm diameter watermain
- 600 mm storm sewer

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 Fire Underwriters Survey (FUS) 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 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. The Rideau Valley Conservation Authority will need to be consulted in order to obtain municipal approval for site development. No other approval requirements from other regulatory agencies are anticipated.

5 WATER SUPPLY AND FIRE PROTECTION

5.1 Existing Water Supply Services and Fire Hydrant Coverage

The subject property lies within the City of Ottawa 1E water distribution network pressure zone. The existing building is currently being serviced via a single 200mm diameter water service and there is an existing 305 mm watermain within James Naismith Drive. There is currently two (2) existing fire hydrants on site and two (2) hydrants within close proximity of the subject property. Refer to ***Appendix B*** for the location of fire hydrants.

5.2 Water Supply Servicing Design

It is proposed to retain the existing 200mm diameter water service to the building in post-development conditions. Refer to *Site Servicing Plan* C.401 in ***Appendix E*** for servicing layout and connection points.

Table 1 below summarizes the City of Ottawa Design Guidelines design parameters employed in the preparation of the water demand estimate.

Table 1: ***City of Ottawa Design Guidelines Design Parameters***

Design Parameter	Value
Residential Bachelor / 1 Bedroom Apartment	1.4 P/unit
Residential 2 Bedroom Apartment	2.1 P/unit
Other Commercial Average Daily Demand	2.8 L/m^2/d
Average Daily Demand	280 L/d/per
Minimum Depth of Cover	2.4 m from top of watermain to finished grade
Desired operating pressure range during normal operating conditions	350 kPa and 480 kPa
During normal operating conditions pressure must not drop below	275 kPa
During normal operating conditions pressure shall not exceed	552 kPa
During fire flow operating conditions pressure must not drop below	140 kPa
**Table updated to reflect technical Bulletin ISDTB-2018-02*	

The interior layout and architectural floor plans have been reviewed, and it was determined that the building will house ***152*** bachelor/one-bedroom units and ***66*** two-bedroom units. Based on the City of Ottawa Design guidelines for population projection, this translates to approximately **351** residents. Table 2 below summarizes the proposed development as interpreted using Table 4.1 of the City of Ottawa Design Guidelines, and Appendix 4-A of the Sewer Design Guidelines.

Table 2: ***Development Residential Population Estimate***

Proposed Unit type	Persons Per Unit	Number of Units	Population
Studio/1 Bedroom	1.4	152	212.8
2 Bedroom Apartment	2.1	66	138.6
		Total Residential Population	351

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

$$\boldsymbol{Q = (q \times P \times M)}$$

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

The following factors were used in calculations as per Table 3-3 in the MOECP Guidelines;

- Maximum Daily Demand Residential Factor = **3.4**

- Peak Hour Demand Residential Factor = **5.0**

Using the above-mentioned factors and design parameters listed in Table 1, anticipated demands were calculated as follows:

- Average daily domestic water demand is **1.14** L/s,
- Maximum daily demand is **3.84** L/s, and
- Maximum hourly is **5.73**L/s.

Refer to ***Appendix B*** for water demand calculations.

The City of Ottawa was contacted to obtain boundary conditions associated with the estimated water demand, as indicated in the boundary request correspondence included in ***Appendix B***. *Table 3* below summarizes anticipated demands and Boundary Conditions.

Table 3: ***Summary of Anticipated Demands & Boundary Conditions***

Design Parameter	**Anticipated Demand (L/s)**	**Boundary Conditions @ Existing Connection Point (kPa)**
Average Daily Demand	1.14	434.6
Max Day + Fire Flow (per FUS)	3.84 + 150	388.5
Peak Hour	5.73	367.9

As per Table 3 above, boundary conditions provided by the City indicate that pressures in all anticipated scenarios are within the desired range stated in Table 2.

The estimated fire flow for the proposed buildings was calculated in accordance with *ISTB-2018-02*. The following parameters were provided by the Architect, see ***Appendix A*** for collaborating correspondence:

- Type of construction – Non-Combustible;
- Occupancy type – Limited Combustibility; and
- Sprinkler Protection – Fully Supervised Sprinkler System.

The estimated fire flow demand was estimated to be **9,000 L/min**, see ***Appendix B*** for details.

There are a total of four (4) existing fire hydrants in close proximity to the existing building that are available to provide the required fire flow demands of 9,000 L/min. Refer to ***Appendix B*** for fire hydrant locations. Table 4 below summarizes the aggregate fire flow of the contributing hydrants in close proximity to the proposed development based on Table 18.5.4.3 of *ISTB-2018-02*.

Table 4: ***Fire Protection Summary Table***

Building	Fire Flow Demand (L/min)	Fire Hydrants(s) within 75m	Fire Hydrant(s) within 150m	Available Combined Fire Flow (L/min)
8-storey Apartment Building	9,000	1	3	(1 x 5678) + (3 x 3785) = 17,033

The total available fire flow from contributing hydrants is equal to **17,033 L/min** which is sufficient to provide adequate fire flow for the proposed development. A certified fire protection system specialist will need to be employed to design the building's fire suppression system and confirm the actual fire flow demand.

The proposed water supply design conforms to all relevant City Guidelines and Policies.

6 SANITARY SERVICE

6.1 Existing Sanitary Sewer Services

The subject property is tributary to the Maxime Relief Trunk. There is an existing 200 mm diameter sanitary service lateral connecting the existing building to the existing 1200mm diameter sanitary trunk within James Naismith Drive.

The existing wet wastewater flows from the 8-storey office building were calculated to be **0.73 L/s** based on assumed parameters of 7.5 L/9.3 m^2/day demand from office use and a total infiltration rate of 0.33 L/s/ha.

6.2 Sanitary Sewer Servicing Design

The proposed redevelopment will be serviced via the existing 200 mm dia. sanitary service connecting the existing building to the existing 1200mm diameter sanitary trunk within James Naismith Dr. Refer to LRL drawing C.401, included in **Appendix F,** for the location of the existing sanitary servicing.

The parameters used to calculate the anticipated sanitary flows are; residential average population per unit of 1.4 person for single units, 2.1 persons for two-bedroom units, a residential daily demand of 280 L/p/day, a residential peaking factor of 3.5 and a total infiltration rate of 0.33 L/s/ha. Based on these parameters, the total anticipated wet wastewater flow was estimated **4.42 L/s**. Refer to ***Appendix C*** for the site sanitary sewer design sheet.

The existing 200 mm diameter sanitary service lateral was assumed to be sloped at 1.0%, with a maximum capacity of **32.80 L/s**. The proposed redevelopment results in an increase in wastewater flow of **3.69 L/s**, which represents approximately 11% of the maximum service lateral's capacity.

7 STORMWATER MANAGEMENT

7.1 Existing Stormwater Infrastructure

The subject property is tributary to the Ottawa River East sub-watershed. Stormwater runoff from the subject property is tributary to the City of Ottawa sewer system as such, approvals for the proposed development within this area are under the approval authority of the City of Ottawa.

In pre-development conditions, drainage from extents of redevelopment within the subject site is depicted by existing watershed EWS-01 (1.388 ha) and is collected via multiple catchbasins and catchbasin manholes. There is an existing network of 300-600mm diameter storm sewers within site that convey flows from the site to the existing 600 mm dia. storm sewer within Telesat Crescent right-of-way. It is unclear whether existing drainage in pre-development conditions is controlled. Refer to plan C701 included in ***Appendix E*** for pre-development drainage characteristics. Refer to ***Appendix D*** for pre- and post-development watershed information.

7.2 Design Criteria

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

Due to the insignificant amount of increased imperviousness of the overall site, the stormwater management approach for the proposed redevelopment was limited to the extents of re-construction and the relative impacted catchment areas only.

7.2.1 Water Quality

The subject property lies within the Ottawa River East sub-watershed and is therefore subject to review by the Rideau Valley Conservation Authority (RVCA). It was determined that 'enhanced' treatment (80% TSS Removal) is required for stormwater runoff from the proposed development. Correspondence with RVCA is included in ***Appendix A***.

7.2.2 Water Quantity

Based on pre-consultation with the City, included in ***Appendix A***, the following stormwater management requirements were identified for the subject site:

- Meet an allowable release rate based on a Rational Method Coefficient of 0.50, employing the City of Ottawa IDF parameters for a 5-year storm with a calculated time of concentration equal to 10 minutes; and

- Attenuate all storms up to and including the City of Ottawa 100-year storm event on site.

The total allowable storm release rate was calculated to be **200.96 L/s**. Refer to ***Appendix D*** for calculations.

7.3 Method of Analysis

The Modified Rational Method has been used to calculate the runoff rate from the site to quantify the detention storage required for quantity control of the development. Refer to ***Appendix D*** for storage calculations.

7.4 Proposed Stormwater Quantity Controls

The proposed stormwater management quantity control for this development will be accomplished using catchbasins with Inlet Control Devices (ICDs). Storage required as a result of quantity control will be accomplished through surface storage.

The site has been analyzed and eight (8) post-development watersheds have been allocated. Table 5 below summarizes post-development drainage areas. Calculations can be seen in ***Appendix D.***

Table 5: ***Drainage Areas***

Drainage Area Name	Area (ha)	Weighted Runoff Coefficient	100 Year Weighted Runoff Coefficient (25% increase)
WS-100A (UNCONTROLLED)	0.024	0.80	1.0
WS-100B (UNCONTROLLED)	0.022	0.80	1.0
WS-100C (UNCONTROLLED)	0.450	0.34	0.42
WS-01 (CONTROLLED)	0.241	0.90	1.00
WS-02 (CONTROLLED)	0.229	0.90	1.00
WS-03 (CONTROLLED)	0.197	0.62	0.78
WS-04A (BLDG-CONTROLLED)	0.041	0.90	1.00
WS-04B (BLDG-CONTROLLED)	0.182	0.90	1.00

Watershed WS-100A consist of the newly proposed dug-out terraces at the north-west side of the building. Flows will be collected via a network of trench drains and will gravity drain to proposed STM MH 100A. A lift station consisting of a set of pumps is proposed in STM MH 100A to pump the flows vertically to the outlet pipe. Pumped flows will then gravity drain to downstream existing storm network as shown in C.401. No flow restrictors are proposed and hence flows are uncontrolled. Refer to **Appendix D** for pump details.

Similarly*, Watershed WS-100B* consist of the newly proposed dug-out terraces at the south-west side of the building. Flows will be collected via a network of trench drains and will gravity drain to proposed STM MH 100B. A lift station consisting of a set of pumps is proposed in STM MH 100B to pump the flows vertically to the outlet pipe. Pumped flows will then gravity drain to downstream existing storm network as shown in C.401. No flow restrictors are proposed and hence flows are uncontrolled. Refer to **Appendix D** for pump details.

Watershed WS-100C (0.45ha) consisting of grass, landscaping, interlocking pavers and paved areas, will flow uncontrolled to the existing storm network.

Watershed WS-01 (0.241ha) consists of the northern half of the proposed paved parking at the building's frontage. Runoff will be captured via proposed catchbasin (CB-01) that will restrict flows via **Hydrovex 125VHV-1** ICD.

Similarly, *Watershed WS-02* (0.229ha) consists of the southern half of the proposed paved parking at the building's frontage. Runoff will be captured via a second proposed catchbasin (CB-02) that will restrict flows via **Hydrovex 125VHV-1** ICD.

Watershed WS-03 (0.197ha) consists mainly of the re-aligned paved drive aisle and access to subject site from neighboring parcel. Runoff will be collected via a third catchbasin (CB-03) that will restrict flows via **Hydrovex 150VHV-2** ICD..Refer to grading plan C301 and servicing plan C401 in ***Appendix E*** for reference.

Phase 1 building's rooftop was analysed and divided into two subwatersheds: *WS-04A* consisting of the penthouse rooftop & *WS-04B* consisting of the lower rooftop. Altogether, a total of **seven (7)** roof drains, each of which is restricting the discharge rate to **2.0 L/s**, resulting in a total release rate from the roof of **12.0 L/s** is proposed. The roof drain flow control device has been selected to provide a flow rate of **2.0 L/s** at a maximum flow depth of **0.15 m**. Proposed roof drains are to be **MURPHCO with two (2) holes openings**. See ***Appendix D*** for more information about the selected roof drain and flow restrictor.

The total available roof storage (m^3) has been calculated using the following formula:

$$V = (\frac{D_{Sl} * A_{Eff}}{3})$$

Where:

V = available (provided) rooftop storage (m^3)
D_{Sl} = slope ponding depth (m)
A_{Eff} = effective roof area (m^2)

Based on the equation above, it was calculated that **19.80 m³** of rooftop storage is available in *WS-04A* and **88.20 m³** of rooftop storage is available in *WS-04B* the 100-year event. For additional details on the calculations for available area of rooftop storage, refer to ***Appendix D***.

As discussed above, the extents of redevelopment within subject site will be serviced via three proposed catchbasins with ICDs that connect to the free-flowing network of 450mm to 600mm diameter storm pipes within the proposed parking lot of the building. At the rear of the building, a network of trench drains and lift stations will collect runoff in the new dug-out terraces and will pump into the existing downstream infrastructure. The building is currently being serviced via a 300mm diameter storm service lateral which will be retained to convey the collected rooftop runoff.

In order to achieve the allowable post-development stormwater release rate established in *Section 7.2.2,* above, the proposed development will utilize surface storage in the parking lot and drive aisle.

Table 6 below summarizes the release rates and storage volumes required to meet the total allowable release rate of **200.96 L/s** for 100-year storm.

Table 6: ***Stormwater Release Rate & Storage Volume Summary***

Catchment Area	Drainage Area (ha)	100-year Release Rate (L/s)	100-Year Required Storage (m^3)
WS-100 (Uncontrolled)	0.497	118.12	0
WS-01	0.241	19.00	76.59
WS-02	0.229	16.00	76.80
WS-03	0.197	33.85	25.23
WS-04A	0.041	2.00	15.98
WS-04B	0.182	12.00	62.64
TOTAL	**1.388**	**200.96**	**257.23**

To attenuate flows to the allowable release rate of **200.96 L/s**, it is calculated that a total of **257.23 m^3** of storage will be required in the 100-year storm. The required storage is proposed to be met via surface ponding in the paved parking lot and drive aisle as well as rooftop stroage. The total required 100-year storage and allowable release rate was divided as per the following;

- ***76.59*** **m^3** is required surface storage in WS-01 corresponding to a maximum restricted flow of ***19.00 L/s*** via proposed Hydrovex 125VHV-1 ICD located in CB-01;
- ***76.80*** **m^3** is required surface storage in WS-02 corresponding to maximum restricted flow of ***16.00 L/s*** via proposed Hydrovex 125VHV-1 ICD located in CB-02;
- ***25.23*** **m^3** is required surface storage in WS-03 corresponding to maximum restricted flow of ***33.85 L/s*** via proposed Hydrovex 150VHV-2 ICD located in CB-03;
- ***15.98*** **m^3** is required surface storage in WS-04A corresponding to maximum restricted flow of ***2.0 L/s*** via proposed restricted roof drain located on the penthouse rooftop;

- ***62.64*** **m³** is required surface storage in WS-04B corresponding to maximum restricted flow of ***12.0 L/s*** via proposed restricted roof drain located on the lower rooftop;

The 100-year maximum ponding extent can be found on drawing "C601 – Stormwater Management Plan" of ***Appendix E***.

To meet stormwater quality control identified by RVCA, a Stormceptor Oil-Grit Separator (*OGS*) Model **EFO6** is proposed at the downstream point of the existing storm sewer network within site to treat captured flows from the proposed re-development areas. While the OGS is sized to provide 80% TSS removal treatment for the redevelopment catchment area only, it will however still be accepting flows from the entire catchment of the site in the interim conditions. It is anticipated that future redevelopment of the remainder of the site will alter catchment areas and re-direct their flows downstream of the proposed OGS, to be treated for quality via independent measures. Hence, it is anticipated that in ultimate conditions, the entire site will treat captured runoff to satisfy the required quality control criteria via the proposed OGS and additional future control measures. While in the interim, conditions will be improved by the addition of the proposed OGS. The OGS finally discharges flows to the existing 600 mm diameter storm sewer within Telesat Crescent. Refer to C401 in ***Appendix E*** for servicing layout and connection points and ***Appendix D*** for OGS sizing report and specs.

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 577. Refer to LRL Associates drawing C.101 for erosion and sediment control details.

9 CONCLUSION

This Stormwater Management and Servicing Report for the development proposed at 1600 James Naismith Drive 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:

Water Service

- The maximum required fire flow was calculated at **9,000 L/min** using the FUS method.
- There are at least four (4) existing fire hydrants available to service the proposed development. They will provide a combined fire flow of **17,033 L/min** to the site.
- The proposed apartment building will be serviced with a dual 200 mmΦ water service connections to the existing 305 mmΦ watermain within James Naismith Dr.

- Boundary conditions have indicated that pressures in all anticipated scenarios are within the desirable range.

Sanitary Service

- The total calculated wet wastewater flow from the proposed redevelopment is **4.42 L/s**, which is an increase of **3.69 L/s** from existing conditions.
- The proposed development will discharge **4.42 L/s** to the existing 1200 mm dia. sanitary trunk within James Naismith Drive Rd via the existing 200 mm diameter sanitary service lateral.
- The increase in wastewater flow represents approx.11% of the maximum capacity of the existing 200mm diameter sanitary service lateral.

Stormwater Management

- An OGS is proposed to meet the required 80% TSS Removal specified as per consultation with RVCA.
- The stormwater release rates from the proposed development will meet calculated weighted allowable release rate of **200.96 L/s.**
- Stormwater quantity control objectives will be met through on-site storm water ponding on the surface parking lot and drive aisle as well as rooftop storage.

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.

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APPENDIX A

Pre-consultation / Correspondence

DEVELOPMENT SERVICING STUDY CHECKLIST	
Project #: 220142	
2022-04-29	
4.1 General Content	
Executive Summary (for larger reports only).	N/A
Date and revision number of the report.	Report Cover sheet
Location map and plan showing municipal address, boundary, and layout of proposed development.	Drawings/Figures
Plan showing the site and location of all existing services.	Figure 1
Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	Section 1.0
Summary of Pre-consultation Meetings with City and other approval agencies.	Section 4.0 & Appendix A
Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.	Section 5.1, 6.1, 7.1
Statement of objectives and servicing criteria.	Section 1.0
Identification of existing and proposed infrastructure available in the immediate area.	Section 5.1, 6.1, 7.1
Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).	Section 7.0
Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	C301

Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	N/A
Proposed phasing of the development, if applicable.	Site Plan (Appendix F)
Reference to geotechnical studies and recommendations concerning servicing.	C401
All preliminary and formal site plan submissions should have the following information:	
◦Metric scale	
◦North arrow (including construction North)	
◦Key plan	
◦Name and contact information of applicant and property owner	C401
◦Property limits including bearings and dimensions	
◦Existing and proposed structures and parking areas	
◦Easements, road widening and rights-of-way	
◦Adjacent street names	

4.2 Development Servicing Report: Water

Confirm consistency with Master Servicing Study, if available	N/A
Availability of public infrastructure to service proposed development	Section 5.1
Identification of system constraints	Section 5.1
Identify boundary conditions	Section 5.2
Confirmation of adequate domestic supply and pressure	Section 5.2
Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.	Section 5.2

Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.	Section 5.2
Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design	N/A
Address reliability requirements such as appropriate location of shut-off valves	N/A
Check on the necessity of a pressure zone boundary modification.	N/A
Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range	Section 5.2
Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.	Section 5.2
Description of off -site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.	N/A
Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Section 5.2
Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	N/A

4.3 Development Servicing Report: Wastewater

Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).	Section 6.2
Confirm consistency with Master Servicing Study and/or justifications for deviations.	N/A

Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.	N.A
Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Section 6.1
Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)	Section 6.2
Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	Section 6.2 Appendix C
Description of proposed sewer network including sewers, pumping stations, and forcemains.	Section 6.2
Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).	N/A
Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	Section 6.1
Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	N/A
Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	N/A
Special considerations such as contamination, corrosive environment etc.	N/A

4.4 Development Servicing Report: Stormwater Checklist

Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)	Section 7.1
Analysis of available capacity in existing public infrastructure.	N/A
A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	N/A
Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.	Section 7.2.2
Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Section 7.2.1
Description of the stormwater management concept with facility locations and descriptions with references and supporting information.	Section 7.4
Set-back from private sewage disposal systems.	N/A
Watercourse and hazard lands setbacks.	N/A
Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	N/A
Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	N/A
Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).	Section 7.4
Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	N/A

Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.	Section 7.4 Appendix D
Any proposed diversion of drainage catchment areas from one outlet to another.	N/A
Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	Appendix D
If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100 year return period storm event.	N/A
Identification of potential impacts to receiving watercourses Identification of municipal drains and related approval requirements.	N/A
Descriptions of how the conveyance and storage capacity will be achieved for the development.	Section 7.4
100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	NA
Inclusion of hydraulic analysis including hydraulic grade line elevations.	N/A
Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Section 8.0
Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.	N/A
Identification of fill constraints related to floodplain and geotechnical investigation	N/A

4.5 Approval and Permit Requirements: Checklist

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

4.6 Conclusion Checklist

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

Site Plan Pre- Application Consultation Notes

Date: Tuesday, December 14, 2021.
Site Location: 1600 James Naismith Dr
Type of Development: ☒ **Residential (**☐ **townhomes,** ☐ **stacked,** ☐ **singles,** ☒ **apartments),** ☐ **Office Space,** ☐ **Commercial,** ☐ **Retail,** ☐ **Institutional,** ☐ **Industrial, Other:** N/A

Infrastructure

Water

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

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)
- Please submit sanitary demands with the water boundary conditions to identify any capacity constraints at the local pumping station (domestic and infiltration demands)

Stormwater Management

The existing stormwater management system would be deemed adequate to service the site provided there are no exterior site alterations. Exterior site alterations are require a stormwater management brief demonstrating the overall site storage and release rate meet the required capacity.

Examples of exterior site alterations: increasing paved areas, regrading, relocation of catch basins, or additional building footprint

Quality Control:

- Rideau Valley Conservation Authority to confirm quality control requirements.

Quantity Control:

- Site is located within the Cyrville Drain Subwatershed Study Area
- Time of concentration (Tc): Tc = pre-development; maximum Tc = 10 min
- Allowable run-off coefficient C = 0.5
- Allowable flowrate: Allowable flowrate: Control the 100-year storm events to the 5-year storm event.

General Service Design Comments

- The City of Ottawa Standard Detail Drawings should be referenced where possible for all work within the Public Right-of-Way.

Other

Capital Works Projects within proximity to application? ☒ **Yes** ☐ **No**

- A multi-use pathway to be constructed/resurfaced within a targeted start time of 1-2 years

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 & 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/

PLANS & STUDIES LIST

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 (if proposed servicing modifications)	2. Site Servicing Brief	S	
S		3. Grade Control and Drainage Plan (if proposed exterior alterations)	4. Geotechnical Study (if proposed new addition/buildings)		
		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 (if proposed exterior alterations. Plans can be combined)	S	
S		11. Storm water Management Brief (if proposed storm sewer modifications/regrading)	12. Hydro-geological and Terrain Analysis		
		13. Water main Analysis	14. Noise / Vibration Study		
		15. Roadway Modification Design Plan	16. Confederation Line Proximity Study		

S – Required for Site Plan Control
Z – Required for Zoning By-Law Amendment

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.

Amr Salem

From: Sophie Couture <scouture@figurr.ca>
Sent: April 13, 2022 2:39 PM
To: Amr Salem
Cc: Kaleigh MacLeod; Brandon Couldrey; Melissa Du Plessis
Subject: RE: LRL220142 - 1600 James Naismith- Fireflow Architectural Assumptions

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Amr,

Please see in red below.

Thanks,
Sophie Couture
Architecte

Figurr
collectif d'architectes
figurr.ca

FIG. 1
3550, Saint-Antoine O.
Montréal QC H4C 1A9
T 514 861–5122 x 115
M 438 837–6157

FIG. 2
190 Somerset St W #206
Ottawa ON
K2P 0J4
T 613 695–6122

****** Le cabinet d'architectes Rubin & Rotman devient le collectif d'architectes Figurr et a emménagé au-dessus de la galerie d'art Parisian Laundry. ******

From: Amr Salem <asalem@lrl.ca>
Sent: 12 avril 2022 12:43
To: Sophie Couture <scouture@figurr.ca>
Cc: Kaleigh MacLeod <kmacleod@figurr.ca>
Subject: LRL220142 - 1600 James Naismith- Fireflow Architectural Assumptions

Hey Sophie,

Can you please confirm the following assumptions to help us determine the fireflow demands of the proposed building conversion;

- Can you please confirm total building area (GFA). Please exclude underground basement. Total GFA excluding basement level is +/-166 225 SF

- Can you please confirm total number of units and provide a breakdown of unit types. This is what I have on file; This table is up-to-date in the site plan previously sent today.

UNIT BREAKDOWN:		UNIT MIX:
LOWER LEVEL:	8 UNITS	2X 1B, 4X 1BD, 2X 2B
LEVEL 1:	21 UNITS	4X STUDIO, 6X 1B, 3X 1BD, 3X 2B, 5X 2BD
LEVEL 2:	27 UNITS	3X STUDIO, 12X 1B, 4X 1BD, 6X 2B, 2X 2BD
LEVEL 3:	27 UNITS	3X STUDIO, 12X 1B, 4X 1BD, 6X 2B, 2X 2BD
LEVEL 4:	27 UNITS	3X STUDIO, 12X 1B, 4X 1BD, 6X 2B, 2X 2BD
LEVEL 5:	27 UNITS	3X STUDIO, 12X 1B, 4X 1BD, 6X 2B, 2X 2BD
LEVEL 6:	27 UNITS	3X STUDIO, 12X 1B, 4X 1BD, 6X 2B, 2X 2BD
LEVEL 7:	27 UNITS	3X STUDIO, 12X 1B, 4X 1BD, 6X 2B, 2X 2BD
LEVEL 8:	27 UNITS	3X STUDIO, 12X 1B, 4X 1BD, 6X 2B, 2X 2BD
TOTAL	218 UNITS	

- Can you confirm if sprinklers are proposed for the building? If yes, please specify if sprinkler system will be ***fully supervised*** and ***automatic***?

The building is already sprinklered, I would say automatic?

- Kindly provide the **ISO class** for the building as per ISO Guide sections 1, 2 and 3. I have included a brief summary of ISO Guide (review chapter 2 for construction types) as well as the section from the City's technical bulletin. Note that ISO refers only to fire-resistive for fire ratings not less than 1-hour.

A. *Determine the type of construction.*

- Coefficient *C* in the FUS method is equivalent to coefficient *F* in the ISO method:

Correspondence between FUS and ISO construction coefficients

FUS type of construction	ISO class of construction	Coefficient *C*
Fire-resistive construction	Class 6 (fire resistive)	0.6
	Class 5 (modified fire resistive)	0.6
Non-combustible construction	Class 4 (masonry non-combustible)	0.8
	Class 3 (non-combustible)	0.8
Ordinary construction	Class 2 (joisted masonry)	1.0
Wood frame construction	Class 1 (frame)	1.5

However, the FUS definition of fire-resistive construction is more restrictive than those of ISO construction classes 5 and 6 (modified fire resistive and fire resistive). FUS requires structural members and floors in buildings of fire-resistive construction to have a fire-resistance rating of 3 hours or longer.

- With the exception of fire-resistive construction that is defined differently by FUS and ISO, practitioners can refer to the definitions of the ISO construction classes (and the supporting definitions of the types of materials and assemblies that make up the ISO construction classes) found in the current ISO guide [4] (see Annex i) to help select coefficient *C*.
- To identify the most appropriate type of construction for buildings of mixed construction, the rules included in the current ISO guide [4] can be followed (see Annex i). For a building to be assigned a given classification, the rules require ⅔ (67%) or more of the total wall area and ⅔ (67%) or more of the total floor and roof area of the building to be constructed according to the given construction class or a higher class.
- New residential developments (less than 4 storeys) are predominantly of wood frame construction ($C = 1.5$) or ordinary construction ($C = 1.0$) if exterior walls are of brick or masonry. Residential buildings with exterior walls of brick or masonry veneer and those with less than ⅔ (67%) of their exterior walls made of brick or masonry are considered wood frame construction ($C = 1.5$).

ISO class 3 (non-combustible)

Let me know if you have questions.

Thank you,

Amr Salem, PMP®
B.Eng, Civil Engineering Services
LRL Engineering
5430 Canotek Road
Ottawa, Ontario K1J 9G2
T (613) 842-3434 or (877) 632-5664 ext 248
F (613) 842-4338
E asalem@lrl.ca
W www.lrl.ca

Amr Salem

From: Jamie Batchelor <jamie.batchelor@rvca.ca>
Sent: April 20, 2022 4:51 PM
To: Amr Salem; Eric Lalande
Subject: RE: LRL220142 - 1600 James Naismith - Quality Control Criteria

Good Afternoon Amr,

Based on the site plan provided, and the distance to the downstream outlet, on-site water quality control of 'enhanced' (80% TSS removal) is required. We would also strongly encourage you to explore Lid measures as part of your stormwater strategy.

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: Amr Salem <asalem@lrl.ca>
Sent: Wednesday, April 20, 2022 12:56 PM
To: Jamie Batchelor <jamie.batchelor@rvca.ca>; Eric Lalande <eric.lalande@rvca.ca>
Subject: LRL220142 - 1600 James Naismith - Quality Control Criteria

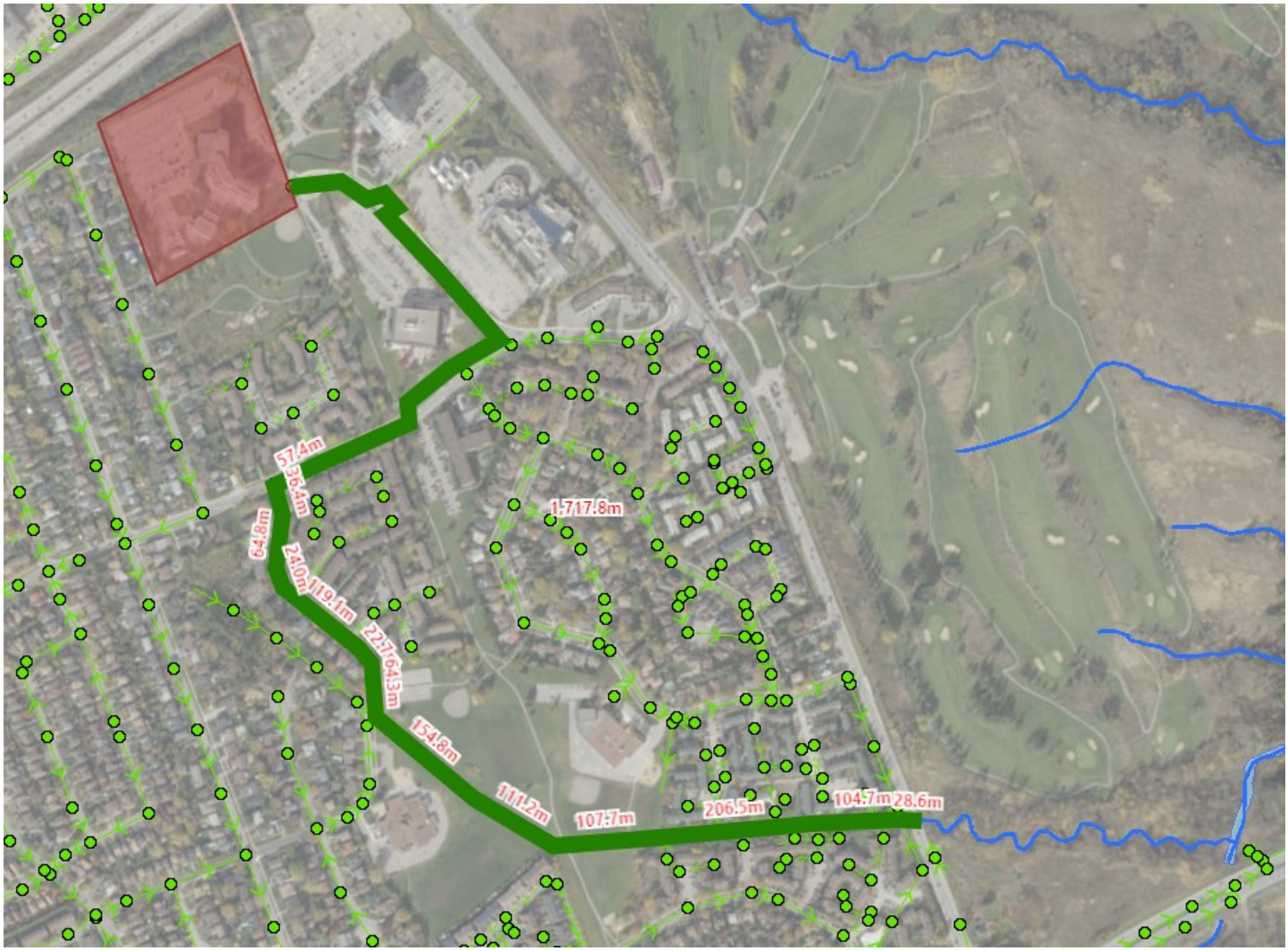
Good morning Jamie/Eric,

Can you please confirm quality control requirements for our subject site at 1600 James Naismith.

The subject site is currently an 8-storey office building with a large rear surface parking space and paved drive aisles/roadways + landscaoing.

The development proposes the conversion of the existing office building to a residential apartment building via interior renovations. Exterior changes include the pavement of additional surface parking in front of the building and the demolition of an existing neighboring 3-storey building. I've attached the site plan for your reference.

The site is within the Cyrville Drain Subwatershed Study Area ans is tributary to the Ottawa River East watershed. Currently, runoff from the site is collected via catchbasins and is directed approx 1.75km to the surface watercourse.



Thanks,

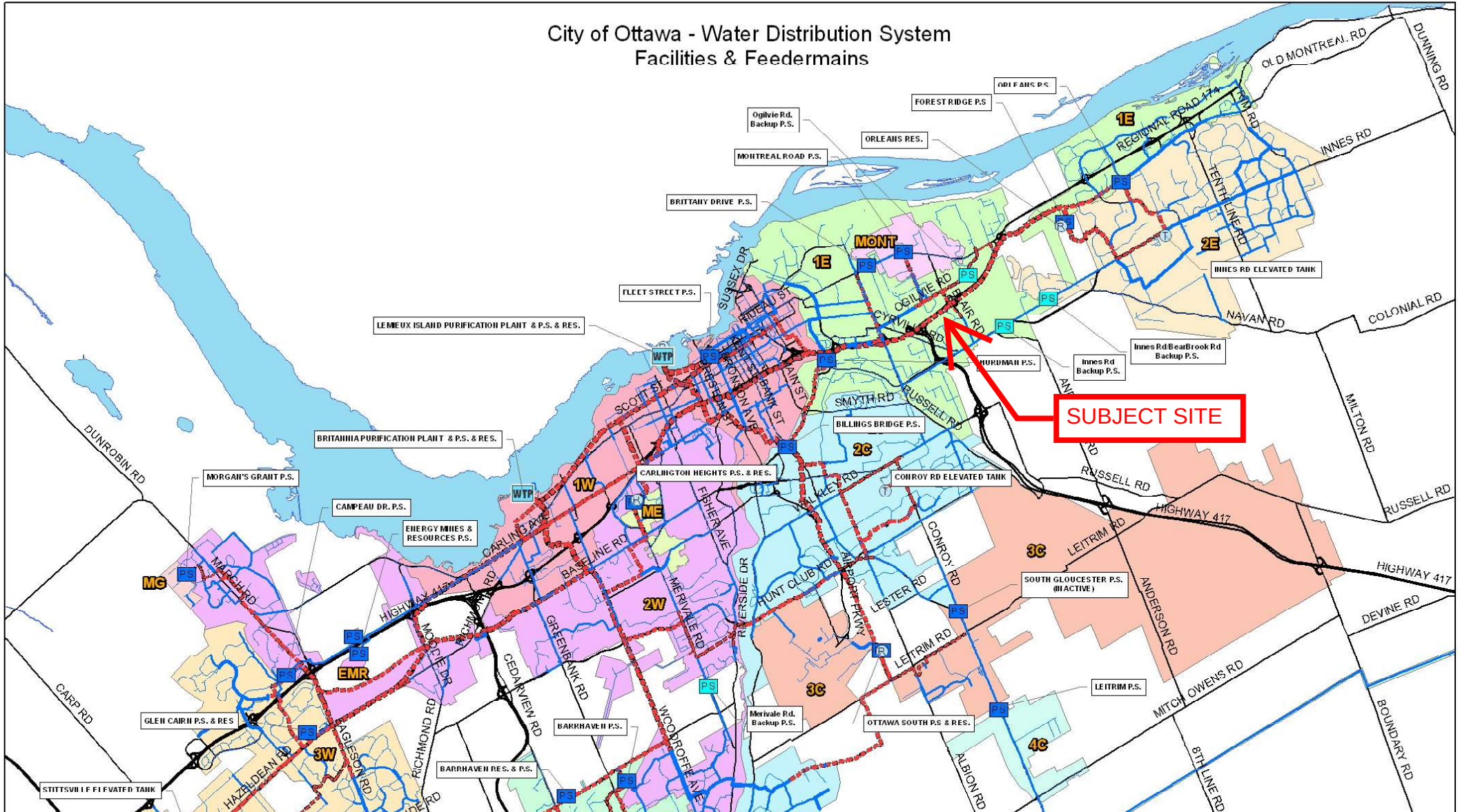
Amr Salem, PMP®, B.Eng
Civil Engineering Services
LRL Engineering
5430 Canotek Road
Ottawa, Ontario K1J 9G2
T (613) 842-3434 or (877) 632-5664 ext 248
F (613) 842-4338

E asalem@lrl.ca
W www.lrl.ca

We care deeply, so let us know how we did by completing our Customer Satisfaction Survey.
Nous nous soucions profondément de votre opinion, nous vous invitons donc à nous faire savoir si nous avons satisfait vos attentes en remplissant notre sondage sur la satisfaction de la clientèle

APPENDIX B

Water Supply Calculations


City of Ottawa - Water Distribution System
Facilities & Feedermains
SUBJECT SITE
Legend
Water System Structure
Pump Station
Backup Pump Station
Water Treatment Plant
Well
Elevated Tank
Reservoir
WATERMAINS
Priority, Internal Diameter
Backbone 1524mm - 1981mm
Backbone 1067mm - 1372mm
Backbone 610mm - 914mm
Backbone 406mm - 508mm
Backbone 152mm - 305mm
Distribution 1676mm - 1981mm
Distribution 1067mm - 1372mm
Distribution 610mm - 914mm
Distribution 406mm - 508mm
Distribution 305mm - 381mm
PRESSURE ZONES
1E
1W
2C
2E
2W
3C
3W
4C
BARR
EMR
ME
MG
MONT
SHAD
FOREST RIDGE P.S
ORLEANS P.S.
Ogilvie Rd. Backup P.S.
ORLEANS RES.
MONTREAL ROAD P.S.
BRITTANY DRIVE P.S.
FLEET STREET P.S.
LEMIEUX ISLAND PURIFICATION PLANT & P.S. & RES.
BRITANNIA PURIFICATION PLANT & P.S. & RES.
MORGAN'S GRANT P.S.
CAMPEAU DR. P.S.
ENERGY MINES & RESOURCES P.S.
CARLINGTON HEIGHTS P.S. & RES.
BILLINGS BRIDGE P.S.
CONROY RD ELEVATED TANK
HURDMAN P.S.
Innes Rd Backup P.S.
Innes Rd/BearBrook Rd Backup P.S.
INNES RD ELEVATED TANK
SOUTH GLOUCESTER P.S. (INACTIVE)
LEITRIM P.S.
OTTAWA SOUTH P.S & RES.
Merivale Rd. Backup P.S.
BARRHAVEN P.S.
BARRHAVEN RES. & P.S.
GLEN CAIRN P.S. & RES
STITTSVILLE ELEVATED TANK
REGIONAL ROAD 174
OLD MONTREAL RD
DUNNING RD
INNES RD
TENTH LINE RD
COLONIAL RD
NAVAN RD
MILTON RD
RUSSELL RD
HIGHWAY 417
DEVINE RD
ANDERSON RD
MITCH OWENS RD
BOUNDARY RD
8TH LINE RD
ALBION RD
LEITRIM RD
CONROY RD
LESTER RD
AIRPORT PKWY
HUNT CLUB RD
RIVERSIDE DR
WOODROFFE AVE
MERIVALE RD
FISHER AVE
CARLING AVE
BASELINE RD
GREENBANK RD
CEDARVIEW RD
RICHMOND RD
MOODIE DR
MARCH RD
CARP RD
HAZELDEAN RD
EAGLESON RD
DUNROBIN RD
SCOTT ST
BRONSON AVE
BANK ST
RIDEAU ST
SUSSEX DR
OGILVIE RD
CYRVILLE RD
SMYTH RD
WALKLEY RD

Water Supply Calculations

LRL File No.	220142
Project	1600 James naismith
Date	September 7, 2022
Prepared by	Amr Salem

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

Domestic Demand			
Unit Type	**Persons Per Unit**	**Number of Units**	**Population**
1 Bedroom Apartment	1.4	152	212.8
2 Bedroom Apartment	2.1	66	138.6
	Total	**218**	**351**

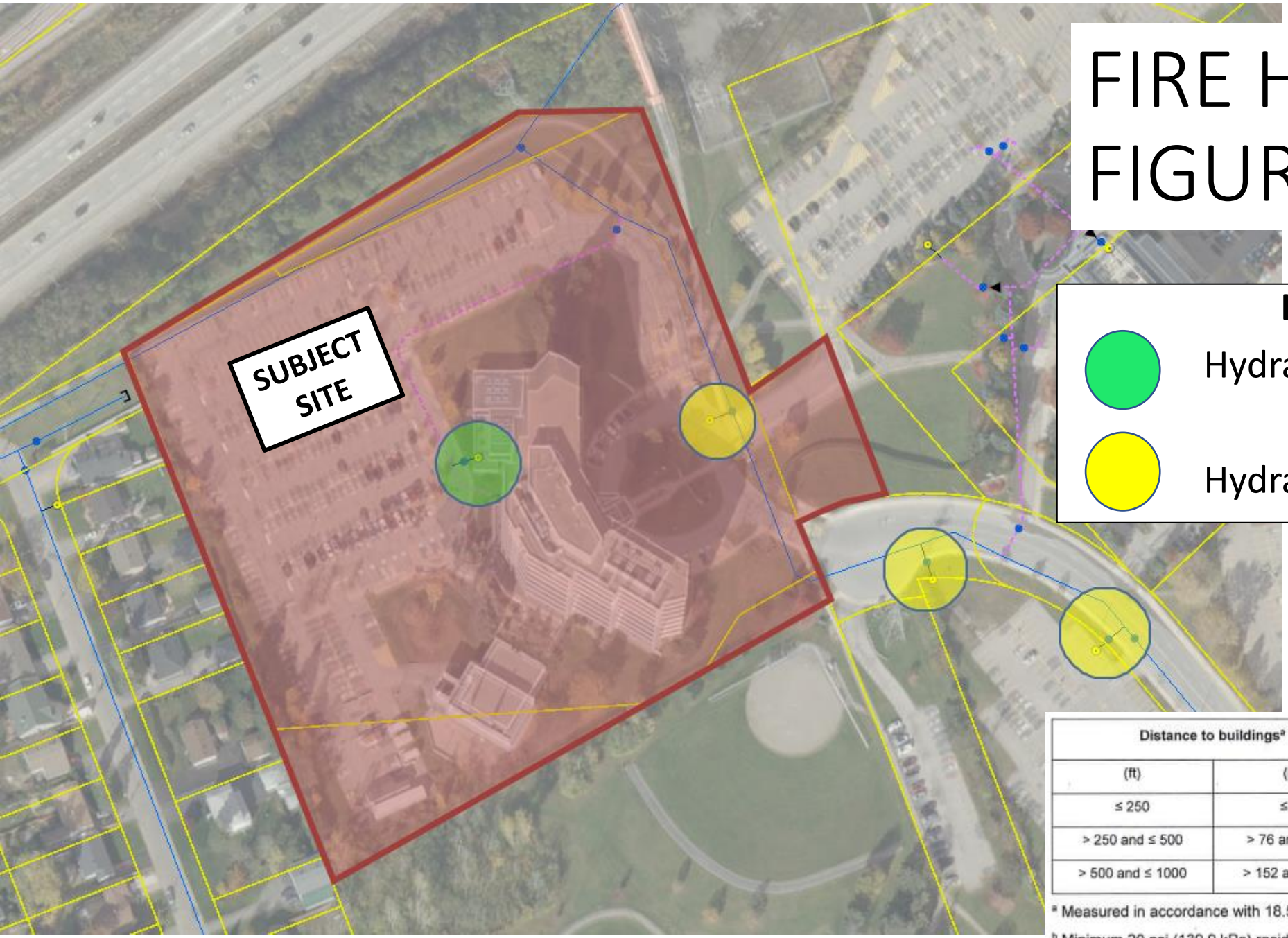
Average Water Consumption Rate	280	L/p/d		
Average Day Demand	**98,392**	**L/d**	**1.14**	**L/s**
Maximum Day Factor	3.4		(MOE Table 3-3)	
Maximum Daily Demand	**331,464**	**L/d**	**3.84**	**L/s**
Peak Hour Factor	5.0		(MOE Table 3-3)	
Maximum Hour Demand	**494,864**	**L/d**	**5.73**	**L/s**

Fire Flow Calculations - 1600 James Naismith

LRL File No. 220142
Date April 13, 2022
Method Fire Underwriters Survey (FUS)
Prepared by Amr Salem

Step	Task	Term	Options	Multiplier	Choose:	Value	Unit	Fire Flow
Structural Framing Material								
1	Choose frame used for building	Coefficient C related to the type of construction	Wood Frame	1.5	Non-combustible construction	**0.8**		
			Ordinary Construction	1.0				
			Non-combustible construction	0.8				
			Fire resistive construction <2 hrs	0.7				
			Fire resistive construction >2 hrs	0.6				
Floor Space Area (A)								
2	Total area					**15,443**	m^2	
3	Obtain fire flow before reductions	Required fire flow *(rounded to nearest 1,000 L/min)*	Fire Flow = 220 x C x $A^{0.5}$				L/min	**22,000**
Reductions or surcharge due to factors affecting burning								
4	Choose combustibility of contents	Occupancy hazard reduction or surcharge	Non-combustible	-25%	Limited combustible	**-15%**	L/min	**18,700**
			Limited combustible	-15%				
			Combustible	0%				
			Free burning	15%				
			Rapid burning	25%				
5	Choose reduction for sprinklers	Sprinkler reduction	Full automatic sprinklers	-30%	True	**-30%**	L/min	**9,350**
			Water supply is standard for both the system and fire department hose lines	-10%	True	**-10%**		
			Fully supervised system	-10%	True	**-10%**		
6	Choose separation	Exposure distance between units	North side	>30m	0%		L/min	**9,350**
			East side	>30m	0%			
			South side	>30m	0%			
			West side	>30m	0%	**0%**		
Net required fire flow								
7	Obtain fire flow, duration, and volume				Minimum required fire flow rate (rounded to nearest 1000)		L/min	**9,000**
					Minimum required fire flow rate		L/s	**150.0**
					Required duration of fire flow		hr	**2**

FIRE HYDRANT FIGURE



LEGEND

Hydrants within 75m

Hydrants within 150m

Distance to buildings[a]		Maximum capacity[b]	
(ft)	(m)	(gpm)	(L/min)
≤ 250	≤ 76	1500	5678
> 250 and ≤ 500	> 76 and ≤ 152	1000	3785
> 500 and ≤ 1000	> 152 and ≤ 305	750	2839

[a] Measured in accordance with 18.5.1.4 and 18.5.1.5.

[b] Minimum 20 psi (139.9 kPa) residual pressure.

Amr Salem

From: Rasool, Rubina <Rubina.Rasool@ottawa.ca>
Sent: May 16, 2022 8:56 AM
To: Amr Salem
Subject: RE: LRL220142 - 1600 James Naismith - Boundary Conditions
Attachments: 1600 Jame Naismith Drive May 2022.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

******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 1600 James Naismith Drive (zone 1E) assumed to be two connections to the 305 mm watermain on James Naismith Drive (see attached PDF for location).

Both Connections:

Minimum HGL: 110.5 m

Maximum HGL: 117.3 m

Max Day + FF (150.0 L/s): 112.6 m (Connection 1)

Max Day + FF (150.0 L/s): 111.9 m (Connection 2)

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.

Rubina

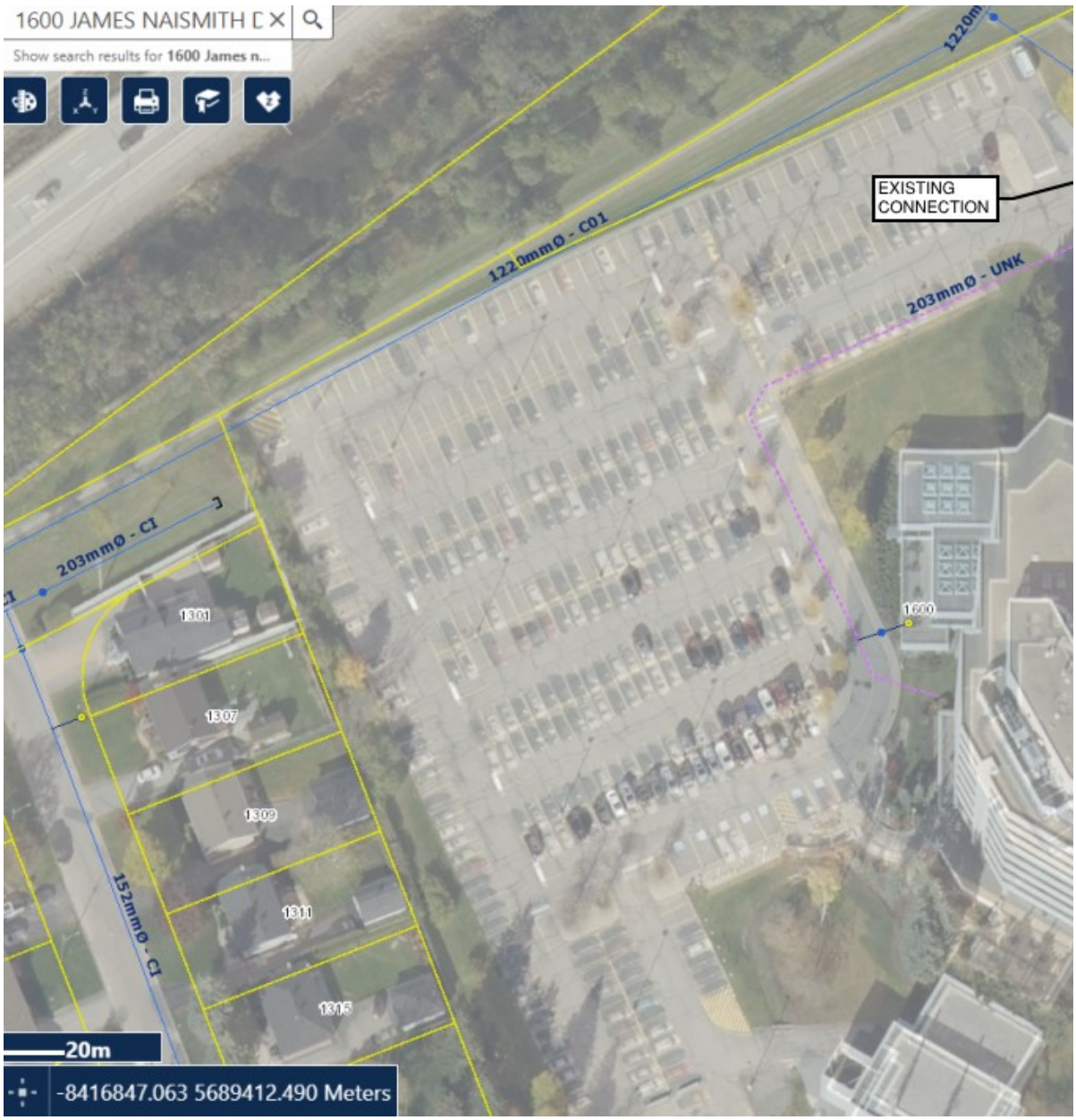
Rubina Rasool, E.I.T.
Project Manager
Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique
Development Review – East Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue Laurier Ouest. Ottawa (Ontario) K1P 1J1 rubina.rasool@ottawa.ca

From: Amr Salem <asalem@lrl.ca>
Sent: April 13, 2022 6:24 PM
To: Rasool, Rubina <Rubina.Rasool@ottawa.ca>
Subject: LRL220142 - 1600 James Naismith - Boundary Conditions

Hello Natasha,

I would like to kindly request boundary conditions for the proposed development at 1600 James Naismith using the following proposed development demands:

- Type of development**: proposed conversion of 8-storey office bldg to residential with surface parking.** ***(draft site plan attached for reference)***
- Proposed Connection Points:
    - **<u>Retain</u> existing connection to the existing 305mm watermain within the subject site**
    - **Propose a 2nd connection point to the 300mm ex. watermain within the subject site;**



- Please provide pressures for the following water demand scenarios required for the proposed development:

	Demand L/s
Avg. Daily	1.14
Max Day + FUS	3.84 + 150
Peak Hour	19.30

Thank you,

Amr Salem, PMP®
B.Eng, Civil Engineering Services
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5430 Canotek Road
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E asalem@lrl.ca
W www.lrl.ca

We care deeply, so let us know how we did by completing our Customer Satisfaction Survey.
Nous nous soucions profondément de votre opinion, nous vous invitons donc à nous faire savoir si nous avons satisfait vos attentes en remplissant notre sondage sur la satisfaction de la clientèle

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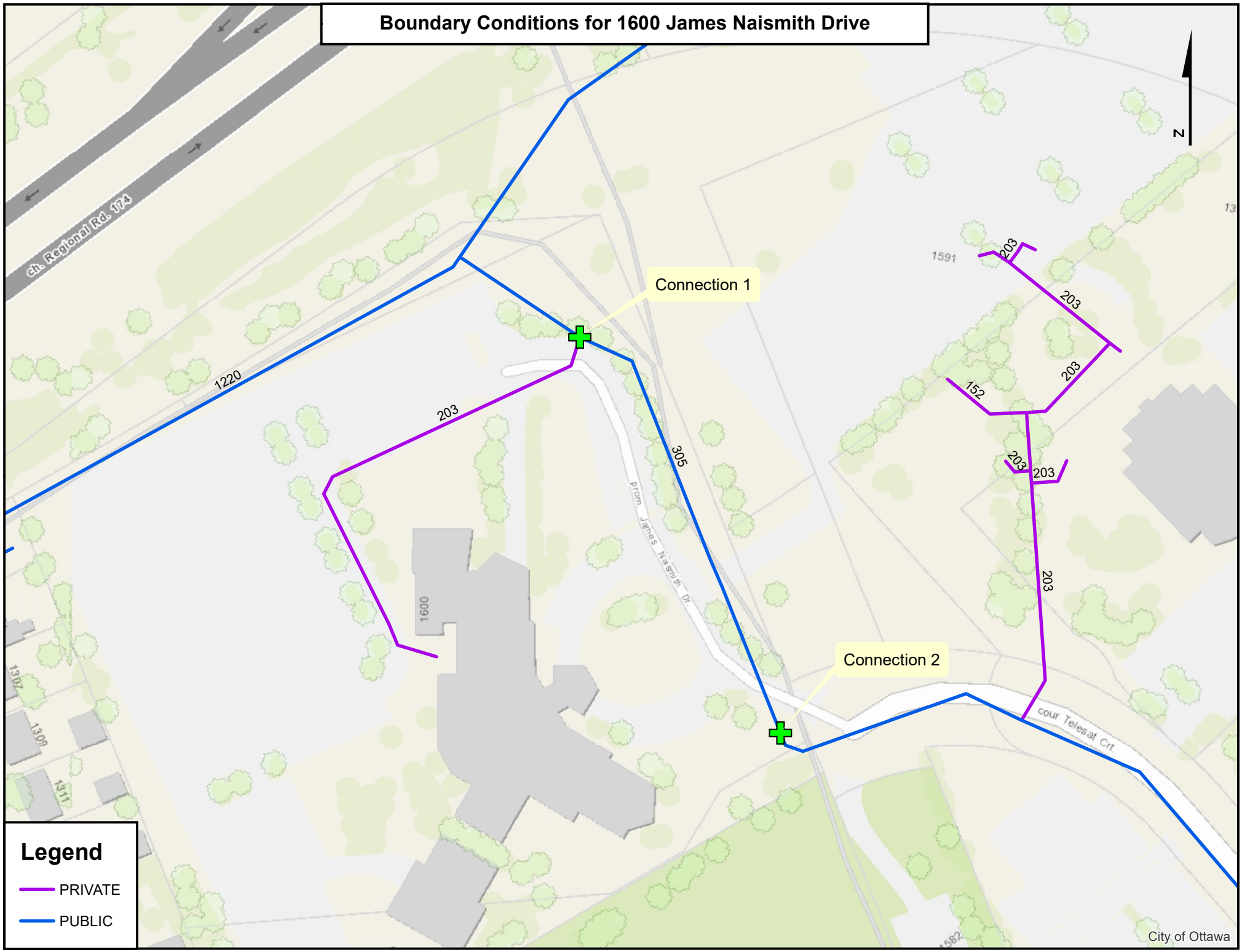
Boundary Conditions for 1600 James Naismith Drive
ch. Regional Rd. 174
1220
203
Connection 1
305
prom. James Naismith Dr
1600
1307
1309
1311
1591
203
203
203
152
203
203
203
Connection 2
cour Telesat Crt
N
Legend
PRIVATE
PUBLIC
City of Ottawa

APPENDIX C

Wastewater Collection Calculations

LRL File No. 220142
Project: 8-Storey Apartment Bldg
Location: 1600 James Naismith
Date: May 2, 2022

Sanitary Design Parameters

Average Daily Flow = 280 L/p/day
Office= 75 L/9.3m2/d
Commercial & Institutional Flow = 50000 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 = 7
Extraneous Flow = 0.33L/s/gross ha

Pipe Design Parameters

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

LOCATION			RESIDENTIAL AREA AND POPULATION						COMMERCIAL		INDUSTRIAL			*INSTITUTIONAL - **OFFICE***		C+I+I	INFILTRATION			TOTAL FLOW (l/s)	PIPE					
STREET	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)
EXISTING FLOW	Bldg	*EX. SAN MH*	0.000	0.0	0.00	0.0	3.8	0.00	0.000	0.000	0.00	0.00	7.0	1.544	1.5	0.22	1.544	1.544	0.51	0.73	62.4	200	*1.00%*	PVC	32.80	1.04
PROPOSED FLOW	Bldg	*EX. SAN MH*	1.544	351.0	1.54	351.0	3.4	3.91	0.000	0.000	0.00	0.00	7.0	0.0	0.0	0.00	1.544	1.544	0.51	4.42	62.4	200	*1.00%*	PVC	32.80	1.04

NOTES: Existing inverts and slopes are estimated. They are to be confirmed on-site.

Designed: A.S.	PROJECT: Apartment Building		
Checked: V.J.	LOCATION: 1600 James Naismith Dr		
Dwg. Reference: C.401	File Ref.: 220142	Date: 2022-05-02	Sheet No. 1 of 1

APPENDIX D

Stormwater Management Calculations
Hydrovex ICD
Stormceptor OGS
Klassikdrain
Pump Design

LRL Associates Ltd.

Storm Watershed Summary

LRL File No.	220142
Project:	8-Storey Apartment Building Converison
Location:	1600 James Naismith
Date:	April 18, 2022
Designed:	Amr Salem
Drawing Reference:	C701/C702

Pre-Development Catchments

WATERSHED	C = 0.2	C = 0.80	C = 0.90	Total Area (m^2)	Total Area (ha)	Combined C
EWS-01	7161.0		6715.0	13876.0	1.388	0.54
TOTAL	**7161.0**	**0.0**	**6715.0**	**13876.0**	**1.388**	**0.54**

Post-Development Catchments

WATERSHED	C = 0.20	C = 0.80	C = 0.90	Total Area (m^2)	Total Area (ha)	Combined C
WS-100A (UNCONTROLLED)		242.0		242.0	0.024	0.80
WS-100B (UNCONTROLLED)		224.0		224.0	0.022	0.80
WS-100C (UNCONTROLLED)	3604.0		900.0	4504.0	0.450	0.34
WS-01 (CONTROLLED)			2410.0	2410.0	0.241	0.90
WS-02 (CONTROLLED)			2290.0	2290.0	0.229	0.90
WS-03 (CONTROLLED)	788.0		1184.0	1972.0	0.197	0.62
WS-04A (BLDG-CONTROLLED)			412.0	412.0	0.041	0.90
WS-04B (BLDG-CONTROLLED)			1822.0	1822.0	0.182	0.90
TOTAL	**4392.0**	**466.0**	**6784.0**	**13876.0**	**1.388**	**0.68**

LRL File No.	220142
Project:	8-Storey Apartment Building Converison
Location:	1600 James Naismith
Date:	April 18, 2022
Designed:	Amr Salem
Drawing Ref.:	C600

Stormwater Management Design Sheet

Runoff Equation

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

Pre-development Stormwater Management

I_5 = $998.071 / (Td + 6.053)^{0.814}$ **a = 998.071** **b = 0.814** **C = 6.053**

C =	0.50	max of 0.5 as per City of Ottawa
I =	104.2	mm/hr
Tc =	10	min
Total Area =	1.388	ha

Allowable Release Rate= 200.96 L/s

Post-development Stormwater Management

					$\sum R_{2\&5}$	$\sum R_{100}$
	Total Site Area =	**0.1964**	ha	**∑R=**	**4.77**	**1.00**
Controlled	WS-01	0.241	ha	R=	0.90	1.00
	WS-02	0.229	ha	R=	0.90	1.00
	WS-03	0.197	ha	R=	0.62	0.78
	WS-04A	0.041	ha	R=	0.90	1.00
	WS-04B	0.182	ha	R=	0.90	1.00
	Total Controlled =	**0.891**	**ha**	**∑R=**	**0.84**	**1.00**
Un-controlled	WS-100A (UNCONTROLLED)	0.024	ha	R=	0.80	1.00
	WS-100B (UNCONTROLLED)	0.022	ha	R=	0.80	1.00
	WS-100C (UNCONTROLLED)	0.450	ha	R=	0.34	0.42
	Total Un-Controlled =	**0.497**	**ha**	**∑R=**	**0.38**	**0.48**

Post-development Stormwater Management (Uncontrolled Catchment WS-100 TOTAL)

100 Year Storm Event:

I_{100} = $1735.688 / (Td + 6.014)^{0.820}$ **a = 1735.688** **b = 0.820** **C = 6.014**

Time (min)	Intensity (mm/hr)	Uncontrolled Runoff (L/s)	Controlled Release Rate Constant (L/s)	Total Release Rate (L/s)	
10	178.6	12.01	0.00	*12.01*	*WS-100A*
10	178.6	11.12	0.00	*11.12*	*WS-100B*
10	178.6	94.99	0.00	*94.99*	*WS-100A*
10	178.6	118.12	0.00	**118.12**	**WS-100 - TOTAL**

Post-development Stormwater Management (WS-02)

100 Year Storm Event:

I_{100} = $1735.688 / (Td + 6.014)^{0.820}$ **a = 1735.688** **b = 0.820** **C = 6.014**

		Storage Required				
Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m^3)	Controlled Release Rate Constant (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	178.6	119.63	60.38	19.00	0.00	19.00
15	142.9	95.74	69.06	19.00	0.00	19.00
20	120.0	80.36	73.64	19.00	0.00	19.00
25	103.8	69.58	75.86	19.00	0.00	19.00
30	91.9	61.55	76.59	19.00	0.00	19.00
35	82.6	55.33	76.28	19.00	0.00	19.00
40	75.1	50.35	75.23	19.00	0.00	19.00
45	69.1	46.26	73.61	19.00	0.00	19.00
50	64.0	42.85	71.54	19.00	0.00	19.00
60	55.9	37.45	66.41	19.00	0.00	19.00
70	49.8	33.36	60.30	19.00	0.00	19.00
90	41.1	27.54	46.13	19.00	0.00	19.00
110	35.2	23.58	30.26	19.00	0.00	19.00
130	30.9	20.70	13.27	19.00	0.00	19.00
150	27.6	18.50	0.00	19.00	0.00	19.00
170	25.0	16.76	0.00	19.00	0.00	19.00

Total Storage Required = 76.59 m^3 refer to LRL Plan C.601
Available Storage = 103.20 m^3
100-Yr HWL= 73.80 m

Post-development Stormwater Management (WS-02)

100 Year Storm Event:

I_{100} = $1735.688 / (Td + 6.014)^{0.820}$ **a = 1735.688** **b = 0.820** **C = 6.014**

Storage Required

LRL File No. 220142
Project: 8-Storey Apartment Building Conversion
Location: 1600 James Naismith
Date: April 18, 2022
Designed: Amr Salem
Drawing Ref.: C600

Stormwater Management Design Sheet

Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m^3)	Controlled Release Rate Constant (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	178.6	113.67	58.60	16.00	0.00	16.00
15	142.9	90.97	67.47	16.00	0.00	16.00
20	120.0	76.36	72.44	16.00	0.00	16.00
25	103.8	66.11	75.17	16.00	0.00	16.00
30	91.9	58.49	76.47	16.00	0.00	16.00
35	82.6	52.57	76.80	16.00	0.00	16.00
40	75.1	47.84	76.41	16.00	0.00	16.00
45	69.1	43.96	75.49	16.00	0.00	16.00
50	64.0	40.71	74.14	16.00	0.00	16.00
60	55.9	35.58	70.50	16.00	0.00	16.00
70	49.8	31.70	65.93	16.00	0.00	16.00
90	41.1	26.17	54.93	16.00	0.00	16.00
110	35.2	22.41	42.31	16.00	0.00	16.00
130	30.9	19.67	28.63	16.00	0.00	16.00
150	27.6	17.58	14.20	16.00	0.00	16.00
170	25.0	15.92	0.00	16.00	0.00	16.00

Total Storage Required = **76.80** m^3 refer to LRL Plan C.601
Available Storage = **90.00** m^3
100-Yr HWL= **73.80** m

Post-development Stormwater Management (WS-03)

100 Year Storm Event:

$I_{100} = 1735.688 / (Td + 6.014)^{0.820}$ **a =** 1735.688 **b =** 0.820 **C =** 6.014

		Storage Required				
Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m^3)	Controlled Release Rate Constant (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	178.6	75.90	25.23	33.85	0.00	33.85
15	142.9	60.74	24.20	33.85	0.00	33.85
20	120.0	50.99	20.57	33.85	0.00	33.85
25	103.8	44.14	15.44	33.85	0.00	33.85
30	91.9	39.05	9.37	33.85	0.00	33.85
35	82.6	35.10	2.63	33.85	0.00	33.85
40	75.1	31.94	0.00	33.85	0.00	33.85
45	69.1	29.35	0.00	33.85	0.00	33.85
50	64.0	27.18	0.00	33.85	0.00	33.85
60	55.9	23.76	0.00	33.85	0.00	33.85
70	49.8	21.16	0.00	33.85	0.00	33.85
90	41.1	17.47	0.00	33.85	0.00	33.85
110	35.2	14.96	0.00	33.85	0.00	33.85
130	30.9	13.13	0.00	33.85	0.00	33.85
150	27.6	11.74	0.00	33.85	0.00	33.85
170	25.0	10.63	0.00	33.85	0.00	33.85

Total Storage Required = **25.23** m^3 refer to LRL Plan C.601
Available Storage = **26.00** m^3
100-Yr HWL= **73.20** m

Post-development Stormwater Management (WS-04A)

100 Year Storm Event:

$I_{100} = 1735.688 / (Td + 6.014)^{0.820}$ **a =** 1735.688 **b =** 0.820 **C =** 6.014

		Storage Required				
Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m^3)	Controlled Release Rate Constant (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	178.6	20.45	11.07	2.00	0.00	2.00
15	142.9	16.37	12.93	2.00	0.00	2.00
20	120.0	13.74	14.09	2.00	0.00	2.00
25	103.8	11.89	14.84	2.00	0.00	2.00
30	91.9	10.52	15.34	2.00	0.00	2.00
35	82.6	9.46	15.66	2.00	0.00	2.00
40	75.1	8.61	15.86	2.00	0.00	2.00
45	69.1	7.91	15.95	2.00	0.00	2.00
50	64.0	7.33	15.98	2.00	0.00	2.00
60	55.9	6.40	15.85	2.00	0.00	2.00
70	49.8	5.70	15.55	2.00	0.00	2.00
90	41.1	4.71	14.63	2.00	0.00	2.00
110	35.2	4.03	13.41	2.00	0.00	2.00
130	30.9	3.54	12.00	2.00	0.00	2.00
150	27.6	3.16	10.46	2.00	0.00	2.00
170	25.0	2.86	8.82	2.00	0.00	2.00

Summary of Roof Storage

Maximum Required Roof Storage (100 Year) =	15.98	m^3
Proposed Head =	150	mm
Control Flow/Drain =	1.60	L/s
Number of Roof Drains =	**1**	
Total Flow from Roof Drain =	2.00	L/s
Available Roof Surface =	412	m^2
Available Roof Storage =	**19.80**	m^3
Roof Drain Model =	**MURPHCO moulded control flow dome strainer (1 HOLE)**	

*An Emergency overflow scupper is provided above this height.

Post-development Stormwater Management (WS-04B)

LRL File No. 220142
Project: 8-Storey Apartment Building Converison
Location: 1600 James Naismith
Date: April 18, 2022
Designed: Amr Salem
Drawing Ref.: C600

Stormwater Management Design Sheet

100 Year Storm Event:

$I_{100} = 1735.688 / (Td + 6.014)^{0.820}$ a = 1735.688 b = 0.820 C = 6.014

		Storage Required				
Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m^3)	Controlled Release Rate Constant (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	178.6	90.44	47.07	12.00	0.00	12.00
15	142.9	72.38	54.34	12.00	0.00	12.00
20	120.0	60.76	58.51	12.00	0.00	12.00
25	103.8	52.60	60.90	12.00	0.00	12.00
30	91.9	46.53	62.16	12.00	0.00	12.00
35	82.6	41.83	62.64	12.00	0.00	12.00
40	75.1	38.06	62.55	12.00	0.00	12.00
45	69.1	34.98	62.03	12.00	0.00	12.00
50	64.0	32.39	61.18	12.00	0.00	12.00
60	55.9	28.31	58.72	12.00	0.00	12.00
70	49.8	25.22	55.52	12.00	0.00	12.00
90	41.1	20.82	47.65	12.00	0.00	12.00
110	35.2	17.83	38.48	12.00	0.00	12.00
130	30.9	15.65	28.47	12.00	0.00	12.00
150	27.6	13.99	17.87	12.00	0.00	12.00
170	25.0	12.67	6.82	12.00	0.00	12.00

Summary of Roof Storage

Maximum Required Roof Storage (100 Year) =	62.64	m^3
Proposed Head =	150	mm
Control Flow/Drain =	2.00	L/s
Number of Roof Drains =	**6**	
Total Flow from Roof Drain =	12.00	L/s
Available Roof Surface =	1980	m^2
Available Roof Storage =	**81.20**	m^3
Roof Drain Model =	**MURPHCO moulded control flow dome strainer (2 HOLEs)**	

*An Emergency overflow scupper is provided above this height.

Summary of release Rates and Storage Volumes

Catchment Area	Drainage Area (ha)	100-year Release Rate (L/s)	100-Year Required Storage (m3)	Total Available Storage (m3)
WS-100 (Uncontrolled)	0.497	118.12	0	0
WS-01	0.241	19.00	76.59	103.20
WS-02	0.229	16.00	76.80	90.00
WS-03	0.197	33.85	25.23	26.00
WS-04A	0.041	2.00	15.98	19.80
WS-04B	0.182	12.00	62.64	81.20
TOTAL	**1.388**	**200.96**	**257.23**	**320.20**

LRL File No.	220142
Project:	8-Storey Apartment Building Converison
Location:	1600 James Naismith
Date:	April 18, 2022
Designed:	Amr Salem
Drawing Ref.:	C600

Stormwater Management Design Sheet

Runoff Equation

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

Pre-development Stormwater Management

I_2 = 732.95 / (Td + 6.199)$^{0.81}$ **a = 732.951** **b = 0.81** **C = 6.199**

C =	0.50	max of 0.5 as per City of Ottawa
I =	76.8	mm/hr
Tc =	10	min
Total Area =	1.388	ha

Allowable Release Rate= 148.14 L/s

Post-development Stormwater Management

					$\sum R_{2\&5}$	$\sum R_{100}$
	Total Site Area =	**0.1964**	ha	**∑R=**	**4.77**	**1.00**
Controlled	WS-01	0.241	ha	R=	0.90	1.00
	WS-02	0.229	ha	R=	0.90	1.00
	WS-03	0.197	ha	R=	0.62	0.78
	WS-04A	0.041	ha	R=	0.90	1.00
	WS-04B	0.182	ha	R=	0.90	1.00
	Total Controlled =	**0.891**	**ha**	**∑R=**	**0.84**	**1.00**
Un-controlled	WS-100A (UNCONTROLLED)	0.024	ha	R=	0.80	1.00
	WS-100B (UNCONTROLLED)	0.022	ha	R=	0.80	1.00
	WS-100C (UNCONTROLLED)	0.450	ha	R=	0.34	0.42
	Total Un-Controlled =	**0.497**	**ha**	**∑R=**	**0.38**	**0.48**

Post-development Stormwater Management (Uncontrolled Catchment WS-100 TOTAL)

2 Year Storm Event:

I_2 = 732.95 / (Td + 6.199)$^{0.81}$ **a = 732.951** **b = 0.81** **C = 6.199**

Time (min)	Intensity (mm/hr)	Uncontrolled Runoff (L/s)	Controlled Release Rate Constant (L/s)	Total Release Rate (L/s)	
10	76.8	5.17	0.00	*5.17*	*WS-100A*
10	76.8	4.78	0.00	*4.78*	*WS-100B*
10	76.8	40.86	0.00	*40.86*	*WS-100A*
10	76.8	50.81	0.00	**50.81**	**WS-100 - TOTAL**

Post-development Stormwater Management (WS-02)

2 Year Storm Event:

I_2 = 732.95 / (Td + 6.199)$^{0.81}$ **a = 732.951** **b = 0.81** **C = 6.199**

		Storage Required				
Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m^3)	Controlled Release Rate Constant (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	76.8	51.46	19.47	19.00	0.00	19.00
15	61.8	41.38	20.14	19.00	0.00	19.00
20	52.0	34.86	19.03	19.00	0.00	19.00
25	45.2	30.26	16.89	19.00	0.00	19.00
30	40.0	26.83	14.09	19.00	0.00	19.00
35	36.1	24.16	10.83	19.00	0.00	19.00
40	32.9	22.02	7.24	19.00	0.00	19.00
45	30.2	20.26	3.40	19.00	0.00	19.00
50	28.0	18.79	0.00	19.00	0.00	19.00
60	24.6	16.45	0.00	19.00	0.00	19.00
70	21.9	14.68	0.00	19.00	0.00	19.00
90	18.1	12.16	0.00	19.00	0.00	19.00
110	15.6	10.43	0.00	19.00	0.00	19.00
130	13.7	9.17	0.00	19.00	0.00	19.00
150	12.3	8.21	0.00	19.00	0.00	19.00
170	11.1	7.45	0.00	19.00	0.00	19.00

Total Storage Required = 20.14 m^3 refer to LRL Plan C.601
Available Storage = 23.17 m^3
2-Yr HWL= 73.68 m

Post-development Stormwater Management (WS-02)

2 Year Storm Event:

I_2 = 732.95 / (Td + 6.199)$^{0.81}$ **a = 732.951** **b = 0.81** **C = 6.199**

Storage Required

LRL File No. 220142
Project: 8-Storey Apartment Building Converison
Location: 1600 James Naismith
Date: April 18, 2022
Designed: Amr Salem
Drawing Ref.: C600

Stormwater Management Design Sheet

Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m^3)	Controlled Release Rate Constant (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	76.8	48.90	19.74	16.00	0.00	16.00
15	61.8	39.32	20.99	16.00	0.00	16.00
20	52.0	33.12	20.55	16.00	0.00	16.00
25	45.2	28.75	19.13	16.00	0.00	16.00
30	40.0	25.49	17.09	16.00	0.00	16.00
35	36.1	22.96	14.61	16.00	0.00	16.00
40	32.9	20.92	11.81	16.00	0.00	16.00
45	30.2	19.25	8.78	16.00	0.00	16.00
50	28.0	17.85	5.55	16.00	0.00	16.00
60	24.6	15.63	0.00	16.00	0.00	16.00
70	21.9	13.95	0.00	16.00	0.00	16.00
90	18.1	11.55	0.00	16.00	0.00	16.00
110	15.6	9.91	0.00	16.00	0.00	16.00
130	13.7	8.72	0.00	16.00	0.00	16.00
150	12.3	7.80	0.00	16.00	0.00	16.00
170	11.1	7.07	0.00	16.00	0.00	16.00

Total Storage Required = **20.99** m^3 refer to LRL Plan C.601
Available Storage = **24.54** m^3
2-Yr HWL= **73.69** m

Post-development Stormwater Management (WS-03)

2 Year Storm Event:

$I_2 = 732.95 / (Td + 6.199)^{0.81}$ **a =** 732.951 **b =** 0.81 **C =** 6.199

		Storage Required				
Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m^3)	Controlled Release Rate Constant (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	76.8	32.65	0.00	33.00	0.00	33.00
15	61.8	26.25	0.00	33.00	0.00	33.00
20	52.0	22.12	0.00	33.00	0.00	33.00
25	45.2	19.20	0.00	33.00	0.00	33.00
30	40.0	17.02	0.00	33.00	0.00	33.00
35	36.1	15.33	0.00	33.00	0.00	33.00
40	32.9	13.97	0.00	33.00	0.00	33.00
45	30.2	12.85	0.00	33.00	0.00	33.00
50	28.0	11.92	0.00	33.00	0.00	33.00
60	24.6	10.44	0.00	33.00	0.00	33.00
70	21.9	9.31	0.00	33.00	0.00	33.00
90	18.1	7.71	0.00	33.00	0.00	33.00
110	15.6	6.62	0.00	33.00	0.00	33.00
130	13.7	5.82	0.00	33.00	0.00	33.00
150	12.3	5.21	0.00	33.00	0.00	33.00
170	11.1	4.72	0.00	33.00	0.00	33.00

Total Storage Required = **0.00** m^3 refer to LRL Plan C.601
Available Storage = **0.00** m^3
2-Yr HWL= **72.90** m

Summary of release Rates and Storage Volumes

Catchment Area	Drainage Area (ha)	100-year Release Rate (L/s)	100-Year Required Storage (m3)	Total Available Storage (m3)
WS-100 (Uncontrolled)	0.497	50.81	0	0
WS-01	0.241	19.00	20.14	23.17
WS-02	0.229	16.00	20.99	24.54
WS-03	0.197	33.00	0.00	0.00

Stormceptor®

FORTERRA

Stormceptor® EF Sizing Report

STORMCEPTOR®
ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

09/30/2022

Province:	Ontario
City:	Ottawa
Nearest Rainfall Station:	OTTAWA CDA RCS
Climate Station Id:	6105978
Years of Rainfall Data:	20

Site Name:	Ph 1 only

Drainage Area (ha):	0.91
Runoff Coefficient 'c':	0.84

Particle Size Distribution:	Fine
Target TSS Removal (%):	80.0

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	24.67
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	
Site Sediment Transport Rate (kg/ha/yr):	

Project Name:	1600 James Naismith Dr.
Project Number:	220142
Designer Name:	Brandon O'Leary
Designer Company:	Forterra
Designer Email:	brandon.oleary@forterrabp.com
Designer Phone:	905-630-0359
EOR Name:	Amr Salem
EOR Company:	LRL Associates Ltd.
EOR Email:	
EOR Phone:	

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EFO4	77
EFO6	87
EFO8	93
EFO10	96
EFO12	98

Recommended Stormceptor EFO Model: **EFO6**

Estimated Net Annual Sediment (TSS) Load Reduction (%): **87**

Water Quality Runoff Volume Capture (%): **> 90**

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THIRD-PARTY TESTING AND VERIFICATION

►**Stormceptor® EF and Stormceptor® EFO** are the latest evolutions in the Stormceptor® oil-grit separator (OGS) technology series, and are designed to remove a wide variety of pollutants from stormwater and snowmelt runoff. These technologies have been third-party tested in accordance with the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** and performance has been third-party verified in accordance with the **ISO 14034 Environmental Technology Verification (ETV)** protocol.

PERFORMANCE

►**Stormceptor® EF and EFO** remove stormwater pollutants through gravity separation and floatation, and feature a patent-pending design that generates positive removal of total suspended solids (TSS) throughout each storm event, including high-intensity storms. Captured pollutants include sediment, free oils, and sediment-bound pollutants such as nutrients, heavy metals, and petroleum hydrocarbons. Stormceptor is sized to remove a high level of TSS from the frequent rainfall events that contribute the vast majority of annual runoff volume and pollutant load. The technology incorporates an internal bypass to convey excessive stormwater flows from high-intensity storms through the device without resuspension and washout (scour) of previously captured pollutants. Proper routine maintenance ensures high pollutant removal performance and protection of downstream waterways.

PARTICLE SIZE DISTRIBUTION (PSD)

►The **Canadian ETV PSD** shown in the table below was used, or in part, for this sizing. This is the identical PSD that is referenced in the Canadian ETV ***Procedure for Laboratory Testing of Oil-Grit Separators*** for both sediment removal testing and scour testing. The Canadian ETV PSD contains a wide range of particle sizes in the sand and silt fractions, and is considered reasonably representative of the particle size fractions found in typical urban stormwater runoff.

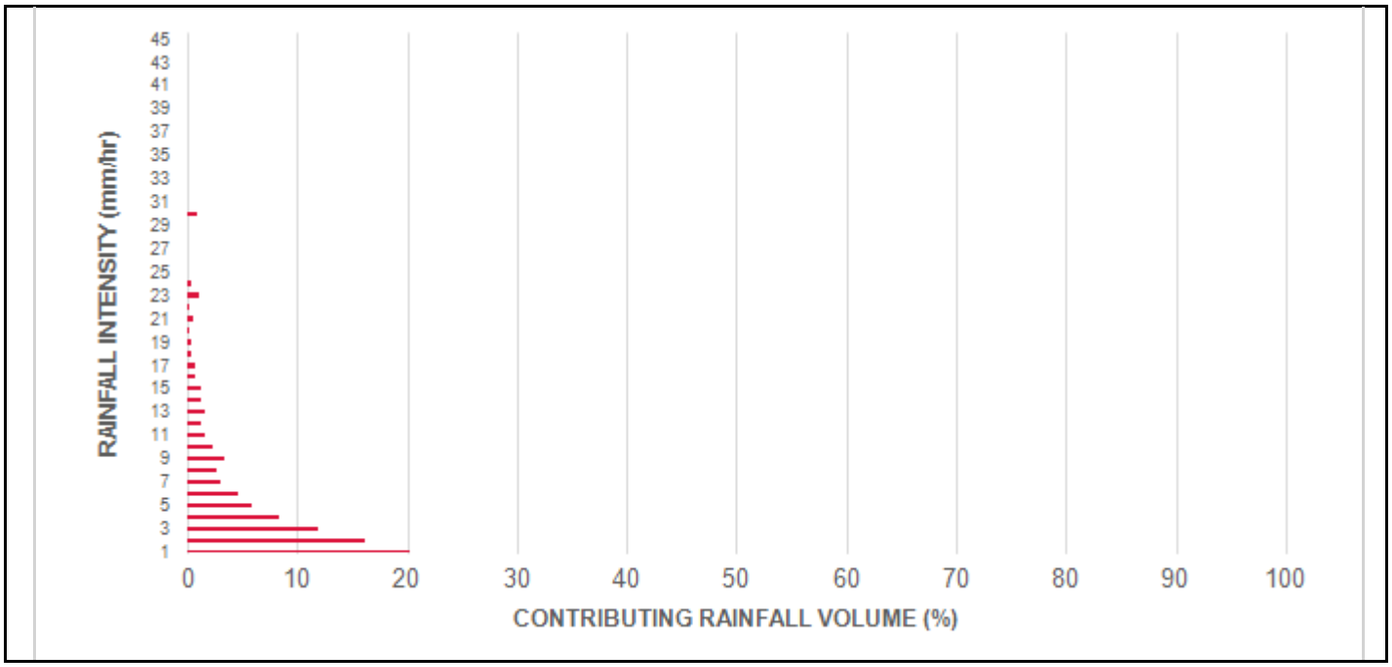
Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

Stormceptor® EF Sizing Report

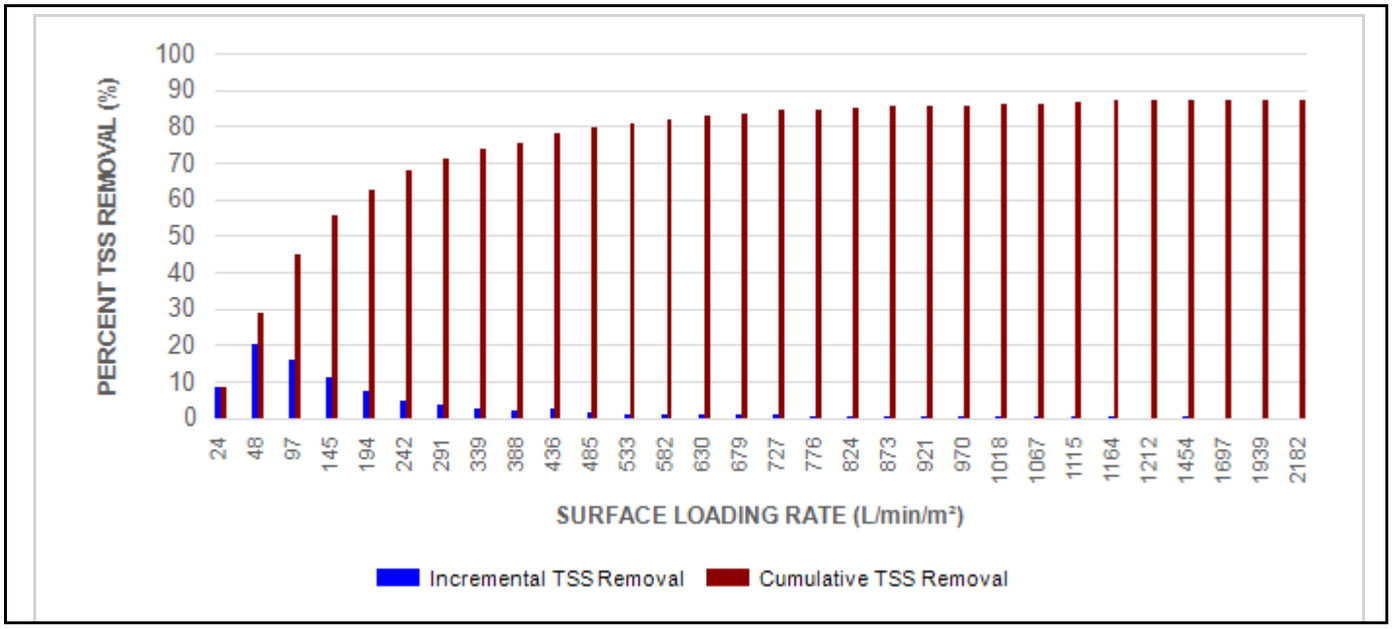
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.5	8.6	8.6	1.06	64.0	24.0	100	8.6	8.6
1	20.3	29.0	2.13	128.0	48.0	100	20.3	29.0
2	16.2	45.2	4.25	255.0	97.0	97	15.8	44.7
3	12.0	57.2	6.38	383.0	145.0	91	10.9	55.6
4	8.4	65.6	8.50	510.0	194.0	84	7.1	62.7
5	5.9	71.6	10.63	638.0	242.0	81	4.8	67.6
6	4.6	76.2	12.75	765.0	291.0	79	3.7	71.2
7	3.1	79.3	14.88	893.0	339.0	77	2.3	73.6
8	2.7	82.0	17.00	1020.0	388.0	75	2.0	75.6
9	3.3	85.3	19.13	1148.0	436.0	72	2.4	78.0
10	2.3	87.6	21.25	1275.0	485.0	70	1.6	79.6
11	1.6	89.2	23.38	1403.0	533.0	68	1.1	80.7
12	1.3	90.5	25.50	1530.0	582.0	66	0.9	81.6
13	1.7	92.2	27.63	1658.0	630.0	64	1.1	82.7
14	1.2	93.5	29.75	1785.0	679.0	64	0.8	83.5
15	1.2	94.6	31.88	1913.0	727.0	64	0.7	84.2
16	0.7	95.3	34.00	2040.0	776.0	63	0.4	84.6
17	0.7	96.1	36.13	2168.0	824.0	63	0.5	85.1
18	0.4	96.5	38.25	2295.0	873.0	63	0.2	85.4
19	0.4	96.9	40.38	2423.0	921.0	62	0.3	85.6
20	0.2	97.1	42.50	2550.0	970.0	62	0.1	85.7
21	0.5	97.5	44.63	2678.0	1018.0	61	0.3	86.0
22	0.2	97.8	46.75	2805.0	1067.0	60	0.1	86.2
23	1.0	98.8	48.88	2933.0	1115.0	59	0.6	86.8
24	0.3	99.1	51.00	3060.0	1164.0	58	0.2	86.9
25	0.0	99.1	53.13	3188.0	1212.0	57	0.0	86.9
30	0.9	100.0	63.75	3825.0	1454.0	51	0.5	87.4
35	0.0	100.0	74.38	4463.0	1697.0	43	0.0	87.4
40	0.0	100.0	85.00	5100.0	1939.0	38	0.0	87.4
45	0.0	100.0	95.63	5738.0	2182.0	34	0.0	87.4
Estimated Net Annual Sediment (TSS) Load Reduction =								**87 %**

Climate Station ID: 6105978 *Years of Rainfall Data*: 20

RAINFALL DATA FROM OTTAWA CDA RCS RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL
FOR THE RECOMMENDED STORMCEPTOR® MODEL



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Maximum Pipe Diameter / Peak Conveyance

Stormceptor EF / EFO	Model Diameter		Min Angle Inlet / Outlet Pipes	Max Inlet Pipe Diameter		Max Outlet Pipe Diameter		Peak Conveyance Flow Rate	
	(m)	(ft)		(mm)	(in)	(mm)	(in)	(L/s)	(cfs)
EF4 / EFO4	1.2	4	90	609	24	609	24	425	15
EF6 / EFO6	1.8	6	90	914	36	914	36	990	35
EF8 / EFO8	2.4	8	90	1219	48	1219	48	1700	60
EF10 / EFO10	3.0	10	90	1828	72	1828	72	2830	100
EF12 / EFO12	3.6	12	90	1828	72	1828	72	2830	100

SCOUR PREVENTION AND ONLINE CONFIGURATION

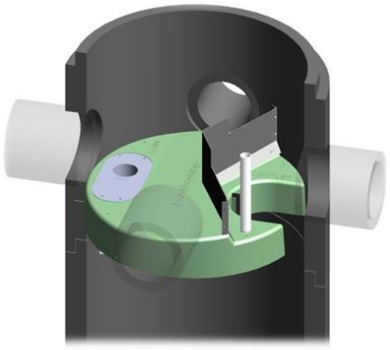
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test performance has been third-party verified in accordance with the ISO 14034 ETV protocol. As a result, Stormceptor EF and EFO are approved for online installation, eliminating the need for costly additional bypass structures, piping, and installation expense.

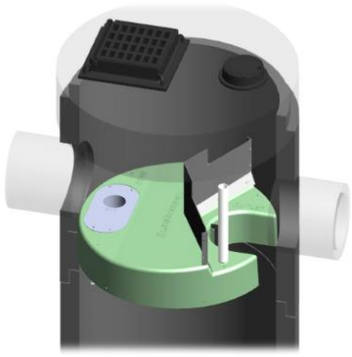
DESIGN FLEXIBILITY

►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle, and can be modified to ensure performance in submerged conditions.

OIL CAPTURE AND RETENTION

►While Stormceptor® EF will capture and retain oil from dry weather spills and low intensity runoff, **Stormceptor® EFO** has demonstrated superior oil capture and greater than 99% oil retention in third-party testing according to the light liquid re-entrainment testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**. Stormceptor EFO is recommended for sites where oil capture and retention is a requirement.





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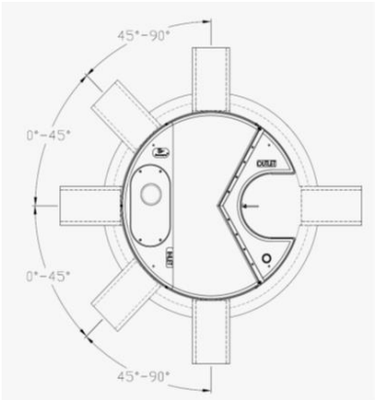

INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.
0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.
45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

HEAD LOSS

The head loss through Stormceptor EF is similar to that of a 60-degree bend structure. The applicable K value for calculating minor losses through the unit is 1.1. For submerged conditions the applicable K value is 3.0.

Pollutant Capacity

Stormceptor EF / EFO	Model Diameter		Depth (Outlet Pipe Invert to Sump Floor)		Oil Volume		Recommended Sediment Maintenance Depth *		Maximum Sediment Volume *		Maximum Sediment Mass **	
	(m)	(ft)	(m)	(ft)	(L)	(Gal)	(mm)	(in)	(L)	(ft^3)	(kg)	(lb)
EF4 / EFO4	1.2	4	1.52	5.0	265	70	203	8	1190	42	1904	5250
EF6 / EFO6	1.8	6	1.93	6.3	610	160	305	12	3470	123	5552	15375
EF8 / EFO8	2.4	8	2.59	8.5	1070	280	610	24	8780	310	14048	38750
EF10 / EFO10	3.0	10	3.25	10.7	1670	440	610	24	17790	628	28464	78500
EF12 / EFO12	3.6	12	3.89	12.8	2475	655	610	24	31220	1103	49952	137875

*Increased sump depth may be added to increase sediment storage capacity
** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft^3)

Feature	Benefit	Feature Appeals To
Patent-pending enhanced flow treatment and scour prevention technology	Superior, verified third-party performance	Regulator, Specifying & Design Engineer
Third-party verified light liquid capture and retention for EFO version	Proven performance for fuel/oil hotspot locations	Regulator, Specifying & Design Engineer, Site Owner
Functions as bend, junction or inlet structure	Design flexibility	Specifying & Design Engineer
Minimal drop between inlet and outlet	Site installation ease	Contractor
Large diameter outlet riser for inspection and maintenance	Easy maintenance access from grade	Maintenance Contractor & Site Owner

STANDARD STORMCEPTOR EF/EFO DRAWINGS

For standard details, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

STANDARD STORMCEPTOR EF/EFO SPECIFICATION

For specifications, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

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STANDARD PERFORMANCE SPECIFICATION FOR "OIL GRIT SEPARATOR" (OGS) STORMWATER QUALITY TREATMENT DEVICE

PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program's **Procedure for Laboratory Testing of Oil-Grit** S**eparators**

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The minimum sediment & petroleum hydrocarbon storage capacity shall be as follows:

2.1.1	4 ft (1219 mm) Diameter OGS Units:	1.19 m^3 sediment / 265 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m^3 sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m^3 sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m^3 sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m^3 sediment / 2,476 L oil

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol Procedure for Laboratory Testing of Oil-Grit Separators, as follows:

3.2.1 Sediment removal efficiency for a given surface loading rate and its associated flow rate shall be based on sediment removal efficiency demonstrated at the seven (7) tested surface loading rates specified in the protocol, ranging 40 L/min/m^2 to 1400 L/min/m^2, and as stated in the ISO 14034 ETV Verification Statement for the OGS device.

3.2.2 Sediment removal efficiency for surface loading rates between 40 L/min/m^2 and 1400 L/min/m^2 shall be based on linear interpolation of data between consecutive tested surface loading rates.

3.2.3 Sediment removal efficiency for surface loading rates less than the lowest tested surface loading rate of 40 L/min/m^2 shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m^2. No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m^2.

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m^2 shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m^2, and shall be calculated using a simple proportioning formula, with 1400 L/min/m^2 in the numerator and the higher surface loading rate in the denominator, and multiplying the resulting fraction times the sediment removal efficiency at 1400 L/min/m^2.

The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in

accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.**

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m^2.

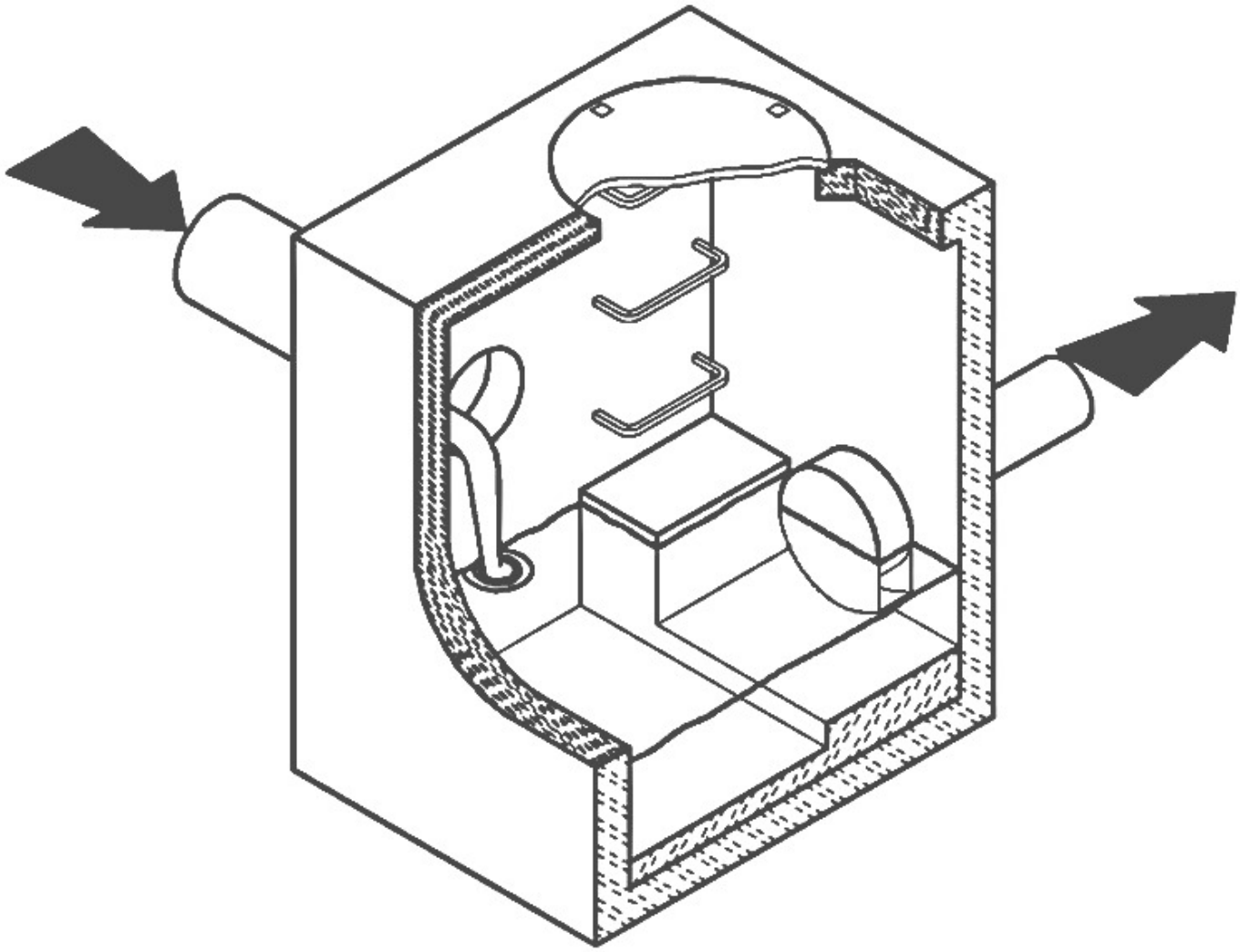
3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid Re-entrainment Simulation Testing in accordance with the Canadian ETV **Program's Procedure for Laboratory Testing of Oil-Grit Separators,** with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-entrainment testing is conducted with the device pre-loaded with low density polyethylene (LDPE) plastic beads as a surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to assess whether light liquids captured after a spill are effectively retained at high flow rates.

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m^2 to 2600 L/min/m^2) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.** However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.

CSO/STORMWATER MANAGEMENT

HYDROVEX® VHV / SVHV
Vertical Vortex Flow Regulator



JOHN MEUNIER

APPLICATIONS

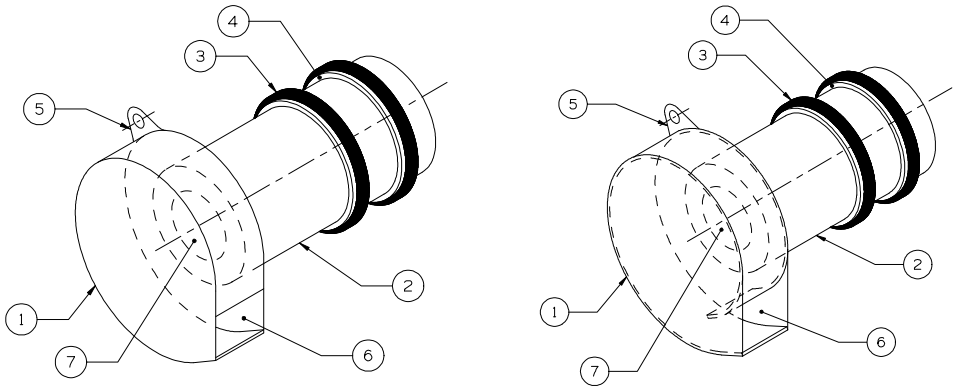
One of the major problems of urban wet weather flow management is the runoff generated after a heavy rainfall. During a storm, uncontrolled flows may overload the drainage system and cause flooding. Due to increased velocities, sewer pipe wear is increased dramatically and results in network deterioration. 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.

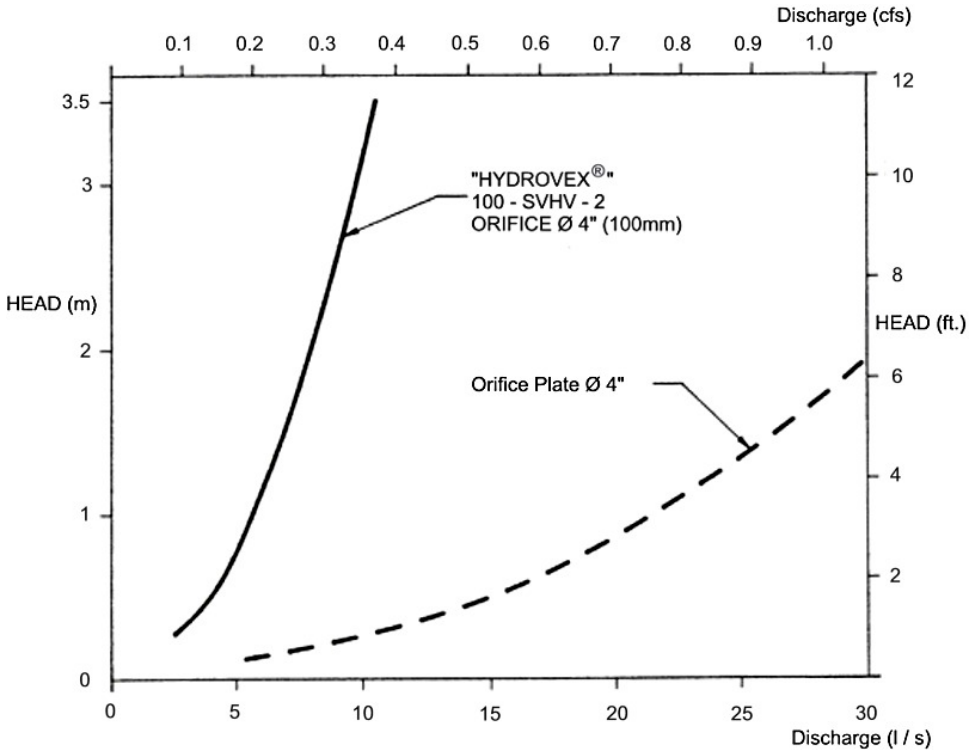


FIGURE 2: DISCHARGE CURVE SHOWING A HYDROVEX® FLOW REGULATOR VS AN ORIFICE PLATE

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:

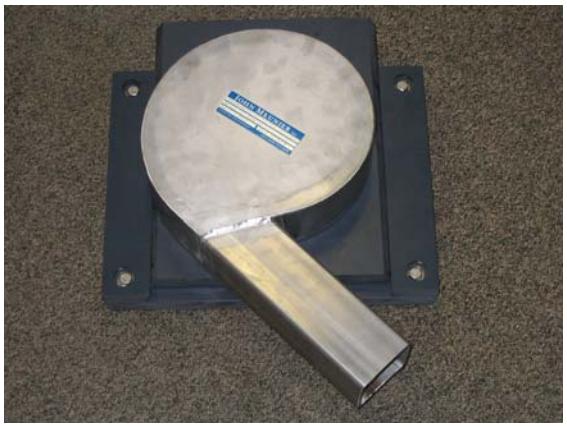
- ***project design flow rate***
- ***pressure head***
- ***chamber's outlet pipe diameter and type***

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

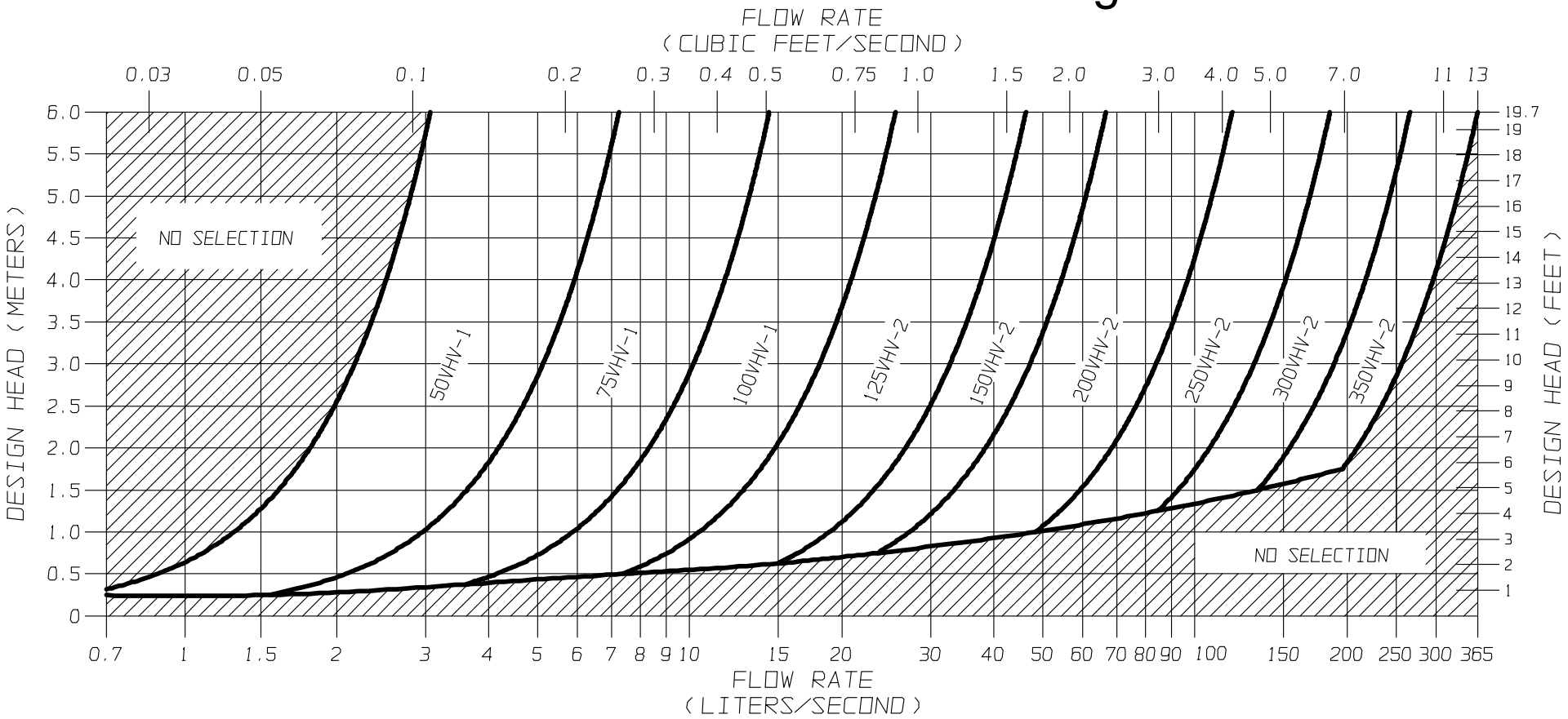


FIGURE 3 - VHV

JOHN MEUNIER

HYDROVEX®

SVHV Vertical Vortex Flow Regulator

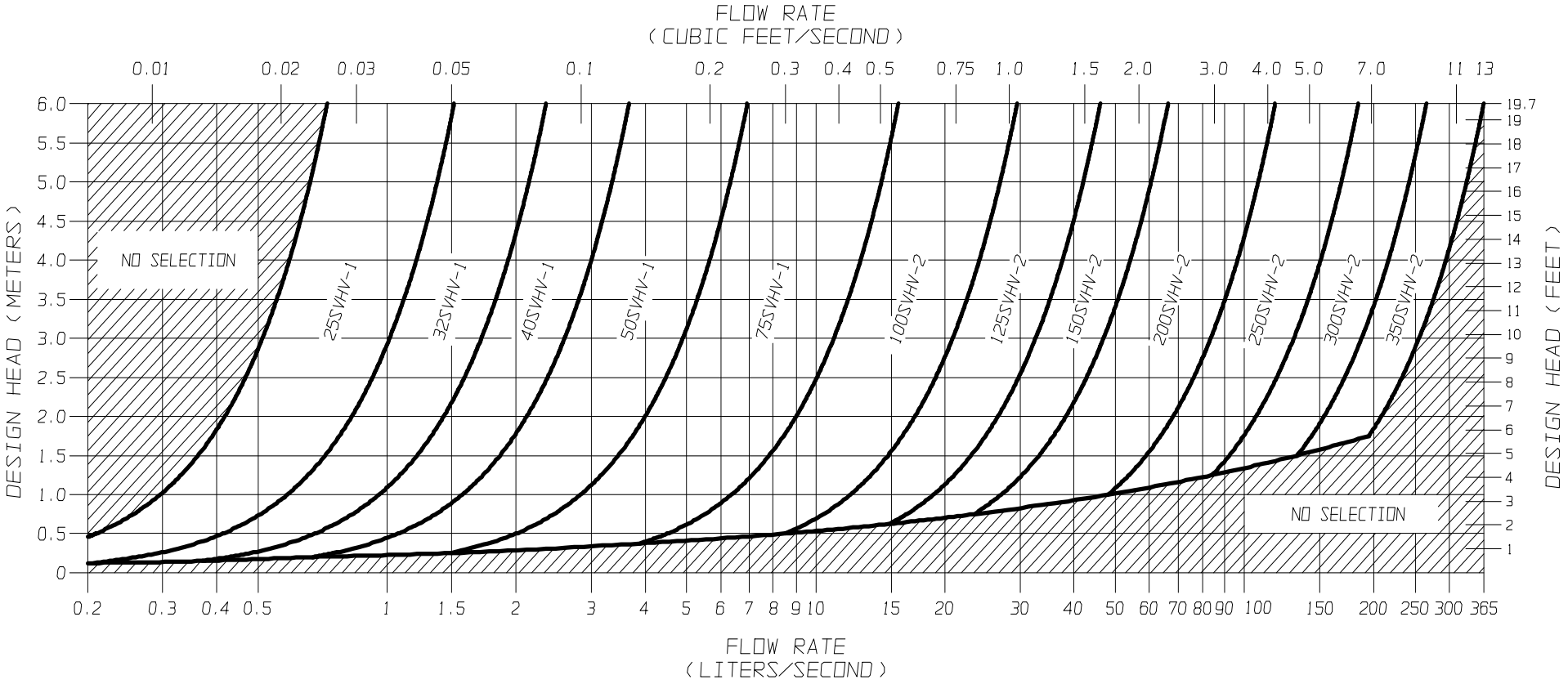
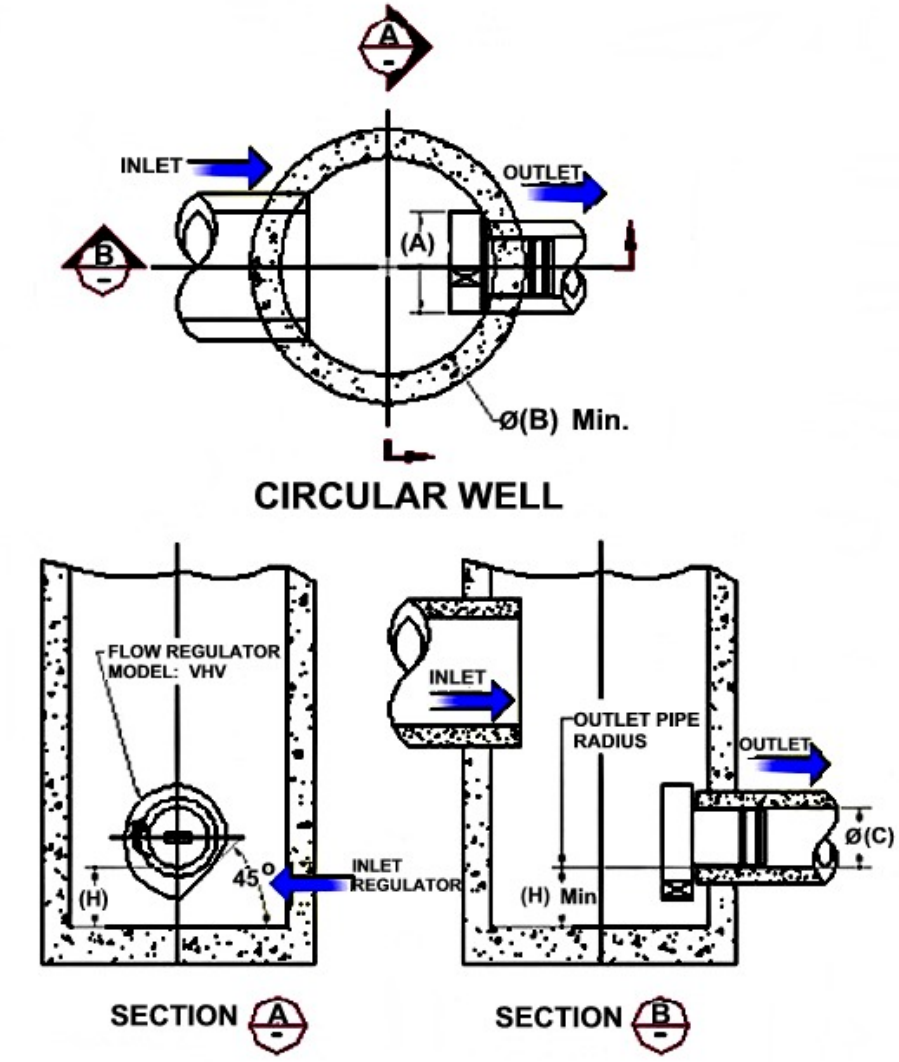


FIGURE 3 - SVHV

JOHN MEUNIER

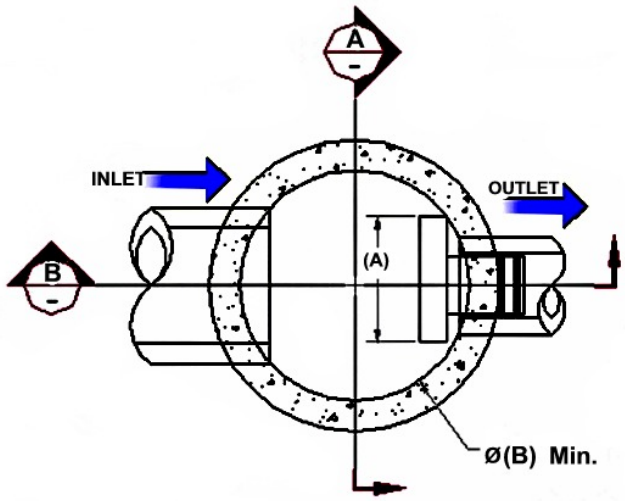
FLOW REGULATOR TYPICAL INSTALLATION IN CIRCULAR MANHOLE
FIGURE 4 (MODEL VHV)

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

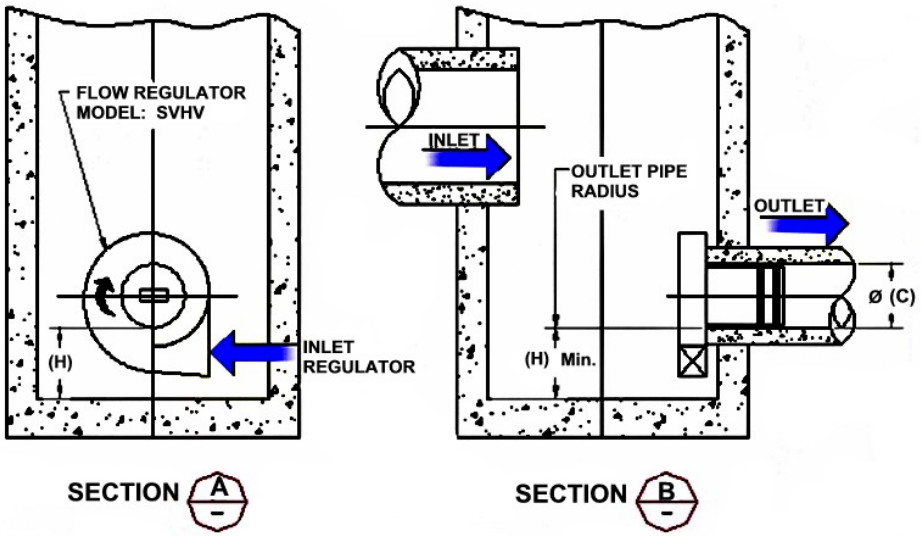


FLOW REGULATOR TYPICAL INSTALLATION IN CIRCULAR MANHOLE
FIGURE 4 (MODEL SVHV)

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.)
25 SVHV-1	125	5	600	24	150	6	150	6
32 SVHV-1	150	6	600	24	150	6	150	6
40 SVHV-1	200	8	600	24	150	6	150	6
50 SVHV-1	250	10	600	24	150	6	150	6
75 SVHV-1	375	15	900	36	150	6	275	11
100 SVHV-2	275	11	900	36	150	6	250	10
125 SVHV-2	350	14	900	36	150	6	300	12
150 SVHV-2	425	17	1200	48	150	6	350	14
200 SVHV-2	575	23	1600	64	200	8	450	18
250 SVHV-2	700	28	1800	72	250	10	550	22
300 SVHV-2	850	34	2400	96	250	10	650	26
350 SVHV-2	1000	40	2400	96	250	10	700	28



CIRCULAR WELL

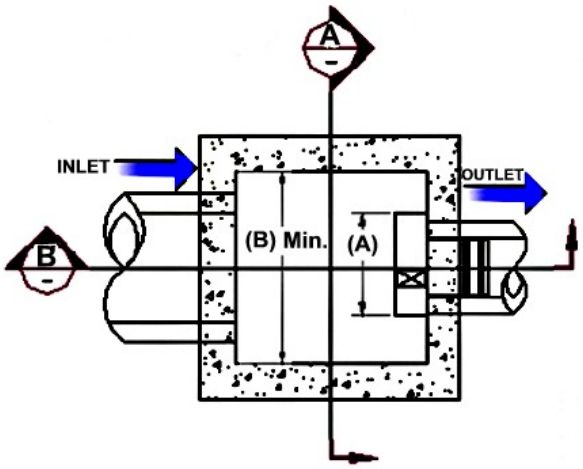


SECTION A **SECTION B**

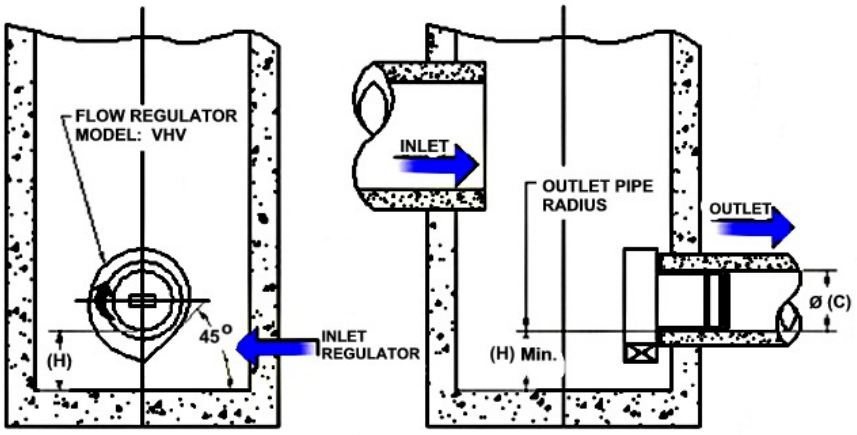
FLOW REGULATOR TYPICAL INSTALLATION IN SQUARE MANHOLE
FIGURE 4 (MODEL VHV)

Model Number	Regulator Diameter		Minimum Chamber Width		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	600	24	150	6	200	8
125VHV-2	275	11	600	24	150	6	200	8
150VHV-2	350	14	600	24	150	6	225	9
200VHV-2	450	18	900	36	200	8	300	12
250VHV-2	575	23	900	36	250	10	350	14
300VHV-2	675	27	1200	48	250	10	400	16
350VHV-2	800	32	1200	48	300	12	500	20

NOTE: ***In the case of a square manhole, the outlet flow pipe must be centered on the wall to ensure enough clearance for the unit.***



SQUARE / RECTANGULAR WELL

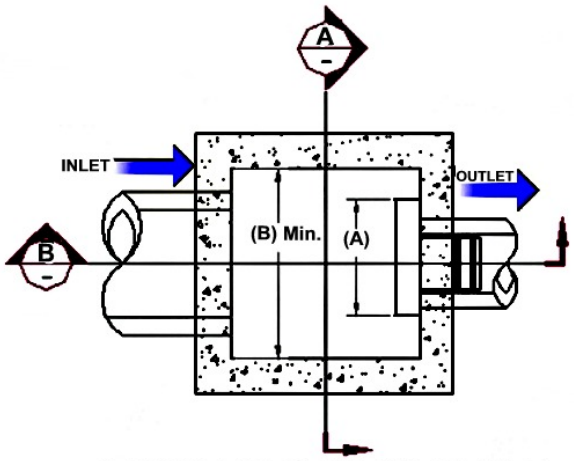


SECTION A **SECTION B**

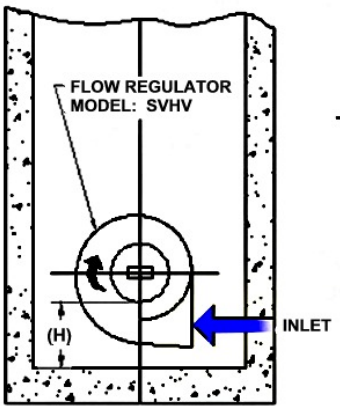
FLOW REGULATOR TYPICAL INSTALLATION IN SQUARE MANHOLE
FIGURE 4 (MODEL SVHV)

Model Number	Regulator Diameter		Minimum Chamber Width		Minimum Outlet Pipe Diameter		Minimum Clearance	
	A (mm)	**A** (in.)	**B** (mm)	**B** (in.)	**C** (mm)	**C** (in.)	**H** (mm)	**H** (in.)
25 SVHV-1	125	5	600	24	150	6	150	6
32 SVHV-1	150	6	600	24	150	6	150	6
40 SVHV-1	200	8	600	24	150	6	150	6
50 SVHV-1	250	10	600	24	150	6	150	6
75 SVHV-1	375	15	600	24	150	6	275	11
100 SVHV-2	275	11	600	24	150	6	250	10
125 SVHV-2	350	14	600	24	150	6	300	12
150 SVHV-2	425	17	600	24	150	6	350	14
200 SVHV-2	575	23	900	36	200	8	450	18
250 SVHV-2	700	28	900	36	250	10	550	22
300 SVHV-2	850	34	1200	48	250	10	650	26
350 SVHV-2	1000	40	1200	48	250	10	700	28

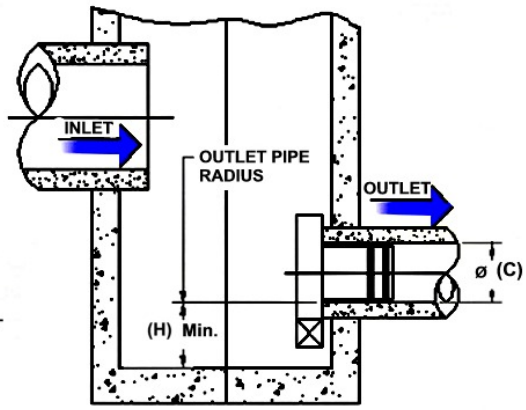
NOTE: ***In the case of a square manhole, the outlet flow pipe must be centered on the wall to ensure enough clearance for the unit.***



SQUARE / RECTANGULAR WELL



SECTION A



SECTION B

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.

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ISO 9001 : 2008

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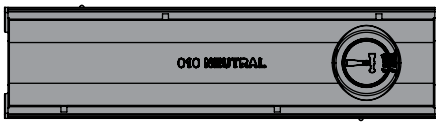
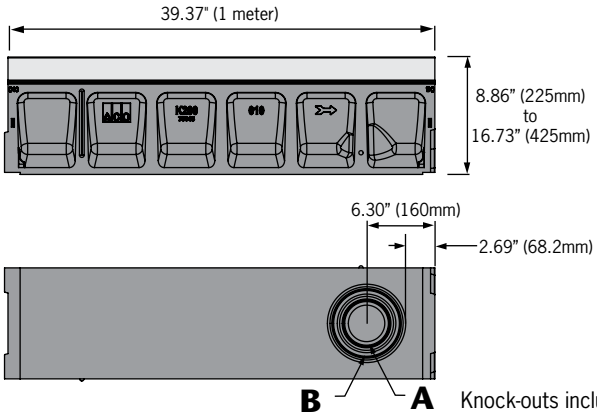
Revised: 2011-05-03

KlassikDrain - K200 Galvanized steel edge rail channel system

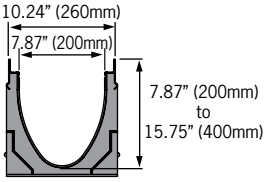
One meter channel



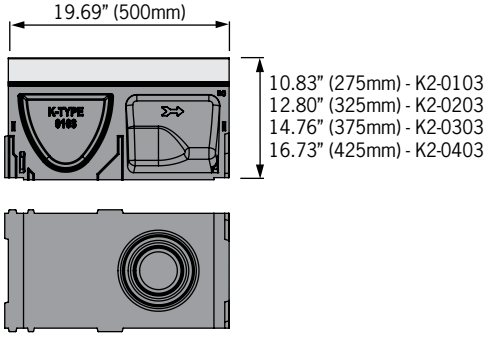
Inside view of channel - showing channel ID number and knockout if applicable (every 5th channel)



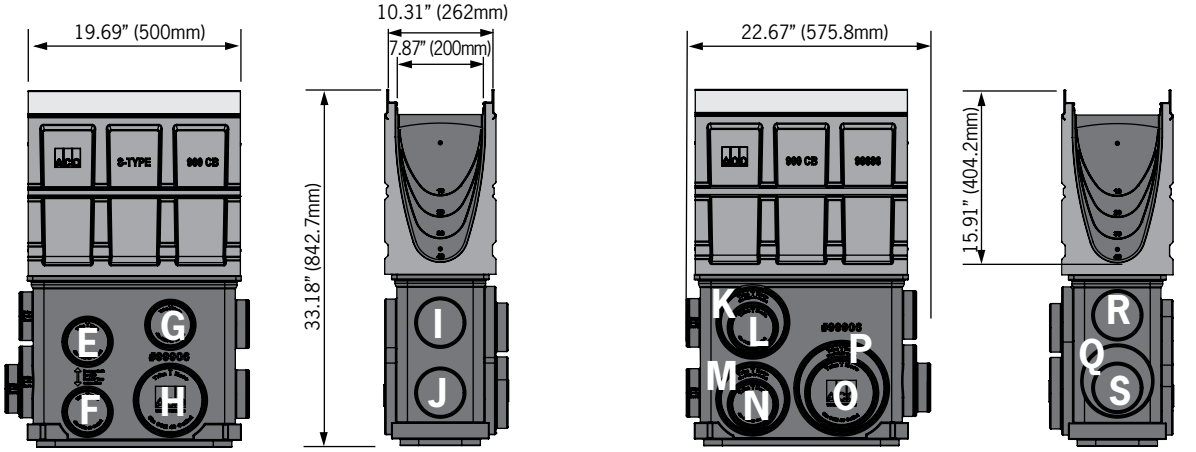
Knock-outs included on every 5th channel



Half meter channel



Type 902G In-line catch basin



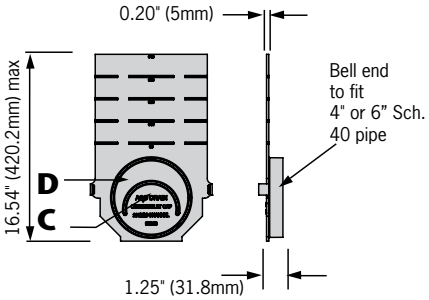
Total capacity = 19 gallons

Outlet flow rates

Outlet	Product	Outlet size (Sch. 40)	Invert Depth	GPM	CFS
A	Bottom outlet - K2-00	4" round	7.87"	153	0.34
A	Bottom outlet - K2-040	4" round	15.75"	216	0.48
B	Bottom outlet -K2-00	6" round	7.87"	344	0.77
B	Bottom outlet - K2-040	6" round	15.75"	486	1.08
C	End outlet - K2-00	4" round	7.87"	132	0.29
C	End outlet - K2-40	4" round	15.75"	202	0.45
D	End outlet - K2-10	6" round	9.84"	320	0.71
D	End outlet - K2-40	6" round	15.75"	437	0.97
E	Type K2-902G	4" round	25.33"	263	0.59
F	Type K2-902G	4" round	31.83"	297	0.66
G	Type K2-902G	4" round	23.76"	254	0.57
H	Type K2-902G	6" round	31.83"	658	1.47
I	Type K2-902G	4" round	23.91"	255	0.57
J	Type K2-902G	4" round	30.40"	290	0.65
K	Type K2-902G	6" round	24.68"	570	1.27
L	Type K2-902G	4" round	24.13"	256	0.57
M	Type K2-902G	6" round	31.82"	658	1.47
N	Type K2-902G	4" round	31.26"	294	0.66
O	Type K2-902G	6" round	31.26"	651	1.45
P	Type K2-902G	8" round	31.82"	1149	2.56
Q	Type K2-902G	6" round	30.32"	640	1.43
R	Type K2-902G	4" round	23.19"	251	0.56
S	Type K2-902G	4" round	29.90"	288	0.64

Note: These are the pipe flow rates at the specified outlet, **NOT** channel flow rates.*Catch basin flow rates are without trash bucket - using trash bucket reduces flow.

End Cap



ACO Specification Information

KlassikDrain - K200 Galvanized steel edge rail channel system

Description	Part No.	Invert Inches[2]	Invert mm[2]	Wgt Lbs.
K2-00 Neutral channel - 39.37" (1m)[1]	**75041**	**7.87**	**200**	**83.6**
K2-1 Sloped channel - 39.37" (1m)	**75001**	8.07	205	83.6
K2-2 Sloped channel - 39.37" (1m)	**75002**	8.27	210	84.7
K2-3 Sloped channel - 39.37" (1m)	**75003**	8.46	215	85.8
K2-4 Sloped channel - 39.37" (1m)	**75004**	8.66	220	86.9
K2-5 Sloped channel - 39.37" (1m)[1]	**75005**	8.86	225	88.0
K2-6 Sloped channel - 39.37" (1m)	**75006**	9.06	230	89.1
K2-7 Sloped channel - 39.37" (1m)	**75007**	9.25	235	90.2
K2-8 Sloped channel - 39.37" (1m)	**75008**	9.45	240	91.3
K2-9 Sloped channel - 39.37" (1m)	**75009**	9.65	245	92.4
K2-10 Sloped channel - 39.37" (1m)[1]	**75010**	9.84	250	93.5
K2-010 Neutral channel - 39.37" (1m)[1]	**75043**	**9.84**	**250**	**93.5**
K2-0103 Neutral channel - 19.69" (0.5m)[1]	**75044**	**9.84**	**250**	**56.0**
K2-11 Sloped channel - 39.37" (1m)	**75011**	10.04	255	94.6
K2-12 Sloped channel - 39.37" (1m)	**75012**	10.24	260	95.7
K2-13 Sloped channel - 39.37" (1m)	**75013**	10.43	265	96.8
K2-14 Sloped channel - 39.37" (1m)	**75014**	10.63	270	97.9
K2-15 Sloped channel - 39.37" (1m)[1]	**75015**	10.83	275	99.0
K2-16 Sloped channel - 39.37" (1m)	**75016**	11.02	280	100.1
K2-17 Sloped channel - 39.37" (1m)	**75017**	11.22	285	101.2
K2-18 Sloped channel - 39.37" (1m)	**75018**	11.41	290	102.3
K2-19 Sloped channel - 39.37" (1m)	**75019**	11.61	295	103.4
K2-20 Sloped channel - 39.37" (1m)[1]	**75020**	11.81	300	104.5
K2-020 Neutral channel - 39.37" (1m)[1]	**75045**	**11.81**	**300**	**104.5**
K2-0203 Neutral channel - 19.69" (0.5m)[1]	**75046**	**11.81**	**300**	**64.0**
K2-21 Sloped channel - 39.37" (1m)	**75021**	12.01	305	105.6
K2-22 Sloped channel - 39.37" (1m)	**75022**	12.20	310	106.7
K2-23 Sloped channel - 39.37" (1m)	**75023**	12.40	315	107.8
K2-24 Sloped channel - 39.37" (1m)	**75024**	12.60	320	108.9
K2-25 Sloped channel - 39.37" (1m)[1]	**75025**	12.80	325	110.0
K2-26 Sloped channel - 39.37" (1m)	**75026**	12.99	330	111.1
K2-27 Sloped channel - 39.37" (1m)	**75027**	13.19	335	112.2

Description	Part No.	Invert Inches[2]	Invert mm[2]	Wgt Lbs.
K2-28 Sloped channel - 39.37" (1m)	**75028**	13.39	340	113.3
K2-29 Sloped channel - 39.37" (1m)	**75029**	13.58	345	114.4
K2-30 Sloped channel - 39.37" (1m)[1]	**75030**	13.78	350	115.5
K2-030 Neutral channel - 39.37" (1m)[1]	**75047**	**13.78**	**350**	**115.5**
K2-0303 Neutral channel - 19.69" (0.5m)[1]	**75048**	**13.78**	**350**	**68.0**
K2-31 Sloped channel - 39.37" (1m)	**75031**	13.98	355	116.6
K2-32 Sloped channel - 39.37" (1m)	**75032**	14.17	360	117.7
K2-33 Sloped channel - 39.37" (1m)	**75033**	14.37	365	118.8
K2-34 Sloped channel - 39.37" (1m)	**75034**	14.57	370	119.9
K2-35 Sloped channel - 39.37" (1m)[1]	**75035**	14.76	375	121.0
K2-36 Sloped channel - 39.37" (1m)	**75036**	14.96	380	122.1
K2-37 Sloped channel - 39.37" (1m)	**75037**	15.16	385	123.2
K2-38 Sloped channel - 39.37" (1m)	**75038**	15.35	390	124.3
K2-39 Sloped channel - 39.37" (1m)	**75039**	15.55	395	125.4
K2-40 Sloped channel - 39.37" (1m)[1]	**75040**	15.75	400	126.5
K2-040 Neutral channel - 39.37" (1m)[1]	**75049**	**15.75**	**400**	**126.5**
K2-0403 Neutral channel - 19.69" (0.5m)[1]	**75050**	**15.75**	**400**	**77.0**
K2-901G In-line catch basin - 19.69" (0.5m)[3]	**94611**	32.81	833.3	68.0
K2-621G catch basin - 19.69" (0.5m)[3]	**94620**	37.33	948.1	91.0
K2-631G catch basin - 19.69" (0.5m)[4]	**94633**	49.33	1252.9	101.0
K2-Series 600 Optional plastic riser	**99902**	-	-	10.0
Foul air trap - fits both 900 & 600 series basins	**90854**	-	-	1.2
Universal end cap	**96821**	15.71	399	1.4
Debris strainer for 8" bottom knockout	**93488**	-	-	0.2
K2-Installation device	**97478**	-	-	2.8
Grate removal tool	**01318**	-	-	0.3
K2-QuickLok locking bar	**10457**	-	-	0.5

Notes:
1. This channel offers a bottom knockout feature; 4" & 6" round
2. Inverts shown are for the male end; for female invert depth subtract 5mm (≈0.2") from the male invert (except for neutral channels, where it will be same as male invert). To calculate the overall channel depth add 25mm (≈1.0") to invert depth.
3. This catch basin kit includes a polymer concrete top, removable Quicklok locking bar, trash bucket and plastic base. Select an appropriate grate.
4. This catch basin kit includes a polymer concrete top, removable Quicklok locking bar, deep trash bucket, plastic riser and plastic base. Select an appropriate grate.

Specifications

General
The surface drainage system shall be ACO Drain K200 complete with gratings secured with 'QuickLok' locking as manufactured by ACO Polymer Products, Inc. or approved equal.

Materials
The trench system bodies shall be manufactured from polyester polymer concrete with the minimum properties as follows:

Compressive strength:	14,000 psi
Flexural strength:	4,000 psi
Water absorption	0.07%
Frost proof	YES
Salt proof	YES
Dilute acid and alkali resistant	YES

The nominal clear opening shall be 8" (200mm) with overall width of 10.24" (260mm). Pre-cast units shall be manufactured with either an invert slope of 0.5% or with neutral invert and have a wall thickness of at least 0.50" (13mm). Each unit will feature a partial radius in the trench bottom and a male to female interconnecting end profile. Units shall have horizontal cast in anchoring keys on the outside wall to ensure maximum mechanical bond to the surrounding bedding material and pavement surface. The galvanized steel edge rail will be integrally cast in by the manufacturer to ensure maximum homogeneity between polymer concrete body and edge rail. Each edge rail shall be at least 3/32" (2.5mm) thick.

Grates
Grates shall be specified. See separate ACO Spec Info grate sheets for details. After removal of grates and 'QuickLok' bar there shall be uninterrupted access to the trench to aid maintenance.

Installation
The trench drain system shall be installed in accordance with the manufacturer's installation instructions and recommendations.

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Casa Grande, AZ 85130
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Toll Free: (888) 490-9552
Fax: (520) 421-9899

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Fort Mill, SC 29708
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SPEC INFO

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NORTH-WEST TERRACES
STM MH100A

Job/Project:		Representative:	
ESP-Systemwize: WIZE-88161815	Created On: 09/29/2022	Phone:	
Location/Tag:		Email:	Revision:
Engineer:		Submitted By:	Date:
Contractor:		Approved By:	Date:

Wastewater

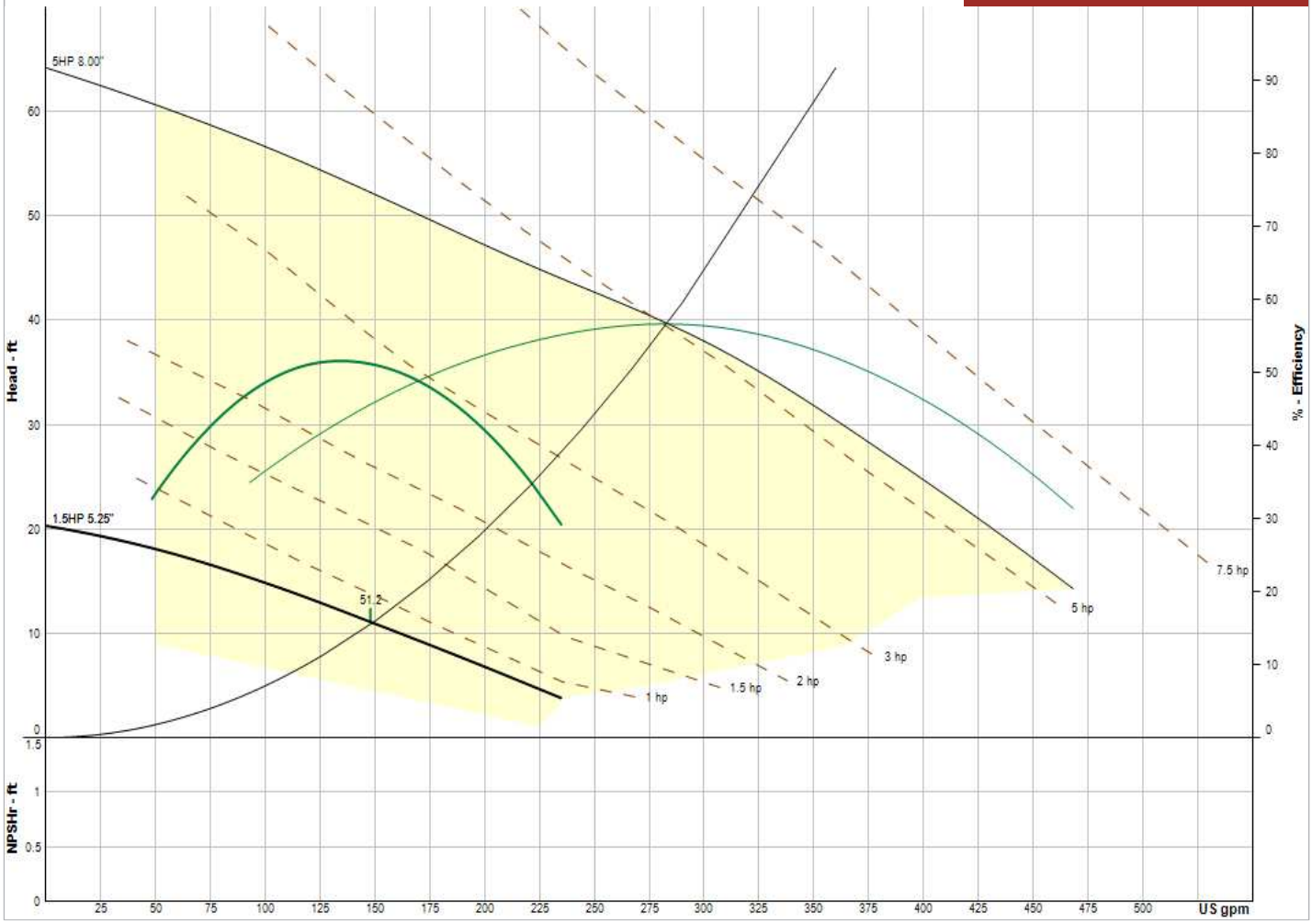
Type: Sewage/Stormwater

Model: 3WDA1537M

Pump Selection Summary	
No. of Pumps / Reserve	1 / 1
Nominal flow	127 US gpm
Nominal Head	8 ft
Static Head	0 ft
Inlet Pressure	0
NPSHr	---
Fluid Type	Water
Fluid Temperature	68 °F
Duty Point Pump Efficiency	50.9 %
Hydraulics	1.5HP 5.25"
Duty Point Power	0.809 bhp
Motor Speed	1800 rpm
RPM @ Duty Point	1750 rpm
Minimum Shutoff Head	20.3 ft
Minimum Flow at RPM	--- gpm
Flow @ BEP	148 gpm

Performance Curve

Sewage/Stormwater
3WDA1537M



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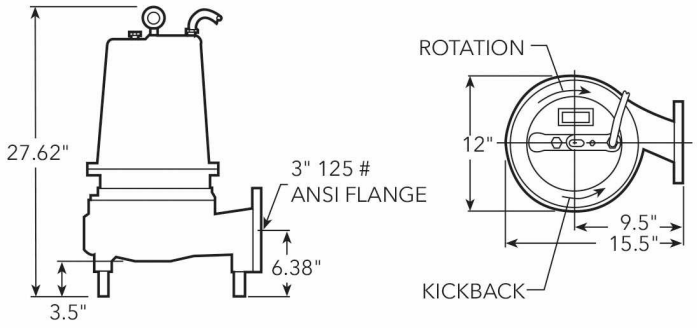
8200 N. Austin Avenue, Morton Grove, IL 60053
Phone: (847)966-3700 Fax: (847)965-8379
www.bellgossett.com


27.62"
3" 125 #
ANSI FLANGE
6.38"
3.5"
ROTATION
12"
9.5"
15.5"
KICKBACK

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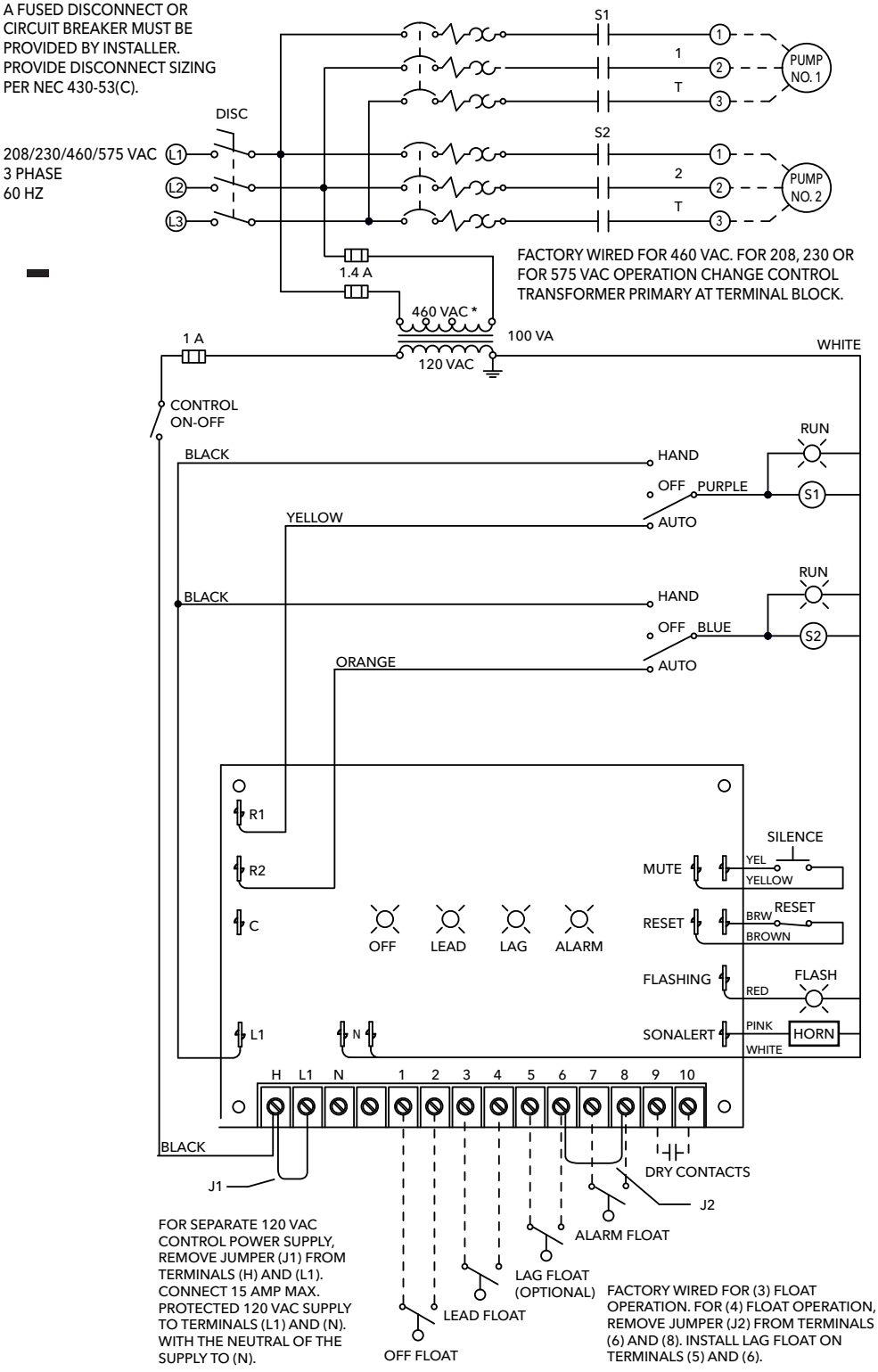
SUBMITTAL
BGDUP3ØDISC

Duplex Panel Installation - Three Phase



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SUBMITTAL
BGA2DSERIES

A2D Series

SJE PUMPMASTER® PUMP SWITCH

Features

- Mechanically activated, heavy duty contacts
- Non-corrosive PVC housing for use in liquids up to 140° F (60° C)
- Not sensitive to rotation or turbulence
- Pumping range: 7" to 36"
- 16 AWG, SJOW cord
- For non-potable water, water or sewage applications
- UL Recognized for use in water and sewage
- CSA Certified

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SUBMITTAL
BGCBE3030H

3" Lift Out Dimensions

MATERIALS OF CONSTRUCTION:

Base Elbow: Cast ductile iron

Lift-Out Flange: Cast ductile iron

Lower Guide Bracket: 304 SST

All Fasteners are 304 Series SST

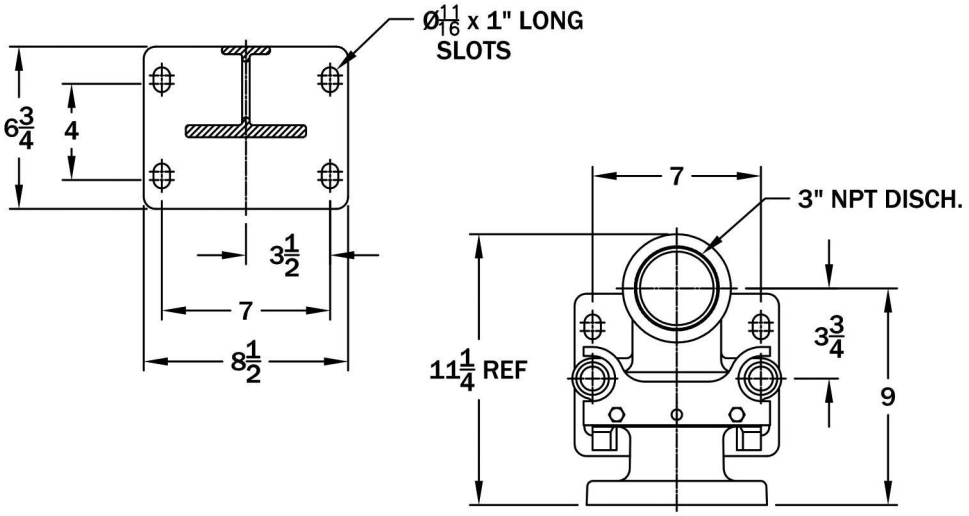
Usable Guide Rail Sizes: ¾", 1", 1¼"

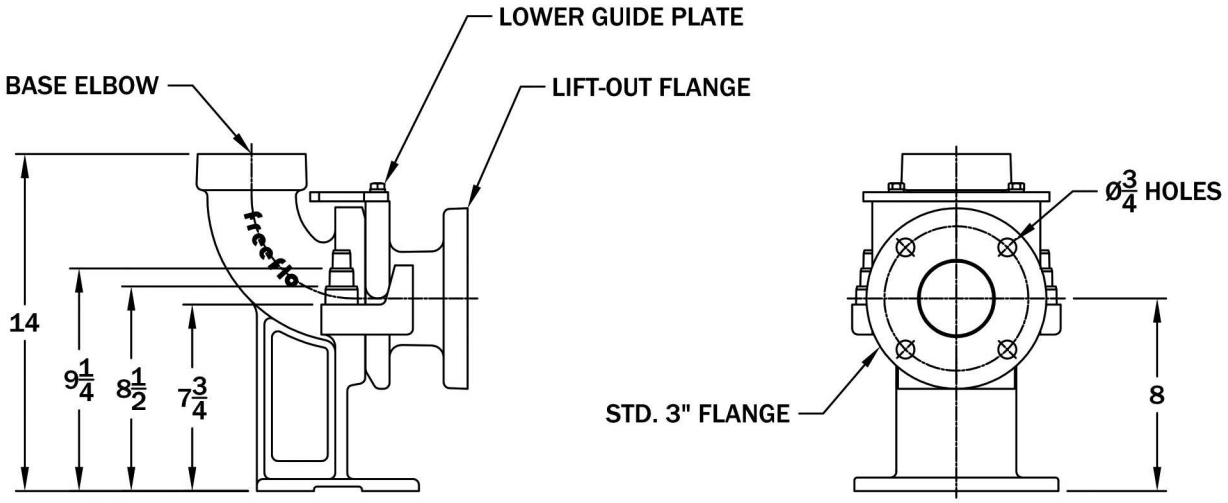
Spherical Solids Size: 3" diameter

Maximum Weight Allowance: 400 lbs

Note: All dimensions are in inches

MOUNTING DIMENSIONS





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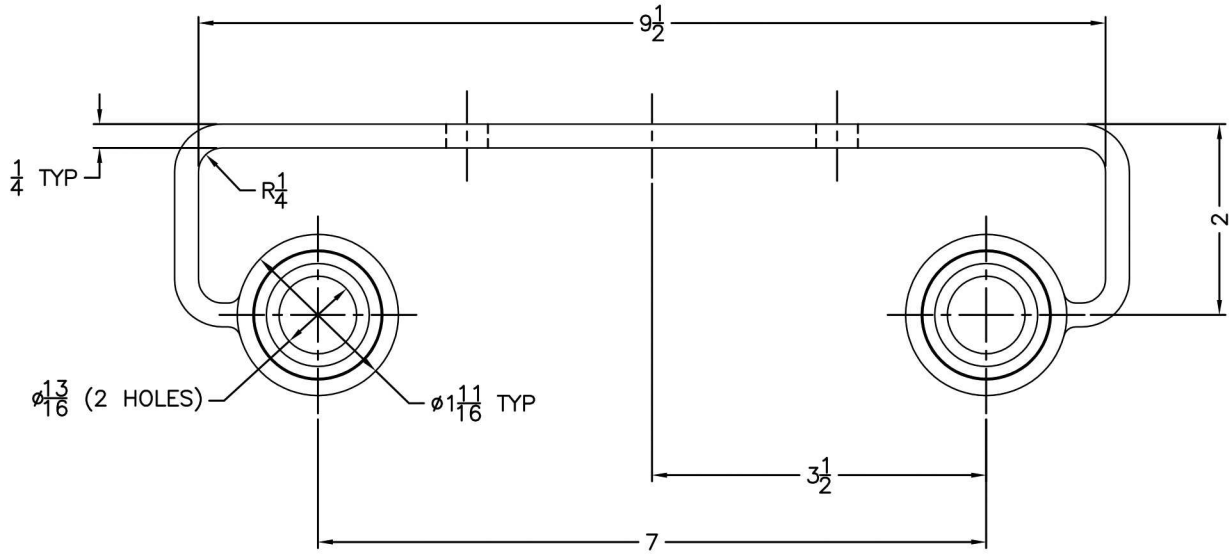
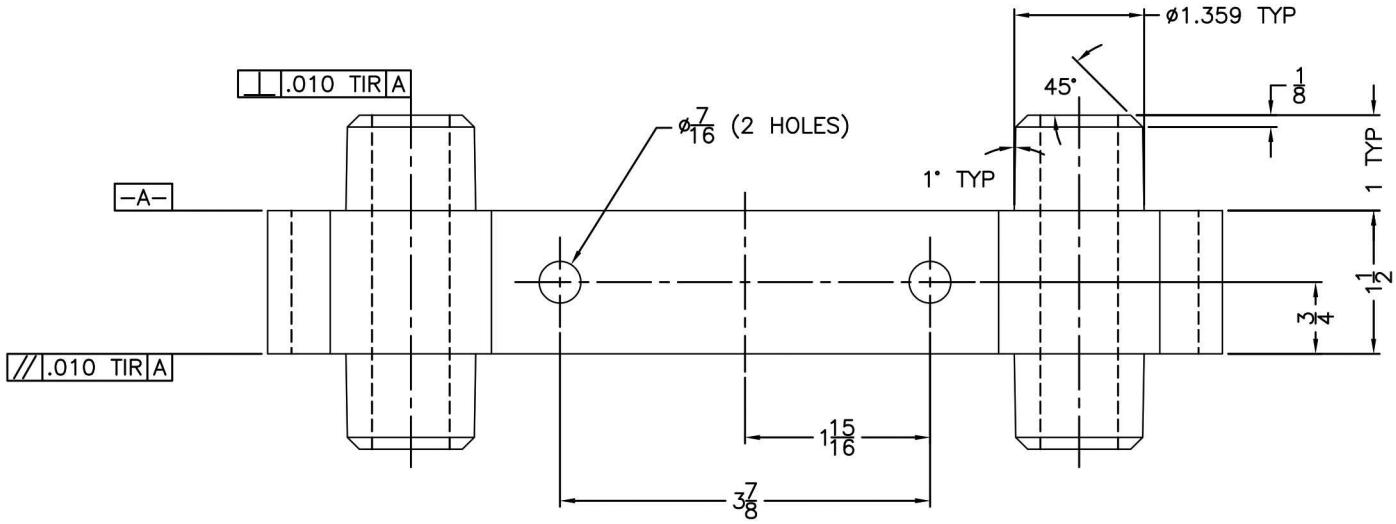
SUBMITTAL
BGCBR125

Intermediate Guide Bracket 1¼" Rails





Note: Surface of part must be free of porosity.
Part must be free of distortion due to casting process.

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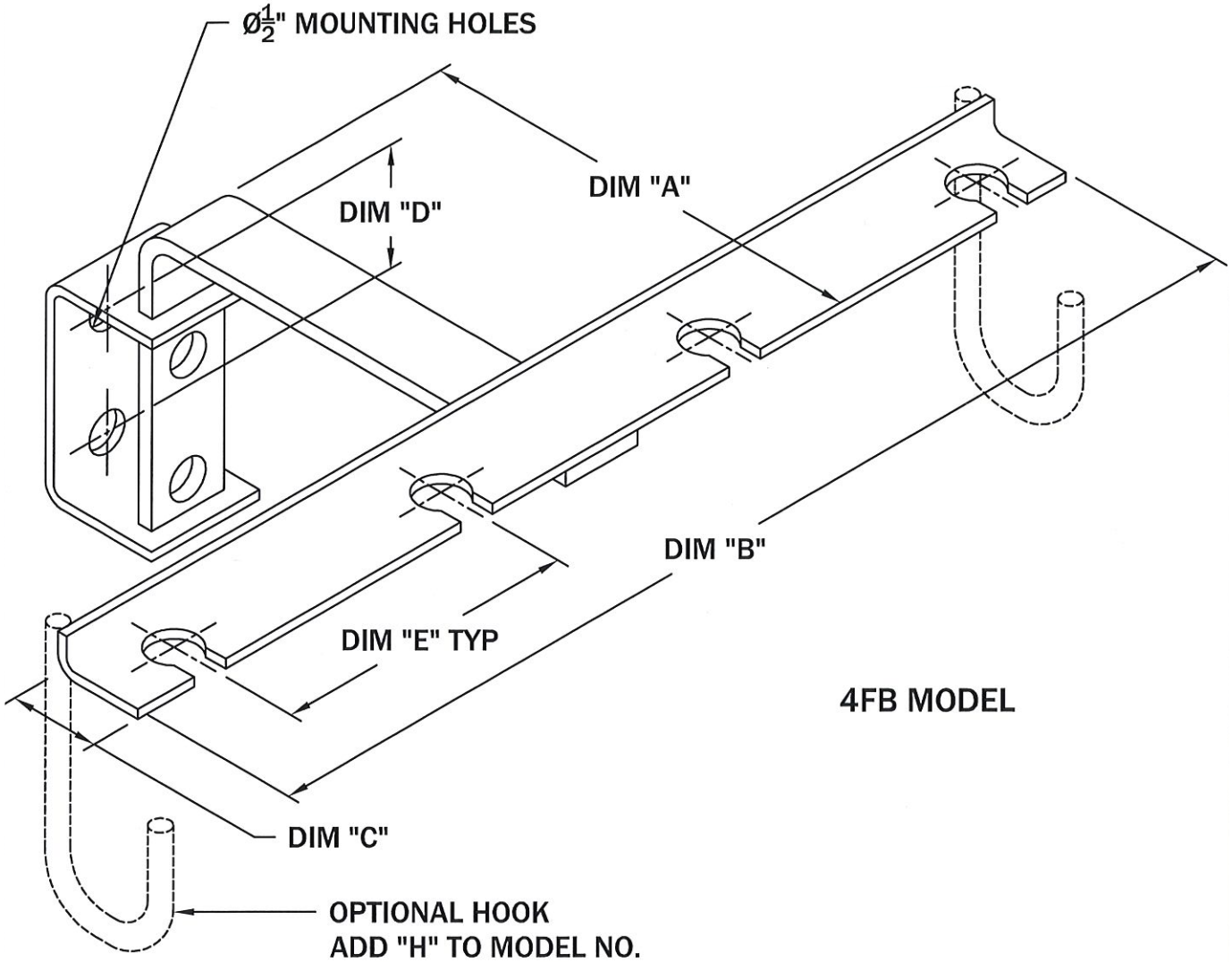
SUBMITTAL
BGFSB4FB

Float Bracket - "T" Shaped



Model No.	Dim. "A"	Dim. "B"	Dim. "C"	Dim. "D"	Dim. "E"
4FB / 4FBH	6"	13"	1 1/8"	1½"	3¾"
5FB / 5FBH		16¾"			
6FB / 6FBH		20½"			

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SOUTH-WEST TERRACES
STM MH100B

Job/Project:		Representative:	
ESP-Systemwize: WIZE-A406E529	Created On: 09/29/2022	Phone:	
Location/Tag:		Email:	Revision:
Engineer:		Submitted By:	Date:
Contractor:		Approved By:	Date:

Wastewater

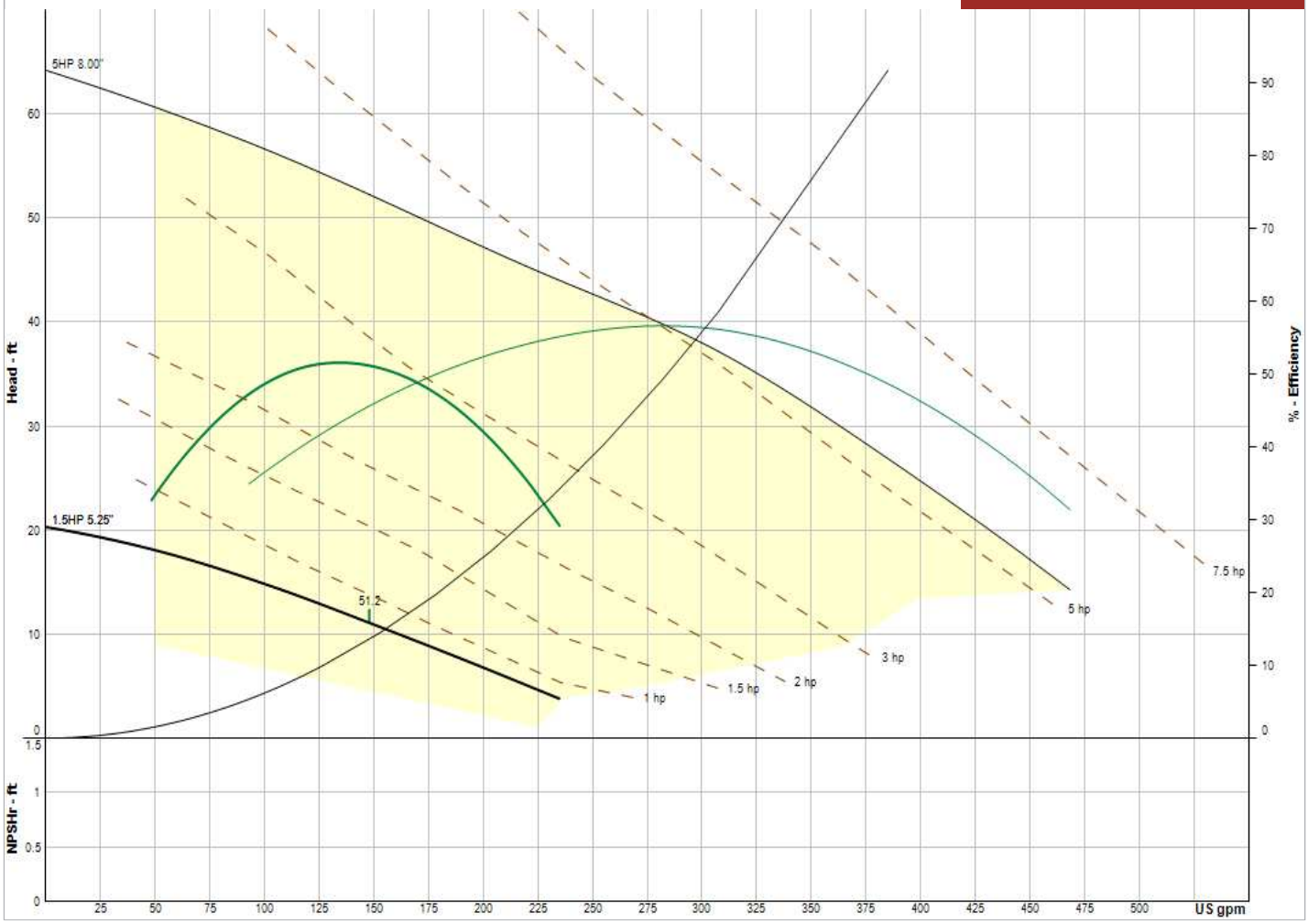
Type: Sewage/Stormwater

Model: 3WDA1537M

Pump Selection Summary	
No. of Pumps / Reserve	1 / 1
Nominal flow	127 US gpm
Nominal Head	7 ft
Static Head	0 ft
Inlet Pressure	0
NPSHr	---
Fluid Type	Water
Fluid Temperature	68 °F
Duty Point Pump Efficiency	49.3 %
Hydraulics	1.5HP 5.25"
Duty Point Power	0.806 bhp
Motor Speed	1800 rpm
RPM @ Duty Point	1750 rpm
Minimum Shutoff Head	20.3 ft
Minimum Flow at RPM	--- gpm
Flow @ BEP	148 gpm

Performance Curve

Sewage/Stormwater
3WDA1537M



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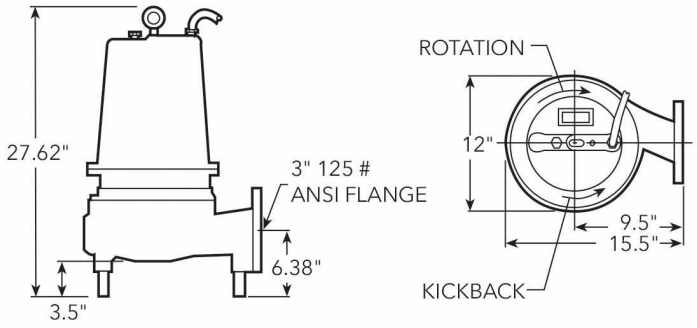
27.62"
3" 125 #
ANSI FLANGE
6.38"
3.5"
ROTATION
12"
9.5"
15.5"
KICKBACK

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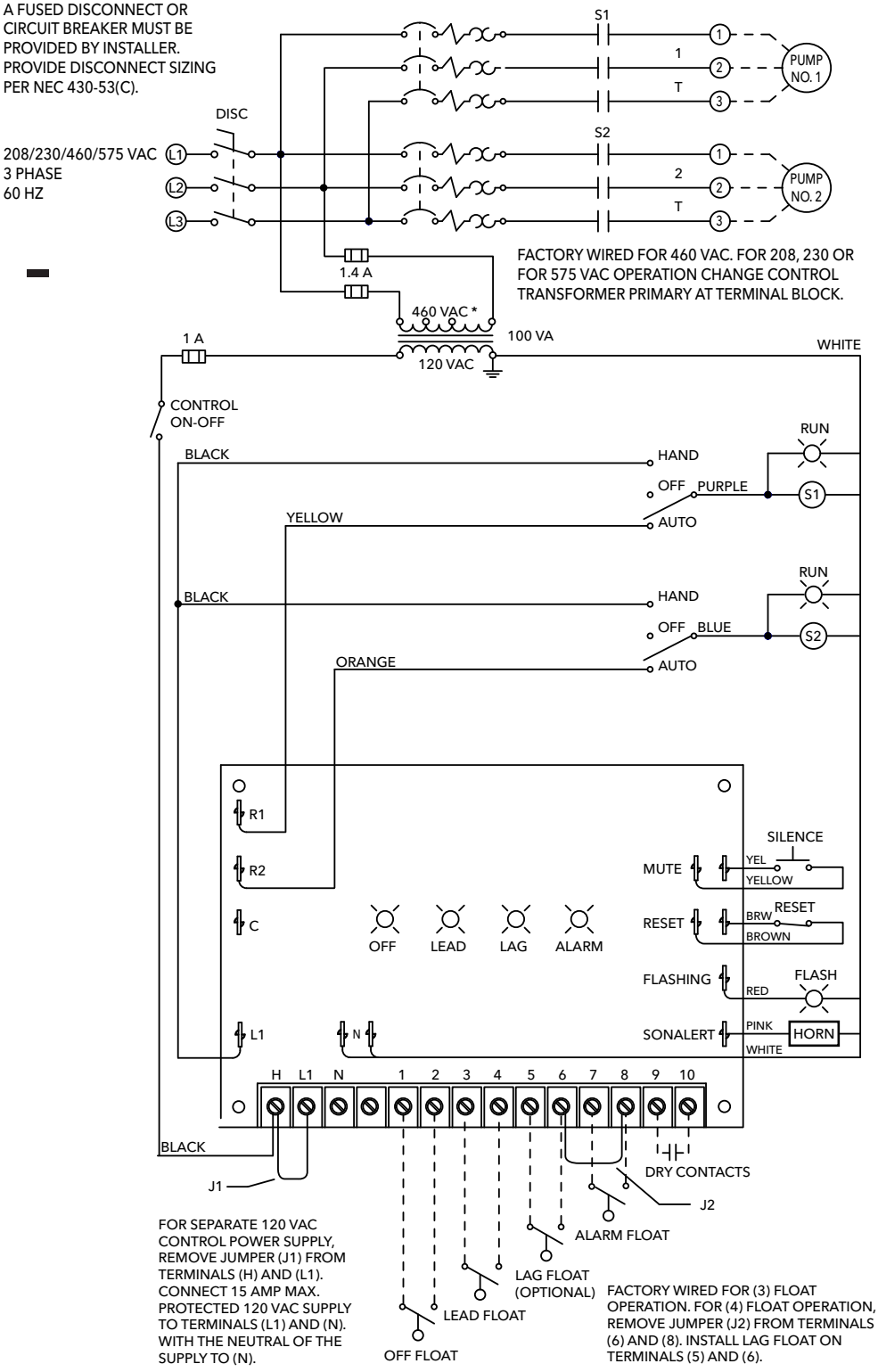
SUBMITTAL
BGDUP3ØDISC

Duplex Panel Installation - Three Phase



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SUBMITTAL
BGA2DSERIES

A2D Series

SJE PUMPMASTER® PUMP SWITCH

Features

- Mechanically activated, heavy duty contacts
- Non-corrosive PVC housing for use in liquids up to 140° F (60° C)
- Not sensitive to rotation or turbulence
- Pumping range: 7" to 36"
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- For non-potable water, water or sewage applications
- UL Recognized for use in water and sewage
- CSA Certified

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SUBMITTAL
BGCBE3030H

3" Lift Out Dimensions

MATERIALS OF CONSTRUCTION:

Base Elbow: Cast ductile iron

Lift-Out Flange: Cast ductile iron

Lower Guide Bracket: 304 SST

All Fasteners are 304 Series SST

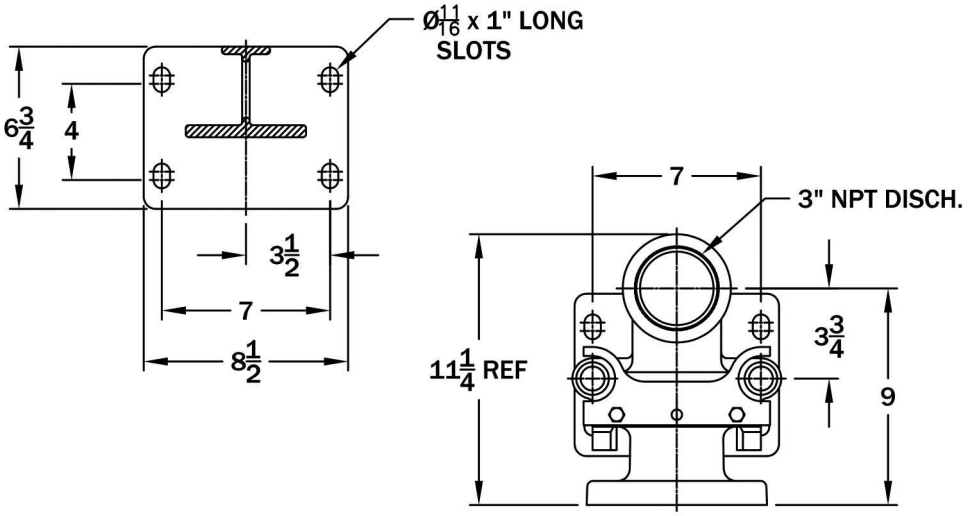
Usable Guide Rail Sizes: ¾", 1", 1¼"

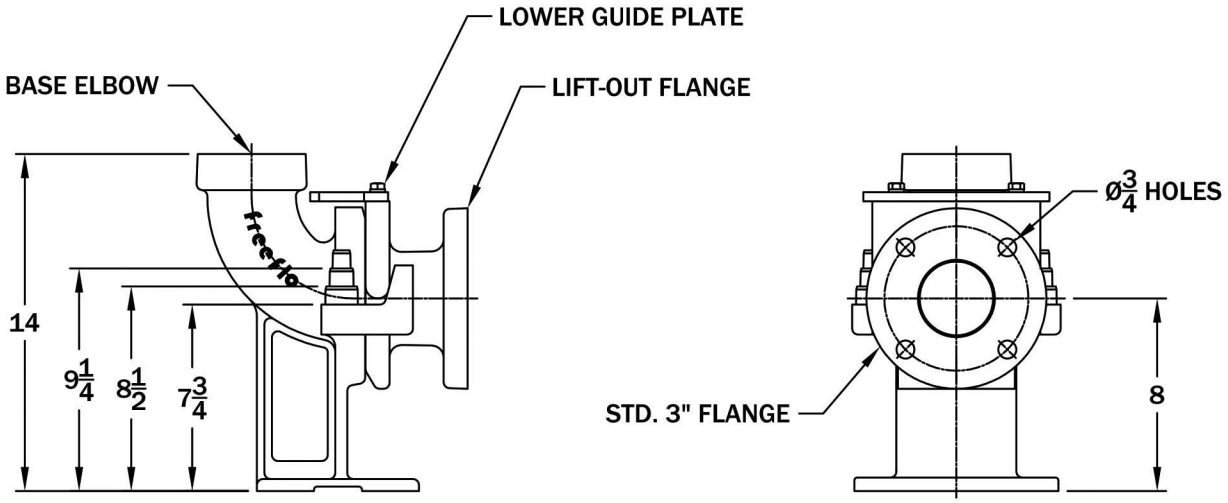
Spherical Solids Size: 3" diameter

Maximum Weight Allowance: 400 lbs

Note: All dimensions are in inches

MOUNTING DIMENSIONS





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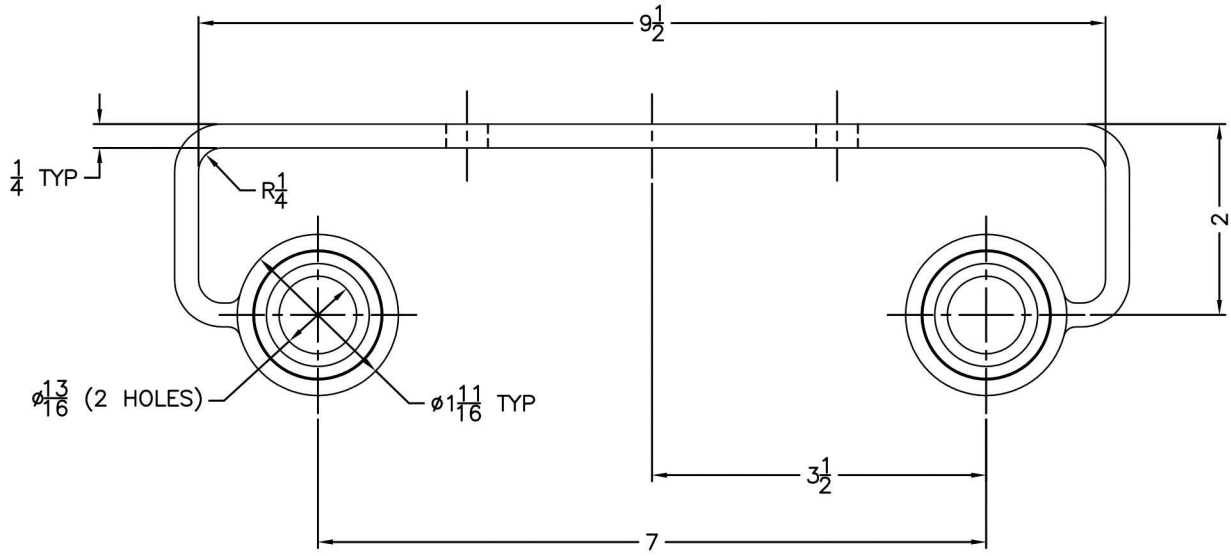
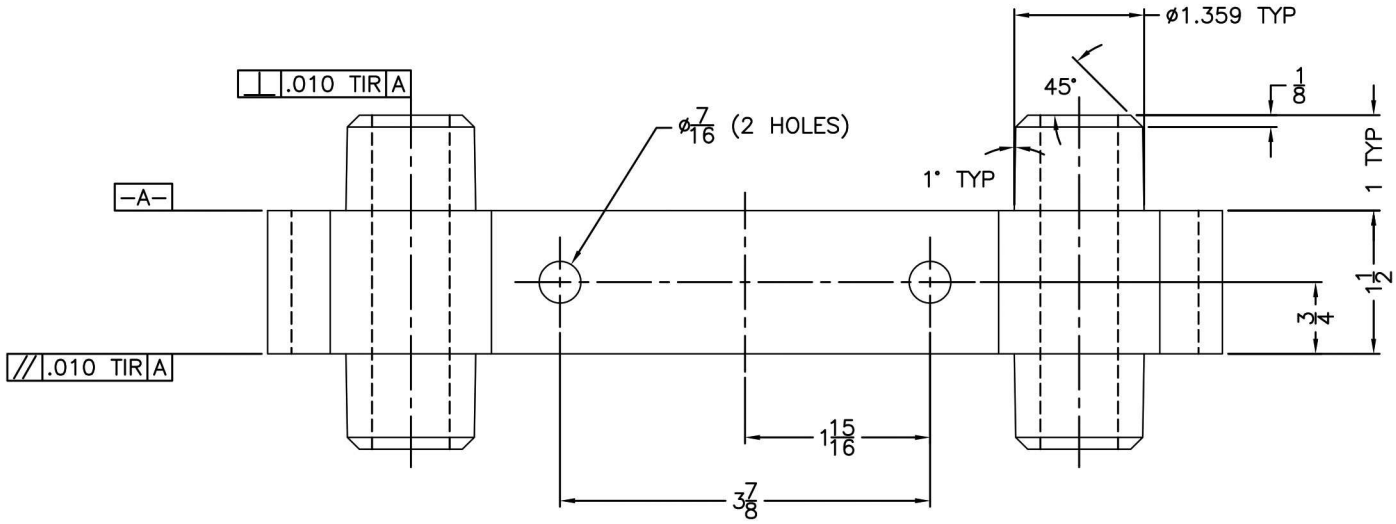
SUBMITTAL
BGCBR125

Intermediate Guide Bracket 1¼" Rails





Note: Surface of part must be free of porosity.
Part must be free of distortion due to casting process.

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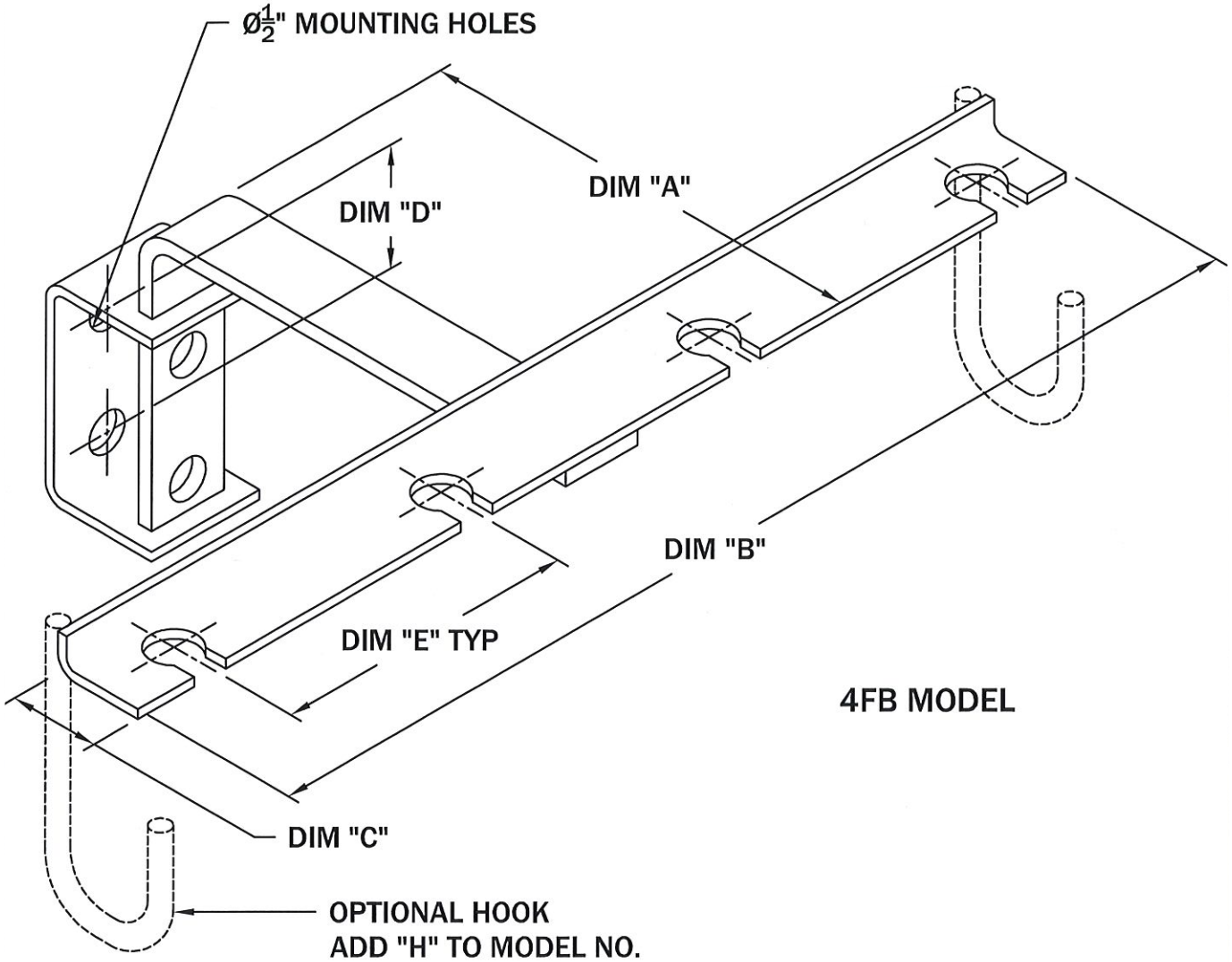
SUBMITTAL
BGFSB4FB

Float Bracket - "T" Shaped



Model No.	Dim. "A"	Dim. "B"	Dim. "C"	Dim. "D"	Dim. "E"
4FB / 4FBH	6"	13"	1 1/8"	1½"	3¾"
5FB / 5FBH		16¾"			
6FB / 6FBH		20½"			

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APPENDIX E

Civil Engineering Drawings

1600 JAMES NAISMITH DRIVE, OTTAWA, ONTARIO

REVISION 02

KEY PLAN (N.T.S.)

DRAWING INDEX	
TITLE PAGE	
SEDIMENT AND EROSION CONTROL PLAN	C101
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

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www.lrl.ca | (613) 842-3434

1600 JAMES NAISMITH
OTTAWA, ONTARIO
REV.02 - ISSUED FOR MUNICIPAL APPROVAL - SEPTEMBER 30, 2022
LRL PROJECT no: 220142

LICENSED PROFESSIONAL ENGINEER
V. JOHNSON
100510576
PROVINCE OF ONTARIO
Sept 30/22

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 METRES 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 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 FRO 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 METRES 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.

ROADWORK SPECIFICATIONS

15. ROADWORK TO BE COMPLETED IN ACCORDANCE WITH GEOTECHNICAL REPORT, PREPARED BY LRL ASSOCIATES. DATED NOVEMBER 2020.
16. AL 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. THE SUBGRADE SHALL BE CROWNED AND SLOPED AT LEAST 2% AND PROOF ROLLED WITH HEAVY ROLLERS.
18. SUB-EXCAVATE SOFT AREAS AND FILL WITH GRANULAR 'A', TYPE II COMPACTED IN MAXIMUM 300MM LIFTS.
19. 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 SSP-1.

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 OR 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.

SUBJECT TO APPROVAL

No.	REVISIONS	BY	DATE
02	ISSUED FOR MUNICIPAL APPROVAL	A.S.	30 SEP 2022
01	ISSUED FOR MUNICIPAL APPROVAL	A.S.	12 MAY 2022

LICENSED PROFESSIONAL ENGINEER
V. JOHNSON
100510576
Sept 30, 2022
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

LRL
ENGINEERING | INGÉNIERIE
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CLIENT
1600 JAMES NAISMITH LP
1460 THE QUEENSWAY, SUITE M264,
TORONTO, ON, M8Z 1S4

DESIGNED BY:	DRAWN BY:	APPROVED BY:
A.S.	A.S.	V.J.

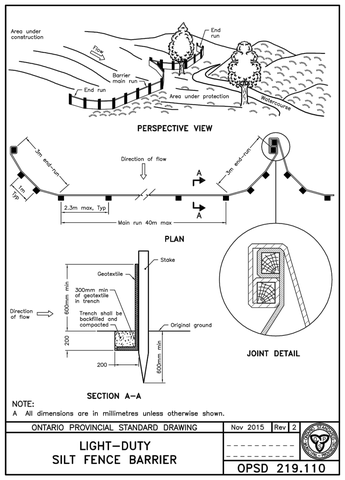
PROJECT
PROPOSED 8 STOREY APARTMENT BUILDING
1600 JAMES NAISMITH DRIVE
OTTAWA, ON

DRAWING TITLE
GENERAL NOTES

PROJECT NO.
220142

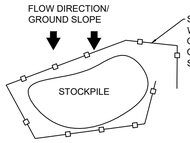
DATE
MARCH 2022

C001



NOTE:
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev 2
LIGHT–DUTY SILT FENCE BARRIER		OPSD 219.110



STOCKPILE EROSION PROTECTION
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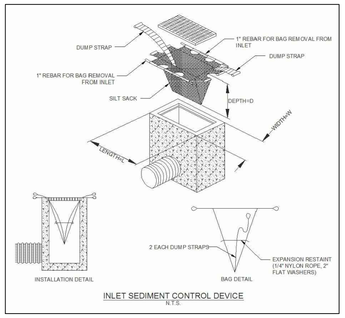
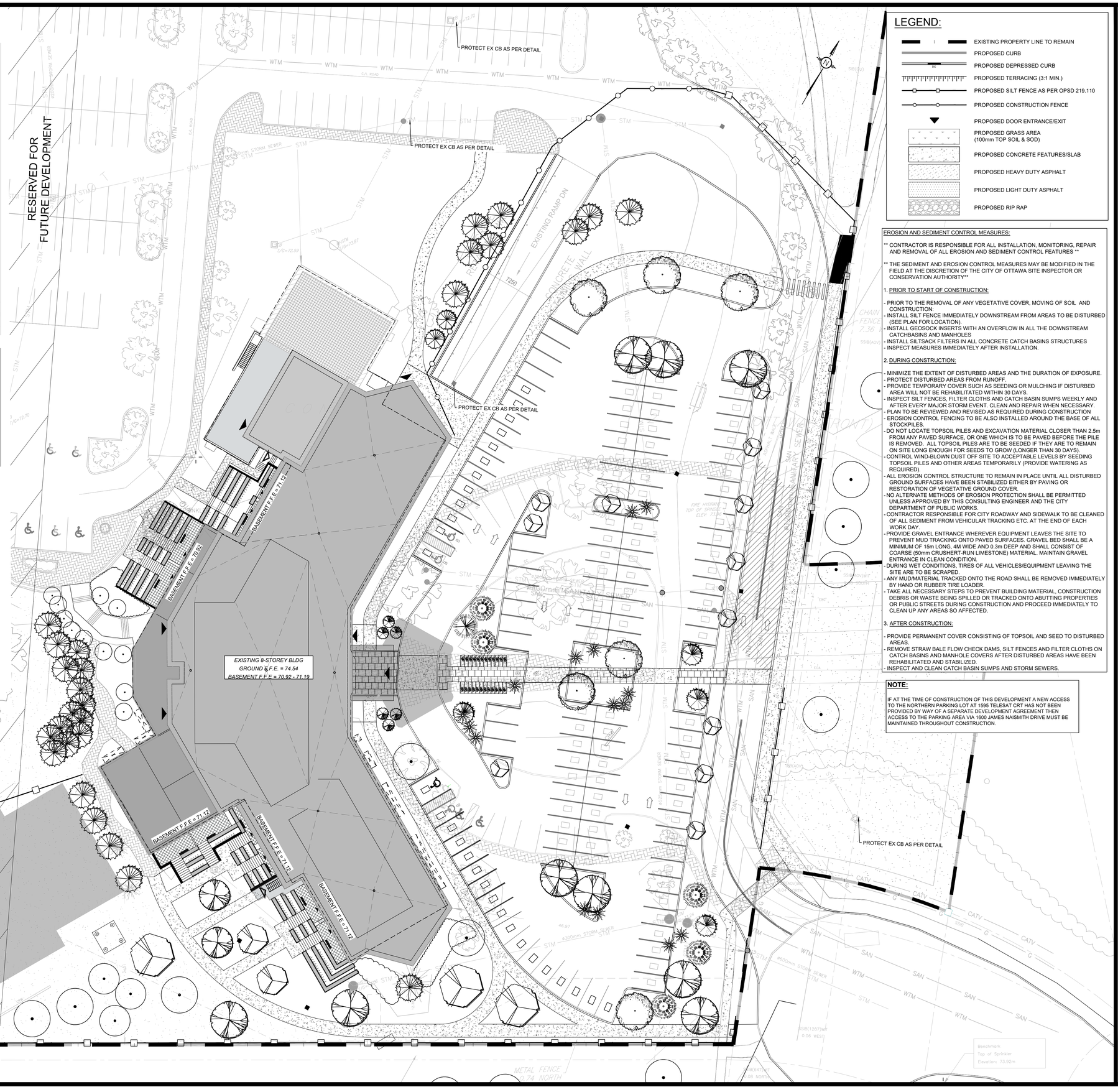


INLET SEDIMENT CONTROL DEVICE
N.T.S.



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 CONSTRUCTION FENCE
- PROPOSED DOOR ENTRANCE/EXIT
- PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
- PROPOSED CONCRETE FEATURES/SLAB
- PROPOSED HEAVY DUTY ASPHALT
- PROPOSED LIGHT DUTY ASPHALT
- PROPOSED RIP RAP

EROSION AND SEDIMENT CONTROL MEASURES:

** CONTRACTOR IS RESPONSIBLE FOR ALL INSTALLATION, MONITORING, REPAIR AND REMOVAL OF ALL EROSION AND SEDIMENT CONTROL FEATURES **

** THE SEDIMENT AND EROSION CONTROL MEASURES MAY BE MODIFIED IN THE FIELD AT THE DISCRETION OF THE CITY OF OTTAWA SITE INSPECTOR OR CONSERVATION AUTHORITY**

1. PRIOR TO START OF CONSTRUCTION:

- PRIOR TO THE REMOVAL OF ANY VEGETATIVE COVER, MOVING OF SOIL AND CONSTRUCTION:
- INSTALL SILT FENCE IMMEDIATELY DOWNSTREAM FROM AREAS TO BE DISTURBED (SEE PLAN FOR LOCATION).
- INSTALL GEOSOCK INSERTS WITH AN OVERFLOW IN ALL THE DOWNSTREAM CATCHBASINS AND MANHOLES
- INSTALL SILTSACK FILTERS IN ALL CONCRETE CATCH BASINS STRUCTURES
- INSPECT MEASURES IMMEDIATELY AFTER INSTALLATION.

2. DURING CONSTRUCTION:

- MINIMIZE THE EXTENT OF DISTURBED AREAS AND THE DURATION OF EXPOSURE.
- PROTECT DISTURBED AREAS FROM RUNOFF.
- PROVIDE TEMPORARY COVER SUCH AS SEEDING OR MULCHING IF DISTURBED AREA WILL NOT BE REHABILITATED WITHIN 30 DAYS.
- INSPECT SILT FENCES, FILTER CLOTHS AND CATCH BASIN SUMPS WEEKLY AND AFTER EVERY MAJOR STORM EVENT. CLEAN AND REPAIR WHEN NECESSARY.
- PLAN TO BE REVIEWED AND REVISED AS REQUIRED DURING CONSTRUCTION
- EROSION CONTROL FENCING TO BE ALSO INSTALLED AROUND THE BASE OF ALL STOCKPILES.
- DO NOT LOCATE TOPSOIL PILES AND EXCAVATION MATERIAL CLOSER THAN 2.5m FROM ANY PAVED SURFACE, OR ONE WHICH IS TO BE PAVED BEFORE THE PILE IS REMOVED. ALL TOPSOIL PILES ARE TO BE SEEDED IF THEY ARE TO REMAIN ON SITE LONG ENOUGH FOR SEEDS TO GROW (LONGER THAN 30 DAYS).
- CONTROL WIND-BLOWN DUST OFF SITE TO ACCEPTABLE LEVELS BY SEEDING TOPSOIL PILES AND OTHER AREAS TEMPORARILY (PROVIDE WATERING AS REQUIRED).
- ALL EROSION CONTROL STRUCTURE TO REMAIN IN PLACE UNTIL ALL DISTURBED GROUND SURFACES HAVE BEEN STABILIZED EITHER BY PAVING OR RESTORATION OF VEGETATIVE GROUND COVER.
- NO ALTERNATE METHODS OF EROSION PROTECTION SHALL BE PERMITTED UNLESS APPROVED BY THIS CONSULTING ENGINEER AND THE CITY DEPARTMENT OF PUBLIC WORKS.
- CONTRACTOR RESPONSIBLE FOR CITY ROADWAY AND SIDEWALK TO BE CLEANED OF ALL SEDIMENT FROM VEHICULAR TRACKING ETC. AT THE END OF EACH WORK DAY.
- PROVIDE GRAVEL ENTRANCE WHEREVER EQUIPMENT LEAVES THE SITE TO PREVENT MUD TRACKING ONTO PAVED SURFACES. GRAVEL BED SHALL BE A MINIMUM OF 15m LONG, 4M WIDE AND 0.3m DEEP AND SHALL CONSIST OF COARSE (50mm CRUSHERT-RUN LIMESTONE) MATERIAL. MAINTAIN GRAVEL ENTRANCE IN CLEAN CONDITION.
- DURING WET CONDITIONS, TIRES OF ALL VEHICLES/EQUIPMENT LEAVING THE SITE ARE TO BE SCRAPED.
- ANY MUD/MATERIAL TRACKED ONTO THE ROAD SHALL BE REMOVED IMMEDIATELY BY HAND OR RUBBER TIRE LOADER.
- TAKE ALL NECESSARY STEPS TO PREVENT BUILDING MATERIAL, CONSTRUCTION DEBRIS OR WASTE BEING SPILLED OR TRACKED ONTO ABUTTING PROPERTIES OR PUBLIC STREETS DURING CONSTRUCTION AND PROCEED IMMEDIATELY TO CLEAN UP ANY AREAS SO AFFECTED.

3. AFTER CONSTRUCTION:

- PROVIDE PERMANENT COVER CONSISTING OF TOPSOIL AND SEED TO DISTURBED AREAS.
- REMOVE STRAW BALE FLOW CHECK DAMS, SILT FENCES AND FILTER CLOTHS ON CATCH BASINS AND MANHOLE COVERS AFTER DISTURBED AREAS HAVE BEEN REHABILITATED AND STABILIZED.
- INSPECT AND CLEAN CATCH BASIN SUMPS AND STORM SEWERS.

NOTE:

IF AT THE TIME OF CONSTRUCTION OF THIS DEVELOPMENT A NEW ACCESS TO THE NORTHERN PARKING LOT AT 1595 TELESAT CRT HAS NOT BEEN PROVIDED BY WAY OF A SEPARATE DEVELOPMENT AGREEMENT THEN ACCESS TO THE PARKING AREA VIA 1600 JAMES NAISMITH DRIVE MUST BE MAINTAINED THROUGHOUT CONSTRUCTION.

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.

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5m 2 0 5 10m

SCALE: 1:300

SUBJECT TO APPROVAL

No.	REVISIONS	BY	DATE
02	ISSUED FOR MUNICIPAL APPROVAL	A.S.	30 SEP 2022
01	ISSUED FOR MUNICIPAL APPROVAL	A.S.	12 MAY 2022

LICENSED PROFESSIONAL ENGINEER V. JOHNSON 100510576 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
1600 JAMES NAISMITH LP
1460 THE QUEENSWAY, SUITE M264, TORONTO, ON, M8Z 1S4

DESIGNED BY:	DRAWN BY:	APPROVED BY:
A.S.	A.S.	V.J.

PROJECT
PROPOSED 8 STOREY APARTMENT BUILDING
1600 JAMES NAISMITH DRIVE
OTTAWA, ON

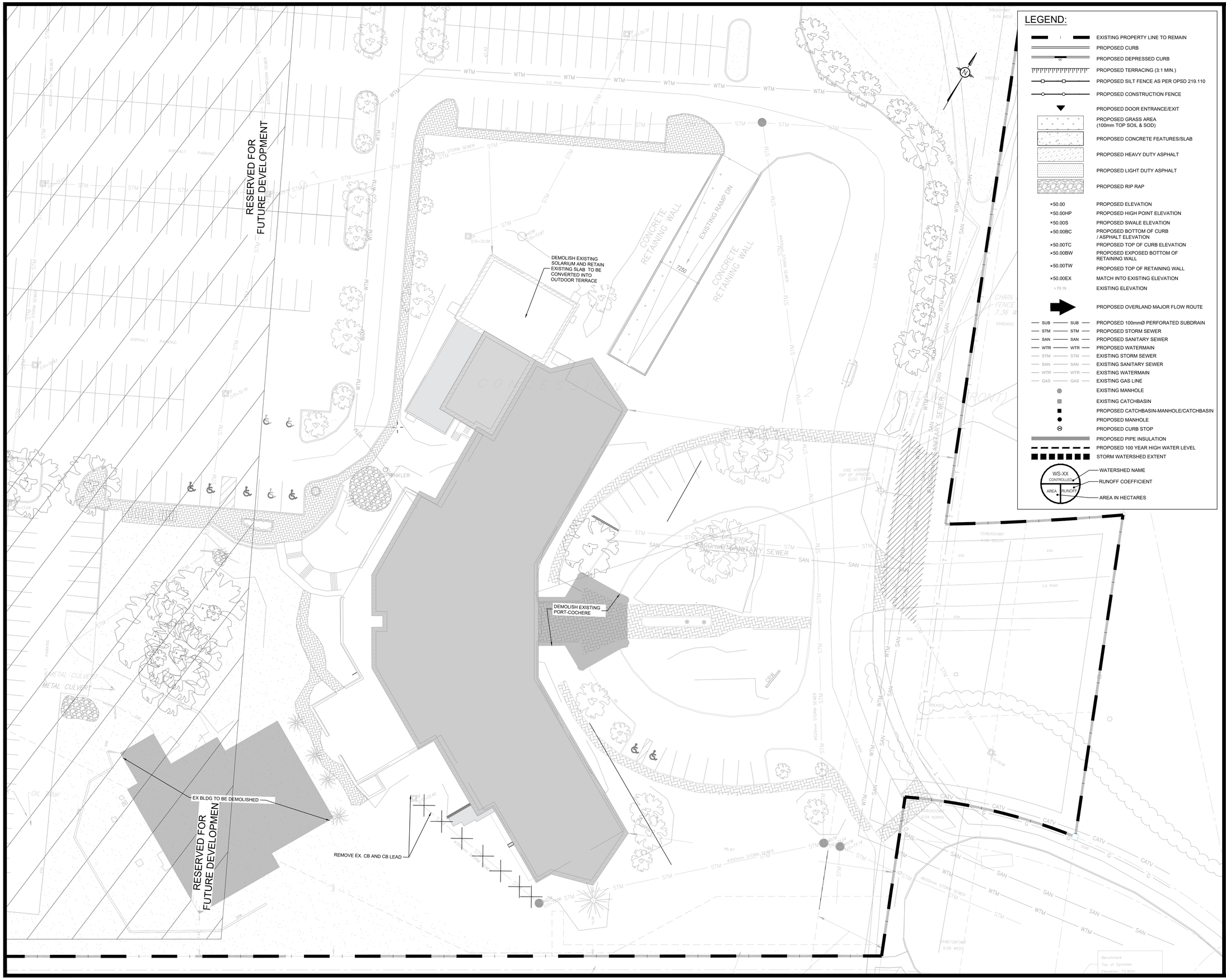
DRAWING TITLE
EROSION AND SEDIMENT CONTROL PLAN

PROJECT NO.
220142

DATE
MARCH 2022

C101

LRL–PRL_841X594_A1–EN



LEGEND:

- EXISTING PROPERTY LINE TO REMAIN
- PROPOSED CURB
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- PROPOSED TERRACING (3:1 MIN.)
- PROPOSED SILT FENCE AS PER OPSD 219.110
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- PROPOSED DOOR ENTRANCE/EXIT
- PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
- PROPOSED CONCRETE FEATURES/SLAB
- PROPOSED HEAVY DUTY ASPHALT
- PROPOSED LIGHT DUTY ASPHALT
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- ×50.00 — PROPOSED ELEVATION
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- SUB — SUB — PROPOSED 100mmØ PERFORATED SUBDRAIN
- STM — STM — PROPOSED STORM SEWER
- SAN — SAN — PROPOSED SANITARY SEWER
- WTR — WTR — PROPOSED WATERMAIN
- STM — STM — EXISTING STORM SEWER
- SAN — SAN — EXISTING SANITARY SEWER
- WTR — WTR — EXISTING WATERMAIN
- GAS — GAS — EXISTING GAS LINE
- EXISTING MANHOLE
- EXISTING CATCHBASIN
- PROPOSED CATCHBASIN-MANHOLE/CATCHBASIN
- PROPOSED MANHOLE
- PROPOSED CURB STOP
- PROPOSED PIPE INSULATION
- PROPOSED 100 YEAR HIGH WATER LEVEL
- STORM WATERSHED EXTENT
- WS-XX (CONTROLLER) / AREA / RUNOFF — WATERSHED NAME, RUNOFF COEFFICIENT, AREA IN HECTARES

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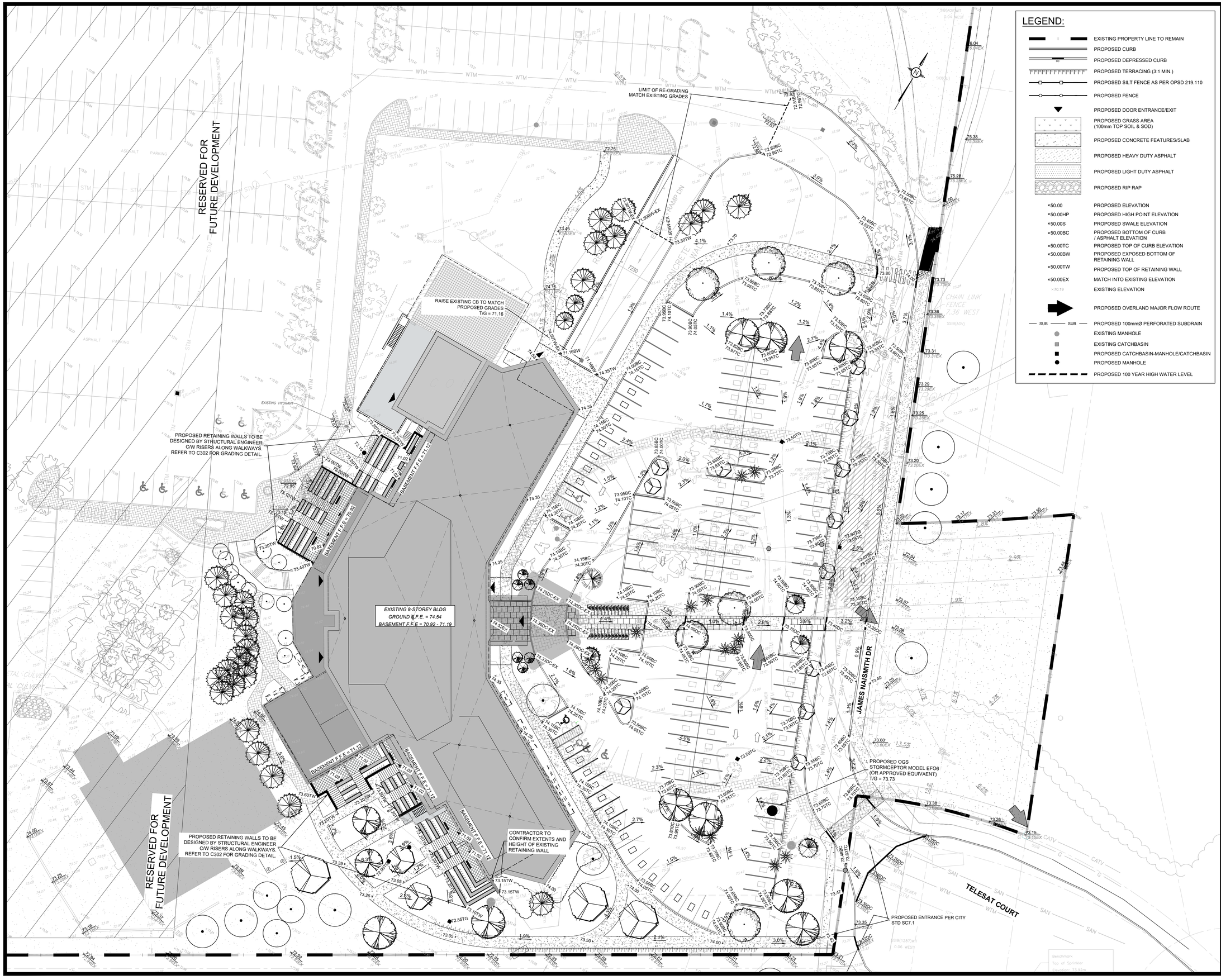
PROJECT
PROPOSED 8 STOREY APARTMENT BUILDING
1600 JAMES NAISMITH DRIVE
OTTAWA, ON

DRAWING TITLE
DEMOLITION PLAN

PROJECT NO.
220142

DATE
MARCH 2022

C102



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5m 2 0 5 10m

SCALE: 1:300

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LICENSED PROFESSIONAL ENGINEER
V. JOHNSON
100510576
Sept 30, 2022
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

LRL
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5430 Canotek Road | Ottawa, ON, K1J 9G2
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CLIENT

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1460 THE QUEENSWAY, SUITE M264,
TORONTO, ON, M8Z 1S4

DESIGNED BY:	DRAWN BY:	APPROVED BY:
A.S.	A.S.	V.J.

PROJECT

PROPOSED 8 STOREY APARTMENT BUILDING
1600 JAMES NAISMITH DRIVE
OTTAWA, ON

DRAWING TITLE

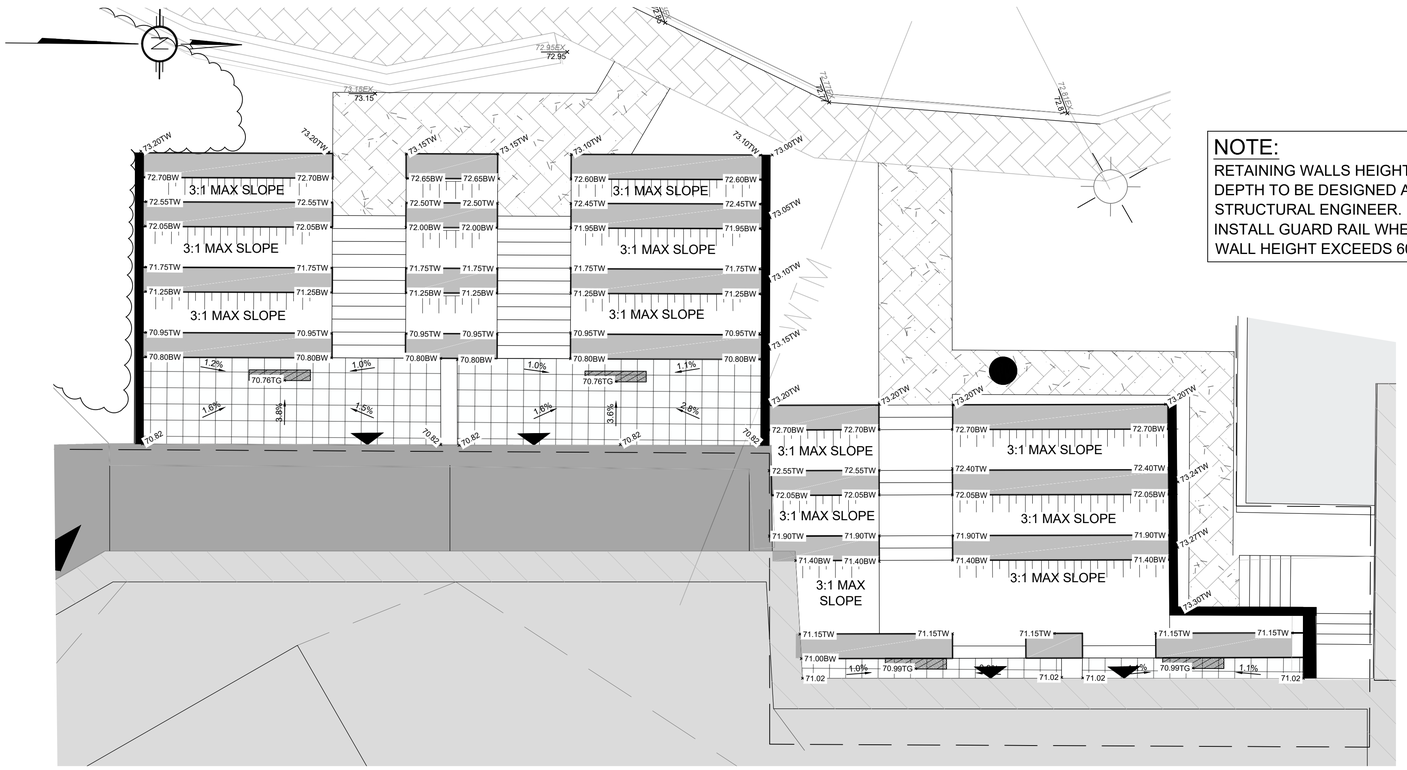
GRADING AND DRAINAGE PLAN

PROJECT NO.
220142

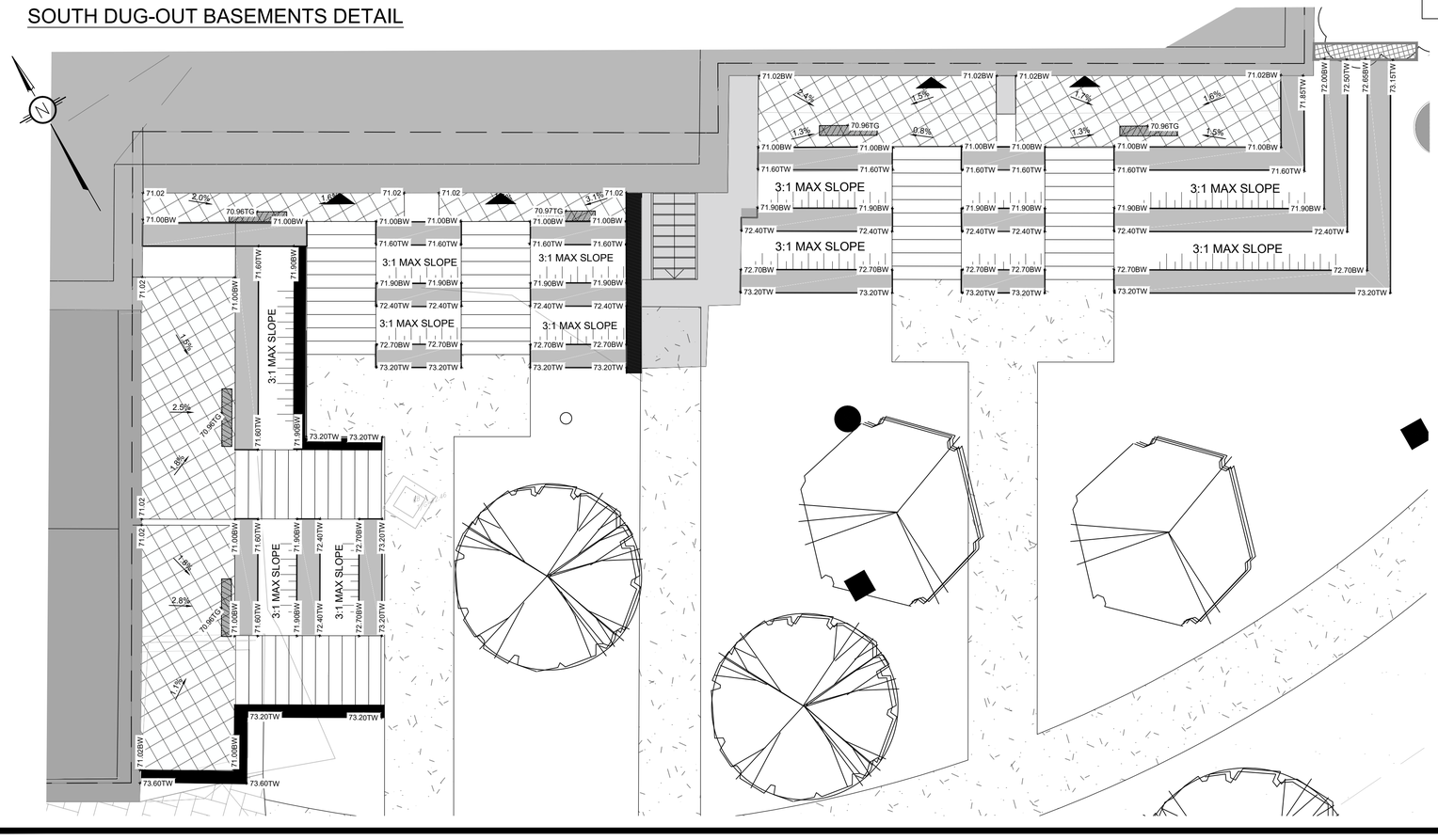
DATE
MARCH 2022

C301

NORTH DUG-OUT BASEMENTS DETAIL



SOUTH DUG-OUT BASEMENTS DETAIL



NOTE:

RETAINING WALLS HEIGHT, WIDTH, AND DEPTH TO BE DESIGNED AND STAMPED BY A STRUCTURAL ENGINEER.
INSTALL GUARD RAIL WHERE RETAINING WALL HEIGHT EXCEEDS 600mm.

LEGEND:

	EXISTING PROPERTY LINE TO REMAIN
	PROPOSED CURB
DC	PROPOSED DEPRESSED CURB
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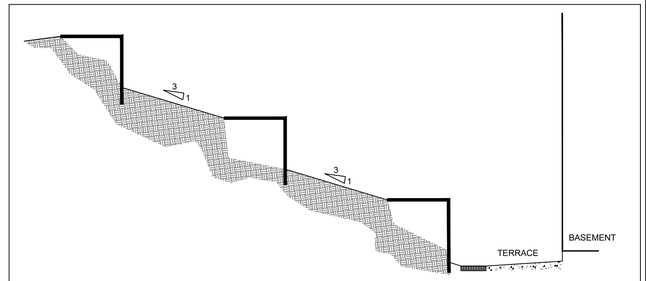

AMOUR STONE RETAINING WALLS - TYPICAL SECTION
(N.T.S.)

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SCALE: 1:75

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1600 JAMES NAISMITH DRIVE
OTTAWA, ON

DRAWING TITLE
GRADING DETAILS PLAN

PROJECT NO.
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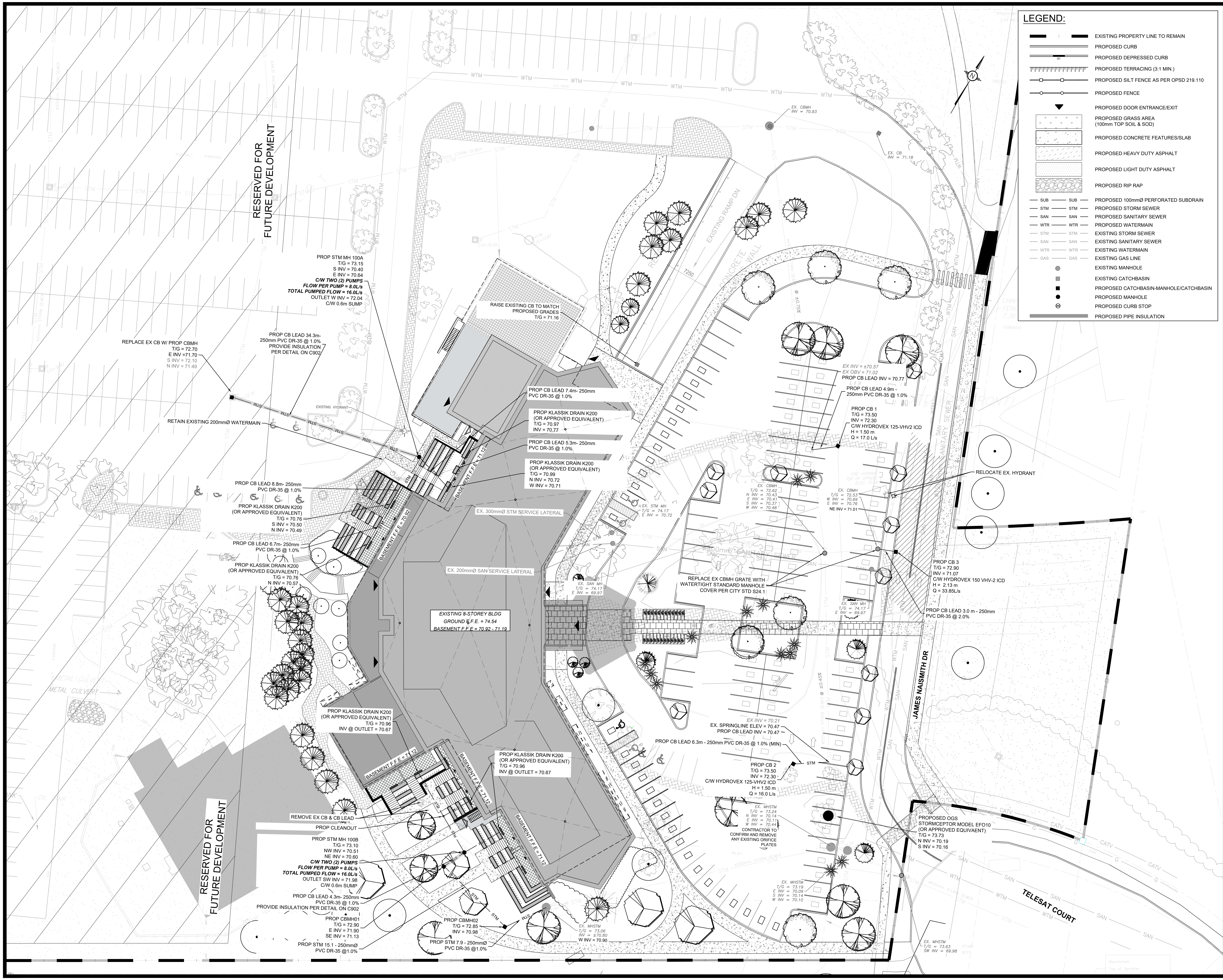
C302



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5m 2 0 5 10m

SCALE: 1:300

No.	REVISIONS	BY	DATE
02	ISSUED FOR MUNICIPAL APPROVAL	A.S.	30 SEP 2022
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LICENSED PROFESSIONAL ENGINEER
V. JOHNSON
100510576
Sept 30, 2022
PROVINCE OF ONTARIO

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LRL
ENGINEERING | INGÉNIERIE
5430 Canotek Road | Ottawa, ON, K1J 9G2
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CLIENT

1600 JAMES NAISMITH LP
1460 THE QUEENSWAY, SUITE M264,
TORONTO, ON, M8Z 1S4

DESIGNED BY:	DRAWN BY:	APPROVED BY:
A.S.	A.S.	V.J.

PROJECT

PROPOSED 8 STOREY APARTMENT BUILDING
1600 JAMES NAISMITH DRIVE
OTTAWA, ON

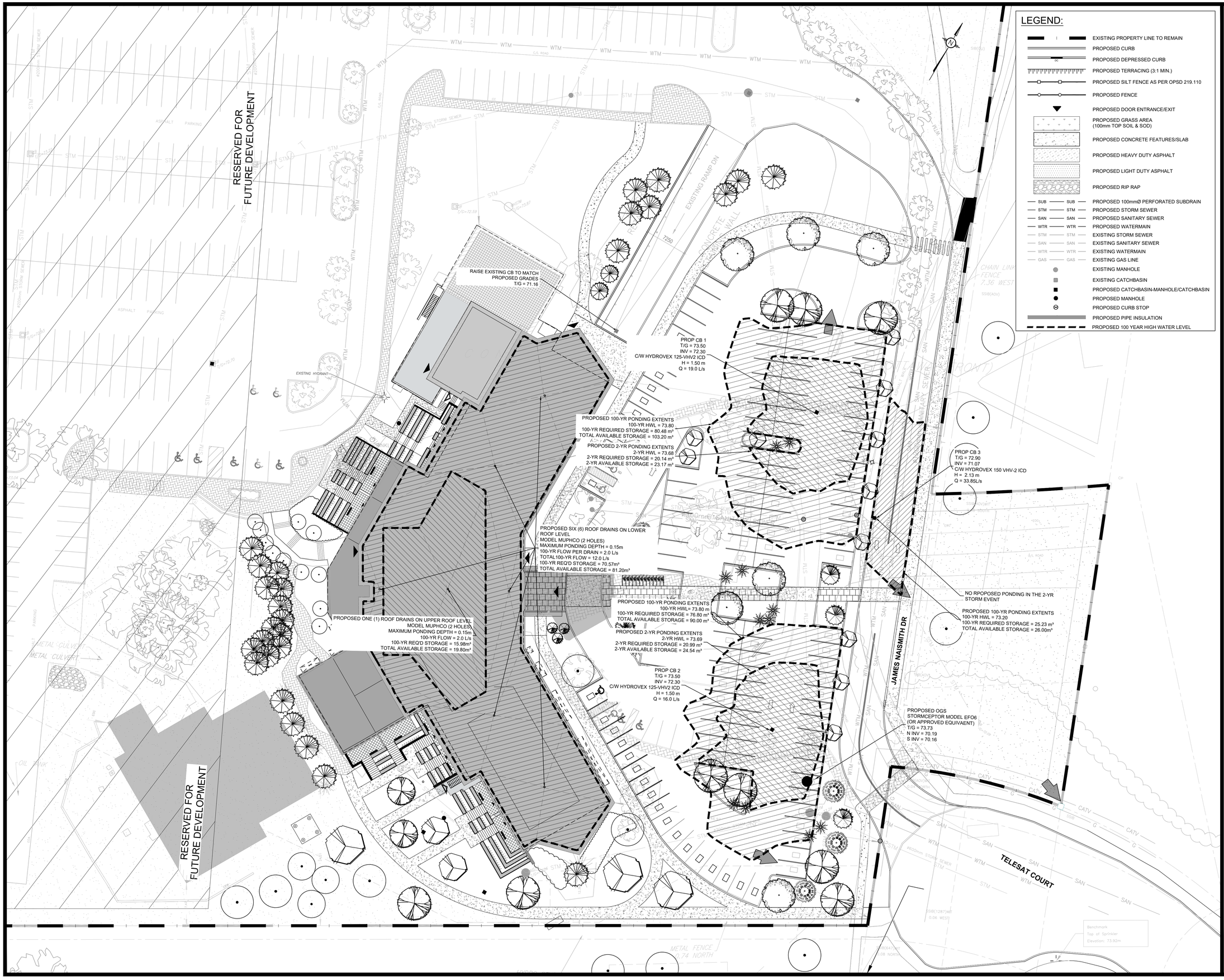
DRAWING TITLE

SERVICING PLAN

PROJECT NO.
220142

DATE
MARCH 2022

C401



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
- PROPOSED LIGHT DUTY ASPHALT
- PROPOSED RIP RAP
- PROPOSED 100mmØ PERFORATED SUBDRAIN
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED WATERMAIN
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- EXISTING WATERMAIN
- EXISTING GAS LINE
- EXISTING MANHOLE
- EXISTING CATCHBASIN
- PROPOSED CATCHBASIN-MANHOLE/CATCHBASIN
- PROPOSED MANHOLE
- PROPOSED CURB STOP
- PROPOSED PIPE INSULATION
- PROPOSED 100 YEAR HIGH WATER LEVEL

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SCALE : 1:300

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LICENSED PROFESSIONAL ENGINEER
V. JOHNSON
100510576
30 SEPTEMBER 2022
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

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CLIENT

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1460 THE QUEENSWAY, SUITE M264,
TORONTO, ON, M8Z 1S4

DESIGNED BY:	DRAWN BY:	APPROVED BY:
A.S.	A.S.	V.J.

PROJECT

PROPOSED 8 STOREY APARTMENT BUILDING
1600 JAMES NAISMITH DRIVE
OTTAWA, ON

DRAWING TITLE

STORMWATER MANAGEMENT PLAN

PROJECT NO.
220142

DATE
MARCH 2022

C601

RESERVED FOR
FUTURE DEVELOPMENT

RESERVED FOR
FUTURE DEVELOPMENT

EWS-01
UN-CONTROLLED
1.388 | 0.54

LEGEND:

- EXISTING PROPERTY LINE TO REMAIN
- PROPOSED CURB
- PROPOSED DEPRESSED CURB
- PROPOSED TERRACING (3:1 MIN.)
- PROPOSED DOOR ENTRANCE/EXIT
- PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
- PROPOSED CONCRETE FEATURES/SLAB
- PROPOSED HEAVY DUTY ASPHALT
- PROPOSED LIGHT DUTY ASPHALT
- PROPOSED RIP RAP
- ×70.19 EXISTING ELEVATION
- PROPOSED OVERLAND MAJOR FLOW ROUTE
- EXISTING MANHOLE
- EXISTING CATCHBASIN
- PROPOSED CATCHBASIN-MANHOLE/CATCHBASIN
- PROPOSED MANHOLE
- PROPOSED CURB STOP
- STORM WATERSHED EXTENT
- WS-XX CONTROLLED / AREA / RUNOFF
  - WATERSHED NAME
  - RUNOFF COEFFICIENT
  - AREA IN HECTARES

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5m 2 0 5 10m

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LICENSED PROFESSIONAL ENGINEER
V. JOHNSON
100510576
PROVINCE OF ONTARIO

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CLIENT
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1460 THE QUEENSWAY, SUITE M264,
TORONTO, ON, M8Z 1S4

DESIGNED BY:	DRAWN BY:	APPROVED BY:
A.S.	A.S.	V.J.

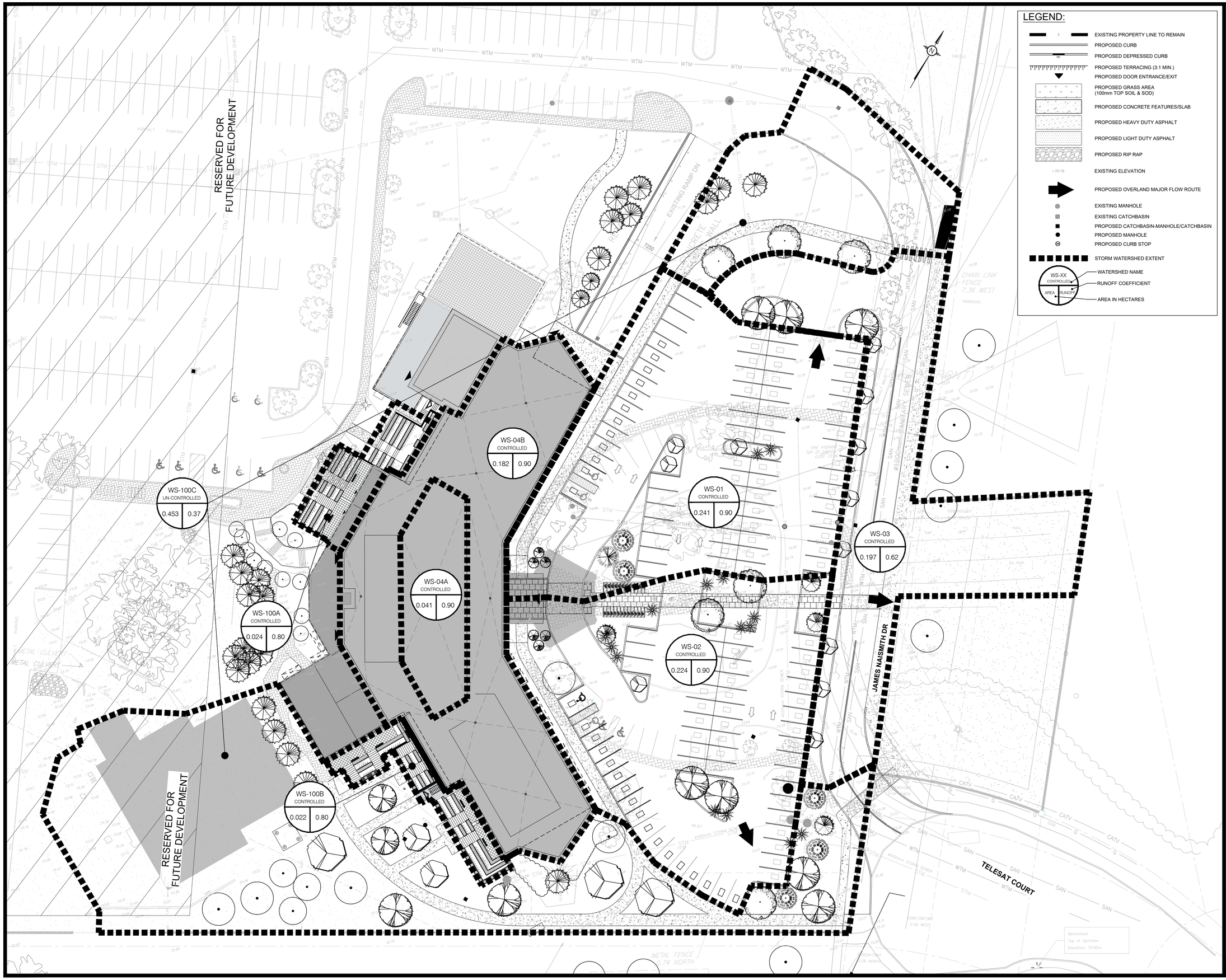
PROJECT
PROPOSED 8 STOREY APARTMENT BUILDING
1600 JAMES NAISMITH DRIVE
OTTAWA, ON

DRAWING TITLE
PRE-DEVELOPMENT
WATERSHED PLAN

PROJECT NO.
220142

DATE
MARCH 2022

C701



LEGEND:

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- PROPOSED DEPRESSED CURB
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- PROPOSED DOOR ENTRANCE/EXIT
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- PROPOSED CONCRETE FEATURES/SLAB
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- ×70.19 EXISTING ELEVATION
- PROPOSED OVERLAND MAJOR FLOW ROUTE
- EXISTING MANHOLE
- EXISTING CATCHBASIN
- PROPOSED CATCHBASIN-MANHOLE/CATCHBASIN
- PROPOSED MANHOLE
- PROPOSED CURB STOP
- STORM WATERSHED EXTENT
- WS-XX (CONTROLLED / UN-CONTROLLED) — AREA | RUNOFF
  - WATERSHED NAME
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5m 2 0 5 10m

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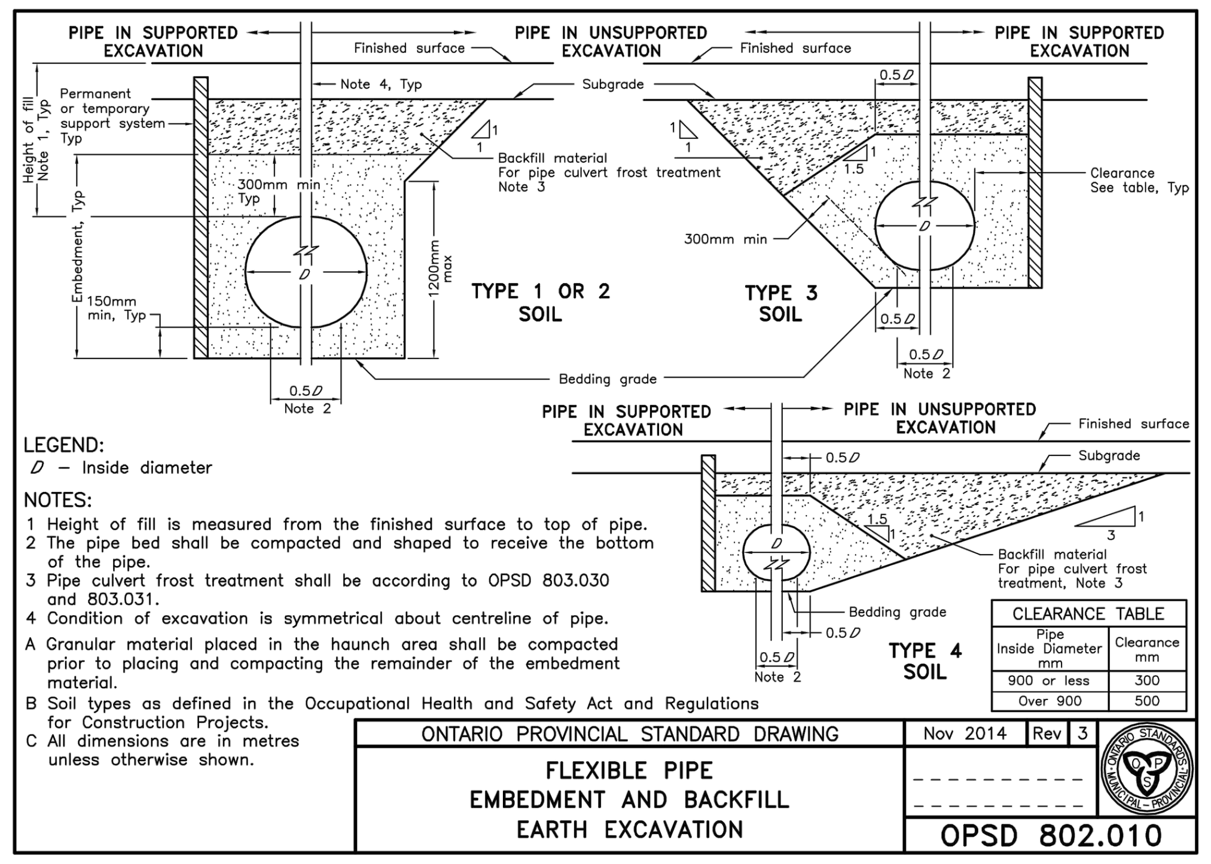
OTTAWA, ON

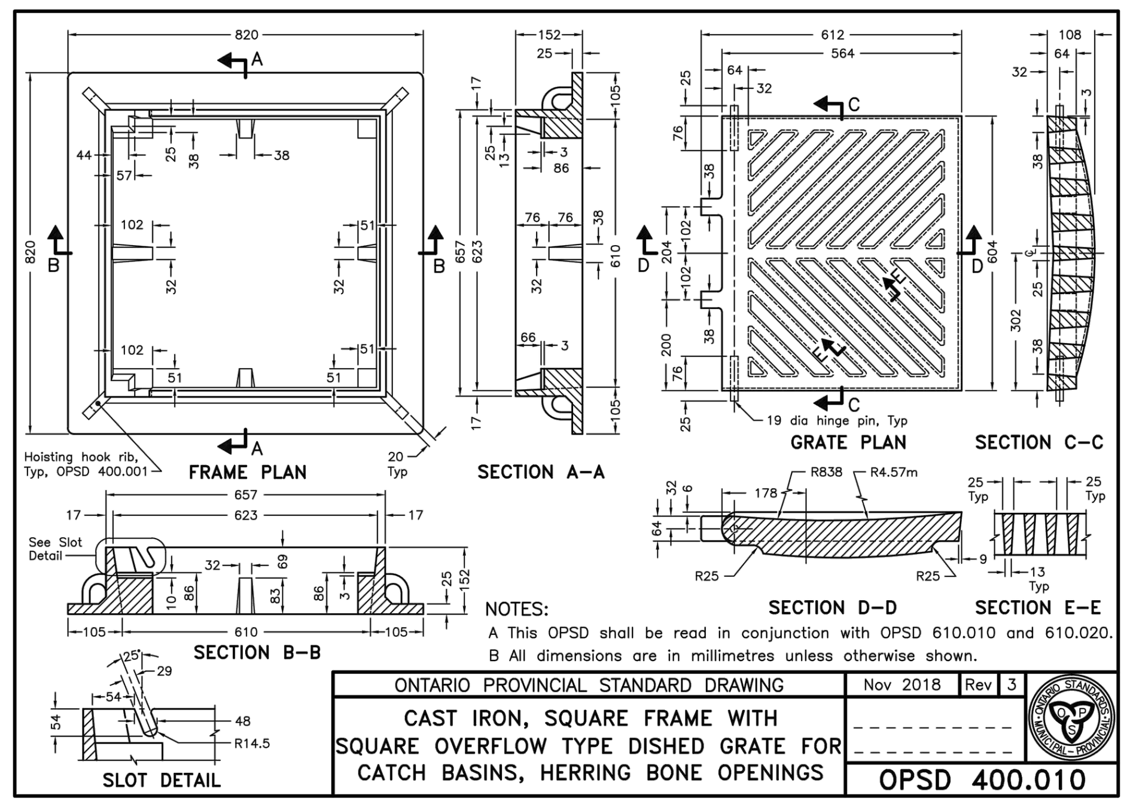
DRAWING TITLE
POST-DEVELOPMENT
WATERSHED PLAN

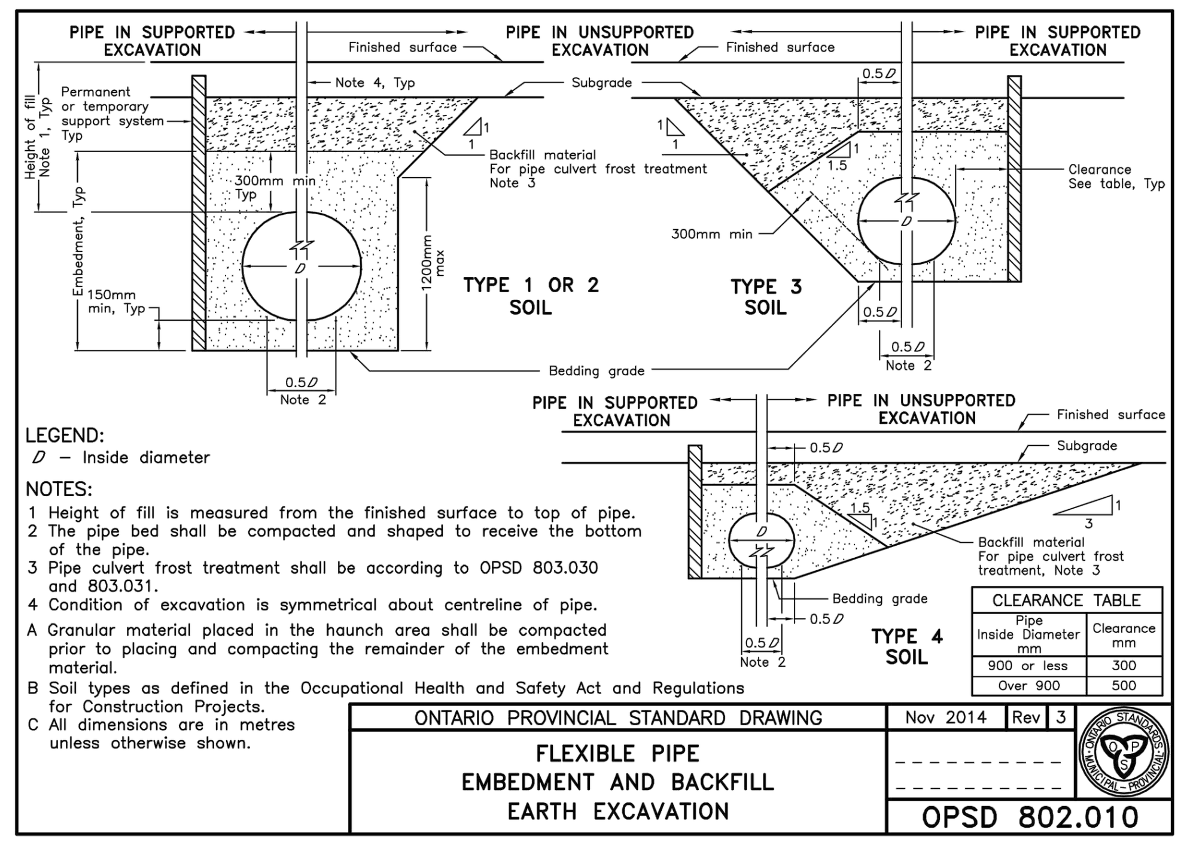
PROJECT NO.
220142

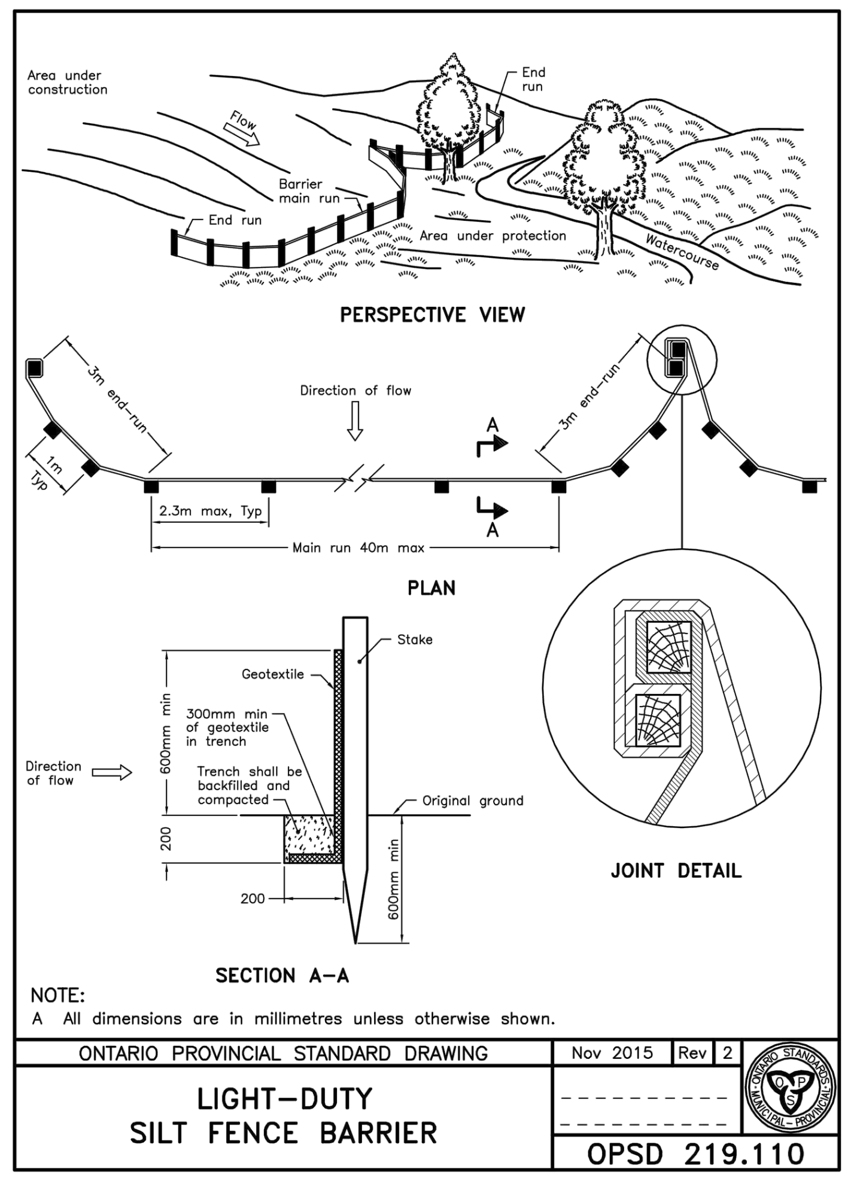
DATE
MARCH 2022

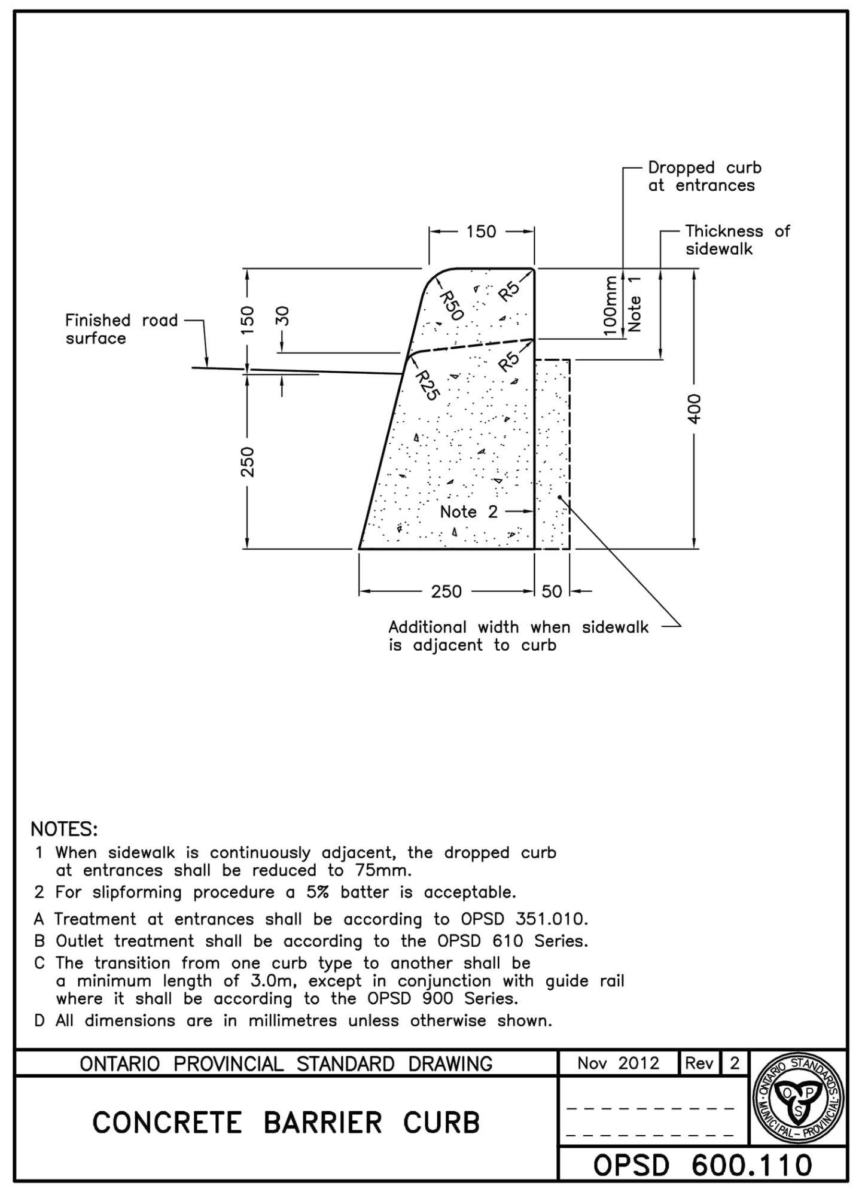
C702

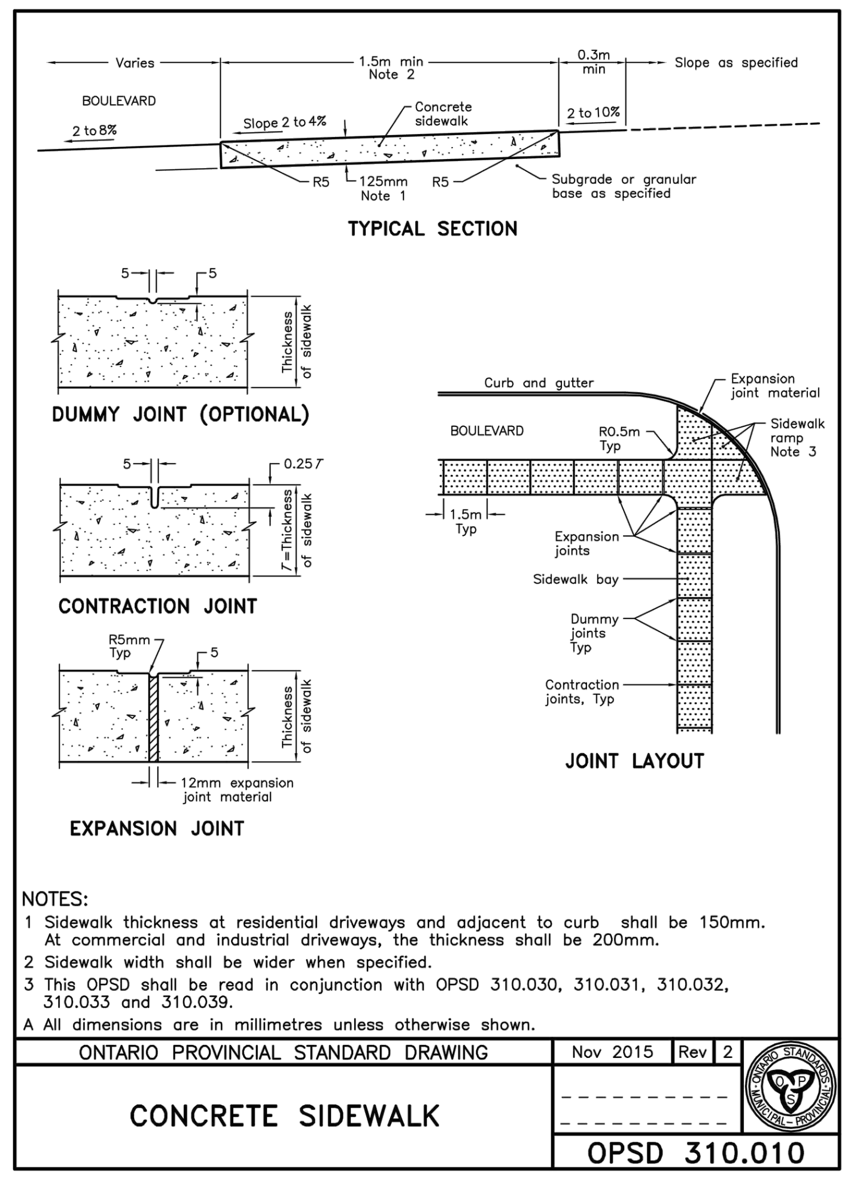


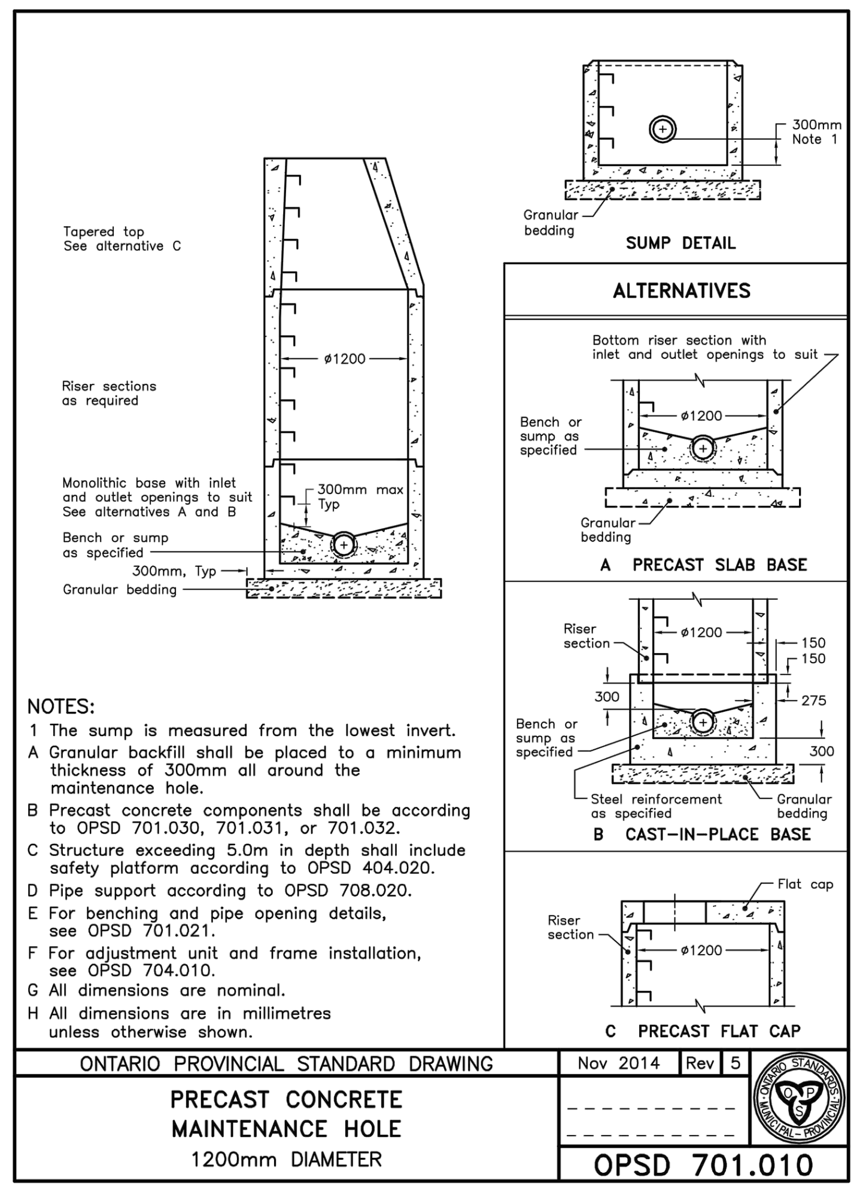


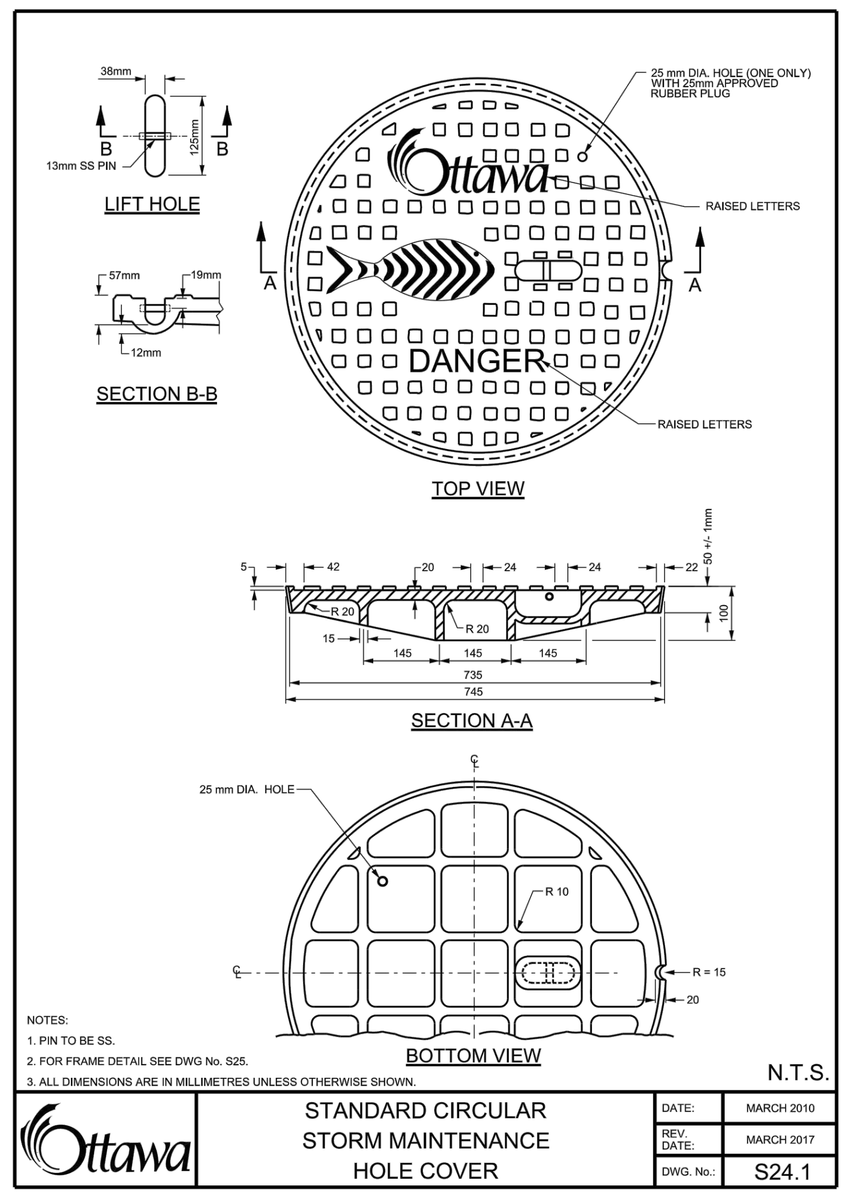


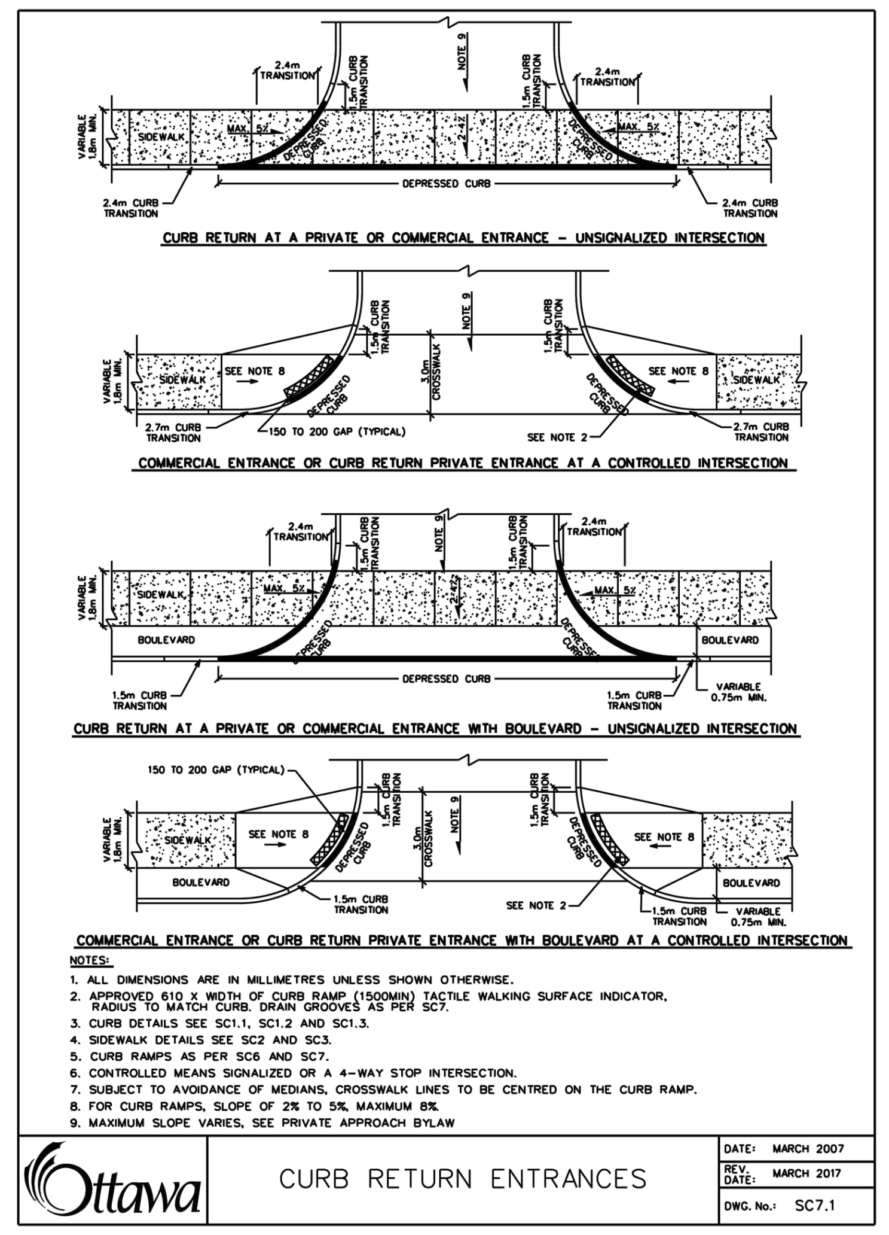


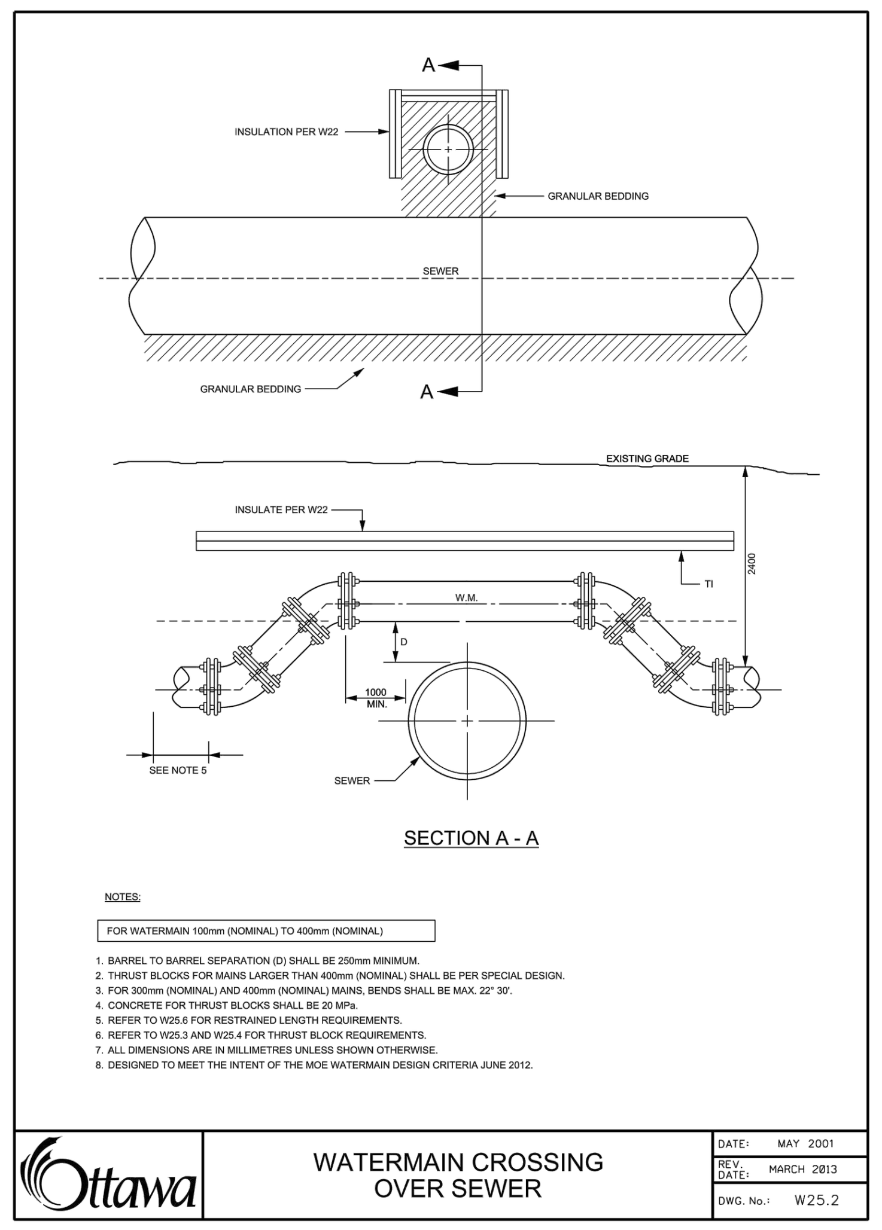


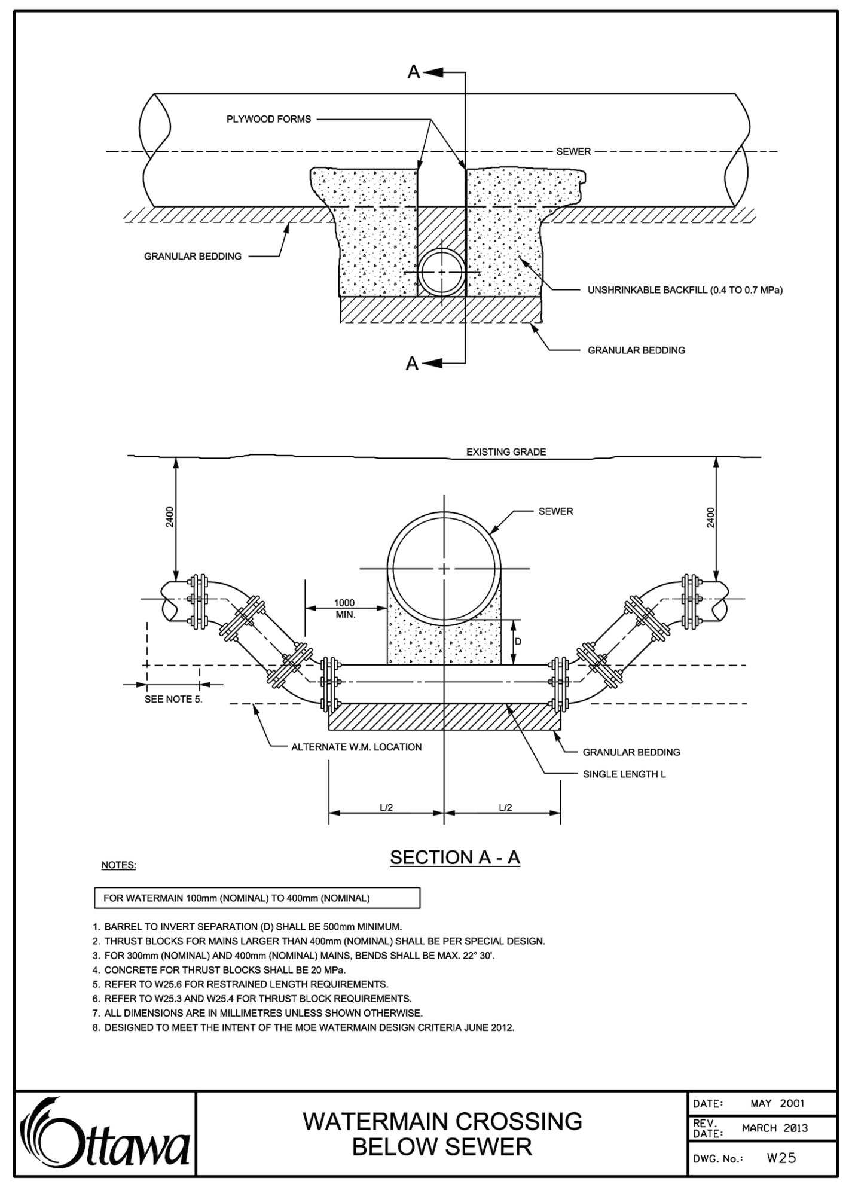


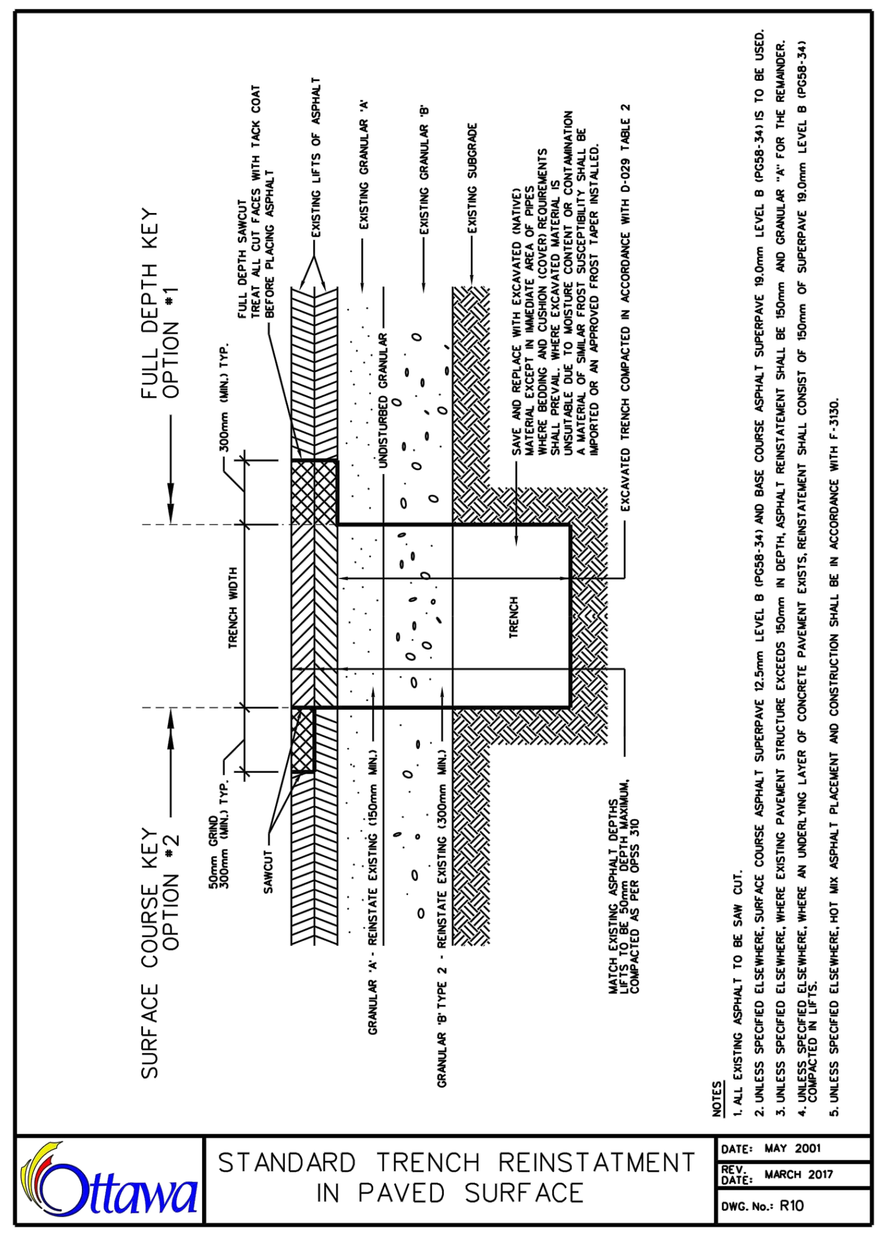


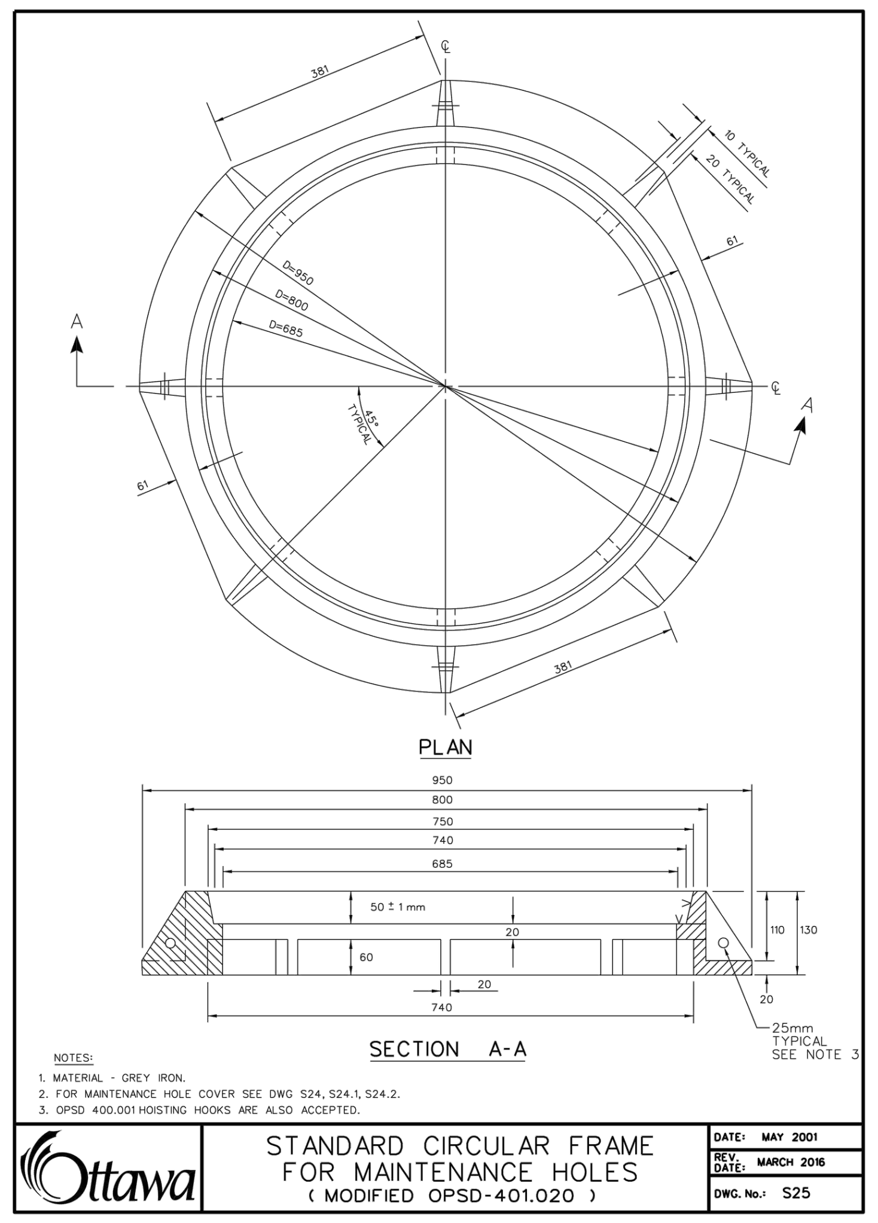


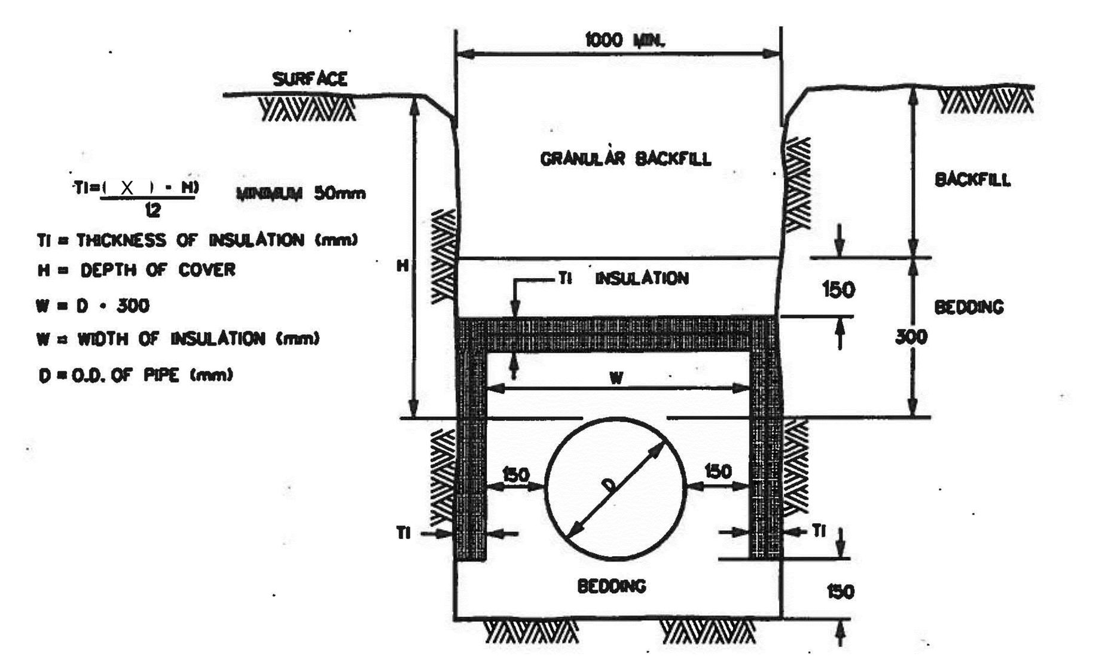












NOTES:
- -FOR STORM INSULATION USE AN X VALUE OF 2000 IN THE ABOVE "TI" EQUATION.
- -FOR SANITARY INSULATION USE AN X VALUE OF 2500 IN THE ABOVE "TI" EQUATION.
- -FOR WATERMAIN INSULATION USE AN X VALUE OF 2400 IN THE ABOVE "TI" EQUATION.
- -INCREMENTS OF INSULATION THICKNESS SHALL BE ADJUSTABLE TO 25mm.
- -STAGGER JOINTS OF MULTIPLE SHEETS.
- -ALL DIMENSIONS ARE IN MILLIMETERS UNLESS SHOWN OTHERWISE.

TYPICAL STORM AND SANITARYSEWER AND WATERMAIN INSULATION DETAIL

(N.T.S.)

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.

SUBJECT TO APPROVAL

No.	REVISIONS	BY	DATE
02	ISSUED FOR MUNICIPAL APPROVAL	A.S.	30 SEP 2022
01	ISSUED FOR MUNICIPAL APPROVAL	A.S.	12 MAY 2022

LICENSED PROFESSIONAL ENGINEER
V. JOHNSON
100510576
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

1600 JAMES NAISMITH LP
1460 THE QUEENSWAY, SUITE M264,
TORONTO, ON, M8Z 1S4

DESIGNED BY:	DRAWN BY:	APPROVED BY:
A.S.	A.S.	V.J.

PROJECT

PROPOSED 8 STOREY APARTMENT BUILDING
1600 JAMES NAISMITH DRIVE
OTTAWA, ON

DRAWING TITLE

CONSTRUCTION DETAIL PLAN

PROJECT NO.
220142

DATE
MARCH 2022

C901

DRAWINGS/FIGURES

Proposed Site Plan
Legal Survey

NOTES:

- PROPERTY LINES ARE BASED ON BOUNDARY SURVEY BY STANTEC GEOMATICS LTD. DATED JANUARY 10, 2022.
- REFER TO CIVIL DRAWINGS FOR GRADING, STORM WATER MANAGEMENT, UTILITIES & SITE SERVICES, ROADWAY DESIGN, RETAINING WALLS, BERMS, ETC.
- LANDSCAPING INFORMATION IS SHOWN FOR REFERENCE PURPOSES ONLY. REFER TO LANDSCAPE DRAWINGS FOR TREES, PLANTINGS, LANDSCAPE SURFACE TREATMENTS AND COVERINGS, SIGNAGE MONUMENTS AT GRADE, ETC.
- DOUBLE TRAFFIC LANES (AND AISLES) TO BE A MINIMUM OF 6.0 METERS WIDE.

PROPERTY DESCRIPTION

PHASE 1 - EXISTING 8-STOREY OFFICE BUILDING - CONVERSION TO RESIDENTIAL	
CITY OF OTTAWA PIN NUMBER	04361-0300, 04361-0418, 04361-0298
MUNICIPAL ADDRESS	1600 JAMES NAISMITH DRIVE

SITE INFORMATION

LOT AREA:	38,022sq.m (TD1 16 475 sq.m., TD2 21 512 sq.m.)
LOT FRONTAGE:	192.2m (corner lot)
LOT DEPTH:	222.7m (E to W) and 192.6m (N to S)

BUILDING INFORMATION

BUILDING AREA:	2392sq.m
BUILDING FLOOR AREA:	+/- 19136sq.m
PROPOSED USE:	RESIDENTIAL APARTMENT BUILDING

UNIT BREAKDOWN:		UNIT MIX:
BASEMENT LEVEL:	8 UNITS	0X STUDIO, 2X 1B, 3X 1BD, 3X 2B
LEVEL 1:	21 UNITS	5X STUDIO, 7X 1B, 1X 1BD, 6X 2B, 1X 2BD, 1X 3B
LEVEL 2:	27 UNITS	2X STUDIO, 5X 1B, 10X 1BD, 9X 2B, 1X 2BD
LEVEL 3:	27 UNITS	2X STUDIO, 5X 1B, 10X 1BD, 9X 2B, 1X 2BD
LEVEL 4:	27 UNITS	2X STUDIO, 5X 1B, 10X 1BD, 9X 2B, 1X 2BD
LEVEL 5:	27 UNITS	2X STUDIO, 5X 1B, 10X 1BD, 9X 2B, 1X 2BD
LEVEL 6:	27 UNITS	2X STUDIO, 5X 1B, 10X 1BD, 9X 2B, 1X 2BD
LEVEL 7:	27 UNITS	2X STUDIO, 5X 1B, 10X 1BD, 9X 2B, 1X 2BD
LEVEL 8:	27 UNITS	2X STUDIO, 5X 1B, 10X 1BD, 9X 2B, 1X 2BD
TOTAL	218 UNITS	19X STUDIO, 44X 1B, 74X 1BD, 72X 2B, 8X 2BD, 1X 3B

ZONING TABLE — TD1(2087) & TD2(2087)

CITY OF OTTAWA ZONING BY-LAW No. 2014-292	REQUIRED	PROPOSED / EXISTING
MINIMUM LOT AREA	NO MINIMUM	38, 022sq.m
MINIMUM LOT WIDTH	NO MINIMUM	192.6m
MINIMUM FRONT YARD SETBACK (JAMES NAISMITH)	3m (abutting a lot in a R zone) 2m (abutting RTC) 10m (parking garage not incorp.) 3m (res. use building) 0.5m (all other cases)	Existing : 43.9m
MINIMUM INTERIOR SIDE YARD SETBACK (NORTH AND SOUTH LOT LINES)	NO MINIMUM	Existing north: 67.5m Existing south: 11.3m
MINIMUM REAR YARD SETBACK (WEST LOT LINE)	6m (abutting a lot in a R zone) 2m (abutting RTC) no min. (all other cases) 12m (more than 6 storeys)	Existing: 85.1m
MAXIMUM BUILDING HEIGHT	TD1: 20 metres TD2: 60 metres	TD2 - Existing: 28.5m
HYDRO SETBACK	6m	Existing: 63m
MAXIMUM FLOOR SPACE INDEX	N/A	
MINIMUM DENSITY 196 (2)	Lot greater than 0.125ha: 150 units/hectare or 250 if TD2 Lot 0.125ha in area or less: no min.	PHASE 2 (TD2): 92 units/ hect. PHASE 1+3: 295 units/hect.
VEHICLE PARKING REQUIREMENTS (SCHEDULE 2B, TD ZONE, TABLE 103) By-law 2016-336	21 for visitors NO MINIMUM FOR RESIDENTIAL	128 spaces + 108 temporary (4 ADA + 3 TEMP. ADA) VISITOR: 21 spaces RESIDENTIAL: 215 spaces TOTAL: 236 SPACES
PARKING AREA AND SURROUNDING LANDSCAPING	30% MIN OF 3945.11sq.m (FRONT YARD PARKING = 1183.53sq.m	57.6% = 2272.45sq.m
BICYCLE PARKING SPACES (TABLE 111A)	0.5 space/unit = 109 SPACES	88 int. spaces + 24 ext. spaces (0.5 as per City's) + 40 stacked spaces + 9 existing (ratio: 0.74) TOTAL: 161 SPACES
AMENITY AREA REQUIREMENTS (TABLE 137)	Apartment building, mid-high rise: 6sq.m per dwelling unit = 1308sq.m 50% Communal = 654sq.m	COMMUNAL : 1001 sq.m PRIVATE: 487 sq.m TOTAL = 1488 sq.m
OUTDOOR COMMUNAL SPACE	Lot greater than 1250 sq.m., 2% of total lot area to be provided as outdoor communal space - at grade = 760 sq.m.	PHASE 1: 6536 sq.m.

LEGEND

- EXISTING BUILDING
- EXISTING TERRACES
- EXISTING PEDESTRIAN PATH
- NEW PEDESTRIAN PATH
- NEW PRIVATE TERRACES
- CONVERTED TERRACE
- EXISTING BUILDING ELEMENT TO BE REMOVED
- EXISTING FENCE
- NEW BOARD FENCE REFER TO LANDSCAPE
- LOT LINE
- SETBACK LINE
- LIMIT OF CONSTRUCTION LINE
- FIRE ROUTE
- DESIGNATED BUILDING ENTRANCE / EXIT
- FH — FIRE HYDRANT. REFER TO CIVIL
- FDC — FIRE DEPARTMENT CONNECTION
- *NOTE: 'X'-E INDICATES EXISTING TO REMAIN*
- UP — UTILITY POLE
- OVERHEAD UTILITY WIRES
- L.S. — LIGHT STANDARD
- DC — DEPRESSED CURB
- EXISTING TREE TO BE REMOVED (REFER TO LANDSCAPE DRAWINGS)
- EXISTING TREE TO REMAIN (REFER TO LANDSCAPE DRAWINGS)
- NEW TREE (REFER TO LANDSCAPE DRAWINGS)
- NEW SHRUBS (REFER TO LANDSCAPE DRAWINGS)
- NEW EVERGREEN SHRUB (REFER TO LANDSCAPE DRAWINGS)
- 77.70 — EXISTING GROUND ELEVATION [TO DETERMINE EXISTING AVERAGE GRADE]
- 78.00 — NEW GROUND ELEVATION REFER TO CIVIL

No.	Date	Emis pour / Object
1	2021.12.10	CLIENT REVIEW
2	2021.12.22	CLIENT REVIEW
3	2022.01.21	CLIENT REVIEW
4	2022.02.18	CLIENT REVIEW
5	2022.03.09	COORDINATION
6	2022.04.13	COORDINATION
7	2022.05.17	SPC SUBMISSION
8	**2022.08.19**	**COORDINATION**

Ingénieur / Engineer
(Mécanique & Électricité / Mechanical & Electrical)

Ingénieur / Engineer
(Structure / Structure)

Architecte Architect
(paysagiste / Landscape)

Stantec

Ingénieur / Engineer
(Civil / Civil)

LRJ ENGINEERING / INGÉNIERIE

Client / Client

1600 JAMES NAISMITH LP

Architecte / Architect

Collectif d'architectes / Architects Collective

figurr

www.figurr.ca

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Sceau / Seal

Note:

L'entrepreneur doit vérifier toutes les dimensions et informations sur le site et aviser immédiatement l'architecte de toutes erreurs ou omissions.

Contractor shall verify all information and dimensions on site and immediately report any errors or omissions to the architect.

Projet / Project

8 STOREY APARTMENT BUILDING CONVERSION

1600 JAMES NAISMITH LP

Titre / Title

SITE PLAN - PHASE 1

Dessiné par / Drawn by KM, SC, GCG	No. projet / Project number *2164*	
Vérifié par / Verified by RC	No. dessin / Drawing number	Révision / Revision 08
Échelle / Scale *AS SHOWN*		
Date de création du dessin / Drawing creation date 2021/12/10		

A106

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
V-16770

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

24 January 2022 - 11:04 AM

PLAN OF TOPOGRAPHIC SURVEY
PART OF LOTS 21 & 22 CONCESSION 2 (OTTAWA FRONT)
(GEOGRAPHIC TOWNSHIP OF GLOUCESTER)

CITY OF OTTAWA

Scale 1:500

10 0 10 20 30 METRES

Stantec Geomatics Ltd.
ONTARIO LAND SURVEYORS

METRIC CONVERSION

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

BEARING NOTE

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

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

FOR BEARING COMPARISONS, A ROTATION OF 0° 0' 10" COUNTER-CLOCKWISE HAS BEEN APPLIED TO BEARINGS ON PLAN P1, P2 & P3.

ELEVATION NOTE

ELEVATIONS SHOWN HEREON ARE GEODETIC (CGVD-1928:1978) AND ARE DERIVED FROM A SITE BENCHMARK AS SHOWN ON A PLAN BY SG DATED OCTOBER 3, 2014.

LEGEND

■	DENOTES	FOUND MONUMENTS
□	"	SET MONUMENTS
IB	"	IRON BAR
IB⊕	"	ROUND IRON BAR
SIB	"	STANDARD IRON BAR
SSIB	"	SHORT STANDARD IRON BAR
CC	"	CUT CROSS
CP	"	CONCRETE PIN
WIT	"	WITNESS
PIN	"	PROPERTY IDENTIFICATION NUMBER
MEAS	"	MEASURED
INST	"	INSTRUMENT
PROP	"	PROPORTIONED
OU	"	ORIGIN UNKNOWN
SG	"	STANTEC GEOMATICS LTD.
P1	"	4R-16053
P2	"	4R-16752
P3	"	4R-33739
SRW	"	STONE RETAINING WALL

SURVEYOR'S CERTIFICATE

I CERTIFY THAT :

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON THE 10th DAY OF JANUARY, 2022.

DATE

FRANCIS LAU
ONTARIO LAND SURVEYOR

REVISION NOTE:

PLAN UPDATED TO ADD ADDITIONAL SITE INFORMATION AND ELEVATIONS PER FIELD SURVEY DATED JANUARY 10, 2022.

Jan 26, 2022
DATE

FRANCIS LAU
ONTARIO LAND SURVEYOR

SRO MAP COORD.=5032456.85, 374643.88

Stantec Geomatics Ltd.
CANADA LANDS SURVEYORS
ONTARIO LAND SURVEYORS
1331 CLYDE AVENUE, SUITE 400
OTTAWA, ONTARIO, K2C 3G4
TEL 613.722.4420
stantec.com

DRAWN: TMT | CHECKED: CK | PM: KJ | FIELD: ES | PROJECT No.: 161614423-110

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

W:\active\161614423\prof\drawing\161614423-110-dft-r3d.dwg