

Mina & Balsa Laban
c/o Floisand Studio
1941 First Avenue South, Suite 2E
Seattle, Washington 98134

Attention: Ms. Allison Hogue

Subject: Supplemental Geotechnical Engineering Services
Laban Residence Improvements
10 Brook Bay Drive
Mercer Island, Washington 98040

Dear Ms. Hogue,

Zipper Geo Associates, LLC (ZGA) prepared and submitted the following geotechnical report for the referenced project in Mercer Island, Washington.

- *Geotechnical Engineering Report, Laban Residence Improvements, 10 Brook Bay, Mercer Island, Washington, dated 27 February 2023.*

Per your request, this supplemental report provides revised geotechnical design recommendations for the permanent shoring walls and pipe pile foundation support in response to design changes and City of Mercer Island plan review comments. This report is considered supplemental to and should only be used in conjunction with our 27 February 2023 geotechnical report referenced above.

Driven Soldier Pile Wall

Section 3.7 of our 27 February 2023 geotechnical report provides geotechnical design recommendations for a driven soldier pile wall located near the southeast corner of the residence. We understand that the soldier pile wall alignment has been shifted slightly south and east to the outside of the buildings existing shallow spread permanent foundation. We further understand that the relocated soldier pile wall will function as temporary shoring and will provide permanent vertical or lateral support for the new basement concrete retaining wall that will be constructed against the soldier pile wall. Based on the new design parameters, we recommend that the driven soldier pile wall be designed in accordance with the Revised Lateral Earth Pressures presented in Figure 2 enclosed with this report. The active, at-rest, and surcharge loads presented in Figure 2 assumed a drained condition.

Pipe Pile Foundation Support

Section 3.8 of the 27 February 2023 geotechnical report provides geotechnical recommendations for pipe pile support of new foundation elements associated with the remodel. We understand that the project has been modified to include 2-inch and 3-inch diameter driven pipe pile support of both new and existing

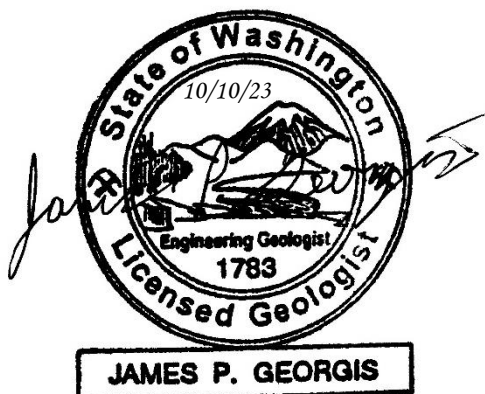
foundations to limit potential total and differential static and seismic settlements. We take no exception to this modification and the recommendations presented in Section 3.8 of our report are applicable to both new and existing foundation support.

Section 3.8.1 of the 27 February 2023 geotechnical report recommends an allowable axial compressive capacity of 3 tons per pile for 2-inch diameter pipe piles driven to refusal. We understand that City of Mercer Island plan review comments suggest that the standard of practice in this region is to limit the axial capacity of 2-inch diameter pipe piles to 2 tons per pile in liquefaction and peat hazard areas, presumable due to pile bucking concerns. Section 3.2 of our 27 February 2023 geotechnical report addresses City of Mercer Island geologic hazard areas and identifies the relatively level northwestern portion of the site (northwest of the site slope) as a seismic hazard area with the potential for liquefaction during the 2018 IBC design earthquake. To address the City review comment, we recommend that 2-inch diameter pipe piles located in the northwestern portion of the building be designed for an allowable axial capacity of 2 tons per pile while 2-inch diameter driven pile piles located in the southeastern portion of the building (beyond the limits of potential liquefaction) be designed for an allowable axial capacity of 3 tons per pile. Exhibit A enclosed with this letter presented our recommended transition line from 2 ton to 3 ton piles and is based on geotechnical borings B-1 through B-3, groundwater data, and site topography. We anticipate that total and differential static and seismic settlements for foundations supported on pipe piles design and installed as recommended herein and our 27 February 2023 geotechnical report will be on the order of ½ inch or less. Most of the settlement is expected to occur rapidly as loads are applied. Post construction differential settlement should be minor.

CLOSURE

We appreciate the opportunity to be of assistance and we hope that this supplemental report meets your current needs. If you have any questions or comments, please call us at (425) 582-9928.

Respectfully Submitted,
Zipper Geo Associates, LLC



James P. Georgis, LEG
Principal



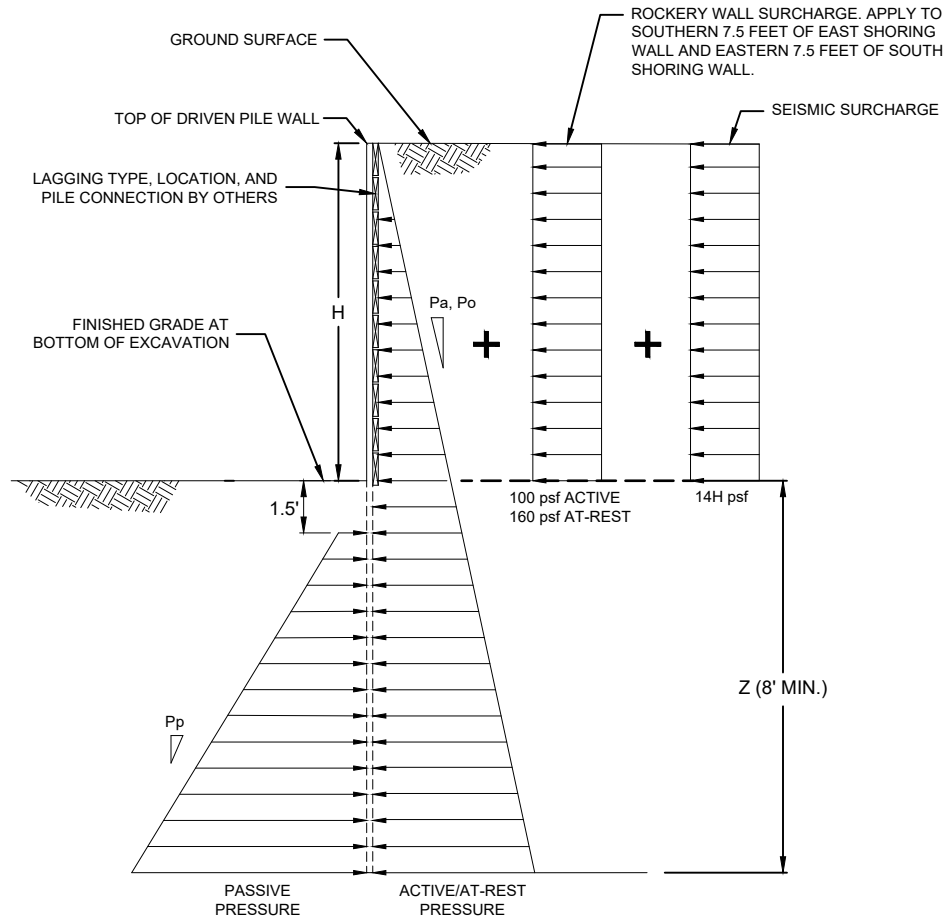
Robert A. Ross, PE
Principal

Laban Residence Improvements
ZGA Project Number: 2560.01
September 18, 2023



Enclosure: Figure 2: Revised Lateral Earth Pressures
 Exhibit A: 2-inch Diameter Pipe Pile Allowable Axial Capacity

Distribution: Addressee (1 electronic copy)



CANTILEVER PRESSURE DIAGRAM

TEMPORARY DRIVEN SOLDIER PILE SHORING DESIGN PARAMETERS			
BACKSLOPE	ACTIVE EARTH PRESSURE, P_a (pcf)	AT-REST EARTH PRESSURE, P_o (pcf)	ULTIMATE PASSIVE PRESSURE RESISTANCE, P_p (pcf)
LEVEL	35	55	425

NOTES:

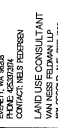
1. ALL DIMENSIONS IN FEET.
2. PASSIVE PRESSURE APPLIES OVER THREE DRIVEN PIPE PILE DIAMETERS (OR THREE TIMES THE FLANGE WIDTH IF DRIVEN W OR H SHAPE BEAMS ARE USED) OR PILE SPACING, WHICHEVER IS LESS. PASSIVE LATERAL EARTH PRESSURE PRESENTED HEREIN IS ULTIMATE. AN APPROPRIATE SAFETY FACTOR SHOULD BE APPLIED
3. ACTIVE/AT-REST PRESSURE APPLIES OVER PILE SPACING ABOVE EXCAVATION BASE AND OVER ONE PILE DIAMETER/FLANGE WIDTH BELOW EXCAVATION BASE.
- 4 SHORING DESIGN MUST SATISFY FORCE AND MOMENT EQUILIBRIUM ANALYSES.
5. DESIGN LAGGING IN ACCORDANCE WITH SECTION 6-16.3(6) OF THE WSDOT STANDARD SPECIFICATIONS FOR SOIL TYPE 1.
6. SEE REPORT TEXT AND FIGURE 3 FOR CALCULATION OF SURCHARGE LOADS ACTING ON THE WALL, AND FOR ADDITIONAL RECOMMENDATIONS.

LABAN RESIDENCE 10 Brook Bay Drive Mercer Island, Washington	
REVISED LATERAL EARTH PRESSURES PERMANENT DRIVEN SOLDIER PILE WALL	
Date: September 2023	Job No. 2560.01
Zipper Geo Associates, LLC 19019 36th Ave. W., Suite E Lynnwood, WA, 98036	FIGURE SHT. 1 of 1

FLOISAND STUDIO
1041 1st Avenue South, 2e
Seattle, WA 98134
PH 206.634.0135

OWNER: WA LABAN
ARCHITECT: FLOISAND STUDIO, LLC
SEATTLE, WA 98101
CONTACT: ALISON MOSE
SURVEYOR: JEFFREY
BELLEAU, WA 98004
WETLAND BIOLOGIST: WETLAND BIOLOGIST
CONTACT: WALTER ROG
WETLAND BIOLOGIST: WETLAND BIOLOGIST
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LAND USE CONSULTANT: VAN NESS FULDAAN LLP
SEATTLE, WA 98101
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STRUCTURAL: LALAN REMODEL
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CONTACT: MARC MALSAM
CIVIL ENGINEER: MARC MALSAM
SEATTLE, WA 98101
CONTACT: DAVID PARR
GEOTECHNICAL ENGINEER: ZIMMERMAN
SEATTLE, WA 98101
CONTACT: JAMES BEARDS

10 BROOK BAY
MERIDEN BEACH, WA 98040

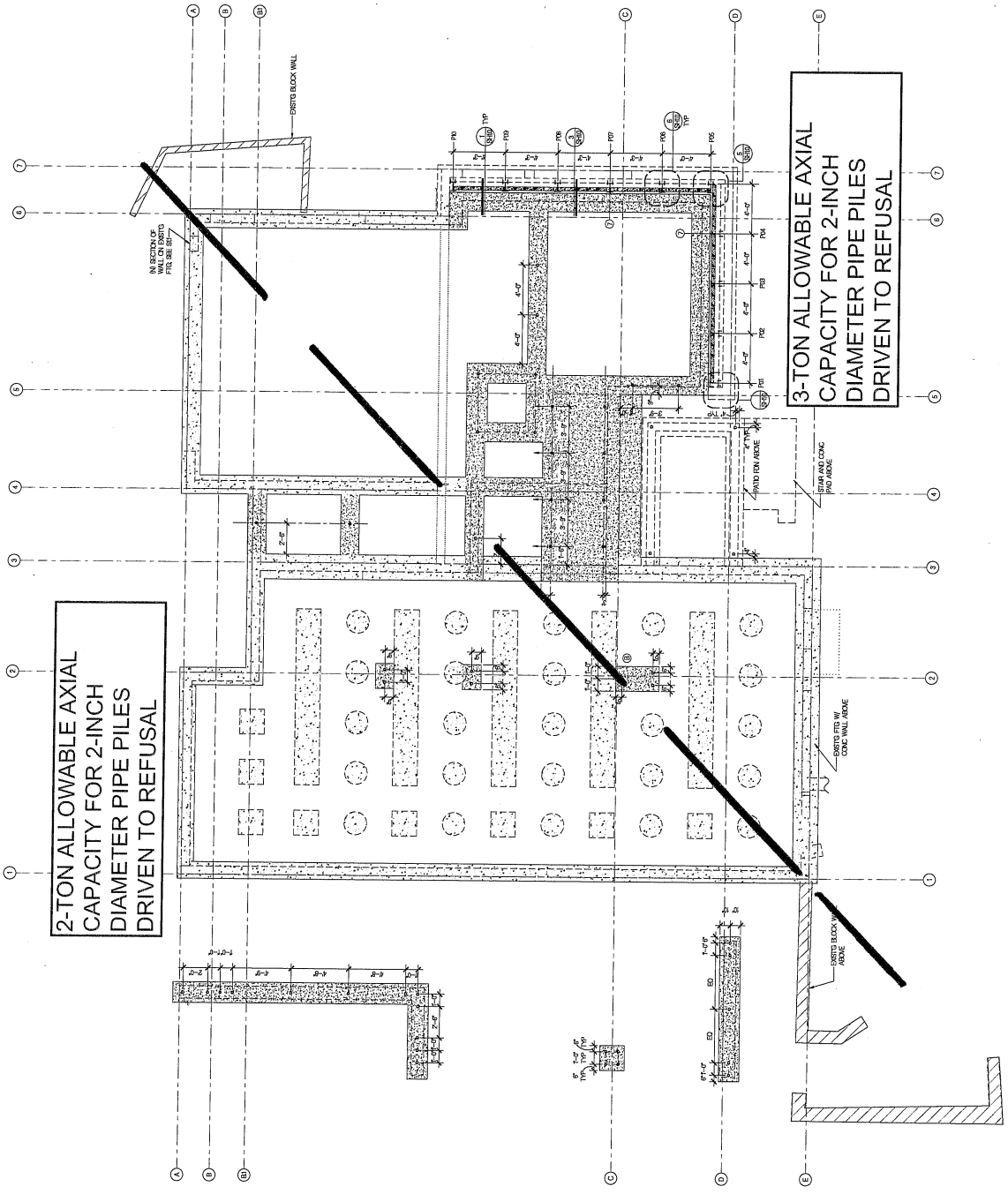


PROFESSIONAL STAMP
STRUCTURAL ENGINEER ONLY
BUILDING DEPT. STAMP

DATE: 4/28
PERMIT SET

PIN PILE AND SHORING PLAN

S1.0



2-TON ALLOWABLE AXIAL CAPACITY FOR 2-INCH DIAMETER PIPE PILES DRIVEN TO REFUSAL

3-TON ALLOWABLE AXIAL CAPACITY FOR 2-INCH DIAMETER PIPE PILES DRIVEN TO REFUSAL

STRUCTURAL LEGEND
EXISTING CONCRETE
NEW CONCRETE
EXISTING FOOTING
NEW FOOTING
SHORING PILE PER PLAN
STRUCTURE TO BE DEMOLISHED
WALL ABOVE
STEP PER ARCH DINGS
2" DIA. EXTRA-STRENGTH EXTRA-STRENGTH CAPACITY PER TO AND NOTING
2" DIA. BATTERED SHOR EXTRA-STRENGTH CAPACITY PER TO AND NOTING

PIPE PILE PLAN NOTES
1. 2" DIAMETER EXTRA-STRENGTH GALVANIZED PIPE PILES SHALL BE PERMANENTLY IDENTIFIED WITH A PERMANENT MARK (NUMBER) AS DEFINED BY THE GEOTECHNICAL ENGINEER.
2. ALL PIPE PILES SHALL BE DRIVEN TO REFUSAL.
3. GEOTECHNICAL RECORD INSPECTOR SHALL BE CONTINUOUSLY PRESENT DURING PIPE PILE INSTALLATION AND TESTING.
4. THE OBSERVATION OF THE INSTALLATION.
5. STEEL PIPE SHALL BE DRIVEN TO A MAXIMUM PENETRATION OF 25.0% OF THE TOTAL PENETRATION.
6. PIPE PILES NEED TO BE PLACED WITHIN 2' OF DESIGN LOCATION. THE CONTRACTOR SHALL DETERMINE THE LOCATION OF ALL ADJACENT UNDERGROUND UTILITIES PRIOR TO DRIVING PILES.

SHORING NOTES
1. REFER TO GENERAL STRUCTURAL NOTES SHEET FOR ADDITIONAL REQUIREMENTS.
2. REFER TO SOLE REPORT FOR ADDITIONAL REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY ALL ELEVATIONS AND DIMENSIONS WITH ARCHITECTURAL DRAWINGS.
4. SHORING DIMENSIONS AND DRIVING SITE CONDITIONS.
5. SHORING SHALL BE PLACED IN THE RIGHT OF WAY ONCE THEY ARE NO LONGER NEEDED FOR CONSTRUCTION.
6. CONSTRUCTION DIMENSIONS REFER TO ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS.
7. TOP OF PILES ARE TO MATCH THE TOP OF EXISTING FOOTINGS - TOP OF PILES SHALL BE VERIFIED IN THE FIELD TO DETERMINE ACTUAL LENGTH OF PILE REQUIRED.

SHORING PILE SCHEDULE

PILE MARK	PILE SIZE	NO. OF PILES PER CAP	NO. OF CAPS	NO. OF PILES	NO. OF CAPS	NO. OF PILES	NO. OF CAPS	LOADING	DETAIL
P01	18x18	353	457	547	307	827	PERMANENT	3000	SECTION
P02	18x18	353	457	547	307	827	PERMANENT	3000	SECTION
P03	18x18	353	457	547	307	827	PERMANENT	3000	SECTION
P04	18x18	353	457	547	307	827	PERMANENT	3000	SECTION
P05	18x18	353	457	547	307	827	PERMANENT	3000	SECTION
P06	18x18	353	457	547	307	827	PERMANENT	3000	SECTION
P07	18x18	353	457	547	307	827	PERMANENT	3000	SECTION
P08	18x18	353	457	547	307	827	PERMANENT	3000	SECTION
P09	18x18	353	457	547	307	827	PERMANENT	3000	SECTION
P10	18x18	353	457	547	307	827	PERMANENT	3000	SECTION



PIN PILE AND PERMANENT SHORING PILE PLAN
11-7-15