PCL CONSTRUCTORS CANADA INC.

UNIVERSITY OF OTTAWA ADVANCED MEDICAL RESEARCH CENTRE (AMRC)

SERVICING REPORT

APRIL 18, 2024

UNIVERSITY OF OTTAWA ADVANCED MEDICAL RESEARCH CENTRE (AMRC), OTTAWA, ON
SERVICING REPORT

PCL CONSTRUCTORS CANADA INC.

SITE PLAN APPLICATION

PROJECT NO.: CA0009956.0165
DATE: APRIL 2024

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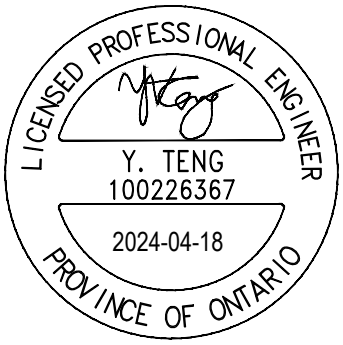

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1 GENERAL

1.1 EXECUTIVE SUMMARY

WSP was retained by PCL Constructors Canada Inc. to provide servicing, grading and stormwater management design services for a proposed addition to the University of Ottawa Roger Guidon Hall (RGN) located on a 20.35 ha site at 451 Smyth Road, south of the Ring Road. The site to be redeveloped for the proposed addition is approximately 2.02 ha. The sanitary, storm and water services will be provided by the private utilities on the Ring Road of the site. This report outlines findings and calculations pertaining to the servicing of the proposed building with a gross building footprint area of 0.54 ha for the addition. The stormwater management of the site is discussed under separate cover.

The proposed addition is a six-storey building with a gross floor area of 13,726 square metres and a maximum building height of 40.3m, located on the north of the existing Roger Guidon Hall building. To the west of the addition, there will be a parking lot and an access road providing access to the Ring Road. To the east of the addition, there will be a lay-by/drop-off area fronting on a privately owned road connected to the Ring Road. The fire route access to the building is located on the lay-by/drop-off entrance.

Currently the land proposed for the building is an existing parking lot with a landscaped buffer between the parking lot and the Ring Road. The total study is currently zoned as I2. The legal description of the site as indicated on the Plan of Survey is Part of Lots 30, 31 & 32, Part of Terrace Road (Closed by Judge's Order INST GL40441), Registered Plan 405, Part of Lot 15, Junction Gore, Geographic Township of Gloucester, Being Part of the Northerly and Westerly Limits of P.I.N. 04258-0412, City of Ottawa. Surveyed by Farley, Smith & Denis Surveying Ltd. 2022 (File No.: ca0009). Based on the topographic survey, the site is relatively flat with a slight slope to the north and west of the site. Storm and sanitary maintenance holes are located on the Ring Road. Stormwater collected from this site is directed towards the Ottawa River located to the west of the site.

Design of a drainage and stormwater management system in this development must be prepared in accordance with the following documents:

- Sewer Design Guidelines, City of Ottawa, October 2012;
- Stormwater Management Planning and Design Manual, Ministry of the Environment, March 2003; and
- Stormwater Management Facility Design Guidelines, City of Ottawa, April 2012

This report was prepared utilizing servicing design criteria obtained from the City of Ottawa and outlines the design for water, sanitary wastewater, and stormwater facilities, including stormwater management.

The format of this report matches that of the servicing study checklist found in Section 4 of the City of Ottawa's Servicing Study Guidelines for Development Applications, November 2009.

The following municipal services are available at the north-east property line as recorded from GeoOttawa.
Ring Road:

- 375mm diameter sanitary sewer, 900mm storm sewer and 305mm watermain.

Private access road:

- 152mm watermain

It is proposed that:

- On-site stormwater management systems, employing surface storage, underground storage and roof storage will be provided to attenuate flow rates leaving the site. Existing drainage patterns, previously established controlled flow rates and storm sewers will be maintained.

1.2 DATE AND REVISION NUMBER

This version of the report is the third issue, dated April 18th, 2024.

1.3 LOCATION MAP AND PLAN

The proposed institutional development is located at 451 Smyth Road, Ottawa, Ontario at the location shown in Figure 1-1 below. The 2.02 ha study area (the smaller area that is to be redeveloped within the larger 20.35 ha site) excludes the Ring Road to the north as this is outside the scope of the area to be redeveloped. Refer to drawing C110 in Appendix C for the study site limits. Note that the access on the east side of the site will be referred to as the 'Private Access Road' throughout this report.

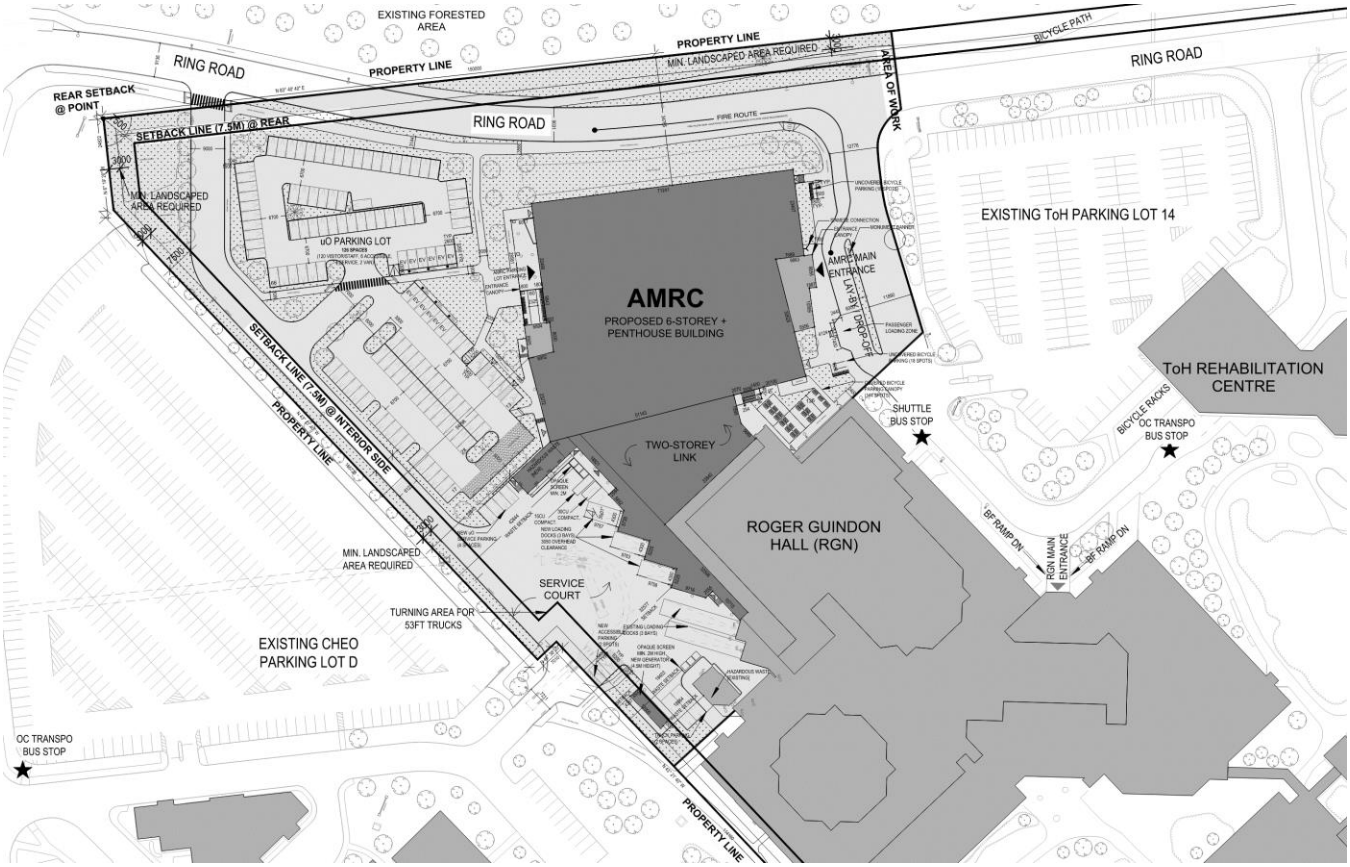


Figure 1-1 Site Location

1.4 ADHERENCE TO ZONING AND RELATED REQUIREMENTS

The proposed property use will be in conformance with zoning and related requirements prior to approval and construction and is understood that a minor zoning bylaw amendment is currently required.

1.5 PRE-CONSULTATION MEETINGS

A pre-consultation meeting was held with the City of Ottawa on August 23rd, 2023. On October 26th, 2023, the Pre-Consultation Meeting Feedback was revised. Revised notes from this meeting are provided in Appendix A.

1.6 HIGHER LEVEL STUDIES

The review for servicing has been undertaken in conformance with, and utilizing information from, the following documents:

- Ottawa Sewer Design Guidelines, Second Edition, Document SDG002, October 2012, City of Ottawa including:
    - Technical Bulletin ISDTB-2012-4 (20 June 2012)
    - Technical Bulletin ISDTB-2014-01 (05 February 2014)
    - Technical Bulletin PIEDTB-2016-01 (September 6, 2018)
    - Technical Bulletin ISDTB-2018-01 (21 March 2018)
    - Technical Bulletin ISDTB-2018-04 (27 June 2018)
- Ottawa Design Guidelines – Water Distribution, July 2010 (WDG001), including:
    - Technical Bulletin ISDTB-2014-02 (May 27, 2014)
    - Technical Bulletin ISTB-2018-02 (21 March 2018)
- Stormwater Management Planning and Design Manual, Ontario Ministry of the Environment and Climate Change, March 2003 (SMPDM).
- Ottawa Health Sciences Centre Stormwater Master Plan, prepared by Morrison Hershfield, dated July 2019, report no. 180398000.
- Ottawa Health Sciences Centre Storm and Sanitary Sewer Capacity Assessment, prepared by Morrison Hershfield, dated May 2017, report no. 2160501.01.
- Design Guidelines for Drinking-Water Systems, Ontario Ministry of the Environment and Climate Change, 2008 (GDWS).
- Fire Underwriters Survey, Water Supply for Public Fire Protection (FUS), 2020.

1.7 STATEMENT OF OBJECTIVES AND SERVICING CRITERIA

The objective of the site servicing is to meet the requirements for the proposed modification of the site while adhering to the stipulations of the applicable higher-level studies and City of Ottawa servicing design guidelines. The site plan includes a new addition, a new parking area, a lay-by/drop off area and a new access road.

1.8 AVAILABLE EXISTING AND PROPOSED INFRASTRUCTURE

There is an existing storm sewer line within the site currently drain the parking lot of the proposed development, a portion of the lot to the west of the site and includes a connection leading to Roger Guidon Hall. The connections to catchbasins within the site will be removed from this storm sewer however the remainder of the storm sewer will be protected during project works. The storm sewer connects to the 900mm storm sewer located on the Ring Road. The storm sewer outlets to city-owned storm sewers located west of the site which eventually discharge into the Ottawa River.

There is an existing sanitary sewer located on the Ring Road which eventually outlets to the Rideau River Collection Sewer.

Water service for this addition is proposed to connect to the existing 152mm watermain located on the privately owned road and the 305mm watermain located on the Ring Road.

Site access is proposed from the Ring Road north of the building.

1.9 ENVIRONMENTALLY SIGNIFICANT AREAS, WATERCOURSES AND MUNICIPAL DRAINS

There are no watercourses, municipal drains or environmentally significant areas on the site. The proposed changes to the site will not require any additional approvals or amendments to approvals pertaining to environmentally significant areas, watercourses or municipal drains.

1.10 CONCEPT LEVEL MASTER GRADING PLAN

As the design is being submitted for site plan approval, the grading plan has been developed to the final design level. The existing and proposed grading are shown on Drawing C103 through C105 - Grading Plan. Existing grading information is based on a topographic survey of the site completed in November 2022 and is noted in the background of the Drawing C103. No changes in grading are proposed beyond the site boundaries. The proposed grading plan confirms the feasibility of the proposed stormwater management system, drainage, soil removal and fills. The geotechnical investigation was completed in 2023 by Paterson Group.

1.11 IMPACTS ON PRIVATE SERVICES

There is an existing storm sewer located on the west side of the site that drains a portion of the loading dock, a portion of the parking lot located west of the site and includes a connection to the existing Roger Guidon Hall. With the construction of the addition, storm sewers are proposed to drain the proposed site and the westerly parking lot separately. The storm sewer capturing flow from the existing westerly parking lot and the existing Roger Guidon Hall will be unaffected by the changes to the site and will drain per existing conditions. The parking lot within the site boundaries will be captured and treated per the stormwater management requirements of the site.

1.12 DEVELOPMENT PHASING

There are no development phasing considerations for the site.

1.13 GEOTECHNICAL STUDY

A geotechnical investigation report was previously prepared by Arcadis Canada Inc. in 2021. A more recent report was prepared by Paterson Group on October 20th, 2023. No additional geotechnical information was required for the design of the modified site services, including paving. This geotechnical report will be included with the contract documents to be issued for construction, and the recommendations of the reports will be referenced in the construction specifications.

1.14 DRAWING REQUIREMENT

The engineering plans submitted for site plan approval will be in compliance with City requirements.

2 WATER DISTRIBUTION

2.1 CONSISTENCY WITH MASTER SERVICING STUDY AND AVAILABILITY OF PUBLIC INFRASTRUCTURE

The new addition at 451 Smyth Road is within zone 2W2C. The water services for the proposed development are proposed to connect to the existing 300mm watermain on Smyth Road and the existing 152mm diameter private watermain along the access road west of the building. The new addition will be protected with a supervised automatic fire protection sprinkler system and a 2-hour fire wall is proposed between the existing building and addition. The fire department connection is located at the east side of the addition fronting to the private access road. It is 12m and 76m away, respectively, from the proposed and existing municipal fire hydrants on the private access road. No changes are required to the existing City water distribution system to allow servicing for this property. The water entry room for the addition is located in the south-east corner.

Fire hydrant testing was completed on site in October 2023. The table below summarizes the results of the hydrant testing.

Table 2-1: Fire Hydrant Testing Results

Hydrant Location	Residual Hydrant Static Pressure (psi)	Residual Hydrant Flowing Pressure (psi)	Flowing Hydrant Pitot Pressure (psi)	Measured flow (GPM / L/s)	Available Fire Flow at 20 psi (GPM/ L/s)
Private Access Road	67	65	55	672/42.4	2231/140.8
Southwest of RGN	67	67	30	2044/129.0	

2.2 SYSTEM CONSTRAINTS AND BOUNDARY CONDITIONS

A boundary service request was submitted to the City of Ottawa and boundary conditions have been received and summarized below. A fire flow of 8,000 l/min (133 l/s) was estimated for the proposed addition.

Table 2-2: Boundary Conditions

Boundary Conditions at Connection 1	
SCENARIO	HGL (m) /Hydraulic Pressure (kPa)
Average Day (MAX HGL)	131.1 / 462.0
Peak Hour (MIN HGL)	123.6 /388.5
Max Day + Fire Flow	123.1 / 383.6
Boundary Conditions at Connection 2	
SCENARIO	HGL (m)/ Hydraulic Pressure (kPa)
Average Day (MAX HGL)	130.8 / 449.3
Peak Hour (MIN HGL)	123.6 / 378.7
Max Day + Fire Flow	123.0 / 372.8

2.3 CONFIRMATION OF ADEQUATE DOMESTIC SUPPLY AND PRESSURE

Water demands are based on Table 4.2 of the Ottawa Design Guidelines – Water Distribution. As previously noted, the development is considered as institutional development. A water demand calculation sheet is included in Appendix B, and the total water demands are summarized as follows:

	WSP
Average Day	0.65 l/s
Maximum Day	0.98 l/s
Peak Hour	1.77 l/s

The 2010 City of Ottawa Water Distribution Guidelines stated that the preferred practice for design of a new distribution system is to have normal operating pressures range between 345 kPa (50 psi) and 552 kPa (80 psi) under maximum daily flow conditions. Other pressure criteria identified in the guidelines are as follows:

Minimum Pressure	Minimum system pressure under peak hour demand conditions shall not be less than 276 kPa (40 psi)
Fire Flow	During the period of maximum day demand, the system pressure shall not be less than 140 kPa (20 psi) during a fire flow event.
Maximum Pressure	Maximum pressure at any point the distribution system shall not exceed 689 kPa (100 psi).

Based on the hydrant flow test, the residual pressure within the hydrant located at the private access road is 67 psi (462 kPa), the measured flow is 42.4 l/and thus meets the requirements of minimum system pressure.

2.4 CONFIRMATION OF ADEQUATE FIRE FLOW PROTECTION

The fire flow rate has been calculated using the Fire Underwriters Survey (FUS) method. The method takes into account the type of building construction, the building occupancy, the use of sprinklers and the exposures to adjacent structures.

For the addition, assuming non-combustible construction and a fully supervised sprinkler system, a fire flow demand of 8,000 l/min (133 l/s) has been calculated. The demand of max day + fire flow results in a flow requirement of 133.98 l/s. A copy of the FUS calculations is included in Appendix B.

The demand of 133.98 l/s for the addition can be delivered through one existing municipal fire hydrant and one proposed relocated fire hydrant. The addition is serviced by the 152mm watermain on the private access road. There is one proposed relocated hydrant and one existing hydrant located on this stretch of watermain rated at 95 l/s and 63 l/s respectively. The hydrant flow test completed indicates that the flow available from the hydrant is sufficient. The two hydrants have a combined total of 9,480 l/min (158 l/s). There is also a hydrant on the south-west side of the addition 257m away from the Siamese connection rated at 2,820 l/min.

The residual pressure calculated from the hydrant flow test is 67 psi (462 kPa) which exceeds the minimum residual pressure requirement of 140 kPa.

2.5 CHECK OF HIGH PRESSURE

The recommended pressure range is respected during the Maximum Day plus Fire Flow scenario as well as the Peak Hour demands. A pressure check should be conducted at the completion of construction to determine if pressure control is required.

2.6 PHASING CONSTRAINTS

No development phasing constraint has been detailed for the site.

2.7 RELIABILITY REQUIREMENTS

There is a looped watermain network on the Ring Road. A shut off valve is provided for the private watermain at the connection to the 152mm watermain on the private road and at the connection to the 305mm watermain on the Ring Road. Water can be supplied from both sides of the watermain within the Ring Road.

2.8 NEED FOR PRESSURE ZONE BOUNDARY MODIFICATION

There is no need for a pressure zone boundary modification.

2.9 CAPABILITY OF MAJOR INFRASTRUCTURE TO SUPPLY SUFFICIENT WATER

The capability of the major infrastructure to supply sufficient water is confirmed.

2.10 DESCRIPTION OF PROPOSED WATER DISTRIBUTION NETWORK

Two new 150mm service mains are proposed to service the addition from the 152mm watermain on the private access road and from the 305mm watermain on the Ring Road.

2.11 OFF-SITE REQUIREMENTS

No off-site improvements to watermains, feedermains, pumping stations, or other water infrastructure are required to maintain existing conditions and service the adjacent developments.

2.12 CALCULATION OF WATER DEMANDS

Water demands were calculated as described in Sections 2.3 and 2.4 above.

2.13 MODEL SCHEMATIC

A model schematic is not required.

3 WASTEWATER DISPOSAL

3.1 DESIGN CRITERIA

In accordance with the City of Ottawa's Sewer Design Guidelines, the following design criteria have been utilized in order to predict wastewater flows generated by the subject site and complete the sewer design;

- Minimum Velocity 0.6 m/s
- Maximum Velocity 3.0 m/s
- Manning Roughness Coefficient 0.013
- Total est. Hectares for Institutional use 2.02
- Average sanitary flow for Institutional use 28,000 L/Ha/day
- Commercial/Institutional Peaking Factor 1.5
- Infiltration Allowance (Total) 0.33 L/Ha/s
- Minimum Sewer Slopes – 200 mm diameter 0.32%

The area of 2.02 ha represents the lot area of the site, excluding the Ring Road. This is the sanitary collection area that is being considered to contribute to the proposed 200mm sanitary service connection to the municipal sanitary sewer.

3.2 CONSISTENCY WITH MASTER SERVICING STUDY

The outlet for the sanitary service from the existing building is the 375 mm diameter municipal sewer at the north-east corner of the Site at the intersection of the Ring Road and the private access road. The Ottawa Sewer Design Guidelines provide estimates of sewage flows based on institutional development.
The criteria to determine anticipated actual peak flow based on site used as described in Ottawa Sewer Design Guidelines Appendix 4-A are as follows;

For the school and the addition:

- Institutional 28000 L/Ha/day = 0.324 L/Ha/s
- Peak flow = (0.324 L/Ha/s x 2.02 ha x 1.5 peaking factor) + 0.33 l/Ha/s x 2.02 ha = 1.65 L/s

3.3 REVIEW OF SOIL CONDITIONS

There are no specific local subsurface conditions that suggest the need for a higher extraneous flow allowance.
Soil conditions have been reviewed by Paterson Group. Bedding and backfill will be provided as recommended, conventional sewer materials will be utilized, and dewatering will be undertaken as necessary in accordance with the geotechnical recommendations and conditions encountered. The geotechnical report indicates that groundwater table was observed to be between 74.56 m and 77.61 m with the boreholes nearest to the sanitary service showing groundwater table elevations of 74.56m and 75.63m. It is therefore expected that the groundwater impact on the sanitary sewer service will be minimal.

3.4 DESCRIPTION OF EXISTING SANITARY SEWER

The outlet sanitary sewer for the addition will be the 375mm sanitary sewer located on the Ring Road which runs from the south-east corner of the site to the north-west corner of the site. From there, the sanitary sewer travels west and ultimately discharges into the Rideau River Collection Sewer.

3.5 VERIFICATION OF AVAILABLE CAPACITY IN DOWNSTREAM SEWER

The existing sanitary sewer on the Ring Road is a 375mm diameter sewer at 0.52% slope. This size and slope of sewer provides a capacity of 126.4 l/s.

Based on the *Ottawa Health Sciences Centre Storm and Sanitary Sewer Capacity Analysis* report, the existing sanitary system is being used at 5-12% of its full capacity in 2011. The additional flow from the site of 1.65 l/s is approximately 1.3% of the existing 375mm sanitary sewer's capacity. Thus, the capacity of the sanitary sewer is not a concern.

3.6 CALCULATIONS FOR NEW SANITARY SEWER

The new sanitary service from the site is a 200 mm diameter sewer at a slope of 1%. This size and slope of sewer provides a capacity of 32.8 L/s.

For the 2.02 ha site, the sanitary peak flow is calculated at 0.98 l/s with an infiltration flow of 0.67 l/s (based on a peak extraneous flow of 0.33 l/s/ha) for a total flow of 1.65 l/s. The new sanitary sewer connection, with a capacity of 32.8 l/s is adequate to convey this flow.

3.7 DESCRIPTION OF PROPOSED SEWER NETWORK

The proposed sanitary sewer network on site will consist of a 200mm sanitary service and three 1200mm maintenance holes.

3.8 ENVIRONMENTAL CONSTRAINTS

There are no previously identified environmental constraints that impact the sanitary servicing design in order to preserve the physical condition of watercourses, vegetation, or soil cover, or to manage water quantity or quality.

3.9 PUMPING REQUIREMENTS

The proposed development will have no impact on existing pumping stations and will not require new pumping facilities.

3.10 FORCEMAINS

There are no sanitary forcemains proposed on this site.

3.11 EMERGENCY OVERFLOWS FROM SANITARY PUMPING STATIONS

No sanitary pumping stations are proposed on this site.

3.12 SPECIAL CONSIDERATIONS

There is no known need for special considerations for sanitary sewer design related to existing site conditions.

4 SITE STORM SERVICING

4.1 EXISTING CONDITION

The subject property is within the Ottawa Health Sciences Centre (OHSC) campus at 451 Smyth Road. Most of the runoff from the institutional land is directed towards the 600mm storm sewer at the north-west corner of the site south of the Ring Road. The sewer discharges ultimately to the Rideau River.

Based on the *Ottawa Health Sciences Centre Stormwater Master Plan* and the City of Ottawa pre-consultation notes, the allowable release rate from the site must consider a pre-development C value of 0.5 and control peak flows to a 2-year event. The allowable release rate has been set to 215.7 l/s for the site. Flow exceeding this amount up to the 100-year storm are retained on site and released at a rate not exceeding 215.7 l/s.

4.2 ANALYSIS OF AVAILABLE CAPACITY IN PUBLIC INFRASTRUCTURE

Based on the *Ottawa Health Sciences Centre Stormwater Master Plan*, the overall existing OHSC campus dual drainage system does not meet City of Ottawa criteria which resulted in the criteria for future development noted in section 4.1. For the proposed development, the allowable release rate from the site is consistent with the recommendations of the *Ottawa Health Sciences Centre Stormwater Master Plan*, which will reduce the runoff from the site to the existing storm sewer.

The total controlled site draining to the existing 900mm storm sewer is approximately 1.805 ha. There is approximately 0.215 ha of uncontrolled area (including the one-storey roof) draining towards the site boundary in all directions. Runoff from the controlled areas discharges to the 600mm storm sewer at the north-west corner of the site which ultimately drains to the 900mm storm sewer on Ring Road. On-site attenuation to a 100-year flow results in a flow of 208 l/s from this area. Using information from the previous studies, the slope of the existing 900mm storm sewer is at a slope of 1.8% with a capacity of 2538.8 l/s. as the proposed stormwater management works for the site will reduce the runoff rate to a peak discharge at the outlet equal to 215.7 l/s, capacity in the minor system is not a concern.

The release rate of 215.7 l/s is calculated in the Stormwater Management Report.

4.3 DRAINAGE DRAWING

Drawing C106 to C108 shows the detailed site sewer network. Drawings C103 to C105 provides proposed grading and drainage and includes existing grading information. Drawing C110 and C111 provides post-development drainage area plans, including both site and roof information. Site sub-area information is also provided on the storm sewer design sheet attached in Appendix C. An overall grading plan and Servicing plan have also been attached to Appendix C for reference.

4.4 WATER QUANTITY CONTROL OBJECTIVE

Refer to the Stormwater Management Report for the water quantity objective for the site.

4.5 WATER QUALITY CONTROL OBJECTIVE

On-site quality control measures are expected for the proposed development per the previous studies. It is assumed that enhanced protection (80% TSS removal of suspended solids) will be required for the site.

4.6 DESIGN CRITERIA

The stormwater system was designed following the principles of dual drainage, making accommodation for both major and minor flow.

Some of the key criteria include the following:

• Design Storm (minor system)	1:2 year return (Ottawa)
• Rational Method Sewer Sizing	
• Initial Time of Concentration	10 minutes
• Runoff Coefficients	
Landscaped Areas	C = 0.25
Playground Mulch Areas	C = 0.40
Gravel Areas	C = 0.75
Asphalt/Concrete	C = 0.90
Traditional Roof	C = 0.90
• Pipe Velocities	0.80 m/s to 6.0 m/s
• Minimum Pipe Size	250 mm diameter (200 mm CB Leads and service pipes)

4.7 PROPOSED MINOR SYSTEM

The detailed design for this site will maintain the existing 600mm storm sewer connection to the 900mm storm sewer located on the Ring Road. The drainage system consists of a series of manholes, catchbasins and storm sewers leading to the outlet manhole Ex.MH at the north-west of the site. All drainage areas on the site are collected in the site piped drainage system.

It is also customary for larger buildings to be provided with piped storm services for roof drainage. The roof drains for the proposed school are connected to the storm sewer that flows into the sewer in an uncontrolled capacity, ensuring an unobstructed flow for these areas.

Using the above noted criteria, the existing on-site storm sewers were sized accordingly. A detailed storm sewer design sheet and the associated post development storm sewer drainage area plan are included in Appendix C.

4.8 STORMWATER MANAGEMENT

Refer to the Stormwater Management Report.

4.9 INLET CONTROLS

Refer to the Stormwater Management report.

4.10 ON-SITE DETENTION

Refer to the Stormwater Management report.

4.11 WATERCOURSES

There will be no modification to watercourses as a result of this proposed site plan.

4.12 PRE AND POST DEVELOPMENT PEAK FLOW RATES

Pre and post development peak flow rates have been noted in the Stormwater Management Report.

4.13 DIVERSION OF DRAINAGE CATCHMENT AREAS

There will be no diversion of existing drainage catchment areas arising from the proposed work described in this report.

4.14 DOWNSTREAM CAPACITY WHERE QUANTITY CONTROL IS NOT PROPOSED

This checklist item is not applicable to this development as quantity control is provided.

4.15 IMPACTS TO RECEIVING WATERCOURSES

No significant negative impact is anticipated to downstream receiving watercourses due to proposed quantity and quality control measures.

4.16 MUNICIPAL DRAINS AND RELATED APPROVALS

There are no municipal drains on the site or associated with the drainage from the site.

4.17 MEANS OF CONVEYANCE AND STORAGE CAPACITY

The means of flow conveyance and storage capacity are described in Sections 4.7, 4.8, 4.9 and 4.10 above.

4.18 HYDRAULIC ANALYSIS

Hydraulic calculations for the site storm sewers are provided in the storm sewer design sheet.

4.19 IDENTIFICATION OF FLOODPLAINS

There are no designated floodplains on the site of this development.

4.20 FILL CONSTRAINTS

There are no known fill constraints applicable to this site related to any floodplain. The site is generally being raised higher relative to existing conditions.

5 SEDIMENT AND EROSION CONTROL

5.1 GENERAL

During construction, existing storm sewer system can be exposed to sediment loadings. Several construction techniques designed to reduce unnecessary construction sediment loadings will be used, including:

- Silt sacks will remain on open surface structures such as manholes and catchbasins until these structures are commissioned and put into use;
- Installation of silt fence, where applicable, around the perimeter of the proposed work area.
- The installation of straw bales within existing drainage features surrounding the site;
- Bulkhead barriers will be installed in the outlet pipes;
- Mud mats will be placed at the site entrances;

During construction of the services, any trench dewatering using pumps will be fitted with a "filter sock." Thus, any pumped groundwater will be filtered prior to release to the existing surface runoff. The contractor will inspect and maintain the filter sock as needed including sediment removal and disposal.

All catchbasins, and to a lesser degree, manholes, convey surface water to sewers. Consequently, until the surrounding surface has been completed, these structures will be covered to prevent sediment from entering the minor storm sewer system. These measures will stay in place and be maintained during construction and build-out until it is appropriate to remove them.

During construction of any development both imported and native soils are placed in stockpiles. Mitigative measures and proper management to prevent these materials entering the sewer system are needed.

During construction of the deeper watermains and sewers, imported granular bedding materials are temporarily stockpiled on site. These materials are however quickly used up and generally placed before any catchbasins are installed.

Refer to the Erosion and Sedimentation Control Plan C109 provided in Appendix D.

6 APPROVAL AND PERMIT REQUIREMENTS

6.1 GENERAL

The proposed development is subject to site plan approval and building permit approval.

No approvals related to municipal drains are required.

No permits or approvals are anticipated to be required from the Ontario Ministry of Transportation, National Capital Commission, Parks Canada, Public Works and Government Services Canada, or any other provincial or federal regulatory agency.

7 CONCLUSION CHECKLIST

7.1 CONCLUSIONS AND RECOMMENDATIONS

It is concluded that the proposed development can meet all provided servicing constraints and associated requirements. It is recommended that this report be submitted to the City of Ottawa in support of the application for site plan approval.

7.2 COMMENTS RECEIVED FROM REVIEW AGENCIES

Phase 3 Pre-Consultation Review Feedback for 451 Smyth Road was received March 28th, 2024. There were no engineering comments to be addressed in this 3rd version of the report.

APPENDIX

A

- PRE-CONSULTATION MEETING NOTES
- ARCHITECTURAL SITE PLAN
- TOPOGRAPHICAL SURVEY PLAN

File No.: PC2023-0222

August 25, 2023

Nadia De Santi
WSP
Via email: nadia.de-santi@wsp.com

Subject: **Phase 1 - Pre-Consultation: Meeting Feedback**
Proposed Site Plan and likely Zoning By-Law Amendment Application – 451 Smyth Road and 630 Peter Morand

Please find below information regarding next steps as well as consolidated comments from the above-noted pre-consultation meeting held on August 23, 2023.

Pre-Consultation Preliminary Assessment

1 ☐	**2** ☐	**3** ☐	**4** ☒	**5** ☐

One (1) indicates that considerable major revisions are required while five (5) suggests that the proposal appears to meet the City's key land use policies and guidelines. This assessment is purely advisory and does not consider technical aspects of the proposal or in any way guarantee application approval.

Next Steps

1. A review of the proposal and materials submitted for the above-noted pre-consultation has been undertaken. Please proceed to complete a Phase 2 Pre-consultation Application Form and submit it together with the necessary studies and/or plans to planningcirculations@ottawa.ca.

2. In your subsequent pre-consultation submission, please ensure that all comments or issues detailed herein are addressed. A detailed cover letter stating how each issue has been addressed must be included with the submission materials. Please coordinate the numbering of your responses within the cover letter with the comment number(s) herein.

3. Please note, if your development proposal changes significantly in scope, design, or density before the Phase 3 pre-consultation, you may be required to repeat the Phase 2 pre-consultation process.

Supporting Information and Material Requirements

1. The attached **Study and Plan Identification List** (SPIL) outlines the information and material that has been identified, during this phase of pre-consultation, as either required (R) or advised (A) as part of a future complete application submission.

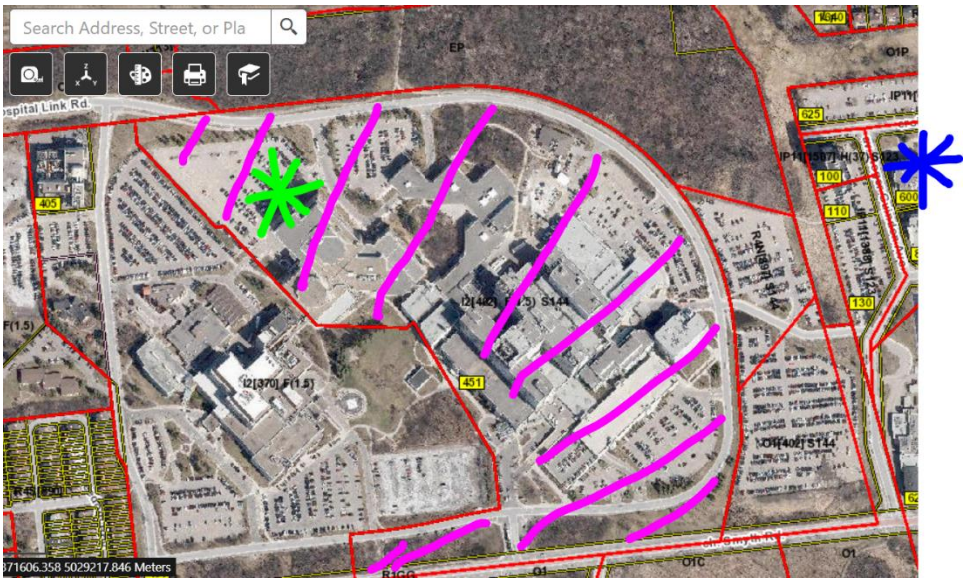
a. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on Ottawa.ca. These ToR and Guidelines outline the specific requirements that must be met for each plan or study to be deemed adequate.

Consultation with Technical Agencies

1. You are encouraged to consult with technical agencies early in the development process and throughout the development of your project concept. A list of technical agencies and their contact information is enclosed.

Planning (Tracey Scaramozzino, Mitch Lesage – Zoning):

Basic Understanding of the Site and proposed development:



Green star is proposed new AMRC bldg and the pink is the 'one lot for zoning purposes (if we are only looking at TOH – General Campus – but there is the possibility of including the CHEO site immediately to the west). The Peter Morand site is the blue star and is not on the same lot for zoning purposes.

1. Site is part of TOH – General Campus. It was determined (in Dec 2022 pre pre con notes) that the site of 451 Smyth would be reviewed as one site for zoning purposes (S. 93) – since the entire property (despite the various bldgs and roads etc) functions as one lot and was developed together.
2. One option for the AMRC building is to request a MV for the site to allow:

a. Reduced parking for the AMRC bldg
b. To permit parking for AMRC bldg to be located away from the bldg

Note: City staff cannot guarantee a positive decision from the cofa panel

3. The Peter M site would need to be rezoned to allow it to be used as a parking lot (for the AMRC bldg)

Questions from the Applicant for the Phase 1 precon, Aug 23, 2023:

1. **Confirmation that the AMRC building would be considered a "post-secondary educational institution" at 451 Smyth.**

- City Response: At the Aug 23, 2023 Phase 1 Preconsultation meeting, the Applicant provided confirmation that this facility functions as a Post-secondary educational institution – as described in the Zoning Definition outlined below. If the site needs to be rezoned – the Applicant could consider adding in the R&D use, but this is not necessary for the current proposal.

> **Post-secondary educational institution** includes a:
>
> 1. university which means a **place** of higher education, which has a body of teachers and students on the premises, and that offers instruction at the undergraduate level, post-graduate level, or both, and which is empowered by law to grant a degree upon the successful completion of a prescribed course of study;
> 2. college which means a college of applied arts and technology or other similar **place** of post secondary education which has a body of teachers and students on the premises, and that provides instruction in business, a trade, or a craft; and that is empowered by law to grant diplomas, licenses or certificates that permit the holders to represent themselves as qualified to work in a particular trade or occupation; or
> 3. any **residential use buildings, dwelling units** or **rooming units ancillary** to and located on the same **lot** as a university or college. (établissement d'enseignement postsecondaire)

2. **Can the overflow proposed Parking lot at 630 Peter Morand Crescent be considered accessory parking to the proposed use at 451 Smyth?**

- City Response: The lot at 630 Peter Morand could not be considered as 'accessory parking'. The 630 Peter Morand site would be a parking lot and would have a clause on title to confirm that XXX spaces were for the developments at 451 Smyth (including the RGN and AMRC buildings and others). This 'parking lot' use would require a rezoning application.
- Other Brainstorming ideas to assist with timing (to start construction on the AMRC building soon, which likely then puts parking numbers into non-compliance as per zoning):
    - Applicant to consider applying for MV to reduce the parking rate for 451 Smyth. City staff can't be sure that the cofa panel would be supportive, esp since it is a public process and nearby residents may have concerns over over-flow parking on the local streets.

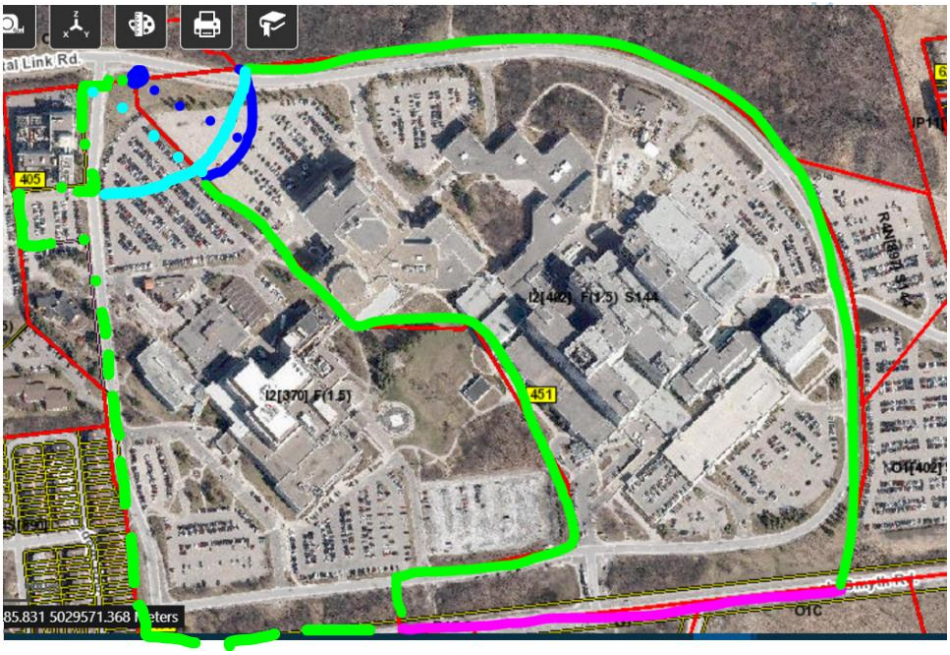
- Applicant to determine if they are OVER-providing parking at 451 Smyth – that they can then allocate to the new building
- City staff are reviewing if this file can be fast-tracked with High Economic Impact Project (HEIP) process

3. **Is there another option to allow a parking lot on Peter Morand to be tied to the proposed AMRC use without needing another development application approval? Would an internal bus service from another lot help resolve this issue?**

- The Peter M site would need to be rezoned to allow for a parking lot – and then it would be tied to the 451 smyth/AMRC bldg.
- I don't believe there is a way to avoid another devt application.
- The bus idea would be useful to make the sites function together and would make the request to reduce the parking on site at the AMRC bldg more amenable, but won't help in the zoning provisions to allow the site to be used as a parking lot.

4. **The December 2022 Pre consultation meeting minutes referred to "the point in the top left corner is a rear point" for 451 Smyth. Please confirm what this means in relation to the rear yard setback zoning requirement. Please note that the Ring Road is privately owned**.

- City Response: Pls refer to marked-up drawing below. The rear lot is the blue point in the north-west corner. The rear yard setback would be drawn out as a straight line from the centre – as shown in dark blue. The front lot line is along Smyth and shown in pink and the remaining lines are interior lot lines and shown in green.
- If CHEO and TOH are under the same 'ownership', the lot line would change to the dashed green line to the west and then the light-blue point and arc would be the rear lot point and setback.



5. **Please confirm that the minimum parking space rate for a post secondary educational institution of 0.75 m per 100 m^2 of gross floor area would be applied for both 451 Smyth and 630 Peter Morand only.**

- City Response: With the AMRC bldg being considered a post-secondary facility, then that parking rate would be used for the amount of req'd parking at the site as well as what is allocated to the AMRC bldg

6. **Do we need to use the minimum parking space rate shown in Section 206, provision 11(h) for 630 Peter Morand ?**

(h) parking must be provided for all uses at the rate of one space per 100 square metres of gross floor area;

- City Response: 11(h) above does not apply, as that would only be for uses that located on that site. If this site is rezoned as a parking lot for 451 Smyth, the parking rate would be the requirement for the post-secondary institution – as the spaces would be tied to AMRC building. - BUT – the parking lot doesn't have a GFA so this wouldn't apply…

7. **The construction of the AMRC building at 451 Smyth will result in the removal of the parking lot that currently services the existing RGN building, which is adjacent to the site. Does the proposed parking lot at 630 Peter Morand need to be operational before decommissioning the existing parking lot at 451**

Smyth? If yes, would the 630 Peter Morand parking be considered a permanent or a temporary lot?

- City Response: If REQD parking is being removed and can't be located elsewhere at 451 Smyth (possibly adding additional spaces if required/possible – including smaller car sizes if appropriate), then yes, Peter M parking lot needs to be up 1st (zoning in place and parking lot built);

TOH (George): explained that the 630 Peter Morand site was conveyed to university for development. He will forward the conveyance agreement in case there is an opportunity to develop the site for a parking lot without the zoning requirement for the parking lot use. (630 Peter M has a building and a surface parking lot and part of the lot is also vacant grassed lands.)

if there is no where else for the vehicular parking at 451 Smyth Road, then yes, the lot at 630 Peter M would need to be operational. I presume it would be a permanent parking lot, as it will be needed on a permanent basis for the existing RGN bldg and the proposed AMRC bldg.

8. **Regarding the list of plans and studies, we would like to understand where the City is at with the revisions to the Terms of Reference**.

- City Response: The TOR's have been updated and are on the City's website.

9. **What would be needed in a Zoning Conformance Report that wouldn't be provided in a Planning Rationale?**

- City Response: the Zoning Conformance Report should go through every provision of the Zoning By-Law that applies to this site. It may or may not be the same as what you already provide in the Planning Rationale.

10. **Confirmation that we don't need to go through the UDRP process.**

- City Response: no requirement for UDRP, as it is not within a 'design priority area' in Schedule C7-A.

11. **Confirmation of Phases 2 and 3 requirements and timing, under the City's new multi-tiered pre application consultation process.**

- City Response: Our goal is to conduct a meeting within 10 business days and provide feedback to the Applicant in 3 business days for phases 1 and 2. Phase 3

allows the City 10 business days for internal review against the City's TOR and to provide feedback in 5 business days. These timelines are NOT regulated and will strive to meet them.

- Phase 2 is required to discuss the parking situation and whether the Rezoning is required for the parking lot at 630 Peter Morand and also to review the conveyance agreement with the City and the High Economic Impact Project opportunity.

Urban Design (Nader Kadri):

- Formal comments not received.

Engineering (Tyler Cassidy):

1. The Stormwater Management Criteria, for the subject site located at **451 Smyth Road**, is to be based on the following:

    a. The 2-yr & 5-yr storm event using the IDF information derived from the Meteorological Services of Canada rainfall data, taken from the MacDonald Cartier Airport, collected 1966 to 1997.

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

    c. The City of Ottawa requires, at minimum, controlling the post-development flows to the pre-development peak flow during the 5-year event. The applicant has stated that the Ottawa Hospital General Campus has more restrictive SWM criteria, with a recommended post-development release rate being controlled to the pre-development 2 year storm event.

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

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

    f. Quality control is to be provided on-site to the 'enhanced' criteria (80% TSS removal). Records show that there is an existing OGS unit providing some level of quality control downstream the site on Hospital Link Road. It is the consultant/applicant's responsibility to confirm what level of service is being provided by existing infrastructure downstream, and to provide detailed OGS sizing calculations that confirm an overall TSS removal of 80% is being achieved. Any shortfall in TSS removal from the existing OGS unit is expected to be made up on site.

g. If the soils are conducive to LIDs then explore LID measures on-site or use the City's Low Impact Development Technical Guidance Report (Dillon – February 2021) to develop Best Management Practices

2. The Stormwater Management Criteria, for the subject site located at **630 Peter Morand Crescent**, is to be based on the following:

    a. The 2-yr & 5-yr storm event using the IDF information derived from the Meteorological Services of Canada rainfall data, taken from the MacDonald Cartier Airport, collected 1966 to 1997.

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

    c. The Allowable release rate is to be based on the approved Stormwater Management Report "*Proposed Relocation of the Existing Stormwater Pond at the Ottawa Life Sciences Technology Park*" prepared by Stantec, dated November 19, 2002, revised December 17, 2002.

    d. All runoff beyond the minor system allowable release rate is to be controlled/stored on site up to the 100-year design storm.

    e. Quality control is to be provided to the 'enhanced' criteria (80% TSS removal). There is an existing stormwater management facility located at 775 Peter Morand Crescent which provides some level of quality control for this site. It is the consultant/applicant's responsibility to confirm that 80% TSS removal is being provided to the site. Any shortfall in TSS removal from the existing stormwater management facility is expected to be made up on site.

3. Deep Services – **451 Smyth Road** (Storm, Sanitary & Water Supply)

    a. 305mm dia. Watermain on Hospital Link Rd. (Private)

    b. Service areas with a basic day demand greater than 50 m^3/day shall provide a minimum of two water main connections to avoid the creation of vulnerable service areas.

    c. 375 mm dia. Conc. Sanitary Sewer on Hospital Link Road.(Private)

    d. Existing STM MH connecting to 600 mm dia. Conc. Storm Sewer on Hospital Link Road (MHST49588), or;

    e. Existing STM MH connecting to 300 mm dia. Conc. Storm Sewer on Hospital Link Road (MHST49589)

4. Deep Services – **630 Peter Morand Crescent** (Storm, Sanitary & Water Supply)

a. 305mm dia. PVC Watermain on Peter Morand Crescent.

b. 250 mm dia. PVC sewer on Peter Morand Crescent.

c. Existing 750 mm dia. Conc. STM sewer on Peter Morand Crescent.

5. General Servicing Comments:

    d. Connections to trunk sewers and easement sewers are typically not permitted.

    e. A sanitary monitoring maintenance hole is required if the sanitary service connects to a *public* sanitary sewer. The monitoring maintenance hole should be located in an accessible location on private property near the property line (ie. Not in a parking area). If the proposed sanitary service connects to a *private* sanitary sewer, a monitoring maintenance hole will not be required.

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

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

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

        iii. 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,

        iv. 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.

        v. 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:

    a. Location of service

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

    c. Average daily demand: ___ l/s.

d. Maximum daily demand: ___l/s.

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

7. An MECP Environmental Compliance Approval **Industrial Sewage Works or Private Sewage Works** maybe required for the proposed development. Please contact the Ministry of the Environment, Conservation and Parks, Ottawa District Office to arrange a pre-submission consultation:

    f. Emily Diamond at (613) 521-3450, ext. 238 or Emily.Diamond@ontario.ca

8. Background studies include:

    a. **451 Smyth Road:** "Design Brief – Hospital Link Storm Drainage System Alta Vista Transportation Corridor" prepared by Delcan, consultant report no. T03016EOD, dated May 21, 2014.

    b. **451 Smyth Road:** "Design Brief – Hospital Link Storm Drainage System Alta Vista Transportation Corridor ADDENDUM" prepared by Delcan, consultant report no. T03016EOD, dated August 13, 2014.

    c. **630 Peter Morand Crescent:** Stormwater Management Report "Proposed Relocation of the Existing Stormwater Pond at the Ottawa Life Sciences Technology Park" prepared by Stantec, dated November 19, 2002, revised December 17, 2002.

9. Frontage Charges do not apply to this application.

10. There are no Capital Works Projects scheduled within the vicinity of this project.

Feel free to contact Tyler Cassidy, Infrastructure Project Manager, for follow-up questions.

Noise (Mike Giampa):

11. A Road Noise Impact Study is required

Feel free to contact Mike Giampa, TPM, for follow-up questions.

Transportation (Mike Giampa):

12. A TIA is warranted- proceed to scoping (step 2). Required modules can be adjusted at this step. The Scoping report must be submitted at Phase 2 precon (if applicable) or 14 calendar days prior to Phase 3 precon.

13. The application will not be deemed complete until the submission of the draft step 2-3. Synchro files are required at Step 3/Phase 3 precon for a complete submission.

14. Ensure that the clear throat requirements meet TAC guidelines (applies to arterial and collectors only).

15. A Road Noise Impact Study is required.

16. Ensure that the development proposal complies with the Right-of-Way protection requirements of the Official Plan's Schedule C16. The ROW protection will then be verified at submission. Any requests for exceptions to ROW protection requirements must be discussed with Transportation Planning and concurrence provided by Transportation Planning management.

    i. See Schedule C16 of the Official Plan.

17. Any requests for exceptions to ROW protection requirements must be discussed with Transportation Planning and concurrence provided by Transportation Planning management.

Feel free to contact Mike Giampa, Transportation Project Manager, for follow-up questions.

Environment and Trees

1. Comments not received.

Feel free to contact Matthew Hayley, Environmental Planner, or Mark Richardson, Forester, for follow-up questions.

Parkland (Steve Gauthier):

18. Cash-in-lieu of parkland will be required as per the Parkland Dedication Bylaw

    a. Parkland Dedication By-law No. 2022-280

Feel free to contact Steve Gauthier, Parks Planner, for follow-up questions.

Conservation Authority (RVCA – Eric Lalande)

19. Ensure the reduction of quantity control from 5yrs to 2yrs does not negatively impact erosion.

Feel free to contact Eric Lalande, RVCA, for follow-up questions.

Other

20. For the Site Plan Control stage: The High Performance Development Standard (HPDS) is a collection of voluntary and required standards that raise the performance of new building projects to achieve sustainable and resilient design. The HPDS was passed by Council on April 13, 2022.

    a. At this time, the HPDS is not in effect and Council has referred the 2023 HPDS Update Report back to staff with direction to bring forward an updated report to Committee with recommendations for revised phasing timelines, resource requirements and associated amendments to the Site Plan Control By-law by no later than Q1 2024.

    b. Please refer to the HPDS information attached and ottawa.ca/HPDS for more information.

21. The City is reviewing this application for potential “High Economic Impact Process – HEIP” which would help to speed the file through the approval process. The File Lead or the HEIP team (while the file lead is away Sept 2-Sept 18) will advise if the file is selected.

Submission Requirements and Fees

1. The attached **Study and Plan Identification List** (SPIL) outlines the information and material that has been identified as either required (R) or advised (A) as part of a future complete application submission.

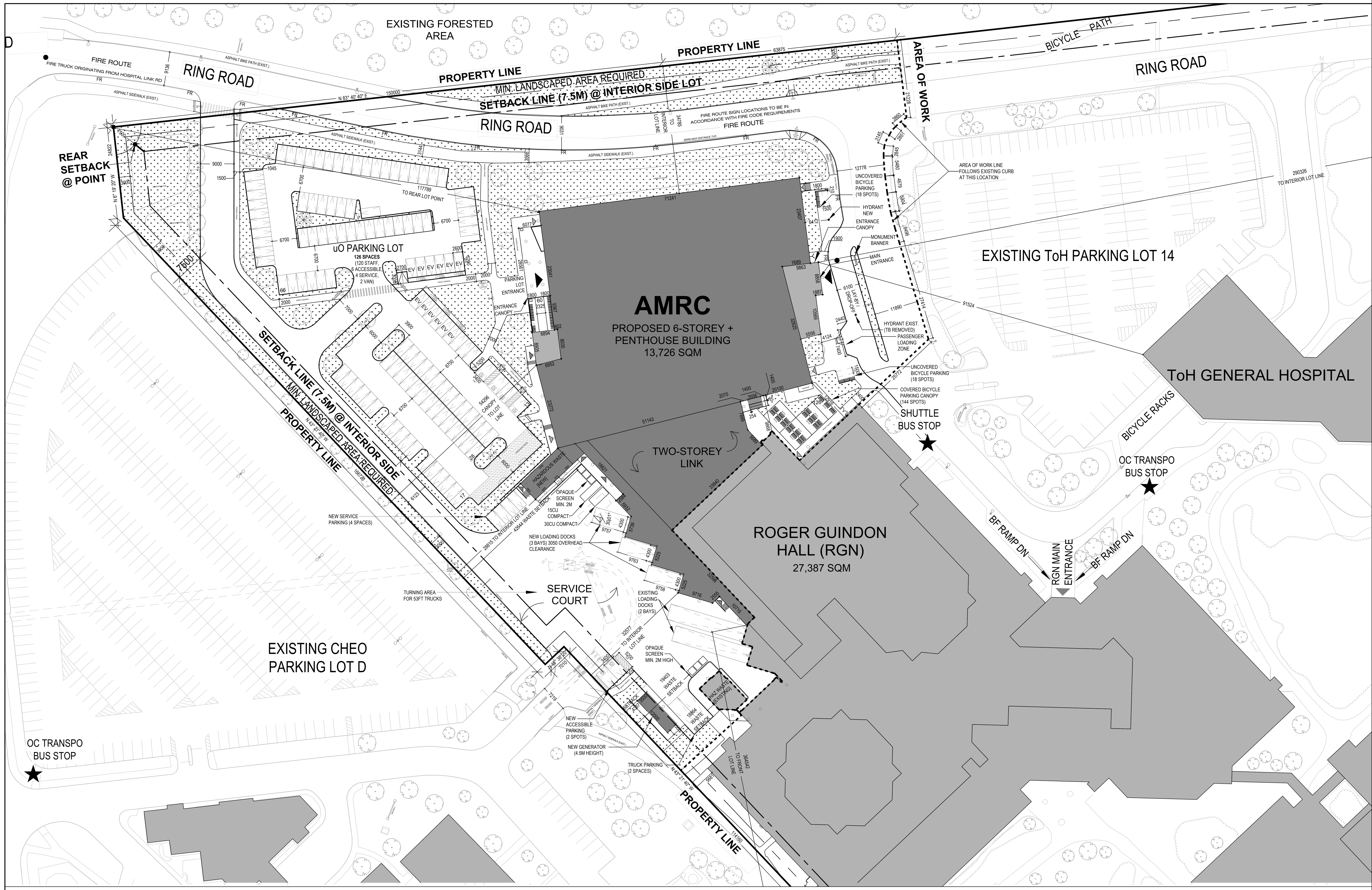
    a. The required plans and studies must meet the City’s Terms of Reference (ToR) and/or Guidelines, as available on Ottawa.ca. These ToR and Guidelines outline the specific requirements that must be met for each plan or study to be deemed adequate.

2. All of the above comments or issues should be addressed to ensure the effectiveness of the application submission review.

Should there be any questions, please do not hesitate to contact myself or the contact identified for the above areas / disciplines.

Yours Truly,
Tracey Scaramozzino

cc.
City contacts, as per above



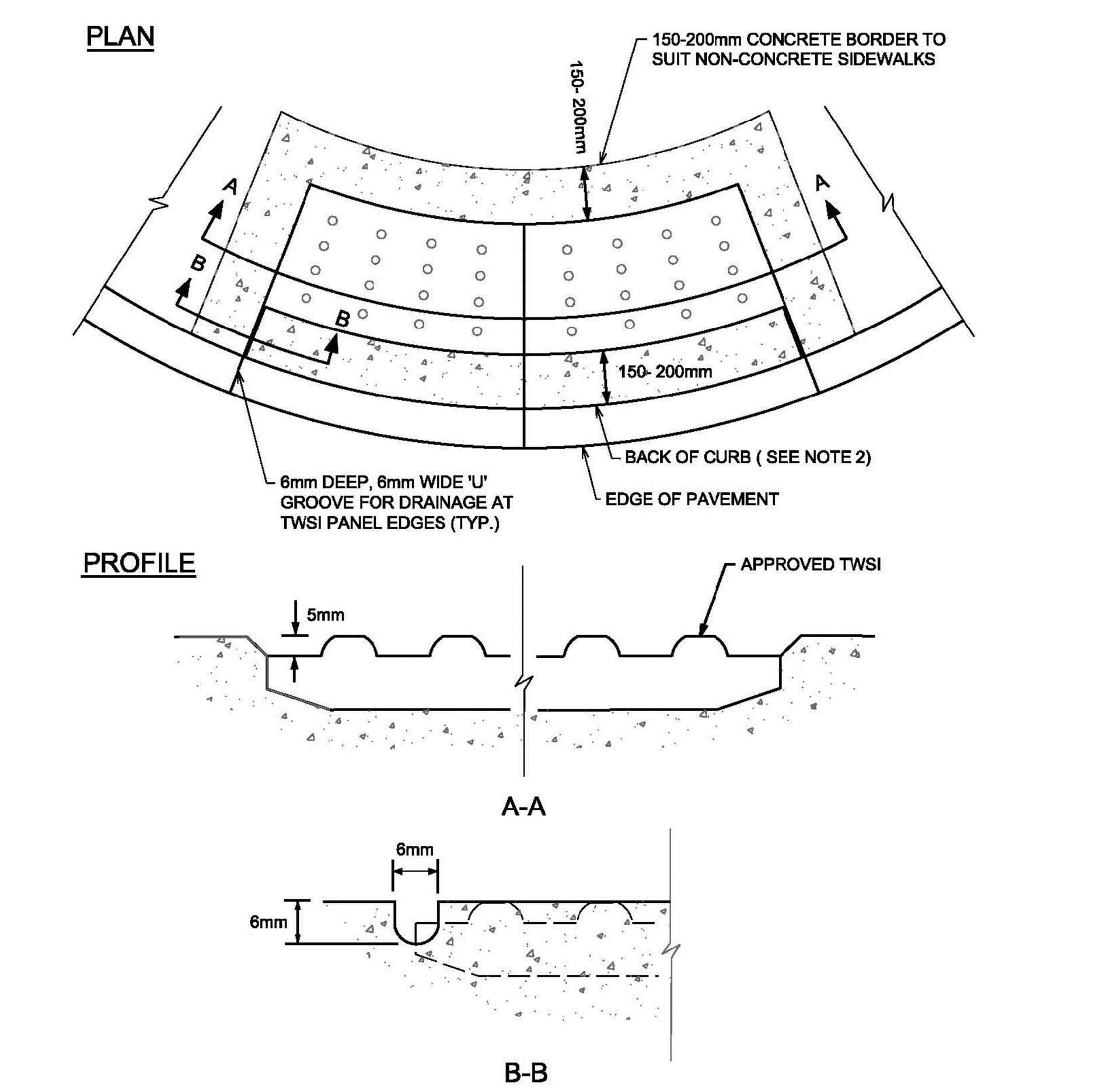
SITE PLAN - PROPOSED (1 / A1000) 1:500

LEGEND

- EXISTING ELEMENT
- NEW ELEMENT
- NEW ELEMENT - CANOPY
- SNOW STORAGE AREA
- LANDSCAPED AREA
- BUILDING ENTRANCE
- SERVICE ENTRANCE
- EMERGENCY EXIT
- PROPERTY LINE
- SETBACK LINE
- LANDSCAPE BUFFER LINE
- AREA OF WORK LINE
- EV ELECTRIC VEHICLE PARKING SPOT
- FR FIRE ACCESS ROUTE SIGN
- CR CURB RAMP
- TREE
- ACCESSIBLE PARKING SPOT
- STANDARD EXT. LIGHT FIXTURE
- STANDARD EXT. POST LIGHT

0 10 20 50 100

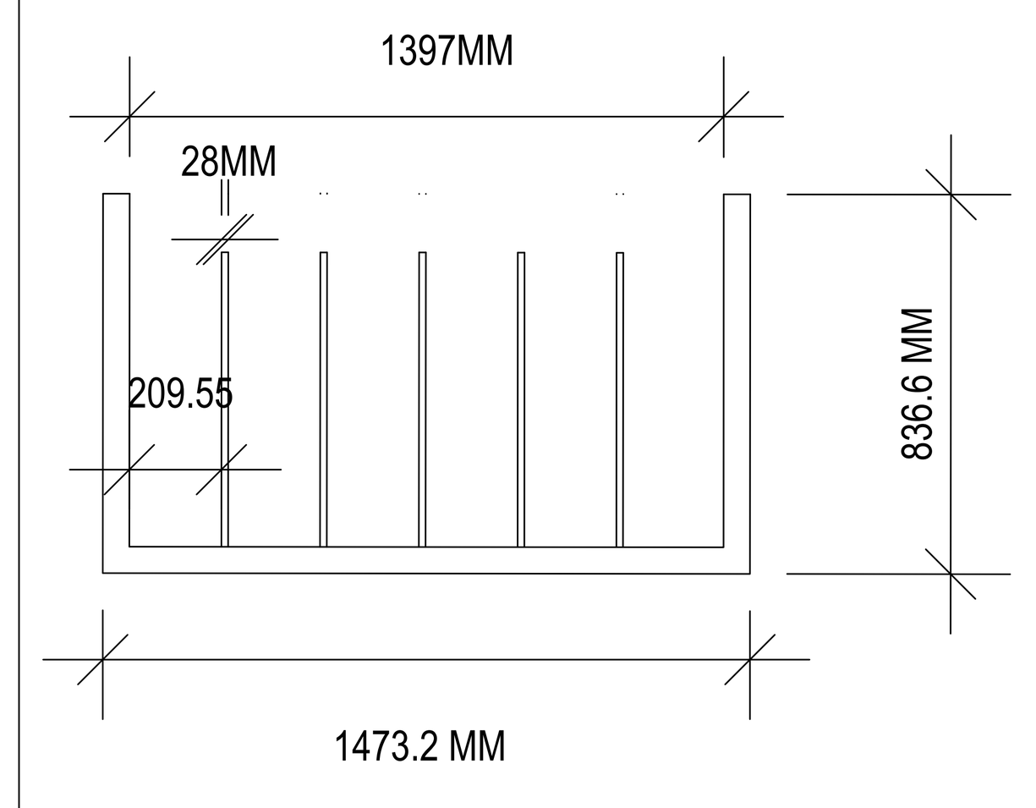
SCALE BAR 1:500



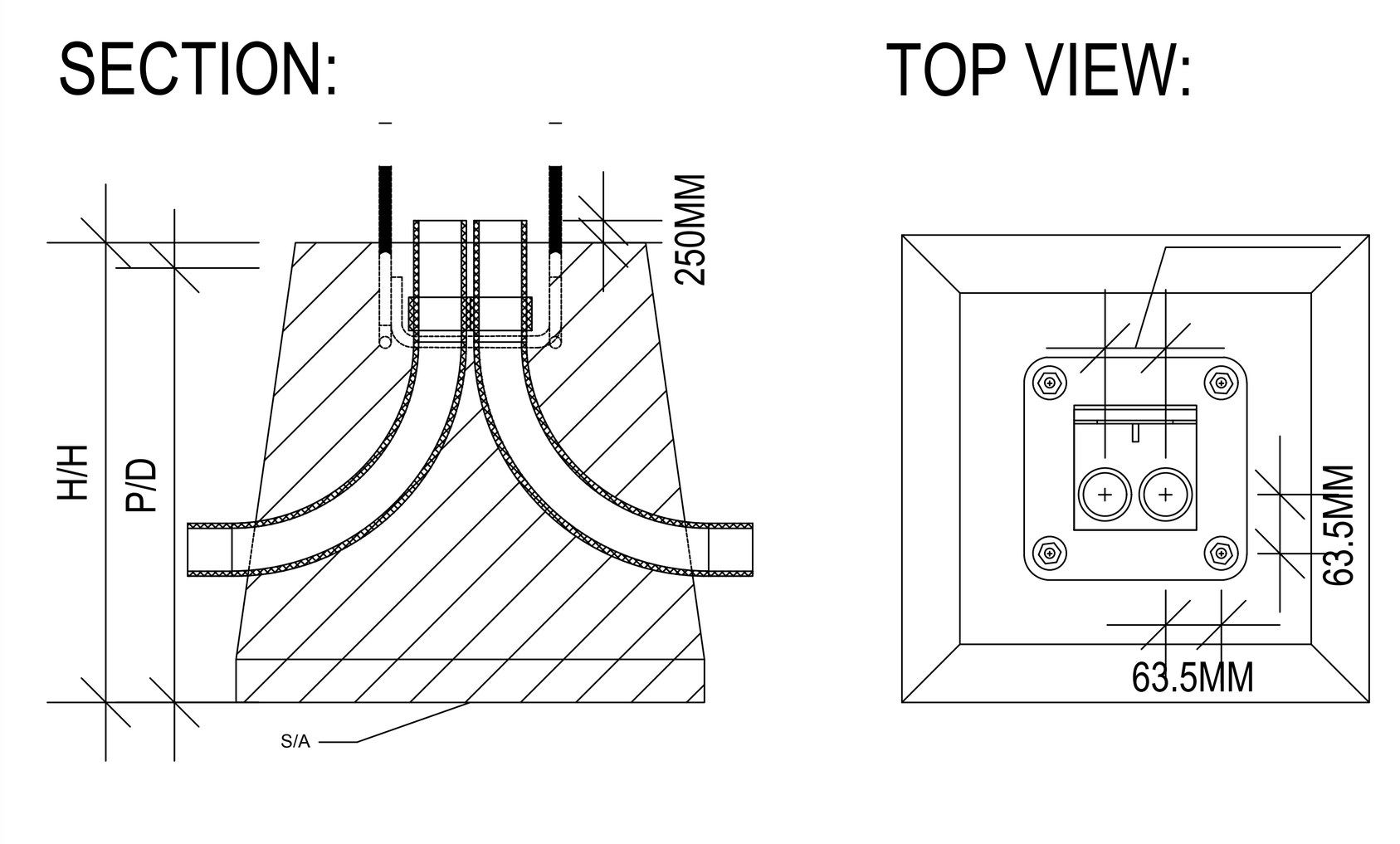
NOTES:
1. TOPS OF TWSI'S (TACTILE WALKING SURFACE INDICATOR) SHALL BE ALIGNED & LEVEL WITH THE ADJACENT CONCRETE SURFACE & INSTALLATION IN WET CONCRETE SHALL BE EFFECTIVE IN PERMANENTLY SECURING THE TWSI IN PLACE ONCE DRY.
2. FOR MONOLITHIC SIDEWALKS, TWSI SHALL BE 300 TO 350mm BACK FROM THE CURB FACE.

N.T.S.

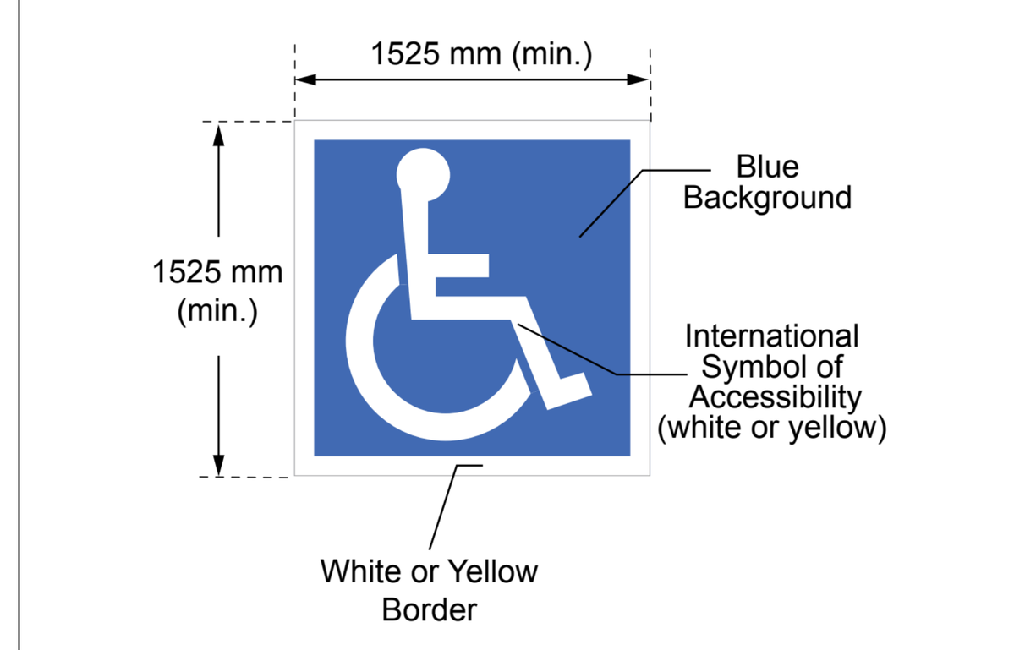
DETAIL - TYPICAL CURB RAMP / DEPRESSED CURB (2 / A1000) NTS



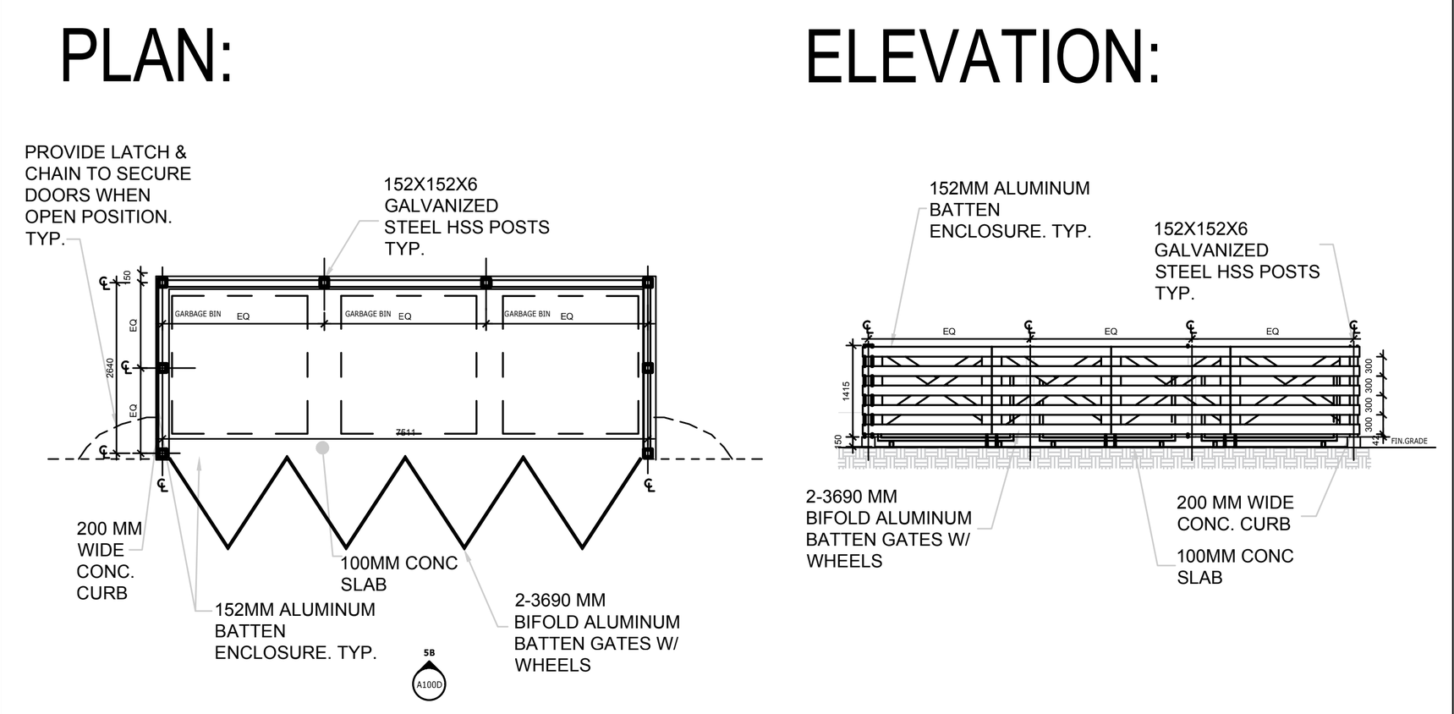
DETAIL - TYPICAL BICYCLE RACK (3 / A1000) NTS



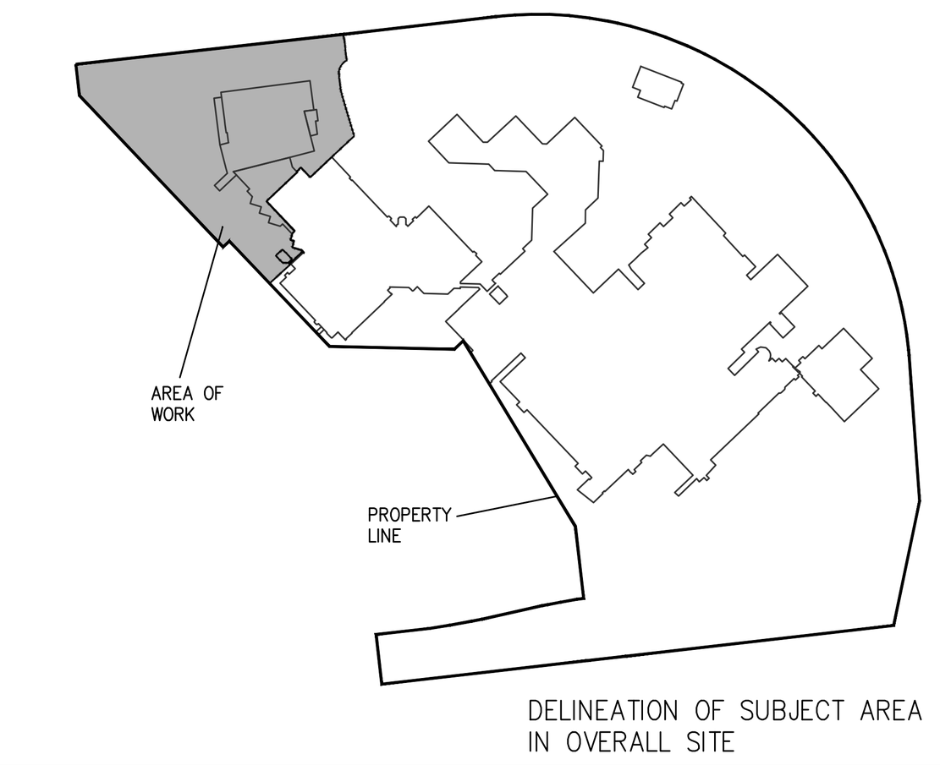
DETAIL - TYPICAL EV CHARGER (5 / A1000) NTS



DETAIL - ACCESSIBLE PARKING PAVEMENT MARKING (4 / A1000) NTS



DETAIL - TYPICAL WASTE ENCLOSURE (6 / A1000) NTS



REFERENCE SURVEY:	1) 2023-11-25 REF. NO. 105 - 15 (JG) GR* 2) 2022-11-22 FILE NO. 623-22**
MUNICIPAL ADDRESS:	451 SMYTH ROAD, OTTAWA, ON K1H 8M5, CANADA
PIN:	04258-0412
ZONE:	I2 [402] F(1.5) S144
SCHEDULE 1A:	AREA B - INNER URBAN
SCHEDULE 1B:	AREA B

AREA OF WORK:	24,078.02 M2
COMPLETE SITE AREA:	204,834.211 M2
GFA (CITY OF OTTAWA DEF.) OF PROPOSED AMRC:	13,726.17 M2
GFA (CITY OF OTTAWA DEF.) OF EXIST. BUILDINGS ON SITE:	128,023 M2
GFA (CITY OF OTTAWA DEF.) OF PROPOSED + EXIST. BLDGS ON SITE:	141,749.17 M2
BUILDING HEIGHT:	40.3M (6 STOREYS + MECHANICAL PENTHOUSE AND ATRIUM ROOF)

ZONING PROVISION	REQUIRED	PROVIDED
MIN. LOT WIDTH	NO MINIMUM	257.13 M
MIN. LOT AREA	NO MINIMUM	204834.211 M
MIN. FRONT YARD SETBACK	46M	YES - 364.54M
MIN. REAR YARD SETBACK***	7.5M	YES - 117.79
MIN. INTERIOR YARD SETBACK	7.5M	YES - 34.79M
MAX. HEIGHT	NO MAXIMUM	39.1 M
LANDSCAPED AREA (AREA OF WORK)	15%	22.8% (5502.69 M2)
LANDSCAPED AREA (SITE)	15%	29% (59721.75 M2)

PARKING QUEING + LOADING	REQUIRED	PROVIDED
EXISTING PARKING SPACES	1617	2079
EXISTING SPACES TB ELIMINATED	N/A	361
PROPOSED PARKING SPACES	N/A	120
PROPOSED SERVICE SPACES	N/A	6
PROPOSED ACCESSIBLE SPACES	3	6
PROPOSED TOTAL SPACES	103	126
TOTAL PARKING (EXIST. + PROPOSED)	1720	1863
BY USE: AMRC (POST-SEC. FACTOR)	103	126
BY USE: RGN (POST-SEC. FACTOR)	205	191
BY USE: TOTAL POST-SEC. FACTOR	308	317
BY USE: DAYCARE FACTOR	13	11
BY USE: HOSPITAL FACTOR	1399	1535
EXISTING BICYCLE PARKING	267	477
PROPOSED BICYCLE PARKING (AMRC)	55	222
TOTAL BICYCLE PARKING(PRO.+EXIST.)	322	699
BY USE: AMRC (POST-SEC. FACTOR)	55	222
BY USE: RGN (POST-SEC. FACTOR)	109	190
BY USE: TOTAL POST-SEC. FACTOR	164	412
BY USE: DAYCARE FACTOR	3	0
BY USE: HOSPITAL FACTOR	100	287
EXISTING LOADING DOCKS	2	2
NEW LOADING DOCKS	2	3
TOTAL LOADING DOCKS	2	5

SITE PLAN GENERAL NOTES:

1. ALL SITE INFORMATION GATHERED FROM SURVEYS 2022-11-22 FILE NO. 623-22 AND 2023-11-25 REF. NO. 101 - 15 (JG) GR
2. NO EXISTING TREES ARE TO BE RETAINED - ALL TREES IN PLAN WILL BE PLANTED.
3. SNOW STORAGE WILL OCCUR OFF SITE. AN INTERIM SNOW STORAGE LOCATION HAS BEEN OUTLINED AS PER THE RELEVANT HATCH (SEE LEGEND).

* A PORTION OF THE LANDS OWNED BY THE OTTAWA HEALTH SCIENCES CENTRE INC. AND CHILDREN'S HOSPITAL OF EASTERN ONTARIO CHILDREN'S TREATMENT CENTRE, CITY OF OTTAWA; FARLEY, SMITH & DENIS SURVEYING LTD. 2022; 2023-11-25

** PART OF LOTS 30, 31 & 32, PART OF TERRACE ROAD (CLOSED BY JUDGE'S ORDER INST.GL40441) REGISTERED PLAN 405 PART OF LOT 15 JUNCTION GORE, GEOGRAPHIC TOWNSHIP OF GLOUCESTER BEING PART OF THE NORTHERLY AND WESTERLY LIMITS OF P.I.N. 04258-0412 CITY OF OTTAWA; FARLEY, SMITH & DENIS SURVEYING LTD. 2022; 2022-11-22

*** MEASURED TO REAR LOT POINT (REAR LOT IS A POINT, NOT A LINE)

PARKING CALCULATIONS:

VEHICLE:

GFA OF BUILDINGS ON SITE (PER CITY OF OTTAWA DEFINITION)*:

AMRC = 13,726.17 m2
RGN = 27,387 m2
TOH = 99,988 m2
OASIS = 648 m2

POST-SECONDARY FACTOR (AMRC + RGN)
= 0.75 * ((13,726.17 + 27,387)/100)
= 0.75 * (411.1317)
= 308 SPOTS

HOSPITAL FACTOR (TOH)
= 1.4 * (99,988/100)
= 1399.83 SPOTS

DAYCARE FACTOR (OASIS)
= 2 * (648/100)
= 12.96 SPOTS

TOTAL =(308+1399.83+12.96)= 1720.79 SPOTS REQ.
= 1720 SPOTS (ROUNDED)

*BUILDING AREAS AS PER PLANNING RATIONALE

BICYCLE:

GFA OF BUILDINGS ON SITE (PER CITY OF OTTAWA DEFINITION):

AMRC = 13,726.17 m2
RGN = 27,387 m2
TOH = 99,988 m2*
OASIS = 648 m2*

POST-SECONDARY FACTOR (AMRC + RGN)
= 1 * ((13,726.17 + 27,387)/250)
= 164.45 SPOTS

HOSPITAL FACTOR (TOH)
= 1 * (99,988/1000)
= 99.98 SPOTS

DAYCARE FACTOR (OASIS)
= 1 * (648/250)
= 2.59 SPOTS

TOTAL = (164.45 + 99.98 + 2.59) = 267.02 SPOTS REQ.
= 267 SPOTS TOTAL

TN

No.	Description	Date
3	ISSUED FOR SPA PHASE 3 RESUBMISSION	04/10/24
2	ISSUED FOR SPA PHASE 3 RESUBMISSION	02/26/24
1	ISSUED FOR REVISED SITE PLAN APPL.	01/22/24

Revisions:

ONTARIO ASSOCIATION OF ARCHITECTS
RICHARD WILSON HUOT
LICENCE 7932

All measurements are to be checked and verified on site by the contractor before proceeding with the work.

Do not scale the drawings.

PARKIN

Owner:
uOttawa
UNIVERSITY OF OTTAWA
451 SMYTH ROAD
OTTAWA, ONTARIO, K1H 8M5
TEL: 613-229-7104

Applicant:
PCL CONSTRUCTORS CANADA INC.
49 AURIGA DRIVE
NEPEAN, ONTARIO, K2E 8A1
TEL: 613-229-7104

Consultants:

WSP
2611 QUEENSVIEW DRIVE, SUITE 300
OTTAWA, ONTARIO, K2B 8K2
TEL: 613-829-2800

FAIRHALL MOFFATT & WOODLAND LTD.
600 TERRY FOX DRIVE, SUITE 100
OTTAWA, ONTARIO, K2L 4B6
TEL: 613-591-1495

CLELAND JARDINE ENGINEERING LTD.
580 TERRY FOX DRIVE
KANATA, ONTARIO, K2L 4B9
TEL: 613-591-1495

MERRICK
580 TERRY FOX DRIVE
KANATA, ONTARIO, K2L 4B9
TEL: 613-592-5289

Project:
ADVANCED MEDICAL RESEARCH CENTRE

Address:
451 SMYTH ROAD
OTTAWA, ON K1H 8M5

Drawn By:
Date: 04/10/2024
Checked By:
Scale: 1:500

Sheet Title:
SITE PLAN - PROPOSED

Sheet Number:
A100D

A0 841x1189

APPENDIX

B

- FIRE UNDERWRITERS SURVEY – FIRE FLOW CALCULATION FOR ADDITION
- WATER DEMAND CALCULATION
- UPDATED BOUNDARY CONDITION
- HYDRANT FLOW TEST RESULTS

Fire Flow Design Sheet (FUS)
uOttawa Advanced Medical Research Centre Building
451 Smyth Road
Project: CA0009956.0165
Date: February 2024

New Addition
Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 2020

1. An estimate of the Fire Flow required for a given fire area may be estimated by: $F = 220\ C\ \sqrt{A}$

F = required fire flow in litres per minute
C = coefficient related to the type of construction
- 1.5 for **Type V** Wood Frame Construction
- 0.8 for **Type IV-A** Mass Timber Construction
- 0.9 for **Type IV-B** Mass Timber Construction
- 1.0 for **Type IV-C** Mass Timber Construction
- 1.5 for **Type IV-D** Mass Timber Construction
- 1.0 for **Type III** Ordinary Construction
- 0.8 for **Type II** Noncombustible Construction
- 0.6 for **Type I** Fire resistive Construction

A =2-b) The single largest Floor Area plus 25% of each of the two immediately adjoining floors

A = 7448 m^2
C = 0.8
F = 15189.1 L/min

rounded off to 15,000 L/min (min value of 2000 L/min)

2. The value obtained in 1. may be reduced by as much as 25% for occupancies having a low contents fire hazard.

Non-combustible	-25%
Limited Combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Burning	25%

Reduction due to low occupancy hazard 0% x 15,000 = 15,000 L/min

3. The value obtained in 2. may be reduced by as much as 50% for buildings equipped with automatic sprinkler protection.

Adequate Sprinkler confirms to NFPA13	-30%
Water supply common for sprinklers & fire hoses	-10%
Fully supervised system	-10%
No Automatic Sprinkler System	0%

Reduction due to Sprinkler System -50% x 15,000 = -7,500 L/min

4. The value obtained in 2. is increased for structures exposed within 45 metres by the fire area under consideration.

Separation	Charge
0 to 3 m	25%
3.1 to 10 m	20%
10.1 to 20 m	15%
20.1 to 30 m	10%
30.1 to 45 m	0%

Side 1	60	0%	north side
Side 2	90	0%	east side
Side 3	2-Hr FW	0%	south side
Side 4	60	0%	west side
		0%	(Total shall not exceed 75%)

Increase due to separation 0% x 15,000 = 0 L/min

5. The flow requirement is the value obtained in 2., minus the reduction in 3., plus the addition in 4.

The fire flow requirement is 8,000 L/min (Rounded to nearest 1000 L/min)
or **133 L/sec**
or 2,113 gpm (us)
or 1,760 gpm (uk)

Based on method described in:
"Water Supply for Public Fire Protection - A Guide to Recommended Practice", 2020
by Fire Underwriters Survey

Water Demand Calculation Sheet

Project:	**uOttawa Advanced Medical Research Centre Building**	**Date:**	**26/02/2024**
Location:	**451 Smyth Road**	**Design:**	**VT**
WSP Project No.	**CA0009956.0165**	**Page:**	**1 of 1**

Proposed Buildings	Residential			School	Non-Residential			Average Daily			Maximum Daily			Maximum Hourly			Fire
	Units			per Student	Industrial	Institutional	Commercial	Demand (l/s)			Demand (l/s)			Demand (l/s)			Demand
	SF	APT	ST		(ha)	(ha)	(ha)	Res.	Non-Res.	Total	Res.	Non-Res.	Total	Res.	Non-Res.	Total	(l/min)
uOttawa AMRC						2.02			0.65	0.65		0.98	0.98		1.77	1.77	8,000

Population Densities

Single Family	3.4	person/unit
Semi-Detached	2.7	person/unit
Duplex	2.3	person/unit
Townhome (Row)	2.7	person/unit
Bachelor Apartment	1.4	person/unit
1 Bedroom Apartment	1.4	person/unit
2 Bedroom Apartment	2.1	person/unit
3 Bedroom Apartment	3.1	person/unit
4 Bedroom Apartment	4.1	person/unit
Avg. Apartment	1.8	person/unit

Average Daily Demand

Residential	280	l/cap/day
Industrial	35000	l/ha/day
Institutional	28000	l/ha/day
Commercial	28000	l/ha/day
School	70	l/day/student

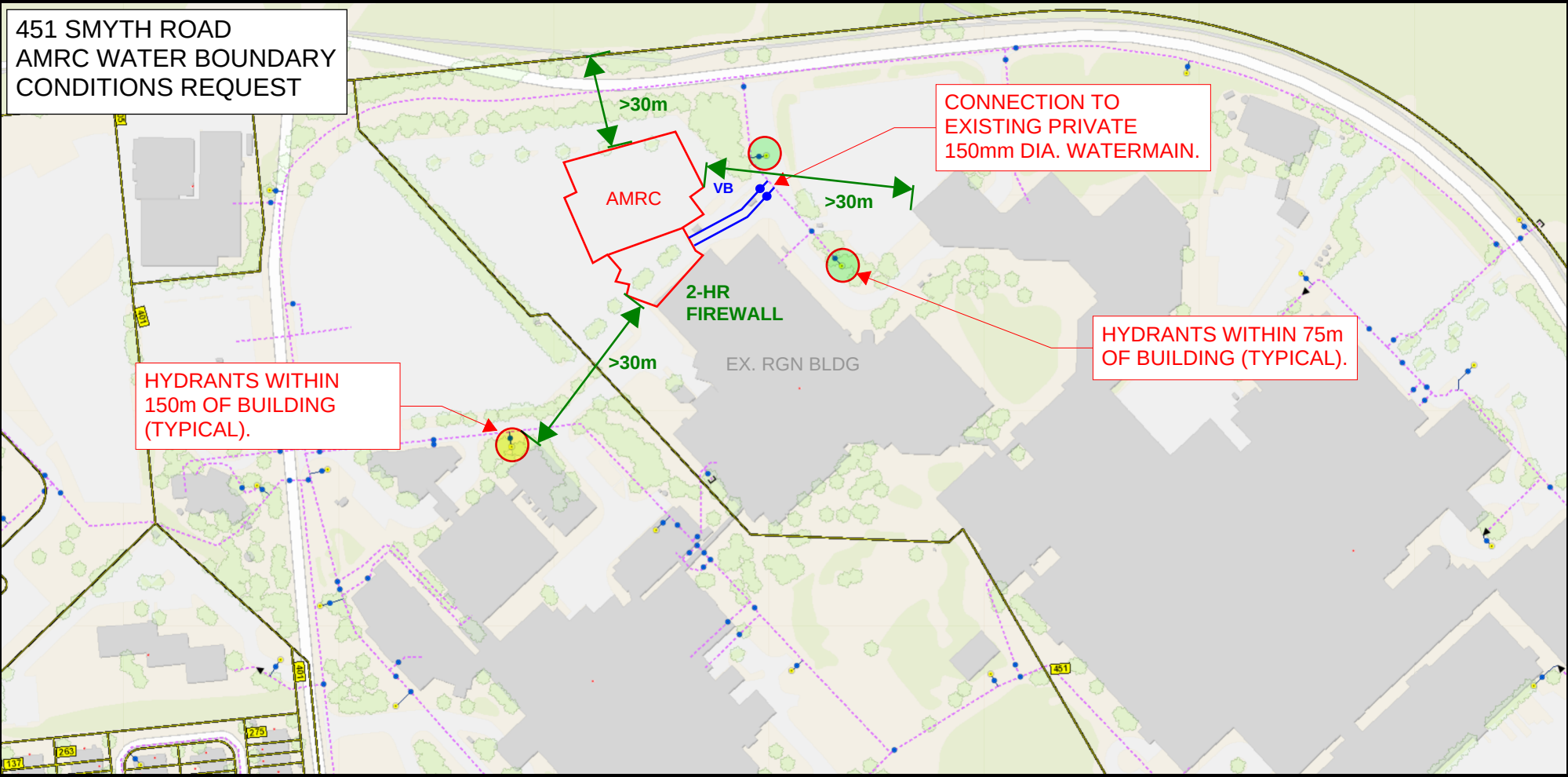
Assume: 8 hours of operating day

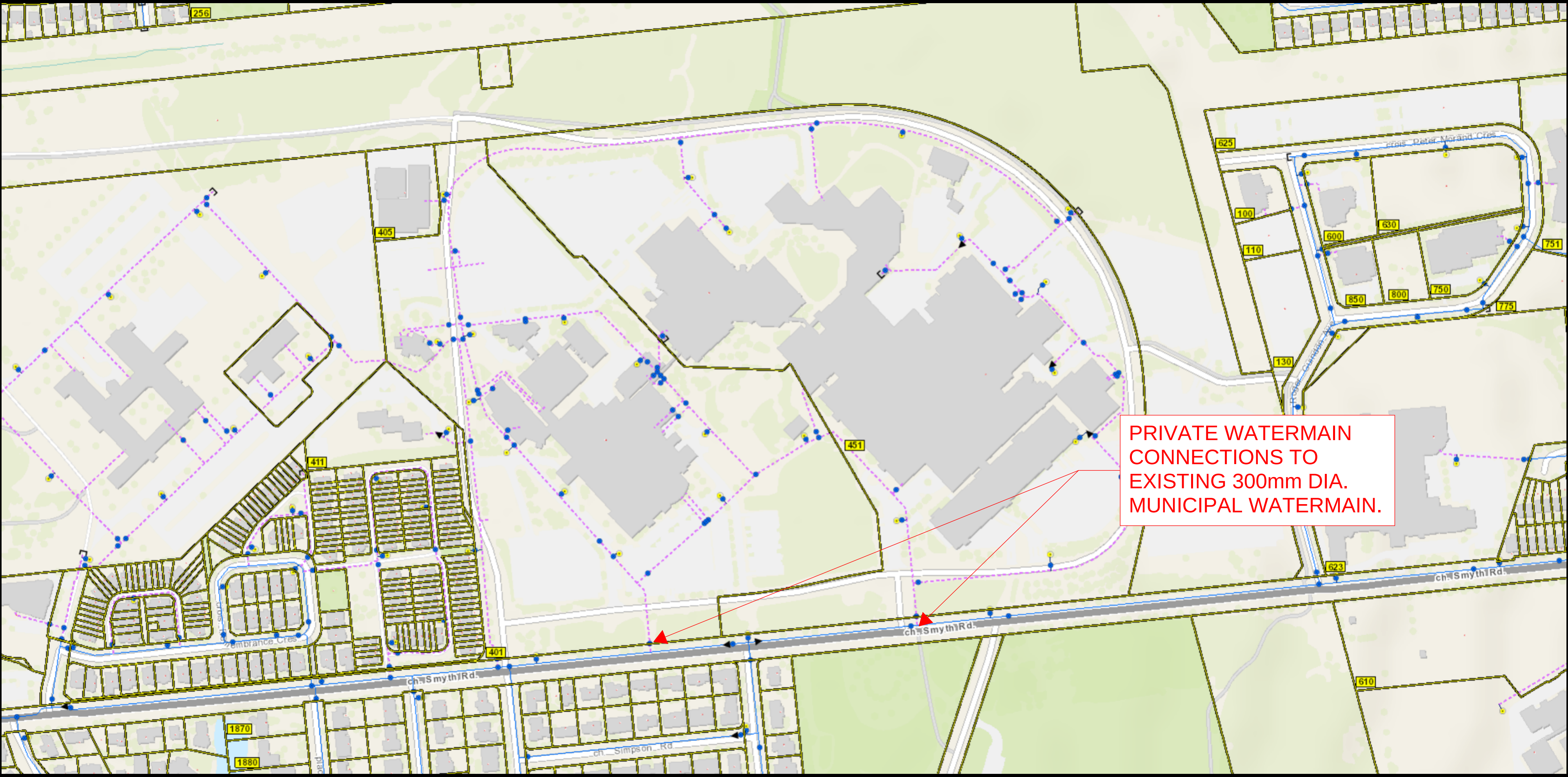
Maximum Daily Demand

Residential	2.5	x avg. day
Industrial	1.5	x avg. day
Institutional	1.5	x avg. day
Commercial	1.5	x avg. day

Maximum Hourly Demand

Residential	2.2	x max. day
Industrial	1.8	x max. day
Institutional	1.8	x max. day
Commercial	1.8	x max. day


451 SMYTH ROAD
AMRC WATER BOUNDARY
CONDITIONS REQUEST
>30m
AMRC
VB
CONNECTION TO
EXISTING PRIVATE
150mm DIA. WATERMAIN.
>30m
2-HR
FIREWALL
EX. RGN BLDG
HYDRANTS WITHIN 75m
OF BUILDING (TYPICAL).
>30m
HYDRANTS WITHIN
150m OF BUILDING
(TYPICAL).
451



PRIVATE WATERMAIN CONNECTIONS TO EXISTING 300mm DIA. MUNICIPAL WATERMAIN.
256
405
411
401
451
625
100
110
600
630
751
850
800
750
775
130
623
610
1870
1880
ch. Smyth Rd.
ch. Smyth Rd.
ch. Smyth Rd.
ch. Simpson Rd

From: Cassidy, Tyler <tyler.cassidy@ottawa.ca>
Sent: Tuesday, October 31, 2023 1:29 PM
To: Ali, Zarak
Cc: Teng, Victoria
Subject: RE: UOttawa AMRC Boundary Conditions Request - 451 Smyth Road
Attachments: 451 Smyth Road October 2023.pdf

Hi Zarak,

Please find below the boundary conditions for 451 Smythe Road.

The following are boundary conditions, HGL, for hydraulic analysis at 451 Smyth Road (zone 2W2C) assumed to be connected at the public 305mm watermain on Smyth Road (see attached PDF for location).

Connection 1:

Minimum HGL = 123.6 m

Maximum HGL = 131.1 m

Max Day + Fire Flow (133 L/s) = 123.1 m

Max Day + Fire Flow (167 L/s) = 121.2 m

Connection 2:

Minimum HGL = 123.6 m

Maximum HGL = 130.8 m

Max Day + Fire Flow (133 L/s) = 123.0 m

Max Day + Fire Flow (167 L/s) = 121.0 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.

Regards,

Tyler Cassidy, P.Eng
Infrastructure Project Manager,

Planning, Real Estate and Economic Development Department / Direction générale de la planification, des biens immobiliers et du développement économique - South Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 12977, Tyler.Cassidy@ottawa.ca

From: Cassidy, Tyler
Sent: October 19, 2023 8:26 AM
To: Ali, Zarak <Zarak.Ali@wsp.com>
Cc: Teng, Victoria <Victoria.Teng@wsp.com>
Subject: RE: UOttawa AMRC Boundary Conditions Request - 451 Smyth Road

Hi Zarak,

Thank you for providing your calculations. I've submitted the boundary condition request to our Water Resources group. Please allow for up to 10 business days for the results to be provided. I'll forward them to your attention once they come in.

Regards,

Tyler Cassidy, P.Eng
Infrastructure Project Manager,
Planning, Real Estate and Economic Development Department / Direction générale de la planification, des biens immobiliers et du développement économique - South Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 12977, Tyler.Cassidy@ottawa.ca

From: Ali, Zarak <Zarak.Ali@wsp.com>
Sent: October 18, 2023 11:58 AM
To: Cassidy, Tyler <tyler.cassidy@ottawa.ca>
Cc: Teng, Victoria <Victoria.Teng@wsp.com>
Subject: RE: UOttawa AMRC Boundary Conditions Request - 451 Smyth Road

Hi Tyler,

See attached the requested FUS calculations and water demand calculations.

Regards,

Zarak Ali
Designer E.I.T

Municipal Engineering - Ottawa

T+ 1 343-227-9179
Zarak.ali@wsp.com

WSP Global Inc.
2611 Queensview Drive, Suite 300
Ottawa, Ontario
K2B 8K2 Canada

wsp.com

From: Cassidy, Tyler <tyler.cassidy@ottawa.ca>
Sent: Wednesday, October 18, 2023 11:01 AM
To: Ali, Zarak <Zarak.Ali@wsp.com>
Cc: Teng, Victoria <Victoria.Teng@wsp.com>
Subject: RE: UOttawa AMRC Boundary Conditions Request - 451 Smyth Road

Hi Zarak,

I'll begin looking into this. Are you able to provide me with the FUS (2020) calculations, as well as the water demand calculations, for your proposed site plan? I am required to confirm the RFF was calculated with the FUS 2020 methodology before I can reach out to our Water Resources Group. Once submitted, it usually takes about 10 business days for boundary condition results to be provided.

Thank you,

Tyler Cassidy, P.Eng
Infrastructure Project Manager,
Planning, Real Estate and Economic Development Department / Direction générale de la planification, des biens immobiliers et du développement économique - South Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 12977, Tyler.Cassidy@ottawa.ca

From: Ali, Zarak <Zarak.Ali@wsp.com>
Sent: October 18, 2023 9:00 AM
To: Cassidy, Tyler <tyler.cassidy@ottawa.ca>
Cc: Teng, Victoria <Victoria.Teng@wsp.com>
Subject: UOttawa AMRC Boundary Conditions Request - 451 Smyth Road

Good morning Tyler,

We are requesting water boundary conditions for the proposed institutional development: 6-storey building addition (Advanced Medical Research Centre - AMRC) to the existing University of Ottawa Roger Guindon Hall (RGN), located at 451 Smyth Road.

See the attached sketch for the location of the proposed building services, fire flow separation distances and hydrant locations near the proposed development.

The water demands are listed below:

- Avg. Day Demand = 0.66 L/s
- Max. Day Demand = 1.00 L/s
- Peak Hour Demand = 1.79 L/s
- Required Fire Flow Demand = 133 L/s

Note that the total peak sanitary flows from the proposed AMRC building is approximately 1.67 L/s.

Please let me know if you require any additional information.

Regards,

Zarak Ali
Designer E.I.T
Municipal Engineering - Ottawa

T+ 1 343-227-9179
Zarak.ali@wsp.com

WSP Global Inc.
2611 Queensview Drive, Suite 300
Ottawa, Ontario
K2B 8K2 Canada

wsp.com

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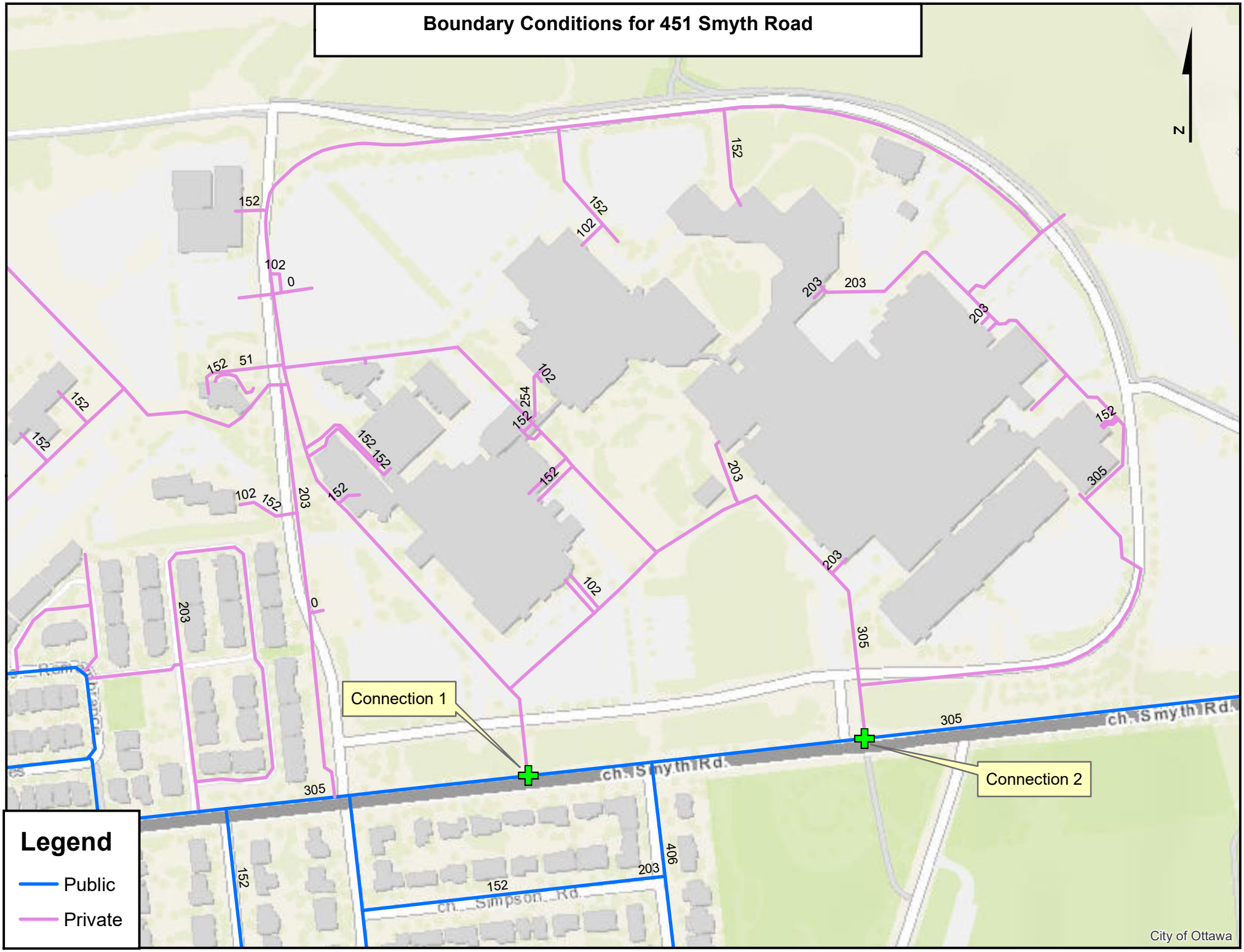
'

Boundary Conditions for 451 Smyth Road



AMRC - FLOW TEST

Inspecting Firm: Fast Response Fire Systems
Name of Property: University of Ottawa
Inspector Name: Robert Drapeau

Date of Test Oct. 25, 2023
Time of Test 5 A.M

Location
501 Smyth Road, Ottawa Ontario K1H 8L6

Hydrant 13 - Flow Test

Static Pressure 67 P.S.I.

Flow # 1			
Nozzle Size	**Pitot Pressure**	**G.P.M.**	**Residual Pressure**
13/4"	55	672	65 PSI
Flow # 2			
Nozzle	**Pitot Pressure**	**G.P.M.**	**Residual Pressure**
21/2"	55	914	58 PSI
Flow # 3			
Nozzle Size	**Pitot Pressure**	**G.P.M.**	**Residual Pressure**
21/2"	10	590	50 PSI
21/2"	10	590	50 PSI

Note 1 : Residual readings were taken at Hydrant 12

Note 2 : Hydrant 13 is fed from one direction and is located at the end of the run

AMRC - FLOW TEST

Inspecting Firm: Fast Response Fire Systems
Name of Property: University of Ottawa
Inspector Name: Robert Drapeau

Date of Test Oct. 25, 2023
Time of Test 5:30 A.M

Location
501 Smyth Road, Ottawa Ontario K1H 8L6

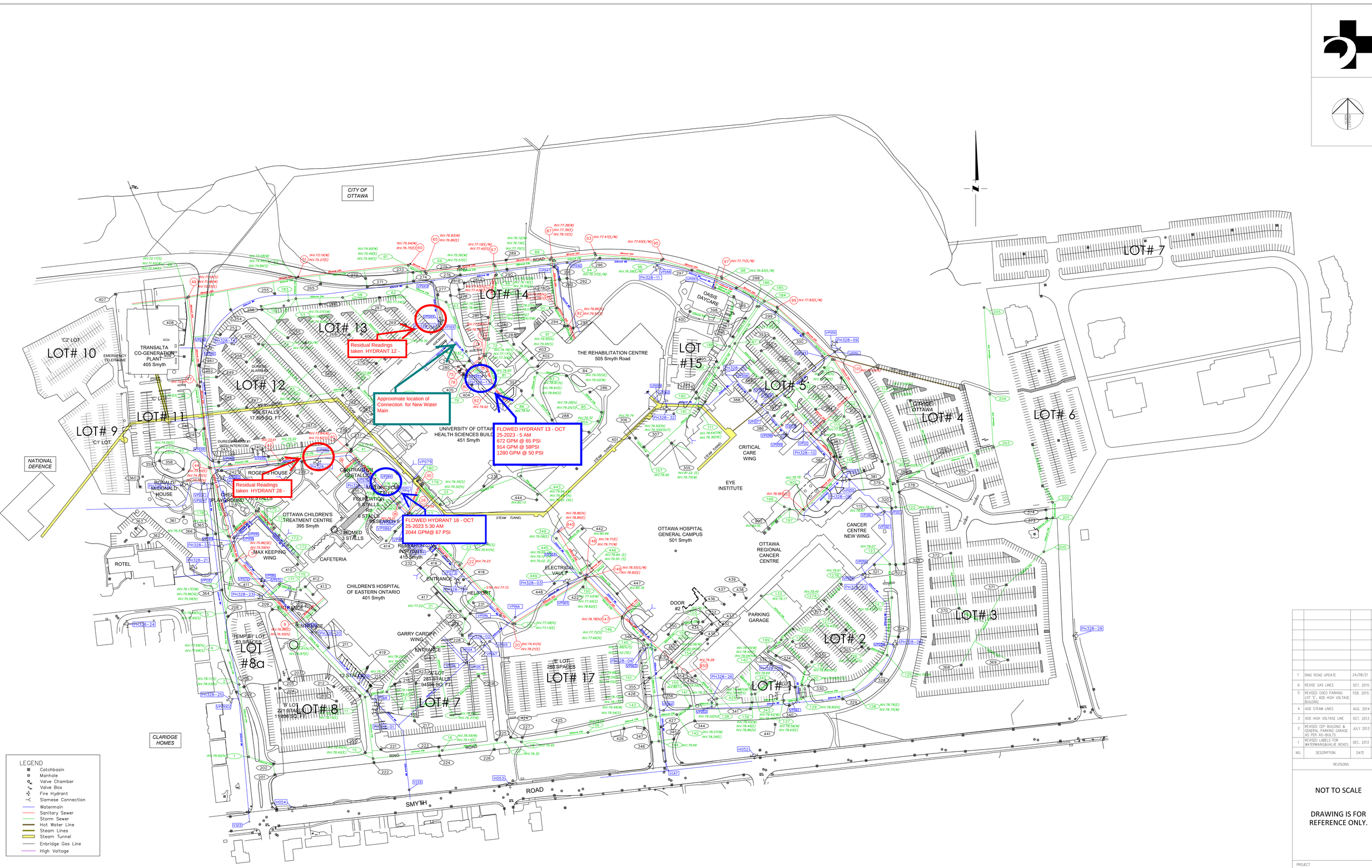
Hydrant 18 - Flow Test

Static Pressure 67 P.S.I.

Flow # 1			
Nozzle Size	**Pitot Pressure**	**G.P.M.**	**Residual Pressure**
21/2"	30	1022	67 PSI
21/2"	30	1022	67 PSI

Note 1 : Residual readings were taken at Hydrant 28

Note 2 : Hydrant 18 is fed from 2 direction and is located on a loop main



LEGEND

- Catchbasin
- Manhole
- Valve Chamber
- Valve Box
- Fire Hydrant
- Siamese Connection
- Watermain
- Sanitary Sewer
- Storm Sewer
- Hot Water Line
- Steam Lines
- Steam Tunnel
- Enbridge Gas Line
- High Voltage

NO.	DESCRIPTION	DATE	BY
1	RING ROAD UPDATE	24/08/21	M.V.
6	REVISE GAS LINES	OCT. 2015	
5	REVISED CHEO PARKING LOT 'E', ADD HIGH VOLTAGE BUILDING	FEB. 2015	
4	ADD STEAM LINES	AUG. 2014	
3	ADD HIGH VOLTAGE LINE	OCT. 2013	
2	REVISED CEP BUILDING & GENERAL PARKING GARAGE AS PER AS-BUILTS	JULY 2013	
1	REVISED LABELS FOR WATERMAINS&VALVE BOXES	DEC. 2012	

REVISIONS

NOT TO SCALE

DRAWING IS FOR REFERENCE ONLY.

PROJECT

The Ottawa Hospital | L'Hôpital d'Ottawa

General Campus Général

501 chemin Smyth Road Ottawa, Ontario K1H 8L6

DRAWING TITLE

OHSC SITE SERVICES
MECHANICAL SERVICES

DRAWN	M.V.
CHECKED	
DATE	2022
SCALE	NOT TO SCALE
DRAWING NUMBER	
PROJECT NUMBER	MASTER PLANS

APPENDIX

C

- STORM SEWER DESIGN SHEET
- STORM DRAINAGE AREA PLAN C110
- ROOF PLAN C111
- RESPONSE LETTER – SITE PLAN CONTROL APPLICATION
- FLOW CONTROL ROOF DRAINAGE DECLARATION
- SANITARY SEWER DESIGN SHEET
- DWG C103 TO C105 – GRADING PLAN
- DWG C106 TO C108 - SERVICING PLAN

STORM SEWER DESIGN SHEET

uOttawa Advanced Medical Research Centre Building
451 Smyth Road
Project: CA0009956.0165
Date: February 2024

LOCATION				AREA (Ha)						RATIONAL DESIGN FLOW									PROPSOED SEWER DATA								
STREET	AREA ID	FROM	TO	C= 0.20	C= 0.35	C= 0.50	C= 0.75	C= 0.80	C= 0.90	IND 2.78AC	CUM 2.78 AC	INLET (min)	TOTAL (min)	i (2) (mm/hr)	i (5) (mm/hr)	i (100) (mm/hr)	2yr PEAK FLOW (L/s)	DESIGN FLOW (L/s)	MATERIAL PIPE	SIZE (mm)	SLOPE (%)	LENGTH (m)	CAPACITY (l/s)	VELOCITY (m/s)	TIME IN PIPE	AVAIL CAP (2yr) (L/s)	AVAIL CAP (2yr) (%)
POST-DEVELOPMENT																											
	A-18	CB 20	STMH 109	0.012					0.140	0.357	0.357	10.00	10.38	76.81	104.19	178.56	27.42	27.42	PVC DR-35	200	1.00	23.80	32.83	1.04	0.38	5.42	16.50%
	A-17	CB 01	MAIN	0.007					0.135	0.342	0.342	10.00	10.08	76.81	104.19	178.56	26.24	26.24	PVC DR-35	200	2.00	7.50	46.43	1.48	0.08	20.19	43.48%
	A-16	EX-CB 02	MAIN	0.013					0.052	0.137	0.137	10.00	10.13	76.81	104.19	178.56	10.55	10.55	PVC DR-35	200	2.00	11.70	46.43	1.48	0.13	35.88	77.28%
	A-15	CB 02	MAIN	0.011					0.046	0.120	0.120	10.00	10.05	76.81	104.19	178.56	9.25	9.25	PVC DR-35	200	2.00	4.00	46.43	1.48	0.05	37.18	80.08%
	A-14	CB 03	MAIN	0.015					0.055	0.146	0.146	10.00	10.14	76.81	104.19	178.56	11.18	11.18	PVC DR-35	200	2.00	12.10	46.43	1.48	0.14	35.25	75.92%
		STMH 109	STMH 108							0.000	1.102	10.38	11.77	75.38	102.23	175.16	83.06	83.06	CONC.	525	0.20	73.90	192.52	0.89	1.39	109.46	56.86%
	A-20	CB 04	MAIN	0.026					0.030	0.090	0.090	10.00	10.31	76.81	104.19	178.56	6.92	6.92	PVC DR-35	200	1.00	19.60	32.83	1.04	0.31	25.91	78.92%
	A-12	CB 05	MAIN	0.029					0.075	0.204	0.204	10.00	10.15	76.81	104.19	178.56	15.70	15.70	PVC DR-35	200	2.00	13.60	46.43	1.48	0.15	30.74	66.20%
	A-13	CB 06	MAIN	0.002					0.046	0.117	0.117	10.00	10.06	76.81	104.19	178.56	8.95	8.95	PVC DR-35	200	2.00	5.70	46.43	1.48	0.06	37.48	80.71%
	A-21	CB 08	MAIN	0.029					0.046	0.131	0.131	10.00	10.05	76.81	104.19	178.56	10.03	10.03	PVC DR-35	200	1.00	3.10	32.83	1.04	0.05	22.80	69.44%
	A-22	CB 13	MAIN	0.017					0.043	0.116	0.116	10.00	10.06	76.81	104.19	178.56	8.94	8.94	PVC DR-35	200	1.00	4.00	32.83	1.04	0.06	23.89	72.76%
		STMH 108	SMALL POND							0.000	1.760	11.77	12.99	70.63	95.71	163.88	124.31	124.31	CONC.	525	0.24	71.60	210.90	0.97	1.23	86.59	41.06%
		SMALL POND	BIG POND							0.000	1.760	12.99	13.10	66.95	90.66	155.16	117.84	117.84	HDPE	525	1.00	13.10	430.50	1.99	0.11	312.66	72.63%
	A-6	BIG POND	EFO6	0.085					0.017	0.090	1.850	13.10	13.25	66.64	90.24	154.43	123.28	123.28	PVC DR-35	375	1.40	16.10	207.66	1.88	0.14	84.38	40.63%
*SEE NOTE		EFO6	EX. STMH							0.000	1.850	13.25	13.49	66.25	89.69	153.49	122.55	122.55	PVC DR-35	375	1.25	26.40	196.22	1.77	0.25	73.68	37.55%
	A-9	CB 10	CBMH 102	0.000					0.033	0.083	0.083	10.00	10.25	76.81	104.19	178.56	6.34	6.34	PVC DR-35	200	1.00	15.80	32.83	1.04	0.25	26.49	80.68%
	A-11	CB 12	MAIN	0.006					0.036	0.093	0.093	10.00	10.02	76.81	104.19	178.56	7.16	7.16	PVC DR-35	200	2.00	1.50	46.43	1.48	0.02	39.27	84.58%
	A-10	CBMH 102	STMH 102 / CHAMBERS	0.003					0.023	0.059	0.235	10.25	10.50	75.85	102.88	176.29	17.82	17.82	CONC,	450	0.50	19.20	201.80	1.27	0.25	183.98	91.17%
	A-7	CB 14	CBMH 108	0.005					0.054	0.137	0.137	10.00	10.41	76.81	104.19	178.56	10.53	10.53	PVC DR-35	200	1.00	25.50	32.83	1.04	0.41	22.30	67.93%
	A-8	CBMH 108	STMH 114 / CHAMBERS	0.002					0.043	0.107	0.244	10.41	10.85	75.28	102.09	174.92	18.39	18.39	PVC DR-35	250	0.50	22.90	42.09	0.86	0.45	23.70	56.31%
	A-4	CB 15	STMH 114 / CHAMBERS	0.120					0.028	0.137	0.137	10.00	10.19	76.81	104.19	178.56	10.51	10.51	PVC DR-35	200	2.00	17.20	46.43	1.48	0.19	35.92	77.36%
		STMH 114 / CHAMBERS	STORM CHAMBERS							0.000	0.381	10.85	10.85	73.68	99.90	171.12	28.08	28.08									
**SEE NOTE		STMH 112 / CHAMBERS	EFO4							0.000	0.616	10.85	10.99	73.68	99.90	171.12	45.40	45.40	PVC DR-35	375	1.00	13.30	175.51	1.59	0.14	130.11	74.13%
		EFO4	EX-STMH							0.000	0.616	10.99	11.11	73.19	99.23	169.97	45.10	45.10	PVC DR-35	375	1.00	11.50	175.51	1.59	0.12	130.41	74.30%
***SEE NOTE	A-23	CB 07	Ex. MAIN	0.011					0.089	0.229	0.229	10.00	10.12	76.81	104.19	178.56	17.59	17.59	PVC DR-35	200	2.00	11.00	46.43	1.48	0.12	28.84	62.12%
†SEE NOTE	R1, R2	BLDG	Ex. STMH	0.000					0.537	1.344	1.344	10.00	10.07	76.81	104.19	178.56	103.19	103.19	PVC DR-35	300	2.00	7.80	136.89	1.93	0.07	33.70	24.62%

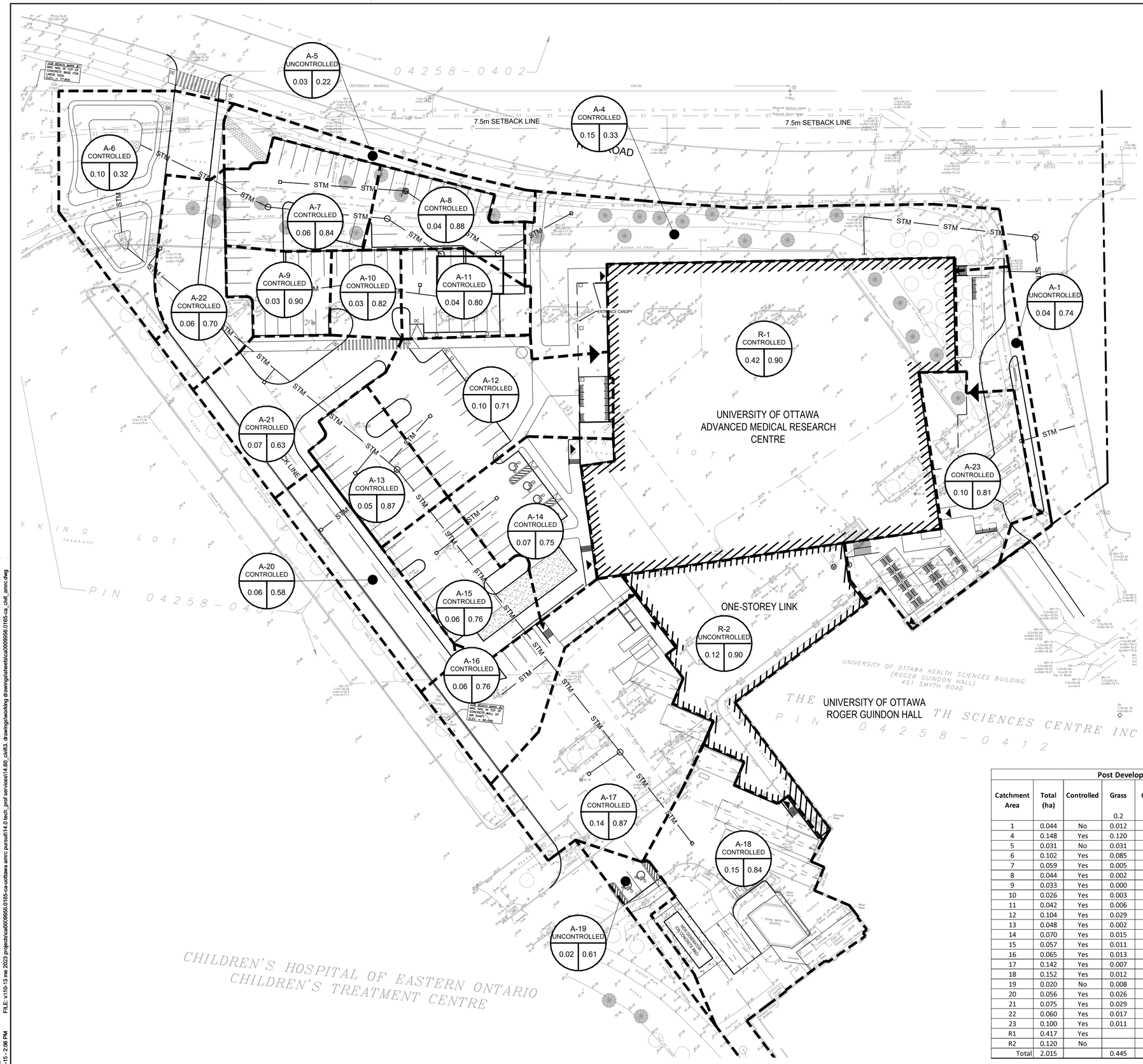
Definition:
Q=2.78CiA, where:
Q = Peak Flow in Litres per Second (L/s)
A = Area in Hectares (Ha)
i = Rainfall Intensity in millimeters per hour (mm/hr)
i = 732.951/(TC+6.199)^0.810 2 Year
i = 1174.184/(TC+6.014)^0.816 5 Year
i = 1735.688/(TC+6.014)^0.820 100 Year

Notes:
1. Mannings coefficient (n) = 0.013
2-YR Flow:
*Flow controlled to 52.15 l/s
**Flow controlled to 2.9 l/s
***Flow controlled to 18.15 l/s
†Flow from roofs controlled to 39.14 l/s

Designed: Z.A
Checked: V.T
Dwg. Reference: C110

Revision	Date
City Submission No. 1	2023-11-30
City Submission No. 2	2024-02-26

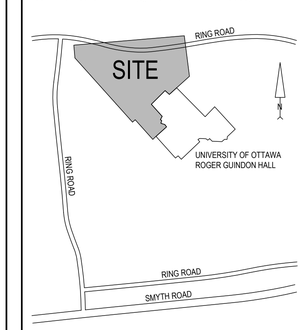
File	Date:	Sheet No:
		1 of 1



Post Development Storm Drainage Area Table

Catchment Area	Total (ha)	Controlled	Grass 0.2	Gravel 0.75	Asphalt 0.9	Outlet Structure	100-Yr Ponding Area (m^2)	100-Yr Ponding Depth (m)	100-Yr Ponding Volume (m^3)
1	0.044	No	0.012		0.032				
4	0.148	Yes	0.120		0.028	CB 15			
5	0.031	No	0.031		0.000				
6	0.102	Yes	0.085		0.017	Pond			219.93
7	0.059	Yes	0.005		0.054	CB 14			
8	0.044	Yes	0.002		0.043	CBMH 108			
9	0.033	Yes	0.000		0.033	CB 10			
10	0.026	Yes	0.003		0.023	CBMH 102			
11	0.042	Yes	0.006		0.036	CB 12			
12	0.104	Yes	0.029		0.075	CB 05			
13	0.048	Yes	0.002		0.046	CB 06			
14	0.070	Yes	0.015		0.055	CB 03			
15	0.057	Yes	0.011		0.046	CB 02			
16	0.065	Yes	0.013		0.052	EX CB 02			
17	0.142	Yes	0.007		0.135	CB 01			
18	0.152	Yes	0.012		0.140	CB 20			
19	0.020	No	0.008		0.012				
20	0.056	Yes	0.026		0.030	CB 04			
21	0.075	Yes	0.029		0.046	CB 08			
22	0.060	Yes	0.017		0.043	CB 13			
23	0.100	Yes	0.011		0.089	CB 07	1.29	0.02	0.12
R1	0.417	Yes			0.417				
R2	0.120	No			0.120				
Total	2.015		0.445		1.570		1.29		220.05

DISCIPLINE/PROJECT DEFINED (eg LEGEND / KEY PLAN / LOGOS)



KEY PLAN
NTS

REVISION:

REV	DATE	DESCRIPTION	BY
6	2024-04-10	ISSUED FOR PHASE 3 RE-SUBMISSION	VT
5	2024-02-26	ISSUED FOR SITE PLAN APPROVAL	VT
4	2024-02-02	ISSUED FOR COORDINATION	VT
3	2023-11-30	ISSUED FOR SITE PLAN APPROVAL	VT
2	2023-11-20	ISSUED FOR BUILDING PERMIT	VT
1	2023-10-31	ISSUED FOR PRICING PROPOSAL	VT

SEAL:

LICENSED PROFESSIONAL ENGINEER
Y. TENG
100226367
2024-04-10
PROVINCE OF ONTARIO

NORTH:

ORIGINAL SCALE: AS NOTED
DESIGNED BY: V. TENG
DRAWN BY: B. NANDLAL
APPROVED BY: I. JAFFERJEE
DATE: 2023-09-25
IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE.
25mm
DISCIPLINE: CIVIL

WSP CANADA INC.
2611 QUEENSVIEW DRIVE, SUITE 300
OTTAWA ONTARIO K2B 8K2 CANADA
WSP.COM

PROJECT NUMBER: CA0009956.0165-CA

CLIENT:

uOttawa

PCL

CLIENT REF. #:

PROJECT:

ADVANCED MEDICAL RESEARCH CENTRE

TITLE:

DRAWING NUMBER: C110

REV. 6

CTB: wsp_ottawa.ctb
PLOTTED: 2024-04-15 - 2:06 PM
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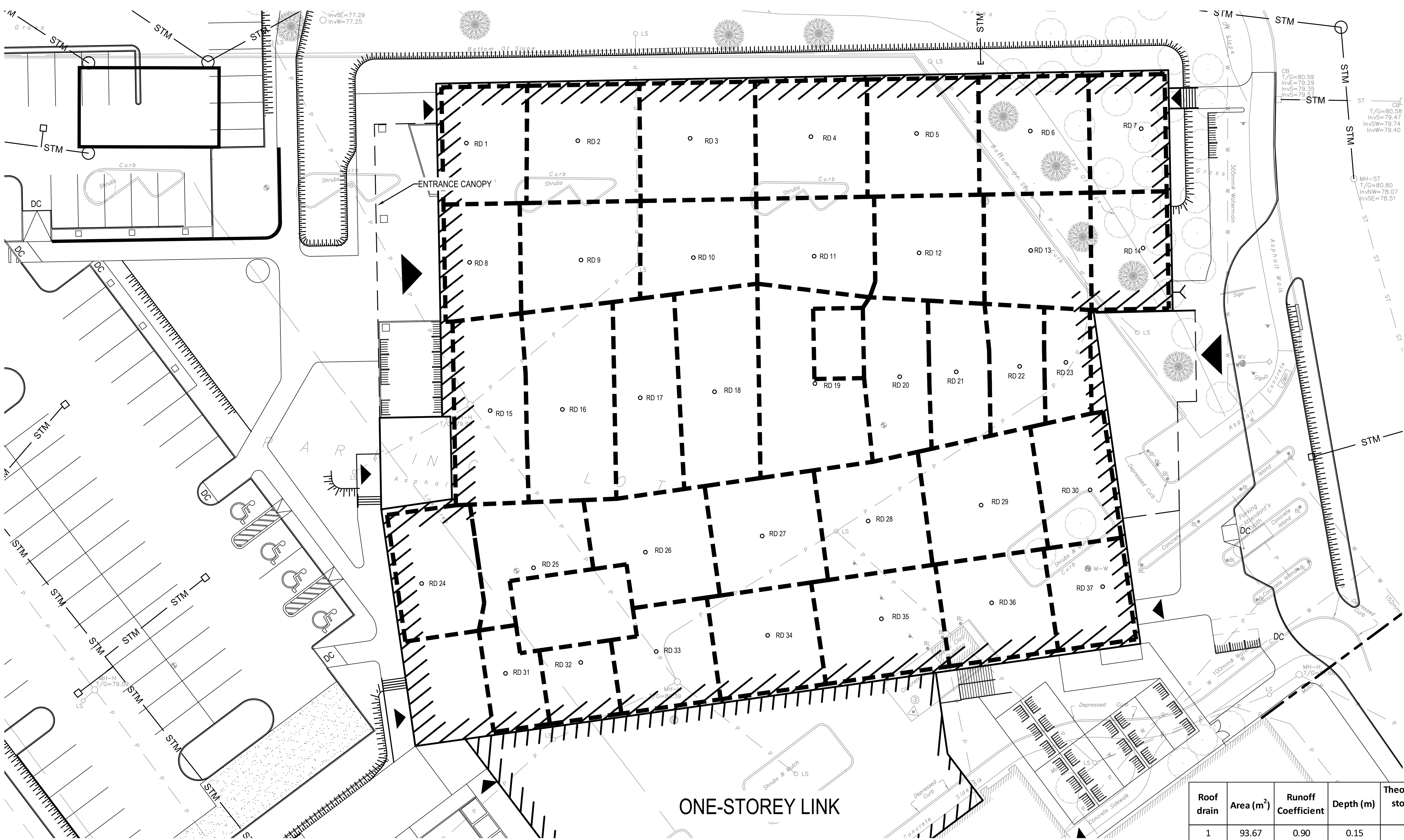
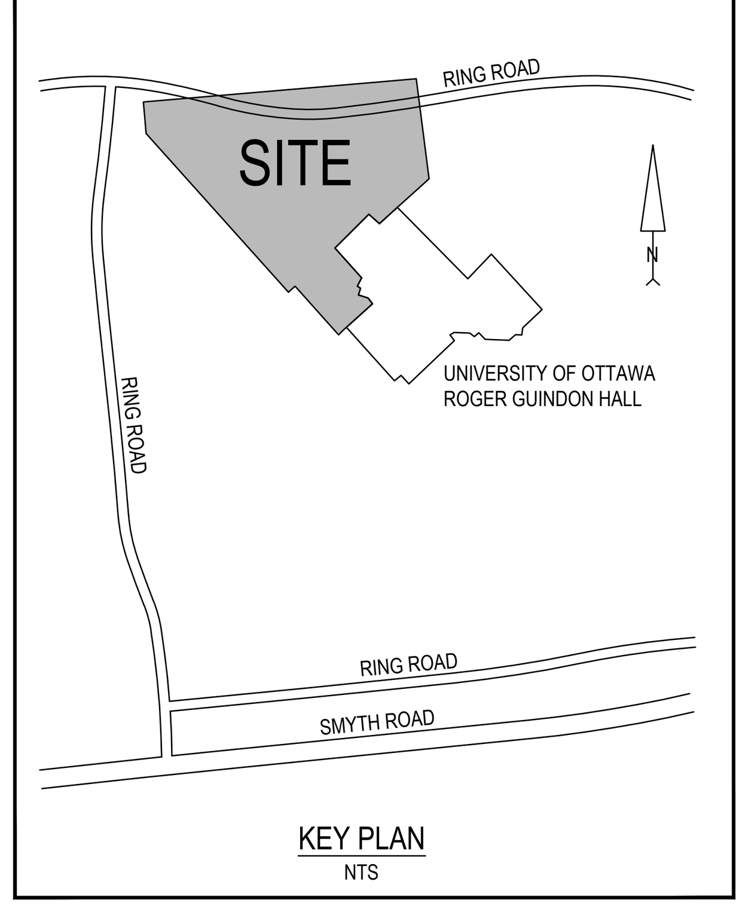


Roof drain	Area (m^2)	Runoff Coefficient	Depth (m)	Theoretical rooftop storage volume (m^3)	Storage volume (m^3)	Max flow rate (l/s)	Weir Exposure	2-Yr and 100-Yr*
1	93.67	0.90	0.15	14.05	11.24	0.32	Closed	100-Yr Storage Depth = 0.13m 100-Yr Storage Volume = 406.6 m^3 2-Yr Storage Depth = 0.08m 2-Yr Storage Volume = 233.3 m3
2	125.58	0.90	0.15	18.84	15.07	0.32	Closed	
3	128.33	0.90	0.15	19.25	15.40	0.32	Closed	
4	123.95	0.90	0.15	18.59	14.87	1.89	Fully Open	
5	123.98	0.90	0.15	18.60	14.88	0.32	Closed	
6	122.60	0.90	0.15	18.39	14.71	0.32	Closed	
7	84.62	0.90	0.15	12.69	10.15	0.32	Closed	
8	81.94	0.90	0.15	12.29	9.83	0.32	Closed	
9	117.95	0.90	0.15	17.69	14.15	0.32	Closed	
10	100.58	0.90	0.15	15.09	12.07	0.32	Closed	
11	103.48	0.90	0.15	15.52	12.42	1.89	Fully Open	
12	109.12	0.90	0.15	16.37	13.09	0.32	Closed	
13	114.63	0.90	0.15	17.19	13.76	0.32	Closed	
14	85.18	0.90	0.15	12.78	10.22	0.32	Closed	
15	126.66	0.90	0.15	19.00	15.20	0.32	Closed	
16	162.34	0.90	0.15	24.35	19.48	0.32	Closed	
17	120.31	0.90	0.15	18.05	14.44	0.32	Closed	
18	147.54	0.90	0.15	22.13	17.70	0.32	Closed	
19	149.81	0.90	0.15	22.47	17.98	1.89	Fully Open	
20	94.25	0.90	0.15	14.14	11.31	1.89	Fully Open	
21	78.86	0.90	0.15	11.83	9.46	0.32	Closed	
22	65.59	0.90	0.15	9.84	7.87	0.32	Closed	
23	48.06	0.90	0.15	7.21	5.77	0.32	Closed	
24	99.71	0.90	0.15	14.96	11.97	0.32	Closed	
25	93.70	0.90	0.15	14.06	11.24	0.32	Closed	
26	113.87	0.90	0.15	17.08	13.66	0.32	Closed	
27	114.89	0.90	0.15	17.23	13.79	0.32	Closed	
28	111.31	0.90	0.15	16.70	13.36	1.89	Fully Open	
29	129.66	0.90	0.15	19.45	15.56	0.32	Closed	
30	87.94	0.90	0.15	13.19	10.55	0.32	Closed	
31	50.02	0.90	0.15	7.50	6.00	0.32	Closed	
32	50.81	0.90	0.15	7.62	6.10	0.32	Closed	
33	90.80	0.90	0.15	13.62	10.90	0.32	Closed	
34	102.96	0.90	0.15	15.44	12.36	0.32	Closed	
35	121.60	0.90	0.15	18.24	14.59	1.89	Fully Open	
36	106.63	0.90	0.15	15.99	12.80	0.32	Closed	
37	76.33	0.90	0.15	11.45	9.16	0.32	Closed	
Total	**3859.26**				**463.11**	**21.26**		

* Refer to Section 3.2 of the SWM Report for the 2-Yr and 100-Yr roof flows and more details.

0 5m 10m 20m 25m
SCALE: 1:250

DISCIPLINE/PROJECT DEFINED (eg LEGEND / KEY PLAN / LOGOS)



KEY PLAN
NTS

REVISION:

REV	DATE	DESCRIPTION	BY
6	2024-04-10	ISSUED FOR PHASE 3 RE-SUBMISSION	VT
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1	2023-10-31	ISSUED FOR PRICING PROPOSAL	VT

SEAL: LICENSED PROFESSIONAL ENGINEER Y. TENG 100226367 2024-04-10 PROVINCE OF ONTARIO

NORTH: N

ORIGINAL SCALE: AS NOTED
DATE: 2023-09-25
DESIGNED BY: V. TENG
DRAWN BY: B. NANDLAL
APPROVED BY: I. JAFFERJEE
IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE. 25mm
DISCIPLINE: CIVIL

wsp
WSP CANADA INC.
2611 QUEENSVIEW DRIVE, SUITE 300
OTTAWA ONTARIO K2B 8K2 CANADA
WSP.COM

PROJECT NUMBER: CA0009956.0165-CA

CLIENT: uOttawa PCL

CLIENT REF. #:

PROJECT:
ADVANCED MEDICAL RESEARCH CENTRE

TITLE:
ROOF AREA PLAN

DRAWING NUMBER: C111
REV. 6

CTB: wsp_ottawa.ctb
PLOTTED: 2024-04-15 - 2:06 PM
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SANITARY SEWER DESIGN SHEET

uOttawa Advanced Medical Research Centre Building
451 Smyth Road
Project: CA0009956.0165
Date: February 2024

LOCATION				RESIDENTIAL AREA AND POPULATION												INDUSTRIAL				COMMERCIAL		INSTITUTIONAL		I+C+I	INFILTRATION				PIPE					
LOCATION	FROM M.H.	TO M.H.	SANITARY DRAINAGE AREA ID	INDV AREA (ha)	ACCU AREA (ha)	NUMBER OF UNITS						POPULATION		PEAK FACT.	PEAK FLOW (l/s)	GROSS AREA (ha)	DEVEL. AREA (ha)	ACCU. AREA (ha)	PEAK FACTOR	INDIV AREA (ha)	ACCU. AREA (ha)	INDIV AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	INDIV AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	LENGTH (m)	DIA. (mm)	SLOPE (%)	CAP. (FULL) (l/s)	VEL. (FULL) (m/s)	AVAIL. CAP. (%)
						SINGLES	SEMIS	TOWNS	1-BED APT.	2-BED APT.	3-BED APT.	INDIV POP.	ACCU POP.																					
BASED ON AREA																																	
	BLDG	SAMH100																				2.02	2.02	0.98	2.02	2.02	0.67	**1.65**	*18.80*	*200*	*1.12*	34.71	1.10	**95.25%**
	SAMH100	SAMH101																				0.00	2.02	0.98	0.00	2.02	0.67	**1.65**	*29.60*	*200*	*1.00*	32.80	1.04	**94.97%**
	SAMH101	*Ex. SAMH 1*																				0.00	2.02	0.98	0.00	2.02	0.67	**1.65**	*60.60*	*200*	*1.00*	32.80	1.04	**94.97%**

DESIGN PARAMETERS

RESIDENTIAL AVG. DAILY FLOW =	280	l/cap/day	COMMERCIAL PEAK FACTOR =	1.5	(WHEN AREA > 20%)	PEAK POPULATION FLOW, (l/s) =	P*q*M/86400	UNIT TYPE	PERSONS/UNIT	**DESIGNED:**	**NO.**	**REVISION**	**DATE**
COMMERCIAL AVG. DAILY FLOW =	28,000	l/ha/day		1.0	(WHEN AREA < 20%)	PEAK EXTRANEOUS FLOW, (l/s) =	I*Ac	SINGLES	3.4	Victoria Teng, P.Eng	1.	City Submission No.1	30/11/2023
	0.324	l/ha/s				RESIDENTIAL PEAKING FACTOR, M =	1+(14/(4+P^0.5))*K	SEMI-DETACHED	2.7	**CHECKED:**	2	City Submission No.2	26/02/2024
INSTITUTIONAL AVG. DAILY FLOW =	28,000	l/ha/day	INSTITUTIONAL PEAK FACTOR =	1.5	(WHEN AREA > 20%)	Ac = CUMULATIVE AREA (ha)		TOWNHOMES	2.7	Ishaque Jafferjee, P.Eng			
	0.324	l/ha/s		1.0	(WHEN AREA < 20%)	P = POPULATION (THOUSANDS)		SINGLE APT. UNIT	1.4	**PROJECT:**			
LIGHT INDUSTRIAL FLOW =	35,000	l/ha/day						2-BED APT. UNIT	2.1	uOTTAWA AMRC			
	0.405	l/ha/s	RESIDENTIAL CORRECTION FACTOR, K =	0.80		SEWER CAPACITY, Qcap (l/s) =	1/N S^(1/2) R^(2/3) Ac	3-BED APT. UNIT	3.1	451 Smyth Road			
HEAVY INDUSTRIAL FLOW =	55,000	l/ha/day	MANNING N =	0.013		(MANNING'S EQUATION)				**LOCATION:**			
	0.637	l/ha/s	PEAK EXTRANEOUS FLOW, I (l/s/ha) =	0.33						Ottawa, Ontario			
INSTITUTIONAL AVG. DAILY FLOW =	70	l/student/day								**PAGE NO:**	**FILE & DWG. REFERENCE:**		
										1 of 1			

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

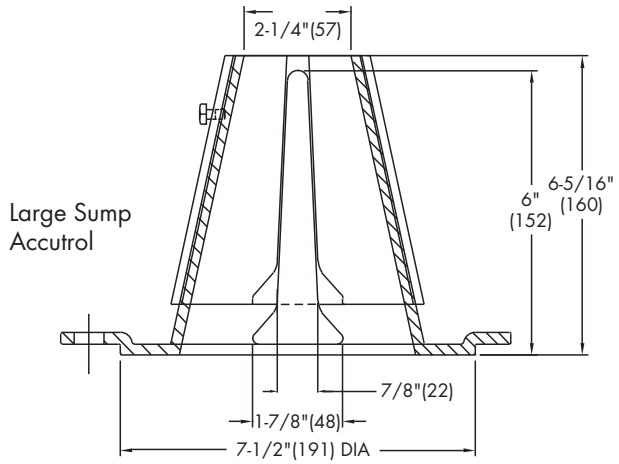
ADJUSTABLE ACCUTROL (for Large Sump Roof Drains only)

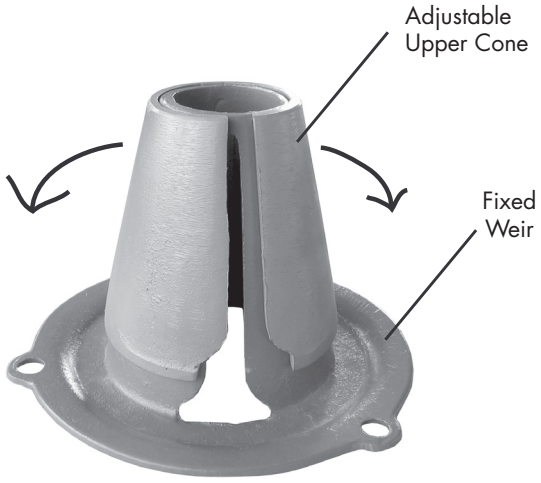
For more flexibility in controlling flow with heads deeper than 2", Watts Drainage offers the Adjustable Accutrol. The Adjustable Accutrol Weir is designed with a single parabolic opening that can be covered to restrict flow above 2" of head to less than 5 gpm per inch, up to 6" of head. To adjust the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

EXAMPLE:

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

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





1/2 Weir Opening Exposed Shown Above

TABLE 1. Adjustable Accutrol Flow Rate Settings

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

Job Name _____ Contractor _____

Job Location _____ Contractor's P.O. No. _____

Engineer _____ Representative _____

USA: Tel: (800) 338-2581 • Fax: (828) 248-3929 • Watts.com
Canada: Tel: (905) 332-4090 • Fax: (905) 332-7068 • Watts.ca
Latin America: Tel: (52) 81-1001-8600 • Fax: (52) 81-8000-7091 • Watts.com

WATTS®
A Watts Water Technologies Company

Recommended Pavement Structure - Access Lanes and Heavy Truck Parking/Loading Areas	
THICKNESS (mm)	MATERIAL DESCRIPTION
40	**Wear Course:** HL-3 of Superpave 12.5 Asphaltic Concrete
50	**Binder Course:** HL-8 or Superpave 19.0 Asphaltic Concrete
150	**Base:** OPSS Granular A Crushed Stone
400	**Subbase:** OPSS Granular B Type II
Subgrade: Either fill, in-situ soil or OPSS Granular B Type I or II material placed over in-situ soil or fill.	

Recommended Pavement Structure-Car Only Parking Areas	
THICKNESS (mm)	MATERIAL DESCRIPTION
50	**Wear Course:** HL-3 of Superpave 12.5 Asphaltic Concrete
150	**Base:** OPSS Granular A Crushed Stone
300	**Subbase:** OPSS Granular B Type II
Subgrade: Either fill, in-situ soil or OPSS Granular B Type I or II material placed over in-situ soil or fill.	

SLOPE 3:1 (MAX) TO MATCH INTO TOP OF POND (TYP.).

MAINTAIN AND PROTECT EX. CB (TYP.).

MATCH INTO EXISTING CURB AND PAVEMENT ELEVATIONS (TYP.).

JOB BENCH MARK #1 MAG NAIL IN TOP OF CONCRETE BASE FOR LARGE SIGN ELEV.= 77.800

SLOPE 3:1 (MAX) FROM TOP OF CURB TO MATCH INTO BACK OF SIDEWALK ELEVATIONS (TYP.).

SLOPE 3:1 (MAX) FROM TOP OF CURB TO MATCH INTO BACK OF SIDEWALK ELEVATIONS (TYP.).

PLACE GRANULAR B AT BOTTOM OF POND.

7.5m SETBACK LINE

MATCH INTO EXISTING SIDEWALK ELEVATIONS (TYP.).

SLOPE 3:1 (MAX) TO MATCH INTO BOTTOM OF SWALE (TYP.).

ENTRANCE CANOPY

PROPOSED 30.4m RETAINING WALL. REFER TO CITY OF OTTAWA STANDARD L7 (MAX WIDTH 300mm).

SLOPE 3:1 (MAX) TO MATCH INTO CONCRETE PAD/TOP OF CURB ELEVATIONS (TYP).

4 STEPS @ 0.17m EACH

5 STEPS @ 0.17m EACH

INTERIM SNOW STORAGE

7.5m SETBACK LINE

SLOPE 3:1 (MAX) FROM TOP OF CURB TO MATCH INTO TOP OF CURB ELEVATIONS (TYP.).

UNIVERSITY OF OTTAW
ADVANCED MEDICAL RESE
CENTRE
FFE= 82.05m
UNDERSIDE OF SLAB = 8

PIN 04258-0402

PIN 04258-0401

RING ROAD

PARKING LOT (Asphalt)

MATCHLINE SEE SHEET C104

MATCHLINE SEE SHEET C105

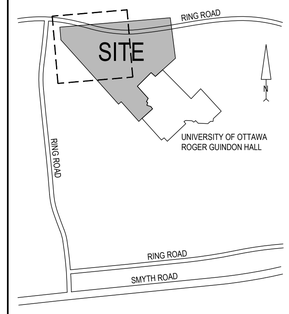
0 5m 10m 20m 25m

SCALE: 1:250

LEGEND: GRADING

- × 79.55 EXISTING ELEVATION
- CB EXISTING CATCHBASIN
- MH–ST EXISTING MANHOLE
- × 79.55 PROPOSED ELEVATION
- × TC79.55 PROPOSED TOP OF CURB
- × TG79.55 PROPOSED TOP OF GRATE
- × 79.55 (S) PROPOSED SWALE GRADE
- 2.55% PROPOSED GRADE SLOPE
- S PROPOSED SWALE
- CB PROPOSED CATCHBASIN
- STMH PROPOSED STORM MANHOLE
- SAN PROPOSED SANITARY MANHOLE
- PROPOSED GRADE TERRACING
- OVERLAND FLOW RELIEF
- HIGH POINT
- DC DEPRESSED CURB
- PAVEMENT STRUCTURE - CAR ONLY PARKING AREA
- PAVEMENT STRUCTURE - ACCESS LANE & HEAVY TRUCK
- GRASS/ LANDSCAPE AREA
- PROPOSED RIP-RAP

DISCIPLINE/PROJECT DEFINED (eg LEGEND / KEY PLAN / LOGOS)



KEY PLAN
NTS

REVISION:

REV	DATE	DESCRIPTION	BY
6	2024-04-10	ISSUED FOR PHASE 3 RE-SUBMISSION	VT
5	2024-02-26	ISSUED FOR SITE PLAN APPROVAL	VT
4	2024-02-02	ISSUED FOR COORDINATION	VT
3	2023-11-30	ISSUED FOR SITE PLAN APPROVAL	VT
2	2023-11-20	ISSUED FOR BUILDING PERMIT	VT
1	2023-10-31	ISSUED FOR PRICING PROPOSAL	VT

SEAL:

LICENSED PROFESSIONAL ENGINEER
Y. TENG
100226367
2024-04-10
PROVINCE OF ONTARIO

NORTH:

N

ORIGINAL SCALE: AS NOTED
DESIGNED BY: V. TENG
DRAWN BY: B. NANDLAL
APPROVED BY: I. JAFFERJEE
DATE: 2023-09-25
IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE. 25mm
DISCIPLINE: CIVIL

WSP CANADA INC.
2611 QUEENSVIEW DRIVE, SUITE 300
OTTAWA ONTARIO K2B 8K2 CANADA
WSP.COM

PROJECT NUMBER: CA0009956.0165-CA

CLIENT:

uOttawa PCL

CLIENT REF. #:

PROJECT:

ADVANCED MEDICAL RESEARCH CENTRE

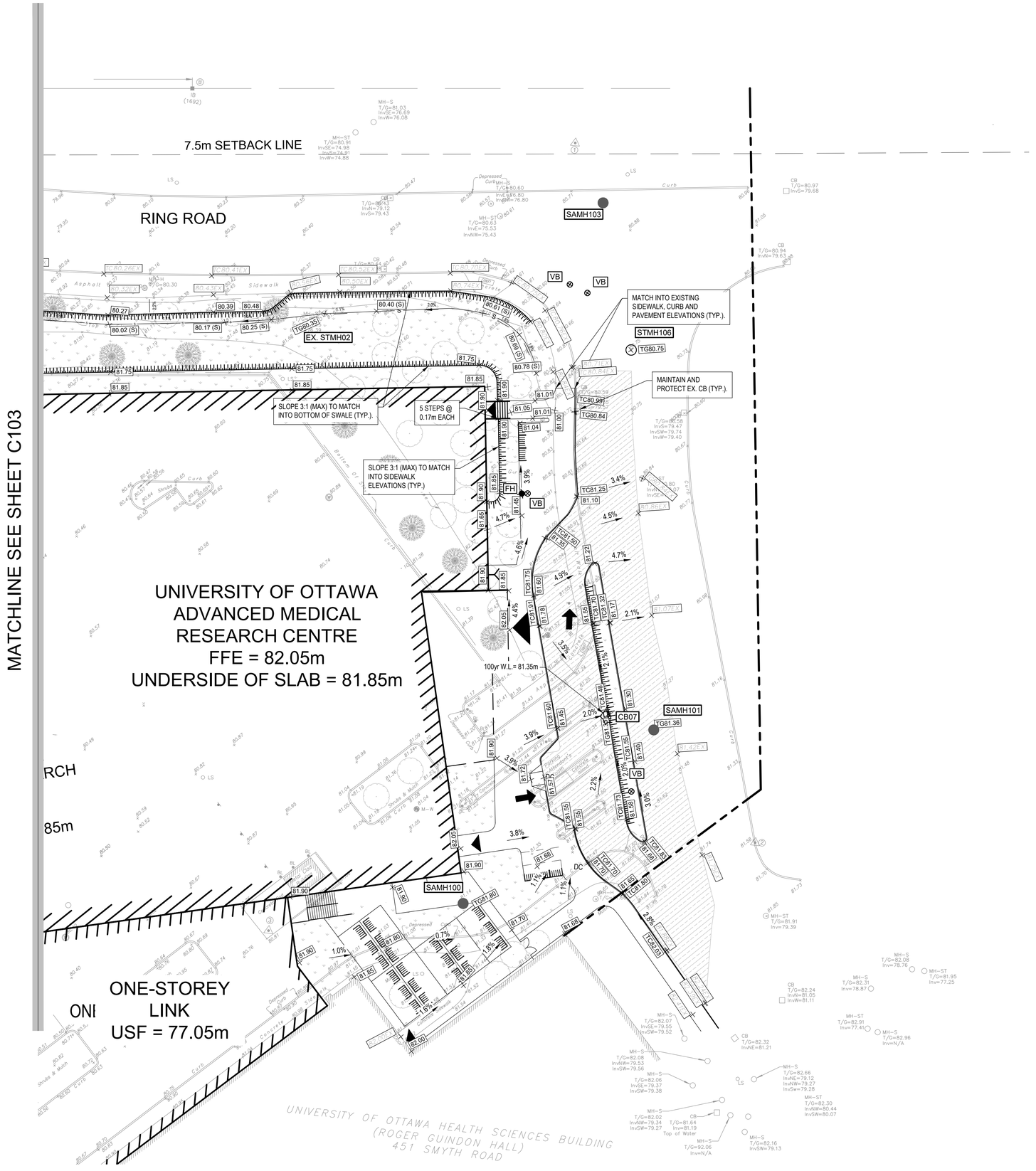
TITLE:

GRADING PLAN

DRAWING NUMBER: C103

REV. 6

CTB: wsp_ottawa.ctb
PLOTTED: 2024-04-15 - 2:05 PM FILE: v:\10-13 me 2023 projects\ca0009956.0165-ca-uottawa amrc pursuit\14.0 tech_prof services\14.60_civil\3. drawings\working drawings\sheets\ca0009956.0165-ca_civil_amrc.dwg



0 5m 10m 20m 25m

SCALE: 1:250

LEGEND: GRADING

× 79.55	EXISTING ELEVATION
CB □	EXISTING CATCHBASIN
MH–ST ○	EXISTING MANHOLE
× 79.55	PROPOSED ELEVATION
× TC79.55	PROPOSED TOP OF CURB
× TG79.55	PROPOSED TOP OF GRATE
× 79.55 (S)	PROPOSED SWALE GRADE
2.55%	PROPOSED GRADE SLOPE
S	PROPOSED SWALE
CB	PROPOSED CATCHBASIN
STMH	PROPOSED STORM MANHOLE
SAN	PROPOSED SANITARY MANHOLE
	PROPOSED GRADE TERRACING
	OVERLAND FLOW RELIEF
	HIGH POINT
DC	DEPRESSED CURB
	PAVEMENT STRUCTURE - CAR ONLY PARKING AREA
	PAVEMENT STRUCTURE - ACCESS LANE & HEAVY TRUCK
	GRASS/ LANDSCAPE AREA
	PROPOSED RIP-RAP

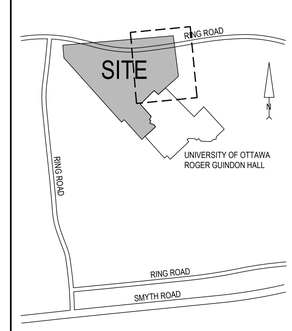
Recommended Pavement Structure-Car Only Parking Areas

THICKNESS (mm)	MATERIAL DESCRIPTION
50	**Wear Course:** HL-3 of Superpave 12.5 Asphaltic Concrete
150	**Base:** OPSS Granular A Crushed Stone
300	**Subbase:** OPSS Granular B Type II
Subgrade: Either fill, in-situ soil or OPSS Granular B Type I or II material placed over in-situ soil or fill.	

Recommended Pavement Structure - Access Lanes and Heavy Truck Parking/Loading Areas

THICKNESS (mm)	MATERIAL DESCRIPTION
40	**Wear Course:** HL-3 of Superpave 12.5 Asphaltic Concrete
50	**Binder Course:** HL-8 or Superpave 19.0 Asphaltic Concrete
150	**Base:** OPSS Granular A Crushed Stone
400	**Subbase:** OPSS Granular B Type II
Subgrade: Either fill, in-situ soil or OPSS Granular B Type I or II material placed over in-situ soil or fill.	

DISCIPLINE/PROJECT DEFINED (eg LEGEND / KEY PLAN / LOGOS)



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SEAL:

LICENSED PROFESSIONAL ENGINEER
Y. TENG
100226367
2024-04-10
PROVINCE OF ONTARIO

NORTH:

ORIGINAL SCALE: AS NOTED
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DISCIPLINE: CIVIL

WSP CANADA INC.
2611 QUEENSVIEW DRIVE, SUITE 300
OTTAWA ONTARIO K2B 8K2 CANADA
WSP.COM

PROJECT NUMBER: CA0009956.0165-CA

CLIENT:

uOttawa PCL

CLIENT REF. #:

PROJECT:

ADVANCED MEDICAL RESEARCH CENTRE

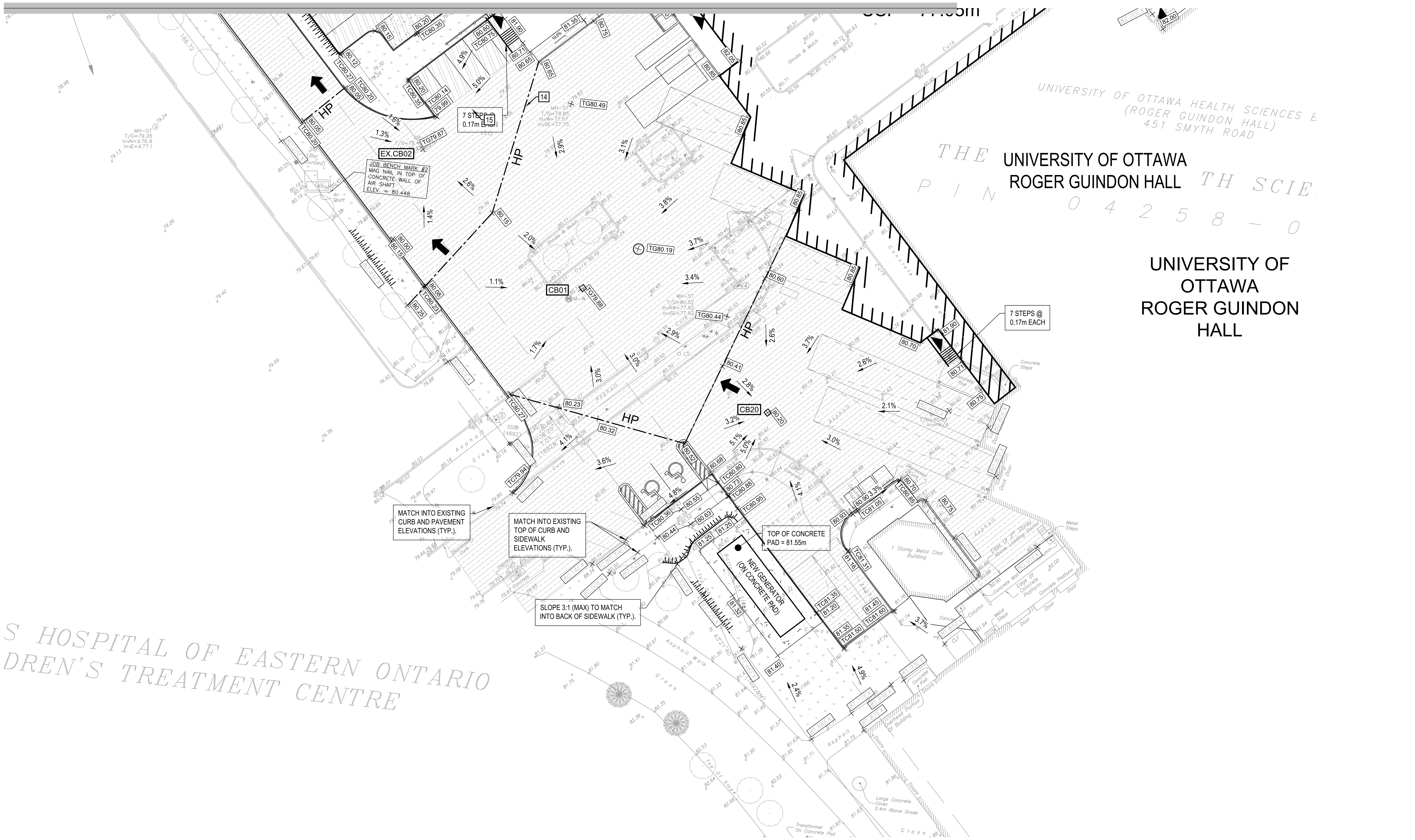
TITLE:

GRADING PLAN

DRAWING NUMBER: C104
REV. 6

CTB: wsp_ottawa.ctb
PLOTTED: 2024-04-15 - 2:05 PM FILE: v:\10-13 mar 2023 projects\ca0009956.0165-ca-uottawa amrc pursuit\14.0 tech_prof services\14.60_civil\3. drawings\working drawings\latest\ca0009956.0165-ca_civil_amrc.dwg

MATCHLINE SEE SHEET C103



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- MH–ST — EXISTING MANHOLE
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- STMH — PROPOSED STORM MANHOLE
- SAN — PROPOSED SANITARY MANHOLE
- PROPOSED GRADE TERRACING
- OVERLAND FLOW RELIEF
- HIGH POINT
- DC — DEPRESSED CURB
- PAVEMENT STRUCTURE - CAR ONLY PARKING AREA
- PAVEMENT STRUCTURE - ACCESS LANE & HEAVY TRUCK
- GRASS/ LANDSCAPE AREA
- PROPOSED RIP-RAP

Recommended Pavement Structure-Car Only Parking Areas

THICKNESS (mm)	MATERIAL DESCRIPTION
50	**Wear Course:** HL-3 of Superpave 12.5 Asphaltic Concrete
150	**Base:** OPSS Granular A Crushed Stone
300	**Subbase:** OPSS Granular B Type II

Subgrade: Either fill, in-situ soil or OPSS Granular B Type I or II material placed over in-situ soil or fill.

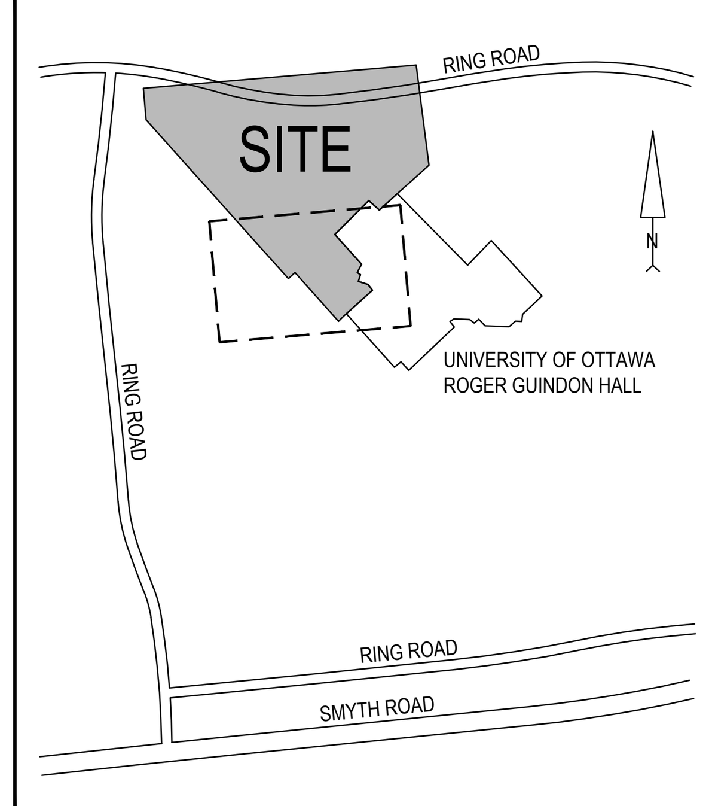
Recommended Pavement Structure - Access Lanes and Heavy Truck Parking/Loading Areas

THICKNESS (mm)	MATERIAL DESCRIPTION
40	**Wear Course:** HL-3 of Superpave 12.5 Asphaltic Concrete
50	**Binder Course:** HL-8 or Superpave 19.0 Asphaltic Concrete
150	**Base:** OPSS Granular A Crushed Stone
400	**Subbase:** OPSS Granular B Type II

Subgrade: Either fill, in-situ soil or OPSS Granular B Type I or II material placed over in-situ soil or fill.

0 5m 10m 20m 25m
SCALE: 1:250

DISCIPLINE/PROJECT DEFINED (eg LEGEND / KEY PLAN / LOGOS)



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NORTH: N

ORIGINAL SCALE: AS NOTED
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2611 QUEENSVIEW DRIVE, SUITE 300
OTTAWA ONTARIO K2B 8K2 CANADA
WSP.COM

PROJECT NUMBER: CA0009956.0165-CA

CLIENT: uOttawa PCL

CLIENT REF. #:

PROJECT: ADVANCED MEDICAL RESEARCH CENTRE

TITLE: GRADING PLAN

DRAWING NUMBER: C105
REV. 6

CTB: wsp_ottawa.ctb
PLOTTED: 2024-04-15 - 2:05 PM
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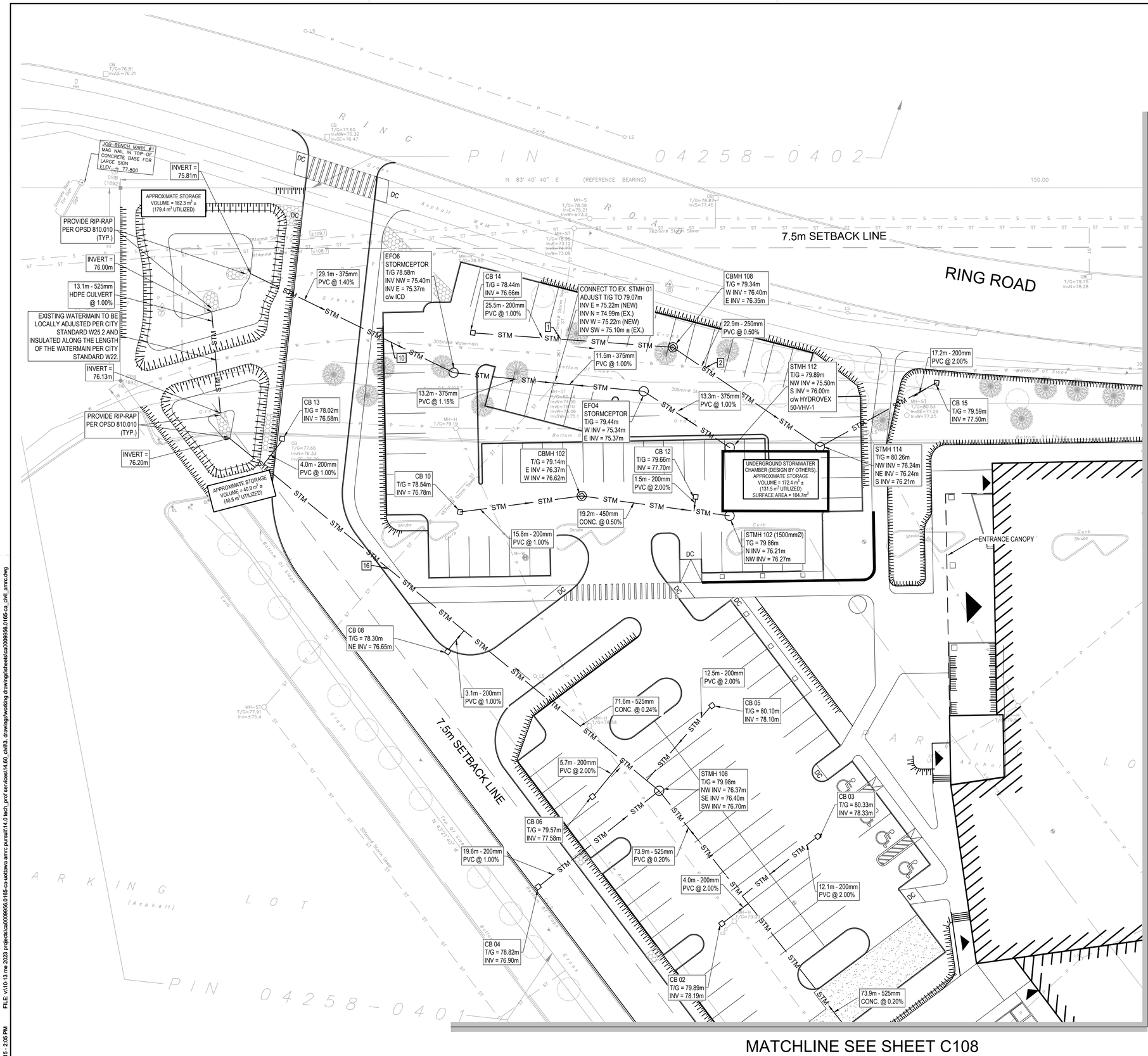
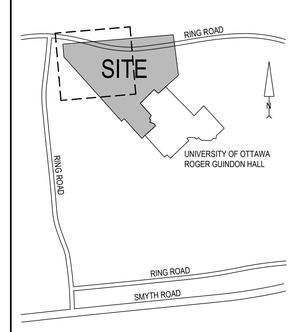


DISCIPLINE/PROJECT DEFINED (eg LEGEND / KEY PLAN / LOGOS)



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SEAL:

LICENSED PROFESSIONAL ENGINEER
Y. TENG
100226367
2024-04-10
PROVINCE OF ONTARIO

NORTH:

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WSP CANADA INC.
2611 QUEENSVIEW DRIVE, SUITE 300
OTTAWA ONTARIO K2B 8K2 CANADA
WSP.COM

PROJECT NUMBER: CA0009956.0165-CA
CLIENT: uOttawa PCL
CLIENT REF. #:

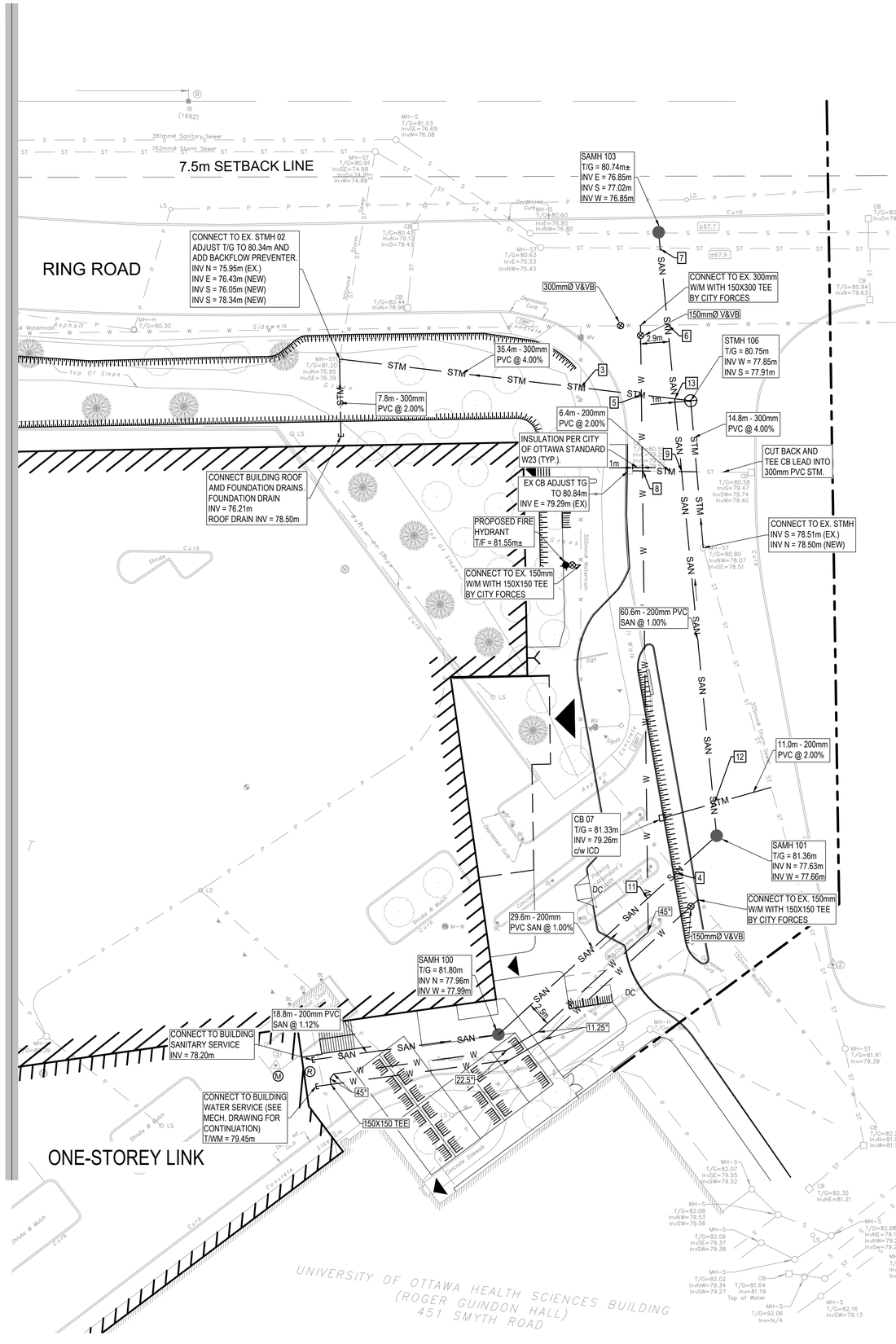
PROJECT:
ADVANCED MEDICAL RESEARCH CENTRE

TITLE:
SERVICING PLAN

DRAWING NUMBER: C106
REV. 6

CTB: wsp_ottawa.ctb
PLOTTED: 2024-04-15 - 2:05 PM FILE: v110-13 mar 2023 projects\ca0009956.0165-ca-uottawa amrc pursuit\14.0 tech_prof services\14.60_civil\3 drawing\working drawings\sheets\ca0009956.0165-ca_civil_amrc.dwg

MATCHLINE SEE SHEET C106



STORM STRUCTURE AND ICD DATA TABLE

STRUCTURE ID	AREA ID	SIZE	STRUCTURE	COVER	TOP OF GRATE	INLET	INLET	INLET	OUTLET	OUTLET DIAMETER (mm)	TYPE	100-YR HEAD	100-YR FLOW (l/s)	ICD TYPE
451 SMYTH ROAD														
STMH 102	A11	1500mm DIA.	OPSD 701.011	S24.1	79.86		76.270		76.210					
EFO4	A8	1200mm DIA.		S24.1	79.44		75.370		75.340	375	PVC SDR-35			
STMH 106	N/A	1200mm DIA.	OPSD 701.010	S24.1	80.75		77.910		77.850	300	PVC SDR-35			
STMH 108	A13	1200mm DIA.	OPSD 701.010	S24.1	79.98	76.400	76.700		76.370	525	CONC. 100D			
CBMH 102	A10	1200mm DIA.	OPSD 701.010	S28.1	79.14		76.620		76.370	450	CONC. 100D			
CBMH 108	A8	1200mm DIA.	OPSD 701.010	S28.1	79.34		76.400		76.350	250	PVC SDR-35			
STMH 109	A17	1200mm DIA.	OPSD 701.010	S24.1	80.19	76.880	76.880		76.550	525	CONC. 100D			
STMH 112	A11	1200mm DIA.	OPSD 701.010	S24.1	79.89		76.000		75.500	375	PVC SDR-35	1.92	4.09	Hydrovex 50 VHV-1
STMH 114	A8	1200mm DIA.	OPSD 701.010	S24.1	80.26	76.240	76.240		76.210					
EFO6	A7	1800mm DIA.		S24.1	78.58		75.400		75.370	375	PVC SDR-35	1.38	74.96	Orifice (175mm Dia.)
EX STMH 01	A7				79.07	75.220	75.220	75.100	74.990	610	EX. CONC.			
EX STMH 02	A4				80.34	76.430	76.050	78.340	75.950	305	EX. CONC.			
CB 01	A17	600X600mm	OPSD 705.010	S19	79.88				77.180	200	PVC SDR-35			
Ex. CB 02	A16				79.87				77.060	200	PVC SDR-35			
CB 02	A15	600X600mm	OPSD 705.010	S19	79.89				78.190	200	PVC SDR-35			
CB 03	A14	600X600mm	OPSD 705.010	S19	80.33				78.330	200	PVC SDR-35			
CB 04	A20	600X600mm	OPSD 705.010	S19	78.82				76.900	200	PVC SDR-35			
CB 05	A12	600X600mm	OPSD 705.010	S19	80.10				78.100	200	PVC SDR-35			
CB 06	A13	600X600mm	OPSD 705.010	S19	79.57				77.580	200	PVC SDR-35			
CB 07	A23	600X600mm	OPSD 705.010	S19	81.33				79.260	200	PVC SDR-35	2.09	49.49	Orifice (125mm Dia.)
CB 08	A21	600X600mm	OPSD 705.010	S19	78.30				76.650	200	PVC SDR-35			
CB 10	A9	600X600mm	OPSD 705.010	S19	78.54				76.780	200	PVC SDR-35			
CB 12	A11	600X600mm	OPSD 705.010	S19	79.66				77.700	200	PVC SDR-35			
CB 13	A22	600X600mm	OPSD 705.010	S19	78.02				76.580	200	PVC SDR-35			
CB 14	A7	600X600mm	OPSD 705.010	S19	78.44				76.660	200	PVC SDR-18			
CB 15	A4	600X600mm	OPSD 705.010	S19	79.59				77.500	200	PVC SDR-35			
CB 20	A18	600X600mm	OPSD 705.010	S19	80.20				78.500	200	PVC SDR-35			

LEGEND: SERVICING

- STM — PROPOSED STORM SEWER
- SAN — PROPOSED SANITARY SEWER
- W — PROPOSED WATERMAIN
- CB — PROPOSED CATCHBASIN
- STMH — PROPOSED STORM MANHOLE
- SAMH — PROPOSED SANITARY MANHOLE
- CBMH — PROPOSED CATCHBASIN MANHOLE
- PROPOSED FIRE HYDRANT
- PROPOSED VALVE AND BOX
- PROPOSED WATER METER
- PROPOSED REMOTE WATER METER
- PROPOSED RIP-RAP

WATERMAIN SCHEDULE

STATION	DESCRIPTION	FINISHED GRADE	TOP OF WATERMAIN	AS-BUILT WATERMAIN	COVER
150mm W/M Service					
0+000	Connect to Ex. 300mm WM w/ 150x300 Tee	80.700		78.300	2.400
0+001.0	150mm V&VB	80.690	78.290		2.400
0+060.7	45 DEG. Bend	81.570	79.170		2.400
0+075.6	11.25 DEG. Bend	81.740	79.340		2.400
0+079.3	22.5 DEG. Bend	81.770	79.370		2.400
0+096.8	45 DEG. Bend	81.880	79.480		2.400
0+097.4	45 DEG. Bend	81.880	79.480		2.400
0+098.0	Connect to 150mm WM w/ 150x150 Tee	81.880	79.480		2.400
1+000	Connect to Ex. 150mm WM w/ 150x150 Tee	81.480		79.080	2.400
1+001.0	150mm V&VB	81.570	79.100		2.470
1+020.8	11.25 DEG. Bend	81.720	79.320		2.400
1+024.9	22.5 DEG. Bend	81.750	79.350		2.400
1+043.0	Connect to 150mm WM w/ 150x150 Tee	81.880	79.480		2.400
1+044.5	Cap 1.0m from Foundation Wall	81.900	79.500		2.400

SAN STRUCTURE TABLE

STRUCTURE ID	TOP OF GRATE ELEVATION	INLET	INLET	OUTLET	DESCRIPTION SIZE	DESCRIPTION OPSD	DESCRIPTION COVER
SAMH 100	81.80		77.990	77.960	1200mm DIA.	OPSD-701.010	S24
SAMH 101	81.36		77.660	77.630	1200mm DIA.	OPSD-701.010	S24
SAMH 103	80.74±	76.850	77.020	76.850	1200mm DIA.	OPSD-701.010	S24

PIPE CROSSING TABLE

		Invert	Obvert			Invert	Obvert	
1	200mmØ PVC STM	76.560	76.760	1.030	Clearance Above	74.920	75.530	EX. 600mmØ STM
2	250mmØ PVC STM	76.340	76.590	0.860	Clearance Under	77.450	77.750	Ex. 300mmØ W/M
3	300mmØ PVC STM	77.390	77.690	0.410	Clearance Under	78.100	78.400	Ex. 300mmØ W/M
4	200mmØ PVC SAN	77.720	77.920	0.930	Clearance Under	78.850	79.000	Ex. 150mmØ W/M
5	150mmØ W/M	78.190	78.340	0.240	Clearance Above	77.650	77.950	300mmØ PVC STM
6	200mmØ PVC SAN	77.110	77.310	0.740	Clearance Under	78.050	78.350	Ex. 300mmØ W/M
7	Ex. 375mmØ PVC STM	75.590	75.970	1.070	Clearance Under	77.040	77.240	200mmØ PVC SAN
8	150mmØ W/M	78.050	78.200	1.070	Clearance Under	79.270	79.470	200mmØ PVC CB LEAD
9	200mmØ PVC SAN	77.260	77.460	1.730	Clearance Under	79.190	79.390	200mmØ PVC CB LEAD
10	375mmØ PVC STM	75.520	75.895	0.905	Clearance Under	76.800	77.100	EX. 300mmØ W/M
11	200mmØ PVC SAN	77.750	77.950	1.000	Clearance Under	78.950	79.100	150mmØ W/M
12	200mmØ PVC SAN	77.600	77.800	1.360	Clearance Under	79.160	79.360	200mmØ PVC CB LEAD
13	200mmØ PVC SAN	77.190	77.390	0.400	Clearance Under	77.790	78.090	300mmØ PVC STM
14	Ex. 300mmØ PVC STM	77.610	77.915	0.575	Clearance Above	76.510	77.035	525mmØ PVC STM
15	Ex. 300mmØ PVC STM	77.530	77.835	0.430	Clearance Above	76.900	77.100	200mmØ PVC CB LEAD
16	Ex. 450mmØ CONC. STM	75.270	75.720	0.540	Clearance Below	76.260	76.785	525mmØ CONC. STM

0 5m 10m 20m 25m

SCALE: 1:250

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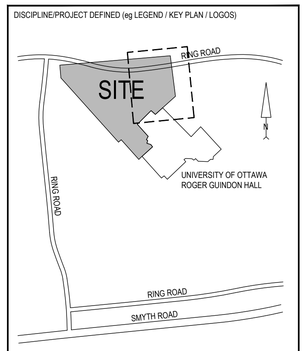

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CLIENT: uOttawa PCL

CLIENT REF. #:

PROJECT:

ADVANCED MEDICAL RESEARCH CENTRE

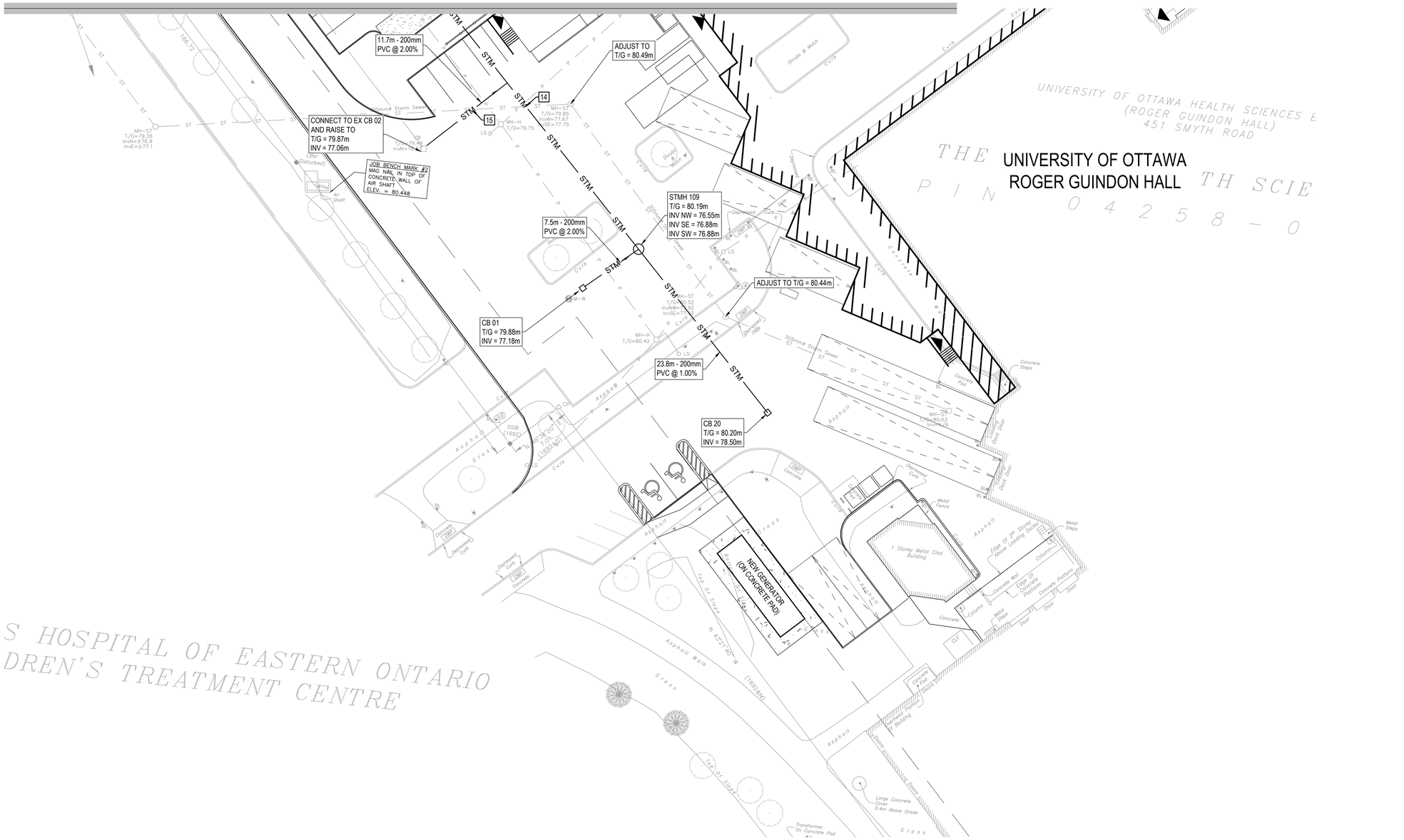
TITLE:

SERVICING PLAN

DRAWING NUMBER: C107

REV. 6

CTB: wsp_ottawa.ctb
PLOTTED: 2024-04-15 - 2:05 PM FILE: u:\10-13 me 2023 projects\ca0009956.0165-ca-ottawa amrc pursuit\14.0 tech_prof services\14.60_civil\3. drawing\working drawing\sheets\ca0009956.0165-ca_civil_amrc.dwg



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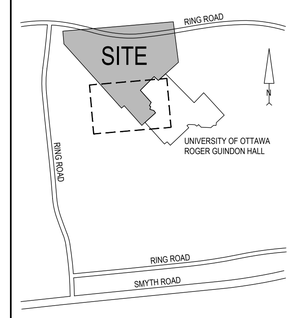
SCALE: 1:250

DISCIPLINE/PROJECT DEFINED (eg LEGEND / KEY PLAN / LOGOS)



KEY PLAN
NTS

REVISION:

REV	DATE	DESCRIPTION	BY
6	2024-04-10	ISSUED FOR PHASE 3 RE-SUBMISSION	VT
5	2024-02-26	ISSUED FOR SITE PLAN APPROVAL	VT
4	2024-02-02	ISSUED FOR COORDINATION	VT
3	2023-11-30	ISSUED FOR SITE PLAN APPROVAL	VT
2	2023-11-20	ISSUED FOR BUILDING PERMIT	VT
1	2023-10-31	ISSUED FOR PRICING PROPOSAL	VT

SEAL:

LICENSED PROFESSIONAL ENGINEER
Y. TENG
100226367
2024-04-10
PROVINCE OF ONTARIO

NORTH:

ORIGINAL SCALE: AS NOTED
DESIGNED BY: V. TENG
DRAWN BY: B. NANDLAL
APPROVED BY: I. JAFFERJEE
DATE: 2023-09-25
IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE. 25mm
DISCIPLINE: CIVIL

WSP CANADA INC.
2611 QUEENSVIEW DRIVE, SUITE 300
OTTAWA ONTARIO K2B 8K2 CANADA
WSP.COM

PROJECT NUMBER: CA0009956.0165-CA

CLIENT: uOttawa PCL

CLIENT REF. #:

PROJECT: ADVANCED MEDICAL RESEARCH CENTRE

TITLE: SERVICING PLAN

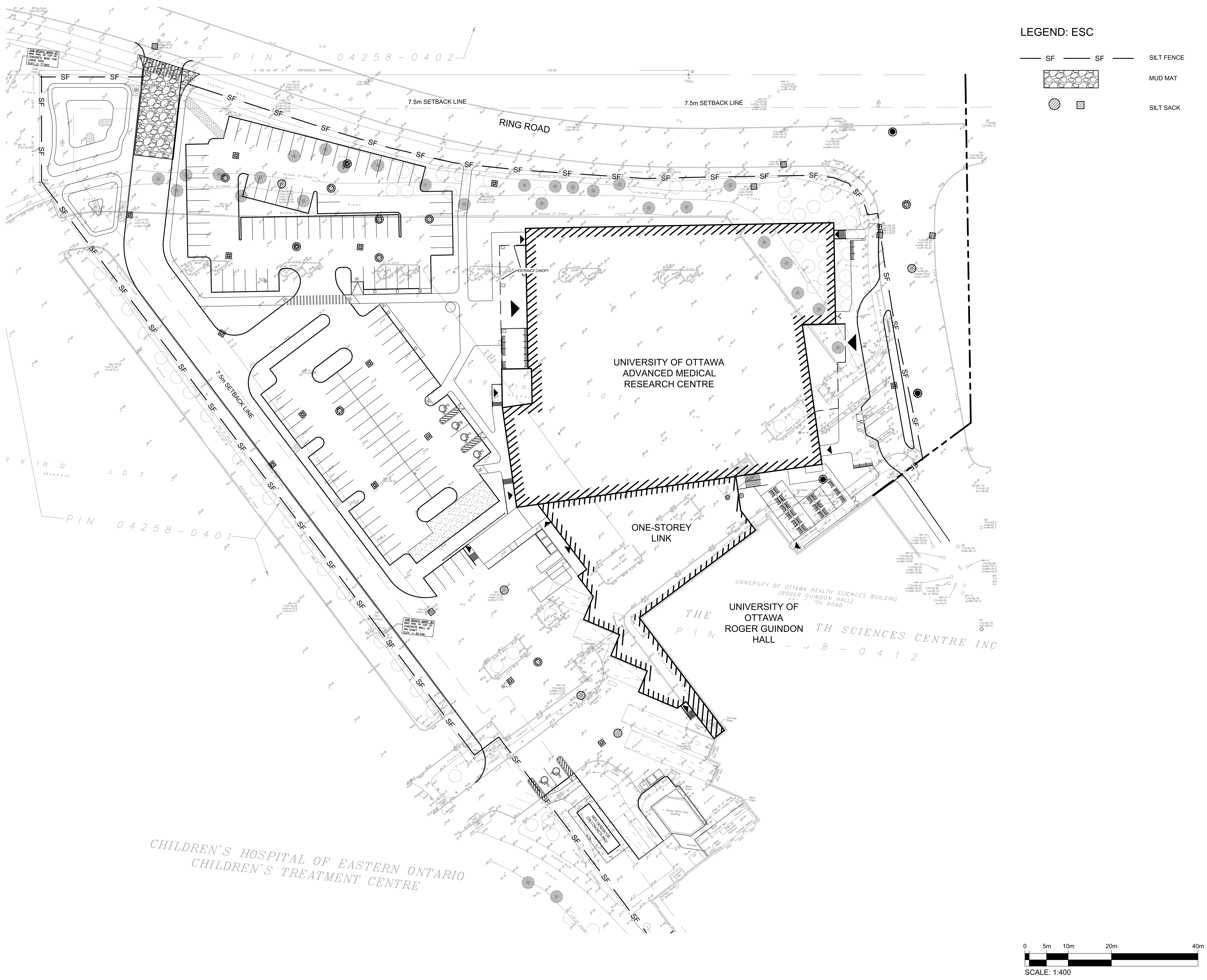
DRAWING NUMBER: C108
REV. 6

CTB: wsp_ottawa.ctb
PLOTTED: 2024-04-15 - 2:06 PM FILE: v:\10-13 me 2023 projects\ca0009956.0165-ca-ottawa amrc pursuit\14.0 tech_prof services\14.60_civil\3. drawing\working drawings\sheets\ca0009956.0165-ca_civil_amrc.dwg

APPENDIX

D

- EROSION AND SEDIMENTATION CONTROL PLAN C109



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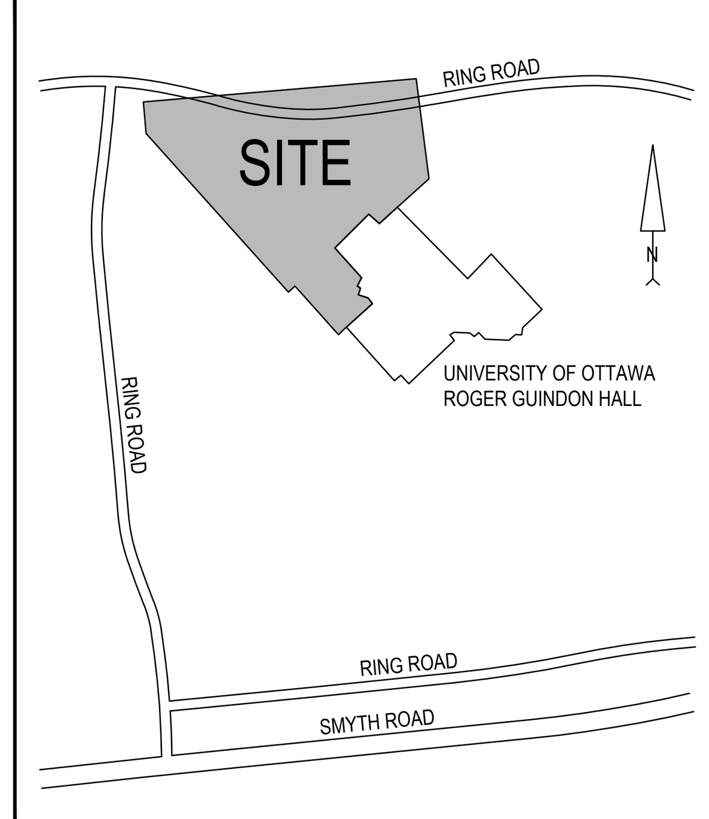
PLOTTED: 2024-04-15 - 2:06 PM
CTB: wsp_ottawa.ctb

DISCIPLINE/PROJECT DEFINED (eg LEGEND / KEY PLAN / LOGOS)



KEY PLAN
NTS

REVISION:

REV	DATE	DESCRIPTION	BY
6	2024-04-10	ISSUED FOR PHASE 3 RE-SUBMISSION	VT
5	2024-02-26	ISSUED FOR SITE PLAN APPROVAL	VT
4	2024-02-02	ISSUED FOR COORDINATION	VT
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2	2023-11-20	ISSUED FOR BUILDING PERMIT	VT
1	2023-10-31	ISSUED FOR PRICING PROPOSAL	VT

SEAL: LICENSED PROFESSIONAL ENGINEER Y. TENG 100226367 2024-04-10 PROVINCE OF ONTARIO

NORTH: N

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ORIGINAL SCALE: AS NOTED
DATE: 2023-09-25
DESIGNED BY: V. TENG
DRAWN BY: B. NANDLAL
APPROVED BY: I. JAFFERJEE
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CLIENT:
uOttawa
PCL

CLIENT REF. #:

PROJECT:
ADVANCED MEDICAL RESEARCH CENTRE

TITLE:
EROSION AND SEDIMENT CONTROL PLAN

DRAWING NUMBER: C109
REV. 6

APPENDIX

E

- SUBMISSION CHECK LIST