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39 Years

Merivale Medical Imaging Clinic
1545A Merivale Road
Ottawa, Ontario

Servicing Design Brief

MERIVALE MEDICAL IMAGING CLINIC
1545A MERIVALE ROAD
OTTAWA, ONTARIO

SERVICING DESIGN BRIEF
IN SUPPORT OF A
SITE PLAN CONTROL APPLICATION

Prepared For:

1545A Merivale Inc.

Prepared By:

NOVATECH
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario
K2M 1P6

May 12, 2023

Novatech File: 122098
Ref: R-2022-207

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May 12, 2023

City of Ottawa
Infrastructure Services and Community Sustainability
110 Laurier Avenue West, 4th Floor
Ottawa, ON K1P 1J1

Attention: **Colette Gorni, Planner II**

Reference: **Merivale Medical Imaging Clinic**
1545A Merivale Road
Servicing Design Brief
Our File No.: 122098

Enclosed for your review and approval is the Servicing Design Brief for the proposed Merivale Medical Imaging Clinic at 1545A Merivale Road in support of the site plan control application.

If you have any questions or comments, please do not hesitate to contact us.

Sincerely,

NOVATECH

Trevor McKay, P.Eng.
Project Manager

cc: Dr. Keyur Shah, MMI
Dr. Nirav Patal, MMI

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1.0 INTRODUCTION

1.1 Background

Novatech has been retained to prepare a Servicing Design Brief for the proposed Merivale Medical Imaging Clinic, located at 1545A Merivale Road in the City of Ottawa. The site will be developed by 1545A Merivale Inc. This report is being submitted in support of a Site Plan Control application.

1545A Merivale Inc. is proposing to construct a one-storey medical imaging facility at 1545A Merivale Road in Ottawa, Ontario. The site is located approximately 1.1 kilometers southwest of the intersection of Merivale Road and Baseline Road, along the arterial of Merivale Road in the former municipality of Nepean. **Figure 1** shows the location of the proposed development.

The site is approximately 6,905 square meters (0.69 ha) in area and is irregularly shaped. A narrow front lot line approximately 4.7 metres in width provides access to the site from Merivale Road, in conjunction with a right-of-way over an adjacent site (1543 Merivale Road). There is currently a 1-storey building on the site which was constructed during the 1950s. The immediate surroundings of the site are other commercial uses.

This Servicing Design Brief provides information on the considerations and approach by which Novatech has analyzed the existing site information for the Merivale Medical Imaging Clinic development, and details how the development lands will be serviced while meeting the City of Ottawa requirements and all other relevant regulations.

This report should be read in conjunction with the following:

- Geotechnical Investigation, Proposed Commercial Building, 1545 Merivale Road, Ottawa, Ontario, prepared by Paterson Group, dated August 3, 2022 (Report: PG6288-1). **[1]**

1.2 Proposed Development

The site will consist of a new one-storey medical imaging facility with underground parking. The proposed Site Plan is shown in **Figure 2**. Site modifications associated with the proposed development include:

- Demolition of the existing building;
- Construction of a 1-storey medical imaging building of approximately 2,566 square meters;
- Creation of a surface parking lot containing 70 vehicle spaces, including 2 accessible spaces;
- Construction of one level of underground parking containing 57 spaces, to be accessed via a ramp at the rear of the building;
- Installation of a 1.8-meter sidewalk to provide safe pedestrian access to the main building entrance from Merivale Road;
- Provision of bicycle parking at the front of the building;
- Landscaping elements interspersed throughout the parking lot and around the edges of the site, along with a landscaped outdoor amenity area for staff at the rear of the building;
- Installation of water, sanitary and storm infrastructure to service the new building.

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N.T.S.

CITY of OTTAWA
MERIVALE MEDICAL IMAGING CLINIC
(1545A MERIVALE ROAD)

KEY PLAN

DATE	JOB	FIGURE
MAY 2023	122098	FIG-1

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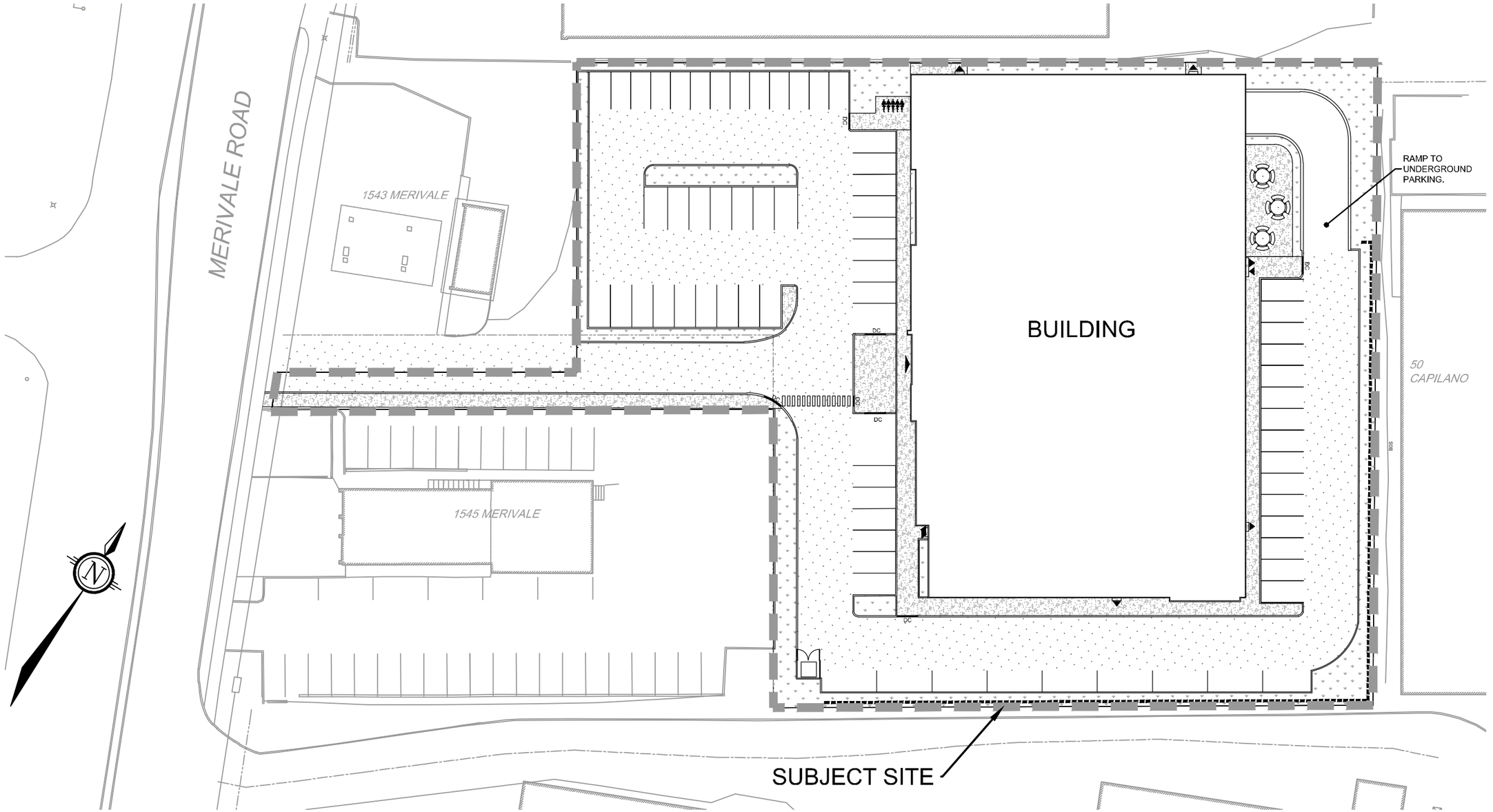

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CITY of OTTAWA
MERIVALE MEDICAL IMAGING CLINIC
(1545A MERIVALE ROAD)

SITE PLAN

SCALE 1 : 500 (0 5 10 15 20)

DATE MAY 2023 | JOB 122098 | FIGURE FIG-2

SHT11X17.DWG - 279mmX432mm

1.3 Pre-Consultation Information

A pre-consultation meeting was held with the City of Ottawa on June 16, 2022, at which time the client was advised of the general submission requirements. The Rideau Valley Conservation Authority (RVCA) was also consulted regarding the proposed development. Refer to **Appendix A** for a summary of the correspondence related to the proposed development.

2.0 SITE GRADING

2.1 Existing Conditions

The site has an existing vacant commercial building. The remainder of the site is primarily composed of asphalt-paved parking areas with some gravel towards the rear (east) of the site. The site slopes to the east (back) of the site. The site is partially graded to direct flows to two existing catch basins in the middle of the site. These catchbasins outlet to an offsite maintenance hole located on the property to the south of the subject site.

A geotechnical investigation was carried out by Paterson Group **[1]** indicating varying bedrock elevations across the site. Inferred bedrock depths varied from 3.1-4.6m below existing grade. The groundwater elevation varied between 1.71-2.89m below existing grade in Boreholes 2-22 and 3-22. No groundwater elevation was reported for Borehole 1-22.

2.2 Proposed Conditions

The design grades will tie into existing back of sidewalk elevations along Merivale Road at the entrance and the existing grades on the south side of the right of way along the adjacent property (1543 Merivale Road). Elevations along the north side of the site to the existing commercial plaza, the west of the site (to the rear of 1543 & 1545 Merivale Road) and the south side of the access driveway along the adjacent site (1545 Merivale Road) will terrace down to existing elevations. Retaining walls will be required along the south and east sides of the site abutting 1547 Merivale Road and 50 Capilano Drive, respectively, to tie into existing grades at property line. For detailed grading refer to drawing **122098-GR (Appendix F)**.

The proposed grading will fall within these ranges:

- Landscaped Areas: Minimum 2% - Maximum 6%
- Parking Areas: 0.5% - 5%
- Maximum Terracing Grade of 3H:1V

2.3 Emergency Overland Flow Route

In the case of a major rainfall event exceeding the 100-year design storm provided for, the site will be graded to provide an overland flow route for the stormwater to leave the site. The major system flow route from the subject site will overflow towards Merivale Road. There are several small landscaped areas along the north and northeast portions of the property that are sloped towards the adjacent properties, consistent with the existing drainage conditions. The finished floor elevation of the building is a minimum of 0.30m above the major system overflow points. The emergency overland flow route is shown on drawing **122098-STM (Appendix F)**.

3.0 EROSION AND SEDIMENT CONTROL

Erosion and sediment control measures will be implemented during construction in accordance with the "Guidelines on Erosion and Sediment Control for Urban Construction Sites" (Government of Ontario, May 1987). Typical erosion and sediment control measures recommended include, but are not limited to, the use of silt fences around perimeter of site, filter fabric or inserts under catch basin/maintenance hole lids, heavy duty silt fence barrier, straw bale check dams, rock check dams, turbidity curtain, dewatering trap, temporary water passage system, riprap, mud mats, silt bags for dewatering operations, topsoil and sod to disturbed areas and natural grassed waterways. Dewatering and sediment control techniques will be developed for the individual situations based on the above guidelines and utilizing typical measures to ensure erosion and sediment control is controlled in an acceptable manner and there is no negative impact to adjacent lands, water bodies or water treatment/conveyance facilities.

The following erosion and sediment control measures will be implemented during construction. Details are provided on the Erosion and Sediment Control Plan.

- All erosion and sediment control measures are to be installed to the satisfaction of the engineer, the municipality and the conservation authority prior to undertaking any site alterations (filling, grading, removal of vegetation, etc.) and remain present during all phases of site preparation and construction.
- A qualified inspector should conduct daily visits during construction to ensure that the contractor is working in accordance with the design drawings and that mitigation measures are being implemented as specified.
    - A light duty silt fence barrier is to be installed in the locations shown on the Erosion and Sediment Control & Removals Plan (**122098-ESC, Appendix F).**
    - Catchbasin inlet protection measures are to be established for all proposed and existing catchbasins and storm sewer structures.
    - After complete build-out, all sewers are to be inspected and cleaned and all sediment and construction fencing is to be removed.
- The contractor shall ensure that proper dust control is provided with the application of water (and if required, calcium chloride) during dry periods.
- The contractor shall immediately report to the engineer or inspector any accidental discharges of sediment material into any ditch or sewer system. Appropriate response measures shall be carried out by the contractor without delay.
- The contractor acknowledges that failure to implement erosion and sediment control measures may result in penalties imposed by any applicable regulatory agency.

Temporary erosion and sediment control measures would be implemented both prior to commencement and during construction in accordance with the "Guidelines on Erosion and Sediment Control for Urban Construction Sites", (Government of Ontario, May 1987).

4.0 SANITARY SEWERS

4.1 Existing Conditions

There is an existing 250mm diameter sanitary sewer in Merivale Road. The existing sanitary service lateral on the property was unable to be located. The existing service will be located during the demolition of the existing building and will be abandoned in accordance with City of Ottawa standards.

4.2 Proposed Conditions

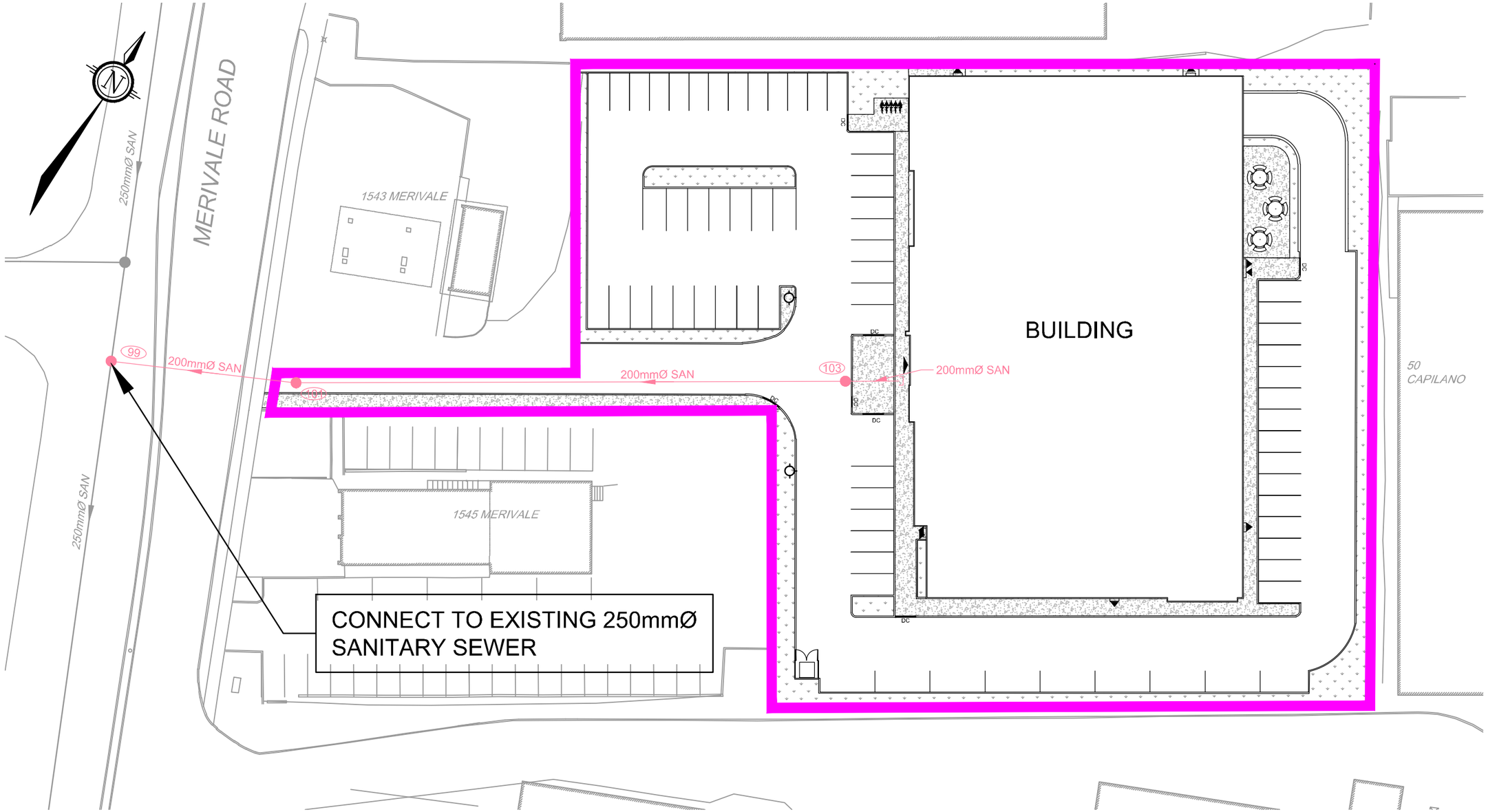
The peak design flow parameters in **Table 4-1** have been used in the sewer capacity analysis. Design parameters are specified in the City of Ottawa Sewer Design Guidelines **[2]**.

Under post-development conditions, the proposed development will be serviced by a new 200mm diameter sanitary sewer connected to the existing municipal 250mm diameter sanitary sewer located in Merivale Road. A new maintenance hole will be required to be installed on the existing sanitary sewer to facilitate the connection to the existing 250mm diameter rigid pipe sanitary sewer. The sanitary sewer layout is shown in **Figure 3** and the sanitary design sheet is attached in **Appendix B**. Sanitary flows from the site will outlet at MH 99 with a peak design flow of 0.56 L/s.

Due to the irregular lot shape, the proposed development only has 4.7m of frontage onto Merivale Road. To provide municipal services to the site, it is proposed to provide 1m (centre to centre) separation between each of the proposed sewers and the watermain. The proposed separation distance is less than the preferred separation distances for mainline sewers (1.5m) and watermains (3m), however the provided distance in greater than the minimum distance required for services (approximately 0.5m) as outlined in the City of Ottawa specifications.

Table 4-1: Sanitary Sewer Design Parameters

Parameter	Design Parameter
Gross Area	0.69 ha
Commercial Average Flow	28,000 L/gross ha/day
Commercial Peaking Factor	1.5
Infiltration Rate	0.33 L/s/ha
Minimum Pipe Size	200 mm
Minimum Velocity	0.6 m/s
Maximum Velocity	3.0 m/s



LEGEND

- PROPOSED SANITARY SEWER
- *EXISTING SANITARY SEWER*
- SITE BOUNDARY

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CITY of OTTAWA
MERIVALE MEDICAL IMAGING CLINIC
(1545A MERIVALE ROAD)

SANITARY SEWER NETWORK

SCALE 1 : 500 (0 5 10 15 20)

DATE	JOB	FIGURE
MAY 2023	122098	FIG-3

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5.0 STORM DRAINAGE & STORMWATER MANAGEMENT

Storm servicing for the proposed development at 1545A Merivale Road will be provided using a dual drainage system. Runoff will be stored and conveyed by underground storm sewers (minor system), while flows from large storm events which exceed the capacity of the minor system will be conveyed overland along defined overland flow routes (major system). Water quality treatment will ultimately be provided by the existing Nepean Creek Stormwater Facility, located at the outlet of the Merivale Road storm sewer.

5.1 Existing Conditions

The site is partially graded to direct flows to two existing catch basins in the middle of the site which outlets to an existing storm maintenance hole on the property to the south of the subject site (1547 Merivale Road). The remainder of the site sheet drains to the adjacent properties to the north (1541 Merivale Road), east (50 Capilano Drive) and south (1547 Merivale Road) of the site. These properties all have storm sewer (minor system) inlets which capture the existing runoff from the site. Based on existing topography, most of the overland drainage leaving the site that is not captured by the adjacent minor system inlets is directed through the adjacent properties to Capilano Drive. Portions of the existing property to the northeast (1543 Merivale Road) currently sheet drain onto the 1545A Merivale Road property.

5.2 Stormwater Management Criteria

The following stormwater management criteria for the proposed development were prepared in accordance with the City of Ottawa Sewer Design Guidelines (October 2012), and Technical Bulletins PIEDTB-2016-01, ISTB-2018-01, ISTB-2018-02, and ISTB-2018-03 **[2]**.

5.2.1 Minor System (Storm Sewers)

- Storm sewers are to be designed using the Rational Method for a 2-year return period;
- A maximum minor system release rate calculated based on the pre-development runoff coefficient or a maximum equivalent 'C' of 0.5, whichever is less, with a time of concentration no less than 10 minutes.

5.2.2 Major System

- Provide on-site storage for storm runoff which exceeds the allowable minor system release rate from the site up to and including the 100-year design event;
- Ponding depths are not to exceed 0.35m (static + dynamic) and are not to be within 0.30m (vertical) to the nearest building opening;
- No surface ponding for storms up to and including the 2-year event.

5.2.3 Water Quality

- Provide an *Enhanced* level (80% long-term TSS removal) of water quality control;
- Where possible, implement lot-level and conveyance best management practices to maximize the potential for water quality treatment.

5.3 Storm Sewer Design (Minor System)

The proposed storm sewers have been designed using the Rational Method to convey peak flows associated with the 2-year return period. The storm sewer layout is shown in **Figure 4** and the storm sewer design sheet is provided in **Appendix C**. The corresponding Storm Drainage Area Plan (**122098-STM**) is provided in **Appendix F**.

Table 5-1: Storm Sewer Design Parameters

Parameter	Design Criteria
Private Site	2 Year Return Period
Storm Sewer Design	Rational Method/PCSWMM
IDF Rainfall Data	Ottawa Sewer Design Guidelines **[2]**
Initial Time of Concentration (T_c)	10 min
Minimum Velocity	0.8 m/s
Maximum Velocity	3.0 m/s
Minimum Diameter	250 mm

Table 5-2: Runoff Coefficients

Land Use	Runoff Coefficient
Hard Surface	0.90
Soft Surface	0.20

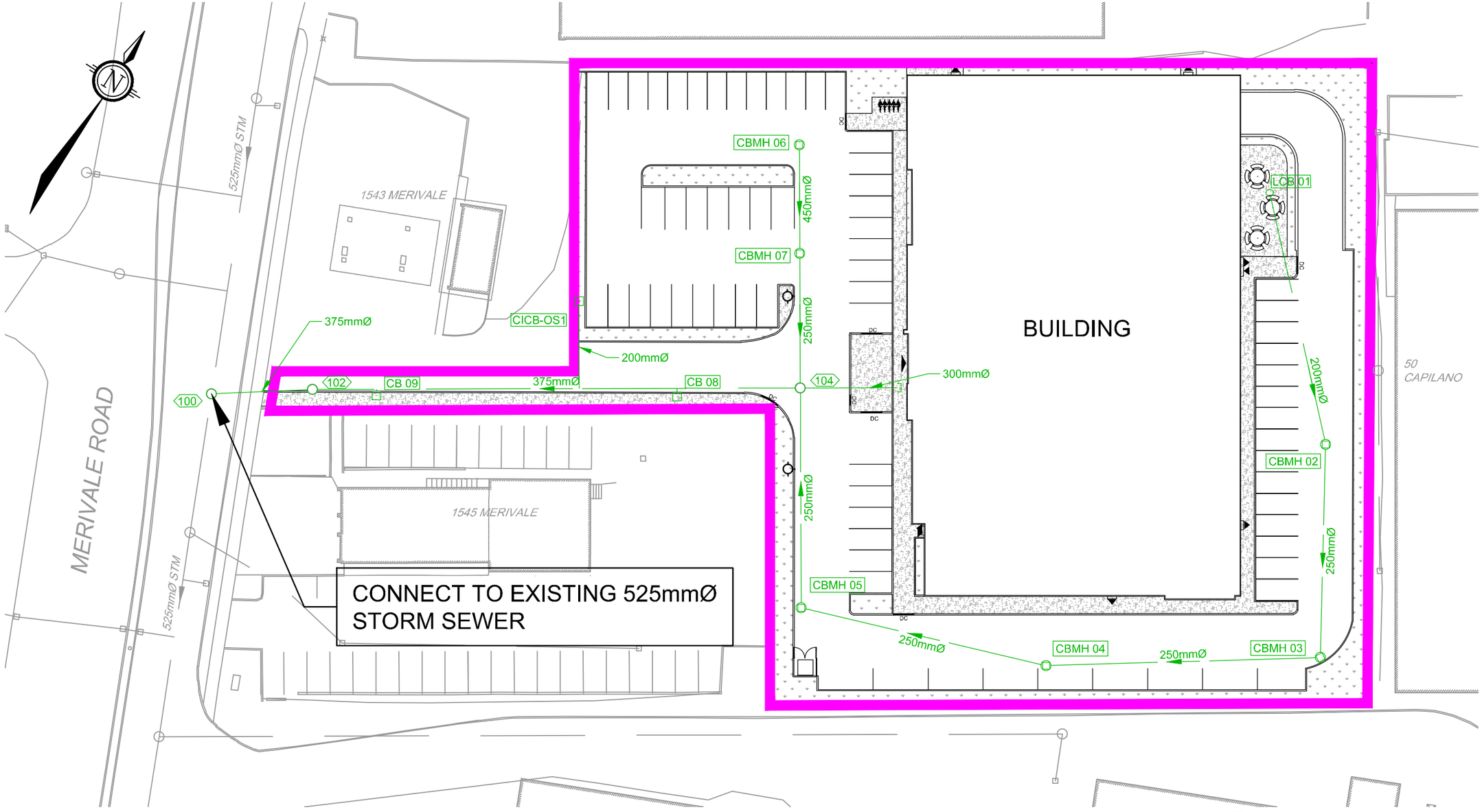
5.3.1 Allowable Release Rate

As noted above in the design criteria, the allowable release rate for the site is based on using either the pre-development runoff coefficient, or a C=0.5, whichever is less. Under existing conditions, the site consists of a parking lot, a flat-roofed building, and a small strip of grass which would give an approximate runoff coefficient of C=0.85. As such, a runoff coefficient of C=0.5 has been used in the Rational Method calculation for the allowable release rate. Calculations as follows:

$Q_{allowable}$=2.78CiA where;
C =0.5
i = 76.81 mm/hr (for a 2-year event and Tc of 10 mins)
A = 0.77 ha (refer to **122098-STM** for total drainage area tributary to the outlet)
$Q_{allowable}$ = 2.78 * 0.5 * 76.81 * 0.77
$Q_{allowable}$ = 82.2 L/s

5.3.2 Outlet Orifice Controls

Outflows to the Merivale Road storm sewers will be controlled using orifices sized to restrict the flow from the proposed site to the allowable release rate for each storm event. This will result in some surface ponding in the parking areas during larger storm events (greater than the 2-year return period). Orifice controls are to be installed in CBMH05, CBMH07, CB08, and CB09 to control the runoff from the parking areas.



LEGEND

- PROPOSED STORM SEWER
- *EXISTING STORM SEWER*
- SITE BOUNDARY

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CITY of OTTAWA
MERIVALE MEDICAL IMAGING CLINIC
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STORM SEWER NETWORK

SCALE 1 : 500 (0 5 10 15 20)

DATE MAY 2023 | JOB 122098 | FIGURE FIG-4

SHT11X17.DWG - 279mmX432mm

5.3.3 Water Quality Controls

Water quality control for the site will be provided by the existing Nepean Creek Stormwater Facility, located approximately 1.8km downstream from the site outlet to the Merivale Road storm sewer. Through discussions with City and RVCA staff, it has been determined that this facility will provide the requisite water quality control for the site. The facility was designed to provide quality control at a minimum design of 70% long-term TSS removal, however pond performance has been shown to range between 70-90% long-term TSS removal. Refer to **Appendix A** for details and correspondence with City and RVCA staff.

5.3.4 Upstream Drainage Areas

There are two small areas from the property to the northeast of the site which are tributary to catchbasins on the subject site. These areas have been included in the calculation of the allowable release rate from the site, and runoff from them will be controlled accordingly.

5.4 On-Site Storage

A total storage volume of approximately 250m^3 can be provided across the 0.69ha drainage area by a combination of surface storage, rooftop storage, and underground storage (superpipe).

5.4.1 Overland Flow and Surface Storage (Major System)

The parking areas have been designed to store runoff from storms that exceed the capacity of the storm sewers and superpipe at each catchbasin/ catchbasin maintenance hole inlet. The site has been graded to ensure that ponding is confined within the parking areas to a maximum depth of 0.35m (static ponding + dynamic flow). An overland flow path has been provided to ensure that runoff from extreme storm events (i.e., storms that exceed the 100-year event) in excess of the available on-site storage volume can be safely directed onto the adjacent roadway (Merivale Road).

The storage available at each low-point above the catchbasins was calculated using the Autodesk Civil 3D software, based on the proposed surface shown on the Grading Plan (**122098-GR**). Based on these calculations, approximately 150m^3 of storage (static) is available within the low points of the parking area.

5.4.2 Rooftop Storage and Controls

Runoff from the building roof will be attenuated by the use of seven (7) Watts flow control roof drains, and storage for runoff which exceeds the flow rate of these drains will be provided on the roof surface. Manufacturer specifications for the proposed roof drains have been provided in **Appendix D**. The Mechanical and Structural Engineer's will be required to ensure that the proposed roof ponding volumes and total release rates from the roof are incorporated and accounted for during the detailed design of the building.

5.4.3 Underground Storage (Superpipe)

A single run of storm sewers, between CBMH06 and CBMH07 has been over-sized to provide additional storage upstream of the flow-control orifice located in CBMH07. Based on Rational method calculations, the required sewer size to convey flows was 250mm, but the pipe has been

upsized to 450mm to provide additional storage volume to prevent surface ponding during the 2-year storm event.

5.5 Hydrologic & Hydraulic Modeling

The City of Ottawa Sewer Design Guidelines **[2]** require hydrologic modeling for all dual drainage systems. The performance of the proposed storm drainage system for the site was evaluated using the *PCSWMM* hydrologic/hydraulic modeling software.

Design Storms

The hydrologic analysis was completed using the following synthetic design storms and historical storms. The IDF parameters used to generate the design storms were taken from the Sewer Design Guidelines **[2]**.

Chicago Storms:
25mm 4-hr Chicago storm
2-year 3-hr Chicago storm
5-year 3-hr Chicago storm
100-year 3-hr Chicago storm

12 *Hour SCS Storms*:
2-year 12-hr SCS storm
5-year 12-hr Chicago storm
100-year 12-hr Chicago storm

The 3-hour Chicago distribution generates the highest peak flows for both the minor and major systems and was determined to be the critical storm distribution for the design of the storm drainage system.

The proposed drainage system has also been stress tested using a 3-hour Chicago design storm that has a 20% higher intensity and total volume compared to the 100-year event.

Model Development

The PCSWMM model accounts for both minor and major system flows (*dual drainage*), including the routing of flows through the storm sewer network (*minor system*), and overland along the road network (*major system*). The results of the analysis were used to;

- Determine the total major and minor system runoff from the site;
- Size the ICDs to ensure the allowable release rate from the site is not exceeded;
- Calculate the storm sewer hydraulic grade line for the 100-year storm event; and
- Evaluate the overland flow depths and ponding volumes during the 100-year event.

The model is capable of accounting for both static and dynamic storage within the private roadways and parking areas, including the overland flow across all high points. The 100-year flow depths computed by the model represent the total (static + dynamic) ponding depths at low points for areas in road and parking sags.

Storm Drainage Area Plan & Subcatchment Parameters

The development has been divided into sub-catchments based on the drainage areas tributary to each inlet of the proposed storm sewer system. The catchment areas are shown on the Storm Drainage Area Plan (**122098-STM**) in **Appendix F**.

The hydrologic parameters for each subcatchment were developed based on the Site Plan (**Figure 2**) and the Storm Drainage Area Plan specified above. Subcatchment parameters are outlined in **Table 5-3**.

Table 5-3: Subcatchment Model Parameters

Area ID	Catchment Area (ha)	Runoff Coefficient (C)	Percent Impervious (%)	No Depression (%)	Flow Path Length (m)	Equivalent Width (m)	Average Slope (%)
A-01	0.009	0.77	81%	0%	12.49	7.21	0.5%
A-02	0.046	0.90	100%	0%	32.56	14.13	1.6%
A-03	0.032	0.90	100%	0%	19.46	16.44	1.0%
A-04	0.039	0.90	100%	0%	33.72	11.57	1.0%
A-05	0.055	0.76	80%	0%	30.55	18.00	1.5%
A-06	0.055	0.81	87%	0%	38.00	14.47	1.5%
A-07	0.069	0.90	100%	0%	38.27	18.03	1.5%
A-08	0.050	0.84	91%	0%	47.28	10.58	1.5%
A-09	0.025	0.90	100%	0%	29.88	8.37	2.0%
B-01	0.257	0.90	100%	0%	62.27	41.27	1.0%
B-02	0.015	0.90	100%	0%	23.71	6.33	3.0%
DR-01	0.020	0.20	0%	0%	75.17	2.66	0.5%
DR-02	0.011	0.20	0%	0%	67.27	1.64	0.5%
DR-03	0.015	0.26	9%	0%	74.71	2.01	0.5%
DR-04	0.004	0.31	16%	0%	28.38	1.41	0.5%
OS-01	0.047	0.47	39%	0%	32.86	14.30	0.5%
OS-02	0.013	0.90	100%	0%	7.51	17.32	0.5%

Infiltration

Infiltration losses for all catchment areas were modeled using Horton's infiltration equation, which defines the infiltration capacity of the soil over the duration of a precipitation event using a decay function that ranges from an initial maximum infiltration rate to a minimum rate as the storm progresses. The default values for the City of Ottawa were used for all catchments.

Horton's Equation:
$f(t) = f_c + (f_o - f_c)e^{-k(t)}$

Initial infiltration rate: f_o = 76.2 mm/hr
Final infiltration rate: f_c = 13.2 mm/hr
Decay Coefficient: k = 4.14/hr

Depression Storage

The default values for depression storage in the City of Ottawa were used for all catchments.

- Depression Storage (pervious areas): 4.67 mm
- Depression Storage (impervious areas): 1.57 mm

Equivalent Width

Equivalent Width' refers to the width of the sub-catchment flow path. This parameter is calculated as described in the Sewer Design Guidelines **[2]**, Section 5.4.5.6. The flow paths used to calculate the equivalent widths are shown on the PCSWMM schematics provided in **Appendix D**.

Impervious Values

Runoff coefficients for each subcatchment area were calculated based on the proposed Site Plan (**Figure 2**). Refer to the Storm Drainage Area Plan (**122098-STM**) for details. Percent impervious values were calculated using the following equation:

$$\%imp = \frac{C - 0.2}{0.7}$$

Boundary Condition

The site outlets to the 525mm diameter storm sewer under Merivale Road. The HGL in the Merivale sewer is unknown and the boundary condition for the storm outlet was assumed to be the obvert of the receiving 525mm diameter storm sewer (94.43m) as no HGL issues within the existing storm sewer were identified during the pre-consultation process with the City of Ottawa.

5.6 Minor System Design and Analysis

The following sections outline the model parameters and results of the PCSWMM model pertaining to the minor system (storm sewers).

5.6.1 Orifice Controls

Inflows to the storm sewer were modeled based on the characteristics of each inlet. All the catchbasins in the parking areas and roadway are located at low points. Inflows to the storm sewer are based on the ICD specified for the inlet and the maximum depth of ponding. ICDs have been sized to limit the ultimate outlet peak flows to the allowable release rate of 82 L/s.

Per the Storm Sewer Design Guidelines **[2]**, *"ICDs shall not be used in series (i.e. where the backwater from one device affect the next upstream device) unless a dynamic model is used to assess their performance and to compute the corresponding upstream water elevation and storage requirements"*. As such, ICDs have been installed in the downstream catchbasin maintenance hole to limit peak flows from the upstream series of inlets, as well as take advantage of the storage provided by the upstream storm sewers. Details are outlined as follows in **Table 5-4**. ICD information is indicated on the General Plan of Services (**122098-GP**, **Appendix F**). Roof drain calculations have been included in **Appendix D**.

Table 5-4: Inlet Control Devices & Design Flows

Structure	ICD Size	Max Head* (m)	Calculated Max. Capture Rate** (L/s)	100-yr Head*** (m)	100-year Approach Flow*** (L/s)	100-year Capture Rate*** (L/s)
CBMH05	LMF78	2.12	7.84	1.96	39.41	7.41
CBMH07	83mm	2.13	21.68	1.92	45.20	19.79
CB08	LMF94	1.37	9.09	1.14	24.38	8.17
CB09	LMF86	1.37	7.64	1.12	18.85	6.83

**Max head is calculated as the T/G elevation plus 0.35m*
*** Max capture rate is calculated using the orifice equation, based on the max head*
**** From PCSWMM 100-yr 3-hour Chicago Storm event*

5.6.2 Roof Drains

The building rooftop was simulated in PCSWMM based on an outlet rating curve for the proposed roof drains and using a storage node to represent the available storage provided by the roof surface. It has been assumed that the building roof will have seven (7) drains each set to fully open, giving flow rates outlined in **Table 5-5** for a single drain (converted from inches and gallons per minute). For modelling purposes, a single outlet link for the roof has been used, with the flow rates below multiplied by seven (7) to give the total flow from all drains.

Table 5-5: Roof Drain Rating Curve

Head (m)	Single Drain - Controlled Flow Rate* (L/s)				
	Fully Open	3/4 Open	1/2 Open	1/4 Open	Fully Closed
0.000	0.00	0.00	0.00	0.00	0.00
0.025	0.32	0.32	0.32	0.32	0.32
0.051	0.63	0.63	0.63	0.63	0.63
0.076	0.95	0.87	0.79	0.71	0.63
0.102	1.26	1.10	0.95	0.79	0.63
0.127	1.58	1.34	1.10	0.87	0.63
0.150	1.89	1.58	1.26	0.95	0.63
1.000	1.89	1.58	1.26	0.95	0.63

**Watts Flow Control Roof Drains Rating Curve (single drain)*

The available storage and flow rating curve for the roof drains has been multiplied by the number of drains and the storage lumped into a single storage node. Approximately 96m^3 of storage can be provided by the building rooftop. **Table 5-6** and **Table 5-7** summarize the controlled post-development design flows from the building rooftop, the maximum anticipated ponding depths, storage volumes required, and the storage volumes provided for the 5-year and 100-year storm events.

Table 5-6: 5-year Roof Storage & Peak Flows

Area ID	Static Ponding Area (m^2)	Drainage Area (ha)	Uncontrolled Peak Flow (L/s)	Controlled Peak Flow (L/s)	Flow Depth (m)	Storage Available (m^3)	Storage Utilized (m^3)
R-01	299	0.038	9.8	1.26	0.12	14.97	6.99
R-02	300	0.043	11.1	1.26	0.12	14.98	8.32
R-03	339	0.045	11.7	1.26	0.12	16.95	8.94
R-04	305	0.045	11.8	1.26	0.13	15.23	9.03
R-05	271	0.037	9.7	1.26	0.12	13.54	6.82
R-06	205	0.023	5.9	1.26	0.10	10.25	3.31
R-07	205	0.023	5.9	1.26	0.10	10.24	3.31
TOTAL		**0.253**	**66.0**	**8.82**	-	**96.16**	**46.73**

Table 5-7: 100-year Roof Storage & Peak Flows

Area ID	Static Ponding Area (m^2)	Drainage Area (ha)	Uncontrolled Peak Flow (L/s)	Controlled Peak Flow (L/s)	Flow Depth (m)	Storage Available (m^3)	Storage Utilized (m^3)
R-01	299	0.038	18.7	1.89	0.15	14.97	14.46
R-02	300	0.043	21.2	1.89	0.15	14.98	14.98
R-03	339	0.045	22.3	1.89	0.15	16.95	16.95
R-04	305	0.045	22.5	1.89	0.15	15.23	15.23
R-05	271	0.037	18.4	1.89	0.15	13.54	13.54
R-06	205	0.023	11.3	1.89	0.13	10.25	7.07
R-07	205	0.023	11.3	1.89	0.13	10.24	7.06
TOTAL		**0.253**	**125.8**	**13.23**	-	**96.16**	**89.29**

As shown in the above tables, the building roof will provide sufficient storage for all storm events up to the 100-year event, with some overflow through the building scuppers during the 100-year event and larger. Flows exceeding the available storage will overflow through the scuppers and onto the ground surface below and will be conveyed to storm sewer inlets via the major system flow routes. Detailed calculations for each of the roof drains have been provided in **Appendix D**.

5.6.3 Hydraulic Grade Line

The results of the analysis were used to determine if there would be any surcharging from the storm sewer system during the 100-year storm event. **Table 5-8** provides a summary of the 100-year HGL elevation at each storm maintenance hole within the proposed development, as well as a summary of the HGL elevations for a 20% increase (rainfall intensity and total precipitation) in the 100-year design event.

Table 5-8: 100-year HGL Elevations (m)

Maintenance Hole ID	MH Invert Elevation (m)	T/G Elevation (m)	HGL Elevation: 100yr-3hr (m)	HGL Elevation: 100yr-3hr +20% (m)	Clearance from T/G (100yr) (m)	Clearance from T/G (100yr+20%) (m)
MH102	94.14	96.63	94.47	94.48	2.16	2.15
MH104	94.40	96.69	94.59	94.60	2.10	2.09

5.6.4 Upstream Drainage Areas

Two areas from the property to the northwest of the site are tributary to the proposed storm infrastructure. Area OS-1 (0.047ha) is tributary to a curb-inlet catchbasin (CICB-OS1) to be installed in the grassed area between the site and the adjacent property. Runoff from this area will flow uncontrolled into the storm sewer. Area OS-2 (0.013ha) is tributary to CB09 and runoff from this area will pond above this CB with inflows controlled by the ICD located within CB09.

5.7 Major System Design and Analysis

Catchbasin maintenance holes were modeled as storage nodes to account for the surface storage provided by the parking areas of the proposed development, and the storage provided by the structure itself. The storage nodes are interconnected using short rectangular open channels to simulate the flows cascading over high points when the available static storage is exceeded. A total volume of approximately 150 m^3 is provided by the low points in the parking areas and roadway, as shown in **Table 5-9**.

Table 5-9: Ponding Volumes (m^3)

STM Area ID	CB ID	Ponding Area (m^2)	Available Static Ponding Volume (m^3)
A-02	CBMH02	169.14	11.26
A-03	CBMH03	215.85	14.26
A-04	CBMH04	230.32	15.77
A-05	CBMH05	283.42	21.02
A-06	CBMH06	350.36	35.79
A-07	CBMH07	456.33	39.94
A-08	CB08	210.14	9.55
A-09	CB09	60.25	2.66

The major system network was evaluated using the PCSWMM model to ensure that the ponding depths conform to City standards. A summary of ponding depths at each inlet for the 100-year event is provided in **Table 5-10**. There will be no ponding during the 2-year event, and ponding which occurs for larger storm events will be less than 0.35m in total depth.

Table 5-10: 100-year Event Ponding Depths

Structure	T/G	Max. Static Ponding (Spill Depth)		100-yr Event (3hr)			
	(m)	Elev. (m)	Depth (m)	Elev. (m)	Depth (m)	Cascading Flow?	Cascade Depth (m)
CBMH02	96.50	96.70	0.20	96.63	0.13	N	0.00
CBMH03	96.50	96.70	0.20	96.63	0.13	N	0.00
CBMH04	96.50	96.70	0.20	96.63	0.13	N	0.00
CBMH05	96.45	96.70	0.25	96.62	0.17	N	0.00
CBMH06	96.45	96.70	0.25	96.55	0.10	N	0.00
CBMH07	96.45	96.70	0.25	96.55	0.10	N	0.00
CB08	96.55	96.70	0.15	96.64	0.09	N	0.00
CB09	96.55	96.69	0.14	96.62	0.07	N	0.00

An expanded table of the ponding depths at low points in the parking lots (including the stress-test event) is provided in **Appendix D**. Based on these results, the proposed storm drainage system will not experience any adverse flooding even with a 20% increase to the 100-year event.

5.8 Peak Flows

For all storm events, the allowable release rate is 82 L/s. Peak flows for each storm event are outlined in the following table:

Table 5-11: Peak Flows (L/s)

Storm Distribution->	3hr Chicago					12hr SCS		
Return Period->	25mm	2yr	5yr	100yr	100yr +20%	2yr	5yr	100yr
Offsite - North	0	0	1	2	3	0	1	2
Offsite - East	0	0	0	2	3	0	0	2
STM to Merivale	43	51	60	74	81	38	49	66
Maj. System to Merivale	0	0	0	0	0	0	0	0
TOTAL	43	51	61	78	87	38	50	70

As outlined in the above table, peak flows for all storm events up to and including the 100-year event will be controlled to the allowable release rate of 82 L/s. There will be no major overland flow directed to Merivale Road for all storm events up to and including the stress test event (100-year + 20%).

6.0 WATER

6.1 Existing Conditions

The subject site is located within the City of Ottawa 2W2C watermain pressure zone. There is an existing 300mm watermain in Merivale Road to the west of the site.

The existing watermain boundary conditions that were provided for the site by the City of Ottawa (October 2022) are listed in **Table 6-1**, and are included in **Appendix E**.

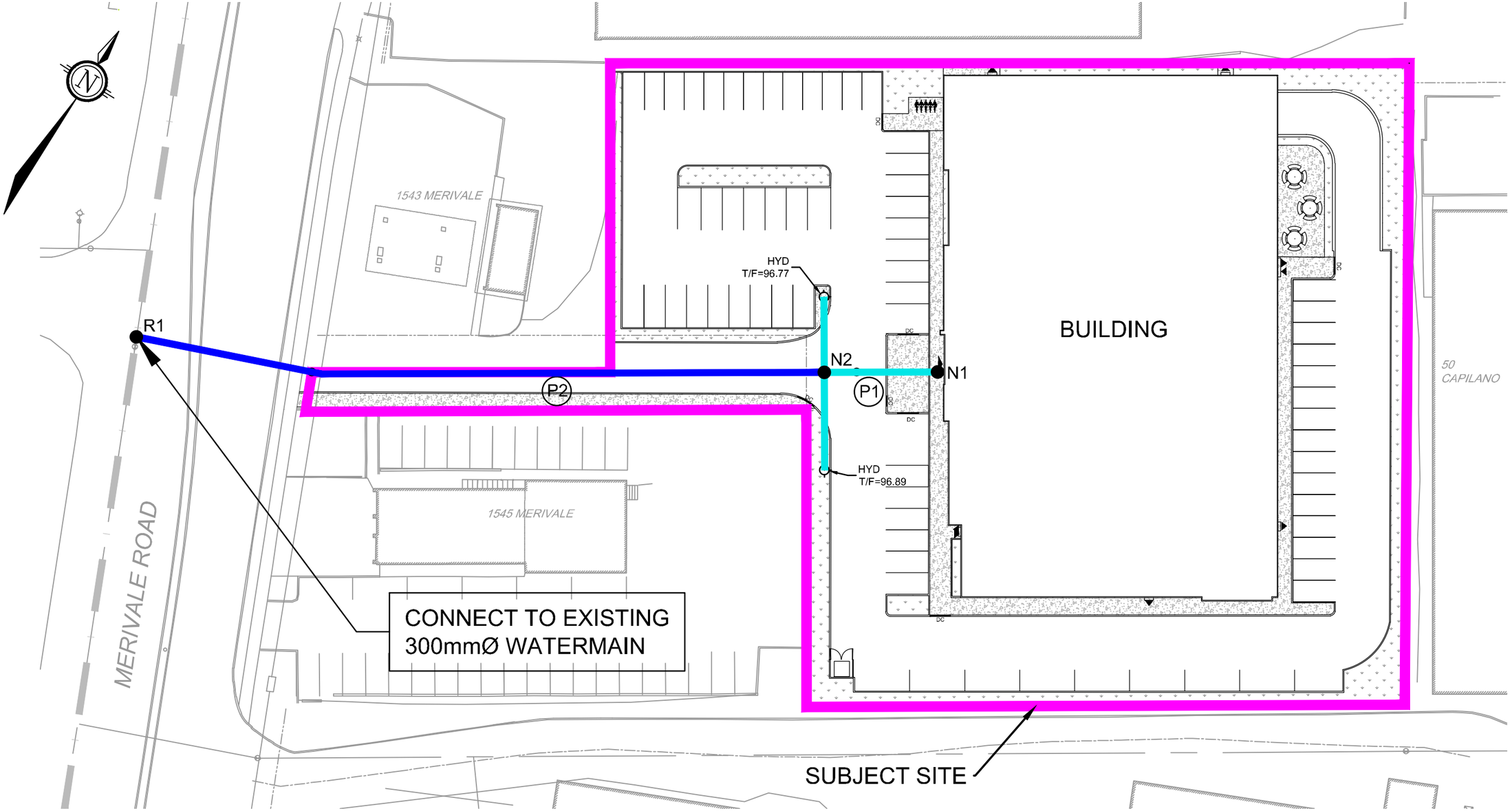
Table 6-1: Watermain Boundary Conditions

Location	Pressure (m)		
	Maximum HGL	Max Daily and Fire Flow (183L/s)	Peak Hour
Merivale Road	134.1	123.0	125.4

6.2 Proposed Conditions

The site will be serviced with approximately 13m of 150mm diameter watermain and 85m of 250mm diameter watermain connecting to the existing 300mm watermain on Merivale Road. The building will be fully sprinklered. Shut-off valves will be provided on the proposed watermain at the property line and on the building service.

The proposed watermain will service the commercial building and two hydrants. It will provide sufficient capacity to maintain appropriate pressures for the high pressure and peak hour demand conditions. **Figure 5** provides a high-level schematic of the proposed water distribution system. Due to the distance from the proposed building to the existing fire hydrants located on Merivale Road, two on-site fire hydrants will be required to provide the required fire flow rate.



LEGEND

- SITE BOUNDARY
- PROPOSED 250mmØ WATERMAIN
- PROPOSED 150mmØ WATERMAIN
- N1 ● PROPOSED WATERMAIN NODE
- (P1) PROPOSED WM PIPE NUMBER
- EXISTING 300mmØ WATERMAIN

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CITY of OTTAWA
MERIVALE MEDICAL IMAGING CLINIC
(1545A MERIVALE ROAD)

WATERMAIN LAYOUT

SCALE 1 : 500 (0, 5, 10, 15, 20)

DATE	JOB	FIGURE
MAY 2023	122098	FIG-5

SHT11X17.DWG - 279mmX432mm

M:\2022\122098\CAD\Civil\Figures\Servicing\122098-WM.dwg, FIG5-WM, May 16, 2023 - 9:47am, jroy

The water demand was calculated using City of Ottawa Design Guidelines – Water Distribution (2010) **[3]** and the fire flow demands were calculated as per the Fire Underwriter's Survey (2020) guidelines. The design criteria used are outlined in **Table 6-2**. Refer to **Appendix E** for fire flow calculations.

Table 6-2: Watermain Design Criteria

Design Parameter	Design Criteria
Commercial Site Area (gross)	0.69 ha
Average Day Commercial Demand	28,000 L/gross ha/d
Maximum Day Demand	1.5 x Average Day
Peak Hour Demand	1.8 x Maximum Day
Fire Demand	Fire Underwriters Survey (2020)
Maximum Pressure	690 kPa (100psi) unoccupied areas
Maximum Pressure	552 kPa (80psi) occupied areas outside of ROW
Minimum Pressure	275 kPa (40 psi) except during fire flow
Minimum Pressure	140 kPa (20 psi) fire flow conditions

The water demand for the site was calculated and is summarized in **Table 6-3** for high pressure, maximum daily and fire flow, and peak hour demand conditions for the site.

Table 6-3: Water Demand Summary

Commercial Site Area (ha)	Average Day Commercial Demand (L/gross ha/d)	Demand (L/s)			
		Average Day	Maximum Day	Peak Hour	Fire Flow
0.69	28,000	0.22	0.34	0.60	183

The proposed watermain was modeled using EPANET 2 for the watermain layout per **122098-GP** (**Appendix F**). The results of the modelling are presented in **Table 6-4.**

Table 6-4: Water Operating Conditions

Condition	Demand (L/s)	Minimum/Maximum Allowable Pressure (kPa/psi)	Operating Pressure (kPa/psi)
High Pressure	0.22	552/80 (max)	365.4/53.0
Maximum Day Demand (c/w Max Fire Flow)	0.34 (183.34)	140/20 (min)	200.52/29.08
Peak Hour Demand	0.60	275/40 (min)	278.6/40.4

These results confirm that proposed watermain layout is adequate to maintain hydraulic pressures within the normal operating range meeting the City of Ottawa Guidelines **[3]**. Full model results are included in **Appendix E**. This report concludes the proposed water design will adequately service the site.

7.0 GEOTECHNICAL INVESTIGATION

A geotechnical investigation has been completed by Paterson Group Inc. for the proposed project. Refer to the corresponding Geotechnical Report **[1]** for subsurface conditions, construction recommendations and geotechnical inspection requirements.

8.0 CONCLUSIONS AND RECOMMENDATIONS

This report has been prepared in support of Site Plan Control application for the proposed Merivale Medical Imaging Clinic. The conclusions are as follows:

- The proposed building will be serviced by on-site water, storm and sanitary sewers connecting to the municipal watermain, sanitary and storm sewers within the right-of-way for Merivale Road.
- The building will be sprinklered and supplied with a fire department siamese connection. The siamese connection will be located within 45m of the proposed on-site fire hydrants.
- The post-development site stormwater flow will be approximately 51 L/s during the 2-year design event, 61 L/s during the 5-year design event and 78 L/s during the 100-year event, all less than the target control rate of 82 L/s. Post-development flows are being controlled by inlet control devices, utilizing a combination of underground and surface storage (roof and parking lots).
- Water quality control for the site will be provided by the existing end of pipe stormwater management facility (Nepean Creek Stormwater Facility).

It is recommended that the proposed site servicing and stormwater management design be approved for implementation. Please contact the undersigned should you have questions or require additional information.

Sincerely,

NOVATECH

Prepared By:

Samantha Bennett, M.A.Sc, E.I.T.
Civil Engineering Intern, Land Development

Prepared By:

Melanie Schroeder, B.A.Sc., P.Eng.
Project Engineer, Water Resources

Reviewed/Approved By:

Trevor McKay, P.Eng.
Project Manager, Land Development

References

1. “Geotechnical Investigation, Proposed Commercial Building, 1545 Merivale Road, Ottawa, Ontario prepared by Paterson Group (Report: PG6288-1). [August 3, 2022]

2. “Sewer Design Guidelines”, Department of Public Works and Services, City of Ottawa [October 2012] as ammended by Technical Bulletins PIEDTB-2016-01, ISTB-2018-01, ISTB-2018-03, ISTB-2018-04, and ISTB-2019-02

3. “Ottawa Design Guidelines – Water Distribution”, Infrastructure Services Department, City of Ottawa [July 2010] as ammended by Technical Bulletins ISTB-2014-02, ISTB-2018-02, ISTB-2018-03, and ISTB-2021-03.

APPENDIX A

Correspondence

File Number: PC2022-0137
July 4, 2022

Pre-Application Consultation Meeting Minutes

Property Address: 1545(A) Merivale Road
Location: Virtual – Microsoft Teams
Meeting Date: June 16, 2022

Attendees: Colette Groni – Planner (File Lead), City of Ottawa
Patrick McMahon – Transportation Project Manager, City of Ottawa
Ann O'Connor – Urban Design Planner, City of Ottawa
Louise Cerveny – Parks Planner, City of Ottawa
Alexa Giannini – Transportation Co-op Student, City of Ottawa
Steven Payne – Planning Co-op Student, City of Ottawa
Philippe Doyle – Lalande + Doyle Architects Inc
Louise Lalande – Lalande + Doyle Architects Inc
Melanie Riddell – Novatech

Regrets: Sami Rehman – Planner (Environment), City of Ottawa
Julie Candow – Infrastructure Project Manager, City of Ottawa
Mark Richardson – Planning Forester, City of Ottawa
Eric Lalande – Planner, RVCA

Applicant Comments

1. The applicant is proposing a new one-storey medical facility with a gross floor area of 2,300 m^2. The proposed building is located at the rear of the site with surface parking in front; 103 vehicle parking spaces are currently proposed.
2. The owners are seeking to relocate their medical imaging business to the new facility and have expressed that a one-storey building is preferable due to operational considerations for the business.
3. The neighbouring site, 1545 Merivale Road, is under the same ownership. It has approximately 36m of frontage along Merivale Road and is currently occupied by a vacant restaurant building. The owner's current intention is to develop/sell this parcel in the future as a separate development.
4. The neighbouring site, 1543 Merivale Road, is under separate ownership. However, there is an existing agreement in place between the owner of 1543 Merivale Road and the subject site allowing for a portion of the site to be used as a part of the access to subject site. It is currently occupied by a gas station.

Planning

1. Confirm ownership situation for 1545 (A) Merivale Road and 1545 Merivale Road (currently occupied by vacant restaurant). Please note that if both properties are

under the same ownership than they will have merged on title, which may have implications for how zoning is applied.

2. Please note that Merivale Road is considered the front lot line for the purposes of zoning, as per Section 186(10)(a) of the Zoning By-law.
3. Please note that a rear yard setback of 7.5m is required as per Section 186(10)(d)(ii). The provided plan currently shows a rear yard setback of approximately 1.5m.
4. Vehicle parking is to be provided at the rates specified for Area C on Schedule 1A in Table 101 of the Zoning By-law:
    a. Medical facility – 4 per 100 m^2 of gross floor area (~103 spaces required)
5. Bicycle parking is to be provided at the rates specified in Table 111A of the Zoning By-law:
    a. Medical facility – 1 per 1000 m2 of gross floor area (~2-3 spaces required)
6. Please note that the minimum required width of a landscaped buffer around a parking lot containing 100 or more spaces is 3m. Based on the provided plan, a total of 104 parking spaces are proposed, therefore 3m landscaped buffers are required.
7. Consider including additional landscaped islands throughout the parking lot to address the urban heat island effect.
8. Staff have concerns with the current location of the proposed building. Consider shifting the building towards Merivale Road and having parking in behind. Please note that if the building is brought forward to Merivale Road, that it will need to comply with the requirements set out in Section 186(10)(e)-(h)
9. Based on the current proposal, relief is required from Section 186(10)(b)(i) of the Zoning By-law, which requires at least 50% of the frontage along the front lot line (Merivale) must be occupied by building walls located within 3m of the frontage for non-residential buildings. This can be achieved by way of a Minor Zoning By-law Amendment or through a minor variance application to the Committee of Adjustment. Please note that staff have concerns with providing relief from this provision as the proposed development does not align with applicable policies, and it appears that the provision could be met by bring the building forward to Merivale Road.
10. Confirm whether paid parking is proposed on site. Please note that paid parking is considered to be a separate use (i.e., “parking lot”), not accessory to the medical facility use. It would also not contribute to the minimum required parking spaces. Further, as “parking lot” is not identified as a permitted use in the AM10 zone, a major zoning by-law amendment would be required to permit it.

11. Required applications:

    a. Minor Zoning By-law Amendment or Minor Variances. Please note that staff believe that a minor rezoning would be more appropriate.

        i. More information on Zoning By-law Amendment applications can be found here.

        ii. Please note that Minor Variances are handled by the Committee of Adjustment. The Planning Department provides comments on Committee of Adjustment applications; however, the Committee of Adjustment makes the decision. For more information on the Committee of Adjustment, including application forms and fees, please visit: https://ottawa.ca/en/city-hall/planning-and-development/committee-adjustment. For questions pertaining to forms and fees, please contact the Committee of Adjustment directly at cofa@ottawa.ca or at (613)-580-2436.

    b. The proposed development is subject to Site Plan Control, and will be a "New – Site Plan Control – Complex" application. Application, timeline and fees can be found here.

Feel free to contact Colette Gorni, Planner (File Lead), at Colette.Gorni@ottawa.ca for follow-up questions.

Transportation

1. Follow Traffic Impact Assessment Guidelines

    a. Submit a screening form alongside the Scoping report. Start this process as soon as possible.

    b. The application will not be deemed complete until the submission of the draft step 1-4, including the functional draft RMA package. An RMA may be required to restrict access through the median break. Use of the existing median depression for this site should be evaluated within the TIA, this movement is not guaranteed.

    c. Collaboration and communication between development proponents and City staff are required at the end of every step of the TIA process.

2. Noise Impact Study is recommended for the following:

    a. Road (proximity to Merivale Road); and,

    b. Aircraft (within the 25 NEF/NEP line).

3. The clear throat requirement for general office of less than 5,000m^2 accessing an arterial is 15m.

4. On site plan:

a. Show all details of the roads abutting the site up to and including the opposite curb; include such items as pavement markings, accesses and/or sidewalks.

b. Turning templates will be required for all accesses showing the largest vehicle to access the site; required for internal movements and at all access (entering and exiting and going in both directions).

c. Show all curb radii measurements; ensure that all curb radii are reduced as much as possible

d. Sidewalk is to be continuous across access as per City Specification 7.1.

5. Merivale Road has a protected right of way of 44.5m, it appears that a widening is required. Show this line on the site plan.

6. Consider how pedestrians are going to reach the office from Merivale Road and provide a connection, preferably a separated sidewalk.

7. Ensure that appropriate access aisles are provided for the accessible parking spaces.

Feel free to contact Patrick McMahon, Transportation Project Manager, at Patrick.McMahon@ottawa.ca.

Urban Design

1. A Design Brief is required. A terms of reference is attached.

2. The property is within a Design Priority Area. Please ensure the design brief addresses how the development meets Design Priority Area policies in Section 2.5.1 of the Official Plan (2008, as amended) and in the New OP.

3. Urban Design staff have some concerns with the current proposal of a large 1-storey building located at the rear of the property located on an Arterial Mainstreet. Explore the option of consolidating the subject site with the existing restaurant site and bringing the building up to Merivale Road to establish a strong street edge along the Arterial Mainstreet and provide active street frontage. Explore a multi-storey building. This re-design would align with the direction the City has for development along Arterial Mainstreets / Main Corridors. Below are examples of such policies:

    a) Urban Design Guidelines for Development along Arterial Mainstreets:

        - Guideline 1: Locate new buildings along the public street edge
        - Guideline 4: Use buildings, landscaping and other streetscape elements to create continuous streetscapes
        - Guideline 6: Set new buildings 0 to 3.0 metres back from the front property line…

- Guideline 12: Design the built form in relation to the adjacent properties to create coherent streetscapes.

b) Merivale Road Secondary Plan

- 2.1 Goals – (1)(a)(i) strengthen the visual character of the area; (ii) Improve the quality and consistency of pedestrian amenities in the public and private realm; (vi) Provide, to the maximum extent possible, for a safe and efficient environment for all users – transit riders, pedestrians, cyclists and rivers travelling within and through the study area.
- 3.1.1.2 (1)(a)(vi) Parking on sites with multiple retail and commercial uses should be directed to the interior of the block with access between frontage buildings or at the rear
- 3.1.1.3 The streetscape treatment along Merivale Road should be consistent with an environment that supports and encourages pedestrian activity
- 3.1.2.1 (1)(a)(i) All public sidewalks should be connected to sidewalks on adjacent private retail and commercial properties

c) Official Plan (2008, as amended)

- Section 3.6.3 – Mainstreets, Policy 9: On Arterial Mainstreets, the location of surface parking will be evaluated in the context of Section 2.5.1 and Section 4.11
- Section 2.5.1 Design Objectives (2) To define quality public and private spaces through development / (3) To create places that are safe, accessible and are easy to get to, and move through
- Section 4.11 Policy 6: The City will require that all applications for new development: (a) Orient the principal façade and entrance(s) of main building(s) to the street.

4. If the building will not have frontage on Merivale Road, provide a landscaped promenade connecting the building to Merivale Road. This promenade should include:

a) A continuous 2.0m wide concrete continuous sidewalk connecting the public sidewalk on Merivale Road to the proposed new entrance to the building. Where there are breaks required in the sidewalk for drive aisles, clear pavement markings and signage should be included to indicate pedestrian priority.

b) Landscaping alongside the connecting sidewalk, providing visual ques to lead people from Merivale Road into the site.

c) Align the front door of the building to be the viewpoint terminus at the end of the promenade. The front door should be visible from Merivale Road.

5. Consider the width of the access needed off of Merivale Road. It appears the subject site has only 4.5 metres of lot frontage on Merivale Road, which is insufficient to provide vehicular access as well as a pedestrian sidewalk and landscaping. Provide clarity if a lot line adjustment will be pursued and/or provide clarity on the existing or proposed easements for access.
6. Consider increasing the width of the setback from the eastern rear property line.
7. Consider accessibility needs when designing access, the surface parking lot and the building itself.
8. Include a sidewalk around the building.
9. Provide more information on the gate/controlled access to the parking lot.
10. Google streetview shows a large sign with directional arrow close to the entrance off of Merivale Road; however, this is not illustrated on the concept plan. Clarify if updated wayfinding measures will be put in place.
11. Please adhere to and address the policies in the Merivale Road Secondary Plan and the Urban Design Guidelines for Development along Arterial Mainstreets.

Feel free to contact Ann O'Connor, Urban Design Planner, for follow-up questions at Ann.OConnor@ottawa.ca.

Engineering

1. The Servicing Study Guidelines for Development Applications are available at the following address: https://ottawa.ca/en/planning-development-and-construction/developing-property/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 geoinformation@ottawa.ca or by phone at (613) 580-2424 x.44455).

4. The Stormwater Management Criteria, for the subject site, is to be based on the following:

   i. The 2-yr storm event using the IDF information derived from the Meteorological Services of Canada rainfall data, taken from the MacDonald Cartier Airport, collected 1966 to 1997 (separated sewer system built pre-1970 on Merivale Road).

   ii. The pre-development runoff coefficient or a maximum equivalent 'C' of 0.5, whichever is less (§ 8.3.7.3).

   iii. A calculated time of concentration (Cannot be less than 10 minutes).

   iv. Flows to the storm sewer in excess of the 2-year storm release rate, up to and including the 100-year storm event, must be detained on site.

5. Deep Services (Storm, Sanitary & Water Supply)

   i. Existing deep services on Merivale Road; 525mm dia. storm, 300mm dia. watermain, 250mm dia. sanitary sewer. Please confirm the location and size of the existing service laterals onsite. If the existing service laterals are to be re-used, please provide CCTV inspection reports (if possible) to confirm the condition of the existing services. New services must be grouped in a common trench to minimize the number of road cuts.

   ii. A monitoring maintenance hole for storm and sanitary sewers shall be required just inside the property line for all non-residential building connections from a private sewer to a public sewer. See the sewer use by-law for details.

   iii. Sewer connections to be made above the springline of the sewermain as per:

      a. Std Dwg S11.1 for flexible main sewers – *connections made using approved tee or wye fittings.*

      b. Std Dwg S11 (For rigid main sewers) – *lateral must be less that 50% the diameter of the sewermain,*

      c. Std Dwg S11.2 (for rigid main sewers using bell end insert method) – *for larger diameter laterals where manufactured inserts are not available; lateral must be less that 50% the diameter of the sewermain,*

d. Connections to manholes permitted when the connection is to rigid main sewers where the lateral exceeds 50% the diameter of the sewermain. – Connect obvert to obvert with the outlet pipe unless pipes are a similar size.

e. No submerged outlet connections.

6. Water Boundary condition requests must include the location of the service (map or plan with connection location(s) indicated) and the expected loads required by the proposed development, including calculations. Please provide the following information:

    i. Location of service

    ii. Type of development and the amount of fire flow required (as per FUS 2020).

    iii. Average daily demand: ___ l/s.

    iv. Maximum daily demand: ___l/s.

    v. Maximum hourly daily demand: ___ l/s.

7. MECP ECA Requirements

    An MECP Environmental Compliance Approval is not anticipated to be required for this application assuming the proposed development meets the following criteria:

    i. Is designed to service one lot or parcel of land;

    ii. Discharges into a storm sewer that is not a combined sewer;

    iii. Does not service industrial land or a structure located on industrial land; and

    iv. Is not located on industrial land. O.Reg. 525/98, s. 3; O.Reg. 40/15, s. 4.

8. Phase 1 ESAs and Phase 2 ESAs must conform to clause 4.8.4 of the Official Plan that requires that development applications conform to Ontario Regulation 153/04.

Should you have any questions or require additional information, please contact me directly at Julie.candow@ottawa.ca.

Parks

1. Pursuant to Section 3 and Section 10 Parkland Dedication By-law 2009-05, as amended, cash-in-lieu (CIL) of parkland shall be paid at the time of Site Plan Control approval.

2. The land valuation shall be determined as of the day before Site Plan Control approval and shall be at the cost of the Owner.

3. Parks and Facilities Planning is currently undertaking a legislated review for the replacement of the Parkland Dedication By-law, with the new by-law to be considered by City Council in early July 2022. To ensure you are aware of parkland dedication requirements for your proposed development, we encourage you to familiarize yourself with the existing Parkland Dedication By-law and to sign up for project notifications on the Engage Ottawa project page or by emailing the project lead at Kersten.Nitsche@ottawa.ca

Feel free to contact Louise Cerveny, Parks Planner, at

Forestry

TCR requirements:

1. A Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City

    a. An approved TCR is a requirement of Site Plan approval.

    b. The TCR may be combined with the LP provided all information is supplied

2. Any removal of privately-owned trees 10cm or larger in diameter, or city-owned trees of any diameter requires a tree permit issued under the Tree Protection Bylaw (Bylaw 2020 – 340); the permit will be based on an approved TCR and made available at or near plan approval.

3. The Planning Forester from Planning and Growth Management as well as foresters from Forestry Services will review the submitted TCR

    a. If tree removal is required, both municipal and privately-owned trees will be addressed in a single permit issued through the Planning Forester

    b. Compensation may be required for city owned trees – if so, it will need to be paid prior to the release of the tree permit

4. The TCR must list all trees on site, as well as off-site trees if the CRZ extends into the developed area, by species, diameter and health condition

5. Please identify trees by ownership – private onsite, private on adjoining site, city owned, co-owned (trees on a property line)

6. If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained

7. All retained trees must be shown, and all retained trees within the area impacted by the development process must be protected as per City guidelines available at Tree Protection Specification or by searching Ottawa.ca

    a. The location of tree protection fencing must be shown on the plan

    b. Show the critical root zone of the retained trees

    c. If excavation will occur within the critical root zone, please show the limits of excavation

8. The City encourages the retention of healthy trees; if possible, please seek opportunities for retention of trees that will contribute to the design/function of the site.

For more information on the process or help with tree retention options, contact Mark Richardson mark.richardson@ottawa.ca or on City of Ottawa

LP tree planting requirements:

For additional information on the following please contact adam.palmer@Ottawa.ca

9. Minimum Setbacks

    a. Maintain 1.5m from sidewalk or MUP/cycle track or water service laterals.

    b. Maintain 2.5m from curb

    c. Coniferous species require a minimum 4.5m setback from curb, sidewalk or MUP/cycle track/pathway.

    d. Maintain 7.5m between large growing trees, and 4m between small growing trees. Park or open space planting should consider 10m spacing, except where otherwise approved in naturalization / afforestation areas. Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.

10. Tree specifications

    a. Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.

    b. Maximize the use of large deciduous species wherever possible to maximize future canopy coverage

c. Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; and include watering and warranty as described in the specification (can be provided by Forestry Services).

d. Plant native trees whenever possible

e. No root barriers, dead-man anchor systems, or planters are permitted.

f. No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)

11. Hard surface planting

a. Curb style planter is highly recommended

b. No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.

c. Trees are to be planted at grade

12. Soil Volume

a. Please document on the LP that adequate soil volumes can be met:

Tree Type/Size	Single Tree Soil Volume (m3)	Multiple Tree Soil Volume (m3/tree)
Ornamental	15	9
Columnar	15	9
Small	20	12
Medium	25	15
Large	30	18
Conifer	25	15

*Please note that these soil volumes are not applicable in cases with Sensitive Marine Clay.

13. Sensitive Marine Clay

a. Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines

14. Tree Canopy Cover

a. The landscape plan shall show how the proposed tree planting will replace and increase canopy cover on the site over time, to support the City's 40% urban forest canopy cover target.

b. At a site level, efforts shall be made to provide as much canopy cover as possible, through tree planting and tree retention, with an aim of 40% canopy cover at 40 years, as appropriate.

c. Indicate on the plan the projected future canopy cover at 40 years for the site.

Environment

1. No environmental concerns with the proposed development.

Feel free to contact Sami Rehman, Environmental Planner, at Sami.Rehman@ottawa.ca for follow-up questions.

Rideau Valley Conservation Authority (RVCA)

1. Enhanced Water quality protection be detailed through the SWM report. Either through best management practices and on-site controls or confirmation that the downstream outlet pond provides quality protection.

Feel free to contact Eric Lalande, RVCA Planner, at eric.lalande@rvca.ca for follow-up questions.

City Surveyor

1. The determination of property boundaries, minimum setbacks and other regulatory constraints are a critical component of development. An Ontario Land Surveyor (O.L.S.) needs to be consulted at the outset of a project to ensure properties are properly defined and can be used as the geospatial framework for the development.
2. Topographic details may also be required for a project and should be either carried out by the O.L.S. that has provided the Legal Survey or done in consultation with the O.L.S. to ensure that the project is integrated to the appropriate control network.

Questions regarding the above requirements can be directed to the City's Surveyor, Bill Harper, at Bill.Harper@ottawa.ca

Other

1. Plans are to be standard A1 size (594 mm x 841 mm) or Arch D size (609.6 mm x 914.4 mm) sheets, dimensioned in metric and utilizing an appropriate Metric scale (1:200, 1:250, 1:300, 1:400 or 1:500).
2. All PDF submitted documents are to be unlocked and flattened.
3. You are encouraged to contact the Ward Councillor, Councillor Keith Egli, at Keith.Egli@ottawa.ca about the proposal.

Samantha Bennett

From: Candow, Julie <julie.candow@ottawa.ca>
Sent: Thursday, December 1, 2022 12:51 PM
To: Trevor McKay
Subject: RE: 1545A Merivale Road - Existing Services

Hi Trevor,

I agree with your statement below, that will be acceptable for SPA submission.

"…the existing service will be located during building demolition and blanked at the property line as per City of Ottawa standards."

Thanks

Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Trevor McKay <t.mcKay@novatech-eng.com>
Sent: December 01, 2022 12:27 PM
To: Candow, Julie <julie.candow@ottawa.ca>
Subject: 1545A Merivale Road - Existing Services

Julie,

The site owners have engaged a utility locator to trace the existing services for the property as noted in the pre-consultation notes. They have been unable to locate the existing sanitary lateral.

We are not planning on reusing the existing lateral (we expect that it is likely not large enough and is likely not aligned with current property boundaries given the age and history of the property) and are proposing a new sanitary service.

Is it a requirement of the site plan application to show the location of the existing services, or would it be all right to note that the existing service will be located during building demolition and blanked at the property line as per City of Ottawa standards?

Thank you again for all your help on this project.

Trevor McKay, B.Eng., E.I.T., Project Manager | Land Development Engineering
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 291 | Cell: 613.263.9113

From: Candow, Julie <julie.candow@ottawa.ca>
Sent: Tuesday, November 22, 2022 11:30 AM
To: Trevor McKay
Subject: FW: 15435A Merivale Road - PC2022-0137

Hi Trevor,

Please see below from Chris Roy regarding the DMA chamber for 1545A Merivale Road. The City will not be imposing a DMA chamber at this location. I am also okay with the reduced separation for the services entering the property. As long as you provide rationale within your Servicing Study for the reduced separation (small road frontage), and the solution is reasonable, will can accept it.

Happy to still meet tomorrow at 9am if required.
Thanks,

Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Roy, Christopher <Christopher.Roy@ottawa.ca>
Sent: November 22, 2022 11:02 AM
To: Candow, Julie <julie.candow@ottawa.ca>
Cc: Hannewyk, Joseph <Joseph.Hannewyk@ottawa.ca>
Subject: RE: 15435A Merivale Road - PC2022-0137

Hi Julie,

A DMA chamber is not required here since the private watermain length is approximately 100m. Although this additional detail is not in the design guidelines, 150m of private watermain has been the length cut off of when a DMA chamber is required or not.

Thanks,

Chris

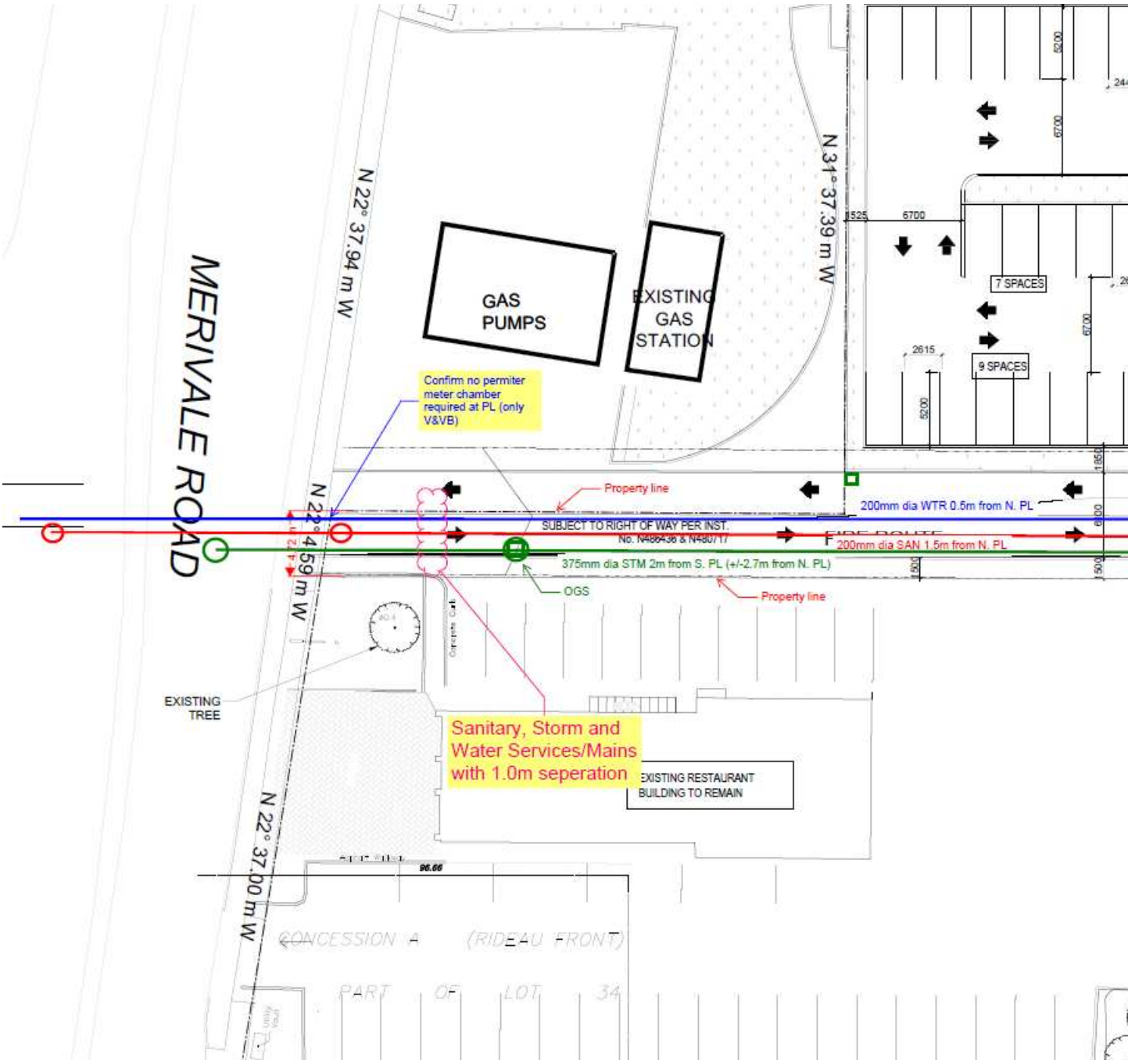
Chris Roy, P.Eng.
Program Engineer, Water Loss Program
Infrastructure & Water Services Department
613.797-1484
Christopher.Roy@ottawa.ca

From: Candow, Julie <julie.candow@ottawa.ca>
Sent: 2022/11/21 1:45 PM
To: Hannewyk, Joseph <Joseph.Hannewyk@ottawa.ca>; Roy, Christopher <Christopher.Roy@ottawa.ca>
Subject: FW: 15435A Merivale Road - PC2022-0137

Hi Joseph and Chris,

I was advised to reach out to you both regarding the need for a District Metering Area chamber at a private site (1545A Merivale Road) for a proposed medical imaging building. They have not submitted a formal application yet but Novatech has inquired as to whether a DMA chamber will be requested. As per the water design guidelines, a single DMA chamber is required for private developments when serviced by a connection of 150mm or larger. They have a very small frontage on Merivale Road, +/- 4.7m and do not see any way of accommodating a DMA chamber at the Merivale Road property line if one were to be requested. Please see attached site plan and also below snip of proposed services. Can you please confirm if a DMA chamber will be enforced by the City on this site plan.

Thank you both, and let me know if any additional information is required.



Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Trevor McKay <t.mcKay@novatech-eng.com>
Sent: November 21, 2022 10:39 AM
To: Candow, Julie <julie.candow@ottawa.ca>
Cc: McGirr, Emily [NN-CA] <emily.mcgirr@parsons.com>
Subject: 15435A Merivale Road - PC2022-0137

Julie,

I hope you are doing well. I'm reaching out regarding the upcoming site plan application for the 1545A Merivale Road property.

I know that everyone at the City is very busy right now, however I was wondering if you would be able to spare 30 minutes or less in the next day or two to review the proposed servicing alignment for the site. In particular, I would like to get your thoughts on the proposed +/-1.0m separation between the storm, sanitary and water mains as they enter the site. The reasoning behind the decreased separation is that there is only +/- 4.7m of site frontage on Merivale Road so we are limited in the available space.

The second question I have is whether a perimeter water meter chamber is going to be requested for this site. Given the lack of space at the property line, we do not see any way to accommodate one at the Merivale Road property line if it is requested.

I've attached the current site plan concept with a pdf markup of the proposed servicing layout and the pre-consultation meeting notes. I'm busy 12-1pm today, however I can make myself available any other time over the next few days.

613-263-9113 or teams/zoom.

Thanks,

Trevor McKay, B.Eng., E.I.T., Project Manager | Land Development Engineering
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 291 | Cell: 613.263.9113

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Kallie Auld

From: Candow, Julie <julie.candow@ottawa.ca>
Sent: Tuesday, November 29, 2022 12:29 PM
To: Eric Lalande; Kallie Auld
Cc: Trevor McKay
Subject: RE: 1545A Merivale Road water quality criteria
Attachments: R-5572.pdf

Hi Kallie,

I apologize for the delay. Based on the attached Nepean Creek Stormwater Facility 2005 Annual Report, it appears that the criteria for this pond is 70% TSS removal. That said, I have reached out to our Asset Management branch to try and locate the original SWM Report and/or a more recent monitoring report. The attached is the only report I could find in our digital records.

I will keep you undated with any further details provided by our Asset Management branch. From there, I will let RVCA decide if additional TSS removal will be required for this site.

Thanks,

Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Eric Lalande <eric.lalande@rvca.ca>
Sent: November 29, 2022 10:03 AM
To: Kallie Auld <k.auld@novatech-eng.com>; Candow, Julie <julie.candow@ottawa.ca>
Cc: Trevor McKay <t.mcKay@novatech-eng.com>
Subject: RE: 1545A Merivale Road water quality criteria

Hi Kallie,

I'll defer to the City, as don't have access to the pond design criteria, currently. Based on memory I believe it does, but I would look to confirm that formally.

Thanks,

Eric Lalande, MCIP, RPP
Planner, RVCA
613-692-3571 x1137

From: Kallie Auld <k.auld@novatech-eng.com>
Sent: Tuesday, November 29, 2022 8:47 AM
To: Eric Lalande <eric.lalande@rvca.ca>; Julie.candow@ottawa.ca
Cc: Trevor McKay <t.mcKay@novatech-eng.com>
Subject: RE: 1545A Merivale Road water quality criteria

Good morning Eric/ Julie,

I'm just following up on my email below.

Thanks very much,

Kallie Auld, P.Eng. (she/her), Project Manager | Water Resources
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 294 | Fax: 613.254.5867 | Email: k.auld@novatech-eng.com

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From: Kallie Auld
Sent: Wednesday, November 23, 2022 1:29 PM
To: eric.lalande@rvca.ca; Julie.candow@ottawa.ca
Cc: Trevor McKay <t.mcKay@novatech-eng.com>
Subject: 1545A Merivale Road water quality criteria

Good afternoon Eric/ Julie,

I'm emailing you to check about the water quality requirements for our site located at 1545A Merivale Road. In the preconsult meeting minutes it states that *"Enhanced Water quality protection be detailed through the SWM report. Either through best management practices and on-site controls or confirmation that the downstream outlet pond provides quality protection."*

Per geoOttawa, outflows from 1545A Merivale Road outlet to the storm sewers on Merivale Road which outlet approximately 1.8 km downstream to Nepean Creek, which then flows into an existing SWM facility, which ultimately outlets to the Rideau River (please see attached screenshot).

I was wondering if either of you have any information about this existing SWM facility and if it would provide the required water quality protection for our site, or if you think on-site controls would be required.

Thanks very much,

Kallie Auld, P.Eng. (she/her), Project Manager | Water Resources
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 294 | Fax: 613.254.5867 | Email: k.auld@novatech-eng.com

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Kallie Auld

From: Eric Lalande <eric.lalande@rvca.ca>
Sent: Wednesday, November 30, 2022 10:08 AM
To: Kallie Auld; Julie.candow@ottawa.ca
Cc: Trevor McKay
Subject: RE: 1545A Merivale Road water quality criteria

Hi Kallie,

With some follow up through City staff, they were able to confirm the design parameters of the SWM Facility. It was designed to provide quality control (albeit at a minimum design of 70% TSS). That being said the pond performance varies between 70-90%.

The RVCA will not require any additional on-site quality control measures, however, encourage best management practices to be implemented where feasible.

Thank you,

Eric Lalande, MCIP, RPP
Planner, RVCA
613-692-3571 x1137

From: Kallie Auld <k.auld@novatech-eng.com>
Sent: Tuesday, November 29, 2022 8:47 AM
To: Eric Lalande <eric.lalande@rvca.ca>; Julie.candow@ottawa.ca
Cc: Trevor McKay <t.mcKay@novatech-eng.com>
Subject: RE: 1545A Merivale Road water quality criteria

Good morning Eric/ Julie,

I'm just following up on my email below.

Thanks very much,

Kallie Auld, P.Eng. (she/her), Project Manager | Water Resources
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 294 | Fax: 613.254.5867 | Email: k.auld@novatech-eng.com

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From: Kallie Auld
Sent: Wednesday, November 23, 2022 1:29 PM
To: eric.lalande@rvca.ca; Julie.candow@ottawa.ca
Cc: Trevor McKay <t.mcKay@novatech-eng.com>
Subject: 1545A Merivale Road water quality criteria

Good afternoon Eric/ Julie,

I'm emailing you to check about the water quality requirements for our site located at 1545A Merivale Road. In the preconsult meeting minutes it states that *"Enhanced Water quality protection be detailed through the SWM report. Either through best management practices and on-site controls or confirmation that the downstream outlet pond provides quality protection."*

Per geoOttawa, outflows from 1545A Merivale Road outlet to the storm sewers on Merivale Road which outlet approximately 1.8 km downstream to Nepean Creek, which then flows into an existing SWM facility, which ultimately outlets to the Rideau River (please see attached screenshot).

I was wondering if either of you have any information about this existing SWM facility and if it would provide the required water quality protection for our site, or if you think on-site controls would be required.

Thanks very much,

Kallie Auld, P.Eng. (she/her), Project Manager | Water Resources
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 294 | Fax: 613.254.5867 | Email: k.auld@novatech-eng.com

APPENDIX B

Sanitary Sewer Design Sheet

Merivale Medical Imaging Clinic - 1545A Merivale Road: Sanitary Sewer Design Sheet

AREA		COMMERCIAL				INFILTRATION				PIPE							
From	To	GROSS HA	PEAK FACTOR	Accum. Area (ha)	Peak Flow (L/s)	Total Area (ha)	Accum. Area (ha)	Infilt. Flow (l/s)	Total Flow (l/s)	Size (mm)	Slope (%)	Length (m)	Capacity (L/s)	Full Flow Vel. (m/s)	Actual Vel. (m/s)	Q/Q_{full} (%)	d/D
BUILDING	**103**	0.69	1.5	0.69	0.34	0.69	0.69	0.23	0.56	200	2.00	7.0	48.4	1.49	0.43	1.2%	0.077
103	**101**	0.00	1.5	0.69	0.34	0.00	0.69	0.23	0.56	200	0.40	66.9	21.6	0.67	0.24	2.6%	0.108
101	**99**	0.00	1.5	0.69	0.34	0.00	0.69	0.23	0.56	200	1.00	22.7	34.2	1.06	0.32	1.6%	0.077

Design Parameters:

Commercial average flow = 28000 l/gross ha/day
Infiltration = 0.33 l/s/ha
Pipe Friction n = 0.013
Peaking Factor = 1.5

Project: 1545A Merivale Road (122098)
Designed: SAB
Checked: TJM
Date: December 23, 2022
Revised: May 12, 2023

NOVATECH
Engineers, Planners & Landscape Architects

APPENDIX C

Storm Sewer Design Sheet

Merivale Medical Imaging Clinic - 1545A Merivale Road: Storm Sewer Design Sheet (Rational Method)

LOCATION			AREA				FLOW						PROPOSED SEWER							
Location	From Node	To Node	Hard Surface	Soft Surface	Total Area	Weighted Runoff Coefficient	Indivi 2.78 AR	Accum 2.78 AR	Time of Concentration	Rain Intensity (2 year)	Peak Flow	**Total Peak Flow (Q)**	Pipe	Size	Grade	Length	Capacity	Full Flow Velocity	Time of Flow	Q/Qfull
			0.90	0.20	(ha)				(min)	(mm/hr)	(L/s)	**(L/s)**	Type	(mm)	(%)	(m)	(l/s)	(m/s)	(min.)	(%)
A-1	**LCB-1**	**CBMH2**	**0.007**	**0.002**	**0.009**	**0.77**	**0.02**	**0.02**	**10.00**	**76.81**	**1.5**	**1.5**	**PVC**	**200**	**1.00**	**31.4**	**34.2**	**1.06**	**0.50**	**4.4%**
A-2	**CBMH2**	**CBMH3**	**0.046**	**0.000**	**0.046**	**0.90**	**0.12**	**0.13**	**10.50**	**74.95**	**10.1**	**10.1**	**PVC**	**250**	**0.50**	**26.0**	**43.9**	**0.87**	**0.50**	**23.1%**
A-3	**CBMH3**	**CBMH4**	**0.032**	**0.000**	**0.032**	**0.90**	**0.08**	**0.21**	**11.00**	**73.18**	**15.7**	**15.7**	**PVC**	**250**	**0.50**	**33.5**	**43.9**	**0.87**	**0.64**	**35.8%**
A-4	**CBMH4**	**CBMH5**	**0.039**	**0.000**	**0.039**	**0.90**	**0.10**	**0.31**	**11.64**	**71.03**	**22.2**	**22.2**	**PVC**	**250**	**0.50**	**30.7**	**43.9**	**0.87**	**0.59**	**50.7%**
A-5	**CBMH5**	**104**	**0.044**	**0.011**	**0.055**	**0.76**	**0.12**	**0.43**	**12.23**	**69.18**	**29.7**	**29.7**	**PVC**	**250**	**0.50**	**26.8**	**43.9**	**0.87**	**0.52**	**67.8%**
A-6	**CBMH6**	**CBMH7**	**0.048**	**0.007**	**0.055**	**0.81**	**0.12**	**0.12**	**10.00**	**76.81**	**9.6**	**9.6**	**CONC**	**450**	**1.00**	**13.2**	**297.4**	**1.81**	**0.12**	**3.2%**
A-7	**CBMH7**	**104**	**0.069**	**0.000**	**0.069**	**0.90**	**0.17**	**0.30**	**10.12**	**76.34**	**22.6**	**22.6**	**PVC**	**250**	**0.50**	**16.4**	**43.9**	**0.87**	**0.32**	**51.5%**
B-1, B-2	**BLDG**	**104**	**0.272**	**0.000**	**0.272**	**0.90**	**0.68**	**0.68**	**10.00**	**76.81**	**52.2**	**52.2**	**PVC**	**300**	**2.00**	**12.3**	**142.7**	**1.96**	**0.10**	**36.6%**
A-8, A-9, OS-1, OS-2, DR-4	**104**	**102**	**0.103**	**0.037**	**0.140**	**0.71**	**0.28**	**1.68**	**12.75**	**67.65**	**113.9**	**113.9**	**PVC**	**375**	**0.45**	**59.5**	**122.7**	**1.08**	**0.92**	**92.9%**
-	**102**	**100**	**0.000**	**0.000**	**0.000**	**-**	**0.00**	**1.68**	**13.67**	**65.10**	**109.6**	**109.6**	**PVC**	**375**	**1.00**	**12.3**	**182.9**	**1.60**	**0.13**	**59.9%**

Project: Merivale Medical Imaging Clinic - 1545A Merivale Road (122098)

Q = 2.78 AIR

WHERE : Q = PEAK FLOW IN LITRES PER SECOND (L/s)
A = AREA IN HECTARES (ha)
I = RAINFALL INTENSITY IN MILLIMETERS PER HOUR (mm/hr)
R = WEIGHTED RUNOFF COEFFICIENT

Q = (1/n) A R^(2/3)So^(1/2)

WHERE : Q = CAPACITY (L/s)
n = MANNING COEFFICIENT OF ROUGHNESS (0.013)
A = FLOW AREA (m^2)

Designed: SAB
Checked:TJM
Date: December 23, 2022
Revised: May 12, 2023

NOVATECH
Engineers, Planners & Landscape Architects

APPENDIX D

SWM Calculations

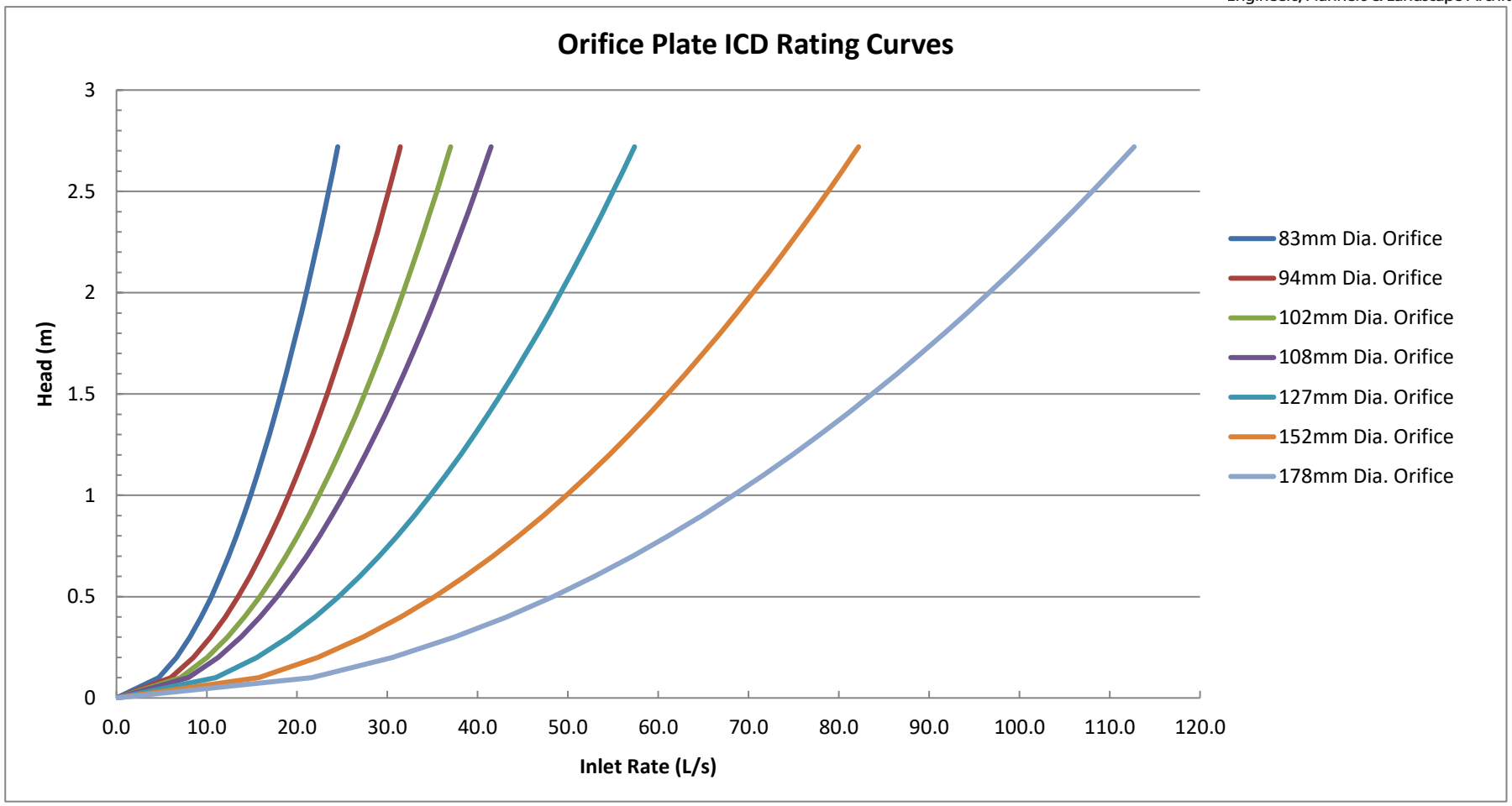
1545A Merivale Road
Overall Model Schematic

NOVATECH
Engineers, Planners & Landscape Architects

5/16/2023
PREPARED BY: NOVATECH

M:\2022\122098\DATA\Calculations\SWM\122098-ModelParams_Rev1.xlsx

1545A Merivale Road
ICD Rating Curves



TEMPEST Product Submittal Package

Date: May 15, 2023

Customer: Novatech

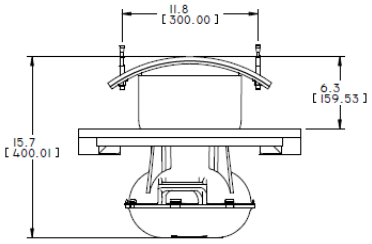
Contact: Melanie Schroeder

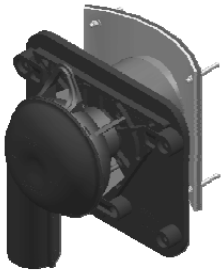
Location: Ottawa

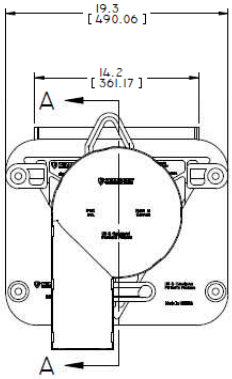
Project Name: 1545 Merivale Rd

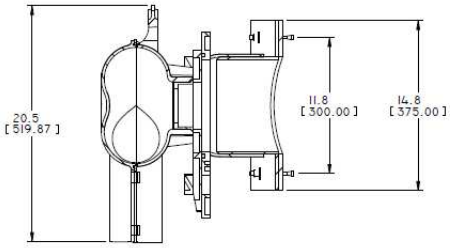
IPEX

Tempest LMF ICD Rd Shop Drawing







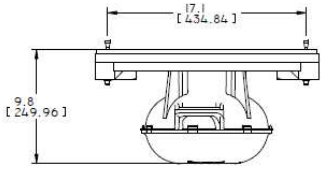


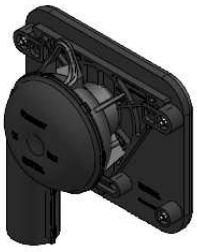
SECTION A-A

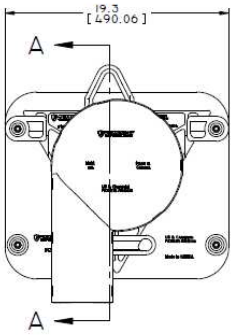
TOLERANCES: UNLESS OTHERWISE SPECIFIED LINEAR: X ±0.060" [±1.50 mm] X.X ±0.010" [±0.30 mm] X.XX ±0.005" [±0.13 mm] X.XXX ±0.001" [±0.05 mm] FRACTION ±1/64" ANGULAR ±1.0°	IPEX TECHNOLOGIES INC.			PRODUCT DEVELOPMENT ENGINEERING 5 Place du commerce, Suite 101 Lac des Iles, Montreal, QC, H7E 1A7 Canada Tel. 514 769 2200 www.ipexna.com
	PROJECTION	UNITS: in (mm)	TITLE: LMF ROUND CB ASSEMBLY	
	DRAWN BY: H. M-MARTIN	DATE: 2011-07-26	SIZE: B	SCALE(S): 1/8	SHEET: 1 OF 1
	VERIFIED BY	DATE: 2011-07-26	DRAWING NUMBER: SGM74_FA002R03	REV: 3

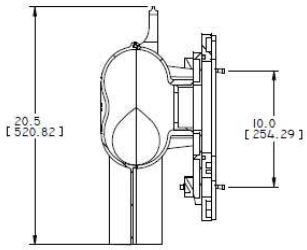
IPEX

<u>Tempest LMF ICD Sq</u> Shop Drawing

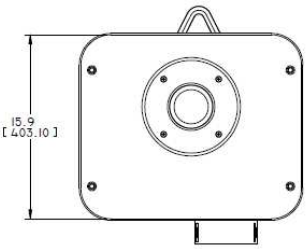








SECTION A-A



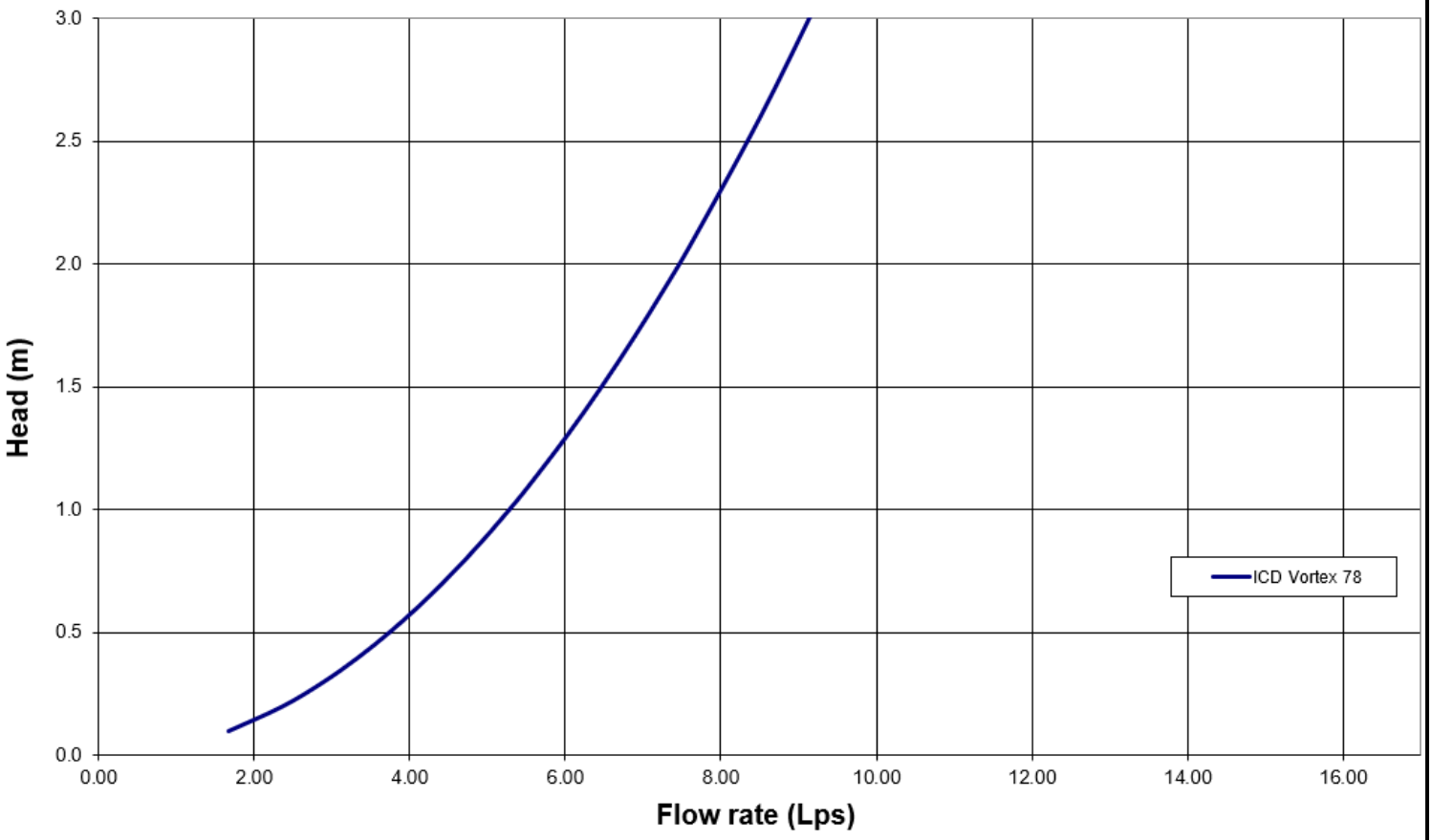
IPEX TECHNOLOGIES INC.

PROJECTION	UNITS: in (mm)	TITLE: LMF SQUARE CB ASSEMBLY	
DRAWN BY: H. M-MARTIN	DATE: 2011-07-27	SIZE: B	SCALE(S): 1/8
VERIFIED BY	DATE: 2011-07-27	DRAWING NUMBER: SGM74_FA00(R03	REV: 3

IPEX

Tempest LMF ICD Flow Curve

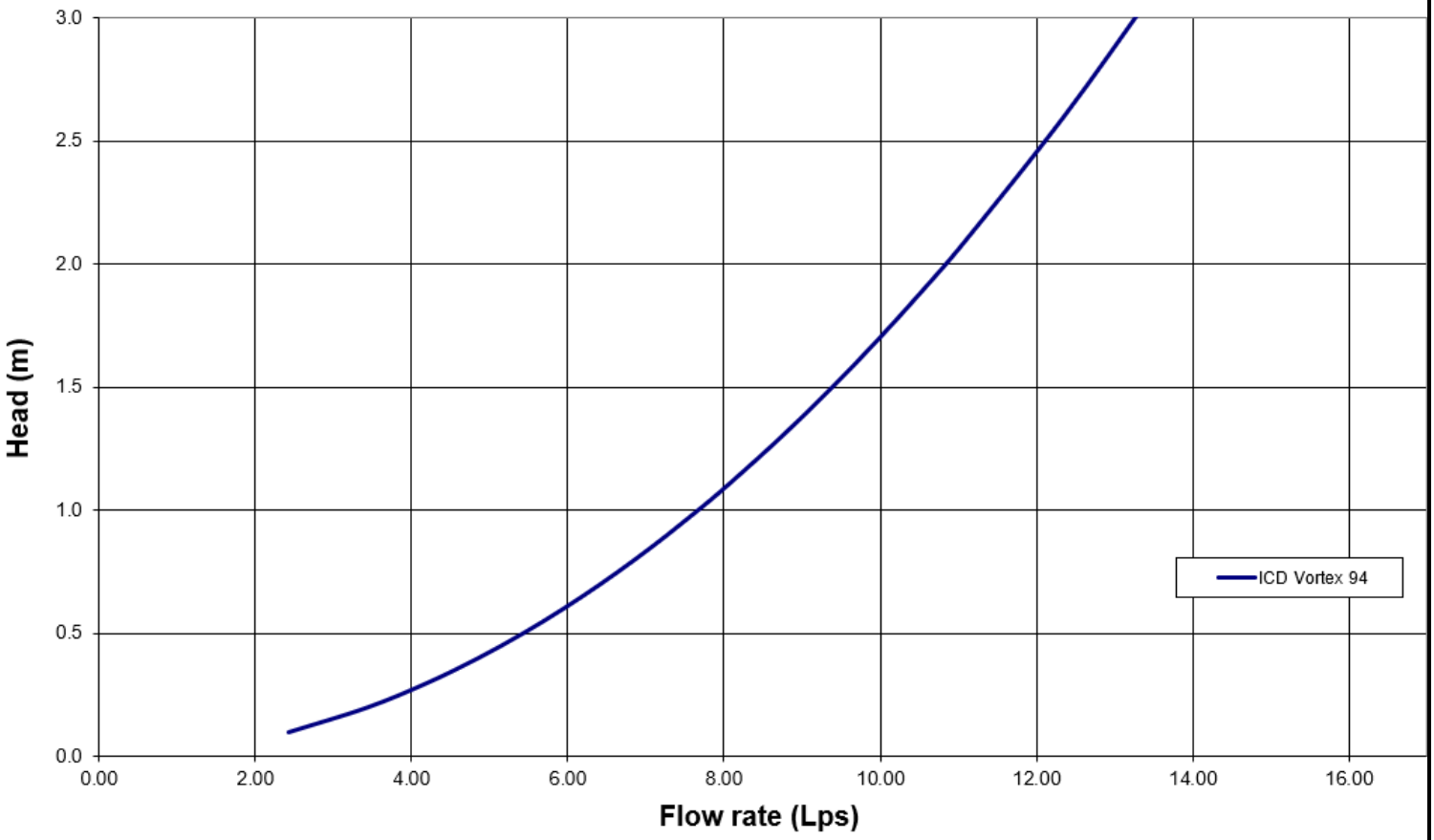
Flow: 7.4 L/s
Head: 1.96 m
CBMH05



IPEX

Tempest LMF ICD Flow Curve

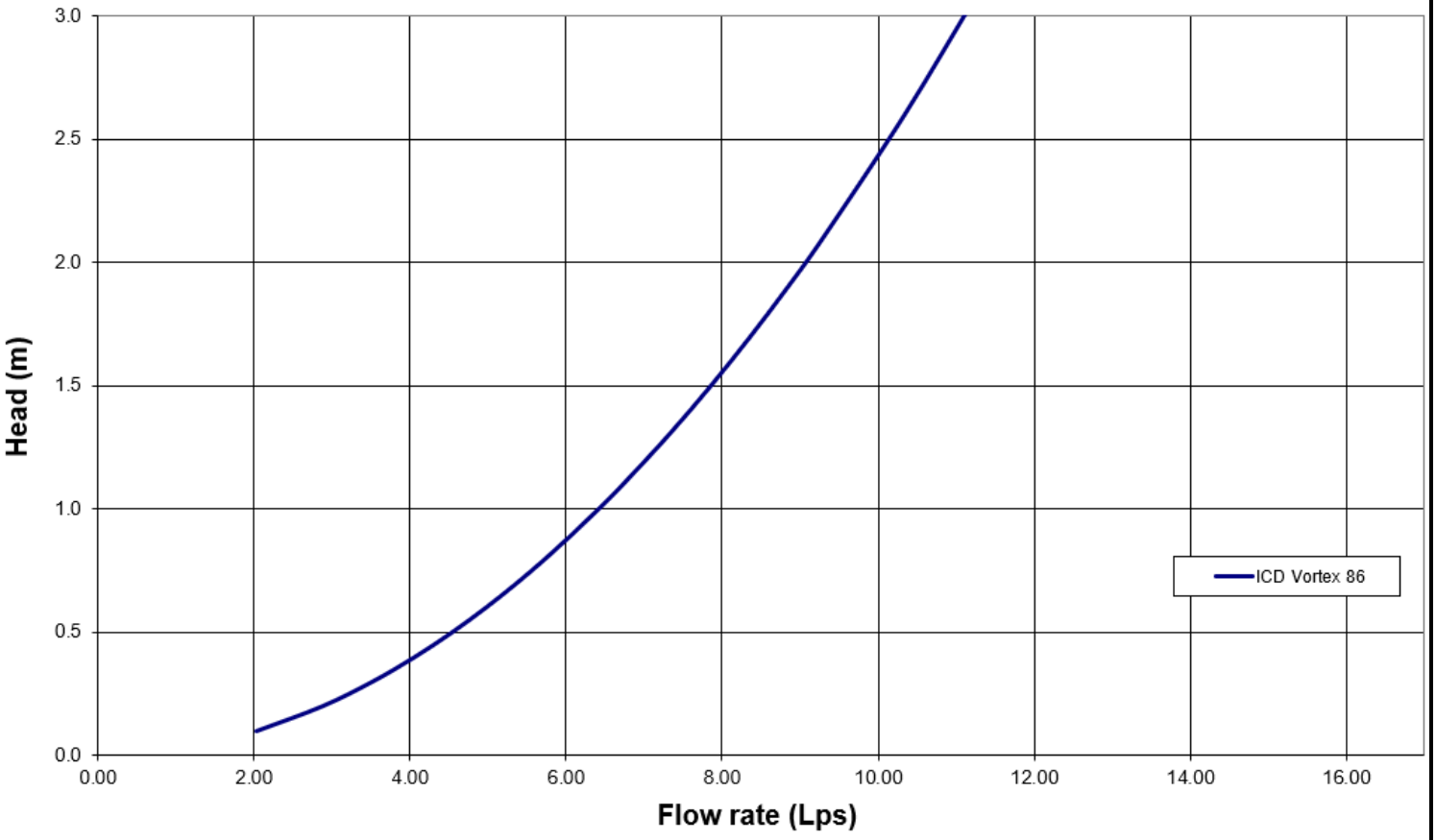
Flow: 8.17 L/s
Head: 1.14 m
CB08



IPEX

Tempest LMF ICD Flow Curve

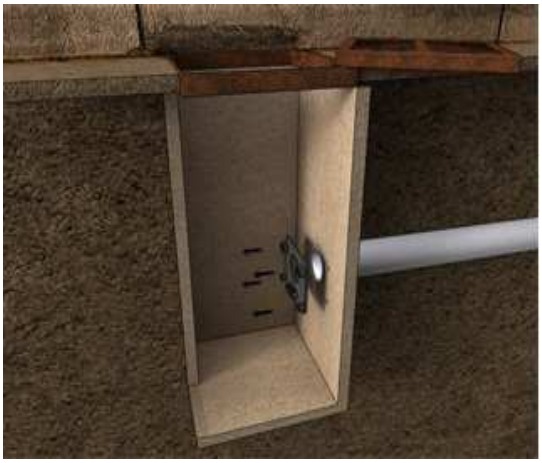
Flow: 6.83 L/s
Head: 1.12 m
CB09

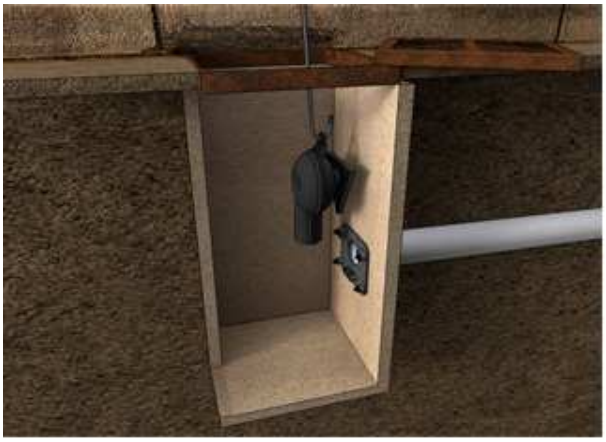


IPEX

Square CB Installation Notes:

1. Materials and tooling verification:
   - Tooling: impact drill, 3/8'' concrete bit, torque wrench for 9/16''nut, hand hammer, level, and marker.
   - Material: (4) concrete anchor 3/8x3-1/2, (4) washers, (4) nuts
2. Use the mounting wall plate to locate and mark the hole (4) pattern on the catch basin wall. You should use a level to ensure that the plate is at the horizontal.
3. Use an impact drill with a 3/8'' concrete bit to make the four holes at a minimum of 1-1/2'' depth up to 2-1/2''. Clean the concrete dust from the holes.
4. Install the anchors (4) in the holes by using a hammer. Put the nuts on the top of the anchors to protect the threads when you will hit the anchors with the hammer. Remove the nuts on the ends of the anchors
5. Install the wall mounting plate on the anchors and screw the nut in place with a maximum torque of 40 N.m (30 lbf-ft). There should be no gap between the wall mounting plate and the catch basin wall.
6. From ground above using a reach bar, lower the device by hooking the end of the reach bar to the handle of the LMF device. Align the triangular plate portion into the mounting wall plate. Push down the device to be sure it has centered in to the wall mounting plate and has created a seal.



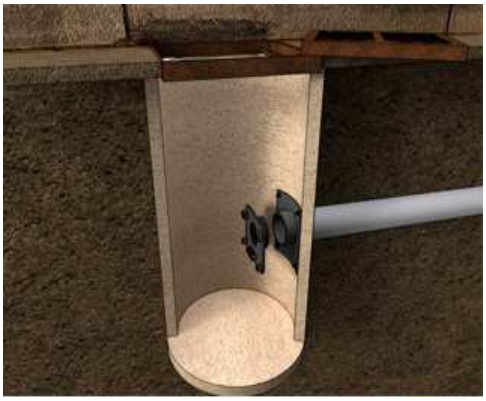


IPEX

Round CB Installation Notes: (Refer to square install notes above for steps 1 , 3, & 4)

2. Use spigot catch basin wall plate to locate and mark the hole (4) pattern on the catch basin wall. You should use a level to ensure that the plate is at the horizontal.
5. Install the CB spigot wall plate on the anchors and screw the 4 nuts in place with a maximum torque of 40 N.m (30 lb-ft). There should be no gap between the CB spigot wall plate and the catch basin wall.
6. Apply solvent cement on the hub of the universal mounting plate and the spigot of the spigot CB wall plate. Slide the hub over the spigot. Make sure the universal mounting plate is at the horizontal and its hub is completely inserted onto the spigot. Normally, the corners of the universal mounting plate hub adapter should touch the catch basin wall.
7. From ground above using a reach bar, lower the ICD device by hooking the end of the reach bar to the handle of the ICD device. Align the triangular plate portion into the mounting wall plate. Push down the device to be sure it has centered into the mounting plate and has created a seal.






CAUTION/WARNING/DISCLAIM:

- Verify that the inlet(s) pipe(s) is not protruding into the catch basin. If it is, cut it back so that the inlet pipe is flush with the catch basin wall.
- Any required cement in the installation must be approved for PVC.
- The solvent cement should not be used below 0°C (32°F) or in a high humidity environment. Please refer to the IPEX solvent cement guide to confirm required curing times or attend the IPEX **Online Solvent Cement Training Course**.
- Call your IPEX representative for more information or if you have any questions about our products.

IPEX

IPEX TEMPEST Inlet Control Devices Technical Specification

General

Inlet control devices (ICD's) are designed to provide flow control at a specified rate for a given water head level and also provide odour and floatable control where specified. All ICD's will be IPEX Tempest or approved equal.

All devices shall be removable from a universal mounting plate. An operator from street level using only a T-bar with a hook will be able to retrieve the device while leaving the universal mounting plate secured to the catch basin wall face. The removal of the TEMPEST devices listed above must not require any unbolting or special manipulation or any special tools.

High Flow (HF) Sump devices will consist of a removable threaded cap which can be accessible from street level with out entry into the catchbasin (CB). The removal of the threaded cap shall not require any special tools other than the operator's hand.

ICD's must have no moving parts.

Materials

ICD's are to be manufactured from Polyvinyl Chloride (PVC) or Polyurethane material, designed to be durable enough to withstand multiple freeze-thaw cycles and exposure to harsh elements.

The inner ring seal will be manufactured using a Buna or Nitrile material with hardness between Duro 50 and Duro 70.

The wall seal is to be comprised of a 3/8" thick Neoprene Closed Cell Sponge gasket which is attached to the back of the wall plate.

All hardware will be made from 304 stainless steel.

Dimensioning

The Low Medium Flow (LMF), High Flow (HF) and the High Flow (HF) Sump shall allow for a minimum outlet pipe diameter of 200mm with a 600mm deep Catch Basin sump.

Installation

Contractor shall be responsible for securing, supporting and connecting the ICD's to the existing influent pipe and catchbasin/manhole structure as specified and designed by the Engineer.

1545 Merivale Road

ROW Ponding Depths

Structure	T/G	Max. Static Ponding (Spill Depth)		2-yr Event (3hr)				5-yr Event (3hr)				100-yr Event (3hr)				100-yr Event (+20%) (3hr)			
	(m)	Elev. (m)	Depth (m)	Elev. (m)	Depth (m)	Cascading Flow?	Cascade Depth (m)	Elev. (m)	Depth (m)	Cascading Flow?	Cascade Depth (m)	Elev. (m)	Depth (m)	Cascading Flow?	Cascade Depth (m)	Elev. (m)	Depth (m)	Cascading Flow?	Cascade Depth (m)
CBMH02	96.50	96.70	0.20	96.40	0.00	N	0.00	96.54	0.04	N	0.00	96.63	0.13	N	0.00	96.67	0.17	N	0.00
CBMH03	96.50	96.70	0.20	96.40	0.00	N	0.00	96.54	0.04	N	0.00	96.63	0.13	N	0.00	96.67	0.17	N	0.00
CBMH04	96.50	96.70	0.20	96.40	0.00	N	0.00	96.54	0.04	N	0.00	96.63	0.13	N	0.00	96.67	0.17	N	0.00
CBMH05	96.45	96.70	0.25	96.39	0.00	N	0.00	96.54	0.09	N	0.00	96.62	0.17	N	0.00	96.67	0.22	N	0.00
CBMH06	96.45	96.70	0.25	96.00	0.00	N	0.00	96.48	0.03	N	0.00	96.55	0.10	N	0.00	96.57	0.12	N	0.00
CBMH07	96.45	96.70	0.25	96.00	0.00	N	0.00	96.48	0.03	N	0.00	96.55	0.10	N	0.00	96.57	0.12	N	0.00
CB08	96.55	96.70	0.15	96.55	0.00	N	0.00	96.57	0.02	N	0.00	96.64	0.09	N	0.00	96.66	0.11	N	0.00
CB09	96.55	96.69	0.14	96.55	0.00	N	0.00	96.57	0.02	N	0.00	96.62	0.07	N	0.00	96.65	0.10	N	0.00

1545A Merivale
Major Flow

Location	100-year					100-year +20%			
	Peak Flow (m^3/s)	Velocity (m/s)	Static Depth (m)	Total Depth (static + dynamic) (m)	Velocity x Depth (m^2/s)	Peak Flow (m^3/s)	Velocity (m/s)	Total Depth (m)	Velocity x Depth (m^2/s)
Catchbasins at Low Points									
CBMH02	0.030	0.00	0.20	0.13	0.00	0.034	0.01	0.17	0.00
CBMH03	0.027	0.00	0.20	0.13	0.00	0.031	0.01	0.17	0.00
CBMH04	0.031	0.00	0.20	0.13	0.00	0.034	0.00	0.17	0.00
CBMH05	0.039	0.00	0.25	0.17	0.00	0.044	0.00	0.22	0.00
CBMH06	0.028	0.02	0.25	0.10	0.00	0.034	0.02	0.12	0.00
CBMH07	0.045	0.02	0.25	0.10	0.00	0.054	0.02	0.12	0.00
CB08	0.024	0.00	0.15	0.09	0.00	0.029	0.04	0.11	0.00
CB09	0.019	0.00	0.14	0.07	0.00	0.023	0.00	0.10	0.00
High Points									
HP01	0.000	0.00	-	0.00	0.00	0.000	0.00	0.00	0.00
HP02	0.000	0.00	-	0.00	0.00	0.003	0.01	0.00	0.00
HP03	0.000	0.00	-	0.00	0.00	0.000	0.00	0.00	0.00
HP04	0.000	0.00	-	0.00	0.00	0.001	0.00	0.00	0.00
HP05	0.000	0.00	-	0.00	0.00	0.000	0.00	0.00	0.00
HP06	0.005	0.02	-	0.02	0.00	0.008	0.02	0.04	0.00
HP07	0.000	0.00	-	0.00	0.00	0.000	0.00	0.00	0.00
HP08	0.000	0.00	-	0.00	0.00	0.000	0.00	0.00	0.00

1545A Merivale Road
Design Storm Time Series Data
3-hour Chicago Design Storms

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C25mm-3.stm		C2-3.stm		C5-3.stm	
Duration	Intensity	Duration	Intensity	Duration	Intensity
min	mm/hr	min	mm/hr	min	mm/hr
0:00	0	0:00	0	0:00	0
0:10	2.21	0:10	2.81	0:10	3.68
0:20	2.75	0:20	3.5	0:20	4.58
0:30	3.68	0:30	4.69	0:30	6.15
0:40	5.73	0:40	7.3	0:40	9.61
0:50	14.29	0:50	18.21	0:50	24.17
1:00	60.28	1:00	76.81	1:00	104.19
1:10	18.9	1:10	24.08	1:10	32.04
1:20	9.7	1:20	12.36	1:20	16.34
1:30	6.53	1:30	8.32	1:30	10.96
1:40	4.94	1:40	6.3	1:40	8.29
1:50	3.99	1:50	5.09	1:50	6.69
2:00	3.37	2:00	4.29	2:00	5.63
2:10	2.92	2:10	3.72	2:10	4.87
2:20	2.58	2:20	3.29	2:20	4.3
2:30	2.32	2:30	2.95	2:30	3.86
2:40	2.1	2:40	2.68	2:40	3.51
2:50	1.93	2:50	2.46	2:50	3.22
3:00	1.79	3:00	2.28	3:00	2.98

1545A Merivale Road
Design Storm Time Series Data
3-hour Chicago Design Storms

NOVATECH
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C100-3.stm		C100-3+20%.stm	
Duration	Intensity	Duration	Intensity
min	mm/hr	min	mm/hr
0:00	0	0:00	0
0:10	6.05	0:10	6:14
0:20	7.54	0:20	9.05
0:30	10.16	0:30	12.19
0:40	15.97	0:40	19.16
0:50	40.65	0:50	48.78
1:00	178.56	1:00	214.27
1:10	54.05	1:10	64.86
1:20	27.32	1:20	32.78
1:30	18.24	1:30	21.89
1:40	13.74	1:40	16.49
1:50	11.06	1:50	13.27
2:00	9.29	2:00	11.15
2:10	8.02	2:10	9.62
2:20	7.08	2:20	8.5
2:30	6.35	2:30	7.62
2:40	5.76	2:40	6.91
2:50	5.28	2:50	6.34
3:00	4.88	3:00	5.86

1545A Merivale Road
Design Storm Time Series Data
SCS Design Storms

NOVATECH
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S2-12.stm		S5-12.stm		S100-12.stm	
Duration	Intensity	Duration	Intensity	Duration	Intensity
min	mm/hr	min	mm/hr	min	mm/hr
0:00	0.00	0:00	0	0:00	0
0:30	1.27	0:30	1.69	0:30	2.82
1:00	0.59	1:00	0.79	1:00	1.31
1:30	1.10	1:30	1.46	1:30	2.44
2:00	1.10	2:00	1.46	2:00	2.44
2:30	1.44	2:30	1.91	2:30	3.19
3:00	1.27	3:00	1.69	3:00	2.82
3:30	1.69	3:30	2.25	3:30	3.76
4:00	1.69	4:00	2.25	4:00	3.76
4:30	2.29	4:30	3.03	4:30	5.07
5:00	2.88	5:00	3.82	5:00	6.39
5:30	4.57	5:30	6.07	5:30	10.14
6:00	36.24	6:00	48.08	6:00	80.38
6:30	9.23	6:30	12.25	6:30	20.47
7:00	4.06	7:00	5.39	7:00	9.01
7:30	2.71	7:30	3.59	7:30	6.01
8:00	2.37	8:00	3.15	8:00	5.26
8:30	1.86	8:30	2.47	8:30	4.13
9:00	1.95	9:00	2.58	9:00	4.32
9:30	1.27	9:30	1.69	9:30	2.82
10:00	1.02	10:00	1.35	10:00	2.25
10:30	1.44	10:30	1.91	10:30	3.19
11:00	0.93	11:00	1.24	11:00	2.07
11:30	0.85	11:30	1.12	11:30	1.88
12:00	0.85	12:00	1.12	12:00	1.88

1545A Merivale Road
Roof Drain Calculations

NOVATECH
Engineers, Planners & Landscape Architects

Roof Drain Calculations Summary

5-Year

Area ID	Static Ponding Area (m^2)	Drainage Area (ha)	Runoff Coef. (5-year)	Time-of-Conc. (min)	Rainfall Intensity mm/hr	Uncontrolled Peak Flow (L/s)	Roof Drain Flow Control System	Setting	Controlled Peak Flow (L/s)	Flow Depth (m)	Storage Required (m^3)	Storage Utilized (m^3)	Storage Available (m^3)
R-01	299	0.038	0.90	10.00	104.19	9.8	Watts Flow Control	Fully Open	1.26	0.12	6.99	6.99	14.97
R-02	300	0.043	0.90	10.00	104.19	11.1	Watts Flow Control	Fully Open	1.26	0.12	8.32	8.32	14.98
R-03	339	0.045	0.90	10.00	104.19	11.7	Watts Flow Control	Fully Open	1.26	0.12	8.94	8.94	16.95
R-04	305	0.045	0.90	10.00	104.19	11.8	Watts Flow Control	Fully Open	1.26	0.13	9.03	9.03	15.23
R-05	271	0.037	0.90	10.00	104.19	9.7	Watts Flow Control	Fully Open	1.26	0.12	6.82	6.82	13.54
R-06	205	0.023	0.90	10.00	104.19	5.9	Watts Flow Control	Fully Open	1.26	0.10	3.31	3.31	10.25
R-07	205	0.023	0.90	10.00	104.19	5.9	Watts Flow Control	Fully Open	1.26	0.10	3.31	3.31	10.24
TOTAL		**0.253**				**66.0**			8.82		**46.73**	**46.73**	**96.16**

100-Year

Area ID	Static Ponding Area (m^2)	Drainage Area (ha)	Runoff Coef. (100-year)	Time-of-Conc. (min)	Rainfall Intensity mm/hr	Uncontrolled Peak Flow (L/s)	Roof Drain Flow Control System	Setting	Controlled Peak Flow (L/s)	Flow Depth (m)	Storage Required (m^3)	Storage Utilized (m^3)	Storage Available (m^3)
R-01	299	0.038	1.00	10.00	178.56	18.7	Watts Flow Control	Fully Open	1.89	0.15	14.46	14.46	14.97
R-02	300	0.043	1.00	10.00	178.56	21.2	Watts Flow Control	Fully Open	1.89	0.15	17.13	14.98	14.98
R-03	339	0.045	1.00	10.00	178.56	22.3	Watts Flow Control	Fully Open	1.89	0.15	18.37	16.95	16.95
R-04	305	0.045	1.00	10.00	178.56	22.5	Watts Flow Control	Fully Open	1.89	0.15	18.54	15.23	15.23
R-05	271	0.037	1.00	10.00	178.56	18.4	Watts Flow Control	Fully Open	1.89	0.15	14.12	13.54	13.54
R-06	205	0.023	1.00	10.00	178.56	11.3	Watts Flow Control	Fully Open	1.89	0.13	7.07	7.07	10.25
R-07	205	0.023	1.00	10.00	178.56	11.3	Watts Flow Control	Fully Open	1.89	0.13	7.06	7.06	10.24
TOTAL		**0.253**				**125.8**			13.23		**96.74**	**89.29**	**96.16**

1545A Merivale Road
Roof Drain Calculations

NOVATECH
Engineers, Planners & Landscape Architects

Area ID	R-01			
5-Year Event			Static Ponding Area =	299 m2
Area =	0.038 ha	ha	Qcontrolled =	1.26 L/s
C =	0.90		Vol(req.) =	6.99 m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	141.18	13.33	12.07	3.62
10	104.19	9.84	8.58	5.15
15	83.56	7.89	6.63	5.97
20	70.25	6.63	5.37	6.45
25	60.90	5.75	4.49	6.74
30	53.93	5.09	3.83	6.90
35	48.52	4.58	3.32	6.97
40	44.18	4.17	2.91	6.99
45	40.63	3.84	2.58	6.96
50	37.65	3.56	2.30	6.89
55	35.12	3.32	2.06	6.79
60	32.94	3.11	1.85	6.66
65	31.04	2.93	1.67	6.52
70	29.37	2.77	1.51	6.36
75	27.89	2.63	1.37	6.18
80	26.56	2.51	1.25	5.99
85	25.37	2.40	1.14	5.79
90	24.29	2.29	1.03	5.58

*City of Ottawa IDF Data (Sewer Design Guidelines, Oct. 2012)

Notes: Vol = Qnet x time
Qnet = Q - Qallow

Ponding Depth (5-Year Storm)		
Area m^2	V m^3	H m
0	0.00	0.00
1	0.00	0.01
5	0.04	0.02
12	0.12	0.03
21	0.28	0.04
33	0.55	0.05
48	0.96	0.06
65	1.52	0.07
85	2.27	0.08
108	3.23	0.09
133	4.43	0.10
161	5.90	0.11
192	7.66	0.12
225	9.74	0.13
261	12.17	0.14
299	**14.97**	**0.15**

Linear Interpolation					
0.12	H	0.11		H =	0.116 m
7.66	6.99	5.90		Q_{allow} =	1.26 L/s

Area ID	R-01			
100-Year Event			Static Ponding Area =	299 m2
Area =	0.038 ha	ha	Qcontrolled =	1.89 L/s
C =	1.00		Vol(req.) =	14.46 m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	242.70	25.46	23.57	7.07
10	178.56	18.73	16.84	10.11
15	142.89	14.99	13.10	11.79
20	119.95	12.58	10.69	12.83
25	103.85	10.90	9.01	13.51
30	91.87	9.64	7.75	13.95
35	82.58	8.66	6.77	14.23
40	75.15	7.88	5.99	14.39
45	69.05	7.24	5.35	14.46
50	63.95	6.71	4.82	14.46
55	59.62	6.26	4.37	14.41
60	55.89	5.86	3.97	14.31
65	52.65	5.52	3.63	14.17
70	49.79	5.22	3.33	14.00
75	47.26	4.96	3.07	13.81
80	44.99	4.72	2.83	13.59
85	42.95	4.51	2.62	13.34
90	41.11	4.31	2.42	13.09

*City of Ottawa IDF Data (Sewer Design Guidelines, Oct. 2012)

Notes: Vol = Qnet x time
Qnet = Q - Qallow

Ponding Depth (100-Year Storm)		
Area m^2	V m^3	H m
0	0.00	0.00
1	0.00	0.01
5	0.04	0.02
12	0.12	0.03
21	0.28	0.04
33	0.55	0.05
48	0.96	0.06
65	1.52	0.07
85	2.27	0.08
108	3.23	0.09
133	4.43	0.10
161	5.90	0.11
192	7.66	0.12
225	9.74	0.13
261	12.17	0.14
299	**14.97**	**0.15**

Linear Interpolation					
0.15	H	0.14		H =	0.148 m
14.97	14.46	12.17		Q_{allow} =	1.89 L/s

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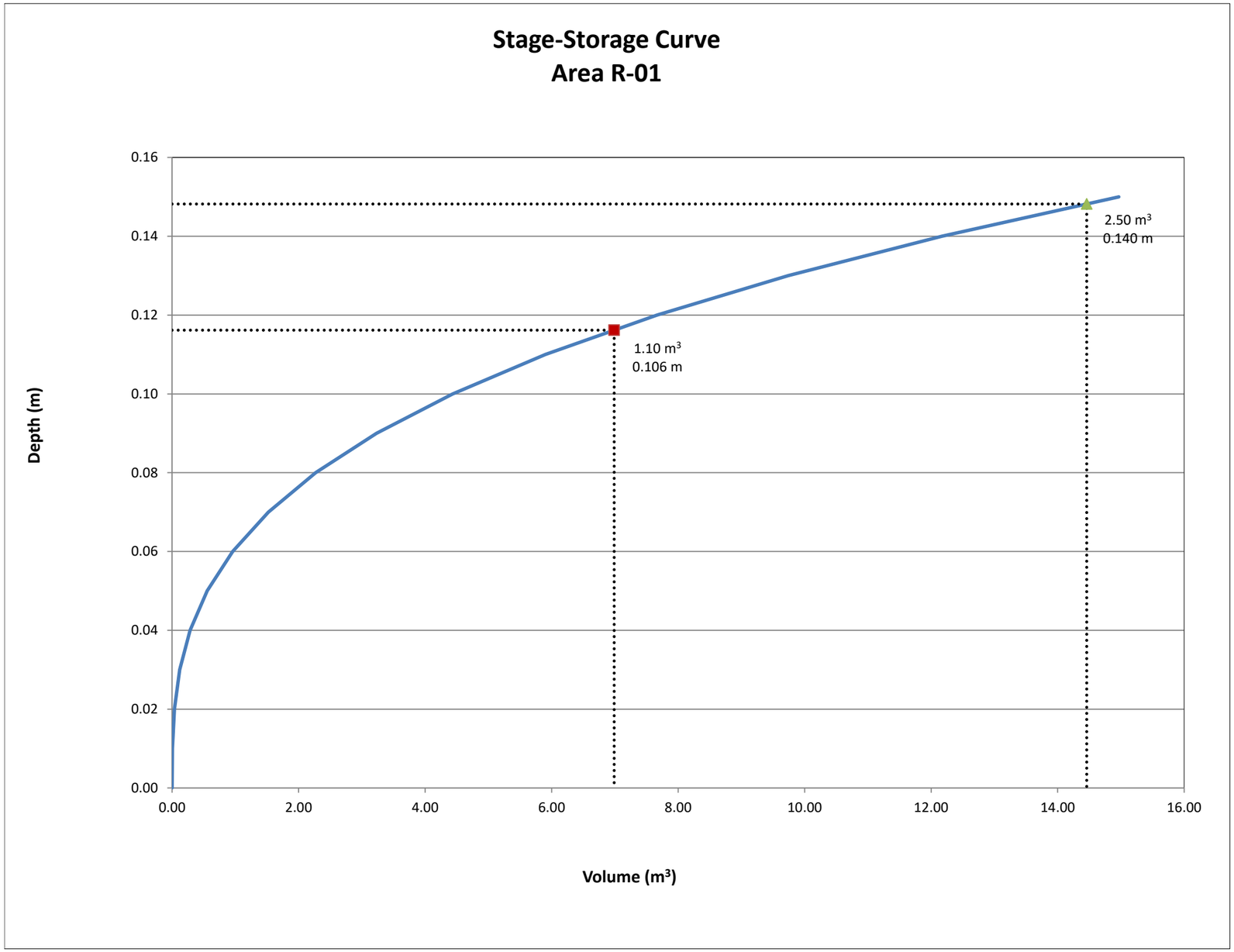
DATE: 5/16/2023


Stage-Storage Curve
Area R-01
Depth (m)
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
Volume (m³)
1.10 m³
0.106 m
2.50 m³
0.140 m

1545A Merivale Road
Roof Drain Calculations

Area ID	R-02			
5-Year Event			Static Ponding Area =	300 m2
Area =	0.043 ha	ha	Qcontrolled =	1.26 L/s
C =	0.90		Vol(req.) =	8.32 m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	141.18	15.09	13.83	4.15
10	104.19	11.14	9.88	5.93
15	83.56	8.93	7.67	6.90
20	70.25	7.51	6.25	7.50
25	60.90	6.51	5.25	7.87
30	53.93	5.76	4.50	8.11
35	48.52	5.19	3.93	8.24
40	44.18	4.72	3.46	8.31
45	40.63	4.34	3.08	8.32
50	37.65	4.02	2.76	8.29
55	35.12	3.75	2.49	8.23
60	32.94	3.52	2.26	8.14
65	31.04	3.32	2.06	8.03
70	29.37	3.14	1.88	7.89
75	27.89	2.98	1.72	7.74
80	26.56	2.84	1.58	7.58
85	25.37	2.71	1.45	7.40
90	24.29	2.60	1.34	7.21

*City of Ottawa IDF Data (Sewer Design Guidelines, Oct. 2012)

Notes: Vol = Qnet x time
Qnet = Q - Qallow

Ponding Depth (5-Year Storm)		
Area m^2	V m^3	H m
0	0.00	0.00
1	0.00	0.01
5	0.04	0.02
12	0.12	0.03
21	0.28	0.04
33	0.55	0.05
48	0.96	0.06
65	1.52	0.07
85	2.27	0.08
108	3.23	0.09
133	4.44	0.10
161	5.91	0.11
192	7.67	0.12
225	9.75	0.13
261	12.18	0.14
300	**14.98**	**0.15**

Linear Interpolation					
0.13	H	0.12		H =	0.123 m
9.75	8.32	7.67		Q_{allow} =	1.26 L/s

Area ID	R-02			
100-Year Event			Static Ponding Area =	300 m2
Area =	0.043 ha	ha	Qcontrolled =	1.89 L/s
C =	1.00		Vol(req.) =	17.13 m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	242.70	28.82	26.93	8.08
10	178.56	21.21	19.32	11.59
15	142.89	16.97	15.08	13.57
20	119.95	14.25	12.36	14.83
25	103.85	12.33	10.44	15.66
30	91.87	10.91	9.02	16.24
35	82.58	9.81	7.92	16.63
40	75.15	8.92	7.03	16.88
45	69.05	8.20	6.31	17.04
50	63.95	7.60	5.71	17.12
55	59.62	7.08	5.19	17.13
60	55.89	6.64	4.75	17.09
65	52.65	6.25	4.36	17.01
70	49.79	5.91	4.02	16.90
75	47.26	5.61	3.72	16.75
80	44.99	5.34	3.45	16.58
85	42.95	5.10	3.21	16.38
90	41.11	4.88	2.99	16.16

*City of Ottawa IDF Data (Sewer Design Guidelines, Oct. 2012)

Notes: Vol = Qnet x time
Qnet = Q - Qallow

Ponding Depth (100-Year Storm)		
Area m^2	V m^3	H m
0	0.00	0.00
1	0.00	0.01
5	0.04	0.02
12	0.12	0.03
21	0.28	0.04
33	0.55	0.05
48	0.96	0.06
65	1.52	0.07
85	2.27	0.08
108	3.23	0.09
133	4.44	0.10
161	5.91	0.11
192	7.67	0.12
225	9.75	0.13
261	12.18	0.14
300	**14.98**	**0.15**

Linear Interpolation					
0.16	H	0.15		H =	0.150 m
14.98	17.13	14.98		Q_{allow} =	1.89 L/s

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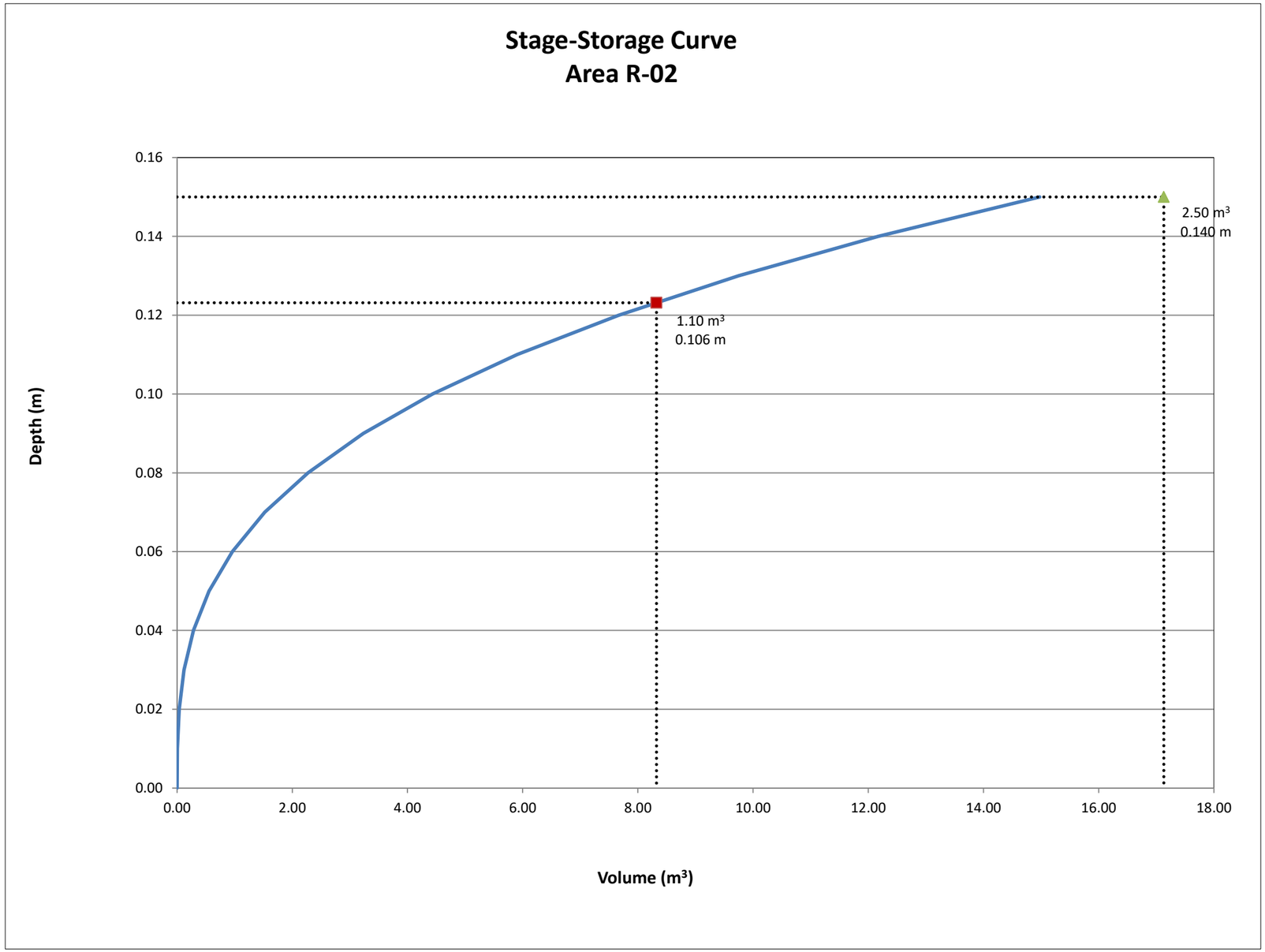
DATE: 5/16/2023


Stage-Storage Curve
Area R-02
Depth (m)
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
18.00
1.10 m³
0.106 m
2.50 m³
0.140 m
Volume (m³)

1545A Merivale Road
Roof Drain Calculations

NOVATECH
Engineers, Planners & Landscape Architects

Area ID	R-03			
5-Year Event			Static Ponding Area =	339 m2
Area =	0.045 ha	ha	Qcontrolled =	1.26 L/s
C =	0.90		Vol(req.) =	8.94 m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	141.18	15.89	14.63	4.39
10	104.19	11.73	10.47	6.28
15	83.56	9.40	8.14	7.33
20	70.25	7.91	6.65	7.98
25	60.90	6.85	5.59	8.39
30	53.93	6.07	4.81	8.66
35	48.52	5.46	4.20	8.82
40	44.18	4.97	3.71	8.91
45	40.63	4.57	3.31	8.94
50	37.65	4.24	2.98	8.93
55	35.12	3.95	2.69	8.89
60	32.94	3.71	2.45	8.81
65	31.04	3.49	2.23	8.71
70	29.37	3.31	2.05	8.59
75	27.89	3.14	1.88	8.45
80	26.56	2.99	1.73	8.30
85	25.37	2.85	1.59	8.13
90	24.29	2.73	1.47	7.96

*City of Ottawa IDF Data (Sewer Design Guidelines, Oct. 2012)

Notes: Vol = Qnet x time
Qnet = Q - Qallow

Ponding Depth (5-Year Storm)		
Area m^2	V m^3	H m
0	0.00	0.00
2	0.01	0.01
6	0.04	0.02
14	0.14	0.03
24	0.32	0.04
38	0.63	0.05
54	1.08	0.06
74	1.72	0.07
96	2.57	0.08
122	3.66	0.09
151	5.02	0.10
182	6.69	0.11
217	8.68	0.12
255	11.03	0.13
295	13.78	0.14
339	**16.95**	**0.15**

Linear Interpolation					
0.13	H	0.12		H =	0.121 m
11.03	8.94	8.68		Q_{allow} =	1.26 L/s

Area ID	R-03			
100-Year Event			Static Ponding Area =	339 m2
Area =	0.045 ha	ha	Qcontrolled =	1.89 L/s
C =	1.00		Vol(req.) =	18.37 m3

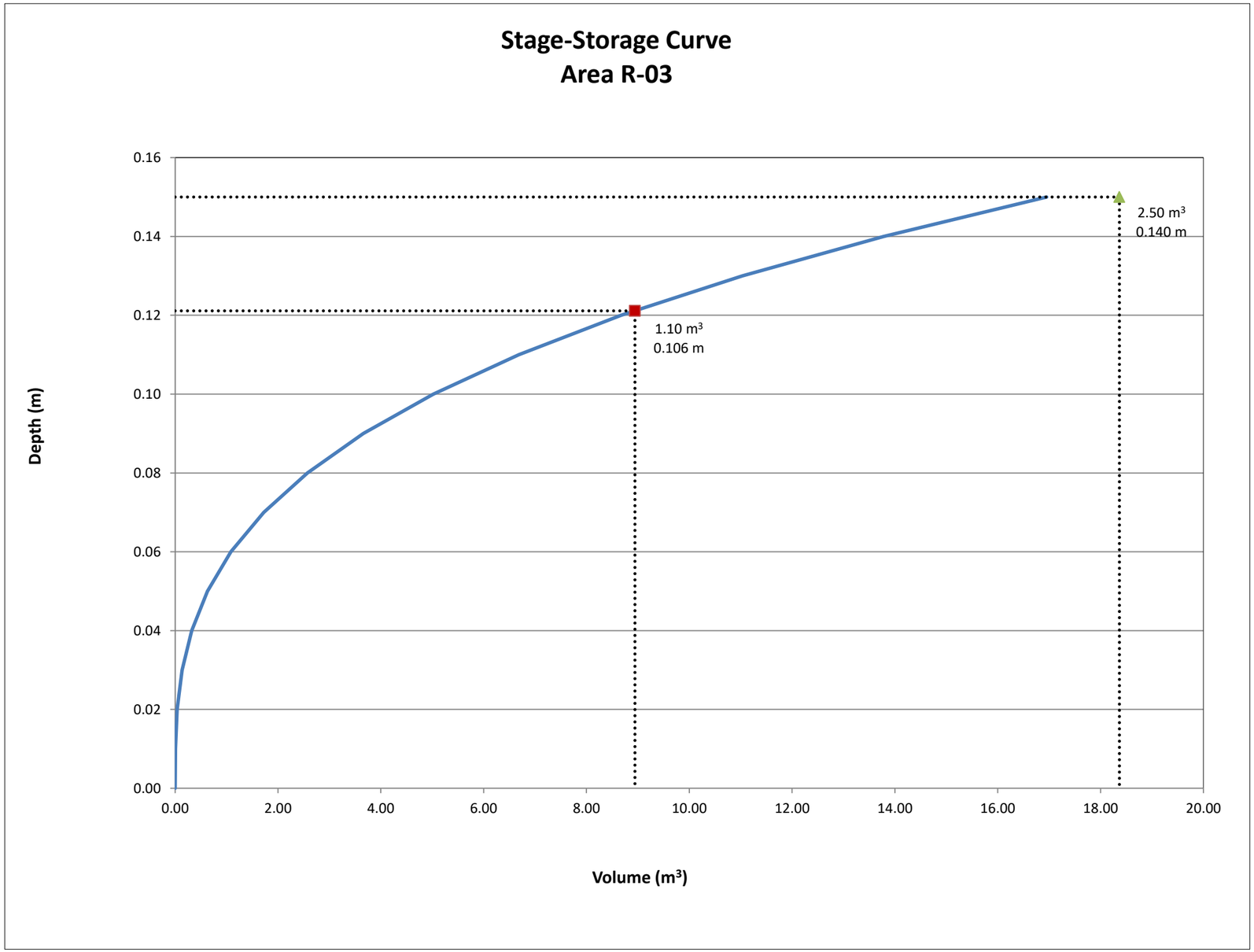
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	242.70	30.35	28.46	8.54
10	178.56	22.33	20.44	12.26
15	142.89	17.87	15.98	14.38
20	119.95	15.00	13.11	15.73
25	103.85	12.99	11.10	16.64
30	91.87	11.49	9.60	17.28
35	82.58	10.33	8.44	17.72
40	75.15	9.40	7.51	18.02
45	69.05	8.63	6.74	18.21
50	63.95	8.00	6.11	18.32
55	59.62	7.46	5.57	18.37
60	55.89	6.99	5.10	18.36
65	52.65	6.58	4.69	18.30
70	49.79	6.23	4.34	18.21
75	47.26	5.91	4.02	18.09
80	44.99	5.63	3.74	17.93
85	42.95	5.37	3.48	17.75
90	41.11	5.14	3.25	17.55

*City of Ottawa IDF Data (Sewer Design Guidelines, Oct. 2012)

Notes: Vol = Qnet x time
Qnet = Q - Qallow

Ponding Depth (100-Year Storm)		
Area m^2	V m^3	H m
0	0.00	0.00
2	0.01	0.01
6	0.04	0.02
14	0.14	0.03
24	0.32	0.04
38	0.63	0.05
54	1.08	0.06
74	1.72	0.07
96	2.57	0.08
122	3.66	0.09
151	5.02	0.10
182	6.69	0.11
217	8.68	0.12
255	11.03	0.13
295	13.78	0.14
339	**16.95**	**0.15**

Linear Interpolation					
0.16	H	0.15		H =	0.150 m
16.95	18.37	16.95		Q_{allow} =	1.89 L/s


Stage-Storage Curve
Area R-03
Depth (m)
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
18.00
20.00
Volume (m³)
2.50 m³
0.140 m
1.10 m³
0.106 m

1545A Merivale Road
Roof Drain Calculations

NOVATECH
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Area ID	R-04			
5-Year Event			Static Ponding Area =	305 m2
Area =	0.045 ha	ha	Qcontrolled =	1.26 L/s
C =	0.90		Vol(req.) =	9.03 m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	141.18	16.00	14.74	4.42
10	104.19	11.81	10.55	6.33
15	83.56	9.47	8.21	7.39
20	70.25	7.96	6.70	8.04
25	60.90	6.90	5.64	8.46
30	53.93	6.11	4.85	8.73
35	48.52	5.50	4.24	8.90
40	44.18	5.01	3.75	8.99
45	40.63	4.60	3.34	9.03
50	37.65	4.27	3.01	9.02
55	35.12	3.98	2.72	8.98
60	32.94	3.73	2.47	8.90
65	31.04	3.52	2.26	8.81
70	29.37	3.33	2.07	8.69
75	27.89	3.16	1.90	8.55
80	26.56	3.01	1.75	8.40
85	25.37	2.87	1.61	8.23
90	24.29	2.75	1.49	8.06

*City of Ottawa IDF Data (Sewer Design Guidelines, Oct. 2012)

Notes: Vol = Qnet x time
Qnet = Q - Qallow

Ponding Depth (5-Year Storm)		
Area m^2	V m^3	H m
0	0.00	0.00
1	0.00	0.01
5	0.04	0.02
12	0.12	0.03
22	0.29	0.04
34	0.56	0.05
49	0.97	0.06
66	1.55	0.07
87	2.31	0.08
110	3.29	0.09
135	4.51	0.10
164	6.01	0.11
195	7.80	0.12
229	9.92	0.13
265	12.38	0.14
305	**15.23**	**0.15**

Linear Interpolation					
0.13	H	0.12		H =	0.126 m
9.92	9.03	7.80		Q_{allow} =	1.26 L/s

Area ID	R-04			
100-Year Event			Static Ponding Area =	305 m2
Area =	0.045 ha	ha	Qcontrolled =	1.89 L/s
C =	1.00		Vol(req.) =	18.54 m3

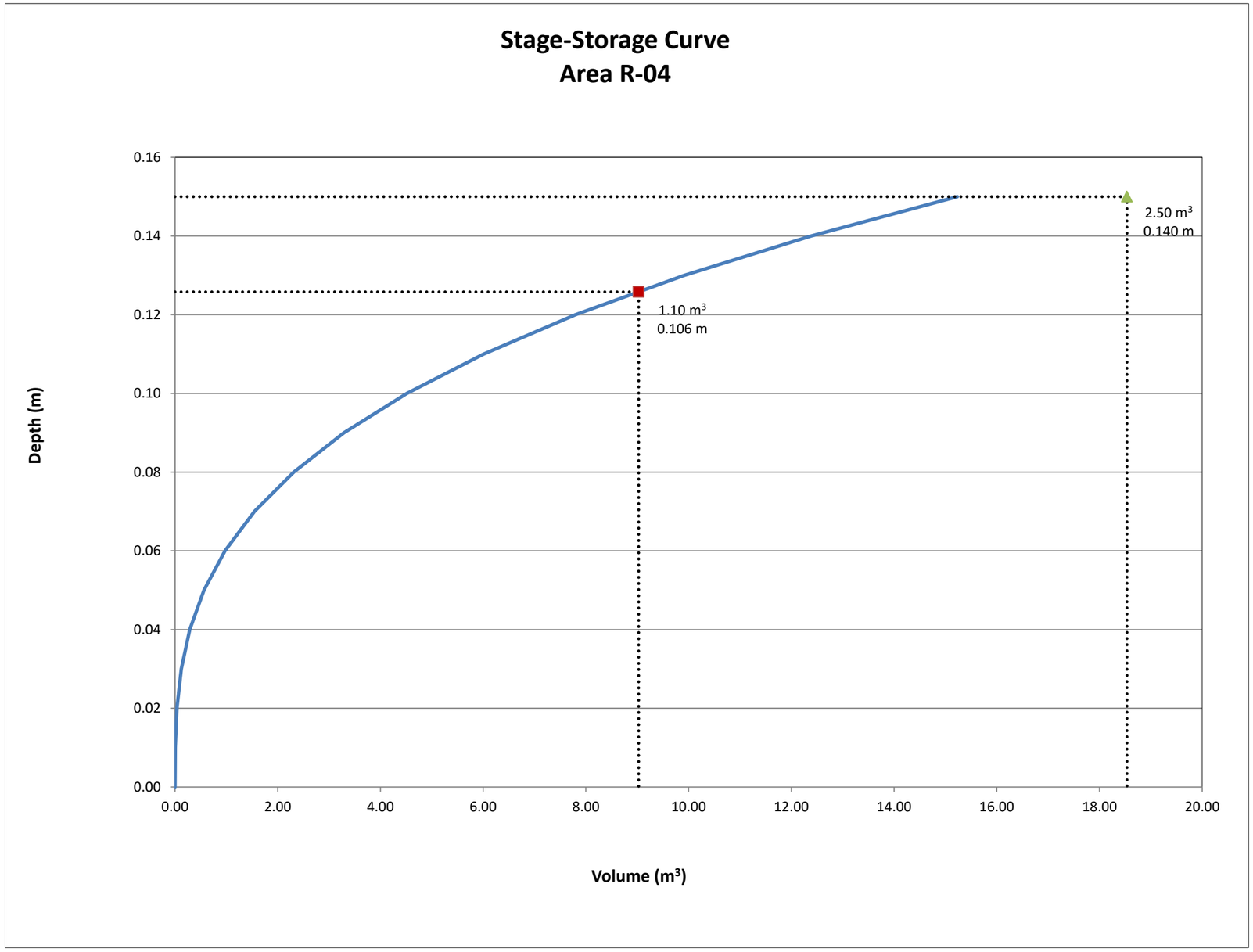
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	242.70	30.56	28.67	8.60
10	178.56	22.48	20.59	12.36
15	142.89	17.99	16.10	14.49
20	119.95	15.10	13.21	15.86
25	103.85	13.07	11.18	16.78
30	91.87	11.57	9.68	17.42
35	82.58	10.40	8.51	17.87
40	75.15	9.46	7.57	18.17
45	69.05	8.69	6.80	18.37
50	63.95	8.05	6.16	18.49
55	59.62	7.51	5.62	18.54
60	55.89	7.04	5.15	18.53
65	52.65	6.63	4.74	18.48
70	49.79	6.27	4.38	18.39
75	47.26	5.95	4.06	18.27
80	44.99	5.66	3.77	18.12
85	42.95	5.41	3.52	17.94
90	41.11	5.18	3.29	17.75

*City of Ottawa IDF Data (Sewer Design Guidelines, Oct. 2012)

Notes: Vol = Qnet x time
Qnet = Q - Qallow

Ponding Depth (100-Year Storm)		
Area m^2	V m^3	H m
0	0.00	0.00
1	0.00	0.01
5	0.04	0.02
12	0.12	0.03
22	0.29	0.04
34	0.56	0.05
49	0.97	0.06
66	1.55	0.07
87	2.31	0.08
110	3.29	0.09
135	4.51	0.10
164	6.01	0.11
195	7.80	0.12
229	9.92	0.13
265	12.38	0.14
305	**15.23**	**0.15**

Linear Interpolation					
0.16	H	0.15		H =	0.150 m
15.23	18.54	15.23		Q_{allow} =	1.89 L/s


Stage-Storage Curve
Area R-04
Depth (m)
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
18.00
20.00
1.10 m³
0.106 m
2.50 m³
0.140 m
Volume (m³)

1545A Merivale Road
Roof Drain Calculations

NOVATECH
Engineers, Planners & Landscape Architects

Area ID	R-05			
5-Year Event			Static Ponding Area =	271 m2
Area =	0.037 ha	ha	Qcontrolled =	1.26 L/s
C =	0.90		Vol(req.) =	6.82 m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	141.18	13.10	11.84	3.55
10	104.19	9.67	8.41	5.05
15	83.56	7.75	6.49	5.84
20	70.25	6.52	5.26	6.31
25	60.90	5.65	4.39	6.59
30	53.93	5.00	3.74	6.74
35	48.52	4.50	3.24	6.81
40	44.18	4.10	2.84	6.82
45	40.63	3.77	2.51	6.78
50	37.65	3.49	2.23	6.70
55	35.12	3.26	2.00	6.60
60	32.94	3.06	1.80	6.47
65	31.04	2.88	1.62	6.32
70	29.37	2.73	1.47	6.16
75	27.89	2.59	1.33	5.98
80	26.56	2.46	1.20	5.78
85	25.37	2.35	1.09	5.58
90	24.29	2.25	0.99	5.37

*City of Ottawa IDF Data (Sewer Design Guidelines, Oct. 2012)

Notes: Vol = Qnet x time
Qnet = Q - Qallow

Ponding Depth (5-Year Storm)		
Area m^2	V m^3	H m
0	0.00	0.00
1	0.00	0.01
5	0.03	0.02
11	0.11	0.03
19	0.26	0.04
30	0.50	0.05
43	0.87	0.06
59	1.38	0.07
77	2.05	0.08
97	2.92	0.09
120	4.01	0.10
146	5.34	0.11
173	6.93	0.12
203	8.81	0.13
236	11.01	0.14
271	**13.54**	**0.15**

Linear Interpolation					
0.12	H	0.11		H =	0.119 m
6.93	6.82	5.34		Q_{allow} =	1.26 L/s

Area ID	R-05			
100-Year Event			Static Ponding Area =	271 m2
Area =	0.037 ha	ha	Qcontrolled =	1.89 L/s
C =	1.00		Vol(req.) =	14.12 m3

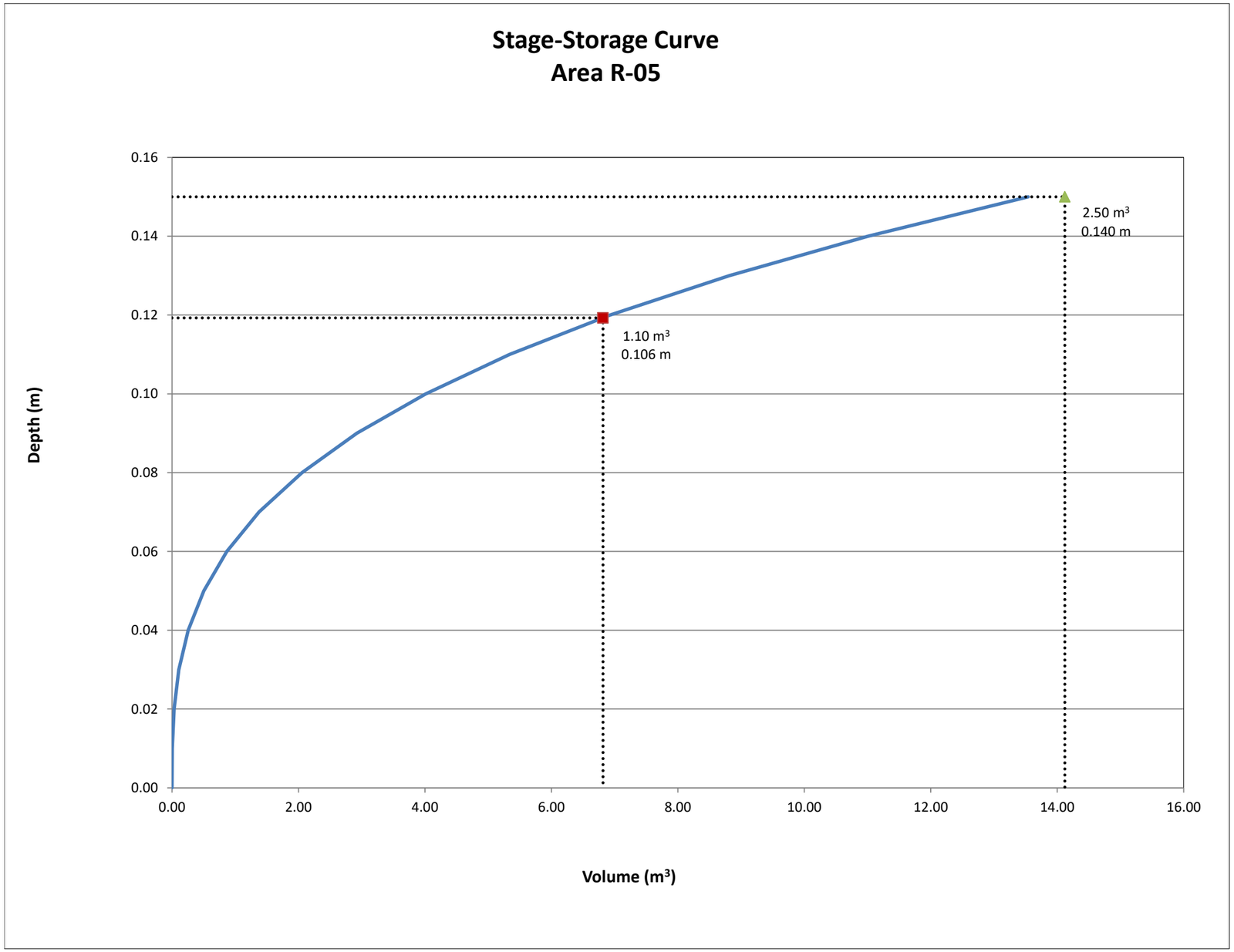
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	242.70	25.03	23.14	6.94
10	178.56	18.41	16.52	9.91
15	142.89	14.73	12.84	11.56
20	119.95	12.37	10.48	12.57
25	103.85	10.71	8.82	13.23
30	91.87	9.47	7.58	13.65
35	82.58	8.51	6.62	13.91
40	75.15	7.75	5.86	14.06
45	69.05	7.12	5.23	14.12
50	63.95	6.59	4.70	14.11
55	59.62	6.15	4.26	14.05
60	55.89	5.76	3.87	13.94
65	52.65	5.43	3.54	13.80
70	49.79	5.13	3.24	13.62
75	47.26	4.87	2.98	13.42
80	44.99	4.64	2.75	13.20
85	42.95	4.43	2.54	12.95
90	41.11	4.24	2.35	12.68

*City of Ottawa IDF Data (Sewer Design Guidelines, Oct. 2012)

Notes: Vol = Qnet x time
Qnet = Q - Qallow

Ponding Depth (100-Year Storm)		
Area m^2	V m^3	H m
0	0.00	0.00
1	0.00	0.01
5	0.03	0.02
11	0.11	0.03
19	0.26	0.04
30	0.50	0.05
43	0.87	0.06
59	1.38	0.07
77	2.05	0.08
97	2.92	0.09
120	4.01	0.10
146	5.34	0.11
173	6.93	0.12
203	8.81	0.13
236	11.01	0.14
271	**13.54**	**0.15**

Linear Interpolation					
0.16	H	0.15		H =	0.150 m
13.54	14.12	13.54		Q_{allow} =	1.89 L/s


Stage-Storage Curve
Area R-05
Depth (m)
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
1.10 m³
0.106 m
2.50 m³
0.140 m
Volume (m³)

1545A Merivale Road
Roof Drain Calculations

NOVATECH
Engineers, Planners & Landscape Architects

Area ID	R-06			
5-Year Event			Static Ponding Area =	205 m2
Area =	0.023 ha	ha	Qcontrolled =	1.26 L/s
C =	0.90		Vol(req.) =	3.31 m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	141.18	8.04	6.78	2.03
10	104.19	5.94	4.68	2.81
15	83.56	4.76	3.50	3.15
20	70.25	4.00	2.74	3.29
25	60.90	3.47	2.21	3.31
30	53.93	3.07	1.81	3.26
35	48.52	2.76	1.50	3.16
40	44.18	2.52	1.26	3.02
45	40.63	2.31	1.05	2.85
50	37.65	2.15	0.89	2.66
55	35.12	2.00	0.74	2.45
60	32.94	1.88	0.62	2.22
65	31.04	1.77	0.51	1.98
70	29.37	1.67	0.41	1.74
75	27.89	1.59	0.33	1.48
80	26.56	1.51	0.25	1.22
85	25.37	1.45	0.19	0.94
90	24.29	1.38	0.12	0.67

*City of Ottawa IDF Data (Sewer Design Guidelines, Oct. 2012)

Notes: Vol = Qnet x time
Qnet = Q - Qallow

Ponding Depth (5-Year Storm)		
Area m^2	V m^3	H m
0	0.00	0.00
1	0.00	0.01
4	0.02	0.02
8	0.08	0.03
15	0.19	0.04
23	0.38	0.05
33	0.66	0.06
45	1.04	0.07
58	1.55	0.08
74	2.21	0.09
91	3.04	0.10
110	4.04	0.11
131	5.25	0.12
154	6.67	0.13
179	8.33	0.14
205	**10.25**	**0.15**

Linear Interpolation					
0.11	H	0.10		H =	0.103 m
4.04	3.31	3.04		Q_{allow} =	1.26 L/s

Area ID	R-06			
100-Year Event			Static Ponding Area =	205 m2
Area =	0.023 ha	ha	Qcontrolled =	1.89 L/s
C =	1.00		Vol(req.) =	7.07 m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	242.70	15.36	13.47	4.04
10	178.56	11.30	9.41	5.65
15	142.89	9.05	7.16	6.44
20	119.95	7.59	5.70	6.84
25	103.85	6.57	4.68	7.03
30	91.87	5.82	3.93	7.07
35	82.58	5.23	3.34	7.01
40	75.15	4.76	2.87	6.88
45	69.05	4.37	2.48	6.70
50	63.95	4.05	2.16	6.48
55	59.62	3.77	1.88	6.22
60	55.89	3.54	1.65	5.93
65	52.65	3.33	1.44	5.63
70	49.79	3.15	1.26	5.30
75	47.26	2.99	1.10	4.96
80	44.99	2.85	0.96	4.60
85	42.95	2.72	0.83	4.23
90	41.11	2.60	0.71	3.85

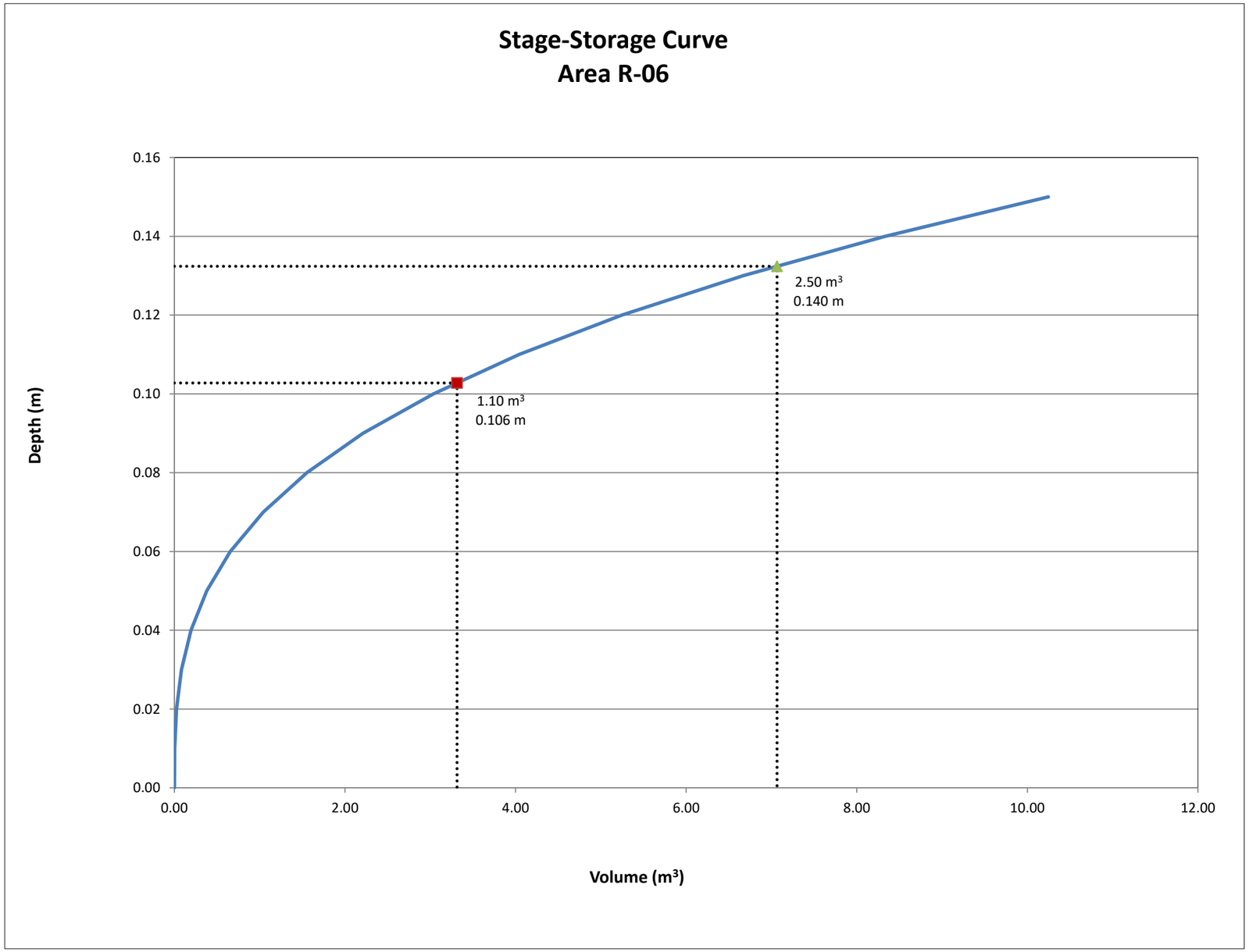
*City of Ottawa IDF Data (Sewer Design Guidelines, Oct. 2012)

Notes: Vol = Qnet x time
Qnet = Q - Qallow

Ponding Depth (100-Year Storm)		
Area m^2	V m^3	H m
0	0.00	0.00
1	0.00	0.01
4	0.02	0.02
8	0.08	0.03
15	0.19	0.04
23	0.38	0.05
33	0.66	0.06
45	1.04	0.07
58	1.55	0.08
74	2.21	0.09
91	3.04	0.10
110	4.04	0.11
131	5.25	0.12
154	6.67	0.13
179	8.33	0.14
205	**10.25**	**0.15**

Linear Interpolation					
0.14	H	0.13		H =	0.132 m
8.33	7.07	6.67		Q_{allow} =	1.89 L/s

PREPARED BY: NOVATECH
DATE: 5/16/2023


Stage-Storage Curve
Area R-06
Depth (m)
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
Volume (m³)
2.50 m³
0.140 m
1.10 m³
0.106 m

1545A Merivale Road
Roof Drain Calculations

Area ID	R-07			
5-Year Event			Static Ponding Area =	205 m2
Area =	0.023 ha	ha	Qcontrolled =	1.26 L/s
C =	0.90		Vol(req.) =	3.31 m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	141.18	8.04	6.78	2.03
10	104.19	5.93	4.67	2.80
15	83.56	4.76	3.50	3.15
20	70.25	4.00	2.74	3.29
25	60.90	3.47	2.21	3.31
30	53.93	3.07	1.81	3.26
35	48.52	2.76	1.50	3.16
40	44.18	2.52	1.26	3.01
45	40.63	2.31	1.05	2.84
50	37.65	2.14	0.88	2.65
55	35.12	2.00	0.74	2.44
60	32.94	1.88	0.62	2.22
65	31.04	1.77	0.51	1.98
70	29.37	1.67	0.41	1.73
75	27.89	1.59	0.33	1.48
80	26.56	1.51	0.25	1.21
85	25.37	1.44	0.18	0.94
90	24.29	1.38	0.12	0.66

*City of Ottawa IDF Data (Sewer Design Guidelines, Oct. 2012)

Notes: Vol = Qnet x time
Qnet = Q - Qallow

Ponding Depth (5-Year Storm)		
Area m^2	V m^3	H m
0	0.00	0.00
1	0.00	0.01
4	0.02	0.02
8	0.08	0.03
15	0.19	0.04
23	0.38	0.05
33	0.66	0.06
45	1.04	0.07
58	1.55	0.08
74	2.21	0.09
91	3.03	0.10
110	4.04	0.11
131	5.24	0.12
154	6.67	0.13
178	8.33	0.14
205	**10.24**	**0.15**

Linear Interpolation					
0.11	H	0.10		H =	0.103 m
4.04	3.31	3.03		Q_{allow} =	1.26 L/s

Area ID	R-07			
100-Year Event			Static Ponding Area =	205 m2
Area =	0.023 ha	ha	Qcontrolled =	1.89 L/s
C =	1.00		Vol(req.) =	7.06 m3

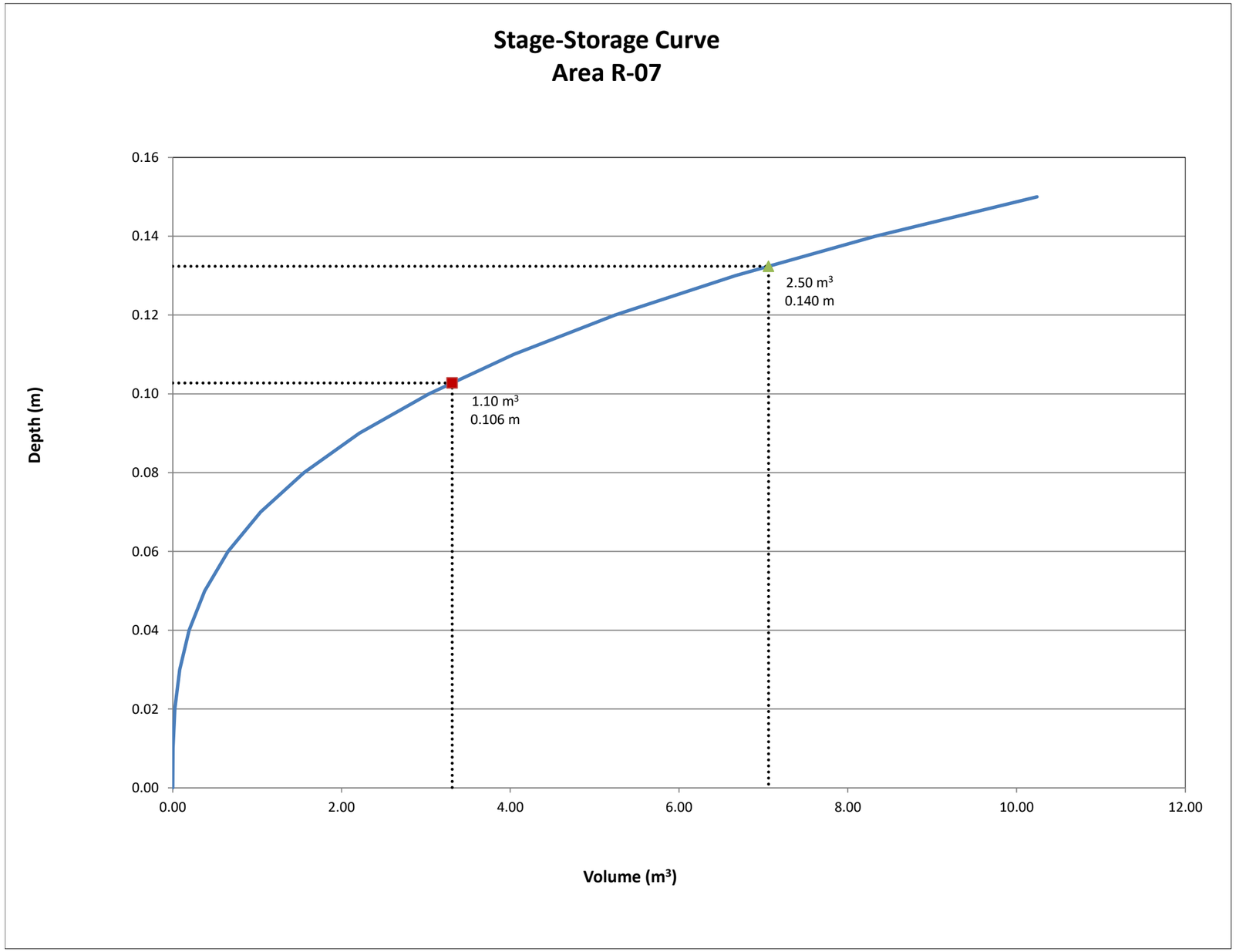
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	242.70	15.36	13.47	4.04
10	178.56	11.30	9.41	5.64
15	142.89	9.04	7.15	6.44
20	119.95	7.59	5.70	6.84
25	103.85	6.57	4.68	7.02
30	91.87	5.81	3.92	7.06
35	82.58	5.22	3.33	7.00
40	75.15	4.75	2.86	6.88
45	69.05	4.37	2.48	6.69
50	63.95	4.05	2.16	6.47
55	59.62	3.77	1.88	6.21
60	55.89	3.54	1.65	5.93
65	52.65	3.33	1.44	5.62
70	49.79	3.15	1.26	5.29
75	47.26	2.99	1.10	4.95
80	44.99	2.85	0.96	4.59
85	42.95	2.72	0.83	4.22
90	41.11	2.60	0.71	3.84

*City of Ottawa IDF Data (Sewer Design Guidelines, Oct. 2012)

Notes: Vol = Qnet x time
Qnet = Q - Qallow

Ponding Depth (100-Year Storm)		
Area m^2	V m^3	H m
0	0.00	0.00
1	0.00	0.01
4	0.02	0.02
8	0.08	0.03
15	0.19	0.04
23	0.38	0.05
33	0.66	0.06
45	1.04	0.07
58	1.55	0.08
74	2.21	0.09
91	3.03	0.10
110	4.04	0.11
131	5.24	0.12
154	6.67	0.13
178	8.33	0.14
205	**10.24**	**0.15**

Linear Interpolation					
0.14	H	0.13		H =	0.132 m
8.33	7.06	6.67		Q_{allow} =	1.89 L/s


Stage-Storage Curve
Area R-07
Depth (m)
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
2.50 m³
0.140 m
1.10 m³
0.106 m
Volume (m³)

APPENDIX E

Water Boundary Conditions
& Hydraulic Calculations

From: Candow, Julie <julie.candow@ottawa.ca>
Sent: Wednesday, October 26, 2022 10:16 AM
To: Trevor McKay
Cc: Melanie Riddell; Samantha Bennett
Subject: RE: 1545A Merivale Road Site Plan Application - Water Boundary Condition Request
Attachments: 1545A Merivale Road October 2022.pdf

Good morning all,

The following are boundary conditions, HGL, for hydraulic analysis at 1545A Merivale Road (zone 2W2C) assumed to be connected to the 305 mm on Merivale Road (see attached PDF for location).

Minimum HGL: 125.4 m

Maximum HGL: 134.1 m

Max Day + FF (183 L/s): 123.0 m

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

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

Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Trevor McKay <t.mcKay@novatech-eng.com>
Sent: October 04, 2022 10:09 AM
To: Candow, Julie <julie.candow@ottawa.ca>
Cc: Melanie Riddell <m.riddell@novatech-eng.com>; Samantha Bennett <s.bennett@novatech-

eng.com>
Subject: RE: 1545A Merivale Road Site Plan Application - Water Boundary Condition Request

Julie,

Revised as requested.

Thanks,

Trevor McKay, B.Eng., E.I.T., Project Coordinator | Engineering/Contract Administration
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 291 | Cell: 613.263.9113 | Fax: 613.254.5867

From: Candow, Julie <julie.candow@ottawa.ca>
Sent: Tuesday, October 4, 2022 10:04 AM
To: Trevor McKay <t.mcKay@novatech-eng.com>
Cc: Melanie Riddell <m.riddell@novatech-eng.com>; Samantha Bennett <s.bennett@novatech-eng.com>
Subject: RE: 1545A Merivale Road Site Plan Application - Water Boundary Condition Request

Hi Trevor,

Apologies for the back and forth, I received the below from AM:

"They need to resubmit using 2020 FUS & also referencing the 2020 FUS guidelines. Their submissions states 1999 FUS. Please ask them for a re-submission."

Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Trevor McKay <t.mcKay@novatech-eng.com>
Sent: October 04, 2022 9:00 AM

To: Candow, Julie <julie.candow@ottawa.ca>
Cc: Melanie Riddell <m.riddell@novatech-eng.com>; Samantha Bennett <s.bennett@novatech-eng.com>
Subject: RE: 1545A Merivale Road Site Plan Application - Water Boundary Condition Request

You are correct the calculations do not change between the 1999 FUS and the 2020 FUS. We can confirm that the fire flow boundary conditions requested are consistent with the 2020 FUS method.

Do you require a resubmission, or is this sufficient to move forward?

Thanks,

Trevor McKay, B.Eng., E.I.T., Project Coordinator | Engineering/Contract Administration
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 291 | Cell: 613.263.9113 | Fax: 613.254.5867

From: Candow, Julie <julie.candow@ottawa.ca>
Sent: Monday, October 3, 2022 1:45 PM
To: Trevor McKay <t.mcKay@novatech-eng.com>
Cc: Melanie Riddell <m.riddell@novatech-eng.com>; Samantha Bennett <s.bennett@novatech-eng.com>
Subject: RE: 1545A Merivale Road Site Plan Application - Water Boundary Condition Request

Hi Trevor,

Asset Management noted that in your 'notes' the 1999 Fire Underwriter's Survey Guidelines are referenced. As you may be aware the 2020 Fire Underwriter's Survey Guidelines were released and should be used. I don't believe there are any changes to your calculations but can you please confirm that the 2020 FUS Guidelines were referenced.

Thanks,

Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Trevor McKay <t.mcKay@novatech-eng.com>
Sent: September 29, 2022 2:04 PM
To: Candow, Julie <julie.candow@ottawa.ca>
Cc: Melanie Riddell <m.riddell@novatech-eng.com>; Samantha Bennett <s.bennett@novatech-eng.com>
Subject: RE: 1545A Merivale Road Site Plan Application - Water Boundary Condition Request

Good catch. Please see revised boundary conditions request.

We'll reach out to Doug for 50 Capilano. Appreciate your help.

Thank you,

Trevor McKay, B.Eng., E.I.T., Project Coordinator | Engineering/Contract Administration
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 291 | Cell: 613.263.9113 | Fax: 613.254.5867

From: Candow, Julie <julie.candow@ottawa.ca>
Sent: Thursday, September 29, 2022 1:48 PM
To: Trevor McKay <t.mcKay@novatech-eng.com>
Cc: Melanie Riddell <m.riddell@novatech-eng.com>; colette.groni@ottawa.ca; Samantha Bennett <s.bennett@novatech-eng.com>
Subject: RE: 1545A Merivale Road Site Plan Application - Water Boundary Condition Request

Hi Trevor,

For the boundary condition request, the water demands for the commercial site area should be calculated using 28,000 L/gross ha/day. The entire hectarage of the site shall be used in the calculation, versus the floor area of the commercial building. Alternatively, Appendix 4-A of the Sewer Design Guidelines can be used to estimate the Daily Volume in Liters based on the use of the commercial space. Please update the calculations accordingly.

For 50 Capilano Drive, I was able to locate the design drawings (missing the SWM plan), the Geotech Report and the Phase I ESA but for some reason the Site Servicing Report and SWM Report is missing. I

can see from the drawings that the site plan application was done by D.B. Gray Engineering (Douglas Gray d.gray@dbgrayengineering.com). I suggest you reach out to Doug to determine if he has a copy of the report.

If you need a copy of the Site Plan, Grading Plan and Servicing Plan for 50 Capilano I can pull those from records and provide them to you.

Hope that helps,

Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Trevor McKay <t.mcKay@novatech-eng.com>
Sent: September 29, 2022 8:09 AM
To: Candow, Julie <julie.candow@ottawa.ca>
Cc: Melanie Riddell <m.riddell@novatech-eng.com>; colette.groni@ottawa.ca; Samantha Bennett <s.bennett@novatech-eng.com>
Subject: 1545A Merivale Road Site Plan Application - Water Boundary Condition Request

We have been retained to provide the site servicing and stormwater management design services for the pending site plan application for 1545A Merivale Road. There was a pre-application consultation meeting held in June (meeting notes attached for reference – PC2022-0137).

We would like to request watermain boundary conditions for the project. Please see attached boundary condition request documents (20220928-122098-BC-Request). If there is any additional information required to accommodate this request, please let us know.

Secondly, we were hopeful that you may be able to provide a stormwater management plan/report for 50 Capilano Drive (estimated to be circa 2010-2014). We had included this information as part of our records request from the City Geoinformation centre, however their search didn't provide any information. Based on a preliminary review of the available site information/survey, it appears that a significant portion of the current storm drainage from the 1545A Merivale Road property is directed to

several catchbasins on the adjacent City View curling club property (50 Capilano Drive). It appears that the curling rink was built in +/-2014. Any information you may be able to provide would be helpful.

If you have any questions, please don't hesitate to reach out. We appreciate your time in processing these requests.

Trevor McKay, B.Eng., E.I.T., Project Coordinator | Engineering/Contract Administration
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 291 | Cell: 613.263.9113 | Fax: 613.254.5867

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Boundary Conditions for 1545A Merivale Road
1528
203
152
152
ch. Merivale Rd.
1543
1545
(A)
50
N
51
152
203
av. Rossland Ave.
203
1548
152
305
152
203
Legend
PRIVATE
PUBLIC
City of Ottawa

1545A MERIVALE RD
POST-DEVELOPMENT WATER DEMANDS

DOMESTIC WATER DEMANDS

Commercial Space / Amenity Use	
Commercial Space	6,900 m^2
Average Day Demand (28,000 L/ha/day)	**0.22 L/s**
Maximum Day Demand (1.5 x avg. day)	**0.34 L/s**
Peak Hour Demand (1.8 x max. day)	**0.60 L/s**
TOTALS	
Average Day Demand	**0.22 L/s**
Maximum Day Demand	**0.34 L/s**
Peak Hour Demand	**0.60 L/s**

Required Fire Flow (as per FUS) **183L/s**

Notes:
1) Water demand based on City of Ottawa Design Guidelines - Water Distribution (2010, as ammended)
2) Fireflows calculated as per 2020 Fire Underwriter's Survey Guidelines.

FUS - Fire Flow Calculations

As per 2020 Fire Underwriter's Survey Guidelines

NOVATECH
Engineers, Planners & Landscape Architects

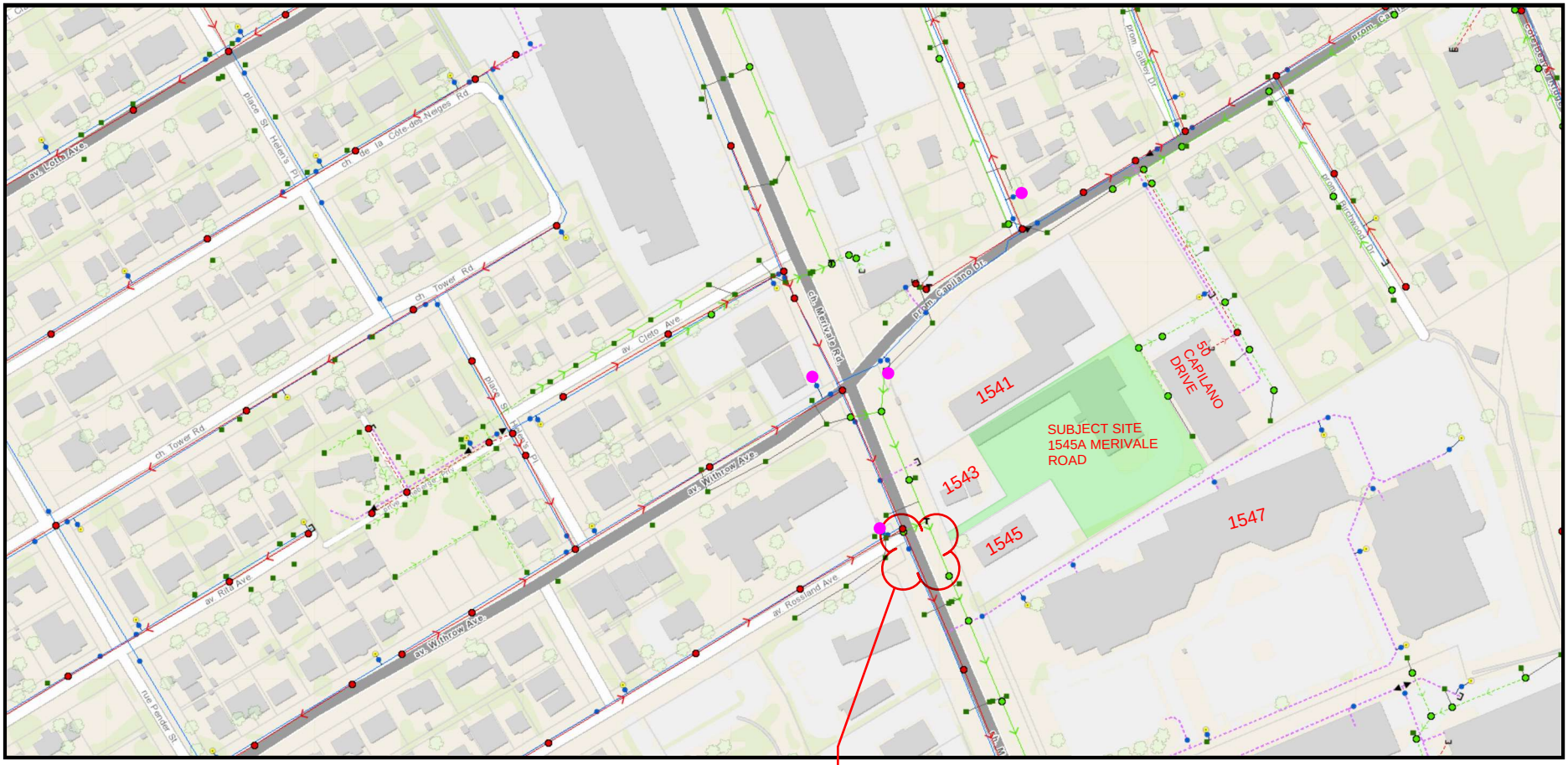
Novatech Project #: 122098
Project Name: 1545A MERIVALE ROAD
Date: 9/28/2022
Input By: Samantha Bennett
Reviewed By: Trevor McKay

Legend: Input by User; No Information or Input Required

Building Description: Commercial 1 Storey + underground parking garage
Non-combustible construction

Step			Input		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction **C**	Wood frame		1.5	0.8	
		Ordinary construction		1		
		Non-combustible construction	Yes	0.8		
		Modified Fire resistive construction (2 hrs)		0.6		
		Fire resistive construction (> 3 hrs)		0.6		
2	**Floor Area**					
	A	Building Footprint (m^2)	2566			
		Number of Floors/Storeys	1			
		Area of structure considered (m^2)			**2,566**	
	F	**Base fire flow without reductions**				**9,000**
		F = 220 **C** (**A**)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**			**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	0%	**9,000**
		Limited combustible		-15%		
		Combustible	Yes	0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**			**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%	-30%	**-2,700**
		Standard Water Supply		-10%		
		Fully Supervised System		-10%		
				Cumulative Total	**-30%**	
5	**Exposure Surcharge (cumulative %)**				**Surcharge**	
	(3)	North Side	3.1 - 10 m		20%	**4,500**
		East Side	10.1 - 20 m		15%	
		South Side	20.1 - 30 m		10%	
		West Side	30.1- 45 m		5%	
				Cumulative Total	**50%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**11,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**183**
				or	USGPM	2,906
7	**Storage Volume**	Required Duration of Fire Flow (hours)			Hours	2
		Required Volume of Fire Flow (m^3)			m^3	1320

1545A Merivale Road
Water Boundary Conditions Request
Novatech File No. 122098
Date: September 28, 2022



PROPOSED CONNECTION TO EX. 300mm DIA.
WATERMAIN ON MERIVALE ROAD.
+/-15m SOUTH OF ROSSLAND AVE.

● EXISTING PUBLIC HYDRANT

WATERMAIN DESIGN SHEET

		Consumption Rates (L/s)		
Node	**Elevation**	**Average Daily**	**Maximum Daily**	**Maximum Hourly**
N1 (Building)	97.00	0.22	0.34	0.60
N2 (Cross for Hydrant Leads)	96.85	0.00	0.00	0.00
		0.22	**0.34**	**0.60**

Water Demand Parameters

1. Commercial Space

Average Day Demand	28,000 L/ha/day
Commercial Area	6,900 m^2
Maximum Day Demand	1.5 x avg. day
Peak Hour Demand	1.8 x max. day

2. Required Fire Flow =183L/s (at N2)

Notes:

1) Water demand based on City of Ottawa Design Guidelines - Water Distribution (2010, as amended)
2) Fireflows calculated as per 2020 Fire Underwriter's Survey Guidelines.

Junction Report

Node ID	Elevation	Demand	Total Head	Pressure	Pressure	Pressure	Age
	m	LPS	m	m	kPa	psi	hours
R1	134.10	-0.22	134.10	0.00	0.00	0.00	0.0
N1	97.00	0.22	134.10	37.10	363.95	52.79	5.6
N2	96.85	0.00	134.10	37.25	365.42	53.00	5.3

Maximum Pressure
Maximum Age

Pipe Report

Link ID	Length	Diameter	Roughness	Flow	Velocity	Headloss	Friction
	m	mm		LPS	m/s	m/km	Factor
Pipe 1	13.00	150	100	0.22	0.01	0.00	0.082
Pipe 2	85.00	250	110	0.22	0.00	0.00	0.053

Junction Report

Node ID	Elevation m	Demand LPS	Total Head m	Pressure m	Pressure kPa	Pressure psi
R1	125.40	-0.60	125.40	0.00	0.00	0.00
N1	97.00	0.60	125.40	28.40	278.60	40.41
N2	96.85	0.00	125.40	28.55	280.08	40.62

Minimum Pressure

Pipe Report

Link ID	Length m	Diameter mm	Roughness	Flow LPS	Velocity m/s	Headloss m/km	Friction Factor
Pipe 1	13.00	150	100	0.60	0.03	0.020	0.060
Pipe 2	85.00	250	110	0.60	0.01	0.000	0.054

Junction Report

Node ID	Elevation m	Demand LPS	Total Head m	Pressure m	Pressure kPa	Pressure psi
R1	123.00	-183.34	123.00	0.00	0.00	0.00
N1	97.00	0.34	117.44	20.44	200.52	29.08
N2	96.85	183.00	117.44	20.59	201.99	29.30

Minimum Pressure

Pipe Report

Link ID	Length m	Diameter mm	Roughness	Flow LPS	Velocity m/s	Headloss m/km	Friction Factor
Pipe 1	13.00	150	100	0.34	0.020	0.010	0.068
Pipe 2	85.00	200	110	183.34	3.730	65.400	0.023

APPENDIX F

Drawings

122098-GP
122098-GR
122098-STM
122098-ESC

SAN MANHOLE TABLE

MANHOLE ID	T/G ELEV	INVERT
99	96.58	NE=94.50 *NW=93.80* *SE=93.80*
101	96.68	NE=94.76 SW=94.73
103	96.75	SW=95.03 NE=95.06

STM MANHOLE TABLE

MANHOLE ID	T/G ELEV	INVERT
100	96.55	NE=94.01 *NW=93.90* *SE=93.90*
102	96.63	NE=94.14 SW=94.14
104	96.69	SW=94.40 NE=94.49 SE=94.53 NW=94.55

CATCHBASIN MANHOLE TABLE

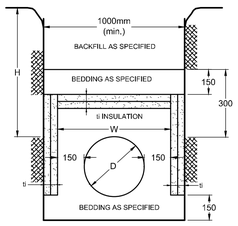
CBMH ID	SIZE (mm)	T/G ELEV (m)	INVERT (m)	ICD DIA (mm)	2yr CAPTURE RATE (L/s)
CBMH 02	1200mm Ø	96.50	NW=95.29 SE=95.26	-	-
CBMH 03	1200mm Ø	96.50	NW=95.13 SW=95.07	-	-
CBMH 04	1200mm Ø	96.50	NE=94.90 W=94.87	-	-
CBMH 05	1200mm Ø	96.45	E=94.72 NW=94.66	LMF-78	6.95
CBMH 06	1200mm Ø	96.45	SE=94.77	-	-
CBMH 07	1200mm Ø	96.45	NW=94.64 SE=94.63	83mm	16.57

CATCHBASIN TABLE

CB ID	T/G ELEV (m)	INVERT (m)	ICD DIA (mm)	2yr CAPTURE RATE (L/s)
CB 08	96.55	95.50	LMF-94	7.85
CB 09	96.55	95.50	LMF-86	6.61
CICB-OS1	96.54	95.49	-	-
LCB 01	96.80	95.60	-	-

WATERMAIN TABLE

Station	F/G ELEVATION	TOP OF WATERMAIN	DESCRIPTION
0+007.19	96.59	*±95.15*	250 x 300 TEE
0+009.76	96.56	94.56	45° VERTICAL BEND
0+010.26	96.56	94.14	45° VERTICAL BEND
0+019.30	96.54	94.14	45° VERTICAL BEND
0+020.20	96.54	95.04	45° VERTICAL BEND
0+022.92	96.53	95.04	45° VERTICAL BEND
0+023.82	96.53	94.13	45° VERTICAL BEND
0+028.97	96.70	94.29	V&VB
0+030.14	96,71	94.29	11.25° HORIZONTAL BEND
0+091.41	96.67	94.27	250 x150 CROSS
0+094.29	96.71	94.31	250 x 150 REDUCER
0+095.35	96.72	94.32	V&VB
0+105.24	97.00	94.50	CAP



INSULATION DETAIL FOR SHALLOW SEWERS ONLY

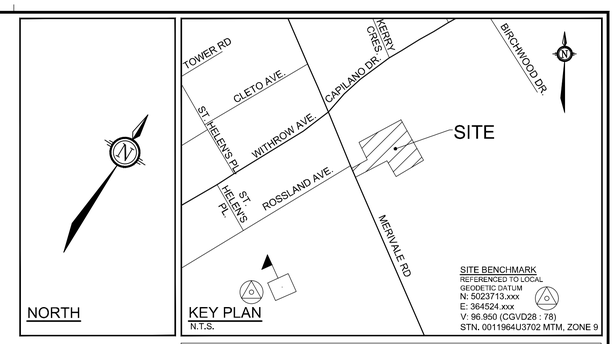
NOT TO SCALE

COVER (mm)	INSULATION THICKNESS (mm)
1800-1500	50
1500-1200	75
1200-900	100
900-600	125

ti = THICKNESS OF INSULATION (mm)
h = DEPTH OF COVER
W = D + 300 (1000 min.)
W = WIDTH OF INSULATION (mm)
D = O.D OF PIPE (mm)

NOTES:

1. INSULATE ALL SEWER PIPES THAT ARE LESS THAN 600mmØ AND HAVE LESS THAN 1.8m COVER WITH EXPANDED POLYSTYRENE INSULATION AS SHOWN.
2. THE THICKNESS OF INSULATION SHALL BE THE EQUIVALENT OF 25mm FOR EVERY 300mm REDUCTION IN THE REQUIRED DEPTH OF COVER (SEE TABLE)

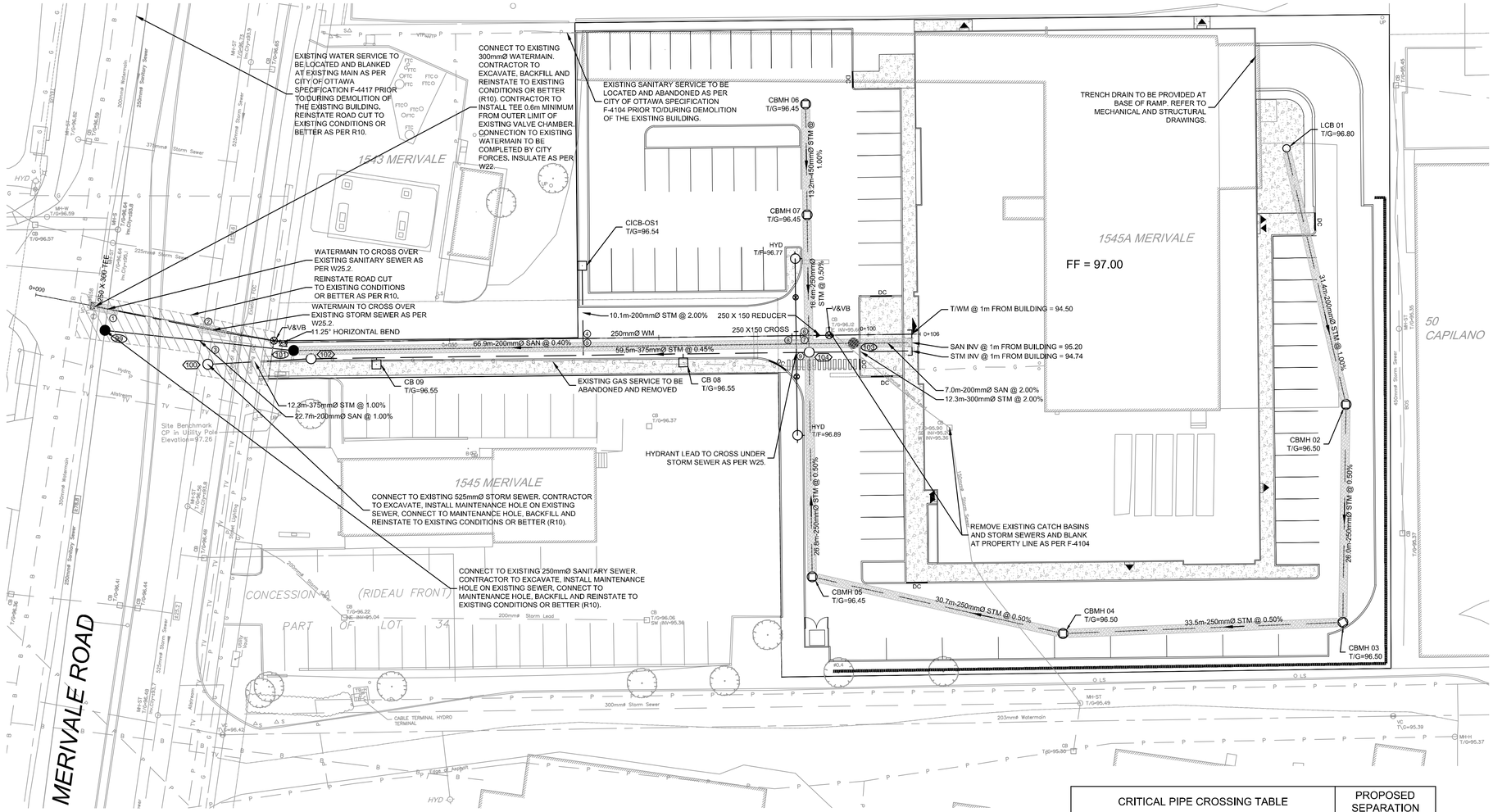


SOURCE REFERENCE:

TOPOGRAPHIC PLAN OF SURVEY OF PART OF LOT 16 REGISTERED PLAN 353 AND PART OF LOT 34 CONCESSION A (RIDEAU FRONT), PREPARED BY FARLEY, SMITH & DENIS SURVEYING LTD. 2021 ON OCTOBER 1st, 2021.

TOPOGRAPHIC INFORMATION:

HORIZONTAL DATUM: NAD 83 (ORIGINAL), MTM - ZONE 9
VERTICAL DATUM: CGVD 1928-1978
1. CITY OF OTTAWA 1:1000 MAPPING
2. FARLEY, SMITH & DENIS SURVEYING LTD'S TOPOGRAPHIC PLAN OF SURVEY



LEGEND

- DC — DEPRESSED CURB
- PROPOSED RETAINING WALL
- PROPOSED ROAD CUT LIMITS
- PROPOSED THERMAL INSULATION
- MH — PROPOSED SANITARY MAINTENANCE HOLE, SEWER & DIRECTION OF FLOW
- MH — PROPOSED STORM MAINTENANCE HOLE, SEWER & DIRECTION OF FLOW
- CB — PROPOSED CATCHBASIN
- CBMH — PROPOSED CATCHBASIN MAINTENANCE HOLE
- LCB — PROPOSED LANDSCAPE TYPE CATCHBASIN
- 150mmØ WM — PROPOSED WATERMAIN AND DIAMETER
- V&VB — PROPOSED VALVE & VALVE BOX
- 250 x 150 REDUCER — PROPOSED REDUCER
- 11.25° — PROPOSED BEND AND THRUST BLOCK
- PROPOSED CAP
- HYD — PROPOSED HYDRANT C/W VALVE & 150mm DIA. LEAD (T/F= TOP OF FLANGE ELEVATION)
- EXISTING SANITARY MANHOLE, SEWER & DIRECTION OF FLOW WITH TOP OF GRATE AND INVERT ELEVATIONS
- EXISTING STORM MANHOLE, SEWER & DIRECTION OF FLOW WITH TOP OF GRATE AND INVERT ELEVATIONS
- EXISTING CATCHBASIN WITH TOP OF GRATE ELEVATION
- EXISTING WATERMAIN AND DIAMETER
- EXISTING VALVE CHAMBER WITH TOP OF GRATE ELEVATION
- EXISTING HYDRANT C/W VALVE & LEAD

CRITICAL PIPE CROSSING TABLE			PROPOSED SEPARATION
①	250mmØ WM INV=94.36	250mmØ SAN OBV=94.06	WM-SAN=0.30m
②	250mmØ WM INV=94.79	525mmØ STM OBV=94.54	WM-STM=0.25m
③	200mmØ SAN INV=94.63	525mmØ STM OBV=94.54	SAN-STM=0.09m
④	200mmØ STM INV=95.33	250mmØ WM OBV=94.28	STM-WM=1.05m
⑤	200mmØ STM INV=95.31	200mmØ SAN OBV=95.10	STM-SAN=0.21m
⑥	250mmØ STM INV=94.56	250mmØ WM OBV=94.29	STM-WM=0.27m
⑦	200mmØ SAN INV=95.01	250mmØ WM OBV=94.81	SAN-STM=0.20m
⑧	200mmØ SAN INV=95.00	150mmØ WM OBV=94.21	SAN-WM=0.79m
⑨	375mmØ STM INV=94.39	150mmØ WM OBV=93.89	STM-WM=0.50m

GENERAL NOTES:

1. DIMENSIONS AND LAYOUT INFORMATION SHALL BE CONFIRMED PRIOR TO START OF CONSTRUCTION.
2. THE ORIGINAL TOPOGRAPHY AND GROUND ELEVATIONS, SERVICING AND SURVEY INFORMATION SHOWN ON THIS PLAN ARE SUPPLIED FOR INFORMATION PURPOSES ONLY. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE ACCURACY OF ALL INFORMATION OBTAINED FROM THIS PLAN, PRIOR TO COMMENCING ANY ON SITE SERVICING THE CONTRACTOR SHALL VERIFY THE ELEVATIONS OF THE EXISTING SEWERS, WATERMAINS AND UTILITIES IN THE MERIVALE ROAD RIGHT OF WAY.
3. CO-ORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
4. BEFORE COMMENCING CONSTRUCTION, PROVIDE PROOF OF COMPREHENSIVE ALL RISK AND OPERATIONAL LIABILITY INSURANCE INCLUDING BLASTING. INSURANCE POLICY TO NAME THE OWNER, ENGINEER AND THE CITY AS CO-INSURED.
5. CONNECT TO EXISTING SYSTEMS AS DETAILED, INCLUDING ALL RESTORATION WORK NECESSARY TO REINSTATE SURFACES TO EXISTING CONDITIONS OR BETTER.
6. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THESE DRAWINGS.
7. OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND APPROVALS BEFORE COMMENCING CONSTRUCTION.
8. RESTORE ALL TRENCHES AND SURFACE FEATURES TO EXISTING CONDITIONS OR BETTER AND TO THE SATISFACTION OF MUNICIPAL AUTHORITIES.
9. REMOVE FROM SITE ALL DEBRIS AND EXCESS EXCAVATED MATERIAL UNLESS OTHERWISE INSTRUCTED BY THE ENGINEER.
10. ALL ELEVATIONS ARE GEODETIC AND UTILIZE METRIC UNITS.
11. REFER TO STRUCTURAL PLANS FOR UNDERSIDE OF FOOTING AND TOP OF FOUNDATION INFORMATION.
12. REFER TO GEOTECHNICAL INVESTIGATION PG6288-1 (DATED AUGUST 3, 2022), PREPARED BY PATERSON GROUP INC. FOR SUBSURFACE CONDITIONS AND CONSTRUCTION RECOMMENDATIONS.
13. PERFORATED PIPE SUB-DRAINS TO BE PROVIDED 300mm BELOW SUBGRADE LEVEL EXTENDING FROM THE ROADSIDE CATCHBASIN FOR A DISTANCE OF 3.0m, PARALLEL TO THE CURB IN TWO DIRECTIONS AS PER CITY OF OTTAWA DETAIL R1.
14. PERFORATED PIPE SUB-DRAINS TO BE PROVIDED 300mm BELOW SUBGRADE LEVEL EXTENDING FROM ALL PARKING LOT CATCHBASIN AND CATCHBASIN MAINTENANCE HOLES FOR A DISTANCE OF 3.0m, PARALLEL AND PERPENDICULAR TO THE CURB IN FOUR DIRECTIONS. CLEAR STONE PIPE SURROUND AND GEOTEXTILE WRAP TO BE PROVIDED AS PER CITY OF OTTAWA DETAIL R1.
15. CONTRACTOR TO PROVIDE ALL LINE PAINTING AND PARKING LOT MARKINGS.
16. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES INDICATING ALL SERVICING AS-BUILT INFORMATION SHOWN ON THIS PLAN. AS-BUILT INFORMATION MUST INCLUDE: PIPE MATERIAL, SIZES, LENGTHS, SLOPES, INVERT AND T/G ELEVATIONS, STRUCTURE LOCATIONS, VALVE AND HYDRANT LOCATIONS, T/WM ELEVATIONS AND ANY ALIGNMENT CHANGES, ETC.
17. ALL WORK TO BE CONSTRUCTED TO CITY OF OTTAWA AND ONTARIO PROVINCIAL STANDARDS.

SEWER NOTES:

1. SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
CATCHBASIN (600x600mm)	705.010	OPSD
CATCHBASIN MAINTENANCE HOLE (1200Ø)	701.010	OPSD
STORM / SANITARY MAINTENANCE HOLE (1200Ø)	701.010	OPSD
CURB INLET CB, FRAME & COVER	S3 & S22	CITY of OTTAWA
CBMH FRAME & COVER	S25 & S28.1	CITY of OTTAWA
STORM / SANITARY MH FRAME & COVER	S24.1 / S24 & S25	CITY of OTTAWA
STORM SEWER	PVC DR 35 OR 100-D CONC.	
SANITARY SEWER	PVC DR 35	
CATCHBASIN LEAD	PVC DR 35	
LANDSCAPE CB	S31	CITY OF OTTAWA
SEWER TRENCH	S6	CITY OF OTTAWA

2. ALL CATCHBASIN LEADS ARE TO BE 200mm DIA. PVC SDR 35 AT 2% SLOPE UNLESS OTHERWISE SPECIFIED ON THE DRAWING.
3. INSULATE ALL PIPES (SAN/STM) THAT HAVE LESS THAN 1.8m COVER AS PER THE INSULATION DETAIL FOR SHALLOW SEWERS.
4. SERVICES ARE TO BE CONSTRUCTED TO 1.0m FROM BUILDING FACE AT 2.0% SLOPE (1.0% MINIMUM). SERVICES TO BE CONNECTED TO MAINLINE SEWER AS PER CITY OF OTTAWA S11.1
5. PIPE BEDDING AND COVER ARE TO BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY. WHERE THE BEDDING IS LOCATED WITHIN FIRM TO SOFT GREY SILTY CLAY, THE THICKNESS OF THE BEDDING MATERIAL SHOULD BE INCREASED TO A MINIMUM OF 300mm. THE COVER MATERIAL SHALL CONSIST OF OPSS GRANULAR 'A' AND SHOULD EXTEND FROM THE SPRING LINE OF THE PIPE TO AT LEAST 300mm ABOVE THE OBVERT OF THE PIPE.
6. THE SITE SERVICING CONTRACTOR SHALL PERFORM FIELD TESTS FOR QUALITY CONTROL OF ALL SANITARY SEWERS. LEAKAGE TESTING SHALL BE COMPLETED IN ACCORDANCE WITH OPSS 410.07.16 AND 407.07.24. DYE TESTING IS TO BE COMPLETED ON ALL SANITARY SERVICES TO CONFIRM PROPER CONNECTION TO THE SANITARY SEWER MAIN. THE FIELD TESTS SHALL BE PERFORMED IN THE PRESENCE OF THE ENGINEER.
7. STORM MAINTENANCE HOLES AND CBMHS SHALL HAVE 300mm SUMPS UNLESS OTHERWISE INDICATED.
8. CONTRACTOR TO TELEVISE (CCTV) ALL PROPOSED SEWERS, 200mmØ OR GREATER PRIOR TO BASE COURSE ASPHALT. UPON COMPLETION OF CONTRACT, THE CONTRACTOR IS RESPONSIBLE TO FLUSH AND CLEAN ALL SEWERS & APPURTENANCES.

WATERMAIN NOTES:

1. GENERAL:

ITEM	DETAIL No.	REFERENCE
WATERMAIN TRENCHING	W17	CITY OF OTTAWA
THERMAL INSULATION IN SHALLOW TRENCHES	W22	CITY OF OTTAWA
WATERMAIN CROSSING BELOW SEWER / OVER SEWER	W25 / W25.2	CITY OF OTTAWA
HYDRANT INSTALLATION	W19	CITY OF OTTAWA

2. THE WATERMAIN SHALL BE PVC DR 18 IN ACCORDANCE WITH MATERIAL SPECIFICATION MW-18.1, UNLESS OTHERWISE INDICATED.
3. SUPPLY AND CONSTRUCT ALL WATERMAINS AND APPURTENANCES IN ACCORDANCE WITH THE CITY OF OTTAWA STANDARDS AND SPECIFICATIONS, EXCAVATION, INSTALLATION, BACKFILL AND RESTORATION OF ALL WATERMAINS BY THE CONTRACTOR. CONNECTIONS AND SHUT-OFFS AT THE MAIN SHALL BE PERFORMED BY CITY OFFICIALS.
4. WATERMAIN SHALL BE MINIMUM 2.4m DEPTH BELOW GRADE UNLESS OTHERWISE INDICATED. CONTRACTOR TO SUPPLY AND INSTALL INSULATION AS PER W22 FOR ALL WATERMAIN LESS THAN 2.4m BELOW GRADE.
5. PROVIDE MINIMUM CLEARANCE BETWEEN OUTSIDE OF PIPES AT ALL CROSSINGS PER W25 (0.50m) AND W25.2 (0.25m).
6. WATER SERVICES ARE TO BE CAPPED 1.0m FROM BUILDING FACE.
7. UPON COMPLETION, CONTRACTOR TO PERFORM TESTING AND PROVIDE PRIVATE FIRE HYDRANT FLOW AND PRESSURE TEST REPORTS TO THE CONSULTANT. ALL PRIVATE HYDRANTS (ON-SITE) ARE TO BE RED. ALL PAINT SHALL BE ALKYD ENAMEL AND MEET THE MANUFACTURERS REQUIREMENTS. THE BONNET, PUMPER AND HOSE OUTLET CAPS SHALL ALL BE PAINTED ACCORDING TO THE FOLLOWING TABLE:
CAP COLOUR - MEASURED FLOW
BLUE - 1500 GPM (5700L/min)
GREEN - 1000-1499GPM (3800-5699L/min)
ORANGE - 500-999GPM (1900-3799L/min)

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

MMI Merivale Medical Imaging

No.	REVISION	DATE	BY
3.	ISSUED FOR SITE PLAN APPROVAL - REVISED	MAY 12/23	TJM
2.	ISSUED FOR SITE PLAN APPROVAL	DEC 23/22	TJM
1.	ISSUED FOR COORDINATION	NOV 16/22	TJM

SCALE: 1:300 (1:300 0 3 6 9 12)

DESIGN: JMR
CHECKED: SAB
DRAWN: JMR
CHECKED: SAB
APPROVED: TJM

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER — T. J. MCKAY 100195434 — MAY 18, 2023 — PROVINCE OF ONTARIO

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
1545A MERIVALE ROAD

DRAWING NAME
GENERAL PLAN OF SERVICES

PROJECT No. 122098
REV # 3
DRAWING No. 122098-GP

D07-12-22-0190

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PLAN1.DWG - Bennett/MMI

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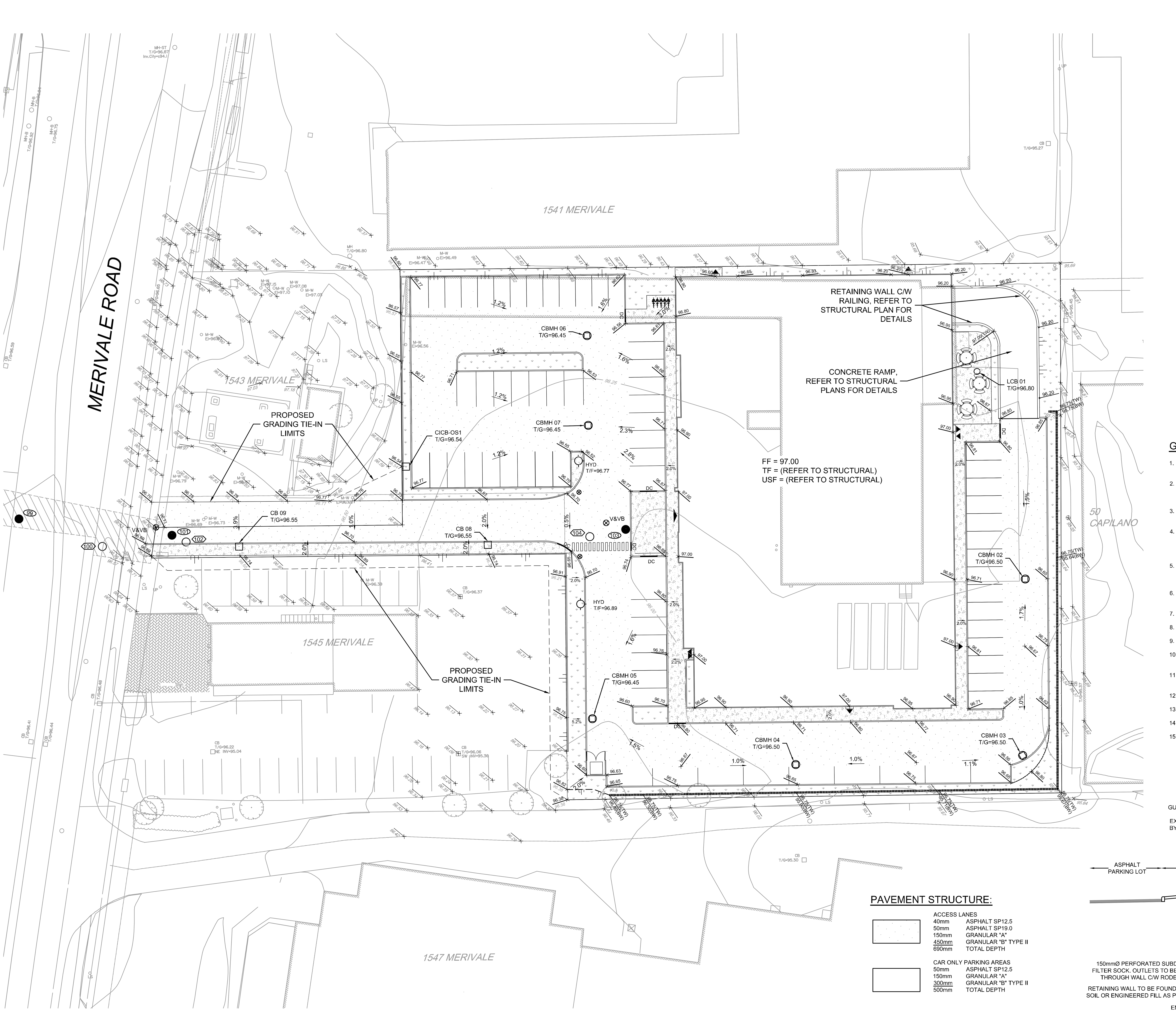

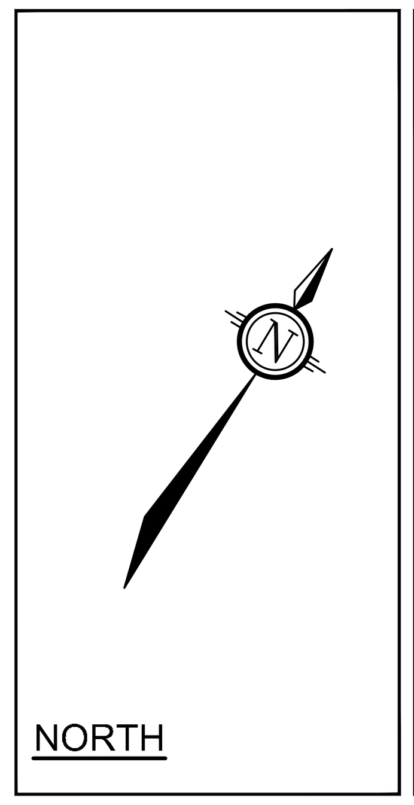

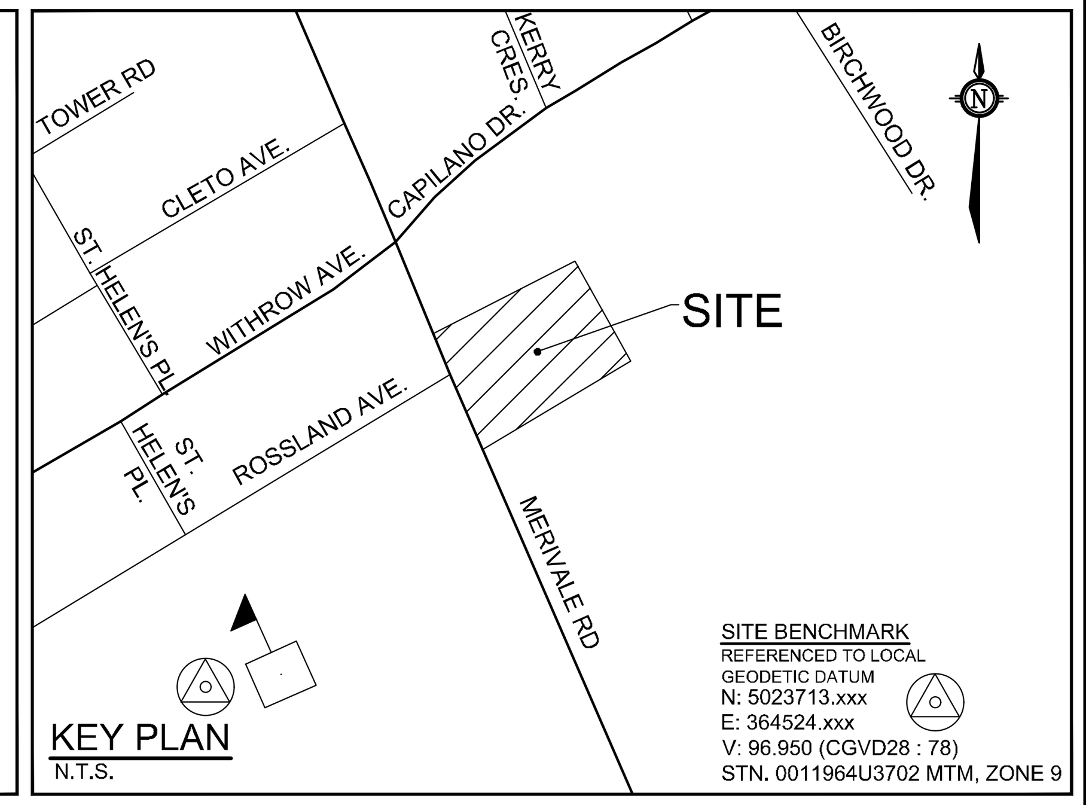

SOURCE REFERENCE:
TOPOGRAPHIC PLAN OF SURVEY OF PART OF LOT 16 REGISTERED PLAN 353 AND PART OF LOT 34 CONCESSION A (RIDEAU FRONT), PREPARED BY FARLEY, SMITH & DENIS SURVEYING LTD. 2021 ON OCTOBER 1st, 2021.
TOPOGRAPHIC INFORMATION:
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VERTICAL DATUM: CGVD 1928-1978
1. CITY OF OTTAWA 1:1000 MAPPING
2. FARLEY, SMITH & DENIS SURVEYING LTD'S TOPOGRAPHIC PLAN OF SURVEY

LEGEND

Symbol	Description	Symbol	Description
97.00 / 96.59	PROPOSED ELEVATION / EXISTING ELEVATION	101	PROPOSED SANITARY MAINTENANCE HOLE
97.00(TW)	PROPOSED TOP OF WALL ELEVATION	100	PROPOSED STORM MAINTENANCE HOLE
97.00(BW)	PROPOSED ELEVATION AT FRONT FACE OF RETAINING WALL (TO MATCH EXISTING GRADE)	CB	PROPOSED CATCHBASIN
96.00	EXISTING CONTOUR AND ELEVATION	CBMH	PROPOSED CATCHBASIN MAINTENANCE HOLE
	TERRACE TO EXISTING (3:1 MAX)	LCB	PROPOSED LANDSCAPE TYPE CATCHBASIN
	PROPOSED RETAINING WALL, COMPLETE WITH GUARDRAIL	VB	PROPOSED VALVE & VALVE BOX LOCATION
	PROPOSED GRADING TIE-IN LIMITS	HYD	PROPOSED HYDRANT WITH TOP OF FLANGE ELEVATION
	PROPOSED BERM LIMITS	DC	DEPRESSED CURB

GRADING AND PAVEMENT NOTES:

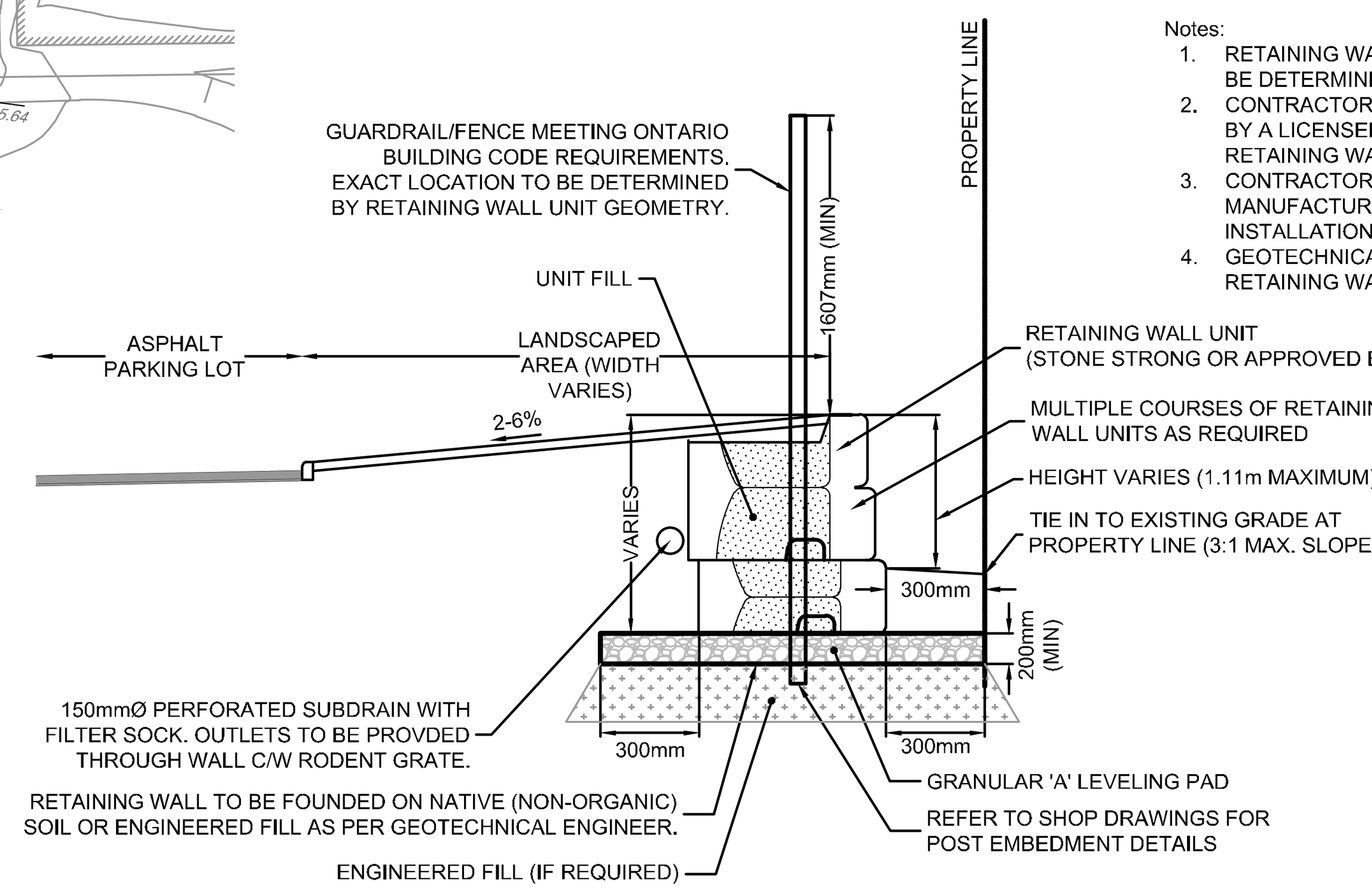
1. ALL TOPSOIL, ORGANIC OR DELETERIOUS MATERIAL MUST BE ENTIRELY REMOVED FROM BENEATH THE PROPOSED HARD SURFACE (ie. PAVEMENT, CURB, SIDEWALK, ETC.) AREAS AS DIRECTED BY THE SITE ENGINEER OR GEOTECHNICAL ENGINEER.
2. EXPOSED SUBGRADES IN PROPOSED PAVED AREAS SHOULD BE HEAVILY PROOF ROLLED WITH A LARGE (10 TON) VIBRATORY STEEL DRUM ROLLER UNDER DRY CONDITIONS AND INSPECTED BY THE GEOTECHNICAL ENGINEER PRIOR TO THE PLACEMENT OF GRANULARS.
3. ANY SOFT AREAS EVIDENT FROM THE PROOF ROLLING SHOULD BE SUB-EXCAVATED AND REPLACED WITH SUITABLE MATERIAL THAT IS FROST COMPATIBLE WITH THE EXISTING SOILS AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER.
4. THE GRANULAR BASE SHOULD BE PLACED IN MAXIMUM 300mm LIFTS AND COMPACTED TO AT LEAST 98% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE. ANY ADDITIONAL GRANULAR FILL USED BELOW THE PROPOSED PAVEMENT SHOULD BE PLACED IN MAXIMUM 300mm LIFTS AND COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE.
5. ROADWAY SUBGRADE TO BE INSPECTED BY THE GEOTECHNICAL ENGINEER AT THE TIME OF CONSTRUCTION TO REVIEW IF A WOVEN GEOTEXTILE IS REQUIRED BELOW THE GRANULAR MATERIALS; AND TO CONFIRM THE DEPTH AND COMPACTION OF GRANULAR 'B'.
6. PRIOR TO PLACEMENT OF WEAR COURSE ASPHALT, THE CONTRACTOR SHALL ADJUST ALL STRUCTURES TO FINAL GRADE PER CITY OF OTTAWA STANDARDS.
7. MINIMUM OF 2% GRADE FOR ALL GRASSED AREAS UNLESS OTHERWISE NOTED.
8. MAXIMUM TERRACING GRADE TO BE 3:1 UNLESS OTHERWISE NOTED.
9. ALL GRADES BY CURBS ARE EDGE OF PAVEMENT GRADES UNLESS OTHERWISE INDICATED.
10. ALL CURBS SHALL BE BARRIER CURB UNLESS OTHERWISE NOTED AND CONSTRUCTED PER CITY OF OTTAWA STANDARD (SC1.1).
11. ALL SIDEWALKS ARE TO HAVE 2% CROSSFALL UNLESS OTHERWISE NOTED. CROSSFALL IS TO BE DIRECTED AWAY FROM BUILDINGS AND PROPERTY LINES UNLESS OTHERWISE NOTED.
12. BARRIER FREE CURB RAMPS TO BE PROVIDED AS PER CITY OF OTTAWA STANDARD (SC6).
13. REFER TO LANDSCAPE PLAN FOR PLANTING AND OTHER LANDSCAPE FEATURE DETAILS.
14. CONTRACTOR TO SUBMIT SHOP DRAWINGS OF ALL TWSI'S TO THE CONSULTANT.
15. ALL RETAINING WALLS TO BE DESIGNED BY STRUCTURAL ENGINEER. ANY RETAINING WALL WITH EXPOSED FACE >0.6m WILL REQUIRE A GUARDRAIL AS PER OBC. TYPICAL CROSS SECTION OF RETAINING WALL PROVIDED FOR REFERENCE. TYPE OF WALL AND RAILING TO BE CONFIRMED DURING BUILDING PERMIT PROCESS. CONTRACTOR TO PROVIDE STAMPED STRUCTURAL DRAWING FOR APPROVED RETAINING WALL AND RAILING.

Notes:
1. RETAINING WALL AND GUARDRAIL PRODUCT TYPES TO BE DETERMINED DURING BUILDING PERMIT PROCESS.
2. CONTRACTOR TO PROVIDE SHOP DRAWING STAMPED BY A LICENSED PROFESSIONAL ENGINEER FOR THE RETAINING WALL AND THE GUARDRAIL.
3. CONTRACTOR TO REFER TO SHOP DRAWINGS AND MANUFACTURER'S DETAILS FOR BACKFILL & INSTALLATION REQUIREMENTS.
4. GEOTECHNICAL ENGINEER REQUIRED TO REVIEW RETAINING WALL BASE AND SUBBASE REQUIREMENTS.

PAVEMENT STRUCTURE:

	ACCESS LANES	
40mm	ASPHALT SP12.5	
50mm	ASPHALT SP19.0	
150mm	GRANULAR "A"	
450mm	GRANULAR "B" TYPE II	
690mm	TOTAL DEPTH	

	CAR ONLY PARKING AREAS
50mm	ASPHALT SP12.5
150mm	GRANULAR "A"
300mm	GRANULAR "B" TYPE II
500mm	TOTAL DEPTH



SEGMENTAL BLOCK RETAINING WALL - TYPICAL CROSS SECTION
(N.T.S.)

NOTE:
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MMI Merivale Medical Imaging

No.	REVISION	DATE	BY
3.	ISSUED FOR SITE PLAN APPROVAL - REVISED	MAY 12/23	TJM
2.	ISSUED FOR SITE PLAN APPROVAL	DEC 23/22	TJM
1.	ISSUED FOR COORDINATION	NOV 16/22	TJM

SCALE 1:300

DESIGN	JMR
CHECKED	SAB
DRAWN	JMR
CHECKED	SAB
APPROVED	TJM

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER T. J. MCKAY 100195434 MAY 18, 2023 PROVINCE OF ONTARIO

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
1545A MERIVALE ROAD

DRAWING NAME
GRADING PLAN

PROJECT No. 122098
REV # 3
DRAWING No. 122098-GR

D07-12-22-0190

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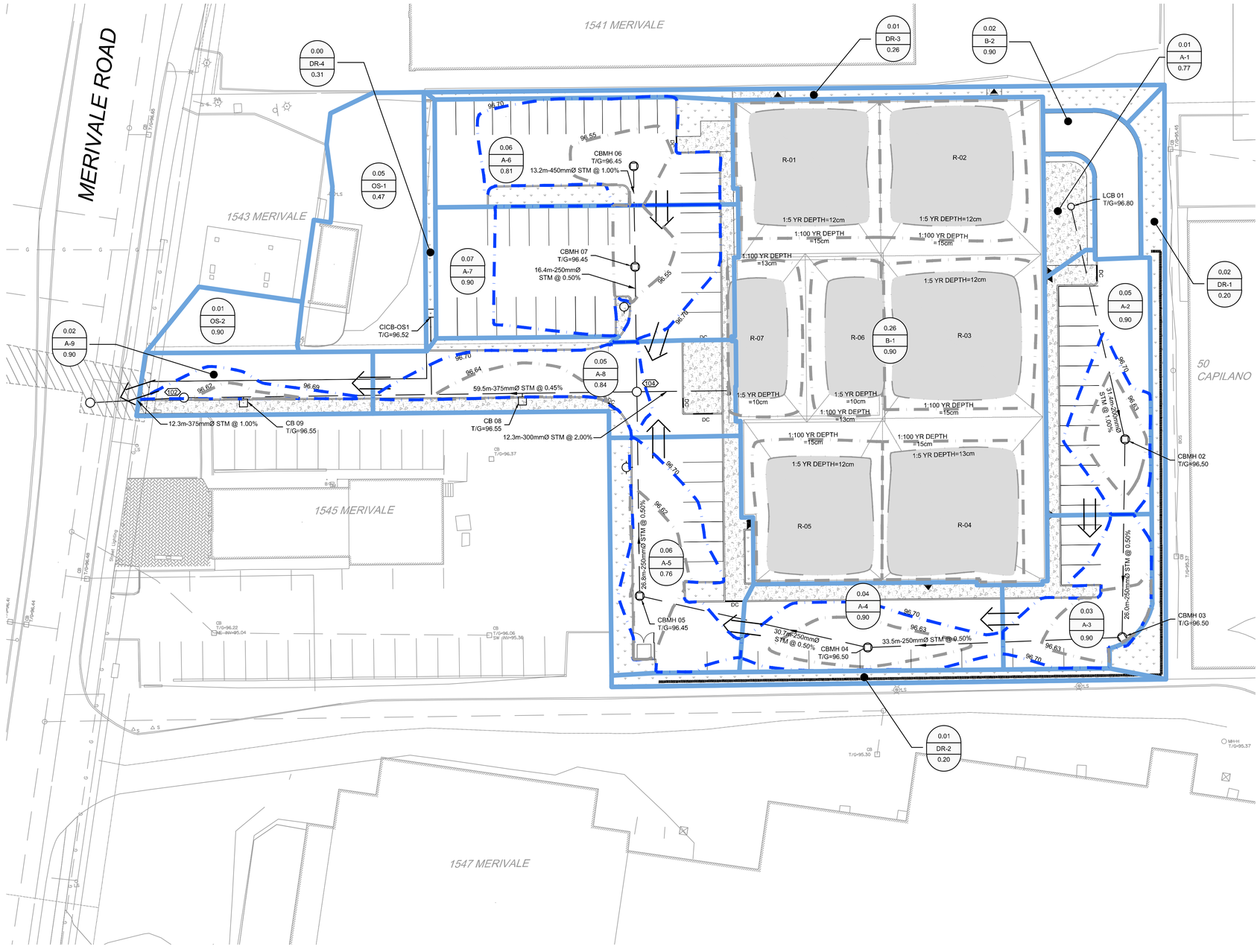

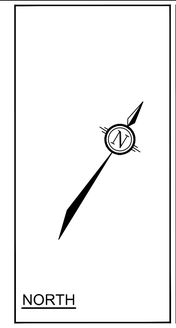

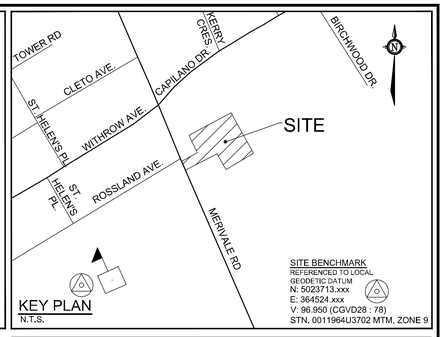

SITE BENCHMARK
REFERENCED TO LOCAL GEODETIC DATUM
N: 5023713.xxx
E: 364524.xxx
V: 96.950 (CGVD28 : 78)
STN. 0011964U3702 MTM, ZONE 9

SOURCE REFERENCE:
TOPOGRAPHIC PLAN OF SURVEY OF PART OF LOT 16 REGISTERED PLAN 353 AND PART OF LOT 34 CONCESSION A (RIDEAU FRONT), PREPARED BY FARLEY, SMITH & DENIS SURVEYING LTD. 2021 ON OCTOBER 1st, 2021

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2. *FARLEY, SMITH & DENIS SURVEYING LTD'S TOPOGRAPHIC PLAN OF SURVEY*

LEGEND

- 0.01 / A-1 / 0.28 — CATCHMENT AREA (HECTARES), AREA ID, RUNOFF COEFFICIENT
- DRAINAGE BOUNDARY AREA
- 100 — PROPOSED STORM MAINTENANCE HOLE & SEWER WITH DIRECTION OF FLOW
- CBMH 2 T/G=96.55 — PROPOSED CATCHBASIN MAINTENANCE HOLE
- CB 8 T/G=96.55 — PROPOSED CATCHBASIN
- LCB 1 T/G=96.80 — PROPOSED LANDSCAPE CATCHBASIN
- MAJOR OVERLAND FLOW DIRECTION
- 99.54 — 1:5yr PONDING AREA AND ELEVATION
- 99.58 — 1:100yr PONDING AREA AND ELEVATION
- 99.70 — STATIC PONDING AREA AND ELEVATION (MAXIMUM PONDING AREA & ELEVATION ABOVE THE 100-YR)
- CB T/G=95.45 — EXISTING CATCHBASIN
- MH-ST T/G=95.35 — EXISTING STORM MAINTENANCE HOLE

PROPOSED ROOF DRAIN TABLE: AREA B-1 (ROOF DRAINS 1 to 7)

AREA ID *	ROOF DRAIN No. (WATTS MODEL)	ROOF DRAIN OPENING SETTING	1:5 YEAR RELEASE RATE	APPROX. 5-YR PONDING DEPTH	1:100 YEAR RELEASE RATE	APPROX. 100-YR PONDING DEPTH
B-1	RD 1 (RD-100-A-ADJ)	FULLY OPEN	1.26 L/s	12 cm	1.89 L/s	15 cm
B-1	RD 2 (RD-100-A-ADJ)	FULLY OPEN	1.26 L/s	12 cm	1.89 L/s	15 cm
B-1	RD 3 (RD-100-A-ADJ)	FULLY OPEN	1.26 L/s	12 cm	1.89 L/s	15 cm
B-1	RD 4 (RD-100-A-ADJ)	FULLY OPEN	1.26 L/s	13 cm	1.89 L/s	15 cm
B-1	RD 5 (RD-100-A-ADJ)	FULLY OPEN	1.26 L/s	12 cm	1.89 L/s	15 cm
B-1	RD 6 (RD-100-A-ADJ)	FULLY OPEN	1.26 L/s	10 cm	1.89 L/s	13 cm
B-1	RD 7 (RD-100-A-ADJ)	FULLY OPEN	1.26 L/s	10 cm	1.89 L/s	13 cm

* REFER TO THE 'SERVICING DESIGN BRIEF' (R-2022-207) PREPARED BY NOVATECH FOR STORMWATER MANAGEMENT DETAILS.
**ALL CONTROLLED FLOW ROOF DRAINS FOR THE PROPOSED BUILDING TO BE WATTS 'ADJUSTABLE ACCUTROL' ROOF DRAINS.

INLET CONTROL DEVICE DATA TABLE - CBMH05

DESIGN EVENT	ICD TYPE	DIAMETER OF OUTLET PIPE (mm)	DESIGN FLOW (L/s)	DESIGN HEAD (m)	WATER ELEVATION (m)	VOLUME (m^3)	AVAILABLE STORAGE
1:2 YR	IPEX TEMPEST VORTEX LMF 78	250mmØ PVC	6.95	1.73	96.39	11.88	74.62 m^3
1:5 YR			7.24	1.88	96.54	19.09	
1:100 YR			7.41	1.96	96.62	54.20	

INLET CONTROL DEVICE DATA TABLE - CBMH07

DESIGN EVENT	ICD TYPE	DIAMETER OF OUTLET PIPE (mm)	DESIGN FLOW (L/s)	DESIGN HEAD (m)	WATER ELEVATION (m)	VOLUME (m^3)	AVAILABLE STORAGE
1:2 YR	SLIDE-IN-PLATE ICD c/w 83mmØ ORIFICE @ OUTLET PIPE INVERT	250mmØ PVC	16.57	1.37	96.00	5.04	81.79 m^3
1:5 YR			19.41	1.85	96.48	7.20	
1:100 YR			19.79	1.92	96.55	21.03	

INLET CONTROL DEVICE DATA TABLE - CB08

DESIGN EVENT	ICD TYPE	DIAMETER OF OUTLET PIPE (mm)	DESIGN FLOW (L/s)	DESIGN HEAD (m)	WATER ELEVATION (m)	VOLUME (m^3)	AVAILABLE STORAGE
1:2 YR	IPEX TEMPEST VORTEX LMF 94	200mmØ PVC	7.85	1.05	96.55	0.38	9.93 m^3
1:5 YR			7.92	1.07	96.57	0.38	
1:100 YR			8.17	1.14	96.64	2.15	

INLET CONTROL DEVICE DATA TABLE - CB09

DESIGN EVENT	ICD TYPE	DIAMETER OF OUTLET PIPE (mm)	DESIGN FLOW (L/s)	DESIGN HEAD (m)	WATER ELEVATION (m)	VOLUME (m^3)	AVAILABLE STORAGE
1:2 YR	IPEX TEMPEST VORTEX LMF 86	200mmØ PVC	6.61	1.05	96.55	0.38	3.04 m^3
1:5 YR			6.66	1.07	96.57	0.38	
1:100 YR			6.83	1.12	96.62	0.68	

NOTE: AVAILABLE STORAGE FOR EACH CONTROLLED INLET INCLUDES ALL STRUCTURE AND PIPE STORAGE UPSTREAM OF THE INLET CONTROL DEVICE IN ADDITION TO ALL AVAILABLE STATIC PONDING ON THE SURFACE UNLESS OTHERWISE NOTED.

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MMI Merivale Medical Imaging

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2.	ISSUED FOR SITE PLAN APPROVAL - REVISED	MAY 12/23	TJM
1.	ISSUED FOR SITE PLAN APPROVAL	DEC 23/22	TJM

SCALE: 1:300
1:300
0 3 6 9 12

DESIGN: SAB
CHECKED: TJM
DRAWN: SAB
CHECKED: TJM
APPROVED: MER

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
T. J. MCKAY
100195434
MAY 18, 2023
PROVINCE OF ONTARIO

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
1545A MERIVALE ROAD

DRAWING NAME
STORM DRAINAGE AREA PLAN

PROJECT No. 122098
REV REV # 2
DRAWING No. 122098-STM

D07-12-22-0190

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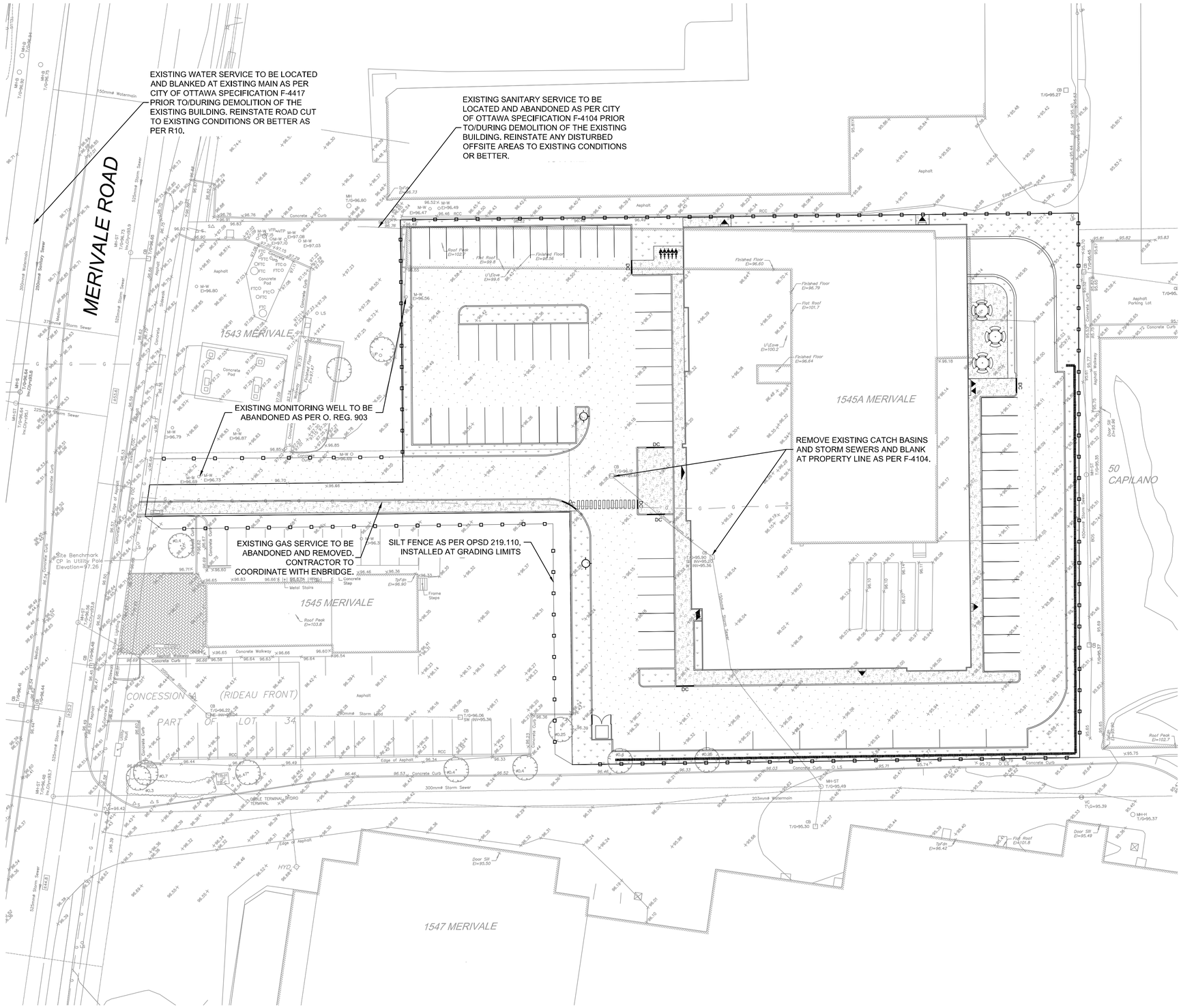

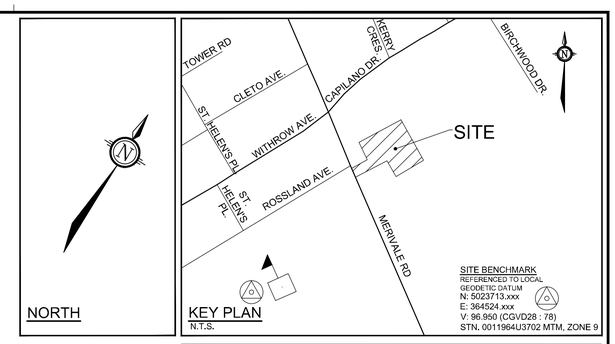

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LEGEND

- SILT FENCE PER OPSD 219.110
- M-W EL=XX.XX — MONITORING WELL (WITH ELEVATION)
- CB T/G=95.90 INV.97.70 — EXISTING CATCHBASIN (WITH TOP OF GRATE)
- EXISITING CONTOUR AND ELEVATION
- PROPOSED RETAINING WALL
- DC — DEPRESSED CURB

EROSION AND SEDIMENT CONTROL NOTES :

1. ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE INSTALLED TO THE SATISFACTION OF THE ENGINEER, THE MUNICIPALITY AND THE CONSERVATION AUTHORITY. THEY ARE TO BE APPROPRIATE TO THE SITE CONDITIONS, INSTALLED PRIOR TO UNDERTAKING ANY SITE ALTERATIONS (FILLING, GRADING, REMOVAL OF VEGETATION, ETC.) AND DURING ALL PHASES OF SITE PREPARATION AND CONSTRUCTION. THESE PRACTICES ARE TO BE IMPLEMENTED IN ACCORDANCE WITH THE CURRENT BEST MANAGEMENT PRACTICES FOR EROSION AND SEDIMENT CONTROL AND SHOULD INCLUDE AS A MINIMUM THOSE INDICATED ON THE PLAN.
2. TO PREVENT SURFACE EROSION FROM ENTERING THE STORM SYSTEM DURING CONSTRUCTION, SILT SOXX OR SILT SACKS, OR APPROVED EQUIVALENTS, WILL BE PLACED AROUND/UNDER GRATES OF ALL PROPOSED AND EXISTING CATCHBASINS AND STRUCTURES. A LIGHT DUTY SILT FENCE BARRIER WILL ALSO BE INSTALLED IN SELECTED LOCATIONS SHOWN ON THIS PLAN, AND STRAW BALE BARRIERS WILL BE INSTALLED WITHIN THE OUTLET DITCHES. THESE CONTROL MEASURES WILL REMAIN IN PLACE UNTIL VEGETATION HAS BEEN ESTABLISHED AND CONSTRUCTION COMPLETE.
3. THE SEDIMENT CONTROL MEASURES SHALL ONLY BE REMOVED WHEN, IN THE OPINION OF THE ENGINEER, THE MEASURES ARE NO LONGER REQUIRED. NO CONTROL MEASURES MAY BE PERMANENTLY REMOVED WITHOUT PRIOR AUTHORIZATION FROM THE ENGINEER.
4. THE CONTRACTOR SHALL IMMEDIATELY REPORT TO THE ENGINEER ANY ACCIDENTAL DISCHARGES OF SEDIMENT MATERIAL INTO ANY DITCH OR STORM SEWER SYSTEM. APPROPRIATE RESPONSE MEASURES, INCLUDING ANY REPAIRS TO EXISTING CONTROL MEASURES OR THE IMPLEMENTATION OF ADDITIONAL CONTROL MEASURES, SHALL BE CARRIED OUT BY THE CONTRACTOR WITHOUT DELAY.
5. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
6. THE CONTRACTOR SHALL ENSURE PROPER DUST CONTROL IS PROVIDED WITH THE APPLICATION OF WATER (AND IF REQUIRED, CALCIUM CHLORIDE) DURING DRY PERIODS.
7. THE CONTRACTOR SHALL PROTECT ALL SURVEY MONUMENTS.
8. ALL TOPSOIL AND ANY SOFT, WET OR DELETERIOUS MATERIAL SHALL BE REMOVED FROM IMPROVED AREAS UNLESS OTHERWISE DIRECTED BY ENGINEER. CONTRACTOR SHALL BE RESPONSIBLE FOR ADHERING TO ALL LEGISLATION REGARDING REMOVALS, INCLUDING EXCESS SOILS.

PAVEMENT STRUCTURE:

ACCESS LANES

40mm	ASPHALT SP12.5
50mm	ASPHALT SP19.0
150mm	GRANULAR "A"
450mm	GRANULAR "B" TYPE II
690mm	TOTAL DEPTH

CAR ONLY PARKING AREAS

50mm	ASPHALT SP12.5
150mm	GRANULAR "A"
300mm	GRANULAR "B" TYPE II
500mm	TOTAL DEPTH

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SCALE 1:300 (1:300, 0 3 6 9 12)

DESIGN JMR | CHECKED SAB | DRAWN JMR | CHECKED SAB | APPROVED TJM

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER — T. J. MCKAY — 100195434 — MAY 18, 2023 — PROVINCE OF ONTARIO

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
1545A MERIVALE ROAD

DRAWING NAME
EROSION AND SEDIMENT CONTROL PLAN

PROJECT No. 122098
REV REV # 3
DRAWING No. 122098-ESC

D07-12-22-0190

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APPENDIX G

Development Servicing Study Checklist

Development Servicing Study Checklist

4.1 General Content	Addressed (Y/N/NA)	Section	Comments
Executive Summary (for larger reports only).	NA		
Date and revision number of the report.	Y	Cover	
Location map and plan showing municipal address, boundary, and layout of proposed development.	Y	Fig 1-2	
Plan showing the site and location of all existing services.	Y	122098-ESC 122098-GP	Appendix F
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.	N		Refer to Planning Rationale
Summary of Pre-consultation Meetings with City and other approval agencies.	Y	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.	N		No higher level plans referenced in pre-construction meeting note design criteria.
Statement of objectives and servicing criteria.	Y	4.0-6.0	
Identification of existing and proposed infrastructure available in the immediate area.	Y		Figures 3 to 5
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).	NA		
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 neighboring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	Y	122098-GR	Appendix F

Development Servicing Study Checklist

4.1 General Content	Addressed (Y/N/NA)	Section	Comments
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.	NA		
Proposed phasing of the development, if applicable.	NA		
Reference to geotechnical studies and recommendations concerning servicing.	Y	1.1 & 7.0	
All preliminary and formal site plan submissions should have the following information:			
Metric scale	Y		
North arrow (including construction North)	Y		
Key plan	Y		
Name and contact information of applicant and property owner	Y		
Property limits including bearings and dimensions	Y		Refer to Topographic Plan of Survey
Existing and proposed structures and parking areas	Y		
Easements, road widening and rights-of-way	Y		
Adjacent street names	Y		

Development Servicing Study Checklist

4.2 Water	Addressed (Y/N/NA)	Section	Comments
Confirm consistency with Master Servicing Study, if available.	NA		
Availability of public infrastructure to service proposed development.	Y	6.1	
Identification of system constraints.	Y	6.1	
Identify boundary conditions.	Y	6.1	And Appendix E
Confirmation of adequate domestic supply and pressure.	Y	6.2	And Appendix E
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.	Y	6.2	And Appendix E
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.	Y	6.2	And Appendix E
Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design.	NA		
Address reliability requirements such as appropriate location of shut-off valves.	Y	6.2	
Check on the necessity of a pressure zone boundary modification.	NA		
Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range.	Y	6.2	
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.	Y	6.2	
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.	NA		
Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Y	6.2	
Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	Y	6.0	Figure 5 and Appendix E

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4.3 Wastewater	Addressed (Y/N/NA)	Section	Comments
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).	Y	4.0	
Confirm consistency with Master Servicing Study and/or justifications for deviations.	NA		
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.	NA		
Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Y	5.1	
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)	NA		No constraints identified in Pre-consultation meeting notes.
Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	Y		Appendix B
Description of proposed sewer network including sewers, pumping stations, and forcemains.	Y	4.0	Figure 3
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).	NA		
Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	NA		
Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	NA		
Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	NA		
Special considerations such as contamination, corrosive environment etc.	NA		

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4.4 Stormwater	Addressed (Y/N/NA)	Section	Comments
Description of drainage outlets and downstream constraints including legality of outlet (i.e. municipal drain, right-of-way, watercourse, or private property).	Y	5.0	
Analysis of the available capacity in existing public infrastructure.	NA		No constraints identified in Pre-consultation meeting notes. Allowable release rate calculated based on
A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns and proposed drainage patterns.	Y		122098-STM & 122098-GR, Appendix F
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.	Y	5.2	
Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Y	5.2	
Description of stormwater management concept with facility locations and descriptions with references and supporting information.	Y	5.3.3	
Set-back from private sewage disposal systems.	NA		
Watercourse and hazard lands setbacks.	NA		
Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	NA		
Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	NA		
Storage requirements (complete with calcs) and conveyance capacity for 5 yr and 100 yr events.	Y	5.0	Appendix C & D
Identification of watercourse within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	NA		
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.	Y	5.0	Appendix C & D
Any proposed diversion of drainage catchment areas from one outlet to another.	NA		
Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and SWM facilities.	Y	5.0	Appendix C & D

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4.4 Stormwater (Continued)	Addressed (Y/N/NA)	Section	Comments
If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event.	NA		
Identification of municipal drains and related approval requirements.	NA		
Description of how the conveyance and storage capacity will be achieved for the development.	Y	5	
100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	Y	5	Appendix C
Inclusion of hydraulic analysis including HGL elevations.	Y	5	Appendix C
Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Y	3	
Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.	NA		
Identification of fill constrains related to floodplain and geotechnical investigation.	NA		

4.5 Approval and Permit Requirements	Addressed (Y/N/NA)	Section	Comments
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.	NA		
Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.	NA		
Changes to Municipal Drains.	NA		
Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	NA		

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4.6 Conclusion	Addressed (Y/N/NA)	Section	Comments
Clearly stated conclusions and recommendations.	Y	8.0	
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.	Y		Comment responses are compiled under a separate letter to the development review project lead. Required revisions were incorporated into the report.
All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario.	Y	8.0	