PATERSON GROUP

memorandum

re: **Grading and Site Servicing Plans Review**
Proposed Church
3555 Borrisokane Road, Ottawa, Ontario
to: Fotenn Consultants Inc. – **Mr. Nico Church** – church@fotenn.com
to: Fotenn Consultants Inc. – **Mr. Thomas Freeman** – freeman@fotenn.com
date: February 22, 2024
file: PG6842-MEMO.02 Revision 1

Further to your request and authorization, Paterson Group (Paterson) prepared the current memorandum to provide a grading and site servicing plans review for the proposed church at the aforementioned site. The following memorandum should be read in conjunction with Paterson Report PG6842-2 dated November 3, 2023.

1.0 Grading Plan Review

Paterson reviewed the following grading plan prepared by Pearson Engineering for the aforementioned development:

- ❑ Site Grading Plan - Project No. 22099 – Drawing No. SG-1 - Revision 2 dated February 12, 2024.

Paterson has reviewed the subsurface conditions within the footprint(s) of the proposed buildings. Based on our review, **a permissible grade raise of 1.0 m** is recommended for finished grading within 6 m of the proposed building footprint. **A permissible grade raise of 1.5 m** can be used only for the grading of parking areas, access roads, and landscaping areas.

Based on our review of the above-noted drawing, the proposed grading was found to be within the permissible grade raise of 1.5 m for the proposed parking areas, access roads, and landscaping areas. However, based on the finished floor elevations and proposed grade raise around the building, lightweight fill (LWF) should be placed below the middle portion of the proposed building footprint with a minimum thickness of 600 mm as shown in Figure 2 attached to the current memorandum. In addition, The LWF shall extend 6m beyond the face of the building as presented area in Figure 2.

Reference should be made to Figure 1 - EPS Block Installation Recommendations and to Figure 3 - Marked-Up Grading Plan Indicating the Extent of LWF. It shall be noted that the LWF shall not extend vertically below the USF. The LWF should consist of EPS (expanded polystyrene) geofoam blocks, which allow for raising the grade without adding a significant load to the underlying soils. For this application, EPS type 15 should be used.

2.0 Site Servicing Plan Review

Paterson reviewed the following site servicing prepared by Pearson Engineering for the aforementioned development:

- ❑ Site Servicing Plan - Project No. 22099 – Drawing No. SS-1 - Revision 2 dated February 12, 2024.

Based on our review of the above-noted site service plans, it should be noted that all services will be constructed outside the lateral zones of the proposed footings of the building and are considered to be acceptable from a geotechnical perspective.

Further, it should be noted that all watermain pipes have been provided with sufficient soil cover at the subject site for the frost protection. However, insufficient frost protection has been provided for the majority of the proposed storm and sanitary sewer pipes throughout the subject site. The proposed storm and sanitary sewer pipes are located within the frost zone, approximately 2.1 m below the finished grade. In the following section, frost protection of the site servicing is recommended where insufficient frost cover has been provided. Reference should be made to Figure 4 - Marked-Up Site Servicing Plan indicating where insufficient frost cover has been provided, attached to the current memorandum.

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. Where insufficient soil cover is present above the invert of storm and sanitary sewer pipes, the following frost protection criteria should be followed:

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

Thermal Condition	Soil Cover Provided (mm)	Insulation Dimensions	
		Thickness (mm)	Extension (mm)
Unheated	600 to 900	125	Extend 1200 mm horizontally beyond edge face of the pipe
	900 to 1200	100	Extend 1200 mm horizontally beyond edge face of the pipe
	1200 to 1500	75	Extend 900 mm horizontally beyond edge face of the pipe
	1500 to 1800	50	Extend 600 mm horizontally beyond edge face of the pipe
	1800 to <2100	25	Extend 300 mm horizontally beyond edge face of the pipe
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. Reference should be made to Figure 2 - Typical Frost Insulation Detail, attached to this memorandum.

We trust that this information satisfies your requirements.

Best Regards,

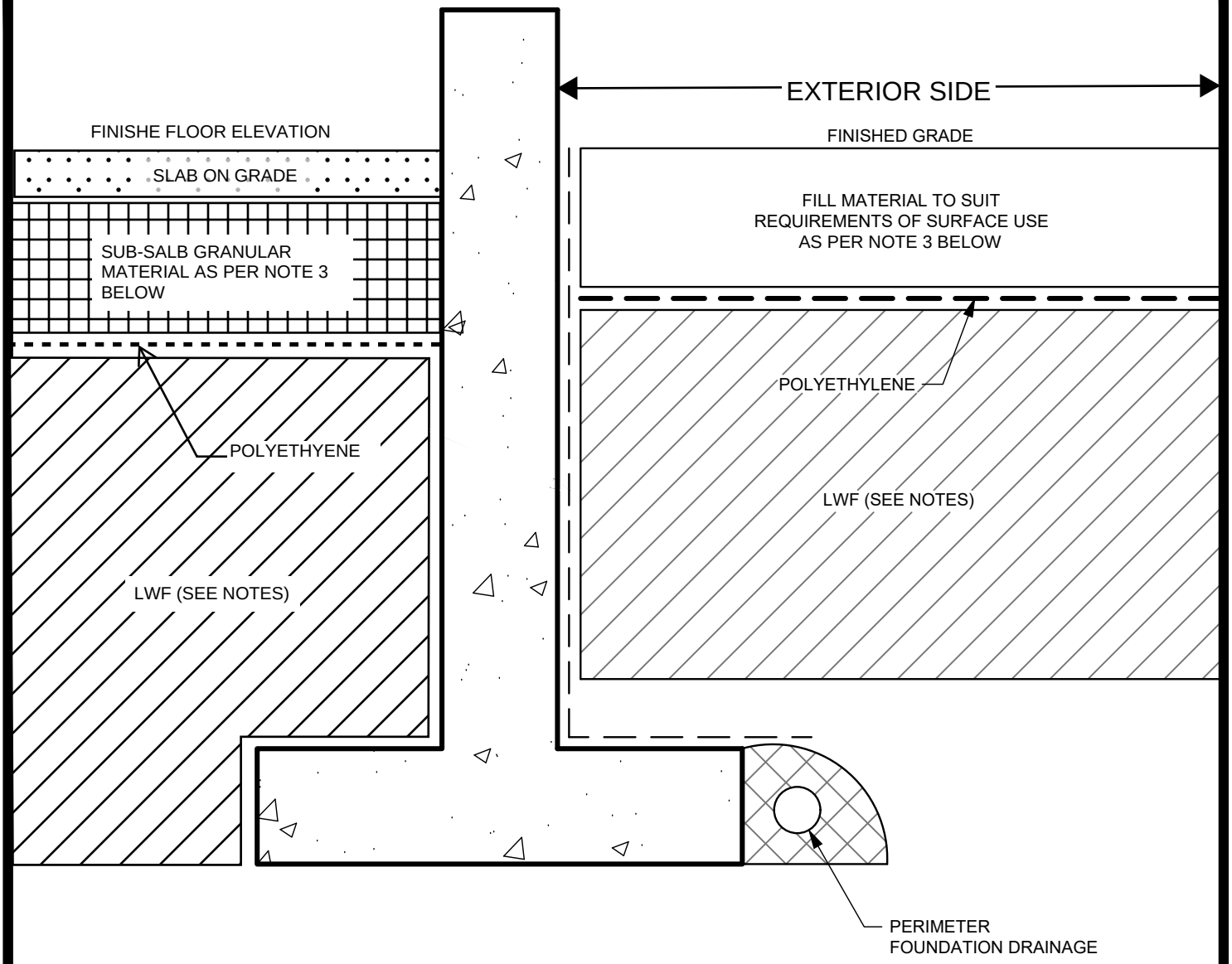
Paterson Group Inc.

Yashar Ziaeimehr, M.A.Sc.

Faisal I. Abou-Seido, P.Eng.

Attachments:

- ❑ Figure 1 - EPS Block Installation Recommendations.
- ❑ Figure 2 - Typical Frost Insulation Detail.
- ❑ Figure 3 - Marked-Up Grading Plan Indicating the Extent of LWF.
- ❑ Figure 4 - Marked-Up Site Servicing Plan.



NOTES:

1. USE EPS12 BELOW LANDSCAPED AREAS
2. USE EPS15 BELOW GARAGE DRIVEWAYAND INTERIOR AREA
3. MINIMUM GRANULAR THICKNESS OVER LWF SHOULD BE AS FOLLOWS:

FRONT PORCH	150mm OF OPSS GRANULAR A
GARAGE	300mm OF OPSS GRANULAR A
DRIVEWAY	450mm OF OPSS GRANULAR A
LANDSCAPED	500mm OF APPROVED BACKFILL SOIL
INTERIOR AREA	300mm OF OPSS GRANULAR A

4. PLACEMENT OF LWF SHOULD BE ON A LEVELED SURFACE (SAND CAN BE USED TO PROVIDE AN ADEQUATE LEVELLING SURFACE).

PATERSON GROUP

Title:

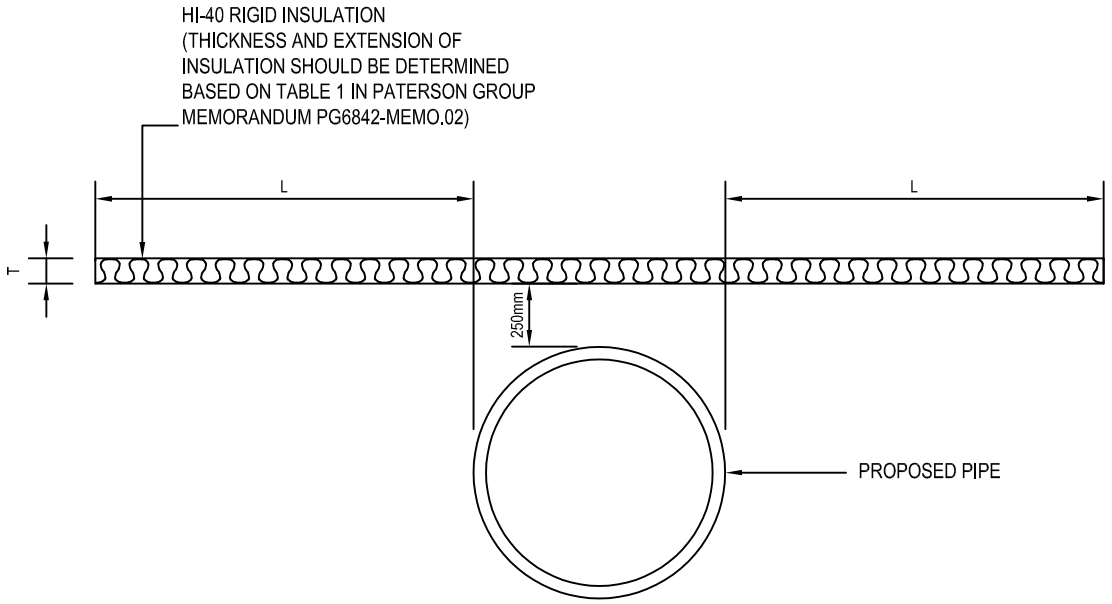
EPS BLOCK INSTALLATION

FOR SLAB ON GRADE BUILDINGS

Scale:	Date:
N.T.S.	07/2022

Drawn by:	Checked by:	Drawing No.:
NFRV	FA	FIGURE 1

p:\autocad drawings\geotechnicalleps lwf figure.dwg



PATERSON GROUP
SOLUTION ORIENTED ENGINEERING

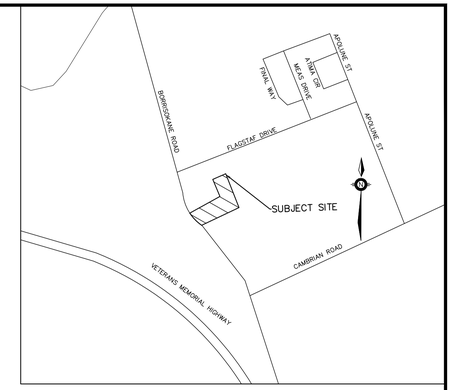
TYPICAL FROST INSULATION DETAIL

Scale: N.T.S	Date: 02/2024
Drawn by: MPG	Report No.: PG6842-MEMO.02
Checked by: YZ	Drawing No.: FIG.2
Approved by: FA	Revision No.:

8-1/2x11

Figure 3 - Marked-Up Grading Plan Indicating the Extent of LWF

Minimum 600 mm thick layer of EPS 15 geofoam lightweight fill blocks should be placed within the highlighted area and extend horizontally a minimum 6 m beyond foundation walls.



KEYMAP NTS

LEGEND

- CB — CATCH BASIN
- DCB — DOUBLE CATCH BASIN
- CBMH — CATCH BASIN
- MH — STORM MANHOLE
- MH — SANITARY MANHOLE
- SERVICE CAP
- H&V — FIRE HYDRANT
- VB — WATER VALVE
- CS — CURB STOP W/ SERVICE
- 254.63 / 254.09 — PROPOSED ELEVATION / EXISTING ELEVATION
- 1.5% — PROPOSED DIRECTION AND GRADE
- BACK OF CURB
- EDGE OF PAVEMENT
- CURB CUT LOCATION
-) (— HIGH POINT
- MAX 3:1
- 100-YEAR PONDING LIMIT ELEV: 92.70
- TACTILE PLATE
- EX. TOPO ELEVATIONS

SITE GRADING NOTES:

1. NO EXCESS DRAINAGE, DURING OR AFTER CONSTRUCTION TO BE DIRECTED TOWARDS NEIGHBORING PROPERTIES.
2. EXISTING DRAINAGE PATTERNS TO BE MAINTAINED.
3. ENSURE POSITIVE DRAINAGE AWAY FROM FOUNDATION
4. LANDSCAPE AREAS TO HAVE MINIMUM 2% MAXIMUM 7% SLOPE UNLESS TERRACED AT 3:1 MAXIMUM.
5. NO ALTERATION TO EXISTING GRADES ON PROPERTY LINES.
6. USF TO BE MINIMUM 1.5m BELOW FINISHED GRADE OR INSULATION IS REQUIRED.
7. TOF TO BE MINIMUM 0.15m ABOVE FINISHED GRADE.
8. SUNKEN ENTRANCE DRAIN ANNOT CONNECT DIRECTLY TO WEEPING TILE. ANY WATER IN SUNKEN ENTRANCE TO DRAIN DOWN INTO PERMEABLE FILL WHERE IT WILL BE PICKED UP BY WEEPING TILE SYSTEM.
9. REFER TO LANDSCAPING PLAN FOR FENCING DETAILS

NO.	REVISION NOTE	DATE	BY
02.	AS PER 2nd SUBMISSION COMMENTS	02/12/24	JM
01.	AS PER 1st SUBMISSION COMMENTS	11/02/23	JM

BENCHMARK:
SPIKE IN UTILITY POLE LOCATED ON THE SE CORNER OF THE BORRISOKANE RD. AND PROMENADE FLAGSTAFF DR. INTERSECTION.
ELEV: 92.96

LICENCED PROFESSIONAL ENGINEER
M.W. DEJEAN
Feb 12, 2024
PROVINCE OF ONTARIO

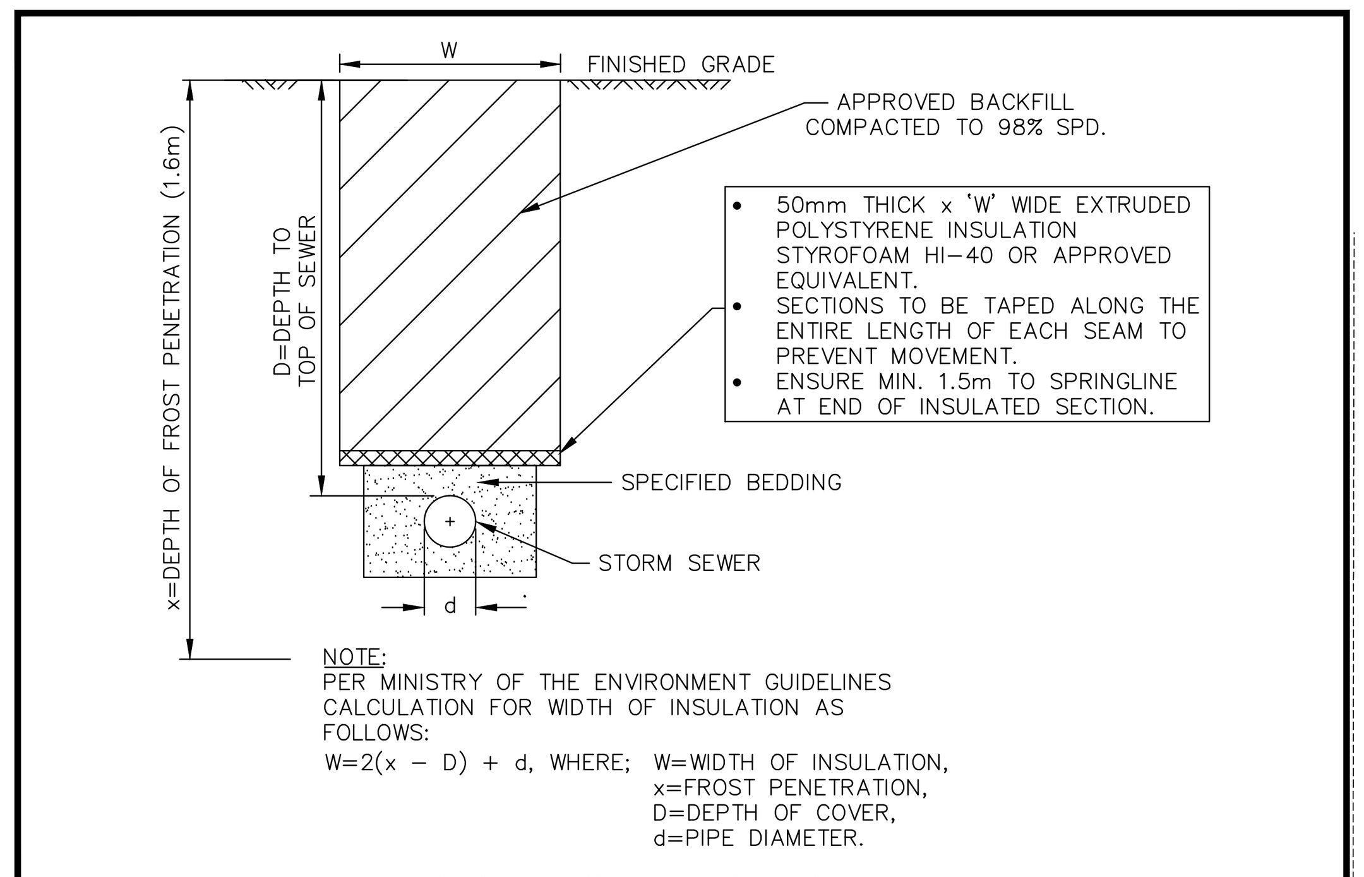
KOREAN COMMUNITY CHURCH
3555 BORRISOKANE ROAD
CITY OF OTTAWA

SITE GRADING PLAN

PEARSON ENGINEERING
PEARSONENG.COM PH. 705.719.4785

DESIGNED BY	NW/MWD	HORIZ SCALE	1:300
DRAWN BY	JM	VERT SCALE	N/A
CHECKED BY	MWD	DATE	JUNE 2023
PROJECT #	22099		
DRAWING #	SG-1		
REVISION #	2		

Figure 4 - Marked-Up Site Servicing Plan

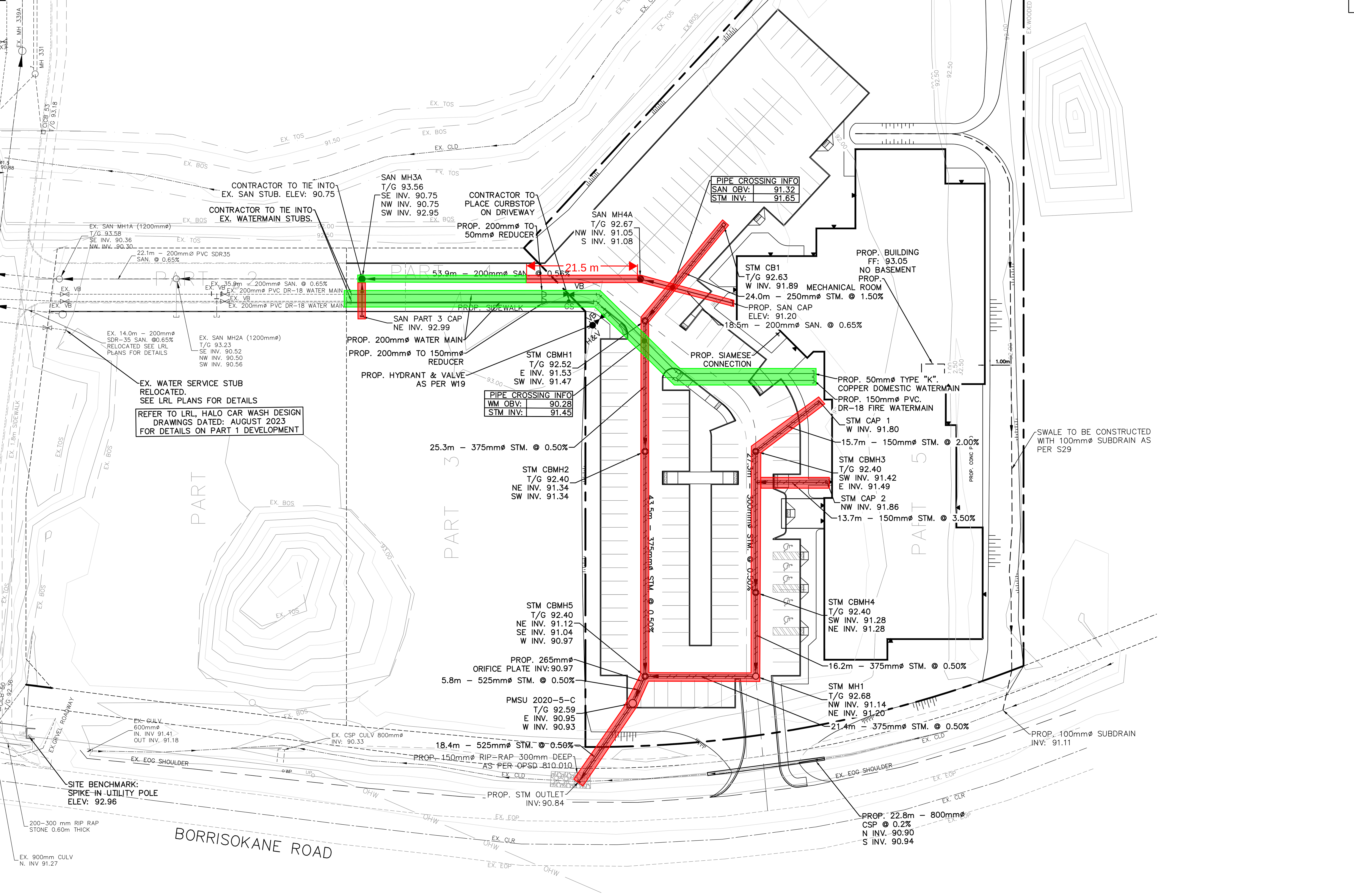


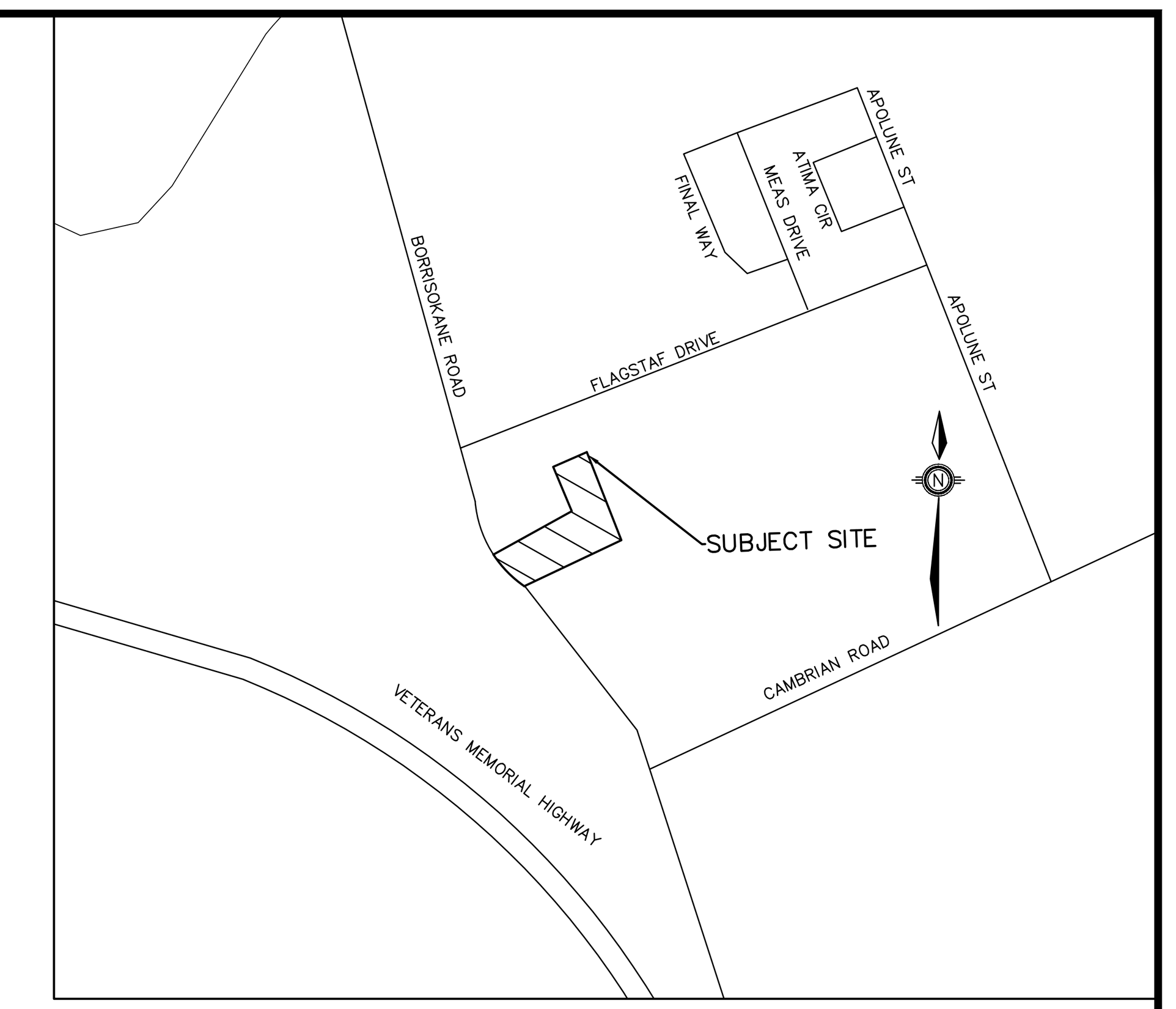
PIPE INSULATION DETAIL

(N.T.S.)

LEGEND:

- Sufficient soil cover (more than 2.1 m)
- Insufficient soil cover (less than 2.1 m)





KEYMAP NTS

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	BACK OF CURB
	EDGE OF PAVEMENT
	CURB CUT LOCATION
) (	HIGH POINT
	PROPOSED PIPE INSULATION AS PER SS-1 DETAIL

SITE SERVICING NOTES:

1. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM CITY OF OTTAWA BEFORE COMMENCING WORK.
2. REFER TO CITY OF OTTAWA STANDARD R10 FOR ASPHALT TIE INS.
3. BACKWATER VALVES TO BE INSTALLED AS PER CITY OF OTTAWA STANDARD S14, AND S14.1 OR S14.2
4. EXISTING SERVICES TO BE BLANKED AT MAIN.
5. THERMAL INSULATION TO BE PROVIDED FOR WATER SERVICES LESS THAN 2.4m FROM OPEN STRUCTURES AS PER CITY OF OTTAWA STANDARD W23.
6. WATER SERVICE TO HAVE MORE THAN 2.4m OF COVER OR BE INSULATED AS PER CITY OF OTTAWA STANDARD DRAWING W22.
7. SUNKEN ENTRANCE DRAIN CANNOT CONNECT DIRECTLY TO WEEPING TILE. ANY WATER IN SUNKEN ENTRANCE TO DRAIN DOWN INTO PERMEABLE FILL WHERE IT WILL BE PICKED UP BY WEEPING TILE SYSTEM.

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DRAWN BY	JM	VERT SCALE	N/A	DRAWING #	SS-1
CHECKED BY	MWD	DATE	JUNE 2023	REVISION #	2