

**re: Geotechnical Assessment of Existing Retaining Wall**  
**Proposed Commercial Development**  
**200 Maple Creek Court - Carp, ON**

**to:** Norris Construction Management Inc. - **Mr. Kristopher Norris** -  
kris@ncmhydrovac.com

**to:** Terlin Construction Ltd. - **Mr. Andrew Pinet** - andrew.pinet@terlin.ca

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Further to your request and authorization, Paterson Group (Paterson) prepared the following memorandum to provide a review and certification of the construction of the existing retaining wall installed by the owner along the east portion of the property at 200 Maple Creek Court.

The purpose of this review was to assess the stability of the existing retaining wall on the basis that it had been constructed as had been communicated by the owner's representative to Paterson personnel. It is understood that the existing retaining wall will remain in place as part of the proposed development. The design in which the retaining wall was built in accordance with and our visual observations of the current performance of the wall will be considered to provide a thorough analysis and provide certification to ensure the wall was built to the industry standards taken into consideration the global stability of the retaining wall structure.

## **Background**

It is understood that a retaining wall had been recently constructed within the rear portion of the subject site. At the time of construction, reviews had not been completed by a geotechnical consultant to verify that the construction of the subject retaining wall had been carried out in general conformance to a specific design. Furthermore, it is understood that construction had been carried out in reference to a retaining wall design that had been completed by others for a separate site.

## **Field Review**

### **Observations**

A site visit was completed on March 30, 2020 to review the existing retaining wall along the rear of the subject site. The existing retaining wall was observed to consist of non-battered (vertical) segmental concrete blocks and is approximately 1.8 to 2.4 m in height. The retaining wall blocks were measured to be 600 mm in width and height.

The top retaining wall blocks were observed not retaining any soils for the majority of the wall. Each row of blocks was observed to have been provided a layer of biaxial geogrid. The retained fill was observed to consist of a well-graded granular crushed stone with the largest diameter of stone was noted to be approximately 100 mm. The retained fill had been observed at the sides and top of the retaining wall to confirm the composition of the fill.

During our review it was noted that an older row of decorative blocks had been in place prior to the construction of the aforementioned existing retaining wall. The second observed upper row of blocks was observed to consist of non-battered segmental concrete blocks and is approximately 0.6 m wide and thick with the same block dimensions indicated above. The second upper row of blocks had been observed to be setback approximately 3.2 m from the rear face of the lower aforementioned retaining wall.

It was observed that the area behind the decorative blocks consisted of soil stockpiling and sorting. These operations would consist of heavy-trucks stockpiling soil which would be sorted by an excavator within a proximity of 4 to 6 m from the rear face of the upper retaining wall. At the time of our visit, the soil stockpile reached a height of approximately 2.5 m and its bottom was approximately 4 m from the rear face of the north corner of the upper retaining wall. The stockpiles were observed to consist of a high moisture content due to the rain and spring metlwater accumulating across their surfaces.

Photographs from our site visit are attached to the current memorandum report.

## **Provided Information**

As previously noted, the basis of this assessment is upon the information provided by the owners representative in regards to the construction of the subject retaining wall. Based on conversation with Terlin Construction personnel, the following considerations were undertaken throughout the construction of the retaining wall:

- ☐ The observed top of wall height and wall span are not subject to further additions and/or modifications.
- ☐ The bottom block had been founded upon a minimum 300 mm thick and 1.2 m wide granular base, which had been further founded upon a competent, native glacial till bearing medium.
- ☐ The observed retained fill consisted of well-graded, free draining crushed granular fill material which likely consisted of OPSS Granular B Type II.
- ☐ The owner has advised that the bottom of the wall had been provided a 150 mm diameter perforated pipe surrounded by 19 mm clear stone, and had been provided a gravity drain towards a catch basin located to the front of the property.
- ☐ Each layer of geogrid extends approximately 3 m away from the retaining wall.

Figure 1 attached to the present memorandum depicts a typical cross-section of the above-noted retaining wall construction as based on the information provided by the owner.

## Geotechnical Assessment

Based on the observations from the site visit and the information provided by Terlin Construction and the owner, the existing retaining wall is considered structurally stable and constructed in accordance with industry standards with a minimum global stability factor of safety of 1.5. Construction activities are not anticipated to affect the stability of the retaining wall from a geotechnical perspective.

## Additional Recommendations

Considering the heavy-tuck traffic and potential volume of soil that may be stockpiled along the rear portion of the walls, it's advised that the bottoms of soil stockpiles higher than 1.5 m should be setback a minimum of 4.0 m from the rear face of the uppermost retaining wall.

The area of retained soil behind the lower retaining wall should be clear of sloughing stockpile soil, construction debris and should not be used to store equipment and materials. Grades along the rear of the lower retaining wall should be sloped to promote positive drainage away from the wall and eliminate ponding of water. Furthermore, measures such as placement of a silt-fence barrier system along the length of the upper retaining wall and extending a minimum of 4 m away from the edge of the retaining wall should be considered. This measure would minimize the amount of soil sloughing from the stockpiles onto the retained backfill behind the lower wall.

We trust that this information satisfies your immediate requirements.

**Paterson Group Inc.**



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## Photographs from Site Visit – March 30, 2020

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Photo 1: Photo of existing lower retaining wall with an approximate height of 1.8 m.



Photo 2: Photo of north face of lower retaining wall. Some soil noted sloughing onto the retained fill from the existing stockpile uphill from the retaining wall.





## Photographs from Site Visit – March 30, 2020

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Photo 3: Photo of construction debris and excess stockpile soil along the top of the retaining wall.



# 200 MAPLE CREEK COURT

## Retaining Wall Schematic

← Fill Pile

