

Technical Memorandum

May 2, 2022

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| From | Sahar Soleimani/David Beauseigle | Ref. No. | 12560245 |
| Subject | Grading Plan Review for Ellwood House Development at 2262 Braeside Avenue, Ottawa, Ontario | | |

This technical memorandum provides a summary of the grading plan and engineering design review for the proposed Ellwood House development at 2262 Braeside Avenue (herein after referred to as “the site”) in Ottawa, Ontario.

It is noted that this summary should be read in conjunction with the previous geotechnical summary memorandum dated September 27, 2021, as well as the geotechnical report prepared for this property in 2018.

1. Background

In 2018, GHD Limited (GHD) completed a previous geotechnical investigation on the property for the development. The results of that investigation were provided in a report titled “Geotechnical Investigation, 2262 Braeside Avenue, Ottawa, Ontario” dated March 16, 2018 (11155186 | A1 | Report No. 1). That investigation included five boreholes advanced to depths varying between 2.2 metres (m) and 5.1 m and two monitoring wells within the footprint of the proposed building.

Based on the GHD 2018 report, the subsurface conditions consisted of deposits of topsoil or asphalt paved surface which in turn is underlain by fill material with variable thickness over shale bedrock of Billings formation. A thin layer of gravelly sandy silt glacial till overlaid the bedrock only at one borehole location at the north end of the site. The groundwater levels were found at depths of 2.2 m and 3.3 m below the ground surface (Elevations 96.7 m and 96.0 m).

The fill material extends to depths ranging from 1.7 m to 3.5 m (Elevations 97.6 m to 95.6 m). Practical refusal to auger advancement was encountered in all boreholes, at depths ranging from 2.2 to 3.5 m below the existing ground surface. Shale bedrock with limestone lamination was confirmed at three borehole locations at depths ranging from 1.7 to 3.5 m (Elevations 97.6 m to 95.1 m).

GHD also provided a geotechnical summary memorandum on September 27, 2021 to provide additional geotechnical design recommendations with respect to shoring, excavation impact to existing Ellwood House structure and groundwater control.

2. Grading Plan and Engineering Design Drawing Review

The following grading plan and design drawings prepared by Colizza Bruni Architecture and D. B. Gray Engineering Inc. have been provided to GHD for review:

- Drawing No. L1 – Landscape Plan, dated March 22, 2022

- Drawing No. SP1 – Site Plan, dated April 4, 2022
- Drawing No. C – 1 – Site Servicing Plan, dated April 14, 2022 (Revision 3)
- Drawing No. C – 2 – Existing Condition Removals and Decommissioning, dated April 14, 2022 (Revision 3)
- Drawing No. C – 3 – Grading Plan and Erosion Control, dated April 14, 2022 (Revision 3)
- Drawing No. C – 4 – Notes and Details, dated April 14, 2022 (Revision 3)
- Drawing No. C – 5 – Details, dated April 14, 2022 (Revision 3)
- Drawing No. C – 6 – Areas Changing from Soft to hard Surfaces, dated April 14, 2022 (Revision 3)
- Drawing No. C – 7 – Sub-Catchment Area Drainage Plan, dated April 14, 2022 (Revision 3)
- Drawing No. C – 8 – Stormwater Management Drainage Plan, dated April 14, 2022 (Revision 3)
- Drawing No. C – 9 – Predevelopment Drainage Plan, dated April 14, 2022 (Revision 3)

GHD has reviewed relevant drawings and information in Drawing Nos. SP1, C-1, C-3, and C-4.

2.1 Grade Raise Review

Table 2.1 summarizes the proposed grades at different corners of the proposed structure. According to these drawings, and the proposed finished grades, grade raises of up to 0.91 m is being considered near the proposed structure.

Based on the results of the geotechnical investigation, silty clay was not encountered at any of the boreholes advanced within the site. Therefore, from a foundation design perspective, no practical restrictions apply to the thickness of grade raise fill that may be placed within the proposed residential development area. Accordingly, no light weight fill is required.

In addition, there would be sufficient earth cover over the footing bearing surfaces for the house (i.e., greater than the 1.5 m required for frost protection) at this site.

Table 2.1 Summary of Grading Review and Grade Raise Restriction

| Location of Proposed Elwood House Structure | Front House Grade (m) | | | Underside of Footing (USF) Elevation (m) | Depth of Footing (USF) Elevation (m) | Serviceability Limit State (SLS) (kPa) | Ultimate Limit State (ULS) (kPa) | Lightweight Fill Requirement |
|---|-----------------------|----------|-------------|--|--------------------------------------|--|----------------------------------|------------------------------|
| | Existing | Proposed | Grade Raise | | | | | |
| North West Corner | 100.45 | 100.66 | 0.21 | 98.3 | 2.36 | 350 | 500 | No |
| North East Corner | 99.89 | 100.80 | 0.91 | | 2.50 | 350 | 500 | No |
| South East Corner | 101.44 | 101.45 | 0.01 | | 3.15 | 350 | 500 | No |
| South West Corner | 101.57 | 101.45 | -0.12 | | 3.15 | 350 | 500 | No |

2.2 Tree Restriction

It is understood 37 new trees, including six new trees adjacent to the proposed extension, are being proposed to be planted at the site. Based on the results of the previous investigation, sensitive silty clay was not present in any of the boreholes advanced at this site. Therefore, as per City of Ottawa Tree Planting Guideline, no geotechnical restriction applies to tree planting and the distance of trees to the foundation elements. However, it is recommended to keep trees further away from foundation elements, so tree roots do not interfere with the foundation causing any structural damage.

2.3 Foundations

It is considered that the proposed building could feasibly be supported on or within the weathered shale bedrock or glacial till using conventional spread footing foundations. As noted in the geotechnical report and memorandum footings placed on weathered shale bedrock or glacial till can be designed using a preliminary serviceability limit state (SLS) bearing capacity value of 350 kilopascal (kPa) . A factored ultimate limit states (ULS) bearing resistance of 500 kPa can be used for structural elements resting on weathered bedrock or glacial till.

It is understood that underside of footings is being proposed at elevation 98.3 m. Based on the previous geotechnical investigation, the subgrade will consist of fill material at this elevation. The surficial fill material and topsoil are not suitable for support of the foundation loads and should be removed from the foundation areas. Where required, Engineered Fill could be placed below a footing to raise grades to the design footing level. The Engineered Fill should consist of Granular B Type II and must be placed in maximum loose lift thicknesses of 0.2 m and compacted with suitable vibratory compaction equipment to 100 percent SPMDD. Engineered Fill for support of foundations should be placed extending downwards and outwards from the edge of footing at 2 horizontal to 1 vertical.

3. Closure

We trust that this memo provides sufficient information for your present requirements. If you have any questions concerning this memo, please do not hesitate to contact the undersigned.

Regards



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