

re: Landscaping Plan Review - Block 22
Wateridge Village Residential Development - Phase 1B - Block 22
1400 Hemlock Road - Ottawa

to: Mattamy Homes - Mr. Conor Sutherland - Conor.Sutherland@mattamycorp.com

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file: PG5345-MEMO.01 Revision 1

Further to your request and authorization, Paterson Group (Paterson) prepared the current memorandum to provide a review of the landscaping drawings for Block 22 of the aforementioned residential development. It should be noted that Block 22 is located along both, City of Ottawa publicly owned roads and on a private road. The following memorandum should be read in conjunction with Paterson Report PG5345-1 Revision 1 dated September 10, 2020.

Landscaping Plan Review

Paterson reviewed the following landscaping plan prepared by Nak Design Strategies and grading plan prepared by DSEL regarding the aforementioned development:

- Landscape Plan - Block 22 - Job No. 20-076, Sheet No. L-01, Revision 4 dated September 30, 2020.
- Planting Plan - Block 22 - Job No. 20-076, Sheet No. L-02, Revision 4 dated September 30, 2020.
- Grading Plan - Wateridge Block 22 - Phase 1- Project No. 17-948, Sheet No. 3, Revision 11, dated June 23, 2020 (Received September 2020).

Blocks Adjacent to Publicly Owned Roads

Based on the landscaping plans provided, the proposed tree planting is in compliance with the recommendations provided by Paterson and is considered acceptable from a geotechnical perspective, provided the items noted below are addressed. Atterberg testing was completed at two (2) borehole locations across the overall site, all with plasticity index results of less than 40%. This satisfies the first condition for reducing the tree foundation setback to **4.5 m** in the City of Ottawa guideline "Tree Planting in Sensitive Marine Clay Soils - 2017 Guidelines." The following conditions are also required to be met based on the tree planting guidelines:

- The proposed trees should have a minimum setback of 4.5 m from the proposed foundation walls. Based on our review of the landscaping plan, a 4.5 m setback has been provided for all street trees, **with the exception of Block 2 - Unit 6**. It was noted that the 4.5 m setback intersected with the majority of stair and porch structures fronting onto a publicly owned road.

- The underside of footing is required to be 2.1 m below finished grade at the locations of the trees. Reference should be made to Table 1 below and following comments regarding the underside of footing elevations.
- Adequate soil volumes are required to be provided for the proposed trees - 25 cubic meters for small trees and 30 cubic meters for medium trees. This should be confirmed by the landscape architect.
- Tree species are required to be small to medium size, confirmed by the landscape architect. Reference should be made to the section below for comments regarding the tree species and appropriate setbacks from building foundation walls.
- The foundation walls are required to have a minimum of two 15-M bars in the upper and lower sections of the foundation walls. This should be indicated on the drawings for the relevant blocks foundation wall. Reference should be made to the additional comments below.
- Grading surrounding the tree should be designed to promote draining towards the tree root zone. This should be confirmed by the landscape architect and civil engineer.

Table 1 below provides a summary of the landscaping and grading information for the relevant Blocks:

Table 1 - Landscaping Plan and Grading Details					
Block - Unit	Underside of Footing Elevation	Lowest Prop. Finished Grade	Foundation Depth (m)	Underside of Engineered Pad (If Required)	Tree to Foundation (m)
1-1	89.20	89.48	0.28	87.38	5.3
1-2	89.20	89.56	0.36	87.46	6.6
1-3	89.20	89.64	0.44	87.54	6.7
1-4	89.20	89.73	0.53	87.63	6.4
1-5	89.20	89.81	0.90	88.00	7.8
1-6	89.20	90.13	0.93	88.03	7.8
2-1	89.37	90.13	0.76	88.03	7.7
2-2	89.37	90.02	0.65	87.92	6.4
2-3	89.37	90.10	0.73	88.00	6.6
2-4	89.37	90.18	0.81	88.08	6.4
2-5	89.37	90.26	0.89	88.40	6.4
2-6	89.37	90.34	0.97	88.50	3.1
3-1	89.23	90.13	0.90	88.03	6.1
3-2	89.23	90.16	0.93	88.06	7.2
3-3	89.23	90.18	0.95	88.08	6.3
3-4	89.23	90.20	0.97	88.10	7.2

Table 1 - Landscaping Plan and Grading Details					
Block - Unit	Underside of Footing Elevation	Lowest Prop. Finished Grade	Foundation Depth (m)	Underside of Engineered Pad (If Required)	Tree to Foundation (m)
3-5	89.23	90.22	0.99	88.12	6.5
3-6	89.23	90.25	1.02	88.15	6.1
4-1	87.57	89.46	1.89	87.36	8.4
4-2	87.57	89.64	2.07	87.54	8.6
4-3	87.57	89.64	2.07	87.54	8.6
4-4	87.57	89.64	2.07	87.54	8.6
4-5	87.57	89.64	2.07	87.54	8.5
4-6	87.57	89.89	1.90	87.79	5.9
4-7	87.57	89.86	2.29	N/A	N/A
4-8	87.57	89.83	1.80	N/A	N/A
4-9	87.57	89.79	2.22	N/A	N/A
4-10	87.57	89.69	1.70	N/A	N/A

Based on our review, the following outstanding issues need to be completed for the proposed development to qualify for the reduced tree planting setback:

Item A: Underside of Footing Elevation

Based on our review, a 2.1 m depth to underside of footing has not been provided for the blocks where trees have less than 10 m horizontal separation from the foundation wall.

Based on Paterson’s conversations with the City staff for Block 15, It is understood that the City of Ottawa is open to accept reducing the required soil cover down to 1.9 m provided additional measures are provided and approved by the geotechnical consultant. Therefore, it is assumed the same approved recommendations provided for Block 15 would apply for Block 22 based on the similar subsurface profiles encountered throughout the subject sites. The following summarizes our justification for a reduced soil cover based on the subsurface profile, groundwater table and the proposed tree planting setback:

Based on our review of the proposed site conditions, the proposed footings along the front of the lots can be placed with a minimum 1.9 m soil cover provided that a minimum 300 mm thick granular pad be placed between the underside of footing and the underlying silty clay deposit. The rationale for this is that tree roots cannot penetrate a compacted granular fill. In addition, the groundwater table is well below the granular pad which makes it too deep for the roots to reach and impact the underlying silty clay material that is considered consolidated as a result of the surcharge program. Therefore, provided a minimum 300 mm thick granular pad is in place, the 1.9 m soil cover between the underside of pad to finished grade is sufficient from a geotechnical perspective.

Based on our review of the proposed USF levels, it is our understanding that footing depths range between 0.28 to 2.3 m below proposed finished grade. To compensate for the reduced foundation depth, an engineered fill pad (OPSS Granular A or Granular B Type II) can be placed below the footing to a depth of 1.9 m below proposed finished grade surrounding the building. The engineered fill should be placed in 300 mm thick loose lifts and compacted to a minimum 98% of the material's SPMDD and approved by Paterson at the time of construction. The engineered fill pad will effectively increase the depth between the finished grade and the underlying silty clay deposit to the required 1.9 m which achieves the same goal as lowering the footing from a tree planting perspective. More recommendations will follow in Item D below. Reference can be made to Figure 1 attached for additional information.

These recommendations are required for Block 1, Block 2, Block 3 and Block 4 - Unit 1 through Unit 6.

Item B: Tree Species

The landscaping architect should confirm that the tree species placed within 7.5 m of the foundation wall consist of small and medium size trees with a mature tree height less than or equal to 14 m. It is understood that the tree heights listed on the plan are the mature heights of these trees in natural conditions and not in city conditions.

Item C: Additional Reinforcing Requirements

As required by the guidelines, the foundation walls should be provided with a minimum of two 15-M bars in the upper and lower sections of the foundation walls. This should be indicated on the relevant drawings and reviewed by Paterson at the time of construction. This requirement applies to **all residential structures** adjacent to ROW trees within Block 22 of Phase 1B.

Provided these remaining conditions have been met, the landscaping drawings noted above are in compliance with the City of Ottawa tree planting guidelines.

Item D: Trees within 4.5 m of Front Stairs or Porches

Based on our review of the above noted drawings, the footing depths were found to be at a minimum of 0.6 m below proposed finished grade or lower. Based on the newest tree planting guidelines, the footings need to be placed at a minimum depth of 2.1 m below finished grade or an approved reduced depth of 1.9 m..

It is understood that a number of the stair case structures have 2 or 3 risers extending horizontally beyond the foundation walls towards publicly owned roads within the 4.5 m allowable tree planting horizontal separation, which includes **Block 1, Block 2, Block 3 and Block 4 - Unit 1 through Unit 6.**

In order to avoid lowering the footings and/or have differential settlement due to part of the riser being within the 4.5 m tree setback, it is recommended that where the front porch footings/risers are located within the 4.5 m setback, a granular backfill be introduced. Where the 1.9 m soil cover is not satisfied, the native material within the footprint of the front porch footings should be sub-excavated to a maximum 300 below the USF level and replaced with a granular pad consisting of OPSS Granular A or Granular B Type II placed in 300 mm loose lifts and compacted to 98% of the material's SPMDD. The granular pad should only be extended horizontally a minimum of 600 mm beyond the face of the foundation wall (towards the interior side of the front porch). It is important to note that a minimum 3H:1V frost taper will be required to transition from the granular pad to the native soil. Please refer to Figure 1 attached.

In addition, the backfill against the front facing porch foundation should also be backfilled with the above noted granular material. The horizontal extent of the foundation wall backfill should be dependent on the extent of the risers above, a minimum of 300 mm wide layer should be provided beyond the lowest riser.

We trust that this information satisfies your immediate requirements.

Best Regards,

Paterson Group Inc.



Drew Petahtegoose, B.Eng.



Faisal I. Abou-Seido, P.Eng.

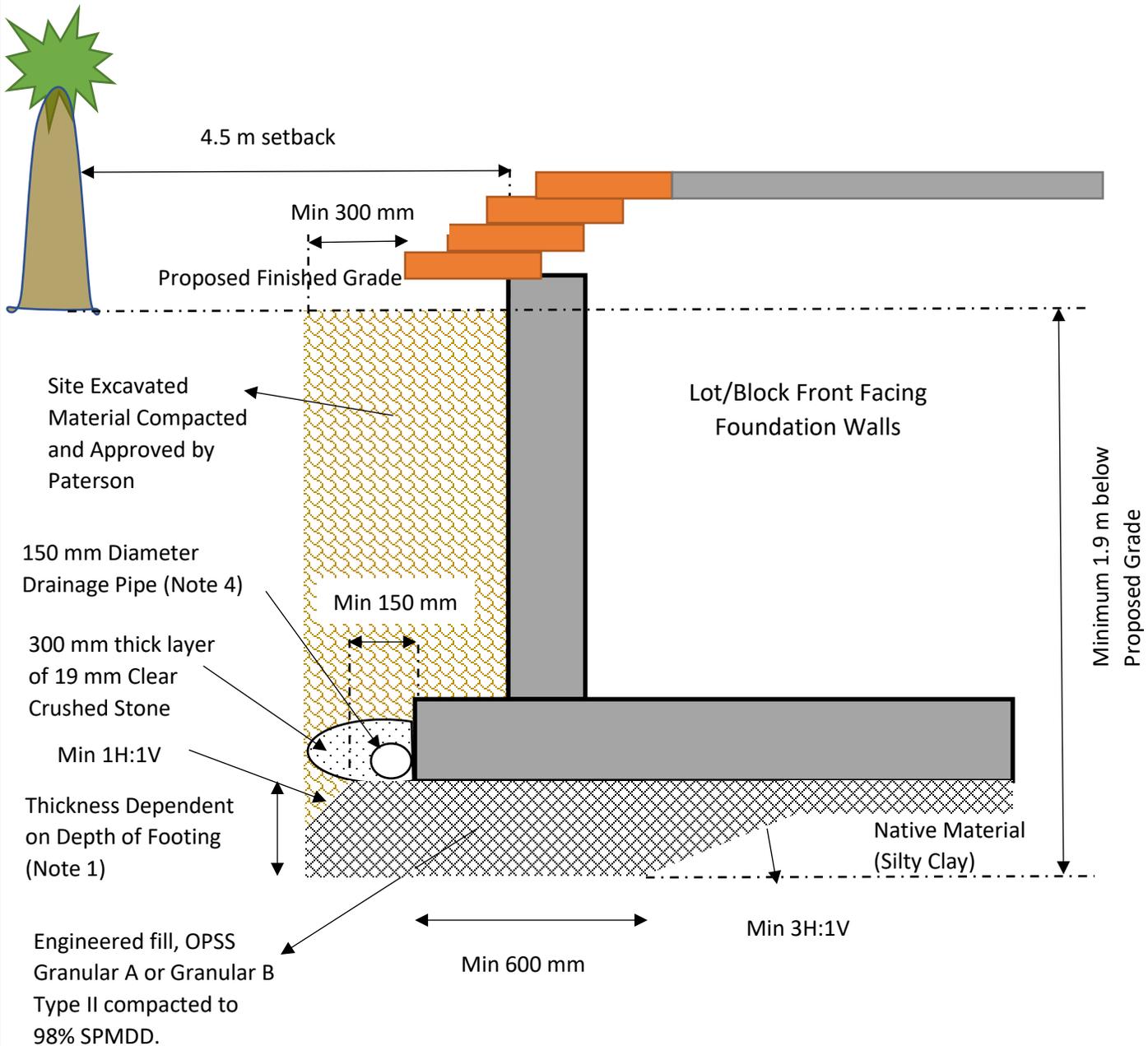
Paterson Group Inc.

Head Office and Laboratory
154 Colonnade Road South
Ottawa - Ontario - K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

Northern Office and Laboratory
63 Gibson Street
North Bay - Ontario - P1B 8Z4
Tel: (705) 472-5331 Fax: (705) 472-2334

St. Lawrence Office
993 Princess Street
Kingston - Ontario - K7L 1H3
Tel: (613) 542-7381

Figure 1 – Engineered Pad Below USF For Tree Planting Purposes



Notes:

- Note 1: Where front porch footings have a minimum depth below finished grade of 1.9 m, the granular pad below the footings will not be required.
- Note 2: The thickness of the engineered pad is dependent of the depth of footings below proposed grade. The thickness of the engineered pad can be calculated by subtracting the depth of footing from 1.9 m.
- Note 3: The placement of the engineered fill should be reviewed and approved in the field by Paterson personnel.
- Note 4: The 150 mm diameter perforated, corrugated drainage pipe should be geotextile wrapped, placed at the founding level and connected to a positive outlet with a gravity connection.