Cobalt Geosciences, LLC
P.O. Box 1792
North Bend, WA 98045

July 2, 2025

Artoush Fanaiyan
Artoush76@yahoo.com

RE: Geotechnical Addendum
Proposed Residence
5818 West Mercer Way
Mercer Island, Washington

In accordance with your authorization, Cobalt Geosciences, LLC has prepared this letter to discuss global stability of the planned block wall-detention tank area west of the proposed residence. We have also included responses to City comments.

Sheet 3.2 shows a temporary excavation system in front of the pile wall. For this condition, we recommend lowering the passive pressure to 200 pcf equivalent fluid pressure in the upper 8 feet and to 250 pcf below 8 feet. Once backfilled and completed, the original design pressures may apply. The soil bearing of 2,000 psf is applicable to the foundation elements located in these areas.

Our geotechnical report includes temporary excavation magnitudes. Permanent slopes should have a maximum inclination of 3H:1V in stiff or firmer native soils (fully vegetated).

We have included pressure diagrams as they pertain to single and multiple rows of tieback anchors. Sites underlain by very fine grained soils can require additional 'roughening' of the drilled tieback holes with the bit. Post grouting could be necessary and we recommend load testing at least one anchor soon after installation to verify suitability of the drilling and grouting process.

Slope Stability Analyses

We performed slope stability analyses through a representational cross section through the downslope neighbor's property, rockery walls, and planned driveway, block wall, detention vault and structure west of the pile wall. Analyses were performed using data from the explorations, location and anticipated elevations of the proposed structure, and topography from the provided topographic survey.

The commercially available slope stability computer program Slope/W was used to evaluate the global stability of the slope within the property. The slope stability was analyzed under static and seismic (pseudo-static method) conditions for the existing and proposed topography.

The computer program calculates factors of safety for potential slope failures and generates the potential failure planes. This software calculates the slope stability under seismic conditions using pseudo-static methods. The stability of the described configuration was analyzed by comparing observed factors of safety to minimum values as set by standard geotechnical practice.

A factor of safety of 1.0 is considered equilibrium and less than 1.0 is considered failure. The required factor of safety for global stability is 1.5 for static conditions and 1.1 for seismic conditions. In accordance with typical engineering standards, we used a seismic acceleration equal to one half of the horizontal peak ground acceleration. At this location, the site modified PGA is 0.627 with one half equal to 0.31.

The following estimated soil parameters were used in our analyses:

Soil Description	Unit Weight (pcf)	Cohesion (psf)	Friction (degrees)
Weathered Glacial Soils	115	0	30
Structural Fill	130	0	36
Ultra Blocks	155	10,000	45
Rockery Boulders	145	5,000	45

Slope Stability Results

Cross Section	Static Factor of Safety	0.31g Seismic Factor of Safety
Global Stability with Deeper Block Wall	1.750	1.135

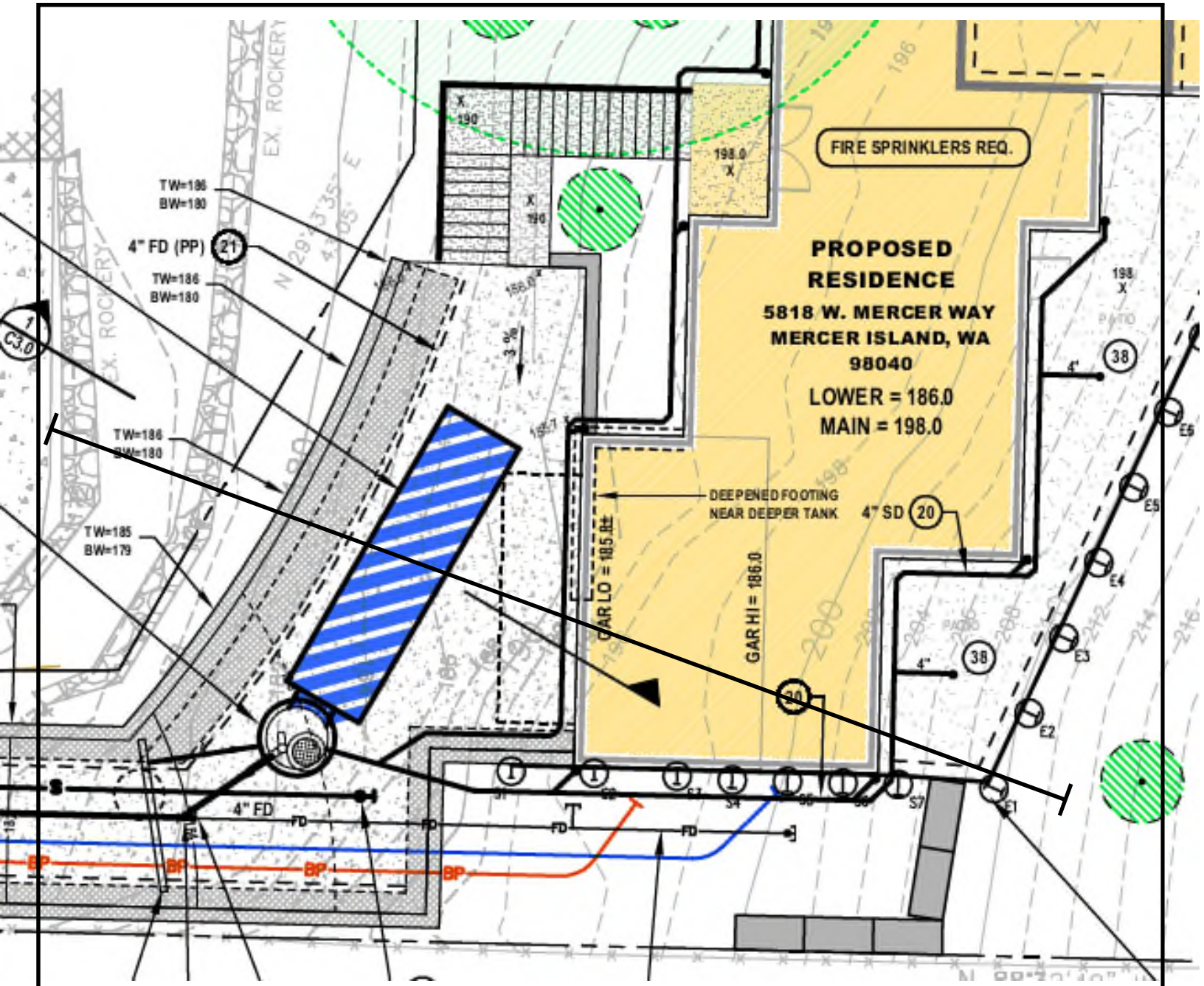
The analyses indicate suitable factors of safety can be achieved by utilizing a larger and deeper block wall system that penetrates through looser soils and embeds at the base of the elevation of the adjacent rockery (elevation 174 feet). This will require a double block wall with interlocking Ultra blocks for three rows (7.5 feet) with two single-depth blocks above this zone, similar to what is shown in the current plans. The only difference is additional blocks buried below the gravity wall shown on the civil plans. All voids behind and around blocks should be filled with 5/8 to 2 inch clean angular rock. A footing drain is necessary to alleviate any buildup of surface or groundwater.

These analyses do not determine safety during construction. Typically, construction activities are temporary and provided excavation recommendations from the geotechnical engineer are followed, the risk of failure can be managed through daily observation of stability. Please see the temporary excavation section of this report for more information.

Sincerely,

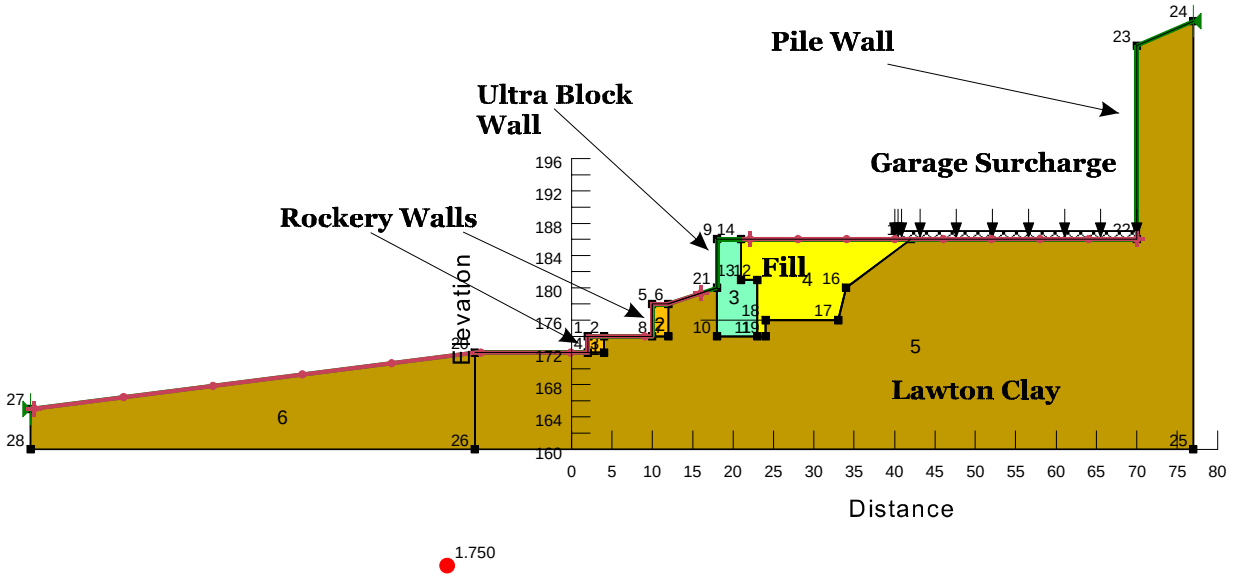
Cobalt Geosciences, LLC

7/2/2025
Phil Haberman, PE, LG, LEG
Principal

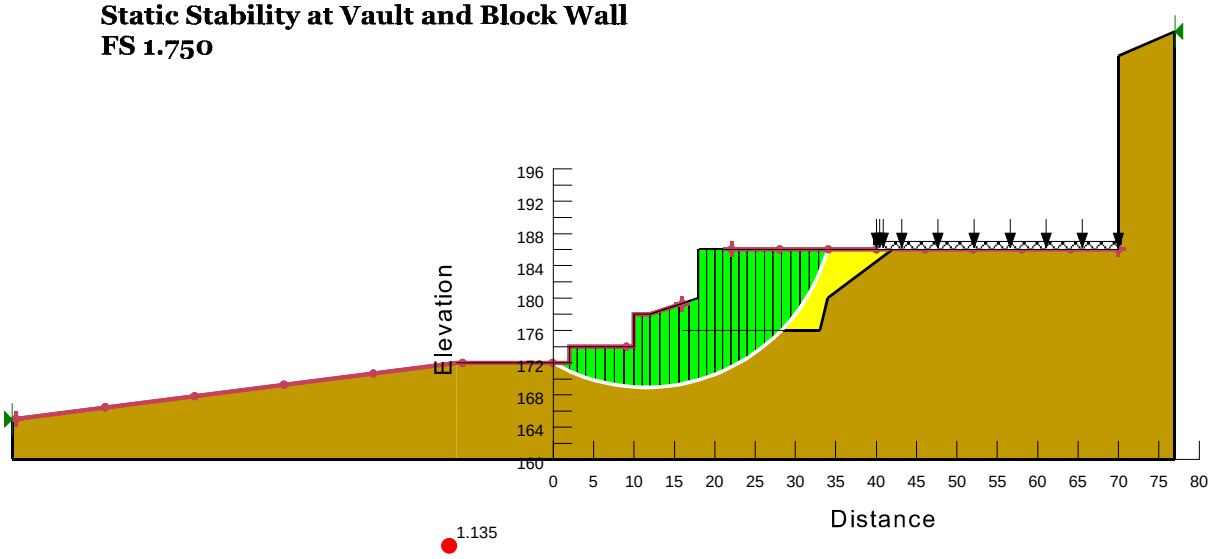


Section for Analysis

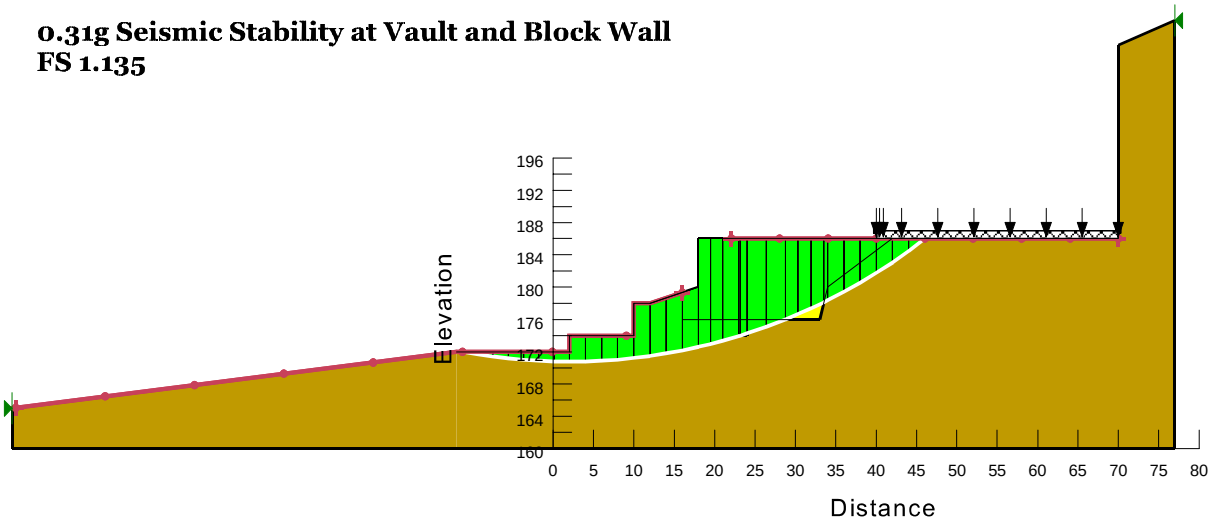
COBALT GEOSCIENCES	Proposed Residence 5818 W. Mercer Way Mercer Island, Washington	**Site Plan Excerpt**	Cobalt Geosciences, LLC P.O. Box 82243 Kenmore, WA 98028 (206) 331-1097 www.cobaltgeo.com cobaltgeo@gmail.com



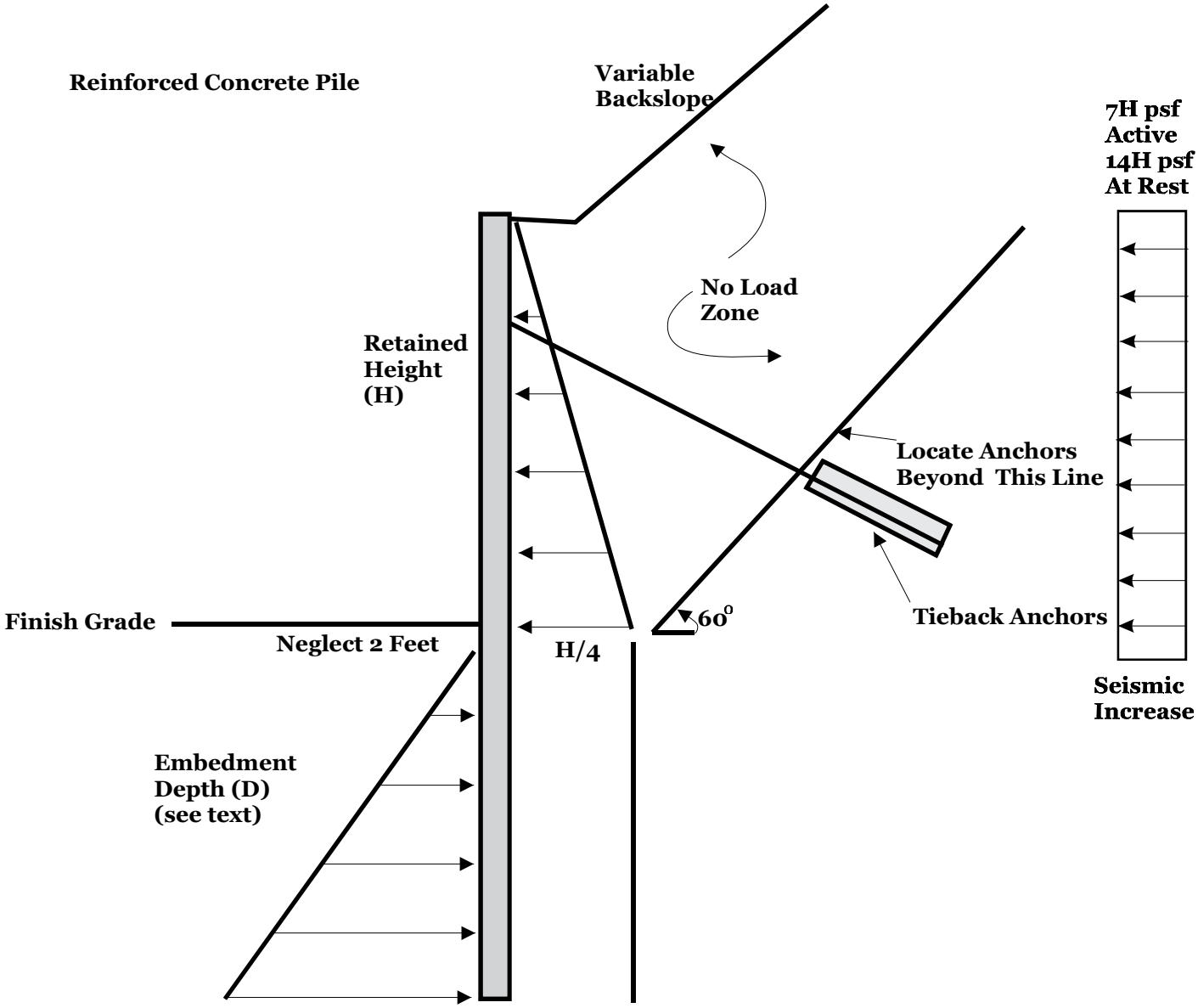
Static Stability at Vault and Block Wall
FS 1.750



0.31g Seismic Stability at Vault and Block Wall
FS 1.135



COBALT GEOSCIENCES	Proposed Residence 5818 W. Mercer Way Mercer Island, Washington	**Slope Stability**	Cobalt Geosciences, LLC P.O. Box 82243 Kenmore, WA 98028 (206) 331-1097 www.cobaltgeo.com cobaltgeo@gmail.com

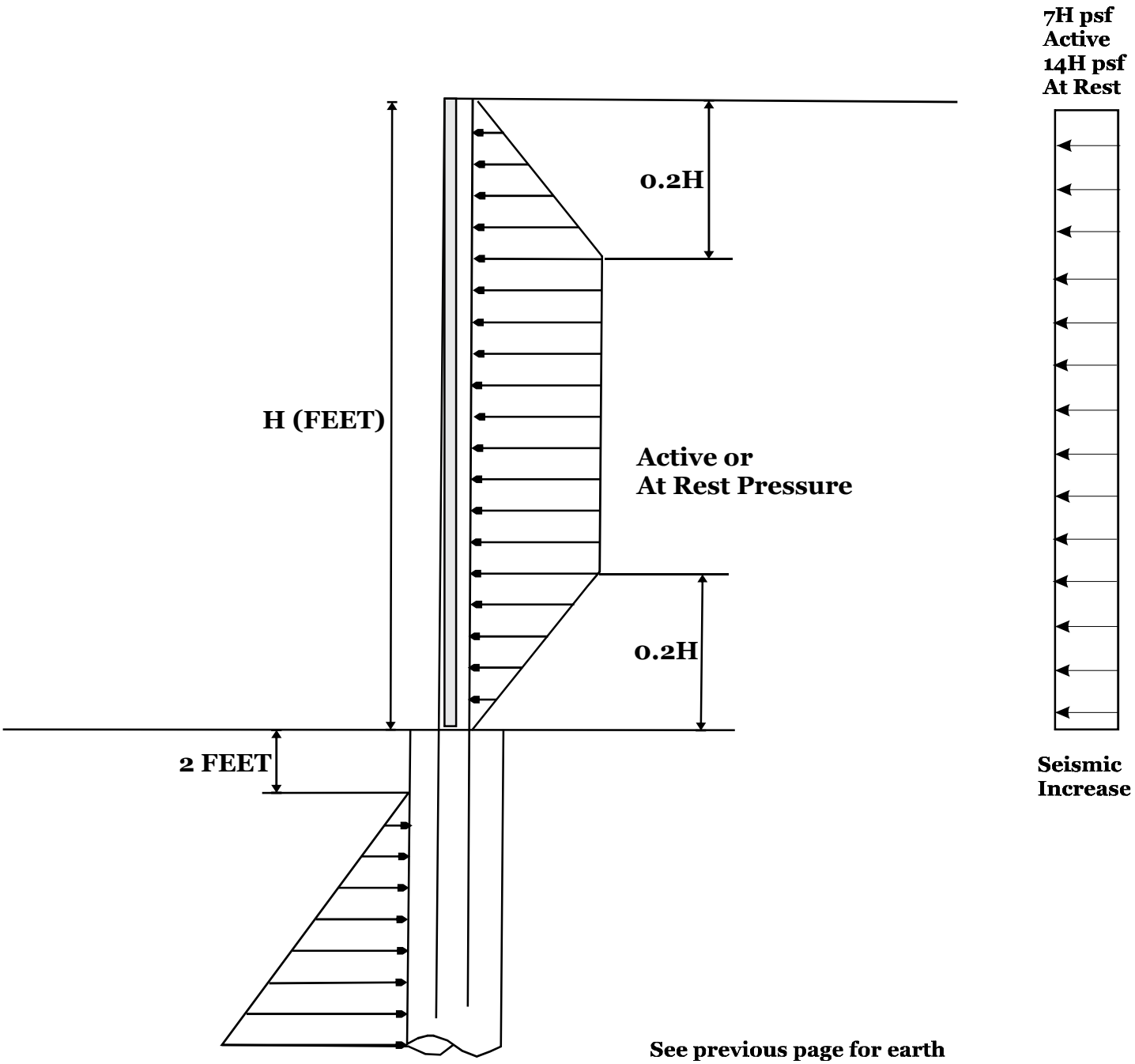


Notes:

See report for additional specific information
Soil pressures act over the pile spacing
Passive pressures act over twice the grouted pile diameter on the pile spacing, whichever is smaller
Assumed no hydrostatic pressures act on the back of the walls
At least 2 anchors (3 percent) to be tested to 200 percent of the design load
Preliminary adhesion of 3 kips per lineal foot (pressure grouted with post grouting)

COBALT GEOSCIENCES	Proposed Residence 5818 W. Mercer Way Mercer Island, Washington	**Soldier Pile Wall with Tiebacks**	Cobalt Geosciences, LLC P.O. Box 82243 Kenmore, WA 98028 (206) 331-1097 www.cobaltgeo.com cobaltgeo@gmail.com

SOLDIER PILE WALL WITH TWO OR MORE ROWS OF TIEBACKS



See previous page for earth pressures

COBALT GEOSCIENCES	Proposed Residence 5818 W. Mercer Way Mercer Island, Washington	**Soldier Pile Wall with Two Tiebacks**	Cobalt Geosciences, LLC P.O. Box 82243 Kenmore, WA 98028 (206) 331-1097 www.cobaltgeo.com cobaltgeo@gmail.com