



re: Grading and Site Servicing Plans Review
Proposed Building Addition
1981 Century Road – Ottawa, Ontario
to: Brunstad Christian Church Ottawa
to: Q9 Planning – Christine McCuaig – christine@q9planning.com
date: August 24, 2026
file: PG6727-MEMO.03

Further to your request and authorization, Paterson Group (Paterson) prepared the current memorandum to provide a review, from a geotechnical perspective, of the grading and site servicing plans for the proposed building addition at the aforementioned site. This memorandum should be read in conjunction with Paterson Group Geotechnical Investigation Report PG6727-1, Revision 3 dated August 24, 2026.

The following grading and site servicing plan drawings prepared by TATHAM Engineering have been reviewed by Paterson in the preparation of the current memorandum:

- ☐ Site Grading and Servicing Plan – 1981 Century Rd. West – Burnstad Christian Church Ottawa – File No. 523654 – Drawing No. SG-1 and SG-2 – Revision 5, dated July 2026.

1.0 Grading Plan Review

Based on our review of the above-noted grading plan drawings, the proposed grade raises within the aforementioned site are within the recommended permissible grade raises of 1.5 m in the above noted geotechnical report. No exceedances were noted for any area within the subject site. Therefore, the proposed grade raises are generally acceptable from a geotechnical perspective and will not require the use of lightweight fill at this time.

Further, the proposed addition is located approximately 7.7 m from the existing building to the west. Based on the proposed USF elevation of 89.02 m at the lowest point, the proposed excavation is expected to remain outside the lateral support zone of the existing building footings. Therefore, no adverse impact on the existing footings is anticipated due to the proposed excavation.

However, should lean concrete trenches be used to support the proposed building foundations, the excavation required for these trenches would extend into the lateral support zone (1.5H:1V) of the existing footings in the vicinity of the existing building. In this case, underpinning of the existing footings would be required to maintain their support during construction.



Conventional underpinning piers constructed in stages, such as the “piano key” method, would be considered suitable. The underpinning piers should extend to at least the same depth as the proposed lean concrete trenches. Depending on the required underpinning depth and site conditions, lateral support, such as tieback anchors, may also be required.

The underpinning design should be prepared by a qualified engineer experienced in underpinning and excavation support and provided to Paterson for review prior to construction.

1.1 Protection of Footings Against Frost Action

Perimeter footings of heated structures are required to be insulated against the deleterious effects of frost action. A minimum 1.5 m thick soil cover (or insulation equivalent) should be provided in this regard.

Other exterior unheated footings, such as those for isolated exterior piers, footings located below loading docks, and loading dock ramp wing-wall are more prone to deleterious movement associated with frost action than the exterior walls of the proper structure. These footings should be provided with a minimum 2.1 m thick soil cover (or insulation equivalent).

Based on our review of the above-noted grading plan drawings and the proposed underside of footing (USF) elevations, a minimum soil cover of 1.5 m is expected to be provided above the proposed building footings for the portion of the building with one basement level. Accordingly, rigid insulation will not be required for the footings in this portion of the building.

For the portion of the proposed building without a basement, it is assumed that the USF elevation of the footings will also be at least 1.5 m below the proposed finished grades. Where the minimum 1.5 m soil cover cannot be maintained, frost protection should be provided using rigid insulation in accordance with the recommendations presented in Table 1 below. These recommendations also apply to footings supporting other structures within the proposed development where the minimum required soil cover cannot be achieved.



Table 1 – Frost Protection Recommendations for Footings with Reduced Soil Cover

Thermal Condition	Soil Cover Provided (mm)	Insulation Dimensions	
		Thickness (mm)	Extension (mm)
Heated	1200-1500	25	Extend 900 mm horizontally beyond edge of footing face
	900-1200	50	Extend 1200 mm horizontally beyond edge of footing face
	600-900	75	Extend 1500 mm horizontally beyond edge of footing face
	300-600	100	Extend 1800 mm horizontally beyond edge of footing face
	0-300	125	Extend 2100 mm horizontally beyond edge of footing face
Unheated	1800-2100	25	Extend 600 mm horizontally beyond edge of footing face
	1200-1800	50	Extend 600 mm horizontally beyond edge of footing face
	900-1200	75	Extend 1200 mm horizontally beyond edge of footing face
	600-900	100	Extend 1800 mm horizontally beyond edge of footing face
	300-600	150	Extend 2100 mm horizontally beyond edge of footing face
	0-300	200	Extend 2100 mm horizontally beyond edge of footing face

All rigid insulation should consist of either Dow Chemical High-Load 40 (HI-40), Styro Rail SR.P400, or equivalent approved by Paterson.

Rigid insulation boards should be placed upon a level and flat surface with negligible gaps between abutting boards. Consideration can be given to placing a thin levelling mat consisting of a layer of compacted OPSS Granular A crushed stone, stone dust, or sand below the insulation layer, as required. The placement of the insulation layers should be reviewed by Paterson personnel at the time of construction.

It is recommended that Paterson review the proposed footing and/or insulation details once the final detail design drawings are available for the above noted items prior to construction to ensure the effects of frost action are mitigated appropriately.



2.0 Site Servicing Plan Review

Based on the above-noted site servicing plan drawings, the site servicing layout does not impede the lateral support zones of any adjacent buildings/structures and is in conformance with our recommendations in the above noted geotechnical report.

2.1 Frost Protection for the Service Pipes

Insufficient frost protection has been provided for the proposed storm sewer pipes throughout the subject site. Reference should be made to Figures 1 and 2, including Paterson's markup on site servicing plans for the location of pipes where insulation will be required, attached to this memorandum.

In the following section, frost protection of the site servicing is recommended where insufficient frost cover has been provided. Any portion of the services installed at a depth of 2.1 m below the 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 sewer pipe, the following frost protection criteria given in Table 2 should be followed.

Table 2 - Rigid Insulation Recommendations for Sanitary and Storm 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 3 – Typical Frost Insulation Detail, attached to this memorandum.



It is recommended that Paterson review the proposed insulation details once the final detail design drawings are available for the above noted items prior to construction to ensure the effects of frost action are mitigated appropriately.

2.2 Frost Protection for the Proposed Twin Culvert

It is understood that a twin culvert will be constructed as part of the proposed pond at the subject site. Based on our review of the above noted grading and site services plan drawings, it is further understood that the soil cover for the proposed twin culvert is less than 1.5 m. Where the minimum 1.5 m soil cover cannot be maintained, including at the proposed twin culvert, frost protection should be provided using rigid insulation in accordance with the recommendations presented in Table 1 above. These recommendations should also be applied to any other structures within the proposed development where the minimum required soil cover cannot be achieved.

2.3 Proposed Rip Rap Materials

It is understood that rip-rap protection will be provided at the pipe outlet and inlet locations associated with the proposed pond and twin culvert, as well as at the emergency overflow area. The rip-rap should consist of sound, durable, angular rock capable of withstanding the anticipated flow conditions. A non-woven filter fabric, such as Terrafix 270R or an approved equivalent, should be placed over the prepared subgrade prior to placement of the rip-rap to prevent migration of the underlying fine-grained soils. The rip-rap should be placed carefully to provide a stable, interlocked surface and minimize the potential for localized erosion and scour at the pipe outlets, culvert ends, and emergency overflow area.

The prepared subgrade beneath the rip-rap should be relatively smooth and free of loose or deleterious materials. The filter fabric should be installed in accordance with the manufacturer's recommendations, including appropriate overlaps and anchoring, to prevent displacement during construction and operation.

Based on the current civil drawings, the proposed rip-rap over Terrafix 270R filter fabric is considered appropriate for erosion protection at these locations from a geotechnical perspective.



We trust that the current submission meets your immediate requirements.

Best Regards,

Paterson Group Inc.

Yashar Ziaeimehr, M.A.Sc., P.Eng.

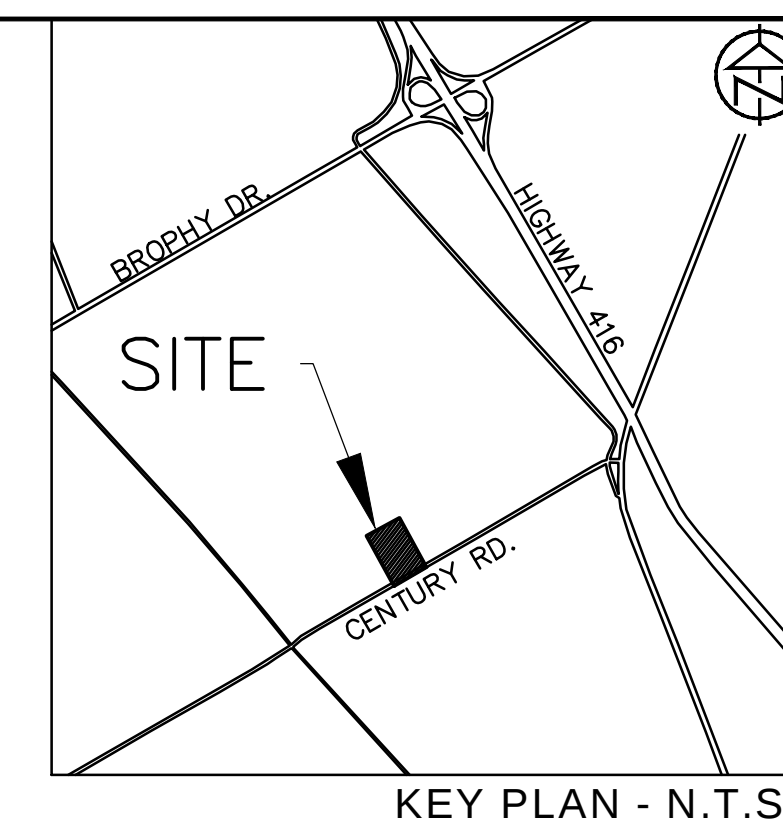


Drew Petahtegoose, P.Eng.

Attachments:

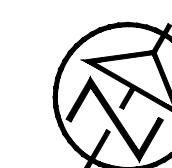
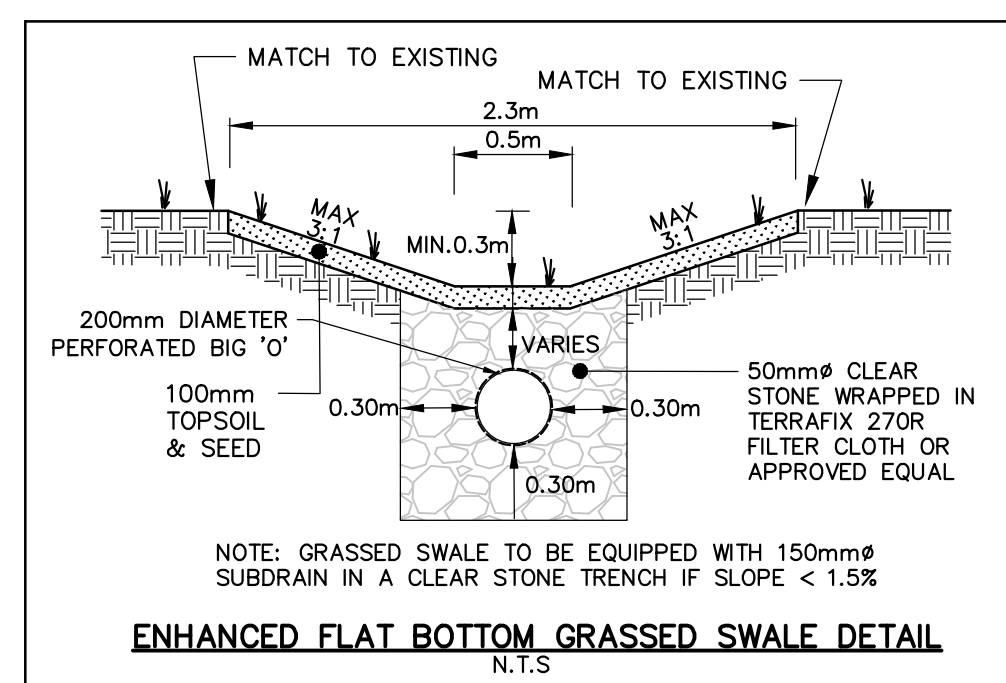
- ☐ Figures 1 and 2 – Markup site servicing plans for the location of pipes where insulation will be required.
- ☐ Figure 3 – Typical Frost Insulation Detail.





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9 AURIGA DRIVE
OTTAWA, ON
K2E 7Y9
TEL: (613) 226-7388



 TATHAM ENGINEERING		
DESIGN: HY	FILE: 523654	DWG: SG-1
DRAWN: HY	DATE: SEPT 2024	
CHECK: GC	SCALE: 1:300	

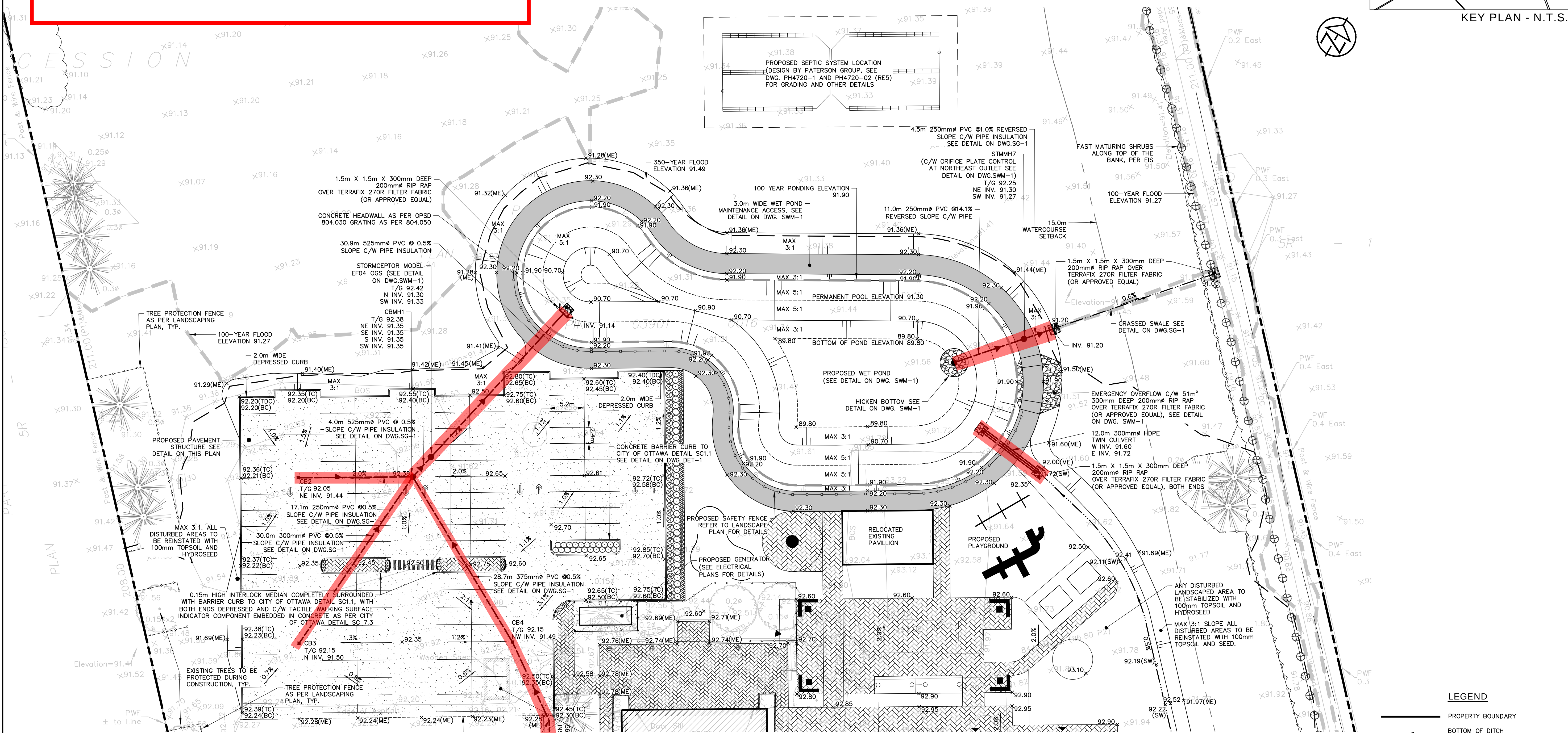
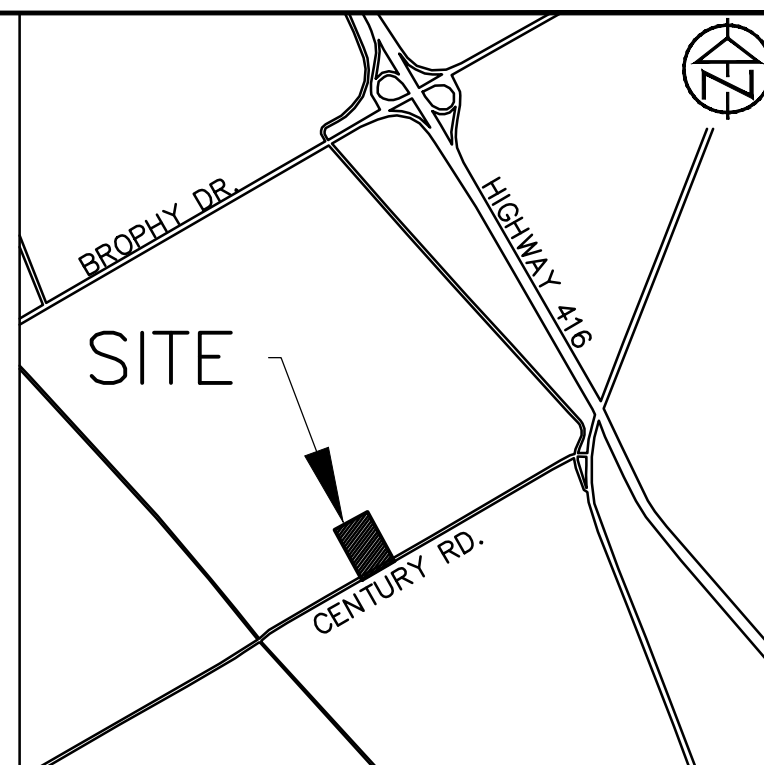
Figure 2 - markup site servicing plan for the location of pipes where insulation will be required

LEGEND:

Insufficient Soil Cover for Pipes or Culverts (Less than 2.1 m)



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SEE DWG. SG-1

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ELEVATION SHOWN ARE GEODETIC AND ARE REFERRED TO CGVD28 GEODETIC DATUM.
TBM1: TOP OF PROPERTY IRON BAR LOCATED ON SOUTHEAST OF THE PROPERTY, ELEVATION 91.86.

No.	REVISION DESCRIPTION	DATE
1.	ISSUED FOR APPROVAL	JAN 2025
2.	RE-ISSUED FOR SITE PLAN APPROVAL	JUL 2025
3.	RE-ISSUED FOR SITE PLAN APPROVAL	AUG 2025
4.	RE-ISSUED FOR SITE PLAN APPROVAL	APR 2026
5.	ISSUED FOR BUILDING PERMIT	JULY 2026

ENGINEER STAMP

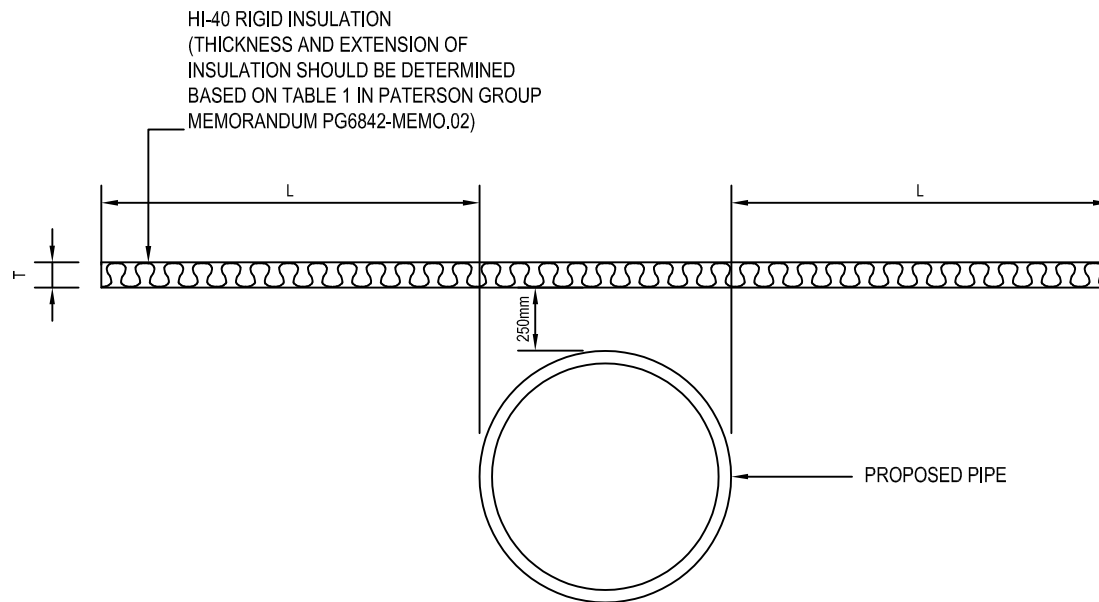


1881 CENTURY RD. WEST
CITY OF OTTAWA
BRUNSTAD CHRISTIAN CHURCH OTTAWA

SITE GRADING AND
SERVICING PLAN



DESIGN: HY	FILE: 523654	DWG: SG-2
DRAWN: HY	DATE: SEPT 2024	
CHECK: GC	SCALE: 1:300	



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SOLUTION ORIENTED
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TYPICAL FROST INSULATION DETAIL

Scale:	N.T.S	Date:	08/2026
Drawn by:	MPG	Report No.:	PG6727-MEMO.03
Checked by:	YZ	Drawing No.:	Figure 3
Approved by:	DP	Revision No.:	