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December 3, 2020

Project PS1918096B

Mark Vail
Central Kitsap School District
9210 Silverdale Way NW
Silverdale WA 98383

Subject: Geotechnical Engineering Supplement No. 4: East Stairway Construction
Central Kitsap High School and Middle School Campus Redevelopment
3700 NW Anderson Hill Road/10130 Frontier Place NE, Silverdale, Washington

Dear Mr. Vail,

Wood Environment & Infrastructure Solutions, Inc. (Wood) is pleased to submit this geotechnical engineering letter for the Central Kitsap High School and Middle School Campus Redevelopment project. This letter addresses the construction of a stairway on the east slope, between Building 900 and Dahl Road NW, and is supplemental to our April 2017 Geotechnical Engineering Report for Central Kitsap High School and Middle School Redevelopment.

Project Development

We understand that students have been accessing the school grounds via Dahl Road NW by walking up the east slope and climbing over the chain-link fence located near the northeast corner of Building 900. A stairway was recently installed on the slope to improve accessibility and safety. It was constructed on the path that students had used, in a narrow, wooded section of the slope. Based on information provided by you, the stairway was constructed of pressure-treated timbers with a gravel infill; landings were constructed at the top and bottom of the stairway. We understand that minimal clearing/grubbing and excavation were necessary during construction, as this location was already clear of most vegetation by repeated foot traffic.

Geologically Hazardous Area Designation

Based on information provided by Kitsap County, the top stairway landing was constructed approximately 30 feet from the toe of a slope designated as a mapped Geologic Hazard Area (west slope). Additionally, the east slope adjacent to Dahl Road NW (upon which the stairway was constructed) could be considered a moderate-to-high hazard area due to its relatively steep grade. Based on Kitsap County Code (KCC) 19.400.435(A), the construction setback shall be equal to:

- the height of the slope (1:1 horizontal to vertical) plus the greater of one-third of the vertical slope height or 25 feet for high landslide hazard areas; or
- 40 feet from the top of slope for moderate landslide hazard areas.

Our review of Kitsap County online mapping tools indicates that the stairway does not meet the above setback requirements. Based on KCC 19.400.440 and our conversations with Kitsap County, we understand that a geotechnical assessment is necessary to evaluate the stability of the stairway and surrounding slopes. This letter addresses the general stability of the stairway considering its proximity to the mapped hazard area, in accordance with KCC 19.400.435(A) and 19.400.440(B).

Site Visit and Conclusions

A Wood geotechnical engineer visited the school grounds on November 17, 2020, to evaluate the visible condition of the east and west slopes. We observed that the stairs were constructed within shallow cut segments on the east slope and were placed at a slight angle to facilitate rainwater runoff. A small culvert, consisting of polyvinyl chloride (PVC) pipe, was installed at the bottom landing, adjacent to Dahl Road NW, and covered with gravel (Photo 1). We understand that the PVC pipe culvert was installed in order to accommodate water flow along an existing north-south ditch line at the base of the slope.



Photo 1: Stairway constructed on east slope; view facing west.

We used a 0.5-inch-diameter, steel T-probe to evaluate the relative density of surficial soil adjacent to the stairway. On either side of the stairway, we generally observed a thin layer (approximately 0.5 foot) of loose material, underlain by relatively dense soil. The loose surficial layer likely consists of spoils from the stairway excavation that were placed back onto the slope. We observed that the construction of the stairway did not significantly disturb the native slope soils (e.g., large, unsupported cuts were not required to install the stairway). Likewise, we did not observe features such as surficial creep on the east or west slope.

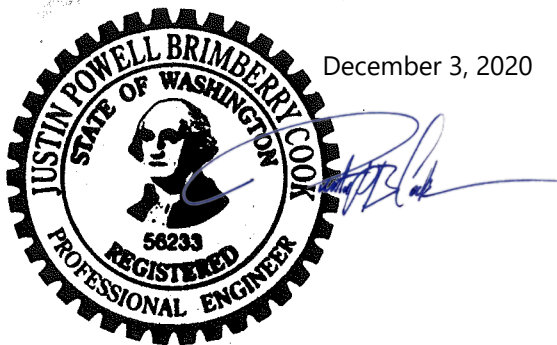
We reviewed test pit TP-4, excavated approximately 160 feet north of the stairway location in 1991 (conducted under our former name of Rittenhouse-Zeman & Associates, Inc.). The soils in TP-4 were dense fill consisting of silty sand to about 5.5 to 7 feet below ground surface. This layer was underlain by glacial till consisting of very dense, silty sand to the bottom of TP-4 (approximately 8 feet below ground surface). Based on our recent field observations and the relatively dense soils encountered in TP-4, it is our opinion that the stairway and surrounding slopes are stable, and the construction did not affect the mapped geologic hazard area.

We recommend that the PVC pipe at the bottom landing of the stairway be regularly cleaned of leaves and other organic debris to maintain water flow along the ditch line. In accordance with KCC 19.400.435(A), we recommend that any areas that were cleared and grubbed during construction (i.e., on either side of the stairway) be revegetated with native plants to promote erosion control.

If you have any questions or need additional information, please feel free to contact our office.

Sincerely,

Wood Environment & Infrastructure Solutions, Inc.



December 3, 2020

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A handwritten signature in black ink that reads "Todd D. Wentworth".

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