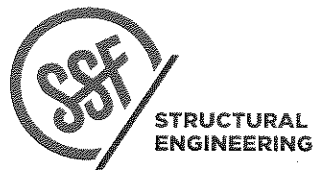
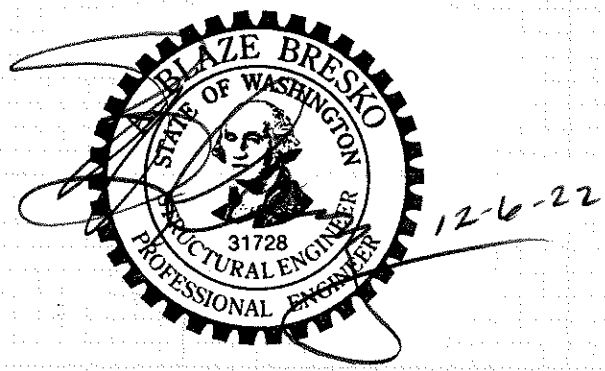


SHORING CALCULATIONS
FOR THE
PATISON RESIDENCE

8019 SE 20th ST
Mercer Is, WA 98040

ARCHITECT
CHARLES FRITZEMIER



PATISON Shoring
PROJECT

DATE
12-6-22
DESIGN
Cover
SHEET

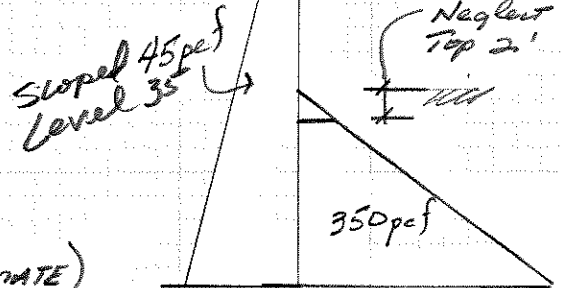
SHORING DESIGN

Geotechnical Criteria by
 PAN GEO #20-332, 11-23-22

$P_{active} = 35 \text{ psf (LEVEL)}$
 $45 \text{ psf (SLOPING 2:1 MAX)}$

$P_{SEISMIC} = 12 \text{ H psf}$

$P_{PASSIVE} = 350 \text{ psf} \times 1.5 = 525 \text{ psf (ULTIMATE)}$

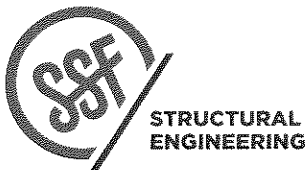


SUMMARY OF DESIGN AS FOLLOWS FOR $P_a = 45 \text{ psf}$ sloping

H	AUGER	WF SIZE	LENGTH	SPACING
22'	36	W27x129	45'	5'-6"
20'	36	W27x114	41'	6'-0"
18'	36	W27x114	39'	8'-0"
16'	36	W27x84	35'	8'-0"
14'	36	W24x68	30'	8'-0"
12'	36	W24x55	27'	8'-0"
10'	30	W21x44	23'	8'-0"
8'	24	W18x35	20'	8'-0"
6'	24	W16x26	15'	8'-0"

SUMMARY OF DESIGN FOR $P_a = 35 \text{ psf}$ (LEVEL BACKFILL)

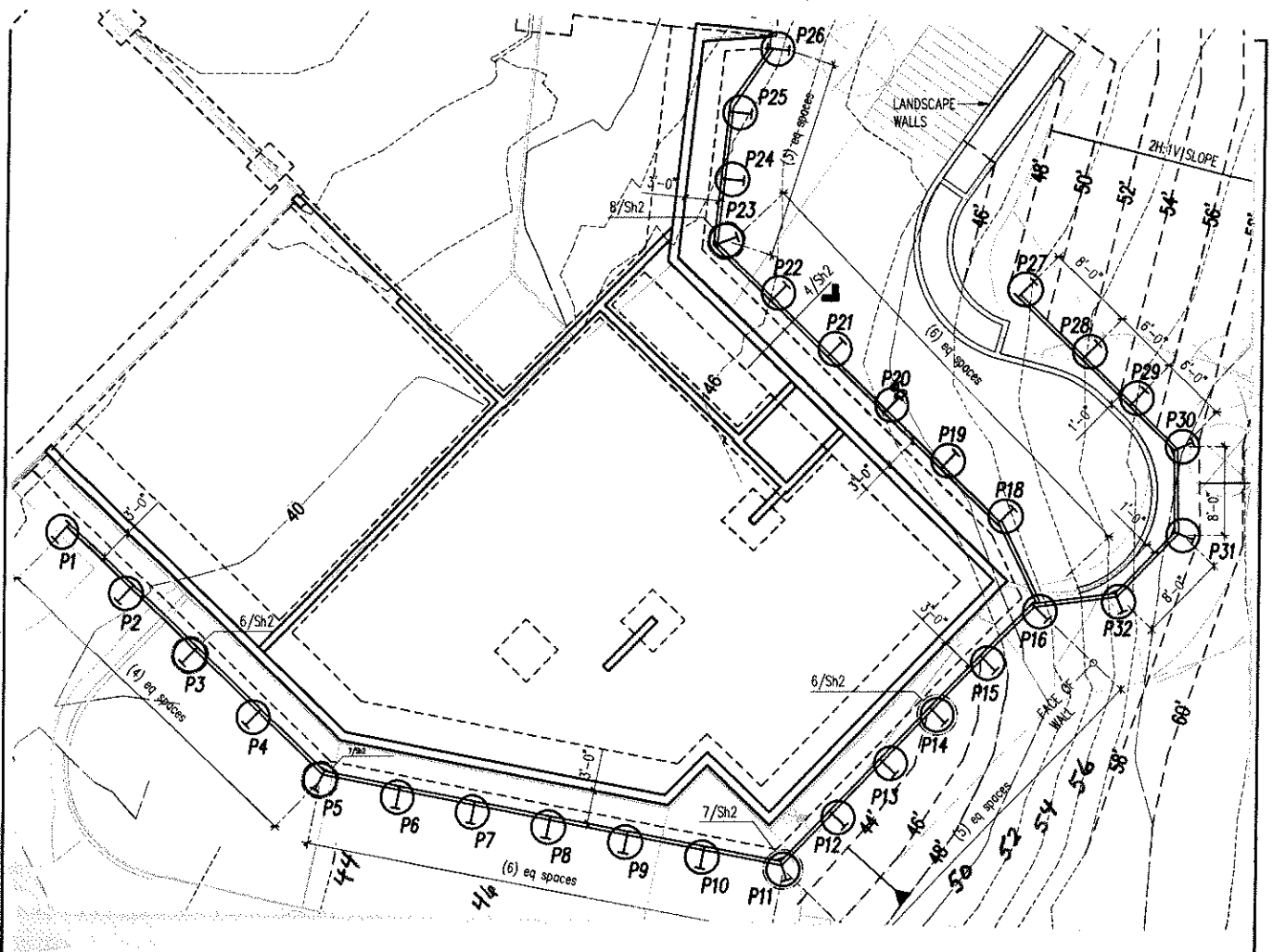
H	φ	WF	LENGTH	SPACING
22	36	W27x102	42'	6'-0"
20	36	W27x102	40'	8'-0"
18	36	W27x84	37'	8'-0"
14	36	W24x68	33'	8'-0"
14	36	W24x55	29'	8'-0"
12	30	W21x44	25'	8'-0"
10	24	W18x35	23'	8'-0"
8	24	W16x26	18'	8'-0"



Partition
 PROJECT

12-6-22
 DATE

PROJ
 DESIGN
 SHEET 541

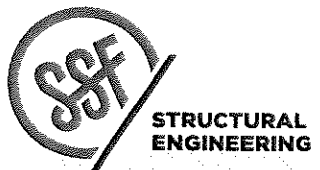


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 TACOMA 934 Broadway, Suite 100, Tacoma, WA 98402 | 253.284.9470

ssfengineers.com

Pile Schedule

Pile Mark	Auger Dia.	Wide Flange Size	Top of Pile	Bottom of Excavation	Max. Height H (ft.)	Min. Embed D (ft.)	Bottom of Auger	MARK	DIAM	WF SIZE	T.O. PILE	B.O. EXC.	H	D	B.O. AUGER
P1	36"	W24x55	44'	32'	12'	15'	16'								
P2	36"	W24x55	44'	32'	12'	15'	16'	P18	36"	W24x55	44'	32'	12'	15'	16'
P3	36"	W24x55	44'	32'	12'	15'	16'	P19	36"	W24x55	44'	32'	12'	15'	16'
P4	36"	W24x55	44'	32'	12'	15'	16'	P20	36"	W24x55	44'	32'	12'	15'	16'
P5	36"	W24x55	44'	32'	12'	15'	16'	P21	36"	W24x55	44'	32'	12'	15'	16'
P6	36"	W24x55	44'	32'	12'	15'	16'	P22	36"	W24x55	44'	32'	12'	15'	16'
P7	36"	W24x55	44'	32'	12'	15'	16'	P23	36"	W24x55	44'	32'	12'	15'	16'
P8	36"	W24x55	44'	32'	12'	15'	16'	P24	36"	W24x55	44'	32'	12'	15'	16'
P9	36"	W24x55	44'	32'	12'	15'	16'	P25	36"	W24x55	44'	32'	12'	15'	16'
P10	36"	W24x55	44'	32'	12'	15'	16'	P26	36"	W24x55	44'	32'	12'	15'	16'
P11	36"	W24x55	44'	32'	12'	15'	16'	P27	36"	W18x35	48'	43'	5'	10'	32'
P12	36"	W24x55	44'	32'	12'	15'	16'	P28	36"	W21x44	52'	43'	9'	13'	29'
P13	36"	W24x55	44'	32'	12'	15'	16'	P29	36"	W24x68	56'	43'	13'	17'	25'
P14	36"	W24x68	46'	32'	14'	17'	14'	P30	36"	W27x84	58'	43'	15'	19'	23'
P15	36"	W27x84	48'	32'	16'	19'	12'	P31	36"	W27x84	58'	43'	15'	19'	23'
P16	36"	W27x102	56'	32'	20'	22'	9'	P32	36"	W27x84	58'	43'	15'	19'	23'

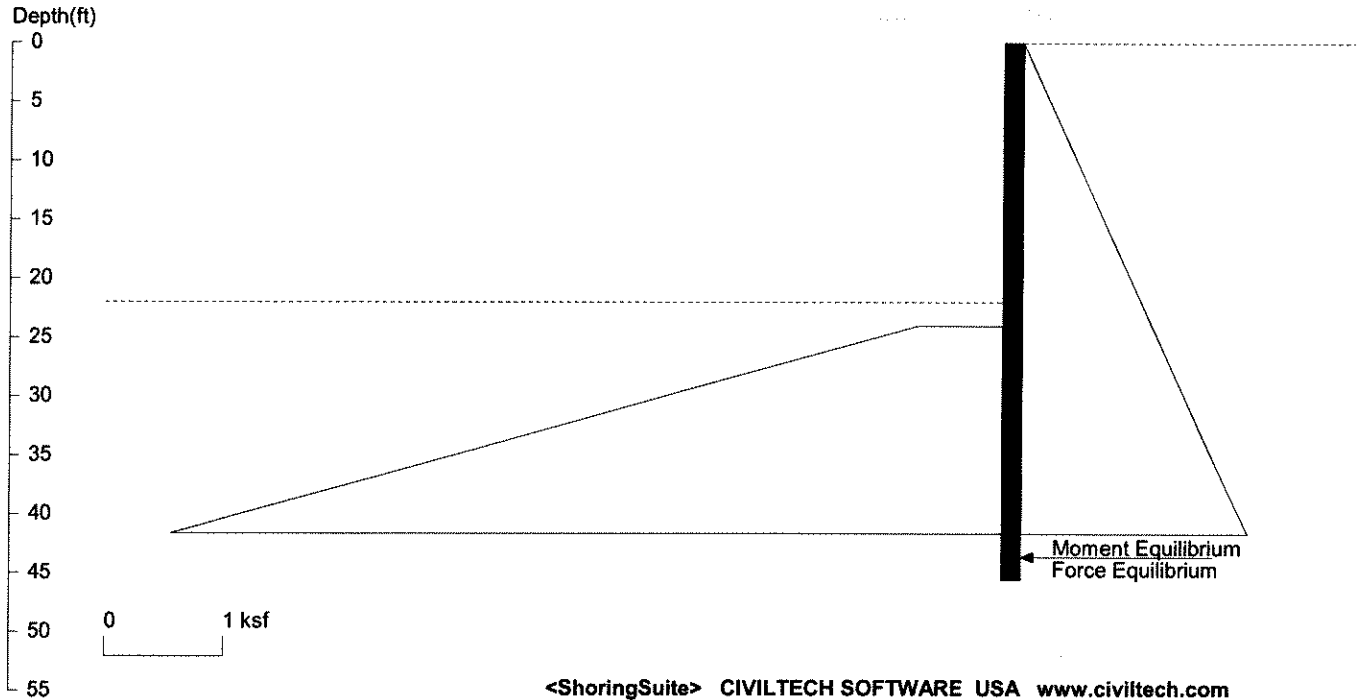


PATISON
PROJECT

12-6-22
DATE

PROJ: _____
DESIGN: *[Signature]*
SHEET: SH 2

Pattison Shoring 22 ft height



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File: UNTITLED

Date: 9/21/2022

Wall Height=22.0 Pile Diameter=3.0 Pile Spacing=5.5 Wall Type: 2. Soldier Pile, Drilled

PILE LENGTH: Min. Embedment=23.56 Min. Pile Length=45.56
MOMENT IN PILE: Max. Moment=922.23 per Pile Spacing=5.5 at Depth=32.24

PILE SELECTION:

Request Min. Section Modulus = 335.4 in³/pile=5495.46 cm³/pile, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
W27X129 has Section Modulus = 345.0 in³/pile=5653.52 cm³/pile. It is greater than Min. Requirements!
Top Deflection = 2.25(in) based on E (ksi)=29000.00 and I (in⁴)/pile=4760.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	50	2.250	.045

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
24	.7	50	9.800	.35

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	5.50
2	22.00	3.00

PASSIVE SPACING:

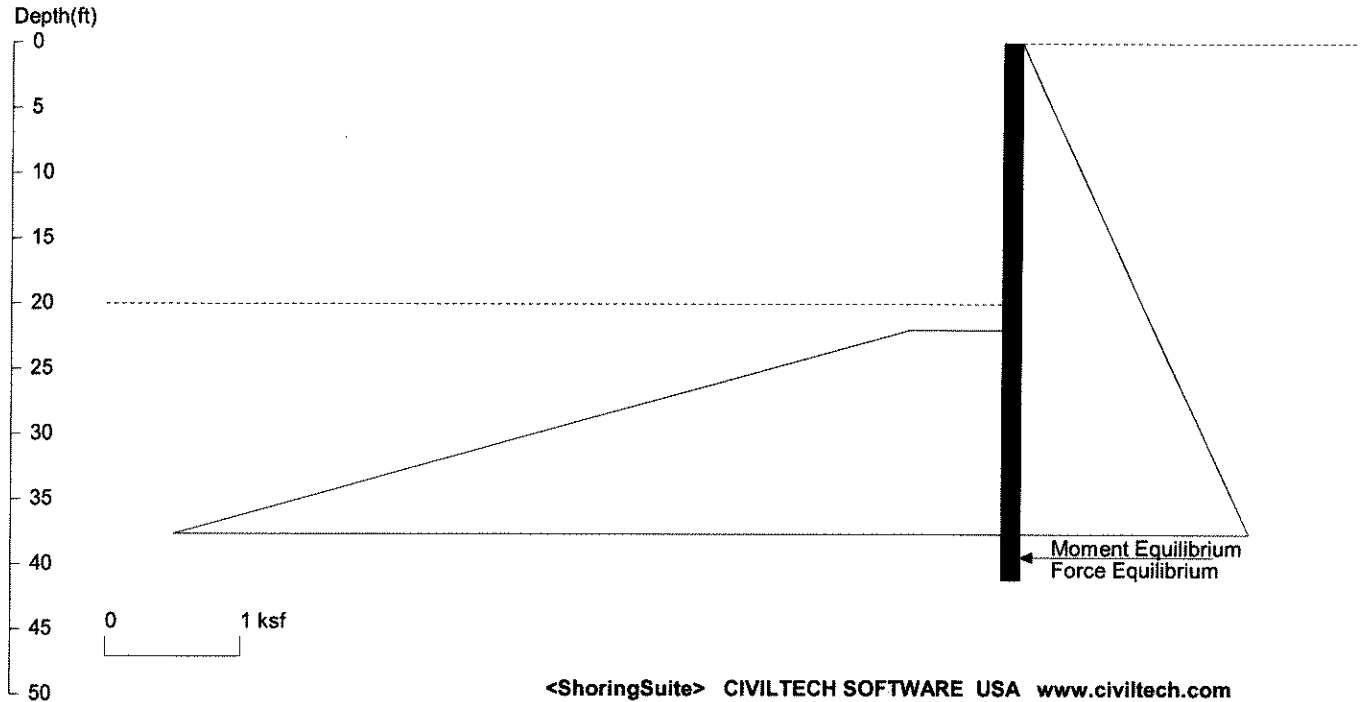
No.	Z depth	Spacing
1	22.00	5.50

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

12-6-22
[Signature] SA3

Pattison Shoring

20 ft height



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Date: 9/21/2022

File: UNTITLED

Wall Height=20.0 Pile Diameter=3.0 Pile Spacing=6.0 Wall Type: 2. Soldier Pile, Drilled

PILE LENGTH: Min. Embedment=21.19 Min. Pile Length=41.19

MOMENT IN PILE: Max. Moment=749.08 per Pile Spacing=6.0 at Depth=29.20

PILE SELECTION:

Request Min. Section Modulus = 272.4 in³/pile=4463.72 cm³/pile, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
 W27X114 has Section Modulus = 299.0 in³/pile=4899.71 cm³/pile. It is greater than Min. Requirements!
 Top Deflection = 1.75(in) based on E (ksi)=29000.00 and I (in⁴)/pile=4080.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	50	2.250	.045

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
22	.7	50	10.500	.35

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	6.00
2	20.00	3.00

PASSIVE SPACING:

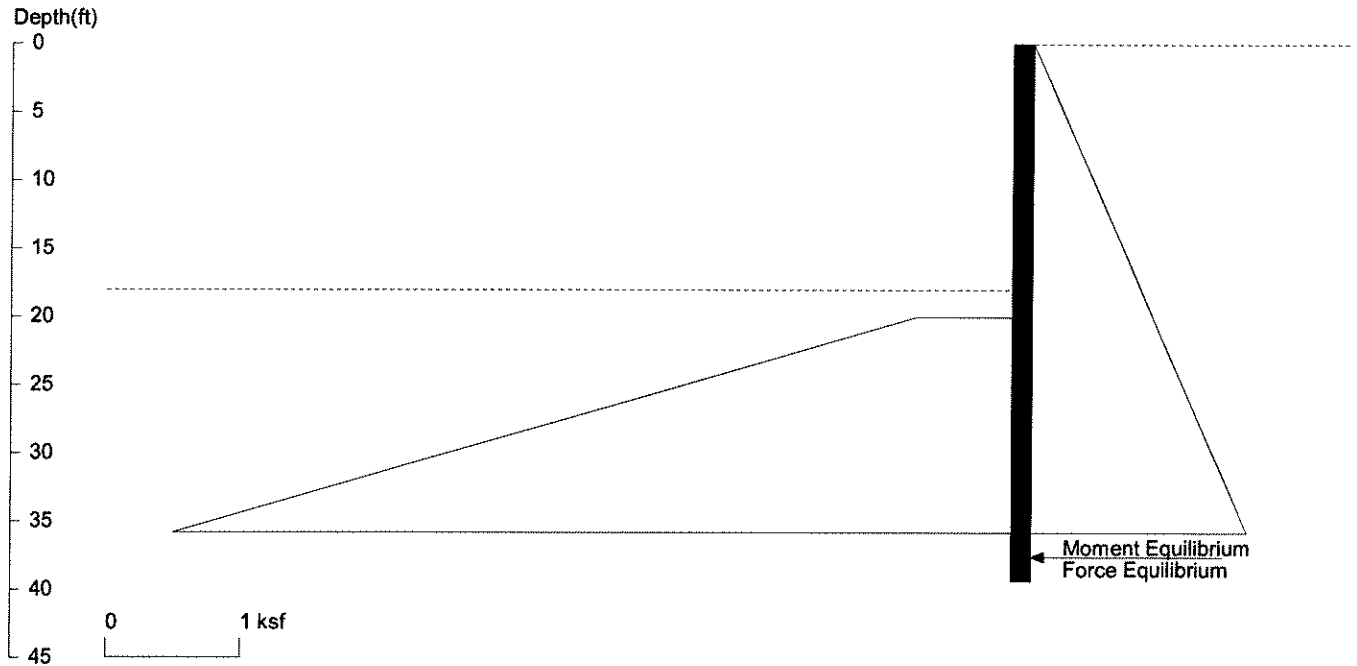
No.	Z depth	Spacing
1	20.00	6.00

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

12-16-22
Blay SH4

Pattison Shoring

18 ft height



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Date: 9/21/2022

File: UNTITLED

Wall Height=18.0 Pile Diameter=3.0 Pile Spacing=8.0 Wall Type: 2. Soldier Pile, Drilled

PILE LENGTH: Min. Embedment=21.33 Min. Pile Length=39.33

MOMENT IN PILE: Max. Moment=767.41 per Pile Spacing=8.0 at Depth=27.30

PILE SELECTION:

Request Min. Section Modulus = 279.1 in³/pile=4572.96 cm³/pile, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
W27X114 has Section Modulus = 299.0 in³/pile=4899.71 cm³/pile. It is greater than Min. Requirements!
Top Deflection = 1.56(in) based on E (ksi)=29000.00 and I (in⁴)/pile=4080.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	50	2.250	.045

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
20	.7	50	11.200	.35

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	8.00
2	18.00	3.00

PASSIVE SPACING:

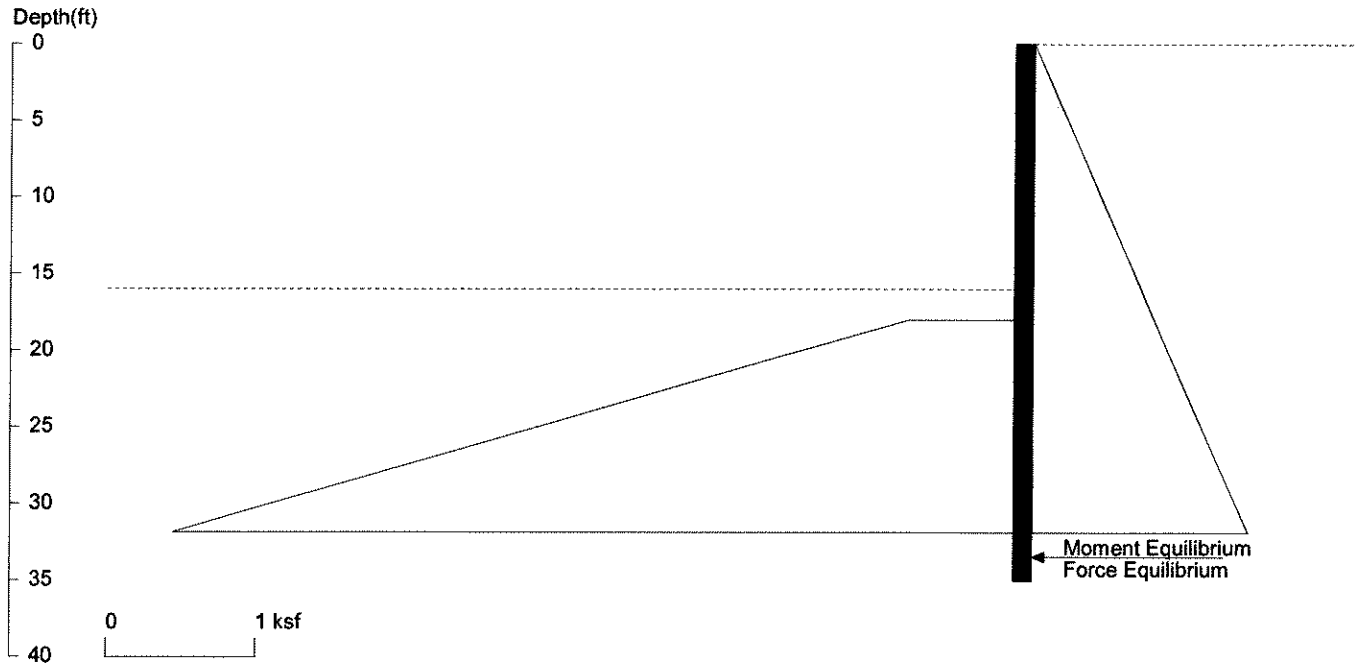
No.	Z depth	Spacing
1	18.00	6.00

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

12-6-22
Blay 545

Pattison Shoring

16 ft height



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Date: 9/21/2022

File: UNTITLED

Wall Height=16.0 Pile Diameter=3.0 Pile Spacing=8.0 Wall Type: 2. Soldier Pile, Drilled

PILE LENGTH: Min. Embedment=19.05 Min. Pile Length=35.05

MOMENT IN PILE: Max. Moment=544.63 per Pile Spacing=8.0 at Depth=24.33

PILE SELECTION:

Request Min. Section Modulus = 198.0 in³/pile=3245.43 cm³/pile, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
 W27X84 has Section Modulus = 213.0 in³/pile=3490.43 cm³/pile. It is greater than Min. Requirements!
 Top Deflection = 1.26(in) based on E (ksi)=29000.00 and I (in⁴)/pile=2850.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	50	2.250	.045

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
18	.7	50	11.900	.35

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	8.00
2	16.00	3.00

PASSIVE SPACING:

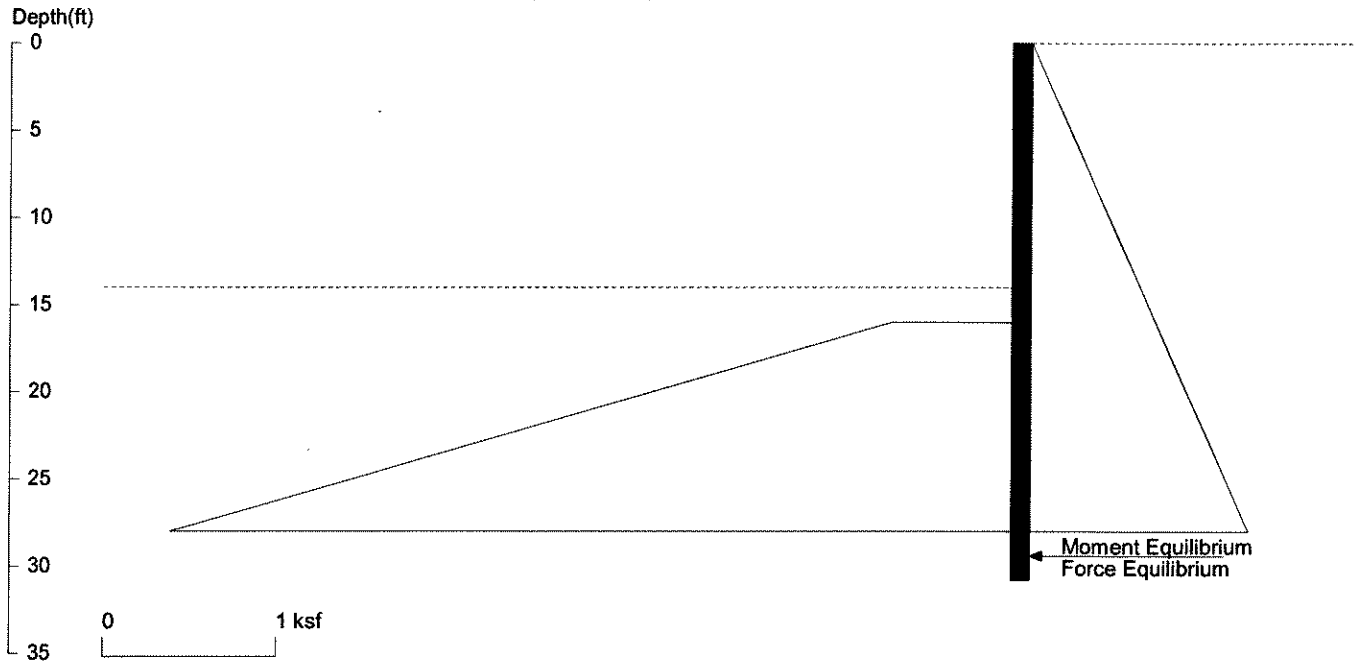
No.	Z depth	Spacing
1	16.00	6.00

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

12-6-22
 Bly
 & SHG

Pattison Shoring

14 ft height



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Date: 9/21/2022

File: UNTITLED

Wall Height=14.0 Pile Diameter=3.0 Pile Spacing=8.0 Wall Type: 2. Soldier Pile, Drilled

PILE LENGTH: Min. Embedment=16.78 Min. Pile Length=30.78

MOMENT IN PILE: Max. Moment=370.23 per Pile Spacing=8.0 at Depth=21.36

PILE SELECTION:

Request Min. Section Modulus = 134.6 in³/pile=2206.18 cm³/pile, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
 W24X68 has Section Modulus = 154.0 in³/pile=2523.60 cm³/pile. It is greater than Min. Requirements!
 Top Deflection = 1.02(in) based on E (ksi)=29000.00 and I (in⁴)/pile=1830.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	50	2.250	.045

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
16	.7	50	12.600	.35

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	8.00
2	14.00	3.00

PASSIVE SPACING:

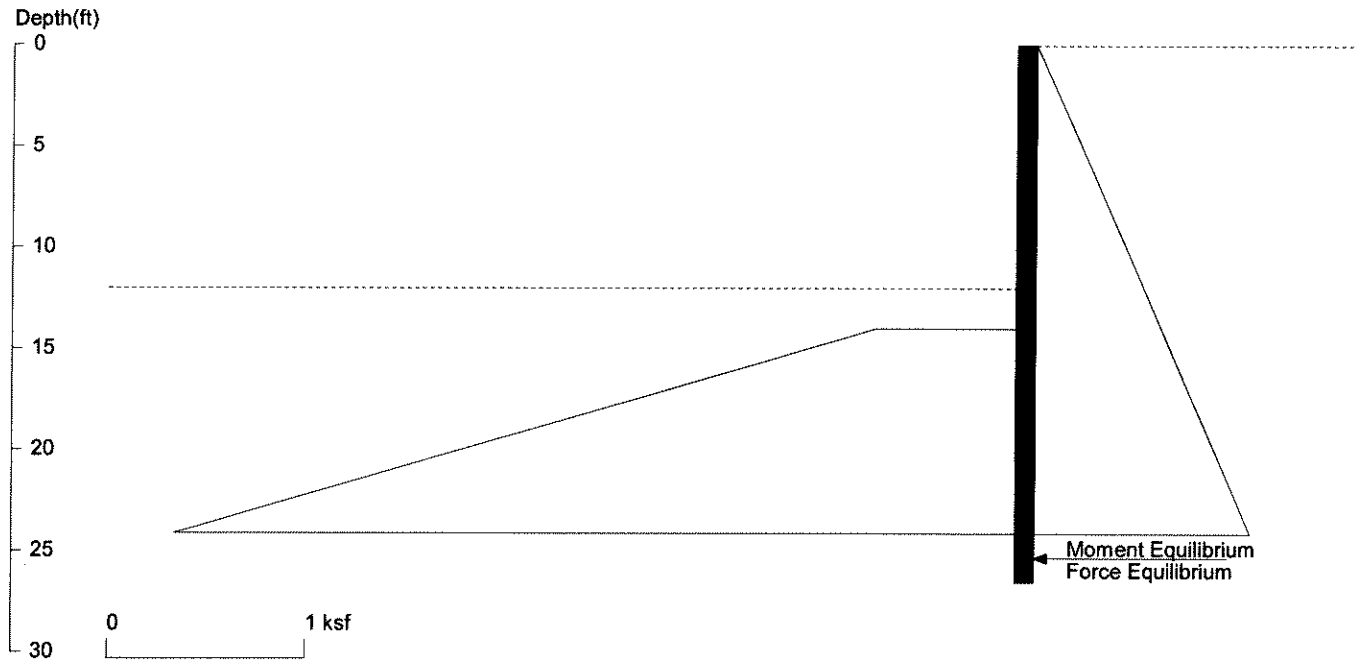
No.	Z depth	Spacing
1	14.00	6.00

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

12-6-22

Blay 347

Pattison Shoring 12 ft height



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File: UNTITLED

Date: 9/21/2022

Wall Height=12.0 Pile Diameter=3.0 Pile Spacing=8.0 Wall Type: 2. Soldier Pile, Drilled

PILE LENGTH: Min. Embedment=14.53 Min. Pile Length=26.53
MOMENT IN PILE: Max. Moment=238.18 per Pile Spacing=8.0 at Depth=18.43

PILE SELECTION:

Request Min. Section Modulus = 86.6 in³/pile=1419.27 cm³/pile, F_y= 50 ksi = 345 MPa, F_b/F_y=0.66
W24X55 has Section Modulus = 114.0 in³/pile=1868.12 cm³/pile. It is greater than Min. Requirements!
Top Deflection = 0.65(in) based on E (ksi)=29000.00 and I (in⁴)/pile=1350.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	50	2.250	.045

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
14	.7	50	13.300	.35

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	8.00
2	12.00	3.00

PASSIVE SPACING:

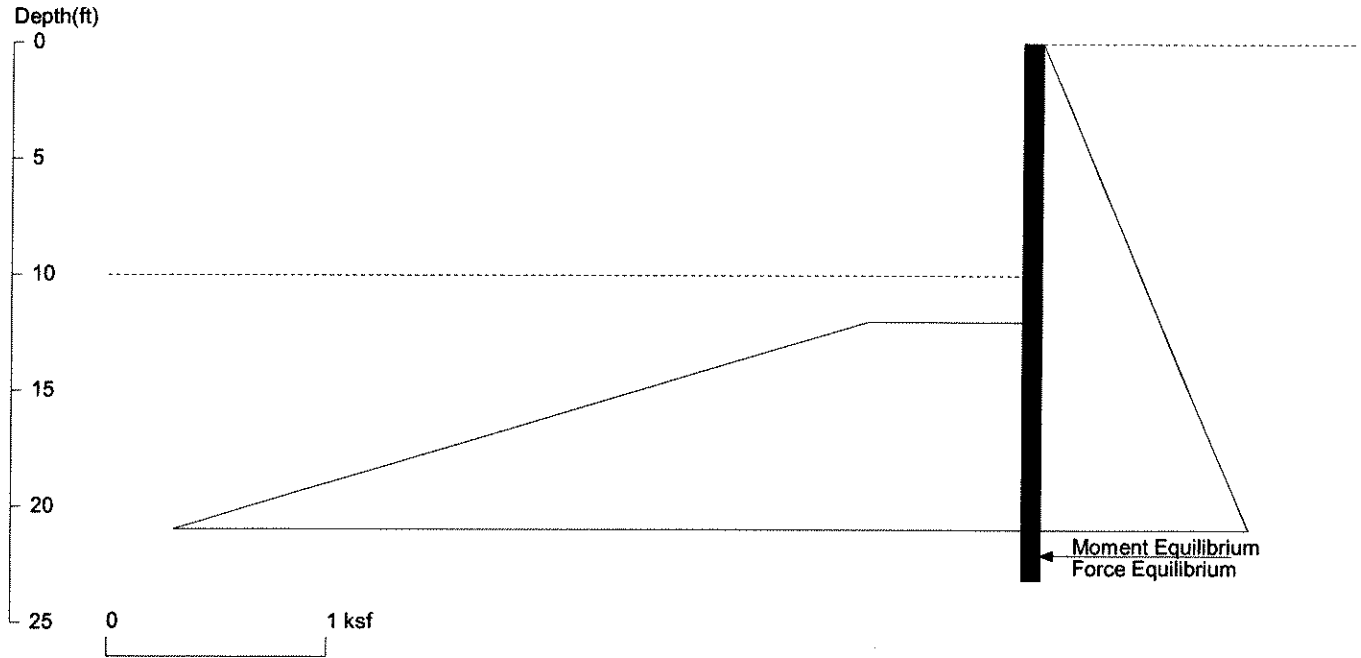
No.	Z depth	Spacing
1	12.00	6.00

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

12-6-22

Blay SHS

Pattison Shoring 10 ft height



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File: UNTITLED

Date: 9/21/2022

Wall Height=10.0 Pile Diameter=2.5 Pile Spacing=8.0 Wall Type: 2. Soldier Pile, Drilled

PILE LENGTH: Min. Embedment=13.14 Min. Pile Length=23.14
MOMENT IN PILE: Max. Moment=145.72 per Pile Spacing=8.0 at Depth=15.85

PILE SELECTION:

Request Min. Section Modulus = 53.0 in³/pile=868.33 cm³/pile, F_y= 50 ksi = 345 MPa, F_b/F_y=0.66
W21X44 has Section Modulus = 81.6 in³/pile=1337.18 cm³/pile. It is greater than Min. Requirements!
Top Deflection = 0.47(in) based on E (ksi)=29000.00 and I (in⁴)/pile=843.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	50	2.250	.045

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
12	.7	50	14.000	.35

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	8.00
2	10.00	2.50

PASSIVE SPACING:

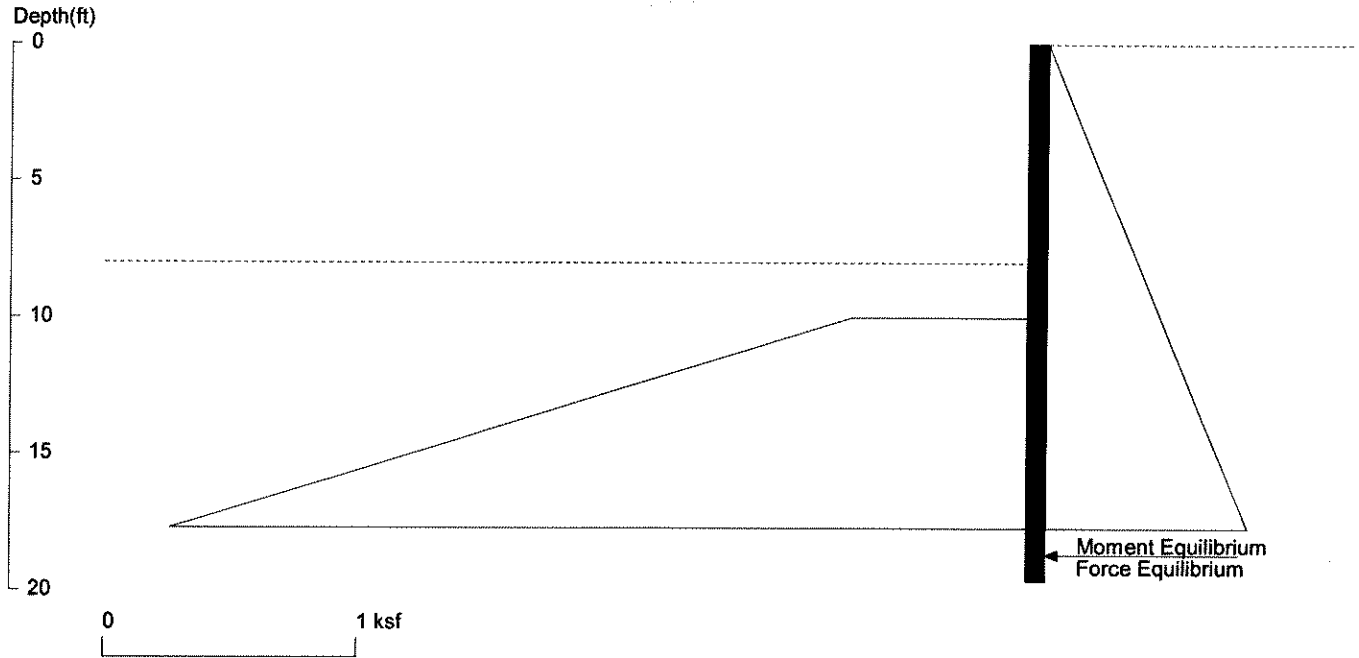
No.	Z depth	Spacing
1	10.00	5.00

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

12-6-22
[Signature] SH9

Pattison Shoring

8 ft height



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Date: 9/21/2022

File: UNTITLED

Wall Height=8.0

Pile Diameter=2.0

Pile Spacing=8.0

Wall Type: 2. Soldier Pile, Drilled

PILE LENGTH: Min. Embedment=11.65 Min. Pile Length=19.65

MOMENT IN PILE: Max. Moment=80.50 per Pile Spacing=8.0 at Depth=13.26

PILE SELECTION:

Request Min. Section Modulus = 29.3 in³/pile=479.67 cm³/pile, F_y= 50 ksi = 345 MPa, F_b/F_y=0.66

W18X35 has Section Modulus = 57.6 in³/pile=943.89 cm³/pile. It is greater than Min. Requirements!

Top Deflection = 0.30(in) based on E (ksi)=29000.00 and I (in⁴)/pile=510.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	50	2.250	.045

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
10	.7	50	14.700	.35

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	8.00
2	8.00	2.00

PASSIVE SPACING:

No.	Z depth	Spacing
1	8.00	4.00

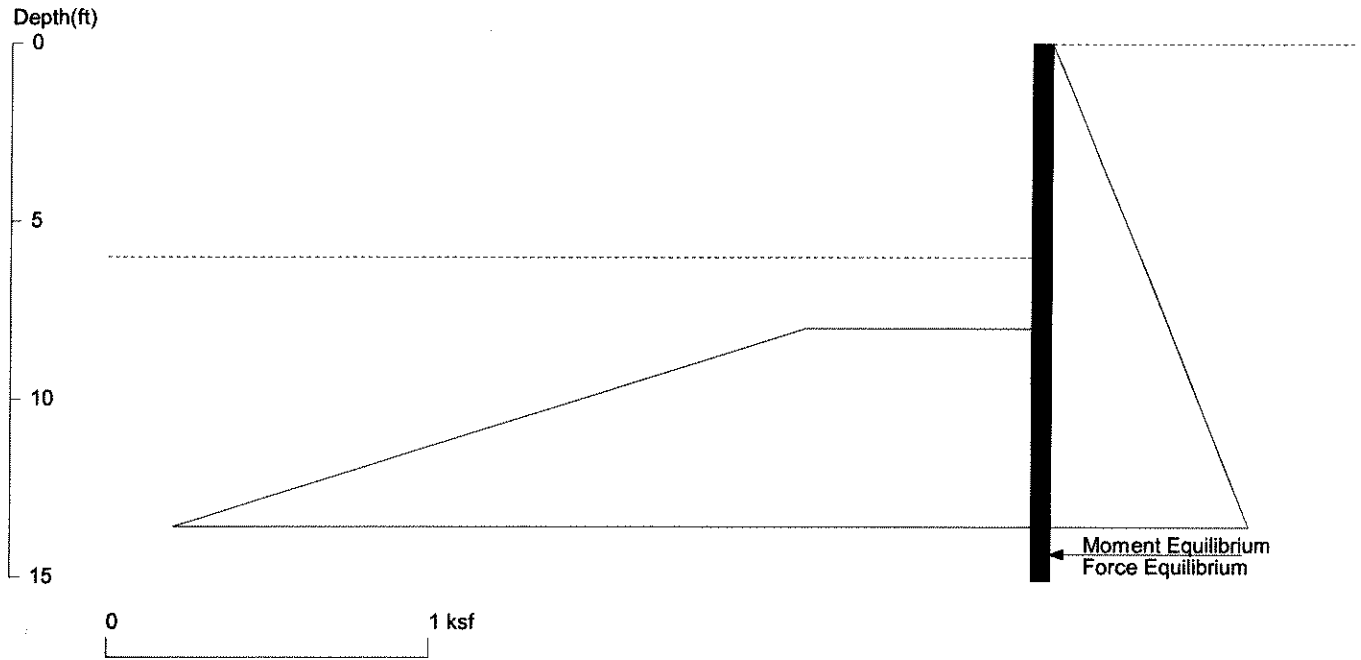
UNITS: Width, Spacing, Diameter, Length, and Depth - ft; Force - kip; Moment - kip-ft
Friction, Bearing, and Pressure - ksf; Pres. Slope - kip/ft³; Deflection - in

12-6-22

Bly SH10

Pattison Shoring

6 ft height



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File: UNTITLED

Date: 9/21/2022

Wall Height=6.0 Pile Diameter=2.0 Pile Spacing=8.0 Wall Type: 2. Soldier Pile, Drilled

PILE LENGTH: Min. Embedment=9.10 Min. Pile Length=15.10
MOMENT IN PILE: Max. Moment=36.79 per Pile Spacing=8.0 at Depth=10.20

PILE SELECTION:

Request Min. Section Modulus = 13.4 in³/pile=219.23 cm³/pile, F_y= 50 ksi = 345 MPa, F_b/F_y=0.66
W16X26 has Section Modulus = 38.4 in³/pile=629.26 cm³/pile. It is greater than Min. Requirements!
Top Deflection = 0.14(in) based on E (ksi)=29000.00 and I (in⁴)/pile=301.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	50	2.250	.045

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
8	.7	50	15.400	.35

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	8.00
2	6.00	2.00

PASSIVE SPACING:

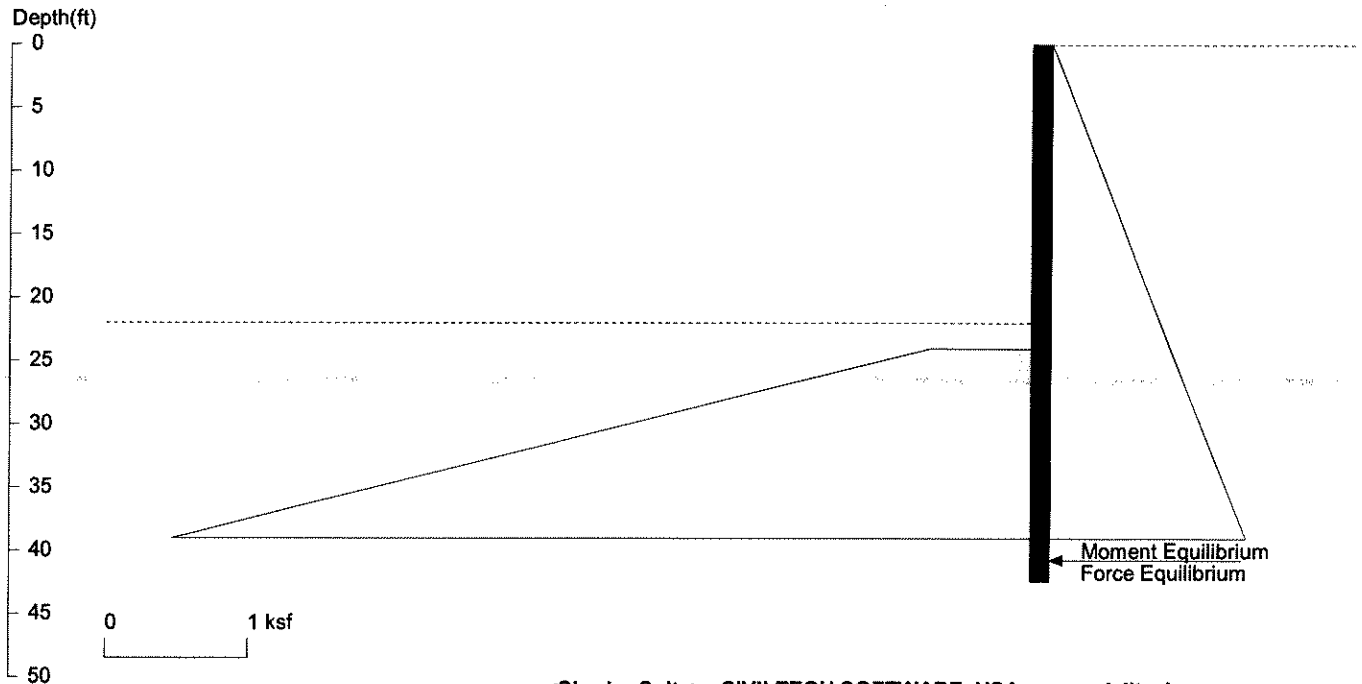
No.	Z depth	Spacing
1	6.00	4.00

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

12-6-22
Blay SH11

Pattison Shoring (Level Backfill)

22 ft height



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File: UNTITLED

Date: 9/21/2022

Wall Height=22.0 Pile Diameter=3.0 Pile Spacing=6.0 Wall Type: 2. Soldier Pile, Drilled

PILE LENGTH: Min. Embedment=20.42 Min. Pile Length=42.42
MOMENT IN PILE: Max. Moment=714.23 per Pile Spacing=6.0 at Depth=30.69

PILE SELECTION:

Request Min. Section Modulus = 259.7 in³/pile=4256.02 cm³/pile, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
W27X102 has Section Modulus = 267.0 in³/pile=4375.33 cm³/pile. It is greater than Min. Requirements!
Top Deflection = 2.14(in) based on E (ksi)=29000.00 and I (in⁴)/pile=3620.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	50	1.750	.035

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
24	.7	50	9.800	.35

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	6.00
2	22.00	3.00

PASSIVE SPACING:

No.	Z depth	Spacing
1	22.00	6.00

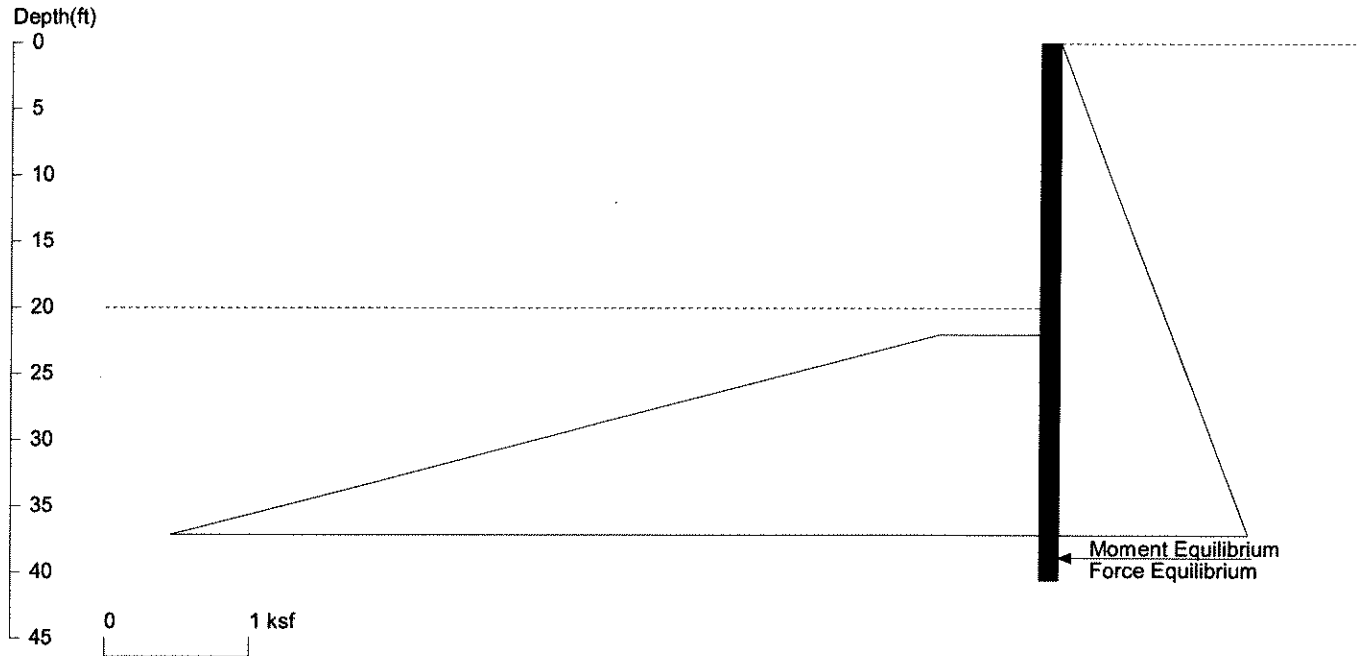
UNITS: Width, Spacing, Diameter, Length, and Depth - ft; Force - kip; Moment - kip-ft
Friction, Bearing, and Pressure - ksf; Pres. Slope - kip/ft³; Deflection - in

12-6-22

Blay SH12

Pattison Shoring (Level Backfill)

20 ft height



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Wall Height=20.0 Pile Diameter=3.0 Pile Spacing=7.8 Wall Type: 2. Soldier Pile, Drilled

PILE LENGTH: Min. Embedment=20.57 Min. Pile Length=40.57
MOMENT IN PILE: Max. Moment=730.56 per Pile Spacing=7.8 at Depth=28.80

PILE SELECTION:

Request Min. Section Modulus = 265.7 in³/pile=4353.36 cm³/pile, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
W27X102 has Section Modulus = 267.0 in³/pile=4375.33 cm³/pile. It is greater than Min. Requirements!
Top Deflection = 1.91(in) based on E (ksi)=29000.00 and I (in⁴)/pile=3620.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	50	1.750	.035

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
22	.7	50	10.500	.35

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	7.80
2	20.00	3.00

PASSIVE SPACING:

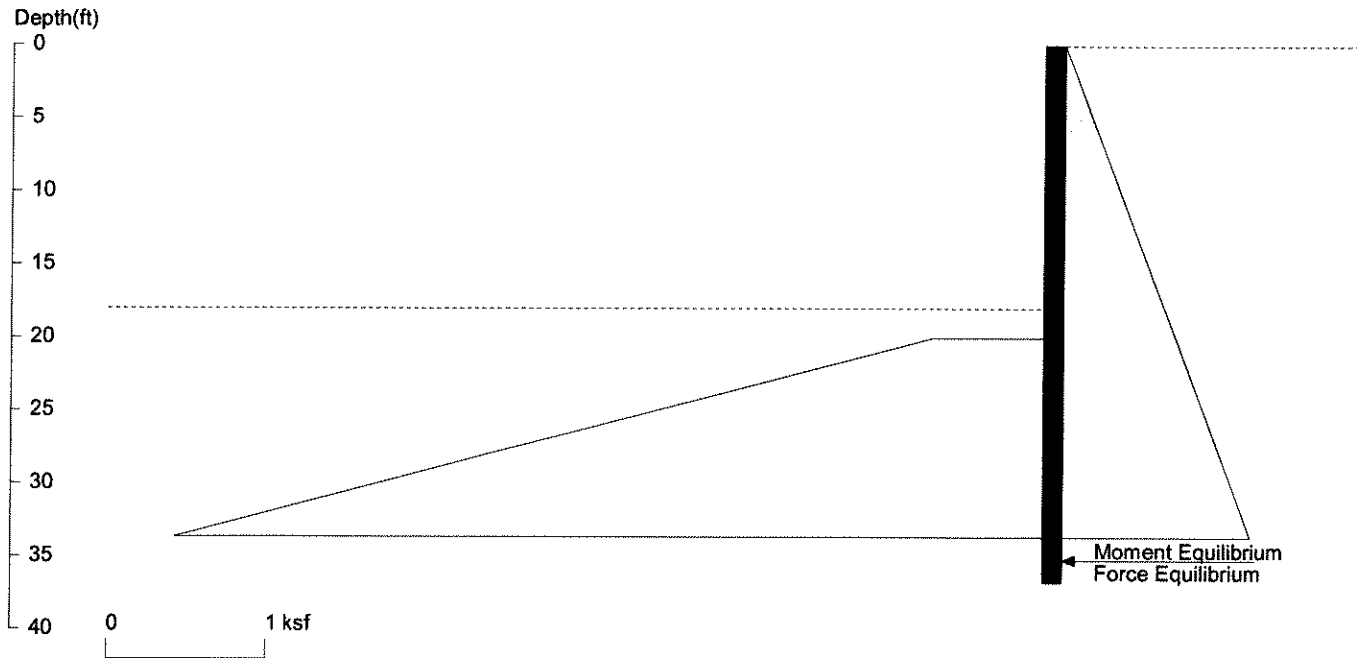
No.	Z depth	Spacing
1	20.00	6.00

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

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Blg SH13

Pattison Shoring (Level Backfill)

18 ft height



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Date: 9/21/2022

Wall Height=18.0 Pile Diameter=3.0 Pile Spacing=8.0 Wall Type: 2. Soldier Pile, Drilled

PILE LENGTH: Min. Embedment=18.77 Min. Pile Length=36.77
MOMENT IN PILE: Max. Moment=553.30 per Pile Spacing=8.0 at Depth=26.05

PILE SELECTION:

Request Min. Section Modulus = 201.2 in³/pile=3297.09 cm³/pile, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
W27X84 has Section Modulus = 213.0 in³/pile=3490.43 cm³/pile. It is greater than Min. Requirements!
Top Deflection = 1.50(in) based on E (ksi)=29000.00 and I (in⁴)/pile=2850.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	50	1.750	.035

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
20	.7	50	11.200	.35

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	8.00
2	18.00	3.00

PASSIVE SPACING:

No.	Z depth	Spacing
1	18.00	6.00

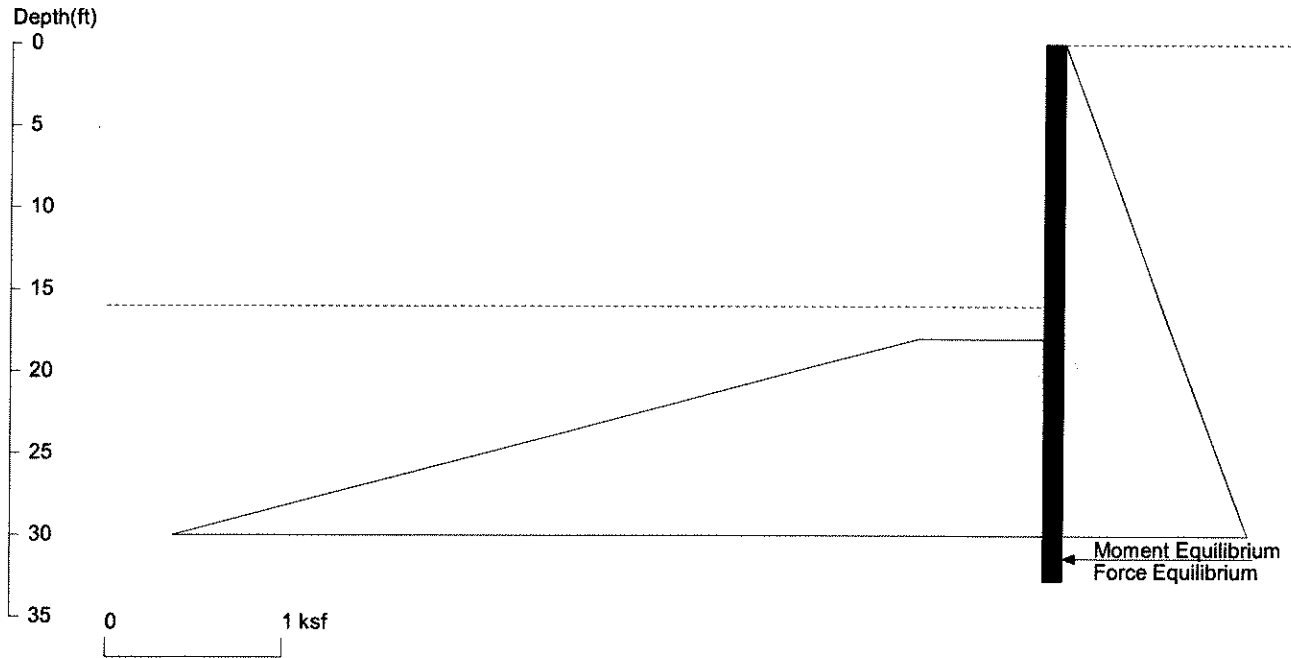
UNITS: Width, Spacing, Diameter, Length, and Depth - ft; Force - kip; Moment - kip-ft
Friction, Bearing, and Pressure - ksf; Pres. Slope - kip/ft³; Deflection - in

12-6-22

Blay SH14

Pattison Shoring (Level Backfill)

16 ft height



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Date: 9/21/2022

Wall Height=16.0 Pile Diameter=3.0 Pile Spacing=8.0 Wall Type: 2. Soldier Pile, Drilled

PILE LENGTH: Min. Embedment=16.79 Min. Pile Length=32.79
MOMENT IN PILE: Max. Moment=393.28 per Pile Spacing=8.0 at Depth=23.22

PILE SELECTION:

Request Min. Section Modulus = 143.0 in³/pile=2343.53 cm³/pile, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
W24X68 has Section Modulus = 154.0 in³/pile=2523.60 cm³/pile. It is greater than Min. Requirements!
Top Deflection = 1.31(in) based on E (ksi)=29000.00 and I (in⁴)/pile=1830.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	50	1.750	.035

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
18	.7	50	11.900	.35

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	8.00
2	16.00	3.00

PASSIVE SPACING:

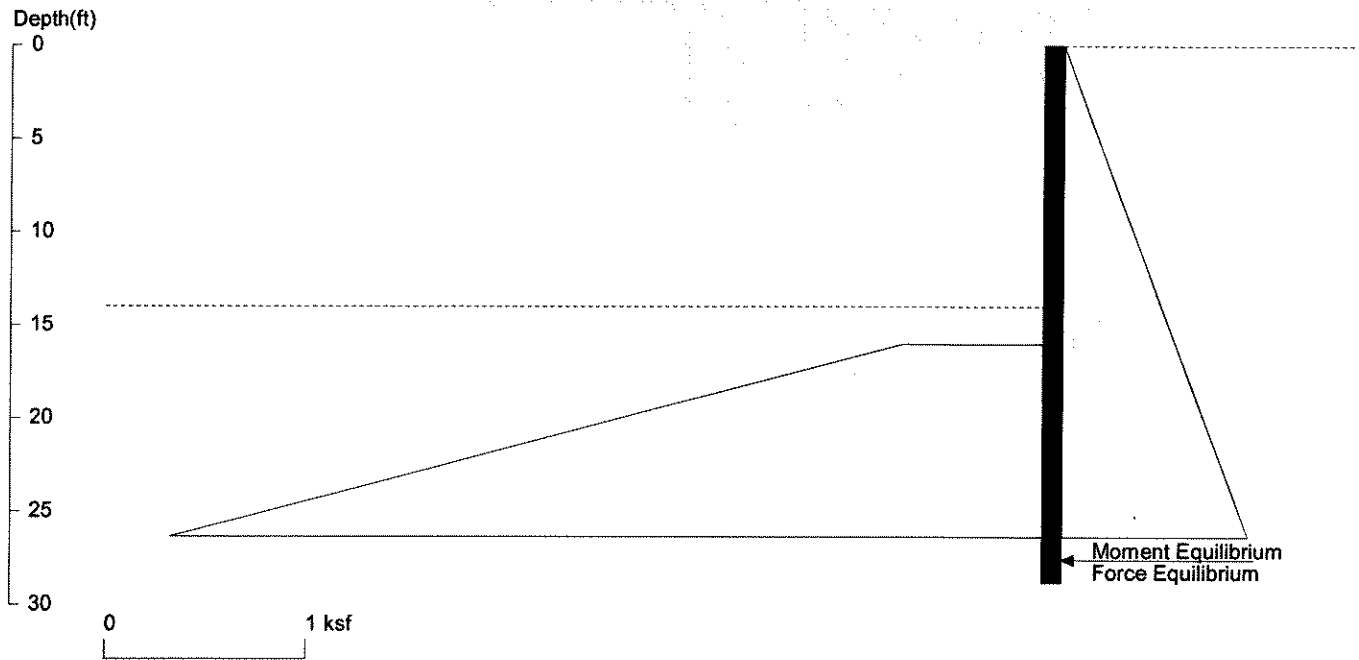
No.	Z depth	Spacing
1	16.00	6.00

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

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Blay SH15

Pattison Shoring (Level Backfill)

14 ft height



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Date: 9/21/2022

Wall Height=14.0 Pile Diameter=3.0 Pile Spacing=8.0 Wall Type: 2. Soldier Pile, Drilled

PILE LENGTH: Min. Embedment=14.81 Min. Pile Length=28.81
MOMENT IN PILE: Max. Moment=267.89 per Pile Spacing=8.0 at Depth=20.43

PILE SELECTION:

Request Min. Section Modulus = 97.4 in³/pile=1596.35 cm³/pile, F_y= 50 ksi = 345 MPa, F_b/F_y=0.66
W24X55 has Section Modulus = 114.0 in³/pile=1868.12 cm³/pile. It is greater than Min. Requirements!
Top Deflection = 0.93(in) based on E (ksi)=29000.00 and I (in⁴)/pile=1350.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	50	1.750	.035

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
16	.7	50	12.600	.35

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	8.00
2	14.00	3.00

PASSIVE SPACING:

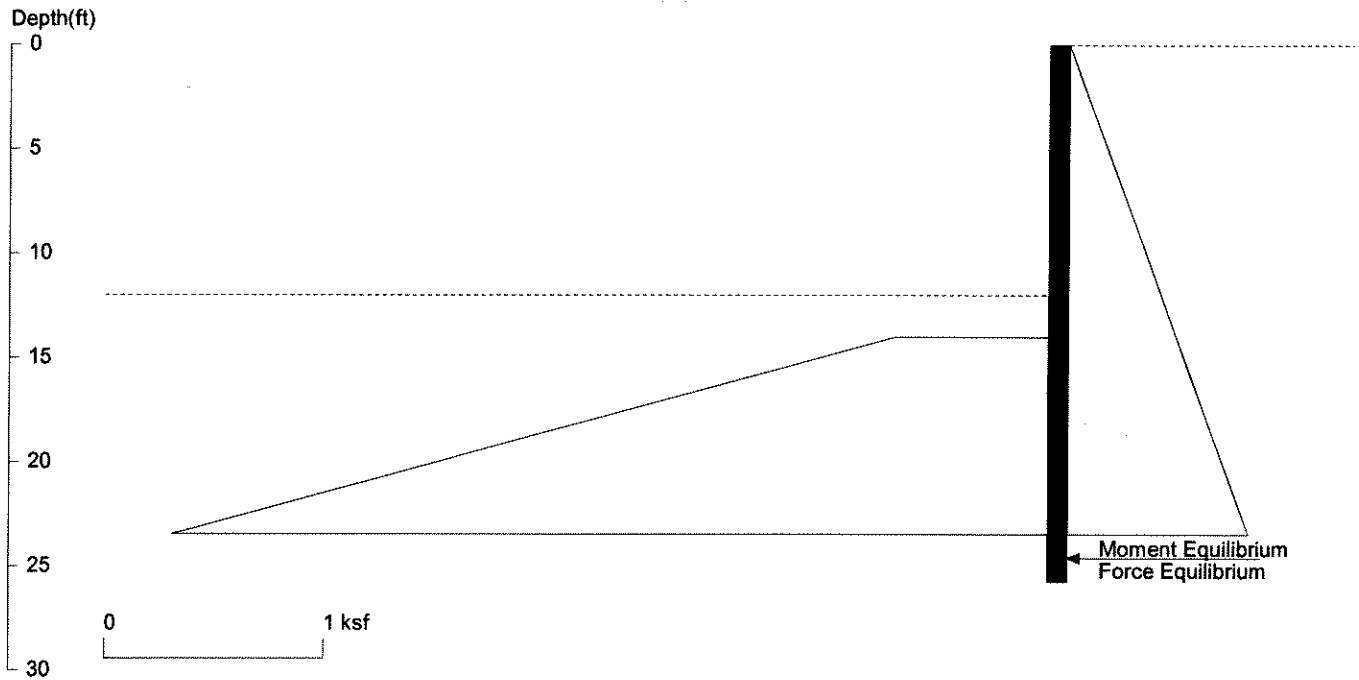
No.	Z depth	Spacing
1	14.00	6.00

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

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Blay SH16

Pattison Shoring (Level Backfill)

12 ft height



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Date: 9/21/2022

Wall Height=12.0 Pile Diameter=2.5 Pile Spacing=8.0 Wall Type: 2. Soldier Pile, Drilled

PILE LENGTH: Min. Embedment=13.74 Min. Pile Length=25.74
MOMENT IN PILE: Max. Moment=176.98 per Pile Spacing=8.0 at Depth=18.00

PILE SELECTION:

Request Min. Section Modulus = 64.4 in³/pile=1054.63 cm³/pile, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
W21X44 has Section Modulus = 81.6 in³/pile=1337.18 cm³/pile. It is greater than Min. Requirements!
Top Deflection = 0.75(in) based on E (ksi)=29000.00 and I (in⁴)/pile=843.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	50	1.750	.035

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
14	.7	50	13.300	.35

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	8.00
2	12.00	2.50

PASSIVE SPACING:

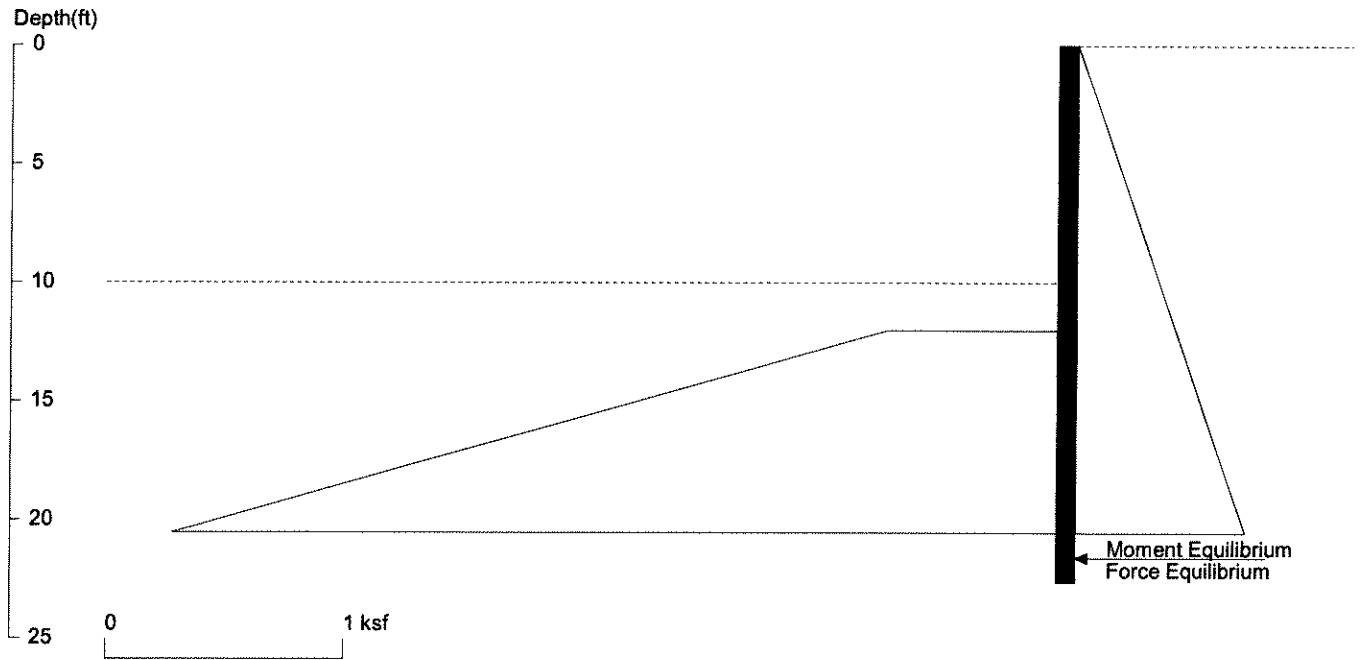
No.	Z depth	Spacing
1	12.00	5.00

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

12-6-22
R. Blay 5417

Pattison Shoring (Level Backfill)

10 ft height



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Date: 9/21/2022

Wall Height=10.0 Pile Diameter=2.0 Pile Spacing=8.0 Wall Type: 2. Soldier Pile, Drilled

PILE LENGTH: Min. Embedment=12.63 Min. Pile Length=22.63
MOMENT IN PILE: Max. Moment=109.06 per Pile Spacing=8.0 at Depth=15.58

PILE SELECTION:

Request Min. Section Modulus = 39.7 in³/pile=649.89 cm³/pile, F_y= 50 ksi = 345 MPa, F_b/F_y=0.66
W18X35 has Section Modulus = 57.6 in³/pile=943.89 cm³/pile. It is greater than Min. Requirements!
Top Deflection = 0.57(in) based on E (ksi)=29000.00 and I (in⁴)/pile=510.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	50	1.750	.035

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
12	.7	50	14.000	.35

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	8.00
2	10.00	2.00

PASSIVE SPACING:

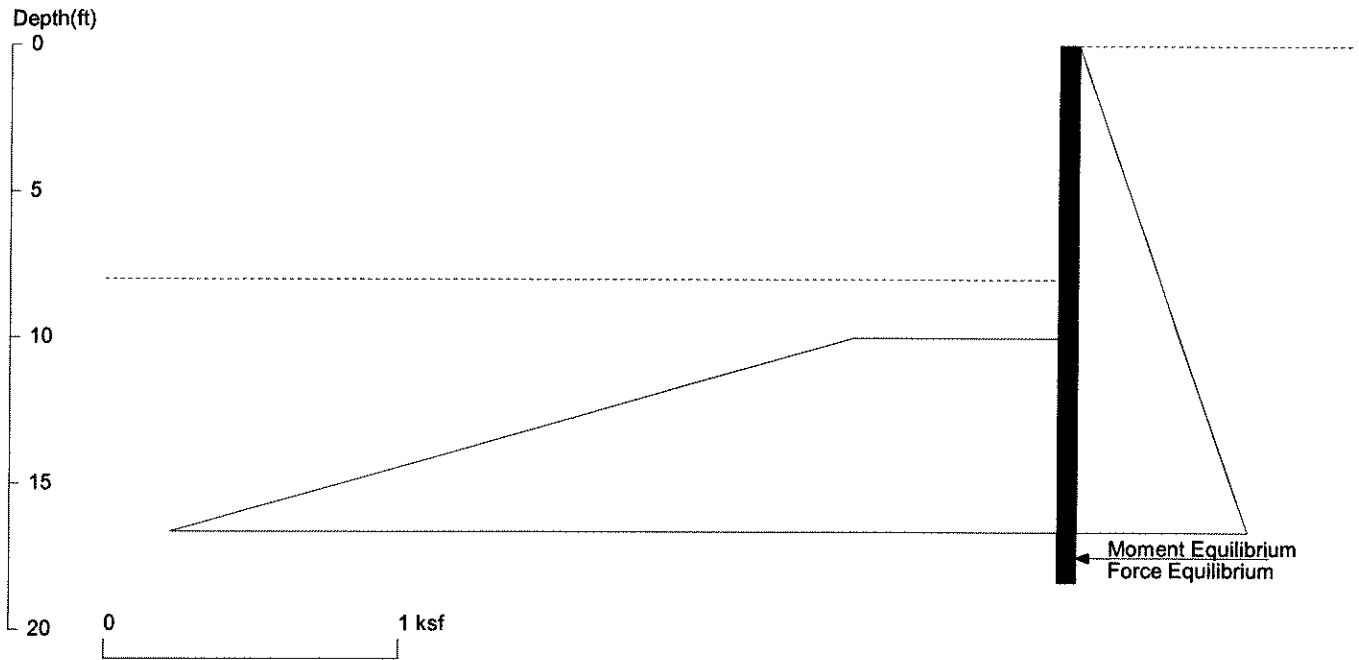
No.	Z depth	Spacing
1	10.00	4.00

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

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Blay SH18

Pattison Shoring (Level Backfill)

8 ft height



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Date: 9/21/2022

Wall Height=8.0 Pile Diameter=2.0 Pile Spacing=8.0 Wall Type: 2. Soldier Pile, Drilled

PILE LENGTH: Min. Embedment=10.36 Min. Pile Length=18.36
MOMENT IN PILE: Max. Moment=58.61 per Pile Spacing=8.0 at Depth=12.64

PILE SELECTION:

Request Min. Section Modulus = 21.3 in³/pile=349.26 cm³/pile, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
W16X26 has Section Modulus = 38.4 in³/pile=629.26 cm³/pile. It is greater than Min. Requirements!
Top Deflection = 0.34(in) based on E (ksi)=29000.00 and I (in⁴)/pile=301.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	50	1.750	.035

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
10	.7	50	14.700	.35

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	8.00
2	8.00	2.00

PASSIVE SPACING:

No.	Z depth	Spacing
1	8.00	4.00

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

12-6-22
Blay 5419