October 22, 2021

Scenic RE, LLC
157 Columbus Avenue, Suite 515
New York, NY 10023

Attn: Mr. Michael Pullman
p: (914) 879-2005
e: michael@scenicinvestment.com

Re: Sheet Pile Retaining Wall
Washington Avenue Student Housing
Albany, New York
Terracon Proposal No. PJB205071 Supplemental

Dear Mr. Pullman:

Terracon Consultants-NY, Inc. (Terracon) is pleased to provide the attached design drawings, details and calculations for the sheet pile wall planned for construction along an existing archaeological right of way located on the south side of the proposed student housing development. This design document was prepared in general accordance with our supplemental services agreement which was authorized by Scenic RE LLC on or about August 31, 2021.

We understand the retaining wall will be about 550 ft long and range in exposed wall heights from about 2 ft to 8 ft in the final grading configuration. We also understand that along a portion of the retaining wall, a temporary excavation of about 10 ft deep (below the bottom of wall elevation) will be necessary to construct the below grade Sediment and Infiltration Basin. Our design considers this temporary condition.

Attached are the analyses for two sections designed using the AZ19-700 sheet pile. One section considers a retained height of 10 feet with a 1V:2H back slope at the top of the wall. The other section considers a retained height of 5 feet with a 1V:2H back slope at the top of the wall. These sections model the conditions anticipated in both the temporary case at the Sediment and Infiltration Basin excavation and the final planned grading.

For each section, the sheet pile retaining wall system was analyzed using the design software Shoring (Civiltech). Below is a summary of the results:

- AZ19-700 Sheet Pile
- 10 ft and 5 ft high maximum exposed heights
- Embedment depth varies between 10 ft to 20 ft depending on the exposed height of the wall

- Grade 50 ksi steel
- Sheet pile sizing considers 1/16” additional thickness on either side of the sheet pile to account for potential section loss due to corrosion
- 3/8” Thick Bent Plate Sheet Pile Cap

The analysis considers the following:

- A minimum safety factor of 1.5 for embedment length of sheet piles
- A minimum safety factor of 1.67 for flexural strength in sheet piles
- Top 2 ft of passive resistance is ignored
- The maximum deflection at the top of the wall is ¾"
- No seismic load is considered in the performed analyses
- No surcharge is considered above the retaining walls

Our design document has been prepared for the exclusive use of our client for specific application to the project discussed herein. It has been prepared in accordance with generally accepted geotechnical engineering practices. No additional warranties, either expressed or implied, are made.

We appreciate the opportunity to provide this final sheet pile wall design for your use. Please contact either of the undersigned if clarification is needed for any aspect of this report.

Sincerely,
Terracon Consultants - NY, Inc.

Joseph Robichaud, Jr., P.E.
Office Manager / Sr. Associate

Darrell S. Wilder, P.E.
Sr. Associate

Cc: Mo Nasim, Ph.D., P.E. - APR

List of Attachments:

Sheet Pile Wall Design Calculations Package
Sheet Pile Retaining Wall Drawings

DESIGN CALCULATION ANALYSIS COVER SHEET

Project Name: 1415 Washington Ave	**Date:** 10-21-2021
Terracon Project Number: JB205071	**No. of Pages:** 26

Calculation Description:

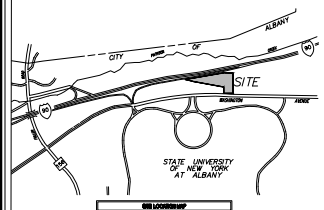
Two sections were designed using the AZ 19-700 sheet pile. One section considers a retained height of 10 feet with a 1V:2H back slope at the top of the wall. The other section considers a retained height of 5 feet with a 1V:2H back slope at the top of the wall. Soil parameters were developed based on the geotechnical engineering report prepared by Terracon dated September 9, 2020. For each section, the sheet pile retaining wall system was analyzed using the design software Shoring Suite.
Below is a summary of the results:

- AZ19-700 Sheet Pile
- 10 ft and 5 ft high maximum exposed heights
- Embedment depth varies between 12 ft to 20 ft depending on the exposed height of the wall
- Grade 50 ksi steel
- 3/8" Thick Bent Plate Sheet Pile Cap

Robichaud Jr, Joe L
Oct 21 2021 5:33 PM

10/21/2021

Performed By:	Ashkan Nafisi		10-21-21
	(Print Name)	(Sign)	(Date)
Checked By:	Darrell Wilder, PE		10-21-21
	(Print Name)	(Sign)	(Date)
Reviewed By:	Joe Robichaud, PE		10-21-21
	(Print Name)	(Sign)	(Date)



SEE LOCATION MAP

ZONING INFORMATION

MU-CU MIXED-USE COMMUNITY URBAN

MIN. LOT WIDTH	20 FEET
MAX. FRONT YARD	10 FEET
MIN. SIDE YARD	NONE
MIN. REAR YARD	0 FEET
MAX. LOT COVERAGE	90%

ZONING INFORMATION ADOPTED FROM: CITY OF ALBANY, N.Y. ADOPTED USDO ZONING REPORT

PROPOSED PARKING TABLE

REGULAR PARKING	175
HANDICAPPED PARKING	6
TOTAL PARKING SPACES	181
BICYCLE PARKING REQUIRED (20% OF CAR PARKING)	37
BICYCLE PARKING (OUTSIDE)	5
BICYCLE PARKING (INSIDE)	50
TOTAL BICYCLE PARKING	55

CITY OF ALBANY NOTES

SITE REQUIREMENTS

THE CONTRACTOR WILL BE RESPONSIBLE FOR THE FOLLOWING

THE REMOVAL AND REPLACING OF ALL EXISTING SIDEWALKS, CURBS, STREET PAVEMENT, TREES, BRICK PAVERS, AND SHRUBBERY DAMAGED DURING THE COURSE OF THIS PROJECT AND WITHIN THE FULL LIMITATIONS OF THE PROJECT.

IT WILL BE THE CONTRACTORS RESPONSIBILITY TO ENSURE THAT ALL METHODS AVAILABLE HAVE BEEN TAKEN TO PROTECT ALL THE AFOREMENTIONED ENTITIES BEFORE CONSTRUCTION WORK BEGINS.

IF AT ANY TIME DURING SAID CONSTRUCTION, THE CITY ENGINEER OR HIS REPRESENTATIVE DEEM THAT ANY AND/OR ALL PORTIONS OF SIDEWALK, CURB PAVEMENT AND/OR ANY OTHER APPURTENANCES HAVE BEEN DAMAGED BY EITHER THE GENERAL CONTRACTOR OR ANY OF HIS SUB-CONTRACTORS, IT WILL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO MAKE ALL REPAIRS AND/OR CORRECTIONS TO SAID AREAS WITHOUT ANY COST TO THE CITY OF ALBANY.

PERMIT REQUIREMENTS:

THE GENERAL CONTRACTOR, PRIOR TO BEGINNING ANY WORK ON SAID PROJECT, WILL PROCURE THE FOLLOWING PERMITS WHERE APPLICABLE:

*ENGINEERING DEPARTMENT	*DEPARTMENT OF GENERAL SERVICES
*GRADING AND MINING	*CURB CUT APPLICATION
*SANITARY/STORM SEWER	*SIDEWALK/CURB RESTORATION
*RETAINING WALL	*STREET RESTORATION
*WATER DEPARTMENT	*WATER SERVICE

THE CONTRACTOR WILL PROCURE BEFORE BEGINNING OF CONSTRUCTION ALL REQUIRED PERMITS LIABILITY INSURANCE FOR $1,000,000.00 AND A PERFORMANCE BOND AS ASSESSED BY CITY ENGINEER. BOND AND LIABILITY INSURANCE TO BE SUBMITTED TO THE ENGINEERING DEPARTMENT BEFORE THE GENERAL CONTRACTOR INTENDS TO BEGIN ANY SITE EXCAVATION.

THE CONTRACTOR WILL NOTIFY THE ENGINEERING DEPARTMENT FORTY-EIGHT, (48) HOURS PRIOR TO PERFORMING ALL UTILITY OR SITE RESTORATION WORK. FAILURE TO NOTIFY THE ENGINEERING DEPARTMENT BEFORE BEGINNING WORK COULD RESULT IN A ONE HUNDRED DOLLAR ($100.00) FINE FOR EACH DAY THE OFFENSE OCCURS.

THE CONTRACTOR WILL NOTIFY THE DEPARTMENT OF WATER AND WATER SUPPLY FORTY-EIGHT (48) HOURS PRIOR TO SCHEDULE AN INSPECTION FOR WATER, SANITARY AND STORM UTILITY WORK.

NOTES

1. THE CONTRACTOR SHALL OBTAIN A STREET OPENING PERMIT AND A STREET ACCESS APPLICATION (CURB-CUT) FROM THE DEPARTMENT OF GENERAL SERVICES FOR ANY WORK WITHIN THE CITY'S ROW. CONTACT GARY BOHL AT 518-438-3589

2. A GRADING PERMIT IS REQUIRED. CONTRACTOR TO CONTACT PATRICK MCCUTCHEON, ENGINEERING DEPARTMENT (518-434-5967) FOR APPLICATION AND REVIEW.

3. THERE SHALL NOT BE CONSTRUCTION VEHICLE PARKING ON EITHER SIDE OF WASHINGTON AVENUE. CONTRACTORS MUST PROVIDE ON-SITE OR OFF-SITE PARKING FOR EMPLOYEES DURING CONSTRUCTION.

4. PROPERTY LINE STAKES WITH OFFSETS TO BE PLACED PRIOR TO THE ISSUANCE OF A GRADING PERMIT AND SHALL BE MAINTAINED UNTIL PERMANENT IRONS PINS ARE INSTALLED.

6. WORK PERMIT FROM NYSDOT MAY BE NECESSARY FOR PERFORMING PORTIONS OF THE WORK. ENGINEER/OWNER SHALL BE RESPONSIBLE TO NOTIFY NYSDOT OF IMPENDING WORK AND OBTAIN THE PERMITS IF REQUIRED.

6. BOND TO THE CITY OF ALBANY WILL BE REQUIRED FOR ALL SITE WORK WITH THE APPLICATION OF THE GRADING PERMIT.

EXISTING SITE COVERAGE STATISTICS

description	s.f.	acres	%
gross site area	141,177	3.24	100.00
impervious area	79,792	1.83	56.5
building area	22,079	0.50	15.5
pavement/sidewalk area	57,713	1.33	41.0
gross area	61,385	1.41	43.5

PROPOSED SITE COVERAGE STATISTICS

description	s.f.	acres	%
gross site area	141,177	3.24	100.00
impervious area	109,303	2.51	77.4
building coverage	60,740	1.39	43.0
pavement/sidewalk area	48,563	1.12	34.4
gross area	31,874	0.73	22.6

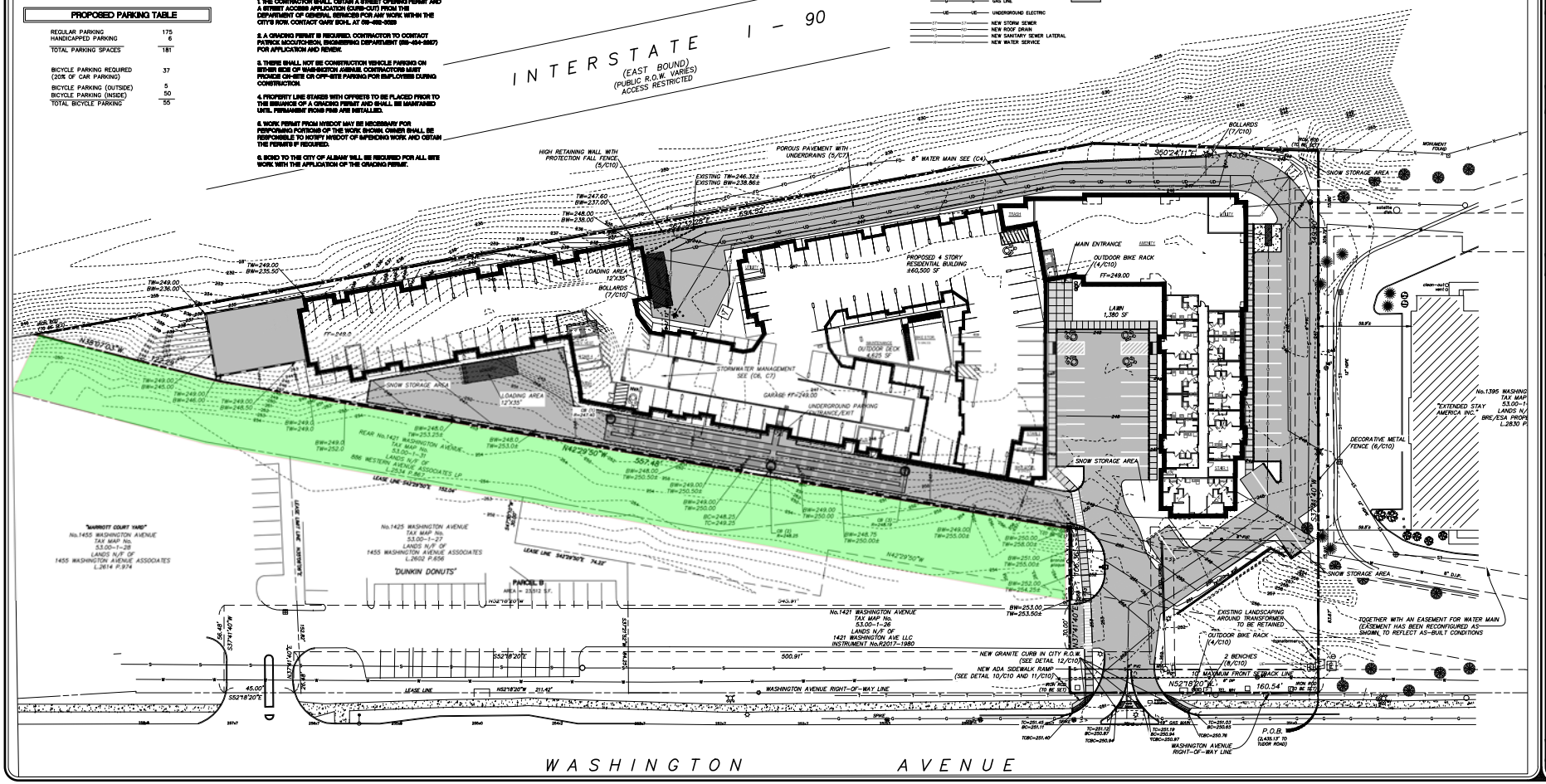
RECREATION SPACE TABLE

description	requirment	quantity	# required
dwelling, multi family	10% of site area	121,116	12,112 sf
area 1: outdoor deck			4,625 sf
area 2: lawn			1,766 sf
TOTAL			6,391 sf

LEGEND

R.O.W.	RIGHT OF WAY		MONUMENT
No.	NUMBER		IRON ROD
enc.	ENCROACHMENT		MANHOLE
P.O.B.	POINT OF BEGINNING		CATCHBASIN
S.F.	SQUARE FEET		SIGN
N/F	NOW OR FORMERLY		BOLLARD
FT.	FEET		FENCE LINE
Deg.	DEGREE		GUARD RAIL
R	RECORD		OVERHEAD WIRE, UTILITY POLE & GUY WIRE
M	MEASURED		TRAFFIC FLOW ACCESS AREA
N	NORTH		WATER SHUT OFF
S	SOUTH		WATER VALVE
E	EAST		HYDRANT
W	WEST		GAS VALVE
tel.	TELEPHONE		GAS TEST
elec.	ELECTRIC		GAS DRIP
L	LIBER		STREET LIGHT
P.	PAGE		LIGHT POLE
W	WATER LINE		CONCRETE
ST	STORM LINE		
S	SEWER LINE		ASPHALT
G	GAS LINE		
UE	UNDERGROUND ELECTRIC		
ST	NEW STORM SEWER		
ST	NEW ROOF DRAIN		
S	NEW SANITARY SEWER LATERAL		
W	NEW WATER SERVICE		

0 30 60 Feet



HERSHBERG & HERSHBERG
Consulting Engineers and Land Surveyors
18 Locust Street
Albany, New York 12203

ALTERATION OF THIS DOCUMENT EXCEPT BY A LICENSED PROFESSIONAL ENGINEER OR LAND SURVEYOR, IS ILLEGAL.

STATE OF NEW YORK — DANIEL G. HERSHBERG — 044228 — LICENSED PROFESSIONAL ENGINEER

REMARKS	DATE
FULL SET OF PLANS	10/16/20
RESPONSE REVISIONS	12/30/20
GENERAL REVISIONS	1/26/21
GENERAL REVISIONS	6/8/21
RESPONSE REVISIONS	7/12/21
GENERAL REVISIONS	7/26/21

REVISIONS

SITE PLAN
1415 WASHINGTON AVENUE
CITY OF ALBANY, STATE OF NEW YORK

P.I.E. 20015	20015-1.DWG
SCALE 1"=30'	DATE: 12/4/2020
BY: MT	CHK: DHH

C2/14

Soil Parameters from GER

Saw-cut control joints should be placed in the slab to help control the location and extent of cracking. For additional recommendations refer to the ACI Design Manual.

Floor slab subgrades should be prepared as outlined in the **Earthwork** section herein. Under these conditions, a modulus of subgrade reaction equal to 150 pounds per cubic inch (pci/in) may be assumed at the top of the stone base layer for slab design purposes.

Floor Slab Construction Considerations

Even with the base course recommended above, we caution that the subgrades may not support repeated heavy construction traffic or telehandlers without suffering rutting and weaving that may be especially severe during wet seasons. If the grades are to be repeatedly traversed by these types of equipment, they should be reinforced as necessary to support them. Areas which become disturbed or weakened should be excavated and stabilized accordingly.

The Geotechnical Engineer should approve the condition of floor slab or pad subgrades immediately prior to placement of the subbase course. Attention should be paid to high traffic areas that were rutted and disturbed earlier, and to areas where backfilled trenches are located.

EARTH RETAINING WALL DESIGN

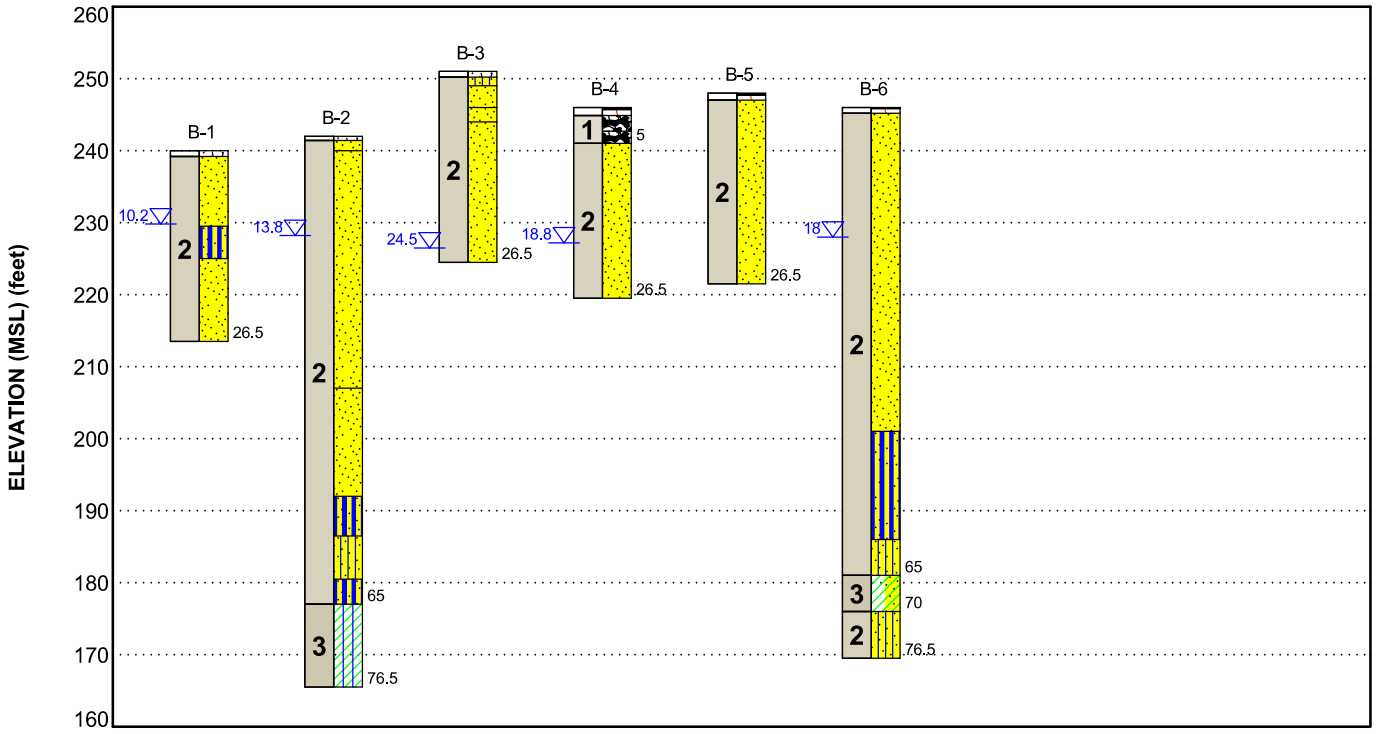
All earth-retaining foundation walls or structures should be designed to resist the lateral pressures generated by earth backfill and any temporary or permanent surcharge loads. Active earth pressures may be assumed for walls that are free to deflect as the backfill is placed and surcharge loads applied. At-rest earth pressures should be assumed for walls that are braced prior to backfilling or applying surcharge loads. The following design parameters are provided to assist in determining the lateral wall loads, whichever apply:

- Soil angle of internal friction - 30 degrees
- Coefficient of At-Rest earth pressure (k_o) - 0.50
- Coefficient of Active earth pressure (k_a) - 0.33
- Coefficient of Passive earth pressure (k_p) - 3.00
- Total unit weight of compacted soil - 125 pcf
- Coefficient of sliding friction - 0.35 (concrete on native soils or structural fill)

The recommended design parameters assume relatively level grades on either side of the wall, that the wall is backfilled with imported granular fill (reuse of excavated onsite soils for this purpose should be avoided), and that the backfill remains permanently well-drained. Water must not be allowed to collect against the wall unless the wall is designed to accommodate the added hydrostatic pressure. Drainage system recommendations are provided below.

GEOMODEL

Proposed Student Housing ■ Albany, NY
Terracon Project No. JB205071



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	Fill	Typically sandy soils with lesser amounts of foreign matter (e.g., wood, roots, gravel).
2	Sand	Native fine sand, generally with relatively little silt. Occasional silty layers which become more prevalent with depth.
3	Silt & Clay	Interlayered silt and clay deposits.

LEGEND

- Topsoil
- Poorly-graded Sand
- Sandy Silt
- Silty Sand
- Silty Clay
- Asphalt
- Aggregate Base Course
- Fill
- Lean Clay with Sand

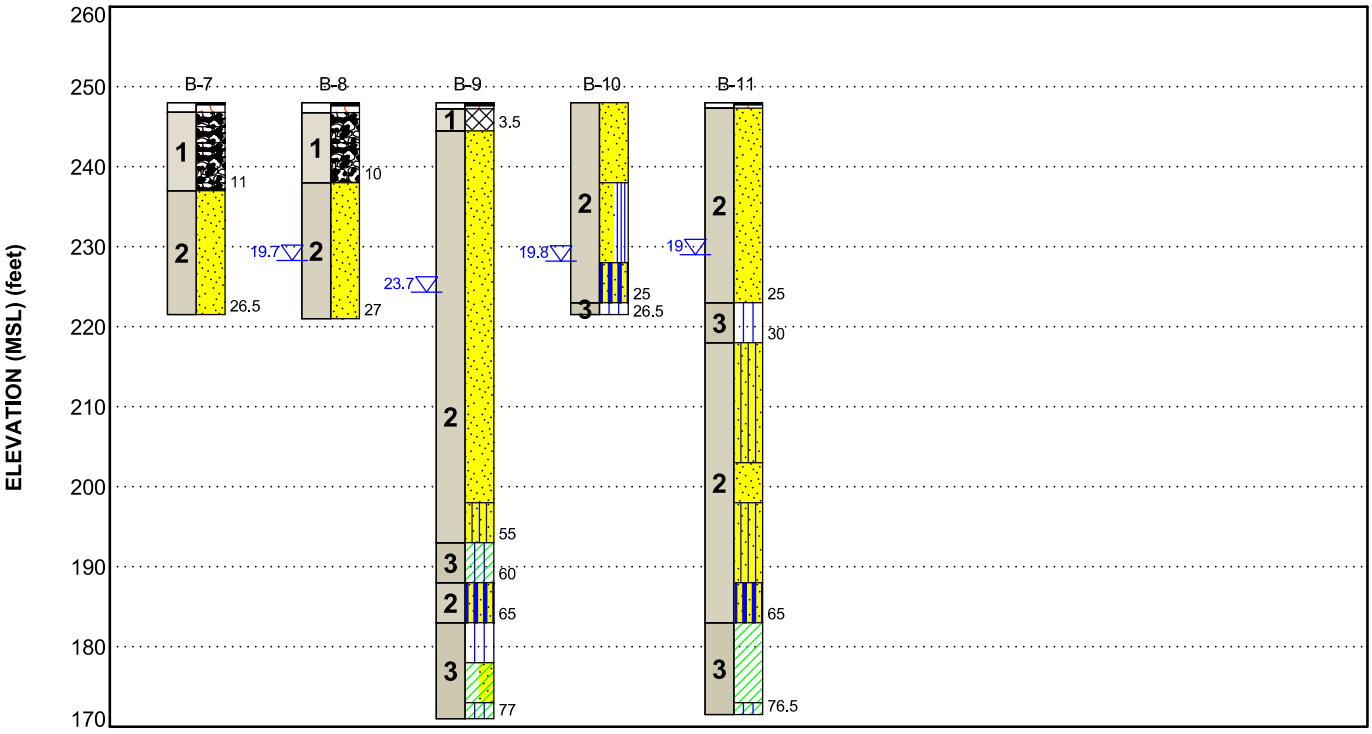
▽ First Water Observation

Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time. Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

GEOMODEL

Proposed Student Housing ■ Albany, NY
Terracon Project No. JB205071



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3	**Silt & Clay**	Interlayered silt and clay deposits.

LEGEND

- Asphalt
- Aggregate Base Course
- Fill
- Poorly-graded Sand
- Fill
- Silty Sand
- Silty Clay
- Sandy Silt
- Silt
- Lean Clay with Sand
- Poorly-graded Sand with Silt
- Lean Clay

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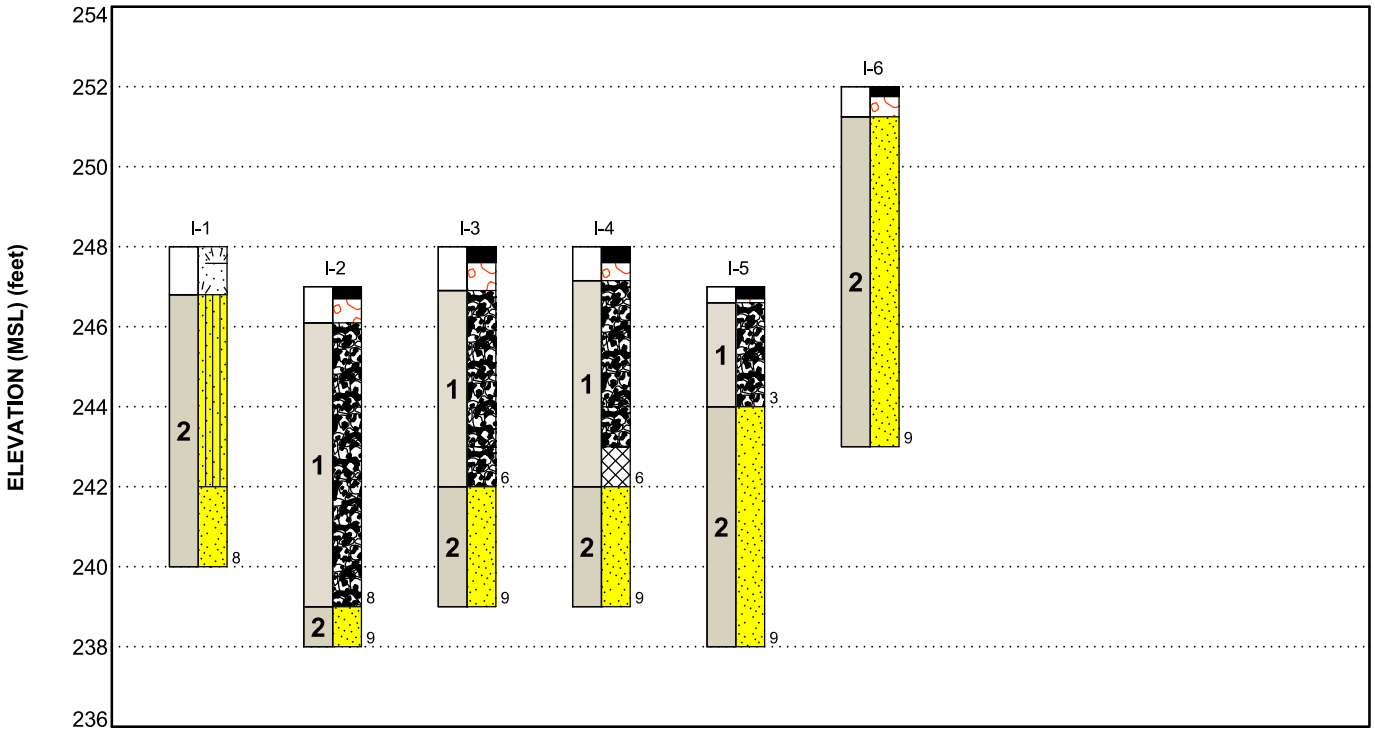
GEOMODEL

Proposed Student Housing ■ Albany, NY
Terracon Project No. JB205071



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3	**Silt & Clay**	Interlayered silt and clay deposits.

LEGEND

- Topsoil
- Asphalt
- Fill
- Silty Sand
- Aggregate Base Course
- Poorly-graded Sand
- Fill

▽ First Water Observation

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NOTES:
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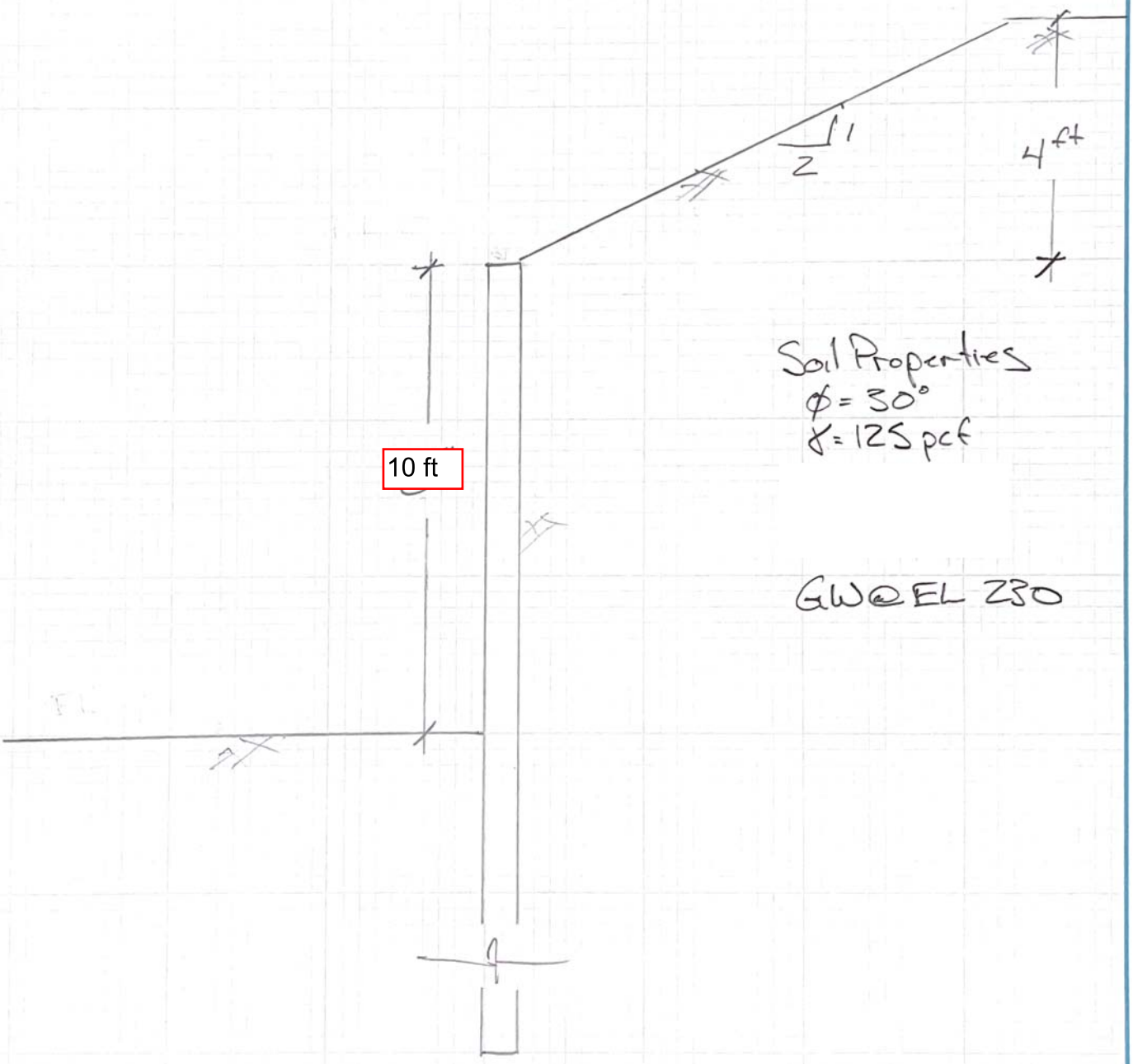
Stability Analysis- H= 10 ft

Terracon

PROJECT: 1415 Washington Ave - Retaining Wall Page _____ of _____

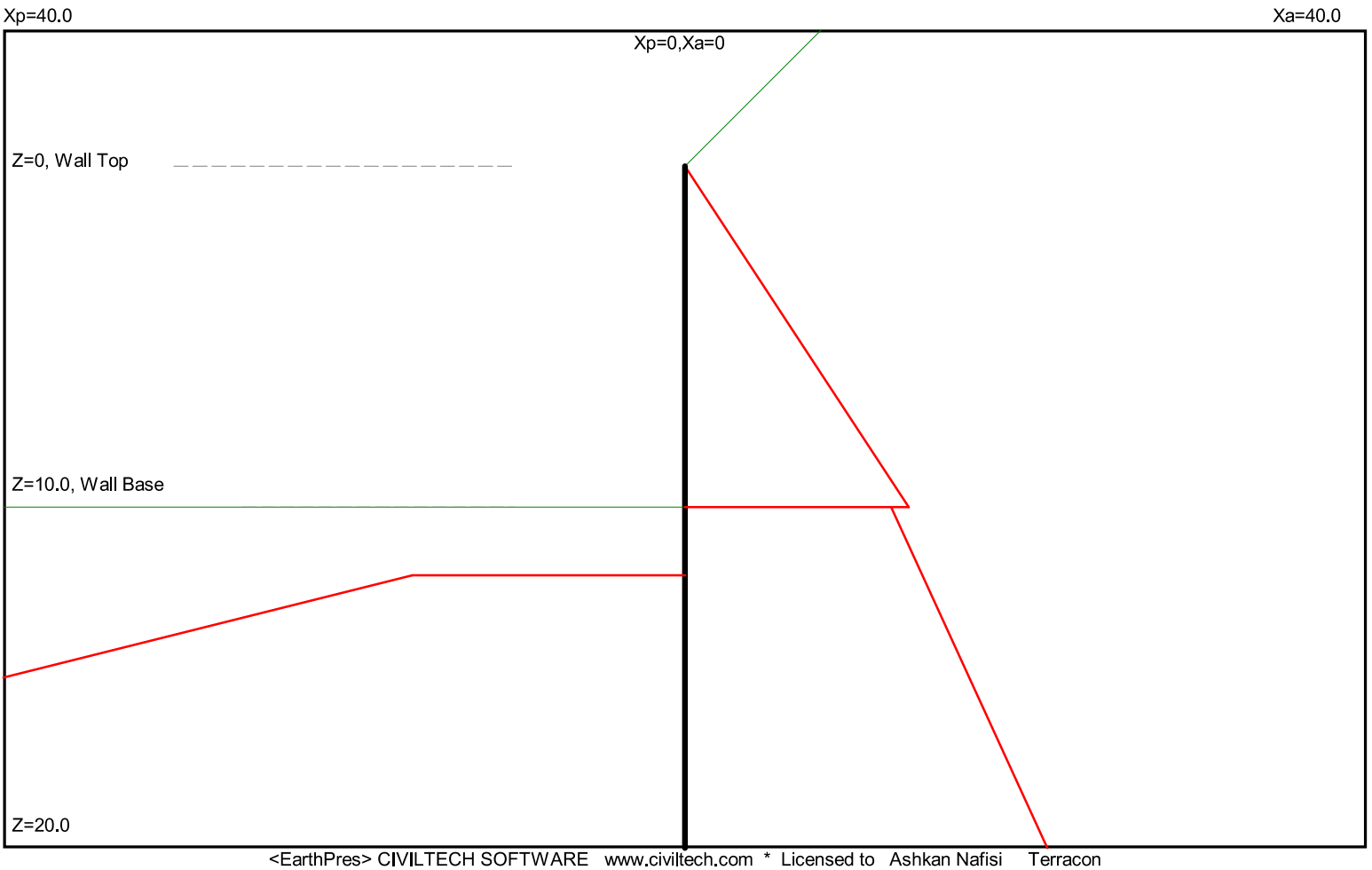
JOB NO. PJB205071 Date 9/2/21 Comp. By DSW CHECKED BY: _____



Soil Properties
$\phi = 30°$
$\gamma = 125$ pcf

GW @ EL 230

1415 Washington Ave-10 ft Section



<EarthPres> CIVILTECH SOFTWARE www.civiltech.com * Licensed to Ashkan Nafisi Terracon
UNITS: DEPTH/DISTANCE: ft, UNIT WEIGHT: pcf, FORCE: kip/ft, PRESSURE: ksf, SLOPE: kcf
Date: 10/8/2021 File: C:\Users\anafisi\OneDrive - Terracon Consultants Inc\Desktop\My Files\1415 Washington Ave- PJB205071\8.5 ft-Earth Pressure.ep8

* INPUT DATA *

Wall Height=10.0 Total Soil Types= 1

Soil No.	Weight	Saturate	Phi	Cohesion	Nspt	Type	Description
1	125.0	125.0	30	0.0	0	4	Sand

Ground Surface at Active Side:

Line	Z1	Xa1	Z2	Xa2	Soil No.	Description
1	0.0	0.0	-4.0	8.0	1	Sand
2	-4.0	8.0	-4.0	800.0	1	Sand

Ground Surface at Passive Side:

Line	Z1	Xp1	Z2	Xp2	Soil No.	Description
1	10.0	0.0	10.0	800.0	1	Sand

Wall Friction Options: 1.* No wall friction
Wall Batter Angle = 0
Apparent Pressure Conversion: 1.* Default (Terzaghi and Peck)*
Water Density = 62.4
Water Pressure: 6. No Water Table

* OUTPUT RESULTS *

Total Force above Base= 3.08 per one linear foot (or meter) width along wall height
Total Static Force above Base= 3.08. Distributed in Triangular Envelope along wall height. Ignore soil layers and water line

Driving Pressure above Base - Output to Shoring - Multiplier of Pressure = 1

Z1	Pa1	Z2	Pa2	Slope	Coef.
0.00	0.00	10.00	0.62	0.0615	0.4921

Driving Pressure below Base - Output to Shoring - Multiplier of Pressure = 1

Z1	Pa1	Z2	Pa2	Slope	Ka or Ko
10.00	0.57	20.00	1.00	0.0430	0.3441

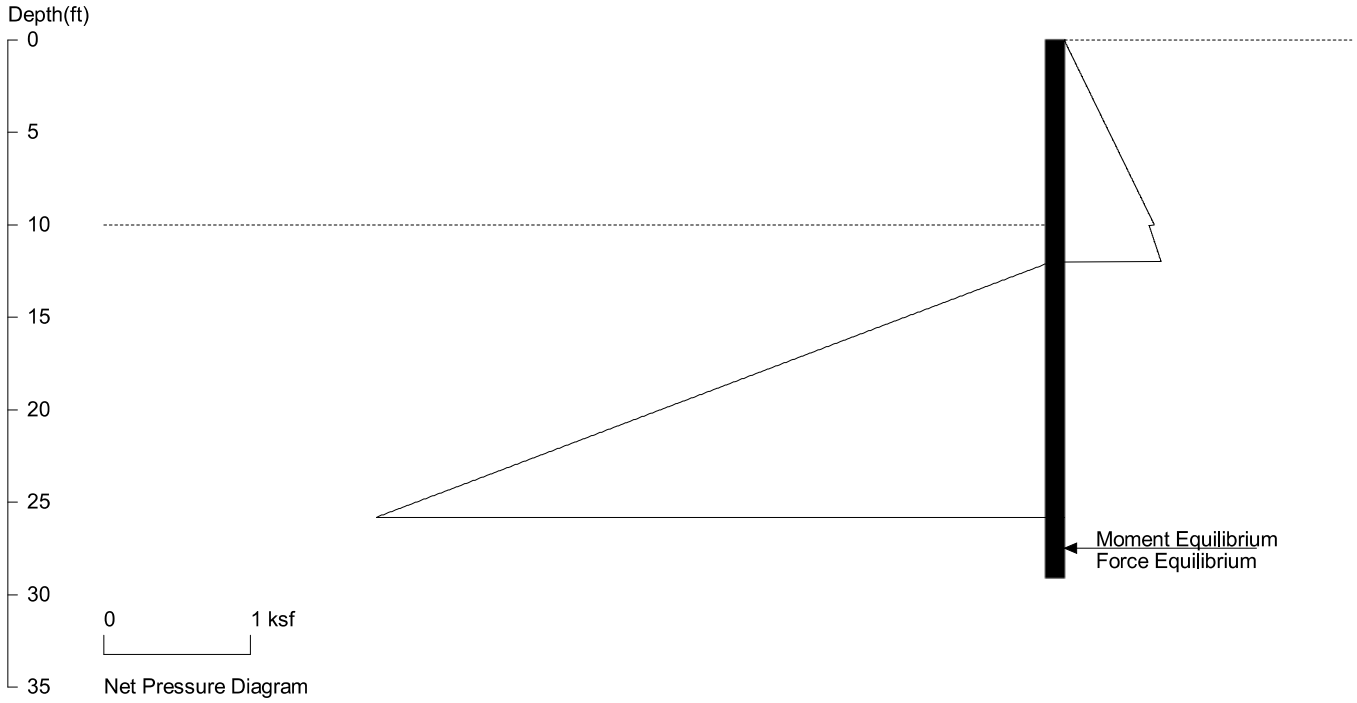
Passive Pressure below Base - Output to Shoring - Multiplier of Pressure = 1

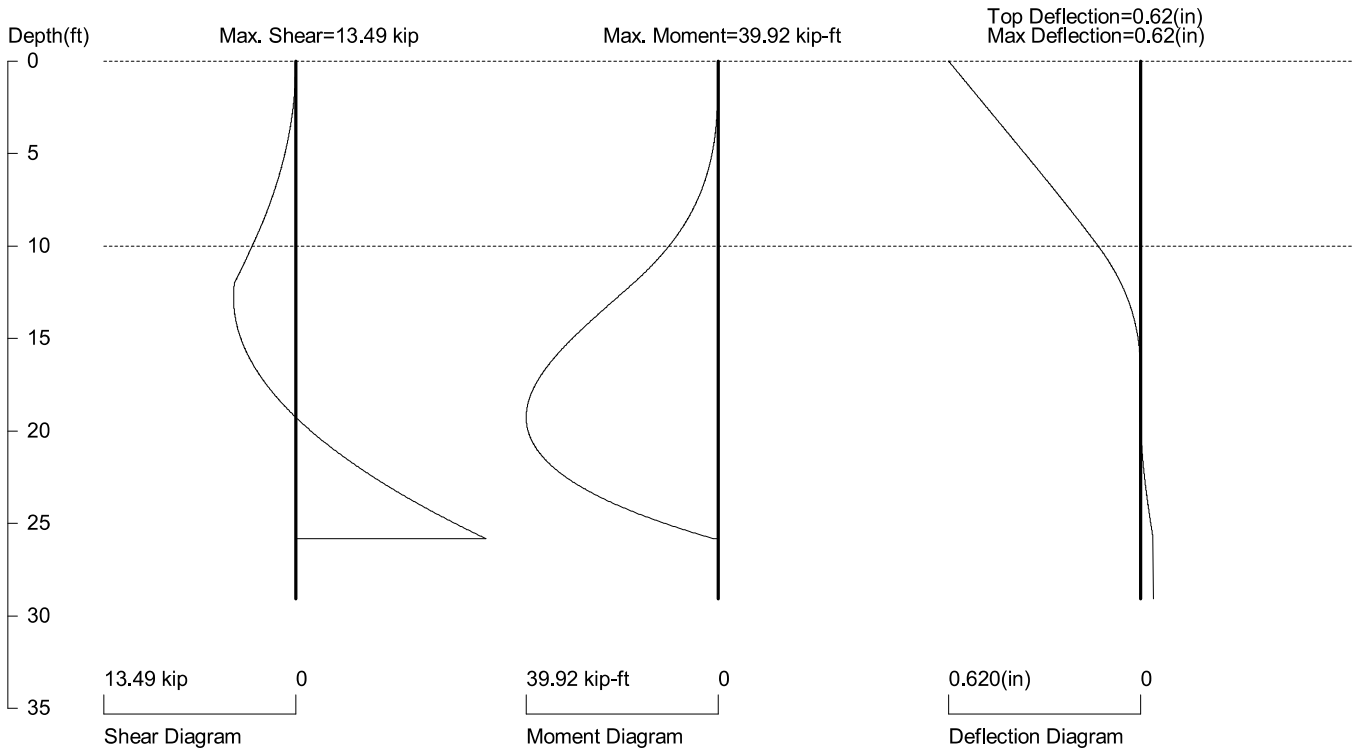
Z1	Pp1	Z2	Pp2	Slope	Kp
12.00	0.75	20.00	3.75	0.375	3.0000

UNITS: DEPTH/DISTANCE: ft, UNIT WEIGHT: pcf, FORCE: kip/ft, PRESSURE: ksf, SLOPE: kcf

Date: 10/8/2021 File Name: C:\Users\anafisi\OneDrive - Terracon Consultants Inc\Desktop\My Files\1415 Washington Ave- PJB205071\8.5 ft-Earth Pressu

1415 Washington Ave-10 ft Section





PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on pile spacing: 1.0 foot or meter

User Input I: E (ksi)=29000.0, I (in4)/foot=288.4

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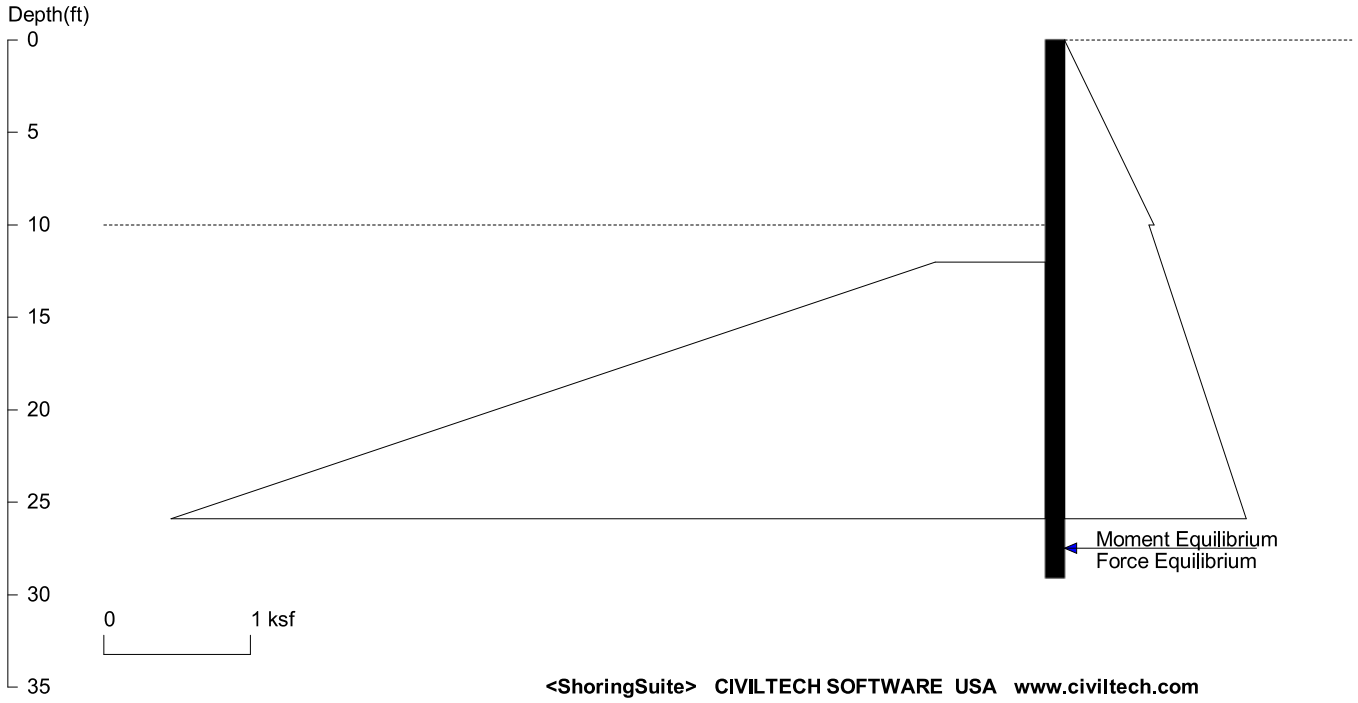
1415 Washington Ave-10 ft Section



Licensed to Ashkan Nafisi Terracon Date: 10/19/2021

File: C:\Users\anafisi\OneDrive - Terracon Consultants Inc\Desktop\My Files\1415 Washington Ave- PJB205071\Sheet Pile\8

Wall Height=10.0 Pile Diameter=1.0 Pile Spacing=1.0 Wall Type: 1. Sheet Pile

PILE LENGTH: Min. Embedment=19.08 Min. Pile Length=29.08
MOMENT IN PILE: Max. Moment=39.92 per Pile Spacing=1.0 at Depth=19.25

PILE SELECTION:
Request Min. Section Modulus = 14.5 in3/ft=780.37 cm3/m, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
User Input I (Moment of Inertia):
Top Deflection = 0.62(in) based on E (ksi)=29000.00 and I (in4)/foot=288.4

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
*	Above	Base		
0.000	0.000	10.00	0.615	0.061513
*	Below	Base		
10.00	0.578	90.00	3.918	0.041756

PASSIVE PRESSURES: Pressures below will be divided by a Factor of Safety =1.5

Z1	P1	Z2	P2	Slope
*	Below	Base		
12.00	0.750	90.00	30.00	0.375000

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00
2	10.00	1.00

PASSIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00

UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft3; Deflection - in

****

SHORING WALL CALCULATION SUMMARY
The leading shoring design and calculation software

www.civiltech.com

****

ShoringSuite Software is developed by CivilTech Software, Bellevue, WA, USA.
The calculation method is based on the following references:

1. FHWA 98-011, FHWA-RD-97-130, FHWA SA 96-069, FHWA-IF-99-015
2. STEEL SHEET PILING DESIGN MANUAL by Pile Buck Inc., 1987
3. DESIGN MANUAL DM-7 (NAVFAC), Department of the Navy, May 1982
4. TRENCHING AND SHORING MANUAL Revision 12, California Department of Transportation, January 2000
6. EARTH SUPPORT SYSTEM & RETAINING STRUCTURES, Pile Buck Inc. 2002
5. DESIGN OF SHEET PILE WALLS, EM 1110-2-2504, U.S. Army Corps of Engineers, 31 March 1994
7. EARTH RETENTION SYSTEMS HANDBOOK, Alan Macnab, McGraw-Hill. 2002
8. Temporary Structures in Construction, Robert T. Ratay (Co-author of Chapter 7: John J. Peirce), McGraw-Hill. 2012
9. AASHTO HB-17, American Association of State and Highway Transportation Officials, 2 September 2002

UNITS: Width/Spacing/Diameter/Length/Depth - ft, Force - kip, Moment - kip-ft, Friction/Bearing/Pressure - ksf, Pres. Slope - kip/ft3, Deflection - in

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Date: 10/19/2021 File: C:\Users\anafisi\OneDrive - Terracon Consultants Inc\Desktop\My Files\1415 Washington Ave- PJB205071\Sheet Pile\8.5 ft.sh8

Title: 1415 Washington Ave-10 ft Section
Subtitle:

**********INPUT DATA**********

Wall Type: 1. Sheet Pile
Wall Height: 10.00
Pile Diameter: 1.00
Pile Spacing: 1.00
Factor of Safety (F.S.): 1.50
Lateral Support Type (Braces): 1. No
Top Brace Increase (Multi-Bracing): Add 15%*
Embedment Option: 1. Yes
Friction at Pile Tip: No
Pile Properties:
Steel Strength, Fy: 50 ksi = 345 MPa
Allowable Fb/Fy: 0.66
Elastic Module, E: 29000.00
Moment of Inertia, I: 288.4
User Input Pile: AZ18

* DRIVING PRESSURE (ACTIVE, WATER, & SURCHARGE) *

No.	Z1 top	Top Pres.	Z2 bottom	Bottom Pres.	Slope
1	*	Above	Base		
2	0.000	0.000	10.00	0.615	0.061513
3	*	Below	Base		
4	10.00	0.578	90.00	3.918	0.041756

* PASSIVE PRESSURE *

The pressures below will be divided by a Factor of Safety =1.5

No.	Z1 top	Top Pres.	Z2 bottom	Bottom Pres.	Slope
1	*	Below	Base		
2	12.00	0.750	90.00	30.00	0.375000

* ACTIVE SPACE *

No.	Z depth	Spacing
1	0.00	1.00
2	10.00	1.00

* PASSIVE SPACE *

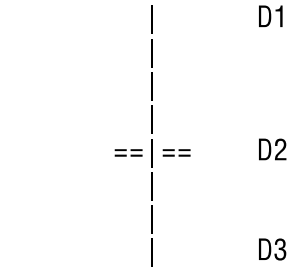
No.	Z depth	Spacing
1	0.00	1.00

*For Tieback: Input1 = Diameter; Input2 = Bond Strength
*For Plate: Input1 = Diameter; Input2 = Allowable Pressure
*For Deadman: Input1 = Horz. Width; Input2 = Passive Pressure;
*For Sheet Pile Anchor: Input1 = Horz. Width; Input2 = Passive Slope;

**********CALCULATION**********

The calculated moment and shear are per pile spacing. Sheet piles are per one foot or meter; Soldier piles are per pile.

Top Pressures start at depth = 0.00



D1 - TOP DEPTH
D2 - EXCAVATION BASE
D3 - PILE TIP

MOMENT equilibrium AT DEPTH=25.90 WITH EMBEDMENT OF 15.90
FORCE equilibrium AT DEPTH=29.08 WITH EMBEDMENT OF 19.08

The program calculates an embedment for moment equilibrium, then increase the embedment by 1.2

**********RESULTS**********

* EMBEDMENT Notes *
Based on USS Design Manual, first calculate embedment for moment equilibrium, then increased the embedment to get the design depth.
The embedment for moment equilibrium is 15.90
The program calculates an embedment for moment equilibrium, then increase the embedment by 1.2
The total desigh embedment is 19.08

Embedment Information:
If 20% increased, the total design embedment is 19.08
If 30% increased, the total design embedment is 20.67
If 40% increased, the total design embedment is 22.26
If 50% increased, the total design embedment is 23.85

* MOMENT IN PILE (per pile spacing)*
Pile Spacing: sheet piles are one foot or one meter; soldier piles are one pile.
Overall Maximum Moment = 39.92 at 19.25
Maximum Shear = 13.49
Moment and Shear are per pile spacing: 1.0 foot or meter

* VERTICAL LOADING *
Vertical Loading from Braces = 0.00
Vertical Loading from External Load = 0.00
Total Vertical Loading = 0.00

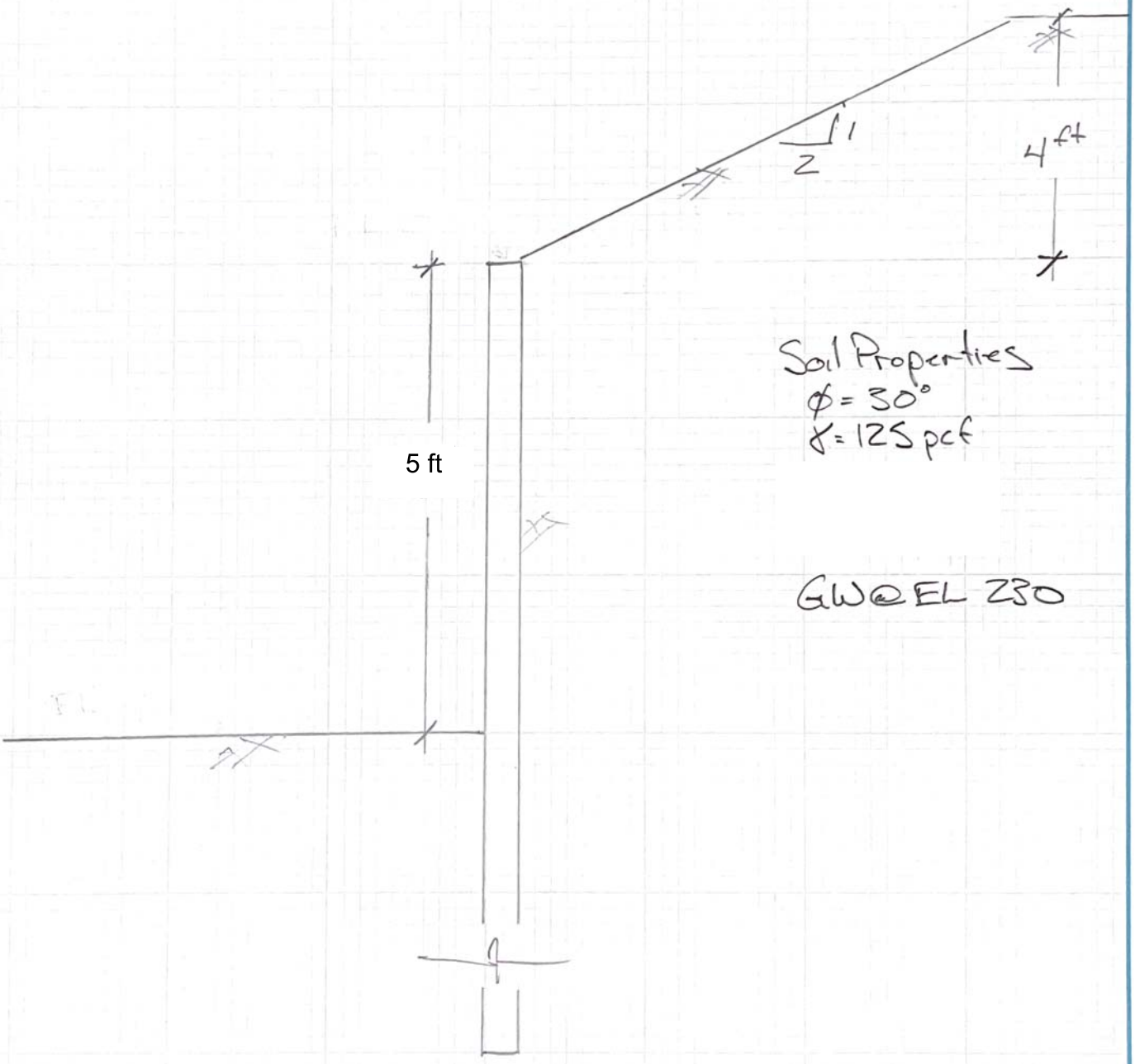
* DEFLECTION *
I (in4)/foot=288.40
Top deflection = 0.620(in)
Max. deflection = 0.620(in)

Stability Analysis- H= 5 ft

Terracon

PROJECT: 1415 Washington Ave - Retaining Wall Page ____ of ____

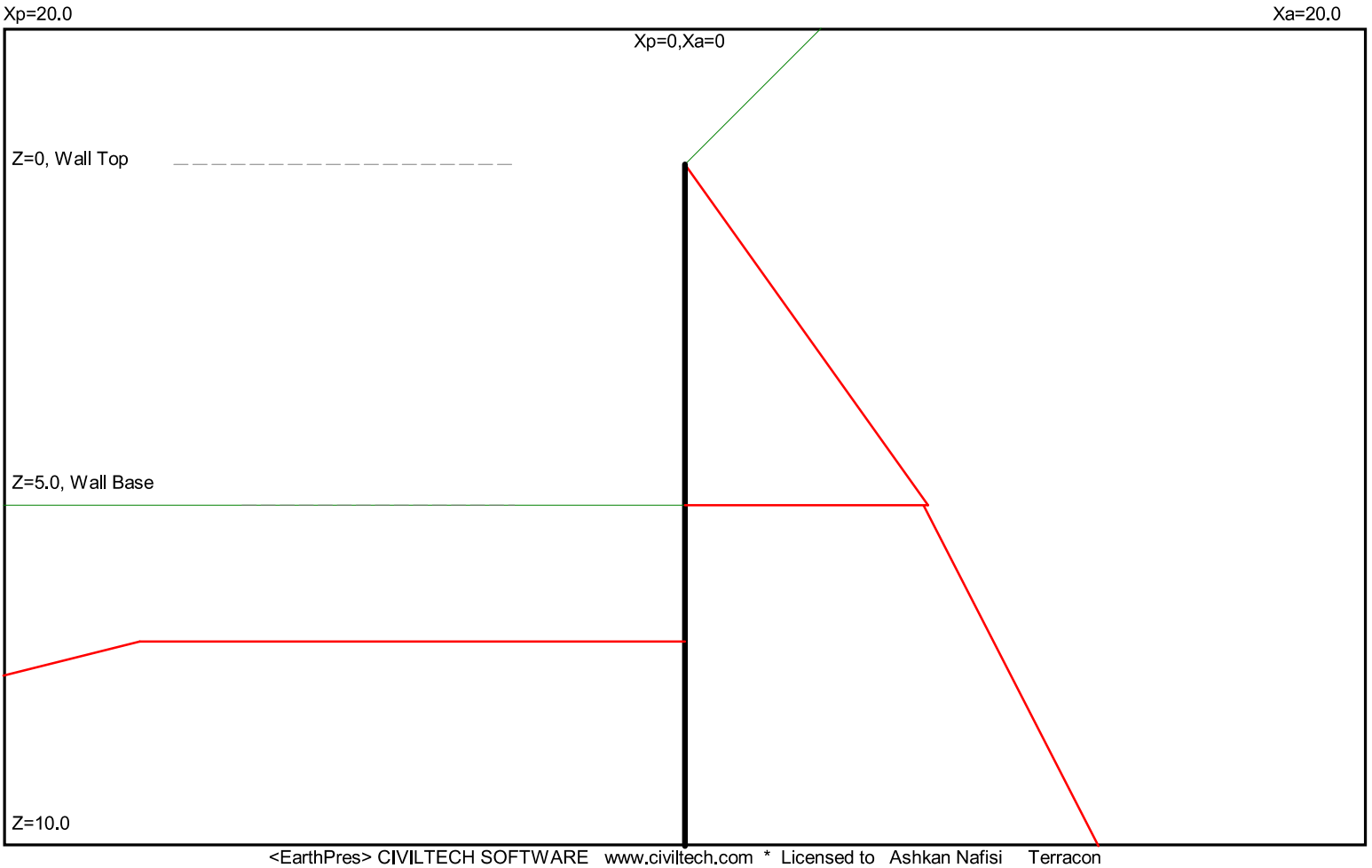
JOB NO. PJB205071 Date 9/2/21 Comp. By DSW CHECKED BY: ____



Soil Properties
$\phi = 30°$
$\gamma = 125$ pcf

GW @ EL 230

1415 Washington Ave



<EarthPres> CIVILTECH SOFTWARE www.civiltech.com * Licensed to Ashkan Nafisi Terracon

UNITS: DEPTH/DISTANCE: ft, UNIT WEIGHT: pcf, FORCE: kip/ft, PRESSURE: ksf, SLOPE: kcf

Date: 10/14/2021 File: C:\Users\anafisi\OneDrive - Terracon Consultants Inc\Desktop\My Files\1415 Washington Ave- PJB205071\Sheet Pile\4ft\5 ft-Earth Pressure.ep8

* INPUT DATA *

Wall Height=5.0 Total Soil Types= 1

Soil No.	Weight	Saturate	Phi	Cohesion	Nspt	Type	Description
1	125.0	125.0	30	0.0	0	4	Sand

Ground Surface at Active Side:

Line	Z1	Xa1	Z2	Xa2	Soil No.	Description
1	0.0	0.0	-4.0	8.0	1	Sand
2	-4.0	8.0	-4.0	800.0	1	Sand

Ground Surface at Passive Side:

Line	Z1	Xp1	Z2	Xp2	Soil No.	Description
1	5.0	0.0	5.0	800.0	1	Sand

Wall Friction Options: 1.* No wall friction

Wall Batter Angle = 0

Apparent Pressure Conversion: 1.* Default (Terzaghi and Peck)*

Water Density = 62.4

Water Pressure: 6. No Water Table

* OUTPUT RESULTS *

Total Force above Base= 0.84 per one linear foot (or meter) width along wall height

Total Static Force above Base= 0.84. Distributed in Triangular Envelope along wall height. Ignore soil layers and water line

Driving Pressure above Base - Output to Shoring - Multiplier of Pressure = 1

Z1	Pa1	Z2	Pa2	Slope	Coef.
0.00	0.00	5.00	0.33	0.0668	0.5346

Driving Pressure below Base - Output to Shoring - Multiplier of Pressure = 1

Z1	Pa1	Z2	Pa2	Slope	Ka or Ko
5.00	0.33	10.00	0.57	0.0481	0.3850

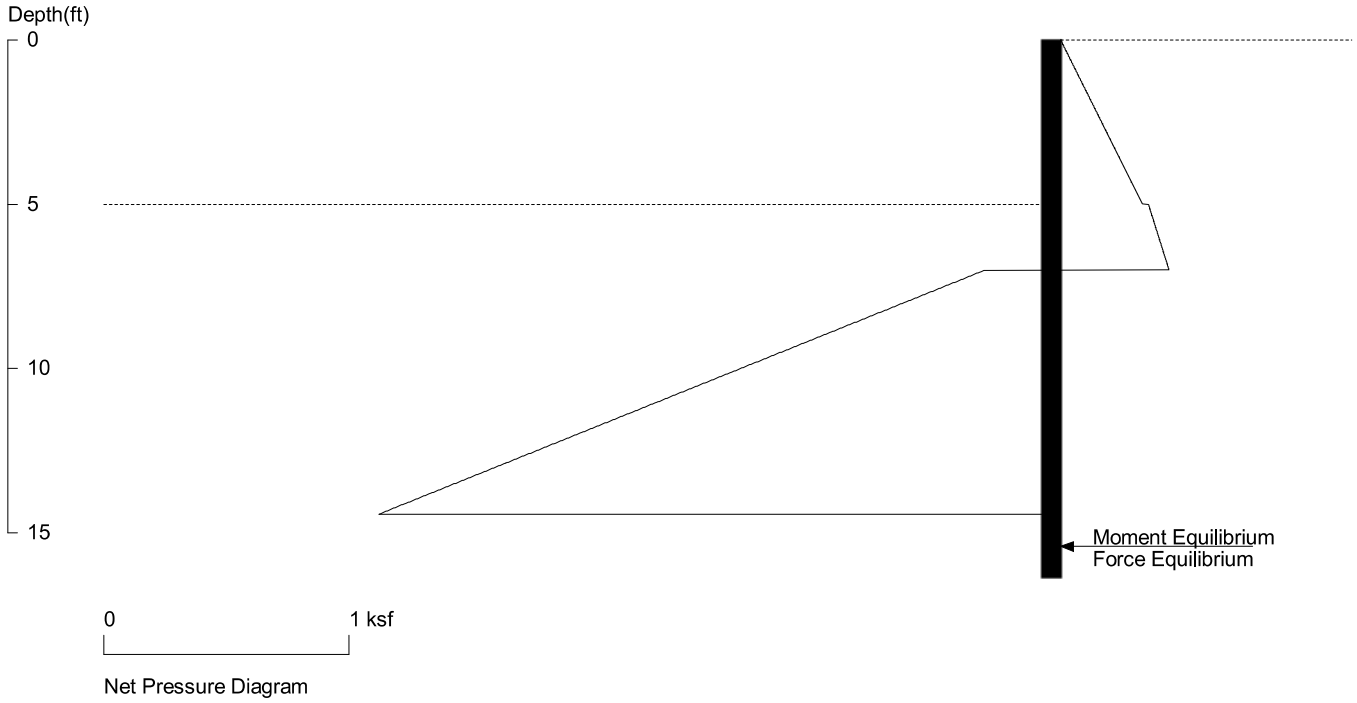
Passive Pressure below Base - Output to Shoring - Multiplier of Pressure = 1

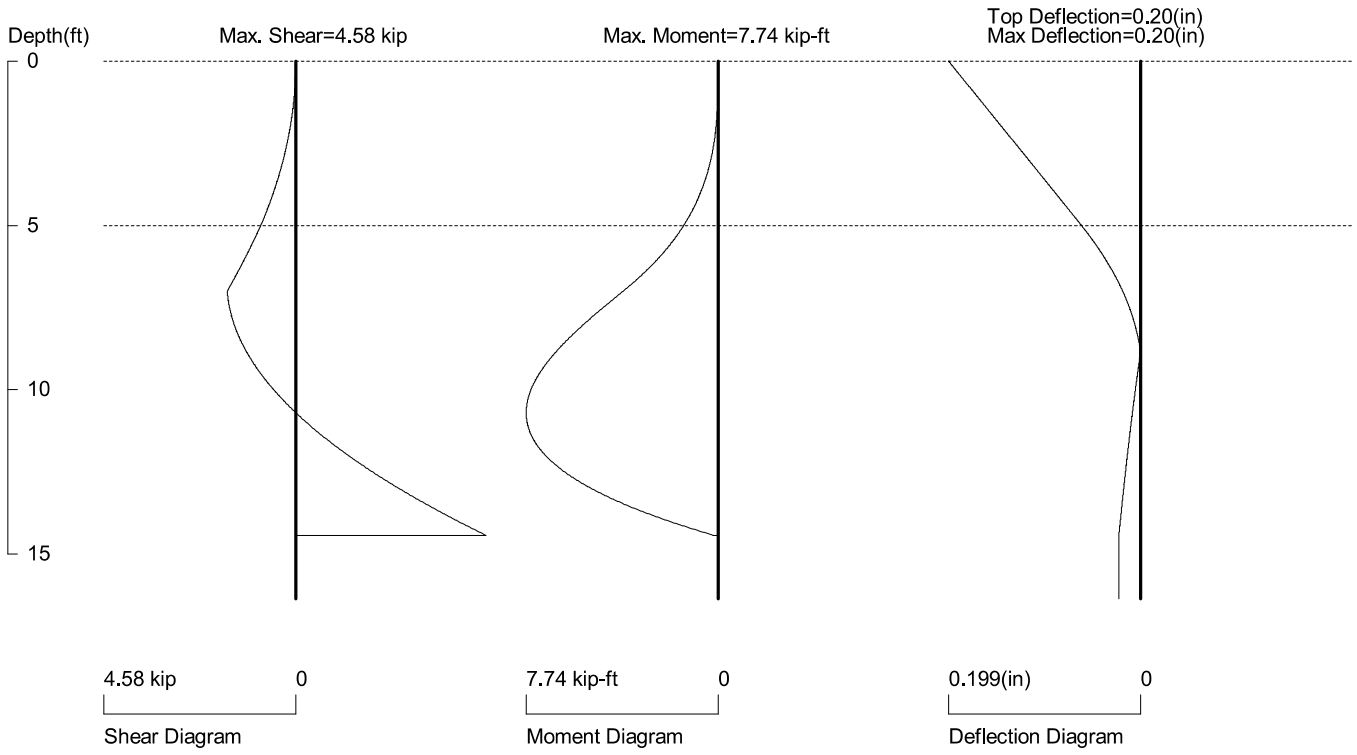
Z1	Pp1	Z2	Pp2	Slope	Kp
7.00	0.75	10.00	1.87	0.375	3.0000

UNITS: DEPTH/DISTANCE: ft, UNIT WEIGHT: pcf, FORCE: kip/ft, PRESSURE: ksf, SLOPE: kcf

Date: 10/14/2021 File Name: C:\Users\anafisi\OneDrive - Terracon Consultants Inc\Desktop\My Files\1415 Washington Ave- PJB205071\Sheet Pile\4ft\5 ft-

1415 Washington Ave





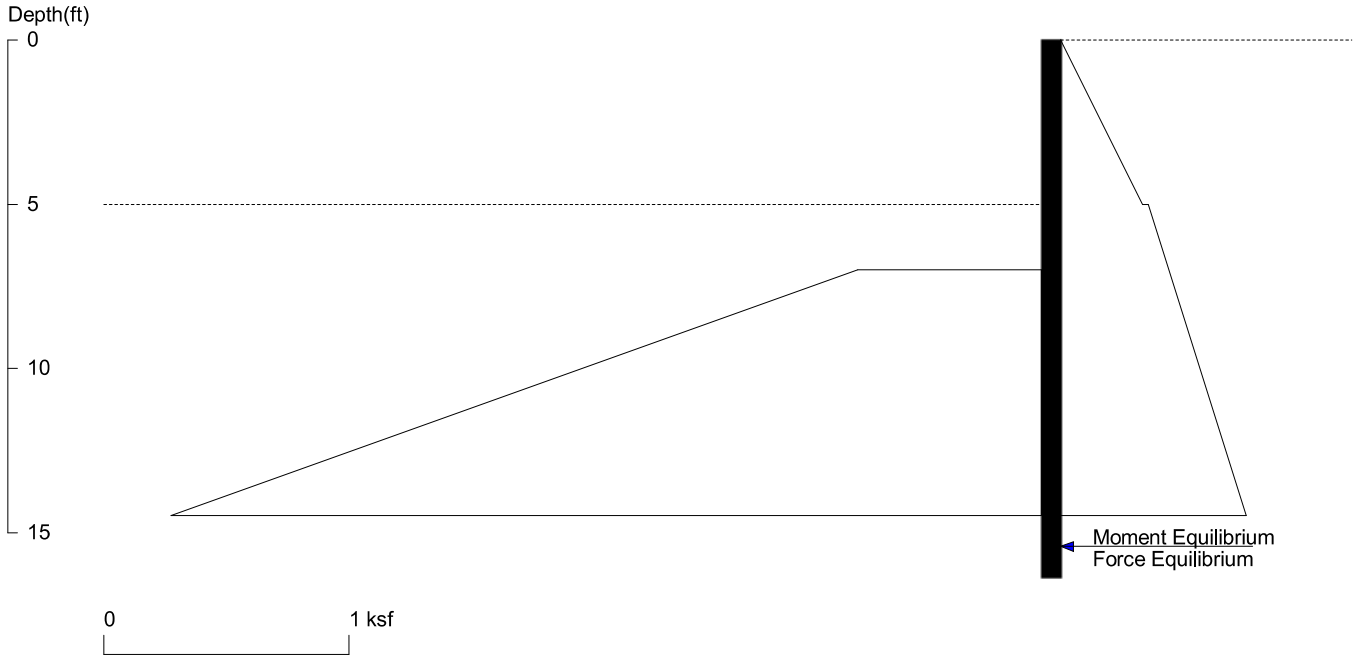
PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on pile spacing: 1.0 foot or meter

User Input I: E (ksi)=29000.0, I (in4)/foot=288.4

File: C:\Users\anafisi\OneDrive - Terracon Consultants Inc\Desktop\My Files\1415 Washington Ave- PJB205071\Sheet Pile\4ft\5 ft .sh8

1415 Washington Ave



<ShoringSuite> CIVILTECH SOFTWARE USA www.civiltech.com

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File: C:\Users\anafisi\OneDrive - Terracon Consultants Inc\Desktop\My Files\1415 Washington Ave- PJB205071\Sheet Pile\4

Wall Height=5.0 Pile Diameter=1.0 Pile Spacing=1.0 Wall Type: 1. Sheet Pile

PILE LENGTH: Min. Embedment=11.36 Min. Pile Length=16.36
MOMENT IN PILE: Max. Moment=7.74 per Pile Spacing=1.0 at Depth=10.69

PILE SELECTION:
Request Min. Section Modulus = 2.8 in3/ft=151.26 cm3/m, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
User Input I (Moment of Inertia):
Top Deflection = 0.20(in) based on E (ksi)=29000.00 and I (in4)/foot=288.4

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
*	Above	Base		
0.000	0.000	5.000	0.334	0.066829
*	Below	Base		
5.000	0.358	50.00	2.254	0.042142

PASSIVE PRESSURES: Pressures below will be divided by a Factor of Safety =1.5

Z1	P1	Z2	P2	Slope
*	Below	Base		
7.000	0.750	50.00	16.87	0.375000

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00
2	5.00	1.00

PASSIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00

UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft3; Deflection - in

****

SHORING WALL CALCULATION SUMMARY
The leading shoring design and calculation software
Software Copyright by CivilTech Software
www.civiltech.com

****

ShoringSuite Software is developed by CivilTech Software, Bellevue, WA, USA.
The calculation method is based on the following references:

1. FHWA 98-011, FHWA-RD-97-130, FHWA SA 96-069, FHWA-IF-99-015
2. STEEL SHEET PILING DESIGN MANUAL by Pile Buck Inc., 1987
3. DESIGN MANUAL DM-7 (NAVFAC), Department of the Navy, May 1982
4. TRENCHING AND SHORING MANUAL Revision 12, California Department of Transportation, January 2000
6. EARTH SUPPORT SYSTEM & RETAINING STRUCTURES, Pile Buck Inc. 2002
5. DESIGN OF SHEET PILE WALLS, EM 1110-2-2504, U.S. Army Corps of Engineers, 31 March 1994
7. EARTH RETENTION SYSTEMS HANDBOOK, Alan Macnab, McGraw-Hill. 2002
8. Temporary Structures in Construction, Robert T. Ratay (Co-author of Chapter 7: John J. Peirce), McGraw-Hill. 2012
9. AASHTO HB-17, American Association of State and Highway Transportation Officials, 2 September 2002

UNITS: Width/Spacing/Diameter/Length/Depth - ft, Force - kip, Moment - kip-ft, Friction/Bearing/Pressure - ksf, Pres. Slope - kip/ft3, Deflection - in

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Title: 1415 Washington Ave
Subtitle:

**********INPUT DATA**********

Wall Type: 1. Sheet Pile
Wall Height: 5.00
Pile Diameter: 1.00
Pile Spacing: 1.00
Factor of Safety (F.S.): 1.50
Lateral Support Type (Braces): 1. No
Top Brace Increase (Multi-Bracing): Add 15%*
Embedment Option: 1. Yes
Friction at Pile Tip: No
Pile Properties:
Steel Strength, Fy: 50 ksi = 345 MPa
Allowable Fb/Fy: 0.66
Elastic Module, E: 29000.00
Moment of Inertia, I: 288.4
User Input Pile: AZ19

* DRIVING PRESSURE (ACTIVE, WATER, & SURCHARGE) *

No.	Z1 top	Top Pres.	Z2 bottom	Bottom Pres.	Slope
1	*	Above	Base		
2	0.000	0.000	5.000	0.334	0.066829
3	*	Below	Base		
4	5.000	0.358	50.00	2.254	0.042142

* PASSIVE PRESSURE *

The pressures below will be divided by a Factor of Safety =1.5

No.	Z1 top	Top Pres.	Z2 bottom	Bottom Pres.	Slope
1	*	Below	Base		
2	7.000	0.750	50.00	16.87	0.375000

* ACTIVE SPACE *

No.	Z depth	Spacing
1	0.00	1.00
2	5.00	1.00

* PASSIVE SPACE *

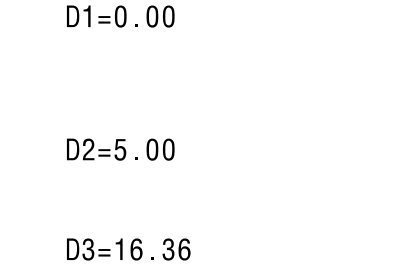
No.	Z depth	Spacing
1	0.00	1.00

*For Tieback: Input1 = Diameter; Input2 = Bond Strength
*For Plate: Input1 = Diameter; Input2 = Allowable Pressure
*For Deadman: Input1 = Horz. Width; Input2 = Passive Pressure;
*For Sheet Pile Anchor: Input1 = Horz. Width; Input2 = Passive Slope;

**********CALCULATION**********

The calculated moment and shear are per pile spacing. Sheet piles are per one foot or meter; Soldier piles are per pile.

Top Pressures start at depth = 0.00



D1 - TOP DEPTH
D2 - EXCAVATION BASE
D3 - PILE TIP

MOMENT equilibrium AT DEPTH=14.47 WITH EMBEDMENT OF 9.47
FORCE equilibrium AT DEPTH=16.36 WITH EMBEDMENT OF 11.36

The program calculates an embedment for moment equilibrium, then increase the embedment by 1.2

**********RESULTS**********

* EMBEDMENT Notes *
Based on USS Design Manual, first calculate embedment for moment equilibrium, then increased the embedment to get the design depth.
The embedment for moment equilibrium is 9.47
The program calculates an embedment for moment equilibrium, then increase the embedment by 1.2
The total desigh embedment is 11.36

Embedment Information:
If 20% increased, the total design embedment is 11.36
If 30% increased, the total design embedment is 12.31
If 40% increased, the total design embedment is 13.26
If 50% increased, the total design embedment is 14.21

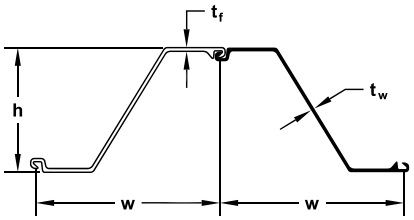
* MOMENT IN PILE (per pile spacing)*
Pile Spacing: sheet piles are one foot or one meter; soldier piles are one pile.
Overall Maximum Moment = 7.74 at 10.69
Maximum Shear = 4.58
Moment and Shear are per pile spacing: 1.0 foot or meter

* VERTICAL LOADING *
Vertical Loading from Braces = 0.00
Vertical Loading from External Load = 0.00
Total Vertical Loading = 0.00

* DEFLECTION *
I (in4)/foot=288.40
Top deflection = 0.199(in)
Max. deflection = 0.199(in)

AZ

AZ Hot Rolled Steel Sheet Pile



SECTION	Width (w) in mm	Height (h) in mm	THICKNESS Flange (t_f) in mm	THICKNESS Web (t_w) in mm	Cross Sectional Area in²/ft cm²/m	WEIGHT Pile lb/ft kg/m	WEIGHT Wall lb/ft² kg/m²	SECTION MODULUS Elastic in³/ft cm³/m	SECTION MODULUS Plastic in³/ft cm³/m	Moment of Inertia in⁴/ft cm⁴/m	COATING AREA Both Sides ft²/ft of single m²/m	COATING AREA Wall Surface ft²/ft² m²/m²
AZ 12-770	30.31 770	13.52 344	0.335 8.5	0.335 8.5	5.67 120.1	48.78 72.6	19.31 94.3	23.2 1245	27.5 1480	156.9 21430	6.07 1.85	1.20 1.20
AZ 13-770	30.31 770	13.54 344	0.354 9.0	0.354 9.0	5.94 125.8	51.14 76.1	20.24 98.8	24.2 1300	28.8 1546	163.7 22360	6.07 1.85	1.20 1.20
AZ 14-770	30.31 770	13.56 345	0.375 9.5	0.375 9.5	6.21 131.5	53.42 79.5	21.14 103.2	25.2 1355	30.0 1611	170.6 23300	6.07 1.85	1.20 1.20
AZ 17-700	27.56 700	16.52 420	0.335 8.5	0.335 8.5	6.28 133.0	49.12 73.1	21.38 104.4	32.2 1730	37.7 2027	265.3 36230	6.10 1.86	1.33 1.33
AZ 18-700	27.56 700	16.54 420	0.354 9.0	0.354 9.0	6.58 139.2	51.41 76.5	22.39 109.3	33.5 1800	39.4 2116	276.8 37800	6.10 1.86	1.33 1.33
AZ 19-700	27.56 700	16.56 421	0.375 9.5	0.375 9.5	6.88 145.6	53.76 80.0	23.35 114.3	34.8 1870	41.0 2206	288.4 39380	6.10 1.86	1.33 1.33
AZ 20-700	27.56 700	16.57 421	0.394 10.0	0.394 10.0	7.18 152.0	56.11 83.5	24.43 119.3	36.2 1945	42.7 2296	300.0 40960	6.10 1.86	1.33 1.33
AZ 18-800	31.5 800	17.68 449	0.335 8.5	0.335 8.5	6.07 128.6	54.26 80.7	20.67 100.9	34.2 1840	39.7 2135	302.6 41320	6.82 2.08	1.30 1.30
AZ 20-800	31.5 800	17.72 450	0.375 9.5	0.375 9.5	6.66 141.0	59.50 88.6	22.67 110.7	37.2 2000	43.3 2330	329.9 45050	6.82 2.08	1.30 1.30
AZ 22-800	31.5 800	17.76 451	0.413 10.5	0.413 10.5	7.25 153.5	64.77 96.4	24.68 120.5	40.3 2165	47.0 2525	357.3 48790	6.82 2.08	1.30 1.30
AZ 23-800	31.50 800	18.66 474	0.453 11.5	0.354 9.0	7.12 150.6	63.56 94.6	24.22 118.2	43.3 2330	49.9 2680	404.6 55260	6.94 2.11	1.32 1.32
AZ 25-800	31.50 800	18.70 475	0.492 12.5	0.394 10.0	7.71 163.3	68.91 102.6	26.26 128.2	46.5 2500	53.8 2890	435.1 59410	6.94 2.11	1.32 1.32
AZ 27-800	31.50 800	18.74 476	0.531 13.5	0.433 11.0	8.31 176.0	74.26 110.5	28.29 138.1	49.7 2670	57.6 3100	465.5 63570	6.94 2.11	1.32 1.32
AZ 24-700	27.56 700	18.07 459	0.441 11.2	0.441 11.2	8.23 174.1	64.30 95.7	28.00 136.7	45.2 2430	53.5 2867	408.8 55820	6.33 1.93	1.38 1.38
AZ 26-700	27.56 700	18.11 460	0.480 12.2	0.480 12.2	8.84 187.2	69.12 102.9	30.10 146.9	48.4 2600	57.1 3070	437.3 59720	6.33 1.93	1.38 1.38
AZ 28-700	27.56 700	18.15 461	0.520 13.2	0.520 13.2	9.46 200.2	73.93 110.0	32.19 157.2	51.3 2760	60.9 3273	465.9 63620	6.33 1.93	1.38 1.38
AZ 28-750	29.53 750.0	20.04 509.0	0.472 12.00	0.394 10.00	8.09 171.2	67.73 100.80	27.53 134.40	52.3 2810	60.3 3245	523.9 71540	6.93 2.11	1.41 1.41
AZ 30-750	29.53 750.0	20.08 510.0	0.512 13.00	0.433 11.00	8.73 184.7	73.08 108.80	29.70 145.00	55.9 3005	64.8 3485	561.5 76670	6.93 2.11	1.41 1.41
AZ 32-750	29.53 750.0	20.12 511.0	0.551 14.00	0.472 12.00	9.37 198.3	78.44 116.70	31.88 155.60	59.5 3200	69.2 3720	599.0 81800	6.93 2.11	1.41 1.41
AZ 36-700N	27.56 700	19.65 499	0.591 15.0	0.441 11.2	10.20 215.9	79.72 118.6	34.71 169.5	66.8 3590	76.4 4110	656.2 89610	6.73 2.05	1.47 1.47
AZ 38-700N	27.56 700	19.69 500	0.630 16.0	0.480 12.2	10.87 230.0	84.94 126.4	36.98 180.6	70.6 3795	81.1 4360	694.5 94840	6.73 2.05	1.47 1.47
AZ 40-700N	27.56 700	19.72 501	0.669 17.0	0.520 13.2	11.54 244.2	90.16 134.2	39.26 191.7	74.3 3995	85.7 4605	732.9 100080	6.73 2.05	1.47 1.47
AZ 42-700N	27.56 700	19.65 499	0.709 18.0	0.551 14.0	12.22 258.7	95.51 142.1	41.59 203.1	78.2 4205	90.3 4855	768.4 104930	6.75 2.06	1.47 1.47
AZ 44-700N	27.56 700	19.69 500	0.748 19.0	0.591 15.0	12.89 272.8	100.74 149.9	43.87 214.2	81.9 4405	95.0 5105	806.6 110150	6.75 2.06	1.47 1.47
AZ 46-700N	27.56 700	19.72 501	0.787 20.0	0.630 16.0	13.56 287.0	105.97 157.7	46.14 225.3	85.7 4605	99.5 5350	844.9 115370	6.75 2.06	1.47 1.47
AZ 48-700	27.56 700.0	19.80 503.0	0.866 22.00	0.591 15.00	13.63 288.4	106.49 158.50	46.37 226.40	88.4 4755	102.1 5490	876.2 119650	6.70 2.04	1.46 1.46
AZ 50-700	27.56 700.0	19.84 504.0	0.906 23.00	0.630 16.00	14.30 302.6	111.73 166.30	48.65 237.50	92.2 4955	106.7 5735	914.6 124890	6.70 2.04	1.46 1.46
AZ 52-700	27.56 700.0	19.88 505.0	0.945 24.00	0.669 17.00	14.97 317.0	116.97 174.10	50.93 248.70	95.9 5155	111.3 5985	953.0 130140	6.70 2.04	1.46 1.46

UNIVERSITY OF ALBANY STUDENT HOUSING

1415 WASHINGTON AVENUE
ALBANY, NEW YORK

SHEET PILE RETAINING WALL

SHEET INDEX

GENERAL NOTES

GENERAL

THE CONTRACTOR AND SUBCONTRACTORS ARE RESPONSIBLE FOR THE CONSTRUCTION PROCESS AND THE SAFETY OF THE WORKERS. THIS INCLUDES BUT IS NOT LIMITED TO, THE CONSTRUCTION SEQUENCE, TEMPORARY HANDRAILS, AND BARRIERS.

THE CONTRACTOR SHALL PROVIDE PROTECTION OF PEDESTRIANS AND VEHICULAR TRAFFIC WHEN CONSTRUCTION ACTIVITIES REQUIRE SUCH.

NO CONSTRUCTION ACTIVITIES ARE ALLOWED WITHIN ARCHAEOLOGICAL RIGHT OF WAY BEHIND THE TOP OF THE WALL.

DESIGN LIVE LOADS

CONSTRUCTION SURCHARGE ON TOP OF THE RETAINING WALL = 0 PSF

CONTRACTOR SHALL NOT APPLY ANY VERTICAL SURCHARGES ON TOP OF THE WALL WITHIN ARCHAEOLOGICAL RIGHT OF WALL WITHOUT PRIOR APPROVAL BY ENGINEER.

SUBSURFACE DESIGN

SUBSURFACE SOIL AND WATER PARAMETERS USED IN THE DESIGN WERE BASED ON THE SUBSURFACE CHARACTERIZATION PRESENTED IN THE REPORT TITLED "GEOTECHNICAL ENGINEERING REPORT" BY TERRACON, DATED SEPTEMBER 9, 2020

SOIL PROFILE

POORLY GRADED SAND
FROM EXISTING GROUND SURFACE, EL VARIES (258 TO 250) TO ~EL 200
UNIT WEIGHT = 125 PCF
FRICTION ANGLE = 30 DEGREES

GROUNDWATER

THIS DESIGN CONSIDERS THAT THE GROUNDWATER TABLE WILL BE BELOW THE BOTTOM OF EXCAVATION AT APPROXIMATELY EL 230 OR DEEPER. CONTRACTOR SHALL PERFORM DEWATERING IF NECESSARY. THIS DESIGN DOES NOT PROVIDE PROVISIONS FOR METHODS OF DEWATERING.

EXISTING UNDERGROUND OBSTRUCTIONS AND UTILITIES

THE CONTRACTOR MUST FIELD VERIFY ALL EXISTING DIMENSIONS AND SITE CONDITIONS. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING ACTUAL LOCATIONS OF ALL EXISTING UTILITIES SHOWN ON THE PLANS AND THOSE UTILITIES OR UNDERGROUND OBSTRUCTIONS NOT SHOWN ON THE PLANS. THE CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF ALL ABANDONED UTILITIES, OR OTHER UNDERGROUND OBSTRUCTIONS THAT INTERFERE WITH THE NEW CONSTRUCTION. LOCATION AND/OR ABANDONMENT MUST BE COMPLETED PRIOR TO VERTICAL ELEMENT INSTALLATION AND EXCAVATION.

JOB SITE SAFETY

INSOFAR AS JOB SITE SAFETY IS CONCERNED, TERRACON IS RESPONSIBLE FOR THE HEALTH AND SAFETY OF ITS EMPLOYEES. NOTHING HEREIN SHALL BE CONSTRUED TO RELIEVE CLIENT OR ANY OTHER CONSULTANTS OR CONTRACTORS FROM THEIR RESPONSIBILITIES FOR MAINTAINING A SAFE JOB SITE. TERRACON SHALL NOT ADVISE ON, ISSUE DIRECTIONS REGARDING, OR ASSUME CONTROL OVER SAFETY CONDITIONS AND PROGRAMS FOR OTHERS AT THE JOB SITE. NEITHER THE PROFESSIONAL ACTIVITIES OF TERRACON, NOR THE PRESENCE OF TERRACON OR ITS EMPLOYEES AND SUBCONTRACTORS, SHALL BE CONSTRUED TO IMPLY THAT TERRACON CONTROLS THE OPERATIONS OF OTHERS OR HAS ANY RESPONSIBILITY FOR JOB SITE SAFETY.

RETAINING WALL DEFLECTION

THE RETAINING WALL IS DESIGNED FOR 3/4 INCH OR LESS DEFLECTION AT THE TOP OF THE SHEET PILE UNDER STATIC CONDITIONS.

GENERAL NOTES (CONT.)

SHEET PILES

SHEET PILES SHALL BE AZ19-700 (Sx=34.8 IN^3/FT,I=288.4 IN^4/FT, Fy=50 KSI) OR APPROVED SIMILAR WITH GREATER THAN OR EQUAL SECTION MODULUS, MOMENT OF INERTIA, AND YIELD STRESS.

CORROSION PROTECTION:

SHEET PILE SIZING CONSIDERS $\frac{1}{16}$" ADDITIONAL THICKNESS ON EITHER SIDE OF THE SHEET PILE TO ACCOUNT FOR CORROSION PROTECTION.

RETAINING WALL LAYOUT

LAYOUT OF RETAINING WALL SHALL BE BASED ON THESE PLANS TAKING INTO ACCOUNT ANY ADDITIONAL OFFSET TO PREVENT ENCROACHMENT INTO THE HISTORIC ZONE ADJACENT TO THE RETAINING WALL.

RETAINING WALL MONITORING

PART 1 - GENERAL

1.01 DESCRIPTION

A.CONSTRUCTION MONITORING OF THE RETAINING WALLS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL CONSIST OF CONTROLLED SURVEYING AS DESCRIBED IN THIS SECTION. EXECUTION OF THE SURVEYING SHALL BE PERFORMED BY A LICENSED SURVEYOR. CONTROLLED SURVEYING SHALL BE PERFORMED TO DETERMINE: (A) ELEVATION AND PLAN LOCATION OF MONITORING POINTS; AND (B) VERTICAL AND HORIZONTAL MOVEMENT OF THE MONITORING POINTS.

B. MONITORING POINTS SHALL CONSIST OF BOLTS OR RODS EMBEDDED INTO THE OBJECT OF INTEREST, OR CROSS-HAIRS SCRIBED ONTO A PLATE THAT IS ATTACHED TO THE FACE OF THE OBJECT OF INTEREST. SURVEY ACCURACY SHALL BE TO +/- 0.01 FT.

C. MONITORING POINTS SHALL BE ESTABLISHED: (A) AT 10 FT SPACING ALONG THE WALL WHERE THE RETAINGING WALL IS UTILIZED AS TEMPORARY SUPPORT OF EXCAVATION ADJACENT TO THE SEDIMENT AND INFILTRATION BASINS; (B) ON ALL EXISTING STRUCTURES THAT ARE SENSITIVE TO MOVEMENT AND WITHIN 20 FEET OF THE EXCAVATION.

1.02 MONITORING FREQUENCY AND REPORTING

A. SURVEY AND REPORTING OF MOVEMENT OF MONITORING POINTS SHALL BE PERFORMED AT LEAST TWICE PER WEEK DURING CONSTRUCTION OF THE RETAINING WALL. THE SURVEYS MUST BE PERFORMED BY A LICENSED SURVEYOR. THE SURVEY FREQUENCY CAN BE DECREASED AFTER THE COMPLETION OF RETAINING WALL IF THE DATA INDICATES LITTLE OR NO ADDITIONAL MOVEMENT. SURVEYING MUST CONTINUE UNTIL THE PERMANENT STRUCTURE IS COMPLETE UP TO FINAL GRADE. THE SURVEY MONITORING PERIOD WILL BE DETERMINED BY THE GEOTECHNICAL ENGINEER.

B. IMMEDIATELY AND DIRECTLY NOTIFY THE GEOTECHNICAL AND STRUCTURAL ENGINEERS, WALL DESIGNER, AND OWNER IF 0.5 INCHES OF MOVEMENT OCCURS BETWEEN TWO CONSECUTIVE READINGS AND WHEN TOTAL MOVEMENTS REACH 3/4 INCH. AT THAT AMOUNT OF MOVEMENT, THE ENGINEERS AND DESIGNERS SHALL DETERMINE THE CAUSE OF DISPLACEMENT AND DEVELOP REMEDIAL MEASURES SUFFICIENT TO LIMIT TOTAL WALL MOVEMENTS TO 1 INCH. ALL EARTHWORK AND CONSTRUCTION ACTIVITIES MUST BE DIRECTED TOWARDS IMMEDIATE IMPLEMENTATION OF REMEDIAL MEASURES NECESSARY TO LIMIT TOTAL WALL MOVEMENTS TO WHAT HAS BEEN DEFINED AS ACCEPTABLE BY THE DESIGN TEAM AND OWNER.

REV.	DATE	BY	DESCRIPTION

GENERAL NOTES
UNIVERSITY OF ALBANY STUDENT HOUSING
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ALBANY NEW YORK

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Consulting Engineers and Scientists
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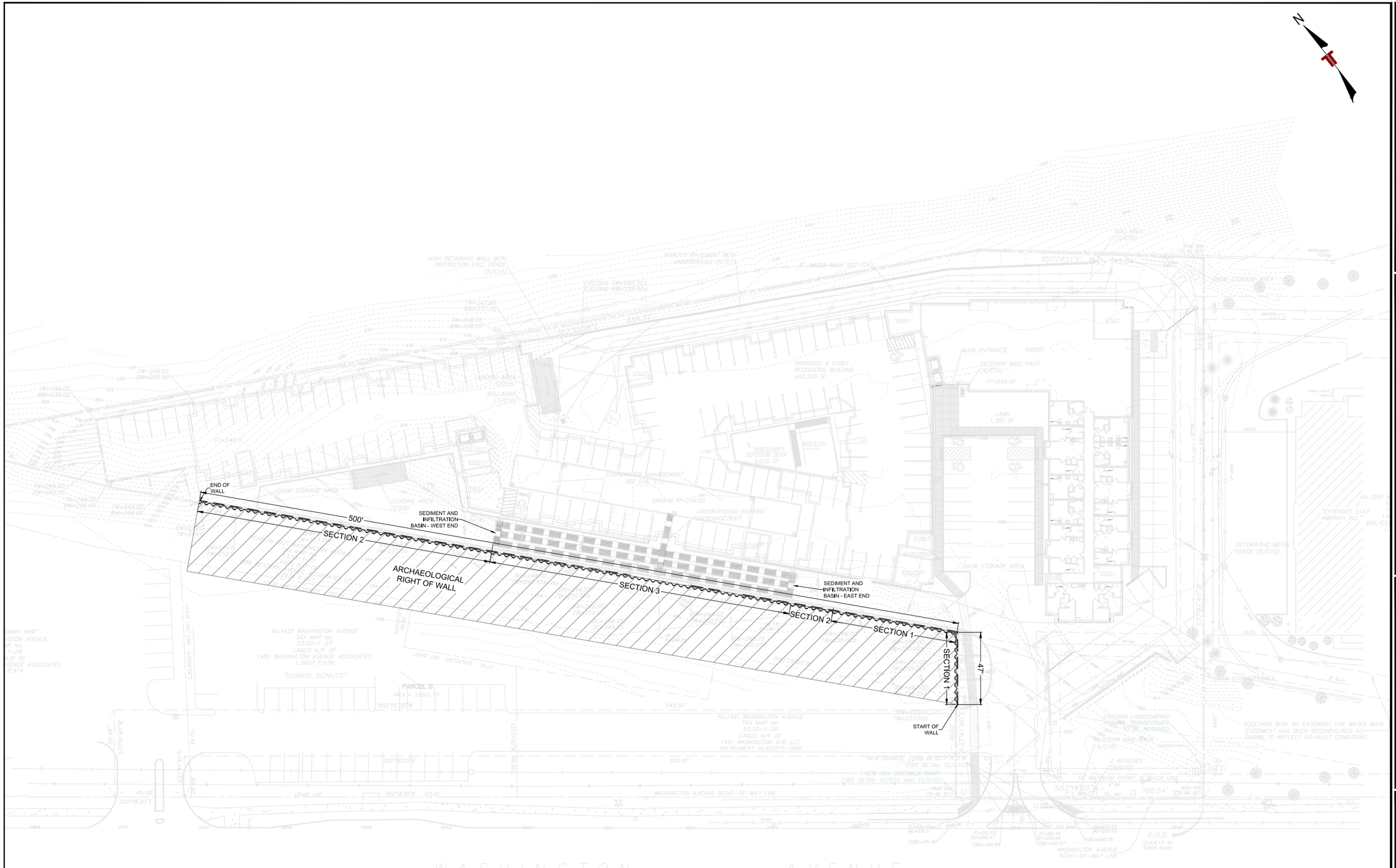
PH. (518) 266-0310 F. (518) 266-0238

10/21/2021

RW1.0

DESIGNED BY:	AN
DRAWN BY:	AMP
APPVD. BY:	MN
SCALE:	AS SHOWN
DATE:	OCT. 2021
JOB NO.	EY205074
SHEET NO.:	1 OF 3



***NOTE:**
LOCATION OF RETAINING WALL IS APPROXIMATE AS SHOWN. FIELD LOCATION OF THE WALL SHALL BE DETERMINED BY CONTRACTOR IN CONJUNCTION WITH THE SITE ENGINEER SO AS NO TO ENCROACH ON ARCHEOLOGICAL RIGHT OF WAY.

LEGEND
- RETAINING WALL
- 547' WALL LENGTH
- SHEET PILE - AZ19-700

60 0 10 20 30 60
SCALE IN FEET

REV.	DATE	BY	DESCRIPTION

SITE PLAN

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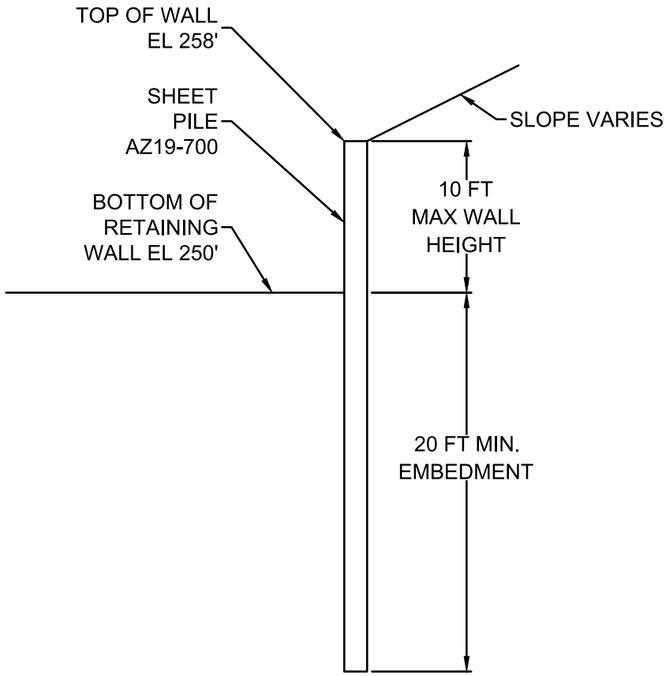
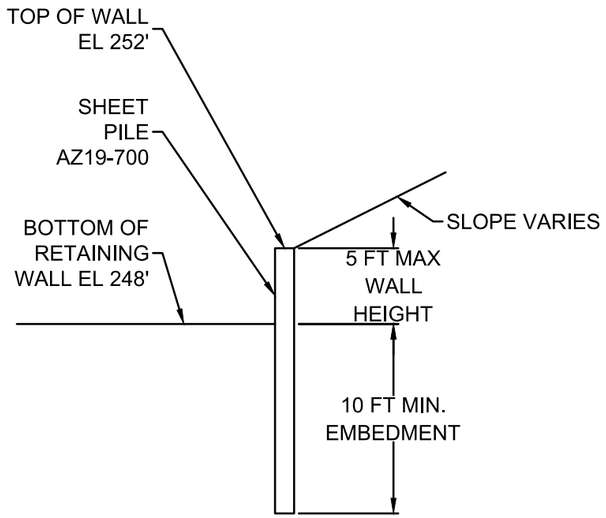
10/21/2021

RW2.0	
DESIGNED BY:	AN
DRAWN BY:	AMP
APPVD. BY:	MN
SCALE:	AS SHOWN
DATE:	OCT. 2021
JOB NO.	EY205074
SHEET NO.:	2 OF 3



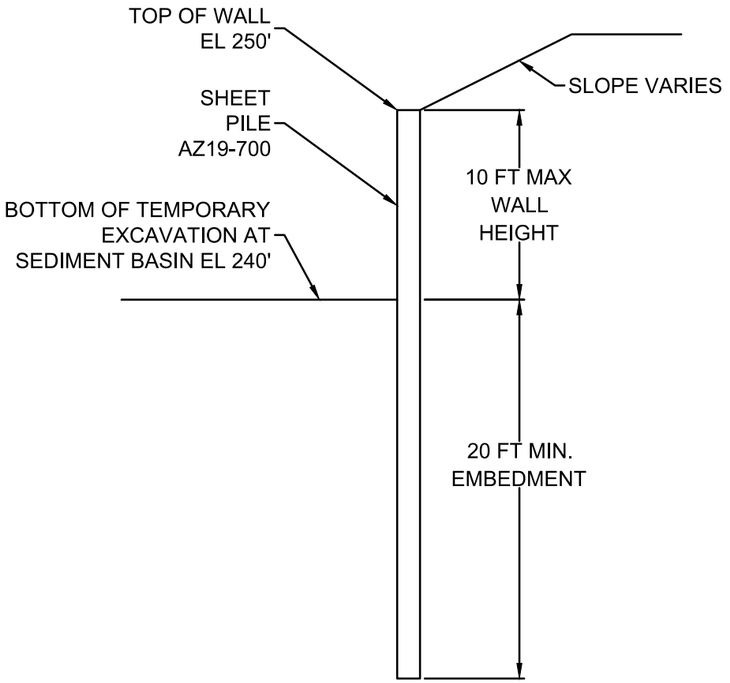
SECTION 1 - RETAINING WALL HEIGHT 5 FT TO 10 FT

N.T.S.



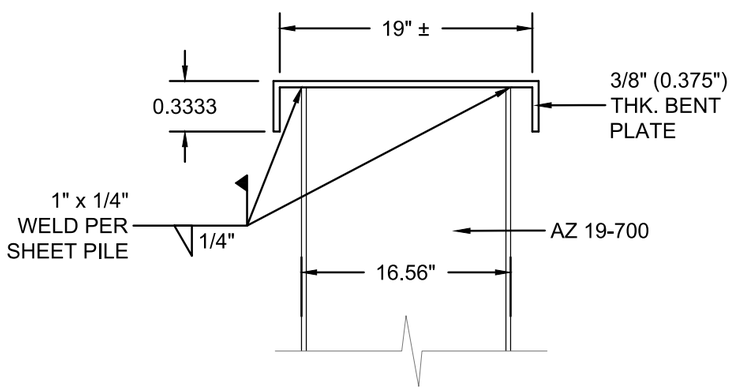
SECTION 2 - RETAINING WALL HEIGHT LESS THAN 5 FT

N.T.S.



SECTION 3 - TEMPORARY SUPPORT OF EXCAVATION AT SEDIMENT BASIN

N.T.S.



TYPICAL SHEET PILE TOP CAP DETAIL

REV.	DATE	BY	DESCRIPTION

CROSS SECTIONS

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10/21/2021

RW3.0	
DESIGNED BY:	AN
DRAWN BY:	AMP
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SCALE:	AS SHOWN
DATE:	OCT. 2021
JOB NO.	EY205074
SHEET NO.:	3 OF 3