PROJECT DESCRIPTIVE NARRATIVE

For
PATTERSON RESIDENCE, Permit Number 2306-282
8019 SE 20th ST
MERCER ISLAND, WA 98040

Located at 8019 Southeast 20th Street in Mercer Island, Washington, the project site is an 18,701 square foot parcel and is generally trapezoidal-shaped. Southeast 20th Street borders the north and single-family residences to the east, west, and south. An existing one-story house occupies the property with a basement level situated near the south property line. The basement level is open to daylight toward the north. A paved driveway accesses the house from Southeast 20th Street to the north corner of the house basement.

There are two existing detached garages near the north property line on the access driveway's east and west sides in addition to the house. There is a deck connecting the first level of the existing house to the west detached garage roof. The east and west detached garages are partially set back into the existing site slopes. There is also a playhouse/shed near the northeast corner of the property, built on small diameter pipe piles.

The overall property is on a generally northwest-facing slope that descends about 40 feet total from the southeast corner at an approximate elevation of 67 feet to the northwest property corner at an approximate elevation of 27 feet to ascend beyond the south and east property line. The landscaped slope has large and small trees, shrubs, shallow rockeries, retaining walls, and mulch. A site tree analysis accompanies this submittal.

The finished basement floor shall be at an approximate elevation of 34½ feet. Both detached garages will remain with the new residence connecting to the structures. See the drawing set for site details.

The existing house, having been initially a beach cabin in the 50s, then added to in various stages, has reached the end of its useful life. Despite numerous upgrades, there are concerns for life safety surrounding the structure. As previously noted, the new house shall incorporate the existing garage structures located on the east and northwest corners of the site. Since these structures are relatively new, detailed information regarding their construction and preliminary analysis by the structural engineer indicates that the proposed development is feasible.

The proposed structure is intended to meet a new and expanding family's current needs and meet long-range residential goals for the primary occupants. To this end, since both parents are professionally active, accommodation should be provided for live-in support staff, providing all parties a level of autonomy. Beyond meeting the needs of a dynamic and growing family from a spatial perspective, the house is intended to meet social activities' needs, including friends and family from the Puget Sound area and afar.

The house will follow what is widely considered "The Northwest Contemporary" vernacular, combining Modernist sensibility with appropriate materials referencing the local area while providing spatial separation fitting to contemporary active professional lifestyles in an ever-changing environment. As such, beyond obliging live-in assistance, the house will have internal autonomy that can support isolation and function in a protected social environment. The main structure will have a full story above the lower level and a partial story above that, situated to step up the hillside. The existing west garage will form the base for the lower level, continuing use as auto storage, and its roof deck will continue to be used on the second level. The east garage will remain as a garage, but a second level will be added dean and as family aid quarters, which will be internally linked to the central structure. The main new construction will be primarily located around the existing house, with modifications made to honor the setbacks and stay within allowable site coverage limits. Several large existing trees will be carefully avoided and celebrated as part of the overall site design; these trees are key to maintaining an appropriate northwest feeling on the site and will aid in the integration of the structures with the natural setting.

The house shall be designed and constructed with three key principles: respect, beauty, and value. First, will be respected for the site and its natural attributes – slope, trees, and views. Second is the need for an attractive but unobtrusive house – a statement will be made, but it will not shout. The third is long term value - a building that will have both longevity through good design and quality construction and selection of systems and materials that are energy-efficient, durable, and easy to maintain.

Part of the value added to the property will be the use of energy-efficient systems exceeding the current Washington State Energy Code requirements for a structure of this nature. We have designed and constructed numerous residents, multifamily buildings, and commercial buildings using super-insulation in several forms included Insulated Concrete Forms (ICF) and have pursued these energy-saving system for this house. Our previous ICF projects have reached Energy Net Zero and LEED Platinum rating. Although we are not seeking strict LEED ratings for this house, we shall follow LEED principles, and move as close to

Energy Net Zero as feasible. ICF provides tremendous strength and durability with very high R values and real advantages in scenarios that require sub-level excavation. Ground source heat pumps are the sources of heating and cooling. Photo-voltaic panels are located on the flat roof areas.

We have a building footprint of roughly five-thousand square feet, including the existing garage and shop facilities. Pervious paving shall be used as practical. The natural vegetation of the site will be left as undisturbed as construction allows. The structure itself will step into the hillside using shoring and supported by conventional footings. The building height does not exceed the thirty-foot height limit. Construction of interior walls will be conventional wood framing. Exterior finishes will be combinations of wood-like paneling and prefinished impact-resistant siding panels.

CRITICAL AREA REVIEW 2 NARRATIVE

For
PATTERSON RESIDENCE, Permit Number 2306-282
8019 SE 20th ST
MERCER ISLAND, WA 98040

This Critical Area Review 2 submittal is in response to the request on March 13, 2024, as part of a round of corrections for the proposed single-family residence under permit 2306-282.

Attached is the Geotech Report which includes a Critical Area Study that was submitted during the initial permit review process for 2306-282. Please see PanGeo's assessment and recommendations below and in the attached full report:

5.0 GEOLOGIC HAZARD ASSESSMENT

5.1 SEISMIC HAZARD REVIEW

Based on our review of the City of Mercer Island GIS Map, the property location is mapped as a seismic hazard.

Based on the presence of dense Pre-Olympia glacial deposits near the ground surface and the lack of groundwater observed in all four of our test borings, in our opinion, the potential for soil liquefaction is considered low. As such, it is our opinion that special design considerations associated with soil liquefaction are not needed for this project.

We also evaluated the site stability during the design earthquake. Details of our seismic stability are discussed in Section 5.2.2 of this report. In summary, the results of our

analysis indicate that a minimum factor of safety of 1.1 can be achieved if the recommendations outlined in this report are implemented.

5.2 LANDSLIDE HAZARD REVIEW

According to the City of Mercer Island GIS Map, the property is located in a potential landslide area. The following sections detail our assessment of the overall site stability, including our visual observations, a quantitative slope stability analysis of the site slope, and recommendations for maintaining stability during and post-construction.

5.2.1 Existing Site Conditions

During our site reconnaissance, we did not observe evidence of recent instability such as slide scarps, hummocky ground surface, or tension cracks within the subject property. The site slopes south of the existing house appears well landscaped with trees and small shrubs with no visible signs of instability. The site retaining walls along the south side of the existing house appears vertical, indicating the site retaining walls are stable with no sights of creep or leaning. Based on our onsite observations, the overall site appears to be stable in the existing condition.

5.2.2 Quantitative Slope Stability Analysis

We performed a quantitative slope stability analysis of the site based on the soil profile shown in Figure 3. The soil profile was generated through the middle of the existing house and perpendicular to the site slope where we believe the most critical section is. Our analysis includes models for two cases: the static slope stability during the temporary excavation condition with shoring (Figure 4a), and the seismic (pseudo-static) condition with the permanent structure in place (Figure 4b). The post-condition static case is not as critical as the during-construction case and hence not included in our report.

We performed our slope stability analysis using the program SLIDE2 (Slide) published by Rocscience Inc. Slide is a two-dimensional limit equilibrium slope stability analysis program. Our analysis used the Janbu Simplified Method to determine potential failure planes as it yielded the most conservative results. The following discusses our model and analysis:

Soil Parameters: A summary of the input soil parameters is provided in Table 1 below. Input parameters were selected based on general estimates provided in USGS Open-File Report 2006-1139 (Laprade et al., 2006) and our own judgement and experience with similar soils. For the seismic condition, a cohesion of 200 psf was applied to the Pre-Olympia fine grained deposits (very stiff to hard silt and clay). According to Laprade et al., effective cohesion for pre-Olympia fine grained deposits can be estimated at about

600 psf. As such, in our opinion, a seismic induced cohesion of 200 psf is appropriately conservative.

The proposed civil engineering performed by Parametrix and structural engineering provided by Swensen Say Faget for this house have been coordinated with the Geotech Report including allowable bearing pressures, lateral resistance, footing and foundation performance, surcharge, drainage and backfill. The majority of the new structure falls outside of the steep slope area and is confined within the footprint of the previous structure that has been extent for nearly one-hundred years. Structural engineering drawings include shoring that has also been reviewed by the project geotechnical engineer and has been accepted as a viable solution to mitigate the steep slope condition per the findings of the report. Retaining walls have been designed by the structural engineer and coordinated by the civil engineer using the parameters set by PanGeo. The conclusion is that there should be no issues on this site regarding the designated steep slope area.