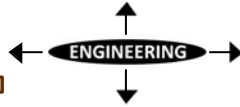


Environmental Safety Health Geotechnical

O'Reilly, Talbot & Okun
[A S S O C I A T E S]



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J2447-01-03
May 27, 2014

Mr. Jason Doornbos
Landmark Properties
455 Epps Bridge Parkway
Building 100, Suite 201
Athens, Georgia 30606

Re: Supplemental Test Pit Investigations
Proposed Housing Development, Retreat at Amherst
North Amherst, Massachusetts

Dear Mr. Doornbos:

We are pleased to provide this letter report documenting our supplemental investigations at the proposed Retreat at Amherst housing development in North Amherst, Massachusetts (Site). During November and December 2013, O'Reilly Talbot & Okun Associates, Inc. (OTO) performed 22 backhoe test pits at the Site to evaluate soil conditions along the proposed roadways, particularly in cut areas. This letter documents test pit excavation in areas not previously investigated.

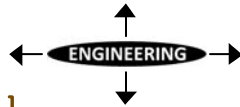
In general, soil conditions consisted of granular soils over bedrock. A description of subsurface conditions, along with preliminary recommendations, was provided in a preliminary geotechnical report dated December 20, 2013, which is attached as Appendix C. Since that time, the proposed layout for Roadway B has changed and additional test pits were performed to investigate conditions in new cut areas. These additional test pits are documented in this report.

In our preliminary geotechnical report, we recommended that borings be performed and rock cores be collected in areas where bedrock was encountered above cut elevations. These investigations are in progress and will be documented in a supplemental letter.

A Site Locus is attached as Figure 1. A Site Plan is attached as Figure 2. We note that Figure 2 has been updated to include the new roadway layout.

SITE CONDITIONS AND PROPOSED PROJECT

As described in our preliminary geotechnical report, the Site presently consists of wooded land that has been used for harvesting timber. It is undeveloped with the exception of overhead electrical transmission lines in the western part of the Site, and logging roads throughout the Site. An intermittent stream is located in the central and western portions of the Site. In general, the topography slopes from the east (elevation



500 feet) to the west (elevation 325 feet). The terrain varies greatly with hills and valleys throughout the parcel, and contains some steep slopes (up to 40 percent in the proposed development areas). We understand that grade changes of the proposed roadways will be ten percent or less. Cuts up to 28 feet and fills on the order of eight feet will be needed to achieve the proposed grades. In addition, underground utilities will extend to a depth below pavements, so the maximum cut will be greater than 28 feet. Proposed lots, roadways and existing ground surface topography are shown on Figure 2.

ADDITIONAL SUBSURFACE INVESTIGATIONS

As described above, the proposed layout for Roadway B has changed and includes a loop as shown on the attached Figure 2. Additional test pits were performed along this roadway alignment, particularly in cut areas, to observe soil conditions and to document the depth to bedrock, if encountered.

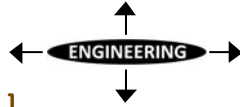
Supplemental explorations consisted of four backhoe test pits (designated TP-23 through TP-26) performed by Seaboard Drilling of Chicopee, Massachusetts on May 1, 2014. The test pits were performed using a Caterpillar 420 backhoe equipped with a 1/2 cubic yard bucket and were generally three feet wide and between seven and nine feet long. The test pits were performed along the proposed loop of Roadway B to observe the near subsurface soils, particularly in proposed cut areas. The investigations were observed by an O'Reilly, Talbot & Okun Associates, Inc. (OTO) geotechnical engineer. Test pit locations are shown on Figure 2. Test pit logs and photographs are attached as Appendix A and Appendix B respectively.

A summary of test pit information, including test pits performed during the initial investigations in 2013, is provided in Table 1. The location of each test pit (Roadway, Station and Offset, when available, the maximum depth of exploration and refusal information, along with existing and proposed grades for each of the test pits), is shown on Table 1. Elevation data is also presented in Table 1.

SOIL CONDITIONS

Soil conditions encountered in test pits TP-23 through TP-26 were similar to conditions encountered during our previous explorations. A summary of the soil conditions is discussed below.

The ground surface at test pit locations TP-23 through TP-26 was covered by five to ten inches of topsoil. In each of the test pits, brown, fine sand with little amounts of silt and trace amounts of medium sand and gravel were encountered beneath the topsoil layer. Tree roots were observed in this layer, which extend to a depth of two to three feet below ground surface in most areas. Beneath this layer, the subsurface soils consist of light brown to gray, fine sand with some to little amounts of gravel, little to trace amounts of silt, and trace amounts of medium and coarse sand. The amount of gravel present generally increases with depth. Numerous cobbles (diameter between three and six inches) and boulders (10 to 12 inches in diameter) were observed. The number and size of boulders observed are documented in the test pit logs. Each of the test pits



terminated within this layer at a depth between 8 and 10 feet below ground surface. No bedrock was encountered at test pit locations TP-23 to TP-26.

No groundwater was encountered in test pits TP-24 and TP-26. Groundwater was encountered in test pit TP-23 at a depth of four feet below ground surface. In addition, water was observed seeping into test pit TP-25 at a depth of four feet; however, the soils beneath this depth were dry, indicating a perched groundwater layer in this area. Therefore, at this time it appears that significant groundwater will not be encountered during roadway construction. However, perched groundwater may be encountered above the bedrock surface in localized areas, and surface water flow is expected during periods of wet weather.

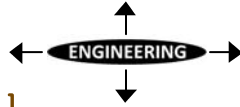
SUMMARY AND RECOMMENDATIONS

In summary, the soil conditions encountered in the supplemental test pits were similar to those encountered previously across the site. We note that bedrock was not encountered above anticipated cut depths for the new layout of Loop B. Therefore, it does not appear that significant rock excavations or blasting will be needed in this area.

Other recommendations provided in our December 20, 2013 report are appropriate, such as the use of on-site soils as engineered fills. At this time, it appears that most of the Site soils encountered are predominately granular and may be suitable for use as engineered fill, provided that oversized materials are removed. If on-Site soils are to be used as fill, we recommend that testing be performed on excavated materials to confirm that fill gradation requirements are met.

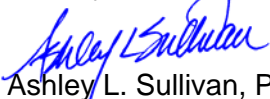
We note that our initial test pit investigations identified six areas where test pits were terminated above proposed roadway grades, either upon bedrock or large boulders, and portions of the roadway will require the excavation of bedrock or large boulders to achieve proposed Site grades. Other areas may also require bedrock excavation since the test pits were widely spread and the bedrock surface may vary locally.


Additional investigations are in progress to collect information regarding the bedrock and/or boulders. This information will be presented in a supplemental letter and can then be used by the owner for final design and to obtain unit prices for blasting and excavation. Once these investigations are performed, we will complete a final report that includes the results of all the investigations performed and provides construction and earthwork related recommendations.



We appreciate the opportunity to be of service on this project. If you have any questions, please call the undersigned.

Sincerely yours,
O'Reilly, Talbot & Okun Associates, Inc.


Ashley L. Sullivan, P.E.
Sr. Project Engineer


Michael J. Talbot, P.E.
Principal

Attachments:

- Figure 1 – Site Locus
- Figure 2 – Site Plan
- Table 1 – Test Pit Summary Table
- Appendix A – Test Pit Logs (May 2014)
- Appendix B – Test Pit Photos (May 2014)
- Appendix C – Preliminary Geotechnical Report (December 2013)

Ec: Tony Wonseski, SVE Associates

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