



Earth
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City of Camas
Community Development Department
616 Northeast 4th Avenue
Camas, Washington 98607
Attention: Madeline Sutherland

Phone: 360-817-7237
E-mail: msutherland@cityofcamas.us

**Subject: Geotechnical Peer Review #4
Proposed Hidden Ridge Estates Residential Subdivision
Northeast Ingle Road
Camas, Clark County, Washington
EEI Report No. 20-013-4**

Dear Ms. Sutherland:

As requested, **Earth Engineers, Inc. (EEI)** has completed a geotechnical review for the project referenced above. EEI previously issued the following peer review reports for this project:

- EEI Report No. 20-013-1 dated February 3, 2020
- EEI Report No. 20-013-2 dated February 20, 2020.

In those reports we issued several comments related to our peer review of the July 13, 2019 report by Engineering Northwest PLLC titled "Geotechnical Engineering Study for Hidden Ridge Estates, City of Camas, Washington." Ultimately, we recommended that Engineering Northwest revise their geotechnical report and resubmit.

- EEI Report No. 20-013-3 dated March 3, 2020. This EEI report was issued to respond to an updated geotechnical report received from Engineering Northwest. After reviewing the updated Engineering Northwest report, we still had questions about their geotechnical recommendations and recommended that Engineering Northwest resubmit again.

We have now been forwarded a new report titled "Critical Area Report for Parcel # 253124-000" by Engineering Northwest. We could not find a date on the report. The PE stamp on the report was dated February 2, 2020.

Based on our review of that report, we have the following comments:

1. The geotechnical report still makes no reference to the project drawings. In addition, the drawings make no reference to the July 13, 2019 report. For clarity, if the drawings are based on the geotechnical report, it should be so stated on the drawings. In addition, the geotechnical report should state that the drawings have been reviewed and are in compliance with the geotechnical recommendations. We would expect that the geotechnical report would have a date more recent than the date of the drawings as it would not be possible to review the drawings before the drawings are created. **We recommend the City consider making it a condition of approval that the geotechnical consultant issue a supplemental report noting that the project drawings have been reviewed and are in compliance with the geotechnical reports.**
2. In our first geotechnical review, we had suggested that 1 test pit did not meet the geotechnical engineering standard of care for a property of this size—especially a property with slopes and a designated geotechnical hazard area (see Sheet C000). Based on reviewing their revised reports, it appears that Engineering NW has chosen to not perform any additional subsurface explorations, or to provide recommendations on how they are going to confirm the subsurface conditions within the bearing stratum of structures further along in the project. It is still our professional opinion that 1 exploration location is not sufficient for a property of this size. **We recommend the City consider making it a condition of approval that prior to construction, the geotechnical consultant perform supplemental subsurface explorations to confirm the subsurface conditions are acceptable. The explorations should include an evaluation of soil strength (i.e. pocket penetrometer readings, dynamic cone penetrometer readings, vane shear readings, SPT readings, or some other acceptable method of evaluating soil strength).**
3. We still have concerns that the geotechnical reports sometimes refer to the site soils as “clay” and sometimes as “silt.” When the nomenclature in a geotechnical report is not consistent, it can lead to confusion later in the project design and construction phases. However, it is our professional opinion that this discrepancy is not significant enough to not approve the project. **We are not recommending any conditions of approval for this item.**
4. We still have concerns that the geotechnical reports state that lab tests were performed that are not reported. However, it is our professional opinion that this discrepancy is not significant enough to not approve the project. **We are not recommending any conditions of approval for this item.**
5. We still have concerns that the geotechnical reports state that the soil is classified as a clay. Clay soils in the Camas area are known to be potentially expansive. The reports do not state whether the clay soils encountered on the site were tested so that they could be evaluated for expansion potential (i.e. Expansion Index lab test). **We recommend the City consider making it a condition of approval that prior to construction, the geotechnical consultant evaluate whether the site clay soils are**

potentially expansive. If they are, then geotechnical recommendations should be provided to mitigate that risk.

6. We still have concerns that a 6-foot deep geotechnical test pit was loosely backfilled and Engineering Northwest recommends that only the top 3 feet of the loose backfill be recompacted. This recommendation would leave 3 feet of poorly compacted test pit backfill in place, which could lead to settlement. **We recommend the City consider making it a condition of approval that prior to construction, the test pit be fully excavated and backfilled with properly compacted structural fill in accordance with Engineering Northwest's recommendations. The backfill should be inspected and approved by the geotechnical engineer.**
7. We still have concerns that the geotechnical reports have conflicting recommendations for the required minimum compaction of structural fill (90 versus 92 percent). **We recommend the City consider making it a condition of approval that prior to construction, Engineering Northwest issue a supplemental report clarifying the required percent compaction requirement.**
8. We still have concerns that the geotechnical reports have incorrectly noted that undocumented fill (sand and gravel) was encountered at the site. In reviewing the exploration log (TP-1) for this project, we did not see a note about existing sand and gravel fill being present. **We recommend the City consider making it a condition of approval that prior to construction, Engineering Northwest issue a supplemental report clarifying if existing fill soils are present on the property and any necessary mitigation measures.**
9. We still have concerns that the geotechnical reports do not make it clear what the acceptable bearing soil are, based on their subsurface investigation. **We recommend the City consider making it a condition of approval that prior to construction, Engineering Northwest issue a supplemental report clarifying the acceptable foundation bearing soils.**
10. We still have concerns that the geotechnical reports provide a *preliminary* Site Class recommendation. Ultimately, the project should be designed based on a *final* Site Class recommendation--in accordance with the currently adopted version of the IBC, not the outdated 2009 version. We also recommend they take another look at the Site Class recommendation. The report recommends site Class C, but that is not supported by the subsurface information presented in the report. Engineering NW should provide justification (i.e. the calculation) for how they determined Site Class C from their subsurface investigation. It appears that Site Class D is likely to be more appropriate. **We recommend the City consider making it a condition of approval that prior to construction, Engineering Northwest issue a supplemental report finalizing the Site Class recommendation.**
11. We still have concerns that the geotechnical reports do not provide consistent utility trench backfill compaction requirements. **We recommend the City consider making it**

a condition of approval that prior to construction, Engineering Northwest issue a supplemental report with consistent utility trench backfill recommendations.

12. The newest report we have received for review does not appear to address the following requirements of Camas Municipal Code (CMC) Chapter 16.59.060—Critical Area Report Requirements for Geologically Hazardous Areas:
- a. Identification of geologically hazardous areas in the report, including the type and extent of the geological hazard, and the reason the area is or is not likely to be impacted by the proposed development plan (reference Section C.1.a). In particular, previous reports from Engineering Northwest discussed expansive clay soils. The hazard of expansive soils has not been fully addressed and no mitigation recommendations have been provided.
 - b. Description of proposed grading, areas proposed for storage of materials, proposed storm drainage areas (reference Section C.1.b). These items are shown on the Civil drawings, but there is no discussion or recommendations in the geotechnical report as required.
 - c. A recommendation for whether any areas of the project require a minimum setback from geologically hazard areas, or not (reference Section C.5). The Critical Area Report does provide a minimum geotechnical setback of 15 feet from the top of slopes, but there is no engineering discussion or analysis demonstrating why that 15-foot setback is appropriate.

With regard to general compliance with Camas Municipal Code (CMC) 16.59.060 and general geotechnical engineering standard of care, it is our professional opinion that the geotechnical report provided to us still does not satisfy the intent of the code section or standard of care.

It is also our professional opinion that none of the items listed above would prevent the project from ultimately being approved by the City of Camas. The site does appear generally appropriate for the project being considered. Our main concern is that the geotechnical reports are inconsistent and lacking in detail. As such, we feel comfortable recommending that the City address all of these items through the conditions of approval process at a later date, if the applicant is not going to address them with a revised geotechnical report at this time.

If you have any questions pertaining to this report, or if we may be of further service, please contact Troy Hull at 360-567-1806 (office) or 360-903-2784 (cell).

Sincerely,
Earth Engineers, Inc.



Troy Hull, P.E.
Principal Geotechnical Engineer