PCL CONSTRUCTORS CANADA INC.

UOTTAWA FACULTY OF HEALTH SCIENCES BUILDING, 200 LEES AVE., OTTAWA, ON

SITE SERVICING REPORT

JUNE 28, 2021

UOTTAWA FACULTY OF HEALTH SCIENCES BUILDING, 200 LEES AVE., OTTAWA, ON

SITE SERVICING REPORT

PCL CONSTRUCTORS CANADA INC.

FOR SITE PLAN APPROVAL

PROJECT NO.: 211-01094-01
DATE: JUNE 2021

WSP
2611 QUEENSVIEW DRIVE, SUITE 300
OTTAWA, ON, CANADA, K2B 8K2

WSP.COM

June 28, 2021

49 Auriga Drive
Nepean, ON
K2E 8A1

Attention: David Wroblewski, P.Eng., GSC, LEED GA

Dear Sir:

Subject: uOttawa Faculty of Heath Sciences Building, 200 Lees Ave., Ottawa, ON – Site Servicing Report

Please find attached our site servicing report issued for site plan approval application.

Yours sincerely,

Stephen McCaughey, P.Eng.
Project Engineer

WSP ref.: 211-01094-01

2611 QUEENSVIEW DRIVE, SUITE 300
OTTAWA, ON, CANADA, K2B 8K2

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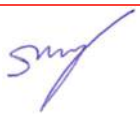
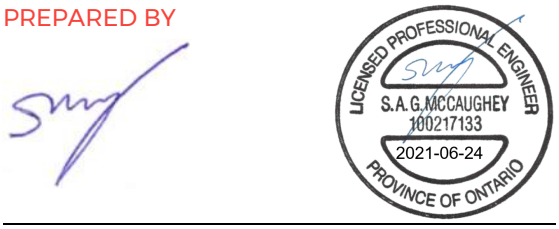
QUALITY MANAGEMENT

ISSUE/REVISION	FIRST ISSUE	REVISION 1	REVISION 2	REVISION 3
Remarks	Issued for Site Plan Approval Application			
Date	2021-06-28			
Prepared by	Stephen McCaughey, P.Eng.			
Signature				
Checked by	James Johnston, P.Eng.			
Signature				
Authorised by				
Signature				
Project number	211-01094-00			
Report number				
File reference				

SIGNATURES

PREPARED BY



Stephen McCaughey, P.Eng.
Project Engineer

REVIEWED BY

James Johnston, P.Eng.
Senior Project Engineer

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1 INTRODUCTION

1.1 EXECUTIVE SUMMARY

WSP was retained by PCL Constructors Canada Inc. to provide servicing, grading and stormwater management design services in support of the site plan approval for the proposed University of Ottawa Faculty of Health Sciences building at 200 Lees Avenue ("Lees Campus"), in the City of Ottawa. The proposed work consists of replacing three existing buildings with a single 5-storey institutional building for classrooms, offices, laboratories, etc. This report will provide sufficient detail to demonstrate that the proposed development can be supported by the existing municipal infrastructure services (watermain, sanitary and storm sewers) and that the servicing design conforms to the applicable standards and guidelines. The report will also include measures to be taken during the construction to minimize erosion and sedimentation. A separate report (200 Lees Ave. – Stormwater Management Report) is provided detailing the stormwater management approach and addressing the quantity control and quality measures in accordance with the applicable guidelines.

Currently, the site contains existing Buildings B, C, and D along with a parking lot. The project site (limits of construction) is 1.92 ha in size. The site is bounded by the LRT to the west, the Rideau River to the south, an access road to the north, and existing Buildings A and E to the east. The site is serviced by private water and sanitary on the Lees Campus, and storm sewers on site which discharge immediately to the River.

The City of Ottawa requires that the 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. 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 currently available within Lees Campus adjacent to the development as recorded from the as-built drawings received from the University:

Lees Campus

- 150/200 mm public/private watermain loop connected to 1200mm trunk feedermain that runs E-W along the north of the Campus.
- 200/300 mm private sanitary sewer connected to 1500mm trunk sewer that runs S-N along the west of the Campus.
- 1200 mm stormwater sewer on west property line and 600/750 mm stormwater sewer at east edge of project site.

It is proposed that an on-site stormwater management system will be provided to collect and attenuate flow rates leaving the site. Refer to stormwater management report for details.

1.2 LOCATION MAP AND PLAN

The site at 200 Lees Ave. is shown in the centre of Figure 1-1 below as presented in the GeoOttawa website showing existing water, sanitary, and storm infrastructure.

Figure 1-1 Site Location

The proposed development will consist of replacing Buildings B, C, and D with a 5-storey L-shaped building for classrooms, offices, laboratories, etc.. The building will have a gross floor area of approximately 21,000 m^2 on a footprint of approximately 5,200 m^2.

1.3 HIGHER LEVEL AND EXISTING STUDIES

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

- Ottawa Sewer Design Guidelines, Second Edition, Document SDG002, October 2012, City of Ottawa including all amendments issued as part of Technical Bulletins.

- Ottawa Design Guidelines – Water Distribution, July 2010 (WDG001), including all amendments issued as part of Technical Bulletins.

- Stormwater Management Planning and Design Manual, Ontario Ministry of the Environment and Climate Change, March 2003 (SMPDM).

- 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), 1999.

As well as the following background documents:

- Addendum to the Approved March 2012 Site Servicing & Stormwater Management Report; Building A Renovation/Addition and Open Air Stadium; 200 Lees Avenue, Ottawa, Ontario; Prepared by Delcan Corporation dated April 2013

- Fire Hydrant Inspection and Analysis Report; University of Ottawa, 140 Louis Pasteur, Ottawa, ON; Prepared by Hydra Spec dated Fall 2019

- University of Ottawa Lees Campus – Faculty of Health Sciences Building; Owner's Statement of Requirements & Indicative Design; Prepared by IBI Group dated November 2020.

1.4 AVAILABLE EXISTING AND PROPOSED INFRASTRUCTURE

As described above, all municipal mains (sanitary, storm and watermain) are available and located on the Lees Campus. Valved water servicing will be provided as well as sanitary servicing with monitoring hole outside the building. Quantity and quality control is required to restrict the stormwater discharge leaving the site, thus the on-site storm runoff will be captured, detention storage provided, flow release restricted, treated for quality control requirements, and finally directed towards the existing storm sewers that discharge to the River.

1.5 GEOTECHNICAL STUDY

Golder provided a draft geotechnical investigation report of the subject property dated April 2020 in support of the preliminary design. Based on the report, groundwater was measured between around 4 m below grade. Paterson Group has been further retained to provide geotechnical recommendations in support of the detailed design phase.

2 WATER DISTRIBUTION

2.1 SYSTEM CONSTRAINTS AND BOUNDARY CONDITIONS

Boundary conditions have been provided by the City of Ottawa at the existing public portions of the 203mm watermain loop (Zone 1W).

Table 2-1: Boundary Conditions (City of Ottawa)

Scenario	Lees Campus Connection
Average Day (MAX HGL)	114.6m
Peak Hour (MIN HGL)	105.5m
Max Day + Fire Flow	104.9m (West Connection) 100.5m (East Connection)

2.2 CONFIRMATION OF ADEQUATE DOMESTIC SUPPLY AND PRESSURE

Water demands are based on Table 4.2 of the Ottawa Design Guidelines – Water Distribution for these institutional demands (70 L/d/cap) based on the number of occupants expected per the University of Ottawa's indicative design: 3,006. A water demand calculation sheet is included in Appendix B, and the total water demands are summarized as follows:

Table 2-2: Proposed Building Water Demand Estimate

Average Day Demand	2.44 L/s
Maximum Day Demand	3.65 L/s
Peak Hour Demand	6.58 L/s

Since the average day demand is greater than 50,000 L/d (0.58 L/s) redundant servicing must be provided. This redundancy is provided through the Campus' 150/200mm loop, which will be re-established around the proposed building.

The 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). In accordance with the Ontario Building/Plumbing Code, the maximum pressure should not exceed 552 kPa (80 psi). Pressure reduction controls may be required for buildings where it is not possible/feasible to maintain the system pressure below 552 kPa.

In order to analyze the pressure conditions at the proposed building connection from the boundary conditions provided by the City at the connection points to the public watermain, the existing Buildings A and E will be taken into account as well. Per the Site Servicing & Stormwater Management Report for Building A Renovation/Addition and Open Air Stadium by Delcan Corporation dated April 2013, Building A is estimated at 0.73 L/s average day demand. Using this demand and

approximate gross floor area as analogue the demand at Building E was also estimated. The total demands estimated for the Lees Campus private watermain loop are as follows:

Table 2-3: Lees Campus Water Demand Estimate

	GFA	Average Day Demand	Maximum Day Demand	Peak Hour Demand
Proposed FHS Building	-	2.44 L/s	3.65 L/s	6.58 L/s
Building A	5,300 m^2	0.73 L/s	1.10 L/s	1.98 L/s
Building E	54,000 m^3	0.55 L/s	0.83 L/s	1.49 L/s
Total		**3.72 L/s**	**5.58 L/s**	**10.05 L/s**

The site has been analyzed as summarized below and in Table 2-4 to ensure all the City of Ottawa minimum criteria for water pressures are met for the two conditions (maximum day + fire flow and peak hour). The analysis was carried out using EPANET hydraulic analysis based on the boundary conditions provided by the City of Ottawa. The detailed EPANET output results are also included in the Appendix A.

With respect to a max day + fire flow of 220 L/s, the model indicated that the pressure drop in the pipe was acceptable and within the City of Ottawa's minimum pressure requirements. Section 2.3 following details the fire flow estimation of the proposed building.

With respect to a peak hour demand of 6.58 L/s, the model indicated that the pressure drop in the pipe was also acceptable and within the City of Ottawa's minimum pressure requirements.

Refer to Appendix A for the detailed water distribution analysis output.

Table 2-4: Summary of Water Pressure from EPANET results

Scenario	Pressure at Building Connection	
	(psi)	(kPa)
Max Day + Fire Flow	43	300
Peak Hour (MIN HGL)	62	426
Average Day (Max HGL)	75	516

2.3 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 non-combustible construction, limited combustible occupancy, with a full sprinkler system, and adjacent Buildings A and E the calculated fire flow demand is 13,000 L/min (217 L/s). A copy of the FUS calculations are included in Appendix A.

The maximum fire demand of 13,000 L/min can be delivered through 150/200mm Campus loop. Further, there are eight Class AA fire hydrant on the Campus and one proposed within 45m from the Fire Department Connection. Two of the hydrants are within 75m of the building and the rest within 150m, which per City of Ottawa Technical Bulletin ISTB-2018-02, will also be able to provide the fire flow. This is further validated by the Fire Hydrant Inspection and Analysis Report for the University of Ottawa conducted by Hydra Spec in Fall 2019 where the hydrants on Lees Campus had calculated capacities at the min. 140 kPa of 7,900-11,300 L/min each.

The boundary condition for Maximum Day and Fire Flow results in a pressure of 300 kPa at the building. In the guidelines, a minimum residual pressure of 140 kPa must be maintained in the distribution system for a fire flow and maximum day event; therefore, the fire flow requirement is met.

3 WASTEWATER DISPOSAL

3.1 DESIGN CRITERIA

In accordance with the City of Ottawa's Sewer Design Guidelines and University of Ottawa Indicative Design for the proposed building the following design criteria have been utilized in order to estimate wastewater flows generated by the subject site and verify existing capacity;

- Average sanitary flow for day school with facilities 90 L/d/cap
- Expected occupants 3,006 cap
- Gross area institutional use 1.92 ha
- Infiltration & foundation allowance (total) 0.33 L/s/ha

3.2 CALCULATIONS FOR SANITARY DEMAND

The criteria to determine anticipated peak flow based on site used as described in Ottawa Sewer Design Guidelines Appendix 4-A are as follows, refer to Appendix B for detailed calculation. Detailed calculations are provided in Appendix B.

Table 3-1: Proposed Building Sanitary Demand Estimate

Average Day Demand	3.13 L/s
Peak Demand	4.70 L/s
Extraneous Flow	0.63 L/s
Total	**5.33 L/s**

3.3 VERIFICATION OF AVAILABLE CAPACITY IN EXISTING SEWER

The sanitary demand will be serviced by a 200mm sewer with a minimum slope of 2%, to maintain scouring velocity, to the existing manhole on the 1500mm trunk sewer. This proposed connection is in anticipation of future renovations in the Campus which may include demolition/abandonment of existing 200/300mm sewer along the north. Per communication with the City provided in Appendix B, the increase in flow is insignificant to the existing sewer capacity.

4 SITE STORM SERVICING

4.1 EXISTING CONDITION

The subject site is located on the University of Ottawa's Lees Campus (200 Lees Ave.), with the LRT track to the west, Rideau River to the south, existing Buildings A and E to the east and access road to the north. The site contains existing Buildings B, C and D that will be demolished as part of this project. The site contains storm infrastructure (pipes, maintenance holes, catch basins) that will be removed/abandoned as part of the development. The storm runoff is directed to one of two outlets to the Rideau River, or is uncontrolled. There is a 1200mm storm sewer along the west property line with existing catch basins that discharges to the River, and a 600/750mm storm sewer at the southeast corner of the site beside Building A that discharges to the River. Most runoff from the subject site is ultimately directed to 600/750mm outlet, with the western edge directed to the 1200mm outlet, and the southern portion uncontrolled to the River. A drainage area plan from the Site Servicing & Stormwater Management Report for Building A Renovation/Addition and Open Air Stadium by Delcan Corporation dated April 2013 is shown in Appendix C.

4.2 DRAINAGE DRAWINGS

Site drawings are included in Appendix D including servicing, grading, drainage area, and erosion and sediment control.

4.3 WATER QUANTITY CONTROL OBJECTIVE

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

4.4 WATER QUALITY CONTROL OBJECTIVE

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

4.5 PROPOSED MINOR SYSTEM

Runoff from the new development area of the site will be collected by a network of surface inlets and storm sewers. The roof runoff and most of the west and south area of the project site will be collected and controlled. The west edge of the property will drain to the existing catch basins on the 1200mm outlet (maintaining the existing condition) and the north will drain to the existing catch basins around the access road/parking lot (maintaining the existing condition) that ultimately connect to the 750mm outlet. The controlled flow is directed to a storm detention chamber for storage located in the central courtyard. Due to soil/groundwater contamination and concern of additional mobilization of groundwater contamination from infiltration, the storage chambers will be wrapped in impermeable liner. All controlled flow is directed through an oil grit separator immediately prior to discharging to the existing outlet at the southeast corner. Prior to the site oil grit separator, a orifice plate will be placed in a maintenance hole to restrict post-development flows to the allowable rate as described in the Stormwater Management Report. The storm sewer design sheet for the site storm system is provided in Appendix C.

4.6 PROPOSED MAJOR SYSTEM

The major overland flow routes generally lead out to the Rideau River, with the overflow elevations at minimum 300mm below the building entrances (63.00m). For the loading dock (northeast corner) the overland flow route is north to the access road and the north parking lot beyond. Additionally, the spillover points are less than 300mm from the catch basin

elevation so there will be no ponding greater than 300mm even in cases of catch basin blockage. The storm sewers are sized such that no ponding will occur during the 2-year, with capacity exceedances backflowing into the cistern. The storm sewer design sheets are provided in Appendix C.

5 SEDIMENT AND EROSION CONTROL

5.1 GENERAL

The sediment and erosion control requirements are based on the City of Ottawa requirements and US EPA 2017 Construction General Permit requirements to achieve LEED credit. Prior to topsoil stripping, earthworks or underground construction, erosion and sediment controls will be implemented and will be maintained throughout construction. Silt fences will be installed around the perimeter of the site and will be cleaned and maintained throughout construction. Silt fences will remain in place until the working areas have been stabilized or re-vegetated. Catch basins and manholes will have filter fabric installed under the grate during construction to protect from silt entering the storm sewer system. A mud mat will be installed at the construction accesses to reduce risk of mud tracking onto adjacent roads.

Erosion and sediment controls must be in place during construction. Recommendations to the contractor will be included in the erosion and sediment control plan in Appendix D and are summarized below:

During all construction activities, erosion and sedimentation shall be controlled by the following techniques:

Prior to start of construction:

- Install silt fence along the perimeter of the project site. A 15m buffer must be maintained between the project site silt fenceline and River.
- Install filter fabric or silt sack filters in all the catchbasins and manholes that capture runoff from the construction area. Install straw bale check dam in existing ditches/swales.
- Install mud mats at construction accesses.

During construction:

- Minimize the extent of disturbed areas and the duration of exposure and impacts to existing grading.
- Perimeter vegetation to remain in place until permanent storm water management is in place otherwise, immediately install silt fence when the existing site is disturbed at the perimeter.
- Protect disturbed areas from overland flow by providing temporary swales to the satisfaction of the field engineer. Tie-in temporary swale to existing catchbasins as required.
- Provide temporary cover such as seeding or mulching if disturbed area will not be rehabilitated within 30 days.
- Inspect silt fences, filter fabric filters, catch basin sumps, and check dams weekly and within 24 hours after a storm event. Clean and repair when necessary.
- Drawing to be reviewed and revised as required during construction.
- Erosion control fencing to be also installed around the base of all stockpiles.
- Do not locate topsoil piles and excavation material closer than 2.5m from any paved surface, or one which is to be paved before the pile is removed. All topsoil piles are to be seeded if they are to remain on site long enough for seeds to grow (longer than 30 days).
- Control dust blown off-site by seeding topsoil piles and other areas temporarily (provide watering as required and to the satisfaction of the engineer).
- No alternate methods of erosion protection shall be permitted unless approved by the field engineer.

- City roadway and sidewalk to be cleaned of all sediment from vehicular tracking as required.
- Provide gravel entrance (mud mat) wherever equipment leaves the site to provide mud tracking onto paved surfaces.
    - During wet conditions, tires of all vehicles/equipment leaving the site are to be scrapped.
    - Any mud/material tracked onto the road shall be removed immediately by hand or rubber tire loader.
    - Take all necessary steps to prevent building material, construction debris or waste being spilled or tracked onto abutting properties or public streets during construction and proceed immediately to clean up any areas so affected.
    - All erosion control structure to remain in place until all disturbed ground surfaces have been stabilized either by paving or restoration of vegetative ground cover.
    - During the course of construction, if the engineer believes that additional prevention methods are required to control erosion and sedimentation, the contractor will install additional silt fences or other methods as required to the satisfaction of the engineer.
    - The contractor shall implement best management practices, to provide for protection of the area drainage system and the receiving watercourse, during construction activities. The contractor acknowledges that failure to implement appropriate erosion and sediment control measures may be subject to penalties imposed by any applicable regulatory agency.

6 APPROVAL AND PERMIT REQUIREMENTS

6.1 GENERAL

The proposed development is subject to City of Ottawa site plan approval and criteria from the Rideau Valley Conservation Authority.

No other permits or approvals are anticipated to be required from the Ontario Ministry of the Environment, Conservation and Parks (MECP), Ontario Ministry of Transportation, National Capital Commission, Parks Canada, Public Works and Government Services Canada, or any other provincial or federal regulatory agency except those noted above.

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.

A WATER DEMAND

DOMESTIC WATER - PROPOSED WATER FLOWS
200 Lees Ave. - FHS Building

Average Day Demand		
Residential	280	L/c/d
Commercial	28,000	L/gross ha/d
Institutional*	70	L/cap/d
Light Industrial	35,000	L/gross ha/d
Heavy Industrial	55,000	L/gross ha/d

*Per ODG-WD Table 4.2

Max Day Demand		
Residential	2.5	x avg day
Light Industrial	1.5	x avg day
Heavy Industrial	1.5	x avg day
Commercial	1.5	x avg day
Institutional	1.5	x avg day

Peak Hour Demand		
Residential	2.2	x max day
Light Industrial	1.8	x max day
Heavy Industrial	1.8	x max day
Commercial	1.8	x max day
Institutional	1.8	x max day

Unit Type	**Person Per Unit**
Single Family	3.4
Semi-detached	2.7
Duplex	2.3
Townhouse (row)	2.7
Apartments:	
Bachelor	1.4
1 Bedroom	1.4
2 Bedroom	2.1
3 Bedroom	3.1
Average Apt.	1.8

Gateway West

	Health Science Bldg
Usage Type	
Residential (Population)	3,006
Commercial (m2)	
Institutional (m2)	
Light Industrial (m2)	
Heavy Industrial (m2)	
Other (L/d)	
Total Population:	**3,006**
Total Other Flow (L/d)	**0.0**
Total Area (ha):	**0.0**

	Health Science Bldg		
Demand Type=	**Institutional***		
Average Day Demand=	70		L/cap/d
Population	**3,006**		
Site Area (ha)	**0.0**		
	70	x	3,006.0
	210,420		L/day
Average Daily Flow=	**2.44**		**L/s**
Peaking Factor Type	Institutional*		
Peaking Factor	1.5	x	avg day flow
	1.5	x	2.44
Max Day Flow=	**3.65**		**L/s**
Peaking Factor Type	Institutional*		
Peaking Factor	1.8	x	max day flow
	1.8	x	3.65
Peak Hour Flow=	**6.58**		**L/s**

WATER DISTRIBUTION - PROPOSED FIRE FLOW DEMANDS
200 Lees Ave. - FHS Building

$$F = 220\ C\ \sqrt{A}$$

Type of Construction Coefficient:		Comments
Wood Frame	1.5	(all structurally combustible)
Ordinary	1.0	(brick, masonry wall, combustible floor and interior)
Non-Combustible	0.8	(unprotected metal structural component, masonry or metal walls)
Fire Resistive	0.6	(fully protected frame, floors and roof)

Combustibility:		
Non-Combustible	-25%	
Limited Combustible	-15%	
Combustible	0%	
Free Burning	15%	
Rapid Burning	25%	

Sprinkler Protection:		
Complete Sprinkler System	-50%	(max.)
NFPA 13 Conformed	-30%	(max.)
Standard Supply and Fire Lines	-10%	additional (max.)
Fully Supervised System	-10%	additional (max.)
None	0%	

Gateway West

		Health Science Bldg		
Type of Construction Coefficient		Non-Combustible		
		0.8		
Gross Floor Area (m^2)		21,000	m2	
Fire Flow, F		25,505	L/min	
F(round)		26,000	L/min	
Modification 1: Occupancy				
Combustibility		Limited Combustible		
		-15%		
Occupancy Credit		-3,900	L/min	
F(mod1) = F(round) + Occupancy Credit		22,100	L/min	
Modification 2: Sprinkler Protection		Complete Sprinkler System		
		-50%		
Additional Credit		Standard Supply and Fire Lines		
		0		
Sprinkler Credit		-11,050	L/min	
F(mod2) = F(mod1) + Sprinkler Credit		11,050	L/min	
Modification 3: Exposure Distances				
North		>45	m	0%
South		>45	m	0%
East		20.1	m	10%
West		>45	m	0%
		Total %	=	10%
		22,100	x	0.10
Exposure Credit		2,210	L/min	
F(mod3) = F(mod2) + Exposure Credit		13,260	L/min	
F(final) = F(mod3) rounded to nearest 1,000L/min		**13,000**	**L/min**	
F(final)		**217**	**L/s**	

Max Day Flow (L/s)	3.7
Fire Flow (L/s)	216.7
Max Day + Fire (L/s)	**220.3**

McCaughey, Stephen

From: Wessel, Shawn <shawn.wessel@ottawa.ca>
Sent: Friday, June 18, 2021 2:46 PM
To: McCaughey, Stephen
Cc: Renaud, Jean-Charles
Subject: RE: uOttawa FHS - SPA Confirmation of Site Services
Attachments: uOttawa FHS June 2021.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Good afternoon Mr. McCaughey.

Further to your inquiry, please see boundary conditions below and attached:

An additional connection west of the site off of Lees; would be a good idea so that in the event the 1220mm backbone watermain is out of service, Ottawa U would still have water.

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

The following are boundary conditions, HGL, for hydraulic analysis at University of Ottawa – Lees Campus (zone 1W) assumed to be looped and connected to both the 203mm's off Lees Avenue (see attached PDF for location).

Both Connections:

Minimum HGL : 105.5 m

Maximum HGL : 114.6 m

Max Day + Fire Flow (Connection 1): 104.9 m

Max Day + Fire Flow (Connection 2): 100.5 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.

If you require additional information or clarification, please do not hesitate to contact me anytime.

Thank you

Regards,

Shawn Wessel, A.Sc.T.,rcji
Project Manager - Infrastructure Approvals
Gestionnaire de projet – Approbation des demandes d'infrastructures

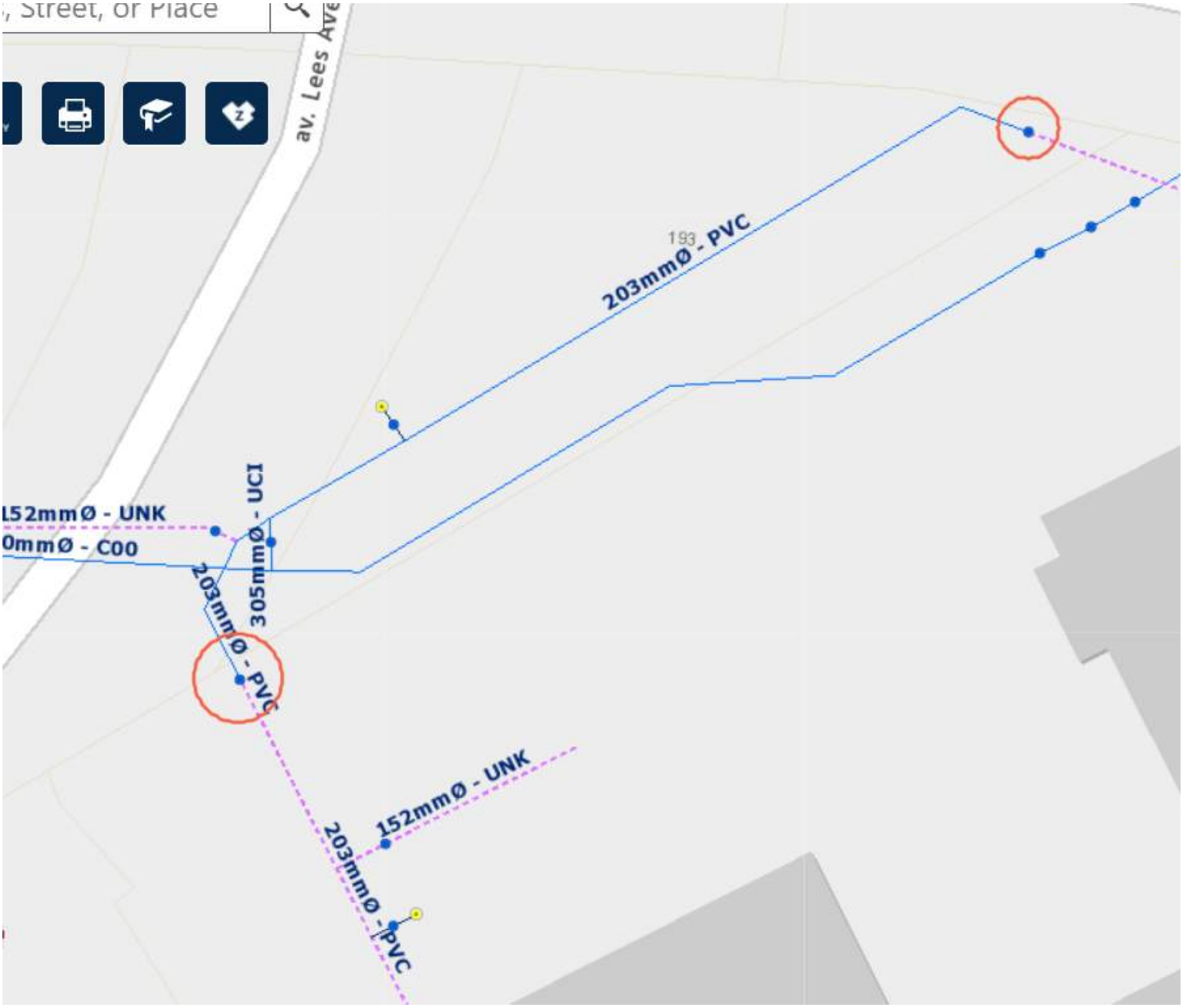
Development Review Central Branch | Direction de l'examen des projets d'aménagement, Centrale
Planning, Infrastructure and Economic Development Department | Direction générale de la planification de l'infrastructure et du développement économique
City of Ottawa | Ville d'Ottawa
110 Laurier Ave. W. | 110, avenue Laurier Ouest, Ottawa ON K1P 1J1
(613) 580 2424 Ext. | Poste 33017
Int. Mail Code | Code de Courrier Interne 01-14
shawn.wessel@ottawa.ca

*****Please also note that, while my work hours may be affected by the current situation and am working from home, I still have access to email, video conferencing and telephone. Feel free to schedule video conferences and/or telephone calls, as necessary.*****

From: McCaughey, Stephen <Stephen.Mccaughey@wsp.com>
Sent: June 14, 2021 2:59 PM
To: Wessel, Shawn <shawn.wessel@ottawa.ca>
Subject: RE: uOttawa FHS - SPA Confirmation of Site Services

Hi Shawn,

If we're looking at both ends of the 200mm loop, then yes please. Our proposed building will be tapping off the continued private 200mm loop.



Thank you,
Stephen McCaughey, P.Eng.
T +1 613-690-3955 (Direct)
T +1 613-829-2800 (Office)

From: Wessel, Shawn <shawn.wessel@ottawa.ca>
Sent: Monday, June 14, 2021 2:42 PM
To: McCaughey, Stephen <Stephen.Mccaughey@wsp.com>
Subject: uOttawa FHS - SPA Confirmation of Site Services

Good afternoon Mr. McCaughey.

Water Distribution had some questions about your inquiry, Please see below.

8 SANITARY SEWER

The sanitary service connection will not be disturbed as part of the proposed work. The existing peak sanitary flow for the building is conservatively estimated (from MOE guidelines) to be 1.15 L/s. The proposed peak sanitary flow for the renovated Building A is estimated to be 0.88 L/s, a reduction of more than 20%.

The building service connection is more than adequate to handle the anticipated sewage peak flow.

9 WATERMAIN

The water service connection will not be disturbed as part of the proposed work. The existing 150 mm watermain located within the drive isle along Building A east wall will be relocated to along the proposed drive isle between the sports field and Building A. The watermain will be reconstructed with a minimum depth of cover of 2.4 m to City of Ottawa standards. The existing fire hydrant located at the south east corner of Building A will be relocated as well near Building A east wall.

The existing water demand for Building A is conservatively estimated (from MOE guidelines) and is shown in Table 2 below. The proposed water demand for the renovated Building A is shown in Table 3, a reduction of more than 20%.

Table 2 - Water Demand for Existing Building A

Area ID	Average Daily Demand (ADD)	Maximum Daily Demand (MDD)	Peak Hourly Demand (PHD)
	L/s	1.5*ADD L/s	1.8*MDD L/s
200 Lees Avenue			
Building A	0.96	1.44	2.59
Total	0.96	1.44	2.59

Table 3 - Water Demand for Proposed Building A

Area ID	Average Daily Demand (ADD)	Maximum Daily Demand (MDD)	Peak Hourly Demand (PHD)
	L/s	1.5*ADD L/s	1.8*MDD L/s
200 Lees Avenue			
Building A	0.73	1.10	1.98
Total	0.73	1.10	1.98

10 EROSION AND SEDIMENT CONTROL DURING CONSTRUCTION

To mitigate the impacts due to erosion and sedimentation during construction, erosion and sediment control measures shall be installed and maintained throughout the duration of construction. Measures shall only be removed once the construction activities are complete, and the site has stabilized.

The measure will include:

- Filter fabric installed between the frame and cover of existing and new catchbasins and manholes, to minimize sediments entering the storm drainage system.

Boundary Conditions for uOttawa FHS - Lees Campus

Network Map

Day 1, 1

Auto-Length Off | LPS | 100% | X,Y: -3347.13, 6053.51

```
**********************************************************************
*                           E P A N E T                              *
*                   Hydraulic and Water Quality                      *
*                   Analysis for Pipe Networks                       *
*                         Version 2.0                                *
**********************************************************************
```

Input File: uOttawa Lees Health Science Bldg - Model.net

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
8	25	26	9	152
9	25	27	64	203
10	27	28	22	152
11	28	BldgE	19	152
12	27	30	17	203
13	30	BldgA	24	102
14	30	32	7	203
15	32	33	12	152
16	32	34	15	203
17	34	35	19	152
18	35	36	82	152
19	36	37	7	152
20	36	38	6	152
21	38	39	49	152
22	39	40	10	152
23	40	41	8	152
24	40	42	46	152
26	7	6	16	203
29	7	BuildingConnection	11	203
31	5	4	57	203
32	4	3	54	203
33	3	42	30	203
34	7	9	7	203
35	9	5	45	203
36	BuildingHydrant	9	5	152
1	2	25	30	203
2	1	6	30	203

Page 2

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
25	0.00	114.60	54.60	0.00
26	0.00	114.60	54.60	0.00
27	0.00	114.60	54.60	0.00
28	0.00	114.60	54.60	0.00
BldgE	0.55	114.60	52.60	0.00
30	0.00	114.60	54.60	0.00
BldgA	0.73	114.59	52.59	0.00
32	0.00	114.60	54.60	0.00
33	0.00	114.60	52.60	0.00
34	0.00	114.60	54.60	0.00
35	0.00	114.60	54.60	0.00
36	0.00	114.60	54.60	0.00

37	0.00	114.60	52.60	0.00
38	0.00	114.60	54.60	0.00
39	0.00	114.60	54.60	0.00
40	0.00	114.60	54.60	0.00
41	0.00	114.60	52.60	0.00
42	0.00	114.60	54.60	0.00
3	0.00	114.60	54.60	0.00
4	0.00	114.60	54.60	0.00
5	0.00	114.60	52.60	0.00
6	0.00	114.60	54.60	0.00
7	0.00	114.60	54.60	0.00
BuildingConnection	2.44	114.60	52.60	0.00
9	0.00	114.60	54.60	0.00
BuildingHydrant	0.00	114.60	52.60	0.00
1	-2.31	114.60	0.00	0.00 Reservoir
2	-1.41	114.60	0.00	0.00 Reservoir

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
8	0.00	0.00	0.00	Open
9	1.41	0.04	0.02	Open
10	0.55	0.03	0.02	Open
11	0.55	0.03	0.02	Open
12	0.86	0.03	0.01	Open
13	0.73	0.09	0.22	Open
14	0.13	0.00	0.00	Open
15	0.00	0.00	0.00	Open
16	0.13	0.00	0.00	Open
17	0.13	0.01	0.00	Open
18	0.13	0.01	0.00	Open
19	0.00	0.00	0.00	Open
20	0.13	0.01	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
21	0.13	0.01	0.00	Open
22	0.13	0.01	0.00	Open
23	0.00	0.00	0.00	Open
24	0.13	0.01	0.00	Open
26	-2.31	0.07	0.05	Open
29	2.44	0.08	0.06	Open
31	-0.13	0.00	0.00	Open
32	-0.13	0.00	0.00	Open
33	-0.13	0.00	0.00	Open
34	-0.13	0.00	0.00	Open
35	-0.13	0.00	0.00	Open
36	0.00	0.00	0.00	Open
1	1.41	0.04	0.02	Open
2	2.31	0.07	0.05	Open

```
**********************************************************************
*                           E P A N E T                              *
*                   Hydraulic and Water Quality                      *
*                   Analysis for Pipe Networks                       *
*                         Version 2.0                                *
**********************************************************************
```

Input File: uOttawa Lees Health Science Bldg - Model.net

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
8	25	26	9	152
9	25	27	64	203
10	27	28	22	152
11	28	BldgE	19	152
12	27	30	17	203
13	30	BldgA	24	102
14	30	32	7	203
15	32	33	12	152
16	32	34	15	203
17	34	35	19	152
18	35	36	82	152
19	36	37	7	152
20	36	38	6	152
21	38	39	49	152
22	39	40	10	152
23	40	41	8	152
24	40	42	46	152
26	7	6	16	203
29	7	BuildingConnection	11	203
31	5	4	57	203
32	4	3	54	203
33	3	42	30	203
34	7	9	7	203
35	9	5	45	203
36	BuildingHydrant9		5	152
1	2	25	30	203
2	1	6	30	203

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
25	0.00	105.50	45.50	0.00
26	0.00	105.50	45.50	0.00
27	0.00	105.49	45.49	0.00
28	0.00	105.48	45.48	0.00
BldgE	1.49	105.48	43.48	0.00
30	0.00	105.49	45.49	0.00
BldgA	1.98	105.45	43.45	0.00
32	0.00	105.49	45.49	0.00
33	0.00	105.49	43.49	0.00
34	0.00	105.49	45.49	0.00
35	0.00	105.49	45.49	0.00
36	0.00	105.49	45.49	0.00

37	0.00	105.49	43.49	0.00
38	0.00	105.49	45.49	0.00
39	0.00	105.48	45.48	0.00
40	0.00	105.48	45.48	0.00
41	0.00	105.48	43.48	0.00
42	0.00	105.48	45.48	0.00
3	0.00	105.48	45.48	0.00
4	0.00	105.48	45.48	0.00
5	0.00	105.48	43.48	0.00
6	0.00	105.49	45.49	0.00
7	0.00	105.48	45.48	0.00
BuildingConnection	6.58	105.48	43.48	0.00
9	0.00	105.48	45.48	0.00
BuildingHydrant	0.00	105.48	43.48	0.00
1	-6.24	105.50	0.00	0.00 Reservoir
2	-3.81	105.50	0.00	0.00 Reservoir

Link Results:

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
8	0.00	0.00	0.00	Open
9	3.81	0.12	0.14	Open
10	1.49	0.08	0.12	Open
11	1.49	0.08	0.12	Open
12	2.32	0.07	0.05	Open
13	1.98	0.24	1.40	Open
14	0.34	0.01	0.00	Open
15	0.00	0.00	0.00	Open
16	0.34	0.01	0.00	Open
17	0.34	0.02	0.01	Open
18	0.34	0.02	0.01	Open
19	0.00	0.00	0.00	Open
20	0.34	0.02	0.01	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
21	0.34	0.02	0.01	Open
22	0.34	0.02	0.01	Open
23	0.00	0.00	0.00	Open
24	0.34	0.02	0.01	Open
26	-6.24	0.19	0.34	Open
29	6.58	0.20	0.38	Open
31	-0.34	0.01	0.00	Open
32	-0.34	0.01	0.00	Open
33	-0.34	0.01	0.00	Open
34	-0.34	0.01	0.00	Open
35	-0.34	0.01	0.00	Open
36	0.00	0.00	0.00	Open
1	3.81	0.12	0.14	Open
2	6.24	0.19	0.34	Open

```
******************************************************************************
*                            E P A N E T                                     *
*                     Hydraulic and Water Quality                            *
*                     Analysis for Pipe Networks                             *
*                          Version 2.0                                       *
******************************************************************************

Input File: uOttawa Lees Health Science Bldg - Model.net
```

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
8	25	26	9	152
9	25	27	64	203
10	27	28	22	152
11	28	BldgE	19	152
12	27	30	17	203
13	30	BldgA	24	102
14	30	32	7	203
15	32	33	12	152
16	32	34	15	203
17	34	35	19	152
18	35	36	82	152
19	36	37	7	152
20	36	38	6	152
21	38	39	49	152
22	39	40	10	152
23	40	41	8	152
24	40	42	46	152
26	7	6	16	203
29	7	BuildingConnection	11	203
31	5	4	57	203
32	4	3	54	203
33	3	42	30	203
34	7	9	7	203
35	9	5	45	203
36	BuildingHydrant	9	5	152
1	2	25	30	203
2	1	6	30	203

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
25	0.00	100.37	40.37	0.00
26	0.00	100.37	40.37	0.00
27	0.00	100.09	40.09	0.00
28	0.00	100.09	40.09	0.00
BldgE	0.83	100.09	38.09	0.00
30	0.00	100.02	40.02	0.00
BldgA	1.10	100.01	38.01	0.00
32	0.00	100.00	40.00	0.00
33	0.00	100.00	38.00	0.00
34	0.00	99.94	39.94	0.00
35	0.00	99.59	39.59	0.00
36	0.00	98.10	38.10	0.00

37	0.00	98.10	36.10	0.00	
38	0.00	97.99	37.99	0.00	
39	0.00	97.10	37.10	0.00	
40	0.00	96.92	36.92	0.00	
41	0.00	96.92	34.92	0.00	
42	0.00	96.08	36.08	0.00	
3	0.00	95.97	35.97	0.00	
4	0.00	95.76	35.76	0.00	
5	0.00	95.55	33.55	0.00	
6	0.00	98.68	38.68	0.00	
7	0.00	95.36	35.36	0.00	
BuildingConnection	220.32	92.57	30.57	0.00	
9	0.00	95.38	35.38	0.00	
BuildingHydrant	0.00	95.38	33.38	0.00	
1	-197.73	104.90	0.00	0.00	Reservoir
2	-24.52	100.50	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
8	0.00	0.00	0.00	Open
9	24.52	0.76	4.34	Open
10	0.83	0.05	0.04	Open
11	0.83	0.05	0.04	Open
12	23.69	0.73	4.08	Open
13	1.10	0.13	0.47	Open
14	22.59	0.70	3.73	Open
15	0.00	0.00	0.00	Open
16	22.59	0.70	3.73	Open
17	22.59	1.24	18.22	Open
18	22.59	1.24	18.22	Open
19	0.00	0.00	0.00	Open
20	22.59	1.24	18.22	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
21	22.59	1.24	18.22	Open
22	22.59	1.24	18.22	Open
23	0.00	0.00	0.00	Open
24	22.59	1.24	18.22	Open
26	-197.73	6.11	207.45	Open
29	220.32	6.81	253.45	Open
31	-22.59	0.70	3.73	Open
32	-22.59	0.70	3.73	Open
33	-22.59	0.70	3.73	Open
34	-22.59	0.70	3.73	Open
35	-22.59	0.70	3.73	Open
36	0.00	0.00	0.00	Open
1	24.52	0.76	4.34	Open
2	197.73	6.11	207.45	Open

B SANITARY DEMAND

SANITARY SEWAGE - PROPOSED SANITARY FLOWS
200 Lees Ave. - FHS Building

Average Wastewater Flows:		
Residential	280	L/c/d
Commercial	28,000	L/gross ha/d
Institutional*	90	L/cap/d
Light Industrial	35,000	L/gross ha/d
Heavy Industrial	55,000	L/gross ha/d

*Per OSDG Appendix 4a, day school w. cafeteria, gym, showers

Peaking Factors:		
Residential	Harmon Equation	
Commercial (>20% Area)	1.5	
Commercial (<20% Area)	1.0	
Institutional (>20% Area)	1.5	
Institutional (<20% Area)	1.0	
Industrial	6	Per Figure in Appendix 4-B

$$P.F. = 1 + \left(\frac{14}{4 + \left(\frac{P}{1000} \right) \text{^} 0.5} \right) * \text{K}$$

where P = population
K = correction factor = 0.8

Peak Extraneous Flows:	
Infiltration Allowance	0.33
Less than 10 ha:	
Foundation Drain Allowance	5.0
10 ha - 100 ha:	
Foundation Drain Allowance	3.0
Greater than 100 ha:	
Foundation Drain Allowance	2.0

Unit Type	**Person Per Unit**
Single Family	3.4
Semi-detached	2.7
Duplex	2.3
Townhouse (row)	2.7
Apartments:	
Bachelor	1.4
1 Bedroom	1.4
2 Bedroom	2.1
3 Bedroom	3.1
Average Apt.	1.8

	Health Science Bldg
Usage Type	
Residential (Population)	3,006
Commercial (m2)	
Institutional (m2)	19,200
Light Industrial (m2)	
Heavy Industrial (m2)	
Other (L/d)	
Total Population:	**3006**
Total Other Flow (L/d)	**0**
Total Area (ha):	**1.9**

	Health Science Building		
Demand Type=	**Institutional***		
Average Day Demand=	90		L/cap/d
Population	**3,006**		
Site Area (ha)	**1.9**		
	90	x	3,006.0
	270,540		L/day
Average Daily Flow=	**3.13**		**L/s**
Peaking Factor Type	Institutional*		
Peaking Factor	1.50		
	1.50	x	average day
	1.50	x	270,540
	405,810		L/day
Peak Daily Flow=	**4.70**		**L/s**
Infiltration Allowance	0.33		
	0.33	x	lot area
	0.33	x	1.920
Peak Extraneous Flow=	**0.63**		**L/s**
	peak daily flow	+	extraneous flow
	4.70	+	0.63
Total Peak Design Flow=	**5.33**		**L/s**

McCaughey, Stephen

From: Wessel, Shawn <shawn.wessel@ottawa.ca>
Sent: Monday, June 21, 2021 10:47 AM
To: McCaughey, Stephen
Cc: LeRoy, Tom; Renaud, Jean-Charles
Subject: RE: uOttawa FHS - SPA Confirmation of Site Services

Good morning Mr. McCaughey

From Water Resources Dept.:

The sanitary flow increase is too small to have any impact.

If you require additional information or clarification, please do not hesitate to contact me anytime.

Thank you

Regards,

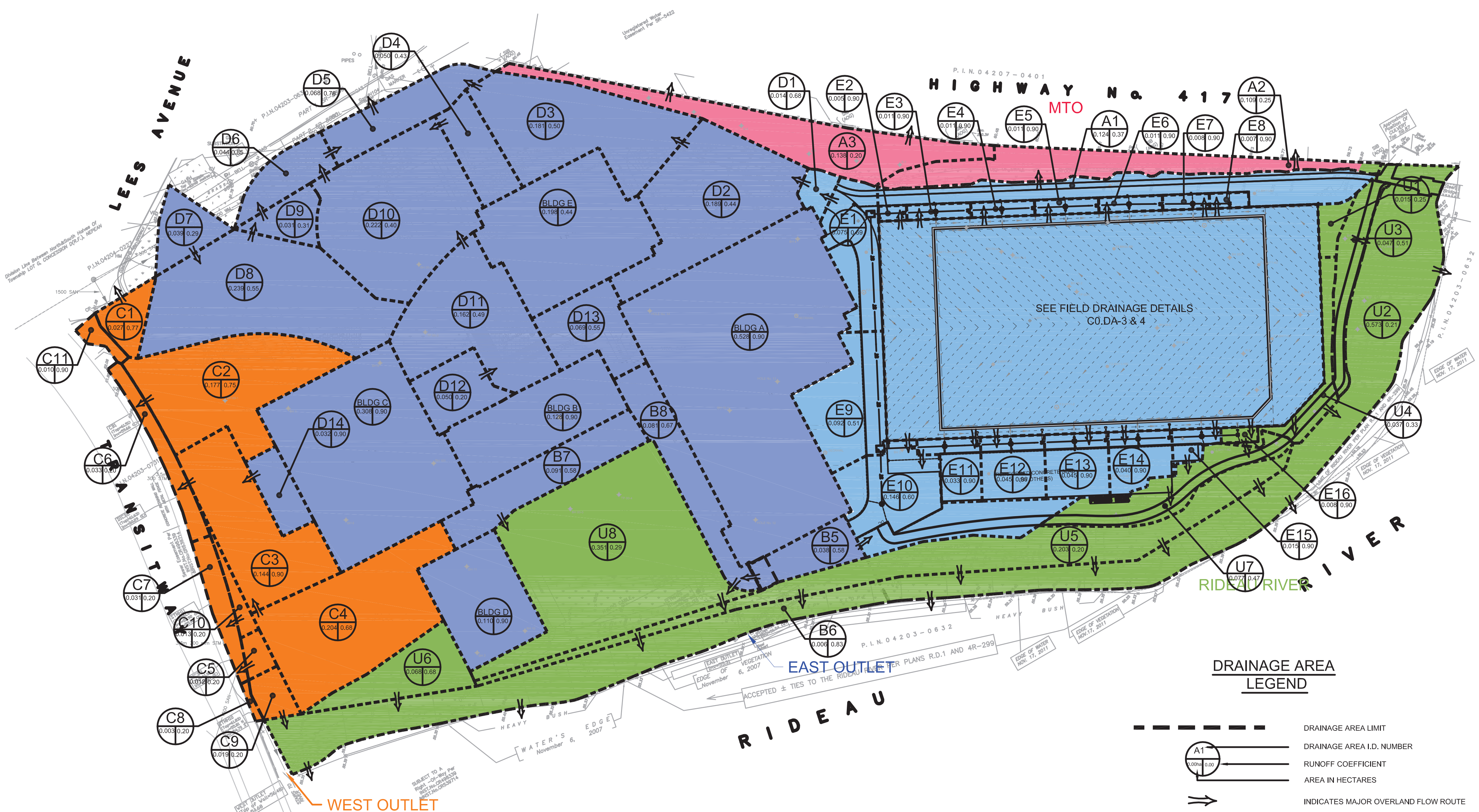
Shawn Wessel, A.Sc.T.,rcji
Project Manager - Infrastructure Approvals
Gestionnaire de projet – Approbation des demandes d'infrastructures

Development Review Central Branch | Direction de l'examen des projets d'aménagement, Centrale
Planning, Infrastructure and Economic Development Department | Direction générale de la planification de l'infrastructure et du développement économique
City of Ottawa | Ville d'Ottawa
110 Laurier Ave. W. | 110, avenue Laurier Ouest, Ottawa ON K1P 1J1
(613) 580 2424 Ext. | Poste 33017
Int. Mail Code | Code de Courrier Interne 01-14
shawn.wessel@ottawa.ca

*****Please also note that, while my work hours may be affected by the current situation and am working from home, I still have access to email, video conferencing and telephone. Feel free to schedule video conferences and/or telephone calls, as necessary.*****

From: McCaughey, Stephen <Stephen.Mccaughey@wsp.com>
Sent: June 18, 2021 5:21 PM
To: Wessel, Shawn <shawn.wessel@ottawa.ca>

C STORM SEWER DESIGN



DRAINAGE AREA LEGEND

- DRAINAGE AREA LIMIT
- DRAINAGE AREA I.D. NUMBER
- RUNOFF COEFFICIENT
- AREA IN HECTARES
- INDICATES MAJOR OVERLAND FLOW ROUTE
- WEST OUTLET CATCHMENT AREA
- EAST OUTLET CATCHMENT AREA
- EAST OUTLET CATCHMENT AREA (DISTURBED AREA)
- MTO CATCHEMENT AREA
- RIDEAU RIVER CATCHEMENT AREA

H:\ISO\EO2375\EOB\DWGS\Working DWGs\SPA\SPA Sports Field design - Standard\SPA Sports Field design.dwg 13/3/2012 11:30 AM

Revision Table

REV	DATE	DESCRIPTION	BY
02	09-03-12	ISSUED PER CITY COMMENTS	S.P.
01	07-02-12	ISSUED PER CITY COMMENTS	S.P.

Plan Clef / Key Plan:

Notes Générales / General Notes:

Consultant:

Delcan
TRANSPORTATION • INFORMATION TECHNOLOGY • WATER
1223 Michael Street, Suite 100, Ottawa, Ontario, Canada K1J 7T2
Tel: (613) 738-4160 Fax: (613) 739-7105

LICENSED PROFESSIONAL ENGINEER
M.S.F.L. PLANTE
09/03/12
PROVINCE OF ONTARIO

uOttawa

Service des immeubles
Physical Resources Service

uOttawa Proj. No: 101-008-060
Date (dd/mm/yyyy): 21/07/2011

Projet / Project:
BUILDING A RENOVATION/ADDITION AND OPEN AIR STADIUM PHASE 1

Concept par / Design by: PJH/SO/SP — Date (dd/mm/yyyy): 18/10/2011

Dessiné par / Drawn by: PJH/JN/JT — Date (dd/mm/yyyy): 18/10/2011

Vérifié par / Checked by: SP/RT — Date (dd/mm/yyyy):

BLOC A
BLOCK A
200 Lees Ave.
Ottawa, ON

Dessin / Drawing:
POST-REDEVELOPMENT CATCHMENT AREA

Édifice/Bldg:
Niveau/Level:

Échelle/Scale: N.T.S.
Revision:
Feuille/Sheet: FIGURE 3
of/de

WSP Canada

Storm Sewer Design Sheet

LOCATION					FLOW							PIPE							MANHOLE	
Catchment Area	FROM MH	TO MH	Coefficient	Area (ha)	Indiv. 2.78*AC	Cum. 2.78*AC	Time of Conc. (min.)	Rainfall Intensity (mm.hr)	Indiv. Area Flow (L/s)	Cum. Flow (L/s)	Controlled Cum. Flow (L/s)	Length (m)	Dia. (mm)	Slope (%)	Cap. (Full) (L/s)	Velocity (Full) (m/s)	Time of flow (min.)	Ratio (Q/Qfull)	UP INVERT (m)	DOWN INVERT (m)
	BLDG	STMMH02	0.9	0.52	1.301	1.301	10.00	76.81	99.93	99.93	99.93	29	450	1.03%	289.98	1.8	0.27	34%	60.45	60.15
	CB02	STMMH02	0.9	0.16	0.400	0.400	10.00	76.81	30.75	30.75	30.75	17	250	1.71%	77.67	1.6	0.18	40%	60.38	60.09
	STMMH02	CBMH04	0.0	0.00	0.000	1.701	10.31	75.65	0.00	128.70	128.70	42	450	1.64%	365.43	2.3	0.30	35%	60.09	59.40
	CBMH04	STMTECH*	0.4	0.21	0.234	1.935	10.61	74.53	17.40	144.21	144.21	10	450	2.00%	403.20	2.5	0.07	36%	59.40	59.20
	CB03	STMTECH*	0.4	0.21	0.234	0.234	10.00	76.81	17.94	17.94	17.94	2	250	2.50%	94.03	1.9	0.02	19%	59.25	59.20
	STMTECH*	CBMH01	0.0	0.0	0.000	2.168	10.55	74.75	0.00	162.09	162.09	28	375	1.93%	243.49	2.2	0.21	67%	59.20	58.66
	CB01	CBMH03	0.4	0.07	0.078	0.078	10.00	76.81	5.98	5.98	5.98	32	250	1.03%	60.39	1.2	0.43	10%	59.77	59.44
	CBMH03	CBMH02	0.4	0.07	0.078	0.156	10.43	75.18	5.85	11.70	11.70	41	250	0.98%	58.74	1.2	0.57	20%	59.44	59.04
	CBMH02	CBMH01	0.4	0.07	0.078	0.234	11.00	73.15	5.69	17.08	17.08	29	250	1.00%	59.47	1.2	0.40	29%	59.01	58.72
	CBMH01**	STMMH01	0.4	0.07	0.078	2.480	10.89	73.54	5.72	182.36	*28.00*	10	375	1.90%	241.68	2.2	0.08	12%	58.66	58.47
	STMMH01***	Ex. STMH22	0.0	0.0	0.000	2.480	10.97	73.27	0.00	181.70	*28.00*	11	375	1.27%	197.80	1.8	0.10	14%	58.44	58.30
	Ex. STMH22	Ex. STMH21	-	-	1.800	-	26.27	43.73	78.72	78.72	*106.72*	8	600	0.72%	522.05	1.8	0.07	20%	58.24	58.18

DESIGN PARAMETERS

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

Ottawa IDF Curve
IDF Curve Equation (2yr storm)
I = 732.951/(T+6.199)^0.81
Min. velocity = 0.8 m/s
Max. velocity = 3.0 m/s
Manning 'n' = 0.013

Designed: Stephen McCaughey, P.Eng.

Checked: Ishaque Jafferjee, P.Eng.

Dwg. Reference:

PROJECT: uOttawa Faculty of Health Sciences, Lees Campus

LOCATION: 200 Lees Avenue, Ottawa

File Ref.:

Date: June 2021

Sheet No. 1 of 1

WSP Canada

Storm Sewer Design Sheet

LOCATION					FLOW							PIPE							MANHOLE	
Catchment Area	FROM MH	TO MH	Coefficient	Area (ha)	Indiv. 2.78*AC	Cum. 2.78*AC	Time of Conc. (min.)	Rainfall Intensity (mm.hr)	Indiv. Area Flow (L/s)	Cum. Flow (L/s)	Controlled Cum. Flow (L/s)	Length (m)	Dia. (mm)	Slope (%)	Cap. (Full) (L/s)	Velocity (Full) (m/s)	Time of flow (min.)	Ratio (Q/Qfull)	UP INVERT (m)	DOWN INVERT (m)
	BLDG	STMMH02	1.0	0.5	1.446	1.446	10.00	178.56	258.12	258.12	258.12	29	450	1.03%	289.98	1.8	0.27	89%	60.45	60.15
	CB02	STMMH02	0.9	0.16	0.400	0.400	10.00	178.56	71.48	71.48	71.48	17	250	1.71%	77.67	1.6	0.18	92%	60.38	60.09
	STMMH02	CBMH04	0.0	0.00	0.000	1.846	10.31	175.80	0.00	324.51	324.51	42	450	1.64%	365.43	2.3	0.30	89%	60.09	59.40
	CBMH04	STMTECH*	0.5	0.2	0.292	2.138	10.61	173.15	50.54	370.17	370.17	10	450	2.00%	403.20	2.5	0.07	92%	59.40	59.20
	CB03	STMTECH*	0.5	0.2	0.292	0.292	10.00	178.56	52.12	52.12	52.12	2	250	2.50%	94.03	1.9	0.02	55%	59.25	59.20
	STMTECH*	CBMH01	0.0	0.0	0.000	2.430	10.55	173.67	0.00	421.97	421.97	28	375	1.93%	243.49	2.2	0.21	173%	59.20	58.66
	CB01	CBMH03	0.5	0.1	0.097	0.097	10.00	178.56	17.37	17.37	17.37	32	250	1.03%	60.39	1.2	0.43	29%	59.77	59.44
	CBMH03	CBMH02	0.5	0.1	0.097	0.195	10.43	174.69	17.00	33.99	33.99	41	250	0.98%	58.74	1.2	0.57	58%	59.44	59.04
	CBMH02	CBMH01	0.5	0.1	0.097	0.292	11.00	169.87	16.53	49.58	49.58	29	250	1.00%	59.47	1.2	0.40	83%	59.01	58.72
	CBMH01**	STMMH01	0.5	0.1	0.097	2.819	10.89	170.79	16.62	481.43	*28.00*	10	375	1.90%	241.68	2.2	0.08	12%	58.66	58.47
	STMMH01***	Ex. STMH22	0.0	0.0	0.000	2.819	10.97	170.16	0.00	479.66	*28.00*	11	375	1.27%	197.80	1.8	0.10	14%	58.44	58.30
	Ex. STMH22	Ex. STMH21	-	-	1.800	-	26.27	100.49	180.87	180.87	*208.87*	8	600	0.72%	522.05	1.8	0.07	40%	58.24	58.18

DESIGN PARAMETERS

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

Ottawa IDF Curve
IDF Curve Equation (100yr storm)
I = 1735.688/(T+6.014)^0.82
Min. velocity = 0.8 m/s
Max. velocity = 3.0 m/s
Manning 'n' = 0.013

Designed: Stephen McCaughey, P.Eng.

Checked: Ishaque Jafferjee, P.Eng.

Dwg. Reference:

PROJECT: uOttawa Faculty of Health Sciences, Lees Campus

LOCATION: 200 Lees Avenue, Ottawa

File Ref.:

Date: June 2021

Sheet No. 1 of 1

WSP Canada

Storm Sewer Design Sheet

LOCATION					FLOW							PIPE							MANHOLE	
Catchment Area	FROM MH	TO MH	Coefficient	Area (ha)	Indiv. 2.78*AC	Cum. 2.78*AC	Time of Conc. (min.)	Rainfall Intensity + 20% (mm.hr)	Indiv. Area Flow (L/s)	Cum. Flow (L/s)	Controlled Cum. Flow (L/s)	Length (m)	Dia. (mm)	Slope (%)	Cap. (Full) (L/s)	Velocity (Full) (m/s)	Time of flow (min.)	Ratio (Q/Qfull)	UP INVERT (m)	DOWN INVERT (m)
	BLDG	STMMH02	1.0	0.5	1.446	1.446	10.00	214.27	309.75	309.75	309.75	29	450	1.03%	289.98	1.8	0.27	107%	60.45	60.15
	CB02	STMMH02	0.9	0.16	0.400	0.400	10.00	214.27	85.78	85.78	85.78	17	250	1.71%	77.67	1.6	0.18	110%	60.38	60.09
	STMMH02	CBMH04	0.0	0.00	0.000	1.846	10.31	210.96	0.00	389.41	389.41	42	450	1.64%	365.43	2.3	0.30	107%	60.09	59.40
	CBMH04	STMTECH*	0.5	0.2	0.292	2.138	10.61	207.78	60.65	444.20	444.20	10	450	2.00%	403.20	2.5	0.07	110%	59.40	59.20
	CB03	STMTECH*	0.5	0.2	0.292	0.292	10.00	214.27	62.55	62.55	62.55	2	250	2.50%	94.03	1.9	0.02	67%	59.25	59.20
	STMTECH*	CBMH01	0.0	0.0	0.000	2.430	10.55	208.40	0.00	506.36	506.36	28	375	1.93%	243.49	2.2	0.21	208%	59.20	58.66
	CB01	CBMH03	0.5	0.1	0.097	0.097	10.00	214.27	20.85	20.85	20.85	32	250	1.03%	60.39	1.2	0.43	35%	59.77	59.44
	CBMH03	CBMH02	0.5	0.1	0.097	0.195	10.43	209.63	20.40	40.79	40.79	41	250	0.98%	58.74	1.2	0.57	69%	59.44	59.04
	CBMH02	CBMH01	0.5	0.1	0.097	0.292	11.00	203.84	19.83	59.50	59.50	29	250	1.00%	59.47	1.2	0.40	100%	59.01	58.72
	CBMH01**	STMMH01	0.5	0.1	0.097	2.819	10.89	204.94	19.94	577.72	*28.00*	10	375	1.90%	241.68	2.2	0.08	12%	58.66	58.47
	STMMH01***	Ex. STMH22	0.0	0.0	0.000	2.819	10.97	204.19	0.00	575.59	*28.00*	11	375	1.27%	197.80	1.8	0.10	14%	58.44	58.30
	Ex. STMH22	Ex. STMH21	-	-	1.800	-	26.27	120.58	217.05	217.05	*245.05*	8	600	0.72%	522.05	1.8	0.07	47%	58.24	58.18

DESIGN PARAMETERS

Q = 2.78CIA where,
Q = Peak flow in L/s
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I = Rainfall intensity (mm/hr)
C = Runoff coefficient

Ottawa IDF Curve
IDF Curve Equation (100yr storm)
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Max. velocity = 3.0 m/s
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Designed: Stephen McCaughey, P.Eng.

Checked: Ishaque Jafferjee, P.Eng.

Dwg. Reference:

PROJECT: uOttawa Faculty of Health Sciences, Lees Campus

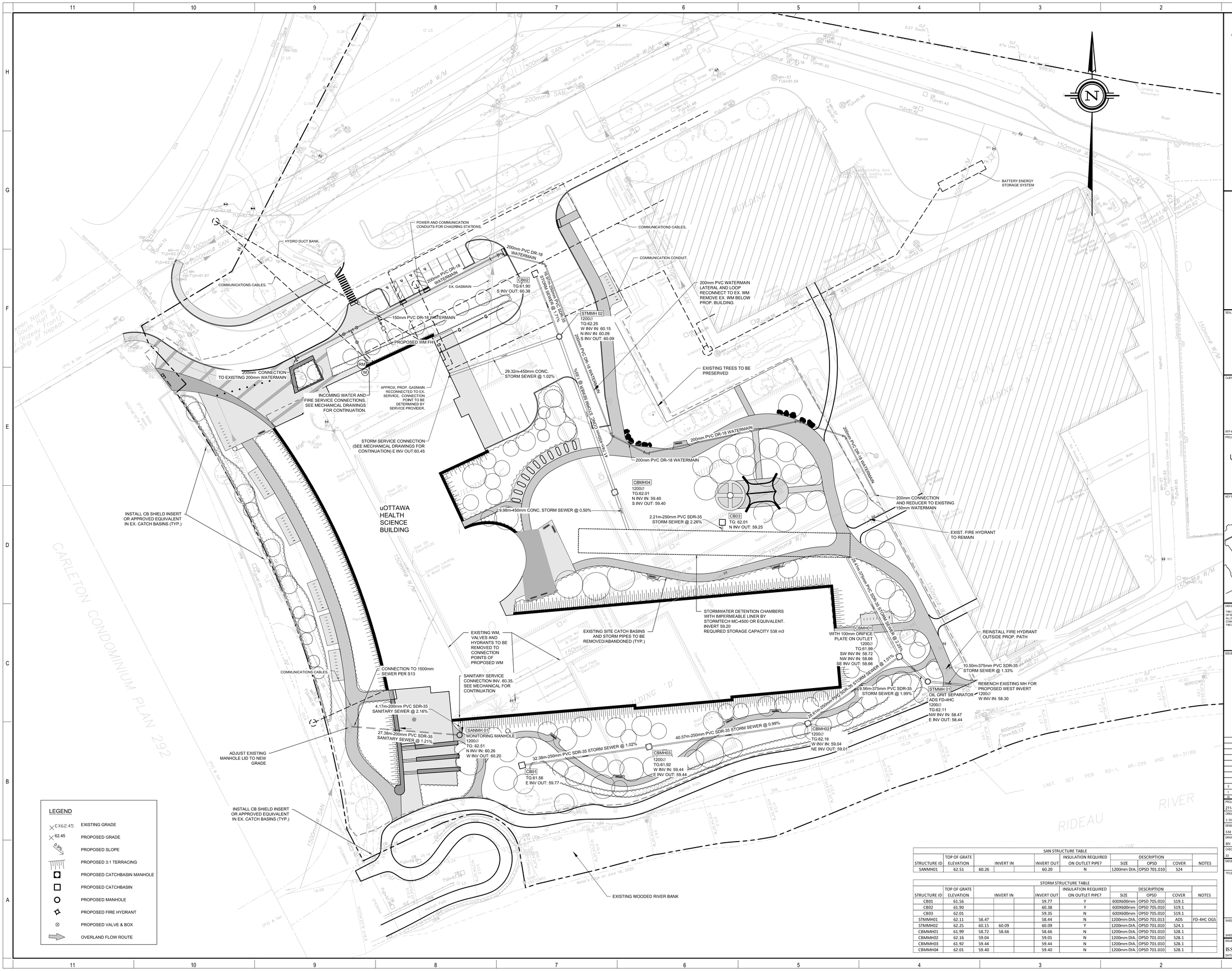
LOCATION: 200 Lees Avenue, Ottawa

File Ref.:

Date: June 2021

Sheet No. 1 of 1

D SITE DRAWINGS



SAN STRUCTURE TABLE

STRUCTURE ID	TOP OF GRATE ELEVATION	INVERT IN			INVERT OUT	INSULATION REQUIRED ON OUTLET PIPE?	DESCRIPTION SIZE	OPSD	COVER	NOTES
SANMH01	62.51	60.26			60.20	N	1200mm DIA.	OPSD 701.010	524	

STORM STRUCTURE TABLE

STRUCTURE ID	TOP OF GRATE ELEVATION	INVERT IN			INVERT OUT	INSULATION REQUIRED ON OUTLET PIPE?	DESCRIPTION SIZE	OPSD	COVER	NOTES
CB01	61.56				59.77	Y	600X600mm	OPSD 705.010	S19.1	
CB02	61.90				60.38	Y	600X600mm	OPSD 705.010	S19.1	
CB03	62.01				59.35	N	600X600mm	OPSD 705.010	S19.1	
STMMH01	62.11	58.47			58.44	N	1200mm DIA.	OPSD 701.013	ADS	FD-4HC OGS
STMMH02	62.25	60.15	60.09		60.09	Y	1200mm DIA.	OPSD 701.010	S24.1	
CBMMH01	61.99	58.72	58.66		58.66	N	1200mm DIA.	OPSD 701.010	S28.1	
CBMMH02	62.16	59.04			59.01	N	1200mm DIA.	OPSD 701.010	S28.1	
CBMMH03	61.92	59.44			59.44	N	1200mm DIA.	OPSD 701.010	S28.1	
CBMMH04	62.01	59.40			59.40	N	1200mm DIA.	OPSD 701.010	S28.1	

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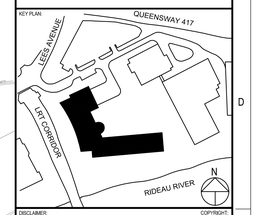
SEAL:

CLIENT: uOttawa

WP #: 2020-40369 CLIENT REF. #: BT20-18477

PROJECT:
University of Ottawa - Faculty of Health Sciences Building

KEY PLAN:


ISSUED FOR - REVISION:

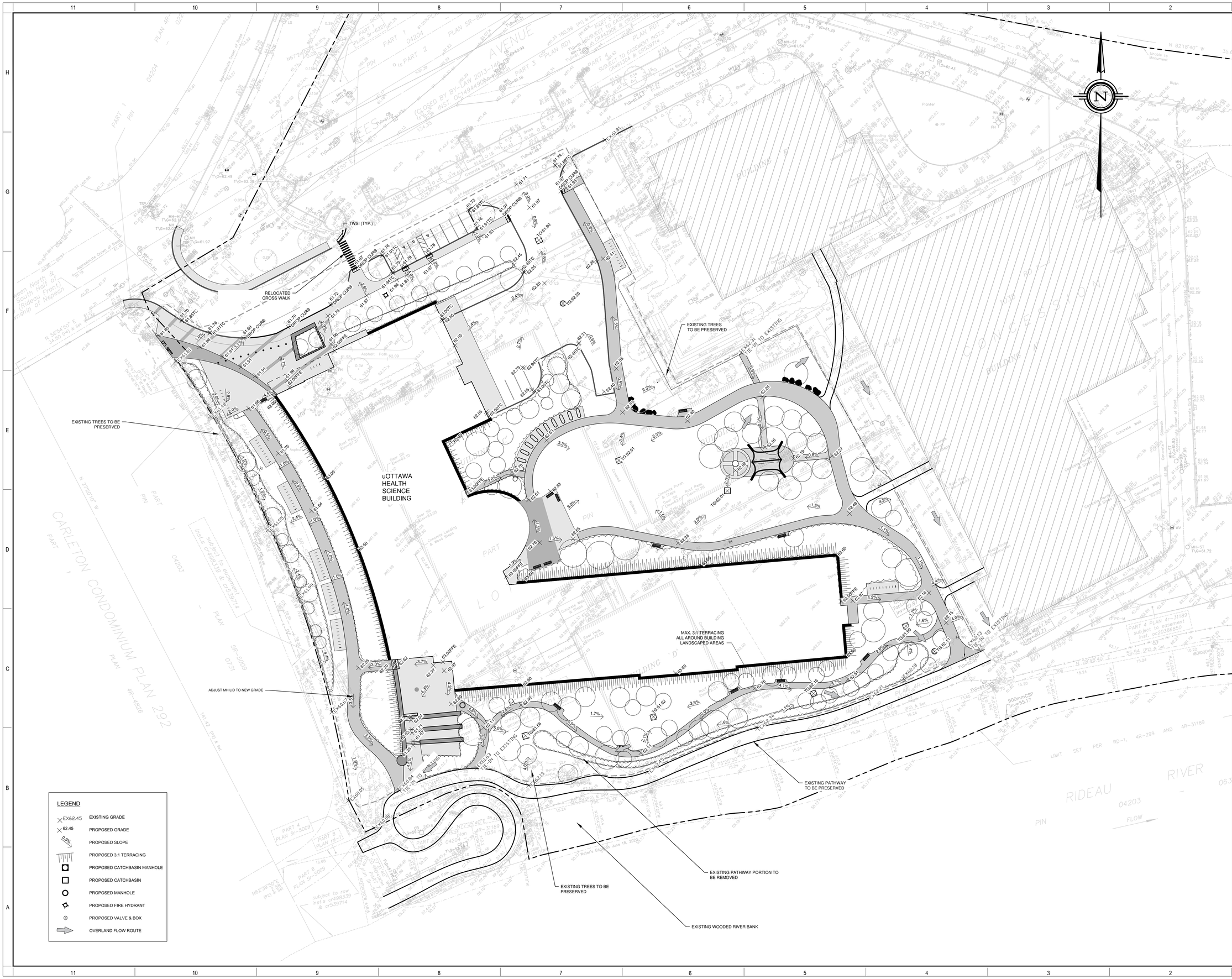
2		2021-06-28	ISSUED FOR SITE APPLICATION
1		2021-04-15	ISSUED FOR TECHNICAL SUMMISSION
ID	KE	DATE	DESCRIPTION

PROJECT NO: 211-01094-01
DATE: 2021-06-28
ORIGINAL SCALE: 1:300
IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE.
25mm
DESIGNED BY: SM
DRAWN BY: BN
CHECKED BY: JJ
DISCIPLINE: CIVIL

TITLE:
SERVICING PLAN

SHEET NUMBER: C-001
SHEET # 1 OF 4

ISSUE: ISSUED FOR SITE APPLICATION
REV # 2
DATE OF: 2021-06-28



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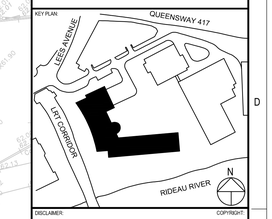
SEAL:

CLIENT:
uOttawa

WP #: 2020-40369 CLIENT REF. #: BT20-18477

PROJECT:
University of Ottawa - Faculty of Health Sciences Building

KEY PLAN:


ISSUED FOR - REVISION:

NO	BY	DATE	DESCRIPTION
2		2021-06-28	ISSUED FOR SITE APPLICATION
1		2021-04-15	ISSUED FOR TECHNICAL SUBMISSION

PROJECT NO: 211-01094-01
DATE: 2021-06-28
ORIGINAL SCALE: 1:300
DESIGNED BY: SM
DRAWN BY: BN
CHECKED BY: JJ
IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE. 25mm
DISCIPLINE: CIVIL
TITLE: GRADING PLAN
SHEET NUMBER: C-002
SHEET # 2 OF 4
ISSUE: ISSUED FOR SITE APPLICATION
REV # 2
DATE OF: 2021-06-28

NOTES: EROSION AND SEDIMENT CONTROL

** CONTRACTOR IS RESPONSIBLE FOR ALL INSTALLATION, MONITORING, REPAIR AND REMOVAL OF ALL EROSION AND SEDIMENT CONTROL FEATURES TO MEET LEED SUSTAINABLE SITE REQUIREMENTS, INCLUDING:. **

1. PRIOR TO START OF CONSTRUCTION:

1.1. INSTALL SILT FENCE IN LOCATION SHOWN.
1.2. INSTALL MUD MAT AT CONSTRUCTION ENTRANCES.
1.3. INSTALL FILTER FABRIC OR SILT SACK FILTERS IN ALL THE CATCHBASINS AND MANHOLES TO REMAIN DURING CONSTRUCTION WITHIN THE SITE (SEE TYPICAL DETAIL). INSTALL CHECK DAM.
1.4. INSPECT MEASURES IMMEDIATELY AFTER INSTALLATION.

2. DURING CONSTRUCTION:

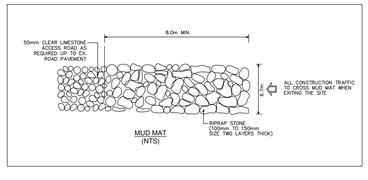
2.1. MINIMIZE THE EXTENT OF DISTURBED AREAS AND THE DURATION OF EXPOSURE AND IMPACTS TO EXISTING GRADING.
2.2. PERIMETER VEGETATION TO REMAIN IN PLACE UNTIL PERMANENT STORM WATER MANAGEMENT IS IN PLACE. OTHERWISE, IMMEDIATELY INSTALL SILT FENCE WHEN THE EXISTING SITE IS DISTURBED AT THE PERIMETER.
2.3. PROTECT DISTURBED AREAS FROM OVERLAND FLOW BY PROVIDING TEMPORARY SWALES TO THE SATISFACTION OF THE FIELD ENGINEER. TIE-IN TEMPORARY SWALE TO EXISTING CB'S AS REQUIRED.
2.4. PROVIDE TEMPORARY COVER SUCH AS SEEDING OR MULCHING IF DISTURBED AREA WILL NOT BE REHABILITATED WITHIN 30 DAYS.
2.5. INSPECT SILT FENCES, FILTER FABRIC FILTERS AND CATCH BASIN SUMPS WEEKLY AND WITHIN 24 HOURS AFTER A STORM EVENT. CLEAN AND REPAIR WHEN NECESSARY.
2.6. DOWNSTREAM STORM INFRASTRUCTURE SHALL BE PROTECTED FROM UNFILTERED RUNOFF DURING DEMOLITION OF STORM INFRASTRUCTURE ON SITE.
2.7. DRAWING TO BE REVIEWED AND REVISED AS REQUIRED DURING CONSTRUCTION.
2.8. EROSION CONTROL FENCING TO BE ALSO INSTALLED AROUND THE BASE OF ALL STOCKPILES.
2.9. DO NOT LOCATE TOPSOIL PILES AND EXCAVATION MATERIAL CLOSER THAN 2.5m FROM ANY PAVED SURFACE, OR ONE WHICH IS TO BE PAVED BEFORE THE PILE IS REMOVED. ALL TOPSOIL PILES ARE TO BE SEEDED IF THEY ARE TO REMAIN ON SITE LONG ENOUGH FOR SEEDS TO GROW (LONGER THAN 30 DAYS).
2.10. CONTROL WIND-BLOWN DUST OFF SITE BY SEEDING TOPSOIL PILES AND OTHER AREAS TEMPORARILY (PROVIDE WATERING AS REQUIRED AND TO THE SATISFACTION OF THE ENGINEER).
2.11. NO ALTERNATE METHODS OF EROSION PROTECTION SHALL BE PERMITTED UNLESS APPROVED BY THE FIELD ENGINEER.
2.12. CITY ROADWAY AND SIDEWALK TO BE CLEANED OF ALL SEDIMENT FROM VEHICULAR TRACKING AS REQUIRED.
2.13. DURING WET CONDITIONS, TIRES OF ALL VEHICLES/EQUIPMENT LEAVING THE SITE ARE TO BE SCRAPED.
2.14. ANY MUD/MATERIAL TRACKED ONTO THE ROAD SHALL BE REMOVED IMMEDIATELY BY HAND OR RUBBER TIRE LOADER.
2.15. TAKE ALL NECESSARY STEPS TO PREVENT BUILDING MATERIAL, CONSTRUCTION DEBRIS OR WASTE BEING SPILLED OR TRACKED ONTO ABUTTING PROPERTIES OR PUBLIC STREETS DURING CONSTRUCTION AND PROCEED IMMEDIATELY TO CLEAN UP ANY AREAS SO AFFECTED.
2.16. ALL EROSION CONTROL STRUCTURE TO REMAIN IN PLACE UNTIL ALL DISTURBED GROUND SURFACES HAVE BEEN STABILIZED EITHER BY PAVING OR RESTORATION OF VEGETATIVE GROUND COVER.
2.17. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.

uOTTAWA
HEALTH
SCIENCE
BUILDING

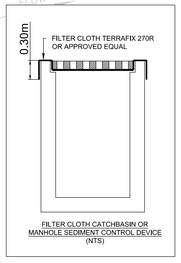
MIN. 15m BUFFER
BETWEEN SILT FENCE
AND EDGE OF RIVER

LEGEND

- SF — LIGHT DUTY SILT FENCE AS PER OPSD 219.110
- FILTER CLOTH PLACED UNDER CB AND CBMH COVER
- STRAW BALE CHECK DAM PER OPSD 219.180
- MUD MAT



MUD MAT
(NTS)



FILTER CLOTH CATCHBASIN OR MANHOLE SEDIMENT CONTROL DEVICE
(NTS)

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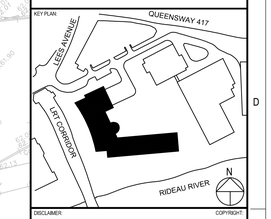
SEAL:

CLIENT: uOttawa

WP #: 2020-40369 CLIENT REF. #: BT20-18477

PROJECT:
University of Ottawa - Faculty of Health Sciences Building

KEY PLAN:



ISSUED FOR - REVISION:

NO.	BY	DATE	DESCRIPTION
0		2021-06-28	ISSUED FOR SITE APPLICATION

PROJECT NO: 211-01094-01
DATE: 2021-06-28
ORIGINAL SCALE: 1:300
DESIGNED BY: SM
DRAWN BY: BN
CHECKED BY: JJ
IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE.
25mm
DISCIPLINE: CIVIL

TITLE:
EROSION AND SEDIMENT CONTROL PLAN

SHEET NUMBER: C-003
SHEET #: 3 OF 4
ISSUE: ISSUED FOR SITE APPLICATION
REV #: 1
DATE OF: 2021-06-28

NOTES: GENERAL

1. DRAWINGS TO BE READ IN CONJUNCTION WITH ARCHITECTURAL AND LANDSCAPE DRAWINGS FOR LAYOUT AND SURFACE MATERIALS. ARCHITECTURAL PLAN SHALL TAKE PRECEDENCE FOR SITE LAYOUT. LANDSCAPE PLAN SHALL TAKE PRECEDENCE FOR SITE MATERIALS.

2. ALL SERVICES, MATERIALS, CONSTRUCTION METHODS AND INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND REGULATIONS OF THE: CITY OF OTTAWA STANDARD SPECIFICATIONS AND DRAWINGS, ONTARIO PROVINCIAL SPECIFICATION STANDARD SPECIFICATION (OPSS) AND ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD), UNLESS OTHERWISE SPECIFIED, TO THE SATISFACTION OF THE CITY AND THE CONSULTANT

3. THE POSITION OF EXISTING POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND ABOVEGROUND UTILITIES, STRUCTURES AND APPURTENANCES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWING, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL SATISFY HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM DURING THE COURSE OF CONSTRUCTION. ANY RELOCATION OF EXISTING UTILITIES REQUIRED BY THE DEVELOPMENT OF SUBJECT LANDS IS TO BE UNDERTAKEN AT CONTRACTOR'S EXPENSE.

4. THE CONTRACTOR MUST NOTIFY ALL EXISTING UTILITY COMPANY OFFICIALS FIVE (5) BUSINESS DAYS PRIOR TO START OF CONSTRUCTION AND HAVE ALL EXISTING UTILITIES AND SERVICES LOCATED IN THE FIELD OR EXPOSED PRIOR TO THE START OF CONSTRUCTION, INCLUDING BUT NOT LIMITED TO POWER, COMMUNICATION AND GAS LINES.

5. ALL TRENCHING AND EXCAVATIONS TO BE IN ACCORDANCE WITH THE LATEST REVISIONS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS AND AS PER THE RECOMMENDATIONS INCLUDED IN THE GEOTECHNICAL REPORT.

6. REFER TO ARCHITECTS PLANS FOR BUILDING DIMENSIONS, LAYOUT AND REMOVALS. REFER TO LANDSCAPE PLAN FOR LANDSCAPED DETAILS AND OTHER RELEVANT INFORMATION. ALL INFORMATION SHALL BE CONFIRMED PRIOR TO COMMENCEMENT OF CONSTRUCTION.

7. TOPOGRAPHIC SURVEY COMPLETED AND PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD. DATED JULY 21, 2020. CONTRACTOR TO VERIFY IN THE FIELD PRIOR TO CONSTRUCTION OF ANY WORK AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.

8. ALL ELEVATIONS ARE GEODETIC AND UTILIZE METRIC UNITS. VERIFY THAT JOB BENCHMARKS HAVE NOT BEEN ALTERED OR DISTURBED.

9. ALL GROUND SURFACES SHALL BE EVENLY GRADED WITHOUT PONDING AREAS AND WITHOUT LOW POINTS EXCEPT WHERE APPROVED SWALE OR CATCH BASIN OUTLETS ARE PROVIDED.

10. ALL EDGES OF DISTURBED PAVEMENT SHALL BE SAW CUT TO FORM A NEAT AND STRAIGHT LINE PRIOR TO PLACING NEW PAVEMENT. PAVEMENT REINSTATEMENT SHALL BE WITH STEP JOINTS OF 500mm WIDTH MINIMUM.

11. ALL DISTURBED AREAS OUTSIDE PROPOSED GRADING LIMITS TO BE RESTORED TO ORIGINAL ELEVATIONS AND CONDITIONS UNLESS OTHERWISE SPECIFIED. ALL RESTORATION SHALL BE COMPLETED WITH THE GEOTECHNICAL REQUIREMENTS FOR BACKFILL AND COMPACTION.

12. ABUTTING PROPERTY GRADES TO BE MATCHED UNLESS OTHERWISE SHOWN.

13. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND APPROVALS FROM THE MUNICIPAL AUTHORITIES PRIOR TO COMMENCING CONSTRUCTION, INCLUDING WATER PERMIT AND ROAD CUT PERMIT.

14. MINIMIZE DISTURBANCE TO EXISTING VEGETATION DURING THE EXECUTION OF ALL WORKS.

15. REMOVE/ABANDON EXISTING WATERMAIN AND APPURTENANCES; STORM SEWERS, STRUCTURES , AND APPURTENANCES; SANITARY SEWERS FROM PROJECT SITE AND BLANK WHERE CONNECTS TO EXISTING. MONITORING WELLS TO BE DECOMMISSIONED IN ACCORDANCE TO O.REG. 903.

16. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL UNLESS OTHERWISE DIRECTED FROM THE ENGINEER. EXCAVATE AND REMOVE ALL ORGANIC MATERIAL AND DEBRIS LOCATED WITHIN THE PROPOSED BUILDING, PARKING AND ROADWAY LOCATIONS.

17. AT PROPOSED UTILITY CONNECTION POINTS AND CROSSINGS (I.E. STORM SEWER, SANITARY SEWER, WATER, ETC.) THE CONTRACTOR SHALL DETERMINE THE PRECISE LOCATION AND DEPTH OF EXISTING UTILITIES AND REPORT ANY DISCREPANCIES OR CONFLICTS TO THE ENGINEER BEFORE COMMENCING WORK.

18. CONTRACTOR TO OBTAIN POST-CONSTRUCTION TOPOGRAPHIC SURVEY, COMPLETED BY OLS OR P.ENG CONFIRMING COMPLIANCE WITH DESIGN GRADING AND SERVICING. SURVEY IS TO INCLUDE LOCATION AND INVERTS FOR BURIED UTILITIES.

19. ABIDE BY RECOMMENDATIONS OF GEOTECHNICAL REPORT. REPORT ANY VARIATIONS IN OBSERVED CONATIONS FROM THOSE INCLUDED IN REPORT.

20. PROVIDE CCTV INSPECTION REPORT FOR ALL SEWERS AND CATCHBASIN LEADS 200mm DIAMETER AND LARGER. REPEAT CCTV INSPECTION FOLLOWING RECTIFICATION OF ANY DEFICIENCIES.

NOTES: PARKING LOT, ROADWAY, AND WORK IN PUBLIC RIGHTS OF WAY

1. CONTRACTOR TO REINSTATE ROAD CUTS AS PER CITY OF OTTAWA DETAIL R10.

2. REFER TO GEOTECHNICAL INVESTIGATION REPORT PREPARED BY GOLDER ASSOCIATES DATED APRIL 2020 FOR GEOTECHNICAL RECOMMENDATIONS.

3. CONTRACTOR TO PREPARE SUBGRADE, INCLUDING PROOFROLLING, TO THE SATISFACTION OF THE GEOTECHNICAL CONSULTANT PRIOR TO THE COMMENCEMENT OF PLACEMENT OF GRANULAR B MATERIAL.

4. FILL TO BE PLACED AND COMPACTED PER THE GEOTECHNICAL REPORT REQUIREMENTS.

5. CONTRACTOR TO SUPPLY, PLACE AND COMPACT GRANULAR B MATERIAL IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL CONSULTANT. CONTRACTOR TO PROVIDE CONSULTANT WITH SAMPLES OF GRANULAR B MATERIAL FOR TESTING AND CERTIFICATION FROM THE GEOTECHNICAL CONSULTANT THAT THE MATERIAL MEETS THE GRADATION REQUIREMENTS SPECIFIED IN THE GEOTECHNICAL REPORT.

6. GRANULAR A MATERIAL TO BE PLACED ONLY UPON APPROVAL BY THE GEOTECHNICAL CONSULTANT OF GRANULAR B PLACEMENT.

7. CONTRACTOR TO SUPPLY, PLACE AND COMPACT GRANULAR A MATERIAL IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL CONSULTANT. CONTRACTOR TO PROVIDE CONSULTANT WITH SAMPLES OF GRANULAR A MATERIAL FOR TESTING AND CERTIFICATION FROM THE GEOTECHNICAL CONSULTANT THAT THE MATERIAL MEETS THE GRADATION REQUIREMENTS SPECIFIED IN THE GEOTECHNICAL REPORT.

8. ASPHALT MATERIAL TO BE PLACED ONLY UPON APPROVAL BY THE GEOTECHNICAL CONSULTANT OF GRANULAR A PLACEMENT.

9. CONTRACTOR TO SUPPLY, PLACE AND COMPACT ASPHALT MATERIAL IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL CONSULTANT. CONTRACTOR TO PROVIDE CONSULTANT WITH SAMPLES OF ASPHALT MATERIAL FOR TESTING AND CERTIFICATION FROM THE GEOTECHNICAL CONSULTANT THAT THE MATERIAL MEETS THE REQUIREMENTS SPECIFIED IN THE GEOTECHNICAL REPORT.

10. CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING LINE AND GRADE IN ACCORDANCE WITH THE PLANS, AND FOR PROVIDING THE CONSULTANT WITH VERIFICATION PRIOR TO PLACEMENT.

11. ALL EXCESS MATERIAL TO BE HAULED OFFSITE AND DISPOSED OF AT AN APPROVED DUMP SITE. SHOULD THE CONTRACTOR DISCOVER ANY HAZARDOUS MATERIAL, CONTRACTOR IS TO NOTIFY CONSULTANT. CONSULTANT TO DETERMINE APPROPRIATE DISPOSAL METHOD/LOCATION.

12. PAVEMENT STRUCTURE (MATERIAL TYPES AND THICKNESS) TO BE AS SPECIFIED BY THE GEOTECHNICAL CONSULTANT.

NOTES: STORM SEWERS AND STRUCTURES

1. ALL STORM SEWER MATERIALS AND CONSTRUCTION METHODS SHALL CONFORM TO THE CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS. PROVIDE CCTV INSPECTION REPORTS FOR ALL NEW STORM SEWERS, SERVICES AND CB LEADS.

2. STORM SEWERS 450mm DIAMETER AND SMALLER SHALL BE PVC SDR-35, WITH RUBBER GASKET PER CSA A-257.3.

3. STORM SEWER LARGER THAN 450mm SHALL BE REINFORCED CONCRETE CLASS 100.

4. SEWER BEDDING AS PER CITY OF OTTAWA DETAIL S6.

5. ALL STORM MANHOLES TO BE AS PER STORM STRUCTURE TABLE ON C-001.

6. ANY NEW OR EXISTING STORM SEWER WITH LESS THAN 2.0m COVER REQUIRES THERMAL INSULATION AS PER CITY OF OTTAWA STANDARD W22, OR APPROVED BY THE ENGINEER.

7. ALL CATCHBASIN LEADS TO BE MINIMUM 200mm DIAMETER AT MINIMUM 1.0% SLOPE UNLESS OTHERWISE SPECIFIED.

8. STORM CATCHBASINS AS PER OPSD 705.010 AND FRAME/COVER AS PER CITY STANDARD DRAWINGS S19. STORM CBMH'S AS INDICATED IN TABLE WITH SUMP, ADJUSTMENT SECTIONS SHALL BE AS PER OPSD 704.010.

9. INSTALLATION OF FLOW CONTROL ICD'S TO BE VERIFIED BY QUALITY VERIFICATION ENGINEER RETAINED BY CONTRACTOR.

NOTES: SANITARY SEWER AND MANHOLES

1. ALL SANITARY SEWER, SANITARY SEWER APPURTENANCES AND CONSTRUCTION METHODS SHALL CONFORM TO THE CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS. PROVIDE CCTV INSPECTION REPORTS FOR ALL NEW SANITARY PIPING. PROVIDE DYE TESTING FOR NEW SERVICES.

2. SANITARY SEWER PIPE SIZE 150mm DIAMETER AND GREATER TO BE PVC SDR-35 (UNLESS SPECIFIED OTHERWISE) WITH RUBBER GASKET TYPE JOINTS IN CONFORMANCE WITH CSA B-182.2,3,4.

3. SEWER BEDDING AS PER CITY OF OTTAWA DETAIL S6.

4. ALL SANITARY MANHOLES 1200mm IN DIAMETER TO BE AS PER OPSD 701.01. FRAME AND COVER TO BE AS PER CITY OF OTTAWA STANDARD S.25 AND S.24.

5. MAINTENANCE HOLE BENCHING AND PIPE OPENING ALTERNATIVES AS PER THE OPSD 701.021

6. ANY SANITARY SEWER WITH LESS THAN 2.0m COVER REQUIRES THERMAL INSULATION AS PER CITY OF OTTAWA STANDARD W22, OR APPROVED BY THE ENGINEER.

NOTES: WATERMAIN

1. ALL WATERMAIN AND WATERMAIN APPURTANANCES, MATERIALS, CONSTRUCTION AND TESTING METHODS SHALL CONFORM TO THE CURRENT CITY OF OTTAWA AND MINISTRY OF ENVIRONMENT STANDARDS AND SPECIFICATIONS.

2. ALL WATERMAIN 300mm DIAMETER AND SMALLER TO BE POLY VINYL CHLORIDE (PVC) CLASS 150 DR 18 MEETING AWWA SPECIFICATION C900.

3. ALL WATERMAIN TO BE INSTALLED AT MINIMUM COVER OF 2.4m BELOW FINISHED GRADE. WHERE WATERMAINS CROSS OVER OTHER UTILITIES, A MINIMUM 0.30m CLEARANCE SHALL BE MAINTAINED; WHERE WATERMAINS CROSS UNDER OTHER UTILITIES, A MINIMUM 0.50m CLEARANCE SHALL BE MAINTAINED. WHERE THE MINIMUM SEPARATION CANNOT BE ACHIEVED, THE WATERMAIN SHALL BE INSTALLED AS PER CITY OF OTTAWA STANDARDS W25 AND W25.2. WHERE 2.4m MINIMUM DEPTH CANNOT BE ACHIEVED, THERMAL INSULATION SHALL BE PROVIDED AS PER CITY OF OTTAWA STANDARD W22. WHERE A WATERMAIN IS IN CLOSE PROXIMITY TO AN OPEN STRUCTURE, THERMAL INSULATION SHALL BE PROVIDED AS PER CITY OF OTTAWA STANDARD W23.

4. CONCRETE THRUST BLOCKS AND MECHANICAL RESTRAINTS ARE TO BE INSTALLED AT ALL TEES, BENDS, HYDRANTS, REDUCERS, ENDS OF MAINS AND CONNECTIONS 100mm AND LARGER, IN ACCORDANCE WITH CITY OF OTTAWA STANDARDS W25.3 & W25.4.

5. CATHODIC PROTECTION REQUIRED FOR ALL IRON FITTINGS AS PER CITY OF OTTAWA STANDARD W40 & W42.

6. ALL VALVES AND VALVE BOXES AND CHAMBERS, HYDRANTS, AND HYDRANT VALVES AND ASSEMBLES SHALL BE INSTALLED AS PER CITY OF OTTAWA STANDARD

7. FIRE HYDRANT LOCATION AND INSTALLATION AS PER CITY OF OTTAWA STANDARD W18 & W19. CONTRACTOR TO PROVIDE FLOW TEST AND PAINTING OF NEW HYDRANT IN ACCORDANCE WITH CITY STANDARDS.

8. IF WATER MAIN MUST BE DEFLECTED TO MEET ALIGNMENT, ENSURE THAT THE AMOUNT OF DEFLECTION USED IS LESS THAN HALF THAT RECOMMENDED BY THE MANUFACTURER.

PAVEMENT COMPONENT- HEAVY DUTY TRAFFIC	
SUPERPAVE 12.5 SURFACE COURSE	50mm
SUPERPAVE 19.mm BASE COURSE	70mm
OPPS GRANULAR A BASE	150mm
OPPS GRANULAR B TYPE II SUBBASE	450mm

NOTE: PAVEMENT STRUCTURE FOR LOADING DOCK AND ACCESS ROAD RE-ESTABLISHMENT

ARCHITECTURE 49

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SEAL:

CLIENT:

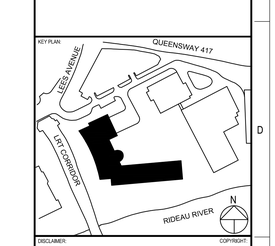
uOttawa

RFP #: 2020-40369 CLIENT REF. #: BT20-18477

PROJECT:

University of Ottawa - Faculty of Health Sciences Building

KEY PLAN:



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ISSUED FOR - REVISION:

NO	RE	DATE	DESCRIPTION
0		2021-06-28	ISSUED FOR SITE APPLICATION

PROJECT NO: 211-01094-01
DATE: 2021-06-28
ORIGINAL SCALE: N.T.S
DESIGNED BY: SM
DRAWN BY: BN
CHECKED BY: JJ

IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE.

25mm

DISCIPLINE: CIVIL

TITLE: GENERAL NOTES & DETAILS

SHEET NUMBER: C-004

SHEET # 1 OF 4

ISSUE: ISSUED FOR SITE PLAN APPLICATION
REV #: 1
DATE OF: 2021-06-28