May 4, 2018

Project Number: 1801-104
Project Address: 6025 77th Avenue SE

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 on the lower side of a slope that descends from 77th Avenue SE westerly toward Lake Washington. The site is accessed from the north only by a driveway accessed on 77th Avenue SE. The topography of the parcel ascends moderately from an existing rock bulkhead on the shore of Lake Washington about 80 horizontal feet to the toe of a steep slope that ascends about 16 vertical feet between 16 and 26 feet horizontal feet to the relatively flat rear yard of the parcel above. The inclinations of the slope from the lake to the toe and from the toe to the top of the steep slope are about 13% and 100% respectively. The parcel is located within the Environmentally Critical Areas due to geologic hazards identified in the Mercer Island Code as Landslide Hazard Areas, Erosion Hazard Areas, and Seismic Hazard Areas. Please refer to the Site Survey provided for topographical and site information.

The proposed scope of the project is to remove the existing single family residence and detached garage. A new single family residence with basement and attached garage will be constructed in a similar location on the property. The new residence will be excavated into the hillside, creating cuts between 15-24 feet in overall height at the east side of the residence. The new residence will be supported on conventional spread footings founded on native undisturbed dense glacial soil or compacted fill. A soil nail shoring wall will be installed into the hillside to the east to stabilize the hillside. A 5'-0" concrete catchment is designed into the top of the concrete foundation wall on the east side of the house to collect minor sloughing or slides.

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 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 number of 1,116 s.f, being: 657.0 s.f. 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 LA-01.

The proposed scope for the excavation at the hillside is not within these buffers and will not impact the shoreline or the required buffers. Please refer to the TESC PLAN SOUTH, sheet C1.0 in the included plan set. This sheet illustrates the location of a proposed silt fence to catch any sediments from entering the lake. Construction limits are clearly defined at the shoreline perimeter. Existing vegetation adjacent to the shoreline will be protected. Please refer to recommendations in the attached Geotechnical Report dated July 6, 2017 and prepared by the Galli Group:

"Given the soil disturbance will be confined largely within the existing developed area at the toe of the slope, we anticipate that conventional BMPs and maintaining a vegetative buffer

between the building footprint and the lake should be adequate to prevent erosion, sediment transport and slope incision during construction."

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 July 6, 2017 and prepared by the Galli Group, page 5 for recommended mitigation measures. The shoring wall will be constructed where excavation is planned. Above the wall is a proposed catchment wall that is 5' minimum above grade to collect minor sloughing, shallow skin slides, and/or erosion from man made causes or extreme runoff events. Conventional BMPS used during construction will control sediment transport and limit erosion. These include recommendations listed on page 7 for the construction entrance, contractor monitoring of the tracking of sediment onto the roadway and shared driveway. 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 spoils 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 14 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 property.

Please refer to civil sheet Drainage Plan South, C2.0 for proposed systems for collecting water and discharge. At the top of the proposed new shoring wall, an open concrete trench will collect runoff from the slope above and will tie the storm water into the new system that will discharge into the lake. Behind the shoring wall, against the hillside area that is excavated, a drain mat is proposed to collect and drain water from the face of the shoring wall into the new storm water system. See details provided on sheet SH5.0.

Existing vegetation will remain on the hillside above the area of excavation. Sheet C1.0 illustrates the limits of construction on the hillside. A group of existing trees will remain on the hillside and will be protected by recommendations in the attached Arborist report prepared by Anthony Moran. Trees on adjacent properties, in particular the exceptional tree on the east adjacent property, will be protected per recommendations in Moran's report. Section 3/A-4.0 also

illustrates that the existing trees to remain are uphill from the area of excavation and will not be impacted by the installation of the shoring wall and soil nails into the hillside.

The proposed scope for this project 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. Based on recommendations by the Galli Group, Harriott Valentine Structural Engineers in collaboration with Groundsupport Engineers have designed the house foundation system and shoring wall to meet the criteria outlined within the geotechnical report. Please reference the attached drawings as well as the Permanent Retaining Wall Design Calculations by Groundsupport, and the Structural Calculations by Harriott Valentine Engineers. D.R Strong civil engineers have designed the drainage system to meet the requirements of Mercer Island and have provided a Drainage Report.

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 LA-01. New vegetation will be planted per the Mercer Island code of 60% required vegetation. Impervious surface has been limited per code to under 40% of the net lot area, with less than 9% of net lot area for additional hardscape.

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;”. The Galli Group provides a Risk Assessment within their report on page 6:

“Most of the proposed development activity occurs within the previously developed area of the existing building, decks or flatwork. There will be additional excavation at the toe of the hillside requiring shoring. Provided the recommendations in our report are incorporated into the proposed design and construction the development will not adversely impact the adjacent properties or the geologic hazard areas.

More specifically, the proposed activity will provide a catchment wall to prevent soil from moving downslope to the residence. The residence will be supported on dense underlying soil and possibly the soldier pile wall. Best management practices will be incorporated unto the construction erosion control and permanent site stabilization.”

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 5 for seasonal limitations. The Galli Group states that mass excavation and construction of the shoring wall 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 possibility

of additional erosion control measures being required. The Galli Group recommends that upon completion of the project, exposed soils in the work area 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. See attached.
Plan set. See attached.
Arborist Report:
SEPA Checklist: This project is a single family residence and is exempt from a SEPA checklist.
Bond Quantity worksheet. See attached.

This report has been prepared by:

Lisa Sidlauskas 5.7.10

Lisa Sidlauskas, licensed architect, Stuart Silk Architects

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