

**Revised Design Calculation Package
Legacy Parkway Project
Bridges C863 & C867 - Bent 2
MP 798.06 & MP 798.04
Excavation Support**

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1. Design Criteria

1. Temporary Shoring Design Criteria

A temporary and permanent sheet pile shoring system was designed to facilitate the excavation and construction of the new foundation for Bent 2 of structures C863 and C867 for the Legacy Parkway – Segment 3 Project located in Davis County, Utah. The sheet piles have been designed to temporarily shore the required excavation and also to permanently support lateral pressures and minimize lateral forces on the Bent footing that will develop from trains traveling on the nearby Union Pacific Main Line #1 (UP ML#1). Based on the UDOT project drawings numbers C863A, C863, C867A and C867 we anticipate the bottom of the Bent 2 footing for each structure to be at elevation 4,237.8 feet (1,292.0 meters). Assuming that the existing ground surface is at elevation 4,251.9 feet (1,296.3 meters) and 4,253.5 feet (1,296.8 meters) and that there will be at least 1 foot of over-excavation for stabilization fill, the maximum anticipated excavation is 15.1 feet and 16.7 feet for structures C863 and C867 respectively. Also based on the UDOT project drawings, we anticipate that the sheet piling will be approximately 12 feet and 14 feet and from the center of the UP ML #1 at the closest points for structures C863 and C867 respectively.

Geotechnical Design Parameters

Geotechnical parameters used in the shoring design were developed from information provided in the field test boring logs and cone penetration test (CPT) logs provided in the UDOT project drawing numbers C863 and C867. An idealized soil profile was developed for our design based specifically from boring logs RB-385 and from CPT log SC-27-341. The following summarizes the soil profile and estimated design parameters.

Approx. elevation at top of soil layer (Thickness of layer, ft)	Soil Type	Total Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (degrees)	Modulus of Elasticity, Es (ksi)	Poisson's Ratio, ν
(5 to 7) ft	FILL – Silty SAND (SM)	125	0	36	14.58	0.29
4247 ft (5)	Lean Clay (CL)	110	0	28	2.08	0.40
4240 ft (10)	Poorly Graded Sand (SP)	115	0	34	2.92	0.31
4230 ft (15)	Sandy SILT/Lean Clay (ML/CL)	115	0	30	3.61	0.33
4215 ft	Silty SAND with Gravel (SM)	125	0	36	14.58	0.29

The modulus of elasticity and Poisson's ratio for each soil type listed above was estimated using Table C10.4.6.3-1 of the AASHTO LRFD Bridge Design Specification 2006 Interim and the material description and SPT $(N_1)_{60}$ values. A wall to soil friction angle of 14 degrees was also used in our design. The wall friction angle was estimated from the recommended friction angle values for steel sheet piles listed in Table 3.11.5.3-1 of the AASHTO LRFD Bridge Design Specification. Based on the material description and sample moisture contents in the boring logs and the equilibrium pore pressure from dissipation in the CPT logs, the groundwater was assumed to be at elevation 4,246 feet which is approximately 5 to 8 feet below the existing ground surface.

2. Design Calculations

2. Design Calculations

Analyses of typical sheet pile sections for each structure with varying E80 live loads and excavation spoil surcharge loads were performed using the computer software Shoring Suite Plus version 8 and the previously detailed soil parameters to determine the minimum required sheet section modulus, embedment depth and the anticipated sheet pile deflection. The analyses included reducing the passive resistance by 0.67. In order to minimize the sheet pile deflection as required by AREMA (2006) and the Temporary Shoring Guidelines published by Union Pacific Rail Road and Santa Fe Rail Road (October, 2004), AZ26 sheet piles supported by an outside waler were selected for the sheet piling closest to the UP ML#1.

For the sheet piling that will not experience E80 live loads, AZ18 sheet piles supported by an outside waler were selected. A surcharge load of 600 psf located a distance of 8 feet from the edge of the sheet piles was also included in our analysis of the AZ18 sheet pile sections to account for the potential surcharge due to excavation spoils. We have assumed that the excavation spoils will be no more than 5 feet tall and no closer than 8 feet to the edge of the sheet piles.

The minimum depth of embedment for the sheet pile section closest to the UP ML#1 was calculated to be 11.7 feet for a total minimum pile length of 27.7 feet. The required sheet pile sections and waler beam support is detailed in the attached shop drawings.

The maximum waler loads of 6.5 and 7.1 kips per lineal foot of shoring calculated in our analyses of the sheet piles were used to design the required waler beams for the shoring system at structures C863 and C867 respectively.

It is anticipated that the footings for the new Bent foundation will be constructed by pouring the concrete flush against the shoring system. In order to minimize transferring potential lateral loads from the E80 live loads to the new Bent foundation, a foam separator should be placed between the sheet piling and the concrete. The foam separator should be at least 1-inch thick. The sheet piles should be installed based on the surveyed footing lines and should not be installed closer than 12 feet to the center line of UP ML#1. Conflicts with the foundation piling and the sheet pile shoring system should be identified by the contractor and IGES, Inc. notified prior to the sheet pile installation.

It has been assumed that existing utilities will not conflict with the installation of the shoring system; however, all utilities must be potholed and visually located by the contractor prior to the sheet pile installation. Any identified potential conflicts should be reported to IGES, Inc. immediately for review and design revision as they deem necessary.

A finite element model (PLAXIS, v.8.2) was used to estimate the horizontal displacement of the permanent sheet pile wall due to the lateral pressures developed by the train live load. Using the previously detailed soil parameters, the model estimated 0.09 inches and 0.05 inches for the total and horizontal sheet pile movement respectively for an equivalent E80 surcharge placed 14 feet from the edge of the shoring. The estimated total deflection was used to size the required foam separator between the sheet pile and the new concrete footing.

A simplified finite element model without the sheet pile wall was also used to compare the change in vertical and horizontal effective stresses with depth due to the E80 loading at a location

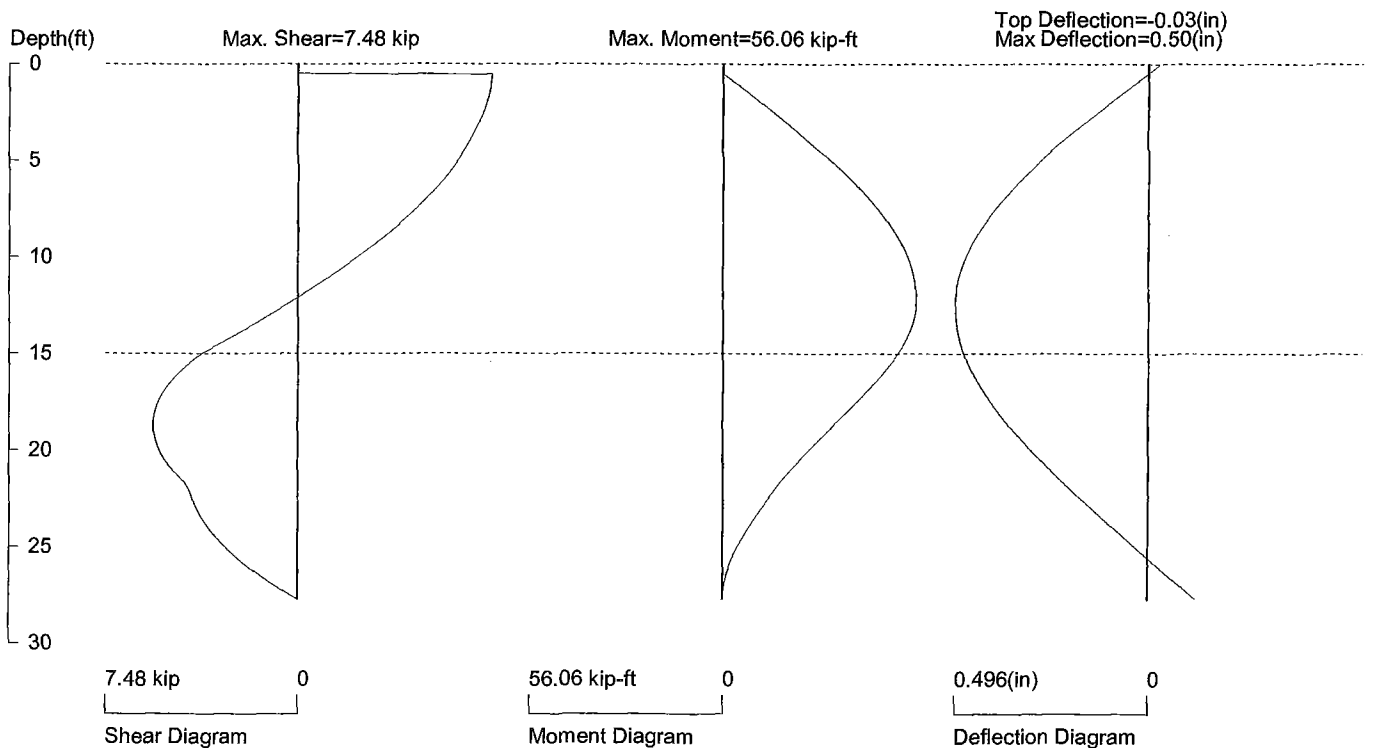
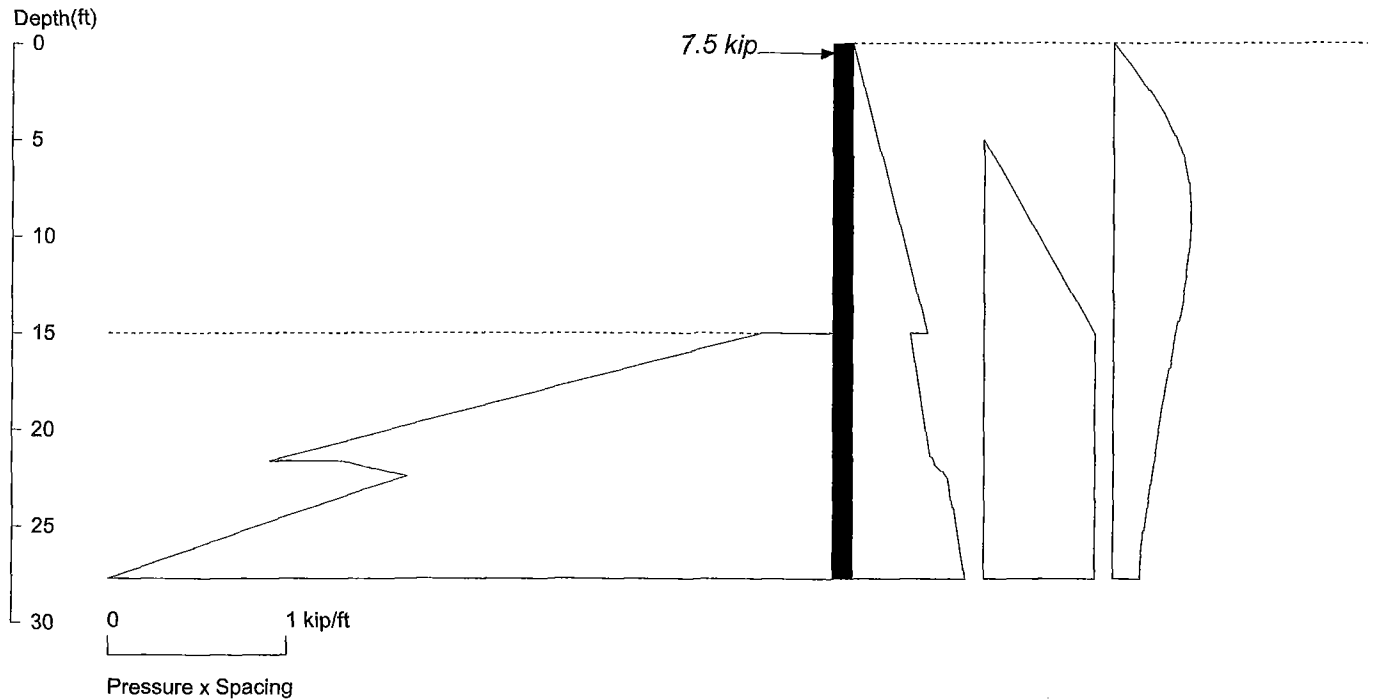
of 14 feet away from the center of the strip load. Two plots with initial and final stress curves are included in the PLAXIS Analysis Section. The initial and final curves refer to the effective stress without and with the E80 loading, respectively. The model depth referenced on the plots is the depth from the top of the PLAXIS model which has the ground surface at 33 feet. The largest change in vertical and horizontal effective stresses due to the applied E80 loading is 224 psf and 193 psf at a depth of 24 feet and 9 feet below the ground surface, respectively.

For another comparison, the Boussinesq equation for an infinite uniform strip load was used to compute the lateral pressure due to the E80 loading at a distance of 14 feet from the center of the strip load. The maximum computed lateral pressure due to the E80 load was 258 psf at a depth of approximately 6.5 feet below the ground surface. Using the footing width of 28 feet and height of 8.5 feet, the lateral load to the pile cap induced by the E80 live loading is 61.4 kips. Assuming very little pile cap movement such that the pile cap is in an at-rest condition and using an earth pressure coefficient of 0.5, the at-rest pressure including the soil surcharge above the footing resisting the load on the pile cap is approximately 122 kips.

Analyses details follow.

SHEET PILE DESIGN

Legacy Pkwy - C863 Bent 2 - E80 at 12ft - GW at 5ft with wall friction



PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on one soldier pile or one foot spacing of sheet pile

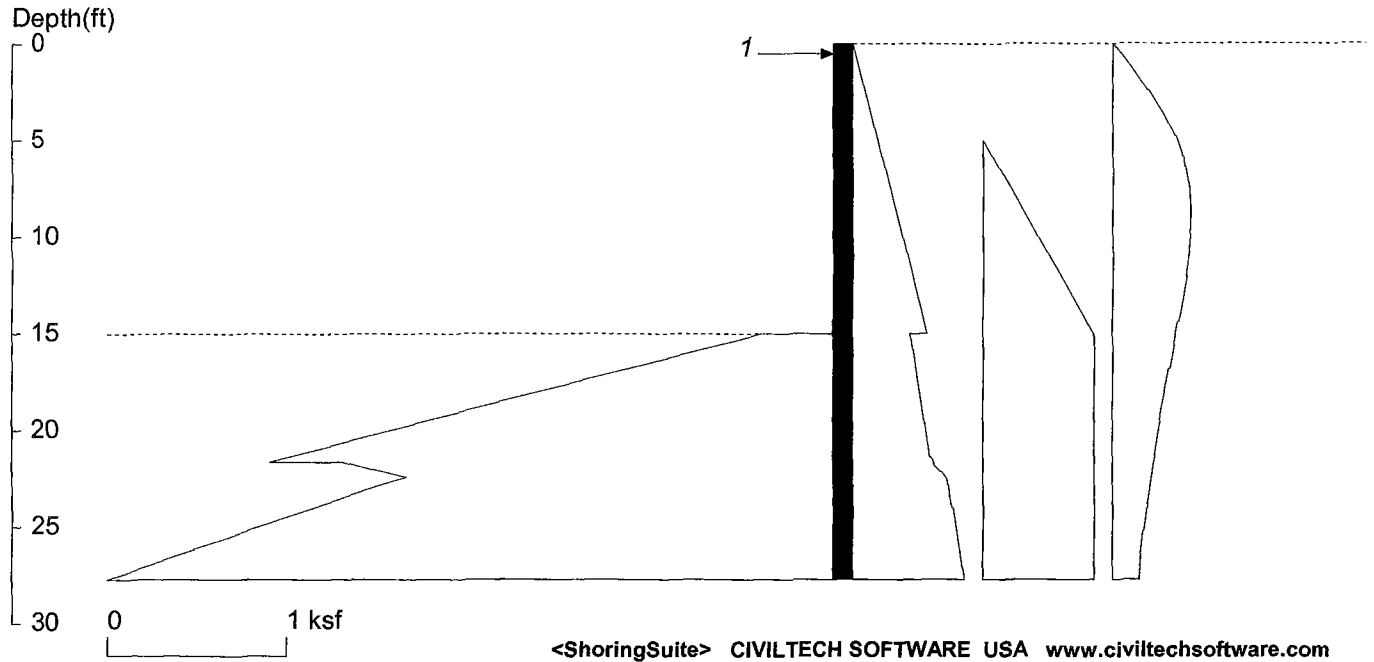
Pile: AZ26 meet Section Requirements. Properties: 6. E (ksi)=29000, 4. I (in⁴)=406.5

Date: 1/19/2007 File Name: W:\00409 BUILDINC\046 Legacy Segment 3 - C863 & C867\ShoringSuite\C863 - 15ft_E80_12ft_GW_5ft_wf.sh8

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<ShoringSuite> CIVILTECH SOFTWARE USA www.civiltechsoftware.com

Legacy Pkwy - C863 Bent 2 - E80 at 12ft - GW at 5ft with wall friction



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Date: 1/19/2007 File Name: W:\00409 BUILDINC\046 Legacy Segment 3 - C863 & C867\ShoringSuite\C863 - 1f

Wall Height=15.0

Pile Diameter=1.0

Pile Spacing=1.0

ACTIVE SPACE:		Z depth	Spacing
1		0.00	1.00
2		15.00	1.00
PASSIVE SPACE:		Z depth	Spacing
1		15.00	1.00

PILE LENGTH: Min. Embedment=12.71, Min. Pile Length=27.71

MOMENT IN PILE: Max. Moment=56.06 at Depth of 12.07

VERTICAL BEARING CAPACITY: Vertical Loading=0.0, Resistance=40.9, Vertical Factor of Safety=999.00

PILE SELECTION:

Request Min. Section Modulus = 20.4 in³/feet, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66

AZ26 has Section Modulus = 48.4. It is greater than Min. Requirements!, Top Deflection = -0.03(in)

BRACE FORCE: Strut, Tieback, Plate Anchor, and Deadman

No. & Type	Depth	Angle	Total	Horiz.	Vert.	N/A	N/A
1. Strut	0.5	0.0	7.5	7.5	0.0	0.0	0.0

UNITS: Length/Depth - ft, Force - kip, Moment - kip-ft, Pressure - ksf, Pres. Slope - kip/ft³, Deflection - in

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SHORING WALL CALCULATION SUMMARY

The leading shoring design and calculation software
Software Copyright by CivilTech Software
www.civiltechsoftware.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

DEPTH: ft, PRESSURE, FRICTION, BEARING: ksf, SLOPE: kcf, FORCE: kip, MOMENT: kip-ft, DEFLECTION: in, I: in⁴, E: ksi

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Date: 1/19/2007 File: W:\00409 BUILDINC\046 Legacy Segment 3 - C863 & C867\ShoringSuite\C863 - 15ft_E80_12ft_GW_5ft_wf.sh8

Title: Legacy Pkwy - C863 Bent 2 - E80 at 12ft - GW at 5ft

Subtitle: with wall friction

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

Wall Type: 1. Sheet Pile

Wall Height: 15.00

Pile Diameter: 1.00

Pile Spacing: 1.00

Factor of Safety (F.S.): 1.50

Max. Moment reduce 20%

Lateral Support Type (Braces): 2. Strut, Raker

Top Brace Increase (Multi-Bracing): Add 15%*

Brace Position (One Brace Case): Normal Brace*

Embedment Option: 1. Yes

Friction at Pile Tip: No*

Check Vertical Bearing Capacity:

Side Friction for Bearing: 1.00

Tip Resistance for Bearing: 1.00

Pile Properties:

Allowable Fb/Fy: 0.66

Steel Strength, Fy: 50 ksi = 345 MPa

Elastic Module, E: 29000.00

Moment of Inertia, I: 406.50

User Input Pile: AZ26

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

No.	Z2 top	Top Pres.	Z2 bottom	Bottom Pres.	Slope
1	0.00	0.00	15.00	0.42	0.0280
2	15.00	0.32	19.50	0.40	0.0180
3	19.50	0.40	20.63	0.42	0.0190
4	20.63	0.42	21.38	0.44	0.0180
5	21.38	0.44	21.75	0.45	0.0510
6	21.75	0.45	22.13	0.50	0.1170
7	22.13	0.50	22.50	0.53	0.0850
8	22.50	0.53	23.25	0.54	0.0190

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9	23.25	0.54	24.00	0.56	0.0210
10	24.00	0.56	36.38	0.80	0.0190
11	36.38	0.80	36.75	0.78	-0.0580
12	36.75	0.78	37.13	0.70	-0.2130
13	37.13	0.70	37.50	0.65	-0.1370
14	37.50	0.65	42.75	0.73	0.0170
15	42.75	0.73	43.50	0.75	0.0220
16	43.50	0.75	56.63	0.98	0.0170
17	56.63	0.98	57.00	0.98	0.0180
18	57.00	0.98	57.75	1.00	0.0210
19	57.75	1.00	75.00	1.30	0.0170
20	5.00	0.00	15.00	0.62	0.0620
21	15.00	0.62	75.00	0.62	0.0000
22	0.00	0.00	1.20	0.10	0.0870
23	1.20	0.10	2.40	0.20	0.0800
24	2.40	0.20	3.60	0.28	0.0690
25	3.60	0.28	4.80	0.35	0.0540
26	4.80	0.35	6.00	0.39	0.0380
27	6.00	0.39	7.20	0.42	0.0230
28	7.20	0.42	8.40	0.43	0.0100
29	8.40	0.43	9.60	0.43	0.0000
30	9.60	0.43	10.80	0.42	-0.0080
31	10.80	0.42	12.00	0.41	-0.0140
32	12.00	0.41	13.20	0.39	-0.0170
33	13.20	0.39	14.40	0.36	-0.0190
34	14.40	0.36	15.60	0.34	-0.0200
35	15.60	0.34	16.80	0.31	-0.0200
36	16.80	0.31	18.00	0.29	-0.0190
37	18.00	0.29	19.20	0.27	-0.0180
38	19.20	0.27	20.40	0.25	-0.0170
39	20.40	0.25	21.60	0.23	-0.0150
40	21.60	0.23	22.80	0.21	-0.0140
41	22.80	0.21	24.00	0.19	-0.0130
42	24.00	0.19	25.20	0.17	-0.0120
43	25.20	0.17	26.40	0.16	-0.0110
44	26.40	0.16	27.60	0.15	-0.0100
45	27.60	0.15	28.80	0.14	-0.0090
46	28.80	0.14	30.00	0.12	-0.0080
47	30.00	0.12	31.20	0.11	-0.0070
48	31.20	0.11	32.40	0.11	-0.0070
49	32.40	0.11	33.60	0.10	-0.0060
50	33.60	0.10	34.80	0.09	-0.0060
51	34.80	0.09	36.00	0.08	-0.0050
52	36.00	0.08	37.20	0.08	-0.0050
53	37.20	0.08	38.40	0.07	-0.0040
54	38.40	0.07	39.60	0.07	-0.0040
55	39.60	0.07	40.80	0.06	-0.0040
56	40.80	0.06	42.00	0.06	-0.0030
57	42.00	0.06	43.20	0.05	-0.0030
58	43.20	0.05	44.40	0.05	-0.0030
59	44.40	0.05	45.60	0.05	-0.0030
60	45.60	0.05	46.80	0.04	-0.0020
61	46.80	0.04	48.00	0.04	-0.0020
62	48.00	0.04	49.20	0.04	-0.0020
63	49.20	0.04	50.40	0.04	-0.0020
64	50.40	0.04	51.60	0.03	-0.0020
65	51.60	0.03	52.80	0.03	-0.0020
66	52.80	0.03	54.00	0.03	-0.0020
67	54.00	0.03	55.20	0.03	-0.0010
68	55.20	0.03	56.40	0.03	-0.0010
69	56.40	0.03	57.60	0.03	-0.0010
70	57.60	0.03	58.80	0.02	-0.0010
71	58.80	0.02	60.00	0.02	-0.0010

* PASSIVE PRESSURE *

No.	Z1 top	Top Pres.	Z2 bottom	Bottom Pres.	Slope
1	15.00	0.41	21.63	2.74	0.4130
2	21.63	2.74	22.00	2.57	-0.4520
3	22.00	2.57	22.38	2.38	-0.4890
4	22.38	2.38	22.75	2.51	0.3360
5	22.75	2.51	23.13	2.63	0.3290
6	23.13	2.63	23.50	2.75	0.3250
7	23.50	2.75	23.88	2.87	0.3210
8	23.88	2.87	24.25	2.99	0.3180
9	24.25	2.99	24.63	3.11	0.3160
10	24.63	3.11	25.00	3.23	0.3140
11	25.00	3.23	25.38	3.34	0.3030
12	25.38	3.34	25.75	3.46	0.2990
13	25.75	3.46	26.13	3.57	0.3070
14	26.13	3.57	26.88	3.80	0.3100
15	26.88	3.80	28.00	4.15	0.3090
16	28.00	4.15	29.88	4.73	0.3070
17	29.88	4.73	34.75	6.22	0.3060
18	34.75	6.22	36.63	6.79	0.3050
19	36.63	6.79	37.00	8.05	3.3570
20	37.00	8.05	37.38	9.35	3.4720
21	37.38	9.35	37.75	9.55	0.5330
22	37.75	9.55	38.13	9.75	0.5310
23	38.13	9.75	38.50	9.95	0.5300
24	38.50	9.95	38.88	10.14	0.5280
25	38.88	10.14	39.25	10.34	0.5270
26	39.25	10.34	39.63	10.54	0.5250
27	39.63	10.54	40.00	10.73	0.5240
28	40.00	10.73	40.38	10.91	0.4730
29	40.38	10.91	40.75	11.08	0.4490
30	40.75	11.08	41.13	11.27	0.4930
31	41.13	11.27	41.50	11.46	0.5120
32	41.50	11.46	41.88	11.65	0.5110
33	41.88	11.65	42.25	11.84	0.5100
34	42.25	11.84	43.00	12.22	0.5090
35	43.00	12.22	43.75	12.60	0.5070
36	43.75	12.60	44.50	12.98	0.5050
37	44.50	12.98	45.25	13.36	0.5040
38	45.25	13.36	46.00	13.73	0.5020
39	46.00	13.73	46.75	14.11	0.5010
40	46.75	14.11	47.50	14.48	0.5000
41	47.50	14.48	48.25	14.86	0.4980
42	48.25	14.86	49.38	15.42	0.4970
43	49.38	15.42	50.50	15.97	0.4960
44	50.50	15.97	51.63	16.53	0.4950
45	51.63	16.53	53.13	17.27	0.4940
46	53.13	17.27	54.25	17.82	0.4920
47	54.25	17.82	54.63	17.99	0.4440
48	54.63	17.99	55.00	18.15	0.4260
49	55.00	18.15	55.38	18.33	0.4720
50	55.38	18.33	57.63	19.43	0.4880
51	57.63	19.42	60.25	20.70	0.4870
52	60.25	20.70	63.63	22.34	0.4860
53	63.63	22.34	68.88	24.89	0.4850
54	68.88	24.89	74.88	27.79	0.4840

The pressure above will be divided by a Factor of Safety =1.5

* ACTIVE SPACE *

No.	Z depth	Spacing
1	0.00	1.00
2	15.00	1.00

* PASSIVE SPACE *

No.	Z depth	Spacing
1	15.00	1.00

* BRACE: STRUT, TIEBACK, ANCHOR PLATE, OR DEADMAN *

No.	Z brace	Angle	Spacing	Input1*	Input2*
1	0.50	0.0	1.00	1.00	1.00
Strut					

*For Tieback: Input1 = Diameter; Input2 = Bond Strength

*For Plate: Input1 = Diameter; Input2 = Allowable Pressure

*For Deaman: Input1 = Horz. Width; Input2 = Allowable Pressure; Angle = 0

*****SPECIFIED PILE *****

AZ26 has been found in Sheet Pile list!

AZ26 Sx= 48.4 Ix= 406.5 Weight= 31.75

* Note: All the pile dimensions are in English Units per one foot width.

*****CALCULATION*****

Top Pressures start at depth = 0.00

NUMBER OF BRACE LEVEL = 1

	D1=0.00	
<--	D2=0.50	R1=7.49
==	D3=15.00	
	D4=27.71	

D1 - TOP DEPTH

D2 - BRACE DEPTH

D3 - EXCAVATION BASE

D4 - PILE TIP

R1 - REACTION

TOTAL REACTION: R1 = 7.49

TOTAL PRESSURE ACTING ON WALL = 7.49

Total Reaction = Total Pressure, OK!

BRACE NO.1 AT DEPTH = 0.50

R1 = Brace Load = 7.49

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*****RESULTS*****

* EMBEDMENT *

MINIMUM EMBEDMENT = 12.71

TOTAL MINIMUM PILE LENGTH = 27.71

* MOMENT IN PILE *

No.	Depth	M @ Brace	Mmax in Span	Depth of Mmax
1	0.50	0.00	56.06	12.07

Overall Maximum Moment = 56.06 at 12.07

Maximum Shear = 7.48

* BRACE: STRUT, TIEBACK, ANCHOR PLATE, OR DEADMAN *

No.	DEPTH	Tangle	SPACING	HORIZONTAL	VERTICAL
1	0.50	0.0	1.00	7.49	0.00

7.49

No.	DEPTH	Free length	Type and Data
1	0.50	0.00	Strut

* VERTICAL LOADING *

Vertical Loading from Braces = 0.00

Vertical Loading from External Load = 0.00

Total Vertical Loading = 0.00

* VERTICAL BEARING CAPACITY CHECK *

Tip Depth	Tip Area	Bearing	Tip Resistance
27.71	0.50	1.00	0.50
Embedment	Side Area*	Friction	Side Resistance
12.71	40.42	1.00	40.42

*Side Area is the surface area of embedment below base and contact area between pile and soil above base.

Total Vertical Resistance = 40.92

Total Vertical Loading = 0.00

Vertical Factor of Safety = 999.00

*****SPECIFIED PILE *****

AZ26 has been found in Sheet Pile list!

AZ26 Sx= 48.4 Ix= 406.5 Weight= 31.75

* Note: All the pile dimensions are in English Units per one foot width.

Request Min. Section Modulus = 20.4 in³/feet, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66

The pile selection is based on the magnitude of the moment only. Axial force is neglected. Ref. Note 3

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AZ26 is capable to support the shoring!
Top deflection = -0.029(in)
Max. deflection = 0.496(in)

*****SHEAR, MOMENT, AND DEFLECTION V.S. DEPTH*****

User Input Pile: AZ26
Elastic Module, E: 29000.00
Moment of Inertia, I: 406.50

No	DEPTH ft	SHEAR kip	MOMENT kip-ft	DEFLECTION in
1	0.00	0.00	0.00	-0.029
2	0.03	0.00	0.00	-0.027
3	0.07	0.00	0.00	-0.025
4	0.10	0.00	0.00	-0.022
5	0.14	0.00	0.00	-0.020
6	0.17	0.00	0.00	-0.018
7	0.21	0.00	0.00	-0.016
8	0.24	0.00	0.00	-0.013
9	0.28	0.00	0.00	-0.011
10	0.31	0.01	0.00	-0.009
11	0.35	0.01	0.00	-0.007
12	0.38	0.01	0.00	-0.004
13	0.42	0.01	0.00	-0.002
14	0.45	0.01	0.00	0.000
15	0.49	0.01	0.00	0.002
16	0.52	-7.48	-0.15	0.004
17	0.55	-7.47	-0.41	0.007
18	0.59	-7.47	-0.67	0.009
19	0.62	-7.47	-0.93	0.011
20	0.66	-7.47	-1.19	0.013
21	0.69	-7.46	-1.44	0.016
22	0.73	-7.46	-1.70	0.018
23	0.76	-7.46	-1.96	0.020
24	0.80	-7.46	-2.22	0.022
25	0.83	-7.45	-2.48	0.025
26	0.87	-7.45	-2.74	0.027
27	0.90	-7.45	-3.00	0.029
28	0.94	-7.44	-3.25	0.031
29	0.97	-7.44	-3.51	0.033
30	1.01	-7.43	-3.77	0.036
31	1.04	-7.43	-4.03	0.038
32	1.08	-7.43	-4.29	0.040
33	1.11	-7.42	-4.54	0.042
34	1.14	-7.42	-4.80	0.045
35	1.18	-7.41	-5.06	0.047
36	1.21	-7.41	-5.31	0.049
37	1.25	-7.40	-5.57	0.051
38	1.28	-7.40	-5.83	0.053
39	1.32	-7.39	-6.08	0.056
40	1.35	-7.39	-6.34	0.058
41	1.39	-7.38	-6.60	0.060
42	1.42	-7.38	-6.85	0.062
43	1.46	-7.37	-7.11	0.065
44	1.49	-7.37	-7.36	0.067
45	1.53	-7.36	-7.62	0.069
46	1.56	-7.35	-7.88	0.071
47	1.60	-7.35	-8.13	0.073
48	1.63	-7.34	-8.38	0.076
49	1.66	-7.34	-8.64	0.078

				report.out
50	1.70	-7.33	-8.89	0.080
51	1.73	-7.32	-9.15	0.082
52	1.77	-7.32	-9.40	0.084
53	1.80	-7.31	-9.66	0.087
54	1.84	-7.30	-9.91	0.089
55	1.87	-7.29	-10.16	0.091
56	1.91	-7.29	-10.41	0.093
57	1.94	-7.28	-10.67	0.095
58	1.98	-7.27	-10.92	0.098
59	2.01	-7.27	-11.17	0.100
60	2.05	-7.26	-11.42	0.102
61	2.08	-7.25	-11.68	0.104
62	2.12	-7.24	-11.93	0.106
63	2.15	-7.23	-12.18	0.108
64	2.19	-7.23	-12.43	0.111
65	2.22	-7.22	-12.68	0.113
66	2.25	-7.21	-12.93	0.115
67	2.29	-7.20	-13.18	0.117
68	2.32	-7.19	-13.43	0.119
69	2.36	-7.18	-13.68	0.121
70	2.39	-7.17	-13.93	0.124
71	2.43	-7.16	-14.18	0.126
72	2.46	-7.15	-14.42	0.128
73	2.50	-7.14	-14.67	0.130
74	2.53	-7.13	-14.92	0.132
75	2.57	-7.13	-15.17	0.134
76	2.60	-7.12	-15.41	0.137
77	2.64	-7.11	-15.66	0.139
78	2.67	-7.10	-15.91	0.141
79	2.71	-7.08	-16.15	0.143
80	2.74	-7.07	-16.40	0.145
81	2.77	-7.06	-16.64	0.147
82	2.81	-7.05	-16.89	0.149
83	2.84	-7.04	-17.13	0.151
84	2.88	-7.03	-17.38	0.154
85	2.91	-7.02	-17.62	0.156
86	2.95	-7.01	-17.86	0.158
87	2.98	-7.00	-18.11	0.160
88	3.02	-6.99	-18.35	0.162
89	3.05	-6.98	-18.59	0.164
90	3.09	-6.96	-18.83	0.166
91	3.12	-6.95	-19.07	0.168
92	3.16	-6.94	-19.32	0.170
93	3.19	-6.93	-19.56	0.173
94	3.23	-6.92	-19.80	0.175
95	3.26	-6.91	-20.04	0.177
96	3.30	-6.89	-20.27	0.179
97	3.33	-6.88	-20.51	0.181
98	3.36	-6.87	-20.75	0.183
99	3.40	-6.86	-20.99	0.185
100	3.43	-6.84	-21.23	0.187
101	3.47	-6.83	-21.46	0.189
102	3.50	-6.82	-21.70	0.191
103	3.54	-6.80	-21.94	0.193
104	3.57	-6.79	-22.17	0.195
105	3.61	-6.78	-22.41	0.197
106	3.64	-6.76	-22.64	0.199
107	3.68	-6.75	-22.88	0.201
108	3.71	-6.74	-23.11	0.204
109	3.75	-6.72	-23.35	0.206
110	3.78	-6.71	-23.58	0.208
111	3.82	-6.70	-23.81	0.210
112	3.85	-6.68	-24.04	0.212

				report.out
113	3.88	-6.67	-24.27	0.214
114	3.92	-6.65	-24.51	0.216
115	3.95	-6.64	-24.74	0.218
116	3.99	-6.63	-24.97	0.220
117	4.02	-6.61	-25.20	0.222
118	4.06	-6.60	-25.42	0.224
119	4.09	-6.58	-25.65	0.226
120	4.13	-6.57	-25.88	0.228
121	4.16	-6.55	-26.11	0.230
122	4.20	-6.54	-26.34	0.232
123	4.23	-6.52	-26.56	0.234
124	4.27	-6.51	-26.79	0.236
125	4.30	-6.49	-27.01	0.237
126	4.34	-6.48	-27.24	0.239
127	4.37	-6.46	-27.46	0.241
128	4.41	-6.45	-27.69	0.243
129	4.44	-6.43	-27.91	0.245
130	4.47	-6.42	-28.13	0.247
131	4.51	-6.40	-28.36	0.249
132	4.54	-6.38	-28.58	0.251
133	4.58	-6.37	-28.80	0.253
134	4.61	-6.35	-29.02	0.255
135	4.65	-6.34	-29.24	0.257
136	4.68	-6.32	-29.46	0.259
137	4.72	-6.30	-29.68	0.261
138	4.75	-6.29	-29.90	0.263
139	4.79	-6.27	-30.11	0.264
140	4.82	-6.25	-30.33	0.266
141	4.86	-6.24	-30.55	0.268
142	4.89	-6.22	-30.76	0.270
143	4.93	-6.20	-30.98	0.272
144	4.96	-6.19	-31.19	0.274
145	4.99	-6.17	-31.41	0.276
146	5.03	-6.15	-31.62	0.277
147	5.06	-6.13	-31.84	0.279
148	5.10	-6.12	-32.05	0.281
149	5.13	-6.10	-32.26	0.283
150	5.17	-6.08	-32.47	0.285
151	5.20	-6.06	-32.68	0.287
152	5.24	-6.04	-32.89	0.288
153	5.27	-6.03	-33.10	0.290
154	5.31	-6.01	-33.31	0.292
155	5.34	-5.99	-33.52	0.294
156	5.38	-5.97	-33.73	0.296
157	5.41	-5.95	-33.93	0.297
158	5.45	-5.93	-34.14	0.299
159	5.48	-5.91	-34.34	0.301
160	5.51	-5.89	-34.55	0.303
161	5.55	-5.87	-34.75	0.305
162	5.58	-5.85	-34.96	0.306
163	5.62	-5.83	-35.16	0.308
164	5.65	-5.81	-35.36	0.310
165	5.69	-5.79	-35.56	0.312
166	5.72	-5.77	-35.76	0.313
167	5.76	-5.75	-35.96	0.315
168	5.79	-5.73	-36.16	0.317
169	5.83	-5.71	-36.36	0.318
170	5.86	-5.69	-36.56	0.320
171	5.90	-5.67	-36.75	0.322
172	5.93	-5.65	-36.95	0.324
173	5.97	-5.63	-37.15	0.325
174	6.00	-5.60	-37.34	0.327
175	6.04	-5.58	-37.53	0.329

				report.out
176	6.07	-5.56	-37.73	0.330
177	6.10	-5.54	-37.92	0.332
178	6.14	-5.52	-38.11	0.334
179	6.17	-5.50	-38.30	0.335
180	6.21	-5.47	-38.49	0.337
181	6.24	-5.45	-38.68	0.339
182	6.28	-5.43	-38.87	0.340
183	6.31	-5.41	-39.06	0.342
184	6.35	-5.38	-39.25	0.343
185	6.38	-5.36	-39.43	0.345
186	6.42	-5.34	-39.62	0.347
187	6.45	-5.31	-39.80	0.348
188	6.49	-5.29	-39.99	0.350
189	6.52	-5.27	-40.17	0.351
190	6.56	-5.24	-40.35	0.353
191	6.59	-5.22	-40.53	0.354
192	6.62	-5.20	-40.71	0.356
193	6.66	-5.17	-40.89	0.358
194	6.69	-5.15	-41.07	0.359
195	6.73	-5.12	-41.25	0.361
196	6.76	-5.10	-41.43	0.362
197	6.80	-5.07	-41.60	0.364
198	6.83	-5.05	-41.78	0.365
199	6.87	-5.02	-41.96	0.367
200	6.90	-5.00	-42.13	0.368
201	6.94	-4.97	-42.30	0.370
202	6.97	-4.95	-42.47	0.371
203	7.01	-4.92	-42.65	0.373
204	7.04	-4.90	-42.82	0.374
205	7.08	-4.87	-42.98	0.376
206	7.11	-4.85	-43.15	0.377
207	7.15	-4.82	-43.32	0.379
208	7.18	-4.79	-43.49	0.380
209	7.21	-4.77	-43.65	0.381
210	7.25	-4.74	-43.82	0.383
211	7.28	-4.72	-43.98	0.384
212	7.32	-4.69	-44.15	0.386
213	7.35	-4.66	-44.31	0.387
214	7.39	-4.64	-44.47	0.388
215	7.42	-4.61	-44.63	0.390
216	7.46	-4.58	-44.79	0.391
217	7.49	-4.55	-44.95	0.393
218	7.53	-4.53	-45.10	0.394
219	7.56	-4.50	-45.26	0.395
220	7.60	-4.47	-45.42	0.397
221	7.63	-4.44	-45.57	0.398
222	7.67	-4.42	-45.73	0.399
223	7.70	-4.39	-45.88	0.401
224	7.73	-4.36	-46.03	0.402
225	7.77	-4.33	-46.18	0.403
226	7.80	-4.30	-46.33	0.404
227	7.84	-4.27	-46.48	0.406
228	7.87	-4.25	-46.63	0.407
229	7.91	-4.22	-46.77	0.408
230	7.94	-4.19	-46.92	0.410
231	7.98	-4.16	-47.06	0.411
232	8.01	-4.13	-47.21	0.412
233	8.05	-4.10	-47.35	0.413
234	8.08	-4.07	-47.49	0.415
235	8.12	-4.04	-47.63	0.416
236	8.15	-4.01	-47.77	0.417
237	8.19	-3.98	-47.91	0.418
238	8.22	-3.95	-48.05	0.419

				report.out
239	8.26	-3.92	-48.19	0.421
240	8.29	-3.89	-48.32	0.422
241	8.32	-3.86	-48.46	0.423
242	8.36	-3.83	-48.59	0.424
243	8.39	-3.80	-48.72	0.425
244	8.43	-3.77	-48.85	0.426
245	8.46	-3.74	-48.98	0.427
246	8.50	-3.71	-49.11	0.429
247	8.53	-3.68	-49.24	0.430
248	8.57	-3.65	-49.37	0.431
249	8.60	-3.62	-49.49	0.432
250	8.64	-3.59	-49.62	0.433
251	8.67	-3.56	-49.74	0.434
252	8.71	-3.53	-49.87	0.435
253	8.74	-3.49	-49.99	0.436
254	8.78	-3.46	-50.11	0.437
255	8.81	-3.43	-50.23	0.438
256	8.84	-3.40	-50.35	0.439
257	8.88	-3.37	-50.46	0.440
258	8.91	-3.34	-50.58	0.441
259	8.95	-3.30	-50.69	0.442
260	8.98	-3.27	-50.81	0.443
261	9.02	-3.24	-50.92	0.444
262	9.05	-3.21	-51.03	0.445
263	9.09	-3.17	-51.14	0.446
264	9.12	-3.14	-51.25	0.447
265	9.16	-3.11	-51.36	0.448
266	9.19	-3.08	-51.47	0.449
267	9.23	-3.04	-51.58	0.450
268	9.26	-3.01	-51.68	0.451
269	9.30	-2.98	-51.78	0.452
270	9.33	-2.94	-51.89	0.453
271	9.36	-2.91	-51.99	0.454
272	9.40	-2.88	-52.09	0.455
273	9.43	-2.84	-52.19	0.456
274	9.47	-2.81	-52.29	0.457
275	9.50	-2.78	-52.38	0.457
276	9.54	-2.74	-52.48	0.458
277	9.57	-2.71	-52.57	0.459
278	9.61	-2.67	-52.67	0.460
279	9.64	-2.64	-52.76	0.461
280	9.68	-2.61	-52.85	0.462
281	9.71	-2.57	-52.94	0.462
282	9.75	-2.54	-53.03	0.463
283	9.78	-2.50	-53.12	0.464
284	9.82	-2.47	-53.20	0.465
285	9.85	-2.43	-53.29	0.466
286	9.89	-2.40	-53.37	0.466
287	9.92	-2.36	-53.45	0.467
288	9.95	-2.33	-53.53	0.468
289	9.99	-2.29	-53.61	0.469
290	10.02	-2.26	-53.69	0.469
291	10.06	-2.22	-53.77	0.470
292	10.09	-2.19	-53.85	0.471
293	10.13	-2.15	-53.92	0.471
294	10.16	-2.12	-54.00	0.472
295	10.20	-2.08	-54.07	0.473
296	10.23	-2.04	-54.14	0.473
297	10.27	-2.01	-54.21	0.474
298	10.30	-1.97	-54.28	0.475
299	10.34	-1.94	-54.35	0.475
300	10.37	-1.90	-54.41	0.476
301	10.41	-1.86	-54.48	0.477

				report.out
302	10.44	-1.83	-54.54	0.477
303	10.47	-1.79	-54.61	0.478
304	10.51	-1.75	-54.67	0.478
305	10.54	-1.72	-54.73	0.479
306	10.58	-1.68	-54.79	0.480
307	10.61	-1.64	-54.84	0.480
308	10.65	-1.61	-54.90	0.481
309	10.68	-1.57	-54.96	0.481
310	10.72	-1.53	-55.01	0.482
311	10.75	-1.49	-55.06	0.482
312	10.79	-1.46	-55.11	0.483
313	10.82	-1.42	-55.16	0.483
314	10.86	-1.38	-55.21	0.484
315	10.89	-1.34	-55.26	0.484
316	10.93	-1.31	-55.30	0.485
317	10.96	-1.27	-55.35	0.485
318	11.00	-1.23	-55.39	0.486
319	11.03	-1.19	-55.43	0.486
320	11.06	-1.15	-55.48	0.487
321	11.10	-1.11	-55.51	0.487
322	11.13	-1.08	-55.55	0.487
323	11.17	-1.04	-55.59	0.488
324	11.20	-1.00	-55.62	0.488
325	11.24	-0.96	-55.66	0.489
326	11.27	-0.92	-55.69	0.489
327	11.31	-0.88	-55.72	0.489
328	11.34	-0.84	-55.75	0.490
329	11.38	-0.81	-55.78	0.490
330	11.41	-0.77	-55.81	0.490
331	11.45	-0.73	-55.83	0.491
332	11.48	-0.69	-55.86	0.491
333	11.52	-0.65	-55.88	0.491
334	11.55	-0.61	-55.90	0.492
335	11.58	-0.57	-55.92	0.492
336	11.62	-0.53	-55.94	0.492
337	11.65	-0.49	-55.96	0.492
338	11.69	-0.45	-55.98	0.493
339	11.72	-0.41	-55.99	0.493
340	11.76	-0.37	-56.01	0.493
341	11.79	-0.33	-56.02	0.493
342	11.83	-0.29	-56.03	0.494
343	11.86	-0.25	-56.04	0.494
344	11.90	-0.21	-56.05	0.494
345	11.93	-0.17	-56.05	0.494
346	11.97	-0.13	-56.06	0.494
347	12.00	-0.09	-56.06	0.495
348	12.04	-0.05	-56.06	0.495
349	12.07	-0.01	-56.06	0.495
350	12.11	0.04	-56.06	0.495
351	12.14	0.08	-56.06	0.495
352	12.17	0.12	-56.06	0.495
353	12.21	0.16	-56.05	0.495
354	12.24	0.20	-56.05	0.496
355	12.28	0.24	-56.04	0.496
356	12.31	0.28	-56.03	0.496
357	12.35	0.33	-56.02	0.496
358	12.38	0.37	-56.01	0.496
359	12.42	0.41	-55.99	0.496
360	12.45	0.45	-55.98	0.496
361	12.49	0.49	-55.96	0.496
362	12.52	0.54	-55.95	0.496
363	12.56	0.58	-55.93	0.496
364	12.59	0.62	-55.91	0.496

				report.out
365	12.63	0.66	-55.88	0.496
366	12.66	0.71	-55.86	0.496
367	12.69	0.75	-55.83	0.496
368	12.73	0.79	-55.81	0.496
369	12.76	0.83	-55.78	0.496
370	12.80	0.88	-55.75	0.496
371	12.83	0.92	-55.72	0.496
372	12.87	0.96	-55.69	0.496
373	12.90	1.01	-55.65	0.496
374	12.94	1.05	-55.62	0.496
375	12.97	1.09	-55.58	0.495
376	13.01	1.14	-55.54	0.495
377	13.04	1.18	-55.50	0.495
378	13.08	1.22	-55.46	0.495
379	13.11	1.27	-55.41	0.495
380	13.15	1.31	-55.37	0.495
381	13.18	1.35	-55.32	0.495
382	13.22	1.40	-55.28	0.494
383	13.25	1.44	-55.23	0.494
384	13.28	1.49	-55.18	0.494
385	13.32	1.53	-55.12	0.494
386	13.35	1.58	-55.07	0.494
387	13.39	1.62	-55.01	0.493
388	13.42	1.66	-54.96	0.493
389	13.46	1.71	-54.90	0.493
390	13.49	1.75	-54.84	0.493
391	13.53	1.80	-54.78	0.492
392	13.56	1.84	-54.71	0.492
393	13.60	1.89	-54.65	0.492
394	13.63	1.93	-54.58	0.492
395	13.67	1.98	-54.52	0.491
396	13.70	2.02	-54.45	0.491
397	13.74	2.07	-54.38	0.491
398	13.77	2.11	-54.30	0.490
399	13.80	2.16	-54.23	0.490
400	13.84	2.20	-54.15	0.490
401	13.87	2.25	-54.08	0.489
402	13.91	2.30	-54.00	0.489
403	13.94	2.34	-53.92	0.488
404	13.98	2.39	-53.83	0.488
405	14.01	2.43	-53.75	0.488
406	14.05	2.48	-53.67	0.487
407	14.08	2.53	-53.58	0.487
408	14.12	2.57	-53.49	0.486
409	14.15	2.62	-53.40	0.486
410	14.19	2.66	-53.31	0.486
411	14.22	2.71	-53.22	0.485
412	14.26	2.76	-53.12	0.485
413	14.29	2.80	-53.02	0.484
414	14.32	2.85	-52.93	0.484
415	14.36	2.90	-52.83	0.483
416	14.39	2.94	-52.72	0.483
417	14.43	2.99	-52.62	0.482
418	14.46	3.04	-52.52	0.482
419	14.50	3.09	-52.41	0.481
420	14.53	3.13	-52.30	0.481
421	14.57	3.18	-52.19	0.480
422	14.60	3.23	-52.08	0.480
423	14.64	3.27	-51.97	0.479
424	14.67	3.32	-51.86	0.478
425	14.71	3.37	-51.74	0.478
426	14.74	3.42	-51.62	0.477
427	14.78	3.46	-51.50	0.477

				report.out
428	14.81	3.51	-51.38	0.476
429	14.85	3.56	-51.26	0.475
430	14.88	3.61	-51.13	0.475
431	14.91	3.65	-51.01	0.474
432	14.95	3.70	-50.88	0.474
433	14.98	3.75	-50.75	0.473
434	15.02	3.79	-50.62	0.472
435	15.05	3.83	-50.49	0.472
436	15.09	3.86	-50.36	0.471
437	15.12	3.90	-50.22	0.470
438	15.16	3.93	-50.09	0.469
439	15.19	3.96	-49.95	0.469
440	15.23	4.00	-49.81	0.468
441	15.26	4.03	-49.67	0.467
442	15.30	4.06	-49.53	0.467
443	15.33	4.09	-49.39	0.466
444	15.37	4.13	-49.25	0.465
445	15.40	4.16	-49.10	0.464
446	15.43	4.19	-48.96	0.464
447	15.47	4.22	-48.81	0.463
448	15.50	4.25	-48.67	0.462
449	15.54	4.28	-48.52	0.461
450	15.57	4.31	-48.37	0.460
451	15.61	4.34	-48.22	0.460
452	15.64	4.37	-48.07	0.459
453	15.68	4.40	-47.92	0.458
454	15.71	4.43	-47.76	0.457
455	15.75	4.45	-47.61	0.456
456	15.78	4.48	-47.45	0.455
457	15.82	4.51	-47.30	0.455
458	15.85	4.54	-47.14	0.454
459	15.89	4.56	-46.98	0.453
460	15.92	4.59	-46.83	0.452
461	15.96	4.62	-46.67	0.451
462	15.99	4.64	-46.50	0.450
463	16.02	4.67	-46.34	0.449
464	16.06	4.69	-46.18	0.448
465	16.09	4.72	-46.02	0.447
466	16.13	4.74	-45.85	0.446
467	16.16	4.77	-45.69	0.445
468	16.20	4.79	-45.52	0.445
469	16.23	4.82	-45.36	0.444
470	16.27	4.84	-45.19	0.443
471	16.30	4.86	-45.02	0.442
472	16.34	4.88	-44.85	0.441
473	16.37	4.91	-44.68	0.440
474	16.41	4.93	-44.51	0.439
475	16.44	4.95	-44.34	0.438
476	16.48	4.97	-44.17	0.437
477	16.51	4.99	-44.00	0.436
478	16.54	5.01	-43.82	0.435
479	16.58	5.03	-43.65	0.434
480	16.61	5.05	-43.47	0.432
481	16.65	5.07	-43.30	0.431
482	16.68	5.09	-43.12	0.430
483	16.72	5.11	-42.94	0.429
484	16.75	5.13	-42.77	0.428
485	16.79	5.15	-42.59	0.427
486	16.82	5.17	-42.41	0.426
487	16.86	5.18	-42.23	0.425
488	16.89	5.20	-42.05	0.424
489	16.93	5.22	-41.87	0.423
490	16.96	5.23	-41.69	0.422

				report.out
491	17.00	5.25	-41.51	0.420
492	17.03	5.27	-41.32	0.419
493	17.07	5.28	-41.14	0.418
494	17.10	5.30	-40.96	0.417
495	17.13	5.31	-40.77	0.416
496	17.17	5.33	-40.59	0.415
497	17.20	5.34	-40.40	0.414
498	17.24	5.35	-40.22	0.412
499	17.27	5.37	-40.03	0.411
500	17.31	5.38	-39.85	0.410
501	17.34	5.39	-39.66	0.409
502	17.38	5.40	-39.47	0.408
503	17.41	5.42	-39.28	0.406
504	17.45	5.43	-39.10	0.405
505	17.48	5.44	-38.91	0.404
506	17.52	5.45	-38.72	0.403
507	17.55	5.46	-38.53	0.401
508	17.59	5.47	-38.34	0.400
509	17.62	5.48	-38.15	0.399
510	17.65	5.49	-37.96	0.398
511	17.69	5.50	-37.77	0.396
512	17.72	5.51	-37.58	0.395
513	17.76	5.52	-37.39	0.394
514	17.79	5.53	-37.19	0.393
515	17.83	5.54	-37.00	0.391
516	17.86	5.54	-36.81	0.390
517	17.90	5.55	-36.62	0.389
518	17.93	5.56	-36.43	0.387
519	17.97	5.56	-36.23	0.386
520	18.00	5.57	-36.04	0.385
521	18.04	5.58	-35.85	0.383
522	18.07	5.58	-35.65	0.382
523	18.11	5.59	-35.46	0.381
524	18.14	5.59	-35.27	0.379
525	18.18	5.60	-35.07	0.378
526	18.21	5.60	-34.88	0.377
527	18.24	5.61	-34.68	0.375
528	18.28	5.61	-34.49	0.374
529	18.31	5.62	-34.29	0.373
530	18.35	5.62	-34.10	0.371
531	18.38	5.62	-33.90	0.370
532	18.42	5.62	-33.71	0.368
533	18.45	5.63	-33.51	0.367
534	18.49	5.63	-33.32	0.366
535	18.52	5.63	-33.12	0.364
536	18.56	5.63	-32.93	0.363
537	18.59	5.63	-32.73	0.361
538	18.63	5.63	-32.54	0.360
539	18.66	5.63	-32.34	0.358
540	18.70	5.63	-32.15	0.357
541	18.73	5.63	-31.95	0.356
542	18.76	5.63	-31.76	0.354
543	18.80	5.63	-31.56	0.353
544	18.83	5.63	-31.36	0.351
545	18.87	5.63	-31.17	0.350
546	18.90	5.63	-30.97	0.348
547	18.94	5.62	-30.78	0.347
548	18.97	5.62	-30.58	0.345
549	19.01	5.62	-30.39	0.344
550	19.04	5.61	-30.19	0.342
551	19.08	5.61	-30.00	0.341
552	19.11	5.61	-29.81	0.339
553	19.15	5.60	-29.61	0.338

				report.out
554	19.18	5.60	-29.42	0.336
555	19.22	5.59	-29.22	0.335
556	19.25	5.59	-29.03	0.333
557	19.28	5.58	-28.84	0.332
558	19.32	5.57	-28.64	0.330
559	19.35	5.57	-28.45	0.328
560	19.39	5.56	-28.26	0.327
561	19.42	5.55	-28.06	0.325
562	19.46	5.55	-27.87	0.324
563	19.49	5.54	-27.68	0.322
564	19.53	5.53	-27.49	0.321
565	19.56	5.52	-27.29	0.319
566	19.60	5.51	-27.10	0.318
567	19.63	5.51	-26.91	0.316
568	19.67	5.50	-26.72	0.314
569	19.70	5.49	-26.53	0.313
570	19.74	5.48	-26.34	0.311
571	19.77	5.47	-26.15	0.310
572	19.81	5.46	-25.96	0.308
573	19.84	5.44	-25.77	0.306
574	19.87	5.43	-25.58	0.305
575	19.91	5.42	-25.40	0.303
576	19.94	5.41	-25.21	0.301
577	19.98	5.40	-25.02	0.300
578	20.01	5.39	-24.83	0.298
579	20.05	5.37	-24.65	0.297
580	20.08	5.36	-24.46	0.295
581	20.12	5.35	-24.27	0.293
582	20.15	5.33	-24.09	0.292
583	20.19	5.32	-23.90	0.290
584	20.22	5.30	-23.72	0.288
585	20.26	5.29	-23.54	0.287
586	20.29	5.27	-23.35	0.285
587	20.33	5.26	-23.17	0.283
588	20.36	5.24	-22.99	0.282
589	20.39	5.22	-22.81	0.280
590	20.43	5.21	-22.63	0.278
591	20.46	5.19	-22.45	0.277
592	20.50	5.17	-22.27	0.275
593	20.53	5.16	-22.09	0.273
594	20.57	5.14	-21.91	0.271
595	20.60	5.12	-21.73	0.270
596	20.64	5.10	-21.55	0.268
597	20.67	5.08	-21.38	0.266
598	20.71	5.06	-21.20	0.265
599	20.74	5.04	-21.03	0.263
600	20.78	5.02	-20.85	0.261
601	20.81	5.00	-20.68	0.259
602	20.85	4.98	-20.50	0.258
603	20.88	4.96	-20.33	0.256
604	20.92	4.94	-20.16	0.254
605	20.95	4.92	-19.99	0.252
606	20.98	4.90	-19.82	0.251
607	21.02	4.88	-19.65	0.249
608	21.05	4.85	-19.48	0.247
609	21.09	4.83	-19.31	0.245
610	21.12	4.81	-19.15	0.244
611	21.16	4.78	-18.98	0.242
612	21.19	4.76	-18.81	0.240
613	21.23	4.74	-18.65	0.238
614	21.26	4.71	-18.48	0.237
615	21.30	4.69	-18.32	0.235
616	21.33	4.66	-18.16	0.233

				report.out
617	21.37	4.64	-18.00	0.231
618	21.40	4.61	-17.84	0.230
619	21.44	4.58	-17.68	0.228
620	21.47	4.56	-17.52	0.226
621	21.50	4.53	-17.36	0.224
622	21.54	4.51	-17.21	0.222
623	21.57	4.48	-17.05	0.221
624	21.61	4.45	-16.89	0.219
625	21.64	4.43	-16.74	0.217
626	21.68	4.41	-16.59	0.215
627	21.71	4.39	-16.44	0.213
628	21.75	4.37	-16.28	0.212
629	21.78	4.36	-16.13	0.210
630	21.82	4.34	-15.98	0.208
631	21.85	4.33	-15.83	0.206
632	21.89	4.31	-15.68	0.204
633	21.92	4.30	-15.53	0.202
634	21.96	4.28	-15.38	0.201
635	21.99	4.27	-15.23	0.199
636	22.03	4.25	-15.09	0.197
637	22.06	4.24	-14.94	0.195
638	22.09	4.23	-14.79	0.193
639	22.13	4.22	-14.65	0.191
640	22.16	4.21	-14.50	0.190
641	22.20	4.19	-14.35	0.188
642	22.23	4.18	-14.21	0.186
643	22.27	4.17	-14.06	0.184
644	22.30	4.17	-13.92	0.182
645	22.34	4.16	-13.78	0.180
646	22.37	4.15	-13.63	0.178
647	22.41	4.14	-13.49	0.177
648	22.44	4.13	-13.34	0.175
649	22.48	4.12	-13.20	0.173
650	22.51	4.12	-13.06	0.171
651	22.55	4.11	-12.92	0.169
652	22.58	4.10	-12.77	0.167
653	22.61	4.09	-12.63	0.165
654	22.65	4.08	-12.49	0.163
655	22.68	4.07	-12.35	0.162
656	22.72	4.06	-12.21	0.160
657	22.75	4.05	-12.07	0.158
658	22.79	4.04	-11.93	0.156
659	22.82	4.03	-11.79	0.154
660	22.86	4.01	-11.65	0.152
661	22.89	4.00	-11.51	0.150
662	22.93	3.99	-11.37	0.148
663	22.96	3.98	-11.23	0.146
664	23.00	3.97	-11.09	0.145
665	23.03	3.95	-10.96	0.143
666	23.07	3.94	-10.82	0.141
667	23.10	3.93	-10.68	0.139
668	23.13	3.91	-10.55	0.137
669	23.17	3.90	-10.41	0.135
670	23.20	3.89	-10.28	0.133
671	23.24	3.87	-10.14	0.131
672	23.27	3.86	-10.01	0.129
673	23.31	3.84	-9.87	0.127
674	23.34	3.83	-9.74	0.125
675	23.38	3.81	-9.61	0.123
676	23.41	3.80	-9.48	0.122
677	23.45	3.78	-9.34	0.120
678	23.48	3.77	-9.21	0.118
679	23.52	3.75	-9.08	0.116

				report.out
680	23.55	3.73	-8.95	0.114
681	23.59	3.72	-8.82	0.112
682	23.62	3.70	-8.70	0.110
683	23.66	3.68	-8.57	0.108
684	23.69	3.67	-8.44	0.106
685	23.72	3.65	-8.31	0.104
686	23.76	3.63	-8.19	0.102
687	23.79	3.61	-8.06	0.100
688	23.83	3.59	-7.94	0.098
689	23.86	3.57	-7.81	0.096
690	23.90	3.56	-7.69	0.094
691	23.93	3.54	-7.57	0.093
692	23.97	3.52	-7.44	0.091
693	24.00	3.50	-7.32	0.089
694	24.04	3.48	-7.20	0.087
695	24.07	3.46	-7.08	0.085
696	24.11	3.44	-6.96	0.083
697	24.14	3.42	-6.84	0.081
698	24.18	3.40	-6.72	0.079
699	24.21	3.37	-6.61	0.077
700	24.24	3.35	-6.49	0.075
701	24.28	3.33	-6.37	0.073
702	24.31	3.31	-6.26	0.071
703	24.35	3.29	-6.14	0.069
704	24.38	3.27	-6.03	0.067
705	24.42	3.24	-5.92	0.065
706	24.45	3.22	-5.81	0.063
707	24.49	3.20	-5.69	0.061
708	24.52	3.17	-5.58	0.059
709	24.56	3.15	-5.47	0.057
710	24.59	3.13	-5.37	0.055
711	24.63	3.10	-5.26	0.053
712	24.66	3.08	-5.15	0.051
713	24.70	3.05	-5.04	0.049
714	24.73	3.03	-4.94	0.047
715	24.77	3.00	-4.83	0.046
716	24.80	2.98	-4.73	0.044
717	24.83	2.95	-4.63	0.042
718	24.87	2.93	-4.53	0.040
719	24.90	2.90	-4.42	0.038
720	24.94	2.87	-4.32	0.036
721	24.97	2.85	-4.22	0.034
722	25.01	2.82	-4.13	0.032
723	25.04	2.79	-4.03	0.030
724	25.08	2.77	-3.93	0.028
725	25.11	2.74	-3.84	0.026
726	25.15	2.71	-3.74	0.024
727	25.18	2.68	-3.65	0.022
728	25.22	2.65	-3.56	0.020
729	25.25	2.63	-3.47	0.018
730	25.29	2.60	-3.37	0.016
731	25.32	2.57	-3.29	0.014
732	25.35	2.54	-3.20	0.012
733	25.39	2.51	-3.11	0.010
734	25.42	2.48	-3.02	0.008
735	25.46	2.45	-2.94	0.006
736	25.49	2.42	-2.85	0.004
737	25.53	2.39	-2.77	0.002
738	25.56	2.36	-2.69	0.000
739	25.60	2.33	-2.61	-0.002
740	25.63	2.29	-2.53	-0.004
741	25.67	2.26	-2.45	-0.006
742	25.70	2.23	-2.37	-0.008

				report.out
743	25.74	2.20	-2.29	-0.010
744	25.77	2.17	-2.22	-0.012
745	25.81	2.14	-2.14	-0.014
746	25.84	2.10	-2.07	-0.016
747	25.88	2.07	-2.00	-0.018
748	25.91	2.04	-1.92	-0.020
749	25.94	2.00	-1.85	-0.022
750	25.98	1.97	-1.79	-0.024
751	26.01	1.94	-1.72	-0.026
752	26.05	1.90	-1.65	-0.028
753	26.08	1.87	-1.59	-0.030
754	26.12	1.83	-1.52	-0.032
755	26.15	1.80	-1.46	-0.034
756	26.19	1.76	-1.40	-0.036
757	26.22	1.73	-1.34	-0.038
758	26.26	1.69	-1.28	-0.040
759	26.29	1.66	-1.22	-0.042
760	26.33	1.62	-1.16	-0.044
761	26.36	1.58	-1.11	-0.046
762	26.40	1.55	-1.05	-0.048
763	26.43	1.51	-1.00	-0.050
764	26.46	1.47	-0.95	-0.052
765	26.50	1.44	-0.90	-0.054
766	26.53	1.40	-0.85	-0.056
767	26.57	1.36	-0.80	-0.058
768	26.60	1.32	-0.75	-0.060
769	26.64	1.29	-0.71	-0.062
770	26.67	1.25	-0.66	-0.064
771	26.71	1.21	-0.62	-0.066
772	26.74	1.17	-0.58	-0.068
773	26.78	1.13	-0.54	-0.070
774	26.81	1.09	-0.50	-0.072
775	26.85	1.05	-0.46	-0.074
776	26.88	1.01	-0.43	-0.076
777	26.92	0.97	-0.39	-0.078
778	26.95	0.93	-0.36	-0.080
779	26.99	0.89	-0.33	-0.082
780	27.02	0.85	-0.30	-0.084
781	27.05	0.81	-0.27	-0.086
782	27.09	0.77	-0.24	-0.088
783	27.12	0.73	-0.22	-0.090
784	27.16	0.69	-0.19	-0.092
785	27.19	0.65	-0.17	-0.094
786	27.23	0.61	-0.15	-0.096
787	27.26	0.56	-0.13	-0.098
788	27.30	0.52	-0.11	-0.100
789	27.33	0.48	-0.09	-0.102
790	27.37	0.44	-0.08	-0.104
791	27.40	0.39	-0.06	-0.106
792	27.44	0.35	-0.05	-0.108
793	27.47	0.31	-0.04	-0.110
794	27.51	0.26	-0.03	-0.112
795	27.54	0.22	-0.02	-0.114
796	27.57	0.17	-0.01	-0.116
797	27.61	0.13	-0.01	-0.118
798	27.64	0.08	0.00	-0.120
799	27.68	0.04	0.00	-0.122

 Users can select data, then copy and paste into Excel to create graphics

Legacy Pkwy - C863 Bent 2 - E80 at 12ft - GW at 5ft

Xp=90.0

Xa=90.0

Xp=0, Xa=0

Z=0, Wall Top

Z=15.0, Wall Base

Z=45.0

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

* INPUT DATA *

Wall Height=15.0 Total Soil Types= 5

No	Weight	Saturate	Phi	Cohesion	Nspt	Type	Description
1	125.0	137.7	36.0	0.0	40	4	FILL
2	110.0	120.0	28.0	0.0	6	4	CL
3	120.0	132.0	34.0	0.0	16	4	SP
4	115.0	126.0	30.0	0.0	10	4	ML
5	125.0	135.0	36.0	0.0	40	4	SM/GM

Ground Surface at Active Side:

Line	Z1	Xa1	Z2	Xa2	Soil No.
1	15.0	0.0	15.0	80000.0	3
2	22.0	0.0	22.0	80000.0	4
3	37.0	0.0	37.0	80000.0	5

Water Table at Active Side:

Point	Z-water	X-water
1	15.0	0.0
2	15.0	80000.0

Ground Surface at Passive Side:

Line	Z1	Xp1	Z2	Xp2	Soil No.
1	15.0	0.0	15.0	80000.0	3
2	22.0	0.0	22.0	80000.0	4
3	37.0	0.0	37.0	80000.0	5

Water Table at Passive Side:

Point	Z-water	X-water
1	15.0	0.0
2	15.0	80000.0

*** OUTPUT RESULTS ***

Eae (Total Force above Base)= 3.13

Ea (Total Static Force above Base)= 3.13

Ea (Total Earthquake Force above Base)= 0.00

Apparent Pressure above Base - Output to Shoring

No	Z1	Pa1	Z2	Pa2	ka1
0	0.00	0.00	15.00	0.42	0.0279

Active Pressure below Base - Output to Shoring

No	Z1	Pa1	Z2	Pa2	ka1
0	15.00	0.32	19.50	0.40	0.0179
1	19.50	0.40	20.63	0.42	0.0190
2	20.63	0.42	21.38	0.44	0.0180
3	21.38	0.44	21.75	0.45	0.0510
4	21.75	0.45	22.13	0.50	0.1175
5	22.13	0.50	22.50	0.53	0.0850
6	22.50	0.53	23.25	0.54	0.0191
7	23.25	0.54	24.00	0.56	0.0210
8	24.00	0.56	36.38	0.80	0.0192
9	36.38	0.80	36.75	0.78	-0.0579
10	36.75	0.78	37.13	0.70	-0.2128
11	37.13	0.70	37.50	0.65	-0.1368
12	37.50	0.65	42.75	0.73	0.0169
13	42.75	0.73	43.50	0.75	0.0225
14	43.50	0.75	45.00	0.78	0.0171

Passive Pressure below Base - Output to Shoring

No	Z1	Pp1	Z2	Pp2	kp1
0	16.00	0.4	21.63	2.7	0.413
1	21.63	2.7	22.00	2.6	-0.452
2	22.00	2.6	22.38	2.4	-0.489
3	22.38	2.4	22.75	2.5	0.336
4	22.75	2.5	23.13	2.6	0.329
5	23.13	2.6	23.50	2.8	0.325
6	23.50	2.8	23.88	2.9	0.321
7	23.88	2.9	24.25	3.0	0.318
8	24.25	3.0	24.63	3.1	0.316
9	24.63	3.1	25.00	3.2	0.314
10	25.00	3.2	25.38	3.3	0.303
11	25.38	3.3	25.75	3.5	0.299
12	25.75	3.5	26.13	3.6	0.307
13	26.13	3.6	26.88	3.8	0.310
14	26.88	3.8	28.00	4.2	0.309
15	28.00	4.2	29.88	4.7	0.307
16	29.88	4.7	34.75	6.2	0.306
17	34.75	6.2	36.63	6.8	0.305
18	36.63	6.8	37.00	8.0	3.357
19	37.00	8.0	37.38	9.3	3.472
20	37.38	9.3	37.75	9.5	0.533
21	37.75	9.5	38.13	9.7	0.531
22	38.13	9.7	38.50	9.9	0.530
23	38.50	9.9	38.88	10.1	0.528

24	38 88	10 1	39 25	10 3	0 527
25	39 25	10 3	39 63	10 5	0 525
26	39 63	10 5	40 00	10 7	0 524
27	40 00	10 7	40 38	10 9	0 473
28	40 38	10 9	40 75	11 1	0 449
29	40 75	11 1	41 13	11 3	0 493
30	41 13	11 3	41 50	11 5	0 512
31	41 50	11 5	41 88	11 6	0 511
32	41 88	11 6	42 25	11 8	0 510
33	42 25	11 8	43 00	12 2	0 509
34	43 00	12 2	43 75	12 6	0 507
35	43 75	12 6	44 50	13 0	0 505
36	44 50	13 0	44 88	13 2	0 504

Water Pressure - Output to Shoring

No	Z1	Pw1	Z2	Pw2	kw1
0	5 00	0 00	15 00	0 62	0 06
1	15 00	0 62	45 00	0 62	0 00

UNITS DEPTH, DISTANCE ft, UNIT WEIGHT pcf, FORCE kip, PRESSURE ksf, SLOPE kcf
Date 1/19/2007 File Name W \00409 BUILDINC\046 Legacy Segment 3 - C863 & C867\ShoringSuite\C863-14ft ep8

report.out

EARTH PRESSURE ANALYSIS SUMMARY
<EarthPres>
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Date: 1/19/2007 File: W:\00409 BUILDINC\046 Legacy Segment 3 - C863 &
C867\ShoringSuite\C863-14ft.ep8

Title 1: Legacy Pkwy - C863 Bent 2 - E80 at 12ft - GW at 5ft
Title 2:

Input data: *****

Wall Height = 15.00
Depth of Ground at Active Side = 0.00
Depth of Ground at Passive Side = 16.00
Apparent Pressure Envelope: 1. Triangular (No-braced, all soils)
Pressure Type: 1. Active, Ka*
Earthquake Loading Apply to: 1. No Earthq. Loads
Earthquake Horizontal Acceleration, Kh = 0
Earthquake Vertical Acceleration, Kv = 0
Calculation Methods: 1. Wedge Analysis*
Wall Friction Options: 3. Both sides (for sheet pile)
Wall Friction = 14
Apparent Pressure Conversion: 1. Default (Terzaghi and Peck)*
Conversion Ratio for Total Active Force above Base = 1
Trapezoid Top Shape = 0.25
Trapezoid Bottom Shape = 0.25
Water Density = 62.4
Water Pressure: 1. No seepage at wall tip*
Seepage at depth =
User's Settings
Ignore Passive from Depth = 1
Output Factor for Active Pressure = 1
Output Factor for Passive Pressure = 1
Load Factor for Soil Weight = 1
Load Factor for Earthquake = 1
Estimate Embedment: Default: 3H
Program's Settings
Max. Height, Hmax = 75.00
Analysis Segment, dz = 0.38
No. of Active Segment at H, nz0 = 40
No. of Active Segment at Hmax, nz = 203
No. of Passive Segment, nzp = 160
Active Depth at H, Zh = 15.00
Active Depth at Hmax, Z = 76.13
Passive Depth at Hmax, Zp = 76.00
Max. Pressure = 28.42

Total Soil Types= 5

No	Weight	w(S)	Phi	Cohesion	Nspt	Type	Description
1	125.0	137.7	36.0	0.0	40	4	FILL
2	110.0	120.0	28.0	0.0	6	4	CL
3	120.0	132.0	34.0	0.0	16	4	SP
4	115.0	126.0	30.0	0.0	10	4	ML
5	125.0	135.0	36.0	0.0	40	4	SM/GM

Ground Surface at Active Side:

Line	Z1	Xa1	Z2	Xa2	Soil No.
------	----	-----	----	-----	----------

				report.out	
1	0.0	0.0	0.0	80000.0	1
2	5.0	0.0	5.0	80000.0	2
3	12.0	0.0	12.0	80000.0	3
4	22.0	0.0	22.0	80000.0	4
5	37.0	0.0	37.0	80000.0	5

Water Table at Active Side:

Point	Z-water	X-water
1	5.0	0.0
2	5.0	80000.0

Ground Surface at Passive Side:

Line	Z1	Xp1	Z2	Xp2	Soil No.
1	15.0	0.0	15.0	80000.0	3
2	22.0	0.0	22.0	80000.0	4
3	37.0	0.0	37.0	80000.0	5

Water Table at Passive Side:

Point	Z-water	X-water
1	15.0	0.0
2	15.0	80000.0

Output data: *****

Eae (Total Force above Base)= 3.13
 Ea (Total Static Force above Base)= 3.13
 Ea (Total Earthquake Force above Base)= 0.00

Apparent Pressure above Base - Output to Shoring
 Total Active Force above Base, Ea = 3.13

No	Z1	Pa1	Z2	Pa2	ka1
0	0.00	0.00	15.00	0.42	0.0279

Active Pressure below Base - Output to Shoring

No	Z1	Pa1	Z2	Pa2	ka1
0	15.00	0.32	19.50	0.40	0.0179
1	19.50	0.40	20.63	0.42	0.0190
2	20.63	0.42	21.38	0.44	0.0180
3	21.38	0.44	21.75	0.45	0.0510
4	21.75	0.45	22.13	0.50	0.1175
5	22.13	0.50	22.50	0.53	0.0850
6	22.50	0.53	23.25	0.54	0.0191
7	23.25	0.54	24.00	0.56	0.0210
8	24.00	0.56	36.38	0.80	0.0192
9	36.38	0.80	36.75	0.78	-0.0579
10	36.75	0.78	37.13	0.70	-0.2128
11	37.13	0.70	37.50	0.65	-0.1368
12	37.50	0.65	42.75	0.73	0.0169
13	42.75	0.73	43.50	0.75	0.0225
14	43.50	0.75	56.63	0.98	0.0171
15	56.63	0.98	57.00	0.98	0.0182
16	57.00	0.98	57.75	1.00	0.0214
17	57.75	1.00	75.00	1.30	0.0173

Passive Pressure below Base - Output to Shoring

No	Z1	Pp1	Z2	Pp2	kp1
0	16.00	0.4	21.63	2.7	0.413
1	21.63	2.7	22.00	2.6	-0.452
2	22.00	2.6	22.38	2.4	-0.489
3	22.38	2.4	22.75	2.5	0.336
4	22.75	2.5	23.13	2.6	0.329
5	23.13	2.6	23.50	2.8	0.325

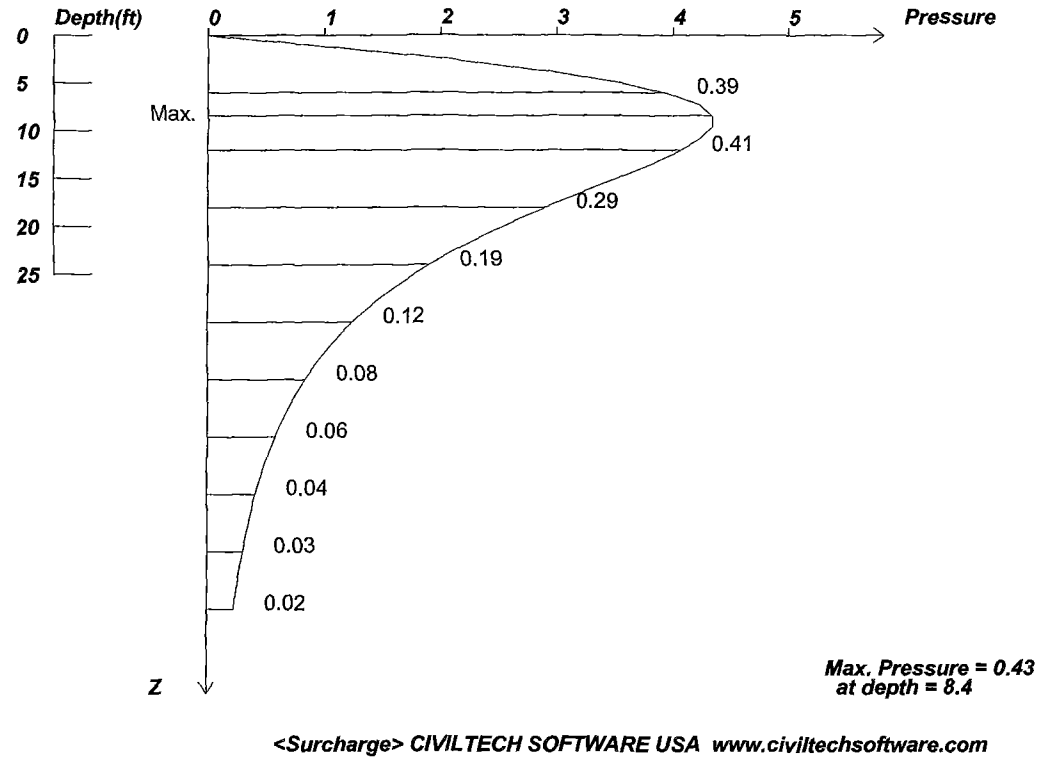
					report.out
6	23.50	2.8	23.88	2.9	0.321
7	23.88	2.9	24.25	3.0	0.318
8	24.25	3.0	24.63	3.1	0.316
9	24.63	3.1	25.00	3.2	0.314
10	25.00	3.2	25.38	3.3	0.303
11	25.38	3.3	25.75	3.5	0.299
12	25.75	3.5	26.13	3.6	0.307
13	26.13	3.6	26.88	3.8	0.310
14	26.88	3.8	28.00	4.2	0.309
15	28.00	4.2	29.88	4.7	0.307
16	29.88	4.7	34.75	6.2	0.306
17	34.75	6.2	36.63	6.8	0.305
18	36.63	6.8	37.00	8.0	3.357
19	37.00	8.0	37.38	9.3	3.472
20	37.38	9.3	37.75	9.5	0.533
21	37.75	9.5	38.13	9.7	0.531
22	38.13	9.7	38.50	9.9	0.530
23	38.50	9.9	38.88	10.1	0.528
24	38.88	10.1	39.25	10.3	0.527
25	39.25	10.3	39.63	10.5	0.525
26	39.63	10.5	40.00	10.7	0.524
27	40.00	10.7	40.38	10.9	0.473
28	40.38	10.9	40.75	11.1	0.449
29	40.75	11.1	41.13	11.3	0.493
30	41.13	11.3	41.50	11.5	0.512
31	41.50	11.5	41.88	11.6	0.511
32	41.88	11.6	42.25	11.8	0.510
33	42.25	11.8	43.00	12.2	0.509
34	43.00	12.2	43.75	12.6	0.507
35	43.75	12.6	44.50	13.0	0.505
36	44.50	13.0	45.25	13.4	0.504
37	45.25	13.4	46.00	13.7	0.502
38	46.00	13.7	46.75	14.1	0.501
39	46.75	14.1	47.50	14.5	0.500
40	47.50	14.5	48.25	14.9	0.498
41	48.25	14.9	49.38	15.4	0.497
42	49.38	15.4	50.50	16.0	0.496
43	50.50	16.0	51.63	16.5	0.495
44	51.63	16.5	53.13	17.3	0.494
45	53.13	17.3	54.25	17.8	0.492
46	54.25	17.8	54.63	18.0	0.444
47	54.63	18.0	55.00	18.1	0.426
48	55.00	18.1	55.38	18.3	0.472
49	55.38	18.3	57.63	19.4	0.488
50	57.63	19.4	60.25	20.7	0.487
51	60.25	20.7	63.63	22.3	0.486
52	63.63	22.3	68.88	24.9	0.485
53	68.88	24.9	74.88	27.8	0.484

Water Pressure - Output to Shoring

No	Z1	Pw1	Z2	Pw2	kw1
0	5.00	0.00	15.00	0.62	0.06
1	15.00	0.62	75.00	0.62	0.00

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

Legacy Pkwy - C863 Bent 2 - E80 at 12ft - GW at 5ft



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Date: 1/19/2007

Wall Height, H= 15

Load Depth at Surface, D= 0

Load Factor of Surcharge Loading = 1

Rigid Wall Condition -- No movement or deflection of the wall are allowed.

Max. Pressure = 0.43 at depth = 8.4

Cooper E 80 Railroad Loading. From wall to railroad center, X=12.0

UNITS: LENGTH, DEPTH: ft, Qpoint: kip, Qline: kip/ft, Qstrip, Qarea, PRESSURE: ksf

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 SURCHARGE LOADS CALCULATION SUMMARY
 <Surcharge>
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 Time: 12/30/1899 5:05:22 PM
 Date: 1/19/2007

Legacy Pkwy - C863 Bent 2 - E80 at 12ft - GW at 5ft

Height of wall = 15
 Depth of wall = 0
 Load Factor of Surcharge Loading = 1

Wall Condition:
 Rigid Wall Condition -- No movement or deflection of the wall are allowed.

*****Loading*****

RAILROAD LOADING:
 Cooper E 80 Railroad Loading. From wall to railroad center, X=12.0

*****Total Pressure Distribution*****

Max. Pressure =0.434 at depth =8.40

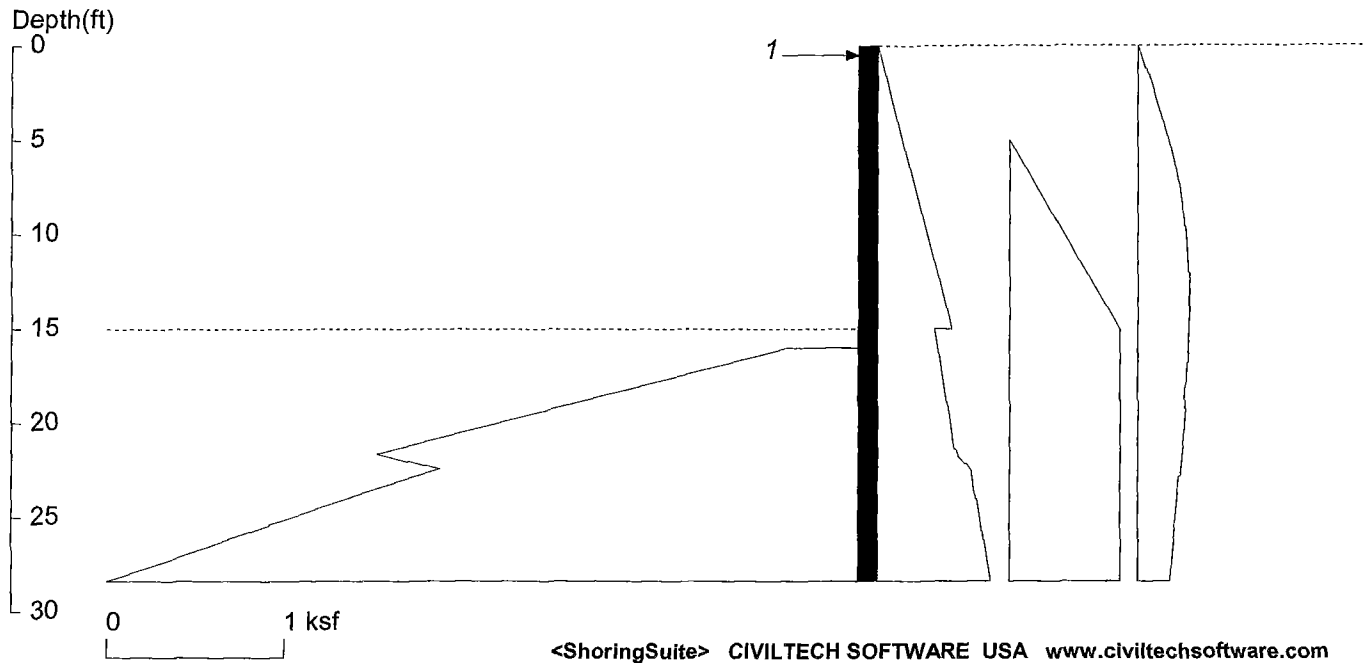
Depth	Pressure
0.00	0.000
1.20	0.104
2.40	0.201
3.60	0.283
4.80	0.348
6.00	0.394
7.20	0.422
8.40	0.434
9.60	0.434
10.80	0.424
12.00	0.407
13.20	0.386
14.40	0.363
15.60	0.339
16.80	0.314
18.00	0.290
19.20	0.267
20.40	0.246
21.60	0.226
22.80	0.207
24.00	0.190
25.20	0.175
26.40	0.160
27.60	0.147
28.80	0.135
30.00	0.125
31.20	0.115
32.40	0.106

	report.out
33.60	0.098
34.80	0.091
36.00	0.084
37.20	0.078
38.40	0.072
39.60	0.067
40.80	0.062
42.00	0.058
43.20	0.054
44.40	0.051
45.60	0.047
46.80	0.044
48.00	0.042
49.20	0.039
50.40	0.037
51.60	0.035
52.80	0.033
54.00	0.031
55.20	0.029
56.40	0.027
57.60	0.026
58.80	0.024
60.00	0.023

Depth Is Measured From Top of the Wall

LENGTH, DEPTH: ft, Qpoint: kip, Qline: kip/ft, Qstrip, Qarea, PRESSURE: ksf

Legacy Pkwy - C863 Bent 2 - E80 at 20ft - GW at 5ft with wall friction



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Date: 1/22/2007

File Name: W:\00409 BUILDINC\046 Legacy Segment 3 - C863 & C867\ShoringSuite\C863 - 1!

Wall Height=15.0

Pile Diameter=1.0

Pile Spacing=1.0

ACTIVE SPACE:		Z depth	Spacing
1		0.00	1.00
2		15.00	1.00
PASSIVE SPACE:		Z depth	Spacing
1		15.00	1.00

PILE LENGTH: Min. Embedment=13.36, Min. Pile Length=28.36

MOMENT IN PILE: Max. Moment=56.55 at Depth of 12.92

VERTICAL BEARING CAPACITY: Vertical Loading=0.0, Resistance=42.2, Vertical Factor of Safety=999.00

PILE SELECTION:

Request Min. Section Modulus = 20.6 in³/feet, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66

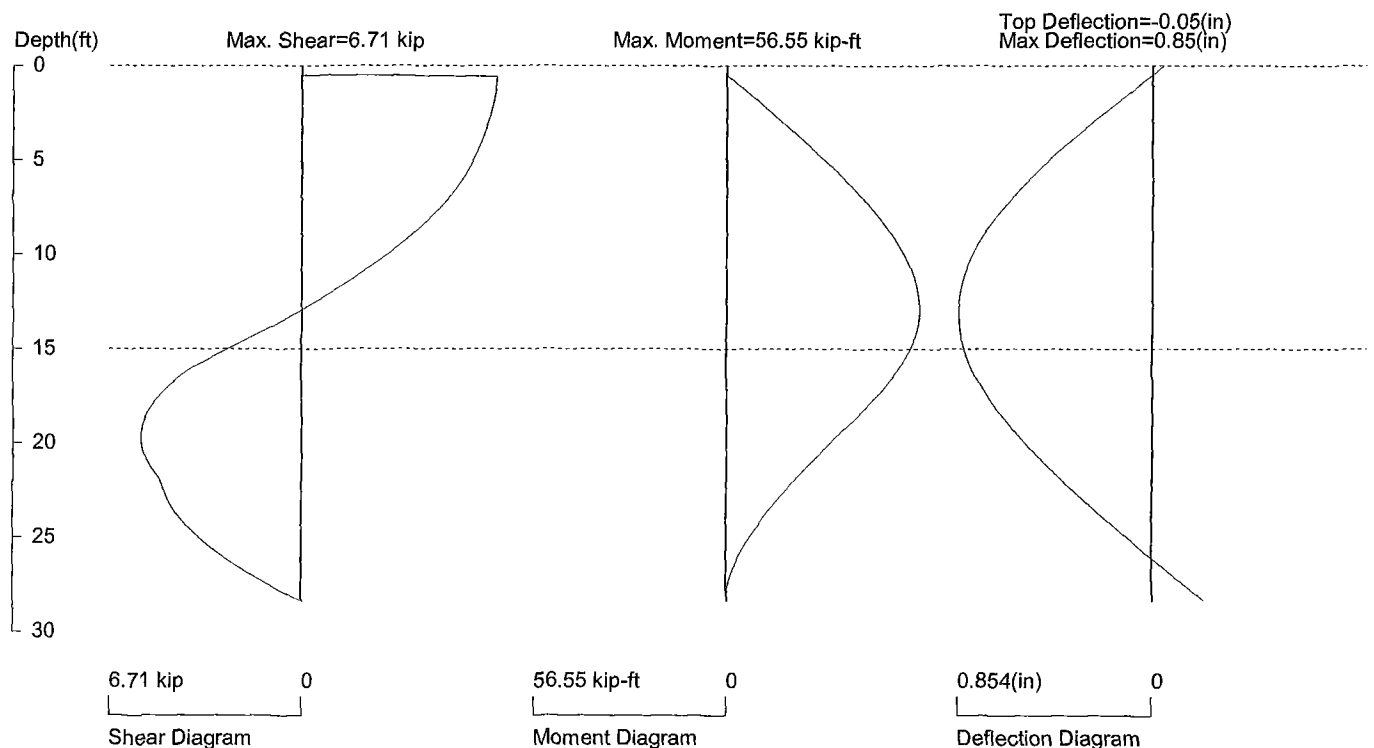
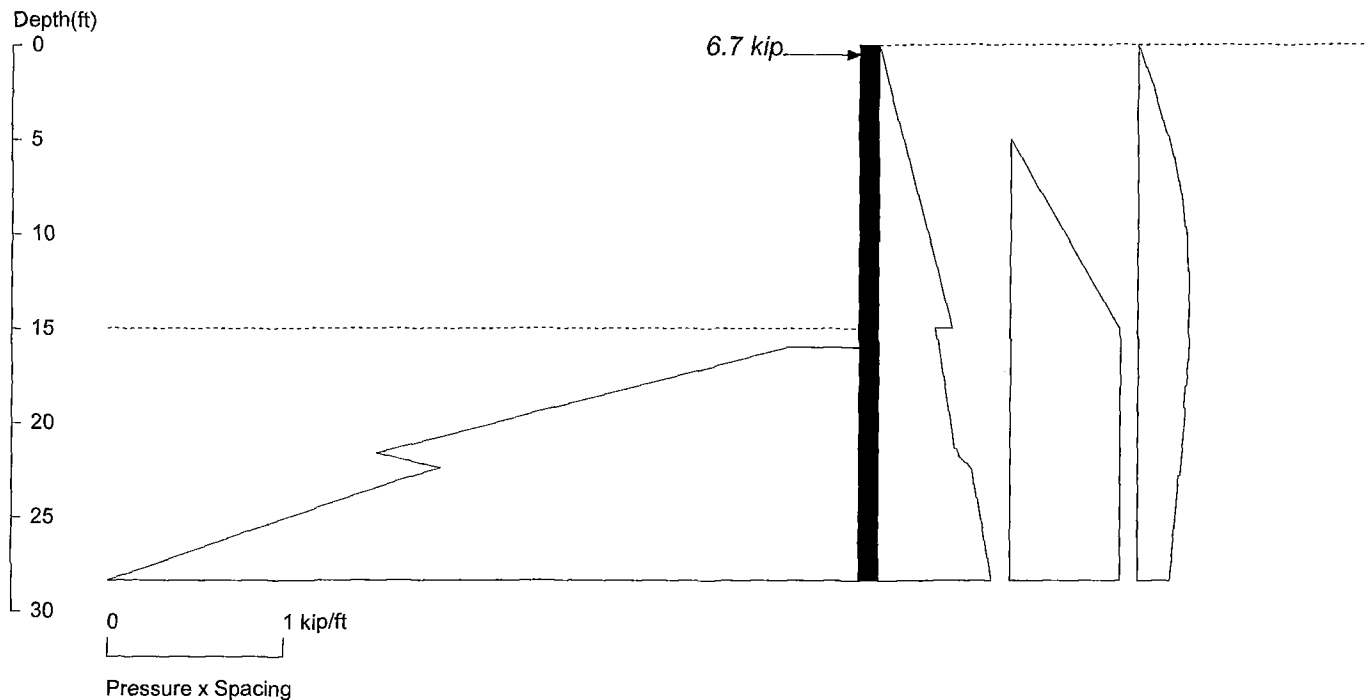
AZ18 has Section Modulus = 33.5. It is greater than Min. Requirements!, Top Deflection = -0.05(in)

BRACE FORCE: Strut, Tieback, Plate Anchor, and Deadman

No. & Type	Depth	Angle	Total	Horiz.	Vert.	N/A	N/A
1. Strut	0.5	0.0	6.7	6.7	0.0	0.0	0.0

UNITS: Length/Depth - ft, Force - kip, Moment - kip-ft, Pressure - ksf, Pres. Slope - kip/ft³, Deflection - in

**Legacy Pkwy - C863 Bent 2 - E80 at 20ft - GW at 5ft
with wall friction**



PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on one soldier pile or one foot spacing of sheet pile

Pile: AZ18 meet Section Requirements. Properties: 6. E (ksi)=29000, 4. I (in⁴)=250.4

Date: 1/22/2007 File Name: W:\00409 BUILDING\046 Legacy Segment 3 - C863 & C867\ShoringSuite\C863 - 15ft_E80_20ft_GW_5ft_wf.sh8

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SHORING WALL CALCULATION SUMMARY
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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

DEPTH: ft, PRESSURE, FRICTION, BEARING: ksf, SLOPE: kcf, FORCE: kip, MOMENT: kip-ft,
DEFLECTION: in, I: in⁴, E: ksi

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Date: 1/22/2007 File: W:\00409 BUILDINC\046 Legacy Segment 3 - C863 &
C867\ShoringSuite\C863 - 15ft_E80_20ft_GW_5ft_wf.sh8

Title: Legacy Pkwy - C863 Bent 2 - E80 at 20ft - GW at 5ft

Subtitle: with wall friction

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

Wall Type: 1. Sheet Pile

Wall Height: 15.00

Pile Diameter: 1.00

Pile Spacing: 1.00

Factor of Safety (F.S.): 1.50

Max. Moment reduce 20%

Lateral Support Type (Braces): 2. Strut, Raker

Top Brace Increase (Multi-Bracing): Add 15%*

Brace Position (One Brace Case): Normal Brace*

Embedment Option: 1. Yes

Friction at Pile Tip: No*

Check Vertical Bearing Capacity:

Side Friction for Bearing: 1.00

Tip Resistance for Bearing: 1.00

Pile Properties:

Allowable Fb/Fy: 0.66

Steel Strength, Fy: 50 ksi = 345 MPa

Elastic Module, E: 29000.00

Moment of Inertia, I: 250.40

User Input Pile: AZ18

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

No.	Z2 top	Top Pres.	Z2 bottom	Bottom Pres.	Slope
1	0.00	0.00	15.00	0.42	0.0280
2	15.00	0.32	19.50	0.40	0.0180
3	19.50	0.40	20.63	0.42	0.0190
4	20.63	0.42	21.38	0.44	0.0180
5	21.38	0.44	21.75	0.45	0.0510
6	21.75	0.45	22.13	0.50	0.1170
7	22.13	0.50	22.50	0.53	0.0850
8	22.50	0.53	23.25	0.54	0.0190

9	23.25	0.54	report.out	24.00	0.56	0.0210
10	24.00	0.56		36.38	0.80	0.0190
11	36.38	0.80		36.75	0.78	-0.0580
12	36.75	0.78		37.13	0.70	-0.2130
13	37.13	0.70		37.50	0.65	-0.1370
14	37.50	0.65		42.75	0.73	0.0170
15	42.75	0.73		43.50	0.75	0.0220
16	43.50	0.75		56.63	0.98	0.0170
17	56.63	0.98		57.00	0.98	0.0180
18	57.00	0.98		57.75	1.00	0.0210
19	57.75	1.00		75.00	1.30	0.0170
20	5.00	0.00		15.00	0.62	0.0620
21	15.00	0.62		75.00	0.62	0.0000
22	0.00	0.00		1.20	0.05	0.0380
23	1.20	0.05		2.40	0.09	0.0370
24	2.40	0.09		3.60	0.13	0.0340
25	3.60	0.13		4.80	0.17	0.0310
26	4.80	0.17		6.00	0.20	0.0270
27	6.00	0.20		7.20	0.23	0.0230
28	7.20	0.23		8.40	0.25	0.0190
29	8.40	0.25		9.60	0.27	0.0140
30	9.60	0.27		10.80	0.28	0.0100
31	10.80	0.28		12.00	0.29	0.0060
32	12.00	0.29		13.20	0.29	0.0030
33	13.20	0.29		14.40	0.29	0.0000
34	14.40	0.29		15.60	0.29	-0.0030
35	15.60	0.29		16.80	0.28	-0.0050
36	16.80	0.28		18.00	0.27	-0.0060
37	18.00	0.27		19.20	0.27	-0.0070
38	19.20	0.27		20.40	0.26	-0.0080
39	20.40	0.26		21.60	0.25	-0.0090
40	21.60	0.25		22.80	0.23	-0.0090
41	22.80	0.23		24.00	0.22	-0.0090
42	24.00	0.22		25.20	0.21	-0.0090
43	25.20	0.21		26.40	0.20	-0.0090
44	26.40	0.20		27.60	0.19	-0.0090
45	27.60	0.19		28.80	0.18	-0.0090
46	28.80	0.18		30.00	0.17	-0.0080
47	30.00	0.17		31.20	0.16	-0.0080
48	31.20	0.16		32.40	0.15	-0.0070
49	32.40	0.15		33.60	0.14	-0.0070
50	33.60	0.14		34.80	0.14	-0.0070
51	34.80	0.14		36.00	0.13	-0.0060
52	36.00	0.13		37.20	0.12	-0.0060
53	37.20	0.12		38.40	0.11	-0.0060
54	38.40	0.11		39.60	0.11	-0.0050
55	39.60	0.11		40.80	0.10	-0.0050
56	40.80	0.10		42.00	0.10	-0.0050
57	42.00	0.10		43.20	0.09	-0.0040
58	43.20	0.09		44.40	0.09	-0.0040
59	44.40	0.09		45.60	0.08	-0.0040
60	45.60	0.08		46.80	0.08	-0.0040
61	46.80	0.08		48.00	0.07	-0.0030
62	48.00	0.07		49.20	0.07	-0.0030
63	49.20	0.07		50.40	0.07	-0.0030
64	50.40	0.07		51.60	0.06	-0.0030
65	51.60	0.06		52.80	0.06	-0.0030
66	52.80	0.06		54.00	0.06	-0.0020
67	54.00	0.06		55.20	0.05	-0.0020
68	55.20	0.05		56.40	0.05	-0.0020
69	56.40	0.05		57.60	0.05	-0.0020
70	57.60	0.05		58.80	0.05	-0.0020
71	58.80	0.05		60.00	0.04	-0.0020

* PASSIVE PRESSURE *

No.	Z1 top	Top Pres.	Z2 bottom	Bottom Pres.	Slope
1	16.00	0.41	21.63	2.74	0.4130
2	21.63	2.74	22.00	2.57	-0.4520
3	22.00	2.57	22.38	2.38	-0.4890
4	22.38	2.38	22.75	2.51	0.3360
5	22.75	2.51	23.13	2.63	0.3290
6	23.13	2.63	23.50	2.75	0.3250
7	23.50	2.75	23.88	2.87	0.3210
8	23.88	2.87	24.25	2.99	0.3180
9	24.25	2.99	24.63	3.11	0.3160
10	24.63	3.11	25.00	3.23	0.3140
11	25.00	3.23	25.38	3.34	0.3030
12	25.38	3.34	25.75	3.46	0.2990
13	25.75	3.46	26.13	3.57	0.3070
14	26.13	3.57	26.88	3.80	0.3100
15	26.88	3.80	28.00	4.15	0.3090
16	28.00	4.15	29.88	4.73	0.3070
17	29.88	4.73	34.75	6.22	0.3060
18	34.75	6.22	36.63	6.79	0.3050
19	36.63	6.79	37.00	8.05	3.3570
20	37.00	8.05	37.38	9.35	3.4720
21	37.38	9.35	37.75	9.55	0.5330
22	37.75	9.55	38.13	9.75	0.5310
23	38.13	9.75	38.50	9.95	0.5300
24	38.50	9.95	38.88	10.14	0.5280
25	38.88	10.14	39.25	10.34	0.5270
26	39.25	10.34	39.63	10.54	0.5250
27	39.63	10.54	40.00	10.73	0.5240
28	40.00	10.73	40.38	10.91	0.4730
29	40.38	10.91	40.75	11.08	0.4490
30	40.75	11.08	41.13	11.27	0.4930
31	41.13	11.27	41.50	11.46	0.5120
32	41.50	11.46	41.88	11.65	0.5110
33	41.88	11.65	42.25	11.84	0.5100
34	42.25	11.84	43.00	12.22	0.5090
35	43.00	12.22	43.75	12.60	0.5070
36	43.75	12.60	44.50	12.98	0.5050
37	44.50	12.98	45.25	13.36	0.5040
38	45.25	13.36	46.00	13.73	0.5020
39	46.00	13.73	46.75	14.11	0.5010
40	46.75	14.11	47.50	14.48	0.5000
41	47.50	14.48	48.25	14.86	0.4980
42	48.25	14.86	49.38	15.42	0.4970
43	49.38	15.42	50.50	15.97	0.4960
44	50.50	15.97	51.63	16.53	0.4950
45	51.63	16.53	53.13	17.27	0.4940
46	53.13	17.27	54.25	17.82	0.4920
47	54.25	17.82	54.63	17.99	0.4440
48	54.63	17.99	55.00	18.15	0.4260
49	55.00	18.15	55.38	18.33	0.4720
50	55.38	18.33	57.63	19.43	0.4880
51	57.63	19.42	60.25	20.70	0.4870
52	60.25	20.70	63.63	22.34	0.4860
53	63.63	22.34	68.88	24.89	0.4850
54	68.88	24.89	74.88	27.79	0.4840

The pressure above will be divided by a Factor of Safety =1.5

* ACTIVE SPACE *

No.	Z depth	Spacing
1	0.00	1.00
2	15.00	1.00

* PASSIVE SPACE *

No.	Z depth	Spacing
1	15.00	1.00

* BRACE: STRUT, TIEBACK, ANCHOR PLATE, OR DEADMAN *

No.	Z brace	Angle	Spacing	Input1*	Input2*
1	0.50	0.0	1.00	1.00	1.00
Strut					

*For Tieback: Input1 = Diameter; Input2 = Bond Stength

*For Plate: Input1 = Diameter; Input2 = Allowable Pressure

*For Deaman: Input1 = Horz. Width; Input2 = Allowable Pressure; Angle = 0

*****SPECIFIED PILE *****

AZ18 has been found in Sheet Pile list!

AZ18 Sx= 33.5 Ix= 250.4 weight= 24.17

* Note: All the pile dimensions are in English Units per one foot width.

*****CALCULATION*****

Top Pressures start at depth = 0.00

NUMBER OF BRACE LEVEL = 1

	D1=0.00	
<--	D2=0.50	R1=6.72
==	D3=15.00	
	D4=28.36	

D1 - TOP DEPTH

D2 - BRACE DEPTH

D3 - EXCAVATION BASE

D4 - PILE TIP

R1 - REACTION

TOTAL REACTION: R1 = 6.72

TOTAL PRESSURE ACTING ON WALL = 6.72

Total Reaction = Total Pressure, OK!

BRACE NO.1 AT DEPTH = 0.50

R1 = Brace Load = 6.72

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*****RESULTS*****

* EMBEDMENT *

MINIMUM EMBEDMENT = 13.36

TOTAL MINIMUM PILE LENGTH = 28.36

* MOMENT IN PILE *

No.	Depth	M @ Brace	Mmax in Span	Depth of Mmax
1	0.50	0.00	56.55	12.92

Overall Maximum Moment = 56.55 at 12.92

Maximum Shear = 6.71

* BRACE: STRUT, TIEBACK, ANCHOR PLATE, OR DEADMAN *

No.	DEPTH	Tangle	SPACING	HORIZONTAL	VERTICAL
1	0.50	0.0	1.00	6.72	0.00
6.72					

* BRACE: STRUT, TIEBACK, ANCHOR PLATE, OR DEADMAN *

No.	DEPTH	Free length	Type and Data
1	0.50	0.00	Strut

* VERTICAL LOADING *

Vertical Loading from Braces = 0.00

Vertical Loading from External Load = 0.00

Total Vertical Loading = 0.00

* VERTICAL BEARING CAPACITY CHECK *

Tip Depth	Tip Area	Bearing	Tip Resistance
28.36	0.50	1.00	0.50
Embedment	Side Area*	Friction	Side Resistance
13.36	41.72	1.00	41.72

*Side Area is the surface area of embedment below base and contact area between pile and soil above base.

Total Vertical Resistance = 42.22

Total Vertical Loading = 0.00

Vertical Factor of Safety = 999.00

*****SPECIFIED PILE *****

AZ18 has been found in Sheet Pile list!

AZ18 Sx= 33.5 Ix= 250.4 weight= 24.17

* Note: All the pile dimensions are in English Units per one foot width.

Request Min. Section Modulus = 20.6 in³/feet, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66

The pile selection is based on the magnitude of the moment only. Axial force is neglected. Ref. Note 3

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AZ18 is capable to support the shoring!

Top deflection = -0.049(in)

Max. deflection = 0.854(in)

*****SHEAR, MOMENT, AND DEFLECTION V.S. DEPTH*****

User Input Pile: AZ18

Elastic Module, E: 29000.00

Moment of Inertia, I: 250.40

No	DEPTH ft	SHEAR kip	MOMENT kip-ft	DEFLECTION in
1	0.00	0.00	0.00	-0.049
2	0.04	0.00	0.00	-0.045
3	0.07	0.00	0.00	-0.041
4	0.11	0.00	0.00	-0.038
5	0.14	0.00	0.00	-0.034
6	0.18	0.00	0.00	-0.030
7	0.21	0.00	0.00	-0.026
8	0.25	0.00	0.00	-0.023
9	0.28	0.00	0.00	-0.019
10	0.32	0.00	0.00	-0.015
11	0.36	0.00	0.00	-0.011
12	0.39	0.01	0.00	-0.008
13	0.43	0.01	0.00	-0.004
14	0.46	0.01	0.00	0.000
15	0.50	0.01	0.00	0.004
16	0.53	-6.71	-0.22	0.008
17	0.57	-6.71	-0.46	0.011
18	0.60	-6.70	-0.69	0.015
19	0.64	-6.70	-0.93	0.019
20	0.67	-6.70	-1.17	0.023
21	0.71	-6.70	-1.41	0.026
22	0.75	-6.70	-1.64	0.030
23	0.78	-6.70	-1.88	0.034
24	0.82	-6.70	-2.12	0.038
25	0.85	-6.69	-2.36	0.041
26	0.89	-6.69	-2.60	0.045
27	0.92	-6.69	-2.83	0.049
28	0.96	-6.69	-3.07	0.053
29	0.99	-6.68	-3.31	0.056
30	1.03	-6.68	-3.55	0.060
31	1.07	-6.68	-3.78	0.064
32	1.10	-6.68	-4.02	0.068
33	1.14	-6.67	-4.26	0.071
34	1.17	-6.67	-4.49	0.075
35	1.21	-6.67	-4.73	0.079
36	1.24	-6.67	-4.97	0.083
37	1.28	-6.66	-5.20	0.086
38	1.31	-6.66	-5.44	0.090
39	1.35	-6.66	-5.68	0.094
40	1.38	-6.65	-5.91	0.098
41	1.42	-6.65	-6.15	0.101
42	1.46	-6.65	-6.38	0.105
43	1.49	-6.64	-6.62	0.109
44	1.53	-6.64	-6.86	0.112
45	1.56	-6.63	-7.09	0.116
46	1.60	-6.63	-7.33	0.120
47	1.63	-6.63	-7.56	0.124
48	1.67	-6.62	-7.80	0.127
49	1.70	-6.62	-8.03	0.131

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50	1.74	-6.61	-8.27	0.135
51	1.78	-6.61	-8.50	0.138
52	1.81	-6.61	-8.74	0.142
53	1.85	-6.60	-8.97	0.146
54	1.88	-6.60	-9.21	0.150
55	1.92	-6.59	-9.44	0.153
56	1.95	-6.59	-9.67	0.157
57	1.99	-6.58	-9.91	0.161
58	2.02	-6.58	-10.14	0.164
59	2.06	-6.57	-10.38	0.168
60	2.09	-6.57	-10.61	0.172
61	2.13	-6.56	-10.84	0.175
62	2.17	-6.56	-11.07	0.179
63	2.20	-6.55	-11.31	0.183
64	2.24	-6.55	-11.54	0.186
65	2.27	-6.54	-11.77	0.190
66	2.31	-6.54	-12.00	0.194
67	2.34	-6.53	-12.24	0.197
68	2.38	-6.53	-12.47	0.201
69	2.41	-6.52	-12.70	0.205
70	2.45	-6.51	-12.93	0.208
71	2.49	-6.51	-13.16	0.212
72	2.52	-6.50	-13.39	0.216
73	2.56	-6.50	-13.62	0.219
74	2.59	-6.49	-13.86	0.223
75	2.63	-6.49	-14.09	0.227
76	2.66	-6.48	-14.32	0.230
77	2.70	-6.47	-14.55	0.234
78	2.73	-6.47	-14.78	0.237
79	2.77	-6.46	-15.00	0.241
80	2.80	-6.45	-15.23	0.245
81	2.84	-6.45	-15.46	0.248
82	2.88	-6.44	-15.69	0.252
83	2.91	-6.43	-15.92	0.255
84	2.95	-6.43	-16.15	0.259
85	2.98	-6.42	-16.38	0.263
86	3.02	-6.41	-16.60	0.266
87	3.05	-6.41	-16.83	0.270
88	3.09	-6.40	-17.06	0.273
89	3.12	-6.39	-17.29	0.277
90	3.16	-6.39	-17.51	0.280
91	3.20	-6.38	-17.74	0.284
92	3.23	-6.37	-17.97	0.288
93	3.27	-6.36	-18.19	0.291
94	3.30	-6.36	-18.42	0.295
95	3.34	-6.35	-18.64	0.298
96	3.37	-6.34	-18.87	0.302
97	3.41	-6.33	-19.09	0.305
98	3.44	-6.32	-19.32	0.309
99	3.48	-6.32	-19.54	0.312
100	3.51	-6.31	-19.77	0.316
101	3.55	-6.30	-19.99	0.319
102	3.59	-6.29	-20.21	0.323
103	3.62	-6.28	-20.44	0.326
104	3.66	-6.28	-20.66	0.330
105	3.69	-6.27	-20.88	0.333
106	3.73	-6.26	-21.11	0.337
107	3.76	-6.25	-21.33	0.340
108	3.80	-6.24	-21.55	0.344
109	3.83	-6.23	-21.77	0.347
110	3.87	-6.22	-21.99	0.350
111	3.91	-6.22	-22.21	0.354
112	3.94	-6.21	-22.43	0.357

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113	3.98	-6.20	-22.65	0.361
114	4.01	-6.19	-22.87	0.364
115	4.05	-6.18	-23.09	0.368
116	4.08	-6.17	-23.31	0.371
117	4.12	-6.16	-23.53	0.374
118	4.15	-6.15	-23.75	0.378
119	4.19	-6.14	-23.97	0.381
120	4.22	-6.13	-24.19	0.384
121	4.26	-6.12	-24.40	0.388
122	4.30	-6.11	-24.62	0.391
123	4.33	-6.10	-24.84	0.394
124	4.37	-6.09	-25.05	0.398
125	4.40	-6.08	-25.27	0.401
126	4.44	-6.07	-25.49	0.404
127	4.47	-6.07	-25.70	0.408
128	4.51	-6.05	-25.92	0.411
129	4.54	-6.04	-26.13	0.414
130	4.58	-6.03	-26.35	0.418
131	4.62	-6.02	-26.56	0.421
132	4.65	-6.01	-26.77	0.424
133	4.69	-6.00	-26.99	0.428
134	4.72	-5.99	-27.20	0.431
135	4.76	-5.98	-27.41	0.434
136	4.79	-5.97	-27.62	0.437
137	4.83	-5.96	-27.84	0.441
138	4.86	-5.95	-28.05	0.444
139	4.90	-5.94	-28.26	0.447
140	4.93	-5.93	-28.47	0.450
141	4.97	-5.92	-28.68	0.453
142	5.01	-5.91	-28.89	0.457
143	5.04	-5.89	-29.10	0.460
144	5.08	-5.88	-29.31	0.463
145	5.11	-5.87	-29.52	0.466
146	5.15	-5.86	-29.73	0.469
147	5.18	-5.85	-29.93	0.472
148	5.22	-5.84	-30.14	0.476
149	5.25	-5.82	-30.35	0.479
150	5.29	-5.81	-30.55	0.482
151	5.33	-5.80	-30.76	0.485
152	5.36	-5.79	-30.97	0.488
153	5.40	-5.77	-31.17	0.491
154	5.43	-5.76	-31.38	0.494
155	5.47	-5.75	-31.58	0.497
156	5.50	-5.73	-31.78	0.500
157	5.54	-5.72	-31.99	0.503
158	5.57	-5.71	-32.19	0.506
159	5.61	-5.69	-32.39	0.509
160	5.65	-5.68	-32.59	0.512
161	5.68	-5.67	-32.80	0.515
162	5.72	-5.65	-33.00	0.519
163	5.75	-5.64	-33.20	0.522
164	5.79	-5.62	-33.40	0.524
165	5.82	-5.61	-33.60	0.527
166	5.86	-5.59	-33.80	0.530
167	5.89	-5.58	-33.99	0.533
168	5.93	-5.56	-34.19	0.536
169	5.96	-5.55	-34.39	0.539
170	6.00	-5.53	-34.59	0.542
171	6.04	-5.52	-34.78	0.545
172	6.07	-5.50	-34.98	0.548
173	6.11	-5.49	-35.17	0.551
174	6.14	-5.47	-35.37	0.554
175	6.18	-5.46	-35.56	0.557

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176	6.21	-5.44	-35.75	0.560
177	6.25	-5.42	-35.95	0.562
178	6.28	-5.41	-36.14	0.565
179	6.32	-5.39	-36.33	0.568
180	6.36	-5.37	-36.52	0.571
181	6.39	-5.36	-36.71	0.574
182	6.43	-5.34	-36.90	0.576
183	6.46	-5.32	-37.09	0.579
184	6.50	-5.31	-37.28	0.582
185	6.53	-5.29	-37.47	0.585
186	6.57	-5.27	-37.66	0.588
187	6.60	-5.25	-37.84	0.590
188	6.64	-5.24	-38.03	0.593
189	6.67	-5.22	-38.21	0.596
190	6.71	-5.20	-38.40	0.598
191	6.75	-5.18	-38.58	0.601
192	6.78	-5.16	-38.77	0.604
193	6.82	-5.14	-38.95	0.606
194	6.85	-5.13	-39.13	0.609
195	6.89	-5.11	-39.31	0.612
196	6.92	-5.09	-39.50	0.614
197	6.96	-5.07	-39.68	0.617
198	6.99	-5.05	-39.86	0.620
199	7.03	-5.03	-40.03	0.622
200	7.07	-5.01	-40.21	0.625
201	7.10	-4.99	-40.39	0.627
202	7.14	-4.97	-40.57	0.630
203	7.17	-4.95	-40.74	0.633
204	7.21	-4.93	-40.92	0.635
205	7.24	-4.91	-41.09	0.638
206	7.28	-4.89	-41.27	0.640
207	7.31	-4.87	-41.44	0.643
208	7.35	-4.85	-41.61	0.645
209	7.38	-4.83	-41.79	0.648
210	7.42	-4.81	-41.96	0.650
211	7.46	-4.79	-42.13	0.652
212	7.49	-4.77	-42.30	0.655
213	7.53	-4.75	-42.47	0.657
214	7.56	-4.72	-42.63	0.660
215	7.60	-4.70	-42.80	0.662
216	7.63	-4.68	-42.97	0.665
217	7.67	-4.66	-43.13	0.667
218	7.70	-4.64	-43.30	0.669
219	7.74	-4.61	-43.46	0.672
220	7.78	-4.59	-43.63	0.674
221	7.81	-4.57	-43.79	0.676
222	7.85	-4.55	-43.95	0.679
223	7.88	-4.52	-44.11	0.681
224	7.92	-4.50	-44.27	0.683
225	7.95	-4.48	-44.43	0.685
226	7.99	-4.45	-44.59	0.688
227	8.02	-4.43	-44.75	0.690
228	8.06	-4.41	-44.90	0.692
229	8.09	-4.38	-45.06	0.694
230	8.13	-4.36	-45.22	0.697
231	8.17	-4.34	-45.37	0.699
232	8.20	-4.31	-45.52	0.701
233	8.24	-4.29	-45.68	0.703
234	8.27	-4.26	-45.83	0.705
235	8.31	-4.24	-45.98	0.707
236	8.34	-4.22	-46.13	0.710
237	8.38	-4.19	-46.28	0.712
238	8.41	-4.17	-46.43	0.714

				report.out
239	8.45	-4.14	-46.57	0.716
240	8.49	-4.12	-46.72	0.718
241	8.52	-4.09	-46.87	0.720
242	8.56	-4.07	-47.01	0.722
243	8.59	-4.04	-47.16	0.724
244	8.63	-4.02	-47.30	0.726
245	8.66	-3.99	-47.44	0.728
246	8.70	-3.96	-47.58	0.730
247	8.73	-3.94	-47.72	0.732
248	8.77	-3.91	-47.86	0.734
249	8.80	-3.89	-48.00	0.736
250	8.84	-3.86	-48.14	0.738
251	8.88	-3.83	-48.27	0.740
252	8.91	-3.81	-48.41	0.742
253	8.95	-3.78	-48.54	0.743
254	8.98	-3.75	-48.68	0.745
255	9.02	-3.73	-48.81	0.747
256	9.05	-3.70	-48.94	0.749
257	9.09	-3.67	-49.07	0.751
258	9.12	-3.64	-49.20	0.753
259	9.16	-3.62	-49.33	0.754
260	9.20	-3.59	-49.46	0.756
261	9.23	-3.56	-49.59	0.758
262	9.27	-3.53	-49.71	0.760
263	9.30	-3.51	-49.84	0.761
264	9.34	-3.48	-49.96	0.763
265	9.37	-3.45	-50.08	0.765
266	9.41	-3.42	-50.21	0.766
267	9.44	-3.39	-50.33	0.768
268	9.48	-3.36	-50.45	0.770
269	9.51	-3.34	-50.57	0.771
270	9.55	-3.31	-50.68	0.773
271	9.59	-3.28	-50.80	0.775
272	9.62	-3.25	-50.92	0.776
273	9.66	-3.22	-51.03	0.778
274	9.69	-3.19	-51.15	0.779
275	9.73	-3.16	-51.26	0.781
276	9.76	-3.13	-51.37	0.782
277	9.80	-3.10	-51.48	0.784
278	9.83	-3.07	-51.59	0.785
279	9.87	-3.04	-51.70	0.787
280	9.91	-3.01	-51.81	0.788
281	9.94	-2.98	-51.91	0.790
282	9.98	-2.95	-52.02	0.791
283	10.01	-2.92	-52.12	0.793
284	10.05	-2.89	-52.23	0.794
285	10.08	-2.86	-52.33	0.796
286	10.12	-2.83	-52.43	0.797
287	10.15	-2.79	-52.53	0.798
288	10.19	-2.76	-52.63	0.800
289	10.22	-2.73	-52.72	0.801
290	10.26	-2.70	-52.82	0.802
291	10.30	-2.67	-52.92	0.804
292	10.33	-2.64	-53.01	0.805
293	10.37	-2.60	-53.10	0.806
294	10.40	-2.57	-53.19	0.807
295	10.44	-2.54	-53.29	0.809
296	10.47	-2.51	-53.38	0.810
297	10.51	-2.48	-53.46	0.811
298	10.54	-2.44	-53.55	0.812
299	10.58	-2.41	-53.64	0.813
300	10.62	-2.38	-53.72	0.815
301	10.65	-2.34	-53.81	0.816

				report.out
302	10.69	-2.31	-53.89	0.817
303	10.72	-2.28	-53.97	0.818
304	10.76	-2.25	-54.05	0.819
305	10.79	-2.21	-54.13	0.820
306	10.83	-2.18	-54.21	0.821
307	10.86	-2.14	-54.28	0.822
308	10.90	-2.11	-54.36	0.823
309	10.94	-2.08	-54.43	0.824
310	10.97	-2.04	-54.51	0.825
311	11.01	-2.01	-54.58	0.826
312	11.04	-1.98	-54.65	0.827
313	11.08	-1.94	-54.72	0.828
314	11.11	-1.91	-54.79	0.829
315	11.15	-1.87	-54.85	0.830
316	11.18	-1.84	-54.92	0.831
317	11.22	-1.80	-54.99	0.832
318	11.25	-1.77	-55.05	0.832
319	11.29	-1.73	-55.11	0.833
320	11.33	-1.70	-55.17	0.834
321	11.36	-1.66	-55.23	0.835
322	11.40	-1.63	-55.29	0.836
323	11.43	-1.59	-55.35	0.837
324	11.47	-1.56	-55.40	0.837
325	11.50	-1.52	-55.46	0.838
326	11.54	-1.48	-55.51	0.839
327	11.57	-1.45	-55.56	0.839
328	11.61	-1.41	-55.61	0.840
329	11.65	-1.38	-55.66	0.841
330	11.68	-1.34	-55.71	0.842
331	11.72	-1.30	-55.76	0.842
332	11.75	-1.27	-55.80	0.843
333	11.79	-1.23	-55.85	0.843
334	11.82	-1.19	-55.89	0.844
335	11.86	-1.15	-55.93	0.845
336	11.89	-1.12	-55.97	0.845
337	11.93	-1.08	-56.01	0.846
338	11.96	-1.04	-56.05	0.846
339	12.00	-1.01	-56.09	0.847
340	12.04	-0.97	-56.12	0.847
341	12.07	-0.93	-56.15	0.848
342	12.11	-0.89	-56.19	0.848
343	12.14	-0.85	-56.22	0.849
344	12.18	-0.82	-56.25	0.849
345	12.21	-0.78	-56.28	0.849
346	12.25	-0.74	-56.30	0.850
347	12.28	-0.70	-56.33	0.850
348	12.32	-0.66	-56.35	0.851
349	12.36	-0.62	-56.38	0.851
350	12.39	-0.58	-56.40	0.851
351	12.43	-0.55	-56.42	0.851
352	12.46	-0.51	-56.44	0.852
353	12.50	-0.47	-56.45	0.852
354	12.53	-0.43	-56.47	0.852
355	12.57	-0.39	-56.48	0.853
356	12.60	-0.35	-56.50	0.853
357	12.64	-0.31	-56.51	0.853
358	12.67	-0.27	-56.52	0.853
359	12.71	-0.23	-56.53	0.853
360	12.75	-0.19	-56.53	0.853
361	12.78	-0.15	-56.54	0.854
362	12.82	-0.11	-56.55	0.854
363	12.85	-0.07	-56.55	0.854
364	12.89	-0.03	-56.55	0.854

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365	12.92	0.01	-56.55	0.854
366	12.96	0.05	-56.55	0.854
367	12.99	0.09	-56.55	0.854
368	13.03	0.13	-56.54	0.854
369	13.07	0.18	-56.54	0.854
370	13.10	0.22	-56.53	0.854
371	13.14	0.26	-56.52	0.854
372	13.17	0.30	-56.51	0.854
373	13.21	0.34	-56.50	0.854
374	13.24	0.38	-56.49	0.854
375	13.28	0.42	-56.47	0.854
376	13.31	0.47	-56.46	0.854
377	13.35	0.51	-56.44	0.853
378	13.38	0.55	-56.42	0.853
379	13.42	0.59	-56.40	0.853
380	13.46	0.63	-56.38	0.853
381	13.49	0.68	-56.36	0.853
382	13.53	0.72	-56.33	0.853
383	13.56	0.76	-56.30	0.852
384	13.60	0.80	-56.28	0.852
385	13.63	0.85	-56.25	0.852
386	13.67	0.89	-56.22	0.852
387	13.70	0.93	-56.18	0.851
388	13.74	0.98	-56.15	0.851
389	13.78	1.02	-56.11	0.851
390	13.81	1.06	-56.08	0.850
391	13.85	1.11	-56.04	0.850
392	13.88	1.15	-56.00	0.849
393	13.92	1.19	-55.96	0.849
394	13.95	1.24	-55.91	0.849
395	13.99	1.28	-55.87	0.848
396	14.02	1.33	-55.82	0.848
397	14.06	1.37	-55.78	0.847
398	14.09	1.41	-55.73	0.847
399	14.13	1.46	-55.68	0.846
400	14.17	1.50	-55.62	0.846
401	14.20	1.55	-55.57	0.845
402	14.24	1.59	-55.51	0.845
403	14.27	1.64	-55.46	0.844
404	14.31	1.68	-55.40	0.843
405	14.34	1.73	-55.34	0.843
406	14.38	1.77	-55.27	0.842
407	14.41	1.82	-55.21	0.842
408	14.45	1.86	-55.14	0.841
409	14.49	1.91	-55.08	0.840
410	14.52	1.95	-55.01	0.840
411	14.56	2.00	-54.94	0.839
412	14.59	2.05	-54.87	0.838
413	14.63	2.09	-54.79	0.837
414	14.66	2.14	-54.72	0.837
415	14.70	2.18	-54.64	0.836
416	14.73	2.23	-54.56	0.835
417	14.77	2.28	-54.48	0.834
418	14.80	2.32	-54.40	0.834
419	14.84	2.37	-54.32	0.833
420	14.88	2.42	-54.23	0.832
421	14.91	2.46	-54.15	0.831
422	14.95	2.51	-54.06	0.830
423	14.98	2.56	-53.97	0.829
424	15.02	2.60	-53.88	0.828
425	15.05	2.65	-53.78	0.827
426	15.09	2.69	-53.69	0.826
427	15.12	2.73	-53.59	0.825

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428	15.16	2.78	-53.50	0.824
429	15.20	2.82	-53.40	0.823
430	15.23	2.86	-53.29	0.822
431	15.27	2.91	-53.19	0.821
432	15.30	2.95	-53.09	0.820
433	15.34	3.00	-52.98	0.819
434	15.37	3.04	-52.88	0.818
435	15.41	3.08	-52.77	0.817
436	15.44	3.13	-52.66	0.816
437	15.48	3.17	-52.54	0.815
438	15.51	3.22	-52.43	0.814
439	15.55	3.26	-52.32	0.813
440	15.59	3.30	-52.20	0.811
441	15.62	3.35	-52.08	0.810
442	15.66	3.39	-51.96	0.809
443	15.69	3.44	-51.84	0.808
444	15.73	3.48	-51.72	0.807
445	15.76	3.52	-51.59	0.805
446	15.80	3.57	-51.47	0.804
447	15.83	3.61	-51.34	0.803
448	15.87	3.66	-51.21	0.801
449	15.91	3.70	-51.08	0.800
450	15.94	3.74	-50.95	0.799
451	15.98	3.79	-50.82	0.798
452	16.01	3.83	-50.68	0.796
453	16.05	3.86	-50.54	0.795
454	16.08	3.90	-50.41	0.793
455	16.12	3.93	-50.27	0.792
456	16.15	3.96	-50.13	0.791
457	16.19	4.00	-49.99	0.789
458	16.23	4.03	-49.84	0.788
459	16.26	4.06	-49.70	0.786
460	16.30	4.09	-49.55	0.785
461	16.33	4.13	-49.41	0.783
462	16.37	4.16	-49.26	0.782
463	16.40	4.19	-49.11	0.780
464	16.44	4.22	-48.96	0.779
465	16.47	4.25	-48.81	0.777
466	16.51	4.28	-48.66	0.776
467	16.54	4.31	-48.51	0.774
468	16.58	4.34	-48.36	0.772
469	16.62	4.37	-48.20	0.771
470	16.65	4.40	-48.05	0.769
471	16.69	4.42	-47.89	0.768
472	16.72	4.45	-47.73	0.766
473	16.76	4.48	-47.57	0.764
474	16.79	4.51	-47.41	0.763
475	16.83	4.53	-47.25	0.761
476	16.86	4.56	-47.09	0.759
477	16.90	4.59	-46.93	0.757
478	16.94	4.61	-46.77	0.756
479	16.97	4.64	-46.60	0.754
480	17.01	4.66	-46.44	0.752
481	17.04	4.69	-46.27	0.750
482	17.08	4.71	-46.10	0.749
483	17.11	4.74	-45.94	0.747
484	17.15	4.76	-45.77	0.745
485	17.18	4.78	-45.60	0.743
486	17.22	4.81	-45.43	0.741
487	17.25	4.83	-45.26	0.739
488	17.29	4.85	-45.09	0.738
489	17.33	4.87	-44.91	0.736
490	17.36	4.90	-44.74	0.734

				report.out
491	17.40	4.92	-44.57	0.732
492	17.43	4.94	-44.39	0.730
493	17.47	4.96	-44.21	0.728
494	17.50	4.98	-44.04	0.726
495	17.54	5.00	-43.86	0.724
496	17.57	5.02	-43.68	0.722
497	17.61	5.04	-43.50	0.720
498	17.65	5.06	-43.33	0.718
499	17.68	5.08	-43.15	0.716
500	17.72	5.10	-42.96	0.714
501	17.75	5.11	-42.78	0.712
502	17.79	5.13	-42.60	0.710
503	17.82	5.15	-42.42	0.708
504	17.86	5.17	-42.24	0.706
505	17.89	5.18	-42.05	0.704
506	17.93	5.20	-41.87	0.702
507	17.96	5.22	-41.68	0.700
508	18.00	5.23	-41.50	0.697
509	18.04	5.25	-41.31	0.695
510	18.07	5.26	-41.12	0.693
511	18.11	5.28	-40.94	0.691
512	18.14	5.29	-40.75	0.689
513	18.18	5.31	-40.56	0.687
514	18.21	5.32	-40.37	0.684
515	18.25	5.33	-40.18	0.682
516	18.28	5.35	-39.99	0.680
517	18.32	5.36	-39.80	0.678
518	18.36	5.37	-39.61	0.675
519	18.39	5.38	-39.42	0.673
520	18.43	5.40	-39.23	0.671
521	18.46	5.41	-39.04	0.669
522	18.50	5.42	-38.85	0.666
523	18.53	5.43	-38.65	0.664
524	18.57	5.44	-38.46	0.662
525	18.60	5.45	-38.27	0.659
526	18.64	5.46	-38.07	0.657
527	18.67	5.47	-37.88	0.655
528	18.71	5.48	-37.69	0.652
529	18.75	5.49	-37.49	0.650
530	18.78	5.50	-37.30	0.647
531	18.82	5.50	-37.10	0.645
532	18.85	5.51	-36.91	0.643
533	18.89	5.52	-36.71	0.640
534	18.92	5.53	-36.51	0.638
535	18.96	5.53	-36.32	0.635
536	18.99	5.54	-36.12	0.633
537	19.03	5.55	-35.92	0.630
538	19.07	5.55	-35.73	0.628
539	19.10	5.56	-35.53	0.625
540	19.14	5.56	-35.33	0.623
541	19.17	5.57	-35.14	0.620
542	19.21	5.57	-34.94	0.618
543	19.24	5.58	-34.74	0.615
544	19.28	5.58	-34.54	0.613
545	19.31	5.58	-34.34	0.610
546	19.35	5.59	-34.15	0.608
547	19.38	5.59	-33.95	0.605
548	19.42	5.59	-33.75	0.603
549	19.46	5.60	-33.55	0.600
550	19.49	5.60	-33.35	0.597
551	19.53	5.60	-33.15	0.595
552	19.56	5.60	-32.95	0.592
553	19.60	5.60	-32.75	0.589

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554	19.63	5.60	-32.56	0.587
555	19.67	5.60	-32.36	0.584
556	19.70	5.60	-32.16	0.582
557	19.74	5.60	-31.96	0.579
558	19.78	5.60	-31.76	0.576
559	19.81	5.60	-31.56	0.573
560	19.85	5.60	-31.36	0.571
561	19.88	5.60	-31.16	0.568
562	19.92	5.60	-30.96	0.565
563	19.95	5.59	-30.77	0.563
564	19.99	5.59	-30.57	0.560
565	20.02	5.59	-30.37	0.557
566	20.06	5.58	-30.17	0.554
567	20.09	5.58	-29.97	0.552
568	20.13	5.58	-29.77	0.549
569	20.17	5.57	-29.58	0.546
570	20.20	5.57	-29.38	0.543
571	20.24	5.56	-29.18	0.540
572	20.27	5.56	-28.98	0.538
573	20.31	5.55	-28.79	0.535
574	20.34	5.55	-28.59	0.532
575	20.38	5.54	-28.39	0.529
576	20.41	5.53	-28.20	0.526
577	20.45	5.53	-28.00	0.524
578	20.49	5.52	-27.80	0.521
579	20.52	5.51	-27.61	0.518
580	20.56	5.50	-27.41	0.515
581	20.59	5.50	-27.22	0.512
582	20.63	5.49	-27.02	0.509
583	20.66	5.48	-26.83	0.506
584	20.70	5.47	-26.63	0.503
585	20.73	5.46	-26.44	0.500
586	20.77	5.45	-26.25	0.497
587	20.80	5.44	-26.05	0.495
588	20.84	5.43	-25.86	0.492
589	20.88	5.42	-25.67	0.489
590	20.91	5.41	-25.47	0.486
591	20.95	5.39	-25.28	0.483
592	20.98	5.38	-25.09	0.480
593	21.02	5.37	-24.90	0.477
594	21.05	5.36	-24.71	0.474
595	21.09	5.34	-24.52	0.471
596	21.12	5.33	-24.33	0.468
597	21.16	5.32	-24.14	0.465
598	21.20	5.30	-23.95	0.462
599	21.23	5.29	-23.77	0.459
600	21.27	5.27	-23.58	0.456
601	21.30	5.26	-23.39	0.453
602	21.34	5.24	-23.20	0.450
603	21.37	5.23	-23.02	0.447
604	21.41	5.21	-22.83	0.444
605	21.44	5.19	-22.65	0.441
606	21.48	5.18	-22.46	0.437
607	21.52	5.16	-22.28	0.434
608	21.55	5.14	-22.10	0.431
609	21.59	5.13	-21.92	0.428
610	21.62	5.11	-21.73	0.425
611	21.66	5.09	-21.55	0.422
612	21.69	5.07	-21.37	0.419
613	21.73	5.06	-21.19	0.416
614	21.76	5.04	-21.01	0.413
615	21.80	5.02	-20.83	0.410
616	21.83	5.01	-20.66	0.406

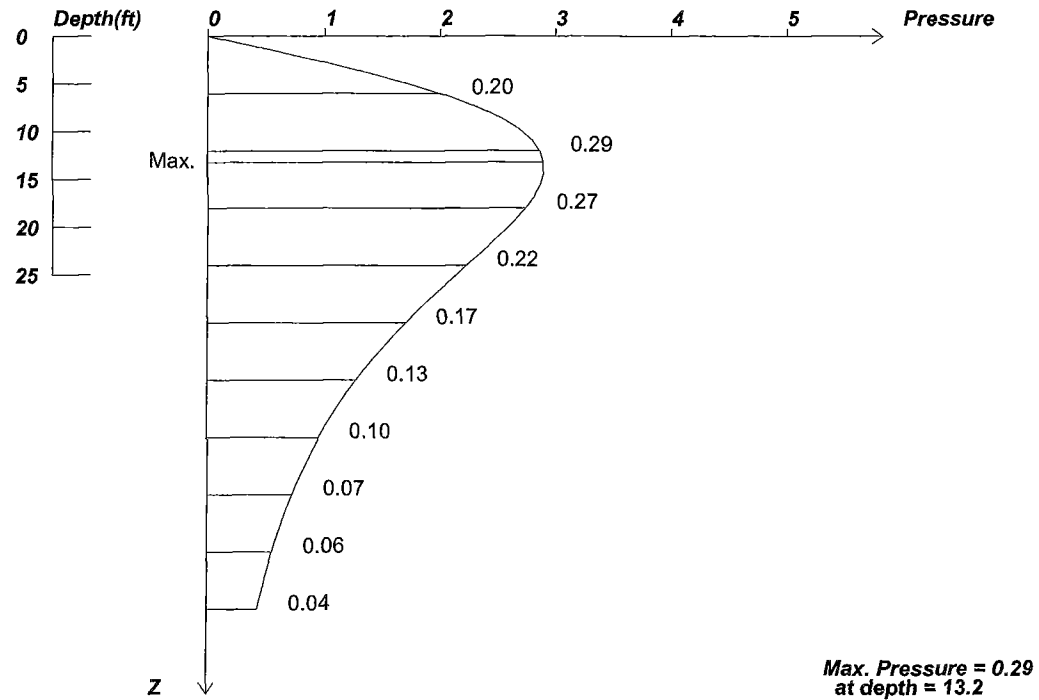
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617	21.87	4.99	-20.48	0.403
618	21.91	4.98	-20.30	0.400
619	21.94	4.96	-20.13	0.397
620	21.98	4.95	-19.95	0.394
621	22.01	4.94	-19.77	0.391
622	22.05	4.93	-19.60	0.387
623	22.08	4.91	-19.42	0.384
624	22.12	4.90	-19.25	0.381
625	22.15	4.89	-19.08	0.378
626	22.19	4.88	-18.90	0.375
627	22.23	4.87	-18.73	0.372
628	22.26	4.86	-18.56	0.368
629	22.30	4.85	-18.38	0.365
630	22.33	4.84	-18.21	0.362
631	22.37	4.84	-18.04	0.359
632	22.40	4.83	-17.87	0.355
633	22.44	4.82	-17.70	0.352
634	22.47	4.81	-17.53	0.349
635	22.51	4.81	-17.36	0.346
636	22.54	4.80	-17.19	0.343
637	22.58	4.79	-17.01	0.339
638	22.62	4.78	-16.84	0.336
639	22.65	4.77	-16.68	0.333
640	22.69	4.76	-16.51	0.329
641	22.72	4.75	-16.34	0.326
642	22.76	4.74	-16.17	0.323
643	22.79	4.73	-16.00	0.320
644	22.83	4.72	-15.83	0.316
645	22.86	4.71	-15.66	0.313
646	22.90	4.70	-15.50	0.310
647	22.94	4.69	-15.33	0.306
648	22.97	4.68	-15.16	0.303
649	23.01	4.67	-15.00	0.300
650	23.04	4.65	-14.83	0.297
651	23.08	4.64	-14.67	0.293
652	23.11	4.63	-14.50	0.290
653	23.15	4.62	-14.34	0.287
654	23.18	4.60	-14.18	0.283
655	23.22	4.59	-14.01	0.280
656	23.25	4.58	-13.85	0.277
657	23.29	4.56	-13.69	0.273
658	23.33	4.55	-13.53	0.270
659	23.36	4.53	-13.36	0.267
660	23.40	4.52	-13.20	0.263
661	23.43	4.50	-13.04	0.260
662	23.47	4.49	-12.88	0.256
663	23.50	4.47	-12.73	0.253
664	23.54	4.46	-12.57	0.250
665	23.57	4.44	-12.41	0.246
666	23.61	4.42	-12.25	0.243
667	23.65	4.41	-12.10	0.240
668	23.68	4.39	-11.94	0.236
669	23.72	4.37	-11.78	0.233
670	23.75	4.35	-11.63	0.229
671	23.79	4.34	-11.47	0.226
672	23.82	4.32	-11.32	0.223
673	23.86	4.30	-11.17	0.219
674	23.89	4.28	-11.02	0.216
675	23.93	4.26	-10.86	0.212
676	23.96	4.24	-10.71	0.209
677	24.00	4.23	-10.56	0.206
678	24.04	4.21	-10.41	0.202
679	24.07	4.19	-10.26	0.199

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680	24.11	4.17	-10.12	0.195
681	24.14	4.15	-9.97	0.192
682	24.18	4.13	-9.82	0.188
683	24.21	4.11	-9.67	0.185
684	24.25	4.09	-9.53	0.182
685	24.28	4.06	-9.38	0.178
686	24.32	4.04	-9.24	0.175
687	24.36	4.02	-9.10	0.171
688	24.39	4.00	-8.96	0.168
689	24.43	3.98	-8.81	0.164
690	24.46	3.95	-8.67	0.161
691	24.50	3.93	-8.53	0.157
692	24.53	3.91	-8.39	0.154
693	24.57	3.89	-8.26	0.151
694	24.60	3.86	-8.12	0.147
695	24.64	3.84	-7.98	0.144
696	24.67	3.82	-7.84	0.140
697	24.71	3.79	-7.71	0.137
698	24.75	3.77	-7.58	0.133
699	24.78	3.74	-7.44	0.130
700	24.82	3.72	-7.31	0.126
701	24.85	3.69	-7.18	0.123
702	24.89	3.67	-7.05	0.119
703	24.92	3.64	-6.92	0.116
704	24.96	3.62	-6.79	0.112
705	24.99	3.59	-6.66	0.109
706	25.03	3.56	-6.53	0.105
707	25.07	3.54	-6.41	0.102
708	25.10	3.51	-6.28	0.098
709	25.14	3.48	-6.16	0.095
710	25.17	3.45	-6.04	0.091
711	25.21	3.43	-5.91	0.088
712	25.24	3.40	-5.79	0.084
713	25.28	3.37	-5.67	0.081
714	25.31	3.34	-5.55	0.077
715	25.35	3.31	-5.44	0.074
716	25.38	3.28	-5.32	0.070
717	25.42	3.26	-5.20	0.067
718	25.46	3.23	-5.09	0.063
719	25.49	3.20	-4.97	0.060
720	25.53	3.17	-4.86	0.056
721	25.56	3.14	-4.75	0.053
722	25.60	3.11	-4.64	0.049
723	25.63	3.08	-4.53	0.046
724	25.67	3.05	-4.42	0.042
725	25.70	3.02	-4.31	0.039
726	25.74	2.98	-4.20	0.035
727	25.78	2.95	-4.10	0.032
728	25.81	2.92	-3.99	0.028
729	25.85	2.89	-3.89	0.025
730	25.88	2.86	-3.79	0.021
731	25.92	2.82	-3.69	0.018
732	25.95	2.79	-3.59	0.014
733	25.99	2.76	-3.49	0.011
734	26.02	2.72	-3.39	0.007
735	26.06	2.69	-3.30	0.004
736	26.09	2.66	-3.20	0.000
737	26.13	2.62	-3.11	-0.004
738	26.17	2.59	-3.02	-0.007
739	26.20	2.55	-2.92	-0.011
740	26.24	2.52	-2.83	-0.014
741	26.27	2.49	-2.75	-0.018
742	26.31	2.45	-2.66	-0.021

				report.out
743	26.34	2.41	-2.57	-0.025
744	26.38	2.38	-2.49	-0.028
745	26.41	2.34	-2.40	-0.032
746	26.45	2.31	-2.32	-0.035
747	26.49	2.27	-2.24	-0.039
748	26.52	2.23	-2.16	-0.042
749	26.56	2.20	-2.08	-0.046
750	26.59	2.16	-2.00	-0.050
751	26.63	2.12	-1.93	-0.053
752	26.66	2.09	-1.85	-0.057
753	26.70	2.05	-1.78	-0.060
754	26.73	2.01	-1.71	-0.064
755	26.77	1.97	-1.64	-0.067
756	26.81	1.93	-1.57	-0.071
757	26.84	1.89	-1.50	-0.074
758	26.88	1.85	-1.43	-0.078
759	26.91	1.82	-1.37	-0.081
760	26.95	1.78	-1.30	-0.085
761	26.98	1.74	-1.24	-0.089
762	27.02	1.70	-1.18	-0.092
763	27.05	1.66	-1.12	-0.096
764	27.09	1.62	-1.06	-0.099
765	27.12	1.57	-1.01	-0.103
766	27.16	1.53	-0.95	-0.106
767	27.20	1.49	-0.90	-0.110
768	27.23	1.45	-0.84	-0.113
769	27.27	1.41	-0.79	-0.117
770	27.30	1.37	-0.74	-0.120
771	27.34	1.33	-0.70	-0.124
772	27.37	1.28	-0.65	-0.128
773	27.41	1.24	-0.61	-0.131
774	27.44	1.20	-0.56	-0.135
775	27.48	1.15	-0.52	-0.138
776	27.52	1.11	-0.48	-0.142
777	27.55	1.07	-0.44	-0.145
778	27.59	1.02	-0.41	-0.149
779	27.62	0.98	-0.37	-0.152
780	27.66	0.93	-0.34	-0.156
781	27.69	0.89	-0.30	-0.159
782	27.73	0.84	-0.27	-0.163
783	27.76	0.80	-0.24	-0.167
784	27.80	0.75	-0.22	-0.170
785	27.83	0.71	-0.19	-0.174
786	27.87	0.66	-0.17	-0.177
787	27.91	0.62	-0.14	-0.181
788	27.94	0.57	-0.12	-0.184
789	27.98	0.52	-0.10	-0.188
790	28.01	0.48	-0.08	-0.191
791	28.05	0.43	-0.07	-0.195
792	28.08	0.38	-0.05	-0.199
793	28.12	0.33	-0.04	-0.202
794	28.15	0.29	-0.03	-0.206
795	28.19	0.24	-0.02	-0.209
796	28.23	0.19	-0.01	-0.213
797	28.26	0.14	-0.01	-0.216
798	28.30	0.09	0.00	-0.220
799	28.33	0.04	0.00	-0.223

Users can select data, then copy and paste into Excel to create graphics

Legacy Pkwy - C863 Bent 2 - E80 at 20ft - GW at 5ft



<Surcharge> CIVILTECH SOFTWARE USA www.civiltechsoftware.com

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Date: 1/22/2007

Wall Height, H= 15 Load Depth at Surface, D= 0

Load Factor of Surcharge Loading = 1

Rigid Wall Condition -- No movement or deflection of the wall are allowed.

Max. Pressure = 0.29 at depth = 13.2

Cooper E 80 Railroad Loading. From wall to railroad center, X=20.0

UNITS: LENGTH, DEPTH: ft, Qpoint: kip, Qline: kip/ft, Qstrip, Qarea, PRESSURE: ksf

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SURCHARGE LOADS CALCULATION SUMMARY
<Surcharge>
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Time: 12/30/1899 12:17:55 PM
Date: 1/22/2007

Legacy Pkwy - C863 Bent 2 - E80 at 20ft - GW at 5ft

Height of wall = 15
Depth of wall = 0
Load Factor of Surcharge Loading = 1

Wall Condition:
Rigid Wall Condition -- No movement or deflection of the wall are allowed.

*****Loading*****

RAILROAD LOADING:
Cooper E 80 Railroad Loading. From wall to railroad center, X=20.0

*****Total Pressure Distribution*****

Max. Pressure =0.290 at depth =13.20

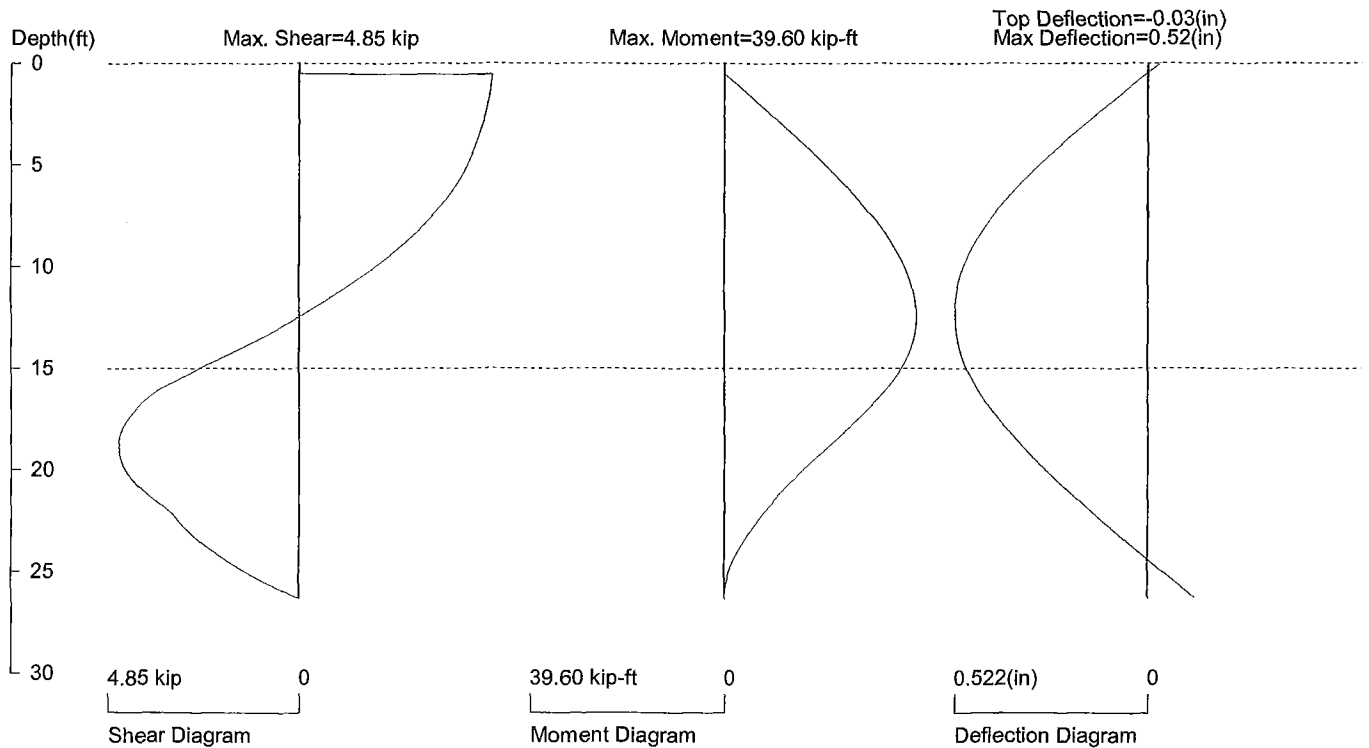
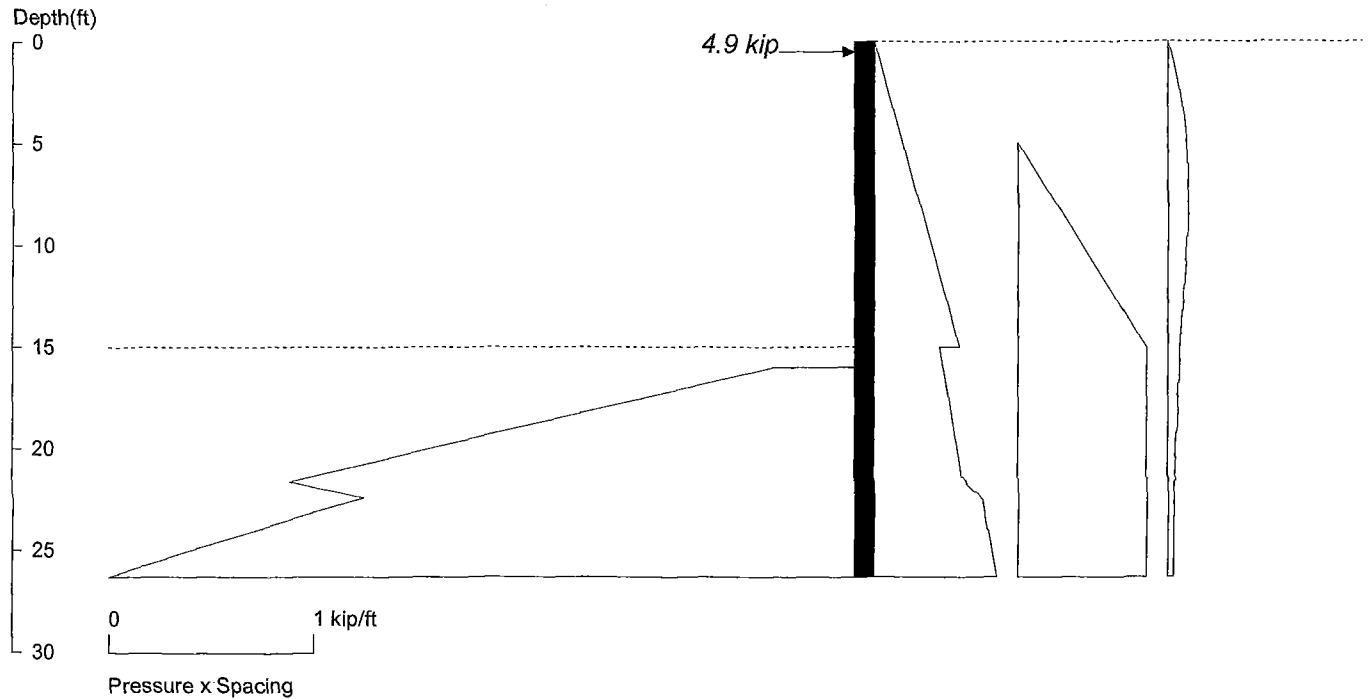
Depth	Pressure
0.00	0.000
1.20	0.045
2.40	0.089
3.60	0.130
4.80	0.168
6.00	0.201
7.20	0.228
8.40	0.251
9.60	0.268
10.80	0.280
12.00	0.287
13.20	0.290
14.40	0.290
15.60	0.287
16.80	0.281
18.00	0.274
19.20	0.265
20.40	0.255
21.60	0.245
22.80	0.234
24.00	0.223
25.20	0.212
26.40	0.201
27.60	0.191
28.80	0.180
30.00	0.171
31.20	0.161
32.40	0.152

	report.out
33.60	0.144
34.80	0.135
36.00	0.128
37.20	0.121
38.40	0.114
39.60	0.107
40.80	0.102
42.00	0.096
43.20	0.091
44.40	0.086
45.60	0.081
46.80	0.077
48.00	0.073
49.20	0.069
50.40	0.065
51.60	0.062
52.80	0.059
54.00	0.056
55.20	0.053
56.40	0.050
57.60	0.048
58.80	0.046
60.00	0.043

Depth Is Measured From Top of the Wall

LENGTH, DEPTH: ft, Qpoint: kip, Qline: kip/ft, Qstrip, Qarea, PRESSURE: ksf

Legacy Pkwy - C863 Bent 2 - Spoils at 8ft - GW at 5ft with wall friction



PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on one soldier pile or one foot spacing of sheet pile

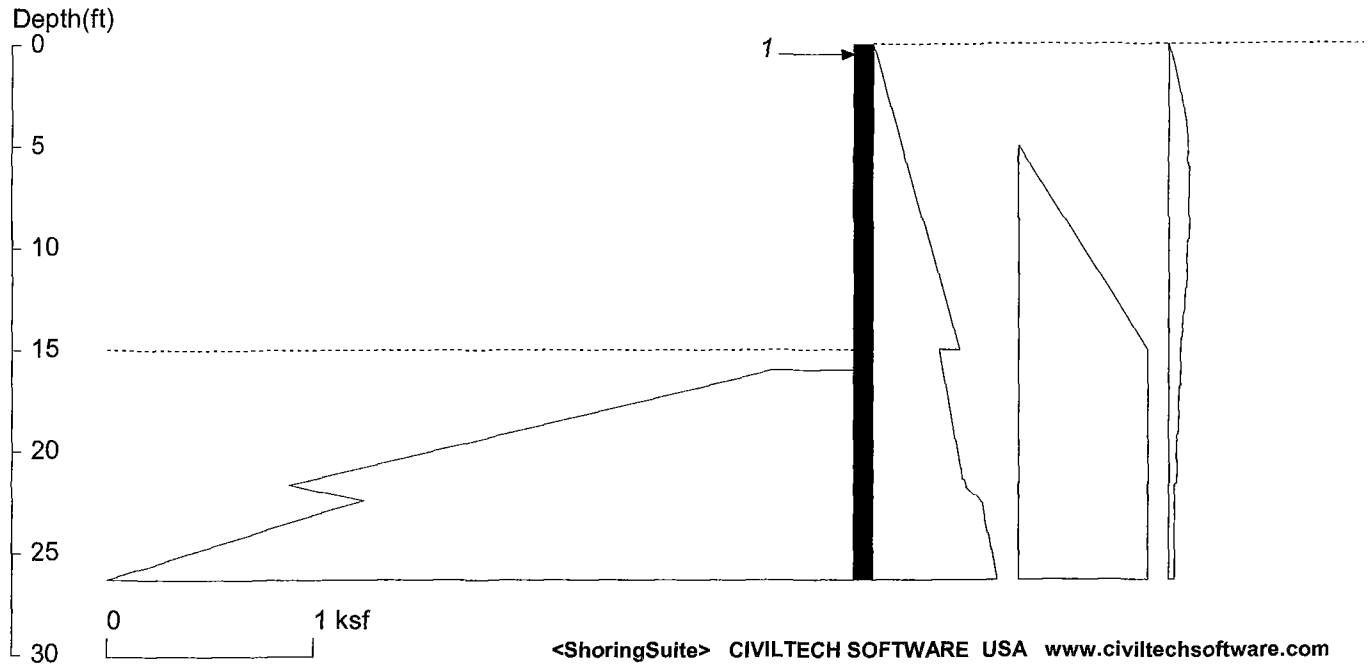
Pile: AZ18 meet Section Requirements. Properties: 6. E (ksi)=29000, 4. I (in⁴)=250.4

Date: 1/22/2007 File Name: UNTITLED

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<ShoringSuite> CIVILTECH SOFTWARE USA www.civiltechsoftware.com

Legacy Pkwy - C863 Bent 2 - Spoils at 8ft - GW at 5ft with wall friction



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Date: 1/22/2007 File Name: UNTITLED

Wall Height=15.0

Pile Diameter=1.0

Pile Spacing=1.0

ACTIVE SPACE:		Z depth	Spacing
1		0.00	1.00
2		15.00	1.00
PASSIVE SPACE:		Z depth	Spacing
1		15.00	1.00

PILE LENGTH: Min. Embedment=11.31, Min. Pile Length=26.31

MOMENT IN PILE: Max. Moment=39.60 at Depth of 12.45

VERTICAL BEARING CAPACITY: Vertical Loading=0.0, Resistance=38.1, Vertical Factor of Safety=999.00

PILE SELECTION:

Request Min. Section Modulus = 14.4 in³/feet, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66

AZ18 has Section Modulus = 33.5. It is greater than Min. Requirements!, Top Deflection = -0.03(in)

BRACE FORCE: Strut, Tieback, Plate Anchor, and Deadman

No. & Type	Depth	Angle	Total	Horiz.	Vert.	N/A	N/A
1. Strut	0.5	0.0	4.9	4.9	0.0	0.0	0.0

UNITS: Length/Depth - ft, Force - kip, Moment - kip-ft, Pressure - ksf, Pres. Slope - kip/ft³, Deflection - in

report.out

SHORING WALL CALCULATION SUMMARY
The leading shoring design and calculation software
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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

DEPTH: ft, PRESSURE, FRICTION, BEARING: ksf, SLOPE: kcf, FORCE: kip, MOMENT: kip-ft,
DEFLECTION: in, I: in⁴, E: ksi

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Date: 1/22/2007 File: UNTITLED

Title: Legacy Pkwy - C863 Bent 2 - Spoils at 8ft - GW at 5ft
Subtitle: with wall friction

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

Wall Type: 1. Sheet Pile
Wall Height: 15.00
Pile Diameter: 1.00
Pile Spacing: 1.00
Factor of Safety (F.S.): 1.50
Max. Moment reduce 20%
Lateral Support Type (Braces): 2. Strut, Raker
Top Brace Increase (Multi-Bracing): Add 15%*
Brace Position (One Brace Case): Normal Brace*
Embedment Option: 1. Yes
Friction at Pile Tip: No*
Check Vertical Bearing Capacity:
Side Friction for Bearing: 1.00
Tip Resistance for Bearing: 1.00
Pile Properties:
Allowable Fb/Fy: 0.66
Steel Strength, Fy: 50 ksi = 345 MPa
Elastic Module, E: 29000.00
Moment of Inertia, I: 250.40
User Input Pile: AZ18

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

No.	Z2 top	Top Pres.	Z2 bottom	Bottom Pres.	Slope
1	0.00	0.00	15.00	0.42	0.0280
2	15.00	0.32	19.50	0.40	0.0180
3	19.50	0.40	20.63	0.42	0.0190
4	20.63	0.42	21.38	0.44	0.0180
5	21.38	0.44	21.75	0.45	0.0510
6	21.75	0.45	22.13	0.50	0.1170
7	22.13	0.50	22.50	0.53	0.0850
8	22.50	0.53	23.25	0.54	0.0190
9	23.25	0.54	24.00	0.56	0.0210

			report.out		
10	24.00	0.56	36.38	0.80	0.0190
11	36.38	0.80	36.75	0.78	-0.0580
12	36.75	0.78	37.13	0.70	-0.2130
13	37.13	0.70	37.50	0.65	-0.1370
14	37.50	0.65	42.75	0.73	0.0170
15	42.75	0.73	43.50	0.75	0.0220
16	43.50	0.75	56.63	0.98	0.0170
17	56.63	0.98	57.00	0.98	0.0180
18	57.00	0.98	57.75	1.00	0.0210
19	57.75	1.00	75.00	1.30	0.0170
20	5.00	0.00	15.00	0.62	0.0620
21	15.00	0.62	75.00	0.62	0.0000
22	0.00	0.00	1.20	0.03	0.0270
23	1.20	0.03	2.40	0.06	0.0230
24	2.40	0.06	3.60	0.08	0.0170
25	3.60	0.08	4.80	0.09	0.0110
26	4.80	0.09	6.00	0.10	0.0050
27	6.00	0.10	7.20	0.10	0.0000
28	7.20	0.10	8.40	0.10	-0.0030
29	8.40	0.10	9.60	0.09	-0.0040
30	9.60	0.09	10.80	0.09	-0.0050
31	10.80	0.09	12.00	0.08	-0.0060
32	12.00	0.08	13.20	0.07	-0.0060
33	13.20	0.07	14.40	0.06	-0.0060
34	14.40	0.06	15.60	0.06	-0.0050
35	15.60	0.06	16.80	0.05	-0.0050
36	16.80	0.05	18.00	0.05	-0.0040
37	18.00	0.05	19.20	0.04	-0.0040
38	19.20	0.04	20.40	0.04	-0.0040
39	20.40	0.04	21.60	0.03	-0.0030
40	21.60	0.03	22.80	0.03	-0.0030
41	22.80	0.03	24.00	0.03	-0.0030
42	24.00	0.03	25.20	0.03	-0.0020
43	25.20	0.03	26.40	0.02	-0.0020
44	26.40	0.02	27.60	0.02	-0.0020
45	27.60	0.02	28.80	0.02	-0.0020
46	28.80	0.02	30.00	0.02	-0.0010
47	30.00	0.02	31.20	0.02	-0.0010
48	31.20	0.02	32.40	0.01	-0.0010
49	32.40	0.01	33.60	0.01	-0.0010
50	33.60	0.01	34.80	0.01	-0.0010
51	34.80	0.01	36.00	0.01	-0.0010
52	36.00	0.01	37.20	0.01	-0.0010
53	37.20	0.01	38.40	0.01	-0.0010
54	38.40	0.01	39.60	0.01	-0.0010
55	39.60	0.01	40.80	0.01	-0.0010
56	40.80	0.01	42.00	0.01	0.0000
57	42.00	0.01	43.20	0.01	0.0000
58	43.20	0.01	44.40	0.01	0.0000
59	44.40	0.01	45.60	0.01	0.0000
60	45.60	0.01	46.80	0.01	0.0000
61	46.80	0.01	48.00	0.01	0.0000
62	48.00	0.01	49.20	0.01	0.0000
63	49.20	0.01	50.40	0.00	0.0000
64	50.40	0.00	51.60	0.00	0.0000
65	51.60	0.00	52.80	0.00	0.0000
66	52.80	0.00	54.00	0.00	0.0000
67	54.00	0.00	55.20	0.00	0.0000
68	55.20	0.00	56.40	0.00	0.0000
69	56.40	0.00	57.60	0.00	0.0000
70	57.60	0.00	58.80	0.00	0.0000
71	58.80	0.00	60.00	0.00	0.0000

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* PASSIVE PRESSURE *

No.	Z1 top	Top Pres.	Z2 bottom	Bottom Pres.	Slope
1	16.00	0.41	21.63	2.74	0.4130
2	21.63	2.74	22.00	2.57	-0.4520
3	22.00	2.57	22.38	2.38	-0.4890
4	22.38	2.38	22.75	2.51	0.3360
5	22.75	2.51	23.13	2.63	0.3290
6	23.13	2.63	23.50	2.75	0.3250
7	23.50	2.75	23.88	2.87	0.3210
8	23.88	2.87	24.25	2.99	0.3180
9	24.25	2.99	24.63	3.11	0.3160
10	24.63	3.11	25.00	3.23	0.3140
11	25.00	3.23	25.38	3.34	0.3030
12	25.38	3.34	25.75	3.46	0.2990
13	25.75	3.46	26.13	3.57	0.3070
14	26.13	3.57	26.88	3.80	0.3100
15	26.88	3.80	28.00	4.15	0.3090
16	28.00	4.15	29.88	4.73	0.3070
17	29.88	4.73	34.75	6.22	0.3060
18	34.75	6.22	36.63	6.79	0.3050
19	36.63	6.79	37.00	8.05	3.3570
20	37.00	8.05	37.38	9.35	3.4720
21	37.38	9.35	37.75	9.55	0.5330
22	37.75	9.55	38.13	9.75	0.5310
23	38.13	9.75	38.50	9.95	0.5300
24	38.50	9.95	38.88	10.14	0.5280
25	38.88	10.14	39.25	10.34	0.5270
26	39.25	10.34	39.63	10.54	0.5250
27	39.63	10.54	40.00	10.73	0.5240
28	40.00	10.73	40.38	10.91	0.4730
29	40.38	10.91	40.75	11.08	0.4490
30	40.75	11.08	41.13	11.27	0.4930
31	41.13	11.27	41.50	11.46	0.5120
32	41.50	11.46	41.88	11.65	0.5110
33	41.88	11.65	42.25	11.84	0.5100
34	42.25	11.84	43.00	12.22	0.5090
35	43.00	12.22	43.75	12.60	0.5070
36	43.75	12.60	44.50	12.98	0.5050
37	44.50	12.98	45.25	13.36	0.5040
38	45.25	13.36	46.00	13.73	0.5020
39	46.00	13.73	46.75	14.11	0.5010
40	46.75	14.11	47.50	14.48	0.5000
41	47.50	14.48	48.25	14.86	0.4980
42	48.25	14.86	49.38	15.42	0.4970
43	49.38	15.42	50.50	15.97	0.4960
44	50.50	15.97	51.63	16.53	0.4950
45	51.63	16.53	53.13	17.27	0.4940
46	53.13	17.27	54.25	17.82	0.4920
47	54.25	17.82	54.63	17.99	0.4440
48	54.63	17.99	55.00	18.15	0.4260
49	55.00	18.15	55.38	18.33	0.4720
50	55.38	18.33	57.63	19.43	0.4880
51	57.63	19.42	60.25	20.70	0.4870
52	60.25	20.70	63.63	22.34	0.4860
53	63.63	22.34	68.88	24.89	0.4850
54	68.88	24.89	74.88	27.79	0.4840

The pressure above will be divided by a Factor of Safety =1.5

* ACTIVE SPACE *

No. Z depth Spacing

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1	0.00	1.00
2	15.00	1.00

* PASSIVE SPACE *

No.	Z depth	Spacing
1	15.00	1.00

* BRACE: STRUT, TIEBACK, ANCHOR PLATE, OR DEADMAN *

No.	Z brace	Angle	Spacing	Input1*	Input2*
1	0.50	0.0	1.00	1.00	1.00
Strut					

*For Tieback: Input1 = Diameter; Input2 = Bond Strength

*For Plate: Input1 = Diameter; Input2 = Allowable Pressure

*For Deaman: Input1 = Horz. Width; Input2 = Allowable Pressure; Angle = 0

*****SPECIFIED PILE *****

AZ18 has been found in Sheet Pile list!

AZ18 SX= 33.5 IX= 250.4 Weight= 24.17

* Note: All the pile dimensions are in English Units per one foot width.

*****CALCULATION*****

Top Pressures start at depth = 0.00

NUMBER OF BRACE LEVEL = 1

	D1=0.00	
<--	D2=0.50	R1=4.86
==	D3=15.00	
	D4=26.31	

D1 - TOP DEPTH
D2 - BRACE DEPTH
D3 - EXCAVATION BASE
D4 - PILE TIP
R1 - REACTION

TOTAL REACTION: R1 = 4.86

TOTAL PRESSURE ACTING ON WALL = 4.86

Total Reaction = Total Pressure, OK!

BRACE NO.1 AT DEPTH = 0.50

R1 = Brace Load = 4.86

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*****RESULTS*****

* EMBEDMENT *

MINIMUM EMBEDMENT = 11.31

TOTAL MINIMUM PILE LENGTH = 26.31

* MOMENT IN PILE *

No.	Depth	M @ Brace	Mmax in Span	Depth of Mmax
1	0.50	0.00	39.60	12.45

Overall Maximum Moment = 39.60 at 12.45

Maximum Shear = 4.85

* BRACE: STRUT, TIEBACK, ANCHOR PLATE, OR DEADMAN *

No.	DEPTH	Tangle	SPACING	HORIZONTAL	VERTICAL
1	0.50	0.0	1.00	4.86	0.00
4.86					

No.	DEPTH	Free length	Type and Data
1	0.50	0.00	Strut

* VERTICAL LOADING *

Vertical Loading from Braces = 0.00

Vertical Loading from External Load = 0.00

Total Vertical Loading = 0.00

* VERTICAL BEARING CAPACITY CHECK *

Tip Depth	Tip Area	Bearing	Tip Resistance
26.31	0.50	1.00	0.50
Embedment	Side Area*	Friction	Side Resistance
11.31	37.62	1.00	37.62

*Side Area is the surface area of embedment below base and contact area between pile and soil above base.

Total Vertical Resistance = 38.12

Total Vertical Loading = 0.00

Vertical Factor of Safety = 999.00

*****SPECIFIED PILE *****

AZ18 has been found in Sheet Pile list!

AZ18 Sx= 33.5 Ix= 250.4 weight= 24.17

* Note: All the pile dimensions are in English Units per one foot width.

Request Min. Section Modulus = 14.4 in³/feet, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66

The pile selection is based on the magnitude of the moment only. Axial force is neglected. Ref. Note 3

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AZ18 is capable to support the shoring!
 Top deflection = -0.032(in)
 Max. deflection = 0.522(in)

*****SHEAR, MOMENT, AND DEFLECTION V.S. DEPTH*****

User Input Pile: AZ18
 Elastic Module, E: 29000.00
 Moment of Inertia, I: 250.40

No	DEPTH ft	SHEAR kip	MOMENT kip-ft	DEFLECTION in
1	0.00	0.00	0.00	-0.032
2	0.03	0.00	0.00	-0.029
3	0.07	0.00	0.00	-0.027
4	0.10	0.00	0.00	-0.025
5	0.13	0.00	0.00	-0.023
6	0.16	0.00	0.00	-0.020
7	0.20	0.00	0.00	-0.018
8	0.23	0.00	0.00	-0.016
9	0.26	0.00	0.00	-0.014
10	0.30	0.00	0.00	-0.011
11	0.33	0.00	0.00	-0.009
12	0.36	0.00	0.00	-0.007
13	0.40	0.00	0.00	-0.005
14	0.43	0.01	0.00	-0.002
15	0.46	0.01	0.00	0.000
16	0.49	0.01	0.00	0.002
17	0.53	-4.85	-0.13	0.005
18	0.56	-4.85	-0.29	0.007
19	0.59	-4.85	-0.45	0.009
20	0.63	-4.85	-0.61	0.011
21	0.66	-4.85	-0.77	0.014
22	0.69	-4.85	-0.93	0.016
23	0.72	-4.85	-1.09	0.018
24	0.76	-4.85	-1.25	0.020
25	0.79	-4.85	-1.41	0.023
26	0.82	-4.84	-1.57	0.025
27	0.86	-4.84	-1.73	0.027
28	0.89	-4.84	-1.89	0.029
29	0.92	-4.84	-2.05	0.032
30	0.96	-4.84	-2.20	0.034
31	0.99	-4.84	-2.36	0.036
32	1.02	-4.83	-2.52	0.038
33	1.05	-4.83	-2.68	0.041
34	1.09	-4.83	-2.84	0.043
35	1.12	-4.83	-3.00	0.045
36	1.15	-4.83	-3.16	0.047
37	1.19	-4.82	-3.32	0.050
38	1.22	-4.82	-3.48	0.052
39	1.25	-4.82	-3.64	0.054
40	1.28	-4.82	-3.79	0.056
41	1.32	-4.82	-3.95	0.059
42	1.35	-4.81	-4.11	0.061
43	1.38	-4.81	-4.27	0.063
44	1.42	-4.81	-4.43	0.065
45	1.45	-4.81	-4.59	0.068
46	1.48	-4.80	-4.75	0.070
47	1.51	-4.80	-4.90	0.072
48	1.55	-4.80	-5.06	0.074
49	1.58	-4.79	-5.22	0.077
50	1.61	-4.79	-5.38	0.079

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51	1.65	-4.79	-5.53	0.081
52	1.68	-4.79	-5.69	0.083
53	1.71	-4.78	-5.85	0.085
54	1.75	-4.78	-6.01	0.088
55	1.78	-4.78	-6.17	0.090
56	1.81	-4.77	-6.32	0.092
57	1.84	-4.77	-6.48	0.094
58	1.88	-4.77	-6.64	0.097
59	1.91	-4.76	-6.79	0.099
60	1.94	-4.76	-6.95	0.101
61	1.98	-4.76	-7.11	0.103
62	2.01	-4.75	-7.26	0.105
63	2.04	-4.75	-7.42	0.108
64	2.07	-4.75	-7.58	0.110
65	2.11	-4.74	-7.73	0.112
66	2.14	-4.74	-7.89	0.114
67	2.17	-4.74	-8.05	0.116
68	2.21	-4.73	-8.20	0.119
69	2.24	-4.73	-8.36	0.121
70	2.27	-4.73	-8.51	0.123
71	2.31	-4.72	-8.67	0.125
72	2.34	-4.72	-8.82	0.127
73	2.37	-4.71	-8.98	0.130
74	2.40	-4.71	-9.13	0.132
75	2.44	-4.71	-9.29	0.134
76	2.47	-4.70	-9.44	0.136
77	2.50	-4.70	-9.60	0.138
78	2.54	-4.69	-9.75	0.141
79	2.57	-4.69	-9.91	0.143
80	2.60	-4.68	-10.06	0.145
81	2.63	-4.68	-10.22	0.147
82	2.67	-4.67	-10.37	0.149
83	2.70	-4.67	-10.52	0.151
84	2.73	-4.66	-10.68	0.154
85	2.77	-4.66	-10.83	0.156
86	2.80	-4.66	-10.98	0.158
87	2.83	-4.65	-11.14	0.160
88	2.87	-4.65	-11.29	0.162
89	2.90	-4.64	-11.44	0.164
90	2.93	-4.64	-11.60	0.166
91	2.96	-4.63	-11.75	0.169
92	3.00	-4.63	-11.90	0.171
93	3.03	-4.62	-12.05	0.173
94	3.06	-4.62	-12.21	0.175
95	3.10	-4.61	-12.36	0.177
96	3.13	-4.61	-12.51	0.179
97	3.16	-4.60	-12.66	0.181
98	3.19	-4.59	-12.81	0.184
99	3.23	-4.59	-12.96	0.186
100	3.26	-4.58	-13.12	0.188
101	3.29	-4.58	-13.27	0.190
102	3.33	-4.57	-13.42	0.192
103	3.36	-4.57	-13.57	0.194
104	3.39	-4.56	-13.72	0.196
105	3.43	-4.56	-13.87	0.198
106	3.46	-4.55	-14.02	0.200
107	3.49	-4.54	-14.17	0.202
108	3.52	-4.54	-14.32	0.205
109	3.56	-4.53	-14.47	0.207
110	3.59	-4.53	-14.62	0.209
111	3.62	-4.52	-14.76	0.211
112	3.66	-4.51	-14.91	0.213
113	3.69	-4.51	-15.06	0.215

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114	3.72	-4.50	-15.21	0.217
115	3.75	-4.50	-15.36	0.219
116	3.79	-4.49	-15.51	0.221
117	3.82	-4.48	-15.65	0.223
118	3.85	-4.48	-15.80	0.225
119	3.89	-4.47	-15.95	0.227
120	3.92	-4.47	-16.10	0.229
121	3.95	-4.46	-16.24	0.231
122	3.98	-4.45	-16.39	0.233
123	4.02	-4.45	-16.54	0.235
124	4.05	-4.44	-16.68	0.237
125	4.08	-4.43	-16.83	0.239
126	4.12	-4.43	-16.97	0.241
127	4.15	-4.42	-17.12	0.243
128	4.18	-4.41	-17.27	0.245
129	4.22	-4.41	-17.41	0.247
130	4.25	-4.40	-17.56	0.249
131	4.28	-4.39	-17.70	0.251
132	4.31	-4.39	-17.85	0.253
133	4.35	-4.38	-17.99	0.255
134	4.38	-4.37	-18.13	0.257
135	4.41	-4.36	-18.28	0.259
136	4.45	-4.36	-18.42	0.261
137	4.48	-4.35	-18.56	0.263
138	4.51	-4.34	-18.71	0.265
139	4.54	-4.34	-18.85	0.267
140	4.58	-4.33	-18.99	0.269
141	4.61	-4.32	-19.14	0.271
142	4.64	-4.31	-19.28	0.273
143	4.68	-4.31	-19.42	0.275
144	4.71	-4.30	-19.56	0.277
145	4.74	-4.29	-19.70	0.279
146	4.78	-4.29	-19.84	0.281
147	4.81	-4.28	-19.99	0.283
148	4.84	-4.27	-20.13	0.284
149	4.87	-4.26	-20.27	0.286
150	4.91	-4.26	-20.41	0.288
151	4.94	-4.25	-20.55	0.290
152	4.97	-4.24	-20.69	0.292
153	5.01	-4.23	-20.83	0.294
154	5.04	-4.23	-20.97	0.296
155	5.07	-4.22	-21.10	0.298
156	5.10	-4.21	-21.24	0.300
157	5.14	-4.20	-21.38	0.301
158	5.17	-4.19	-21.52	0.303
159	5.20	-4.19	-21.66	0.305
160	5.24	-4.18	-21.80	0.307
161	5.27	-4.17	-21.93	0.309
162	5.30	-4.16	-22.07	0.311
163	5.34	-4.15	-22.21	0.312
164	5.37	-4.14	-22.34	0.314
165	5.40	-4.13	-22.48	0.316
166	5.43	-4.13	-22.62	0.318
167	5.47	-4.12	-22.75	0.320
168	5.50	-4.11	-22.89	0.321
169	5.53	-4.10	-23.02	0.323
170	5.57	-4.09	-23.16	0.325
171	5.60	-4.08	-23.29	0.327
172	5.63	-4.07	-23.43	0.329
173	5.66	-4.06	-23.56	0.330
174	5.70	-4.05	-23.69	0.332
175	5.73	-4.04	-23.83	0.334
176	5.76	-4.03	-23.96	0.336

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177	5.80	-4.02	-24.09	0.337
178	5.83	-4.01	-24.22	0.339
179	5.86	-4.00	-24.36	0.341
180	5.89	-3.99	-24.49	0.343
181	5.93	-3.98	-24.62	0.344
182	5.96	-3.97	-24.75	0.346
183	5.99	-3.96	-24.88	0.348
184	6.03	-3.95	-25.01	0.349
185	6.06	-3.94	-25.14	0.351
186	6.09	-3.92	-25.27	0.353
187	6.13	-3.91	-25.40	0.354
188	6.16	-3.90	-25.53	0.356
189	6.19	-3.89	-25.66	0.358
190	6.22	-3.88	-25.78	0.359
191	6.26	-3.87	-25.91	0.361
192	6.29	-3.86	-26.04	0.363
193	6.32	-3.84	-26.17	0.364
194	6.36	-3.83	-26.29	0.366
195	6.39	-3.82	-26.42	0.368
196	6.42	-3.81	-26.54	0.369
197	6.45	-3.80	-26.67	0.371
198	6.49	-3.78	-26.79	0.372
199	6.52	-3.77	-26.92	0.374
200	6.55	-3.76	-27.04	0.376
201	6.59	-3.75	-27.17	0.377
202	6.62	-3.73	-27.29	0.379
203	6.65	-3.72	-27.41	0.380
204	6.69	-3.71	-27.53	0.382
205	6.72	-3.70	-27.66	0.383
206	6.75	-3.68	-27.78	0.385
207	6.78	-3.67	-27.90	0.386
208	6.82	-3.66	-28.02	0.388
209	6.85	-3.64	-28.14	0.390
210	6.88	-3.63	-28.26	0.391
211	6.92	-3.62	-28.38	0.393
212	6.95	-3.60	-28.50	0.394
213	6.98	-3.59	-28.61	0.396
214	7.01	-3.57	-28.73	0.397
215	7.05	-3.56	-28.85	0.398
216	7.08	-3.55	-28.97	0.400
217	7.11	-3.53	-29.08	0.401
218	7.15	-3.52	-29.20	0.403
219	7.18	-3.50	-29.32	0.404
220	7.21	-3.49	-29.43	0.406
221	7.25	-3.47	-29.55	0.407
222	7.28	-3.46	-29.66	0.409
223	7.31	-3.45	-29.77	0.410
224	7.34	-3.43	-29.89	0.411
225	7.38	-3.42	-30.00	0.413
226	7.41	-3.40	-30.11	0.414
227	7.44	-3.39	-30.22	0.416
228	7.48	-3.37	-30.33	0.417
229	7.51	-3.36	-30.45	0.418
230	7.54	-3.34	-30.56	0.420
231	7.57	-3.32	-30.67	0.421
232	7.61	-3.31	-30.77	0.422
233	7.64	-3.29	-30.88	0.424
234	7.67	-3.28	-30.99	0.425
235	7.71	-3.26	-31.10	0.426
236	7.74	-3.25	-31.21	0.428
237	7.77	-3.23	-31.31	0.429
238	7.81	-3.21	-31.42	0.430
239	7.84	-3.20	-31.52	0.432

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240	7.87	-3.18	-31.63	0.433
241	7.90	-3.17	-31.73	0.434
242	7.94	-3.15	-31.84	0.436
243	7.97	-3.13	-31.94	0.437
244	8.00	-3.12	-32.04	0.438
245	8.04	-3.10	-32.15	0.439
246	8.07	-3.08	-32.25	0.440
247	8.10	-3.06	-32.35	0.442
248	8.13	-3.05	-32.45	0.443
249	8.17	-3.03	-32.55	0.444
250	8.20	-3.01	-32.65	0.445
251	8.23	-3.00	-32.75	0.447
252	8.27	-2.98	-32.85	0.448
253	8.30	-2.96	-32.95	0.449
254	8.33	-2.94	-33.04	0.450
255	8.36	-2.93	-33.14	0.451
256	8.40	-2.91	-33.24	0.452
257	8.43	-2.89	-33.33	0.454
258	8.46	-2.87	-33.43	0.455
259	8.50	-2.85	-33.52	0.456
260	8.53	-2.84	-33.61	0.457
261	8.56	-2.82	-33.71	0.458
262	8.60	-2.80	-33.80	0.459
263	8.63	-2.78	-33.89	0.460
264	8.66	-2.76	-33.98	0.461
265	8.69	-2.74	-34.07	0.462
266	8.73	-2.72	-34.16	0.463
267	8.76	-2.70	-34.25	0.464
268	8.79	-2.69	-34.34	0.465
269	8.83	-2.67	-34.43	0.467
270	8.86	-2.65	-34.52	0.468
271	8.89	-2.63	-34.60	0.469
272	8.92	-2.61	-34.69	0.470
273	8.96	-2.59	-34.78	0.471
274	8.99	-2.57	-34.86	0.472
275	9.02	-2.55	-34.94	0.473
276	9.06	-2.53	-35.03	0.474
277	9.09	-2.51	-35.11	0.474
278	9.12	-2.49	-35.19	0.475
279	9.16	-2.47	-35.27	0.476
280	9.19	-2.45	-35.36	0.477
281	9.22	-2.43	-35.44	0.478
282	9.25	-2.41	-35.52	0.479
283	9.29	-2.39	-35.59	0.480
284	9.32	-2.37	-35.67	0.481
285	9.35	-2.35	-35.75	0.482
286	9.39	-2.33	-35.83	0.483
287	9.42	-2.31	-35.90	0.484
288	9.45	-2.28	-35.98	0.484
289	9.48	-2.26	-36.05	0.485
290	9.52	-2.24	-36.13	0.486
291	9.55	-2.22	-36.20	0.487
292	9.58	-2.20	-36.28	0.488
293	9.62	-2.18	-36.35	0.489
294	9.65	-2.16	-36.42	0.489
295	9.68	-2.14	-36.49	0.490
296	9.72	-2.11	-36.56	0.491
297	9.75	-2.09	-36.63	0.492
298	9.78	-2.07	-36.70	0.493
299	9.81	-2.05	-36.77	0.493
300	9.85	-2.03	-36.83	0.494
301	9.88	-2.01	-36.90	0.495
302	9.91	-1.98	-36.96	0.496

				report.out
303	9.95	-1.96	-37.03	0.496
304	9.98	-1.94	-37.09	0.497
305	10.01	-1.92	-37.16	0.498
306	10.04	-1.89	-37.22	0.498
307	10.08	-1.87	-37.28	0.499
308	10.11	-1.85	-37.34	0.500
309	10.14	-1.83	-37.40	0.500
310	10.18	-1.80	-37.46	0.501
311	10.21	-1.78	-37.52	0.502
312	10.24	-1.76	-37.58	0.502
313	10.28	-1.74	-37.64	0.503
314	10.31	-1.71	-37.70	0.504
315	10.34	-1.69	-37.75	0.504
316	10.37	-1.67	-37.81	0.505
317	10.41	-1.64	-37.86	0.505
318	10.44	-1.62	-37.91	0.506
319	10.47	-1.60	-37.97	0.507
320	10.51	-1.57	-38.02	0.507
321	10.54	-1.55	-38.07	0.508
322	10.57	-1.52	-38.12	0.508
323	10.60	-1.50	-38.17	0.509
324	10.64	-1.48	-38.22	0.509
325	10.67	-1.45	-38.27	0.510
326	10.70	-1.43	-38.32	0.510
327	10.74	-1.40	-38.36	0.511
328	10.77	-1.38	-38.41	0.511
329	10.80	-1.35	-38.45	0.512
330	10.83	-1.33	-38.50	0.512
331	10.87	-1.30	-38.54	0.513
332	10.90	-1.28	-38.58	0.513
333	10.93	-1.25	-38.63	0.513
334	10.97	-1.23	-38.67	0.514
335	11.00	-1.20	-38.71	0.514
336	11.03	-1.18	-38.75	0.515
337	11.07	-1.15	-38.78	0.515
338	11.10	-1.13	-38.82	0.515
339	11.13	-1.10	-38.86	0.516
340	11.16	-1.08	-38.89	0.516
341	11.20	-1.05	-38.93	0.516
342	11.23	-1.02	-38.96	0.517
343	11.26	-1.00	-39.00	0.517
344	11.30	-0.97	-39.03	0.517
345	11.33	-0.95	-39.06	0.518
346	11.36	-0.92	-39.09	0.518
347	11.39	-0.89	-39.12	0.518
348	11.43	-0.87	-39.15	0.519
349	11.46	-0.84	-39.18	0.519
350	11.49	-0.81	-39.21	0.519
351	11.53	-0.79	-39.23	0.519
352	11.56	-0.76	-39.26	0.520
353	11.59	-0.73	-39.28	0.520
354	11.63	-0.71	-39.31	0.520
355	11.66	-0.68	-39.33	0.520
356	11.69	-0.65	-39.35	0.520
357	11.72	-0.62	-39.37	0.521
358	11.76	-0.60	-39.39	0.521
359	11.79	-0.57	-39.41	0.521
360	11.82	-0.54	-39.43	0.521
361	11.86	-0.51	-39.45	0.521
362	11.89	-0.49	-39.46	0.521
363	11.92	-0.46	-39.48	0.522
364	11.95	-0.43	-39.49	0.522
365	11.99	-0.40	-39.51	0.522

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366	12.02	-0.38	-39.52	0.522
367	12.05	-0.35	-39.53	0.522
368	12.09	-0.32	-39.54	0.522
369	12.12	-0.29	-39.55	0.522
370	12.15	-0.26	-39.56	0.522
371	12.19	-0.23	-39.57	0.522
372	12.22	-0.21	-39.58	0.522
373	12.25	-0.18	-39.58	0.522
374	12.28	-0.15	-39.59	0.522
375	12.32	-0.12	-39.59	0.522
376	12.35	-0.09	-39.60	0.522
377	12.38	-0.06	-39.60	0.522
378	12.42	-0.03	-39.60	0.522
379	12.45	0.00	-39.60	0.522
380	12.48	0.03	-39.60	0.522
381	12.51	0.06	-39.60	0.522
382	12.55	0.09	-39.60	0.522
383	12.58	0.11	-39.59	0.522
384	12.61	0.14	-39.59	0.522
385	12.65	0.17	-39.58	0.522
386	12.68	0.20	-39.58	0.522
387	12.71	0.23	-39.57	0.521
388	12.75	0.26	-39.56	0.521
389	12.78	0.29	-39.55	0.521
390	12.81	0.32	-39.54	0.521
391	12.84	0.35	-39.53	0.521
392	12.88	0.38	-39.52	0.521
393	12.91	0.42	-39.51	0.521
394	12.94	0.45	-39.49	0.520
395	12.98	0.48	-39.48	0.520
396	13.01	0.51	-39.46	0.520
397	13.04	0.54	-39.44	0.520
398	13.07	0.57	-39.43	0.519
399	13.11	0.60	-39.41	0.519
400	13.14	0.63	-39.39	0.519
401	13.17	0.66	-39.36	0.519
402	13.21	0.69	-39.34	0.518
403	13.24	0.72	-39.32	0.518
404	13.27	0.76	-39.29	0.518
405	13.30	0.79	-39.27	0.518
406	13.34	0.82	-39.24	0.517
407	13.37	0.85	-39.22	0.517
408	13.40	0.88	-39.19	0.517
409	13.44	0.91	-39.16	0.516
410	13.47	0.95	-39.13	0.516
411	13.50	0.98	-39.09	0.516
412	13.54	1.01	-39.06	0.515
413	13.57	1.04	-39.03	0.515
414	13.60	1.08	-38.99	0.514
415	13.63	1.11	-38.96	0.514
416	13.67	1.14	-38.92	0.514
417	13.70	1.17	-38.88	0.513
418	13.73	1.21	-38.84	0.513
419	13.77	1.24	-38.80	0.512
420	13.80	1.27	-38.76	0.512
421	13.83	1.30	-38.72	0.511
422	13.86	1.34	-38.68	0.511
423	13.90	1.37	-38.63	0.510
424	13.93	1.40	-38.59	0.510
425	13.96	1.44	-38.54	0.509
426	14.00	1.47	-38.49	0.509
427	14.03	1.50	-38.44	0.508
428	14.06	1.54	-38.39	0.508

				report.out
429	14.10	1.57	-38.34	0.507
430	14.13	1.60	-38.29	0.507
431	14.16	1.64	-38.24	0.506
432	14.19	1.67	-38.18	0.506
433	14.23	1.71	-38.13	0.505
434	14.26	1.74	-38.07	0.504
435	14.29	1.77	-38.01	0.504
436	14.33	1.81	-37.95	0.503
437	14.36	1.84	-37.89	0.503
438	14.39	1.88	-37.83	0.502
439	14.42	1.91	-37.77	0.501
440	14.46	1.95	-37.70	0.501
441	14.49	1.98	-37.64	0.500
442	14.52	2.02	-37.57	0.499
443	14.56	2.05	-37.51	0.499
444	14.59	2.09	-37.44	0.498
445	14.62	2.12	-37.37	0.497
446	14.66	2.16	-37.30	0.496
447	14.69	2.19	-37.23	0.496
448	14.72	2.23	-37.15	0.495
449	14.75	2.26	-37.08	0.494
450	14.79	2.30	-37.01	0.494
451	14.82	2.33	-36.93	0.493
452	14.85	2.37	-36.85	0.492
453	14.89	2.40	-36.77	0.491
454	14.92	2.44	-36.69	0.490
455	14.95	2.48	-36.61	0.490
456	14.98	2.51	-36.53	0.489
457	15.02	2.55	-36.45	0.488
458	15.05	2.58	-36.36	0.487
459	15.08	2.61	-36.28	0.486
460	15.12	2.64	-36.19	0.486
461	15.15	2.68	-36.10	0.485
462	15.18	2.71	-36.01	0.484
463	15.22	2.74	-35.92	0.483
464	15.25	2.78	-35.83	0.482
465	15.28	2.81	-35.74	0.481
466	15.31	2.84	-35.65	0.480
467	15.35	2.88	-35.55	0.479
468	15.38	2.91	-35.46	0.478
469	15.41	2.94	-35.36	0.478
470	15.45	2.97	-35.27	0.477
471	15.48	3.01	-35.17	0.476
472	15.51	3.04	-35.07	0.475
473	15.54	3.07	-34.97	0.474
474	15.58	3.11	-34.87	0.473
475	15.61	3.14	-34.76	0.472
476	15.64	3.17	-34.66	0.471
477	15.68	3.21	-34.55	0.470
478	15.71	3.24	-34.45	0.469
479	15.74	3.27	-34.34	0.468
480	15.77	3.31	-34.23	0.467
481	15.81	3.34	-34.12	0.466
482	15.84	3.37	-34.01	0.465
483	15.87	3.41	-33.90	0.464
484	15.91	3.44	-33.79	0.463
485	15.94	3.47	-33.67	0.462
486	15.97	3.51	-33.56	0.460
487	16.01	3.54	-33.44	0.459
488	16.04	3.56	-33.33	0.458
489	16.07	3.59	-33.21	0.457
490	16.10	3.61	-33.09	0.456
491	16.14	3.63	-32.97	0.455

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492	16.17	3.66	-32.85	0.454
493	16.20	3.68	-32.73	0.453
494	16.24	3.70	-32.61	0.452
495	16.27	3.72	-32.49	0.450
496	16.30	3.75	-32.36	0.449
497	16.33	3.77	-32.24	0.448
498	16.37	3.79	-32.11	0.447
499	16.40	3.81	-31.99	0.446
500	16.43	3.83	-31.86	0.444
501	16.47	3.85	-31.74	0.443
502	16.50	3.87	-31.61	0.442
503	16.53	3.89	-31.48	0.441
504	16.57	3.91	-31.35	0.440
505	16.60	3.93	-31.22	0.438
506	16.63	3.95	-31.09	0.437
507	16.66	3.97	-30.96	0.436
508	16.70	3.99	-30.83	0.435
509	16.73	4.01	-30.70	0.433
510	16.76	4.02	-30.57	0.432
511	16.80	4.04	-30.44	0.431
512	16.83	4.06	-30.30	0.429
513	16.86	4.08	-30.17	0.428
514	16.89	4.09	-30.03	0.427
515	16.93	4.11	-29.90	0.426
516	16.96	4.13	-29.76	0.424
517	16.99	4.14	-29.63	0.423
518	17.03	4.16	-29.49	0.422
519	17.06	4.17	-29.35	0.420
520	17.09	4.19	-29.22	0.419
521	17.13	4.20	-29.08	0.418
522	17.16	4.22	-28.94	0.416
523	17.19	4.23	-28.80	0.415
524	17.22	4.25	-28.66	0.413
525	17.26	4.26	-28.52	0.412
526	17.29	4.27	-28.38	0.411
527	17.32	4.29	-28.24	0.409
528	17.36	4.30	-28.10	0.408
529	17.39	4.31	-27.96	0.406
530	17.42	4.32	-27.81	0.405
531	17.45	4.34	-27.67	0.404
532	17.49	4.35	-27.53	0.402
533	17.52	4.36	-27.38	0.401
534	17.55	4.37	-27.24	0.399
535	17.59	4.38	-27.10	0.398
536	17.62	4.39	-26.95	0.396
537	17.65	4.40	-26.81	0.395
538	17.69	4.41	-26.66	0.393
539	17.72	4.42	-26.52	0.392
540	17.75	4.43	-26.37	0.390
541	17.78	4.44	-26.22	0.389
542	17.82	4.45	-26.08	0.387
543	17.85	4.46	-25.93	0.386
544	17.88	4.46	-25.79	0.384
545	17.92	4.47	-25.64	0.383
546	17.95	4.48	-25.49	0.381
547	17.98	4.49	-25.34	0.380
548	18.01	4.49	-25.19	0.378
549	18.05	4.50	-25.05	0.377
550	18.08	4.51	-24.90	0.375
551	18.11	4.51	-24.75	0.373
552	18.15	4.52	-24.60	0.372
553	18.18	4.53	-24.45	0.370
554	18.21	4.53	-24.30	0.369

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555	18.24	4.54	-24.15	0.367
556	18.28	4.54	-24.00	0.365
557	18.31	4.55	-23.85	0.364
558	18.34	4.55	-23.70	0.362
559	18.38	4.56	-23.55	0.361
560	18.41	4.56	-23.40	0.359
561	18.44	4.56	-23.25	0.357
562	18.48	4.57	-23.10	0.356
563	18.51	4.57	-22.95	0.354
564	18.54	4.57	-22.80	0.352
565	18.57	4.57	-22.65	0.351
566	18.61	4.58	-22.50	0.349
567	18.64	4.58	-22.35	0.347
568	18.67	4.58	-22.20	0.346
569	18.71	4.58	-22.05	0.344
570	18.74	4.58	-21.90	0.342
571	18.77	4.58	-21.75	0.341
572	18.80	4.58	-21.60	0.339
573	18.84	4.58	-21.45	0.337
574	18.87	4.58	-21.29	0.336
575	18.90	4.58	-21.14	0.334
576	18.94	4.58	-20.99	0.332
577	18.97	4.58	-20.84	0.331
578	19.00	4.58	-20.69	0.329
579	19.04	4.58	-20.54	0.327
580	19.07	4.58	-20.39	0.325
581	19.10	4.58	-20.24	0.324
582	19.13	4.57	-20.09	0.322
583	19.17	4.57	-19.94	0.320
584	19.20	4.57	-19.79	0.318
585	19.23	4.56	-19.64	0.317
586	19.27	4.56	-19.49	0.315
587	19.30	4.56	-19.34	0.313
588	19.33	4.55	-19.19	0.311
589	19.36	4.55	-19.04	0.309
590	19.40	4.54	-18.89	0.308
591	19.43	4.54	-18.74	0.306
592	19.46	4.53	-18.59	0.304
593	19.50	4.53	-18.44	0.302
594	19.53	4.52	-18.29	0.300
595	19.56	4.51	-18.14	0.299
596	19.60	4.51	-17.99	0.297
597	19.63	4.50	-17.84	0.295
598	19.66	4.49	-17.70	0.293
599	19.69	4.49	-17.55	0.291
600	19.73	4.48	-17.40	0.290
601	19.76	4.47	-17.25	0.288
602	19.79	4.46	-17.11	0.286
603	19.83	4.45	-16.96	0.284
604	19.86	4.45	-16.81	0.282
605	19.89	4.44	-16.67	0.280
606	19.92	4.43	-16.52	0.278
607	19.96	4.42	-16.38	0.277
608	19.99	4.41	-16.23	0.275
609	20.02	4.40	-16.08	0.273
610	20.06	4.39	-15.94	0.271
611	20.09	4.38	-15.80	0.269
612	20.12	4.36	-15.65	0.267
613	20.15	4.35	-15.51	0.265
614	20.19	4.34	-15.37	0.263
615	20.22	4.33	-15.22	0.262
616	20.25	4.32	-15.08	0.260
617	20.29	4.31	-14.94	0.258

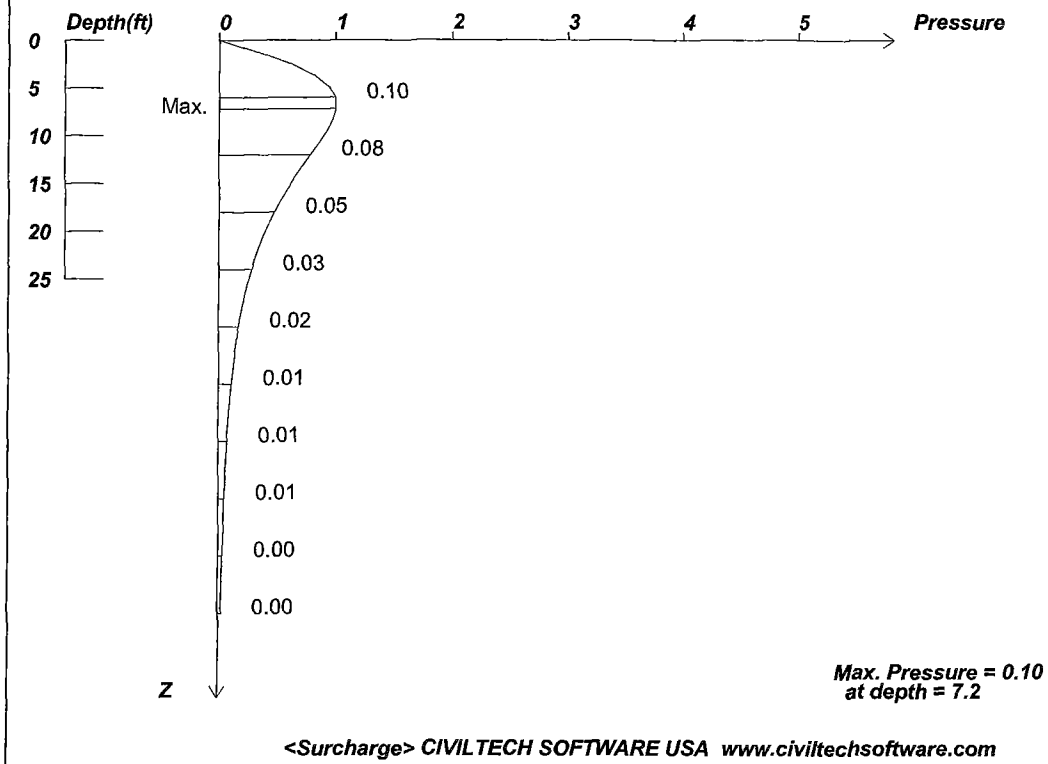
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618	20.32	4.29	-14.80	0.256
619	20.35	4.28	-14.66	0.254
620	20.39	4.27	-14.51	0.252
621	20.42	4.25	-14.37	0.250
622	20.45	4.24	-14.23	0.248
623	20.48	4.22	-14.10	0.246
624	20.52	4.21	-13.96	0.244
625	20.55	4.20	-13.82	0.242
626	20.58	4.18	-13.68	0.240
627	20.62	4.17	-13.54	0.238
628	20.65	4.15	-13.41	0.237
629	20.68	4.13	-13.27	0.235
630	20.71	4.12	-13.13	0.233
631	20.75	4.10	-13.00	0.231
632	20.78	4.09	-12.86	0.229
633	20.81	4.07	-12.73	0.227
634	20.85	4.05	-12.60	0.225
635	20.88	4.03	-12.46	0.223
636	20.91	4.02	-12.33	0.221
637	20.95	4.00	-12.20	0.219
638	20.98	3.98	-12.07	0.217
639	21.01	3.96	-11.94	0.215
640	21.04	3.94	-11.81	0.213
641	21.08	3.92	-11.68	0.211
642	21.11	3.90	-11.55	0.209
643	21.14	3.88	-11.42	0.207
644	21.18	3.86	-11.29	0.205
645	21.21	3.84	-11.16	0.203
646	21.24	3.82	-11.04	0.201
647	21.27	3.80	-10.91	0.199
648	21.31	3.78	-10.79	0.197
649	21.34	3.76	-10.66	0.195
650	21.37	3.74	-10.54	0.193
651	21.41	3.72	-10.42	0.191
652	21.44	3.70	-10.29	0.189
653	21.47	3.67	-10.17	0.187
654	21.51	3.65	-10.05	0.185
655	21.54	3.63	-9.93	0.183
656	21.57	3.60	-9.81	0.181
657	21.60	3.58	-9.70	0.179
658	21.64	3.56	-9.58	0.177
659	21.67	3.53	-9.46	0.175
660	21.70	3.51	-9.35	0.173
661	21.74	3.49	-9.23	0.171
662	21.77	3.47	-9.12	0.169
663	21.80	3.44	-9.00	0.167
664	21.83	3.42	-8.89	0.165
665	21.87	3.40	-8.78	0.162
666	21.90	3.38	-8.66	0.160
667	21.93	3.36	-8.55	0.158
668	21.97	3.34	-8.44	0.156
669	22.00	3.32	-8.33	0.154
670	22.03	3.30	-8.22	0.152
671	22.07	3.28	-8.12	0.150
672	22.10	3.26	-8.01	0.148
673	22.13	3.25	-7.90	0.146
674	22.16	3.23	-7.79	0.144
675	22.20	3.21	-7.69	0.142
676	22.23	3.20	-7.58	0.140
677	22.26	3.18	-7.48	0.138
678	22.30	3.17	-7.37	0.136
679	22.33	3.15	-7.27	0.134
680	22.36	3.14	-7.17	0.132

				report.out
681	22.39	3.12	-7.06	0.129
682	22.43	3.11	-6.96	0.127
683	22.46	3.09	-6.86	0.125
684	22.49	3.08	-6.76	0.123
685	22.53	3.07	-6.66	0.121
686	22.56	3.05	-6.55	0.119
687	22.59	3.04	-6.45	0.117
688	22.62	3.02	-6.35	0.115
689	22.66	3.01	-6.26	0.113
690	22.69	2.99	-6.16	0.111
691	22.72	2.97	-6.06	0.109
692	22.76	2.96	-5.96	0.106
693	22.79	2.94	-5.86	0.104
694	22.82	2.93	-5.77	0.102
695	22.86	2.91	-5.67	0.100
696	22.89	2.89	-5.58	0.098
697	22.92	2.87	-5.48	0.096
698	22.95	2.86	-5.39	0.094
699	22.99	2.84	-5.29	0.092
700	23.02	2.82	-5.20	0.090
701	23.05	2.80	-5.11	0.087
702	23.09	2.79	-5.01	0.085
703	23.12	2.77	-4.92	0.083
704	23.15	2.75	-4.83	0.081
705	23.18	2.73	-4.74	0.079
706	23.22	2.71	-4.65	0.077
707	23.25	2.69	-4.56	0.075
708	23.28	2.67	-4.48	0.073
709	23.32	2.65	-4.39	0.071
710	23.35	2.63	-4.30	0.068
711	23.38	2.61	-4.21	0.066
712	23.42	2.59	-4.13	0.064
713	23.45	2.57	-4.04	0.062
714	23.48	2.55	-3.96	0.060
715	23.51	2.53	-3.88	0.058
716	23.55	2.51	-3.79	0.056
717	23.58	2.49	-3.71	0.054
718	23.61	2.46	-3.63	0.051
719	23.65	2.44	-3.55	0.049
720	23.68	2.42	-3.47	0.047
721	23.71	2.40	-3.39	0.045
722	23.74	2.38	-3.31	0.043
723	23.78	2.35	-3.23	0.041
724	23.81	2.33	-3.15	0.039
725	23.84	2.31	-3.08	0.036
726	23.88	2.28	-3.00	0.034
727	23.91	2.26	-2.93	0.032
728	23.94	2.24	-2.85	0.030
729	23.98	2.21	-2.78	0.028
730	24.01	2.19	-2.71	0.026
731	24.04	2.16	-2.64	0.024
732	24.07	2.14	-2.57	0.021
733	24.11	2.12	-2.50	0.019
734	24.14	2.09	-2.43	0.017
735	24.17	2.07	-2.36	0.015
736	24.21	2.04	-2.29	0.013
737	24.24	2.01	-2.22	0.011
738	24.27	1.99	-2.16	0.009
739	24.30	1.96	-2.09	0.006
740	24.34	1.94	-2.03	0.004
741	24.37	1.91	-1.97	0.002
742	24.40	1.88	-1.90	0.000
743	24.44	1.86	-1.84	-0.002

				report.out
744	24.47	1.83	-1.78	-0.004
745	24.50	1.80	-1.72	-0.006
746	24.53	1.78	-1.66	-0.009
747	24.57	1.75	-1.60	-0.011
748	24.60	1.72	-1.55	-0.013
749	24.63	1.69	-1.49	-0.015
750	24.67	1.66	-1.43	-0.017
751	24.70	1.64	-1.38	-0.019
752	24.73	1.61	-1.33	-0.022
753	24.77	1.58	-1.27	-0.024
754	24.80	1.55	-1.22	-0.026
755	24.83	1.52	-1.17	-0.028
756	24.86	1.49	-1.12	-0.030
757	24.90	1.46	-1.07	-0.032
758	24.93	1.43	-1.03	-0.034
759	24.96	1.40	-0.98	-0.037
760	25.00	1.37	-0.93	-0.039
761	25.03	1.34	-0.89	-0.041
762	25.06	1.31	-0.85	-0.043
763	25.09	1.28	-0.80	-0.045
764	25.13	1.25	-0.76	-0.047
765	25.16	1.22	-0.72	-0.050
766	25.19	1.18	-0.68	-0.052
767	25.23	1.15	-0.64	-0.054
768	25.26	1.12	-0.61	-0.056
769	25.29	1.09	-0.57	-0.058
770	25.33	1.06	-0.53	-0.060
771	25.36	1.02	-0.50	-0.062
772	25.39	0.99	-0.47	-0.065
773	25.42	0.96	-0.43	-0.067
774	25.46	0.93	-0.40	-0.069
775	25.49	0.89	-0.37	-0.071
776	25.52	0.86	-0.35	-0.073
777	25.56	0.83	-0.32	-0.075
778	25.59	0.79	-0.29	-0.078
779	25.62	0.76	-0.27	-0.080
780	25.65	0.72	-0.24	-0.082
781	25.69	0.69	-0.22	-0.084
782	25.72	0.65	-0.20	-0.086
783	25.75	0.62	-0.17	-0.088
784	25.79	0.58	-0.15	-0.090
785	25.82	0.55	-0.14	-0.093
786	25.85	0.51	-0.12	-0.095
787	25.89	0.48	-0.10	-0.097
788	25.92	0.44	-0.09	-0.099
789	25.95	0.41	-0.07	-0.101
790	25.98	0.37	-0.06	-0.103
791	26.02	0.33	-0.05	-0.106
792	26.05	0.30	-0.04	-0.108
793	26.08	0.26	-0.03	-0.110
794	26.12	0.22	-0.02	-0.112
795	26.15	0.18	-0.02	-0.114
796	26.18	0.15	-0.01	-0.116
797	26.21	0.11	-0.01	-0.119
798	26.25	0.07	0.00	-0.121
799	26.28	0.03	0.00	-0.123

 Users can select data, then copy and paste into Excel to create graphics

Legacy Pkwy - C863 Bent 2 - Spoils at 8ft - GW at 5ft



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Date: 1/22/2007

Wall Height, H= 15

Load Depth at Surface, D= 0

Load Factor of Surcharge Loading = 1

Flexible Wall Condition -- Small Movement or deflection are allowed.

Max. Pressure = 0.10 at depth = 7.2

X	Width	Strip Load
8.0	10.0	.63

UNITS: LENGTH, DEPTH: ft, Qpoint: kip, Qline: kip/ft, Qstrip, Qarea, PRESSURE: ksf

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SURCHARGE LOADS CALCULATION SUMMARY

<Surcharge>

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Time: 12/30/1899 12:23:05 PM
Date: 1/22/2007

Legacy Pkwy - C863 Bent 2 - Spoils at 8ft - GW at 5ft

Height of wall = 15
Depth of wall = 0
Load Factor of Surcharge Loading = 1

Wall Condition:
Flexible wall Condition -- Small Movement or deflection are allowed.

*****Loading*****

STRIP LOADING:

Xstrip	width	Qstrip
8.0	10.0	0.6

*****Total Pressure Distribution*****

Max. Pressure =0.100 at depth =7.20

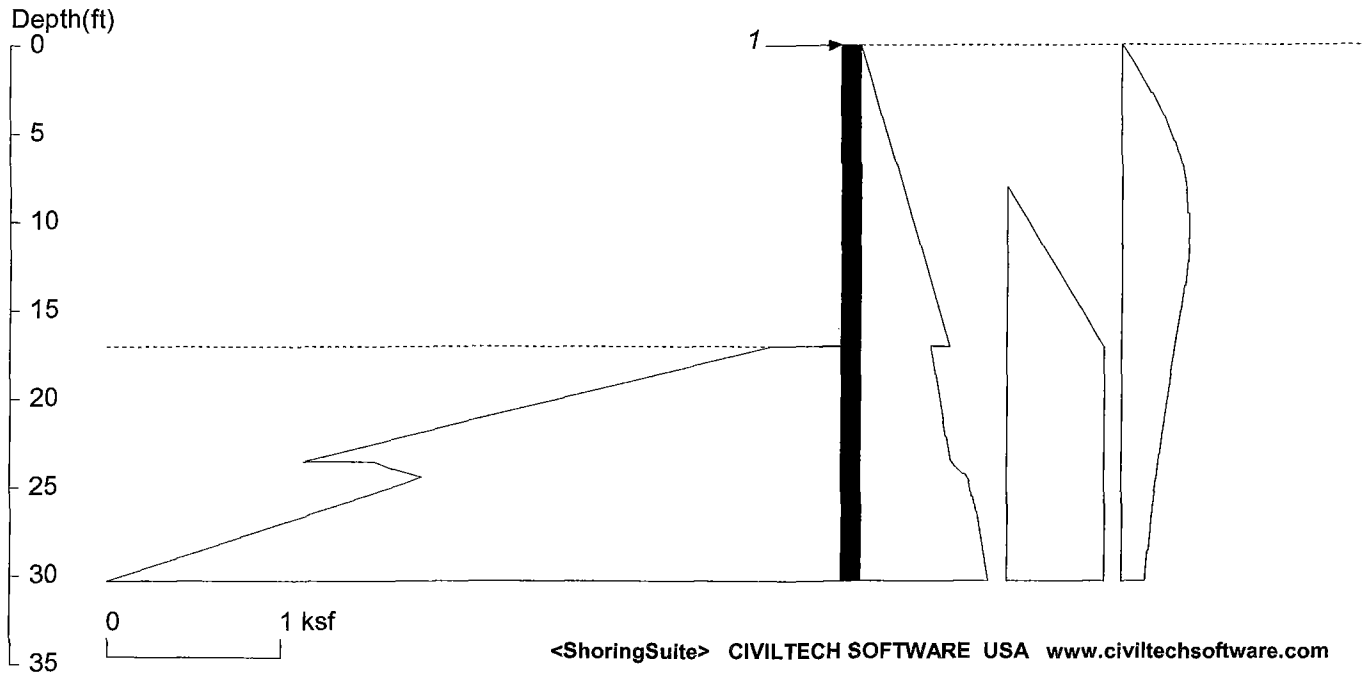
Depth	Pressure
0.00	0.000
1.20	0.032
2.40	0.060
3.60	0.081
4.80	0.094
6.00	0.100
7.20	0.100
8.40	0.097
9.60	0.092
10.80	0.086
12.00	0.079
13.20	0.072
14.40	0.065
15.60	0.058
16.80	0.053
18.00	0.047
19.20	0.043
20.40	0.038
21.60	0.035
22.80	0.031
24.00	0.028
25.20	0.026
26.40	0.023
27.60	0.021
28.80	0.019
30.00	0.017

	report.out
31.20	0.016
32.40	0.015
33.60	0.013
34.80	0.012
36.00	0.011
37.20	0.010
38.40	0.010
39.60	0.009
40.80	0.008
42.00	0.008
43.20	0.007
44.40	0.007
45.60	0.006
46.80	0.006
48.00	0.005
49.20	0.005
50.40	0.005
51.60	0.004
52.80	0.004
54.00	0.004
55.20	0.004
56.40	0.003
57.60	0.003
58.80	0.003
60.00	0.003

Depth Is Measured From Top of the wall

LENGTH, DEPTH: ft, Qpoint: kip, Qline: kip/ft, Qstrip, Qarea, PRESSURE: ksf

Legacy Pkwy - C867 Bent 2 - E80 at 14ft - GW at 8ft with wall friction



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Date: 1/22/2007

File Name: W:\00409 BUILDINC\046 Legacy Segment 3 - C863 & C867\ShoringSuite\C867 - 17

Wall Height=17.0

Pile Diameter=1.0

Pile Spacing=1.0

ACTIVE SPACE:		Z depth	Spacing
1		0.00	1.00
2		17.00	1.00
PASSIVE SPACE:		Z depth	Spacing
1		17.00	1.00

PILE LENGTH: Min. Embedment=13.27, Min. Pile Length=30.27

MOMENT IN PILE: Max. Moment=66.55 at Depth of 13.45

VERTICAL BEARING CAPACITY: Vertical Loading=0.0, Resistance=44.0, Vertical Factor of Safety=999.00

PILE SELECTION:

Request Min. Section Modulus = 24.2 in³/feet, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66

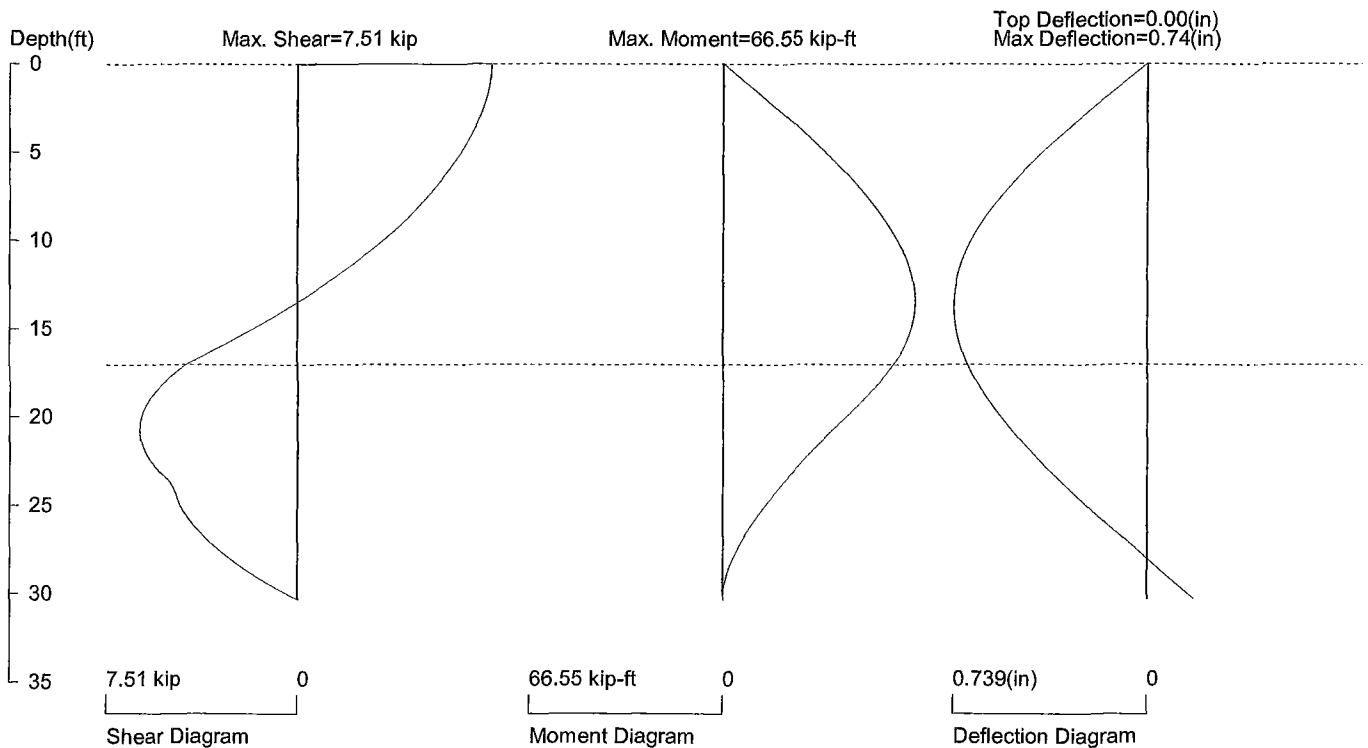
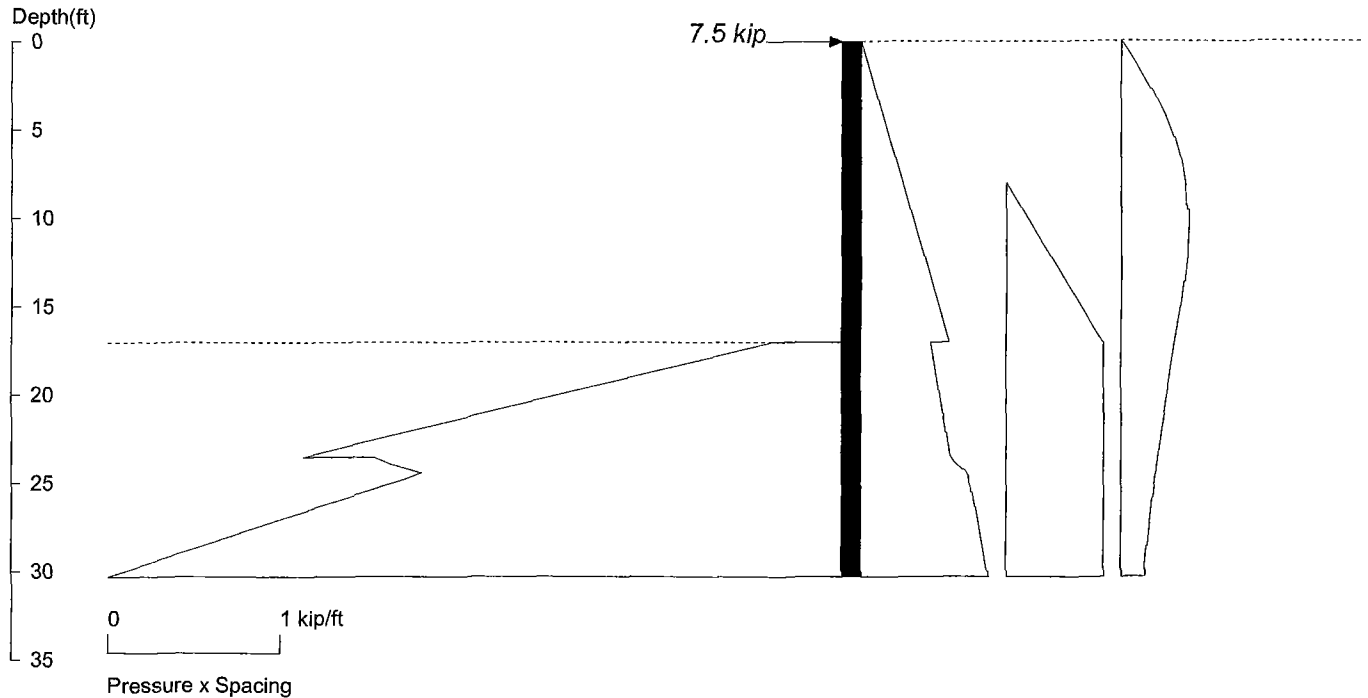
AZ26 has Section Modulus = 48.4. It is greater than Min. Requirements!, Top Deflection = 0.00(in)

BRACE FORCE: Strut, Tieback, Plate Anchor, and Deadman

No. & Type	Depth	Angle	Total	Horiz.	Vert.	N/A	N/A
1. Strut	0.0	0.0	7.5	7.5	0.0	0.0	0.0

UNITS: Length/Depth - ft, Force - kip, Moment - kip-ft, Pressure - ksf, Pres. Slope - kip/ft³, Deflection - in

Legacy Pkwy - C867 Bent 2 - E80 at 14ft - GW at 8f with wall friction



PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on one soldier pile or one foot spacing of sheet pile

Pile: AZ26 meet Section Requirements. Properties: 6. E (ksi)=29000, 4. I (in⁴)=406.5

Date: 1/22/2007 File Name: W:\00409 BUILDINC\046 Legacy Segment 3 - C863 & C867\ShoringSuite\C867 - 17ft_E80_14ft_GW_8ft_wf.sh8

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<ShoringSuite> CIVILTECH SOFTWARE USA www.civiltechsoftware.com

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SHORING WALL CALCULATION SUMMARY

The leading shoring design and calculation software
Software Copyright by CivilTech Software
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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

DEPTH: ft, PRESSURE, FRICTION, BEARING: ksf, SLOPE: kcf, FORCE: kip, MOMENT: kip-ft,
DEFLECTION: in, I: in⁴, E: ksi

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Date: 1/22/2007 File: W:\00409 BUILDINC\046 Legacy Segment 3 - C863 &
C867\ShoringSuite\C867 - 17ft_E80_14ft_GW_8ft_wf.sh8

Title: Legacy Pkwy - C867 Bent 2 - E80 at 14ft - GW at 8ft

Subtitle: with wall friction

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

Wall Type: 1. Sheet Pile

Wall Height: 17.00

Pile Diameter: 1.00

Pile Spacing: 1.00

Factor of Safety (F.S.): 1.50

Max. Moment reduce 20%

Lateral Support Type (Braces): 2. Strut, Raker

Top Brace Increase (Multi-Bracing): Add 15%*

Brace Position (One Brace Case): Normal Brace*

Embedment Option: 1. Yes

Friction at Pile Tip: No*

Check Vertical Bearing Capacity:

Side Friction for Bearing: 1.00

Tip Resistance for Bearing: 1.00

Pile Properties:

Allowable Fb/Fy: 0.66

Steel Strength, Fy: 50 ksi = 345 MPa

Elastic Module, E: 29000.00

Moment of Inertia, I: 406.40

User Input Pile: AZ26

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

No.	Z2 top	Top Pres.	Z2 bottom	Bottom Pres.	Slope
1	0.00	0.00	17.00	0.52	0.0300
2	17.00	0.40	21.25	0.47	0.0180
3	21.25	0.47	22.10	0.49	0.0190
4	22.10	0.49	23.38	0.51	0.0180
5	23.38	0.51	23.80	0.54	0.0720
6	23.80	0.54	24.22	0.60	0.1210
7	24.22	0.60	24.65	0.62	0.0670
8	24.65	0.62	25.50	0.64	0.0190

9	25.50	0.64	report.out	26.35	0.66	0.0210
10	26.35	0.66		38.25	0.89	0.0190
11	38.25	0.89		38.67	0.87	-0.0340
12	38.67	0.87		39.10	0.78	-0.2090
13	39.10	0.78		39.52	0.72	-0.1560
14	39.52	0.72		44.63	0.80	0.0170
15	44.63	0.80		45.05	0.81	0.0210
16	45.05	0.81		45.48	0.82	0.0220
17	45.48	0.82		45.90	0.83	0.0190
18	45.90	0.83		59.92	1.07	0.0170
19	59.92	1.07		60.35	1.08	0.0200
20	60.35	1.08		60.77	1.09	0.0210
21	60.77	1.09		61.20	1.10	0.0190
22	61.20	1.10		85.00	1.51	0.0170
23	8.00	0.00		17.00	0.56	0.0620
24	17.00	0.56		85.00	0.56	0.0000
25	0.00	0.00		1.36	0.09	0.0680
26	1.36	0.09		2.72	0.18	0.0630
27	2.72	0.18		4.08	0.25	0.0540
28	4.08	0.25		5.44	0.31	0.0420
29	5.44	0.31		6.80	0.35	0.0300
30	6.80	0.35		8.16	0.37	0.0180
31	8.16	0.37		9.52	0.39	0.0080
32	9.52	0.39		10.88	0.39	0.0000
33	10.88	0.39		12.24	0.38	-0.0060
34	12.24	0.38		13.60	0.36	-0.0110
35	13.60	0.36		14.96	0.34	-0.0140
36	14.96	0.34		16.32	0.32	-0.0150
37	16.32	0.32		17.68	0.30	-0.0160
38	17.68	0.30		19.04	0.28	-0.0160
39	19.04	0.28		20.40	0.26	-0.0160
40	20.40	0.26		21.76	0.24	-0.0150
41	21.76	0.24		23.12	0.22	-0.0140
42	23.12	0.22		24.48	0.20	-0.0130
43	24.48	0.20		25.84	0.18	-0.0120
44	25.84	0.18		27.20	0.17	-0.0110
45	27.20	0.17		28.56	0.15	-0.0100
46	28.56	0.15		29.92	0.14	-0.0090
47	29.92	0.14		31.28	0.13	-0.0080
48	31.28	0.13		32.64	0.12	-0.0080
49	32.64	0.12		34.00	0.11	-0.0070
50	34.00	0.11		35.36	0.10	-0.0060
51	35.36	0.10		36.72	0.09	-0.0060
52	36.72	0.09		38.08	0.09	-0.0050
53	38.08	0.09		39.44	0.08	-0.0050
54	39.44	0.08		40.80	0.07	-0.0040
55	40.80	0.07		42.16	0.07	-0.0040
56	42.16	0.07		43.52	0.06	-0.0040
57	43.52	0.06		44.88	0.06	-0.0030
58	44.88	0.06		46.24	0.05	-0.0030
59	46.24	0.05		47.60	0.05	-0.0030
60	47.60	0.05		48.96	0.05	-0.0030
61	48.96	0.05		50.32	0.04	-0.0020
62	50.32	0.04		51.68	0.04	-0.0020
63	51.68	0.04		53.04	0.04	-0.0020
64	53.04	0.04		54.40	0.04	-0.0020
65	54.40	0.04		55.76	0.03	-0.0020
66	55.76	0.03		57.12	0.03	-0.0020
67	57.12	0.03		58.48	0.03	-0.0010
68	58.48	0.03		59.84	0.03	-0.0010
69	59.84	0.03		61.20	0.03	-0.0010
70	61.20	0.03		62.56	0.03	-0.0010
71	62.56	0.03		63.92	0.02	-0.0010

72	63.92	0.02	report.out 65.28	0.02	-0.0010
73	65.28	0.02	66.64	0.02	-0.0010
74	66.64	0.02	68.00	0.02	-0.0010

* PASSIVE PRESSURE *

No.	Z1 top	Top Pres.	Z2 bottom	Bottom Pres.	Slope
1	17.00	0.41	23.52	2.69	0.4130
2	23.52	2.69	23.95	2.58	-0.2600
3	23.95	2.58	24.38	2.42	-0.3850
4	24.38	2.42	24.80	2.53	0.2480
5	24.80	2.53	25.23	2.67	0.3280
6	25.23	2.67	25.65	2.80	0.3230
7	25.65	2.80	26.07	2.94	0.3200
8	26.07	2.94	26.50	3.07	0.3170
9	26.50	3.07	26.93	3.21	0.3150
10	26.93	3.21	27.35	3.34	0.3050
11	27.35	3.34	27.77	3.46	0.3010
12	27.77	3.46	28.20	3.59	0.3070
13	28.20	3.59	29.05	3.86	0.3100
14	29.05	3.86	30.32	4.25	0.3080
15	30.32	4.25	32.45	4.90	0.3070
16	32.45	4.90	38.40	6.72	0.3060
17	38.40	6.72	38.83	7.52	1.8790
18	38.83	7.52	39.25	8.82	3.0720
19	39.25	8.82	39.67	9.51	1.6120
20	39.67	9.51	40.10	9.73	0.5310
21	40.10	9.73	40.52	9.96	0.5300
22	40.52	9.96	40.95	10.18	0.5280
23	40.95	10.18	41.38	10.41	0.5260
24	41.38	10.41	41.80	10.63	0.5240
25	41.80	10.63	42.23	10.84	0.4990
26	42.23	10.84	42.65	11.04	0.4580
27	42.65	11.04	43.08	11.24	0.4770
28	43.08	11.24	43.50	11.46	0.5120
29	43.50	11.46	43.92	11.67	0.5110
30	43.92	11.67	44.35	11.89	0.5100
31	44.35	11.89	44.77	12.11	0.5090
32	44.77	12.11	45.20	12.32	0.5080
33	45.20	12.32	46.05	12.75	0.5070
34	46.05	12.75	46.90	13.18	0.5050
35	46.90	13.18	47.75	13.61	0.5030
36	47.75	13.61	48.60	14.03	0.5010
37	48.60	14.03	49.45	14.46	0.5000
38	49.45	14.46	50.30	14.88	0.4980
39	50.30	14.88	51.15	15.31	0.4970
40	51.15	15.31	52.42	15.94	0.4960
41	52.42	15.94	53.70	16.57	0.4950
42	53.70	16.57	54.98	17.20	0.4930
43	54.98	17.20	56.25	17.82	0.4920
44	56.25	17.82	56.67	18.01	0.4410
45	56.67	18.01	57.10	18.20	0.4340
46	57.10	18.20	57.52	18.40	0.4830
47	57.52	18.40	59.65	19.44	0.4880
48	59.65	19.44	62.20	20.68	0.4870
49	62.20	20.68	65.60	22.33	0.4860
50	65.60	22.33	70.70	24.80	0.4850
51	70.70	24.80	79.63	29.12	0.4840
52	79.63	29.12	85.15	31.79	0.4830

The pressure above will be divided by a Factor of Safety =1.5

* ACTIVE SPACE *

No.	Z depth	Spacing
1	0.00	1.00
2	17.00	1.00

* PASSIVE SPACE *

No.	Z depth	Spacing
1	17.00	1.00

* BRACE: STRUT, TIEBACK, ANCHOR PLATE, OR DEADMAN *

No. Type	Z brace	Angle	Spacing	Input1*	Input2*
1 Strut	0.00	0.0	1.00	1.00	1.00

*For Tieback: Input1 = Diameter; Input2 = Bond Stength

*For Plate: Input1 = Diameter; Input2 = Allowable Pressure

*For Deaman: Input1 = Horz. Width; Input2 = Allowable Pressure; Angle = 0

*****SPECIFIED PILE *****

AZ26 has been found in Sheet Pile list!

AZ26 SX= 48.4 IX= 406.5 weight= 31.75

* Note: All the pile dimensions are in English Units per one foot width.

*****CALCULATION*****

Top Pressures start at depth = 0.00

NUMBER OF BRACE LEVEL = 1

```

      |      D1=0.00
      |      <-- D2=0.00      R1=7.51
      |
==|==      D3=17.00
      |      D4=30.27

```

D1 - TOP DEPTH

D2 - BRACE DEPTH

D3 - EXCAVATION BASE

D4 - PILE TIP

R1 - REACTION

TOTAL REACTION: R1 = 7.51

TOTAL PRESSURE ACTING ON WALL = 7.51

Total Reaction = Total Pressure, OK!

BRACE NO.1 AT DEPTH = 0.00

R1 = Brace Load = 7.51

report.out

*****RESULTS*****

* EMBEDMENT *

MINIMUM EMBEDMENT = 13.27

TOTAL MINIMUM PILE LENGTH = 30.27

* MOMENT IN PILE *

No.	Depth	M @ Brace	Mmax in Span	Depth of Mmax
1	0.00	0.00	66.55	13.45

Overall Maximum Moment = 66.55 at 13.45

Maximum Shear = 7.51

* BRACE: STRUT, TIEBACK, ANCHOR PLATE, OR DEADMAN *

No.	DEPTH	Tangle	SPACING	HORIZONTAL	VERTICAL
1	0.00	0.0	1.00	7.51	0.00

No.	DEPTH	Free length	Type and Data
1	0.00	0.00	Strut

* VERTICAL LOADING *

Vertical Loading from Braces = 0.00

Vertical Loading from External Load = 0.00

Total Vertical Loading = 0.00

* VERTICAL BEARING CAPACITY CHECK *

Tip Depth	Tip Area	Bearing	Tip Resistance
30.27	0.50	1.00	0.50
Embedment	Side Area*	Friction	Side Resistance
13.27	43.54	1.00	43.54

*Side Area is the surface area of embedment below base and contact area between pile and soil above base.

Total Vertical Resistance = 44.04

Total Vertical Loading = 0.00

Vertical Factor of Safety = 999.00

*****SPECIFIED PILE *****

AZ26 has been found in Sheet Pile list!

AZ26 Sx= 48.4 Ix= 406.5 Weight= 31.75

* Note: All the pile dimensions are in English Units per one foot width.

Request Min. Section Modulus = 24.2 in³/feet, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
The pile selection is based on the magnitude of the moment only. Axial force is

neglected. Ref. Note 3

AZ26 is capable to support the shoring!

Top deflection = 0.003(in)

Max. deflection = 0.739(in)

*****SHEAR, MOMENT, AND DEFLECTION V.S. DEPTH*****

User Input Pile: AZ26

Elastic Module, E: 29000.00

Moment of Inertia, I: 406.50

No	DEPTH ft	SHEAR kip	MOMENT kip-ft	DEFLECTION in
1	0.00	-7.51	0.00	0.003
2	0.04	-7.51	-0.28	0.006
3	0.08	-7.51	-0.57	0.010
4	0.11	-7.51	-0.85	0.013
5	0.15	-7.51	-1.14	0.016
6	0.19	-7.51	-1.42	0.019
7	0.23	-7.51	-1.71	0.022
8	0.27	-7.51	-1.99	0.026
9	0.30	-7.51	-2.28	0.029
10	0.34	-7.51	-2.56	0.032
11	0.38	-7.50	-2.85	0.035
12	0.42	-7.50	-3.13	0.038
13	0.45	-7.50	-3.41	0.042
14	0.49	-7.50	-3.70	0.045
15	0.53	-7.50	-3.98	0.048
16	0.57	-7.50	-4.27	0.051
17	0.61	-7.49	-4.55	0.054
18	0.64	-7.49	-4.83	0.058
19	0.68	-7.49	-5.12	0.061
20	0.72	-7.49	-5.40	0.064
21	0.76	-7.48	-5.68	0.067
22	0.80	-7.48	-5.97	0.070
23	0.83	-7.48	-6.25	0.074
24	0.87	-7.47	-6.54	0.077
25	0.91	-7.47	-6.82	0.080
26	0.95	-7.47	-7.10	0.083
27	0.99	-7.46	-7.38	0.086
28	1.02	-7.46	-7.67	0.089
29	1.06	-7.46	-7.95	0.093
30	1.10	-7.45	-8.23	0.096
31	1.14	-7.45	-8.51	0.099
32	1.17	-7.44	-8.80	0.102
33	1.21	-7.44	-9.08	0.105
34	1.25	-7.43	-9.36	0.109
35	1.29	-7.43	-9.64	0.112
36	1.33	-7.42	-9.92	0.115
37	1.36	-7.42	-10.20	0.118
38	1.40	-7.41	-10.49	0.121
39	1.44	-7.41	-10.77	0.124
40	1.48	-7.40	-11.05	0.127
41	1.52	-7.40	-11.33	0.131
42	1.55	-7.39	-11.61	0.134
43	1.59	-7.39	-11.89	0.137
44	1.63	-7.38	-12.17	0.140
45	1.67	-7.38	-12.45	0.143
46	1.71	-7.37	-12.73	0.146
47	1.74	-7.36	-13.01	0.149
48	1.78	-7.36	-13.28	0.153

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49	1.82	-7.35	-13.56	0.156
50	1.86	-7.34	-13.84	0.159
51	1.89	-7.34	-14.12	0.162
52	1.93	-7.33	-14.40	0.165
53	1.97	-7.32	-14.68	0.168
54	2.01	-7.32	-14.95	0.171
55	2.05	-7.31	-15.23	0.174
56	2.08	-7.30	-15.51	0.178
57	2.12	-7.29	-15.78	0.181
58	2.16	-7.29	-16.06	0.184
59	2.20	-7.28	-16.33	0.187
60	2.24	-7.27	-16.61	0.190
61	2.27	-7.26	-16.89	0.193
62	2.31	-7.25	-17.16	0.196
63	2.35	-7.25	-17.44	0.199
64	2.39	-7.24	-17.71	0.202
65	2.43	-7.23	-17.98	0.205
66	2.46	-7.22	-18.26	0.209
67	2.50	-7.21	-18.53	0.212
68	2.54	-7.20	-18.80	0.215
69	2.58	-7.19	-19.08	0.218
70	2.61	-7.18	-19.35	0.221
71	2.65	-7.17	-19.62	0.224
72	2.69	-7.16	-19.89	0.227
73	2.73	-7.15	-20.16	0.230
74	2.77	-7.14	-20.44	0.233
75	2.80	-7.13	-20.71	0.236
76	2.84	-7.12	-20.98	0.239
77	2.88	-7.11	-21.25	0.242
78	2.92	-7.10	-21.51	0.245
79	2.96	-7.09	-21.78	0.248
80	2.99	-7.08	-22.05	0.251
81	3.03	-7.07	-22.32	0.254
82	3.07	-7.06	-22.59	0.257
83	3.11	-7.05	-22.86	0.260
84	3.14	-7.04	-23.12	0.263
85	3.18	-7.03	-23.39	0.266
86	3.22	-7.01	-23.65	0.269
87	3.26	-7.00	-23.92	0.272
88	3.30	-6.99	-24.19	0.275
89	3.33	-6.98	-24.45	0.278
90	3.37	-6.97	-24.71	0.281
91	3.41	-6.96	-24.98	0.284
92	3.45	-6.94	-25.24	0.287
93	3.49	-6.93	-25.50	0.290
94	3.52	-6.92	-25.77	0.293
95	3.56	-6.91	-26.03	0.296
96	3.60	-6.89	-26.29	0.299
97	3.64	-6.88	-26.55	0.302
98	3.68	-6.87	-26.81	0.305
99	3.71	-6.86	-27.07	0.307
100	3.75	-6.84	-27.33	0.310
101	3.79	-6.83	-27.59	0.313
102	3.83	-6.82	-27.85	0.316
103	3.86	-6.80	-28.11	0.319
104	3.90	-6.79	-28.36	0.322
105	3.94	-6.77	-28.62	0.325
106	3.98	-6.76	-28.88	0.328
107	4.02	-6.75	-29.13	0.331
108	4.05	-6.73	-29.39	0.333
109	4.09	-6.72	-29.64	0.336
110	4.13	-6.70	-29.90	0.339
111	4.17	-6.69	-30.15	0.342

				report.out
112	4.21	-6.68	-30.41	0.345
113	4.24	-6.66	-30.66	0.348
114	4.28	-6.65	-30.91	0.351
115	4.32	-6.63	-31.16	0.353
116	4.36	-6.62	-31.41	0.356
117	4.40	-6.60	-31.66	0.359
118	4.43	-6.59	-31.91	0.362
119	4.47	-6.57	-32.16	0.365
120	4.51	-6.56	-32.41	0.367
121	4.55	-6.54	-32.66	0.370
122	4.58	-6.53	-32.91	0.373
123	4.62	-6.51	-33.15	0.376
124	4.66	-6.49	-33.40	0.378
125	4.70	-6.48	-33.65	0.381
126	4.74	-6.46	-33.89	0.384
127	4.77	-6.45	-34.14	0.387
128	4.81	-6.43	-34.38	0.389
129	4.85	-6.41	-34.62	0.392
130	4.89	-6.40	-34.87	0.395
131	4.93	-6.38	-35.11	0.397
132	4.96	-6.37	-35.35	0.400
133	5.00	-6.35	-35.59	0.403
134	5.04	-6.33	-35.83	0.406
135	5.08	-6.32	-36.07	0.408
136	5.12	-6.30	-36.31	0.411
137	5.15	-6.28	-36.55	0.414
138	5.19	-6.26	-36.79	0.416
139	5.23	-6.25	-37.02	0.419
140	5.27	-6.23	-37.26	0.421
141	5.30	-6.21	-37.49	0.424
142	5.34	-6.20	-37.73	0.427
143	5.38	-6.18	-37.96	0.429
144	5.42	-6.16	-38.20	0.432
145	5.46	-6.14	-38.43	0.435
146	5.49	-6.12	-38.66	0.437
147	5.53	-6.11	-38.89	0.440
148	5.57	-6.09	-39.13	0.442
149	5.61	-6.07	-39.36	0.445
150	5.65	-6.05	-39.59	0.447
151	5.68	-6.03	-39.81	0.450
152	5.72	-6.01	-40.04	0.453
153	5.76	-6.00	-40.27	0.455
154	5.80	-5.98	-40.50	0.458
155	5.84	-5.96	-40.72	0.460
156	5.87	-5.94	-40.95	0.463
157	5.91	-5.92	-41.17	0.465
158	5.95	-5.90	-41.40	0.468
159	5.99	-5.88	-41.62	0.470
160	6.02	-5.86	-41.84	0.473
161	6.06	-5.84	-42.07	0.475
162	6.10	-5.82	-42.29	0.477
163	6.14	-5.80	-42.51	0.480
164	6.18	-5.79	-42.73	0.482
165	6.21	-5.77	-42.95	0.485
166	6.25	-5.75	-43.16	0.487
167	6.29	-5.73	-43.38	0.490
168	6.33	-5.71	-43.60	0.492
169	6.37	-5.69	-43.81	0.494
170	6.40	-5.67	-44.03	0.497
171	6.44	-5.65	-44.24	0.499
172	6.48	-5.63	-44.46	0.501
173	6.52	-5.61	-44.67	0.504
174	6.56	-5.58	-44.88	0.506

				report.out
175	6.59	-5.56	-45.09	0.508
176	6.63	-5.54	-45.30	0.511
177	6.67	-5.52	-45.51	0.513
178	6.71	-5.50	-45.72	0.515
179	6.74	-5.48	-45.93	0.518
180	6.78	-5.46	-46.14	0.520
181	6.82	-5.44	-46.34	0.522
182	6.86	-5.42	-46.55	0.525
183	6.90	-5.40	-46.75	0.527
184	6.93	-5.38	-46.96	0.529
185	6.97	-5.35	-47.16	0.531
186	7.01	-5.33	-47.36	0.533
187	7.05	-5.31	-47.57	0.536
188	7.09	-5.29	-47.77	0.538
189	7.12	-5.27	-47.97	0.540
190	7.16	-5.25	-48.17	0.542
191	7.20	-5.23	-48.36	0.544
192	7.24	-5.20	-48.56	0.547
193	7.28	-5.18	-48.76	0.549
194	7.31	-5.16	-48.95	0.551
195	7.35	-5.14	-49.15	0.553
196	7.39	-5.12	-49.34	0.555
197	7.43	-5.09	-49.54	0.557
198	7.46	-5.07	-49.73	0.559
199	7.50	-5.05	-49.92	0.562
200	7.54	-5.03	-50.11	0.564
201	7.58	-5.01	-50.30	0.566
202	7.62	-4.98	-50.49	0.568
203	7.65	-4.96	-50.68	0.570
204	7.69	-4.94	-50.87	0.572
205	7.73	-4.92	-51.05	0.574
206	7.77	-4.89	-51.24	0.576
207	7.81	-4.87	-51.42	0.578
208	7.84	-4.85	-51.61	0.580
209	7.88	-4.82	-51.79	0.582
210	7.92	-4.80	-51.97	0.584
211	7.96	-4.78	-52.16	0.586
212	8.00	-4.75	-52.34	0.588
213	8.03	-4.73	-52.52	0.590
214	8.07	-4.71	-52.70	0.592
215	8.11	-4.68	-52.87	0.594
216	8.15	-4.66	-53.05	0.595
217	8.18	-4.64	-53.23	0.597
218	8.22	-4.61	-53.40	0.599
219	8.26	-4.59	-53.58	0.601
220	8.30	-4.57	-53.75	0.603
221	8.34	-4.54	-53.92	0.605
222	8.37	-4.52	-54.09	0.607
223	8.41	-4.49	-54.26	0.608
224	8.45	-4.47	-54.43	0.610
225	8.49	-4.44	-54.60	0.612
226	8.53	-4.42	-54.77	0.614
227	8.56	-4.39	-54.94	0.616
228	8.60	-4.37	-55.10	0.617
229	8.64	-4.34	-55.27	0.619
230	8.68	-4.32	-55.43	0.621
231	8.72	-4.29	-55.60	0.623
232	8.75	-4.26	-55.76	0.624
233	8.79	-4.24	-55.92	0.626
234	8.83	-4.21	-56.08	0.628
235	8.87	-4.19	-56.24	0.629
236	8.90	-4.16	-56.40	0.631
237	8.94	-4.13	-56.55	0.633

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238	8.98	-4.11	-56.71	0.634
239	9.02	-4.08	-56.86	0.636
240	9.06	-4.05	-57.02	0.638
241	9.09	-4.03	-57.17	0.639
242	9.13	-4.00	-57.32	0.641
243	9.17	-3.97	-57.47	0.643
244	9.21	-3.94	-57.62	0.644
245	9.25	-3.92	-57.77	0.646
246	9.28	-3.89	-57.92	0.647
247	9.32	-3.86	-58.07	0.649
248	9.36	-3.83	-58.21	0.650
249	9.40	-3.80	-58.36	0.652
250	9.43	-3.77	-58.50	0.653
251	9.47	-3.75	-58.64	0.655
252	9.51	-3.72	-58.79	0.656
253	9.55	-3.69	-58.93	0.658
254	9.59	-3.66	-59.06	0.659
255	9.62	-3.63	-59.20	0.661
256	9.66	-3.60	-59.34	0.662
257	9.70	-3.57	-59.48	0.664
258	9.74	-3.54	-59.61	0.665
259	9.78	-3.51	-59.74	0.666
260	9.81	-3.48	-59.88	0.668
261	9.85	-3.45	-60.01	0.669
262	9.89	-3.42	-60.14	0.670
263	9.93	-3.39	-60.27	0.672
264	9.97	-3.36	-60.39	0.673
265	10.00	-3.33	-60.52	0.674
266	10.04	-3.30	-60.65	0.676
267	10.08	-3.27	-60.77	0.677
268	10.12	-3.23	-60.89	0.678
269	10.15	-3.20	-61.02	0.680
270	10.19	-3.17	-61.14	0.681
271	10.23	-3.14	-61.26	0.682
272	10.27	-3.11	-61.37	0.683
273	10.31	-3.08	-61.49	0.685
274	10.34	-3.04	-61.61	0.686
275	10.38	-3.01	-61.72	0.687
276	10.42	-2.98	-61.84	0.688
277	10.46	-2.95	-61.95	0.689
278	10.50	-2.92	-62.06	0.690
279	10.53	-2.88	-62.17	0.692
280	10.57	-2.85	-62.28	0.693
281	10.61	-2.82	-62.39	0.694
282	10.65	-2.78	-62.49	0.695
283	10.69	-2.75	-62.60	0.696
284	10.72	-2.72	-62.70	0.697
285	10.76	-2.68	-62.80	0.698
286	10.80	-2.65	-62.90	0.699
287	10.84	-2.62	-63.00	0.700
288	10.87	-2.58	-63.10	0.701
289	10.91	-2.55	-63.20	0.702
290	10.95	-2.51	-63.29	0.703
291	10.99	-2.48	-63.39	0.704
292	11.03	-2.45	-63.48	0.705
293	11.06	-2.41	-63.58	0.706
294	11.10	-2.38	-63.67	0.707
295	11.14	-2.34	-63.76	0.708
296	11.18	-2.31	-63.84	0.709
297	11.22	-2.27	-63.93	0.710
298	11.25	-2.24	-64.02	0.711
299	11.29	-2.20	-64.10	0.712
300	11.33	-2.17	-64.18	0.712

				report.out
301	11.37	-2.13	-64.26	0.713
302	11.41	-2.10	-64.34	0.714
303	11.44	-2.06	-64.42	0.715
304	11.48	-2.02	-64.50	0.716
305	11.52	-1.99	-64.58	0.717
306	11.56	-1.95	-64.65	0.717
307	11.59	-1.92	-64.72	0.718
308	11.63	-1.88	-64.80	0.719
309	11.67	-1.84	-64.87	0.720
310	11.71	-1.81	-64.94	0.720
311	11.75	-1.77	-65.00	0.721
312	11.78	-1.73	-65.07	0.722
313	11.82	-1.70	-65.13	0.722
314	11.86	-1.66	-65.20	0.723
315	11.90	-1.62	-65.26	0.724
316	11.94	-1.59	-65.32	0.724
317	11.97	-1.55	-65.38	0.725
318	12.01	-1.51	-65.44	0.726
319	12.05	-1.47	-65.50	0.726
320	12.09	-1.43	-65.55	0.727
321	12.13	-1.40	-65.60	0.727
322	12.16	-1.36	-65.66	0.728
323	12.20	-1.32	-65.71	0.728
324	12.24	-1.28	-65.76	0.729
325	12.28	-1.24	-65.80	0.729
326	12.31	-1.21	-65.85	0.730
327	12.35	-1.17	-65.90	0.730
328	12.39	-1.13	-65.94	0.731
329	12.43	-1.09	-65.98	0.731
330	12.47	-1.05	-66.02	0.732
331	12.50	-1.01	-66.06	0.732
332	12.54	-0.97	-66.10	0.733
333	12.58	-0.93	-66.13	0.733
334	12.62	-0.89	-66.17	0.733
335	12.66	-0.85	-66.20	0.734
336	12.69	-0.81	-66.23	0.734
337	12.73	-0.78	-66.26	0.735
338	12.77	-0.74	-66.29	0.735
339	12.81	-0.70	-66.32	0.735
340	12.85	-0.66	-66.35	0.736
341	12.88	-0.62	-66.37	0.736
342	12.92	-0.57	-66.39	0.736
343	12.96	-0.53	-66.41	0.736
344	13.00	-0.49	-66.43	0.737
345	13.03	-0.45	-66.45	0.737
346	13.07	-0.41	-66.47	0.737
347	13.11	-0.37	-66.48	0.737
348	13.15	-0.33	-66.49	0.737
349	13.19	-0.29	-66.51	0.738
350	13.22	-0.25	-66.52	0.738
351	13.26	-0.21	-66.53	0.738
352	13.30	-0.17	-66.53	0.738
353	13.34	-0.12	-66.54	0.738
354	13.38	-0.08	-66.54	0.738
355	13.41	-0.04	-66.54	0.738
356	13.45	0.00	-66.55	0.739
357	13.49	0.04	-66.54	0.739
358	13.53	0.09	-66.54	0.739
359	13.57	0.13	-66.54	0.739
360	13.60	0.17	-66.53	0.739
361	13.64	0.21	-66.52	0.739
362	13.68	0.26	-66.52	0.739
363	13.72	0.30	-66.51	0.739

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364	13.75	0.34	-66.49	0.739
365	13.79	0.38	-66.48	0.739
366	13.83	0.43	-66.46	0.739
367	13.87	0.47	-66.45	0.739
368	13.91	0.51	-66.43	0.738
369	13.94	0.56	-66.41	0.738
370	13.98	0.60	-66.39	0.738
371	14.02	0.64	-66.36	0.738
372	14.06	0.69	-66.34	0.738
373	14.10	0.73	-66.31	0.738
374	14.13	0.77	-66.28	0.738
375	14.17	0.82	-66.25	0.737
376	14.21	0.86	-66.22	0.737
377	14.25	0.91	-66.19	0.737
378	14.29	0.95	-66.15	0.737
379	14.32	0.99	-66.12	0.737
380	14.36	1.04	-66.08	0.736
381	14.40	1.08	-66.04	0.736
382	14.44	1.13	-65.99	0.736
383	14.47	1.17	-65.95	0.735
384	14.51	1.22	-65.91	0.735
385	14.55	1.26	-65.86	0.735
386	14.59	1.31	-65.81	0.735
387	14.63	1.35	-65.76	0.734
388	14.66	1.40	-65.71	0.734
389	14.70	1.44	-65.65	0.733
390	14.74	1.49	-65.60	0.733
391	14.78	1.53	-65.54	0.733
392	14.82	1.58	-65.48	0.732
393	14.85	1.63	-65.42	0.732
394	14.89	1.67	-65.36	0.731
395	14.93	1.72	-65.29	0.731
396	14.97	1.76	-65.23	0.730
397	15.00	1.81	-65.16	0.730
398	15.04	1.86	-65.09	0.729
399	15.08	1.90	-65.02	0.729
400	15.12	1.95	-64.95	0.728
401	15.16	2.00	-64.87	0.728
402	15.19	2.04	-64.80	0.727
403	15.23	2.09	-64.72	0.727
404	15.27	2.14	-64.64	0.726
405	15.31	2.19	-64.56	0.726
406	15.35	2.23	-64.47	0.725
407	15.38	2.28	-64.39	0.724
408	15.42	2.33	-64.30	0.724
409	15.46	2.38	-64.21	0.723
410	15.50	2.42	-64.12	0.722
411	15.54	2.47	-64.03	0.722
412	15.57	2.52	-63.93	0.721
413	15.61	2.57	-63.84	0.720
414	15.65	2.62	-63.74	0.720
415	15.69	2.66	-63.64	0.719
416	15.72	2.71	-63.54	0.718
417	15.76	2.76	-63.43	0.717
418	15.80	2.81	-63.33	0.717
419	15.84	2.86	-63.22	0.716
420	15.88	2.91	-63.11	0.715
421	15.91	2.96	-63.00	0.714
422	15.95	3.00	-62.89	0.713
423	15.99	3.05	-62.77	0.712
424	16.03	3.10	-62.65	0.712
425	16.07	3.15	-62.54	0.711
426	16.10	3.20	-62.42	0.710

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427	16.14	3.25	-62.29	0.709
428	16.18	3.30	-62.17	0.708
429	16.22	3.35	-62.04	0.707
430	16.26	3.40	-61.91	0.706
431	16.29	3.45	-61.78	0.705
432	16.33	3.50	-61.65	0.704
433	16.37	3.55	-61.52	0.703
434	16.41	3.60	-61.38	0.702
435	16.44	3.65	-61.25	0.701
436	16.48	3.70	-61.11	0.700
437	16.52	3.75	-60.97	0.699
438	16.56	3.81	-60.82	0.698
439	16.60	3.86	-60.68	0.697
440	16.63	3.91	-60.53	0.696
441	16.67	3.96	-60.38	0.695
442	16.71	4.01	-60.23	0.694
443	16.75	4.06	-60.08	0.693
444	16.79	4.11	-59.92	0.692
445	16.82	4.16	-59.77	0.691
446	16.86	4.22	-59.61	0.690
447	16.90	4.27	-59.45	0.688
448	16.94	4.32	-59.28	0.687
449	16.98	4.37	-59.12	0.686
450	17.01	4.42	-58.95	0.685
451	17.05	4.46	-58.78	0.684
452	17.09	4.49	-58.61	0.683
453	17.13	4.53	-58.44	0.681
454	17.16	4.57	-58.27	0.680
455	17.20	4.60	-58.10	0.679
456	17.24	4.64	-57.92	0.678
457	17.28	4.67	-57.75	0.676
458	17.32	4.71	-57.57	0.675
459	17.35	4.74	-57.39	0.674
460	17.39	4.78	-57.21	0.672
461	17.43	4.81	-57.03	0.671
462	17.47	4.84	-56.85	0.670
463	17.51	4.87	-56.66	0.668
464	17.54	4.91	-56.48	0.667
465	17.58	4.94	-56.29	0.666
466	17.62	4.97	-56.10	0.664
467	17.66	5.00	-55.91	0.663
468	17.70	5.03	-55.72	0.662
469	17.73	5.06	-55.53	0.660
470	17.77	5.09	-55.34	0.659
471	17.81	5.12	-55.15	0.657
472	17.85	5.15	-54.95	0.656
473	17.88	5.18	-54.75	0.654
474	17.92	5.21	-54.56	0.653
475	17.96	5.24	-54.36	0.651
476	18.00	5.26	-54.16	0.650
477	18.04	5.29	-53.96	0.648
478	18.07	5.32	-53.76	0.647
479	18.11	5.34	-53.56	0.645
480	18.15	5.37	-53.36	0.644
481	18.19	5.40	-53.15	0.642
482	18.23	5.42	-52.95	0.641
483	18.26	5.45	-52.74	0.639
484	18.30	5.47	-52.53	0.638
485	18.34	5.50	-52.33	0.636
486	18.38	5.52	-52.12	0.634
487	18.42	5.54	-51.91	0.633
488	18.45	5.57	-51.70	0.631
489	18.49	5.59	-51.49	0.630

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490	18.53	5.61	-51.27	0.628
491	18.57	5.63	-51.06	0.626
492	18.60	5.65	-50.85	0.625
493	18.64	5.67	-50.63	0.623
494	18.68	5.69	-50.42	0.621
495	18.72	5.72	-50.20	0.620
496	18.76	5.73	-49.98	0.618
497	18.79	5.75	-49.77	0.616
498	18.83	5.77	-49.55	0.614
499	18.87	5.79	-49.33	0.613
500	18.91	5.81	-49.11	0.611
501	18.95	5.83	-48.89	0.609
502	18.98	5.85	-48.67	0.607
503	19.02	5.86	-48.45	0.606
504	19.06	5.88	-48.22	0.604
505	19.10	5.90	-48.00	0.602
506	19.14	5.91	-47.78	0.600
507	19.17	5.93	-47.55	0.598
508	19.21	5.94	-47.33	0.596
509	19.25	5.96	-47.10	0.595
510	19.29	5.97	-46.88	0.593
511	19.32	5.99	-46.65	0.591
512	19.36	6.00	-46.42	0.589
513	19.40	6.01	-46.19	0.587
514	19.44	6.02	-45.97	0.585
515	19.48	6.04	-45.74	0.583
516	19.51	6.05	-45.51	0.581
517	19.55	6.06	-45.28	0.580
518	19.59	6.07	-45.05	0.578
519	19.63	6.08	-44.82	0.576
520	19.67	6.09	-44.59	0.574
521	19.70	6.10	-44.36	0.572
522	19.74	6.11	-44.13	0.570
523	19.78	6.12	-43.89	0.568
524	19.82	6.13	-43.66	0.566
525	19.86	6.14	-43.43	0.564
526	19.89	6.15	-43.20	0.562
527	19.93	6.16	-42.96	0.560
528	19.97	6.16	-42.73	0.558
529	20.01	6.17	-42.50	0.556
530	20.04	6.18	-42.26	0.554
531	20.08	6.18	-42.03	0.552
532	20.12	6.19	-41.79	0.550
533	20.16	6.19	-41.56	0.548
534	20.20	6.20	-41.32	0.545
535	20.23	6.20	-41.09	0.543
536	20.27	6.21	-40.85	0.541
537	20.31	6.21	-40.62	0.539
538	20.35	6.21	-40.38	0.537
539	20.39	6.22	-40.15	0.535
540	20.42	6.22	-39.91	0.533
541	20.46	6.22	-39.68	0.531
542	20.50	6.22	-39.44	0.529
543	20.54	6.23	-39.21	0.526
544	20.58	6.23	-38.97	0.524
545	20.61	6.23	-38.73	0.522
546	20.65	6.23	-38.50	0.520
547	20.69	6.23	-38.26	0.518
548	20.73	6.23	-38.03	0.515
549	20.76	6.23	-37.79	0.513
550	20.80	6.23	-37.55	0.511
551	20.84	6.22	-37.32	0.509
552	20.88	6.22	-37.08	0.507

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553	20.92	6.22	-36.85	0.504
554	20.95	6.22	-36.61	0.502
555	20.99	6.21	-36.37	0.500
556	21.03	6.21	-36.14	0.498
557	21.07	6.21	-35.90	0.495
558	21.11	6.20	-35.67	0.493
559	21.14	6.20	-35.43	0.491
560	21.18	6.19	-35.20	0.489
561	21.22	6.19	-34.97	0.486
562	21.26	6.18	-34.73	0.484
563	21.29	6.17	-34.50	0.482
564	21.33	6.17	-34.26	0.479
565	21.37	6.16	-34.03	0.477
566	21.41	6.15	-33.80	0.475
567	21.45	6.14	-33.56	0.472
568	21.48	6.13	-33.33	0.470
569	21.52	6.13	-33.10	0.468
570	21.56	6.12	-32.87	0.465
571	21.60	6.11	-32.63	0.463
572	21.64	6.10	-32.40	0.461
573	21.67	6.09	-32.17	0.458
574	21.71	6.08	-31.94	0.456
575	21.75	6.06	-31.71	0.453
576	21.79	6.05	-31.48	0.451
577	21.83	6.04	-31.25	0.449
578	21.86	6.03	-31.03	0.446
579	21.90	6.02	-30.80	0.444
580	21.94	6.00	-30.57	0.441
581	21.98	5.99	-30.34	0.439
582	22.01	5.97	-30.12	0.437
583	22.05	5.96	-29.89	0.434
584	22.09	5.95	-29.66	0.432
585	22.13	5.93	-29.44	0.429
586	22.17	5.92	-29.21	0.427
587	22.20	5.90	-28.99	0.424
588	22.24	5.88	-28.77	0.422
589	22.28	5.87	-28.54	0.419
590	22.32	5.85	-28.32	0.417
591	22.36	5.83	-28.10	0.414
592	22.39	5.82	-27.88	0.412
593	22.43	5.80	-27.66	0.409
594	22.47	5.78	-27.44	0.407
595	22.51	5.76	-27.22	0.404
596	22.55	5.74	-27.00	0.402
597	22.58	5.72	-26.79	0.399
598	22.62	5.70	-26.57	0.397
599	22.66	5.68	-26.36	0.394
600	22.70	5.66	-26.14	0.392
601	22.73	5.64	-25.93	0.389
602	22.77	5.62	-25.71	0.387
603	22.81	5.59	-25.50	0.384
604	22.85	5.57	-25.29	0.381
605	22.89	5.55	-25.08	0.379
606	22.92	5.53	-24.87	0.376
607	22.96	5.50	-24.66	0.374
608	23.00	5.48	-24.45	0.371
609	23.04	5.45	-24.24	0.369
610	23.08	5.43	-24.04	0.366
611	23.11	5.40	-23.83	0.363
612	23.15	5.38	-23.63	0.361
613	23.19	5.35	-23.43	0.358
614	23.23	5.33	-23.22	0.355
615	23.27	5.30	-23.02	0.353

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616	23.30	5.27	-22.82	0.350
617	23.34	5.25	-22.62	0.348
618	23.38	5.22	-22.42	0.345
619	23.42	5.19	-22.23	0.342
620	23.45	5.16	-22.03	0.340
621	23.49	5.13	-21.84	0.337
622	23.53	5.11	-21.64	0.334
623	23.57	5.09	-21.45	0.332
624	23.61	5.07	-21.26	0.329
625	23.64	5.05	-21.06	0.326
626	23.68	5.03	-20.87	0.324
627	23.72	5.02	-20.68	0.321
628	23.76	5.00	-20.49	0.318
629	23.80	4.98	-20.30	0.316
630	23.83	4.97	-20.12	0.313
631	23.87	4.95	-19.93	0.310
632	23.91	4.94	-19.74	0.308
633	23.95	4.92	-19.55	0.305
634	23.99	4.91	-19.37	0.302
635	24.02	4.89	-19.18	0.300
636	24.06	4.88	-19.00	0.297
637	24.10	4.86	-18.81	0.294
638	24.14	4.85	-18.63	0.291
639	24.17	4.84	-18.44	0.289
640	24.21	4.83	-18.26	0.286
641	24.25	4.82	-18.08	0.283
642	24.29	4.81	-17.90	0.280
643	24.33	4.80	-17.71	0.278
644	24.36	4.79	-17.53	0.275
645	24.40	4.78	-17.35	0.272
646	24.44	4.77	-17.17	0.270
647	24.48	4.76	-16.99	0.267
648	24.52	4.75	-16.81	0.264
649	24.55	4.74	-16.63	0.261
650	24.59	4.73	-16.45	0.258
651	24.63	4.72	-16.27	0.256
652	24.67	4.71	-16.09	0.253
653	24.71	4.70	-15.91	0.250
654	24.74	4.69	-15.74	0.247
655	24.78	4.68	-15.56	0.245
656	24.82	4.67	-15.38	0.242
657	24.86	4.65	-15.21	0.239
658	24.89	4.64	-15.03	0.236
659	24.93	4.63	-14.85	0.233
660	24.97	4.62	-14.68	0.231
661	25.01	4.60	-14.50	0.228
662	25.05	4.59	-14.33	0.225
663	25.08	4.58	-14.16	0.222
664	25.12	4.56	-13.98	0.219
665	25.16	4.55	-13.81	0.217
666	25.20	4.53	-13.64	0.214
667	25.24	4.52	-13.47	0.211
668	25.27	4.50	-13.30	0.208
669	25.31	4.49	-13.13	0.205
670	25.35	4.47	-12.96	0.203
671	25.39	4.45	-12.79	0.200
672	25.43	4.44	-12.62	0.197
673	25.46	4.42	-12.45	0.194
674	25.50	4.40	-12.28	0.191
675	25.54	4.39	-12.12	0.188
676	25.58	4.37	-11.95	0.186
677	25.61	4.35	-11.79	0.183
678	25.65	4.33	-11.62	0.180

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679	25.69	4.32	-11.46	0.177
680	25.73	4.30	-11.29	0.174
681	25.77	4.28	-11.13	0.171
682	25.80	4.26	-10.97	0.168
683	25.84	4.24	-10.81	0.166
684	25.88	4.22	-10.65	0.163
685	25.92	4.20	-10.49	0.160
686	25.96	4.18	-10.33	0.157
687	25.99	4.16	-10.17	0.154
688	26.03	4.14	-10.02	0.151
689	26.07	4.12	-9.86	0.148
690	26.11	4.09	-9.70	0.146
691	26.15	4.07	-9.55	0.143
692	26.18	4.05	-9.39	0.140
693	26.22	4.03	-9.24	0.137
694	26.26	4.00	-9.09	0.134
695	26.30	3.98	-8.94	0.131
696	26.33	3.96	-8.79	0.128
697	26.37	3.93	-8.64	0.125
698	26.41	3.91	-8.49	0.122
699	26.45	3.89	-8.34	0.120
700	26.49	3.86	-8.20	0.117
701	26.52	3.84	-8.05	0.114
702	26.56	3.81	-7.90	0.111
703	26.60	3.79	-7.76	0.108
704	26.64	3.76	-7.62	0.105
705	26.68	3.73	-7.48	0.102
706	26.71	3.71	-7.33	0.099
707	26.75	3.68	-7.19	0.096
708	26.79	3.66	-7.06	0.094
709	26.83	3.63	-6.92	0.091
710	26.86	3.60	-6.78	0.088
711	26.90	3.57	-6.64	0.085
712	26.94	3.55	-6.51	0.082
713	26.98	3.52	-6.38	0.079
714	27.02	3.49	-6.24	0.076
715	27.05	3.46	-6.11	0.073
716	27.09	3.43	-5.98	0.070
717	27.13	3.40	-5.85	0.067
718	27.17	3.37	-5.72	0.064
719	27.21	3.34	-5.60	0.061
720	27.24	3.31	-5.47	0.059
721	27.28	3.28	-5.35	0.056
722	27.32	3.25	-5.22	0.053
723	27.36	3.22	-5.10	0.050
724	27.40	3.19	-4.98	0.047
725	27.43	3.16	-4.86	0.044
726	27.47	3.12	-4.74	0.041
727	27.51	3.09	-4.62	0.038
728	27.55	3.06	-4.50	0.035
729	27.58	3.03	-4.39	0.032
730	27.62	3.00	-4.27	0.029
731	27.66	2.96	-4.16	0.026
732	27.70	2.93	-4.05	0.023
733	27.74	2.89	-3.94	0.021
734	27.77	2.86	-3.83	0.018
735	27.81	2.83	-3.72	0.015
736	27.85	2.79	-3.62	0.012
737	27.89	2.76	-3.51	0.009
738	27.93	2.72	-3.41	0.006
739	27.96	2.69	-3.30	0.003
740	28.00	2.65	-3.20	0.000
741	28.04	2.62	-3.10	-0.003

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742	28.08	2.58	-3.01	-0.006
743	28.12	2.54	-2.91	-0.009
744	28.15	2.51	-2.81	-0.012
745	28.19	2.47	-2.72	-0.015
746	28.23	2.43	-2.63	-0.018
747	28.27	2.40	-2.53	-0.021
748	28.30	2.36	-2.44	-0.024
749	28.34	2.32	-2.36	-0.026
750	28.38	2.28	-2.27	-0.029
751	28.42	2.24	-2.18	-0.032
752	28.46	2.20	-2.10	-0.035
753	28.49	2.17	-2.02	-0.038
754	28.53	2.13	-1.93	-0.041
755	28.57	2.09	-1.85	-0.044
756	28.61	2.05	-1.78	-0.047
757	28.65	2.01	-1.70	-0.050
758	28.68	1.96	-1.62	-0.053
759	28.72	1.92	-1.55	-0.056
760	28.76	1.88	-1.48	-0.059
761	28.80	1.84	-1.41	-0.062
762	28.84	1.80	-1.34	-0.065
763	28.87	1.76	-1.27	-0.068
764	28.91	1.71	-1.21	-0.071
765	28.95	1.67	-1.14	-0.074
766	28.99	1.63	-1.08	-0.077
767	29.02	1.58	-1.02	-0.079
768	29.06	1.54	-0.96	-0.082
769	29.10	1.50	-0.90	-0.085
770	29.14	1.45	-0.85	-0.088
771	29.18	1.41	-0.79	-0.091
772	29.21	1.36	-0.74	-0.094
773	29.25	1.32	-0.69	-0.097
774	29.29	1.27	-0.64	-0.100
775	29.33	1.23	-0.59	-0.103
776	29.37	1.18	-0.55	-0.106
777	29.40	1.13	-0.50	-0.109
778	29.44	1.09	-0.46	-0.112
779	29.48	1.04	-0.42	-0.115
780	29.52	0.99	-0.38	-0.118
781	29.56	0.95	-0.34	-0.121
782	29.59	0.90	-0.31	-0.124
783	29.63	0.85	-0.28	-0.127
784	29.67	0.80	-0.24	-0.130
785	29.71	0.75	-0.22	-0.133
786	29.74	0.71	-0.19	-0.136
787	29.78	0.66	-0.16	-0.138
788	29.82	0.61	-0.14	-0.141
789	29.86	0.56	-0.12	-0.144
790	29.90	0.51	-0.10	-0.147
791	29.93	0.46	-0.08	-0.150
792	29.97	0.41	-0.06	-0.153
793	30.01	0.36	-0.05	-0.156
794	30.05	0.30	-0.03	-0.159
795	30.09	0.25	-0.02	-0.162
796	30.12	0.20	-0.02	-0.165
797	30.16	0.15	-0.01	-0.168
798	30.20	0.10	0.00	-0.171
799	30.24	0.05	0.00	-0.174

Users can select data, then copy and paste into Excel to create graphics

Legacy Pkwy - C867 Bent 2 - E80 at 14ft - GW at 8ft

Xp=102.0

Xa=102.0

Xp=0,Xa=0

Z=0, Wall Top

Z=17.0, Wall Base

Z=51.0

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

* INPUT DATA *

Wall Height=17.0 Total Soil Types= 5

No	Weight	Saturate	Phi	Cohesion	Nspt	Type	Description
1	125.0	137.7	36.0	0.0	40	4	FILL
2	110.0	120.0	28.0	0.0	6	4	CL
3	120.0	132.0	34.0	0.0	16	4	SP
4	115.0	126.0	30.0	0.0	10	4	ML
5	125.0	135.0	36.0	0.0	40	4	SM/GM

Ground Surface at Active Side:

Line	Z1	Xa1	Z2	Xa2	Soil No.
1	17.0	0.0	17.0	80000.0	3
2	24.0	0.0	24.0	80000.0	4
3	39.0	0.0	39.0	80000.0	5

Water Table at Active Side:

Point	Z-water	X-water
1	17.0	0.0
2	17.0	80000.0

Ground Surface at Passive Side:

Line	Z1	Xp1	Z2	Xp2	Soil No.
1	17.0	0.0	17.0	80000.0	3
2	24.0	0.0	24.0	80000.0	4
3	39.0	0.0	39.0	80000.0	5

Water Table at Passive Side:

Point	Z-water	X-water
1	17.0	0.0
2	17.0	80000.0

* OUTPUT RESULTS *

Eae (Total Force above Base)= 4.41

Ea (Total Static Force above Base)= 4.41

Ea (Total Earthquake Force above Base)= 0.00

Apparent Pressure above Base - Output to Shoring

No	Z1	Pa1	Z2	Pa2	ka1
0	0.00	0.00	17.00	0.52	0.0305

Active Pressure below Base - Output to Shoring

No	Z1	Pa1	Z2	Pa2	ka1
0	17.00	0.40	21.25	0.47	0.0179
1	21.25	0.47	22.10	0.49	0.0193
2	22.10	0.49	23.38	0.51	0.0180
3	23.38	0.51	23.80	0.54	0.0724
4	23.80	0.54	24.22	0.60	0.1213
5	24.22	0.60	24.65	0.62	0.0674
6	24.65	0.62	25.50	0.64	0.0191
7	25.50	0.64	26.35	0.66	0.0211
8	26.35	0.66	38.25	0.89	0.0192
9	38.25	0.89	38.68	0.87	-0.0342
10	38.68	0.87	39.10	0.78	-0.2087
11	39.10	0.78	39.53	0.72	-0.1564
12	39.53	0.72	44.63	0.80	0.0169
13	44.63	0.80	45.05	0.81	0.0207
14	45.05	0.81	45.48	0.82	0.0223
15	45.48	0.82	45.90	0.83	0.0187
16	45.90	0.83	51.00	0.92	0.0171

Passive Pressure below Base - Output to Shoring

No	Z1	Pp1	Z2	Pp2	kp1
0	18.00	0.4	23.53	2.7	0.413
1	23.53	2.7	23.95	2.6	-0.260
2	23.95	2.6	24.38	2.4	-0.385
3	24.38	2.4	24.80	2.5	0.248
4	24.80	2.5	25.23	2.7	0.328
5	25.23	2.7	25.65	2.8	0.323
6	25.65	2.8	26.08	2.9	0.320
7	26.08	2.9	26.50	3.1	0.317
8	26.50	3.1	26.92	3.2	0.315
9	26.92	3.2	27.35	3.3	0.305
10	27.35	3.3	27.78	3.5	0.301
11	27.78	3.5	28.20	3.6	0.307
12	28.20	3.6	29.05	3.9	0.310
13	29.05	3.9	30.33	4.3	0.308
14	30.33	4.3	32.45	4.9	0.307
15	32.45	4.9	38.40	6.7	0.306
16	38.40	6.7	38.83	7.5	1.879
17	38.83	7.5	39.25	8.8	3.072
18	39.25	8.8	39.68	9.5	1.612
19	39.68	9.5	40.10	9.7	0.531
20	40.10	9.7	40.53	10.0	0.530
21	40.53	10.0	40.95	10.2	0.528

22	40.95	10.2	41.38	10.4	0.526
23	41.38	10.4	41.80	10.6	0.524
24	41.80	10.6	42.22	10.8	0.499
25	42.22	10.8	42.65	11.0	0.458
26	42.65	11.0	43.08	11.2	0.477
27	43.08	11.2	43.50	11.5	0.512
28	43.50	11.5	43.93	11.7	0.511
29	43.93	11.7	44.35	11.9	0.510
30	44.35	11.9	44.78	12.1	0.509
31	44.78	12.1	45.20	12.3	0.508
32	45.20	12.3	46.05	12.8	0.507
33	46.05	12.8	46.90	13.2	0.505
34	46.90	13.2	47.75	13.6	0.503
35	47.75	13.6	48.60	14.0	0.501
36	48.60	14.0	49.45	14.5	0.500
37	49.45	14.5	50.30	14.9	0.498
38	50.30	14.9	51.15	15.3	0.497

Water Pressure - Output to Shoring

No	Z1	Pw1	Z2	Pw2	kw1
0	8.00	0.00	17.00	0.56	0.06
1	17.00	0.56	51.00	0.56	0.00

UNITS: DEPTH, DISTANCE: ft, UNIT WEIGHT: pcf, FORCE: kip, PRESSURE: ksf, SLOPE: kcf
Date: 1/22/2007 File Name: W:\00409 BUILDINC\046 Legacy Segment 3 - C863 & C867\ShoringSuite\C867-15ft.ep8

report.out

EARTH PRESSURE ANALYSIS SUMMARY
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Date: 1/22/2007 File: W:\00409 BUILDINC\046 Legacy Segment 3 - C863 &
C867\shoringSuite\C867-15ft.ep8

Title 1: Legacy Pkwy - C867 Bent 2 - E80 at 14ft - GW at 8ft
Title 2:

Input data: *****

Wall Height = 17.00
Depth of Ground at Active Side = 0.00
Depth of Ground at Passive Side = 18.00
Apparent Pressure Envelope: 1. Triangular (No-braced, all soils)
Pressure Type: 1. Active, K_a^*
Earthquake Loading Apply to: 1. No Earthq. Loads
Earthquake Horizontal Acceleration, $K_h = 0$
Earthquake Vertical Acceleration, $K_v = 0$
Calculation Methods: 1. wedge Analysis*
Wall Friction Options: 3. Both sides (for sheet pile)
Wall Friction = 14
Apparent Pressure Conversion: 1. Default (Terzaghi and Peck)*
Conversion Ratio for Total Active Force above Base = 1
Trapezoid Top Shape = 0.25
Trapezoid Bottom Shape = 0.25
Water Density = 62.4
Water Pressure: 1. No seepage at wall tip*
Seepage at depth =
User's Settings
Ignore Passive from Depth = 1
Output Factor for Active Pressure = 1
Output Factor for Passive Pressure = 1
Load Factor for Soil Weight = 1
Load Factor for Earthquake = 1
Estimate Embedment: Default: 3H
Program's Settings
Max. Height, $H_{max} = 85.00$
Analysis Segment, $dz = 0.43$
No. of Active Segment at H, $nz_0 = 40$
No. of Active Segment at H_{max} , $nz = 203$
No. of Passive Segment, $nzp = 161$
Active Depth at H, $Z_h = 17.00$
Active Depth at H_{max} , $Z = 86.27$
Passive Depth at H_{max} , $Z_p = 86.43$
Max. Pressure = 32.35

Total Soil Types= 5

No	Weight	W(S)	Phi	Cohesion	Nspt	Type	Description
1	125.0	137.7	36.0	0.0	40	4	FILL
2	110.0	120.0	28.0	0.0	6	4	CL
3	120.0	132.0	34.0	0.0	16	4	SP
4	115.0	126.0	30.0	0.0	10	4	ML
5	125.0	135.0	36.0	0.0	40	4	SM/GM

Ground Surface at Active Side:

Line	Z1	Xa1	Z2	Xa2	Soil No.
					Page 1

				report.out	
1	0.0	0.0	0.0	80000.0	1
2	7.0	0.0	7.0	80000.0	2
3	14.0	0.0	14.0	80000.0	3
4	24.0	0.0	24.0	80000.0	4
5	39.0	0.0	39.0	80000.0	5

Water Table at Active Side:

Point	Z-water	X-water
1	8.0	0.0
2	8.0	80000.0

Ground Surface at Passive Side:

Line	Z1	Xp1	Z2	Xp2	Soil	No.
1	17.0	0.0	17.0	80000.0		3
2	24.0	0.0	24.0	80000.0		4
3	39.0	0.0	39.0	80000.0		5

Water Table at Passive Side:

Point	Z-water	X-water
1	17.0	0.0
2	17.0	80000.0

Output data: *****

Eae (Total Force above Base)= 4.41
 Ea (Total Static Force above Base)= 4.41
 Ea (Total Earthquake Force above Base)= 0.00

Apparent Pressure above Base - Output to Shoring

Total Active Force above Base, Ea = 4.41

No	Z1	Pa1	Z2	Pa2	ka1
0	0.00	0.00	17.00	0.52	0.0305

Active Pressure below Base - Output to Shoring

No	Z1	Pa1	Z2	Pa2	ka1
0	17.00	0.40	21.25	0.47	0.0179
1	21.25	0.47	22.10	0.49	0.0193
2	22.10	0.49	23.38	0.51	0.0180
3	23.38	0.51	23.80	0.54	0.0724
4	23.80	0.54	24.22	0.60	0.1213
5	24.22	0.60	24.65	0.62	0.0674
6	24.65	0.62	25.50	0.64	0.0191
7	25.50	0.64	26.35	0.66	0.0211
8	26.35	0.66	38.25	0.89	0.0192
9	38.25	0.89	38.68	0.87	-0.0342
10	38.68	0.87	39.10	0.78	-0.2087
11	39.10	0.78	39.53	0.72	-0.1564
12	39.53	0.72	44.63	0.80	0.0169
13	44.63	0.80	45.05	0.81	0.0207
14	45.05	0.81	45.48	0.82	0.0223
15	45.48	0.82	45.90	0.83	0.0187
16	45.90	0.83	59.93	1.07	0.0171
17	59.93	1.07	60.35	1.08	0.0199
18	60.35	1.08	60.78	1.09	0.0212
19	60.78	1.09	61.20	1.10	0.0185
20	61.20	1.10	85.00	1.51	0.0173

Passive Pressure below Base - Output to Shoring

No	Z1	Pp1	Z2	Pp2	kp1
0	18.00	0.4	23.53	2.7	0.413
1	23.53	2.7	23.95	2.6	-0.260
2	23.95	2.6	24.38	2.4	-0.385

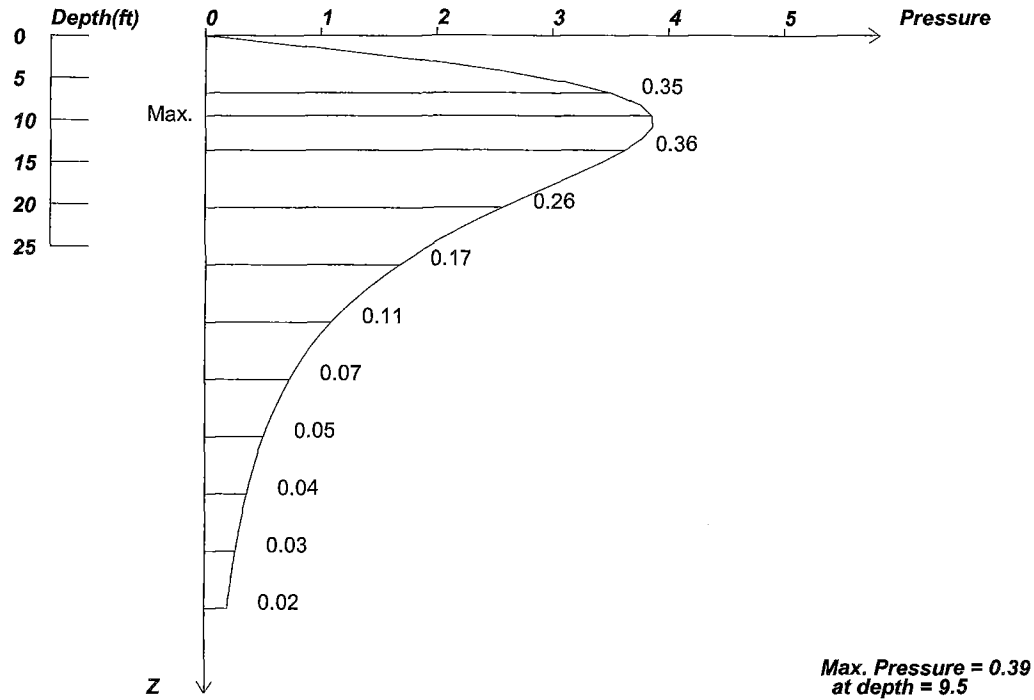
					report.out
3	24.38	2.4	24.80	2.5	0.248
4	24.80	2.5	25.23	2.7	0.328
5	25.23	2.7	25.65	2.8	0.323
6	25.65	2.8	26.08	2.9	0.320
7	26.08	2.9	26.50	3.1	0.317
8	26.50	3.1	26.92	3.2	0.315
9	26.92	3.2	27.35	3.3	0.305
10	27.35	3.3	27.78	3.5	0.301
11	27.78	3.5	28.20	3.6	0.307
12	28.20	3.6	29.05	3.9	0.310
13	29.05	3.9	30.33	4.3	0.308
14	30.33	4.3	32.45	4.9	0.307
15	32.45	4.9	38.40	6.7	0.306
16	38.40	6.7	38.83	7.5	1.879
17	38.83	7.5	39.25	8.8	3.072
18	39.25	8.8	39.68	9.5	1.612
19	39.68	9.5	40.10	9.7	0.531
20	40.10	9.7	40.53	10.0	0.530
21	40.53	10.0	40.95	10.2	0.528
22	40.95	10.2	41.38	10.4	0.526
23	41.38	10.4	41.80	10.6	0.524
24	41.80	10.6	42.22	10.8	0.499
25	42.22	10.8	42.65	11.0	0.458
26	42.65	11.0	43.08	11.2	0.477
27	43.08	11.2	43.50	11.5	0.512
28	43.50	11.5	43.93	11.7	0.511
29	43.93	11.7	44.35	11.9	0.510
30	44.35	11.9	44.78	12.1	0.509
31	44.78	12.1	45.20	12.3	0.508
32	45.20	12.3	46.05	12.8	0.507
33	46.05	12.8	46.90	13.2	0.505
34	46.90	13.2	47.75	13.6	0.503
35	47.75	13.6	48.60	14.0	0.501
36	48.60	14.0	49.45	14.5	0.500
37	49.45	14.5	50.30	14.9	0.498
38	50.30	14.9	51.15	15.3	0.497
39	51.15	15.3	52.43	15.9	0.496
40	52.43	15.9	53.70	16.6	0.495
41	53.70	16.6	54.98	17.2	0.493
42	54.98	17.2	56.25	17.8	0.492
43	56.25	17.8	56.68	18.0	0.441
44	56.68	18.0	57.10	18.2	0.434
45	57.10	18.2	57.53	18.4	0.483
46	57.53	18.4	59.65	19.4	0.488
47	59.65	19.4	62.20	20.7	0.487
48	62.20	20.7	65.60	22.3	0.486
49	65.60	22.3	70.70	24.8	0.485
50	70.70	24.8	79.63	29.1	0.484
51	79.63	29.1	85.15	31.8	0.483

Water Pressure - Output to Shoring

No	Z1	Pw1	Z2	Pw2	kw1
0	8.00	0.00	17.00	0.56	0.06
1	17.00	0.56	85.00	0.56	0.00

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

Legacy Pkwy - C867 Bent 2 - E80 at 14ft - GW at 8ft



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Date: 1/22/2007

Wall Height, H= 17 Load Depth at Surface, D= 0

Load Factor of Surcharge Loading = 1

Rigid Wall Condition -- No movement or deflection of the wall are allowed.

Max. Pressure = 0.39 at depth = 9.5

Cooper E 80 Railroad Loading. From wall to railroad center, X=14.0

UNITS: LENGTH, DEPTH: ft, Qpoint: kip, Qline: kip/ft, Qstrip, Qarea, PRESSURE: ksf

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 SURCHARGE LOADS CALCULATION SUMMARY
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 Time: 12/30/1899 12:30:30 PM
 Date: 1/22/2007

Legacy Pkwy - C867 Bent 2 - E80 at 14ft - GW at 8ft

Height of wall = 17
 Depth of wall = 0
 Load Factor of Surcharge Loading = 1

Wall Condition:
 Rigid Wall Condition -- No movement or deflection of the wall are allowed.

*****Loading*****

RAILROAD LOADING:
 Cooper E 80 Railroad Loading. From wall to railroad center, X=14.0

*****Total Pressure Distribution*****

Max. Pressure =0.386 at depth =9.52

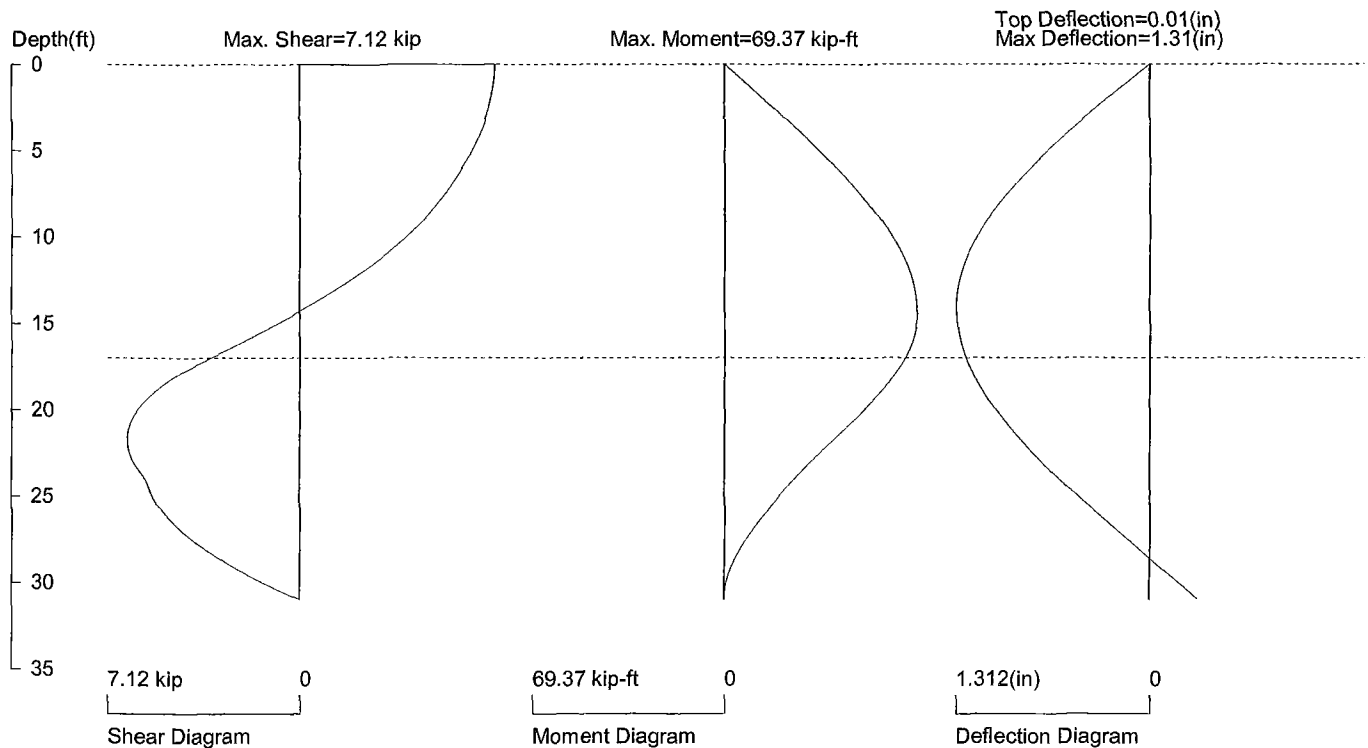
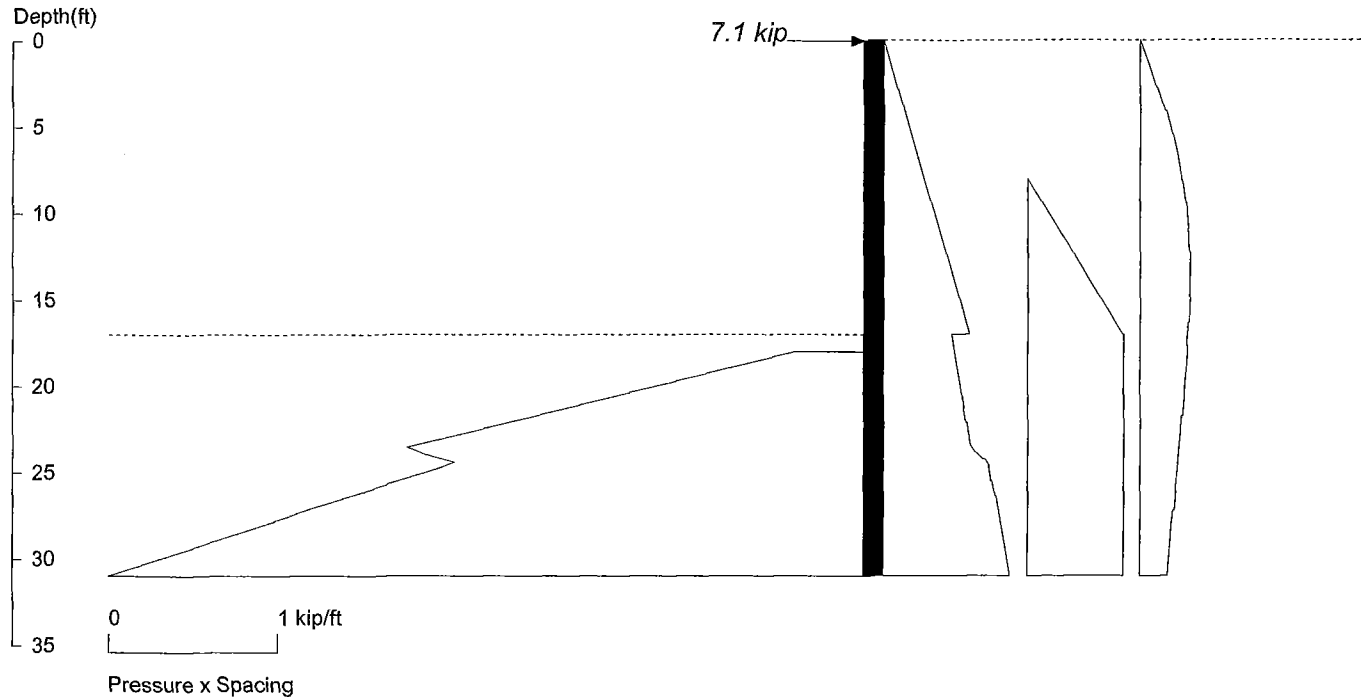
Depth	Pressure
0.00	0.000
1.36	0.092
2.72	0.178
4.08	0.251
5.44	0.309
6.80	0.350
8.16	0.375
9.52	0.386
10.88	0.386
12.24	0.377
13.60	0.362
14.96	0.343
16.32	0.322
17.68	0.300
19.04	0.278
20.40	0.257
21.76	0.236
23.12	0.217
24.48	0.199
25.84	0.183
27.20	0.167
28.56	0.154
29.92	0.141
31.28	0.129
32.64	0.119
34.00	0.109
35.36	0.101
36.72	0.093

	report.out
38.08	0.086
39.44	0.079
40.80	0.073
42.16	0.068
43.52	0.063
44.88	0.059
46.24	0.054
47.60	0.051
48.96	0.047
50.32	0.044
51.68	0.041
53.04	0.039
54.40	0.036
55.76	0.034
57.12	0.032
58.48	0.030
59.84	0.028
61.20	0.027
62.56	0.025
63.92	0.024
65.28	0.022
66.64	0.021
68.00	0.020

Depth Is Measured From Top of the wall

LENGTH, DEPTH: ft, Qpoint: kip, Qline: kip/ft, Qstrip, Qarea, PRESSURE: ksf

Legacy Pkwy - C867 Bent 2 - E80 at 20ft - GW at 8ft



PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on one soldier pile or one foot spacing of sheet pile

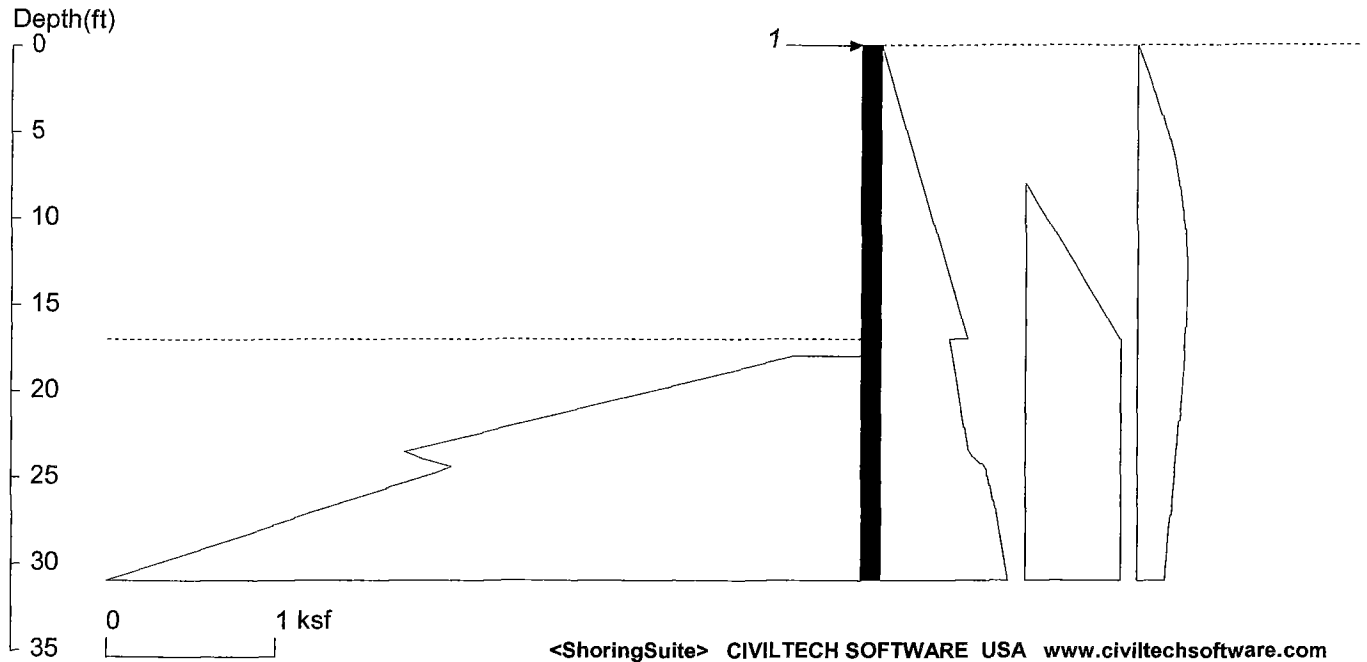
Pile: AZ18 meet Section Requirements. Properties: 6. E (ksi)=29000, 4. I (in⁴)=250.4

Date: 1/22/2007 File Name: W:\00409 BUILDINC\046 Legacy Segment 3 - C863 & C867\ShoringSuite\C867 - 17ft_E80_20ft_GW_8ft_wf.sh8

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<ShoringSuite> CIVILTECH SOFTWARE USA www.civiltechsoftware.com

Legacy Pkwy - C867 Bent 2 - E80 at 20ft - GW at 8ft



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Date: 1/22/2007 File Name: W:\00409 BUILDINC\046 Legacy Segment 3 - C863 & C867\ShoringSuite\C867 - 17

Wall Height=17.0

Pile Diameter=1.0

Pile Spacing=1.0

ACTIVE SPACE:		Z depth	Spacing
1		0.00	1.00
2		17.00	1.00
PASSIVE SPACE:		Z depth	Spacing
1		17.00	1.00

PILE LENGTH: Min. Embedment=13.97, Min. Pile Length=30.97

MOMENT IN PILE: Max. Moment=69.37 at Depth of 14.27

VERTICAL BEARING CAPACITY: Vertical Loading=0.0, Resistance=45.4, Vertical Factor of Safety=999.00

PILE SELECTION:

Request Min. Section Modulus = 25.2 in³/feet, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66

AZ18 has Section Modulus = 33.5. It is greater than Min. Requirements!, Top Deflection = 0.01(in)

BRACE FORCE: Strut, Tieback, Plate Anchor, and Deadman

No. & Type	Depth	Angle	Total	Horiz.	Vert.	N/A	N/A
1. Strut	0.0	0.0	7.1	7.1	0.0	0.0	0.0

UNITS: Length/Depth - ft, Force - kip, Moment - kip-ft, Pressure - ksf, Pres. Slope - kip/ft³, Deflection - in

report.out

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

DEPTH: ft, PRESSURE, FRICTION, BEARING: ksf, SLOPE: kcf, FORCE: kip, MOMENT: kip-ft,
DEFLECTION: in, I: in⁴, E: ksi

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Date: 1/22/2007 File: W:\00409 BUILDINC\046 Legacy Segment 3 - C863 &
C867\ShoringSuite\C867 - 17ft_E80_20ft_GW_8ft_wf.sh8

Title: Legacy Pkwy - C867 Bent 2 - E80 at 20ft - GW at 8ft
Subtitle:

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

Wall Type: 1. Sheet Pile

Wall Height: 17.00

Pile Diameter: 1.00

Pile Spacing: 1.00

Factor of Safety (F.S.): 1.50

Max. Moment reduce 20%

Lateral Support Type (Braces): 2. Strut, Raker

Top Brace Increase (Multi-Bracing): Add 15%*

Brace Position (One Brace Case): Normal Brace*

Embedment Option: 1. Yes

Friction at Pile Tip: No*

Check Vertical Bearing Capacity:

Side Friction for Bearing: 1.00

Tip Resistance for Bearing: 1.00

Pile Properties:

Allowable Fb/Fy: 0.66

Steel Strength, Fy: 50 ksi = 345 MPa

Elastic Module, E: 29000.00

Moment of Inertia, I: 250.40

User Input Pile: AZ18

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

No.	Z2 top	Top Pres.	Z2 bottom	Bottom Pres.	Slope
1	0.00	0.00	17.00	0.52	0.0300
2	17.00	0.40	21.25	0.47	0.0180
3	21.25	0.47	22.10	0.49	0.0190
4	22.10	0.49	23.38	0.51	0.0180
5	23.38	0.51	23.80	0.54	0.0720
6	23.80	0.54	24.22	0.60	0.1210
7	24.22	0.60	24.65	0.62	0.0670
8	24.65	0.62	25.50	0.64	0.0190

9	25.50	0.64	report.out	26.35	0.66	0.0210
10	26.35	0.66		38.25	0.89	0.0190
11	38.25	0.89		38.68	0.87	-0.0340
12	38.68	0.87		39.10	0.78	-0.2090
13	39.10	0.78		39.53	0.72	-0.1560
14	39.53	0.72		44.63	0.80	0.0170
15	44.63	0.80		45.05	0.81	0.0210
16	45.05	0.81		45.48	0.82	0.0220
17	45.48	0.82		45.90	0.83	0.0190
18	45.90	0.83		59.93	1.07	0.0170
19	59.93	1.07		60.35	1.08	0.0200
20	60.35	1.08		60.78	1.09	0.0210
21	60.78	1.09		61.20	1.10	0.0190
22	61.20	1.10		85.00	1.51	0.0170
23	8.00	0.00		17.00	0.56	0.0620
24	17.00	0.56		85.00	0.56	0.0000
25	0.00	0.00		1.36	0.05	0.0380
26	1.36	0.05		2.72	0.10	0.0360
27	2.72	0.10		4.08	0.15	0.0330
28	4.08	0.15		5.44	0.19	0.0290
29	5.44	0.19		6.80	0.22	0.0250
30	6.80	0.22		8.16	0.25	0.0200
31	8.16	0.25		9.52	0.27	0.0150
32	9.52	0.27		10.88	0.28	0.0100
33	10.88	0.28		12.24	0.29	0.0060
34	12.24	0.29		13.60	0.29	0.0020
35	13.60	0.29		14.96	0.29	-0.0010
36	14.96	0.29		16.32	0.28	-0.0040
37	16.32	0.28		17.68	0.28	-0.0060
38	17.68	0.28		19.04	0.27	-0.0070
39	19.04	0.27		20.40	0.26	-0.0080
40	20.40	0.26		21.76	0.24	-0.0090
41	21.76	0.24		23.12	0.23	-0.0090
42	23.12	0.23		24.48	0.22	-0.0090
43	24.48	0.22		25.84	0.21	-0.0090
44	25.84	0.21		27.20	0.19	-0.0090
45	27.20	0.19		28.56	0.18	-0.0090
46	28.56	0.18		29.92	0.17	-0.0080
47	29.92	0.17		31.28	0.16	-0.0080
48	31.28	0.16		32.64	0.15	-0.0070
49	32.64	0.15		34.00	0.14	-0.0070
50	34.00	0.14		35.36	0.13	-0.0070
51	35.36	0.13		36.72	0.12	-0.0060
52	36.72	0.12		38.08	0.12	-0.0060
53	38.08	0.12		39.44	0.11	-0.0050
54	39.44	0.11		40.80	0.10	-0.0050
55	40.80	0.10		42.16	0.10	-0.0050
56	42.16	0.10		43.52	0.09	-0.0040
57	43.52	0.09		44.88	0.08	-0.0040
58	44.88	0.08		46.24	0.08	-0.0040
59	46.24	0.08		47.60	0.07	-0.0030
60	47.60	0.07		48.96	0.07	-0.0030
61	48.96	0.07		50.32	0.07	-0.0030
62	50.32	0.07		51.68	0.06	-0.0030
63	51.68	0.06		53.04	0.06	-0.0030
64	53.04	0.06		54.40	0.05	-0.0020
65	54.40	0.05		55.76	0.05	-0.0020
66	55.76	0.05		57.12	0.05	-0.0020
67	57.12	0.05		58.48	0.05	-0.0020
68	58.48	0.05		59.84	0.04	-0.0020
69	59.84	0.04		61.20	0.04	-0.0020
70	61.20	0.04		62.56	0.04	-0.0020
71	62.56	0.04		63.92	0.04	-0.0010

72	63.92	0.04	report.out 65.28	0.04	-0.0010
73	65.28	0.04	66.64	0.03	-0.0010
74	66.64	0.03	68.00	0.03	-0.0010

* PASSIVE PRESSURE *

No.	Z1 top	Top Pres.	Z2 bottom	Bottom Pres.	Slope
1	18.00	0.41	23.53	2.69	0.4130
2	23.53	2.69	23.95	2.58	-0.2600
3	23.95	2.58	24.38	2.42	-0.3850
4	24.38	2.42	24.80	2.53	0.2480
5	24.80	2.53	25.23	2.67	0.3280
6	25.23	2.67	25.65	2.80	0.3230
7	25.65	2.80	26.08	2.94	0.3200
8	26.08	2.94	26.50	3.07	0.3170
9	26.50	3.07	26.92	3.21	0.3150
10	26.92	3.21	27.35	3.34	0.3050
11	27.35	3.34	27.78	3.46	0.3010
12	27.78	3.46	28.20	3.59	0.3070
13	28.20	3.59	29.05	3.86	0.3100
14	29.05	3.86	30.33	4.25	0.3080
15	30.33	4.25	32.45	4.90	0.3070
16	32.45	4.90	38.40	6.72	0.3060
17	38.40	6.72	38.83	7.52	1.8790
18	38.83	7.52	39.25	8.82	3.0720
19	39.25	8.82	39.68	9.51	1.6120
20	39.68	9.51	40.10	9.73	0.5310
21	40.10	9.73	40.53	9.96	0.5300
22	40.53	9.96	40.95	10.18	0.5280
23	40.95	10.18	41.38	10.41	0.5260
24	41.38	10.41	41.80	10.63	0.5240
25	41.80	10.63	42.22	10.84	0.4990
26	42.22	10.84	42.65	11.04	0.4580
27	42.65	11.04	43.08	11.24	0.4770
28	43.08	11.24	43.50	11.46	0.5120
29	43.50	11.46	43.93	11.67	0.5110
30	43.93	11.67	44.35	11.89	0.5100
31	44.35	11.89	44.78	12.11	0.5090
32	44.78	12.11	45.20	12.32	0.5080
33	45.20	12.32	46.05	12.75	0.5070
34	46.05	12.75	46.90	13.18	0.5050
35	46.90	13.18	47.75	13.61	0.5030
36	47.75	13.61	48.60	14.03	0.5010
37	48.60	14.03	49.45	14.46	0.5000
38	49.45	14.46	50.30	14.88	0.4980
39	50.30	14.88	51.15	15.31	0.4970
40	51.15	15.31	52.43	15.94	0.4960
41	52.43	15.94	53.70	16.57	0.4950
42	53.70	16.57	54.98	17.20	0.4930
43	54.98	17.20	56.25	17.82	0.4920
44	56.25	17.82	56.68	18.01	0.4410
45	56.68	18.01	57.10	18.20	0.4340
46	57.10	18.20	57.53	18.40	0.4830
47	57.53	18.40	59.65	19.44	0.4880
48	59.65	19.44	62.20	20.68	0.4870
49	62.20	20.68	65.60	22.33	0.4860
50	65.60	22.33	70.70	24.80	0.4850
51	70.70	24.80	79.63	29.12	0.4840
52	79.63	29.12	85.15	31.79	0.4830

The pressure above will be divided by a Factor of safety =1.5

* ACTIVE SPACE *

No.	Z depth	Spacing
1	0.00	1.00
2	17.00	1.00

* PASSIVE SPACE *

No.	Z depth	Spacing
1	17.00	1.00

* BRACE: STRUT, TIEBACK, ANCHOR PLATE, OR DEADMAN *

No.	Z brace	Angle	Spacing	Input1*	Input2*
1	0.00	0.0	1.00	1.00	1.00
Strut					

*For Tieback: Input1 = Diameter; Input2 = Bond Strength

*For Plate: Input1 = Diameter; Input2 = Allowable Pressure

*For Deaman: Input1 = Horz. Width; Input2 = Allowable Pressure; Angle = 0

*****SPECIFIED PILE *****

AZ18 has been found in Sheet Pile list!

AZ18 Sx= 33.5 Ix= 250.4 Weight= 24.17

* Note: All the pile dimensions are in English Units per one foot width.

*****CALCULATION*****

Top Pressures start at depth = 0.00

NUMBER OF BRACE LEVEL = 1

	D1=0.00	
<--	D2=0.00	R1=7.12
== ==	D3=17.00	
	D4=30.97	

D1 - TOP DEPTH

D2 - BRACE DEPTH

D3 - EXCAVATION BASE

D4 - PILE TIP

R1 - REACTION

TOTAL REACTION: R1 = 7.12

TOTAL PRESSURE ACTING ON WALL = 7.12

Total Reaction = Total Pressure, OK!

BRACE NO.1 AT DEPTH = 0.00

R1 = Brace Load = 7.12

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*****RESULTS*****

* EMBEDMENT *

MINIMUM EMBEDMENT = 13.97

TOTAL MINIMUM PILE LENGTH = 30.97

* MOMENT IN PILE *

No.	Depth	M @ Brace	Mmax in Span	Depth of Mmax
1	0.00	0.00	69.37	14.27

Overall Maximum Moment = 69.37 at 14.27

Maximum Shear = 7.12

* BRACE: STRUT, TIEBACK, ANCHOR PLATE, OR DEADMAN *

No.	DEPTH	Tangle	SPACING	HORIZONTAL	VERTICAL
1	0.00	0.0	1.00	7.12	0.00

7.12

No.	DEPTH	Free length	Type and Data
1	0.00	0.00	Strut

* VERTICAL LOADING *

Vertical Loading from Braces = 0.00

Vertical Loading from External Load = 0.00

Total Vertical Loading = 0.00

* VERTICAL BEARING CAPACITY CHECK *

Tip Depth	Tip Area	Bearing	Tip Resistance
30.97	0.50	1.00	0.50
Embedment	Side Area*	Friction	Side Resistance
13.97	44.94	1.00	44.94

*Side Area is the surface area of embedment below base and contact area between pile and soil above base.

Total Vertical Resistance = 45.44

Total Vertical Loading = 0.00

Vertical Factor of Safety = 999.00

*****SPECIFIED PILE *****

AZ18 has been found in Sheet Pile list!

AZ18 Sx= 33.5 Ix= 250.4 Weight= 24.17

* Note: All the pile dimensions are in English Units per one foot width.

Request Min. Section Modulus = 25.2 in³/feet, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
The pile selection is based on the magnitude of the moment only. Axial force is

neglected. Ref. Note 3

AZ18 is capable to support the shoring!

Top deflection = 0.006(in)

Max. deflection = 1.312(in)

*****SHEAR, MOMENT, AND DEFLECTION v.s. DEPTH*****

User Input Pile: AZ18

Elastic Module, E: 29000.00

Moment of Inertia, I: 250.40

No	DEPTH ft	SHEAR kip	MOMENT kip-ft	DEFLECTION in
1	0.00	-7.12	0.00	0.006
2	0.04	-7.12	-0.28	0.011
3	0.08	-7.12	-0.55	0.017
4	0.12	-7.12	-0.83	0.022
5	0.16	-7.12	-1.10	0.028
6	0.19	-7.12	-1.38	0.034
7	0.23	-7.12	-1.66	0.039
8	0.27	-7.12	-1.93	0.045
9	0.31	-7.12	-2.21	0.050
10	0.35	-7.12	-2.49	0.056
11	0.39	-7.12	-2.76	0.061
12	0.43	-7.12	-3.04	0.067
13	0.47	-7.12	-3.31	0.073
14	0.50	-7.12	-3.59	0.078
15	0.54	-7.11	-3.87	0.084
16	0.58	-7.11	-4.14	0.089
17	0.62	-7.11	-4.42	0.095
18	0.66	-7.11	-4.69	0.100
19	0.70	-7.11	-4.97	0.106
20	0.74	-7.11	-5.24	0.112
21	0.78	-7.10	-5.52	0.117
22	0.81	-7.10	-5.79	0.123
23	0.85	-7.10	-6.07	0.128
24	0.89	-7.10	-6.35	0.134
25	0.93	-7.10	-6.62	0.139
26	0.97	-7.09	-6.90	0.145
27	1.01	-7.09	-7.17	0.151
28	1.05	-7.09	-7.44	0.156
29	1.09	-7.08	-7.72	0.162
30	1.12	-7.08	-7.99	0.167
31	1.16	-7.08	-8.27	0.173
32	1.20	-7.08	-8.54	0.178
33	1.24	-7.07	-8.82	0.184
34	1.28	-7.07	-9.09	0.189
35	1.32	-7.07	-9.37	0.195
36	1.36	-7.06	-9.64	0.200
37	1.40	-7.06	-9.91	0.206
38	1.43	-7.06	-10.19	0.211
39	1.47	-7.05	-10.46	0.217
40	1.51	-7.05	-10.73	0.222
41	1.55	-7.04	-11.01	0.228
42	1.59	-7.04	-11.28	0.233
43	1.63	-7.04	-11.55	0.239
44	1.67	-7.03	-11.83	0.244
45	1.71	-7.03	-12.10	0.250
46	1.74	-7.02	-12.37	0.255
47	1.78	-7.02	-12.64	0.261
48	1.82	-7.01	-12.91	0.266

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49	1.86	-7.01	-13.19	0.272
50	1.90	-7.00	-13.46	0.277
51	1.94	-7.00	-13.73	0.283
52	1.98	-6.99	-14.00	0.288
53	2.02	-6.99	-14.27	0.294
54	2.05	-6.98	-14.54	0.299
55	2.09	-6.98	-14.81	0.305
56	2.13	-6.97	-15.08	0.310
57	2.17	-6.97	-15.35	0.315
58	2.21	-6.96	-15.62	0.321
59	2.25	-6.96	-15.89	0.326
60	2.29	-6.95	-16.16	0.332
61	2.33	-6.94	-16.43	0.337
62	2.36	-6.94	-16.70	0.342
63	2.40	-6.93	-16.97	0.348
64	2.44	-6.93	-17.24	0.353
65	2.48	-6.92	-17.51	0.359
66	2.52	-6.91	-17.77	0.364
67	2.56	-6.91	-18.04	0.369
68	2.60	-6.90	-18.31	0.375
69	2.64	-6.89	-18.58	0.380
70	2.68	-6.89	-18.84	0.385
71	2.71	-6.88	-19.11	0.391
72	2.75	-6.87	-19.38	0.396
73	2.79	-6.86	-19.64	0.401
74	2.83	-6.86	-19.91	0.407
75	2.87	-6.85	-20.18	0.412
76	2.91	-6.84	-20.44	0.417
77	2.95	-6.83	-20.71	0.423
78	2.99	-6.83	-20.97	0.428
79	3.02	-6.82	-21.24	0.433
80	3.06	-6.81	-21.50	0.439
81	3.10	-6.80	-21.76	0.444
82	3.14	-6.80	-22.03	0.449
83	3.18	-6.79	-22.29	0.454
84	3.22	-6.78	-22.55	0.460
85	3.26	-6.77	-22.82	0.465
86	3.30	-6.76	-23.08	0.470
87	3.33	-6.75	-23.34	0.475
88	3.37	-6.75	-23.60	0.480
89	3.41	-6.74	-23.86	0.486
90	3.45	-6.73	-24.12	0.491
91	3.49	-6.72	-24.39	0.496
92	3.53	-6.71	-24.65	0.501
93	3.57	-6.70	-24.91	0.506
94	3.61	-6.69	-25.17	0.512
95	3.64	-6.68	-25.42	0.517
96	3.68	-6.67	-25.68	0.522
97	3.72	-6.66	-25.94	0.527
98	3.76	-6.65	-26.20	0.532
99	3.80	-6.64	-26.46	0.537
100	3.84	-6.64	-26.72	0.542
101	3.88	-6.63	-26.97	0.547
102	3.92	-6.62	-27.23	0.553
103	3.95	-6.61	-27.49	0.558
104	3.99	-6.60	-27.74	0.563
105	4.03	-6.58	-28.00	0.568
106	4.07	-6.57	-28.25	0.573
107	4.11	-6.56	-28.51	0.578
108	4.15	-6.55	-28.76	0.583
109	4.19	-6.54	-29.01	0.588
110	4.23	-6.53	-29.27	0.593
111	4.26	-6.52	-29.52	0.598

				report.out
112	4.30	-6.51	-29.77	0.603
113	4.34	-6.50	-30.03	0.608
114	4.38	-6.49	-30.28	0.613
115	4.42	-6.48	-30.53	0.618
116	4.46	-6.46	-30.78	0.623
117	4.50	-6.45	-31.03	0.628
118	4.54	-6.44	-31.28	0.632
119	4.57	-6.43	-31.53	0.637
120	4.61	-6.42	-31.78	0.642
121	4.65	-6.41	-32.03	0.647
122	4.69	-6.39	-32.28	0.652
123	4.73	-6.38	-32.52	0.657
124	4.77	-6.37	-32.77	0.662
125	4.81	-6.36	-33.02	0.667
126	4.85	-6.35	-33.26	0.671
127	4.88	-6.33	-33.51	0.676
128	4.92	-6.32	-33.75	0.681
129	4.96	-6.31	-34.00	0.686
130	5.00	-6.30	-34.24	0.691
131	5.04	-6.28	-34.49	0.695
132	5.08	-6.27	-34.73	0.700
133	5.12	-6.26	-34.97	0.705
134	5.16	-6.24	-35.22	0.710
135	5.19	-6.23	-35.46	0.714
136	5.23	-6.22	-35.70	0.719
137	5.27	-6.21	-35.94	0.724
138	5.31	-6.19	-36.18	0.728
139	5.35	-6.18	-36.42	0.733
140	5.39	-6.17	-36.66	0.738
141	5.43	-6.15	-36.90	0.742
142	5.47	-6.14	-37.14	0.747
143	5.51	-6.12	-37.37	0.751
144	5.54	-6.11	-37.61	0.756
145	5.58	-6.10	-37.85	0.761
146	5.62	-6.08	-38.08	0.765
147	5.66	-6.07	-38.32	0.770
148	5.70	-6.05	-38.55	0.774
149	5.74	-6.04	-38.79	0.779
150	5.78	-6.03	-39.02	0.783
151	5.82	-6.01	-39.26	0.788
152	5.85	-6.00	-39.49	0.792
153	5.89	-5.98	-39.72	0.797
154	5.93	-5.97	-39.95	0.801
155	5.97	-5.95	-40.18	0.806
156	6.01	-5.94	-40.41	0.810
157	6.05	-5.92	-40.64	0.815
158	6.09	-5.91	-40.87	0.819
159	6.13	-5.89	-41.10	0.823
160	6.16	-5.88	-41.33	0.828
161	6.20	-5.86	-41.56	0.832
162	6.24	-5.85	-41.78	0.836
163	6.28	-5.83	-42.01	0.841
164	6.32	-5.82	-42.24	0.845
165	6.36	-5.80	-42.46	0.849
166	6.40	-5.78	-42.69	0.854
167	6.44	-5.77	-42.91	0.858
168	6.47	-5.75	-43.13	0.862
169	6.51	-5.74	-43.36	0.866
170	6.55	-5.72	-43.58	0.871
171	6.59	-5.70	-43.80	0.875
172	6.63	-5.69	-44.02	0.879
173	6.67	-5.67	-44.24	0.883
174	6.71	-5.66	-44.46	0.887

				report.out
175	6.75	-5.64	-44.68	0.891
176	6.78	-5.62	-44.90	0.895
177	6.82	-5.61	-45.12	0.900
178	6.86	-5.59	-45.33	0.904
179	6.90	-5.57	-45.55	0.908
180	6.94	-5.56	-45.76	0.912
181	6.98	-5.54	-45.98	0.916
182	7.02	-5.52	-46.19	0.920
183	7.06	-5.51	-46.41	0.924
184	7.09	-5.49	-46.62	0.928
185	7.13	-5.47	-46.83	0.932
186	7.17	-5.45	-47.05	0.936
187	7.21	-5.44	-47.26	0.940
188	7.25	-5.42	-47.47	0.944
189	7.29	-5.40	-47.68	0.948
190	7.33	-5.39	-47.89	0.951
191	7.37	-5.37	-48.09	0.955
192	7.40	-5.35	-48.30	0.959
193	7.44	-5.33	-48.51	0.963
194	7.48	-5.32	-48.72	0.967
195	7.52	-5.30	-48.92	0.971
196	7.56	-5.28	-49.13	0.974
197	7.60	-5.26	-49.33	0.978
198	7.64	-5.24	-49.53	0.982
199	7.68	-5.23	-49.74	0.986
200	7.71	-5.21	-49.94	0.989
201	7.75	-5.19	-50.14	0.993
202	7.79	-5.17	-50.34	0.997
203	7.83	-5.15	-50.54	1.000
204	7.87	-5.13	-50.74	1.004
205	7.91	-5.12	-50.94	1.008
206	7.95	-5.10	-51.14	1.011
207	7.99	-5.08	-51.34	1.015
208	8.03	-5.06	-51.53	1.018
209	8.06	-5.04	-51.73	1.022
210	8.10	-5.02	-51.92	1.025
211	8.14	-5.00	-52.12	1.029
212	8.18	-4.98	-52.31	1.032
213	8.22	-4.96	-52.50	1.036
214	8.26	-4.94	-52.69	1.039
215	8.30	-4.92	-52.89	1.043
216	8.34	-4.90	-53.08	1.046
217	8.37	-4.88	-53.27	1.050
218	8.41	-4.86	-53.46	1.053
219	8.45	-4.84	-53.64	1.056
220	8.49	-4.82	-53.83	1.060
221	8.53	-4.80	-54.02	1.063
222	8.57	-4.78	-54.20	1.066
223	8.61	-4.76	-54.39	1.070
224	8.65	-4.73	-54.57	1.073
225	8.68	-4.71	-54.75	1.076
226	8.72	-4.69	-54.94	1.079
227	8.76	-4.67	-55.12	1.083
228	8.80	-4.65	-55.30	1.086
229	8.84	-4.62	-55.48	1.089
230	8.88	-4.60	-55.66	1.092
231	8.92	-4.58	-55.84	1.095
232	8.96	-4.56	-56.01	1.098
233	8.99	-4.53	-56.19	1.101
234	9.03	-4.51	-56.36	1.104
235	9.07	-4.49	-56.54	1.107
236	9.11	-4.46	-56.71	1.111
237	9.15	-4.44	-56.88	1.114

				report.out
238	9.19	-4.42	-57.06	1.116
239	9.23	-4.39	-57.23	1.119
240	9.27	-4.37	-57.40	1.122
241	9.30	-4.34	-57.57	1.125
242	9.34	-4.32	-57.73	1.128
243	9.38	-4.30	-57.90	1.131
244	9.42	-4.27	-58.07	1.134
245	9.46	-4.25	-58.23	1.137
246	9.50	-4.22	-58.40	1.140
247	9.54	-4.20	-58.56	1.142
248	9.58	-4.17	-58.72	1.145
249	9.61	-4.14	-58.88	1.148
250	9.65	-4.12	-59.04	1.151
251	9.69	-4.09	-59.20	1.153
252	9.73	-4.07	-59.36	1.156
253	9.77	-4.04	-59.52	1.159
254	9.81	-4.02	-59.67	1.161
255	9.85	-3.99	-59.83	1.164
256	9.89	-3.96	-59.98	1.167
257	9.92	-3.94	-60.14	1.169
258	9.96	-3.91	-60.29	1.172
259	10.00	-3.88	-60.44	1.174
260	10.04	-3.85	-60.59	1.177
261	10.08	-3.83	-60.74	1.179
262	10.12	-3.80	-60.89	1.182
263	10.16	-3.77	-61.03	1.184
264	10.20	-3.74	-61.18	1.187
265	10.23	-3.72	-61.32	1.189
266	10.27	-3.69	-61.47	1.191
267	10.31	-3.66	-61.61	1.194
268	10.35	-3.63	-61.75	1.196
269	10.39	-3.60	-61.89	1.199
270	10.43	-3.57	-62.03	1.201
271	10.47	-3.55	-62.17	1.203
272	10.51	-3.52	-62.30	1.205
273	10.55	-3.49	-62.44	1.208
274	10.58	-3.46	-62.57	1.210
275	10.62	-3.43	-62.71	1.212
276	10.66	-3.40	-62.84	1.214
277	10.70	-3.37	-62.97	1.216
278	10.74	-3.34	-63.10	1.218
279	10.78	-3.31	-63.23	1.220
280	10.82	-3.28	-63.36	1.223
281	10.86	-3.25	-63.48	1.225
282	10.89	-3.22	-63.61	1.227
283	10.93	-3.19	-63.73	1.229
284	10.97	-3.16	-63.86	1.231
285	11.01	-3.13	-63.98	1.233
286	11.05	-3.09	-64.10	1.235
287	11.09	-3.06	-64.22	1.236
288	11.13	-3.03	-64.34	1.238
289	11.17	-3.00	-64.45	1.240
290	11.20	-2.97	-64.57	1.242
291	11.24	-2.94	-64.68	1.244
292	11.28	-2.91	-64.80	1.246
293	11.32	-2.87	-64.91	1.247
294	11.36	-2.84	-65.02	1.249
295	11.40	-2.81	-65.13	1.251
296	11.44	-2.78	-65.24	1.253
297	11.48	-2.74	-65.35	1.254
298	11.51	-2.71	-65.45	1.256
299	11.55	-2.68	-65.56	1.258
300	11.59	-2.65	-65.66	1.259

				report.out
301	11.63	-2.61	-65.76	1.261
302	11.67	-2.58	-65.86	1.262
303	11.71	-2.55	-65.96	1.264
304	11.75	-2.51	-66.06	1.265
305	11.79	-2.48	-66.16	1.267
306	11.82	-2.44	-66.25	1.268
307	11.86	-2.41	-66.34	1.270
308	11.90	-2.38	-66.44	1.271
309	11.94	-2.34	-66.53	1.273
310	11.98	-2.31	-66.62	1.274
311	12.02	-2.27	-66.71	1.275
312	12.06	-2.24	-66.80	1.277
313	12.10	-2.20	-66.88	1.278
314	12.13	-2.17	-66.97	1.279
315	12.17	-2.13	-67.05	1.281
316	12.21	-2.10	-67.13	1.282
317	12.25	-2.06	-67.21	1.283
318	12.29	-2.02	-67.29	1.284
319	12.33	-1.99	-67.37	1.285
320	12.37	-1.95	-67.45	1.286
321	12.41	-1.92	-67.52	1.288
322	12.44	-1.88	-67.59	1.289
323	12.48	-1.84	-67.67	1.290
324	12.52	-1.81	-67.74	1.291
325	12.56	-1.77	-67.81	1.292
326	12.60	-1.73	-67.87	1.293
327	12.64	-1.70	-67.94	1.294
328	12.68	-1.66	-68.01	1.295
329	12.72	-1.62	-68.07	1.296
330	12.75	-1.58	-68.13	1.297
331	12.79	-1.55	-68.19	1.297
332	12.83	-1.51	-68.25	1.298
333	12.87	-1.47	-68.31	1.299
334	12.91	-1.43	-68.37	1.300
335	12.95	-1.39	-68.42	1.301
336	12.99	-1.36	-68.47	1.301
337	13.03	-1.32	-68.53	1.302
338	13.07	-1.28	-68.58	1.303
339	13.10	-1.24	-68.62	1.303
340	13.14	-1.20	-68.67	1.304
341	13.18	-1.16	-68.72	1.305
342	13.22	-1.12	-68.76	1.305
343	13.26	-1.08	-68.80	1.306
344	13.30	-1.04	-68.85	1.306
345	13.34	-1.01	-68.89	1.307
346	13.38	-0.97	-68.92	1.307
347	13.41	-0.93	-68.96	1.308
348	13.45	-0.89	-69.00	1.308
349	13.49	-0.85	-69.03	1.309
350	13.53	-0.81	-69.06	1.309
351	13.57	-0.76	-69.09	1.310
352	13.61	-0.72	-69.12	1.310
353	13.65	-0.68	-69.15	1.310
354	13.69	-0.64	-69.17	1.311
355	13.72	-0.60	-69.20	1.311
356	13.76	-0.56	-69.22	1.311
357	13.80	-0.52	-69.24	1.311
358	13.84	-0.48	-69.26	1.312
359	13.88	-0.44	-69.28	1.312
360	13.92	-0.40	-69.29	1.312
361	13.96	-0.35	-69.31	1.312
362	14.00	-0.31	-69.32	1.312
363	14.03	-0.27	-69.33	1.312

				report.out
364	14.07	-0.23	-69.34	1.312
365	14.11	-0.19	-69.35	1.312
366	14.15	-0.14	-69.36	1.312
367	14.19	-0.10	-69.36	1.312
368	14.23	-0.06	-69.37	1.312
369	14.27	-0.02	-69.37	1.312
370	14.31	0.03	-69.37	1.312
371	14.34	0.07	-69.36	1.312
372	14.38	0.11	-69.36	1.312
373	14.42	0.16	-69.36	1.312
374	14.46	0.20	-69.35	1.311
375	14.50	0.24	-69.34	1.311
376	14.54	0.29	-69.33	1.311
377	14.58	0.33	-69.32	1.311
378	14.62	0.38	-69.30	1.310
379	14.65	0.42	-69.29	1.310
380	14.69	0.46	-69.27	1.310
381	14.73	0.51	-69.25	1.309
382	14.77	0.55	-69.23	1.309
383	14.81	0.60	-69.21	1.309
384	14.85	0.64	-69.19	1.308
385	14.89	0.69	-69.16	1.308
386	14.93	0.73	-69.13	1.307
387	14.96	0.78	-69.10	1.307
388	15.00	0.82	-69.07	1.306
389	15.04	0.87	-69.04	1.306
390	15.08	0.92	-69.00	1.305
391	15.12	0.96	-68.97	1.304
392	15.16	1.01	-68.93	1.304
393	15.20	1.05	-68.89	1.303
394	15.24	1.10	-68.85	1.302
395	15.27	1.15	-68.80	1.302
396	15.31	1.19	-68.76	1.301
397	15.35	1.24	-68.71	1.300
398	15.39	1.29	-68.66	1.299
399	15.43	1.33	-68.61	1.299
400	15.47	1.38	-68.56	1.298
401	15.51	1.43	-68.51	1.297
402	15.55	1.47	-68.45	1.296
403	15.59	1.52	-68.39	1.295
404	15.62	1.57	-68.33	1.294
405	15.66	1.62	-68.27	1.293
406	15.70	1.67	-68.21	1.292
407	15.74	1.71	-68.14	1.291
408	15.78	1.76	-68.07	1.290
409	15.82	1.81	-68.00	1.289
410	15.86	1.86	-67.93	1.288
411	15.90	1.91	-67.86	1.287
412	15.93	1.95	-67.78	1.286
413	15.97	2.00	-67.71	1.285
414	16.01	2.05	-67.63	1.283
415	16.05	2.10	-67.55	1.282
416	16.09	2.15	-67.47	1.281
417	16.13	2.20	-67.38	1.280
418	16.17	2.25	-67.30	1.279
419	16.21	2.30	-67.21	1.277
420	16.24	2.35	-67.12	1.276
421	16.28	2.40	-67.03	1.275
422	16.32	2.45	-66.93	1.273
423	16.36	2.50	-66.84	1.272
424	16.40	2.55	-66.74	1.270
425	16.44	2.60	-66.64	1.269
426	16.48	2.65	-66.54	1.268

				report.out
427	16.52	2.70	-66.43	1.266
428	16.55	2.75	-66.33	1.265
429	16.59	2.80	-66.22	1.263
430	16.63	2.85	-66.11	1.261
431	16.67	2.90	-66.00	1.260
432	16.71	2.95	-65.88	1.258
433	16.75	3.00	-65.77	1.257
434	16.79	3.06	-65.65	1.255
435	16.83	3.11	-65.53	1.253
436	16.86	3.16	-65.41	1.252
437	16.90	3.21	-65.29	1.250
438	16.94	3.26	-65.16	1.248
439	16.98	3.31	-65.03	1.246
440	17.02	3.36	-64.91	1.245
441	17.06	3.41	-64.77	1.243
442	17.10	3.46	-64.64	1.241
443	17.14	3.51	-64.51	1.239
444	17.17	3.56	-64.37	1.237
445	17.21	3.60	-64.23	1.235
446	17.25	3.65	-64.09	1.233
447	17.29	3.70	-63.95	1.231
448	17.33	3.75	-63.80	1.229
449	17.37	3.80	-63.66	1.227
450	17.41	3.84	-63.51	1.225
451	17.45	3.89	-63.36	1.223
452	17.48	3.94	-63.21	1.221
453	17.52	3.99	-63.05	1.219
454	17.56	4.04	-62.90	1.217
455	17.60	4.09	-62.74	1.215
456	17.64	4.13	-62.58	1.213
457	17.68	4.18	-62.42	1.211
458	17.72	4.23	-62.26	1.208
459	17.76	4.28	-62.09	1.206
460	17.79	4.33	-61.92	1.204
461	17.83	4.38	-61.76	1.202
462	17.87	4.42	-61.58	1.199
463	17.91	4.47	-61.41	1.197
464	17.95	4.52	-61.24	1.195
465	17.99	4.57	-61.06	1.192
466	18.03	4.61	-60.88	1.190
467	18.07	4.65	-60.70	1.188
468	18.10	4.69	-60.52	1.185
469	18.14	4.72	-60.34	1.183
470	18.18	4.76	-60.16	1.180
471	18.22	4.80	-59.97	1.178
472	18.26	4.83	-59.78	1.175
473	18.30	4.87	-59.60	1.173
474	18.34	4.90	-59.41	1.170
475	18.38	4.94	-59.22	1.168
476	18.42	4.97	-59.02	1.165
477	18.45	5.00	-58.83	1.162
478	18.49	5.04	-58.64	1.160
479	18.53	5.07	-58.44	1.157
480	18.57	5.10	-58.24	1.154
481	18.61	5.13	-58.05	1.152
482	18.65	5.17	-57.85	1.149
483	18.69	5.20	-57.64	1.146
484	18.73	5.23	-57.44	1.144
485	18.76	5.26	-57.24	1.141
486	18.80	5.29	-57.04	1.138
487	18.84	5.32	-56.83	1.135
488	18.88	5.35	-56.62	1.132
489	18.92	5.38	-56.41	1.129

				report.out
490	18.96	5.40	-56.21	1.127
491	19.00	5.43	-56.00	1.124
492	19.04	5.46	-55.78	1.121
493	19.07	5.49	-55.57	1.118
494	19.11	5.51	-55.36	1.115
495	19.15	5.54	-55.14	1.112
496	19.19	5.57	-54.93	1.109
497	19.23	5.59	-54.71	1.106
498	19.27	5.62	-54.50	1.103
499	19.31	5.64	-54.28	1.100
500	19.35	5.67	-54.06	1.097
501	19.38	5.69	-53.84	1.094
502	19.42	5.71	-53.62	1.090
503	19.46	5.74	-53.40	1.087
504	19.50	5.76	-53.17	1.084
505	19.54	5.78	-52.95	1.081
506	19.58	5.81	-52.72	1.078
507	19.62	5.83	-52.50	1.075
508	19.66	5.85	-52.27	1.071
509	19.69	5.87	-52.04	1.068
510	19.73	5.89	-51.82	1.065
511	19.77	5.91	-51.59	1.062
512	19.81	5.93	-51.36	1.058
513	19.85	5.95	-51.13	1.055
514	19.89	5.97	-50.90	1.052
515	19.93	5.99	-50.67	1.048
516	19.97	6.00	-50.43	1.045
517	20.00	6.02	-50.20	1.041
518	20.04	6.04	-49.97	1.038
519	20.08	6.06	-49.73	1.035
520	20.12	6.07	-49.50	1.031
521	20.16	6.09	-49.26	1.028
522	20.20	6.10	-49.02	1.024
523	20.24	6.12	-48.79	1.021
524	20.28	6.13	-48.55	1.017
525	20.31	6.15	-48.31	1.014
526	20.35	6.16	-48.07	1.010
527	20.39	6.18	-47.83	1.007
528	20.43	6.19	-47.59	1.003
529	20.47	6.20	-47.35	0.999
530	20.51	6.22	-47.11	0.996
531	20.55	6.23	-46.87	0.992
532	20.59	6.24	-46.63	0.988
533	20.62	6.25	-46.39	0.985
534	20.66	6.26	-46.15	0.981
535	20.70	6.27	-45.90	0.977
536	20.74	6.28	-45.66	0.974
537	20.78	6.29	-45.42	0.970
538	20.82	6.30	-45.17	0.966
539	20.86	6.31	-44.93	0.962
540	20.90	6.32	-44.68	0.959
541	20.94	6.33	-44.44	0.955
542	20.97	6.34	-44.19	0.951
543	21.01	6.34	-43.95	0.947
544	21.05	6.35	-43.70	0.943
545	21.09	6.36	-43.45	0.940
546	21.13	6.36	-43.21	0.936
547	21.17	6.37	-42.96	0.932
548	21.21	6.37	-42.71	0.928
549	21.25	6.38	-42.47	0.924
550	21.28	6.38	-42.22	0.920
551	21.32	6.39	-41.97	0.916
552	21.36	6.39	-41.72	0.912

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553	21.40	6.39	-41.48	0.908
554	21.44	6.40	-41.23	0.904
555	21.48	6.40	-40.98	0.900
556	21.52	6.40	-40.73	0.896
557	21.56	6.40	-40.48	0.892
558	21.59	6.40	-40.24	0.888
559	21.63	6.40	-39.99	0.884
560	21.67	6.40	-39.74	0.880
561	21.71	6.40	-39.49	0.876
562	21.75	6.40	-39.24	0.872
563	21.79	6.40	-38.99	0.867
564	21.83	6.40	-38.75	0.863
565	21.87	6.40	-38.50	0.859
566	21.90	6.40	-38.25	0.855
567	21.94	6.39	-38.00	0.851
568	21.98	6.39	-37.75	0.847
569	22.02	6.39	-37.51	0.842
570	22.06	6.38	-37.26	0.838
571	22.10	6.38	-37.01	0.834
572	22.14	6.37	-36.77	0.830
573	22.18	6.37	-36.52	0.825
574	22.21	6.36	-36.27	0.821
575	22.25	6.36	-36.02	0.817
576	22.29	6.35	-35.78	0.813
577	22.33	6.34	-35.53	0.808
578	22.37	6.34	-35.29	0.804
579	22.41	6.33	-35.04	0.800
580	22.45	6.32	-34.80	0.795
581	22.49	6.31	-34.55	0.791
582	22.52	6.30	-34.31	0.787
583	22.56	6.30	-34.06	0.782
584	22.60	6.29	-33.82	0.778
585	22.64	6.28	-33.57	0.773
586	22.68	6.27	-33.33	0.769
587	22.72	6.25	-33.09	0.764
588	22.76	6.24	-32.85	0.760
589	22.80	6.23	-32.61	0.756
590	22.83	6.22	-32.36	0.751
591	22.87	6.21	-32.12	0.747
592	22.91	6.20	-31.88	0.742
593	22.95	6.18	-31.64	0.738
594	22.99	6.17	-31.40	0.733
595	23.03	6.16	-31.16	0.729
596	23.07	6.14	-30.93	0.724
597	23.11	6.13	-30.69	0.719
598	23.14	6.11	-30.45	0.715
599	23.18	6.10	-30.21	0.710
600	23.22	6.08	-29.98	0.706
601	23.26	6.06	-29.74	0.701
602	23.30	6.05	-29.51	0.697
603	23.34	6.03	-29.27	0.692
604	23.38	6.01	-29.04	0.687
605	23.42	6.00	-28.81	0.683
606	23.46	5.98	-28.58	0.678
607	23.49	5.96	-28.34	0.673
608	23.53	5.94	-28.11	0.669
609	23.57	5.92	-27.88	0.664
610	23.61	5.90	-27.65	0.659
611	23.65	5.88	-27.43	0.655
612	23.69	5.87	-27.20	0.650
613	23.73	5.85	-26.97	0.645
614	23.77	5.83	-26.74	0.641
615	23.80	5.82	-26.52	0.636

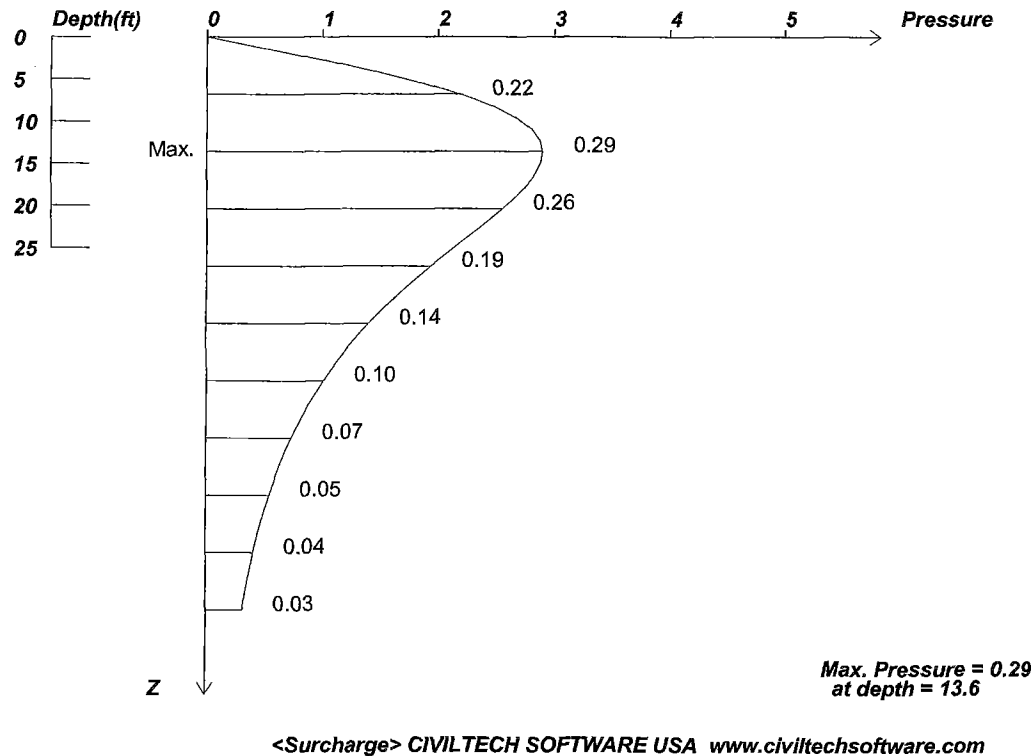
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616	23.84	5.80	-26.29	0.631
617	23.88	5.78	-26.07	0.626
618	23.92	5.77	-25.84	0.622
619	23.96	5.75	-25.62	0.617
620	24.00	5.74	-25.40	0.612
621	24.04	5.73	-25.18	0.607
622	24.08	5.71	-24.95	0.602
623	24.11	5.70	-24.73	0.598
624	24.15	5.69	-24.51	0.593
625	24.19	5.68	-24.29	0.588
626	24.23	5.67	-24.07	0.583
627	24.27	5.66	-23.85	0.578
628	24.31	5.65	-23.63	0.574
629	24.35	5.64	-23.41	0.569
630	24.39	5.63	-23.20	0.564
631	24.42	5.62	-22.98	0.559
632	24.46	5.61	-22.76	0.554
633	24.50	5.60	-22.54	0.549
634	24.54	5.59	-22.33	0.544
635	24.58	5.58	-22.11	0.539
636	24.62	5.57	-21.89	0.534
637	24.66	5.56	-21.68	0.530
638	24.70	5.55	-21.46	0.525
639	24.73	5.54	-21.25	0.520
640	24.77	5.53	-21.03	0.515
641	24.81	5.52	-20.82	0.510
642	24.85	5.51	-20.60	0.505
643	24.89	5.50	-20.39	0.500
644	24.93	5.49	-20.18	0.495
645	24.97	5.47	-19.97	0.490
646	25.01	5.46	-19.75	0.485
647	25.04	5.45	-19.54	0.480
648	25.08	5.44	-19.33	0.475
649	25.12	5.42	-19.12	0.470
650	25.16	5.41	-18.91	0.465
651	25.20	5.39	-18.70	0.460
652	25.24	5.38	-18.49	0.455
653	25.28	5.36	-18.28	0.450
654	25.32	5.35	-18.08	0.445
655	25.35	5.33	-17.87	0.440
656	25.39	5.32	-17.66	0.435
657	25.43	5.30	-17.46	0.430
658	25.47	5.29	-17.25	0.425
659	25.51	5.27	-17.05	0.419
660	25.55	5.25	-16.84	0.414
661	25.59	5.24	-16.64	0.409
662	25.63	5.22	-16.44	0.404
663	25.66	5.20	-16.24	0.399
664	25.70	5.18	-16.03	0.394
665	25.74	5.16	-15.83	0.389
666	25.78	5.15	-15.63	0.384
667	25.82	5.13	-15.43	0.379
668	25.86	5.11	-15.24	0.374
669	25.90	5.09	-15.04	0.368
670	25.94	5.07	-14.84	0.363
671	25.98	5.05	-14.65	0.358
672	26.01	5.03	-14.45	0.353
673	26.05	5.01	-14.26	0.348
674	26.09	4.99	-14.06	0.343
675	26.13	4.97	-13.87	0.338
676	26.17	4.95	-13.68	0.332
677	26.21	4.92	-13.48	0.327
678	26.25	4.90	-13.29	0.322

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679	26.29	4.88	-13.10	0.317
680	26.32	4.86	-12.92	0.312
681	26.36	4.83	-12.73	0.307
682	26.40	4.81	-12.54	0.301
683	26.44	4.79	-12.36	0.296
684	26.48	4.76	-12.17	0.291
685	26.52	4.74	-11.99	0.286
686	26.56	4.71	-11.80	0.281
687	26.60	4.69	-11.62	0.275
688	26.63	4.67	-11.44	0.270
689	26.67	4.64	-11.26	0.265
690	26.71	4.61	-11.08	0.260
691	26.75	4.59	-10.90	0.254
692	26.79	4.56	-10.72	0.249
693	26.83	4.54	-10.55	0.244
694	26.87	4.51	-10.37	0.239
695	26.91	4.48	-10.20	0.233
696	26.94	4.45	-10.02	0.228
697	26.98	4.43	-9.85	0.223
698	27.02	4.40	-9.68	0.218
699	27.06	4.37	-9.51	0.212
700	27.10	4.34	-9.34	0.207
701	27.14	4.31	-9.17	0.202
702	27.18	4.28	-9.01	0.197
703	27.22	4.25	-8.84	0.191
704	27.25	4.22	-8.68	0.186
705	27.29	4.19	-8.51	0.181
706	27.33	4.16	-8.35	0.176
707	27.37	4.13	-8.19	0.170
708	27.41	4.10	-8.03	0.165
709	27.45	4.07	-7.87	0.160
710	27.49	4.04	-7.72	0.154
711	27.53	4.00	-7.56	0.149
712	27.56	3.97	-7.41	0.144
713	27.60	3.94	-7.25	0.139
714	27.64	3.91	-7.10	0.133
715	27.68	3.87	-6.95	0.128
716	27.72	3.84	-6.80	0.123
717	27.76	3.81	-6.65	0.117
718	27.80	3.77	-6.51	0.112
719	27.84	3.74	-6.36	0.107
720	27.87	3.70	-6.22	0.101
721	27.91	3.67	-6.07	0.096
722	27.95	3.63	-5.93	0.091
723	27.99	3.60	-5.79	0.085
724	28.03	3.56	-5.65	0.080
725	28.07	3.53	-5.52	0.075
726	28.11	3.49	-5.38	0.069
727	28.15	3.45	-5.24	0.064
728	28.18	3.42	-5.11	0.059
729	28.22	3.38	-4.98	0.053
730	28.26	3.34	-4.85	0.048
731	28.30	3.30	-4.72	0.043
732	28.34	3.27	-4.59	0.037
733	28.38	3.23	-4.47	0.032
734	28.42	3.19	-4.34	0.027
735	28.46	3.15	-4.22	0.021
736	28.50	3.11	-4.10	0.016
737	28.53	3.07	-3.98	0.011
738	28.57	3.03	-3.86	0.005
739	28.61	2.99	-3.74	0.000
740	28.65	2.95	-3.63	-0.005
741	28.69	2.91	-3.51	-0.011

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742	28.73	2.87	-3.40	-0.016
743	28.77	2.83	-3.29	-0.021
744	28.81	2.79	-3.18	-0.027
745	28.84	2.75	-3.08	-0.032
746	28.88	2.70	-2.97	-0.037
747	28.92	2.66	-2.87	-0.043
748	28.96	2.62	-2.76	-0.048
749	29.00	2.58	-2.66	-0.054
750	29.04	2.53	-2.56	-0.059
751	29.08	2.49	-2.47	-0.064
752	29.12	2.44	-2.37	-0.070
753	29.15	2.40	-2.28	-0.075
754	29.19	2.36	-2.19	-0.080
755	29.23	2.31	-2.09	-0.086
756	29.27	2.27	-2.01	-0.091
757	29.31	2.22	-1.92	-0.096
758	29.35	2.17	-1.83	-0.102
759	29.39	2.13	-1.75	-0.107
760	29.43	2.08	-1.67	-0.113
761	29.46	2.04	-1.59	-0.118
762	29.50	1.99	-1.51	-0.123
763	29.54	1.94	-1.43	-0.129
764	29.58	1.89	-1.36	-0.134
765	29.62	1.85	-1.29	-0.139
766	29.66	1.80	-1.22	-0.145
767	29.70	1.75	-1.15	-0.150
768	29.74	1.70	-1.08	-0.156
769	29.77	1.65	-1.02	-0.161
770	29.81	1.60	-0.95	-0.166
771	29.85	1.55	-0.89	-0.172
772	29.89	1.50	-0.83	-0.177
773	29.93	1.45	-0.78	-0.182
774	29.97	1.40	-0.72	-0.188
775	30.01	1.35	-0.67	-0.193
776	30.05	1.30	-0.62	-0.199
777	30.08	1.25	-0.57	-0.204
778	30.12	1.20	-0.52	-0.209
779	30.16	1.15	-0.47	-0.215
780	30.20	1.09	-0.43	-0.220
781	30.24	1.04	-0.39	-0.225
782	30.28	0.99	-0.35	-0.231
783	30.32	0.94	-0.31	-0.236
784	30.36	0.88	-0.28	-0.242
785	30.39	0.83	-0.24	-0.247
786	30.43	0.78	-0.21	-0.252
787	30.47	0.72	-0.18	-0.258
788	30.51	0.67	-0.16	-0.263
789	30.55	0.61	-0.13	-0.268
790	30.59	0.56	-0.11	-0.274
791	30.63	0.50	-0.09	-0.279
792	30.67	0.45	-0.07	-0.285
793	30.70	0.39	-0.05	-0.290
794	30.74	0.34	-0.04	-0.295
795	30.78	0.28	-0.03	-0.301
796	30.82	0.22	-0.02	-0.306
797	30.86	0.17	-0.01	-0.311
798	30.90	0.11	0.00	-0.317
799	30.94	0.05	0.00	-0.322

Users can select data, then copy and paste into Excel to create graphics

Legacy Pkwy - C867 Bent 2 - E80 at 20ft - GW at 8ft



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Date: 1/22/2007

Wall Height, H= 17 Load Depth at Surface, D= 0

Load Factor of Surcharge Loading = 1

Rigid Wall Condition -- No movement or deflection of the wall are allowed.

Max. Pressure = 0.29 at depth = 13.6

Cooper E 80 Railroad Loading. From wall to railroad center, X=20.0

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 SURCHARGE LOADS CALCULATION SUMMARY
 <Surcharge>
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 Time: 12/30/1899 12:34:51 PM
 Date: 1/22/2007

Legacy Pkwy - C867 Bent 2 - E80 at 20ft - GW at 8ft

Height of wall = 17
 Depth of wall = 0
 Load Factor of Surcharge Loading = 1

Wall Condition:
 Rigid wall Condition -- No movement or deflection of the wall are allowed.

*****Loading*****

RAILROAD LOADING:
 Cooper E 80 Railroad Loading. From wall to railroad center, x=20.0

*****Total Pressure Distribution*****

Max. Pressure =0.291 at depth =13.60

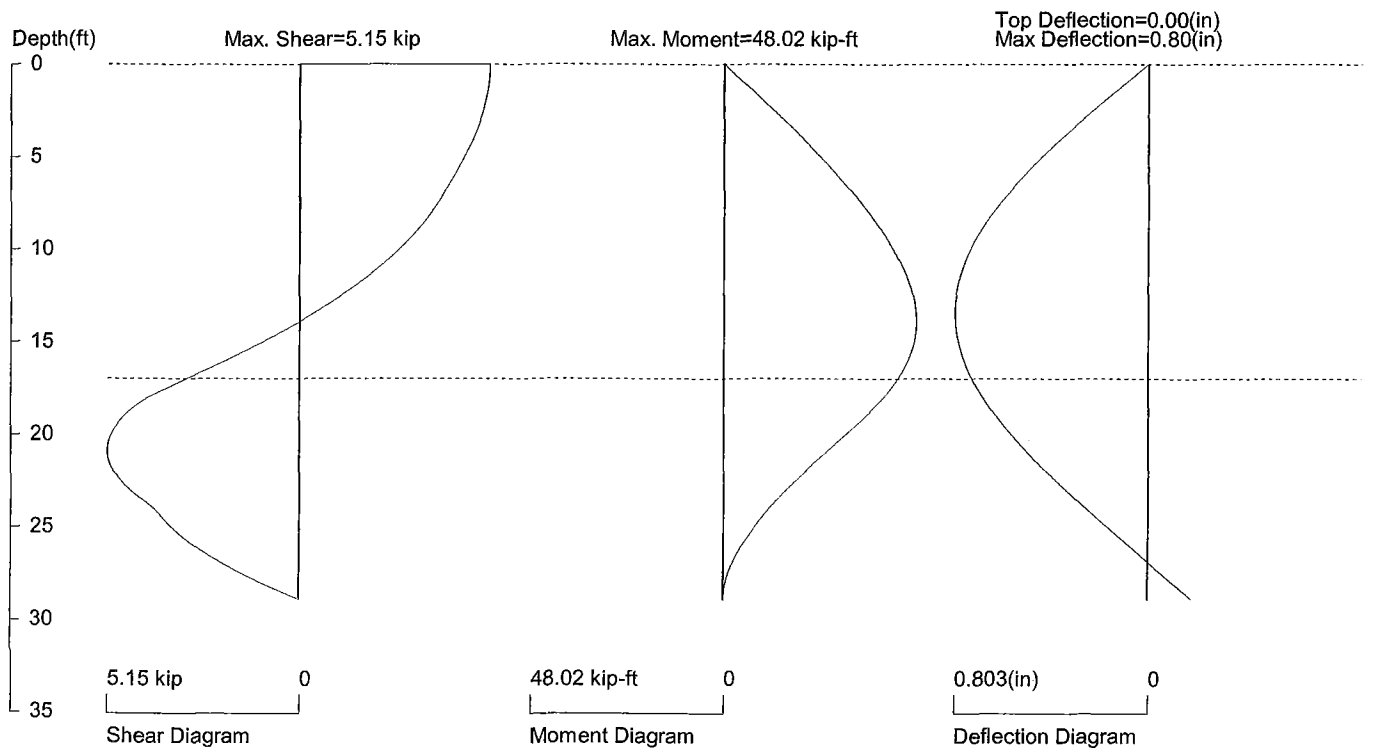
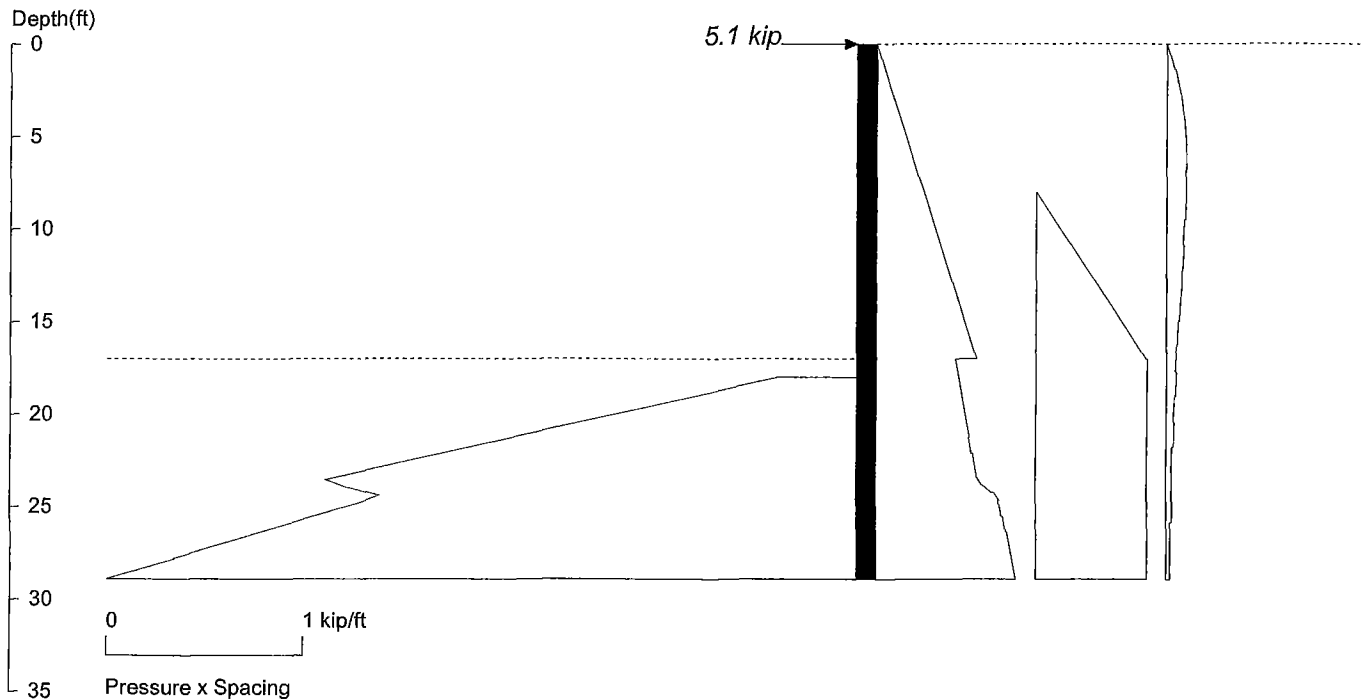
Depth	Pressure
0.00	0.000
1.36	0.051
2.72	0.101
4.08	0.146
5.44	0.186
6.80	0.220
8.16	0.247
9.52	0.267
10.88	0.280
12.24	0.288
13.60	0.291
14.96	0.289
16.32	0.284
17.68	0.276
19.04	0.267
20.40	0.255
21.76	0.244
23.12	0.231
24.48	0.219
25.84	0.206
27.20	0.194
28.56	0.182
29.92	0.171
31.28	0.160
32.64	0.150
34.00	0.141
35.36	0.132
36.72	0.123

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38.08	0.116
39.44	0.108
40.80	0.102
42.16	0.095
43.52	0.089
44.88	0.084
46.24	0.079
47.60	0.074
48.96	0.070
50.32	0.065
51.68	0.062
53.04	0.058
54.40	0.055
55.76	0.052
57.12	0.049
58.48	0.046
59.84	0.044
61.20	0.041
62.56	0.039
63.92	0.037
65.28	0.035
66.64	0.034
68.00	0.032

Depth Is Measured From Top of the Wall

LENGTH, DEPTH: ft, Qpoint: kip, Qline: kip/ft, Qstrip, Qarea, PRESSURE: ksf

Legacy Pkwy - C867 Bent 2 - Spoils at 8ft - GW at 8ft with wall friction



PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on one soldier pile or one foot spacing of sheet pile

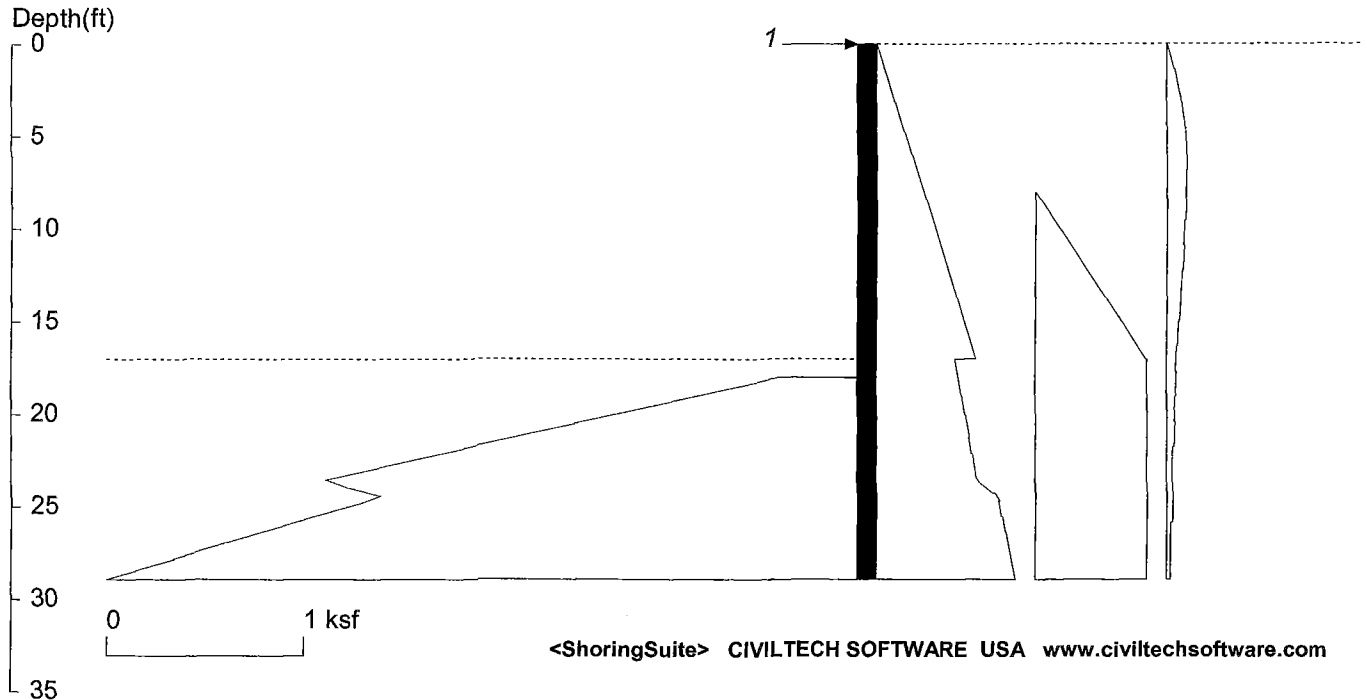
Pile: AZ18 meet Section Requirements. Properties: 6. E (ksi)=29000, 4. I (in⁴)=250.4

Date: 1/22/2007 File Name: UNTITLED

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<ShoringSuite> CIVILTECH SOFTWARE USA www.civiltechsoftware.com

Legacy Pkwy - C867 Bent 2 - Spoils at 8ft - GW at 8ft with wall friction



Licensed to BHG IGES, Inc.

Date: 1/22/2007 File Name: UNTITLED

Wall Height=17.0

Pile Diameter=1.0

Pile Spacing=1.0

ACTIVE SPACE:		Z depth	Spacing
1		0.00	1.00
2		17.00	1.00
PASSIVE SPACE:		Z depth	Spacing
1		17.00	1.00

PILE LENGTH: Min. Embedment=11.90, Min. Pile Length=28.90

MOMENT IN PILE: Max. Moment=48.02 at Depth of 13.89

VERTICAL BEARING CAPACITY: Vertical Loading=0.0, Resistance=41.3, Vertical Factor of Safety=999.00

PILE SELECTION:

Request Min. Section Modulus = 17.5 in³/feet, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66

AZ18 has Section Modulus = 33.5. It is greater than Min. Requirements!, Top Deflection = 0.00(in)

BRACE FORCE: Strut, Tieback, Plate Anchor, and Deadman

No. & Type	Depth	Angle	Total	Horiz.	Vert.	N/A	N/A
1. Strut	0.0	0.0	5.1	5.1	0.0	0.0	0.0

UNITS: Length/Depth - ft, Force - kip, Moment - kip-ft, Pressure - ksf, Pres. Slope - kip/ft³, Deflection - in

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SHORING WALL CALCULATION SUMMARY

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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

DEPTH: ft, PRESSURE, FRICTION, BEARING: ksf, SLOPE: kcf, FORCE: kip, MOMENT: kip-ft,
DEFLECTION: in, I: in4, E: ksi

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Date: 1/22/2007 File: UNTITLED

Title: Legacy Pkwy - C867 Bent 2 - Spoils at 8ft - GW at 8ft
Subtitle: with wall friction

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

Wall Type: 1. Sheet Pile
Wall Height: 17.00
Pile Diameter: 1.00
Pile Spacing: 1.00
Factor of Safety (F.S.): 1.50
Max. Moment reduce 20%
Lateral Support Type (Braces): 2. Strut, Raker
Top Brace Increase (Multi-Bracing): Add 15%*
Brace Position (One Brace Case): Normal Brace*
Embedment Option: 1. Yes
Friction at Pile Tip: No*
Check Vertical Bearing Capacity:
Side Friction for Bearing: 1.00
Tip Resistance for Bearing: 1.00
Pile Properties:
Allowable Fb/Fy: 0.66
Steel Strength, Fy: 50 ksi = 345 MPa
Elastic Module, E: 29000.00
Moment of Inertia, I: 250.40
User Input Pile: AZ18

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

No.	Z2 top	Top Pres.	Z2 bottom	Bottom Pres.	Slope
1	0.00	0.00	17.00	0.52	0.0300
2	17.00	0.40	21.25	0.47	0.0180
3	21.25	0.47	22.10	0.49	0.0190
4	22.10	0.49	23.38	0.51	0.0180
5	23.38	0.51	23.80	0.54	0.0720
6	23.80	0.54	24.22	0.60	0.1210
7	24.22	0.60	24.65	0.62	0.0670
8	24.65	0.62	25.50	0.64	0.0190
9	25.50	0.64	26.35	0.66	0.0210

10	26.35	0.66	report.out	38.25	0.89	0.0190
11	38.25	0.89		38.68	0.87	-0.0340
12	38.68	0.87		39.10	0.78	-0.2090
13	39.10	0.78		39.53	0.72	-0.1560
14	39.53	0.72		44.63	0.80	0.0170
15	44.63	0.80		45.05	0.81	0.0210
16	45.05	0.81		45.48	0.82	0.0220
17	45.48	0.82		45.90	0.83	0.0190
18	45.90	0.83		59.93	1.07	0.0170
19	59.93	1.07		60.35	1.08	0.0200
20	60.35	1.08		60.78	1.09	0.0210
21	60.78	1.09		61.20	1.10	0.0190
22	61.20	1.10		85.00	1.51	0.0170
23	8.00	0.00		17.00	0.56	0.0620
24	17.00	0.56		85.00	0.56	0.0000
25	0.00	0.00		1.36	0.04	0.0270
26	1.36	0.04		2.72	0.07	0.0220
27	2.72	0.07		4.08	0.09	0.0150
28	4.08	0.09		5.44	0.10	0.0080
29	5.44	0.10		6.80	0.10	0.0020
30	6.80	0.10		8.16	0.10	-0.0020
31	8.16	0.10		9.52	0.09	-0.0040
32	9.52	0.09		10.88	0.09	-0.0050
33	10.88	0.09		12.24	0.08	-0.0060
34	12.24	0.08		13.60	0.07	-0.0060
35	13.60	0.07		14.96	0.06	-0.0050
36	14.96	0.06		16.32	0.05	-0.0050
37	16.32	0.05		17.68	0.05	-0.0050
38	17.68	0.05		19.04	0.04	-0.0040
39	19.04	0.04		20.40	0.04	-0.0040
40	20.40	0.04		21.76	0.03	-0.0030
41	21.76	0.03		23.12	0.03	-0.0030
42	23.12	0.03		24.48	0.03	-0.0020
43	24.48	0.03		25.84	0.02	-0.0020
44	25.84	0.02		27.20	0.02	-0.0020
45	27.20	0.02		28.56	0.02	-0.0020
46	28.56	0.02		29.92	0.02	-0.0010
47	29.92	0.02		31.28	0.02	-0.0010
48	31.28	0.02		32.64	0.01	-0.0010
49	32.64	0.01		34.00	0.01	-0.0010
50	34.00	0.01		35.36	0.01	-0.0010
51	35.36	0.01		36.72	0.01	-0.0010
52	36.72	0.01		38.08	0.01	-0.0010
53	38.08	0.01		39.44	0.01	-0.0010
54	39.44	0.01		40.80	0.01	-0.0010
55	40.80	0.01		42.16	0.01	0.0000
56	42.16	0.01		43.52	0.01	0.0000
57	43.52	0.01		44.88	0.01	0.0000
58	44.88	0.01		46.24	0.01	0.0000
59	46.24	0.01		47.60	0.01	0.0000
60	47.60	0.01		48.96	0.01	0.0000
61	48.96	0.01		50.32	0.00	0.0000
62	50.32	0.00		51.68	0.00	0.0000
63	51.68	0.00		53.04	0.00	0.0000
64	53.04	0.00		54.40	0.00	0.0000
65	54.40	0.00		55.76	0.00	0.0000
66	55.76	0.00		57.12	0.00	0.0000
67	57.12	0.00		58.48	0.00	0.0000
68	58.48	0.00		59.84	0.00	0.0000
69	59.84	0.00		61.20	0.00	0.0000
70	61.20	0.00		62.56	0.00	0.0000
71	62.56	0.00		63.92	0.00	0.0000
72	63.92	0.00		65.28	0.00	0.0000

73	65.28	0.00	report.out 66.64	0.00	0.0000
74	66.64	0.00	68.00	0.00	0.0000

* PASSIVE PRESSURE *

No.	Z1 top	Top Pres.	Z2 bottom	Bottom Pres.	Slope
1	18.00	0.41	23.53	2.69	0.4130
2	23.53	2.69	23.95	2.58	-0.2600
3	23.95	2.58	24.38	2.42	-0.3850
4	24.38	2.42	24.80	2.53	0.2480
5	24.80	2.53	25.23	2.67	0.3280
6	25.23	2.67	25.65	2.80	0.3230
7	25.65	2.80	26.08	2.94	0.3200
8	26.08	2.94	26.50	3.07	0.3170
9	26.50	3.07	26.92	3.21	0.3150
10	26.92	3.21	27.35	3.34	0.3050
11	27.35	3.34	27.78	3.46	0.3010
12	27.78	3.46	28.20	3.59	0.3070
13	28.20	3.59	29.05	3.86	0.3100
14	29.05	3.86	30.33	4.25	0.3080
15	30.33	4.25	32.45	4.90	0.3070
16	32.45	4.90	38.40	6.72	0.3060
17	38.40	6.72	38.83	7.52	1.8790
18	38.83	7.52	39.25	8.82	3.0720
19	39.25	8.82	39.68	9.51	1.6120
20	39.68	9.51	40.10	9.73	0.5310
21	40.10	9.73	40.53	9.96	0.5300
22	40.53	9.96	40.95	10.18	0.5280
23	40.95	10.18	41.38	10.41	0.5260
24	41.38	10.41	41.80	10.63	0.5240
25	41.80	10.63	42.22	10.84	0.4990
26	42.22	10.84	42.65	11.04	0.4580
27	42.65	11.04	43.08	11.24	0.4770
28	43.08	11.24	43.50	11.46	0.5120
29	43.50	11.46	43.93	11.67	0.5110
30	43.93	11.67	44.35	11.89	0.5100
31	44.35	11.89	44.78	12.11	0.5090
32	44.78	12.11	45.20	12.32	0.5080
33	45.20	12.32	46.05	12.75	0.5070
34	46.05	12.75	46.90	13.18	0.5050
35	46.90	13.18	47.75	13.61	0.5030
36	47.75	13.61	48.60	14.03	0.5010
37	48.60	14.03	49.45	14.46	0.5000
38	49.45	14.46	50.30	14.88	0.4980
39	50.30	14.88	51.15	15.31	0.4970
40	51.15	15.31	52.43	15.94	0.4960
41	52.43	15.94	53.70	16.57	0.4950
42	53.70	16.57	54.98	17.20	0.4930
43	54.98	17.20	56.25	17.82	0.4920
44	56.25	17.82	56.68	18.01	0.4410
45	56.68	18.01	57.10	18.20	0.4340
46	57.10	18.20	57.53	18.40	0.4830
47	57.53	18.40	59.65	19.44	0.4880
48	59.65	19.44	62.20	20.68	0.4870
49	62.20	20.68	65.60	22.33	0.4860
50	65.60	22.33	70.70	24.80	0.4850
51	70.70	24.80	79.63	29.12	0.4840
52	79.63	29.12	85.15	31.79	0.4830

The pressure above will be divided by a Factor of Safety =1.5

* ACTIVE SPACE *

report.out

No.	Z depth	Spacing
1	0.00	1.00
2	17.00	1.00

* PASSIVE SPACE *

No.	Z depth	Spacing
1	17.00	1.00

* BRACE: STRUT, TIEBACK, ANCHOR PLATE, OR DEADMAN *

No.	Z brace	Angle	Spacing	Input1*	Input2*
1	0.00	0.0	1.00	1.00	1.00
Strut					

*For Tieback: Input1 = Diameter; Input2 = Bond Stength

*For Plate: Input1 = Diameter; Input2 = Allowable Pressure

*For Deaman: Input1 = Horz. Width; Input2 = Allowable Pressure; Angle = 0

*****SPECIFIED PILE *****

AZ18 has been found in Sheet Pile list!

AZ18 Sx= 33.5 Ix= 250.4 Weight= 24.17

* Note: All the pile dimensions are in English Units per one foot width.

*****CALCULATION*****

Top Pressures start at depth = 0.00

NUMBER OF BRACE LEVEL = 1

	D1=0.00	
<--	D2=0.00	R1=5.07
== ==	D3=17.00	
	D4=28.90	

D1 - TOP DEPTH

D2 - BRACE DEPTH

D3 - EXCAVATION BASE

D4 - PILE TIP

R1 - REACTION

TOTAL REACTION: R1 = 5.07

TOTAL PRESSURE ACTING ON WALL = 5.07

Total Reaction = Total Pressure, OK!

BRACE NO.1 AT DEPTH = 0.00

R1 = Brace Load = 5.07

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*****RESULTS*****

* EMBEDMENT *

MINIMUM EMBEDMENT = 11.90

TOTAL MINIMUM PILE LENGTH = 28.90

* MOMENT IN PILE *

No.	Depth	M @ Brace	Mmax in Span	Depth of Mmax
1	0.00	0.00	48.02	13.89

Overall Maximum Moment = 48.02 at 13.89

Maximum Shear = 5.15

* BRACE: STRUT, TIEBACK, ANCHOR PLATE, OR DEADMAN *

No.	DEPTH	Tangle	SPACING	HORIZONTAL	VERTICAL
1	0.00	0.0	1.00	5.07	0.00

5.07

No.	DEPTH	Free length	Type and Data
1	0.00	0.00	Strut

* VERTICAL LOADING *

Vertical Loading from Braces = 0.00

Vertical Loading from External Load = 0.00

Total Vertical Loading = 0.00

* VERTICAL BEARING CAPACITY CHECK *

Tip Depth	Tip Area	Bearing	Tip Resistance
28.90	0.50	1.00	0.50
Embedment	Side Area*	Friction	Side Resistance
11.90	40.80	1.00	40.80

*Side Area is the surface area of embedment below base and contact area between pile and soil above base.

Total Vertical Resistance = 41.30

Total Vertical Loading = 0.00

Vertical Factor of Safety = 999.00

*****SPECIFIED PILE *****

AZ18 has been found in Sheet Pile list!

AZ18 Sx= 33.5 Ix= 250.4 weight= 24.17

* Note: All the pile dimensions are in English Units per one foot width.

Request Min. Section Modulus = 17.5 in3/feet, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66

The pile selection is based on the magnitude of the moment only. Axial force is neglected. Ref. Note 3

report.out

AZ18 is capable to support the shoring!
Top deflection = 0.003(in)
Max. deflection = 0.803(in)

*****SHEAR, MOMENT, AND DEFLECTION v.s. DEPTH*****

User Input Pile: AZ18
Elastic Module, E: 29000.00
Moment of Inertia, I: 250.40

No	DEPTH ft	SHEAR kip	MOMENT kip-ft	DEFLECTION in
1	0.00	-5.07	0.00	0.003
2	0.04	-5.07	-0.18	0.007
3	0.07	-5.07	-0.37	0.010
4	0.11	-5.07	-0.55	0.013
5	0.14	-5.07	-0.73	0.017
6	0.18	-5.07	-0.92	0.020
7	0.22	-5.07	-1.10	0.023
8	0.25	-5.07	-1.28	0.027
9	0.29	-5.07	-1.47	0.030
10	0.33	-5.07	-1.65	0.034
11	0.36	-5.07	-1.84	0.037
12	0.40	-5.07	-2.02	0.040
13	0.43	-5.07	-2.20	0.044
14	0.47	-5.07	-2.39	0.047
15	0.51	-5.07	-2.57	0.050
16	0.54	-5.06	-2.75	0.054
17	0.58	-5.06	-2.93	0.057
18	0.62	-5.06	-3.12	0.060
19	0.65	-5.06	-3.30	0.064
20	0.69	-5.06	-3.48	0.067
21	0.72	-5.06	-3.67	0.070
22	0.76	-5.06	-3.85	0.074
23	0.80	-5.06	-4.03	0.077
24	0.83	-5.05	-4.22	0.080
25	0.87	-5.05	-4.40	0.084
26	0.90	-5.05	-4.58	0.087
27	0.94	-5.05	-4.76	0.090
28	0.98	-5.05	-4.95	0.094
29	1.01	-5.04	-5.13	0.097
30	1.05	-5.04	-5.31	0.100
31	1.09	-5.04	-5.49	0.104
32	1.12	-5.04	-5.68	0.107
33	1.16	-5.04	-5.86	0.110
34	1.19	-5.03	-6.04	0.114
35	1.23	-5.03	-6.22	0.117
36	1.27	-5.03	-6.40	0.120
37	1.30	-5.03	-6.59	0.124
38	1.34	-5.02	-6.77	0.127
39	1.37	-5.02	-6.95	0.130
40	1.41	-5.02	-7.13	0.134
41	1.45	-5.01	-7.31	0.137
42	1.48	-5.01	-7.49	0.140
43	1.52	-5.01	-7.68	0.144
44	1.56	-5.00	-7.86	0.147
45	1.59	-5.00	-8.04	0.150
46	1.63	-5.00	-8.22	0.153
47	1.66	-4.99	-8.40	0.157
48	1.70	-4.99	-8.58	0.160
49	1.74	-4.99	-8.76	0.163

				report.out
50	1.77	-4.98	-8.94	0.167
51	1.81	-4.98	-9.12	0.170
52	1.85	-4.98	-9.30	0.173
53	1.88	-4.97	-9.48	0.176
54	1.92	-4.97	-9.66	0.180
55	1.95	-4.96	-9.84	0.183
56	1.99	-4.96	-10.02	0.186
57	2.03	-4.96	-10.20	0.189
58	2.06	-4.95	-10.38	0.193
59	2.10	-4.95	-10.56	0.196
60	2.13	-4.94	-10.74	0.199
61	2.17	-4.94	-10.91	0.202
62	2.21	-4.93	-11.09	0.206
63	2.24	-4.93	-11.27	0.209
64	2.28	-4.92	-11.45	0.212
65	2.32	-4.92	-11.63	0.215
66	2.35	-4.91	-11.81	0.219
67	2.39	-4.91	-11.98	0.222
68	2.42	-4.91	-12.16	0.225
69	2.46	-4.90	-12.34	0.228
70	2.50	-4.90	-12.52	0.232
71	2.53	-4.89	-12.69	0.235
72	2.57	-4.88	-12.87	0.238
73	2.60	-4.88	-13.05	0.241
74	2.64	-4.87	-13.22	0.244
75	2.68	-4.87	-13.40	0.248
76	2.71	-4.86	-13.58	0.251
77	2.75	-4.86	-13.75	0.254
78	2.79	-4.85	-13.93	0.257
79	2.82	-4.85	-14.10	0.260
80	2.86	-4.84	-14.28	0.264
81	2.89	-4.84	-14.45	0.267
82	2.93	-4.83	-14.63	0.270
83	2.97	-4.82	-14.80	0.273
84	3.00	-4.82	-14.98	0.276
85	3.04	-4.81	-15.15	0.279
86	3.08	-4.81	-15.32	0.283
87	3.11	-4.80	-15.50	0.286
88	3.15	-4.79	-15.67	0.289
89	3.18	-4.79	-15.85	0.292
90	3.22	-4.78	-16.02	0.295
91	3.26	-4.77	-16.19	0.298
92	3.29	-4.77	-16.36	0.301
93	3.33	-4.76	-16.54	0.304
94	3.36	-4.76	-16.71	0.308
95	3.40	-4.75	-16.88	0.311
96	3.44	-4.74	-17.05	0.314
97	3.47	-4.74	-17.22	0.317
98	3.51	-4.73	-17.39	0.320
99	3.55	-4.72	-17.57	0.323
100	3.58	-4.72	-17.74	0.326
101	3.62	-4.71	-17.91	0.329
102	3.65	-4.70	-18.08	0.332
103	3.69	-4.69	-18.25	0.335
104	3.73	-4.69	-18.42	0.338
105	3.76	-4.68	-18.59	0.341
106	3.80	-4.67	-18.76	0.344
107	3.83	-4.67	-18.92	0.347
108	3.87	-4.66	-19.09	0.350
109	3.91	-4.65	-19.26	0.353
110	3.94	-4.64	-19.43	0.356
111	3.98	-4.64	-19.60	0.359
112	4.02	-4.63	-19.76	0.362

				report.out
113	4.05	-4.62	-19.93	0.365
114	4.09	-4.61	-20.10	0.368
115	4.12	-4.61	-20.27	0.371
116	4.16	-4.60	-20.43	0.374
117	4.20	-4.59	-20.60	0.377
118	4.23	-4.58	-20.76	0.380
119	4.27	-4.57	-20.93	0.383
120	4.31	-4.57	-21.10	0.386
121	4.34	-4.56	-21.26	0.389
122	4.38	-4.55	-21.43	0.392
123	4.41	-4.54	-21.59	0.395
124	4.45	-4.53	-21.75	0.398
125	4.49	-4.53	-21.92	0.401
126	4.52	-4.52	-22.08	0.404
127	4.56	-4.51	-22.24	0.407
128	4.59	-4.50	-22.41	0.410
129	4.63	-4.49	-22.57	0.413
130	4.67	-4.48	-22.73	0.415
131	4.70	-4.48	-22.89	0.418
132	4.74	-4.47	-23.06	0.421
133	4.78	-4.46	-23.22	0.424
134	4.81	-4.45	-23.38	0.427
135	4.85	-4.44	-23.54	0.430
136	4.88	-4.43	-23.70	0.433
137	4.92	-4.42	-23.86	0.435
138	4.96	-4.41	-24.02	0.438
139	4.99	-4.41	-24.18	0.441
140	5.03	-4.40	-24.34	0.444
141	5.06	-4.39	-24.50	0.447
142	5.10	-4.38	-24.66	0.450
143	5.14	-4.37	-24.81	0.452
144	5.17	-4.36	-24.97	0.455
145	5.21	-4.35	-25.13	0.458
146	5.25	-4.34	-25.29	0.461
147	5.28	-4.33	-25.44	0.463
148	5.32	-4.32	-25.60	0.466
149	5.35	-4.31	-25.76	0.469
150	5.39	-4.30	-25.91	0.472
151	5.43	-4.29	-26.07	0.474
152	5.46	-4.28	-26.22	0.477
153	5.50	-4.28	-26.38	0.480
154	5.54	-4.27	-26.53	0.482
155	5.57	-4.26	-26.69	0.485
156	5.61	-4.25	-26.84	0.488
157	5.64	-4.24	-26.99	0.491
158	5.68	-4.23	-27.15	0.493
159	5.72	-4.22	-27.30	0.496
160	5.75	-4.21	-27.45	0.498
161	5.79	-4.20	-27.60	0.501
162	5.82	-4.19	-27.76	0.504
163	5.86	-4.18	-27.91	0.506
164	5.90	-4.17	-28.06	0.509
165	5.93	-4.16	-28.21	0.512
166	5.97	-4.15	-28.36	0.514
167	6.01	-4.14	-28.51	0.517
168	6.04	-4.13	-28.66	0.519
169	6.08	-4.12	-28.81	0.522
170	6.11	-4.11	-28.96	0.525
171	6.15	-4.10	-29.11	0.527
172	6.19	-4.09	-29.25	0.530
173	6.22	-4.08	-29.40	0.532
174	6.26	-4.06	-29.55	0.535
175	6.30	-4.05	-29.69	0.537

				report.out
176	6.33	-4.04	-29.84	0.540
177	6.37	-4.03	-29.99	0.542
178	6.40	-4.02	-30.13	0.545
179	6.44	-4.01	-30.28	0.547
180	6.48	-4.00	-30.42	0.550
181	6.51	-3.99	-30.57	0.552
182	6.55	-3.98	-30.71	0.555
183	6.58	-3.97	-30.86	0.557
184	6.62	-3.96	-31.00	0.559
185	6.66	-3.95	-31.14	0.562
186	6.69	-3.94	-31.28	0.564
187	6.73	-3.92	-31.43	0.567
188	6.77	-3.91	-31.57	0.569
189	6.80	-3.90	-31.71	0.571
190	6.84	-3.89	-31.85	0.574
191	6.87	-3.88	-31.99	0.576
192	6.91	-3.87	-32.13	0.579
193	6.95	-3.86	-32.27	0.581
194	6.98	-3.85	-32.41	0.583
195	7.02	-3.84	-32.55	0.586
196	7.05	-3.82	-32.69	0.588
197	7.09	-3.81	-32.83	0.590
198	7.13	-3.80	-32.96	0.592
199	7.16	-3.79	-33.10	0.595
200	7.20	-3.78	-33.24	0.597
201	7.24	-3.77	-33.38	0.599
202	7.27	-3.76	-33.51	0.601
203	7.31	-3.75	-33.65	0.604
204	7.34	-3.73	-33.78	0.606
205	7.38	-3.72	-33.92	0.608
206	7.42	-3.71	-34.05	0.610
207	7.45	-3.70	-34.19	0.613
208	7.49	-3.69	-34.32	0.615
209	7.53	-3.68	-34.45	0.617
210	7.56	-3.66	-34.59	0.619
211	7.60	-3.65	-34.72	0.621
212	7.63	-3.64	-34.85	0.623
213	7.67	-3.63	-34.98	0.626
214	7.71	-3.62	-35.11	0.628
215	7.74	-3.60	-35.24	0.630
216	7.78	-3.59	-35.37	0.632
217	7.81	-3.58	-35.50	0.634
218	7.85	-3.57	-35.63	0.636
219	7.89	-3.56	-35.76	0.638
220	7.92	-3.54	-35.89	0.640
221	7.96	-3.53	-36.02	0.642
222	8.00	-3.52	-36.15	0.644
223	8.03	-3.51	-36.27	0.646
224	8.07	-3.50	-36.40	0.648
225	8.10	-3.48	-36.53	0.650
226	8.14	-3.47	-36.65	0.652
227	8.18	-3.46	-36.78	0.654
228	8.21	-3.44	-36.90	0.656
229	8.25	-3.43	-37.03	0.658
230	8.28	-3.42	-37.15	0.660
231	8.32	-3.40	-37.27	0.662
232	8.36	-3.39	-37.40	0.664
233	8.39	-3.38	-37.52	0.666
234	8.43	-3.36	-37.64	0.668
235	8.47	-3.35	-37.76	0.670
236	8.50	-3.34	-37.88	0.671
237	8.54	-3.32	-38.00	0.673
238	8.57	-3.31	-38.12	0.675

				report.out
239	8.61	-3.29	-38.24	0.677
240	8.65	-3.28	-38.36	0.679
241	8.68	-3.27	-38.48	0.681
242	8.72	-3.25	-38.60	0.682
243	8.76	-3.24	-38.72	0.684
244	8.79	-3.22	-38.83	0.686
245	8.83	-3.21	-38.95	0.688
246	8.86	-3.19	-39.06	0.689
247	8.90	-3.18	-39.18	0.691
248	8.94	-3.16	-39.29	0.693
249	8.97	-3.15	-39.41	0.695
250	9.01	-3.13	-39.52	0.696
251	9.04	-3.11	-39.63	0.698
252	9.08	-3.10	-39.75	0.700
253	9.12	-3.08	-39.86	0.701
254	9.15	-3.07	-39.97	0.703
255	9.19	-3.05	-40.08	0.705
256	9.23	-3.04	-40.19	0.706
257	9.26	-3.02	-40.30	0.708
258	9.30	-3.00	-40.41	0.710
259	9.33	-2.99	-40.52	0.711
260	9.37	-2.97	-40.63	0.713
261	9.41	-2.95	-40.73	0.714
262	9.44	-2.94	-40.84	0.716
263	9.48	-2.92	-40.94	0.717
264	9.51	-2.90	-41.05	0.719
265	9.55	-2.88	-41.15	0.720
266	9.59	-2.87	-41.26	0.722
267	9.62	-2.85	-41.36	0.723
268	9.66	-2.83	-41.47	0.725
269	9.70	-2.82	-41.57	0.726
270	9.73	-2.80	-41.67	0.728
271	9.77	-2.78	-41.77	0.729
272	9.80	-2.76	-41.87	0.731
273	9.84	-2.74	-41.97	0.732
274	9.88	-2.73	-42.07	0.733
275	9.91	-2.71	-42.17	0.735
276	9.95	-2.69	-42.26	0.736
277	9.99	-2.67	-42.36	0.738
278	10.02	-2.65	-42.46	0.739
279	10.06	-2.63	-42.55	0.740
280	10.09	-2.62	-42.65	0.742
281	10.13	-2.60	-42.74	0.743
282	10.17	-2.58	-42.84	0.744
283	10.20	-2.56	-42.93	0.745
284	10.24	-2.54	-43.02	0.747
285	10.27	-2.52	-43.11	0.748
286	10.31	-2.50	-43.20	0.749
287	10.35	-2.48	-43.29	0.750
288	10.38	-2.46	-43.38	0.752
289	10.42	-2.44	-43.47	0.753
290	10.46	-2.42	-43.56	0.754
291	10.49	-2.40	-43.65	0.755
292	10.53	-2.38	-43.73	0.756
293	10.56	-2.36	-43.82	0.757
294	10.60	-2.34	-43.90	0.759
295	10.64	-2.32	-43.99	0.760
296	10.67	-2.30	-44.07	0.761
297	10.71	-2.28	-44.16	0.762
298	10.75	-2.26	-44.24	0.763
299	10.78	-2.24	-44.32	0.764
300	10.82	-2.22	-44.40	0.765
301	10.85	-2.20	-44.48	0.766

				report.out
302	10.89	-2.17	-44.56	0.767
303	10.93	-2.15	-44.64	0.768
304	10.96	-2.13	-44.71	0.769
305	11.00	-2.11	-44.79	0.770
306	11.03	-2.09	-44.87	0.771
307	11.07	-2.06	-44.94	0.772
308	11.11	-2.04	-45.02	0.773
309	11.14	-2.02	-45.09	0.774
310	11.18	-2.00	-45.16	0.775
311	11.22	-1.98	-45.23	0.776
312	11.25	-1.95	-45.31	0.776
313	11.29	-1.93	-45.38	0.777
314	11.32	-1.91	-45.44	0.778
315	11.36	-1.88	-45.51	0.779
316	11.40	-1.86	-45.58	0.780
317	11.43	-1.84	-45.65	0.781
318	11.47	-1.81	-45.71	0.781
319	11.50	-1.79	-45.78	0.782
320	11.54	-1.77	-45.84	0.783
321	11.58	-1.74	-45.91	0.784
322	11.61	-1.72	-45.97	0.784
323	11.65	-1.70	-46.03	0.785
324	11.69	-1.67	-46.09	0.786
325	11.72	-1.65	-46.15	0.787
326	11.76	-1.62	-46.21	0.787
327	11.79	-1.60	-46.27	0.788
328	11.83	-1.58	-46.33	0.789
329	11.87	-1.55	-46.38	0.789
330	11.90	-1.53	-46.44	0.790
331	11.94	-1.50	-46.49	0.790
332	11.98	-1.48	-46.55	0.791
333	12.01	-1.45	-46.60	0.792
334	12.05	-1.43	-46.65	0.792
335	12.08	-1.40	-46.70	0.793
336	12.12	-1.38	-46.76	0.793
337	12.16	-1.35	-46.80	0.794
338	12.19	-1.33	-46.85	0.794
339	12.23	-1.30	-46.90	0.795
340	12.26	-1.27	-46.95	0.795
341	12.30	-1.25	-46.99	0.796
342	12.34	-1.22	-47.04	0.796
343	12.37	-1.20	-47.08	0.797
344	12.41	-1.17	-47.12	0.797
345	12.45	-1.14	-47.17	0.797
346	12.48	-1.12	-47.21	0.798
347	12.52	-1.09	-47.25	0.798
348	12.55	-1.06	-47.29	0.798
349	12.59	-1.04	-47.32	0.799
350	12.63	-1.01	-47.36	0.799
351	12.66	-0.98	-47.40	0.799
352	12.70	-0.96	-47.43	0.800
353	12.73	-0.93	-47.47	0.800
354	12.77	-0.90	-47.50	0.800
355	12.81	-0.87	-47.53	0.801
356	12.84	-0.85	-47.56	0.801
357	12.88	-0.82	-47.59	0.801
358	12.92	-0.79	-47.62	0.801
359	12.95	-0.76	-47.65	0.801
360	12.99	-0.74	-47.68	0.802
361	13.02	-0.71	-47.70	0.802
362	13.06	-0.68	-47.73	0.802
363	13.10	-0.65	-47.75	0.802
364	13.13	-0.62	-47.78	0.802

				report.out
365	13.17	-0.59	-47.80	0.802
366	13.21	-0.57	-47.82	0.802
367	13.24	-0.54	-47.84	0.802
368	13.28	-0.51	-47.86	0.803
369	13.31	-0.48	-47.87	0.803
370	13.35	-0.45	-47.89	0.803
371	13.39	-0.42	-47.91	0.803
372	13.42	-0.39	-47.92	0.803
373	13.46	-0.36	-47.94	0.803
374	13.49	-0.33	-47.95	0.803
375	13.53	-0.30	-47.96	0.803
376	13.57	-0.27	-47.97	0.802
377	13.60	-0.24	-47.98	0.802
378	13.64	-0.21	-47.99	0.802
379	13.68	-0.18	-47.99	0.802
380	13.71	-0.15	-48.00	0.802
381	13.75	-0.12	-48.01	0.802
382	13.78	-0.09	-48.01	0.802
383	13.82	-0.06	-48.01	0.802
384	13.86	-0.03	-48.01	0.801
385	13.89	0.00	-48.02	0.801
386	13.93	0.03	-48.01	0.801
387	13.96	0.06	-48.01	0.801
388	14.00	0.09	-48.01	0.801
389	14.04	0.12	-48.01	0.800
390	14.07	0.15	-48.00	0.800
391	14.11	0.19	-48.00	0.800
392	14.15	0.22	-47.99	0.799
393	14.18	0.25	-47.98	0.799
394	14.22	0.28	-47.97	0.799
395	14.25	0.31	-47.96	0.798
396	14.29	0.34	-47.95	0.798
397	14.33	0.38	-47.93	0.798
398	14.36	0.41	-47.92	0.797
399	14.40	0.44	-47.90	0.797
400	14.44	0.47	-47.89	0.797
401	14.47	0.51	-47.87	0.796
402	14.51	0.54	-47.85	0.796
403	14.54	0.57	-47.83	0.795
404	14.58	0.60	-47.81	0.795
405	14.62	0.64	-47.79	0.794
406	14.65	0.67	-47.76	0.794
407	14.69	0.70	-47.74	0.793
408	14.72	0.74	-47.71	0.793
409	14.76	0.77	-47.69	0.792
410	14.80	0.80	-47.66	0.792
411	14.83	0.84	-47.63	0.791
412	14.87	0.87	-47.60	0.790
413	14.91	0.91	-47.56	0.790
414	14.94	0.94	-47.53	0.789
415	14.98	0.97	-47.50	0.788
416	15.01	1.01	-47.46	0.788
417	15.05	1.04	-47.42	0.787
418	15.09	1.08	-47.39	0.786
419	15.12	1.11	-47.35	0.786
420	15.16	1.15	-47.30	0.785
421	15.19	1.18	-47.26	0.784
422	15.23	1.21	-47.22	0.784
423	15.27	1.25	-47.17	0.783
424	15.30	1.28	-47.13	0.782
425	15.34	1.32	-47.08	0.781
426	15.38	1.36	-47.03	0.780
427	15.41	1.39	-46.98	0.780

				report.out
428	15.45	1.43	-46.93	0.779
429	15.48	1.46	-46.88	0.778
430	15.52	1.50	-46.83	0.777
431	15.56	1.53	-46.77	0.776
432	15.59	1.57	-46.72	0.775
433	15.63	1.61	-46.66	0.774
434	15.67	1.64	-46.60	0.774
435	15.70	1.68	-46.54	0.773
436	15.74	1.71	-46.48	0.772
437	15.77	1.75	-46.42	0.771
438	15.81	1.79	-46.35	0.770
439	15.85	1.82	-46.29	0.769
440	15.88	1.86	-46.22	0.768
441	15.92	1.90	-46.15	0.767
442	15.95	1.94	-46.08	0.766
443	15.99	1.97	-46.01	0.765
444	16.03	2.01	-45.94	0.764
445	16.06	2.05	-45.87	0.762
446	16.10	2.08	-45.79	0.761
447	16.14	2.12	-45.72	0.760
448	16.17	2.16	-45.64	0.759
449	16.21	2.20	-45.56	0.758
450	16.24	2.24	-45.48	0.757
451	16.28	2.27	-45.40	0.756
452	16.32	2.31	-45.31	0.754
453	16.35	2.35	-45.23	0.753
454	16.39	2.39	-45.14	0.752
455	16.43	2.43	-45.06	0.751
456	16.46	2.47	-44.97	0.750
457	16.50	2.50	-44.88	0.748
458	16.53	2.54	-44.79	0.747
459	16.57	2.58	-44.69	0.746
460	16.61	2.62	-44.60	0.745
461	16.64	2.66	-44.51	0.743
462	16.68	2.70	-44.41	0.742
463	16.71	2.74	-44.31	0.741
464	16.75	2.78	-44.21	0.739
465	16.79	2.82	-44.11	0.738
466	16.82	2.86	-44.01	0.737
467	16.86	2.90	-43.90	0.735
468	16.90	2.94	-43.80	0.734
469	16.93	2.98	-43.69	0.732
470	16.97	3.02	-43.58	0.731
471	17.00	3.06	-43.47	0.729
472	17.04	3.09	-43.36	0.728
473	17.08	3.13	-43.25	0.727
474	17.11	3.17	-43.13	0.725
475	17.15	3.20	-43.02	0.724
476	17.18	3.24	-42.90	0.722
477	17.22	3.28	-42.78	0.721
478	17.26	3.31	-42.66	0.719
479	17.29	3.35	-42.54	0.717
480	17.33	3.39	-42.42	0.716
481	17.37	3.42	-42.30	0.714
482	17.40	3.46	-42.17	0.713
483	17.44	3.50	-42.05	0.711
484	17.47	3.53	-41.92	0.710
485	17.51	3.57	-41.79	0.708
486	17.55	3.61	-41.66	0.706
487	17.58	3.64	-41.53	0.705
488	17.62	3.68	-41.40	0.703
489	17.66	3.72	-41.27	0.701
490	17.69	3.75	-41.13	0.700

				report.out
491	17.73	3.79	-40.99	0.698
492	17.76	3.83	-40.86	0.696
493	17.80	3.86	-40.72	0.694
494	17.84	3.90	-40.58	0.693
495	17.87	3.94	-40.44	0.691
496	17.91	3.98	-40.29	0.689
497	17.94	4.01	-40.15	0.687
498	17.98	4.05	-40.00	0.686
499	18.02	4.08	-39.85	0.684
500	18.05	4.11	-39.71	0.682
501	18.09	4.14	-39.56	0.680
502	18.13	4.16	-39.41	0.678
503	18.16	4.19	-39.26	0.676
504	18.20	4.21	-39.10	0.675
505	18.23	4.24	-38.95	0.673
506	18.27	4.26	-38.80	0.671
507	18.31	4.29	-38.64	0.669
508	18.34	4.31	-38.49	0.667
509	18.38	4.34	-38.33	0.665
510	18.41	4.36	-38.17	0.663
511	18.45	4.38	-38.02	0.661
512	18.49	4.41	-37.86	0.659
513	18.52	4.43	-37.70	0.657
514	18.56	4.45	-37.54	0.655
515	18.60	4.47	-37.37	0.653
516	18.63	4.49	-37.21	0.651
517	18.67	4.51	-37.05	0.649
518	18.70	4.53	-36.89	0.647
519	18.74	4.56	-36.72	0.645
520	18.78	4.58	-36.56	0.643
521	18.81	4.60	-36.39	0.641
522	18.85	4.61	-36.22	0.639
523	18.89	4.63	-36.06	0.637
524	18.92	4.65	-35.89	0.635
525	18.96	4.67	-35.72	0.633
526	18.99	4.69	-35.55	0.631
527	19.03	4.71	-35.38	0.628
528	19.07	4.72	-35.21	0.626
529	19.10	4.74	-35.04	0.624
530	19.14	4.76	-34.87	0.622
531	19.17	4.77	-34.69	0.620
532	19.21	4.79	-34.52	0.618
533	19.25	4.80	-34.35	0.615
534	19.28	4.82	-34.17	0.613
535	19.32	4.83	-34.00	0.611
536	19.36	4.85	-33.82	0.609
537	19.39	4.86	-33.65	0.607
538	19.43	4.88	-33.47	0.604
539	19.46	4.89	-33.30	0.602
540	19.50	4.90	-33.12	0.600
541	19.54	4.92	-32.94	0.598
542	19.57	4.93	-32.76	0.595
543	19.61	4.94	-32.58	0.593
544	19.64	4.95	-32.41	0.591
545	19.68	4.96	-32.23	0.588
546	19.72	4.97	-32.05	0.586
547	19.75	4.99	-31.87	0.584
548	19.79	5.00	-31.69	0.581
549	19.83	5.01	-31.50	0.579
550	19.86	5.02	-31.32	0.577
551	19.90	5.02	-31.14	0.574
552	19.93	5.03	-30.96	0.572
553	19.97	5.04	-30.78	0.569

				report.out
554	20.01	5.05	-30.59	0.567
555	20.04	5.06	-30.41	0.565
556	20.08	5.07	-30.23	0.562
557	20.12	5.07	-30.05	0.560
558	20.15	5.08	-29.86	0.557
559	20.19	5.09	-29.68	0.555
560	20.22	5.09	-29.49	0.552
561	20.26	5.10	-29.31	0.550
562	20.30	5.10	-29.12	0.547
563	20.33	5.11	-28.94	0.545
564	20.37	5.11	-28.76	0.542
565	20.40	5.12	-28.57	0.540
566	20.44	5.12	-28.38	0.537
567	20.48	5.13	-28.20	0.535
568	20.51	5.13	-28.01	0.532
569	20.55	5.13	-27.83	0.530
570	20.59	5.14	-27.64	0.527
571	20.62	5.14	-27.46	0.525
572	20.66	5.14	-27.27	0.522
573	20.69	5.14	-27.08	0.519
574	20.73	5.15	-26.90	0.517
575	20.77	5.15	-26.71	0.514
576	20.80	5.15	-26.53	0.512
577	20.84	5.15	-26.34	0.509
578	20.88	5.15	-26.15	0.506
579	20.91	5.15	-25.97	0.504
580	20.95	5.15	-25.78	0.501
581	20.98	5.15	-25.59	0.499
582	21.02	5.15	-25.41	0.496
583	21.06	5.15	-25.22	0.493
584	21.09	5.14	-25.04	0.491
585	21.13	5.14	-24.85	0.488
586	21.16	5.14	-24.66	0.485
587	21.20	5.14	-24.48	0.483
588	21.24	5.13	-24.29	0.480
589	21.27	5.13	-24.11	0.477
590	21.31	5.13	-23.92	0.474
591	21.35	5.12	-23.74	0.472
592	21.38	5.12	-23.55	0.469
593	21.42	5.11	-23.37	0.466
594	21.45	5.11	-23.18	0.464
595	21.49	5.10	-23.00	0.461
596	21.53	5.09	-22.81	0.458
597	21.56	5.09	-22.63	0.455
598	21.60	5.08	-22.44	0.452
599	21.63	5.07	-22.26	0.450
600	21.67	5.07	-22.08	0.447
601	21.71	5.06	-21.89	0.444
602	21.74	5.05	-21.71	0.441
603	21.78	5.04	-21.53	0.439
604	21.82	5.03	-21.34	0.436
605	21.85	5.02	-21.16	0.433
606	21.89	5.01	-20.98	0.430
607	21.92	5.00	-20.80	0.427
608	21.96	4.99	-20.62	0.424
609	22.00	4.98	-20.44	0.422
610	22.03	4.97	-20.26	0.419
611	22.07	4.96	-20.08	0.416
612	22.11	4.95	-19.90	0.413
613	22.14	4.94	-19.72	0.410
614	22.18	4.93	-19.54	0.407
615	22.21	4.91	-19.36	0.404
616	22.25	4.90	-19.19	0.401

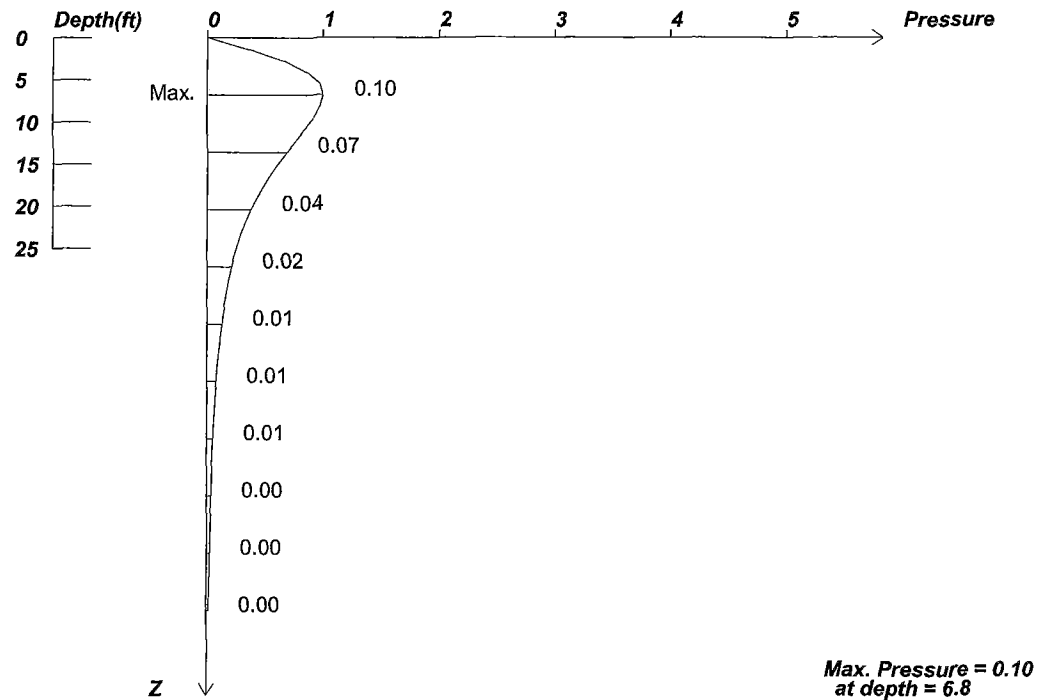
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617	22.29	4.89	-19.01	0.399
618	22.32	4.87	-18.83	0.396
619	22.36	4.86	-18.66	0.393
620	22.39	4.84	-18.48	0.390
621	22.43	4.83	-18.31	0.387
622	22.47	4.81	-18.13	0.384
623	22.50	4.80	-17.96	0.381
624	22.54	4.78	-17.79	0.378
625	22.58	4.77	-17.61	0.375
626	22.61	4.75	-17.44	0.372
627	22.65	4.73	-17.27	0.369
628	22.68	4.72	-17.10	0.366
629	22.72	4.70	-16.93	0.363
630	22.76	4.68	-16.76	0.360
631	22.79	4.66	-16.59	0.357
632	22.83	4.65	-16.42	0.355
633	22.86	4.63	-16.25	0.352
634	22.90	4.61	-16.09	0.349
635	22.94	4.59	-15.92	0.346
636	22.97	4.57	-15.75	0.343
637	23.01	4.55	-15.59	0.340
638	23.05	4.53	-15.42	0.337
639	23.08	4.51	-15.26	0.334
640	23.12	4.49	-15.10	0.331
641	23.15	4.47	-14.94	0.328
642	23.19	4.44	-14.77	0.325
643	23.23	4.42	-14.61	0.321
644	23.26	4.40	-14.45	0.318
645	23.30	4.38	-14.30	0.315
646	23.34	4.35	-14.14	0.312
647	23.37	4.33	-13.98	0.309
648	23.41	4.31	-13.82	0.306
649	23.44	4.28	-13.67	0.303
650	23.48	4.26	-13.51	0.300
651	23.52	4.23	-13.36	0.297
652	23.55	4.21	-13.21	0.294
653	23.59	4.19	-13.06	0.291
654	23.62	4.16	-12.91	0.288
655	23.66	4.14	-12.76	0.285
656	23.70	4.11	-12.61	0.282
657	23.73	4.09	-12.46	0.279
658	23.77	4.07	-12.31	0.276
659	23.81	4.05	-12.16	0.272
660	23.84	4.02	-12.02	0.269
661	23.88	4.00	-11.87	0.266
662	23.91	3.98	-11.73	0.263
663	23.95	3.96	-11.58	0.260
664	23.99	3.94	-11.44	0.257
665	24.02	3.92	-11.30	0.254
666	24.06	3.90	-11.16	0.251
667	24.09	3.88	-11.02	0.248
668	24.13	3.86	-10.88	0.244
669	24.17	3.84	-10.74	0.241
670	24.20	3.83	-10.60	0.238
671	24.24	3.81	-10.46	0.235
672	24.28	3.79	-10.32	0.232
673	24.31	3.78	-10.19	0.229
674	24.35	3.76	-10.05	0.226
675	24.38	3.75	-9.91	0.222
676	24.42	3.73	-9.78	0.219
677	24.46	3.72	-9.64	0.216
678	24.49	3.70	-9.51	0.213
679	24.53	3.69	-9.38	0.210

				report.out
680	24.57	3.67	-9.24	0.207
681	24.60	3.65	-9.11	0.204
682	24.64	3.64	-8.98	0.200
683	24.67	3.62	-8.85	0.197
684	24.71	3.61	-8.72	0.194
685	24.75	3.59	-8.59	0.191
686	24.78	3.57	-8.46	0.188
687	24.82	3.56	-8.33	0.184
688	24.85	3.54	-8.20	0.181
689	24.89	3.52	-8.07	0.178
690	24.93	3.50	-7.94	0.175
691	24.96	3.48	-7.82	0.172
692	25.00	3.47	-7.69	0.169
693	25.04	3.45	-7.57	0.165
694	25.07	3.43	-7.44	0.162
695	25.11	3.41	-7.32	0.159
696	25.14	3.39	-7.20	0.156
697	25.18	3.37	-7.07	0.153
698	25.22	3.35	-6.95	0.149
699	25.25	3.33	-6.83	0.146
700	25.29	3.31	-6.71	0.143
701	25.32	3.29	-6.59	0.140
702	25.36	3.27	-6.47	0.136
703	25.40	3.25	-6.36	0.133
704	25.43	3.22	-6.24	0.130
705	25.47	3.20	-6.12	0.127
706	25.51	3.18	-6.01	0.124
707	25.54	3.16	-5.89	0.120
708	25.58	3.13	-5.78	0.117
709	25.61	3.11	-5.67	0.114
710	25.65	3.09	-5.55	0.111
711	25.69	3.07	-5.44	0.107
712	25.72	3.04	-5.33	0.104
713	25.76	3.02	-5.22	0.101
714	25.80	2.99	-5.11	0.098
715	25.83	2.97	-5.01	0.094
716	25.87	2.95	-4.90	0.091
717	25.90	2.92	-4.79	0.088
718	25.94	2.90	-4.69	0.085
719	25.98	2.87	-4.58	0.082
720	26.01	2.84	-4.48	0.078
721	26.05	2.82	-4.38	0.075
722	26.08	2.79	-4.28	0.072
723	26.12	2.77	-4.18	0.069
724	26.16	2.74	-4.08	0.065
725	26.19	2.71	-3.98	0.062
726	26.23	2.69	-3.88	0.059
727	26.27	2.66	-3.78	0.055
728	26.30	2.63	-3.69	0.052
729	26.34	2.60	-3.59	0.049
730	26.37	2.57	-3.50	0.046
731	26.41	2.55	-3.41	0.042
732	26.45	2.52	-3.31	0.039
733	26.48	2.49	-3.22	0.036
734	26.52	2.46	-3.13	0.033
735	26.56	2.43	-3.05	0.029
736	26.59	2.40	-2.96	0.026
737	26.63	2.37	-2.87	0.023
738	26.66	2.34	-2.79	0.020
739	26.70	2.31	-2.70	0.016
740	26.74	2.28	-2.62	0.013
741	26.77	2.25	-2.54	0.010
742	26.81	2.22	-2.46	0.007

				report.out
743	26.84	2.18	-2.38	0.003
744	26.88	2.15	-2.30	0.000
745	26.92	2.12	-2.22	-0.003
746	26.95	2.09	-2.15	-0.007
747	26.99	2.06	-2.07	-0.010
748	27.03	2.02	-2.00	-0.013
749	27.06	1.99	-1.92	-0.016
750	27.10	1.96	-1.85	-0.020
751	27.13	1.92	-1.78	-0.023
752	27.17	1.89	-1.71	-0.026
753	27.21	1.86	-1.65	-0.029
754	27.24	1.82	-1.58	-0.033
755	27.28	1.79	-1.51	-0.036
756	27.31	1.75	-1.45	-0.039
757	27.35	1.72	-1.39	-0.043
758	27.39	1.68	-1.33	-0.046
759	27.42	1.65	-1.27	-0.049
760	27.46	1.61	-1.21	-0.052
761	27.50	1.58	-1.15	-0.056
762	27.53	1.54	-1.09	-0.059
763	27.57	1.50	-1.04	-0.062
764	27.60	1.47	-0.98	-0.066
765	27.64	1.43	-0.93	-0.069
766	27.68	1.39	-0.88	-0.072
767	27.71	1.36	-0.83	-0.075
768	27.75	1.32	-0.78	-0.079
769	27.79	1.28	-0.74	-0.082
770	27.82	1.24	-0.69	-0.085
771	27.86	1.20	-0.65	-0.089
772	27.89	1.17	-0.60	-0.092
773	27.93	1.13	-0.56	-0.095
774	27.97	1.09	-0.52	-0.098
775	28.00	1.05	-0.48	-0.102
776	28.04	1.01	-0.45	-0.105
777	28.07	0.97	-0.41	-0.108
778	28.11	0.93	-0.38	-0.111
779	28.15	0.89	-0.34	-0.115
780	28.18	0.85	-0.31	-0.118
781	28.22	0.81	-0.28	-0.121
782	28.26	0.77	-0.25	-0.125
783	28.29	0.73	-0.23	-0.128
784	28.33	0.69	-0.20	-0.131
785	28.36	0.65	-0.18	-0.134
786	28.40	0.60	-0.15	-0.138
787	28.44	0.56	-0.13	-0.141
788	28.47	0.52	-0.11	-0.144
789	28.51	0.48	-0.09	-0.148
790	28.54	0.43	-0.08	-0.151
791	28.58	0.39	-0.06	-0.154
792	28.62	0.35	-0.05	-0.157
793	28.65	0.30	-0.04	-0.161
794	28.69	0.26	-0.03	-0.164
795	28.73	0.22	-0.02	-0.167
796	28.76	0.17	-0.01	-0.171
797	28.80	0.13	-0.01	-0.174
798	28.83	0.08	0.00	-0.177
799	28.87	0.04	0.00	-0.180

 Users can select data, then copy and paste into Excel to create graphics

Legacy Pkwy - C867 Bent 2 - Spoils at 8ft - GW at 8ft



<Surcharge> CIVILTECH SOFTWARE USA www.civiltechsoftware.com

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Date: 1/22/2007

Wall Height, H= 17

Load Depth at Surface, D= 0

Load Factor of Surcharge Loading = 1

Flexible Wall Condition -- Small Movement or deflection are allowed.

Max. Pressure = 0.10 at depth = 6.8

X	Width	Strip Load
8.0	10.0	.63

UNITS: LENGTH, DEPTH: ft, Qpoint: kip, Qline: kip/ft, Qstrip, Qarea, PRESSURE: ksf

report.out

SURCHARGE LOADS CALCULATION SUMMARY

<Surcharge>

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Time: 12/30/1899 12:40:27 PM
Date: 1/22/2007

Legacy Pkwy - C867 Bent 2 - Spoils at 8ft - GW at 8ft

Height of Wall = 17
Depth of Wall = 0
Load Factor of Surcharge Loading = 1

Wall Condition:
Flexible Wall Condition -- Small Movement or deflection are allowed.

*****Loading*****

STRIP LOADING:

Xstrip	width	Qstrip
8.0	10.0	0.6

*****Total Pressure Distribution*****

Max. Pressure =0.101 at depth =6.80

Depth	Pressure
0.00	0.000
1.36	0.036
2.72	0.067
4.08	0.087
5.44	0.098
6.80	0.101
8.16	0.098
9.52	0.092
10.88	0.085
12.24	0.077
13.60	0.069
14.96	0.062
16.32	0.055
17.68	0.049
19.04	0.043
20.40	0.038
21.76	0.034
23.12	0.030
24.48	0.027
25.84	0.024
27.20	0.022
28.56	0.019
29.92	0.018
31.28	0.016
32.64	0.014
34.00	0.013

	report.out
35.36	0.012
36.72	0.011
38.08	0.010
39.44	0.009
40.80	0.008
42.16	0.008
43.52	0.007
44.88	0.006
46.24	0.006
47.60	0.005
48.96	0.005
50.32	0.005
51.68	0.004
53.04	0.004
54.40	0.004
55.76	0.004
57.12	0.003
58.48	0.003
59.84	0.003
61.20	0.003
62.56	0.003
63.92	0.002
65.28	0.002
66.64	0.002
68.00	0.002

Depth Is Measured From Top of the wall
 LENGTH, DEPTH: ft, Qpoint: kip, Qline: kip/ft, Qstrip, Qarea, PRESSURE: ksf

WALER BEAM DESIGN



CALDER RICHARDS
CONSULTING ENGINEERS

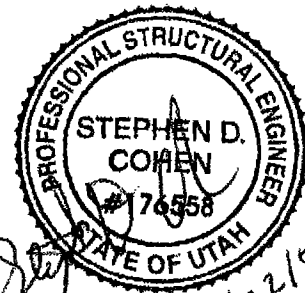
MISCELLANEOUS STRUCTURAL CALCULATIONS

DATE: 1-22-07

FOR: Legacy Parkway - Structure C867 Bent #2
Water Beam and connection design

PREPARED BY: Calder Richards Consulting Engineers, LLC
2015 South 1100 East
Salt Lake City, UT 84106

CLIENT: IGES
4153 Commerce Drive
Salt Lake City Ut



DISCLOSURE STATEMENT

CALDER RICHARDS CONSULTING ENGINEERS' scope of service was to provide a design of specific items pertaining to this project. Scope of services contains only design of items addressed in calculations for compliance with current building code requirements. All other items not addressed in calculations are the responsibility of OTHERS for determining compliance. Construction services such as shop drawing review and field observations are not included in scope of services and will not be performed.

7.5 klf per IGES (00409-046 C367-Bent 2) calculation sheet
dated 1/22/07

$L = 32\text{ft}$ per $\rightarrow$

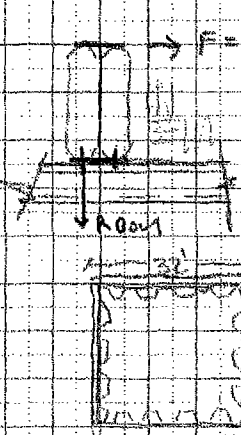
$M_{\max} = 960\text{ k}\cdot\text{ft}$

$V_{\max} = 120\text{ k}$

per table 3-10 (AISC Thirteenth Edition)

@ 960 k ft W 24x146 Good for 15' unbraced length

provide stiffeners and double bolt connection (one each side of flange)
@ every other sheet pile pair. Brace beam @ quarter points



$$F = 1/2 \text{ capacity of flange} = .02(50\text{ ksi})(14.09)(12.9) = 14.1\text{ k}$$

$$\Sigma M = 14.1(24) - R_{\text{bolt}}(8") \quad R_{\text{bolt}} = 42\text{ k}$$

$$7.5\text{ k/ft}(4') = 30\text{ k}$$

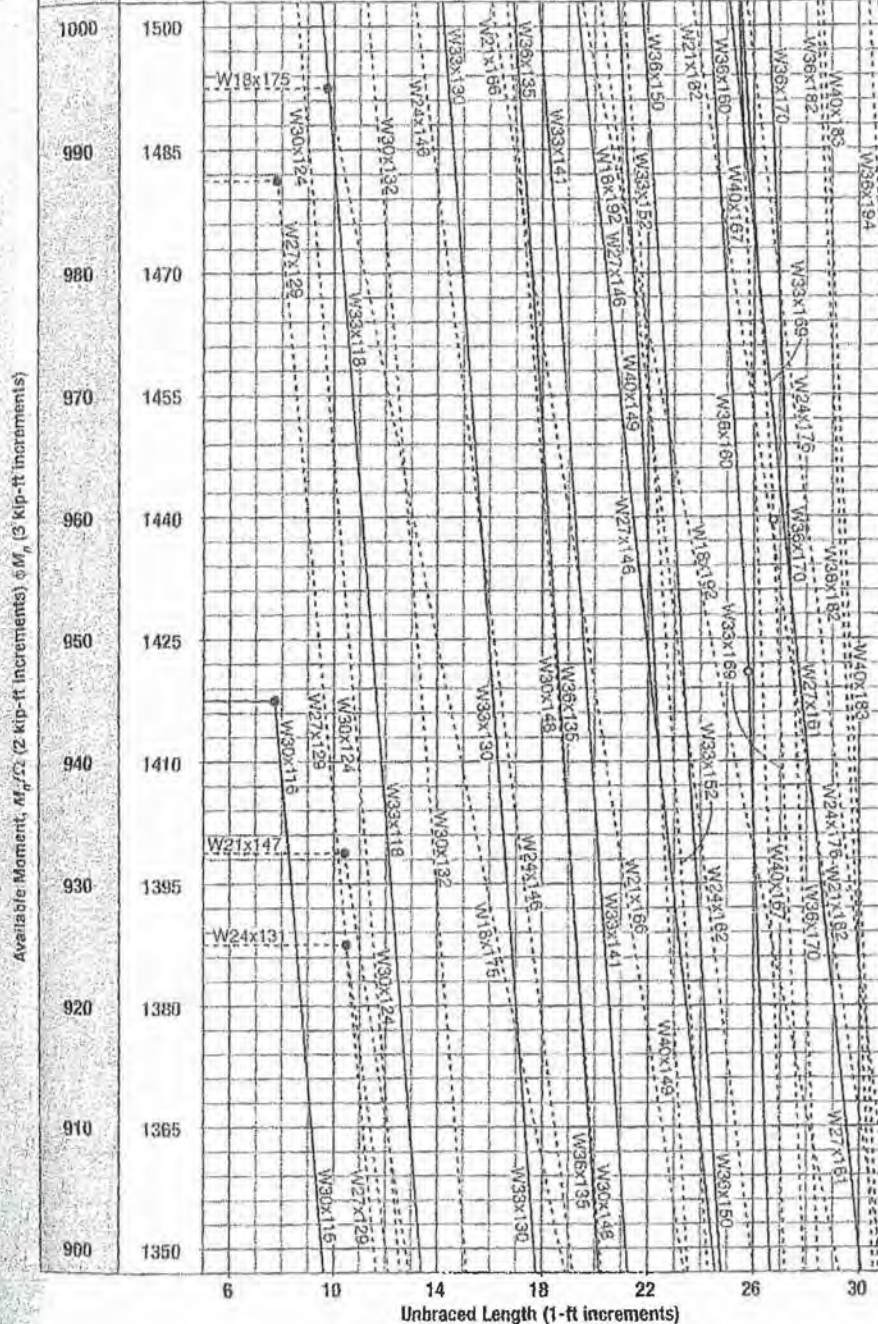
$$42 + 30 = 72\text{ k}$$

$$2 \text{ bolts good for } (2) 56 = 112\text{ k} > 72 \therefore \text{OK}$$

USE W24x146 BEAM W/ 3/4" THICK WEB STIFFENERS WELDED
ALL AROUND BOTH SIDES @ 1/4 POINTS ON BEAM. BOLT
BEAM TO SHEET PILING EVERY SHEET PILE PAIR. PROVIDE
DOUBLE BOLTS @ WEB STIFFENERS. BOLTS SHALL BE 1 1/4" ϕ (NEW)
COIL RODS WITH A WORKING LOAD TENSION CAPACITY
OF 56 KIPS. SPACE DOUBLE BOLTS @ AN 8" GAGE. PROVIDE NEW
(2) B-13 NUTS PER BOLT TIGHTENED PER MANUFACTURE
REQUIREMENTS. PROVIDE 3"x3/8"x3" PLATE WASHERS.

[illegible]

$F_y = 50 \text{ ksi}$	
$C_b = 1$	
M_u/Ω	ϕM_u
kip-ft	kip-ft
ASD	LRFD



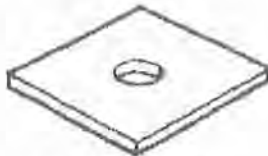
Medium/Heavy Formwork



801-270-9401

B-11 Flat Washers

Dayton/Richmond B-11 Flat Washers are made from flat steel plate and are available in the sizes shown in the accompanying chart. For best results the space spanned by the washer should not exceed the bolt diameter plus 1/4".



B-11 Flat Washer

To Order:
Specify: (1) quantity, (2) name, (3) bolt diameter.

Example:
1,200 pcs. B-11, Standard, 1/2" bolt.

ATTN: BRIAN FROM PAT/FOR-SHOR

B-11 Flat Washer Selection Chart			
Bolt Diameter	Type	Safe Working Load (lbs.)	Size
1/2"	Standard	4,500	3" x 4" x 1/4"
1/2"	Heavy	6,750	4" x 5" x 1/4"
3/4"	Standard	6,750	4" x 5" x 1/4"
3/4"	Heavy	9,000	5" x 5" x 3/8"
1"	Standard	10,000	5" x 5" x 7/16"
1"	Heavy	37,500	7" x 7" x 3/4"
1 1/4"	Standard	27,000	5" x 5" x 7/16"
1 1/4"	Heavy	37,500	7" x 7" x 3/4"
1 1/2"	Standard	37,500	5" x 5" x 3/4"
1 1/2"	Heavy	37,500	7" x 7" x 3/4"

SWL provides a factor of safety of approximately 2 to 1.

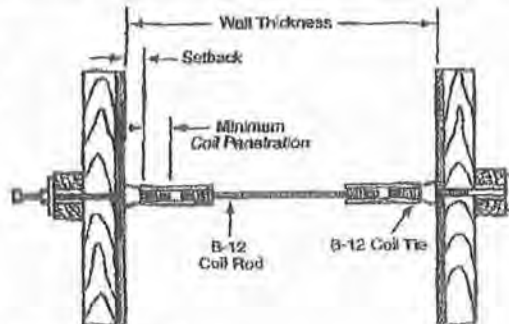
B-12 Coil Rod



B-12 Coil Rod

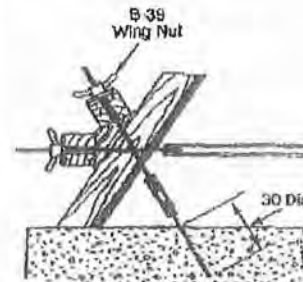
Dayton/Richmond B-12 Coil Rod is available in 1/2" to 1-1/2" diameters in 12' lengths. Field cutting can be accomplished with bolt cutters or carborundum blades.

B-12 threaded rod can be used with Coil Ties in many forming combinations to tie formwork, for adjustable ties, for concrete embedments and/or emergency ties.



B-12 Coil Rod Selection Chart						
Coil Rod Diameter	Safe Working Loads		Minimum Root Area (sq. in.)	Tensile Stress (psi.)	Yield Stress (psi.)	Minimum Coil Penetration
	Tension (lbs.)	Shear (lbs.)				
1/2"	9,000	6,000	.1385	90,000	110,000	2"
5/8"	12,000	8,000	.2124	113,000	98,000	2-1/4"
3/4"	16,000	12,000	.3079	117,000	100,000	2-1/4"
7/8"	31,000	20,600	.4477	117,000	100,000	2-1/2"
1"	38,000	25,300	.5410	140,000	120,000	2-1/2"
1-1/8"	45,000	30,000	.7163	126,000	105,000	2-1/2"
1-1/4"	55,000	37,500	.9161	123,000	105,000	2-1/2"
1-1/2"	68,000	45,300	1.3892	98,000	85,000	3"

SWL provides a factor of safety of approximately 2 to 1.
Warning: See Page 7 before using B-12 Coil Rod.



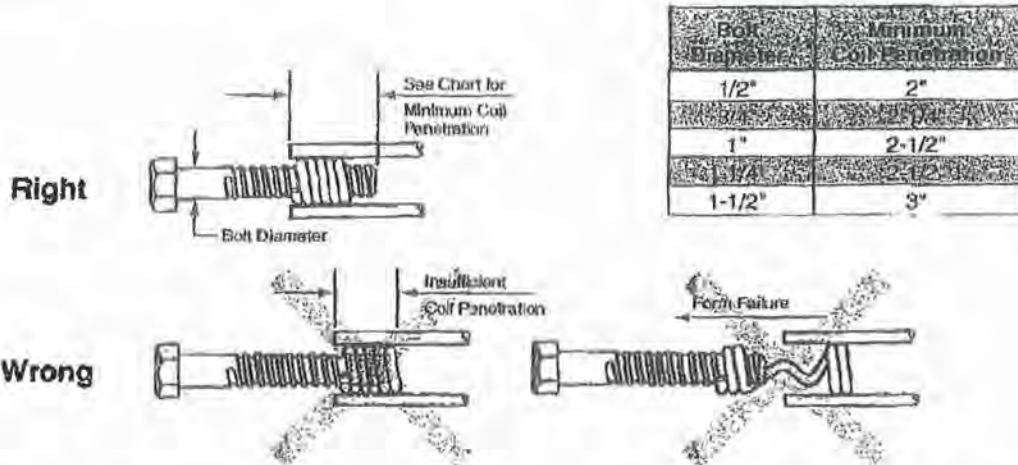
To Order:
Specify: (1) quantity, (2) name, (3) diameter, (4) length.

Example:
500 pcs. B-12 Coil Rod, 1" diameter x 12'-0" long.

General and Technical Information

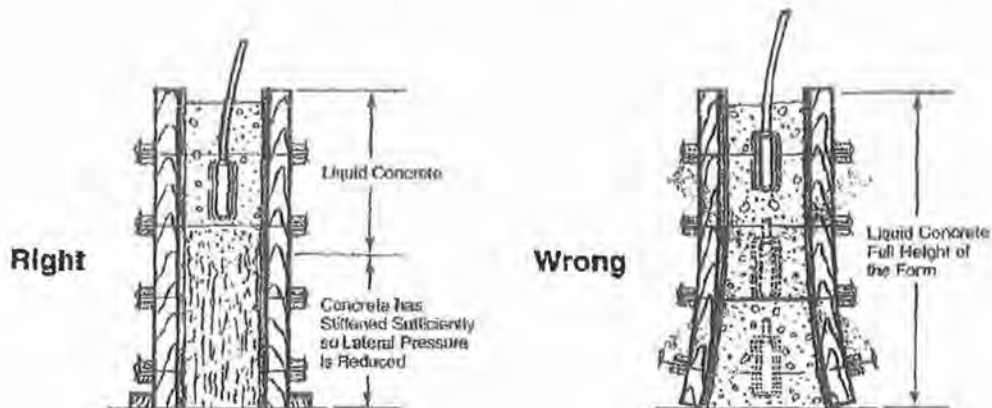


9. Coil bolts, coil rod and other coil thread products must have proper coil penetration. A bolting device with proper coil penetration will extend past the coil a minimum of one diameter of the bolting device. For example a properly penetrating 1/2" diameter coil bolt will extend past the coil a minimum of 1/2". Incorrect penetration of threaded items may result in form failure.



Failure to obtain proper penetration will cause excessive wear on the first few threads of the bolt, but more importantly it places the entire bolt load on a smaller portion of the coil welds. The increased loading can cause the coil welds to fail and result in form failure.

10. Do not beat on the end of loop ties to force them into position. This may damage the tie and result in form failure.
11. Use only correct length form ties. Incorrect length ties, when mixed with correct ones, will cause a transfer of lateral pressure to adjacent ties and may result in form failure.
12. Do not climb on form ties.
13. Do not use impact wrenches to tighten form-tying devices.
14. Do not over-vibrate the concrete. Excessive vibration will cause concrete at the bottom of the form to remain in a liquid state longer than expected. This will result in higher than anticipated lateral form pressure and may result in a form failure. Depth of vibration should be limited to within four (4) feet of the top of the fresh concrete.





B-11 Flat Washer

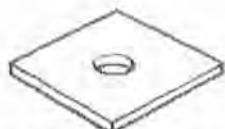
- Made from carbon steel.
- Maximum space spanned by washer should not exceed bolt diameter plus 1/4".

To Order:

Specify: (1) quantity, (2) type, (3) diameter of bolt to be used, (4) finish.

Example:

200, B-11 Heavy Flat Washers, 1" bolt dia., plain finish.



B-11 Flat Washer

Type	Bolt Diameter	Safe Working Load	Sizes
B-11 Standard	1/2"	2,250 lbs.	3" x 4" x 1/4"
B-11 Heavy	1/2"	3,375 lbs.	4" x 5" x 1/4"
B-11 Standard	3/4"	3,375 lbs.	4" x 5" x 1/4"
B-11 Heavy	3/4"	9,000 lbs.	5" x 5" x 3/8"
B-11 Standard	1"	9,000 lbs.	5" x 5" x 7/16"
B-11 Heavy	1"	18,750 lbs.	7" x 7" x 3/4"
B-11 Standard	1-1/4"	12,000 lbs.	5" x 5" x 7/16"
B-11 Heavy	1-1/4"	18,750 lbs.	7" x 7" x 3/4"
B-11 Standard	1-1/2"	18,750 lbs.	5" x 5" x 3/4"
B-11 Heavy	1-1/2"	18,750 lbs.	7" x 7" x 3/4"

Safe Working Load provides a factor of safety of approximately 5 to 1.

Coil Rod

- Available in low tensile (P-49) or high tensile (B-12) strengths.
- May be cut with carborundum blades without damaging the threads.
- Do not use cutting torch to cut coil rod to length.
- Used with B-13 or B-25 Coil Nuts for making special coil bolts.
- B-12 requires two B-13 or one B-25 Coil Nut to develop safe working loads.
- B-12 standard length is 12'-0" and P-49 standard length is 10'-0".
- Available in any length up to 20'-0" on special order.



Coil Rod

To Order:

Specify: (1) quantity, (2) name, (3) diameter, (4) length.

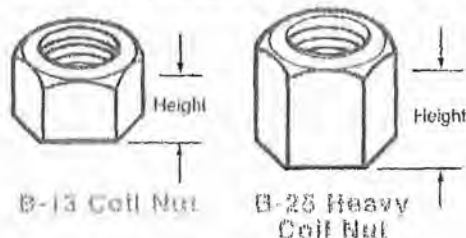
Example:

200, B-12 Coil Rod, 1" dia. x 12'-0" long.

Diameter	B-12 Safe Working Load		P-49 Safe Working Load	
	Tension	Shear	Tension	Shear
1/2"	3,600 lbs.	2,400 lbs.	2,700 lbs.	1,800 lbs.
3/4"	7,200 lbs.	4,800 lbs.	3,600 lbs.	2,400 lbs.
1"	15,000 lbs.	10,000 lbs.	7,200 lbs.	4,800 lbs.
1-1/4"	22,500 lbs.	15,000 lbs.	-	-
1-1/2"	27,000 lbs.	18,000 lbs.	-	-

Safe Working Load provides a factor of safety of approximately 5 to 1.

B-13 Coil Nut and B-25 Heavy Coil Nut



To Order:

Specify: (1) quantity, (2) name, (3) diameter.

Example:

200 B-13 Coil Nuts, 1" diameter.

Type	Diameter	Approx. Height	Safe Working Load Tension	
			Using One B-13 Nut	Using Two B-13 Nuts or One B-25 Heavy Nut
B-13	1/2"	7/16"	1,800 lbs.	3,600 lbs.
B-25	1/2"	1-3/16"	-	3,600 lbs.
B-13	3/4"	5/8"	3,600 lbs.	7,200 lbs.
B-25	3/4"	1-3/16"	-	7,200 lbs.
B-13	1"	1"	7,200 lbs.	15,000 lbs.
B-25	1"	2"	-	15,000 lbs.
B-13	1-1/4"	1-1/4"	10,800 lbs.	22,500 lbs.
B-13	1-1/2"	1-1/2"	16,200 lbs.	27,000 lbs.

Safe Working Load provides a factor of safety of approximately 5 to 1.



Lifting Stresses and Concrete Design

Lifting and rotating a wall panel creates high stresses that may exceed in-place construction values. A tilt-up wall panel with low concrete compressive strength is more susceptible to failure by erection stresses.

The maximum erection stress occurs as the horizontal panel is tilted into a vertical position. These applied stresses happen early in the construction sequence, before the concrete has attained full strength.

As the panel is tilted, the dead weight of the panel induces a flexural moment with associated stresses. The stress level is dependent on the size and weight of the panel, the number of openings, the number of lifting inserts and locations, and the type of rigging and cable lengths used. The lifting

stresses are controlled with proper insert design and placement, strongback options, various reinforcing techniques and/or by increasing the compressive strength of the concrete at the time of lift.

Concrete is weak in tension, therefore induced tensile stresses are limited to values below the tensile resistance of the concrete. The table below lists various safe tensile stress limits.

Concrete Weight	Allowable Tensile Stress
150 PCF	$6\sqrt{f_c}$
Less Than 150 PCF	$.85 \times 6\sqrt{f_c}$
110 PCF	$.75 \times 6\sqrt{f_c}$

Note: f_c refers to the actual concrete compressive strength at time of lift.

Safety Factors

Dayton/Richmond recommends the following minimum safety factors identified by Occupational Safety and Health Administration (OSHA), Act Part 1910 and American National Standards Institute (ANSI 10.9). Tilt-up construction may require additional safety considerations. Many field conditions may warrant higher safety factors, i.e., adhesion of the panel to the casting surface, jerking the crane during lift, inadequate crane size, improper handling of an erected panel, transporting an erected panel over rough surfaces,

exceeding boom capacity, etc. The minimum safety factors listed below should be adjusted accordingly when any of the above conditions are known to exist.

Safety Factor	Intended Use of Product
1.5 to 1	Tilt-up Wall Braces
2 to 1	Floor and Wall Brace Anchors
2 to 1	Lifting Inserts
3 to 1	Permanent Panel Connections
4 to 1	Handling Panels Multiple Times
5 to 1	Lifting Hardware and/or Reusable Hardware

*provide new bolts
for nuts
use SF = 2*

If a different safety factor is required for any reason, the published safe working load must be adjusted. The following equation is used to adjust a safe working load:

$$\text{New Safe Working Load} = \frac{\text{Old Safe Working Load} \times \text{Old Safety Factor}}{\text{New Safety Factor}}$$

Warning: New Safe Working Load must not exceed the product's Mechanical Capacity $\div$ New Safety Factor.



Intermountain GeoEnvironmental Services, Inc.

Project No. 00409-046

CP67/CR63 Bent 2

Date 1/22/02 by BHG

Ckd by _____ on _____

For - Temporary Sheet Piles

Max Excavation = 17 ft

Spoils Surcharge at Pile from sheets = 425 psf

$w = 5.1 \text{ kips/ft}$

Water Beam Design

$$M_{max} = \frac{wl^2}{8} = 653 \text{ kip-ft for } l = 32 \text{ ft}$$

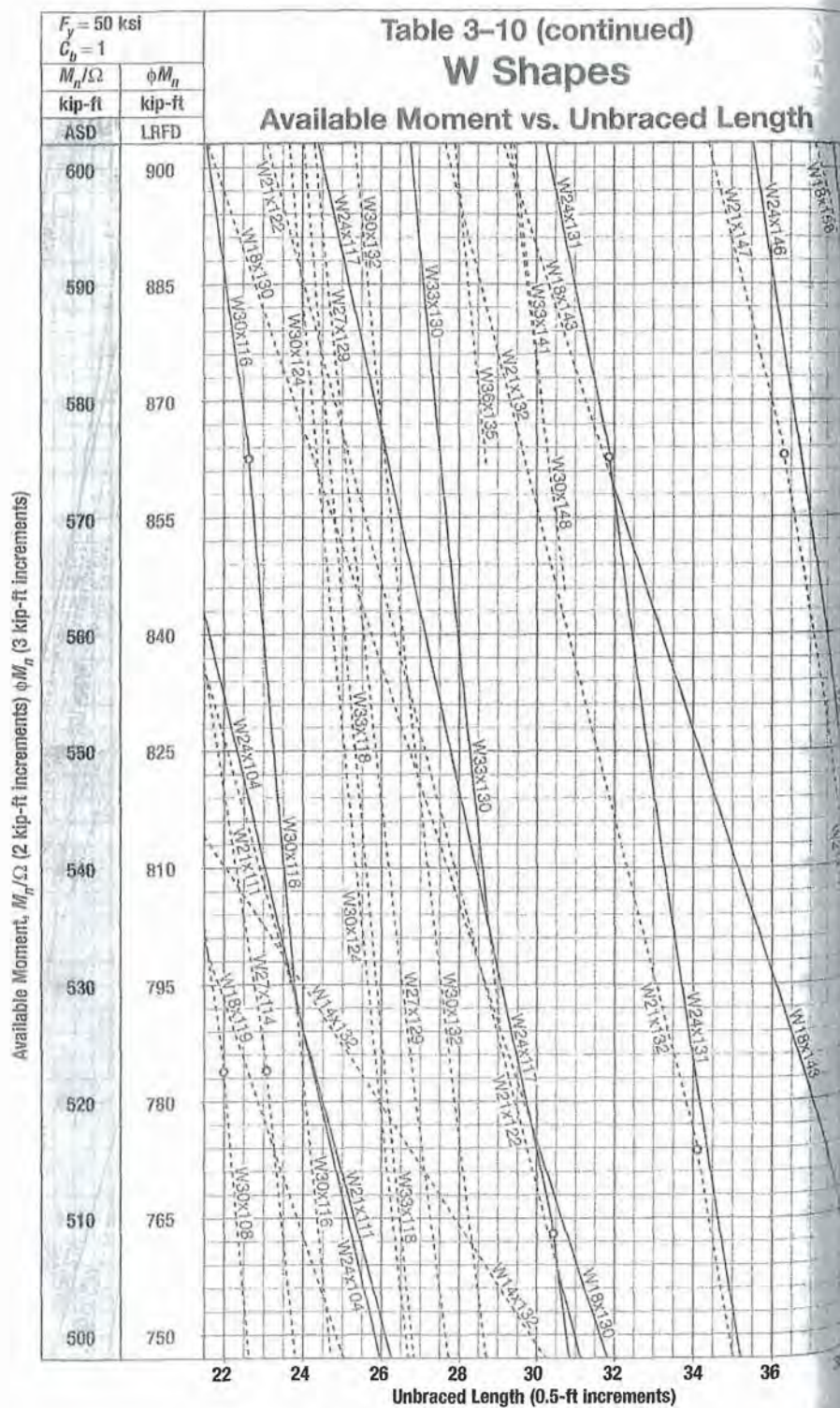
$$V_{max} = \frac{wl}{2} = 82 \text{ kips}$$

For $C_b = 1.14$ (Table 3-1 AISC Thirteenth Edition)

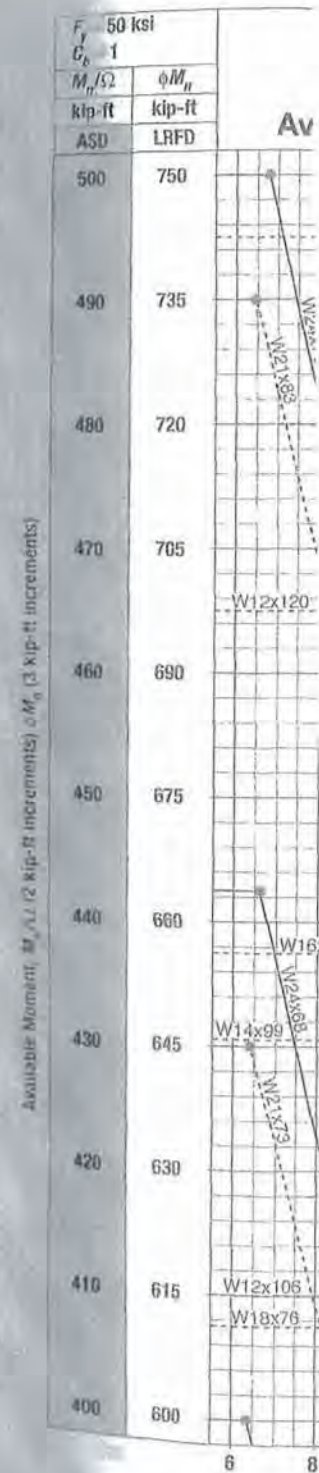
$$\frac{M_{max}}{C_b} = 573 \text{ kip-ft}$$

Using Table 3-10 $\phi L_b = 32 \text{ ft}$ W24x146 OK

@ 573 kips W24x146 Good for 36' unbraced length.



AMERICAN INSTITUTE OF STEEL CONSTRUCTION, INC.



AMERICA

PLAXIS ANALYSIS



Intermountain GeoEnvironmental Services, Inc.

Project No. C867 - BENT 3

02409-046

Date 1/18/07 by BAC

Ckd by _____ on _____

PLAXIS ANALYSIS:

Parameters:

$$AB26 - I = 406.5 \text{ in}^4/\text{ft}$$

$$\text{Weight} = 31.79 \text{ lbs/ft}^2/\text{ft}$$

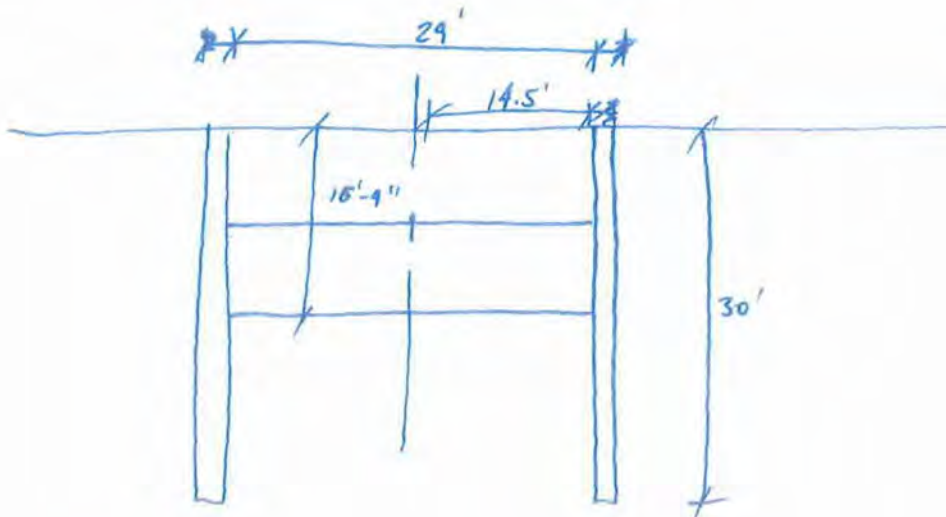
$$h = 16.8 \text{ ft}$$

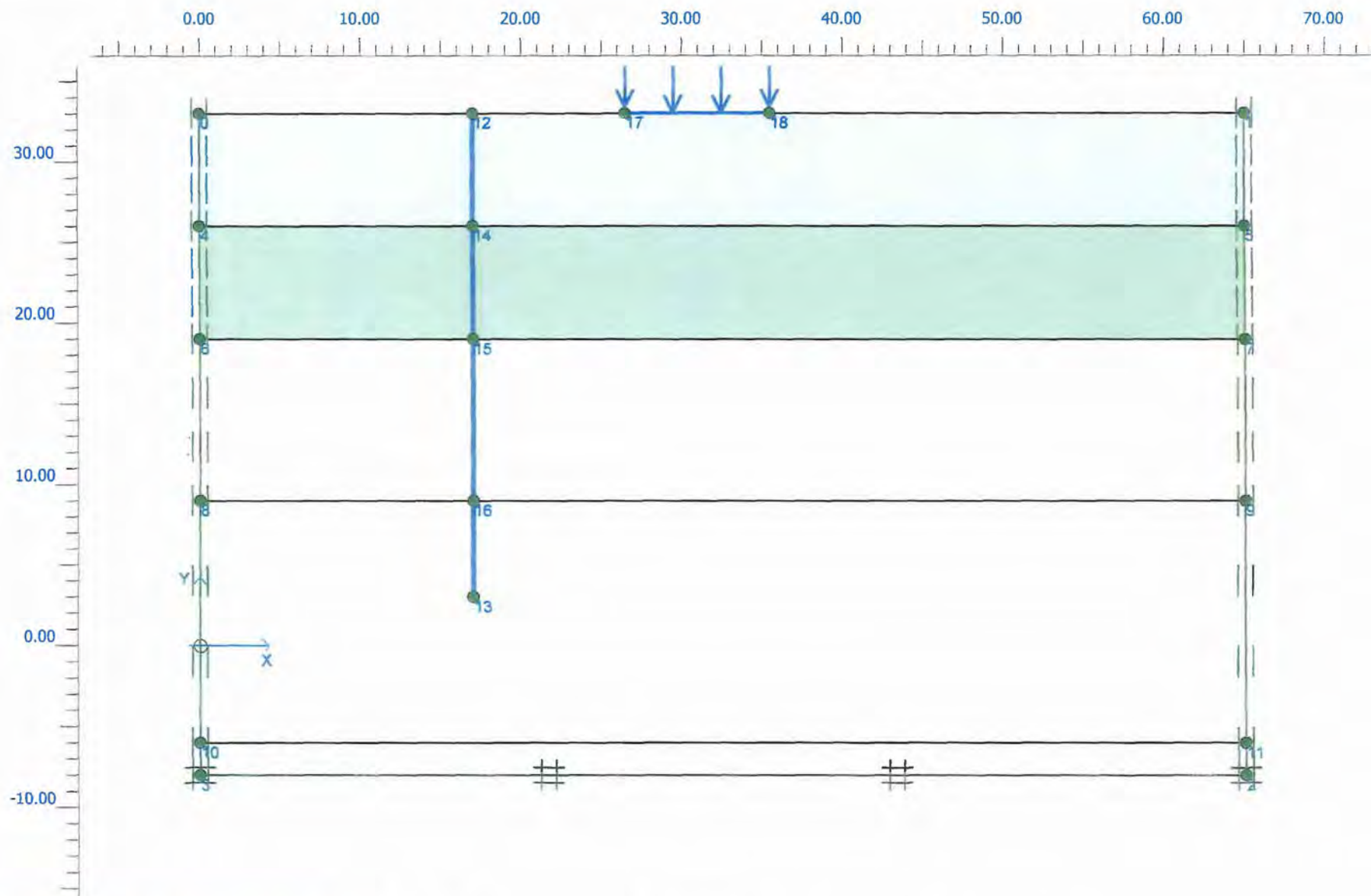
$$W = 24.8 \text{ ft}$$

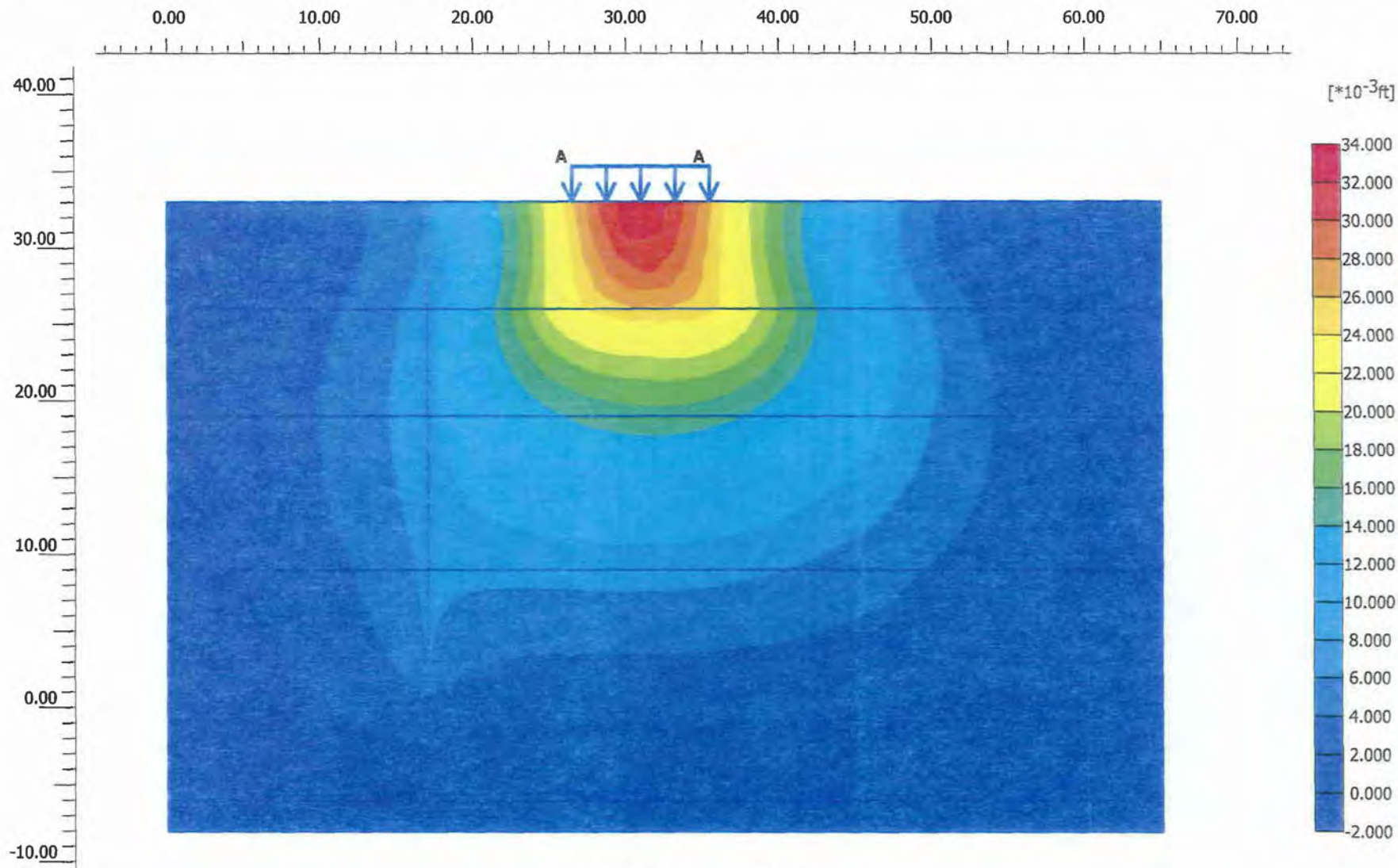
$$A = 19.3 \text{ in}^2 \Rightarrow \left(\frac{19.3 \text{ in}^2}{24.8 \text{ ft}} \right) \left(\frac{12 \text{ in}}{\text{ft}} \right) = 9.3 \text{ in}^2/\text{ft}$$

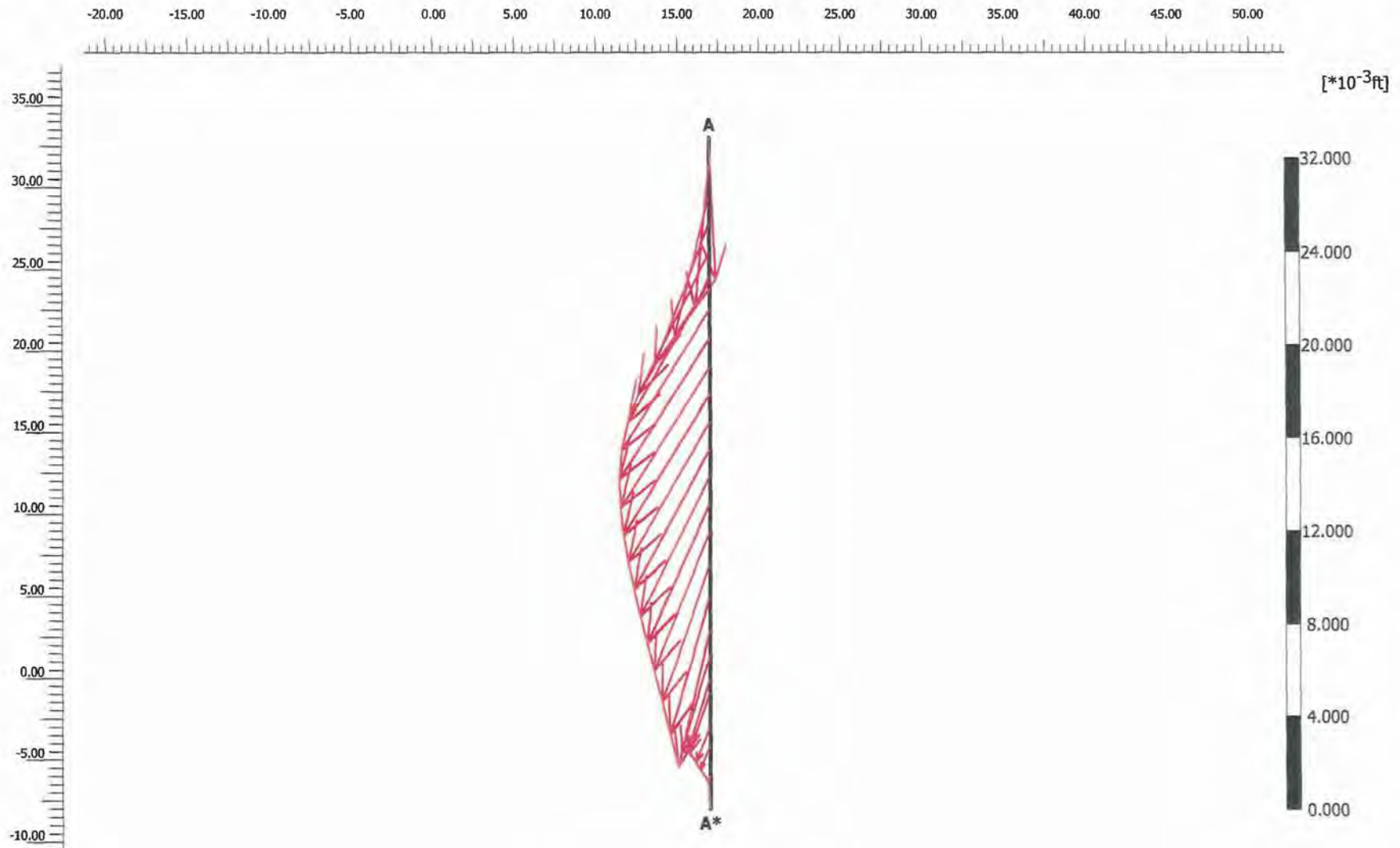
SOILS:

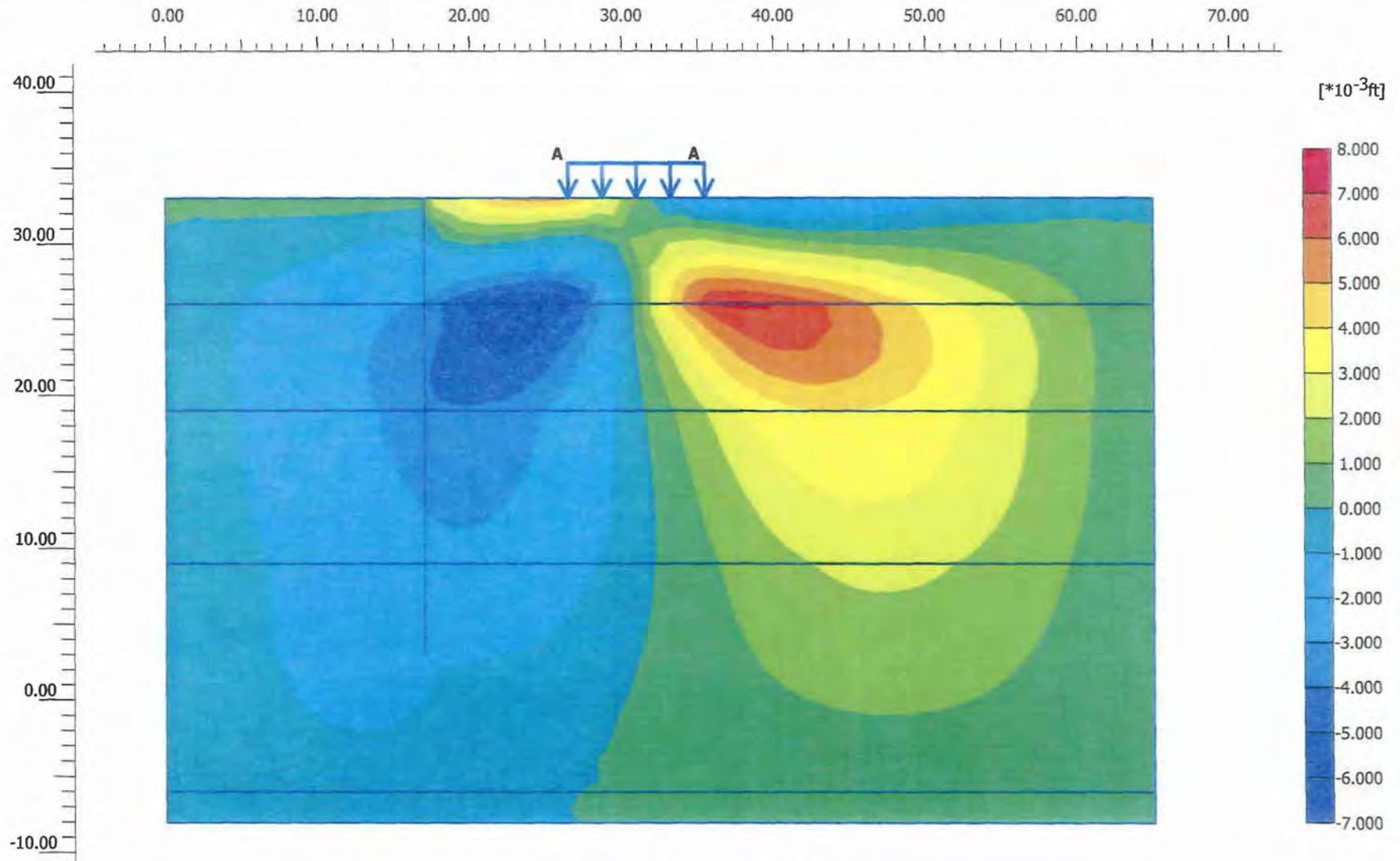
<u>TYPE</u>	<u>E_s (ksi)</u>	<u>Poisson's Ratio</u>	(Table C10.4.6.3-1 AASHTO LRFD BRIDGE DESIGN SPECIFICATION)
FILL	14.58	0.29	
CL	2.08	0.40	
SP-SM	2.92	0.31	
ML/CL	3.61	0.33	
SM/GM	14.58	0.29	

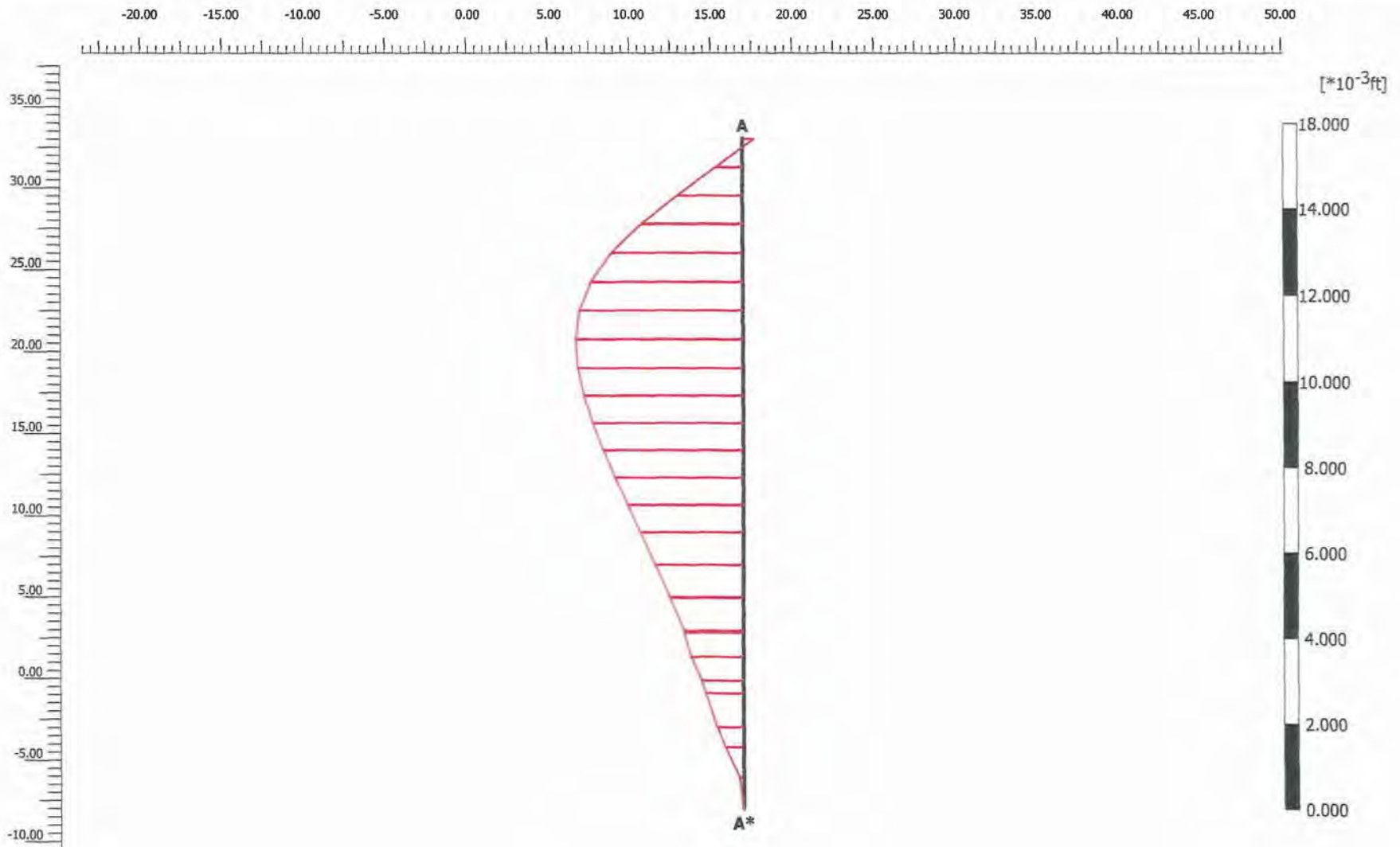












PLAXIS - Finite Element Code for Soil and Rock Analyses

Project description : Legacy Pkwy - C867 - Bent 2

PLAXIS 8.x

User name : IGES, Inc.

Project name : Legacy Pkwy - C867 - Bent 2_b

Date : 1/29/2007

Output : Soil and Interfaces Info - Mohr-Coulomb

Step : 19

Page : 1

ID	Name	Type	γ_{unsat} [lb/ft ³]	γ_{sat} [lb/ft ³]	k_x [ft/day]	k_y [ft/day]	ν [-]	E_{ref} [lb/ft ²]	c_{ref} [lb/ft ²]	ϕ [°]
1	FILL	Drained	125.0	134.0	0.0000	0.0000	0.29	2.09E6	20.0	36.0
2	CL	Drained	110.0	128.0	0.0000	0.0000	0.40	3E5	20.0	28.0
3	SP-SM	Drained	115.0	130.0	0.0000	0.0000	0.31	4.2E5	20.0	34.0
4	ML/CL	Drained	110.0	128.0	0.0000	0.0000	0.33	5.2E5	20.0	30.0
5	SM/GM	Drained	125.0	134.0	0.0000	0.0000	0.29	2.1E6	20.0	36.0

PLAXIS - Finite Element Code for Soil and Rock Analyses

Project description : Legacy Pkwy - C867 - Bent 2

PLAXIS 8.x

User name : IGES, Inc.

Project name : Legacy Pkwy - C867 - Bent 2_b

Date : 1/29/2007

Output : Soil and Interfaces Info - Mohr-Coulomb

Step : 19

Page : 2

ID	ψ [°]	E_{incr} [lb/ft ³]	c_{incr} [lb/ft ³]	y_{ref} [ft]	T-Strength [lb/ft ²]	R_{inter} [-]
1	0.0	0.0	0.0	0.0	0.0	1.00
2	0.0	0.0	0.0	0.0	0.0	1.00
3	0.0	0.0	0.0	0.0	0.0	1.00
4	0.0	0.0	0.0	0.0	0.0	1.00
5	0.0	0.0	0.0	0.0	0.0	1.00

PLAXIS - Finite Element Code for Soil and Rock Analyses

Project description : Legacy Pkwy - C867 - Bent 2

PLAXIS 8.x

User name : IGES, Inc.

Project name : Legacy Pkwy - C867 - Bent 2_b

Date : 1/29/2007

Output : Material data sets - Plates

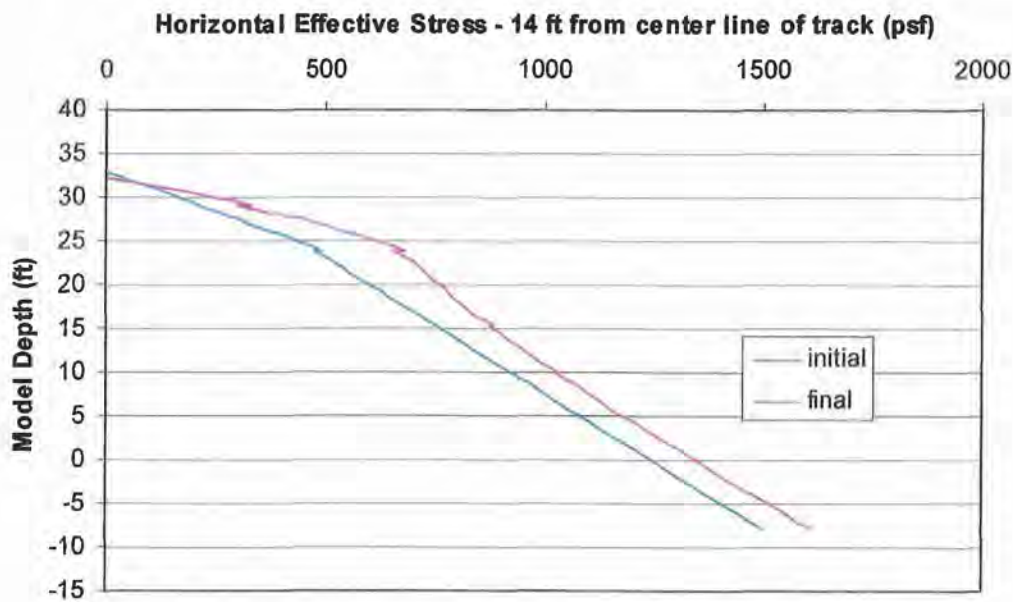
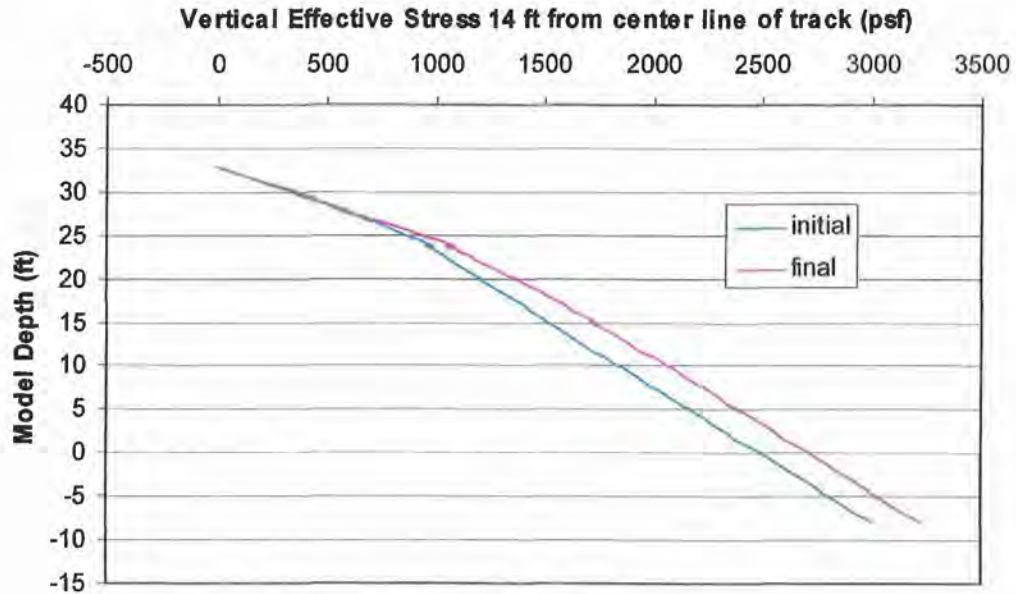
Step : 19

Page : 1

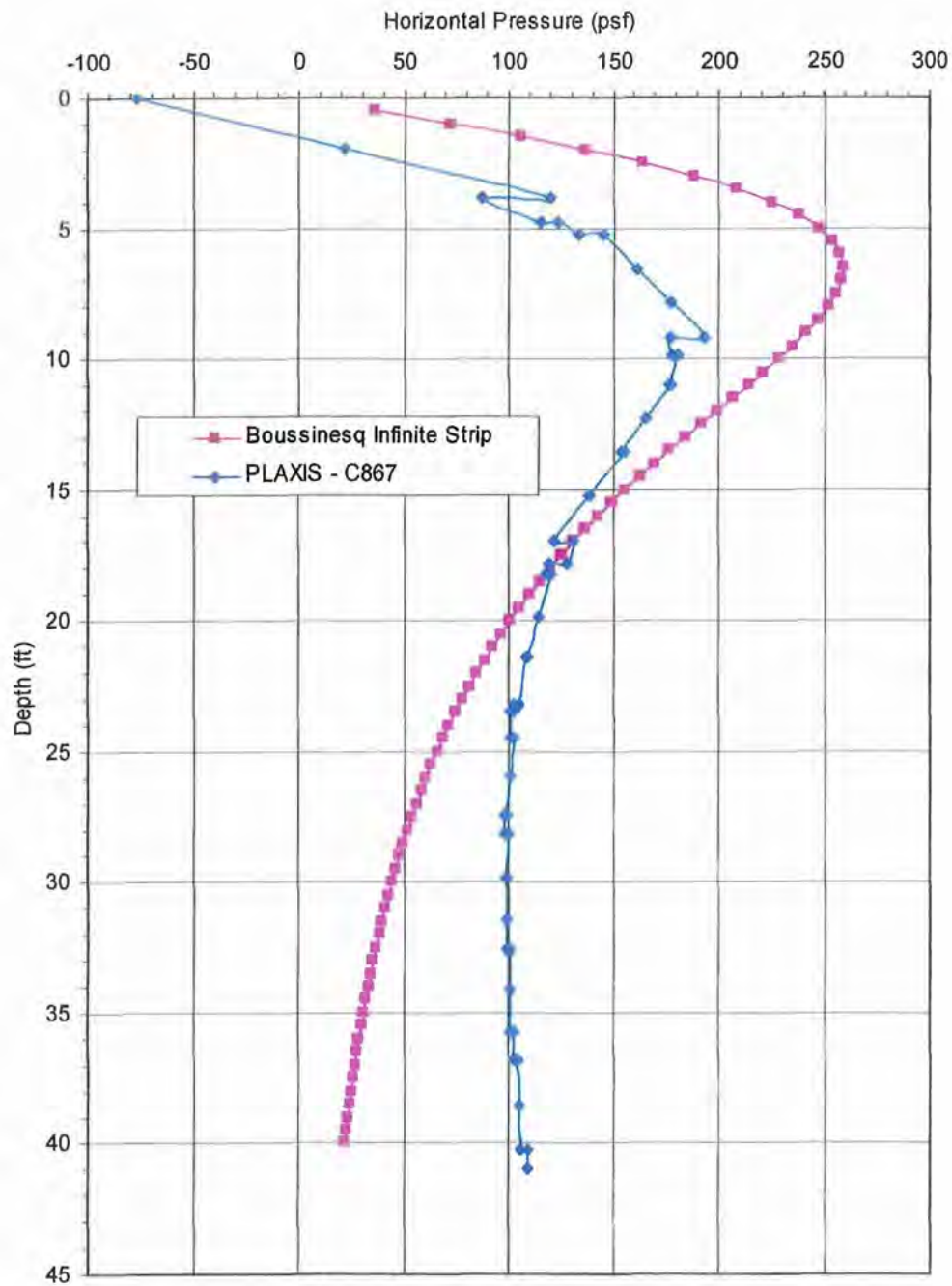
ID	Name	Type	EA [lb/ft]	EI [lbft ² /ft]	w [lb/ft ²]	v [-]	M _p [lbft/ft]	N _p [lb/ft]
1	AZ26	Elastic	2.7E8	8.2E7	31.8	0.29	1E15	1E15

PLAXIS Analysis – Structures C863 (Bridge 23) & C867 (Bridge 25) Bent 2

The following plots are comparisons of the vertical and horizontal effective stresses with depth at a location of 14 feet away from the center of the E80 loading. The model depth referenced on the plots is the depth from the top of the model which has the ground surface at 33 feet. The initial and final curves refer to the stress without and with the E80 loading applied, respectively. The largest change in vertical and horizontal effective stresses due to the applied E80 loading is 224 psf and 193 psf at a depth of 24 feet and 9 feet below the ground surface, respectively.



The change in effective horizontal stress measured in the PLAXIS model was also compared with the lateral earth pressures from a strip load equivalent to the E80 loading a distance of 14 feet from the center of the strip load. The Boussinesq equation for a uniform vertical loading on an infinite strip was used to compute the lateral earth pressure with depth. The maximum computed lateral pressure due to the E80 load was 258 psf at a depth of approximately 6.5 feet below the ground surface.





Intermountain GeoEnvironmental Services, Inc.

Project No. 00409-046

C807-Bent 2

Date 1/30/07 by BHG

Ckd by _____ on _____

PLAXIS ANALYSIS

Comparison w/ Boussinesq infinite strip load equation.

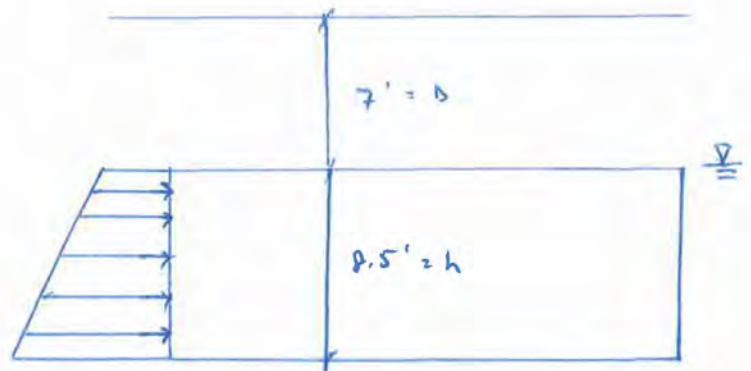
$$\sigma_p^* = 258 \text{ psf}$$

$$P = (258 \text{ lbs/ft}^2)(8.5 \text{ ft})(2 \text{ ft}) \left(\frac{1 \text{ kip}}{1000 \text{ lbs}} \right) = \underline{61.4 \text{ kips}}$$

$$K_0 = 1 - \sin \phi = 1 - \sin(30) = 0.5$$

$$\begin{aligned} P_0 &= \frac{1}{2} \gamma' h^2 K_0 + K_0 \gamma' \Delta h \\ &= \frac{1}{2} (115 \text{ pcf} - 62.4 \text{ pcf})(8.5 \text{ ft})^2 (0.5) \\ &\quad + (0.5)(115 \text{ pcf})(7 \text{ ft})(8.5 \text{ ft}) \\ &= 4.4 \text{ kips/ft} \end{aligned}$$

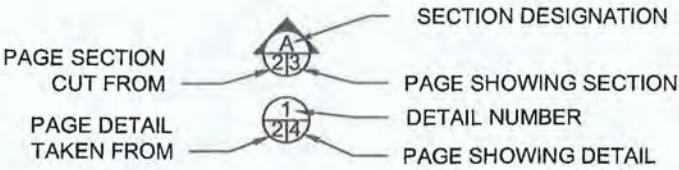
$$P_0 = (4.4 \text{ kips/ft})(28 \text{ ft}) = \underline{122 \text{ kips}}$$



3. Shop Drawings

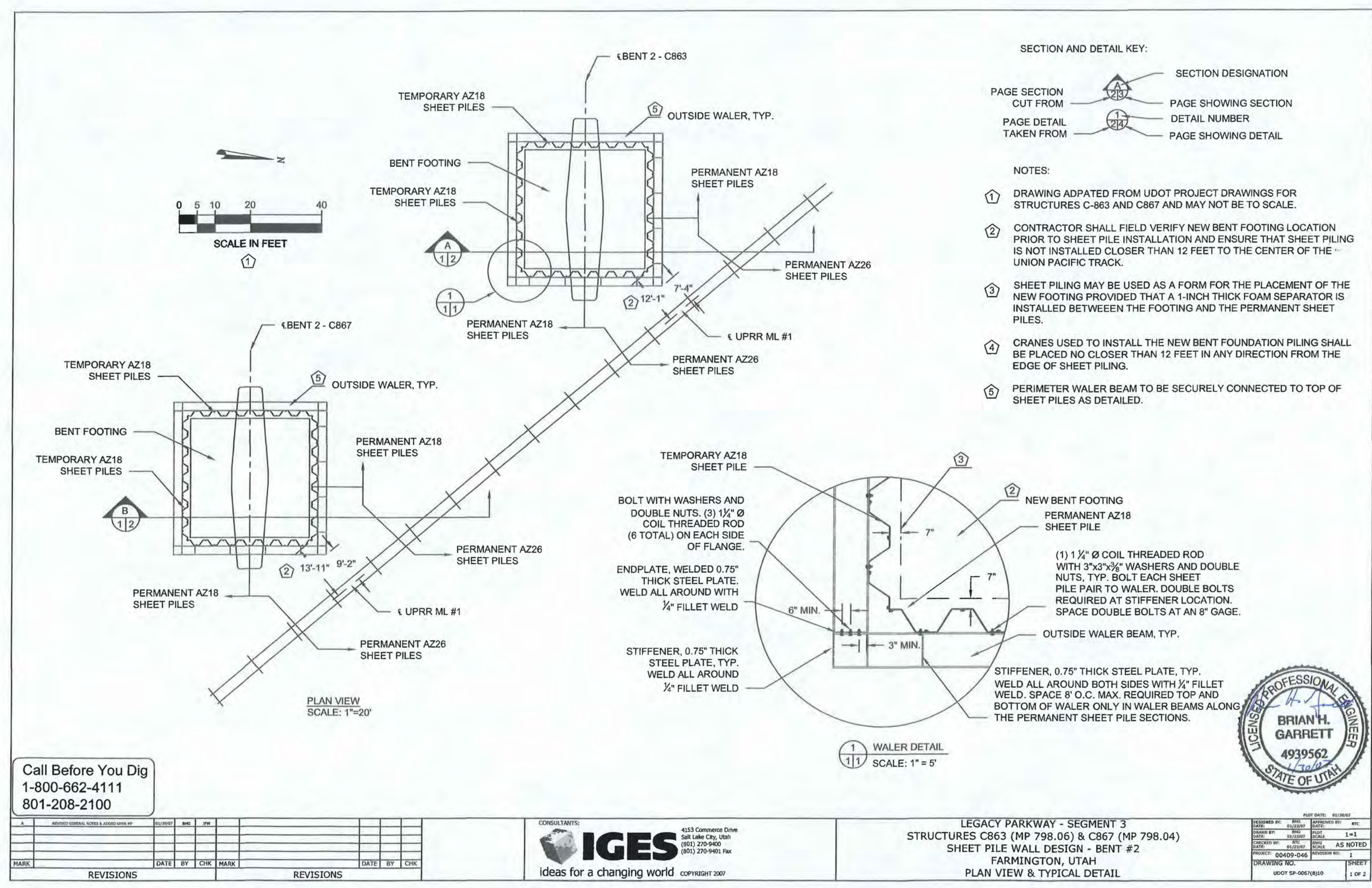
3. Shop Drawings

SECTION AND DETAIL KEY:



NOTES:

- 1 DRAWING ADPTED FROM UDOT PROJECT DRAWINGS FOR STRUCTURES C-863 AND C867 AND MAY NOT BE TO SCALE.
- 2 CONTRACTOR SHALL FIELD VERIFY NEW BENT FOOTING LOCATION PRIOR TO SHEET PILE INSTALLATION AND ENSURE THAT SHEET PILING IS NOT INSTALLED CLOSER THAN 12 FEET TO THE CENTER OF THE UNION PACIFIC TRACK.
- 3 SHEET PILING MAY BE USED AS A FORM FOR THE PLACEMENT OF THE NEW FOOTING PROVIDED THAT A 1-INCH THICK FOAM SEPARATOR IS INSTALLED BETWEEN THE FOOTING AND THE PERMANENT SHEET PILES.
- 4 CRANES USED TO INSTALL THE NEW BENT FOUNDATION PILING SHALL BE PLACED NO CLOSER THAN 12 FEET IN ANY DIRECTION FROM THE EDGE OF SHEET PILING.
- 5 PERIMETER WALER BEAM TO BE SECURELY CONNECTED TO TOP OF SHEET PILES AS DETAILED.



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(801) 270-9401 Fax

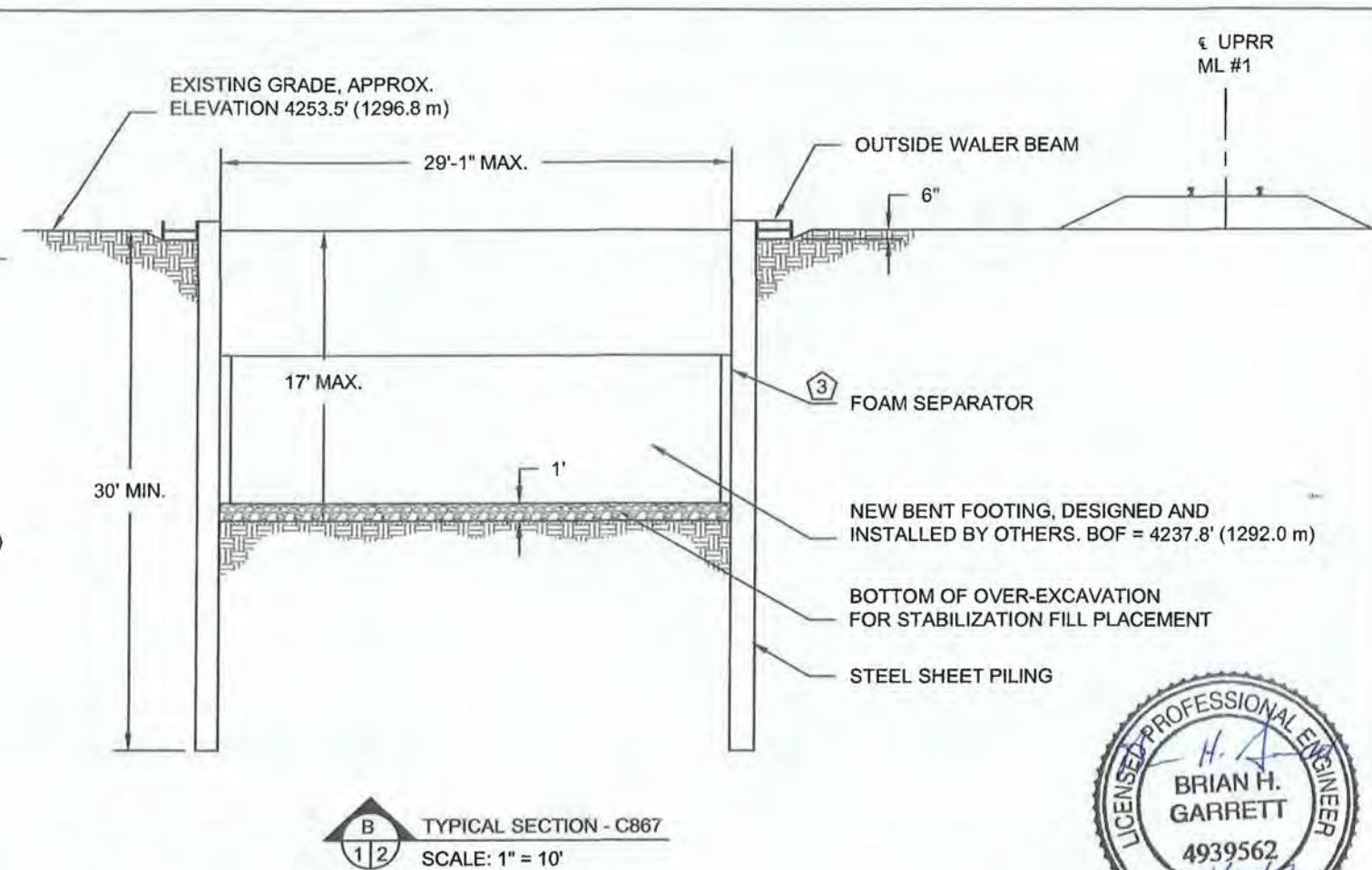
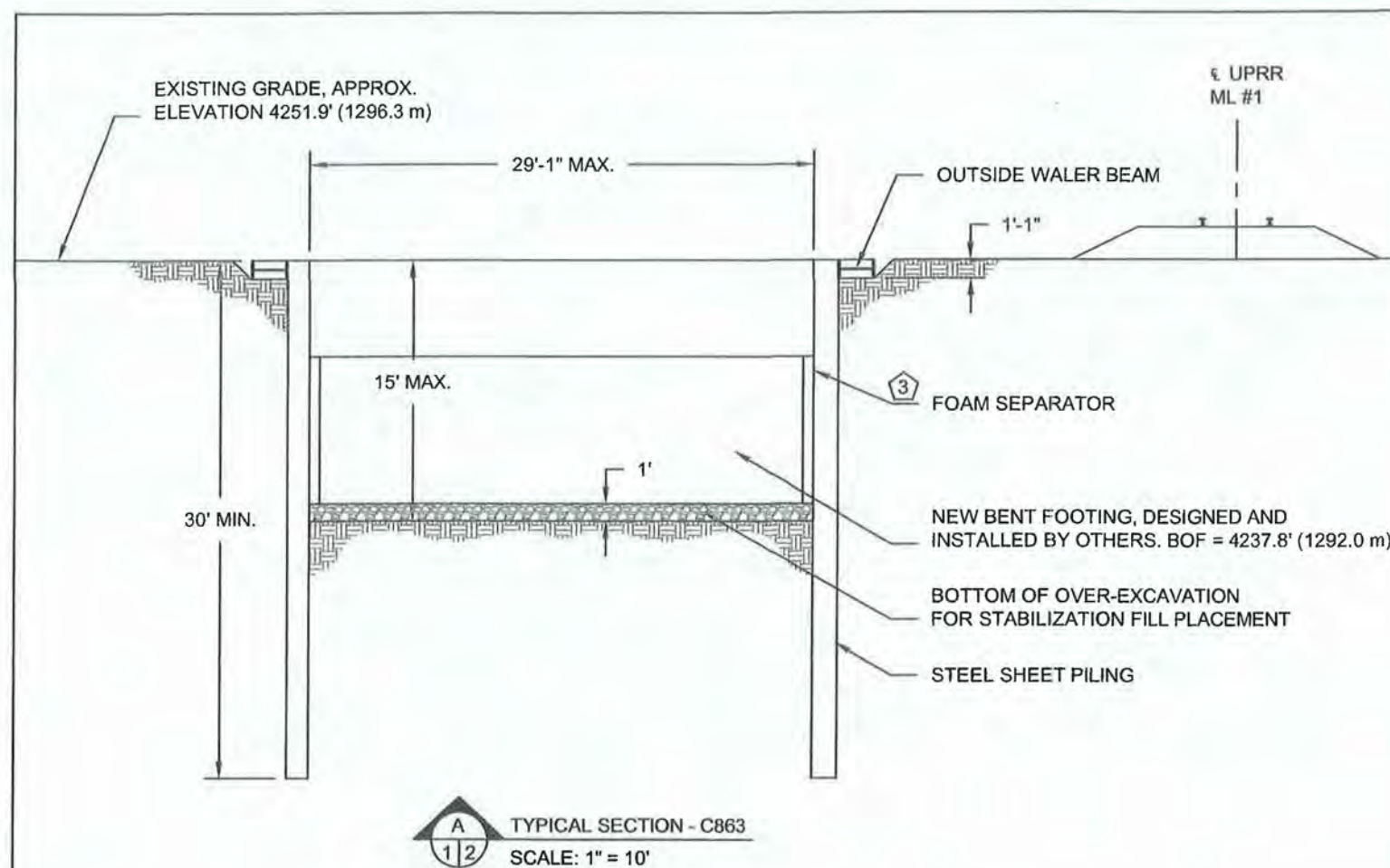
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LEGACY PARKWAY - SEGMENT 3
STRUCTURES C863 (MP 798.06) & C867 (MP 798.04)
SHEET PILE WALL DESIGN - BENT #2
FARMINGTON, UTAH
PLAN VIEW & TYPICAL DETAIL



REVISIONS	REVISIONS
DATE	DATE
BY	BY
CHK	CHK
MARK	MARK

DESIGNED BY: BHS	APPROVED BY: RTC
CHECKED BY: BHS	SCALE: 1=1
DATE: 01/22/07	AS NOTED
PROJECT: 00409-046	REVISION NO: 1
DRAWING NO.	SHEET
UDOT SP-0067(B)10	1 OF 2



SHEET PILE SHORING GENERAL NOTES:

1.0 GENERAL

- 1.1 SHORING IS TO BE INSTALLED TO THE APPROPRIATE LINES AND GRADES INDICATED IN THESE DRAWINGS SUBJECT TO FIELD VERIFICATION BY CONTRACTOR.
- 1.2 ALL UTILITIES SHALL BE POTHOLED AND LOCATED BY CONTRACTOR PRIOR TO THE INSTALLATION OF SHEET PILING.
- 1.3 ANY SIGNS OF INSTABILITY OF THE SHORING STRUCTURE SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF IGES, INC AND ALL WORK BELOW SHORING SHALL BE HALTED.
- 1.4 DRAWINGS ARE THE PROPERTY OF IGES AND BUILD, INC., AND MAY NOT BE USED OR DUPLICATED WITHOUT WRITTEN PERMISSION.

2.0 EXCAVATION

- 2.1 EXCAVATION SHALL BE PERFORMED WITHOUT DAMAGING SHEET PILING, WALER BEAMS, OR STRUT.
- 2.2 EXCAVATION SHALL NOT CONTINUE BEYOND 2 FT BELOW ANY WALER BEAM UNTIL WALER INSTALLATION IS COMPLETE AND APPROVED BY IGES, INC.
- 2.3 ANY UNSHORED EXCAVATIONS AT THE SITE MUST COMPLY WITH OSHA STANDARDS FOR TEMPORARY EXCAVATIONS.
- 2.4 INSTALL TEMPORARY ACCESS RESTRICTION, NOTICE AND OR WARNING ON TOP OF SHEET PILING OR OTHER OSHA APPROVED FALL PROTECTION.
- 2.5 EXCAVATION SHALL NOT EXCEED 15' AND 17' FROM TOP OF SHEET PILING FOR STRUCTURES C863 AND C867 RESPECTIVELY.
- 2.6 EXCAVATION SPOILS AND EXCAVATOR SHALL BE NO CLOSER THAN 8 FEET FROM THE EDGE OF SHEET PILES.

3.0 SHEET PILING

- 3.1 ALL SHEET PILING SHALL BE EITHER AZ18 OR AZ26 SHEET PILES AS DETAILED OR APPROVED EQUIVALENT.
- 3.2 EXTEND SHEET PILING OR INSTALL TEMPORARY HANDRAIL ALONG THE TOP OF THE SHEET PILES TO PREVENT FALL INJURIES. HANDRAIL SHALL COMPLY WITH OSHA REQUIREMENTS.
- 3.3 SHEET PILE CORNER CONNECTIONS AND LAYOUT TO BE FIELD DETERMINED BY SHORING CONTRACTOR.

4.0 WALERS AND HARDWARE

- 4.1 ALL WALERS SHALL CONSIST OF W24X146 STEEL BEAMS OR APPROVED EQUIVALENT CONFORMING TO ASTM A572 WITH A MINIMUM YIELD STRENGTH OF 50 KSI.
- 4.2 WALER BEAMS SHALL BE STIFFENED AS DETAILED USING GRADE 36 PLATE STEEL WITH A MINIMUM THICKNESS OF 0.75 INCHES.
- 4.3 COIL THREADED ROD, NUTS, & WASHERS SHALL BE NEW AND CONFORM TO ASTM A325. COIL RODS SHALL HAVE A MINIMUM WORKING LOAD TENSION CAPACITY OF 56 KIPS.
- 4.4 DOUBLE B-13 NUTS REQUIRED PER BOLT. TIGHTEN NUTS PER MANUFACTURER'S RECOMMENDATIONS.
- 4.5 ALL WELDING SHALL BE PERFORMED IN CONFORMANCE TO AWS D1.1.

5.0 INSTALLATION PROCEDURE

- 5.1 SHORING SHALL BE INSTALLED AND REMOVED FOLLOWING THE PROCEDURES OUTLINED IN SECTION 4 OF THE DESIGN CALCULATION PACKAGE.
- 5.2 AFTER THE COMPLETION OF THE FOOTING CONSTRUCTION, BACKFILL AND CUT THE PERMANENT SHEET PILES OFF 2 FEET BELOW FINISHED GRADE OR AS REQUIRED BY UDOT AND UPRR.
- 5.3 TEMPORARY WALERS MAY BE REMOVED ONLY AFTER BACKFILL HAS BEEN COMPLETED TO A MINIMUM OF 1 FOOT BELOW THE REQUIRED PERMANENT SHEET PILE CUTOFF ELEVATION.

6.0 MONITORING

- 6.1 DAILY INSPECTION OF SHEET PILE SHORING SYSTEM SHALL BE PERFORMED BY A QUALIFIED PERSON PRIOR TO ENTRY INTO EXCAVATION TO COMPLY WITH OSHA REGULATIONS.
- 6.2 VERTICAL AND LATERAL MOVEMENTS OF THE SHEET PILES ADJACENT TO UP ML #1 AND THE UP ML #1 TRACK SHOULD BE MEASURED PRIOR TO INITIAL EXCAVATION AND DAILY FOR A MINIMUM OF 3 DAYS AFTER THE COMPLETION OF EXCAVATION.

Call Before You Dig
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801-208-2100

MARK	DATE	BY	CHK	MARK	DATE	BY	CHK

CONSULTANTS:
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LEGACY PARKWAY - SEGMENT 3
STRUCTURES C863 (MP 798.06) & C867 (MP 798.04)
SHEET PILE WALL DESIGN - BENT #2
FARMINGTON, UTAH
TYPICAL SECTIONS & GENERAL NOTES

DESIGNED BY: BHS	APPROVED BY: RTC
DATE: 01/22/07	DATE: 01/22/07
DRAWN BY: BHS	SCALE: 1"=1'
CHECKED BY: BHS	SCALE: AS NOTED
DATE: 01/22/07	REVISION NO: 1
PROJECT: 00409-046	SHEET
DRAWING NO. UDOT SP-0067(B)10	2 OF 2

4. Shoring Installation/ Extraction Procedure

4. Shoring Installation/Extraction Procedure

The following is an anticipated procedure provided by the shoring installation contractor, Build, Inc., that is to be used as a guideline for sheet pile installation/extraction operations for this project:

- Prior to starting sheet pile installation/extraction activities, the Job Hazard Analysis shall be completed and reviewed by the entire crew. The project superintendent shall note and discuss any special or variable site conditions such as staging areas for sheet pile materials, pedestrian and equipment traffic routes, and overhead & underground utilities. If electrical utilities are located within the working radius of the crane and/or near the sheet piles installation/extraction areas, additional precautions need to be discussed and implemented addressing appropriate safety measures for the specific electrical utility.
- **When working near UPRR rails, the EIC must be present at the daily job briefing. No activities within 25 feet of rails are allowed without the prior consent and supervision of the UPRR-EIC.** Keep all equipment and personnel at least 25 feet from rails unless they are actively involved and required in the construction process.
- Review and verify that subgrade conditions at crane staging and travel areas have sufficient compaction and provide enough space for both sheet pile installation/extraction operations and materials handling equipment servicing the sheet pile installation/extraction operation. Although not anticipated, use crane mats where needed to level up the crane pad or to provide additional stabilization to the subgrade.
- Stockpile sheet-piling materials in approved stockpile/staging areas. Review stockpile/staging areas with Clyde-Geneva representatives to prevent conflict with General Contractor Construction Activities. Block stockpiles to prevent accidental movement.
- When handling sheet pile materials, ensure the load is balanced and secure before and during movement from the sheet pile installation/extractor equipment. When moving sheet piles between or adjacent to existing structures or other construction equipment, physically measure areas to provide safe clearances. Utilize spotters if necessary to insure safe movement of sheet piles.
- Immediately upon moving sheet pile installation/extraction equipment into position for installation/extraction operations, the swing radius guards shall be placed and maintained. **At no time will anyone be permitted to enter the swing radius of the crane unless sheet pile-driving operations have been terminated and the operator signals for entrance.**
- **At no time will anyone be permitted to stand or ride on the catwalks of the crane during operations. No riders will be permitted to ride on any equipment. It is required that operators of all equipment be seated at the controls with the appropriate safety belts fastened.** Utilize spotters if necessary to insure safe movement of equipment.

- If required, sheet piles shall be painted at one (1) foot increments. Each five (5) foot increment shall be numerically labeled. Care shall be exercised to paint and label piles accurately. **Upon installation/extraction, any damaged portion of the sheet pile will be documented and recorded on the installation record for that particular sheet pile.**
- Prior to installation/extraction of sheet piles, the superintendent and pile bucks shall review the layout provided including verifying the new footing location and perform a reasonable review and comparison to the drawings for major discrepancies. Suspected discrepancies shall be brought to the attention of Clyde-Geneva. Build Inc. shall exercise care in preserving all contractor furnished layout points, lines, and grades.
- Where practical, driving templates should be placed to help control the alignment of sheets as they are driven.
- **When using driving templates to assist in the locating of sheet piles during installations particular care needs to be exercised to insure that the template is on the ground without room for any employee's foot to be able to go underneath the template.**
- When rigging the sheet piles for lofting, each pile shall be rigged with a wire rope cable sling of appropriate size & strength for the weight of the sheet pile, and not less than 5/8-inch diameter. Specialized remote release shackles should be used to connect the sheet pile to the crane. **All rigging will be inspected prior to lofting each and every sheet pile. Special attention will be paid to shackles and pins. Shackles will be wired to prevent unscrewing and subsequently uncoupling. Pins, which use only a cotter key, will not be allowed. A threaded shackle pin with nut and cotter key will replace pins. A manlift will be utilized to access the top of the sheet piles when necessary.**
- The Sheet Pile will be carefully raised to vertical using the auxiliary line connected to sheet. All ground personnel must stay clear while lofting sheets. The crane operator must ensure that the boom tip remains directly over the sheet as it is raised, achieving control before lifting it completely off the ground. Additional care must be taken in windy conditions.
- The sheet will then be swung and lowered into position and placed against the driving template or interlocked into the preceding sheet. Where possible a "guide bracket" will be placed holding the leading edge of the sheet against the template. When interlocked into a preceding sheet that has been driven a minimum of 25% of its length into stable soil, the remote release shackles can then be released and raised or lowered out of the way.
- The vibratory hammer will then be carefully lowered on top of the pile. The hammer jaw shall be actuated/closed, making a positive connection between the vibratory hammer and the sheet pile.
- The remote release shackles must be released before actuating the vibratory hammer and the crane will either lower them to the ground or raise them well above the hammer. Specialized sheet pile shackles are subject to damage if exposed to excessive vibration that can occur during sheet pile driving.

- The vibratory hammer will be actuated. The crane will slowly lower the vibratory hammer. The vibratory hammer coupled to the crane will overcome the friction between the installed sheet pile and the surrounding earth driving the sheet into the ground. Every few feet the driving should be stopped and the sheet checked for alignment and plumb in all directions.
- Where possible, sheets will be driven in stages, advancing every-other “pair” 4 or 5 feet. This reduces friction on the interlocks and helps prevent sheets from being pushed out of alignment and plumb by changes in soil conditions or underground obstructions.

Special Notes:

- a. Special care will be exercised in monitoring the sheet pile. Fatigue and subsequent failure of the steel sheet pile from the energy introduced by the vibratory hammer can result in damage. Field observations are the best way to determine the duration of vibratory hammer energy the steel sheet pile is capable of withstanding in these soil conditions. It is possible for pieces of sheet pile to be broken off the top of the sheet pile from the energy released by the vibratory hammer. Personnel need to be aware of this possibility and remain observant on each and every sheet pile. It is possible for the piece of sheet pile resulting from sheet pile failure to be lodged in the vibratory hammer jaws and the piece of sheet pile can be released and fall onto personnel working below typically when the vibratory hammer jaw is opened and/or closed. Additionally, there are times that a piece of sheet pile will break off and the piece will remain interlocked with an adjacent sheet pile. When the energy from the vibratory hammer locked on an adjacent sheet pile is introduced, the forces can provide enough energy to dislodge broken and loose sheet pile pieces from the top of the sheet pile, which results in the possibility of the piece of sheet pile falling on personnel working below.
- b. “Fresh-heading” of the sheet pile should be used as needed to cut off fatigued steel at the top of the sheet pile thereby providing competent steel to transmit the vibratory hammer’s energy into the sheet pile. The “Fresh-Heading” process minimizes dangers associated with broken off pieces from the fatigued steel that can occur at the top of the sheet pile.
- c. For special situations requiring techniques not addressed above, a special planning / coordination / safety meeting shall be held with the crew(s) involved to review the procedures and subsequent work plan.
- d. **Personnel need to exercise care when installing/extracting sheet piles. Numerous pinch points, tripping hazards, and falling object dangers exist. All personnel involved are required to remain constantly attentive.**
- e. After the completion of footing construction, cut the permanent sheet piles off 2 feet below finished grade or as required by UDOT and UPRR.

5. References

AASHTO LRFD Bridge Design Specifications 4th Edition, 2007, American Association of State Highway and Transportation Officials (AASHTO).

AASHTO LRFD Bridge Design Specifications 2006 Interim Revisions, 2006, American Association of State Highway and Transportation Officials (AASHTO).

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Manual for Railway Engineering, Volume 2, 2006, American Railway Engineering and Maintenance-of-Way Association (AREMA).

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