

General Summary

**GEOTECHNICAL EXPLORATION REPORT WOODS VILLAGE DEVELOPMENT
MONONGAHELA STREET PITTSBURGH, ALLEGHENY COUNTY, PENNSYLVANIA**

PS&R Project No. 21-218

**Prepared at the request of: Mr. Krish Pandya Managing Partner Oak Moss
Consulting 322 North Shore Drive Pittsburgh, PA 15212**

Prepared By: Pennsylvania Soil and Rock

March 14, 2022, Revised September 9, 2022

Pennsylvania Soil and Rock Incorporated March 14, 2022

Via Email Revised September 9, 2022

Project No.: 21-218 Mr. Krish Pandya Managing Partner Oak Moss Consulting 322 North Shore Drive Pittsburgh, PA 15212 krish.pandya@oakmossconsulting.com

Revised Geotechnical Exploration Report Woods Village Development Monongahela Street Pittsburgh, Allegheny County, Pennsylvania

Dear Mr. Pandya:

1.0 General Summary

Pennsylvania Soil and Rock, Inc. (PS&R) respectfully submits this revised report presenting the results of the geotechnical exploration for the proposed Woods Village Development on Monongahela Street and Chance Way between Tullymet Street and Berwick Street in Pittsburgh, Allegheny County, Pennsylvania, see Figure 1, Site Location Map, in Appendix A. This revised report incorporates the grading changes as presented in PVE, LLC's September 6th, 2022, Grading Plan (Drawing C-400) for the site. PS&R understands that 53 townhomes, with basements, are proposed on the approximately 2.4-acre site. Based on PVE's Grading Plan, the elevations at the site vary from 838 ft along Monongahela Street to elevation 880 ft in the northeast corner of the site.

The objectives of the geotechnical exploration were to provide an assessment of the nature, character and thickness of the soil, decomposed rock and bedrock within the project area. Pennsylvania Soil and Rock Incorporated Woods Village Development 2 March 14, 2022 Revised September 9, 2022 The scope of the geotechnical exploration included a test-drilling program to evaluate the existing site conditions, laboratory testing, analysis of the data collected, and preparation of this Geotechnical Exploration Report. The work was completed in general accordance with our revised proposal dated February 3rd, 2022.

Based on published literature, the primary coal seam beneath the site is the Pittsburgh Coal. According to the available mapping, the base of the Pittsburgh Coal is situated at approximately elevation 1075, which is above the ground surface at the site. Therefore, the Pittsburgh Coal seam has been eroded from the site in the geologic past and mine subsidence and/or mine related issues will not impact the design or construction of the proposed development.

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Eight Standard Penetration Test (SPT) borings were performed to provide an assessment of the existing subsurface conditions across the project area, see Drawing GE500, Plan and Location of Borings. The overburden soil at the site, in descending order, can be classified as topsoil, fill, colluvium, alluvium, decomposed rock and bedrock. Topsoil thicknesses of 1.0 and 1.5 feet were encountered at Borings B-6 and B-7, respectively. Either fill or colluvium was encountered at the surface of the remaining borings. Fill was encountered at the surface of four of the eight borings and the thickness varied from 1.5 (B-4) to 9.0 feet (B-8). Colluvium was encountered at the ground surface at Borings B-2 and B-5 and beneath the topsoil or fill at the remaining borings. The thickness of the colluvium varied from 4.5 (B-4) to over 31.5 feet (B-2). The colluvium generally consisted of light brown to gray, medium stiff to very stiff silty clay with some rock fragments. There are several gravel layers within the colluvium layer. The decomposed rock and bedrock encountered generally consisted of highly weathered gray to black carbonaceous shale or claystone.

Groundwater was detected at four of the eight borings upon completion of the borings. Groundwater depths of 25.6 (TB-3), 24.5 (TB-5), 28.2 (TB-6), 30.0 (TB-8) were measured in the boreholes. The groundwater detected in TB-3, TB-5, and TB-6 was in the lower part of the alluvium layer indicating that the bottom of the layer is saturated. The groundwater at TB-8 was in the colluvium layer. The boreholes were backfilled with soil cuttings on completion of each boring, therefore, 24-hour groundwater readings were not taken. Therefore, the steady state groundwater level may be higher than the groundwater levels measured at the completion of the borings. It should be noted that groundwater levels may fluctuate due to variations in rainfall, surface water fluctuations, temperature, site grading, and other factors not evident at the times these measurements were made. Those preparing design drawings, specifications, and construction plans should assume that variations will occur and that some dewatering may be necessary during construction. If a more accurate assessment of groundwater level is needed, Pennsylvania Soil and Rock Incorporated Woods Village Development 3 March 14, 2022 Revised September 9, 2022 monitoring wells or piezometers should be installed and monitored to assess groundwater levels and the range of potential groundwater fluctuations.

An approximately 42-foot elevation difference exists between the north and the south ends of the site. Therefore, some grading will be needed to create level building pads for the townhomes. After clearing and grubbing the site and prior to any fill placement, the proposed areas for townhomes and roadway development should be proof rolled. Proof rolling should be completed under the observation of the Geotechnical Engineer or their appointed representative, using a loaded triaxle dump truck (20-ton minimum loaded weight), large vibratory roller or similar weight construction equipment to help detect any soft or yielding areas. Any areas found to be unstable, that cannot be stabilized in-place, should be removed and replaced with suitable fill materials. The on-site soils are generally suitable for reuse as

engineered fill. If off-site soil is used as engineered fill at the site, the soil should be approved by the Geotechnical Engineer.

All engineered fill should be compacted until the in-place density is equal to or greater than 100 percent of the maximum Standard Proctor (ASTM D698) dry density as determined by ASTM D698 methods. All fill materials should be moisture conditioned to within 3 percent of the optimum moisture content at the time of placement. It is likely that some moisture conditioning of the on-site soils will be needed to reach the optimum moisture content for compaction. The moisture content of the fill materials should be maintained as deemed necessary to aid in attaining the required compaction and to maintain overall stability (minimal pumping, yielding and/or rutting). The foundations (frost depth and/or basement level) are generally anticipated to be founded on colluvium. However, foundation excavations in some areas could also encounter existing fill. Due to the potential for the presence of fill and nature of colluvium deposition, the strength of the material can randomly vary over small areas. Therefore, PS&R recommends that all foundation bearing surfaces and exposed basement and garage area subgrades be thoroughly densified / compacted and proofrolled upon the completion of their excavation. Any soft, loose, wet or otherwise unsuitable materials should be over excavated as required and replaced with engineered fill to provide adequate bearing. Provided the foundation bearing materials are verified by the Geotechnical Engineer on a structure-by-structure basis, the townhomes can be supported on conventional shallow foundations. Foundations bearing on stiff or better soil or engineered fill can be designed for a maximum bearing capacity of 2,000 pounds per square foot. Pennsylvania Soil and Rock Incorporated Woods Village Development 4 March 14, 2022 Revised September 9, 2022.

A slope stability analysis was performed on cross section C-C, which is the steepest cross section at the site. Cross-section C-C is shown on Drawing GE501. The cross-section locations are presented on Drawing GE500. A slope stability analysis was performed on the cross section and a factor of safety of 1.52 was obtained see plot in Appendix D. The factor of safety is above the industry standard 1.5 for the long-term stability of slopes. An approximately 280 feet long retaining wall is proposed along the eastern end of the development, see Drawing GE500. An approximately 280 feet long retaining wall is proposed behind the 12 units near the center of the site and on north side of Chance Way. The maximum exposed height of the retaining wall is 14 feet near the eastern end of the wall. A global stability analysis of the slope with retaining wall in place will need to be performed as part of the retaining wall design.