SHORING CALCULATIONS

FOR THE

PERLA RESIDENCE

42xx Holly Lane
Mercer Is, WA 98040

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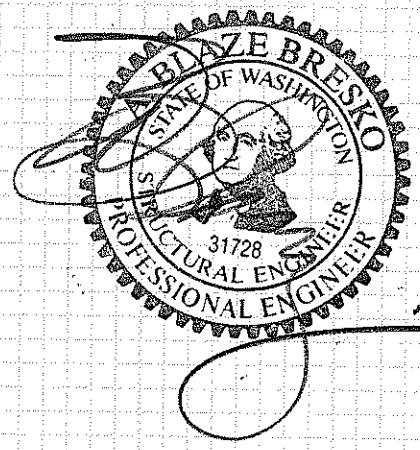

12/17/18

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STRUCTURAL ENGINEERING

PROJECT Perla Shoring

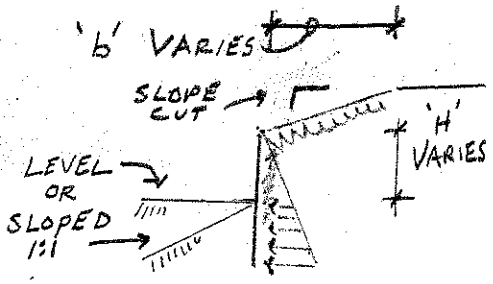
DATE

PROJ #

DESIGN

SHEET

TEMPORARY CASE (FOR SHORING)

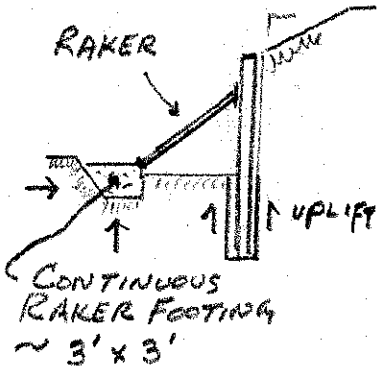


A. CANTILEVER W/ SLOPING BACKFILL

1. ACTIVE PRESSURE 25 pcf
2. SURCHARGE FOR SLOPE 30 pcf
3. RECOMMENDED MAXIMUM SLOPE CUT 2:1
4. TEMPORARY PASSIVE PRESSURE
   - FOR LEVEL CUT IN FRONT 300 pcf
   - FOR 1:1 SLOPE IN FRONT 200 pcf

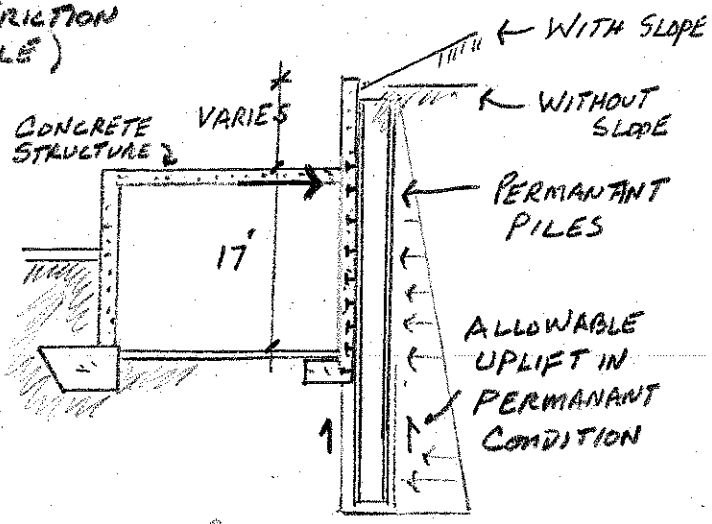
B. BRACED W/ SLOPING BACKFILL

1. ACTIVE PRESSURE } SAME AS A. IF DIFFERENT FROM THE CANTILEVER CASE
2. SURCHARGE FOR SLOPE }
3. RAKER FOOTING BEARING PRESSURE 3000 psf
4. RAKER FOOTING PASSIVE PRESSURE 300 pcf
5. SLIDING COEFFICIENT .35
6. PILE UPLIFT CAPACITY (SKIN FRICTION ON PILE)



PERMANANT CASE

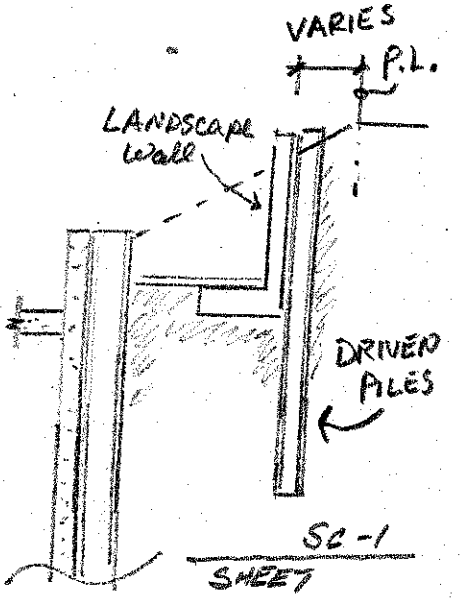
PILES WILL BE DESIGNED TO BE INTEGRAL W/ CONCRETE DESIGN IN THE FINAL CONDITION



1. AT REST PRESSURE
   - WITH SLOPE 35 pcf
   - WITHOUT SLOPE 30 pcf
2. PILE UPLIFT CAPACITY FOR PERMANANT CONDITION .45 (active) = 14 pcf

   (PILE UPLIFT IS REQUIRED FOR GLOBAL OVERTURING OF CONCRETE STRUCTURE)

RETAINING WALLS IN BACK
- I THINK WE WILL NEED A SHORING WALL TO BUILD THEM... WHAT ARE YOUR THOUGHTS ON A DRIVEN WB SYSTEM FOR CUTS UP TO 10' (okay)



BLG 11-15-18

PERLA RESIDENCE

SHORING DESIGN (Driven Piles)

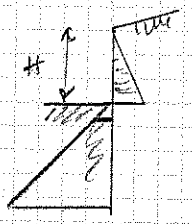
THERE WILL BE 2 ROWS OF SHORING.

STRATEGY WILL BE TO INSTALL 1ST ROW OF SHORING CLOSE TO PROPERTY LINE WHICH WILL SERVE 2-PURPOSES

1) PROVIDE A BENCH FOR 2nd Row of Shoring (Temporary)
2) PROVIDE FOR PERMANT SYSTEM IN FRONT OF FUTURE LANDSCAPE WALLS & WALLS OF GARAGE

FOR THE TEMPORARY CASE PILES WILL DESIGNED TO SUPPORT a 11' MAXIMUM CUT PRIOR TO INSTALLING THE 2nd Row OF SHORING.

MAXIMUM HT = 11'
Sloping backfill 2:1
Level cut in FRONT OF WALL
e_a = 30 pcf
e_p = 300 pcf (Neglect Top 2')



H	PILE	MIN Embed	USED TOTAL Length	SPACING	LIMIT TO 1/2" max Δ
11'	W12x35	12.1	25'	3'-9" c	.47"
10'	"	12.5	25	4'-7" c	.45"
9'	"	13.4	25	6'-7" c	.49"
8'	"	13.6	25	8'-9" c	.44"

SEE Print-out DESIGN SHEETS SC-6 to SC-13

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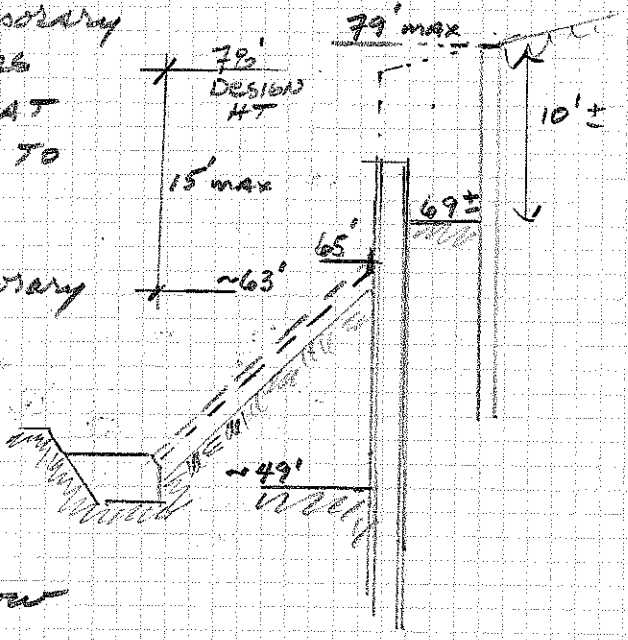
SHORING DESIGN (CONT.)

2nd ROW OF SHORING SHALL CONSIST OF LARGE WF SHAPES ON DRILLED PIERS. THE E&L CUTS WILL BE UP TO 20' TALL THIS ROW OF SHORING WILL BE PLACED IN FRONT OF THE 1ST ROW OF DRIVEN PILES WHICH WILL RETAIN UP TO 10'

TO ACHIEVE MAXIMUM CUT, A TEMPORARY ROW OF INTERNAL BRACE RAKERS IS REQUIRED UNTIL SUCH TIME THAT A CONCRETE STRUCTURE IS BUILT TO SUPPORT ALL FINAL GRADES



THE 1ST CASE TO CONSIDER IS THE TEMPORARY CONDITION FOR THE PURPOSE OF INSTALLING RAKERS.

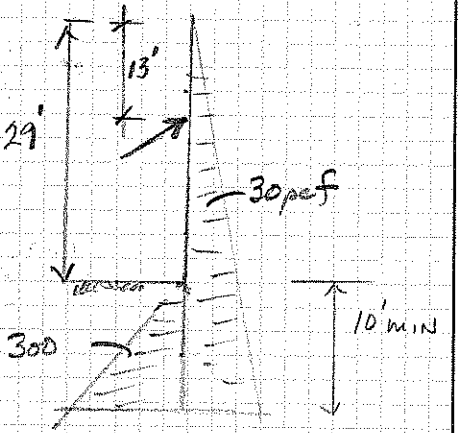
TO CAPTURE THE ENVELOPE OF DRIVEN PILES BEING INSTALLED PRIOR TO OR AFTER THE 2nd ROW DESIGN SHALL ASSUME A FULLY EXPOSED CUT TO A DEPTH 2' BELOW LEVEL OF RAKERS 78'-63'

$H = 15'$

$\ell_{active} = 30 pcf$

$\ell_{passive} = 200 pcf$ (REDUCED PASSIVE FOR 1:1 CUT IN FRONT OF WALL)

W24×84 @ 6'0"c
SEE PRINT-OUTS SC14 - SC18



AFTER RAKERS ARE PLACED, CHECK THE 2nd CASE OF THE BRACED SHORING WALL

$P_{Brace} = 76.7^k$

$L = 21'$ 6"ϕ Sched 80, $P_c = 92^k$
or 8"ϕ Sched 4, $P_c = 123$

UPLIFT EA PILE $= 54^k$

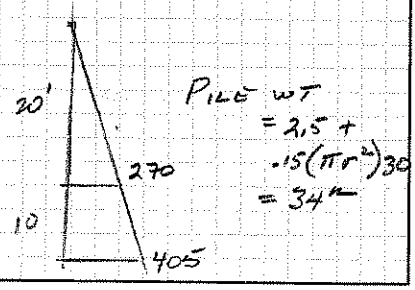
UPLIFT PROVIDED BY SKIN FRICTIONS ON PILE DIAMETER

$F = 30pcf(.45) = 13.5 psf$ Avg HT

1/2 OF PILE DIAMETER FOR UPPER 20'
ALL OF PILE DIAMETER BELOW EXC, 10' MIN

36"ϕ, $C = 2\pi(18) = 113 = 9.4'$

$$P_{UP} = \frac{270}{2}\left(\frac{9.4}{2}\right)(20') + \left(\frac{.405+.27}{2}\right)(9.4)(10) = 44 + 34 = 78^k > 54^k$$



PILE WT
$= 2.5 + .15(\pi r^2)30$
$= 34^k$

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DESIGN

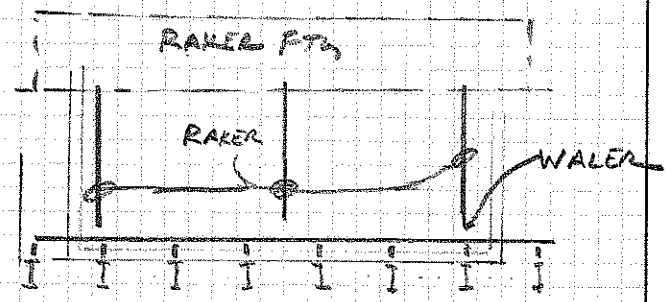
SHEET SC-3

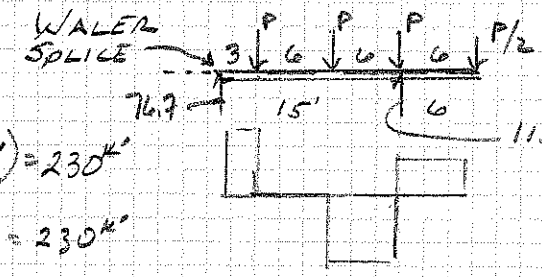
RAKER DESIGN - AND FTG

$P_{Brace\ (6'o/c)} = 76.7^k$ (DIAGONAL BRACE LOAD)

PROVIDE WALER TO SPREAD LOAD TO RAKERS

WALER SPANS BETWEEN RAKERS W/ CANTILEVER TO SUPPORT 1-PILE





$P = 76.7^k$

$M_- = \frac{76.7}{2}(6') = 230^{k'}$

$M_+ = 76.7(3) = 230^{k'}$

W12x65

$f_c = 31.5\ ksi \leq .66(50) = 33\ ksi$

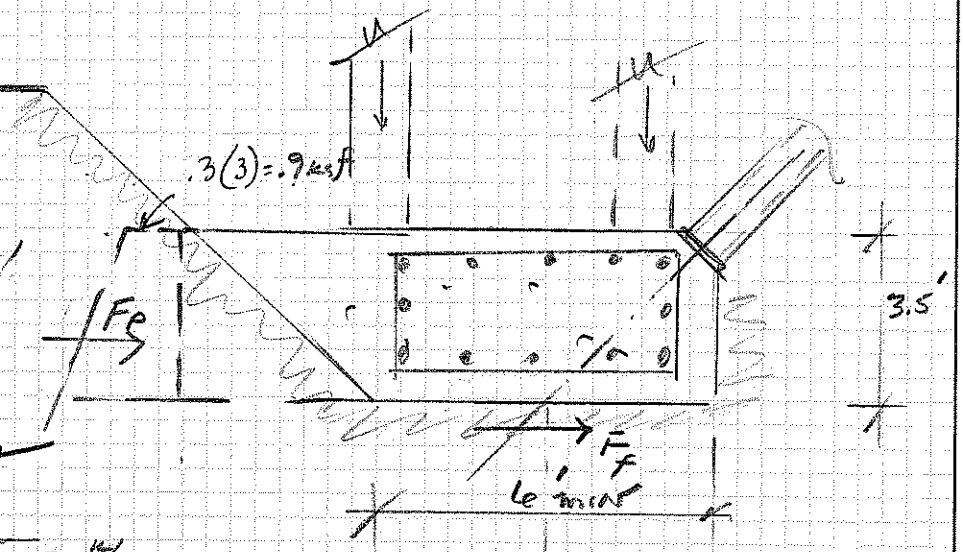
RAKER

$P_{max} = 192^k$

$L_{max} = 19'$

8" ϕ Sched 80

$P_a = 197^k$ ✓



RAKER FTG

$P_{RAKER} = 76.7^k/6 = 12.8^{k/'}$

$P_V = 9^{k/'}$

$P_H = 9^{k/'}$

VERTICAL RESISTANCE

$3\ ksf(6) = 18^{k/'} \geq 9^{k/'}$ ✓

HORIZ RESISTANCE

$F_p = (.9+2.0)/2\,(3.5) = 5.0^{k/'}$

$F_f = (9+3.9).45 = 5.8^{k/'}$

↑ BRACE ↑ FTG

$10.8^{k/'} > 9.0$ ✓

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PROJECT Parks Storage

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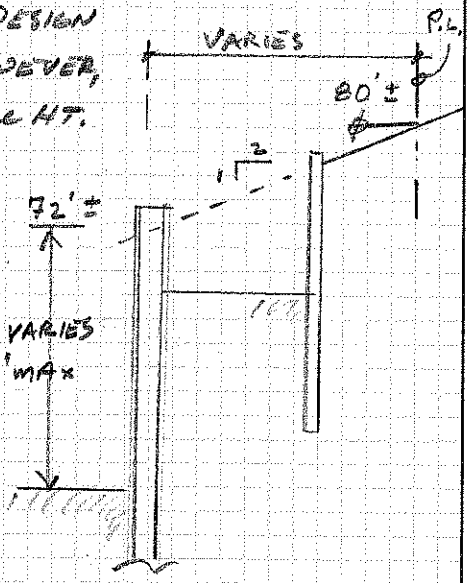
DESIGN

SHEET SC-4

SHORING DESIGN (cont.)

SOLDIER PILE SHORING Beyond SUBTERRANEAN BASEMENT (Northern)
Cantilever CONDITION w/ SLOPING BACKFILL DESIGN
1ST ROW OF SHORING IS PLACED BEHIND WALL, HOWEVER, PILES IN 2nd ROW ARE CHECKED FOR THE FULL HT.
IN TEMPORARY CASE, BOT OF EXC AT 56'
IN FINAL CONDITION, SLAB PLACED AT ELEV 68'
$P_a = 30$ $P_p = 300$



H	PILE SIZE	EMBED	TOT LENGTH	SPACING	DEPTH	
36"ϕ	16'	24x84	13.4	29.4	6	.51"
	14'	24x84	15.3	27.3	8	.39"
28"ϕ	12'	21x62	12.7	24.7	8	.37"
28"ϕ	10'	18x35	10.8	20.8	8	.40"

(PROVIDE WALER AT TOP OF PILES TO SPREAD OUT LOADING EVENLY)
Print-out DESIGN SHEETS SCP-SC25

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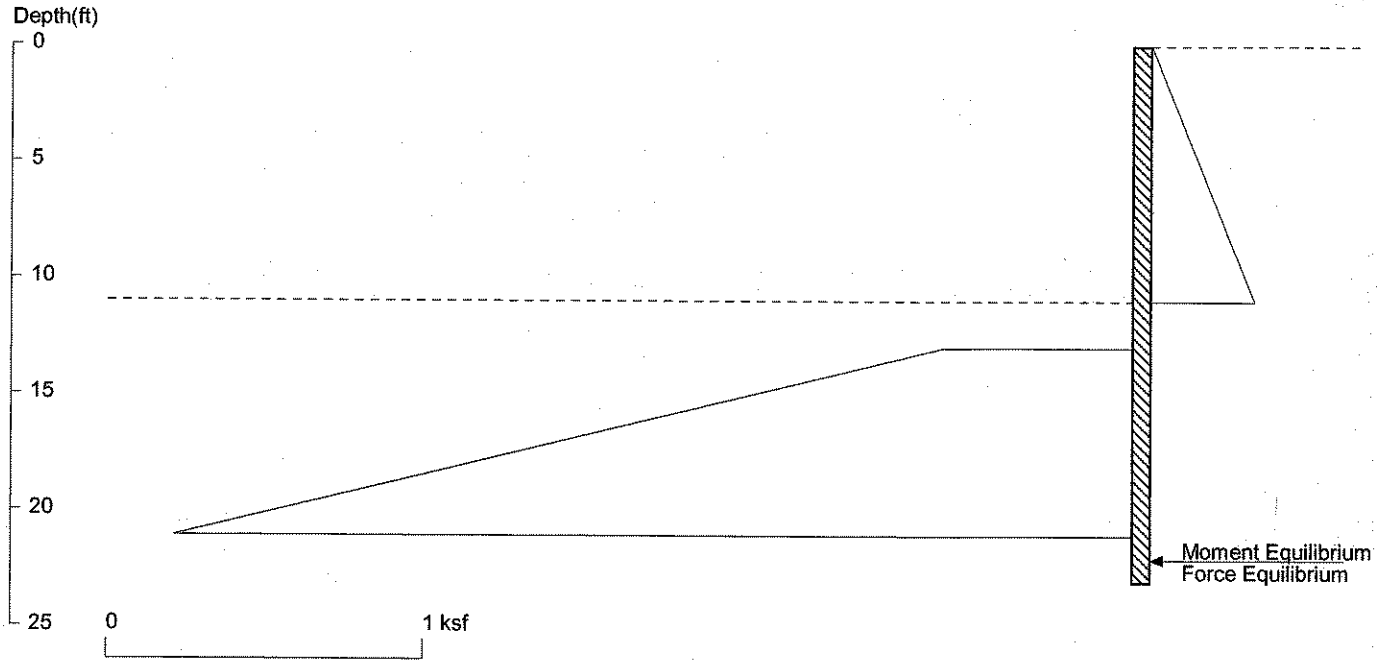
DESIGN
SHEET SC-5

Perla Temp Shoring-Driven Piles
11' Ht-2:1 backfill



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Wall Height=11.0 Pile Diameter=0.5 Pile Spacing=3.0 Wall Type: 3. Soldier Pile, Driving

PILE LENGTH: Min. Embedment=12.12 Min. Pile Length=23.12
MOMENT IN PILE: Max. Moment=40.65 per Pile Spacing=3.0 at Depth=16.13

PILE SELECTION:
Request Min. Section Modulus = 14.8 in3/pile=242.25 cm3/pile, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
W12X35 has Section Modulus = 45.6 in3/pile=747.25 cm3/pile. It is greater than Min. Requirements!
Top Deflection = 0.47(in) based on E (ksi)=29000.00 and I (in4)/pile=285.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	11	0.330	.03

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
13	.6	30	5.700	.3

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	3.00
2	11.00	0.54

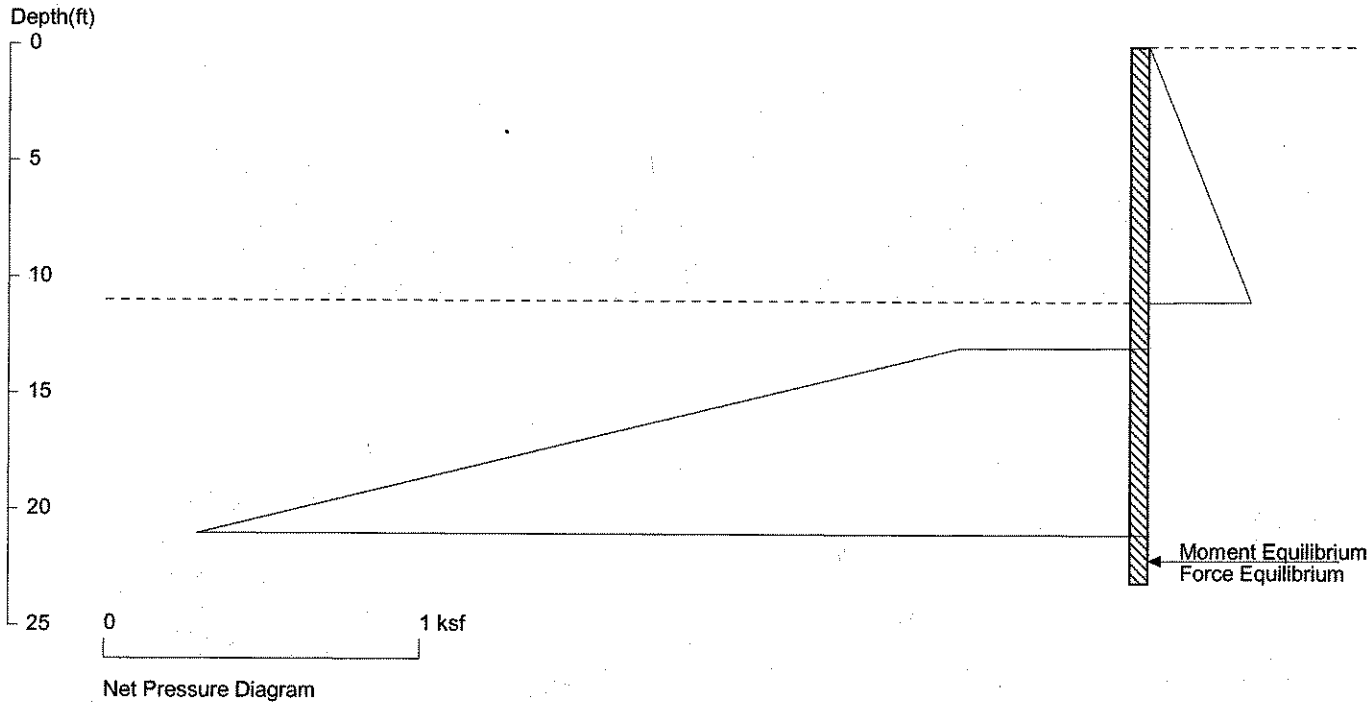
PASSIVE SPACING:

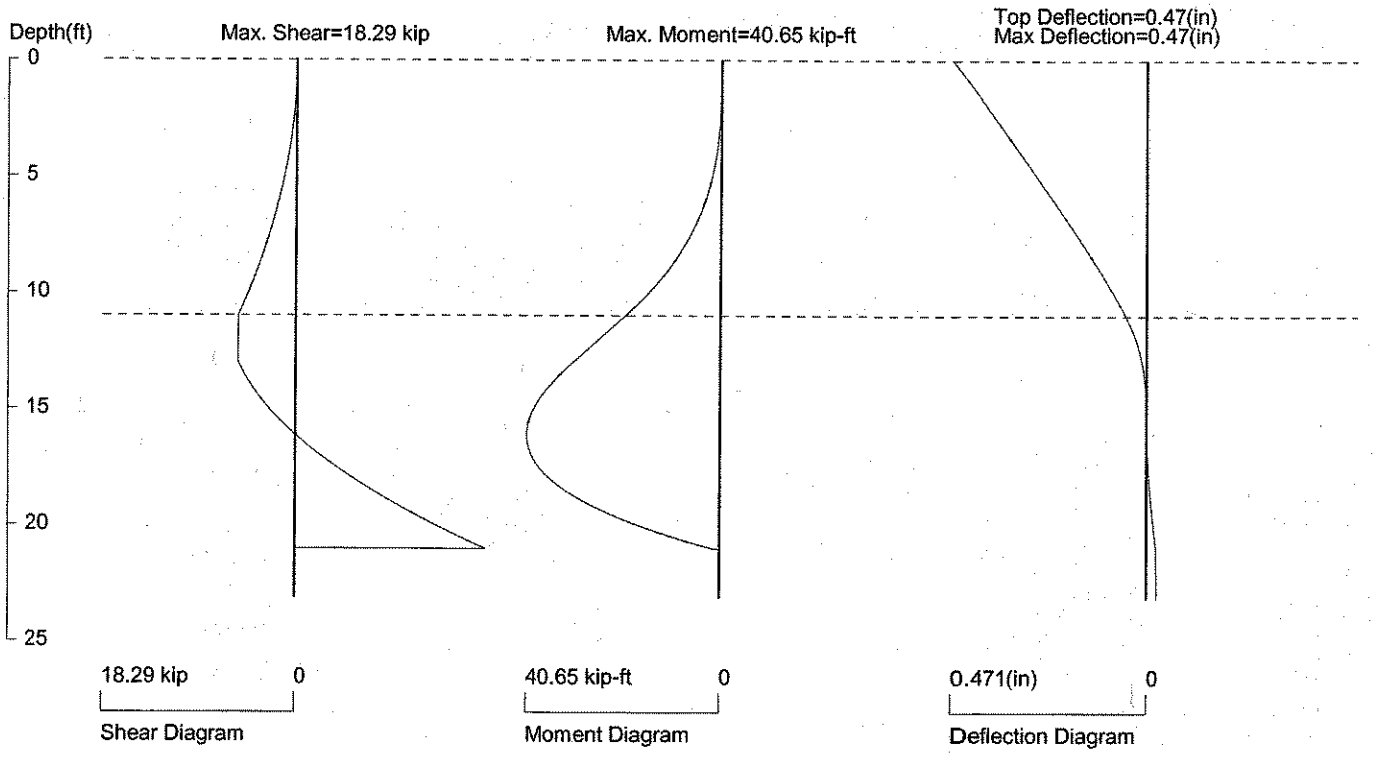
No.	Z depth	Spacing
1	11.00	1.62

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

Sc-6

Perla Temp Shoring-Driven Piles
11' Ht-2:1 backfill





PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on pile spacing: 3.0 foot or meter

User Input Pile, W12x35: E (ksi)=29000.0, I (in4)/pile=285.0

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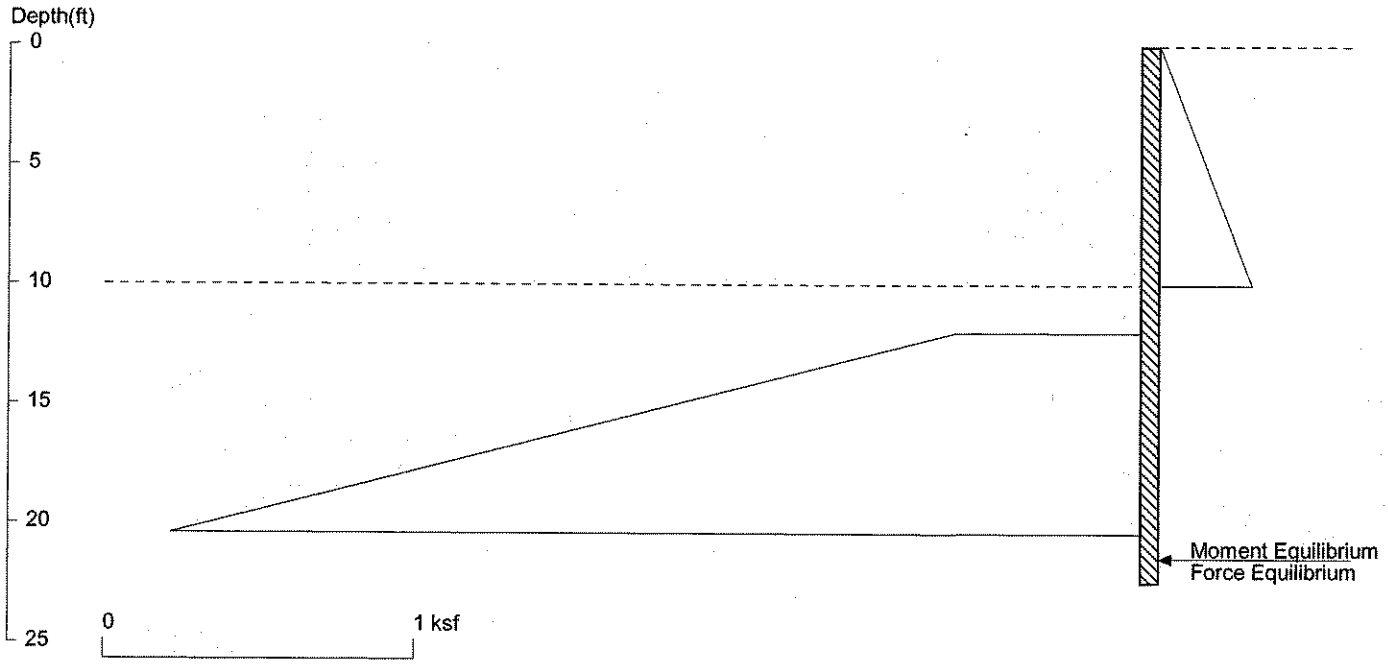
Perla Temp Shoring-Driven Piles

10' Ht-2:1 backfill



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Wall Height=10.0 Pile Diameter=0.5 Pile Spacing=4.0 Wall Type: 3. Soldier Pile, Driving

PILE LENGTH: Min. Embedment=12.49 Min. Pile Length=22.49
MOMENT IN PILE: Max. Moment=43.60 per Pile Spacing=4.0 at Depth=15.35

PILE SELECTION:
Request Min. Section Modulus = 15.9 in3/pile=259.81 cm3/pile, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
W12X35 has Section Modulus = 45.6 in3/pile=747.25 cm3/pile. It is greater than Min. Requirements!
Top Deflection = 0.45(in) based on E (ksi)=29000.00 and I (in4)/pile=285.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	10	0.300	.03

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
12	.6	30	6.000	.3

ACTIVE SPACING:

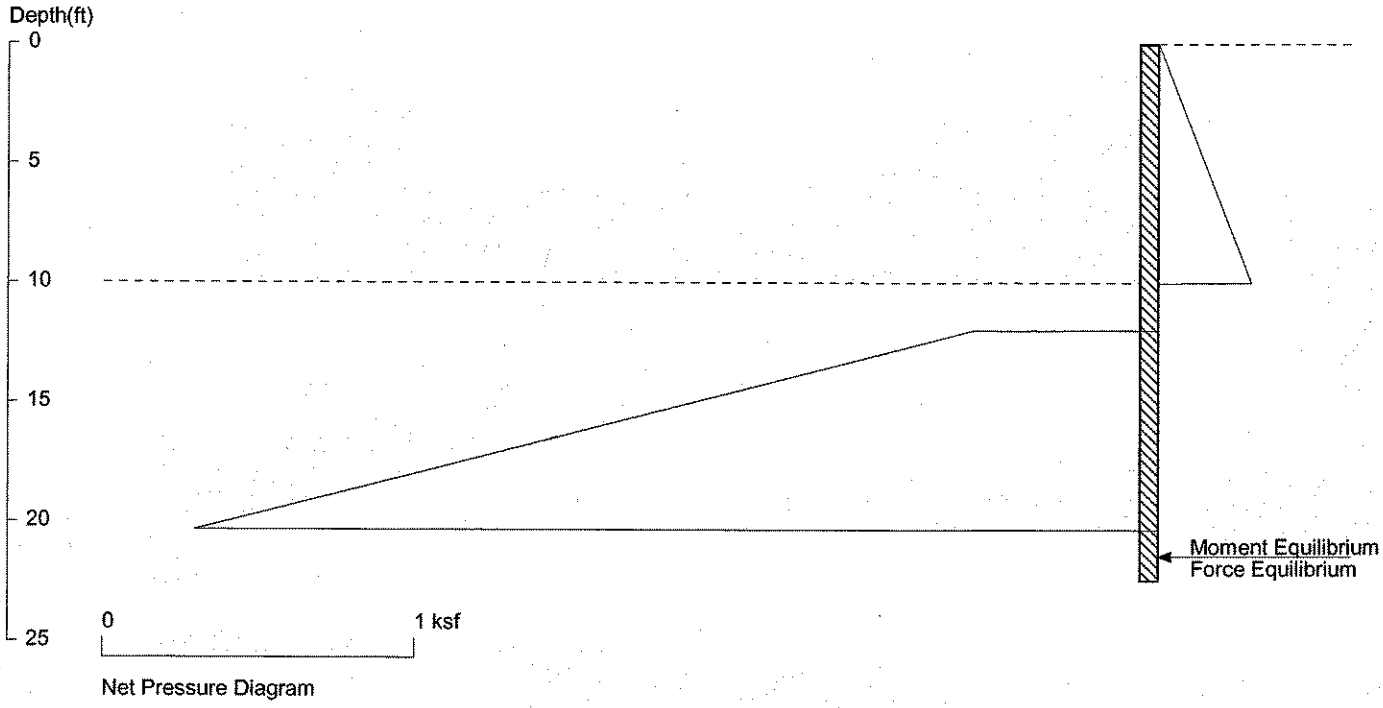
No.	Z depth	Spacing
1	0.00	4.00
2	10.00	0.54

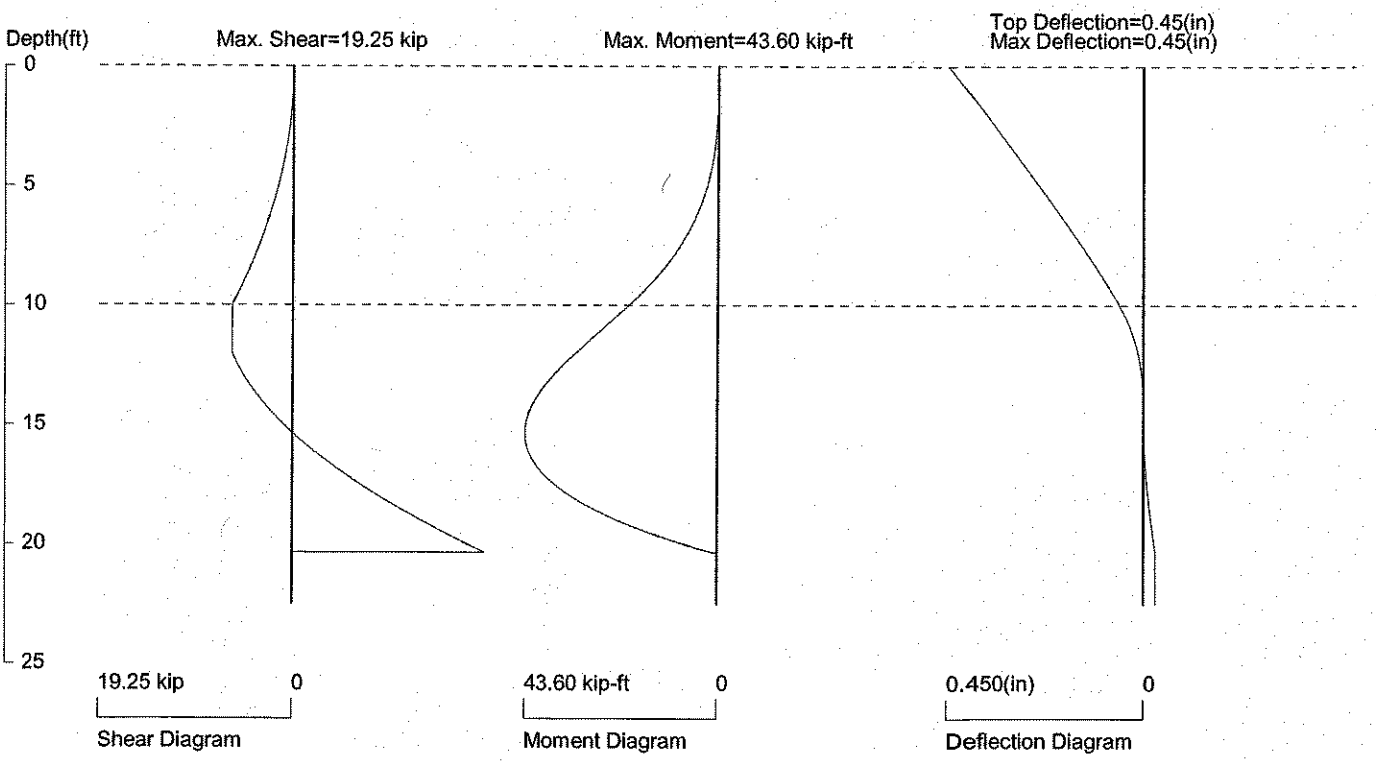
PASSIVE SPACING:

No.	Z depth	Spacing
1	10.00	1.62

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

Perla Temp Shoring-Driven Piles
10' Ht-2:1 backfill





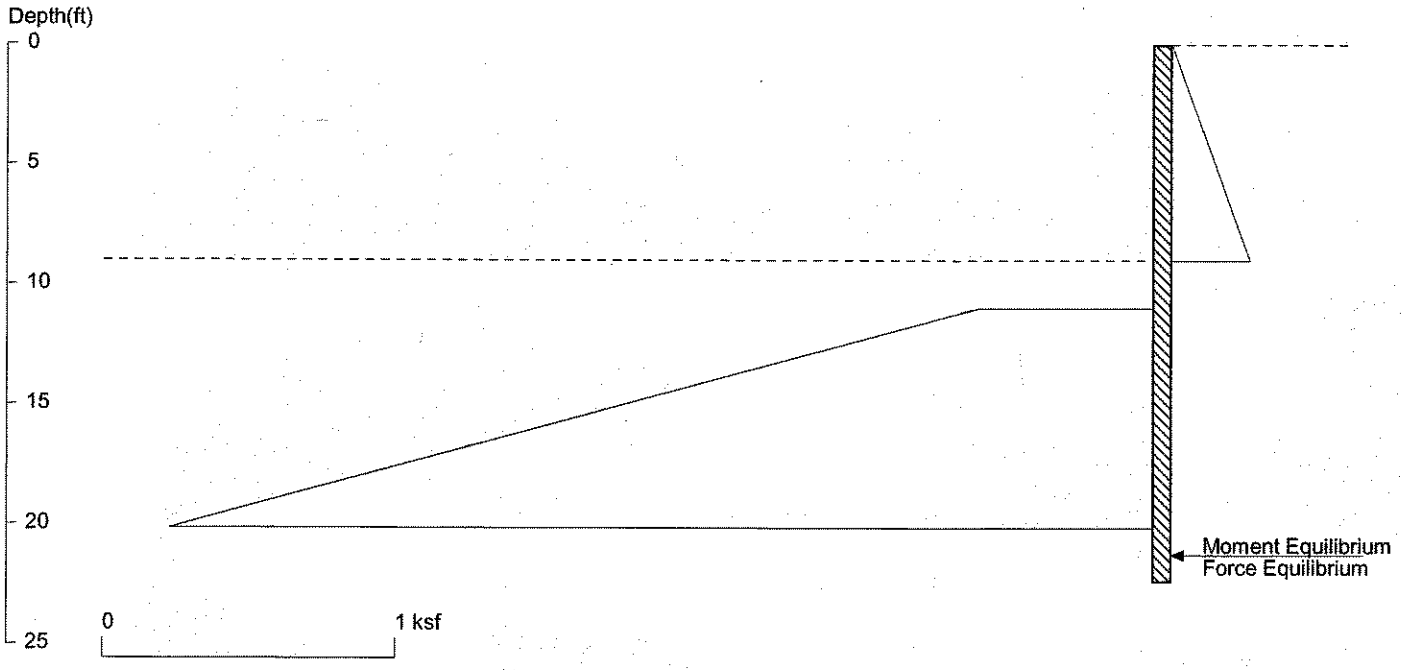
PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on pile spacing: 4.0 foot or meter

User Input Pile, W12x35: E (ksi)=29000.0, I (in4)/pile=285.0

File: UNTITLED

Perla Temp Shoring-Driven Piles
9' Ht-2:1 backfill



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Wall Height=9.0 Pile Diameter=0.5 Pile Spacing=6.0 Wall Type: 3. Soldier Pile, Driving

PILE LENGTH: Min. Embedment=13.40 Min. Pile Length=22.40
MOMENT IN PILE: Max. Moment=52.69 per Pile Spacing=6.0 at Depth=14.83

PILE SELECTION:
Request Min. Section Modulus = 19.2 in3/pile=313.98 cm3/pile, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
W12X35 has Section Modulus = 45.6 in3/pile=747.25 cm3/pile. It is greater than Min. Requirements!
Top Deflection = 0.49(in) based on E (ksi)=29000.00 and I (in4)/pile=285.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	9	0.270	.03

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
11	.6	30	6.300	.3

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	6.00
2	9.00	0.54

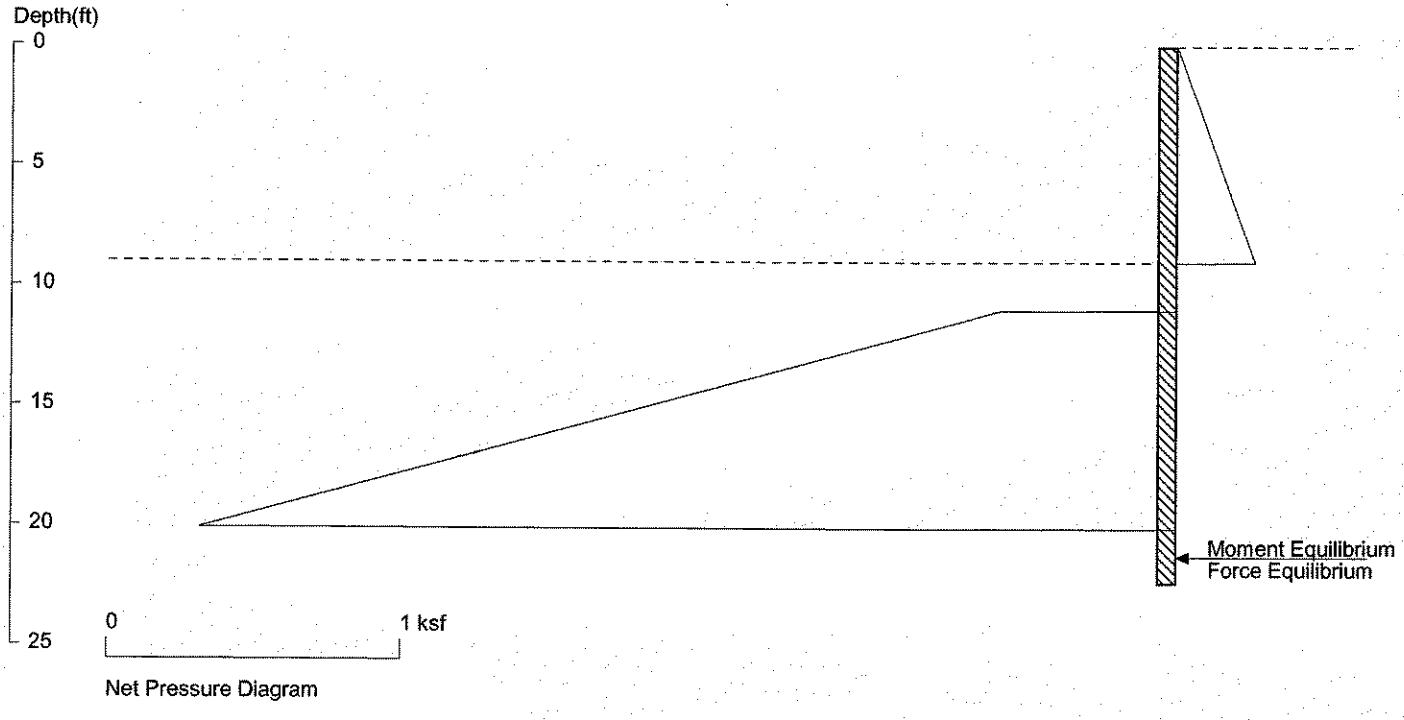
PASSIVE SPACING:

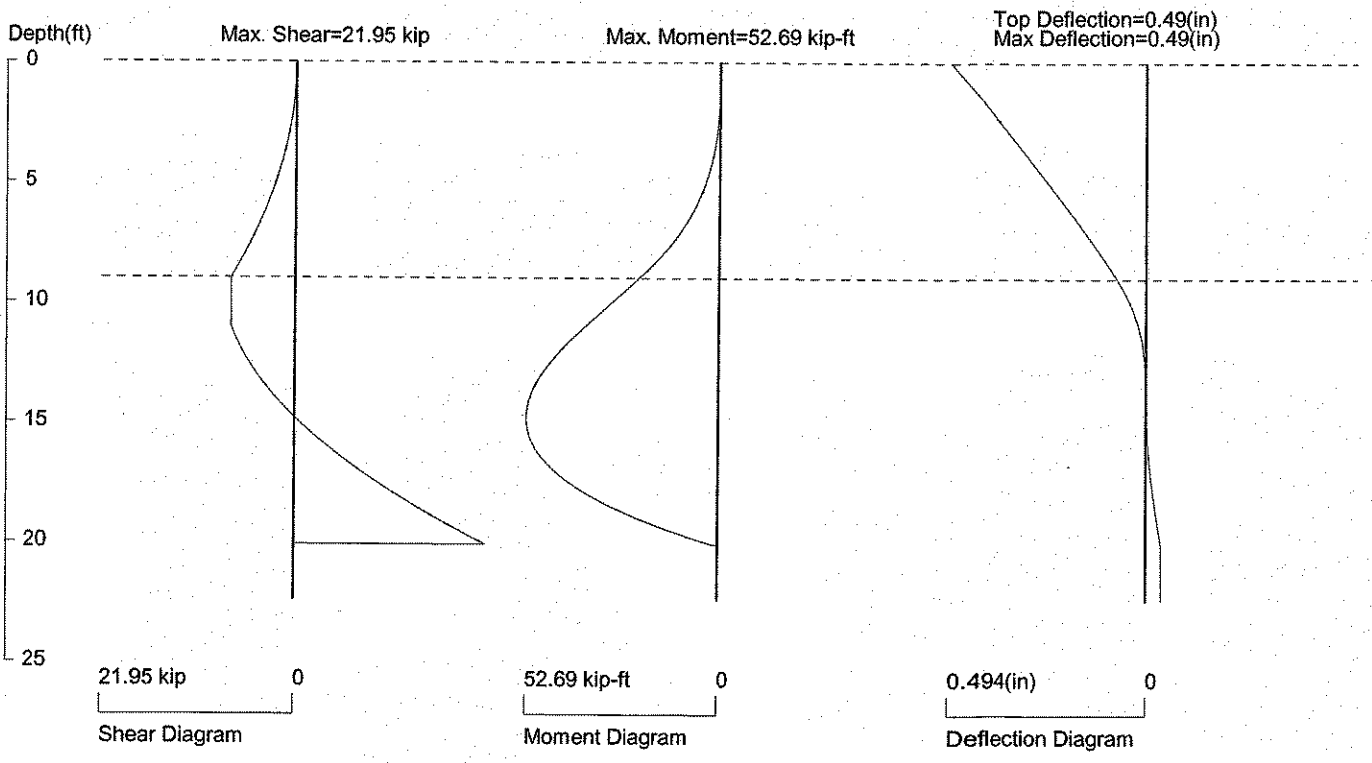
No.	Z depth	Spacing
1	9.00	1.62

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

SC-10

Perla Temp Shoring-Driven Piles
9' Ht-2:1 backfill





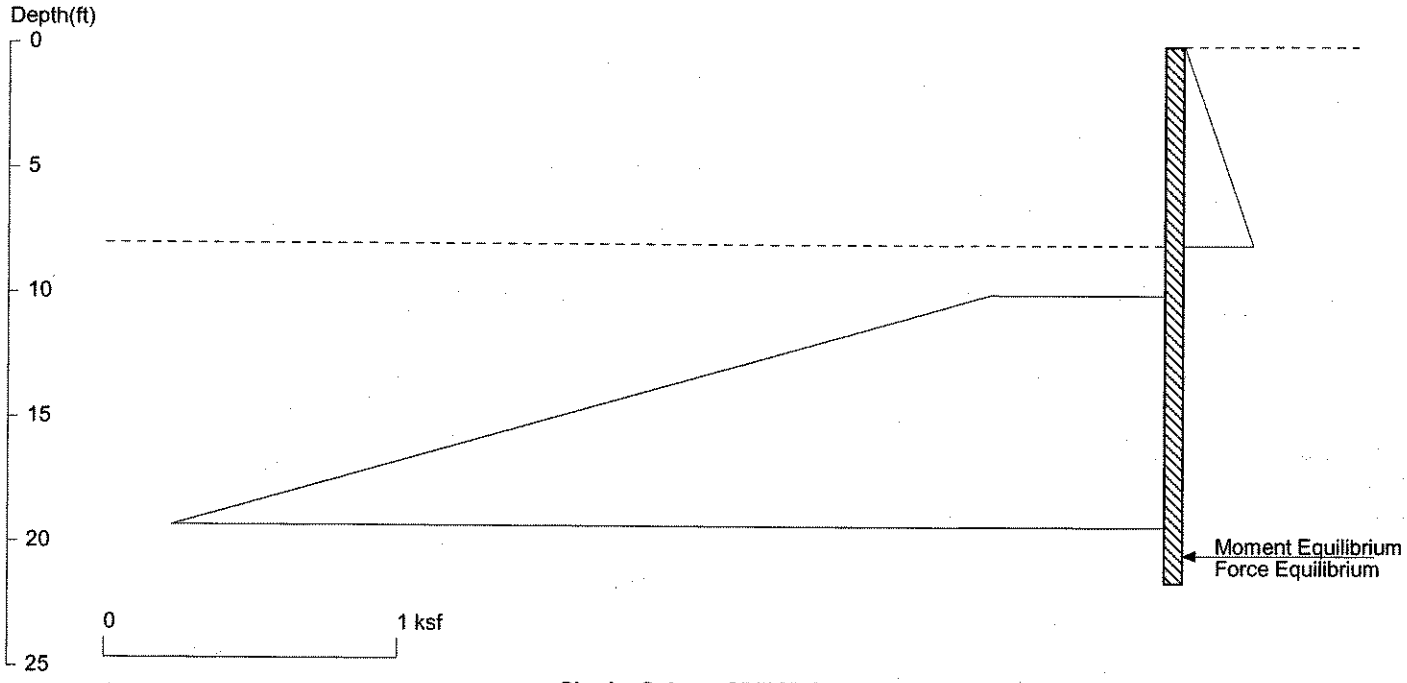
PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on pile spacing: 6.0 foot or meter

User Input Pile, W12x35: E (ksi)=29000.0, I (in4)/pile=285.0

File: UNTITLED

Perla Temp Shoring-Driven Piles
8' Ht-2:1 backfill



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Wall Height=8.0 Pile Diameter=0.5 Pile Spacing=8.0 Wall Type: 3. Soldier Pile, Driving

PILE LENGTH: Min. Embedment=13.56 Min. Pile Length=21.56
MOMENT IN PILE: Max. Moment=53.60 per Pile Spacing=8.0 at Depth=13.96

PILE SELECTION:
Request Min. Section Modulus = 19.5 in3/pile=319.41 cm3/pile, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
W12X35 has Section Modulus = 45.6 in3/pile=747.25 cm3/pile. It is greater than Min. Requirements!
Top Deflection = 0.44(in) based on E (ksi)=29000.00 and I (in4)/pile=285.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	8	0.240	.03

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
10	.6	30	6.600	.3

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	8.00
2	8.00	0.54

PASSIVE SPACING:

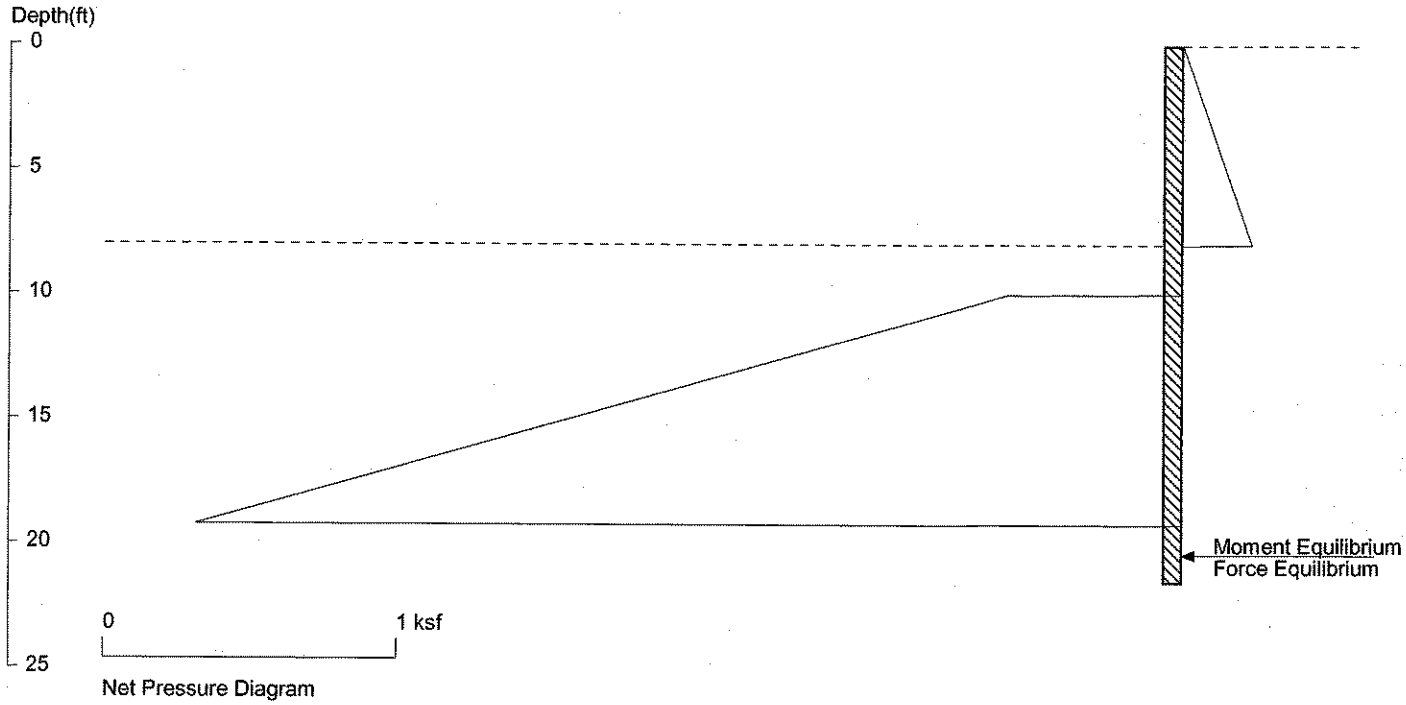
No.	Z depth	Spacing
1	8.00	1.62

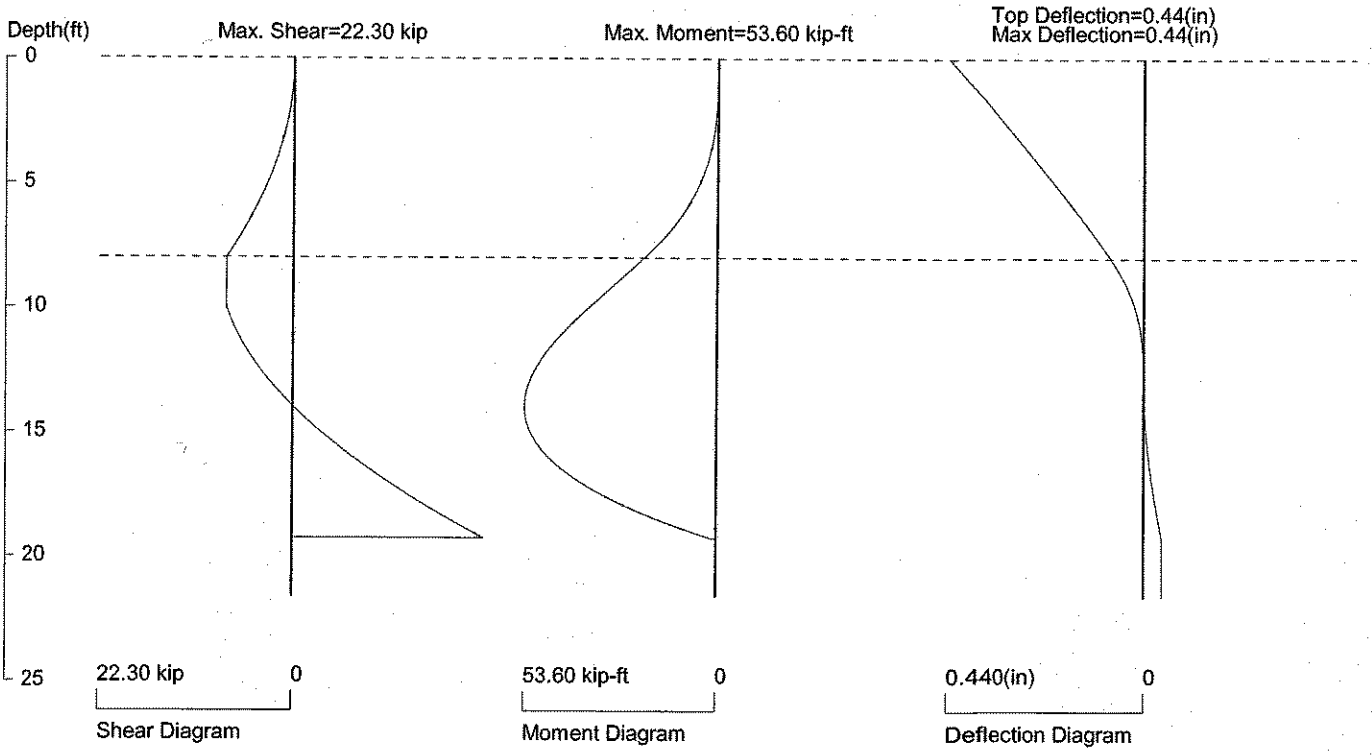
UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft3; Deflection - in

SC-12

Perla Temp Shoring-Driven Piles

8' Ht-2:1 backfill





PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on pile spacing: 8.0 foot or meter

User Input Pile, W12x35: E (ksi)=29000.0, I (in4)/pile=285.0

File: UNTITLED

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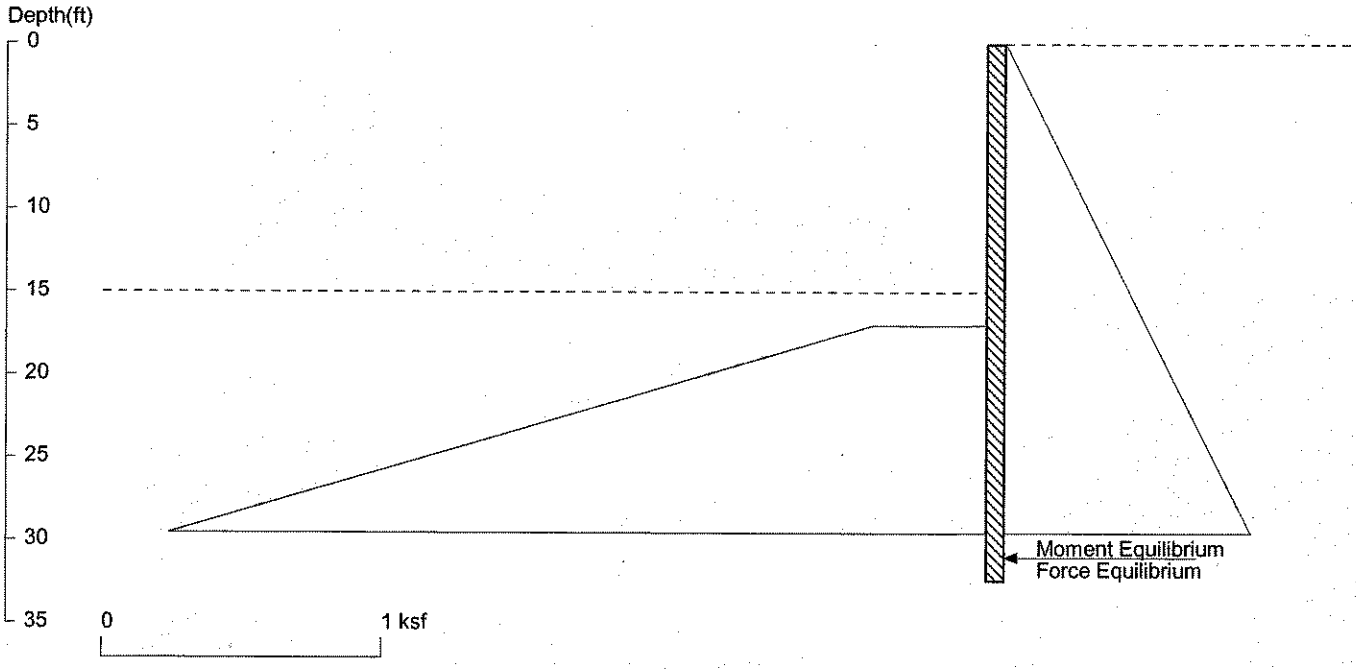
Perla Temp Shoring-Driven Piles

15' Ht-2:1 backfill-1:1 in front of wall



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File: UNTITLED

Wall Height=15.0 Pile Diameter=3.0 Pile Spacing=6.0 Wall Type: 2. Soldier Pile, Drilled

PILE LENGTH: Min. Embedment=17.47 Min. Pile Length=32.47
MOMENT IN PILE: Max. Moment=228.02 per Pile Spacing=6.0 at Depth=22.72

PILE SELECTION:
Request Min. Section Modulus = 82.9 in3/pile=1358.74 cm3/pile, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
W24X84 has Section Modulus = 196.0 in3/pile=3211.85 cm3/pile. It is greater than Min. Requirements!
Top Deflection = 0.54(in) based on E (ksi)=29000.00 and I (in4)/pile=2370.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	40	1.200	.03

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
17	.4	40	5.000	.2

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	6.00
2	15.00	3.00

PASSIVE SPACING:

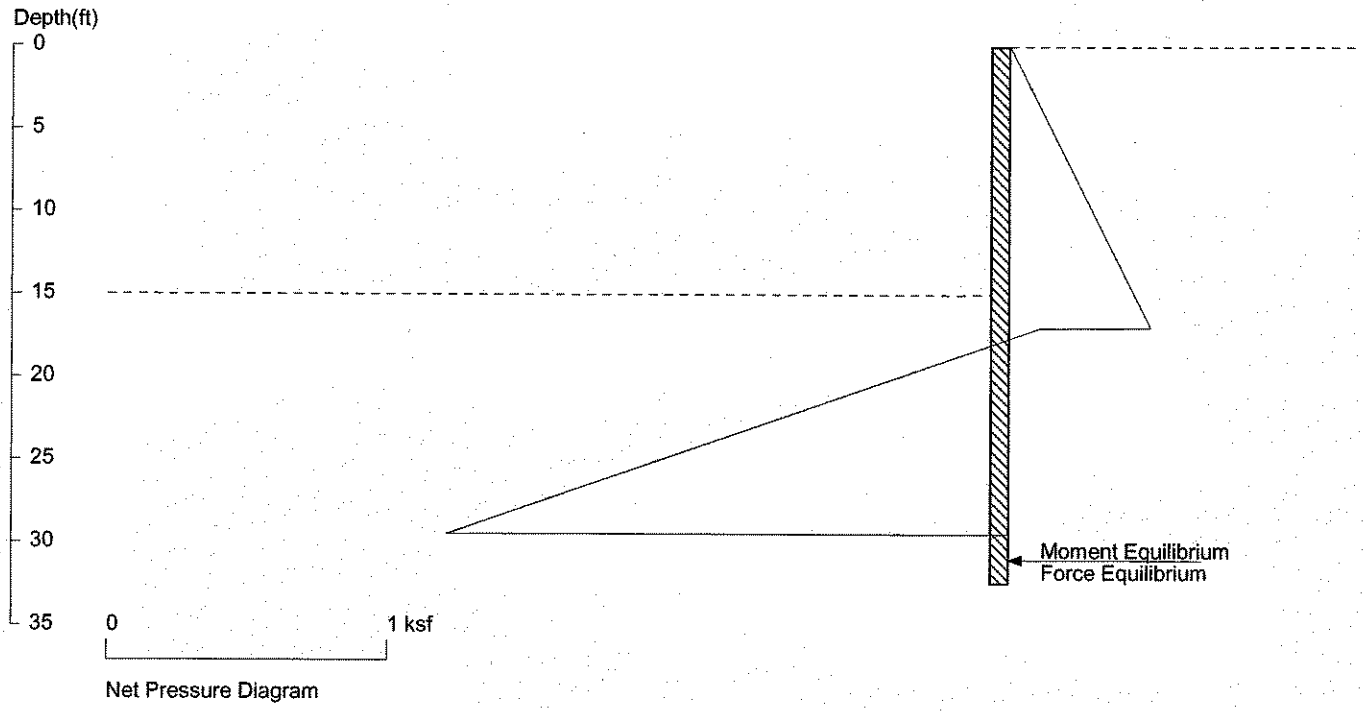
No.	Z depth	Spacing
1	15.00	6.00

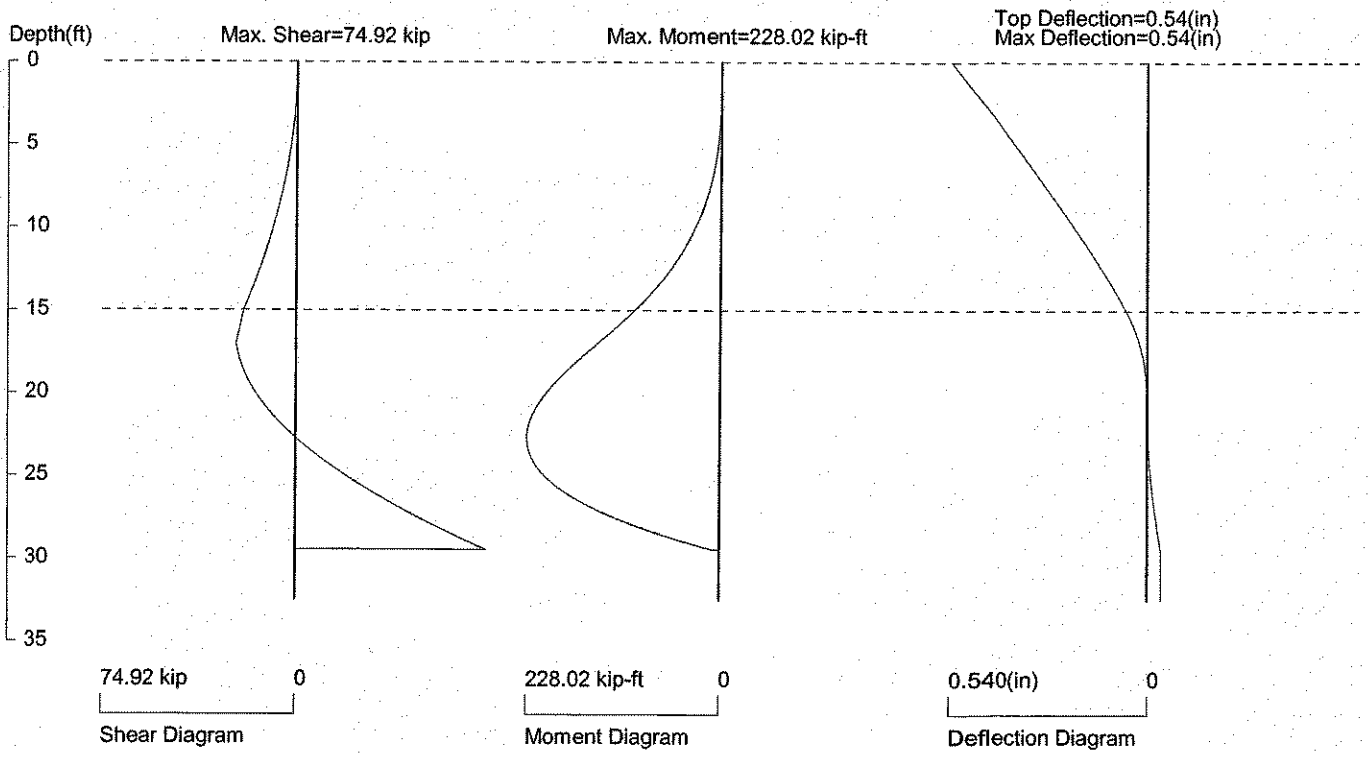
UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft3; Deflection - in

SC-14

Perla Temp Shoring-Driven Piles

15' Ht-2:1 backfill-1:1 in front of wall





PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

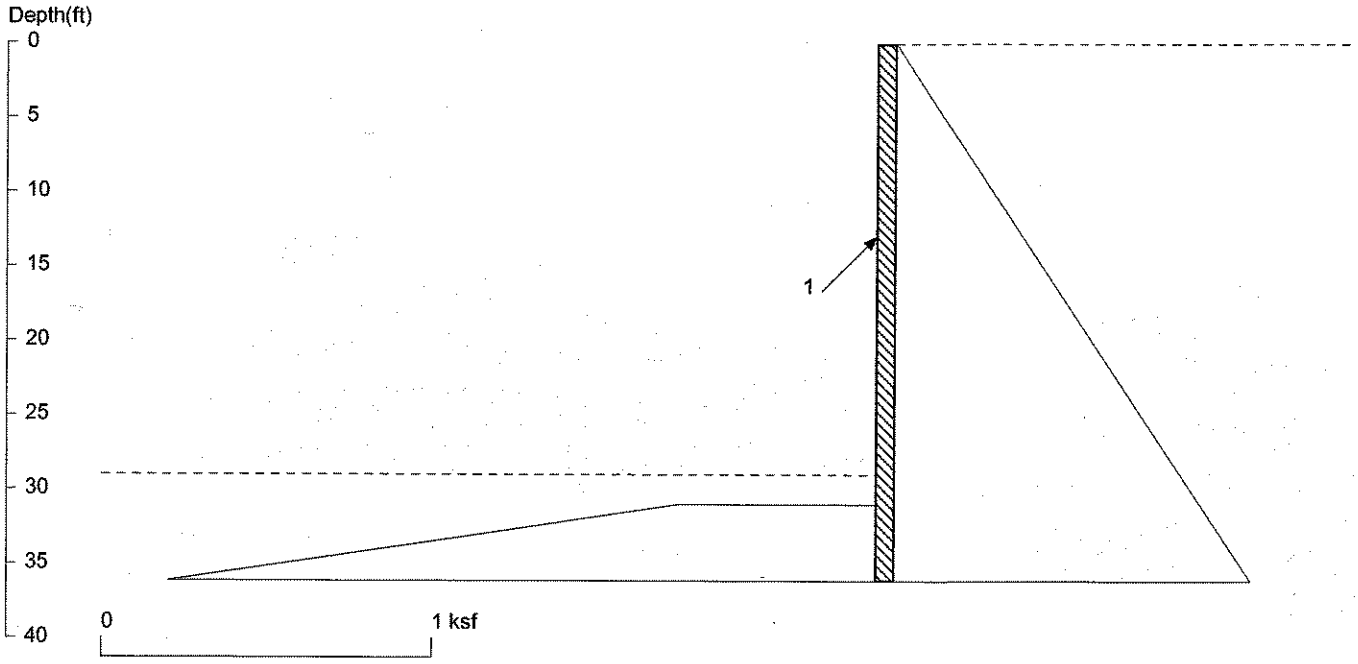
Based on pile spacing: 6.0 foot or meter

User Input Pile, W24x84: E (ksi)=29000.0, I (in4)/pile=2370.0

File: UNTITLED

Perla Temp Shoring-Driven Piles

29' Ht-2:1 backfill-Level cut



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File: UNTITLED

Wall Height=29.0 Pile Diameter=3.0 Pile Spacing=6.0 Wall Type: 2. Soldier Pile, Drilled

PILE LENGTH: Min. Embedment=7.15 Min. Pile Length=36.15
MOMENT IN PILE: Max. Moment=182.92 per Pile Spacing=6.0 at Depth=24.57

PILE SELECTION:
Request Min. Section Modulus = 66.5 in3/pile=1090.01 cm3/pile, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
W24X84 has Section Modulus = 196.0 in3/pile=3211.85 cm3/pile. It is greater than Min. Requirements!
Top Deflection = -0.28(in) based on E (ksi)=29000.00 and I (in4)/pile=2370.0

BRACE FORCE: Strut, Tieback, Plate Anchor, Deadman, Sheet Pile as Anchor

No. & Type	Depth	Angle	Space	Total F.	Horiz. F.	Vert. F.	N/A	N/A
1. Strut	13.0	-45.0	6.0	76.7	54.3	-54.3	0.0	0.0

UNITS: Width,Diameter,Spacing,Length,Depth,and Height - ft; Force - kip; Bond Strength and Pressure - ksf

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	40	1.200	.03

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
31	.6	40	3.300	.3

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	6.00
2	29.00	3.00

PASSIVE SPACING:

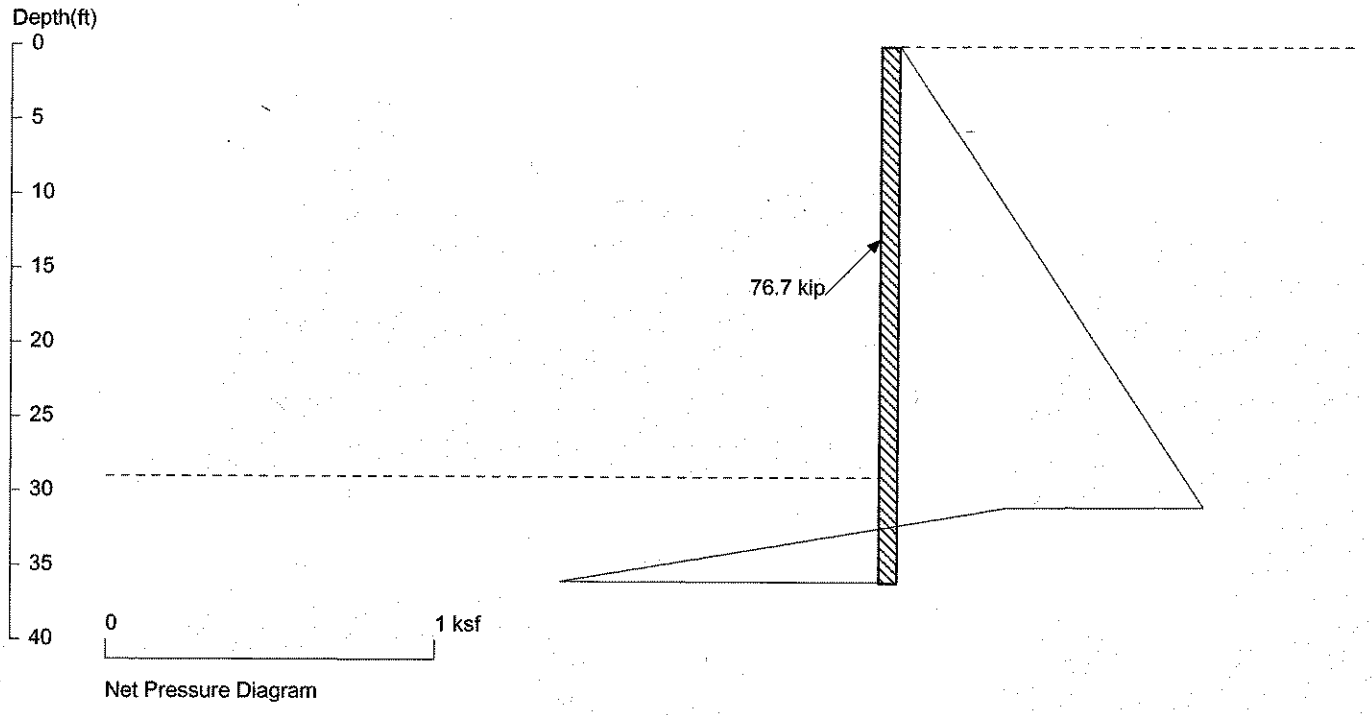
No.	Z depth	Spacing
1	29.00	6.00

SC-16

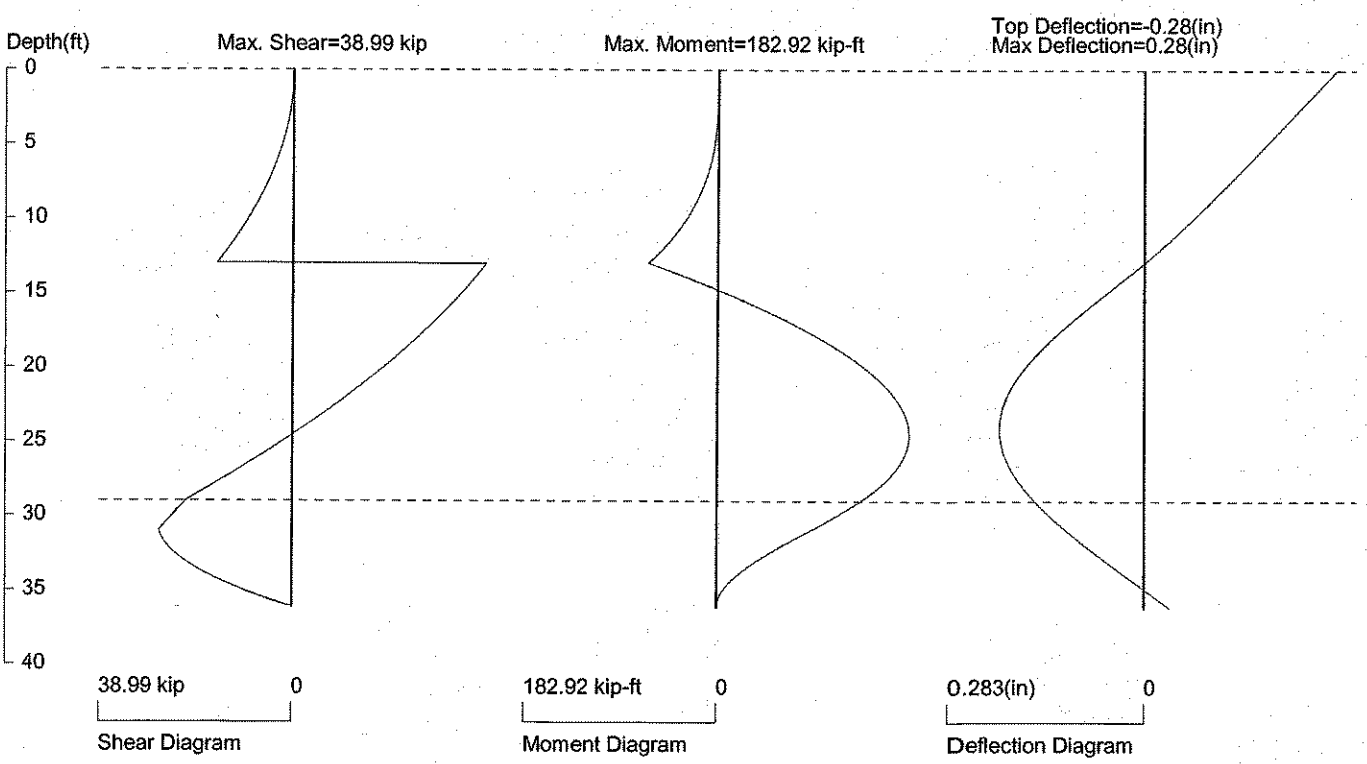
UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft3; Deflection - in

Perla Temp Shoring-Driven Piles

29' Ht-2:1 backfill-Level cut



Net Pressure Diagram



Shear Diagram | Moment Diagram | Deflection Diagram

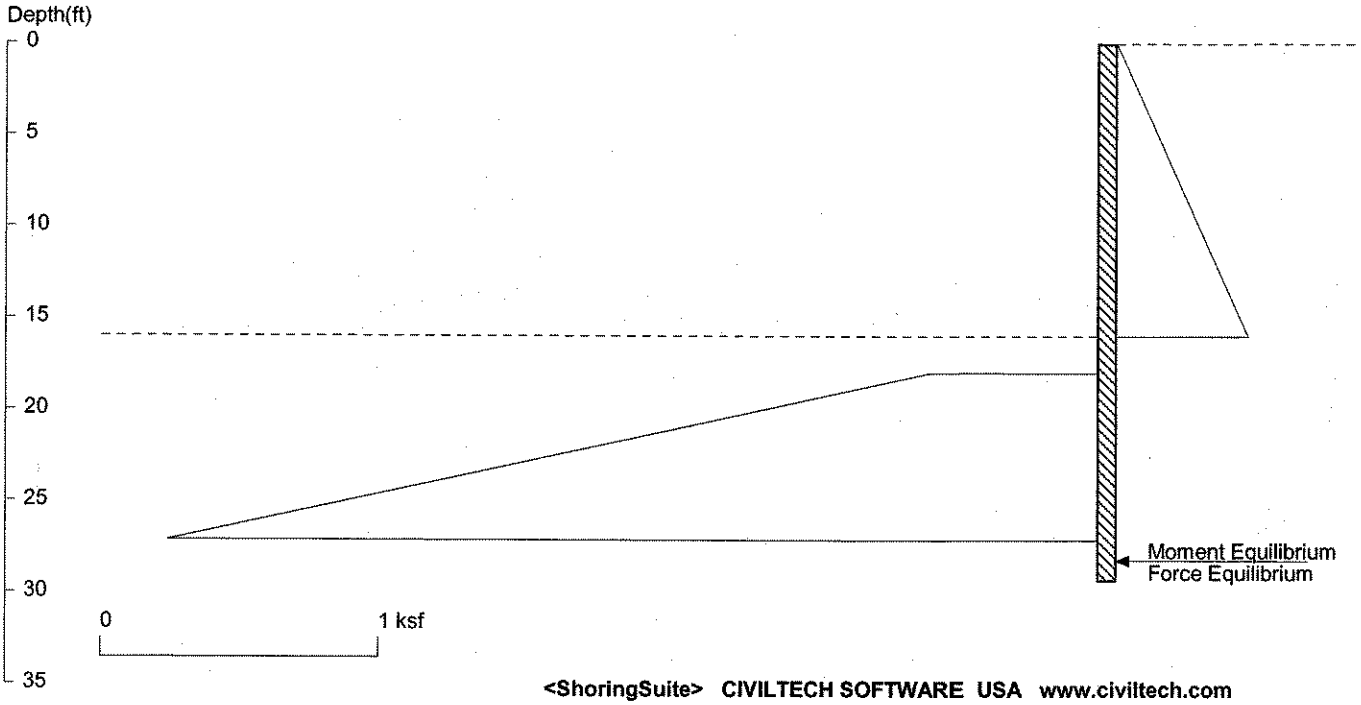
PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on pile spacing: 6.0 foot or meter

User Input Pile, W24x84: E (ksi)=29000.0, I (in4)/pile=2370.0

File: UNTITLED

Perla Temp Shoring
16' ht-2:1 backfill- level cut



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File: UNTITLED

Wall Height=16.0 Pile Diameter=3.0 Pile Spacing=6.0 Wall Type: 2. Soldier Pile, Drilled

PILE LENGTH: Min. Embedment=13.37 Min. Pile Length=29.37
MOMENT IN PILE: Max. Moment=214.70 per Pile Spacing=6.0 at Depth=21.44

PILE SELECTION:
Request Min. Section Modulus = 78.1 in3/pile=1279.41 cm3/pile, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
W24X84 has Section Modulus = 196.0 in3/pile=3211.85 cm3/pile. It is greater than Min. Requirements!
Top Deflection = 0.51(in) based on E (ksi)=29000.00 and I (in4)/pile=2370.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	16	0.480	.03

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
18	.6	40	7.200	.3

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	6.00
2	16.00	3.00

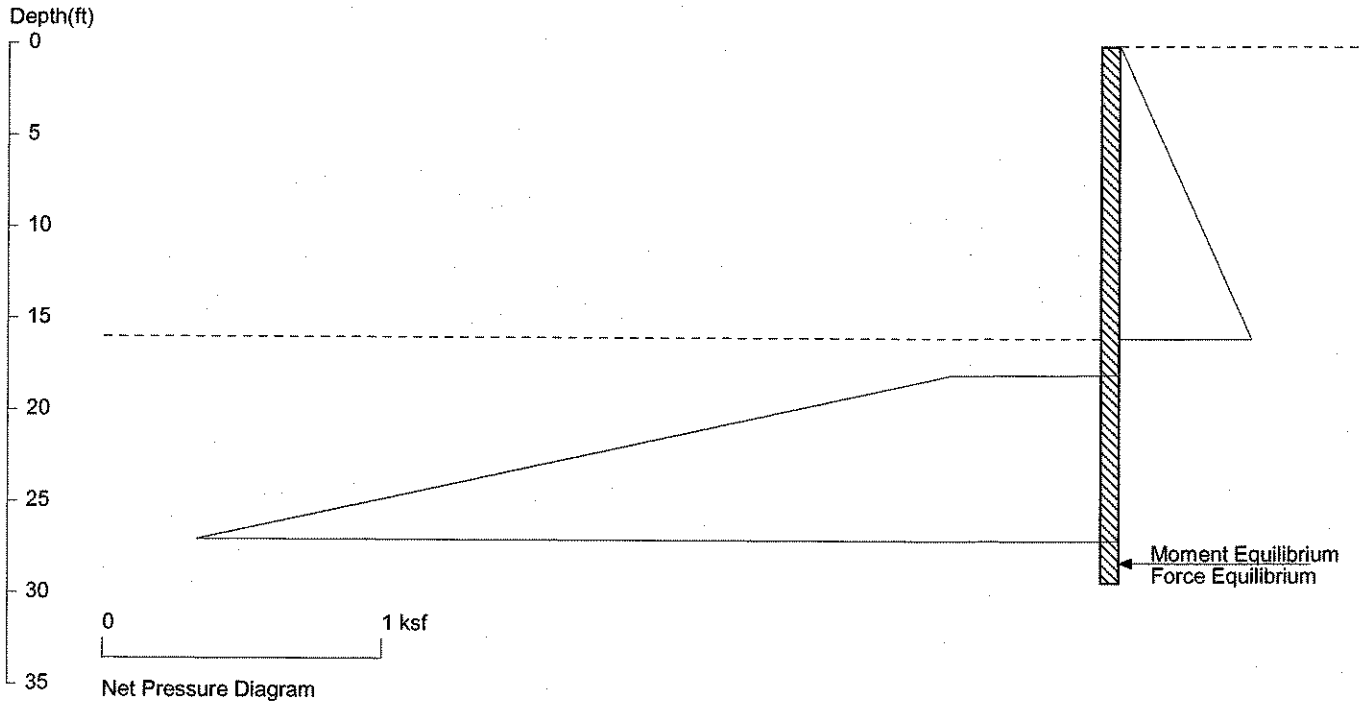
PASSIVE SPACING:

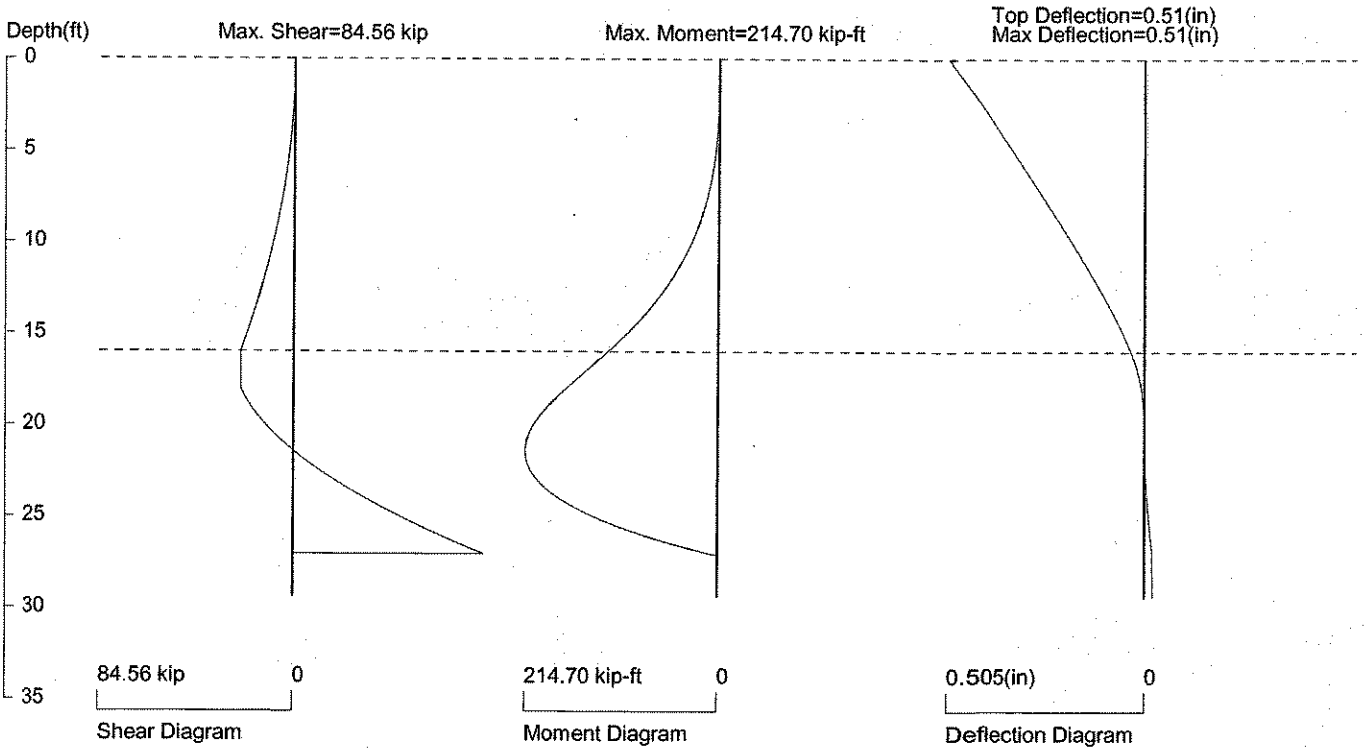
No.	Z depth	Spacing
1	16.00	6.00

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

SC-18

Perla Temp Shoring
16' ht-2:1 backfill- level cut





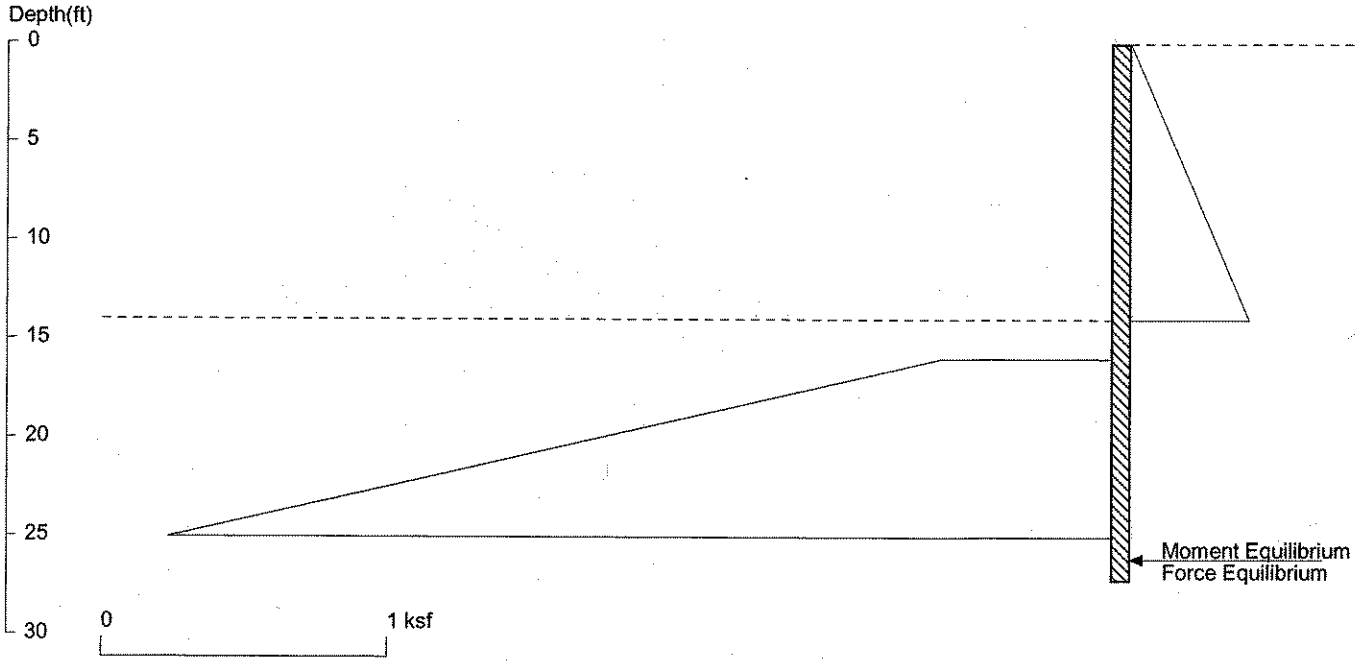
PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on pile spacing: 6.0 foot or meter

User Input Pile, W24x84: E (ksi)=29000.0, I (in4)/pile=2370.0

File: UNTITLED

Perla Temp Shoring
14' ht-2:1 backfill- level cut



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File: UNTITLED

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

PILE LENGTH: Min. Embedment=13.26 Min. Pile Length=27.26
MOMENT IN PILE: Max. Moment=204.21 per Pile Spacing=8.0 at Depth=19.48

PILE SELECTION:
Request Min. Section Modulus = 74.3 in3/pile=1216.85 cm3/pile, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
W24X84 has Section Modulus = 196.0 in3/pile=3211.85 cm3/pile. It is greater than Min. Requirements!
Top Deflection = 0.39(in) based on E (ksi)=29000.00 and I (in4)/pile=2370.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	14	0.420	.03

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
16	.6	40	7.800	.3

ACTIVE SPACING:

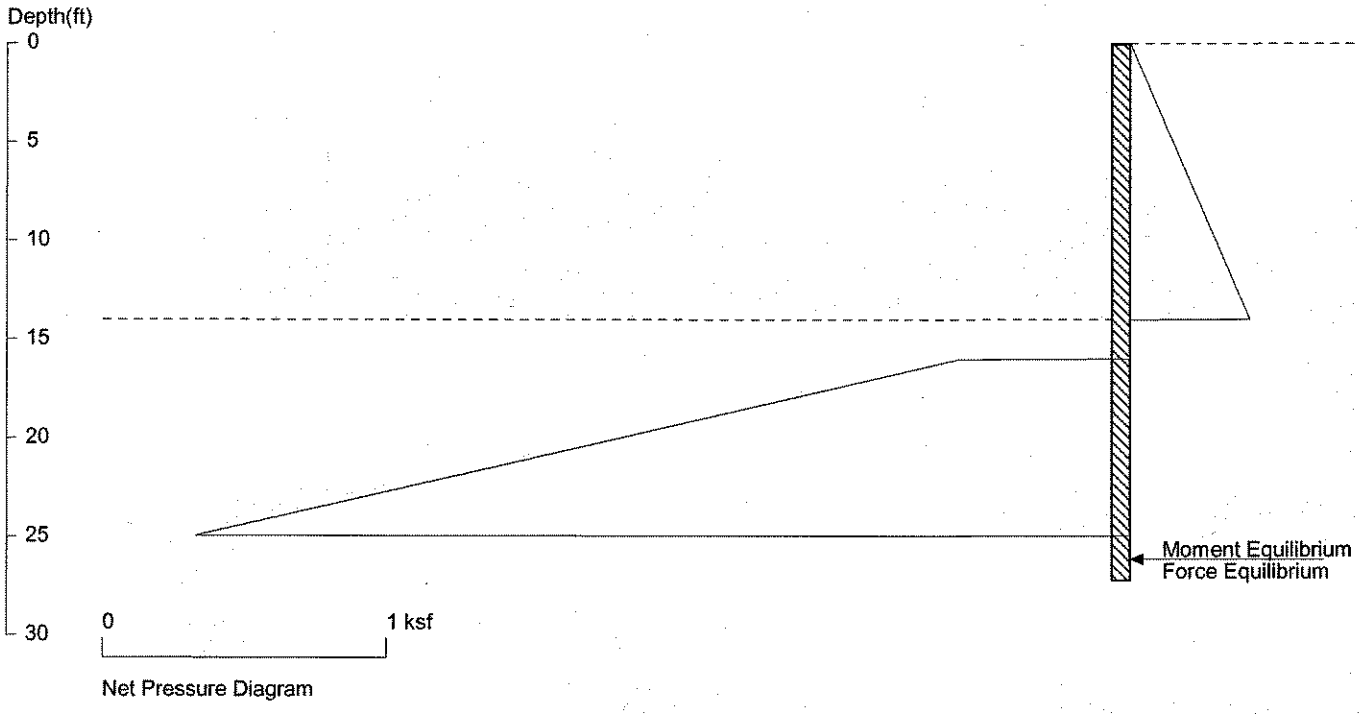
No.	Z depth	Spacing
1	0.00	8.00
2	14.00	3.00

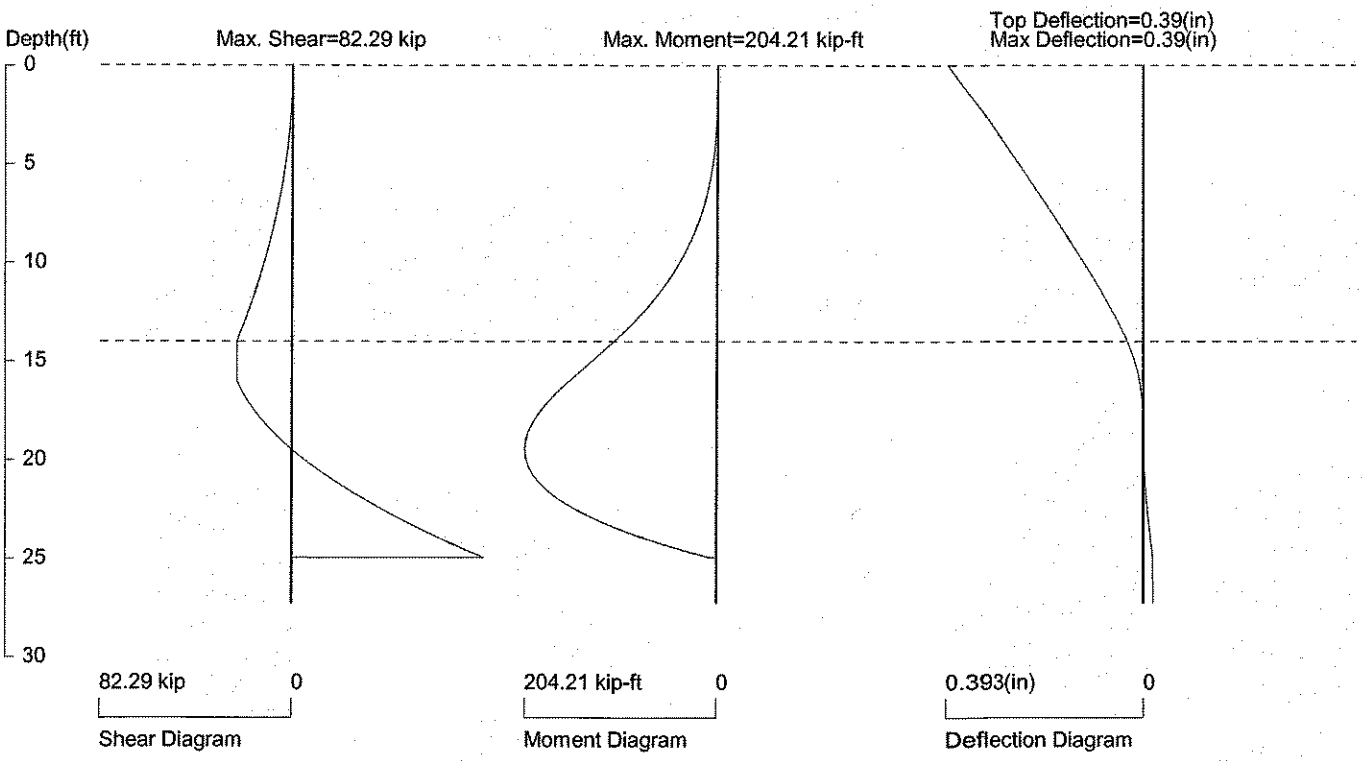
PASSIVE SPACING:

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

Perla Temp Shoring
14' ht-2:1 backfill- level cut





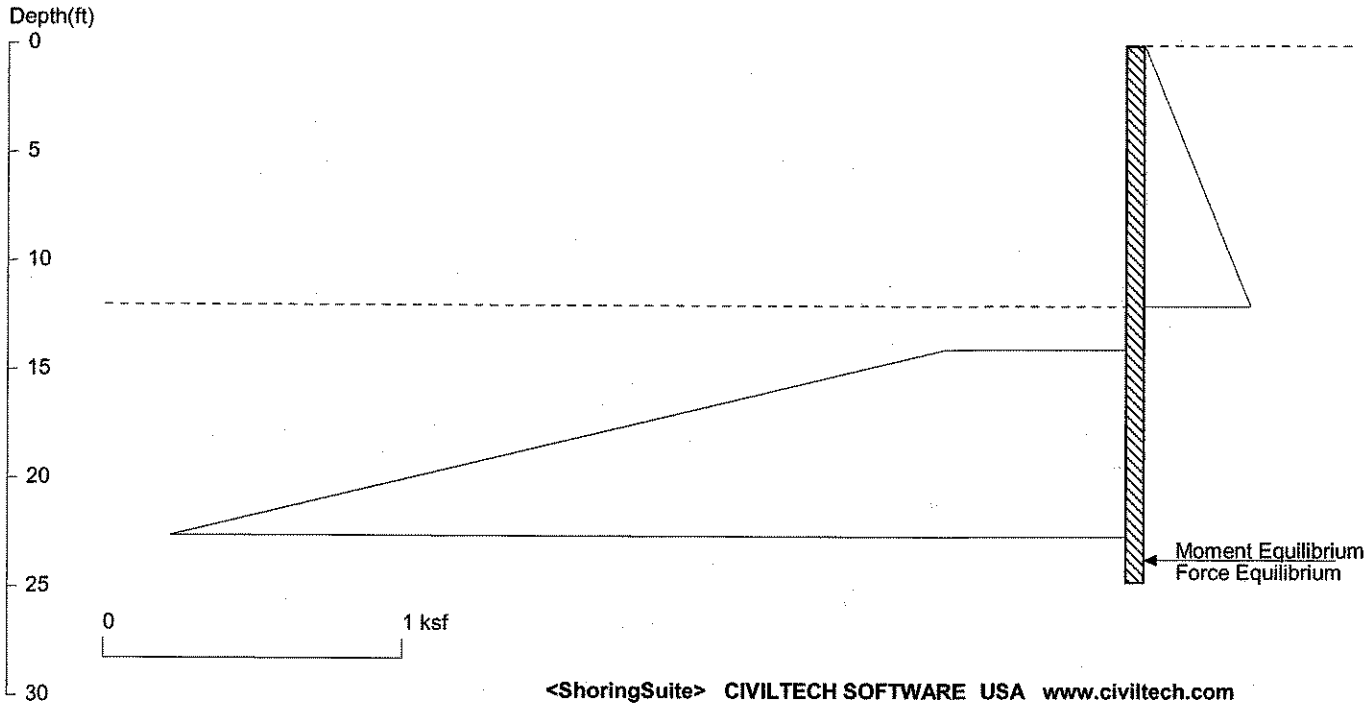
PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on pile spacing: 8.0 foot or meter

User Input Pile, W24x84: E (ksi)=29000.0, I (in4)/pile=2370.0

File: UNTITLED

Perla Temp Shoring
12' ht-2:1 backfill- level cut



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File: UNTITLED

Wall Height=12.0 Pile Diameter=2.3 Pile Spacing=8.0 Wall Type: 2. Soldier Pile, Drilled

PILE LENGTH: Min. Embedment=12.73 Min. Pile Length=24.73
MOMENT IN PILE: Max. Moment=137.12 per Pile Spacing=8.0 at Depth=17.36

PILE SELECTION:
Request Min. Section Modulus = 49.9 in3/pile=817.08 cm3/pile, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
W21X62 has Section Modulus = 127.0 in3/pile=2081.15 cm3/pile. It is greater than Min. Requirements!
Top Deflection = 0.37(in) based on E (ksi)=29000.00 and I (in4)/pile=1330.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	12	0.360	.03

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
14	.6	40	8.400	.3

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	8.00
2	12.00	2.33

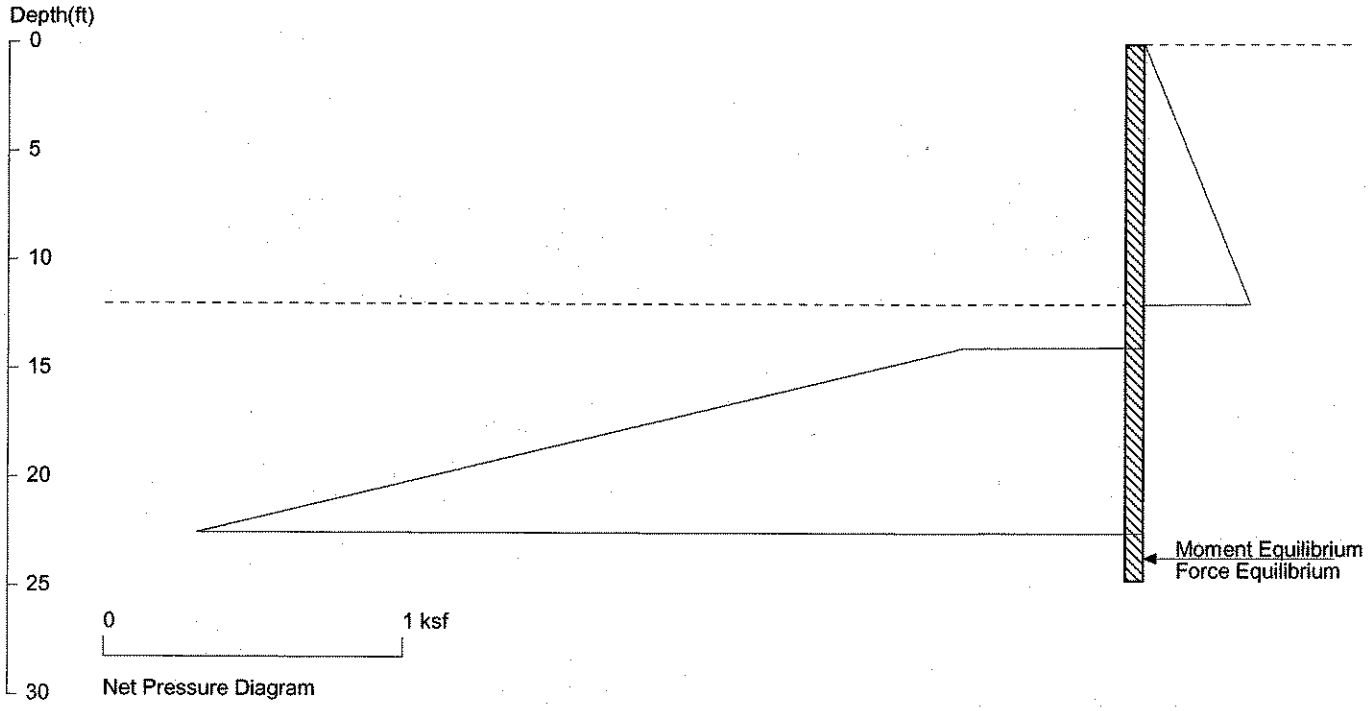
PASSIVE SPACING:

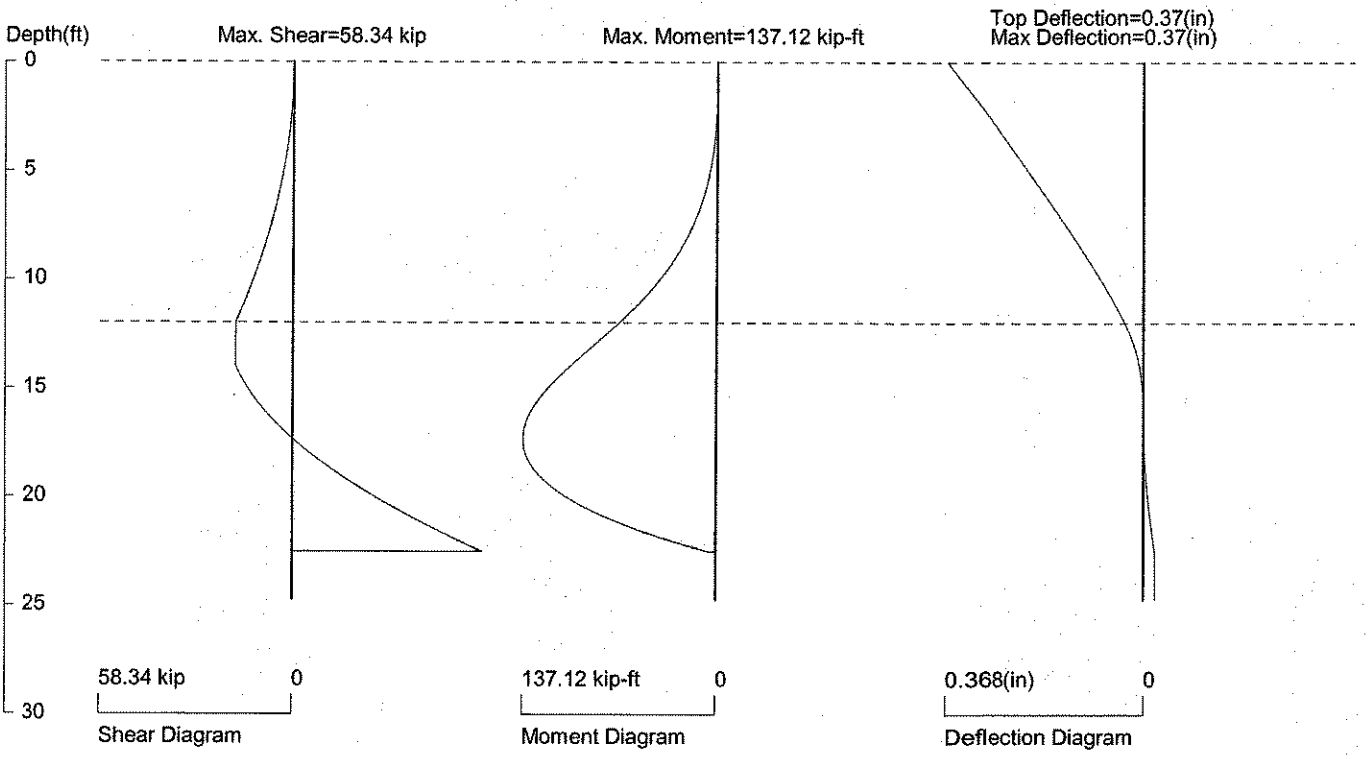
No.	Z depth	Spacing
1	12.00	4.66

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

S-22

Perla Temp Shoring
12' ht-2:1 backfill- level cut





PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on pile spacing: 8.0 foot or meter

User Input Pile, W21x62: E (ksi)=29000.0, I (in4)/pile=1330.0

File: UNTITLED

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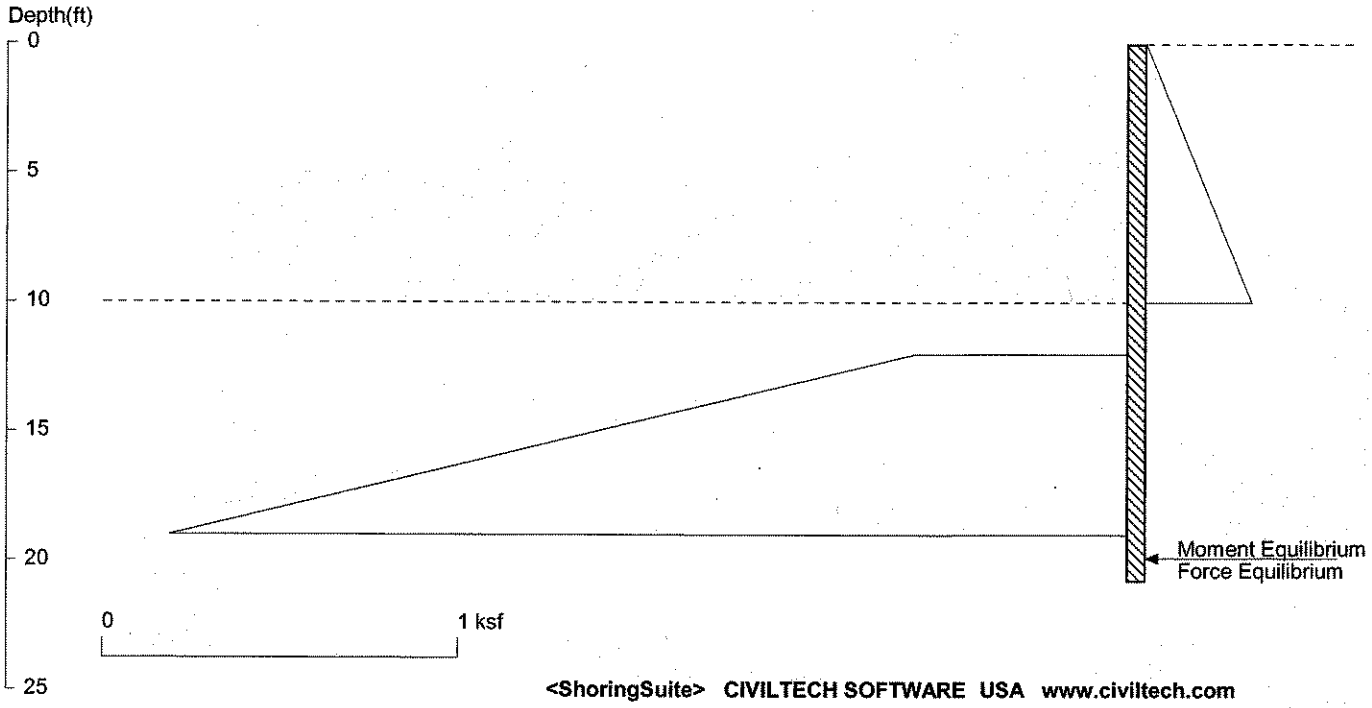
Perla Temp Shoring
10' ht-2:1 backfill- level cut



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File: UNTITLED

Wall Height=10.0 Pile Diameter=2.3 Pile Spacing=8.0 Wall Type: 2. Soldier Pile, Drilled

PILE LENGTH: Min. Embedment=10.79 Min. Pile Length=20.79
MOMENT IN PILE: Max. Moment=81.65 per Pile Spacing=8.0 at Depth=14.60

PILE SELECTION:
Request Min. Section Modulus = 29.7 in3/pile=486.57 cm3/pile, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
W18X35 has Section Modulus = 57.6 in3/pile=943.89 cm3/pile. It is greater than Min. Requirements!
Top Deflection = 0.40(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	10	0.300	.03

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
12	.6	40	9.000	.3

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	8.00
2	10.00	2.33

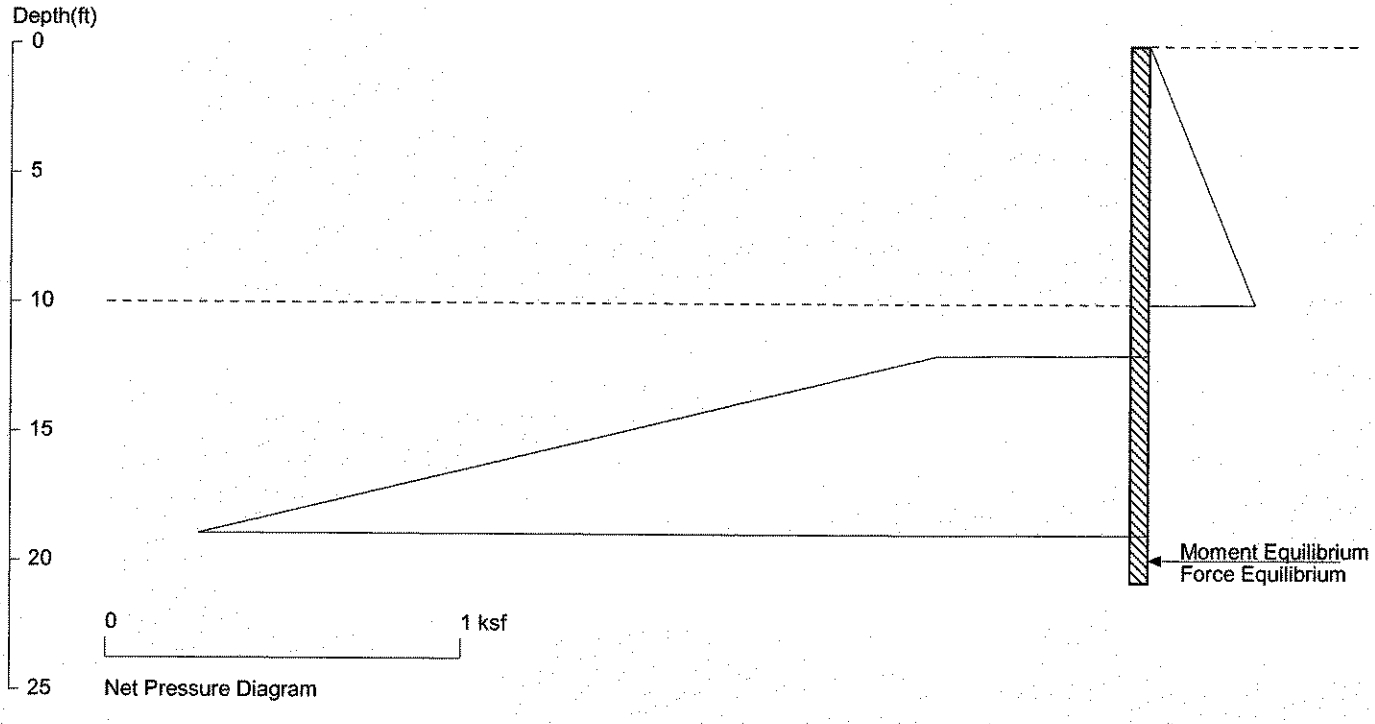
PASSIVE SPACING:

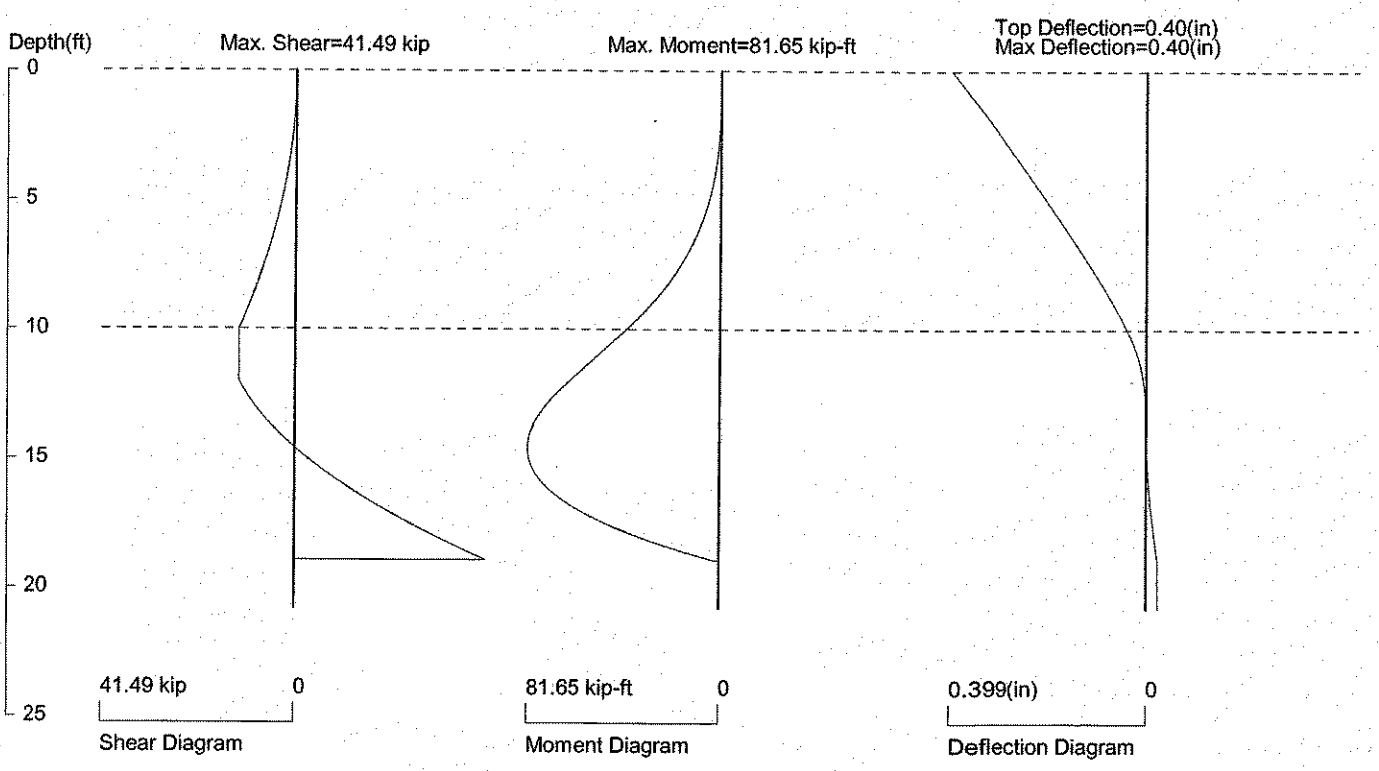
No.	Z depth	Spacing
1	10.00	4.66

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

SC-24

Perla Temp Shoring
10' ht-2:1 backfill- level cut





PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on pile spacing: 8.0 foot or meter

User Input Pile, W18x35: E (ksi)=29000.0, I (in4)/pile=510.0

File: UNTITLED