

CRITICAL AREAS NARRATIVE

Project: Proposed Accessory Dwelling Unit
Address: 4751 Fernridge Lane, Mercer Island, WA 98040
Parcel: 2524000100
Applicant: Keith Pleas
Date: April 2, 2026

Prepared by:
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PROJECT NARRATIVE

The project consists of a 480-square-foot Accessory Dwelling Unit (ADU) to be constructed within the existing crawlspace beneath the primary residence at 4751 Fernridge Lane, Mercer Island. The residence was originally constructed circa 1979 on an approximately 16,440-square-foot lot.

The existing home is supported by a concrete foundation beneath approximately 50 percent of the structure (west side) and six 30-foot drilled concrete pilings supporting the balance of the main floor (east/southeast side) at approximately 20 feet above grade. The pilings are currently cross-braced with 1" metal rods and wood members. The proposed ADU will be located entirely within the existing building footprint and entirely beneath the existing roofline. The existing home features large overhanging eaves, and the ADU location is well within the always-dry area beneath the structure. The project does not increase lot coverage.

The proposed work involves excavating the crawlspace to achieve minimum headroom, constructing new retaining walls on the upslope side, installing 2-inch diameter driven pin piles for new foundation support, pouring a reinforced concrete slab-on-grade, and enclosing the space with insulated walls including furring walls against the existing foundation. The structural design ties the new retaining walls and slab into the existing circa-1979 foundation and connects to the bases of the existing drilled concrete pilings, creating a unified structural system. This integration represents a significant structural improvement to the existing residence.

In addition to providing new housing consistent with Washington's Growth Management Act (GMA) density obligations applicable to Mercer Island, the project improves the energy efficiency of the existing home by creating an insulated daylight basement in place of an open crawlspace, thereby insulating the existing main floor from winter temperatures.

The structural design is by Keith Ryan, P.E., RSD Engineering and Design, Job 7455. The geotechnical study is by PanGEO, Inc., Project 24-459, prepared by Siew L. Tan, P.E., dated February 27, 2025.

MICC 19.07.090 — CRITICAL AREA REVIEW

This section lists the required submittals and review process for critical area reviews. Per MICC 19.07.090(B)(2)(b), when development is proposed on a site containing only geologically hazardous areas, the applicant has the option of either:

- (i) Applying for a critical area review 2 in advance of construction permits, using the procedures required for a Type 3 land use review; or
- (ii) Requesting consolidation of the review of geologically hazardous areas together with construction permit review.

This application is submitted under option (i) as a standalone Critical Area Review 2 (Type 3 land use review) in advance of building permits.

Per the City of Mercer Island Property Hazard Report (generated January 6, 2026) and the PanGEO Geotechnical Report (Project 24-459), the site contains the following geologically hazardous areas: potential landslide hazard, steep slope hazard, seismic hazard, and erosion hazard. No watercourses, wetlands, or fish and wildlife habitat conservation areas have been identified on or adjacent to the site.

The required geotechnical report (PanGEO, Inc., stamped by Siew L. Tan, P.E.) and structural plans (RSD Engineering and Design, Job 7455) are attached. A topographic and boundary survey by GeoDimensions, dated June 20, 2005, was used as the base map for the geotechnical exploration plan.

MICC 19.07.100 — MITIGATION SEQUENCING

MICC 19.07.100 requires applicants to implement the following sequential measures to avoid, minimize, and mitigate impacts to environmentally critical areas and associated buffers. Each measure is addressed below in order of preference.

A. Avoiding the impact altogether by not taking a certain action or parts of an action.

The project avoids impacts to geologically hazardous areas to the maximum extent possible. The ADU is located entirely within the existing building footprint — beneath the existing structure and within the existing roofline. No new lot coverage is created. All construction activity will be completely contained under the existing structure, where the site is dry and sheltered by the large overhanging eaves. No grading, clearing, or construction activity will occur on the steep slopes south and southwest of the existing structure. No trees will be removed. The project does not extend the building footprint toward the steep slope, does not alter the existing drainage patterns on the site, and does not increase impervious surface area.

It is not possible to completely avoid the geologically hazardous area because the entire parcel is mapped within multiple hazard overlays. However, by locating the ADU entirely within the existing footprint, the project avoids any new impact to undisturbed slopes, buffers, or hazard areas beyond what the existing residence already occupies.

B. Minimizing impacts by limiting the degree or magnitude of the action and its implementation, using appropriate technology, or by taking affirmative steps to avoid or reduce impacts.

The project minimizes impacts through the following measures:

- All construction activity is confined to the crawlspace beneath the existing structure. No exterior earthwork beyond the existing foundation perimeter is proposed.
- Pin pile foundations (2-inch diameter driven pipe piles) are used in lieu of conventional excavated footings, minimizing soil disturbance. Pin piles can be installed with hand-held equipment

appropriate to the confined crawlspace, eliminating the need for heavy equipment access on the slope.

- Excavation within the crawlspace is limited to what is necessary to achieve minimum headroom and slab subgrade elevations. The PanGEO report (Section 7.1) specifies that temporary excavations deeper than 4 feet shall be sloped at 1H:1V or shored.

- The structural design by RSD Engineering integrates the new construction with the existing foundation and piling system, minimizing the structural footprint and utilizing existing structural elements rather than introducing new ones.

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

The project rectifies existing conditions rather than creating new impacts. By tying the new retaining walls and slab into the existing circa-1979 foundation and connecting to the bases of the six existing 30-foot drilled concrete pilings, the project creates a unified structural system that is more robust than the current condition. The existing wood cross-bracing on the pilings will be relocated to the exterior face of the posts per the RSD structural details (Detail C/S2.1), maintaining lateral bracing while accommodating the enclosed living space. In addition, the pilings will be attached to new exterior walls that will contain shear walls (CDX plywood) and metal hold-downs, further improving the lateral resistance of the existing structure.

No disturbances outside the building footprint are expected. In the unlikely event any area is disturbed, it will be restored with appropriate vegetation or hardscaping per PanGEO recommendations (Section 5.1.4).

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

The project reduces geologic hazard impact over time. The enclosed and insulated basement space replaces an open crawlspace that is currently exposed to outside temperatures and exposed bare soil beneath the structure. The new concrete slab, retaining walls, and drainage provisions (per PanGEO Section 6.5, wall drainage recommendations) will provide permanent ground cover and moisture management beneath the structure. This is a long-term improvement over existing conditions.

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

No compensatory mitigation is required. The project does not result in a net loss of critical area function. The development is entirely within the existing building footprint, does not remove vegetation, does not alter slopes, and does not increase stormwater runoff. The net effect of the project is a structural and environmental improvement to the site.

F. Monitoring the impact and taking appropriate corrective measures.

PanGEO, Inc. will provide full-time observation during driven pin pile installation to verify adequate refusal within the anticipated bearing stratum (PanGEO report, Section 6.2.5). PanGEO has also committed to reviewing the final design plans to confirm that geotechnical recommendations have been correctly incorporated into the construction documents (PanGEO report, Section 9.0). Erosion

control measures will be monitored and maintained throughout construction per Section 7.5 of the PanGEO report.

MICC 19.07.160 — GEOLOGICALLY HAZARDOUS AREAS

B. General Review Requirements

19.07.160(B)(1) A critical area study is required for alteration within a landslide hazard area, seismic hazard area, or associated buffer. The attached geotechnical report by PanGEO, Inc. (Project 24-459, February 27, 2025, stamped by Siew L. Tan, P.E.) constitutes the required critical area study. The report concludes that the proposed addition will not adversely impact the stability of the site and adjacent properties, and recommends appropriate design and development measures to mitigate geologic hazards.

19.07.160(B)(2) The critical area study documents that the proposed alteration:

(a) Will not adversely impact other critical areas. No watercourses, wetlands, or fish and wildlife habitat conservation areas are present on or adjacent to the site. The project is contained entirely within the existing building footprint and will not impact any critical areas beyond the geologically hazardous areas already addressed in the geotechnical report.

(b) Will not adversely impact the subject property or adjacent properties. PanGEO concludes: "Based on our understanding of subsurface conditions and the project, in our opinion the proposed addition will not adversely impact the stability of the site and adjacent properties" (PanGEO report, cover letter, page ii). The ADU is within the existing footprint, supported on pin piles driven to refusal in the native Advance outwash deposits, with no increase in loading on the surrounding slopes.

(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. The PanGEO report is based on two test borings drilled to depths of 26.5 and 31.5 feet, a site reconnaissance, review of geologic maps, LiDAR imagery analysis, and engineering analysis. The report provides specific design recommendations for pin pile foundations, retaining walls, slab-on-grade construction, temporary excavation support, erosion control, and wet weather construction procedures. The structural design by Keith Ryan, P.E. (RSD Engineering, Job 7455) incorporates these recommendations.

(d) Includes the landscaping of all disturbed areas outside of building footprints and installation of hardscape prior to final inspection. Because the project is located entirely within the existing building footprint and beneath the existing structure, site disturbance outside the footprint is expected to be negligible. Any disturbed areas will be restored with appropriate vegetation or hardscaping prior to final inspection, consistent with PanGEO recommendations (Section 5.1.4).

19.07.160(B)(3) The geotechnical professional provides the following statement of risk per criterion (d):

"The proposed development as currently planned is very small and is located within the footprint of the existing house. As such, it is our opinion that criterion d is applicable to the project. In our opinion, the development is so minor as not to pose a threat to public health, safety and welfare, provided that the recommendations presented in this report are properly incorporated into the design and construction of the project."

C. Development Standards — Landslide Hazard Areas

19.07.160(C)(1) A critical area study is required. The PanGEO geotechnical report is attached.

19.07.160(C)(2) Buffers. The PanGEO report (Section 5.1, Plates 3–6) documents that the site is located within a mapped prehistoric landslide and that portions of the site grade exceed 40 percent slope. Buffer widths for steep slopes are equal to the height of the steep slope, not to exceed 75 feet, applied to the top and toe of slopes (MICC 19.07.160(C)(2)(a)). Because the entire parcel is composed of geologically hazardous areas and their associated buffers, development within the buffer area is necessary to develop anything on the property. The proposed ADU is located within the existing building footprint — the same footprint that the original residence has occupied since 1979 — and does not encroach further into any buffer than the existing development.

PanGEO's site reconnaissance (Section 5.1.3) found no evidence of recent or ongoing instability in the project area, no tension cracks or breaks in vegetation, no groundwater seepage, and mature trees that were generally straight, indicating relative slope stability. PanGEO concludes that the proposed improvement will have no impact on slope stability provided the project follows the report's recommendations (Section 5.1.4).

D. Development Standards — Seismic Hazard Areas

19.07.160(D)(1) A critical area study is required including evaluation by a qualified professional for seismic engineering and design. PanGEO (a geotechnical and earthquake engineering firm) addresses seismic hazards in Section 5.2 of the report. Based on the soils encountered and the absence of a groundwater table, the potential for soil liquefaction is negligible. The site is classified as Seismic Site Class D (Stiff Soils) per the 2021 International Building Code. The structural design by Keith Ryan, P.E. will incorporate appropriate seismic design parameters.

PanGEO acknowledges that the site is within a prehistoric landslide zone and that a design-level seismic event could potentially reactivate the prehistoric landslide. However, given the scale of the prehistoric landslide and the height of the slope, it is not practical to mitigate such an event, and this risk applies equally to the existing residence.

19.07.160(D)(2) Seismic hazard areas are identified in the PanGEO report (Plate 7) using the City of Mercer Island's Geologic Hazards Maps.

19.07.160(D)(3) No active fault has been identified on or near the site. A fault buffer is not required.

E. Development Standards — Erosion Hazard Areas

19.07.160(E)(1) Compliance with Chapter 15.09, stormwater management program. The project does not increase impervious surface area. Stormwater compliance will be addressed with the building permit application.

19.07.160(E)(2) The development will not create a net increase in geological instability on or off site. PanGEO addresses erosion hazards in Section 5.3, finding that near-surface soils exhibit moderate to high erosion potential but that erosion hazards can be effectively mitigated with best management practices during construction and properly implemented landscaping for permanent erosion control. Specific erosion control recommendations are provided in Section 7.5 of the PanGEO report.

F. Development Standards — Additional Criteria for Specific Activities

19.07.160(F)(1) Trail building. Not applicable; no trail construction is proposed.

19.07.160(F)(2) Seasonal construction restrictions. Land clearing, grading, filling, and foundation work within a landslide hazard area are not permitted between October 1 and April 1. If construction activity is necessary during this period, the applicant will seek a waiver per MICC 19.07.160(F)(2)(a), supported by the PanGEO report's wet weather construction recommendations (Section 7.4) and erosion control plan (Section 7.5), which together conclude that geotechnical slope stability, erosion, and sedimentation impacts can be effectively controlled on site.

MICC 19.07.180 — WATERCOURSES

No watercourses are present on or near the subject property. This section is not applicable.

MICC 19.07.190 — WETLANDS

No wetlands are present on or near the subject property. This section is not applicable.

ATTACHMENTS

1. Geotechnical Report and Geologic Hazard Areas Review — PanGEO, Inc., Project 24-459, February 27, 2025 (stamped by Siew L. Tan, P.E.)
2. City of Mercer Island Property Hazard Report — Parcel 2524000100, generated January 6, 2026
3. Structural Plans — RSD Engineering and Design, Job 7455, Preliminary Review Set, September 5, 2025
4. Topographic and Boundary Survey — GeoDimensions, June 20, 2005