



March 4, 2024
ES-0593.05

Earth Solutions NW LLC

Geotechnical Engineering, Construction
Observation/Testing and Environmental Services

RM Homes, LLC
2913 – 5th Avenue Northeast, Suite 201
Puyallup, Washington 98372

Attention: James Kerby

**Subject: Response to Comments
Normandy Heights
2007 Shaw Road
Puyallup, Washington**

Greetings:

As requested by Barghausen Consulting Engineers, Inc. (BCE), Earth Solutions NW, LLC (ESNW) has prepared this response to comments letter for the proposed Normandy Heights residential project. Since the preparation of our geotechnical engineering study (henceforth referred to as “the study”), supporting documents, and the referenced Development Review Team (DRT) letter, we understand that site layouts have been revised.

Site & Project Description

The property is located at the northeast corner of the intersection between Shaw Road East and Crystal Ridge Drive South, in Puyallup, Washington. The property consists of Pierce County parcel number 042035-4039 and totals a gross site area of about 7.35 acres. We understand that current site layouts include the development of 25 homes sites, associated infrastructure improvements, and critical area tract designations. Stormwater management is currently proposed via a stormwater detention vault located within the northeastern site extent of the development. Grading activities will include significant cut and fill operations (on the order of tens of feet in some areas) but will generally maintain a similar northeastern declination, which is current present on site. The building lots will primarily be stepped and grades will be resolved via minor slopes and/or engineered landscape walls.

RESPONSE TO COMMENTS

The following sections provide our response to geotechnically relevant DRT comments issued by the City of Puyallup. The proceeding responses are based on the subsurface soil and groundwater conditions encountered at the time of our excoriations and our understanding of current site layout designs. For the intent of this response letter, comments provided as bullet-points will be numerically ordered in each applicable review section.

Planning Review

Comment 9 (Page 3): The section of the critical areas review in the May 3, 2022 study is incomplete. Please provide revisions and analysis of slopes and critical areas. Please note that areas of sites that exceed 40 percent slopes are critical areas that cannot be modified if those areas are consistent with PMC 21.06.1210(3). Also see PMC 21.06.1230(I) regarding prohibition of 40 percent slope modifications. GIS and topo lines appear to show 40 percent slopes on site.

ESNW Response: We understand that updated topographic and slope delineations have indicated the presence of isolated slope features which exceed a gradient of 40 percent. These features are primarily contained within the proposed Tract C and D site areas, which will not to be modified with the proposed development. Based on our review of the referenced site plan, these slopes are less than 25 feet in height.

Pursuant to PMC 21.06.1240.1a(iii), slopes with a vertical elevation of more than 10 feet but less than 25 feet may utilize a buffer that is equal to the height of the slope divided by two. This provision is contingent on the condition that no other factors that pose a risk to local slope stability are present. Given the relatively isolated extent of the subject slopes and present soil conditions, it is our geotechnical opinion that the project can feasibly pursue the reduced slope buffer, as previously cited, without altering current slope stability characteristics in each respective area.

Engineering Review

Comment 34 (Page 6): Further clarification is needed here. It appears that the geotechnical engineer only investigated the native soils. The existing site is being substantially regraded and fill, up to 32 feet. Is it not possible to construct permeable pavements on the imported fill considered the Ecology Manual allows a minimum feasibility infiltration rate of 0.3 in/hr.? However, there may be other BMP infeasibility criteria outlined in the Ecology Manual that would prevent the use of permeable pavement. For example, downstream impacts associated with lateral flow, or potential erosion hazards, and/or slope stability concerns due to infiltrated stormwater, but the current application materials do not appear sufficient to support a definitive project-wide infeasibility determination for the use of permeable pavement on the imported fill.

ESNW Response: The first part of this comment is confusing, as it is local standard of practice for a geotechnical evaluation to explore native soils on a site. We request clarification from the reviewer if this comment was stated accurately. At the time of our fieldwork, the site was not under active construction and did not appear to have been heavily modified via fill earthwork operations; therefore, our site investigation was appropriate.

From a geotechnical standpoint, utilizing infiltration BMPs is not recommended from the project. Although areas of relatively clean sands and gravels were observed, the overall native soil conditions were generally variable with areas of silt and silty sand dominated soils having also been encountered. Furthermore, the site maintains overall northeasterly declinations with slopes present within and adjacent to the property area. In general, this topographic condition will be maintained with the proposed development. On this basis, it is anticipated that surface and subsurface water flows will drain to the northeast towards slopes and adjacent properties in the post-development condition.

The comment suggests the viability of using fill material for the purpose of LID BMPs. While technically feasible, the process of selectively screening and quality control of any fill (native sourced or imported) is infeasible for practical design and construction, particularly considering the site conditions that prove infiltration into native soils is not recommended. Furthermore, compaction of any fill to the specifications of structural fill would severely reduce the infiltration capacity of that material. On this basis, the focus of any fill activities should be on creating suitable conditions for support of the home sites, infrastructure, and any other structural elements.

Comment 58 (Page 7): Further classification is needed here. It appears that ESNW was simply informed that detention will be used rather than a geotechnical recommendation addressing the feasibility of onsite BMPs per the Ecology Manual, Minimum Requirement 5. This sentence seems to only address the existing native soils. The existing site is being substantially regraded and filled up to 32 feet deep. Is it not possible to construct permeable pavements on the imported fill considering the Ecology Manual allows a minimum feasibility infiltration rate of 0.3 in/hr.? However, there may be other BMP infeasibility criteria outlined in the Ecology Manual that would prevent the use of permeable pavement. For example, downstream impacts associated with lateral flow, or potential erosion hazards, and/or slope stability concerns due to infiltrated stormwater, but the current application materials do not appear sufficient to support a definitive project-wide infeasibility determination for the use of permeable pavement on the imported fill.

ESNW Response: From a geotechnical standpoint, utilizing infiltration BMPs is not recommended from the project. Although areas of relatively clean sands and gravels were observed, the overall native soil conditions were generally variable with areas of silt and silty sand dominated soils having also been encountered. Furthermore, the site maintains overall northeasterly declinations with slopes present within and adjacent to the property area. In general, this topographic condition will be maintained with the proposed development. On this basis, it is anticipated that surface and subsurface water flows will drain to the northeast towards slopes and adjacent properties in the post-development condition.

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Conditions – Engineering Division (General: Stormwater/Erosion Control)

Comment 12 (Page 13): Upon submission of any geotechnical infiltration testing, appropriate long-term correction factors shall be noted for any areas utilizing infiltration into the underlying native soils in accordance with the Ecology Manual, Volume III, Chapter 3. Provide long-term infiltration rate calculation in the stormwater reports.

ESNW Response: As discussed in Engineering Review Comments 34 and 58, infiltration is not recommended for the project based on the following:

- Existing topography of the site and presence of slope areas.
- Proposed overall stepped and northeasterly descending proposed gradient of the project area.
- Inherent variability associated with fill activities and alteration of innate infiltration characteristics of that material once sufficiently compacted to the specifications of structure fill.

Comment 14 – Item 5 and 6 (Page 13): At the time of civil application, the applicant shall further investigate the feasibility/infeasibility of implementing Minimum Requirement #5 permeable pavement based on the final grading plan (cut/fill areas) for the project. If permeable pavement is deemed feasible, the project shall conduct confirmation infiltration testing of the imported fill at the time of construction.

ESNW Response: As discussed in Comments 34 and 58 above, using placed and compacted fill for infiltration is not recommended for the project. Based on a review of the referenced site plan, fill used in grading operations will originate from the site as there is an estimated excess of cut material. It is anticipated that soils sourced for use as fill will possess a degree of variability, and as such, quality control with respect screening applicable soil for use as fill within infiltration BMPs areas is not feasible for practical construction and design. Furthermore, compaction of fill material will alter the innate infiltration characteristics and will significantly reduce infiltration potential.

Conditions – Engineering Division (General: Grading)

Comment 2 (Page 16): A geotechnical report conforming to all requirements of PMC sections 21.14.150 and 21.14.160 will be required prior to issuance of the first building permit. The report shall be prepared by a civil engineer or engineering geologist licensed in the State of Washington. Prior to final acceptance of this project, the author of the report shall provide certification to the City of the following: The project was constructed in accordance with the recommendations contained within the report, and, any building lot within the site suitable for building up to a maximum safe bearing load expressed in psf.

ESNW Response: The above requirements and documentation are typically provided following the completion of mass earthwork activities on the site. ESNW is available to provide earthwork observations and testing services for the project and the requested documentation at the appropriate stage of construction.


Additional Services

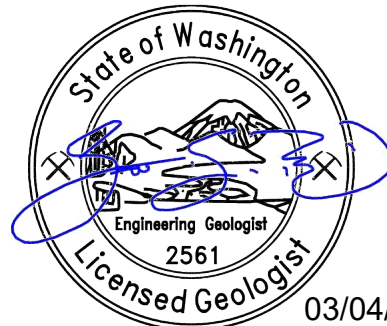
ESNW should have an opportunity to review the final designs concerning the geotechnical recommendations provided in this evaluation. ESNW should also be retained to provide testing and consultation services during the vertical phase of construction.

We trust this letter meets your current needs. Should you have any questions, or if additional information is required, please call.

Sincerely,

EARTH SOLUTIONS NW, LLC


Chase G. Halsen, L.G., L.E.G.
Project Manager



03/04/2024

Scott S. Riegel

Scott S. Riegel, L.G., L.E.G.
Associate Principal Geologist

cc: Barghausen Consulting Engineers, Inc.
Attention: Tyler Murphy
Cara Visintainer

References:

- Geotechnical Engineering Study, prepared by ESNW, ES-0593, updated May 3, 2022
- Geotechnical Addendum, prepared by ESNW, ES-0593.05, dated June 19, 2023
- Preliminary Grading and Utility Layout, prepared by BCE, Job No. 12663, Sheet C3 of 3, dated January 18, 2024
- Development Review Team Letter, prepared by the City of Puyallup Planning Division, dated September 28, 2022