



May 21, 2019
Updated September 30, 2019
ES-4316.03

Earth Solutions NW LLC

Geotechnical Engineering, Construction
Observation/Testing and Environmental Services

Ms. Jennifer Brenes
2675 – 74th Avenue Southeast
Mercer Island, Washington 98040

Subject: Plan Review
Single-Family Residential Improvements
2675 – 74th Avenue Southeast
Mercer Island, Washington

Reference: Mercer Island City Code (MICC) Ordinance 19C-05

Living Shelter Architects, PLLC
C.A.D. Application Narrative, dated April 20, 2019
Architectural Plans, dated May 10, 2019
Landscape Plan, dated July 5, 2019

Swenson Say Faget
Structural Plans, dated May 8, 2019

Earth Solutions NW, LLC
Geotechnical Consulting Services Letter
Project No. ES-4316, dated March 17, 2016

Greetings, Ms. Brenes:

As requested by Living Shelter Architects, PLLC (LSA), Earth Solutions NW, LLC (ESNW) has prepared this plan review letter for the subject project. The pertinent documents for this plan review were the referenced C.A.D. narrative, architectural plans, landscape plan, and structural plans. Our review of each proposed improvement and/or activity, as well as appropriate geotechnical recommendations (as necessary), are provided in this letter.

This letter was updated to be consistent with August 2019 updates to the MICC. This letter was also updated as a result of a discussion with Mr. Gareth Reece, Senior Plans Examiner for the City of Mercer Island (City).

Proposed Improvements

Based on our review, multiple improvements are proposed to the property. Each improvement is outlined below, along with our pertinent geotechnical recommendations and/or opinions.

Landscaping

We understand permanent landscaping features around the northern and eastern sides of the residence include the following:

- On the north slope area, landscaping rockeries (installed consistent with existing topography; see the *North Slope Rockeries* section below), several tree and/or bush species, and jute fabric and staples (for stabilization) are called out. Native vegetation is to be maintained. Downspout connections were installed to direct flow toward a catch basin near the northeastern property corner, providing improved control over the previous condition where flow discharged directly onto the slope.
- On the east slope area, areas of gravel and/or cobblestone, several tree and/or brush species, and jute fabric and staples (for stabilization) are called out. Native vegetation is to be maintained.

Based on our review, the proposed landscaping improvements are feasible from a geotechnical standpoint. The installed permanent landscaping features are anticipated to be successful in mitigating long-term erosion. The landscaping additions did not involve grade cuts or fills, did not alter the slope (as an "alteration" is defined in MICC 19.16.010), and are not expected to adversely impact the slope.

Reconstruct Garage, Entry, and Living Space

We understand the existing carport and entry area southeast of the residence will be removed, and a new two-car garage and entry area will be constructed. A living space will be constructed above the new garage.

Based on our review, the proposed improvements are feasible from a geotechnical standpoint. The plans have incorporated the recommendations provided in the referenced geotechnical consulting services letter (letter). ESNW should be contacted to observe earthwork and grading activities for the garage and entry area during construction.

North Slope Rockeries

We understand two rockeries were installed in the north slope area without a permit. It is noted ESNW was not aware of the rockeries until after construction was completed. Remedial activities will include removing the lower rockery (roughly 70 lineal feet) and attempting to permit construction of the existing upper rockery (roughly 40 to 45 lineal feet).

Based on our review, the proposed remedial activities are feasible from a geotechnical standpoint. ESNW observed the completed rockery installations in July 2018 as part of prior consulting services. Based on our field observations, the rockeries did not involve grade cuts or fills, did not alter the slope (as an "alteration" is defined in MICC 19.16.010), and are not expected to adversely impact the slope. ESNW should be contacted to observe removal of the lower rockery prior to commencement of deconstruction.

Reduce Deck Areas and Install CIP Retaining Walls

We understand both the existing decks and several gravel areas will be removed, and a new "reduced section" of deck space will be constructed around the western, northern, and eastern sides of the residence. Cast-in-place (CIP) retaining walls will be installed to create level grades (for lawn space) where the existing decks are proposed to be removed.

Based on our review, the proposed improvements and/or remedial activities are feasible from a geotechnical standpoint. The plans have incorporated appropriate design parameters and recommendations, as provided in the letter. ESNW should be contacted to observe removal of existing deck areas and subsequent construction of new deck areas. While ESNW is not directly involved in CIP wall design, we recommend ESNW be contacted to observe earthwork activities relating to CIP wall construction given the sensitive nature of the site.

Repair North Residence Wing

We understand support of the north residence wing will be improved by installing pin piles. To support deck space on the north residence wing, the existing cantilevered beams will be replaced by posts and footings.

Based on our review, the proposed structural improvements are feasible from a geotechnical standpoint. The referenced structural plans have incorporated appropriate design parameters and recommendations, as provided in the letter. ESNW should be contacted to observe pin-pile installation on a full-time basis to confirm construction conditions are as anticipated in the letter, specifically to confirm appropriate bearing conditions and pile refusal criteria are met during construction.

Review of MICC 19.07.160

We reviewed MICC 19.07.160, which defines geologically hazardous areas and criteria associated with such areas, to evaluate project compliance with required conditions.

Alterations of Geologically Hazardous Areas

Per MICC 19.07.160(B)(2), alterations of landslide hazards areas, seismic hazard areas, and associated buffers may occur if the proposed alteration:

- a. Will not adversely impact other critical areas.
- b. Will not adversely impact the subject property or adjacent properties.
- c. Will mitigate impacts to the geologically hazardous area, consistent with best-available science to the maximum extent reasonably possible, such that the site is determined to be safe.
- d. Include the landscaping of all disturbed areas outside of building footprints and installation of hardscape prior to final inspection.

We offer the following evaluation of the proposed improvements, with respect to each criterion:

- a. The landscaping improvements in the eastern and northern site areas affect erosion potential positively (long-term erosion hazard is reduced) and do not affect landslide or seismic hazard (landslide and seismic hazard are neither reduced nor increased). The garage and entry-area reconstruction, deck and gravel-area removal, CIP retaining wall construction, and pin-pile installations for the north residence wing have all been designed to incorporate appropriate geotechnical and/or structural considerations, and based on our review, will not adversely impact critical areas on site. Because the rockeries did not involve grade cuts or fills, and therefore did not "alter" the slope, we do not foresee adverse impact to critical areas on site from rockery construction and/or deconstruction.
- b. The above analysis for "a" (for the subject property) is applicable to the discussion of potentially adversely impacting adjacent properties. Landslides and related earth movement are not anticipated as a result of the proposed improvements. Uncontrolled surface-water flows in both the northern and eastern site areas are expected to decrease as a result of landscaping improvements and connecting downspouts to the catch basin.
- c. The proposed improvements have incorporated design recommendations from several consulting professionals, e.g., the project architect, landscape designer, geotechnical engineer, and structural engineer, based on best-available science and professional standards of the area, to the maximum extent reasonably possible.
- d. The landscaping of all disturbed areas outside of building footprints and installation of all impervious surfaces is expected prior to final inspection.

Statement of Risk

Per MICC 19.07.160(B)(3), alterations of landslide hazards areas, seismic hazard areas, and associated buffers may occur if the conditions listed in MICC 19.07.160(B)(2) are satisfied and the geotechnical professional provides a statement of risk matching one of the following:

- a. An evaluation of site-specific subsurface conditions demonstrates that the proposed development is not located in a landslide hazard area or seismic hazard area.
- b. The landslide hazard area or seismic hazard area will be modified, or the development has been designed, so that the risk to the site and adjacent property is eliminated or mitigated, such that the site is determined to be safe.
- c. Construction practices are proposed for the alteration that would render the development as safe as if it were not located in a geologically hazardous area and do not adversely impact adjacent properties.
- d. The development is so minor as not to pose a threat to public health, safety, and welfare.

In our opinion, criterion "c" is met. The proposed construction practices have been designed and reviewed by the project team, which includes the architect, landscape designer, geotechnical engineer, and structural engineer. The risks and hazards have been considered and accounted for in the design, which renders the development as safe as if it were not located in a geologically hazardous area. The proposed construction practices are designed to affect only the subject site and will not impact adjacent properties adversely.

We trust this letter meets your current needs. Please call if you have any questions about this letter or if you need additional information.

Sincerely,

EARTH SOLUTIONS NW, LLC



Keven D. Hoffmann, P.E.
Senior Project Manager

cc: Living Shelter Architects, PLLC
Attention: Mr. Roy McGarrah (Email only)