EVREN NORTHWEST INC
environmental & natural resource consultants

PERSONAL AND CONFIDENTIAL

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June 20, 2023
Project No. 1700-22001-01

Dolan Dolan-Wolfe and Jesse Wolfe
8776 NW Bridge Ave
Portland, Oregon

Addendum No 3
August 25 2021 Geotechnical Engineering Report
Proposed Existing Retaining Walls Repairs
8776 Nw Bridge Ave
Portland, Oregon
Permit No. 21-093603-REV-01-RS

Dear Dolan and Jesse:
EVREN Northwest (ENW), Inc. (formerly Terra Dolce Consultants, Inc (TDC)) is pleased to present our report for our Addendum 3 to TDC's August 25 2021 Geotechnical Engineering Report. Addendum 3 presents our response to the City of Portland's (the City) Bureau of Development Services March 2 2023 Septic Checksheet. ENW worked with PLi System, Inc. and Structural Engineers, Madden and Baughman Engineering, (MBE) Inc, to respond to the City's check sheet for the revised footing.

Project Discussion

During construction of the referenced retaining wall, the pile at the west end of the retaining wall was moved towards the east to avoid exerting additional load to the existing tank. This left a larger section of the wall without the necessary lateral support. To provide the lateral support, a footing was designed and installed at the west end of the wall. When the City reviewed the change, they found that the footing was within 1.3 feet of the concrete septic tanks, and therefore, does not meet the 5-foot setback. The City asked that we evaluate the septic tank to see if it was strong enough to support the additional surcharge from the retaining wall footing. If not, then we would need to modify the design of the footing. Because the septic tank is relatively old and the manufacturer of the tank was not known, we decided to modify the footing with vertical pin-piles to minimize the lateral load acting on the septic tank.

Pipe Pile Support

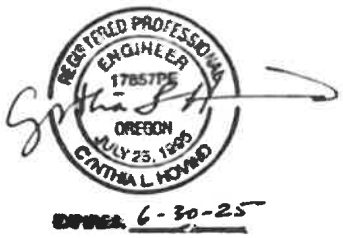
ENW evaluated the vertical capacity of 3-inch diameter XS (Sch 80) pipe piles for the retaining wall footing using CT AllPile (see Attached Pile Calculations). The results indicate that the piles have an allowable vertical capacity of 16 kips each and a lateral capacity of 2.9 kips (see Attached Pile Calculations).

Limitations

It is understood that this report was solely based on visual inspection of the property and house and review of reports provided by the owner. No additional subsurface investigation or

settlement monitoring was completed for this project. Our conclusion and recommendations are based on the performance of similar aged houses built on steep hillsides. Geotechnical engineering is characterized by a certain degree of uncertainty. Professional judgments presented are based partly on our understanding of the proposed construction and partly on our general experience. Our engineering work and judgments rendered meet current professional standards; no other warranties, either expressed or implied are made. This report is subject to review and should not be relied upon after a period of 3 years.

Sincerely,
EVREN Northwest, Inc.



Cynthia L. Hovind, P.E., G.E.
Professional Geotechnical Engineer, OR-**17857PE**

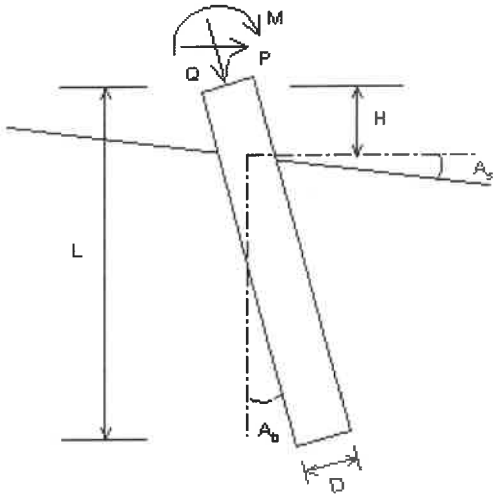
Attachements
CT ALL Pile Caculations

(1) PLi Systems, email

CT ALLPILE CALCULATIONS

VERTICAL ANALYSIS

Figure 1



Driving Steel Pile (Open end)

Loads:
Load Factor for Vertical Loads= 1.0
Load Factor for Lateral Loads= 1.0
Loads Supported by Pile Cap= 0 %
Shear Condition: Static

Vertical Load, Q= 15.0 -kp
Shear Load, P= 0.0 -kp
Slope Restain St= 0.00 -in/-in

Profile:
Pile Length, L= 30.0 -ft
Top Height, H= 0 -ft
Slope Angle, As= 0
Batter Angle, Ab= 0

Fixed Head Condition

Soil Data:

Depth -ft	Gamma -lb/f3	Phi	C -kp/f2	K -lb/i3	e50 or Dr %	Nspt
0	110.9	30.0	0.25	297.0	0.85	10
8	130	30	0.5	554.4	0.68	15
20	145	0.0	2.0	363.1	0.09	10

Pile Data:

Depth -ft	Width -in	Area -in2	Per. -in	I -in4	E -kp/i2	Weight -kp/f
0.0	3.5	2.8	11.0	3.7	29000	0.009
30.0						

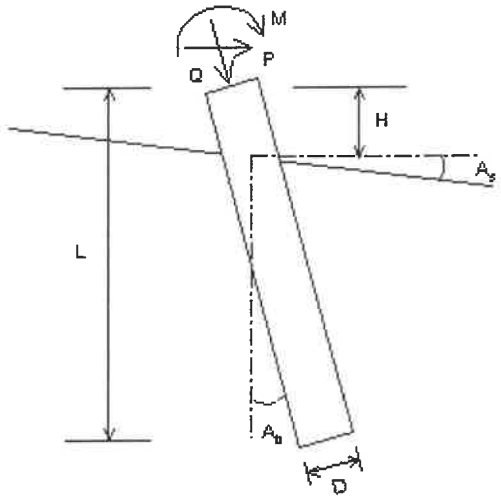
Vertical capacity:
Weight above Ground= 0.00 Total Weight= 0.27-kp *Soil Weight is not included
Side Resistance (Down)= 30.375-kp Side Resistance (Up)= 28.001-kp
Tip Resistance (Down)= 0.350-kp Tip Resistance (Up)= 0.000-kp
Total Ultimate Capacity (Down)= 30.725-kp Total Ultimate Capacity (Up)= 28.271-kp
Total Allowable Capacity (Down)= 15.362-kp Total Allowable Capacity (Up)= 14.270-kp
OK! Qallow > Q

Settlement Calculation:
At Q= 15.00-kp Settlement= 0.03649-in
At Xallow= 1.00-in Qallow= 99999.00000-kp

Note: If the program cannot find a result or the result exceeds the upper limit. The result will be displayed as 99999.

LATERAL ANALYSIS

Figure 2



Driving Steel Pile (Open end)

Loads:
Load Factor for Vertical Loads= 1.0
Load Factor for Lateral Loads= 1.0
Loads Supported by Pile Cap= 0 %
Shear Condition: Static

Vertical Load, Q= 15.0 -kp
Shear Load, P= 5.8 -kp
Slope Restain St= 0.00 -in/-in

Profile:
Pile Length, L= 30.0 -ft
Top Height, H= 0 -ft
Slope Angle, As= 0
Batter Angle, Ab= 0

Fixed Head Condition

Soil Data:

Depth -ft	Gamma -lb/f3	Phi	C -kp/f2	K -lb/i3	e50 or Dr %	Nspt
0	110.9	30.0	0.25	297.0	0.85	10
8	130	35	0.75	554.4	0.68	15

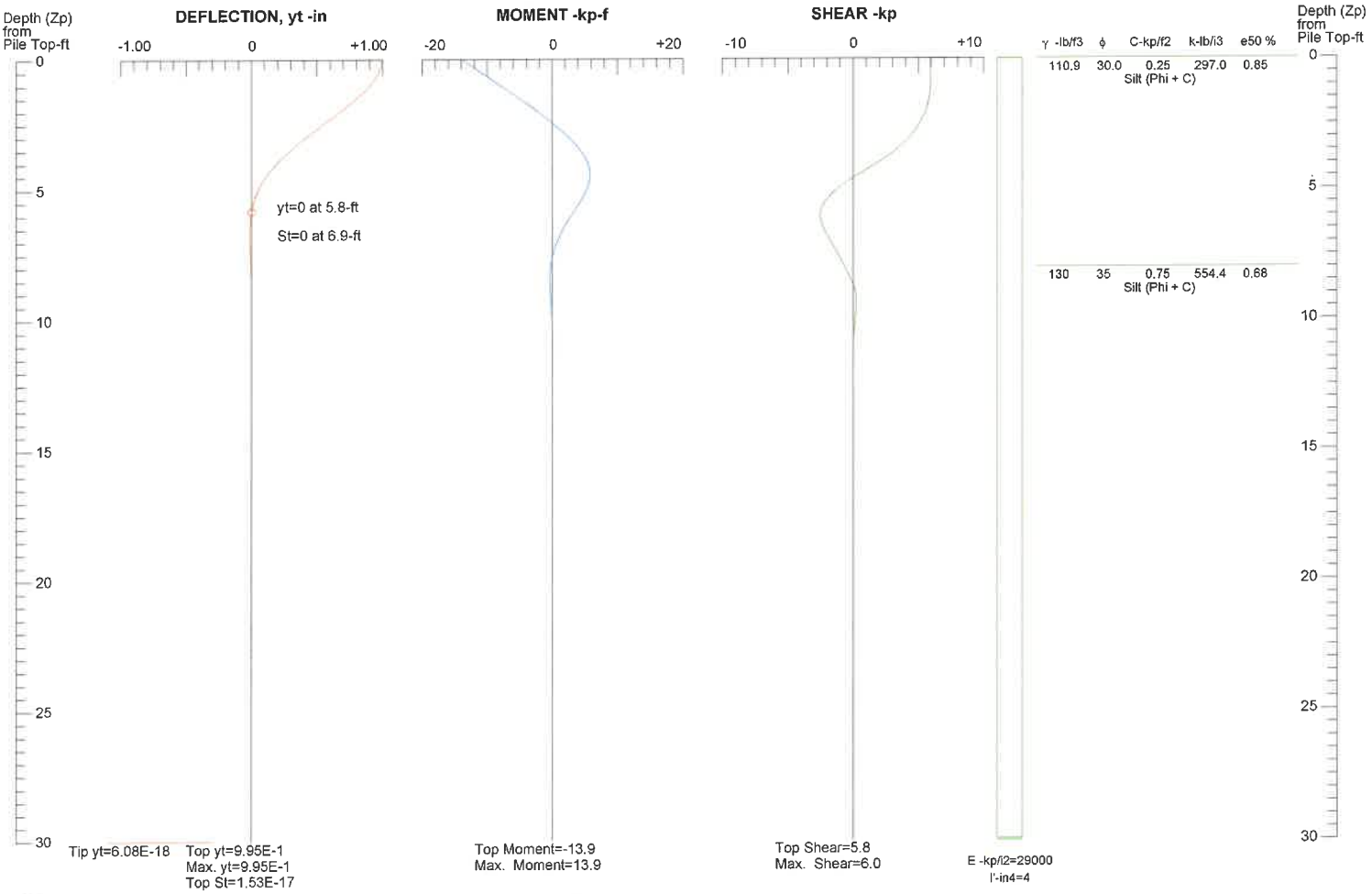
Pile Data:

Depth -ft	Width -in	Area -in2	Per. -in	I -in4	E -kp/i2	Weight -kp/f
0.0	3.5	2.8	11.0	3.7	29000	0.009
30.0						

Single Pile Lateral Analysis:
Top Deflection, yt= 0.99500-in
Max. Moment, M= -13.92-kp-f
Top Deflection Slope, St= 0.00000
OK! Top Deflection, 0.9950-in is less than the Allowable Deflection= 1.00-in

Note: If the program cannot find a result or the result exceeds the upper limit. The result will be displayed as 99999.
The Max. Moment calculated by program is an internal force from the applied load conditions. Structural engineer has to check whether the pile has enough capacity to resist the moment with adequate factor of safety. If not, the pile may fail under the load conditions.

PILE DEFLECTION & FORCE vs DEPTH
Single Pile, Khead=5, Kbc=2



EVREN Northwest, Inc.
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Dolan- Wolfe Pile Supported Footing
3-in XS Pile

Figure 2