Stormwater Management Report and Servicing Brief

Apartment Building
161 Hinchey Avenue
Ottawa, Ontario

Prepared for:

Praveen Muppalla.
450 Creekview Way
Ottawa, ON, K1Y 1L5

Attention: Mr. Praveen Muppalla

LRL File No.: 200295

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

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1 INTRODUCTION AND SITE DESCRIPTION

LRL Associates Ltd. was retained by Praveen Muppalla to complete a Stormwater Management Analysis and Servicing Brief for a proposed four (4) storey residential building located at 161 Hinchey Avenue in Ottawa, Ontario. The property is legally described as Lot 9, Registered Plan 35, Concession 1, City Ward 15 (Kitchissippi) and is zoned R4S. The location of the proposed development can be viewed in **Figure 1** below.

Figure 1: Arial View of Proposed Development

The site to be developed is rectangular shape with a frontage of approximately 15 m along Hinchey Avenue and a depth of approximately 30 m, and a surface area of approximately **0.046 ha.**

The topographic survey of the property was completed by Annis, O'Sullivan, Vollebekk Ltd. (Ontario Land Surveyors). Two site benchmarks were established during the survey for future construction use. These benchmarks, cross-cut on sidewalk along Hinchey Avenue with elevation 63.51 (benchmark No. 1) and 63.75 (benchmark No.2), are shown on the ***Legal Survey*** included in ***Drawings/Figures***.

The development proposes a new four (4) storey residential building consisting of 15 units. Vehicular parking is not proposed on site, however provision for bicycle parking (8 spaces bicycle

storage room) is proposed. For additional information, refer to a copy of the ***Site Plan (SP-01)*** included in ***Drawings/Figures***.

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 considerations, LRL Associates Ltd. should be advised to review the report recommendations.

2 Existing Site and Drainage Description

The subject site measures ***0.046 ha*** and currently consists of a single 2-storey residential building and a paved driveway. Elevations of existing site range between 63.99 m at northeast corner to 63.59 m at the west side of the site.

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-way:

Hinchey Avenue:

- 150 mm diameter PVC watermain
- 250 mm diameter PVC sanitary sewer
- 375 mm diameter PVC 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 1W water distribution network pressure zone. The subject property is located to the east of an existing 150 mm dia. watermain along Hinchey Avenue. There are currently three (3) existing fire hydrants near the property; one within 75m and two within 150 m from proposed building entrance. Refer to ***Appendix B*** for the location of fire hydrants.

5.2 Water Supply Servicing Design

The subject property is proposed to be serviced via a 150 mm dia. service lateral connected to the 150 mm dia. watermain located within Hinchey Avenue. Refer to Site Servicing Plan C.401 in ***Appendix E*** for servicing layout.

Table 1 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
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 nine (9) studio/1-bedroom apartments, and six (6) 2-bedroom units. Based on the City of Ottawa Design guidelines for population projection, this translates to approximately

25.2 residents. Table 2 below summarizes the proposed development as interpreted using table 4.1 of the City of Ottawa Design Guidelines.

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

Proposed Unit type	Persons Per Unit	Number of Units	Population
Studio/1 Bedroom	1.4	9	12.6
2 Bedroom Apartment	2.1	6	12.6
		Total Residential Population	25.2

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

Where:

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

q = average water consumption (L/capita/day)
P = design population (capita)
M = Peak factor
Using a calculated Maximum Day Factor and Peak Hour factor of *10.3* and *15.5* respectively as per Table 3-3 in the *MOE Design Guidelines*, anticipated demands were calculated as follows:

- Average daily domestic water demand is **0.08** L/s,
- Maximum daily demand is **0.84** L/s, and
- Maximum hourly demand is **13.06** L/s.

Based on maximum hourly rate of 13.06 L/s a minimum of 100 mm dia. servicing is required. However, assuming the presence of sprinklers, it is recommended to upsize the water servicing to 150 mm. 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 boundary conditions for the proposed development.

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

Design Parameter	Anticipated Demand (L/min)	Boundary Conditions @ Hinchey Avenue* (m H2O / kPa)
Average Daily Demand	4.9	115.2 / 505.2
Max Day + Fire Flow (per FUS)	50.5 + 9,000	93.0 / 287.6
Peak Hour	783.8	106.5 / 419.9
**Assumed Ground elevation at connection point = 63.65 m.*		
Water demand calculation per City of Ottawa Water Design guidelines. ***See Appendix B*** *for details.*		

Calculated average day demand has increased by 0.02 L/s since boundary conditions were requested. As indicated in Table 3, pressures in all scenarios meet the required pressure range stated in Table 1 as per City of Ottawa Design Guidelines. Refer to ***Appendix B*** for Boundary Conditions.

The estimated fire flow for the proposed buildings was calculated in accordance with *ISTB-2018-02*. The following parameters were provided by the Architect.

- Type of construction – Wood Frame Construction;
- Occupancy type – Limited Combustibility; and
- Sprinkler Protection – Standard Sprinkler System.

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

There are three (3) existing fire hydrants in close proximity to the proposed buildings 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)
Proposed 4 Storey Building	9,000	1	2	(1 x 5678) + (2 x 3785) = 13,248

The total available fire flow from contributing hydrants is equal to **13,248 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

There is an existing 250 mm dia. sanitary sewer within Hinchey Avenue across the subject site. The wastewater flow is ultimately conveyed to the West Nepean Collector trunk sewer.

The pre-development conditions of the lot were reviewed to calculate a total wet wastewater flow of **0.09 L/s** based on assumed conditions of 2 semi-detached residential dwellings.

The post development total flow was calculated to be is **0.34 L/s** as a result of proposed residential population and a small portion of infiltration. Refer to ***Appendix C*** for further information on the calculated sanitary flows. The post development conditions increase existing wastewater flow by approximately **0.25 L/s** as a result of additional residential population from pre-development conditions.

Based on existing as-built, refer to ***Drawings/Figures*** for as-built information, the existing 250mm dia. sanitary sewer within Hinchey Avenue is sloped at 0.70% and is calculated to have a maximum capacity of **49.75 L/s**. The proposed increase in total wastewater flow of **0.25 L/s** represents less than 1% of existing maximum capacity. Therefore, it is anticipated that the existing local sewer network has sufficient capacity to accommodate the proposed development.

6.2 Sanitary Sewer Servicing Design

The proposed development will be serviced via a 150 mm dia. sanitary service lateral which will connect to the existing 250mm dia. sanitary sewer located within Hinchey Avenue. Refer to LRL drawing C.401 for the proposed sanitary servicing.

The parameters used to calculate the anticipated sanitary flows are:; residential average population per unit of 1.4 person for single units and 2.1 persons for two-bedroom units, a residential average daily flow of 280 L/p/day, a residential peaking factor of 4.0 and a total infiltration rate of 0.33 L/s/ha. Based on these parameters and the total site area of 0.046 ha, the total wet anticipated sanitary flow was estimated to **0.34 L/s**. Refer to ***Appendix C*** for the site sanitary sewer design sheet.

7 STORMWATER MANAGEMENT

7.1 Existing Stormwater Infrastructure

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, the stormwater runoff would flow uncontrolled overland to the west side of the site towards Hinchey Ave. right-of-way. There is an existing 375 mm diameter storm sewer within Hinchey Avenue right-of-way. 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 (SWMPD Manual).

7.2.1 Water Quality

The subject property lies within the Ottawa River West sub-watershed and is therefore subject to review by the Rideau Valley Conservation Authority (RVCA). It was determined that no further treatment 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, correspondence included in ***Appendix A***, the following stormwater management requirements were identified for the subject site:

- Meet an allowable release rate based on the existing Rational Method Coefficient no greater than 0.50, employing the City of Ottawa IDF parameters for a 5-year storm with a calculated time of concentration equal to or greater than 10 minutes;

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

The allowable release rate for the subject site was calculated to be **6.63 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 roof drains restricting the flow leaving the rooftop. Storage required as a result of quantity control will be accomplished through rooftop storage.

The subject site is proposed to be serviced via a 250 mm diameter perforated subdrain and 250 mm diameter storm sewers that outlet to the existing 375 mm diameter storm sewer within Hinchey Avenue. The proposed site storm sewer and stormwater management system are shown on drawing C.401 and detailed calculations, including the design sheet, can be found in ***Appendix D***.

The existing site is delineated by catchments EWS-01 which currently drains uncontrolled towards the front of the property.

The site has been analyzed and post-development watersheds have been allocated. Watershed WS-01 (0.023 ha), consisting of grass and pavers, will flow uncontrolled. The runoff will be conveyed to the Hinchey Avenue right-of-way, as per the grading plan C301.

Runoff from the roof, delineated by Watershed WS-02 (0.023 ha), will be captured by the proposed roof drains. Stormwater captured on the rooftop will be controlled by the roof drains and conveyed to the storm sewer network.

Table 5 below summarizes post-development drainage areas. Calculations can be seen in ***Appendix D.***

Table 5: ***Drainage Areas***

Drainage Area Name	Area	Weighted Runoff Coefficient	100 Year Weighted Runoff Coefficient (25% increase)
WS-01 (uncontrolled)	0.023	0.63	0.79
WS-02 (controlled)	0.023	0.90	1.0

Rooftop detention of stormwater is provided with outlet control through two (2) proposed roof drains. The building's rooftop was analysed and divided into two (2) ponding areas. A total of two (2) roof drains, each of which is restricting the discharge rate to **0.63 L/s**, resulting in a total release rate from the roof of **1.26 L/s** is proposed. The roof drain flow control device has been selected to provide a flow rate of **0.63 L/s** at a maximum flow depth of **0.15 m**. Proposed roof drains are to be Watts RD-100-A with a closed exposed weir opening. See ***Appendix D*** for more information about the selected roof drain.

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 **9.00 m³** of rooftop storage is available in the 100-year event. For additional details on the calculations for available area of rooftop storage, refer to ***Appendix D***.

Table 6 below summarize the release rates and storage volumes required to meet the allowable release rate of **6.63 L/s** for 100-year flow rates.

Table 6: ***Stormwater Release Rate & Storage Volume Summary (100 Year)***

Catchment Area	Drainage Area (ha)	100-year Release Rate (L/s)	100-Year Required Storage (m^3)	Total Available Storage (m^3)
WS-01 (Un-controlled)	0.023	9.13	0	0
WS-02 (Roof Controlled)	0.023	1.26	8.26	9.00
TOTAL	**0.046**	**10.39**	**8.26**	**9.00**

All overland stormwater captured will ultimately be conveyed, via underground storm sewers, to the City storm sewer running along 161 Hinchey Avenue at a maximum release rate of **10.39 L/s** (calculated controlled and uncontrolled flow). As per coordination with City of Ottawa staff, the subject site was permitted to exceed the specified allowable release rate by **3.76 L/s** in order to avoid the use of small inlet control devices that may cause maintenance issues.

Therefore, it is calculated that a total of **8.26 m^3** of rooftop storage will be required to attenuate flows to the release rate of **10.39 L/s**. The project runoff exceeding the allowable release rate will be stored on-site via rooftop ponding at the building rooftop. The 100-year maximum ponding extents can be found on drawing "C601 – Stormwater Management Plan" of ***Appendix E***.

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 161 Hinchey Avenue presents the rationale and details for the servicing requirements for the subject property. In accordance with the report objectives, the servicing requirements for the development are summarized below:

Water Service

- The maximum required fire flow was calculated at **9,000 L/min** using the FUS method.
- There are three (3) existing fire hydrants available to service the proposed development which will provide a combined fire flow of **13,248 L/min** to the site.
- The new development/expansion will be serviced with a new 150 mm dia. water service to be connected to the existing 150 mm dia. watermain within Hinchey Avenue.
- Boundary conditions received from the City of Ottawa indicate that sufficient pressure is available to service the proposed site.

Sanitary Service

- The anticipated sanitary flow from the proposed development is **0.34 L/s.**
- The proposed development will be serviced by a 150 mm dia. sanitary service that connects to the existing 250 mm dia. sanitary sewer within Hinchey Avenue.

Stormwater Management

- Stormwater quality control is not required as per consultation with RVCA.
- As per coordination with City of Ottawa staff, the stormwater release rates from the proposed development will exceed the calculated allowable release rate of **6.63 L/s,** by an additional **3.76 L/s,** to discharge at a maximum release rate of **10.39 L/s** during 100-yr storm event.
- Stormwater quantity control objectives will be met through on-site storm water ponding on the roof.

10 Report Conditions and Limitations

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

Prepared by:
LRL Associates Ltd.

Amr Salem
Civil Designer

Mohan Basnet, P.Eng.
Civil Engineer

APPENDIX A

Pre-consultation / Correspondence

DEVELOPMENT SERVICING STUDY CHECKLIST	
Project #: 200295	
Date: 2020-07-30	
4.1 General Content	
Executive Summary (for larger reports only).	N/A
Date and revision number of the report.	Report Cover Hseet
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.	N/A
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 ◦Property limits including bearings and dimensions ◦Existing and proposed structures and parking areas ◦Easements, road widening and rights-of-way ◦Adjacent street names	C401

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

161 Hinchey Avenue – Infrastructure Notes

Available Infrastructure:

Sanitary: 250mm PVC (Install 2000)
Storm: 375mm Conc (Install 2000)
Water: 150mm PVC (Install 2000)

Water Boundary Conditions:

Will be provided at request of consultant. Requests must include the location of the service and the expected loads required by the proposed development. Please provide the following and submit Fire Flow Calculation Sheet per FUS method with the request:

- Location of service
- Type of development and amount of required fire flow (per FUS method – include FUS calculation sheet with request)
- Average Daily Demand (l/s)
- Maximum Hourly Demand (l/s)
- Maximum Daily Demand (l/s)
- Water Supply Redundancy – Fire Flow:
  Applicant to ensure that a second service with an inline valve chamber be provided where the average daily demand exceeds 50 m^3 / day (0.5787 l/s per day)

Water services larger than 19 mm require a Water Data Card. Please complete card and submit.

Stormwater Management:

- Coefficient (C) of runoff determined **as per existing conditions** but in no case more than 0.5
- TC = To be calculated, minimum 10 minutes
- Any storm events greater than 5 year, up to 100 year, and including 100-year storm event must be detained on site.
- Foundation drains are to be independently connected to sewer main unless being pumped with appropriate back up power, sufficient sized pump and back flow prevention.
- Roof drains are to be connected downstream of any incorporated ICD within the SWM system.

Stormwater management criteria (Quality Control)

Include a section in the SWM report concerning quality control requirements. It is the consultant's responsibility to check with the relevant Conservation Authority for quality control issues and include this information in the SWM report.

Phase I and Phase II ESA:

- Phase I ESA is required; Phase II ESA may be required depending on the results of the Phase I ESA. Phase I ESA must include an EcoLog ERIS Report.
- Phase I ESA and Phase II ESAs must conform to clause 4.8.4 of the Official Plan that requires that development applications conform to Ontario Regulation 153/04.

Required Studies

- Stormwater Management Report
- Site Servicing Study
- Geotechnical Study
- Phase I ESA
- Phase II ESA (depends on outcome of Phase I)

Required Plans

- Site Servicing Plan
- Grade Control and Drainage Plan
- Erosion and Sediment Control Plan (Can be combined with grading plan)

Relevant information

1. The Servicing Study Guidelines for Development Applications are available at the following address: https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans#servicing-study-guidelines-development-applications
2. Servicing and site works shall be in accordance with the following documents:
   - ⇨ Ottawa Sewer Design Guidelines (October 2012)
   - ⇨ Ottawa Design Guidelines – Water Distribution (2010)
   - ⇨ Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)
   - ⇨ City of Ottawa Slope Stability Guidelines for Development Applications (revised 2012)
   - ⇨ City of Ottawa Environmental Noise Control Guidelines (January, 2016)
   - ⇨ City of Ottawa Park and Pathway Development Manual (2012)
   - ⇨ City of Ottawa Accessibility Design Standards (2012)
   - ⇨ Ottawa Standard Tender Documents (latest version)
   - ⇨ Ontario Provincial Standards for Roads & Public Works (2013)
3. Record drawings and utility plans are also available for purchase from the City (Contact the City's Information Centre by email at InformationCentre@ottawa.ca or by phone at (613) 580-2424 x.44455).
4. Any proposed work in utility easements requires written consent of easement owner.

Amr Salem

From: Jamie Batchelor <jamie.batchelor@rvca.ca>
Sent: July 9, 2020 11:40 AM
To: Amr Salem
Cc: Mohan Basnet; Maxime Longtin
Subject: RE: 161 Hinchey Avenue - Stormwater Quality Controls

Follow Up Flag: Follow up
Flag Status: Flagged

Good Morning Amr,

Given that the site will have no surface parking areas proposed, no additional water quality control will be required save and except best management practices.

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: Monday, July 6, 2020 2:52 PM
To: Jamie Batchelor <jamie.batchelor@rvca.ca>
Cc: Mohan Basnet <mbasnet@lrl.ca>; Maxime Longtin <mlongtin@lrl.ca>
Subject: 161 Hinchey Avenue - Stormwater Quality Controls

Good morning Jamie,

I wanted to consult with you regarding a residential development we are working on located at 161 Hinchey Avenue.

Existing runoff from the site drains into municipal sewer along Hinchey Ave and travels approx. 610m before discharging into the Ottawa River.

The development proposes a residential 4-storey building, with no surface parking. The site will be landscape with stormwater coming primarily from rooftop and landscaped rear yard. *Refer to draft site plan attached for reference.*

Existing site area consists of an existing residential building and paved area.

Please provide your input about quality controls that may be required for this site.

Thank you,

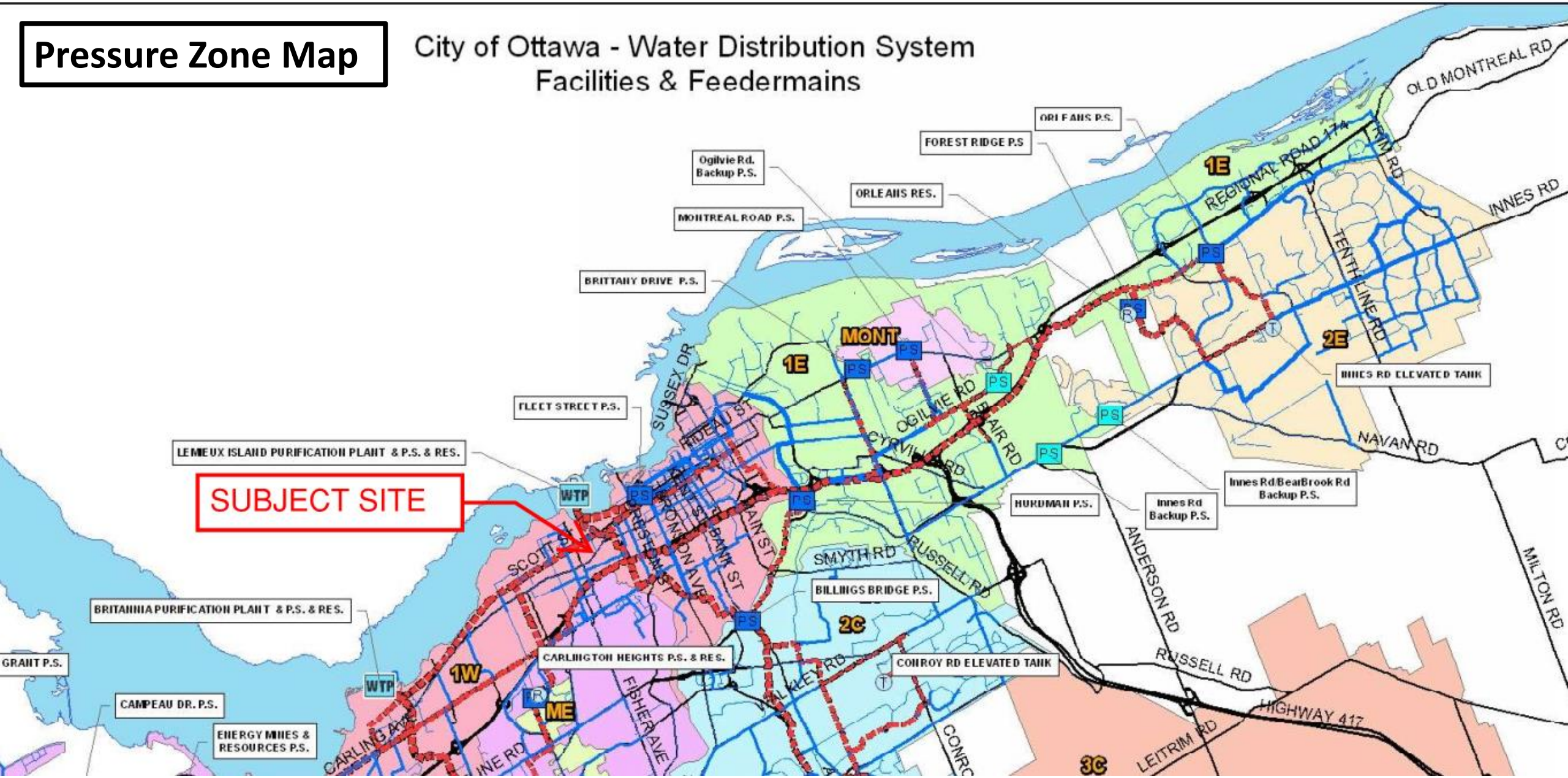
Amr Salem
Civil Designer
LRL Associates Ltd.
5430 Canotek Road
Ottawa, Ontario K1J 9G2
T (613) 842-3434 or (877) 632-5664 ext 248
F (613) 842-4338
E asalem@lrl.ca
W www.lrl.ca

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

Pressure Zone Map



Water Supply Calculations

LRL File No.	200295
Date	September 21, 2020
Prepared by	Amr Salem

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

Unit Type	Persons Per Unit	Number of Units	Population
1 Bedroom Apartment	1.4	9	12.6
2 Bedroom Apartment	2.1	6	12.6
	Total	**15**	**25.2**

Average Water Consumption Rate	280	L/c/d		
Average Day Demand	**7,056**	**L/d**	**0.08**	**L/s**
Maximum Day Factor	10.3		(MOE Table 3-3)	
Maximum Daily Demand	**72,654**	**L/d**	**0.84**	**L/s**
Peak Hour Factor	15.5		(MOE Table 3-3)	
Maximum Hour Demand	**1,128,733**	**L/d**	**13.06**	**L/s**

Water Service Pipe Sizing

Q = VA

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

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

Minimum pipe diameter (d) =	$(4Q/\pi V)^{1/2}$	
=	0.096	m
=	96	mm
Proposed pipe diameter (d) =	**150**	mm
=	**6**	Inches

Fire Flow Calculations

LRL File No. 200295
Date July 14, 2020
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	Ordinary Construction	1		
			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					1,104	m^2	
3	Obtain fire flow before reductions	Required fire flow	Fire Flow = 220 x C x $A^{0.5}$				L/min	7,310
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	6,213
			Limited combustible	-15%				
			Combustible	0%				
			Free burning	15%				
			Rapid burning	25%				
5	Choose reduction for sprinklers	Sprinkler reduction	Full automatic sprinklers	-30%	False	0%	L/min	5,592
			Water supply is standard for both the system and fire department hose lines	-10%	True	-10%		
			Fully supervised system	-10%	False	0%		
6	Choose separation	Exposure distance between units	North side	3.1 to 10m	20%		L/min	9,227
			East side	20.1 to 30m	10%			
			South side	3.1 to 10m	20%			
			West side	10.1 to 20m	15%	65%		
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 Locations Figure

Table 18.5.4.3 Maximum fire flow hydrant capacity

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: Fawzi, Mohammed <mohammed.fawzi@ottawa.ca>
Sent: July 17, 2020 1:52 PM
To: Amr Salem
Cc: Mohan Basnet
Subject: RE: 200295 - 161 Hinchey Avenue Boundary Conditions Request
Attachments: 161 Hinchey July 2020.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Good Afternoon Amr,

The following are boundary conditions, HGL, for hydraulic analysis at 161 Hinchey (zone 1W) assumed to be connected to the 152mm on Hinchey (see attached PDF for location).

Minimum HGL = 106.5m

Maximum HGL = 115.2m

MaxDay + FireFlow (150 L/s) = 93.0m

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.

Thank you.

Best Regards,

Mohammed Fawzi, E.I.T.
Engineering Intern
Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique
Development Review - Central Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 20120, Mohammed.Fawzi@ottawa.ca

From: Fawzi, Mohammed
Sent: July 17, 2020 11:23 AM

To: Amr Salem <asalem@lrl.ca>
Cc: Mohan Basnet <mbasnet@lrl.ca>
Subject: RE: 200295 - 161 Hinchey Avenue Boundary Conditions Request

Hi Amr,

Thank you. The request has been sent.

Best Regards,

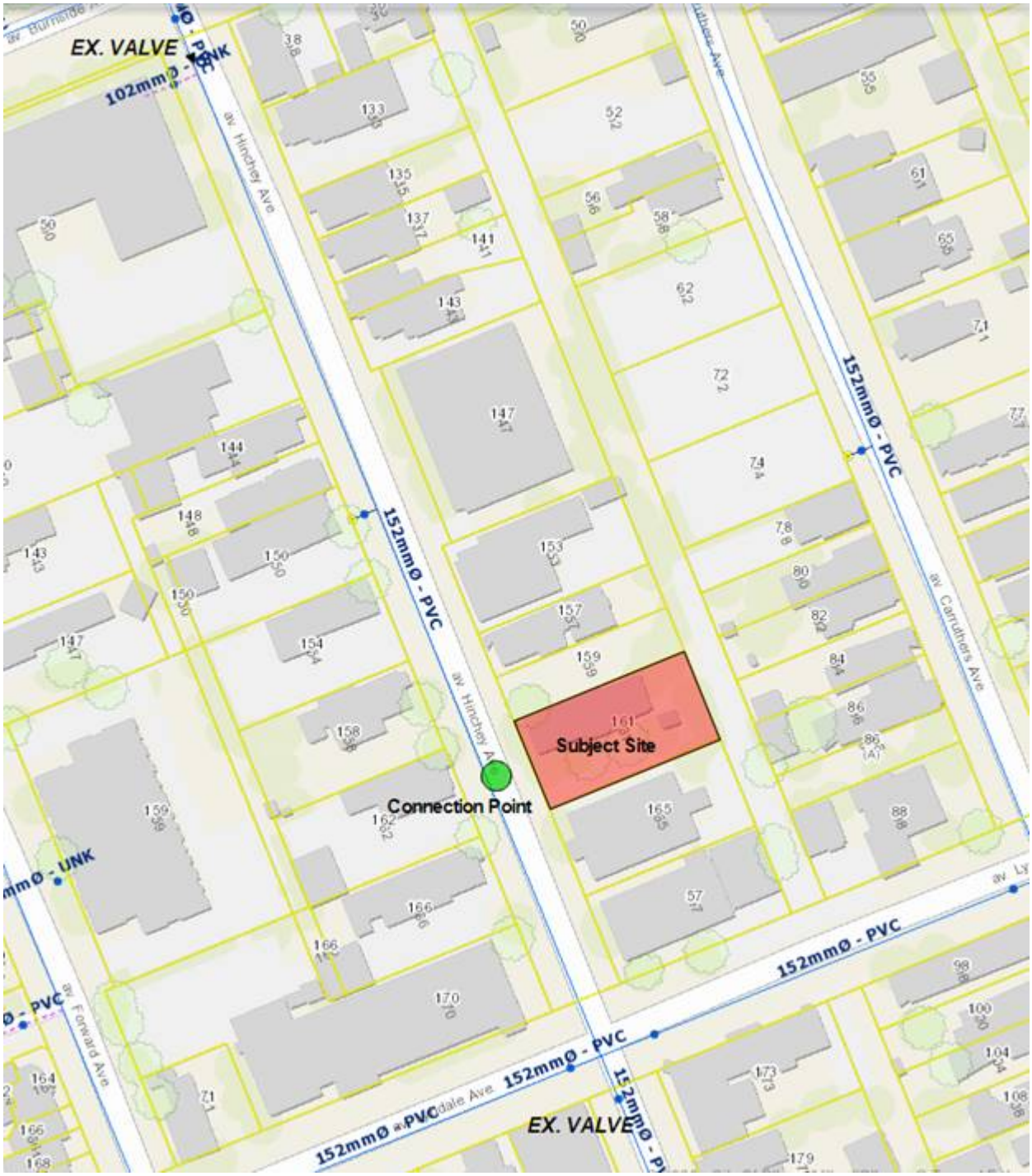
Mohammed Fawzi, E.I.T.
Engineering Intern
Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique
Development Review - Central Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 20120, Mohammed.Fawzi@ottawa.ca

From: Amr Salem <asalem@lrl.ca>
Sent: July 15, 2020 1:36 PM
To: Fawzi, Mohammed <mohammed.fawzi@ottawa.ca>
Cc: Mohan Basnet <mbasnet@lrl.ca>
Subject: 200295 - 161 Hinchey Avenue Boundary Conditions Request

Good afternoon Mohammed,

We would like to kindly request boundary conditions for the proposed development at *161 Hinchey Avenue* using the following proposed development demands:

- Location of Service / Street Number: **161 Hinchey Ave**
- Type of development: **one 4-storey residential building consisting of a total of 12 units.**
- Proposed Connection Point: **a single connection the 150mm watermain along Hinchey Avenue .**



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

	L/min	L/s
Avg. Daily	3.6	0.06
Max Day + FUS	42.0 + 9,000	0.70 + 150
Peak Hour	747.0	12.45

Please contact me if you have any questions.

Thanks,

Amr Salem
Civil Designer
LRL Associates Ltd.
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

'

'


Boundary Condition for 161 Hinchey
50
144
148
143
150
147
150
154
158
159
162
166
166
170
147
153
157
159
161
165
57
72
74
78
80
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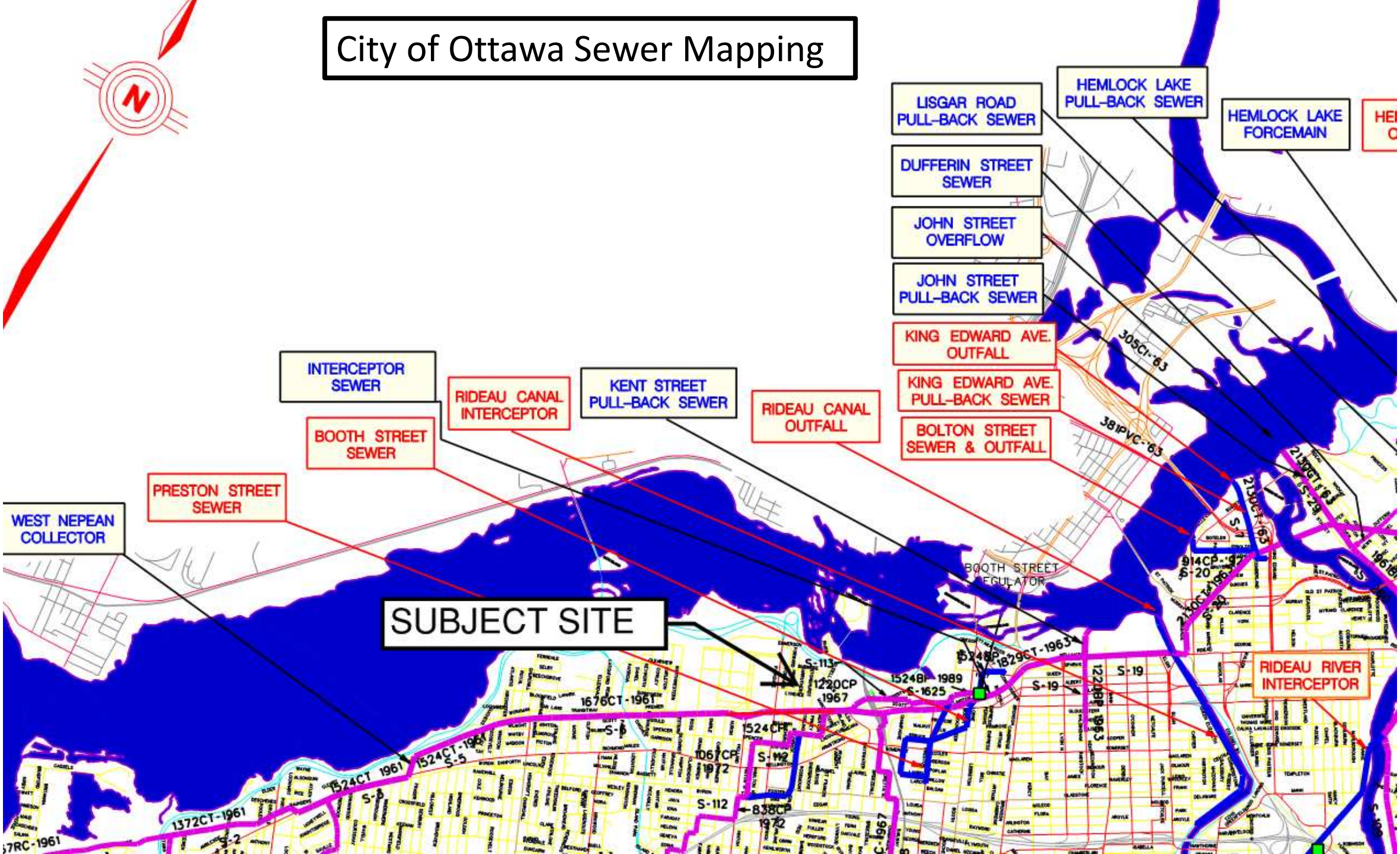
86
88
71
77
79
83
85
87
89
91
99
98
100
104
108
110
173
179
60
62
152
HINCHEY AVE
CARRUTHERS AVE
LYNDALE AVE
N
Legend
PRIVATE
PUBLIC

APPENDIX C

Wastewater Collection Calculations


City of Ottawa Sewer Mapping
N
LISGAR ROAD PULL-BACK SEWER
HEMLOCK LAKE PULL-BACK SEWER
HEMLOCK LAKE FORCEMAIN
DUFFERIN STREET SEWER
JOHN STREET OVERFLOW
JOHN STREET PULL-BACK SEWER
KING EDWARD AVE. OUTFALL
KING EDWARD AVE. PULL-BACK SEWER
BOLTON STREET SEWER & OUTFALL
INTERCEPTOR SEWER
RIDEAU CANAL INTERCEPTOR
KENT STREET PULL-BACK SEWER
RIDEAU CANAL OUTFALL
BOOTH STREET SEWER
PRESTON STREET SEWER
WEST NEPEAN COLLECTOR
SUBJECT SITE
RIDEAU RIVER INTERCEPTOR
BOOTH STREET REGULATOR
305CT-63
381PVC-63
1524CT 1961
1372CT-1961
1676CT-1961
1524CT-1963
1524CP 1989
1829CT-1963
1220CP 1967
1067CP 1972
838CP 1972
914CP-1963

LRL File No. 200295
Project: Apartment Building
Location: 161 Hinchey Avenue
Date: April 19, 2021

Sanitary Design Parameters

Average Daily Flow = 280 L/p/day
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		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)
SITE	PROP. BLDG	EX. SAN	0.046	25.2	0.05	25.2	4.0	0.33	0.000	0.000	0.00	0.00	7.0	0.0	0.0	0.00	0.05	0.05	0.02	0.34	7.4	150	2.00%	PVC	21.54	1.22

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

Designed: A.S.	PROJECT: Apartment Building		
Checked: M.B.	LOCATION: 161 Hinchey Avenue		
Dwg. Reference: C.401	File Ref.: 200295	Date: 2021-04-19	Sheet No. 1 of 1

APPENDIX D

Stormwater Management Calculations
Watts Roof Drain Specification

LRL Associates Ltd.
Storm Watershed Summary

LRL File No.	200295
Project:	Apartment Building
Location:	161 Hinchey Ave
Date:	July 6, 2021
Designed:	Amr Salem
Drawing Reference:	C701/C702

Pre-Development Catchments

WATERSHED	C = 0.2	C = 0.70	C = 0.90	Total Area (m^2)	Total Area (ha)	Combined C
EWS-01	226.0	0.0	232.0	458.0	0.0458	0.55
TOTAL	**226.0**	**0.0**	**232.0**	**458.0**	**0.0458**	**0.55**

Post-Development Catchments

WATERSHED	C = 0.20	C = 0.70	C = 0.90	Total Area (m^2)	Total Area (ha)	Combined C
WS-01(UNCONTROLLED)	88.0	5.0	140.0	233.0	0.023	0.63
WS-02 (CONTROLLED)	0.0	0.0	225.0	225.0	0.023	0.90
TOTAL	**88.0**	**5.0**	**365.0**	**458.0**	**0.0458**	**0.76**

LRL File No. 200295
Project: Apartment Building
Location: 161 Hinchey Ave
Date: July 6, 2021
Designed: Amr Salem
Drawing Ref.: C.601

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 = 0.046 ha

Allowable Release Rate= 6.63 L/s

Post-development Stormwater Management

					ΣR_{max}	ΣR_{min}
	Total Site Area =	0.046	ha	ΣR_C	0.76	0.95
Controlled	WS-02 (Roof)	0.023	ha	R_C	0.90	1.00
	Total Controlled =	0.023	ha	ΣR_C	0.90	1.00
Un-controlled	WS-01	0.023	ha	R_C	0.63	0.79
	Total Un-Controlled =	0.023	ha	ΣR_C	0.63	0.79

Post-development Stormwater Management (Uncontrolled Catchment WS-01)

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	9.13	0.00	9.13

Post-development Stormwater Management (WS-02 On Roof)

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	11.17	5.95	1.26	0.00	1.26
15	142.9	8.94	6.91	1.26	0.00	1.26
20	120.0	7.50	7.49	1.26	0.00	1.26
25	103.8	6.50	7.85	1.26	0.00	1.26
30	91.9	5.75	8.08	1.26	0.00	1.26
35	82.6	5.17	8.20	1.26	0.00	1.26
40	75.1	4.70	8.26	1.26	0.00	1.26
45	69.1	4.32	8.26	1.26	0.00	1.26
50	64.0	4.00	8.22	1.26	0.00	1.26
60	55.9	3.50	8.05	1.26	0.00	1.26
70	49.8	3.11	7.79	1.26	0.00	1.26
80	45.0	2.81	7.46	1.26	0.00	1.26
90	41.1	2.57	7.08	1.26	0.00	1.26
100	37.9	2.37	6.67	1.26	0.00	1.26
110	35.2	2.20	6.22	1.26	0.00	1.26
120	32.9	2.06	5.74	1.26	0.00	1.26

$V = (1/w)*h/3 = Ah/3$

Summary of Roof Storage

Maximum Required Roof Storage (100 Year) =	8.26	m^3		
Watts Roof Drain Discharge =	0.0042	L/s/mm		
Proposed Head =	150	mm	*An Emergency overflow scupper is provided above this height.	
Control Flow/Drain =	0.63	L/s		
Number of Roof Drains =	2			
Total Flow from Roof Drain =	1.26	L/s		
Total Roof Surface =	225	m^2		
Effective Roof Surface =	180	m^2	80	(% of total roof surface)
Available Roof Storage =	**9.00**	m^3		
Roof Drain Model =	**Watts Roof Drain with Adjustable Flow Setting (Watts RD-100 Weir Opening = Closed)**			

Total Storage Required = 8.26 m^3
Available Roof Storage = 9.00 m^3 refer to LRL Plan C.601

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-01	0.023	9.13	0	0
WS-02 (Roof Controls)	0.023	1.26	8.26	9.00
TOTAL	0.046	10.39	8.26	9.00

*Uncontrolled flow exceeding allowable release rate has been approved by City of Ottawa

LRL File No. 200295
Project: Apartment Building
Location: 161 Hinchey Ave
Date: July 6, 2021
Designed: Amr Salem
Drawing Ref.: C.601

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 = 0.046 ha

Allowable Release Rate= 6.53 L/s

Post-development Stormwater Management

					ΣR_{max}	ΣR_{min}
	Total Site Area =	0.046	ha	ΣR_C	0.76	0.95
Controlled	WS-02 (Roof)	0.023	ha	R_C	0.90	1.00
	Total Controlled =	0.023	ha	ΣR_C	0.90	1.00
Un-controlled	WS-01	0.023	ha	R_C	0.63	0.79
	Total Un-Controlled =	0.023	ha	ΣR_C	0.63	0.79

Post-development Stormwater Management (Uncontrolled Catchment WS-01)

5 Year Storm Event:

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

Time (min)	Intensity (mm/hr)	Uncontrolled Runoff (L/s)	Controlled Release Rate Constant (L/s)	Total Release Rate (L/s)
10	104.2	4.26	0.00	4.26

Post-development Stormwater Management (WS-02 On Roof)

5 Year Storm Event:

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

		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	104.2	5.87	2.76	1.26	0.00	1.26
15	83.6	4.70	3.10	1.26	0.00	1.26
20	70.3	3.95	3.23	1.26	0.00	1.26
25	60.9	3.43	3.25	1.26	0.00	1.26
30	53.9	3.04	3.20	1.26	0.00	1.26
35	48.5	2.73	3.09	1.26	0.00	1.26
40	44.2	2.49	2.95	1.26	0.00	1.26
45	40.6	2.29	2.77	1.26	0.00	1.26
50	37.7	2.12	2.58	1.26	0.00	1.26
60	32.9	1.85	2.14	1.26	0.00	1.26
70	29.4	1.65	1.65	1.26	0.00	1.26
80	26.6	1.50	1.13	1.26	0.00	1.26
90	24.3	1.37	0.58	1.26	0.00	1.26
100	22.4	1.26	0.00	1.26	0.00	1.26
110	20.8	1.17	0.00	1.26	0.00	1.26
120	19.5	1.10	0.00	1.26	0.00	1.26

Total Storage Required = 3.25 m^3
Available Roof Storage = 9.00 m^3 refer to LRL Plan C.601

Summary of release Rates and Storage Volumes

Catchment Area	Drainage Area (ha)	5-year Release Rate (L/s)	5-Year Required Storage (m^3)	Total Available Storage (m^3)
WS-01	0.023	4.26	0	0
WS-02 (Roof Controls)	0.023	1.26	3.25	9.00
TOTAL	0.046	5.52	3.25	9.00

LRL Associates Ltd.

Storm Design Sheet

LRL File No.	200295
Project:	Apartment Building
Location:	161 Hinchey Ave
Date:	July 9, 2021
Designed:	Amr Salem
Drawing Reference:	C.401

Storm Design Parameters

Rational Method Q = 2.78CIA

Q = Peak flow in litres per second (L/s)
A = Drainage area in hectares (ha)
C = Runoff coefficient
I = Rainfall intensity (mm/hr)

Runoff Coefficient (C)

Grass	0.20
Gravel	0.80
Asphalt / rooftop	0.90

Ottawa Macdonald-Cartier International Airport IDF curve equation (5 year event, intensity in mm/hr)

$I = 998.071 / (T_c + 6.053)^{0.814}$

Min. velocity = 0.80 m/s

Manning's "n" = 0.013

LOCATION			AREA (ha)			FLOW						STORM SEWER							
WATERSHED / STREET	From MH	To MH	C = 0.20	C = 0.70	C = 0.90	Indiv. 2.78AC	Accum. 2.78AC	Time of Conc. (min.)	Rainfall Intensity (mm/hr)	Peak Flow Q (L/s)	Controlled Flow Q (L/s)	Pipe Diameter (mm)	Type	Slope (%)	Length (m)	Capacity Full (L/s)	Velocity Full (m/s)	Time of Flow (min.)	Ratio (Q/Q_{FULL})
WS-01 - Uncontrolled	CB	CBMH01	0.009	0.001	0.014	0.041	0.04	10.00	104.2	4.26	4.26	250	HDPE	0.50%	8.6	42.0	0.86	0.17	0.10
WS-02 - Roof Controls	CBMH01	CBMH02	0.000	0.000	0.023	0.056	0.10	10.17	103.3	10.04	1.26	250	PVC	1.00%	28.5	59.5	1.21	0.39	0.17
	CBMH02	EX. STM	0.00	0.00	0.00	0.000	0.10	10.56	101.3	9.85	5.52	250	PVC	1.00%	5.0	59.5	1.21	0.07	0.17

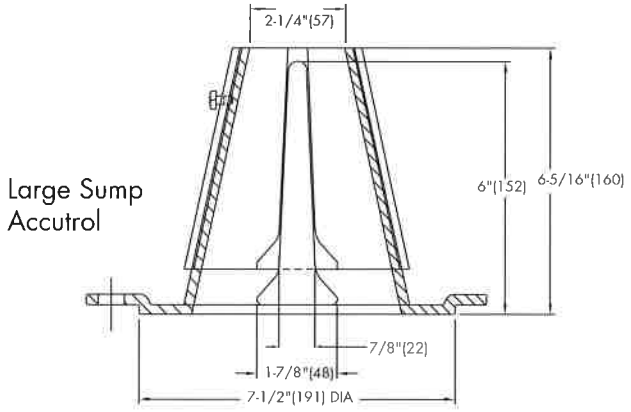
ADJUSTABLE ACCUTROL (for Large Sump Roof Drains only)

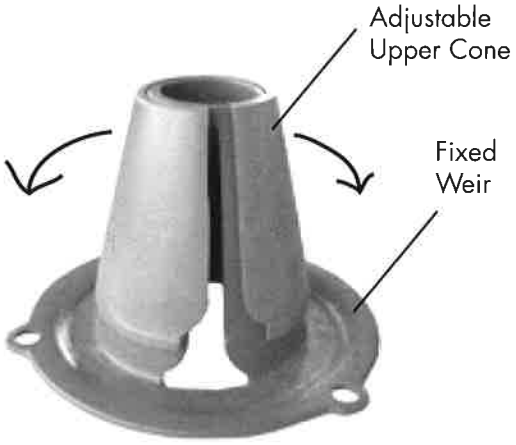
For more flexibility in controlling flow with heads deeper than 2", Watts Drainage offers the Adjustable Accutrol. The Adjustable Accutrol Weir is designed with a single parabolic opening that can be covered to restrict flow above 2" of head to less than 5 gpm per inch, up to 6" of head. To adjust the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

EXAMPLE:

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

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





1/2 Weir Opening Exposed Shown Above

TABLE 1. Adjustable Accutrol Flow Rate Settings

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

Job Name _____ **Model No.** _____

Job Location _____ Contractor _____

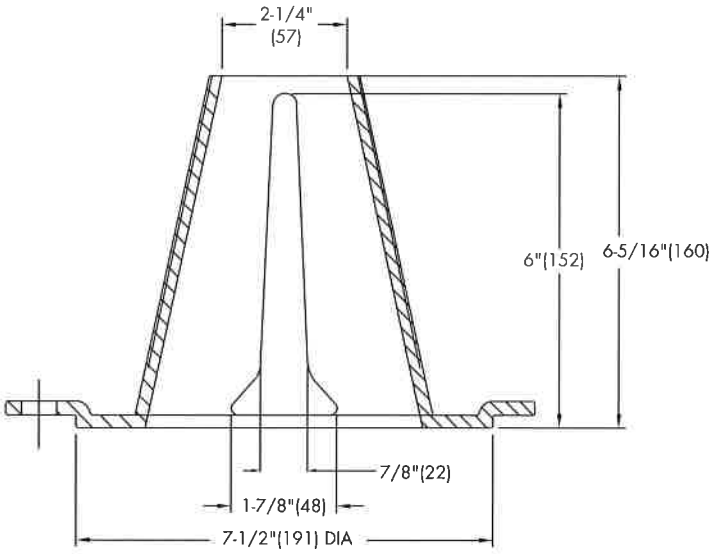
Engineer _____ Representative _____

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

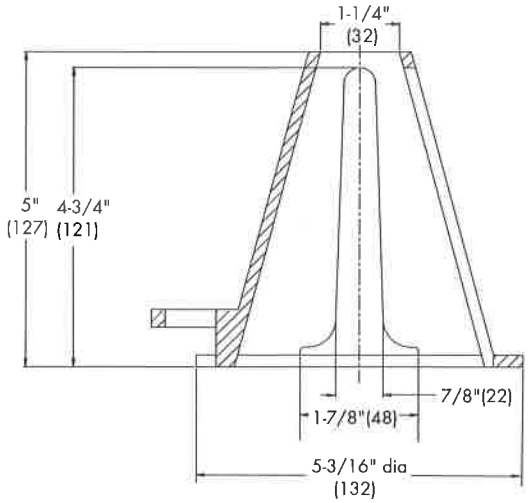
ACCUTROL WEIR FLOW CONTROL

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

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



LARGE SUMP ACCUTROL WEIR



SMALL SUMP ACCUTROL WEIR

Job Name _____ **Model No.** _____

Job Location _____ Contractor _____

Engineer _____ Representative _____

APPENDIX E

Civil Engineering Drawings

EROSION AND SEDIMENT CONTROL MEASURES:

** CONTRACTOR IS RESPONSIBLE FOR ALL INSTALLATION, MONITORING, REPAIR AND REMOVAL OF ALL EROSION AND SEDIMENT CONTROL FEATURES
THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.**

1. PRIOR TO START OF CONSTRUCTION:

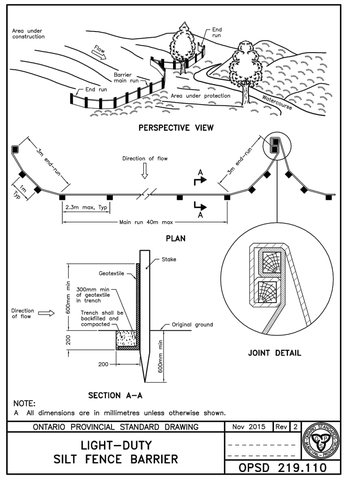
- PRIOR TO THE REMOVAL OF ANY VEGETATIVE COVER, MOVING OF SOIL AND CONSTRUCTION:
- INSTALL SILT FENCE IMMEDIATELY DOWNSTREAM FROM AREAS TO BE DISTURBED (SEE PLAN FOR LOCATION).
- INSTALL GEOSOCK INSERTS WITH AN OVERFLOW IN ALL THE DOWNSTREAM CATCHBASINS AND MANHOLES
- INSTALL SILTSACK FILTERS IN ALL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

2. DURING CONSTRUCTION:

- WORK TO BE DONE IN THE VICINITY OF MAJOR WATERWAYS TO BE CARRIED OUT FROM JULY TO SEPTEMBER ONLY.
- MINIMIZE THE EXTENT OF DISTURBED AREAS AND THE DURATION OF EXPOSURE.
- PROTECT DISTURBED AREAS FROM RUNOFF.
- PROVIDE TEMPORARY COVER SUCH AS SEEDING OR MULCHING IF DISTURBED AREA WILL NOT BE REHABILITATED WITHIN 30 DAYS.
- INSPECT SILT FENCES, FILTER CLOTHS AND CATCH BASIN SUMPS WEEKLY AND AFTER EVERY MAJOR STORM EVENT. CLEAN AND REPAIR WHEN NECESSARY.
- CONSTRUCT SWALES AS PER DETAIL.
- 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 0.5m 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.

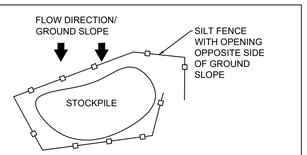
3. AFTER CONSTRUCTION:

- 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.

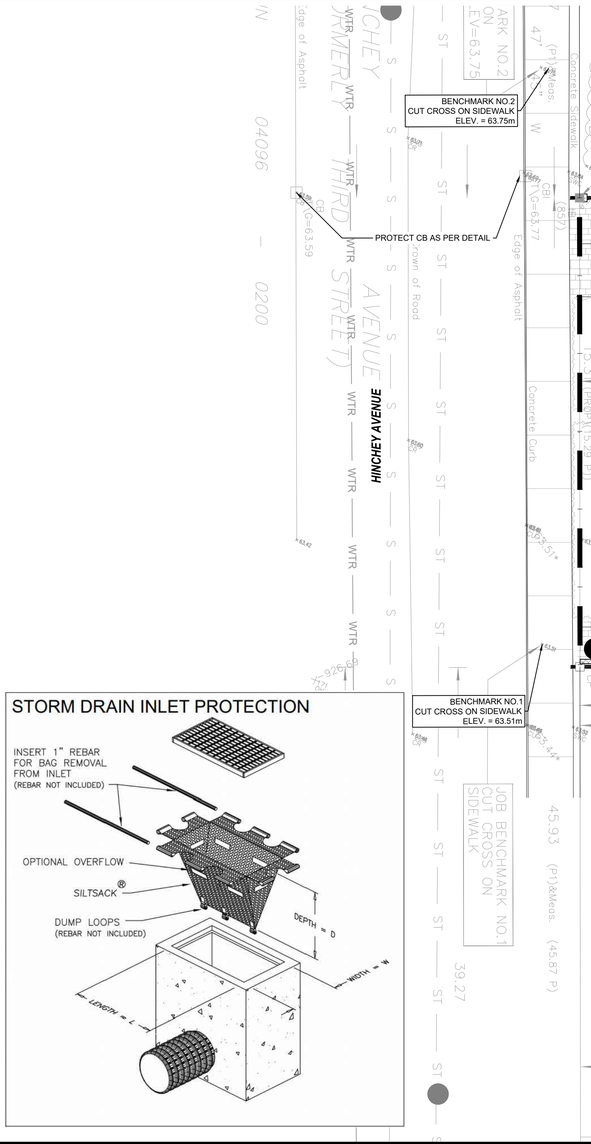


NOTE:
A All dimensions are in millimetres unless otherwise shown.

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



STOCKPILE EROSION PROTECTION
N.T.S.



STORM DRAIN INLET PROTECTION

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
- ×50.00 PROPOSED ELEVATION
- ×50.00HP PROPOSED HIGH POINT ELEVATION
- ×50.00S PROPOSED SWALE ELEVATION
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- ×50.00TC PROPOSED TOP OF CURB ELEVATION
- ×63.87TW / ×63.63BW PROPOSED TOP OF WALL ELEVATION / PROPOSED TOP OF WALL ELEVATION
- 63.44 / 63.44EX MATCH INTO EXISTING ELEVATION
- ×63.19 EXISTING ELEVATION
- PROPOSED OVERLAND MAJOR FLOW ROUTE
- 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

USE AND INTERPRETATION OF DRAWINGS

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

2m 0.5 0 2 4m
SCALE: 1:100

SUBJECT FOR APPROVAL

No.	REVISIONS	BY	DATE
04	ISSUED FOR APPROVAL	A.S.	09 JUL 2021
03	ISSUED FOR APPROVAL	A.S.	23 APR 2021
02	ISSUED FOR APPROVAL	A.S.	29 SEP 2020
01	ISSUED FOR APPROVAL	A.S.	31 JUL 2020

LICENSED PROFESSIONAL ENGINEER M. BASNET 100501996 2021-07-09 PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

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

CLIENT
PRAVEEN MUPPALLA
450 Creekview Way
Ottawa, ON, K1Y 1L5
TEL: 613-805-8278

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

PROJECT
APARTMENT BUILDING
161 HINCHEY AVENUE

DRAWING TITLE
EROSION AND SEDIMENT CONTROL PLAN

PROJECT NO.
200295

DATE
JULY 2020

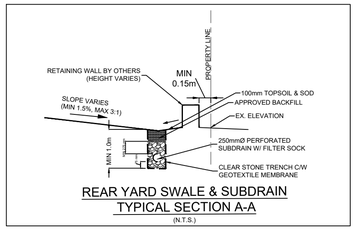
C101

D07-12-20-0142

#18320

GENERALGRADING NOTES

1. ANY MODIFICATIONS IN ELEVATION BETWEEN THE SURVEY AND CONSTRUCTION THAT WILL AFFECT THE PROJECT ARE TO BE COMMUNICATED WITH THE ENGINEER PRIOR TO START OF CONSTRUCTION.
2. PRIOR TO START OF ANY WORK ON SITE, THE CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY EXISTING GRADES AND ENSURE OVERLAND DRAINAGE IS FEASIBLE WITH ACTUAL SITE CONDITIONS.
3. ANY DISCREPANCIES ARE TO BE COMMUNICATED WITH THE ENGINEER PRIOR TO CONSTRUCTION.
4. NO EXCESS DRAINAGE, EITHER DURING OR AFTER CONSTRUCTION, WILL BE DIRECTED TOWARDS NEIGHBOURING PROPERTIES.
5. NO ALTERATION OF EXISTING GRADES AND DRAINAGE PATTERNS ON PROPERTY BOUNDARIES.
6. ENSURE POSITIVE DRAINAGE AWAY FROM FOUNDATION.
7. CONTRACTOR IS RESPONSIBLE TO KEEP THE ROADS FREE AND CLEAN FROM MUD OR DEBRIS.
8. PROPOSED RETAINING WALL TO BE A MINIMUM 0.15m FROM ADJACENT PROPERTY LINES.



REAR YARD SWALE & SUBDRAIN
TYPICAL SECTION A-A
(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 FENCE
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- SUB SUB PROPOSED 100mmØ PERFORATED SUBDRAIN
- STM STM PROPOSED STORM SEWER
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CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES BEFORE WORK COMMENCES. DO NOT SCALE DRAWINGS.

2m 0.5 0 2 4m
SCALE: 1:100

SUBJECT FOR APPROVAL

No.	REVISIONS	BY	DATE
04	ISSUED FOR APPROVAL	A.S.	09 JUL 2021
03	ISSUED FOR APPROVAL	A.S.	23 APR 2021
02	ISSUED FOR APPROVAL	A.S.	29 SEP 2020
01	ISSUED FOR APPROVAL	A.S.	31 JUL 2020

LICENSED PROFESSIONAL ENGINEER M. BASNET 100501996 2021-07-09 PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

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

CLIENT
PRAVEEN MUPPALLA
450 Creekview Way
Ottawa, ON, K1Y 1L5
TEL: 613-805-8278

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

PROJECT
APARTMENT BUILDING
161 HINCHEY AVENUE

DRAWING TITLE
GRADING AND DRAINAGE PLAN

PROJECT NO. 200295
DATE JULY 2020
C301

D07-12-20-0142

#18320

NOTES: GENERAL

1. CONTRACTOR IS RESPONSIBLE FOR ALL LAYOUT FOR CONSTRUCTION PURPOSES.
2. ALL ELEVATIONS ARE GEODETIC AND UTILIZE METRIC UNITS.
3. JOB BENCH MARK - CONFIRM WITH LRL PRIOR TO UTILIZATION.
4. ALL GROUND SURFACES SHALL BE EVENLY GRADED WITHOUT PONDING AREAS AND WITHOUT LOW POINTS EXCEPT WHERE APPROVED SWALE, CATCH BASIN OUTLETS AND/OR STORM DETENTION AREAS ARE PROVIDED.
5. STRIP AND REMOVE ALL TOPSOIL FROM IMPROVED AREAS.
6. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
7. ALL EDGES OF DISTURBED PAVEMENT SHALL BE SAW CUT TO FORM A CLEAN STRAIGHT LINE PRIOR TO PLACING NEW PAVEMENT. PAVEMENT REINSTATEMENT SHALL BE WITH STEP JOINTS OF 500mm WIDTH MINIMUM.
8. CURBS TO BE BARRIER, CONSTRUCTED AS PER OPSD 600.110.
9. ALL MATERIAL SUPPLIED AND PLACED FOR PARKING LOT AND ACCESS ROAD CONSTRUCTION SHALL BE TO OPSS STANDARDS AND SPECIFICATIONS UNLESS OTHERWISE NOTED. CONSTRUCTION TO OPSS 206, 310 & 314. MATERIALS TO OPSS 1001, 1003 & 1010.
10. ABUTTING PROPERTY GRADE TO BE MATCHED.
11. OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND APPROVALS FROM THE MUNICIPAL AUTHORITIES PRIOR TO COMMENCING CONSTRUCTION.
12. MINIMIZE DISTURBANCE TO EXISTING VEGETATION DURING THE EXECUTION OF ALL WORKS.
13. FILTER FABRIC TO BE INSTALLED AND MAINTAINED BETWEEN THE FRAME AND COVER OF ALL CATCHBASINS, CATCHBASIN MANHOLES AND MANHOLES DURING THE CONSTRUCTION PERIOD TO MINIMIZE SEDIMENTS ENTERING THE STORM SEWER SYSTEM. ALL GRASSED AREAS MUST BE COMPLETED PRIOR TO THE REMOVAL OF THE FILTER FABRIC IN THE DRAINAGE STRUCTURES.
14. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL UNLESS OTHERWISE DIRECTED FROM THE ENGINEER. EXCAVATE AND REMOVE ALL ORGANIC MATERIAL AND DEBRIS, IF ANY, LOCATED WITHIN THE PROPOSED BUILDING, PARKING AND ROADWAY LOCATIONS.
15. THE APPROVAL OF THIS PLAN DOES NOT EXEMPT THE CONTRACTOR FROM THE REQUIREMENTS TO OBTAIN THE VARIOUS PERMITS/APPROVALS REQUIRED TO COMPLETE A CONSTRUCTION PROJECT, SUCH AS BUT NOT LIMITED TO; ROAD CUT PERMITS, SEWER PERMITS, WATER PERMIT, ETC.
16. AT PROPOSED UTILITY CONNECTION POINTS AND CROSSINGS (I.E. STORM SEWER, SANITARY SEWER, WATER, ETC.) THE CONTRACTOR SHALL DETERMINE THE PRECISE LOCATION AND DEPTH OF EXISTING UTILITIES AND REPORT ANY DISCREPANCIES OR CONFLICTS TO THE ENGINEER BEFORE COMMENCING WORK.
17. ALL SIDEWALK CONSTRUCTION TO BE AS PER OPSD 310.010 & OPSD 310.050.
18. EXISTING BUILDINGS REQUIRE A CCTV INSPECTION AND REPORT TO ENSURE EXISTING SERVICES TO BE RE-USED ARE IN GOOD WORKING ORDER AND MEET CURRENT MINIMUM SIZE REQUIREMENTS.
19. ALL MATERIALS AND CONSTRUCTION TO BE IN ACCORDANCE WITH CURRENT CITY OF OTTAWA (COA) STANDARDS AND ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS (OPSS & OPSD); SEWER AND WATERMAIN MATERIAL TYPES AND DISINFECTION.
20. SUPPLY AND CONSTRUCT ALL SEWERS AND APPURTENANCES IN ACCORDANCE WITH CURRENT CITY OF OTTAWA (COA) STANDARDS AND ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS (OPSS & OPSD); ROADS AND PUBLIC WORKS.

NOTES: SEWERS

1. SEWER BEDDING AS PER PIPE TRENCH DETAIL WITH GRANULAR 'A' BEDDING COMPACTED TO 95% OF ITS SPMDD.
2. ALL WORK SHALL BE PERFORMED, AS APPLICABLE IN ACCORDANCE WITH OPSS 407, AND 410.
3. CONTRACTOR TO CONFIRM ELEVATION OF EXISTING SEWERS AT PROPOSED CONNECTION POINTS AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE COMMENCING ANY WORK.
4. ALL SEWERS WITH LESS THAN 2.0m OF COVER ARE SUBJECT TO INSULATION DETAIL.
5. INSULATE ALL STORM PIPES WITH LESS THAN 2.0m COVER AND ALL SANITARY PIPES WITH LESS THAN 2.1m COVER WITH APPROPRIATE DEPTH OF THERMAL INSULATION AS PER CITY OF OTTAWA SEWER DESIGN GUIDELINES SECTION 5.7.1.3 & 5.10 AS WELL. ALSO REFER TO COO STD. DWGS. W21-23.
6. FLEXIBLE CONNECTIONS ARE REQUIRED FOR CONNECTION SEWER PIPES TO MANHOLES. SANITARY RUBBER GASKET TYPE JOINTS TO CONFORM TO CSA.
7. QUALITY CONTROL FIELD TESTS, LEAKAGE & DYE TESTS FOR SEWERS TO BE COMPLETED IN ACCORDANCE TO OTTAWA SEWER DESIGN GUIDELINES SECTION 6.1.14 & 6.1.15.

SANITARY

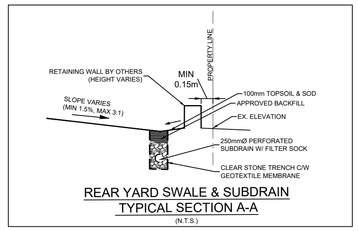
8. ALL SANITARY GRAVITY SEWER SHALL BE PVC SDR 28, IPEX 'RING-TITE' (OR APPROVED EQUIVALENT) PER CSA STANDARD B182.2 OR LATEST AMENDMENT, UNLESS SPECIFIED OTHERWISE.
9. EXISTING MAINTENANCE STRUCTURES TO BE RE-BECNHED WHERE A NEW CONNECTION IS MADE.
10. SANITARY GRAVITY SEWER TRENCH AND BEDDING SHALL BE PER CITY OF OTTAWA STD. S6 AND S7, CLASS 'B' BEDDING, UNLESS SPECIFIED OTHERWISE.
11. SANITARY MAINTENANCE STRUCTURE FRAME AND COVERS SHALL BE PER CITY OF OTTAWA STD. S24 AND S25.
12. SANITARY MAINTENANCE STRUCTURES SHALL BE BENCHED PER OPSD 701.021.

STORM

13. STORM GRAVITY SEWER TRENCH AND BEDDING SHALL BE PER CITY OF OTTAWA STD. S6 AND S7, CLASS 'B' BEDDING, UNLESS SPECIFIED OTHERWISE. BEDDING AND COVER MATERIAL TO BE SPECIFIED BY GEOTECHNICAL ENGINEER.
14. ALL PVC STORM SEWERS ARE TO BE SDR 35 APPROVED PER C.S.A. B182.2 OR LATEST AMENDMENT, UNLESS OTHERWISE SPECIFIED.
15. CATCH BASINS SHALL BE IN ACCORDANCE WITH OPSD 705.010.
16. CATCH BASIN LEADS SHALL BE 200mm DIA. AT 1.0% SLOPE (MIN) UNLESS SPECIFIED OTHERWISE.
17. ALL CATCH BASINS SHALL HAVE 600mm SUMPS, UNLESS SPECIFIED OTHERWISE.
18. ALL CATCH BASIN LEAD INVERTS TO BE 1.5m BELOW FINISHED GRADE UNLESS SPECIFIED OTHERWISE.
19. CATCHBASIN STRUCTURE FRAME AND COVERS SHALL BE PER CITY OF OTTAWA STD 25 AND S24.1, UNLESS SPECIFIED OTHERWISE.
20. CATCHBASIN FRAME AND COVER SHALL BE PER OPSD 400.010 UNLESS OTHERWISE NOTED.

NOTES: WATERMAIN

1. PROPOSED WATER SERVICE TO BE 2.4m BELOW GRADE, WHERE LESS THAN 2.4M COVER, THERMAL INSULATION IS TO BE PROVIDED AS PER COO STD. DWGS. W 21 (DITCHED AREAS), W22 (SHALLOW TRENCHES), W23 (AT OPEN STRUCTURES) AND CITY OF OTTAWA DESIGN GUIDELINES (COODG) -WATER DISTRIBUTION (WD) SECTION 4.3.13.
2. ALL PVC WATERMAINS SHALL BE AWWA C-900 CLASS 150, SDR 18 OR APPROVED EQUIVALENT.
3. WATERMAIN TRENCH AND BEDDING SHALL BE IN ACCORDANCE WITH OPSD 802.010/802.010 AND CITY OF OTTAWA STANDARD W17, UNLESS SPECIFIED OTHERWISE. BEDDING AND COVER MATERIAL TO BE SPECIFIED BY GEOTECHNICAL ENGINEER.
4. FIRE HYDRANT INSTALLATION AS PER CITY STD 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 UNLESS OTHERWISE NOTED.
5. BUILDING SERVICE TO BE CAPPED OFF 1.0m OFF THE FACE OF BUILDING UNLESS OTHERWISE NOTED AND MUST BE RESTRAINED A MINIMUM OF 12m BACK FROM STUB.
6. ALL WATERMAIN STUBS SHALL BE TERMINATED WITH A PLUG AND 500mm BLOW OFF UNLESS OTHERWISE NOTED.
7. METALLIC WARNING TAPE SHALL BE USED OVER ALL WATERMAINS.
8. INSTALL AND TEST TRACER WIRE FOR ALL PROPOSED WATERMAIN IN ACCORDANCE WITH THE COODG-WD AS SPECIFIED IN SECTION 4.3.12 AND COO STD. DWG. W36.
9. WATER SHUTOFF VALVE AND VALVE BOX TO BE WITHIN THE ROW AND LOCATED A MINIMUM DISTANCE OF 1.0 M FROM THE BUILDING FOUNDATION (IF APPLICABLE). TYPICAL PRIVATE SERVICES AS PER COO STD. DWG. W50 (≥ 100MM SERVICE CONNECTION). VALVE BOX ASSEMBLY AS PER COO STD. DWG. W24.
10. ALL CONNECTIONS, RESTRAINT RODS AND VALVE BOLTS TO BE STAINLESS STEEL AS PER COADG – WATER DISTRIBUTION SECTION 4.3.11 AND COO STD DWGS .
11. VALVES TO BE OPERATED BY CITY OF OTTAWA STAFF ONLY.
12. NO CONNECTION TO EXISTING WATER NETWORK SHALL BE COMPLETED UNTIL A WATER PERMIT IS OBTAINED FROM THE CITY OF OTTAWA (COO). COA FORCES TO COMPLETE WATERMAIN CONNECTIONS. EXCAVATION, BACKFILLING AND REINSTATEMENT TO BE COMPLETED BY CONTRACTOR.
13. CATHODIC PROTECTION AS PER OPSD 1109.010, COADG – WATER DISTRIBUTION SECTION 4.8 AND COO STD. DWGS. W39 (DI), W40 (PVC) AND/OR W41-W45 & 48 AS APPLICABLE.
14. PRESSURE TESTING AS PER AWWA C-605-5 & COADG – WATER DISTRIBUTION SECTION 4.6.13.
15. CHLORINATION AS PER AWA C-651-05, COADG – WATER DISTRIBUTION SECTION 4.6.13 & COO STD. DWG. W46.



REAR YARD SWALE & SUBDRAIN
TYPICAL SECTION A-A
(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 FENCE
- 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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- 63.44 / 63.44EX MATCH INTO EXISTING ELEVATION
- ×XX.XX EXISTING ELEVATION
- PROPOSED OVERLAND MAJOR FLOW ROUTE
- SUB PROPOSED 100mmØ PERFORATED SUBDRAIN
- STM PROPOSED STORM SEWER
- SAN PROPOSED SANITARY SEWER
- WTR PROPOSED WATERMAIN
- STM EXISTING STORM SEWER
- SAN EXISTING SANITARY SEWER
- WTR EXISTING WATERMAIN
- GAS EXISTING GAS LINE
- EXISTING MANHOLE
- EXISTING CATCHBASIN
- PROPOSED CATCHBASIN-MANHOLE/CATCHBASIN
- PROPOSED MANHOLE
- PROPOSED CURB STOP
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- PROPOSED 100 YEAR HIGH WATER LEVEL
- STORM WATERSHED EXTENT
- WS-XX CONTROLLED AREA / RUNOFF — WATERSHED NAME, RUNOFF COEFFICIENT, AREA IN HECTARES

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.

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2m 0.5 0 2 4m

SCALE: 1:100

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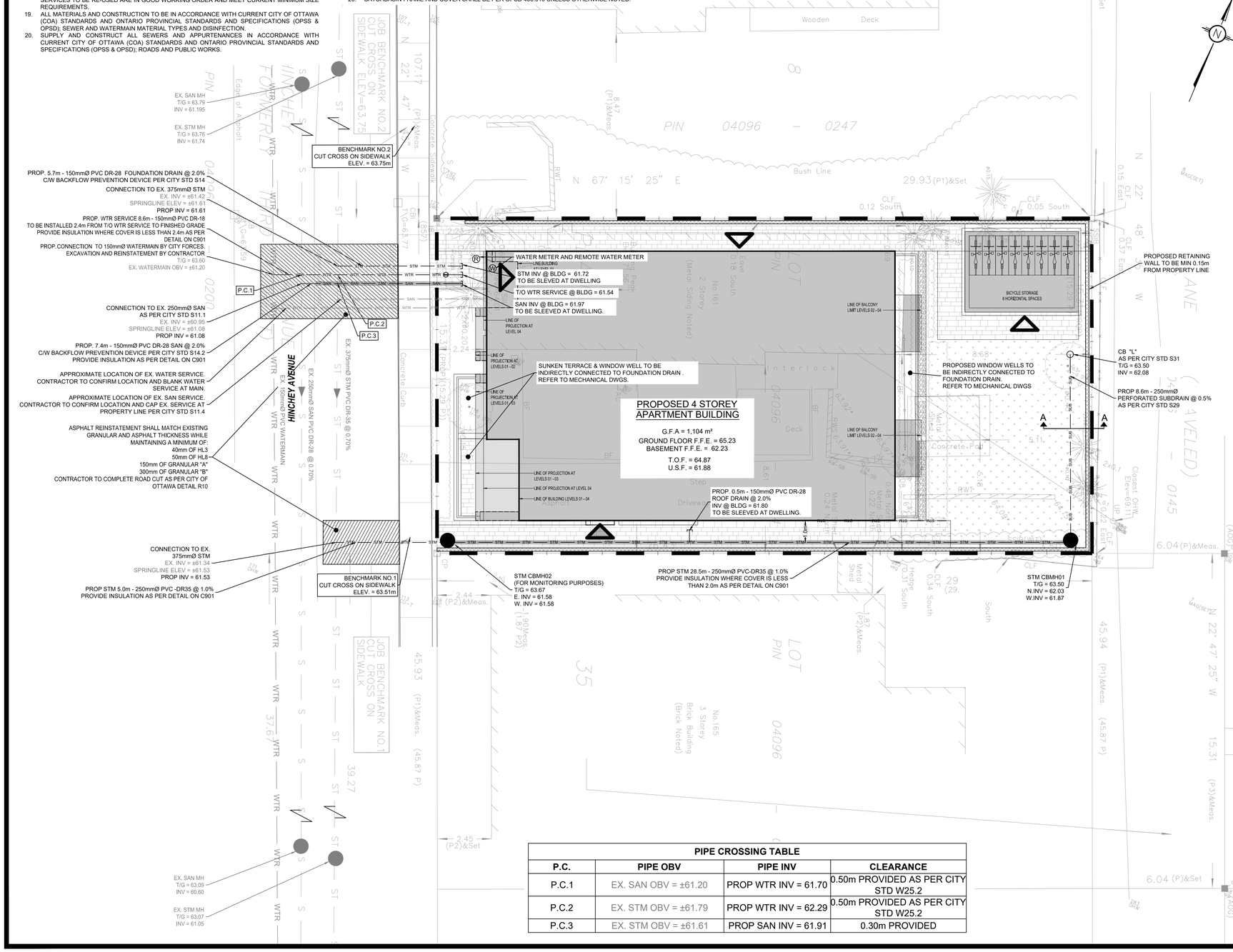

PIPE CROSSING TABLE			
P.C.	PIPE OBV	PIPE INV	CLEARANCE
P.C.1	EX. SAN OBV = ±61.20	PROP WTR INV = 61.70	0.50m PROVIDED AS PER CITY STD W25.2
P.C.2	EX. STM OBV = ±61.79	PROP WTR INV = 62.29	0.50m PROVIDED AS PER CITY STD W25.2
P.C.3	EX. STM OBV = ±61.61	PROP SAN INV = 61.91	0.30m PROVIDED

No.	REVISIONS	BY	DATE
04	ISSUED FOR APPROVAL	A.S.	09 JUL 2021
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DESIGNED BY:	DRAWN BY:	APPROVED BY:
A.S.	A.S.	M.B.

PROJECT
APARTMENT BUILDING
161 HINCHEY AVENUE

DRAWING TITLE
SERVICING PLAN

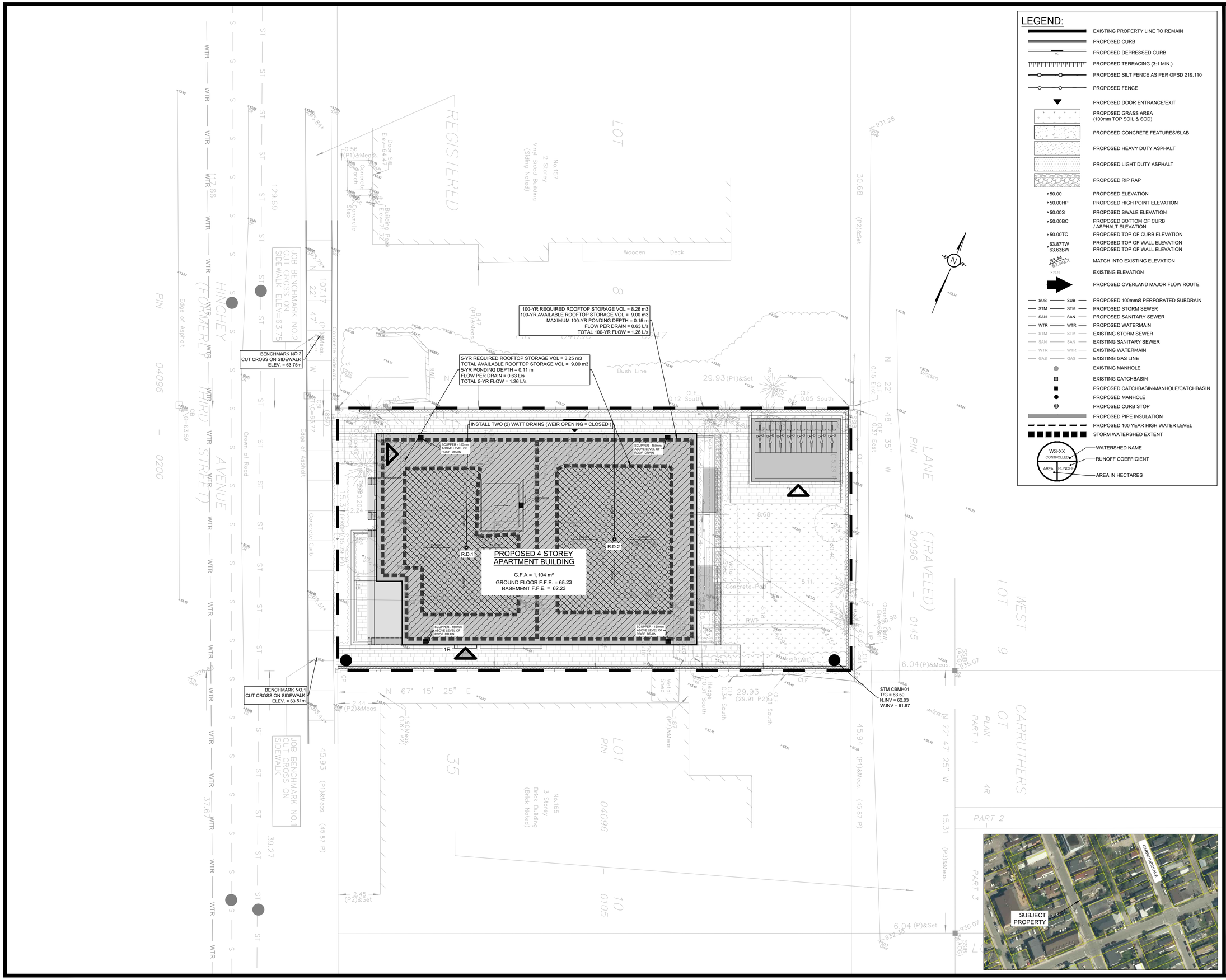
PROJECT NO.
200295

DATE
JULY 2020

C401

D07-12-20-0142

#18320



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2m 0.5 0 2 4m
SCALE: 1:100

SUBJECT FOR APPROVAL

No.	REVISIONS	BY	DATE
04	ISSUED FOR APPROVAL	A.S.	09 JUL 2021
03	ISSUED FOR APPROVAL	A.S.	23 APR 2021
02	ISSUED FOR APPROVAL	A.S.	29 SEP 2020
01	ISSUED FOR APPROVAL	A.S.	31 JUL 2020

LICENCED PROFESSIONAL ENGINEER M. BASNET 100501996 2021-07-09 PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

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

CLIENT
PRAVEEN MUPPALLA
450 Creekview Way
Ottawa, ON, K1Y 1L5
TEL: 613-805-8278

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

PROJECT
APARTMENT BUILDING
161 HINCHEY AVENUE

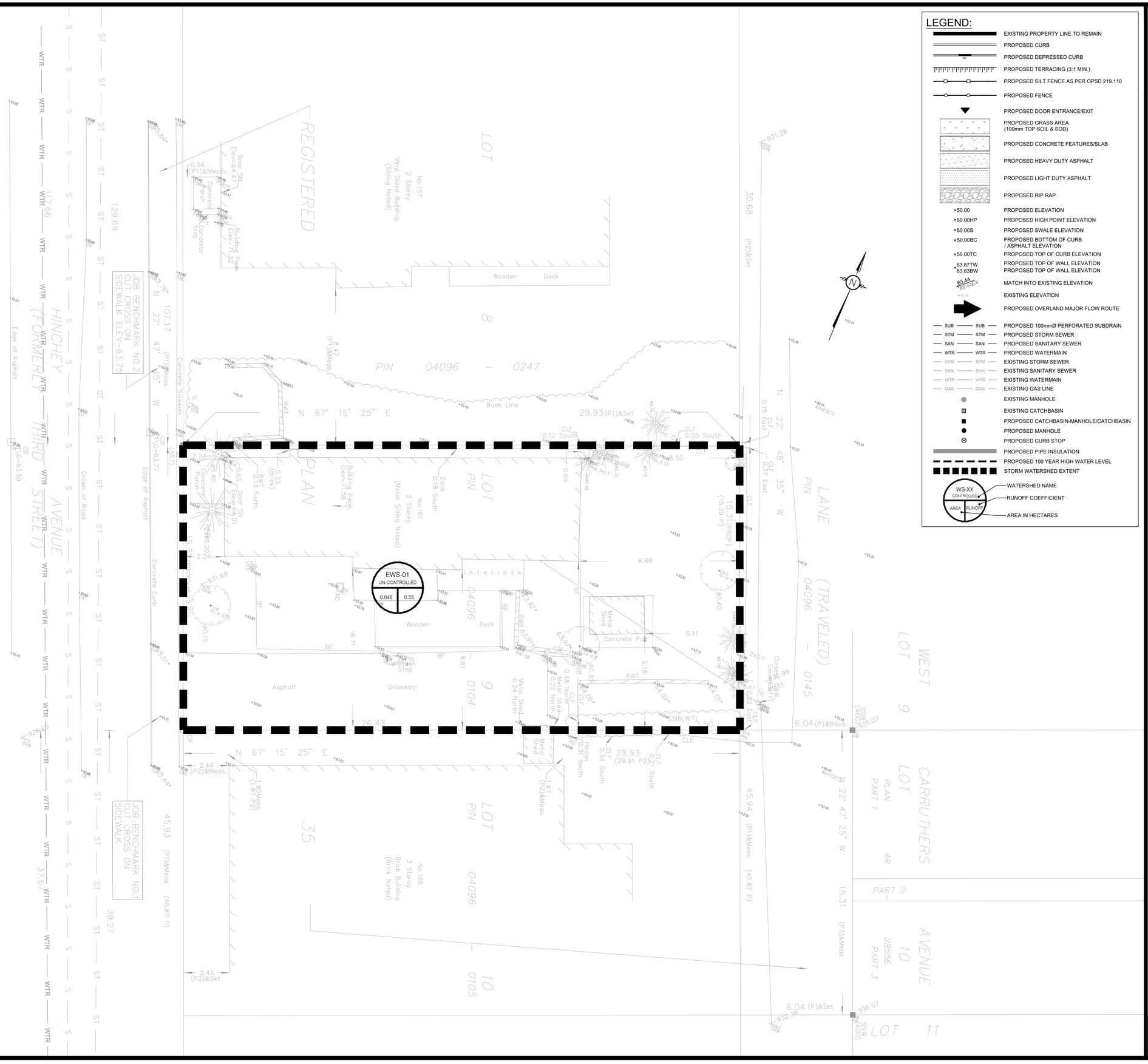
DRAWING TITLE
STORMWATER MANAGEMENT PLAN

PROJECT NO. 200295
DATE JULY 2020

C601

D07-12-20-0142

#18320



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)
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- 63.44 / 63.44EX MATCH INTO EXISTING ELEVATION
- ×50.19 EXISTING ELEVATION
- PROPOSED OVERLAND MAJOR FLOW ROUTE
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- WTR PROPOSED WATERMAIN
- STM EXISTING STORM SEWER
- SAN EXISTING SANITARY SEWER
- WTR EXISTING WATERMAIN
- GAS EXISTING GAS LINE
- EXISTING MANHOLE
- EXISTING CATCHBASIN
- PROPOSED CATCHBASIN-MANHOLE/CATCHBASIN
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- PROPOSED CURB STOP
- PROPOSED PIPE INSULATION
- PROPOSED 100 YEAR HIGH WATER LEVEL
- STORM WATERSHED EXTENT
- WS-XX CONTROLLED / AREA / RUNOFF — WATERSHED NAME, RUNOFF COEFFICIENT, AREA IN HECTARES

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.

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

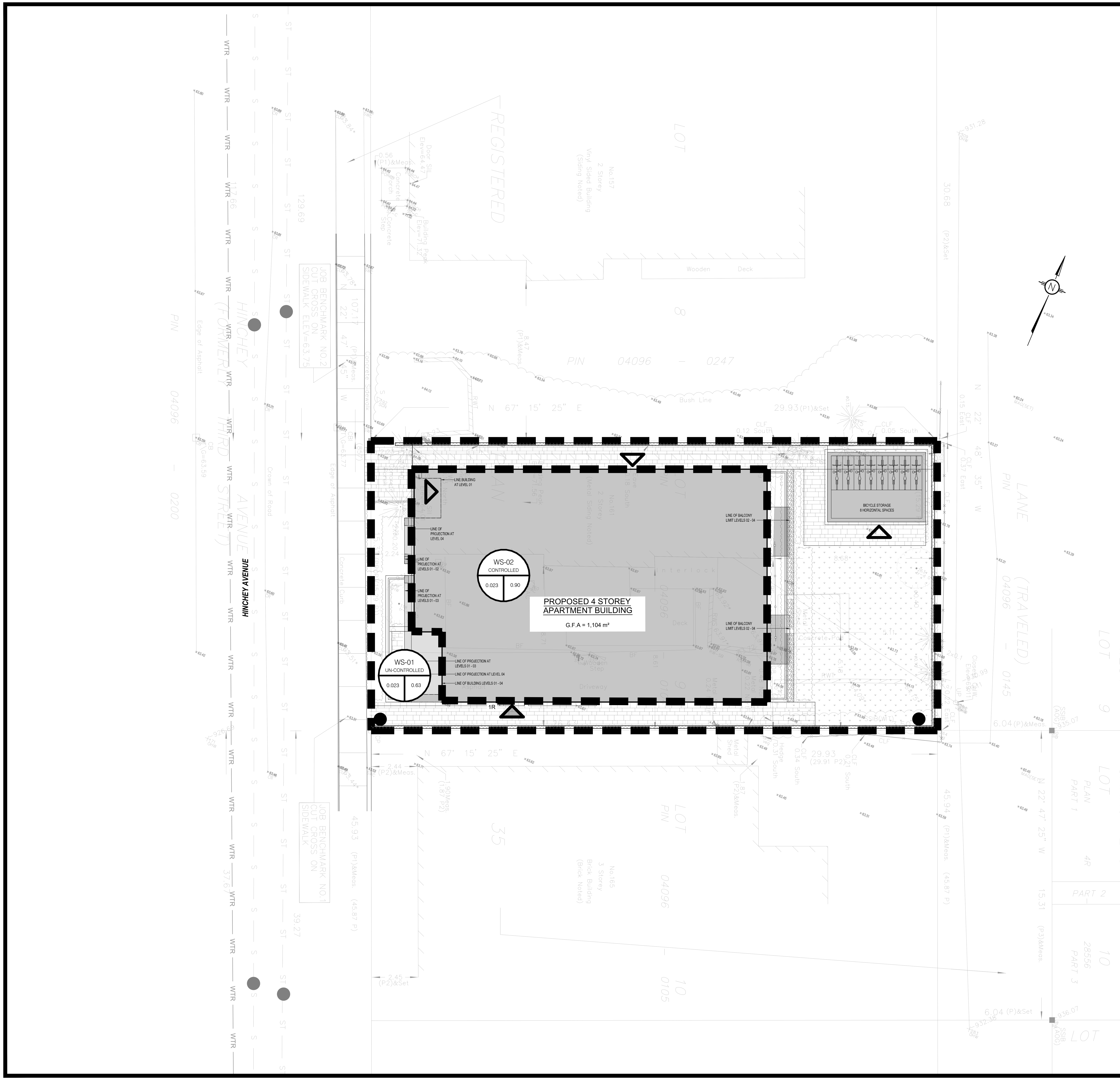
PROJECT
APARTMENT BUILDING
161 HINCHEY AVENUE

DRAWING TITLE
PRE-DEVELOPMENT
WATERSHED PLAN

PROJECT NO. 200295
DATE JULY 2020
C701

D07-12-20-0142

#18320



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LICENSED PROFESSIONAL ENGINEER
M. BASNET
100501996
2021-07-09
PROVINCE OF ONTARIO

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

PROJECT
APARTMENT BUILDING
161 HINCHEY AVENUE

DRAWING TITLE
POST-DEVELOPMENT WATERSHED PLAN

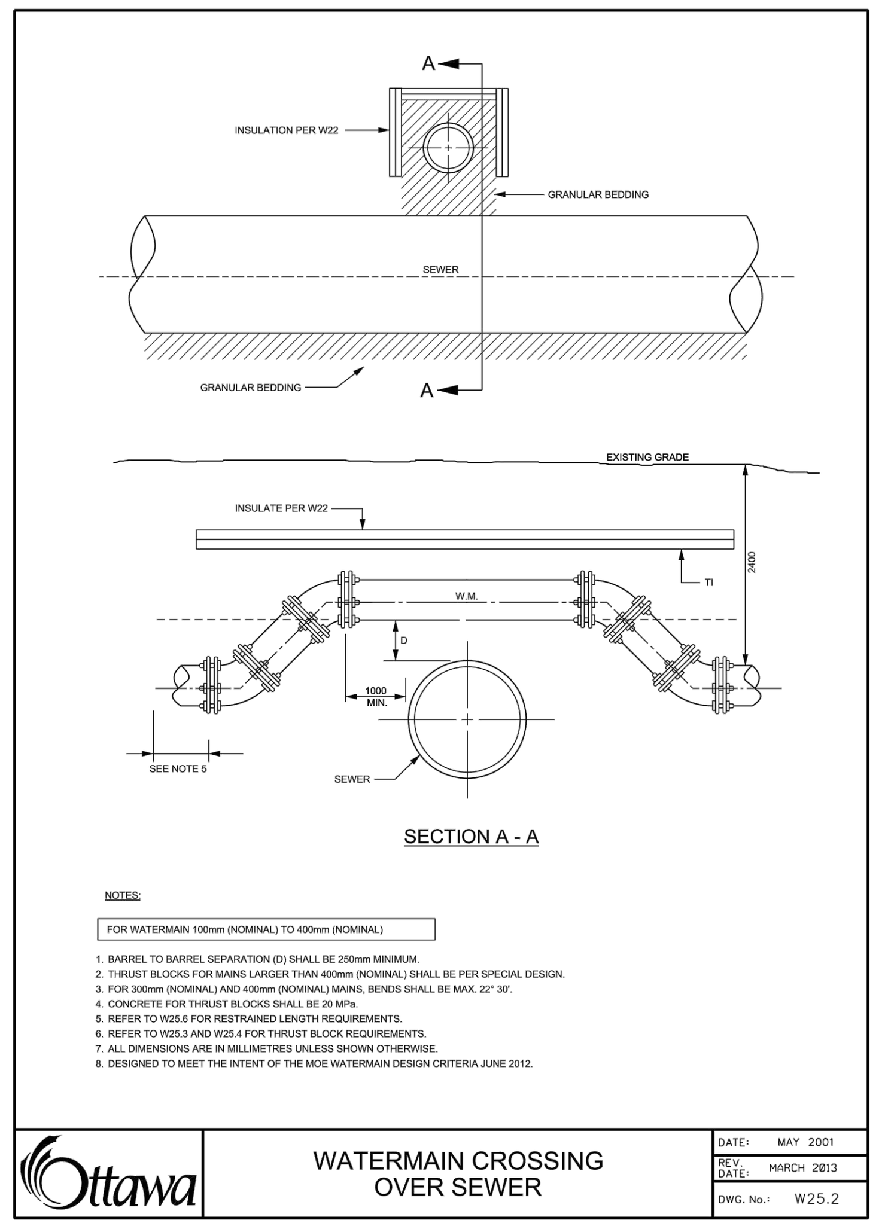
PROJECT NO.
200295

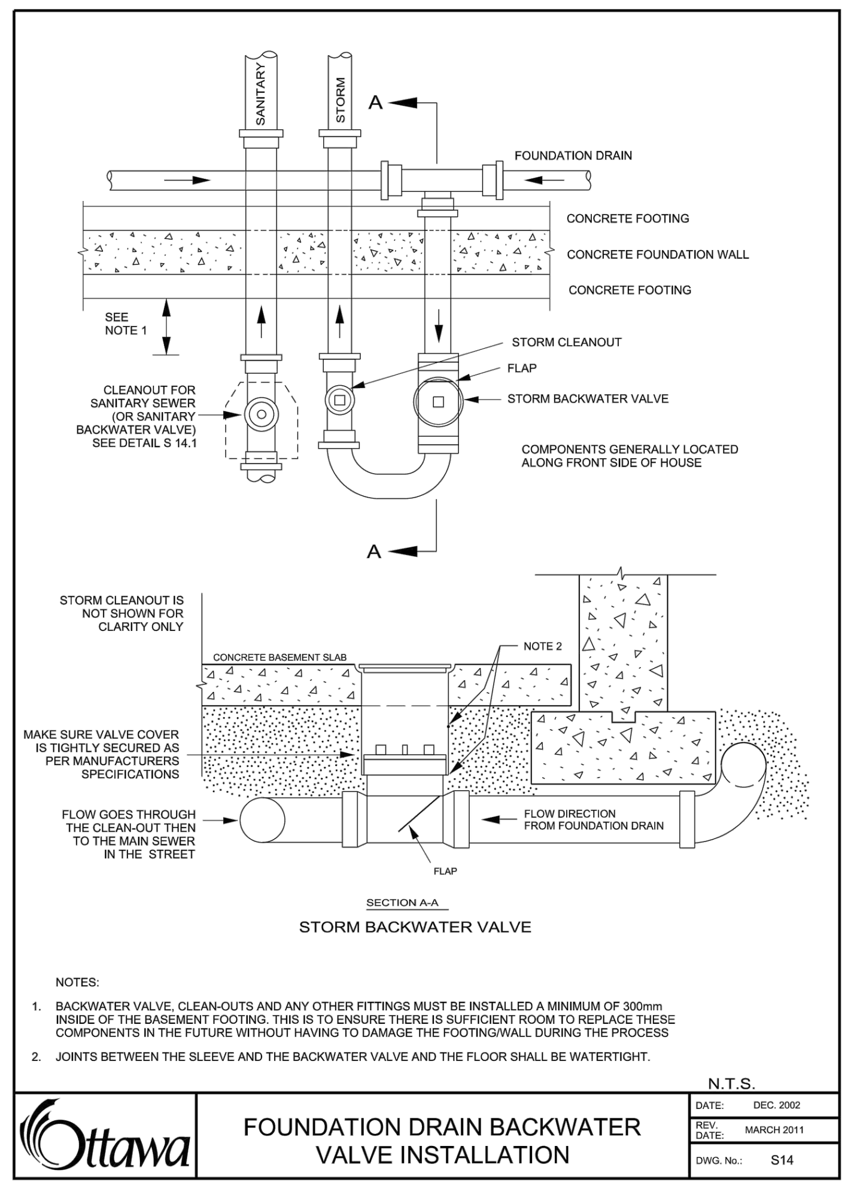
DATE
JULY 2020

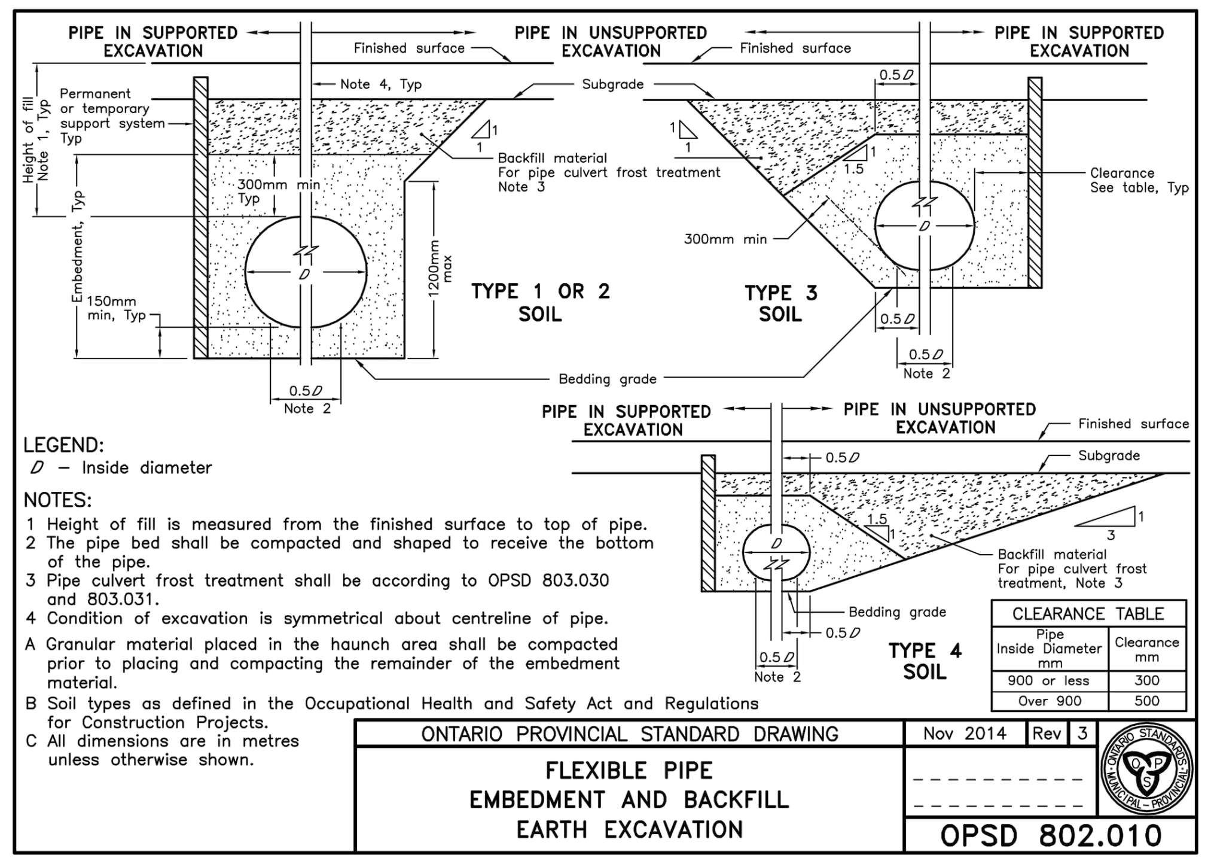
C702

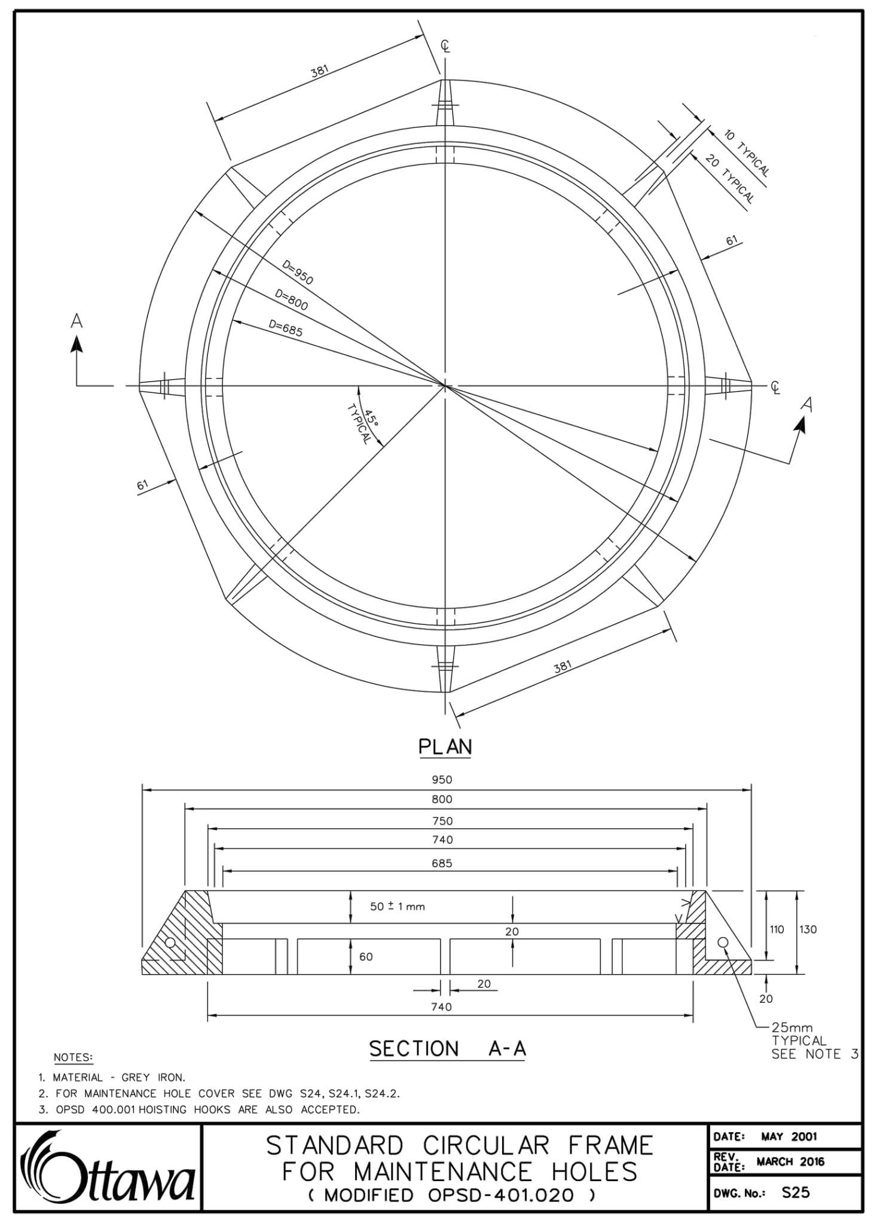
D07-12-20-0142

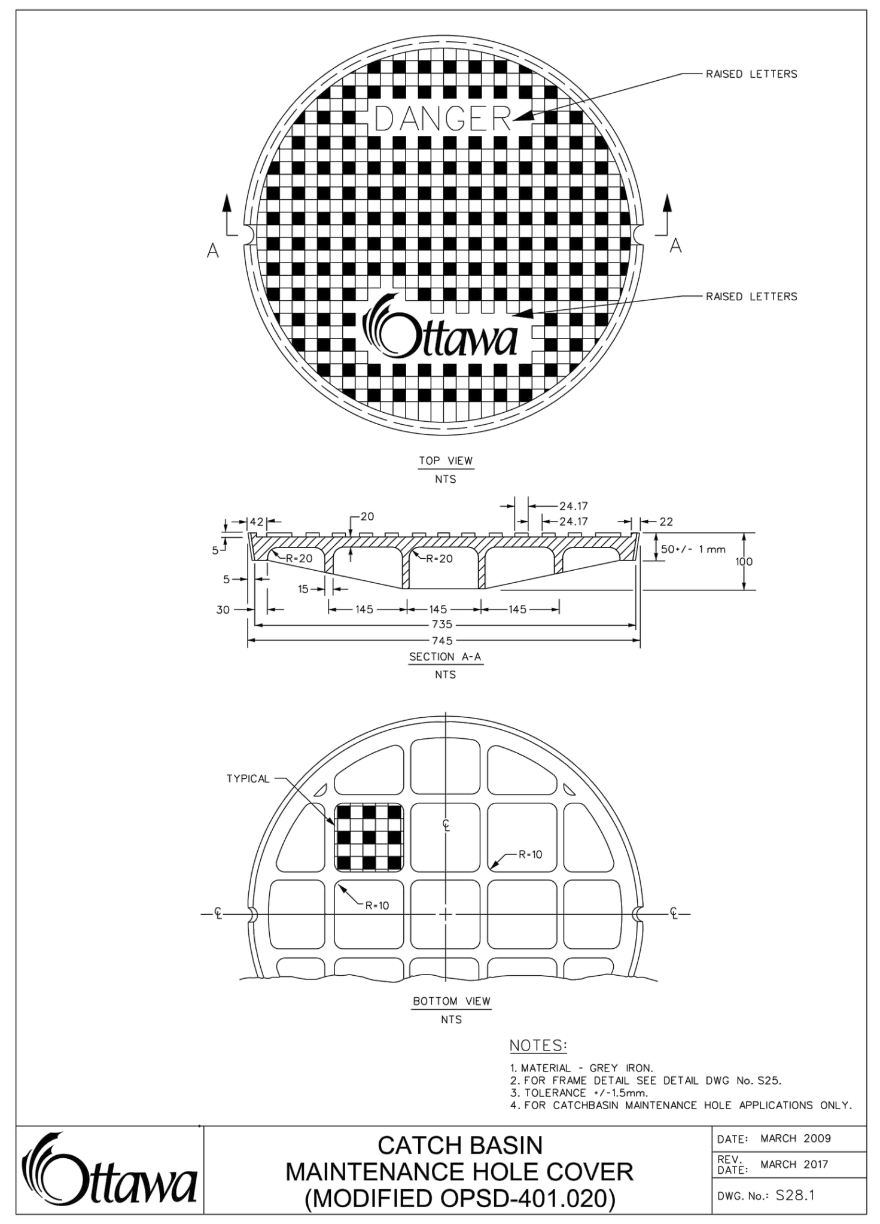
#18320

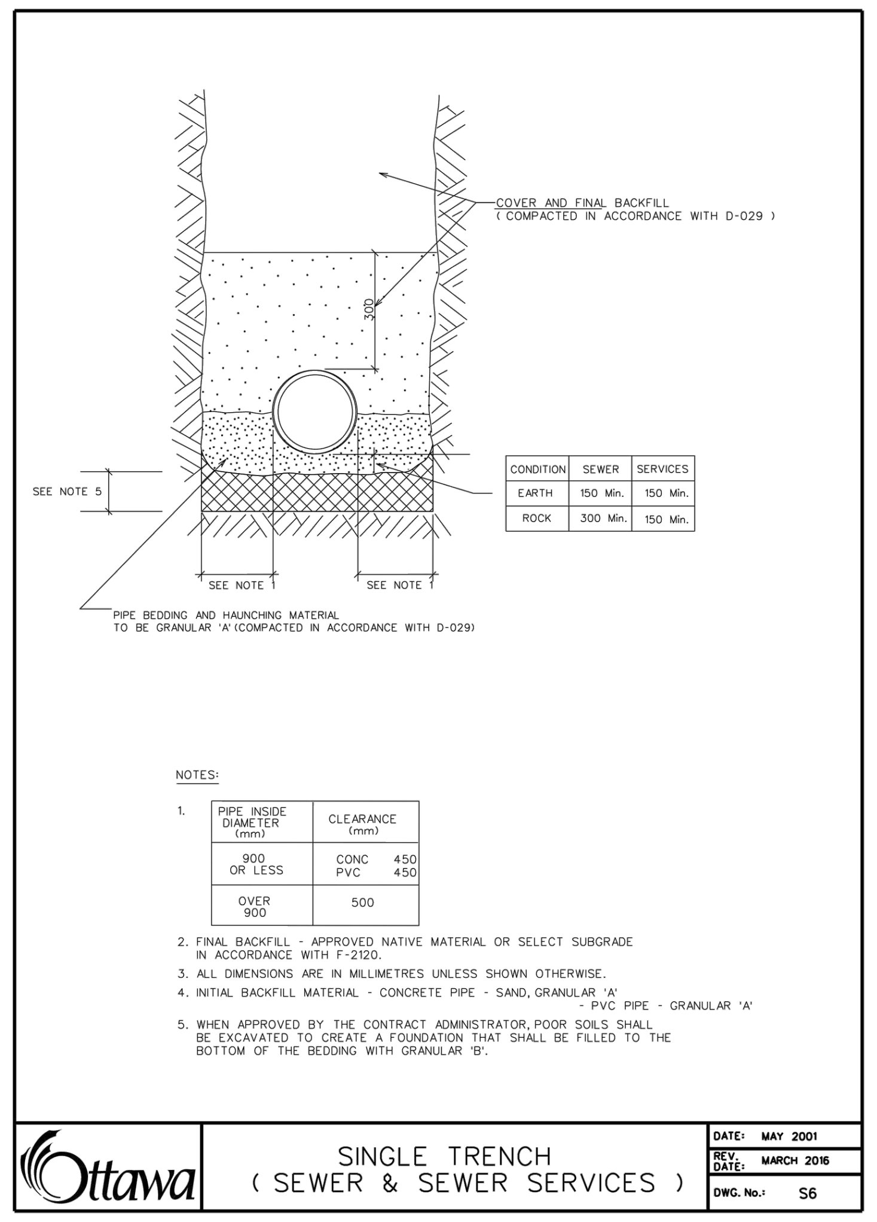


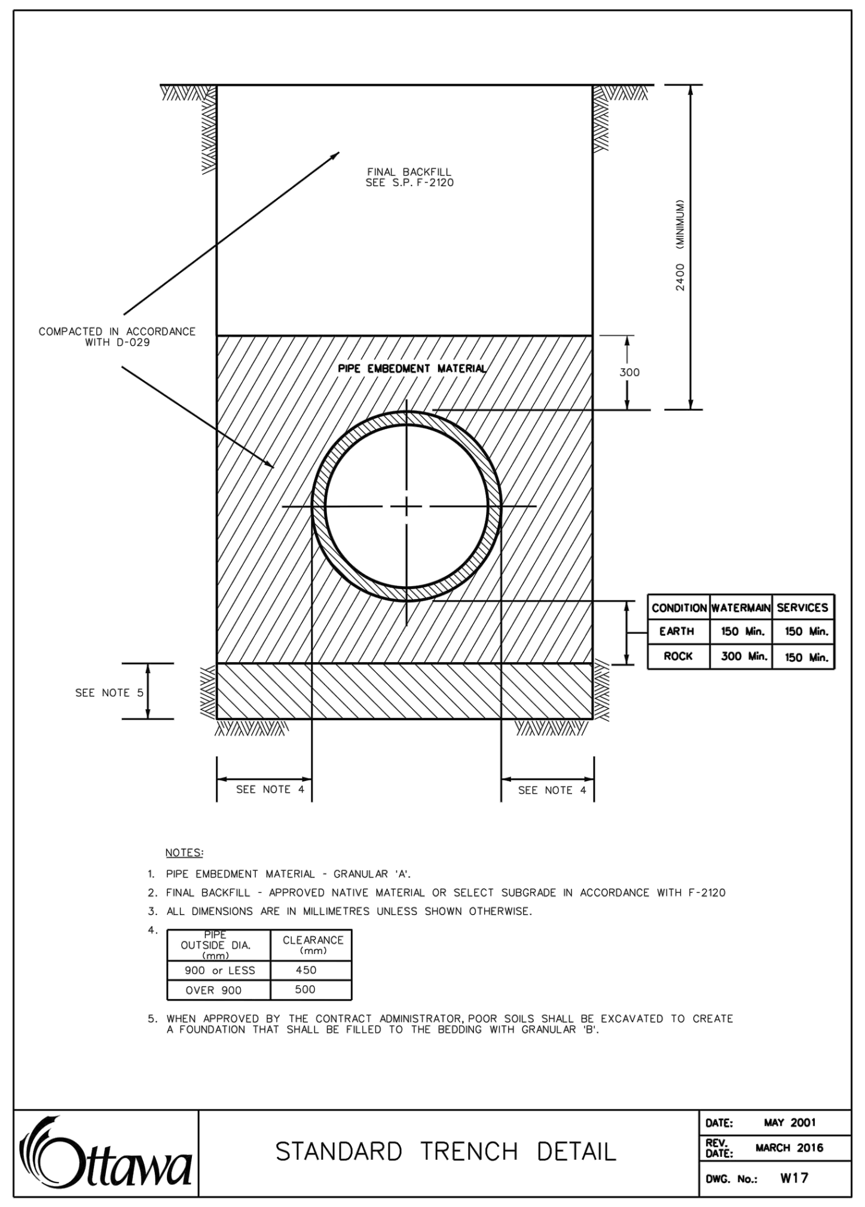


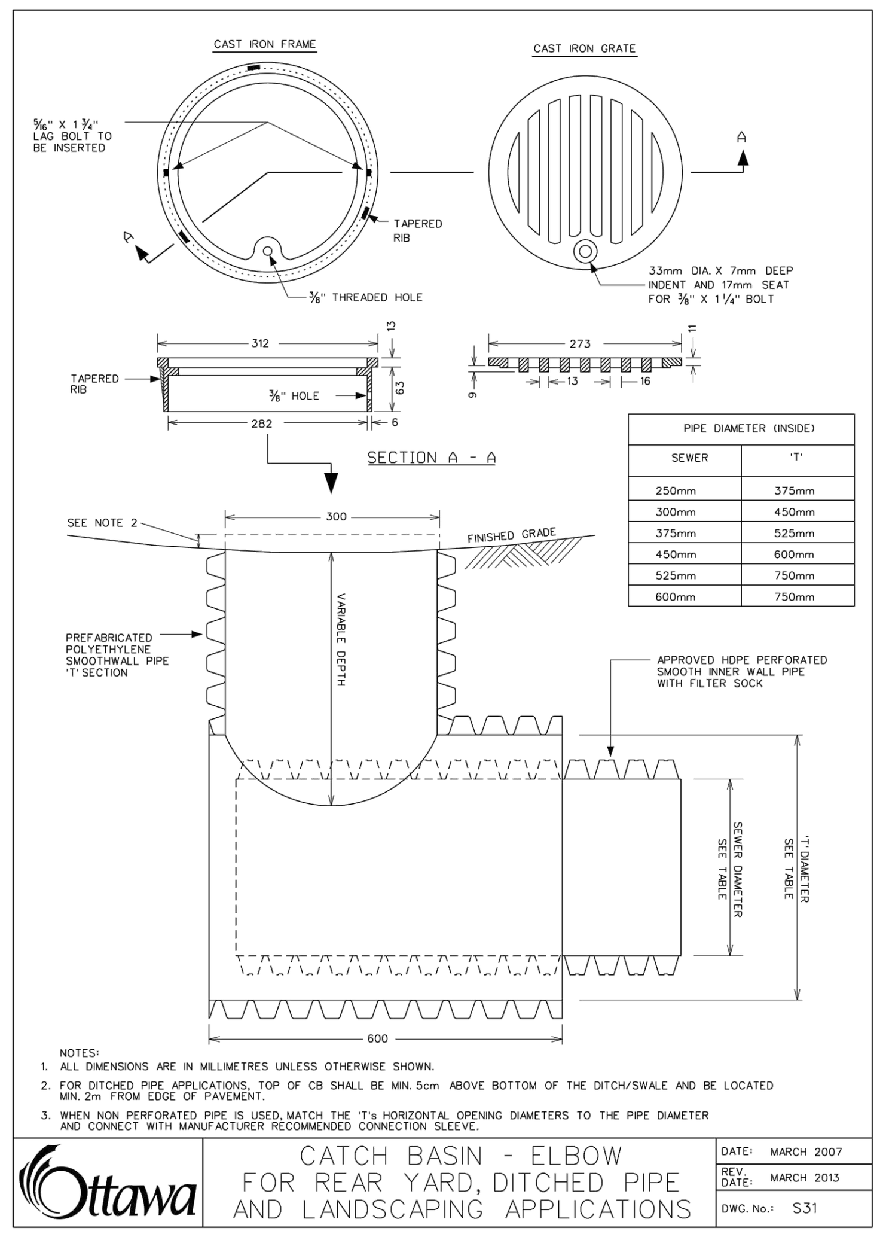


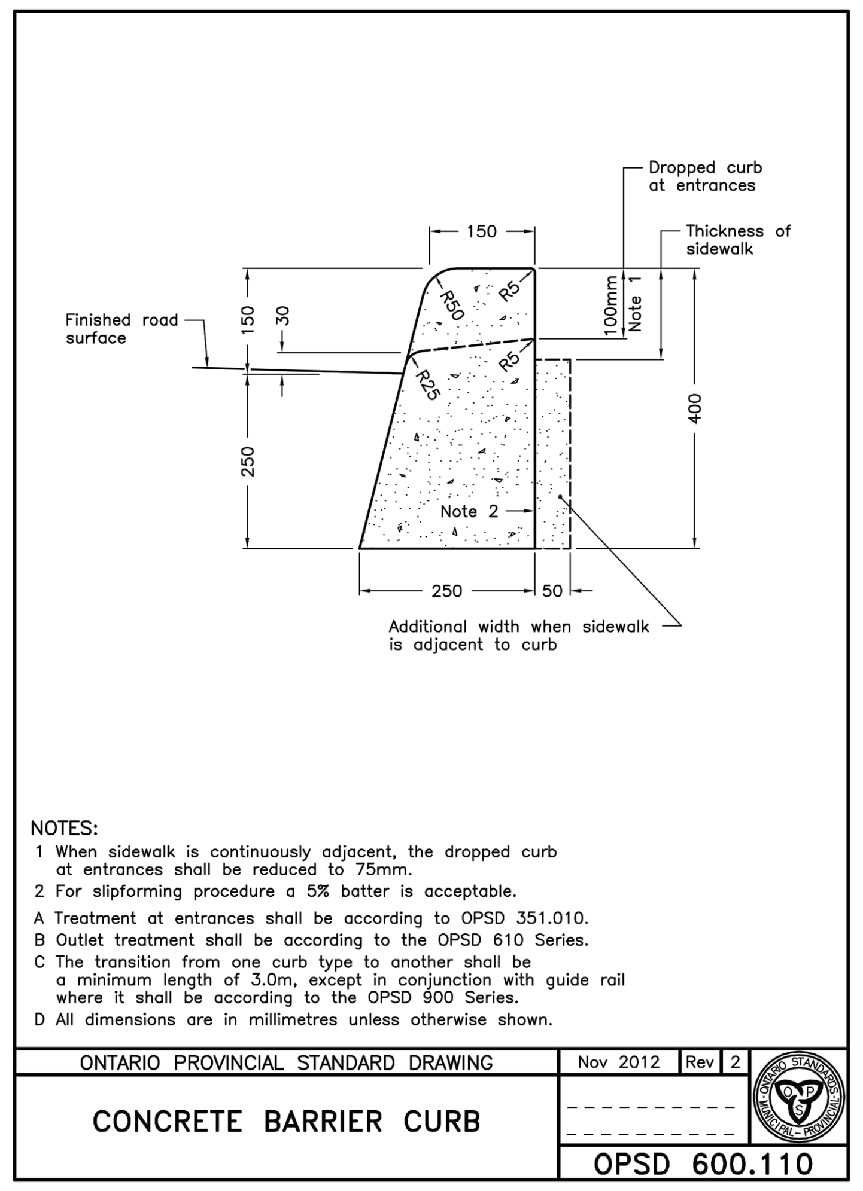


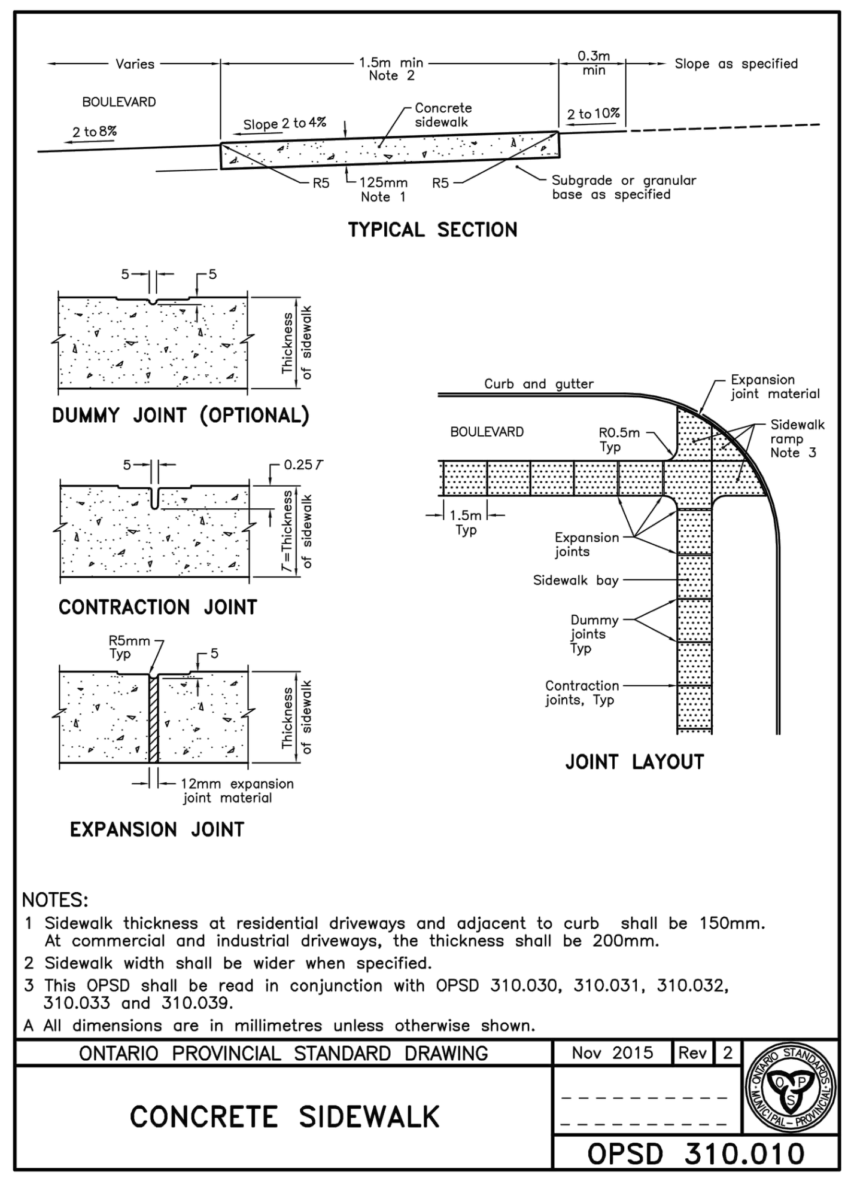


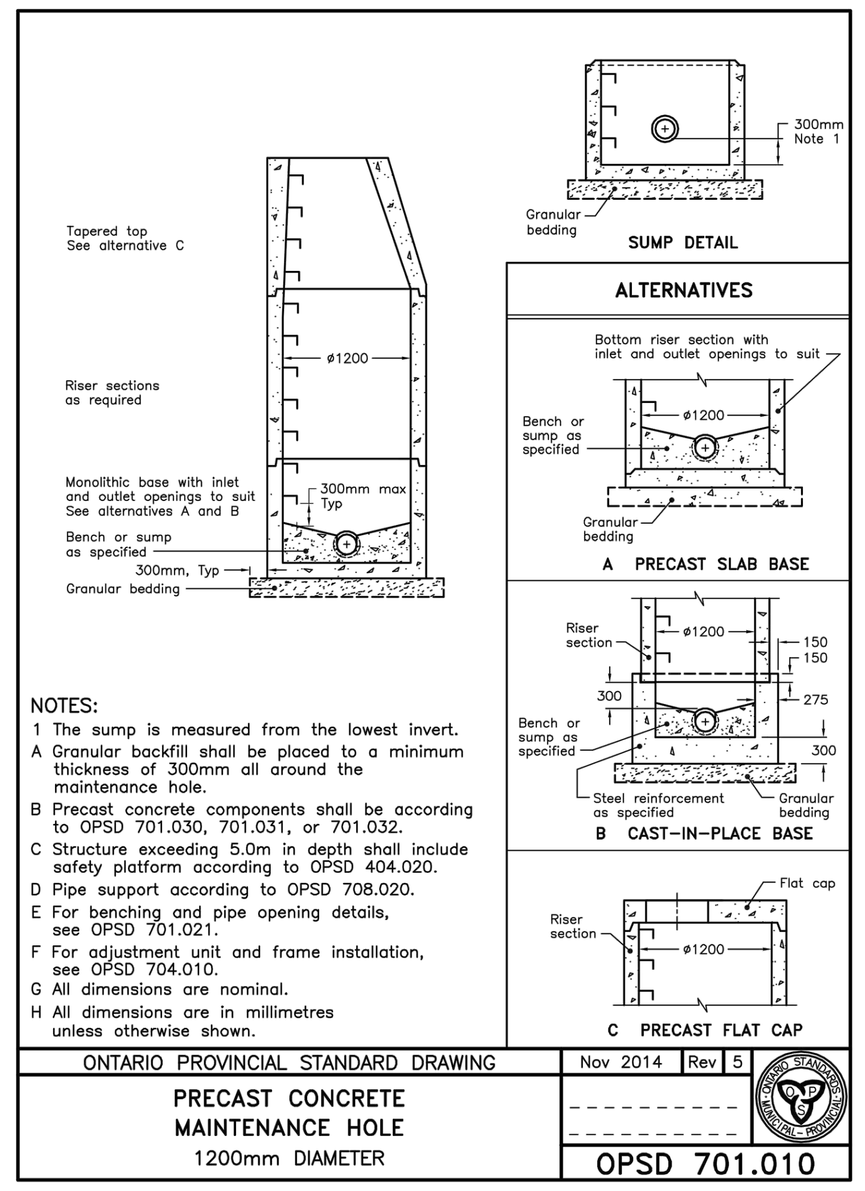


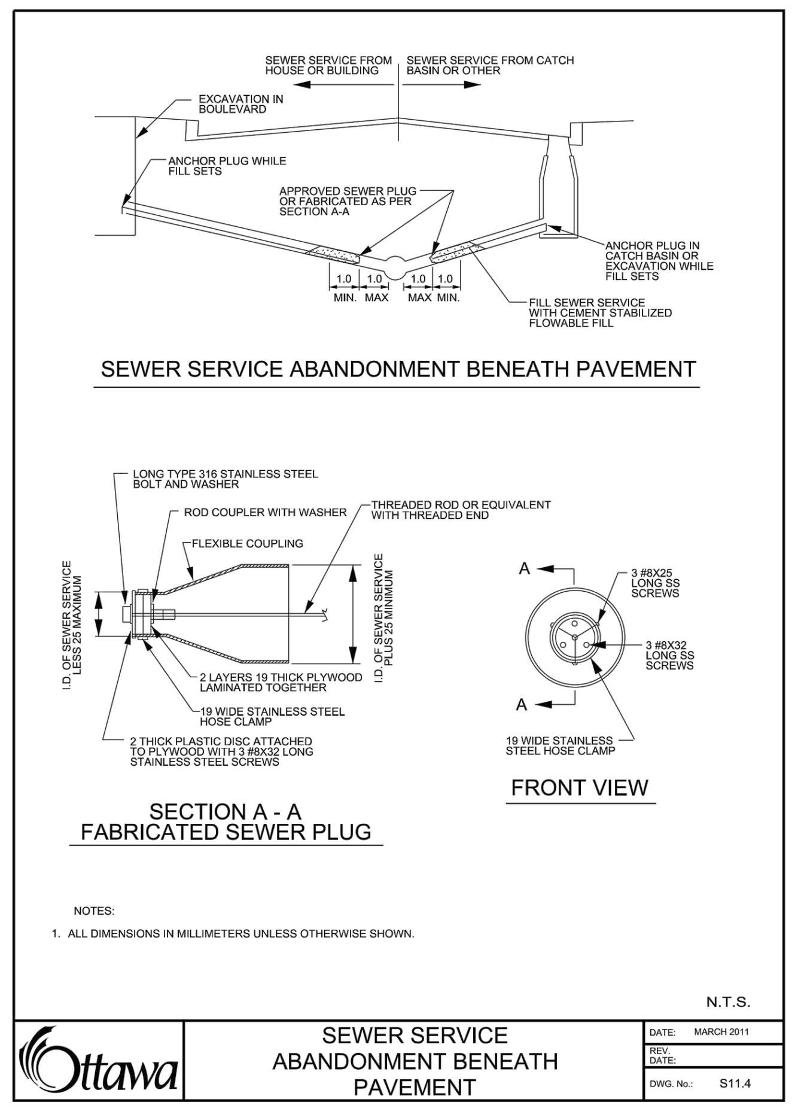


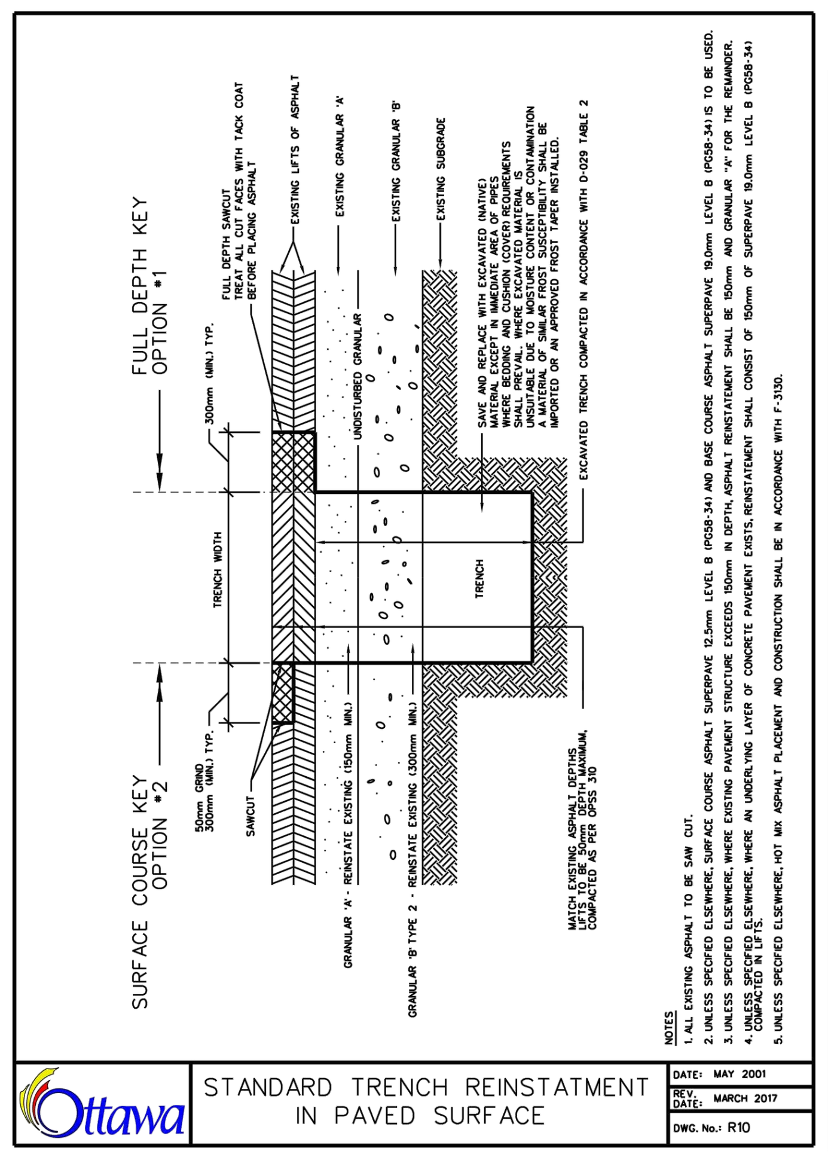


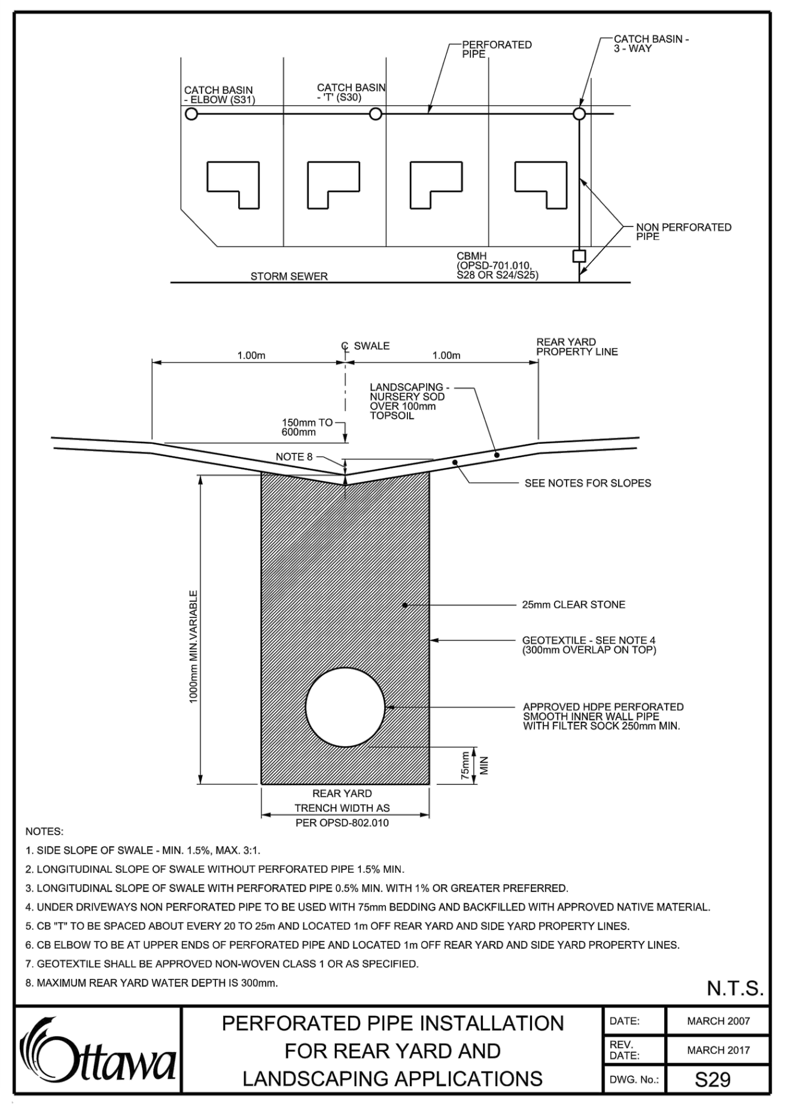


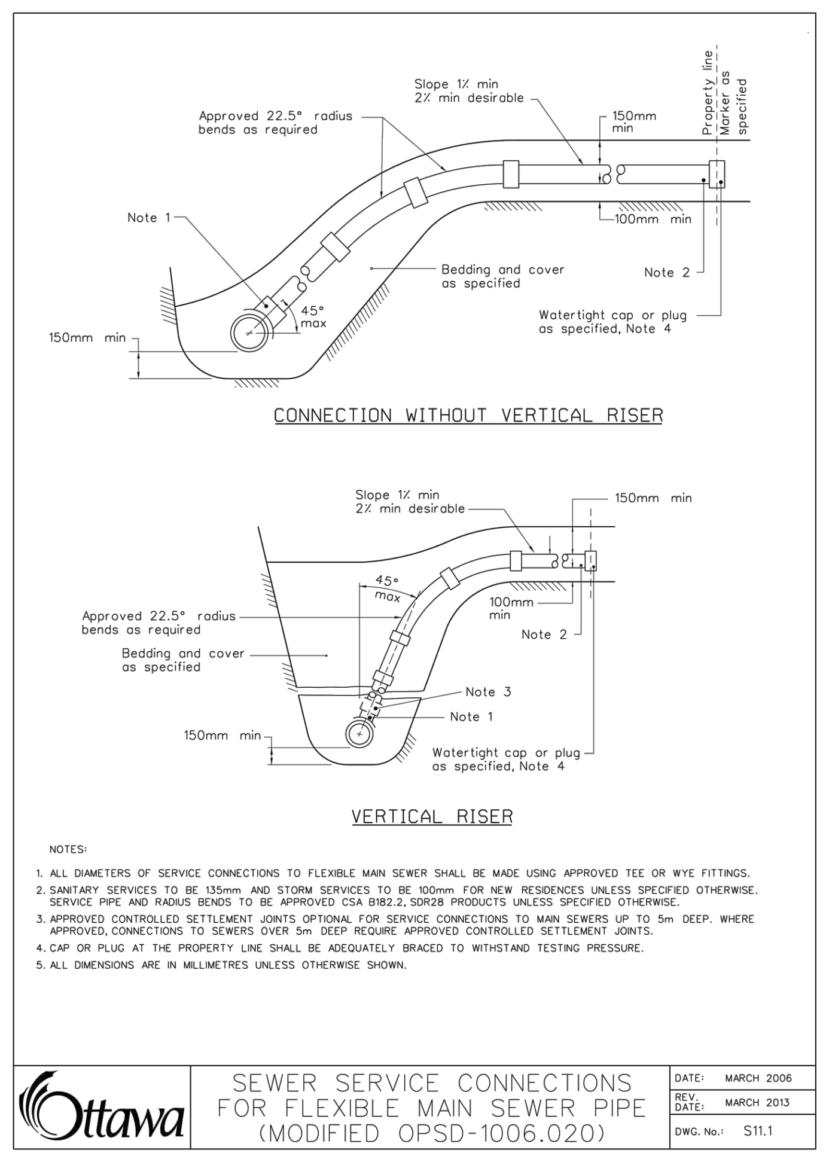


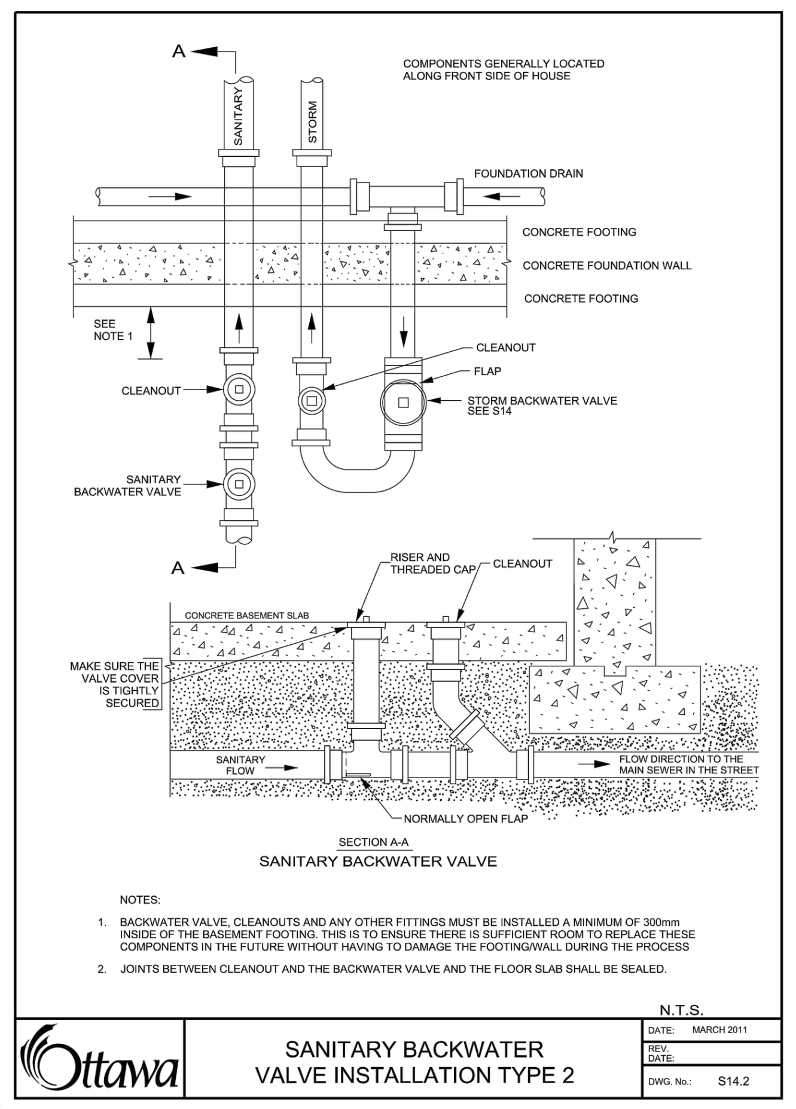


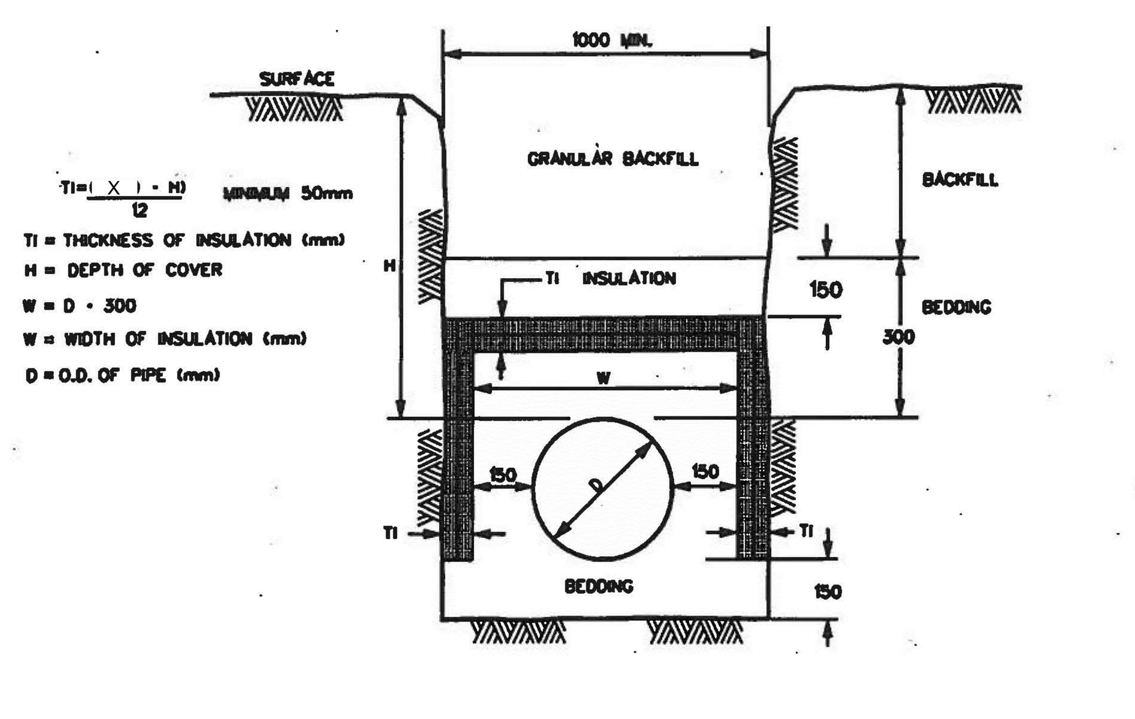












NOTES:
-FOR STORM INSULATION USE AN X VALUE OF 2000 IN THE ABOVE "TI" EQUATION.
-FOR SANITARY INSULATION USE AN X VALUE OF 2500 IN THE ABOVE "TI" EQUATION.
-FOR WATERMAIN INSULATION USE AN X VALUE OF 2400 IN THE ABOVE "TI" EQUATION.
-INCREMENTS OF INSULATION THICKNESS SHALL BE ADJUSTABLE TO 25mm.
-STAGGER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

TYPICAL STORM AND SANITARYSEWER AND WATERMAIN INSULATION DETAIL
(N.T.S.)

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UNAUTHORIZED CHANGES:

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

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

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

GENERAL NOTES:

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

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

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

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

SUBJECT FOR APPROVAL

No.	REVISIONS	BY	DATE
04	ISSUED FOR APPROVAL	A.S.	09 JUL 2021
03	ISSUED FOR APPROVAL	A.S.	23 APR 2021
02	ISSUED FOR APPROVAL	A.S.	29 SEP 2020
01	ISSUED FOR APPROVAL	A.S.	31 JUL 2020

NOT AUTHENTIC UNLESS SIGNED AND DATED

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

CLIENT
PRAVEEN MUPPALLA
450 Creekview Way
Ottawa, ON, K1Y 1L5
TEL: 613-805-8278

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

PROJECT
APARTMENT BUILDING
161 HINCHEY AVENUE

DRAWING TITLE
CONSTRUCTION DETAIL PLAN

PROJECT NO.
200295

DATE
JULY 2020

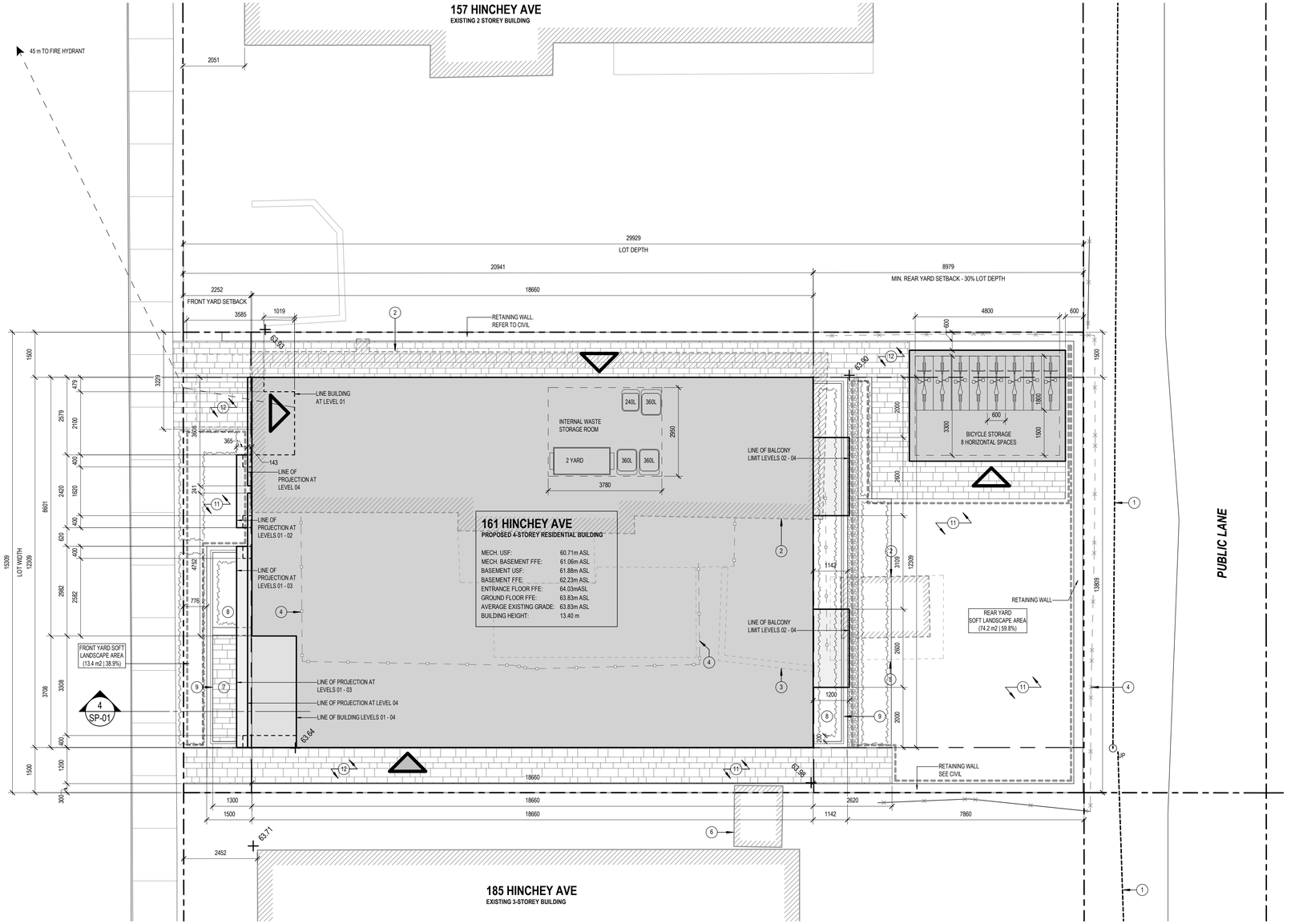
C901

D07-12-20-0142

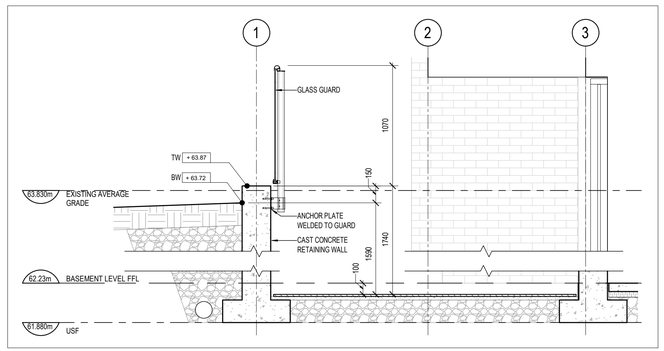
#18320

DRAWINGS/FIGURES

Proposed Site Plan
Legal Survey
As-builts



3 SP-01 SITE PLAN
SCALE: 1 : 75



4 SP-01 SECTION AT TERRACE
SCALE: 1 : 25

2 SP-01 LOCATION PLAN
SCALE: NTS

Site Statistics	
Zoning Designation:	R4-UD
Lot Width:	15.31m
Lot Depth:	29.93m
Total Lot Area:	458.2m2

Proposed Development - 15 Unit Low-Rise Apartment		
Zoning Mechanism	**Required**	**Provided**
Minimum Lot Width *162(a)*	15m	15.31m
Minimum Lot Area *162(a)*	450m2	458.2m2
Min. Front Yard Setback *139(3)(b)*	2.25m *(Average of the setbacks of the existing buildings on the abutting lots)*	2.25m
Min. Interior Side Yard Setback *162(a)*	1.5m	1.5m
Min Rear Yard Setback *161(a)(iii)*	8.979m *(30% of Lot Depth)*	8.979m
Maximum Building height *162(a)*	14.5m	13.4m
Parking Space Rates *101(2)*	0 Spaces *(Area Z)*	0 Spaces
Minimum Visitor Parking Rates *102(2)(i)*	0 Spaces *(0.1 spaces/unit beyond 12 units)*	0 Spaces
Bicycle Parking Rates *Table 111A(b)(i)*	8 Spaces *(12 units x 0.5)*	8 Spaces
Soft Landscaping *161 (13)(b)(iii)*	68.7m2 *(Lots 450m2 or greater, at least 50% of the rear yard)*	74.2 m2 (59.8%)
Front Yard Soft Landscaping *Table 161*	6.9m2 *(20% of Front Yard)*	13.4 m2 (38.9%)
Minimum 2-Bedroom Unit Rates *161(14)(ii)*	4 Units *(At least 25% of units)*	6 Units *(50% of Units)*

1 SP-01 ZONING INFORMATION
SCALE: N.T.S.

1. OVERHEAD WIRE
2. EXISTING BUILDING TO BE DEMOLISHED
3. EXISTING RETAINING WALL TO BE REMOVED
4. EXISTING FENCE TO BE REMOVED
5. EXISTING CONCRETE PAD TO BE REMOVED
6. EXISTING SHED
7. SUNKEN TERRACE
8. LANDSCPAED WINDOW WELL
9. CLEAR GLASS GUARD
11. SOFT LANDSCAPING
12. INTERLOCKING CONCRETE PAVERS

KEYNOTE LEGEND
SCALE: N.T.S.

TOPOGRAPHIC PLAN OF SURVEY OF
LOT 9
REGISTERED PLAN 35
(EAST HINCHEY AVENUE LOTS)
CITY OF OTTAWA

ANNIS, O'SULLIVAN, VOLLEBEKK LTD. 2020

SURVEY INFO
SCALE: NTS

SITE PLAN SYMBOLS LEGEND

- BUILDING ENTRANCE
- BUILDING EXIT
- BICYCLE PARKING
- UTILITY POLE
- EXISTING ELEVATION
- BOARD FENCE
- CHAIN LINK FENCE

SYMBOLS LEGEND
SCALE: NTS

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

5	RE-ISSUED FOR SITE PLAN CONTROL	21-04-20
4	RE-ISSUED FOR SITE PLAN CONTROL	21-03-23
3	ISSUED FOR SITE PLAN CONTROL	20-11-26
2	ISSUED FOR COORDINATION	20-09-16
1	ISSUED FOR COORDINATION	20-05-26

ISSUE RECORD

ONTARIO ASSOCIATION OF ARCHITECTS
RYAN M. KOOLWINE
LICENCE
7370

project1 studio
Project1 Studio
|613.884.3939

161 HINCHEY

161 Hinchey Avenue
Ottawa, ON

PROJ	SCALE	DRAWN	REVIEWED
1931	NOTED	AP	RMK

SITE PLAN

SP-01

D07-12-20-0142

#18320

SKETCH OF BENCHMARK LOCATIONS

161 HINCHEY AVENUE
OTTAWA

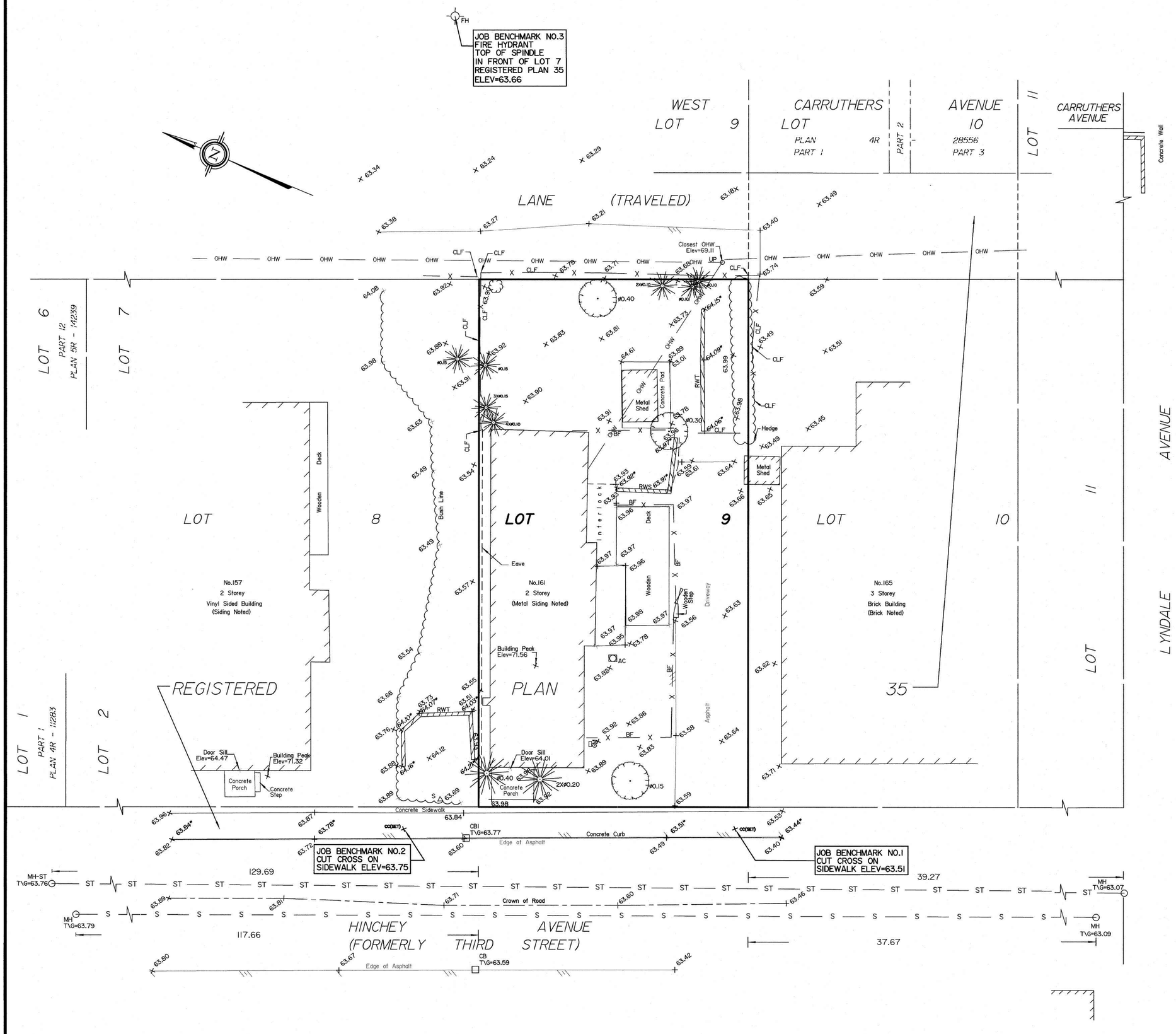
Surveyed by Annis, O'Sullivan, Vollebekk Ltd.

Scale 1 : 150

6 4.5 3.0 1.5 0 3 6 Metres

Metric

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



Notes & Legend

	Denotes	
—□—	"	Survey Monument Planted
—■—	"	Survey Monument Found
SSIB	"	Short Standard Iron Bar
IB	"	Iron Bar
CP	"	Concrete Pin
Meas.	"	Measured
(AOG)	"	Annis, O'Sullivan, Vollebekk Ltd.
(P)	"	Registered Plan 35
(P1)	"	(857) Plan August 9, 2010
(P2)	"	(687) Plan November 25,1985
(P3)	"	Plan 4R-28556
RWT	"	Retaining Wall Timber
RWS	"	Retaining Wall Stone
— OHW —	"	Overhead Wires
o UP	"	Utility Pole
□ CB	"	Catch Basin
□ CB-I	"	Catch Basin Inlet
FH	"	Fire Hydrant
GM	"	Gas Meter
△ S	"	Sign
CLF	"	Chain Link Fence
BF	"	Board Fence
	"	Gate
AC	"	Air Conditioner
	"	Shrub
	"	Deciduous Tree
	"	Coniferous Tree
MH-ST	"	Maintenance Hole (Storm Sewer)
MH-S	"	Maintenance Hole (Sanitary)
— ST —	"	Underground Storm Sewer
— S —	"	Underground Sanitary Sewer
Ø	"	Diameter
+ 65.00	"	Location of Elevation
+ 65.00*	"	Top of Concrete Curb Elevation
+ 65.00*	"	Top of Retaining Wall Elevation
C/L	"	Centreline
	"	Property Line

UTILITY NOTES

1. This drawing cannot be accepted as acknowledging all of the utilities and it will be the responsibility of the user to contact the respective utility authorities for confirmation.
2. Only visible surface utilities were located.
3. Underground utility data derived from City of Ottawa utility sheet reference
4. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.

ELEVATION NOTES

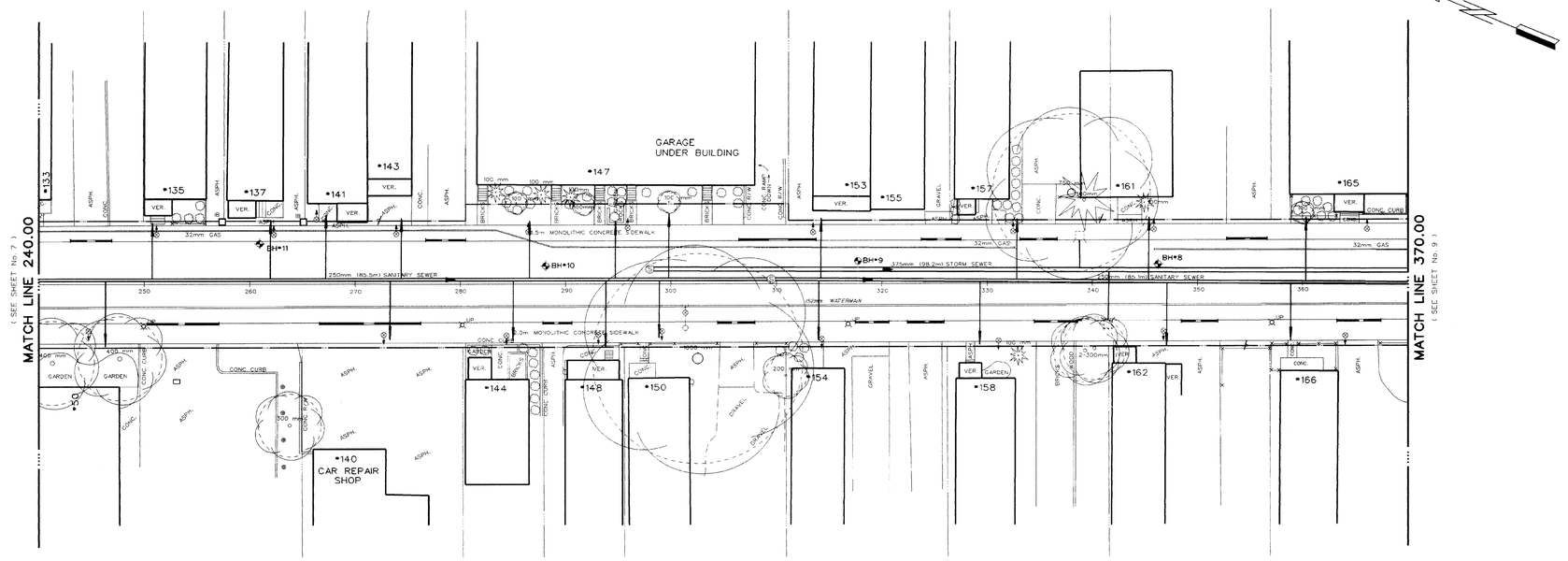
1. Elevations shown are geodetic and are referred to the CGVD28 geodetic datum.
2. It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and that it's relative elevation and description agrees with the information shown on this drawing.

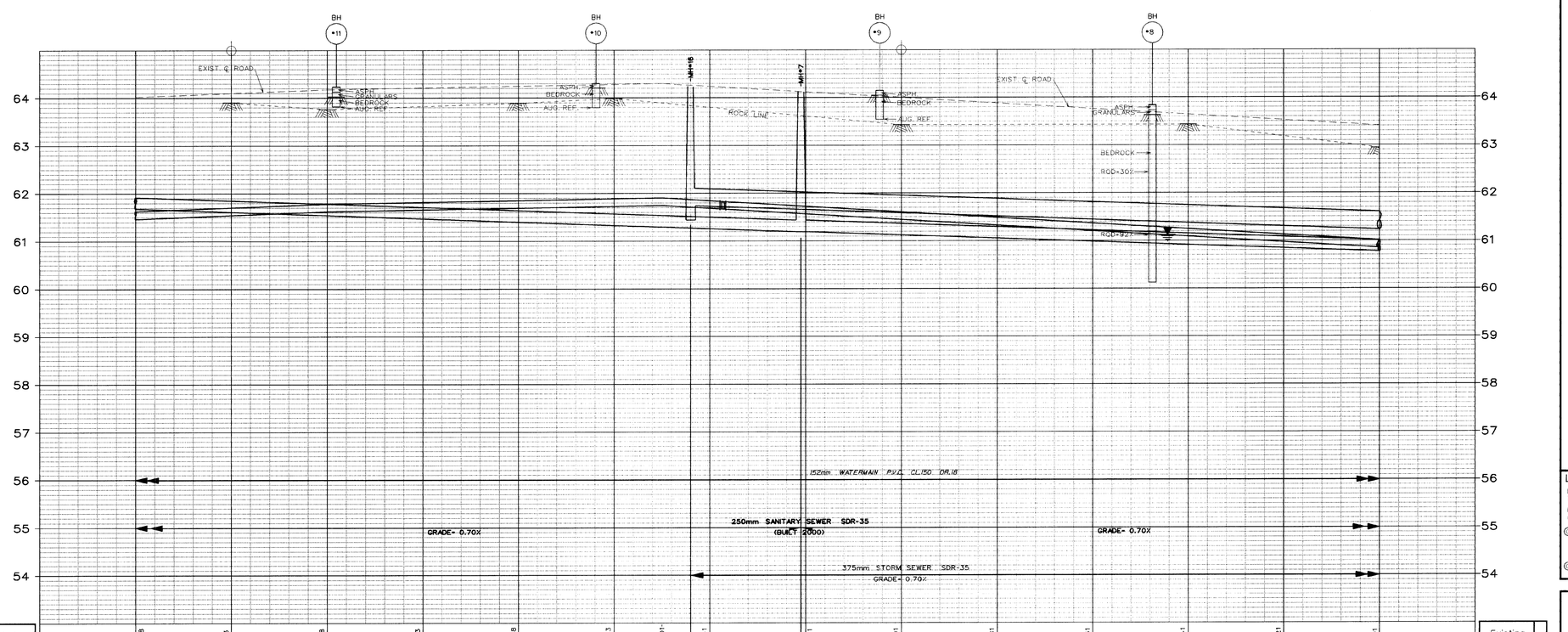
ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 Concourse Gate, Suite 500
Nepean, Ont. K2E 7S6
Phone: (613) 727-0850 / Fax: (613) 727-1079
Email: Nepean@aovltd.com
Ontario Land Surveyors

Job No. 20365-19 Canada Inc-bm Sketch | ST

3266 (8) HINCHEY AVENUE

HINCHEY AVENUE





Elevations	240.00	250.00	260.00	270.00	280.00	290.00	298.00	300.00	309.50	310.00	320.00	330.00	340.00	350.00	360.00	370.00
Existing Surface	64.028	64.103	64.178	64.213	64.248	64.283	64.301	64.241		64.121	64.001	63.881	63.761	63.641	63.521	63.401
East Gutter	63.914	63.989	64.064	64.099	64.134	64.169	64.187	64.127		64.007	63.887	63.767	63.647	63.527	63.407	63.287
West Gutter	63.914	63.989	64.064	64.099	64.134	64.169	64.187	64.127		64.007	63.887	63.767	63.647	63.527	63.407	63.287
Top of Watermain																
Sewer Type & Diameter							375 ST.	HYDRANT/VALVE & BOX	250 SAN.							
Sewer Inverts Existing &							61.740	300.40	61.195							
Stations	240.00	250.00	260.00	270.00	280.00	290.00	298.00	300.00	309.50	310.00	320.00	330.00	340.00	350.00	360.00	370.00

Existing Surface / East Gutter / West Gutter / *Top of Watermain* / Sewer Type & Diameter / Sewer Inverts Existing & / Stations — Elevations

*this drawing was created using MicroStation 95 V.5.05.01.45 (Contract Sheet Revision Date 971001)

Revisions:

No.	Date	Description	Drawn By	Approved By

Design:

	Date	Checked By	Date
Designed By: REG REHBEIN	JAN/00		
Survey Detail By: JOHN FRANCE	JUN/99	Field Checked By: GUY OUROUETTE	OCT/99
Drafting By: GUY OUROUETTE	FEB/00	Checked By	

Chief Design & Construction Engineer
H. V. Pascoe, P.Eng.

Final Measurements:

Construction Type: WATER/SEWERS/ROAD-REHAB.		Inspector: D. BROWN	
Work Commenced: JUNE/00		Project Manager: REG REHBEIN	
Work Completed: JUNE/01		Field Book *:	
Contractor: MALONEY		Date: JAN./05	
Drafting Revisions: D. BROWN	Date: DEC./04	Checked By: D. BROWN	

As Built Notes:

1. Soil information shown is not guaranteed and contractors are advised to collect additional soils information as deemed necessary.
2. Soil information taken from : OMM TROW *MA13549A
3. This plan supercedes (in whole or in part) plan *J-10
4. While illustrations and utilities shown are taken from the best available information, they cannot be guaranteed.
5. The actual rock line was recorded during construction of the existing sanitary sewer.
6. Boreholes prior to construction.
7. See typical cross sections for road structure material depths.
8. All Water information and locations cannot be guaranteed. Please contact the Region of Ottawa Carleton, Environmento Section.

Legal Survey Notes:

Boundary information shown hereon has been compiled and calculated from Teranet data and not based on an actual survey.

Distances shown to survey monuments are for reference purposes only, survey monuments may not define property boundaries.

City of Ville d' **Ottawa**

Department of Urban Planning & Public Works
Engineering Branch
Design And Construction Division
111 SUSSEX DRIVE, SUSSEX PAVILION, 7TH FLOOR, OTTAWA, ONTARIO. K1N 5A1

E.M. Robinson, Commissioner | W.R. Cole, P.Eng., Branch Director

HINCHEY AVENUE

FROM STATION 240.00 TO STATION 370.00

Contract No:	Survey Books:	Scales: (See note)	Plan No:
00C3266		HOR. 1:250 VERT. 1:50	3266 Sheet 8 of 11

Filename: 3266s5.dgn
Reference: Ottebar.dgn
3266ph.dgn
3266b.dgn