PanGEO INCORPORATED
Geotechnical & Earthquake Engineering Consultants

May 7, 2020
File No. 19-062

Mr. Benjamin C. Altman, Exe.,
The Estate of James Altman, Sr.
Attn: George Steirer, Plan to Permit, LLC.
10365 El Honcho Place
San Diego, CA 92124-1219

Subject: **Geotechnical Report Addendum Pin Pile Distribution**
West Lot -Parcel 302405 9213
6423 East Mercer Way
Mercer Island, WA

Dear Mr. Altman,

As requested, PanGEO prepared the following report addendum to provide geotechnical guidance regarding the portion of the foundations of the planned house on Parcel 302405-9213 (west lot) that may require pin pile support. Based on our review of the current plans, it appears that south half of the house may be underlain by soft/loose colluvial soils that may require pin pile foundations to avoid excessive settlement. Accordingly, we recommend that the portion of the foundations illustrated on Figure A be designed with pin pile support. Detailed recommendations for pin pile support are provided in PanGEO's Geotechnical Report dated April 16, 2019. Actual distribution of pin piles will be determined in the field based on observed depth to competent soil in the footing excavations. That is, spread footing foundations may be used in conjunction with subgrade over excavation and replacement with compacted backfill where the competent soil underlies the base of the footings by a depth of about 2 feet or less and pin pile foundations should be used where the competent soil is deeper.

In addition, the house plans call for a deep excavation on the north side of the house (see Fig. B). We anticipate that the excavation will encounter loose colluvium overlying hard,

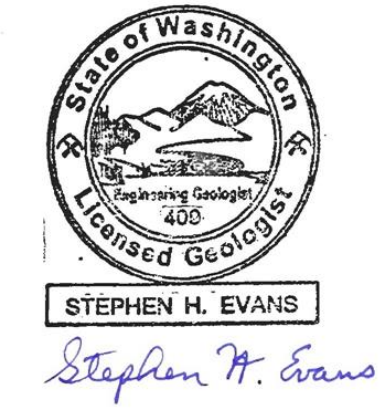
3213 Eastlake Ave E Ste B
Seattle, WA 98102
Tel:(206) 262-0370
Fax:(206) 262-0374

pre-Olympia clay. The loose colluvium may be vulnerable to sloughing and may require excavation cut slopes on the order of 2(H):1(V), where the underlying hard clay may be stable at cuts no steeper than 1H:1V. With the subsurface conditions as illustrated in Figure B, an open cut for the basement will likely encroach into the adjacent parcel to the north. Accordingly, we suggest seeking a construction easement from the uphill property owner to allow encroachment from the temporary excavation cut. Without an easement, a temporary soldier pile shoring wall will be required to complete the excavation. The soldier pile wall should be designed according to the parameters given on Figure C.

Landscaping walls (such as modular blocks) and the basement walls of the house may be designed in accordance with the recommendations from our April 16, 2019, Geotechnical report. Walls underlain by fill or colluvial soils should be designed for an allowable bearing pressure of 2 ksf.

Lateral loads on the basement walls of the house may be reduced by using expanded polystyrene (EPS or geofoam) as backfill in the excavation cut in lieu of the excavated soils. Specifically, a lateral earth pressure corresponding to an equivalent fluid weight of 10 pcf may be used where geofoam is used entirely within the cut. The geofoam blocks should be covered with 2 feet of conventional sand and gravel.

We trust that the information outlined in this letter meets your needs. Please call if you have any questions.



Stephen H. Evans, L.E.
Senior Engineering Geologist

W. Paul Grant, P.E.
Principal Geotechnical Engineer

Encl:
Fig. A Potential Areas Requiring Pin Pile Support
Fig. B Schematic Profile A – A'
Fig. C Shoring Design Parameters – Cantilever / Single Tieback of Strut

10 0 10 20
scale in feet

Scale: 1" = 20'

THICKENED EDGE OF ASPHALT

CONC. WALL

LOT 6

LOT 7

10'W SEWER EASEMENT AFN 5787752

CREEK TRAIL

10'

CREEK

N 01°28'27" E 124.00'(R1)

N 26°05'38" E 81.84'(R1)

S 07°59'58" W 80.00'(R1)

N 01°21'30" E 301.01'(C) 301.00'(R1)

80.01'(C) 80.00'(R1)

L=182.95'(C)
R=95.49'(R1)
Δ=109°46'3

APN 3024059213

A

A'

B-5

B-4

PG-7

House Footprint

Legend:

PG-1 PanGEO Borings (this study)

B-4 AMEC Borings (2000)

Portion of Foundation
Likely Requiring Pin Piles

PanGEO INCORPORATED

Proposed Development
Lot : 3024059213
6423 East Mercer Way
Mercer Island, Washington

Potential Areas Requiring Pint Pile Support

Project No. 19-062

Figure No. A

File.ppt 5/6/2020(10:12 AM) TEA

A

A'

PG-8

silty CLAY

9

12

22

50

55

Hard, silty CLAY

B-5

7

2

6

2

5

3

18

29

25

32

38

50

sandy SILT

Colluvium

House

Porch

FF-167.63

preOlympia Deposit

Colluvium

B-4

5

7

7

8

7

8

10

7

12

22

26

35

32

37

45

51

Elevation (in feet)

200

190

180

170

160

150

140

130

120

210

200

190

180

170

160

150

140

0

10

20

30

40

50

60

70

80

90

100

110

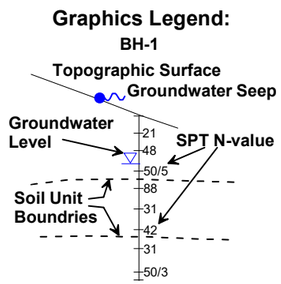
120

130

140

Distance (ft.)

Graphics Legend:



Notes:

1.

19-369 Stick Log and Profile Data.xls 5/8/20 (10:03) SHE

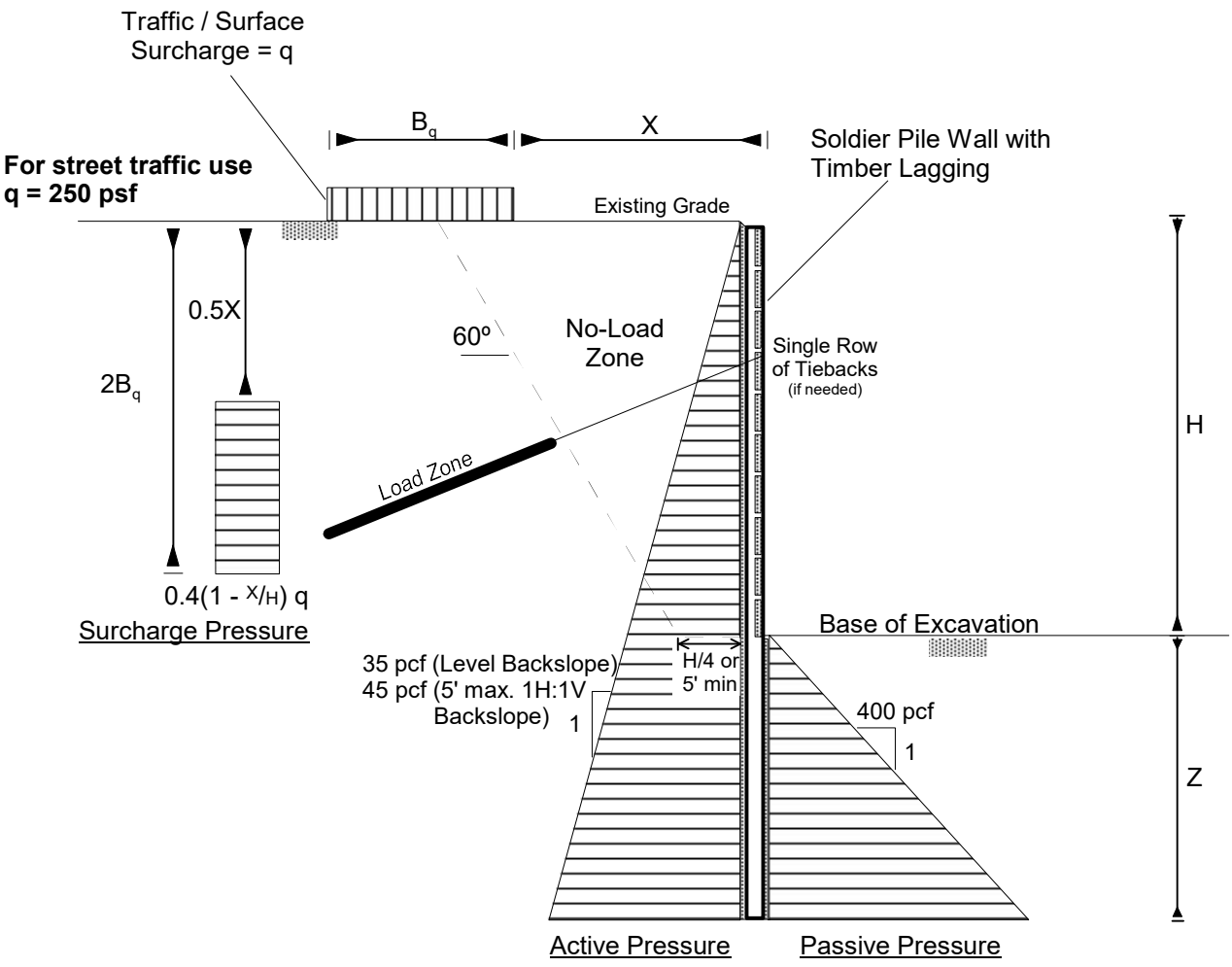
PanGEO INCORPORATED

Proposed Single Family Residence
6423 E Mercer Way
Mercer Island, Washington

GENERALIZED SUBSURFACE PROFILE
SECTION A-A'
WEST PARCEL

Project No. **19-062**

Figure No. **B**



Notes:

1. Embedment (Z) should be determined by summation of moments at the bottom of the soldier piles or at ground anchor location if present. Minimum pile embedment shall be 10 feet.
2. A factor of safety of 1.5 has been applied to the recommended passive earth pressure value. No factor of safety has been applied to the recommended active earth pressure values.
3. Active and surcharge pressures should be applied over the full width of the pile spacing above the base of the excavation, and over one pile diameter below the base of the excavation.
4. Passive pressure should be applied to two times the diameter of the soldier piles.
5. Use uniform earth pressure of 200 psf and 250 psf for lagging design with soldier piles spaced at less than or equal to 8 feet and greater than 8 feet, respectively.
6. Refer to report text for additional discussions.