PCL CONSTRUCTORS CANADA INC.

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

SITE SERVICING REPORT

OCTOBER 8, 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: OCTOBER 2021

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

WSP.COM

October 8, 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 reissued for site plan approval application.

Yours sincerely,

Stephen McCaughey, P.Eng.
Project Engineer

WSP ref.: 211-01094-01

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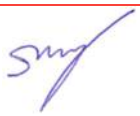
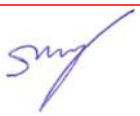
OTTAWA, ON, CANADA, K2B 8K2

wsp.com

QUALITY MANAGEMENT

ISSUE/REVISION	FIRST ISSUE	REVISION 1	REVISION 2	REVISION 3
Remarks	Issued for Site Plan Approval Application	Reissued for Site Plan Approval Application		
Date	2021-06-28	2021-10-08		
Prepared by	Stephen McCaughey, P.Eng.	Stephen McCaughey, P.Eng.		
Signature				
Checked by	James Johnston, P.Eng.	Ishaque Jafferjee, P.Eng.		
Signature				
Authorised by				
Signature				
Project number	211-01094-01	211-01094-01		
Report number				
File reference				

SIGNATURES

PREPARED BY

Stephen McCaughey, P.Eng.
Project Engineer

REVIEWED BY

Ishaque Jafferjee, 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 in a Transit Oriented Development Zone (TD3). 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 servicing designs in this development be prepared in accordance with the applicable and most recent City and provincial standards and guidelines. 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:

- City of Ottawa Sewer Design Guidelines (CoOSDG), Second Edition, Document SDG002, October 2012, City of Ottawa including all amendments issued as part of Technical Bulletins: ISTDB 2012-01, 2014-01, 2016-01, 2018-01, 2019-01 & -02; current Sewer Material Specifications and Sewer, Landscape, and Road Standard Details.

- Sewer Connection (2003-513) and Sewer-Use (2003-514) By-Laws.

- City of Ottawa Water Distribution Design Guidelines (CoOWDDG), July 2010 (WDG001), including all amendments issued as part of Technical Bulletins: ISTDB 2010-02, 2014-02 & 2018-02; current Watermain/Services Material Specifications, and Water & Road Standard Detail Drawings.

- Water (2018-167) By-Law.

- 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. This includes the original pre-consultation meeting with the City for this site.

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 including soil types, bedding and cover for services, asphalt design, and foundation design. It should be noted that the building is a slab-on-grade construction and so no foundation drains have been recommended.

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. A Sanitary Sewer Design Sheet has been provided in Appendix B.

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 building will not implement any flow control or roof storage, so all flow will be immediately directed to the underground storm system. 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, an 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 through 100-yr storm, 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 silt sacks 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 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, siltsacks, 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. Correspondence with the RVCA is provided in Appendix E.

There is an Environmental Compliance Approval (0473-9ABLAT dated August 30, 2013) for the current storm system at 200 Lees that discharges to the River which, following correspondence with the Ministry of Environment, Conservation and Parks (MECP), will require amendment to the proposed additions to the system. The ECA is included in Appendix E for reference.

Further, it is understood that the Ontario Ministry of Transportation does not permit rooftop stormwater storage within the controlled drainage area alongside Highway 417. No rooftop storage is being implemented in this design but nonetheless will correspond with MTO to confirm the stormwater requirements and design. At this stage WSP is anticipating confirmation from the City the appropriate MTO contact.

No other permits or approvals are anticipated to be required from 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. The Development Servicing Study Checklist is provided in Appendix F.

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

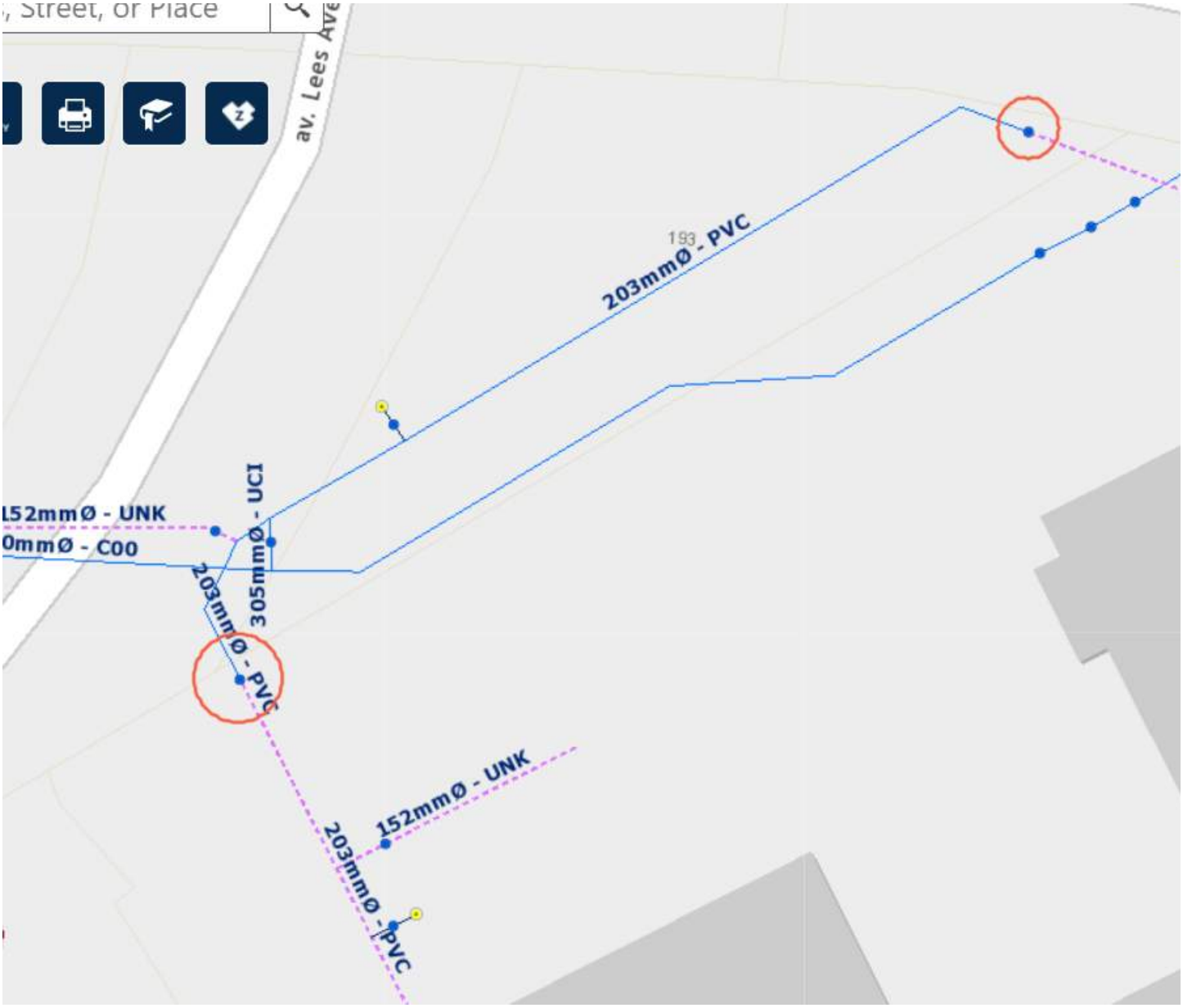
Development Review Central Branch | Direction de l'examen des projets d'aménagement, Centrale
Planning, Infrastructure and Economic Development Department | Direction générale de la planification de l'infrastructure et du développement économique
City of Ottawa | Ville d'Ottawa
110 Laurier Ave. W. | 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.

Do you want boundary conditions to be provided at both connection locations to the publicly owned watermain – I assume the development will be off the existing private watermain loop.

Please confirm.

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

Thank you

Regards,

Shawn Wessel, A.Sc.T.,rcji
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Please consider the environment before printing this email

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'

'

-LAEmHhHzdJzBlTWfa4Hgs7pbKI

'

'

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

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:

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8	25	26	9	152
9	25	27	64	203
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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	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
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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

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

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

Cc: LeRoy, Tom <Tom.LeRoy@wsp.com>; Renaud, Jean-Charles <Jean-Charles.Renaud@ottawa.ca>
Subject: RE: uOttawa FHS - SPA Confirmation of Site Services

Thank you Shawn,

I wanted to confirm if there was any update regarding allotted sanitary capacity to confirm the proposed sanitary flow. At the same time I'm hoping to broach the topic of a possible building service connection to the 1500mm trunk sewer at the SW corner of the site. My understanding is there is consideration by the University for the site as a whole and may include the abandonment of the private 300mm sanitary along the north end, so wanted to pre-empt the City's consideration for this service connection, proposed at existing maintenance hole per S13.

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: Friday, June 18, 2021 2:46 PM
To: McCaughey, Stephen <Stephen.Mccaughey@wsp.com>
Cc: Renaud, Jean-Charles <Jean-Charles.Renaud@ottawa.ca>
Subject: RE: uOttawa FHS - SPA Confirmation of Site Services

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
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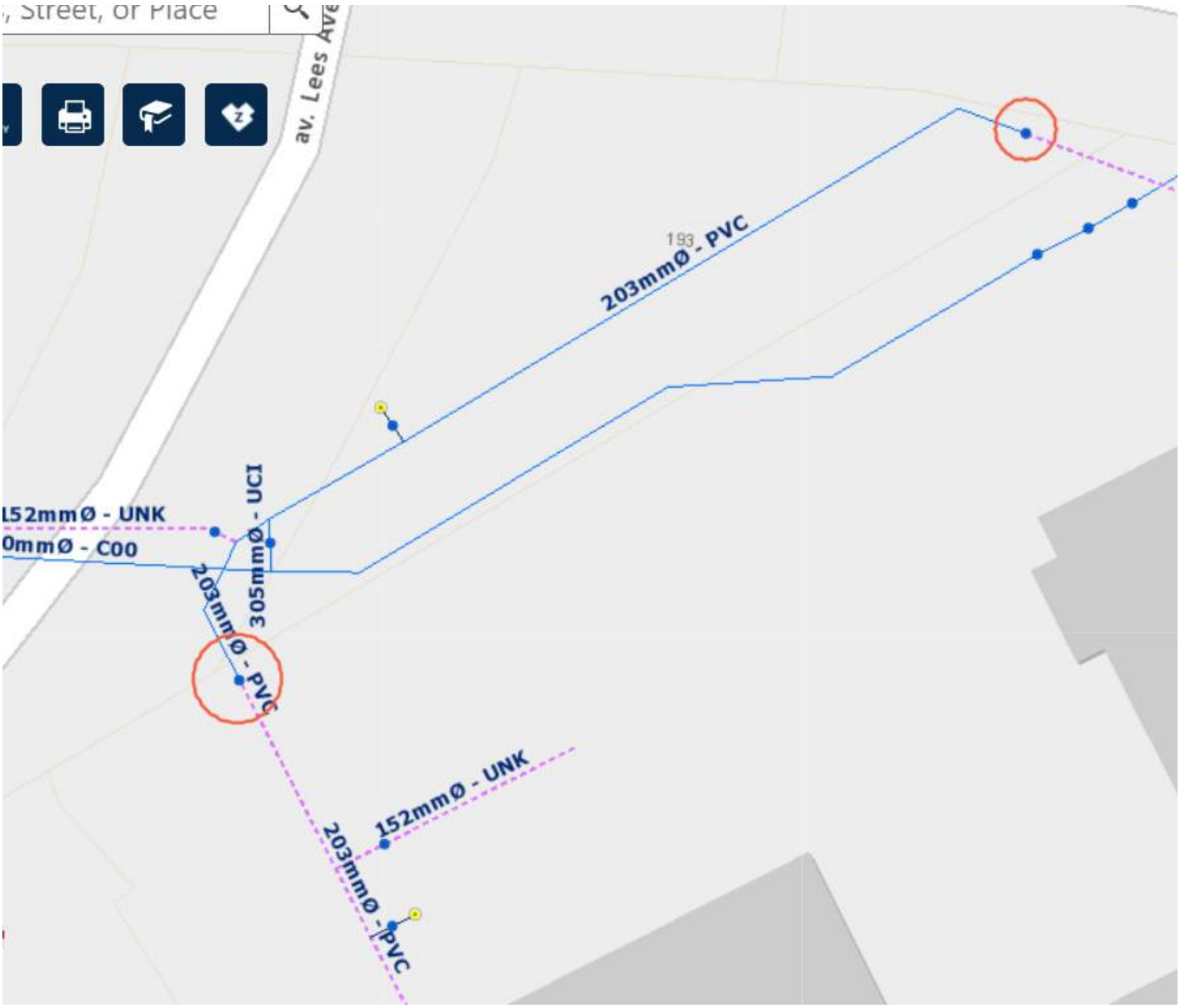
To: Wessel, Shawn <shawn.wessel@ottawa.ca>
Subject: RE: uOttawa FHS - SPA Confirmation of Site Services

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,
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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.

Do you want boundary conditions to be provided at both connection locations to the publicly owned watermain – I assume the development will be off the existing private watermain loop.

Please confirm.

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

Thank you

Regards,

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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.*****

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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**

WSP Canada

Sanitary Sewer Design Sheet

LOCATION			AREA AND POPULATION						INSTITUTIONAL		C+I+I	INFILTRATION			TOTAL FLOW (l/s)	PIPE					
CONNECTIONS	FROM MH	TO MH	AREA (Ha)	POP.	CUMMULATIVE AREA (Ha)	CUMMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (Ha)	ACCU. AREA (Ha)	PEAK FLOW (l/s)	TOTAL AREA (Ha)	ACCU. AREA (Ha)	INFILT. FLOW (l/s)		LENGTH (m)	DIA. (mm)	SLOPE (%)	CAP. (FULL) (l/s)	PIPE CAPACITY USED (%)	VEL. (FULL) (m/s)
Proposed Building	Building	SANMH1	0.520	3006	0.52	3006	1.50	4.70	0.000	0.000	0.00	1.92	1.92	0.63	**5.33**	5	200.00	2.5%	**52.08**	**10.2%**	1.66
	SANMH1	EX. SANMH	0.000	0	0.52	3006	3.96	4.70	0.000	0.000	0.00	0.00	1.92	0.63	**5.33**	30	200.00	3.0%	**56.45**	**9.4%**	1.80

DESIGN PARAMETERS

Institutional (day school w. facilities): 90 L/cap/d
Peak Factor = 1.5
Extraneous Flow = 0.33 l/s/ha
Minimum Velocity = 0.60 m/s
Manning's n = 0.013

Designed: Stephen McCaughey, P.Eng.

Checked: Ishaque Jafferjee, P.Eng.

Dwg. Reference:

PROJECT: uOttawa Faculty of Health Sciences Building, Lees Campus

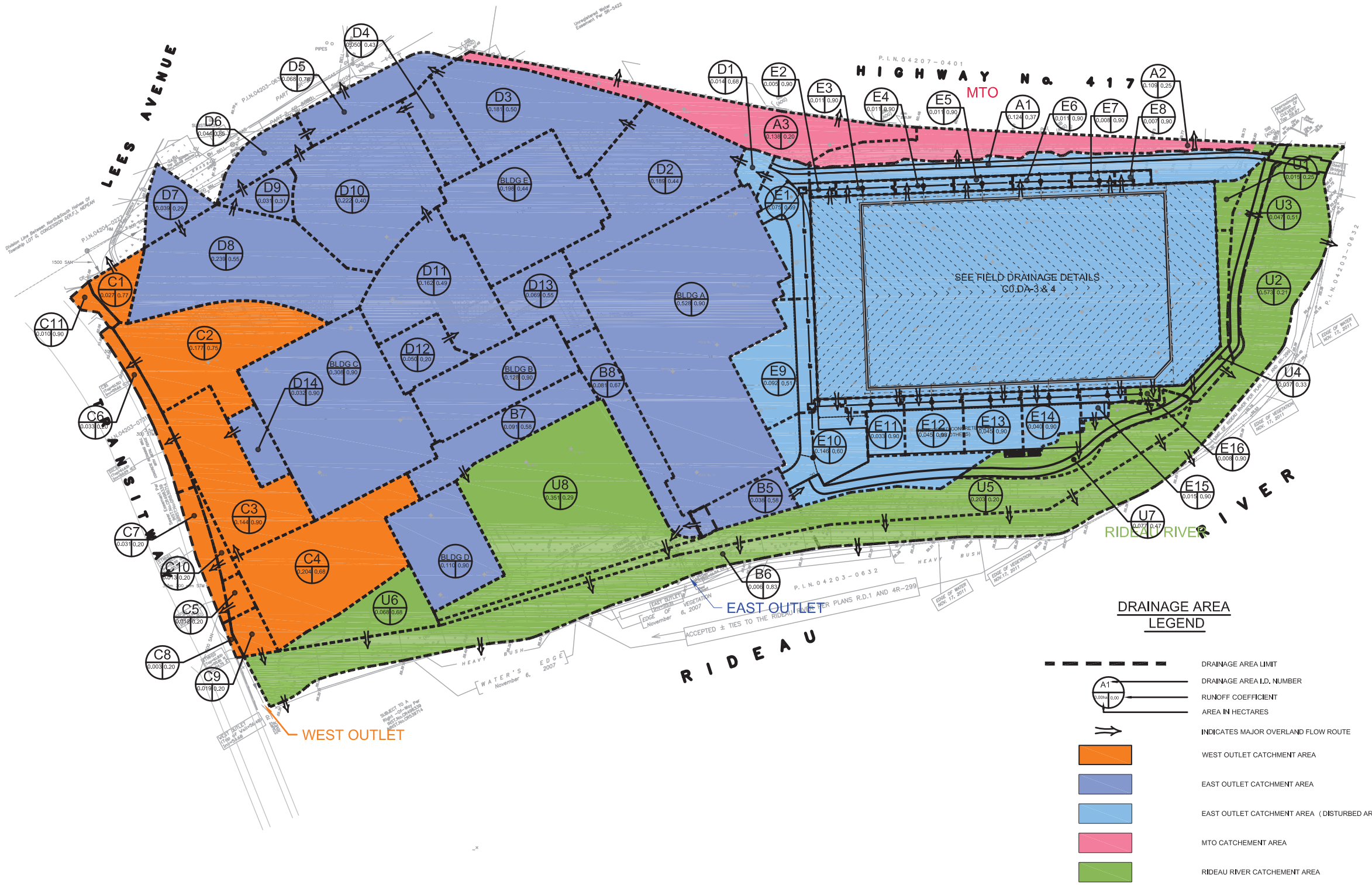
LOCATION: 200 Lees Avenue, Ottawa

File Ref.: 211-01094-01

Date: Oct 2021

Sheet 1 of 1

C STORM SEWER DESIGN



H:\SOE\02375\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
1223 Michael Street, Suite 100, Ottawa, Ontario, Canada K1J 7T2
Tel: (613) 738-4160 Fax: (613) 739-7105

LICENCED PROFESSIONAL ENGINEER
M.S.P.L. PLANTE
09/03/12
PROVINCE OF ONTARIO

uOttawa

Service des immeubles
Physical Resources Service

uOttawa Proj. No:	Date (dd/mm/yyyy):
101-008-060	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:
	Feuille/Sheet: FIGURE 3
Échelle/Scale: N.T.S.	Revision:

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	27	450	3.57%	538.40	3.4	0.13	19%	61.10	60.15
	CB02	STMMH02	0.9	0.16	0.400	0.400	10.00	76.81	30.75	30.75	30.75	17	250	1.64%	76.07	1.5	0.18	40%	60.38	60.10
	STMMH02	CBMH04	0.0	0.00	0.000	1.701	10.17	76.14	0.00	129.54	129.54	42	450	1.65%	366.35	2.3	0.30	35%	60.09	59.40
	CBMH04	STMTECH*	0.4	0.21	0.234	1.935	10.48	75.02	17.52	145.16	145.16	7	450	2.62%	461.49	2.9	0.04	31%	59.38	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	10.42	75.23	0.00	163.12	163.12	28	375	1.83%	237.20	2.1	0.22	69%	59.20	58.68
	CB01	CBMH03	0.4	0.07	0.078	0.078	10.00	76.81	5.98	5.98	5.98	28	250	1.16%	64.13	1.3	0.36	9%	59.78	59.45
	CBMH03	CBMH02	0.4	0.07	0.078	0.156	10.36	75.44	5.87	11.74	11.74	41	250	0.99%	59.05	1.2	0.56	20%	59.44	59.04
	CBMH02	CBMH01	0.4	0.07	0.078	0.234	10.92	73.43	5.72	17.15	17.15	29	250	1.01%	59.87	1.2	0.39	29%	59.01	58.72
	CBMH01**	STMMH01	0.4	0.07	0.078	2.480	10.78	73.94	5.76	183.36	*23.8*	10	375	1.99%	247.17	2.2	0.07	10%	58.66	58.47
	STMMH01***	Ex. STMH22	0.0	0.0	0.000	2.480	10.85	73.69	0.00	182.73	*23.8*	11	375	1.33%	202.45	1.8	0.10	12%	58.44	58.30
	Ex. STMH22	Ex. STMH21	-	-	1.800	-	26.27	43.73	78.72	78.72	*102.52*	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.: 211-01094-01

Date: October 2021

Sheet No. 1 of 3

Note:
* Stormtech MC-4500 Stormwater Storage Chambers System
** ICD on CBMH01 outlet @ 24 L/s Max
***Oil Grit Separator

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	27	450	3.57%	538.40	3.4	0.13	48%	61.10	60.15
	CB02	STMMH02	0.9	0.16	0.400	0.400	10.00	178.56	71.48	71.48	71.48	17	250	1.64%	76.07	1.5	0.18	94%	60.38	60.10
	STMMH02	CBMH04	0.0	0.00	0.000	1.846	10.17	176.98	0.00	326.69	326.69	42	450	1.65%	366.35	2.3	0.30	89%	60.09	59.40
	CBMH04	STMTECH*	0.5	0.2	0.292	2.138	10.48	174.31	50.88	372.65	372.65	7	450	2.62%	461.49	2.9	0.04	81%	59.38	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	10.42	174.80	0.00	424.71	424.71	28	375	1.83%	237.20	2.1	0.22	179%	59.20	58.68
	CB01	CBMH03	0.5	0.1	0.097	0.097	10.00	178.56	17.37	17.37	17.37	28	250	1.16%	64.13	1.3	0.36	27%	59.78	59.45
	CBMH03	CBMH02	0.5	0.1	0.097	0.195	10.36	175.32	17.06	34.12	34.12	41	250	0.99%	59.05	1.2	0.56	58%	59.44	59.04
	CBMH02	CBMH01	0.5	0.1	0.097	0.292	10.92	170.53	16.59	49.78	49.78	29	250	1.01%	59.87	1.2	0.39	83%	59.01	58.72
	CBMH01**	STMMH01	0.5	0.1	0.097	2.819	10.78	171.74	16.71	484.13	*23.8*	10	375	1.99%	247.17	2.2	0.07	10%	58.66	58.47
	STMMH01***	Ex. STMH22	0.0	0.0	0.000	2.819	10.85	171.15	0.00	482.46	*23.8*	11	375	1.33%	202.45	1.8	0.10	12%	58.44	58.30
	Ex. STMH22	Ex. STMH21	-	-	1.800	-	26.27	100.49	180.87	180.87	*204.67*	8	600	0.72%	522.05	1.8	0.07	39%	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.: 211-01094-01

Date: October 2021

Sheet No. 2 of 3

Note:
* Stormtech Stormwater Storage Chambers System
** ICD on CBMH01 outlet @ 24 L/s Max
***Oil Grit Separator

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	27	450	3.57%	538.40	3.4	0.13	58%	61.10	60.15
	CB02	STMMH02	0.9	0.16	0.400	0.400	10.00	214.27	85.78	85.78	85.78	17	250	1.64%	76.07	1.5	0.18	113%	60.38	60.10
	STMMH02	CBMH04	0.0	0.00	0.000	1.846	10.17	212.38	0.00	392.03	392.03	42	450	1.65%	366.35	2.3	0.30	107%	60.09	59.40
	CBMH04	STMTECH*	0.5	0.2	0.292	2.138	10.48	209.18	61.06	447.18	447.18	7	450	2.62%	461.49	2.9	0.04	97%	59.38	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	10.42	209.76	0.00	509.66	509.66	28	375	1.83%	237.20	2.1	0.22	215%	59.20	58.68
	CB01	CBMH03	0.5	0.1	0.097	0.097	10.00	214.27	20.85	20.85	20.85	28	250	1.16%	64.13	1.3	0.36	33%	59.78	59.45
	CBMH03	CBMH02	0.5	0.1	0.097	0.195	10.36	210.38	20.47	40.94	40.94	41	250	0.99%	59.05	1.2	0.56	69%	59.44	59.04
	CBMH02	CBMH01	0.5	0.1	0.097	0.292	10.92	204.64	19.91	59.73	59.73	29	250	1.01%	59.87	1.2	0.39	100%	59.01	58.72
	CBMH01**	STMMH01	0.5	0.1	0.097	2.819	10.78	206.09	20.05	580.96	*23.8*	10	375	1.99%	247.17	2.2	0.07	10%	58.66	58.47
	STMMH01***	Ex. STMH22	0.0	0.0	0.000	2.819	10.85	205.38	0.00	578.95	*23.8*	11	375	1.33%	202.45	1.8	0.10	12%	58.44	58.30
	Ex. STMH22	Ex. STMH21	-	-	1.800	-	26.27	120.58	217.05	217.05	*240.85*	8	600	0.72%	522.05	1.8	0.07	46%	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
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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

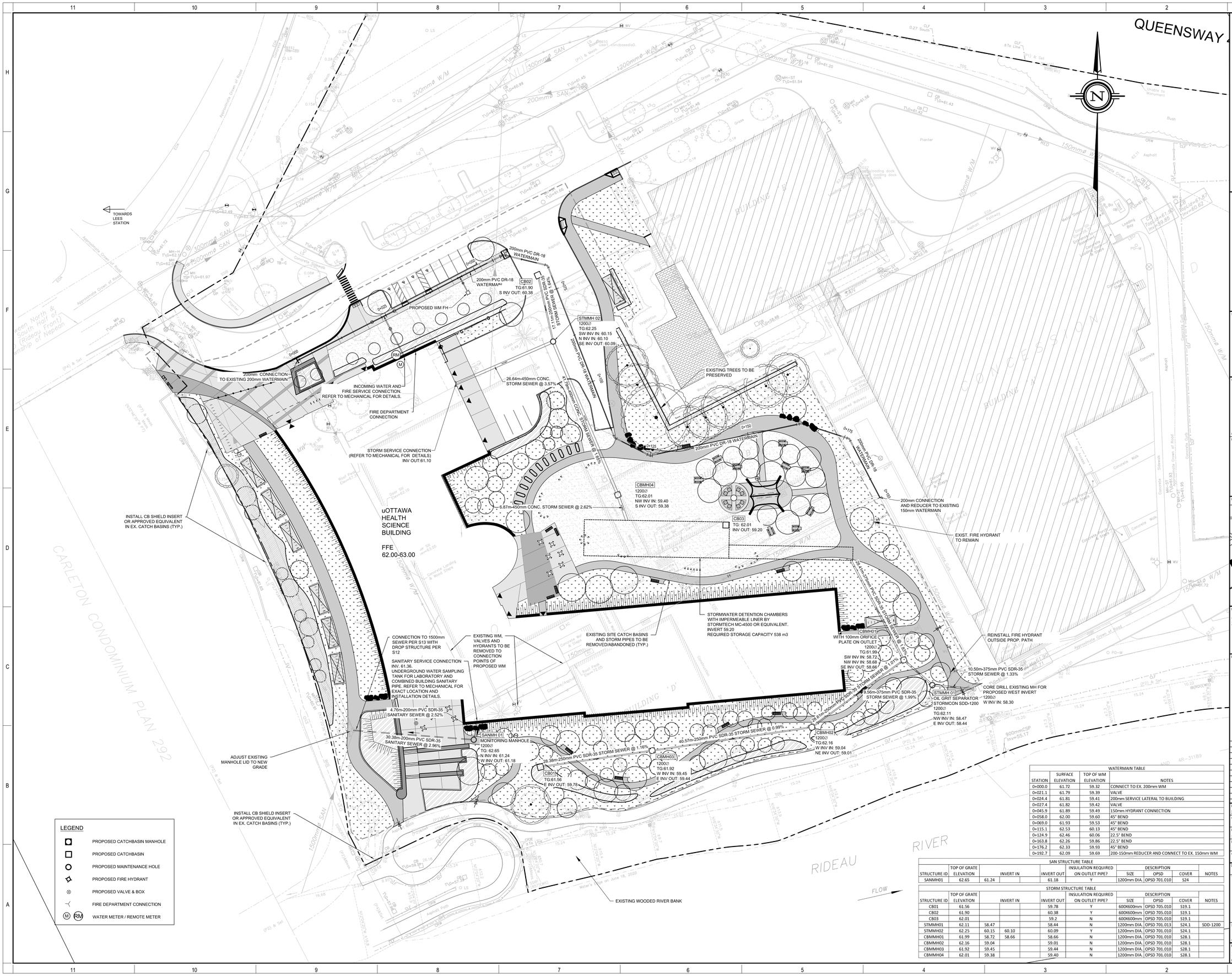
File Ref.: 211-01094-01

Date: October 2021

Sheet No. 3 of 3

Note:
* Stormtech Stormwater Storage Chambers System
** ICD on CBMH01 outlet @ 24 L/s Max
***Oil Grit Separator

D SITE DRAWINGS



WATERMAIN TABLE			
STATION	SURFACE ELEVATION	TOP OF WM ELEVATION	NOTES
0+000.0	61.72	59.32	CONNECT TO EX. 200mm WM
0+021.1	61.79	59.39	VALVE
0+024.4	61.81	59.41	200mm SERVICE LATERAL TO BUILDING
0+027.4	61.82	59.42	VALVE
0+045.9	61.89	59.49	150mm HYDRANT CONNECTION
0+058.0	62.00	59.60	45° BEND
0+069.0	61.93	59.53	45° BEND
0+115.1	62.53	60.13	45° BEND
0+124.9	62.46	60.06	22.5° BEND
0+163.8	62.26	59.86	22.5° BEND
0+176.2	62.33	59.93	45° BEND
0+192.7	62.09	59.69	200-150mm REDUCER AND CONNECT TO EX. 150mm WM

SAN STRUCTURE TABLE									
	TOP OF GRATE		INVERT IN		INVERT OUT	INSULATION REQUIRED	DESCRIPTION			
STRUCTURE ID	ELEVATION					ON OUTLET PIPE?	SIZE	OPSD	COVER	NOTES
SANMH01	62.65	61.24			61.18	Y	1200mm DIA.	OPSD 701.010	S24	

STORM STRUCTURE TABLE										
	TOP OF GRATE		INVERT IN		INVERT OUT	INSULATION REQUIRED	DESCRIPTION			
STRUCTURE ID	ELEVATION					ON OUTLET PIPE?	SIZE	OPSD	COVER	NOTES
CB01	61.56				59.78	Y	600X600mm	OPSD 705.010	S19.1	
CB02	61.90				60.38	Y	600X600mm	OPSD 705.010	S19.1	
CB03	62.01				59.2	N	600X600mm	OPSD 705.010	S19.1	
STMMH01	62.11	58.47			58.44	N	1200mm DIA.	OPSD 701.013	S24.1	SDD-1200
STMMH02	62.25	60.15	60.10		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	59.45			59.44	N	1200mm DIA.	OPSD 701.010	S28.1	
CBMMH04	62.01	59.38			59.40	N	1200mm DIA.	OPSD 701.010	S28.1	

ARCHITECTURE 49
1000-150 ISABELLA STREET
OTTAWA (ONTARIO) CANADA K1S 1V7
Phone: 613-238-0440 | Fax: 613-238-6597 | WWW.ARCHITECTURE49.COM

wsp
2611 Queensview Dr, Suite 300
Ottawa, Ontario, K2B 8K2 Canada
T 613-829-2800 | F 613-829-8299 | www.wsp.com

PCL CONSTRUCTION
49 Auriga Drive
Ottawa, Ontario, K2E 8A1 Canada
T 613-978-5398 | www.pcl.com

SEAL:

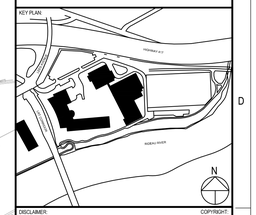
CLIENT: uOttawa

CLIENT REF. #: BT2O-18477

PROJECT:
University of Ottawa - Faculty of Health Sciences Building

200 LEES AVENUE
OTTAWA, ON

KEY PLAN:



ISSUED FOR - REVISION:

4	2021-10-08	REISSUED FOR SCPA
3	2021-09-17	ISSUED FOR DESIGN DEVELOPMENT
2	2021-06-28	ISSUED FOR SPCA
1	2021-04-15	ISSUED FOR TECHNICAL SUBMISSION
ID	DATE	DESCRIPTION

PROJECT NO: 211-010994-01
DATE: 2021-10-08
ORIGINAL SCALE: 1:300
IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE.
DESIGNED BY: SJM
DRAWN BY: BN
CHECKED BY: IJ
25mm

DISCIPLINE: CIVIL

TITLE: SERVICING PLAN

SHEET NUMBER: C-001

SHEET # 1 OF 4

ISSUE: REISSUED FOR SCPA
REV #: 4
DATE OF: 2021-10-08

TOWARDS LEES STATION

RELOCATED CROSS WALK

TWSI (TYP.)

EXISTING TREES TO BE PRESERVED

uOTTAWA HEALTH SCIENCE BUILDING

FFE 62.00-63.00

ADJUST MH LID TO NEW GRADE

100Yr+20% PONDING LIMIT

EXISTING TREES TO BE PRESERVED

MAX. 3:1 TERRACING ALL AROUND BUILDING LANDSCAPED AREAS

EXISTING PATHWAY TO BE PRESERVED

EXISTING TREES TO BE PRESERVED

EXISTING WOODED RIVER BANK

LEGEND

- EX62.45 — EXISTING GRADE
- 62.45 — PROPOSED GRADE
- 0.6% — PROPOSED SLOPE
- PROPOSED 3:1 TERRACING
- PROPOSED CATCHBASIN MANHOLE
- PROPOSED CATCHBASIN
- PROPOSED MAINTENANCE HOLE
- PROPOSED FIRE HYDRANT
- PROPOSED VALVE & BOX
- OVERLAND FLOW ROUTE
- 100yr — 100yr PONDING LIMIT
- 100yr+20% PONDING LIMIT

ARCHITECTURE 49

1000-150 ISABELLA STREET
OTTAWA (ONTARIO) CANADA K1S 1V7
Phone: 613-238-0440 | Fax: 613-238-6597 | WWW.ARCHITECTURE49.COM

wsp

2611 Queensview Dr, Suite 300
Ottawa, Ontario, K2B 8K2 Canada
T 613-829-2800 | F 613-829-8299 | www.wsp.com

PCL CONSTRUCTION

49 Auriga Drive
Ottawa, Ontario, K2E 8A1 Canada
T 613-978-5398 | www.pcl.com

SEAL:

CLIENT: uOttawa

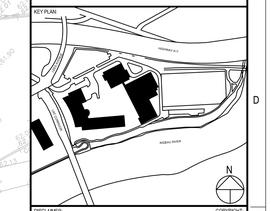
CLIENT REF. #: BT20-18477

PROJECT:

University of Ottawa - Faculty of Health Sciences Building

200 LEES AVENUE
OTTAWA, ON

KEY PLAN



ISSUED FOR - REVISION:

	DATE	DESCRIPTION
5	2021-10-08	REISSUED FOR SCPA
4	2021-10-01	ISSUED FOR DEEP FOUNDATION
3	2021-09-17	ISSUED FOR DESIGN DEVELOPMENT
2	2021-06-28	ISSUED FOR SPCA
1	2021-04-15	ISSUED FOR TECHNICAL SUBMMISSION

PROJECT NO: 211-01094-01
DATE: 2021-10-08
ORIGINAL SCALE: 1:300
DESIGNED BY: SM
DRAWN BY: BN
CHECKED BY: IJ
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: REISSUED FOR SCPA
REV #: 5
DATE OF: 2021-10-08

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.

TOWARDS LEES STATION

TWSI (TYP.)

uOTTAWA HEALTH SCIENCE BUILDING

FFE 62.00-63.00

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

LEGEND

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

FLOW

50mm CLEAR LIMESTONE ACCESS ROAD AS REQUIRED TO EXIST. ROAD PAVEMENT

8.0m MIN.

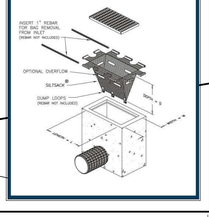
150mm

ALL CONSTRUCTION TRAFFIC TO CROSS MUD MAT WHEN EXITING THE SITE

RIPRAP STONE (100mm TO 150mm SIZE TWO LAYERS THICK)

MUD MAT (NTS)

Typical Siltsack® Construction - Type B



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wsp
2611 Queensview Dr, Suite 300
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PCL CONSTRUCTION
49 Auriga Drive
Ottawa, Ontario, K2E 8A1 Canada
T 613-978-5388 | www.pcl.com

SEAL:

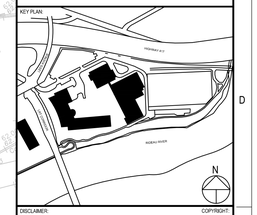
CLIENT: uOttawa

CLIENT REF. #: BT2O-18477

PROJECT: University of Ottawa - Faculty of Health Sciences Building

200 LEES AVENUE
OTTAWA, ON

KEY PLAN:



DISCLAIMER: COPYRIGHT:

THIS DRAWING AND DESIGN IS COPYRIGHT PROTECTED WHICH SHALL NOT BE USED, REPRODUCED OR REVISED WITHOUT WRITTEN PERMISSION BY WSP. THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND UTILITY LOCATIONS AND REPORT ALL ERRORS AND OMISSIONS PRIOR TO COMMENCING WORK.
THIS DRAWING IS NOT TO BE SCALED.

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1	2021-06-28	ISSUED FOR SPCA

PROJECT NO: 211-01094-01
DATE: 2021-10-08
ORIGINAL SCALE: 1:300
DESIGNED BY: SM
DRAWN BY: BN
CHECKED BY: JJ
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DISCIPLINE: CIVIL

TITLE: EROSION AND SEDIMENT CONTROL PLAN

SHEET NUMBER: C-003
SHEET # 3 OF 4

ISSUE: REISSUED FOR SCPA
DATE OF: 2021-10-08
REV.# 3

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 NECESS ARY 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: ROADWAY, PATHWAY, 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 AND PATERSON GROUP DATES JUNE 2021 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. ASPHALT PATHWAYS TO HAVE MINIMUM 1% CROSS-SLOPE TOWARDS NEAREST CATCH BASIN.
12. 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.
13. 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 ASSEMBLIES 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	40mm
SUPERPAVE 19.mm BASE COURSE	50mm
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
1000-150 ISABELLA STREET
OTTAWA (ONTARIO) CANADA K1S 1V7
Phone: 613-238-0440 | Fax: 613-238-6597 | WWW.ARCHITECTURE49.COM

wsp
2611 Queensview Dr, Suite 300
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49 Auriga Drive
Ottawa, Ontario, K2E 8A1 Canada
T 613-978-5388 | www.pcl.com

SEAL:

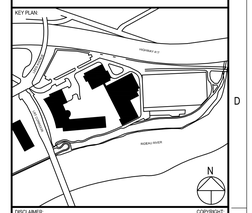
CLIENT:
uOttawa

CLIENT REF. # BT20-18477

PROJECT:
University of Ottawa - Faculty of Health Sciences Building

200 LEES AVENUE
OTTAWA, ON

KEY PLAN:



ISSUED FOR - REVISION:

3	2021-10-08	REISSUED FOR SPCA
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DESIGNED BY: SM
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IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE. 25mm
DISCIPLINE: CIVIL
TITLE: GENERAL NOTES & DETAILS
SHEET NUMBER: C-004
SHEET # 4 OF 4
ISSUE: REISSUED FOR SCPA
REV # 3
DATE OF: 2021-10-08

E AUTHORITIES HAVING JURISDICTION

McCaughey, Stephen

From: Eric Lalande <eric.lalande@rvca.ca>
Sent: Wednesday, July 07, 2021 11:51 AM
To: McCaughey, Stephen
Subject: RE: Stormwater Quality Requirements to Rideau River - 200 Lees Ave.

Hi Stephen,

The criteria that were listed below 80% TSS removal were correct, no other criteria from our end.

Thanks,

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

From: McCaughey, Stephen <Stephen.Mccaughey@wsp.com>
Sent: Wednesday, July 7, 2021 9:38 AM
To: Eric Lalande <eric.lalande@rvca.ca>
Subject: RE: Stormwater Quality Requirements to Rideau River - 200 Lees Ave.

Hi Eric,

Following up from my below correspondence regarding this uOttawa site trying to confirm if there were additional RVCA requirements beyond those noted, most especially as it relates to civil works.

Thanks,

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

From: Jamie Batchelor <jamie.batchelor@rvca.ca>
Sent: Monday, June 21, 2021 11:56 AM
To: McCaughey, Stephen <Stephen.Mccaughey@wsp.com>
Cc: Eric Lalande <eric.lalande@rvca.ca>
Subject: RE: Stormwater Quality Requirements to Rideau River - 200 Lees Ave.

Good Morning Stephen,

I've copied my colleague Eric Lalande on this email as he would be the RVCA Planner on this project.

Jamie Batchelor, MCIP, RPP
Planner, ext. 1191
Jamie.batchelor@rvca.ca

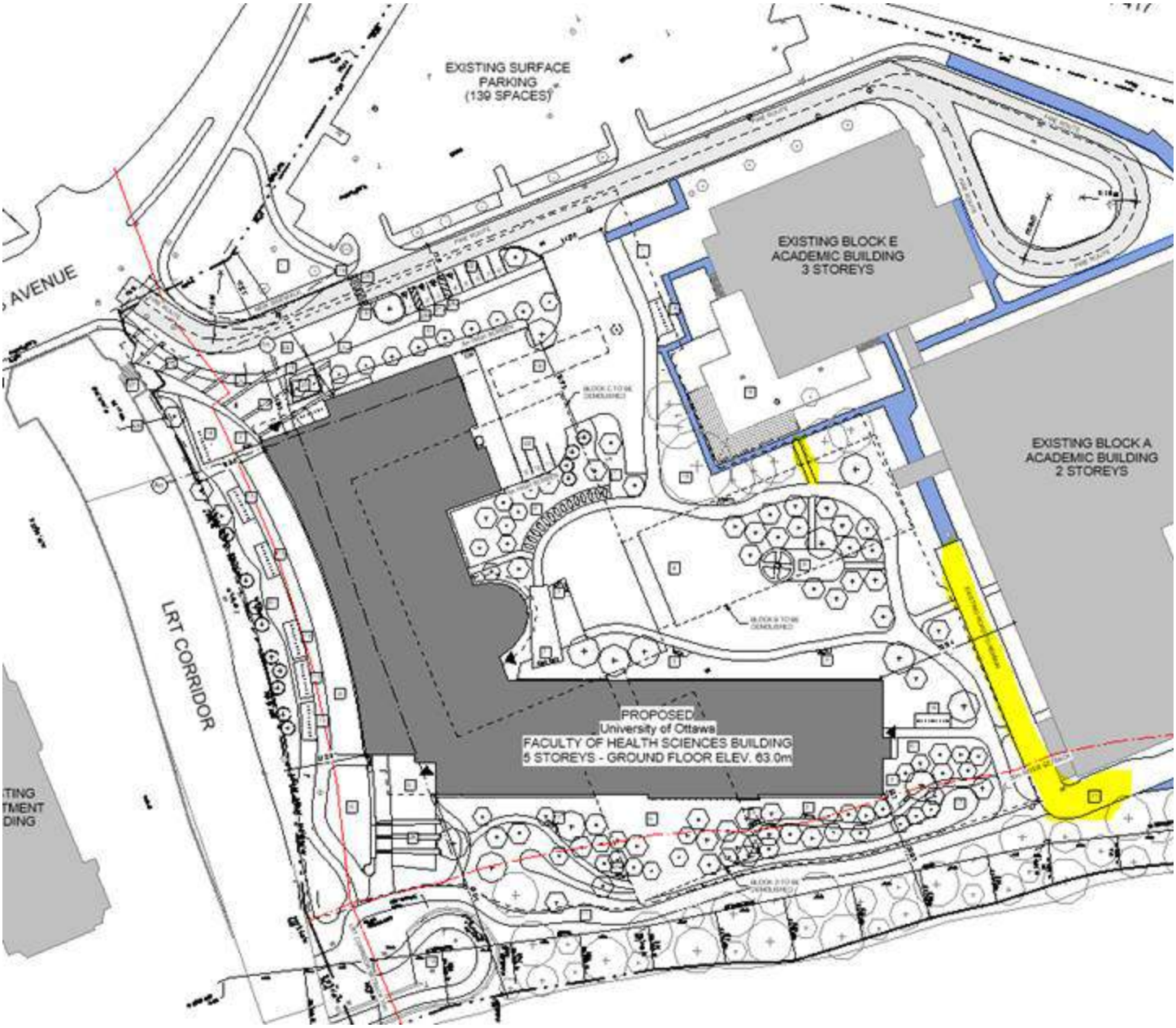
Rideau Valley Conservation Authority
3889 Rideau Valley Drive
PO Box 599, Manotick ON K4M 1A5
T 613-692-3571 | 1-800-267-3504 F 613-692-0831 | www.rvca.ca

From: McCaughey, Stephen <Stephen.Mccaughey@wsp.com>
Sent: Monday, June 21, 2021 11:54 AM
To: Jamie Batchelor <jamie.batchelor@rvca.ca>
Subject: RE: Stormwater Quality Requirements to Rideau River - 200 Lees Ave.

Hi Jamie,

Hope you're the right individual for this area, we're working with the University of Ottawa on this proposed new Faculty of Health Sciences building, replacing 3 existing buildings on the Lees Campus which sits right to the north of Rideau River. We have development criteria from the City of Ottawa and RVCA based on pre-consultation done previously by the University with a preliminary design. The criteria included the 30m development buffer, and stormwater criteria of 80% TSS removal and 100yr post-development to 2yr pre-development. Just wanted to confirm if there would be any other specific criteria from RVCA for the development.

Thank you,



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

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Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER 0473-9ABLAT
Issue Date: August 30, 2013

University of Ottawa
1 Nicholas Street, Suite No. 840
Ottawa, Ontario
K1N 7B7

Site Location: University of Ottawa - Lees Campus
200 Lees Avenue
City of Ottawa

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

Current Proposed Works
the establishment of stormwater management Works to serve Block A of the Physical Resources Centre, University of Ottawa as part of the Building "A" Renovation/Addition and Open Air Stadium Phase 1 site, located within the Lees Campus located at 200 Lees Avenue, in the City of Ottawa, for the disposal of stormwater runoff from a catchment area of 1.22 hectares, to attenuate post development peak flows to allowable release levels, comprising;

surface storage provided upstream of CB 6, having a total volume of 93.6 m 3 with a maximum of 0.3 m surface ponding depth under 100 year design storm; the storage is provided through a flow control device installed in the downstream CB 7;

surface storage provided upstream of CB 7, having a total volume of 86.9 m 3 with a maximum of 0.3 m surface ponding depth under 100 year design storm; the storage is provided through a flow control device installed in CB 7 rated at 12.6 L/s under a head of 1.40 metres discharging to an existing storm sewer network;

surface storage provided upstream of CB 27, having a total volume of 23.8 m 3 with a maximum of 0.26 m surface ponding depth under 100 year design storm; the storage is provided through a flow control device installed in CB 27 rated at 16.7 L/s under a head of 1.89 metres discharging to the existing storm sewer network ;

on-site storage provided through the pipe storage, catch basin, catch basin maintenance holes and maintenance holes, having a combined storage volume of 231.1 m 3 , discharging via a 300 mm diameter storm outlet pipe allowing a maximum discharge of 144.1 L/s under 100-year design storm event into the existing storm system, the storm sewer ultimately outlets to (the East Outlet) to the Rideau River via a 750mm a steel culvert;

one (1) oil/grit interceptor , model Stormceptor STC 2000 located immediately downstream of MH14, servicing a drainage area of 1.22 hectares approximately, with an overall imperviousness of 80% to provide Enhanced level of protection (a minimum long term average total suspended solids removal of 81 %), having a sediment storage capacity of 7700 litres, an oil storage capacity of 2890 litres, a total holding capacity of 11000 litres, and a maximum treatment flow rate of 144.1 litres per second, discharging to Rideau River (the East Outlet) through existing sewers;

all in accordance with the application dated June 18, 2013 and received on June 24, 2013, including the design report entitled "Building a Renovation/Addition and Open Air Stadium, 200 Lees Avenue, Ottawa, Ontario, Site Servicing & Stormwater Management Report, Addendum to the Approved March 2012 Site Servicing & Stormwater Management Report" dated April 2013 and revised May 2013, final plans and specifications prepared by Delcan Corporation.

Previous Approved Works

the establishment of stormwater management Works to serve the Building "A" Renovation/Addition and Open Air Stadium site located within the eastern portion of the University of Ottawa - Lees Campus located at 200 Lees Avenue, in the City of Ottawa, for the disposal of stormwater runoff from a catchment area of 2.5 ha, to attenuate post-development peak flows to allowable release levels, discharging to the Rideau River, for all storm events up to and including the 100-year return storm, consisting of the following:

rooftop storage provided on the 5,270 m 2 roof area of the Building "A", having an available storage volume of 191.8 m 3 and a maximum ponding depth of 36.4 mm, discharging via existing flow control roof drains, together allowing a total maximum discharge of 20.5 L/s (100-year return storm) via a 600 mm diameter storm sewer, a 750 mm diameter storm sewer and a steel culvert (the East Outlet) to the Rideau River;

underground storage provided in a 110 m long, 66 m wide and 0.71 m to 1.04 m deep underground storage system, located under the inside area of the open air stadium seasonal dome, north of the Rideau River, south of Highway No. 417 and east of the Building "A", designed to accommodate up to and including the 100-year return storm runoff from a total catchment area of 0.732 ha, having a bottom area of 7,260 m 2 , an available storage volume of 952.1 m 3 and a storage depth of 0.71 m to 1.04 m, consisting of a 60 mm surface layer, a 15 mm wash sand layer, a 135 mm granular 'O' layer, geotextile, a 200 mm to 530 mm deep 19 mm clear stone layer, geotextile and a 300 mm granular 'A' layer, discharging via sixty six (66) Multi-Flow drains, together allowing a maximum discharge of 28 L/s (100-year storm event) via 300 mm diameter Mulit-Flow collectors, 200 mm diameter Mulit-Flow headers, perimeter catchbasin stubs and 375 mm diameter storm sewers to on-site storage storm sewers;

underground storage provided in a 0.71 m to 1.04 m deep underground storage system, located under the outside area of the open air stadium seasonal dome, north of the Rideau River, south of Highway No. 417 and east of the Building "A", designed to accommodate up to and including the 100-year return storm runoff from a total catchment area of 0.332 ha, having a bottom area of 3,289 m 2 , an available storage volume of 461.6 m 3 and a storage depth of 0.71 m to 1.04 m, consisting of a 60 mm surface layer, a 15 mm wash sand layer, a 135 mm granular 'O' layer, geotextile, a 200 mm to 530 mm deep 19 mm clear stone layer, geotextile and a 300 mm granular 'A' layer, discharging via sixty six (66) Multi-Flow drains, together allowing a maximum discharge of 28.4 L/s (100-year storm event) via 300 mm diameter Mulit-Flow collectors, 200 mm diameter Mulit-Flow headers, perimeter catchbasin stubs and 375 mm diameter storm sewers to on-site storage storm sewers;

underground storage provided in on-site 250 mm diameter, 300 mm diameter, 375 mm diameter and 600 mm diameter storage storm sewers having a total available storage volume of 55.3 m 3 and four (4) catchbasins and fourteen (14) catchbasin manholes, having a total available storage volume of 23.5 m 3 , discharging via a 225 mm diameter storm outlet pipe allowing a maximum discharge of 141.4 L/s (100-year storm event) via a 600 mm diameter storm sewer, a 750 mm diameter storm

sewer and a steel culvert (the East Outlet) to the Rideau River;

all in accordance with the application dated March 16, 2012 and received March 20, 2012, including the design report entitled "Building a Renovation/Addition and Open Air Stadium, 200 Lees Avenue, Ottawa, Ontario, Site Servicing & Stormwater Management Report" dated November 2011 and revised February 2012 and March 2012, final plans and specifications prepared by Delcan Corporation.

For the purpose of this environmental compliance approval, the following definitions apply:

1. "Approval" means this Environmental Compliance Approval and any Schedules to it, including the application and supporting documentation.

2. "Director" means any Ministry employee appointed by the Minister pursuant to section 5 of the Part II.1 of the Environmental Protection Act;

3. *"Water Supervisor"* means the Water Supervisor of the appropriate local office of the Safe Drinking Water Branch of the *Ministry,* where the *Works* are geographically located.

4. "Ministry" means the Ontario Ministry of the Environment;

5. "Owner" means University of Ottawa, and includes its successors and assignees;

6. "Source Protection Plan" means a drinking water source protection plan prepared under the Clean Water Act, 2006;

7. "Works" means the sewage works described in the Owner's application, this Approval and in the supporting documentation referred to herein, to the extent approved by this Approval.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL PROVISIONS

1.1 The Owner shall ensure that any person authorized to carry out work on or operate any aspect of the Works is notified of this Approval and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

1.2 Except as otherwise provided by these Conditions, the Owner shall design, build, install, operate and maintain the Works in accordance with the description given in this Approval, the application for approval of the Works and the submitted supporting documents and plans and specifications as listed in this Approval.

1.3 Where there is a conflict between a provision of any submitted document referred to in this Approval and the Conditions of this Approval, the Conditions in this Approval shall take precedence, and where there is a conflict between the listed submitted documents, the document bearing the most recent date shall prevail.

1.4 Where there is a conflict between the listed submitted documents, and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the

application.

1.5 The requirements of this Approval are severable. If any requirement of this Approval, or the application of any requirement of this Approval to any circumstance, is held invalid or unenforceable, the application of such requirement to other circumstances and the remainder of this Approval shall not be affected thereby.

2. EXPIRY OF APPROVAL

The approval issued by this Approval will cease to apply to those parts of the Works which have not been constructed within five (5) years of the date of this Approval.

3. CHANGE OF OWNER

The Owner shall notify the District Manager and the Director, in writing, of any of the following changes within thirty (30) days of the change occurring:

(a) change of Owner;

(b) change of address of the Owner;

(c) change of partners where the Owner is or at any time becomes a partnership, and a copy of the most recent declaration filed under the Business Names Act , R.S.O. 1990, c.B17 shall be included in the notification to the District Manager; and

(d) change of name of the corporation where the Owner is or at any time becomes a corporation, and a copy of the most current information filed under the Corporations Information Act , R.S.O. 1990, c. C39 shall be included in the notification to the District Manager.

4. OPERATION AND MAINTENANCE

4.1 The *Owner* shall make all necessary investigations, take all necessary steps and obtain all necessary *approval* s so as to ensure that the physical structure, siting and operations of the stormwater management *Works* do not constitute a safety or health hazard to the general public.

4.2 The *Owner* shall design, construct and operate the oil/grit separator with the objective that the effluent from the oil/grit separator is essentially free of floating and settleable solids and does not contain oil or any other substance in amounts sufficient to create a visible film, sheen, foam or discolouration on the receiving waters.

4.3 The *Owner* shall ensure that the design storage volume is maintained at all times.

4.4 The *Owner* shall undertake an inspection of the condition of the stormwater management *Works* , at least once a year, and undertake any necessary cleaning and maintenance to ensure that sediment, debris and excessive decaying vegetation are removed from the above noted stormwater management *Works* to prevent the excessive build-up of sediment, debris and/or decaying vegetation to avoid reduction of capacity of the stormwater management *Works* and any reduction of permeability. The *Owner* shall also regularly inspect and clean out the inlet to and outlet from the *Works* to ensure that these are not obstructed.

4.5 The *Owner* shall carry out and maintain an annual inspection and maintenance program on the operation of the Stormwater Management Works in accordance with the manufacturer's recommendation.

4.6 After a two (2) year period, the District Manager of the MOE District Office may alter the frequency of inspection of the Stormwater Management Works if he/she is requested to do so by the *Owner* and considers it acceptable upon review of information submitted in support of the request.

4.7 The *Owner* shall maintain a logbook to record the results of these inspections and any cleaning and maintenance operations undertaken, and shall keep the logbook at the *Owner's* corporate office for inspection by the *Ministry* . The logbook shall include the following:

(a) the name of the *Works;* and

(b) the date and results of each inspection, maintenance and cleaning, including an estimate of the quantity of any materials removed and method of clean-out of the stormwater management *Works.*

5. RECORD KEEPING

The Owner shall retain for a minimum of five (5) years from the date of their creation, all records and information related to or resulting from the operation and maintenance activities required by this Approval.

6. SOURCE WATER PROTECTION

The Owner shall, within sixty (60) calendar days of the Minister of the Environment posting approval of a Source Protection Plan on the environmental registry established under the Environmental Bill of Rights, 1993 for the area in which this Certificate is applicable, apply to the Director for an amendment to this Certificate that includes the necessary measures to conform with all applicable policies in the approved Source Protection Plan.

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is imposed to ensure that the Works are built and operated in the manner in which they were described for review and upon which Approval was granted. This Condition is also included to emphasize the precedence of Conditions in the Approval and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review. The Condition also advises the Owners their responsibility to notify any person they authorized to carry out work pursuant to this Approval of the existence of this Approval.

2. Condition 2 is included to ensure that, when the Works are constructed, the Works will meet the standards that apply at the time of construction to ensure the ongoing protection of the environment.

3. Condition 3 is included to ensure that the Ministry records are kept accurate and current with respect to approved Works and to ensure that subsequent owners of the Works are made aware of the Approval and continue to operate the Works in compliance with it.

4. Condition 4 is included as regular inspection and necessary removal of sediment and excessive decaying vegetation from this approved stormwater management Works are required to mitigate the impact of sediment, debris and/or decaying vegetation on the treatment capacity of the Works. It is also required to ensure that adequate storage is maintained in the stormwater management facilities at all times as required by the design. Furthermore, Condition 4 is included to ensure that the stormwater management Works are operated and maintained to function as designed.

5. Condition 5 is included to require that all records are retained for a sufficient time period to

adequately evaluate the long-term operation and maintenance of the Works.

6. Condition 6 is included to ensure that the Works covered by this Certificate will conform to the significant threat policies and designated Great Lakes policies in the Source Protection Plan.

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). 3091-8URR5Z issued on May 31, 2012.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*****
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part II.1 of the Environmental Protection Act
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal 's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 314-4506 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 30th day of August, 2013

Sherif Hegazy, P.Eng.
Director

appointed for the purposes of Part II.1 of
the *Environmental Protection Act*

KH/
c: District Manager, MOE Ottawa District.
Suzanne Plante, P. Eng., Delcan Corporation.
Water Supervisor Ottawa, MOE Safe Drinking Water Branch.

F DEVELOPMENT SERVICING STUDY CHECKLIST

Servicing study guidelines for development applications

4. Development Servicing Study Checklist

The following section describes the checklist of the required content of servicing studies. It is expected that the proponent will address each one of the following items for the study to be deemed complete and ready for review by City of Ottawa Infrastructure Approvals staff.

The level of required detail in the Servicing Study will increase depending on the type of application. For example, for Official Plan amendments and re-zoning applications, the main issues will be to determine the capacity requirements for the proposed change in land use and confirm this against the existing capacity constraint, and to define the solutions, phasing of works and the financing of works to address the capacity constraint. For subdivisions and site plans, the above will be required with additional detailed information supporting the servicing within the development boundary.

4.1 General Content

- ☒ Executive Summary (for larger reports only).
- ☒ Date and revision number of the report.
- ☒ Location map and plan showing municipal address, boundary, and layout of proposed development.
- ☒ Plan showing the site and location of all existing services.
- ☒ Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.
- ☒ Summary of Pre-consultation Meetings with City and other approval agencies.
- N/☐ Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.
- ☒ Statement of objectives and servicing criteria.
- ☒ Identification of existing and proposed infrastructure available in the immediate area.
- ☒ Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).
- ☒ Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.
- ☒ Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.
- N/☐ Proposed phasing of the development, if applicable.

☒ Reference to geotechnical studies and recommendations concerning servicing.

☒ All preliminary and formal site plan submissions should have the following information:
- Metric scale
- North arrow (including construction North)
- Key plan
- Name and contact information of applicant and property owner
- Property limits including bearings and dimensions
- Existing and proposed structures and parking areas
- Easements, road widening and rights-of-way
- Adjacent street names

4.2 Development Servicing Report: Water

N/☐ Confirm consistency with Master Servicing Study, if available

☒ Availability of public infrastructure to service proposed development

☒ Identification of system constraints

☒ Identify boundary conditions

☒ Confirmation of adequate domestic supply and pressure

☒ Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.

☒ Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.

N/☐ Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design

☒ Address reliability requirements such as appropriate location of shut-off valves

N/☐ Check on the necessity of a pressure zone boundary modification.

☒ Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range

- ☒ Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.
- N/☐ Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.
- ☒ Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.
- ☒ Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.

4.3 Development Servicing Report: Wastewater

- ☒ Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).
- N/☐ Confirm consistency with Master Servicing Study and/or justifications for deviations.
- ☒ Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.
- ☒ Description of existing sanitary sewer available for discharge of wastewater from proposed development.
- ☒ Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)
- ☒ Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix ‘C’) format.
- ☒ Description of proposed sewer network including sewers, pumping stations, and forcemains.
- N/☐ Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).
- N/☐ Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.
- N/☐ Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.
- N/☐ Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.
- N/☐ Special considerations such as contamination, corrosive environment etc.

4.4 Development Servicing Report: Stormwater Checklist

- ☒ Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)
- N/☐ Analysis of available capacity in existing public infrastructure.
- ☒ A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.
- ☒ Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.
- ☒ Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.
- ☒ Description of the stormwater management concept with facility locations and descriptions with references and supporting information.
- ☒ Set-back from private sewage disposal systems.
- ☒ Watercourse and hazard lands setbacks.
- ☒ Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.
- N/☐ Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.
- ☒ Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).
- ☒ Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.
- ☒ Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.
- ☒ Any proposed diversion of drainage catchment areas from one outlet to another.
- ☒ Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.
- N/☐ If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100 year return period storm event.
- ☒ Identification of potential impacts to receiving watercourses
- N/☐ Identification of municipal drains and related approval requirements.
- ☒ Descriptions of how the conveyance and storage capacity will be achieved for the development.
- ☒ 100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.

N/☐ Inclusion of hydraulic analysis including hydraulic grade line elevations.

☒ Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.

☒ Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.

☒ Identification of fill constraints related to floodplain and geotechnical investigation.

4.5 Approval and Permit Requirements: Checklist

The Servicing Study shall provide a list of applicable permits and regulatory approvals necessary for the proposed development as well as the relevant issues affecting each approval. The approval and permitting shall include but not be limited to the following:

☒ Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement Act. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act.

☒ Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.

N/☐ Changes to Municipal Drains.

☒ Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)

4.6 Conclusion Checklist

☒ Clearly stated conclusions and recommendations

☒ Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.

☒ All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario