patersongroup **memorandum**
consulting engineers

re: **Site Servicing Plan Review**
Proposed Multi-Storey Buildings
Greystone Village - Phase 3 - Scholastic Drive - Ottawa
to: Regional Group - **Mr. Evan Garfinkel** - egarfinkel@regionalgroup.com
date: June 6, 2022
file: PG5383-MEMO.03 Revision 1

Further to your request and authorization, Paterson Group (Paterson) prepared the current memorandum to document our review of the site servicing plans, and to provide associated recommendations from a geotechnical perspective for the aforementioned project. The following memorandum should be read in conjunction with the current Geotechnical Investigation Report (Paterson Group Report PG5383-1 Revision 1, dated March 9, 2022).

Background Information

Based on the above noted geotechnical investigation, the subsurface profile across the subject site consists of topsoil underlain by fill, followed by a hard to very stiff grey/brown silty clay deposit which transitions to a stiff grey silty clay below approximate depths of 2.5 to 4.5 m. The silty clay is further underlain by a silty sand.

Site Servicing Plan Review

Paterson reviewed the following drawings prepared by Novatech for the aforementioned development as part of this review:

- ❒ General Plan of Servicing - Greystone Village Phase 3 - Project No. 114025-PH3 - Drawing No. 114025-GP(PH3) - Revision 8, dated June 3, 2022.

Based on our review of the site servicing plan, insufficient frost protection has been provided to sections of the storm and/or sanitary services which are noted to tie into the existing services located along Scholastic Drive and Deschatelets Avenue.

Specifically, the storm services located at the eastern portion of the site, tying into the services along Scholastic Drive, as well as the storm and sanitary services (invert elevation = 61.42 m) located within the southeast corner of the site and tying into the existing services along Deschatelets Avenue, will be founded within the frost zone (i.e. approximately 2.1 m below the finished grade). Refer to Figure 1, attached to the current memorandum, which illustrates these approximate locations. Frost protection of the site servicing is recommended where insufficient frost cover has been provided.

Geotechnical Recommendations

Any portion of the services installed at a depth of 2.1 m below finished grade or deeper is considered to have sufficient soil cover for frost protection. However, based on our review, the aforementioned sections of site servicing and their subgrades are anticipated to be founded within the frost zone. Where insufficient soil cover is present above the obvert of the pipe, the following frost protection criteria should be followed:

Table 1 - Rigid Insulation Recommendations for Sewer Pipes with Reduced Soil Cover

Thermal Condition	Soil Cover Provided (mm)	Insulation Dimensions	
		Thickness (mm)	**Extension (mm)**
Unheated	1200 to 1500	50	Extend 900 mm horizontally beyond edge face of the sewer
	1500 to 1800	25	Extend 600 mm horizontally beyond edge face of the sewer
	1800 to <2100	25	Extend 300 mm horizontally beyond edge face of the sewer

Notes: All designs are based on a freezing index of 1000°C-days

Table 2 - Rigid Insulation Recommendations for Water Service Pipes with Reduced Soil Cover

Water Pipe	Soil Cover Provided (mm)	Insulation Dimensions	
		Thickness (mm)	**Extension (mm)**
Watermain	2000 to <2100	50	Boxed or Extend 500 mm horizontally beyond edge face of the water pipe
		Pipe Insulation Details	
Water Service Laterals	1800 to <2100	150 mm thick Foamular XPS Pipe Insulation	

Notes: All designs are based on a freezing index of 1000°C-days

All rigid insulation should consist of either Dow Chemical High-Load 40 (HI-40), Styro Rail SR.P400, or equivalent approved by Paterson. The placement of all insulation within the service trenches must be reviewed and approved by Paterson personnel at the time of construction.

Further, to reduce long-term lowering of the groundwater level at, and in the vicinity of, the subject site, clay seals are recommended to be provided in the servicing trenches near the property boundaries.

The clay seals should be at least 1.5 m long (in the trench direction) and extend from trench wall to trench wall. Generally, the seals should extend from the frost line and fully penetrate the bedding, subbedding, and cover material. The barriers should consist of relatively dry and compactable brown silty clay placed in maximum 225 mm thick loose layers compacted to a minimum of 95% of the materials standard Proctor maximum dry density. The clay seals should be placed at the site boundaries and at strategic locations at no more than 50 m intervals in the service trenches.

We trust that this information satisfies your immediate requirements.

Best Regards,

Paterson Group Inc.

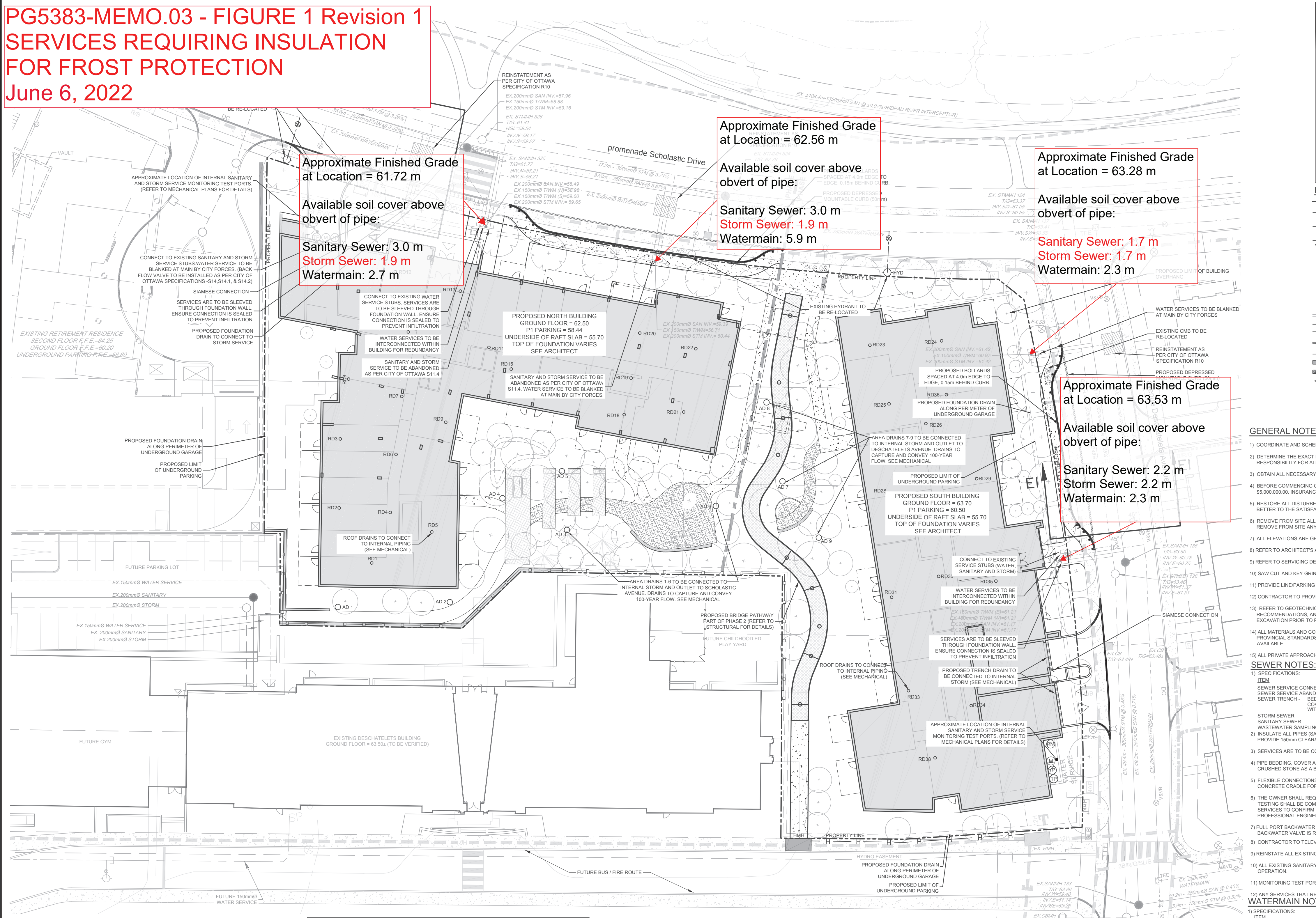
Kevin A. Pickard, EIT

LICENSED PROFESSIONAL ENGINEER
June 6, 2022
S. S. DENNIS
100519516
Scott Dennis
PROVINCE OF ONTARIO

Scott Dennis

Scott S. Dennis, P.Eng.

PG5383-MEMO.03 - FIGURE 1 Revision 1
SERVICES REQUIRING INSULATION FOR FROST PROTECTION
June 6, 2022



Approximate Finished Grade at Location = 61.72 m

Available soil cover above obvert of pipe:

Sanitary Sewer: 3.0 m
Storm Sewer: 1.9 m
Watermain: 2.7 m

Approximate Finished Grade at Location = 62.56 m

Available soil cover above obvert of pipe:

Sanitary Sewer: 3.0 m
Storm Sewer: 1.9 m
Watermain: 5.9 m

Approximate Finished Grade at Location = 63.28 m

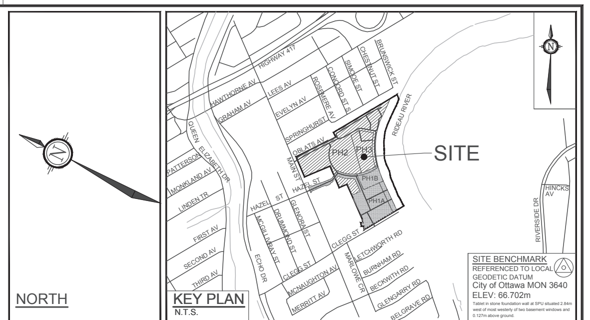
Available soil cover above obvert of pipe:

Sanitary Sewer: 1.7 m
Storm Sewer: 1.7 m
Watermain: 2.3 m

Approximate Finished Grade at Location = 63.53 m

Available soil cover above obvert of pipe:

Sanitary Sewer: 2.2 m
Storm Sewer: 2.2 m
Watermain: 2.3 m



SITE BENCHMARK
REFERENCED TO LOCAL GEODETIC DATUM
City of Ottawa MON 3640
ELEV: 66.702m
Tablet in stone foundation wall at SPU situated 2.84m west of most westerly of two basement windows and 0.127m above ground.

LEGEND

SITE BOUNDARY	EXISTING ADJACENT PROPERTY LINE
PROPOSED STORM SEWER AND DIRECTION OF FLOW	STM MH EXISTING STORM MANHOLE AND SEWER
PROPOSED SANITARY SEWER AND DIRECTION OF FLOW	SAN MH EXISTING SANITARY MANHOLE AND SEWER
PROPOSED WATERMAIN	EXISTING WATERMAIN
V&VB PROPOSED VALVE AND VALVE BOX	VVB EXISTING VALVE AND VALE BOX
Ⓜ PROPOSED WATER METER LOCATION	EXISTING FIRE HYDRANT
RM PROPOSED REMOTE METER LOCATION	EX.CB EXISTING CATCHBASIN
TP PROPOSED SANITARY / STORM MONITORING TEST PORT	T/G EXISTING TOP OF GRATE
TD PROPOSED TRENCH DRAIN	EX UP EXISTING UTILITY POLE C/W GUY WIRES
PROPOSED SIAMESE CONNECTION	EXISTING STREET LIGHT
AD 1 PROPOSED AREA DRAIN	NAP EXISTING ROGERS NETWORK ACCESS POINT
PROPOSED LIMITS OF UNDERGROUND PARKING	GLB EXISTING BELL GRADE LEVEL BOX
PROPOSED BARRIER CURB	EXISTING UNDERGROUND CABLE (BELL, ROGERS,GAS, STREETLIGHT)
DC PROPOSED DEPRESSED CURB	EXISTING UNDERGROUND HYDRO
PROPOSED DEPRESSED MOUNTABLE CURB (50mm)	CMB EXISTING COMMUNITY MAILBOX
H PROPOSED UNDERGROUND HYDRO	EX.HMH EXISTING HYDRO MANHOLE
PROPOSED RETAINING WALL	
PROPOSED RETAINING WALL AND ACOUSTIC FENCE	HMH PROPOSED HYDRO MANHOLE
PROPOSED ACOUSTIC FENCE	
PROPOSED LIMITS OF CONCRETE	EXISTING LIMITS OF CONCRETE
PROPOSED LIMITS OF STONEDUST PAVING	PROPOSED TREES / SHRUBS
PROPOSED METAL GRATE / FOOTBRIDGE	

GENERAL NOTES:

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.

5) RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES 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 ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARDSURFACE AREAS AND DIMENSIONS.

9) REFER TO SERVICING DESIGN BRIEF PREPARED BY NOVATECH ENGINEERING CONSULTANTS LTD.

10) SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).

11) PROVIDE LINE/PARKING PAINTING.

12) CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GRADING PLAN INDICATING THE AS-BUILT ELEVATION OF EVERY DESIGN GRADE SHOWN ON THIS PLAN.

13) REFER TO GEOTECHNICAL REPORT (PG5383-1, DATED AUGUST 11, 2020) PREPARED BY PATERSON GROUP 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.

14) ALL MATERIALS AND CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STANDARDS AND SPECIFICATIONS AND ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS. ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS WILL APPLY WHERE NO CITY STANDARDS ARE AVAILABLE.

15) ALL PRIVATE APPROACHES MUST BE CONSTRUCTED AS PER CITY SPECIFICATION SC13.

SEWER NOTES:

1) SPECIFICATIONS:

ITEM		SPEC. No.	REFERENCE
SEWER SERVICE CONNECTION - RIGID PIPE		S11, S11.1	CITY OF OTTAWA
SEWER SERVICE ABANDONMENT		S11.4	CITY OF OTTAWA
SEWER TRENCH -	BEDDING (GRANULAR A)	S6, S7, W17	CITY OF OTTAWA / OPSD
	COVER (GRANULAR A OR GRANULAR B TYPE I, WITH MAXIMUM PARTICLE SIZE=25mm)	S6, S7, W17	CITY OF OTTAWA / OPSD
STORM SEWER	PVC DR 35		
SANITARY SEWER	PVC DR 35		
WASTEWATER SAMPLING/INSPECTION CHAMBER		S18.1	CITY OF OTTAWA

2) INSULATE ALL PIPES (SAN/STM) THAT HAVE LESS THAN 2.0m COVER FROM STORM AND 2.5m FOR SANITARY SEWER 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 CRADLE 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 OPSS 410.07.16, 410.07.16.04 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) FULL PORT BACKWATER VALVES ARE REQUIRED ON THE SANITARY SERVICES. INSTALLED AS PER THE MANUFACTURERS RECOMMENDATIONS AND A BACKWATER VALVE IS REQUIRED ON THE STORM SERVICES / FOUNDATION DRAINS FOR EACH BUILDING; INSTALLED AS PER STD. DWG S14.

8) CONTRACTOR TO TELEVISE (CCTV) ALL PROPOSED SEWERS/LATERALS.

9) REINSTATE ALL EXISTING PAVEMENT, CURB AND BOULEVARDS AS PER CITY OF OTTAWA R10.

10) ALL EXISTING SANITARY AND STORM SERVICES ARE TO BE CAPPED AT THE PROPERTY LINE TO THE SATISFACTION OF THE CITY OF OTTAWA'S SEWER OPERATION.

11) MONITORING TEST PORTS FOR BUILDING SERVICES TO BE INSTALLED IN PARKING GARAGE.

12) ANY SERVICES THAT REQUIRE ENTRY TO THE BUILDING THROUGH A FOUNDATION WALL ARE TO BE SLEEVED AND SEALED TO PREVENT INFILTRATION

WATERMAIN NOTES:

1) SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
WATERMAIN TRENCHING	W17	CITY OF OTTAWA
THERMAL INSULATION IN SHALLOW TRENCHES	W22	CITY OF OTTAWA
VALVE BOX ASSEMBLY	W24	CITY OF OTTAWA
CONNECTION DETAIL FROM EXISTING TO NEW WM	W25.1	CITY OF OTTAWA
WATERMAIN CROSSING BELOW SEWER	W25	CITY OF OTTAWA
WATERMAIN CROSSING OVER SEWER	W25.2	CITY OF OTTAWA
WATERMAIN (150mmØ)	PVC DR 18	
WATERMAIN (50mmØ)	TYPE 'K' COPPER	
THERMAL INSULATED AT OPEN STRUCTURE	W23	CITY OF OTTAWA
WATER SERVICE INSTALATION AT SEWER CROSSING.	W38	CITY OF OTTAWA

2) SUPPLY AND CONSTRUCT ALL WATERMAINS AND APPURTENANCES IN ACCORDANCE WITH THE CITY OF OTTAWA STANDARD 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. OTHERWISE THERMAL INSULATION IS REQUIRED AS PER STD. DWG W21,W22, AND W23.

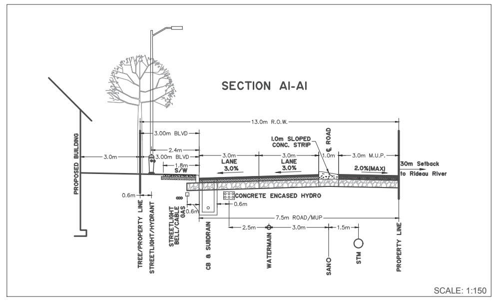
4) PROVIDE MINIMUM 0.50m CLEARANCE BETWEEN OUTSIDE OF PIPES AT ALL CROSSINGS WHEN WATERMAIN IS BELOW AND MINIMUM 0.25m CLEARANCE WHEN WATERMAIN IS ABOVE.

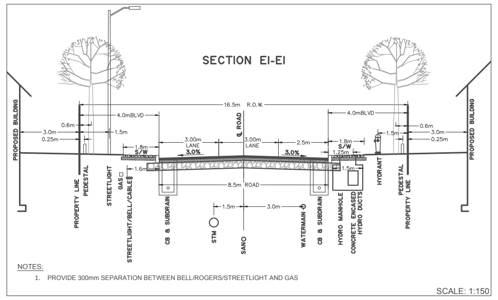
5) WATER SERVICE IS TO BE CONSTRUCTED TO WITHIN 1m OF FOUNDATION WALL AND CAPPED, UNLESS OTHERWISE INDICATED.

6) ALL EXISTING WATER SERVICES TO BE BLANKED AT MAIN BY CITY FORCES. EXCAVATION AND REINSTATEMENT BY CONTRACTOR.

7) VALVES TO BE OPERATED BY CITY OF OTTAWA STAFF ONLY. NO CONNECTION TO EXISTING WATER NETWORK SHALL BE COMPLETED UNTIL A WATER PERMIT IS OBTAINED FROM THE CITY OF OTTAWA (CoO). CoA FORCES TO COMPLETE WATERMAIN CONNECTIONS. EXCAVATION, BACKFILLING AND REINSTATEMENT TO BE COMPLETED BY CONTRACTOR

8) WATERMAINS TO BE INTERCONNECTED FOR REDUNDANCY.





NOTES:
1. PROVIDE 300mm SEPARATION BETWEEN BELL/ROGERS/STREETLIGHT AND GAS

PAVEMENT STRUCTURE DETAILS:

LOCAL ROADWAYS

- 40mm Superpave 12.5mm PG 58-34
- 50mm Superpave 19.0mm PG 58-34
- 150mm GRANULAR 'A' BASE
- 375mm GRANULAR 'B' TYPE II SUBBASE
- OPSS SELECT SUBGRADE MATERIAL (SSM)

COLLECTOR ROADWAYS / BUS LOOP

- 50mm Superpave 12.5mm PG58-34
- 60mm Superpave 19.0mm PG 58-34
- 150mm GRANULAR 'A' BASE
- 450mm GRANULAR 'B' TYPE II SUBBASE
- OPSS SELECT SUBGRADE MATERIAL (SSM)

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

PRELIMINARY
NOT FOR
CONSTRUCTION

No.	REVISION	DATE	BY
8.	REVISED AS PER CITY OF OTTAWA COMMENTS	JUN 3/22	SAZ
7.	ISSUED FOR COORDINATION	MAY 24/22	SAZ
6.	ISSUED FOR COORDINATION	MAR 4/22	SAZ
5.	ISSUED WITH SITE PLAN APPLICATION	JUL 22/21	JAG
4.	ISSUED FOR INFORMATION	MAR 19/21	JAG
3.	RE-ISSUED FOR COORDINATION	FEB 17/21	JAG
2.	ISSUED FOR COORDINATION	DEC 4/20	JAG
1.	ISSUED FOR DISCUSSION PURPOSES	DEC 2/20	JAG

SCALE
1:250

1:250
0 2 4 6 8 10

DESIGN	SAZ
CHECKED	MSP
DRAWN	MTM
CHECKED	SAZ
APPROVED	MSP

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
S.A.N. ZORGEL
100191487
June 3/22
PROVINCE OF ONTARIO

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LOCATION
CITY OF OTTAWA
GREYSTONE VILLAGE PHASE 3

DRAWING NAME
GENERAL PLAN OF SERVICING

PROJECT No.
114025-PH3

REV
REV # 8

DRAWING No.
114025-GP(PH3)

PLANB1.DWG - 1000mmx707mm

D07-12-21-0111

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