PATERSON GROUP

memorandum

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

City of Ottawa
Building Services Branch
OCT 0 4 2023
Building Code Reviewed
Signature

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 Steet 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.

LICENSED PROFESSIONAL ENGINEER
Oct. 2, 2023
S. S. DENNIS
100519516
PROVINCE OF ONTARIO

Scott S. Dennis, P.Eng.

Attachments:

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

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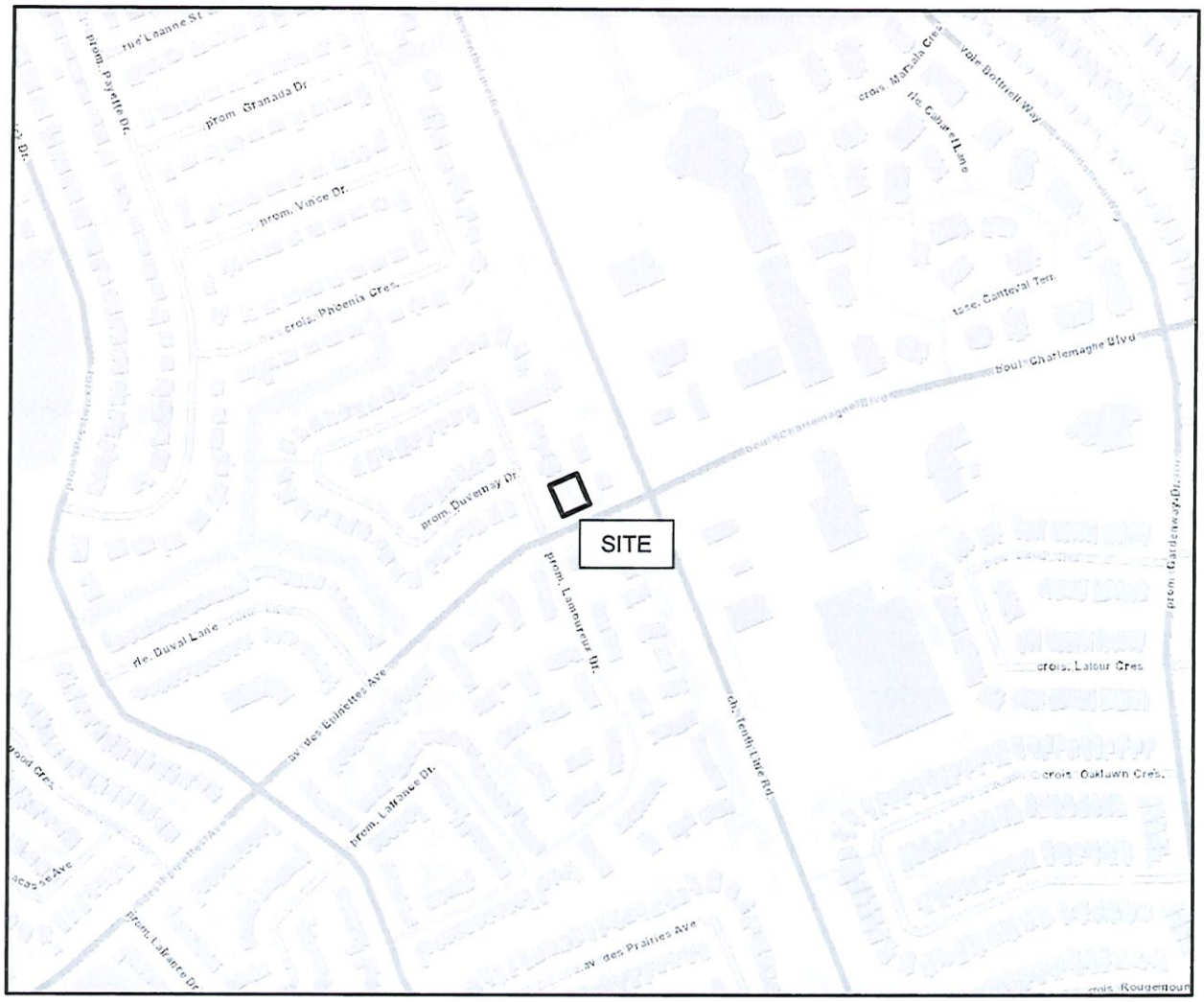

FIGURE 1

KEY PLAN

City of Ottawa
Building Services Branch

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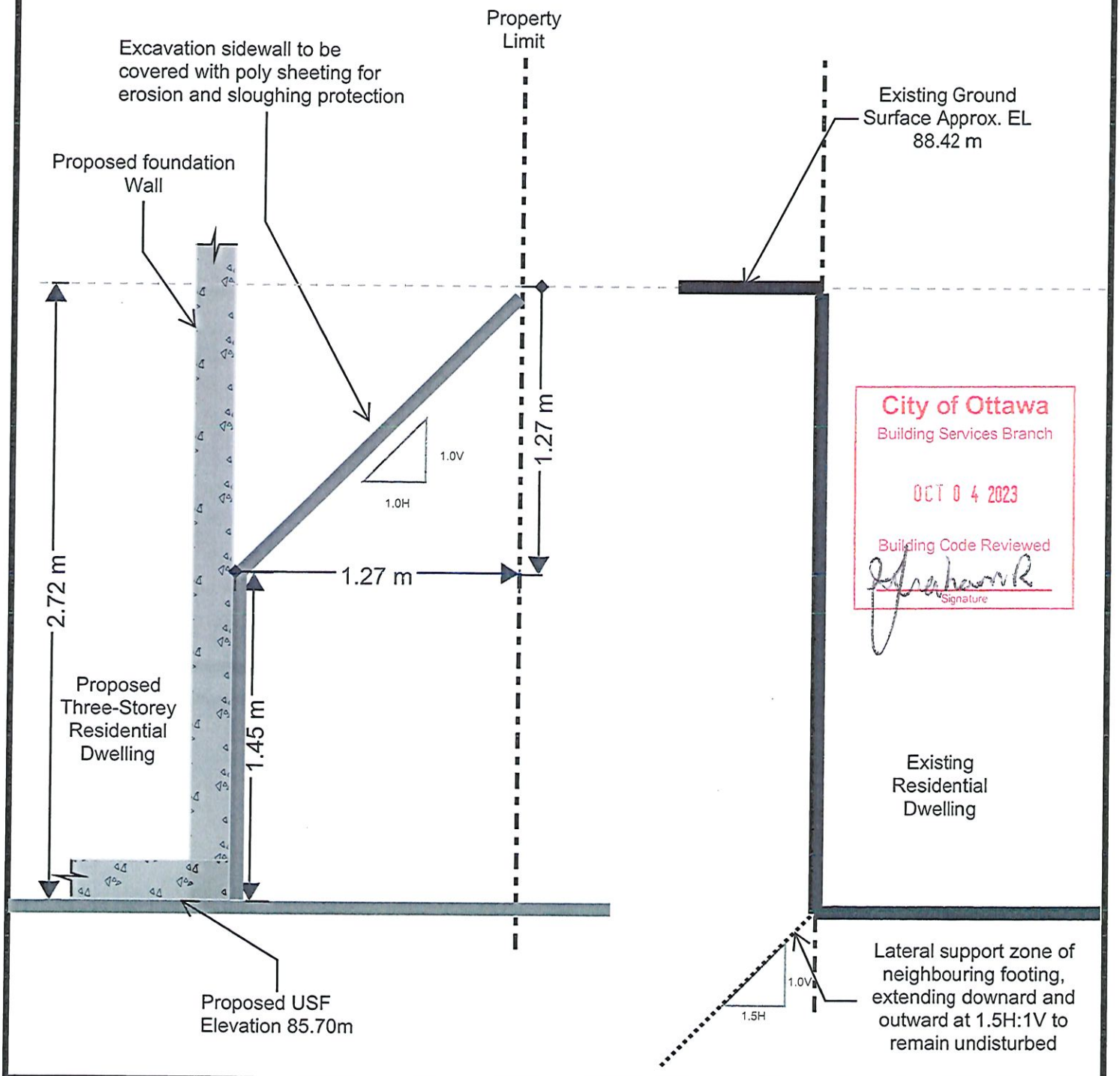
PATERSON GROUP

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	Page: 1 of 1



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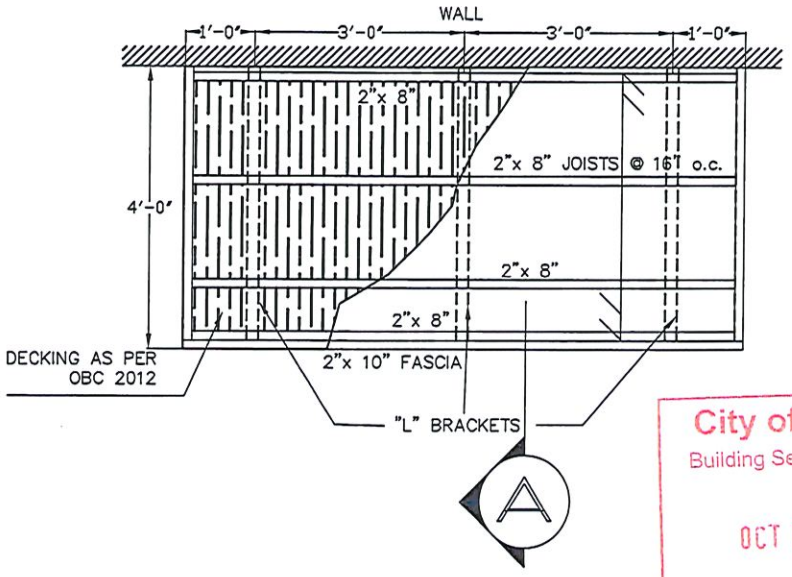
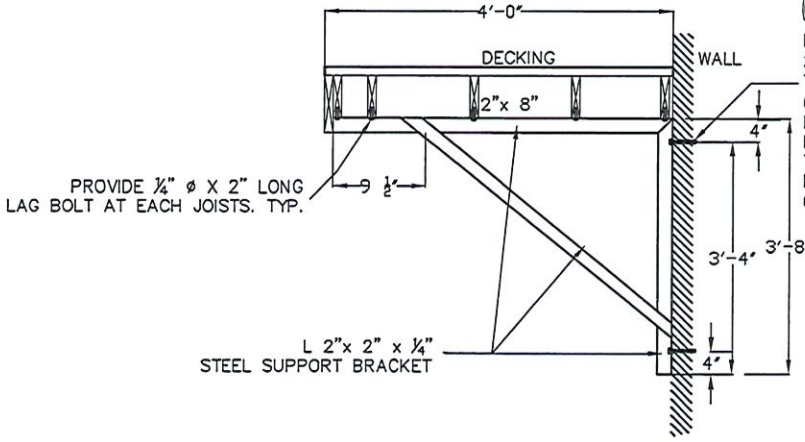
Notes:

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.



PLAN



DRILL INTO EXISTING FOUNDATION WALL
2 -1/2" ø RED HEAD STAINLESS STEEL TRUBOLT WEDGE ANCHOR
(4" MIN. EMBEDMENT)
INSTALL AS PER MANUFACTURERS RECOMMENDATIONS.
TWO BOLTS PER BRACKET LEG.
MIN. EDGE DISTANCE FROM TOP OF CONCRETE WALL=4"

SECTION 'A'

LICENSED PROFESSIONAL ENGINEER
D. SEGURA
100079708
6DEC19
PROVINCE OF ONTARIO

NOTES:
STEEL
-ALL STRUCTURAL STEEL WORK INCLUDING DESIGN OF ALL COMPONENTS SHALL BE CARRIED OUT IN ACCORDANCE WITH CAN/CSA-S16-09.
-HOLLOW STRUCTURAL SECTIONS TO CAN/CSA G40.20 GRADE 350, CLASS C OF H.
- STRUCTURAL STEEL SHALL CONFORM TO CAN/CSA G40.21 GRADE 300W
ALL WORK SHALL CONFORM OBC 2012
CONTRACTOR TO VERIFY ALL DIMENSIONS ON SITE.
FOR ADDITIONAL INFORMATION, SEE ENGINEERING DWGS.

ALL HARDWARE TO BE HOT-DIP GALVANIZED
CONCRETE MIN. STRENGTH: 25 MPA

No.	Revision	Date	By

Contractor must verify all dimensions on the job and report any discrepancy to the architect before proceeding with the work. All drawings and specifications are instruments of service and the property of the architect which must be returned at the completion of the work. Drawings are NOT to be scaled.

Estructura Inc.
TEL: (819) 918-4382
EMAIL: estructurainc@yahoo.com

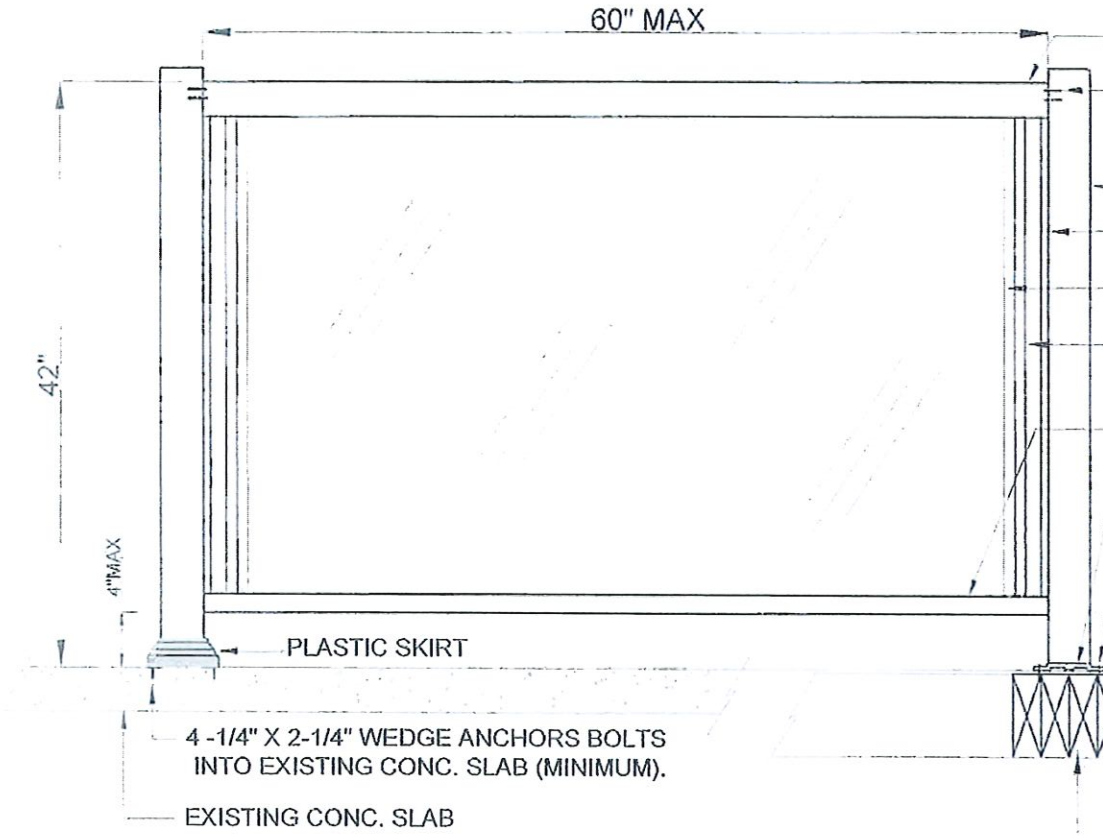
DS DESIGN STRUCTURAL

Client: CUT RITE CONSTRUCTION
Project Name:

Sheet Title: DECK CONNECTION 4'-0"x8'-0"
Drawn By: DS
Checked By: -
Project No.:
Scale: N.T.S.
Date: DECEMBER 2019
Drawing No.: SK-1
File Name:

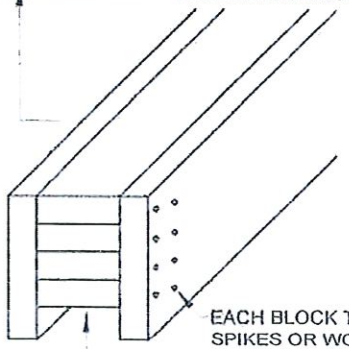
* PLATINUM
EMPRESS
ALUMA
SPRINT
ELITE
PRIMO

ALUMARAIL MFG INC.



WOOD BLOCKING OPTIONS:

WOOD BLOCKING CROSS SECTION

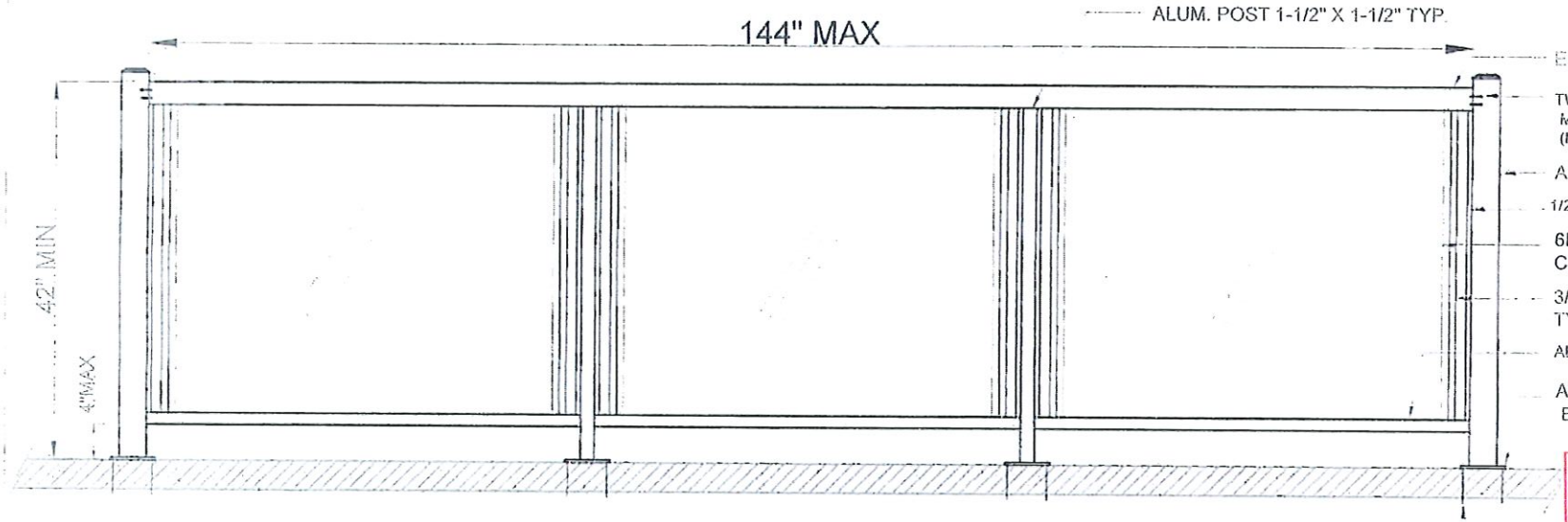


NOTES:

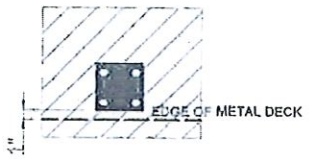
1. RAILING DESIGN IN ACCORDANCE WITH 2010 NATIONAL BUILDING CODE & 2012 ONTARIO BUILDING CODE + SB13 , PART 9 RESIDENTIAL
2. ALL RAILING MATERIAL ALUMINUM ALLOY 6063-T5
3. ALL COMPONENTS SHOULD BE FROM ALUMARAIL MFG INC. OTHERWISE THIS DRAWING IS VOIDED.

DATE: 18 / 01 / 2016	PROJECT NO.
SCALE: 1 / 2" = 1'-0'	DWG NO. GR1
DRAWN BY: ALUMARAIL MFG INC	

ALUMARAIL MFG INC.



LOCATE POST BASE FLANGE MIN. 1" FROM EDGE OF EVOLUTIONDECK METAL DECK EDECK625, AND INSTAL 4 BOLTS THROUGH CLEARANCE HOLE IN SURFACE FINISH ANS THROUGH STEEL DECKPAN, USING MIN.1/4" DIM. X 3.5" SAE GR. 2 GALVANIZED STEEL BOLTS, WITH MIN. CLAMP LOAD 1350 LBS. INSERT GALVANIZED WASHERS BETWEN BOLTS AND BASE FLANGE AND NUTS AND METAL DECK.



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LICENSED PROFESSIONAL ENGINEER
SIU H. E. LEUNG
2016-03-31
PROVINCE OF ONTARIO

DATE: 28 / 01 / 2016	PROJECT NO.
SCALE: 3 / 4" = 1'-0'	DWG NO.
DRAWN BY: ALUMARAIL MFG INC	GR1 INNER POST

Kollaard Associates
Engineers

210 Prescott Street
P.O. Box 189
Kemptville, Ontario K0G 1J0

Civil • Geotechnical •
Structural • Environmental •
Hydrogeology •

(613) 860-0923

FAX: (613) 258-0475

October 2, 2023 (Revised)

Kollaard File # 230726–S1

Phoenix Homes
18A Bentley Avenue
Ottawa, Ontario
K2E 6T8

Attn: Catherine Buck
Tel: 613-723-9227 x 191
Email: CBuck@phoenixhomes.ca

City of Ottawa
Building Services Branch
OCT 0 4 2023
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Re: Proposed Single Family Dwelling, 489 Duvernay Drive, Orleans, City of Ottawa, Kollaard Associates File # 230726

With regard to structural issues only, Kollaard Associates has reviewed the following drawings:

- Phoenix Homes, 489 Duvernay Drive, Sheets # 1 to 13, Dated 02/10/2023
- Grandor Lumber Inc., Roof Truss Layout, Job # B2300408, Dated 06/09/2023
- Grandor Lumber Inc., 3rd Floor Joist Layout, Job # B2300408-F, Dated 06/23/2023
- Grandor Lumber Inc., 2nd Floor Joist Layout, Job # B2300408-F, Dated 06/23/2023
- Grandor Lumber Inc., 1st Floor Joist Layout, Job # B2300408-F, Dated 06/23/2023

Kollaard Associates offers the following comments:

Third Floor Plan – Sheet # 5:

1. It is the opinion of Kollaard Associates that the proposed lintels and supporting posts shown on Phoenix Homes Sheet # 5 are adequate.

2. The proposed tall wall construction (including posts supporting lintels within the tall wall) shown on Phoenix Homes Sheet # 4 and Sheet # 1 are adequate.

3. Posts supporting girders may consist of built up 2x6 posts as indicated on Phoenix Homes Sheet # 5 and are laterally supported by plywood or OSB sheathing (i.e. posts form part of sheathed exterior walls unless noted).

4. Truss design is by others.

Second Floor Plan – Sheet # 4:

5. It is the opinion of Kollaard Associates that the proposed beams (not specified on the floor joist layout), lintels and supporting posts shown on Phoenix Homes Sheet # 4 are adequate.

6. Ramset a 2x6 to the top flange of the steel beams to fasten the above framing and top mounted joist hangers.

7. The proposed web packing of the steel beam to fasten face mounted beam hangers noted on Phoenix Homes Sheet # 4 is adequate.

8. On the exterior side of the W200x27 steel beam, pack the web of the steel beam and fasten the web packing to the web of the steel beam with 2 rows of ½" through bolts (c/w) nuts and washers @ staggered 16" o/c with the bolts located 2" from the top and bottom edges of the ledger. The 2x8 ledger is to be screwed to the ledger with ¼" x 4" SDS screws @ 8" o/c.

9. The proposed tall wall construction (including posts supporting lintels within the tall wall) shown on Sheet # 4 and Sheet # 1 are adequate.

10. Floor joist design and flush LVL beams within the floor structure are by the manufacturer. The posts supporting the flush LVL beams shown on Phoenix Homes Sheet # 4 are adequate.

Ground Floor Plan – Sheet # 3:

11. It is the opinion of Kollaard Associates that the proposed beams (not specified on the floor joist layout), lintels and supporting posts shown on Phoenix Homes Sheet # 3 are adequate.

12. Ramset a 2x6 to the top flange of the steel beams to fasten the above framing and top mounted joist hangers.

13. The proposed tall wall construction (including posts supporting lintels within the tall wall) shown on Sheet # 3 and Sheet # 1 are adequate.

14. Floor joist design and flush LVL beams within the floor structure are by the manufacturer. The posts supporting the flush LVL beams shown on Phoenix Homes Sheet # 3 are adequate.

Basement Plan – Sheet # 2:

15. It is the opinion of Kollaard Associates that the proposed beams and posts shown on Phoenix Homes Sheet # 2 are adequate.

16. Ramset a 2x6 to the top flange of the steel beams to fasten the above framing and top mounted joist hangers. The steel beams may be installed as simple spans or continuous over the intermediate post supports.

17. Unless otherwise designed by the stair manufacturer, the landing to the basement may consist of 2x8 joists @ 16" o/c, supported by 2x4 framed walls bearing on the basement slab.

18. The foundation walls adjacent the stairs to the basement are considered to be laterally unsupported as per 2012 OBC 9.15.4.3. The reinforcement around the window openings shown on Phoenix Homes Sheet # 2 is adequate to withstand the lateral earth pressures.

19. The foundation walls at the bottom of the window openings that exceed 47¼" in width (or the sum of the widths of the window openings exceed 25% of the length of the wall) are considered to be laterally unsupported as per 2012 OBC 9.15.4.3. The reinforcement around the window openings shown on Phoenix Homes Sheet # 2 is adequate to withstand the lateral earth pressures.

20. The remaining reinforced foundation walls (including offset side footings) noted on Phoenix Homes Sheet # 2 is adequate to withstand the lateral earth pressures.

21. The proposed strip footings, offset footings, interior pad footings and exterior pad footings shown on Phoenix Homes Sheet # 2 and Sheet # 1 are adequate.

22. Floor joist design, flush LVL beams within the floor structure and LVL lintels are by the manufacturer.

General Notes:

23. All gravity loads to be carried to foundation through solid blocking.

24. Roof truss design and flush girder trusses are by the manufacturer. Note that the roof truss manufacturer has designed the girder trusses mentioned in this report. The comments provided by Kollaard Associates in this report are based in part on the design indicated in the roof truss layout. If a different roof truss layout is used in construction, comments made in this report may no longer be valid. Provide Kollaard Associates with the full truss package prior to construction.

25. Floor joist design and flush LVL beams/lintels are by the manufacturer. Note that the floor joist supplier has designed the flush LVL beams/lintels shown on the building drawings and shown on the floor joist layouts. The comments provided by Kollaard Associates in this report are based in part on the design indicated in the floor joist layouts. If different floor joist layouts are used in construction, comments made in this report may no longer be valid.

26. All dimension lumber, except non-load bearing 8 ft 2x6 studs to be No.2 grade SPF or better.

27. Non-load bearing 8 ft 2x6 studs to be No.3 or Stud grade SPF or better.

28. All guards to be as per OBC SB-7, unless otherwise mentioned or designed by others.

29. The self supporting stairs and landings are to be designed by the stair manufacturer.

30. All brick lintels to be as per OBC Table 9.20.5.2.B.

31. Unless otherwise noted, LVL's to be 1.8E 3000Fb LVL's with 1¾" nominal width or better.

32. Pemco Steel adjustable posts are designed and approved by the manufacturer. The adjustable steel posts are designed for a maximum allowable load of 106.8 kN at a maximum height of 9'-3".

33. The assumed soil bearing resistance of 75 kPa is to be verified prior to construction.

34. Comments provided in this report are made in consideration of Part 9 and Part 4 (where applicable) of the 2012 OBC as amended.

35. This report constitutes a review of the structural information indicated on the building plans cited in this report for the client indicated above.

We trust this letter provides sufficient information for your present purposes. If you have any questions concerning this letter please do not hesitate to contact our office.

Sincerely,
Kollaard Associates Inc.

LICENSED PROFESSIONAL ENGINEER
2023/10/02
C. A. COGLIATI
100179650
PROVINCE OF ONTARIO

City of Ottawa
Building Services Branch
OCT 0 4 2023
Building Code Reviewed
Signature

Christopher Cogliati, P.Eng.