

M E M O R A N D U M

DATE: MAY 15, 2020 **CITY FILE NUMBER:**

TO: MARK FRASER

FROM: JAZMINE GAUTHIER

RE: 225 SCHOLASTIC AVENUE – GREYSTONE VILLAGE
DESCHÂTELETS BUILDING: SITE SERVICING AND STORMWATER
MANAGEMENT MEMORANDUM

CC: JOHN RIDDELL

ATTACHED: 120055A-GP: GENERAL PLAN OF SERVICES
120055A-STM: STORMWATER MANAGEMENT PLAN
EXCERPTS OF FIRE FLOW CALCS FROM SUBDIVISION REPORT
EXCERPTS OF STORMWATER CRITERIA FROM SUBDIVISION REPORT
EXCERPTS OF SANITARY FROM SUBDIVISION REPORT
(120055A)

This memo is to support a zoning by-law amendment for the property and is supplementary to the MSS: “*Greystone Village - 175 Main Street: Site Servicing, Stormwater Management, Noise, Erosion and Sediment Control Brief (Phase 2 and 3), R-2017-089*”, dated May 26, 2017 to provide specifics related to the Greystone Village Deschâtelets Building which is part of the overall Greystone Village subdivision development.

The proposed development is located at 225 Scholastic Avenue in Old Ottawa East, east of Deschâtelets Avenue, south of des Oblats Avenue, west of Scholastic Avenue and north of Deschâtelets Avenue within the City of Ottawa. The existing property is currently occupied by the existing Deschâtelets building. The proposed re-development of this portion of the site will consist of re-developing the building to include a school/daycare and in the future, possibly a community centre and residential units. Also, in future phases, the plan is to add a future gym building and future parking lot.

The Deschâtelets area subject site is approximately 0.2594 ha in area, the future gym area subject site is approximately 0.1084 ha in area and the future parking area subject site is approximately 0.0858 ha in area. The development will have frontage on the fire route that run through the park block to the west. In future phases, it will have a two-way vehicular access to the parking lot site located on des Oblats Avenue.

This site servicing and stormwater management memorandum will outline how the site will be serviced with sanitary, storm and watermain; and will demonstrate that adequate municipal capacity is available within the proposed infrastructure to service the development.

Sanitary

The proposed redevelopment of the existing 4-storey building between des Oblats Avenue/ Scholastic Avenue/Deschâtelets Avenue will be serviced by a 200mm dia. sanitary service that connects to the existing 250mm dia. sanitary sewer on Scholastic Avenue.

The ultimate outlet is the existing 1350mm Rideau River Interceptor trunk sewer that runs parallel to the Rideau River on the eastern portion of the overall site.

The re-development will consist of school with 401 students, 40 staff and 45 occupants of the daycare; possible 38 residential units; possible 155-person community centre. Also, there is the possible future gym building that would add 363 persons, therefore:

It should be noted that the MSS accounted for 350L/c/d, but this memo will consider 280L/c/d as per the technical bulletin.

Deschâtelets Building

$$Q_{SAN} = (401 \text{ students} \times 90 \text{ L/cap/day}) + (40 \text{ staff} \times 75 \text{ L/cap/day}) + (45 \text{ daycare} \times 75 \text{ L/cap/day}) + (38 \text{ units} \times 1.8 \text{ persons/unit} \times 280 \text{ L/cap/day}) + (155 \text{ persons} \times 75 \text{ L/cap/day}) + (363 \text{ gym} \times 36 \text{ L/cap/day}) = 86,310 \text{ L/day}$$

$$\text{Average Sanitary Flow} = 86,310 \text{ L/day} = 0.999 \text{ L/sec}$$

$$\text{Peak Sanitary Flow} = 3.221 \text{ L/sec (with PF} = 1 + \left(\frac{14}{4 + \left(\frac{1072.4}{1000} \right)^{1/2}} \right) * 0.8 = 3.224)$$

$$\text{Extraneous flow} = 0.33 \text{ L/sec/ha} \times 0.4536 \text{ ha} = 0.1497 \text{ L/sec}$$

Therefore,

Total Site Average Sanitary Flow to Deschâtelets Ave = 1.15 L/sec (with extraneous flows)

Total Site Peak Sanitary Flow to Deschâtelets Ave = 3.37 L/sec (with PF and extraneous flows)

The proposed development population estimates and sanitary flows accounted for in the "Greystone Village - 175 Main Street: Site Servicing, Stormwater Management, Noise, Erosion and Sediment Control Brief (Phase 2 and 3)" are based on the City of Ottawa Sewer Design Guidelines.

Stormwater

The site has an overall slope towards the Rideau River to the East. Storm runoff from the majority of the site is conveyed overland towards the Rideau River.

The proposed redevelopment of the existing 4-storey building between des Oblats Avenue/ Scholastic Avenue/ Deschâtelets Avenue will be serviced by a 200mm dia. storm service that connects to the existing 375mm dia. storm sewer on Scholastic Avenue.

The ultimate outlet is the Rideau River on the eastern portion of the overall site.

As discussed in the “*Greystone Village - 175 Main Street: Site Servicing, Stormwater Management, Noise, Erosion and Sediment Control Brief (Phase 2 and 3)*”, water quality control will be provided within the subdivision’s storm sewer system with Vortech type structures and water quantity control is not required, other than for the roof, since the sewers are ultimately discharging directly to the Rideau River, provided the outlets are designed with suitable erosion protection measures. **The roof is to be controlled to 80L/s/ha.**

The roof of the Deschâtelets building will have uncontrolled roof drains directed to the stormwater tank and be controlled to 80L/s/ha before it outlets to the service. The roof of the future gym will be controlled by a combination of controlled roof drains and a stormwater tank and be controlled to 80L/s/ha before it outlets to the service. The flows will be pump controlled at 12.42L/s and 5.08L/s respectively to Scholastic Avenue and possibly des Oblats Avenue (c/w back-up pump and emergency battery backup). The emergency overflow from the tank will be at the surface.

The site will be graded such that flows in excess of the 100-year storm event will be conveyed overland to des Oblats Avenue, Scholastic Avenue, as well as Deschâtelets Avenue.

Erosion and sediment control measures will be implemented during all phases of construction and inspected regularly.

Watermain

The proposed redevelopment of the existing 4-storey building between des Oblats Avenue/ Scholastic Avenue/Deschâtelets Avenue will be serviced by two 150mm dia. water services that connects to the existing 250mm dia. watermain on des Oblats Avenue and Scholastic Avenue.

It should be noted that both services will need to be interconnected for redundancy at the entry into the building.

The existing 250mm dia. watermain on Deschâtelets Avenue, Scholastic Avenue and des Oblats Avenue are looped from the existing 200mm dia. watermain on Clegg Street to the new 400mm dia. watermain on Main Street.

Estimated domestic water demands for the development are roughly the same as the proposed development sanitary flows listed above. Therefore:

Average Day Demand = 0.999 L/s

Maximum Day Demand = 0.999 L/s * 2.5 = 2.50 L/s

Maximum Hourly Demand = 2.50 L/s * 2.2 = 5.50 L/s

The hydraulic analysis performed for the overall site as per the “*Greystone Village - 175 Main Street: Site Servicing, Stormwater Management, Noise, Erosion and Sediment Control Brief (Phase 2 and 3)*” demonstrates that the system will work for domestic water as well as fire demand.

Table 5.2: Hydraulic Model Results

Operating Condition	Minimum Operating Pressure
Max Daily Demand + Fire Flow	Watermain
MD = 4.83 L/s FF= 286.45 L/s at node N6	293.91 kPa 42.63 psi
MD = 0.62 L/s FF= 167.00 L/s at node N7	319.51 kPa 46.34 psi
MD = 0.16 L/s FF= 286.45 L/s at node N8	300.48 kPa 43.58 psi
MD = 0.57 L/s FF= 219.97 L/s at node N12	257.71 kPa 37.38 psi
MD = 2.25 L/s FF= 300.24 L/s at node N15	211.01 kPa 30.60 psi
MD = 2.48 L/s FF= 300.24 L/s at node N21	238.19 kPa 34.55 psi

Peak Hour Demand	
PH = 48.86 L/s	385.93 kPa (At Node 10) 55.97 psi
Maximum High Pressure	
MHP = node N25	551.91 kPa 80.05 psi
Maximum Time On Site	
MTS = node N30	38.3 hours

The Deschâtelets Building has at least 3 hydrants within less than 75m, therefore at least 17,100L/min is available for fire flow. The calculated fire flow is 15,172L/min.

Other Reference Documents

N/A

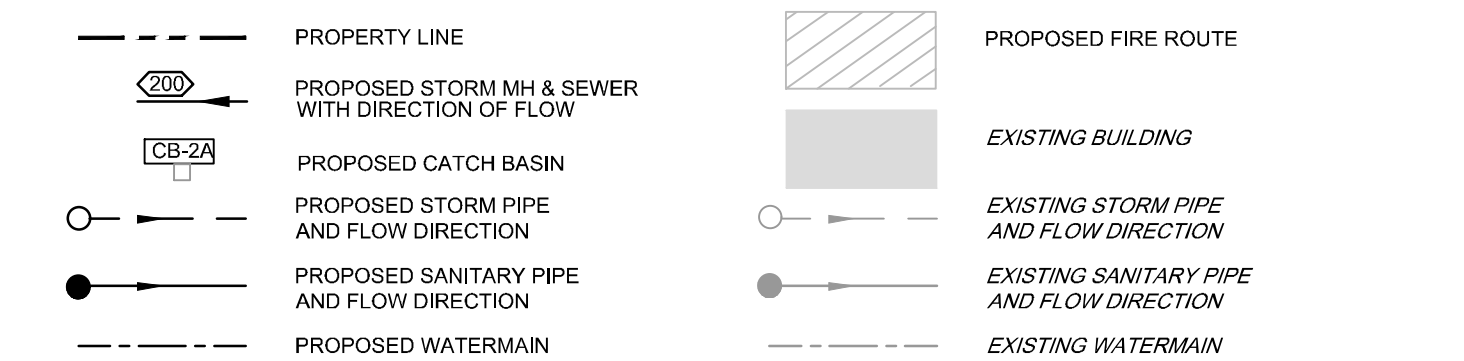
LID

As mentioned in the MSS, LID features were to be considered at the lot level, but no specific LID features were suggested for the Deschâtelets block in the report "Greystone Village -175 Main Street - Potential Low Impact Development Opportunities" (Novatech, November 25th, 2015, R-2015-182). Due to site constraints LID features for this site (Deschâtelets) were deemed not feasible.

We submit the following and request your review and approval in order that we can receive site plan approval.

Thanks.



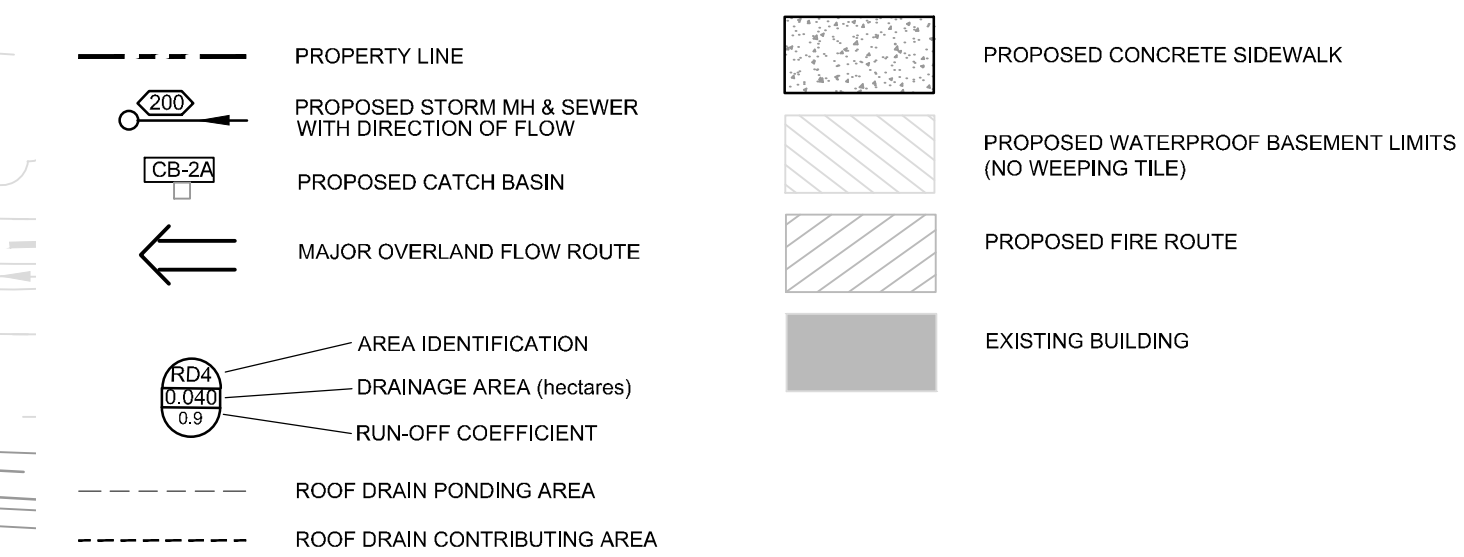




1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
3. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
4. BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR \$5,000,000.00. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED. (amount of liability insurance to be verified on a project by project basis)
5. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALL OWNCANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE CITY OF OTTAWA AND ENGINEER.
6. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
7. ALL ELEVATIONS ARE GEODETIC.
8. REFER TO GEOTECHNICAL REPORT (No. xxxxxx, DATED xxx xx, xxxx) PREPARED BY _____ FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS, AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
9. REFER TO ARCHITECTS' AND LANDSCAPE ARCHITECTS' DRAWINGS FOR BUILDING AND HARDSURFACE AREAS AND DIMENSIONS (project teams must review drawing to ensure that this is indicated on someone's plan)
10. REFER TO STORMWATER MANAGEMENT REPORT(R-xxxxx-xxx) PREPARED BY NOVATECH ENGINEERING CONSULTANTS LTD.
11. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).
12. PROVIDE LINE/PARKING PAINTING.
13. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES INDICATING ALL SERVICING AS-BUILT INFORMATION SHOWN ON THIS PLAN AS-BUILT INFORMATION MUST INCLUDE: PIPE MATERIAL, SIZES, LENGTHS, SLOPES, INVERT AND TIE ELEVATIONS, STRUCTURE LOCATIONS, VALVE AND HYDRANT LOCATIONS, TWM ELEVATIONS AND ANY ALIGNMENT CHANGES, ETC. (optional note; usage to be determined on a project by project basis)

1. SPECIFICATIONS:			
ITEM	SPEC. NO.	REFERENCE	
CATCHBASIN (600x600mm)	705.010	OPSD	
STORM / SANITARY MANHOLE (12000)	701.010	OPSD	
CS FRAME & COVER	400.020	OPSD	
STORM / SANITARY MH FRAME & COVER	401.010	OPSD	
SEWER TRENCH + BEDDING (GRANULAR A)			
COVER (GRANULAR A OR GRANULAR B TYPE I, WITH MAXIMUM PARTICLE SIZE=25mm)			
STORM SEWER	PVC DR 35		
SANITARY SEWER	PVC DR 35		
CATCHBASIN LEAD	PVC DR 35		
2. INSULATE ALL PIPES (SAN/STM) THAT HAVE LESS THAN 1.5m COVER WITH 50mmX1200mm HI-40 INSULATION. PROVIDE 150mm CLEARANCE BETWEEN PIPE AND INSULATION.			
3. SERVICES ARE TO BE CONSTRUCTED TO 1.0m FROM FACE OF BUILDING AT A MINIMUM SLOPE OF 1.0%.			
4. PIPE BEDDING, COVER AND BACKFILL ARE TO BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY. THE USE OF CLEAR CRUSHED STONE AS A BEDDING LAYER SHALL NOT BE PERMITTED.			
5. FLEXIBLE CONNECTIONS ARE REQUIRED FOR CONNECTING PIPES TO MANHOLES (FOR EXAMPLE KOR-N-SEAL, PSX: POSITIVE SEAL AND DURASEAL), THE CONCRETE GRADE FOR THE PIPE CAN BE ELIMINATED.			
6. THE OWNER SHALL REQUIRE THAT THE SITE SERVICING CONTRACTOR PERFORM FIELD TESTS FOR QUALITY CONTROL OF ALL SANITARY SEWERS. LEAKAGE TESTING SHALL BE COMPLETED IN ACCORDANCE WITH OPSR 410.017, 410.016, 410.017, 16.04 AND 407.07.24. DYE TESTING IS TO BE COMPLETED ON ALL SANITARY SERVICES TO CONFIRM PROPER CONNECTION TO THE SANITARY SEWER MAIN. THE FIELD TESTS SHALL BE PERFORMED IN THE PRESENCE OF A CERTIFIED PROFESSIONAL ENGINEER WHO SHALL SUBMIT A CERTIFIED COPY OF THE TEST RESULTS.			
7. STORM MANHOLES AND CBMHS ARE TO HAVE 300mm SUMPS UNLESS OTHERWISE INDICATED.			
8. CONTRACTOR TO TELEVIEW (CCTV) ALL PROPOSED SEWERS, 200mm OR GREATER PRIOR TO BASE COURSE ASPHALT. UPON COMPLETION OF CONTRACT, THE CONTRACTOR IS RESPONSIBLE TO FLUSH AND CLEAN ALL SEWERS & APPURTENANCES.			

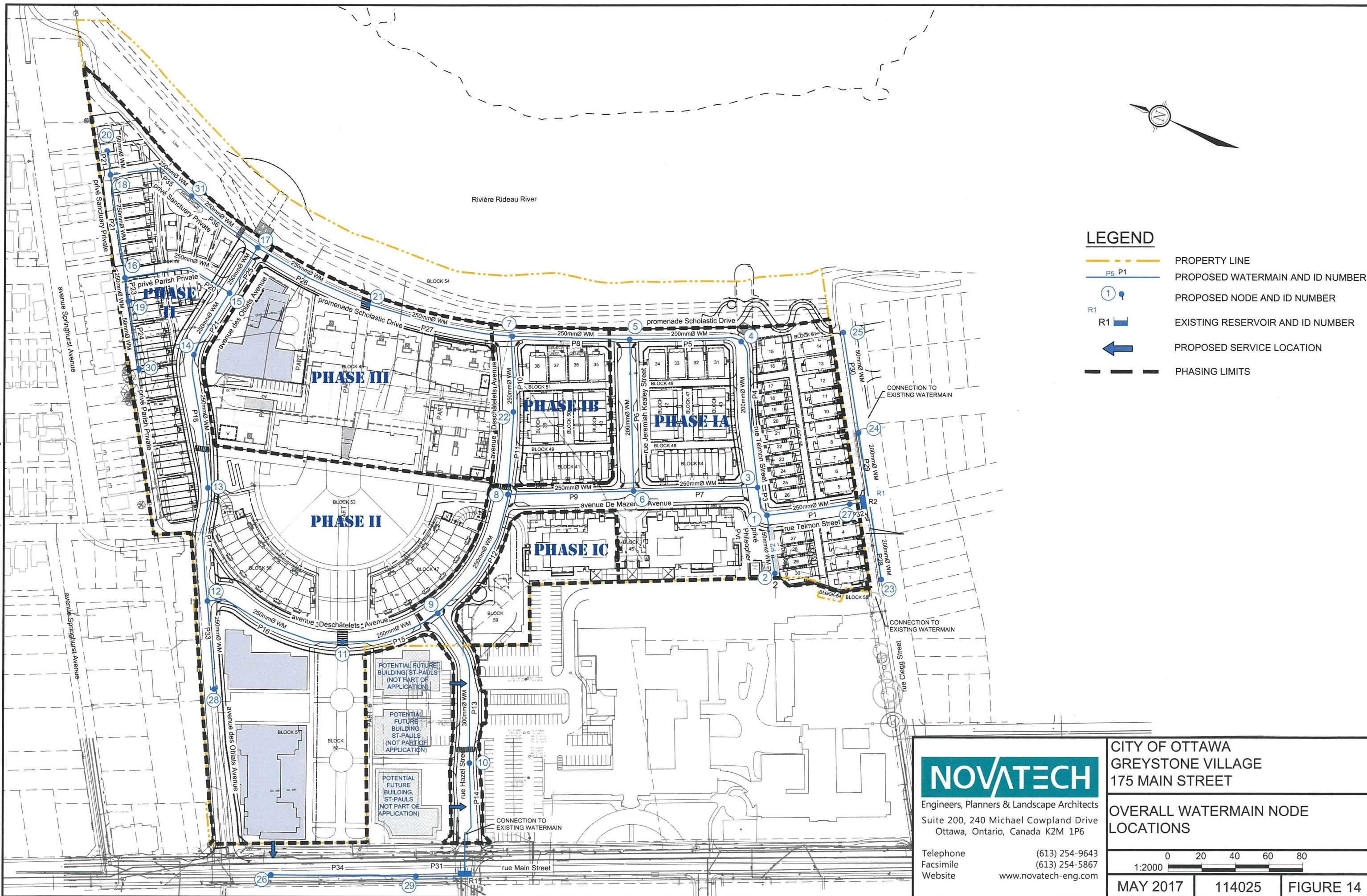
1.	SPECIFICATIONS:		
	ITEM	SPEC. No.	REFERENCE
	WATERMAIN TRENCHING	W17	CITY OF OTTAWA
	THERMAL INSULATION IN SHALLOW TRENCHES	W22	CITY OF OTTAWA
	WATERMAIN CROSSING BELOW SEWER	W25	CITY OF OTTAWA
	WATERMAIN	PVC DR 18	
2.	SUPPLY AND CONSTRUCT ALL WATERMAINS AND APPURTENANCES IN ACCORDANCE WITH THE CITY OF OTTAWA STANDARDS AND SPECIFICATIONS, EXCAVATION, INSTALLATION, BACKFILL AND RESTORATION OF ALL WATERMAINS BY THE CONTRACTOR. CONNECTIONS AND SHUT-OFFS AT THE MAIN AND CHLORINATION OF THE WATER SYSTEM SHALL BE PERFORMED BY CITY OFFICIALS.		
3.	WATERMAIN SHALL BE MINIMUM 2.4m DEPTH BELOW GRADE UNLESS OTHERWISE INDICATED.		
4.	PROVIDE MINIMUM 0.25m CLEARANCE BETWEEN OUTSIDE OF PIPES AT ALL CROSSINGS.		
5.	WATER SERVICE IS TO BE CONSTRUCTED TO WITHIN 1.0m OF FOUNDATION WALL AND CAPPED, UNLESS OTHERWISE INDICATED.		
6.	WATER DEMAND = TBD		

[illegible]

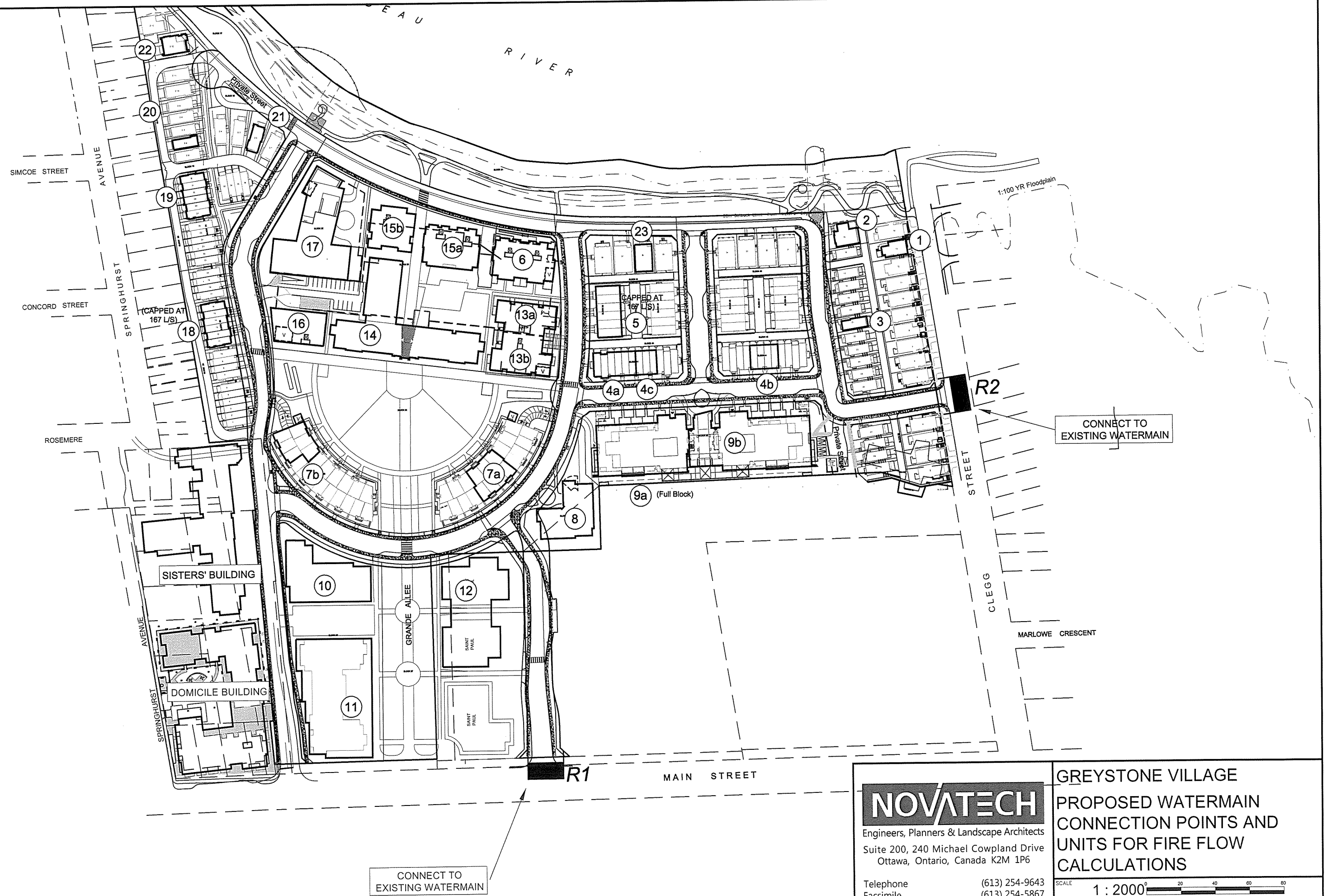


<p>NOTE: THE POSITION OF ALL POLE LINES, CONDUITS, WATERMANS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.</p>				SCALE		DESIGN	FOR REVIEW ONLY		<p>NOVATECH Engineers, Planners & Landscape Architects Suite 200, 240 Michael Cowpland Drive Ottawa, Ontario, Canada K2M 1P6 Telephone (613) 254-9643 Facsimile (613) 254-5867 Website www.novatech-eng.com</p>	LOCATION CITY OF OTTAWA GREYSTONE VILLAGE - DES CHATELETES	
				1:400		CHECKED JAG		DRAWING NAME		PROJECT NO.	
						DRAWN JGR		REV		120055A-0	
						CHECKED RJG		REV #			
	1. ISSUED WITH SERVICING MEMORANDUM			MAY 15/20	GJM	JAG		DRAWING NO.		120055A-STM	
	No. REVISION			DATE	BY	JGR					

M:\2014\114025\CAD\Design\Figures\Design Brief\2017-05-FIGS\FIG-5-SEWER-ALIGN.dwg, FIG-14-WM-NODE, May 31, 2017 - 8:08am, szorgel



M:\2014\114025\CAD\Design\Figures\Hydraulic\20160829-114025-Fireflow calcs.dwg, WM FIG 1 - Fireflow Calcs, May 11, 2017 - 3:43pm, szorgel



NOVATECH

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**GREYSTONE VILLAGE
PROPOSED WATERMAIN
CONNECTION POINTS AND
UNITS FOR FIRE FLOW
CALCULATIONS**

SCALE 1 : 2000

DATE MAY 2017 JOB 114025 FIGURE 1

Fire Flow Calculations - Deschatelets Unit

As per Fire Underwriter's Survey Guidelines

PROJECT: Greystone Village - 175 Main St

DATE: May 10, 2017

JOB#: 114025

DESCHATELETS UNIT #14 - 4 storeys

C Coefficient related to type of construction

[yes/no]

- | | | |
|---|-----|-----|
| ♦ Wood frame | | 1.5 |
| ♦ Ordinary construction | | 1 |
| ♦ Non-combustible construction | yes | 0.8 |
| ♦ Fire resistive construction (< 2 hrs) | | 0.7 |
| ♦ Fire resistive construction (> 2 hrs) | | 0.6 |
| ♦ Interpolation (Using FUS Tables) | | |

A Area of structure considered (m²)

8,500

<==>

91,493 ft²

(All floors excluding Basement)

F Required fire flow (L/min)

$$F = 220 C (A)^{0.5}$$

16,226 L/min

Occupancy hazard reduction of surcharge

[yes/no]

- | | | |
|-----------------------|-----|------|
| ♦ Non-combustible | | -25% |
| ♦ Limited combustible | yes | -15% |
| ♦ Combustible | | 0% |
| ♦ Free burning | | 15% |
| ♦ Rapid burning | | 25% |

13,792 L/min (1)

Sprinkler Reduction

- | | | | |
|--|-----|-----|------------------------|
| ♦ Non-combustible - Fire Resistive (3) | yes | 50% | <u>6,896 L/min</u> (2) |
|--|-----|-----|------------------------|

Exposure surcharge (cumulative (%))

[yes/no]

- | | | | |
|-------------|-----|-----|------------|
| 0 - 3 m | | 25% | |
| 3.1 - 10 m | yes | 20% | 3 side 60% |
| 10.1 - 20 m | | 15% | |
| 20.1 - 30 m | | 10% | |
| 30.1 - 45 m | | 5% | |

Cumulative Total 60%

8,275 L/min

Fire Wall Separation

- ♦ Number of Party Walls * 1000 L/min

(As per City of Ottawa Standard)

8,275 L/min (3)

REQUIRED FIRE FLOW [(1) - (2) + (3)]

(2,000 L/min < Fire Flow < 45,000 L/min)

or

15,172 L/min

or

252.86 L/s

3,340 IGPM

BY: Steve Zorgel

3.0 STORMWATER MANAGEMENT

3.1 Existing Conditions

Existing development consists of the Deschâtelets Building, plus the parking and loading areas on the north, south, and east sides of the building. The remainder of the site consists of vacant land with some mature trees within and around the periphery. The Rideau River Nature Trail runs along the eastern limit of the site. Access is provided from Main Street by Oblate Avenue and the Grande Allée.

Topography and Drainage

The site has an overall slope towards the Rideau River to the East. While the south and west portions of the site are relatively flat, there is a ridge in the northeast portion of the site where the existing ground elevation drops by approximately 5m. There is also a relatively steep vegetated slope adjacent to the Rideau River, and a berm along the southern portion of the site adjacent to Clegg Street.

Storm runoff from the majority of the site is conveyed overland towards the Rideau River. There is also an existing outlet at the back of the existing Deschâtelets building that outlet's along the bank of the Rideau River, which will be abandoned/removed and the flows directed to the new proposed outlet. The southernmost portion of the site drains overland onto Clegg Street. There is also some external overland drainage from St. Paul University to be included in the storm system. Refer to **Figure 4** – Existing Storm Drainage Area Plan for details.

3.2 SWM Criteria

A small portion of the site will be tributary to the existing storm system on Main Street. The majority of the site will outlet directly to the Rideau River. The stormwater management criteria used in the design of the Greystone Village are presented below. They were developed in consultation with the City of Ottawa and the Rideau Valley Conservation Authority.

3.2.1 Water Quality Control

- Provide an Enhanced level of water quality control, corresponding to a long-term TSS removal rate of 80%% for lands draining to the Rideau River
- No water quality treatment is required for areas tributary to the existing storm sewer on Main Street.

3.2.2 Quantity Control

- Quantity control is not required for sewers discharging directly to the Rideau River, provided the outlets are designed with suitable erosion protection measures.
- Areas tributary to the Main Street storm sewer are to be controlled to either:
 - the allowable release rate for the system (to be confirmed by City);
 - to pre-development flow rates.

3.2.3 Minor System (Storm Sewers)

- Storm sewers are to be designed using the Rational Method for a 1:5 year return period;

STM MH ID	Street	Obvert Elevation (m)	T/G Elevation (m)	HGL Elevation (m)	Stress Test HGL (m)	Sur-charge (m)	Clearance from T/G (m)	Minimum Required USF (m)
MH230	Philosopher Pvt.	60.15	63.44	60.63	60.87	0.48	2.81	60.93
MH238	-	59.04	62.56	58.86	58.93	0.00	3.70	59.16
MH242	-	57.00	61.68	58.40	58.52	1.40	3.28	58.70
MH246	-	60.22	64.28	60.69	60.92	0.47	3.59	60.99
MH248	Deschâtelets Ave.	62.23	64.77	62.16	62.20	0.00	2.61	62.46
MH250	Hazel St.	63.08	65.74	62.85	62.88	0.00	2.89	63.15
MH300	des Oblats Ave.	62.74	64.86	62.53	62.54	0.00	2.33	62.83
MH302	des Oblats Ave.	61.80	64.32	61.59	61.61	0.00	2.72	61.89
MH304	des Oblats Ave.	61.26	63.44	61.07	61.08	0.00	2.37	61.37
MH306	des Oblats Ave.	59.77	62.10	59.58	59.59	0.00	2.52	59.88
MH308	des Oblats Ave.	59.05	61.62	58.85	59.01	0.00	2.77	59.15
MH310	des Oblats Ave.	57.20	60.06	58.70	58.87	1.50	1.36	59.00
MH312	Parish Pvt.	61.96	64.19	61.78	61.78	0.00	2.41	62.08
MH314	Parish Pvt.	60.96	63.06	60.81	60.81	0.00	2.25	61.11
MH316	Parish Pvt.	57.51	60.20	59.12	59.27	1.61	1.08	59.42
MH318	Parish Pvt.	57.82	59.59	59.14	59.28	1.32	0.45	59.44
MH320	Parish Pvt.	57.34	59.97	58.97	59.11	1.64	1.00	59.27
MH322	Parish Pvt.	57.30	60.03	58.92	59.07	1.63	1.11	59.22
MH324	Scholastic Dr.	60.95	62.79	60.75	60.75	0.00	2.04	61.05
MH326	Scholastic Dr.	59.57	61.81	59.31	59.31	0.00	2.50	59.61
MH328	Scholastic Dr.	58.40	60.43	59.13	59.36	0.73	1.30	59.43
MH330	Sanctuary Pvt.	57.43	59.30	58.79	59.01	1.37	0.51	59.09
MH332	Sanctuary Pvt.	57.28	59.20	58.78	59.01	1.50	0.41	59.08
MH334	des Oblats Ave.	57.11	59.03	58.62	58.79	1.51	0.41	58.92
MH336	-	56.80	58.81	58.29	58.39	1.49	0.52	58.59
MH338	-	57.09	58.75	58.28	58.37	1.19	0.47	58.58
MH340	-	56.76	58.33	58.12	58.17	1.36	0.21	58.42

3.6 Release Rates for Future Development

The following section provides general guidelines for release rates for future development. Any changes to the proposed land use that significantly differ from the assumptions used in this analysis (land use, imperviousness, storage, etc.) should be identified and discussed with the City as part of the individual Site Plan submissions.

3.6.1 Flat Roof Buildings

Runoff from flat-roof buildings connecting to the storm sewer is to be controlled to a maximum release rate of 80 L/s/ha (equivalent to one drain per 250m² of roof area with a capacity of 2 L/s). This release rate would apply to any land use being proposed for these sites, including parking lots and also applies to roof areas draining to Main Street.

4.0 SANITARY SEWER SYSTEM

4.1 Proposed Sanitary Sewer System

It is proposed that the entirety of the development area will be serviced by 250mm gravity sewers, including a small portion on Clegg Street (in proximity to the outlet #1). The development area will ultimately outlet via two connections to the existing 1350mm Rideau River Interceptor trunk sewer that runs parallel to the Rideau River on the eastern portion of the site. Outlet #1 will connect east of Clegg Street and upstream of the existing manhole on the Rideau River Interceptor to an existing sewer using an offline proposed manhole and the existing 900mm combined sewer pipe. Outlet #2 will connect northeast of the existing building (175 Deschâtelets) and Oblats Avenue to an existing manhole using an offline proposed manhole. A portion of the existing sanitary sewer that currently services the existing building will be removed and replaced with 250mm gravity sewers that will connect to the proposed sanitary system. The buildings along Main Street will be serviced by the proposed 450mm dia. sanitary sewers (replacing existing 375/450mm dia. sanitary sewers) within Main Street. Refer to **Figure 10** – Overall Proposed Sanitary Alignment for details, **Figure 11** – Sanitary Outlet 1 Plan View and **Figure 12** – Proposed Sanitary Outlet 2 Plan View for details on the Phase 1A/1B and the Phase 2/3 connection to the existing trunk sewer.

4.2 Sanitary Design

The design flows were calculated for the development using estimated populations based on design plans and composition of the townhouses/condo buildings and in accordance with the City of Ottawa Sewer Design Guidelines using the following design criteria:

- Residential Average Sewage Flow = 350 L/capita/day
- Residential Peaking Factor = Harmon Equation
- Max Peaking Factor = 4.0
- Infiltration Allowance = 0.28 L/s/ha
- Population Density:
 - 3.4/unit (Singles)
 - 2.7/unit (Towns)
 - 2.1/unit (Apartment)
 - 2.0/unit (School Residence)
 - 1.4/unit (Retirement Residence)

The minimum size for sanitary sewers on the subject site is a 250mm diameter PVC pipe at a slope of 0.24%, which provides full-flow capacity of 30.39 L/s and will achieve the minimum cleansing velocity of 0.60 m/s.

Using the above criteria, the theoretical peak design flow from phase 1A and 1B (Outlet 1) was determined to be 24.03 L/s. The theoretical peak design flow from phase 2 and 3 (Outlet 2) was determined to be 10.72 L/s. The peak sanitary flows are summarized below in **Table 4.1**. Refer to **Appendix B** for Sanitary Design Sheets and to the Sanitary Drainage Areas Plans (Drawings **114025-SAN1, SAN2 and SAN1-B**) for additional information.

SANITARY SEWER DESIGN SHEET
Greystone Village - 175 Main Street - Phase 2 and 3 (Outlet 2)
Developer: Greystone Village Inc.



PROJECT # : 114025
DESIGNED BY : SZ
CHECKED BY : JAG
DATE PREPARED : 18-Nov-16
DATE REVISED: 15-Mar-17
DATE REVISED: 26-May-17

LOCATION				INDIVIDUAL						CUMULATIVE		PEAK FACTOR M	POPULATION FLOW Q(p) (L/s)	PEAK EXTRAN. FLOW Q(i) (L/s)	PEAK DESIGN FLOW Q(d) (L/s)	PROPOSED SEWER							
STREET	FROM MH	TO MH	Area	Single Units	Townhouse Units	Condo Units	Retirement Home Units	Population (in 1000's)	AREA (ha.)	Population (in 1000's)	AREA (ha.)					LENGTH (m)	PIPE SIZE (mm)	PIPE ID (mm)	TYPE OF PIPE	GRADE %	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	Qpeak/ Qcap
OBLATS AVENUE	301A	301	B1					0.000	0.04	0.000	0.040	4.0	0.00	0.01	0.01	18.5	250	254.00	DR 35	5.25	142.1	2.81	0%
OBLATS AVENUE	301	303	B2		3			0.008	0.12	0.008	0.160	4.0	0.13	0.04	0.18	27.9	250	254.00	DR 35	2.30	94.1	1.86	0%
OBLATS AVENUE	303	305	B3		7			0.019	0.15	0.027	0.310	4.0	0.44	0.09	0.52	32.4	250	254.00	DR 35	3.33	113.2	2.23	0%
OBLATS AVENUE	305	307	B4		10	19		0.067	0.33	0.094	0.640	4.0	1.52	0.18	1.70	44.9	250	254.00	DR 35	3.34	113.4	2.24	2%
OBLATS AVENUE	307	309	B5					0.000	0.03	0.094	0.670	4.0	1.52	0.19	1.71	14.8	250	254.00	DR 35	4.99	138.6	2.73	1%
OBLATS AVENUE	309	311	B6					0.000	0.09	0.094	0.760	4.0	1.52	0.21	1.73	36.7	250	254.00	DR 35	3.81	121.1	2.39	1%
PARISH PRIVATE	313	315	B7		12			0.032	0.14	0.032	0.140	4.0	0.53	0.04	0.56	56.5	250	254.00	DR 35	3.24	111.7	2.20	1%
SANCTUARY PRIVATE	317	315	B8	9				0.031	0.33	0.031	0.330	4.0	0.50	0.09	0.59	61.3	250	254.00	DR 35	0.65	50.0	0.99	1%
SANCTUARY PRIVATE	315	319	B9	1	2			0.009	0.15	0.072	0.620	4.0	1.16	0.17	1.34	36.3	250	254.00	DR 35	0.41	39.7	0.78	3%
SANCTUARY PRIVATE	319	321	B10	1	2			0.009	0.06	0.081	0.680	4.0	1.31	0.19	1.50	8.1	250	254.00	DR 35	0.50	43.9	0.87	3%
SANCTUARY PRIVATE	321	311	B11	2				0.007	0.09	0.087	0.770	4.0	1.42	0.22	1.63	22.4	250	254.00	DR 35	0.40	39.2	0.77	4%
OBLATS AVENUE	311	329	B12				141	0.197	0.41	0.379	1.940	4.0	6.14	0.54	6.68	32.9	250	254.00	DR 35	0.42	40.2	0.79	17%
SCHOLASTIC DRIVE	323	325	B13			30	85	0.182	0.84	0.182	0.840	4.0	2.95	0.24	3.18	37.8	250	254.00	DR 35	3.87	122.0	2.41	3%
SCHOLASTIC DRIVE	325	327	B14			30		0.063	0.05	0.245	0.890	4.0	3.97	0.25	4.22	35.3	250	254.00	DR 35	3.32	113.0	2.23	4%
SCHOLASTIC DRIVE	327	329	B15					0.000	0.04	0.245	0.930	4.0	3.97	0.26	4.23	36.7	250	254.00	DR 35	3.88	122.2	2.41	3%
OUTLET	329	331								0.624	2.870	3.9	9.91	0.80	10.72	41.0	250	254.00	DR 35	0.41	39.7	0.78	27%
OUTLET	331	EXMH								0.624	2.870	3.9	9.91	0.80	10.72	5.3	250	254.00	DR 35	0.38	38.2	0.75	28%

Notes:

1. $Q(d) = Q(p) + Q(i)$
2. $Q(i) = 0.28 \text{ L/sec/ha}$
3. $Q(p) = (P \times q \times M / 86,400)$

Definitions:

$Q(d)$ = Design Flow (L/sec)
 $Q(p)$ = Population Flow (L/sec)
 $Q(i)$ = Extraneous Flow (L/sec)

Population = 75 Persons/acre
Institutional Peaking factor = 1.5

P = Population (3.4 persons/single unit, 2.7 persons/townhouse, 2.1 persons/apartment, 1.4 persons/retirement residence)
q = Average per capita flow = 350 L/cap/day - Residential
q = Average per gross ha. flow = 35000 L/gross ha/day - Light industrial
q = Average per gross ha. flow = 50000 L/gross ha/day - Commercial/Mixed use
M = Harmon Formula (maximum of 4.0)
Min pipe size 250mm @ min. slope 0.24%

Development Servicing Study Checklist

4.1 General Content	Addressed (Y/N/NA)	Section	Comments
Executive Summary (for larger reports only).	NA		
Date and revision number of the report.	Y	p.1	
Location map and plan showing municipal address, boundary, and layout of proposed development.	Y	Dwgs	GP, STM
Plan showing the site and location of all existing services.	Y	Dwg	GP
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.	Y	Intro	
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 defensible design criteria.	Y	Memo	All sections
Statement of objectives and servicing criteria.	Y	Memo	
Identification of existing and proposed infrastructure available in the immediate area.	Y	Dwg	GP
Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).	NA		
Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighboring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	Y	Memo	

Development Servicing Study Checklist

4.1 General Content	Addressed (Y/N/NA)	Section	Comments
Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	NA		
Proposed phasing of the development, if applicable.	NA		
Reference to geotechnical studies and recommendations concerning servicing.	Y	Memo	
All preliminary and formal site plan submissions should have the following information:			
Metric scale	Y		All Drawings
North arrow (including construction North)	Y		All Drawings
Key plan	Y		All Drawings
Name and contact information of applicant and property owner	Y		Drawings/Design Brief
Property limits including bearings and dimensions	Y		Design Brief
Existing and proposed structures and parking areas	Y		All Drawings
Easements, road widening and rights-of-way	Y		All Drawings
Adjacent street names	Y		All Drawings

Development Servicing Study Checklist

4.2 Water	Addressed (Y/N/NA)	Section	Comments
Confirm consistency with Master Servicing Study, if available.	Y	Memo	
Availability of public infrastructure to service proposed development.	Y	Memo	
Identification of system constraints.	Y	Memo	
Identify boundary conditions.	Y	Memo	And Appendix
Confirmation of adequate domestic supply and pressure.	Y	Memo	And Appendix
Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.	Y	Memo	And Appendix
Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.	Y	Memo	And Appendix
Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design.	Y	Memo	
Address reliability requirements such as appropriate location of shut-off valves.	Y		GP
Check on the necessity of a pressure zone boundary modification.	NA		
Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range.	Y	Memo	And Appendix
Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.	Y	Memo	
Description of off-site required feeder mains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.	NA		
Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Y	Memo	
Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	Y		Appendix

Development Servicing Study Checklist

4.3 Wastewater	Addressed (Y/N/NA)	Section	Comments
Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).	Y	Memo	
Confirm consistency with Master Servicing Study and/or justifications for deviations.	Y	Memo	
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.	Y	Memo	
Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Y	Memo	
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)	Y	Memo	
Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	NA		
Description of proposed sewer network including sewers, pumping stations, and forcemains.	Y	Memo	
Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).	NA		
Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	NA		
Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	NA		
Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	NA		
Special considerations such as contamination, corrosive environment etc.	NA		

Development Servicing Study Checklist

4.4 Stormwater	Addressed (Y/N/NA)	Section	Comments
Description of drainage outlets and downstream constraints including legality of outlet (i.e. municipal drain, right-of-way, watercourse, or private property).	Y	Memo	
Analysis of the available capacity in existing public infrastructure.	Y	Memo	Appendix
A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns and proposed drainage patterns.	Y		GR, STM
Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.	Y	Memo	
Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Y	Memo	
Description of stormwater management concept with facility locations and descriptions with references and supporting information.	Y	Memo	
Set-back from private sewage disposal systems.	NA		
Watercourse and hazard lands setbacks.	Y		
Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	Y	Memo	
Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	Y	Memo	
Storage requirements (complete with calcs) and conveyance capacity for 5 yr and 100 yr events.	Y		Appendix
Identification of watercourse within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	Y	Memo	
Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.	Y		Appendix
Any proposed diversion of drainage catchment areas from one outlet to another.	NA		

Development Servicing Study Checklist

Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and SWM facilities.	Y	Memo	And Appendix
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.	Y	Memo	And Appendix

4.4 Stormwater	Addressed (Y/N/NA)	Section	Comments
Identification of municipal drains and related approval requirements.	Y	Memo	
Description of how the conveyance and storage capacity will be achieved for the development.	Y	Memo	
100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	Y		Appendix
Inclusion of hydraulic analysis including HGL elevations.	Y		Appendix
Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Y	Memo	
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.	Y		
Identification of fill constraints related to floodplain and geotechnical investigation.	NA		

Development Servicing Study Checklist

4.5 Approval and Permit Requirements	Addressed (Y/N/NA)	Section	Comments
Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement Act. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act.	Y	Memo	
Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.	NA		
Changes to Municipal Drains.	NA		
Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	NA		

4.6 Conclusion	Addressed (Y/N/NA)	Section	Comments
Clearly stated conclusions and recommendations.	Y	Memo	
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.	NA		
All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario.	Y	Memo	