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Gan Chen
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**RE: Geotechnical Letter**
Unpermitted Grading/Wall Construction
7445 W. Mercer Way
Mercer Island, Washington

In accordance with your authorization, Cobalt Geosciences, LLC has prepared this letter to discuss unpermitted grading activities at the site. We were involved in a slope mitigation project in or about 2017 at this site. That project included installation of GeoWeb over the exposed steep slope in the western portion of the property.

A relatively recent project included some site grading near the residence and under the deck with a short timber wall to retain yard fills.

We visited the property in April 2023 and October 2024 to observe the current site conditions. During our recent visits, we note areas of grading and fill placement east, north, and west of the residence in upland areas (not on steep slope/scarp). We observed a timber 'wall' near the northwest corner of the residence and below a deck. Most fills were 2 to 3.5 feet in thickness with local areas north of the residence with minimal fill (0 to 12 inches). Northeast of the residence, about 2 feet of fill was placed over a short rockery, likely to provide equipment access to the western portion of the site.

There are brick patio areas below the deck and in yard areas west of the residence. We are not aware if this was pre-existing or part of the recent grading activities.

We note that the City of Mercer Island GIS Maps indicate that the site contains erosion, potential slide, seismic, and steep slope hazard areas. Most of these hazards are associated with the very steep slope in the western portion of the property.

## City of Mercer Island GIS Mapped Hazards

The site contains erosion, potential slide, seismic, and steep slope hazards. We reviewed historic test pit logs from this area (Shannon and Wilson 1990) which encountered dense to very dense till and outwash-like soils. The exposed soils in the slope during our 2017 visits were also dense and outwash-like.

It is our opinion that the steep slope areas qualify for potential landslide, steep slope and erosion hazard areas. The area of the unpermitted grading and existing residence would be within a buffer zone from these hazards but not within the hazard itself. Seismic hazards are not present other than how seismic activity related to slope stability.

### 19.07.160 - Geologically hazardous areas.

A. *Designation and typing*. Geologically hazardous areas are lands that are susceptible to erosion, landslides, seismic events, or other factors as identified by WAC 365-190-120. These areas may not be suited for development activities because they may pose a threat to public health and safety. Areas susceptible to one or more of the following types of hazards shall be designated as geologically hazardous areas: landslide hazard areas, seismic hazard areas, and erosion hazard areas.

B. *General review requirements.* Alteration within geologically hazardous areas or associated buffers is required to meet the standards in this section, unless the scope of work is exempt pursuant to section 19.07.120, exemptions, or a critical area review 1 approval has been obtained pursuant to section 19.07.090(A).

1. When an alteration within a landslide hazard area, seismic hazard area or buffer associated with those hazards is proposed, the applicant must submit a critical area study concluding that the proposal can effectively mitigate risks of the hazard. The study shall recommend appropriate design and development measures to mitigate such hazards. The code official may waive the requirement for a critical area study and the requirements of subsections (B)(2) and (B)(3) of this section when he or she determines that the proposed development is minor in nature and will not increase the risk of landslide, erosion, or harm from seismic activity, or that the development site does not meet the definition of a geologically hazardous area.

2. Alteration of landslide hazard areas and seismic hazard areas and associated buffers may occur if the critical area study documents find that 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; and

d. Includes the landscaping of all disturbed areas outside of building footprints and installation of hardscape prior to final inspection.

Our observations confirm that the fill and wall construction is near the steep slope, but not within the hazard area. The location of these features are setback an adequate distance from the top of the slope as to not surcharge the steep slope areas and alter existing factors of safety against failure. The grading work is relatively minor and has not adversely affected geologic hazards in this area.

Similarly, this work has not and does not adversely impact adjacent properties. The work does not mitigate hazards and was not intended to mitigate hazards to our knowledge. All areas are and should be fully landscaped to maintain a low risk of erosion of the new fills.

3. Alteration of landslide hazard areas, seismic hazard areas and associated buffers may occur if the conditions listed in subsection (B)(2) of this section 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; or

d. The development is so minor as not to pose a threat to the public health, safety and welfare.

The grading activities meet the criteria of both a. and d. from above. The area of the work is not within a seismic or landslide hazard area and the work is so minor, that it does not pose a threat to the public health, safety and welfare.

C. *Development standards—Landslide hazard areas.* Development is allowed within landslide hazard areas and associated buffers, when the following standards are met:

1. A critical area study shall be required for any alteration of a landslide hazard area or associated buffer;

2. Buffers shall be applied as follows. When more than one condition applies to a site, the largest buffer shall be applied:

a. *Steep slopes*. Buffer widths shall be equal to the height of a steep slope, but not more than 75 feet, and applied to the top and toe of slopes;

b. Shallow landslide hazard areas shall have minimum 25-foot buffers applied in all directions; and

c. Deep-seated landslide hazard areas shall have 75-foot buffers applied in all directions.

Work has occurred within 25 feet of the top of the hazard areas; however, the work has not adversely affected hazards or properties and does not pose a risk to public health, safety, or welfare.

D. *Development standards—Seismic hazard areas.* When development is proposed within a seismic hazard area:

1. A critical area study shall be required and shall include an evaluation by a qualified professional for seismic engineering and design, a determination of the magnitude of seismic settling that could occur during a seismic event, and a demonstration that the risk associated with the proposed alteration is within acceptable limits or that appropriate construction methods are provided to mitigate the risk of seismic settlement such that there will be no significant impact to life, health, safety, and property.

2. *Identification of seismic hazard areas*. Seismic hazard areas shall be identified by a qualified professional who references and interprets information in the U.S. Geological Survey Active Faults Database, performs on-site evaluations, or applies other techniques according to best available science.

Not applicable. No seismic hazards are present based on the soil conditions.

3. When development is proposed on a site with an active fault, the follow provisions shall apply:

a. A 50-foot minimum buffer shall be applied from latest Quaternary, Holocene, or historical fault rupture traces as identified by the United States Geological Survey or Washington Geological Survey map databases or by site investigations by licensed geologic professionals with specialized knowledge of fault trenching studies; or

b. Mitigation sequencing shall be incorporated into the development proposal as recommended based on geotechnical analysis by a qualified professional to prevent increased risk of harm to life and/or property.

Not applicable.

E. *Development standards—Erosion hazard areas.*

1. All development proposals shall demonstrate compliance with chapter 15.09, storm water management program.

2. No development or activity within an erosion hazard area may create a net increase in geological instability on or off site.

The grading has not altered the erosion potential in this area. All areas must be landscaped and graded flat, both of which are observed. No increase in erosion risks have occurred.

F. *Development standards—Additional criteria for specific activities.*

1. Trail building within geologically hazardous areas shall be subject to the following:

a. Trail surfaces shall be constructed of pervious materials and may not be wider than five feet; and

b. Trails shall be located to minimize the need for tree removal.

2. Land clearing, grading, filling, and foundation work within: (a) an erosion hazard area, when 2,000 square feet or more of site disturbance is proposed, and/or (b) a landslide hazard area are not permitted between October 1 and April 1.

a. The code official may grant a waiver to this seasonal development limitation if the applicant provides a critical area study for the site concluding that:

i. Geotechnical slope stability concerns, erosion and sedimentation impacts can be effectively controlled on site consistent with adopted storm water standards; and

ii. The proposed construction work will not subject people or property, including areas off site, to an increased risk of associated impacts.

b. As a condition of the waiver, the code official may require erosion control measures, restoration plans, an indemnification, a release agreement and/or performance bond.

c. If site activities result in erosion impacts or threaten water quality standards, the city may suspend further work on the site and/or require remedial action.

d. Failure to comply with the conditions of an approved waiver shall subject the applicant to code compliance pursuant to chapter 6.10, code compliance, including but not limited to civil penalties and permit suspension.

None of the above aspects appear to be relevant to this project and site.

**19.07.100 - Mitigation sequencing.**

Except as otherwise provided in this chapter, an applicant for a development proposal or activity shall implement the following sequential measures, listed below in order of preference, to avoid, minimize, and mitigate impacts to environmentally critical areas and associated buffers. Applicants shall document how each measure has been addressed before considering and incorporating the next measure in the sequence:

A. Avoiding the impact altogether by not taking a certain action or parts of an action. The applicant shall consider reasonable, affirmative steps and make best efforts to avoid critical area impacts. However, avoidance shall not be construed to mean mandatory withdrawal or denial of the development proposal or activity if the proposal or activity is an allowed, permitted, or conditional use in this title. In determining the extent to which the proposal should be redesigned to avoid the impact, the code official may consider the purpose, effectiveness, engineering feasibility, commercial availability of technology, best management practices, safety and cost of the proposal and identified changes to the proposal. Development proposals should seek to avoid, minimize and mitigate overall impacts based on the functions and values of all of the relevant critical areas and based on the recommendations of a critical area study. If impacts cannot be avoided through redesign, use of a setback deviation pursuant to section 19.06.110(C), or because of site conditions or project requirements, the applicant shall then proceed with the sequence of steps in subsections B through E of this section;

Not applicable as the work is completed. There are no advsere impacts resulting from the work on mapped critical areas.

B. Minimizing impacts by limiting the degree or magnitude of the action and its implementation, using a setback deviation pursuant to section 19.06.110(C), using appropriate technology, or by taking affirmative steps to avoid or reduce impacts;

Work is outside of the hazard areas and very minor in nature. Work is completed and landscaped.

C. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;

The areas in question has been effectively restored with landscaping to a condition equal to or greater than the original condition.

D. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action;

Assumed to be true based on the nature of the work and use of the area. I.e., landscaped area with lawn and vegetation.

E. Compensating for the impact by replacing, enhancing, or providing substitute resources or environments; and/or

Does not appear to apply. Work is 'like for like' with the previous condition.

F. Monitoring the impact and taking appropriate corrective measures to maintain the integrity of compensating measures.

Does not appear to apply. Area remains landscaped areas and lawns to be maintained as such.

## Conclusions

It is our opinion that the grading activities have not adversely affected geologic hazards in this area. Provided all filled areas are properly vegetated, similar to the condition prior to grading, the risk to these hazard areas will remain consistent with what was present prior to the work occurring.

## Closure

The information presented herein is based upon professional interpretation utilizing standard practices and a degree of conservatism deemed proper for this project. We emphasize that this report is valid for this project as outlined above and for the current site conditions and should not be used for any other site.

Sincerely,

**Cobalt Geosciences, LLC**


2/25/2026

Phil Haberman, PE, LG, LEG
Principal

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