patersongroup **memorandum**

consulting engineers

re:	**Geotechnical Review - Frost Protection for Footings** **Proposed Commercial Development - Building A** **2165 Robertson Road - Bells Corners - Ottawa, Ontario**
to:	Huntington Properties - **Mr. Mathieu Desjardins** - mdesjardins@huntingtonproperties.ca
to:	Huntington Properties - **Ms. Lisa Westphal** - lwestphal@huntingtonproperties.ca
date:	July 26, 2021
file:	PG4694-MEMO.03

As requested, Paterson Group (Paterson) prepared the following memorandum to provide frost protection recommendations for the proposed Building A for areas with reduced frost cover for the proposed footings at the aforementioned site. The following memorandum should be read in conjunction with our geotechnical Report PG4694-1 dated November 16, 2018.

Grading Plan Review

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

- ❏ Grading Plan - 2165 Robertson Road - Project No. 18-1062 - Drawing No. GP-1- Sheet No. 2 of 5 - Revision 4 dated May 25, 2021.

Based on our review, the north and eastern portion of the proposed building was noted to be provided reduced soil cover for footings of heated structures against frost action.

Geotechnical Recommendations

Due to the reduced soil cover provided to the aforementioned building, rigid insulation is required to protect the foundations from the detrimental effects of frost heave. Alternatively, a layer of non-frost susceptible fill may be placed below the footings to lower the depth of frost-susceptible soil below the building footprint. These recommendations may be disregarded if the subject perimeter footings are founded at a geodetic elevation of 92.75 m, which would provide sufficient soil cover based on the current grading plan details.

Option A - Rigid Insulation

The rigid insulation layer should be placed directly below and along the length of the footing at footing level to extend laterally beyond the exterior and interior faces of the footing with thicknesses indicated on the attached drawings. Insulation layer thicknesses and lateral extension dimensions should be carried out as indicated on the attached drawing.

Option B - Sub-Footing Engineered Fill

Non-frost susceptible, free-draining crushed stone fill, such as OPSS Granular A or OPSS Granular B Type II, may be placed below the subject footings as a substitute for rigid insulation. The engineered fill should consist of a minimum 300 mm thick layer extending a minimum of 150 mm beyond all faces of the perimeter footing and compacted to a minimum of 98% of the materials SPMDD.

Additional Considerations

It is recommended DOW Chemical High-Load HI-40 rigid insulation, or approved equivalent, be installed within the building footprint and below the pavement structure. Styrofoam (SM) rigid insulation can be used throughout landscaped areas.

Rigid insulation boards should be placed upon a level and flat surface and with negligible gaps between abutting boards. Consideration can be taken 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 layer or sub-footing layer of crushed stone should be reviewed and approved by Paterson personnel at the time of construction.

We trust that this information is satisfactory for your immediate requirements.

Best Regards,

Paterson Group Inc.

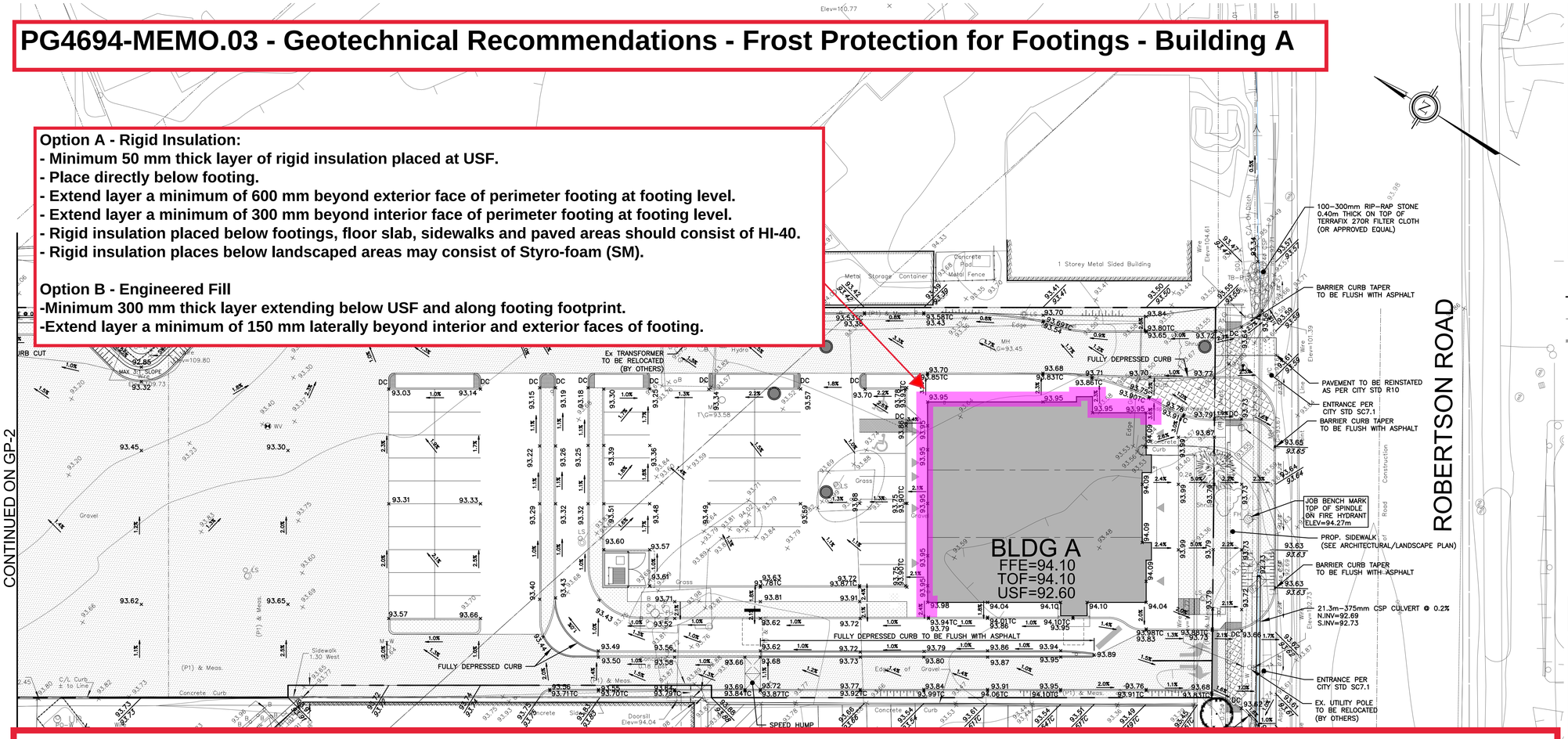
Drew Petahtegoose, B.Eng.

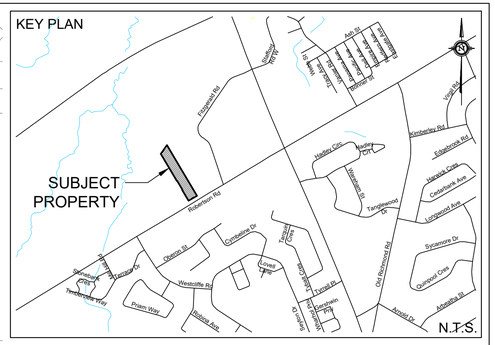
David J. Gilbert, P.Eng.

PG4694-MEMO.03 - Geotechnical Recommendations - Frost Protection for Footings - Building A

Option A - Rigid Insulation:
- Minimum 50 mm thick layer of rigid insulation placed at USF.
- Place directly below footing.
- Extend layer a minimum of 600 mm beyond exterior face of perimeter footing at footing level.
- Extend layer a minimum of 300 mm beyond interior face of perimeter footing at footing level.
- Rigid insulation placed below footings, floor slab, sidewalks and paved areas should consist of HI-40.
- Rigid insulation places below landscaped areas may consist of Styro-foam (SM).

Option B - Engineered Fill
-Minimum 300 mm thick layer extending below USF and along footing footprint.
-Extend layer a minimum of 150 mm laterally beyond interior and exterior faces of footing.





LEGEND

PROPERTY LINE	CONCRETE PAVERS (SEE ARCHITECTURAL & LANDSCAPE PLANS)
PROPOSED SWALE	PROPOSED HEAVY DUTY ASPHALT
PROPOSED PERFORATED SUBDRAIN	PROPOSED STORM MANHOLE
100.00 EXISTING SPOT ELEVATION	PROPOSED SANITARY MANHOLE
100.00 PROPOSED SPOT ELEVATION	PROPOSED CATCH BASIN
100.00T/C PROPOSED TOP OF CURB ELEVATION	PROPOSED CB "I"
100.00B/W PROPOSED BOTTOM OF WALL ELEVATION	PROPOSED FIRE HYDRANT
100.00T/W PROPOSED TOP OF WALL ELEVATION	EMERGENCY FLOW ROUTE
100.00T/L PROPOSED TOP OF LID ELEVATION	LANDSCAPING WALL
1.0% EXISTING GRADE AND DIRECTION	
1.0% PROPOSED GRADE AND DIRECTION	
3:1 SLOPE PROPOSED 3:1 TERRACING	
100.00 / 100.00 PROPOSED/EXISTING SPOT ELEVATION	

ISSUED FOR APPROVAL

TOPOGRAPHIC INFORMATION
TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
PROJ. NO. 17482-18
DATED OCTOBER 19, 2018

SITE PLAN INFORMATION
SITE PLAN PROVIDED BY S.J LAWRENCE ARCHITECT INC.
PROJ. NO. SL-865-17
DATED FEBRUARY 25, 2021

GEOTECHNICAL STUDY
GEOTECHNICAL RECOMMENDATIONS PROVIDED BY PATERSON GROUP
PROJ. NO. PG4694-1
DATED NOVEMBER 16, 2018

SITE SERVICING AND STORMWATER MANAGEMENT STUDY
SERVICING AND STORMWATER MANAGEMENT RECOMMENDATIONS PROVIDED BY DSEL
PROJ. NO. 18-1062
DATED MAY 2021

BENCH MARK
LOCATED AT TOP OF SPINDLE ON FIRE HYDRANT
ELEV= 94.27

No.	BY	YY.MM.DD	DESCRIPTION
4	B.N.C.	21.05.21	ISSUED FOR MUNICIPAL REVIEW
3	B.N.C.	21.03.08	ISSUED FOR MUNICIPAL REVIEW
2	B.N.C.	21.01.29	ISSUED FOR COORDINATION
1	B.N.C.	18.12.21	ISSUED FOR MUNICIPAL REVIEW

CITY FILE No.: D07-12-18-0205 CITY PLAN No.: 17864

Notes:

- This drawing should be read in conjunction with Paterson memorandum PG4694-MEMO.03 and is not to scale.

- All rigid insulation or engineered fill is recommended to be placed the minimum distance beyond the faces of the perimeter footing as noted on this drawing.

- Rigid insulation placed below the paved areas and the building footprint should consist of HI-40. Rigid insulation placed below landscaped areas may consist of boards of SM (Styro-Foam).

- Placement of rigid insulation should be reviewed and approved by Paterson personnel at the time of installation.

- Engineered fill to consist of a minimum 300 mm thick layer of OPSS Granular A or OPSS Granular B Type II, compacted to 98% SPMDD and reviewed and approved by Paterson personnel at the time of construction.