

# **Lpile Analyses Calculations Retaining Wall 4W17 - Tangent Shaft Wall**

**Columbus, Ohio**

**Submitted: 7/11/2022**



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LPile for Windows, Version 2019-11.001

Analysis of Individual Piles and Drilled Shafts  
Subjected to Lateral Loading Using the p-y Method  
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Files Used for Analysis

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Path to file locations:  
\\2015\\2015370\\FRA\\96053\\structures\\wall\_4W17\\design\\Bundled Rebar Design\\

Name of input data file:  
Wall 4W17 Tangent Shaft Design-rev.lp11

Name of output report file:  
Wall 4W17 Tangent Shaft Design-rev.lp11

Name of plot output file:  
Wall 4W17 Tangent Shaft Design-rev.lp11

Name of runtime message file:  
Wall 4W17 Tangent Shaft Design-rev.lp11

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Date and Time of Analysis

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Date: July 11, 2022

Time: 14:03:26

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Problem Title

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FRA-70-14.05 - Wall 4W17 rev

Job Number:

Client:

Engineer: TJW

Description: Tangent Shaft Design

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Program Options and Settings

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Computational Options:

- Use Load and Resistance Factors (LRFD) in computations

Engineering Units Used for Data Input and Computations:

- US Customary System Units (pounds, feet, inches)

Analysis Control Options:

- Maximum number of iterations allowed	=	500
- Deflection tolerance for convergence	=	1.0000E-05 in
- Maximum allowable deflection	=	100.0000 in
- Number of pile increments	=	100

Loading Type and Number of Cycles of Loading:

- Static loading specified
- Analysis uses p-y modification factors for p-y curves
- Analysis uses layering correction (Method of Georgiadis)
- No distributed lateral loads are entered
- Loading by lateral soil movements acting on pile not selected
- Input of shear resistance at the pile tip not selected
- Input of moment resistance at the pile tip not selected
- Computation of pile-head foundation stiffness matrix not selected
- Push-over analysis of pile not selected
- Buckling analysis of pile not selected

Output Options:

- Output files use decimal points to denote decimal symbols.
- Values of pile-head deflection, bending moment, shear force, and soil reaction are printed for full length of pile.
- Printing Increment (nodal spacing of output points) = 1
- No p-y curves to be computed and reported for user-specified depths
- Print using wide report formats

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Pile Structural Properties and Geometry  
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Number of pile sections defined	=	1
Total length of pile	=	80.670 ft
Depth of ground surface below top of pile	=	32.3500 ft

Pile diameters used for p-y curve computations are defined using 2 points.

p-y curves are computed using pile diameter values interpolated with depth over the length of the pile. A summary of values of pile diameter vs. depth follows.

Point No.	Depth Below Pile Head feet	Pile Diameter inches
1	0.000	60.0000
2	80.670	60.0000

Input Structural Properties for Pile Sections:  
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Pile Section No. 1:

Section 1 is a round drilled shaft, bored pile, or CIDH pile

Length of section	=	80.670000 ft
Shaft Diameter	=	60.000000 in
Shear capacity of section	=	0.0000 lbs

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Ground Slope and Pile Batter Angles  
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Ground Slope Angle	=	0.000 degrees
	=	0.000 radians
Pile Batter Angle	=	0.000 degrees
	=	0.000 radians

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Soil and Rock Layering Information  
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The soil profile is modelled using 7 layers

Layer 1 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer	=	32.350000	ft
Distance from top of pile to bottom of layer	=	32.850000	ft
Effective unit weight at top of layer	=	140.000000	pcf
Effective unit weight at bottom of layer	=	140.000000	pcf
Friction angle at top of layer	=	42.000000	deg.
Friction angle at bottom of layer	=	42.000000	deg.
Subgrade k at top of layer	=	195.000000	pci
Subgrade k at bottom of layer	=	195.000000	pci

Layer 2 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer	=	32.850000	ft
Distance from top of pile to bottom of layer	=	42.350000	ft
Effective unit weight at top of layer	=	77.600000	pcf
Effective unit weight at bottom of layer	=	77.600000	pcf
Friction angle at top of layer	=	42.000000	deg.
Friction angle at bottom of layer	=	42.000000	deg.
Subgrade k at top of layer	=	195.000000	pci
Subgrade k at bottom of layer	=	195.000000	pci

Layer 3 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer	=	42.350000	ft
Distance from top of pile to bottom of layer	=	47.350000	ft
Effective unit weight at top of layer	=	77.600000	pcf
Effective unit weight at bottom of layer	=	77.600000	pcf
Friction angle at top of layer	=	38.000000	deg.
Friction angle at bottom of layer	=	38.000000	deg.
Subgrade k at top of layer	=	125.000000	pci
Subgrade k at bottom of layer	=	125.000000	pci

Layer 4 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer	=	47.350000	ft
Distance from top of pile to bottom of layer	=	53.850000	ft
Effective unit weight at top of layer	=	77.600000	pcf
Effective unit weight at bottom of layer	=	77.600000	pcf
Friction angle at top of layer	=	39.000000	deg.
Friction angle at bottom of layer	=	39.000000	deg.
Subgrade k at top of layer	=	140.000000	pci
Subgrade k at bottom of layer	=	140.000000	pci

Layer 5 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer	=	53.850000	ft
Distance from top of pile to bottom of layer	=	58.850000	ft
Effective unit weight at top of layer	=	72.600000	pcf
Effective unit weight at bottom of layer	=	72.600000	pcf
Friction angle at top of layer	=	37.000000	deg.
Friction angle at bottom of layer	=	37.000000	deg.
Subgrade k at top of layer	=	110.000000	pci
Subgrade k at bottom of layer	=	110.000000	pci

Layer 6 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer	=	58.850000	ft
Distance from top of pile to bottom of layer	=	68.850000	ft
Effective unit weight at top of layer	=	77.600000	pcf
Effective unit weight at bottom of layer	=	77.600000	pcf
Friction angle at top of layer	=	41.000000	deg.
Friction angle at bottom of layer	=	41.000000	deg.
Subgrade k at top of layer	=	175.000000	pci
Subgrade k at bottom of layer	=	175.000000	pci

Layer 7 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer	=	68.850000	ft
Distance from top of pile to bottom of layer	=	81.250000	ft

Effective unit weight at top of layer	=	77.600000 pcf
Effective unit weight at bottom of layer	=	77.600000 pcf
Friction angle at top of layer	=	43.000000 deg.
Friction angle at bottom of layer	=	43.000000 deg.
Subgrade k at top of layer	=	215.000000 pci
Subgrade k at bottom of layer	=	215.000000 pci

(Depth of the lowest soil layer extends 0.580 ft below the pile tip)

\*\*\*\* Warning - Possible Input Data Error \*\*\*\*

Values entered for effective unit weights of soil were outside the limits of 20 pcf to 140 pcf.

The maximum input value, in layer 1, for effective unit weight = 140.00 pcf

This data may be erroneous. Please check your data.

#### Summary of Input Soil Properties

Layer Layer Num.	Soil Type Name (p-y Curve Type)	Layer Depth ft	Effective Unit Wt. pcf	Angle of Friction deg.	kpy pci
1	Sand	32.3500	140.0000	42.0000	195.0000
	(Reese, et al.)	32.8500	140.0000	42.0000	195.0000
2	Sand	32.8500	77.6000	42.0000	195.0000
	(Reese, et al.)	42.3500	77.6000	42.0000	195.0000
3	Sand	42.3500	77.6000	38.0000	125.0000
	(Reese, et al.)	47.3500	77.6000	38.0000	125.0000
4	Sand	47.3500	77.6000	39.0000	140.0000
	(Reese, et al.)	53.8500	77.6000	39.0000	140.0000
5	Sand	53.8500	72.6000	37.0000	110.0000
	(Reese, et al.)	58.8500	72.6000	37.0000	110.0000
6	Sand	58.8500	77.6000	41.0000	175.0000
	(Reese, et al.)	68.8500	77.6000	41.0000	175.0000
7	Sand	68.8500	77.6000	43.0000	215.0000
	(Reese, et al.)	81.2500	77.6000	43.0000	215.0000

#### p-y Modification Factors for Group Action

Distribution of p-y modifiers with depth defined using 2 points

Point No.	Depth X ft	p-mult	y-mult
1	34.200	0.6400	1.0000
2	110.000	0.6400	1.0000

#### Static Loading Type

Static loading criteria were used when computing p-y curves for all analyses.

#### Unfactored Loading Groups for LRFD Analysis

Number of Loading Groups = 1

Load Group	Load Type	Horiz. Force lbs	Moment in-lbs	Axial Force lbs	Number of Dist. Lds.
1	Horiz. Soil (Hs)	0.00	0.00	0.00	2

Number of Distributed Loading Points Input for Load Group 1 = 2

Point	Depth in	Distributed Load lb/inch
1	0.00	0.00
2	410.00	641.00

Totals of Unfactored Loads by Load Type for LRFD Analyses:

Number of Defined Unfactored Load Cases = 1

This table presents the sum of unfactored pile-head loads for each load type.

Load Type	Horiz. Force lbs	Moment in-lbs	Axial Force lbs	Number of Loads
Dead Loads (DL)	0.00	0.00	0.00	0
Live Loads (LL)	0.00	0.00	0.00	0
Earthquake (EQ)	0.00	0.00	0.00	0
Impact Load (IM)	0.00	0.00	0.00	0
Wind Loads (W)	0.00	0.00	0.00	0
Water Loads (HW)	0.00	0.00	0.00	0
Ice Loads (Ice)	0.00	0.00	0.00	0
Horiz. Soil (Hs)	0.00	0.00	0.00	1
Live Roof (Lr)	0.00	0.00	0.00	0
Rain Loads (Rn)	0.00	0.00	0.00	0
Snow Loads (Sn)	0.00	0.00	0.00	0
Temperature (Tm)	0.00	0.00	0.00	0
Special (Sp)	0.00	0.00	0.00	0

Load and Resistance Factors by Load Combinations for LRFD Analyses

Number of Factored Load Combinations = 3

Summary of Load and Resistance Factors:

No.	DL	LL	EQ	IM	Wind	Watr	Ice	Soil	Roof	Rain	Snow	Temp	Spec	M Rf	V Rf	Name
1	1.00	--	--	--	--	--	--	1.00	--	--	--	--	--	1.00	1.00	Soil Only
2	1.00	1.00	--	--	--	--	--	1.00	--	--	--	--	--	1.00	1.00	Service 1
3	1.00	1.75	--	--	--	--	--	1.50	--	--	--	--	--	0.90	0.90	Strength 1

Computed Factored Loads for LRFD Analyses

Factored Load Combination No. 1

Load Combination Name = Soil Only

Structural Resistance Factor for Flexure = 1.000  
Structural Resistance Factor for Shear = 1.000

Factored Load = 1.00\*DL + 1.00\*Hs

Factored Horizontal Force = 0.00 lbs  
Factored Vertical Force = 0.00 lbs

Factored Moment = 0.00 in-lbs

Factored Load Combination No. 2

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Load Combination Name = Service 1

Structural Resistance Factor for Flexure = 1.000

Structural Resistance Factor for Shear = 1.000

Factored Load = 1.00\*DL + 1.00\*LL + 1.00\*Hs

Factored Horizontal Force = 0.00 lbs

Factored Vertical Force = 0.00 lbs

Factored Moment = 0.00 in-lbs

Factored Load Combination No. 3

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Load Combination Name = Strength 1

Structural Resistance Factor for Flexure = 0.900

Structural Resistance Factor for Shear = 0.900

Factored Load = 1.00\*DL + 1.75\*LL + 1.50\*Hs

Factored Horizontal Force = 0.00 lbs

Factored Vertical Force = 0.00 lbs

Factored Moment = 0.00 in-lbs

Totals of Factored Loads by Load Combination:

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Load Combination Number	Factored Horiz. Force lbs	Factored Moment in-lbs	Factored Vert. Force lbs	Load Combination Name
1	0.00	0.00	0.00	Soil Only
2	0.00	0.00	0.00	Service 1
3	0.00	0.00	0.00	Strength 1

Sorted Values of Axial Thrust Forces Sorted for LRFD Computations:

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Number of Unique Axial Thrust Values = 1

Number Factored Axial Thrust

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1	0.000
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Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

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Axial thrust force values were determined from LRFD load combinations

Number of Pile Sections Analyzed = 1

Pile Section No. 1:

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Dimensions and Properties of Drilled Shaft (Bored Pile):

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Length of Section = 80.670000 ft

Shaft Diameter = 60.000000 in  
 Concrete Cover Thickness (to edge of long. rebar) = 6.500000 in  
 Number of Reinforcing Bars = 30 bars  
 Yield Stress of Reinforcing Bars = 60000. psi  
 Modulus of Elasticity of Reinforcing Bars = 29000000. psi  
 Gross Area of Shaft = 2827. sq. in.  
 Total Area of Reinforcing Steel = 46.800000 sq. in.  
 Area Ratio of Steel Reinforcement = 1.66 percent  
 Edge-to-Edge Bar Spacing = 6.685193 in  
 Maximum Concrete Aggregate Size = 0.375000 in  
 Ratio of Bar Spacing to Aggregate Size = 17.83  
 Offset of Center of Rebar Cage from Center of Pile = 0.0000 in

#### Axial Structural Capacities:

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 Nom. Axial Structural Capacity =  $0.85 F_c A_c + F_y A_s$  = 12262.154 kips  
 Tensile Load for Cracking of Concrete = -1313.073 kips  
 Nominal Axial Tensile Capacity = -2808.000 kips

#### Reinforcing Bar Dimensions and Positions Used in Computations:

Bar Number	Bar Diam. inches	Bar Area sq. in.	X inches	Y inches
1	1.410000	1.560000	22.784099	-0.704888
2	1.410000	1.560000	22.784099	0.704888
3	1.410000	1.560000	21.101014	8.623181
4	1.410000	1.560000	20.527606	9.911075
5	1.410000	1.560000	15.769371	16.460223
6	1.410000	1.560000	14.721704	17.403547
7	1.410000	1.560000	7.711062	21.451143
8	1.410000	1.560000	6.370286	21.886788
9	1.410000	1.560000	-1.680561	22.732966
10	1.410000	1.560000	-3.082613	22.585604
11	1.410000	1.560000	-10.781599	20.084052
12	1.410000	1.560000	-12.002500	19.379165
13	1.410000	1.560000	-18.018401	13.962423
14	1.410000	1.560000	-18.847046	12.821891
15	1.410000	1.560000	-22.139657	5.426565
16	1.410000	1.560000	-22.432766	4.047596
17	1.410000	1.560000	-22.432766	-4.047596
18	1.410000	1.560000	-22.139657	-5.426565
19	1.410000	1.560000	-18.847046	-12.821891
20	1.410000	1.560000	-18.018401	-13.962423
21	1.410000	1.560000	-12.002500	-19.379165
22	1.410000	1.560000	-10.781599	-20.084052
23	1.410000	1.560000	-3.082613	-22.585604
24	1.410000	1.560000	-1.680561	-22.732966
25	1.410000	1.560000	6.370286	-21.886788
26	1.410000	1.560000	7.711062	-21.451143
27	1.410000	1.560000	14.721704	-17.403547
28	1.410000	1.560000	15.769371	-16.460223
29	1.410000	1.560000	20.527606	-9.911075
30	1.410000	1.560000	21.101014	-8.623181

NOTE: The positions of the above rebars were computed by LPILE

Minimum spacing between any two bars not equal to zero = 6.685 inches  
between bars 14 and 15.

Ratio of bar spacing to maximum aggregate size = 17.83

#### Concrete Properties:

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 Compressive Strength of Concrete = 4000. psi  
 Modulus of Elasticity of Concrete = 3604997. psi  
 Modulus of Rupture of Concrete = -474.341649 psi  
 Compression Strain at Peak Stress = 0.001886  
 Tensile Strain at Fracture of Concrete = -0.0001154  
 Maximum Coarse Aggregate Size = 0.375000 in

Number of Axial Thrust Force Values Determined from LRFD Pile-head Loadings = 1



Number	Axial Thrust Force kips
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1	0.000

# Definitions of Run Messages and Notes:

C = concrete in section has cracked in tension.  
Y = stress in reinforcing steel has reached yield stress.  
T = ACI 318 criteria for tension-controlled section met, tensile strain in reinforcement exceeds 0.005 while simultaneously compressive strain in concrete more than 0.003. See ACI 318, Section 10.3.4.  
Z = depth of tensile zone in concrete section is less than 10 percent of section depth.

Bending Stiffness (EI) = Computed Bending Moment / Curvature.  
Position of neutral axis is measured from edge of compression side of pile.  
Compressive stresses and strains are positive in sign.  
Tensile stresses and strains are negative in sign.

Axial Thrust Force = 0.000 kips

Bending Curvature rad/in.	Bending Moment in-kip	Bending Stiffness kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in	Max Conc Stress ksi	Max Steel Stress ksi	Run Msg
4.16667E-07	1247.	2993684921.	29.9999714	0.00001250	-0.00001250	0.0523123	-0.2863753	
8.33333E-07	2490.	2987723137.	29.9999713	0.00002500	-0.00002500	0.1042803	-0.5727507	
0.00000125	3727.	2981761353.	29.9999712	0.00003750	-0.00003750	0.1559039	-0.8591260	
0.00000167	4960.	2975799569.	29.9999711	0.00005000	-0.00005000	0.2071832	-1.1455014	
0.00000208	6187.	2969837785.	29.9999710	0.00006250	-0.00006250	0.2581182	-1.4318767	
0.00000250	7410.	2963876000.	29.9999709	0.00007500	-0.00007500	0.3087089	-1.7182521	
0.00000292	8627.	2957914216.	29.9999708	0.00008750	-0.00008750	0.3589552	-2.0046275	
0.00000333	9840.	2951952432.	29.9999707	0.00010000	-0.00010000	0.4088572	-2.2910028	
0.00000375	11047.	2945990648.	29.9999706	0.0001125	-0.0001125	0.4584149	-2.5773782	
0.00000417	11047.	2651391583.	16.6719115	0.00006947	-0.0001805	0.2840856	-4.4742274	C
0.00000458	11047.	2410355985.	16.6768155	0.00007644	-0.0001986	0.3120102	-4.9209983	C
0.00000500	11047.	2209492986.	16.6817294	0.00008341	-0.0002166	0.3398463	-5.3676492	C
0.00000542	11047.	2039531987.	16.6866534	0.00009039	-0.0002346	0.3675937	-5.8141798	C
0.00000583	11047.	1893851131.	16.6915874	0.00009737	-0.0002526	0.3952523	-6.2605898	C
0.00000625	11047.	1767594389.	16.6965315	0.0001044	-0.0002706	0.4228219	-6.7068787	C
0.00000667	11047.	1657119739.	16.7014857	0.0001113	-0.0002887	0.4503024	-7.1530461	C
0.00000708	11047.	1559642108.	16.7064501	0.0001183	-0.0003067	0.4776937	-7.5990917	C
0.00000750	11047.	1472995324.	16.7114247	0.0001253	-0.0003247	0.5049956	-8.0450151	C
0.00000792	11047.	1395469254.	16.7164095	0.0001323	-0.0003427	0.5322079	-8.4908160	C
0.00000833	11047.	1325695791.	16.7214046	0.0001393	-0.0003607	0.5593306	-8.9364939	C
0.00000875	11047.	1262567420.	16.7264101	0.0001464	-0.0003786	0.5863635	-9.3820484	C
0.00000917	11047.	1205177992.	16.7314260	0.0001534	-0.0003966	0.6133063	-9.8274792	C
0.00000958	11047.	1152778949.	16.7364523	0.0001604	-0.0004146	0.6401591	-10.2727860	C
0.00001000	11047.	1104746493.	16.7414890	0.0001674	-0.0004326	0.6669217	-10.7179682	C
0.00001042	11047.	1060556633.	16.7465363	0.0001744	-0.0004506	0.6935938	-11.1630255	C
0.00001083	11047.	1019765993.	16.7515941	0.0001815	-0.0004685	0.7201753	-11.6079575	C
0.00001125	11047.	981996883.	16.7566626	0.0001885	-0.0004865	0.7466662	-12.0527638	C
0.00001167	11047.	946925565.	16.7617417	0.0001956	-0.0005044	0.7730662	-12.4974441	C
0.00001208	11047.	914272960.	16.7668314	0.0002026	-0.0005224	0.7993752	-12.9419978	C
0.00001250	11047.	883797194.	16.7719320	0.0002096	-0.0005404	0.8255930	-13.3864246	C
0.00001292	11047.	855287607.	16.7770433	0.0002167	-0.0005583	0.8517196	-13.8307242	C
0.00001333	11047.	828559870.	16.7821655	0.0002238	-0.0005762	0.8777546	-14.2748960	C
0.00001375	11047.	803451995.	16.7872985	0.0002308	-0.0005942	0.9036981	-14.7189397	C
0.00001417	11047.	779821054.	16.7924425	0.0002379	-0.0006121	0.9295498	-15.1628549	C
0.00001458	11136.	763626872.	16.7975974	0.0002450	-0.0006300	0.9553096	-15.6066411	C
0.00001500	11451.	763394398.	16.8027634	0.0002520	-0.0006480	0.9809773	-16.0502979	C
0.00001542	11765.	763161496.	16.8079404	0.0002591	-0.0006659	1.0065528	-16.4938250	C
0.00001583	12080.	762928163.	16.8131286	0.0002662	-0.0006838	1.0320359	-16.9372218	C
0.00001625	12394.	762694398.	16.8183279	0.0002733	-0.0007017	1.0574264	-17.3804880	C
0.00001708	13021.	762225551.	16.8287603	0.0002875	-0.0007375	1.1079292	-18.2666268	C
0.00001792	13648.	761754965.	16.8392379	0.0003017	-0.0007733	1.1580600	-19.1522378	C
0.00001875	14274.	761282614.	16.8497613	0.0003159	-0.0008091	1.2078173	-20.0373175	C
0.00001958	14899.	760808483.	16.8603307	0.0003302	-0.0008448	1.2572000	-20.9218624	C
0.00002042	15523.	760332558.	16.8709466	0.0003444	-0.0008806	1.3062067	-21.8058689	C
0.00002125	16147.	759854824.	16.8816094	0.0003587	-0.0009163	1.3548361	-22.6893334	C
0.00002208	16770.	759375265.	16.8923196	0.0003730	-0.0009520	1.4030869	-23.5722522	C
0.00002292	17391.	758893867.	16.9030775	0.0003874	-0.0009876	1.4509576	-24.4546217	C
0.00002375	18012.	758410613.	16.9138836	0.0004017	-0.0010233	1.4984470	-25.3364379	C
0.00002458	18632.	757925487.	16.9247384	0.0004161	-0.0010589	1.5455537	-26.2176972	C
0.00002542	19252.	757438475.	16.9356422	0.0004304	-0.0010946	1.5922763	-27.0983957	C

0.00002625	19870.	756949559.	16.9465956	0.0004448	-0.0011302	1.6386133	-27.9785294 C
0.00002708	20487.	756458723.	16.9575991	0.0004593	-0.0011657	1.6845634	-28.8580945 C
0.00002792	21104.	755965951.	16.9686529	0.0004737	-0.0012013	1.7301251	-29.7370868 C
0.00002875	21720.	755471226.	16.9797578	0.0004882	-0.0012368	1.7752970	-30.6155024 C
0.00002958	22335.	754974530.	16.9909140	0.0005026	-0.0012724	1.8200775	-31.4933372 C
0.00003042	22949.	754475847.	17.0021222	0.0005171	-0.0013079	1.8644653	-32.3705869 C
0.00003125	23562.	753975158.	17.0133828	0.0005317	-0.0013433	1.9084589	-33.2472475 C
0.00003208	24174.	753472445.	17.0246962	0.0005462	-0.0013788	1.9520567	-34.1233145 C
0.00003292	24785.	752967692.	17.0360631	0.0005608	-0.0014142	1.9952571	-34.9987838 C
0.00003375	25396.	752460879.	17.0474839	0.0005754	-0.0014496	2.0380588	-35.8736508 C
0.00003458	26005.	751951988.	17.0589592	0.0005900	-0.0014850	2.0804600	-36.7479113 C
0.00003542	26614.	751440999.	17.0704895	0.0006046	-0.0015204	2.1224593	-37.6215606 C
0.00003625	27221.	750927895.	17.0820752	0.0006192	-0.0015558	2.1640550	-38.4945943 C
0.00003708	27828.	750412654.	17.0937171	0.0006339	-0.0015911	2.2052455	-39.3670077 C
0.00003792	28434.	749895683.	17.1052235	0.0006486	-0.0016264	2.2460089	-40.2390063 C
0.00003875	29038.	749376946.	17.1165607	0.0006633	-0.0016617	2.2863388	-41.1106409 C
0.00003958	29642.	748865190.	17.1279517	0.0006780	-0.0016970	2.3262576	-41.9816637 C
0.00004042	30245.	748333258.	17.1393970	0.0006927	-0.0017323	2.3657633	-42.8520734 C
0.00004125	30847.	747808176.	17.1508970	0.0007075	-0.0017675	2.4048543	-43.7218643 C
0.00004208	31448.	747280925.	17.1624524	0.0007223	-0.0018027	2.4435289	-44.5910319 C
0.00004292	32048.	746751484.	17.1740638	0.0007371	-0.0018379	2.4817855	-45.4595714 C
0.00004375	32647.	746219834.	17.1857315	0.0007519	-0.0018731	2.5196224	-46.3274780 C
0.00004458	33245.	745685954.	17.1974563	0.0007667	-0.0019083	2.5570379	-47.1947470 C
0.00004542	33842.	745149822.	17.2092387	0.0007816	-0.0019434	2.5940302	-48.0613734 C
0.00004625	34438.	744611419.	17.2210793	0.0007965	-0.0019785	2.6305975	-48.9273523 C
0.00004708	35033.	744070722.	17.2329787	0.0008114	-0.0020136	2.6667382	-49.7926786 C
0.00004792	35627.	743527710.	17.2449374	0.0008263	-0.0020487	2.7024503	-50.6573472 C
0.00004875	36220.	742982360.	17.2569562	0.0008413	-0.0020837	2.7377320	-51.5213531 C
0.00004958	36812.	742434650.	17.2690355	0.0008563	-0.0021187	2.7725816	-52.3846908 C
0.00005292	39170.	740219750.	17.3179720	0.0009164	-0.0022586	2.9076204	-55.8312536 C
0.00005625	41511.	737965200.	17.3679309	0.0009769	-0.0023981	3.0355911	-59.2666875 C
0.00005958	43723.	733805311.	17.4036998	0.0010370	-0.0025380	3.1545931	-60.0000000 CY
0.00006292	45394.	732148820.	17.3713426	0.0010929	-0.0026821	3.2583881	-60.0000000 CY
0.00006625	46734.	705411839.	17.3036938	0.0011464	-0.0028286	3.3510321	-60.0000000 CY
0.00006958	47906.	688465920.	17.2249683	0.0011986	-0.0029764	3.4355523	-60.0000000 CY
0.00007292	48872.	670241087.	17.1295125	0.0012490	-0.0031260	3.5115958	-60.0000000 CY
0.00007625	49769.	652702542.	17.0343590	0.0012989	-0.0032761	3.5812985	-60.0000000 CY
0.00007958	50553.	635223914.	16.9333520	0.0013476	-0.0034274	3.6442472	-60.0000000 CY
0.00008292	51214.	617654206.	16.8255987	0.0013951	-0.0035799	3.7006422	-60.0000000 CY
0.00008625	51848.	601131413.	16.7256322	0.0014426	-0.0037324	3.7521241	-60.0000000 CY
0.00008958	52446.	585441477.	16.6309561	0.0014899	-0.0038851	3.7985688	-60.0000000 CY
0.00009292	52968.	570064053.	16.5345704	0.0015363	-0.0040387	3.8395293	-60.0000000 CY
0.00009625	53417.	554983120.	16.4332260	0.0015817	-0.0041933	3.8750006	-60.0000000 CY
0.00009958	53832.	540575449.	16.3345231	0.0016266	-0.0043484	3.9057790	-60.0000000 CY
0.0001029	54243.	527056085.	16.2442647	0.0016718	-0.0045032	3.9323310	-60.0000000 CY
0.0001063	54642.	514276753.	16.1605198	0.0017171	-0.0046579	3.9545394	-60.0000000 CY
0.0001096	54997.	501875208.	16.0770796	0.0017618	-0.0048132	3.9721598	-60.0000000 CY
0.0001129	55315.	489875171.	15.9947068	0.0018061	-0.0049689	3.9853699	-60.0000000 CY
0.0001163	55600.	478276940.	15.9137291	0.0018500	-0.0051250	3.9943048	-60.0000000 CY
0.0001196	55852.	467056706.	15.8305321	0.0018931	-0.0052819	3.9990494	-60.0000000 CY
0.0001229	56095.	456362395.	15.7517848	0.0019362	-0.0054388	3.9959207	-60.0000000 CY
0.0001263	56333.	446199450.	15.6789901	0.0019795	-0.0055955	3.9995311	-60.0000000 CY
0.0001296	56567.	436526152.	15.6117390	0.0020230	-0.0057520	3.9962669	-60.0000000 CY
0.0001329	56792.	427277459.	15.5487872	0.0020667	-0.0059083	3.9995962	-60.0000000 CY
0.0001363	57001.	418353789.	15.4879509	0.0021102	-0.0060648	3.9956558	-60.0000000 CY
0.0001396	57192.	409731469.	15.4288355	0.0021536	-0.0062214	3.9992524	-60.0000000 CY
0.0001429	57363.	401375170.	15.3706046	0.0021967	-0.0063783	3.9967645	-60.0000000 CY
0.0001462	57520.	393301793.	15.3143112	0.0022397	-0.0065353	3.9980705	-60.0000000 CY
0.0001496	57666.	385511740.	15.2571981	0.0022822	-0.0066928	3.9999294	-60.0000000 CY
0.0001529	57788.	377906082.	15.1985834	0.0023241	-0.0068509	3.9949866	-60.0000000 CY
0.0001562	57907.	370604004.	15.1432441	0.0023661	-0.0070089	3.9985621	-60.0000000 CY
0.0001596	58022.	363581665.	15.0905933	0.0024082	-0.0071668	3.9999753	-60.0000000 CY
0.0001629	58133.	356828960.	15.0414455	0.0024505	-0.0073245	3.9943098	-60.0000000 CY
0.0001662	58244.	350337023.	14.9951385	0.0024929	-0.0074821	3.9980447	-60.0000000 CY
0.0001696	58352.	344091678.	14.9514348	0.0025355	-0.0076395	3.9998345	-60.0000000 CY
0.0001729	58459.	338073758.	14.9105154	0.0025783	-0.0077967	3.9944723	-60.0000000 CY
0.0001762	58562.	332266040.	14.8717479	0.0026211	-0.0079539	3.9961854	-60.0000000 CY
0.0001796	58662.	326653954.	14.8345082	0.0026640	-0.0081110	3.9989634	-60.0000000 CY
0.0001829	58760.	321239677.	14.7992859	0.0027070	-0.0082680	3.9999937	-60.0000000 CY
0.0002029	59197.	291731740.	14.5893835	0.0029604	-0.0092146	3.9923544	-60.0000000 CY
0.0002229	59481.	266828600.	14.3963055	0.0032092	-0.0101658	3.9925382	-60.0000000 CYT
0.0002429	59713.	245815245.	14.2398570	0.0034591	-0.0111159	3.9880042	-60.0000000 CYT
0.0002629	59929.	227939471.	14.1171352	0.0037116	-0.0120634	3.9964778	-60.0000000 CYT
0.0002829	59929.	211825930.	14.0567764	0.0039769	-0.0129981	3.9989022	60.0000000 CYT

Summary of Results for Nominal (Unfactored) Moment Capacity for Section 1

Moment values interpolated at maximum compressive strain = 0.003  
or maximum developed moment if pile fails at smaller strains.

Load No.	Axial Thrust kips	Nominal Mom. Cap. in-kip	Max. Comp. Strain
1	0.000	59242.301	0.00300000

Note that the values of moment capacity in the table above are not factored by a strength reduction factor (phi-factor).

In ACI 318, the value of the strength reduction factor depends on whether the transverse reinforcing steel bars are tied hoops (0.65) or spirals (0.70).

The above values should be multiplied by the appropriate strength reduction factor to compute ultimate moment capacity according to ACI 318, Section 9.3.2.2 or the value required by the design standard being followed.

The following table presents factored moment capacities and corresponding bending stiffnesses computed for common resistance factor values used for reinforced concrete sections.

Axial Load No.	Resist. Factor for Moment	Nominal Moment Cap in-kips	Ult. (Fac) Ax. Thrust kips	Ult. (Fac) Moment Cap in-kips	Bend. Stiff. at Ult Mom kip-in^2
1	0.65	59242.	0.0000	38507.	740842125.
1	0.75	59242.	0.0000	44432.	728578233.
1	0.90	59242.	0.0000	53318.	558312550.

#### Layering Correction Equivalent Depths of Soil & Rock Layers

Layer No.	Top of Layer Below Pile Head ft	Equivalent Top Depth Below Grnd Surf ft	Same Layer Type As Layer Above	Layer is Rock or is Below Rock Layer	F0 Integral for Layer lbs	F1 Integral for Layer lbs
1	32.3500	0.00	N.A.	No	0.00	1280.
2	32.8500	0.4998	Yes	No	1280.	456971.
3	42.3500	11.6900	Yes	No	458251.	469218.
4	47.3500	16.1389	Yes	No	927470.	928002.
5	53.8500	24.2947	Yes	No	1855471.	1054933.
6	58.8500	25.8645	Yes	No	2910404.	3814096.
7	68.8500	33.6866	Yes	No	6724500.	N.A.

Notes: The F0 integral of Layer n+1 equals the sum of the F0 and F1 integrals for Layer n. Layering correction equivalent depths are computed only for soil types with both shallow-depth and deep-depth expressions for peak lateral load transfer. These soil types are soft and stiff clays, non-liquefied sands, and cemented c-phi soil.

Distributed Lateral Loads for LRFD:

Sums of Distributed Lateral Load Per Unit Length due to Horizontal Soil Pressures

Depth in	Distributed Load lb/in
0.00	3.78
9.68	15.13
19.36	30.27
29.04	45.40
38.72	60.54
48.40	75.67
58.08	90.81
67.76	105.94

77.44	121.08
87.12	136.21
96.80	151.34
106.48	166.48
116.16	181.61
125.85	196.75
135.53	211.88
145.21	227.02
154.89	242.15
164.57	257.29
174.25	272.42
183.93	287.56
193.61	302.69
203.29	317.82
212.97	332.96
222.65	348.09
232.33	363.23
242.01	378.36
251.69	393.50
261.37	408.63
271.05	423.77
280.73	438.90
290.41	454.03
300.09	469.17
309.77	484.30
319.45	499.44
329.13	514.57
338.81	529.71
348.49	544.84
358.17	559.98
367.86	575.11
377.54	590.24
387.22	605.38
396.90	620.51
406.58	541.66

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Computed Values of Pile Loading and Deflection  
for Lateral Loading for LRFD Load Case Number 1  
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Load Case No. 1: Soil Only

Depth X feet	Deflect. y inches	Bending Moment in-lbs	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness in-lb^2	Soil Res. p lb/inch	Soil Spr. Es*h lb/inch	Distrib. Lat. Load lb/inch
0.00	3.7589	-4.26E-05	-7.33E-07	-0.00770	0.00	2.99E+12	0.00	0.00	3.7836
0.8067	3.6844	177.2816	91.5674	-0.00770	0.00	2.99E+12	0.00	0.00	15.1345
1.6134	3.6099	1773.	311.3291	-0.00770	0.00	2.99E+12	0.00	0.00	30.2690
2.4201	3.5354	6205.	677.5986	-0.00770	0.00	2.99E+12	0.00	0.00	45.4034
3.2268	3.4609	14892.	1190.	-0.00770	0.00	2.99E+12	0.00	0.00	60.5379
4.0335	3.3864	29251.	1850.	-0.00770	0.00	2.99E+12	0.00	0.00	75.6724
4.8402	3.3119	50703.	2655.	-0.00770	0.00	2.99E+12	0.00	0.00	90.8069
5.6469	3.2374	80663.	3608.	-0.00770	0.00	2.99E+12	0.00	0.00	105.9414
6.4536	3.1629	120552.	4707.	-0.00770	0.00	2.99E+12	0.00	0.00	121.0758
7.2603	3.0884	171786.	5952.	-0.00769	0.00	2.99E+12	0.00	0.00	136.2103
8.0670	3.0140	235785.	7344.	-0.00769	0.00	2.99E+12	0.00	0.00	151.3448
8.8737	2.9395	313966.	8882.	-0.00769	0.00	2.99E+12	0.00	0.00	166.4793
9.6804	2.8650	407748.	10567.	-0.00769	0.00	2.99E+12	0.00	0.00	181.6137
10.4871	2.7906	518549.	12398.	-0.00769	0.00	2.99E+12	0.00	0.00	196.7482
11.2938	2.7161	647788.	14376.	-0.00769	0.00	2.99E+12	0.00	0.00	211.8827
12.1005	2.6417	796882.	16500.	-0.00769	0.00	2.99E+12	0.00	0.00	227.0172
12.9072	2.5673	967249.	18771.	-0.00768	0.00	2.99E+12	0.00	0.00	242.1517
13.7139	2.4929	1160309.	21189.	-0.00768	0.00	2.99E+12	0.00	0.00	257.2861
14.5206	2.4186	1377479.	23753.	-0.00768	0.00	2.99E+12	0.00	0.00	272.4206
15.3273	2.3443	1620178.	26463.	-0.00767	0.00	2.99E+12	0.00	0.00	287.5551
16.1340	2.2701	1889824.	29320.	-0.00767	0.00	2.99E+12	0.00	0.00	302.6896
16.9407	2.1959	2187834.	32323.	-0.00766	0.00	2.99E+12	0.00	0.00	317.8241
17.7474	2.1218	2515628.	35473.	-0.00765	0.00	2.99E+12	0.00	0.00	332.9585
18.5541	2.0478	2874624.	38770.	-0.00764	0.00	2.99E+12	0.00	0.00	348.0930
19.3608	1.9739	3266239.	42213.	-0.00763	0.00	2.98E+12	0.00	0.00	363.2275

20.1675	1.9000	3691893.	45802.	-0.00762	0.00	2.98E+12	0.00	0.00	378.3620
20.9742	1.8263	4153003.	49538.	-0.00761	0.00	2.98E+12	0.00	0.00	393.4965
21.7809	1.7527	4650987.	53420.	-0.00759	0.00	2.98E+12	0.00	0.00	408.6309
22.5876	1.6793	5187265.	57449.	-0.00758	0.00	2.97E+12	0.00	0.00	423.7654
23.3943	1.6060	5763253.	61625.	-0.00756	0.00	2.97E+12	0.00	0.00	438.8999
24.2010	1.5329	6380371.	65947.	-0.00754	0.00	2.97E+12	0.00	0.00	454.0344
25.0077	1.4600	7040037.	70415.	-0.00752	0.00	2.97E+12	0.00	0.00	469.1688
25.8144	1.3873	7743668.	75030.	-0.00749	0.00	2.96E+12	0.00	0.00	484.3033
26.6211	1.3149	8492683.	79792.	-0.00747	0.00	2.96E+12	0.00	0.00	499.4378
27.4278	1.2427	9288501.	84700.	-0.00744	0.00	2.95E+12	0.00	0.00	514.5723
28.2345	1.1709	1.01E+07	89754.	-0.00741	0.00	2.95E+12	0.00	0.00	529.7068
29.0412	1.0993	1.10E+07	94955.	-0.00737	0.00	2.95E+12	0.00	0.00	544.8412
29.8479	1.0282	1.20E+07	100303.	-0.00728	0.00	7.63E+11	0.00	0.00	559.9757
30.6546	0.9584	1.30E+07	105797.	-0.00712	0.00	7.62E+11	0.00	0.00	575.1102
31.4613	0.8903	1.40E+07	111438.	-0.00695	0.00	7.61E+11	0.00	0.00	590.2447
32.2680	0.8239	1.51E+07	117225.	-0.00676	0.00	7.61E+11	0.00	0.00	605.3792
33.0747	0.7594	1.63E+07	121260.	-0.00656	0.00	7.60E+11	-392.1166	4999.	620.5136
33.8814	0.6968	1.75E+07	121490.	-0.00635	0.00	7.59E+11	-722.4967	10037.	541.6575
34.6881	0.6365	1.86E+07	117292.	-0.00612	0.00	7.58E+11	-686.5016	10441.	0.00
35.4948	0.5784	1.97E+07	109532.	-0.00587	0.00	7.57E+11	-916.8301	15344.	0.00
36.3015	0.5228	2.08E+07	99561.	-0.00561	0.00	7.56E+11	-1143.	21168.	0.00
37.1082	0.4697	2.17E+07	87468.	-0.00534	0.00	7.56E+11	-1355.	27930.	0.00
37.9149	0.4194	2.25E+07	73403.	-0.00506	0.00	7.55E+11	-1551.	35795.	0.00
38.7216	0.3718	2.31E+07	57566.	-0.00477	0.00	7.54E+11	-1721.	44816.	0.00
39.5283	0.3271	2.36E+07	40240.	-0.00447	0.00	7.54E+11	-1858.	54998.	0.00
40.3350	0.2853	2.39E+07	21702.	-0.00416	0.00	7.54E+11	-1972.	66895.	0.00
41.1417	0.2465	2.40E+07	2208.	-0.00385	0.00	7.54E+11	-2056.	80734.	0.00
41.9484	0.2107	2.39E+07	-17897.	-0.00355	0.00	7.54E+11	-2098.	96390.	0.00
42.7551	0.1778	2.36E+07	-36341.	-0.00324	0.00	7.54E+11	-1713.	93231.	0.00
43.5618	0.1479	2.32E+07	-52338.	-0.00294	0.00	7.54E+11	-1592.	104193.	0.00
44.3685	0.1209	2.26E+07	-66795.	-0.00265	0.00	7.55E+11	-1395.	111690.	0.00
45.1752	0.09668	2.19E+07	-79308.	-0.00236	0.00	7.55E+11	-1190.	119187.	0.00
45.9819	0.07518	2.11E+07	-89832.	-0.00209	0.00	7.56E+11	-983.8474	126684.	0.00
46.7886	0.05630	2.02E+07	-98371.	-0.00182	0.00	7.57E+11	-780.3167	134181.	0.00
47.5953	0.03991	1.92E+07	-105314.	-0.00157	0.00	7.57E+11	-654.2038	158679.	0.00
48.4020	0.02590	1.81E+07	-110644.	-0.00133	0.00	7.58E+11	-447.0030	167075.	0.00
49.2087	0.01413	1.70E+07	-114047.	-0.00111	0.00	7.59E+11	-256.1306	175472.	0.00
50.0154	0.00447	1.59E+07	-115698.	-8.97E-04	0.00	7.60E+11	-84.8118	183868.	0.00
50.8221	-0.00324	1.48E+07	-115797.	-7.01E-04	0.00	7.61E+11	64.2579	192264.	0.00
51.6288	-0.00911	1.37E+07	-114572.	-5.20E-04	0.00	7.62E+11	188.8825	200661.	0.00
52.4355	-0.01330	1.26E+07	-112267.	-3.53E-04	0.00	7.63E+11	287.3304	209057.	0.00
53.2422	-0.01595	1.15E+07	-109142.	-2.00E-04	0.00	7.63E+11	358.2971	217454.	0.00
54.0489	-0.01718	1.05E+07	-105883.	-1.10E-04	0.00	2.95E+12	314.9686	177454.	0.00
54.8556	-0.01808	9466278.	-102695.	-7.73E-05	0.00	2.95E+12	343.7665	184051.	0.00
55.6623	-0.01868	8488259.	-99250.	-4.79E-05	0.00	2.96E+12	367.8745	190648.	0.00
56.4690	-0.01901	7544714.	-95595.	-2.17E-05	0.00	2.96E+12	387.3199	197245.	0.00
57.2757	-0.01910	6637464.	-91774.	1.43E-06	0.00	2.97E+12	402.1901	203842.	0.00
58.0824	-0.01898	5767904.	-87830.	2.17E-05	0.00	2.97E+12	412.6277	210440.	0.00
58.8891	-0.01868	4937011.	-82607.	3.91E-05	0.00	2.98E+12	666.3132	345286.	0.00
59.6958	-0.01822	4168559.	-76140.	5.39E-05	0.00	2.98E+12	669.8078	355781.	0.00
60.5025	-0.01764	3462874.	-69668.	6.63E-05	0.00	2.98E+12	667.3524	366277.	0.00
61.3092	-0.01694	2819727.	-63246.	7.65E-05	0.00	2.99E+12	659.3895	376772.	0.00
62.1159	-0.01616	2238371.	-56926.	8.47E-05	0.00	2.99E+12	646.3768	387268.	0.00
62.9226	-0.01530	1717587.	-50754.	9.11E-05	0.00	2.99E+12	628.7792	397764.	0.00
63.7293	-0.01439	1255727.	-44773.	9.59E-05	0.00	2.99E+12	607.0584	408259.	0.00
64.5360	-0.01345	850754.	-39019.	9.93E-05	0.00	2.99E+12	581.6674	418755.	0.00
65.3427	-0.01247	500289.	-33527.	1.01E-04	0.00	2.99E+12	553.0404	429250.	0.00
66.1494	-0.01148	201650.	-28325.	1.03E-04	0.00	2.99E+12	521.5892	439746.	0.00
66.9561	-0.01049	-48112.	-23440.	1.03E-04	0.00	2.99E+12	487.6977	450241.	0.00
67.7628	-0.00949	-252171.	-18893.	1.02E-04	0.00	2.99E+12	451.7173	460737.	0.00
68.5695	-0.00850	-413899.	-14703.	1.01E-04	0.00	2.99E+12	413.9640	471232.	0.00
69.3762	-0.00753	-536835.	-10471.	9.97E-05	0.00	2.99E+12	460.3645	591837.	0.00
70.1829	-0.00657	-616630.	-6256.	9.79E-05	0.00	2.99E+12	410.5997	604732.	0.00
70.9896	-0.00563	-657948.	-2528.	9.58E-05	0.00	2.99E+12	359.5164	617626.	0.00
71.7963	-0.00472	-665575.	699.3610	9.37E-05	0.00	2.99E+12	307.2761	630521.	0.00
72.6030	-0.00382	-644408.	3416.	9.16E-05	0.00	2.99E+12	253.9768	643415.	0.00
73.4097	-0.00294	-599440.	5612.	8.96E-05	0.00	2.99E+12	199.6569	656310.	0.00
74.2164	-0.00209	-535762.	7276.	8.77E-05	0.00	2.99E+12	144.2997	669204.	0.00
75.0231	-0.00125	-458562.	8400.	8.61E-05	0.00	2.99E+12	87.8398	682099.	0.00
75.8298	-4.20E-04	-373131.	8971.	8.48E-05	0.00	2.99E+12	30.1706	694993.	0.00
76.6365	3.94E-04	-284872.	8978.	8.37E-05	0.00	2.99E+12	-28.8460	707888.	0.00
77.4432	0.00120	-199317.	8405.	8.29E-05	0.00	2.99E+12	-89.3691	720782.	0.00
78.2499	0.00200	-122136.	7239.	8.24E-05	0.00	2.99E+12	-151.5660	733677.	0.00
79.0566	0.00280	-59158.	5462.	8.21E-05	0.00	2.99E+12	-215.5981	746571.	0.00
79.8633	0.00359	-16385.	3056.	8.20E-05	0.00	2.99E+12	-281.6048	759466.	0.00
80.6700	0.00438	0.00	0.00	8.20E-05	0.00	2.99E+12	-349.6854	386180.	0.00

\* This analysis computed pile response using nonlinear moment-curvature relationships. Values of total stress due to combined axial and bending stresses

are computed only for elastic sections only and do not equal the actual stresses in concrete and steel. Stresses in concrete and steel may be interpolated from the output for nonlinear bending properties relative to the magnitude of bending moment developed in the pile.

Output Summary for Load Case No. 1:

Pile-head deflection = 3.75893127 inches  
 Computed slope at pile head = -0.00769601 radians  
 Maximum bending moment = 23989749. inch-lbs  
 Maximum shear force = 121490. lbs  
 Depth of maximum bending moment = 41.14170000 feet below pile head  
 Depth of maximum shear force = 33.88140000 feet below pile head  
 Number of iterations = 29  
 Number of zero deflection points = 2

Distributed Lateral Loads for LRFD:

Sums of Distributed Lateral Load Per Unit Length due to Horizontal Soil Pressures

Depth in	Distributed Load lb/in
0.00	3.78
9.68	15.13
19.36	30.27
29.04	45.40
38.72	60.54
48.40	75.67
58.08	90.81
67.76	105.94
77.44	121.08
87.12	136.21
96.80	151.34
106.48	166.48
116.16	181.61
125.85	196.75
135.53	211.88
145.21	227.02
154.89	242.15
164.57	257.29
174.25	272.42
183.93	287.56
193.61	302.69
203.29	317.82
212.97	332.96
222.65	348.09
232.33	363.23
242.01	378.36
251.69	393.50
261.37	408.63
271.05	423.77
280.73	438.90
290.41	454.03
300.09	469.17
309.77	484.30
319.45	499.44
329.13	514.57
338.81	529.71
348.49	544.84
358.17	559.98
367.86	575.11
377.54	590.24
387.22	605.38
396.90	620.51
406.58	541.66

Computed Values of Pile Loading and Deflection  
 for Lateral Loading for LRFD Load Case Number 2

## Load Case No. 2: Service 1

Depth X feet	Deflect. y inches	Bending Moment in-lbs	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness in-lb^2	Soil Res. p lb/inch	Soil Spr. Es*h lb/inch	Distrib. Lat. Load lb/inch
0.00	3.7589	-4.26E-05	-7.33E-07	-0.00770	0.00	2.99E+12	0.00	0.00	3.7836
0.8067	3.6844	177.2816	91.5674	-0.00770	0.00	2.99E+12	0.00	0.00	15.1345
1.6134	3.6099	1773.	311.3291	-0.00770	0.00	2.99E+12	0.00	0.00	30.2690
2.4201	3.5354	6205.	677.5986	-0.00770	0.00	2.99E+12	0.00	0.00	45.4034
3.2268	3.4609	14892.	1190.	-0.00770	0.00	2.99E+12	0.00	0.00	60.5379
4.0335	3.3864	29251.	1850.	-0.00770	0.00	2.99E+12	0.00	0.00	75.6724
4.8402	3.3119	50703.	2655.	-0.00770	0.00	2.99E+12	0.00	0.00	90.8069
5.6469	3.2374	80663.	3608.	-0.00770	0.00	2.99E+12	0.00	0.00	105.9414
6.4536	3.1629	120552.	4707.	-0.00770	0.00	2.99E+12	0.00	0.00	121.0758
7.2603	3.0884	171786.	5952.	-0.00769	0.00	2.99E+12	0.00	0.00	136.2103
8.0670	3.0140	235785.	7344.	-0.00769	0.00	2.99E+12	0.00	0.00	151.3448
8.8737	2.9395	313966.	8882.	-0.00769	0.00	2.99E+12	0.00	0.00	166.4793
9.6804	2.8650	407748.	10567.	-0.00769	0.00	2.99E+12	0.00	0.00	181.6137
10.4871	2.7906	518549.	12398.	-0.00769	0.00	2.99E+12	0.00	0.00	196.7482
11.2938	2.7161	647788.	14376.	-0.00769	0.00	2.99E+12	0.00	0.00	211.8827
12.1005	2.6417	796882.	16500.	-0.00769	0.00	2.99E+12	0.00	0.00	227.0172
12.9072	2.5673	967249.	18771.	-0.00768	0.00	2.99E+12	0.00	0.00	242.1517
13.7139	2.4929	1160309.	21189.	-0.00768	0.00	2.99E+12	0.00	0.00	257.2861
14.5206	2.4186	1377479.	23753.	-0.00768	0.00	2.99E+12	0.00	0.00	272.4206
15.3273	2.3443	1620178.	26463.	-0.00767	0.00	2.99E+12	0.00	0.00	287.5551
16.1340	2.2701	1889824.	29320.	-0.00767	0.00	2.99E+12	0.00	0.00	302.6896
16.9407	2.1959	2187834.	32323.	-0.00766	0.00	2.99E+12	0.00	0.00	317.8241
17.7474	2.1218	2515628.	35473.	-0.00765	0.00	2.99E+12	0.00	0.00	332.9585
18.5541	2.0478	2874624.	38770.	-0.00764	0.00	2.99E+12	0.00	0.00	348.0930
19.3608	1.9739	3266239.	42213.	-0.00763	0.00	2.98E+12	0.00	0.00	363.2275
20.1675	1.9000	3691893.	45802.	-0.00762	0.00	2.98E+12	0.00	0.00	378.3620
20.9742	1.8263	4153003.	49538.	-0.00761	0.00	2.98E+12	0.00	0.00	393.4965
21.7809	1.7527	4650987.	53420.	-0.00759	0.00	2.98E+12	0.00	0.00	408.6309
22.5876	1.6793	5187265.	57449.	-0.00758	0.00	2.97E+12	0.00	0.00	423.7654
23.3943	1.6060	5763253.	61625.	-0.00756	0.00	2.97E+12	0.00	0.00	438.8999
24.2010	1.5329	6380371.	65947.	-0.00754	0.00	2.97E+12	0.00	0.00	454.0344
25.0077	1.4600	7040037.	70415.	-0.00752	0.00	2.97E+12	0.00	0.00	469.1688
25.8144	1.3873	7743668.	75030.	-0.00749	0.00	2.96E+12	0.00	0.00	484.3033
26.6211	1.3149	8492683.	79792.	-0.00747	0.00	2.96E+12	0.00	0.00	499.4378
27.4278	1.2427	9288501.	84700.	-0.00744	0.00	2.95E+12	0.00	0.00	514.5723
28.2345	1.1709	1.01E+07	89754.	-0.00741	0.00	2.95E+12	0.00	0.00	529.7068
29.0412	1.0993	1.10E+07	94955.	-0.00737	0.00	2.95E+12	0.00	0.00	544.8412
29.8479	1.0282	1.20E+07	100303.	-0.00728	0.00	7.63E+11	0.00	0.00	559.9757
30.6546	0.9584	1.30E+07	105797.	-0.00712	0.00	7.62E+11	0.00	0.00	575.1102
31.4613	0.8903	1.40E+07	111438.	-0.00695	0.00	7.61E+11	0.00	0.00	590.2447
32.2680	0.8239	1.51E+07	117225.	-0.00676	0.00	7.61E+11	0.00	0.00	605.3792
33.0747	0.7594	1.63E+07	121260.	-0.00656	0.00	7.60E+11	-392.1166	4999.	620.5136
33.8814	0.6968	1.75E+07	121490.	-0.00635	0.00	7.59E+11	-722.4967	10037.	541.6575
34.6881	0.6365	1.86E+07	117292.	-0.00612	0.00	7.58E+11	-686.5016	10441.	0.00
35.4948	0.5784	1.97E+07	109532.	-0.00587	0.00	7.57E+11	-916.8301	15344.	0.00
36.3015	0.5228	2.08E+07	99561.	-0.00561	0.00	7.56E+11	-1143.	21168.	0.00
37.1082	0.4697	2.17E+07	87468.	-0.00534	0.00	7.56E+11	-1355.	27930.	0.00
37.9149	0.4194	2.25E+07	73403.	-0.00506	0.00	7.55E+11	-1551.	35795.	0.00
38.7216	0.3718	2.31E+07	57566.	-0.00477	0.00	7.54E+11	-1721.	44816.	0.00
39.5283	0.3271	2.36E+07	40240.	-0.00447	0.00	7.54E+11	-1858.	54998.	0.00
40.3350	0.2853	2.39E+07	21702.	-0.00416	0.00	7.54E+11	-1972.	66895.	0.00
41.1417	0.2465	2.40E+07	2208.	-0.00385	0.00	7.54E+11	-2056.	80734.	0.00
41.9484	0.2107	2.39E+07	-17897.	-0.00355	0.00	7.54E+11	-2098.	96390.	0.00
42.7551	0.1778	2.36E+07	-36341.	-0.00324	0.00	7.54E+11	-1713.	93231.	0.00
43.5618	0.1479	2.32E+07	-52338.	-0.00294	0.00	7.54E+11	-1592.	104193.	0.00
44.3685	0.1209	2.26E+07	-66795.	-0.00265	0.00	7.55E+11	-1395.	111690.	0.00
45.1752	0.09668	2.19E+07	-79308.	-0.00236	0.00	7.55E+11	-1190.	119187.	0.00
45.9819	0.07518	2.11E+07	-89832.	-0.00209	0.00	7.56E+11	-983.8474	126684.	0.00
46.7886	0.05630	2.02E+07	-98371.	-0.00182	0.00	7.57E+11	-780.3167	134181.	0.00
47.5953	0.03991	1.92E+07	-105314.	-0.00157	0.00	7.57E+11	-654.2038	158679.	0.00
48.4020	0.02590	1.81E+07	-110644.	-0.00133	0.00	7.58E+11	-447.0030	167075.	0.00
49.2087	0.01413	1.70E+07	-114047.	-0.00111	0.00	7.59E+11	-256.1306	175472.	0.00
50.0154	0.00447	1.59E+07	-115698.	-8.97E-04	0.00	7.60E+11	-84.8118	183868.	0.00
50.8221	-0.00324	1.48E+07	-115797.	-7.01E-04	0.00	7.61E+11	64.2579	192264.	0.00
51.6288	-0.00911	1.37E+07	-114572.	-5.20E-04	0.00	7.62E+11	188.8825	200661.	0.00
52.4355	-0.01330	1.26E+07	-112267.	-3.53E-04	0.00	7.63E+11	287.3304	209057.	0.00
53.2422	-0.01595	1.15E+07	-109142.	-2.00E-04	0.00	7.63E+11	358.2971	217454.	0.00
54.0489	-0.01718	1.05E+07	-105883.	-1.10E-04	0.00	2.95E+12	314.9686	177454.	0.00

54.8556	-0.01808	9466278.	-102695.	-7.73E-05	0.00	2.95E+12	343.7665	184051.	0.00
55.6623	-0.01868	8488259.	-99250.	-4.79E-05	0.00	2.96E+12	367.8745	190648.	0.00
56.4690	-0.01901	7544714.	-95595.	-2.17E-05	0.00	2.96E+12	387.3199	197245.	0.00
57.2757	-0.01910	6637464.	-91774.	1.43E-06	0.00	2.97E+12	402.1901	203842.	0.00
58.0824	-0.01898	5767904.	-87830.	2.17E-05	0.00	2.97E+12	412.6277	210440.	0.00
58.8891	-0.01868	4937011.	-82607.	3.91E-05	0.00	2.98E+12	666.3132	345286.	0.00
59.6958	-0.01822	4168559.	-76140.	5.39E-05	0.00	2.98E+12	669.8078	355781.	0.00
60.5025	-0.01764	3462874.	-69668.	6.63E-05	0.00	2.98E+12	667.3524	366277.	0.00
61.3092	-0.01694	2819727.	-63246.	7.65E-05	0.00	2.99E+12	659.3895	376772.	0.00
62.1159	-0.01616	2238371.	-56926.	8.47E-05	0.00	2.99E+12	646.3768	387268.	0.00
62.9226	-0.01530	1717587.	-50754.	9.11E-05	0.00	2.99E+12	628.7792	397764.	0.00
63.7293	-0.01439	1255727.	-44773.	9.59E-05	0.00	2.99E+12	607.0584	408259.	0.00
64.5360	-0.01345	850754.	-39019.	9.93E-05	0.00	2.99E+12	581.6674	418755.	0.00
65.3427	-0.01247	500289.	-33527.	1.01E-04	0.00	2.99E+12	553.0404	429250.	0.00
66.1494	-0.01148	201650.	-28325.	1.03E-04	0.00	2.99E+12	521.5892	439746.	0.00
66.9561	-0.01049	-48112.	-23440.	1.03E-04	0.00	2.99E+12	487.6977	450241.	0.00
67.7628	-0.00949	-252171.	-18893.	1.02E-04	0.00	2.99E+12	451.7173	460737.	0.00
68.5695	-0.00850	-413899.	-14703.	1.01E-04	0.00	2.99E+12	413.9640	471232.	0.00
69.3762	-0.00753	-536835.	-10471.	9.97E-05	0.00	2.99E+12	460.3645	591837.	0.00
70.1829	-0.00657	-616630.	-6256.	9.79E-05	0.00	2.99E+12	410.5997	604732.	0.00
70.9896	-0.00563	-657948.	-2528.	9.58E-05	0.00	2.99E+12	359.5164	617626.	0.00
71.7963	-0.00472	-665575.	699.3610	9.37E-05	0.00	2.99E+12	307.2761	630521.	0.00
72.6030	-0.00382	-644408.	3416.	9.16E-05	0.00	2.99E+12	253.9768	643415.	0.00
73.4097	-0.00294	-599440.	5612.	8.96E-05	0.00	2.99E+12	199.6569	656310.	0.00
74.2164	-0.00209	-535762.	7276.	8.77E-05	0.00	2.99E+12	144.2997	669204.	0.00
75.0231	-0.00125	-458562.	8400.	8.61E-05	0.00	2.99E+12	87.8398	682099.	0.00
75.8298	-4.20E-04	-373131.	8971.	8.48E-05	0.00	2.99E+12	30.1706	694993.	0.00
76.6365	3.94E-04	-284872.	8978.	8.37E-05	0.00	2.99E+12	-28.8460	707888.	0.00
77.4432	0.00120	-199317.	8405.	8.29E-05	0.00	2.99E+12	-89.3691	720782.	0.00
78.2499	0.00200	-122136.	7239.	8.24E-05	0.00	2.99E+12	-151.5660	733677.	0.00
79.0566	0.00280	-59158.	5462.	8.21E-05	0.00	2.99E+12	-215.5981	746571.	0.00
79.8633	0.00359	-16385.	3056.	8.20E-05	0.00	2.99E+12	-281.6048	759466.	0.00
80.6700	0.00438	0.00	0.00	8.20E-05	0.00	2.99E+12	-349.6854	386180.	0.00

\* This analysis computed pile response using nonlinear moment-curvature relationships. Values of total stress due to combined axial and bending stresses are computed only for elastic sections only and do not equal the actual stresses in concrete and steel. Stresses in concrete and steel may be interpolated from the output for nonlinear bending properties relative to the magnitude of bending moment developed in the pile.

Output Summary for Load Case No. 2:

Pile-head deflection	=	3.75893127 inches
Computed slope at pile head	=	-0.00769601 radians
Maximum bending moment	=	23989749. inch-lbs
Maximum shear force	=	121490. lbs
Depth of maximum bending moment	=	41.14170000 feet below pile head
Depth of maximum shear force	=	33.88140000 feet below pile head
Number of iterations	=	29
Number of zero deflection points	=	2

Distributed Lateral Loads for LRFD:

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Sums of Distributed Lateral Load Per Unit Length due to Horizontal Soil Pressures

Depth in	Distributed Load lb/in
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0.00	3.78
9.68	15.13
19.36	30.27
29.04	45.40
38.72	60.54
48.40	75.67
58.08	90.81
67.76	105.94
77.44	121.08
87.12	136.21
96.80	151.34
106.48	166.48
116.16	181.61
125.85	196.75
135.53	211.88



145.21	227.02
154.89	242.15
164.57	257.29
174.25	272.42
183.93	287.56
193.61	302.69
203.29	317.82
212.97	332.96
222.65	348.09
232.33	363.23
242.01	378.36
251.69	393.50
261.37	408.63
271.05	423.77
280.73	438.90
290.41	454.03
300.09	469.17
309.77	484.30
319.45	499.44
329.13	514.57
338.81	529.71
348.49	544.84
358.17	559.98
367.86	575.11
377.54	590.24
387.22	605.38
396.90	620.51
406.58	541.66

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 Computed Values of Pile Loading and Deflection  
 for Lateral Loading for LRFD Load Case Number 3  
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Load Case No. 3: Strength 1

Depth X feet	Deflect. y inches	Bending Moment in-lbs	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness in-lb^2	Soil Res. p lb/inch	Soil Spr. Es*h lb/inch	Distrib. Lat. Load lb/inch
0.00	6.8644	3.12E-04	0.00	-0.01387	0.00	2.99E+12	0.00	0.00	5.6754
0.8067	6.7302	265.9226	137.3511	-0.01387	0.00	2.99E+12	0.00	0.00	22.7017
1.6134	6.5959	2659.	466.9936	-0.01387	0.00	2.99E+12	0.00	0.00	45.4034
2.4201	6.4616	9307.	1016.	-0.01387	0.00	2.99E+12	0.00	0.00	68.1052
3.2268	6.3274	22338.	1786.	-0.01387	0.00	2.99E+12	0.00	0.00	90.8069
4.0335	6.1931	43877.	2774.	-0.01387	0.00	2.99E+12	0.00	0.00	113.5086
4.8402	6.0589	76054.	3983.	-0.01387	0.00	2.99E+12	0.00	0.00	136.2103
5.6469	5.9246	120995.	5412.	-0.01387	0.00	2.99E+12	0.00	0.00	158.9120
6.4536	5.7904	180827.	7060.	-0.01387	0.00	2.99E+12	0.00	0.00	181.6137
7.2603	5.6562	257679.	8928.	-0.01387	0.00	2.99E+12	0.00	0.00	204.3155
8.0670	5.5219	353677.	11016.	-0.01387	0.00	2.99E+12	0.00	0.00	227.0172
8.8737	5.3877	470949.	13323.	-0.01386	0.00	2.99E+12	0.00	0.00	249.7189
9.6804	5.2535	611622.	15850.	-0.01386	0.00	2.99E+12	0.00	0.00	272.4206
10.4871	5.1193	777824.	18597.	-0.01386	0.00	2.99E+12	0.00	0.00	295.1223
11.2938	4.9852	971681.	21564.	-0.01386	0.00	2.99E+12	0.00	0.00	317.8241
12.1005	4.8510	1195322.	24751.	-0.01385	0.00	2.99E+12	0.00	0.00	340.5258
12.9072	4.7169	1450874.	28157.	-0.01385	0.00	2.99E+12	0.00	0.00	363.2275
13.7139	4.5829	1740464.	31783.	-0.01384	0.00	2.99E+12	0.00	0.00	385.9292
14.5206	4.4489	2066219.	35629.	-0.01384	0.00	2.99E+12	0.00	0.00	408.6309
15.3273	4.3150	2430267.	39694.	-0.01383	0.00	2.99E+12	0.00	0.00	431.3327
16.1340	4.1811	2834736.	43980.	-0.01382	0.00	2.99E+12	0.00	0.00	454.0344
16.9407	4.0474	3281752.	48485.	-0.01381	0.00	2.98E+12	0.00	0.00	476.7361
17.7474	3.9137	3773443.	53210.	-0.01380	0.00	2.98E+12	0.00	0.00	499.4378
18.5541	3.7802	4311936.	58154.	-0.01379	0.00	2.98E+12	0.00	0.00	522.1395
19.3608	3.6468	4899359.	63319.	-0.01377	0.00	2.98E+12	0.00	0.00	544.8412
20.1675	3.5135	5537839.	68703.	-0.01376	0.00	2.97E+12	0.00	0.00	567.5430
20.9742	3.3804	6229504.	74307.	-0.01374	0.00	2.97E+12	0.00	0.00	590.2447
21.7809	3.2475	6976481.	80131.	-0.01372	0.00	2.97E+12	0.00	0.00	612.9464
22.5876	3.1149	7780897.	86174.	-0.01369	0.00	2.96E+12	0.00	0.00	635.6481
23.3943	2.9825	8644880.	92437.	-0.01366	0.00	2.96E+12	0.00	0.00	658.3498
24.2010	2.8503	9570557.	98920.	-0.01363	0.00	2.95E+12	0.00	0.00	681.0516
25.0077	2.7185	1.06E+07	105623.	-0.01360	0.00	2.95E+12	0.00	0.00	703.7533

25.8144	2.5870	1.16E+07	112545.	-0.01351	0.00	7.63E+11	0.00	0.00	726.4550
26.6211	2.4569	1.27E+07	119688.	-0.01336	0.00	7.62E+11	0.00	0.00	749.1567
27.4278	2.3284	1.39E+07	127050.	-0.01319	0.00	7.62E+11	0.00	0.00	771.8584
28.2345	2.2016	1.52E+07	134632.	-0.01300	0.00	7.61E+11	0.00	0.00	794.5601
29.0412	2.0767	1.65E+07	142433.	-0.01280	0.00	7.60E+11	0.00	0.00	817.2619
29.8479	1.9538	1.80E+07	150454.	-0.01258	0.00	7.58E+11	0.00	0.00	839.9636
30.6546	1.8332	1.95E+07	158695.	-0.01234	0.00	7.57E+11	0.00	0.00	862.6653
31.4613	1.7149	2.10E+07	167156.	-0.01208	0.00	7.56E+11	0.00	0.00	885.3670
32.2680	1.5993	2.27E+07	175837.	-0.01180	0.00	7.55E+11	0.00	0.00	908.0687
33.0747	1.4864	2.44E+07	182433.	-0.01150	0.00	7.53E+11	-476.0647	3100.	930.7705
33.8814	1.3766	2.62E+07	184310.	-0.01117	0.00	7.52E+11	-879.3602	6184.	812.4863
34.6881	1.2701	2.80E+07	179924.	-0.01082	0.00	7.50E+11	-839.2932	6397.	0.00
35.4948	1.1671	2.97E+07	170421.	-0.01045	0.00	7.49E+11	-1124.	9324.	0.00
36.3015	1.0678	3.13E+07	158167.	-0.01006	0.00	7.47E+11	-1407.	12759.	0.00
37.1082	0.9724	3.28E+07	143226.	-0.00964	0.00	7.46E+11	-1679.	16719.	0.00
37.9149	0.8811	3.41E+07	125729.	-0.00921	0.00	7.45E+11	-1935.	21264.	0.00
38.7216	0.7941	3.52E+07	105881.	-0.00876	0.00	7.44E+11	-2165.	26394.	0.00
39.5283	0.7116	3.61E+07	83984.	-0.00829	0.00	7.43E+11	-2359.	32088.	0.00
40.3350	0.6336	3.68E+07	60329.	-0.00782	0.00	7.42E+11	-2529.	38632.	0.00
41.1417	0.5603	3.73E+07	35176.	-0.00733	0.00	7.42E+11	-2668.	46103.	0.00
41.9484	0.4916	3.75E+07	8899.	-0.00685	0.00	7.42E+11	-2761.	54361.	0.00
42.7551	0.4277	3.75E+07	-15646.	-0.00636	0.00	7.42E+11	-2310.	52287.	0.00
43.5618	0.3686	3.72E+07	-37826.	-0.00587	0.00	7.42E+11	-2272.	59676.	0.00
44.3685	0.3141	3.67E+07	-59484.	-0.00539	0.00	7.43E+11	-2203.	67882.	0.00
45.1752	0.2643	3.61E+07	-80264.	-0.00491	0.00	7.43E+11	-2091.	76578.	0.00
45.9819	0.2190	3.52E+07	-99861.	-0.00445	0.00	7.44E+11	-1958.	86560.	0.00
46.7886	0.1781	3.41E+07	-118141.	-0.00400	0.00	7.45E+11	-1819.	98828.	0.00
47.5953	0.1416	3.29E+07	-135578.	-0.00356	0.00	7.46E+11	-1784.	121970.	0.00
48.4020	0.1092	3.15E+07	-151824.	-0.00315	0.00	7.47E+11	-1573.	139460.	0.00
49.2087	0.08068	3.00E+07	-165857.	-0.00275	0.00	7.49E+11	-1327.	159173.	0.00
50.0154	0.05595	2.83E+07	-177373.	-0.00237	0.00	7.50E+11	-1053.	182109.	0.00
50.8221	0.03476	2.65E+07	-185809.	-0.00202	0.00	7.52E+11	-690.3663	192264.	0.00
51.6288	0.01687	2.47E+07	-190843.	-0.00169	0.00	7.53E+11	-349.7439	200661.	0.00
52.4355	0.00206	2.28E+07	-192751.	-0.00138	0.00	7.55E+11	-44.4346	209057.	0.00
53.2422	-0.00992	2.10E+07	-191887.	-0.00110	0.00	7.56E+11	222.9074	217454.	0.00
54.0489	-0.01931	1.91E+07	-189096.	-8.47E-04	0.00	7.58E+11	353.9174	177454.	0.00
54.8556	-0.02633	1.73E+07	-184960.	-6.15E-04	0.00	7.59E+11	500.5448	184051.	0.00
55.6623	-0.03121	1.55E+07	-179562.	-4.06E-04	0.00	7.60E+11	614.6890	190648.	0.00
56.4690	-0.03418	1.38E+07	-173215.	-2.19E-04	0.00	7.62E+11	696.5003	197245.	0.00
57.2757	-0.03545	1.22E+07	-166231.	-5.41E-05	0.00	7.63E+11	746.5637	203842.	0.00
58.0824	-0.03523	1.06E+07	-158910.	4.06E-05	0.00	2.95E+12	765.8537	210440.	0.00
58.8891	-0.03467	9096031.	-150012.	7.28E-05	0.00	2.96E+12	1073.	299493.	0.00
59.6958	-0.03382	7694113.	-139408.	1.00E-04	0.00	2.96E+12	1118.	320068.	0.00
60.5025	-0.03273	6396980.	-128390.	1.23E-04	0.00	2.97E+12	1158.	342597.	0.00
61.3092	-0.03143	5208385.	-117012.	1.42E-04	0.00	2.97E+12	1192.	367248.	0.00
62.1159	-0.02997	4131533.	-105437.	1.57E-04	0.00	2.98E+12	1199.	387268.	0.00
62.9226	-0.02838	3167048.	-93988.	1.69E-04	0.00	2.98E+12	1166.	397764.	0.00
63.7293	-0.02670	2311857.	-82893.	1.78E-04	0.00	2.99E+12	1126.	408259.	0.00
64.5360	-0.02494	1562171.	-72223.	1.84E-04	0.00	2.99E+12	1079.	418755.	0.00
65.3427	-0.02313	913565.	-62039.	1.88E-04	0.00	2.99E+12	1025.	429250.	0.00
66.1494	-0.02129	361054.	-52395.	1.90E-04	0.00	2.99E+12	967.0036	439746.	0.00
66.9561	-0.01944	-100840.	-43338.	1.91E-04	0.00	2.99E+12	904.0576	450241.	0.00
67.7628	-0.01759	-478014.	-34910.	1.90E-04	0.00	2.99E+12	837.2511	460737.	0.00
68.5695	-0.01576	-776729.	-27144.	1.88E-04	0.00	2.99E+12	767.1691	471232.	0.00
69.3762	-0.01395	-1003553.	-19302.	1.85E-04	0.00	2.99E+12	853.0287	591837.	0.00
70.1829	-0.01218	-1150439.	-11492.	1.82E-04	0.00	2.99E+12	760.6834	604732.	0.00
70.9896	-0.01044	-1226041.	-4587.	1.78E-04	0.00	2.99E+12	665.9051	617626.	0.00
71.7963	-0.00874	-1239242.	1390.	1.74E-04	0.00	2.99E+12	568.9917	630521.	0.00
72.6030	-0.00707	-1199122.	6420.	1.70E-04	0.00	2.99E+12	470.1242	643415.	0.00
73.4097	-0.00545	-1114947.	10483.	1.66E-04	0.00	2.99E+12	369.3723	656310.	0.00
74.2164	-0.00386	-996158.	13562.	1.63E-04	0.00	2.99E+12	266.7040	669204.	0.00
75.0231	-0.00230	-852375.	15637.	1.60E-04	0.00	2.99E+12	161.9966	682099.	0.00
75.8298	-7.67E-04	-693413.	16688.	1.57E-04	0.00	2.99E+12	55.0517	694993.	0.00
76.6365	7.44E-04	-529291.	16691.	1.55E-04	0.00	2.99E+12	-54.3880	707888.	0.00
77.4432	0.00224	-370266.	15621.	1.54E-04	0.00	2.99E+12	-166.6183	720782.	0.00
78.2499	0.00372	-226855.	13450.	1.53E-04	0.00	2.99E+12	-281.9502	733677.	0.00
79.0566	0.00520	-109865.	10146.	1.52E-04	0.00	2.99E+12	-400.6836	746571.	0.00
79.8633	0.00667	-30424.	5675.	1.52E-04	0.00	2.99E+12	-523.0775	759466.	0.00
80.6700	0.00814	0.00	0.00	1.52E-04	0.00	2.99E+12	-649.3166	386180.	0.00

\* This analysis computed pile response using nonlinear moment-curvature relationships. Values of total stress due to combined axial and bending stresses are computed only for elastic sections only and do not equal the actual stresses in concrete and steel. Stresses in concrete and steel may be interpolated from the output for nonlinear bending properties relative to the magnitude of bending moment developed in the pile.

Pile-head deflection = 6.86440308 inches  
 Computed slope at pile head = -0.01386847 radians  
 Maximum bending moment = 37507549. inch-lbs  
 Maximum shear force = -192751. lbs  
 Depth of maximum bending moment = 41.94840000 feet below pile head  
 Depth of maximum shear force = 52.43550000 feet below pile head  
 Number of iterations = 30  
 Number of zero deflection points = 2

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 Summary of Pile Responses for LRFD Analyses  
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Load Case No.	Pile-head Shear lbs	Pile-head Moment in-lbs	Axial Loading lbs	Pile-head Deflection inches	Maximum Moment in Pile in-lbs	Maximum Shear in Pile lbs	Pile-Head Rotation radians
1	0.000000	0.000000	0.000000	3.75893127	23989749.	121490.	-0.00769601
2	0.000000	0.000000	0.000000	3.75893127	23989749.	121490.	-0.00769601
3	0.000000	0.000000	0.000000	6.86440308	37507549.	-192751.	-0.01386847

Maximum pile-head deflection = 6.8644030771 inches  
 Maximum pile-head rotation = -0.0138684662 radians = -0.794605 deg.

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 LRFD Performance by Load Case Combination  
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Load Case No.	Section No.	Factor	Factored Resistance	Maximum Moment	Fact. Mom. Fraction	Pass/Fail for LRFD	Maximum Shear	Pile-top Deflection	Pile-top Rotation	Name
No.	No.	for Moment	of Section	in Section	in Section	of Section	in Section	Developed	Developed	
		Combination	Capacity	Developed	Developed	Moment	Developed	Deflection	Rotation	
			in-lbs	in-lbs			lbs	inches	Radians	
1	1	1.00	59242301.	23989749.	0.404943	Pass	121490.	3.758931	-0.007696	Soil Only
2	1	1.00	59242301.	23989749.	0.404943	Pass	121490.	3.758931	-0.007696	Service 1
3	1	0.90	53318071.	37507549.	0.703468	Pass	-192751.	6.864403	-0.013868	Strength 1

All LRFD load combinations have passed for all pile sections.

The load case and pile section with the greatest level of developed moment capacity:

LRFD Load Case No. = 3  
 Pile Section No. = 1

The analysis ended normally.