Project No.
19026.000.001

October 21, 2022

Mr. Tom Spragg
Bellingham Marine Industries, Inc.
8810 Sparling Lane
Dixon, CA 95620

Subject: Dana Point Marina Rehabilitation Project
Dana Point, California

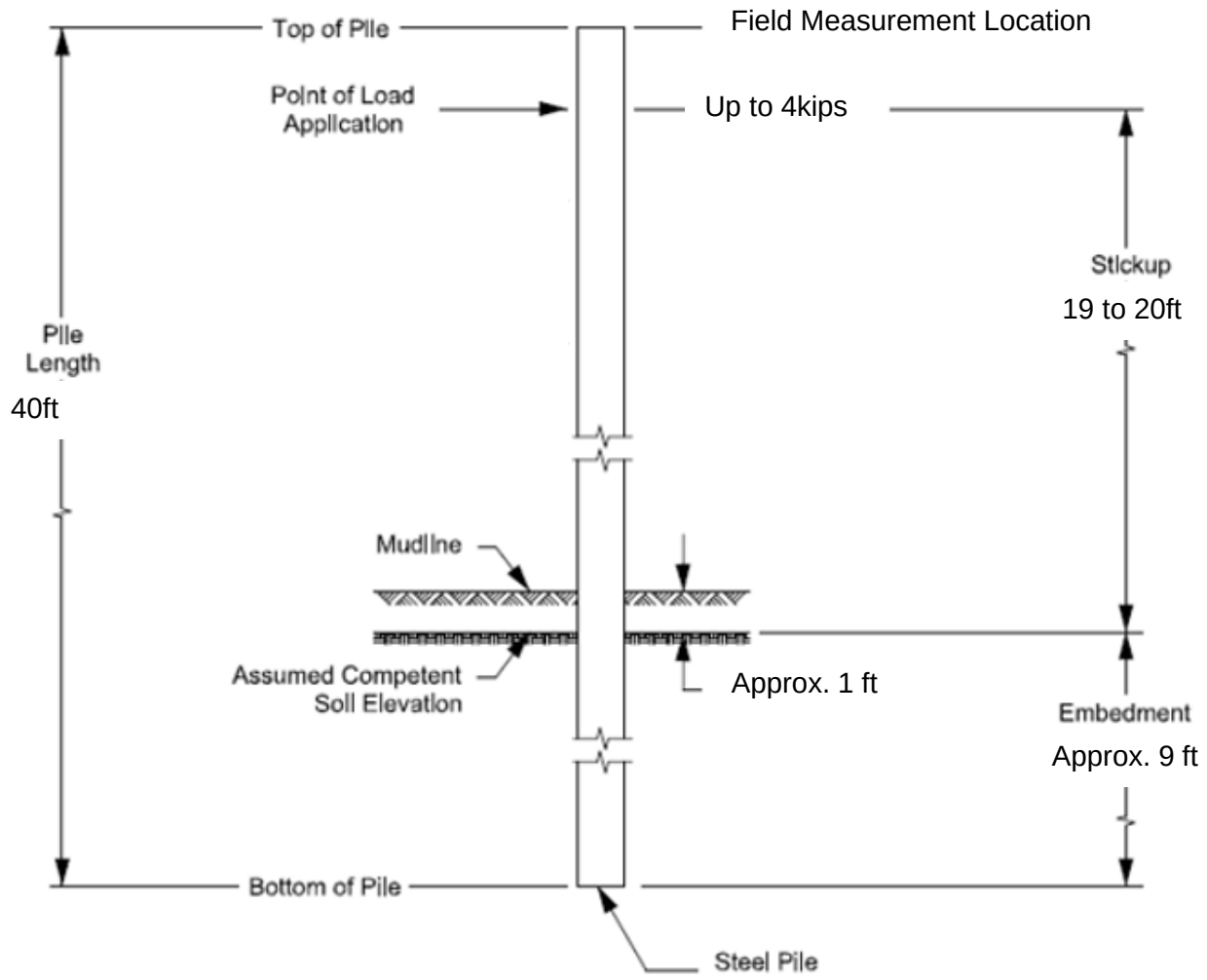
LOAD TESTING AND UPDATED PILE RECOMMENDATIONS

Dear Mr. Spragg:

As requested, we performed a field lateral load test using two recently installed piles within the Dana Point Marina located in Dana Point, California. Using the field load test information, we developed lateral load response curves to provide further understanding of the lateral behavior of the supporting Capistrano Formation and provide the following updated pile recommendations for the subject project.

On October 17, 2022, ENGEO, with assistance from Bellingham Marine personnel, performed a field lateral load pile test on Piles 7 and 8. The subject piles are 40-foot-long, 14-inch-diameter pipe piles with ½-inch wall thickness. Pile testing consisted of applying a lateral load at a height of approximately 19 to 20 feet above the mudline elevation, with lateral measurements taken at the pile head 40 feet above the embedded pile tip elevation. Based on our review of provided blow count information, we understand pile embedment to be approximately 9 feet with blows ranging 28 to 48 per foot for both Piles 7 and 8. To create a lateral load, Piles 7 and 8 were strapped together with a winch and a load cell, and incrementally tensioned the straps in loads of 500-pound increments to a maximum applied load of 4,000 pounds. Pile displacements were record for each applied load from the top of the pile.

EXHIBIT 1: Typical Load Test Section



The data collected from the load tests were then evaluated using the computer program LPILE to back calculate parameters that reasonably fit the load testing data. Results of our load testing and our regression using LPILE is shown in Exhibits 2 and 3, with updated soil parameters in Table 1. Correction to the estimated deformations were applied to account for the displacement observed at the top of the pile relative to the applied load location, as shown in Exhibit 1.

EXHIBIT 2: Load vs. Deflection for Pile 7 – Using Load Testing and LPILE Regression Information

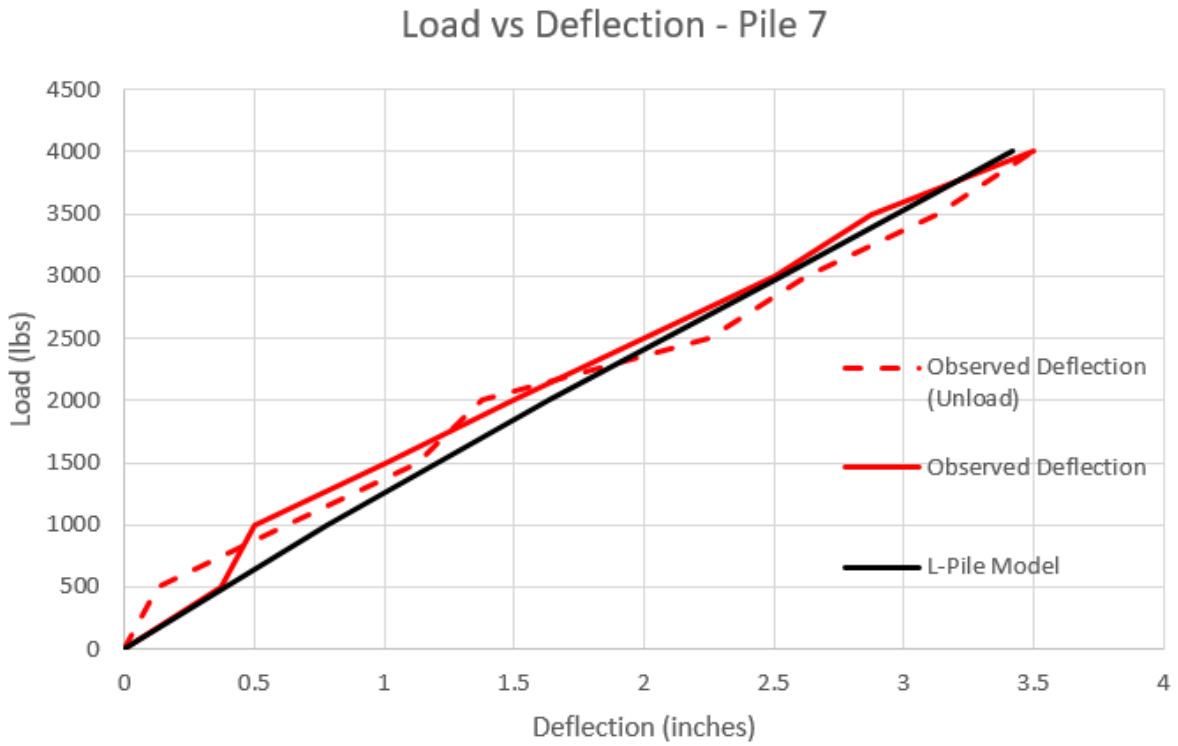
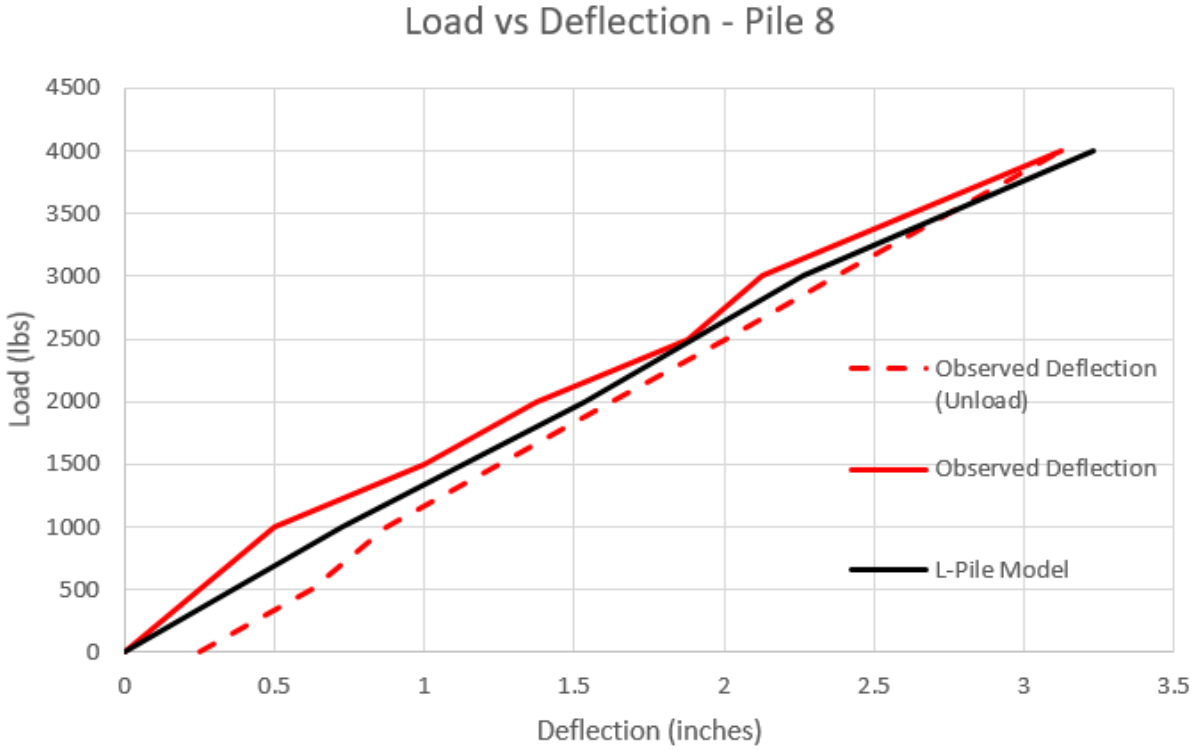


EXHIBIT 3: Load vs Deflection for Pile 8 – Using Load Testing and LPILE Regression Information



L-Pile parameters used in our calibration analysis are provided in Table 1 below.

TABLE 1: Soil Condition Parameters

SOIL TYPE	UNIT WEIGHT (pcf)	COHESION (psf)
Stiff Clay (No Free Water)	60	12,000

Following our LPILE calibration analysis, we performed supplement lateral load capacity analyses. The supplemental analyses (summarized in Table 2) considered multiple mudline conditions were to account for varying thickness of the mudline deposits and depth across the site from Elevation -10 to -17 feet (MLLW).

TABLE 2: L-Pile Results for 14-Inch Steel Pipe Pile

BOTTOM OF MUDLINE (feet)	PILE STICKUP (feet)	PILE EMBEDMENT (feet)	TOTAL PILE LENGTH (feet)	MAXIMUM LATERAL LOAD(kips)	DEFLECTION (Inches)	PILE TIP ELEVATION (feet)	MAXIMUM MOMENT (ft-kip)
-10	19	7	26	13.4	6.6	-17	259
-13	22	7	29	11.6	8	-20	259
-15	24	7	31	10.6	9.3	-22	259
-17	26	7	33	9.9	10.5	-24	259

Based on our analyses, it is our opinion that a 7-foot minimum pile embedment into competent formational material (blow counts on the order of 30 blows per foot) is sufficient for the desired lateral performance of the piles. The recommended pile tip elevations provided are considered approximate due potential variation in mud thickness and encountered subsurface conditions during driving. The above updated recommendations are applicable to the general area tested, should subsurface conditions change substantially, ENGEO should be allowed to review and make updated recommendations, as appropriate.

If you have any questions or comments regarding this letter, please call.

Sincerely,

ENGEO Incorporated

Taylor Strack, PE

REGISTERED PROFESSIONAL ENGINEER TAYLOR JEFF STRACK No. 87513 CIVIL STATE OF CALIFORNIA

Josef J Tootle, GE

REGISTERED PROFESSIONAL ENGINEER JOSEF TOOTLE No. 2677 GEOTECHNICAL STATE OF CALIFORNIA

ts/jjt/ar

Attachments: LPILE Analysis

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LPile for Windows, Version 2022-12.005

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

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Files Used for Analysis ----------

Path to file locations:
\Active Projects_18000 to 19999\19026\analysis\

Name of input data file:
danapt_n10ml_14_12ksf_9ft_nosand.lp12d

Name of output report file:
danapt_n10ml_14_12ksf_9ft_nosand.lp12o

Name of plot output file:
danapt_n10ml_14_12ksf_9ft_nosand.lp12p

Name of runtime message file:
danapt_n10ml_14_12ksf_9ft_nosand.lp12r

Date and Time of Analysis ----------

Date: October 19, 2022 Time: 23:40:40

Problem Title ----------

Project Name: Job Number: Client: Engineer: Description:

Program Options and Settings ----------

Computational Options:
- Conventional Analysis

Engineering Units Used for Data Input and Computations:
- US Customary System Units (pounds, feet, inches)

Analysis Control Options:
- Maximum number of iterations allowed = 750 - Deflection tolerance for convergence = 1.0000E-03 in
- Maximum allowable deflection = 100.0000 in
- Number of pile increments = 100

Loading Type and Number of Cycles of Loading:
- Static loading specified

- Use of p-y modification factors for p-y curves not selected
- 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

 Pile Structural Properties and Geometry ----------

Number of pile sections defined = 1
Total length of pile = 26.000 ft
Depth of ground surface below top of pile = 19.0000 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.

 Depth Below Pile
Point Pile Head Diameter
 No. feet inches ----- ------------- -------------
 1 0.000 14.0000
 2 26.000 14.0000

Input Structural Properties for Pile Sections:

Pile Section No. 1:

 Section 1 is an elastic pile with a specified moment capacity
 Cross-sectional Shape = Circular Pipe
 Length of section = 26.000000 ft
 Width of top of section = 14.000000 in
 Width of bottom of section = 14.000000 in
 Wall Thickness at Top = 0.500000 in
 Wall Thickness at Bottom = 0.500000 in
 Top Area = 21.205750 sq. in
 Bottom Area = 21.205750 sq. in
 Moment of Inertia at Top = 483.756181 in^4 Moment of Inertia at Bottom = 483.756181 in^4
 Elastic Modulus = 29000000. psi
 Plastic Moment Capacity at Top = 3108000. in-lb
 Plastic Moment Capacity at Bottom = 3108000. in-lb
 Top Elastic Bending Stiffness = 1.4029E+10 lbs-in^2
 Bot Elastic Bending Stiffness = 1.4029E+10 lbs-in^2

 Soil and Rock Layering Information ----------

The soil profile is modelled using 1 layers

Layer 1 is stiff clay without free water

Distance from top of pile to top of layer = 19.000000 ft
Distance from top of pile to bottom of layer = 100.000000 ft
Effective unit weight at top of layer = 60.000000 pcf Effective unit weight at bottom of layer = 60.000000 pcf
Undrained cohesion at top of layer = 12000. psf
Undrained cohesion at bottom of layer = 12000. psf
Epsilon-50 at top of layer = 0.0000
Epsilon-50 at bottom of layer = 0.0000

NOTE: Default values for Epsilon-50 will be computed for this layer.

(Depth of the lowest soil layer extends 74.000 ft below the pile tip)

Summary of Input Soil Properties

Layer Num.	Soil Type Name (p-y Curve Type)	Layer Depth ft	Effective Unit Wt. pcf	Cohesion or krm psf	E50
1	Stiff Clay w/o Free Water	19.0000	60.0000	12000.	default
		100.0000	60.0000	12000.	default

Static Loading Type

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

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 1

Load Type	Load Condition 1	Load Condition 2	Axial Thrust Force, lbs	Compute Top y vs. Pile Length	Run Analysis	No.
1	1	V = 13400. lbs	M = 0.0000 in-lbs	0.0000000	No	Yes

V = shear force applied normal to pile axis
M = bending moment applied to pile head

y = lateral deflection normal to pile axis
S = pile slope relative to original pile batter angle
R = rotational stiffness applied to pile head
Values of top y vs. pile lengths can be computed only for load types with specified shear loading (Load Types 1, 2, and 3).
Thrust force is assumed to be acting axially for all pile batter angles.

 Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness ----
---
 Axial thrust force values were determined from pile-head loading conditions

Number of Pile Sections Analyzed = 1

Pile Section No. 1:

Moment-curvature properties were derived from elastic-plastic section properties

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 Computed Values of Pile Loading and Deflection
 for Lateral Loading for Load Case Number 1 ----------

Pile-head conditions are Shear and Moment (Loading Type 1)

Shear force at pile head = 13400.0 lbs
Applied moment at pile head = 0.0 in-lbs
Axial thrust load on pile head = 0.0 lbs

 Depth Deflect. Bending Shear Slope Total Bending Soil Res. Soil Spr.
Distrib. X y Moment Force S Stress Stiffness p Es*H Lat. Load
feet inches in-lbs lbs radians psi* lb-in^2 lb/inch lb/inch lb/inch
---
0.00 6.6458 -4.86E-05 13400. -0.03612 7.04E-07 1.40E+10 0.00 0.00 0.00
0.2600 6.5332 41808. 13400. -0.03611 604.9659 1.40E+10 0.00 0.00 0.00
0.5200 6.4205 83616. 13400. -0.03610 1210. 1.40E+10 0.00 0.00 0.00
0.7800 6.3079 125424. 13400. -0.03608 1815. 1.40E+10 0.00 0.00 0.00
1.0400 6.1954 167232. 13400. -0.03604 2420. 1.40E+10 0.00 0.00 0.00
1.3000 6.0830 209040. 13400. -0.03600 3025. 1.40E+10 0.00 0.00 0.00
1.5600 5.9707 250848. 13400. -0.03595 3630. 1.40E+10 0.00 0.00 0.00
1.8200 5.8587 292656. 13400. -0.03589 4235. 1.40E+10 0.00 0.00 0.00
2.0800 5.7468 334464. 13400. -0.03582 4840. 1.40E+10 0.00 0.00 0.00
2.3400 5.6351 376272. 13400. -0.03574 5445. 1.40E+10 0.00 0.00 0.00
2.6000 5.5237 418080. 13400. -0.03565 6050. 1.40E+10 0.00 0.00 0.00
2.8600 5.4127 459888. 13400. -0.03556 6655. 1.40E+10 0.00 0.00 0.00
3.1200 5.3019 501696. 13400. -0.03545 7260. 1.40E+10 0.00 0.00 0.00
3.3800 5.1915 543504. 13400. -0.03533 7865. 1.40E+10 0.00 0.00 0.00

```
3.6400 5.0814 585312. 13400. -0.03521 8470. 1.40E+10 0.00 0.00 0.00  3.9000
4.9718 627120. 13400. -0.03507 9074. 1.40E+10 0.00 0.00 0.00  4.1600 4.8626
668928. 13400. -0.03493 9679. 1.40E+10 0.00 0.00 0.00  4.4200 4.7538 710736.
13400. -0.03477 10284. 1.40E+10 0.00 0.00 0.00  4.6800 4.6456 752544. 13400.
-0.03461 10889. 1.40E+10 0.00 0.00 0.00  4.9400 4.5378 794352. 13400.
0.03444 11494. 1.40E+10 0.00 0.00 0.00  5.2000 4.4307 836160. 13400. -0.03426
12099. 1.40E+10 0.00 0.00 0.00  5.4600 4.3241 877968. 13400. -0.03407 12704.
1.40E+10 0.00 0.00 0.00  5.7200 4.2181 919776. 13400. -0.03387 13309.
1.40E+10 0.00 0.00 0.00  5.9800 4.1127 961584. 13400. -0.03366 13914.
1.40E+10 0.00 0.00 0.00  6.2400 4.0080 1003392. 13400. -0.03344 14519.
1.40E+10 0.00 0.00 0.00  6.5000 3.9041 1045200. 13400. -0.03321 15124.
1.40E+10 0.00 0.00 0.00  6.7600 3.8008 1087008. 13400. -0.03298 15729.
1.40E+10 0.00 0.00 0.00  7.0200 3.6983 1128816. 13400. -0.03273 16334.
1.40E+10 0.00 0.00 0.00  7.2800 3.5966 1170624. 13400. -0.03247 16939.
1.40E+10 0.00 0.00 0.00  7.5400 3.4957 1212432. 13400. -0.03221 17544.
1.40E+10 0.00 0.00 0.00  7.8000 3.3956 1254240. 13400. -0.03193 18149.
1.40E+10 0.00 0.00 0.00  8.0600 3.2964 1296048. 13400. -0.03165 18754.
1.40E+10 0.00 0.00 0.00  8.3200 3.1981 1337856. 13400. -0.03136 19359.
1.40E+10 0.00 0.00 0.00  8.5800 3.1007 1379664. 13400. -0.03106 19964.
1.40E+10 0.00 0.00 0.00  8.8400 3.0043 1421472. 13400. -0.03074 20569.
1.40E+10 0.00 0.00 0.00  9.1000 2.9089 1463280. 13400. -0.03042 21174.
1.40E+10 0.00 0.00 0.00  9.3600 2.8145 1505088. 13400. -0.03009 21779.
1.40E+10 0.00 0.00 0.00  9.6200 2.7211 1546896. 13400. -0.02975 22384.
1.40E+10 0.00 0.00 0.00  9.8800 2.6288 1588704. 13400. -0.02940 22989.
1.40E+10 0.00 0.00 0.00  10.1400 2.5376 1630512. 13400. -0.02905 23594.
1.40E+10 0.00 0.00 0.00  10.4000 2.4476 1672320. 13400. -0.02868 24199.
1.40E+10 0.00 0.00 0.00  10.6600 2.3586 1714128. 13400. -0.02830 24804.
1.40E+10 0.00 0.00 0.00  10.9200 2.2709 1755936. 13400. -0.02792 25409.
1.40E+10 0.00 0.00 0.00  11.1800 2.1844 1797744. 13400. -0.02752 26014.
1.40E+10 0.00 0.00 0.00  11.4400 2.0992 1839552. 13400. -0.02712 26619.
1.40E+10 0.00 0.00 0.00  11.7000 2.0152 1881360. 13400. -0.02670 27223.
1.40E+10 0.00 0.00 0.00  11.9600 1.9326 1923168. 13400. -0.02628 27828.
1.40E+10 0.00 0.00 0.00  12.2200 1.8512 1964976. 13400. -0.02585 28433.
1.40E+10 0.00 0.00 0.00  12.4800 1.7713 2006784. 13400. -0.02541 29038.
1.40E+10 0.00 0.00 0.00  12.7400 1.6927 2048592. 13400. -0.02496 29643.
1.40E+10 0.00 0.00 0.00  13.0000 1.6155 2090400. 13400. -0.02450 30248.
1.40E+10 0.00 0.00 0.00  13.2600 1.5398 2132208. 13400. -0.02403 30853.
1.40E+10 0.00 0.00 0.00  13.5200 1.4656 2174016. 13400. -0.02355 31458.
1.40E+10 0.00 0.00 0.00  13.7800 1.3929 2215824. 13400. -0.02306 32063.
1.40E+10 0.00 0.00 0.00  14.0400 1.3217 2257632. 13400. -0.02256 32668.
1.40E+10 0.00 0.00 0.00  14.3000 1.2521 2299440. 13400. -0.02205 33273.
1.40E+10 0.00 0.00 0.00  14.5600 1.1841 2341248. 13400. -0.02154 33878.
1.40E+10 0.00 0.00 0.00  14.8200 1.1177 2383056. 13400. -0.02101 34483.
1.40E+10 0.00 0.00 0.00  15.0800 1.0530 2424864. 13400. -0.02048 35088.
1.40E+10 0.00 0.00 0.00  15.3400 0.9899 2466672. 13400. -0.01993 35693.
1.40E+10 0.00 0.00 0.00  15.6000 0.9286 2508480. 13400. -0.01938 36298.
1.40E+10 0.00 0.00 0.00  15.8600 0.8690 2550288. 13400. -0.01882 36903.
1.40E+10 0.00 0.00 0.00  16.1200 0.8112 2592096. 13400. -0.01825 37508.
1.40E+10 0.00 0.00 0.00  16.3800 0.7551 2633904. 13400. -0.01767 38113.
1.40E+10 0.00 0.00 0.00  16.6400 0.7009 2675712. 13400. -0.01708 38718.
1.40E+10 0.00 0.00 0.00  16.9000 0.6486 2717520. 13400. -0.01648 39323.
1.40E+10 0.00 0.00 0.00  17.1600 0.5981 2759328. 13400. -0.01587 39928.
1.40E+10 0.00 0.00 0.00  17.4200 0.5496 2801136. 13400. -0.01525 40533.
1.40E+10 0.00 0.00 0.00  17.6800 0.5030 2842944. 13400. -0.01462 41138.
```

1.40E+10 0.00 0.00 0.00 17.9400 0.4583 2884752. 13400. -0.01398 41743.
1.40E+10 0.00 0.00 0.00 18.2000 0.4157 2926560. 13400. -0.01334 42348.
1.40E+10 0.00 0.00 0.00 18.4600 0.3751 2968368. 13400. -0.01268 42953.
1.40E+10 0.00 0.00 0.00 18.7200 0.3366 3010176. 13400. -0.01202 43558.
1.40E+10 0.00 0.00 0.00 18.9800 0.3001 3051984. 13400. -0.01134 44163.
1.40E+10 0.00 0.00 0.00 19.2400 0.2658 3093792. 10084. -0.01066 44767.
1.40E+10 -2126. 24954. 0.00 19.5000 0.2336 3114908. 3441. -0.00995 45073.
1.32E+10 -2133. 28488. 0.00 19.7600 0.2037 3115261. -3215. -0.00921 45078.
1.32E+10 -2133. 32675. 0.00 20.0200 0.1761 3094848. -9860. -0.00850 44783.
1.40E+10 -2127. 37678. 0.00 20.2800 0.1507 3053732. -16474. -0.00782 44188.
1.40E+10 -2112. 43743. 0.00 20.5400 0.1273 2992053. -23029. -0.00714 43295.
1.40E+10 -2090. 51198. 0.00 20.8000 0.1061 2910033. -29499. -0.00649 42108.
1.40E+10 -2058. 60515. 0.00 21.0600 0.08686 2807981. -35853. -0.00585 40632.
1.40E+10 -2016. 72405. 0.00 21.3200 0.06958 2686307. -42059. -0.00524 38871.
1.40E+10 -1962. 87988. 0.00 21.5800 0.05416 2545531. -48077. -0.00466 36834.
1.40E+10 -1895. 109161. 0.00 21.8400 0.04051 2386307. -53858. -0.00411
34530. 1.40E+10 -1811. 139439. 0.00 22.1000 0.02852 2209458. -59339. -
0.00360 31971. 1.40E+10 -1703. 186280. 0.00 22.3600 0.01806 2016034. -64426.
-0.00313 29172. 1.40E+10 -1558. 269259. 0.00 22.6200 0.00899 1807441. -
68951. -0.00270 26154. 1.40E+10 -1342. 465658. 0.00 22.8800 0.00118 1585783.
-72337. -0.00233 22946. 1.40E+10 -828.408 2183187. 0.00 23.1400 -0.00552
1356060. -71684. -0.00200 19622. 1.40E+10 1247. 704188. 0.00 23.4000 -
0.01129 1138476. -67358. -0.00172 16474. 1.40E+10 1526. 421629. 0.00 23.6600
-0.01627 935747. -62309. -0.00149 13540. 1.40E+10 1710. 327980. 0.00 23.9200
-0.02060 749669. -56747. -0.00130 10848. 1.40E+10 1855. 280973. 0.00 24.1800
-0.02441 581648. -50767. -0.00116 8417. 1.40E+10 1978. 252843. 0.00 24.4400
-0.02781 432882. -44425. -0.00104 6264. 1.40E+10 2088. 234184. 0.00 24.7000
-0.03092 304437. -37754. -9.61E-04 4405. 1.40E+10 2189. 220871. 0.00 24.9600
-0.03381 197298. -30776. -9.05E-04 2855. 1.40E+10 2284. 210797. 0.00 25.2200
-0.03657 112395. -23505. -8.71E-04 1626. 1.40E+10 2377. 202780. 0.00 25.4800
-0.03924 50627. -15949. -8.53E-04 732.5813 1.40E+10 2467. 196118. 0.00
25.7400 -0.04189 12873. -8113. -8.46E-04 186.2690 1.40E+10 2556. 190387. 0.00
26.0000 -0.04452 0.00 0.00 -8.44E-04 0.00 1.40E+10 2645. 92669. 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 = 6.64584687 inches
Computed slope at pile head = -0.0361181 radians
Maximum bending moment = 3115261. inch-lbs
Maximum shear force = -72337. lbs
Depth of maximum bending moment = 19.76000000 feet below pile head
Depth of maximum shear force = 22.88000000 feet below pile head
Number of iterations = 31
Number of zero deflection points = 1
Pile deflection at ground = 0.29747276 inches

Summary of Pile-head Responses for Conventional Analyses ----------
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Definitions of Pile-head Loading Conditions:

Load Type 1: Load 1 = Shear, V, lbs, and Load 2 = Moment, M, in-lbs
Load Type 2: Load 1 = Shear, V, lbs, and Load 2 = Slope, S, radians Load Type 3: Load 1 = Shear, V, lbs, and Load 2 = Rot. Stiffness, R, in-lbs/rad.
Load Type 4: Load 1 = Top Deflection, y, inches, and Load 2 = Moment, M, in-lbs
Load Type 5: Load 1 = Top Deflection, y, inches, and Load 2 = Slope, S, radians

Load Case No.	Load Type 1	Load 1	Axial Load 2	Pile-head Pile-head Type	Pile-head Loading	Max Shear Deflection	Max Moment Rotation	in Pile	in Pile
						lbs	inches	radians	lbs	in-lbs
1	V, lb	13400.	M, in-lb	0.00	0.00	6.6458	-0.03612	-72337.	3115261.

Maximum pile-head deflection = 6.6458468661 inches
Maximum pile-head rotation = -0.0361181130 radians = -2.069415 deg.

Summary of Warning Messages ----------

The following warning was reported 864 times

**** Warning ****

An unreasonable input value for shear strength has been specified for a layer.
defined using the stiff clay without free water criteria. The input value is greater than 8000 psf. Please check your input data for correctness.

The analysis ended normally.

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LPile for Windows, Version 2022-12.005

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

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Files Used for Analysis

Path to file locations:
\Active Projects_18000 to 19999\19026\analysis\

Name of input data file:
danapt_n13ml_14_12ksf_nosand.lp12d

Name of output report file:
danapt_n13ml_14_12ksf_nosand.lp12o

Name of plot output file:
danapt_n13ml_14_12ksf_nosand.lp12p

Name of runtime message file:
danapt_n13ml_14_12ksf_nosand.lp12r

Date and Time of Analysis

Date: October 19, 2022 Time: 23:41:00

Problem Title

Project Name: Job Number: Client: Engineer: Description:

Program Options and Settings

Computational Options:
- Conventional Analysis

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

- Use of p-y modification factors for p-y curves not selected
- 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

 Pile Structural Properties and Geometry ----------

Number of pile sections defined = 1
Total length of pile = 29.000 ft
Depth of ground surface below top of pile = 22.0000 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.

 Depth Below Pile
Point Pile Head Diameter
 No. feet inches ----- ------------ ------------
 1 0.000 14.0000
 2 29.000 14.0000

Input Structural Properties for Pile Sections:

Pile Section No. 1:

 Section 1 is an elastic pile with a specified moment capacity
 Cross-sectional Shape = Circular Pipe
 Length of section = 29.000000 ft
 Width of top of section = 14.000000 in
 Width of bottom of section = 14.000000 in
 Wall Thickness at Top = 0.500000 in
 Wall Thickness at Bottom = 0.500000 in
 Top Area = 21.205750 sq. in
 Bottom Area = 21.205750 sq. in
 Moment of Inertia at Top = 483.756181 in^4 Moment of Inertia at Bottom = 483.756181 in^4
 Elastic Modulus = 29000000. psi
 Plastic Moment Capacity at Top = 3108000. in-lb
 Plastic Moment Capacity at Bottom = 3108000. in-lb
 Top Elastic Bending Stiffness = 1.4029E+10 lbs-in^2
 Bot Elastic Bending Stiffness = 1.4029E+10 lbs-in^2

 Soil and Rock Layering Information ----------

The soil profile is modelled using 1 layers

Layer 1 is stiff clay without free water

Distance from top of pile to top of layer = 22.000000 ft
Distance from top of pile to bottom of layer = 103.000000 ft
Effective unit weight at top of layer = 60.000000 pcf Effective unit weight at bottom of layer = 60.000000 pcf
Undrained cohesion at top of layer = 12000. psf
Undrained cohesion at bottom of layer = 12000. psf
Epsilon-50 at top of layer = 0.0000
Epsilon-50 at bottom of layer = 0.0000

NOTE: Default values for Epsilon-50 will be computed for this layer.

(Depth of the lowest soil layer extends 74.000 ft below the pile tip)

Summary of Input Soil Properties

Layer Num.	Soil Type Name (p-y Curve Type)	Layer Depth ft	Effective Unit Wt. pcf	Cohesion or krm psf	E50
1	Stiff Clay w/o Free Water	22.0000	60.0000	12000.	default
		103.0000	60.0000	12000.	default

Static Loading Type

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

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 1

Load Type	Load Condition 1	Load Condition 2	Axial Thrust Force, lbs	Compute Top y vs. Pile Length	Run Analysis	No.
1	1	V = 11600. lbs	M = 0.0000 in-lbs	0.0000000	No	Yes

V = shear force applied normal to pile axis
M = bending moment applied to pile head

y = lateral deflection normal to pile axis
S = pile slope relative to original pile batter angle
R = rotational stiffness applied to pile head
Values of top y vs. pile lengths can be computed only for load types with specified shear loading (Load Types 1, 2, and 3).
Thrust force is assumed to be acting axially for all pile batter angles.

 Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness ----
---
 Axial thrust force values were determined from pile-head loading conditions

Number of Pile Sections Analyzed = 1

Pile Section No. 1:

Moment-curvature properties were derived from elastic-plastic section properties

---
 Computed Values of Pile Loading and Deflection
 for Lateral Loading for Load Case Number 1 ----------

Pile-head conditions are Shear and Moment (Loading Type 1)

Shear force at pile head = 11600.0 lbs
Applied moment at pile head = 0.0 in-lbs
Axial thrust load on pile head = 0.0 lbs

 Depth Deflect. Bending Shear Slope Total Bending Soil Res. Soil Spr.
Distrib. X y Moment Force S Stress Stiffness p Es*H Lat. Load
feet inches in-lbs lbs radians psi* lb-in^2 lb/inch lb/inch lb/inch
---------- --------- - ---------- ---------- ---------- ---------- ---------- ---------- ---------- ----------
0.00 7.9741 1.65E-05 11600. -0.03887 2.38E-07 1.40E+10 0.00 0.00 0.00
0.2900 7.8388 40368. 11600. -0.03887 584.1290 1.40E+10 0.00 0.00 0.00
0.5800 7.7035 80736. 11600. -0.03885 1168. 1.40E+10 0.00 0.00 0.00
0.8700 7.5684 121104. 11600. -0.03883 1752. 1.40E+10 0.00 0.00 0.00
1.1600 7.4333 161472. 11600. -0.03879 2337. 1.40E+10 0.00 0.00 0.00
1.4500 7.2983 201840. 11600. -0.03875 2921. 1.40E+10 0.00 0.00 0.00
1.7400 7.1636 242208. 11600. -0.03869 3505. 1.40E+10 0.00 0.00 0.00
2.0300 7.0290 282576. 11600. -0.03863 4089. 1.40E+10 0.00 0.00 0.00
2.3200 6.8947 322944. 11600. -0.03855 4673. 1.40E+10 0.00 0.00 0.00
2.6100 6.7607 363312. 11600. -0.03847 5257. 1.40E+10 0.00 0.00 0.00
2.9000 6.6270 403680. 11600. -0.03837 5841. 1.40E+10 0.00 0.00 0.00
3.1900 6.4936 444048. 11600. -0.03827 6425. 1.40E+10 0.00 0.00 0.00
3.4800 6.3606 484416. 11600. -0.03815 7010. 1.40E+10 0.00 0.00 0.00
3.7700 6.2281 524784. 11600. -0.03803 7594. 1.40E+10 0.00 0.00 0.00

4.0600	6.0959	565152.	11600.	-0.03789	8178.	1.40E+10	0.00	0.00	0.00	4.3500	
5.9643	605520.	11600.	-0.03775	8762.	1.40E+10	0.00	0.00	0.00	4.6400	5.8222	
645888.	11600.	-0.03759	9346.	1.40E+10	0.00	0.00	0.00	4.9300	5.7027	686256.	
11600.	-0.03743	9930.	1.40E+10	0.00	0.00	0.00	5.2200	5.5727	726624.	11600.	
0.03725	10514.	1.40E+10	0.00	0.00	0.00	5.5100	5.4434	766992.	11600.	-0.03707	
11098.	1.40E+10	0.00	0.00	0.00	5.8000	5.3147	807360.	11600.	-0.03688	11683.	
1.40E+10	0.00	0.00	0.00	6.0900	5.1868	847728.	11600.	-0.03667	12267.		
1.40E+10	0.00	0.00	0.00	6.3800	5.0595	888096.	11600.	-0.03645	12851.		
1.40E+10	0.00	0.00	0.00	6.6700	4.9331	928464.	11600.	-0.03623	13435.		
1.40E+10	0.00	0.00	0.00	6.9600	4.8074	968832.	11600.	-0.03599	14019.		
1.40E+10	0.00	0.00	0.00	7.2500	4.6826	1009200.	11600.	-0.03575	14603.		
1.40E+10	0.00	0.00	0.00	7.5400	4.5586	1049568.	11600.	-0.03549	15187.		
1.40E+10	0.00	0.00	0.00	7.8300	4.4356	1089936.	11600.	-0.03522	15771.		
1.40E+10	0.00	0.00	0.00	8.1200	4.3134	1130304.	11600.	-0.03495	16356.		
1.40E+10	0.00	0.00	0.00	8.4100	4.1923	1170672.	11600.	-0.03466	16940.		
1.40E+10	0.00	0.00	0.00	8.7000	4.0722	1211040.	11600.	-0.03437	17524.		
1.40E+10	0.00	0.00	0.00	8.9900	3.9531	1251408.	11600.	-0.03406	18108.		
1.40E+10	0.00	0.00	0.00	9.2800	3.8351	1291776.	11600.	-0.03375	18692.		
1.40E+10	0.00	0.00	0.00	9.5700	3.7182	1332144.	11600.	-0.03342	19276.		
1.40E+10	0.00	0.00	0.00	9.8600	3.6025	1372512.	11600.	-0.03309	19860.		
1.40E+10	0.00	0.00	0.00	10.1500	3.4879	1412880.	11600.	-0.03274	20445.		
1.40E+10	0.00	0.00	0.00	10.4400	3.3746	1453248.	11600.	-0.03239	21029.		
1.40E+10	0.00	0.00	0.00	10.7300	3.2625	1493616.	11600.	-0.03202	21613.		
1.40E+10	0.00	0.00	0.00	11.0200	3.1517	1533984.	11600.	-0.03165	22197.		
1.40E+10	0.00	0.00	0.00	11.3100	3.0423	1574352.	11600.	-0.03126	22781.		
1.40E+10	0.00	0.00	0.00	11.6000	2.9342	1614720.	11600.	-0.03086	23365.		
1.40E+10	0.00	0.00	0.00	11.8900	2.8275	1655088.	11600.	-0.03046	23949.		
1.40E+10	0.00	0.00	0.00	12.1800	2.7222	1695456.	11600.	-0.03004	24533.		
1.40E+10	0.00	0.00	0.00	12.4700	2.6184	1735824.	11600.	-0.02962	25118.		
1.40E+10	0.00	0.00	0.00	12.7600	2.5160	1776192.	11600.	-0.02918	25702.		
1.40E+10	0.00	0.00	0.00	13.0500	2.4153	1816560.	11600.	-0.02874	26286.		
1.40E+10	0.00	0.00	0.00	13.3400	2.3160	1856928.	11600.	-0.02828	26870.		
1.40E+10	0.00	0.00	0.00	13.6300	2.2184	1897296.	11600.	-0.02781	27454.		
1.40E+10	0.00	0.00	0.00	13.9200	2.1224	1937664.	11600.	-0.02734	28038.		
1.40E+10	0.00	0.00	0.00	14.2100	2.0281	1978032.	11600.	-0.02685	28622.		
1.40E+10	0.00	0.00	0.00	14.5000	1.9355	2018400.	11600.	-0.02636	29206.		
1.40E+10	0.00	0.00	0.00	14.7900	1.8447	2058768.	11600.	-0.02585	29791.		
1.40E+10	0.00	0.00	0.00	15.0800	1.7556	2099136.	11600.	-0.02534	30375.		
1.40E+10	0.00	0.00	0.00	15.3700	1.6684	2139504.	11600.	-0.02481	30959.		
1.40E+10	0.00	0.00	0.00	15.6600	1.5829	2179872.	11600.	-0.02427	31543.		
1.40E+10	0.00	0.00	0.00	15.9500	1.4994	2220240.	11600.	-0.02373	32127.		
1.40E+10	0.00	0.00	0.00	16.2400	1.4178	2260608.	11600.	-0.02317	32711.		
1.40E+10	0.00	0.00	0.00	16.5300	1.3381	2300976.	11600.	-0.02261	33295.		
1.40E+10	0.00	0.00	0.00	16.8200	1.2604	2341344.	11600.	-0.02203	33879.		
1.40E+10	0.00	0.00	0.00	17.1100	1.1848	2381712.	11600.	-0.02145	34464.		
1.40E+10	0.00	0.00	0.00	17.4000	1.1112	2422080.	11600.	-0.02085	35048.		
1.40E+10	0.00	0.00	0.00	17.6900	1.0396	2462448.	11600.	-0.02024	35632.		
1.40E+10	0.00	0.00	0.00	17.9800	0.9703	2502816.	11600.	-0.01963	36216.		
1.40E+10	0.00	0.00	0.00	18.2700	0.9030	2543184.	11600.	-0.01900	36800.		
1.40E+10	0.00	0.00	0.00	18.5600	0.8380	2583552.	11600.	-0.01837	37384.		
1.40E+10	0.00	0.00	0.00	18.8500	0.7752	2623920.	11600.	-0.01772	37968.		
1.40E+10	0.00	0.00	0.00	19.1400	0.7147	2664288.	11600.	-0.01707	38553.		
1.40E+10	0.00	0.00	0.00	19.4300	0.6564	2704656.	11600.	-0.01640	39137.		
1.40E+10	0.00	0.00	0.00	19.7200	0.6005	2745024.	11600.	-0.01572	39721.		

1.40E+10 0.00 0.00 0.00 20.0100 0.5470 2785392. 11600. -0.01504 40305.
1.40E+10 0.00 0.00 0.00 20.3000 0.4959 2825760. 11600. -0.01434 40880.
1.40E+10 0.00 0.00 0.00 20.5900 0.4472 2866128. 11600. -0.01364 41473.
1.40E+10 0.00 0.00 0.00 20.8800 0.4010 2906496. 11600. -0.01292 42055.
1.40E+10 0.00 0.00 0.00 21.1700 0.3573 2946864. 11600. -0.01219 42641.
1.40E+10 0.00 0.00 0.00 21.4600 0.3161 2987232. 11600. -0.01146 43226.
1.40E+10 0.00 0.00 0.00 21.7500 0.2775 3027600. 11600. -0.01071 43810.
1.40E+10 0.00 0.00 0.00 22.0400 0.2415 3067968. 8090. -0.00996 44394.
1.40E+10 -2017. 29063. 0.00 22.3300 0.2082 3083906. 1057. -0.00919 44624.
1.40E+10 -2025. 33840. 0.00 22.6200 0.1776 3075324. -5987. -0.00843 44500.
1.40E+10 -2024. 39659. 0.00 22.9100 0.1496 3042235. -13011. -0.00767 44021.
1.40E+10 -2013. 46842. 0.00 23.2000 0.1242 2984767. -19982. -0.00692 43190.
1.40E+10 -1993. 55847. 0.00 23.4900 0.1014 2903164. -26863. -0.00619 42009.
1.40E+10 -1962. 67347. 0.00 23.7800 0.08109 2797800. -33617. -0.00548 40484.
1.40E+10 -1919. 82376. 0.00 24.0700 0.06321 2669192. -40199. -0.00481 38623.
1.40E+10 -1864. 102608. 0.00 24.3600 0.04763 2518014. -46561. -0.00416
36436. 1.40E+10 -1792. 130956. 0.00 24.6500 0.03423 2345129. -52641. -
0.00356 33934. 1.40E+10 -1702. 173026. 0.00 24.9400 0.02285 2151634. -58360.
-0.00300 31134. 1.40E+10 -1585. 241373. 0.00 25.2300 0.01333 1938944. -
63599. -0.00250 28057. 1.40E+10 -1426. 372228. 0.00 25.5200 0.00549 1708985.
-68124. -0.00204 24729. 1.40E+10 -1175. 745279. 0.00 25.8100 -8.86E-04
1464800. -68837. -0.00165 21196. 1.40E+10 765.2842 3005997. 0.00 26.1000 -
0.00599 1229882. -65299. -0.00131 17797. 1.40E+10 1268. 736152. 0.00 26.3900
-0.01004 1010317. -60518. -0.00104 14619. 1.40E+10 1480. 513149. 0.00
26.6800 -0.01321 808676. -55114. -8.11E-04 11702. 1.40E+10 1626. 428329. 0.00
26.9700 -0.01568 626726. -49257. -6.33E-04 9069. 1.40E+10 1740. 385989. 0.00
27.2600 -0.01762 465845. -43038. -4.98E-04 6741. 1.40E+10 1835. 362389. 0.00
27.5500 -0.01915 327183. -36508. -4.00E-04 4734. 1.40E+10 1918. 348535. 0.00
27.8400 -0.02040 211748. -29702. -3.33E-04 3064. 1.40E+10 1994. 340135. 0.00
28.1300 -0.02147 120459. -22639. -2.91E-04 1743. 1.40E+10 2065. 334824. 0.00
28.4200 -0.02243 54181. -15331. -2.70E-04 784.0020 1.40E+10 2134. 331192.
0.00 28.7100 -0.02334 13752. -7785. -2.61E-04 198.9944 1.40E+10 2203.
328389. 0.00 29.0000 -0.02425 0.00 0.00 -2.60E-04 0.00 1.40E+10 2271.
162979. 0.00

* This analysis computed pile response using nonlinear moment-curvature rela-
tionships. 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 inter-
polated 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 = 7.97407264 inches
Computed slope at pile head = -0.0388749 radians
Maximum bending moment = 3083906. inch-lbs
Maximum shear force = -68837. lbs
Depth of maximum bending moment = 22.33000000 feet below pile head
Depth of maximum shear force = 25.81000000 feet below pile head
Number of iterations = 40
Number of zero deflection points = 1
Pile deflection at ground = 0.24650484 inches

Summary of Pile-head Responses for Conventional Analyses ----------
---

Definitions of Pile-head Loading Conditions:

Load Type 1: Load 1 = Shear, V, lbs, and Load 2 = Moment, M, in-lbs
Load Type 2: Load 1 = Shear, V, lbs, and Load 2 = Slope, S, radians Load Type 3: Load 1 = Shear, V, lbs, and Load 2 = Rot. Stiffness, R, in-lbs/rad.
Load Type 4: Load 1 = Top Deflection, y, inches, and Load 2 = Moment, M, in-lbs
Load Type 5: Load 1 = Top Deflection, y, inches, and Load 2 = Slope, S, radians

Load Case No.	Load Type 1	Load 1	Axial Load 2	Pile-head Pile-head Type	Pile-head Loading	Max Shear Deflection	Max Moment Rotation	in Pile	in Pile
						lbs	inches	radians	lbs	in-lbs
1	V, lb	11600.	M, in-lb	0.00	0.00	7.9741	-0.03887	-68837.	3083906.

Maximum pile-head deflection = 7.9740726368 inches
Maximum pile-head rotation = -0.0388748532 radians = -2.227365 deg.

Summary of Warning Messages ----------

The following warning was reported 1025 times

**** Warning ****

An unreasonable input value for shear strength has been specified for a layer.
defined using the stiff clay without free water criteria. The input value is greater than 8000 psf. Please check your input data for correctness.

The analysis ended normally.

==========
===

LPile for Windows, Version 2022-12.005

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

==========
===

This copy of LPile is being used by:

TS
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Files Used for Analysis ----------

Path to file locations:
\Active Projects_18000 to 19999\19026\analysis\

Name of input data file:
danapt_n15ml_14_12ksd_nosand.lp12d

Name of output report file:
danapt_n15ml_14_12ksd_nosand.lp12o

Name of plot output file:
danapt_n15ml_14_12ksd_nosand.lp12p

Name of runtime message file:
danapt_n15ml_14_12ksd_nosand.lp12r

Date and Time of Analysis ----------

Date: October 19, 2022 Time: 23:41:26

Problem Title

Project Name: Job Number: Client: Engineer: Description:

Program Options and Settings

Computational Options:
- Conventional Analysis

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

- Use of p-y modification factors for p-y curves not selected
- 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

 Pile Structural Properties and Geometry ----------

Number of pile sections defined = 1
Total length of pile = 31.000 ft
Depth of ground surface below top of pile = 24.0000 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.

 Depth Below Pile
Point Pile Head Diameter
 No. feet inches ----- ------------ ------------
 1 0.000 14.0000
 2 31.000 14.0000

Input Structural Properties for Pile Sections:

Pile Section No. 1:

 Section 1 is an elastic pile with a specified moment capacity
 Cross-sectional Shape = Circular Pipe
 Length of section = 31.000000 ft
 Width of top of section = 14.000000 in
 Width of bottom of section = 14.000000 in
 Wall Thickness at Top = 0.500000 in
 Wall Thickness at Bottom = 0.500000 in
 Top Area = 21.205750 sq. in
 Bottom Area = 21.205750 sq. in
 Moment of Inertia at Top = 483.756181 in^4 Moment of Inertia at Bottom = 483.756181 in^4
 Elastic Modulus = 29000000. psi
 Plastic Moment Capacity at Top = 3108000. in-lb
 Plastic Moment Capacity at Bottom = 3108000. in-lb
 Top Elastic Bending Stiffness = 1.4029E+10 lbs-in^2
 Bot Elastic Bending Stiffness = 1.4029E+10 lbs-in^2

 Soil and Rock Layering Information ----------

The soil profile is modelled using 1 layers

Layer 1 is stiff clay without free water

Distance from top of pile to top of layer = 24.000000 ft
Distance from top of pile to bottom of layer = 105.000000 ft
Effective unit weight at top of layer = 60.000000 pcf Effective unit weight at bottom of layer = 60.000000 pcf
Undrained cohesion at top of layer = 12000. psf
Undrained cohesion at bottom of layer = 12000. psf
Epsilon-50 at top of layer = 0.0000
Epsilon-50 at bottom of layer = 0.0000

NOTE: Default values for Epsilon-50 will be computed for this layer.

(Depth of the lowest soil layer extends 74.000 ft below the pile tip)

Summary of Input Soil Properties

Layer Num.	Soil Type Name (p-y Curve Type)	Layer Depth ft	Effective Unit Wt. pcf	Cohesion or krm psf	E50
1	Stiff Clay w/o Free Water	24.0000	60.0000	12000.	default
		105.0000	60.0000	12000.	default

Static Loading Type

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

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 1

Load Type	Load 1	Condition 2	Axial Thrust Force, lbs	Compute Top y vs. Pile Length	Run Analysis	No.
	1	1	V = 10600. lbs	M = 0.0000 in-lbs	0.0000000	No
Yes						

V = shear force applied normal to pile axis
M = bending moment applied to pile head

y = lateral deflection normal to pile axis
S = pile slope relative to original pile batter angle
R = rotational stiffness applied to pile head
Values of top y vs. pile lengths can be computed only for load types with specified shear loading (Load Types 1, 2, and 3).
Thrust force is assumed to be acting axially for all pile batter angles.

 Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness ----
---
 Axial thrust force values were determined from pile-head loading conditions

Number of Pile Sections Analyzed = 1

Pile Section No. 1:

Moment-curvature properties were derived from elastic-plastic section properties

---
 Computed Values of Pile Loading and Deflection
 for Lateral Loading for Load Case Number 1 ----------

Pile-head conditions are Shear and Moment (Loading Type 1)

Shear force at pile head = 10600.0 lbs
Applied moment at pile head = 0.0 in-lbs
Axial thrust load on pile head = 0.0 lbs

 Depth Deflect. Bending Shear Slope Total Bending Soil Res. Soil Spr.
Distrib. X y Moment Force S Stress Stiffness p Es*H Lat. Load
feet inches in-lbs lbs radians psi* lb-in^2 lb/inch lb/inch lb/inch
---------- --------- ---------- ---------- ---------- ---------- ---------- ---------- ---------- ----------
0.00 9.2586 -4.14E-05 10600. -0.04169 5.99E-07 1.40E+10 0.00 0.00 0.00
0.3100 9.1035 39432. 10600. -0.04168 570.5850 1.40E+10 0.00 0.00 0.00
0.6200 8.9484 78864. 10600. -0.04167 1141. 1.40E+10 0.00 0.00 0.00
0.9300 8.7935 118296. 10600. -0.04164 1712. 1.40E+10 0.00 0.00 0.00
1.2400 8.6386 157728. 10600. -0.04161 2282. 1.40E+10 0.00 0.00 0.00
1.5500 8.4839 197160. 10600. -0.04156 2853. 1.40E+10 0.00 0.00 0.00
1.8600 8.3294 236592. 10600. -0.04150 3424. 1.40E+10 0.00 0.00 0.00
2.1700 8.1752 276024. 10600. -0.04143 3994. 1.40E+10 0.00 0.00 0.00
2.4800 8.0212 315456. 10600. -0.04136 4565. 1.40E+10 0.00 0.00 0.00
2.7900 7.8675 354888. 10600. -0.04127 5135. 1.40E+10 0.00 0.00 0.00
3.1000 7.7141 394320. 10600. -0.04117 5706. 1.40E+10 0.00 0.00 0.00
3.4100 7.5612 433752. 10600. -0.04106 6276. 1.40E+10 0.00 0.00 0.00
3.7200 7.4087 473184. 10600. -0.04094 6847. 1.40E+10 0.00 0.00 0.00
4.0300 7.2566 512616. 10600. -0.04081 7418. 1.40E+10 0.00 0.00 0.00

```
4.3400 7.1051 552048. 10600. -0.04066 7988. 1.40E+10 0.00 0.00 0.00  4.6500
6.9541 591480. 10600. -0.04051 8559. 1.40E+10 0.00 0.00 0.00  4.9600 6.8027
630912. 10600. -0.04035 9129. 1.40E+10 0.00 0.00 0.00  5.2700 6.6539 670344.
10600. -0.04018 9700. 1.40E+10 0.00 0.00 0.00  5.5800 6.5047 7097 6. 10600.
0.04000 10271. 1.40E+10 0.00 0.00 0.00  5.8900 6.3563 749208. 10600. -0.03980
10841. 1.40E+10 0.00 0.00 0.00  6.2000 6.2086 788640. 10600. -0.03960 11412.
1.40E+10 0.00 0.00 0.00  6.5100 6.0617 828072. 10600. -0.03938 11982.
1.40E+10 0.00 0.00 0.00  6.8200 5.9156 867504. 10600. -0.03916 12553.
1.40E+10 0.00 0.00 0.00  7.1300 5.7703 906936. 10600. -0.03892 13123.
1.40E+10 0.00 0.00 0.00  7.4400 5.6260 946368. 10600. -0.03868 13694.
1.40E+10 0.00 0.00 0.00  7.7500 5.4826 985800. 10600. -0.03842 14265.
1.40E+10 0.00 0.00 0.00  8.0600 5.3401 1025232. 10600. -0.03816 14835.
1.40E+10 0.00 0.00 0.00  8.3700 5.1987 1064664. 10600. -0.03788 15406.
1.40E+10 0.00 0.00 0.00  8.6800 5.0583 1104096. 10600. -0.03759 15976.
1.40E+10 0.00 0.00 0.00  8.9900 4.9190 1143528. 10600. -0.03729 16547.
1.40E+10 0.00 0.00 0.00  9.3000 4.7809 1182960. 10600. -0.03698 17118.
1.40E+10 0.00 0.00 0.00  9.6100 4.6439 1222392. 10600. -0.03667 17688.
1.40E+10 0.00 0.00 0.00  9.9200 4.5081 1261824. 10600. -0.03634 18259.
1.40E+10 0.00 0.00 0.00  10.2300 4.3735 1301256. 10600. -0.03600 18829.
1.40E+10 0.00 0.00 0.00  10.5400 4.2402 1340688. 10600. -0.03565 19400.
1.40E+10 0.00 0.00 0.00  10.8500 4.1083 1380120. 10600. -0.03529 19970.
1.40E+10 0.00 0.00 0.00  11.1600 3.9777 1419552. 10600. -0.03491 20541.
1.40E+10 0.00 0.00 0.00  11.4700 3.8485 1458984. 10600. -0.03453 21112.
1.40E+10 0.00 0.00 0.00  11.7800 3.7208 1498416. 10600. -0.03414 21682.
1.40E+10 0.00 0.00 0.00  12.0900 3.5945 1537848. 10600. -0.03374 22253.
1.40E+10 0.00 0.00 0.00  12.4000 3.4698 1577280. 10600. -0.03332 22823.
1.40E+10 0.00 0.00 0.00  12.7100 3.3466 1616712. 10600. -0.03290 23394.
1.40E+10 0.00 0.00 0.00  13.0200 3.2250 1656144. 10600. -0.03247 23965.
1.40E+10 0.00 0.00 0.00  13.3300 3.1050 1695576. 10600. -0.03202 24535.
1.40E+10 0.00 0.00 0.00  13.6400 2.9868 1735008. 10600. -0.03157 25106.
1.40E+10 0.00 0.00 0.00  13.9500 2.8702 1774440. 10600. -0.03110 25676.
1.40E+10 0.00 0.00 0.00  14.2600 2.7553 1813872. 10600. -0.03063 26247.
1.40E+10 0.00 0.00 0.00  14.5700 2.6423 1853304. 10600. -0.03014 26817.
1.40E+10 0.00 0.00 0.00  14.8800 2.5311 1892736. 10600. -0.02964 27388.
1.40E+10 0.00 0.00 0.00  15.1900 2.4218 1932168. 10600. -0.02914 27959.
1.40E+10 0.00 0.00 0.00  15.5000 2.3143 1971600. 10600. -0.02862 28529.
1.40E+10 0.00 0.00 0.00  15.8100 2.2088 2011032. 10600. -0.02809 29100.
1.40E+10 0.00 0.00 0.00  16.1200 2.1053 2050464. 10600. -0.02755 29670.
1.40E+10 0.00 0.00 0.00  16.4300 2.0038 2089896. 10600. -0.02700 30241.
1.40E+10 0.00 0.00 0.00  16.7400 1.9044 2129328. 10600. -0.02644 30812.
1.40E+10 0.00 0.00 0.00  17.0500 1.8071 2168760. 10600. -0.02587 31382.
1.40E+10 0.00 0.00 0.00  17.3600 1.7119 2208192. 10600. -0.02529 31953.
1.40E+10 0.00 0.00 0.00  17.6700 1.6189 2247624. 10600. -0.02470 32523.
1.40E+10 0.00 0.00 0.00  17.9800 1.5281 2287056. 10600. -0.02410 33094.
1.40E+10 0.00 0.00 0.00  18.2900 1.4396 2326488. 10600. -0.02349 33665.
1.40E+10 0.00 0.00 0.00  18.6000 1.3533 2365920. 10600. -0.02287 34235.
1.40E+10 0.00 0.00 0.00  18.9100 1.2694 2405352. 10600. -0.02224 34806.
1.40E+10 0.00 0.00 0.00  19.2200 1.1879 2444784. 10600. -0.02159 35376.
1.40E+10 0.00 0.00 0.00  19.5300 1.1088 2484216. 10600. -0.02094 35947.
1.40E+10 0.00 0.00 0.00  19.8400 1.0321 2523648. 10600. -0.02028 36517.
1.40E+10 0.00 0.00 0.00  20.1500 0.9579 2563080. 10600. -0.01960 37088.
1.40E+10 0.00 0.00 0.00  20.4600 0.8863 2602512. 10600. -0.01892 37659.
1.40E+10 0.00 0.00 0.00  20.7700 0.8172 2641944. 10600. -0.01822 38229.
1.40E+10 0.00 0.00 0.00  21.0800 0.7507 2681376. 10600. -0.01752 38800.
```

1.40E+10 0.00 0.00 0.00 21.3900 0.6869 2720808. 10600. -0.01680 39370.
1.40E+10 0.00 0.00 0.00 21.7000 0.6257 2760240. 10600. -0.01607 39941.
1.40E+10 0.00 0.00 0.00 22.0100 0.5673 2799672. 10600. -0.01534 40512.
1.40E+10 0.00 0.00 0.00 22.3200 0.5116 2839104. 10600. -0.01459 41082.
1.40E+10 0.00 0.00 0.00 22.6300 0.4588 2878536. 10600. -0.01383 41653.
1.40E+10 0.00 0.00 0.00 22.9400 0.4087 2917968. 10600. -0.01306 42223.
1.40E+10 0.00 0.00 0.00 23.2500 0.3616 2957400. 10600. -0.01228 42794.
1.40E+10 0.00 0.00 0.00 23.5600 0.3174 2996832. 10600. -0.01149 43364.
1.40E+10 0.00 0.00 0.00 23.8700 0.2761 3036264. 10600. -0.01069 43935.
1.40E+10 0.00 0.00 0.00 24.1800 0.2378 3075696. 6787. -0.00988 44506.
1.40E+10 -2050. 32066. 0.00 24.4900 0.2026 3086762. -847.978 -0.00907 44666.
1.40E+10 -2055. 37745. 0.00 24.8000 0.1704 3069387. -8485. -0.00825 44414.
1.40E+10 -2051. 44777. 0.00 25.1100 0.1412 3023636. -16084. -0.00744 43752.
1.40E+10 -2035. 53622. 0.00 25.4200 0.1150 2949725. -23603. -0.00665 42683.
1.40E+10 -2008. 64958. 0.00 25.7300 0.09171 2848027. -30999. -0.00588 41211.
1.40E+10 -1968. 79831. 0.00 26.0400 0.07124 2719095. -38219. -0.00514 39346.
1.40E+10 -1914. 99941. 0.00 26.3500 0.05345 2563679. -45206. -0.00444 37097.
1.40E+10 -1843. 128263. 0.00 26.6600 0.03819 2382762. -51890. -0.00379
34479. 1.40E+10 -1751. 170569. 0.00 26.9700 0.02528 2177616. -58179. -
0.00318 31510. 1.40E+10 -1630. 239955. 0.00 27.2800 0.01451 1949908. -63934.
-0.00263 28215. 1.40E+10 -1464. 375170. 0.00 27.5900 0.00568 1701944. -
68875. -0.00215 24627. 1.40E+10 -1193. 781774. 0.00 27.9000 -0.00148
1437475. -69461. -0.00173 20800. 1.40E+10 878.0577 2200398. 0.00 28.2100 -
0.00723 1185157. -65332. -0.00139 17149. 1.40E+10 1342. 690677. 0.00 28.5200
-0.01180 951405. -59937. -0.00110 13767. 1.40E+10 1559. 491485. 0.00 28.8300
-0.01543 739226. -53853. -8.79E-04 10697. 1.40E+10 1712. 412729. 0.00
29.1400 -0.01834 550742. -47255. -7.08E-04 7969. 1.40E+10 1835. 372220. 0.00
29.4500 -0.02070 387650. -40234. -5.83E-04 5609. 1.40E+10 1940. 348630. 0.00
29.7600 -0.02268 251403. -32841. -4.99E-04 3638. 1.40E+10 2034. 333710. 0.00
30.0700 -0.02441 143311. -25108. -4.46E-04 2074. 1.40E+10 2123. 323518. 0.00
30.3800 -0.02600 64596. -17053. -4.19E-04 934.7111 1.40E+10 2208. 315928.
0.00 30.6900 -0.02753 16439. -8682. -4.08E-04 237.8690 1.40E+10 2292.
309753. 0.00 31.0000 -0.02904 0.00 0.00 -4.06E-04 0.00 1.40E+10 2376.
152185. 0.00

* This analysis computed pile response using nonlinear moment-curvature rela-
 tionships. 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 inter-
 polated 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 = 9.25857774 inches
Computed slope at pile head = -0.0416897 radians
Maximum bending moment = 3086762. inch-lbs
Maximum shear force = -69461. lbs
Depth of maximum bending moment = 24.49000000 feet below pile head
Depth of maximum shear force = 27.90000000 feet below pile head
Number of iterations = 41
Number of zero deflection points = 1
Pile deflection at ground = 0.26002409 inches

Summary of Pile-head Responses for Conventional Analyses ----------
---

Definitions of Pile-head Loading Conditions:

Load Type 1: Load 1 = Shear, V, lbs, and Load 2 = Moment, M, in-lbs
Load Type 2: Load 1 = Shear, V, lbs, and Load 2 = Slope, S, radians Load Type 3: Load 1 = Shear, V, lbs, and Load 2 = Rot. Stiffness, R, in-lbs/rad.
Load Type 4: Load 1 = Top Deflection, y, inches, and Load 2 = Moment, M, in-lbs
Load Type 5: Load 1 = Top Deflection, y, inches, and Load 2 = Slope, S, radians

Load Case No.	Load Type 1	Load 1	Axial Load 2	Pile-head Pile-head Type	Pile-head Loading	Max Shear Deflection	Max Moment Rotation	in Pile	in Pile
						lbs	inches	radians	lbs	in-lbs
1	V, lb	10600.	M, in-lb	0.00	0.00	9.2586	-0.04169	-69461.	3086762.

Maximum pile-head deflection = 9.2585777396 inches
Maximum pile-head rotation = -0.0416896684 radians = -2.388642 deg.

Summary of Warning Messages ----------

The following warning was reported 966 times

**** Warning ****

An unreasonable input value for shear strength has been specified for a layer.
defined using the stiff clay without free water criteria. The input value is greater than 8000 psf. Please check your input data for correctness.

The analysis ended normally.

==========

LPile for Windows, Version 2022-12.005

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

==========

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Files Used for Analysis

Path to file locations:
\Active Projects_18000 to 19999\19026\analysis\

Name of input data file:
danapt_n17ml_14_12ksf_nosand.lp12d

Name of output report file:
danapt_n17ml_14_12ksf_nosand.lp12o

Name of plot output file:
danapt_n17ml_14_12ksf_nosand.lp12p

Name of runtime message file:
danapt_n17ml_14_12ksf_nosand.lp12r

Date and Time of Analysis

Date: October 19, 2022 Time: 23:42:06

Problem Title

Project Name: Job Number: Client: Engineer: Description:

Program Options and Settings

Computational Options:
- Conventional Analysis

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

- Use of p-y modification factors for p-y curves not selected
- 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

 Pile Structural Properties and Geometry ----------

Number of pile sections defined = 1
Total length of pile = 33.000 ft
Depth of ground surface below top of pile = 26.0000 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.

 Depth Below Pile
Point Pile Head Diameter
 No. feet inches ----- ------------ ------------
 1 0.000 14.0000
 2 33.000 14.0000

Input Structural Properties for Pile Sections:

Pile Section No. 1:

 Section 1 is an elastic pile with a specified moment capacity
 Cross-sectional Shape = Circular Pipe
 Length of section = 33.000000 ft
 Width of top of section = 14.000000 in
 Width of bottom of section = 14.000000 in
 Wall Thickness at Top = 0.500000 in
 Wall Thickness at Bottom = 0.500000 in
 Top Area = 21.205750 sq. in
 Bottom Area = 21.205750 sq. in
 Moment of Inertia at Top = 483.756181 in^4 Moment of Inertia at Bottom = 483.756181 in^4
 Elastic Modulus = 29000000. psi
 Plastic Moment Capacity at Top = 3108000. in-lb
 Plastic Moment Capacity at Bottom = 3108000. in-lb
 Top Elastic Bending Stiffness = 1.4029E+10 lbs-in^2
 Bot Elastic Bending Stiffness = 1.4029E+10 lbs-in^2

 Soil and Rock Layering Information ----------

The soil profile is modelled using 1 layers

Layer 1 is stiff clay without free water

Distance from top of pile to top of layer = 26.000000 ft
Distance from top of pile to bottom of layer = 107.000000 ft
Effective unit weight at top of layer = 60.000000 pcf Effective unit weight at bottom of layer = 60.000000 pcf
Undrained cohesion at top of layer = 12000. psf
Undrained cohesion at bottom of layer = 12000. psf
Epsilon-50 at top of layer = 0.0000
Epsilon-50 at bottom of layer = 0.0000

NOTE: Default values for Epsilon-50 will be computed for this layer.

(Depth of the lowest soil layer extends 74.000 ft below the pile tip)

Summary of Input Soil Properties

Layer Num.	Soil Type Name (p-y Curve Type)	Layer Depth ft	Effective Unit Wt. pcf	Cohesion or krm psf	E50
1	Stiff Clay w/o Free Water	26.0000	60.0000	12000.	default
		107.0000	60.0000	12000.	default

Static Loading Type

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

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 1

Load Type	Load 1	Condition 2	Axial Thrust Force, lbs	Compute Top y vs. Pile Length	Run Analysis	No. Iterations
1	1	V = 9900. lbs	M = 0.0000 in-lbs	0.0000000	Yes	Yes

V = shear force applied normal to pile axis
M = bending moment applied to pile head

y = lateral deflection normal to pile axis
S = pile slope relative to original pile batter angle
R = rotational stiffness applied to pile head
Values of top y vs. pile lengths can be computed only for load types with specified shear loading (Load Types 1, 2, and 3).
Thrust force is assumed to be acting axially for all pile batter angles.

 Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness ----
---
 Axial thrust force values were determined from pile-head loading conditions

Number of Pile Sections Analyzed = 1

Pile Section No. 1:

Moment-curvature properties were derived from elastic-plastic section properties

---
 Computed Values of Pile Loading and Deflection
 for Lateral Loading for Load Case Number 1 ----------

Pile-head conditions are Shear and Moment (Loading Type 1)

Shear force at pile head = 9900.0 lbs
Applied moment at pile head = 0.0 in-lbs
Axial thrust load on pile head = 0.0 lbs

 Depth Deflect. Bending Shear Slope Total Bending Soil Res. Soil Spr.
Distrib. X y Moment Force S Stress Stiffness p Es*H Lat. Load feet inches
in-lbs lbs radians psi* lb-in^2 lb/inch lb/inch lb/inch ---------- ---------
- ---------- ---------- ---------- ---------- ---------- ---------- ---------
- ---------- 0.00 10.4957 -5.88E-05 9900. -0.04432 8.51E-07 1.40E+10 0.00
0.00 0.00 0.3300 10.3202 39204. 9900. -0.04431 567.2858 1.40E+10 0.00 0.00
0.00 0.6600 10.1447 78408. 9900. -0.04429 1135. 1.40E+10 0.00 0.00 0.00
0.9900 9.9694 117612. 9900. -0.04427 1702. 1.40E+10 0.00 0.00 0.00 1.3200
9.7941 156816. 9900. -0.04423 2269. 1.40E+10 0.00 0.00 0.00 1.6500 9.6191
196020. 9900. -0.04418 2836. 1.40E+10 0.00 0.00 0.00 1.9800 9.4442 235224.
9900. -0.04412 3404. 1.40E+10 0.00 0.00 0.00 2.3100 9.2697 274428. 9900. -
0.04405 3971. 1.40E+10 0.00 0.00 0.00 2.6400 9.0954 313632. 9900. -0.04396
4538. 1.40E+10 0.00 0.00 0.00 2.9700 8.9215 352836. 9900. -0.04387 5106.
1.40E+10 0.00 0.00 0.00 3.3000 8.7479 392040. 9900. -0.04376 5673. 1.40E+10
0.00 0.00 0.00 3.6300 8.5749 431244. 9900. -0.04365 6240. 1.40E+10 0.00 0.00
0.00 3.9600 8.4023 470448. 9900. -0.04352 6807. 1.40E+10 0.00 0.00 0.00
4.2900 8.2302 509652. 9900. -0.04338 7375. 1.40E+10 0.00 0.00 0.00 4.6200

8.0587 548856. 9900. -0.04323 7942. 1.40E+10 0.00 0.00 0.00 4.9500 7.8878
588060. 9900. -0.04307 8509. 1.40E+10 0.00 0.00 0.00 5.2800 7.7175 627264.
9900. -0.04290 9077. 1.40E+10 0.00 0.00 0.00 5.6100 7.5480 666468. 9900. -
0.04272 9644. 1.40E+10 0.00 0.00 0.00 5.9400 7.3792 705672. 9900. -0.04252
10211. 1.40E+10 0.00 0.00 0.00 6.2700 7.2112 744876. 9900. -0.04232 10778.
1.40E+10 0.00 0.00 0.00 6.6000 7.0440 784080. 9900. -0.04210 11346. 1.40E+10
0.00 0.00 0.00 6.9300 6.8777 823284. 9900. -0.04188 11913. 1.40E+10 0.00
0.00 0.00 7.2600 6.7124 862488. 9900. -0.04164 12480. 1.40E+10 0.00 0.00
0.00 7.5900 6.5480 901692. 9900. -0.04139 13048. 1.40E+10 0.00 0.00 0.00
7.9200 6.3846 940896. 9900. -0.04113 13615. 1.40E+10 0.00 0.00 0.00 8.2500
6.2222 980100. 9900. -0.04086 14182. 1.40E+10 0.00 0.00 0.00 8.5800 6.0610
1019304. 9900. -0.04058 14749. 1.40E+10 0.00 0.00 0.00 8.9100 5.9009
1058508. 9900. -0.04028 15317. 1.40E+10 0.00 0.00 0.00 9.2400 5.7419
1097712. 9900. -0.03998 15884. 1.40E+10 0.00 0.00 0.00 9.5700 5.5842
1136916. 9900. -0.03966 16451. 1.40E+10 0.00 0.00 0.00 9.9000 5.4278
1176120. 9900. -0.03934 17019. 1.40E+10 0.00 0.00 0.00 10.2300 5.2727
1215324. 9900. -0.03900 17586. 1.40E+10 0.00 0.00 0.00 10.5600 5.1189
1254528. 9900. -0.03865 18153. 1.40E+10 0.00 0.00 0.00 10.8900 4.9666
1293732. 9900. -0.03829 18720. 1.40E+10 0.00 0.00 0.00 11.2200 4.8156
1332936. 9900. -0.03792 19288. 1.40E+10 0.00 0.00 0.00 11.5500 4.6662
1372140. 9900. -0.03754 19855. 1.40E+10 0.00 0.00 0.00 11.8800 4.5183
1411344. 9900. -0.03715 20422. 1.40E+10 0.00 0.00 0.00 12.2100 4.3720
1450548. 9900. -0.03674 20990. 1.40E+10 0.00 0.00 0.00 12.5400 4.2273
1489752. 9900. -0.03633 21557. 1.40E+10 0.00 0.00 0.00 12.8700 4.0843
1528956. 9900. -0.03590 22124. 1.40E+10 0.00 0.00 0.00 13.2000 3.9430
1568160. 9900. -0.03546 22691. 1.40E+10 0.00 0.00 0.00 13.5300 3.8034
1607364. 9900. -0.03502 23259. 1.40E+10 0.00 0.00 0.00 13.8600 3.6657
1646568. 9900. -0.03456 23826. 1.40E+10 0.00 0.00 0.00 14.1900 3.5297
1685772. 9900. -0.03409 24393. 1.40E+10 0.00 0.00 0.00 14.5200 3.3957
1724976. 9900. -0.03360 24961. 1.40E+10 0.00 0.00 0.00 14.8500 3.2636
1764180. 9900. -0.03311 25528. 1.40E+10 0.00 0.00 0.00 15.1800 3.1335
1803384. 9900. -0.03261 26095. 1.40E+10 0.00 0.00 0.00 15.5100 3.0053
1842588. 9900. -0.03209 26662. 1.40E+10 0.00 0.00 0.00 15.8400 2.8793
1881792. 9900. -0.03157 27230. 1.40E+10 0.00 0.00 0.00 16.1700 2.7553
1920996. 9900. -0.03103 27797. 1.40E+10 0.00 0.00 0.00 16.5000 2.6335
1960200. 9900. -0.03048 28364. 1.40E+10 0.00 0.00 0.00 16.8300 2.5139
1999404. 9900. -0.02993 28932. 1.40E+10 0.00 0.00 0.00 17.1600 2.3965
2038608. 9900. -0.02936 29499. 1.40E+10 0.00 0.00 0.00 17.4900 2.2814
2077812. 9900. -0.02877 30066. 1.40E+10 0.00 0.00 0.00 17.8200 2.1686
2117016. 9900. -0.02818 30633. 1.40E+10 0.00 0.00 0.00 18.1500 2.0582
2156220. 9900. -0.02758 31201. 1.40E+10 0.00 0.00 0.00 18.4800 1.9502
2195424. 9900. -0.02697 31768. 1.40E+10 0.00 0.00 0.00 18.8100 1.8446
2234628. 9900. -0.02634 32335. 1.40E+10 0.00 0.00 0.00 19.1400 1.7416
2273832. 9900. -0.02570 32903. 1.40E+10 0.00 0.00 0.00 19.4700 1.6410
2313036. 9900. -0.02506 33470. 1.40E+10 0.00 0.00 0.00 19.8000 1.5431
2352240. 9900. -0.02440 34037. 1.40E+10 0.00 0.00 0.00 20.1300 1.4478
2391444. 9900. -0.02373 34604. 1.40E+10 0.00 0.00 0.00 20.4600 1.3552
2430648. 9900. -0.02305 35172. 1.40E+10 0.00 0.00 0.00 20.7900 1.2653
2469852. 9900. -0.02236 35739. 1.40E+10 0.00 0.00 0.00 21.1200 1.1781
2509056. 9900. -0.02165 36306. 1.40E+10 0.00 0.00 0.00 21.4500 1.0938
2548260. 9900. -0.02094 36874. 1.40E+10 0.00 0.00 0.00 21.7800 1.0123
2587464. 9900. -0.02021 37441. 1.40E+10 0.00 0.00 0.00 22.1100 0.9337
2626668. 9900. -0.01948 38008. 1.40E+10 0.00 0.00 0.00 22.4400 0.8580
2665872. 9900. -0.01873 38575. 1.40E+10 0.00 0.00 0.00 22.7700 0.7853

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2705076.  9900.  -0.01797  39143.  1.40E+10  0.00  0.00  0.00   23.1000  0.7157
2744280.  9900.  -0.01720  39710.  1.40E+10  0.00  0.00  0.00   23.4300  0.6491
2783484.  9900.  -0.01642  40277.  1.40E+10  0.00  0.00  0.00   23.7600  0.5856
2822688.  9900.  -0.01563  40845.  1.40E+10  0.00  0.00  0.00   24.0900  0.5252
2861892.  9900.  -0.01483  41412.  1.40E+10  0.00  0.00  0.00   24.4200  0.4681
2901096.  9900.  -0.01402  41979.  1.40E+10  0.00  0.00  0.00   24.7500  0.4142
2940300.  9900.  -0.01319  42546.  1.40E+10  0.00  0.00  0.00   25.0800  0.3636
2979504.  9900.  -0.01236  43114.  1.40E+10  0.00  0.00  0.00   25.4100  0.3164
3018708.  9900.  -0.01151  43681.  1.40E+10  0.00  0.00  0.00   25.7400  0.2725
3057912.  9900.  -0.01065  44248.  1.40E+10  0.00  0.00  0.00   26.0700  0.2320
3097116.  5929.  -0.00978  44816.  1.40E+10 -2006.  34236.  0.00   26.4000  0.1950
3104869. -2024.  -0.00891  44928.  1.40E+10 -2011.  40846.  0.00   26.7300  0.1614
3081087. -9975.  -0.00804  44584.  1.40E+10 -2005.  49182.  0.00   27.0600  0.1313
3025868. -17877.  -0.00717  43785.  1.40E+10 -1986.  59893.  0.00   27.3900  0.1046
2939505. -25678.  -0.00633  42535.  1.40E+10 -1954.  73973.  0.00   27.7200  0.08116
2822503. -33321.  -0.00552  40842.  1.40E+10 -1907.  93028.  0.00   28.0500  0.06088
2675601. -40744.  -0.00474  38716.  1.40E+10 -1842.  119822.  0.00   28.3800
 0.04359  2499812.  -47870.  -0.00401  36173.  1.40E+10 -1757.  159597.  0.00
 28.7100  0.02910  2296472.  -54605.  -0.00334  33230.  1.40E+10 -1644.  223778.  0.00
 29.0400  0.01717  2067344.  -60812.  -0.00272  29915.  1.40E+10 -1491.  343740.  0.00
 29.3700  0.00756  1814839.  -66247.  -0.00217  26261.  1.40E+10 -1254.  657270.  0.00
 29.7000 -2.96E-05  1542664.  -68612.  -0.00170  22322.  1.40E+10  60.0624  8032800.
 0.00   30.0300 -0.00589  1271431.  -66010.  -0.00130  18398.  1.40E+10  1254.
 842972.  0.00   30.3600 -0.01033  1019867.  -60582.  -9.78E-04  14758.  1.40E+10
 1487.  569808.  0.00   30.6900 -0.01364  791621.  -54390.  -7.22E-04  11455.
 1.40E+10  1640.  476376.  0.00   31.0200 -0.01605  589098.  -47663.  -5.27E-04  8524.
 1.40E+10  1757.  433487.  0.00   31.3500 -0.01781  414130.  -40514.  -3.86E-04  5993.
 1.40E+10  1853.  412064.  0.00   31.6800 -0.01911  268225.  -33010.  -2.89E-04  3881.
 1.40E+10  1937.  401445.  0.00   32.0100 -0.02010  152692.  -25189.  -2.30E-04  2209.
 1.40E+10  2013.  396563.  0.00   32.3400 -0.02093  68726.  -17075.  -1.99E-04
 994.4688  1.40E+10  2085.  394604.  0.00   32.6700 -0.02167  17459.  -8677.  -1.86E-
 04  252.6270  1.40E+10  2156.  393913.  0.00   33.0000 -0.02240  0.00  0.00 -1.84E-04
 0.00  1.40E+10  2227.  196800.  0.00

* This analysis computed pile response using nonlinear moment-curvature rela-
  tionships. 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 inter-
  polated 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 = 10.49566715 inches
Computed slope at pile head = -0.0443170 radians
Maximum bending moment = 3104869. inch-lbs
Maximum shear force = -68612. lbs
Depth of maximum bending moment = 26.40000000 feet below pile head
Depth of maximum shear force = 29.70000000 feet below pile head
Number of iterations = 40
Number of zero deflection points = 1
Pile deflection at ground = 0.24056476 inches
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 Pile-head Deflection vs. Pile Length for Load Case 1 ----------
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Boundary Condition Type 1, Shear and Moment

Shear = 9900. lbs
Moment = 0. in-lbs
Axial Load = 0. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
33.00000	10.49566715	3104869.	-68612.
31.35000	16.87319822	3091235.	-87353.

 Summary of Pile-head Responses for Conventional Analyses ----------
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Definitions of Pile-head Loading Conditions:

Load Type 1: Load 1 = Shear, V, lbs, and Load 2 = Moment, M, in-lbs
Load Type 2: Load 1 = Shear, V, lbs, and Load 2 = Slope, S, radians
Load Type 3: Load 1 = Shear, V, lbs, and Load 2 = Rot. Stiffness, R, in-lbs/rad.
Load Type 4: Load 1 = Top Deflection, y, inches, and Load 2 = Moment, M, in-lbs
Load Type 5: Load 1 = Top Deflection, y, inches, and Load 2 = Slope, S, radians

Load Case No.	Load Type 1	Load 1	Load Type 2	Load 2	Axial Load lbs	Pile-head Deflection inches	Pile-head Rotation radians	Max Shear in Pile lbs	Max Moment in Pile in-lbs
1	V, lb	9900.	M, in-lb	0.00	0.00	10.4957	-0.04432	-68612.	3104869.

Maximum pile-head deflection = 10.4956671511 inches
Maximum pile-head rotation = -0.0443170238 radians = -2.539178 deg.

 Summary of Warning Messages ----------

The following warning was reported 2843 times

**** Warning ****

An unreasonable input value for shear strength has been specified for a layer. defined using the stiff clay without free water criteria. The input value is
greater than 8000 psf. Please check your input data for correctness.

The analysis ended normally.