

January 4, 2019

Project Number: 1811-010-4041

Project Address: 4041 West Mercer Way, Mercer Island, WA 98040

Critical Area Determination, Critical Areas Study

We are requesting alterations to a critical area that is a geologic hazard area per MICC 19.07.060.

Project Narrative

The project site is located along the shoreline of Lake Washington and on the lower side of a slope that descends from West Mercer Way westerly toward Lake Washington. The irregularly shaped site is accessed from the east by a shared 470 foot driveway with an entrance from West Mercer Way to the east side of the proposed building with one switch-back for the west 250 feet of the driveway. The topography of the parcel is relatively level and has gentle slope towards the west rocky bulkhead along the shoreline. From about 50 feet east of the shoreline the property ascends moderately and generally uniform in slope angle that extends about 150 feet upslope along the North property line (from the shoreline) and about 225 feet upslope along the south property line. There is an existing concrete retaining wall that provides a structural wall and support for the shared driveway, which is supported by a soldier pile wall with a concrete facing. The wall is about 20 feet tall at its highest and cuts through our property running Northeast to Southwest.

The Geotechnical Engineering Report dated October 12, 2018, written by Bryce C. Townsend and Siew L Tan of PanGEO, Inc., state "From the northeast corner of the property to the northwest corner of the property there is a total vertical relief of about 77 feet across about 150 feet. The west 50 feet of the property grades with slopes between 10 to 40 percent with the site slopes on the east side of the site generally at or above 40 percent, with the exception of the paved driveway and retaining structures supporting it. The sloped area between the paved driveway switchback has a generally uniform slope of about 50 percent with a vertical relief of about 70 feet at the maximum along the south property line." The parcel is located within the Environmentally Critical Areas due to Low basin condition (2005 CAO) in the King County GIS mapping and geologic hazards identified in the Mercer Island Code as Landslide Hazard Areas and Erosion Hazard Areas. Per the PanGeo report "based on our review of the City of Mercer Island's Geologic Hazards Maps, the project site is not mapped as a seismic hazard area." Please refer to the Site Survey provided for topographical and site information.

The proposed building, a two-level single family residence with an attached garage, will be excavated into the hillside between the existing soldier pile wall and shoreline, creating cuts between 14-18 feet in overall height at the east side of the residence. Three proposed additional parking spaces are to be constructed on the upslope side of the bottom section of the paved access driveway. One parking spot shall be provided for each of the residences sharing the

driveway. The new residence will be supported on conventional spread footings founded on native undisturbed dense glacial soil or compacted fill. The shoring is permanent; shoring and soil excavation shall be done simultaneously. The construction of the permanent building structure shall commence immediately after the shoring is installed and the bulk excavation is complete. A shoring wall with timber lagging, structural concrete permanent piles, tiebacks and soldier piles will be installed into the hillside to the east, and partially on the north and south walls to stabilize the hillside. Minor sloughing or slides shall be caught with proposed TESC measures per civil engineering TESC plan, sheet C1.

The Mercer Island City code reads under MICC 19.07.060 D Site Development:

D. Site Development.

1. Development Conditions. Alterations of geologic hazard areas may occur if the code official concludes that such alterations:

- a. Will not adversely impact other critical areas;
- b. Will not adversely impact (e.g., landslides, earth movement, increase surface water flows, etc.) the subject property or adjacent properties;
- c. Will mitigate impacts to the geologic hazard area consistent with best available science to the maximum extent reasonably possible such that the site is determined to be safe; and
- d. Include the landscaping of all disturbed areas outside of building footprints and installation of all impervious surfaces prior to final inspection.

The proposed scope for this project will satisfy these requirements per the Mercer Island Code. The proposed residence and related shoring wall within the sloped hillside will not adversely impact other critical areas. The property is a waterfront lot. The development on the site is in compliance with the required buffers for shoreline development per MICC 19.07.110 Shoreline master program. Two buffers are provided: a 25'-0" foot buffer adjacent to the shoreline in which only 10% of coverage may be impervious and no structures are allowed. The area within 10% impervious service setback is 2,550sf; the area of house within this setback is 0sf. The second buffer of 25'-0" that is 25-50' from the shoreline allows for 30% impervious with structures allowed. Our proposed impervious within this buffer is below the required maximum number of 765.9 sf, being: 728 sf. Please see the included plan set, sheets A-1.0, and A-1.2. Within these

buffers, a shoreline restoration plan has been provided. This plan illustrates that within a buffer of 20'-0", 75% is required to be native planting area. Please see the included plan set, sheet L-1.

The development on the site is in compliance with the required side and rear yard setbacks. These include a combined 17 foot with a 7-foot minimum side yard per MICC 19.02.020C(1)(C)(ii); however per e-mail from Robin Proebsting to Kelly McShane dated July 18, 2018, we are "vested to the setback lines shown on the face of the 2005 (permit + plot plan), so are able to use these setbacks instead of the more restrictive current side yard setbacks." Therefore our side yard setbacks include a combined 15 feet with a 5-foot minimum side yard. The 10 foot front yard setback from the access easement shown on the 2005 short plat also applies and we "are vested to the setback lines shown on the face of the plat."

The proposed scope for the excavation at the east side of the lot will not impact the steep slope critical areas located to the east side of the lot. Please refer to the TESC PLAN, sheet C1, in the included plan set. This sheet illustrates the location of a proposed silt fence (BMP C233), straw wattles (BMP C235), inlet protection (IP), mulching, matting, and compost blankets (BMP C121, BMP C125) (MU) to catch any sediments from traveling due west towards the property below or Lake Washington. Construction limits are clearly defined at the property line boundaries. Existing vegetation adjacent to the property will be protected. Please refer to recommendations in the attached Geotechnical Report dated October 12, 2018:

"Based on soil conditions encountered in the borings, the near-surface site soils are likely to exhibit moderate erosion potential. In our opinion, the erosion hazards at the site can be effectively mitigated with the best management practices during construction and with properly designed and implemented landscaping for permanent erosion control. During construction, the temporary erosion hazard can be effectively managed with an appropriate erosion and sediment control plan, including but not limited to installing silt fence at the construction perimeter, limiting removal of vegetation to the construction area, placing gravel or hay bales at the disturbed/traffic areas, covering stockpile soil or cut slopes with plastic sheets, constructing a temporary drainage pond to control surface runoff and sediment trap, placing quarry spalls at the construction entrance, etc. Permanent erosion control measures should include establishing vegetation, landscape plants, and hardscape established at the end of the project, and reducing surface runoff to the minimum extent possible."

The proposed scope for this project will not adversely impact the subject properties or adjacent properties in terms of landslides, earth movement, increase to surface water flows, etc. Please refer to the attached Geotechnical Report dated October 12, 2018 prepared by PanGEO, pages 6-8 and for geologic hazards assessment and recommended mitigation measures. Please refer to page 22 for erosion considerations. The shoring wall will be constructed where excavation is planned. Infiltration and Low Impact Development (LID) are not feasible because the site is mapped as an Erosion Hazard Area by Mercer Island. The Geotechnical report states on page 13” Based on our review of the City of Mercer Island Low Impact Development (LID) infiltration feasibility map, the project site is located in an area where infiltrating LID is not permitted.” Conventional BMPs used during construction will control sediment transport and limit erosion. A silt fence is proposed at downslope limits of the construction area and existing vegetation will be protected. Care will be taken to control storm water runoff with sumps and trenches and handled with designated discharge areas. Any soils will be removed immediately from site or protected from wet weather with plastic sheeting. The geotechnical engineer will be notified by the contractor if any changes need to be made by the TESC measures to achieve the intended result.

Page 19 of the geotechnical report states that the contractor will provide a monitoring system to evaluate the performance of the shoring system and the impact of the excavation on adjacent properties. “The monitoring program should include changes in both the horizontal (x and y directions) and vertical deformations. The monitoring should be performed by the contractor or the project surveyor, and the results be promptly submitted to PanGEO for review. The results of the monitoring will allow the design team to confirm design parameters, and for the contractor to make adjustments if necessary.”

Please refer to civil sheet Storm Drainage Plan, sheet C3 for proposed systems for collecting water and discharge. Per page 7 of the City of Mercer Island Small Project Stormwater Site Plan/Report, prepared by civil engineers D.R. Strong, “the site is within a mapped area where infiltrating LID facilities are not permitted. There is insufficient room for dispersion flow paths and the Site is located within an erosion hazard area and potential slide area. Proposed grading in potential flowpath area between house and bulkhead will result in slopes exceeding 20% which is unsuitable for dispersion BMP’s. All collected runoff and overflow will be piped directly to Lake Washington which is a designated receiving water, and therefore no flow control facilities are required or proposed.”

Existing vegetation will remain on the hillside above the area of excavation. Sheet C2.1 illustrates the limits of construction on the hillside. Two trees, shown on sheet A-1.2, Site Tree Plan, are proposed for removal. Please see Site Tree Plan and tree Calculations for compliance with MICC 19.10.010. Remaining trees on site shall be protected per MICC tree protection standards shown on Sheet C1, TESC Plan and Sheet C2, TESC Details, Tree Protection Fencing. Please see Arborist report, dated January 3, 2019, by Vitalitree for recommendations of the two trees proposed for removal. Other vegetation on the east steep slope areas shall remain without disturbance.

Care has been taken for existing vegetation and trees to remain to be protected during construction. The TESC plan clearly defines areas to not be disturbed during construction. The arborist will monitor excavation and has provided recommendations for tree root protection. Replacement trees as required by the City of Mercer Island Tree Inventory and Replacement Submittal form have been located on sheet L1 and sheet A-1.2, Tree Calculations. Impervious surface has been limited per code to under 30% of the net lot area, with 26.38% proposed lot coverage.

Per the city code of Mercer Island MICC 19.07.060:

2. Statement of Risk. Alteration within geologic hazard areas may occur if the development conditions listed above are satisfied and the geotechnical professional provides a statement of risk with supporting documentation indicating that one of the following conditions can be met:

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

The proposed project will meet the condition that “a. The geologic hazard area will be modified, or the development has been designed so that the risk to the lot and adjacent property is

eliminated or mitigated such that the site is determined to be safe;”. PanGEO provides a risk assessment within their report on page 7:

“Based on our field observations, the general topography of the site and vicinity, and the results of our subsurface explorations, in our opinion the subject site is globally stable in its current configuration. Furthermore, it is our opinion that the proposed development as currently planned is feasible from a geotechnical engineering standpoint, and in our opinion will not adversely affect the overall stability of the site or adjacent properties, provided the recommendations outlined herein are followed and the proposed development is properly designed and constructed.

...It is also our opinion that the potential for seismic-induced landsliding is low at the site due to the hard clay underlying the site, and the presence of existing soldier pile walls for the existing paved driveway along the upslope side of the proposed development. Provided that the design of the excavation support and permanent basement walls are designed and constructed as recommended herein, it is our opinion that the stability of the site will not be compromised by the proposed development.”

Per the city code of Mercer Island MICC 19.07.060:

4. Seasonal Limitations. Land clearing, grading, filling, and foundation work within geologic hazard areas are not permitted between October 1 and April 1. The code official may grant a waiver to this seasonal development limitation if the applicant provides a geotechnical report of the site and the proposed construction activities that concludes erosion and sedimentation impacts can be effectively controlled on-site consistent with adopted storm water standards and the proposed construction work will not subject people or property, including areas off-site, to an increased risk of the hazard. As a condition of the waiver, the code official may require erosion control measures, restoration plans, and/or an indemnification/release agreement. Peer review of the geotechnical report may be required in accordance with subsection C of this section. 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. (Ord. 05C-12 § 5).

Please refer to the Geotechnical report page 21 for wet weather construction recommendations. Excavation and construction of the shoring walls should be done during the drier season and avoided between October 1 and April 1. When the shoring wall is installed, additional excavation may occur during the wet season if a grading extension is obtained with the

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possibility of additional erosion control measures being required. Upon completion of the project, exposed soils in the work area will be protected by a landscape plan that will permanently stabilize disturbed portions of the slope and the site against surficial erosion.

Included submittals:

Title Report dated December 17, 2018

Plan Set dated January 8, 2019

Arborist Report dated January 3, 2019

SEPA Checklist: This project is a single family residence and is exempt from a SEPA Checklist

Geotechnical Report dated October 12, 2018

City of MI Small Project Stormwater Site Plan/Report

City of MI Setback Determination E-mail dated July 18, 2018

This report has been prepared by:

B. Kelly McShane

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