



re: **Geotechnical Excavation Review**
Proposed Residential Development
489 & 495 Duvernay Street – Ottawa, Ontario
to: DCR / Pheonix Group of Companies – **Ms. Catherine Buck** –
cbuck@pheonixhomes.ca
date: October 2, 2023
file: PG6835-MEMO.01

Further to your request and authorization, Paterson Group (Paterson) prepared this memorandum to document our review of the excavation for the proposed residential development to be located at 489 and 495 Duvernay Street in the City of Ottawa (Refer to Figure 1 – Key Plan for the general site location). In particular, the primary purpose of the geotechnical review is to determine if the proposed excavation can be sloped, or if temporary shoring is required.

1.0 Proposed Development

Based on our review of the available drawings provided by the client, it is understood that the proposed development will consist of two 3-storey residential buildings, each with 1 basement level, which will be centrally located within the subject site. It is expected the proposed new development will be municipally serviced.

2.0 Existing Site Conditions

Surface Conditions

The subject site is bordered by a commercial building to the east, Des Epinettes Avenue to the south, Duvernay Drive to the west and a residential property to the north. The existing average ground surface is relatively level and at grade with the surrounding area and streets at an approximate geodetic elevation of 88 m. The subject site primarily consists of a grass covered lot with a few mature trees and bushes. The approximate site location is shown on the attached Figure 1 – Key Plan.

Subsurface Conditions

A total of 3 hand-augered holes were advanced to a maximum depth of 1.5 m below the existing ground surface during our site visit on September 19, 2023 to evaluate the subsurface conditions within the approximate depth of excavation at the subject site.



The subsurface profile at the test hole locations was observed to consist of topsoil underlain by a layer of compact brown silty sand which extends to approximate depths of 0.3 to 0.6 m below the existing ground surface. The silty sand layer was further underlain by a stiff, brown silty clay deposit which extended to the maximum depth of the test holes.

Furthermore, the available geological mapping indicates that the bedrock within the area consists of shale of the Rockcliffe formation with an overburden drift thickness of 25 to 50 m depth.

3.0 Geotechnical Recommendations

Paterson reviewed the following gradient plan prepared by T.A.W. Grading Plans as part of the geotechnical assessment:

- Drawing Number: C1.1 – Grading & Servicing Plan – 489 & 495 Duvenay St. Grading & Servicing Plan, Revision 2 dated August 16, 2023.

In reviewing the grading plan, the underside of footing (USF) elevation is at approximate geodetic elevation 85.70 m for the proposed residential building at 489 Duvernay Street. The existing grades around the footprint of the proposed residential building vary from about geodetic elevation 88.4 m to 88.0 m, therefore, the proposed excavation will have depths varying from about 2.1 to 2.7 m below existing grade.

In reviewing the grading plan for 495 Duvernay Street, the underside of footing (USF) elevation is at approximate geodetic elevation 85.65 m for the proposed residential building. The existing grades around the footprint of the proposed residential building vary from about geodetic elevation 88.0 m to 88.1 m, therefore, the proposed excavation will have depths varying from about 2.3 to 2.5 m below existing grade.

From our review of the available drawings, the proposed development is sufficiently setback from the property lines to allow for the lower 1.5 m of the excavation to be vertical, and then sloped at 1H:1V above this. The limits of the excavation are shown on the attached Figure 2, and the slope cross-section is illustrated on the attached Figure 3 – Section A-A.

Therefore, from a geotechnical perspective, temporary shoring is not considered to be required for the proposed excavation at the subject site. However, it is recommended that the slopes in the overburden soils be covered with tarps or poly sheeting in order to provide erosion protection from rainfall and snowfall events. If the excavation is carried out during the winter season, insulated tarps should be used over the side slopes during the freezing temperatures as opposed to regular tarps or poly sheeting, in order to provide cold weather protection.

Excavated soil stockpiles and heavy equipment should be placed a minimum of 2 m away from any slopes and adjacent structures.



Paterson should be notified when the proposed excavation is commencing, to observe the subsoil and excavation side conditions at the site, and to confirm that the excavation dimensions are consistent with our recommendations.

4.0 Response to City Comments

The following addresses specific comments in the City of Ottawa's Advisory: Excavation and Shoring – Part 9:

- *Confirmation of which system is proposed: sloped excavation or shoring.*

The overburden soils will be sloped back from the excavation, as shown on the attached Figure 3, therefore a shoring system will not be required.

- *Where proposing a sloped excavation, plan of excavation including gradient*

See the attached Figure 2 for the plan of excavation, and Figure 3 for the sloping details.

- *Where proposing a shoring system, shoring construction details and installation procedures.*

Shoring is not required for the proposed excavation.

- *Outline of precipitation management for rainfall and snowfall events*

The overburden soils are to be covered with tarps or poly sheeting in order to provide erosion protection from rainfall and snowfall events.

- *Where applicable, detail for cold weather protection*

Precautions must be taken if winter construction is considered for this project. The subsoil conditions at this site consist of frost susceptible materials. In the presence of water and freezing conditions, ice could form within the soil mass. Heaving and settlement upon thawing could occur.

In the event of construction during below zero temperatures, the founding stratum should be protected from freezing temperatures by the use of straw, propane heaters and tarpaulins or other suitable means. In this regard, the base of the excavations should be insulated from sub-zero temperatures immediately upon exposure and until such time as heat is adequately supplied to the building and the footings are protected with sufficient soil cover to prevent freezing at founding level.



Trench excavations construction are also difficult activities to complete during freezing conditions without introducing frost into the subgrade or in the excavation walls and bottoms. Precautions should be taken if such activities are to be carried out during freezing conditions.

Where the excavation will result in a reduction in the frost cover of 1.5 m for existing footings, a frost protection system shall be applied for the effected footings.

- *Confirmation that excavation or shoring methods will be undertaken in a manner to prevent damage to adjacent property*

Provided the proposed excavation is undertaken in accordance with the recommendations provided in this memo, and on the attached figures, damage will not occur to adjacent properties as a result of the excavation.

- *Where encroachment onto private property is proposed, an informed consent agreement between private property owners is required.*

Encroachment onto the adjacent properties will not occur, provided the sloping details provided herein are followed.

- *Unless an informed consent agreement is in place, confirmation that adjacent private property including landscaping, vegetation and fencing will be reinstated if damaged, to the satisfaction of the city.*

Encroachment onto the adjacent properties will not occur, therefore the reinstatement of landscaping, vegetation, and fencing will not be required.

- *Soil and equipment storage plan in relation to edge of excavation and adjacent structures.*

Equipment and excavated soil should not be located within 2 m of the excavation.

- *Acknowledgement that impacts on infrastructure, utilities and public and private right of ways have been addressed.*

Provided the proposed excavation is undertaken in accordance with the recommendations provided in this memo, and on the attached figures, there will be no impacts to infrastructure, utilities, public and private right-of-ways as a result of the excavation.

- *Comment on adjacent angle of repose and slope stability, where adjacent structure is near the property line.*

The neighbouring building to the north has a basement level, therefore the proposed excavation will not extend within the angle of repose of this adjacent structure



5.0 Final Remarks

Paterson should be notified in order to make an inspection once the excavation has been completed, to confirm that our recommendations have been followed, and that the subsurface conditions are consistent with those encountered in our limited subsurface investigation.

We trust that the current submission meets your immediate requirements.

Best Regards,

Paterson Group Inc.

Kevin A. Pickard, P.Eng.



Scott S. Dennis, P.Eng.

Attachments:

- Figure 1 – Key Plan
- Figure 2 – Site Plan
- Figure 3 – Section A-A



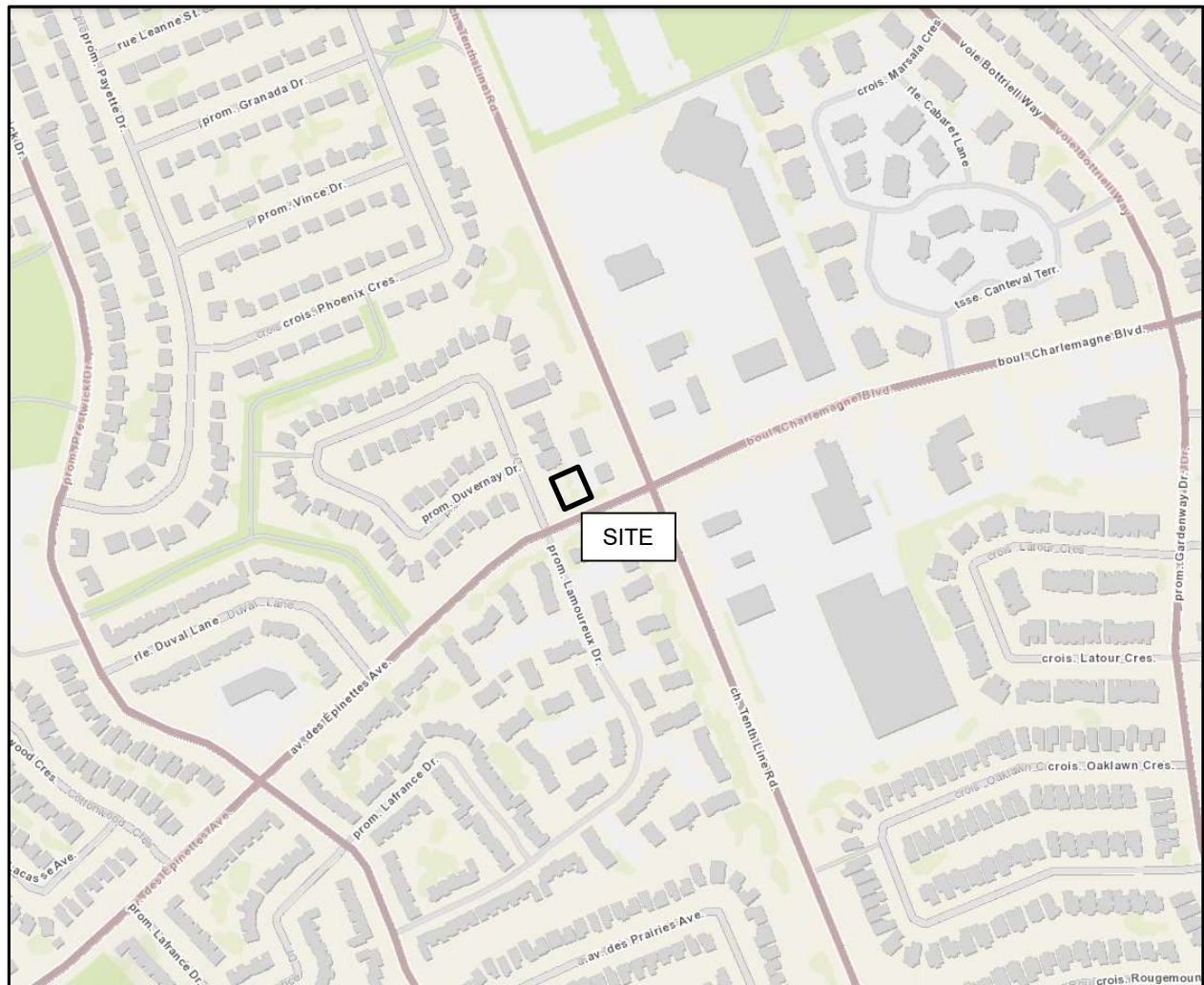
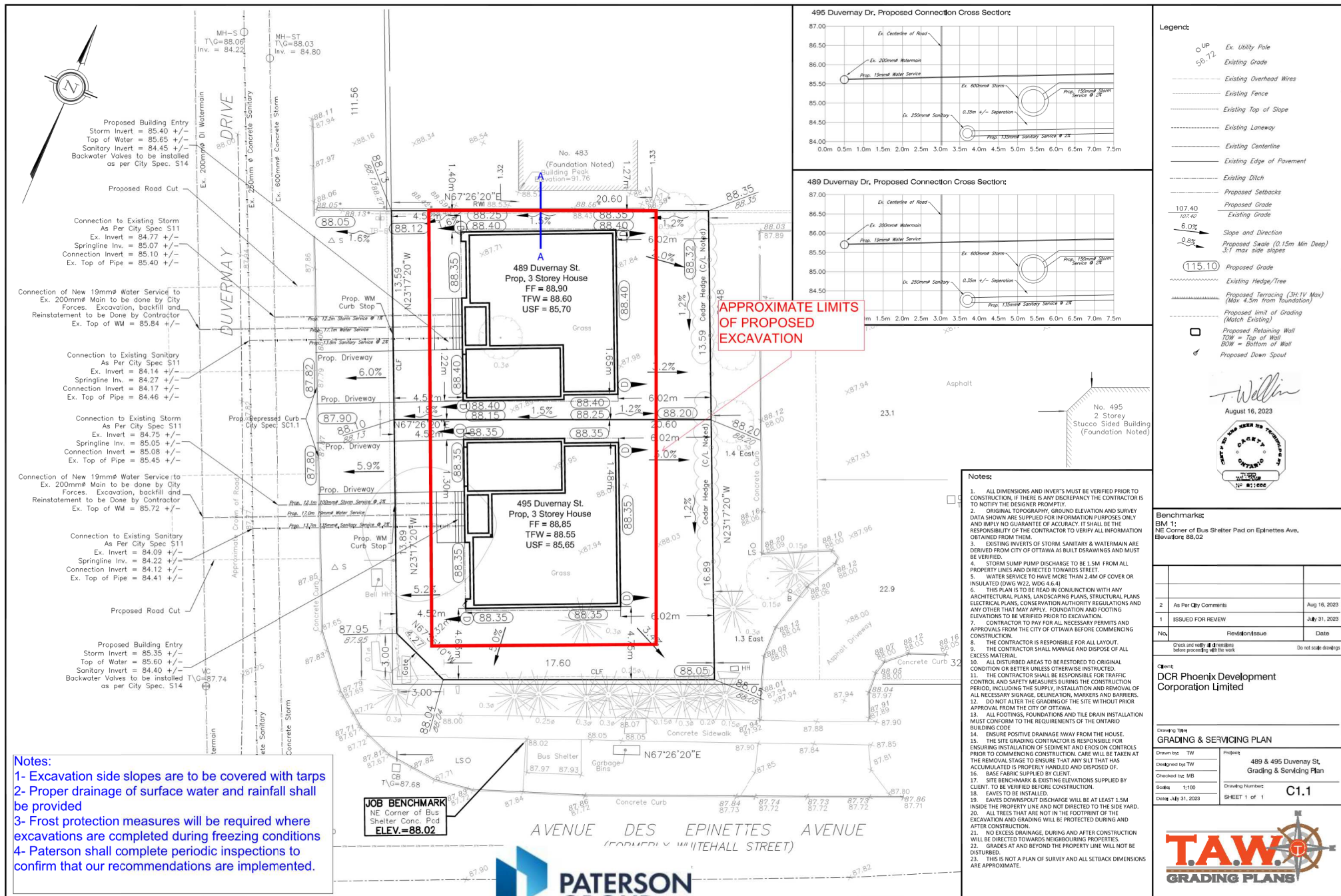


FIGURE 1

KEY PLAN





**PATERSON
GROUP**

Geotechnical Excavation Review

Job No.: PG6854

489 Duvernay Street, Ottawa, ON

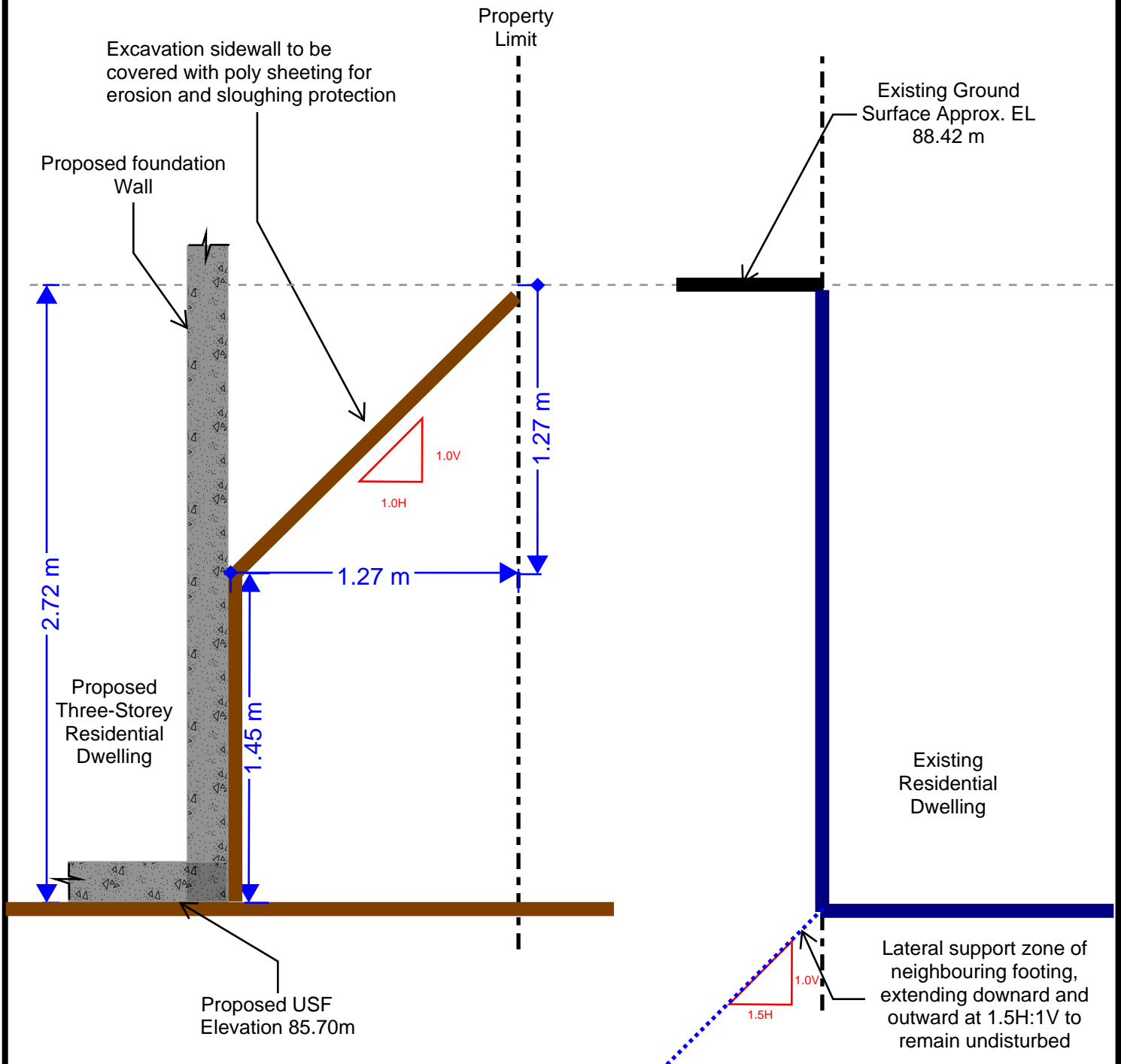
Date: September 29, 2023

Figure 4 - Section A-A

Dwn: MA

Drawing is not to scale

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Notes:

- 1- Excavation side slopes are to be covered with tarp
- 2- Proper drainage of surface water and rainfall shall be provided
- 3- Frost protection measures will be required where excavations are completed during freezing conditions
- 4- Paterson shall complete periodic inspections to confirm that our recommendations are implemented.