March 11, 2024
Updated August 1, 2024
ES-8332.02

Earth Solutions NW LLC
Geotechnical Engineering, Construction
Observation/Testing and Environmental Services

LNL Builds, LLC
317 – 4th Street
Kirkland, Washington 98033

Attention: Vann Lanz

Subject: Plan Review
2436 – 74th Avenue Southeast
Mercer Island, Washington

Dear Vann:

In accordance with your request, Earth Solutions NW, LLC (ESNW) has prepared this updated response letter for the subject property. This updated response addresses the current lot within the short plat that has been submitted for building permit review and was included in the referenced geotechnical report and addresses recent review comments provided via email from the client representative.

Review Comment

Please provide a report addendum from the geotechnical engineer to provide site and subsurface information to support the location of the proposed community storm drain alignment. The report addendum should address potential impacts of the utility installation on the stability of the existing slope and the potential impact of the slope stability on the integrity of the utility line over time. Mitigation measures should be provided as needed based on the site information obtained. Geotechnical engineer to also indicate specific recommended construction techniques to provide a stable temporary and permanent condition.

Please include recommendations as a note on the plan sheet.

ESNW Response

The community storm drain will be a relatively shallow cut/cover utility. In terms of impacts to slope stability, this type of feature is insignificant, as the net weight differential from existing soil is very similar. Therefore, little to no additional surcharge will occur within the slope. ESNW recommends the utility be supported on a firm and unyielding subgrade and backfill consist of mechanically compacted soil that is placed in loose lifts not to exceed 12 inches. Utility trench excavations should be kept to the minimum required to ensure sidewall integrity during construction. The recommendations related to temporary erosion control BMPs and utility trench construction in the referenced geotechnical report remain applicable to this utility trench installation. Upon completion, permanent erosion control BMPs should be implemented as soon as possible and should be maintained until the surface is stabilized and vegetation is established. In terms of long-term stability, we do not anticipate this element will require additional measures to ensure stability and proper performance. As with any construction on sloped terrain, periodic observations should be made by the property owner. If signs of instability are noticed, the city and/or geotechnical engineer should be contacted immediately.

Review Comment

Please have the geotechnical engineer provide stability calculations of the proposed wall and fill slope to verify that the proposed configuration has long term stability under static and seismic loading conditions.

The geotechnical engineering report (page 11) indicated that "fill placement should not occur along sloping areas of this site".

Please revise proposed grading to conform with geotechnical recommendations or have the geotechnical engineer provide specific fill placement recommendations (e.g. recommended dimensions for notching fill into existing sloping ground at this location). Please include detail and/or notes on plan sheet.

ESNW Response

We understand the owner has explored the feasibility of placing fill off the east side of the residence to provide safe useable yard area. The original geotechnical report recommended against placing fill on the slope; however, updated slope stability modeling attached, using geofoam backfill, indicates that stability will not be adversely impacted by the proposed grading on the slope.

In our opinion, the geofoam should be placed on a level and benched subgrade that is configured in a net 1H:1V arrangement with vertical and horizontal steps that do not exceed four feet. Pea gravel should be used to fill any void spaced in the geofoam blocks. A surface layer of sod/topsoil may be placed in the upper approximately 18 inches to provide a viable yard. Final grades behind the wall should be level or sloped away from the top of the wall. The plans indicate a yard drain will be installed to provide a capture/conveyance of surface water away from the top of the retaining wall. The cast in place concrete retaining wall should be designed using the following parameters.

- Density of geofoam backfill — 10 pcf
- Allowable soil bearing capacity for retaining wall — 1,500 psf
- Active earth pressure (unrestrained condition) — 5 pcf (equivalent fluid)
- Passive earth pressure — 150 pcf (equivalent fluid)*
- Coefficient of friction — 0.40
- Seismic surcharge — 8H psf**

* *Neglect the upper three feet of soil for descending slope condition at toe.*
** *Where H equals the retained height (in feet).*

The passive earth pressure and coefficient of friction values include a safety factor of 1.5. The above design parameters are based on a level backfill condition and level grade at the wall toe. Additional surcharge loading from adjacent foundations, sloped backfill, or other relevant loads should be included in the retaining wall design.

Retaining walls should be backfilled with free-draining material that extends along the height of the wall and a distance of at least 12 inches behind the wall. The upper 18 inches of the wall backfill may consist of a less permeable soil if desired. A perforated drainpipe should be placed along the base of the wall and connected to an approved discharge location. If drainage is not provided, hydrostatic pressures should be included in the wall design.

Review Comment

The maximum 4-ft high, landscape block wall called out here is located in an area that has a lowest original grade of elevation 128 feet. With a final grade of 136.5 feet behind the wall, the fill height is at least 8.5 feet and includes a permanent slope. Please have the geotechnical engineer provide foundation recommendations for this wall along with passive pressure recommendation to include the sloping ground condition in front of the wall.

Please provide structural calculations and detail for the design of this wall. For walls greater than 6 feet in height, please include seismic loading.

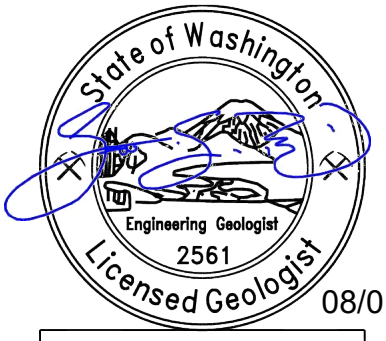
ESNW Response

Please see previous response for parameters requested in this comment.

We trust this plan review letter meets your current needs. Should you have questions, or if additional information is required, please contact us.

Sincerely,

EARTH SOLUTIONS NW, LLC



08/01/2024

Scott S. Riegel

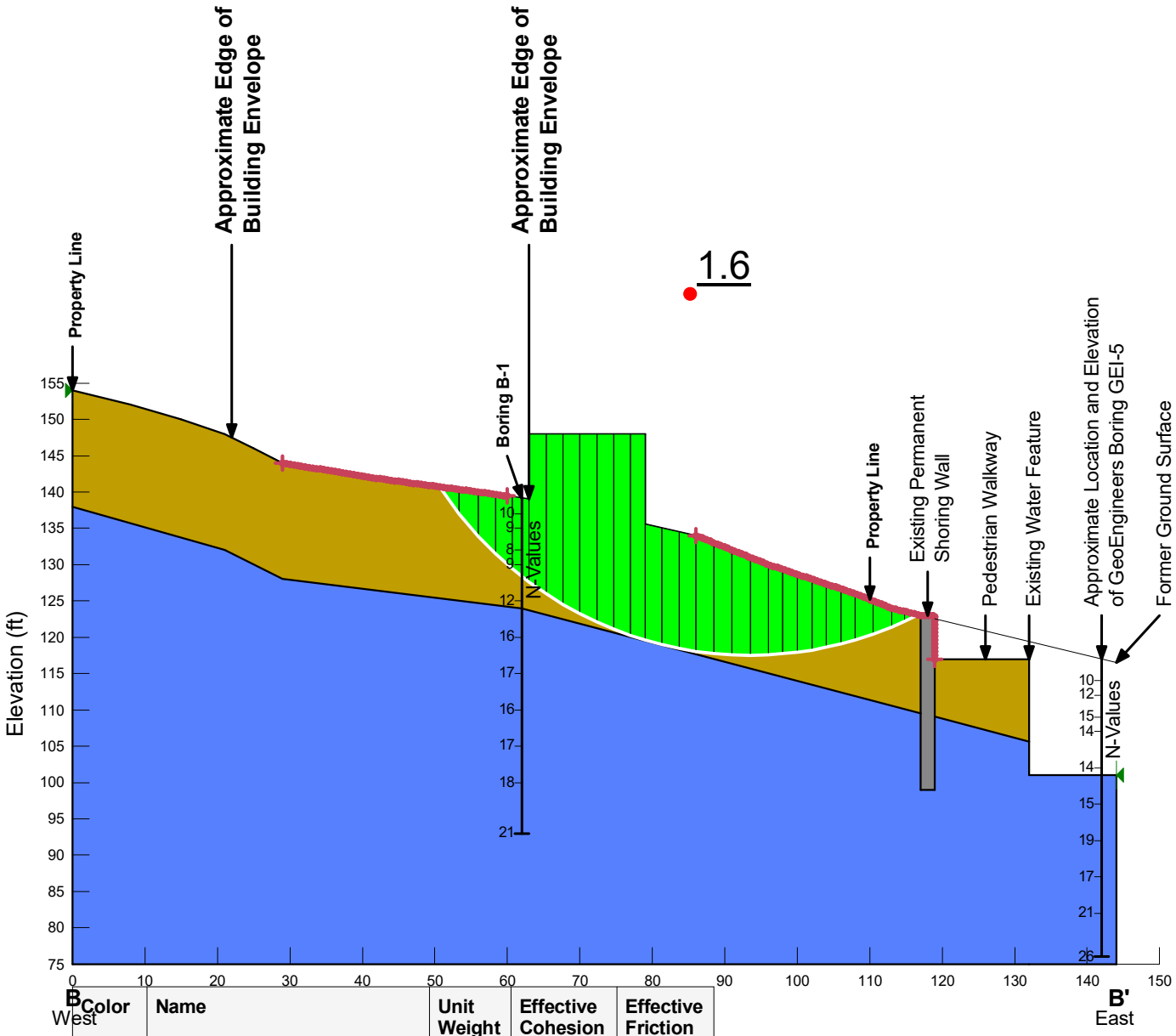
Scott S. Riegel, L.G., L.E.G.
Associate Principal Geologist

Attachment: SlopeW Output

cc: Medici Architects
Attention: Dan Alexander, AIA

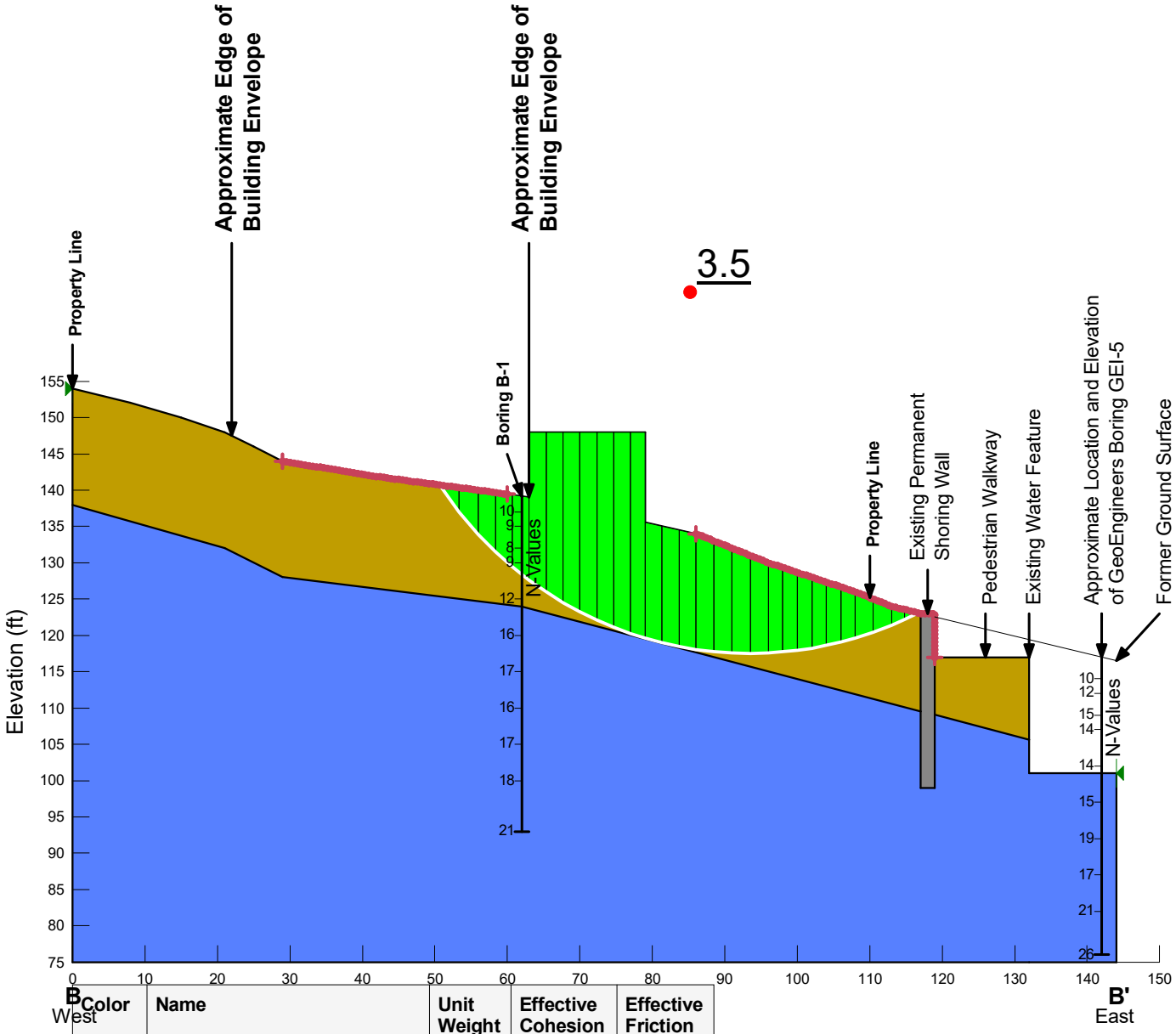
References:

- Architectural Site Plan, prepared by Medici Architects, dated April 30, 2024
- Geotechnical Addendum and Response to Correction Notice, prepared by ESNW, ES-8332.02, dated December 7, 2023
- Geotechnical Engineering Study, prepared by ESNW, ES-8332.01, dated May 2, 2023



Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Disturbed Pre-Olympia Fine-Grained Glacial Deposits (Qpogf)	110	750	5
	Geofoam Fill	10	1,000	0
	Permanent Shoring			
	Undisturbed Pre-Olympia Fine-Grained Glacial Deposits (Qpogf)	115	1,500	7

ES-8332.02
74th Avenue S.E. Property
Parcel B
Cross Section B-B'
Existing Geometry
Seismic Condition
Horizontal Acceleration = 0.329



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ES-8332.02
74th Avenue S.E. Property
Parcel B
Cross Section B-B'
Existing Geometry
Static Condition