



Subgrade & Light Tower Exploration Report (Final)
TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas
Summit County, Ohio
S&ME Project No. 24170232F

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April 9, 2026



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Reference: **Subgrade & Light Tower Exploration Report (Final)**
TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas (PID 122877)
Summit County, Ohio
S&ME Project No. 24170232F

Mr. Hughes:

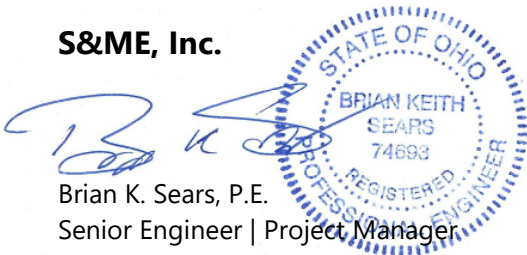
In accordance with our revised proposal dated September 10, 2025, which was authorized on October 17, 2025, an ms consultants, inc. (ms) Task Order Agreement, S&ME has completed a Geotechnical Exploration for a proposed truck parking facility at the active rest areas along IR 271 approximately 1.1 mile east of Medina County in Summit County, Ohio. The SUM-271 Active Rest Areas is known as Site 15 within the TP 26 NE Ohio project. The approximate location of this project is illustrated on the Vicinity Map included as Plate 1 in Appendix I of this report.

In accordance with Section 701 of the ODOT *Specifications for Geotechnical Explorations (SGE)*, S&ME is herewith submitting a "final" version of our February 13, 2026, "draft" report. On April 2, 2026, ODOT District 1 indicated that there were no comments provided by the ODOT Office of Geotechnical Engineering (OGE) on our draft report. Additionally, S&ME has prepared Geotechnical Profile sheets and will submit these drawings under separate cover.

We appreciate having been given the opportunity to be of service. Please do not hesitate to contact us if you have any further questions regarding this report.

Respectfully,

S&ME, Inc.

The block contains a blue ink signature of Brian K. Sears and a circular blue professional engineer seal for the State of Ohio. The seal text includes "STATE OF OHIO", "BRIAN KEITH SEARS", "74693", and "REGISTERED PROFESSIONAL ENGINEER".

Brian K. Sears, P.E.
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1.0 Executive Summary

An overview of this project and the findings of this geotechnical exploration are presented below. This summary should not be used in place of the more detailed recommendations presented in the remainder of this report.

Category (Section Reference)	Project Overview/Geotechnical Findings
Project Description (Section 2.0)	Construct new truck parking areas at two active rest areas along IR 271, approximately 1.1 miles east of the Medina County line. The project includes parking areas in each direction of IR 271, reusing existing entrance and exit ramps and a new passenger car parking lot at the NB parking area.
Exploration Program (Section 4.0)	Seventeen (17) borings, eight (8) pavement cores and two (2) Wildcat DCPs were performed for the truck parking areas, ramps and proposed light towers. See Table 4-1 for a summary of the borings.
Subsurface Conditions (Section 5.0)	<p><i>Surface Materials:</i> Nine (9) borings or pavement cores were advanced through existing pavement and 15 borings through topsoil/rootmat. Table 5-1 summarizes the type and thicknesses of surficial materials encountered.</p> <p><i>Existing Fill:</i> 2.5 feet of fill or possible fill in two (2) borings at the SB parking area consisting of medium dense gravel (A-1-b, A-2-4) or very stiff cohesive (A-4a) soil. Fill in B-017-0-25 contained pockets of organic matter.</p> <p><i>Natural Soil:</i> Primarily stiff to hard cohesive soil (A-4a, A-6a, A-6b, A-7-6) with discontinuous layers of loose to very dense sand/gravel (A-1-a, A-1-b, A-2-4, A-3, A-3a) or silt (A-4b). Borings B-002-0-25 and B-003-0-25 terminated after encountering sand layers described as similar to decomposed sandstone. DCPs encountered soils with similar consistencies to those in the borings.</p> <p><i>Groundwater:</i> No groundwater was noted in 13 of the 17 borings performed at Site 15. Variable amounts of free water were noted during drilling in Borings B-001-0-25, B-002-0-25, B-005-0-25 and B-016-0-25 between depths of 1.0 and 16.0 feet.</p> <p><i>Bedrock:</i> Sandstone bedrock was encountered in Borings B-001-0-25 (El. 1114.6) and B-016-0-25 (El. 1164.0). Five (5) feet of rock was cored in B-001-0-25.</p>
Subgrade Support Parameters (Section 6.2.1)	Average California Bearing Ratio (CBR) of 6%. Resilient Modulus (M_R) of 7,200 psi at both parking areas.
Subgrade Remediation (Sections 6.2.2, 6.2.3 and 6.2.4)	Four (4) of seven (7) borings (57%) in the NB area and six (6) of 10 borings (60%) in the SB area encountered unstable soil that the Subgrade Analysis spreadsheets indicate may require subgrade remediation. Since more than 30 percent of the borings require remediation, S&ME recommends global cement stabilization (14 inches deep) be used to remediate the pavement subgrade.
Groundwater Considerations (Sections 6.4 and 7.4)	Significant groundwater issues are not anticipated in connection with the proposed roadway or light tower foundation construction. Construction surfaces should be graded to prevent pooling/ponding of water.
Light Tower Foundations (Section 7.0)	Light tower foundations are recommended to be 36 inches in diameter and 8 feet below proposed grade with reinforcement as detailed in ODOT SCD HL-20.21.



2.0 Introduction

This project includes the construction of two new truck parking areas (Site 15) in the existing active rest areas along the northbound (NB) and southbound (SB) directions of IR 271 approximately 1.1 miles east of Medina County and approximately 0.4 miles west of Southern Road in Summit County, Ohio. Site improvements will include new or modified truck parking facilities where full depth asphalt pavement construction will be performed. At the NB parking area, a new passenger car parking lot will be constructed east and south of the current parking lot and a new road will circle around the back of the existing rest area building to connect with the ramp to IR 271. At the SB parking area, truck parking will be constructed in a "U" shape on the north, west and south sides of the existing rest area building. Areas of existing pavement not disturbed by the proposed construction will be left as is with no resurfacing. New high mast light towers will surround each parking area and standard highway light poles will be installed along the ramps. The parking areas are proposed to accommodate approximately 39 and 67 new truck parking spots in the NB and SB directions, respectively. The new passenger lot at the NB parking area will provide approximately 34 parking spots.

This geotechnical exploration was performed in general accordance with the January 2025 ODOT *Specifications for Geotechnical Explorations (SGE)* and ODOT *Geotechnical Design Manual (GDM)*.

3.0 Geology and Observations of the Project

3.1 Geology

This project lies within a previously glaciated portion of Ohio Glaciated Allegheny Plateaus section of Ohio which is located within the Killbuck-Glaciated Pittsburgh Plateau Physiographic Region. Overburden soil within this region is typically composed of Wisconsinian-age clayey glacial till.

Bedrock topography mapping indicates the uppermost bedrock may be present within 10 to 30 feet of the ground surface (between approximate El. 1130 and El. 1150 at the SB parking area and between approximate El. 1100 and El. 1130 at the NB parking area) and to consist of Mississippian-age shale, siltstone and sandstone. Bedrock was encountered in two (2) borings performed in this geotechnical exploration ranging from El. 1114.6 (NB parking area) to El. 1164.0 (SB parking area).

The primary groundwater aquifer is anticipated to be within the Mississippian-age interbedded shale and sandstone (predominantly shale) bedrock, developing yields from 10 to 25 gallons per minute (gpm).

A review of the ODNR resources indicates the site is not in an area known to contain karst bedrock features or be subject to severe slope failure. The ODNR online "Mines of Ohio" tool indicates there are no active or abandoned mines reported within or near the project limits.

Please refer to S&ME Desktop Study Report dated June 18, 2025, for a more detailed discussion of the site geology.



3.2 Reconnaissance

S&ME, accompanied by representatives from 2LMN, visited Site 15 on May 15, 2025. The following items were noted during our site visit. Additional observations and site photos are included in our Desktop Study Report dated June 18, 2025.

- Both sites are active rest areas with existing restroom buildings, pavilions, picnic areas, trees, etc.
- The ground surface on most of the SB rest area gently slopes downward from north to south with the slope rate steepening near the southern end of the rest area.
- The southern half of the NB rest area slopes gently upward from south to north, with the slope rate increasing on the northern portion of the NB rest area.
- Existing drainage swales (roughly 2 to 5 feet below IR 271) are present between the outside shoulders of both directions of IR 271 and the adjacent rest area parking.
- Areas of possible wetlands were observed adjacent to and within the tree lines surrounding both rest areas.
- A cell tower is located on the northwest corner of the SB rest area parcel, with an access road departing the north end of the vehicular parking lot and winding north and west to the cell tower.
- Storm sewer inlets were noted within the drainage swales on both sides of IR 271.
- A small sewage treatment plant is located in the southeast corner of the NB rest area.

3.3 Available Information

S&ME searched the online ODOT Transportation Information Mapping System (TIMS) for historic soil boring information in the project vicinity. Within TIMS, soil plan and profile sheets with subgrade borings performed within the limits of both the NB and SB parking areas were located. These borings generally encountered cohesive soil (A-4a, A-6a) with occasional layers of gravel or silt (A-1-b, A-4b). This historic information did not meet current ODOT specifications and, therefore, was not incorporated into this geotechnical exploration for the proposed parking areas.

4.0 Exploration

4.1 Field Investigation

Between November 6 and 12, 2025, a total of 17 borings were performed at Site 15. Seven (7) borings were performed within the parking area and high mast light towers in the NB direction and ten (10) borings were drilled for the SB parking area and high mast light towers. Table 4-1 provides a summary of the borings performed for Site 15, including their purpose and termination depth. For the remainder of this report, the borings will generally be referred to without the two-year designation (i.e., B-001-0).



Table 4-1 – Summary of Project Borings

Northbound Truck Parking Area			Southbound Truck Parking Area		
Boring ID	Termination Depth (ft)	Purpose	Boring ID	Termination Depth (ft)	Purpose
B-001-0-25	17.5	Embankment/Light Tower	B-008-0-25	25.0	Embankment/Light Tower
B-002-0-25	10.0	Embankment	B-009-0-25	10.0	Embankment
B-003-0-25	9.3	Embankment	B-010-0-25	10.0	Embankment
B-004-0-25	10.0	Embankment	B-011-0-25	25.0	Embankment/Light Tower
B-005-0-25	20.0	Embankment/Light Tower	B-012-0-25	25.0	Embankment/Light Tower
B-006-0-25	10.0	Embankment	B-013-0-25	10.0	Embankment
B-007-0-25	10.0	Embankment	B-014-0-25	10.0	Embankment
			B-015-0-25	10.0	Embankment
			B-016-0-25	23.7	Embankment/Light Tower
			B-017-0-25	10.0	Cell Tower Access Rd

The borings were performed by an ATV-mounted drilling rig using a 3¼-inch I.D. hollow-stem auger to advance the borings between sampling attempts. Disturbed but representative soil samples were obtained by lowering a 2-inch O.D. split-barrel sampler to the bottom of the boring and then driving the sampler into the soil with blows from a 140-pound hammer freely falling 30 inches (AASHTO T206 - Standard Penetration Test). Sampling was performed at 2.5-foot intervals in each boring performed to the planned termination depth or until refusal (auger or SPT) was encountered. SPT samples were examined immediately after recovery and representative portions were preserved in airtight jars. In accordance with the ODOT *SGE*, the hammer system on the drill rig used for this exploration was calibrated in accordance with ASTM D4633 on December 30, 2024, and has a drill rod energy of 91.0%. In accordance with the ODOT *SGE*, the energy ratio has been limited to 90%. At Boring B-001, five (5) feet of rock core was attempted with a NQ-size rock core barrel using water as a circulating fluid. Recovered bedrock core was placed in a compartmented cardboard box. A photograph of the recovered bedrock core is included on Plate 24 of Appendix I.

Groundwater observations were made as the borings were being advanced, and again after the completion of drilling. At the completion of drilling, all borings except Boring B-001 were backfilled with soil cuttings mixed with bentonite and, where advanced through existing pavement, the surface of the road was repaired with cold-patch asphalt. Boring B-001-0 was sealed with a bentonite-cement grout and capped with a few inches of soil cuttings.

In addition to the borings, eight (8) pavement cores (X-001-1-25, X-003-1-25, X-005-1-25, X-007-1-25, X-008-1-25, X-010-1-25, X-011-1-25, X-017-1-25) were performed on November 25, 2025, within existing ramp and parking area paved surfaces. At each core location, the granular base was penetrated to determine the thickness of the layer. No granular base samples were recovered for testing. Photos of the cores were taken in the field and have been included as Plates 28 through 31 in Appendix I. For the remainder of this report, the pavement cores will generally be referred to without the two-year designation (i.e., X-001-1)



Within the wooded area in the southwest corner of the SB rest area, two Wildcat Dynamic Cone Penetrometers (DCPs) were performed on December 5, 2025. The DCPs were performed to assess the relative stiffness/density of the soils in that portion of the project where the drill rig could not gain access. The Wildcat DCPs, termed D-009-1-25 and D-009-2-25 were advanced to depths ranging from 9.7 to 10.3 feet, respectively. As with the borings, the DCPs will hereafter be referred to without their year designations (e.g., D-009-1, D-009-2). The Wildcat DCP explorations consist of allowing a 35-pound hammer to freely fall approximately 15 inches down a guide rod to strike an anvil. Below the anvil, steel rods marked at ten-centimeter increments are attached to a sacrificial conical point at the base of the rods which has a 1.4-inch diameter. The number of blows required to drive the rods is recorded in ten-centimeter increments. The number of blows is entered into a manufacturer provided spreadsheet to estimate the relative density/stiffness of the soils encountered. No samples are collected during the performance of the DCPs. Copies of the DCP logs are submitted as Plates 22 and 23 of Appendix I.

The approximate locations of the borings, pavement cores and Wildcat DCPs performed at the NB and SB parking areas are shown on the Plan of Explorations included as Plates 2A and 2B in Appendix I.

In the field, experienced S&ME personnel performed the following: 1) examined all samples recovered from the borings; 2) preserved representative portions of all soil samples in airtight glass jars and rock core samples in compartmented boxes; 3) prepared a log of each boring; 4) made seepage and groundwater observations; 5) made hand-penetrometer measurements in soil specimens exhibiting cohesion; and, 6) provided liaison between the field work and the Project Engineer so the exploration program could be modified in the event unusual or unexpected subsurface conditions were encountered. All recovered samples were transported to the laboratory of S&ME for further examination and testing.

4.2 Laboratory Testing

In the laboratory, moisture-content testing was performed on all recovered soil samples. Classification testing (liquid/plastic limit determinations and/or grain-size analyses) was performed on a minimum of two (2) soil samples recovered from each boring. Sulfate testing was performed on a representative specimen obtained from within 3 feet of the approximate pavement subgrade level anticipated at each boring. The results of these laboratory tests are recorded numerically on the individual boring logs. An unconfined compressive strength test was performed on a section of recovered rock core from Boring B-001-0. The results of this test are presented on Plates 25 and 26 in Appendix I.

Based upon the results of the laboratory testing program, the field logs were modified, if necessary, and copies of the laboratory-corrected boring logs are submitted as Plates 5 through 21 of Appendix I. Shown on these logs are: descriptions of the soil stratigraphy encountered; depths from which samples were preserved; sampling efforts (blow-counts) required to obtain the specimens in the borings; calculated N_{60} values; laboratory testing results; seepage and groundwater observations made at the time of drilling; and, values of hand-penetrometer measurements made in soil samples exhibiting cohesion. For your reference, hand-penetrometer values are roughly equivalent to the unconfined compressive strength of the cohesive fraction of the soil sample.

Soils have been classified in general accordance with Section 603 of the ODOT *SGE* and described in general in accordance with Section 602. An explanation of the symbols and terms used on the boring logs, definitions of the special adjectives used to denote the minor soil components and information pertaining to sampling and identification are presented on Plate 3 of Appendix I. An explanation of the symbols and terms used on the boring



logs related to bedrock are presented on Plates 4A and 4B of Appendix I. Group Indices determined from the results of the laboratory testing program are also provided on the boring logs.

5.0 Findings

5.1 Existing Surficial Materials

Pavement materials were encountered in the two (2) borings (B-002 and B-005) drilled through the existing parking area pavement as well as the additional pavement core locations. The remaining borings were performed in grassy areas outside of the existing pavement and encountered a variable thickness of topsoil/rootmat. The existing surficial materials encountered in the borings are summarized in Table 5-1.

Table 5-1 – Existing Pavement or Topsoil/Rootmat Thicknesses

	Boring No.	Asphalt (in.)	Concrete (in.)	Granular Base (in.)	Topsoil/ Rootmat (in.)
Northbound Truck Parking Area	B-001-0-25	-	-	-	7
	B-002-0-25	6	10	6	-
	B-003-0-25	-	-	-	4
	B-004-0-25	-	-	-	6
	B-005-0-25	5	9¼*	6	-
	B-006-0-25	-	-	-	6
	B-007-0-25	-	-	-	7
	X-001-1-25	13½	-	5	-
	X-003-1-25	5¼	9¾*	6	-
	X-007-1-25	10½	-	7	-

* Steel reinforcement was observed in the recovered pavement core.



Table 5-1 (continued) – Existing Pavement or Topsoil/Rootmat Thicknesses

	Boring No.	Asphalt (in.)	Concrete (in.)	Granular Base (in.)	Topsoil/ Rootmat (in.)
Southbound Truck Parking Area	B-008-0-25	-	-	-	6
	B-009-0-25	-	-	-	6
	B-010-0-25	-	-	-	5
	B-011-0-25	-	-	-	5
	B-012-0-25	-	-	-	6
	B-013-0-25	-	-	-	5
	B-014-0-25	-	-	-	6
	B-015-0-25	-	-	-	7
	B-016-0-25	-	-	9**	3
	B-017-0-25	-	-	-	6
	X-008-1-25	10	-	7	-
	X-010-1-25	4½	9½*	5	-
	X-011-1-25	5½	9*	5	-
	X-017-1-25	14½	-	6	-

* Steel reinforcement was observed in the recovered pavement core.

** Gravel fill was encountered beneath the topsoil/rootmat.

5.2 Subsurface Stratigraphy

5.2.1 Northbound Parking Area

Beneath the surficial materials summarized in Table 5-1, the borings encountered highly variable natural soils consisting of stiff to hard brown and/or gray SANDY SILT (A-4a), SILT AND CLAY (A-6a), SILTY CLAY (A-6b) and CLAY (A-7-6) or loose to very dense brown and/or gray GRAVEL (A-1-a), GRAVEL WITH SAND AND SILT (A-2-4), FINE SAND (A-3), COARSE AND FINE SAND (A-3a), and SILT (A-4b). Borings B-002-0 and B-003-0 were terminated after encountering COARSE AND FINE SAND (A-3a) layers were described as being similar to decomposed sandstone. Roots and/or wood fragments were noted in four of the borings (B-001-0, B-003-0, B-004-0 and B-006-0).

Light brown and gray SANDSTONE bedrock was encountered in Boring B-001-0 at a depth of 11.0 feet (El. 1114.6). After augering 1.5 feet into highly weathered bedrock, coring of the rock began at a depth of 12.5 feet (El. 1113.1) and encountered slightly weathered, moderately strong SANDSTONE.



5.2.2 *Southbound Parking Area*

Beneath the surficial materials summarized in Table 5-1, Borings B-008 and B-017 encountered 2.5 feet of existing fill or possible fill consisting of medium dense brown and gray GRAVEL WITH SAND (A-1-b) and GRAVEL WITH SAND AND SILT (A-2-4) or very stiff brown SANDY SILT (A-4a). The fill in Boring B-017 contained a few pockets of organic matter.

Below the fill (where encountered) or surficial materials, natural soil consisting of predominantly very stiff to hard brown and/or gray SANDY SILT (A-4a), SILT AND CLAY (A-6a), SILTY CLAY (A-6b) and CLAY (A-7-6) was encountered, with a few stiff zones in Borings B-008-0, B-012-0 and B-013-0, and a soft layer from 5.5 to 8.0 feet in Boring B-016-0. Beginning at a depth of 15.5 feet, Boring B-016-0 encountered a 3.8-foot-thick layer of very dense brown GRAVEL WITH SAND (A-1-b) immediately above light gray and brown SANDSTONE which was encountered at a depth of 19.3 feet (El. 1164.0).

DCPs D-009-1 and D-009-2 encountered predominantly very soft to stiff/very loose to loose soils to depths ranging from 2.0 to 2.3 feet, which were then underlain by predominantly very stiff to hard/medium dense to dense to their termination depth.

5.3 **Groundwater Observations**

During drilling, groundwater was not encountered in 13 of the 17 borings. Variable amounts of groundwater were noted in three (3) borings (B-001-0, B-002-0, B-005-0) at the NB parking area between the depths of 9.0 and 16.0 feet. At the SB parking area, seepage was encountered at a depth of 1.0 feet in Boring B-016. Water/moisture was noted on the DCP rods at depths of 1.0 and 7.0 feet below the ground surface in DCPs D-009-1 and D-009-2 respectively. Please refer to the individual boring and DCP logs for more detailed descriptions of the quantity and depth(s) where groundwater was observed or measured in each exploration. Extended water level readings were not obtained at the boring locations.

5.4 **Soil Sulfate Test Results**

Sulfate content testing was performed in accordance with ODOT Supplement 1122 on samples of soil obtained from within 3 feet of the proposed subgrade level in each boring. The results of these tests ranged from 60 parts per million (ppm) to 300 ppm. These results are below the threshold value of 5,000 ppm that is identified in the ODOT *GDM* as the sulfate concentration above which chemical stabilization should not be performed. The results of these tests are reported on the individual boring logs and on Plates 27 in Appendix I.

6.0 **Analysis and Recommendations**

6.1 **General Discussion**

Based on a status set of Stage 2 plans dated January 30, 2026, the following improvements are being proposed at Site 15, SUM-271 Active NB and SB Rest Areas:

- Construction of an approximate 168-foot wide and 410 to 485-foot-long NB truck parking area with 39 spaces.



- Construction of a new approximate 50-foot wide and 178-foot-long new passenger car parking area with 34 spaces on the NB side of Site 15. This lot will be positioned south and west of the existing parking lot and facilities building. A 12-foot-wide drive/ramp will exit the east end of this lot and loop around the back (east) side of the existing building, eventually curving northwest to connect with the exit ramp to IR 271 northbound.
- Construction of a roughly "U" shaped SB truck parking area providing 67 spaces with the following approximate dimensions:
 - ◆ East side: Approximately 220 feet wide by 315 feet long.
 - ◆ North side: Approximately 117 feet wide by 675 feet long.
 - ◆ West side: Approximately 118 feet wide by 221 feet long.
- No resurfacing of existing entrance/exit ramps or passenger car parking lot and current truck parking area on the SB side will be performed.
- Proposed profile information provided by ms indicates the vertical profile of the parking areas and drives will be generally within 2 feet of the existing ground surface, except as follows:
 - ◆ Up to approximately 8 feet of "cut" will be required within the SB entrance drive on the east side of the entrance drive to the SB truck parking area. These "cut" slopes are to be at an inclination no steeper than 2(H):1(V).
 - ◆ Up to approximately 3.5 feet of "cut" along the NB passenger vehicular ramp that circles around the existing rest area building. These "cut" slopes are proposed at an inclination no steeper than 2(H):1(V).
 - ◆ Up to approximately 5.5 feet of new embankment fill on the west side of the SB exit lane of the SB truck parking area.
- An access drive on a new alignment will be constructed for the existing cell tower at the SB parking area.
- A proposed asphalt pavement section consisting of 10 inches of asphalt over 6 inches aggregate base in all full depth pavement areas.
- Four (4), 45-foot-tall high mast light towers are proposed around the NB parking area and 10 high mast light towers at the SB parking area for a total of 14 light towers.

6.2 Subgrade Assessment

6.2.1 Subgrade Support Parameters

Section 600 of the ODOT *GDM* provides a standard approach to performing explorations and assessing roadway subgrades. The associated spreadsheet (Ver. 14.81, updated 7/21/2025) created by the ODOT Office of Geotechnical Engineering (OGE) is used to estimate roadway subgrade support parameters and identify areas requiring remediation. The spreadsheet (see Plates 1 through 5 for the NB parking area and Plates 6 through 10 for the SB parking area in Appendix II) summarizes the soil type (by ODOT/HRB classification), group indices, depth, blow-counts, Atterberg Limit, and sulfate content values of the proposed subgrade soils encountered in the borings drilled for this project. Using this data, this spreadsheet computes an average of the estimated values of the California Bearing Ratio (CBR) for the soils encountered at or below the anticipated subgrade level of the proposed roadway profile.

Based on the profile elevation data for the proposed ramp and parking area pavements, the following average CBR has been computed by an ODOT Subgrade Analysis spreadsheet for each parking for use during new



pavement design at both the NB and SB parking areas based on the anticipated subgrade soils encountered in the borings performed for this project.

$$\text{CBR} = 6\%$$

Based on this average CBR value and Section 203.1 of the current ODOT *Pavement Design Manual (PDM)*, the following value of Resilient Modulus (M_R) correlates to this average CBR value.

$$M_R = 7,200 \text{ psi}$$

These subgrade support values may be used during new pavement thickness design for this project provided that the entire proposed pavement subgrade is prepared in strict accordance with Item 204 of the ODOT *CMS*, and that all borrow soil placed within 3 feet of the final subgrade elevation of the new pavement provides average subgrade support parameters which meet or exceed the above values. This subgrade evaluation also assumes that the subgrade for the new roadway pavements is composed of the materials encountered in the borings. If, at the time of construction, it is determined that the subgrade consists of materials different than those encountered in the borings, the pavement design subgrade criteria should be reviewed and, if necessary, modified.

However, if a global chemical subgrade stabilization program is performed for this project, Section 203.4.1 of the ODOT *PDM* states when the entire subgrade is chemically stabilized, the resilient modulus of the subgrade soil may be increased by a factor of 1.36 during pavement thickness design. This increase in the design Resilient Modulus value would enable ODOT to use a thinner pavement section to carry the same volume of traffic. Therefore, provided a **global** chemical subgrade stabilization program is implemented, the following value of Resilient Modulus (M_{R-GCS}) may be considered for use during replacement pavement design:

$$M_{R-GCS} = 9,700 \text{ psi}$$

Additional discussions and recommendations pertaining to a chemical subgrade remediation program are presented in the following sections of this report.

6.2.2 Subgrade Remediation Assessment

The ODOT Subgrade Analysis spreadsheet also identifies subgrade soils which are “unsuitable” either by classification (A-4b, A-2-5, A-5, A-7-5, A-8a, A-8b) or if the Liquid Limit value is greater than 65%. The spreadsheet also determines if a subgrade soil may be potentially “unstable” and possibly require subgrade remediation if one or more of the following conditions exist: 1) the lab-measured moisture content exceeds the estimated optimum moisture content of the subgrade soil by more than 3%; 2) normalized blow-count (N_{60}) from the SPT sampling is less than 16 (not applicable to all soil types); and, 3) measured hand penetrometer value is less than 2.0 tsf.

Based on these comparisons and correlations, the Subgrade Analysis spreadsheet provides alternative approaches to remediate and establish a stable soil subgrade using either an “excavate and replace” (ODOT *CMS* Item 204) approach, or chemical stabilization (*CMS* Item 206 and Supplement 1120). However, soils with a sulfate content above 5,000 ppm are generally prohibited from being chemically stabilized.



The subgrade remediation depths identified by the Subgrade Analysis spreadsheet prepared for each parking area and presented in Appendix II (Plates 1 through 5 for the NB parking area and Plates 6 through 10 for the SB parking area) are based on the conditions encountered in the borings during this subsurface investigation. However, because the required amount of remediation is dependent on the moisture content of the subgrade soil at the time of construction, Section 600 of the ODOT *GDM* states that the ultimate decision on required remediation depths and limits should be based on observations during either proofrolling or test-rolling operations at the time of construction.

Based on the results of the borings and the Subgrade Analysis spreadsheet, four (4) of the seven (7) borings in the NB parking area and six (6) of the ten (10) borings in the SB parking area encountered soil identified as potentially being unstable (low N_{60} and high moisture content) and which may require remediation by the procedures recommended in the subgrade analysis.

Typical options for subgrade remediation include Item 204 "Excavate and Replace", either with or without geogrid, or chemical stabilization. Because the percentage of borings that may require remediation exceeds 30% at both parking areas, global stabilization of the subgrade beneath all full depth pavement construction at both the NB and SB parking areas is recommended. The global stabilization may consist of chemical stabilization or "excavate and replace". Due to the relatively high percentage of borings encountering conditions requiring remediation (57% at the NB parking area and 60% at the SB parking area), S&ME recommends the subgrade be globally remediated using chemical stabilization.

6.2.3 *Subgrade Remediation Recommendations*

S&ME recommends that 14 inches of **cement** stabilized subgrade be constructed beneath the proposed roadway pavement on this project. The lateral limits of chemical stabilization should extend to at least 18 inches outside the outside edge of the proposed pavement or paved shoulder, including beneath any curbs and gutters.

The Subgrade Analysis spreadsheets indicate that cement should be the chemical additive, based on the average Plasticity Index (PI) of the soils tested in the uppermost 3 feet below the anticipated subgrade. To utilize the improved Resilient Modulus value for a globally stabilized soil subgrade (M_{R-GCS}) discussed in Section 6.2.1 of this report, S&ME recommends that the mixture design for the soil-cement subgrade be performed in accordance with ODOT *CMS* Item 206, including Item 206.06, "Mixture Design for Chemically Stabilized Soils." Section 609 of the ODOT *GDM* presents additional pay items for the chemical stabilization which should be included in the project plans.

Implementation of a chemical subgrade stabilization program will place restrictions on the type of acceptable borrow soil which may be utilized where the roadway is to be widened or where the profile is to be raised. With a global cement subgrade stabilization program, all soil placed as borrow within 2 feet of the proposed pavement subgrade elevation must be tested in the laboratory to determine that the Plasticity Index of the borrow soil is less than 20. We also recommend that lab testing of the borrow soils be performed prior to importing the borrow to the site.

S&ME recommends that construction traffic be minimized once the required subgrade level has been attained. Construction traffic resulting from cyclical haul routes or limited access points may increase the quantity of soil identified by final proof rolling as requiring removal, particularly during periods of moist weather.



6.2.4 *Additional Subgrade Remediation Considerations*

The estimated subgrade remediation depths are based on conditions encountered in the borings during this subsurface exploration. However, because the required amount of remediation is dependent on the materials encountered and moisture content of the subgrade soil at the time of construction, the ultimate decision on required remediation depths should be based on observations during either proof rolling or test-rolling operations.

As underground utilities are anticipated to be present within the project limits, the depths of the known utilities should be taken into consideration prior to commencing subgrade remediation. Utilities near the proposed bottom of subgrade stabilization depth should be removed/relocated prior to commencing subgrade remediation operations.

6.3 General Roadway/Pavement Construction Considerations

Based on the status set Stage 3 plan and profile information provided to S&ME, we are providing the following recommendations for preparation and construction of the subgrade or embankment for this project.

6.3.1 *Subgrade/Embankment Foundation Preparation*

Prior to the commencement of earthwork operations, it is recommended that all existing pavement, granular base, grass, topsoil, vegetation, and other miscellaneous materials be completely removed from the entire footprint of the proposed pavement subgrades. Following the removal of these materials, it is recommended that the entire exposed subgrade be examined by the Geotechnical Engineer of Record or their designated representative to identify any weak, wet, organic, or otherwise unsuitable soils that were not encountered during the subsurface exploration. Any such materials identified should be removed and replaced with suitable compacted fill (ODOT *Construction and Material Specifications*, CMS, Item 204, or Item 203 when more than 12 inches below the proposed subgrade). Test rolling (Item 206.04) of these areas prior to commencing fill placement may assist in identifying soft weak and wet areas.

Existing underground utilities are anticipated beneath the proposed pavement areas, and the type of material used and the relative compactness of backfill within any such utility trenches are unknown. S&ME recommends any planned utility relocation or removal be performed prior to final subgrade proofrolling. Some instability of utility trench backfill may occur during earthwork operations and/or proofrolling, and some recompaction of granular utility trench backfill may become necessary. Additionally, if water has accumulated within the utility backfill, the subgrade soil in the vicinity of any saturated utility trenches may have become sufficiently weak, soft, and/or wet that proofrolling may identify these additional areas as requiring overexcavation and replacement. In any case, care should be taken not to disturb any shallow utilities during proofrolling or overexcavation activities.

6.3.2 *"Fill" Areas*

Prior to commencing fill placement in pavement areas to attain the proposed subgrade near the edges of the ramps or in the NB and SB parking areas, S&ME recommends that consideration be given to performing Item 206.04 Test Rolling on all exposed embankment foundation areas beneath areas where new fill is required. Test rolling, performed in accordance with Item 204.06 of the ODOT CMS and Section 204 of the ODOT *Construction Administration Manual of Procedures*, would assist in identifying soft, wet, or weak zones, or areas of unsuitable,



organic, or highly plastic soil that may be present. If any such zones of soft, wet, or weak soils are present, the materials contained in these zones should be scarified, dried, and thoroughly recompacted in place in accordance with ODOT CMS Item 203.07. If unsuitable or organic soils are encountered, these materials should be completely removed and the overexcavation filled in a controlled manner with compacted, suitable embankment material (CMS Item 203.02) which meet the additional requirements previously discussed in Section 6.2.1 and discussed later in Section 6.3.4.

Soft, weak, wet, or unsuitable soils that are not removed where only a thin layer of fill is required may result in difficulties achieving the compaction percentages required for the new fill (ODOT CMS Items 203.07 or 204.03) such that final subgrade acceptance proofrolling may require the removal of the new fill. Although the ODOT CMS Item 203.05 permits the use of a "bridge lift" to aid in spanning soft or wet foundation areas, S&ME recommends that this practice not be permitted unless more than 3 feet of new embankment fill placement is required.

A review of the status set Stage 2 plans indicates that the inclination of existing grade ranges from approximately 4H:1V to 10H:1V (or flatter) and proposed new fill embankment side slopes no steeper than 2H:1V where new fill will be placed to attain proposed grades. Based on these shallow existing and proposed slope inclinations and the presence of existing predominantly very stiff to hard cohesive soils below the proposed new fill, S&ME believes that, properly constructed (CMS Items 203 and 204), the side slopes of new fill embankments constructed no steeper than 2(H):1(V) will be stable, and as such, stability analyses were not performed.

6.3.3 *Benching*

After all unsuitable materials have been removed and prior to commencing fill placement, it is recommended that horizontal benches be cut into all existing sloping surfaces steeper than 8(H):1(V) to permit placement and compaction of new fill in horizontal lifts. Where new fill is to be placed on an existing ground surface with a slope between 8(H):1(V) and 4(H):1(V), S&ME recommends that benching of the existing ground be performed in accordance with Item 203.05 of the ODOT CMS. At locations where the existing ground surface is steeper than 4(H):1(V), S&ME recommends "Special Benching" procedures as outlined in Section 800 of the ODOT GDM. **If "Special Benching" is required, Plan Note G109 from the ODOT L&D Manual, Vol. 3, should be included in the General Notes.**

During any required Special Benching procedures, S&ME also recommends the following: 1) only one bench be exposed at any given time and that excavation of the next bench should not be permitted until embankment fill placement and compaction has been completed to the top of the backslope of the previous bench; and, 2) the length of any given bench that is exposed should not exceed the quantity of embankment fill which may be properly placed and compacted in one day. Additionally, S&ME recommends that the final, completed side slopes of embankments be constructed no steeper than 2(H):1(V).

6.3.4 *Borrow Requirements and Compaction Criteria*

Soil used as fill/backfill should consist of inorganic soil free of all miscellaneous materials, cobbles, and boulders, placed in uniform, thin layers and then compacted in accordance with:

- CMS Item 203 when more than 14 inches below the proposed subgrade level.
- CMS Item 206 when constructing a chemically stabilized subgrade.



Borrow materials should not be placed in a frozen condition or upon a frozen surface, and any sloping surfaces on which new fill is to be placed should first be benched in accordance with either ODOT CMS Item 203.05 or Section 800 of the ODOT *GDM*, depending on the slope of the existing ground surface at each location.

Borrow materials to be used as new fill or backfill within 3 feet of the proposed subgrade level should be tested in the laboratory to determine that the borrow materials exhibit subgrade support characteristics that are no less than the CBR value used during the pavement design (see Section 6.2.1). Additionally, as the subgrade is anticipated to be chemically stabilized and cement is recommended for use based on site soils, any borrow materials within 2 feet of the proposed subgrade level should have a PI of less than 20.

Compaction requirements (based on the dry unit weight of the type of soil fill being placed as borrow) for the construction of embankment/subgrade materials are based on

- CMS Item 203.07.B when more than 14 inches below the proposed subgrade level.
- CMS Item 206.05.C when constructing a chemically stabilized subgrade.

S&ME also recommends that once the source of borrow for this project is determined, sampling and testing of this borrow material be performed prior to construction to verify that the borrow soils are suitable for the planned construction. Based on the findings of the exploration at both the NB and SB parking areas, the majority of soils encountered may be considered suitable for use as embankment fill provided the materials meet the requirements of CMS Item 203.02.R and the recommendations provided in this report.

6.3.5 Moisture Conditioning and Subgrade Protection

The cohesive soils encountered in the borings performed for this project, if exposed to inclement weather or rainfall, may rapidly absorb additional moisture, and weaken. It is imperative that these soil types not be exposed to rainfall while in a loosened state (such as during discing and drying for moisture conditioning during fill placement). Should these materials become sufficiently saturated that additional moisture conditioning is impractical, the material should be wasted. Therefore, it is recommended that moisture conditioning only be performed when extended periods of suitable weather are anticipated, and that only the amount of borrow soil be exposed that may be moisture conditioned and properly compacted during suitable weather periods.

Moisture conditioning and protection of the chemically stabilized subgrade, including the application of a curing coat, should be performed in accordance with CMS Item 206.05.D & 206.05.F.

6.3.6 Final Subgrade Preparation

The final proofrolling of the chemically stabilized subgrade should be performed in accordance with CMS Item 206.05.E, with any weak or unstable areas being repaired. Additionally, refer to Section 609 in the ODOT *GDM* regarding pay items for chemical stabilization.

S&ME recommends that construction traffic be completely prohibited during the curing period of a chemically stabilized subgrade and minimized following the curing period. Construction traffic resulting from cyclical haul routes or limited access points may increase the quantity of cement stabilized soil identified by final proof rolling as requiring removal.



6.4 Groundwater Considerations for Subgrade/Embankment Construction

Groundwater measurements obtained from the borings should be considered as temporary, short-term observations and should not be assumed to be representative of the long-term static groundwater level. Based upon observations made at the time of this investigation, significant groundwater problems are not anticipated in connection with the proposed construction. The new pavement subgrade should be graded to prevent surface runoff from pooling on the cohesive soils during construction as exposure of cohesive soils to moisture will result in a decrease in strength and an increase in compressibility. Soil softened by standing water or disturbed by construction activities should be removed before proceeding with construction.

In addition to proper subgrade preparation, we recommend that the pavement design and construction include surface and subsurface drainage measures. Water which infiltrates the pavement and remains trapped within the pavement components during traffic loading is one of the leading causes of premature pavement failure. Effective design measures include the use of perforated underdrain pipes or finger drains below pavements and/or the use of perimeter swales, perimeter edge drains, curbs, or a combination of these features to collect surface water runoff from areas adjacent to the pavement. Cohesive subgrade soils should be crowned or sloped to promote drainage of infiltrating water towards subsurface drainage collection systems.

7.0 High Mast Light Towers Foundations

We note that structure borings performed for this exploration were only drilled for proposed high mast light towers. No borings were performed for standard light poles that are proposed to be installed along the existing ramps and no recommendations for light pole foundations are provided in this report.

7.1 Foundation Design Approach

The ODOT *Geotechnical Design Manual (GDM)* Section 1202 provides direction for performing analyses to determine the foundation/embedment length for light towers. Additional information is provided on ODOT's Standard Construction Drawing (SCD) HL-20.21 "Light Tower Foundations".

Based on information provided by ms on January 30 and February 11, 2026, the high mast light towers proposed at each truck parking area are to be 45-foot-tall towers with a 36-inch diameter drilled shaft foundation. ODOT SCD HL-20.21 provides guidance on the type, size, and quantity of longitudinal and transverse reinforcement within each drilled shaft. The length (depth) of the drilled shaft foundation is based on meeting criteria given in the ODOT *GDM*. However, the ODOT *GDM* does not indicate a minimum foundation length for specific high mast light tower heights.

According to Section 1202 of the ODOT *GDM*, drilled shaft foundations for high mast light towers are geotechnically acceptable with respect to the anticipated lateral loading provided the following conditions are true:

- Service Limit State Loading – The maximum resultant deflection at the top of the high mast light tower is less than 10% of the above ground height of the tower. The maximum resultant deflection is defined as the sum of the deflection at the top of the foundation (shaft head) plus the lateral rotation (in radians) at the top of the shaft (in radians) multiplied by the height of the high mast light tower above the top of the



shaft. As all high mast light towers being proposed for this project have a height of 45 feet, the maximum Service Limit deflection is equal to 54 inches (45 feet = 540 inches).

- Extreme Limit State – LPILE does not calculate a very large deflection (typically around 100 inches) or an infinite or incalculable deflection (i.e., the program fails to converge on a solution).

7.2 Lateral (LPILE) Analysis Parameters

Section 1202 of the ODOT *GDM* indicates a design wind speed of 76 mph should be used for the Service Limit State and a speed of 115 mph at the Extreme Limit State. Based on these wind speeds and the height and weight of the proposed towers, ms provided the following load combinations for use in the lateral load (LPILE) analyses.

- Service Limit State Loading (LPILE Load Case 1):
 - Shear (V) = 1,000 lbs; Moment (M) = 315,600 in-lbs; Weight (W) = 4,200 lbs
- Extreme Limit State Loading (LPILE Load Case 2) (maximum weight):
 - Shear (V) = 2,250 lbs; Moment (M) = 724,800 in-lbs; Weight (W) = 4,600 lbs
- Strength Limit State Loading (LPILE Load Case 3) (minimum weight):
 - Shear (V) = 2,250 lbs; Moment (M) = 724,800 in-lbs; Weight (W) = 3,800 lbs

Lateral load analyses were performed using the software LPILE 2022 using the input parameters above and the soil parameters summarized in Appendix III on Plates 1 and 2 for high mast light towers at the NB parking area and Plates 180 through 183 for high mast light towers at the SB parking area. In accordance with Section 1201 of the ODOT *GDM*, the upper three feet of the soil profile in these analyses has been modeled as a soft clay to account for soils weakened by freeze-thaw or other disturbance.

The top elevation in each soil parameter table corresponds to the elevation at the proposed ground surface at each proposed high-mast light tower as provided by ms in their email dated January 30 and February 11, 2026. However, per ODOT SCD HL-20.21, the drilled shaft foundation will rise 6 to 12 inches above the surrounding ground surface. As such, a stick-up height of 12 inches has been used in our analyses.

7.3 Lateral Load Analysis Summary

Tables 7-1 and 7-2 provide a summary of the deflection, moment, and shear values calculated from the lateral loading analyses for the proposed 45-foot-tall high mast light towers. The deflection values calculated in the Service Limit State analyses meet the *GDM* criteria given above and the analyses for the Extreme Limit State achieved convergence. However, it should be noted the structural resistance of the drilled shaft foundations should be verified to ensure the foundations can withstand the maximum moment and shear forces computed by the LPILE program and which are summarized in Tables 7-1 and 7-2. Based on the results of our analyses, S&ME recommends a minimum 8-foot embedment length for all high mast light tower foundations proposed at this project site. LPILE output from each analysis is provided in Appendix III.



Table 7-1 – Summary of Lateral Load Analysis Results – NB Parking Area

Light Tower Location & Boring ID	Limit State*	Embedment Depth (ft)	Lateral Deflection at Shaft Head (in)	Slope at Shaft Head (rad)	Lateral Deflection at Top of Pole (in)	Total Deflection (in)	Max. Moment (kip-in)	Max. Shear (kips)
NC1-6 (B-001-0-25)	SER-I	8	0.2887	0.0036	1.956	2.24	---	---
	EXT-I (+)		---	---	---	---	781.0	23.0
	EXT-I (-)		---	---	---	---	779.9	22.9
NC2-1 (B-002-0-25)	SER-I	8	0.0278	0.0004	0.207	0.235	---	---
	EXT-I (+)		---	---	---	---	791.3	23.4
	EXT-I (-)		---	---	---	---	791.1	23.4
NC1-7 (B-004-0-25)	SER-I	8	0.0423	0.0006	0.329	0.372	---	---
	EXT-I (+)		---	---	---	---	796.9	25.6
	EXT-I (-)		---	---	---	---	796.7	25.6
NC2-7 (B-005-0-25)	SER-I	8	0.0758	0.0010	0.540	0.616	---	---
	EXT-I (+)		---	---	---	---	783.3	20.8
	EXT-I (-)		---	---	---	---	782.6	20.8

* (+) indicates Extreme Limit State with maximum weight and (-) indicates Extreme Limit State with minimum weight



Table 7-2 – Summary of Lateral Load Analysis Results – SB Parking Area

Light Tower Location & Boring ID	Limit State*	Embedment Depth (ft)	Lateral Deflection at Shaft Head (in)	Slope at Shaft Head (rad)	Lateral Deflection at Top of Pole (in)	Total Deflection (in)	Max. Moment (kip-in)	Max. Shear (kips)
SC1-12 (B-008 & B-010-0-25)	SER-I	8	0.0077	0.0001	0.070	0.078	---	---
	EXT-I (+)		---	---	---	---	808.0	25.1
	EXT-I (-)		---	---	---	---	807.9	25.1
SC1-13 (B-012-0-25)	SER-I	8	0.0099	0.0002	0.084	0.094	---	---
	EXT-I (+)		---	---	---	---	805.6	26.6
	EXT-I (-)		---	---	---	---	805.5	26.5
SC1-14 (B-012 & B-013-0-25)	SER-I	8	0.0186	0.0003	0.138	0.157	---	---
	EXT-I (+)		---	---	---	---	796.2	28.1
	EXT-I (-)		---	---	---	---	796.1	28.1
SC1-15 (B-015-0-25)	SER-I	8	0.0064	0.0001	0.062	0.069	---	---
	EXT-I (+)		---	---	---	---	810.8	24.9
	EXT-I (-)		---	---	---	---	810.8	24.9
SC1-16 (B-008-0-25)	SER-I	8	0.1523	0.0017	0.940	1.092	---	---
	EXT-I (+)		---	---	---	---	783.5	22.5
	EXT-I (-)		---	---	---	---	783.0	22.5
SC1-17 (B-008 & B-009-0-25)	SER-I	8	0.0065	0.0001	0.063	0.069	---	---
	EXT-I (+)		---	---	---	---	810.5	24.9
	EXT-I (-)		---	---	---	---	810.4	24.9
SC1-18 (B-009 & B-011-0-25)	SER-I	8	0.0113	0.0002	0.092	0.104	---	---
	EXT-I (+)		---	---	---	---	802.7	25.1
	EXT-I (-)		---	---	---	---	802.6	25.1
SC1-19 (B-011-0-25)	SER-I	8	0.0062	0.0001	0.060	0.067	---	---
	EXT-I (+)		---	---	---	---	811.3	24.7
	EXT-I (-)		---	---	---	---	811.2	24.7
SC1-20 (B-011 & B-014-0-25)	SER-I	8	0.0062	0.0001	0.060	0.067	---	---
	EXT-I (+)		---	---	---	---	811.3	24.7
	EXT-I (-)		---	---	---	---	811.2	24.7
SC1-21 (B-016-0-25)	SER-I	8	0.4084	0.0045	2.441	2.849	---	---
	EXT-I (+)		---	---	---	---	780.1	28.1
	EXT-I (-)		---	---	---	---	778.1	27.9



7.4 Foundation Plan Notes

Based on the results of our analyses and the conditions encountered in the borings, we recommend the following plan note be provided in the plans regarding the high-mast light tower foundations.

Light Tower Foundation, Misc.: 36" x 8' Deep, As Per Plan

For the 45-foot tall High-Mast Light Towers, at all locations, perform drilled shaft foundation excavation and construction in accordance with ODOT C&MS 524. Predominantly cohesive soils were encountered in all the nearby project soil borings at the Northbound Parking Area (B-001-0-25, B-002-0-25, B-004-0-25 and B-005-0-25) and Southbound Parking Area (B-008-25 through B-016-0-25). However, significant quantities of granular soil were encountered in Boring B-001-0-25. Based on the encountered soil conditions, foundation excavation by the Dry Construction Method, in accordance with ODOT C&MS 524.04.A, may be anticipated. See the attached soil borings for specific details. At all light tower locations, the drilled shafts shall be 36-inch diameter and penetrate 8 feet deep into the ground below finished grade (exclusive of any above-grade pedestal height for mounting). Steel reinforcement for the drilled shaft foundations shall be in accordance with standard construction drawing HL-20.21.

7.5 Groundwater Considerations for Light Tower Foundations

During this exploration, no significant sources of groundwater were encountered in the borings drilled for the light towers. Accordingly, no significant quantities of water are anticipated during excavation of the 8-foot-deep foundation at each of the light tower locations. Some water seepage may enter the foundation excavations through sand seams or desiccation cracks; however, the quantity of water is expected to be limited and may likely be controlled by bailing or using portable pumps.

It is recommended that groundwater (if encountered) should not be allowed to accumulate in the light tower foundation excavations, and that surface water runoff be directed away from the foundation excavations both during and after construction, as the cohesive soil in the walls and at the bottom of the light tower excavations will become soft and weaken when exposed to water. Further, we note the presence of sandy/gravelly soils in three borings (B-001-0, B-002-0 and B-004-0) which may have a higher potential of caving if exposed to water. Additionally, the excavations should not be left open, as the excavation walls may exhibit instability in the presence of construction vibrations.

8.0 Limitations and Final Considerations

This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. The conclusions and recommendations contained in this report are based upon applicable standards of our practice in this geographic area at the time this report was prepared. No other representation or warranty, either express or implied, is made.

We relied on project information given to us to develop our conclusions and recommendations. If project information described in this report is not accurate, or if it changes during project development, we should be notified of the changes so that we can modify our recommendations based on this additional information if necessary.



Our conclusions and recommendations are based on limited data from a field exploration program. Subsurface conditions can vary widely between explored areas. Some variations may not become evident until construction. If conditions are encountered which appear different than those described in our report, we should be notified. This report should not be construed to represent subsurface conditions for the entire site.

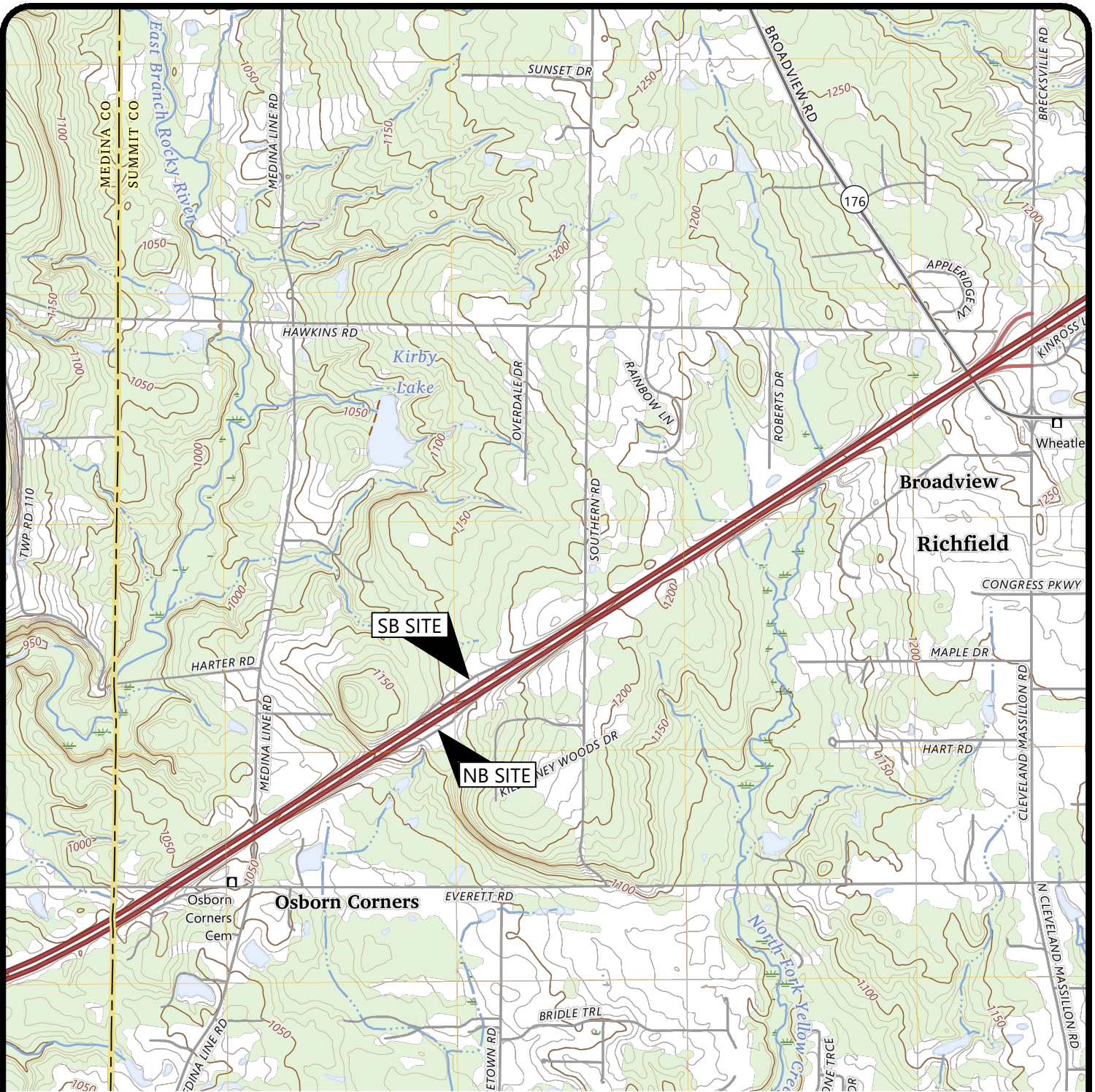
Unless specifically noted otherwise, our field exploration program did not include an assessment of regulatory compliance, environmental conditions or pollutants or presence of any biological materials (mold, fungi, bacteria). If there is a concern about these items, other studies should be performed. S&ME can provide a proposal and perform these services if requested.

S&ME should be retained to review the final plans and specifications to confirm that earthwork, foundation, and other recommendations are properly interpreted and implemented. The recommendations in this report are contingent on S&ME's review of final plans and specifications followed by our observation and monitoring of earthwork and foundation construction activities.

Appendices

Appendix I – General Information

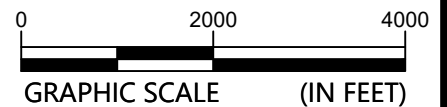
Drawing Path: T:\Columbus-1170\Projects\2024\24170232_ms_TP 26 NE Ohio\GEO\CAD\DWG\Site 15 SUM-271 VMAP.dwg



Project Location
Summit County, Ohio



USGS Mapping:
West Richfield USGS Quad



GRAPHIC SCALE (IN FEET)



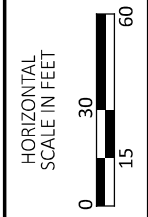
Vicinity Map

Subgrade & Structure Foundation Exploration
TP 26 NE Ohio Site 15 - SUM-271 Active Rest Areas
Summit County, Ohio

SCALE:
GRAPHIC
DATE:
02-13-2026
PROJECT NUMBER
24170232F

FIGURE NO.

1



DESIGN AGENCY

DESIGNER
LIP

REVIEWER

AMT 04/08/26

PROJECT ID

122877

HEET	TOTAL
------	-------

P.85 | 98

Wildcat DCP Location

ITEM 646 - ISLAND MARKING

LEGEND

 B-001-0-25
Boring Location

 X-001-1-25
Pavement Core Location

 D-009-1-25
Wildcat DCP Location

LEGEND

 PLS
ITEM 646 - PARKING LOT STALL MARKING

 LA
ITEM 646 - LANE ARROW



PAVEMENT MARKING PLAN - SB TRUCK PARKING
STA. 14+00.00 TO END

DESIGN AGENCY

2LMN

DESIGNER

JJR

REVIEWER

AMT 04/08/26

PROJECT ID

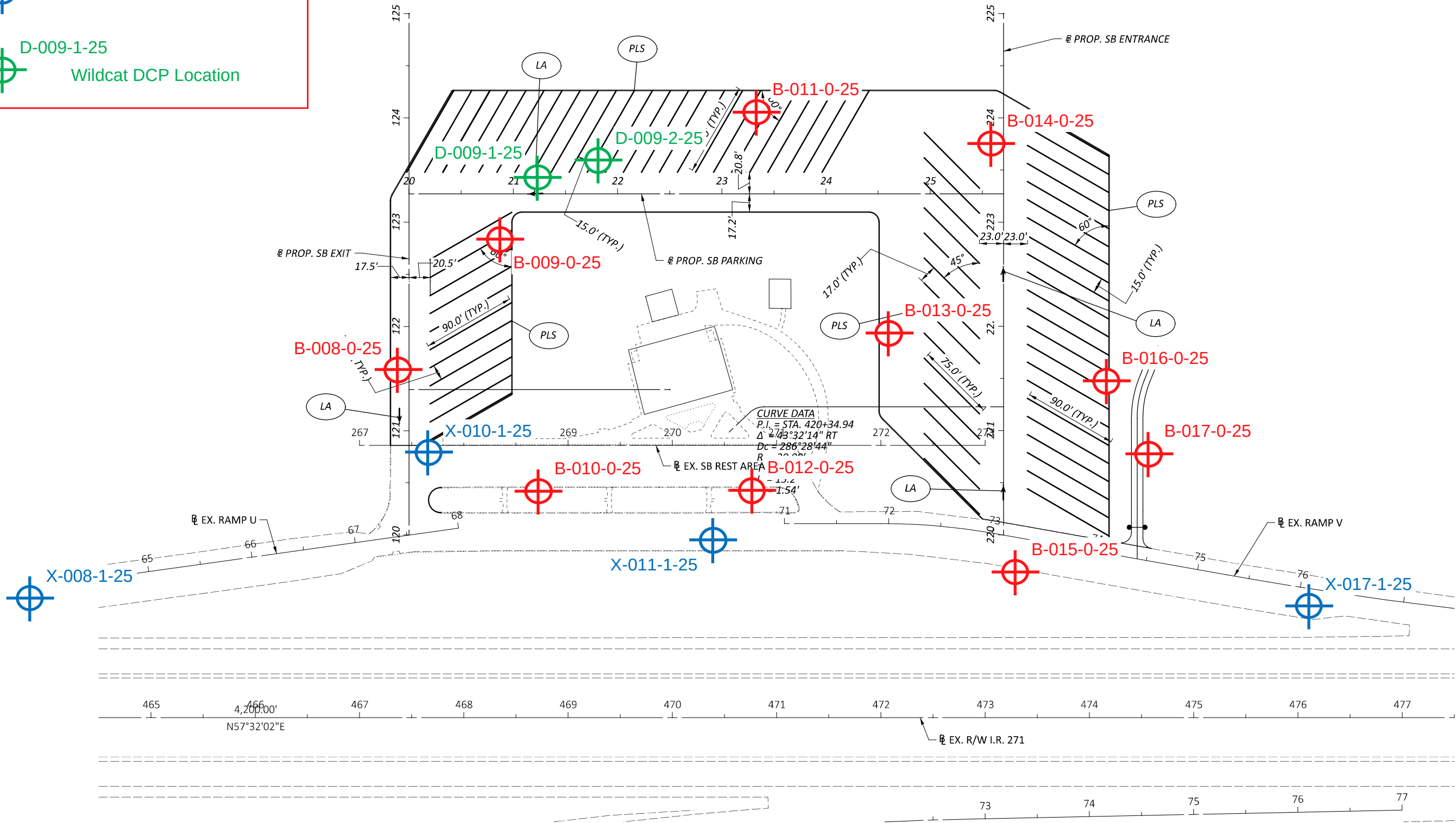
122877

SHEET

P.87

TOTAL

98

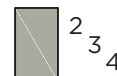


ODOT SOIL LOG

LEGEND



The **STANDARD PENETRATION TEST (SPT)** as defined by AASHTO T206 (or ASTM D1586) is a method to obtain a disturbed soil sample for examination and testing and to obtain relative density and consistency information. A standard 1.4-inch I.D./2-inch O.D. split-barrel sampler is driven three 6-inch increments (see graphic at right) with a 140 lb. hammer freely falling 30 inches. The hammer can either be of a trip, free-fall design, or actuated by a rope and cathead. The SPT N Value is determined by adding the number of blows from the 2nd and 3rd 6-inch increments.



SPT BLOWCOUNT CORRECTION FOR HAMMER EFFICIENCY (N_{60}) is determined by the following equation: $N_{60} = N * [\text{Drill Rod Energy Ratio} (\%) / 60]$, and where the drill rod energy ratio is determined in accordance with ASTM D4633. If the drill rod energy ratio exceeds 90%, it is limited to 90% to determine the N_{60} value and is shown on the log as 90*.

SHELBY TUBE (ST) samples are obtained by hydraulically pushing a thin-walled tube (typically 3-inches in diameter) to obtain a relatively undisturbed sample for testing of fine-grained soils to determine engineering properties such as strength, compressibility, permeability, and density. Shelby tubes are sampled in general accordance with ASTM D1587 (AASHTO T207).



DESCRIPTIVE ORDER OF SOIL STRATA: Consistency/Density, color, ODOT soil classification description, minor soil constituents with percentage modifiers, organic content, miscellaneous constituents or descriptions, relative moisture condition.

ODOT SOIL CLASSIFICATION DESCRIPTION AND SYMBOL

	GRAVEL (A-1-a)		SILT (A-4-b)		ORGANIC CLAY (A-8b)
	GRAVEL WITH SAND (A-1-B)		ELASTIC SILT AND CLAY (A-5)		PEAT
	FINE SAND (A-3)		SILT AND CLAY (A-6a)		UNCONTROLLED FILL
	COARSE AND FINE SAND (A-3a)		SILTY CLAY (A-6b)		BOULDERY ZONE
	GRAVEL WITH SAND AND SILT (A-2-4 OR A-2-5)		ELASTIC CLAY (A-7-5)		SOD/ROOTMAT/TOPSOIL
	GRAVEL WITH SAND, SILT AND CLAY (A-2-6 OR A-2-7)		CLAY (A-7-6)		PAVEMENT OR BASE
	SANDY SILT (A-4a)		ORGANIC SILT (A-8a)		CONCRETE

SOIL LOG SYMBOLS

SS - Split-Spoon Sample	Qu - Unconfined Compressive Strength	FS - Fine Sand Content, %
ST - Shelby Tube Sample	γ_d - Dry Unit Weight, pcf	SI - Silt Content, %
TR - Top of Rock	γ_m - Moist Unit Weight, pcf	CL - Clay Content, %
REC - Sample Recovery, %	GR - Gravel Content, %	LL - Liquid Limit
HP - Hand Penetrometer Value, tsf	CS - Coarse Sand Content, %	PL - Plastic Limit
LOI - Loss on Ignition Test, %		PI - Plasticity Index
		WC - Natural Water Content, %

NOTE: Particle size contents are expressed % by weight.

PARTICLE SIZE

Particle	Size	US Sieve Size
Boulder	>300 mm (12 in.)	12 in.
Cobble	75 - 300 mm (3 - 12 in.)	3 - 12 in.
Coarse gravel	19 - 75 mm (3/4 - 3 in.)	3/4 - 3 in.
Fine gravel	2 - 19 mm (0.08 - 3/4 in.)	#10 - 3/4 in.
Coarse sand	0.42 - 2.0 mm	#40 - #10
Fine sand	0.074 - 0.42 mm	#200 - #40
Silt	0.005 - 0.074 mm	NA
Clay	< 0.005 mm	NA

FINE-GRAINED SOIL (Relative Consistency)

	N_{60}	HP
Very soft	< 2 bpf	< 0.25 tsf
Soft	2 - 4 bpf	> 0.25 - 0.5 tsf
Medium stiff	5 - 8 bpf	> 0.5 - 1.0 tsf
Stiff	9 - 15 bpf	> 1.0 - 2.0 tsf
Very stiff	16 - 30 bpf	> 2.0 - 4.0 tsf
Hard	> 30 bpf	> 4.0 tsf

COARSE-GRAINED SOIL (Relative Density)

	N_{60}
Very loose	< 5 bpf
Loose	5 - 10 bpf
Medium dense	11 - 30 bpf
Dense	31 - 50 bpf
Very dense	> 50 bpf

MINOR CONSTITUENTS (% By Weight)

	Percentage
Trace	0% - 10%
Little	>10% - 20%
Some	>20% - 35%
"And"	$\geq 35\%$

ORGANIC CONTENT OF SOIL (Determined by ASTM D2974 or AASHTO T267)

Classification	Percentage
Slightly organic	2% - 4%
Moderately organic	>4% - 10%
Highly organic	> 10%

RELATIVE MOISTURE CONDITION

Dry	Cohesive - Powdery, WC well below PL Granular - No moisture present
Damp	Cohesive - Leaves very little moisture when pressed, WC < PL Granular - Internal moisture, little to no surface moisture
Moist	Cohesive - Leaves moisture when pressed, PL < WC < LL - 3 Granular - Free water on surface, shiny appearance
Wet	Cohesive - Mushy, WC near or above LL Granular - Voids filled with free water

At Time of Drilling

At end of Drilling

24 hrs After Drilling

Free water (seepage or groundwater) observation made anytime during the drilling process. Depending on time of reading and drilling methodologies, this value may be influenced by the drilling process.

Free water measurement soon after the drilling processes are complete, and the borehole is at final depth. Drilling fluids, if introduced during drilling, may influence this measurement.

Free water measurements made in a borehole hours to days after drilling is complete including the time elapsed (i.e., "24 hrs" as shown at left). Depending on subsurface conditions, elapsed time, drilling process, etc. this observation may reflect a stabilized level.

REFERENCES:

Ohio Department of Transportation (ODOT), Specifications for Geotechnical Explorations (SGE)

ODOT ROCK CORE LOG LEGEND



DESCRIPTIVE ORDER FOR ROCK STRATA

Bedrock type, color, weathering, strength, texture, bedding, other descriptors, type and condition of discontinuities, unit RQD, unit recovery.

When alternating layers occur between two distinct rock types, describe the material as "Interbedded" with the major rock type first, with estimated percentage, and the secondary rock type second, with estimated percentage. Provide the unit RQD and unit recovery, then describe each rock type in detail.

For spread footings founded on or into bedrock, describe discontinuities using the modified Rock Mass Rating (RMR) system (degree of fracturing, aperture width and surface roughness). For drilled shafts extending into bedrock, describe discontinuities using the Geologic Strength Index (GSI) system (discontinuity structure and surface condition). For rock cut slopes, describe discontinuities using both the modified RMR and GSI systems.

COMMON OHIO BEDROCK TYPES AND SYMBOLS



SHALE



SILTSTONE



LIMESTONE



COAL



CLAYSTONE/
MUDSTONE



SANDSTONE



DOLOMITE



UNDERCLAY/
FIRECLAY

WEATHERING

Unweathered	No evidence of chemical or mechanical alternation of the rock mass. Mineral crystals have a bright appearance with no discoloration. Fractures show little or no staining on surfaces.
Slightly Weathered	Slight discoloration of the rock surface with minor alterations along discontinuities. Less than 10% of the rock volume presents alteration.
Moderately Weathered	Portions of the rock mass are discolored with a dull appearance. Surfaces may have a pitted appearance with weathering "halos". Isolated zones of varying rock strengths.
Highly Weathered	Entire rock mass appears discolored and dull. Some pockets of slightly to moderately weathered rock and some areas of severely weathered materials may be present.
Severely Weathered	Majority of the rock mass reduced to a soil-like state. Zones of more resistant rock may be present, but the material can generally be molded and crumbled by hand pressures.

STRENGTH

APPROX. UNCONFINED
COMPRESSIVE STRENGTH (PSI)

Extremely Strong	Cannot be scratched by a knife or sharp pick. Chipping off hand specimens requires hard repeated blows of a geologist's hammer.	> 30,000
Very Strong	Cannot be scratched by a knife or sharp pick. Breaking off hand specimens requires hard repeated blows of a geologist's hammer.	30,000 - 15,000
Strong	Can be scratched with a knife or pick with difficulty. Requires hard hammer blows to detach hand specimen.	15,000 - 7,500
Moderately Strong	Can be scratched with a knife or pick. Gouges ¼" deep can be excavated by a pick. Requires moderate hammer blows to detach specimen.	7,500 - 3,600
Slightly Strong	Can be gouged 0.05 inch deep by firm pressure with a knife or pick point. Can excavate small pieces (1-inch) by hard blows with a pick.	3,600 - 1,500
Weak	Can be gouged readily by a knife or pick or excavated in small fragments by moderate blows of a pick. Small, thin pieces can be broken by hand.	1,500 - 750
Very Weak	Can be carved with a knife and excavated readily with a pick. Pieces 1 inch or more thick can be broken by hand. Can be scratched by fingernail.	750 - 40

TEXTURE

Boulder	> 12 in.
Cobble	12 - 3 in.
Gravel	3 - 0.08 in.
Coarse Sand	0.08 - 0.02 in.
Medium Sand	0.02 - 0.01 in.
Fine Sand	0.01 - 0.005 in.
Very Fine Sand	0.005 - 0.003 in.

BEDDING

Very Thick Bedded	> 36 in.
Thick Bedded	36 in. - 18 in.
Medium Bedded	18 in. - 10 in.
Thin Bedded	10 in. - 2 in.
Very Thin Bedded	2 in. - 0.4 in.
Laminated	0.4 in. - 0.1 in.
Thinly Laminated	< 0.1 in.

ODOT ROCK CORE LOG LEGEND



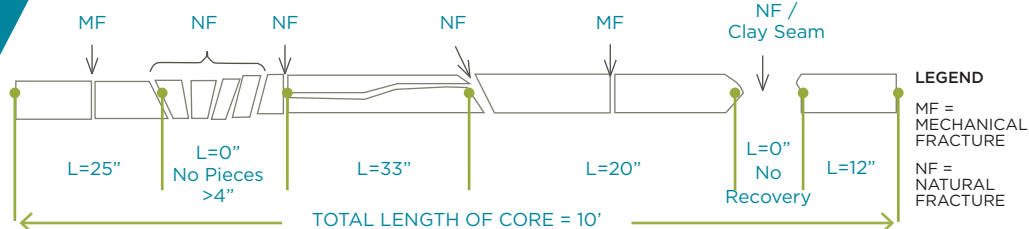
ROCK CORE RECOVERY

Recovery to be determined by core run and by rock unit (layer).

$$REC = \frac{\text{Length of Rock Core Recovered}}{\text{Length of Core Run}} \times 100$$

(Recovery)

ROCK QUALITY DESIGNATION (RQD)



$$RQD = \left(\frac{\sum \text{Core with Length (L)} \geq 4''}{\text{Core Run or Interval Total Length}} \right) \times 100$$

(Equation)

$$RQD = \left(\frac{25'' + 33'' + 20'' + 12''}{120''} \right) \times 100 = 75\%$$

(Example)

DESCRIPTORS

Arenaceous - Sandy
Argillaceous - Clayey
Brecciated - Contains angular gravel
Calcareous - Contains calcium carbonate
Carbonaceous - Contains carbon
Cherty - Contains chert
Conglomeritic - Contains rounded gravel
Crystalline - Contains crystalline structure

Dolomitic - Contains Ca/Mg carbonate
Feriferous - Contains iron
Fissile - Thin planar partings
Fossiliferous - Contains fossils
Friable - Easily broken down
Micaceous - Contains mica
Pyritic - Contains pyrite
Siliceous - Contains silica
Stylolitic - Contains stylotites
Vuggy - Contains openings

DISCONTINUITIES IN BEDROCK

Fault Fracture which expresses displacement parallel to the surface that does not result in a polished surface.

Joint Planar fracture that does not express displacement. Generally occurs at regularly spaced intervals.

Shear Fracture which expresses displacement parallel to the surface that results in polished surfaces or slickensides.

Bedding A surface produced along a bedding plane.

Contact A surface produced along a contact plane. (generally not seen in Ohio)

MODIFIED RMR DISCONTINUITY TERMS

DEGREE OF FRACTURING

Unfractured >10 ft.
Intact 10 ft. - 3 ft.
Slightly Fractured 3 ft. - 1 ft.
Moderately Fractured 12 in. - 4 in.
Fractured 4 in. - 2 in.
Highly Fractured < 2 in.

APERTURE WIDTH

Open > 0.2 in.
Narrow 0.2 in. - 0.05 in.
Tight < 0.05 in.

SURFACE ROUGHNESS

Very Rough Near vertical steps and ridges occur on the discontinuity surface.

Slightly Rough Asperities on the discontinuity surface are distinguishable and can be felt.

Slickensided Surface has a smooth, glassy finish with visual evidence of striation.

GSI DISCONTINUITY TERMS

ROCK MASS STRUCTURE

Intact or Massive Intact rock with few widely spaced discontinuities

Blocky Well interlocked undisturbed rock mass, formed by 3 intersecting discontinuity sets

Very Blocky Interlocked, partially disturbed mass formed by 4 or more joint sets

Blocky/Disturbed/Seamy Angular blocks formed by many intersecting discontinuity sets, bedding planes

Disintegrated Poorly interlocked, heavily broken rock mass

Laminated/Sheared Lack of blockiness due to close spacing of weak shear planes

SURFACE CONDITION

Very Good Very rough, fresh unweathered surfaces

Good Rough, slightly weathered, iron stained surfaces

Fair Smooth, moderately weathered and altered surfaces

Poor Slickensided, high weathered surface with compact coatings

Very Poor Slickensided, highly weathered surface with soft clay coatings

PROJECT: SUM-271 TRUCK PARKING				DRILLING FIRM / OPERATOR: OTB / D. HEPNER				DRILL RIG: OTB ATV B-57				STATION / OFFSET: 461+01, 96' RT				EXPLORATION ID: B-001-0-25							
TYPE: STRUCTURE				SAMPLING FIRM / LOGGER: S&ME / K. HARPER				HAMMER: CME AUTOMATIC				ALIGNMENT: EX CL R/W IR 271				PAGE 1 OF 1							
PID: 122877 BR ID: NA				DRILLING METHOD: 3-1/4" HSA / NQ				CALIBRATION DATE: 12/30/24				ELEVATION: 1125.6 (MSL) EOB: 17.5 ft.											
START: 11/6/25 END: 11/6/25				SAMPLING METHOD: SPT / NQ				ENERGY RATIO (%): 90*				COORD: 41.208148 N, 81.669647 W											
MATERIAL DESCRIPTION AND NOTES			ELEV.	DEPTHS		SPT/RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG				ODOT CLASS (GI)	SO4 ppm	HOLE SEALED	
			1125.6								GR	CS	FS	SI	CL	LL	PL	PI	WC				
TOPSOIL - 7 INCHES			1125.0																				
Dense orangish-brown COARSE AND FINE SAND , some fine to coarse gravel, trace silt, trace clay, damp.				1		3	42	100	SS-1	-	25	23	40	5	7	NP	NP	NP	6	A-3a (0)	200		
			1122.6	2		10 18																	
Medium dense light brown FINE SAND , trace coarse sand, trace silt, trace clay, damp.				3																			
				4		11 6	17	39	SS-2	-	0	3	88	4	5	NP	NP	NP	11	A-3 (0)	-		
			1120.1	5		5																	
Stiff to very stiff dark brown becoming brown SILT AND CLAY , "and" fine to coarse sand, little fine to coarse gravel, few roots and wood fragments, damp.				6		3																	
				7		4 4	12	100	SS-3	1.5-3.0	-	-	-	-	-	-	-	-	20	A-6a (V)	-		
				8																			
				9		2																	
				10		4 5	14	100	SS-4	1.5	18	15	24	24	19	27	15	12	18	A-6a (2)	-		
			1114.6	11		50/2"		100	SS-5	-	-	-	-	-	-	-	-	-	20	Rock (V)	-		
SANDSTONE , light brown, highly weathered, weak.			1113.1	12																			
SANDSTONE , light gray becoming light brown, slightly weathered, moderately strong, medium to coarse grained, medium bedded, jointed, moderately to slightly fractured, narrow aperture, slightly rough surfaces, blocky to intact, good surface condition, few conglomeritic seams at fractures, RQD = 68%, REC = 100%. - From 14.6' - 15.0'; q _u = 7,100 psi; γ _d = 138.7 pcf				13																			
				14																			
				15		68		100	NQ-6	-										CORE			
				16																			
			1108.1	17																			
				EOB																			
<p>NOTES:</p> <p>- Encountered seepage at 11.0' during drilling.</p> <p>- Dry inside augers prior to coring.</p>																							
NOTES: SEE ABOVE.																							
ABANDONMENT METHODS. MATERIALS. QUANTITIES: BENTONITE - CEMENT GROUT: PLASTIC HOLE PLUG DEVICE: SOIL CUTTINGS																							



PROJECT: <u>SUM-271 TRUCK PARKING</u>	DRILLING FIRM / OPERATOR: <u>OTB / D. HEPNER</u>	DRILL RIG: <u>OTB ATV B-57</u>	STATION / OFFSET: <u>461+73, 250' RT</u>	EXPLORATION ID
TYPE: <u>ROADWAY</u>	SAMPLING FIRM / LOGGER: <u>S&ME / K. HARPER</u>	HAMMER: <u>CME AUTOMATIC</u>	ALIGNMENT: <u>EX CL R/W IR 271</u>	B-002-0-25
PID: <u>122877</u> BR ID: <u>NA</u>	DRILLING METHOD: <u>3-1/4" HSA</u>	CALIBRATION DATE: <u>12/30/24</u>	ELEVATION: <u>1126.5 (MSL)</u> EOB: <u>10.0 ft.</u>	PAGE
START: <u>11/6/25</u> END: <u>11/6/25</u>	SAMPLING METHOD: <u>SPT</u>	ENERGY RATIO (%): <u>90*</u>	COORD: <u>41.207898 N, 81.669127 W</u>	1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
								GR	CS	FS	SI	CL	LL	PL	PI				
ASPHALT - 6 INCHES	1126.5																		
CONCRETE - 10 INCHES	1126.0																		
GRANULAR BASE - 6 INCHES	1125.1																		
	1124.6																		
Very stiff dark brown and brown SILT AND CLAY , trace fine to coarse sand, trace fine gravel, damp.	1123.3	1	3	9	100	SS-1A	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	-	
		2	1	5		SS-1B	2.5-4.0	1	1	3	61	34	30	19	11	22	A-6a (8)	120	
Very stiff brown CLAY , "and" silt, trace fine to coarse sand, trace fine gravel, damp.		3																	
		4	2	15	100	SS-2	2.5	1	1	2	59	37	44	21	23	23	A-7-6 (14)	-	
		5	5																
		6																	
	1119.4	7	4	60	100	SS-3A	2.0-4.0	-	-	-	-	-	-	-	-	14	A-7-6 (V)	-	
Very dense becoming medium dense brown and light brown COARSE AND FINE SAND , little fine to coarse gravel, trace silt, trace clay, similar to decomposed sandstone, damp to moist.		8				SS-3B	-	-	-	-	-	-	-	-	-	9	A-3a (V)	-	
		9	10	29	100	SS-4	-	-	-	-	-	-	-	-	-	17	A-3a (V)	-	
	1117.5		11																
	1116.5	10	8																
		EOB																	

NOTES:
- Encountered seepage at 9.0' during drilling.

NOTES: SEE ABOVE.
ABANDONMENT METHODS, MATERIALS, QUANTITIES: ASPHALT PATCH; PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE

PROJECT: SUM-271 TRUCK PARKING			DRILLING FIRM / OPERATOR: OTB / D. HEPNER			DRILL RIG: OTB ATV B-57			STATION / OFFSET: 462+30, 404' RT			EXPLORATION ID: B-003-0-25											
TYPE: ROADWAY			SAMPLING FIRM / LOGGER: S&ME / K. HARPER			HAMMER: CME AUTOMATIC			ALIGNMENT: EX CL R/W IR 271			PAGE 1 OF 1											
PID: 122877 BR ID: NA			DRILLING METHOD: 3-1/4" HSA			CALIBRATION DATE: 12/30/24			ELEVATION: 1125.3 (MSL) EOB: 9.3 ft.														
START: 11/6/25 END: 11/6/25			SAMPLING METHOD: SPT			ENERGY RATIO (%): 90*			COORD: 41.207624 N, 81.668649 W														
MATERIAL DESCRIPTION AND NOTES			ELEV.	DEPTHS		SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG				ODOT CLASS (GI)	SO4 ppm	BACK FILL	
			1125.3								GR	CS	FS	SI	CL	LL	PL	PI	WC				
TOPSOIL - 4 INCHES			1125.0	1		2																	
Hard brown CLAY, "and" silt, trace fine to coarse sand, trace fine gravel, few roots, damp.				2		4	15	100	SS-1	4.5+	1	1	5	54	39	42	20	22	20	A-7-6 (13)	80		
			1122.3	3																			
Hard brown SILT AND CLAY, some fine to coarse sand, little fine gravel, damp.				4		6	20	72	SS-2	4.5+	12	7	20	37	24	30	16	14	12	A-6a (7)	-		
				5		7																	
			1118.6	6		4																	
Very dense light brown COARSE AND FINE SAND, little fine to coarse gravel, trace silt, trace clay, similar to decomposed sandstone, damp.				7		16	62	100	SS-3A	4.5+	-	-	-	-	-	-	-	-	16	A-6a (V)	-		
				8		25			SS-3B	-	-	-	-	-	-	-	-	-	6	A-3a (V)	-		
			1116.0	9		32																	
				9		50/3"	-	100	SS-4	-	-	-	-	-	-	-	-	-	8	A-3a (V)	-		
EOB																							
NOTES: - No water encountered.																							
NOTES: SEE ABOVE.																							
ABANDONMENT METHODS. MATERIALS. QUANTITIES: PLASTIC HOLE PLUG DEVICE: SOIL CUTTINGS MIXED WITH BENTONITE																							



PROJECT: <u>SUM-271 TRUCK PARKING</u>	DRILLING FIRM / OPERATOR: <u>OTB / D. HEPNER</u>	DRILL RIG: <u>OTB ATV B-57</u>	STATION / OFFSET: <u>464+25, 97' RT</u>	EXPLORATION ID
TYPE: <u>ROADWAY</u>	SAMPLING FIRM / LOGGER: <u>S&ME / K. HARPER</u>	HAMMER: <u>CME AUTOMATIC</u>	ALIGNMENT: <u>EX CL R/W IR 271</u>	B-004-0-25
PID: <u>122877</u> BR ID: <u>NA</u>	DRILLING METHOD: <u>3-1/4" HSA</u>	CALIBRATION DATE: <u>12/30/24</u>	ELEVATION: <u>1134.8 (MSL)</u> EOB: <u>10.0 ft.</u>	PAGE
START: <u>11/6/25</u> END: <u>11/6/25</u>	SAMPLING METHOD: <u>SPT</u>	ENERGY RATIO (%): <u>90*</u>	COORD: <u>41.208622 N, 81.668652 W</u>	1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
								GR	CS	FS	SI	CL	LL	PL	PI				
TOPSOIL - 6 INCHES	1134.8																		
Very stiff to hard brown and gray SILT AND CLAY , some fine to coarse sand, trace fine gravel, few roots, damp.	1134.3	1	2																< >
		2	4	12	100	SS-1	3.5-4.0	7	9	16	33	35	33	19	14	16	A-6a (8)	207	< >
		3																	< >
		4	3	15	100	SS-2	4.5+	-	-	-	-	-	-	-	-	19	A-6a (V)	-	< >
Medium dense brown GRAVEL WITH SAND AND SILT , little clay, damp.	1129.3	5	4	6															< >
		6	3																< >
		7	4	11	100	SS-3	-	17	10	39	22	12	NP	NP	NP	11	A-2-4 (0)	-	< >
		8																	< >
- 8.5' to 8.7"; crushed light brown sandstone fragments.	1126.1																		
Very stiff brown SILT AND CLAY , some fine to coarse sand, trace fine to coarse gravel, damp.	1124.8	9	6			SS-4A	-	-	-	-	-	-	-	-	-	8	A-2-4 (V)	-	< >
		10	6	21	100	SS-4B	2.5-3.0	-	-	-	-	-	-	-	-	15	A-6a (V)	-	< >
EOB																			

NOTES:
- No water encountered.

NOTES: SEE ABOVE.
ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE



PROJECT: <u>SUM-271 TRUCK PARKING</u>	DRILLING FIRM / OPERATOR: <u>OTB / D. HEPNER</u>	DRILL RIG: <u>OTB ATV B-57</u>	STATION / OFFSET: <u>464+80, 248' RT</u>	EXPLORATION ID
TYPE: <u>STRUCTURE</u>	SAMPLING FIRM / LOGGER: <u>S&ME / K. HARPER</u>	HAMMER: <u>CME AUTOMATIC</u>	ALIGNMENT: <u>EX CL R/W IR 271</u>	B-005-0-25
PID: <u>122877</u> BR ID: <u>NA</u>	DRILLING METHOD: <u>3-1/4" HSA</u>	CALIBRATION DATE: <u>12/30/24</u>	ELEVATION: <u>1135.9 (MSL)</u> EOB: <u>20.0 ft.</u>	PAGE
START: <u>11/7/25</u> END: <u>11/7/25</u>	SAMPLING METHOD: <u>SPT</u>	ENERGY RATIO (%): <u>90*</u>	COORD: <u>41.208354 N, 81.668188 W</u>	1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
								GR	CS	FS	SI	CL	LL	PL	PI				
ASPHALT - 5 INCHES	1135.9																		
CONCRETE - 9-1/4 INCHES	1135.3	1																	
GRANULAR BASE - 6 INCHES	1134.7	2	4	3	9	100	SS-1A	-	-	-	-	-	-	-	-	14	A-1-b (V)	-	
Very stiff brown and gray SILT AND CLAY , some fine to coarse sand, trace fine gravel, moist.	1134.2	3					SS-1B	3.0	8	5	17	40	30	26	15	11	16	A-6a (7)	160
Stiff brown SILTY CLAY , trace fine sand, few iron oxide stains, moist.	1132.7	4	1	5	15	100	SS-2	1.0-2.0	-	-	-	-	-	-	-	-	26	A-6b (V)	-
	1130.4	5																	
Stiff to very stiff brown SANDY SILT , some clay, little fine to coarse gravel, damp to moist.	1127.9	6	2	3	12	100	SS-3	1.5-2.7	15	6	13	35	31	26	16	10	16	A-4a (6)	-
		7																	
Hard brown and gray SANDY SILT , some clay, trace fine gravel, damp.	1125.4	8	5	12	38	100	SS-4	4.5+	-	-	-	-	-	-	-	-	15	A-4a (V)	-
		9																	
Loose brown COARSE AND FINE SAND , little fine to coarse gravel, little silt, little clay, moist.	1122.9	10																	
		11	2	3	8	100	SS-5	-	15	10	40	20	15	NP	NP	NP	13	A-3a (0)	-
		12																	
Medium dense brown and gray COARSE AND FINE SAND , little silt, trace fine to coarse gravel, trace clay, wet.	1120.4	13	3	7	24	100	SS-6	-	-	-	-	-	-	-	-	-	15	A-3a (V)	-
		14																	
Dense brown FINE SAND , some coarse sand, little, fine gravel, trace silt, trace clay, wet.	1117.9	15																	
		16	11	17	50	100	SS-7	-	11	23	59	5	2	NP	NP	NP	17	A-3 (0)	-
		17																	
Dense brown SILT , trace fine sand, trace clay, moist to wet.	1115.9	18	7	14	48	100	SS-8	-	-	-	-	-	-	-	-	-	25	A-4b (V)	-
		19																	
		20																	

NOTES:
- Encountered seepage at 13.0' during drilling.
- Encountered water at 16.0' during drilling.

NOTES: SEE ABOVE.
ABANDONMENT METHODS, MATERIALS, QUANTITIES: ASPHALT PATCH; PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE



PROJECT: SUM-271 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / D. HEPNER	DRILL RIG: OTB ATV B-57	STATION / OFFSET: 464+88, 422' RT	EXPLORATION ID B-006-0-25
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: EX CL R/W IR 271	
PID: 122877 BR ID: NA	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1141.3 (MSL) EOB: 10.0 ft.	PAGE 1 OF 1
START: 11/6/25 END: 11/6/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	COORD: 41.207964 N, 81.667825 W	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
								GR	CS	FS	SI	CL	LL	PL	PI				
TOPSOIL - 6 INCHES	1141.3																		
Very stiff to hard brown SILTY CLAY , little to some fine to coarse sand, trace to little fine to coarse gravel, few roots above 3.0', damp.	1140.8	1	2	11	100	SS-1	2.0-3.0	14	7	14	33	32	37	19	18	18	A-6b (9)	-	< >
		2	5																< >
		3																	< >
		4	4	17	100	SS-2	4.5+	3	6	12	32	47	37	19	18	20	A-6b (11)	140	< >
		5	6																< >
		6	4																< >
- 5.5' to 8.0'; few iron oxide stains.		7	9	35	100	SS-3	4.5+	-	-	-	-	-	-	-	-	14	A-6b (V)	-	< >
	1133.3	8	14																< >
Medium dense to dense brown and gray GRAVEL (SILTSTONE FRAGMENTS) WITH SAND AND SILT , trace clay, moist.	1131.6	9	5	62	100	SS-4A	-	-	-	-	-	-	-	-	-	10	A-2-4 (V)	-	< >
	1131.3	10	11	30		SS-4B	-	-	-	-	-	-	-	-	-	0	A-1-a (V)	-	< >
Very dense gray GRAVEL (siltstone fragments), dry.	EOB																		< >

NOTES:
- No water encountered.

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT GDT - 2/13/26 12:52 - R-SERVICE LINESCS-2557COLUMBUSGINTWPPROJECTS24170232F SUM-271 TP-GPJ
PLATE 10



PROJECT: <u>SUM-271 TRUCK PARKING</u>	DRILLING FIRM / OPERATOR: <u>OTB / D. HEPNER</u>	DRILL RIG: <u>OTB ATV B-57</u>	STATION / OFFSET: <u>465+85, 202' RT</u>	EXPLORATION ID
TYPE: <u>ROADWAY</u>	SAMPLING FIRM / LOGGER: <u>S&ME / K. HARPER</u>	HAMMER: <u>CME AUTOMATIC</u>	ALIGNMENT: <u>EX CL R/W IR 271</u>	B-007-0-25
PID: <u>122877</u> BR ID: <u>NA</u>	DRILLING METHOD: <u>3-1/4" HSA</u>	CALIBRATION DATE: <u>12/30/24</u>	ELEVATION: <u>1138.4 (MSL)</u> EOB: <u>10.0 ft.</u>	PAGE
START: <u>11/6/25</u> END: <u>11/6/25</u>	SAMPLING METHOD: <u>SPT</u>	ENERGY RATIO (%): <u>90*</u>	COORD: <u>41.208616 N, 81.667958 W</u>	1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
								GR	CS	FS	SI	CL	LL	PL	PI				
TOPSOIL - 7 INCHES	1138.4																		
Hard brown and dark brown SILT AND CLAY , little fine to coarse sand, trace fine gravel, few iron oxide stains, moist.	1137.8	1	3	4	14	100	SS-1	4.5+	3	5	13	42	37	33	19	14	20	A-6a (10)	220
		2	5																
Hard brown SILTY CLAY , little fine to coarse sand, trace fine gravel, moist.	1135.4	3																	
		4	2	5	17	100	SS-2	4.5+	1	6	13	30	50	38	18	20	19	A-6b (12)	-
		5	6																
- 5.5' to 8.0; brown and gray, few iron oxide stains, damp.		6	2																
		7	3	6	14	100	SS-3	4.5+	-	-	-	-	-	-	-	15	A-6b (V)	-	
	1130.4	8																	
Very stiff brown SANDY SILT , some clay, trace fine to coarse gravel, few iron oxide stains, damp.		9	2	4	15	100	SS-4	2.0-2.7	-	-	-	-	-	-	-	11	A-4a (V)	-	
	1128.4	10	6																
		EOB																	

NOTES:
- No water encountered.

NOTES: SEE ABOVE.
ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT GDT - 2/13/26 12:52 - R:SERVICE LINESCS-2557COLUMBUSGINTWPROJECTS\24170232F SUM-271 TP.GPJ



PROJECT: SUM-271 TRUCK PARKING				DRILLING FIRM / OPERATOR: OTB / C. SVITAK				DRILL RIG: OTB ATV B-57				STATION / OFFSET: 467+37, 335' LT				EXPLORATION ID							
TYPE: STRUCTURE				SAMPLING FIRM / LOGGER: S&ME / K. HARPER				HAMMER: CME AUTOMATIC				ALIGNMENT: EX CL R/W IR 271				B-008-0-25							
PID: 122877 BR ID: NA				DRILLING METHOD: 3-1/4" HSA				CALIBRATION DATE: 12/30/24				ELEVATION: 1158.3 (MSL) EOB: 25.0 ft.				PAGE							
START: 11/11/25 END: 11/11/25				SAMPLING METHOD: SPT				ENERGY RATIO (%): 90*				COORD: 41.210083 N, 81.668541 W				1 OF 1							
MATERIAL DESCRIPTION AND NOTES			ELEV.	DEPTHS		SPT/RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG				ODOT CLASS (GI)	SO4 ppm	BACK FILL	
TOPSOIL - 6 INCHES			1158.3																				
Possible Fill: Very stiff brown SANDY SILT, some clay, trace fine to coarse gravel, moist.			1157.8	1		2																	
			1156.4	2		3	7	15	100	SS-1A	2.5	7	8	33	28	24	25	15	10	16	A-4a (3)	-	
Possible Fill: Medium dense brown and gray GRAVEL WITH SAND, trace silt, trace clay, moist.			1155.3	3																			
Stiff gray and brown SANDY SILT, litlle clay, little fine to coarse gravel, moist.				4		2																	
			1152.8	5		3	5	12	61	SS-2	1.7-2.0	15	8	34	24	19	23	14	9	14	A-4a (2)	-	
Very stiff to hard brown and gray SILTY CLAY, trace fine gravel, trace fine to coarse sand, few iron oxide stains, damp.				6		3																	
			1150.3	7		4	7	17	100	SS-3	3.5-4.5	-	-	-	-	-	-	-	-	22	A-6b (V)	-	
Hard brown and gray SILT AND CLAY, "and" fine to coarse gravel, some fine to coarse sand, few iron oxide stains, cobble at 9.0', damp.				8																			
			1147.8	9		4	8	27	89	SS-4	4.5+	37	12	13	20	18	28	15	13	13	A-6a (1)	-	
Hard brown and gray SILT AND CLAY, little fine to coarse sand, trace fine gravel, damp.				10																			
				11		6	13																
				12			47	100	SS-5	4.5+	-	-	-	-	-	-	-	-	16	A-6a (V)	-		
				13			18																
				14		6																	
			1137.8	15			11	38	100	SS-6	4.5+	7	7	12	35	39	30	17	13	14	A-6a (9)	-	
- 16.0' to 20.5'; gray, few sand seams.				16																			
				17		7	12	38	100	SS-7	4.5+	-	-	-	-	-	-	-	-	15	A-6a (V)	-	
				18																			
				19		8	11	33	100	SS-8	4.5+	-	-	-	-	-	-	-	-	12	A-6a (V)	-	
Very stiff to hard gray SANDY SILT, some clay, little fine to coarse gravel, damp.				20																			
			1133.3	21		6	6	21	100	SS-9	4.5+	14	6	10	35	35	24	14	10	13	A-4a (7)	-	
				22																			
				23																			
				24		6	7	23	100	SS-10	4.5+	-	-	-	-	-	-	-	12	A-4a (V)	-		
			EOB	25			8																
NOTES: - No water encountered.																							
NOTES: SEE ABOVE.																							
ABANDONMENT METHODS. MATERIALS. QUANTITIES: PLASTIC HOLE PLUG DEVICE: SOIL CUTTINGS MIXED WITH BENTONITE																							



PROJECT: SUM-271 TRUCK PARKING		DRILLING FIRM / OPERATOR: OTB / C. SVITAK		DRILL RIG: OTB ATV B-57		STATION / OFFSET: 468+30, 460' LT		EXPLORATION ID	
TYPE: STRUCTURE		SAMPLING FIRM / LOGGER: S&ME / K. HARPER		HAMMER: CME AUTOMATIC		ALIGNMENT: EX CL R/W IR 271		B-009-0-25	
PID: 122877 BR ID: NA		DRILLING METHOD: 3-1/4" HSA		CALIBRATION DATE: 12/30/24		ELEVATION: 1156.8 (MSL) EOB: 10.0 ft.		PAGE	
START: 11/11/25 END: 11/11/25		SAMPLING METHOD: SPT		ENERGY RATIO (%): 90*		COORD: 41.210510 N, 81.668499 W		1 OF 1	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
								GR	CS	FS	SI	CL	LL	PL	PI				
TOPSOIL - 6 INCHES	1156.8																		
Very stiff brown and gray CLAY , trace to little fine to coarse sand, trace fine gravel, few iron oxide stains, damp to moist.	1156.2	1	1																<< >>
		2	2	5	11	100	SS-1	2.5-3.5	2	4	12	30	52	47	22	25	23	A-7-6 (15)	120
		3																	<< >>
Hard gray and brown SILT AND CLAY , little fine to coarse sand, trace fine to coarse gravel, cobble at 6', damp.		4	3																<< >>
		5	6	7	20	100	SS-2	4.5+	1	2	4	21	72	47	24	23	20	A-7-6 (15)	-
	1151.3	6	9																<< >>
- 8.0' to 10.0'; few iron oxide stains.		7	11	13	36	100	SS-3	4.5+	-	-	-	-	-	-	-	-	14	A-6a (V)	-
		8																	<< >>
		9	4																<< >>
	1146.8	10	11	15	39	100	SS-4	4.5+	-	-	-	-	-	-	-	-	14	A-6a (V)	-
		EOB																	<< >>

NOTES:
- No water encountered.

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT GDT - 2/13/26 12:52 - R:SERVICE LINES:CS-2557COLUMBUSGINTWP:PROJECTS:24170232F SUM-271 TP:GPJ



PROJECT: SUM-271 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / C. SVITAK	DRILL RIG: OTB ATV B-57	STATION / OFFSET: 468+70, 219' LT	EXPLORATION ID
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: EX CL R/W IR 271	B-010-0-25
PID: 122877 BR ID: NA	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1165.9 (MSL) EOB: 10.0 ft.	PAGE
START: 11/12/25 END: 11/12/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	COORD: 41.210010 N, 81.667904 W	1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
								GR	CS	FS	SI	CL	LL	PL	PI				
TOPSOIL - 5 INCHES	1165.9																		
Very stiff gray and brown SANDY SILT , some clay, little fine gravel, few iron oxide stains, few roots, damp.	1165.5	1	2																< >
		2	3	5	12	100	SS-1	3.7	15	10	31	21	23	24	14	10	13	A-4a (2)	300
	1162.9	3																	< >
Very stiff to hard gray and brown SILTY CLAY , little to some fine to coarse sand, trace fine gravel, damp.		4	3	5	12	100	SS-2	4.2- 4.5+	8	7	14	27	44	36	17	19	17	A-6b (11)	-
		5																	< >
		6	5																< >
	1157.9	7	9	9	27	100	SS-3	4.5+	-	-	-	-	-	-	-	-	14	A-6b (V)	-
		8																	< >
Very stiff gray SANDY SILT , some clay, trace fine to coarse gravel, few iron oxide stains, damp.	1155.9	9	5																< >
		10	6	9	23	100	SS-4	2.0- 4.0	-	-	-	-	-	-	-	-	11	A-4a (V)	-
		EOB																	< >

NOTES:
- No water encountered.

NOTES: SEE ABOVE.
ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE



PROJECT: <u>SUM-271 TRUCK PARKING</u>	DRILLING FIRM / OPERATOR: <u>OTB / C. SVITAK</u>	DRILL RIG: <u>OTB ATV B-57</u>	STATION / OFFSET: <u>470+81, 579' LT</u>	EXPLORATION ID: <u>B-011-0-25</u>
TYPE: <u>STRUCTURE</u>	SAMPLING FIRM / LOGGER: <u>S&ME / K. HARPER</u>	HAMMER: <u>CME AUTOMATIC</u>	ALIGNMENT: <u>EX CL R/W IR 271</u>	PAGE: <u>1 OF 1</u>
PID: <u>122877</u> BR ID: <u>NA</u>	DRILLING METHOD: <u>3-1/4" HSA</u>	CALIBRATION DATE: <u>12/30/24</u>	ELEVATION: <u>1165.1 (MSL)</u> EOB: <u>25.0 ft.</u>	
START: <u>11/11/25</u> END: <u>11/11/25</u>	SAMPLING METHOD: <u>SPT</u>	ENERGY RATIO (%): <u>90*</u>	COORD: <u>41.211154 N, 81.667963 W</u>	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
								GR	CS	FS	SI	CL	LL	PL	PI				
TOPSOIL - 5 INCHES	1165.1																		
Very stiff brown CLAY , little fine and coarse sand, trace fine gravel, few iron oxide stains, few roots, moist.	1164.7	1	1																
		2	3	9	100	SS-1	2.0-2.5	1	3	8	28	60	45	20	25	25	A-7-6 (15)	80	
	1162.1	3																	
Hard gray and brown SILT AND CLAY , little fine to coarse sand, trace fine to coarse gravel, damp.		4	4																
		5	6	20	100	SS-2	4.5+	-	-	-	-	-	-	-	-	16	A-6a (V)	-	
		6																	
Hard brown SILT , some clay, trace fine to coarse sand, trace fine gravel, moist.	1157.1	7	4																
		8	10	36	100	SS-3	4.5+	-	-	-	-	-	-	-	-	16	A-6a (V)	-	
		9	14																
Hard gray becoming dark gray SILT AND CLAY , little fine to coarse sand, trace fine to coarse gravel, damp to moist.	1153.3	10	6																
		11	9	33	100	SS-4	4.5+	1	1	7	59	32	27	17	10	19	A-4b (8)	-	
		12	13																
	1140.1	13	5																
		14	11	30	100	SS-5A	4.5+	-	-	-	-	-	-	-	-	16	A-4b (V)	-	
		15	9			SS-5B	4.5+	-	-	-	-	-	-	-	-	14	A-6a (V)	-	
		16	3																
		17	5	17	100	SS-6	4.5+	-	-	-	-	-	-	-	-	16	A-6a (V)	-	
		18	6																
		19	2																
		20	3	12	100	SS-7	4.5+	7	7	13	36	37	26	15	11	15	A-6a (8)	-	
		21	5																
		22	3																
		23	5	21	100	SS-8	4.5+	-	-	-	-	-	-	-	-	14	A-6a (V)	-	
		24	9																
		25	3																
		26	5	17	100	SS-9	4.5+	-	-	-	-	-	-	-	-	17	A-6a (V)	-	
		27	6																
		28	3																
		29	7	21	100	SS-10	4.5+	-	-	-	-	-	-	-	-	15	A-6a (V)	-	
		30	7																

NOTES:
- No water encountered.

NOTES: SEE ABOVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT GDT - 2/13/26 12:52 - R:SERVICE LINESCS-2557COLUMBUSGINTWPROJECTS24170232F SUM-271 TP-GPJ



PROJECT: <u>SUM-271 TRUCK PARKING</u>	DRILLING FIRM / OPERATOR: <u>OTB / C. SVITAK</u>	DRILL RIG: <u>OTB ATV B-57</u>	STATION / OFFSET: <u>470+76, 217' LT</u>	EXPLORATION ID: <u>B-012-0-25</u>
TYPE: <u>STRUCTURE</u>	SAMPLING FIRM / LOGGER: <u>S&ME / K. HARPER</u>	HAMMER: <u>CME AUTOMATIC</u>	ALIGNMENT: <u>EX CL R/W IR 271</u>	PAGE: <u>1 OF 1</u>
PID: <u>122877</u> BR ID: <u>NA</u>	DRILLING METHOD: <u>3-1/4" HSA</u>	CALIBRATION DATE: <u>12/30/24</u>	ELEVATION: <u>1170.5 (MSL)</u> EOB: <u>25.0 ft.</u>	
START: <u>11/12/25</u> END: <u>11/12/25</u>	SAMPLING METHOD: <u>SPT</u>	ENERGY RATIO (%): <u>90*</u>	COORD: <u>41.210309 N, 81.667272 W</u>	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
								GR	CS	FS	SI	CL	LL	PL	PI				
TOPSOIL - 6 INCHES	1170.5																		
Stiff brown SILT AND CLAY , some fine to coarse sand, little fine to coarse gravel, few roots, moist.	1167.5	1	1	9	78	SS-1	1.0	13	6	28	26	27	28	16	12	17	A-6a (4)	60	
Hard gray and brown SILTY CLAY , little fine to coarse sand, trace fine to coarse gravel, damp.	1165.0	4	4	18	100	SS-2	4.5+	-	-	-	-	-	-	-	-	18	A-6b (V)	-	
Hard brown SANDY SILT , some clay, trace fine gravel, few silt seams, few iron oxide stains, damp.	1162.5	6	4	29	100	SS-3	4.5+	8	10	15	39	28	25	15	10	12	A-4a (6)	-	
Hard brown SILTY CLAY , some fine to coarse sand, trace fine to coarse gravel, few iron oxide stains, damp.	1160.0	9	4	27	100	SS-4	4.5+	-	-	-	-	-	-	-	-	17	A-6b (V)	-	
Hard brown and gray SILT AND CLAY , little fine to coarse sand, trace fine to coarse gravel, few silt and sand seams, few iron oxide stains, damp.	1152.5	14	3	18	100	SS-6	4.5+	10	8	13	36	33	26	15	11	13	A-6a (7)	-	
Hard gray SANDY SILT , some clay, little fine and coarse gravel, few iron oxide stains, damp.	1150.0	19	4	24	100	SS-8	4.5+	16	8	14	33	29	23	14	9	12	A-4a (5)	-	
Hard gray SILT AND CLAY , little fine to coarse sand, trace fine to coarse gravel, damp.	1145.5	24	4	20	100	SS-10	4.5+	-	-	-	-	-	-	-	-	15	A-6a (V)	-	

NOTES:
- No water encountered.

NOTES: SEE ABOVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT GDT - 2/13/26 12:52 - R-SERVICE LINESCS-2557COLUMBUSGINTWPROJECTS24170232F SUM-271 TP-GPJ



PROJECT: SUM-271 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / C. SVITAK	DRILL RIG: OTB ATV B-57	STATION / OFFSET: 472+08, 363' LT	EXPLOSION ID
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: EX CL R/W IR 271	B-013-0-25
PID: 122877 BR ID: NA	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1175.2 (MSL) EOB: 10.0 ft.	PAGE
START: 11/10/25 END: 11/10/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	COORD: 41.210841 N, 81.667151 W	1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
								GR	CS	FS	SI	CL	LL	PL	PI				
TOPSOIL - 5 INCHES	1175.2																		
Stiff brown becoming dark brown SILTY CLAY , some fine to coarse sand, little fine to coarse gravel, few roots above 3.0', moist.	1174.8	1	1																< >
		2	2	6	100	SS-1	1.0-1.5	15	9	18	24	34	39	20	19	23	A-6b (8)	240	< >
		3																	< >
Hard brown SILT AND CLAY , little fine to coarse sand, trace fine gravel, few silt seams, damp.		4	2																< >
		5	3	9	100	SS-2	-	-	-	-	-	-	-	-	-	19	A-6b (V)	-	< >
	1169.7	6																	< >
		7	3																< >
		8	8																< >
		9	10	27	100	SS-3	4.5+	5	5	12	33	45	32	18	14	16	A-6a (10)	-	< >
		10																	< >
	1165.2	EOB	4	12	100	SS-4	4.5+	-	-	-	-	-	-	-	-	16	A-6a (V)	-	< >

NOTES:
- No water encountered.

NOTES: SEE ABOVE.
ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE



PROJECT: SUM-271 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / C. SVITAK	DRILL RIG: OTB ATV B-57	STATION / OFFSET: 473+04, 548' LT	EXPLORATION ID
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: EX CL R/W IR 271	B-014-0-25
PID: 122877 BR ID: NA	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1170.3 (MSL) EOB: 10.0 ft.	PAGE
START: 11/10/25 END: 11/10/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	COORD: 41.211412 N, 81.667218 W	1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
								GR	CS	FS	SI	CL	LL	PL	PI				
TOPSOIL - 6 INCHES	1170.3																		
Very stiff brown CLAY , little fine to coarse sand, trace fine gravel, few roots, damp.	1169.8	1	2	3	14	100	SS-1	3.5	5	5	13	29	48	43	20	23	20	A-7-6 (14)	247
		2	6																
	1167.3	3																	
Hard brown SILT AND CLAY , little fine to coarse sand, trace fine gravel, few iron oxide stains, damp.		4	5	6	18	100	SS-2	4.5+	3	6	13	40	38	29	17	12	14	A-6a (9)	-
		5	6																
		6	4	7															
		7	10	26	100	SS-3	4.5+	-	-	-	-	-	-	-	-	14	A-6a (V)	-	
		8																	
		9	7	11															
	1160.3	10	10	32	100	SS-4	4.5+	-	-	-	-	-	-	-	-	15	A-6a (V)	-	
		EOB																	

NOTES:
- No water encountered.

NOTES: SEE ABOVE.
ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT GDT - 2/13/26 12:52 - R:SERVICE LINESCS-2557COLUMBUSGINTWPPROJECTS\24170232F SUM-271 TP.GPJ

PLATE 18



PROJECT: <u>SUM-271 TRUCK PARKING</u>		DRILLING FIRM / OPERATOR: <u>OTB / C. SVITAK</u>		DRILL RIG: <u>OTB ATV B-57</u>		STATION / OFFSET: <u>473+26, 144' LT</u>		EXPLORATION ID	
TYPE: <u>ROADWAY</u>		SAMPLING FIRM / LOGGER: <u>S&ME / K. HARPER</u>		HAMMER: <u>CME AUTOMATIC</u>		ALIGNMENT: <u>EX CL R/W IR 271</u>		B-015-0-25	
PID: <u>122877</u> BR ID: <u>NA</u>		DRILLING METHOD: <u>3-1/4" HSA</u>		CALIBRATION DATE: <u>12/30/24</u>		ELEVATION: <u>1175.4 (MSL)</u> EOB: <u>10.0 ft.</u>		PAGE	
START: <u>11/12/25</u> END: <u>11/12/25</u>		SAMPLING METHOD: <u>SPT</u>		ENERGY RATIO (%): <u>90*</u>		COORD: <u>41.210510 N, 81.666361 W</u>		1 OF 1	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
								GR	CS	FS	SI	CL	LL	PL	PI				
TOPSOIL - 7 INCHES	1175.4																		
Very stiff brown and dark brown SILT AND CLAY , some fine to coarse sand, trace fine gravel, damp.	1174.8	1	1	11	100	SS-1	3.5	8	8	16	34	34	30	17	13	17	A-6a (8)	200	< >
		2	5																< >
	1172.4	3																	< >
Hard brown mottled with gray SILT AND CLAY , little fine to coarse sand, trace fine gravel, damp.		4	6	26	100	SS-2	4.5+	7	7	12	34	40	28	16	12	15	A-6a (9)	-	< >
		5	9																< >
		6	4																< >
		7	10	35	100	SS-3	4.5+	-	-	-	-	-	-	-	-	14	A-6a (V)	-	< >
		8	13																< >
		9	6																< >
		10	7	51	100	SS-4	4.5+	-	-	-	-	-	-	-	-	16	A-6a (V)	-	< >
	1165.4	EOB	27																< >

NOTES:
- No water encountered.

NOTES: SEE ABOVE.
ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT GDT - 2/13/26 12:52 - R:SERVICE LINESCS-2557COLUMBUSGINTWP/PROJECTS/24170232F SUM-271 TP.GPJ
PLATE 19



PROJECT: <u>SUM-271 TRUCK PARKING</u>			DRILLING FIRM / OPERATOR: <u>OTB / C. SVITAK</u>			DRILL RIG: <u>OTB ATV B-57</u>			STATION / OFFSET: <u>474+13, 319' LT</u>			EXPLORATION ID									
TYPE: <u>STRUCTURE</u>			SAMPLING FIRM / LOGGER: <u>S&ME / K. HARPER</u>			HAMMER: <u>CME AUTOMATIC</u>			ALIGNMENT: <u>EX CL R/W IR 271</u>			B-016-0-25									
PID: <u>122877</u> BR ID: <u>NA</u>			DRILLING METHOD: <u>3-1/4" HSA</u>			CALIBRATION DATE: <u>12/30/24</u>			ELEVATION: <u>1183.3 (MSL)</u> EOB: <u>23.7 ft.</u>			PAGE									
START: <u>11/10/25</u> END: <u>11/10/25</u>			SAMPLING METHOD: <u>SPT</u>			ENERGY RATIO (%): <u>90*</u>			COORD: <u>41.211044 N, 81.666436 W</u>			1 OF 1									
MATERIAL DESCRIPTION AND NOTES		ELEV.	DEPTHS	SPT/RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL	
									GR	CS	FS	SI	CL	LL	PL	PI					
TOPSOIL - 3 INCHES		1183.0	W 1182.3	1	2																
GRAVEL FILL - 9 INCHES		1182.3		2	3	12	61	SS-1	4.5+	-	-	-	-	-	-	-	-	29	A-6b (V)	-	
Hard brown SILTY CLAY , some fine to coarse sand, trace fine gravel, few iron oxide stains, moist.				3	5																
				4	2																
				5	3	12	100	SS-2	4.5+	2	5	16	37	40	38	18	20	23	A-6b (12)	-	
		1177.8		6	5																
Soft (est.) brown SILT AND CLAY , "and" fine to coarse sand, trace fine gravel, few iron oxide stains, moist.				7	1	3	100	SS-3	-	8	15	33	29	15	26	15	11	23	A-6a (2)	120	
		1175.3		8	1																
Very stiff brown SILT AND CLAY , little fine to coarse sand, trace fine gravel, moist.				9	4	27	100	SS-4	3.5	2	5	11	47	35	26	15	11	21	A-6a (8)	-	
				10	8																
- 10.5' to 13.0'; few roots, damp.				11	3																
				12	5	20	100	SS-5	3.5	4	8	12	37	39	27	16	11	16	A-6a (8)	-	
				13																	
- 13.0' to 15.5'; hard, few sand seams, damp.				14	3	39	100	SS-6	4.5+	-	-	-	-	-	-	-	15	A-6a (V)	-		
		1167.8		15	9																
Very dense brown GRAVEL WITH SAND , trace silt, trace clay, damp.				16	8																
				17	20	60	78	SS-7	-	43	17	33	5	2	NP	NP	NP	5	A-1-b (0)	-	
				18	20																
SANDSTONE, light gray and light brown, moderately weathered, weak to slightly strong.		1164.0	TR	19	17	-	100	SS-8	-	-	-	-	-	-	-	-	5	A-1-b (V)	-		
				20	50/3"																
				21	50/1"	-	100	SS-9	-	-	-	-	-	-	-	-	9	Rock (V)	-		
				22																	
		1159.6	EOB	23	50/2"	-	100	SS-10	-	-	-	-	-	-	-	-	6	Rock (V)	-		
<div>NOTES:</div> <div>- Encountered seepage at 1.0'.</div> <div>- Measured water at 16.0' inside augers at completion.</div> <div>- After augers pulled, water measured at 18.0'.</div>																					
NOTES: SEE ABOVE.																					
ABANDONMENT METHODS. MATERIALS. QUANTITIES: ASPHALT PATCH: PLASTIC HOLE PLUG DEVICE: SOIL CUTTINGS MIXED WITH BENTONITE																					



PROJECT: <u>SUM-271 TRUCK PARKING</u>	DRILLING FIRM / OPERATOR: <u>OTB / C. SVITAK</u>	DRILL RIG: <u>OTB ATV B-57</u>	STATION / OFFSET: <u>474+56, 248' LT</u>	EXPLORATION ID
TYPE: <u>ROADWAY</u>	SAMPLING FIRM / LOGGER: <u>S&ME / K. HARPER</u>	HAMMER: <u>CME AUTOMATIC</u>	ALIGNMENT: <u>EX CL R/W IR 271</u>	B-017-0-25
PID: <u>122877</u> BR ID: <u>NA</u>	DRILLING METHOD: <u>3-1/4" HSA</u>	CALIBRATION DATE: <u>12/30/24</u>	ELEVATION: <u>1185.7 (MSL)</u> EOB: <u>10.0 ft.</u>	PAGE
START: <u>11/10/25</u> END: <u>11/10/25</u>	SAMPLING METHOD: <u>SPT</u>	ENERGY RATIO (%): <u>90*</u>	COORD: <u>41.210942 N, 81.666167 W</u>	1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
								GR	CS	FS	SI	CL	LL	PL	PI				
ROOTMAT - 6 INCHES	1185.7																		
Fill: Medium dense gray and dark brown GRAVEL WITH SAND AND SILT , little clay, few pockets of organic matter, damp.	1185.2	1	6																< >
		2	4	12	56	SS-1	-	-	-	-	-	-	-	-	-	11	A-2-4 (V)	-	< >
	1182.7	3																	< >
		4	4	32	100	SS-2	4.5+	12	7	13	32	36	33	18	15	17	A-6a (9)	-	< >
		5	10																< >
		6	11																< >
Hard brown SILT AND CLAY , some fine to coarse sand, trace to little fine to coarse gravel, few sand seams below 8.0', damp.		7	5	35	100	SS-3	4.5+	5	8	14	37	36	29	17	12	17	A-6a (8)	100	< >
		8	10																< >
		9	13																< >
	1175.7	10	7	41	100	SS-4	4.5+	-	-	-	-	-	-	-	-	15	A-6a (V)	-	< >
		EOB	17																< >

NOTES:
- No water encountered.

NOTES: SEE ABOVE.
ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE

WILDCAT DYNAMIC CONE LOG

Page 1 of 1

PROJECT NUMBER: 24170232F
DATE STARTED: 12-05-2025
DATE COMPLETED: 12-05-2025

HOLE #: D-009-1-25
CREW: KAH/BKS
PROJECT: Site 15 SUM-271 Truck Parking
ADDRESS: Richfield, Summit County, OH
LOCATION: 41.210699, -81.668465; Sta. 468+75, 513' Lt.

SURFACE ELEVATION: 1157
WATER ON COMPLETION: 1
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm ²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY	
					NON-COHESIVE	COHESIVE
-	1	4.4	•	1	VERY LOOSE	VERY SOFT
-	3	13.3	...	3	VERY LOOSE	SOFT
- 1 ft	3	13.3	...	3	VERY LOOSE	SOFT
-	5	22.2		6	LOOSE	MEDIUM STIFF
-	8	35.5		10	LOOSE	STIFF
- 2 ft	8	35.5		10	LOOSE	STIFF
-	10	44.4		12	MEDIUM DENSE	STIFF
-	9	40.0		11	MEDIUM DENSE	STIFF
- 3 ft	10	44.4		12	MEDIUM DENSE	STIFF
- 1 m	14	62.2		17	MEDIUM DENSE	VERY STIFF
-	17	65.6		18	MEDIUM DENSE	VERY STIFF
- 4 ft	20	77.2		22	MEDIUM DENSE	VERY STIFF
-	23	88.8		25	MEDIUM DENSE	VERY STIFF
-	25	96.5		25+	MEDIUM DENSE	VERY STIFF
- 5 ft	28	108.1		25+	MEDIUM DENSE	VERY STIFF
-	28	108.1		25+	MEDIUM DENSE	VERY STIFF
-	35	135.1		25+	DENSE	HARD
- 6 ft	26	100.4		25+	MEDIUM DENSE	VERY STIFF
-	26	100.4		25+	MEDIUM DENSE	VERY STIFF
- 2 m	29	111.9		25+	DENSE	HARD
- 7 ft	22	75.2		21	MEDIUM DENSE	VERY STIFF
-	29	99.2		25+	MEDIUM DENSE	VERY STIFF
-	28	95.8		25+	MEDIUM DENSE	VERY STIFF
- 8 ft	28	95.8		25+	MEDIUM DENSE	VERY STIFF
-	27	92.3		25+	MEDIUM DENSE	VERY STIFF
-	32	109.4		25+	DENSE	HARD
- 9 ft	31	106.0		25+	MEDIUM DENSE	VERY STIFF
-	27	92.3		25+	MEDIUM DENSE	VERY STIFF
-	50	171.0		25+	DENSE	HARD
- 3 m 10 ft						
-						
-						
- 11 ft						
-						
- 12 ft						
-						
- 4 m 13 ft						

WILDCAT DYNAMIC CONE LOG

Page 1 of 1

PROJECT NUMBER: 24170232F
DATE STARTED: 12-05-2025
DATE COMPLETED: 12-05-2025

HOLE #: D-009-2-25
CREW: KAH/BKS
PROJECT: Site 15 SUM-271 Truck Parking
ADDRESS: Richfield, Summit County, OH
LOCATION: 41.210838, -81.668342; Sta. 469+31, 538' Lt.

SURFACE ELEVATION: 1160
WATER ON COMPLETION: 7
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm ²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY	
					NON-COHESIVE	COHESIVE
-	2	8.9	••	2	VERY LOOSE	SOFT
-	2	8.9	••	2	VERY LOOSE	SOFT
- 1 ft	3	13.3	•••	3	VERY LOOSE	SOFT
-	4	17.8	••••	5	LOOSE	MEDIUM STIFF
-	8	35.5	••••••••	10	LOOSE	STIFF
- 2 ft	8	35.5	••••••••	10	LOOSE	STIFF
-	7	31.1	••••••••	8	LOOSE	MEDIUM STIFF
-	9	40.0	••••••••	11	MEDIUM DENSE	STIFF
- 3 ft	13	57.7	••••••••••	16	MEDIUM DENSE	VERY STIFF
- 1 m	17	75.5	••••••••••••	21	MEDIUM DENSE	VERY STIFF
-	22	84.9	••••••••••••••	24	MEDIUM DENSE	VERY STIFF
- 4 ft	22	84.9	••••••~	24	MEDIUM DENSE	VERY STIFF
-	23	88.8	••••••~	25	MEDIUM DENSE	VERY STIFF
-	24	92.6	••••••~	25+	MEDIUM DENSE	VERY STIFF
- 5 ft	27	104.2	••••••~	25+	MEDIUM DENSE	VERY STIFF
-	28	108.1	••••••~	25+	MEDIUM DENSE	VERY STIFF
-	27	104.2	••••••~	25+	MEDIUM DENSE	VERY STIFF
- 6 ft	26	100.4	••••••~	25+	MEDIUM DENSE	VERY STIFF
-	26	100.4	••••••~	25+	MEDIUM DENSE	VERY STIFF
- 2 m	27	104.2	••••••~	25+	MEDIUM DENSE	VERY STIFF
- 7 ft	29	99.2	••••••~	25+	MEDIUM DENSE	VERY STIFF
-	20	68.4	••••••~	19	MEDIUM DENSE	VERY STIFF
-	24	82.1	••••••~	23	MEDIUM DENSE	VERY STIFF
- 8 ft	26	88.9	••••••~	25	MEDIUM DENSE	VERY STIFF
-	26	88.9	••••~	25	MEDIUM DENSE	VERY STIFF
-	28	95.8	••••~	25+	MEDIUM DENSE	VERY STIFF
- 9 ft	24	82.1	••••~	23	MEDIUM DENSE	VERY STIFF
-	25	85.5	••••~	24	MEDIUM DENSE	VERY STIFF
-	26	88.9	••••~	25	MEDIUM DENSE	VERY STIFF
- 3 m 10 ft	28	95.8	••••~	25+	MEDIUM DENSE	VERY STIFF
-	55	168.3	••••~	25+	DENSE	HARD
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
- 4 m 13 ft						



B-001-0-25



SCALE

0" 2" 6" 12" 24"

Run #:	Depth		Recovery		RQD	
NQ-6	12.5'	17.5'	60/60	100%	41/60	68%
TP 26 NE OHIO SITE 15 SUM-271 ACTIVE REST AREAS (PID 122877)						

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

ASTM D7012 Method C



S&ME, Inc. - Lexington: 2020 Liberty Road, Suite 105, Lexington, KY 40505

Project No.:	24170232F	Report Date:	01/05/26
Project Name:	TP 26 Site 15 SUM-271	Test Date(s):	12/30/25
Client Name:	ms consultants, inc.		
Client Address:	2221 Schrock Road, Columbus, OH 43229	Received Date:	12/11/25
Location:	B-001-0-25	Depth, ft:	14.6 - 15.0
Sample Description:	Sandstone		

Angle of load relative to lithology: Approximately perpendicular

Test Results

Moisture Content	0.8 %	Compressive Strength	1,020 ksf
Dry Unit Weight	138.7 pcf		7,100 psi



Before Test



After Test

Strain rate: 0.015 in/min.

Notes / Deviations / References: Test specimen did not meet the ASTM standard specifications because of side straightness issue and was capped. Test results for specimens not prepared in accordance with this method may differ from test results from specimens meeting this requirement.

Jacob Folsom
Technical Responsibility

On File
Signature

Laboratory Services Manger
Position

1/14/2026
Date

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UNIAXIAL COMPRESSIVE STRENGTH**OF ROCK**

ASTM D 7012 Method C

**S&ME, Inc. - Lexington: 2020 Liberty Road, Suite 105, Lexington, KY 40505**

Project Name: TP 26 Site 15 SUM-271

Location: B-001-0-25

Depth, feet: 14.6 - 15.0

Summary of Specimen Tolerances

Length/diameter target:

MET

Perpendicularity target:

MET

Side straightness target:

***BEST EFFORT**

Planeness target:

CAPPED

Parallelism target:

CAPPED

*ASTM D4543-08 Standard Practice for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerance, Section 1.2 - "Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content, chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, the rock specimen will be prepared to the closest tolerance practicable and be considered the best effort and report it as such. If allowable or necessary for the intended test, capping the ends of the specimen as discussed in ASTM D7012 is permitted."

Length to Diameter Ratio

Length, inches: 4.51

Diameter, inches: 1.972

Ratio:

2.29

length to 1 diameter

Target tolerance: L:D ratio between 2 to 1 and 2.5 to 1

Side Straightness

Maximum gap between side of core and reference plate, inches: 0.090

Target tolerance: Maximum gap less than .02 inches

Planeness

Dial gauge reading, inches

Not Applicable - Capped

Distance along diameter, inches

Maximum point-line deviation, inches: NA

Target Tolerance: No individually measured point should deviate from the best fit line by more than .001 inches.

Parallelism

Slope difference, Diameter 1, degrees: NA-

Slope difference, Diameter 2, degrees: CAPPED

Target Tolerance: Difference between slopes on each end less than 0.25°

Perpendicularity

Maximum divergence from end surface perpendicularity to long axis: NA

Target Tolerance: Each diameter perpendicular to the long axis to within 0.25°

Note: specimens without straight sides cannot be machined to pass.

Test Information

Strain rate, in/min: 0.015

OR

Stress rate, lbs/sec:

Time to failure, min: 5.63

Temperature: room temperature

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Fax Number: (614) 823-4990	Fax Number: (216) 573-0963	Fax Number: (513) 769-7055

PROJECT	N-25-026
JOB NO.	24-17-0232F
DATE TESTED	12/12/2025
TESTED BY	EM/KL

**DETERMINING SULFATE CONTENT IN SOILS
COLORIMETRIC METHOD
ODOT SUPPLEMENT 1122**

Boring	Sample	SAMPLE DATE	Boring Coordinates		DEPTH	Soaking Time (hr)	Dilution Ratio	Replicate Sample Readings			Average Reading	Sulfate Content (ppm)
			Latitude	Longitude				1	2	3		
B-001-0-25	SS-1	11/6/25	41.208148	-81.669647	1.0'-2.5'	24	20	10	10	10	10.00	200
B-002-0-25	SS-1B	11/6/25	41.207898	-81.669127	1.5'-3.0'	24	20	6	6	6	6.00	120
B-003-0-25	SS-1	11/6/25	41.207624	-81.668649	1.0'-2.5'	24	20	4	4	4	4.00	80
B-004-0-25	SS-1	11/6/25	41.208622	-81.668652	1.0'-2.5'	24	20	11	10	10	10.33	207
B-005-0-25	SS-1B	11/7/25	41.208354	-81.668188	1.5'-3.0'	24	20	8	8	8	8.00	160
B-006-0-25	SS-2	11/6/25	41.207964	-81.667825	3.5'-5.0'	24	20	7	7	7	7.00	140
B-007-0-25	SS-1	11/6/25	41.208616	-81.667958	1.0'-2.5'	24	20	13	13	13	11.00	220
B-009-0-25	SS-1	11/11/25	41.210510	-81.668499	1.0'-2.5'	24	20	6	6	6	6.00	120
B-010-0-25	SS-1	11/12/25	41.210010	-81.667904	1.0'-2.5'	24	20	15	15	15	15.00	300
B-011-0-25	SS-1	11/11/25	41.211154	-81.667963	1.0'-2.5'	24	20	4	4	4	4.00	80
B-012-0-25	SS-1	11/12/25	41.210309	-81.667272	1.0'-2.5'	24	20	3	3	3	3.00	60
B-013-0-25	SS-1	11/10/25	41.210841	-81.667151	1.0'-2.5'	24	20	12	12	12	12.00	240
B-014-0-25	SS-1	11/10/25	41.211412	-81.667218	1.0'-2.5'	24	20	13	12	12	12.33	247
B-015-0-25	SS-1	11/12/25	41.210510	-81.666361	1.0'-2.5'	24	20	10	10	10	10.00	200
B-016-0-25	SS-3	11/10/25	41.211044	-81.666436	6.0'-7.5'	24	20	6	6	6	6.00	120
B-017-0-25	SS-3	11/10/25	41.210942	-81.666167	6.0'-7.5'	24	20	5	5	5	5.00	100

		Date: 11/25/2025
		Photographer: KAH
1	Location / Orientation	X-001-1-25
	Remarks	13½" Asphalt

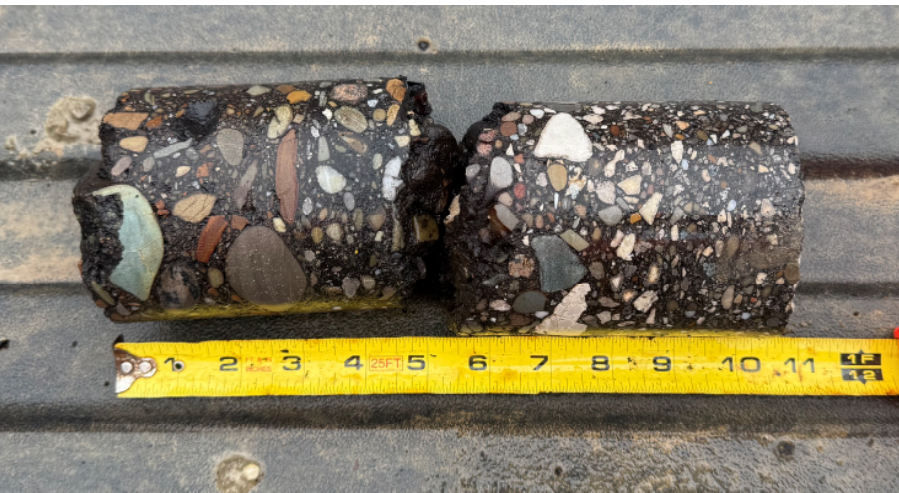
 <p>Rebar</p>		Date: 11/25/2025
		Photographer: KAH
2	Location / Orientation	X-003-1-25
	Remarks	5¼" Asphalt; 9¾" Concrete (with rebar)

Subgrade & Light Tower Exploration Report (Draft)
TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas (PID 122877)

Summit County, Ohio
 S&ME Project No. 24170232F



			Date: 11/25/2025
			Photographer: KAH
3	Location / Orientation	X-005-1-25 (immediately adjacent to B-005-0-25)	
	Remarks	5" Asphalt; 9¼" Concrete (with rebar)	

			Date: 11/25/2025
			Photographer: KAH
4	Location / Orientation	X-007-1-25	
	Remarks	10½" Asphalt	

<div>  </div>			Date: 11/25/2025
			Photographer: KAH
5	Location / Orientation	X-008-1-25	
	Remarks	10" Asphalt	

<div>  <div>Rebar</div> </div>			Date: 11/25/2025
			Photographer: KAH
6	Location / Orientation	X-010-1-25	
	Remarks	4½" Asphalt; 9½" Concrete (with rebar)	

Subgrade & Light Tower Exploration Report (Draft)
TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas (PID 122877)

Summit County, Ohio
 S&ME Project No. 24170232F



			Date: 11/25/2025
			Photographer: KAH
7	Location / Orientation	X-011-1-25	
	Remarks	5½" Asphalt; 9" Concrete (with rebar)	

			Date: 11/25/2025
			Photographer: KAH
8	Location / Orientation	X-017-1-25	
	Remarks	14½" Asphalt	



Important Information About Your Geotechnical Engineering Report

Variations in subsurface conditions can be a principal cause of construction delays, cost overruns and claims. The following information is provided to assist you in understanding and managing the risk of these variations.

Geotechnical Findings Are Professional Opinions

Geotechnical engineers cannot specify material properties as other design engineers do. Geotechnical material properties have a far broader range on a given site than any manufactured construction material, and some geotechnical material properties may change over time because of exposure to air and water, or human activity.

Site exploration identifies subsurface conditions at the time of exploration and only at the points where subsurface tests are performed or samples obtained. Geotechnical engineers review field and laboratory data and then apply their judgment to render professional opinions about site subsurface conditions. Their recommendations rely upon these professional opinions. Variations in the vertical and lateral extent of subsurface materials may be encountered during construction that significantly impact construction schedules, methods and material volumes. While higher levels of subsurface exploration can mitigate the risk of encountering unanticipated subsurface conditions, no level of subsurface exploration can eliminate this risk.

Scope of Geotechnical Services

Professional geotechnical engineering judgment is required to develop a geotechnical exploration scope to obtain information necessary to support design and construction. A number of unique project factors are considered in developing the scope of geotechnical services, such as the exploration objective; the location, type, size and weight of the proposed structure; proposed site grades and improvements; the construction schedule and sequence; and the site geology.

Geotechnical engineers apply their experience with construction methods, subsurface conditions and exploration methods to develop the exploration scope. The scope of each exploration is unique based on available project and site information. Incomplete project information or constraints on the scope of exploration increases the risk of variations in subsurface conditions not being identified and addressed in the geotechnical report.

Services Are Performed for Specific Projects

Because the scope of each geotechnical exploration is unique, each geotechnical report is unique. Subsurface conditions are explored and recommendations are made for a specific project.

Subsurface information and recommendations may not be adequate for other uses. Changes in a proposed structure location, foundation loads, grades, schedule, etc. may require additional geotechnical exploration, analyses, and consultation. The geotechnical engineer should be consulted to determine if additional services are required in response to changes in proposed construction, location, loads, grades, schedule, etc.

Geo-Environmental Issues

The equipment, techniques, and personnel used to perform a geo-environmental study differ significantly from those used for a geotechnical exploration. Indications of environmental contamination may be encountered incidental to performance of a geotechnical exploration but go unrecognized. Determination of the presence, type or extent of environmental contamination is beyond the scope of a geotechnical exploration.

Geotechnical Recommendations Are Not Final

Recommendations are developed based on the geotechnical engineer's understanding of the proposed construction and professional opinion of site subsurface conditions. Observations and tests must be performed during construction to confirm subsurface conditions exposed by construction excavations are consistent with those assumed in development of recommendations. It is advisable to retain the geotechnical engineer that performed the exploration and developed the geotechnical recommendations to conduct tests and observations during construction. This may reduce the risk that variations in subsurface conditions will not be addressed as recommended in the geotechnical report.

Appendix II – Subgrade Analyses

SUBGRADE ANALYSIS
NORTHBOUND REST AREA

OHIO DEPARTMENT OF TRANSPORTATION**OFFICE OF GEOTECHNICAL ENGINEERING****PLAN SUBGRADES****Geotechnical Design Manual Section 600**

**TP 26 SUM-271 Active Rest Areas
122877**

Truck parking area along Northbound IR 271 in eastern Summit County

S&ME, Inc.

Prepared By: Brian K. Sears, PE
Date prepared: Thursday, April 9, 2026

Brian K. Sears, PE
6190 Enterprise Court
Dublin, OH 43016

614-793-2226
bsears@smeinc.com

NO. OF BORINGS: 7

NO. OF DCPS: 0

#	Boring ID	Alignment	Station	Add DCP Test Data Worksheets				Boring EL.	Proposed Subgrade EL.	Cut Fill
				Offset	Dir	Drill Rig	ER			
1	B-001-0-25	Ex. CL R/W SR 271	461+01	96	RT	OTB B57 ATV	90	1125.6	1124.7	0.8 C
2	B-002-0-25	Ex. CL R/W SR 271	416+73	250	RT	OTB B57 ATV	90	1126.5	1125.9	0.6 C
3	B-003-0-25	Ex. CL R/W SR 271	462+30	404	RT	OTB B57 ATV	90	1125.3	1122.9	2.3 C
4	B-004-0-25	Ex. CL R/W SR 271	464+25	97	RT	OTB B57 ATV	90	1134.8	1133.0	1.8 C
5	B-005-0-25	Ex. CL R/W SR 271	464+80	248	RT	OTB B57 ATV	90	1135.9	1134.4	1.5 C
6	B-006-0-25	Ex. CL R/W SR 271	464+88	422	RT	OTB B57 ATV	90	1141.3	1140.0	1.3 C
7	B-007-0-25	Ex. CL R/W SR 271	465+85	202	RT	OTB B57 ATV	90	1138.4	1137.0	1.4 C

#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N ₆₀	N _{60L}		LL	PL	PI	% Silt	% Clay	P200	M _C	M _{OPT}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
1	B 001-0 25	SS-1	1.0	2.5	0.2	1.7	12	11	3.5	33	19	14	33	35	68	16	14	A-6a	8	207					
		SS-2	3.5	5.0	2.7	4.2	15		4.5							19	14	A-6a	10						
		SS-3/4A	6.0	8.7	5.2	7.9	11			NP	NP	NP	22	12	34	11	10	A-2-4							
		SS-4B	8.7	10.0	7.9	9.2	21		3.5							15	14	A-6a							
2	B 002-0 25	SS-1B	1.9	3.0	1.3	2.4	9	9	2.5	30	19	11	61	34	95	22	14	A-6a	8	120		N ₆₀ & Mc			Exc. & Replace - 12" 204 Geotextile or 14" Cem. Stab
		SS-2	3.5	5.0	2.9	4.4	15		2.5	44	21	23	59	37	96	23	18	A-7-6	14						
		SS-3A	6.0	7.1	5.4	6.5	60		2							14	18	A-7-6							
		SS-3B/4	7.1	10.0	6.5	9.4	29									17	8	A-3a							
3	B 003-0 25	SS-1	1.0	2.5	-1.3	0.2	15	15	4.5	42	20	22	54	39	93	20	18	A-7-6	13	80					
		SS-2	3.5	5.0	1.2	2.7	20		4.5	30	16	14	37	24	61	12	14	A-6a	7						
		SS-3A	6.0	6.7	3.7	4.4	62		4.5							16	14	A-6a	10						
		SS-3B/4	6.7	9.3	4.4	7.0	100									6	8	A-3a	0						
4	B 004-0 25	SS-1	1.0	2.5	-0.8	0.7	12	11	3.5	33	19	14	33	35	68	16	14	A-6a	8	207					
		SS-2	3.5	5.0	1.7	3.2	15		4.5							19	14	A-6a	10			Mc			
		SS-3/4A	6.0	8.7	4.2	6.9	11			NP	NP	NP	22	12	34	11	10	A-2-4	0						
		SS-4B	8.7	10.0	6.9	8.2	21		2.5							15	14	A-6a							
5	B 005-0 25	SS-1B	1.9	3.0	0.4	1.5	9	9	3	26	15	11	40	30	70	16	14	A-6a	7	160		N ₆₀		12"	Exc. & Replace - 12" 204 Geotextile or 14" Cem. Stab
		SS-2	3.5	5.0	2.0	3.5	15		1							26	16	A-6b	16			HP & Mc			
		SS-3	6.0	7.5	4.5	6.0	12		1.5	26	16	10	35	31	66	16	11	A-4a	6						
		SS-4	8.5	10.0	7.0	8.5	38		4.5							15	10	A-4a							
6	B 006-0 25	SS-1	1.0	2.5	-0.3	1.2	11	11	2	37	19	18	33	32	65	18	16	A-6b	9			N ₆₀		12"	Exc. & Replace - 12" 204 Geotextile or 14" Cem. Stab
		SS-2	3.5	5.0	2.2	3.7	17		4.5	37	19	18	32	47	79	20	16	A-6b	11	140					
		SS-3	6.0	7.5	4.7	6.2	35		4.5							14	16	A-6b	16						
		SS-4A	8.5	9.7	7.2	8.4	62									10	10	A-2-4							
7	B 007-0 25	SS-1	1.0	2.5	-0.4	1.1	14	14	4.5	33	19	14	42	37	79	20	14	A-6a	10	220		N ₆₀ & Mc		12"	Exc. & Replace - 12" 204 Geotextile or 12" Cem. Stab
		SS-2	3.5	5.0	2.1	3.6	17		4.5	38	18	20	30	50	80	19	16	A-6b	12						
		SS-3	6.0	7.5	4.6	6.1	14		4.5							15	16	A-6b	16						
		SS-4	8.5	10.0	7.1	8.6	15		2							11	10	A-4a							

PID: 122877

County-Route-Section: TP 26 SUM-271 Active Rest Areas

No. of Borings: 7

Geotechnical Consultant: S&ME, Inc.

Prepared By: Brian K. Sears, PE

Date prepared: 4/9/2026

Chemical Stabilization Options		
320	Rubblize & Roll	No
206	Cement Stabilization	Option
	Lime Stabilization	No
206	Depth	12"

Excavate and Replace Stabilization Options	
Global Geotextile Average(N60L): Average(HP):	12" 0"
Global Geogrid Average(N60L): Average(HP):	0" 0"

Design CBR	6
---------------	---

% Samples within 3 feet of subgrade			
$N_{60} \leq 5$	0%	$HP \leq 0.5$	0%
$N_{60} < 12$	14%	$0.5 < HP \leq 1$	5%
$12 \leq N_{60} < 15$	14%	$1 < HP \leq 2$	5%
$N_{60} \geq 20$	5%	$HP > 2$	55%
M+	18%		
Rock	0%		
Unsuitable Soil	0%		

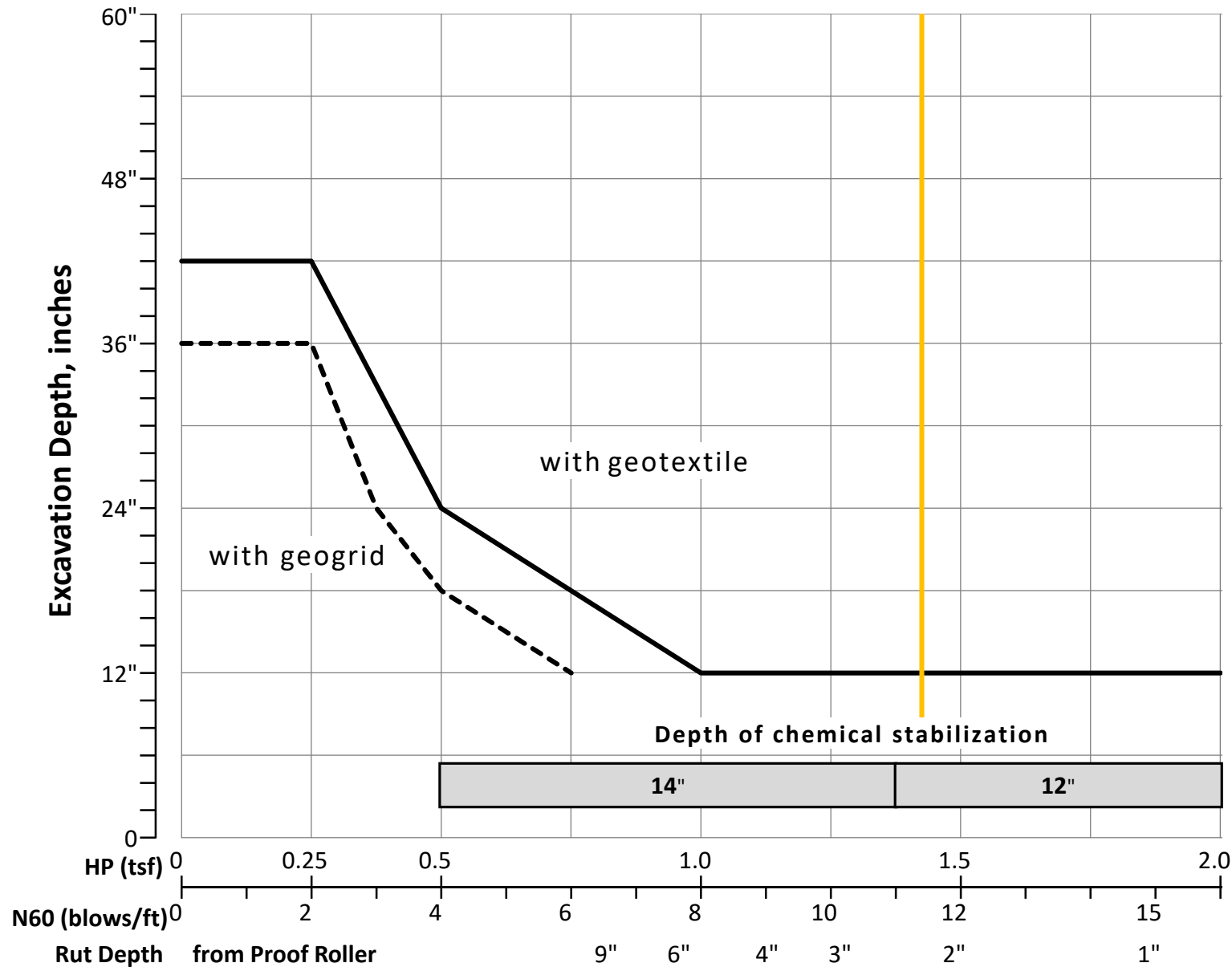
Excavate and Replace at Surface	
Average	0"
Maximum	0"
Minimum	0"

% Proposed Subgrade Surface	
Unstable & Unsuitable	46%
Unstable	46%
Unsuitable (Soil & Rock)	0%

	N_{60}	N_{60L}	HP	LL	PL	PI	Silt	Clay	P 200	M_C	M_{OPT}	GI
Average	25	11	3.43	34	18	16	38	33	71	16	14	10
Maximum	100	15	4.50	44	21	23	61	50	96	26	18	16
Minimum	9	9	1.00	26	15	10	22	12	34	6	8	0

Classification Counts by Sample																				
ODOT Class	UCF	Rock	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7	A-3	A-3a	A-4a	A-4b	A-5	A-6a	A-6b	A-7-5	A-7-6	A-8a	A-8b	Totals
Count	0	0	0	0	3	0	0	0	0	2	3	0	0	11	6	0	3	0	0	28
Percent	0%	0%	0%	0%	11%	0%	0%	0%	0%	7%	11%	0%	0%	39%	21%	0%	11%	0%	0%	100%
% Rock Granular Cohesive	0%	0%	29%									71%								100%
Surface Class Count	0	0	0	0	0	0	0	0	0	0	0	0	0	8	4	0	1	0	0	13
Surface Class Percent	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	62%	31%	0%	8%	0%	0%	100%

Fig. 600-1 – Subgrade Stabilization



OVERRIDE TABLE

Calculated Average	New Values	Check to Override
3.43		☐ HP
11.43		☐ N60L

Average HP

Average N_{60L}



PLATE 5

SUBGRADE ANALYSIS
SOUTHBOUND REST AREA

OHIO DEPARTMENT OF TRANSPORTATION**OFFICE OF GEOTECHNICAL ENGINEERING****PLAN SUBGRADES****Geotechnical Design Manual Section 600****TP 26 SUM-271 Active Rest Areas
122877****Truck parking area along Southbound IR 271 in eastern Summit County****S&ME, Inc.**

Prepared By: Brian K. Sears, PE
Date prepared: Thursday, April 9, 2026

Brian K. Sears, PE
6190 Enterprise Court
Dublin, OH 43016

614-793-2226
bsears@smeinc.com

NO. OF BORINGS: 10**NO. OF DCPS:** 0

#	Boring ID	Alignment	Station	Add DCP Test Data Worksheets				Boring EL.	Proposed Subgrade EL.	Cut Fill
				Offset	Dir	Drill Rig	ER			
1	B-008-0-25	Ex. CL R/W SR 271	467+37	335	LT	OTB B57 ATV	90	1158.3	1161.4	3.1 F
2	B-009-0-25	Ex. CL R/W SR 271	468+30	460	LT	OTB B57 ATV	90	1156.8	1159.3	2.5 F
3	B-010-0-25	Ex. CL R/W SR 271	468+70	219	LT	OTB B57 ATV	90	1165.9	1164.6	1.3 C
4	B-011-0-25	Ex. CL R/W SR 271	470+81	579	LT	OTB B57 ATV	90	1165.1	1165.5	0.4 F
5	B-012-0-25	Ex. CL R/W SR 271	470+76	217	LT	OTB B57 ATV	90	1170.5	1169.2	1.3 C
6	B-013-0-25	Ex. CL R/W SR 271	472+08	363	LT	OTB B57 ATV	90	1175.2	1172.4	2.8 C
7	B-014-0-25	Ex. CL R/W SR 271	473+04	548	LT	OTB B57 ATV	90	1170.3	1169.5	0.7 C
8	B-015-0-25	Ex. CL R/W SR 271	473+26	144	LT	OTB B57 ATV	90	1175.4	1174.1	1.3 C
9	B-016-0-25	Ex. CL R/W SR 271	474+13	319	LT	OTB B57 ATV	90	1183.3	1176.2	7.1 C
10	B-017-0-25	Ex. CL R/W SR 271	474+56	248	LT	OTB B57 ATV	90	1185.7	1184.4	1.3 C

#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics					Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)	
			From	To	From	To	N ₆₀	N _{60L}		LL	PL	PI	% Silt	% Clay	P200	M _C	M _{OPT}	Class		GI	Unsuitable	Unstable	Unsuitable		Unstable
1	B 008-0 25	SS-1A	1.0	1.9	4.1	5.0	15	15	2.5	25	15	10	28	24	52	16	10	A-4a	3						
		SS-1B	1.9	2.5	5.0	5.6	15									12	6	A-1-b							
		SS-2	3.5	5.0	6.6	8.1	12		1.7	23	14	9	24	19	43	14	10	A-4a							
		SS-3	6.0	7.5	9.1	10.6	17		3.5							22	16	A-6b							
2	B 009-0 25	SS-1	1.0	2.5	3.5	5.0	11	11	2.5	47	22	25	30	52	82	23	19	A-7-6	15	120					
		SS-2	3.5	5.0	6.0	7.5	20		4.5	47	24	23	21	72	93	20	21	A-7-6							
		SS-3	6.0	7.5	8.5	10.0	36		4.5							14	14	A-6a							
		SS-4	8.5	10.0	11.0	12.5	39		4.5							14	14	A-6a							
3	B 010-0 25	SS-1	1.0	2.5	-0.3	1.2	12	12	3.7	24	14	10	21	23	44	13	10	A-4a	2	300		N ₆₀ & Mc		12"	Exc. & Replace - 12" 204 Geotextile or 12" Cem. Stab
		SS-2	3.5	5.0	2.2	3.7	12		4.2	36	17	19	27	44	71	17	16	A-6b	11						
		SS-3	6.0	7.5	4.7	6.2	27		4.5							14	16	A-6b	16						
		SS-4	8.5	10.0	7.2	8.7	23		2							11	10	A-4a							
4	B 011-0 25	SS-1	0.5	2.5	0.9	2.9	9	9	2	45	20	25	28	60	88	25	18	A-7-6	15	80		N ₆₀ & Mc		12"	Exc. & Replace - 12" 204 Geotextile or 14" Cem. Stab
		SS-2	3.5	5.0	3.9	5.4	20		4.5							16	14	A-6a	10						
		SS-3	6.0	7.5	6.4	7.9	36		4.5							16	14	A-6a							
		SS-4	8.5	10.0	8.9	10.4	33		4.5	27	17	10	59	32	91	19	12	A-4b							
5	B 012-0 25	SS-1	1.0	2.5	-0.3	1.2	9	9	1	28	16	12	26	27	53	17	14	A-6a	4	60		HP & Mc		12"	Exc. & Replace - 12" 204 Geotextile or 14" Cem. Stab
		SS-2	3.5	5.0	2.2	3.7	18		4.5							18	16	A-6b	16						
		SS-3	6.0	7.5	4.7	6.2	29		4.5	25	15	10	39	28	67	12	10	A-4a	6						
		SS-4	8.5	10.0	7.2	8.7	27		4.5							17	14	A-6a							
6	B 013-0 25	SS-1	1.0	2.5	-1.8	-0.3	6	9	1	39	20	19	24	34	58	23	16	A-6b	8	240					Exc. & Replace - 12" 204 Geotextile or 14" Cem. Stab
		SS-2	3.5	5.0	0.7	2.2	9									19	16	A-6b	16		N ₆₀ & Mc		12"		
		SS-3	6.0	7.5	3.2	4.7	27		4.5	32	18	14	33	45	78	16	14	A-6a	10						
		SS-4	8.5	10.0	5.7	7.2	12		4.5							16	14	A-6a							
7	B 014-0 25	SS-1	1.0	2.5	0.3	1.8	14	14	3.5	43	20	23	29	48	77	20	18	A-7-6	14	247					
		SS-2	3.5	5.0	2.8	4.3	18		4.5	29	17	12	40	38	78	14	14	A-6a	9						
		SS-3	6.0	7.5	5.3	6.8	26		4.5							14	14	A-6a							
		SS-4	8.5	10.0	7.8	9.3	32		4.5							15	14	A-6a							
8	B 015-0 25	SS-1	1.0	2.5	-0.3	1.2	11	11	3.5	30	17	13	34	34	68	17	14	A-6a	8	200		N ₆₀ & Mc		12"	Exc. & Replace - 12" 204 Geotextile or 14" Cem. Stab
		SS-2	3.5	5.0	2.2	3.7	26		4.5	28	16	12	34	40	74	15	14	A-6a	9						
		SS-3	6.0	7.5	4.7	6.2	35		4.5							14	14	A-6a	10						
		SS-4	8.5	10.0	7.2	8.7	51		4.5							16	14	A-6a							
9	B 016-0 25	SS-3	6.0	8.0	-1.1	0.9	3	3		26	15	11	29	15	44	23	14	A-6a	2	120		N ₆₀ & Mc		33"	Exc. & Replace - 33" 204 Geotextile or 14" Cem. Stab
		SS-4	8.0	10.0	0.9	2.9	27		3.5	26	15	11	47	35	82	21	14	A-6a	8		Mc				
		SS-5	11.0	12.5	3.9	5.4	20		3.5	27	16	11	37	39	76	16	14	A-6a	8						
		SS-6	13.5	15.0	6.4	7.9	39		4.5							15	14	A-6a							
10	B 017-0 25	SS-1	1.0	2.5	-0.3	1.2	12	12								11	10	A-2-4	0						
		SS-2	3.5	5.0	2.2	3.7	32		4.5	33	18	15	32	36	68	17	14	A-6a	9						
		SS-3	6.0	7.5	4.7	6.2	35		4.5	29	17	12	37	36	73	17	14	A-6a	8	100					
		SS-4	8.5	10.0	7.2	8.7	41		4.5							15	14	A-6a							

PID: 122877

County-Route-Section: TP 26 SUM-271 Active Rest Areas

No. of Borings: 10

Geotechnical Consultant: S&ME, Inc.

Prepared By: Brian K. Sears, PE

Date prepared: 4/9/2026

Chemical Stabilization Options		
320	Rubblize & Roll	No
206	Cement Stabilization	Option
	Lime Stabilization	No
206	Depth	14"

Excavate and Replace Stabilization Options	
Global Geotextile Average(N60L): Average(HP):	12" 0"
Global Geogrid Average(N60L): Average(HP):	0" 0"

Design CBR	6
---------------	---

% Samples within 3 feet of subgrade			
N ₆₀ ≤ 5	4%	HP ≤ 0.5	0%
N ₆₀ < 12	19%	0.5 < HP ≤ 1	4%
12 ≤ N ₆₀ < 15	15%	1 < HP ≤ 2	4%
N ₆₀ ≥ 20	11%	HP > 2	33%
M+	26%		
Rock	0%		
Unsuitable Soil	0%		

Excavate and Replace at Surface	
Average	0"
Maximum	0"
Minimum	0"

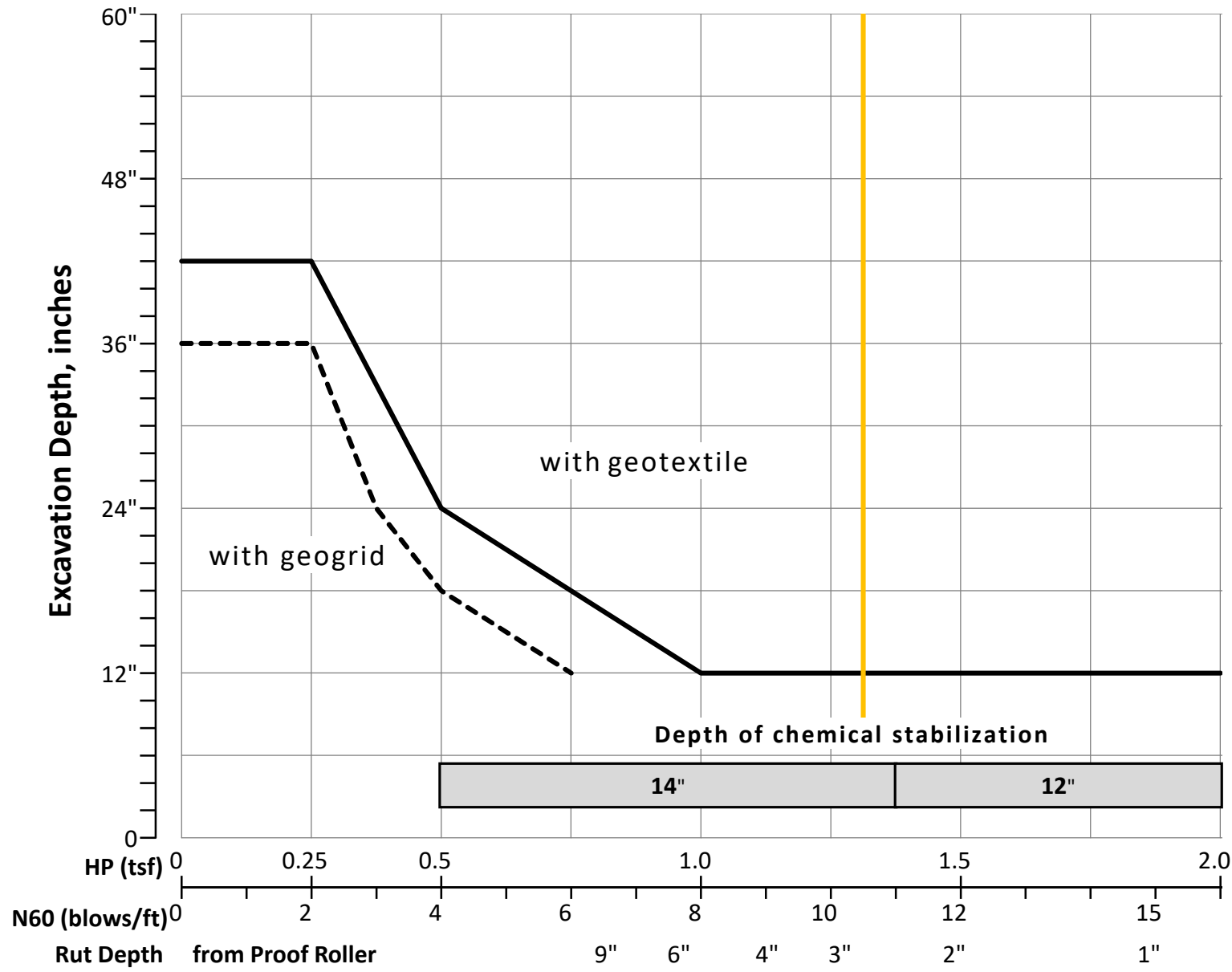
% Proposed Subgrade Surface	
Unstable & Unsuitable	47%
Unstable	47%
Unsuitable (Soil & Rock)	0%

	N ₆₀	N _{60L}	HP	LL	PL	PI	Silt	Clay	P 200	M _C	M _{OPT}	GI
Average	23	11	3.89	32	17	14	33	37	70	16	14	9
Maximum	51	15	4.50	47	24	25	59	72	93	25	21	16
Minimum	3	3	1.00	23	14	9	21	15	43	11	6	0

Classification Counts by Sample																				
ODOT Class	UCF	Rock	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7	A-3	A-3a	A-4a	A-4b	A-5	A-6a	A-6b	A-7-5	A-7-6	A-8a	A-8b	Totals
Count	0	0	0	1	1	0	0	0	0	0	5	1	0	22	5	0	4	0	0	39
Percent	0%	0%	0%	3%	3%	0%	0%	0%	0%	0%	13%	3%	0%	56%	13%	0%	10%	0%	0%	100%
% Rock Granular Cohesive	0%	0%	18%									82%								100%
Surface Class Count	0	0	0	0	1	0	0	0	0	0	1	0	0	7	4	0	2	0	0	15
Surface Class Percent	0%	0%	0%	0%	7%	0%	0%	0%	0%	0%	7%	0%	0%	47%	27%	0%	13%	0%	0%	100%



Fig. 600-1 – Subgrade Stabilization



OVERRIDE TABLE

Calculated Average	New Values	Check to Override
3.89		☐ HP
10.50		☐ N60L

Average HP

Average N_{60L}



PLATE 10

Appendix III – Light Tower Foundation Analyses

LATERAL LOAD (LPILE) ANALYSES
NORTHBOUND PARKING AREA
LPILE SOIL PARAMETERS

LPILE Parameters for Lateral Analyses – SUM-271 Northbound Parking Area

The following tables include parameters used by S&ME to perform a lateral load (LPILE) analysis on the foundations of each light tower at the northbound parking area. These tables include p-y models, soil unit weights, friction angle and subgrade modulus value for granular, and cohesion and strain values for cohesive soils. These parameters are based on the soil encountered and lab data shown on the boring logs, and recommended values given in the LPILE 2022 user's manual and guidance provided by ODOT Office of Geotechnical Engineering (OGE).

Table 1 – LPILE Input Parameters at Light Tower NC1-6 (Boring B-001)

Stratum	Depth* Interval (ft.)	Elevation Range	p-y Soil Model	Effective Unit Weight	Subgrade Modulus, k	C (psf) or ϕ (deg)	Strain ϵ_{50}
Disturbed Layer (per GDM Sec. 1201)	0.0 – 3.0	1,126.7 – 1,123.7	Soft Clay (Matlock)	98 pcf	---	250	0.02
Coarse and Fine Sand (A-3a)	3.0 – 4.1	1,123.7 – 1,122.6	Sand (Reese)	68 pcf	125 pci	36°	---
Fine Sand (A-3)	4.1 – 6.6	1,122.6 – 1,120.1	Sand (Reese)	63 pcf	60 pci	34°	---
Silt and Clay (A-6a)	6.6 – 12.1	1,120.1 – 1,114.6	Stiff Clay w/o Free Water	58 pcf	---	1,500	0.007

*Below proposed ground surface at light tower, estimated to be at El. 1,126.71.

Table 2 – LPILE Input Parameters at Light Tower NC2-1 (Boring B-002)

Stratum	Depth* Interval (ft.)	Elevation Range	p-y Soil Model	Effective Unit Weight	Subgrade Modulus, k	C (psf) or ϕ (deg)	Strain ϵ_{50}
Disturbed Layer (per GDM Sec. 1201)	0.0 – 3.0	1,127.5 – 1,124.5	Soft Clay (Matlock)	98 pcf	---	250	0.02
Silt and Clay (A-6a)	3.0 – 4.2	1,124.5 – 1,123.3	Stiff Clay w/o Free Water	56 pcf	---	2,750	0.005
Elastic Clay (A-7-6)	4.2 – 8.1	1,123.3 – 1,119.4	Stiff Clay w/o Free Water	60 pcf	---	2,500	0.005
Coarse and Fine Sand (A-3a)	8.1 – 11.0	1,119.4 – 1,116.5	Sand (Reese)	66 pcf	60 pci	36°	---

*Below proposed ground surface at light tower, estimated to be at El. 1,127.47.

Table 3 – LPILE Input Parameters at Light Tower NC1-7 (Boring B-004)

Stratum	Depth* Interval (ft.)	Elevation Range	p-y Soil Model	Effective Unit Weight	Subgrade Modulus, k	C (psf) or ϕ (deg)	Strain ϵ_{50}
Disturbed Layer (per GDM Sec. 1201)	0.0 – 3.0	1,136.2 – 1,133.2	Soft Clay (Matlock)	98 pcf	---	250	0.02
Silt and Clay (A-6a)	3.0 – 6.9	1,133.2 – 1,129.3	Stiff Clay w/o Free Water	58 pcf	---	3,750	0.005
Gravel w/ Sand and Silt (A-2-4)	6.9 – 10.1	1,129.3 – 1,126.1	Sand (Reese)	60 pcf	60 pci	34°	---
Silt and Clay (A-6a)	10.1 – 11.4	1,126.1 – 1,124.8	Stiff Clay w/o Free Water	63 pcf	---	2,500	0.005

*Below proposed ground surface at light tower, estimated to be at El. 1,136.15.

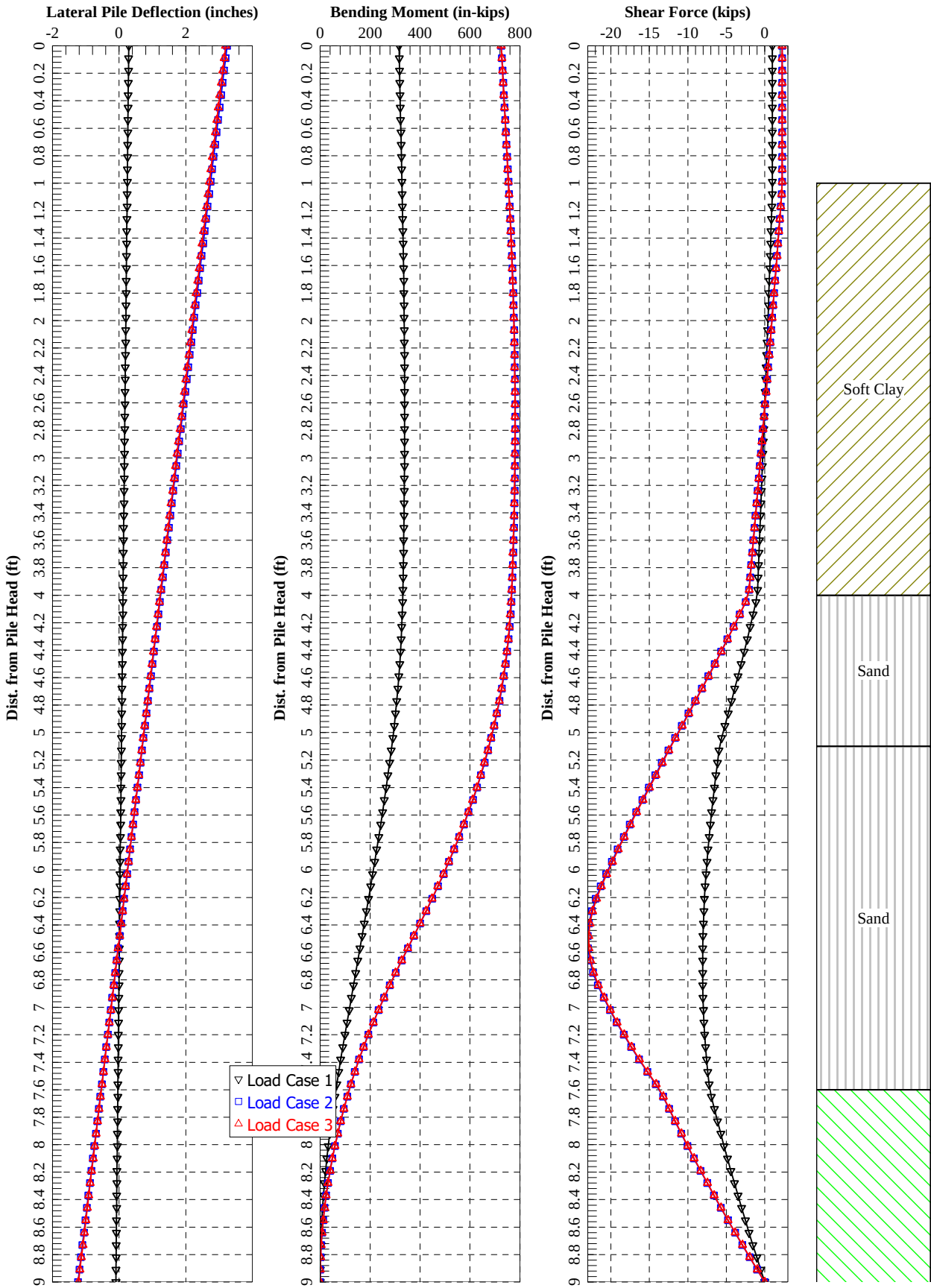
Table 4 – LPILE Input Parameters at Light Tower NC2-7 (Boring B-005)

Stratum	Depth* Interval (ft.)	Elevation Range	p-y Soil Model	Effective Unit Weight	Subgrade Modulus, k	C (psf) or ϕ (deg)	Strain ϵ_{50}
Disturbed Layer (per GDM Sec. 1201)	0.0 – 3.0	1,136.4 – 1,133.4	Soft Clay (Matlock)	98 pcf	---	250	0.02
Silt and Clay (A-6a)	3.0 – 3.7	1,133.4 – 1,132.7	Stiff Clay w/o Free Water	56 pcf	---	3,000	0.005
Silty Clay (A-6b)	3.7 – 6.0	1,132.7 – 1,130.4	Stiff Clay w/o Free Water	60 pcf	---	1,200	0.007
Sandy Silt (A-4a)	6.0 – 8.5	1,130.4 – 1,127.9	Stiff Clay w/o Free Water	58 pcf	---	1,800	0.007
Sandy Silt (A-4a)	8.5 – 11.0	1,127.9 – 1,125.4	Stiff Clay w/o Free Water	68 pcf	---	4,500	0.004
Coarse and Fine Sand (A-3a)	11.0 – 13.5	1,125.4 – 1,122.9	Sand (Reese)	58 pcf	20 pci	32°	---
Coarse and Fine Sand (A-3a)	13.5 – 16.0	1,122.9 – 1,120.4	Sand (Reese)	63 pcf	60 pci	36°	---
Fine Sand (A-3)	16.0 – 18.5	1,120.4 – 1,117.9	Sand (Reese)	70 pcf	125 pci	35°	---
Silt (A-4b)	18.5 – 20.5	1,117.9 – 1,115.9	Sand (Reese)	70 pcf	125 pci	34°	---

*Below proposed ground surface at light tower, estimated to be at El. 1,136.36.

LATERAL LOAD (LPILE) ANALYSES
NORTHBOUND PARKING AREA
LIGHT TOWER NC1-6 (B-001-0-25)

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
Light Tower NC1-6 (Boring B-001-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation



TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
Light Tower NC1-6 (Boring B-001-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

=====

LPILE for Version 2022-12.012

License ID : 228332755
License Type : (Single User License)

Analysis of Individual Piles and Drilled Shafts
Subjected to Lateral Loading Using the p-y Method
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This software is licensed for exclusive use by:
S&ME, Inc.
Valley View, OH

=====

This model was prepared by:
BSears

Files Used for Analysis

Path to file locations:

\Columbus-1170\Projects\2024\24170232_ms_TP 26 NE Ohio\GEO\Project Docs\Site 15_SUM-271
(2LMN)\Calcs\Light Towers\LPILE (Final Report)\NB\

Name of input data file:

Tower NC1-6 (B-001).lp12d

Name of output report file:

Tower NC1-6 (B-001).lp12o

Name of plot output file:

Tower NC1-6 (B-001).lp12p

Name of runtime message file:

Tower NC1-6 (B-001).lp12r

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
Light Tower NC1-6 (Boring B-001-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Date and Time of Analysis

Date: April 8, 2026

Time: 20:02:32

Problem Title

Project Name: TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas

Job Number: 24170232F

Client: ms consultants, inc.

Engineer: BKS

Description: Light Tower NC1-6 (B-001-0-25)

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

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
Light Tower NC1-6 (Boring B-001-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

- 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	=	9.000 ft
Depth of ground surface below top of pile	=	1.0000 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.

Point No.	Depth Below Pile Head feet	Pile Diameter inches
1	0.000	36.0000
2	9.000	36.0000

Input Structural Properties for Pile Sections:

Pile Section No. 1:

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
Light Tower NC1-6 (Boring B-001-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

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

Length of section	=	9.000000 ft
Shaft Diameter	=	36.000000 in

Soil and Rock Layering Information

The soil profile is modelled using 4 layers

Layer 1 is soft clay, p-y criteria by Matlock, 1970

Distance from top of pile to top of layer	=	1.000000 ft
Distance from top of pile to bottom of layer	=	4.000000 ft
Effective unit weight at top of layer	=	98.000000 pcf
Effective unit weight at bottom of layer	=	98.000000 pcf
Undrained cohesion at top of layer	=	250.000000 psf
Undrained cohesion at bottom of layer	=	250.000000 psf
Epsilon-50 at top of layer	=	0.020000
Epsilon-50 at bottom of layer	=	0.020000

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

Distance from top of pile to top of layer	=	4.000000 ft
Distance from top of pile to bottom of layer	=	5.100000 ft
Effective unit weight at top of layer	=	68.000000 pcf
Effective unit weight at bottom of layer	=	68.000000 pcf
Friction angle at top of layer	=	36.000000 deg.
Friction angle at bottom of layer	=	36.000000 deg.
Subgrade k at top of layer	=	125.000000 pci
Subgrade k at bottom of layer	=	125.000000 pci

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

Distance from top of pile to top of layer	=	5.100000 ft
Distance from top of pile to bottom of layer	=	7.600000 ft
Effective unit weight at top of layer	=	63.000000 pcf
Effective unit weight at bottom of layer	=	63.000000 pcf
Friction angle at top of layer	=	34.000000 deg.
Friction angle at bottom of layer	=	34.000000 deg.
Subgrade k at top of layer	=	60.000000 pci
Subgrade k at bottom of layer	=	60.000000 pci

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC1-6 (Boring B-001-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Layer 4 is stiff clay without free water

Distance from top of pile to top of layer	=	7.600000 ft
Distance from top of pile to bottom of layer	=	13.100000 ft
Effective unit weight at top of layer	=	58.000000 pcf
Effective unit weight at bottom of layer	=	58.000000 pcf
Undrained cohesion at top of layer	=	1500. psf
Undrained cohesion at bottom of layer	=	1500. psf
Epsilon-50 at top of layer	=	0.007000
Epsilon-50 at bottom of layer	=	0.007000

(Depth of the lowest soil layer extends 4.100 ft below the pile tip)

 Summary of Input Soil Properties

Layer E50 Num.	Soil Type Name kpy (p-y Curve Type) pci	Layer Depth ft	Effective Unit Wt. pcf	Cohesion psf	Angle of Friction deg.	or
krm						
-----	-----	-----	-----	-----	-----	
1	Soft	1.0000	98.0000	250.0000	--	
0.02000	--					
	Clay	4.0000	98.0000	250.0000	--	
0.02000	--					
2	Sand	4.0000	68.0000	--	36.0000	--
	125.0000					
	(Reese, et al.)	5.1000	68.0000	--	36.0000	--
	125.0000					
3	Sand	5.1000	63.0000	--	34.0000	--
	60.0000					
	(Reese, et al.)	7.6000	63.0000	--	34.0000	--
	60.0000					
4	Stiff Clay	7.6000	58.0000	1500.	--	
0.00700	--					
	w/o Free Water	13.1000	58.0000	1500.	--	
0.00700	--					

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC1-6 (Boring B-001-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

 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 = 3

Load Compute No. Pile	Load Top y Type Length	Condition Run Analysis 1	Condition 2	Axial Thrust Force, lbs	vs.
1 Yes	1	V = 1000.000000 lbs Yes	M = 315600. in-lbs	4200.	
2 Yes	1	V = 2250. lbs Yes	M = 724800. in-lbs	4600.	
3 Yes	1	V = 2250. lbs Yes	M = 724800. in-lbs	3800.	

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

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC1-6 (Boring B-001-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

File Section No. 1:

Dimensions and Properties of Drilled Shaft (Bored Pile):

Length of Section	=	9.000000 ft
Shaft Diameter	=	36.000000 in
Concrete Cover Thickness (to edge of trans. reinf.)	=	3.500000 in
Number of Reinforcing Bars	=	16 bars
Yield Stress of Reinforcing Bars	=	60000. psi
Modulus of Elasticity of Reinforcing Bars	=	29000000. psi
Gross Area of Shaft	=	1018. sq. in.
Total Area of Reinforcing Steel	=	16.000000 sq. in.
Area Ratio of Steel Reinforcement	=	1.57 percent
Edge-to-Edge Bar Spacing	=	4.114467 in
Maximum Concrete Aggregate Size	=	0.750000 in
Ratio of Bar Spacing to Aggregate Size	=	5.49
Offset of Center of Rebar Cage from Center of Pile	=	0.0000 in
Transverse Reinforcement		
Type: Spiral		
Number of Transverse Reinf. (per spacing)	=	1
Spacing of Transverse Reinf.	=	4.500000 in
Yield Stress of Transverse Reinf.	=	60000. psi
Diameter of Transverse Reinf.	=	0.500000 in

Axial Structural Capacities:

Nom. Axial Structural Capacity = $0.85 F_c A_c + F_y A_s$	=	4366.378 kips
Tensile Load for Cracking of Concrete	=	-470.222 kips
Nominal Axial Tensile Capacity	=	-960.000 kips

Reinforcing Bar Dimensions and Positions Used in Computations:

Bar Number	Bar Diam. inches	Bar Area sq. in.	X inches	Y inches
1	1.128000	1.000000	13.436000	0.000000
2	1.128000	1.000000	12.413245	5.141735
3	1.128000	1.000000	9.500687	9.500687
4	1.128000	1.000000	5.141735	12.413245
5	1.128000	1.000000	0.000000	13.436000
6	1.128000	1.000000	-5.14173	12.413245
7	1.128000	1.000000	-9.50069	9.500687
8	1.128000	1.000000	-12.41325	5.141735

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC1-6 (Boring B-001-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

9	1.128000	1.000000	-13.43600	0.00000
10	1.128000	1.000000	-12.41325	-5.14173
11	1.128000	1.000000	-9.50069	-9.50069
12	1.128000	1.000000	-5.14173	-12.41325
13	1.128000	1.000000	0.00000	-13.43600
14	1.128000	1.000000	5.141735	-12.41325
15	1.128000	1.000000	9.500687	-9.50069
16	1.128000	1.000000	12.413245	-5.14173

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

Minimum spacing between any two bars not equal to zero = 4.114 inches
 between bars 11 and 12.

Ratio of bar spacing to maximum aggregate size = 5.49

Concrete Properties:

Compressive Strength of Concrete	=	4000. psi
Modulus of Elasticity of Concrete	=	3604997. psi
Modulus of Rupture of Concrete	=	-474.34165 psi
Compression Strain at Peak Stress	=	0.001886
Tensile Strain at Fracture of Concrete	=	-0.0001154
Maximum Coarse Aggregate Size	=	0.750000 in

Number of Axial Thrust Force Values Determined from Pile-head Loadings = 3

Number	Axial Thrust Force kips
-----	-----
1	3.800
2	4.200
3	4.600

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 318-14, Section 21.2.3.

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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 = 3.800 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Run Moment Stress Msg in-kip ksi	Bending Stiffness kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
6.25000E-07	240.5062135	384809942.	19.2929823	0.00001206	-0.00001044
0.0505030	0.2746478				
0.00000125	480.1472468	384117797.	18.6479768	0.00002331	-0.00002169
0.0973082	0.5259142				
0.00000188	718.9174733	383422652.	18.4329804	0.00003456	-0.00003294
0.1438345	0.7771808				
0.00000250	956.8168886	382726755.	18.3254857	0.00004581	-0.00004419
0.1900818	1.0284477				
0.00000313	1194.	382030558.	18.2609917	0.00005707	-0.00005543
0.2360502	1.2797149				
0.00000375	1430.	381334209.	18.2179981	0.00006832	-0.00006668
0.2817396	1.5309823				
0.00000438	1665.	380637775.	18.1872904	0.00007957	-0.00007793
0.3271500	1.7822500				
0.00000500	1900.	379941287.	18.1642614	0.00009082	-0.00008918
0.3722815	2.0335179				
0.00000563	2133.	379244764.	18.1463515	0.0001021	-0.000100
0.4171340	2.2847861				
0.00000625	2366.	378548215.	18.1320251	0.0001133	-0.000112
0.4617075	2.5360546				
0.00000688	2366.	344134741.	10.2494785	0.00007047	-0.000177
0.2882187	-4.308598 C				
0.00000750	2366.	315456846.	10.2198771	0.00007665	-0.000193
0.3129821	-4.706727 C				
0.00000813	2366.	291190934.	10.1952302	0.00008284	-0.000210
0.3376758	-5.104761 C				
0.00000875	2366.	270391582.	10.1744772	0.00008903	-0.000226
0.3622998	-5.502701 C				

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0.00000938	2366.	252365477.	10.1568402	0.00009522	-0.000242
0.3868539	-5.900547 C				
0.00001000	2366.	236592634.	10.1417358	0.0001014	-0.000259
0.4113380	-6.298297 C				
0.00001063	2366.	222675420.	10.1287027	0.0001076	-0.000275
0.4357521	-6.695951 C				
0.00001125	2366.	210304564.	10.1174231	0.0001138	-0.000291
0.4600960	-7.093510 C				
0.00001188	2366.	199235903.	10.1076093	0.0001200	-0.000307
0.4843696	-7.490973 C				
0.00001250	2366.	189274107.	10.0990420	0.0001262	-0.000324
0.5085729	-7.888340 C				
0.00001313	2366.	180261055.	10.0915439	0.0001325	-0.000340
0.5327056	-8.285611 C				
0.00001375	2366.	172067370.	10.0849699	0.0001387	-0.000356
0.5567678	-8.682785 C				
0.00001438	2366.	164586180.	10.0792000	0.0001449	-0.000373
0.5807594	-9.079861 C				
0.00001500	2366.	157728423.	10.0741344	0.0001511	-0.000389
0.6046801	-9.476841 C				
0.00001563	2366.	151419286.	10.0696892	0.0001573	-0.000405
0.6285300	-9.873723 C				
0.00001625	2366.	145595467.	10.0657933	0.0001636	-0.000421
0.6523089	-10.270507 C				
0.00001688	2366.	140203043.	10.0623863	0.0001698	-0.000438
0.6760167	-10.667193 C				
0.00001750	2366.	135195791.	10.0594163	0.0001760	-0.000454
0.6996534	-11.063781 C				
0.00001813	2366.	130533867.	10.0568387	0.0001823	-0.000470
0.7232187	-11.460271 C				
0.00001875	2366.	126182738.	10.0546147	0.0001885	-0.000486
0.7467127	-11.856661 C				
0.00001938	2366.	122112327.	10.0527107	0.0001948	-0.000503
0.7701352	-12.252952 C				
0.00002000	2366.	118296317.	10.0510970	0.0002010	-0.000519
0.7934860	-12.649144 C				
0.00002063	2366.	114711580.	10.0497478	0.0002073	-0.000535
0.8167652	-13.045236 C				
0.00002125	2366.	111337710.	10.0486401	0.0002135	-0.000551
0.8399726	-13.441228 C				
0.00002188	2366.	108156633.	10.0477539	0.0002198	-0.000568
0.8631080	-13.837120 C				
0.00002250	2366.	105152282.	10.0470709	0.0002261	-0.000584
0.8861714	-14.232911 C				
0.00002313	2366.	102310328.	10.0465752	0.0002323	-0.000600
0.9091627	-14.628602 C				
0.00002375	2366.	99617951.	10.0462524	0.0002386	-0.000616

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0.9320817	-15.024191 C				
0.00002438	2366.	97063645.	10.0460897	0.0002449	-0.000633
0.9549284	-15.419678 C				
0.00002563	2429.	94800037.	10.0461990	0.0002574	-0.000665
1.0004043	-16.210348 C				
0.00002688	2545.	94692477.	10.0468231	0.0002700	-0.000697
1.0455896	-17.000609 C				
0.00002813	2660.	94589756.	10.0479254	0.0002826	-0.000730
1.0904832	-17.790458 C				
0.00002938	2776.	94491232.	10.0493946	0.0002952	-0.000762
1.1350844	-18.579893 C				
0.00003063	2891.	94396370.	10.0512127	0.0003078	-0.000795
1.1793922	-19.368912 C				
0.00003188	3006.	94304718.	10.0533415	0.0003205	-0.000827
1.2234058	-20.157511 C				
0.00003313	3121.	94215891.	10.0557483	0.0003331	-0.000859
1.2671243	-20.945689 C				
0.00003438	3236.	94129561.	10.0584054	0.0003458	-0.000892
1.3105466	-21.733443 C				
0.00003563	3350.	94045446.	10.0612887	0.0003584	-0.000924
1.3536720	-22.520771 C				
0.00003688	3465.	93963300.	10.0643778	0.0003711	-0.000956
1.3964994	-23.307669 C				
0.00003813	3579.	93882912.	10.0676547	0.0003838	-0.000989
1.4390279	-24.094136 C				
0.00003938	3694.	93804096.	10.0711039	0.0003965	-0.001021
1.4812567	-24.880169 C				
0.00004063	3808.	93726688.	10.0747116	0.0004093	-0.001053
1.5231846	-25.665765 C				
0.00004188	3922.	93650546.	10.0784659	0.0004220	-0.001085
1.5648108	-26.450921 C				
0.00004313	4035.	93575540.	10.0823562	0.0004348	-0.001118
1.6061342	-27.235635 C				
0.00004438	4149.	93501560.	10.0863731	0.0004476	-0.001150
1.6471540	-28.019904 C				
0.00004563	4263.	93428502.	10.0905084	0.0004604	-0.001182
1.6878690	-28.803725 C				
0.00004688	4376.	93356279.	10.0947545	0.0004732	-0.001214
1.7282784	-29.587096 C				
0.00004813	4489.	93284807.	10.0991050	0.0004860	-0.001246
1.7683810	-30.370013 C				
0.00004938	4602.	93214014.	10.1035538	0.0004989	-0.001279
1.8081759	-31.152474 C				
0.00005063	4715.	93143835.	10.1080956	0.0005117	-0.001311
1.8476620	-31.934476 C				
0.00005188	4828.	93074209.	10.1127258	0.0005246	-0.001343
1.8868384	-32.716016 C				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00005313	4941.	93005082.	10.1174399	0.0005375	-0.001375
1.9257039	-33.497091 C				
0.00005438	5053.	92936405.	10.1222340	0.0005504	-0.001407
1.9642575	-34.277698 C				
0.00005563	5166.	92868132.	10.1271047	0.0005633	-0.001439
2.0024981	-35.057833 C				
0.00005688	5278.	92800222.	10.1320488	0.0005763	-0.001471
2.0404247	-35.837495 C				
0.00005813	5390.	92732637.	10.1370633	0.0005892	-0.001503
2.0780361	-36.616679 C				
0.00005938	5502.	92665342.	10.1421457	0.0006022	-0.001535
2.1153313	-37.395383 C				
0.00006063	5614.	92598305.	10.1472935	0.0006152	-0.001567
2.1523092	-38.173604 C				
0.00006188	5725.	92531497.	10.1525046	0.0006282	-0.001599
2.1889685	-38.951338 C				
0.00006313	5837.	92464888.	10.1577769	0.0006412	-0.001631
2.2253083	-39.728581 C				
0.00006438	5948.	92398455.	10.1631088	0.0006543	-0.001663
2.2613274	-40.505332 C				
0.00006563	6059.	92332173.	10.1684984	0.0006673	-0.001695
2.2970245	-41.281586 C				
0.00006688	6170.	92266020.	10.1739444	0.0006804	-0.001727
2.3323987	-42.057340 C				
0.00006813	6281.	92199976.	10.1794453	0.0006935	-0.001759
2.3674485	-42.832591 C				
0.00006938	6392.	92134020.	10.1849998	0.0007066	-0.001791
2.4021730	-43.607335 C				
0.00007063	6502.	92068136.	10.1906070	0.0007197	-0.001823
2.4365708	-44.381568 C				
0.00007188	6613.	92002305.	10.1962656	0.0007329	-0.001855
2.4706408	-45.155288 C				
0.00007313	6723.	91936511.	10.2020028	0.0007460	-0.001886
2.5043818	-45.928490 C				
0.00007438	6833.	91870742.	10.2077616	0.0007592	-0.001918
2.5377924	-46.701172 C				
0.00007938	7271.	91607617.	10.2312788	0.0008121	-0.002045
2.6681070	-49.786612 C				
0.00008438	7707.	91343844.	10.2555391	0.0008653	-0.002172
2.7930345	-52.863415 C				
0.00008938	8140.	91079227.	10.2796933	0.0009187	-0.002299
2.9123325	-55.933382 C				
0.00009438	8570.	90813004.	10.3043877	0.0009725	-0.002425
3.0260259	-58.995009 C				
0.00009938	8979.	90357411.	10.3225581	0.0010258	-0.002552
3.1326575	-60.000000 CY				
0.0001044	9304.	89144470.	10.3110511	0.0010762	-0.002681

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3.2276850	-60.000000 CY				
0.0001094	9546.	87273573.	10.2718035	0.0011235	-0.002814
3.3116704	-60.000000 CY				
0.0001144	9782.	85523680.	10.2357064	0.0011707	-0.002947
3.3907664	-60.000000 CY				
0.0001194	10004.	83800225.	10.1987328	0.0012175	-0.003080
3.4643165	-60.000000 CY				
0.0001244	10154.	81641326.	10.1374818	0.0012608	-0.003217
3.5282172	-60.000000 CY				
0.0001294	10287.	79513660.	10.0756441	0.0013035	-0.003354
3.5871212	-60.000000 CY				
0.0001344	10419.	77536664.	10.0197410	0.0013464	-0.003491
3.6423258	-60.000000 CY				
0.0001394	10550.	75693983.	9.9691573	0.0013895	-0.003628
3.6937845	-60.000000 CY				
0.0001444	10680.	73971519.	9.9233661	0.0014327	-0.003765
3.7414497	-60.000000 CY				
0.0001494	10808.	72355946.	9.8810316	0.0014760	-0.003902
3.7851328	-60.000000 CY				
0.0001544	10925.	70772035.	9.8368433	0.0015186	-0.004039
3.8241552	-60.000000 CY				
0.0001594	11008.	69072220.	9.7809580	0.0015588	-0.004179
3.8574366	-60.000000 CY				
0.0001644	11071.	67351790.	9.7204156	0.0015978	-0.004320
3.8862696	-60.000000 CY				
0.0001694	11131.	65719446.	9.6635689	0.0016368	-0.004461
3.9118664	-60.000000 CY				
0.0001744	11191.	64176802.	9.6094393	0.0016756	-0.004602
3.9342902	-60.000000 CY				
0.0001794	11250.	62716278.	9.5601863	0.0017149	-0.004743
3.9535015	-60.000000 CY				
0.0001844	11308.	61329164.	9.5136161	0.0017541	-0.004883
3.9693617	-60.000000 CY				
0.0001894	11364.	60009896.	9.4690774	0.0017932	-0.005024
3.9819050	-60.000000 CY				
0.0001944	11420.	58754909.	9.4280227	0.0018326	-0.005165
3.9911986	-60.000000 CY				
0.0001994	11476.	57559296.	9.3897594	0.0018721	-0.005305
3.9971986	-60.000000 CY				
0.0002044	11531.	56418622.	9.3531932	0.0019116	-0.005446
3.9998595	-60.000000 CY				
0.0002094	11584.	55328385.	9.3201259	0.0019514	-0.005586
3.9974517	-60.000000 CY				
0.0002144	11637.	54285454.	9.2909722	0.0019918	-0.005726
3.9998812	-60.000000 CY				
0.0002194	11690.	53285909.	9.2626721	0.0020320	-0.005866
3.9969940	-60.000000 CY				

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0.0002244	11740.	52321336.	9.2356724	0.0020723	-0.006005
3.9997138	-60.000000 CY				
0.0002294	11786.	51384137.	9.2093226	0.0021124	-0.006145
3.9955528	-60.000000 CY				
0.0002344	11823.	50445667.	9.1796872	0.0021515	-0.006286
3.9989818	-60.000000 CY				
0.0002394	11855.	49524943.	9.1473565	0.0021896	-0.006428
3.9994466	-60.000000 CY				
0.0002444	11876.	48598228.	9.1109548	0.0022265	-0.006571
3.9965160	-60.000000 CY				
0.0002494	11895.	47701101.	9.0745971	0.0022630	-0.006715
3.9991770	-60.000000 CY				
0.0002544	11912.	46829816.	9.0405915	0.0022997	-0.006858
3.9995775	-60.000000 CY				
0.0002594	11929.	45990067.	9.0077660	0.0023364	-0.007001
3.9954763	-60.000000 CY				
0.0002644	11945.	45181124.	8.9766457	0.0023732	-0.007144
3.9984997	-60.000000 CY				
0.0002694	11961.	44401256.	8.9468563	0.0024101	-0.007287
3.9998981	-60.000000 CY				
0.0002744	11976.	43648250.	8.9191370	0.0024472	-0.007430
3.9944635	-60.000000 CY				
0.0003044	12062.	39628140.	8.7757363	0.0026711	-0.008286
3.9984635	-60.000000 CY				
0.0003344	12138.	36300180.	8.6628609	0.0028966	-0.009141
3.9998209	-60.000000 CY				
0.0003644	12207.	33502446.	8.5793723	0.0031261	-0.009991
3.9999551	-60.000000 CYT				
0.0003944	12272.	31117026.	8.5161103	0.0033585	-0.010839
3.9996166	-60.000000 CYT				
0.0004244	12331.	29056485.	8.4674428	0.0035934	-0.011684
3.9972132	-60.000000 CYT				
0.0004544	12377.	27238942.	8.4178614	0.0038249	-0.012533
3.9873462	-60.000000 CYT				

Axial Thrust Force = 4.200 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Run Moment Stress Msg in-kip ksi	Bending Stiffness kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
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6.25000E-07	240.5049676	384807948.	19.4290859	0.00001214	-0.00001036

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0.0508615	0.2771147				
0.00000125	480.1459926	384116794.	18.7161837	0.00002340	-0.00002160
0.0976654	0.5283867				
0.00000188	718.9162127	383421980.	18.4785558	0.00003465	-0.00003285
0.1441903	0.7796589				
0.00000250	956.8156222	382726249.	18.3597458	0.00004590	-0.00004410
0.1904363	1.0309315				
0.00000313	1194.	382030150.	18.2884629	0.00005715	-0.00005535
0.2364034	1.2822044				
0.00000375	1430.	381333869.	18.2409436	0.00006840	-0.00006660
0.2820914	1.5334776				
0.00000438	1665.	380637482.	18.2070035	0.00007966	-0.00007784
0.3275005	1.7847511				
0.00000500	1900.	379941029.	18.1815504	0.00009091	-0.00008909
0.3726306	2.0360248				
0.00000563	2133.	379244533.	18.1617553	0.0001022	-0.000100
0.4174818	2.2872988				
0.00000625	2366.	378548006.	18.1459208	0.0001134	-0.000112
0.4620539	2.5385732				
0.00000688	2366.	344134551.	10.2895004	0.00007074	-0.000177
0.2893429	-4.300617 C				
0.00000750	2366.	315456672.	10.2575513	0.00007693	-0.000193
0.3141325	-4.698533 C				
0.00000813	2366.	291190774.	10.2300378	0.00008312	-0.000209
0.3388235	-5.096560 C				
0.00000875	2366.	270391433.	10.2068278	0.00008931	-0.000226
0.3634446	-5.494492 C				
0.00000938	2366.	252365338.	10.1870615	0.00009550	-0.000242
0.3879959	-5.892330 C				
0.00001000	2366.	236592504.	10.1700940	0.0001017	-0.000258
0.4124772	-6.290073 C				
0.00001063	2366.	222675298.	10.1554324	0.0001079	-0.000275
0.4368884	-6.687720 C				
0.00001125	2366.	210304448.	10.1426931	0.0001141	-0.000291
0.4612294	-7.085271 C				
0.00001188	2366.	199235793.	10.1315564	0.0001203	-0.000307
0.4855002	-7.482727 C				
0.00001250	2366.	189274003.	10.1218127	0.0001265	-0.000323
0.5097005	-7.880086 C				
0.00001313	2366.	180260955.	10.1132503	0.0001327	-0.000340
0.5338304	-8.277349 C				
0.00001375	2366.	172067276.	10.1057088	0.0001390	-0.000356
0.5578898	-8.674515 C				
0.00001438	2366.	164586090.	10.0990556	0.0001452	-0.000372
0.5818784	-9.071585 C				
0.00001500	2366.	157728336.	10.0931803	0.0001514	-0.000389
0.6057963	-9.468556 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC1-6 (Boring B-001-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00001563	2366.	151419203.	10.0879903	0.0001576	-0.000405
0.6296433	-9.865431 C				
0.00001625	2366.	145595387.	10.0834069	0.0001639	-0.000421
0.6534193	-10.262207 C				
0.00001688	2366.	140202965.	10.0793634	0.0001701	-0.000437
0.6771242	-10.658886 C				
0.00001750	2366.	135195717.	10.0758025	0.0001763	-0.000454
0.7007579	-11.055466 C				
0.00001813	2366.	130533795.	10.0726747	0.0001826	-0.000470
0.7243204	-11.451947 C				
0.00001875	2366.	126182669.	10.0699372	0.0001888	-0.000486
0.7478114	-11.848330 C				
0.00001938	2366.	122112260.	10.0675528	0.0001951	-0.000502
0.7712309	-12.244613 C				
0.00002000	2366.	118296252.	10.0654889	0.0002013	-0.000519
0.7945789	-12.640797 C				
0.00002063	2366.	114711517.	10.0637168	0.0002076	-0.000535
0.8178551	-13.036882 C				
0.00002125	2366.	111337649.	10.0622112	0.0002138	-0.000551
0.8410595	-13.432866 C				
0.00002188	2366.	108156573.	10.0609497	0.0002201	-0.000567
0.8641920	-13.828750 C				
0.00002250	2366.	105152224.	10.0599125	0.0002263	-0.000584
0.8872524	-14.224533 C				
0.00002313	2366.	102310272.	10.0590817	0.0002326	-0.000600
0.9102407	-14.620215 C				
0.00002375	2366.	99617896.	10.0584414	0.0002389	-0.000616
0.9331568	-15.015796 C				
0.00002438	2366.	97063591.	10.0579776	0.0002452	-0.000632
0.9560005	-15.411276 C				
0.00002563	2432.	94924068.	10.0575288	0.0002577	-0.000665
1.0014704	-16.201930 C				
0.00002688	2548.	94810571.	10.0576469	0.0002703	-0.000697
1.0466496	-16.992174 C				
0.00002813	2664.	94702439.	10.0582592	0.0002829	-0.000730
1.0915372	-17.782007 C				
0.00002938	2779.	94598964.	10.0593353	0.0002955	-0.000762
1.1361324	-18.571425 C				
0.00003063	2894.	94499555.	10.0607664	0.0003081	-0.000794
1.1804341	-19.360427 C				
0.00003188	3009.	94403710.	10.0625387	0.0003207	-0.000827
1.2244416	-20.149010 C				
0.00003313	3124.	94311007.	10.0646159	0.0003334	-0.000859
1.2681539	-20.937171 C				
0.00003438	3239.	94221082.	10.0669675	0.0003461	-0.000891
1.3115700	-21.724908 C				
0.00003563	3354.	94133623.	10.0695670	0.0003587	-0.000924

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 Light Tower NC1-6 (Boring B-001-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

1.3546892	-22.512219 C				
0.00003688	3468.	94048359.	10.0723915	0.0003714	-0.000956
1.3975103	-23.299100 C				
0.00003813	3582.	93965057.	10.0754214	0.0003841	-0.000988
1.4400326	-24.085550 C				
0.00003938	3697.	93883511.	10.0786392	0.0003968	-0.001021
1.4822550	-24.871565 C				
0.00004063	3811.	93803541.	10.0820299	0.0004096	-0.001053
1.5241766	-25.657144 C				
0.00004188	3925.	93724988.	10.0855803	0.0004223	-0.001085
1.5657965	-26.442282 C				
0.00004313	4039.	93647711.	10.0892786	0.0004351	-0.001117
1.6071135	-27.226979 C				
0.00004438	4152.	93571586.	10.0931145	0.0004479	-0.001150
1.6481268	-28.011230 C				
0.00004563	4266.	93496502.	10.0970787	0.0004607	-0.001182
1.6888354	-28.795033 C				
0.00004688	4379.	93422358.	10.1011630	0.0004735	-0.001214
1.7292383	-29.578385 C				
0.00004813	4492.	93349066.	10.1053601	0.0004863	-0.001246
1.7693344	-30.361284 C				
0.00004938	4606.	93276544.	10.1096634	0.0004992	-0.001278
1.8091228	-31.143727 C				
0.00005063	4718.	93204721.	10.1140670	0.0005120	-0.001310
1.8486023	-31.925710 C				
0.00005188	4831.	93133529.	10.1185657	0.0005249	-0.001343
1.8877721	-32.707231 C				
0.00005313	4944.	93062909.	10.1231546	0.0005378	-0.001375
1.9266309	-33.488287 C				
0.00005438	5056.	92992807.	10.1278294	0.0005507	-0.001407
1.9651778	-34.268875 C				
0.00005563	5169.	92923173.	10.1325862	0.0005636	-0.001439
2.0034117	-35.048992 C				
0.00005688	5281.	92853961.	10.1374215	0.0005766	-0.001471
2.0413316	-35.828634 C				
0.00005813	5393.	92785130.	10.1423320	0.0005895	-0.001503
2.0789362	-36.607799 C				
0.00005938	5505.	92716640.	10.1473148	0.0006025	-0.001535
2.1162246	-37.386484 C				
0.00006063	5617.	92648458.	10.1523672	0.0006155	-0.001567
2.1531956	-38.164685 C				
0.00006188	5728.	92580549.	10.1574868	0.0006285	-0.001599
2.1898481	-38.942399 C				
0.00006313	5840.	92512883.	10.1626714	0.0006415	-0.001631
2.2261809	-39.719622 C				
0.00006438	5951.	92445433.	10.1679189	0.0006546	-0.001663
2.2621930	-40.496353 C				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00006563	6062.	92378172.	10.1732276	0.0006676	-0.001695
2.2978832	-41.272587 C				
0.00006688	6173.	92311077.	10.1785957	0.0006807	-0.001727
2.3332503	-42.048320 C				
0.00006813	6284.	92244124.	10.1840217	0.0006938	-0.001759
2.3682931	-42.823550 C				
0.00006938	6395.	92177292.	10.1895041	0.0007069	-0.001791
2.4030104	-43.598274 C				
0.00007063	6505.	92110561.	10.1950417	0.0007200	-0.001822
2.4374011	-44.372486 C				
0.00007188	6616.	92043913.	10.2006608	0.0007332	-0.001854
2.4714639	-45.146185 C				
0.00007313	6726.	91977331.	10.2063053	0.0007463	-0.001886
2.5051976	-45.919366 C				
0.00007438	6836.	91910797.	10.2120017	0.0007595	-0.001918
2.5386010	-46.692026 C				
0.00007938	7274.	91644853.	10.2352897	0.0008124	-0.002045
2.6688860	-49.777380 C				
0.00008438	7710.	91378587.	10.2593338	0.0008656	-0.002172
2.7937834	-52.854093 C				
0.00008938	8143.	91111830.	10.2831857	0.0009191	-0.002298
2.9130226	-55.924331 C				
0.00009438	8573.	90843621.	10.3077273	0.0009728	-0.002425
3.0266854	-58.985869 C				
0.00009938	8982.	90387473.	10.3258078	0.0010261	-0.002551
3.1332951	-60.000000 CY				
0.0001044	9308.	89176212.	10.3143071	0.0010766	-0.002681
3.2283182	-60.000000 CY				
0.0001094	9549.	87304848.	10.2749831	0.0011238	-0.002814
3.3122821	-60.000000 CY				
0.0001144	9785.	85553556.	10.2389100	0.0011711	-0.002946
3.3913727	-60.000000 CY				
0.0001194	10007.	83830919.	10.2019402	0.0012179	-0.003080
3.4649106	-60.000000 CY				
0.0001244	10158.	81671814.	10.1406407	0.0012612	-0.003216
3.5287895	-60.000000 CY				
0.0001294	10291.	79542859.	10.0787027	0.0013039	-0.003354
3.5876602	-60.000000 CY				
0.0001344	10423.	77564670.	10.0227059	0.0013468	-0.003491
3.6428308	-60.000000 CY				
0.0001394	10554.	75720878.	9.9720357	0.0013899	-0.003628
3.6942550	-60.000000 CY				
0.0001444	10683.	73997378.	9.9261646	0.0014331	-0.003764
3.7418850	-60.000000 CY				
0.0001494	10812.	72381005.	9.8838986	0.0014764	-0.003901
3.7855535	-60.000000 CY				
0.0001544	10929.	70796718.	9.8396771	0.0015190	-0.004038

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

3.8245440	-60.000000 CY				
0.0001594	11012.	69097838.	9.7838573	0.0015593	-0.004178
3.8578061	-60.000000 CY				
0.0001644	11075.	67376662.	9.7232508	0.0015983	-0.004319
3.8866026	-60.000000 CY				
0.0001694	11135.	65743511.	9.6663364	0.0016372	-0.004460
3.9121613	-60.000000 CY				
0.0001744	11195.	64200103.	9.6121495	0.0016761	-0.004601
3.9345463	-60.000000 CY				
0.0001794	11254.	62738857.	9.5628376	0.0017153	-0.004742
3.9537182	-60.000000 CY				
0.0001844	11312.	61351278.	9.5162917	0.0017546	-0.004883
3.9695496	-60.000000 CY				
0.0001894	11368.	60031354.	9.4717005	0.0017937	-0.005024
3.9820503	-60.000000 CY				
0.0001944	11425.	58775745.	9.4305957	0.0018331	-0.005164
3.9913005	-60.000000 CY				
0.0001994	11480.	57579537.	9.3922863	0.0018726	-0.005305
3.9972564	-60.000000 CY				
0.0002044	11535.	56438298.	9.3556780	0.0019121	-0.005445
3.9998723	-60.000000 CY				
0.0002094	11588.	55347517.	9.3241700	0.0019522	-0.005585
3.9975077	-60.000000 CY				
0.0002144	11641.	54304067.	9.2934428	0.0019923	-0.005725
3.9998931	-60.000000 CY				
0.0002194	11694.	53304015.	9.2651074	0.0020325	-0.005865
3.9970558	-60.000000 CY				
0.0002244	11744.	52339157.	9.2380944	0.0020728	-0.006005
3.9997330	-60.000000 CY				
0.0002294	11790.	51401489.	9.2117130	0.0021129	-0.006145
3.9956300	-60.000000 CY				
0.0002344	11827.	50463153.	9.1821360	0.0021521	-0.006285
3.9990203	-60.000000 CY				
0.0002394	11859.	49542728.	9.1500193	0.0021903	-0.006427
3.9992468	-60.000000 CY				
0.0002444	11880.	48615611.	9.1135780	0.0022271	-0.006570
3.9965958	-60.000000 CY				
0.0002494	11900.	47718283.	9.0771076	0.0022636	-0.006714
3.9992162	-60.000000 CY				
0.0002544	11917.	46846598.	9.0431776	0.0023004	-0.006857
3.9993713	-60.000000 CY				
0.0002594	11933.	46006491.	9.0103157	0.0023371	-0.007000
3.9955701	-60.000000 CY				
0.0002644	11949.	45197204.	8.9791598	0.0023739	-0.007144
3.9985538	-60.000000 CY				
0.0002694	11965.	44417005.	8.9493437	0.0024107	-0.007287
3.9999119	-60.000000 CY				

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0.0002744	11980.	43663657.	8.9215934	0.0024479	-0.007430
3.9942523	-60.000000 CY				
0.0003044	12066.	39641995.	8.7782176	0.0026719	-0.008286
3.9985257	-60.000000 CY				
0.0003344	12142.	36312646.	8.6652203	0.0028974	-0.009140
3.9998424	-60.000000 CY				
0.0003644	12212.	33513765.	8.5815911	0.0031269	-0.009991
3.9999658	-60.000000 CYT				
0.0003944	12276.	31127384.	8.5182268	0.0033594	-0.010838
3.9996505	-60.000000 CYT				
0.0004244	12335.	29066055.	8.4694819	0.0035942	-0.011683
3.9973093	-60.000000 CYT				
0.0004544	12381.	27248100.	8.4201387	0.0038259	-0.012532
3.9875919	-60.000000 CYT				

Axial Thrust Force = 4.600 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Run Moment Stress Msg in-kip ksi	Bending Stiffness kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
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6.25000E-07	240.5035986	384805758.	19.5651901	0.00001223	-0.00001027
0.0512199	0.2795816				
0.00000125	480.1446137	384115691.	18.7843907	0.00002348	-0.00002152
0.0980225	0.5308592				
0.00000188	718.9148267	383421241.	18.5241312	0.00003473	-0.00003277
0.1445462	0.7821371				
0.00000250	956.8142298	382725692.	18.3940059	0.00004599	-0.00004401
0.1907908	1.0334154				
0.00000313	1194.	382029703.	18.3159341	0.00005724	-0.00005526
0.2367565	1.2846940				
0.00000375	1430.	381333494.	18.2638891	0.00006849	-0.00006651
0.2824433	1.5359729				
0.00000438	1665.	380637159.	18.2267166	0.00007974	-0.00007776
0.3278510	1.7872522				
0.00000500	1900.	379940746.	18.1988394	0.00009099	-0.00008901
0.3729798	2.0385317				
0.00000563	2133.	379244280.	18.1771590	0.0001022	-0.000100
0.4178295	2.2898116				
0.00000625	2366.	378547777.	18.1598165	0.0001135	-0.000112
0.4624003	2.5410917				
0.00000688	2366.	344134343.	10.3291778	0.00007101	-0.000176

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0.2904571	-4.292706 C				
0.00000750	2366.	315456481.	10.2940289	0.00007721	-0.000193
0.3152465	-4.690597 C				
0.00000813	2366.	291190598.	10.2646762	0.00008340	-0.000209
0.3399656	-5.088396 C				
0.00000875	2366.	270391269.	10.2391817	0.00008959	-0.000225
0.3645893	-5.486283 C				
0.00000938	2366.	252365185.	10.2172859	0.00009579	-0.000242
0.3891378	-5.884113 C				
0.00001000	2366.	236592361.	10.1984552	0.0001020	-0.000258
0.4136162	-6.281848 C				
0.00001063	2366.	222675163.	10.1821496	0.0001082	-0.000274
0.4380246	-6.679488 C				
0.00001125	2366.	210304321.	10.1679490	0.0001144	-0.000291
0.4623628	-7.077032 C				
0.00001188	2366.	199235672.	10.1555219	0.0001206	-0.000307
0.4866307	-7.474480 C				
0.00001250	2366.	189273889.	10.1446030	0.0001268	-0.000323
0.5108282	-7.871831 C				
0.00001313	2366.	180260846.	10.1349589	0.0001330	-0.000339
0.5349552	-8.269087 C				
0.00001375	2366.	172067171.	10.1264498	0.0001392	-0.000356
0.5590117	-8.666245 C				
0.00001438	2366.	164585990.	10.1189132	0.0001455	-0.000372
0.5829974	-9.063307 C				
0.00001500	2366.	157728241.	10.1122282	0.0001517	-0.000388
0.6069124	-9.460271 C				
0.00001563	2366.	151419111.	10.1062933	0.0001579	-0.000405
0.6307565	-9.857138 C				
0.00001625	2366.	145595299.	10.1010224	0.0001641	-0.000421
0.6545296	-10.253907 C				
0.00001688	2366.	140202880.	10.0963423	0.0001704	-0.000437
0.6782316	-10.650577 C				
0.00001750	2366.	135195635.	10.0921903	0.0001766	-0.000453
0.7018624	-11.047150 C				
0.00001813	2366.	130533716.	10.0885122	0.0001829	-0.000470
0.7254219	-11.443623 C				
0.00001875	2366.	126182592.	10.0852613	0.0001891	-0.000486
0.7489100	-11.839998 C				
0.00001938	2366.	122112186.	10.0823966	0.0001953	-0.000502
0.7723266	-12.236274 C				
0.00002000	2366.	118296180.	10.0798824	0.0002016	-0.000518
0.7956716	-12.632450 C				
0.00002063	2366.	114711448.	10.0776874	0.0002079	-0.000535
0.8189449	-13.028526 C				
0.00002125	2366.	111337582.	10.0757837	0.0002141	-0.000551
0.8421464	-13.424502 C				

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0.00002188	2366.	108156508.	10.0741470	0.0002204	-0.000567
0.8652759	-13.820378 C				
0.00002250	2366.	105152160.	10.0727554	0.0002266	-0.000583
0.8883333	-14.216153 C				
0.00002313	2366.	102310210.	10.0715894	0.0002329	-0.000600
0.9113187	-14.611828 C				
0.00002375	2366.	99617836.	10.0706317	0.0002392	-0.000616
0.9342318	-15.007401 C				
0.00002438	2366.	97063533.	10.0698667	0.0002455	-0.000632
0.9570725	-15.402873 C				
0.00002563	2436.	95048091.	10.0688598	0.0002580	-0.000664
1.0025364	-16.193510 C				
0.00002688	2551.	94928657.	10.0684718	0.0002706	-0.000697
1.0477096	-16.983738 C				
0.00002813	2667.	94815115.	10.0686232	0.0002832	-0.000729
1.0925912	-17.773555 C				
0.00002938	2782.	94706690.	10.0692479	0.0002958	-0.000762
1.1371802	-18.562957 C				
0.00003063	2897.	94602733.	10.0703211	0.0003084	-0.000794
1.1814759	-19.351942 C				
0.00003188	3012.	94502697.	10.0717368	0.0003210	-0.000826
1.2254772	-20.140508 C				
0.00003313	3127.	94406117.	10.0734845	0.0003337	-0.000859
1.2691834	-20.928652 C				
0.00003438	3242.	94312597.	10.0755306	0.0003463	-0.000891
1.3125933	-21.716373 C				
0.00003563	3357.	94221794.	10.0778462	0.0003590	-0.000923
1.3557063	-22.503666 C				
0.00003688	3471.	94133413.	10.0804061	0.0003717	-0.000956
1.3985212	-23.290530 C				
0.00003813	3586.	94047197.	10.0831888	0.0003844	-0.000988
1.4410372	-24.076963 C				
0.00003938	3700.	93962921.	10.0861753	0.0003971	-0.001020
1.4832533	-24.862961 C				
0.00004063	3814.	93880388.	10.0893491	0.0004099	-0.001053
1.5251686	-25.648521 C				
0.00004188	3928.	93799425.	10.0926956	0.0004226	-0.001085
1.5667821	-26.433642 C				
0.00004313	4042.	93719877.	10.0962019	0.0004354	-0.001117
1.6080927	-27.218321 C				
0.00004438	4155.	93641609.	10.0998566	0.0004482	-0.001149
1.6490996	-28.002554 C				
0.00004563	4269.	93564497.	10.1036497	0.0004610	-0.001182
1.6898018	-28.786339 C				
0.00004688	4382.	93488434.	10.1075722	0.0004738	-0.001214
1.7301982	-29.569674 C				
0.00004813	4496.	93413321.	10.1116159	0.0004866	-0.001246

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

1.7702878	-30.352554 C				
0.00004938	4609.	93339070.	10.1157737	0.0004995	-0.001278
1.8100696	-31.134978 C				
0.00005063	4722.	93265602.	10.1200391	0.0005123	-0.001310
1.8495425	-31.916943 C				
0.00005188	4834.	93192845.	10.1244063	0.0005252	-0.001342
1.8887057	-32.698446 C				
0.00005313	4947.	93120733.	10.1288700	0.0005381	-0.001374
1.9275579	-33.479483 C				
0.00005438	5060.	93049206.	10.1334255	0.0005510	-0.001406
1.9660981	-34.260052 C				
0.00005563	5172.	92978211.	10.1380684	0.0005639	-0.001439
2.0043253	-35.040149 C				
0.00005688	5284.	92907697.	10.1427948	0.0005769	-0.001471
2.0422384	-35.819772 C				
0.00005813	5396.	92837619.	10.1476012	0.0005898	-0.001503
2.0798362	-36.598918 C				
0.00005938	5508.	92767935.	10.1524844	0.0006028	-0.001535
2.1171178	-37.377583 C				
0.00006063	5620.	92698606.	10.1574414	0.0006158	-0.001567
2.1540819	-38.155764 C				
0.00006188	5731.	92629597.	10.1624696	0.0006288	-0.001599
2.1907275	-38.933458 C				
0.00006313	5843.	92560874.	10.1675664	0.0006418	-0.001631
2.2270535	-39.710662 C				
0.00006438	5954.	92492407.	10.1727297	0.0006549	-0.001663
2.2630586	-40.487373 C				
0.00006563	6065.	92424168.	10.1779574	0.0006679	-0.001695
2.2987417	-41.263586 C				
0.00006688	6176.	92356130.	10.1832476	0.0006810	-0.001726
2.3341018	-42.039299 C				
0.00006813	6287.	92288268.	10.1885986	0.0006941	-0.001758
2.3691375	-42.814509 C				
0.00006938	6398.	92220560.	10.1940089	0.0007072	-0.001790
2.4038477	-43.589211 C				
0.00007063	6508.	92152983.	10.1995039	0.0007203	-0.001822
2.4382312	-44.363403 C				
0.00007188	6619.	92085519.	10.2050285	0.0007335	-0.001854
2.4722868	-45.137081 C				
0.00007313	6729.	92018147.	10.2106084	0.0007467	-0.001886
2.5060133	-45.910241 C				
0.00007438	6839.	91950850.	10.2162424	0.0007598	-0.001918
2.5394094	-46.682880 C				
0.00007938	7277.	91682087.	10.2393011	0.0008127	-0.002045
2.6696649	-49.768146 C				
0.00008438	7713.	91413389.	10.2630109	0.0008659	-0.002172
2.7945082	-52.845065 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC1-6 (Boring B-001-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00008938	8146.	91144431.	10.2866786	0.0009194	-0.002298
2.9137126	-55.915279 C				
0.00009438	8576.	90874234.	10.3110673	0.0009731	-0.002424
3.0273448	-58.976728 C				
0.00009938	8985.	90417533.	10.3290580	0.0010265	-0.002551
3.1339327	-60.000000 CY				
0.0001044	9311.	89207952.	10.3175636	0.0010769	-0.002681
3.2289512	-60.000000 CY				
0.0001094	9552.	87336121.	10.2781631	0.0011242	-0.002813
3.3128936	-60.000000 CY				
0.0001144	9789.	85583430.	10.2421143	0.0011714	-0.002946
3.3919789	-60.000000 CY				
0.0001194	10011.	83861611.	10.2051482	0.0012182	-0.003079
3.4655044	-60.000000 CY				
0.0001244	10162.	81702300.	10.1438002	0.0012616	-0.003216
3.5293615	-60.000000 CY				
0.0001294	10295.	79572057.	10.0817619	0.0013043	-0.003353
3.5881988	-60.000000 CY				
0.0001344	10427.	77592674.	10.0256713	0.0013472	-0.003490
3.6433355	-60.000000 CY				
0.0001394	10557.	75747771.	9.9749147	0.0013903	-0.003627
3.6947252	-60.000000 CY				
0.0001444	10687.	74023236.	9.9289636	0.0014335	-0.003764
3.7423201	-60.000000 CY				
0.0001494	10816.	72406063.	9.8867661	0.0014768	-0.003901
3.7859739	-60.000000 CY				
0.0001544	10933.	70821400.	9.8425115	0.0015194	-0.004038
3.8249324	-60.000000 CY				
0.0001594	11017.	69123456.	9.7867573	0.0015598	-0.004178
3.8581753	-60.000000 CY				
0.0001644	11079.	67401534.	9.7260868	0.0015987	-0.004319
3.8869352	-60.000000 CY				
0.0001694	11139.	65767574.	9.6691048	0.0016377	-0.004460
3.9124557	-60.000000 CY				
0.0001744	11199.	64223403.	9.6148605	0.0016766	-0.004601
3.9348020	-60.000000 CY				
0.0001794	11258.	62761436.	9.5654896	0.0017158	-0.004742
3.9539345	-60.000000 CY				
0.0001844	11316.	61373390.	9.5189681	0.0017551	-0.004882
3.9697370	-60.000000 CY				
0.0001894	11373.	60052811.	9.4743244	0.0017942	-0.005023
3.9821950	-60.000000 CY				
0.0001944	11429.	58796578.	9.4331695	0.0018336	-0.005164
3.9914019	-60.000000 CY				
0.0001994	11484.	57599778.	9.3948139	0.0018731	-0.005304
3.9973136	-60.000000 CY				
0.0002044	11539.	56457972.	9.3581635	0.0019126	-0.005445

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 Light Tower NC1-6 (Boring B-001-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

3.9998845	-60.000000 CY				
0.0002094	11592.	55366642.	9.3266817	0.0019528	-0.005585
3.9975630	-60.000000 CY				
0.0002144	11645.	54322678.	9.2959142	0.0019928	-0.005725
3.9999044	-60.000000 CY				
0.0002194	11698.	53322120.	9.2675435	0.0020331	-0.005864
3.9971169	-60.000000 CY				
0.0002244	11748.	52356977.	9.2405172	0.0020733	-0.006004
3.9997515	-60.000000 CY				
0.0002294	11794.	51418840.	9.2141042	0.0021135	-0.006144
3.9957066	-60.000000 CY				
0.0002344	11831.	50480617.	9.1845645	0.0021526	-0.006285
3.9990577	-60.000000 CY				
0.0002394	11864.	49560513.	9.1526832	0.0021909	-0.006427
3.9990468	-60.000000 CY				
0.0002444	11885.	48632992.	9.1162023	0.0022278	-0.006570
3.9966747	-60.000000 CY				
0.0002494	11904.	47735462.	9.0796192	0.0022642	-0.006713
3.9992545	-60.000000 CY				
0.0002544	11921.	46863378.	9.0457647	0.0023010	-0.006856
3.9991650	-60.000000 CY				
0.0002594	11937.	46022914.	9.0128664	0.0023377	-0.007000
3.9956629	-60.000000 CY				
0.0002644	11953.	45213284.	8.9816750	0.0023745	-0.007143
3.9986069	-60.000000 CY				
0.0002694	11969.	44432753.	8.9518321	0.0024114	-0.007286
3.9999247	-60.000000 CY				
0.0002744	11984.	43679063.	8.9240509	0.0024485	-0.007429
3.9940409	-60.000000 CY				
0.0003044	12070.	39655848.	8.7807001	0.0026726	-0.008285
3.9985866	-60.000000 CY				
0.0003344	12146.	36325110.	8.6675807	0.0028982	-0.009139
3.9998625	-60.000000 CY				
0.0003644	12216.	33525083.	8.5838110	0.0031277	-0.009990
3.9999751	-60.000000 CYT				
0.0003944	12280.	31137740.	8.5203443	0.0033602	-0.010837
3.9996828	-60.000000 CYT				
0.0004244	12339.	29075625.	8.4715220	0.0035951	-0.011682
3.9974037	-60.000000 CYT				
0.0004544	12385.	27257253.	8.4224181	0.0038269	-0.012531
3.9878351	-60.000000 CYT				

 Summary of Results for Nominal Moment Capacity for Section 1

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC1-6 (Boring B-001-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

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	Max. Tens. Strain
----	-----	-----	-----	-----
1	3.800	12169.214	0.00300000	-0.00952396
2	4.200	12173.120	0.00300000	-0.00952020
3	4.600	12177.027	0.00300000	-0.00951645

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 (0.75).

The above values should be multiplied by the appropriate strength reduction factor to compute ultimate moment capacity according to ACI 318, 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 Stiff. Load Mom No.	Resist. Factor	Nominal Ax. Thrust kips	Nominal Moment Cap in-kips	Ult. (Fac) Ax. Thrust kips	Ult. (Fac) Moment Cap in-kips	Bend. at Ult kip-in^2
-----	-----	-----	-----	-----	-----	-----
1 91219895.	0.65	3.800000	12169.	2.470000	7910.	
2 91253873.	0.65	4.200000	12173.	2.730000	7913.	
3 91287886.	0.65	4.600000	12177.	2.990000	7915.	
1 89806706.	0.75	3.800000	12169.	2.850000	9127.	
2 89838295.	0.75	4.200000	12173.	3.150000	9130.	
3 89869877.	0.75	4.600000	12177.	3.450000	9133.	
1	0.90	3.800000	12169.	3.420000	10952.	

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70221645.					
2	0.90	4.200000	12173.	3.780000	10956.
70254444.					
3	0.90	4.600000	12177.	4.140000	10959.
70287179.					

 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	1.0000	0.00	N.A.	No	0.00	8636.
2	4.0000	2.1572	No	No	8636.	11644.
3	5.1000	3.5536	Yes	No	20279.	38411.
4	7.6000	3.8144	No	No	58690.	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.

 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	=	1000.0 lbs
Applied moment at pile head	=	315600.0 in-lbs
Axial thrust load on pile head	=	4200.0 lbs

Depth Soil Spr.	Deflect. Distrib.	Bending Moment	Shear Force	Slope S	Total Stress	Bending Stiffness	Soil Res. p
X Es*H	y Lat. Load						

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

feet lb/inch	inches lb/inch	in-lbs	lbs	radians	psi*	lb-in^2	lb/inch
0.00	0.2887	315600.	1000.	-0.00362	0.00	3.84E+11	0.00
0.00	0.00						
0.09000	0.2848	316696.	999.9999	-0.00362	0.00	3.84E+11	0.00
0.00	0.00						
0.1800	0.2809	317793.	1000.	-0.00362	0.00	3.84E+11	0.00
0.00	0.00						
0.2700	0.2770	318889.	1000.	-0.00362	0.00	3.84E+11	0.00
0.00	0.00						
0.3600	0.2731	319986.	1000.	-0.00362	0.00	3.84E+11	0.00
0.00	0.00						
0.4500	0.2692	321082.	1000.	-0.00362	0.00	3.84E+11	0.00
0.00	0.00						
0.5400	0.2653	322178.	1000.	-0.00362	0.00	3.84E+11	0.00
0.00	0.00						
0.6300	0.2613	323275.	1000.	-0.00362	0.00	3.84E+11	0.00
0.00	0.00						
0.7200	0.2574	324371.	1000.	-0.00361	0.00	3.84E+11	0.00
0.00	0.00						
0.8100	0.2535	325468.	1000.	-0.00361	0.00	3.84E+11	0.00
0.00	0.00						
0.9000	0.2496	326564.	1000.	-0.00361	0.00	3.84E+11	0.00
0.00	0.00						
0.9900	0.2457	327660.	1000.	-0.00361	0.00	3.84E+11	0.00
0.00	0.00						
1.0800	0.2418	328757.	973.6844	-0.00361	0.00	3.84E+11	-48.733
217.6293	0.00						
1.1700	0.2379	329796.	920.7629	-0.00361	0.00	3.84E+11	-49.270
223.6334	0.00						
1.2600	0.2340	330778.	867.2677	-0.00361	0.00	3.84E+11	-49.795
229.7829	0.00						
1.3500	0.2301	331702.	813.2114	-0.00361	0.00	3.84E+11	-50.309
236.0841	0.00						
1.4400	0.2262	332568.	758.6067	-0.00361	0.00	3.84E+11	-50.811
242.5437	0.00						
1.5300	0.2224	333374.	703.4671	-0.00361	0.00	3.84E+11	-51.300
249.1688	0.00						
1.6200	0.2185	334120.	647.8057	-0.00361	0.00	3.84E+11	-51.777
255.9669	0.00						
1.7100	0.2146	334806.	591.6365	-0.00360	0.00	3.84E+11	-52.241
262.9459	0.00						
1.8000	0.2107	335431.	534.9732	-0.00360	0.00	3.84E+11	-52.691
270.1145	0.00						
1.8900	0.2068	335994.	477.8303	-0.00360	0.00	3.84E+11	-53.129

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277.4816	0.00						
1.9800	0.2029	336495.	420.2223	-0.00360	0.00	3.84E+11	-53.553
285.0571	0.00						
2.0700	0.1990	336934.	362.1642	-0.00360	0.00	3.84E+11	-53.962
292.8514	0.00						
2.1600	0.1951	337310.	303.6713	-0.00360	0.00	3.84E+11	-54.358
300.8755	0.00						
2.2500	0.1912	337623.	244.7592	-0.00360	0.00	3.84E+11	-54.739
309.1416	0.00						
2.3400	0.1873	337872.	185.4439	-0.00360	0.00	3.84E+11	-55.105
317.6623	0.00						
2.4300	0.1835	338056.	125.7418	-0.00360	0.00	3.84E+11	-55.455
326.4516	0.00						
2.5200	0.1796	338176.	65.6698	-0.00360	0.00	3.84E+11	-55.790
335.5243	0.00						
2.6100	0.1757	338231.	5.2451	-0.00359	0.00	3.84E+11	-56.108
344.8965	0.00						
2.7000	0.1718	338220.	-55.515	-0.00359	0.00	3.84E+11	-56.410
354.5857	0.00						
2.7900	0.1679	338143.	-116.591	-0.00359	0.00	3.84E+11	-56.695
364.6105	0.00						
2.8800	0.1641	338001.	-177.965	-0.00359	0.00	3.84E+11	-56.962
374.9915	0.00						
2.9700	0.1602	337791.	-239.618	-0.00359	0.00	3.84E+11	-57.211
385.7507	0.00						
3.0600	0.1563	337516.	-301.530	-0.00359	0.00	3.84E+11	-57.441
396.9125	0.00						
3.1500	0.1524	337173.	-363.681	-0.00359	0.00	3.84E+11	-57.652
408.5031	0.00						
3.2400	0.1485	336763.	-426.048	-0.00359	0.00	3.84E+11	-57.843
420.5514	0.00						
3.3300	0.1447	336285.	-488.611	-0.00359	0.00	3.84E+11	-58.014
433.0890	0.00						
3.4200	0.1408	335740.	-551.347	-0.00359	0.00	3.84E+11	-58.164
446.1506	0.00						
3.5100	0.1369	335127.	-614.233	-0.00359	0.00	3.84E+11	-58.291
459.7745	0.00						
3.6000	0.1331	334445.	-677.244	-0.00358	0.00	3.84E+11	-58.396
474.0031	0.00						
3.6900	0.1292	333696.	-740.356	-0.00358	0.00	3.84E+11	-58.477
488.8830	0.00						
3.7800	0.1253	332879.	-803.542	-0.00358	0.00	3.84E+11	-58.534
504.4664	0.00						
3.8700	0.1214	331993.	-866.775	-0.00358	0.00	3.84E+11	-58.565
520.8113	0.00						
3.9600	0.1176	331039.	-930.028	-0.00358	0.00	3.84E+11	-58.569
537.9825	0.00						

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4.0500	0.1137	330017.	-1143.	-0.00358	0.00	3.84E+11	-336.669
3198.	0.00						
4.1400	0.1098	328602.	-1512.	-0.00358	0.00	3.84E+11	-345.488
3397.	0.00						
4.2300	0.1060	326784.	-1889.	-0.00358	0.00	3.84E+11	-353.859
3606.	0.00						
4.3200	0.1021	324553.	-2276.	-0.00358	0.00	3.84E+11	-361.759
3826.	0.00						
4.4100	0.09826	321900.	-2671.	-0.00358	0.00	3.84E+11	-369.166
4058.	0.00						
4.5000	0.09439	318817.	-3073.	-0.00357	0.00	3.84E+11	-376.053
4303.	0.00						
4.5900	0.09053	315295.	-3483.	-0.00357	0.00	3.84E+11	-382.395
4562.	0.00						
4.6800	0.08667	311327.	-3899.	-0.00357	0.00	3.84E+11	-388.162
4837.	0.00						
4.7700	0.08282	306906.	-4321.	-0.00357	0.00	3.85E+11	-393.324
5129.	0.00						
4.8600	0.07896	302027.	-4748.	-0.00357	0.00	3.85E+11	-397.944
5443.	0.00						
4.9500	0.07510	296683.	-5180.	-0.00357	0.00	3.85E+11	-402.311
5785.	0.00						
5.0400	0.07125	290870.	-5617.	-0.00357	0.00	3.85E+11	-405.996
6154.	0.00						
5.1300	0.06739	284583.	-5944.	-0.00357	0.00	3.85E+11	-200.394
3211.	0.00						
5.2200	0.06354	278063.	-6157.	-0.00357	0.00	3.85E+11	-193.051
3281.	0.00						
5.3100	0.05968	271318.	-6361.	-0.00357	0.00	3.85E+11	-185.211
3351.	0.00						
5.4000	0.05583	264356.	-6556.	-0.00357	0.00	3.85E+11	-176.874
3421.	0.00						
5.4900	0.05198	257189.	-6743.	-0.00357	0.00	3.85E+11	-168.040
3491.	0.00						
5.5800	0.04813	249825.	-6919.	-0.00357	0.00	3.85E+11	-158.710
3561.	0.00						
5.6700	0.04428	242276.	-7085.	-0.00356	0.00	3.85E+11	-148.884
3631.	0.00						
5.7600	0.04043	234553.	-7240.	-0.00356	0.00	3.85E+11	-138.560
3701.	0.00						
5.8500	0.03658	226669.	-7384.	-0.00356	0.00	3.85E+11	-127.741
3771.	0.00						
5.9400	0.03273	218636.	-7516.	-0.00356	0.00	3.85E+11	-116.425
3841.	0.00						
6.0300	0.02889	210467.	-7635.	-0.00356	0.00	3.85E+11	-104.613
3911.	0.00						
6.1200	0.02504	202176.	-7742.	-0.00356	0.00	3.85E+11	-92.305

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area

Light Tower NC1-6 (Boring B-001-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

3981.	0.00						
6.2100	0.02119	193777.	-7834.	-0.00356	0.00	3.85E+11	-79.500
4051.	0.00						
6.3000	0.01735	185286.	-7913.	-0.00356	0.00	3.85E+11	-66.199
4121.	0.00						
6.3900	0.01350	176717.	-7977.	-0.00356	0.00	3.85E+11	-52.402
4191.	0.00						
6.4800	0.00966	168088.	-8026.	-0.00356	0.00	3.85E+11	-38.109
4261.	0.00						
6.5700	0.00581	159413.	-8059.	-0.00356	0.00	3.85E+11	-23.320
4331.	0.00						
6.6600	0.00197	150712.	-8076.	-0.00356	0.00	3.85E+11	-8.034
4401.	0.00						
6.7500	-0.00187	142001.	-8076.	-0.00356	0.00	3.85E+11	7.7477
4471.	0.00						
6.8400	-0.00571	133299.	-8059.	-0.00356	0.00	3.85E+11	24.0256
4541.	0.00						
6.9300	-0.00956	124626.	-8024.	-0.00356	0.00	3.85E+11	40.7999
4611.	0.00						
7.0200	-0.01340	116000.	-7971.	-0.00356	0.00	3.85E+11	58.0704
4681.	0.00						
7.1100	-0.01724	107441.	-7898.	-0.00356	0.00	3.85E+11	75.8372
4751.	0.00						
7.2000	-0.02108	98971.	-7807.	-0.00356	0.00	3.85E+11	94.1005
4821.	0.00						
7.2900	-0.02492	90611.	-7695.	-0.00356	0.00	3.85E+11	112.8601
4891.	0.00						
7.3800	-0.02876	82383.	-7563.	-0.00356	0.00	3.85E+11	132.1163
4961.	0.00						
7.4700	-0.03260	74308.	-7409.	-0.00356	0.00	3.85E+11	151.8690
5031.	0.00						
7.5600	-0.03644	66411.	-7234.	-0.00356	0.00	3.85E+11	172.1183
5101.	0.00						
7.6500	-0.04028	58714.	-6945.	-0.00356	0.00	3.85E+11	362.9222
9731.	0.00						
7.7400	-0.04412	51441.	-6548.	-0.00356	0.00	3.85E+11	373.1114
9133.	0.00						
7.8300	-0.04796	44603.	-6140.	-0.00355	0.00	3.85E+11	382.8474
8621.	0.00						
7.9200	-0.05180	38212.	-5721.	-0.00355	0.00	3.85E+11	392.1957
8177.	0.00						
8.0100	-0.05564	32277.	-5293.	-0.00355	0.00	3.85E+11	401.2083
7788.	0.00						
8.1000	-0.05948	26811.	-4855.	-0.00355	0.00	3.85E+11	409.9276
7444.	0.00						
8.1900	-0.06332	21824.	-4407.	-0.00355	0.00	3.85E+11	418.3884
7137.	0.00						

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC1-6 (Boring B-001-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

8.2800	-0.06716	17324.	-3951.	-0.00355	0.00	3.85E+11	426.6197
6861.	0.00						
8.3700	-0.07099	13321.	-3486.	-0.00355	0.00	3.85E+11	434.6461
6612.	0.00						
8.4600	-0.07483	9826.	-3012.	-0.00355	0.00	3.85E+11	442.4883
6386.	0.00						
8.5500	-0.07867	6847.	-2530.	-0.00355	0.00	3.85E+11	450.1641
6180.	0.00						
8.6400	-0.08251	4393.	-2040.	-0.00355	0.00	3.85E+11	457.6891
5991.	0.00						
8.7300	-0.08635	2472.	-1542.	-0.00355	0.00	3.85E+11	465.0767
5817.	0.00						
8.8200	-0.09019	1095.	-1036.	-0.00355	0.00	3.85E+11	472.3387
5656.	0.00						
8.9100	-0.09403	267.6192	-521.646	-0.00355	0.00	3.85E+11	479.4853
5507.	0.00						
9.0000	-0.09787	0.00	0.00	-0.00355	0.00	3.85E+11	486.5259
2685.	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 = 0.28870365 inches
 Computed slope at pile head = -0.0036215 radians
 Maximum bending moment = 338231. inch-lbs
 Maximum shear force = -8076. lbs
 Depth of maximum bending moment = 2.61000000 feet below pile head
 Depth of maximum shear force = 6.75000000 feet below pile head
 Number of iterations = 28
 Number of zero deflection points = 1
 Pile deflection at ground = 0.24530614 inches

 Pile-head Deflection vs. Pile Length for Load Case 1

Boundary Condition Type 1, Shear and Moment

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC1-6 (Boring B-001-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Shear = 1000. lbs
 Moment = 315600. in-lbs
 Axial Load = 4200. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	0.28870365	338231.	-8076.
8.55000	0.46006836	336618.	-8866.
8.10000	0.73405195	336183.	-10013.
7.65000	1.11783598	336052.	-11135.
7.20000	2.13959115	335493.	-12566.
6.75000	5.17730218	338286.	-14424.

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

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

Shear force at pile head = 2250.0 lbs
 Applied moment at pile head = 724800.0 in-lbs
 Axial thrust load on pile head = 4600.0 lbs

Depth Soil Spr. X Es*H feet lb/inch	Deflect. Distrib. y Lat. Load inches lb/inch	Bending Moment in-lbs	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness lb-in^2	Soil Res. p lb/inch
0.00	3.2399	724800.	2250.	-0.04154	0.00	3.83E+11	0.00
0.00	0.00						
0.09000	3.1950	727436.	2250.	-0.04154	0.00	3.83E+11	0.00
0.00	0.00						
0.1800	3.1502	730073.	2250.	-0.04154	0.00	3.83E+11	0.00
0.00	0.00						
0.2700	3.1053	732709.	2250.	-0.04153	0.00	3.83E+11	0.00
0.00	0.00						
0.3600	3.0605	735345.	2250.	-0.04153	0.00	3.83E+11	0.00
0.00	0.00						
0.4500	3.0156	737982.	2250.	-0.04153	0.00	3.83E+11	0.00

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Light Tower NC1-6 (Boring B-001-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00	0.00						
0.5400	2.9708	740618.	2250.	-0.04153	0.00	3.83E+11	0.00
0.00	0.00						
0.6300	2.9259	743254.	2250.	-0.04153	0.00	3.83E+11	0.00
0.00	0.00						
0.7200	2.8811	745891.	2250.	-0.04152	0.00	3.83E+11	0.00
0.00	0.00						
0.8100	2.8362	748527.	2250.	-0.04152	0.00	3.83E+11	0.00
0.00	0.00						
0.9000	2.7914	751163.	2250.	-0.04152	0.00	3.83E+11	0.00
0.00	0.00						
0.9900	2.7465	753800.	2250.	-0.04152	0.00	3.83E+11	0.00
0.00	0.00						
1.0800	2.7017	756436.	2191.	-0.04151	0.00	3.83E+11	-108.939
43.5481	0.00						
1.1700	2.6569	758945.	2073.	-0.04151	0.00	3.83E+11	-110.122
44.7639	0.00						
1.2600	2.6120	761326.	1953.	-0.04151	0.00	3.83E+11	-111.278
46.0102	0.00						
1.3500	2.5672	763577.	1833.	-0.04151	0.00	3.83E+11	-112.406
47.2883	0.00						
1.4400	2.5224	765696.	1711.	-0.04151	0.00	3.83E+11	-113.506
48.5998	0.00						
1.5300	2.4775	767684.	1587.	-0.04150	0.00	3.83E+11	-114.578
49.9461	0.00						
1.6200	2.4327	769537.	1463.	-0.04150	0.00	3.83E+11	-115.620
51.3290	0.00						
1.7100	2.3879	771256.	1338.	-0.04150	0.00	3.83E+11	-116.632
52.7501	0.00						
1.8000	2.3431	772839.	1211.	-0.04150	0.00	3.83E+11	-117.613
54.2115	0.00						
1.8900	2.2983	774285.	1084.	-0.04150	0.00	3.83E+11	-118.563
55.7150	0.00						
1.9800	2.2535	775592.	955.0827	-0.04149	0.00	3.83E+11	-119.481
57.2628	0.00						
2.0700	2.2086	776760.	825.5658	-0.04149	0.00	3.83E+11	-120.366
58.8573	0.00						
2.1600	2.1638	777788.	695.1113	-0.04149	0.00	3.83E+11	-121.217
60.5009	0.00						
2.2500	2.1190	778674.	563.7562	-0.04149	0.00	3.83E+11	-122.033
62.1964	0.00						
2.3400	2.0742	779417.	431.5389	-0.04148	0.00	3.83E+11	-122.814
63.9465	0.00						
2.4300	2.0294	780018.	298.4971	-0.04148	0.00	3.83E+11	-123.559
65.7545	0.00						
2.5200	1.9846	780474.	164.6711	-0.04148	0.00	3.83E+11	-124.266
67.6237	0.00						

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

2.6100	1.9398	780786.	30.1025	-0.04148	0.00	3.83E+11	-124.935
69.5577	0.00						
2.7000	1.8950	780952.	-105.167	-0.04148	0.00	3.83E+11	-125.564
71.5605	0.00						
2.7900	1.8502	780971.	-241.094	-0.04147	0.00	3.83E+11	-126.153
73.6365	0.00						
2.8800	1.8055	780843.	-377.635	-0.04147	0.00	3.83E+11	-126.700
75.7902	0.00						
2.9700	1.7607	780567.	-514.742	-0.04147	0.00	3.83E+11	-127.203
78.0268	0.00						
3.0600	1.7159	780143.	-652.369	-0.04147	0.00	3.83E+11	-127.661
80.3520	0.00						
3.1500	1.6711	779570.	-790.466	-0.04146	0.00	3.83E+11	-128.074
82.7718	0.00						
3.2400	1.6263	778848.	-928.983	-0.04146	0.00	3.83E+11	-128.438
85.2931	0.00						
3.3300	1.5815	777975.	-1068.	-0.04146	0.00	3.83E+11	-128.754
87.9232	0.00						
3.4200	1.5368	776953.	-1207.	-0.04146	0.00	3.83E+11	-129.017
90.6704	0.00						
3.5100	1.4920	775780.	-1347.	-0.04146	0.00	3.83E+11	-129.228
93.5438	0.00						
3.6000	1.4472	774456.	-1486.	-0.04145	0.00	3.83E+11	-129.383
96.5535	0.00						
3.6900	1.4024	772982.	-1626.	-0.04145	0.00	3.83E+11	-129.481
99.7109	0.00						
3.7800	1.3577	771356.	-1766.	-0.04145	0.00	3.83E+11	-129.519
103.0286	0.00						
3.8700	1.3129	769579.	-1906.	-0.04145	0.00	3.83E+11	-129.494
106.5208	0.00						
3.9600	1.2682	767652.	-2045.	-0.04144	0.00	3.83E+11	-129.403
110.2035	0.00						
4.0500	1.2234	765573.	-2498.	-0.04144	0.00	3.83E+11	-708.407
625.3721	0.00						
4.1400	1.1786	762668.	-3271.	-0.04144	0.00	3.83E+11	-723.352
662.8140	0.00						
4.2300	1.1339	758919.	-4060.	-0.04144	0.00	3.83E+11	-737.266
702.2280	0.00						
4.3200	1.0891	754311.	-4863.	-0.04144	0.00	3.83E+11	-750.134
743.8425	0.00						
4.4100	1.0444	748827.	-5680.	-0.04143	0.00	3.83E+11	-761.942
787.9248	0.00						
4.5000	0.9996	742455.	-6508.	-0.04143	0.00	3.83E+11	-772.674
834.7905	0.00						
4.5900	0.9549	735181.	-7348.	-0.04143	0.00	3.83E+11	-782.317
884.8143	0.00						
4.6800	0.9101	726995.	-8197.	-0.04143	0.00	3.83E+11	-790.857

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938.4451	0.00						
4.7700	0.8654	717886.	-9056.	-0.04143	0.00	3.83E+11	-798.279
996.2252	0.00						
4.8600	0.8207	707846.	-9921.	-0.04142	0.00	3.83E+11	-804.680
1059.	0.00						
4.9500	0.7759	696868.	-10793.	-0.04142	0.00	3.83E+11	-810.423
1128.	0.00						
5.0400	0.7312	684945.	-11671.	-0.04142	0.00	3.83E+11	-815.055
1204.	0.00						
5.1300	0.6865	672070.	-12534.	-0.04142	0.00	3.84E+11	-782.973
1232.	0.00						
5.2200	0.6417	658283.	-13379.	-0.04142	0.00	3.84E+11	-781.323
1315.	0.00						
5.3100	0.5970	643584.	-14221.	-0.04141	0.00	3.84E+11	-778.706
1409.	0.00						
5.4000	0.5523	627976.	-15060.	-0.04141	0.00	3.84E+11	-774.570
1515.	0.00						
5.4900	0.5076	611466.	-15893.	-0.04141	0.00	3.84E+11	-768.347
1635.	0.00						
5.5800	0.4628	594059.	-16718.	-0.04141	0.00	3.84E+11	-759.805
1773.	0.00						
5.6700	0.4181	575766.	-17533.	-0.04141	0.00	3.84E+11	-748.649
1934.	0.00						
5.7600	0.3734	556599.	-18334.	-0.04141	0.00	3.84E+11	-734.510
2124.	0.00						
5.8500	0.3287	536576.	-19117.	-0.04140	0.00	3.84E+11	-716.897
2356.	0.00						
5.9400	0.2840	515717.	-19880.	-0.04140	0.00	3.84E+11	-695.145
2644.	0.00						
6.0300	0.2392	494047.	-20616.	-0.04140	0.00	3.84E+11	-668.298
3017.	0.00						
6.1200	0.1945	471597.	-21321.	-0.04140	0.00	3.84E+11	-636.127
3532.	0.00						
6.2100	0.1498	448406.	-21968.	-0.04140	0.00	3.84E+11	-562.017
4051.	0.00						
6.3000	0.1051	424559.	-22488.	-0.04140	0.00	3.84E+11	-401.113
4121.	0.00						
6.3900	0.06040	400243.	-22831.	-0.04140	0.00	3.84E+11	-234.419
4191.	0.00						
6.4800	0.01570	375655.	-22991.	-0.04140	0.00	3.84E+11	-61.936
4261.	0.00						
6.5700	-0.02901	350994.	-22962.	-0.04139	0.00	3.84E+11	116.3367
4331.	0.00						
6.6600	-0.07371	326469.	-22737.	-0.04139	0.00	3.84E+11	300.3989
4401.	0.00						
6.7500	-0.118	302295.	-22310.	-0.04139	0.00	3.85E+11	490.2508
4471.	0.00						

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

6.8400	-0.163	278692.	-21685.	-0.04139	0.00	3.85E+11	665.9410
4409.	0.00						
6.9300	-0.208	255866.	-20933.	-0.04139	0.00	3.85E+11	726.9560
3778.	0.00						
7.0200	-0.253	233888.	-20118.	-0.04139	0.00	3.85E+11	781.7076
3343.	0.00						
7.1100	-0.297	212821.	-19247.	-0.04139	0.00	3.85E+11	832.0470
3023.	0.00						
7.2000	-0.342	192725.	-18323.	-0.04139	0.00	3.85E+11	879.0855
2777.	0.00						
7.2900	-0.387	173655.	-17350.	-0.04139	0.00	3.85E+11	923.5427
2580.	0.00						
7.3800	-0.431	155662.	-16329.	-0.04139	0.00	3.85E+11	965.9107
2419.	0.00						
7.4700	-0.476	138795.	-15264.	-0.04139	0.00	3.85E+11	1007.
2284.	0.00						
7.5600	-0.521	123102.	-14156.	-0.04139	0.00	3.85E+11	1046.
2169.	0.00						
7.6500	-0.565	108630.	-13212.	-0.04139	0.00	3.85E+11	702.4517
1342.	0.00						
7.7400	-0.610	94977.	-12444.	-0.04139	0.00	3.85E+11	719.4776
1274.	0.00						
7.8300	-0.655	82162.	-11658.	-0.04139	0.00	3.85E+11	735.9048
1214.	0.00						
7.9200	-0.700	70207.	-10855.	-0.04139	0.00	3.85E+11	751.8081
1161.	0.00						
8.0100	-0.744	59128.	-10034.	-0.04139	0.00	3.85E+11	767.2492
1113.	0.00						
8.1000	-0.789	48944.	-9197.	-0.04139	0.00	3.85E+11	782.2796
1071.	0.00						
8.1900	-0.834	39673.	-8345.	-0.04139	0.00	3.85E+11	796.9427
1033.	0.00						
8.2800	-0.878	31331.	-7476.	-0.04139	0.00	3.85E+11	811.2756
997.5853	0.00						
8.3700	-0.923	23935.	-6592.	-0.04139	0.00	3.85E+11	825.3100
965.6987	0.00						
8.4600	-0.968	17502.	-5694.	-0.04139	0.00	3.85E+11	839.0735
936.4554	0.00						
8.5500	-1.012	12048.	-4780.	-0.04139	0.00	3.85E+11	852.5901
909.5309	0.00						
8.6400	-1.057	7588.	-3852.	-0.04139	0.00	3.85E+11	865.8808
884.6525	0.00						
8.7300	-1.102	4138.	-2910.	-0.04139	0.00	3.85E+11	878.9643
861.5895	0.00						
8.8200	-1.146	1714.	-1954.	-0.04139	0.00	3.85E+11	891.8570
840.1450	0.00						
8.9100	-1.191	329.2664	-983.718	-0.04139	0.00	3.85E+11	904.5735

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC1-6 (Boring B-001-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

820.1502	0.00						
9.0000	-1.236	0.00	0.00	-0.04139	0.00	3.85E+11	917.1270
400.7295	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	=	3.23989037 inches
Computed slope at pile head	=	-0.0415396 radians
Maximum bending moment	=	780971. inch-lbs
Maximum shear force	=	-22991. lbs
Depth of maximum bending moment	=	2.79000000 feet below pile head
Depth of maximum shear force	=	6.48000000 feet below pile head
Number of iterations	=	38
Number of zero deflection points	=	1
Pile deflection at ground	=	2.74155308 inches

 Pile-head Deflection vs. Pile Length for Load Case 2

Boundary Condition Type 1, Shear and Moment

Shear	=	2250. lbs
Moment	=	724800. in-lbs
Axial Load	=	4600. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	3.23989037	780971.	-22991.
8.55000	5.53110389	779970.	-25184.
8.10000	17.21436978	793151.	-29374.

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC1-6 (Boring B-001-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Computed Values of Pile Loading and Deflection
 for Lateral Loading for Load Case Number 3

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

Shear force at pile head = 2250.0 lbs
 Applied moment at pile head = 724800.0 in-lbs
 Axial thrust load on pile head = 3800.0 lbs

Depth Soil Spr. X Es*H feet lb/inch	Deflect. Distrib. y Lat. Load inches lb/inch	Bending Moment in-lbs	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness lb-in^2	Soil Res. p lb/inch
0.00	3.1992	724800.	2250.	-0.04101	0.00	3.83E+11	0.00
0.00	0.00						
0.09000	3.1549	727398.	2250.	-0.04101	0.00	3.83E+11	0.00
0.00	0.00						
0.1800	3.1106	729997.	2250.	-0.04101	0.00	3.83E+11	0.00
0.00	0.00						
0.2700	3.0664	732595.	2250.	-0.04101	0.00	3.83E+11	0.00
0.00	0.00						
0.3600	3.0221	735193.	2250.	-0.04100	0.00	3.83E+11	0.00
0.00	0.00						
0.4500	2.9778	737791.	2250.	-0.04100	0.00	3.83E+11	0.00
0.00	0.00						
0.5400	2.9335	740390.	2250.	-0.04100	0.00	3.83E+11	0.00
0.00	0.00						
0.6300	2.8892	742988.	2250.	-0.04100	0.00	3.83E+11	0.00
0.00	0.00						
0.7200	2.8450	745586.	2250.	-0.04099	0.00	3.83E+11	0.00
0.00	0.00						
0.8100	2.8007	748184.	2250.	-0.04099	0.00	3.83E+11	0.00
0.00	0.00						
0.9000	2.7564	750783.	2250.	-0.04099	0.00	3.83E+11	0.00
0.00	0.00						
0.9900	2.7121	753381.	2250.	-0.04099	0.00	3.83E+11	0.00
0.00	0.00						
1.0800	2.6679	755979.	2191.	-0.04099	0.00	3.83E+11	-108.482
43.9154	0.00						
1.1700	2.6236	758451.	2074.	-0.04098	0.00	3.83E+11	-109.660
45.1413	0.00						
1.2600	2.5793	760794.	1955.	-0.04098	0.00	3.83E+11	-110.812

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46.3980	0.00						
1.3500	2.5351	763009.	1834.	-0.04098	0.00	3.83E+11	-111.935
47.6868	0.00						
1.4400	2.4908	765093.	1713.	-0.04098	0.00	3.83E+11	-113.031
49.0092	0.00						
1.5300	2.4466	767045.	1590.	-0.04098	0.00	3.83E+11	-114.098
50.3667	0.00						
1.6200	2.4023	768864.	1466.	-0.04097	0.00	3.83E+11	-115.136
51.7611	0.00						
1.7100	2.3581	770549.	1341.	-0.04097	0.00	3.83E+11	-116.144
53.1940	0.00						
1.8000	2.3138	772098.	1216.	-0.04097	0.00	3.83E+11	-117.121
54.6675	0.00						
1.8900	2.2696	773510.	1089.	-0.04097	0.00	3.83E+11	-118.068
56.1834	0.00						
1.9800	2.2253	774785.	960.5032	-0.04096	0.00	3.83E+11	-118.982
57.7441	0.00						
2.0700	2.1811	775921.	831.5270	-0.04096	0.00	3.83E+11	-119.863
59.3518	0.00						
2.1600	2.1369	776918.	701.6171	-0.04096	0.00	3.83E+11	-120.711
61.0090	0.00						
2.2500	2.0926	777773.	570.8103	-0.04096	0.00	3.83E+11	-121.524
62.7185	0.00						
2.3400	2.0484	778487.	439.1443	-0.04096	0.00	3.83E+11	-122.302
64.4830	0.00						
2.4300	2.0042	779058.	306.6572	-0.04095	0.00	3.83E+11	-123.044
66.3059	0.00						
2.5200	1.9599	779485.	173.3889	-0.04095	0.00	3.83E+11	-123.749
68.1905	0.00						
2.6100	1.9157	779768.	39.3804	-0.04095	0.00	3.83E+11	-124.415
70.1404	0.00						
2.7000	1.8715	779906.	-95.326	-0.04095	0.00	3.83E+11	-125.042
72.1596	0.00						
2.7900	1.8273	779899.	-230.689	-0.04094	0.00	3.83E+11	-125.628
74.2526	0.00						
2.8800	1.7830	779744.	-366.661	-0.04094	0.00	3.83E+11	-126.173
76.4239	0.00						
2.9700	1.7388	779443.	-503.199	-0.04094	0.00	3.83E+11	-126.675
78.6788	0.00						
3.0600	1.6946	778993.	-640.254	-0.04094	0.00	3.83E+11	-127.132
81.0229	0.00						
3.1500	1.6504	778396.	-777.779	-0.04094	0.00	3.83E+11	-127.543
83.4624	0.00						
3.2400	1.6062	777649.	-915.721	-0.04093	0.00	3.83E+11	-127.906
86.0042	0.00						
3.3300	1.5620	776754.	-1054.	-0.04093	0.00	3.83E+11	-128.221
88.6556	0.00						

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3.4200	1.5178	775709.	-1193.	-0.04093	0.00	3.83E+11	-128.484
91.4250	0.00						
3.5100	1.4736	774514.	-1332.	-0.04093	0.00	3.83E+11	-128.694
94.3216	0.00						
3.6000	1.4294	773168.	-1471.	-0.04093	0.00	3.83E+11	-128.849
97.3555	0.00						
3.6900	1.3852	771673.	-1610.	-0.04092	0.00	3.83E+11	-128.947
100.5383	0.00						
3.7800	1.3410	770027.	-1749.	-0.04092	0.00	3.83E+11	-128.985
103.8825	0.00						
3.8700	1.2968	768231.	-1888.	-0.04092	0.00	3.83E+11	-128.961
107.4025	0.00						
3.9600	1.2526	766284.	-2028.	-0.04092	0.00	3.83E+11	-128.872
111.1145	0.00						
4.0500	1.2084	764187.	-2478.	-0.04091	0.00	3.83E+11	-704.469
629.6124	0.00						
4.1400	1.1642	761268.	-3247.	-0.04091	0.00	3.83E+11	-719.412
667.3699	0.00						
4.2300	1.1200	757510.	-4031.	-0.04091	0.00	3.83E+11	-733.335
707.1221	0.00						
4.3200	1.0759	752897.	-4830.	-0.04091	0.00	3.83E+11	-746.224
749.0998	0.00						
4.4100	1.0317	747413.	-5642.	-0.04091	0.00	3.83E+11	-758.064
793.5735	0.00						
4.5000	0.9875	741046.	-6467.	-0.04090	0.00	3.83E+11	-768.841
840.8619	0.00						
4.5900	0.9433	733781.	-7302.	-0.04090	0.00	3.83E+11	-778.541
891.3440	0.00						
4.6800	0.8991	725608.	-8148.	-0.04090	0.00	3.83E+11	-787.150
945.4733	0.00						
4.7700	0.8550	716517.	-9002.	-0.04090	0.00	3.83E+11	-794.654
1004.	0.00						
4.8600	0.8108	706499.	-9864.	-0.04090	0.00	3.83E+11	-801.148
1067.	0.00						
4.9500	0.7666	695547.	-10732.	-0.04089	0.00	3.83E+11	-806.996
1137.	0.00						
5.0400	0.7225	683654.	-11606.	-0.04089	0.00	3.83E+11	-811.747
1213.	0.00						
5.1300	0.6783	670813.	-12466.	-0.04089	0.00	3.84E+11	-779.911
1242.	0.00						
5.2200	0.6342	657063.	-13307.	-0.04089	0.00	3.84E+11	-778.412
1326.	0.00						
5.3100	0.5900	642405.	-14147.	-0.04089	0.00	3.84E+11	-775.935
1420.	0.00						
5.4000	0.5458	626842.	-14982.	-0.04088	0.00	3.84E+11	-771.826
1527.	0.00						
5.4900	0.5017	610379.	-15813.	-0.04088	0.00	3.84E+11	-765.642

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

1648.	0.00						
5.5800	0.4575	593022.	-16635.	-0.04088	0.00	3.84E+11	-757.149
1787.	0.00						
5.6700	0.4134	574783.	-17447.	-0.04088	0.00	3.84E+11	-746.058
1949.	0.00						
5.7600	0.3692	555673.	-18245.	-0.04088	0.00	3.84E+11	-732.000
2141.	0.00						
5.8500	0.3251	535709.	-19026.	-0.04088	0.00	3.84E+11	-714.491
2374.	0.00						
5.9400	0.2809	514912.	-19786.	-0.04087	0.00	3.84E+11	-692.867
2663.	0.00						
6.0300	0.2368	493307.	-20520.	-0.04087	0.00	3.84E+11	-666.185
3038.	0.00						
6.1200	0.1927	470925.	-21222.	-0.04087	0.00	3.84E+11	-634.226
3555.	0.00						
6.2100	0.1485	447803.	-21865.	-0.04087	0.00	3.84E+11	-557.133
4051.	0.00						
6.3000	0.1044	424031.	-22381.	-0.04087	0.00	3.84E+11	-398.321
4121.	0.00						
6.3900	0.06024	399795.	-22723.	-0.04087	0.00	3.84E+11	-233.793
4191.	0.00						
6.4800	0.01611	375286.	-22883.	-0.04087	0.00	3.84E+11	-63.550
4261.	0.00						
6.5700	-0.02803	350703.	-22857.	-0.04087	0.00	3.84E+11	112.4080
4331.	0.00						
6.6600	-0.07216	326251.	-22637.	-0.04087	0.00	3.84E+11	294.0821
4401.	0.00						
6.7500	-0.116	302141.	-22219.	-0.04086	0.00	3.85E+11	481.4720
4471.	0.00						
6.8400	-0.160	278594.	-21601.	-0.04086	0.00	3.85E+11	662.4297
4459.	0.00						
6.9300	-0.205	255819.	-20853.	-0.04086	0.00	3.85E+11	723.2976
3819.	0.00						
7.0200	-0.249	233888.	-20042.	-0.04086	0.00	3.85E+11	777.8904
3378.	0.00						
7.1100	-0.293	212864.	-19175.	-0.04086	0.00	3.85E+11	828.0668
3054.	0.00						
7.2000	-0.337	192806.	-18255.	-0.04086	0.00	3.85E+11	874.9409
2804.	0.00						
7.2900	-0.381	173769.	-17286.	-0.04086	0.00	3.85E+11	919.2336
2605.	0.00						
7.3800	-0.425	155803.	-16271.	-0.04086	0.00	3.85E+11	961.4378
2442.	0.00						
7.4700	-0.469	138959.	-15210.	-0.04086	0.00	3.85E+11	1002.
2305.	0.00						
7.5600	-0.513	123284.	-14107.	-0.04086	0.00	3.85E+11	1041.
2190.	0.00						

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

7.6500	-0.558	108823.	-13167.	-0.04086	0.00	3.85E+11	700.0085
1356.	0.00						
7.7400	-0.602	95179.	-12402.	-0.04086	0.00	3.85E+11	716.9895
1287.	0.00						
7.8300	-0.646	82371.	-11619.	-0.04086	0.00	3.85E+11	733.3726
1226.	0.00						
7.9200	-0.690	70418.	-10818.	-0.04086	0.00	3.85E+11	749.2325
1173.	0.00						
8.0100	-0.734	59339.	-10000.	-0.04086	0.00	3.85E+11	764.6308
1125.	0.00						
8.1000	-0.778	49153.	-9167.	-0.04086	0.00	3.85E+11	779.6191
1082.	0.00						
8.1900	-0.822	39875.	-8317.	-0.04086	0.00	3.85E+11	794.2406
1043.	0.00						
8.2800	-0.866	31524.	-7451.	-0.04086	0.00	3.85E+11	808.5325
1008.	0.00						
8.3700	-0.911	24116.	-6570.	-0.04086	0.00	3.85E+11	822.5264
975.5351	0.00						
8.4600	-0.955	17667.	-5675.	-0.04086	0.00	3.85E+11	836.2499
945.9721	0.00						
8.5500	-0.999	12194.	-4764.	-0.04086	0.00	3.85E+11	849.7270
918.7546	0.00						
8.6400	-1.043	7712.	-3839.	-0.04086	0.00	3.85E+11	862.9787
893.6067	0.00						
8.7300	-1.087	4236.	-2900.	-0.04086	0.00	3.85E+11	876.0235
870.2948	0.00						
8.8200	-1.131	1782.	-1947.	-0.04086	0.00	3.85E+11	888.8779
848.6197	0.00						
8.9100	-1.175	365.4096	-980.440	-0.04086	0.00	3.85E+11	901.5565
828.4106	0.00						
9.0000	-1.219	0.00	0.00	-0.04086	0.00	3.85E+11	914.0725
404.7600	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. 3:

Pile-head deflection	=	3.19922001 inches
Computed slope at pile head	=	-0.0410112 radians
Maximum bending moment	=	779906. inch-lbs
Maximum shear force	=	-22883. lbs

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Light Tower NC1-6 (Boring B-001-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Depth of maximum bending moment = 2.70000000 feet below pile head
 Depth of maximum shear force = 6.48000000 feet below pile head
 Number of iterations = 38
 Number of zero deflection points = 1
 Pile deflection at ground = 2.70722307 inches

Pile-head Deflection vs. Pile Length for Load Case 3

Boundary Condition Type 1, Shear and Moment

Shear = 2250. lbs
 Moment = 724800. in-lbs
 Axial Load = 3800. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	3.19922001	779906.	-22883.
8.55000	5.38158365	778180.	-24968.
8.10000	13.88112954	784798.	-28427.

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 Type 2	Load Type 3	Load Type 4	Load Type 5	Axial Load	Pile-head Deflection	Pile-head Rotation	Max Shear in Pile
	Load 1	Load 2	Load 1	Load 2	Load 1	lbs	inches	radians	lbs

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC1-6 (Boring B-001-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

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1  V, lb 1000.0000 M, in-lb 315600. 4200. 0.2887 -0.00362 -8076.
338231.
2  V, lb 2250. M, in-lb 724800. 4600. 3.2399 -0.04154 -22991.
780971.
3  V, lb 2250. M, in-lb 724800. 3800. 3.1992 -0.04101 -22883.
779906.
  
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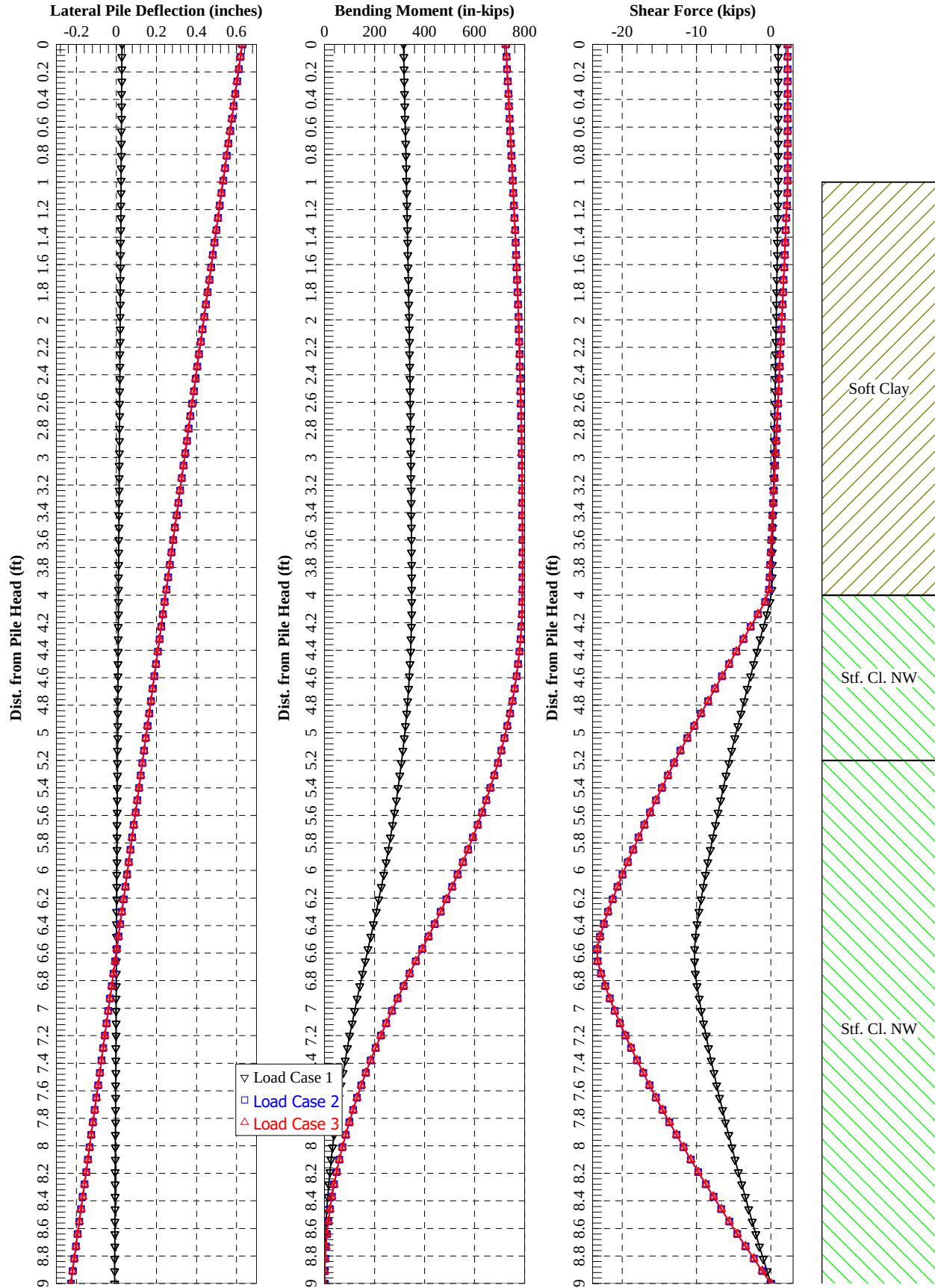
Maximum pile-head deflection = 3.2398903652 inches

Maximum pile-head rotation = -0.0415396115 radians = -2.380044 deg.

The analysis ended normally.

LATERAL LOAD (LPILE) ANALYSES
NORTHBOUND PARKING AREA
LIGHT TOWER NC2-1 (B-002-0-25)

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC2-1 (Boring B-002-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation



TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
Light Tower NC2-1 (Boring B-002-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

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

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This model was prepared by:
BSears

Files Used for Analysis

Path to file locations:
\Columbus-1170\Projects\2024\24170232_ms_TP 26 NE Ohio\GEO\Project Docs\Site
15_SUM-271 (2LMN)\Calcs\Light Towers\LPILE (Final Report)\NB\

Name of input data file:
Tower NC2-1 (B-002).lp12d

Name of output report file:
Tower NC2-1 (B-002).lp12o

Name of plot output file:
Tower NC2-1 (B-002).lp12p

Name of runtime message file:
Tower NC2-1 (B-002).lp12r

Date and Time of Analysis

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
Light Tower NC2-1 (Boring B-002-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Date: April 8, 2026

Time: 20:08:31

Problem Title

Project Name: TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas

Job Number: 24170232F

Client: ms consultants, inc.

Engineer: BKS

Description: Light Tower NC2-1 (B-002-0-25)

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

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- 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	=	9.000 ft
Depth of ground surface below top of pile	=	1.0000 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.

Point No.	Depth Below Pile Head feet	Pile Diameter inches
-----	-----	-----
1	0.000	36.0000
2	9.000	36.0000

Input Structural Properties for Pile Sections:

Pile Section No. 1:

Section 1 is a round drilled shaft, bored pile, or CIDH pile	
Length of section	= 9.000000 ft
Shaft Diameter	= 36.000000 in

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Soil and Rock Layering Information

The soil profile is modelled using 4 layers

Layer 1 is soft clay, p-y criteria by Matlock, 1970

Distance from top of pile to top of layer	=	1.000000 ft
Distance from top of pile to bottom of layer	=	4.000000 ft
Effective unit weight at top of layer	=	98.000000 pcf
Effective unit weight at bottom of layer	=	98.000000 pcf
Undrained cohesion at top of layer	=	250.000000 psf
Undrained cohesion at bottom of layer	=	250.000000 psf
Epsilon-50 at top of layer	=	0.020000
Epsilon-50 at bottom of layer	=	0.020000

Layer 2 is stiff clay without free water

Distance from top of pile to top of layer	=	4.000000 ft
Distance from top of pile to bottom of layer	=	5.200000 ft
Effective unit weight at top of layer	=	56.000000 pcf
Effective unit weight at bottom of layer	=	56.000000 pcf
Undrained cohesion at top of layer	=	2750. psf
Undrained cohesion at bottom of layer	=	2750. psf
Epsilon-50 at top of layer	=	0.005000
Epsilon-50 at bottom of layer	=	0.005000

Layer 3 is stiff clay without free water

Distance from top of pile to top of layer	=	5.200000 ft
Distance from top of pile to bottom of layer	=	9.100000 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	=	2500. psf
Undrained cohesion at bottom of layer	=	2500. psf
Epsilon-50 at top of layer	=	0.005000
Epsilon-50 at bottom of layer	=	0.005000

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

Distance from top of pile to top of layer	=	9.100000 ft
Distance from top of pile to bottom of layer	=	12.000000 ft
Effective unit weight at top of layer	=	66.000000 pcf

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Effective unit weight at bottom of layer = 66.000000 pcf
 Friction angle at top of layer = 36.000000 deg.
 Friction angle at bottom of layer = 36.000000 deg.
 Subgrade k at top of layer = 60.000000 pci
 Subgrade k at bottom of layer = 60.000000 pci

(Depth of the lowest soil layer extends 3.000 ft below the pile tip)

Summary of Input Soil Properties

Layer E50 Num. or krm	Soil Type Name kpy (p-y Curve Type) pci	Layer Depth ft	Effective Unit Wt. pcf	Cohesion psf	Angle of Friction deg.
1 0.02000	Soft --	1.0000	98.0000	250.0000	--
0.02000	Clay --	4.0000	98.0000	250.0000	--
2 0.00500	Stiff Clay --	4.0000	56.0000	2750.	--
0.00500	w/o Free Water --	5.2000	56.0000	2750.	--
3 0.00500	Stiff Clay --	5.2000	60.0000	2500.	--
0.00500	w/o Free Water --	9.1000	60.0000	2500.	--
4 --	Sand 60.0000	9.1000	66.0000	--	36.0000
--	(Reese, et al.) 60.0000	12.0000	66.0000	--	36.0000

Static Loading Type

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

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36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 3

Load Compute No.	Load Top y Type	Condition Run Analysis 1	Condition 2	Axial Thrust Force, lbs
vs. Pile Length				
1	1	V = 1000.000000 lbs	M = 315600. in-lbs	4200.
Yes		Yes		
2	1	V = 2250. lbs	M = 724800. in-lbs	4600.
Yes		Yes		
3	1	V = 2250. lbs	M = 724800. in-lbs	3800.
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:

Dimensions and Properties of Drilled Shaft (Bored Pile):

Length of Section	=	9.000000 ft
Shaft Diameter	=	36.000000 in
Concrete Cover Thickness (to edge of trans. reinf.)	=	3.500000 in
Number of Reinforcing Bars	=	16 bars
Yield Stress of Reinforcing Bars	=	60000. psi
Modulus of Elasticity of Reinforcing Bars	=	29000000. psi
Gross Area of Shaft	=	1018. sq. in.

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Total Area of Reinforcing Steel	=	16.000000 sq. in.
Area Ratio of Steel Reinforcement	=	1.57 percent
Edge-to-Edge Bar Spacing	=	4.114467 in
Maximum Concrete Aggregate Size	=	0.750000 in
Ratio of Bar Spacing to Aggregate Size	=	5.49
Offset of Center of Rebar Cage from Center of Pile	=	0.0000 in
Transverse Reinforcement		
Type: Spiral		
Number of Transverse Reinf. (per spacing)	=	1
Spacing of Transverse Reinf.	=	4.500000 in
Yield Stress of Transverse Reinf.	=	60000. psi
Diameter of Transverse Reinf.	=	0.500000 in

Axial Structural Capacities:

Nom. Axial Structural Capacity = $0.85 F_c A_c + F_y A_s$	=	4366.378 kips
Tensile Load for Cracking of Concrete	=	-470.222 kips
Nominal Axial Tensile Capacity	=	-960.000 kips

Reinforcing Bar Dimensions and Positions Used in Computations:

Bar Number	Bar Diam. inches	Bar Area sq. in.	X inches	Y inches
-----	-----	-----	-----	-----
1	1.128000	1.000000	13.436000	0.000000
2	1.128000	1.000000	12.413245	5.141735
3	1.128000	1.000000	9.500687	9.500687
4	1.128000	1.000000	5.141735	12.413245
5	1.128000	1.000000	0.000000	13.436000
6	1.128000	1.000000	-5.14173	12.413245
7	1.128000	1.000000	-9.50069	9.500687
8	1.128000	1.000000	-12.41325	5.141735
9	1.128000	1.000000	-13.43600	0.000000
10	1.128000	1.000000	-12.41325	-5.14173
11	1.128000	1.000000	-9.50069	-9.50069
12	1.128000	1.000000	-5.14173	-12.41325
13	1.128000	1.000000	0.000000	-13.43600
14	1.128000	1.000000	5.141735	-12.41325
15	1.128000	1.000000	9.500687	-9.50069
16	1.128000	1.000000	12.413245	-5.14173

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

Minimum spacing between any two bars not equal to zero = 4.114 inches
between bars 11 and 12.

Ratio of bar spacing to maximum aggregate size = 5.49

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Concrete Properties:

Compressive Strength of Concrete	=	4000. psi
Modulus of Elasticity of Concrete	=	3604997. psi
Modulus of Rupture of Concrete	=	-474.34165 psi
Compression Strain at Peak Stress	=	0.001886
Tensile Strain at Fracture of Concrete	=	-0.0001154
Maximum Coarse Aggregate Size	=	0.750000 in

Number of Axial Thrust Force Values Determined from Pile-head Loadings = 3

Number	Axial Thrust Force kips
-----	-----
1	3.800
2	4.200
3	4.600

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 318-14, Section 21.2.3.
 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 = 3.800 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----

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6.25000E-07	240.5062135	384809942.	19.2929823	0.00001206	-0.00001044
0.0505030	0.2746478				
0.00000125	480.1472468	384117797.	18.6479768	0.00002331	-0.00002169
0.0973082	0.5259142				
0.00000188	718.9174733	383422652.	18.4329804	0.00003456	-0.00003294
0.1438345	0.7771808				
0.00000250	956.8168886	382726755.	18.3254857	0.00004581	-0.00004419
0.1900818	1.0284477				
0.00000313	1194.	382030558.	18.2609917	0.00005707	-0.00005543
0.2360502	1.2797149				
0.00000375	1430.	381334209.	18.2179981	0.00006832	-0.00006668
0.2817396	1.5309823				
0.00000438	1665.	380637775.	18.1872904	0.00007957	-0.00007793
0.3271500	1.7822500				
0.00000500	1900.	379941287.	18.1642614	0.00009082	-0.00008918
0.3722815	2.0335179				
0.00000563	2133.	379244764.	18.1463515	0.0001021	-0.000100
0.4171340	2.2847861				
0.00000625	2366.	378548215.	18.1320251	0.0001133	-0.000112
0.4617075	2.5360546				
0.00000688	2366.	344134741.	10.2494785	0.00007047	-0.000177
0.2882187	-4.308598 C				
0.00000750	2366.	315456846.	10.2198771	0.00007665	-0.000193
0.3129821	-4.706727 C				
0.00000813	2366.	291190934.	10.1952302	0.00008284	-0.000210
0.3376758	-5.104761 C				
0.00000875	2366.	270391582.	10.1744772	0.00008903	-0.000226
0.3622998	-5.502701 C				
0.00000938	2366.	252365477.	10.1568402	0.00009522	-0.000242
0.3868539	-5.900547 C				
0.00001000	2366.	236592634.	10.1417358	0.0001014	-0.000259
0.4113380	-6.298297 C				
0.00001063	2366.	222675420.	10.1287027	0.0001076	-0.000275
0.4357521	-6.695951 C				
0.00001125	2366.	210304564.	10.1174231	0.0001138	-0.000291
0.4600960	-7.093510 C				
0.00001188	2366.	199235903.	10.1076093	0.0001200	-0.000307
0.4843696	-7.490973 C				
0.00001250	2366.	189274107.	10.0990420	0.0001262	-0.000324
0.5085729	-7.888340 C				
0.00001313	2366.	180261055.	10.0915439	0.0001325	-0.000340
0.5327056	-8.285611 C				
0.00001375	2366.	172067370.	10.0849699	0.0001387	-0.000356
0.5567678	-8.682785 C				
0.00001438	2366.	164586180.	10.0792000	0.0001449	-0.000373
0.5807594	-9.079861 C				
0.00001500	2366.	157728423.	10.0741344	0.0001511	-0.000389
0.6046801	-9.476841 C				
0.00001563	2366.	151419286.	10.0696892	0.0001573	-0.000405
0.6285300	-9.873723 C				

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0.00001625	2366.	145595467.	10.0657933	0.0001636	-0.000421
0.6523089	-10.270507 C				
0.00001688	2366.	140203043.	10.0623863	0.0001698	-0.000438
0.6760167	-10.667193 C				
0.00001750	2366.	135195791.	10.0594163	0.0001760	-0.000454
0.6996534	-11.063781 C				
0.00001813	2366.	130533867.	10.0568387	0.0001823	-0.000470
0.7232187	-11.460271 C				
0.00001875	2366.	126182738.	10.0546147	0.0001885	-0.000486
0.7467127	-11.856661 C				
0.00001938	2366.	122112327.	10.0527107	0.0001948	-0.000503
0.7701352	-12.252952 C				
0.00002000	2366.	118296317.	10.0510970	0.0002010	-0.000519
0.7934860	-12.649144 C				
0.00002063	2366.	114711580.	10.0497478	0.0002073	-0.000535
0.8167652	-13.045236 C				
0.00002125	2366.	111337710.	10.0486401	0.0002135	-0.000551
0.8399726	-13.441228 C				
0.00002188	2366.	108156633.	10.0477539	0.0002198	-0.000568
0.8631080	-13.837120 C				
0.00002250	2366.	105152282.	10.0470709	0.0002261	-0.000584
0.8861714	-14.232911 C				
0.00002313	2366.	102310328.	10.0465752	0.0002323	-0.000600
0.9091627	-14.628602 C				
0.00002375	2366.	99617951.	10.0462524	0.0002386	-0.000616
0.9320817	-15.024191 C				
0.00002438	2366.	97063645.	10.0460897	0.0002449	-0.000633
0.9549284	-15.419678 C				
0.00002563	2429.	94800037.	10.0461990	0.0002574	-0.000665
1.0004043	-16.210348 C				
0.00002688	2545.	94692477.	10.0468231	0.0002700	-0.000697
1.0455896	-17.000609 C				
0.00002813	2660.	94589756.	10.0479254	0.0002826	-0.000730
1.0904832	-17.790458 C				
0.00002938	2776.	94491232.	10.0493946	0.0002952	-0.000762
1.1350844	-18.579893 C				
0.00003063	2891.	94396370.	10.0512127	0.0003078	-0.000795
1.1793922	-19.368912 C				
0.00003188	3006.	94304718.	10.0533415	0.0003205	-0.000827
1.2234058	-20.157511 C				
0.00003313	3121.	94215891.	10.0557483	0.0003331	-0.000859
1.2671243	-20.945689 C				
0.00003438	3236.	94129561.	10.0584054	0.0003458	-0.000892
1.3105466	-21.733443 C				
0.00003563	3350.	94045446.	10.0612887	0.0003584	-0.000924
1.3536720	-22.520771 C				
0.00003688	3465.	93963300.	10.0643778	0.0003711	-0.000956
1.3964994	-23.307669 C				
0.00003813	3579.	93882912.	10.0676547	0.0003838	-0.000989
1.4390279	-24.094136 C				

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0.00003938	3694.	93804096.	10.0711039	0.0003965	-0.001021
1.4812567	-24.880169 C				
0.00004063	3808.	93726688.	10.0747116	0.0004093	-0.001053
1.5231846	-25.665765 C				
0.00004188	3922.	93650546.	10.0784659	0.0004220	-0.001085
1.5648108	-26.450921 C				
0.00004313	4035.	93575540.	10.0823562	0.0004348	-0.001118
1.6061342	-27.235635 C				
0.00004438	4149.	93501560.	10.0863731	0.0004476	-0.001150
1.6471540	-28.019904 C				
0.00004563	4263.	93428502.	10.0905084	0.0004604	-0.001182
1.6878690	-28.803725 C				
0.00004688	4376.	93356279.	10.0947545	0.0004732	-0.001214
1.7282784	-29.587096 C				
0.00004813	4489.	93284807.	10.0991050	0.0004860	-0.001246
1.7683810	-30.370013 C				
0.00004938	4602.	93214014.	10.1035538	0.0004989	-0.001279
1.8081759	-31.152474 C				
0.00005063	4715.	93143835.	10.1080956	0.0005117	-0.001311
1.8476620	-31.934476 C				
0.00005188	4828.	93074209.	10.1127258	0.0005246	-0.001343
1.8868384	-32.716016 C				
0.00005313	4941.	93005082.	10.1174399	0.0005375	-0.001375
1.9257039	-33.497091 C				
0.00005438	5053.	92936405.	10.1222340	0.0005504	-0.001407
1.9642575	-34.277698 C				
0.00005563	5166.	92868132.	10.1271047	0.0005633	-0.001439
2.0024981	-35.057833 C				
0.00005688	5278.	92800222.	10.1320488	0.0005763	-0.001471
2.0404247	-35.837495 C				
0.00005813	5390.	92732637.	10.1370633	0.0005892	-0.001503
2.0780361	-36.616679 C				
0.00005938	5502.	92665342.	10.1421457	0.0006022	-0.001535
2.1153313	-37.395383 C				
0.00006063	5614.	92598305.	10.1472935	0.0006152	-0.001567
2.1523092	-38.173604 C				
0.00006188	5725.	92531497.	10.1525046	0.0006282	-0.001599
2.1889685	-38.951338 C				
0.00006313	5837.	92464888.	10.1577769	0.0006412	-0.001631
2.2253083	-39.728581 C				
0.00006438	5948.	92398455.	10.1631088	0.0006543	-0.001663
2.2613274	-40.505332 C				
0.00006563	6059.	92332173.	10.1684984	0.0006673	-0.001695
2.2970245	-41.281586 C				
0.00006688	6170.	92266020.	10.1739444	0.0006804	-0.001727
2.3323987	-42.057340 C				
0.00006813	6281.	92199976.	10.1794453	0.0006935	-0.001759
2.3674485	-42.832591 C				
0.00006938	6392.	92134020.	10.1849998	0.0007066	-0.001791
2.4021730	-43.607335 C				

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0.00007063	6502.	92068136.	10.1906070	0.0007197	-0.001823
2.4365708	-44.381568 C				
0.00007188	6613.	92002305.	10.1962656	0.0007329	-0.001855
2.4706408	-45.155288 C				
0.00007313	6723.	91936511.	10.2020028	0.0007460	-0.001886
2.5043818	-45.928490 C				
0.00007438	6833.	91870742.	10.2077616	0.0007592	-0.001918
2.5377924	-46.701172 C				
0.00007938	7271.	91607617.	10.2312788	0.0008121	-0.002045
2.6681070	-49.786612 C				
0.00008438	7707.	91343844.	10.2555391	0.0008653	-0.002172
2.7930345	-52.863415 C				
0.00008938	8140.	91079227.	10.2796933	0.0009187	-0.002299
2.9123325	-55.933382 C				
0.00009438	8570.	90813004.	10.3043877	0.0009725	-0.002425
3.0260259	-58.995009 C				
0.00009938	8979.	90357411.	10.3225581	0.0010258	-0.002552
3.1326575	-60.000000 CY				
0.0001044	9304.	89144470.	10.3110511	0.0010762	-0.002681
3.2276850	-60.000000 CY				
0.0001094	9546.	87273573.	10.2718035	0.0011235	-0.002814
3.3116704	-60.000000 CY				
0.0001144	9782.	85523680.	10.2357064	0.0011707	-0.002947
3.3907664	-60.000000 CY				
0.0001194	10004.	83800225.	10.1987328	0.0012175	-0.003080
3.4643165	-60.000000 CY				
0.0001244	10154.	81641326.	10.1374818	0.0012608	-0.003217
3.5282172	-60.000000 CY				
0.0001294	10287.	79513660.	10.0756441	0.0013035	-0.003354
3.5871212	-60.000000 CY				
0.0001344	10419.	77536664.	10.0197410	0.0013464	-0.003491
3.6423258	-60.000000 CY				
0.0001394	10550.	75693983.	9.9691573	0.0013895	-0.003628
3.6937845	-60.000000 CY				
0.0001444	10680.	73971519.	9.9233661	0.0014327	-0.003765
3.7414497	-60.000000 CY				
0.0001494	10808.	72355946.	9.8810316	0.0014760	-0.003902
3.7851328	-60.000000 CY				
0.0001544	10925.	70772035.	9.8368433	0.0015186	-0.004039
3.8241552	-60.000000 CY				
0.0001594	11008.	69072220.	9.7809580	0.0015588	-0.004179
3.8574366	-60.000000 CY				
0.0001644	11071.	67351790.	9.7204156	0.0015978	-0.004320
3.8862696	-60.000000 CY				
0.0001694	11131.	65719446.	9.6635689	0.0016368	-0.004461
3.9118664	-60.000000 CY				
0.0001744	11191.	64176802.	9.6094393	0.0016756	-0.004602
3.9342902	-60.000000 CY				
0.0001794	11250.	62716278.	9.5601863	0.0017149	-0.004743
3.9535015	-60.000000 CY				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC2-1 (Boring B-002-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0001844	11308.	61329164.	9.5136161	0.0017541	-0.004883
3.9693617	-60.000000 CY				
0.0001894	11364.	60009896.	9.4690774	0.0017932	-0.005024
3.9819050	-60.000000 CY				
0.0001944	11420.	58754909.	9.4280227	0.0018326	-0.005165
3.9911986	-60.000000 CY				
0.0001994	11476.	57559296.	9.3897594	0.0018721	-0.005305
3.9971986	-60.000000 CY				
0.0002044	11531.	56418622.	9.3531932	0.0019116	-0.005446
3.9998595	-60.000000 CY				
0.0002094	11584.	55328385.	9.3201259	0.0019514	-0.005586
3.9974517	-60.000000 CY				
0.0002144	11637.	54285454.	9.2909722	0.0019918	-0.005726
3.9998812	-60.000000 CY				
0.0002194	11690.	53285909.	9.2626721	0.0020320	-0.005866
3.9969940	-60.000000 CY				
0.0002244	11740.	52321336.	9.2356724	0.0020723	-0.006005
3.9997138	-60.000000 CY				
0.0002294	11786.	51384137.	9.2093226	0.0021124	-0.006145
3.9955528	-60.000000 CY				
0.0002344	11823.	50445667.	9.1796872	0.0021515	-0.006286
3.9989818	-60.000000 CY				
0.0002394	11855.	49524943.	9.1473565	0.0021896	-0.006428
3.9994466	-60.000000 CY				
0.0002444	11876.	48598228.	9.1109548	0.0022265	-0.006571
3.9965160	-60.000000 CY				
0.0002494	11895.	47701101.	9.0745971	0.0022630	-0.006715
3.9991770	-60.000000 CY				
0.0002544	11912.	46829816.	9.0405915	0.0022997	-0.006858
3.9995775	-60.000000 CY				
0.0002594	11929.	45990067.	9.0077660	0.0023364	-0.007001
3.9954763	-60.000000 CY				
0.0002644	11945.	45181124.	8.9766457	0.0023732	-0.007144
3.9984997	-60.000000 CY				
0.0002694	11961.	44401256.	8.9468563	0.0024101	-0.007287
3.9998981	-60.000000 CY				
0.0002744	11976.	43648250.	8.9191370	0.0024472	-0.007430
3.9944635	-60.000000 CY				
0.0003044	12062.	39628140.	8.7757363	0.0026711	-0.008286
3.9984635	-60.000000 CY				
0.0003344	12138.	36300180.	8.6628609	0.0028966	-0.009141
3.9998209	-60.000000 CY				
0.0003644	12207.	33502446.	8.5793723	0.0031261	-0.009991
3.9999551	-60.000000 CYT				
0.0003944	12272.	31117026.	8.5161103	0.0033585	-0.010839
3.9996166	-60.000000 CYT				
0.0004244	12331.	29056485.	8.4674428	0.0035934	-0.011684
3.9972132	-60.000000 CYT				
0.0004544	12377.	27238942.	8.4178614	0.0038249	-0.012533
3.9873462	-60.000000 CYT				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC2-1 (Boring B-002-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Axial Thrust Force = 4.200 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
-----	-----	-----	-----	-----	-----
6.25000E-07	240.5049676	384807948.	19.4290859	0.00001214	-0.00001036
0.0508615	0.2771147				
0.00000125	480.1459926	384116794.	18.7161837	0.00002340	-0.00002160
0.0976654	0.5283867				
0.00000188	718.9162127	383421980.	18.4785558	0.00003465	-0.00003285
0.1441903	0.7796589				
0.00000250	956.8156222	382726249.	18.3597458	0.00004590	-0.00004410
0.1904363	1.0309315				
0.00000313	1194.	382030150.	18.2884629	0.00005715	-0.00005535
0.2364034	1.2822044				
0.00000375	1430.	381333869.	18.2409436	0.00006840	-0.00006660
0.2820914	1.5334776				
0.00000438	1665.	380637482.	18.2070035	0.00007966	-0.00007784
0.3275005	1.7847511				
0.00000500	1900.	379941029.	18.1815504	0.00009091	-0.00008909
0.3726306	2.0360248				
0.00000563	2133.	379244533.	18.1617553	0.0001022	-0.000100
0.4174818	2.2872988				
0.00000625	2366.	378548006.	18.1459208	0.0001134	-0.000112
0.4620539	2.5385732				
0.00000688	2366.	344134551.	10.2895004	0.00007074	-0.000177
0.2893429	-4.300617 C				
0.00000750	2366.	315456672.	10.2575513	0.00007693	-0.000193
0.3141325	-4.698533 C				
0.00000813	2366.	291190774.	10.2300378	0.00008312	-0.000209
0.3388235	-5.096560 C				
0.00000875	2366.	270391433.	10.2068278	0.00008931	-0.000226
0.3634446	-5.494492 C				
0.00000938	2366.	252365338.	10.1870615	0.00009550	-0.000242
0.3879959	-5.892330 C				
0.00001000	2366.	236592504.	10.1700940	0.0001017	-0.000258
0.4124772	-6.290073 C				
0.00001063	2366.	222675298.	10.1554324	0.0001079	-0.000275
0.4368884	-6.687720 C				
0.00001125	2366.	210304448.	10.1426931	0.0001141	-0.000291
0.4612294	-7.085271 C				
0.00001188	2366.	199235793.	10.1315564	0.0001203	-0.000307
0.4855002	-7.482727 C				

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 Light Tower NC2-1 (Boring B-002-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00001250	2366.	189274003.	10.1218127	0.0001265	-0.000323
0.5097005	-7.880086 C				
0.00001313	2366.	180260955.	10.1132503	0.0001327	-0.000340
0.5338304	-8.277349 C				
0.00001375	2366.	172067276.	10.1057088	0.0001390	-0.000356
0.5578898	-8.674515 C				
0.00001438	2366.	164586090.	10.0990556	0.0001452	-0.000372
0.5818784	-9.071585 C				
0.00001500	2366.	157728336.	10.0931803	0.0001514	-0.000389
0.6057963	-9.468556 C				
0.00001563	2366.	151419203.	10.0879903	0.0001576	-0.000405
0.6296433	-9.865431 C				
0.00001625	2366.	145595387.	10.0834069	0.0001639	-0.000421
0.6534193	-10.262207 C				
0.00001688	2366.	140202965.	10.0793634	0.0001701	-0.000437
0.6771242	-10.658886 C				
0.00001750	2366.	135195717.	10.0758025	0.0001763	-0.000454
0.7007579	-11.055466 C				
0.00001813	2366.	130533795.	10.0726747	0.0001826	-0.000470
0.7243204	-11.451947 C				
0.00001875	2366.	126182669.	10.0699372	0.0001888	-0.000486
0.7478114	-11.848330 C				
0.00001938	2366.	122112260.	10.0675528	0.0001951	-0.000502
0.7712309	-12.244613 C				
0.00002000	2366.	118296252.	10.0654889	0.0002013	-0.000519
0.7945789	-12.640797 C				
0.00002063	2366.	114711517.	10.0637168	0.0002076	-0.000535
0.8178551	-13.036882 C				
0.00002125	2366.	111337649.	10.0622112	0.0002138	-0.000551
0.8410595	-13.432866 C				
0.00002188	2366.	108156573.	10.0609497	0.0002201	-0.000567
0.8641920	-13.828750 C				
0.00002250	2366.	105152224.	10.0599125	0.0002263	-0.000584
0.8872524	-14.224533 C				
0.00002313	2366.	102310272.	10.0590817	0.0002326	-0.000600
0.9102407	-14.620215 C				
0.00002375	2366.	99617896.	10.0584414	0.0002389	-0.000616
0.9331568	-15.015796 C				
0.00002438	2366.	97063591.	10.0579776	0.0002452	-0.000632
0.9560005	-15.411276 C				
0.00002563	2432.	94924068.	10.0575288	0.0002577	-0.000665
1.0014704	-16.201930 C				
0.00002688	2548.	94810571.	10.0576469	0.0002703	-0.000697
1.0466496	-16.992174 C				
0.00002813	2664.	94702439.	10.0582592	0.0002829	-0.000730
1.0915372	-17.782007 C				
0.00002938	2779.	94598964.	10.0593353	0.0002955	-0.000762
1.1361324	-18.571425 C				
0.00003063	2894.	94499555.	10.0607664	0.0003081	-0.000794
1.1804341	-19.360427 C				

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 Light Tower NC2-1 (Boring B-002-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00003188	3009.	94403710.	10.0625387	0.0003207	-0.000827
1.2244416	-20.149010 C				
0.00003313	3124.	94311007.	10.0646159	0.0003334	-0.000859
1.2681539	-20.937171 C				
0.00003438	3239.	94221082.	10.0669675	0.0003461	-0.000891
1.3115700	-21.724908 C				
0.00003563	3354.	94133623.	10.0695670	0.0003587	-0.000924
1.3546892	-22.512219 C				
0.00003688	3468.	94048359.	10.0723915	0.0003714	-0.000956
1.3975103	-23.299100 C				
0.00003813	3582.	93965057.	10.0754214	0.0003841	-0.000988
1.4400326	-24.085550 C				
0.00003938	3697.	93883511.	10.0786392	0.0003968	-0.001021
1.4822550	-24.871565 C				
0.00004063	3811.	93803541.	10.0820299	0.0004096	-0.001053
1.5241766	-25.657144 C				
0.00004188	3925.	93724988.	10.0855803	0.0004223	-0.001085
1.5657965	-26.442282 C				
0.00004313	4039.	93647711.	10.0892786	0.0004351	-0.001117
1.6071135	-27.226979 C				
0.00004438	4152.	93571586.	10.0931145	0.0004479	-0.001150
1.6481268	-28.011230 C				
0.00004563	4266.	93496502.	10.0970787	0.0004607	-0.001182
1.6888354	-28.795033 C				
0.00004688	4379.	93422358.	10.1011630	0.0004735	-0.001214
1.7292383	-29.578385 C				
0.00004813	4492.	93349066.	10.1053601	0.0004863	-0.001246
1.7693344	-30.361284 C				
0.00004938	4606.	93276544.	10.1096634	0.0004992	-0.001278
1.8091228	-31.143727 C				
0.00005063	4718.	93204721.	10.1140670	0.0005120	-0.001310
1.8486023	-31.925710 C				
0.00005188	4831.	93133529.	10.1185657	0.0005249	-0.001343
1.8877721	-32.707231 C				
0.00005313	4944.	93062909.	10.1231546	0.0005378	-0.001375
1.9266309	-33.488287 C				
0.00005438	5056.	92992807.	10.1278294	0.0005507	-0.001407
1.9651778	-34.268875 C				
0.00005563	5169.	92923173.	10.1325862	0.0005636	-0.001439
2.0034117	-35.048992 C				
0.00005688	5281.	92853961.	10.1374215	0.0005766	-0.001471
2.0413316	-35.828634 C				
0.00005813	5393.	92785130.	10.1423320	0.0005895	-0.001503
2.0789362	-36.607799 C				
0.00005938	5505.	92716640.	10.1473148	0.0006025	-0.001535
2.1162246	-37.386484 C				
0.00006063	5617.	92648458.	10.1523672	0.0006155	-0.001567
2.1531956	-38.164685 C				
0.00006188	5728.	92580549.	10.1574868	0.0006285	-0.001599
2.1898481	-38.942399 C				

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0.00006313	5840.	92512883.	10.1626714	0.0006415	-0.001631
2.2261809	-39.719622 C				
0.00006438	5951.	92445433.	10.1679189	0.0006546	-0.001663
2.2621930	-40.496353 C				
0.00006563	6062.	92378172.	10.1732276	0.0006676	-0.001695
2.2978832	-41.272587 C				
0.00006688	6173.	92311077.	10.1785957	0.0006807	-0.001727
2.3332503	-42.048320 C				
0.00006813	6284.	92244124.	10.1840217	0.0006938	-0.001759
2.3682931	-42.823550 C				
0.00006938	6395.	92177292.	10.1895041	0.0007069	-0.001791
2.4030104	-43.598274 C				
0.00007063	6505.	92110561.	10.1950417	0.0007200	-0.001822
2.4374011	-44.372486 C				
0.00007188	6616.	92043913.	10.2006608	0.0007332	-0.001854
2.4714639	-45.146185 C				
0.00007313	6726.	91977331.	10.2063053	0.0007463	-0.001886
2.5051976	-45.919366 C				
0.00007438	6836.	91910797.	10.2120017	0.0007595	-0.001918
2.5386010	-46.692026 C				
0.00007938	7274.	91644853.	10.2352897	0.0008124	-0.002045
2.6688860	-49.777380 C				
0.00008438	7710.	91378587.	10.2593338	0.0008656	-0.002172
2.7937834	-52.854093 C				
0.00008938	8143.	91111830.	10.2831857	0.0009191	-0.002298
2.9130226	-55.924331 C				
0.00009438	8573.	90843621.	10.3077273	0.0009728	-0.002425
3.0266854	-58.985869 C				
0.00009938	8982.	90387473.	10.3258078	0.0010261	-0.002551
3.1332951	-60.000000 CY				
0.0001044	9308.	89176212.	10.3143071	0.0010766	-0.002681
3.2283182	-60.000000 CY				
0.0001094	9549.	87304848.	10.2749831	0.0011238	-0.002814
3.3122821	-60.000000 CY				
0.0001144	9785.	85553556.	10.2389100	0.0011711	-0.002946
3.3913727	-60.000000 CY				
0.0001194	10007.	83830919.	10.2019402	0.0012179	-0.003080
3.4649106	-60.000000 CY				
0.0001244	10158.	81671814.	10.1406407	0.0012612	-0.003216
3.5287895	-60.000000 CY				
0.0001294	10291.	79542859.	10.0787027	0.0013039	-0.003354
3.5876602	-60.000000 CY				
0.0001344	10423.	77564670.	10.0227059	0.0013468	-0.003491
3.6428308	-60.000000 CY				
0.0001394	10554.	75720878.	9.9720357	0.0013899	-0.003628
3.6942550	-60.000000 CY				
0.0001444	10683.	73997378.	9.9261646	0.0014331	-0.003764
3.7418850	-60.000000 CY				
0.0001494	10812.	72381005.	9.8838986	0.0014764	-0.003901
3.7855535	-60.000000 CY				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0001544	10929.	70796718.	9.8396771	0.0015190	-0.004038
3.8245440	-60.000000 CY				
0.0001594	11012.	69097838.	9.7838573	0.0015593	-0.004178
3.8578061	-60.000000 CY				
0.0001644	11075.	67376662.	9.7232508	0.0015983	-0.004319
3.8866026	-60.000000 CY				
0.0001694	11135.	65743511.	9.6663364	0.0016372	-0.004460
3.9121613	-60.000000 CY				
0.0001744	11195.	64200103.	9.6121495	0.0016761	-0.004601
3.9345463	-60.000000 CY				
0.0001794	11254.	62738857.	9.5628376	0.0017153	-0.004742
3.9537182	-60.000000 CY				
0.0001844	11312.	61351278.	9.5162917	0.0017546	-0.004883
3.9695496	-60.000000 CY				
0.0001894	11368.	60031354.	9.4717005	0.0017937	-0.005024
3.9820503	-60.000000 CY				
0.0001944	11425.	58775745.	9.4305957	0.0018331	-0.005164
3.9913005	-60.000000 CY				
0.0001994	11480.	57579537.	9.3922863	0.0018726	-0.005305
3.9972564	-60.000000 CY				
0.0002044	11535.	56438298.	9.3556780	0.0019121	-0.005445
3.9998723	-60.000000 CY				
0.0002094	11588.	55347517.	9.3241700	0.0019522	-0.005585
3.9975077	-60.000000 CY				
0.0002144	11641.	54304067.	9.2934428	0.0019923	-0.005725
3.9998931	-60.000000 CY				
0.0002194	11694.	53304015.	9.2651074	0.0020325	-0.005865
3.9970558	-60.000000 CY				
0.0002244	11744.	52339157.	9.2380944	0.0020728	-0.006005
3.9997330	-60.000000 CY				
0.0002294	11790.	51401489.	9.2117130	0.0021129	-0.006145
3.9956300	-60.000000 CY				
0.0002344	11827.	50463153.	9.1821360	0.0021521	-0.006285
3.9990203	-60.000000 CY				
0.0002394	11859.	49542728.	9.1500193	0.0021903	-0.006427
3.9992468	-60.000000 CY				
0.0002444	11880.	48615611.	9.1135780	0.0022271	-0.006570
3.9965958	-60.000000 CY				
0.0002494	11900.	47718283.	9.0771076	0.0022636	-0.006714
3.9992162	-60.000000 CY				
0.0002544	11917.	46846598.	9.0431776	0.0023004	-0.006857
3.9993713	-60.000000 CY				
0.0002594	11933.	46006491.	9.0103157	0.0023371	-0.007000
3.9955701	-60.000000 CY				
0.0002644	11949.	45197204.	8.9791598	0.0023739	-0.007144
3.9985538	-60.000000 CY				
0.0002694	11965.	44417005.	8.9493437	0.0024107	-0.007287
3.9999119	-60.000000 CY				
0.0002744	11980.	43663657.	8.9215934	0.0024479	-0.007430
3.9942523	-60.000000 CY				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC2-1 (Boring B-002-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0003044	12066.	39641995.	8.7782176	0.0026719	-0.008286
3.9985257	-60.000000 CY				
0.0003344	12142.	36312646.	8.6652203	0.0028974	-0.009140
3.9998424	-60.000000 CY				
0.0003644	12212.	33513765.	8.5815911	0.0031269	-0.009991
3.9999658	-60.000000 CYT				
0.0003944	12276.	31127384.	8.5182268	0.0033594	-0.010838
3.9996505	-60.000000 CYT				
0.0004244	12335.	29066055.	8.4694819	0.0035942	-0.011683
3.9973093	-60.000000 CYT				
0.0004544	12381.	27248100.	8.4201387	0.0038259	-0.012532
3.9875919	-60.000000 CYT				

Axial Thrust Force = 4.600 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
-----	-----	-----	-----	-----	-----
6.25000E-07	240.5035986	384805758.	19.5651901	0.00001223	-0.00001027
0.0512199	0.2795816				
0.00000125	480.1446137	384115691.	18.7843907	0.00002348	-0.00002152
0.0980225	0.5308592				
0.00000188	718.9148267	383421241.	18.5241312	0.00003473	-0.00003277
0.1445462	0.7821371				
0.00000250	956.8142298	382725692.	18.3940059	0.00004599	-0.00004401
0.1907908	1.0334154				
0.00000313	1194.	382029703.	18.3159341	0.00005724	-0.00005526
0.2367565	1.2846940				
0.00000375	1430.	381333494.	18.2638891	0.00006849	-0.00006651
0.2824433	1.5359729				
0.00000438	1665.	380637159.	18.2267166	0.00007974	-0.00007776
0.3278510	1.7872522				
0.00000500	1900.	379940746.	18.1988394	0.00009099	-0.00008901
0.3729798	2.0385317				
0.00000563	2133.	379244280.	18.1771590	0.0001022	-0.000100
0.4178295	2.2898116				
0.00000625	2366.	378547777.	18.1598165	0.0001135	-0.000112
0.4624003	2.5410917				
0.00000688	2366.	344134343.	10.3291778	0.00007101	-0.000176
0.2904571	-4.292706 C				
0.00000750	2366.	315456481.	10.2940289	0.00007721	-0.000193
0.3152465	-4.690597 C				
0.00000813	2366.	291190598.	10.2646762	0.00008340	-0.000209
0.3399656	-5.088396 C				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00000875	2366.	270391269.	10.2391817	0.00008959	-0.000225
0.3645893	-5.486283 C				
0.00000938	2366.	252365185.	10.2172859	0.00009579	-0.000242
0.3891378	-5.884113 C				
0.00001000	2366.	236592361.	10.1984552	0.0001020	-0.000258
0.4136162	-6.281848 C				
0.00001063	2366.	222675163.	10.1821496	0.0001082	-0.000274
0.4380246	-6.679488 C				
0.00001125	2366.	210304321.	10.1679490	0.0001144	-0.000291
0.4623628	-7.077032 C				
0.00001188	2366.	199235672.	10.1555219	0.0001206	-0.000307
0.4866307	-7.474480 C				
0.00001250	2366.	189273889.	10.1446030	0.0001268	-0.000323
0.5108282	-7.871831 C				
0.00001313	2366.	180260846.	10.1349589	0.0001330	-0.000339
0.5349552	-8.269087 C				
0.00001375	2366.	172067171.	10.1264498	0.0001392	-0.000356
0.5590117	-8.666245 C				
0.00001438	2366.	164585990.	10.1189132	0.0001455	-0.000372
0.5829974	-9.063307 C				
0.00001500	2366.	157728241.	10.1122282	0.0001517	-0.000388
0.6069124	-9.460271 C				
0.00001563	2366.	151419111.	10.1062933	0.0001579	-0.000405
0.6307565	-9.857138 C				
0.00001625	2366.	145595299.	10.1010224	0.0001641	-0.000421
0.6545296	-10.253907 C				
0.00001688	2366.	140202880.	10.0963423	0.0001704	-0.000437
0.6782316	-10.650577 C				
0.00001750	2366.	135195635.	10.0921903	0.0001766	-0.000453
0.7018624	-11.047150 C				
0.00001813	2366.	130533716.	10.0885122	0.0001829	-0.000470
0.7254219	-11.443623 C				
0.00001875	2366.	126182592.	10.0852613	0.0001891	-0.000486
0.7489100	-11.839998 C				
0.00001938	2366.	122112186.	10.0823966	0.0001953	-0.000502
0.7723266	-12.236274 C				
0.00002000	2366.	118296180.	10.0798824	0.0002016	-0.000518
0.7956716	-12.632450 C				
0.00002063	2366.	114711448.	10.0776874	0.0002079	-0.000535
0.8189449	-13.028526 C				
0.00002125	2366.	111337582.	10.0757837	0.0002141	-0.000551
0.8421464	-13.424502 C				
0.00002188	2366.	108156508.	10.0741470	0.0002204	-0.000567
0.8652759	-13.820378 C				
0.00002250	2366.	105152160.	10.0727554	0.0002266	-0.000583
0.8883333	-14.216153 C				
0.00002313	2366.	102310210.	10.0715894	0.0002329	-0.000600
0.9113187	-14.611828 C				
0.00002375	2366.	99617836.	10.0706317	0.0002392	-0.000616
0.9342318	-15.007401 C				

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 Light Tower NC2-1 (Boring B-002-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00002438	2366.	97063533.	10.0698667	0.0002455	-0.000632
0.9570725	-15.402873 C				
0.00002563	2436.	95048091.	10.0688598	0.0002580	-0.000664
1.0025364	-16.193510 C				
0.00002688	2551.	94928657.	10.0684718	0.0002706	-0.000697
1.0477096	-16.983738 C				
0.00002813	2667.	94815115.	10.0686232	0.0002832	-0.000729
1.0925912	-17.773555 C				
0.00002938	2782.	94706690.	10.0692479	0.0002958	-0.000762
1.1371802	-18.562957 C				
0.00003063	2897.	94602733.	10.0703211	0.0003084	-0.000794
1.1814759	-19.351942 C				
0.00003188	3012.	94502697.	10.0717368	0.0003210	-0.000826
1.2254772	-20.140508 C				
0.00003313	3127.	94406117.	10.0734845	0.0003337	-0.000859
1.2691834	-20.928652 C				
0.00003438	3242.	94312597.	10.0755306	0.0003463	-0.000891
1.3125933	-21.716373 C				
0.00003563	3357.	94221794.	10.0778462	0.0003590	-0.000923
1.3557063	-22.503666 C				
0.00003688	3471.	94133413.	10.0804061	0.0003717	-0.000956
1.3985212	-23.290530 C				
0.00003813	3586.	94047197.	10.0831888	0.0003844	-0.000988
1.4410372	-24.076963 C				
0.00003938	3700.	93962921.	10.0861753	0.0003971	-0.001020
1.4832533	-24.862961 C				
0.00004063	3814.	93880388.	10.0893491	0.0004099	-0.001053
1.5251686	-25.648521 C				
0.00004188	3928.	93799425.	10.0926956	0.0004226	-0.001085
1.5667821	-26.433642 C				
0.00004313	4042.	93719877.	10.0962019	0.0004354	-0.001117
1.6080927	-27.218321 C				
0.00004438	4155.	93641609.	10.0998566	0.0004482	-0.001149
1.6490996	-28.002554 C				
0.00004563	4269.	93564497.	10.1036497	0.0004610	-0.001182
1.6898018	-28.786339 C				
0.00004688	4382.	93488434.	10.1075722	0.0004738	-0.001214
1.7301982	-29.569674 C				
0.00004813	4496.	93413321.	10.1116159	0.0004866	-0.001246
1.7702878	-30.352554 C				
0.00004938	4609.	93339070.	10.1157737	0.0004995	-0.001278
1.8100696	-31.134978 C				
0.00005063	4722.	93265602.	10.1200391	0.0005123	-0.001310
1.8495425	-31.916943 C				
0.00005188	4834.	93192845.	10.1244063	0.0005252	-0.001342
1.8887057	-32.698446 C				
0.00005313	4947.	93120733.	10.1288700	0.0005381	-0.001374
1.9275579	-33.479483 C				
0.00005438	5060.	93049206.	10.1334255	0.0005510	-0.001406
1.9660981	-34.260052 C				

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 Light Tower NC2-1 (Boring B-002-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00005563	5172.	92978211.	10.1380684	0.0005639	-0.001439
2.0043253	-35.040149 C				
0.00005688	5284.	92907697.	10.1427948	0.0005769	-0.001471
2.0422384	-35.819772 C				
0.00005813	5396.	92837619.	10.1476012	0.0005898	-0.001503
2.0798362	-36.598918 C				
0.00005938	5508.	92767935.	10.1524844	0.0006028	-0.001535
2.1171178	-37.377583 C				
0.00006063	5620.	92698606.	10.1574414	0.0006158	-0.001567
2.1540819	-38.155764 C				
0.00006188	5731.	92629597.	10.1624696	0.0006288	-0.001599
2.1907275	-38.933458 C				
0.00006313	5843.	92560874.	10.1675664	0.0006418	-0.001631
2.2270535	-39.710662 C				
0.00006438	5954.	92492407.	10.1727297	0.0006549	-0.001663
2.2630586	-40.487373 C				
0.00006563	6065.	92424168.	10.1779574	0.0006679	-0.001695
2.2987417	-41.263586 C				
0.00006688	6176.	92356130.	10.1832476	0.0006810	-0.001726
2.3341018	-42.039299 C				
0.00006813	6287.	92288268.	10.1885986	0.0006941	-0.001758
2.3691375	-42.814509 C				
0.00006938	6398.	92220560.	10.1940089	0.0007072	-0.001790
2.4038477	-43.589211 C				
0.00007063	6508.	92152983.	10.1995039	0.0007203	-0.001822
2.4382312	-44.363403 C				
0.00007188	6619.	92085519.	10.2050285	0.0007335	-0.001854
2.4722868	-45.137081 C				
0.00007313	6729.	92018147.	10.2106084	0.0007467	-0.001886
2.5060133	-45.910241 C				
0.00007438	6839.	91950850.	10.2162424	0.0007598	-0.001918
2.5394094	-46.682880 C				
0.00007938	7277.	91682087.	10.2393011	0.0008127	-0.002045
2.6696649	-49.768146 C				
0.00008438	7713.	91413389.	10.2630109	0.0008659	-0.002172
2.7945082	-52.845065 C				
0.00008938	8146.	91144431.	10.2866786	0.0009194	-0.002298
2.9137126	-55.915279 C				
0.00009438	8576.	90874234.	10.3110673	0.0009731	-0.002424
3.0273448	-58.976728 C				
0.00009938	8985.	90417533.	10.3290580	0.0010265	-0.002551
3.1339327	-60.000000 CY				
0.0001044	9311.	89207952.	10.3175636	0.0010769	-0.002681
3.2289512	-60.000000 CY				
0.0001094	9552.	87336121.	10.2781631	0.0011242	-0.002813
3.3128936	-60.000000 CY				
0.0001144	9789.	85583430.	10.2421143	0.0011714	-0.002946
3.3919789	-60.000000 CY				
0.0001194	10011.	83861611.	10.2051482	0.0012182	-0.003079
3.4655044	-60.000000 CY				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0001244	10162.	81702300.	10.1438002	0.0012616	-0.003216
3.5293615	-60.000000 CY				
0.0001294	10295.	79572057.	10.0817619	0.0013043	-0.003353
3.5881988	-60.000000 CY				
0.0001344	10427.	77592674.	10.0256713	0.0013472	-0.003490
3.6433355	-60.000000 CY				
0.0001394	10557.	75747771.	9.9749147	0.0013903	-0.003627
3.6947252	-60.000000 CY				
0.0001444	10687.	74023236.	9.9289636	0.0014335	-0.003764
3.7423201	-60.000000 CY				
0.0001494	10816.	72406063.	9.8867661	0.0014768	-0.003901
3.7859739	-60.000000 CY				
0.0001544	10933.	70821400.	9.8425115	0.0015194	-0.004038
3.8249324	-60.000000 CY				
0.0001594	11017.	69123456.	9.7867573	0.0015598	-0.004178
3.8581753	-60.000000 CY				
0.0001644	11079.	67401534.	9.7260868	0.0015987	-0.004319
3.8869352	-60.000000 CY				
0.0001694	11139.	65767574.	9.6691048	0.0016377	-0.004460
3.9124557	-60.000000 CY				
0.0001744	11199.	64223403.	9.6148605	0.0016766	-0.004601
3.9348020	-60.000000 CY				
0.0001794	11258.	62761436.	9.5654896	0.0017158	-0.004742
3.9539345	-60.000000 CY				
0.0001844	11316.	61373390.	9.5189681	0.0017551	-0.004882
3.9697370	-60.000000 CY				
0.0001894	11373.	60052811.	9.4743244	0.0017942	-0.005023
3.9821950	-60.000000 CY				
0.0001944	11429.	58796578.	9.4331695	0.0018336	-0.005164
3.9914019	-60.000000 CY				
0.0001994	11484.	57599778.	9.3948139	0.0018731	-0.005304
3.9973136	-60.000000 CY				
0.0002044	11539.	56457972.	9.3581635	0.0019126	-0.005445
3.9998845	-60.000000 CY				
0.0002094	11592.	55366642.	9.3266817	0.0019528	-0.005585
3.9975630	-60.000000 CY				
0.0002144	11645.	54322678.	9.2959142	0.0019928	-0.005725
3.9999044	-60.000000 CY				
0.0002194	11698.	53322120.	9.2675435	0.0020331	-0.005864
3.9971169	-60.000000 CY				
0.0002244	11748.	52356977.	9.2405172	0.0020733	-0.006004
3.9997515	-60.000000 CY				
0.0002294	11794.	51418840.	9.2141042	0.0021135	-0.006144
3.9957066	-60.000000 CY				
0.0002344	11831.	50480617.	9.1845645	0.0021526	-0.006285
3.9990577	-60.000000 CY				
0.0002394	11864.	49560513.	9.1526832	0.0021909	-0.006427
3.9990468	-60.000000 CY				
0.0002444	11885.	48632992.	9.1162023	0.0022278	-0.006570
3.9966747	-60.000000 CY				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0002494	11904.	47735462.	9.0796192	0.0022642	-0.006713
3.9992545	-60.000000 CY				
0.0002544	11921.	46863378.	9.0457647	0.0023010	-0.006856
3.9991650	-60.000000 CY				
0.0002594	11937.	46022914.	9.0128664	0.0023377	-0.007000
3.9956629	-60.000000 CY				
0.0002644	11953.	45213284.	8.9816750	0.0023745	-0.007143
3.9986069	-60.000000 CY				
0.0002694	11969.	44432753.	8.9518321	0.0024114	-0.007286
3.9999247	-60.000000 CY				
0.0002744	11984.	43679063.	8.9240509	0.0024485	-0.007429
3.9940409	-60.000000 CY				
0.0003044	12070.	39655848.	8.7807001	0.0026726	-0.008285
3.9985866	-60.000000 CY				
0.0003344	12146.	36325110.	8.6675807	0.0028982	-0.009139
3.9998625	-60.000000 CY				
0.0003644	12216.	33525083.	8.5838110	0.0031277	-0.009990
3.9999751	-60.000000 CYT				
0.0003944	12280.	31137740.	8.5203443	0.0033602	-0.010837
3.9996828	-60.000000 CYT				
0.0004244	12339.	29075625.	8.4715220	0.0035951	-0.011682
3.9974037	-60.000000 CYT				
0.0004544	12385.	27257253.	8.4224181	0.0038269	-0.012531
3.9878351	-60.000000 CYT				

 Summary of Results for Nominal 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 Tens. No. Strain	Axial Thrust kips	Nominal Mom. Cap. in-kip	Max. Comp. Strain	Max.
----	-----	-----	-----	
1 -0.00952396	3.800	12169.214	0.00300000	
2 -0.00952020	4.200	12173.120	0.00300000	
3 -0.00951645	4.600	12177.027	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

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 Light Tower NC2-1 (Boring B-002-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

the transverse reinforcing steel bars are tied hoops (0.65) or spirals (0.75).

The above values should be multiplied by the appropriate strength reduction factor to compute ultimate moment capacity according to ACI 318, 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 Stiff. Load Ult Mom No. kip-in ²	Resist. Factor	Nominal Ax. Thrust kips	Nominal Moment Cap in-kips	Ult. (Fac) Ax. Thrust kips	Ult. (Fac) Moment Cap in-kips	Bend. at
-----	-----	-----	-----	-----	-----	
1 91219895.	0.65	3.800000	12169.	2.470000	7910.	
2 91253873.	0.65	4.200000	12173.	2.730000	7913.	
3 91287886.	0.65	4.600000	12177.	2.990000	7915.	
1 89806706.	0.75	3.800000	12169.	2.850000	9127.	
2 89838295.	0.75	4.200000	12173.	3.150000	9130.	
3 89869877.	0.75	4.600000	12177.	3.450000	9133.	
1 70221645.	0.90	3.800000	12169.	3.420000	10952.	
2 70254444.	0.90	4.200000	12173.	3.780000	10956.	
3 70287179.	0.90	4.600000	12177.	4.140000	10959.	

 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
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Light Tower NC2-1 (Boring B-002-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

1	1.0000	0.00	N.A.	No	0.00	8767.
2	4.0000	0.3501	No	No	8767.	31525.
3	5.2000	1.6945	Yes	No	40292.	105764.
4	9.1000	8.1000	No	No	146056.	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.

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 = 1000.0 lbs
Applied moment at pile head = 315600.0 in-lbs
Axial thrust load on pile head = 4200.0 lbs

Depth Res.	Soil	Deflect. Spr.	Bending Distrib.	Shear	Slope	Total	Bending	Soil
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	0.00	0.02777	315600.	1000.0000	-3.84E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.09000	0.00	0.02736	316682.	1000.0000	-3.83E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.1800	0.00	0.02694	317763.	1000.	-3.82E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.2700	0.00	0.02653	318845.	1000.	-3.81E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.3600	0.00	0.02612	319927.	1000.0000	-3.81E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.4500	0.00	0.02571	321009.	1000.0000	-3.80E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.5400	0.00	0.02530	322090.	1000.0000	-3.79E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.6300	0.00	0.02489	323172.	1000.0000	-3.78E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area

Light Tower NC2-1 (Boring B-002-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.7200	0.02448	324254.	1000.0000	-3.77E-04	0.00	3.84E+11
0.00	0.00	0.00				
0.8100	0.02408	325336.	1000.0000	-3.76E-04	0.00	3.84E+11
0.00	0.00	0.00				
0.9000	0.02367	326417.	1000.0000	-3.75E-04	0.00	3.84E+11
0.00	0.00	0.00				
0.9900	0.02327	327499.	1000.0000	-3.74E-04	0.00	3.84E+11
0.00	0.00	0.00				
1.0800	0.02286	328581.	988.0095	-3.73E-04	0.00	3.84E+11
-22.205	1049.	0.00				
1.1700	0.02246	329636.	963.9023	-3.72E-04	0.00	3.84E+11
-22.438	1079.	0.00				
1.2600	0.02206	330666.	939.5461	-3.71E-04	0.00	3.84E+11
-22.666	1110.	0.00				
1.3500	0.02166	331669.	914.9470	-3.70E-04	0.00	3.84E+11
-22.888	1141.	0.00				
1.4400	0.02126	332646.	890.1112	-3.70E-04	0.00	3.84E+11
-23.104	1174.	0.00				
1.5300	0.02086	333595.	865.0449	-3.69E-04	0.00	3.84E+11
-23.315	1207.	0.00				
1.6200	0.02046	334518.	839.7548	-3.68E-04	0.00	3.84E+11
-23.519	1241.	0.00				
1.7100	0.02007	335412.	814.2473	-3.67E-04	0.00	3.84E+11
-23.717	1277.	0.00				
1.8000	0.01967	336280.	788.5292	-3.66E-04	0.00	3.84E+11
-23.909	1313.	0.00				
1.8900	0.01928	337119.	762.6073	-3.65E-04	0.00	3.84E+11
-24.095	1350.	0.00				
1.9800	0.01888	337930.	736.4886	-3.64E-04	0.00	3.84E+11
-24.273	1388.	0.00				
2.0700	0.01849	338713.	710.1802	-3.63E-04	0.00	3.84E+11
-24.446	1428.	0.00				
2.1600	0.01810	339467.	683.6894	-3.62E-04	0.00	3.84E+11
-24.611	1469.	0.00				
2.2500	0.01771	340193.	657.0237	-3.61E-04	0.00	3.84E+11
-24.770	1511.	0.00				
2.3400	0.01732	340890.	630.1906	-3.60E-04	0.00	3.84E+11
-24.921	1554.	0.00				
2.4300	0.01693	341558.	603.1980	-3.59E-04	0.00	3.84E+11
-25.065	1599.	0.00				
2.5200	0.01654	342196.	576.0539	-3.58E-04	0.00	3.84E+11
-25.202	1645.	0.00				
2.6100	0.01616	342805.	548.7663	-3.57E-04	0.00	3.84E+11
-25.331	1693.	0.00				
2.7000	0.01577	343385.	521.3438	-3.56E-04	0.00	3.84E+11
-25.452	1743.	0.00				
2.7900	0.01539	343934.	493.7949	-3.55E-04	0.00	3.84E+11
-25.565	1794.	0.00				
2.8800	0.01500	344454.	466.1284	-3.54E-04	0.00	3.84E+11
-25.669	1848.	0.00				

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Light Tower NC2-1 (Boring B-002-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

2.9700	0.01462	344944.	438.3534	-3.53E-04	0.00	3.84E+11
-25.766	1903.	0.00				
3.0600	0.01424	345404.	410.4794	-3.52E-04	0.00	3.84E+11
-25.853	1961.	0.00				
3.1500	0.01386	345834.	382.5159	-3.51E-04	0.00	3.84E+11
-25.931	2021.	0.00				
3.2400	0.01348	346234.	354.4728	-3.50E-04	0.00	3.84E+11
-26.000	2083.	0.00				
3.3300	0.01310	346603.	326.3604	-3.49E-04	0.00	3.84E+11
-26.060	2148.	0.00				
3.4200	0.01273	346942.	298.1893	-3.48E-04	0.00	3.84E+11
-26.109	2216.	0.00				
3.5100	0.01235	347250.	269.9703	-3.47E-04	0.00	3.84E+11
-26.148	2286.	0.00				
3.6000	0.01198	347528.	241.7149	-3.46E-04	0.00	3.84E+11
-26.177	2361.	0.00				
3.6900	0.01160	347776.	213.4348	-3.46E-04	0.00	3.84E+11
-26.194	2438.	0.00				
3.7800	0.01123	347992.	185.1421	-3.45E-04	0.00	3.84E+11
-26.200	2520.	0.00				
3.8700	0.01086	348179.	156.8495	-3.44E-04	0.00	3.84E+11
-26.194	2605.	0.00				
3.9600	0.01049	348334.	128.5702	-3.43E-04	0.00	3.84E+11
-26.175	2695.	0.00				
4.0500	0.01012	348460.	-107.078	-3.42E-04	0.00	3.84E+11
-410.211	43784.	0.00				
4.1400	0.00975	348106.	-549.342	-3.41E-04	0.00	3.84E+11
-408.796	45282.	0.00				
4.2300	0.00938	347276.	-989.997	-3.40E-04	0.00	3.84E+11
-407.230	46874.	0.00				
4.3200	0.00902	345971.	-1429.	-3.39E-04	0.00	3.84E+11
-405.506	48572.	0.00				
4.4100	0.00865	344193.	-1866.	-3.38E-04	0.00	3.84E+11
-403.614	50386.	0.00				
4.5000	0.00829	341944.	-2301.	-3.37E-04	0.00	3.84E+11
-401.546	52331.	0.00				
4.5900	0.00792	339227.	-2733.	-3.36E-04	0.00	3.84E+11
-399.290	54422.	0.00				
4.6800	0.00756	336043.	-3163.	-3.35E-04	0.00	3.84E+11
-396.834	56677.	0.00				
4.7700	0.00720	332398.	-3590.	-3.34E-04	0.00	3.84E+11
-394.164	59119.	0.00				
4.8600	0.00684	328292.	-4014.	-3.33E-04	0.00	3.84E+11
-391.264	61774.	0.00				
4.9500	0.00648	323730.	-4435.	-3.32E-04	0.00	3.84E+11
-388.115	64671.	0.00				
5.0400	0.00612	318715.	-4852.	-3.31E-04	0.00	3.84E+11
-384.697	67851.	0.00				
5.1300	0.00577	313252.	-5266.	-3.30E-04	0.00	3.84E+11
-380.983	71358.	0.00				

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36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

5.2200	0.00541	307344.	-5659.	-3.29E-04	0.00	3.85E+11
-346.192	69111.	0.00				
5.3100	0.00505	301032.	-6030.	-3.29E-04	0.00	3.85E+11
-342.164	73108.	0.00				
5.4000	0.00470	294322.	-6397.	-3.28E-04	0.00	3.85E+11
-337.770	77610.	0.00				
5.4900	0.00435	287217.	-6760.	-3.27E-04	0.00	3.85E+11
-332.963	82726.	0.00				
5.5800	0.00399	279724.	-7116.	-3.26E-04	0.00	3.85E+11
-327.688	88602.	0.00				
5.6700	0.00364	271848.	-7467.	-3.25E-04	0.00	3.85E+11
-321.874	95435.	0.00				
5.7600	0.00329	263598.	-7811.	-3.25E-04	0.00	3.85E+11
-315.434	103496.	0.00				
5.8500	0.00294	254979.	-8148.	-3.24E-04	0.00	3.85E+11
-308.252	113178.	0.00				
5.9400	0.00259	246001.	-8477.	-3.23E-04	0.00	3.85E+11
-300.174	125066.	0.00				
6.0300	0.00224	236672.	-8796.	-3.22E-04	0.00	3.85E+11
-290.987	140076.	0.00				
6.1200	0.00190	227005.	-9104.	-3.22E-04	0.00	3.85E+11
-280.381	159740.	0.00				
6.2100	0.00155	217010.	-9400.	-3.21E-04	0.00	3.85E+11
-267.880	186838.	0.00				
6.3000	0.00120	206703.	-9682.	-3.21E-04	0.00	3.85E+11
-252.684	227054.	0.00				
6.3900	8.56E-04	196101.	-9944.	-3.20E-04	0.00	3.85E+11
-233.269	294313.	0.00				
6.4800	5.11E-04	185227.	-10156.	-3.19E-04	0.00	3.85E+11
-159.181	336642.	0.00				
6.5700	1.66E-04	174167.	-10270.	-3.19E-04	0.00	3.85E+11
-51.970	338281.	0.00				
6.6600	-1.78E-04	163046.	-10268.	-3.19E-04	0.00	3.85E+11
56.1217	339919.	0.00				
6.7500	-5.22E-04	151992.	-10148.	-3.18E-04	0.00	3.85E+11
165.1006	341556.	0.00				
6.8400	-8.65E-04	141129.	-9930.	-3.18E-04	0.00	3.85E+11
239.6299	299079.	0.00				
6.9300	-0.00121	130546.	-9659.	-3.17E-04	0.00	3.85E+11
261.7224	233957.	0.00				
7.0200	-0.00155	120269.	-9366.	-3.17E-04	0.00	3.85E+11
279.8904	194942.	0.00				
7.1100	-0.00189	110318.	-9056.	-3.17E-04	0.00	3.85E+11
295.5800	168661.	0.00				
7.2000	-0.00223	100711.	-8729.	-3.16E-04	0.00	3.85E+11
309.5491	149617.	0.00				
7.2900	-0.00258	91466.	-8388.	-3.16E-04	0.00	3.85E+11
322.2486	135109.	0.00				
7.3800	-0.00292	82597.	-8033.	-3.16E-04	0.00	3.85E+11
333.9700	123647.	0.00				

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36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

7.4700	-0.00326	74117.	-7667.	-3.16E-04	0.00	3.85E+11
344.9134	114336.	0.00				
7.5600	-0.00360	66039.	-7289.	-3.15E-04	0.00	3.85E+11
355.2227	106605.	0.00				
7.6500	-0.00394	58376.	-6900.	-3.15E-04	0.00	3.85E+11
365.0047	100073.	0.00				
7.7400	-0.00428	51139.	-6501.	-3.15E-04	0.00	3.85E+11
374.3414	94471.	0.00				
7.8300	-0.00462	44338.	-6091.	-3.15E-04	0.00	3.85E+11
383.2968	89608.	0.00				
7.9200	-0.00496	37984.	-5673.	-3.15E-04	0.00	3.85E+11
391.9223	85343.	0.00				
8.0100	-0.00530	32087.	-5245.	-3.15E-04	0.00	3.85E+11
400.2593	81568.	0.00				
8.1000	-0.00564	26658.	-4808.	-3.15E-04	0.00	3.85E+11
408.3422	78201.	0.00				
8.1900	-0.00598	21704.	-4363.	-3.15E-04	0.00	3.85E+11
416.1995	75177.	0.00				
8.2800	-0.00632	17236.	-3910.	-3.14E-04	0.00	3.85E+11
423.8553	72444.	0.00				
8.3700	-0.00666	13262.	-3448.	-3.14E-04	0.00	3.85E+11
431.3300	69962.	0.00				
8.4600	-0.00700	9792.	-2978.	-3.14E-04	0.00	3.85E+11
438.6413	67695.	0.00				
8.5500	-0.00734	6833.	-2500.	-3.14E-04	0.00	3.85E+11
445.8042	65617.	0.00				
8.6400	-0.00768	4394.	-2015.	-3.14E-04	0.00	3.85E+11
452.8320	63703.	0.00				
8.7300	-0.00802	2483.	-1522.	-3.14E-04	0.00	3.85E+11
459.7363	61936.	0.00				
8.8200	-0.00836	1109.	-1022.	-3.14E-04	0.00	3.85E+11
466.5273	60297.	0.00				
8.9100	-0.00870	278.3959	-514.630	-3.14E-04	0.00	3.85E+11
473.2139	58773.	0.00				
9.0000	-0.00904	0.00	0.00	-3.14E-04	0.00	3.85E+11
479.8041	28676.	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 = 0.02777024 inches
 Computed slope at pile head = -0.0003841 radians
 Maximum bending moment = 348460. inch-lbs

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36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Maximum shear force = -10270. lbs
 Depth of maximum bending moment = 4.05000000 feet below pile head
 Depth of maximum shear force = 6.57000000 feet below pile head
 Number of iterations = 26
 Number of zero deflection points = 1
 Pile deflection at ground = 0.02322106 inches

Pile-head Deflection vs. Pile Length for Load Case 1

Boundary Condition Type 1, Shear and Moment

Shear = 1000. lbs
 Moment = 315600. in-lbs
 Axial Load = 4200. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	0.02777024	348460.	-10270.
8.55000	0.05188987	344509.	-11098.
8.10000	0.11713213	341148.	-12103.
7.65000	0.27714169	338550.	-13190.
7.20000	0.65973642	336056.	-14348.
6.75000	1.93984131	335747.	-15909.
6.30000	6.68003424	340520.	-18199.

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

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

Shear force at pile head = 2250.0 lbs
 Applied moment at pile head = 724800.0 in-lbs
 Axial thrust load on pile head = 4600.0 lbs

Depth Res.	Soil X	Deflect. Spr. y	Bending Distrib. Moment Lat. Load	Shear Force	Slope S	Total Stress	Bending Stiffness	Soil p
Es*H feet lb/inch		inches lb/inch	in-lbs lb/inch	lbs	radians	psi*	lb-in^2	

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area

Light Tower NC2-1 (Boring B-002-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00	0.6290	724800.	2250.	-0.00803	0.00	3.83E+11
0.00	0.00	0.00				
0.09000	0.6203	727270.	2250.	-0.00803	0.00	3.83E+11
0.00	0.00	0.00				
0.1800	0.6117	729740.	2250.	-0.00803	0.00	3.83E+11
0.00	0.00	0.00				
0.2700	0.6030	732210.	2250.	-0.00803	0.00	3.83E+11
0.00	0.00	0.00				
0.3600	0.5943	734680.	2250.	-0.00802	0.00	3.83E+11
0.00	0.00	0.00				
0.4500	0.5857	737149.	2250.	-0.00802	0.00	3.83E+11
0.00	0.00	0.00				
0.5400	0.5770	739619.	2250.	-0.00802	0.00	3.83E+11
0.00	0.00	0.00				
0.6300	0.5683	742089.	2250.	-0.00802	0.00	3.83E+11
0.00	0.00	0.00				
0.7200	0.5597	744559.	2250.	-0.00802	0.00	3.83E+11
0.00	0.00	0.00				
0.8100	0.5510	747029.	2250.	-0.00801	0.00	3.83E+11
0.00	0.00	0.00				
0.9000	0.5424	749499.	2250.	-0.00801	0.00	3.83E+11
0.00	0.00	0.00				
0.9900	0.5337	751968.	2250.	-0.00801	0.00	3.83E+11
0.00	0.00	0.00				
1.0800	0.5251	754438.	2216.	-0.00801	0.00	3.83E+11
-63.102	129.7938	0.00				
1.1700	0.5164	756834.	2147.	-0.00801	0.00	3.83E+11
-63.790	133.4059	0.00				
1.2600	0.5078	759156.	2078.	-0.00800	0.00	3.83E+11
-64.463	137.1076	0.00				
1.3500	0.4991	761403.	2008.	-0.00800	0.00	3.83E+11
-65.120	140.9028	0.00				
1.4400	0.4905	763573.	1937.	-0.00800	0.00	3.83E+11
-65.760	144.7956	0.00				
1.5300	0.4819	765667.	1866.	-0.00800	0.00	3.83E+11
-66.385	148.7906	0.00				
1.6200	0.4732	767684.	1794.	-0.00799	0.00	3.83E+11
-66.992	152.8925	0.00				
1.7100	0.4646	769622.	1721.	-0.00799	0.00	3.83E+11
-67.583	157.1063	0.00				
1.8000	0.4560	771481.	1648.	-0.00799	0.00	3.83E+11
-68.156	161.4375	0.00				
1.8900	0.4473	773261.	1574.	-0.00799	0.00	3.83E+11
-68.711	165.8919	0.00				
1.9800	0.4387	774961.	1500.	-0.00799	0.00	3.83E+11
-69.248	170.4756	0.00				
2.0700	0.4301	776580.	1425.	-0.00798	0.00	3.83E+11
-69.766	175.1953	0.00				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area

Light Tower NC2-1 (Boring B-002-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

2.1600	0.4215	778118.	1349.	-0.00798	0.00	3.83E+11
-70.265	180.0581	0.00				
2.2500	0.4128	779573.	1273.	-0.00798	0.00	3.83E+11
-70.745	185.0717	0.00				
2.3400	0.4042	780946.	1196.	-0.00798	0.00	3.83E+11
-71.204	190.2442	0.00				
2.4300	0.3956	782236.	1119.	-0.00797	0.00	3.83E+11
-71.643	195.5846	0.00				
2.5200	0.3870	783443.	1042.	-0.00797	0.00	3.83E+11
-72.061	201.1024	0.00				
2.6100	0.3784	784565.	963.4786	-0.00797	0.00	3.83E+11
-72.457	206.8080	0.00				
2.7000	0.3698	785603.	885.0237	-0.00797	0.00	3.83E+11
-72.830	212.7126	0.00				
2.7900	0.3612	786556.	806.1779	-0.00797	0.00	3.83E+11
-73.181	218.8285	0.00				
2.8800	0.3526	787424.	726.9662	-0.00796	0.00	3.83E+11
-73.508	225.1687	0.00				
2.9700	0.3440	788206.	647.4148	-0.00796	0.00	3.83E+11
-73.810	231.7479	0.00				
3.0600	0.3354	788901.	567.5502	-0.00796	0.00	3.83E+11
-74.087	238.5818	0.00				
3.1500	0.3268	789511.	487.4002	-0.00796	0.00	3.83E+11
-74.339	245.6876	0.00				
3.2400	0.3182	790033.	406.9933	-0.00796	0.00	3.83E+11
-74.563	253.0843	0.00				
3.3300	0.3096	790469.	326.3590	-0.00795	0.00	3.83E+11
-74.760	260.7926	0.00				
3.4200	0.3010	790817.	245.5277	-0.00795	0.00	3.83E+11
-74.928	268.8355	0.00				
3.5100	0.2924	791078.	164.5312	-0.00795	0.00	3.83E+11
-75.066	277.2385	0.00				
3.6000	0.2838	791251.	83.4023	-0.00795	0.00	3.83E+11
-75.173	286.0296	0.00				
3.6900	0.2753	791337.	2.1749	-0.00794	0.00	3.83E+11
-75.248	295.2401	0.00				
3.7800	0.2667	791335.	-79.115	-0.00794	0.00	3.83E+11
-75.289	304.9049	0.00				
3.8700	0.2581	791245.	-160.431	-0.00794	0.00	3.83E+11
-75.296	315.0630	0.00				
3.9600	0.2495	791067.	-241.735	-0.00794	0.00	3.83E+11
-75.266	325.7585	0.00				
4.0500	0.2410	790802.	-771.586	-0.00793	0.00	3.83E+11
-905.940	4060.	0.00				
4.1400	0.2324	789480.	-1748.	-0.00793	0.00	3.83E+11
-903.014	4197.	0.00				
4.2300	0.2238	787104.	-2722.	-0.00793	0.00	3.83E+11
-899.746	4341.	0.00				
4.3200	0.2153	783679.	-3692.	-0.00793	0.00	3.83E+11
-896.117	4496.	0.00				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area

Light Tower NC2-1 (Boring B-002-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

4.4100	0.2067	779209.	-4657.	-0.00793	0.00	3.83E+11
-892.107	4661.	0.00				
4.5000	0.1981	773698.	-5618.	-0.00792	0.00	3.83E+11
-887.695	4838.	0.00				
4.5900	0.1896	767152.	-6575.	-0.00792	0.00	3.83E+11
-882.855	5029.	0.00				
4.6800	0.1810	759576.	-7525.	-0.00792	0.00	3.83E+11
-877.558	5235.	0.00				
4.7700	0.1725	750976.	-8470.	-0.00792	0.00	3.83E+11
-871.771	5459.	0.00				
4.8600	0.1639	741360.	-9408.	-0.00792	0.00	3.83E+11
-865.457	5702.	0.00				
4.9500	0.1554	730734.	-10339.	-0.00791	0.00	3.83E+11
-858.572	5968.	0.00				
5.0400	0.1468	719106.	-11262.	-0.00791	0.00	3.83E+11
-851.067	6260.	0.00				
5.1300	0.1383	706486.	-12177.	-0.00791	0.00	3.83E+11
-842.885	6582.	0.00				
5.2200	0.1298	692883.	-13046.	-0.00791	0.00	3.83E+11
-765.916	6375.	0.00				
5.3100	0.1212	678387.	-13868.	-0.00791	0.00	3.84E+11
-756.977	6745.	0.00				
5.4000	0.1127	663007.	-14680.	-0.00790	0.00	3.84E+11
-747.190	7162.	0.00				
5.4900	0.1041	646756.	-15481.	-0.00790	0.00	3.84E+11
-736.448	7637.	0.00				
5.5800	0.09561	629646.	-16270.	-0.00790	0.00	3.84E+11
-724.619	8185.	0.00				
5.6700	0.08708	611691.	-17046.	-0.00790	0.00	3.84E+11
-711.537	8825.	0.00				
5.7600	0.07855	592905.	-17806.	-0.00790	0.00	3.84E+11
-696.991	9583.	0.00				
5.8500	0.07002	573307.	-18550.	-0.00789	0.00	3.84E+11
-680.704	10499.	0.00				
5.9400	0.06150	552915.	-19276.	-0.00789	0.00	3.84E+11
-662.304	11631.	0.00				
6.0300	0.05297	531750.	-19980.	-0.00789	0.00	3.84E+11
-641.269	13074.	0.00				
6.1200	0.04445	509838.	-20659.	-0.00789	0.00	3.84E+11
-616.832	14986.	0.00				
6.2100	0.03593	487206.	-21309.	-0.00789	0.00	3.84E+11
-587.786	17667.	0.00				
6.3000	0.02741	463888.	-21925.	-0.00789	0.00	3.84E+11
-552.055	21749.	0.00				
6.3900	0.01890	439926.	-22496.	-0.00789	0.00	3.84E+11
-505.491	28892.	0.00				
6.4800	0.01038	415375.	-23005.	-0.00788	0.00	3.84E+11
-437.303	45504.	0.00				
6.5700	0.00186	390313.	-23396.	-0.00788	0.00	3.84E+11
-286.047	165743.	0.00				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC2-1 (Boring B-002-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

6.6600	-0.00665	364918.	-23337.	-0.00788	0.00	3.84E+11
395.0651	64161.	0.00				
6.7500	-0.01516	339984.	-22860.	-0.00788	0.00	3.84E+11
487.7986	34744.	0.00				
6.8400	-0.02367	315619.	-22301.	-0.00788	0.00	3.84E+11
547.8864	24994.	0.00				
6.9300	-0.03219	291893.	-21684.	-0.00788	0.00	3.85E+11
594.4273	19946.	0.00				
7.0200	-0.04070	268860.	-21021.	-0.00788	0.00	3.85E+11
633.3207	16808.	0.00				
7.1100	-0.04920	246566.	-20319.	-0.00788	0.00	3.85E+11
667.2394	14645.	0.00				
7.2000	-0.05771	225050.	-19582.	-0.00788	0.00	3.85E+11
697.6398	13055.	0.00				
7.2900	-0.06622	204348.	-18813.	-0.00788	0.00	3.85E+11
725.4102	11831.	0.00				
7.3800	-0.07473	184491.	-18016.	-0.00788	0.00	3.85E+11
751.1348	10856.	0.00				
7.4700	-0.08323	165511.	-17192.	-0.00788	0.00	3.85E+11
775.2202	10059.	0.00				
7.5600	-0.09174	147436.	-16342.	-0.00788	0.00	3.85E+11
797.9611	9394.	0.00				
7.6500	-0.100	130291.	-15469.	-0.00788	0.00	3.85E+11
819.5788	8830.	0.00				
7.7400	-0.109	114102.	-14572.	-0.00787	0.00	3.85E+11
840.2435	8344.	0.00				
7.8300	-0.117	98893.	-13654.	-0.00787	0.00	3.85E+11
860.0894	7922.	0.00				
7.9200	-0.126	84687.	-12715.	-0.00787	0.00	3.85E+11
879.2241	7551.	0.00				
8.0100	-0.134	71507.	-11755.	-0.00787	0.00	3.85E+11
897.7355	7221.	0.00				
8.1000	-0.143	59374.	-10776.	-0.00787	0.00	3.85E+11
915.6960	6927.	0.00				
8.1900	-0.151	48309.	-9778.	-0.00787	0.00	3.85E+11
933.1664	6662.	0.00				
8.2800	-0.160	38332.	-8761.	-0.00787	0.00	3.85E+11
950.1979	6423.	0.00				
8.3700	-0.168	29464.	-7726.	-0.00787	0.00	3.85E+11
966.8343	6205.	0.00				
8.4600	-0.177	21723.	-6673.	-0.00787	0.00	3.85E+11
983.1133	6006.	0.00				
8.5500	-0.185	15129.	-5602.	-0.00787	0.00	3.85E+11
999.0674	5823.	0.00				
8.6400	-0.194	9701.	-4515.	-0.00787	0.00	3.85E+11
1015.	5655.	0.00				
8.7300	-0.202	5456.	-3411.	-0.00787	0.00	3.85E+11
1030.	5500.	0.00				
8.8200	-0.211	2412.	-2290.	-0.00787	0.00	3.85E+11
1045.	5355.	0.00				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area

Light Tower NC2-1 (Boring B-002-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

8.9100	-0.219	587.7378	-1153.	-0.00787	0.00	3.85E+11
1060.	5221.	0.00				
9.0000	-0.228	0.00	0.00	-0.00787	0.00	3.85E+11
1075.	2548.	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	=	0.62900732 inches
Computed slope at pile head	=	-0.0080325 radians
Maximum bending moment	=	791337. inch-lbs
Maximum shear force	=	-23396. lbs
Depth of maximum bending moment	=	3.69000000 feet below pile head
Depth of maximum shear force	=	6.57000000 feet below pile head
Number of iterations	=	40
Number of zero deflection points	=	1
Pile deflection at ground	=	0.53275501 inches

Pile-head Deflection vs. Pile Length for Load Case 2

Boundary Condition Type 1, Shear and Moment

Shear	=	2250. lbs
Moment	=	724800. in-lbs
Axial Load	=	4600. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	0.62900732	791337.	-23396.
8.55000	1.21529100	784522.	-25036.
8.10000	2.81741727	781344.	-27395.
7.65000	7.14847750	783773.	-30457.
7.20000	24.25964003	808675.	-36476.

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area

Light Tower NC2-1 (Boring B-002-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Computed Values of Pile Loading and Deflection
for Lateral Loading for Load Case Number 3

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

Shear force at pile head = 2250.0 lbs
Applied moment at pile head = 724800.0 in-lbs
Axial thrust load on pile head = 3800.0 lbs

Depth Res.	Soil X Es*H feet lb/inch	Deflect. Spr. y Lat. inches lb/inch	Bending Distrib. Moment Load in-lbs lb/inch	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness lb-in^2	Soil p
0.00	0.00	0.6272	724800.	2250.	-0.00801	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.09000	0.00	0.6185	727263.	2250.	-0.00801	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.1800	0.00	0.6099	729726.	2250.	-0.00801	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.2700	0.00	0.6012	732189.	2250.	-0.00800	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.3600	0.00	0.5926	734651.	2250.	-0.00800	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.4500	0.00	0.5840	737114.	2250.	-0.00800	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.5400	0.00	0.5753	739577.	2250.	-0.00800	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.6300	0.00	0.5667	742040.	2250.	-0.00799	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.7200	0.00	0.5581	744503.	2250.	-0.00799	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.8100	0.00	0.5494	746965.	2250.	-0.00799	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.9000	0.00	0.5408	749428.	2250.	-0.00799	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.9900	0.00	0.5322	751891.	2250.	-0.00799	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
1.0800	0.00	0.5235	754354.	2216.	-0.00798	0.00	3.83E+11	
-63.041	130.0452	0.00	0.00					
1.1700	0.00	0.5149	756743.	2148.	-0.00798	0.00	3.83E+11	
-63.729	133.6643	0.00	0.00					
1.2600	0.00	0.5063	759058.	2078.	-0.00798	0.00	3.83E+11	
-64.400	137.3731	0.00	0.00					
1.3500	0.00	0.4977	761298.	2008.	-0.00798	0.00	3.83E+11	
-65.057	141.1756	0.00	0.00					

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area

Light Tower NC2-1 (Boring B-002-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

1.4400	0.4891	763462.	1938.	-0.00798	0.00	3.83E+11
-65.697	145.0760	0.00				
1.5300	0.4805	765549.	1867.	-0.00797	0.00	3.83E+11
-66.321	149.0787	0.00				
1.6200	0.4718	767559.	1795.	-0.00797	0.00	3.83E+11
-66.928	153.1885	0.00				
1.7100	0.4632	769491.	1722.	-0.00797	0.00	3.83E+11
-67.518	157.4105	0.00				
1.8000	0.4546	771344.	1649.	-0.00797	0.00	3.83E+11
-68.090	161.7501	0.00				
1.8900	0.4460	773117.	1575.	-0.00796	0.00	3.83E+11
-68.645	166.2131	0.00				
1.9800	0.4374	774811.	1500.	-0.00796	0.00	3.83E+11
-69.181	170.8057	0.00				
2.0700	0.4288	776424.	1425.	-0.00796	0.00	3.83E+11
-69.699	175.5345	0.00				
2.1600	0.4202	777955.	1350.	-0.00796	0.00	3.83E+11
-70.198	180.4067	0.00				
2.2500	0.4116	779405.	1274.	-0.00796	0.00	3.83E+11
-70.677	185.4299	0.00				
2.3400	0.4031	780772.	1197.	-0.00795	0.00	3.83E+11
-71.136	190.6124	0.00				
2.4300	0.3945	782056.	1120.	-0.00795	0.00	3.83E+11
-71.574	195.9631	0.00				
2.5200	0.3859	783257.	1043.	-0.00795	0.00	3.83E+11
-71.991	201.4915	0.00				
2.6100	0.3773	784374.	964.7228	-0.00795	0.00	3.83E+11
-72.387	207.2081	0.00				
2.7000	0.3687	785406.	886.3437	-0.00795	0.00	3.83E+11
-72.760	213.1241	0.00				
2.7900	0.3601	786353.	807.5741	-0.00794	0.00	3.83E+11
-73.110	219.2517	0.00				
2.8800	0.3516	787215.	728.4389	-0.00794	0.00	3.83E+11
-73.437	225.6042	0.00				
2.9700	0.3430	787992.	648.9643	-0.00794	0.00	3.83E+11
-73.739	232.1961	0.00				
3.0600	0.3344	788682.	569.1768	-0.00794	0.00	3.83E+11
-74.016	239.0431	0.00				
3.1500	0.3258	789286.	489.1042	-0.00793	0.00	3.83E+11
-74.267	246.1625	0.00				
3.2400	0.3173	789804.	408.7749	-0.00793	0.00	3.83E+11
-74.491	253.5734	0.00				
3.3300	0.3087	790234.	328.2184	-0.00793	0.00	3.83E+11
-74.688	261.2965	0.00				
3.4200	0.3001	790578.	247.4652	-0.00793	0.00	3.83E+11
-74.855	269.3549	0.00				
3.5100	0.2916	790834.	166.5468	-0.00793	0.00	3.83E+11
-74.993	277.7739	0.00				
3.6000	0.2830	791003.	85.4961	-0.00792	0.00	3.83E+11
-75.100	286.5818	0.00				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area

Light Tower NC2-1 (Boring B-002-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

3.6900	0.2745	791084.	4.3471	-0.00792	0.00	3.83E+11
-75.175	295.8099	0.00				
3.7800	0.2659	791077.	-76.865	-0.00792	0.00	3.83E+11
-75.217	305.4932	0.00				
3.8700	0.2574	790983.	-158.103	-0.00792	0.00	3.83E+11
-75.223	315.6707	0.00				
3.9600	0.2488	790801.	-239.328	-0.00791	0.00	3.83E+11
-75.194	326.3866	0.00				
4.0500	0.2403	790531.	-768.787	-0.00791	0.00	3.83E+11
-905.286	4069.	0.00				
4.1400	0.2317	789205.	-1745.	-0.00791	0.00	3.83E+11
-902.363	4206.	0.00				
4.2300	0.2232	786827.	-2718.	-0.00791	0.00	3.83E+11
-899.097	4351.	0.00				
4.3200	0.2146	783400.	-3687.	-0.00791	0.00	3.83E+11
-895.471	4506.	0.00				
4.4100	0.2061	778928.	-4652.	-0.00790	0.00	3.83E+11
-891.465	4671.	0.00				
4.5000	0.1976	773417.	-5612.	-0.00790	0.00	3.83E+11
-887.056	4849.	0.00				
4.5900	0.1890	766871.	-6568.	-0.00790	0.00	3.83E+11
-882.220	5040.	0.00				
4.6800	0.1805	759296.	-7517.	-0.00790	0.00	3.83E+11
-876.927	5247.	0.00				
4.7700	0.1720	750698.	-8461.	-0.00789	0.00	3.83E+11
-871.145	5470.	0.00				
4.8600	0.1635	741084.	-9399.	-0.00789	0.00	3.83E+11
-864.836	5714.	0.00				
4.9500	0.1549	730461.	-10329.	-0.00789	0.00	3.83E+11
-857.957	5980.	0.00				
5.0400	0.1464	718838.	-11252.	-0.00789	0.00	3.83E+11
-850.459	6273.	0.00				
5.1300	0.1379	706222.	-12166.	-0.00789	0.00	3.83E+11
-842.283	6597.	0.00				
5.2200	0.1294	692624.	-13034.	-0.00788	0.00	3.83E+11
-765.370	6389.	0.00				
5.3100	0.1209	678134.	-13856.	-0.00788	0.00	3.84E+11
-756.439	6759.	0.00				
5.4000	0.1124	662761.	-14667.	-0.00788	0.00	3.84E+11
-746.660	7177.	0.00				
5.4900	0.1038	646517.	-15468.	-0.00788	0.00	3.84E+11
-735.927	7653.	0.00				
5.5800	0.09534	629415.	-16256.	-0.00788	0.00	3.84E+11
-724.108	8202.	0.00				
5.6700	0.08684	611468.	-17031.	-0.00787	0.00	3.84E+11
-711.037	8843.	0.00				
5.7600	0.07833	592691.	-17791.	-0.00787	0.00	3.84E+11
-696.503	9603.	0.00				
5.8500	0.06983	573103.	-18535.	-0.00787	0.00	3.84E+11
-680.231	10521.	0.00				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC2-1 (Boring B-002-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

5.9400	0.06133	552721.	-19260.	-0.00787	0.00	3.84E+11
-661.848	11655.	0.00				
6.0300	0.05283	531567.	-19963.	-0.00787	0.00	3.84E+11
-640.832	13100.	0.00				
6.1200	0.04433	509665.	-20642.	-0.00787	0.00	3.84E+11
-616.417	15016.	0.00				
6.2100	0.03584	487045.	-21292.	-0.00787	0.00	3.84E+11
-587.400	17702.	0.00				
6.3000	0.02734	463739.	-21907.	-0.00786	0.00	3.84E+11
-551.706	21791.	0.00				
6.3900	0.01885	439790.	-22478.	-0.00786	0.00	3.84E+11
-505.195	28943.	0.00				
6.4800	0.01036	415251.	-22987.	-0.00786	0.00	3.84E+11
-437.100	45568.	0.00				
6.5700	0.00187	390203.	-23377.	-0.00786	0.00	3.84E+11
-286.267	165361.	0.00				
6.6600	-0.00662	364821.	-23319.	-0.00786	0.00	3.84E+11
394.6072	64385.	0.00				
6.7500	-0.01511	339899.	-22843.	-0.00786	0.00	3.84E+11
487.3491	34841.	0.00				
6.8400	-0.02359	315545.	-22284.	-0.00786	0.00	3.84E+11
547.4182	25058.	0.00				
6.9300	-0.03208	291830.	-21667.	-0.00786	0.00	3.85E+11
593.9380	19996.	0.00				
7.0200	-0.04056	268808.	-21005.	-0.00786	0.00	3.85E+11
632.8109	16848.	0.00				
7.1100	-0.04905	246524.	-20303.	-0.00786	0.00	3.85E+11
666.7102	14680.	0.00				
7.2000	-0.05753	225018.	-19567.	-0.00785	0.00	3.85E+11
697.0924	13086.	0.00				
7.2900	-0.06601	204324.	-18799.	-0.00785	0.00	3.85E+11
724.8455	11858.	0.00				
7.3800	-0.07450	184476.	-18002.	-0.00785	0.00	3.85E+11
750.5537	10881.	0.00				
7.4700	-0.08298	165504.	-17179.	-0.00785	0.00	3.85E+11
774.6234	10082.	0.00				
7.5600	-0.09146	147435.	-16330.	-0.00785	0.00	3.85E+11
797.3494	9416.	0.00				
7.6500	-0.09994	130296.	-15457.	-0.00785	0.00	3.85E+11
818.9526	8850.	0.00				
7.7400	-0.108	114112.	-14561.	-0.00785	0.00	3.85E+11
839.6033	8364.	0.00				
7.8300	-0.117	98908.	-13644.	-0.00785	0.00	3.85E+11
859.4357	7940.	0.00				
7.9200	-0.125	84706.	-12705.	-0.00785	0.00	3.85E+11
878.5573	7568.	0.00				
8.0100	-0.134	71529.	-11747.	-0.00785	0.00	3.85E+11
897.0558	7238.	0.00				
8.1000	-0.142	59398.	-10768.	-0.00785	0.00	3.85E+11
915.0039	6943.	0.00				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area

Light Tower NC2-1 (Boring B-002-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

8.1900	-0.151	48334.	-9770.	-0.00785	0.00	3.85E+11
932.4621	6677.	0.00				
8.2800	-0.159	38358.	-8754.	-0.00785	0.00	3.85E+11
949.4817	6437.	0.00				
8.3700	-0.168	29490.	-7720.	-0.00785	0.00	3.85E+11
966.1064	6219.	0.00				
8.4600	-0.176	21748.	-6668.	-0.00785	0.00	3.85E+11
982.3739	6020.	0.00				
8.5500	-0.185	15152.	-5598.	-0.00785	0.00	3.85E+11
998.3167	5837.	0.00				
8.6400	-0.193	9721.	-4511.	-0.00785	0.00	3.85E+11
1014.	5668.	0.00				
8.7300	-0.202	5472.	-3408.	-0.00785	0.00	3.85E+11
1029.	5512.	0.00				
8.8200	-0.210	2424.	-2288.	-0.00785	0.00	3.85E+11
1044.	5367.	0.00				
8.9100	-0.219	594.1663	-1152.	-0.00785	0.00	3.85E+11
1059.	5233.	0.00				
9.0000	-0.227	0.00	0.00	-0.00785	0.00	3.85E+11
1074.	2554.	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. 3:

Pile-head deflection	=	0.62718513 inches
Computed slope at pile head	=	-0.0080093 radians
Maximum bending moment	=	791084. inch-lbs
Maximum shear force	=	-23377. lbs
Depth of maximum bending moment	=	3.69000000 feet below pile head
Depth of maximum shear force	=	6.57000000 feet below pile head
Number of iterations	=	40
Number of zero deflection points	=	1
Pile deflection at ground	=	0.53121123 inches

Pile-head Deflection vs. Pile Length for Load Case 3

Boundary Condition Type 1, Shear and Moment

Shear = 2250. lbs

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area

Light Tower NC2-1 (Boring B-002-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Moment = 724800. in-lbs
 Axial Load = 3800. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	0.62718513	791084.	-23377.
8.55000	1.20844737	784066.	-24998.
8.10000	2.78036291	780337.	-27298.
7.65000	6.90020454	781142.	-30170.
7.20000	19.85326488	793023.	-34640.

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	Load Type	Load 1	Load 2	Axial Loading	Pile-head Deflection	Pile-head Rotation	Max in lbs
Shear	Max Moment	Pile-head Load 1	Type	Pile-head Load 2	lbs	inches	radians
Pile No.	1	in-lbs	2	Load 2	lbs	inches	radians
1	V, lb	1000.0000	M, in-lb	315600.	4200.	0.02777	-3.84E-04
-10270.		348460.					
2	V, lb	2250.	M, in-lb	724800.	4600.	0.6290	-0.00803
-23396.		791337.					
3	V, lb	2250.	M, in-lb	724800.	3800.	0.6272	-0.00801
-23377.		791084.					

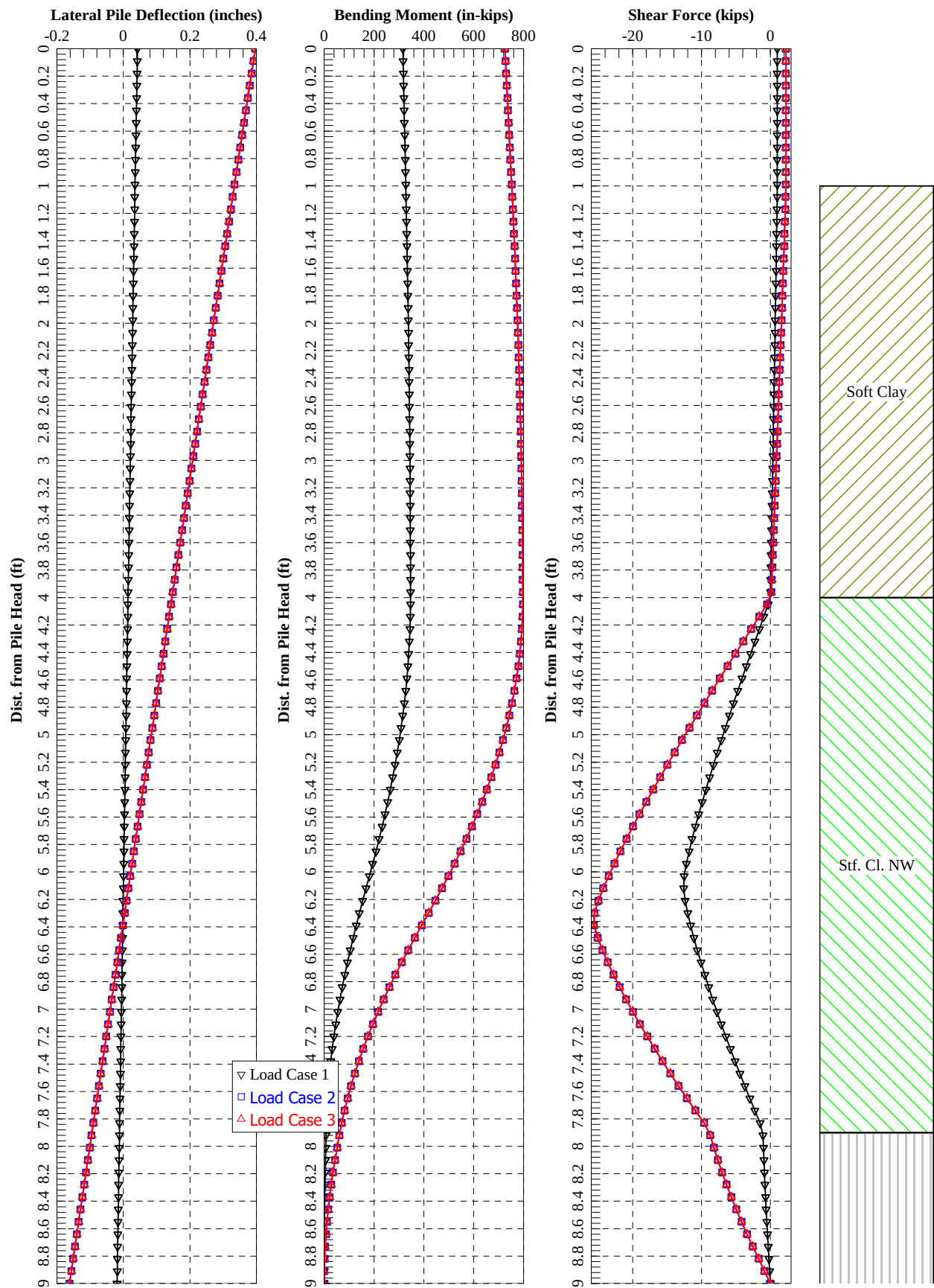
Maximum pile-head deflection = 0.6290073171 inches

Maximum pile-head rotation = -0.0080325204 radians = -0.460230 deg.

The analysis ended normally.

LATERAL LOAD (LPILE) ANALYSES
NORTHBOUND PARKING AREA
LIGHT TOWER NC1-7 (B-004-0-25)

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
Light Tower NC1-7 (Boring B-004-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation



TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
Light Tower NC1-7 (Boring B-004-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

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

This model was prepared by:
BSears

Files Used for Analysis

Path to file locations:
\Columbus-1170\Projects\2024\24170232_ms_TP 26 NE Ohio\GEO\Project Docs\Site
15_SUM-271 (2LMN)\Calcs\Light Towers\LPILE (Final Report)\NB\

Name of input data file:
Tower NC1-7 (B-004).lp12d

Name of output report file:
Tower NC1-7 (B-004).lp12o

Name of plot output file:
Tower NC1-7 (B-004).lp12p

Name of runtime message file:
Tower NC1-7 (B-004).lp12r

Date and Time of Analysis

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
Light Tower NC1-7 (Boring B-004-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Date: April 8, 2026

Time: 20:12:59

Problem Title

Project Name: TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas

Job Number: 24170232F

Client: ms consultants, inc.

Engineer: BKS

Description: Light Tower NC1-7 (B-004-0-25)

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

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
Light Tower NC1-7 (Boring B-004-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

- 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	=	9.000 ft
Depth of ground surface below top of pile	=	1.0000 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.

Point No.	Depth Below Pile Head feet	Pile Diameter inches
-----	-----	-----
1	0.000	36.0000
2	9.000	36.0000

Input Structural Properties for Pile Sections:

Pile Section No. 1:

Section 1 is a round drilled shaft, bored pile, or CIDH pile	
Length of section	= 9.000000 ft
Shaft Diameter	= 36.000000 in

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
Light Tower NC1-7 (Boring B-004-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Soil and Rock Layering Information

The soil profile is modelled using 4 layers

Layer 1 is soft clay, p-y criteria by Matlock, 1970

Distance from top of pile to top of layer	=	1.000000 ft
Distance from top of pile to bottom of layer	=	4.000000 ft
Effective unit weight at top of layer	=	98.000000 pcf
Effective unit weight at bottom of layer	=	98.000000 pcf
Undrained cohesion at top of layer	=	250.000000 psf
Undrained cohesion at bottom of layer	=	250.000000 psf
Epsilon-50 at top of layer	=	0.020000
Epsilon-50 at bottom of layer	=	0.020000

Layer 2 is stiff clay without free water

Distance from top of pile to top of layer	=	4.000000 ft
Distance from top of pile to bottom of layer	=	7.900000 ft
Effective unit weight at top of layer	=	58.000000 pcf
Effective unit weight at bottom of layer	=	58.000000 pcf
Undrained cohesion at top of layer	=	3750. psf
Undrained cohesion at bottom of layer	=	3750. psf
Epsilon-50 at top of layer	=	0.005000
Epsilon-50 at bottom of layer	=	0.005000

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

Distance from top of pile to top of layer	=	7.900000 ft
Distance from top of pile to bottom of layer	=	11.100000 ft
Effective unit weight at top of layer	=	60.000000 pcf
Effective unit weight at bottom of layer	=	60.000000 pcf
Friction angle at top of layer	=	34.000000 deg.
Friction angle at bottom of layer	=	34.000000 deg.
Subgrade k at top of layer	=	60.000000 pci
Subgrade k at bottom of layer	=	60.000000 pci

Layer 4 is stiff clay without free water

Distance from top of pile to top of layer	=	11.100000 ft
Distance from top of pile to bottom of layer	=	12.400000 ft
Effective unit weight at top of layer	=	63.000000 pcf

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area

Light Tower NC1-7 (Boring B-004-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Effective unit weight at bottom of layer	=	63.000000	pcf
Undrained cohesion at top of layer	=	2500.	psf
Undrained cohesion at bottom of layer	=	2500.	psf
Epsilon-50 at top of layer	=	0.005000	
Epsilon-50 at bottom of layer	=	0.005000	

(Depth of the lowest soil layer extends 3.400 ft below the pile tip)

Summary of Input Soil Properties

Layer E50 Num. or krm	Soil Type Name kpy (p-y Curve Type) pci	Layer Depth ft	Effective Unit Wt. pcf	Cohesion psf	Angle of Friction deg.
1 0.02000	Soft --	1.0000	98.0000	250.0000	--
0.02000	Clay --	4.0000	98.0000	250.0000	--
2 0.00500	Stiff Clay --	4.0000	58.0000	3750.	--
0.00500	w/o Free Water --	7.9000	58.0000	3750.	--
3 --	Sand 60.0000	7.9000	60.0000	--	34.0000
--	(Reese, et al.) 60.0000	11.1000	60.0000	--	34.0000
4 0.00500	Stiff Clay --	11.1000	63.0000	2500.	--
0.00500	w/o Free Water --	12.4000	63.0000	2500.	--

Static Loading Type

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

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area

Light Tower NC1-7 (Boring B-004-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 3

Load Compute No.	Load Top y Type	Condition Run Analysis 1	Condition 2	Axial Thrust Force, lbs
vs. Pile Length				
1	1	V = 1000.000000 lbs	M = 315600. in-lbs	4200.
Yes		Yes		
2	1	V = 2250. lbs	M = 724800. in-lbs	4600.
Yes		Yes		
3	1	V = 2250. lbs	M = 724800. in-lbs	3800.
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:

Dimensions and Properties of Drilled Shaft (Bored Pile):

Length of Section	=	9.000000 ft
Shaft Diameter	=	36.000000 in
Concrete Cover Thickness (to edge of trans. reinf.)	=	3.500000 in
Number of Reinforcing Bars	=	16 bars
Yield Stress of Reinforcing Bars	=	60000. psi
Modulus of Elasticity of Reinforcing Bars	=	29000000. psi
Gross Area of Shaft	=	1018. sq. in.

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area

Light Tower NC1-7 (Boring B-004-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Total Area of Reinforcing Steel	=	16.000000 sq. in.
Area Ratio of Steel Reinforcement	=	1.57 percent
Edge-to-Edge Bar Spacing	=	4.114467 in
Maximum Concrete Aggregate Size	=	0.750000 in
Ratio of Bar Spacing to Aggregate Size	=	5.49
Offset of Center of Rebar Cage from Center of Pile	=	0.0000 in
Transverse Reinforcement		
Type: Spiral		
Number of Transverse Reinf. (per spacing)	=	1
Spacing of Transverse Reinf.	=	4.500000 in
Yield Stress of Transverse Reinf.	=	60000. psi
Diameter of Transverse Reinf.	=	0.500000 in

Axial Structural Capacities:

Nom. Axial Structural Capacity = $0.85 F_c A_c + F_y A_s$	=	4366.378 kips
Tensile Load for Cracking of Concrete	=	-470.222 kips
Nominal Axial Tensile Capacity	=	-960.000 kips

Reinforcing Bar Dimensions and Positions Used in Computations:

Bar Number	Bar Diam. inches	Bar Area sq. in.	X inches	Y inches
-----	-----	-----	-----	-----
1	1.128000	1.000000	13.436000	0.000000
2	1.128000	1.000000	12.413245	5.141735
3	1.128000	1.000000	9.500687	9.500687
4	1.128000	1.000000	5.141735	12.413245
5	1.128000	1.000000	0.000000	13.436000
6	1.128000	1.000000	-5.14173	12.413245
7	1.128000	1.000000	-9.50069	9.500687
8	1.128000	1.000000	-12.41325	5.141735
9	1.128000	1.000000	-13.43600	0.000000
10	1.128000	1.000000	-12.41325	-5.14173
11	1.128000	1.000000	-9.50069	-9.50069
12	1.128000	1.000000	-5.14173	-12.41325
13	1.128000	1.000000	0.000000	-13.43600
14	1.128000	1.000000	5.141735	-12.41325
15	1.128000	1.000000	9.500687	-9.50069
16	1.128000	1.000000	12.413245	-5.14173

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

Minimum spacing between any two bars not equal to zero = 4.114 inches
between bars 11 and 12.

Ratio of bar spacing to maximum aggregate size = 5.49

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC1-7 (Boring B-004-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Concrete Properties:

Compressive Strength of Concrete	=	4000. psi
Modulus of Elasticity of Concrete	=	3604997. psi
Modulus of Rupture of Concrete	=	-474.34165 psi
Compression Strain at Peak Stress	=	0.001886
Tensile Strain at Fracture of Concrete	=	-0.0001154
Maximum Coarse Aggregate Size	=	0.750000 in

Number of Axial Thrust Force Values Determined from Pile-head Loadings = 3

Number	Axial Thrust Force kips
-----	-----
1	3.800
2	4.200
3	4.600

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 318-14, Section 21.2.3.
 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 = 3.800 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC1-7 (Boring B-004-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

6.25000E-07	240.5062135	384809942.	19.2929823	0.00001206	-0.00001044
0.0505030	0.2746478				
0.00000125	480.1472468	384117797.	18.6479768	0.00002331	-0.00002169
0.0973082	0.5259142				
0.00000188	718.9174733	383422652.	18.4329804	0.00003456	-0.00003294
0.1438345	0.7771808				
0.00000250	956.8168886	382726755.	18.3254857	0.00004581	-0.00004419
0.1900818	1.0284477				
0.00000313	1194.	382030558.	18.2609917	0.00005707	-0.00005543
0.2360502	1.2797149				
0.00000375	1430.	381334209.	18.2179981	0.00006832	-0.00006668
0.2817396	1.5309823				
0.00000438	1665.	380637775.	18.1872904	0.00007957	-0.00007793
0.3271500	1.7822500				
0.00000500	1900.	379941287.	18.1642614	0.00009082	-0.00008918
0.3722815	2.0335179				
0.00000563	2133.	379244764.	18.1463515	0.0001021	-0.000100
0.4171340	2.2847861				
0.00000625	2366.	378548215.	18.1320251	0.0001133	-0.000112
0.4617075	2.5360546				
0.00000688	2366.	344134741.	10.2494785	0.00007047	-0.000177
0.2882187	-4.308598 C				
0.00000750	2366.	315456846.	10.2198771	0.00007665	-0.000193
0.3129821	-4.706727 C				
0.00000813	2366.	291190934.	10.1952302	0.00008284	-0.000210
0.3376758	-5.104761 C				
0.00000875	2366.	270391582.	10.1744772	0.00008903	-0.000226
0.3622998	-5.502701 C				
0.00000938	2366.	252365477.	10.1568402	0.00009522	-0.000242
0.3868539	-5.900547 C				
0.00001000	2366.	236592634.	10.1417358	0.0001014	-0.000259
0.4113380	-6.298297 C				
0.00001063	2366.	222675420.	10.1287027	0.0001076	-0.000275
0.4357521	-6.695951 C				
0.00001125	2366.	210304564.	10.1174231	0.0001138	-0.000291
0.4600960	-7.093510 C				
0.00001188	2366.	199235903.	10.1076093	0.0001200	-0.000307
0.4843696	-7.490973 C				
0.00001250	2366.	189274107.	10.0990420	0.0001262	-0.000324
0.5085729	-7.888340 C				
0.00001313	2366.	180261055.	10.0915439	0.0001325	-0.000340
0.5327056	-8.285611 C				
0.00001375	2366.	172067370.	10.0849699	0.0001387	-0.000356
0.5567678	-8.682785 C				
0.00001438	2366.	164586180.	10.0792000	0.0001449	-0.000373
0.5807594	-9.079861 C				
0.00001500	2366.	157728423.	10.0741344	0.0001511	-0.000389
0.6046801	-9.476841 C				
0.00001563	2366.	151419286.	10.0696892	0.0001573	-0.000405
0.6285300	-9.873723 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC1-7 (Boring B-004-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00001625	2366.	145595467.	10.0657933	0.0001636	-0.000421
0.6523089	-10.270507 C				
0.00001688	2366.	140203043.	10.0623863	0.0001698	-0.000438
0.6760167	-10.667193 C				
0.00001750	2366.	135195791.	10.0594163	0.0001760	-0.000454
0.6996534	-11.063781 C				
0.00001813	2366.	130533867.	10.0568387	0.0001823	-0.000470
0.7232187	-11.460271 C				
0.00001875	2366.	126182738.	10.0546147	0.0001885	-0.000486
0.7467127	-11.856661 C				
0.00001938	2366.	122112327.	10.0527107	0.0001948	-0.000503
0.7701352	-12.252952 C				
0.00002000	2366.	118296317.	10.0510970	0.0002010	-0.000519
0.7934860	-12.649144 C				
0.00002063	2366.	114711580.	10.0497478	0.0002073	-0.000535
0.8167652	-13.045236 C				
0.00002125	2366.	111337710.	10.0486401	0.0002135	-0.000551
0.8399726	-13.441228 C				
0.00002188	2366.	108156633.	10.0477539	0.0002198	-0.000568
0.8631080	-13.837120 C				
0.00002250	2366.	105152282.	10.0470709	0.0002261	-0.000584
0.8861714	-14.232911 C				
0.00002313	2366.	102310328.	10.0465752	0.0002323	-0.000600
0.9091627	-14.628602 C				
0.00002375	2366.	99617951.	10.0462524	0.0002386	-0.000616
0.9320817	-15.024191 C				
0.00002438	2366.	97063645.	10.0460897	0.0002449	-0.000633
0.9549284	-15.419678 C				
0.00002563	2429.	94800037.	10.0461990	0.0002574	-0.000665
1.0004043	-16.210348 C				
0.00002688	2545.	94692477.	10.0468231	0.0002700	-0.000697
1.0455896	-17.000609 C				
0.00002813	2660.	94589756.	10.0479254	0.0002826	-0.000730
1.0904832	-17.790458 C				
0.00002938	2776.	94491232.	10.0493946	0.0002952	-0.000762
1.1350844	-18.579893 C				
0.00003063	2891.	94396370.	10.0512127	0.0003078	-0.000795
1.1793922	-19.368912 C				
0.00003188	3006.	94304718.	10.0533415	0.0003205	-0.000827
1.2234058	-20.157511 C				
0.00003313	3121.	94215891.	10.0557483	0.0003331	-0.000859
1.2671243	-20.945689 C				
0.00003438	3236.	94129561.	10.0584054	0.0003458	-0.000892
1.3105466	-21.733443 C				
0.00003563	3350.	94045446.	10.0612887	0.0003584	-0.000924
1.3536720	-22.520771 C				
0.00003688	3465.	93963300.	10.0643778	0.0003711	-0.000956
1.3964994	-23.307669 C				
0.00003813	3579.	93882912.	10.0676547	0.0003838	-0.000989
1.4390279	-24.094136 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC1-7 (Boring B-004-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00003938	3694.	93804096.	10.0711039	0.0003965	-0.001021
1.4812567	-24.880169 C				
0.00004063	3808.	93726688.	10.0747116	0.0004093	-0.001053
1.5231846	-25.665765 C				
0.00004188	3922.	93650546.	10.0784659	0.0004220	-0.001085
1.5648108	-26.450921 C				
0.00004313	4035.	93575540.	10.0823562	0.0004348	-0.001118
1.6061342	-27.235635 C				
0.00004438	4149.	93501560.	10.0863731	0.0004476	-0.001150
1.6471540	-28.019904 C				
0.00004563	4263.	93428502.	10.0905084	0.0004604	-0.001182
1.6878690	-28.803725 C				
0.00004688	4376.	93356279.	10.0947545	0.0004732	-0.001214
1.7282784	-29.587096 C				
0.00004813	4489.	93284807.	10.0991050	0.0004860	-0.001246
1.7683810	-30.370013 C				
0.00004938	4602.	93214014.	10.1035538	0.0004989	-0.001279
1.8081759	-31.152474 C				
0.00005063	4715.	93143835.	10.1080956	0.0005117	-0.001311
1.8476620	-31.934476 C				
0.00005188	4828.	93074209.	10.1127258	0.0005246	-0.001343
1.8868384	-32.716016 C				
0.00005313	4941.	93005082.	10.1174399	0.0005375	-0.001375
1.9257039	-33.497091 C				
0.00005438	5053.	92936405.	10.1222340	0.0005504	-0.001407
1.9642575	-34.277698 C				
0.00005563	5166.	92868132.	10.1271047	0.0005633	-0.001439
2.0024981	-35.057833 C				
0.00005688	5278.	92800222.	10.1320488	0.0005763	-0.001471
2.0404247	-35.837495 C				
0.00005813	5390.	92732637.	10.1370633	0.0005892	-0.001503
2.0780361	-36.616679 C				
0.00005938	5502.	92665342.	10.1421457	0.0006022	-0.001535
2.1153313	-37.395383 C				
0.00006063	5614.	92598305.	10.1472935	0.0006152	-0.001567
2.1523092	-38.173604 C				
0.00006188	5725.	92531497.	10.1525046	0.0006282	-0.001599
2.1889685	-38.951338 C				
0.00006313	5837.	92464888.	10.1577769	0.0006412	-0.001631
2.2253083	-39.728581 C				
0.00006438	5948.	92398455.	10.1631088	0.0006543	-0.001663
2.2613274	-40.505332 C				
0.00006563	6059.	92332173.	10.1684984	0.0006673	-0.001695
2.2970245	-41.281586 C				
0.00006688	6170.	92266020.	10.1739444	0.0006804	-0.001727
2.3323987	-42.057340 C				
0.00006813	6281.	92199976.	10.1794453	0.0006935	-0.001759
2.3674485	-42.832591 C				
0.00006938	6392.	92134020.	10.1849998	0.0007066	-0.001791
2.4021730	-43.607335 C				

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 Light Tower NC1-7 (Boring B-004-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00007063	6502.	92068136.	10.1906070	0.0007197	-0.001823
2.4365708	-44.381568 C				
0.00007188	6613.	92002305.	10.1962656	0.0007329	-0.001855
2.4706408	-45.155288 C				
0.00007313	6723.	91936511.	10.2020028	0.0007460	-0.001886
2.5043818	-45.928490 C				
0.00007438	6833.	91870742.	10.2077616	0.0007592	-0.001918
2.5377924	-46.701172 C				
0.00007938	7271.	91607617.	10.2312788	0.0008121	-0.002045
2.6681070	-49.786612 C				
0.00008438	7707.	91343844.	10.2555391	0.0008653	-0.002172
2.7930345	-52.863415 C				
0.00008938	8140.	91079227.	10.2796933	0.0009187	-0.002299
2.9123325	-55.933382 C				
0.00009438	8570.	90813004.	10.3043877	0.0009725	-0.002425
3.0260259	-58.995009 C				
0.00009938	8979.	90357411.	10.3225581	0.0010258	-0.002552
3.1326575	-60.000000 CY				
0.0001044	9304.	89144470.	10.3110511	0.0010762	-0.002681
3.2276850	-60.000000 CY				
0.0001094	9546.	87273573.	10.2718035	0.0011235	-0.002814
3.3116704	-60.000000 CY				
0.0001144	9782.	85523680.	10.2357064	0.0011707	-0.002947
3.3907664	-60.000000 CY				
0.0001194	10004.	83800225.	10.1987328	0.0012175	-0.003080
3.4643165	-60.000000 CY				
0.0001244	10154.	81641326.	10.1374818	0.0012608	-0.003217
3.5282172	-60.000000 CY				
0.0001294	10287.	79513660.	10.0756441	0.0013035	-0.003354
3.5871212	-60.000000 CY				
0.0001344	10419.	77536664.	10.0197410	0.0013464	-0.003491
3.6423258	-60.000000 CY				
0.0001394	10550.	75693983.	9.9691573	0.0013895	-0.003628
3.6937845	-60.000000 CY				
0.0001444	10680.	73971519.	9.9233661	0.0014327	-0.003765
3.7414497	-60.000000 CY				
0.0001494	10808.	72355946.	9.8810316	0.0014760	-0.003902
3.7851328	-60.000000 CY				
0.0001544	10925.	70772035.	9.8368433	0.0015186	-0.004039
3.8241552	-60.000000 CY				
0.0001594	11008.	69072220.	9.7809580	0.0015588	-0.004179
3.8574366	-60.000000 CY				
0.0001644	11071.	67351790.	9.7204156	0.0015978	-0.004320
3.8862696	-60.000000 CY				
0.0001694	11131.	65719446.	9.6635689	0.0016368	-0.004461
3.9118664	-60.000000 CY				
0.0001744	11191.	64176802.	9.6094393	0.0016756	-0.004602
3.9342902	-60.000000 CY				
0.0001794	11250.	62716278.	9.5601863	0.0017149	-0.004743
3.9535015	-60.000000 CY				

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 Light Tower NC1-7 (Boring B-004-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0001844	11308.	61329164.	9.5136161	0.0017541	-0.004883
3.9693617	-60.000000 CY				
0.0001894	11364.	60009896.	9.4690774	0.0017932	-0.005024
3.9819050	-60.000000 CY				
0.0001944	11420.	58754909.	9.4280227	0.0018326	-0.005165
3.9911986	-60.000000 CY				
0.0001994	11476.	57559296.	9.3897594	0.0018721	-0.005305
3.9971986	-60.000000 CY				
0.0002044	11531.	56418622.	9.3531932	0.0019116	-0.005446
3.9998595	-60.000000 CY				
0.0002094	11584.	55328385.	9.3201259	0.0019514	-0.005586
3.9974517	-60.000000 CY				
0.0002144	11637.	54285454.	9.2909722	0.0019918	-0.005726
3.9998812	-60.000000 CY				
0.0002194	11690.	53285909.	9.2626721	0.0020320	-0.005866
3.9969940	-60.000000 CY				
0.0002244	11740.	52321336.	9.2356724	0.0020723	-0.006005
3.9997138	-60.000000 CY				
0.0002294	11786.	51384137.	9.2093226	0.0021124	-0.006145
3.9955528	-60.000000 CY				
0.0002344	11823.	50445667.	9.1796872	0.0021515	-0.006286
3.9989818	-60.000000 CY				
0.0002394	11855.	49524943.	9.1473565	0.0021896	-0.006428
3.9994466	-60.000000 CY				
0.0002444	11876.	48598228.	9.1109548	0.0022265	-0.006571
3.9965160	-60.000000 CY				
0.0002494	11895.	47701101.	9.0745971	0.0022630	-0.006715
3.9991770	-60.000000 CY				
0.0002544	11912.	46829816.	9.0405915	0.0022997	-0.006858
3.9995775	-60.000000 CY				
0.0002594	11929.	45990067.	9.0077660	0.0023364	-0.007001
3.9954763	-60.000000 CY				
0.0002644	11945.	45181124.	8.9766457	0.0023732	-0.007144
3.9984997	-60.000000 CY				
0.0002694	11961.	44401256.	8.9468563	0.0024101	-0.007287
3.9998981	-60.000000 CY				
0.0002744	11976.	43648250.	8.9191370	0.0024472	-0.007430
3.9944635	-60.000000 CY				
0.0003044	12062.	39628140.	8.7757363	0.0026711	-0.008286
3.9984635	-60.000000 CY				
0.0003344	12138.	36300180.	8.6628609	0.0028966	-0.009141
3.9998209	-60.000000 CY				
0.0003644	12207.	33502446.	8.5793723	0.0031261	-0.009991
3.9999551	-60.000000 CYT				
0.0003944	12272.	31117026.	8.5161103	0.0033585	-0.010839
3.9996166	-60.000000 CYT				
0.0004244	12331.	29056485.	8.4674428	0.0035934	-0.011684
3.9972132	-60.000000 CYT				
0.0004544	12377.	27238942.	8.4178614	0.0038249	-0.012533
3.9873462	-60.000000 CYT				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Axial Thrust Force = 4.200 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
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6.25000E-07	240.5049676	384807948.	19.4290859	0.00001214	-0.00001036
0.0508615	0.2771147				
0.00000125	480.1459926	384116794.	18.7161837	0.00002340	-0.00002160
0.0976654	0.5283867				
0.00000188	718.9162127	383421980.	18.4785558	0.00003465	-0.00003285
0.1441903	0.7796589				
0.00000250	956.8156222	382726249.	18.3597458	0.00004590	-0.00004410
0.1904363	1.0309315				
0.00000313	1194.	382030150.	18.2884629	0.00005715	-0.00005535
0.2364034	1.2822044				
0.00000375	1430.	381333869.	18.2409436	0.00006840	-0.00006660
0.2820914	1.5334776				
0.00000438	1665.	380637482.	18.2070035	0.00007966	-0.00007784
0.3275005	1.7847511				
0.00000500	1900.	379941029.	18.1815504	0.00009091	-0.00008909
0.3726306	2.0360248				
0.00000563	2133.	379244533.	18.1617553	0.0001022	-0.000100
0.4174818	2.2872988				
0.00000625	2366.	378548006.	18.1459208	0.0001134	-0.000112
0.4620539	2.5385732				
0.00000688	2366.	344134551.	10.2895004	0.00007074	-0.000177
0.2893429	-4.300617 C				
0.00000750	2366.	315456672.	10.2575513	0.00007693	-0.000193
0.3141325	-4.698533 C				
0.00000813	2366.	291190774.	10.2300378	0.00008312	-0.000209
0.3388235	-5.096560 C				
0.00000875	2366.	270391433.	10.2068278	0.00008931	-0.000226
0.3634446	-5.494492 C				
0.00000938	2366.	252365338.	10.1870615	0.00009550	-0.000242
0.3879959	-5.892330 C				
0.00001000	2366.	236592504.	10.1700940	0.0001017	-0.000258
0.4124772	-6.290073 C				
0.00001063	2366.	222675298.	10.1554324	0.0001079	-0.000275
0.4368884	-6.687720 C				
0.00001125	2366.	210304448.	10.1426931	0.0001141	-0.000291
0.4612294	-7.085271 C				
0.00001188	2366.	199235793.	10.1315564	0.0001203	-0.000307
0.4855002	-7.482727 C				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00001250	2366.	189274003.	10.1218127	0.0001265	-0.000323
0.5097005	-7.880086 C				
0.00001313	2366.	180260955.	10.1132503	0.0001327	-0.000340
0.5338304	-8.277349 C				
0.00001375	2366.	172067276.	10.1057088	0.0001390	-0.000356
0.5578898	-8.674515 C				
0.00001438	2366.	164586090.	10.0990556	0.0001452	-0.000372
0.5818784	-9.071585 C				
0.00001500	2366.	157728336.	10.0931803	0.0001514	-0.000389
0.6057963	-9.468556 C				
0.00001563	2366.	151419203.	10.0879903	0.0001576	-0.000405
0.6296433	-9.865431 C				
0.00001625	2366.	145595387.	10.0834069	0.0001639	-0.000421
0.6534193	-10.262207 C				
0.00001688	2366.	140202965.	10.0793634	0.0001701	-0.000437
0.6771242	-10.658886 C				
0.00001750	2366.	135195717.	10.0758025	0.0001763	-0.000454
0.7007579	-11.055466 C				
0.00001813	2366.	130533795.	10.0726747	0.0001826	-0.000470
0.7243204	-11.451947 C				
0.00001875	2366.	126182669.	10.0699372	0.0001888	-0.000486
0.7478114	-11.848330 C				
0.00001938	2366.	122112260.	10.0675528	0.0001951	-0.000502
0.7712309	-12.244613 C				
0.00002000	2366.	118296252.	10.0654889	0.0002013	-0.000519
0.7945789	-12.640797 C				
0.00002063	2366.	114711517.	10.0637168	0.0002076	-0.000535
0.8178551	-13.036882 C				
0.00002125	2366.	111337649.	10.0622112	0.0002138	-0.000551
0.8410595	-13.432866 C				
0.00002188	2366.	108156573.	10.0609497	0.0002201	-0.000567
0.8641920	-13.828750 C				
0.00002250	2366.	105152224.	10.0599125	0.0002263	-0.000584
0.8872524	-14.224533 C				
0.00002313	2366.	102310272.	10.0590817	0.0002326	-0.000600
0.9102407	-14.620215 C				
0.00002375	2366.	99617896.	10.0584414	0.0002389	-0.000616
0.9331568	-15.015796 C				
0.00002438	2366.	97063591.	10.0579776	0.0002452	-0.000632
0.9560005	-15.411276 C				
0.00002563	2432.	94924068.	10.0575288	0.0002577	-0.000665
1.0014704	-16.201930 C				
0.00002688	2548.	94810571.	10.0576469	0.0002703	-0.000697
1.0466496	-16.992174 C				
0.00002813	2664.	94702439.	10.0582592	0.0002829	-0.000730
1.0915372	-17.782007 C				
0.00002938	2779.	94598964.	10.0593353	0.0002955	-0.000762
1.1361324	-18.571425 C				
0.00003063	2894.	94499555.	10.0607664	0.0003081	-0.000794
1.1804341	-19.360427 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC1-7 (Boring B-004-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00003188	3009.	94403710.	10.0625387	0.0003207	-0.000827
1.2244416	-20.149010 C				
0.00003313	3124.	94311007.	10.0646159	0.0003334	-0.000859
1.2681539	-20.937171 C				
0.00003438	3239.	94221082.	10.0669675	0.0003461	-0.000891
1.3115700	-21.724908 C				
0.00003563	3354.	94133623.	10.0695670	0.0003587	-0.000924
1.3546892	-22.512219 C				
0.00003688	3468.	94048359.	10.0723915	0.0003714	-0.000956
1.3975103	-23.299100 C				
0.00003813	3582.	93965057.	10.0754214	0.0003841	-0.000988
1.4400326	-24.085550 C				
0.00003938	3697.	93883511.	10.0786392	0.0003968	-0.001021
1.4822550	-24.871565 C				
0.00004063	3811.	93803541.	10.0820299	0.0004096	-0.001053
1.5241766	-25.657144 C				
0.00004188	3925.	93724988.	10.0855803	0.0004223	-0.001085
1.5657965	-26.442282 C				
0.00004313	4039.	93647711.	10.0892786	0.0004351	-0.001117
1.6071135	-27.226979 C				
0.00004438	4152.	93571586.	10.0931145	0.0004479	-0.001150
1.6481268	-28.011230 C				
0.00004563	4266.	93496502.	10.0970787	0.0004607	-0.001182
1.6888354	-28.795033 C				
0.00004688	4379.	93422358.	10.1011630	0.0004735	-0.001214
1.7292383	-29.578385 C				
0.00004813	4492.	93349066.	10.1053601	0.0004863	-0.001246
1.7693344	-30.361284 C				
0.00004938	4606.	93276544.	10.1096634	0.0004992	-0.001278
1.8091228	-31.143727 C				
0.00005063	4718.	93204721.	10.1140670	0.0005120	-0.001310
1.8486023	-31.925710 C				
0.00005188	4831.	93133529.	10.1185657	0.0005249	-0.001343
1.8877721	-32.707231 C				
0.00005313	4944.	93062909.	10.1231546	0.0005378	-0.001375
1.9266309	-33.488287 C				
0.00005438	5056.	92992807.	10.1278294	0.0005507	-0.001407
1.9651778	-34.268875 C				
0.00005563	5169.	92923173.	10.1325862	0.0005636	-0.001439
2.0034117	-35.048992 C				
0.00005688	5281.	92853961.	10.1374215	0.0005766	-0.001471
2.0413316	-35.828634 C				
0.00005813	5393.	92785130.	10.1423320	0.0005895	-0.001503
2.0789362	-36.607799 C				
0.00005938	5505.	92716640.	10.1473148	0.0006025	-0.001535
2.1162246	-37.386484 C				
0.00006063	5617.	92648458.	10.1523672	0.0006155	-0.001567
2.1531956	-38.164685 C				
0.00006188	5728.	92580549.	10.1574868	0.0006285	-0.001599
2.1898481	-38.942399 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC1-7 (Boring B-004-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00006313	5840.	92512883.	10.1626714	0.0006415	-0.001631
2.2261809	-39.719622 C				
0.00006438	5951.	92445433.	10.1679189	0.0006546	-0.001663
2.2621930	-40.496353 C				
0.00006563	6062.	92378172.	10.1732276	0.0006676	-0.001695
2.2978832	-41.272587 C				
0.00006688	6173.	92311077.	10.1785957	0.0006807	-0.001727
2.3332503	-42.048320 C				
0.00006813	6284.	92244124.	10.1840217	0.0006938	-0.001759
2.3682931	-42.823550 C				
0.00006938	6395.	92177292.	10.1895041	0.0007069	-0.001791
2.4030104	-43.598274 C				
0.00007063	6505.	92110561.	10.1950417	0.0007200	-0.001822
2.4374011	-44.372486 C				
0.00007188	6616.	92043913.	10.2006608	0.0007332	-0.001854
2.4714639	-45.146185 C				
0.00007313	6726.	91977331.	10.2063053	0.0007463	-0.001886
2.5051976	-45.919366 C				
0.00007438	6836.	91910797.	10.2120017	0.0007595	-0.001918
2.5386010	-46.692026 C				
0.00007938	7274.	91644853.	10.2352897	0.0008124	-0.002045
2.6688860	-49.777380 C				
0.00008438	7710.	91378587.	10.2593338	0.0008656	-0.002172
2.7937834	-52.854093 C				
0.00008938	8143.	91111830.	10.2831857	0.0009191	-0.002298
2.9130226	-55.924331 C				
0.00009438	8573.	90843621.	10.3077273	0.0009728	-0.002425
3.0266854	-58.985869 C				
0.00009938	8982.	90387473.	10.3258078	0.0010261	-0.002551
3.1332951	-60.000000 CY				
0.0001044	9308.	89176212.	10.3143071	0.0010766	-0.002681
3.2283182	-60.000000 CY				
0.0001094	9549.	87304848.	10.2749831	0.0011238	-0.002814
3.3122821	-60.000000 CY				
0.0001144	9785.	85553556.	10.2389100	0.0011711	-0.002946
3.3913727	-60.000000 CY				
0.0001194	10007.	83830919.	10.2019402	0.0012179	-0.003080
3.4649106	-60.000000 CY				
0.0001244	10158.	81671814.	10.1406407	0.0012612	-0.003216
3.5287895	-60.000000 CY				
0.0001294	10291.	79542859.	10.0787027	0.0013039	-0.003354
3.5876602	-60.000000 CY				
0.0001344	10423.	77564670.	10.0227059	0.0013468	-0.003491
3.6428308	-60.000000 CY				
0.0001394	10554.	75720878.	9.9720357	0.0013899	-0.003628
3.6942550	-60.000000 CY				
0.0001444	10683.	73997378.	9.9261646	0.0014331	-0.003764
3.7418850	-60.000000 CY				
0.0001494	10812.	72381005.	9.8838986	0.0014764	-0.003901
3.7855535	-60.000000 CY				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0001544	10929.	70796718.	9.8396771	0.0015190	-0.004038
3.8245440	-60.000000 CY				
0.0001594	11012.	69097838.	9.7838573	0.0015593	-0.004178
3.8578061	-60.000000 CY				
0.0001644	11075.	67376662.	9.7232508	0.0015983	-0.004319
3.8866026	-60.000000 CY				
0.0001694	11135.	65743511.	9.6663364	0.0016372	-0.004460
3.9121613	-60.000000 CY				
0.0001744	11195.	64200103.	9.6121495	0.0016761	-0.004601
3.9345463	-60.000000 CY				
0.0001794	11254.	62738857.	9.5628376	0.0017153	-0.004742
3.9537182	-60.000000 CY				
0.0001844	11312.	61351278.	9.5162917	0.0017546	-0.004883
3.9695496	-60.000000 CY				
0.0001894	11368.	60031354.	9.4717005	0.0017937	-0.005024
3.9820503	-60.000000 CY				
0.0001944	11425.	58775745.	9.4305957	0.0018331	-0.005164
3.9913005	-60.000000 CY				
0.0001994	11480.	57579537.	9.3922863	0.0018726	-0.005305
3.9972564	-60.000000 CY				
0.0002044	11535.	56438298.	9.3556780	0.0019121	-0.005445
3.9998723	-60.000000 CY				
0.0002094	11588.	55347517.	9.3241700	0.0019522	-0.005585
3.9975077	-60.000000 CY				
0.0002144	11641.	54304067.	9.2934428	0.0019923	-0.005725
3.9998931	-60.000000 CY				
0.0002194	11694.	53304015.	9.2651074	0.0020325	-0.005865
3.9970558	-60.000000 CY				
0.0002244	11744.	52339157.	9.2380944	0.0020728	-0.006005
3.9997330	-60.000000 CY				
0.0002294	11790.	51401489.	9.2117130	0.0021129	-0.006145
3.9956300	-60.000000 CY				
0.0002344	11827.	50463153.	9.1821360	0.0021521	-0.006285
3.9990203	-60.000000 CY				
0.0002394	11859.	49542728.	9.1500193	0.0021903	-0.006427
3.9992468	-60.000000 CY				
0.0002444	11880.	48615611.	9.1135780	0.0022271	-0.006570
3.9965958	-60.000000 CY				
0.0002494	11900.	47718283.	9.0771076	0.0022636	-0.006714
3.9992162	-60.000000 CY				
0.0002544	11917.	46846598.	9.0431776	0.0023004	-0.006857
3.9993713	-60.000000 CY				
0.0002594	11933.	46006491.	9.0103157	0.0023371	-0.007000
3.9955701	-60.000000 CY				
0.0002644	11949.	45197204.	8.9791598	0.0023739	-0.007144
3.9985538	-60.000000 CY				
0.0002694	11965.	44417005.	8.9493437	0.0024107	-0.007287
3.9999119	-60.000000 CY				
0.0002744	11980.	43663657.	8.9215934	0.0024479	-0.007430
3.9942523	-60.000000 CY				

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0.0003044	12066.	39641995.	8.7782176	0.0026719	-0.008286
3.9985257	-60.000000 CY				
0.0003344	12142.	36312646.	8.6652203	0.0028974	-0.009140
3.9998424	-60.000000 CY				
0.0003644	12212.	33513765.	8.5815911	0.0031269	-0.009991
3.9999658	-60.000000 CYT				
0.0003944	12276.	31127384.	8.5182268	0.0033594	-0.010838
3.9996505	-60.000000 CYT				
0.0004244	12335.	29066055.	8.4694819	0.0035942	-0.011683
3.9973093	-60.000000 CYT				
0.0004544	12381.	27248100.	8.4201387	0.0038259	-0.012532
3.9875919	-60.000000 CYT				

Axial Thrust Force = 4.600 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
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6.25000E-07	240.5035986	384805758.	19.5651901	0.00001223	-0.00001027
0.0512199	0.2795816				
0.00000125	480.1446137	384115691.	18.7843907	0.00002348	-0.00002152
0.0980225	0.5308592				
0.00000188	718.9148267	383421241.	18.5241312	0.00003473	-0.00003277
0.1445462	0.7821371				
0.00000250	956.8142298	382725692.	18.3940059	0.00004599	-0.00004401
0.1907908	1.0334154				
0.00000313	1194.	382029703.	18.3159341	0.00005724	-0.00005526
0.2367565	1.2846940				
0.00000375	1430.	381333494.	18.2638891	0.00006849	-0.00006651
0.2824433	1.5359729				
0.00000438	1665.	380637159.	18.2267166	0.00007974	-0.00007776
0.3278510	1.7872522				
0.00000500	1900.	379940746.	18.1988394	0.00009099	-0.00008901
0.3729798	2.0385317				
0.00000563	2133.	379244280.	18.1771590	0.0001022	-0.000100
0.4178295	2.2898116				
0.00000625	2366.	378547777.	18.1598165	0.0001135	-0.000112
0.4624003	2.5410917				
0.00000688	2366.	344134343.	10.3291778	0.00007101	-0.000176
0.2904571	-4.292706 C				
0.00000750	2366.	315456481.	10.2940289	0.00007721	-0.000193
0.3152465	-4.690597 C				
0.00000813	2366.	291190598.	10.2646762	0.00008340	-0.000209
0.3399656	-5.088396 C				

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0.00000875	2366.	270391269.	10.2391817	0.00008959	-0.000225
0.3645893	-5.486283 C				
0.00000938	2366.	252365185.	10.2172859	0.00009579	-0.000242
0.3891378	-5.884113 C				
0.00001000	2366.	236592361.	10.1984552	0.0001020	-0.000258
0.4136162	-6.281848 C				
0.00001063	2366.	222675163.	10.1821496	0.0001082	-0.000274
0.4380246	-6.679488 C				
0.00001125	2366.	210304321.	10.1679490	0.0001144	-0.000291
0.4623628	-7.077032 C				
0.00001188	2366.	199235672.	10.1555219	0.0001206	-0.000307
0.4866307	-7.474480 C				
0.00001250	2366.	189273889.	10.1446030	0.0001268	-0.000323
0.5108282	-7.871831 C				
0.00001313	2366.	180260846.	10.1349589	0.0001330	-0.000339
0.5349552	-8.269087 C				
0.00001375	2366.	172067171.	10.1264498	0.0001392	-0.000356
0.5590117	-8.666245 C				
0.00001438	2366.	164585990.	10.1189132	0.0001455	-0.000372
0.5829974	-9.063307 C				
0.00001500	2366.	157728241.	10.1122282	0.0001517	-0.000388
0.6069124	-9.460271 C				
0.00001563	2366.	151419111.	10.1062933	0.0001579	-0.000405
0.6307565	-9.857138 C				
0.00001625	2366.	145595299.	10.1010224	0.0001641	-0.000421
0.6545296	-10.253907 C				
0.00001688	2366.	140202880.	10.0963423	0.0001704	-0.000437
0.6782316	-10.650577 C				
0.00001750	2366.	135195635.	10.0921903	0.0001766	-0.000453
0.7018624	-11.047150 C				
0.00001813	2366.	130533716.	10.0885122	0.0001829	-0.000470
0.7254219	-11.443623 C				
0.00001875	2366.	126182592.	10.0852613	0.0001891	-0.000486
0.7489100	-11.839998 C				
0.00001938	2366.	122112186.	10.0823966	0.0001953	-0.000502
0.7723266	-12.236274 C				
0.00002000	2366.	118296180.	10.0798824	0.0002016	-0.000518
0.7956716	-12.632450 C				
0.00002063	2366.	114711448.	10.0776874	0.0002079	-0.000535
0.8189449	-13.028526 C				
0.00002125	2366.	111337582.	10.0757837	0.0002141	-0.000551
0.8421464	-13.424502 C				
0.00002188	2366.	108156508.	10.0741470	0.0002204	-0.000567
0.8652759	-13.820378 C				
0.00002250	2366.	105152160.	10.0727554	0.0002266	-0.000583
0.8883333	-14.216153 C				
0.00002313	2366.	102310210.	10.0715894	0.0002329	-0.000600
0.9113187	-14.611828 C				
0.00002375	2366.	99617836.	10.0706317	0.0002392	-0.000616
0.9342318	-15.007401 C				

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0.00002438	2366.	97063533.	10.0698667	0.0002455	-0.000632
0.9570725	-15.402873 C				
0.00002563	2436.	95048091.	10.0688598	0.0002580	-0.000664
1.0025364	-16.193510 C				
0.00002688	2551.	94928657.	10.0684718	0.0002706	-0.000697
1.0477096	-16.983738 C				
0.00002813	2667.	94815115.	10.0686232	0.0002832	-0.000729
1.0925912	-17.773555 C				
0.00002938	2782.	94706690.	10.0692479	0.0002958	-0.000762
1.1371802	-18.562957 C				
0.00003063	2897.	94602733.	10.0703211	0.0003084	-0.000794
1.1814759	-19.351942 C				
0.00003188	3012.	94502697.	10.0717368	0.0003210	-0.000826
1.2254772	-20.140508 C				
0.00003313	3127.	94406117.	10.0734845	0.0003337	-0.000859
1.2691834	-20.928652 C				
0.00003438	3242.	94312597.	10.0755306	0.0003463	-0.000891
1.3125933	-21.716373 C				
0.00003563	3357.	94221794.	10.0778462	0.0003590	-0.000923
1.3557063	-22.503666 C				
0.00003688	3471.	94133413.	10.0804061	0.0003717	-0.000956
1.3985212	-23.290530 C				
0.00003813	3586.	94047197.	10.0831888	0.0003844	-0.000988
1.4410372	-24.076963 C				
0.00003938	3700.	93962921.	10.0861753	0.0003971	-0.001020
1.4832533	-24.862961 C				
0.00004063	3814.	93880388.	10.0893491	0.0004099	-0.001053
1.5251686	-25.648521 C				
0.00004188	3928.	93799425.	10.0926956	0.0004226	-0.001085
1.5667821	-26.433642 C				
0.00004313	4042.	93719877.	10.0962019	0.0004354	-0.001117
1.6080927	-27.218321 C				
0.00004438	4155.	93641609.	10.0998566	0.0004482	-0.001149
1.6490996	-28.002554 C				
0.00004563	4269.	93564497.	10.1036497	0.0004610	-0.001182
1.6898018	-28.786339 C				
0.00004688	4382.	93488434.	10.1075722	0.0004738	-0.001214
1.7301982	-29.569674 C				
0.00004813	4496.	93413321.	10.1116159	0.0004866	-0.001246
1.7702878	-30.352554 C				
0.00004938	4609.	93339070.	10.1157737	0.0004995	-0.001278
1.8100696	-31.134978 C				
0.00005063	4722.	93265602.	10.1200391	0.0005123	-0.001310
1.8495425	-31.916943 C				
0.00005188	4834.	93192845.	10.1244063	0.0005252	-0.001342
1.8887057	-32.698446 C				
0.00005313	4947.	93120733.	10.1288700	0.0005381	-0.001374
1.9275579	-33.479483 C				
0.00005438	5060.	93049206.	10.1334255	0.0005510	-0.001406
1.9660981	-34.260052 C				

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0.00005563	5172.	92978211.	10.1380684	0.0005639	-0.001439
2.0043253	-35.040149 C				
0.00005688	5284.	92907697.	10.1427948	0.0005769	-0.001471
2.0422384	-35.819772 C				
0.00005813	5396.	92837619.	10.1476012	0.0005898	-0.001503
2.0798362	-36.598918 C				
0.00005938	5508.	92767935.	10.1524844	0.0006028	-0.001535
2.1171178	-37.377583 C				
0.00006063	5620.	92698606.	10.1574414	0.0006158	-0.001567
2.1540819	-38.155764 C				
0.00006188	5731.	92629597.	10.1624696	0.0006288	-0.001599
2.1907275	-38.933458 C				
0.00006313	5843.	92560874.	10.1675664	0.0006418	-0.001631
2.2270535	-39.710662 C				
0.00006438	5954.	92492407.	10.1727297	0.0006549	-0.001663
2.2630586	-40.487373 C				
0.00006563	6065.	92424168.	10.1779574	0.0006679	-0.001695
2.2987417	-41.263586 C				
0.00006688	6176.	92356130.	10.1832476	0.0006810	-0.001726
2.3341018	-42.039299 C				
0.00006813	6287.	92288268.	10.1885986	0.0006941	-0.001758
2.3691375	-42.814509 C				
0.00006938	6398.	92220560.	10.1940089	0.0007072	-0.001790
2.4038477	-43.589211 C				
0.00007063	6508.	92152983.	10.1995039	0.0007203	-0.001822
2.4382312	-44.363403 C				
0.00007188	6619.	92085519.	10.2050285	0.0007335	-0.001854
2.4722868	-45.137081 C				
0.00007313	6729.	92018147.	10.2106084	0.0007467	-0.001886
2.5060133	-45.910241 C				
0.00007438	6839.	91950850.	10.2162424	0.0007598	-0.001918
2.5394094	-46.682880 C				
0.00007938	7277.	91682087.	10.2393011	0.0008127	-0.002045
2.6696649	-49.768146 C				
0.00008438	7713.	91413389.	10.2630109	0.0008659	-0.002172
2.7945082	-52.845065 C				
0.00008938	8146.	91144431.	10.2866786	0.0009194	-0.002298
2.9137126	-55.915279 C				
0.00009438	8576.	90874234.	10.3110673	0.0009731	-0.002424
3.0273448	-58.976728 C				
0.00009938	8985.	90417533.	10.3290580	0.0010265	-0.002551
3.1339327	-60.000000 CY				
0.0001044	9311.	89207952.	10.3175636	0.0010769	-0.002681
3.2289512	-60.000000 CY				
0.0001094	9552.	87336121.	10.2781631	0.0011242	-0.002813
3.3128936	-60.000000 CY				
0.0001144	9789.	85583430.	10.2421143	0.0011714	-0.002946
3.3919789	-60.000000 CY				
0.0001194	10011.	83861611.	10.2051482	0.0012182	-0.003079
3.4655044	-60.000000 CY				

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0.0001244	10162.	81702300.	10.1438002	0.0012616	-0.003216
3.5293615	-60.000000 CY				
0.0001294	10295.	79572057.	10.0817619	0.0013043	-0.003353
3.5881988	-60.000000 CY				
0.0001344	10427.	77592674.	10.0256713	0.0013472	-0.003490
3.6433355	-60.000000 CY				
0.0001394	10557.	75747771.	9.9749147	0.0013903	-0.003627
3.6947252	-60.000000 CY				
0.0001444	10687.	74023236.	9.9289636	0.0014335	-0.003764
3.7423201	-60.000000 CY				
0.0001494	10816.	72406063.	9.8867661	0.0014768	-0.003901
3.7859739	-60.000000 CY				
0.0001544	10933.	70821400.	9.8425115	0.0015194	-0.004038
3.8249324	-60.000000 CY				
0.0001594	11017.	69123456.	9.7867573	0.0015598	-0.004178
3.8581753	-60.000000 CY				
0.0001644	11079.	67401534.	9.7260868	0.0015987	-0.004319
3.8869352	-60.000000 CY				
0.0001694	11139.	65767574.	9.6691048	0.0016377	-0.004460
3.9124557	-60.000000 CY				
0.0001744	11199.	64223403.	9.6148605	0.0016766	-0.004601
3.9348020	-60.000000 CY				
0.0001794	11258.	62761436.	9.5654896	0.0017158	-0.004742
3.9539345	-60.000000 CY				
0.0001844	11316.	61373390.	9.5189681	0.0017551	-0.004882
3.9697370	-60.000000 CY				
0.0001894	11373.	60052811.	9.4743244	0.0017942	-0.005023
3.9821950	-60.000000 CY				
0.0001944	11429.	58796578.	9.4331695	0.0018336	-0.005164
3.9914019	-60.000000 CY				
0.0001994	11484.	57599778.	9.3948139	0.0018731	-0.005304
3.9973136	-60.000000 CY				
0.0002044	11539.	56457972.	9.3581635	0.0019126	-0.005445
3.9998845	-60.000000 CY				
0.0002094	11592.	55366642.	9.3266817	0.0019528	-0.005585
3.9975630	-60.000000 CY				
0.0002144	11645.	54322678.	9.2959142	0.0019928	-0.005725
3.9999044	-60.000000 CY				
0.0002194	11698.	53322120.	9.2675435	0.0020331	-0.005864
3.9971169	-60.000000 CY				
0.0002244	11748.	52356977.	9.2405172	0.0020733	-0.006004
3.9997515	-60.000000 CY				
0.0002294	11794.	51418840.	9.2141042	0.0021135	-0.006144
3.9957066	-60.000000 CY				
0.0002344	11831.	50480617.	9.1845645	0.0021526	-0.006285
3.9990577	-60.000000 CY				
0.0002394	11864.	49560513.	9.1526832	0.0021909	-0.006427
3.9990468	-60.000000 CY				
0.0002444	11885.	48632992.	9.1162023	0.0022278	-0.006570
3.9966747	-60.000000 CY				

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0.0002494	11904.	47735462.	9.0796192	0.0022642	-0.006713
3.9992545	-60.000000 CY				
0.0002544	11921.	46863378.	9.0457647	0.0023010	-0.006856
3.9991650	-60.000000 CY				
0.0002594	11937.	46022914.	9.0128664	0.0023377	-0.007000
3.9956629	-60.000000 CY				
0.0002644	11953.	45213284.	8.9816750	0.0023745	-0.007143
3.9986069	-60.000000 CY				
0.0002694	11969.	44432753.	8.9518321	0.0024114	-0.007286
3.9999247	-60.000000 CY				
0.0002744	11984.	43679063.	8.9240509	0.0024485	-0.007429
3.9940409	-60.000000 CY				
0.0003044	12070.	39655848.	8.7807001	0.0026726	-0.008285
3.9985866	-60.000000 CY				
0.0003344	12146.	36325110.	8.6675807	0.0028982	-0.009139
3.9998625	-60.000000 CY				
0.0003644	12216.	33525083.	8.5838110	0.0031277	-0.009990
3.9999751	-60.000000 CYT				
0.0003944	12280.	31137740.	8.5203443	0.0033602	-0.010837
3.9996828	-60.000000 CYT				
0.0004244	12339.	29075625.	8.4715220	0.0035951	-0.011682
3.9974037	-60.000000 CYT				
0.0004544	12385.	27257253.	8.4224181	0.0038269	-0.012531
3.9878351	-60.000000 CYT				

 Summary of Results for Nominal 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 Tens. No. Strain	Axial Thrust kips	Nominal Mom. Cap. in-kip	Max. Comp. Strain	Max.
----	-----	-----	-----	
1 -0.00952396	3.800	12169.214	0.00300000	
2 -0.00952020	4.200	12173.120	0.00300000	
3 -0.00951645	4.600	12177.027	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

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the transverse reinforcing steel bars are tied hoops (0.65) or spirals (0.75).

The above values should be multiplied by the appropriate strength reduction factor to compute ultimate moment capacity according to ACI 318, 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 Stiff. Load Ult Mom No. kip-in ²	Resist. Factor	Nominal Ax. Thrust kips	Nominal Moment Cap in-kips	Ult. (Fac) Ax. Thrust kips	Ult. (Fac) Moment Cap in-kips	Bend. at
-----	-----	-----	-----	-----	-----	
1 91219895.	0.65	3.800000	12169.	2.470000	7910.	
2 91253873.	0.65	4.200000	12173.	2.730000	7913.	
3 91287886.	0.65	4.600000	12177.	2.990000	7915.	
1 89806706.	0.75	3.800000	12169.	2.850000	9127.	
2 89838295.	0.75	4.200000	12173.	3.150000	9130.	
3 89869877.	0.75	4.600000	12177.	3.450000	9133.	
1 70221645.	0.90	3.800000	12169.	3.420000	10952.	
2 70254444.	0.90	4.200000	12173.	3.780000	10956.	
3 70287179.	0.90	4.600000	12177.	4.140000	10959.	

 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
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1	1.0000	0.00	N.A.	No	0.00	8819.
2	4.0000	0.2591	No	No	8819.	149653.
3	7.9000	10.6953	No	No	158472.	33283.
4	11.1000	10.1000	No	No	191755.	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.

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 = 1000.0 lbs
Applied moment at pile head = 315600.0 in-lbs
Axial thrust load on pile head = 4200.0 lbs

Depth Res.	Soil X	Deflect. Spr.	Bending Distrib.	Shear Force	Slope S	Total Stress	Bending Stiffness	Soil p
	Es*H	y	Moment					
feet	inches	Lat. Load	in-lbs	lbs	radians	psi*	lb-in^2	
lb/inch	lb/inch	lb/inch	lb/inch					
0.00	0.00	0.04231	315600.	1000.0000	-6.10E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.09000	0.00	0.04166	316683.	999.9999	-6.09E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.1800	0.00	0.04100	317766.	1000.	-6.08E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.2700	0.00	0.04034	318848.	1000.	-6.07E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.3600	0.00	0.03969	319931.	1000.	-6.06E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.4500	0.00	0.03903	321014.	1000.	-6.05E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.5400	0.00	0.03838	322097.	1000.	-6.04E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.6300	0.00	0.03773	323179.	1000.	-6.03E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					

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0.7200	0.03708	324262.	1000.	-6.02E-04	0.00	3.84E+11
0.00	0.00	0.00				
0.8100	0.03643	325345.	1000.	-6.01E-04	0.00	3.84E+11
0.00	0.00	0.00				
0.9000	0.03578	326427.	1000.	-6.01E-04	0.00	3.84E+11
0.00	0.00	0.00				
0.9900	0.03513	327510.	1000.0000	-6.00E-04	0.00	3.84E+11
0.00	0.00	0.00				
1.0800	0.03448	328593.	986.2504	-5.99E-04	0.00	3.84E+11
-25.462	797.4429	0.00				
1.1700	0.03384	329646.	958.6121	-5.98E-04	0.00	3.84E+11
-25.720	820.8978	0.00				
1.2600	0.03319	330669.	930.6991	-5.97E-04	0.00	3.84E+11
-25.971	845.0080	0.00				
1.3500	0.03255	331662.	902.5194	-5.96E-04	0.00	3.84E+11
-26.214	869.8051	0.00				
1.4400	0.03191	332624.	874.0808	-5.95E-04	0.00	3.84E+11
-26.450	895.3233	0.00				
1.5300	0.03126	333555.	845.3915	-5.94E-04	0.00	3.84E+11
-26.678	921.5987	0.00				
1.6200	0.03062	334455.	816.4599	-5.93E-04	0.00	3.84E+11
-26.899	948.6704	0.00				
1.7100	0.02998	335324.	787.2943	-5.92E-04	0.00	3.84E+11
-27.111	976.5801	0.00				
1.8000	0.02934	336161.	757.9034	-5.91E-04	0.00	3.84E+11
-27.316	1005.	0.00				
1.8900	0.02871	336966.	728.2963	-5.90E-04	0.00	3.84E+11
-27.512	1035.	0.00				
1.9800	0.02807	337740.	698.4820	-5.89E-04	0.00	3.84E+11
-27.700	1066.	0.00				
2.0700	0.02743	338480.	668.4698	-5.88E-04	0.00	3.84E+11
-27.878	1098.	0.00				
2.1600	0.02680	339189.	638.2693	-5.87E-04	0.00	3.84E+11
-28.048	1130.	0.00				
2.2500	0.02616	339864.	607.8904	-5.86E-04	0.00	3.84E+11
-28.209	1164.	0.00				
2.3400	0.02553	340507.	577.3432	-5.86E-04	0.00	3.84E+11
-28.360	1200.	0.00				
2.4300	0.02490	341117.	546.6381	-5.85E-04	0.00	3.84E+11
-28.501	1236.	0.00				
2.5200	0.02427	341693.	515.7858	-5.84E-04	0.00	3.84E+11
-28.633	1274.	0.00				
2.6100	0.02364	342236.	484.7974	-5.83E-04	0.00	3.84E+11
-28.753	1314.	0.00				
2.7000	0.02301	342746.	453.6841	-5.82E-04	0.00	3.84E+11
-28.864	1355.	0.00				
2.7900	0.02238	343221.	422.4577	-5.81E-04	0.00	3.84E+11
-28.963	1398.	0.00				
2.8800	0.02176	343663.	391.1304	-5.80E-04	0.00	3.84E+11
-29.051	1442.	0.00				

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2.9700	0.02113	344072.	359.7146	-5.79E-04	0.00	3.84E+11
-29.127	1489.	0.00				
3.0600	0.02051	344446.	328.2234	-5.78E-04	0.00	3.84E+11
-29.190	1537.	0.00				
3.1500	0.01988	344786.	296.6702	-5.77E-04	0.00	3.84E+11
-29.241	1588.	0.00				
3.2400	0.01926	345092.	265.0689	-5.76E-04	0.00	3.84E+11
-29.279	1642.	0.00				
3.3300	0.01864	345364.	233.4342	-5.75E-04	0.00	3.84E+11
-29.304	1698.	0.00				
3.4200	0.01802	345601.	201.7811	-5.74E-04	0.00	3.84E+11
-29.313	1757.	0.00				
3.5100	0.01740	345805.	170.1253	-5.73E-04	0.00	3.84E+11
-29.308	1819.	0.00				
3.6000	0.01678	345974.	138.4835	-5.72E-04	0.00	3.84E+11
-29.288	1885.	0.00				
3.6900	0.01616	346109.	106.8727	-5.71E-04	0.00	3.84E+11
-29.251	1955.	0.00				
3.7800	0.01555	346210.	75.3111	-5.70E-04	0.00	3.84E+11
-29.197	2028.	0.00				
3.8700	0.01493	346277.	43.8176	-5.69E-04	0.00	3.84E+11
-29.125	2107.	0.00				
3.9600	0.01432	346310.	12.4124	-5.68E-04	0.00	3.84E+11
-29.033	2190.	0.00				
4.0500	0.01370	346309.	-326.836	-5.67E-04	0.00	3.84E+11
-599.203	47222.	0.00				
4.1400	0.01309	345609.	-972.101	-5.66E-04	0.00	3.84E+11
-595.733	49143.	0.00				
4.2300	0.01248	344214.	-1613.	-5.65E-04	0.00	3.84E+11
-591.944	51220.	0.00				
4.3200	0.01187	342129.	-2251.	-5.64E-04	0.00	3.84E+11
-587.813	53476.	0.00				
4.4100	0.01126	339358.	-2883.	-5.63E-04	0.00	3.84E+11
-583.314	55935.	0.00				
4.5000	0.01065	335907.	-3510.	-5.62E-04	0.00	3.84E+11
-578.417	58630.	0.00				
4.5900	0.01005	331781.	-4132.	-5.61E-04	0.00	3.84E+11
-573.085	61597.	0.00				
4.6800	0.00944	326987.	-4748.	-5.60E-04	0.00	3.84E+11
-567.277	64885.	0.00				
4.7700	0.00884	321531.	-5357.	-5.60E-04	0.00	3.84E+11
-560.944	68551.	0.00				
4.8600	0.00823	315420.	-5959.	-5.59E-04	0.00	3.84E+11
-554.028	72672.	0.00				
4.9500	0.00763	308664.	-6553.	-5.58E-04	0.00	3.85E+11
-546.457	77341.	0.00				
5.0400	0.00703	301270.	-7139.	-5.57E-04	0.00	3.85E+11
-538.147	82688.	0.00				
5.1300	0.00643	293248.	-7715.	-5.56E-04	0.00	3.85E+11
-528.990	88881.	0.00				

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5.2200	0.00583	284610.	-8281.	-5.55E-04	0.00	3.85E+11
-518.851	96154.	0.00				
5.3100	0.00523	275366.	-8835.	-5.54E-04	0.00	3.85E+11
-507.557	104842.	0.00				
5.4000	0.00463	265530.	-9377.	-5.54E-04	0.00	3.85E+11
-494.878	115435.	0.00				
5.4900	0.00403	255117.	-9904.	-5.53E-04	0.00	3.85E+11
-480.498	128692.	0.00				
5.5800	0.00344	244144.	-10414.	-5.52E-04	0.00	3.85E+11
-463.965	145852.	0.00				
5.6700	0.00284	232629.	-10904.	-5.52E-04	0.00	3.85E+11
-444.600	169106.	0.00				
5.7600	0.00224	220596.	-11372.	-5.51E-04	0.00	3.85E+11
-421.293	202757.	0.00				
5.8500	0.00165	208071.	-11811.	-5.50E-04	0.00	3.85E+11
-392.022	256702.	0.00				
5.9400	0.00106	195089.	-12213.	-5.50E-04	0.00	3.85E+11
-352.358	360633.	0.00				
6.0300	4.62E-04	181696.	-12515.	-5.49E-04	0.00	3.85E+11
-206.295	482554.	0.00				
6.1200	-1.31E-04	168063.	-12594.	-5.49E-04	0.00	3.85E+11
58.9293	484902.	0.00				
6.2100	-7.24E-04	154498.	-12387.	-5.48E-04	0.00	3.85E+11
325.1970	485302.	0.00				
6.3000	-0.00132	141312.	-12006.	-5.48E-04	0.00	3.85E+11
379.4790	311502.	0.00				
6.3900	-0.00191	128570.	-11575.	-5.48E-04	0.00	3.85E+11
418.4054	236928.	0.00				
6.4800	-0.00250	116315.	-11107.	-5.47E-04	0.00	3.85E+11
449.7658	194424.	0.00				
6.5700	-0.00309	104585.	-10606.	-5.47E-04	0.00	3.85E+11
476.5324	166598.	0.00				
6.6600	-0.00368	93410.	-10079.	-5.47E-04	0.00	3.85E+11
500.1848	146805.	0.00				
6.7500	-0.00427	82819.	-9527.	-5.46E-04	0.00	3.85E+11
521.5751	131923.	0.00				
6.8400	-0.00486	72836.	-8953.	-5.46E-04	0.00	3.85E+11
541.2425	120279.	0.00				
6.9300	-0.00545	63485.	-8359.	-5.46E-04	0.00	3.85E+11
559.5512	110892.	0.00				
7.0200	-0.00604	54786.	-7745.	-5.46E-04	0.00	3.85E+11
576.7596	103144.	0.00				
7.1100	-0.00663	46761.	-7113.	-5.46E-04	0.00	3.85E+11
593.0581	96628.	0.00				
7.2000	-0.00722	39426.	-6465.	-5.46E-04	0.00	3.85E+11
608.5912	91064.	0.00				
7.2900	-0.00781	32802.	-5799.	-5.45E-04	0.00	3.85E+11
623.4714	86251.	0.00				
7.3800	-0.00840	26905.	-5118.	-5.45E-04	0.00	3.85E+11
637.7881	82041.	0.00				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC1-7 (Boring B-004-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

7.4700	-0.00898	21752.	-4422.	-5.45E-04	0.00	3.85E+11
651.6133	78325.	0.00				
7.5600	-0.00957	17359.	-3711.	-5.45E-04	0.00	3.85E+11
665.0064	75019.	0.00				
7.6500	-0.01016	13741.	-2986.	-5.45E-04	0.00	3.85E+11
678.0166	72055.	0.00				
7.7400	-0.01075	10914.	-2247.	-5.45E-04	0.00	3.85E+11
690.6851	69381.	0.00				
7.8300	-0.01134	8893.	-1494.	-5.45E-04	0.00	3.85E+11
703.0469	66956.	0.00				
7.9200	-0.01193	7692.	-1082.	-5.45E-04	0.00	3.85E+11
59.4340	5381.	0.00				
8.0100	-0.01252	6561.	-1016.	-5.45E-04	0.00	3.85E+11
63.1782	5451.	0.00				
8.1000	-0.01311	5503.	-945.737	-5.45E-04	0.00	3.85E+11
66.9986	5521.	0.00				
8.1900	-0.01369	4523.	-871.274	-5.45E-04	0.00	3.85E+11
70.8953	5591.	0.00				
8.2800	-0.01428	3626.	-792.562	-5.45E-04	0.00	3.85E+11
74.8681	5661.	0.00				
8.3700	-0.01487	2816.	-709.518	-5.45E-04	0.00	3.85E+11
78.9172	5731.	0.00				
8.4600	-0.01546	2098.	-622.060	-5.45E-04	0.00	3.85E+11
83.0426	5801.	0.00				
8.5500	-0.01605	1477.	-530.105	-5.45E-04	0.00	3.85E+11
87.2441	5871.	0.00				
8.6400	-0.01664	957.8975	-433.571	-5.45E-04	0.00	3.85E+11
91.5220	5941.	0.00				
8.7300	-0.01723	545.4885	-332.376	-5.45E-04	0.00	3.85E+11
95.8761	6011.	0.00				
8.8200	-0.01782	244.9093	-226.438	-5.45E-04	0.00	3.85E+11
100.3065	6081.	0.00				
8.9100	-0.01840	61.3276	-115.673	-5.45E-04	0.00	3.85E+11
104.8131	6151.	0.00				
9.0000	-0.01899	0.00	0.00	-5.45E-04	0.00	3.85E+11
109.3961	3110.	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	=	0.04231404 inches
Computed slope at pile head	=	-0.0006096 radians
Maximum bending moment	=	346310. inch-lbs

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area

Light Tower NC1-7 (Boring B-004-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Maximum shear force = -12594. lbs
 Depth of maximum bending moment = 3.96000000 feet below pile head
 Depth of maximum shear force = 6.12000000 feet below pile head
 Number of iterations = 24
 Number of zero deflection points = 1
 Pile deflection at ground = 0.03505932 inches

 Pile-head Deflection vs. Pile Length for Load Case 1

Boundary Condition Type 1, Shear and Moment

Shear = 1000. lbs
 Moment = 315600. in-lbs
 Axial Load = 4200. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	0.04231404	346310.	-12594.
8.55000	0.04409123	345532.	-12758.
8.10000	0.05335984	344800.	-13071.
7.65000	0.09259015	342420.	-13886.
7.20000	0.23217778	338442.	-15178.
6.75000	0.72036064	336070.	-16869.
6.30000	2.40461686	336127.	-18888.
5.85000	14.76761820	352788.	-23692.

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

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

Shear force at pile head = 2250.0 lbs
 Applied moment at pile head = 724800.0 in-lbs
 Axial thrust load on pile head = 4600.0 lbs

Depth Res.	Soil Spr.	Deflect. Distrib.	Bending Moment	Shear Force	Slope S	Total Stress	Bending Stiffness	Soil p
X Es*H feet		y Lat. Load inches	in-lbs	lbs	radians	psi*	lb-in^2	

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC1-7 (Boring B-004-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

lb/inch	lb/inch	lb/inch				
-----	-----	-----	-----	-----	-----	-----
0.00	0.3969	724800.	2250.	-0.00528	0.00	3.83E+11
0.00	0.00	0.00				
0.09000	0.3912	727256.	2250.	-0.00527	0.00	3.83E+11
0.00	0.00	0.00				
0.1800	0.3855	729712.	2250.	-0.00527	0.00	3.83E+11
0.00	0.00	0.00				
0.2700	0.3798	732169.	2250.	-0.00527	0.00	3.83E+11
0.00	0.00	0.00				
0.3600	0.3741	734625.	2250.	-0.00527	0.00	3.83E+11
0.00	0.00	0.00				
0.4500	0.3685	737081.	2250.	-0.00526	0.00	3.83E+11
0.00	0.00	0.00				
0.5400	0.3628	739537.	2250.	-0.00526	0.00	3.83E+11
0.00	0.00	0.00				
0.6300	0.3571	741993.	2250.	-0.00526	0.00	3.83E+11
0.00	0.00	0.00				
0.7200	0.3514	744449.	2250.	-0.00526	0.00	3.83E+11
0.00	0.00	0.00				
0.8100	0.3457	746905.	2250.	-0.00526	0.00	3.83E+11
0.00	0.00	0.00				
0.9000	0.3401	749362.	2250.	-0.00525	0.00	3.83E+11
0.00	0.00	0.00				
0.9900	0.3344	751818.	2250.	-0.00525	0.00	3.83E+11
0.00	0.00	0.00				
1.0800	0.3287	754274.	2221.	-0.00525	0.00	3.83E+11
-53.982	177.3606	0.00				
1.1700	0.3230	756667.	2162.	-0.00525	0.00	3.83E+11
-54.556	182.3928	0.00				
1.2600	0.3174	758996.	2103.	-0.00525	0.00	3.83E+11
-55.116	187.5557	0.00				
1.3500	0.3117	761262.	2043.	-0.00524	0.00	3.83E+11
-55.662	192.8556	0.00				
1.4400	0.3060	763462.	1983.	-0.00524	0.00	3.83E+11
-56.194	198.2988	0.00				
1.5300	0.3004	765596.	1922.	-0.00524	0.00	3.83E+11
-56.710	203.8922	0.00				
1.6200	0.2947	767665.	1860.	-0.00524	0.00	3.83E+11
-57.212	209.6431	0.00				
1.7100	0.2891	769667.	1798.	-0.00524	0.00	3.83E+11
-57.697	215.5593	0.00				
1.8000	0.2834	771601.	1736.	-0.00523	0.00	3.83E+11
-58.167	221.6493	0.00				
1.8900	0.2778	773468.	1673.	-0.00523	0.00	3.83E+11
-58.621	227.9220	0.00				
1.9800	0.2721	775266.	1609.	-0.00523	0.00	3.83E+11
-59.058	234.3870	0.00				
2.0700	0.2665	776995.	1545.	-0.00523	0.00	3.83E+11

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area

Light Tower NC1-7 (Boring B-004-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

-59.478	241.0549	0.00				
2.1600	0.2608	778655.	1481.	-0.00522	0.00	3.83E+11
-59.880	247.9367	0.00				
2.2500	0.2552	780245.	1416.	-0.00522	0.00	3.83E+11
-60.265	255.0445	0.00				
2.3400	0.2496	781765.	1350.	-0.00522	0.00	3.83E+11
-60.631	262.3915	0.00				
2.4300	0.2439	783214.	1285.	-0.00522	0.00	3.83E+11
-60.978	269.9917	0.00				
2.5200	0.2383	784592.	1219.	-0.00522	0.00	3.83E+11
-61.306	277.8604	0.00				
2.6100	0.2327	785899.	1152.	-0.00521	0.00	3.83E+11
-61.613	286.0143	0.00				
2.7000	0.2270	787133.	1086.	-0.00521	0.00	3.83E+11
-61.900	294.4714	0.00				
2.7900	0.2214	788295.	1019.	-0.00521	0.00	3.83E+11
-62.166	303.2517	0.00				
2.8800	0.2158	789385.	951.4096	-0.00521	0.00	3.83E+11
-62.410	312.3766	0.00				
2.9700	0.2102	790402.	883.8874	-0.00520	0.00	3.83E+11
-62.631	321.8699	0.00				
3.0600	0.2045	791346.	816.1390	-0.00520	0.00	3.83E+11
-62.829	331.7575	0.00				
3.1500	0.1989	792217.	748.1900	-0.00520	0.00	3.83E+11
-63.002	342.0681	0.00				
3.2400	0.1933	793014.	680.0672	-0.00520	0.00	3.83E+11
-63.151	352.8333	0.00				
3.3300	0.1877	793737.	611.7981	-0.00520	0.00	3.83E+11
-63.273	364.0880	0.00				
3.4200	0.1821	794387.	543.4115	-0.00519	0.00	3.83E+11
-63.369	375.8712	0.00				
3.5100	0.1765	794963.	474.9370	-0.00519	0.00	3.83E+11
-63.436	388.2262	0.00				
3.6000	0.1709	795464.	406.4058	-0.00519	0.00	3.83E+11
-63.474	401.2013	0.00				
3.6900	0.1653	795892.	337.8501	-0.00519	0.00	3.83E+11
-63.481	414.8507	0.00				
3.7800	0.1597	796246.	269.3036	-0.00518	0.00	3.83E+11
-63.457	429.2357	0.00				
3.8700	0.1541	796525.	200.8017	-0.00518	0.00	3.83E+11
-63.399	444.4253	0.00				
3.9600	0.1485	796731.	132.3812	-0.00518	0.00	3.83E+11
-63.306	460.4978	0.00				
4.0500	0.1429	796863.	-483.160	-0.00518	0.00	3.83E+11
-1077.	8138.	0.00				
4.1400	0.1373	795739.	-1643.	-0.00518	0.00	3.83E+11
-1072.	8432.	0.00				
4.2300	0.1317	793365.	-2798.	-0.00517	0.00	3.83E+11
-1067.	8748.	0.00				
4.3200	0.1261	789746.	-3947.	-0.00517	0.00	3.83E+11

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area

Light Tower NC1-7 (Boring B-004-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

-1061.	9087.	0.00				
4.4100	0.1205	784890.	-5090.	-0.00517	0.00	3.83E+11
-1055.	9452.	0.00				
4.5000	0.1149	778803.	-6226.	-0.00517	0.00	3.83E+11
-1048.	9848.	0.00				
4.5900	0.1094	771494.	-7354.	-0.00516	0.00	3.83E+11
-1041.	10278.	0.00				
4.6800	0.1038	762971.	-8473.	-0.00516	0.00	3.83E+11
-1033.	10746.	0.00				
4.7700	0.09822	753243.	-9584.	-0.00516	0.00	3.83E+11
-1024.	11260.	0.00				
4.8600	0.09265	742321.	-10685.	-0.00516	0.00	3.83E+11
-1015.	11827.	0.00				
4.9500	0.08708	730215.	-11775.	-0.00516	0.00	3.83E+11
-1004.	12455.	0.00				
5.0400	0.08151	716938.	-12854.	-0.00515	0.00	3.83E+11
-992.957	13156.	0.00				
5.1300	0.07595	702503.	-13919.	-0.00515	0.00	3.83E+11
-980.627	13945.	0.00				
5.2200	0.07039	686923.	-14971.	-0.00515	0.00	3.83E+11
-967.123	14840.	0.00				
5.3100	0.06482	670216.	-16008.	-0.00515	0.00	3.84E+11
-952.289	15866.	0.00				
5.4000	0.05927	652398.	-17027.	-0.00515	0.00	3.84E+11
-935.933	17055.	0.00				
5.4900	0.05371	633489.	-18028.	-0.00514	0.00	3.84E+11
-917.808	18456.	0.00				
5.5800	0.04815	613508.	-19009.	-0.00514	0.00	3.84E+11
-897.599	20131.	0.00				
5.6700	0.04260	592481.	-19966.	-0.00514	0.00	3.84E+11
-874.885	22179.	0.00				
5.7600	0.03705	570434.	-20897.	-0.00514	0.00	3.84E+11
-849.087	24750.	0.00				
5.8500	0.03150	547396.	-21798.	-0.00514	0.00	3.84E+11
-819.376	28092.	0.00				
5.9400	0.02595	523402.	-22664.	-0.00514	0.00	3.84E+11
-784.491	32645.	0.00				
6.0300	0.02041	498493.	-23488.	-0.00513	0.00	3.84E+11
-742.361	39287.	0.00				
6.1200	0.01486	472719.	-24261.	-0.00513	0.00	3.84E+11
-689.155	50076.	0.00				
6.2100	0.00932	446140.	-24966.	-0.00513	0.00	3.84E+11
-616.273	71413.	0.00				
6.3000	0.00378	418843.	-25566.	-0.00513	0.00	3.84E+11
-494.258	141280.	0.00				
6.3900	-0.00176	390969.	-25611.	-0.00513	0.00	3.84E+11
409.7794	251147.	0.00				
6.4800	-0.00730	363573.	-25073.	-0.00513	0.00	3.84E+11
587.8928	86959.	0.00				
6.5700	-0.01284	336863.	-24388.	-0.00513	0.00	3.84E+11

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

680.2738	57221.	0.00				
6.6600	-0.01838	310946.	-23617.	-0.00513	0.00	3.84E+11
747.6074	43937.	0.00				
6.7500	-0.02391	285901.	-22780.	-0.00513	0.00	3.85E+11
802.2433	36232.	0.00				
6.8400	-0.02945	261792.	-21888.	-0.00512	0.00	3.85E+11
849.0632	31139.	0.00				
6.9300	-0.03498	238674.	-20949.	-0.00512	0.00	3.85E+11
890.5407	27493.	0.00				
7.0200	-0.04052	216594.	-19967.	-0.00512	0.00	3.85E+11
928.1158	24740.	0.00				
7.1100	-0.04605	195597.	-18946.	-0.00512	0.00	3.85E+11
962.7062	22578.	0.00				
7.2000	-0.05158	175722.	-17889.	-0.00512	0.00	3.85E+11
994.9354	20831.	0.00				
7.2900	-0.05711	157008.	-16798.	-0.00512	0.00	3.85E+11
1025.	19387.	0.00				
7.3800	-0.06265	139490.	-15675.	-0.00512	0.00	3.85E+11
1054.	18170.	0.00				
7.4700	-0.06818	123201.	-14522.	-0.00512	0.00	3.85E+11
1081.	17130.	0.00				
7.5600	-0.07371	108174.	-13340.	-0.00512	0.00	3.85E+11
1108.	16229.	0.00				
7.6500	-0.07924	94438.	-12130.	-0.00512	0.00	3.85E+11
1133.	15440.	0.00				
7.7400	-0.08477	82024.	-10893.	-0.00512	0.00	3.85E+11
1157.	14744.	0.00				
7.8300	-0.09030	70960.	-9631.	-0.00512	0.00	3.85E+11
1181.	14123.	0.00				
7.9200	-0.09583	61273.	-8735.	-0.00512	0.00	3.85E+11
477.4544	5381.	0.00				
8.0100	-0.101	52142.	-8201.	-0.00512	0.00	3.85E+11
511.5726	5451.	0.00				
8.1000	-0.107	43609.	-7630.	-0.00512	0.00	3.85E+11
546.4067	5521.	0.00				
8.1900	-0.112	35713.	-7021.	-0.00512	0.00	3.85E+11
581.9566	5591.	0.00				
8.2800	-0.118	28495.	-6372.	-0.00512	0.00	3.85E+11
618.2226	5661.	0.00				
8.3700	-0.123	21999.	-5685.	-0.00512	0.00	3.85E+11
655.2046	5731.	0.00				
8.4600	-0.129	16267.	-4957.	-0.00512	0.00	3.85E+11
692.9029	5801.	0.00				
8.5500	-0.135	11343.	-4188.	-0.00512	0.00	3.85E+11
731.3175	5871.	0.00				
8.6400	-0.140	7272.	-3381.	-0.00512	0.00	3.85E+11
762.1283	5877.	0.00				
8.7300	-0.146	4091.	-2552.	-0.00512	0.00	3.85E+11
772.7045	5732.	0.00				
8.8200	-0.151	1810.	-1712.	-0.00512	0.00	3.85E+11

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Light Tower NC1-7 (Boring B-004-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

782.9466	5595.	0.00				
8.9100	-0.157	442.5701	-861.484	-0.00512	0.00	3.85E+11
792.8663	5466.	0.00				
9.0000	-0.162	0.00	0.00	-0.00512	0.00	3.85E+11
802.4739	2672.	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	=	0.39691797 inches
Computed slope at pile head	=	-0.0052752 radians
Maximum bending moment	=	796863. inch-lbs
Maximum shear force	=	-25611. lbs
Depth of maximum bending moment	=	4.05000000 feet below pile head
Depth of maximum shear force	=	6.39000000 feet below pile head
Number of iterations	=	32
Number of zero deflection points	=	1
Pile deflection at ground	=	0.33375299 inches

Pile-head Deflection vs. Pile Length for Load Case 2

Boundary Condition Type 1, Shear and Moment

Shear	=	2250. lbs
Moment	=	724800. in-lbs
Axial Load	=	4600. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	0.39691797	796863.	-25611.
8.55000	0.55386835	791848.	-26956.
8.10000	0.99371074	787078.	-28825.
7.65000	2.24094767	782881.	-31391.
7.20000	5.92857258	781480.	-34820.

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC1-7 (Boring B-004-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

 Computed Values of Pile Loading and Deflection
 for Lateral Loading for Load Case Number 3

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

Shear force at pile head = 2250.0 lbs
 Applied moment at pile head = 724800.0 in-lbs
 Axial thrust load on pile head = 3800.0 lbs

Depth Res.	Soil X Es*H feet lb/inch	Deflect. Spr. y Lat. inches lb/inch	Bending Distrib. Moment Load in-lbs lb/inch	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness lb-in^2	Soil p
0.00	0.00	0.3964	724800.	2250.	-0.00527	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.09000	0.00	0.3907	727252.	2250.	-0.00527	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.1800	0.00	0.3850	729703.	2250.	-0.00526	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.2700	0.00	0.3793	732155.	2250.	-0.00526	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.3600	0.00	0.3736	734606.	2250.	-0.00526	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.4500	0.00	0.3680	737058.	2250.	-0.00526	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.5400	0.00	0.3623	739510.	2250.	-0.00526	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.6300	0.00	0.3566	741961.	2250.	-0.00525	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.7200	0.00	0.3509	744413.	2250.	-0.00525	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.8100	0.00	0.3453	746864.	2250.	-0.00525	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.9000	0.00	0.3396	749316.	2250.	-0.00525	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.9900	0.00	0.3339	751767.	2250.	-0.00525	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
1.0800	0.00	0.3283	754219.	2221.	-0.00524	0.00	3.83E+11	
-53.958	177.5190	0.00	0.00					
1.1700	0.00	0.3226	756607.	2162.	-0.00524	0.00	3.83E+11	
-54.532	182.5557	0.00	0.00					
1.2600	0.00	0.3170	758932.	2103.	-0.00524	0.00	3.83E+11	
-55.092	187.7234	0.00	0.00					
1.3500	0.00	0.3113	761193.	2043.	-0.00524	0.00	3.83E+11	

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area

Light Tower NC1-7 (Boring B-004-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

-55.637	193.0281	0.00				
1.4400	0.3056	763389.	1983.	-0.00523	0.00	3.83E+11
-56.169	198.4763	0.00				
1.5300	0.3000	765519.	1922.	-0.00523	0.00	3.83E+11
-56.685	204.0749	0.00				
1.6200	0.2943	767583.	1860.	-0.00523	0.00	3.83E+11
-57.186	209.8311	0.00				
1.7100	0.2887	769581.	1798.	-0.00523	0.00	3.83E+11
-57.671	215.7528	0.00				
1.8000	0.2830	771511.	1736.	-0.00523	0.00	3.83E+11
-58.141	221.8484	0.00				
1.8900	0.2774	773373.	1673.	-0.00522	0.00	3.83E+11
-58.595	228.1269	0.00				
1.9800	0.2718	775167.	1609.	-0.00522	0.00	3.83E+11
-59.031	234.5980	0.00				
2.0700	0.2661	776892.	1545.	-0.00522	0.00	3.83E+11
-59.451	241.2720	0.00				
2.1600	0.2605	778548.	1481.	-0.00522	0.00	3.83E+11
-59.853	248.1602	0.00				
2.2500	0.2548	780134.	1416.	-0.00522	0.00	3.83E+11
-60.238	255.2748	0.00				
2.3400	0.2492	781650.	1351.	-0.00521	0.00	3.83E+11
-60.604	262.6286	0.00				
2.4300	0.2436	783095.	1285.	-0.00521	0.00	3.83E+11
-60.950	270.2359	0.00				
2.5200	0.2380	784469.	1219.	-0.00521	0.00	3.83E+11
-61.278	278.1120	0.00				
2.6100	0.2323	785771.	1153.	-0.00521	0.00	3.83E+11
-61.585	286.2736	0.00				
2.7000	0.2267	787001.	1086.	-0.00520	0.00	3.83E+11
-61.872	294.7388	0.00				
2.7900	0.2211	788160.	1019.	-0.00520	0.00	3.83E+11
-62.138	303.5274	0.00				
2.8800	0.2155	789246.	951.9941	-0.00520	0.00	3.83E+11
-62.382	312.6610	0.00				
2.9700	0.2099	790259.	884.5026	-0.00520	0.00	3.83E+11
-62.603	322.1633	0.00				
3.0600	0.2043	791199.	816.7851	-0.00520	0.00	3.83E+11
-62.800	332.0604	0.00				
3.1500	0.1986	792066.	748.8671	-0.00519	0.00	3.83E+11
-62.974	342.3809	0.00				
3.2400	0.1930	792859.	680.7754	-0.00519	0.00	3.83E+11
-63.122	353.1564	0.00				
3.3300	0.1874	793579.	612.5376	-0.00519	0.00	3.83E+11
-63.244	364.4221	0.00				
3.4200	0.1818	794225.	544.1824	-0.00519	0.00	3.83E+11
-63.340	376.2167	0.00				
3.5100	0.1762	794797.	475.7394	-0.00518	0.00	3.83E+11
-63.407	388.5837	0.00				
3.6000	0.1706	795295.	407.2397	-0.00518	0.00	3.83E+11

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area

Light Tower NC1-7 (Boring B-004-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

-63.445	401.5715	0.00					
3.6900	0.1650	795719.	338.7157	-0.00518	0.00	3.83E+11	
-63.452	415.2344	0.00					
3.7800	0.1594	796069.	270.2009	-0.00518	0.00	3.83E+11	
-63.427	429.6336	0.00					
3.8700	0.1539	796345.	201.7307	-0.00518	0.00	3.83E+11	
-63.369	444.8382	0.00					
3.9600	0.1483	796547.	133.3421	-0.00517	0.00	3.83E+11	
-63.276	460.9268	0.00					
4.0500	0.1427	796676.	-481.979	-0.00517	0.00	3.83E+11	
-1076.	8146.	0.00					
4.1400	0.1371	795549.	-1642.	-0.00517	0.00	3.83E+11	
-1072.	8441.	0.00					
4.2300	0.1315	793172.	-2796.	-0.00517	0.00	3.83E+11	
-1066.	8757.	0.00					
4.3200	0.1259	789551.	-3945.	-0.00516	0.00	3.83E+11	
-1061.	9096.	0.00					
4.4100	0.1204	784693.	-5087.	-0.00516	0.00	3.83E+11	
-1055.	9462.	0.00					
4.5000	0.1148	778606.	-6222.	-0.00516	0.00	3.83E+11	
-1048.	9858.	0.00					
4.5900	0.1092	771296.	-7350.	-0.00516	0.00	3.83E+11	
-1040.	10289.	0.00					
4.6800	0.1036	762772.	-8469.	-0.00516	0.00	3.83E+11	
-1032.	10758.	0.00					
4.7700	0.09808	753044.	-9580.	-0.00515	0.00	3.83E+11	
-1024.	11273.	0.00					
4.8600	0.09251	742122.	-10680.	-0.00515	0.00	3.83E+11	
-1014.	11840.	0.00					
4.9500	0.08695	730018.	-11770.	-0.00515	0.00	3.83E+11	
-1004.	12469.	0.00					
5.0400	0.08139	716742.	-12848.	-0.00515	0.00	3.83E+11	
-992.591	13171.	0.00					
5.1300	0.07583	702308.	-13913.	-0.00514	0.00	3.83E+11	
-980.262	13960.	0.00					
5.2200	0.07028	686731.	-14965.	-0.00514	0.00	3.83E+11	
-966.759	14856.	0.00					
5.3100	0.06473	670027.	-16001.	-0.00514	0.00	3.84E+11	
-951.927	15884.	0.00					
5.4000	0.05917	652212.	-17020.	-0.00514	0.00	3.84E+11	
-935.572	17075.	0.00					
5.4900	0.05363	633306.	-18021.	-0.00514	0.00	3.84E+11	
-917.449	18477.	0.00					
5.5800	0.04808	613329.	-19001.	-0.00514	0.00	3.84E+11	
-897.241	20155.	0.00					
5.6700	0.04253	592307.	-19957.	-0.00513	0.00	3.84E+11	
-874.527	22206.	0.00					
5.7600	0.03699	570264.	-20888.	-0.00513	0.00	3.84E+11	
-848.730	24782.	0.00					
5.8500	0.03145	547231.	-21788.	-0.00513	0.00	3.84E+11	

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area

Light Tower NC1-7 (Boring B-004-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

-819.018	28129.	0.00				
5.9400	0.02591	523243.	-22654.	-0.00513	0.00	3.84E+11
-784.130	32690.	0.00				
6.0300	0.02037	498340.	-23478.	-0.00513	0.00	3.84E+11
-741.992	39345.	0.00				
6.1200	0.01483	472572.	-24251.	-0.00513	0.00	3.84E+11
-688.769	50160.	0.00				
6.2100	0.00929	446000.	-24955.	-0.00513	0.00	3.84E+11
-615.841	71563.	0.00				
6.3000	0.00376	418710.	-25554.	-0.00512	0.00	3.84E+11
-493.642	141809.	0.00				
6.3900	-0.00177	390845.	-25599.	-0.00512	0.00	3.84E+11
410.4543	249922.	0.00				
6.4800	-0.00731	363458.	-25060.	-0.00512	0.00	3.84E+11
587.9804	86920.	0.00				
6.5700	-0.01284	336756.	-24375.	-0.00512	0.00	3.84E+11
680.2354	57231.	0.00				
6.6600	-0.01837	310849.	-23604.	-0.00512	0.00	3.84E+11
747.5042	43955.	0.00				
6.7500	-0.02390	285813.	-22768.	-0.00512	0.00	3.85E+11
802.0974	36252.	0.00				
6.8400	-0.02942	261713.	-21876.	-0.00512	0.00	3.85E+11
848.8857	31158.	0.00				
6.9300	-0.03495	238602.	-20937.	-0.00512	0.00	3.85E+11
890.3378	27512.	0.00				
7.0200	-0.04048	216531.	-19955.	-0.00512	0.00	3.85E+11
927.8917	24757.	0.00				
7.1100	-0.04600	195541.	-18934.	-0.00512	0.00	3.85E+11
962.4639	22595.	0.00				
7.2000	-0.05153	175675.	-17877.	-0.00512	0.00	3.85E+11
994.6769	20848.	0.00				
7.2900	-0.05705	156968.	-16787.	-0.00512	0.00	3.85E+11
1025.	19402.	0.00				
7.3800	-0.06258	139457.	-15664.	-0.00511	0.00	3.85E+11
1054.	18185.	0.00				
7.4700	-0.06810	123175.	-14512.	-0.00511	0.00	3.85E+11
1081.	17144.	0.00				
7.5600	-0.07363	108154.	-13330.	-0.00511	0.00	3.85E+11
1107.	16243.	0.00				
7.6500	-0.07915	94424.	-12120.	-0.00511	0.00	3.85E+11
1133.	15454.	0.00				
7.7400	-0.08467	82016.	-10884.	-0.00511	0.00	3.85E+11
1157.	14756.	0.00				
7.8300	-0.09019	70957.	-9622.	-0.00511	0.00	3.85E+11
1181.	14136.	0.00				
7.9200	-0.09572	61274.	-8727.	-0.00511	0.00	3.85E+11
476.8989	5381.	0.00				
8.0100	-0.101	52148.	-8193.	-0.00511	0.00	3.85E+11
510.9733	5451.	0.00				
8.1000	-0.107	43618.	-7623.	-0.00511	0.00	3.85E+11

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC1-7 (Boring B-004-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

545.7627	5521.	0.00				
8.1900	-0.112	35725.	-7014.	-0.00511	0.00	3.85E+11
581.2670	5591.	0.00				
8.2800	-0.118	28510.	-6367.	-0.00511	0.00	3.85E+11
617.4864	5661.	0.00				
8.3700	-0.123	22014.	-5680.	-0.00511	0.00	3.85E+11
654.4209	5731.	0.00				
8.4600	-0.129	16283.	-4953.	-0.00511	0.00	3.85E+11
692.0708	5801.	0.00				
8.5500	-0.134	11358.	-4185.	-0.00511	0.00	3.85E+11
730.4360	5871.	0.00				
8.6400	-0.140	7285.	-3379.	-0.00511	0.00	3.85E+11
761.6492	5880.	0.00				
8.7300	-0.145	4101.	-2551.	-0.00511	0.00	3.85E+11
772.2117	5735.	0.00				
8.8200	-0.151	1818.	-1711.	-0.00511	0.00	3.85E+11
782.4401	5599.	0.00				
8.9100	-0.156	446.7093	-860.914	-0.00511	0.00	3.85E+11
792.3461	5469.	0.00				
9.0000	-0.162	0.00	0.00	-0.00511	0.00	3.85E+11
801.9399	2673.	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. 3:

Pile-head deflection	=	0.39639109 inches
Computed slope at pile head	=	-0.0052685 radians
Maximum bending moment	=	796676. inch-lbs
Maximum shear force	=	-25599. lbs
Depth of maximum bending moment	=	4.05000000 feet below pile head
Depth of maximum shear force	=	6.39000000 feet below pile head
Number of iterations	=	32
Number of zero deflection points	=	1
Pile deflection at ground	=	0.33330688 inches

 Pile-head Deflection vs. Pile Length for Load Case 3

Boundary Condition Type 1, Shear and Moment

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC1-7 (Boring B-004-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Shear = 2250. lbs
 Moment = 724800. in-lbs
 Axial Load = 3800. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment in-lbs	Maximum Shear lbs
9.00000	0.39639109	796676.	-25599.
8.55000	0.55273806	791597.	-26939.
8.10000	0.98944731	786670.	-28791.
7.65000	2.21800639	782022.	-31305.
7.20000	5.76322951	779288.	-34559.
6.75000	23.48352721	800150.	-41452.

 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

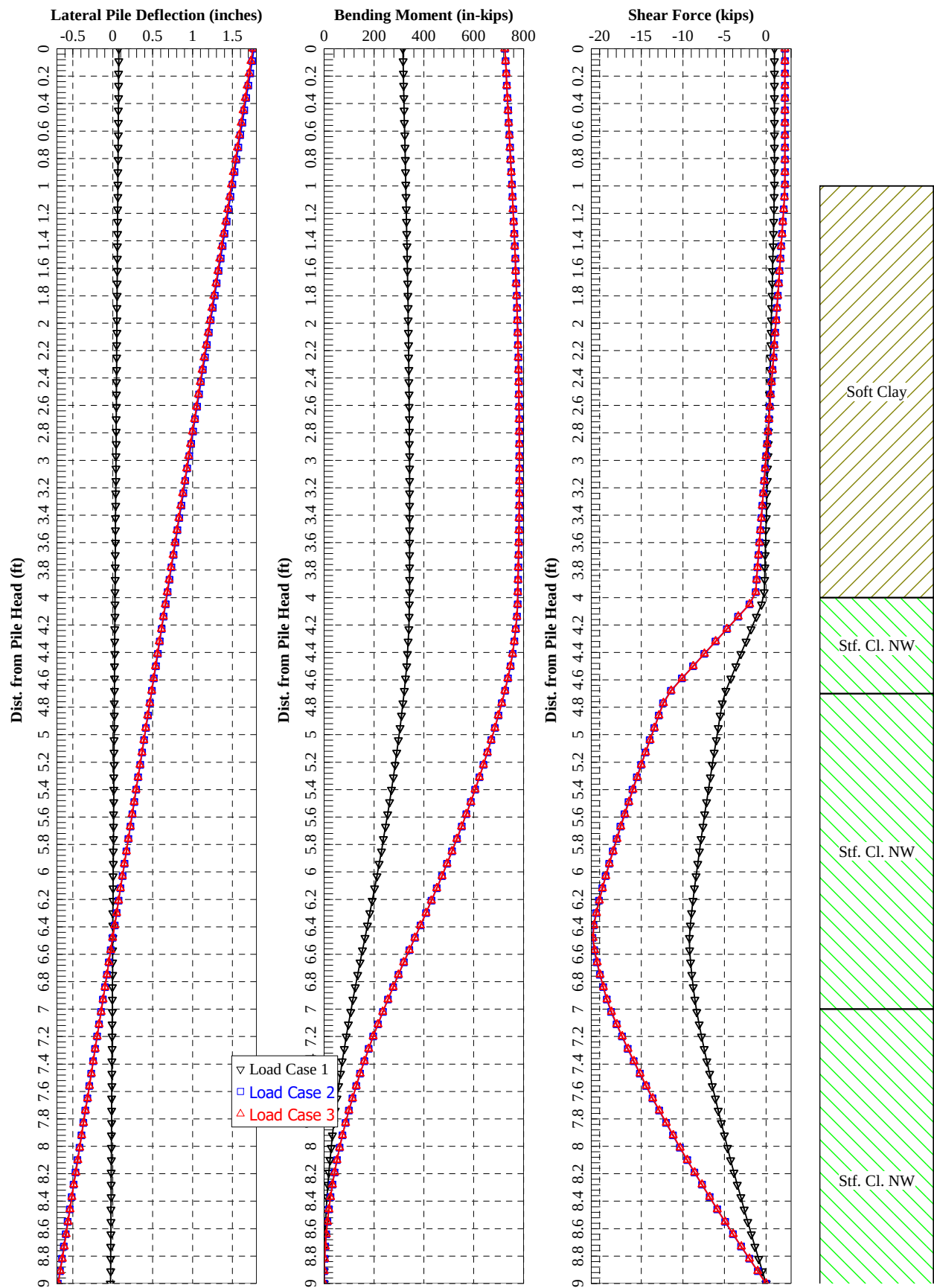
Load Case	Load Type	Load 1	Load 2	Axial Loading	Pile-head Deflection	Pile-head Rotation	Max in lbs
No.		Load 1	2	lbs	inches	radians	
1	V, lb	1000.0000	M, in-lb	4200.	0.04231	-6.10E-04	
-12594.		346310.					
2	V, lb	2250.	M, in-lb	4600.	0.3969	-0.00528	
-25611.		796863.					
3	V, lb	2250.	M, in-lb	3800.	0.3964	-0.00527	
-25599.		796676.					

Maximum pile-head deflection = 0.3969179683 inches
 Maximum pile-head rotation = -0.0052752426 radians = -0.302249 deg.

The analysis ended normally.

LATERAL LOAD (LPILE) ANALYSES
NORTHBOUND PARKING AREA
LIGHT TOWER NC2-7 (B-005-0-25)

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
Light Tower NC2-7 (Boring B-005-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation



TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
Light Tower NC2-7 (Boring B-005-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

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LPILE for Version 2022-12.012

License ID : 228332755
License Type : (Single User License)

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:
\Columbus-1170\Projects\2024\24170232_ms_TP 26 NE Ohio\GEO\Project Docs\Site
15_SUM-271 (2LMN)\Calcs\Light Towers\LPILE (Final Report)\NB\

Name of input data file:
Tower NC2-7 (B-005).lp12d

Name of output report file:
Tower NC2-7 (B-005).lp12o

Name of plot output file:
Tower NC2-7 (B-005).lp12p

Name of runtime message file:
Tower NC2-7 (B-005).lp12r

Date and Time of Analysis

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
Light Tower NC2-7 (Boring B-005-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Date: April 8, 2026

Time: 20:16:21

Problem Title

Project Name: TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas

Job Number: 24170232F

Client: ms consultants, inc.

Engineer: BKS

Description: Light Tower NC2-7 (B-005-0-25)

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

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- 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	=	9.000 ft
Depth of ground surface below top of pile	=	1.0000 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.

Point No.	Depth Below Pile Head feet	Pile Diameter inches
-----	-----	-----
1	0.000	36.0000
2	9.000	36.0000

Input Structural Properties for Pile Sections:

Pile Section No. 1:

Section 1 is a round drilled shaft, bored pile, or CIDH pile	
Length of section	= 9.000000 ft
Shaft Diameter	= 36.000000 in

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Soil and Rock Layering Information

The soil profile is modelled using 9 layers

Layer 1 is soft clay, p-y criteria by Matlock, 1970

Distance from top of pile to top of layer	=	1.000000 ft
Distance from top of pile to bottom of layer	=	4.000000 ft
Effective unit weight at top of layer	=	98.000000 pcf
Effective unit weight at bottom of layer	=	98.000000 pcf
Undrained cohesion at top of layer	=	250.000000 psf
Undrained cohesion at bottom of layer	=	250.000000 psf
Epsilon-50 at top of layer	=	0.020000
Epsilon-50 at bottom of layer	=	0.020000

Layer 2 is stiff clay without free water

Distance from top of pile to top of layer	=	4.000000 ft
Distance from top of pile to bottom of layer	=	4.700000 ft
Effective unit weight at top of layer	=	56.000000 pcf
Effective unit weight at bottom of layer	=	56.000000 pcf
Undrained cohesion at top of layer	=	3000. psf
Undrained cohesion at bottom of layer	=	3000. psf
Epsilon-50 at top of layer	=	0.005000
Epsilon-50 at bottom of layer	=	0.005000

Layer 3 is stiff clay without free water

Distance from top of pile to top of layer	=	4.700000 ft
Distance from top of pile to bottom of layer	=	7.000000 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	=	1200. psf
Undrained cohesion at bottom of layer	=	1200. psf
Epsilon-50 at top of layer	=	0.007000
Epsilon-50 at bottom of layer	=	0.007000

Layer 4 is stiff clay without free water

Distance from top of pile to top of layer	=	7.000000 ft
Distance from top of pile to bottom of layer	=	9.500000 ft
Effective unit weight at top of layer	=	58.000000 pcf

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Effective unit weight at bottom of layer	=	58.000000	pcf
Undrained cohesion at top of layer	=	1800.	psf
Undrained cohesion at bottom of layer	=	1800.	psf
Epsilon-50 at top of layer	=	0.007000	
Epsilon-50 at bottom of layer	=	0.007000	

Layer 5 is stiff clay without free water

Distance from top of pile to top of layer	=	9.500000	ft
Distance from top of pile to bottom of layer	=	12.000000	ft
Effective unit weight at top of layer	=	68.000000	pcf
Effective unit weight at bottom of layer	=	68.000000	pcf
Undrained cohesion at top of layer	=	4500.	psf
Undrained cohesion at bottom of layer	=	4500.	psf
Epsilon-50 at top of layer	=	0.004000	
Epsilon-50 at bottom of layer	=	0.004000	

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

Distance from top of pile to top of layer	=	12.000000	ft
Distance from top of pile to bottom of layer	=	14.500000	ft
Effective unit weight at top of layer	=	58.000000	pcf
Effective unit weight at bottom of layer	=	58.000000	pcf
Friction angle at top of layer	=	32.000000	deg.
Friction angle at bottom of layer	=	32.000000	deg.
Subgrade k at top of layer	=	20.000000	pci
Subgrade k at bottom of layer	=	20.000000	pci

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

Distance from top of pile to top of layer	=	14.500000	ft
Distance from top of pile to bottom of layer	=	17.000000	ft
Effective unit weight at top of layer	=	63.000000	pcf
Effective unit weight at bottom of layer	=	63.000000	pcf
Friction angle at top of layer	=	36.000000	deg.
Friction angle at bottom of layer	=	36.000000	deg.
Subgrade k at top of layer	=	60.000000	pci
Subgrade k at bottom of layer	=	60.000000	pci

Layer 8 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer	=	17.000000	ft
Distance from top of pile to bottom of layer	=	19.500000	ft
Effective unit weight at top of layer	=	70.000000	pcf
Effective unit weight at bottom of layer	=	70.000000	pcf
Friction angle at top of layer	=	35.000000	deg.

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Friction angle at bottom of layer = 35.000000 deg.
 Subgrade k at top of layer = 125.000000 pci
 Subgrade k at bottom of layer = 125.000000 pci

Layer 9 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer = 19.500000 ft
 Distance from top of pile to bottom of layer = 21.500000 ft
 Effective unit weight at top of layer = 70.000000 pcf
 Effective unit weight at bottom of layer = 70.000000 pcf
 Friction angle at top of layer = 34.000000 deg.
 Friction angle at bottom of layer = 34.000000 deg.
 Subgrade k at top of layer = 125.000000 pci
 Subgrade k at bottom of layer = 125.000000 pci

(Depth of the lowest soil layer extends 12.500 ft below the pile tip)

 Summary of Input Soil Properties

Layer E50 Num. or krm	Soil Type Name kpy (p-y Curve Type) pci	Layer Depth ft	Effective Unit Wt. pcf	Cohesion psf	Angle of Friction deg.
1 0.02000	Soft --	1.0000	98.0000	250.0000	--
0.02000	Clay --	4.0000	98.0000	250.0000	--
2 0.00500	Stiff Clay --	4.0000	56.0000	3000.	--
0.00500	w/o Free Water --	4.7000	56.0000	3000.	--
3 0.00700	Stiff Clay --	4.7000	60.0000	1200.	--
0.00700	w/o Free Water --	7.0000	60.0000	1200.	--
4 0.00700	Stiff Clay --	7.0000	58.0000	1800.	--
0.00700	w/o Free Water --	9.5000	58.0000	1800.	--
5 0.00700	Stiff Clay	9.5000	68.0000	4500.	--

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0.00400	--				
	w/o Free Water	12.0000	68.0000	4500.	--
0.00400	--				
6	Sand	12.0000	58.0000	--	32.0000
--	20.0000				
	(Reese, et al.)	14.5000	58.0000	--	32.0000
--	20.0000				
7	Sand	14.5000	63.0000	--	36.0000
--	60.0000				
	(Reese, et al.)	17.0000	63.0000	--	36.0000
--	60.0000				
8	Sand	17.0000	70.0000	--	35.0000
--	125.0000				
	(Reese, et al.)	19.5000	70.0000	--	35.0000
--	125.0000				
9	Sand	19.5000	70.0000	--	34.0000
--	125.0000				
	(Reese, et al.)	21.5000	70.0000	--	34.0000
--	125.0000				

 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 = 3

Load Compute No.	Load Top y Type	Condition Run Analysis 1	Condition 2	Axial Thrust Force, lbs
vs. Pile Length				
1	1	V = 1000.000000 lbs	M = 315600. in-lbs	4200.
Yes		Yes		
2	1	V = 2250. lbs	M = 724800. in-lbs	4600.
Yes		Yes		
3	1	V = 2250. lbs	M = 724800. in-lbs	3800.
Yes		Yes		

V = shear force applied normal to pile axis

M = bending moment applied to pile head

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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:

Dimensions and Properties of Drilled Shaft (Bored Pile):

Length of Section	=	9.000000 ft
Shaft Diameter	=	36.000000 in
Concrete Cover Thickness (to edge of trans. reinf.)	=	3.500000 in
Number of Reinforcing Bars	=	16 bars
Yield Stress of Reinforcing Bars	=	60000. psi
Modulus of Elasticity of Reinforcing Bars	=	29000000. psi
Gross Area of Shaft	=	1018. sq. in.
Total Area of Reinforcing Steel	=	16.000000 sq. in.
Area Ratio of Steel Reinforcement	=	1.57 percent
Edge-to-Edge Bar Spacing	=	4.114467 in
Maximum Concrete Aggregate Size	=	0.750000 in
Ratio of Bar Spacing to Aggregate Size	=	5.49
Offset of Center of Rebar Cage from Center of Pile	=	0.0000 in
Transverse Reinforcement		
Type: Spiral		
Number of Transverse Reinf. (per spacing)	=	1
Spacing of Transverse Reinf.	=	4.500000 in
Yield Stress of Transverse Reinf.	=	60000. psi
Diameter of Transverse Reinf.	=	0.500000 in

Axial Structural Capacities:

Nom. Axial Structural Capacity = $0.85 F_c A_c + F_y A_s$	=	4366.378 kips
Tensile Load for Cracking of Concrete	=	-470.222 kips
Nominal Axial Tensile Capacity	=	-960.000 kips

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Reinforcing Bar Dimensions and Positions Used in Computations:

Bar Number	Bar Diam. inches	Bar Area sq. in.	X inches	Y inches
-----	-----	-----	-----	-----
1	1.128000	1.000000	13.436000	0.000000
2	1.128000	1.000000	12.413245	5.141735
3	1.128000	1.000000	9.500687	9.500687
4	1.128000	1.000000	5.141735	12.413245
5	1.128000	1.000000	0.000000	13.436000
6	1.128000	1.000000	-5.14173	12.413245
7	1.128000	1.000000	-9.50069	9.500687
8	1.128000	1.000000	-12.41325	5.141735
9	1.128000	1.000000	-13.43600	0.000000
10	1.128000	1.000000	-12.41325	-5.14173
11	1.128000	1.000000	-9.50069	-9.50069
12	1.128000	1.000000	-5.14173	-12.41325
13	1.128000	1.000000	0.000000	-13.43600
14	1.128000	1.000000	5.141735	-12.41325
15	1.128000	1.000000	9.500687	-9.50069
16	1.128000	1.000000	12.413245	-5.14173

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

Minimum spacing between any two bars not equal to zero = 4.114 inches
 between bars 11 and 12.

Ratio of bar spacing to maximum aggregate size = 5.49

Concrete Properties:

Compressive Strength of Concrete	=	4000. psi
Modulus of Elasticity of Concrete	=	3604997. psi
Modulus of Rupture of Concrete	=	-474.34165 psi
Compression Strain at Peak Stress	=	0.001886
Tensile Strain at Fracture of Concrete	=	-0.0001154
Maximum Coarse Aggregate Size	=	0.750000 in

Number of Axial Thrust Force Values Determined from Pile-head Loadings = 3

Number	Axial Thrust Force kips
-----	-----
1	3.800
2	4.200

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3

4.600

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 318-14, Section 21.2.3.

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 = 3.800 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
-----	-----	-----	-----	-----	-----
6.25000E-07	240.5062135	384809942.	19.2929823	0.00001206	-0.00001044
0.0505030	0.2746478				
0.00000125	480.1472468	384117797.	18.6479768	0.00002331	-0.00002169
0.0973082	0.5259142				
0.00000188	718.9174733	383422652.	18.4329804	0.00003456	-0.00003294
0.1438345	0.7771808				
0.00000250	956.8168886	382726755.	18.3254857	0.00004581	-0.00004419
0.1900818	1.0284477				
0.00000313	1194.	382030558.	18.2609917	0.00005707	-0.00005543
0.2360502	1.2797149				
0.00000375	1430.	381334209.	18.2179981	0.00006832	-0.00006668
0.2817396	1.5309823				
0.00000438	1665.	380637775.	18.1872904	0.00007957	-0.00007793
0.3271500	1.7822500				
0.00000500	1900.	379941287.	18.1642614	0.00009082	-0.00008918
0.3722815	2.0335179				
0.00000563	2133.	379244764.	18.1463515	0.0001021	-0.000100
0.4171340	2.2847861				
0.00000625	2366.	378548215.	18.1320251	0.0001133	-0.000112
0.4617075	2.5360546				

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0.00000688	2366.	344134741.	10.2494785	0.00007047	-0.000177
0.2882187	-4.308598 C				
0.00000750	2366.	315456846.	10.2198771	0.00007665	-0.000193
0.3129821	-4.706727 C				
0.00000813	2366.	291190934.	10.1952302	0.00008284	-0.000210
0.3376758	-5.104761 C				
0.00000875	2366.	270391582.	10.1744772	0.00008903	-0.000226
0.3622998	-5.502701 C				
0.00000938	2366.	252365477.	10.1568402	0.00009522	-0.000242
0.3868539	-5.900547 C				
0.00001000	2366.	236592634.	10.1417358	0.0001014	-0.000259
0.4113380	-6.298297 C				
0.00001063	2366.	222675420.	10.1287027	0.0001076	-0.000275
0.4357521	-6.695951 C				
0.00001125	2366.	210304564.	10.1174231	0.0001138	-0.000291
0.4600960	-7.093510 C				
0.00001188	2366.	199235903.	10.1076093	0.0001200	-0.000307
0.4843696	-7.490973 C				
0.00001250	2366.	189274107.	10.0990420	0.0001262	-0.000324
0.5085729	-7.888340 C				
0.00001313	2366.	180261055.	10.0915439	0.0001325	-0.000340
0.5327056	-8.285611 C				
0.00001375	2366.	172067370.	10.0849699	0.0001387	-0.000356
0.5567678	-8.682785 C				
0.00001438	2366.	164586180.	10.0792000	0.0001449	-0.000373
0.5807594	-9.079861 C				
0.00001500	2366.	157728423.	10.0741344	0.0001511	-0.000389
0.6046801	-9.476841 C				
0.00001563	2366.	151419286.	10.0696892	0.0001573	-0.000405
0.6285300	-9.873723 C				
0.00001625	2366.	145595467.	10.0657933	0.0001636	-0.000421
0.6523089	-10.270507 C				
0.00001688	2366.	140203043.	10.0623863	0.0001698	-0.000438
0.6760167	-10.667193 C				
0.00001750	2366.	135195791.	10.0594163	0.0001760	-0.000454
0.6996534	-11.063781 C				
0.00001813	2366.	130533867.	10.0568387	0.0001823	-0.000470
0.7232187	-11.460271 C				
0.00001875	2366.	126182738.	10.0546147	0.0001885	-0.000486
0.7467127	-11.856661 C				
0.00001938	2366.	122112327.	10.0527107	0.0001948	-0.000503
0.7701352	-12.252952 C				
0.00002000	2366.	118296317.	10.0510970	0.0002010	-0.000519
0.7934860	-12.649144 C				
0.00002063	2366.	114711580.	10.0497478	0.0002073	-0.000535
0.8167652	-13.045236 C				
0.00002125	2366.	111337710.	10.0486401	0.0002135	-0.000551
0.8399726	-13.441228 C				
0.00002188	2366.	108156633.	10.0477539	0.0002198	-0.000568
0.8631080	-13.837120 C				

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0.00002250	2366.	105152282.	10.0470709	0.0002261	-0.000584
0.8861714	-14.232911 C				
0.00002313	2366.	102310328.	10.0465752	0.0002323	-0.000600
0.9091627	-14.628602 C				
0.00002375	2366.	99617951.	10.0462524	0.0002386	-0.000616
0.9320817	-15.024191 C				
0.00002438	2366.	97063645.	10.0460897	0.0002449	-0.000633
0.9549284	-15.419678 C				
0.00002563	2429.	94800037.	10.0461990	0.0002574	-0.000665
1.0004043	-16.210348 C				
0.00002688	2545.	94692477.	10.0468231	0.0002700	-0.000697
1.0455896	-17.000609 C				
0.00002813	2660.	94589756.	10.0479254	0.0002826	-0.000730
1.0904832	-17.790458 C				
0.00002938	2776.	94491232.	10.0493946	0.0002952	-0.000762
1.1350844	-18.579893 C				
0.00003063	2891.	94396370.	10.0512127	0.0003078	-0.000795
1.1793922	-19.368912 C				
0.00003188	3006.	94304718.	10.0533415	0.0003205	-0.000827
1.2234058	-20.157511 C				
0.00003313	3121.	94215891.	10.0557483	0.0003331	-0.000859
1.2671243	-20.945689 C				
0.00003438	3236.	94129561.	10.0584054	0.0003458	-0.000892
1.3105466	-21.733443 C				
0.00003563	3350.	94045446.	10.0612887	0.0003584	-0.000924
1.3536720	-22.520771 C				
0.00003688	3465.	93963300.	10.0643778	0.0003711	-0.000956
1.3964994	-23.307669 C				
0.00003813	3579.	93882912.	10.0676547	0.0003838	-0.000989
1.4390279	-24.094136 C				
0.00003938	3694.	93804096.	10.0711039	0.0003965	-0.001021
1.4812567	-24.880169 C				
0.00004063	3808.	93726688.	10.0747116	0.0004093	-0.001053
1.5231846	-25.665765 C				
0.00004188	3922.	93650546.	10.0784659	0.0004220	-0.001085
1.5648108	-26.450921 C				
0.00004313	4035.	93575540.	10.0823562	0.0004348	-0.001118
1.6061342	-27.235635 C				
0.00004438	4149.	93501560.	10.0863731	0.0004476	-0.001150
1.6471540	-28.019904 C				
0.00004563	4263.	93428502.	10.0905084	0.0004604	-0.001182
1.6878690	-28.803725 C				
0.00004688	4376.	93356279.	10.0947545	0.0004732	-0.001214
1.7282784	-29.587096 C				
0.00004813	4489.	93284807.	10.0991050	0.0004860	-0.001246
1.7683810	-30.370013 C				
0.00004938	4602.	93214014.	10.1035538	0.0004989	-0.001279
1.8081759	-31.152474 C				
0.00005063	4715.	93143835.	10.1080956	0.0005117	-0.001311
1.8476620	-31.934476 C				

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0.00005188	4828.	93074209.	10.1127258	0.0005246	-0.001343
1.8868384	-32.716016 C				
0.00005313	4941.	93005082.	10.1174399	0.0005375	-0.001375
1.9257039	-33.497091 C				
0.00005438	5053.	92936405.	10.1222340	0.0005504	-0.001407
1.9642575	-34.277698 C				
0.00005563	5166.	92868132.	10.1271047	0.0005633	-0.001439
2.0024981	-35.057833 C				
0.00005688	5278.	92800222.	10.1320488	0.0005763	-0.001471
2.0404247	-35.837495 C				
0.00005813	5390.	92732637.	10.1370633	0.0005892	-0.001503
2.0780361	-36.616679 C				
0.00005938	5502.	92665342.	10.1421457	0.0006022	-0.001535
2.1153313	-37.395383 C				
0.00006063	5614.	92598305.	10.1472935	0.0006152	-0.001567
2.1523092	-38.173604 C				
0.00006188	5725.	92531497.	10.1525046	0.0006282	-0.001599
2.1889685	-38.951338 C				
0.00006313	5837.	92464888.	10.1577769	0.0006412	-0.001631
2.2253083	-39.728581 C				
0.00006438	5948.	92398455.	10.1631088	0.0006543	-0.001663
2.2613274	-40.505332 C				
0.00006563	6059.	92332173.	10.1684984	0.0006673	-0.001695
2.2970245	-41.281586 C				
0.00006688	6170.	92266020.	10.1739444	0.0006804	-0.001727
2.3323987	-42.057340 C				
0.00006813	6281.	92199976.	10.1794453	0.0006935	-0.001759
2.3674485	-42.832591 C				
0.00006938	6392.	92134020.	10.1849998	0.0007066	-0.001791
2.4021730	-43.607335 C				
0.00007063	6502.	92068136.	10.1906070	0.0007197	-0.001823
2.4365708	-44.381568 C				
0.00007188	6613.	92002305.	10.1962656	0.0007329	-0.001855
2.4706408	-45.155288 C				
0.00007313	6723.	91936511.	10.2020028	0.0007460	-0.001886
2.5043818	-45.928490 C				
0.00007438	6833.	91870742.	10.2077616	0.0007592	-0.001918
2.5377924	-46.701172 C				
0.00007938	7271.	91607617.	10.2312788	0.0008121	-0.002045
2.6681070	-49.786612 C				
0.00008438	7707.	91343844.	10.2555391	0.0008653	-0.002172
2.7930345	-52.863415 C				
0.00008938	8140.	91079227.	10.2796933	0.0009187	-0.002299
2.9123325	-55.933382 C				
0.00009438	8570.	90813004.	10.3043877	0.0009725	-0.002425
3.0260259	-58.995009 C				
0.00009938	8979.	90357411.	10.3225581	0.0010258	-0.002552
3.1326575	-60.000000 CY				
0.0001044	9304.	89144470.	10.3110511	0.0010762	-0.002681
3.2276850	-60.000000 CY				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC2-7 (Boring B-005-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0001094	9546.	87273573.	10.2718035	0.0011235	-0.002814
3.3116704	-60.000000 CY				
0.0001144	9782.	85523680.	10.2357064	0.0011707	-0.002947
3.3907664	-60.000000 CY				
0.0001194	10004.	83800225.	10.1987328	0.0012175	-0.003080
3.4643165	-60.000000 CY				
0.0001244	10154.	81641326.	10.1374818	0.0012608	-0.003217
3.5282172	-60.000000 CY				
0.0001294	10287.	79513660.	10.0756441	0.0013035	-0.003354
3.5871212	-60.000000 CY				
0.0001344	10419.	77536664.	10.0197410	0.0013464	-0.003491
3.6423258	-60.000000 CY				
0.0001394	10550.	75693983.	9.9691573	0.0013895	-0.003628
3.6937845	-60.000000 CY				
0.0001444	10680.	73971519.	9.9233661	0.0014327	-0.003765
3.7414497	-60.000000 CY				
0.0001494	10808.	72355946.	9.8810316	0.0014760	-0.003902
3.7851328	-60.000000 CY				
0.0001544	10925.	70772035.	9.8368433	0.0015186	-0.004039
3.8241552	-60.000000 CY				
0.0001594	11008.	69072220.	9.7809580	0.0015588	-0.004179
3.8574366	-60.000000 CY				
0.0001644	11071.	67351790.	9.7204156	0.0015978	-0.004320
3.8862696	-60.000000 CY				
0.0001694	11131.	65719446.	9.6635689	0.0016368	-0.004461
3.9118664	-60.000000 CY				
0.0001744	11191.	64176802.	9.6094393	0.0016756	-0.004602
3.9342902	-60.000000 CY				
0.0001794	11250.	62716278.	9.5601863	0.0017149	-0.004743
3.9535015	-60.000000 CY				
0.0001844	11308.	61329164.	9.5136161	0.0017541	-0.004883
3.9693617	-60.000000 CY				
0.0001894	11364.	60009896.	9.4690774	0.0017932	-0.005024
3.9819050	-60.000000 CY				
0.0001944	11420.	58754909.	9.4280227	0.0018326	-0.005165
3.9911986	-60.000000 CY				
0.0001994	11476.	57559296.	9.3897594	0.0018721	-0.005305
3.9971986	-60.000000 CY				
0.0002044	11531.	56418622.	9.3531932	0.0019116	-0.005446
3.9998595	-60.000000 CY				
0.0002094	11584.	55328385.	9.3201259	0.0019514	-0.005586
3.9974517	-60.000000 CY				
0.0002144	11637.	54285454.	9.2909722	0.0019918	-0.005726
3.9998812	-60.000000 CY				
0.0002194	11690.	53285909.	9.2626721	0.0020320	-0.005866
3.9969940	-60.000000 CY				
0.0002244	11740.	52321336.	9.2356724	0.0020723	-0.006005
3.9997138	-60.000000 CY				
0.0002294	11786.	51384137.	9.2093226	0.0021124	-0.006145
3.9955528	-60.000000 CY				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0002344	11823.	50445667.	9.1796872	0.0021515	-0.006286
3.9989818	-60.000000 CY				
0.0002394	11855.	49524943.	9.1473565	0.0021896	-0.006428
3.9994466	-60.000000 CY				
0.0002444	11876.	48598228.	9.1109548	0.0022265	-0.006571
3.9965160	-60.000000 CY				
0.0002494	11895.	47701101.	9.0745971	0.0022630	-0.006715
3.9991770	-60.000000 CY				
0.0002544	11912.	46829816.	9.0405915	0.0022997	-0.006858
3.9995775	-60.000000 CY				
0.0002594	11929.	45990067.	9.0077660	0.0023364	-0.007001
3.9954763	-60.000000 CY				
0.0002644	11945.	45181124.	8.9766457	0.0023732	-0.007144
3.9984997	-60.000000 CY				
0.0002694	11961.	44401256.	8.9468563	0.0024101	-0.007287
3.9998981	-60.000000 CY				
0.0002744	11976.	43648250.	8.9191370	0.0024472	-0.007430
3.9944635	-60.000000 CY				
0.0003044	12062.	39628140.	8.7757363	0.0026711	-0.008286
3.9984635	-60.000000 CY				
0.0003344	12138.	36300180.	8.6628609	0.0028966	-0.009141
3.9998209	-60.000000 CY				
0.0003644	12207.	33502446.	8.5793723	0.0031261	-0.009991
3.9999551	-60.000000 CYT				
0.0003944	12272.	31117026.	8.5161103	0.0033585	-0.010839
3.9996166	-60.000000 CYT				
0.0004244	12331.	29056485.	8.4674428	0.0035934	-0.011684
3.9972132	-60.000000 CYT				
0.0004544	12377.	27238942.	8.4178614	0.0038249	-0.012533
3.9873462	-60.000000 CYT				

Axial Thrust Force = 4.200 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in

6.25000E-07	240.5049676	384807948.	19.4290859	0.00001214	-0.00001036
0.0508615	0.2771147				
0.00000125	480.1459926	384116794.	18.7161837	0.00002340	-0.00002160
0.0976654	0.5283867				
0.00000188	718.9162127	383421980.	18.4785558	0.00003465	-0.00003285
0.1441903	0.7796589				
0.00000250	956.8156222	382726249.	18.3597458	0.00004590	-0.00004410
0.1904363	1.0309315				

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0.00000313	1194.	382030150.	18.2884629	0.00005715	-0.00005535
0.2364034	1.2822044				
0.00000375	1430.	381333869.	18.2409436	0.00006840	-0.00006660
0.2820914	1.5334776				
0.00000438	1665.	380637482.	18.2070035	0.00007966	-0.00007784
0.3275005	1.7847511				
0.00000500	1900.	379941029.	18.1815504	0.00009091	-0.00008909
0.3726306	2.0360248				
0.00000563	2133.	379244533.	18.1617553	0.0001022	-0.000100
0.4174818	2.2872988				
0.00000625	2366.	378548006.	18.1459208	0.0001134	-0.000112
0.4620539	2.5385732				
0.00000688	2366.	344134551.	10.2895004	0.00007074	-0.000177
0.2893429	-4.300617 C				
0.00000750	2366.	315456672.	10.2575513	0.00007693	-0.000193
0.3141325	-4.698533 C				
0.00000813	2366.	291190774.	10.2300378	0.00008312	-0.000209
0.3388235	-5.096560 C				
0.00000875	2366.	270391433.	10.2068278	0.00008931	-0.000226
0.3634446	-5.494492 C				
0.00000938	2366.	252365338.	10.1870615	0.00009550	-0.000242
0.3879959	-5.892330 C				
0.00001000	2366.	236592504.	10.1700940	0.0001017	-0.000258
0.4124772	-6.290073 C				
0.00001063	2366.	222675298.	10.1554324	0.0001079	-0.000275
0.4368884	-6.687720 C				
0.00001125	2366.	210304448.	10.1426931	0.0001141	-0.000291
0.4612294	-7.085271 C				
0.00001188	2366.	199235793.	10.1315564	0.0001203	-0.000307
0.4855002	-7.482727 C				
0.00001250	2366.	189274003.	10.1218127	0.0001265	-0.000323
0.5097005	-7.880086 C				
0.00001313	2366.	180260955.	10.1132503	0.0001327	-0.000340
0.5338304	-8.277349 C				
0.00001375	2366.	172067276.	10.1057088	0.0001390	-0.000356
0.5578898	-8.674515 C				
0.00001438	2366.	164586090.	10.0990556	0.0001452	-0.000372
0.5818784	-9.071585 C				
0.00001500	2366.	157728336.	10.0931803	0.0001514	-0.000389
0.6057963	-9.468556 C				
0.00001563	2366.	151419203.	10.0879903	0.0001576	-0.000405
0.6296433	-9.865431 C				
0.00001625	2366.	145595387.	10.0834069	0.0001639	-0.000421
0.6534193	-10.262207 C				
0.00001688	2366.	140202965.	10.0793634	0.0001701	-0.000437
0.6771242	-10.658886 C				
0.00001750	2366.	135195717.	10.0758025	0.0001763	-0.000454
0.7007579	-11.055466 C				
0.00001813	2366.	130533795.	10.0726747	0.0001826	-0.000470
0.7243204	-11.451947 C				

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0.00001875	2366.	126182669.	10.0699372	0.0001888	-0.000486
0.7478114	-11.848330 C				
0.00001938	2366.	122112260.	10.0675528	0.0001951	-0.000502
0.7712309	-12.244613 C				
0.00002000	2366.	118296252.	10.0654889	0.0002013	-0.000519
0.7945789	-12.640797 C				
0.00002063	2366.	114711517.	10.0637168	0.0002076	-0.000535
0.8178551	-13.036882 C				
0.00002125	2366.	111337649.	10.0622112	0.0002138	-0.000551
0.8410595	-13.432866 C				
0.00002188	2366.	108156573.	10.0609497	0.0002201	-0.000567
0.8641920	-13.828750 C				
0.00002250	2366.	105152224.	10.0599125	0.0002263	-0.000584
0.8872524	-14.224533 C				
0.00002313	2366.	102310272.	10.0590817	0.0002326	-0.000600
0.9102407	-14.620215 C				
0.00002375	2366.	99617896.	10.0584414	0.0002389	-0.000616
0.9331568	-15.015796 C				
0.00002438	2366.	97063591.	10.0579776	0.0002452	-0.000632
0.9560005	-15.411276 C				
0.00002563	2432.	94924068.	10.0575288	0.0002577	-0.000665
1.0014704	-16.201930 C				
0.00002688	2548.	94810571.	10.0576469	0.0002703	-0.000697
1.0466496	-16.992174 C				
0.00002813	2664.	94702439.	10.0582592	0.0002829	-0.000730
1.0915372	-17.782007 C				
0.00002938	2779.	94598964.	10.0593353	0.0002955	-0.000762
1.1361324	-18.571425 C				
0.00003063	2894.	94499555.	10.0607664	0.0003081	-0.000794
1.1804341	-19.360427 C				
0.00003188	3009.	94403710.	10.0625387	0.0003207	-0.000827
1.2244416	-20.149010 C				
0.00003313	3124.	94311007.	10.0646159	0.0003334	-0.000859
1.2681539	-20.937171 C				
0.00003438	3239.	94221082.	10.0669675	0.0003461	-0.000891
1.3115700	-21.724908 C				
0.00003563	3354.	94133623.	10.0695670	0.0003587	-0.000924
1.3546892	-22.512219 C				
0.00003688	3468.	94048359.	10.0723915	0.0003714	-0.000956
1.3975103	-23.299100 C				
0.00003813	3582.	93965057.	10.0754214	0.0003841	-0.000988
1.4400326	-24.085550 C				
0.00003938	3697.	93883511.	10.0786392	0.0003968	-0.001021
1.4822550	-24.871565 C				
0.00004063	3811.	93803541.	10.0820299	0.0004096	-0.001053
1.5241766	-25.657144 C				
0.00004188	3925.	93724988.	10.0855803	0.0004223	-0.001085
1.5657965	-26.442282 C				
0.00004313	4039.	93647711.	10.0892786	0.0004351	-0.001117
1.6071135	-27.226979 C				

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0.00004438	4152.	93571586.	10.0931145	0.0004479	-0.001150
1.6481268	-28.011230 C				
0.00004563	4266.	93496502.	10.0970787	0.0004607	-0.001182
1.6888354	-28.795033 C				
0.00004688	4379.	93422358.	10.1011630	0.0004735	-0.001214
1.7292383	-29.578385 C				
0.00004813	4492.	93349066.	10.1053601	0.0004863	-0.001246
1.7693344	-30.361284 C				
0.00004938	4606.	93276544.	10.1096634	0.0004992	-0.001278
1.8091228	-31.143727 C				
0.00005063	4718.	93204721.	10.1140670	0.0005120	-0.001310
1.8486023	-31.925710 C				
0.00005188	4831.	93133529.	10.1185657	0.0005249	-0.001343
1.8877721	-32.707231 C				
0.00005313	4944.	93062909.	10.1231546	0.0005378	-0.001375
1.9266309	-33.488287 C				
0.00005438	5056.	92992807.	10.1278294	0.0005507	-0.001407
1.9651778	-34.268875 C				
0.00005563	5169.	92923173.	10.1325862	0.0005636	-0.001439
2.0034117	-35.048992 C				
0.00005688	5281.	92853961.	10.1374215	0.0005766	-0.001471
2.0413316	-35.828634 C				
0.00005813	5393.	92785130.	10.1423320	0.0005895	-0.001503
2.0789362	-36.607799 C				
0.00005938	5505.	92716640.	10.1473148	0.0006025	-0.001535
2.1162246	-37.386484 C				
0.00006063	5617.	92648458.	10.1523672	0.0006155	-0.001567
2.1531956	-38.164685 C				
0.00006188	5728.	92580549.	10.1574868	0.0006285	-0.001599
2.1898481	-38.942399 C				
0.00006313	5840.	92512883.	10.1626714	0.0006415	-0.001631
2.2261809	-39.719622 C				
0.00006438	5951.	92445433.	10.1679189	0.0006546	-0.001663
2.2621930	-40.496353 C				
0.00006563	6062.	92378172.	10.1732276	0.0006676	-0.001695
2.2978832	-41.272587 C				
0.00006688	6173.	92311077.	10.1785957	0.0006807	-0.001727
2.3332503	-42.048320 C				
0.00006813	6284.	92244124.	10.1840217	0.0006938	-0.001759
2.3682931	-42.823550 C				
0.00006938	6395.	92177292.	10.1895041	0.0007069	-0.001791
2.4030104	-43.598274 C				
0.00007063	6505.	92110561.	10.1950417	0.0007200	-0.001822
2.4374011	-44.372486 C				
0.00007188	6616.	92043913.	10.2006608	0.0007332	-0.001854
2.4714639	-45.146185 C				
0.00007313	6726.	91977331.	10.2063053	0.0007463	-0.001886
2.5051976	-45.919366 C				
0.00007438	6836.	91910797.	10.2120017	0.0007595	-0.001918
2.5386010	-46.692026 C				

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0.00007938	7274.	91644853.	10.2352897	0.0008124	-0.002045
2.6688860	-49.777380 C				
0.00008438	7710.	91378587.	10.2593338	0.0008656	-0.002172
2.7937834	-52.854093 C				
0.00008938	8143.	91111830.	10.2831857	0.0009191	-0.002298
2.9130226	-55.924331 C				
0.00009438	8573.	90843621.	10.3077273	0.0009728	-0.002425
3.0266854	-58.985869 C				
0.00009938	8982.	90387473.	10.3258078	0.0010261	-0.002551
3.1332951	-60.000000 CY				
0.0001044	9308.	89176212.	10.3143071	0.0010766	-0.002681
3.2283182	-60.000000 CY				
0.0001094	9549.	87304848.	10.2749831	0.0011238	-0.002814
3.3122821	-60.000000 CY				
0.0001144	9785.	85553556.	10.2389100	0.0011711	-0.002946
3.3913727	-60.000000 CY				
0.0001194	10007.	83830919.	10.2019402	0.0012179	-0.003080
3.4649106	-60.000000 CY				
0.0001244	10158.	81671814.	10.1406407	0.0012612	-0.003216
3.5287895	-60.000000 CY				
0.0001294	10291.	79542859.	10.0787027	0.0013039	-0.003354
3.5876602	-60.000000 CY				
0.0001344	10423.	77564670.	10.0227059	0.0013468	-0.003491
3.6428308	-60.000000 CY				
0.0001394	10554.	75720878.	9.9720357	0.0013899	-0.003628
3.6942550	-60.000000 CY				
0.0001444	10683.	73997378.	9.9261646	0.0014331	-0.003764
3.7418850	-60.000000 CY				
0.0001494	10812.	72381005.	9.8838986	0.0014764	-0.003901
3.7855535	-60.000000 CY				
0.0001544	10929.	70796718.	9.8396771	0.0015190	-0.004038
3.8245440	-60.000000 CY				
0.0001594	11012.	69097838.	9.7838573	0.0015593	-0.004178
3.8578061	-60.000000 CY				
0.0001644	11075.	67376662.	9.7232508	0.0015983	-0.004319
3.8866026	-60.000000 CY				
0.0001694	11135.	65743511.	9.6663364	0.0016372	-0.004460
3.9121613	-60.000000 CY				
0.0001744	11195.	64200103.	9.6121495	0.0016761	-0.004601
3.9345463	-60.000000 CY				
0.0001794	11254.	62738857.	9.5628376	0.0017153	-0.004742
3.9537182	-60.000000 CY				
0.0001844	11312.	61351278.	9.5162917	0.0017546	-0.004883
3.9695496	-60.000000 CY				
0.0001894	11368.	60031354.	9.4717005	0.0017937	-0.005024
3.9820503	-60.000000 CY				
0.0001944	11425.	58775745.	9.4305957	0.0018331	-0.005164
3.9913005	-60.000000 CY				
0.0001994	11480.	57579537.	9.3922863	0.0018726	-0.005305
3.9972564	-60.000000 CY				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC2-7 (Boring B-005-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0002044	11535.	56438298.	9.3556780	0.0019121	-0.005445
3.9998723	-60.000000 CY				
0.0002094	11588.	55347517.	9.3241700	0.0019522	-0.005585
3.9975077	-60.000000 CY				
0.0002144	11641.	54304067.	9.2934428	0.0019923	-0.005725
3.9998931	-60.000000 CY				
0.0002194	11694.	53304015.	9.2651074	0.0020325	-0.005865
3.9970558	-60.000000 CY				
0.0002244	11744.	52339157.	9.2380944	0.0020728	-0.006005
3.9997330	-60.000000 CY				
0.0002294	11790.	51401489.	9.2117130	0.0021129	-0.006145
3.9956300	-60.000000 CY				
0.0002344	11827.	50463153.	9.1821360	0.0021521	-0.006285
3.9990203	-60.000000 CY				
0.0002394	11859.	49542728.	9.1500193	0.0021903	-0.006427
3.9992468	-60.000000 CY				
0.0002444	11880.	48615611.	9.1135780	0.0022271	-0.006570
3.9965958	-60.000000 CY				
0.0002494	11900.	47718283.	9.0771076	0.0022636	-0.006714
3.9992162	-60.000000 CY				
0.0002544	11917.	46846598.	9.0431776	0.0023004	-0.006857
3.9993713	-60.000000 CY				
0.0002594	11933.	46006491.	9.0103157	0.0023371	-0.007000
3.9955701	-60.000000 CY				
0.0002644	11949.	45197204.	8.9791598	0.0023739	-0.007144
3.9985538	-60.000000 CY				
0.0002694	11965.	44417005.	8.9493437	0.0024107	-0.007287
3.9999119	-60.000000 CY				
0.0002744	11980.	43663657.	8.9215934	0.0024479	-0.007430
3.9942523	-60.000000 CY				
0.0003044	12066.	39641995.	8.7782176	0.0026719	-0.008286
3.9985257	-60.000000 CY				
0.0003344	12142.	36312646.	8.6652203	0.0028974	-0.009140
3.9998424	-60.000000 CY				
0.0003644	12212.	33513765.	8.5815911	0.0031269	-0.009991
3.9999658	-60.000000 CYT				
0.0003944	12276.	31127384.	8.5182268	0.0033594	-0.010838
3.9996505	-60.000000 CYT				
0.0004244	12335.	29066055.	8.4694819	0.0035942	-0.011683
3.9973093	-60.000000 CYT				
0.0004544	12381.	27248100.	8.4201387	0.0038259	-0.012532
3.9875919	-60.000000 CYT				

Axial Thrust Force = 4.600 kips

Bending Max Conc Curvature Stress	Bending Max Steel Moment Stress	Bending Run Stiffness Msg	Depth to N Axis	Max Comp Strain	Max Tens Strain
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TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC2-7 (Boring B-005-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

rad/in. ksi	in-kip ksi	kip-in2	in	in/in	in/in
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6.25000E-07	240.5035986	384805758.	19.5651901	0.00001223	-0.00001027
0.0512199	0.2795816				
0.00000125	480.1446137	384115691.	18.7843907	0.00002348	-0.00002152
0.0980225	0.5308592				
0.00000188	718.9148267	383421241.	18.5241312	0.00003473	-0.00003277
0.1445462	0.7821371				
0.00000250	956.8142298	382725692.	18.3940059	0.00004599	-0.00004401
0.1907908	1.0334154				
0.00000313	1194.	382029703.	18.3159341	0.00005724	-0.00005526
0.2367565	1.2846940				
0.00000375	1430.	381333494.	18.2638891	0.00006849	-0.00006651
0.2824433	1.5359729				
0.00000438	1665.	380637159.	18.2267166	0.00007974	-0.00007776
0.3278510	1.7872522				
0.00000500	1900.	379940746.	18.1988394	0.00009099	-0.00008901
0.3729798	2.0385317				
0.00000563	2133.	379244280.	18.1771590	0.0001022	-0.000100
0.4178295	2.2898116				
0.00000625	2366.	378547777.	18.1598165	0.0001135	-0.000112
0.4624003	2.5410917				
0.00000688	2366.	344134343.	10.3291778	0.00007101	-0.000176
0.2904571	-4.292706 C				
0.00000750	2366.	315456481.	10.2940289	0.00007721	-0.000193
0.3152465	-4.690597 C				
0.00000813	2366.	291190598.	10.2646762	0.00008340	-0.000209
0.3399656	-5.088396 C				
0.00000875	2366.	270391269.	10.2391817	0.00008959	-0.000225
0.3645893	-5.486283 C				
0.00000938	2366.	252365185.	10.2172859	0.00009579	-0.000242
0.3891378	-5.884113 C				
0.00001000	2366.	236592361.	10.1984552	0.0001020	-0.000258
0.4136162	-6.281848 C				
0.00001063	2366.	222675163.	10.1821496	0.0001082	-0.000274
0.4380246	-6.679488 C				
0.00001125	2366.	210304321.	10.1679490	0.0001144	-0.000291
0.4623628	-7.077032 C				
0.00001188	2366.	199235672.	10.1555219	0.0001206	-0.000307
0.4866307	-7.474480 C				
0.00001250	2366.	189273889.	10.1446030	0.0001268	-0.000323
0.5108282	-7.871831 C				
0.00001313	2366.	180260846.	10.1349589	0.0001330	-0.000339
0.5349552	-8.269087 C				
0.00001375	2366.	172067171.	10.1264498	0.0001392	-0.000356
0.5590117	-8.666245 C				
0.00001438	2366.	164585990.	10.1189132	0.0001455	-0.000372
0.5829974	-9.063307 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC2-7 (Boring B-005-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00001500	2366.	157728241.	10.1122282	0.0001517	-0.000388
0.6069124	-9.460271 C				
0.00001563	2366.	151419111.	10.1062933	0.0001579	-0.000405
0.6307565	-9.857138 C				
0.00001625	2366.	145595299.	10.1010224	0.0001641	-0.000421
0.6545296	-10.253907 C				
0.00001688	2366.	140202880.	10.0963423	0.0001704	-0.000437
0.6782316	-10.650577 C				
0.00001750	2366.	135195635.	10.0921903	0.0001766	-0.000453
0.7018624	-11.047150 C				
0.00001813	2366.	130533716.	10.0885122	0.0001829	-0.000470
0.7254219	-11.443623 C				
0.00001875	2366.	126182592.	10.0852613	0.0001891	-0.000486
0.7489100	-11.839998 C				
0.00001938	2366.	122112186.	10.0823966	0.0001953	-0.000502
0.7723266	-12.236274 C				
0.00002000	2366.	118296180.	10.0798824	0.0002016	-0.000518
0.7956716	-12.632450 C				
0.00002063	2366.	114711448.	10.0776874	0.0002079	-0.000535
0.8189449	-13.028526 C				
0.00002125	2366.	111337582.	10.0757837	0.0002141	-0.000551
0.8421464	-13.424502 C				
0.00002188	2366.	108156508.	10.0741470	0.0002204	-0.000567
0.8652759	-13.820378 C				
0.00002250	2366.	105152160.	10.0727554	0.0002266	-0.000583
0.8883333	-14.216153 C				
0.00002313	2366.	102310210.	10.0715894	0.0002329	-0.000600
0.9113187	-14.611828 C				
0.00002375	2366.	99617836.	10.0706317	0.0002392	-0.000616
0.9342318	-15.007401 C				
0.00002438	2366.	97063533.	10.0698667	0.0002455	-0.000632
0.9570725	-15.402873 C				
0.00002563	2436.	95048091.	10.0688598	0.0002580	-0.000664
1.0025364	-16.193510 C				
0.00002688	2551.	94928657.	10.0684718	0.0002706	-0.000697
1.0477096	-16.983738 C				
0.00002813	2667.	94815115.	10.0686232	0.0002832	-0.000729
1.0925912	-17.773555 C				
0.00002938	2782.	94706690.	10.0692479	0.0002958	-0.000762
1.1371802	-18.562957 C				
0.00003063	2897.	94602733.	10.0703211	0.0003084	-0.000794
1.1814759	-19.351942 C				
0.00003188	3012.	94502697.	10.0717368	0.0003210	-0.000826
1.2254772	-20.140508 C				
0.00003313	3127.	94406117.	10.0734845	0.0003337	-0.000859
1.2691834	-20.928652 C				
0.00003438	3242.	94312597.	10.0755306	0.0003463	-0.000891
1.3125933	-21.716373 C				
0.00003563	3357.	94221794.	10.0778462	0.0003590	-0.000923
1.3557063	-22.503666 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC2-7 (Boring B-005-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00003688	3471.	94133413.	10.0804061	0.0003717	-0.000956
1.3985212	-23.290530 C				
0.00003813	3586.	94047197.	10.0831888	0.0003844	-0.000988
1.4410372	-24.076963 C				
0.00003938	3700.	93962921.	10.0861753	0.0003971	-0.001020
1.4832533	-24.862961 C				
0.00004063	3814.	93880388.	10.0893491	0.0004099	-0.001053
1.5251686	-25.648521 C				
0.00004188	3928.	93799425.	10.0926956	0.0004226	-0.001085
1.5667821	-26.433642 C				
0.00004313	4042.	93719877.	10.0962019	0.0004354	-0.001117
1.6080927	-27.218321 C				
0.00004438	4155.	93641609.	10.0998566	0.0004482	-0.001149
1.6490996	-28.002554 C				
0.00004563	4269.	93564497.	10.1036497	0.0004610	-0.001182
1.6898018	-28.786339 C				
0.00004688	4382.	93488434.	10.1075722	0.0004738	-0.001214
1.7301982	-29.569674 C				
0.00004813	4496.	93413321.	10.1116159	0.0004866	-0.001246
1.7702878	-30.352554 C				
0.00004938	4609.	93339070.	10.1157737	0.0004995	-0.001278
1.8100696	-31.134978 C				
0.00005063	4722.	93265602.	10.1200391	0.0005123	-0.001310
1.8495425	-31.916943 C				
0.00005188	4834.	93192845.	10.1244063	0.0005252	-0.001342
1.8887057	-32.698446 C				
0.00005313	4947.	93120733.	10.1288700	0.0005381	-0.001374
1.9275579	-33.479483 C				
0.00005438	5060.	93049206.	10.1334255	0.0005510	-0.001406
1.9660981	-34.260052 C				
0.00005563	5172.	92978211.	10.1380684	0.0005639	-0.001439
2.0043253	-35.040149 C				
0.00005688	5284.	92907697.	10.1427948	0.0005769	-0.001471
2.0422384	-35.819772 C				
0.00005813	5396.	92837619.	10.1476012	0.0005898	-0.001503
2.0798362	-36.598918 C				
0.00005938	5508.	92767935.	10.1524844	0.0006028	-0.001535
2.1171178	-37.377583 C				
0.00006063	5620.	92698606.	10.1574414	0.0006158	-0.001567
2.1540819	-38.155764 C				
0.00006188	5731.	92629597.	10.1624696	0.0006288	-0.001599
2.1907275	-38.933458 C				
0.00006313	5843.	92560874.	10.1675664	0.0006418	-0.001631
2.2270535	-39.710662 C				
0.00006438	5954.	92492407.	10.1727297	0.0006549	-0.001663
2.2630586	-40.487373 C				
0.00006563	6065.	92424168.	10.1779574	0.0006679	-0.001695
2.2987417	-41.263586 C				
0.00006688	6176.	92356130.	10.1832476	0.0006810	-0.001726
2.3341018	-42.039299 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC2-7 (Boring B-005-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00006813	6287.	92288268.	10.1885986	0.0006941	-0.001758
2.3691375	-42.814509 C				
0.00006938	6398.	92220560.	10.1940089	0.0007072	-0.001790
2.4038477	-43.589211 C				
0.00007063	6508.	92152983.	10.1995039	0.0007203	-0.001822
2.4382312	-44.363403 C				
0.00007188	6619.	92085519.	10.2050285	0.0007335	-0.001854
2.4722868	-45.137081 C				
0.00007313	6729.	92018147.	10.2106084	0.0007467	-0.001886
2.5060133	-45.910241 C				
0.00007438	6839.	91950850.	10.2162424	0.0007598	-0.001918
2.5394094	-46.682880 C				
0.00007938	7277.	91682087.	10.2393011	0.0008127	-0.002045
2.6696649	-49.768146 C				
0.00008438	7713.	91413389.	10.2630109	0.0008659	-0.002172
2.7945082	-52.845065 C				
0.00008938	8146.	91144431.	10.2866786	0.0009194	-0.002298
2.9137126	-55.915279 C				
0.00009438	8576.	90874234.	10.3110673	0.0009731	-0.002424
3.0273448	-58.976728 C				
0.00009938	8985.	90417533.	10.3290580	0.0010265	-0.002551
3.1339327	-60.000000 CY				
0.0001044	9311.	89207952.	10.3175636	0.0010769	-0.002681
3.2289512	-60.000000 CY				
0.0001094	9552.	87336121.	10.2781631	0.0011242	-0.002813
3.3128936	-60.000000 CY				
0.0001144	9789.	85583430.	10.2421143	0.0011714	-0.002946
3.3919789	-60.000000 CY				
0.0001194	10011.	83861611.	10.2051482	0.0012182	-0.003079
3.4655044	-60.000000 CY				
0.0001244	10162.	81702300.	10.1438002	0.0012616	-0.003216
3.5293615	-60.000000 CY				
0.0001294	10295.	79572057.	10.0817619	0.0013043	-0.003353
3.5881988	-60.000000 CY				
0.0001344	10427.	77592674.	10.0256713	0.0013472	-0.003490
3.6433355	-60.000000 CY				
0.0001394	10557.	75747771.	9.9749147	0.0013903	-0.003627
3.6947252	-60.000000 CY				
0.0001444	10687.	74023236.	9.9289636	0.0014335	-0.003764
3.7423201	-60.000000 CY				
0.0001494	10816.	72406063.	9.8867661	0.0014768	-0.003901
3.7859739	-60.000000 CY				
0.0001544	10933.	70821400.	9.8425115	0.0015194	-0.004038
3.8249324	-60.000000 CY				
0.0001594	11017.	69123456.	9.7867573	0.0015598	-0.004178
3.8581753	-60.000000 CY				
0.0001644	11079.	67401534.	9.7260868	0.0015987	-0.004319
3.8869352	-60.000000 CY				
0.0001694	11139.	65767574.	9.6691048	0.0016377	-0.004460
3.9124557	-60.000000 CY				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC2-7 (Boring B-005-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0001744	11199.	64223403.	9.6148605	0.0016766	-0.004601
3.9348020	-60.000000 CY				
0.0001794	11258.	62761436.	9.5654896	0.0017158	-0.004742
3.9539345	-60.000000 CY				
0.0001844	11316.	61373390.	9.5189681	0.0017551	-0.004882
3.9697370	-60.000000 CY				
0.0001894	11373.	60052811.	9.4743244	0.0017942	-0.005023
3.9821950	-60.000000 CY				
0.0001944	11429.	58796578.	9.4331695	0.0018336	-0.005164
3.9914019	-60.000000 CY				
0.0001994	11484.	57599778.	9.3948139	0.0018731	-0.005304
3.9973136	-60.000000 CY				
0.0002044	11539.	56457972.	9.3581635	0.0019126	-0.005445
3.9998845	-60.000000 CY				
0.0002094	11592.	55366642.	9.3266817	0.0019528	-0.005585
3.9975630	-60.000000 CY				
0.0002144	11645.	54322678.	9.2959142	0.0019928	-0.005725
3.9999044	-60.000000 CY				
0.0002194	11698.	53322120.	9.2675435	0.0020331	-0.005864
3.9971169	-60.000000 CY				
0.0002244	11748.	52356977.	9.2405172	0.0020733	-0.006004
3.9997515	-60.000000 CY				
0.0002294	11794.	51418840.	9.2141042	0.0021135	-0.006144
3.9957066	-60.000000 CY				
0.0002344	11831.	50480617.	9.1845645	0.0021526	-0.006285
3.9990577	-60.000000 CY				
0.0002394	11864.	49560513.	9.1526832	0.0021909	-0.006427
3.9990468	-60.000000 CY				
0.0002444	11885.	48632992.	9.1162023	0.0022278	-0.006570
3.9966747	-60.000000 CY				
0.0002494	11904.	47735462.	9.0796192	0.0022642	-0.006713
3.9992545	-60.000000 CY				
0.0002544	11921.	46863378.	9.0457647	0.0023010	-0.006856
3.9991650	-60.000000 CY				
0.0002594	11937.	46022914.	9.0128664	0.0023377	-0.007000
3.9956629	-60.000000 CY				
0.0002644	11953.	45213284.	8.9816750	0.0023745	-0.007143
3.9986069	-60.000000 CY				
0.0002694	11969.	44432753.	8.9518321	0.0024114	-0.007286
3.9999247	-60.000000 CY				
0.0002744	11984.	43679063.	8.9240509	0.0024485	-0.007429
3.9940409	-60.000000 CY				
0.0003044	12070.	39655848.	8.7807001	0.0026726	-0.008285
3.9985866	-60.000000 CY				
0.0003344	12146.	36325110.	8.6675807	0.0028982	-0.009139
3.9998625	-60.000000 CY				
0.0003644	12216.	33525083.	8.5838110	0.0031277	-0.009990
3.9999751	-60.000000 CYT				
0.0003944	12280.	31137740.	8.5203443	0.0033602	-0.010837
3.9996828	-60.000000 CYT				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC2-7 (Boring B-005-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0004244	12339.	29075625.	8.4715220	0.0035951	-0.011682
3.9974037	-60.000000 CYT				
0.0004544	12385.	27257253.	8.4224181	0.0038269	-0.012531
3.9878351	-60.000000 CYT				

 Summary of Results for Nominal 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 Tens. No. Strain	Axial Thrust kips	Nominal Mom. Cap. in-kip	Max. Comp. Strain	Max.
----	-----	-----	-----	
1 -0.00952396	3.800	12169.214	0.00300000	
2 -0.00952020	4.200	12173.120	0.00300000	
3 -0.00951645	4.600	12177.027	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 (0.75).

The above values should be multiplied by the appropriate strength reduction factor to compute ultimate moment capacity according to ACI 318, 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 Stiff. Load Ult Mom No. kip-in^2	Resist. Factor	Nominal Ax. Thrust kips	Nominal Moment Cap in-kips	Ult. (Fac) Ax. Thrust kips	Ult. (Fac) Moment Cap in-kips	Bend. at
-----	-----	-----	-----	-----	-----	
1 91219895.	0.65	3.800000	12169.	2.470000	7910.	

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2 91253873.	0.65	4.200000	12173.	2.730000	7913.
3 91287886.	0.65	4.600000	12177.	2.990000	7915.
1 89806706.	0.75	3.800000	12169.	2.850000	9127.
2 89838295.	0.75	4.200000	12173.	3.150000	9130.
3 89869877.	0.75	4.600000	12177.	3.450000	9133.
1 70221645.	0.90	3.800000	12169.	3.420000	10952.
2 70254444.	0.90	4.200000	12173.	3.780000	10956.
3 70287179.	0.90	4.600000	12177.	4.140000	10959.

 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	1.0000	0.00	N.A.	No	0.00	8780.
2	4.0000	0.3217	No	No	8780.	19687.
3	4.7000	2.4032	Yes	No	28467.	31869.
4	7.0000	3.3347	Yes	No	60336.	42145.
5	9.5000	8.5000	No	No	102482.	0.00
6	12.0000	11.0000	No	No	0.00	0.00
7	14.5000	13.5000	No	No	0.00	0.00
8	17.0000	16.0000	No	No	0.00	0.00
9	19.5000	18.5000	No	No	0.00	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.

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36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

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 = 1000.0 lbs
Applied moment at pile head = 315600.0 in-lbs
Axial thrust load on pile head = 4200.0 lbs

Depth Res.	Soil X Es*H feet lb/inch	Deflect. Spr. y Lat. inches lb/inch	Distrib. Moment Load in-lbs lb/inch	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness lb-in^2	Soil p
0.00	0.00	0.07578	315600.	1000.0000	-0.00100	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.09000	0.00	0.07470	316685.	999.9999	-0.00100	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.1800	0.00	0.07362	317769.	1000.0000	-0.00100	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.2700	0.00	0.07254	318854.	1000.0000	-9.99E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.3600	0.00	0.07146	319938.	1000.0000	-9.98E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.4500	0.00	0.07038	321023.	1000.0000	-9.98E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.5400	0.00	0.06931	322107.	1000.0000	-9.97E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.6300	0.00	0.06823	323192.	1000.0000	-9.96E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.7200	0.00	0.06716	324276.	1000.0000	-9.95E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.8100	0.00	0.06608	325361.	1000.0000	-9.94E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.9000	0.00	0.06501	326445.	1000.	-9.93E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.9900	0.00	0.06394	327530.	1000.	-9.92E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
1.0800	0.00	0.06287	328614.	983.2041	-9.91E-04	0.00	3.84E+11	
-31.103	534.3372		0.00					
1.1700	0.00	0.06180	329662.	949.4325	-9.90E-04	0.00	3.84E+11	
-31.437	549.4132		0.00					
1.2600	0.00	0.06073	330674.	915.3052	-9.89E-04	0.00	3.84E+11	
-31.762	564.8722		0.00					
1.3500	0.00	0.05966	331649.	880.8307	-9.88E-04	0.00	3.84E+11	

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36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

-32.080	580.7312	0.00					
1.4400	0.05859	332586.	846.0177	-9.87E-04	0.00	3.84E+11	
-32.389	597.0084	0.00					
1.5300	0.05753	333485.	810.8752	-9.87E-04	0.00	3.84E+11	
-32.690	613.7230	0.00					
1.6200	0.05646	334346.	775.4121	-9.86E-04	0.00	3.84E+11	
-32.982	630.8957	0.00					
1.7100	0.05540	335169.	739.6377	-9.85E-04	0.00	3.84E+11	
-33.266	648.5484	0.00					
1.8000	0.05433	335953.	703.5614	-9.84E-04	0.00	3.84E+11	
-33.542	666.7046	0.00					
1.8900	0.05327	336697.	667.1928	-9.83E-04	0.00	3.84E+11	
-33.808	685.3894	0.00					
1.9800	0.05221	337403.	630.5418	-9.82E-04	0.00	3.84E+11	
-34.065	704.6297	0.00					
2.0700	0.05115	338068.	593.6184	-9.81E-04	0.00	3.84E+11	
-34.312	724.4544	0.00					
2.1600	0.05009	338694.	556.4331	-9.80E-04	0.00	3.84E+11	
-34.550	744.8943	0.00					
2.2500	0.04903	339279.	518.9962	-9.79E-04	0.00	3.84E+11	
-34.778	765.9830	0.00					
2.3400	0.04798	339824.	481.3188	-9.78E-04	0.00	3.84E+11	
-34.995	787.7563	0.00					
2.4300	0.04692	340327.	443.4118	-9.77E-04	0.00	3.84E+11	
-35.203	810.2529	0.00					
2.5200	0.04587	340790.	405.2867	-9.76E-04	0.00	3.84E+11	
-35.399	833.5149	0.00					
2.6100	0.04481	341212.	366.9551	-9.75E-04	0.00	3.84E+11	
-35.585	857.5876	0.00					
2.7000	0.04376	341592.	328.4291	-9.74E-04	0.00	3.84E+11	
-35.759	882.5201	0.00					
2.7900	0.04271	341930.	289.7211	-9.73E-04	0.00	3.84E+11	
-35.922	908.3661	0.00					
2.8800	0.04166	342226.	250.8437	-9.72E-04	0.00	3.84E+11	
-36.073	935.1839	0.00					
2.9700	0.04061	342481.	211.8101	-9.71E-04	0.00	3.84E+11	
-36.211	963.0369	0.00					
3.0600	0.03956	342693.	172.6337	-9.70E-04	0.00	3.84E+11	
-36.337	991.9948	0.00					
3.1500	0.03851	342862.	133.3286	-9.69E-04	0.00	3.84E+11	
-36.450	1022.	0.00					
3.2400	0.03747	342989.	93.9092	-9.68E-04	0.00	3.84E+11	
-36.549	1054.	0.00					
3.3300	0.03642	343074.	54.3903	-9.67E-04	0.00	3.84E+11	
-36.634	1086.	0.00					
3.4200	0.03538	343116.	14.7874	-9.67E-04	0.00	3.84E+11	
-36.705	1121.	0.00					
3.5100	0.03433	343115.	-24.884	-9.66E-04	0.00	3.84E+11	
-36.760	1156.	0.00					
3.6000	0.03329	343071.	-64.606	-9.65E-04	0.00	3.84E+11	

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-36.800	1194.	0.00				
3.6900	0.03225	342984.	-104.362	-9.64E-04	0.00	3.84E+11
-36.823	1233.	0.00				
3.7800	0.03121	342854.	-144.135	-9.63E-04	0.00	3.84E+11
-36.830	1274.	0.00				
3.8700	0.03017	342681.	-183.905	-9.62E-04	0.00	3.84E+11
-36.819	1318.	0.00				
3.9600	0.02913	342466.	-223.653	-9.61E-04	0.00	3.84E+11
-36.789	1364.	0.00				
4.0500	0.02810	342207.	-554.710	-9.60E-04	0.00	3.84E+11
-576.279	22152.	0.00				
4.1400	0.02706	341276.	-1176.	-9.59E-04	0.00	3.84E+11
-574.186	22917.	0.00				
4.2300	0.02603	339676.	-1795.	-9.58E-04	0.00	3.84E+11
-571.866	23732.	0.00				
4.3200	0.02499	337408.	-2411.	-9.57E-04	0.00	3.84E+11
-569.308	24603.	0.00				
4.4100	0.02396	334476.	-3024.	-9.56E-04	0.00	3.84E+11
-566.498	25537.	0.00				
4.5000	0.02293	330884.	-3635.	-9.55E-04	0.00	3.84E+11
-563.420	26541.	0.00				
4.5900	0.02190	326634.	-4241.	-9.54E-04	0.00	3.84E+11
-560.056	27625.	0.00				
4.6800	0.02087	321732.	-4844.	-9.53E-04	0.00	3.84E+11
-556.387	28799.	0.00				
4.7700	0.01984	316180.	-5267.	-9.52E-04	0.00	3.84E+11
-227.278	12374.	0.00				
4.8600	0.01881	310363.	-5512.	-9.51E-04	0.00	3.84E+11
-225.537	12951.	0.00				
4.9500	0.01778	304283.	-5754.	-9.51E-04	0.00	3.85E+11
-223.635	13583.	0.00				
5.0400	0.01676	297942.	-5995.	-9.50E-04	0.00	3.85E+11
-221.559	14281.	0.00				
5.1300	0.01573	291343.	-6233.	-9.49E-04	0.00	3.85E+11
-219.290	15056.	0.00				
5.2200	0.01471	284488.	-6468.	-9.48E-04	0.00	3.85E+11
-216.810	15923.	0.00				
5.3100	0.01368	277380.	-6701.	-9.47E-04	0.00	3.85E+11
-214.092	16899.	0.00				
5.4000	0.01266	270022.	-6931.	-9.47E-04	0.00	3.85E+11
-211.108	18010.	0.00				
5.4900	0.01164	262418.	-7157.	-9.46E-04	0.00	3.85E+11
-207.821	19286.	0.00				
5.5800	0.01062	254572.	-7379.	-9.45E-04	0.00	3.85E+11
-204.187	20771.	0.00				
5.6700	0.00960	246487.	-7598.	-9.44E-04	0.00	3.85E+11
-200.148	22525.	0.00				
5.7600	0.00858	238170.	-7811.	-9.44E-04	0.00	3.85E+11
-195.631	24634.	0.00				
5.8500	0.00756	229623.	-8020.	-9.43E-04	0.00	3.85E+11

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-190.534	27226.	0.00				
5.9400	0.00654	220855.	-8223.	-9.42E-04	0.00	3.85E+11
-184.721	30504.	0.00				
6.0300	0.00552	211871.	-8418.	-9.42E-04	0.00	3.85E+11
-177.990	34807.	0.00				
6.1200	0.00451	202680.	-8606.	-9.41E-04	0.00	3.85E+11
-170.032	40754.	0.00				
6.2100	0.00349	193290.	-8785.	-9.41E-04	0.00	3.85E+11
-160.323	49616.	0.00				
6.3000	0.00247	183713.	-8951.	-9.40E-04	0.00	3.85E+11
-147.860	64542.	0.00				
6.3900	0.00146	173964.	-9101.	-9.40E-04	0.00	3.85E+11
-130.228	96387.	0.00				
6.4800	4.45E-04	164063.	-9208.	-9.39E-04	0.00	3.85E+11
-67.747	164530.	0.00				
6.5700	-5.69E-04	154083.	-9198.	-9.39E-04	0.00	3.85E+11
87.1605	165352.	0.00				
6.6600	-0.00158	144204.	-9078.	-9.38E-04	0.00	3.85E+11
134.9085	92052.	0.00				
6.7500	-0.00260	134483.	-8922.	-9.38E-04	0.00	3.85E+11
153.4227	63830.	0.00				
6.8400	-0.00361	124941.	-8749.	-9.37E-04	0.00	3.85E+11
167.4086	50103.	0.00				
6.9300	-0.00462	115594.	-8562.	-9.37E-04	0.00	3.85E+11
178.9535	41825.	0.00				
7.0200	-0.00563	106456.	-8327.	-9.37E-04	0.00	3.85E+11
256.3890	49158.	0.00				
7.1100	-0.00664	97617.	-8043.	-9.37E-04	0.00	3.85E+11
268.5204	43646.	0.00				
7.2000	-0.00766	89091.	-7747.	-9.36E-04	0.00	3.85E+11
279.5713	39439.	0.00				
7.2900	-0.00867	80891.	-7440.	-9.36E-04	0.00	3.85E+11
289.7886	36111.	0.00				
7.3800	-0.00968	73029.	-7122.	-9.36E-04	0.00	3.85E+11
299.3422	33406.	0.00				
7.4700	-0.01069	65517.	-6794.	-9.36E-04	0.00	3.85E+11
308.3542	31158.	0.00				
7.5600	-0.01170	58364.	-6456.	-9.35E-04	0.00	3.85E+11
316.9157	29257.	0.00				
7.6500	-0.01271	51580.	-6109.	-9.35E-04	0.00	3.85E+11
325.0962	27627.	0.00				
7.7400	-0.01372	45176.	-5754.	-9.35E-04	0.00	3.85E+11
332.9504	26211.	0.00				
7.8300	-0.01473	39160.	-5390.	-9.35E-04	0.00	3.85E+11
340.5221	24969.	0.00				
7.9200	-0.01574	33542.	-5019.	-9.35E-04	0.00	3.85E+11
347.8467	23870.	0.00				
8.0100	-0.01675	28329.	-4639.	-9.35E-04	0.00	3.85E+11
354.9534	22889.	0.00				
8.1000	-0.01776	23530.	-4252.	-9.35E-04	0.00	3.85E+11

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361.8666	22008.	0.00				
8.1900	-0.01877	19153.	-3857.	-9.35E-04	0.00	3.85E+11
368.6069	21212.	0.00				
8.2800	-0.01978	15206.	-3456.	-9.35E-04	0.00	3.85E+11
375.1919	20489.	0.00				
8.3700	-0.02079	11697.	-3047.	-9.35E-04	0.00	3.85E+11
381.6364	19829.	0.00				
8.4600	-0.02180	8633.	-2632.	-9.35E-04	0.00	3.85E+11
387.9536	19223.	0.00				
8.5500	-0.02281	6021.	-2209.	-9.35E-04	0.00	3.85E+11
394.1547	18666.	0.00				
8.6400	-0.02381	3869.	-1780.	-9.35E-04	0.00	3.85E+11
400.2497	18151.	0.00				
8.7300	-0.02482	2184.	-1345.	-9.35E-04	0.00	3.85E+11
406.2474	17674.	0.00				
8.8200	-0.02583	973.2922	-902.797	-9.35E-04	0.00	3.85E+11
412.1554	17231.	0.00				
8.9100	-0.02684	242.8797	-454.523	-9.35E-04	0.00	3.85E+11
417.9807	16817.	0.00				
9.0000	-0.02785	0.00	0.00	-9.35E-04	0.00	3.85E+11
423.7294	8215.	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	=	0.07578298 inches
Computed slope at pile head	=	-0.0010021 radians
Maximum bending moment	=	343116. inch-lbs
Maximum shear force	=	-9208. lbs
Depth of maximum bending moment	=	3.42000000 feet below pile head
Depth of maximum shear force	=	6.48000000 feet below pile head
Number of iterations	=	31
Number of zero deflection points	=	1
Pile deflection at ground	=	0.06381811 inches

 Pile-head Deflection vs. Pile Length for Load Case 1

Boundary Condition Type 1, Shear and Moment

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36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Shear = 1000. lbs
 Moment = 315600. in-lbs
 Axial Load = 4200. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	0.07578298	343116.	-9208.
8.55000	0.14152653	340066.	-9758.
8.10000	0.30005392	338098.	-10584.
7.65000	0.74112137	336630.	-11573.
7.20000	2.01859366	335828.	-13029.
6.75000	7.58086031	342125.	-15526.

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

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

Shear force at pile head = 2250.0 lbs
 Applied moment at pile head = 724800.0 in-lbs
 Axial thrust load on pile head = 4600.0 lbs

Depth Res. Soil X feet lb/inch	Deflect. Spr. y inches lb/inch	Bending Distrib. Moment in-lbs lb/inch	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness lb-in^2	Soil p
0.00	1.7711	724800.	2250.	-0.02286	0.00	3.83E+11	
0.00	0.00	0.00					
0.09000	1.7465	727344.	2250.	-0.02286	0.00	3.83E+11	
0.00	0.00	0.00					
0.1800	1.7218	729887.	2250.	-0.02286	0.00	3.83E+11	
0.00	0.00	0.00					
0.2700	1.6971	732431.	2250.	-0.02285	0.00	3.83E+11	
0.00	0.00	0.00					
0.3600	1.6724	734974.	2250.	-0.02285	0.00	3.83E+11	
0.00	0.00	0.00					
0.4500	1.6477	737518.	2250.	-0.02285	0.00	3.83E+11	
0.00	0.00	0.00					
0.5400	1.6231	740061.	2250.	-0.02285	0.00	3.83E+11	
0.00	0.00	0.00					

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area

Light Tower NC2-7 (Boring B-005-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.6300	1.5984	742605.	2250.	-0.02285	0.00	3.83E+11
0.00	0.00	0.00				
0.7200	1.5737	745148.	2250.	-0.02284	0.00	3.83E+11
0.00	0.00	0.00				
0.8100	1.5490	747692.	2250.	-0.02284	0.00	3.83E+11
0.00	0.00	0.00				
0.9000	1.5244	750235.	2250.	-0.02284	0.00	3.83E+11
0.00	0.00	0.00				
0.9900	1.4997	752779.	2250.	-0.02284	0.00	3.83E+11
0.00	0.00	0.00				
1.0800	1.4750	755322.	2202.	-0.02283	0.00	3.83E+11
-89.037	65.1915	0.00				
1.1700	1.4504	757762.	2105.	-0.02283	0.00	3.83E+11
-90.001	67.0171	0.00				
1.2600	1.4257	760096.	2008.	-0.02283	0.00	3.83E+11
-90.941	68.8888	0.00				
1.3500	1.4011	762325.	1909.	-0.02283	0.00	3.83E+11
-91.860	70.8088	0.00				
1.4400	1.3764	764446.	1809.	-0.02283	0.00	3.83E+11
-92.754	72.7792	0.00				
1.5300	1.3518	766459.	1708.	-0.02282	0.00	3.83E+11
-93.626	74.8024	0.00				
1.6200	1.3271	768363.	1607.	-0.02282	0.00	3.83E+11
-94.472	76.8810	0.00				
1.7100	1.3025	770157.	1504.	-0.02282	0.00	3.83E+11
-95.295	79.0175	0.00				
1.8000	1.2778	771840.	1401.	-0.02282	0.00	3.83E+11
-96.091	81.2149	0.00				
1.8900	1.2532	773410.	1297.	-0.02282	0.00	3.83E+11
-96.862	83.4762	0.00				
1.9800	1.2285	774868.	1192.	-0.02281	0.00	3.83E+11
-97.607	85.8047	0.00				
2.0700	1.2039	776211.	1086.	-0.02281	0.00	3.83E+11
-98.324	88.2041	0.00				
2.1600	1.1793	777440.	979.5125	-0.02281	0.00	3.83E+11
-99.013	90.6780	0.00				
2.2500	1.1546	778554.	872.2212	-0.02281	0.00	3.83E+11
-99.674	93.2306	0.00				
2.3400	1.1300	779551.	764.2321	-0.02280	0.00	3.83E+11
-100.306	95.8663	0.00				
2.4300	1.1054	780431.	655.5772	-0.02280	0.00	3.83E+11
-100.907	98.5898	0.00				
2.5200	1.0808	781193.	546.2892	-0.02280	0.00	3.83E+11
-101.478	101.4064	0.00				
2.6100	1.0561	781837.	436.4020	-0.02280	0.00	3.83E+11
-102.017	104.3216	0.00				
2.7000	1.0315	782362.	325.9506	-0.02280	0.00	3.83E+11
-102.523	107.3415	0.00				
2.7900	1.0069	782768.	214.9707	-0.02279	0.00	3.83E+11
-102.995	110.4727	0.00				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area

Light Tower NC2-7 (Boring B-005-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

2.8800	0.9823	783053.	103.4994	-0.02279	0.00	3.83E+11
-103.433	113.7224	0.00				
2.9700	0.9577	783218.	-8.425	-0.02279	0.00	3.83E+11
-103.835	117.0985	0.00				
3.0600	0.9331	783261.	-120.764	-0.02279	0.00	3.83E+11
-104.200	120.6096	0.00				
3.1500	0.9085	783183.	-233.477	-0.02278	0.00	3.83E+11
-104.527	124.2652	0.00				
3.2400	0.8838	782984.	-346.521	-0.02278	0.00	3.83E+11
-104.814	128.0757	0.00				
3.3300	0.8592	782661.	-459.853	-0.02278	0.00	3.83E+11
-105.060	132.0525	0.00				
3.4200	0.8346	782217.	-573.429	-0.02278	0.00	3.83E+11
-105.264	136.2085	0.00				
3.5100	0.8100	781649.	-687.200	-0.02278	0.00	3.83E+11
-105.424	140.5576	0.00				
3.6000	0.7854	780959.	-801.119	-0.02277	0.00	3.83E+11
-105.537	145.1156	0.00				
3.6900	0.7609	780145.	-915.135	-0.02277	0.00	3.83E+11
-105.603	149.9000	0.00				
3.7800	0.7363	779208.	-1029.	-0.02277	0.00	3.83E+11
-105.620	154.9305	0.00				
3.8700	0.7117	778148.	-1143.	-0.02277	0.00	3.83E+11
-105.584	160.2291	0.00				
3.9600	0.6871	776965.	-1257.	-0.02276	0.00	3.83E+11
-105.493	165.8207	0.00				
4.0500	0.6625	775659.	-2000.	-0.02276	0.00	3.83E+11
-1270.	2070.	0.00				
4.1400	0.6379	772871.	-3369.	-0.02276	0.00	3.83E+11
-1265.	2142.	0.00				
4.2300	0.6133	768608.	-4732.	-0.02276	0.00	3.83E+11
-1260.	2219.	0.00				
4.3200	0.5888	762876.	-6090.	-0.02276	0.00	3.83E+11
-1254.	2301.	0.00				
4.4100	0.5642	755681.	-7441.	-0.02275	0.00	3.83E+11
-1248.	2389.	0.00				
4.5000	0.5396	747030.	-8785.	-0.02275	0.00	3.83E+11
-1241.	2484.	0.00				
4.5900	0.5150	736931.	-10121.	-0.02275	0.00	3.83E+11
-1233.	2586.	0.00				
4.6800	0.4905	725395.	-11448.	-0.02275	0.00	3.83E+11
-1225.	2697.	0.00				
4.7700	0.4659	712429.	-12380.	-0.02275	0.00	3.83E+11
-500.299	1160.	0.00				
4.8600	0.4413	698880.	-12918.	-0.02274	0.00	3.83E+11
-496.348	1215.	0.00				
4.9500	0.4168	684752.	-13452.	-0.02274	0.00	3.83E+11
-492.027	1275.	0.00				
5.0400	0.3922	670050.	-13981.	-0.02274	0.00	3.84E+11
-487.302	1342.	0.00				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area

Light Tower NC2-7 (Boring B-005-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

5.1300	0.3677	654779.	-14504.	-0.02274	0.00	3.84E+11
-482.129	1416.	0.00				
5.2200	0.3431	638947.	-15022.	-0.02274	0.00	3.84E+11
-476.462	1500.	0.00				
5.3100	0.3186	622558.	-15533.	-0.02273	0.00	3.84E+11
-470.240	1594.	0.00				
5.4000	0.2940	605621.	-16037.	-0.02273	0.00	3.84E+11
-463.394	1702.	0.00				
5.4900	0.2694	588143.	-16534.	-0.02273	0.00	3.84E+11
-455.833	1827.	0.00				
5.5800	0.2449	570134.	-17021.	-0.02273	0.00	3.84E+11
-447.448	1973.	0.00				
5.6700	0.2204	551603.	-17500.	-0.02273	0.00	3.84E+11
-438.096	2147.	0.00				
5.7600	0.1958	532561.	-17967.	-0.02273	0.00	3.84E+11
-427.589	2358.	0.00				
5.8500	0.1713	513020.	-18422.	-0.02272	0.00	3.84E+11
-415.673	2621.	0.00				
5.9400	0.1467	492994.	-18864.	-0.02272	0.00	3.84E+11
-401.986	2959.	0.00				
6.0300	0.1222	472500.	-19289.	-0.02272	0.00	3.84E+11
-385.991	3412.	0.00				
6.1200	0.09764	451555.	-19696.	-0.02272	0.00	3.84E+11
-366.827	4057.	0.00				
6.2100	0.07311	430182.	-20079.	-0.02272	0.00	3.84E+11
-342.966	5067.	0.00				
6.3000	0.04857	408409.	-20433.	-0.02272	0.00	3.84E+11
-311.211	6920.	0.00				
6.3900	0.02404	386273.	-20742.	-0.02272	0.00	3.84E+11
-262.339	11788.	0.00				
6.4800	-4.98E-04	363832.	-20843.	-0.02272	0.00	3.84E+11
75.8889	164530.	0.00				
6.5700	-0.02503	341478.	-20657.	-0.02271	0.00	3.84E+11
267.6735	11549.	0.00				
6.6600	-0.04956	319437.	-20341.	-0.02271	0.00	3.84E+11
319.0990	6953.	0.00				
6.7500	-0.07409	297768.	-19977.	-0.02271	0.00	3.85E+11
354.5852	5169.	0.00				
6.8400	-0.09862	276513.	-19579.	-0.02271	0.00	3.85E+11
382.7349	4191.	0.00				
6.9300	-0.123	255704.	-19152.	-0.02271	0.00	3.85E+11
406.5648	3565.	0.00				
7.0200	-0.148	235370.	-18620.	-0.02271	0.00	3.85E+11
580.1084	4242.	0.00				
7.1100	-0.172	215712.	-17979.	-0.02271	0.00	3.85E+11
605.8104	3799.	0.00				
7.2000	-0.197	196760.	-17312.	-0.02271	0.00	3.85E+11
629.4000	3455.	0.00				
7.2900	-0.221	178543.	-16621.	-0.02271	0.00	3.85E+11
651.3341	3179.	0.00				

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Light Tower NC2-7 (Boring B-005-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

7.3800	-0.246	161085.	-15906.	-0.02271	0.00	3.85E+11
671.9340	2953.	0.00				
7.4700	-0.270	144412.	-15170.	-0.02271	0.00	3.85E+11
691.4348	2763.	0.00				
7.5600	-0.295	128544.	-14413.	-0.02271	0.00	3.85E+11
710.0141	2601.	0.00				
7.6500	-0.319	113505.	-13637.	-0.02271	0.00	3.85E+11
727.8092	2461.	0.00				
7.7400	-0.344	99315.	-12841.	-0.02271	0.00	3.85E+11
744.9289	2340.	0.00				
7.8300	-0.368	85993.	-12028.	-0.02271	0.00	3.85E+11
761.4609	2232.	0.00				
7.9200	-0.393	73560.	-11197.	-0.02271	0.00	3.85E+11
777.4768	2137.	0.00				
8.0100	-0.417	62034.	-10349.	-0.02271	0.00	3.85E+11
793.0360	2052.	0.00				
8.1000	-0.442	51432.	-9484.	-0.02271	0.00	3.85E+11
808.1884	1975.	0.00				
8.1900	-0.467	41774.	-8603.	-0.02271	0.00	3.85E+11
822.9761	1905.	0.00				
8.2800	-0.491	33075.	-7707.	-0.02271	0.00	3.85E+11
837.4351	1842.	0.00				
8.3700	-0.516	25353.	-6795.	-0.02271	0.00	3.85E+11
851.5967	1784.	0.00				
8.4600	-0.540	18624.	-5867.	-0.02271	0.00	3.85E+11
865.4878	1731.	0.00				
8.5500	-0.565	12905.	-4925.	-0.02271	0.00	3.85E+11
879.1319	1682.	0.00				
8.6400	-0.589	8211.	-3969.	-0.02271	0.00	3.85E+11
892.5498	1636.	0.00				
8.7300	-0.614	4559.	-2997.	-0.02271	0.00	3.85E+11
905.7598	1594.	0.00				
8.8200	-0.638	1962.	-2012.	-0.02271	0.00	3.85E+11
918.7782	1555.	0.00				
8.9100	-0.663	437.9105	-1013.	-0.02271	0.00	3.85E+11
931.6194	1518.	0.00				
9.0000	-0.687	0.00	0.00	-0.02271	0.00	3.85E+11
944.2966	742.0215	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 = 1.77114768 inches

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area

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36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Computed slope at pile head = -0.0228597 radians
 Maximum bending moment = 783261. inch-lbs
 Maximum shear force = -20843. lbs
 Depth of maximum bending moment = 3.06000000 feet below pile head
 Depth of maximum shear force = 6.48000000 feet below pile head
 Number of iterations = 44
 Number of zero deflection points = 1
 Pile deflection at ground = 1.49696912 inches

Pile-head Deflection vs. Pile Length for Load Case 2

Boundary Condition Type 1, Shear and Moment

Shear = 2250. lbs
 Moment = 724800. in-lbs
 Axial Load = 4600. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	1.77114768	783261.	-20843.
8.55000	3.40340049	780051.	-22222.
8.10000	7.87218003	783941.	-24742.

Computed Values of Pile Loading and Deflection
for Lateral Loading for Load Case Number 3

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

Shear force at pile head = 2250.0 lbs
 Applied moment at pile head = 724800.0 in-lbs
 Axial thrust load on pile head = 3800.0 lbs

Depth Res. Soil	Deflect. Spr.	Bending Distrib.	Shear	Slope	Total	Bending	Soil
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					

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36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00	1.7563	724800.	2250.	-0.02267	0.00	3.83E+11
0.00	0.00	0.00				
0.09000	1.7318	727323.	2250.	-0.02267	0.00	3.83E+11
0.00	0.00	0.00				
0.1800	1.7073	729846.	2250.	-0.02266	0.00	3.83E+11
0.00	0.00	0.00				
0.2700	1.6828	732369.	2250.	-0.02266	0.00	3.83E+11
0.00	0.00	0.00				
0.3600	1.6584	734892.	2250.	-0.02266	0.00	3.83E+11
0.00	0.00	0.00				
0.4500	1.6339	737415.	2250.	-0.02266	0.00	3.83E+11
0.00	0.00	0.00				
0.5400	1.6094	739938.	2250.	-0.02266	0.00	3.83E+11
0.00	0.00	0.00				
0.6300	1.5850	742461.	2250.	-0.02265	0.00	3.83E+11
0.00	0.00	0.00				
0.7200	1.5605	744984.	2250.	-0.02265	0.00	3.83E+11
0.00	0.00	0.00				
0.8100	1.5360	747507.	2250.	-0.02265	0.00	3.83E+11
0.00	0.00	0.00				
0.9000	1.5116	750030.	2250.	-0.02265	0.00	3.83E+11
0.00	0.00	0.00				
0.9900	1.4871	752553.	2250.	-0.02264	0.00	3.83E+11
0.00	0.00	0.00				
1.0800	1.4627	755076.	2202.	-0.02264	0.00	3.83E+11
-88.787	65.5593	0.00				
1.1700	1.4382	757495.	2106.	-0.02264	0.00	3.83E+11
-89.748	67.3952	0.00				
1.2600	1.4137	759810.	2008.	-0.02264	0.00	3.83E+11
-90.686	69.2775	0.00				
1.3500	1.3893	762019.	1910.	-0.02264	0.00	3.83E+11
-91.601	71.2083	0.00				
1.4400	1.3649	764121.	1810.	-0.02263	0.00	3.83E+11
-92.494	73.1898	0.00				
1.5300	1.3404	766115.	1710.	-0.02263	0.00	3.83E+11
-93.363	75.2244	0.00				
1.6200	1.3160	768000.	1609.	-0.02263	0.00	3.83E+11
-94.207	77.3147	0.00				
1.7100	1.2915	769775.	1507.	-0.02263	0.00	3.83E+11
-95.027	79.4632	0.00				
1.8000	1.2671	771440.	1403.	-0.02263	0.00	3.83E+11
-95.821	81.6730	0.00				
1.8900	1.2427	772993.	1300.	-0.02262	0.00	3.83E+11
-96.590	83.9471	0.00				
1.9800	1.2182	774433.	1195.	-0.02262	0.00	3.83E+11
-97.333	86.2888	0.00				
2.0700	1.1938	775759.	1089.	-0.02262	0.00	3.83E+11
-98.048	88.7016	0.00				
2.1600	1.1694	776971.	983.0821	-0.02262	0.00	3.83E+11
-98.735	91.1895	0.00				

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Light Tower NC2-7 (Boring B-005-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

2.2500	1.1449	778068.	876.0922	-0.02261	0.00	3.83E+11
-99.394	93.7565	0.00				
2.3400	1.1205	779049.	768.4065	-0.02261	0.00	3.83E+11
-100.024	96.4070	0.00				
2.4300	1.0961	779914.	660.0566	-0.02261	0.00	3.83E+11
-100.624	99.1459	0.00				
2.5200	1.0717	780661.	551.0755	-0.02261	0.00	3.83E+11
-101.193	101.9783	0.00				
2.6100	1.0473	781289.	441.4971	-0.02261	0.00	3.83E+11
-101.730	104.9099	0.00				
2.7000	1.0229	781800.	331.3559	-0.02260	0.00	3.83E+11
-102.235	107.9468	0.00				
2.7900	0.9984	782191.	220.6876	-0.02260	0.00	3.83E+11
-102.706	111.0956	0.00				
2.8800	0.9740	782462.	109.5293	-0.02260	0.00	3.83E+11
-103.143	114.3636	0.00				
2.9700	0.9496	782613.	-2.081	-0.02260	0.00	3.83E+11
-103.544	117.7587	0.00				
3.0600	0.9252	782643.	-114.105	-0.02259	0.00	3.83E+11
-103.908	121.2896	0.00				
3.1500	0.9008	782552.	-226.501	-0.02259	0.00	3.83E+11
-104.233	124.9658	0.00				
3.2400	0.8764	782339.	-339.228	-0.02259	0.00	3.83E+11
-104.520	128.7977	0.00				
3.3300	0.8520	782005.	-452.242	-0.02259	0.00	3.83E+11
-104.765	132.7969	0.00				
3.4200	0.8276	781548.	-565.498	-0.02259	0.00	3.83E+11
-104.969	136.9762	0.00				
3.5100	0.8032	780968.	-678.950	-0.02258	0.00	3.83E+11
-105.128	141.3497	0.00				
3.6000	0.7789	780267.	-792.550	-0.02258	0.00	3.83E+11
-105.241	145.9333	0.00				
3.6900	0.7545	779442.	-906.246	-0.02258	0.00	3.83E+11
-105.307	150.7446	0.00				
3.7800	0.7301	778494.	-1020.	-0.02258	0.00	3.83E+11
-105.323	155.8033	0.00				
3.8700	0.7057	777424.	-1134.	-0.02258	0.00	3.83E+11
-105.287	161.1316	0.00				
3.9600	0.6813	776231.	-1247.	-0.02257	0.00	3.83E+11
-105.197	166.7546	0.00				
4.0500	0.6569	774915.	-1988.	-0.02257	0.00	3.83E+11
-1267.	2083.	0.00				
4.1400	0.6326	772121.	-3354.	-0.02257	0.00	3.83E+11
-1262.	2155.	0.00				
4.2300	0.6082	767855.	-4715.	-0.02257	0.00	3.83E+11
-1257.	2233.	0.00				
4.3200	0.5838	762122.	-6070.	-0.02256	0.00	3.83E+11
-1252.	2315.	0.00				
4.4100	0.5595	754929.	-7418.	-0.02256	0.00	3.83E+11
-1245.	2404.	0.00				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area

Light Tower NC2-7 (Boring B-005-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

4.5000	0.5351	746284.	-8759.	-0.02256	0.00	3.83E+11
-1238.	2499.	0.00				
4.5900	0.5107	736195.	-10092.	-0.02256	0.00	3.83E+11
-1231.	2602.	0.00				
4.6800	0.4864	724670.	-11417.	-0.02256	0.00	3.83E+11
-1222.	2714.	0.00				
4.7700	0.4620	711719.	-12347.	-0.02255	0.00	3.83E+11
-499.249	1167.	0.00				
4.8600	0.4376	698186.	-12884.	-0.02255	0.00	3.83E+11
-495.307	1222.	0.00				
4.9500	0.4133	684075.	-13416.	-0.02255	0.00	3.83E+11
-490.996	1283.	0.00				
5.0400	0.3889	669392.	-13944.	-0.02255	0.00	3.84E+11
-486.280	1350.	0.00				
5.1300	0.3646	654141.	-14467.	-0.02255	0.00	3.84E+11
-481.119	1425.	0.00				
5.2200	0.3402	638329.	-14983.	-0.02254	0.00	3.84E+11
-475.465	1509.	0.00				
5.3100	0.3159	621963.	-15493.	-0.02254	0.00	3.84E+11
-469.257	1604.	0.00				
5.4000	0.2916	605049.	-15996.	-0.02254	0.00	3.84E+11
-462.425	1713.	0.00				
5.4900	0.2672	587596.	-16492.	-0.02254	0.00	3.84E+11
-454.882	1839.	0.00				
5.5800	0.2429	569612.	-16978.	-0.02254	0.00	3.84E+11
-446.515	1986.	0.00				
5.6700	0.2185	551107.	-17456.	-0.02254	0.00	3.84E+11
-437.184	2161.	0.00				
5.7600	0.1942	532093.	-17922.	-0.02253	0.00	3.84E+11
-426.701	2373.	0.00				
5.8500	0.1699	512580.	-18377.	-0.02253	0.00	3.84E+11
-414.812	2638.	0.00				
5.9400	0.1455	492584.	-18817.	-0.02253	0.00	3.84E+11
-401.157	2977.	0.00				
6.0300	0.1212	472120.	-19242.	-0.02253	0.00	3.84E+11
-385.200	3433.	0.00				
6.1200	0.09685	451207.	-19647.	-0.02253	0.00	3.84E+11
-366.081	4082.	0.00				
6.2100	0.07252	429867.	-20030.	-0.02253	0.00	3.84E+11
-342.279	5097.	0.00				
6.3000	0.04819	408127.	-20383.	-0.02253	0.00	3.84E+11
-310.605	6961.	0.00				
6.3900	0.02387	386025.	-20692.	-0.02253	0.00	3.84E+11
-261.873	11851.	0.00				
6.4800	-4.61E-04	363618.	-20795.	-0.02252	0.00	3.84E+11
70.2751	164530.	0.00				
6.5700	-0.02479	341293.	-20613.	-0.02252	0.00	3.84E+11
267.0186	11634.	0.00				
6.6600	-0.04911	319279.	-20297.	-0.02252	0.00	3.84E+11
318.3702	7001.	0.00				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC2-7 (Boring B-005-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

6.7500	-0.07343	297636.	-19934.	-0.02252	0.00	3.85E+11
353.7949	5203.	0.00				
6.8400	-0.09776	276406.	-19537.	-0.02252	0.00	3.85E+11
381.8923	4219.	0.00				
6.9300	-0.122	255622.	-19111.	-0.02252	0.00	3.85E+11
405.6765	3589.	0.00				
7.0200	-0.146	235311.	-18580.	-0.02252	0.00	3.85E+11
578.8474	4270.	0.00				
7.1100	-0.171	215674.	-17941.	-0.02252	0.00	3.85E+11
604.4983	3824.	0.00				
7.2000	-0.195	196743.	-17275.	-0.02252	0.00	3.85E+11
628.0405	3478.	0.00				
7.2900	-0.219	178545.	-16585.	-0.02252	0.00	3.85E+11
649.9302	3200.	0.00				
7.3800	-0.244	161104.	-15872.	-0.02252	0.00	3.85E+11
670.4882	2972.	0.00				
7.4700	-0.268	144446.	-15137.	-0.02252	0.00	3.85E+11
689.9491	2780.	0.00				
7.5600	-0.292	128593.	-14382.	-0.02252	0.00	3.85E+11
708.4902	2618.	0.00				
7.6500	-0.317	113565.	-13607.	-0.02252	0.00	3.85E+11
726.2487	2477.	0.00				
7.7400	-0.341	99385.	-12814.	-0.02252	0.00	3.85E+11
743.3331	2355.	0.00				
7.8300	-0.365	86072.	-12002.	-0.02252	0.00	3.85E+11
759.8308	2247.	0.00				
7.9200	-0.390	73645.	-11173.	-0.02251	0.00	3.85E+11
775.8135	2151.	0.00				
8.0100	-0.414	62123.	-10327.	-0.02251	0.00	3.85E+11
791.3404	2065.	0.00				
8.1000	-0.438	51524.	-9464.	-0.02251	0.00	3.85E+11
806.4612	1988.	0.00				
8.1900	-0.463	41866.	-8585.	-0.02251	0.00	3.85E+11
821.2181	1918.	0.00				
8.2800	-0.487	33166.	-7690.	-0.02251	0.00	3.85E+11
835.6470	1854.	0.00				
8.3700	-0.511	25440.	-6780.	-0.02251	0.00	3.85E+11
849.7790	1795.	0.00				
8.4600	-0.535	18706.	-5855.	-0.02251	0.00	3.85E+11
863.6410	1742.	0.00				
8.5500	-0.560	12978.	-4915.	-0.02251	0.00	3.85E+11
877.2566	1692.	0.00				
8.6400	-0.584	8275.	-3960.	-0.02251	0.00	3.85E+11
890.6464	1647.	0.00				
8.7300	-0.608	4609.	-2991.	-0.02251	0.00	3.85E+11
903.8287	1604.	0.00				
8.8200	-0.633	1999.	-2008.	-0.02251	0.00	3.85E+11
916.8198	1565.	0.00				
8.9100	-0.657	457.1423	-1011.	-0.02251	0.00	3.85E+11
929.6341	1528.	0.00				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area

Light Tower NC2-7 (Boring B-005-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

9.0000	-0.681	0.00	0.00	-0.02251	0.00	3.85E+11
942.2847	746.7838	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. 3:

Pile-head deflection	=	1.75626499 inches
Computed slope at pile head	=	-0.0226678 radians
Maximum bending moment	=	782643. inch-lbs
Maximum shear force	=	-20795. lbs
Depth of maximum bending moment	=	3.06000000 feet below pile head
Depth of maximum shear force	=	6.48000000 feet below pile head
Number of iterations	=	44
Number of zero deflection points	=	1
Pile deflection at ground	=	1.48438930 inches

Pile-head Deflection vs. Pile Length for Load Case 3

Boundary Condition Type 1, Shear and Moment

Shear	=	2250. lbs
Moment	=	724800. in-lbs
Axial Load	=	3800. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	1.75626499	782643.	-20795.
8.55000	3.34714834	778882.	-22121.
8.10000	7.54695511	780992.	-24458.

Summary of Pile-head Responses for Conventional Analyses

Definitions of Pile-head Loading Conditions:

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Northbound Parking Area
 Light Tower NC2-7 (Boring B-005-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

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 Shear	Load Max	Load Moment	Load Type	Load Type	Axial Loading	Pile-head Deflection	Pile-head Rotation	Max in
Case	Type	Pile-head	Type	Pile-head				
Pile	in	Pile						
No.	1	Load 1	2	Load 2	lbs	inches	radians	lbs
	in-lbs							
1	V, lb	1000.0000	M, in-lb	315600.	4200.	0.07578	-0.00100	
-9208.		343116.						
2	V, lb	2250.	M, in-lb	724800.	4600.	1.7711	-0.02286	
-20843.		783261.						
3	V, lb	2250.	M, in-lb	724800.	3800.	1.7563	-0.02267	
-20795.		782643.						

Maximum pile-head deflection = 1.7711476847 inches

Maximum pile-head rotation = -0.0228597134 radians = -1.309765 deg.

The analysis ended normally.

LATERAL LOAD (LPILE) ANALYSES
SOUTHBOUND PARKING AREA
LPILE SOIL PARAMETERS

LPILE Parameters for Lateral Analyses – SUM-271 Southbound Parking Area

The following tables include parameters used by S&ME to perform a lateral load (LPILE) analysis on the foundations of each light tower at the southbound parking area. These tables include p-y models, soil unit weights, friction angle and subgrade modulus value for granular, and cohesion and strain values for cohesive soils. These parameters are based on the soil encountered and lab data shown on the boring logs, and recommended values given in the LPILE 2022 user's manual and guidance provided by ODOT Office of Geotechnical Engineering (OGE).

Table 5 – LPILE Input Parameters at Light Tower SC1-12 (Boring B-008 & B-010)

Stratum	Depth* Interval (ft.)	Elevation Range	p-y Soil Model	Effective Unit Weight	Subgrade Modulus, k	C (psf) or ϕ (deg)	Strain ϵ_{50}
Disturbed Layer (per GDM Sec. 1201)	0.0 – 3.0	1,166.5 – 1,163.5	Soft Clay (Matlock)	98 pcf	---	250	0.02
Sandy Silt (A-4a)	3.0 – 3.6	1,163.5 – 1,162.9	Stiff Clay w/o Free Water	58 pcf	---	3,500	0.005
Silty Clay (A-6b)	3.6 – 8.6	1,162.9 – 1,157.9	Stiff Clay w/o Free Water	60 pcf	---	4,250	0.004
Sandy Silt (A-4a)	8.6 – 10.6	1,157.9 – 1,155.9	Stiff Clay w/o Free Water	63 pcf	---	2,500	0.005
Sandy Silt (A-4a)	10.6 – 13.7	1,155.9 – 1,152.8	Stiff Clay w/o Free Water	58 pcf	---	1,750	0.007

*Below proposed ground surface at light tower, estimated to be at El. 1,166.50.

Table 6 – LPILE Input Parameters at Light Tower SC1-13 (Boring B-012)

Stratum	Depth* Interval (ft.)	Elevation Range	p-y Soil Model	Effective Unit Weight	Subgrade Modulus, k	C (psf) or ϕ (deg)	Strain ϵ_{50}
Disturbed Layer (per GDM Sec. 1201)	0.0 – 3.0	1,171.0 – 1,168.0	Soft Clay (Matlock)	98 pcf	---	250	0.02
Silt and Clay (A-6a)	3.0 – 3.5	1,168.0 – 1,167.5	Soft Clay (Matlock)	56 pcf	---	1,000	0.01
Silty Clay (A-6b)	3.5 – 6.0	1,167.5 – 1,165.0	Stiff Clay w/o Free Water	60 pcf	---	4,500	0.004
Sandy Silt (A-4a)	6.0 – 8.5	1,165.0 – 1,162.5	Stiff Clay w/o Free Water	66 pcf	---	4,500	0.004
Silt and Clay (A-6a)	8.5 – 11.0	1,162.5 – 1,160.0	Stiff Clay w/o Free Water	63 pcf	---	4,500	0.004
Silt and Clay (A-6a)	11.0 – 18.5	1,160.0 – 1,152.5	Stiff Clay w/o Free Water	60 pcf	---	4,500	0.004
Sandy Silt (A-4a)	18.5 – 21.0	1,152.5 – 1,150.0	Stiff Clay w/o Free Water	63 pcf	---	4,500	0.004
Silt and Clay (A-6a)	21.0 – 25.5	1,150.0 – 1,145.5	Stiff Clay w/o Free Water	63 pcf	---	4,500	0.004

*Below proposed ground surface at light tower, estimated to be at El. 1,170.95.

Table 7 – LPILE Input Parameters at Light Tower SC1-14 (Boring B-012 & B-013)

Stratum	Depth* Interval (ft.)	Elevation Range	p-y Soil Model	Effective Unit Weight	Subgrade Modulus, k	C (psf) or ϕ (deg)	Strain ϵ_{50}
Disturbed Layer (per GDM Sec. 1201)	0.0 – 3.0	1,173.9 – 1,170.9	Soft Clay (Matlock)	98 pcf	---	250	0.02
Silty Clay (A-6b)	3.0 – 4.2	1,170.9 – 1,169.7	Stiff Clay w/o Free Water	56 pcf	---	1,100	0.007
Silt and Clay (A-6a)	4.2 – 8.7	1,169.7 – 1,165.2	Stiff Clay w/o Free Water	60 pcf	---	4,500	0.004
Sandy Silt (A-4a)	8.7 – 11.4	1,165.2 – 1,162.5	Stiff Clay w/o Free Water	66 pcf	---	4,500	0.004
Silty Clay (A-6b)	11.4 – 13.9	1,162.5 – 1,160.0	Stiff Clay w/o Free Water	63 pcf	---	4,500	0.004

*Below proposed ground surface at light tower, estimated to be at El. 1,173.89.

Table 8 – LPILE Input Parameters at Light Tower SC1-15 (Boring B-015)

Stratum	Depth* Interval (ft.)	Elevation Range	p-y Soil Model	Effective Unit Weight	Subgrade Modulus, k	C (psf) or ϕ (deg)	Strain ϵ_{50}
Disturbed Layer (per GDM Sec. 1201)	0.0 – 3.0	1,175.6 – 1,172.6	Soft Clay (Matlock)	98 pcf	---	250	0.02
Silt and Clay (A-6a)	3.0 – 3.2	1,172.6 – 1,172.4	Stiff Clay w/o Free Water	58 pcf	---	3,500	0.005
Silt and Clay (A-6a)	3.2 – 10.2	1,172.4 – 1,165.4	Stiff Clay w/o Free Water	66 pcf	---	4,500	0.004

*Below proposed ground surface at light tower, estimated to be at El. 1,175.62.

Table 9 – LPILE Input Parameters at Light Tower SC1-16 (Boring B-008)

Stratum	Depth* Interval (ft.)	Elevation Range	p-y Soil Model	Effective Unit Weight	Subgrade Modulus, k	C (psf) or ϕ (deg)	Strain ϵ_{50}
Disturbed Layer (per GDM Sec. 1201)	0.0 – 3.0	1,159.7 – 1,156.7	Soft Clay (Matlock)	98 pcf	---	250	0.02
Gravel with Sand (A-1-b)	3.0 – 4.4	1156.7 – 1155.3	Sand (Reese)	63 pcf	60 pci	34°	---
Sandy Silt (A-4a)	4.4 – 6.9	1,155.3 – 1,152.8	Stiff Clay w/o Free Water	58 pcf	---	1,750	0.007
Silty Clay (A-6b)	6.9 – 9.4	1,152.8 – 1,150.3	Stiff Clay w/o Free Water	60 pcf	---	3,750	0.005
Silt and Clay (A-6a)	9.4 – 11.9	1,150.3 – 1,147.8	Stiff Clay w/o Free Water	63 pcf	---	4,500	0.004
Silt and Clay (A-6a)	11.9 – 21.9	1,147.8 – 1,137.8	Stiff Clay w/o Free Water	68 pcf	---	4,500	0.004
Sandy Silt (A-4a)	21.9 – 26.4	1,137.8 – 1,133.3	Stiff Clay w/o Free Water	63 pcf	---	4,500	0.004

*Below proposed ground surface at light tower, estimated to be at El. 1,159.74.

Table 10 – LPILE Input Parameters at Light Tower SC1-17 (Boring B-008 & B-009)

Stratum	Depth* Interval (ft.)	Elevation Range	p-y Soil Model	Effective Unit Weight	Subgrade Modulus, k	C (psf) or ϕ (deg)	Strain ϵ_{50}
Disturbed Layer (per GDM Sec. 1201)	0.0 – 3.0	1,153.9 – 1,150.9	Soft Clay (Matlock)	98 pcf	---	250	0.02
Silty Clay (A-6b)	3.0 – 3.6	1,150.9 – 1,150.3	Stiff Clay w/o Free Water	60 pcf	---	4,000	0.004
Silt and Clay (A-6a)	3.6 – 16.1	1,150.3 – 1,137.8	Stiff Clay w/o Free Water	68 pcf	---	4,500	0.004
Sandy Silt (A-4a)	16.1 – 20.6	1,137.8 – 1,133.3	Stiff Clay w/o Free Water	63 pcf	---	4,500	0.004

*Below proposed ground surface at light tower, estimated to be at El. 1,153.85.

Table 11 – LPILE Input Parameters at Light Tower SC1-18 (Boring B-009 & B-011)

Stratum	Depth* Interval (ft.)	Elevation Range	p-y Soil Model	Effective Unit Weight	Subgrade Modulus, k	C (psf) or ϕ (deg)	Strain ϵ_{50}
Disturbed Layer (per GDM Sec. 1201)	0.0 – 3.0	1,156.7 – 1,153.7	Soft Clay (Matlock)	98 pcf	---	250	0.02
Elastic Clay (A-7-6)	3.0 – 5.4	1,153.7 – 1,151.3	Stiff Clay w/o Free Water	58 pcf	---	3,000	0.005
Silt And Clay (A-6a)	5.4 – 16.6	1,151.3 – 1,140.1	Stiff Clay w/o Free Water	60 pcf	---	4,500	0.004

*Below proposed ground surface at light tower, estimated to be at El. 1,156.70.

Table 12 – LPILE Input Parameters at Light Tower SC1-19 (Boring B-011)

Stratum	Depth* Interval (ft.)	Elevation Range	p-y Soil Model	Effective Unit Weight	Subgrade Modulus, k	C (psf) or ϕ (deg)	Strain ϵ_{50}
Disturbed Layer (per GDM Sec. 1201)	0.0 – 3.0	1,162.2 – 1,159.2	Soft Clay (Matlock)	98 pcf	---	250	0.02
Silt and Clay (A-6a)	3.0 – 5.1	1,159.2 – 1,157.1	Stiff Clay w/o Free Water	63 pcf	---	4,500	0.004
Silt (A-4b)	5.1 – 8.9	1,157.1 – 1,153.3	Stiff Clay w/o Free Water	66 pcf	---	4,500	0.004
Silt and Clay (A-6a)	8.9 – 22.1	1,153.3 – 1,140.1	Stiff Clay w/o Free Water	60 pcf	---	4,500	0.004

*Below proposed ground surface at light tower, estimated to be at El. 1,162.16.

Table 13 – LPile Input Parameters at Light Tower SC1-20 (Boring B-011 & B-014)

Stratum	Depth* Interval (ft.)	Elevation Range	p-y Soil Model	Effective Unit Weight	Subgrade Modulus, k	C (psf) or ϕ (deg)	Strain ϵ_{50}
Disturbed Layer (per GDM Sec. 1201)	0.0 – 3.0	1,168.4 – 1,165.4	Soft Clay (Matlock)	98 pcf	---	250	0.02
Silt and Clay (A-6a)	3.0 – 11.3	1,165.4 – 1,157.1	Stiff Clay w/o Free Water	63 pcf	---	4,500	0.004
Silt (A-4b)	11.3 – 15.1	1,157.1 – 1,153.3	Stiff Clay w/o Free Water	66 pcf	---	4,500	0.004

*Below proposed ground surface at light tower, estimated to be at El. 1,168.41.

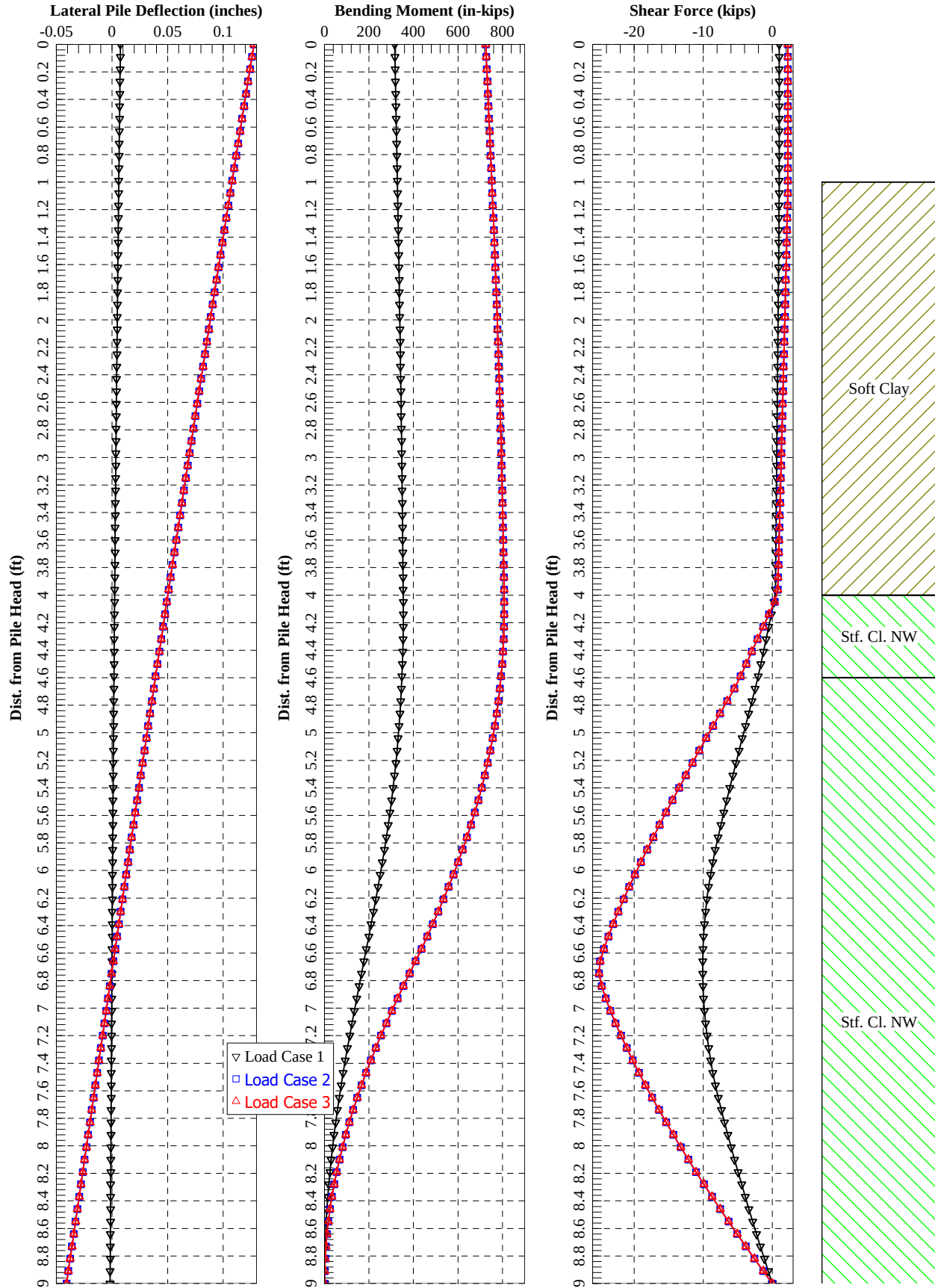
Table 14 – LPile Input Parameters at Light Tower SC1-21 (Boring B-016)

Stratum	Depth* Interval (ft.)	Elevation Range	p-y Soil Model	Effective Unit Weight	Subgrade Modulus, k	C (psf) or ϕ (deg)	Strain ϵ_{50}
Disturbed Layer (per GDM Sec. 1201)	0.0 – 3.0	1,180.8 – 1,177.8	Soft Clay (Matlock)	98 pcf	---	250	0.02
Silt and Clay (A-6a)	3.0 – 5.5	1,177.8 – 1,175.3	Soft Clay (Matlock)	48 pcf	---	500	0.02
Silt and Clay (A-6a)	5.5 – 13.0	1,175.3 – 1,167.8	Stiff Clay w/o Free Water	63 pcf	---	3,500	0.005
Gravel w/ Sand (A-1-b)	13.0 – 16.8	1,167.8 – 1,164.0	Sand (Reese)	78 pcf	125 pci	36°	---

*Below proposed ground surface at light tower, estimated to be at El. 1,180.83.

LATERAL LOAD (LPILE) ANALYSES
SOUTHBOUND PARKING AREA
LIGHT TOWER SC1-12 (B-010-0-25)

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-12 (Boring B-008 & 010-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation



TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-12 (Boring B-008 & 010-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

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LFile for Version 2022-12.012

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

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This model was prepared by:
BSears

Files Used for Analysis

Path to file locations:
\Columbus-1170\Projects\2024\24170232_ms_TP 26 NE Ohio\GEO\Project Docs\Site
15_SUM-271 (2LMN)\Calcs\Light Towers\LPILE (Final Report)\SB\

Name of input data file:
Tower SC1-12 (B-008 & B-010).lp12d

Name of output report file:
Tower SC1-12 (B-008 & B-010).lp12o

Name of plot output file:
Tower SC1-12 (B-008 & B-010).lp12p

Name of runtime message file:
Tower SC1-12 (B-008 & B-010).lp12r

Date and Time of Analysis

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Date: April 8, 2026

Time: 20:20:29

Problem Title

Project Name: TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas

Job Number: 24170232F

Client: ms consultants, inc.

Engineer: BKS

Description: Light Tower SC1-12 (B-008-0-25 & B-010-0-25)

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

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- 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	=	9.000 ft
Depth of ground surface below top of pile	=	1.0000 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.

Point No.	Depth Below Pile Head feet	Pile Diameter inches
-----	-----	-----
1	0.000	36.0000
2	9.000	36.0000

Input Structural Properties for Pile Sections:

Pile Section No. 1:

Section 1 is a round drilled shaft, bored pile, or CIDH pile	
Length of section	= 9.000000 ft
Shaft Diameter	= 36.000000 in

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Soil and Rock Layering Information

The soil profile is modelled using 5 layers

Layer 1 is soft clay, p-y criteria by Matlock, 1970

Distance from top of pile to top of layer	=	1.000000 ft
Distance from top of pile to bottom of layer	=	4.000000 ft
Effective unit weight at top of layer	=	98.000000 pcf
Effective unit weight at bottom of layer	=	98.000000 pcf
Undrained cohesion at top of layer	=	250.000000 psf
Undrained cohesion at bottom of layer	=	250.000000 psf
Epsilon-50 at top of layer	=	0.020000
Epsilon-50 at bottom of layer	=	0.020000

Layer 2 is stiff clay without free water

Distance from top of pile to top of layer	=	4.000000 ft
Distance from top of pile to bottom of layer	=	4.600000 ft
Effective unit weight at top of layer	=	58.000000 pcf
Effective unit weight at bottom of layer	=	58.000000 pcf
Undrained cohesion at top of layer	=	3500. psf
Undrained cohesion at bottom of layer	=	3500. psf
Epsilon-50 at top of layer	=	0.005000
Epsilon-50 at bottom of layer	=	0.005000

Layer 3 is stiff clay without free water

Distance from top of pile to top of layer	=	4.600000 ft
Distance from top of pile to bottom of layer	=	9.600000 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	=	4250. psf
Undrained cohesion at bottom of layer	=	4250. psf
Epsilon-50 at top of layer	=	0.004000
Epsilon-50 at bottom of layer	=	0.004000

Layer 4 is stiff clay without free water

Distance from top of pile to top of layer	=	9.600000 ft
Distance from top of pile to bottom of layer	=	11.600000 ft
Effective unit weight at top of layer	=	63.000000 pcf

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Effective unit weight at bottom of layer	=	63.000000 pcf
Undrained cohesion at top of layer	=	2500. psf
Undrained cohesion at bottom of layer	=	2500. psf
Epsilon-50 at top of layer	=	0.005000
Epsilon-50 at bottom of layer	=	0.005000

Layer 5 is stiff clay without free water

Distance from top of pile to top of layer	=	11.600000 ft
Distance from top of pile to bottom of layer	=	14.700000 ft
Effective unit weight at top of layer	=	58.000000 pcf
Effective unit weight at bottom of layer	=	58.000000 pcf
Undrained cohesion at top of layer	=	1750. psf
Undrained cohesion at bottom of layer	=	1750. psf
Epsilon-50 at top of layer	=	0.007000
Epsilon-50 at bottom of layer	=	0.007000

(Depth of the lowest soil layer extends 5.700 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 psf	E50 or krm
1	Soft Clay	1.0000 4.0000	98.0000 98.0000	250.0000 250.0000	0.02000 0.02000
2	Stiff Clay w/o Free Water	4.0000 4.6000	58.0000 58.0000	3500. 3500.	0.00500 0.00500
3	Stiff Clay w/o Free Water	4.6000 9.6000	60.0000 60.0000	4250. 4250.	0.00400 0.00400
4	Stiff Clay w/o Free Water	9.6000 11.6000	63.0000 63.0000	2500. 2500.	0.00500 0.00500
5	Stiff Clay w/o Free Water	11.6000 14.7000	58.0000 58.0000	1750. 1750.	0.00700 0.00700

 Static Loading Type

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

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 Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 3

Load Compute No.	Load Top y Type	Condition Run Analysis 1	Condition 2	Axial Thrust Force, lbs
vs. Pile Length				
1	1	V = 1000.000000 lbs	M = 315600. in-lbs	4200.
Yes		Yes		
2	1	V = 2250. lbs	M = 724800. in-lbs	4600.
Yes		Yes		
3	1	V = 2250. lbs	M = 724800. in-lbs	3800.
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:

 Dimensions and Properties of Drilled Shaft (Bored Pile):

Length of Section	=	9.000000 ft
Shaft Diameter	=	36.000000 in
Concrete Cover Thickness (to edge of trans. reinf.)	=	3.500000 in
Number of Reinforcing Bars	=	16 bars
Yield Stress of Reinforcing Bars	=	60000. psi

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Modulus of Elasticity of Reinforcing Bars	=	29000000. psi
Gross Area of Shaft	=	1018. sq. in.
Total Area of Reinforcing Steel	=	16.000000 sq. in.
Area Ratio of Steel Reinforcement	=	1.57 percent
Edge-to-Edge Bar Spacing	=	4.114467 in
Maximum Concrete Aggregate Size	=	0.750000 in
Ratio of Bar Spacing to Aggregate Size	=	5.49
Offset of Center of Rebar Cage from Center of Pile	=	0.0000 in
Transverse Reinforcement		
Type: Spiral		
Number of Transverse Reinf. (per spacing)	=	1
Spacing of Transverse Reinf.	=	4.500000 in
Yield Stress of Transverse Reinf.	=	60000. psi
Diameter of Transverse Reinf.	=	0.500000 in

Axial Structural Capacities:

Nom. Axial Structural Capacity = $0.85 F_c A_c + F_y A_s$	=	4366.378 kips
Tensile Load for Cracking of Concrete	=	-470.222 kips
Nominal Axial Tensile Capacity	=	-960.000 kips

Reinforcing Bar Dimensions and Positions Used in Computations:

Bar Number	Bar Diam. inches	Bar Area sq. in.	X inches	Y inches
-----	-----	-----	-----	-----
1	1.128000	1.000000	13.436000	0.000000
2	1.128000	1.000000	12.413245	5.141735
3	1.128000	1.000000	9.500687	9.500687
4	1.128000	1.000000	5.141735	12.413245
5	1.128000	1.000000	0.000000	13.436000
6	1.128000	1.000000	-5.14173	12.413245
7	1.128000	1.000000	-9.50069	9.500687
8	1.128000	1.000000	-12.41325	5.141735
9	1.128000	1.000000	-13.43600	0.000000
10	1.128000	1.000000	-12.41325	-5.14173
11	1.128000	1.000000	-9.50069	-9.50069
12	1.128000	1.000000	-5.14173	-12.41325
13	1.128000	1.000000	0.000000	-13.43600
14	1.128000	1.000000	5.141735	-12.41325
15	1.128000	1.000000	9.500687	-9.50069
16	1.128000	1.000000	12.413245	-5.14173

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

Minimum spacing between any two bars not equal to zero = 4.114 inches
 between bars 11 and 12.

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Ratio of bar spacing to maximum aggregate size = 5.49

Concrete Properties:

Compressive Strength of Concrete	=	4000. psi
Modulus of Elasticity of Concrete	=	3604997. psi
Modulus of Rupture of Concrete	=	-474.34165 psi
Compression Strain at Peak Stress	=	0.001886
Tensile Strain at Fracture of Concrete	=	-0.0001154
Maximum Coarse Aggregate Size	=	0.750000 in

Number of Axial Thrust Force Values Determined from Pile-head Loadings = 3

Number	Axial Thrust Force kips
-----	-----
1	3.800
2	4.200
3	4.600

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 318-14, Section 21.2.3.
 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 = 3.800 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
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6.25000E-07	240.5062135	384809942.	19.2929823	0.00001206	-0.00001044
0.0505030	0.2746478				
0.00000125	480.1472468	384117797.	18.6479768	0.00002331	-0.00002169
0.0973082	0.5259142				
0.00000188	718.9174733	383422652.	18.4329804	0.00003456	-0.00003294
0.1438345	0.7771808				
0.00000250	956.8168886	382726755.	18.3254857	0.00004581	-0.00004419
0.1900818	1.0284477				
0.00000313	1194.	382030558.	18.2609917	0.00005707	-0.00005543
0.2360502	1.2797149				
0.00000375	1430.	381334209.	18.2179981	0.00006832	-0.00006668
0.2817396	1.5309823				
0.00000438	1665.	380637775.	18.1872904	0.00007957	-0.00007793
0.3271500	1.7822500				
0.00000500	1900.	379941287.	18.1642614	0.00009082	-0.00008918
0.3722815	2.0335179				
0.00000563	2133.	379244764.	18.1463515	0.0001021	-0.000100
0.4171340	2.2847861				
0.00000625	2366.	378548215.	18.1320251	0.0001133	-0.000112
0.4617075	2.5360546				
0.00000688	2366.	344134741.	10.2494785	0.00007047	-0.000177
0.2882187	-4.308598 C				
0.00000750	2366.	315456846.	10.2198771	0.00007665	-0.000193
0.3129821	-4.706727 C				
0.00000813	2366.	291190934.	10.1952302	0.00008284	-0.000210
0.3376758	-5.104761 C				
0.00000875	2366.	270391582.	10.1744772	0.00008903	-0.000226
0.3622998	-5.502701 C				
0.00000938	2366.	252365477.	10.1568402	0.00009522	-0.000242
0.3868539	-5.900547 C				
0.00001000	2366.	236592634.	10.1417358	0.0001014	-0.000259
0.4113380	-6.298297 C				
0.00001063	2366.	222675420.	10.1287027	0.0001076	-0.000275
0.4357521	-6.695951 C				
0.00001125	2366.	210304564.	10.1174231	0.0001138	-0.000291
0.4600960	-7.093510 C				
0.00001188	2366.	199235903.	10.1076093	0.0001200	-0.000307
0.4843696	-7.490973 C				
0.00001250	2366.	189274107.	10.0990420	0.0001262	-0.000324
0.5085729	-7.888340 C				
0.00001313	2366.	180261055.	10.0915439	0.0001325	-0.000340
0.5327056	-8.285611 C				
0.00001375	2366.	172067370.	10.0849699	0.0001387	-0.000356
0.5567678	-8.682785 C				
0.00001438	2366.	164586180.	10.0792000	0.0001449	-0.000373
0.5807594	-9.079861 C				
0.00001500	2366.	157728423.	10.0741344	0.0001511	-0.000389
0.6046801	-9.476841 C				

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0.00001563	2366.	151419286.	10.0696892	0.0001573	-0.000405
0.6285300	-9.873723 C				
0.00001625	2366.	145595467.	10.0657933	0.0001636	-0.000421
0.6523089	-10.270507 C				
0.00001688	2366.	140203043.	10.0623863	0.0001698	-0.000438
0.6760167	-10.667193 C				
0.00001750	2366.	135195791.	10.0594163	0.0001760	-0.000454
0.6996534	-11.063781 C				
0.00001813	2366.	130533867.	10.0568387	0.0001823	-0.000470
0.7232187	-11.460271 C				
0.00001875	2366.	126182738.	10.0546147	0.0001885	-0.000486
0.7467127	-11.856661 C				
0.00001938	2366.	122112327.	10.0527107	0.0001948	-0.000503
0.7701352	-12.252952 C				
0.00002000	2366.	118296317.	10.0510970	0.0002010	-0.000519
0.7934860	-12.649144 C				
0.00002063	2366.	114711580.	10.0497478	0.0002073	-0.000535
0.8167652	-13.045236 C				
0.00002125	2366.	111337710.	10.0486401	0.0002135	-0.000551
0.8399726	-13.441228 C				
0.00002188	2366.	108156633.	10.0477539	0.0002198	-0.000568
0.8631080	-13.837120 C				
0.00002250	2366.	105152282.	10.0470709	0.0002261	-0.000584
0.8861714	-14.232911 C				
0.00002313	2366.	102310328.	10.0465752	0.0002323	-0.000600
0.9091627	-14.628602 C				
0.00002375	2366.	99617951.	10.0462524	0.0002386	-0.000616
0.9320817	-15.024191 C				
0.00002438	2366.	97063645.	10.0460897	0.0002449	-0.000633
0.9549284	-15.419678 C				
0.00002563	2429.	94800037.	10.0461990	0.0002574	-0.000665
1.0004043	-16.210348 C				
0.00002688	2545.	94692477.	10.0468231	0.0002700	-0.000697
1.0455896	-17.000609 C				
0.00002813	2660.	94589756.	10.0479254	0.0002826	-0.000730
1.0904832	-17.790458 C				
0.00002938	2776.	94491232.	10.0493946	0.0002952	-0.000762
1.1350844	-18.579893 C				
0.00003063	2891.	94396370.	10.0512127	0.0003078	-0.000795
1.1793922	-19.368912 C				
0.00003188	3006.	94304718.	10.0533415	0.0003205	-0.000827
1.2234058	-20.157511 C				
0.00003313	3121.	94215891.	10.0557483	0.0003331	-0.000859
1.2671243	-20.945689 C				
0.00003438	3236.	94129561.	10.0584054	0.0003458	-0.000892
1.3105466	-21.733443 C				
0.00003563	3350.	94045446.	10.0612887	0.0003584	-0.000924
1.3536720	-22.520771 C				
0.00003688	3465.	93963300.	10.0643778	0.0003711	-0.000956
1.3964994	-23.307669 C				

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0.00003813	3579.	93882912.	10.0676547	0.0003838	-0.000989
1.4390279	-24.094136 C				
0.00003938	3694.	93804096.	10.0711039	0.0003965	-0.001021
1.4812567	-24.880169 C				
0.00004063	3808.	93726688.	10.0747116	0.0004093	-0.001053
1.5231846	-25.665765 C				
0.00004188	3922.	93650546.	10.0784659	0.0004220	-0.001085
1.5648108	-26.450921 C				
0.00004313	4035.	93575540.	10.0823562	0.0004348	-0.001118
1.6061342	-27.235635 C				
0.00004438	4149.	93501560.	10.0863731	0.0004476	-0.001150
1.6471540	-28.019904 C				
0.00004563	4263.	93428502.	10.0905084	0.0004604	-0.001182
1.6878690	-28.803725 C				
0.00004688	4376.	93356279.	10.0947545	0.0004732	-0.001214
1.7282784	-29.587096 C				
0.00004813	4489.	93284807.	10.0991050	0.0004860	-0.001246
1.7683810	-30.370013 C				
0.00004938	4602.	93214014.	10.1035538	0.0004989	-0.001279
1.8081759	-31.152474 C				
0.00005063	4715.	93143835.	10.1080956	0.0005117	-0.001311
1.8476620	-31.934476 C				
0.00005188	4828.	93074209.	10.1127258	0.0005246	-0.001343
1.8868384	-32.716016 C				
0.00005313	4941.	93005082.	10.1174399	0.0005375	-0.001375
1.9257039	-33.497091 C				
0.00005438	5053.	92936405.	10.1222340	0.0005504	-0.001407
1.9642575	-34.277698 C				
0.00005563	5166.	92868132.	10.1271047	0.0005633	-0.001439
2.0024981	-35.057833 C				
0.00005688	5278.	92800222.	10.1320488	0.0005763	-0.001471
2.0404247	-35.837495 C				
0.00005813	5390.	92732637.	10.1370633	0.0005892	-0.001503
2.0780361	-36.616679 C				
0.00005938	5502.	92665342.	10.1421457	0.0006022	-0.001535
2.1153313	-37.395383 C				
0.00006063	5614.	92598305.	10.1472935	0.0006152	-0.001567
2.1523092	-38.173604 C				
0.00006188	5725.	92531497.	10.1525046	0.0006282	-0.001599
2.1889685	-38.951338 C				
0.00006313	5837.	92464888.	10.1577769	0.0006412	-0.001631
2.2253083	-39.728581 C				
0.00006438	5948.	92398455.	10.1631088	0.0006543	-0.001663
2.2613274	-40.505332 C				
0.00006563	6059.	92332173.	10.1684984	0.0006673	-0.001695
2.2970245	-41.281586 C				
0.00006688	6170.	92266020.	10.1739444	0.0006804	-0.001727
2.3323987	-42.057340 C				
0.00006813	6281.	92199976.	10.1794453	0.0006935	-0.001759
2.3674485	-42.832591 C				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00006938	6392.	92134020.	10.1849998	0.0007066	-0.001791
2.4021730	-43.607335 C				
0.00007063	6502.	92068136.	10.1906070	0.0007197	-0.001823
2.4365708	-44.381568 C				
0.00007188	6613.	92002305.	10.1962656	0.0007329	-0.001855
2.4706408	-45.155288 C				
0.00007313	6723.	91936511.	10.2020028	0.0007460	-0.001886
2.5043818	-45.928490 C				
0.00007438	6833.	91870742.	10.2077616	0.0007592	-0.001918
2.5377924	-46.701172 C				
0.00007938	7271.	91607617.	10.2312788	0.0008121	-0.002045
2.6681070	-49.786612 C				
0.00008438	7707.	91343844.	10.2555391	0.0008653	-0.002172
2.7930345	-52.863415 C				
0.00008938	8140.	91079227.	10.2796933	0.0009187	-0.002299
2.9123325	-55.933382 C				
0.00009438	8570.	90813004.	10.3043877	0.0009725	-0.002425
3.0260259	-58.995009 C				
0.00009938	8979.	90357411.	10.3225581	0.0010258	-0.002552
3.1326575	-60.000000 CY				
0.0001044	9304.	89144470.	10.3110511	0.0010762	-0.002681
3.2276850	-60.000000 CY				
0.0001094	9546.	87273573.	10.2718035	0.0011235	-0.002814
3.3116704	-60.000000 CY				
0.0001144	9782.	85523680.	10.2357064	0.0011707	-0.002947
3.3907664	-60.000000 CY				
0.0001194	10004.	83800225.	10.1987328	0.0012175	-0.003080
3.4643165	-60.000000 CY				
0.0001244	10154.	81641326.	10.1374818	0.0012608	-0.003217
3.5282172	-60.000000 CY				
0.0001294	10287.	79513660.	10.0756441	0.0013035	-0.003354
3.5871212	-60.000000 CY				
0.0001344	10419.	77536664.	10.0197410	0.0013464	-0.003491
3.6423258	-60.000000 CY				
0.0001394	10550.	75693983.	9.9691573	0.0013895	-0.003628
3.6937845	-60.000000 CY				
0.0001444	10680.	73971519.	9.9233661	0.0014327	-0.003765
3.7414497	-60.000000 CY				
0.0001494	10808.	72355946.	9.8810316	0.0014760	-0.003902
3.7851328	-60.000000 CY				
0.0001544	10925.	70772035.	9.8368433	0.0015186	-0.004039
3.8241552	-60.000000 CY				
0.0001594	11008.	69072220.	9.7809580	0.0015588	-0.004179
3.8574366	-60.000000 CY				
0.0001644	11071.	67351790.	9.7204156	0.0015978	-0.004320
3.8862696	-60.000000 CY				
0.0001694	11131.	65719446.	9.6635689	0.0016368	-0.004461
3.9118664	-60.000000 CY				
0.0001744	11191.	64176802.	9.6094393	0.0016756	-0.004602
3.9342902	-60.000000 CY				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-12 (Boring B-008 & 010-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0001794	11250.	62716278.	9.5601863	0.0017149	-0.004743
3.9535015	-60.000000 CY				
0.0001844	11308.	61329164.	9.5136161	0.0017541	-0.004883
3.9693617	-60.000000 CY				
0.0001894	11364.	60009896.	9.4690774	0.0017932	-0.005024
3.9819050	-60.000000 CY				
0.0001944	11420.	58754909.	9.4280227	0.0018326	-0.005165
3.9911986	-60.000000 CY				
0.0001994	11476.	57559296.	9.3897594	0.0018721	-0.005305
3.9971986	-60.000000 CY				
0.0002044	11531.	56418622.	9.3531932	0.0019116	-0.005446
3.9998595	-60.000000 CY				
0.0002094	11584.	55328385.	9.3201259	0.0019514	-0.005586
3.9974517	-60.000000 CY				
0.0002144	11637.	54285454.	9.2909722	0.0019918	-0.005726
3.9998812	-60.000000 CY				
0.0002194	11690.	53285909.	9.2626721	0.0020320	-0.005866
3.9969940	-60.000000 CY				
0.0002244	11740.	52321336.	9.2356724	0.0020723	-0.006005
3.9997138	-60.000000 CY				
0.0002294	11786.	51384137.	9.2093226	0.0021124	-0.006145
3.9955528	-60.000000 CY				
0.0002344	11823.	50445667.	9.1796872	0.0021515	-0.006286
3.9989818	-60.000000 CY				
0.0002394	11855.	49524943.	9.1473565	0.0021896	-0.006428
3.9994466	-60.000000 CY				
0.0002444	11876.	48598228.	9.1109548	0.0022265	-0.006571
3.9965160	-60.000000 CY				
0.0002494	11895.	47701101.	9.0745971	0.0022630	-0.006715
3.9991770	-60.000000 CY				
0.0002544	11912.	46829816.	9.0405915	0.0022997	-0.006858
3.9995775	-60.000000 CY				
0.0002594	11929.	45990067.	9.0077660	0.0023364	-0.007001
3.9954763	-60.000000 CY				
0.0002644	11945.	45181124.	8.9766457	0.0023732	-0.007144
3.9984997	-60.000000 CY				
0.0002694	11961.	44401256.	8.9468563	0.0024101	-0.007287
3.9998981	-60.000000 CY				
0.0002744	11976.	43648250.	8.9191370	0.0024472	-0.007430
3.9944635	-60.000000 CY				
0.0003044	12062.	39628140.	8.7757363	0.0026711	-0.008286
3.9984635	-60.000000 CY				
0.0003344	12138.	36300180.	8.6628609	0.0028966	-0.009141
3.9998209	-60.000000 CY				
0.0003644	12207.	33502446.	8.5793723	0.0031261	-0.009991
3.9999551	-60.000000 CYT				
0.0003944	12272.	31117026.	8.5161103	0.0033585	-0.010839
3.9996166	-60.000000 CYT				
0.0004244	12331.	29056485.	8.4674428	0.0035934	-0.011684
3.9972132	-60.000000 CYT				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0004544 12377. 27238942. 8.4178614 0.0038249 -0.012533
 3.9873462 -60.000000 CYT

Axial Thrust Force = 4.200 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
-----	-----	-----	-----	-----	-----
6.25000E-07	240.5049676	384807948.	19.4290859	0.00001214	-0.00001036
0.0508615	0.2771147				
0.00000125	480.1459926	384116794.	18.7161837	0.00002340	-0.00002160
0.0976654	0.5283867				
0.00000188	718.9162127	383421980.	18.4785558	0.00003465	-0.00003285
0.1441903	0.7796589				
0.00000250	956.8156222	382726249.	18.3597458	0.00004590	-0.00004410
0.1904363	1.0309315				
0.00000313	1194.	382030150.	18.2884629	0.00005715	-0.00005535
0.2364034	1.2822044				
0.00000375	1430.	381333869.	18.2409436	0.00006840	-0.00006660
0.2820914	1.5334776				
0.00000438	1665.	380637482.	18.2070035	0.00007966	-0.00007784
0.3275005	1.7847511				
0.00000500	1900.	379941029.	18.1815504	0.00009091	-0.00008909
0.3726306	2.0360248				
0.00000563	2133.	379244533.	18.1617553	0.0001022	-0.000100
0.4174818	2.2872988				
0.00000625	2366.	378548006.	18.1459208	0.0001134	-0.000112
0.4620539	2.5385732				
0.00000688	2366.	344134551.	10.2895004	0.00007074	-0.000177
0.2893429	-4.300617 C				
0.00000750	2366.	315456672.	10.2575513	0.00007693	-0.000193
0.3141325	-4.698533 C				
0.00000813	2366.	291190774.	10.2300378	0.00008312	-0.000209
0.3388235	-5.096560 C				
0.00000875	2366.	270391433.	10.2068278	0.00008931	-0.000226
0.3634446	-5.494492 C				
0.00000938	2366.	252365338.	10.1870615	0.00009550	-0.000242
0.3879959	-5.892330 C				
0.00001000	2366.	236592504.	10.1700940	0.0001017	-0.000258
0.4124772	-6.290073 C				
0.00001063	2366.	222675298.	10.1554324	0.0001079	-0.000275
0.4368884	-6.687720 C				
0.00001125	2366.	210304448.	10.1426931	0.0001141	-0.000291
0.4612294	-7.085271 C				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00001188	2366.	199235793.	10.1315564	0.0001203	-0.000307
0.4855002	-7.482727 C				
0.00001250	2366.	189274003.	10.1218127	0.0001265	-0.000323
0.5097005	-7.880086 C				
0.00001313	2366.	180260955.	10.1132503	0.0001327	-0.000340
0.5338304	-8.277349 C				
0.00001375	2366.	172067276.	10.1057088	0.0001390	-0.000356
0.5578898	-8.674515 C				
0.00001438	2366.	164586090.	10.0990556	0.0001452	-0.000372
0.5818784	-9.071585 C				
0.00001500	2366.	157728336.	10.0931803	0.0001514	-0.000389
0.6057963	-9.468556 C				
0.00001563	2366.	151419203.	10.0879903	0.0001576	-0.000405
0.6296433	-9.865431 C				
0.00001625	2366.	145595387.	10.0834069	0.0001639	-0.000421
0.6534193	-10.262207 C				
0.00001688	2366.	140202965.	10.0793634	0.0001701	-0.000437
0.6771242	-10.658886 C				
0.00001750	2366.	135195717.	10.0758025	0.0001763	-0.000454
0.7007579	-11.055466 C				
0.00001813	2366.	130533795.	10.0726747	0.0001826	-0.000470
0.7243204	-11.451947 C				
0.00001875	2366.	126182669.	10.0699372	0.0001888	-0.000486
0.7478114	-11.848330 C				
0.00001938	2366.	122112260.	10.0675528	0.0001951	-0.000502
0.7712309	-12.244613 C				
0.00002000	2366.	118296252.	10.0654889	0.0002013	-0.000519
0.7945789	-12.640797 C				
0.00002063	2366.	114711517.	10.0637168	0.0002076	-0.000535
0.8178551	-13.036882 C				
0.00002125	2366.	111337649.	10.0622112	0.0002138	-0.000551
0.8410595	-13.432866 C				
0.00002188	2366.	108156573.	10.0609497	0.0002201	-0.000567
0.8641920	-13.828750 C				
0.00002250	2366.	105152224.	10.0599125	0.0002263	-0.000584
0.8872524	-14.224533 C				
0.00002313	2366.	102310272.	10.0590817	0.0002326	-0.000600
0.9102407	-14.620215 C				
0.00002375	2366.	99617896.	10.0584414	0.0002389	-0.000616
0.9331568	-15.015796 C				
0.00002438	2366.	97063591.	10.0579776	0.0002452	-0.000632
0.9560005	-15.411276 C				
0.00002563	2432.	94924068.	10.0575288	0.0002577	-0.000665
1.0014704	-16.201930 C				
0.00002688	2548.	94810571.	10.0576469	0.0002703	-0.000697
1.0466496	-16.992174 C				
0.00002813	2664.	94702439.	10.0582592	0.0002829	-0.000730
1.0915372	-17.782007 C				
0.00002938	2779.	94598964.	10.0593353	0.0002955	-0.000762
1.1361324	-18.571425 C				

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 Light Tower SC1-12 (Boring B-008 & 010-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00003063	2894.	94499555.	10.0607664	0.0003081	-0.000794
1.1804341	-19.360427 C				
0.00003188	3009.	94403710.	10.0625387	0.0003207	-0.000827
1.2244416	-20.149010 C				
0.00003313	3124.	94311007.	10.0646159	0.0003334	-0.000859
1.2681539	-20.937171 C				
0.00003438	3239.	94221082.	10.0669675	0.0003461	-0.000891
1.3115700	-21.724908 C				
0.00003563	3354.	94133623.	10.0695670	0.0003587	-0.000924
1.3546892	-22.512219 C				
0.00003688	3468.	94048359.	10.0723915	0.0003714	-0.000956
1.3975103	-23.299100 C				
0.00003813	3582.	93965057.	10.0754214	0.0003841	-0.000988
1.4400326	-24.085550 C				
0.00003938	3697.	93883511.	10.0786392	0.0003968	-0.001021
1.4822550	-24.871565 C				
0.00004063	3811.	93803541.	10.0820299	0.0004096	-0.001053
1.5241766	-25.657144 C				
0.00004188	3925.	93724988.	10.0855803	0.0004223	-0.001085
1.5657965	-26.442282 C				
0.00004313	4039.	93647711.	10.0892786	0.0004351	-0.001117
1.6071135	-27.226979 C				
0.00004438	4152.	93571586.	10.0931145	0.0004479	-0.001150
1.6481268	-28.011230 C				
0.00004563	4266.	93496502.	10.0970787	0.0004607	-0.001182
1.6888354	-28.795033 C				
0.00004688	4379.	93422358.	10.1011630	0.0004735	-0.001214
1.7292383	-29.578385 C				
0.00004813	4492.	93349066.	10.1053601	0.0004863	-0.001246
1.7693344	-30.361284 C				
0.00004938	4606.	93276544.	10.1096634	0.0004992	-0.001278
1.8091228	-31.143727 C				
0.00005063	4718.	93204721.	10.1140670	0.0005120	-0.001310
1.8486023	-31.925710 C				
0.00005188	4831.	93133529.	10.1185657	0.0005249	-0.001343
1.8877721	-32.707231 C				
0.00005313	4944.	93062909.	10.1231546	0.0005378	-0.001375
1.9266309	-33.488287 C				
0.00005438	5056.	92992807.	10.1278294	0.0005507	-0.001407
1.9651778	-34.268875 C				
0.00005563	5169.	92923173.	10.1325862	0.0005636	-0.001439
2.0034117	-35.048992 C				
0.00005688	5281.	92853961.	10.1374215	0.0005766	-0.001471
2.0413316	-35.828634 C				
0.00005813	5393.	92785130.	10.1423320	0.0005895	-0.001503
2.0789362	-36.607799 C				
0.00005938	5505.	92716640.	10.1473148	0.0006025	-0.001535
2.1162246	-37.386484 C				
0.00006063	5617.	92648458.	10.1523672	0.0006155	-0.001567
2.1531956	-38.164685 C				

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0.00006188	5728.	92580549.	10.1574868	0.0006285	-0.001599
2.1898481	-38.942399 C				
0.00006313	5840.	92512883.	10.1626714	0.0006415	-0.001631
2.2261809	-39.719622 C				
0.00006438	5951.	92445433.	10.1679189	0.0006546	-0.001663
2.2621930	-40.496353 C				
0.00006563	6062.	92378172.	10.1732276	0.0006676	-0.001695
2.2978832	-41.272587 C				
0.00006688	6173.	92311077.	10.1785957	0.0006807	-0.001727
2.3332503	-42.048320 C				
0.00006813	6284.	92244124.	10.1840217	0.0006938	-0.001759
2.3682931	-42.823550 C				
0.00006938	6395.	92177292.	10.1895041	0.0007069	-0.001791
2.4030104	-43.598274 C				
0.00007063	6505.	92110561.	10.1950417	0.0007200	-0.001822
2.4374011	-44.372486 C				
0.00007188	6616.	92043913.	10.2006608	0.0007332	-0.001854
2.4714639	-45.146185 C				
0.00007313	6726.	91977331.	10.2063053	0.0007463	-0.001886
2.5051976	-45.919366 C				
0.00007438	6836.	91910797.	10.2120017	0.0007595	-0.001918
2.5386010	-46.692026 C				
0.00007938	7274.	91644853.	10.2352897	0.0008124	-0.002045
2.6688860	-49.777380 C				
0.00008438	7710.	91378587.	10.2593338	0.0008656	-0.002172
2.7937834	-52.854093 C				
0.00008938	8143.	91111830.	10.2831857	0.0009191	-0.002298
2.9130226	-55.924331 C				
0.00009438	8573.	90843621.	10.3077273	0.0009728	-0.002425
3.0266854	-58.985869 C				
0.00009938	8982.	90387473.	10.3258078	0.0010261	-0.002551
3.1332951	-60.000000 CY				
0.0001044	9308.	89176212.	10.3143071	0.0010766	-0.002681
3.2283182	-60.000000 CY				
0.0001094	9549.	87304848.	10.2749831	0.0011238	-0.002814
3.3122821	-60.000000 CY				
0.0001144	9785.	85553556.	10.2389100	0.0011711	-0.002946
3.3913727	-60.000000 CY				
0.0001194	10007.	83830919.	10.2019402	0.0012179	-0.003080
3.4649106	-60.000000 CY				
0.0001244	10158.	81671814.	10.1406407	0.0012612	-0.003216
3.5287895	-60.000000 CY				
0.0001294	10291.	79542859.	10.0787027	0.0013039	-0.003354
3.5876602	-60.000000 CY				
0.0001344	10423.	77564670.	10.0227059	0.0013468	-0.003491
3.6428308	-60.000000 CY				
0.0001394	10554.	75720878.	9.9720357	0.0013899	-0.003628
3.6942550	-60.000000 CY				
0.0001444	10683.	73997378.	9.9261646	0.0014331	-0.003764
3.7418850	-60.000000 CY				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0001494	10812.	72381005.	9.8838986	0.0014764	-0.003901
3.7855535	-60.000000 CY				
0.0001544	10929.	70796718.	9.8396771	0.0015190	-0.004038
3.8245440	-60.000000 CY				
0.0001594	11012.	69097838.	9.7838573	0.0015593	-0.004178
3.8578061	-60.000000 CY				
0.0001644	11075.	67376662.	9.7232508	0.0015983	-0.004319
3.8866026	-60.000000 CY				
0.0001694	11135.	65743511.	9.6663364	0.0016372	-0.004460
3.9121613	-60.000000 CY				
0.0001744	11195.	64200103.	9.6121495	0.0016761	-0.004601
3.9345463	-60.000000 CY				
0.0001794	11254.	62738857.	9.5628376	0.0017153	-0.004742
3.9537182	-60.000000 CY				
0.0001844	11312.	61351278.	9.5162917	0.0017546	-0.004883
3.9695496	-60.000000 CY				
0.0001894	11368.	60031354.	9.4717005	0.0017937	-0.005024
3.9820503	-60.000000 CY				
0.0001944	11425.	58775745.	9.4305957	0.0018331	-0.005164
3.9913005	-60.000000 CY				
0.0001994	11480.	57579537.	9.3922863	0.0018726	-0.005305
3.9972564	-60.000000 CY				
0.0002044	11535.	56438298.	9.3556780	0.0019121	-0.005445
3.9998723	-60.000000 CY				
0.0002094	11588.	55347517.	9.3241700	0.0019522	-0.005585
3.9975077	-60.000000 CY				
0.0002144	11641.	54304067.	9.2934428	0.0019923	-0.005725
3.9998931	-60.000000 CY				
0.0002194	11694.	53304015.	9.2651074	0.0020325	-0.005865
3.9970558	-60.000000 CY				
0.0002244	11744.	52339157.	9.2380944	0.0020728	-0.006005
3.9997330	-60.000000 CY				
0.0002294	11790.	51401489.	9.2117130	0.0021129	-0.006145
3.9956300	-60.000000 CY				
0.0002344	11827.	50463153.	9.1821360	0.0021521	-0.006285
3.9990203	-60.000000 CY				
0.0002394	11859.	49542728.	9.1500193	0.0021903	-0.006427
3.9992468	-60.000000 CY				
0.0002444	11880.	48615611.	9.1135780	0.0022271	-0.006570
3.9965958	-60.000000 CY				
0.0002494	11900.	47718283.	9.0771076	0.0022636	-0.006714
3.9992162	-60.000000 CY				
0.0002544	11917.	46846598.	9.0431776	0.0023004	-0.006857
3.9993713	-60.000000 CY				
0.0002594	11933.	46006491.	9.0103157	0.0023371	-0.007000
3.9955701	-60.000000 CY				
0.0002644	11949.	45197204.	8.9791598	0.0023739	-0.007144
3.9985538	-60.000000 CY				
0.0002694	11965.	44417005.	8.9493437	0.0024107	-0.007287
3.9999119	-60.000000 CY				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-12 (Boring B-008 & 010-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0002744	11980.	43663657.	8.9215934	0.0024479	-0.007430
3.9942523	-60.000000 CY				
0.0003044	12066.	39641995.	8.7782176	0.0026719	-0.008286
3.9985257	-60.000000 CY				
0.0003344	12142.	36312646.	8.6652203	0.0028974	-0.009140
3.9998424	-60.000000 CY				
0.0003644	12212.	33513765.	8.5815911	0.0031269	-0.009991
3.9999658	-60.000000 CYT				
0.0003944	12276.	31127384.	8.5182268	0.0033594	-0.010838
3.9996505	-60.000000 CYT				
0.0004244	12335.	29066055.	8.4694819	0.0035942	-0.011683
3.9973093	-60.000000 CYT				
0.0004544	12381.	27248100.	8.4201387	0.0038259	-0.012532
3.9875919	-60.000000 CYT				

Axial Thrust Force = 4.600 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
-----	-----	-----	-----	-----	-----
6.25000E-07	240.5035986	384805758.	19.5651901	0.00001223	-0.00001027
0.0512199	0.2795816				
0.00000125	480.1446137	384115691.	18.7843907	0.00002348	-0.00002152
0.0980225	0.5308592				
0.00000188	718.9148267	383421241.	18.5241312	0.00003473	-0.00003277
0.1445462	0.7821371				
0.00000250	956.8142298	382725692.	18.3940059	0.00004599	-0.00004401
0.1907908	1.0334154				
0.00000313	1194.	382029703.	18.3159341	0.00005724	-0.00005526
0.2367565	1.2846940				
0.00000375	1430.	381333494.	18.2638891	0.00006849	-0.00006651
0.2824433	1.5359729				
0.00000438	1665.	380637159.	18.2267166	0.00007974	-0.00007776
0.3278510	1.7872522				
0.00000500	1900.	379940746.	18.1988394	0.00009099	-0.00008901
0.3729798	2.0385317				
0.00000563	2133.	379244280.	18.1771590	0.0001022	-0.000100
0.4178295	2.2898116				
0.00000625	2366.	378547777.	18.1598165	0.0001135	-0.000112
0.4624003	2.5410917				
0.00000688	2366.	344134343.	10.3291778	0.00007101	-0.000176
0.2904571	-4.292706 C				
0.00000750	2366.	315456481.	10.2940289	0.00007721	-0.000193
0.3152465	-4.690597 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00000813	2366.	291190598.	10.2646762	0.00008340	-0.000209
0.3399656	-5.088396 C				
0.00000875	2366.	270391269.	10.2391817	0.00008959	-0.000225
0.3645893	-5.486283 C				
0.00000938	2366.	252365185.	10.2172859	0.00009579	-0.000242
0.3891378	-5.884113 C				
0.00001000	2366.	236592361.	10.1984552	0.0001020	-0.000258
0.4136162	-6.281848 C				
0.00001063	2366.	222675163.	10.1821496	0.0001082	-0.000274
0.4380246	-6.679488 C				
0.00001125	2366.	210304321.	10.1679490	0.0001144	-0.000291
0.4623628	-7.077032 C				
0.00001188	2366.	199235672.	10.1555219	0.0001206	-0.000307
0.4866307	-7.474480 C				
0.00001250	2366.	189273889.	10.1446030	0.0001268	-0.000323
0.5108282	-7.871831 C				
0.00001313	2366.	180260846.	10.1349589	0.0001330	-0.000339
0.5349552	-8.269087 C				
0.00001375	2366.	172067171.	10.1264498	0.0001392	-0.000356
0.5590117	-8.666245 C				
0.00001438	2366.	164585990.	10.1189132	0.0001455	-0.000372
0.5829974	-9.063307 C				
0.00001500	2366.	157728241.	10.1122282	0.0001517	-0.000388
0.6069124	-9.460271 C				
0.00001563	2366.	151419111.	10.1062933	0.0001579	-0.000405
0.6307565	-9.857138 C				
0.00001625	2366.	145595299.	10.1010224	0.0001641	-0.000421
0.6545296	-10.253907 C				
0.00001688	2366.	140202880.	10.0963423	0.0001704	-0.000437
0.6782316	-10.650577 C				
0.00001750	2366.	135195635.	10.0921903	0.0001766	-0.000453
0.7018624	-11.047150 C				
0.00001813	2366.	130533716.	10.0885122	0.0001829	-0.000470
0.7254219	-11.443623 C				
0.00001875	2366.	126182592.	10.0852613	0.0001891	-0.000486
0.7489100	-11.839998 C				
0.00001938	2366.	122112186.	10.0823966	0.0001953	-0.000502
0.7723266	-12.236274 C				
0.00002000	2366.	118296180.	10.0798824	0.0002016	-0.000518
0.7956716	-12.632450 C				
0.00002063	2366.	114711448.	10.0776874	0.0002079	-0.000535
0.8189449	-13.028526 C				
0.00002125	2366.	111337582.	10.0757837	0.0002141	-0.000551
0.8421464	-13.424502 C				
0.00002188	2366.	108156508.	10.0741470	0.0002204	-0.000567
0.8652759	-13.820378 C				
0.00002250	2366.	105152160.	10.0727554	0.0002266	-0.000583
0.8883333	-14.216153 C				
0.00002313	2366.	102310210.	10.0715894	0.0002329	-0.000600
0.9113187	-14.611828 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
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36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00002375	2366.	99617836.	10.0706317	0.0002392	-0.000616
0.9342318	-15.007401 C				
0.00002438	2366.	97063533.	10.0698667	0.0002455	-0.000632
0.9570725	-15.402873 C				
0.00002563	2436.	95048091.	10.0688598	0.0002580	-0.000664
1.0025364	-16.193510 C				
0.00002688	2551.	94928657.	10.0684718	0.0002706	-0.000697
1.0477096	-16.983738 C				
0.00002813	2667.	94815115.	10.0686232	0.0002832	-0.000729
1.0925912	-17.773555 C				
0.00002938	2782.	94706690.	10.0692479	0.0002958	-0.000762
1.1371802	-18.562957 C				
0.00003063	2897.	94602733.	10.0703211	0.0003084	-0.000794
1.1814759	-19.351942 C				
0.00003188	3012.	94502697.	10.0717368	0.0003210	-0.000826
1.2254772	-20.140508 C				
0.00003313	3127.	94406117.	10.0734845	0.0003337	-0.000859
1.2691834	-20.928652 C				
0.00003438	3242.	94312597.	10.0755306	0.0003463	-0.000891
1.3125933	-21.716373 C				
0.00003563	3357.	94221794.	10.0778462	0.0003590	-0.000923
1.3557063	-22.503666 C				
0.00003688	3471.	94133413.	10.0804061	0.0003717	-0.000956
1.3985212	-23.290530 C				
0.00003813	3586.	94047197.	10.0831888	0.0003844	-0.000988
1.4410372	-24.076963 C				
0.00003938	3700.	93962921.	10.0861753	0.0003971	-0.001020
1.4832533	-24.862961 C				
0.00004063	3814.	93880388.	10.0893491	0.0004099	-0.001053
1.5251686	-25.648521 C				
0.00004188	3928.	93799425.	10.0926956	0.0004226	-0.001085
1.5667821	-26.433642 C				
0.00004313	4042.	93719877.	10.0962019	0.0004354	-0.001117
1.6080927	-27.218321 C				
0.00004438	4155.	93641609.	10.0998566	0.0004482	-0.001149
1.6490996	-28.002554 C				
0.00004563	4269.	93564497.	10.1036497	0.0004610	-0.001182
1.6898018	-28.786339 C				
0.00004688	4382.	93488434.	10.1075722	0.0004738	-0.001214
1.7301982	-29.569674 C				
0.00004813	4496.	93413321.	10.1116159	0.0004866	-0.001246
1.7702878	-30.352554 C				
0.00004938	4609.	93339070.	10.1157737	0.0004995	-0.001278
1.8100696	-31.134978 C				
0.00005063	4722.	93265602.	10.1200391	0.0005123	-0.001310
1.8495425	-31.916943 C				
0.00005188	4834.	93192845.	10.1244063	0.0005252	-0.001342
1.8887057	-32.698446 C				
0.00005313	4947.	93120733.	10.1288700	0.0005381	-0.001374
1.9275579	-33.479483 C				

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Light Tower SC1-12 (Boring B-008 & 010-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00005438	5060.	93049206.	10.1334255	0.0005510	-0.001406
1.9660981	-34.260052 C				
0.00005563	5172.	92978211.	10.1380684	0.0005639	-0.001439
2.0043253	-35.040149 C				
0.00005688	5284.	92907697.	10.1427948	0.0005769	-0.001471
2.0422384	-35.819772 C				
0.00005813	5396.	92837619.	10.1476012	0.0005898	-0.001503
2.0798362	-36.598918 C				
0.00005938	5508.	92767935.	10.1524844	0.0006028	-0.001535
2.1171178	-37.377583 C				
0.00006063	5620.	92698606.	10.1574414	0.0006158	-0.001567
2.1540819	-38.155764 C				
0.00006188	5731.	92629597.	10.1624696	0.0006288	-0.001599
2.1907275	-38.933458 C				
0.00006313	5843.	92560874.	10.1675664	0.0006418	-0.001631
2.2270535	-39.710662 C				
0.00006438	5954.	92492407.	10.1727297	0.0006549	-0.001663
2.2630586	-40.487373 C				
0.00006563	6065.	92424168.	10.1779574	0.0006679	-0.001695
2.2987417	-41.263586 C				
0.00006688	6176.	92356130.	10.1832476	0.0006810	-0.001726
2.3341018	-42.039299 C				
0.00006813	6287.	92288268.	10.1885986	0.0006941	-0.001758
2.3691375	-42.814509 C				
0.00006938	6398.	92220560.	10.1940089	0.0007072	-0.001790
2.4038477	-43.589211 C				
0.00007063	6508.	92152983.	10.1995039	0.0007203	-0.001822
2.4382312	-44.363403 C				
0.00007188	6619.	92085519.	10.2050285	0.0007335	-0.001854
2.4722868	-45.137081 C				
0.00007313	6729.	92018147.	10.2106084	0.0007467	-0.001886
2.5060133	-45.910241 C				
0.00007438	6839.	91950850.	10.2162424	0.0007598	-0.001918
2.5394094	-46.682880 C				
0.00007938	7277.	91682087.	10.2393011	0.0008127	-0.002045
2.6696649	-49.768146 C				
0.00008438	7713.	91413389.	10.2630109	0.0008659	-0.002172
2.7945082	-52.845065 C				
0.00008938	8146.	91144431.	10.2866786	0.0009194	-0.002298
2.9137126	-55.915279 C				
0.00009438	8576.	90874234.	10.3110673	0.0009731	-0.002424
3.0273448	-58.976728 C				
0.00009938	8985.	90417533.	10.3290580	0.0010265	-0.002551
3.1339327	-60.000000 CY				
0.0001044	9311.	89207952.	10.3175636	0.0010769	-0.002681
3.2289512	-60.000000 CY				
0.0001094	9552.	87336121.	10.2781631	0.0011242	-0.002813
3.3128936	-60.000000 CY				
0.0001144	9789.	85583430.	10.2421143	0.0011714	-0.002946
3.3919789	-60.000000 CY				

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0.0001194	10011.	83861611.	10.2051482	0.0012182	-0.003079
3.4655044	-60.000000 CY				
0.0001244	10162.	81702300.	10.1438002	0.0012616	-0.003216
3.5293615	-60.000000 CY				
0.0001294	10295.	79572057.	10.0817619	0.0013043	-0.003353
3.5881988	-60.000000 CY				
0.0001344	10427.	77592674.	10.0256713	0.0013472	-0.003490
3.6433355	-60.000000 CY				
0.0001394	10557.	75747771.	9.9749147	0.0013903	-0.003627
3.6947252	-60.000000 CY				
0.0001444	10687.	74023236.	9.9289636	0.0014335	-0.003764
3.7423201	-60.000000 CY				
0.0001494	10816.	72406063.	9.8867661	0.0014768	-0.003901
3.7859739	-60.000000 CY				
0.0001544	10933.	70821400.	9.8425115	0.0015194	-0.004038
3.8249324	-60.000000 CY				
0.0001594	11017.	69123456.	9.7867573	0.0015598	-0.004178
3.8581753	-60.000000 CY				
0.0001644	11079.	67401534.	9.7260868	0.0015987	-0.004319
3.8869352	-60.000000 CY				
0.0001694	11139.	65767574.	9.6691048	0.0016377	-0.004460
3.9124557	-60.000000 CY				
0.0001744	11199.	64223403.	9.6148605	0.0016766	-0.004601
3.9348020	-60.000000 CY				
0.0001794	11258.	62761436.	9.5654896	0.0017158	-0.004742
3.9539345	-60.000000 CY				
0.0001844	11316.	61373390.	9.5189681	0.0017551	-0.004882
3.9697370	-60.000000 CY				
0.0001894	11373.	60052811.	9.4743244	0.0017942	-0.005023
3.9821950	-60.000000 CY				
0.0001944	11429.	58796578.	9.4331695	0.0018336	-0.005164
3.9914019	-60.000000 CY				
0.0001994	11484.	57599778.	9.3948139	0.0018731	-0.005304
3.9973136	-60.000000 CY				
0.0002044	11539.	56457972.	9.3581635	0.0019126	-0.005445
3.9998845	-60.000000 CY				
0.0002094	11592.	55366642.	9.3266817	0.0019528	-0.005585
3.9975630	-60.000000 CY				
0.0002144	11645.	54322678.	9.2959142	0.0019928	-0.005725
3.9999044	-60.000000 CY				
0.0002194	11698.	53322120.	9.2675435	0.0020331	-0.005864
3.9971169	-60.000000 CY				
0.0002244	11748.	52356977.	9.2405172	0.0020733	-0.006004
3.9997515	-60.000000 CY				
0.0002294	11794.	51418840.	9.2141042	0.0021135	-0.006144
3.9957066	-60.000000 CY				
0.0002344	11831.	50480617.	9.1845645	0.0021526	-0.006285
3.9990577	-60.000000 CY				
0.0002394	11864.	49560513.	9.1526832	0.0021909	-0.006427
3.9990468	-60.000000 CY				

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 Light Tower SC1-12 (Boring B-008 & 010-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0002444	11885.	48632992.	9.1162023	0.0022278	-0.006570
3.9966747	-60.000000 CY				
0.0002494	11904.	47735462.	9.0796192	0.0022642	-0.006713
3.9992545	-60.000000 CY				
0.0002544	11921.	46863378.	9.0457647	0.0023010	-0.006856
3.9991650	-60.000000 CY				
0.0002594	11937.	46022914.	9.0128664	0.0023377	-0.007000
3.9956629	-60.000000 CY				
0.0002644	11953.	45213284.	8.9816750	0.0023745	-0.007143
3.9986069	-60.000000 CY				
0.0002694	11969.	44432753.	8.9518321	0.0024114	-0.007286
3.9999247	-60.000000 CY				
0.0002744	11984.	43679063.	8.9240509	0.0024485	-0.007429
3.9940409	-60.000000 CY				
0.0003044	12070.	39655848.	8.7807001	0.0026726	-0.008285
3.9985866	-60.000000 CY				
0.0003344	12146.	36325110.	8.6675807	0.0028982	-0.009139
3.9998625	-60.000000 CY				
0.0003644	12216.	33525083.	8.5838110	0.0031277	-0.009990
3.9999751	-60.000000 CYT				
0.0003944	12280.	31137740.	8.5203443	0.0033602	-0.010837
3.9996828	-60.000000 CYT				
0.0004244	12339.	29075625.	8.4715220	0.0035951	-0.011682
3.9974037	-60.000000 CYT				
0.0004544	12385.	27257253.	8.4224181	0.0038269	-0.012531
3.9878351	-60.000000 CYT				

 Summary of Results for Nominal 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 Tens. No. Strain	Axial Thrust kips	Nominal Mom. Cap. in-kip	Max. Comp. Strain	Max.
----	-----	-----	-----	
1 -0.00952396	3.800	12169.214	0.00300000	
2 -0.00952020	4.200	12173.120	0.00300000	
3 -0.00951645	4.600	12177.027	0.00300000	

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

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

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 (0.75).

The above values should be multiplied by the appropriate strength reduction factor to compute ultimate moment capacity according to ACI 318, 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 Stiff. Load Ult Mom No. kip-in ²	Resist. Factor	Nominal Ax. Thrust kips	Nominal Moment Cap in-kips	Ult. (Fac) Ax. Thrust kips	Ult. (Fac) Moment Cap in-kips	Bend. at
-----	-----	-----	-----	-----	-----	
1 91219895.	0.65	3.800000	12169.	2.470000	7910.	
2 91253873.	0.65	4.200000	12173.	2.730000	7913.	
3 91287886.	0.65	4.600000	12177.	2.990000	7915.	
1 89806706.	0.75	3.800000	12169.	2.850000	9127.	
2 89838295.	0.75	4.200000	12173.	3.150000	9130.	
3 89869877.	0.75	4.600000	12177.	3.450000	9133.	
1 70221645.	0.90	3.800000	12169.	3.420000	10952.	
2 70254444.	0.90	4.200000	12173.	3.780000	10956.	
3 70287179.	0.90	4.600000	12177.	4.140000	10959.	

 Layering Correction Equivalent Depths of Soil & Rock Layers

Layer	Top of Layer Below	Equivalent Top Depth Below	Same Layer Type As	Layer is Rock or	F0 Integral	F1 Integral
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TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-12 (Boring B-008 & 010-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

No.	Pile Head ft	Grnd Surf ft	Layer Above	is Below Rock Layer	for Layer lbs	for Layer lbs
1	1.0000	0.00	N.A.	No	0.00	8806.
2	4.0000	0.2771	No	No	8806.	19581.
3	4.6000	0.7256	Yes	No	28387.	198632.
4	9.6000	8.6000	No	No	227019.	0.00
5	11.6000	10.6000	No	No	0.00	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.

 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 = 1000.0 lbs
 Applied moment at pile head = 315600.0 in-lbs
 Axial thrust load on pile head = 4200.0 lbs

Depth Res.	Soil X	Deflect. Spr.	Distrib. y	Bending Moment	Shear Force	Slope S	Total Stress	Bending Stiffness	Soil p
	Es*H		Lat. Load						
	feet		inches	in-lbs	lbs	radians	psi*	lb-in^2	
	lb/inch		lb/inch	lb/inch					
	0.00		0.00765	315600.	1000.0000	-1.30E-04	0.00	3.84E+11	
0.00		0.00		0.00					
	0.09000		0.00751	316681.	1000.0000	-1.29E-04	0.00	3.84E+11	
0.00		0.00		0.00					
	0.1800		0.00738	317761.	1000.	-1.28E-04	0.00	3.84E+11	
0.00		0.00		0.00					
	0.2700		0.00724	318842.	1000.0000	-1.27E-04	0.00	3.84E+11	
0.00		0.00		0.00					
	0.3600		0.00710	319922.	1000.0000	-1.26E-04	0.00	3.84E+11	
0.00		0.00		0.00					
	0.4500		0.00696	321003.	1000.0000	-1.26E-04	0.00	3.84E+11	
0.00		0.00		0.00					
	0.5400		0.00683	322083.	1000.0000	-1.25E-04	0.00	3.84E+11	

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0.00	0.00	0.00				
0.6300	0.00670	323164.	1000.0000	-1.24E-04	0.00	3.84E+11
0.00	0.00	0.00				
0.7200	0.00656	324245.	1000.0000	-1.23E-04	0.00	3.84E+11
0.00	0.00	0.00				
0.8100	0.00643	325325.	1000.0000	-1.22E-04	0.00	3.84E+11
0.00	0.00	0.00				
0.9000	0.00630	326406.	1000.	-1.21E-04	0.00	3.84E+11
0.00	0.00	0.00				
0.9900	0.00617	327486.	1000.	-1.20E-04	0.00	3.84E+11
0.00	0.00	0.00				
1.0800	0.00604	328567.	992.3013	-1.19E-04	0.00	3.84E+11
-14.257	2549.	0.00				
1.1700	0.00591	329631.	976.8324	-1.18E-04	0.00	3.84E+11
-14.389	2629.	0.00				
1.2600	0.00578	330678.	961.2228	-1.17E-04	0.00	3.84E+11
-14.517	2711.	0.00				
1.3500	0.00566	331708.	945.4770	-1.16E-04	0.00	3.84E+11
-14.642	2795.	0.00				
1.4400	0.00553	332721.	929.5994	-1.15E-04	0.00	3.84E+11
-14.761	2881.	0.00				
1.5300	0.00541	333717.	913.5945	-1.14E-04	0.00	3.84E+11
-14.877	2971.	0.00				
1.6200	0.00529	334696.	897.4668	-1.14E-04	0.00	3.84E+11
-14.989	3063.	0.00				
1.7100	0.00516	335657.	881.2210	-1.13E-04	0.00	3.84E+11
-15.096	3158.	0.00				
1.8000	0.00504	336600.	864.8619	-1.12E-04	0.00	3.84E+11
-15.199	3255.	0.00				
1.8900	0.00492	337526.	848.3940	-1.11E-04	0.00	3.84E+11
-15.297	3356.	0.00				
1.9800	0.00480	338433.	831.8223	-1.10E-04	0.00	3.84E+11
-15.391	3461.	0.00				
2.0700	0.00469	339323.	815.1517	-1.09E-04	0.00	3.84E+11
-15.480	3568.	0.00				
2.1600	0.00457	340195.	798.3872	-1.08E-04	0.00	3.84E+11
-15.565	3680.	0.00				
2.2500	0.00445	341049.	781.5337	-1.07E-04	0.00	3.84E+11
-15.645	3795.	0.00				
2.3400	0.00434	341884.	764.5966	-1.06E-04	0.00	3.84E+11
-15.720	3914.	0.00				
2.4300	0.00422	342701.	747.5809	-1.05E-04	0.00	3.84E+11
-15.790	4038.	0.00				
2.5200	0.00411	343500.	730.4920	-1.04E-04	0.00	3.84E+11
-15.856	4166.	0.00				
2.6100	0.00400	344280.	713.3353	-1.03E-04	0.00	3.84E+11
-15.916	4299.	0.00				
2.7000	0.00389	345042.	696.1164	-1.02E-04	0.00	3.84E+11
-15.971	4437.	0.00				
2.7900	0.00378	345785.	678.8408	-1.01E-04	0.00	3.84E+11

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

-16.021	4580.	0.00				
2.8800	0.00367	346509.	661.5144	-1.00E-04	0.00	3.84E+11
-16.065	4728.	0.00				
2.9700	0.00356	347214.	644.1429	-9.92E-05	0.00	3.84E+11
-16.104	4883.	0.00				
3.0600	0.00346	347901.	626.7324	-9.82E-05	0.00	3.84E+11
-16.138	5044.	0.00				
3.1500	0.00335	348569.	609.2890	-9.72E-05	0.00	3.84E+11
-16.165	5212.	0.00				
3.2400	0.00325	349218.	591.8189	-9.62E-05	0.00	3.84E+11
-16.187	5387.	0.00				
3.3300	0.00314	349848.	574.3286	-9.52E-05	0.00	3.84E+11
-16.203	5569.	0.00				
3.4200	0.00304	350460.	556.8246	-9.43E-05	0.00	3.84E+11
-16.212	5760.	0.00				
3.5100	0.00294	351052.	539.3137	-9.33E-05	0.00	3.84E+11
-16.215	5960.	0.00				
3.6000	0.00284	351625.	521.8029	-9.23E-05	0.00	3.84E+11
-16.212	6169.	0.00				
3.6900	0.00274	352180.	504.2992	-9.13E-05	0.00	3.84E+11
-16.202	6389.	0.00				
3.7800	0.00264	352715.	486.8099	-9.03E-05	0.00	3.84E+11
-16.185	6619.	0.00				
3.8700	0.00254	353232.	469.3428	-8.93E-05	0.00	3.84E+11
-16.161	6861.	0.00				
3.9600	0.00245	353730.	451.9056	-8.83E-05	0.00	3.84E+11
-16.130	7116.	0.00				
4.0500	0.00235	354209.	248.3220	-8.73E-05	0.00	3.84E+11
-360.877	165627.	0.00				
4.1400	0.00226	354267.	-140.549	-8.63E-05	0.00	3.84E+11
-359.255	171727.	0.00				
4.2300	0.00217	353906.	-527.603	-8.53E-05	0.00	3.84E+11
-357.513	178206.	0.00				
4.3200	0.00208	353128.	-912.710	-8.43E-05	0.00	3.84E+11
-355.647	185104.	0.00				
4.4100	0.00198	351936.	-1296.	-8.34E-05	0.00	3.84E+11
-353.650	192464.	0.00				
4.5000	0.00189	350330.	-1677.	-8.24E-05	0.00	3.84E+11
-351.516	200336.	0.00				
4.5900	0.00181	348315.	-2055.	-8.14E-05	0.00	3.84E+11
-349.237	208780.	0.00				
4.6800	0.00172	345892.	-2481.	-8.04E-05	0.00	3.84E+11
-440.689	276840.	0.00				
4.7700	0.00163	342956.	-2956.	-7.94E-05	0.00	3.84E+11
-437.369	289278.	0.00				
4.8600	0.00155	339509.	-3426.	-7.85E-05	0.00	3.84E+11
-433.827	302747.	0.00				
4.9500	0.00146	335556.	-3893.	-7.75E-05	0.00	3.84E+11
-430.049	317388.	0.00				
5.0400	0.00138	331102.	-4355.	-7.66E-05	0.00	3.84E+11

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

-426.014	333372.	0.00				
5.1300	0.00130	326150.	-4813.	-7.57E-05	0.00	3.84E+11
-421.701	350902.	0.00				
5.2200	0.00122	320707.	-5266.	-7.48E-05	0.00	3.84E+11
-417.084	370233.	0.00				
5.3100	0.00114	314777.	-5713.	-7.39E-05	0.00	3.84E+11
-412.132	391676.	0.00				
5.4000	0.00106	308367.	-6156.	-7.30E-05	0.00	3.85E+11
-406.809	415624.	0.00				
5.4900	9.79E-04	301482.	-6592.	-7.21E-05	0.00	3.85E+11
-401.074	442577.	0.00				
5.5800	9.01E-04	294129.	-7022.	-7.13E-05	0.00	3.85E+11
-394.872	473182.	0.00				
5.6700	8.25E-04	286316.	-7444.	-7.05E-05	0.00	3.85E+11
-388.141	508298.	0.00				
5.7600	7.49E-04	278050.	-7860.	-6.97E-05	0.00	3.85E+11
-380.800	549084.	0.00				
5.8500	6.74E-04	269340.	-8257.	-6.89E-05	0.00	3.85E+11
-354.279	567566.	0.00				
5.9400	6.00E-04	260216.	-8619.	-6.82E-05	0.00	3.85E+11
-316.921	570356.	0.00				
6.0300	5.27E-04	250723.	-8941.	-6.75E-05	0.00	3.85E+11
-279.598	573145.	0.00				
6.1200	4.54E-04	240904.	-9223.	-6.68E-05	0.00	3.85E+11
-242.302	575932.	0.00				
6.2100	3.83E-04	230802.	-9465.	-6.61E-05	0.00	3.85E+11
-205.022	578717.	0.00				
6.3000	3.12E-04	220461.	-9666.	-6.55E-05	0.00	3.85E+11
-167.748	581501.	0.00				
6.3900	2.41E-04	209924.	-9827.	-6.49E-05	0.00	3.85E+11
-130.469	584283.	0.00				
6.4800	1.71E-04	199235.	-9948.	-6.43E-05	0.00	3.85E+11
-93.173	587064.	0.00				
6.5700	1.02E-04	188438.	-10028.	-6.38E-05	0.00	3.85E+11
-55.847	589844.	0.00				
6.6600	3.37E-05	177575.	-10068.	-6.33E-05	0.00	3.85E+11
-18.479	592622.	0.00				
6.7500	-3.44E-05	166691.	-10068.	-6.28E-05	0.00	3.85E+11
18.9449	595400.	0.00				
6.8400	-1.02E-04	155829.	-10027.	-6.23E-05	0.00	3.85E+11
56.4391	598176.	0.00				
6.9300	-1.69E-04	145033.	-9946.	-6.19E-05	0.00	3.85E+11
94.0176	600952.	0.00				
7.0200	-2.36E-04	134346.	-9824.	-6.15E-05	0.00	3.85E+11
131.6948	603726.	0.00				
7.1100	-3.02E-04	123813.	-9662.	-6.11E-05	0.00	3.85E+11
169.4853	606499.	0.00				
7.2000	-3.68E-04	113477.	-9458.	-6.08E-05	0.00	3.85E+11
207.4038	609272.	0.00				
7.2900	-4.33E-04	103384.	-9213.	-6.05E-05	0.00	3.85E+11

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

245.4651	612043.	0.00				
7.3800	-4.98E-04	93577.	-8928.	-6.02E-05	0.00	3.85E+11
283.6838	614814.	0.00				
7.4700	-5.63E-04	84101.	-8601.	-6.00E-05	0.00	3.85E+11
322.0744	617584.	0.00				
7.5600	-6.28E-04	75000.	-8232.	-5.98E-05	0.00	3.85E+11
360.6509	620353.	0.00				
7.6500	-6.92E-04	66320.	-7822.	-5.96E-05	0.00	3.85E+11
399.4274	623121.	0.00				
7.7400	-7.57E-04	58106.	-7377.	-5.94E-05	0.00	3.85E+11
423.0323	603926.	0.00				
7.8300	-8.21E-04	50385.	-6915.	-5.92E-05	0.00	3.85E+11
433.6272	570736.	0.00				
7.9200	-8.84E-04	43171.	-6441.	-5.91E-05	0.00	3.85E+11
443.7802	541907.	0.00				
8.0100	-9.48E-04	36473.	-5956.	-5.90E-05	0.00	3.85E+11
453.5521	516599.	0.00				
8.1000	-0.00101	30305.	-5462.	-5.89E-05	0.00	3.85E+11
462.9921	494179.	0.00				
8.1900	-0.00108	24677.	-4957.	-5.88E-05	0.00	3.85E+11
472.1405	474161.	0.00				
8.2800	-0.00114	19600.	-4442.	-5.88E-05	0.00	3.85E+11
481.0312	456163.	0.00				
8.3700	-0.00120	15083.	-3918.	-5.87E-05	0.00	3.85E+11
489.6924	439881.	0.00				
8.4600	-0.00127	11138.	-3384.	-5.87E-05	0.00	3.85E+11
498.1481	425070.	0.00				
8.5500	-0.00133	7774.	-2842.	-5.86E-05	0.00	3.85E+11
506.4189	411532.	0.00				
8.6400	-0.00139	5001.	-2290.	-5.86E-05	0.00	3.85E+11
514.5224	399103.	0.00				
8.7300	-0.00146	2827.	-1730.	-5.86E-05	0.00	3.85E+11
522.4738	387646.	0.00				
8.8200	-0.00152	1263.	-1162.	-5.86E-05	0.00	3.85E+11
530.2864	377048.	0.00				
8.9100	-0.00158	317.8931	-585.096	-5.86E-05	0.00	3.85E+11
537.9718	367212.	0.00				
9.0000	-0.00165	0.00	0.00	-5.86E-05	0.00	3.85E+11
545.5401	179028.	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:

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-12 (Boring B-008 & 010-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Pile-head deflection = 0.00765429 inches
 Computed slope at pile head = -0.0001300 radians
 Maximum bending moment = 354267. inch-lbs
 Maximum shear force = -10068. lbs
 Depth of maximum bending moment = 4.14000000 feet below pile head
 Depth of maximum shear force = 6.66000000 feet below pile head
 Number of iterations = 14
 Number of zero deflection points = 1
 Pile deflection at ground = 0.00615427 inches

 Pile-head Deflection vs. Pile Length for Load Case 1

Boundary Condition Type 1, Shear and Moment

Shear = 1000. lbs
 Moment = 315600. in-lbs
 Axial Load = 4200. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	0.00765429	354267.	-10068.
8.55000	0.01224041	351905.	-11390.
8.10000	0.02646319	348667.	-12910.
7.65000	0.06591391	343976.	-14386.
7.20000	0.16867553	339462.	-15755.
6.75000	0.55036697	336475.	-17520.
6.30000	1.90653672	335782.	-19501.
5.85000	10.39847374	346411.	-23389.

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

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

Shear force at pile head = 2250.0 lbs
 Applied moment at pile head = 724800.0 in-lbs
 Axial thrust load on pile head = 4600.0 lbs

Depth	Deflect.	Bending	Shear	Slope	Total	Bending	Soil
Res.	Soil Spr.	Distrib.					

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X Es*H feet lb/inch	y Lat. inches lb/inch	Moment Load in-lbs lb/inch	Force lbs	S radians	Stress psi*	Stiffness lb-in^2	p
-----	-----	-----	-----	-----	-----	-----	
0.00	0.1277	724800.	2250.	-0.00166	0.00	3.83E+11	
0.00	0.00	0.00					
0.09000	0.1259	727238.	2250.	-0.00166	0.00	3.83E+11	
0.00	0.00	0.00					
0.1800	0.1241	729676.	2250.	-0.00166	0.00	3.83E+11	
0.00	0.00	0.00					
0.2700	0.1223	732115.	2250.	-0.00165	0.00	3.83E+11	
0.00	0.00	0.00					
0.3600	0.1206	734553.	2250.	-0.00165	0.00	3.83E+11	
0.00	0.00	0.00					
0.4500	0.1188	736991.	2250.	-0.00165	0.00	3.83E+11	
0.00	0.00	0.00					
0.5400	0.1170	739429.	2250.	-0.00165	0.00	3.83E+11	
0.00	0.00	0.00					
0.6300	0.1152	741868.	2250.	-0.00165	0.00	3.83E+11	
0.00	0.00	0.00					
0.7200	0.1134	744306.	2250.	-0.00164	0.00	3.83E+11	
0.00	0.00	0.00					
0.8100	0.1117	746744.	2250.	-0.00164	0.00	3.83E+11	
0.00	0.00	0.00					
0.9000	0.1099	749182.	2250.	-0.00164	0.00	3.83E+11	
0.00	0.00	0.00					
0.9900	0.1081	751620.	2250.	-0.00164	0.00	3.83E+11	
0.00	0.00	0.00					
1.0800	0.1063	754058.	2230.	-0.00164	0.00	3.83E+11	
-37.059	376.3568	0.00					
1.1700	0.1046	756453.	2190.	-0.00163	0.00	3.83E+11	
-37.461	386.8665	0.00					
1.2600	0.1028	758804.	2149.	-0.00163	0.00	3.83E+11	
-37.855	397.6344	0.00					
1.3500	0.1011	761111.	2108.	-0.00163	0.00	3.83E+11	
-38.239	408.6715	0.00					
1.4400	0.09930	763374.	2066.	-0.00163	0.00	3.83E+11	
-38.614	419.9895	0.00					
1.5300	0.09754	765591.	2025.	-0.00163	0.00	3.83E+11	
-38.979	431.6008	0.00					
1.6200	0.09578	767763.	1982.	-0.00162	0.00	3.83E+11	
-39.335	443.5186	0.00					
1.7100	0.09403	769889.	1940.	-0.00162	0.00	3.83E+11	
-39.681	455.7570	0.00					
1.8000	0.09228	771969.	1897.	-0.00162	0.00	3.83E+11	
-40.018	468.3309	0.00					
1.8900	0.09054	774002.	1853.	-0.00162	0.00	3.83E+11	
-40.343	481.2563	0.00					

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-12 (Boring B-008 & 010-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

1.9800	0.08879	775988.	1809.	-0.00161	0.00	3.83E+11
-40.659	494.5503	0.00				
2.0700	0.08705	777926.	1765.	-0.00161	0.00	3.83E+11
-40.964	508.2311	0.00				
2.1600	0.08531	779817.	1721.	-0.00161	0.00	3.83E+11
-41.257	522.3183	0.00				
2.2500	0.08357	781660.	1676.	-0.00161	0.00	3.83E+11
-41.540	536.8326	0.00				
2.3400	0.08183	783454.	1631.	-0.00161	0.00	3.83E+11
-41.811	551.7968	0.00				
2.4300	0.08010	785199.	1586.	-0.00160	0.00	3.83E+11
-42.071	567.2348	0.00				
2.5200	0.07837	786895.	1540.	-0.00160	0.00	3.83E+11
-42.318	583.1727	0.00				
2.6100	0.07664	788542.	1495.	-0.00160	0.00	3.83E+11
-42.554	599.6386	0.00				
2.7000	0.07492	790139.	1448.	-0.00160	0.00	3.83E+11
-42.776	616.6628	0.00				
2.7900	0.07319	791687.	1402.	-0.00159	0.00	3.83E+11
-42.986	634.2781	0.00				
2.8800	0.07147	793184.	1356.	-0.00159	0.00	3.83E+11
-43.183	652.5201	0.00				
2.9700	0.06975	794631.	1309.	-0.00159	0.00	3.83E+11
-43.366	671.4273	0.00				
3.0600	0.06804	796027.	1262.	-0.00159	0.00	3.83E+11
-43.534	691.0418	0.00				
3.1500	0.06632	797372.	1215.	-0.00159	0.00	3.83E+11
-43.689	711.4094	0.00				
3.2400	0.06461	798667.	1168.	-0.00158	0.00	3.83E+11
-43.828	732.5802	0.00				
3.3300	0.06290	799910.	1120.	-0.00158	0.00	3.83E+11
-43.952	754.6090	0.00				
3.4200	0.06120	801102.	1073.	-0.00158	0.00	3.83E+11
-44.060	777.5561	0.00				
3.5100	0.05949	802243.	1025.	-0.00158	0.00	3.83E+11
-44.151	801.4876	0.00				
3.6000	0.05779	803332.	977.3329	-0.00157	0.00	3.83E+11
-44.226	826.4767	0.00				
3.6900	0.05609	804370.	929.5387	-0.00157	0.00	3.83E+11
-44.282	852.6043	0.00				
3.7800	0.05440	805355.	881.6931	-0.00157	0.00	3.83E+11
-44.321	879.9602	0.00				
3.8700	0.05270	806290.	833.8164	-0.00157	0.00	3.83E+11
-44.340	908.6444	0.00				
3.9600	0.05101	807172.	785.9296	-0.00157	0.00	3.83E+11
-44.339	938.7684	0.00				
4.0500	0.04932	808003.	345.5209	-0.00156	0.00	3.83E+11
-771.232	16888.	0.00				
4.1400	0.04763	807934.	-486.143	-0.00156	0.00	3.83E+11
-768.886	17433.	0.00				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

4.2300	0.04595	806968.	-1315.	-0.00156	0.00	3.83E+11
-766.280	18011.	0.00				
4.3200	0.04427	805109.	-2141.	-0.00156	0.00	3.83E+11
-763.403	18625.	0.00				
4.4100	0.04259	802359.	-2964.	-0.00155	0.00	3.83E+11
-760.239	19279.	0.00				
4.5000	0.04091	798722.	-3783.	-0.00155	0.00	3.83E+11
-756.772	19978.	0.00				
4.5900	0.03924	794203.	-4598.	-0.00155	0.00	3.83E+11
-752.986	20726.	0.00				
4.6800	0.03756	788805.	-5519.	-0.00155	0.00	3.83E+11
-951.585	27359.	0.00				
4.7700	0.03589	782297.	-6543.	-0.00155	0.00	3.83E+11
-945.834	28459.	0.00				
4.8600	0.03423	774686.	-7562.	-0.00154	0.00	3.83E+11
-939.592	29648.	0.00				
4.9500	0.03256	765980.	-8573.	-0.00154	0.00	3.83E+11
-932.822	30940.	0.00				
5.0400	0.03090	756185.	-9576.	-0.00154	0.00	3.83E+11
-925.481	32348.	0.00				
5.1300	0.02924	745310.	-10571.	-0.00154	0.00	3.83E+11
-917.520	33891.	0.00				
5.2200	0.02758	733366.	-11558.	-0.00153	0.00	3.83E+11
-908.884	35590.	0.00				
5.3100	0.02592	720361.	-12534.	-0.00153	0.00	3.83E+11
-899.505	37473.	0.00				
5.4000	0.02427	706307.	-13500.	-0.00153	0.00	3.83E+11
-889.306	39573.	0.00				
5.4900	0.02262	691216.	-14455.	-0.00153	0.00	3.83E+11
-878.195	41931.	0.00				
5.5800	0.02097	675100.	-15396.	-0.00153	0.00	3.84E+11
-866.060	44605.	0.00				
5.6700	0.01932	657975.	-16325.	-0.00152	0.00	3.84E+11
-852.768	47665.	0.00				
5.7600	0.01768	639854.	-17238.	-0.00152	0.00	3.84E+11
-838.148	51209.	0.00				
5.8500	0.01603	620756.	-18134.	-0.00152	0.00	3.84E+11
-821.992	55370.	0.00				
5.9400	0.01439	600700.	-19012.	-0.00152	0.00	3.84E+11
-804.025	60337.	0.00				
6.0300	0.01275	579705.	-19870.	-0.00152	0.00	3.84E+11
-783.886	66391.	0.00				
6.1200	0.01111	557796.	-20704.	-0.00152	0.00	3.84E+11
-761.083	73960.	0.00				
6.2100	0.00948	534999.	-21512.	-0.00151	0.00	3.84E+11
-734.911	83747.	0.00				
6.3000	0.00784	511345.	-22289.	-0.00151	0.00	3.84E+11
-704.309	96988.	0.00				
6.3900	0.00621	486870.	-23030.	-0.00151	0.00	3.84E+11
-667.552	116104.	0.00				

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6.4800	0.00458	461616.	-23726.	-0.00151	0.00	3.84E+11
-621.511	146624.	0.00				
6.5700	0.00295	435637.	-24364.	-0.00151	0.00	3.84E+11
-559.374	204951.	0.00				
6.6600	0.00132	409005.	-24914.	-0.00151	0.00	3.84E+11
-459.634	376434.	0.00				
6.7500	-3.09E-04	381838.	-25070.	-0.00151	0.00	3.84E+11
170.3496	595400.	0.00				
6.8400	-0.00194	354869.	-24702.	-0.00151	0.00	3.84E+11
510.6523	284935.	0.00				
6.9300	-0.00356	328496.	-24104.	-0.00150	0.00	3.84E+11
597.4871	181209.	0.00				
7.0200	-0.00519	302819.	-23425.	-0.00150	0.00	3.85E+11
659.3757	137331.	0.00				
7.1100	-0.00681	277912.	-22686.	-0.00150	0.00	3.85E+11
709.0838	112470.	0.00				
7.2000	-0.00843	253832.	-21898.	-0.00150	0.00	3.85E+11
751.4261	96248.	0.00				
7.2900	-0.01005	230628.	-21066.	-0.00150	0.00	3.85E+11
788.7864	84734.	0.00				
7.3800	-0.01167	208344.	-20196.	-0.00150	0.00	3.85E+11
822.5329	76089.	0.00				
7.4700	-0.01330	187020.	-19291.	-0.00150	0.00	3.85E+11
853.5293	69332.	0.00				
7.5600	-0.01492	166691.	-18353.	-0.00150	0.00	3.85E+11
882.3583	63889.	0.00				
7.6500	-0.01654	147392.	-17386.	-0.00150	0.00	3.85E+11
909.4327	59400.	0.00				
7.7400	-0.01815	129153.	-16390.	-0.00150	0.00	3.85E+11
935.0564	55627.	0.00				
7.8300	-0.01977	112005.	-15367.	-0.00150	0.00	3.85E+11
959.4601	52406.	0.00				
7.9200	-0.02139	95976.	-14318.	-0.00150	0.00	3.85E+11
982.8230	49621.	0.00				
8.0100	-0.02301	81093.	-13244.	-0.00150	0.00	3.85E+11
1005.	47186.	0.00				
8.1000	-0.02463	67383.	-12147.	-0.00150	0.00	3.85E+11
1027.	45037.	0.00				
8.1900	-0.02624	54871.	-11026.	-0.00150	0.00	3.85E+11
1048.	43125.	0.00				
8.2800	-0.02786	43581.	-9884.	-0.00150	0.00	3.85E+11
1068.	41411.	0.00				
8.3700	-0.02948	33537.	-8719.	-0.00150	0.00	3.85E+11
1088.	39866.	0.00				
8.4600	-0.03110	24763.	-7533.	-0.00150	0.00	3.85E+11
1108.	38465.	0.00				
8.5500	-0.03271	17280.	-6327.	-0.00150	0.00	3.85E+11
1126.	37188.	0.00				
8.6400	-0.03433	11111.	-5101.	-0.00150	0.00	3.85E+11
1145.	36018.	0.00				

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8.7300	-0.03595	6278.	-3854.	-0.00150	0.00	3.85E+11
1163.	34943.	0.00				
8.8200	-0.03757	2801.	-2588.	-0.00150	0.00	3.85E+11
1181.	33951.	0.00				
8.9100	-0.03918	701.5208	-1304.	-0.00150	0.00	3.85E+11
1198.	33033.	0.00				
9.0000	-0.04080	0.00	0.00	-0.00150	0.00	3.85E+11
1216.	16090.	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	=	0.12771195 inches
Computed slope at pile head	=	-0.0016611 radians
Maximum bending moment	=	808003. inch-lbs
Maximum shear force	=	-25070. lbs
Depth of maximum bending moment	=	4.05000000 feet below pile head
Depth of maximum shear force	=	6.75000000 feet below pile head
Number of iterations	=	34
Number of zero deflection points	=	1
Pile deflection at ground	=	0.10791653 inches

 Pile-head Deflection vs. Pile Length for Load Case 2

Boundary Condition Type 1, Shear and Moment

Shear	=	2250. lbs
Moment	=	724800. in-lbs
Axial Load	=	4600. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	0.12771195	808003.	-25070.
8.55000	0.25276403	800568.	-26901.
8.10000	0.60865077	791585.	-29461.
7.65000	1.58002665	784492.	-32435.

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7.20000	4.18948905	780512.	-35814.
6.75000	16.88159920	796016.	-42298.

 Computed Values of Pile Loading and Deflection
 for Lateral Loading for Load Case Number 3

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

Shear force at pile head	=	2250.0 lbs
Applied moment at pile head	=	724800.0 in-lbs
Axial thrust load on pile head	=	3800.0 lbs

Depth Res.	Soil X	Deflect. Spr. y	Bending Distrib. Lat. Load	Shear Force	Slope S	Total Stress	Bending Stiffness	Soil p
	Es*H feet lb/inch	inches lb/inch	Moment in-lbs lb/inch	lbs	radians	psi*	lb-in^2	

0.00	0.00	0.1276	724800.	2250.	-0.00166	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.09000	0.00	0.1258	727237.	2250.	-0.00166	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.1800	0.00	0.1241	729674.	2250.	-0.00166	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.2700	0.00	0.1223	732110.	2250.	-0.00165	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.3600	0.00	0.1205	734547.	2250.	-0.00165	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.4500	0.00	0.1187	736984.	2250.	-0.00165	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.5400	0.00	0.1169	739421.	2250.	-0.00165	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.6300	0.00	0.1151	741857.	2250.	-0.00165	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.7200	0.00	0.1134	744294.	2250.	-0.00164	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.8100	0.00	0.1116	746731.	2250.	-0.00164	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.9000	0.00	0.1098	749168.	2250.	-0.00164	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.9900	0.00	0.1081	751604.	2250.	-0.00164	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
1.0800	0.00	0.1063	754041.	2230.	-0.00164	0.00	3.83E+11	
-37.052	376.4976		0.00					
1.1700	0.00	0.1045	756435.	2190.	-0.00163	0.00	3.83E+11	

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-37.454	387.0113	0.00				
1.2600	0.1028	758784.	2149.	-0.00163	0.00	3.83E+11
-37.847	397.7833	0.00				
1.3500	0.1010	761090.	2108.	-0.00163	0.00	3.83E+11
-38.232	408.8246	0.00				
1.4400	0.09924	763351.	2067.	-0.00163	0.00	3.83E+11
-38.607	420.1469	0.00				
1.5300	0.09748	765567.	2025.	-0.00162	0.00	3.83E+11
-38.972	431.7627	0.00				
1.6200	0.09573	767738.	1982.	-0.00162	0.00	3.83E+11
-39.328	443.6851	0.00				
1.7100	0.09398	769862.	1940.	-0.00162	0.00	3.83E+11
-39.674	455.9281	0.00				
1.8000	0.09223	771941.	1897.	-0.00162	0.00	3.83E+11
-40.010	468.5069	0.00				
1.8900	0.09048	773972.	1853.	-0.00162	0.00	3.83E+11
-40.336	481.4373	0.00				
1.9800	0.08874	775957.	1810.	-0.00161	0.00	3.83E+11
-40.651	494.7364	0.00				
2.0700	0.08700	777894.	1765.	-0.00161	0.00	3.83E+11
-40.956	508.4224	0.00				
2.1600	0.08526	779784.	1721.	-0.00161	0.00	3.83E+11
-41.250	522.5150	0.00				
2.2500	0.08352	781625.	1676.	-0.00161	0.00	3.83E+11
-41.532	537.0349	0.00				
2.3400	0.08179	783418.	1631.	-0.00160	0.00	3.83E+11
-41.803	552.0048	0.00				
2.4300	0.08006	785162.	1586.	-0.00160	0.00	3.83E+11
-42.063	567.4488	0.00				
2.5200	0.07833	786857.	1541.	-0.00160	0.00	3.83E+11
-42.310	583.3928	0.00				
2.6100	0.07660	788503.	1495.	-0.00160	0.00	3.83E+11
-42.546	599.8651	0.00				
2.7000	0.07487	790099.	1449.	-0.00160	0.00	3.83E+11
-42.768	616.8958	0.00				
2.7900	0.07315	791645.	1402.	-0.00159	0.00	3.83E+11
-42.978	634.5179	0.00				
2.8800	0.07143	793141.	1356.	-0.00159	0.00	3.83E+11
-43.175	652.7669	0.00				
2.9700	0.06971	794586.	1309.	-0.00159	0.00	3.83E+11
-43.357	671.6814	0.00				
3.0600	0.06800	795981.	1262.	-0.00159	0.00	3.83E+11
-43.526	691.3034	0.00				
3.1500	0.06629	797326.	1215.	-0.00158	0.00	3.83E+11
-43.680	711.6789	0.00				
3.2400	0.06458	798619.	1168.	-0.00158	0.00	3.83E+11
-43.820	732.8578	0.00				
3.3300	0.06287	799861.	1120.	-0.00158	0.00	3.83E+11
-43.943	754.8951	0.00				
3.4200	0.06116	801052.	1073.	-0.00158	0.00	3.83E+11

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

-44.051	777.8510	0.00					
	3.5100	0.05946	802192.	1025.	-0.00158	0.00	3.83E+11
-44.143	801.7917	0.00					
	3.6000	0.05776	803280.	977.5730	-0.00157	0.00	3.83E+11
-44.217	826.7905	0.00					
	3.6900	0.05606	804316.	929.7879	-0.00157	0.00	3.83E+11
-44.274	852.9281	0.00					
	3.7800	0.05436	805301.	881.9514	-0.00157	0.00	3.83E+11
-44.312	880.2946	0.00					
	3.8700	0.05267	806234.	834.0838	-0.00157	0.00	3.83E+11
-44.331	908.9898	0.00					
	3.9600	0.05098	807115.	786.2061	-0.00156	0.00	3.83E+11
-44.331	939.1254	0.00					
	4.0500	0.04929	807945.	345.8614	-0.00156	0.00	3.83E+11
-771.122	16895.	0.00					
	4.1400	0.04761	807875.	-485.684	-0.00156	0.00	3.83E+11
-768.776	17440.	0.00					
	4.2300	0.04592	806909.	-1315.	-0.00156	0.00	3.83E+11
-766.171	18018.	0.00					
	4.3200	0.04424	805048.	-2140.	-0.00156	0.00	3.83E+11
-763.293	18633.	0.00					
	4.4100	0.04256	802298.	-2963.	-0.00155	0.00	3.83E+11
-760.130	19287.	0.00					
	4.5000	0.04089	798661.	-3782.	-0.00155	0.00	3.83E+11
-756.664	19987.	0.00					
	4.5900	0.03921	794141.	-4597.	-0.00155	0.00	3.83E+11
-752.878	20735.	0.00					
	4.6800	0.03754	788743.	-5518.	-0.00155	0.00	3.83E+11
-951.449	27371.	0.00					
	4.7700	0.03587	782236.	-6542.	-0.00154	0.00	3.83E+11
-945.699	28471.	0.00					
	4.8600	0.03421	774625.	-7560.	-0.00154	0.00	3.83E+11
-939.458	29661.	0.00					
	4.9500	0.03254	765919.	-8571.	-0.00154	0.00	3.83E+11
-932.689	30953.	0.00					
	5.0400	0.03088	756124.	-9574.	-0.00154	0.00	3.83E+11
-925.349	32362.	0.00					
	5.1300	0.02922	745250.	-10569.	-0.00154	0.00	3.83E+11
-917.389	33906.	0.00					
	5.2200	0.02756	733307.	-11556.	-0.00153	0.00	3.83E+11
-908.753	35606.	0.00					
	5.3100	0.02591	720303.	-12532.	-0.00153	0.00	3.83E+11
-899.376	37489.	0.00					
	5.4000	0.02426	706250.	-13498.	-0.00153	0.00	3.83E+11
-889.178	39589.	0.00					
	5.4900	0.02261	691160.	-14452.	-0.00153	0.00	3.83E+11
-878.069	41949.	0.00					
	5.5800	0.02096	675046.	-15394.	-0.00153	0.00	3.84E+11
-865.937	44624.	0.00					
	5.6700	0.01931	657922.	-16322.	-0.00152	0.00	3.84E+11

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-12 (Boring B-008 & 010-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

-852.646	47685.	0.00				
5.7600	0.01767	639803.	-17235.	-0.00152	0.00	3.84E+11
-838.029	51231.	0.00				
5.8500	0.01602	620707.	-18131.	-0.00152	0.00	3.84E+11
-821.875	55393.	0.00				
5.9400	0.01438	600652.	-19009.	-0.00152	0.00	3.84E+11
-803.910	60363.	0.00				
6.0300	0.01274	579660.	-19867.	-0.00152	0.00	3.84E+11
-783.775	66419.	0.00				
6.1200	0.01111	557753.	-20701.	-0.00152	0.00	3.84E+11
-760.976	73991.	0.00				
6.2100	0.00947	534959.	-21508.	-0.00151	0.00	3.84E+11
-734.808	83782.	0.00				
6.3000	0.00784	511307.	-22285.	-0.00151	0.00	3.84E+11
-704.211	97029.	0.00				
6.3900	0.00621	486834.	-23026.	-0.00151	0.00	3.84E+11
-667.460	116152.	0.00				
6.4800	0.00458	461583.	-23722.	-0.00151	0.00	3.84E+11
-621.427	146684.	0.00				
6.5700	0.00295	435607.	-24360.	-0.00151	0.00	3.84E+11
-559.301	205031.	0.00				
6.6600	0.00132	408978.	-24910.	-0.00151	0.00	3.84E+11
-459.583	376559.	0.00				
6.7500	-3.09E-04	381814.	-25066.	-0.00151	0.00	3.84E+11
170.1500	595400.	0.00				
6.8400	-0.00193	354848.	-24699.	-0.00150	0.00	3.84E+11
510.5658	285080.	0.00				
6.9300	-0.00356	328477.	-24100.	-0.00150	0.00	3.84E+11
597.3922	181295.	0.00				
7.0200	-0.00518	302803.	-23422.	-0.00150	0.00	3.85E+11
659.2736	137394.	0.00				
7.1100	-0.00680	277898.	-22683.	-0.00150	0.00	3.85E+11
708.9755	112521.	0.00				
7.2000	-0.00843	253820.	-21894.	-0.00150	0.00	3.85E+11
751.3123	96292.	0.00				
7.2900	-0.01005	230619.	-21063.	-0.00150	0.00	3.85E+11
788.6675	84772.	0.00				
7.3800	-0.01167	208337.	-20193.	-0.00150	0.00	3.85E+11
822.4094	76123.	0.00				
7.4700	-0.01329	187015.	-19288.	-0.00150	0.00	3.85E+11
853.4016	69364.	0.00				
7.5600	-0.01491	166688.	-18351.	-0.00150	0.00	3.85E+11
882.2266	63918.	0.00				
7.6500	-0.01653	147390.	-17383.	-0.00150	0.00	3.85E+11
909.2972	59427.	0.00				
7.7400	-0.01814	129152.	-16387.	-0.00150	0.00	3.85E+11
934.9173	55652.	0.00				
7.8300	-0.01976	112005.	-15364.	-0.00150	0.00	3.85E+11
959.3175	52429.	0.00				
7.9200	-0.02138	95977.	-14316.	-0.00150	0.00	3.85E+11

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

982.6771	49643.	0.00				
8.0100	-0.02300	81095.	-13242.	-0.00150	0.00	3.85E+11
1005.	47207.	0.00				
8.1000	-0.02461	67386.	-12145.	-0.00150	0.00	3.85E+11
1027.	45057.	0.00				
8.1900	-0.02623	54874.	-11025.	-0.00150	0.00	3.85E+11
1048.	43144.	0.00				
8.2800	-0.02785	43585.	-9882.	-0.00150	0.00	3.85E+11
1068.	41430.	0.00				
8.3700	-0.02946	33541.	-8718.	-0.00150	0.00	3.85E+11
1088.	39884.	0.00				
8.4600	-0.03108	24767.	-7532.	-0.00150	0.00	3.85E+11
1107.	38482.	0.00				
8.5500	-0.03269	17284.	-6326.	-0.00150	0.00	3.85E+11
1126.	37204.	0.00				
8.6400	-0.03431	11115.	-5100.	-0.00150	0.00	3.85E+11
1145.	36034.	0.00				
8.7300	-0.03593	6281.	-3854.	-0.00150	0.00	3.85E+11
1163.	34959.	0.00				
8.8200	-0.03754	2803.	-2588.	-0.00150	0.00	3.85E+11
1181.	33966.	0.00				
8.9100	-0.03916	702.7134	-1303.	-0.00150	0.00	3.85E+11
1198.	33047.	0.00				
9.0000	-0.04078	0.00	0.00	-0.00150	0.00	3.85E+11
1215.	16097.	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. 3:

Pile-head deflection	=	0.12764079 inches
Computed slope at pile head	=	-0.0016602 radians
Maximum bending moment	=	807945. inch-lbs
Maximum shear force	=	-25066. lbs
Depth of maximum bending moment	=	4.05000000 feet below pile head
Depth of maximum shear force	=	6.75000000 feet below pile head
Number of iterations	=	34
Number of zero deflection points	=	1
Pile deflection at ground	=	0.10785601 inches

 Pile-head Deflection vs. Pile Length for Load Case 3

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Boundary Condition Type 1, Shear and Moment

Shear = 2250. lbs
 Moment = 724800. in-lbs
 Axial Load = 3800. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	0.12764079	807945.	-25066.
8.55000	0.25247907	800453.	-26892.
8.10000	0.60699081	791316.	-29440.
7.65000	1.56883877	783871.	-32374.
7.20000	4.10955208	778958.	-35632.
6.75000	15.40623224	788381.	-41281.

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	Load Type	Load 1	Load 2	Axial Loading	Pile-head Deflection	Pile-head Rotation	Max in lbs
No.		in-lbs		lbs	inches	radians	
1	V, lb	1000.0000	M, in-lb	4200.	0.00765	-1.30E-04	
-10068.		354267.					
2	V, lb	2250.	M, in-lb	4600.	0.1277	-0.00166	
-25070.		808003.					
3	V, lb	2250.	M, in-lb	3800.	0.1276	-0.00166	
-25066.		807945.					

Maximum pile-head deflection = 0.1277119502 inches

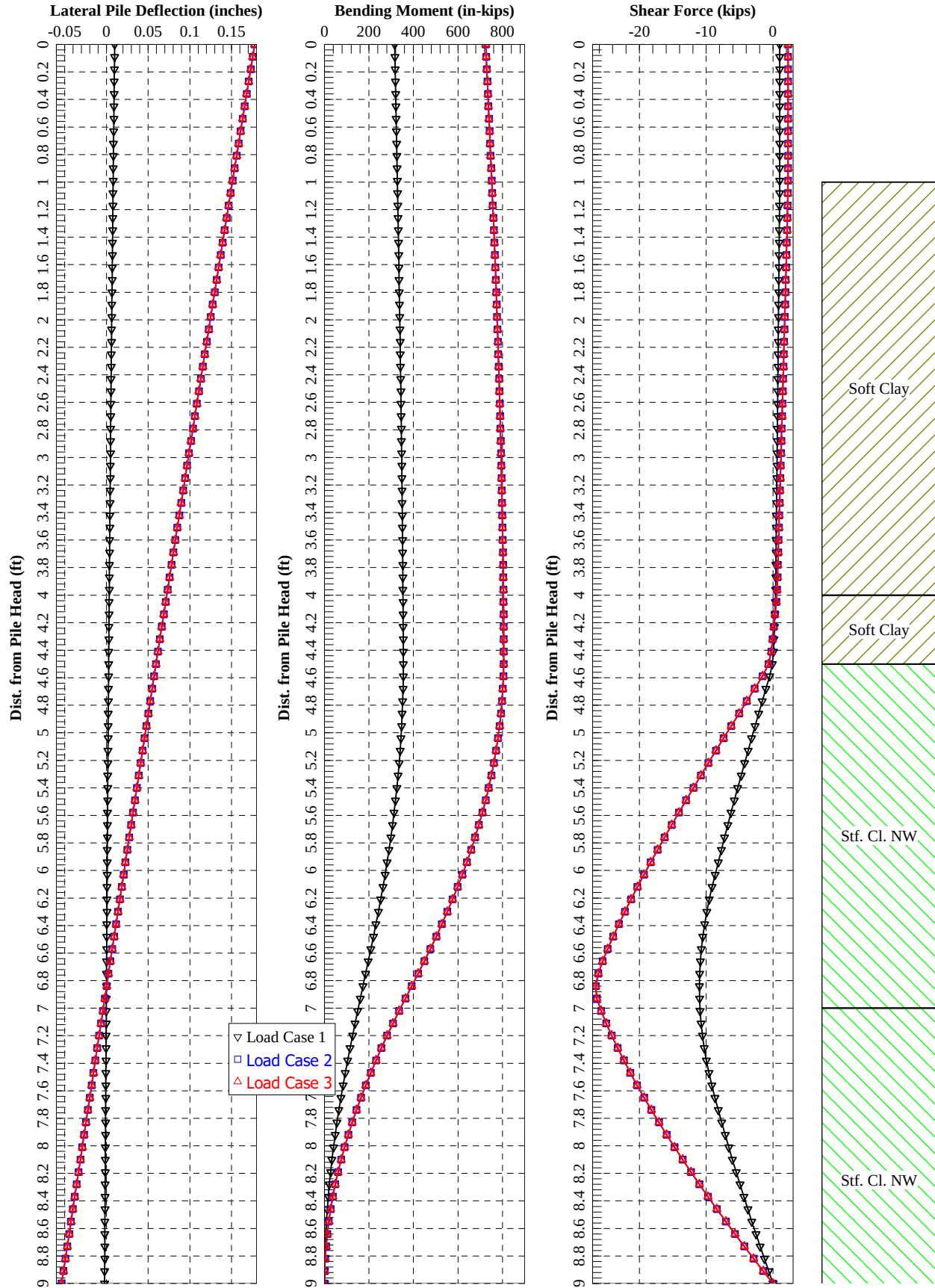
TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
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36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Maximum pile-head rotation = -0.0016611114 radians = -0.095175 deg.

The analysis ended normally.

LATERAL LOAD (LPILE) ANALYSES
SOUTHBOUND PARKING AREA
LIGHT TOWER SC1-13 (B-012-0-25)

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-13 (Boring B-012-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation



TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-13 (Boring B-012-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

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

This model was prepared by:
BSears

Files Used for Analysis

Path to file locations:
\Columbus-1170\Projects\2024\24170232_ms_TP 26 NE Ohio\GEO\Project Docs\Site
15_SUM-271 (2LMN)\Calcs\Light Towers\LPILE Files\SB\

Name of input data file:
Tower SC1-13 (B-012).lp12d

Name of output report file:
Tower SC1-13 (B-012).lp12o

Name of plot output file:
Tower SC1-13 (B-012).lp12p

Name of runtime message file:
Tower SC1-13 (B-012).lp12r

Date and Time of Analysis

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-13 (Boring B-012-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Date: February 11, 2026

Time: 19:07:49

Problem Title

Project Name: TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas

Job Number: 24170232F

Client: ms consultants, inc.

Engineer: BKS

Description: Light Tower SC1-13 (B-012-0-25)

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

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-13 (Boring B-012-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

- 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	=	9.000 ft
Depth of ground surface below top of pile	=	1.0000 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.

Point No.	Depth Below Pile Head feet	Pile Diameter inches
-----	-----	-----
1	0.000	36.0000
2	9.000	36.0000

Input Structural Properties for Pile Sections:

Pile Section No. 1:

Section 1 is a round drilled shaft, bored pile, or CIDH pile	
Length of section	= 9.000000 ft
Shaft Diameter	= 36.000000 in

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36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Soil and Rock Layering Information

The soil profile is modelled using 8 layers

Layer 1 is soft clay, p-y criteria by Matlock, 1970

Distance from top of pile to top of layer	=	1.000000	ft
Distance from top of pile to bottom of layer	=	4.000000	ft
Effective unit weight at top of layer	=	98.000000	pcf
Effective unit weight at bottom of layer	=	98.000000	pcf
Undrained cohesion at top of layer	=	250.000000	psf
Undrained cohesion at bottom of layer	=	250.000000	psf
Epsilon-50 at top of layer	=	0.020000	
Epsilon-50 at bottom of layer	=	0.020000	

Layer 2 is soft clay, p-y criteria by Matlock, 1970

Distance from top of pile to top of layer	=	4.000000	ft
Distance from top of pile to bottom of layer	=	4.500000	ft
Effective unit weight at top of layer	=	56.000000	pcf
Effective unit weight at bottom of layer	=	56.000000	pcf
Undrained cohesion at top of layer	=	1000.000000	psf
Undrained cohesion at bottom of layer	=	1000.000000	psf
Epsilon-50 at top of layer	=	0.010000	
Epsilon-50 at bottom of layer	=	0.010000	

Layer 3 is stiff clay without free water

Distance from top of pile to top of layer	=	4.500000	ft
Distance from top of pile to bottom of layer	=	7.000000	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	=	4500.	psf
Undrained cohesion at bottom of layer	=	4500.	psf
Epsilon-50 at top of layer	=	0.004000	
Epsilon-50 at bottom of layer	=	0.004000	

Layer 4 is stiff clay without free water

Distance from top of pile to top of layer	=	7.000000	ft
Distance from top of pile to bottom of layer	=	9.500000	ft
Effective unit weight at top of layer	=	66.000000	pcf

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 Light Tower SC1-13 (Boring B-012-0-25) Lateral Load Analysis
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Effective unit weight at bottom of layer	=	66.000000 pcf
Undrained cohesion at top of layer	=	4500. psf
Undrained cohesion at bottom of layer	=	4500. psf
Epsilon-50 at top of layer	=	0.004000
Epsilon-50 at bottom of layer	=	0.004000

Layer 5 is stiff clay without free water

Distance from top of pile to top of layer	=	9.500000 ft
Distance from top of pile to bottom of layer	=	12.000000 ft
Effective unit weight at top of layer	=	63.000000 pcf
Effective unit weight at bottom of layer	=	63.000000 pcf
Undrained cohesion at top of layer	=	4500. psf
Undrained cohesion at bottom of layer	=	4500. psf
Epsilon-50 at top of layer	=	0.004000
Epsilon-50 at bottom of layer	=	0.004000

Layer 6 is stiff clay without free water

Distance from top of pile to top of layer	=	12.000000 ft
Distance from top of pile to bottom of layer	=	19.500000 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	=	4500. psf
Undrained cohesion at bottom of layer	=	4500. psf
Epsilon-50 at top of layer	=	0.004000
Epsilon-50 at bottom of layer	=	0.004000

Layer 7 is stiff clay without free water

Distance from top of pile to top of layer	=	19.500000 ft
Distance from top of pile to bottom of layer	=	22.000000 ft
Effective unit weight at top of layer	=	63.000000 pcf
Effective unit weight at bottom of layer	=	63.000000 pcf
Undrained cohesion at top of layer	=	4500. psf
Undrained cohesion at bottom of layer	=	4500. psf
Epsilon-50 at top of layer	=	0.004000
Epsilon-50 at bottom of layer	=	0.004000

Layer 8 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	=	26.500000 ft
Effective unit weight at top of layer	=	63.000000 pcf
Effective unit weight at bottom of layer	=	63.000000 pcf
Undrained cohesion at top of layer	=	4500. psf

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 Light Tower SC1-13 (Boring B-012-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Undrained cohesion at bottom of layer = 4500. psf
 Epsilon-50 at top of layer = 0.004000
 Epsilon-50 at bottom of layer = 0.004000

(Depth of the lowest soil layer extends 17.500 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 psf	E50 or krm
1	Soft Clay	1.0000 4.0000	98.0000 98.0000	250.0000 250.0000	0.02000 0.02000
2	Soft Clay	4.0000 4.5000	56.0000 56.0000	1000.0000 1000.0000	0.01000 0.01000
3	Stiff Clay w/o Free Water	4.5000 7.0000	60.0000 60.0000	4500. 4500.	0.00400 0.00400
4	Stiff Clay w/o Free Water	7.0000 9.5000	66.0000 66.0000	4500. 4500.	0.00400 0.00400
5	Stiff Clay w/o Free Water	9.5000 12.0000	63.0000 63.0000	4500. 4500.	0.00400 0.00400
6	Stiff Clay w/o Free Water	12.0000 19.5000	60.0000 60.0000	4500. 4500.	0.00400 0.00400
7	Stiff Clay w/o Free Water	19.5000 22.0000	63.0000 63.0000	4500. 4500.	0.00400 0.00400
8	Stiff Clay w/o Free Water	22.0000 26.5000	63.0000 63.0000	4500. 4500.	0.00400 0.00400

 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 = 3

Load	Load	Condition	Condition	Axial Thrust
------	------	-----------	-----------	--------------

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-13 (Boring B-012-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Compute No.	Top y Type	Run Analysis		Force, lbs
		1	2	
vs. Pile Length				
1	1	V = 1000.000000 lbs	M = 315600. in-lbs	4200.
Yes		Yes		
2	1	V = 2250. lbs	M = 724800. in-lbs	4600.
Yes		Yes		
3	1	V = 2250. lbs	M = 724800. in-lbs	3800.
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:

 Dimensions and Properties of Drilled Shaft (Bored Pile):

Length of Section	=	9.000000 ft
Shaft Diameter	=	36.000000 in
Concrete Cover Thickness (to edge of trans. reinf.)	=	3.500000 in
Number of Reinforcing Bars	=	16 bars
Yield Stress of Reinforcing Bars	=	60000. psi
Modulus of Elasticity of Reinforcing Bars	=	29000000. psi
Gross Area of Shaft	=	1018. sq. in.
Total Area of Reinforcing Steel	=	16.000000 sq. in.
Area Ratio of Steel Reinforcement	=	1.57 percent
Edge-to-Edge Bar Spacing	=	4.114467 in
Maximum Concrete Aggregate Size	=	0.750000 in
Ratio of Bar Spacing to Aggregate Size	=	5.49
Offset of Center of Rebar Cage from Center of Pile	=	0.0000 in

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-13 (Boring B-012-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Transverse Reinforcement

Type: Spiral

Number of Transverse Reinf. (per spacing)	=	1
Spacing of Transverse Reinf.	=	4.500000 in
Yield Stress of Transverse Reinf.	=	60000. psi
Diameter of Transverse Reinf.	=	0.500000 in

Axial Structural Capacities:

Nom. Axial Structural Capacity = $0.85 F_c A_c + F_y A_s$	=	4366.378 kips
Tensile Load for Cracking of Concrete	=	-470.222 kips
Nominal Axial Tensile Capacity	=	-960.000 kips

Reinforcing Bar Dimensions and Positions Used in Computations:

Bar Number	Bar Diam. inches	Bar Area sq. in.	X inches	Y inches
-----	-----	-----	-----	-----
1	1.128000	1.000000	13.436000	0.000000
2	1.128000	1.000000	12.413245	5.141735
3	1.128000	1.000000	9.500687	9.500687
4	1.128000	1.000000	5.141735	12.413245
5	1.128000	1.000000	0.000000	13.436000
6	1.128000	1.000000	-5.14173	12.413245
7	1.128000	1.000000	-9.50069	9.500687
8	1.128000	1.000000	-12.41325	5.141735
9	1.128000	1.000000	-13.43600	0.000000
10	1.128000	1.000000	-12.41325	-5.14173
11	1.128000	1.000000	-9.50069	-9.50069
12	1.128000	1.000000	-5.14173	-12.41325
13	1.128000	1.000000	0.000000	-13.43600
14	1.128000	1.000000	5.141735	-12.41325
15	1.128000	1.000000	9.500687	-9.50069
16	1.128000	1.000000	12.413245	-5.14173

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

Minimum spacing between any two bars not equal to zero = 4.114 inches
 between bars 11 and 12.

Ratio of bar spacing to maximum aggregate size = 5.49

Concrete Properties:

Compressive Strength of Concrete	=	4000. psi
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TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-13 (Boring B-012-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Modulus of Elasticity of Concrete	=	3604997. psi
Modulus of Rupture of Concrete	=	-474.34165 psi
Compression Strain at Peak Stress	=	0.001886
Tensile Strain at Fracture of Concrete	=	-0.0001154
Maximum Coarse Aggregate Size	=	0.750000 in

Number of Axial Thrust Force Values Determined from Pile-head Loadings = 3

Number	Axial Thrust Force kips
1	3.800
2	4.200
3	4.600

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 318-14, Section 21.2.3.
 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 = 3.800 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
6.25000E-07	240.5062135	384809942.	19.2929823	0.00001206	-0.00001044
0.0505030	0.2746478				
0.00000125	480.1472468	384117797.	18.6479768	0.00002331	-0.00002169
0.0973082	0.5259142				
0.00000188	718.9174733	383422652.	18.4329804	0.00003456	-0.00003294
0.1438345	0.7771808				

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0.00000250	956.8168886	382726755.	18.3254857	0.00004581	-0.00004419
0.1900818	1.0284477				
0.00000313	1194.	382030558.	18.2609917	0.00005707	-0.00005543
0.2360502	1.2797149				
0.00000375	1430.	381334209.	18.2179981	0.00006832	-0.00006668
0.2817396	1.5309823				
0.00000438	1665.	380637775.	18.1872904	0.00007957	-0.00007793
0.3271500	1.7822500				
0.00000500	1900.	379941287.	18.1642614	0.00009082	-0.00008918
0.3722815	2.0335179				
0.00000563	2133.	379244764.	18.1463515	0.0001021	-0.000100
0.4171340	2.2847861				
0.00000625	2366.	378548215.	18.1320251	0.0001133	-0.000112
0.4617075	2.5360546				
0.00000688	2366.	344134741.	10.2494785	0.00007047	-0.000177
0.2882187	-4.308598 C				
0.00000750	2366.	315456846.	10.2198771	0.00007665	-0.000193
0.3129821	-4.706727 C				
0.00000813	2366.	291190934.	10.1952302	0.00008284	-0.000210
0.3376758	-5.104761 C				
0.00000875	2366.	270391582.	10.1744772	0.00008903	-0.000226
0.3622998	-5.502701 C				
0.00000938	2366.	252365477.	10.1568402	0.00009522	-0.000242
0.3868539	-5.900547 C				
0.00001000	2366.	236592634.	10.1417358	0.0001014	-0.000259
0.4113380	-6.298297 C				
0.00001063	2366.	222675420.	10.1287027	0.0001076	-0.000275
0.4357521	-6.695951 C				
0.00001125	2366.	210304564.	10.1174231	0.0001138	-0.000291
0.4600960	-7.093510 C				
0.00001188	2366.	199235903.	10.1076093	0.0001200	-0.000307
0.4843696	-7.490973 C				
0.00001250	2366.	189274107.	10.0990420	0.0001262	-0.000324
0.5085729	-7.888340 C				
0.00001313	2366.	180261055.	10.0915439	0.0001325	-0.000340
0.5327056	-8.285611 C				
0.00001375	2366.	172067370.	10.0849699	0.0001387	-0.000356
0.5567678	-8.682785 C				
0.00001438	2366.	164586180.	10.0792000	0.0001449	-0.000373
0.5807594	-9.079861 C				
0.00001500	2366.	157728423.	10.0741344	0.0001511	-0.000389
0.6046801	-9.476841 C				
0.00001563	2366.	151419286.	10.0696892	0.0001573	-0.000405
0.6285300	-9.873723 C				
0.00001625	2366.	145595467.	10.0657933	0.0001636	-0.000421
0.6523089	-10.270507 C				
0.00001688	2366.	140203043.	10.0623863	0.0001698	-0.000438
0.6760167	-10.667193 C				
0.00001750	2366.	135195791.	10.0594163	0.0001760	-0.000454
0.6996534	-11.063781 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-13 (Boring B-012-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00001813	2366.	130533867.	10.0568387	0.0001823	-0.000470
0.7232187	-11.460271 C				
0.00001875	2366.	126182738.	10.0546147	0.0001885	-0.000486
0.7467127	-11.856661 C				
0.00001938	2366.	122112327.	10.0527107	0.0001948	-0.000503
0.7701352	-12.252952 C				
0.00002000	2366.	118296317.	10.0510970	0.0002010	-0.000519
0.7934860	-12.649144 C				
0.00002063	2366.	114711580.	10.0497478	0.0002073	-0.000535
0.8167652	-13.045236 C				
0.00002125	2366.	111337710.	10.0486401	0.0002135	-0.000551
0.8399726	-13.441228 C				
0.00002188	2366.	108156633.	10.0477539	0.0002198	-0.000568
0.8631080	-13.837120 C				
0.00002250	2366.	105152282.	10.0470709	0.0002261	-0.000584
0.8861714	-14.232911 C				
0.00002313	2366.	102310328.	10.0465752	0.0002323	-0.000600
0.9091627	-14.628602 C				
0.00002375	2366.	99617951.	10.0462524	0.0002386	-0.000616
0.9320817	-15.024191 C				
0.00002438	2366.	97063645.	10.0460897	0.0002449	-0.000633
0.9549284	-15.419678 C				
0.00002563	2429.	94800037.	10.0461990	0.0002574	-0.000665
1.0004043	-16.210348 C				
0.00002688	2545.	94692477.	10.0468231	0.0002700	-0.000697
1.0455896	-17.000609 C				
0.00002813	2660.	94589756.	10.0479254	0.0002826	-0.000730
1.0904832	-17.790458 C				
0.00002938	2776.	94491232.	10.0493946	0.0002952	-0.000762
1.1350844	-18.579893 C				
0.00003063	2891.	94396370.	10.0512127	0.0003078	-0.000795
1.1793922	-19.368912 C				
0.00003188	3006.	94304718.	10.0533415	0.0003205	-0.000827
1.2234058	-20.157511 C				
0.00003313	3121.	94215891.	10.0557483	0.0003331	-0.000859
1.2671243	-20.945689 C				
0.00003438	3236.	94129561.	10.0584054	0.0003458	-0.000892
1.3105466	-21.733443 C				
0.00003563	3350.	94045446.	10.0612887	0.0003584	-0.000924
1.3536720	-22.520771 C				
0.00003688	3465.	93963300.	10.0643778	0.0003711	-0.000956
1.3964994	-23.307669 C				
0.00003813	3579.	93882912.	10.0676547	0.0003838	-0.000989
1.4390279	-24.094136 C				
0.00003938	3694.	93804096.	10.0711039	0.0003965	-0.001021
1.4812567	-24.880169 C				
0.00004063	3808.	93726688.	10.0747116	0.0004093	-0.001053
1.5231846	-25.665765 C				
0.00004188	3922.	93650546.	10.0784659	0.0004220	-0.001085
1.5648108	-26.450921 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
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36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00004313	4035.	93575540.	10.0823562	0.0004348	-0.001118
1.6061342	-27.235635 C				
0.00004438	4149.	93501560.	10.0863731	0.0004476	-0.001150
1.6471540	-28.019904 C				
0.00004563	4263.	93428502.	10.0905084	0.0004604	-0.001182
1.6878690	-28.803725 C				
0.00004688	4376.	93356279.	10.0947545	0.0004732	-0.001214
1.7282784	-29.587096 C				
0.00004813	4489.	93284807.	10.0991050	0.0004860	-0.001246
1.7683810	-30.370013 C				
0.00004938	4602.	93214014.	10.1035538	0.0004989	-0.001279
1.8081759	-31.152474 C				
0.00005063	4715.	93143835.	10.1080956	0.0005117	-0.001311
1.8476620	-31.934476 C				
0.00005188	4828.	93074209.	10.1127258	0.0005246	-0.001343
1.8868384	-32.716016 C				
0.00005313	4941.	93005082.	10.1174399	0.0005375	-0.001375
1.9257039	-33.497091 C				
0.00005438	5053.	92936405.	10.1222340	0.0005504	-0.001407
1.9642575	-34.277698 C				
0.00005563	5166.	92868132.	10.1271047	0.0005633	-0.001439
2.0024981	-35.057833 C				
0.00005688	5278.	92800222.	10.1320488	0.0005763	-0.001471
2.0404247	-35.837495 C				
0.00005813	5390.	92732637.	10.1370633	0.0005892	-0.001503
2.0780361	-36.616679 C				
0.00005938	5502.	92665342.	10.1421457	0.0006022	-0.001535
2.1153313	-37.395383 C				
0.00006063	5614.	92598305.	10.1472935	0.0006152	-0.001567
2.1523092	-38.173604 C				
0.00006188	5725.	92531497.	10.1525046	0.0006282	-0.001599
2.1889685	-38.951338 C				
0.00006313	5837.	92464888.	10.1577769	0.0006412	-0.001631
2.2253083	-39.728581 C				
0.00006438	5948.	92398455.	10.1631088	0.0006543	-0.001663
2.2613274	-40.505332 C				
0.00006563	6059.	92332173.	10.1684984	0.0006673	-0.001695
2.2970245	-41.281586 C				
0.00006688	6170.	92266020.	10.1739444	0.0006804	-0.001727
2.3323987	-42.057340 C				
0.00006813	6281.	92199976.	10.1794453	0.0006935	-0.001759
2.3674485	-42.832591 C				
0.00006938	6392.	92134020.	10.1849998	0.0007066	-0.001791
2.4021730	-43.607335 C				
0.00007063	6502.	92068136.	10.1906070	0.0007197	-0.001823
2.4365708	-44.381568 C				
0.00007188	6613.	92002305.	10.1962656	0.0007329	-0.001855
2.4706408	-45.155288 C				
0.00007313	6723.	91936511.	10.2020028	0.0007460	-0.001886
2.5043818	-45.928490 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-13 (Boring B-012-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00007438	6833.	91870742.	10.2077616	0.0007592	-0.001918
2.5377924	-46.701172 C				
0.00007938	7271.	91607617.	10.2312788	0.0008121	-0.002045
2.6681070	-49.786612 C				
0.00008438	7707.	91343844.	10.2555391	0.0008653	-0.002172
2.7930345	-52.863415 C				
0.00008938	8140.	91079227.	10.2796933	0.0009187	-0.002299
2.9123325	-55.933382 C				
0.00009438	8570.	90813004.	10.3043877	0.0009725	-0.002425
3.0260259	-58.995009 C				
0.00009938	8979.	90357411.	10.3225581	0.0010258	-0.002552
3.1326575	-60.000000 CY				
0.0001044	9304.	89144470.	10.3110511	0.0010762	-0.002681
3.2276850	-60.000000 CY				
0.0001094	9546.	87273573.	10.2718035	0.0011235	-0.002814
3.3116704	-60.000000 CY				
0.0001144	9782.	85523680.	10.2357064	0.0011707	-0.002947
3.3907664	-60.000000 CY				
0.0001194	10004.	83800225.	10.1987328	0.0012175	-0.003080
3.4643165	-60.000000 CY				
0.0001244	10154.	81641326.	10.1374818	0.0012608	-0.003217
3.5282172	-60.000000 CY				
0.0001294	10287.	79513660.	10.0756441	0.0013035	-0.003354
3.5871212	-60.000000 CY				
0.0001344	10419.	77536664.	10.0197410	0.0013464	-0.003491
3.6423258	-60.000000 CY				
0.0001394	10550.	75693983.	9.9691573	0.0013895	-0.003628
3.6937845	-60.000000 CY				
0.0001444	10680.	73971519.	9.9233661	0.0014327	-0.003765
3.7414497	-60.000000 CY				
0.0001494	10808.	72355946.	9.8810316	0.0014760	-0.003902
3.7851328	-60.000000 CY				
0.0001544	10925.	70772035.	9.8368433	0.0015186	-0.004039
3.8241552	-60.000000 CY				
0.0001594	11008.	69072220.	9.7809580	0.0015588	-0.004179
3.8574366	-60.000000 CY				
0.0001644	11071.	67351790.	9.7204156	0.0015978	-0.004320
3.8862696	-60.000000 CY				
0.0001694	11131.	65719446.	9.6635689	0.0016368	-0.004461
3.9118664	-60.000000 CY				
0.0001744	11191.	64176802.	9.6094393	0.0016756	-0.004602
3.9342902	-60.000000 CY				
0.0001794	11250.	62716278.	9.5601863	0.0017149	-0.004743
3.9535015	-60.000000 CY				
0.0001844	11308.	61329164.	9.5136161	0.0017541	-0.004883
3.9693617	-60.000000 CY				
0.0001894	11364.	60009896.	9.4690774	0.0017932	-0.005024
3.9819050	-60.000000 CY				
0.0001944	11420.	58754909.	9.4280227	0.0018326	-0.005165
3.9911986	-60.000000 CY				

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0.0001994	11476.	57559296.	9.3897594	0.0018721	-0.005305
3.9971986	-60.000000 CY				
0.0002044	11531.	56418622.	9.3531932	0.0019116	-0.005446
3.9998595	-60.000000 CY				
0.0002094	11584.	55328385.	9.3201259	0.0019514	-0.005586
3.9974517	-60.000000 CY				
0.0002144	11637.	54285454.	9.2909722	0.0019918	-0.005726
3.9998812	-60.000000 CY				
0.0002194	11690.	53285909.	9.2626721	0.0020320	-0.005866
3.9969940	-60.000000 CY				
0.0002244	11740.	52321336.	9.2356724	0.0020723	-0.006005
3.9997138	-60.000000 CY				
0.0002294	11786.	51384137.	9.2093226	0.0021124	-0.006145
3.9955528	-60.000000 CY				
0.0002344	11823.	50445667.	9.1796872	0.0021515	-0.006286
3.9989818	-60.000000 CY				
0.0002394	11855.	49524943.	9.1473565	0.0021896	-0.006428
3.9994466	-60.000000 CY				
0.0002444	11876.	48598228.	9.1109548	0.0022265	-0.006571
3.9965160	-60.000000 CY				
0.0002494	11895.	47701101.	9.0745971	0.0022630	-0.006715
3.9991770	-60.000000 CY				
0.0002544	11912.	46829816.	9.0405915	0.0022997	-0.006858
3.9995775	-60.000000 CY				
0.0002594	11929.	45990067.	9.0077660	0.0023364	-0.007001
3.9954763	-60.000000 CY				
0.0002644	11945.	45181124.	8.9766457	0.0023732	-0.007144
3.9984997	-60.000000 CY				
0.0002694	11961.	44401256.	8.9468563	0.0024101	-0.007287
3.9998981	-60.000000 CY				
0.0002744	11976.	43648250.	8.9191370	0.0024472	-0.007430
3.9944635	-60.000000 CY				
0.0003044	12062.	39628140.	8.7757363	0.0026711	-0.008286
3.9984635	-60.000000 CY				
0.0003344	12138.	36300180.	8.6628609	0.0028966	-0.009141
3.9998209	-60.000000 CY				
0.0003644	12207.	33502446.	8.5793723	0.0031261	-0.009991
3.9999551	-60.000000 CYT				
0.0003944	12272.	31117026.	8.5161103	0.0033585	-0.010839
3.9996166	-60.000000 CYT				
0.0004244	12331.	29056485.	8.4674428	0.0035934	-0.011684
3.9972132	-60.000000 CYT				
0.0004544	12377.	27238942.	8.4178614	0.0038249	-0.012533
3.9873462	-60.000000 CYT				

Axial Thrust Force = 4.200 kips

Bending Max Conc	Bending Max Steel	Bending Run	Depth to	Max Comp	Max Tens
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TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-13 (Boring B-012-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Curvature Stress rad/in. ksi	Moment Stress in-kip ksi	Stiffness Msg kip-in2	N Axis in	Strain in/in	Strain in/in
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6.25000E-07	240.5049676	384807948.	19.4290859	0.00001214	-0.00001036
0.0508615	0.2771147				
0.00000125	480.1459926	384116794.	18.7161837	0.00002340	-0.00002160
0.0976654	0.5283867				
0.00000188	718.9162127	383421980.	18.4785558	0.00003465	-0.00003285
0.1441903	0.7796589				
0.00000250	956.8156222	382726249.	18.3597458	0.00004590	-0.00004410
0.1904363	1.0309315				
0.00000313	1194.	382030150.	18.2884629	0.00005715	-0.00005535
0.2364034	1.2822044				
0.00000375	1430.	381333869.	18.2409436	0.00006840	-0.00006660
0.2820914	1.5334776				
0.00000438	1665.	380637482.	18.2070035	0.00007966	-0.00007784
0.3275005	1.7847511				
0.00000500	1900.	379941029.	18.1815504	0.00009091	-0.00008909
0.3726306	2.0360248				
0.00000563	2133.	379244533.	18.1617553	0.0001022	-0.000100
0.4174818	2.2872988				
0.00000625	2366.	378548006.	18.1459208	0.0001134	-0.000112
0.4620539	2.5385732				
0.00000688	2366.	344134551.	10.2895004	0.00007074	-0.000177
0.2893429	-4.300617 C				
0.00000750	2366.	315456672.	10.2575513	0.00007693	-0.000193
0.3141325	-4.698533 C				
0.00000813	2366.	291190774.	10.2300378	0.00008312	-0.000209
0.3388235	-5.096560 C				
0.00000875	2366.	270391433.	10.2068278	0.00008931	-0.000226
0.3634446	-5.494492 C				
0.00000938	2366.	252365338.	10.1870615	0.00009550	-0.000242
0.3879959	-5.892330 C				
0.00001000	2366.	236592504.	10.1700940	0.0001017	-0.000258
0.4124772	-6.290073 C				
0.00001063	2366.	222675298.	10.1554324	0.0001079	-0.000275
0.4368884	-6.687720 C				
0.00001125	2366.	210304448.	10.1426931	0.0001141	-0.000291
0.4612294	-7.085271 C				
0.00001188	2366.	199235793.	10.1315564	0.0001203	-0.000307
0.4855002	-7.482727 C				
0.00001250	2366.	189274003.	10.1218127	0.0001265	-0.000323
0.5097005	-7.880086 C				
0.00001313	2366.	180260955.	10.1132503	0.0001327	-0.000340
0.5338304	-8.277349 C				
0.00001375	2366.	172067276.	10.1057088	0.0001390	-0.000356
0.5578898	-8.674515 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-13 (Boring B-012-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00001438	2366.	164586090.	10.0990556	0.0001452	-0.000372
0.5818784	-9.071585 C				
0.00001500	2366.	157728336.	10.0931803	0.0001514	-0.000389
0.6057963	-9.468556 C				
0.00001563	2366.	151419203.	10.0879903	0.0001576	-0.000405
0.6296433	-9.865431 C				
0.00001625	2366.	145595387.	10.0834069	0.0001639	-0.000421
0.6534193	-10.262207 C				
0.00001688	2366.	140202965.	10.0793634	0.0001701	-0.000437
0.6771242	-10.658886 C				
0.00001750	2366.	135195717.	10.0758025	0.0001763	-0.000454
0.7007579	-11.055466 C				
0.00001813	2366.	130533795.	10.0726747	0.0001826	-0.000470
0.7243204	-11.451947 C				
0.00001875	2366.	126182669.	10.0699372	0.0001888	-0.000486
0.7478114	-11.848330 C				
0.00001938	2366.	122112260.	10.0675528	0.0001951	-0.000502
0.7712309	-12.244613 C				
0.00002000	2366.	118296252.	10.0654889	0.0002013	-0.000519
0.7945789	-12.640797 C				
0.00002063	2366.	114711517.	10.0637168	0.0002076	-0.000535
0.8178551	-13.036882 C				
0.00002125	2366.	111337649.	10.0622112	0.0002138	-0.000551
0.8410595	-13.432866 C				
0.00002188	2366.	108156573.	10.0609497	0.0002201	-0.000567
0.8641920	-13.828750 C				
0.00002250	2366.	105152224.	10.0599125	0.0002263	-0.000584
0.8872524	-14.224533 C				
0.00002313	2366.	102310272.	10.0590817	0.0002326	-0.000600
0.9102407	-14.620215 C				
0.00002375	2366.	99617896.	10.0584414	0.0002389	-0.000616
0.9331568	-15.015796 C				
0.00002438	2366.	97063591.	10.0579776	0.0002452	-0.000632
0.9560005	-15.411276 C				
0.00002563	2432.	94924068.	10.0575288	0.0002577	-0.000665
1.0014704	-16.201930 C				
0.00002688	2548.	94810571.	10.0576469	0.0002703	-0.000697
1.0466496	-16.992174 C				
0.00002813	2664.	94702439.	10.0582592	0.0002829	-0.000730
1.0915372	-17.782007 C				
0.00002938	2779.	94598964.	10.0593353	0.0002955	-0.000762
1.1361324	-18.571425 C				
0.00003063	2894.	94499555.	10.0607664	0.0003081	-0.000794
1.1804341	-19.360427 C				
0.00003188	3009.	94403710.	10.0625387	0.0003207	-0.000827
1.2244416	-20.149010 C				
0.00003313	3124.	94311007.	10.0646159	0.0003334	-0.000859
1.2681539	-20.937171 C				
0.00003438	3239.	94221082.	10.0669675	0.0003461	-0.000891
1.3115700	-21.724908 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-13 (Boring B-012-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00003563	3354.	94133623.	10.0695670	0.0003587	-0.000924
1.3546892	-22.512219 C				
0.00003688	3468.	94048359.	10.0723915	0.0003714	-0.000956
1.3975103	-23.299100 C				
0.00003813	3582.	93965057.	10.0754214	0.0003841	-0.000988
1.4400326	-24.085550 C				
0.00003938	3697.	93883511.	10.0786392	0.0003968	-0.001021
1.4822550	-24.871565 C				
0.00004063	3811.	93803541.	10.0820299	0.0004096	-0.001053
1.5241766	-25.657144 C				
0.00004188	3925.	93724988.	10.0855803	0.0004223	-0.001085
1.5657965	-26.442282 C				
0.00004313	4039.	93647711.	10.0892786	0.0004351	-0.001117
1.6071135	-27.226979 C				
0.00004438	4152.	93571586.	10.0931145	0.0004479	-0.001150
1.6481268	-28.011230 C				
0.00004563	4266.	93496502.	10.0970787	0.0004607	-0.001182
1.6888354	-28.795033 C				
0.00004688	4379.	93422358.	10.1011630	0.0004735	-0.001214
1.7292383	-29.578385 C				
0.00004813	4492.	93349066.	10.1053601	0.0004863	-0.001246
1.7693344	-30.361284 C				
0.00004938	4606.	93276544.	10.1096634	0.0004992	-0.001278
1.8091228	-31.143727 C				
0.00005063	4718.	93204721.	10.1140670	0.0005120	-0.001310
1.8486023	-31.925710 C				
0.00005188	4831.	93133529.	10.1185657	0.0005249	-0.001343
1.8877721	-32.707231 C				
0.00005313	4944.	93062909.	10.1231546	0.0005378	-0.001375
1.9266309	-33.488287 C				
0.00005438	5056.	92992807.	10.1278294	0.0005507	-0.001407
1.9651778	-34.268875 C				
0.00005563	5169.	92923173.	10.1325862	0.0005636	-0.001439
2.0034117	-35.048992 C				
0.00005688	5281.	92853961.	10.1374215	0.0005766	-0.001471
2.0413316	-35.828634 C				
0.00005813	5393.	92785130.	10.1423320	0.0005895	-0.001503
2.0789362	-36.607799 C				
0.00005938	5505.	92716640.	10.1473148	0.0006025	-0.001535
2.1162246	-37.386484 C				
0.00006063	5617.	92648458.	10.1523672	0.0006155	-0.001567
2.1531956	-38.164685 C				
0.00006188	5728.	92580549.	10.1574868	0.0006285	-0.001599
2.1898481	-38.942399 C				
0.00006313	5840.	92512883.	10.1626714	0.0006415	-0.001631
2.2261809	-39.719622 C				
0.00006438	5951.	92445433.	10.1679189	0.0006546	-0.001663
2.2621930	-40.496353 C				
0.00006563	6062.	92378172.	10.1732276	0.0006676	-0.001695
2.2978832	-41.272587 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-13 (Boring B-012-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00006688	6173.	92311077.	10.1785957	0.0006807	-0.001727
2.3332503	-42.048320 C				
0.00006813	6284.	92244124.	10.1840217	0.0006938	-0.001759
2.3682931	-42.823550 C				
0.00006938	6395.	92177292.	10.1895041	0.0007069	-0.001791
2.4030104	-43.598274 C				
0.00007063	6505.	92110561.	10.1950417	0.0007200	-0.001822
2.4374011	-44.372486 C				
0.00007188	6616.	92043913.	10.2006608	0.0007332	-0.001854
2.4714639	-45.146185 C				
0.00007313	6726.	91977331.	10.2063053	0.0007463	-0.001886
2.5051976	-45.919366 C				
0.00007438	6836.	91910797.	10.2120017	0.0007595	-0.001918
2.5386010	-46.692026 C				
0.00007938	7274.	91644853.	10.2352897	0.0008124	-0.002045
2.6688860	-49.777380 C				
0.00008438	7710.	91378587.	10.2593338	0.0008656	-0.002172
2.7937834	-52.854093 C				
0.00008938	8143.	91111830.	10.2831857	0.0009191	-0.002298
2.9130226	-55.924331 C				
0.00009438	8573.	90843621.	10.3077273	0.0009728	-0.002425
3.0266854	-58.985869 C				
0.00009938	8982.	90387473.	10.3258078	0.0010261	-0.002551
3.1332951	-60.000000 CY				
0.0001044	9308.	89176212.	10.3143071	0.0010766	-0.002681
3.2283182	-60.000000 CY				
0.0001094	9549.	87304848.	10.2749831	0.0011238	-0.002814
3.3122821	-60.000000 CY				
0.0001144	9785.	85553556.	10.2389100	0.0011711	-0.002946
3.3913727	-60.000000 CY				
0.0001194	10007.	83830919.	10.2019402	0.0012179	-0.003080
3.4649106	-60.000000 CY				
0.0001244	10158.	81671814.	10.1406407	0.0012612	-0.003216
3.5287895	-60.000000 CY				
0.0001294	10291.	79542859.	10.0787027	0.0013039	-0.003354
3.5876602	-60.000000 CY				
0.0001344	10423.	77564670.	10.0227059	0.0013468	-0.003491
3.6428308	-60.000000 CY				
0.0001394	10554.	75720878.	9.9720357	0.0013899	-0.003628
3.6942550	-60.000000 CY				
0.0001444	10683.	73997378.	9.9261646	0.0014331	-0.003764
3.7418850	-60.000000 CY				
0.0001494	10812.	72381005.	9.8838986	0.0014764	-0.003901
3.7855535	-60.000000 CY				
0.0001544	10929.	70796718.	9.8396771	0.0015190	-0.004038
3.8245440	-60.000000 CY				
0.0001594	11012.	69097838.	9.7838573	0.0015593	-0.004178
3.8578061	-60.000000 CY				
0.0001644	11075.	67376662.	9.7232508	0.0015983	-0.004319
3.8866026	-60.000000 CY				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-13 (Boring B-012-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0001694	11135.	65743511.	9.6663364	0.0016372	-0.004460
3.9121613	-60.000000 CY				
0.0001744	11195.	64200103.	9.6121495	0.0016761	-0.004601
3.9345463	-60.000000 CY				
0.0001794	11254.	62738857.	9.5628376	0.0017153	-0.004742
3.9537182	-60.000000 CY				
0.0001844	11312.	61351278.	9.5162917	0.0017546	-0.004883
3.9695496	-60.000000 CY				
0.0001894	11368.	60031354.	9.4717005	0.0017937	-0.005024
3.9820503	-60.000000 CY				
0.0001944	11425.	58775745.	9.4305957	0.0018331	-0.005164
3.9913005	-60.000000 CY				
0.0001994	11480.	57579537.	9.3922863	0.0018726	-0.005305
3.9972564	-60.000000 CY				
0.0002044	11535.	56438298.	9.3556780	0.0019121	-0.005445
3.9998723	-60.000000 CY				
0.0002094	11588.	55347517.	9.3241700	0.0019522	-0.005585
3.9975077	-60.000000 CY				
0.0002144	11641.	54304067.	9.2934428	0.0019923	-0.005725
3.9998931	-60.000000 CY				
0.0002194	11694.	53304015.	9.2651074	0.0020325	-0.005865
3.9970558	-60.000000 CY				
0.0002244	11744.	52339157.	9.2380944	0.0020728	-0.006005
3.9997330	-60.000000 CY				
0.0002294	11790.	51401489.	9.2117130	0.0021129	-0.006145
3.9956300	-60.000000 CY				
0.0002344	11827.	50463153.	9.1821360	0.0021521	-0.006285
3.9990203	-60.000000 CY				
0.0002394	11859.	49542728.	9.1500193	0.0021903	-0.006427
3.9992468	-60.000000 CY				
0.0002444	11880.	48615611.	9.1135780	0.0022271	-0.006570
3.9965958	-60.000000 CY				
0.0002494	11900.	47718283.	9.0771076	0.0022636	-0.006714
3.9992162	-60.000000 CY				
0.0002544	11917.	46846598.	9.0431776	0.0023004	-0.006857
3.9993713	-60.000000 CY				
0.0002594	11933.	46006491.	9.0103157	0.0023371	-0.007000
3.9955701	-60.000000 CY				
0.0002644	11949.	45197204.	8.9791598	0.0023739	-0.007144
3.9985538	-60.000000 CY				
0.0002694	11965.	44417005.	8.9493437	0.0024107	-0.007287
3.9999119	-60.000000 CY				
0.0002744	11980.	43663657.	8.9215934	0.0024479	-0.007430
3.9942523	-60.000000 CY				
0.0003044	12066.	39641995.	8.7782176	0.0026719	-0.008286
3.9985257	-60.000000 CY				
0.0003344	12142.	36312646.	8.6652203	0.0028974	-0.009140
3.9998424	-60.000000 CY				
0.0003644	12212.	33513765.	8.5815911	0.0031269	-0.009991
3.9999658	-60.000000 CYT				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0003944	12276.	31127384.	8.5182268	0.0033594	-0.010838
3.9996505	-60.000000 CYT				
0.0004244	12335.	29066055.	8.4694819	0.0035942	-0.011683
3.9973093	-60.000000 CYT				
0.0004544	12381.	27248100.	8.4201387	0.0038259	-0.012532
3.9875919	-60.000000 CYT				

Axial Thrust Force = 4.600 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
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6.25000E-07	240.5035986	384805758.	19.5651901	0.00001223	-0.00001027
0.0512199	0.2795816				
0.00000125	480.1446137	384115691.	18.7843907	0.00002348	-0.00002152
0.0980225	0.5308592				
0.00000188	718.9148267	383421241.	18.5241312	0.00003473	-0.00003277
0.1445462	0.7821371				
0.00000250	956.8142298	382725692.	18.3940059	0.00004599	-0.00004401
0.1907908	1.0334154				
0.00000313	1194.	382029703.	18.3159341	0.00005724	-0.00005526
0.2367565	1.2846940				
0.00000375	1430.	381333494.	18.2638891	0.00006849	-0.00006651
0.2824433	1.5359729				
0.00000438	1665.	380637159.	18.2267166	0.00007974	-0.00007776
0.3278510	1.7872522				
0.00000500	1900.	379940746.	18.1988394	0.00009099	-0.00008901
0.3729798	2.0385317				
0.00000563	2133.	379244280.	18.1771590	0.0001022	-0.000100
0.4178295	2.2898116				
0.00000625	2366.	378547777.	18.1598165	0.0001135	-0.000112
0.4624003	2.5410917				
0.00000688	2366.	344134343.	10.3291778	0.00007101	-0.000176
0.2904571	-4.292706 C				
0.00000750	2366.	315456481.	10.2940289	0.00007721	-0.000193
0.3152465	-4.690597 C				
0.00000813	2366.	291190598.	10.2646762	0.00008340	-0.000209
0.3399656	-5.088396 C				
0.00000875	2366.	270391269.	10.2391817	0.00008959	-0.000225
0.3645893	-5.486283 C				
0.00000938	2366.	252365185.	10.2172859	0.00009579	-0.000242
0.3891378	-5.884113 C				
0.00001000	2366.	236592361.	10.1984552	0.0001020	-0.000258
0.4136162	-6.281848 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-13 (Boring B-012-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00001063	2366.	222675163.	10.1821496	0.0001082	-0.000274
0.4380246	-6.679488 C				
0.00001125	2366.	210304321.	10.1679490	0.0001144	-0.000291
0.4623628	-7.077032 C				
0.00001188	2366.	199235672.	10.1555219	0.0001206	-0.000307
0.4866307	-7.474480 C				
0.00001250	2366.	189273889.	10.1446030	0.0001268	-0.000323
0.5108282	-7.871831 C				
0.00001313	2366.	180260846.	10.1349589	0.0001330	-0.000339
0.5349552	-8.269087 C				
0.00001375	2366.	172067171.	10.1264498	0.0001392	-0.000356
0.5590117	-8.666245 C				
0.00001438	2366.	164585990.	10.1189132	0.0001455	-0.000372
0.5829974	-9.063307 C				
0.00001500	2366.	157728241.	10.1122282	0.0001517	-0.000388
0.6069124	-9.460271 C				
0.00001563	2366.	151419111.	10.1062933	0.0001579	-0.000405
0.6307565	-9.857138 C				
0.00001625	2366.	145595299.	10.1010224	0.0001641	-0.000421
0.6545296	-10.253907 C				
0.00001688	2366.	140202880.	10.0963423	0.0001704	-0.000437
0.6782316	-10.650577 C				
0.00001750	2366.	135195635.	10.0921903	0.0001766	-0.000453
0.7018624	-11.047150 C				
0.00001813	2366.	130533716.	10.0885122	0.0001829	-0.000470
0.7254219	-11.443623 C				
0.00001875	2366.	126182592.	10.0852613	0.0001891	-0.000486
0.7489100	-11.839998 C				
0.00001938	2366.	122112186.	10.0823966	0.0001953	-0.000502
0.7723266	-12.236274 C				
0.00002000	2366.	118296180.	10.0798824	0.0002016	-0.000518
0.7956716	-12.632450 C				
0.00002063	2366.	114711448.	10.0776874	0.0002079	-0.000535
0.8189449	-13.028526 C				
0.00002125	2366.	111337582.	10.0757837	0.0002141	-0.000551
0.8421464	-13.424502 C				
0.00002188	2366.	108156508.	10.0741470	0.0002204	-0.000567
0.8652759	-13.820378 C				
0.00002250	2366.	105152160.	10.0727554	0.0002266	-0.000583
0.8883333	-14.216153 C				
0.00002313	2366.	102310210.	10.0715894	0.0002329	-0.000600
0.9113187	-14.611828 C				
0.00002375	2366.	99617836.	10.0706317	0.0002392	-0.000616
0.9342318	-15.007401 C				
0.00002438	2366.	97063533.	10.0698667	0.0002455	-0.000632
0.9570725	-15.402873 C				
0.00002563	2436.	95048091.	10.0688598	0.0002580	-0.000664
1.0025364	-16.193510 C				
0.00002688	2551.	94928657.	10.0684718	0.0002706	-0.000697
1.0477096	-16.983738 C				

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0.00002813	2667.	94815115.	10.0686232	0.0002832	-0.000729
1.0925912	-17.773555 C				
0.00002938	2782.	94706690.	10.0692479	0.0002958	-0.000762
1.1371802	-18.562957 C				
0.00003063	2897.	94602733.	10.0703211	0.0003084	-0.000794
1.1814759	-19.351942 C				
0.00003188	3012.	94502697.	10.0717368	0.0003210	-0.000826
1.2254772	-20.140508 C				
0.00003313	3127.	94406117.	10.0734845	0.0003337	-0.000859
1.2691834	-20.928652 C				
0.00003438	3242.	94312597.	10.0755306	0.0003463	-0.000891
1.3125933	-21.716373 C				
0.00003563	3357.	94221794.	10.0778462	0.0003590	-0.000923
1.3557063	-22.503666 C				
0.00003688	3471.	94133413.	10.0804061	0.0003717	-0.000956
1.3985212	-23.290530 C				
0.00003813	3586.	94047197.	10.0831888	0.0003844	-0.000988
1.4410372	-24.076963 C				
0.00003938	3700.	93962921.	10.0861753	0.0003971	-0.001020
1.4832533	-24.862961 C				
0.00004063	3814.	93880388.	10.0893491	0.0004099	-0.001053
1.5251686	-25.648521 C				
0.00004188	3928.	93799425.	10.0926956	0.0004226	-0.001085
1.5667821	-26.433642 C				
0.00004313	4042.	93719877.	10.0962019	0.0004354	-0.001117
1.6080927	-27.218321 C				
0.00004438	4155.	93641609.	10.0998566	0.0004482	-0.001149
1.6490996	-28.002554 C				
0.00004563	4269.	93564497.	10.1036497	0.0004610	-0.001182
1.6898018	-28.786339 C				
0.00004688	4382.	93488434.	10.1075722	0.0004738	-0.001214
1.7301982	-29.569674 C				
0.00004813	4496.	93413321.	10.1116159	0.0004866	-0.001246
1.7702878	-30.352554 C				
0.00004938	4609.	93339070.	10.1157737	0.0004995	-0.001278
1.8100696	-31.134978 C				
0.00005063	4722.	93265602.	10.1200391	0.0005123	-0.001310
1.8495425	-31.916943 C				
0.00005188	4834.	93192845.	10.1244063	0.0005252	-0.001342
1.8887057	-32.698446 C				
0.00005313	4947.	93120733.	10.1288700	0.0005381	-0.001374
1.9275579	-33.479483 C				
0.00005438	5060.	93049206.	10.1334255	0.0005510	-0.001406
1.9660981	-34.260052 C				
0.00005563	5172.	92978211.	10.1380684	0.0005639	-0.001439
2.0043253	-35.040149 C				
0.00005688	5284.	92907697.	10.1427948	0.0005769	-0.001471
2.0422384	-35.819772 C				
0.00005813	5396.	92837619.	10.1476012	0.0005898	-0.001503
2.0798362	-36.598918 C				

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0.00005938	5508.	92767935.	10.1524844	0.0006028	-0.001535
2.1171178	-37.377583 C				
0.00006063	5620.	92698606.	10.1574414	0.0006158	-0.001567
2.1540819	-38.155764 C				
0.00006188	5731.	92629597.	10.1624696	0.0006288	-0.001599
2.1907275	-38.933458 C				
0.00006313	5843.	92560874.	10.1675664	0.0006418	-0.001631
2.2270535	-39.710662 C				
0.00006438	5954.	92492407.	10.1727297	0.0006549	-0.001663
2.2630586	-40.487373 C				
0.00006563	6065.	92424168.	10.1779574	0.0006679	-0.001695
2.2987417	-41.263586 C				
0.00006688	6176.	92356130.	10.1832476	0.0006810	-0.001726
2.3341018	-42.039299 C				
0.00006813	6287.	92288268.	10.1885986	0.0006941	-0.001758
2.3691375	-42.814509 C				
0.00006938	6398.	92220560.	10.1940089	0.0007072	-0.001790
2.4038477	-43.589211 C				
0.00007063	6508.	92152983.	10.1995039	0.0007203	-0.001822
2.4382312	-44.363403 C				
0.00007188	6619.	92085519.	10.2050285	0.0007335	-0.001854
2.4722868	-45.137081 C				
0.00007313	6729.	92018147.	10.2106084	0.0007467	-0.001886
2.5060133	-45.910241 C				
0.00007438	6839.	91950850.	10.2162424	0.0007598	-0.001918
2.5394094	-46.682880 C				
0.00007938	7277.	91682087.	10.2393011	0.0008127	-0.002045
2.6696649	-49.768146 C				
0.00008438	7713.	91413389.	10.2630109	0.0008659	-0.002172
2.7945082	-52.845065 C				
0.00008938	8146.	91144431.	10.2866786	0.0009194	-0.002298
2.9137126	-55.915279 C				
0.00009438	8576.	90874234.	10.3110673	0.0009731	-0.002424
3.0273448	-58.976728 C				
0.00009938	8985.	90417533.	10.3290580	0.0010265	-0.002551
3.1339327	-60.000000 CY				
0.0001044	9311.	89207952.	10.3175636	0.0010769	-0.002681
3.2289512	-60.000000 CY				
0.0001094	9552.	87336121.	10.2781631	0.0011242	-0.002813
3.3128936	-60.000000 CY				
0.0001144	9789.	85583430.	10.2421143	0.0011714	-0.002946
3.3919789	-60.000000 CY				
0.0001194	10011.	83861611.	10.2051482	0.0012182	-0.003079
3.4655044	-60.000000 CY				
0.0001244	10162.	81702300.	10.1438002	0.0012616	-0.003216
3.5293615	-60.000000 CY				
0.0001294	10295.	79572057.	10.0817619	0.0013043	-0.003353
3.5881988	-60.000000 CY				
0.0001344	10427.	77592674.	10.0256713	0.0013472	-0.003490
3.6433355	-60.000000 CY				

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0.0001394	10557.	75747771.	9.9749147	0.0013903	-0.003627
3.6947252	-60.000000 CY				
0.0001444	10687.	74023236.	9.9289636	0.0014335	-0.003764
3.7423201	-60.000000 CY				
0.0001494	10816.	72406063.	9.8867661	0.0014768	-0.003901
3.7859739	-60.000000 CY				
0.0001544	10933.	70821400.	9.8425115	0.0015194	-0.004038
3.8249324	-60.000000 CY				
0.0001594	11017.	69123456.	9.7867573	0.0015598	-0.004178
3.8581753	-60.000000 CY				
0.0001644	11079.	67401534.	9.7260868	0.0015987	-0.004319
3.8869352	-60.000000 CY				
0.0001694	11139.	65767574.	9.6691048	0.0016377	-0.004460
3.9124557	-60.000000 CY				
0.0001744	11199.	64223403.	9.6148605	0.0016766	-0.004601
3.9348020	-60.000000 CY				
0.0001794	11258.	62761436.	9.5654896	0.0017158	-0.004742
3.9539345	-60.000000 CY				
0.0001844	11316.	61373390.	9.5189681	0.0017551	-0.004882
3.9697370	-60.000000 CY				
0.0001894	11373.	60052811.	9.4743244	0.0017942	-0.005023
3.9821950	-60.000000 CY				
0.0001944	11429.	58796578.	9.4331695	0.0018336	-0.005164
3.9914019	-60.000000 CY				
0.0001994	11484.	57599778.	9.3948139	0.0018731	-0.005304
3.9973136	-60.000000 CY				
0.0002044	11539.	56457972.	9.3581635	0.0019126	-0.005445
3.9998845	-60.000000 CY				
0.0002094	11592.	55366642.	9.3266817	0.0019528	-0.005585
3.9975630	-60.000000 CY				
0.0002144	11645.	54322678.	9.2959142	0.0019928	-0.005725
3.9999044	-60.000000 CY				
0.0002194	11698.	53322120.	9.2675435	0.0020331	-0.005864
3.9971169	-60.000000 CY				
0.0002244	11748.	52356977.	9.2405172	0.0020733	-0.006004
3.9997515	-60.000000 CY				
0.0002294	11794.	51418840.	9.2141042	0.0021135	-0.006144
3.9957066	-60.000000 CY				
0.0002344	11831.	50480617.	9.1845645	0.0021526	-0.006285
3.9990577	-60.000000 CY				
0.0002394	11864.	49560513.	9.1526832	0.0021909	-0.006427
3.9990468	-60.000000 CY				
0.0002444	11885.	48632992.	9.1162023	0.0022278	-0.006570
3.9966747	-60.000000 CY				
0.0002494	11904.	47735462.	9.0796192	0.0022642	-0.006713
3.9992545	-60.000000 CY				
0.0002544	11921.	46863378.	9.0457647	0.0023010	-0.006856
3.9991650	-60.000000 CY				
0.0002594	11937.	46022914.	9.0128664	0.0023377	-0.007000
3.9956629	-60.000000 CY				

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0.0002644	11953.	45213284.	8.9816750	0.0023745	-0.007143
3.9986069	-60.000000 CY				
0.0002694	11969.	44432753.	8.9518321	0.0024114	-0.007286
3.9999247	-60.000000 CY				
0.0002744	11984.	43679063.	8.9240509	0.0024485	-0.007429
3.9940409	-60.000000 CY				
0.0003044	12070.	39655848.	8.7807001	0.0026726	-0.008285
3.9985866	-60.000000 CY				
0.0003344	12146.	36325110.	8.6675807	0.0028982	-0.009139
3.9998625	-60.000000 CY				
0.0003644	12216.	33525083.	8.5838110	0.0031277	-0.009990
3.9999751	-60.000000 CYT				
0.0003944	12280.	31137740.	8.5203443	0.0033602	-0.010837
3.9996828	-60.000000 CYT				
0.0004244	12339.	29075625.	8.4715220	0.0035951	-0.011682
3.9974037	-60.000000 CYT				
0.0004544	12385.	27257253.	8.4224181	0.0038269	-0.012531
3.9878351	-60.000000 CYT				

 Summary of Results for Nominal 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 Tens. No. Strain	Axial Thrust kips	Nominal Mom. Cap. in-kip	Max. Comp. Strain	Max.
----	-----	-----	-----	
1 -0.00952396	3.800	12169.214	0.00300000	
2 -0.00952020	4.200	12173.120	0.00300000	
3 -0.00951645	4.600	12177.027	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 (0.75).

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

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

Axial Stiff. Load Ult Mom No. kip-in ²	Resist. Factor	Nominal Ax. Thrust kips	Nominal Moment Cap in-kips	Ult. (Fac) Ax. Thrust kips	Ult. (Fac) Moment Cap in-kips	Bend. at
-----	-----	-----	-----	-----	-----	-----
1 91219895.	0.65	3.800000	12169.	2.470000	7910.	
2 91253873.	0.65	4.200000	12173.	2.730000	7913.	
3 91287886.	0.65	4.600000	12177.	2.990000	7915.	
1 89806706.	0.75	3.800000	12169.	2.850000	9127.	
2 89838295.	0.75	4.200000	12173.	3.150000	9130.	
3 89869877.	0.75	4.600000	12177.	3.450000	9133.	
1 70221645.	0.90	3.800000	12169.	3.420000	10952.	
2 70254444.	0.90	4.200000	12173.	3.780000	10956.	
3 70287179.	0.90	4.600000	12177.	4.140000	10959.	

 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	1.0000	0.00	N.A.	No	0.00	8675.
2	4.0000	0.9260	Yes	No	8675.	4983.
3	4.5000	0.3338	No	No	13658.	111004.
4	7.0000	2.8319	Yes	No	124662.	100009.
5	9.5000	8.5000	No	No	224672.	0.00

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6	12.0000	11.0000	No	No	0.00	0.00
7	19.5000	18.5000	No	No	0.00	0.00
8	22.0000	21.0000	No	No	0.00	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.

 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 = 1000.0 lbs
 Applied moment at pile head = 315600.0 in-lbs
 Axial thrust load on pile head = 4200.0 lbs

Depth Res.	Soil X	Deflect. Spr.	Bending Distrib.	Shear Force	Slope S	Total Stress	Bending Stiffness	Soil p
	Es*H	y	Moment					
feet	inches	Lat.	Load	lbs	radians	psi*	lb-in^2	
lb/inch	lb/inch	lb/inch	lb/inch					
0.00	0.00991	315600.	1000.	-1.56E-04	0.00	3.84E+11		
0.00	0.00	0.00						
0.09000	0.00974	316681.	1000.	-1.55E-04	0.00	3.84E+11		
0.00	0.00	0.00						
0.1800	0.00957	317761.	1000.0000	-1.54E-04	0.00	3.84E+11		
0.00	0.00	0.00						
0.2700	0.00941	318842.	1000.0000	-1.54E-04	0.00	3.84E+11		
0.00	0.00	0.00						
0.3600	0.00924	319923.	1000.0000	-1.53E-04	0.00	3.84E+11		
0.00	0.00	0.00						
0.4500	0.00908	321003.	1000.0000	-1.52E-04	0.00	3.84E+11		
0.00	0.00	0.00						
0.5400	0.00891	322084.	1000.0000	-1.51E-04	0.00	3.84E+11		
0.00	0.00	0.00						
0.6300	0.00875	323165.	1000.0000	-1.50E-04	0.00	3.84E+11		
0.00	0.00	0.00						
0.7200	0.00859	324246.	1000.0000	-1.49E-04	0.00	3.84E+11		
0.00	0.00	0.00						

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0.8100	0.00843	325326.	1000.0000	-1.48E-04	0.00	3.84E+11
0.00	0.00	0.00				
0.9000	0.00827	326407.	1000.0000	-1.47E-04	0.00	3.84E+11
0.00	0.00	0.00				
0.9900	0.00811	327488.	1000.0000	-1.46E-04	0.00	3.84E+11
0.00	0.00	0.00				
1.0800	0.00795	328568.	991.5636	-1.45E-04	0.00	3.84E+11
-15.623	2122.	0.00				
1.1700	0.00780	329631.	974.6082	-1.44E-04	0.00	3.84E+11
-15.776	2185.	0.00				
1.2600	0.00764	330675.	957.4896	-1.44E-04	0.00	3.84E+11
-15.925	2251.	0.00				
1.3500	0.00749	331700.	940.2124	-1.43E-04	0.00	3.84E+11
-16.070	2318.	0.00				
1.4400	0.00733	332707.	922.7811	-1.42E-04	0.00	3.84E+11
-16.210	2388.	0.00				
1.5300	0.00718	333695.	905.2003	-1.41E-04	0.00	3.84E+11
-16.347	2459.	0.00				
1.6200	0.00703	334663.	887.4748	-1.40E-04	0.00	3.84E+11
-16.478	2532.	0.00				
1.7100	0.00688	335613.	869.6092	-1.39E-04	0.00	3.84E+11
-16.606	2607.	0.00				
1.8000	0.00673	336543.	851.6085	-1.38E-04	0.00	3.84E+11
-16.729	2685.	0.00				
1.8900	0.00658	337454.	833.4776	-1.37E-04	0.00	3.84E+11
-16.847	2765.	0.00				
1.9800	0.00643	338345.	815.2214	-1.36E-04	0.00	3.84E+11
-16.961	2848.	0.00				
2.0700	0.00629	339216.	796.8449	-1.35E-04	0.00	3.84E+11
-17.070	2933.	0.00				
2.1600	0.00614	340067.	778.3534	-1.34E-04	0.00	3.84E+11
-17.174	3020.	0.00				
2.2500	0.00600	340898.	759.7521	-1.33E-04	0.00	3.84E+11
-17.273	3111.	0.00				
2.3400	0.00585	341709.	741.0462	-1.32E-04	0.00	3.84E+11
-17.367	3204.	0.00				
2.4300	0.00571	342500.	722.2412	-1.31E-04	0.00	3.84E+11
-17.457	3301.	0.00				
2.5200	0.00557	343270.	703.3426	-1.30E-04	0.00	3.84E+11
-17.541	3401.	0.00				
2.6100	0.00543	344020.	684.3560	-1.29E-04	0.00	3.84E+11
-17.620	3505.	0.00				
2.7000	0.00529	344750.	665.2872	-1.28E-04	0.00	3.84E+11
-17.693	3612.	0.00				
2.7900	0.00515	345459.	646.1420	-1.27E-04	0.00	3.84E+11
-17.761	3723.	0.00				
2.8800	0.00502	346147.	626.9264	-1.26E-04	0.00	3.84E+11
-17.823	3838.	0.00				
2.9700	0.00488	346814.	607.6464	-1.25E-04	0.00	3.84E+11
-17.880	3958.	0.00				

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3.0600	0.00474	347460.	588.3083	-1.24E-04	0.00	3.84E+11
-17.931	4082.	0.00				
3.1500	0.00461	348086.	568.9184	-1.23E-04	0.00	3.84E+11
-17.976	4211.	0.00				
3.2400	0.00448	348690.	549.4834	-1.23E-04	0.00	3.84E+11
-18.015	4345.	0.00				
3.3300	0.00435	349274.	530.0099	-1.22E-04	0.00	3.84E+11
-18.047	4485.	0.00				
3.4200	0.00422	349836.	510.5047	-1.21E-04	0.00	3.84E+11
-18.073	4631.	0.00				
3.5100	0.00409	350378.	490.9749	-1.20E-04	0.00	3.84E+11
-18.093	4783.	0.00				
3.6000	0.00396	350898.	471.4278	-1.19E-04	0.00	3.84E+11
-18.106	4942.	0.00				
3.6900	0.00383	351397.	451.8707	-1.18E-04	0.00	3.84E+11
-18.111	5108.	0.00				
3.7800	0.00370	351875.	432.3115	-1.17E-04	0.00	3.84E+11
-18.110	5282.	0.00				
3.8700	0.00358	352332.	412.7579	-1.16E-04	0.00	3.84E+11
-18.101	5464.	0.00				
3.9600	0.00345	352767.	393.2182	-1.15E-04	0.00	3.84E+11
-18.084	5656.	0.00				
4.0500	0.00333	353182.	349.4166	-1.14E-04	0.00	3.84E+11
-63.030	20442.	0.00				
4.1400	0.00321	353523.	281.5333	-1.13E-04	0.00	3.84E+11
-62.680	21103.	0.00				
4.2300	0.00309	353791.	214.0428	-1.12E-04	0.00	3.84E+11
-62.303	21799.	0.00				
4.3200	0.00297	353987.	146.9740	-1.11E-04	0.00	3.84E+11
-61.899	22533.	0.00				
4.4100	0.00285	354110.	80.3569	-1.10E-04	0.00	3.84E+11
-61.466	23311.	0.00				
4.5000	0.00273	354161.	-99.020	-1.09E-04	0.00	3.84E+11
-270.713	107100.	0.00				
4.5900	0.00261	353897.	-518.449	-1.08E-04	0.00	3.84E+11
-506.007	209137.	0.00				
4.6800	0.00250	353042.	-1063.	-1.07E-04	0.00	3.84E+11
-503.030	217542.	0.00				
4.7700	0.00238	351601.	-1605.	-1.06E-04	0.00	3.84E+11
-499.839	226565.	0.00				
4.8600	0.00227	349577.	-2143.	-1.05E-04	0.00	3.84E+11
-496.421	236281.	0.00				
4.9500	0.00216	346973.	-2677.	-1.04E-04	0.00	3.84E+11
-492.760	246777.	0.00				
5.0400	0.00205	343795.	-3207.	-1.03E-04	0.00	3.84E+11
-488.839	258160.	0.00				
5.1300	0.00193	340047.	-3733.	-1.02E-04	0.00	3.84E+11
-484.637	270552.	0.00				
5.2200	0.00183	335733.	-4254.	-1.01E-04	0.00	3.84E+11
-480.132	284104.	0.00				

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5.3100	0.00172	330860.	-4770.	-9.99E-05	0.00	3.84E+11
-475.295	298998.	0.00				
5.4000	0.00161	325432.	-5280.	-9.90E-05	0.00	3.84E+11
-470.096	315460.	0.00				
5.4900	0.00150	319456.	-5785.	-9.81E-05	0.00	3.84E+11
-464.498	333769.	0.00				
5.5800	0.00140	312938.	-6283.	-9.72E-05	0.00	3.84E+11
-458.455	354279.	0.00				
5.6700	0.00129	305885.	-6775.	-9.63E-05	0.00	3.85E+11
-451.916	377443.	0.00				
5.7600	0.00119	298305.	-7259.	-9.55E-05	0.00	3.85E+11
-444.814	403853.	0.00				
5.8500	0.00109	290206.	-7735.	-9.46E-05	0.00	3.85E+11
-437.071	434300.	0.00				
5.9400	9.85E-04	281597.	-8203.	-9.38E-05	0.00	3.85E+11
-428.585	469863.	0.00				
6.0300	8.84E-04	272489.	-8661.	-9.31E-05	0.00	3.85E+11
-419.228	512059.	0.00				
6.1200	7.84E-04	262891.	-9108.	-9.23E-05	0.00	3.85E+11
-408.830	563098.	0.00				
6.2100	6.85E-04	252817.	-9535.	-9.16E-05	0.00	3.85E+11
-382.157	602677.	0.00				
6.3000	5.86E-04	242297.	-9919.	-9.09E-05	0.00	3.85E+11
-328.771	605614.	0.00				
6.3900	4.89E-04	231393.	-10245.	-9.02E-05	0.00	3.85E+11
-275.263	608548.	0.00				
6.4800	3.91E-04	220169.	-10513.	-8.96E-05	0.00	3.85E+11
-221.619	611482.	0.00				
6.5700	2.95E-04	208685.	-10724.	-8.90E-05	0.00	3.85E+11
-167.827	614414.	0.00				
6.6600	1.99E-04	197007.	-10876.	-8.84E-05	0.00	3.85E+11
-113.873	617345.	0.00				
6.7500	1.04E-04	185195.	-10969.	-8.79E-05	0.00	3.85E+11
-59.742	620274.	0.00				
6.8400	9.39E-06	173313.	-11005.	-8.74E-05	0.00	3.85E+11
-5.418	623202.	0.00				
6.9300	-8.47E-05	161426.	-10981.	-8.69E-05	0.00	3.85E+11
49.1136	626130.	0.00				
7.0200	-1.78E-04	149595.	-10898.	-8.65E-05	0.00	3.85E+11
103.8610	628998.	0.00				
7.1100	-2.71E-04	137886.	-10757.	-8.61E-05	0.00	3.85E+11
158.8573	631933.	0.00				
7.2000	-3.64E-04	126362.	-10555.	-8.57E-05	0.00	3.85E+11
214.1141	634868.	0.00				
7.2900	-4.57E-04	115087.	-10294.	-8.54E-05	0.00	3.85E+11
269.6484	637802.	0.00				
7.3800	-5.49E-04	104128.	-9973.	-8.51E-05	0.00	3.85E+11
325.4773	640735.	0.00				
7.4700	-6.40E-04	93548.	-9591.	-8.48E-05	0.00	3.85E+11
381.6176	643668.	0.00				

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7.5600	-7.32E-04	83413.	-9151.	-8.45E-05	0.00	3.85E+11
433.2437	639454.	0.00				
7.6500	-8.23E-04	73783.	-8675.	-8.43E-05	0.00	3.85E+11
448.1726	588207.	0.00				
7.7400	-9.14E-04	64676.	-8183.	-8.41E-05	0.00	3.85E+11
462.1488	546191.	0.00				
7.8300	-0.00100	56108.	-7677.	-8.39E-05	0.00	3.85E+11
475.3435	511040.	0.00				
7.9200	-0.00110	48095.	-7157.	-8.38E-05	0.00	3.85E+11
487.8855	481144.	0.00				
8.0100	-0.00119	40650.	-6623.	-8.37E-05	0.00	3.85E+11
499.8743	455367.	0.00				
8.1000	-0.00128	33789.	-6077.	-8.36E-05	0.00	3.85E+11
511.3885	432884.	0.00				
8.1900	-0.00137	27524.	-5519.	-8.35E-05	0.00	3.85E+11
522.4911	413079.	0.00				
8.2800	-0.00146	21869.	-4949.	-8.34E-05	0.00	3.85E+11
533.2336	395483.	0.00				
8.3700	-0.00155	16835.	-4367.	-8.34E-05	0.00	3.85E+11
543.6587	379732.	0.00				
8.4600	-0.00164	12436.	-3775.	-8.33E-05	0.00	3.85E+11
553.8019	365540.	0.00				
8.5500	-0.00173	8682.	-3171.	-8.33E-05	0.00	3.85E+11
563.6931	352678.	0.00				
8.6400	-0.00182	5587.	-2557.	-8.33E-05	0.00	3.85E+11
573.3579	340961.	0.00				
8.7300	-0.00191	3159.	-1933.	-8.33E-05	0.00	3.85E+11
582.8183	330237.	0.00				
8.8200	-0.00200	1412.	-1299.	-8.32E-05	0.00	3.85E+11
592.0929	320379.	0.00				
8.9100	-0.00209	355.4611	-654.127	-8.32E-05	0.00	3.85E+11
601.1983	311285.	0.00				
9.0000	-0.00218	0.00	0.00	-8.32E-05	0.00	3.85E+11
610.1487	151433.	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	=	0.00990803 inches
Computed slope at pile head	=	-0.0001563 radians
Maximum bending moment	=	354161. inch-lbs
Maximum shear force	=	-11005. lbs
Depth of maximum bending moment	=	4.50000000 feet below pile head

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Depth of maximum shear force = 6.84000000 feet below pile head
 Number of iterations = 17
 Number of zero deflection points = 1
 Pile deflection at ground = 0.00809280 inches

 Pile-head Deflection vs. Pile Length for Load Case 1

Boundary Condition Type 1, Shear and Moment

Shear = 1000. lbs
 Moment = 315600. in-lbs
 Axial Load = 4200. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	0.00990803	354161.	-11005.
8.55000	0.01796230	350385.	-12426.
8.10000	0.04105077	346124.	-13902.
7.65000	0.10249495	341916.	-15309.
7.20000	0.30116932	337633.	-16867.
6.75000	0.96231393	335673.	-18590.
6.30000	3.74966677	337006.	-20694.

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

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

Shear force at pile head = 2250.0 lbs
 Applied moment at pile head = 724800.0 in-lbs
 Axial thrust load on pile head = 4600.0 lbs

Depth Res. Soil	Deflect. Spr.	Bending Distrib.	Shear	Slope	Total	Bending	Soil
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					
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0.00	0.1778	724800.	2250.	-0.00225	0.00	3.83E+11
0.00	0.00	0.00				
0.09000	0.1754	727241.	2250.	-0.00224	0.00	3.83E+11
0.00	0.00	0.00				
0.1800	0.1730	729682.	2250.	-0.00224	0.00	3.83E+11
0.00	0.00	0.00				
0.2700	0.1706	732123.	2250.	-0.00224	0.00	3.83E+11
0.00	0.00	0.00				
0.3600	0.1682	734565.	2250.	-0.00224	0.00	3.83E+11
0.00	0.00	0.00				
0.4500	0.1658	737006.	2250.	-0.00223	0.00	3.83E+11
0.00	0.00	0.00				
0.5400	0.1633	739447.	2250.	-0.00223	0.00	3.83E+11
0.00	0.00	0.00				
0.6300	0.1609	741888.	2250.	-0.00223	0.00	3.83E+11
0.00	0.00	0.00				
0.7200	0.1585	744329.	2250.	-0.00223	0.00	3.83E+11
0.00	0.00	0.00				
0.8100	0.1561	746770.	2250.	-0.00223	0.00	3.83E+11
0.00	0.00	0.00				
0.9000	0.1537	749211.	2250.	-0.00222	0.00	3.83E+11
0.00	0.00	0.00				
0.9900	0.1513	751652.	2250.	-0.00222	0.00	3.83E+11
0.00	0.00	0.00				
1.0800	0.1489	754093.	2228.	-0.00222	0.00	3.83E+11
-41.460	300.6901	0.00				
1.1700	0.1465	756486.	2183.	-0.00222	0.00	3.83E+11
-41.917	308.9798	0.00				
1.2600	0.1441	758830.	2137.	-0.00222	0.00	3.83E+11
-42.365	317.4675	0.00				
1.3500	0.1417	761124.	2091.	-0.00221	0.00	3.83E+11
-42.802	326.1614	0.00				
1.4400	0.1393	763368.	2045.	-0.00221	0.00	3.83E+11
-43.230	335.0704	0.00				
1.5300	0.1370	765562.	1998.	-0.00221	0.00	3.83E+11
-43.648	344.2038	0.00				
1.6200	0.1346	767705.	1950.	-0.00221	0.00	3.83E+11
-44.055	353.5713	0.00				
1.7100	0.1322	769797.	1903.	-0.00221	0.00	3.83E+11
-44.451	363.1836	0.00				
1.8000	0.1298	771837.	1854.	-0.00220	0.00	3.83E+11
-44.837	373.0518	0.00				
1.8900	0.1274	773824.	1806.	-0.00220	0.00	3.83E+11
-45.211	383.1878	0.00				
1.9800	0.1251	775759.	1757.	-0.00220	0.00	3.83E+11
-45.575	393.6043	0.00				
2.0700	0.1227	777641.	1707.	-0.00220	0.00	3.83E+11
-45.926	404.3149	0.00				
2.1600	0.1203	779469.	1658.	-0.00219	0.00	3.83E+11
-46.266	415.3339	0.00				

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2.2500	0.1179	781243.	1607.	-0.00219	0.00	3.83E+11
-46.594	426.6770	0.00				
2.3400	0.1156	782962.	1557.	-0.00219	0.00	3.83E+11
-46.909	438.3607	0.00				
2.4300	0.1132	784627.	1506.	-0.00219	0.00	3.83E+11
-47.212	450.4028	0.00				
2.5200	0.1108	786237.	1455.	-0.00219	0.00	3.83E+11
-47.502	462.8226	0.00				
2.6100	0.1085	787791.	1403.	-0.00218	0.00	3.83E+11
-47.779	475.6406	0.00				
2.7000	0.1061	789290.	1352.	-0.00218	0.00	3.83E+11
-48.042	488.8791	0.00				
2.7900	0.1038	790733.	1300.	-0.00218	0.00	3.83E+11
-48.291	502.5621	0.00				
2.8800	0.1014	792119.	1247.	-0.00218	0.00	3.83E+11
-48.526	516.7155	0.00				
2.9700	0.09908	793449.	1195.	-0.00217	0.00	3.83E+11
-48.746	531.3675	0.00				
3.0600	0.09673	794722.	1142.	-0.00217	0.00	3.83E+11
-48.951	546.5487	0.00				
3.1500	0.09438	795937.	1089.	-0.00217	0.00	3.83E+11
-49.140	562.2921	0.00				
3.2400	0.09204	797096.	1036.	-0.00217	0.00	3.83E+11
-49.314	578.6341	0.00				
3.3300	0.08970	798197.	982.6368	-0.00217	0.00	3.83E+11
-49.471	595.6142	0.00				
3.4200	0.08737	799240.	929.1331	-0.00216	0.00	3.83E+11
-49.610	613.2756	0.00				
3.5100	0.08503	800225.	875.4882	-0.00216	0.00	3.83E+11
-49.732	631.6658	0.00				
3.6000	0.08270	801152.	821.7212	-0.00216	0.00	3.83E+11
-49.836	650.8369	0.00				
3.6900	0.08037	802021.	767.8522	-0.00216	0.00	3.83E+11
-49.921	670.8467	0.00				
3.7800	0.07804	802832.	713.9021	-0.00215	0.00	3.83E+11
-49.986	691.7586	0.00				
3.8700	0.07572	803585.	659.8924	-0.00215	0.00	3.83E+11
-50.032	713.6433	0.00				
3.9600	0.07339	804279.	605.8455	-0.00215	0.00	3.83E+11
-50.055	736.5793	0.00				
4.0500	0.07107	804915.	484.4727	-0.00215	0.00	3.83E+11
-174.709	2655.	0.00				
4.1400	0.06876	805347.	296.1797	-0.00214	0.00	3.83E+11
-173.982	2733.	0.00				
4.2300	0.06644	805576.	108.7126	-0.00214	0.00	3.83E+11
-173.179	2815.	0.00				
4.3200	0.06413	805603.	-77.845	-0.00214	0.00	3.83E+11
-172.298	2902.	0.00				
4.4100	0.06182	805429.	-263.408	-0.00214	0.00	3.83E+11
-171.336	2993.	0.00				

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4.5000	0.05951	805055.	-671.535	-0.00214	0.00	3.83E+11
-584.456	10607.	0.00				
4.5900	0.05720	804000.	-1578.	-0.00213	0.00	3.83E+11
-1094.	20647.	0.00				
4.6800	0.05490	801669.	-2756.	-0.00213	0.00	3.83E+11
-1088.	21409.	0.00				
4.7700	0.05260	798068.	-3928.	-0.00213	0.00	3.83E+11
-1083.	22227.	0.00				
4.8600	0.05030	793205.	-5094.	-0.00213	0.00	3.83E+11
-1076.	23107.	0.00				
4.9500	0.04801	787086.	-6253.	-0.00212	0.00	3.83E+11
-1069.	24059.	0.00				
5.0400	0.04571	779720.	-7404.	-0.00212	0.00	3.83E+11
-1062.	25090.	0.00				
5.1300	0.04342	771116.	-8546.	-0.00212	0.00	3.83E+11
-1054.	26214.	0.00				
5.2200	0.04113	761282.	-9680.	-0.00212	0.00	3.83E+11
-1045.	27443.	0.00				
5.3100	0.03885	750229.	-10803.	-0.00212	0.00	3.83E+11
-1036.	28794.	0.00				
5.4000	0.03656	737968.	-11916.	-0.00211	0.00	3.83E+11
-1025.	30289.	0.00				
5.4900	0.03428	724510.	-13018.	-0.00211	0.00	3.83E+11
-1014.	31951.	0.00				
5.5800	0.03200	709870.	-14106.	-0.00211	0.00	3.83E+11
-1002.	33815.	0.00				
5.6700	0.02972	694061.	-15181.	-0.00211	0.00	3.83E+11
-988.644	35921.	0.00				
5.7600	0.02745	677099.	-16241.	-0.00211	0.00	3.84E+11
-974.039	38324.	0.00				
5.8500	0.02518	659001.	-17285.	-0.00210	0.00	3.84E+11
-957.989	41096.	0.00				
5.9400	0.02290	639786.	-18310.	-0.00210	0.00	3.84E+11
-940.271	44336.	0.00				
6.0300	0.02064	619473.	-19315.	-0.00210	0.00	3.84E+11
-920.600	48182.	0.00				
6.1200	0.01837	598087.	-20297.	-0.00210	0.00	3.84E+11
-898.602	52836.	0.00				
6.2100	0.01610	575653.	-21254.	-0.00210	0.00	3.84E+11
-873.770	58604.	0.00				
6.3000	0.01384	552199.	-22182.	-0.00210	0.00	3.84E+11
-845.392	65977.	0.00				
6.3900	0.01158	527760.	-23078.	-0.00209	0.00	3.84E+11
-812.416	75793.	0.00				
6.4800	0.00932	502373.	-23934.	-0.00209	0.00	3.84E+11
-773.177	89635.	0.00				
6.5700	0.00706	476084.	-24743.	-0.00209	0.00	3.84E+11
-724.775	110921.	0.00				
6.6600	0.00480	448949.	-25491.	-0.00209	0.00	3.84E+11
-661.319	148817.	0.00				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-13 (Boring B-012-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

6.7500	0.00254	421044.	-26154.	-0.00209	0.00	3.84E+11
-566.908	240749.	0.00				
6.8400	2.88E-04	392477.	-26550.	-0.00209	0.00	3.84E+11
-166.317	623202.	0.00				
6.9300	-0.00197	363716.	-26350.	-0.00209	0.00	3.84E+11
536.5730	294834.	0.00				
7.0200	-0.00422	335581.	-25708.	-0.00209	0.00	3.84E+11
652.4125	167042.	0.00				
7.1100	-0.00647	308206.	-24962.	-0.00208	0.00	3.85E+11
729.4324	121765.	0.00				
7.2000	-0.00872	281683.	-24142.	-0.00208	0.00	3.85E+11
789.6041	97790.	0.00				
7.2900	-0.01097	256081.	-23262.	-0.00208	0.00	3.85E+11
840.1006	82706.	0.00				
7.3800	-0.01322	231458.	-22331.	-0.00208	0.00	3.85E+11
884.2436	72242.	0.00				
7.4700	-0.01547	207867.	-21354.	-0.00208	0.00	3.85E+11
923.8662	64507.	0.00				
7.5600	-0.01772	185354.	-20337.	-0.00208	0.00	3.85E+11
960.0954	58531.	0.00				
7.6500	-0.01996	163960.	-19282.	-0.00208	0.00	3.85E+11
993.6770	53759.	0.00				
7.7400	-0.02221	143725.	-18192.	-0.00208	0.00	3.85E+11
1025.	49851.	0.00				
7.8300	-0.02446	124687.	-17069.	-0.00208	0.00	3.85E+11
1055.	46584.	0.00				
7.9200	-0.02670	106878.	-15914.	-0.00208	0.00	3.85E+11
1083.	43808.	0.00				
8.0100	-0.02895	90333.	-14730.	-0.00208	0.00	3.85E+11
1110.	41417.	0.00				
8.1000	-0.03119	75082.	-13517.	-0.00208	0.00	3.85E+11
1136.	39334.	0.00				
8.1900	-0.03344	61157.	-12276.	-0.00208	0.00	3.85E+11
1161.	37501.	0.00				
8.2800	-0.03568	48586.	-11009.	-0.00208	0.00	3.85E+11
1185.	35874.	0.00				
8.3700	-0.03793	37397.	-9717.	-0.00208	0.00	3.85E+11
1209.	34419.	0.00				
8.4600	-0.04017	27618.	-8399.	-0.00208	0.00	3.85E+11
1232.	33110.	0.00				
8.5500	-0.04242	19276.	-7057.	-0.00208	0.00	3.85E+11
1254.	31925.	0.00				
8.6400	-0.04466	12396.	-5691.	-0.00208	0.00	3.85E+11
1276.	30846.	0.00				
8.7300	-0.04690	7004.	-4302.	-0.00208	0.00	3.85E+11
1297.	29860.	0.00				
8.8200	-0.04915	3124.	-2890.	-0.00208	0.00	3.85E+11
1318.	28955.	0.00				
8.9100	-0.05139	781.7997	-1456.	-0.00208	0.00	3.85E+11
1338.	28120.	0.00				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area

Light Tower SC1-13 (Boring B-012-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

9.0000 -0.05364 0.00 0.00 -0.00208 0.00 3.85E+11
1358. 13674. 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 = 0.17784802 inches
Computed slope at pile head = -0.0022451 radians
Maximum bending moment = 805603. inch-lbs
Maximum shear force = -26550. lbs
Depth of maximum bending moment = 4.32000000 feet below pile head
Depth of maximum shear force = 6.84000000 feet below pile head
Number of iterations = 35
Number of zero deflection points = 1
Pile deflection at ground = 0.15104447 inches

Pile-head Deflection vs. Pile Length for Load Case 2

Boundary Condition Type 1, Shear and Moment

Shear = 2250. lbs
Moment = 724800. in-lbs
Axial Load = 4600. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	0.17784802	805603.	-26550.
8.55000	0.37537045	796029.	-28630.
8.10000	0.91380697	787528.	-31297.
7.65000	2.33851089	782480.	-34360.
7.20000	7.18646047	781948.	-38352.

Computed Values of Pile Loading and Deflection
for Lateral Loading for Load Case Number 3

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-13 (Boring B-012-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

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

Shear force at pile head = 2250.0 lbs
 Applied moment at pile head = 724800.0 in-lbs
 Axial thrust load on pile head = 3800.0 lbs

Depth Res.	Soil X	Deflect. Spr.	Bending Distrib.	Shear Force	Slope S	Total Stress	Bending Stiffness	Soil p
	Es*H	y	Moment					
feet	inches	Lat. Load	in-lbs	lbs	radians	psi*	lb-in^2	
lb/inch	lb/inch	lb/inch	lb/inch					
0.00	0.1777	724800.	2250.	-0.00224	0.00	3.83E+11		
0.00	0.00	0.00	2250.	-0.00224	0.00	3.83E+11		
0.09000	0.1753	727239.	2250.	-0.00224	0.00	3.83E+11		
0.00	0.00	0.00	2250.	-0.00224	0.00	3.83E+11		
0.1800	0.1729	729678.	2250.	-0.00224	0.00	3.83E+11		
0.00	0.00	0.00	2250.	-0.00224	0.00	3.83E+11		
0.2700	0.1705	732118.	2250.	-0.00224	0.00	3.83E+11		
0.00	0.00	0.00	2250.	-0.00224	0.00	3.83E+11		
0.3600	0.1680	734557.	2250.	-0.00224	0.00	3.83E+11		
0.00	0.00	0.00	2250.	-0.00223	0.00	3.83E+11		
0.4500	0.1656	736996.	2250.	-0.00223	0.00	3.83E+11		
0.00	0.00	0.00	2250.	-0.00223	0.00	3.83E+11		
0.5400	0.1632	739435.	2250.	-0.00223	0.00	3.83E+11		
0.00	0.00	0.00	2250.	-0.00223	0.00	3.83E+11		
0.6300	0.1608	741874.	2250.	-0.00223	0.00	3.83E+11		
0.00	0.00	0.00	2250.	-0.00223	0.00	3.83E+11		
0.7200	0.1584	744313.	2250.	-0.00223	0.00	3.83E+11		
0.00	0.00	0.00	2250.	-0.00222	0.00	3.83E+11		
0.8100	0.1560	746753.	2250.	-0.00222	0.00	3.83E+11		
0.00	0.00	0.00	2250.	-0.00222	0.00	3.83E+11		
0.9000	0.1536	749192.	2250.	-0.00222	0.00	3.83E+11		
0.00	0.00	0.00	2250.	-0.00222	0.00	3.83E+11		
0.9900	0.1512	751631.	2250.	-0.00222	0.00	3.83E+11		
0.00	0.00	0.00	2228.	-0.00222	0.00	3.83E+11		
1.0800	0.1488	754070.	2228.	-0.00222	0.00	3.83E+11		
-41.449	300.8431	0.00	2183.	-0.00222	0.00	3.83E+11		
1.1700	0.1464	756461.	2183.	-0.00222	0.00	3.83E+11		
-41.906	309.1371	0.00	2137.	-0.00221	0.00	3.83E+11		
1.2600	0.1440	758802.	2137.	-0.00221	0.00	3.83E+11		
-42.354	317.6291	0.00	2091.	-0.00221	0.00	3.83E+11		
1.3500	0.1416	761095.	2091.	-0.00221	0.00	3.83E+11		
-42.792	326.3276	0.00	2045.	-0.00221	0.00	3.83E+11		
1.4400	0.1392	763337.	2045.	-0.00221	0.00	3.83E+11		
-43.219	335.2412	0.00						

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

1.5300	0.1368	765530.	1998.	-0.00221	0.00	3.83E+11
-43.637	344.3792	0.00				
1.6200	0.1345	767671.	1950.	-0.00221	0.00	3.83E+11
-44.044	353.7516	0.00				
1.7100	0.1321	769761.	1903.	-0.00220	0.00	3.83E+11
-44.440	363.3689	0.00				
1.8000	0.1297	771799.	1854.	-0.00220	0.00	3.83E+11
-44.825	373.2422	0.00				
1.8900	0.1273	773784.	1806.	-0.00220	0.00	3.83E+11
-45.200	383.3835	0.00				
1.9800	0.1250	775717.	1757.	-0.00220	0.00	3.83E+11
-45.563	393.8053	0.00				
2.0700	0.1226	777597.	1707.	-0.00219	0.00	3.83E+11
-45.914	404.5214	0.00				
2.1600	0.1202	779423.	1658.	-0.00219	0.00	3.83E+11
-46.254	415.5462	0.00				
2.2500	0.1178	781196.	1608.	-0.00219	0.00	3.83E+11
-46.582	426.8951	0.00				
2.3400	0.1155	782914.	1557.	-0.00219	0.00	3.83E+11
-46.897	438.5848	0.00				
2.4300	0.1131	784577.	1506.	-0.00219	0.00	3.83E+11
-47.200	450.6332	0.00				
2.5200	0.1108	786185.	1455.	-0.00218	0.00	3.83E+11
-47.490	463.0594	0.00				
2.6100	0.1084	787738.	1404.	-0.00218	0.00	3.83E+11
-47.767	475.8841	0.00				
2.7000	0.1060	789235.	1352.	-0.00218	0.00	3.83E+11
-48.030	489.1295	0.00				
2.7900	0.1037	790676.	1300.	-0.00218	0.00	3.83E+11
-48.279	502.8195	0.00				
2.8800	0.1013	792060.	1248.	-0.00217	0.00	3.83E+11
-48.513	516.9803	0.00				
2.9700	0.09900	793389.	1195.	-0.00217	0.00	3.83E+11
-48.734	531.6399	0.00				
3.0600	0.09665	794660.	1142.	-0.00217	0.00	3.83E+11
-48.938	546.8289	0.00				
3.1500	0.09431	795874.	1089.	-0.00217	0.00	3.83E+11
-49.128	562.5805	0.00				
3.2400	0.09197	797031.	1036.	-0.00217	0.00	3.83E+11
-49.301	578.9310	0.00				
3.3300	0.08963	798130.	982.9609	-0.00216	0.00	3.83E+11
-49.458	595.9198	0.00				
3.4200	0.08730	799172.	929.4710	-0.00216	0.00	3.83E+11
-49.598	613.5903	0.00				
3.5100	0.08497	800156.	875.8398	-0.00216	0.00	3.83E+11
-49.720	631.9900	0.00				
3.6000	0.08263	801081.	822.0866	-0.00216	0.00	3.83E+11
-49.823	651.1711	0.00				
3.6900	0.08031	801949.	768.2315	-0.00215	0.00	3.83E+11
-49.908	671.1912	0.00				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

3.7800	0.07798	802758.	714.2953	-0.00215	0.00	3.83E+11
-49.974	692.1140	0.00				
3.8700	0.07566	803509.	660.2995	-0.00215	0.00	3.83E+11
-50.019	714.0100	0.00				
3.9600	0.07334	804202.	606.2664	-0.00215	0.00	3.83E+11
-50.043	736.9579	0.00				
4.0500	0.07102	804837.	484.9249	-0.00215	0.00	3.83E+11
-174.664	2656.	0.00				
4.1400	0.06870	805267.	296.6802	-0.00214	0.00	3.83E+11
-173.937	2734.	0.00				
4.2300	0.06639	805495.	109.2614	-0.00214	0.00	3.83E+11
-173.135	2817.	0.00				
4.3200	0.06408	805521.	-77.248	-0.00214	0.00	3.83E+11
-172.254	2903.	0.00				
4.4100	0.06177	805346.	-262.763	-0.00214	0.00	3.83E+11
-171.292	2995.	0.00				
4.5000	0.05946	804971.	-670.806	-0.00213	0.00	3.83E+11
-584.344	10613.	0.00				
4.5900	0.05716	803914.	-1577.	-0.00213	0.00	3.83E+11
-1093.	20659.	0.00				
4.6800	0.05486	801582.	-2755.	-0.00213	0.00	3.83E+11
-1088.	21421.	0.00				
4.7700	0.05256	797981.	-3927.	-0.00213	0.00	3.83E+11
-1082.	22240.	0.00				
4.8600	0.05026	793118.	-5092.	-0.00213	0.00	3.83E+11
-1076.	23121.	0.00				
4.9500	0.04797	787000.	-6251.	-0.00212	0.00	3.83E+11
-1069.	24073.	0.00				
5.0400	0.04568	779634.	-7401.	-0.00212	0.00	3.83E+11
-1062.	25105.	0.00				
5.1300	0.04339	771030.	-8544.	-0.00212	0.00	3.83E+11
-1054.	26229.	0.00				
5.2200	0.04110	761196.	-9677.	-0.00212	0.00	3.83E+11
-1045.	27459.	0.00				
5.3100	0.03882	750144.	-10801.	-0.00211	0.00	3.83E+11
-1036.	28811.	0.00				
5.4000	0.03653	737884.	-11913.	-0.00211	0.00	3.83E+11
-1025.	30306.	0.00				
5.4900	0.03425	724429.	-13015.	-0.00211	0.00	3.83E+11
-1014.	31970.	0.00				
5.5800	0.03198	709790.	-14103.	-0.00211	0.00	3.83E+11
-1002.	33835.	0.00				
5.6700	0.02970	693983.	-15178.	-0.00211	0.00	3.83E+11
-988.454	35942.	0.00				
5.7600	0.02743	677023.	-16238.	-0.00210	0.00	3.84E+11
-973.852	38346.	0.00				
5.8500	0.02516	658927.	-17281.	-0.00210	0.00	3.84E+11
-957.806	41120.	0.00				
5.9400	0.02289	639714.	-18306.	-0.00210	0.00	3.84E+11
-940.092	44361.	0.00				

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6.0300	0.02062	619404.	-19310.	-0.00210	0.00	3.84E+11
-920.425	48209.	0.00				
6.1200	0.01835	598021.	-20292.	-0.00210	0.00	3.84E+11
-898.432	52866.	0.00				
6.2100	0.01609	575590.	-21249.	-0.00210	0.00	3.84E+11
-873.605	58638.	0.00				
6.3000	0.01383	552140.	-22177.	-0.00209	0.00	3.84E+11
-845.233	66014.	0.00				
6.3900	0.01157	527704.	-23073.	-0.00209	0.00	3.84E+11
-812.265	75835.	0.00				
6.4800	0.00931	502321.	-23929.	-0.00209	0.00	3.84E+11
-773.036	89684.	0.00				
6.5700	0.00705	476035.	-24737.	-0.00209	0.00	3.84E+11
-724.646	110980.	0.00				
6.6600	0.00480	448905.	-25486.	-0.00209	0.00	3.84E+11
-661.206	148893.	0.00				
6.7500	0.00254	421004.	-26149.	-0.00209	0.00	3.84E+11
-566.824	240856.	0.00				
6.8400	2.88E-04	392441.	-26545.	-0.00209	0.00	3.84E+11
-166.472	623202.	0.00				
6.9300	-0.00196	363684.	-26345.	-0.00208	0.00	3.84E+11
536.4335	295064.	0.00				
7.0200	-0.00421	335553.	-25703.	-0.00208	0.00	3.84E+11
652.2649	167155.	0.00				
7.1100	-0.00646	308182.	-24957.	-0.00208	0.00	3.85E+11
729.2748	121844.	0.00				
7.2000	-0.00871	281663.	-24137.	-0.00208	0.00	3.85E+11
789.4373	97852.	0.00				
7.2900	-0.01096	256064.	-23257.	-0.00208	0.00	3.85E+11
839.9255	82758.	0.00				
7.3800	-0.01321	231444.	-22326.	-0.00208	0.00	3.85E+11
884.0610	72286.	0.00				
7.4700	-0.01545	207856.	-21350.	-0.00208	0.00	3.85E+11
923.6767	64547.	0.00				
7.5600	-0.01770	185345.	-20333.	-0.00208	0.00	3.85E+11
959.8994	58567.	0.00				
7.6500	-0.01995	163954.	-19278.	-0.00208	0.00	3.85E+11
993.4750	53792.	0.00				
7.7400	-0.02219	143722.	-18188.	-0.00208	0.00	3.85E+11
1025.	49881.	0.00				
7.8300	-0.02444	124685.	-17065.	-0.00208	0.00	3.85E+11
1055.	46612.	0.00				
7.9200	-0.02668	106878.	-15911.	-0.00208	0.00	3.85E+11
1083.	43835.	0.00				
8.0100	-0.02892	90334.	-14727.	-0.00208	0.00	3.85E+11
1110.	41442.	0.00				
8.1000	-0.03117	75085.	-13514.	-0.00208	0.00	3.85E+11
1136.	39358.	0.00				
8.1900	-0.03341	61161.	-12274.	-0.00208	0.00	3.85E+11
1161.	37524.	0.00				

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8.2800	-0.03565	48591.	-11007.	-0.00208	0.00	3.85E+11
1185.	35896.	0.00				
8.3700	-0.03790	37402.	-9715.	-0.00208	0.00	3.85E+11
1208.	34440.	0.00				
8.4600	-0.04014	27624.	-8397.	-0.00208	0.00	3.85E+11
1231.	33130.	0.00				
8.5500	-0.04238	19281.	-7056.	-0.00208	0.00	3.85E+11
1254.	31944.	0.00				
8.6400	-0.04462	12401.	-5690.	-0.00208	0.00	3.85E+11
1275.	30865.	0.00				
8.7300	-0.04687	7008.	-4301.	-0.00208	0.00	3.85E+11
1297.	29878.	0.00				
8.8200	-0.04911	3127.	-2890.	-0.00208	0.00	3.85E+11
1317.	28972.	0.00				
8.9100	-0.05135	783.4437	-1456.	-0.00208	0.00	3.85E+11
1338.	28137.	0.00				
9.0000	-0.05359	0.00	0.00	-0.00208	0.00	3.85E+11
1358.	13682.	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. 3:

Pile-head deflection	=	0.17771298 inches
Computed slope at pile head	=	-0.0022435 radians
Maximum bending moment	=	805521. inch-lbs
Maximum shear force	=	-26545. lbs
Depth of maximum bending moment	=	4.32000000 feet below pile head
Depth of maximum shear force	=	6.84000000 feet below pile head
Number of iterations	=	35
Number of zero deflection points	=	1
Pile deflection at ground	=	0.15092927 inches

 Pile-head Deflection vs. Pile Length for Load Case 3

Boundary Condition Type 1, Shear and Moment

Shear	=	2250. lbs
Moment	=	724800. in-lbs
Axial Load	=	3800. lbs

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-13 (Boring B-012-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Pile Length feet	Pile Head Deflection inches	Maximum Moment In-lbs	Maximum Shear lbs
9.00000	0.17771298	805521.	-26545.
8.55000	0.37476171	795864.	-28618.
8.10000	0.91019391	787160.	-31264.
7.65000	2.31476696	781624.	-34266.
7.20000	6.95698763	779383.	-38016.

 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

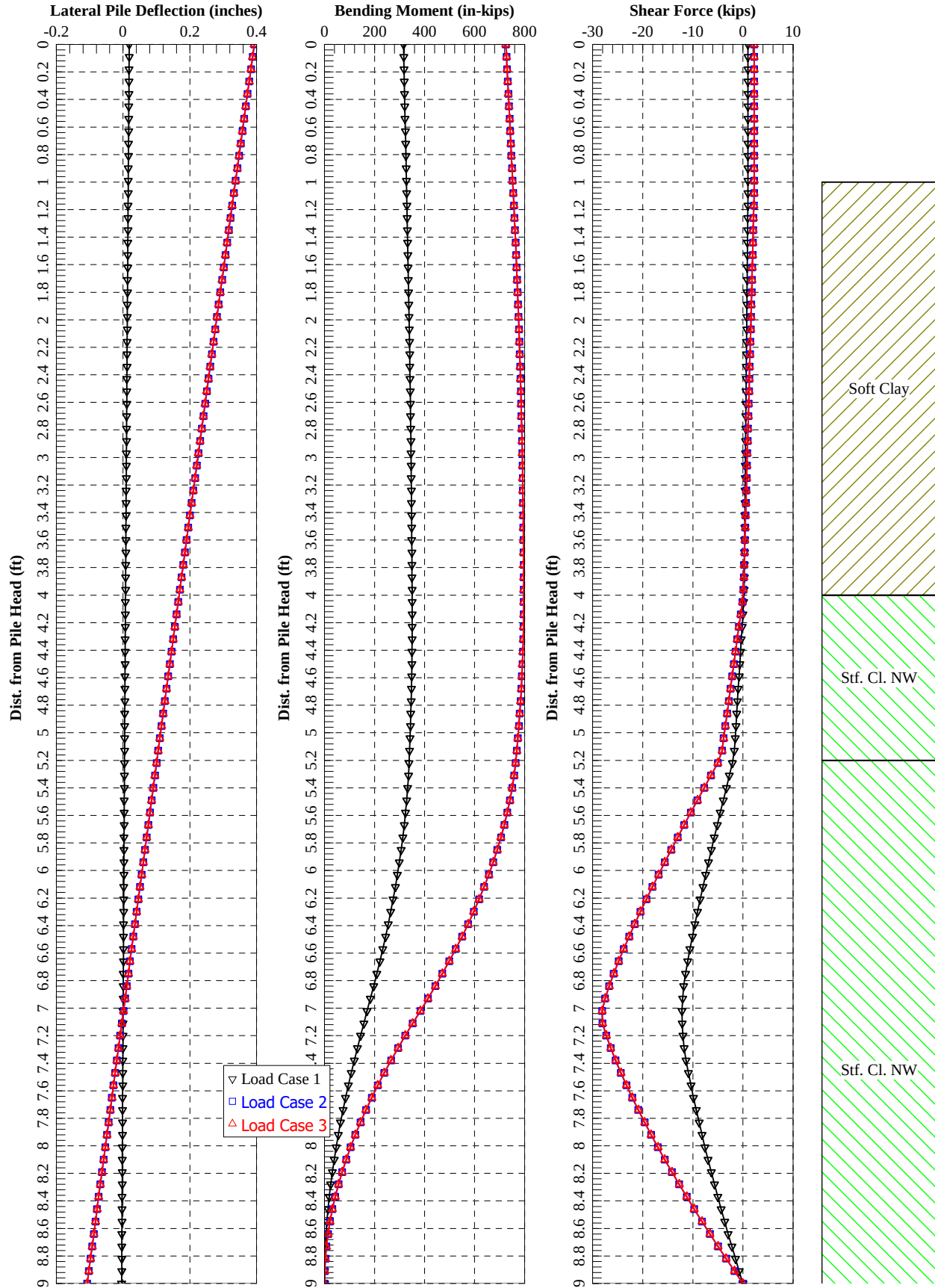
Load Shear	Load Max	Load Moment	Load Type	Load Pile-head	Axial Loading	Pile-head Deflection	Pile-head Rotation	Max in lbs
Case Pile No.	Type 1	Pile-head Load 1	Type 2	Pile-head Load 2	lbs	inches	radians	
1	V, lb	1000.0000	M, in-lb	315600.	4200.	0.00991	-1.56E-04	
-11005.		354161.						
2	V, lb	2250.	M, in-lb	724800.	4600.	0.1778	-0.00225	
-26550.		805603.						
3	V, lb	2250.	M, in-lb	724800.	3800.	0.1777	-0.00224	
-26545.		805521.						

Maximum pile-head deflection = 0.1778480191 inches
 Maximum pile-head rotation = -0.0022451225 radians = -0.128636 deg.

The analysis ended normally.

LATERAL LOAD (LPILE) ANALYSES
SOUTHBOUND PARKING AREA
LIGHT TOWER SC1-14 (B-013-0-25)

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-14 (Boring B-012 & 013-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation



TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-14 (Boring B-012 & 013-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

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

=====

This model was prepared by:
BSears

Files Used for Analysis

Path to file locations:
\Columbus-1170\Projects\2024\24170232_ms_TP 26 NE Ohio\GEO\Project Docs\Site
15_SUM-271 (2LMN)\Calcs\Light Towers\LPILE Files\SB\

Name of input data file:
Tower SC1-14 (B-012 & B-013).lp12d

Name of output report file:
Tower SC1-14 (B-012 & B-013).lp12o

Name of plot output file:
Tower SC1-14 (B-012 & B-013).lp12p

Name of runtime message file:
Tower SC1-14 (B-012 & B-013).lp12r

Date and Time of Analysis

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-14 (Boring B-012 & 013-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Date: February 11, 2026

Time: 19:14:07

Problem Title

Project Name: TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas

Job Number: 24170232F

Client: ms consultants, inc.

Engineer: BKS

Description: Light Tower SC1-14 (B-012-0-25 & B-013-0-25)

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

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-14 (Boring B-012 & 013-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

- 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	=	9.000 ft
Depth of ground surface below top of pile	=	1.0000 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.

Point No.	Depth Below Pile Head feet	Pile Diameter inches
-----	-----	-----
1	0.000	36.0000
2	9.000	36.0000

Input Structural Properties for Pile Sections:

Pile Section No. 1:

Section 1 is a round drilled shaft, bored pile, or CIDH pile	
Length of section	= 9.000000 ft
Shaft Diameter	= 36.000000 in

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-14 (Boring B-012 & 013-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Soil and Rock Layering Information

The soil profile is modelled using 5 layers

Layer 1 is soft clay, p-y criteria by Matlock, 1970

Distance from top of pile to top of layer	=	1.000000 ft
Distance from top of pile to bottom of layer	=	4.000000 ft
Effective unit weight at top of layer	=	98.000000 pcf
Effective unit weight at bottom of layer	=	98.000000 pcf
Undrained cohesion at top of layer	=	250.000000 psf
Undrained cohesion at bottom of layer	=	250.000000 psf
Epsilon-50 at top of layer	=	0.020000
Epsilon-50 at bottom of layer	=	0.020000

Layer 2 is stiff clay without free water

Distance from top of pile to top of layer	=	4.000000 ft
Distance from top of pile to bottom of layer	=	5.200000 ft
Effective unit weight at top of layer	=	56.000000 pcf
Effective unit weight at bottom of layer	=	56.000000 pcf
Undrained cohesion at top of layer	=	1100. psf
Undrained cohesion at bottom of layer	=	1100. psf
Epsilon-50 at top of layer	=	0.007000
Epsilon-50 at bottom of layer	=	0.007000

Layer 3 is stiff clay without free water

Distance from top of pile to top of layer	=	5.200000 ft
Distance from top of pile to bottom of layer	=	9.700000 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	=	4500. psf
Undrained cohesion at bottom of layer	=	4500. psf
Epsilon-50 at top of layer	=	0.004000
Epsilon-50 at bottom of layer	=	0.004000

Layer 4 is stiff clay without free water

Distance from top of pile to top of layer	=	9.700000 ft
Distance from top of pile to bottom of layer	=	12.400000 ft
Effective unit weight at top of layer	=	66.000000 pcf

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-14 (Boring B-012 & 013-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Effective unit weight at bottom of layer	=	66.000000 pcf
Undrained cohesion at top of layer	=	4500. psf
Undrained cohesion at bottom of layer	=	4500. psf
Epsilon-50 at top of layer	=	0.004000
Epsilon-50 at bottom of layer	=	0.004000

Layer 5 is stiff clay without free water

Distance from top of pile to top of layer	=	12.400000 ft
Distance from top of pile to bottom of layer	=	14.900000 ft
Effective unit weight at top of layer	=	63.000000 pcf
Effective unit weight at bottom of layer	=	63.000000 pcf
Undrained cohesion at top of layer	=	4500. psf
Undrained cohesion at bottom of layer	=	4500. psf
Epsilon-50 at top of layer	=	0.004000
Epsilon-50 at bottom of layer	=	0.004000

(Depth of the lowest soil layer extends 5.900 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 psf	E50 or krm
1	Soft	1.0000	98.0000	250.0000	0.02000
	Clay	4.0000	98.0000	250.0000	0.02000
2	Stiff Clay	4.0000	56.0000	1100.	0.00700
	w/o Free Water	5.2000	56.0000	1100.	0.00700
3	Stiff Clay	5.2000	60.0000	4500.	0.00400
	w/o Free Water	9.7000	60.0000	4500.	0.00400
4	Stiff Clay	9.7000	66.0000	4500.	0.00400
	w/o Free Water	12.4000	66.0000	4500.	0.00400
5	Stiff Clay	12.4000	63.0000	4500.	0.00400
	w/o Free Water	14.9000	63.0000	4500.	0.00400

 Static Loading Type

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

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-14 (Boring B-012 & 013-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

 Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 3

Load Compute No.	Load Top y Type vs. Pile Length	Condition Run Analysis 1	Condition 2	Axial Thrust Force, lbs
1	1	V = 1000.000000 lbs	M = 315600. in-lbs	4200.
Yes		Yes		
2	1	V = 2250. lbs	M = 724800. in-lbs	4600.
Yes		Yes		
3	1	V = 2250. lbs	M = 724800. in-lbs	3800.
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:

 Dimensions and Properties of Drilled Shaft (Bored Pile):

Length of Section	=	9.000000 ft
Shaft Diameter	=	36.000000 in
Concrete Cover Thickness (to edge of trans. reinf.)	=	3.500000 in
Number of Reinforcing Bars	=	16 bars
Yield Stress of Reinforcing Bars	=	60000. psi

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-14 (Boring B-012 & 013-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Modulus of Elasticity of Reinforcing Bars	=	29000000. psi
Gross Area of Shaft	=	1018. sq. in.
Total Area of Reinforcing Steel	=	16.000000 sq. in.
Area Ratio of Steel Reinforcement	=	1.57 percent
Edge-to-Edge Bar Spacing	=	4.114467 in
Maximum Concrete Aggregate Size	=	0.750000 in
Ratio of Bar Spacing to Aggregate Size	=	5.49
Offset of Center of Rebar Cage from Center of Pile	=	0.0000 in
Transverse Reinforcement		
Type: Spiral		
Number of Transverse Reinf. (per spacing)	=	1
Spacing of Transverse Reinf.	=	4.500000 in
Yield Stress of Transverse Reinf.	=	60000. psi
Diameter of Transverse Reinf.	=	0.500000 in

Axial Structural Capacities:

Nom. Axial Structural Capacity = $0.85 F_c A_c + F_y A_s$	=	4366.378 kips
Tensile Load for Cracking of Concrete	=	-470.222 kips
Nominal Axial Tensile Capacity	=	-960.000 kips

Reinforcing Bar Dimensions and Positions Used in Computations:

Bar Number	Bar Diam. inches	Bar Area sq. in.	X inches	Y inches
-----	-----	-----	-----	-----
1	1.128000	1.000000	13.436000	0.000000
2	1.128000	1.000000	12.413245	5.141735
3	1.128000	1.000000	9.500687	9.500687
4	1.128000	1.000000	5.141735	12.413245
5	1.128000	1.000000	0.000000	13.436000
6	1.128000	1.000000	-5.14173	12.413245
7	1.128000	1.000000	-9.50069	9.500687
8	1.128000	1.000000	-12.41325	5.141735
9	1.128000	1.000000	-13.43600	0.000000
10	1.128000	1.000000	-12.41325	-5.14173
11	1.128000	1.000000	-9.50069	-9.50069
12	1.128000	1.000000	-5.14173	-12.41325
13	1.128000	1.000000	0.000000	-13.43600
14	1.128000	1.000000	5.141735	-12.41325
15	1.128000	1.000000	9.500687	-9.50069
16	1.128000	1.000000	12.413245	-5.14173

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

Minimum spacing between any two bars not equal to zero = 4.114 inches
 between bars 11 and 12.

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-14 (Boring B-012 & 013-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Ratio of bar spacing to maximum aggregate size = 5.49

Concrete Properties:

Compressive Strength of Concrete	=	4000. psi
Modulus of Elasticity of Concrete	=	3604997. psi
Modulus of Rupture of Concrete	=	-474.34165 psi
Compression Strain at Peak Stress	=	0.001886
Tensile Strain at Fracture of Concrete	=	-0.0001154
Maximum Coarse Aggregate Size	=	0.750000 in

Number of Axial Thrust Force Values Determined from Pile-head Loadings = 3

Number	Axial Thrust Force kips
-----	-----
1	3.800
2	4.200
3	4.600

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 318-14, Section 21.2.3.
 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 = 3.800 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
--	---	---	--------------------------	-----------------------------	-----------------------------

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-14 (Boring B-012 & 013-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

6.25000E-07	240.5062135	384809942.	19.2929823	0.00001206	-0.00001044
0.0505030	0.2746478				
0.00000125	480.1472468	384117797.	18.6479768	0.00002331	-0.00002169
0.0973082	0.5259142				
0.00000188	718.9174733	383422652.	18.4329804	0.00003456	-0.00003294
0.1438345	0.7771808				
0.00000250	956.8168886	382726755.	18.3254857	0.00004581	-0.00004419
0.1900818	1.0284477				
0.00000313	1194.	382030558.	18.2609917	0.00005707	-0.00005543
0.2360502	1.2797149				
0.00000375	1430.	381334209.	18.2179981	0.00006832	-0.00006668
0.2817396	1.5309823				
0.00000438	1665.	380637775.	18.1872904	0.00007957	-0.00007793
0.3271500	1.7822500				
0.00000500	1900.	379941287.	18.1642614	0.00009082	-0.00008918
0.3722815	2.0335179				
0.00000563	2133.	379244764.	18.1463515	0.0001021	-0.000100
0.4171340	2.2847861				
0.00000625	2366.	378548215.	18.1320251	0.0001133	-0.000112
0.4617075	2.5360546				
0.00000688	2366.	344134741.	10.2494785	0.00007047	-0.000177
0.2882187	-4.308598 C				
0.00000750	2366.	315456846.	10.2198771	0.00007665	-0.000193
0.3129821	-4.706727 C				
0.00000813	2366.	291190934.	10.1952302	0.00008284	-0.000210
0.3376758	-5.104761 C				
0.00000875	2366.	270391582.	10.1744772	0.00008903	-0.000226
0.3622998	-5.502701 C				
0.00000938	2366.	252365477.	10.1568402	0.00009522	-0.000242
0.3868539	-5.900547 C				
0.00001000	2366.	236592634.	10.1417358	0.0001014	-0.000259
0.4113380	-6.298297 C				
0.00001063	2366.	222675420.	10.1287027	0.0001076	-0.000275
0.4357521	-6.695951 C				
0.00001125	2366.	210304564.	10.1174231	0.0001138	-0.000291
0.4600960	-7.093510 C				
0.00001188	2366.	199235903.	10.1076093	0.0001200	-0.000307
0.4843696	-7.490973 C				
0.00001250	2366.	189274107.	10.0990420	0.0001262	-0.000324
0.5085729	-7.888340 C				
0.00001313	2366.	180261055.	10.0915439	0.0001325	-0.000340
0.5327056	-8.285611 C				
0.00001375	2366.	172067370.	10.0849699	0.0001387	-0.000356
0.5567678	-8.682785 C				
0.00001438	2366.	164586180.	10.0792000	0.0001449	-0.000373
0.5807594	-9.079861 C				
0.00001500	2366.	157728423.	10.0741344	0.0001511	-0.000389
0.6046801	-9.476841 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-14 (Boring B-012 & 013-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00001563	2366.	151419286.	10.0696892	0.0001573	-0.000405
0.6285300	-9.873723 C				
0.00001625	2366.	145595467.	10.0657933	0.0001636	-0.000421
0.6523089	-10.270507 C				
0.00001688	2366.	140203043.	10.0623863	0.0001698	-0.000438
0.6760167	-10.667193 C				
0.00001750	2366.	135195791.	10.0594163	0.0001760	-0.000454
0.6996534	-11.063781 C				
0.00001813	2366.	130533867.	10.0568387	0.0001823	-0.000470
0.7232187	-11.460271 C				
0.00001875	2366.	126182738.	10.0546147	0.0001885	-0.000486
0.7467127	-11.856661 C				
0.00001938	2366.	122112327.	10.0527107	0.0001948	-0.000503
0.7701352	-12.252952 C				
0.00002000	2366.	118296317.	10.0510970	0.0002010	-0.000519
0.7934860	-12.649144 C				
0.00002063	2366.	114711580.	10.0497478	0.0002073	-0.000535
0.8167652	-13.045236 C				
0.00002125	2366.	111337710.	10.0486401	0.0002135	-0.000551
0.8399726	-13.441228 C				
0.00002188	2366.	108156633.	10.0477539	0.0002198	-0.000568
0.8631080	-13.837120 C				
0.00002250	2366.	105152282.	10.0470709	0.0002261	-0.000584
0.8861714	-14.232911 C				
0.00002313	2366.	102310328.	10.0465752	0.0002323	-0.000600
0.9091627	-14.628602 C				
0.00002375	2366.	99617951.	10.0462524	0.0002386	-0.000616
0.9320817	-15.024191 C				
0.00002438	2366.	97063645.	10.0460897	0.0002449	-0.000633
0.9549284	-15.419678 C				
0.00002563	2429.	94800037.	10.0461990	0.0002574	-0.000665
1.0004043	-16.210348 C				
0.00002688	2545.	94692477.	10.0468231	0.0002700	-0.000697
1.0455896	-17.000609 C				
0.00002813	2660.	94589756.	10.0479254	0.0002826	-0.000730
1.0904832	-17.790458 C				
0.00002938	2776.	94491232.	10.0493946	0.0002952	-0.000762
1.1350844	-18.579893 C				
0.00003063	2891.	94396370.	10.0512127	0.0003078	-0.000795
1.1793922	-19.368912 C				
0.00003188	3006.	94304718.	10.0533415	0.0003205	-0.000827
1.2234058	-20.157511 C				
0.00003313	3121.	94215891.	10.0557483	0.0003331	-0.000859
1.2671243	-20.945689 C				
0.00003438	3236.	94129561.	10.0584054	0.0003458	-0.000892
1.3105466	-21.733443 C				
0.00003563	3350.	94045446.	10.0612887	0.0003584	-0.000924
1.3536720	-22.520771 C				
0.00003688	3465.	93963300.	10.0643778	0.0003711	-0.000956
1.3964994	-23.307669 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-14 (Boring B-012 & 013-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00003813	3579.	93882912.	10.0676547	0.0003838	-0.000989
1.4390279	-24.094136 C				
0.00003938	3694.	93804096.	10.0711039	0.0003965	-0.001021
1.4812567	-24.880169 C				
0.00004063	3808.	93726688.	10.0747116	0.0004093	-0.001053
1.5231846	-25.665765 C				
0.00004188	3922.	93650546.	10.0784659	0.0004220	-0.001085
1.5648108	-26.450921 C				
0.00004313	4035.	93575540.	10.0823562	0.0004348	-0.001118
1.6061342	-27.235635 C				
0.00004438	4149.	93501560.	10.0863731	0.0004476	-0.001150
1.6471540	-28.019904 C				
0.00004563	4263.	93428502.	10.0905084	0.0004604	-0.001182
1.6878690	-28.803725 C				
0.00004688	4376.	93356279.	10.0947545	0.0004732	-0.001214
1.7282784	-29.587096 C				
0.00004813	4489.	93284807.	10.0991050	0.0004860	-0.001246
1.7683810	-30.370013 C				
0.00004938	4602.	93214014.	10.1035538	0.0004989	-0.001279
1.8081759	-31.152474 C				
0.00005063	4715.	93143835.	10.1080956	0.0005117	-0.001311
1.8476620	-31.934476 C				
0.00005188	4828.	93074209.	10.1127258	0.0005246	-0.001343
1.8868384	-32.716016 C				
0.00005313	4941.	93005082.	10.1174399	0.0005375	-0.001375
1.9257039	-33.497091 C				
0.00005438	5053.	92936405.	10.1222340	0.0005504	-0.001407
1.9642575	-34.277698 C				
0.00005563	5166.	92868132.	10.1271047	0.0005633	-0.001439
2.0024981	-35.057833 C				
0.00005688	5278.	92800222.	10.1320488	0.0005763	-0.001471
2.0404247	-35.837495 C				
0.00005813	5390.	92732637.	10.1370633	0.0005892	-0.001503
2.0780361	-36.616679 C				
0.00005938	5502.	92665342.	10.1421457	0.0006022	-0.001535
2.1153313	-37.395383 C				
0.00006063	5614.	92598305.	10.1472935	0.0006152	-0.001567
2.1523092	-38.173604 C				
0.00006188	5725.	92531497.	10.1525046	0.0006282	-0.001599
2.1889685	-38.951338 C				
0.00006313	5837.	92464888.	10.1577769	0.0006412	-0.001631
2.2253083	-39.728581 C				
0.00006438	5948.	92398455.	10.1631088	0.0006543	-0.001663
2.2613274	-40.505332 C				
0.00006563	6059.	92332173.	10.1684984	0.0006673	-0.001695
2.2970245	-41.281586 C				
0.00006688	6170.	92266020.	10.1739444	0.0006804	-0.001727
2.3323987	-42.057340 C				
0.00006813	6281.	92199976.	10.1794453	0.0006935	-0.001759
2.3674485	-42.832591 C				

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0.00006938	6392.	92134020.	10.1849998	0.0007066	-0.001791
2.4021730	-43.607335 C				
0.00007063	6502.	92068136.	10.1906070	0.0007197	-0.001823
2.4365708	-44.381568 C				
0.00007188	6613.	92002305.	10.1962656	0.0007329	-0.001855
2.4706408	-45.155288 C				
0.00007313	6723.	91936511.	10.2020028	0.0007460	-0.001886
2.5043818	-45.928490 C				
0.00007438	6833.	91870742.	10.2077616	0.0007592	-0.001918
2.5377924	-46.701172 C				
0.00007938	7271.	91607617.	10.2312788	0.0008121	-0.002045
2.6681070	-49.786612 C				
0.00008438	7707.	91343844.	10.2555391	0.0008653	-0.002172
2.7930345	-52.863415 C				
0.00008938	8140.	91079227.	10.2796933	0.0009187	-0.002299
2.9123325	-55.933382 C				
0.00009438	8570.	90813004.	10.3043877	0.0009725	-0.002425
3.0260259	-58.995009 C				
0.00009938	8979.	90357411.	10.3225581	0.0010258	-0.002552
3.1326575	-60.000000 CY				
0.0001044	9304.	89144470.	10.3110511	0.0010762	-0.002681
3.2276850	-60.000000 CY				
0.0001094	9546.	87273573.	10.2718035	0.0011235	-0.002814
3.3116704	-60.000000 CY				
0.0001144	9782.	85523680.	10.2357064	0.0011707	-0.002947
3.3907664	-60.000000 CY				
0.0001194	10004.	83800225.	10.1987328	0.0012175	-0.003080
3.4643165	-60.000000 CY				
0.0001244	10154.	81641326.	10.1374818	0.0012608	-0.003217
3.5282172	-60.000000 CY				
0.0001294	10287.	79513660.	10.0756441	0.0013035	-0.003354
3.5871212	-60.000000 CY				
0.0001344	10419.	77536664.	10.0197410	0.0013464	-0.003491
3.6423258	-60.000000 CY				
0.0001394	10550.	75693983.	9.9691573	0.0013895	-0.003628
3.6937845	-60.000000 CY				
0.0001444	10680.	73971519.	9.9233661	0.0014327	-0.003765
3.7414497	-60.000000 CY				
0.0001494	10808.	72355946.	9.8810316	0.0014760	-0.003902
3.7851328	-60.000000 CY				
0.0001544	10925.	70772035.	9.8368433	0.0015186	-0.004039
3.8241552	-60.000000 CY				
0.0001594	11008.	69072220.	9.7809580	0.0015588	-0.004179
3.8574366	-60.000000 CY				
0.0001644	11071.	67351790.	9.7204156	0.0015978	-0.004320
3.8862696	-60.000000 CY				
0.0001694	11131.	65719446.	9.6635689	0.0016368	-0.004461
3.9118664	-60.000000 CY				
0.0001744	11191.	64176802.	9.6094393	0.0016756	-0.004602
3.9342902	-60.000000 CY				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0001794	11250.	62716278.	9.5601863	0.0017149	-0.004743
3.9535015	-60.000000 CY				
0.0001844	11308.	61329164.	9.5136161	0.0017541	-0.004883
3.9693617	-60.000000 CY				
0.0001894	11364.	60009896.	9.4690774	0.0017932	-0.005024
3.9819050	-60.000000 CY				
0.0001944	11420.	58754909.	9.4280227	0.0018326	-0.005165
3.9911986	-60.000000 CY				
0.0001994	11476.	57559296.	9.3897594	0.0018721	-0.005305
3.9971986	-60.000000 CY				
0.0002044	11531.	56418622.	9.3531932	0.0019116	-0.005446
3.9998595	-60.000000 CY				
0.0002094	11584.	55328385.	9.3201259	0.0019514	-0.005586
3.9974517	-60.000000 CY				
0.0002144	11637.	54285454.	9.2909722	0.0019918	-0.005726
3.9998812	-60.000000 CY				
0.0002194	11690.	53285909.	9.2626721	0.0020320	-0.005866
3.9969940	-60.000000 CY				
0.0002244	11740.	52321336.	9.2356724	0.0020723	-0.006005
3.9997138	-60.000000 CY				
0.0002294	11786.	51384137.	9.2093226	0.0021124	-0.006145
3.9955528	-60.000000 CY				
0.0002344	11823.	50445667.	9.1796872	0.0021515	-0.006286
3.9989818	-60.000000 CY				
0.0002394	11855.	49524943.	9.1473565	0.0021896	-0.006428
3.9994466	-60.000000 CY				
0.0002444	11876.	48598228.	9.1109548	0.0022265	-0.006571
3.9965160	-60.000000 CY				
0.0002494	11895.	47701101.	9.0745971	0.0022630	-0.006715
3.9991770	-60.000000 CY				
0.0002544	11912.	46829816.	9.0405915	0.0022997	-0.006858
3.9995775	-60.000000 CY				
0.0002594	11929.	45990067.	9.0077660	0.0023364	-0.007001
3.9954763	-60.000000 CY				
0.0002644	11945.	45181124.	8.9766457	0.0023732	-0.007144
3.9984997	-60.000000 CY				
0.0002694	11961.	44401256.	8.9468563	0.0024101	-0.007287
3.9998981	-60.000000 CY				
0.0002744	11976.	43648250.	8.9191370	0.0024472	-0.007430
3.9944635	-60.000000 CY				
0.0003044	12062.	39628140.	8.7757363	0.0026711	-0.008286
3.9984635	-60.000000 CY				
0.0003344	12138.	36300180.	8.6628609	0.0028966	-0.009141
3.9998209	-60.000000 CY				
0.0003644	12207.	33502446.	8.5793723	0.0031261	-0.009991
3.9999551	-60.000000 CYT				
0.0003944	12272.	31117026.	8.5161103	0.0033585	-0.010839
3.9996166	-60.000000 CYT				
0.0004244	12331.	29056485.	8.4674428	0.0035934	-0.011684
3.9972132	-60.000000 CYT				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0004544 12377. 27238942. 8.4178614 0.0038249 -0.012533
 3.9873462 -60.000000 CYT

Axial Thrust Force = 4.200 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
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6.25000E-07	240.5049676	384807948.	19.4290859	0.00001214	-0.00001036
0.0508615	0.2771147				
0.00000125	480.1459926	384116794.	18.7161837	0.00002340	-0.00002160
0.0976654	0.5283867				
0.00000188	718.9162127	383421980.	18.4785558	0.00003465	-0.00003285
0.1441903	0.7796589				
0.00000250	956.8156222	382726249.	18.3597458	0.00004590	-0.00004410
0.1904363	1.0309315				
0.00000313	1194.	382030150.	18.2884629	0.00005715	-0.00005535
0.2364034	1.2822044				
0.00000375	1430.	381333869.	18.2409436	0.00006840	-0.00006660
0.2820914	1.5334776				
0.00000438	1665.	380637482.	18.2070035	0.00007966	-0.00007784
0.3275005	1.7847511				
0.00000500	1900.	379941029.	18.1815504	0.00009091	-0.00008909
0.3726306	2.0360248				
0.00000563	2133.	379244533.	18.1617553	0.0001022	-0.000100
0.4174818	2.2872988				
0.00000625	2366.	378548006.	18.1459208	0.0001134	-0.000112
0.4620539	2.5385732				
0.00000688	2366.	344134551.	10.2895004	0.00007074	-0.000177
0.2893429	-4.300617 C				
0.00000750	2366.	315456672.	10.2575513	0.00007693	-0.000193
0.3141325	-4.698533 C				
0.00000813	2366.	291190774.	10.2300378	0.00008312	-0.000209
0.3388235	-5.096560 C				
0.00000875	2366.	270391433.	10.2068278	0.00008931	-0.000226
0.3634446	-5.494492 C				
0.00000938	2366.	252365338.	10.1870615	0.00009550	-0.000242
0.3879959	-5.892330 C				
0.00001000	2366.	236592504.	10.1700940	0.0001017	-0.000258
0.4124772	-6.290073 C				
0.00001063	2366.	222675298.	10.1554324	0.0001079	-0.000275
0.4368884	-6.687720 C				
0.00001125	2366.	210304448.	10.1426931	0.0001141	-0.000291
0.4612294	-7.085271 C				

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0.00001188	2366.	199235793.	10.1315564	0.0001203	-0.000307
0.4855002	-7.482727 C				
0.00001250	2366.	189274003.	10.1218127	0.0001265	-0.000323
0.5097005	-7.880086 C				
0.00001313	2366.	180260955.	10.1132503	0.0001327	-0.000340
0.5338304	-8.277349 C				
0.00001375	2366.	172067276.	10.1057088	0.0001390	-0.000356
0.5578898	-8.674515 C				
0.00001438	2366.	164586090.	10.0990556	0.0001452	-0.000372
0.5818784	-9.071585 C				
0.00001500	2366.	157728336.	10.0931803	0.0001514	-0.000389
0.6057963	-9.468556 C				
0.00001563	2366.	151419203.	10.0879903	0.0001576	-0.000405
0.6296433	-9.865431 C				
0.00001625	2366.	145595387.	10.0834069	0.0001639	-0.000421
0.6534193	-10.262207 C				
0.00001688	2366.	140202965.	10.0793634	0.0001701	-0.000437
0.6771242	-10.658886 C				
0.00001750	2366.	135195717.	10.0758025	0.0001763	-0.000454
0.7007579	-11.055466 C				
0.00001813	2366.	130533795.	10.0726747	0.0001826	-0.000470
0.7243204	-11.451947 C				
0.00001875	2366.	126182669.	10.0699372	0.0001888	-0.000486
0.7478114	-11.848330 C				
0.00001938	2366.	122112260.	10.0675528	0.0001951	-0.000502
0.7712309	-12.244613 C				
0.00002000	2366.	118296252.	10.0654889	0.0002013	-0.000519
0.7945789	-12.640797 C				
0.00002063	2366.	114711517.	10.0637168	0.0002076	-0.000535
0.8178551	-13.036882 C				
0.00002125	2366.	111337649.	10.0622112	0.0002138	-0.000551
0.8410595	-13.432866 C				
0.00002188	2366.	108156573.	10.0609497	0.0002201	-0.000567
0.8641920	-13.828750 C				
0.00002250	2366.	105152224.	10.0599125	0.0002263	-0.000584
0.8872524	-14.224533 C				
0.00002313	2366.	102310272.	10.0590817	0.0002326	-0.000600
0.9102407	-14.620215 C				
0.00002375	2366.	99617896.	10.0584414	0.0002389	-0.000616
0.9331568	-15.015796 C				
0.00002438	2366.	97063591.	10.0579776	0.0002452	-0.000632
0.9560005	-15.411276 C				
0.00002563	2432.	94924068.	10.0575288	0.0002577	-0.000665
1.0014704	-16.201930 C				
0.00002688	2548.	94810571.	10.0576469	0.0002703	-0.000697
1.0466496	-16.992174 C				
0.00002813	2664.	94702439.	10.0582592	0.0002829	-0.000730
1.0915372	-17.782007 C				
0.00002938	2779.	94598964.	10.0593353	0.0002955	-0.000762
1.1361324	-18.571425 C				

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0.00003063	2894.	94499555.	10.0607664	0.0003081	-0.000794
1.1804341	-19.360427 C				
0.00003188	3009.	94403710.	10.0625387	0.0003207	-0.000827
1.2244416	-20.149010 C				
0.00003313	3124.	94311007.	10.0646159	0.0003334	-0.000859
1.2681539	-20.937171 C				
0.00003438	3239.	94221082.	10.0669675	0.0003461	-0.000891
1.3115700	-21.724908 C				
0.00003563	3354.	94133623.	10.0695670	0.0003587	-0.000924
1.3546892	-22.512219 C				
0.00003688	3468.	94048359.	10.0723915	0.0003714	-0.000956
1.3975103	-23.299100 C				
0.00003813	3582.	93965057.	10.0754214	0.0003841	-0.000988
1.4400326	-24.085550 C				
0.00003938	3697.	93883511.	10.0786392	0.0003968	-0.001021
1.4822550	-24.871565 C				
0.00004063	3811.	93803541.	10.0820299	0.0004096	-0.001053
1.5241766	-25.657144 C				
0.00004188	3925.	93724988.	10.0855803	0.0004223	-0.001085
1.5657965	-26.442282 C				
0.00004313	4039.	93647711.	10.0892786	0.0004351	-0.001117
1.6071135	-27.226979 C				
0.00004438	4152.	93571586.	10.0931145	0.0004479	-0.001150
1.6481268	-28.011230 C				
0.00004563	4266.	93496502.	10.0970787	0.0004607	-0.001182
1.6888354	-28.795033 C				
0.00004688	4379.	93422358.	10.1011630	0.0004735	-0.001214
1.7292383	-29.578385 C				
0.00004813	4492.	93349066.	10.1053601	0.0004863	-0.001246
1.7693344	-30.361284 C				
0.00004938	4606.	93276544.	10.1096634	0.0004992	-0.001278
1.8091228	-31.143727 C				
0.00005063	4718.	93204721.	10.1140670	0.0005120	-0.001310
1.8486023	-31.925710 C				
0.00005188	4831.	93133529.	10.1185657	0.0005249	-0.001343
1.8877721	-32.707231 C				
0.00005313	4944.	93062909.	10.1231546	0.0005378	-0.001375
1.9266309	-33.488287 C				
0.00005438	5056.	92992807.	10.1278294	0.0005507	-0.001407
1.9651778	-34.268875 C				
0.00005563	5169.	92923173.	10.1325862	0.0005636	-0.001439
2.0034117	-35.048992 C				
0.00005688	5281.	92853961.	10.1374215	0.0005766	-0.001471
2.0413316	-35.828634 C				
0.00005813	5393.	92785130.	10.1423320	0.0005895	-0.001503
2.0789362	-36.607799 C				
0.00005938	5505.	92716640.	10.1473148	0.0006025	-0.001535
2.1162246	-37.386484 C				
0.00006063	5617.	92648458.	10.1523672	0.0006155	-0.001567
2.1531956	-38.164685 C				

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0.00006188	5728.	92580549.	10.1574868	0.0006285	-0.001599
2.1898481	-38.942399 C				
0.00006313	5840.	92512883.	10.1626714	0.0006415	-0.001631
2.2261809	-39.719622 C				
0.00006438	5951.	92445433.	10.1679189	0.0006546	-0.001663
2.2621930	-40.496353 C				
0.00006563	6062.	92378172.	10.1732276	0.0006676	-0.001695
2.2978832	-41.272587 C				
0.00006688	6173.	92311077.	10.1785957	0.0006807	-0.001727
2.3332503	-42.048320 C				
0.00006813	6284.	92244124.	10.1840217	0.0006938	-0.001759
2.3682931	-42.823550 C				
0.00006938	6395.	92177292.	10.1895041	0.0007069	-0.001791
2.4030104	-43.598274 C				
0.00007063	6505.	92110561.	10.1950417	0.0007200	-0.001822
2.4374011	-44.372486 C				
0.00007188	6616.	92043913.	10.2006608	0.0007332	-0.001854
2.4714639	-45.146185 C				
0.00007313	6726.	91977331.	10.2063053	0.0007463	-0.001886
2.5051976	-45.919366 C				
0.00007438	6836.	91910797.	10.2120017	0.0007595	-0.001918
2.5386010	-46.692026 C				
0.00007938	7274.	91644853.	10.2352897	0.0008124	-0.002045
2.6688860	-49.777380 C				
0.00008438	7710.	91378587.	10.2593338	0.0008656	-0.002172
2.7937834	-52.854093 C				
0.00008938	8143.	91111830.	10.2831857	0.0009191	-0.002298
2.9130226	-55.924331 C				
0.00009438	8573.	90843621.	10.3077273	0.0009728	-0.002425
3.0266854	-58.985869 C				
0.00009938	8982.	90387473.	10.3258078	0.0010261	-0.002551
3.1332951	-60.000000 CY				
0.0001044	9308.	89176212.	10.3143071	0.0010766	-0.002681
3.2283182	-60.000000 CY				
0.0001094	9549.	87304848.	10.2749831	0.0011238	-0.002814
3.3122821	-60.000000 CY				
0.0001144	9785.	85553556.	10.2389100	0.0011711	-0.002946
3.3913727	-60.000000 CY				
0.0001194	10007.	83830919.	10.2019402	0.0012179	-0.003080
3.4649106	-60.000000 CY				
0.0001244	10158.	81671814.	10.1406407	0.0012612	-0.003216
3.5287895	-60.000000 CY				
0.0001294	10291.	79542859.	10.0787027	0.0013039	-0.003354
3.5876602	-60.000000 CY				
0.0001344	10423.	77564670.	10.0227059	0.0013468	-0.003491
3.6428308	-60.000000 CY				
0.0001394	10554.	75720878.	9.9720357	0.0013899	-0.003628
3.6942550	-60.000000 CY				
0.0001444	10683.	73997378.	9.9261646	0.0014331	-0.003764
3.7418850	-60.000000 CY				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-14 (Boring B-012 & 013-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0001494	10812.	72381005.	9.8838986	0.0014764	-0.003901
3.7855535	-60.000000 CY				
0.0001544	10929.	70796718.	9.8396771	0.0015190	-0.004038
3.8245440	-60.000000 CY				
0.0001594	11012.	69097838.	9.7838573	0.0015593	-0.004178
3.8578061	-60.000000 CY				
0.0001644	11075.	67376662.	9.7232508	0.0015983	-0.004319
3.8866026	-60.000000 CY				
0.0001694	11135.	65743511.	9.6663364	0.0016372	-0.004460
3.9121613	-60.000000 CY				
0.0001744	11195.	64200103.	9.6121495	0.0016761	-0.004601
3.9345463	-60.000000 CY				
0.0001794	11254.	62738857.	9.5628376	0.0017153	-0.004742
3.9537182	-60.000000 CY				
0.0001844	11312.	61351278.	9.5162917	0.0017546	-0.004883
3.9695496	-60.000000 CY				
0.0001894	11368.	60031354.	9.4717005	0.0017937	-0.005024
3.9820503	-60.000000 CY				
0.0001944	11425.	58775745.	9.4305957	0.0018331	-0.005164
3.9913005	-60.000000 CY				
0.0001994	11480.	57579537.	9.3922863	0.0018726	-0.005305
3.9972564	-60.000000 CY				
0.0002044	11535.	56438298.	9.3556780	0.0019121	-0.005445
3.9998723	-60.000000 CY				
0.0002094	11588.	55347517.	9.3241700	0.0019522	-0.005585
3.9975077	-60.000000 CY				
0.0002144	11641.	54304067.	9.2934428	0.0019923	-0.005725
3.9998931	-60.000000 CY				
0.0002194	11694.	53304015.	9.2651074	0.0020325	-0.005865
3.9970558	-60.000000 CY				
0.0002244	11744.	52339157.	9.2380944	0.0020728	-0.006005
3.9997330	-60.000000 CY				
0.0002294	11790.	51401489.	9.2117130	0.0021129	-0.006145
3.9956300	-60.000000 CY				
0.0002344	11827.	50463153.	9.1821360	0.0021521	-0.006285
3.9990203	-60.000000 CY				
0.0002394	11859.	49542728.	9.1500193	0.0021903	-0.006427
3.9992468	-60.000000 CY				
0.0002444	11880.	48615611.	9.1135780	0.0022271	-0.006570
3.9965958	-60.000000 CY				
0.0002494	11900.	47718283.	9.0771076	0.0022636	-0.006714
3.9992162	-60.000000 CY				
0.0002544	11917.	46846598.	9.0431776	0.0023004	-0.006857
3.9993713	-60.000000 CY				
0.0002594	11933.	46006491.	9.0103157	0.0023371	-0.007000
3.9955701	-60.000000 CY				
0.0002644	11949.	45197204.	8.9791598	0.0023739	-0.007144
3.9985538	-60.000000 CY				
0.0002694	11965.	44417005.	8.9493437	0.0024107	-0.007287
3.9999119	-60.000000 CY				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-14 (Boring B-012 & 013-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0002744	11980.	43663657.	8.9215934	0.0024479	-0.007430
3.9942523	-60.000000 CY				
0.0003044	12066.	39641995.	8.7782176	0.0026719	-0.008286
3.9985257	-60.000000 CY				
0.0003344	12142.	36312646.	8.6652203	0.0028974	-0.009140
3.9998424	-60.000000 CY				
0.0003644	12212.	33513765.	8.5815911	0.0031269	-0.009991
3.9999658	-60.000000 CYT				
0.0003944	12276.	31127384.	8.5182268	0.0033594	-0.010838
3.9996505	-60.000000 CYT				
0.0004244	12335.	29066055.	8.4694819	0.0035942	-0.011683
3.9973093	-60.000000 CYT				
0.0004544	12381.	27248100.	8.4201387	0.0038259	-0.012532
3.9875919	-60.000000 CYT				

Axial Thrust Force = 4.600 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
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6.25000E-07	240.5035986	384805758.	19.5651901	0.00001223	-0.00001027
0.0512199	0.2795816				
0.00000125	480.1446137	384115691.	18.7843907	0.00002348	-0.00002152
0.0980225	0.5308592				
0.00000188	718.9148267	383421241.	18.5241312	0.00003473	-0.00003277
0.1445462	0.7821371				
0.00000250	956.8142298	382725692.	18.3940059	0.00004599	-0.00004401
0.1907908	1.0334154				
0.00000313	1194.	382029703.	18.3159341	0.00005724	-0.00005526
0.2367565	1.2846940				
0.00000375	1430.	381333494.	18.2638891	0.00006849	-0.00006651
0.2824433	1.5359729				
0.00000438	1665.	380637159.	18.2267166	0.00007974	-0.00007776
0.3278510	1.7872522				
0.00000500	1900.	379940746.	18.1988394	0.00009099	-0.00008901
0.3729798	2.0385317				
0.00000563	2133.	379244280.	18.1771590	0.0001022	-0.000100
0.4178295	2.2898116				
0.00000625	2366.	378547777.	18.1598165	0.0001135	-0.000112
0.4624003	2.5410917				
0.00000688	2366.	344134343.	10.3291778	0.00007101	-0.000176
0.2904571	-4.292706 C				
0.00000750	2366.	315456481.	10.2940289	0.00007721	-0.000193
0.3152465	-4.690597 C				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00000813	2366.	291190598.	10.2646762	0.00008340	-0.000209
0.3399656	-5.088396 C				
0.00000875	2366.	270391269.	10.2391817	0.00008959	-0.000225
0.3645893	-5.486283 C				
0.00000938	2366.	252365185.	10.2172859	0.00009579	-0.000242
0.3891378	-5.884113 C				
0.00001000	2366.	236592361.	10.1984552	0.0001020	-0.000258
0.4136162	-6.281848 C				
0.00001063	2366.	222675163.	10.1821496	0.0001082	-0.000274
0.4380246	-6.679488 C				
0.00001125	2366.	210304321.	10.1679490	0.0001144	-0.000291
0.4623628	-7.077032 C				
0.00001188	2366.	199235672.	10.1555219	0.0001206	-0.000307
0.4866307	-7.474480 C				
0.00001250	2366.	189273889.	10.1446030	0.0001268	-0.000323
0.5108282	-7.871831 C				
0.00001313	2366.	180260846.	10.1349589	0.0001330	-0.000339
0.5349552	-8.269087 C				
0.00001375	2366.	172067171.	10.1264498	0.0001392	-0.000356
0.5590117	-8.666245 C				
0.00001438	2366.	164585990.	10.1189132	0.0001455	-0.000372
0.5829974	-9.063307 C				
0.00001500	2366.	157728241.	10.1122282	0.0001517	-0.000388
0.6069124	-9.460271 C				
0.00001563	2366.	151419111.	10.1062933	0.0001579	-0.000405
0.6307565	-9.857138 C				
0.00001625	2366.	145595299.	10.1010224	0.0001641	-0.000421
0.6545296	-10.253907 C				
0.00001688	2366.	140202880.	10.0963423	0.0001704	-0.000437
0.6782316	-10.650577 C				
0.00001750	2366.	135195635.	10.0921903	0.0001766	-0.000453
0.7018624	-11.047150 C				
0.00001813	2366.	130533716.	10.0885122	0.0001829	-0.000470
0.7254219	-11.443623 C				
0.00001875	2366.	126182592.	10.0852613	0.0001891	-0.000486
0.7489100	-11.839998 C				
0.00001938	2366.	122112186.	10.0823966	0.0001953	-0.000502
0.7723266	-12.236274 C				
0.00002000	2366.	118296180.	10.0798824	0.0002016	-0.000518
0.7956716	-12.632450 C				
0.00002063	2366.	114711448.	10.0776874	0.0002079	-0.000535
0.8189449	-13.028526 C				
0.00002125	2366.	111337582.	10.0757837	0.0002141	-0.000551
0.8421464	-13.424502 C				
0.00002188	2366.	108156508.	10.0741470	0.0002204	-0.000567
0.8652759	-13.820378 C				
0.00002250	2366.	105152160.	10.0727554	0.0002266	-0.000583
0.8883333	-14.216153 C				
0.00002313	2366.	102310210.	10.0715894	0.0002329	-0.000600
0.9113187	-14.611828 C				

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 Light Tower SC1-14 (Boring B-012 & 013-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00002375	2366.	99617836.	10.0706317	0.0002392	-0.000616
0.9342318	-15.007401 C				
0.00002438	2366.	97063533.	10.0698667	0.0002455	-0.000632
0.9570725	-15.402873 C				
0.00002563	2436.	95048091.	10.0688598	0.0002580	-0.000664
1.0025364	-16.193510 C				
0.00002688	2551.	94928657.	10.0684718	0.0002706	-0.000697
1.0477096	-16.983738 C				
0.00002813	2667.	94815115.	10.0686232	0.0002832	-0.000729
1.0925912	-17.773555 C				
0.00002938	2782.	94706690.	10.0692479	0.0002958	-0.000762
1.1371802	-18.562957 C				
0.00003063	2897.	94602733.	10.0703211	0.0003084	-0.000794
1.1814759	-19.351942 C				
0.00003188	3012.	94502697.	10.0717368	0.0003210	-0.000826
1.2254772	-20.140508 C				
0.00003313	3127.	94406117.	10.0734845	0.0003337	-0.000859
1.2691834	-20.928652 C				
0.00003438	3242.	94312597.	10.0755306	0.0003463	-0.000891
1.3125933	-21.716373 C				
0.00003563	3357.	94221794.	10.0778462	0.0003590	-0.000923
1.3557063	-22.503666 C				
0.00003688	3471.	94133413.	10.0804061	0.0003717	-0.000956
1.3985212	-23.290530 C				
0.00003813	3586.	94047197.	10.0831888	0.0003844	-0.000988
1.4410372	-24.076963 C				
0.00003938	3700.	93962921.	10.0861753	0.0003971	-0.001020
1.4832533	-24.862961 C				
0.00004063	3814.	93880388.	10.0893491	0.0004099	-0.001053
1.5251686	-25.648521 C				
0.00004188	3928.	93799425.	10.0926956	0.0004226	-0.001085
1.5667821	-26.433642 C				
0.00004313	4042.	93719877.	10.0962019	0.0004354	-0.001117
1.6080927	-27.218321 C				
0.00004438	4155.	93641609.	10.0998566	0.0004482	-0.001149
1.6490996	-28.002554 C				
0.00004563	4269.	93564497.	10.1036497	0.0004610	-0.001182
1.6898018	-28.786339 C				
0.00004688	4382.	93488434.	10.1075722	0.0004738	-0.001214
1.7301982	-29.569674 C				
0.00004813	4496.	93413321.	10.1116159	0.0004866	-0.001246
1.7702878	-30.352554 C				
0.00004938	4609.	93339070.	10.1157737	0.0004995	-0.001278
1.8100696	-31.134978 C				
0.00005063	4722.	93265602.	10.1200391	0.0005123	-0.001310
1.8495425	-31.916943 C				
0.00005188	4834.	93192845.	10.1244063	0.0005252	-0.001342
1.8887057	-32.698446 C				
0.00005313	4947.	93120733.	10.1288700	0.0005381	-0.001374
1.9275579	-33.479483 C				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00005438	5060.	93049206.	10.1334255	0.0005510	-0.001406
1.9660981	-34.260052 C				
0.00005563	5172.	92978211.	10.1380684	0.0005639	-0.001439
2.0043253	-35.040149 C				
0.00005688	5284.	92907697.	10.1427948	0.0005769	-0.001471
2.0422384	-35.819772 C				
0.00005813	5396.	92837619.	10.1476012	0.0005898	-0.001503
2.0798362	-36.598918 C				
0.00005938	5508.	92767935.	10.1524844	0.0006028	-0.001535
2.1171178	-37.377583 C				
0.00006063	5620.	92698606.	10.1574414	0.0006158	-0.001567
2.1540819	-38.155764 C				
0.00006188	5731.	92629597.	10.1624696	0.0006288	-0.001599
2.1907275	-38.933458 C				
0.00006313	5843.	92560874.	10.1675664	0.0006418	-0.001631
2.2270535	-39.710662 C				
0.00006438	5954.	92492407.	10.1727297	0.0006549	-0.001663
2.2630586	-40.487373 C				
0.00006563	6065.	92424168.	10.1779574	0.0006679	-0.001695
2.2987417	-41.263586 C				
0.00006688	6176.	92356130.	10.1832476	0.0006810	-0.001726
2.3341018	-42.039299 C				
0.00006813	6287.	92288268.	10.1885986	0.0006941	-0.001758
2.3691375	-42.814509 C				
0.00006938	6398.	92220560.	10.1940089	0.0007072	-0.001790
2.4038477	-43.589211 C				
0.00007063	6508.	92152983.	10.1995039	0.0007203	-0.001822
2.4382312	-44.363403 C				
0.00007188	6619.	92085519.	10.2050285	0.0007335	-0.001854
2.4722868	-45.137081 C				
0.00007313	6729.	92018147.	10.2106084	0.0007467	-0.001886
2.5060133	-45.910241 C				
0.00007438	6839.	91950850.	10.2162424	0.0007598	-0.001918
2.5394094	-46.682880 C				
0.00007938	7277.	91682087.	10.2393011	0.0008127	-0.002045
2.6696649	-49.768146 C				
0.00008438	7713.	91413389.	10.2630109	0.0008659	-0.002172
2.7945082	-52.845065 C				
0.00008938	8146.	91144431.	10.2866786	0.0009194	-0.002298
2.9137126	-55.915279 C				
0.00009438	8576.	90874234.	10.3110673	0.0009731	-0.002424
3.0273448	-58.976728 C				
0.00009938	8985.	90417533.	10.3290580	0.0010265	-0.002551
3.1339327	-60.000000 CY				
0.0001044	9311.	89207952.	10.3175636	0.0010769	-0.002681
3.2289512	-60.000000 CY				
0.0001094	9552.	87336121.	10.2781631	0.0011242	-0.002813
3.3128936	-60.000000 CY				
0.0001144	9789.	85583430.	10.2421143	0.0011714	-0.002946
3.3919789	-60.000000 CY				

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0.0001194	10011.	83861611.	10.2051482	0.0012182	-0.003079
3.4655044	-60.000000 CY				
0.0001244	10162.	81702300.	10.1438002	0.0012616	-0.003216
3.5293615	-60.000000 CY				
0.0001294	10295.	79572057.	10.0817619	0.0013043	-0.003353
3.5881988	-60.000000 CY				
0.0001344	10427.	77592674.	10.0256713	0.0013472	-0.003490
3.6433355	-60.000000 CY				
0.0001394	10557.	75747771.	9.9749147	0.0013903	-0.003627
3.6947252	-60.000000 CY				
0.0001444	10687.	74023236.	9.9289636	0.0014335	-0.003764
3.7423201	-60.000000 CY				
0.0001494	10816.	72406063.	9.8867661	0.0014768	-0.003901
3.7859739	-60.000000 CY				
0.0001544	10933.	70821400.	9.8425115	0.0015194	-0.004038
3.8249324	-60.000000 CY				
0.0001594	11017.	69123456.	9.7867573	0.0015598	-0.004178
3.8581753	-60.000000 CY				
0.0001644	11079.	67401534.	9.7260868	0.0015987	-0.004319
3.8869352	-60.000000 CY				
0.0001694	11139.	65767574.	9.6691048	0.0016377	-0.004460
3.9124557	-60.000000 CY				
0.0001744	11199.	64223403.	9.6148605	0.0016766	-0.004601
3.9348020	-60.000000 CY				
0.0001794	11258.	62761436.	9.5654896	0.0017158	-0.004742
3.9539345	-60.000000 CY				
0.0001844	11316.	61373390.	9.5189681	0.0017551	-0.004882
3.9697370	-60.000000 CY				
0.0001894	11373.	60052811.	9.4743244	0.0017942	-0.005023
3.9821950	-60.000000 CY				
0.0001944	11429.	58796578.	9.4331695	0.0018336	-0.005164
3.9914019	-60.000000 CY				
0.0001994	11484.	57599778.	9.3948139	0.0018731	-0.005304
3.9973136	-60.000000 CY				
0.0002044	11539.	56457972.	9.3581635	0.0019126	-0.005445
3.9998845	-60.000000 CY				
0.0002094	11592.	55366642.	9.3266817	0.0019528	-0.005585
3.9975630	-60.000000 CY				
0.0002144	11645.	54322678.	9.2959142	0.0019928	-0.005725
3.9999044	-60.000000 CY				
0.0002194	11698.	53322120.	9.2675435	0.0020331	-0.005864
3.9971169	-60.000000 CY				
0.0002244	11748.	52356977.	9.2405172	0.0020733	-0.006004
3.9997515	-60.000000 CY				
0.0002294	11794.	51418840.	9.2141042	0.0021135	-0.006144
3.9957066	-60.000000 CY				
0.0002344	11831.	50480617.	9.1845645	0.0021526	-0.006285
3.9990577	-60.000000 CY				
0.0002394	11864.	49560513.	9.1526832	0.0021909	-0.006427
3.9990468	-60.000000 CY				

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0.0002444	11885.	48632992.	9.1162023	0.0022278	-0.006570
3.9966747	-60.000000 CY				
0.0002494	11904.	47735462.	9.0796192	0.0022642	-0.006713
3.9992545	-60.000000 CY				
0.0002544	11921.	46863378.	9.0457647	0.0023010	-0.006856
3.9991650	-60.000000 CY				
0.0002594	11937.	46022914.	9.0128664	0.0023377	-0.007000
3.9956629	-60.000000 CY				
0.0002644	11953.	45213284.	8.9816750	0.0023745	-0.007143
3.9986069	-60.000000 CY				
0.0002694	11969.	44432753.	8.9518321	0.0024114	-0.007286
3.9999247	-60.000000 CY				
0.0002744	11984.	43679063.	8.9240509	0.0024485	-0.007429
3.9940409	-60.000000 CY				
0.0003044	12070.	39655848.	8.7807001	0.0026726	-0.008285
3.9985866	-60.000000 CY				
0.0003344	12146.	36325110.	8.6675807	0.0028982	-0.009139
3.9998625	-60.000000 CY				
0.0003644	12216.	33525083.	8.5838110	0.0031277	-0.009990
3.9999751	-60.000000 CYT				
0.0003944	12280.	31137740.	8.5203443	0.0033602	-0.010837
3.9996828	-60.000000 CYT				
0.0004244	12339.	29075625.	8.4715220	0.0035951	-0.011682
3.9974037	-60.000000 CYT				
0.0004544	12385.	27257253.	8.4224181	0.0038269	-0.012531
3.9878351	-60.000000 CYT				

 Summary of Results for Nominal 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 Tens. No. Strain	Axial Thrust kips	Nominal Mom. Cap. in-kip	Max. Comp. Strain	Max.
----	-----	-----	-----	
1 -0.00952396	3.800	12169.214	0.00300000	
2 -0.00952020	4.200	12173.120	0.00300000	
3 -0.00951645	4.600	12177.027	0.00300000	

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

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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 (0.75).

The above values should be multiplied by the appropriate strength reduction factor to compute ultimate moment capacity according to ACI 318, 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 Stiff. Load Ult Mom No. kip-in ²	Resist. Factor	Nominal Ax. Thrust kips	Nominal Moment Cap in-kips	Ult. (Fac) Ax. Thrust kips	Ult. (Fac) Moment Cap in-kips	Bend. at
-----	-----	-----	-----	-----	-----	
1 91219895.	0.65	3.800000	12169.	2.470000	7910.	
2 91253873.	0.65	4.200000	12173.	2.730000	7913.	
3 91287886.	0.65	4.600000	12177.	2.990000	7915.	
1 89806706.	0.75	3.800000	12169.	2.850000	9127.	
2 89838295.	0.75	4.200000	12173.	3.150000	9130.	
3 89869877.	0.75	4.600000	12177.	3.450000	9133.	
1 70221645.	0.90	3.800000	12169.	3.420000	10952.	
2 70254444.	0.90	4.200000	12173.	3.780000	10956.	
3 70287179.	0.90	4.600000	12177.	4.140000	10959.	

 Layering Correction Equivalent Depths of Soil & Rock Layers

Layer	Top of Layer Below	Equivalent Top Depth Below	Same Layer Type As	Layer is Rock or	F0 Integral	F1 Integral
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No.	Pile Head ft	Grnd Surf ft	Layer Above	is Below Rock Layer	for Layer lbs	for Layer lbs
1	1.0000	0.00	N.A.	No	0.00	8680.
2	4.0000	0.8462	No	No	8680.	13358.
3	5.2000	0.5353	Yes	No	22038.	176659.
4	9.7000	8.7000	No	No	198697.	0.00
5	12.4000	11.4000	No	No	0.00	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.

 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 = 1000.0 lbs
 Applied moment at pile head = 315600.0 in-lbs
 Axial thrust load on pile head = 4200.0 lbs

Depth Res.	Deflect. Soil Spr.	Bending Distrib.	Shear	Slope	Total	Bending	Soil
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	0.01857	315600.	1000.	-2.56E-04	0.00	3.84E+11	
0.00	0.00	0.00					
0.09000	0.01829	316681.	1000.	-2.55E-04	0.00	3.84E+11	
0.00	0.00	0.00					
0.1800	0.01802	317762.	1000.0000	-2.54E-04	0.00	3.84E+11	
0.00	0.00	0.00					
0.2700	0.01774	318843.	1000.0000	-2.53E-04	0.00	3.84E+11	
0.00	0.00	0.00					
0.3600	0.01747	319925.	1000.	-2.53E-04	0.00	3.84E+11	
0.00	0.00	0.00					
0.4500	0.01720	321006.	1000.	-2.52E-04	0.00	3.84E+11	
0.00	0.00	0.00					
0.5400	0.01693	322087.	1000.	-2.51E-04	0.00	3.84E+11	

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0.00	0.00	0.00				
0.6300	0.01666	323168.	1000.0000	-2.50E-04	0.00	3.84E+11
0.00	0.00	0.00				
0.7200	0.01639	324249.	1000.0000	-2.49E-04	0.00	3.84E+11
0.00	0.00	0.00				
0.8100	0.01612	325330.	1000.	-2.48E-04	0.00	3.84E+11
0.00	0.00	0.00				
0.9000	0.01585	326411.	1000.0000	-2.47E-04	0.00	3.84E+11
0.00	0.00	0.00				
0.9900	0.01559	327493.	1000.0000	-2.46E-04	0.00	3.84E+11
0.00	0.00	0.00				
1.0800	0.01532	328574.	989.5063	-2.45E-04	0.00	3.84E+11
-19.433	1370.	0.00				
1.1700	0.01506	329632.	968.4074	-2.44E-04	0.00	3.84E+11
-19.639	1409.	0.00				
1.2600	0.01479	330668.	947.0879	-2.43E-04	0.00	3.84E+11
-19.841	1449.	0.00				
1.3500	0.01453	331680.	925.5527	-2.42E-04	0.00	3.84E+11
-20.039	1489.	0.00				
1.4400	0.01427	332669.	903.8070	-2.42E-04	0.00	3.84E+11
-20.231	1531.	0.00				
1.5300	0.01401	333634.	881.8560	-2.41E-04	0.00	3.84E+11
-20.419	1574.	0.00				
1.6200	0.01375	334576.	859.7050	-2.40E-04	0.00	3.84E+11
-20.602	1618.	0.00				
1.7100	0.01349	335494.	837.3593	-2.39E-04	0.00	3.84E+11
-20.779	1663.	0.00				
1.8000	0.01323	336387.	814.8244	-2.38E-04	0.00	3.84E+11
-20.952	1710.	0.00				
1.8900	0.01298	337256.	792.1057	-2.37E-04	0.00	3.84E+11
-21.120	1758.	0.00				
1.9800	0.01272	338100.	769.2091	-2.36E-04	0.00	3.84E+11
-21.282	1807.	0.00				
2.0700	0.01247	338919.	746.1401	-2.35E-04	0.00	3.84E+11
-21.439	1857.	0.00				
2.1600	0.01221	339714.	722.9045	-2.34E-04	0.00	3.84E+11
-21.590	1909.	0.00				
2.2500	0.01196	340483.	699.5085	-2.33E-04	0.00	3.84E+11
-21.736	1962.	0.00				
2.3400	0.01171	341227.	675.9579	-2.32E-04	0.00	3.84E+11
-21.876	2017.	0.00				
2.4300	0.01146	341945.	652.2590	-2.31E-04	0.00	3.84E+11
-22.011	2074.	0.00				
2.5200	0.01121	342638.	628.4180	-2.30E-04	0.00	3.84E+11
-22.139	2133.	0.00				
2.6100	0.01096	343305.	604.4415	-2.29E-04	0.00	3.84E+11
-22.262	2193.	0.00				
2.7000	0.01072	343945.	580.3359	-2.28E-04	0.00	3.84E+11
-22.378	2255.	0.00				
2.7900	0.01047	344560.	556.1079	-2.27E-04	0.00	3.84E+11

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-22.488	2320.	0.00				
2.8800	0.01023	345149.	531.7644	-2.26E-04	0.00	3.84E+11
-22.592	2386.	0.00				
2.9700	0.00998	345711.	507.3124	-2.25E-04	0.00	3.84E+11
-22.689	2455.	0.00				
3.0600	0.00974	346247.	482.7591	-2.24E-04	0.00	3.84E+11
-22.780	2526.	0.00				
3.1500	0.00950	346756.	458.1118	-2.23E-04	0.00	3.84E+11
-22.863	2600.	0.00				
3.2400	0.00926	347238.	433.3781	-2.22E-04	0.00	3.84E+11
-22.940	2676.	0.00				
3.3300	0.00902	347694.	408.5658	-2.21E-04	0.00	3.84E+11
-23.009	2756.	0.00				
3.4200	0.00878	348123.	383.6826	-2.20E-04	0.00	3.84E+11
-23.071	2838.	0.00				
3.5100	0.00854	348525.	358.7369	-2.19E-04	0.00	3.84E+11
-23.125	2924.	0.00				
3.6000	0.00830	348899.	333.7370	-2.18E-04	0.00	3.84E+11
-23.171	3014.	0.00				
3.6900	0.00807	349247.	308.6916	-2.18E-04	0.00	3.84E+11
-23.209	3107.	0.00				
3.7800	0.00783	349568.	283.6096	-2.17E-04	0.00	3.84E+11
-23.239	3204.	0.00				
3.8700	0.00760	349862.	258.5002	-2.16E-04	0.00	3.84E+11
-23.260	3305.	0.00				
3.9600	0.00737	350129.	233.3729	-2.15E-04	0.00	3.84E+11
-23.272	3411.	0.00				
4.0500	0.00714	350368.	142.5638	-2.14E-04	0.00	3.84E+11
-144.893	21924.	0.00				
4.1400	0.00691	350438.	-13.809	-2.13E-04	0.00	3.84E+11
-144.685	22622.	0.00				
4.2300	0.00668	350340.	-169.932	-2.12E-04	0.00	3.84E+11
-144.432	23357.	0.00				
4.3200	0.00645	350073.	-325.755	-2.11E-04	0.00	3.84E+11
-144.130	24132.	0.00				
4.4100	0.00622	349638.	-481.227	-2.10E-04	0.00	3.84E+11
-143.780	24952.	0.00				
4.5000	0.00600	349036.	-636.292	-2.09E-04	0.00	3.84E+11
-143.378	25819.	0.00				
4.5900	0.00577	348266.	-790.895	-2.08E-04	0.00	3.84E+11
-142.924	26740.	0.00				
4.6800	0.00555	347329.	-944.978	-2.07E-04	0.00	3.84E+11
-142.414	27719.	0.00				
4.7700	0.00533	346227.	-1098.	-2.06E-04	0.00	3.84E+11
-141.847	28763.	0.00				
4.8600	0.00510	344958.	-1251.	-2.05E-04	0.00	3.84E+11
-141.219	29879.	0.00				
4.9500	0.00488	343526.	-1403.	-2.04E-04	0.00	3.84E+11
-140.526	31075.	0.00				
5.0400	0.00466	341929.	-1555.	-2.03E-04	0.00	3.84E+11

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-139.766	32362.	0.00				
5.1300	0.00445	340169.	-1705.	-2.02E-04	0.00	3.84E+11
-138.933	33751.	0.00				
5.2200	0.00423	338247.	-2091.	-2.01E-04	0.00	3.84E+11
-574.861	146834.	0.00				
5.3100	0.00401	335655.	-2709.	-2.00E-04	0.00	3.84E+11
-570.400	153557.	0.00				
5.4000	0.00380	332397.	-3323.	-1.99E-04	0.00	3.84E+11
-565.579	160901.	0.00				
5.4900	0.00358	328480.	-3931.	-1.98E-04	0.00	3.84E+11
-560.368	168963.	0.00				
5.5800	0.00337	323909.	-4533.	-1.97E-04	0.00	3.84E+11
-554.730	177862.	0.00				
5.6700	0.00316	318690.	-5129.	-1.96E-04	0.00	3.84E+11
-548.621	187747.	0.00				
5.7600	0.00294	312833.	-5718.	-1.95E-04	0.00	3.84E+11
-541.991	198801.	0.00				
5.8500	0.00273	306342.	-6299.	-1.95E-04	0.00	3.85E+11
-534.779	211264.	0.00				
5.9400	0.00252	299228.	-6872.	-1.94E-04	0.00	3.85E+11
-526.910	225442.	0.00				
6.0300	0.00232	291500.	-7437.	-1.93E-04	0.00	3.85E+11
-518.296	241746.	0.00				
6.1200	0.00211	283167.	-7991.	-1.92E-04	0.00	3.85E+11
-508.822	260730.	0.00				
6.2100	0.00190	274240.	-8535.	-1.91E-04	0.00	3.85E+11
-498.344	283170.	0.00				
6.3000	0.00169	264732.	-9067.	-1.91E-04	0.00	3.85E+11
-486.674	310181.	0.00				
6.3900	0.00149	254657.	-9586.	-1.90E-04	0.00	3.85E+11
-473.559	343441.	0.00				
6.4800	0.00128	244029.	-10089.	-1.89E-04	0.00	3.85E+11
-458.648	385598.	0.00				
6.5700	0.00108	232866.	-10575.	-1.88E-04	0.00	3.85E+11
-441.426	441112.	0.00				
6.6600	8.78E-04	221189.	-11041.	-1.88E-04	0.00	3.85E+11
-421.093	518185.	0.00				
6.7500	6.75E-04	209020.	-11472.	-1.87E-04	0.00	3.85E+11
-377.502	603838.	0.00				
6.8400	4.73E-04	196410.	-11820.	-1.87E-04	0.00	3.85E+11
-265.946	606772.	0.00				
6.9300	2.72E-04	183491.	-12046.	-1.86E-04	0.00	3.85E+11
-153.630	609703.	0.00				
7.0200	7.15E-05	170392.	-12151.	-1.86E-04	0.00	3.85E+11
-40.536	612634.	0.00				
7.1100	-1.29E-04	157247.	-12133.	-1.85E-04	0.00	3.85E+11
73.3516	615563.	0.00				
7.2000	-3.28E-04	144186.	-11992.	-1.85E-04	0.00	3.85E+11
188.0522	618492.	0.00				
7.2900	-5.28E-04	131345.	-11727.	-1.84E-04	0.00	3.85E+11

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303.5835	621419.	0.00				
7.3800	-7.26E-04	118858.	-11337.	-1.84E-04	0.00	3.85E+11
417.3544	620466.	0.00				
7.4700	-9.25E-04	106858.	-10871.	-1.84E-04	0.00	3.85E+11
445.4074	520076.	0.00				
7.5600	-0.00112	95378.	-10377.	-1.83E-04	0.00	3.85E+11
469.7331	451706.	0.00				
7.6500	-0.00132	84445.	-9858.	-1.83E-04	0.00	3.85E+11
491.4488	401798.	0.00				
7.7400	-0.00152	74086.	-9317.	-1.83E-04	0.00	3.85E+11
511.2269	363578.	0.00				
7.8300	-0.00172	64323.	-8755.	-1.83E-04	0.00	3.85E+11
529.5064	333260.	0.00				
7.9200	-0.00191	55177.	-8174.	-1.83E-04	0.00	3.85E+11
546.5903	308554.	0.00				
8.0100	-0.00211	46669.	-7575.	-1.82E-04	0.00	3.85E+11
562.6975	287989.	0.00				
8.1000	-0.00231	38817.	-6959.	-1.82E-04	0.00	3.85E+11
577.9915	270571.	0.00				
8.1900	-0.00250	31640.	-6327.	-1.82E-04	0.00	3.85E+11
592.5977	255608.	0.00				
8.2800	-0.00270	25154.	-5679.	-1.82E-04	0.00	3.85E+11
606.6145	242599.	0.00				
8.3700	-0.00290	19375.	-5017.	-1.82E-04	0.00	3.85E+11
620.1209	231171.	0.00				
8.4600	-0.00309	14319.	-4340.	-1.82E-04	0.00	3.85E+11
633.1809	221044.	0.00				
8.5500	-0.00329	10003.	-3649.	-1.82E-04	0.00	3.85E+11
645.8473	212001.	0.00				
8.6400	-0.00349	6439.	-2945.	-1.82E-04	0.00	3.85E+11
658.1642	203870.	0.00				
8.7300	-0.00368	3643.	-2228.	-1.82E-04	0.00	3.85E+11
670.1686	196516.	0.00				
8.8200	-0.00388	1629.	-1498.	-1.82E-04	0.00	3.85E+11
681.8920	189830.	0.00				
8.9100	-0.00408	410.0982	-754.900	-1.82E-04	0.00	3.85E+11
693.3616	183720.	0.00				
9.0000	-0.00427	0.00	0.00	-1.82E-04	0.00	3.85E+11
704.6007	89057.	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:

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Pile-head deflection = 0.01856994 inches
 Computed slope at pile head = -0.0002561 radians
 Maximum bending moment = 350438. inch-lbs
 Maximum shear force = -12151. lbs
 Depth of maximum bending moment = 4.14000000 feet below pile head
 Depth of maximum shear force = 7.02000000 feet below pile head
 Number of iterations = 23
 Number of zero deflection points = 1
 Pile deflection at ground = 0.01555627 inches

 Pile-head Deflection vs. Pile Length for Load Case 1

Boundary Condition Type 1, Shear and Moment

Shear = 1000. lbs
 Moment = 315600. in-lbs
 Axial Load = 4200. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	0.01856994	350438.	-12151.
8.55000	0.03904594	345911.	-13378.
8.10000	0.10457900	341460.	-14722.
7.65000	0.26598964	338534.	-15916.
7.20000	0.80632654	335600.	-16915.
6.75000	2.66317195	335761.	-17850.
6.30000	9.87336813	343007.	-18991.

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

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

Shear force at pile head = 2250.0 lbs
 Applied moment at pile head = 724800.0 in-lbs
 Axial thrust load on pile head = 4600.0 lbs

Depth Res. Soil	Deflect. Spr.	Bending Distrib.	Shear	Slope	Total	Bending	Soil
X	y	Moment	Force	S	Stress	Stiffness	p

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-14 (Boring B-012 & 013-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Es*H feet lb/inch	Lat. Load inches lb/inch	in-lbs lb/inch	lbs	radians	psi*	lb-in^2
0.00	0.3935	724800.	2250.	-0.00474	0.00	3.83E+11
0.00	0.00	0.00				
0.09000	0.3884	727254.	2250.	-0.00474	0.00	3.83E+11
0.00	0.00	0.00				
0.1800	0.3833	729707.	2250.	-0.00474	0.00	3.83E+11
0.00	0.00	0.00				
0.2700	0.3781	732161.	2250.	-0.00474	0.00	3.83E+11
0.00	0.00	0.00				
0.3600	0.3730	734614.	2250.	-0.00473	0.00	3.83E+11
0.00	0.00	0.00				
0.4500	0.3679	737068.	2250.	-0.00473	0.00	3.83E+11
0.00	0.00	0.00				
0.5400	0.3628	739521.	2250.	-0.00473	0.00	3.83E+11
0.00	0.00	0.00				
0.6300	0.3577	741975.	2250.	-0.00473	0.00	3.83E+11
0.00	0.00	0.00				
0.7200	0.3526	744428.	2250.	-0.00473	0.00	3.83E+11
0.00	0.00	0.00				
0.8100	0.3475	746882.	2250.	-0.00472	0.00	3.83E+11
0.00	0.00	0.00				
0.9000	0.3424	749335.	2250.	-0.00472	0.00	3.83E+11
0.00	0.00	0.00				
0.9900	0.3373	751789.	2250.	-0.00472	0.00	3.83E+11
0.00	0.00	0.00				
1.0800	0.3322	754242.	2221.	-0.00472	0.00	3.83E+11
-54.172	176.1165	0.00				
1.1700	0.3271	756632.	2162.	-0.00472	0.00	3.83E+11
-54.784	180.8785	0.00				
1.2600	0.3220	758959.	2102.	-0.00471	0.00	3.83E+11
-55.383	185.7494	0.00				
1.3500	0.3169	761220.	2042.	-0.00471	0.00	3.83E+11
-55.971	190.7336	0.00				
1.4400	0.3118	763417.	1982.	-0.00471	0.00	3.83E+11
-56.546	195.8357	0.00				
1.5300	0.3068	765547.	1920.	-0.00471	0.00	3.83E+11
-57.108	201.0607	0.00				
1.6200	0.3017	767611.	1858.	-0.00470	0.00	3.83E+11
-57.657	206.4137	0.00				
1.7100	0.2966	769608.	1796.	-0.00470	0.00	3.83E+11
-58.193	211.9005	0.00				
1.8000	0.2915	771536.	1732.	-0.00470	0.00	3.83E+11
-58.716	217.5268	0.00				
1.8900	0.2864	773396.	1669.	-0.00470	0.00	3.83E+11
-59.224	223.2989	0.00				
1.9800	0.2814	775188.	1605.	-0.00470	0.00	3.83E+11

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-14 (Boring B-012 & 013-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

-59.719	229.2235	0.00				
2.0700	0.2763	776909.	1540.	-0.00469	0.00	3.83E+11
-60.199	235.3076	0.00				
2.1600	0.2712	778560.	1475.	-0.00469	0.00	3.83E+11
-60.665	241.5589	0.00				
2.2500	0.2662	780141.	1409.	-0.00469	0.00	3.83E+11
-61.116	247.9854	0.00				
2.3400	0.2611	781650.	1343.	-0.00469	0.00	3.83E+11
-61.552	254.5957	0.00				
2.4300	0.2560	783087.	1276.	-0.00468	0.00	3.83E+11
-61.972	261.3992	0.00				
2.5200	0.2510	784452.	1209.	-0.00468	0.00	3.83E+11
-62.376	268.4056	0.00				
2.6100	0.2459	785744.	1141.	-0.00468	0.00	3.83E+11
-62.763	275.6256	0.00				
2.7000	0.2409	786964.	1073.	-0.00468	0.00	3.83E+11
-63.134	283.0708	0.00				
2.7900	0.2358	788109.	1005.	-0.00468	0.00	3.83E+11
-63.488	290.7532	0.00				
2.8800	0.2308	789180.	936.0183	-0.00467	0.00	3.83E+11
-63.824	298.6862	0.00				
2.9700	0.2257	790177.	866.9170	-0.00467	0.00	3.83E+11
-64.142	306.8842	0.00				
3.0600	0.2207	791099.	797.4825	-0.00467	0.00	3.83E+11
-64.441	315.3625	0.00				
3.1500	0.2156	791946.	727.7352	-0.00467	0.00	3.83E+11
-64.721	324.1381	0.00				
3.2400	0.2106	792718.	657.6959	-0.00466	0.00	3.83E+11
-64.981	333.2289	0.00				
3.3300	0.2056	793413.	587.3864	-0.00466	0.00	3.83E+11
-65.221	342.6549	0.00				
3.4200	0.2005	794033.	516.8288	-0.00466	0.00	3.83E+11
-65.441	352.4377	0.00				
3.5100	0.1955	794576.	446.0461	-0.00466	0.00	3.83E+11
-65.638	362.6007	0.00				
3.6000	0.1905	795042.	375.0618	-0.00466	0.00	3.83E+11
-65.814	373.1698	0.00				
3.6900	0.1854	795432.	303.9005	-0.00465	0.00	3.83E+11
-65.966	384.1732	0.00				
3.7800	0.1804	795745.	232.5874	-0.00465	0.00	3.83E+11
-66.095	395.6420	0.00				
3.8700	0.1754	795981.	161.1486	-0.00465	0.00	3.83E+11
-66.199	407.6105	0.00				
3.9600	0.1704	796139.	89.6113	-0.00465	0.00	3.83E+11
-66.277	420.1167	0.00				
4.0500	0.1654	796220.	-117.772	-0.00464	0.00	3.83E+11
-317.766	2075.	0.00				
4.1400	0.1603	795931.	-460.798	-0.00464	0.00	3.83E+11
-317.467	2138.	0.00				
4.2300	0.1553	795271.	-803.446	-0.00464	0.00	3.83E+11

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

-317.066	2204.	0.00				
4.3200	0.1503	794242.	-1146.	-0.00464	0.00	3.83E+11
-316.559	2274.	0.00				
4.4100	0.1453	792843.	-1487.	-0.00464	0.00	3.83E+11
-315.942	2348.	0.00				
4.5000	0.1403	791075.	-1828.	-0.00463	0.00	3.83E+11
-315.211	2426.	0.00				
4.5900	0.1353	788940.	-2168.	-0.00463	0.00	3.83E+11
-314.362	2509.	0.00				
4.6800	0.1303	786439.	-2507.	-0.00463	0.00	3.83E+11
-313.388	2597.	0.00				
4.7700	0.1253	783571.	-2845.	-0.00463	0.00	3.83E+11
-312.284	2691.	0.00				
4.8600	0.1203	780340.	-3181.	-0.00462	0.00	3.83E+11
-311.043	2792.	0.00				
4.9500	0.1153	776746.	-3517.	-0.00462	0.00	3.83E+11
-309.656	2900.	0.00				
5.0400	0.1103	772790.	-3850.	-0.00462	0.00	3.83E+11
-308.116	3016.	0.00				
5.1300	0.1053	768475.	-4182.	-0.00462	0.00	3.83E+11
-306.411	3141.	0.00				
5.2200	0.1004	763803.	-5032.	-0.00462	0.00	3.83E+11
-1268.	13649.	0.00				
5.3100	0.09537	757651.	-6397.	-0.00461	0.00	3.83E+11
-1259.	14257.	0.00				
5.4000	0.09039	750031.	-7751.	-0.00461	0.00	3.83E+11
-1249.	14921.	0.00				
5.4900	0.08541	740954.	-9094.	-0.00461	0.00	3.83E+11
-1238.	15652.	0.00				
5.5800	0.08044	730433.	-10425.	-0.00461	0.00	3.83E+11
-1226.	16458.	0.00				
5.6700	0.07546	718482.	-11741.	-0.00461	0.00	3.83E+11
-1213.	17356.	0.00				
5.7600	0.07049	705117.	-13043.	-0.00460	0.00	3.83E+11
-1198.	18361.	0.00				
5.8500	0.06552	690354.	-14329.	-0.00460	0.00	3.83E+11
-1183.	19497.	0.00				
5.9400	0.06055	674212.	-15597.	-0.00460	0.00	3.84E+11
-1166.	20791.	0.00				
6.0300	0.05558	656710.	-16846.	-0.00460	0.00	3.84E+11
-1147.	22282.	0.00				
6.1200	0.05062	637870.	-18073.	-0.00460	0.00	3.84E+11
-1126.	24023.	0.00				
6.2100	0.04566	617717.	-19277.	-0.00459	0.00	3.84E+11
-1103.	26087.	0.00				
6.3000	0.04070	596277.	-20454.	-0.00459	0.00	3.84E+11
-1077.	28580.	0.00				
6.3900	0.03574	573581.	-21601.	-0.00459	0.00	3.84E+11
-1048.	31662.	0.00				
6.4800	0.03078	549663.	-22715.	-0.00459	0.00	3.84E+11

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 Light Tower SC1-14 (Boring B-012 & 013-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

-1014.	35589.	0.00				
6.5700	0.02583	524562.	-23790.	-0.00459	0.00	3.84E+11
-975.615	40797.	0.00				
6.6600	0.02087	498324.	-24818.	-0.00459	0.00	3.84E+11
-929.576	48097.	0.00				
6.7500	0.01592	471000.	-25792.	-0.00458	0.00	3.84E+11
-872.965	59216.	0.00				
6.8400	0.01097	442659.	-26695.	-0.00458	0.00	3.84E+11
-799.215	78678.	0.00				
6.9300	0.00602	413385.	-27500.	-0.00458	0.00	3.84E+11
-691.226	123980.	0.00				
7.0200	0.00107	383305.	-28117.	-0.00458	0.00	3.84E+11
-451.270	454094.	0.00				
7.1100	-0.00387	352699.	-28023.	-0.00458	0.00	3.84E+11
625.0174	174260.	0.00				
7.2000	-0.00882	322822.	-27269.	-0.00458	0.00	3.84E+11
771.4012	94463.	0.00				
7.2900	-0.01376	293844.	-26384.	-0.00458	0.00	3.85E+11
866.2793	67972.	0.00				
7.3800	-0.01871	265877.	-25409.	-0.00458	0.00	3.85E+11
939.7611	54251.	0.00				
7.4700	-0.02365	239006.	-24361.	-0.00458	0.00	3.85E+11
1001.	45716.	0.00				
7.5600	-0.02859	213303.	-23251.	-0.00458	0.00	3.85E+11
1055.	39836.	0.00				
7.6500	-0.03354	188830.	-22086.	-0.00458	0.00	3.85E+11
1103.	35511.	0.00				
7.7400	-0.03848	165643.	-20871.	-0.00457	0.00	3.85E+11
1146.	32180.	0.00				
7.8300	-0.04342	143794.	-19611.	-0.00457	0.00	3.85E+11
1187.	29528.	0.00				
7.9200	-0.04836	123329.	-18309.	-0.00457	0.00	3.85E+11
1225.	27360.	0.00				
8.0100	-0.05330	104292.	-16966.	-0.00457	0.00	3.85E+11
1261.	25551.	0.00				
8.1000	-0.05824	86727.	-15586.	-0.00457	0.00	3.85E+11
1295.	24016.	0.00				
8.1900	-0.06318	70672.	-14170.	-0.00457	0.00	3.85E+11
1328.	22695.	0.00				
8.2800	-0.06812	56166.	-12719.	-0.00457	0.00	3.85E+11
1359.	21545.	0.00				
8.3700	-0.07305	43244.	-11235.	-0.00457	0.00	3.85E+11
1389.	20535.	0.00				
8.4600	-0.07799	31943.	-9719.	-0.00457	0.00	3.85E+11
1418.	19638.	0.00				
8.5500	-0.08293	22296.	-8172.	-0.00457	0.00	3.85E+11
1447.	18838.	0.00				
8.6400	-0.08787	14336.	-6595.	-0.00457	0.00	3.85E+11
1474.	18117.	0.00				
8.7300	-0.09281	8096.	-4989.	-0.00457	0.00	3.85E+11

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1501.	17465.	0.00					
	8.8200	-0.09775	3606.	-3354.	-0.00457	0.00	3.85E+11
1527.	16873.	0.00					
	8.9100	-0.103	897.4998	-1691.	-0.00457	0.00	3.85E+11
1553.	16331.	0.00					
	9.0000	-0.108	0.00	0.00	-0.00457	0.00	3.85E+11
1578.	7917.	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	=	0.39349718 inches
Computed slope at pile head	=	-0.0047422 radians
Maximum bending moment	=	796220. inch-lbs
Maximum shear force	=	-28117. lbs
Depth of maximum bending moment	=	4.05000000 feet below pile head
Depth of maximum shear force	=	7.02000000 feet below pile head
Number of iterations	=	38
Number of zero deflection points	=	1
Pile deflection at ground	=	0.33672897 inches

 Pile-head Deflection vs. Pile Length for Load Case 2

Boundary Condition Type 1, Shear and Moment

Shear	=	2250. lbs
Moment	=	724800. in-lbs
Axial Load	=	4600. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
-----	-----	-----	-----
9.00000	0.39349718	796220.	-28117.
8.55000	0.88453514	786633.	-30206.
8.10000	2.43297814	781142.	-32943.
7.65000	6.49613679	782010.	-36094.

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36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Computed Values of Pile Loading and Deflection
for Lateral Loading for Load Case Number 3

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

Shear force at pile head = 2250.0 lbs
Applied moment at pile head = 724800.0 in-lbs
Axial thrust load on pile head = 3800.0 lbs

Depth Res.	Soil X Es*H feet lb/inch	Deflect. Spr. y Lat. inches lb/inch	Bending Distrib. Moment Load in-lbs lb/inch	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness lb-in^2	Soil p
0.00	0.00	0.3928	724800.	2250.	-0.00473	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.09000	0.00	0.3877	727249.	2250.	-0.00473	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.1800	0.00	0.3826	729699.	2250.	-0.00473	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.2700	0.00	0.3775	732148.	2250.	-0.00473	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.3600	0.00	0.3724	734598.	2250.	-0.00473	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.4500	0.00	0.3673	737047.	2250.	-0.00472	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.5400	0.00	0.3622	739496.	2250.	-0.00472	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.6300	0.00	0.3571	741946.	2250.	-0.00472	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.7200	0.00	0.3520	744395.	2250.	-0.00472	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.8100	0.00	0.3469	746845.	2250.	-0.00472	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.9000	0.00	0.3418	749294.	2250.	-0.00471	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.9900	0.00	0.3367	751743.	2250.	-0.00471	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
1.0800	0.00	0.3316	754193.	2221.	-0.00471	0.00	3.83E+11	
-54.142	176.3124		0.00					
1.1700	0.00	0.3266	756579.	2162.	-0.00471	0.00	3.83E+11	
-54.753	181.0797		0.00					
1.2600	0.00	0.3215	758901.	2103.	-0.00471	0.00	3.83E+11	
-55.353	185.9560		0.00					

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1.3500	0.3164	761159.	2042.	-0.00470	0.00	3.83E+11
-55.940	190.9457	0.00				
1.4400	0.3113	763351.	1982.	-0.00470	0.00	3.83E+11
-56.514	196.0535	0.00				
1.5300	0.3062	765478.	1920.	-0.00470	0.00	3.83E+11
-57.076	201.2844	0.00				
1.6200	0.3012	767538.	1858.	-0.00470	0.00	3.83E+11
-57.625	206.6434	0.00				
1.7100	0.2961	769530.	1796.	-0.00469	0.00	3.83E+11
-58.161	212.1363	0.00				
1.8000	0.2910	771455.	1733.	-0.00469	0.00	3.83E+11
-58.683	217.7689	0.00				
1.8900	0.2860	773312.	1669.	-0.00469	0.00	3.83E+11
-59.191	223.5475	0.00				
1.9800	0.2809	775099.	1605.	-0.00469	0.00	3.83E+11
-59.686	229.4787	0.00				
2.0700	0.2758	776817.	1540.	-0.00469	0.00	3.83E+11
-60.166	235.5696	0.00				
2.1600	0.2708	778464.	1475.	-0.00468	0.00	3.83E+11
-60.632	241.8279	0.00				
2.2500	0.2657	780041.	1409.	-0.00468	0.00	3.83E+11
-61.082	248.2616	0.00				
2.3400	0.2607	781547.	1343.	-0.00468	0.00	3.83E+11
-61.517	254.8793	0.00				
2.4300	0.2556	782981.	1276.	-0.00468	0.00	3.83E+11
-61.937	261.6903	0.00				
2.5200	0.2506	784342.	1209.	-0.00467	0.00	3.83E+11
-62.341	268.7046	0.00				
2.6100	0.2455	785631.	1142.	-0.00467	0.00	3.83E+11
-62.728	275.9327	0.00				
2.7000	0.2405	786847.	1074.	-0.00467	0.00	3.83E+11
-63.099	283.3862	0.00				
2.7900	0.2354	787989.	1005.	-0.00467	0.00	3.83E+11
-63.452	291.0772	0.00				
2.8800	0.2304	789057.	936.7492	-0.00467	0.00	3.83E+11
-63.788	299.0191	0.00				
2.9700	0.2254	790051.	867.6864	-0.00466	0.00	3.83E+11
-64.106	307.2262	0.00				
3.0600	0.2203	790969.	798.2906	-0.00466	0.00	3.83E+11
-64.405	315.7140	0.00				
3.1500	0.2153	791813.	728.5821	-0.00466	0.00	3.83E+11
-64.685	324.4993	0.00				
3.2400	0.2103	792581.	658.5819	-0.00466	0.00	3.83E+11
-64.945	333.6003	0.00				
3.3300	0.2052	793274.	588.3115	-0.00465	0.00	3.83E+11
-65.185	343.0369	0.00				
3.4200	0.2002	793890.	517.7933	-0.00465	0.00	3.83E+11
-65.404	352.8305	0.00				
3.5100	0.1952	794431.	447.0500	-0.00465	0.00	3.83E+11
-65.602	363.0049	0.00				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-14 (Boring B-012 & 013-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

3.6000	0.1902	794894.	376.1053	-0.00465	0.00	3.83E+11
-65.777	373.5857	0.00				
3.6900	0.1851	795281.	304.9837	-0.00465	0.00	3.83E+11
-65.930	384.6014	0.00				
3.7800	0.1801	795591.	233.7103	-0.00464	0.00	3.83E+11
-66.058	396.0830	0.00				
3.8700	0.1751	795824.	162.3113	-0.00464	0.00	3.83E+11
-66.162	408.0649	0.00				
3.9600	0.1701	795980.	90.8139	-0.00464	0.00	3.83E+11
-66.241	420.5850	0.00				
4.0500	0.1651	796058.	-116.478	-0.00464	0.00	3.83E+11
-317.633	2078.	0.00				
4.1400	0.1601	795766.	-459.360	-0.00463	0.00	3.83E+11
-317.335	2141.	0.00				
4.2300	0.1551	795104.	-801.865	-0.00463	0.00	3.83E+11
-316.934	2207.	0.00				
4.3200	0.1501	794072.	-1144.	-0.00463	0.00	3.83E+11
-316.427	2277.	0.00				
4.4100	0.1451	792671.	-1485.	-0.00463	0.00	3.83E+11
-315.810	2351.	0.00				
4.5000	0.1401	790902.	-1826.	-0.00463	0.00	3.83E+11
-315.080	2429.	0.00				
4.5900	0.1351	788765.	-2166.	-0.00462	0.00	3.83E+11
-314.230	2512.	0.00				
4.6800	0.1301	786262.	-2505.	-0.00462	0.00	3.83E+11
-313.257	2601.	0.00				
4.7700	0.1251	783393.	-2842.	-0.00462	0.00	3.83E+11
-312.153	2695.	0.00				
4.8600	0.1201	780160.	-3179.	-0.00462	0.00	3.83E+11
-310.913	2796.	0.00				
4.9500	0.1151	776565.	-3514.	-0.00461	0.00	3.83E+11
-309.527	2904.	0.00				
5.0400	0.1101	772608.	-3847.	-0.00461	0.00	3.83E+11
-307.987	3020.	0.00				
5.1300	0.1052	768292.	-4179.	-0.00461	0.00	3.83E+11
-306.283	3145.	0.00				
5.2200	0.1002	763619.	-5029.	-0.00461	0.00	3.83E+11
-1268.	13666.	0.00				
5.3100	0.09522	757467.	-6393.	-0.00461	0.00	3.83E+11
-1259.	14275.	0.00				
5.4000	0.09024	749848.	-7747.	-0.00460	0.00	3.83E+11
-1248.	14940.	0.00				
5.4900	0.08527	740772.	-9089.	-0.00460	0.00	3.83E+11
-1237.	15671.	0.00				
5.5800	0.08030	730253.	-10419.	-0.00460	0.00	3.83E+11
-1225.	16479.	0.00				
5.6700	0.07534	718304.	-11735.	-0.00460	0.00	3.83E+11
-1212.	17378.	0.00				
5.7600	0.07037	704942.	-13037.	-0.00460	0.00	3.83E+11
-1198.	18384.	0.00				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-14 (Boring B-012 & 013-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

5.8500	0.06541	690183.	-14322.	-0.00459	0.00	3.83E+11
-1182.	19521.	0.00				
5.9400	0.06045	674044.	-15590.	-0.00459	0.00	3.84E+11
-1165.	20817.	0.00				
6.0300	0.05549	656547.	-16838.	-0.00459	0.00	3.84E+11
-1146.	22310.	0.00				
6.1200	0.05054	637712.	-18065.	-0.00459	0.00	3.84E+11
-1126.	24053.	0.00				
6.2100	0.04558	617565.	-19268.	-0.00459	0.00	3.84E+11
-1102.	26119.	0.00				
6.3000	0.04063	596131.	-20444.	-0.00458	0.00	3.84E+11
-1077.	28615.	0.00				
6.3900	0.03568	573442.	-21591.	-0.00458	0.00	3.84E+11
-1047.	31701.	0.00				
6.4800	0.03073	549532.	-22704.	-0.00458	0.00	3.84E+11
-1014.	35632.	0.00				
6.5700	0.02579	524439.	-23779.	-0.00458	0.00	3.84E+11
-975.225	40846.	0.00				
6.6600	0.02084	498208.	-24807.	-0.00458	0.00	3.84E+11
-929.210	48154.	0.00				
6.7500	0.01590	470893.	-25780.	-0.00458	0.00	3.84E+11
-872.628	59285.	0.00				
6.8400	0.01095	442561.	-26683.	-0.00458	0.00	3.84E+11
-798.921	78765.	0.00				
6.9300	0.00601	413296.	-27487.	-0.00457	0.00	3.84E+11
-691.003	124100.	0.00				
7.0200	0.00107	383226.	-28104.	-0.00457	0.00	3.84E+11
-451.335	453899.	0.00				
7.1100	-0.00386	352629.	-28010.	-0.00457	0.00	3.84E+11
624.6540	174564.	0.00				
7.2000	-0.00880	322761.	-27257.	-0.00457	0.00	3.84E+11
771.0208	94603.	0.00				
7.2900	-0.01374	293793.	-26373.	-0.00457	0.00	3.85E+11
865.8736	68067.	0.00				
7.3800	-0.01867	265834.	-25398.	-0.00457	0.00	3.85E+11
939.3319	54325.	0.00				
7.4700	-0.02361	238970.	-24350.	-0.00457	0.00	3.85E+11
1001.	45778.	0.00				
7.5600	-0.02854	213274.	-23241.	-0.00457	0.00	3.85E+11
1054.	39889.	0.00				
7.6500	-0.03348	188808.	-22076.	-0.00457	0.00	3.85E+11
1102.	35558.	0.00				
7.7400	-0.03841	165627.	-20862.	-0.00457	0.00	3.85E+11
1146.	32223.	0.00				
7.8300	-0.04334	143783.	-19603.	-0.00457	0.00	3.85E+11
1187.	29567.	0.00				
7.9200	-0.04827	123323.	-18301.	-0.00457	0.00	3.85E+11
1225.	27396.	0.00				
8.0100	-0.05320	104291.	-16959.	-0.00457	0.00	3.85E+11
1260.	25584.	0.00				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-14 (Boring B-012 & 013-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

8.1000	-0.05814	86729.	-15579.	-0.00457	0.00	3.85E+11
1294.	24047.	0.00				
8.1900	-0.06307	70677.	-14164.	-0.00457	0.00	3.85E+11
1327.	22725.	0.00				
8.2800	-0.06800	56173.	-12714.	-0.00457	0.00	3.85E+11
1358.	21573.	0.00				
8.3700	-0.07293	43254.	-11230.	-0.00457	0.00	3.85E+11
1388.	20561.	0.00				
8.4600	-0.07786	31953.	-9715.	-0.00457	0.00	3.85E+11
1418.	19664.	0.00				
8.5500	-0.08279	22306.	-8169.	-0.00457	0.00	3.85E+11
1446.	18862.	0.00				
8.6400	-0.08772	14346.	-6592.	-0.00457	0.00	3.85E+11
1473.	18141.	0.00				
8.7300	-0.09265	8104.	-4987.	-0.00457	0.00	3.85E+11
1500.	17488.	0.00				
8.8200	-0.09758	3613.	-3352.	-0.00456	0.00	3.85E+11
1526.	16894.	0.00				
8.9100	-0.103	901.0867	-1690.	-0.00456	0.00	3.85E+11
1552.	16352.	0.00				
9.0000	-0.107	0.00	0.00	-0.00456	0.00	3.85E+11
1577.	7927.	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. 3:

Pile-head deflection	=	0.39284292 inches
Computed slope at pile head	=	-0.0047344 radians
Maximum bending moment	=	796058. inch-lbs
Maximum shear force	=	-28104. lbs
Depth of maximum bending moment	=	4.05000000 feet below pile head
Depth of maximum shear force	=	7.02000000 feet below pile head
Number of iterations	=	38
Number of zero deflection points	=	1
Pile deflection at ground	=	0.33616812 inches

 Pile-head Deflection vs. Pile Length for Load Case 3

Boundary Condition Type 1, Shear and Moment

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-14 (Boring B-012 & 013-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Shear = 2250. lbs
 Moment = 724800. in-lbs
 Axial Load = 3800. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	0.39284292	796058.	-28104.
8.55000	0.88122594	786309.	-30176.
8.10000	2.40807882	780342.	-32854.
7.65000	6.31374611	779853.	-35823.
7.20000	24.88496952	797526.	-40894.

 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

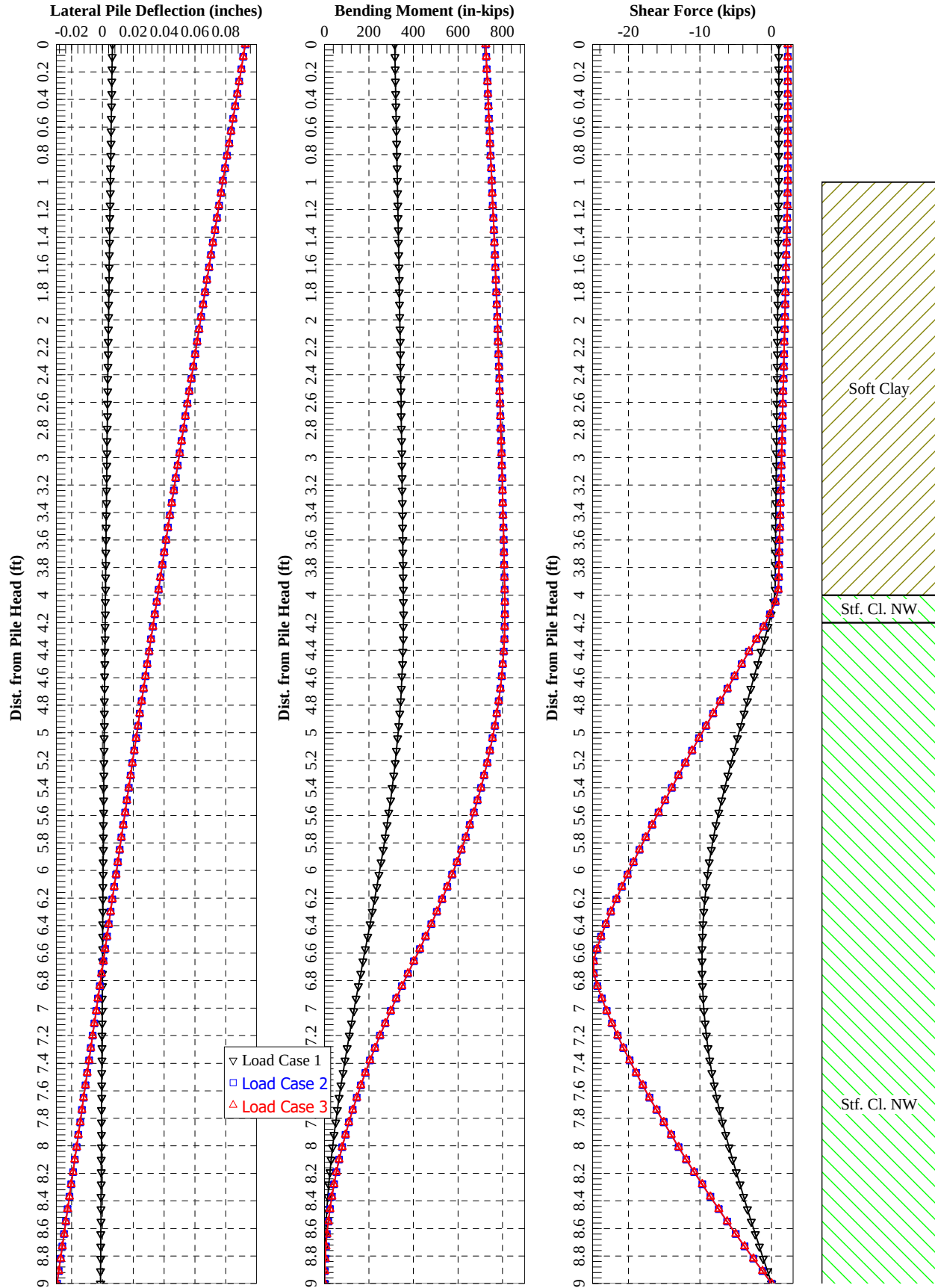
Load Case	Load Type	Load 1	Load 2	Axial Load	Pile-head Deflection	Pile-head Rotation	Max in lbs
No.		Load 1	Load 2	lbs	inches	radians	
1	V, lb	1000.0000	M, in-lb	4200.	0.01857	-2.56E-04	
		350438.					
2	V, lb	2250.	M, in-lb	4600.	0.3935	-0.00474	
		796220.					
3	V, lb	2250.	M, in-lb	3800.	0.3928	-0.00473	
		796058.					

Maximum pile-head deflection = 0.3934971802 inches
 Maximum pile-head rotation = -0.0047421785 radians = -0.271707 deg.

The analysis ended normally.

LATERAL LOAD (LPILE) ANALYSES
SOUTHBOUND PARKING AREA
LIGHT TOWER SC1-15 (B-015-0-25)

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-15 (Boring B-015-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation



TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-15 (Boring B-015-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

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LPILE for Version 2022-12.012

License ID : 228332755
License Type : (Single User License)

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

This model was prepared by:
BSears

Files Used for Analysis

Path to file locations:
\Columbus-1170\Projects\2024\24170232_ms_TP 26 NE Ohio\GEO\Project Docs\Site
15_SUM-271 (2LMN)\Calcs\Light Towers\LPILE Files\SB\

Name of input data file:
Tower SC1-15 (B-015).lp12d

Name of output report file:
Tower SC1-15 (B-015).lp12o

Name of plot output file:
Tower SC1-15 (B-015).lp12p

Name of runtime message file:
Tower SC1-15 (B-015).lp12r

Date and Time of Analysis

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-15 (Boring B-015-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Date: February 11, 2026

Time: 19:25:03

Problem Title

Project Name: TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas

Job Number: 24170232F

Client: ms consultants, inc.

Engineer: BKS

Description: Light Tower SC1-15 (B-015-0-25)

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

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-15 (Boring B-015-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

- 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	=	9.000 ft
Depth of ground surface below top of pile	=	1.0000 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.

Point No.	Depth Below Pile Head feet	Pile Diameter inches
-----	-----	-----
1	0.000	36.0000
2	9.000	36.0000

Input Structural Properties for Pile Sections:

Pile Section No. 1:

Section 1 is a round drilled shaft, bored pile, or CIDH pile	
Length of section	= 9.000000 ft
Shaft Diameter	= 36.000000 in

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-15 (Boring B-015-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Soil and Rock Layering Information

The soil profile is modelled using 3 layers

Layer 1 is soft clay, p-y criteria by Matlock, 1970

Distance from top of pile to top of layer	=	1.000000 ft
Distance from top of pile to bottom of layer	=	4.000000 ft
Effective unit weight at top of layer	=	98.000000 pcf
Effective unit weight at bottom of layer	=	98.000000 pcf
Undrained cohesion at top of layer	=	250.000000 psf
Undrained cohesion at bottom of layer	=	250.000000 psf
Epsilon-50 at top of layer	=	0.020000
Epsilon-50 at bottom of layer	=	0.020000

Layer 2 is stiff clay without free water

Distance from top of pile to top of layer	=	4.000000 ft
Distance from top of pile to bottom of layer	=	4.200000 ft
Effective unit weight at top of layer	=	58.000000 pcf
Effective unit weight at bottom of layer	=	58.000000 pcf
Undrained cohesion at top of layer	=	3500. psf
Undrained cohesion at bottom of layer	=	3500. psf
Epsilon-50 at top of layer	=	0.005000
Epsilon-50 at bottom of layer	=	0.005000

Layer 3 is stiff clay without free water

Distance from top of pile to top of layer	=	4.200000 ft
Distance from top of pile to bottom of layer	=	11.200000 ft
Effective unit weight at top of layer	=	66.000000 pcf
Effective unit weight at bottom of layer	=	66.000000 pcf
Undrained cohesion at top of layer	=	4500. psf
Undrained cohesion at bottom of layer	=	4500. psf
Epsilon-50 at top of layer	=	0.004000
Epsilon-50 at bottom of layer	=	0.004000

(Depth of the lowest soil layer extends 2.200 ft below the pile tip)

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-15 (Boring B-015-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Summary of Input Soil Properties

Layer Num.	Soil Type Name (p-y Curve Type)	Layer Depth ft	Effective Unit Wt. pcf	Cohesion psf	E50 or krm
1	Soft Clay	1.0000 4.0000	98.0000 98.0000	250.0000 250.0000	0.02000 0.02000
2	Stiff Clay w/o Free Water	4.0000 4.2000	58.0000 58.0000	3500. 3500.	0.00500 0.00500
3	Stiff Clay w/o Free Water	4.2000 11.2000	66.0000 66.0000	4500. 4500.	0.00400 0.00400

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 = 3

Load Compute No.	Load Top y Type vs. Pile Length	Condition Run Analysis 1	Condition 2	Axial Thrust Force, lbs
1	1	V = 1000.000000 lbs	M = 315600. in-lbs	4200.
Yes		Yes		
2	1	V = 2250. lbs	M = 724800. in-lbs	4600.
Yes		Yes		
3	1	V = 2250. lbs	M = 724800. in-lbs	3800.
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.

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-15 (Boring B-015-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

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:

Dimensions and Properties of Drilled Shaft (Bored Pile):

Length of Section	=	9.000000 ft
Shaft Diameter	=	36.000000 in
Concrete Cover Thickness (to edge of trans. reinf.)	=	3.500000 in
Number of Reinforcing Bars	=	16 bars
Yield Stress of Reinforcing Bars	=	60000. psi
Modulus of Elasticity of Reinforcing Bars	=	29000000. psi
Gross Area of Shaft	=	1018. sq. in.
Total Area of Reinforcing Steel	=	16.000000 sq. in.
Area Ratio of Steel Reinforcement	=	1.57 percent
Edge-to-Edge Bar Spacing	=	4.114467 in
Maximum Concrete Aggregate Size	=	0.750000 in
Ratio of Bar Spacing to Aggregate Size	=	5.49
Offset of Center of Rebar Cage from Center of Pile	=	0.0000 in
Transverse Reinforcement		
Type: Spiral		
Number of Transverse Reinf. (per spacing)	=	1
Spacing of Transverse Reinf.	=	4.500000 in
Yield Stress of Transverse Reinf.	=	60000. psi
Diameter of Transverse Reinf.	=	0.500000 in

Axial Structural Capacities:

Nom. Axial Structural Capacity = $0.85 F_c A_c + F_y A_s$	=	4366.378 kips
Tensile Load for Cracking of Concrete	=	-470.222 kips
Nominal Axial Tensile Capacity	=	-960.000 kips

Reinforcing Bar Dimensions and Positions Used in Computations:

Bar Number	Bar Diam. inches	Bar Area sq. in.	X inches	Y inches
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TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-15 (Boring B-015-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

1	1.128000	1.000000	13.436000	0.000000
2	1.128000	1.000000	12.413245	5.141735
3	1.128000	1.000000	9.500687	9.500687
4	1.128000	1.000000	5.141735	12.413245
5	1.128000	1.000000	0.000000	13.436000
6	1.128000	1.000000	-5.14173	12.413245
7	1.128000	1.000000	-9.50069	9.500687
8	1.128000	1.000000	-12.41325	5.141735
9	1.128000	1.000000	-13.43600	0.000000
10	1.128000	1.000000	-12.41325	-5.14173
11	1.128000	1.000000	-9.50069	-9.50069
12	1.128000	1.000000	-5.14173	-12.41325
13	1.128000	1.000000	0.000000	-13.43600
14	1.128000	1.000000	5.141735	-12.41325
15	1.128000	1.000000	9.500687	-9.50069
16	1.128000	1.000000	12.413245	-5.14173

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

Minimum spacing between any two bars not equal to zero = 4.114 inches
 between bars 11 and 12.

Ratio of bar spacing to maximum aggregate size = 5.49

Concrete Properties:

Compressive Strength of Concrete	=	4000. psi
Modulus of Elasticity of Concrete	=	3604997. psi
Modulus of Rupture of Concrete	=	-474.34165 psi
Compression Strain at Peak Stress	=	0.001886
Tensile Strain at Fracture of Concrete	=	-0.0001154
Maximum Coarse Aggregate Size	=	0.750000 in

Number of Axial Thrust Force Values Determined from Pile-head Loadings = 3

Number	Axial Thrust Force kips
-----	-----
1	3.800
2	4.200
3	4.600

Definitions of Run Messages and Notes:

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

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 318-14, Section 21.2.3.

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 = 3.800 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
-----	-----	-----	-----	-----	-----
6.25000E-07	240.5062135	384809942.	19.2929823	0.00001206	-0.00001044
0.0505030	0.2746478				
0.00000125	480.1472468	384117797.	18.6479768	0.00002331	-0.00002169
0.0973082	0.5259142				
0.00000188	718.9174733	383422652.	18.4329804	0.00003456	-0.00003294
0.1438345	0.7771808				
0.00000250	956.8168886	382726755.	18.3254857	0.00004581	-0.00004419
0.1900818	1.0284477				
0.00000313	1194.	382030558.	18.2609917	0.00005707	-0.00005543
0.2360502	1.2797149				
0.00000375	1430.	381334209.	18.2179981	0.00006832	-0.00006668
0.2817396	1.5309823				
0.00000438	1665.	380637775.	18.1872904	0.00007957	-0.00007793
0.3271500	1.7822500				
0.00000500	1900.	379941287.	18.1642614	0.00009082	-0.00008918
0.3722815	2.0335179				
0.00000563	2133.	379244764.	18.1463515	0.0001021	-0.000100
0.4171340	2.2847861				
0.00000625	2366.	378548215.	18.1320251	0.0001133	-0.000112
0.4617075	2.5360546				
0.00000688	2366.	344134741.	10.2494785	0.00007047	-0.000177
0.2882187	-4.308598 C				
0.00000750	2366.	315456846.	10.2198771	0.00007665	-0.000193
0.3129821	-4.706727 C				
0.00000813	2366.	291190934.	10.1952302	0.00008284	-0.000210
0.3376758	-5.104761 C				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00000875	2366.	270391582.	10.1744772	0.00008903	-0.000226
0.3622998	-5.502701 C				
0.00000938	2366.	252365477.	10.1568402	0.00009522	-0.000242
0.3868539	-5.900547 C				
0.00001000	2366.	236592634.	10.1417358	0.0001014	-0.000259
0.4113380	-6.298297 C				
0.00001063	2366.	222675420.	10.1287027	0.0001076	-0.000275
0.4357521	-6.695951 C				
0.00001125	2366.	210304564.	10.1174231	0.0001138	-0.000291
0.4600960	-7.093510 C				
0.00001188	2366.	199235903.	10.1076093	0.0001200	-0.000307
0.4843696	-7.490973 C				
0.00001250	2366.	189274107.	10.0990420	0.0001262	-0.000324
0.5085729	-7.888340 C				
0.00001313	2366.	180261055.	10.0915439	0.0001325	-0.000340
0.5327056	-8.285611 C				
0.00001375	2366.	172067370.	10.0849699	0.0001387	-0.000356
0.5567678	-8.682785 C				
0.00001438	2366.	164586180.	10.0792000	0.0001449	-0.000373
0.5807594	-9.079861 C				
0.00001500	2366.	157728423.	10.0741344	0.0001511	-0.000389
0.6046801	-9.476841 C				
0.00001563	2366.	151419286.	10.0696892	0.0001573	-0.000405
0.6285300	-9.873723 C				
0.00001625	2366.	145595467.	10.0657933	0.0001636	-0.000421
0.6523089	-10.270507 C				
0.00001688	2366.	140203043.	10.0623863	0.0001698	-0.000438
0.6760167	-10.667193 C				
0.00001750	2366.	135195791.	10.0594163	0.0001760	-0.000454
0.6996534	-11.063781 C				
0.00001813	2366.	130533867.	10.0568387	0.0001823	-0.000470
0.7232187	-11.460271 C				
0.00001875	2366.	126182738.	10.0546147	0.0001885	-0.000486
0.7467127	-11.856661 C				
0.00001938	2366.	122112327.	10.0527107	0.0001948	-0.000503
0.7701352	-12.252952 C				
0.00002000	2366.	118296317.	10.0510970	0.0002010	-0.000519
0.7934860	-12.649144 C				
0.00002063	2366.	114711580.	10.0497478	0.0002073	-0.000535
0.8167652	-13.045236 C				
0.00002125	2366.	111337710.	10.0486401	0.0002135	-0.000551
0.8399726	-13.441228 C				
0.00002188	2366.	108156633.	10.0477539	0.0002198	-0.000568
0.8631080	-13.837120 C				
0.00002250	2366.	105152282.	10.0470709	0.0002261	-0.000584
0.8861714	-14.232911 C				
0.00002313	2366.	102310328.	10.0465752	0.0002323	-0.000600
0.9091627	-14.628602 C				
0.00002375	2366.	99617951.	10.0462524	0.0002386	-0.000616
0.9320817	-15.024191 C				

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0.00002438	2366.	97063645.	10.0460897	0.0002449	-0.000633
0.9549284	-15.419678 C				
0.00002563	2429.	94800037.	10.0461990	0.0002574	-0.000665
1.0004043	-16.210348 C				
0.00002688	2545.	94692477.	10.0468231	0.0002700	-0.000697
1.0455896	-17.000609 C				
0.00002813	2660.	94589756.	10.0479254	0.0002826	-0.000730
1.0904832	-17.790458 C				
0.00002938	2776.	94491232.	10.0493946	0.0002952	-0.000762
1.1350844	-18.579893 C				
0.00003063	2891.	94396370.	10.0512127	0.0003078	-0.000795
1.1793922	-19.368912 C				
0.00003188	3006.	94304718.	10.0533415	0.0003205	-0.000827
1.2234058	-20.157511 C				
0.00003313	3121.	94215891.	10.0557483	0.0003331	-0.000859
1.2671243	-20.945689 C				
0.00003438	3236.	94129561.	10.0584054	0.0003458	-0.000892
1.3105466	-21.733443 C				
0.00003563	3350.	94045446.	10.0612887	0.0003584	-0.000924
1.3536720	-22.520771 C				
0.00003688	3465.	93963300.	10.0643778	0.0003711	-0.000956
1.3964994	-23.307669 C				
0.00003813	3579.	93882912.	10.0676547	0.0003838	-0.000989
1.4390279	-24.094136 C				
0.00003938	3694.	93804096.	10.0711039	0.0003965	-0.001021
1.4812567	-24.880169 C				
0.00004063	3808.	93726688.	10.0747116	0.0004093	-0.001053
1.5231846	-25.665765 C				
0.00004188	3922.	93650546.	10.0784659	0.0004220	-0.001085
1.5648108	-26.450921 C				
0.00004313	4035.	93575540.	10.0823562	0.0004348	-0.001118
1.6061342	-27.235635 C				
0.00004438	4149.	93501560.	10.0863731	0.0004476	-0.001150
1.6471540	-28.019904 C				
0.00004563	4263.	93428502.	10.0905084	0.0004604	-0.001182
1.6878690	-28.803725 C				
0.00004688	4376.	93356279.	10.0947545	0.0004732	-0.001214
1.7282784	-29.587096 C				
0.00004813	4489.	93284807.	10.0991050	0.0004860	-0.001246
1.7683810	-30.370013 C				
0.00004938	4602.	93214014.	10.1035538	0.0004989	-0.001279
1.8081759	-31.152474 C				
0.00005063	4715.	93143835.	10.1080956	0.0005117	-0.001311
1.8476620	-31.934476 C				
0.00005188	4828.	93074209.	10.1127258	0.0005246	-0.001343
1.8868384	-32.716016 C				
0.00005313	4941.	93005082.	10.1174399	0.0005375	-0.001375
1.9257039	-33.497091 C				
0.00005438	5053.	92936405.	10.1222340	0.0005504	-0.001407
1.9642575	-34.277698 C				

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0.00005563	5166.	92868132.	10.1271047	0.0005633	-0.001439
2.0024981	-35.057833 C				
0.00005688	5278.	92800222.	10.1320488	0.0005763	-0.001471
2.0404247	-35.837495 C				
0.00005813	5390.	92732637.	10.1370633	0.0005892	-0.001503
2.0780361	-36.616679 C				
0.00005938	5502.	92665342.	10.1421457	0.0006022	-0.001535
2.1153313	-37.395383 C				
0.00006063	5614.	92598305.	10.1472935	0.0006152	-0.001567
2.1523092	-38.173604 C				
0.00006188	5725.	92531497.	10.1525046	0.0006282	-0.001599
2.1889685	-38.951338 C				
0.00006313	5837.	92464888.	10.1577769	0.0006412	-0.001631
2.2253083	-39.728581 C				
0.00006438	5948.	92398455.	10.1631088	0.0006543	-0.001663
2.2613274	-40.505332 C				
0.00006563	6059.	92332173.	10.1684984	0.0006673	-0.001695
2.2970245	-41.281586 C				
0.00006688	6170.	92266020.	10.1739444	0.0006804	-0.001727
2.3323987	-42.057340 C				
0.00006813	6281.	92199976.	10.1794453	0.0006935	-0.001759
2.3674485	-42.832591 C				
0.00006938	6392.	92134020.	10.1849998	0.0007066	-0.001791
2.4021730	-43.607335 C				
0.00007063	6502.	92068136.	10.1906070	0.0007197	-0.001823
2.4365708	-44.381568 C				
0.00007188	6613.	92002305.	10.1962656	0.0007329	-0.001855
2.4706408	-45.155288 C				
0.00007313	6723.	91936511.	10.2020028	0.0007460	-0.001886
2.5043818	-45.928490 C				
0.00007438	6833.	91870742.	10.2077616	0.0007592	-0.001918
2.5377924	-46.701172 C				
0.00007938	7271.	91607617.	10.2312788	0.0008121	-0.002045
2.6681070	-49.786612 C				
0.00008438	7707.	91343844.	10.2555391	0.0008653	-0.002172
2.7930345	-52.863415 C				
0.00008938	8140.	91079227.	10.2796933	0.0009187	-0.002299
2.9123325	-55.933382 C				
0.00009438	8570.	90813004.	10.3043877	0.0009725	-0.002425
3.0260259	-58.995009 C				
0.00009938	8979.	90357411.	10.3225581	0.0010258	-0.002552
3.1326575	-60.000000 CY				
0.0001044	9304.	89144470.	10.3110511	0.0010762	-0.002681
3.2276850	-60.000000 CY				
0.0001094	9546.	87273573.	10.2718035	0.0011235	-0.002814
3.3116704	-60.000000 CY				
0.0001144	9782.	85523680.	10.2357064	0.0011707	-0.002947
3.3907664	-60.000000 CY				
0.0001194	10004.	83800225.	10.1987328	0.0012175	-0.003080
3.4643165	-60.000000 CY				

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0.0001244	10154.	81641326.	10.1374818	0.0012608	-0.003217
3.5282172	-60.000000 CY				
0.0001294	10287.	79513660.	10.0756441	0.0013035	-0.003354
3.5871212	-60.000000 CY				
0.0001344	10419.	77536664.	10.0197410	0.0013464	-0.003491
3.6423258	-60.000000 CY				
0.0001394	10550.	75693983.	9.9691573	0.0013895	-0.003628
3.6937845	-60.000000 CY				
0.0001444	10680.	73971519.	9.9233661	0.0014327	-0.003765
3.7414497	-60.000000 CY				
0.0001494	10808.	72355946.	9.8810316	0.0014760	-0.003902
3.7851328	-60.000000 CY				
0.0001544	10925.	70772035.	9.8368433	0.0015186	-0.004039
3.8241552	-60.000000 CY				
0.0001594	11008.	69072220.	9.7809580	0.0015588	-0.004179
3.8574366	-60.000000 CY				
0.0001644	11071.	67351790.	9.7204156	0.0015978	-0.004320
3.8862696	-60.000000 CY				
0.0001694	11131.	65719446.	9.6635689	0.0016368	-0.004461
3.9118664	-60.000000 CY				
0.0001744	11191.	64176802.	9.6094393	0.0016756	-0.004602
3.9342902	-60.000000 CY				
0.0001794	11250.	62716278.	9.5601863	0.0017149	-0.004743
3.9535015	-60.000000 CY				
0.0001844	11308.	61329164.	9.5136161	0.0017541	-0.004883
3.9693617	-60.000000 CY				
0.0001894	11364.	60009896.	9.4690774	0.0017932	-0.005024
3.9819050	-60.000000 CY				
0.0001944	11420.	58754909.	9.4280227	0.0018326	-0.005165
3.9911986	-60.000000 CY				
0.0001994	11476.	57559296.	9.3897594	0.0018721	-0.005305
3.9971986	-60.000000 CY				
0.0002044	11531.	56418622.	9.3531932	0.0019116	-0.005446
3.9998595	-60.000000 CY				
0.0002094	11584.	55328385.	9.3201259	0.0019514	-0.005586
3.9974517	-60.000000 CY				
0.0002144	11637.	54285454.	9.2909722	0.0019918	-0.005726
3.9998812	-60.000000 CY				
0.0002194	11690.	53285909.	9.2626721	0.0020320	-0.005866
3.9969940	-60.000000 CY				
0.0002244	11740.	52321336.	9.2356724	0.0020723	-0.006005
3.9997138	-60.000000 CY				
0.0002294	11786.	51384137.	9.2093226	0.0021124	-0.006145
3.9955528	-60.000000 CY				
0.0002344	11823.	50445667.	9.1796872	0.0021515	-0.006286
3.9989818	-60.000000 CY				
0.0002394	11855.	49524943.	9.1473565	0.0021896	-0.006428
3.9994466	-60.000000 CY				
0.0002444	11876.	48598228.	9.1109548	0.0022265	-0.006571
3.9965160	-60.000000 CY				

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0.0002494	11895.	47701101.	9.0745971	0.0022630	-0.006715
3.9991770	-60.000000 CY				
0.0002544	11912.	46829816.	9.0405915	0.0022997	-0.006858
3.9995775	-60.000000 CY				
0.0002594	11929.	45990067.	9.0077660	0.0023364	-0.007001
3.9954763	-60.000000 CY				
0.0002644	11945.	45181124.	8.9766457	0.0023732	-0.007144
3.9984997	-60.000000 CY				
0.0002694	11961.	44401256.	8.9468563	0.0024101	-0.007287
3.9998981	-60.000000 CY				
0.0002744	11976.	43648250.	8.9191370	0.0024472	-0.007430
3.9944635	-60.000000 CY				
0.0003044	12062.	39628140.	8.7757363	0.0026711	-0.008286
3.9984635	-60.000000 CY				
0.0003344	12138.	36300180.	8.6628609	0.0028966	-0.009141
3.9998209	-60.000000 CY				
0.0003644	12207.	33502446.	8.5793723	0.0031261	-0.009991
3.9999551	-60.000000 CYT				
0.0003944	12272.	31117026.	8.5161103	0.0033585	-0.010839
3.9996166	-60.000000 CYT				
0.0004244	12331.	29056485.	8.4674428	0.0035934	-0.011684
3.9972132	-60.000000 CYT				
0.0004544	12377.	27238942.	8.4178614	0.0038249	-0.012533
3.9873462	-60.000000 CYT				

Axial Thrust Force = 4.200 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in

6.25000E-07	240.5049676	384807948.	19.4290859	0.00001214	-0.00001036
0.0508615	0.2771147				
0.00000125	480.1459926	384116794.	18.7161837	0.00002340	-0.00002160
0.0976654	0.5283867				
0.00000188	718.9162127	383421980.	18.4785558	0.00003465	-0.00003285
0.1441903	0.7796589				
0.00000250	956.8156222	382726249.	18.3597458	0.00004590	-0.00004410
0.1904363	1.0309315				
0.00000313	1194.	382030150.	18.2884629	0.00005715	-0.00005535
0.2364034	1.2822044				
0.00000375	1430.	381333869.	18.2409436	0.00006840	-0.00006660
0.2820914	1.5334776				
0.00000438	1665.	380637482.	18.2070035	0.00007966	-0.00007784
0.3275005	1.7847511				

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0.00000500	1900.	379941029.	18.1815504	0.00009091	-0.00008909
0.3726306	2.0360248				
0.00000563	2133.	379244533.	18.1617553	0.0001022	-0.000100
0.4174818	2.2872988				
0.00000625	2366.	378548006.	18.1459208	0.0001134	-0.000112
0.4620539	2.5385732				
0.00000688	2366.	344134551.	10.2895004	0.00007074	-0.000177
0.2893429	-4.300617 C				
0.00000750	2366.	315456672.	10.2575513	0.00007693	-0.000193
0.3141325	-4.698533 C				
0.00000813	2366.	291190774.	10.2300378	0.00008312	-0.000209
0.3388235	-5.096560 C				
0.00000875	2366.	270391433.	10.2068278	0.00008931	-0.000226
0.3634446	-5.494492 C				
0.00000938	2366.	252365338.	10.1870615	0.00009550	-0.000242
0.3879959	-5.892330 C				
0.00001000	2366.	236592504.	10.1700940	0.0001017	-0.000258
0.4124772	-6.290073 C				
0.00001063	2366.	222675298.	10.1554324	0.0001079	-0.000275
0.4368884	-6.687720 C				
0.00001125	2366.	210304448.	10.1426931	0.0001141	-0.000291
0.4612294	-7.085271 C				
0.00001188	2366.	199235793.	10.1315564	0.0001203	-0.000307
0.4855002	-7.482727 C				
0.00001250	2366.	189274003.	10.1218127	0.0001265	-0.000323
0.5097005	-7.880086 C				
0.00001313	2366.	180260955.	10.1132503	0.0001327	-0.000340
0.5338304	-8.277349 C				
0.00001375	2366.	172067276.	10.1057088	0.0001390	-0.000356
0.5578898	-8.674515 C				
0.00001438	2366.	164586090.	10.0990556	0.0001452	-0.000372
0.5818784	-9.071585 C				
0.00001500	2366.	157728336.	10.0931803	0.0001514	-0.000389
0.6057963	-9.468556 C				
0.00001563	2366.	151419203.	10.0879903	0.0001576	-0.000405
0.6296433	-9.865431 C				
0.00001625	2366.	145595387.	10.0834069	0.0001639	-0.000421
0.6534193	-10.262207 C				
0.00001688	2366.	140202965.	10.0793634	0.0001701	-0.000437
0.6771242	-10.658886 C				
0.00001750	2366.	135195717.	10.0758025	0.0001763	-0.000454
0.7007579	-11.055466 C				
0.00001813	2366.	130533795.	10.0726747	0.0001826	-0.000470
0.7243204	-11.451947 C				
0.00001875	2366.	126182669.	10.0699372	0.0001888	-0.000486
0.7478114	-11.848330 C				
0.00001938	2366.	122112260.	10.0675528	0.0001951	-0.000502
0.7712309	-12.244613 C				
0.00002000	2366.	118296252.	10.0654889	0.0002013	-0.000519
0.7945789	-12.640797 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-15 (Boring B-015-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00002063	2366.	114711517.	10.0637168	0.0002076	-0.000535
0.8178551	-13.036882 C				
0.00002125	2366.	111337649.	10.0622112	0.0002138	-0.000551
0.8410595	-13.432866 C				
0.00002188	2366.	108156573.	10.0609497	0.0002201	-0.000567
0.8641920	-13.828750 C				
0.00002250	2366.	105152224.	10.0599125	0.0002263	-0.000584
0.8872524	-14.224533 C				
0.00002313	2366.	102310272.	10.0590817	0.0002326	-0.000600
0.9102407	-14.620215 C				
0.00002375	2366.	99617896.	10.0584414	0.0002389	-0.000616
0.9331568	-15.015796 C				
0.00002438	2366.	97063591.	10.0579776	0.0002452	-0.000632
0.9560005	-15.411276 C				
0.00002563	2432.	94924068.	10.0575288	0.0002577	-0.000665
1.0014704	-16.201930 C				
0.00002688	2548.	94810571.	10.0576469	0.0002703	-0.000697
1.0466496	-16.992174 C				
0.00002813	2664.	94702439.	10.0582592	0.0002829	-0.000730
1.0915372	-17.782007 C				
0.00002938	2779.	94598964.	10.0593353	0.0002955	-0.000762
1.1361324	-18.571425 C				
0.00003063	2894.	94499555.	10.0607664	0.0003081	-0.000794
1.1804341	-19.360427 C				
0.00003188	3009.	94403710.	10.0625387	0.0003207	-0.000827
1.2244416	-20.149010 C				
0.00003313	3124.	94311007.	10.0646159	0.0003334	-0.000859
1.2681539	-20.937171 C				
0.00003438	3239.	94221082.	10.0669675	0.0003461	-0.000891
1.3115700	-21.724908 C				
0.00003563	3354.	94133623.	10.0695670	0.0003587	-0.000924
1.3546892	-22.512219 C				
0.00003688	3468.	94048359.	10.0723915	0.0003714	-0.000956
1.3975103	-23.299100 C				
0.00003813	3582.	93965057.	10.0754214	0.0003841	-0.000988
1.4400326	-24.085550 C				
0.00003938	3697.	93883511.	10.0786392	0.0003968	-0.001021
1.4822550	-24.871565 C				
0.00004063	3811.	93803541.	10.0820299	0.0004096	-0.001053
1.5241766	-25.657144 C				
0.00004188	3925.	93724988.	10.0855803	0.0004223	-0.001085
1.5657965	-26.442282 C				
0.00004313	4039.	93647711.	10.0892786	0.0004351	-0.001117
1.6071135	-27.226979 C				
0.00004438	4152.	93571586.	10.0931145	0.0004479	-0.001150
1.6481268	-28.011230 C				
0.00004563	4266.	93496502.	10.0970787	0.0004607	-0.001182
1.6888354	-28.795033 C				
0.00004688	4379.	93422358.	10.1011630	0.0004735	-0.001214
1.7292383	-29.578385 C				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00004813	4492.	93349066.	10.1053601	0.0004863	-0.001246
1.7693344	-30.361284 C				
0.00004938	4606.	93276544.	10.1096634	0.0004992	-0.001278
1.8091228	-31.143727 C				
0.00005063	4718.	93204721.	10.1140670	0.0005120	-0.001310
1.8486023	-31.925710 C				
0.00005188	4831.	93133529.	10.1185657	0.0005249	-0.001343
1.8877721	-32.707231 C				
0.00005313	4944.	93062909.	10.1231546	0.0005378	-0.001375
1.9266309	-33.488287 C				
0.00005438	5056.	92992807.	10.1278294	0.0005507	-0.001407
1.9651778	-34.268875 C				
0.00005563	5169.	92923173.	10.1325862	0.0005636	-0.001439
2.0034117	-35.048992 C				
0.00005688	5281.	92853961.	10.1374215	0.0005766	-0.001471
2.0413316	-35.828634 C				
0.00005813	5393.	92785130.	10.1423320	0.0005895	-0.001503
2.0789362	-36.607799 C				
0.00005938	5505.	92716640.	10.1473148	0.0006025	-0.001535
2.1162246	-37.386484 C				
0.00006063	5617.	92648458.	10.1523672	0.0006155	-0.001567
2.1531956	-38.164685 C				
0.00006188	5728.	92580549.	10.1574868	0.0006285	-0.001599
2.1898481	-38.942399 C				
0.00006313	5840.	92512883.	10.1626714	0.0006415	-0.001631
2.2261809	-39.719622 C				
0.00006438	5951.	92445433.	10.1679189	0.0006546	-0.001663
2.2621930	-40.496353 C				
0.00006563	6062.	92378172.	10.1732276	0.0006676	-0.001695
2.2978832	-41.272587 C				
0.00006688	6173.	92311077.	10.1785957	0.0006807	-0.001727
2.3332503	-42.048320 C				
0.00006813	6284.	92244124.	10.1840217	0.0006938	-0.001759
2.3682931	-42.823550 C				
0.00006938	6395.	92177292.	10.1895041	0.0007069	-0.001791
2.4030104	-43.598274 C				
0.00007063	6505.	92110561.	10.1950417	0.0007200	-0.001822
2.4374011	-44.372486 C				
0.00007188	6616.	92043913.	10.2006608	0.0007332	-0.001854
2.4714639	-45.146185 C				
0.00007313	6726.	91977331.	10.2063053	0.0007463	-0.001886
2.5051976	-45.919366 C				
0.00007438	6836.	91910797.	10.2120017	0.0007595	-0.001918
2.5386010	-46.692026 C				
0.00007938	7274.	91644853.	10.2352897	0.0008124	-0.002045
2.6688860	-49.777380 C				
0.00008438	7710.	91378587.	10.2593338	0.0008656	-0.002172
2.7937834	-52.854093 C				
0.00008938	8143.	91111830.	10.2831857	0.0009191	-0.002298
2.9130226	-55.924331 C				

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Light Tower SC1-15 (Boring B-015-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00009438	8573.	90843621.	10.3077273	0.0009728	-0.002425
3.0266854	-58.985869 C				
0.00009938	8982.	90387473.	10.3258078	0.0010261	-0.002551
3.1332951	-60.000000 CY				
0.0001044	9308.	89176212.	10.3143071	0.0010766	-0.002681
3.2283182	-60.000000 CY				
0.0001094	9549.	87304848.	10.2749831	0.0011238	-0.002814
3.3122821	-60.000000 CY				
0.0001144	9785.	85553556.	10.2389100	0.0011711	-0.002946
3.3913727	-60.000000 CY				
0.0001194	10007.	83830919.	10.2019402	0.0012179	-0.003080
3.4649106	-60.000000 CY				
0.0001244	10158.	81671814.	10.1406407	0.0012612	-0.003216
3.5287895	-60.000000 CY				
0.0001294	10291.	79542859.	10.0787027	0.0013039	-0.003354
3.5876602	-60.000000 CY				
0.0001344	10423.	77564670.	10.0227059	0.0013468	-0.003491
3.6428308	-60.000000 CY				
0.0001394	10554.	75720878.	9.9720357	0.0013899	-0.003628
3.6942550	-60.000000 CY				
0.0001444	10683.	73997378.	9.9261646	0.0014331	-0.003764
3.7418850	-60.000000 CY				
0.0001494	10812.	72381005.	9.8838986	0.0014764	-0.003901
3.7855535	-60.000000 CY				
0.0001544	10929.	70796718.	9.8396771	0.0015190	-0.004038
3.8245440	-60.000000 CY				
0.0001594	11012.	69097838.	9.7838573	0.0015593	-0.004178
3.8578061	-60.000000 CY				
0.0001644	11075.	67376662.	9.7232508	0.0015983	-0.004319
3.8866026	-60.000000 CY				
0.0001694	11135.	65743511.	9.6663364	0.0016372	-0.004460
3.9121613	-60.000000 CY				
0.0001744	11195.	64200103.	9.6121495	0.0016761	-0.004601
3.9345463	-60.000000 CY				
0.0001794	11254.	62738857.	9.5628376	0.0017153	-0.004742
3.9537182	-60.000000 CY				
0.0001844	11312.	61351278.	9.5162917	0.0017546	-0.004883
3.9695496	-60.000000 CY				
0.0001894	11368.	60031354.	9.4717005	0.0017937	-0.005024
3.9820503	-60.000000 CY				
0.0001944	11425.	58775745.	9.4305957	0.0018331	-0.005164
3.9913005	-60.000000 CY				
0.0001994	11480.	57579537.	9.3922863	0.0018726	-0.005305
3.9972564	-60.000000 CY				
0.0002044	11535.	56438298.	9.3556780	0.0019121	-0.005445
3.9998723	-60.000000 CY				
0.0002094	11588.	55347517.	9.3241700	0.0019522	-0.005585
3.9975077	-60.000000 CY				
0.0002144	11641.	54304067.	9.2934428	0.0019923	-0.005725
3.9998931	-60.000000 CY				

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 Light Tower SC1-15 (Boring B-015-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0002194	11694.	53304015.	9.2651074	0.0020325	-0.005865
3.9970558	-60.000000 CY				
0.0002244	11744.	52339157.	9.2380944	0.0020728	-0.006005
3.9997330	-60.000000 CY				
0.0002294	11790.	51401489.	9.2117130	0.0021129	-0.006145
3.9956300	-60.000000 CY				
0.0002344	11827.	50463153.	9.1821360	0.0021521	-0.006285
3.9990203	-60.000000 CY				
0.0002394	11859.	49542728.	9.1500193	0.0021903	-0.006427
3.9992468	-60.000000 CY				
0.0002444	11880.	48615611.	9.1135780	0.0022271	-0.006570
3.9965958	-60.000000 CY				
0.0002494	11900.	47718283.	9.0771076	0.0022636	-0.006714
3.9992162	-60.000000 CY				
0.0002544	11917.	46846598.	9.0431776	0.0023004	-0.006857
3.9993713	-60.000000 CY				
0.0002594	11933.	46006491.	9.0103157	0.0023371	-0.007000
3.9955701	-60.000000 CY				
0.0002644	11949.	45197204.	8.9791598	0.0023739	-0.007144
3.9985538	-60.000000 CY				
0.0002694	11965.	44417005.	8.9493437	0.0024107	-0.007287
3.9999119	-60.000000 CY				
0.0002744	11980.	43663657.	8.9215934	0.0024479	-0.007430
3.9942523	-60.000000 CY				
0.0003044	12066.	39641995.	8.7782176	0.0026719	-0.008286
3.9985257	-60.000000 CY				
0.0003344	12142.	36312646.	8.6652203	0.0028974	-0.009140
3.9998424	-60.000000 CY				
0.0003644	12212.	33513765.	8.5815911	0.0031269	-0.009991
3.9999658	-60.000000 CYT				
0.0003944	12276.	31127384.	8.5182268	0.0033594	-0.010838
3.9996505	-60.000000 CYT				
0.0004244	12335.	29066055.	8.4694819	0.0035942	-0.011683
3.9973093	-60.000000 CYT				
0.0004544	12381.	27248100.	8.4201387	0.0038259	-0.012532
3.9875919	-60.000000 CYT				

Axial Thrust Force = 4.600 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
<hr/>					
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6.25000E-07 0.0512199	240.5035986 0.2795816	384805758.	19.5651901	0.00001223	-0.00001027

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0.00000125	480.1446137	384115691.	18.7843907	0.00002348	-0.00002152
0.0980225	0.5308592				
0.00000188	718.9148267	383421241.	18.5241312	0.00003473	-0.00003277
0.1445462	0.7821371				
0.00000250	956.8142298	382725692.	18.3940059	0.00004599	-0.00004401
0.1907908	1.0334154				
0.00000313	1194.	382029703.	18.3159341	0.00005724	-0.00005526
0.2367565	1.2846940				
0.00000375	1430.	381333494.	18.2638891	0.00006849	-0.00006651
0.2824433	1.5359729				
0.00000438	1665.	380637159.	18.2267166	0.00007974	-0.00007776
0.3278510	1.7872522				
0.00000500	1900.	379940746.	18.1988394	0.00009099	-0.00008901
0.3729798	2.0385317				
0.00000563	2133.	379244280.	18.1771590	0.0001022	-0.000100
0.4178295	2.2898116				
0.00000625	2366.	378547777.	18.1598165	0.0001135	-0.000112
0.4624003	2.5410917				
0.00000688	2366.	344134343.	10.3291778	0.00007101	-0.000176
0.2904571	-4.292706 C				
0.00000750	2366.	315456481.	10.2940289	0.00007721	-0.000193
0.3152465	-4.690597 C				
0.00000813	2366.	291190598.	10.2646762	0.00008340	-0.000209
0.3399656	-5.088396 C				
0.00000875	2366.	270391269.	10.2391817	0.00008959	-0.000225
0.3645893	-5.486283 C				
0.00000938	2366.	252365185.	10.2172859	0.00009579	-0.000242
0.3891378	-5.884113 C				
0.00001000	2366.	236592361.	10.1984552	0.0001020	-0.000258
0.4136162	-6.281848 C				
0.00001063	2366.	222675163.	10.1821496	0.0001082	-0.000274
0.4380246	-6.679488 C				
0.00001125	2366.	210304321.	10.1679490	0.0001144	-0.000291
0.4623628	-7.077032 C				
0.00001188	2366.	199235672.	10.1555219	0.0001206	-0.000307
0.4866307	-7.474480 C				
0.00001250	2366.	189273889.	10.1446030	0.0001268	-0.000323
0.5108282	-7.871831 C				
0.00001313	2366.	180260846.	10.1349589	0.0001330	-0.000339
0.5349552	-8.269087 C				
0.00001375	2366.	172067171.	10.1264498	0.0001392	-0.000356
0.5590117	-8.666245 C				
0.00001438	2366.	164585990.	10.1189132	0.0001455	-0.000372
0.5829974	-9.063307 C				
0.00001500	2366.	157728241.	10.1122282	0.0001517	-0.000388
0.6069124	-9.460271 C				
0.00001563	2366.	151419111.	10.1062933	0.0001579	-0.000405
0.6307565	-9.857138 C				
0.00001625	2366.	145595299.	10.1010224	0.0001641	-0.000421
0.6545296	-10.253907 C				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00001688	2366.	140202880.	10.0963423	0.0001704	-0.000437
0.6782316	-10.650577 C				
0.00001750	2366.	135195635.	10.0921903	0.0001766	-0.000453
0.7018624	-11.047150 C				
0.00001813	2366.	130533716.	10.0885122	0.0001829	-0.000470
0.7254219	-11.443623 C				
0.00001875	2366.	126182592.	10.0852613	0.0001891	-0.000486
0.7489100	-11.839998 C				
0.00001938	2366.	122112186.	10.0823966	0.0001953	-0.000502
0.7723266	-12.236274 C				
0.00002000	2366.	118296180.	10.0798824	0.0002016	-0.000518
0.7956716	-12.632450 C				
0.00002063	2366.	114711448.	10.0776874	0.0002079	-0.000535
0.8189449	-13.028526 C				
0.00002125	2366.	111337582.	10.0757837	0.0002141	-0.000551
0.8421464	-13.424502 C				
0.00002188	2366.	108156508.	10.0741470	0.0002204	-0.000567
0.8652759	-13.820378 C				
0.00002250	2366.	105152160.	10.0727554	0.0002266	-0.000583
0.8883333	-14.216153 C				
0.00002313	2366.	102310210.	10.0715894	0.0002329	-0.000600
0.9113187	-14.611828 C				
0.00002375	2366.	99617836.	10.0706317	0.0002392	-0.000616
0.9342318	-15.007401 C				
0.00002438	2366.	97063533.	10.0698667	0.0002455	-0.000632
0.9570725	-15.402873 C				
0.00002563	2436.	95048091.	10.0688598	0.0002580	-0.000664
1.0025364	-16.193510 C				
0.00002688	2551.	94928657.	10.0684718	0.0002706	-0.000697
1.0477096	-16.983738 C				
0.00002813	2667.	94815115.	10.0686232	0.0002832	-0.000729
1.0925912	-17.773555 C				
0.00002938	2782.	94706690.	10.0692479	0.0002958	-0.000762
1.1371802	-18.562957 C				
0.00003063	2897.	94602733.	10.0703211	0.0003084	-0.000794
1.1814759	-19.351942 C				
0.00003188	3012.	94502697.	10.0717368	0.0003210	-0.000826
1.2254772	-20.140508 C				
0.00003313	3127.	94406117.	10.0734845	0.0003337	-0.000859
1.2691834	-20.928652 C				
0.00003438	3242.	94312597.	10.0755306	0.0003463	-0.000891
1.3125933	-21.716373 C				
0.00003563	3357.	94221794.	10.0778462	0.0003590	-0.000923
1.3557063	-22.503666 C				
0.00003688	3471.	94133413.	10.0804061	0.0003717	-0.000956
1.3985212	-23.290530 C				
0.00003813	3586.	94047197.	10.0831888	0.0003844	-0.000988
1.4410372	-24.076963 C				
0.00003938	3700.	93962921.	10.0861753	0.0003971	-0.001020
1.4832533	-24.862961 C				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00004063	3814.	93880388.	10.0893491	0.0004099	-0.001053
1.5251686	-25.648521 C				
0.00004188	3928.	93799425.	10.0926956	0.0004226	-0.001085
1.5667821	-26.433642 C				
0.00004313	4042.	93719877.	10.0962019	0.0004354	-0.001117
1.6080927	-27.218321 C				
0.00004438	4155.	93641609.	10.0998566	0.0004482	-0.001149
1.6490996	-28.002554 C				
0.00004563	4269.	93564497.	10.1036497	0.0004610	-0.001182
1.6898018	-28.786339 C				
0.00004688	4382.	93488434.	10.1075722	0.0004738	-0.001214
1.7301982	-29.569674 C				
0.00004813	4496.	93413321.	10.1116159	0.0004866	-0.001246
1.7702878	-30.352554 C				
0.00004938	4609.	93339070.	10.1157737	0.0004995	-0.001278
1.8100696	-31.134978 C				
0.00005063	4722.	93265602.	10.1200391	0.0005123	-0.001310
1.8495425	-31.916943 C				
0.00005188	4834.	93192845.	10.1244063	0.0005252	-0.001342
1.8887057	-32.698446 C				
0.00005313	4947.	93120733.	10.1288700	0.0005381	-0.001374
1.9275579	-33.479483 C				
0.00005438	5060.	93049206.	10.1334255	0.0005510	-0.001406
1.9660981	-34.260052 C				
0.00005563	5172.	92978211.	10.1380684	0.0005639	-0.001439
2.0043253	-35.040149 C				
0.00005688	5284.	92907697.	10.1427948	0.0005769	-0.001471
2.0422384	-35.819772 C				
0.00005813	5396.	92837619.	10.1476012	0.0005898	-0.001503
2.0798362	-36.598918 C				
0.00005938	5508.	92767935.	10.1524844	0.0006028	-0.001535
2.1171178	-37.377583 C				
0.00006063	5620.	92698606.	10.1574414	0.0006158	-0.001567
2.1540819	-38.155764 C				
0.00006188	5731.	92629597.	10.1624696	0.0006288	-0.001599
2.1907275	-38.933458 C				
0.00006313	5843.	92560874.	10.1675664	0.0006418	-0.001631
2.2270535	-39.710662 C				
0.00006438	5954.	92492407.	10.1727297	0.0006549	-0.001663
2.2630586	-40.487373 C				
0.00006563	6065.	92424168.	10.1779574	0.0006679	-0.001695
2.2987417	-41.263586 C				
0.00006688	6176.	92356130.	10.1832476	0.0006810	-0.001726
2.3341018	-42.039299 C				
0.00006813	6287.	92288268.	10.1885986	0.0006941	-0.001758
2.3691375	-42.814509 C				
0.00006938	6398.	92220560.	10.1940089	0.0007072	-0.001790
2.4038477	-43.589211 C				
0.00007063	6508.	92152983.	10.1995039	0.0007203	-0.001822
2.4382312	-44.363403 C				

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0.00007188	6619.	92085519.	10.2050285	0.0007335	-0.001854
2.4722868	-45.137081 C				
0.00007313	6729.	92018147.	10.2106084	0.0007467	-0.001886
2.5060133	-45.910241 C				
0.00007438	6839.	91950850.	10.2162424	0.0007598	-0.001918
2.5394094	-46.682880 C				
0.00007938	7277.	91682087.	10.2393011	0.0008127	-0.002045
2.6696649	-49.768146 C				
0.00008438	7713.	91413389.	10.2630109	0.0008659	-0.002172
2.7945082	-52.845065 C				
0.00008938	8146.	91144431.	10.2866786	0.0009194	-0.002298
2.9137126	-55.915279 C				
0.00009438	8576.	90874234.	10.3110673	0.0009731	-0.002424
3.0273448	-58.976728 C				
0.00009938	8985.	90417533.	10.3290580	0.0010265	-0.002551
3.1339327	-60.000000 CY				
0.0001044	9311.	89207952.	10.3175636	0.0010769	-0.002681
3.2289512	-60.000000 CY				
0.0001094	9552.	87336121.	10.2781631	0.0011242	-0.002813
3.3128936	-60.000000 CY				
0.0001144	9789.	85583430.	10.2421143	0.0011714	-0.002946
3.3919789	-60.000000 CY				
0.0001194	10011.	83861611.	10.2051482	0.0012182	-0.003079
3.4655044	-60.000000 CY				
0.0001244	10162.	81702300.	10.1438002	0.0012616	-0.003216
3.5293615	-60.000000 CY				
0.0001294	10295.	79572057.	10.0817619	0.0013043	-0.003353
3.5881988	-60.000000 CY				
0.0001344	10427.	77592674.	10.0256713	0.0013472	-0.003490
3.6433355	-60.000000 CY				
0.0001394	10557.	75747771.	9.9749147	0.0013903	-0.003627
3.6947252	-60.000000 CY				
0.0001444	10687.	74023236.	9.9289636	0.0014335	-0.003764
3.7423201	-60.000000 CY				
0.0001494	10816.	72406063.	9.8867661	0.0014768	-0.003901
3.7859739	-60.000000 CY				
0.0001544	10933.	70821400.	9.8425115	0.0015194	-0.004038
3.8249324	-60.000000 CY				
0.0001594	11017.	69123456.	9.7867573	0.0015598	-0.004178
3.8581753	-60.000000 CY				
0.0001644	11079.	67401534.	9.7260868	0.0015987	-0.004319
3.8869352	-60.000000 CY				
0.0001694	11139.	65767574.	9.6691048	0.0016377	-0.004460
3.9124557	-60.000000 CY				
0.0001744	11199.	64223403.	9.6148605	0.0016766	-0.004601
3.9348020	-60.000000 CY				
0.0001794	11258.	62761436.	9.5654896	0.0017158	-0.004742
3.9539345	-60.000000 CY				
0.0001844	11316.	61373390.	9.5189681	0.0017551	-0.004882
3.9697370	-60.000000 CY				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0001894	11373.	60052811.	9.4743244	0.0017942	-0.005023
3.9821950	-60.000000 CY				
0.0001944	11429.	58796578.	9.4331695	0.0018336	-0.005164
3.9914019	-60.000000 CY				
0.0001994	11484.	57599778.	9.3948139	0.0018731	-0.005304
3.9973136	-60.000000 CY				
0.0002044	11539.	56457972.	9.3581635	0.0019126	-0.005445
3.9998845	-60.000000 CY				
0.0002094	11592.	55366642.	9.3266817	0.0019528	-0.005585
3.9975630	-60.000000 CY				
0.0002144	11645.	54322678.	9.2959142	0.0019928	-0.005725
3.9999044	-60.000000 CY				
0.0002194	11698.	53322120.	9.2675435	0.0020331	-0.005864
3.9971169	-60.000000 CY				
0.0002244	11748.	52356977.	9.2405172	0.0020733	-0.006004
3.9997515	-60.000000 CY				
0.0002294	11794.	51418840.	9.2141042	0.0021135	-0.006144
3.9957066	-60.000000 CY				
0.0002344	11831.	50480617.	9.1845645	0.0021526	-0.006285
3.9990577	-60.000000 CY				
0.0002394	11864.	49560513.	9.1526832	0.0021909	-0.006427
3.9990468	-60.000000 CY				
0.0002444	11885.	48632992.	9.1162023	0.0022278	-0.006570
3.9966747	-60.000000 CY				
0.0002494	11904.	47735462.	9.0796192	0.0022642	-0.006713
3.9992545	-60.000000 CY				
0.0002544	11921.	46863378.	9.0457647	0.0023010	-0.006856
3.9991650	-60.000000 CY				
0.0002594	11937.	46022914.	9.0128664	0.0023377	-0.007000
3.9956629	-60.000000 CY				
0.0002644	11953.	45213284.	8.9816750	0.0023745	-0.007143
3.9986069	-60.000000 CY				
0.0002694	11969.	44432753.	8.9518321	0.0024114	-0.007286
3.9999247	-60.000000 CY				
0.0002744	11984.	43679063.	8.9240509	0.0024485	-0.007429
3.9940409	-60.000000 CY				
0.0003044	12070.	39655848.	8.7807001	0.0026726	-0.008285
3.9985866	-60.000000 CY				
0.0003344	12146.	36325110.	8.6675807	0.0028982	-0.009139
3.9998625	-60.000000 CY				
0.0003644	12216.	33525083.	8.5838110	0.0031277	-0.009990
3.9999751	-60.000000 CYT				
0.0003944	12280.	31137740.	8.5203443	0.0033602	-0.010837
3.9996828	-60.000000 CYT				
0.0004244	12339.	29075625.	8.4715220	0.0035951	-0.011682
3.9974037	-60.000000 CYT				
0.0004544	12385.	27257253.	8.4224181	0.0038269	-0.012531
3.9878351	-60.000000 CYT				

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 Summary of Results for Nominal 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 Tens. No. Strain	Axial Thrust kips	Nominal Mom. Cap. in-kip	Max. Comp. Strain	Max.
----- -----	----- -----	----- -----	----- -----	
1 -0.00952396	3.800	12169.214	0.00300000	
2 -0.00952020	4.200	12173.120	0.00300000	
3 -0.00951645	4.600	12177.027	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 (0.75).

The above values should be multiplied by the appropriate strength reduction factor to compute ultimate moment capacity according to ACI 318, 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 Stiff. Load Ult Mom No. kip-in^2	Resist. Factor	Nominal Ax. Thrust kips	Nominal Moment Cap in-kips	Ult. (Fac) Ax. Thrust kips	Ult. (Fac) Moment Cap in-kips	Bend. at
----- -----	----- -----	----- -----	----- -----	----- -----	----- -----	
1 91219895.	0.65	3.800000	12169.	2.470000	7910.	
2 91253873.	0.65	4.200000	12173.	2.730000	7913.	
3 91287886.	0.65	4.600000	12177.	2.990000	7915.	
1	0.75	3.800000	12169.	2.850000	9127.	

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89806706.					
2	0.75	4.200000	12173.	3.150000	9130.
89838295.					
3	0.75	4.600000	12177.	3.450000	9133.
89869877.					
1	0.90	3.800000	12169.	3.420000	10952.
70221645.					
2	0.90	4.200000	12173.	3.780000	10956.
70254444.					
3	0.90	4.600000	12177.	4.140000	10959.
70287179.					

 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	1.0000	0.00	N.A.	No	0.00	8806.
2	4.0000	0.2771	No	No	8806.	6447.
3	4.2000	0.3723	Yes	No	15253.	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.

 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 = 1000.0 lbs
 Applied moment at pile head = 315600.0 in-lbs
 Axial thrust load on pile head = 4200.0 lbs

Depth	Deflect.	Bending	Shear	Slope	Total	Bending	Soil
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Res.	Soil	Spr.	Distrib.					p
X	y		Moment	Force	S	Stress	Stiffness	
Es*H	Lat.	Load						
feet	inches	in-lbs		lbs	radians	psi*	lb-in^2	
lb/inch	lb/inch	lb/inch						
-----	-----	-----	-----	-----	-----	-----	-----	
0.00	0.00641	315600.	1000.	-1.15E-04	0.00	3.84E+11		
0.00	0.00	0.00						
0.09000	0.00629	316681.	1000.0000	-1.14E-04	0.00	3.84E+11		
0.00	0.00	0.00						
0.1800	0.00617	317761.	1000.	-1.13E-04	0.00	3.84E+11		
0.00	0.00	0.00						
0.2700	0.00605	318842.	1000.	-1.12E-04	0.00	3.84E+11		
0.00	0.00	0.00						
0.3600	0.00593	319922.	1000.0000	-1.11E-04	0.00	3.84E+11		
0.00	0.00	0.00						
0.4500	0.00581	321003.	1000.0000	-1.11E-04	0.00	3.84E+11		
0.00	0.00	0.00						
0.5400	0.00569	322083.	1000.0000	-1.10E-04	0.00	3.84E+11		
0.00	0.00	0.00						
0.6300	0.00557	323164.	1000.0000	-1.09E-04	0.00	3.84E+11		
0.00	0.00	0.00						
0.7200	0.00545	324244.	1000.0000	-1.08E-04	0.00	3.84E+11		
0.00	0.00	0.00						
0.8100	0.00534	325325.	1000.0000	-1.07E-04	0.00	3.84E+11		
0.00	0.00	0.00						
0.9000	0.00522	326405.	1000.0000	-1.06E-04	0.00	3.84E+11		
0.00	0.00	0.00						
0.9900	0.00511	327485.	1000.0000	-1.05E-04	0.00	3.84E+11		
0.00	0.00	0.00						
1.0800	0.00499	328566.	992.7752	-1.04E-04	0.00	3.84E+11		
-13.379	2893.	0.00						
1.1700	0.00488	329631.	978.2614	-1.03E-04	0.00	3.84E+11		
-13.498	2986.	0.00						
1.2600	0.00477	330680.	963.6217	-1.02E-04	0.00	3.84E+11		
-13.613	3081.	0.00						
1.3500	0.00466	331713.	948.8603	-1.01E-04	0.00	3.84E+11		
-13.723	3180.	0.00						
1.4400	0.00455	332730.	933.9817	-1.00E-04	0.00	3.84E+11		
-13.830	3281.	0.00						
1.5300	0.00444	333731.	918.9902	-9.95E-05	0.00	3.84E+11		
-13.932	3385.	0.00						
1.6200	0.00434	334716.	903.8903	-9.85E-05	0.00	3.84E+11		
-14.030	3493.	0.00						
1.7100	0.00423	335685.	888.6866	-9.76E-05	0.00	3.84E+11		
-14.125	3605.	0.00						
1.8000	0.00413	336637.	873.3837	-9.66E-05	0.00	3.84E+11		
-14.214	3720.	0.00						
1.8900	0.00402	337572.	857.9861	-9.57E-05	0.00	3.84E+11		

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-14.300	3839.	0.00				
1.9800	0.00392	338491.	842.4987	-9.47E-05	0.00	3.84E+11
-14.381	3962.	0.00				
2.0700	0.00382	339393.	826.9262	-9.38E-05	0.00	3.84E+11
-14.457	4089.	0.00				
2.1600	0.00372	340278.	811.2735	-9.28E-05	0.00	3.84E+11
-14.529	4221.	0.00				
2.2500	0.00362	341146.	795.5455	-9.19E-05	0.00	3.84E+11
-14.597	4357.	0.00				
2.3400	0.00352	341997.	779.7472	-9.09E-05	0.00	3.84E+11
-14.659	4499.	0.00				
2.4300	0.00342	342831.	763.8838	-9.00E-05	0.00	3.84E+11
-14.717	4646.	0.00				
2.5200	0.00332	343648.	747.9603	-8.90E-05	0.00	3.84E+11
-14.771	4798.	0.00				
2.6100	0.00323	344448.	731.9820	-8.80E-05	0.00	3.84E+11
-14.819	4956.	0.00				
2.7000	0.00313	345230.	715.9544	-8.71E-05	0.00	3.84E+11
-14.862	5120.	0.00				
2.7900	0.00304	345995.	699.8829	-8.61E-05	0.00	3.84E+11
-14.900	5291.	0.00				
2.8800	0.00295	346742.	683.7729	-8.51E-05	0.00	3.84E+11
-14.933	5469.	0.00				
2.9700	0.00286	347472.	667.6302	-8.41E-05	0.00	3.84E+11
-14.961	5655.	0.00				
3.0600	0.00277	348185.	651.4606	-8.32E-05	0.00	3.84E+11
-14.983	5848.	0.00				
3.1500	0.00268	348880.	635.2700	-8.22E-05	0.00	3.84E+11
-15.000	6050.	0.00				
3.2400	0.00259	349558.	619.0644	-8.12E-05	0.00	3.84E+11
-15.011	6261.	0.00				
3.3300	0.00250	350218.	602.8499	-8.02E-05	0.00	3.84E+11
-15.016	6481.	0.00				
3.4200	0.00242	350861.	586.6330	-7.92E-05	0.00	3.84E+11
-15.015	6712.	0.00				
3.5100	0.00233	351486.	570.4200	-7.82E-05	0.00	3.84E+11
-15.009	6953.	0.00				
3.6000	0.00225	352094.	554.2177	-7.73E-05	0.00	3.84E+11
-14.996	7207.	0.00				
3.6900	0.00216	352684.	538.0328	-7.63E-05	0.00	3.84E+11
-14.976	7473.	0.00				
3.7800	0.00208	353257.	521.8724	-7.53E-05	0.00	3.84E+11
-14.950	7753.	0.00				
3.8700	0.00200	353812.	505.7436	-7.43E-05	0.00	3.84E+11
-14.918	8048.	0.00				
3.9600	0.00192	354350.	489.6541	-7.33E-05	0.00	3.84E+11
-14.878	8360.	0.00				
4.0500	0.00184	354870.	298.3202	-7.23E-05	0.00	3.84E+11
-339.444	198865.	0.00				
4.1400	0.00177	354995.	-67.351	-7.13E-05	0.00	3.84E+11

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

-337.724	206545.	0.00				
4.2300	0.00169	354725.	-494.495	-7.03E-05	0.00	3.84E+11
-453.283	289763.	0.00				
4.3200	0.00161	353927.	-982.589	-6.93E-05	0.00	3.84E+11
-450.595	301496.	0.00				
4.4100	0.00154	352604.	-1468.	-6.83E-05	0.00	3.84E+11
-447.740	314043.	0.00				
4.5000	0.00147	350758.	-1950.	-6.73E-05	0.00	3.84E+11
-444.709	327492.	0.00				
4.5900	0.00139	348393.	-2428.	-6.63E-05	0.00	3.84E+11
-441.491	341950.	0.00				
4.6800	0.00132	345513.	-2903.	-6.54E-05	0.00	3.84E+11
-438.076	357538.	0.00				
4.7700	0.00125	342123.	-3374.	-6.44E-05	0.00	3.84E+11
-434.448	374401.	0.00				
4.8600	0.00118	338226.	-3841.	-6.34E-05	0.00	3.84E+11
-430.594	392710.	0.00				
4.9500	0.00112	333826.	-4304.	-6.25E-05	0.00	3.84E+11
-426.495	412669.	0.00				
5.0400	0.00105	328929.	-4762.	-6.16E-05	0.00	3.84E+11
-422.132	434524.	0.00				
5.1300	9.83E-04	323540.	-5216.	-6.06E-05	0.00	3.84E+11
-417.480	458577.	0.00				
5.2200	9.18E-04	317663.	-5664.	-5.97E-05	0.00	3.84E+11
-412.512	485200.	0.00				
5.3100	8.54E-04	311306.	-6107.	-5.89E-05	0.00	3.84E+11
-407.194	514855.	0.00				
5.4000	7.91E-04	304473.	-6543.	-5.80E-05	0.00	3.85E+11
-401.487	548131.	0.00				
5.4900	7.29E-04	297172.	-6974.	-5.72E-05	0.00	3.85E+11
-395.344	585784.	0.00				
5.5800	6.68E-04	289411.	-7385.	-5.63E-05	0.00	3.85E+11
-366.831	593422.	0.00				
5.6700	6.07E-04	281221.	-7764.	-5.55E-05	0.00	3.85E+11
-335.308	596379.	0.00				
5.7600	5.48E-04	272640.	-8110.	-5.47E-05	0.00	3.85E+11
-303.926	599333.	0.00				
5.8500	4.89E-04	263704.	-8421.	-5.40E-05	0.00	3.85E+11
-272.679	602287.	0.00				
5.9400	4.31E-04	254451.	-8699.	-5.33E-05	0.00	3.85E+11
-241.559	605238.	0.00				
6.0300	3.74E-04	244916.	-8943.	-5.26E-05	0.00	3.85E+11
-210.556	608189.	0.00				
6.1200	3.17E-04	235135.	-9154.	-5.19E-05	0.00	3.85E+11
-179.660	611138.	0.00				
6.2100	2.62E-04	225145.	-9331.	-5.12E-05	0.00	3.85E+11
-148.861	614086.	0.00				
6.3000	2.07E-04	214981.	-9475.	-5.06E-05	0.00	3.85E+11
-118.148	617032.	0.00				
6.3900	1.52E-04	204679.	-9586.	-5.00E-05	0.00	3.85E+11

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-87.509	619977.	0.00				
6.4800	9.87E-05	194275.	-9664.	-4.95E-05	0.00	3.85E+11
-56.931	622922.	0.00				
6.5700	4.56E-05	183805.	-9709.	-4.90E-05	0.00	3.85E+11
-26.401	625865.	0.00				
6.6600	-7.03E-06	173304.	-9721.	-4.85E-05	0.00	3.85E+11
4.0940	628807.	0.00				
6.7500	-5.91E-05	162807.	-9700.	-4.80E-05	0.00	3.85E+11
34.5683	631748.	0.00				
6.8400	-1.11E-04	152351.	-9647.	-4.75E-05	0.00	3.85E+11
65.0361	634689.	0.00				
6.9300	-1.62E-04	141971.	-9560.	-4.71E-05	0.00	3.85E+11
95.5119	637628.	0.00				
7.0200	-2.12E-04	131702.	-9440.	-4.67E-05	0.00	3.85E+11
126.0106	640567.	0.00				
7.1100	-2.63E-04	121581.	-9288.	-4.64E-05	0.00	3.85E+11
156.5469	643505.	0.00				
7.2000	-3.13E-04	111642.	-9102.	-4.61E-05	0.00	3.85E+11
187.1361	646442.	0.00				
7.2900	-3.62E-04	101921.	-8883.	-4.58E-05	0.00	3.85E+11
217.7930	649378.	0.00				
7.3800	-4.11E-04	92454.	-8632.	-4.55E-05	0.00	3.85E+11
248.5326	652314.	0.00				
7.4700	-4.60E-04	83277.	-8347.	-4.52E-05	0.00	3.85E+11
279.3697	655249.	0.00				
7.5600	-5.09E-04	74426.	-8028.	-4.50E-05	0.00	3.85E+11
310.3189	658184.	0.00				
7.6500	-5.58E-04	65937.	-7676.	-4.48E-05	0.00	3.85E+11
341.3945	661117.	0.00				
7.7400	-6.06E-04	57846.	-7291.	-4.46E-05	0.00	3.85E+11
372.6105	664051.	0.00				
7.8300	-6.54E-04	50189.	-6871.	-4.45E-05	0.00	3.85E+11
403.9802	666983.	0.00				
7.9200	-7.02E-04	43004.	-6418.	-4.44E-05	0.00	3.85E+11
435.5166	669916.	0.00				
8.0100	-7.50E-04	36327.	-5938.	-4.43E-05	0.00	3.85E+11
453.6712	653319.	0.00				
8.1000	-7.98E-04	30179.	-5443.	-4.42E-05	0.00	3.85E+11
462.7367	626495.	0.00				
8.1900	-8.45E-04	24571.	-4938.	-4.41E-05	0.00	3.85E+11
471.5376	602428.	0.00				
8.2800	-8.93E-04	19512.	-4424.	-4.40E-05	0.00	3.85E+11
480.1042	580694.	0.00				
8.3700	-9.40E-04	15014.	-3901.	-4.40E-05	0.00	3.85E+11
488.4617	560954.	0.00				
8.4600	-9.88E-04	11086.	-3370.	-4.39E-05	0.00	3.85E+11
496.6318	542933.	0.00				
8.5500	-0.00104	7736.	-2829.	-4.39E-05	0.00	3.85E+11
504.6330	526405.	0.00				
8.6400	-0.00108	4976.	-2280.	-4.39E-05	0.00	3.85E+11

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512.4812	511184.	0.00				
8.7300	-0.00113	2813.	-1722.	-4.39E-05	0.00	3.85E+11
520.1902	497113.	0.00				
8.8200	-0.00118	1257.	-1156.	-4.39E-05	0.00	3.85E+11
527.7721	484062.	0.00				
8.9100	-0.00122	316.2424	-582.029	-4.39E-05	0.00	3.85E+11
535.2373	471919.	0.00				
9.0000	-0.00127	0.00	0.00	-4.39E-05	0.00	3.85E+11
542.5949	230295.	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	=	0.00641436 inches
Computed slope at pile head	=	-0.0001150 radians
Maximum bending moment	=	354995. inch-lbs
Maximum shear force	=	-9721. lbs
Depth of maximum bending moment	=	4.14000000 feet below pile head
Depth of maximum shear force	=	6.66000000 feet below pile head
Number of iterations	=	12
Number of zero deflection points	=	1
Pile deflection at ground	=	0.00509460 inches

 Pile-head Deflection vs. Pile Length for Load Case 1

Boundary Condition Type 1, Shear and Moment

Shear	=	1000. lbs
Moment	=	315600. in-lbs
Axial Load	=	4200. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	0.00641436	354995.	-9721.
8.55000	0.00975407	352846.	-11151.
8.10000	0.01949774	350224.	-12726.

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7.65000	0.04668646	345818.	-14239.
7.20000	0.12435975	340609.	-15787.
6.75000	0.40184874	337130.	-17658.
6.30000	1.39127214	335675.	-19779.
5.85000	7.18131432	342245.	-23378.

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

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

Shear force at pile head = 2250.0 lbs
 Applied moment at pile head = 724800.0 in-lbs
 Axial thrust load on pile head = 4600.0 lbs

Depth Res.	Soil X	Deflect. Spr. y	Bending Distrib. Lat. Load	Shear Force	Slope S	Total Stress	Bending Stiffness	Soil p
	Es*H		Moment					
feet		inches	in-lbs	lbs	radians	psi*	lb-in^2	
lb/inch		lb/inch	lb/inch					
0.00	0.00	0.09271	724800.	2250.	-0.00123	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.09000	0.00	0.09137	727236.	2250.	-0.00123	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.1800	0.00	0.09005	729672.	2250.	-0.00123	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.2700	0.00	0.08872	732108.	2250.	-0.00123	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.3600	0.00	0.08740	734544.	2250.	-0.00122	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.4500	0.00	0.08607	736981.	2250.	-0.00122	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.5400	0.00	0.08475	739417.	2250.	-0.00122	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.6300	0.00	0.08344	741853.	2250.	-0.00122	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.7200	0.00	0.08212	744289.	2250.	-0.00122	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.8100	0.00	0.08081	746725.	2250.	-0.00121	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.9000	0.00	0.07950	749161.	2250.	-0.00121	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.9900	0.00	0.07819	751597.	2250.	-0.00121	0.00	3.83E+11	
0.00	0.00	0.00	0.00					

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1.0800	0.07689	754033.	2232.	-0.00121	0.00	3.83E+11
-33.262	467.2252	0.00				
1.1700	0.07558	756430.	2196.	-0.00121	0.00	3.83E+11
-33.619	480.3863	0.00				
1.2600	0.07428	758788.	2159.	-0.00120	0.00	3.83E+11
-33.968	493.8756	0.00				
1.3500	0.07298	761106.	2123.	-0.00120	0.00	3.83E+11
-34.309	507.7071	0.00				
1.4400	0.07168	763385.	2085.	-0.00120	0.00	3.83E+11
-34.641	521.8957	0.00				
1.5300	0.07039	765623.	2048.	-0.00120	0.00	3.83E+11
-34.964	536.4573	0.00				
1.6200	0.06910	767820.	2010.	-0.00120	0.00	3.83E+11
-35.279	551.4088	0.00				
1.7100	0.06781	769976.	1972.	-0.00119	0.00	3.83E+11
-35.585	566.7681	0.00				
1.8000	0.06652	772090.	1933.	-0.00119	0.00	3.83E+11
-35.882	582.5544	0.00				
1.8900	0.06524	774163.	1894.	-0.00119	0.00	3.83E+11
-36.169	598.7882	0.00				
1.9800	0.06395	776193.	1855.	-0.00119	0.00	3.83E+11
-36.447	615.4912	0.00				
2.0700	0.06267	778181.	1815.	-0.00118	0.00	3.83E+11
-36.716	632.6868	0.00				
2.1600	0.06140	780126.	1776.	-0.00118	0.00	3.83E+11
-36.974	650.4000	0.00				
2.2500	0.06012	782028.	1735.	-0.00118	0.00	3.83E+11
-37.222	668.6576	0.00				
2.3400	0.05885	783886.	1695.	-0.00118	0.00	3.83E+11
-37.460	687.4885	0.00				
2.4300	0.05758	785701.	1655.	-0.00118	0.00	3.83E+11
-37.687	706.9236	0.00				
2.5200	0.05631	787472.	1614.	-0.00117	0.00	3.83E+11
-37.904	726.9963	0.00				
2.6100	0.05504	789198.	1573.	-0.00117	0.00	3.83E+11
-38.109	747.7426	0.00				
2.7000	0.05378	790880.	1531.	-0.00117	0.00	3.83E+11
-38.302	769.2015	0.00				
2.7900	0.05252	792518.	1490.	-0.00117	0.00	3.83E+11
-38.484	791.4151	0.00				
2.8800	0.05126	794110.	1448.	-0.00116	0.00	3.83E+11
-38.654	814.4291	0.00				
2.9700	0.05000	795658.	1406.	-0.00116	0.00	3.83E+11
-38.812	838.2933	0.00				
3.0600	0.04875	797160.	1364.	-0.00116	0.00	3.83E+11
-38.957	863.0616	0.00				
3.1500	0.04750	798616.	1322.	-0.00116	0.00	3.83E+11
-39.088	888.7932	0.00				
3.2400	0.04625	800027.	1280.	-0.00116	0.00	3.83E+11
-39.206	915.5525	0.00				

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3.3300	0.04500	801393.	1238.	-0.00115	0.00	3.83E+11
-39.310	943.4103	0.00				
3.4200	0.04376	802712.	1195.	-0.00115	0.00	3.83E+11
-39.400	972.4444	0.00				
3.5100	0.04252	803986.	1153.	-0.00115	0.00	3.83E+11
-39.474	1003.	0.00				
3.6000	0.04128	805213.	1110.	-0.00115	0.00	3.83E+11
-39.533	1034.	0.00				
3.6900	0.04004	806394.	1067.	-0.00114	0.00	3.83E+11
-39.576	1068.	0.00				
3.7800	0.03881	807530.	1024.	-0.00114	0.00	3.83E+11
-39.603	1102.	0.00				
3.8700	0.03757	808619.	981.6451	-0.00114	0.00	3.83E+11
-39.612	1139.	0.00				
3.9600	0.03634	809661.	938.8691	-0.00114	0.00	3.83E+11
-39.603	1177.	0.00				
4.0500	0.03512	810658.	534.9106	-0.00113	0.00	3.83E+11
-708.469	21789.	0.00				
4.1400	0.03389	810828.	-229.006	-0.00113	0.00	3.83E+11
-706.191	22503.	0.00				
4.2300	0.03267	810174.	-1123.	-0.00113	0.00	3.83E+11
-949.605	31392.	0.00				
4.3200	0.03145	808413.	-2147.	-0.00113	0.00	3.83E+11
-945.760	32477.	0.00				
4.4100	0.03023	805549.	-3166.	-0.00113	0.00	3.83E+11
-941.559	33634.	0.00				
4.5000	0.02902	801586.	-4180.	-0.00112	0.00	3.83E+11
-936.982	34872.	0.00				
4.5900	0.02781	796531.	-5189.	-0.00112	0.00	3.83E+11
-932.006	36199.	0.00				
4.6800	0.02660	790388.	-6193.	-0.00112	0.00	3.83E+11
-926.604	37626.	0.00				
4.7700	0.02539	783165.	-7191.	-0.00112	0.00	3.83E+11
-920.747	39166.	0.00				
4.8600	0.02418	774868.	-8182.	-0.00111	0.00	3.83E+11
-914.401	40834.	0.00				
4.9500	0.02298	765504.	-9165.	-0.00111	0.00	3.83E+11
-907.529	42648.	0.00				
5.0400	0.02178	755081.	-10142.	-0.00111	0.00	3.83E+11
-900.086	44629.	0.00				
5.1300	0.02058	743609.	-11109.	-0.00111	0.00	3.83E+11
-892.024	46803.	0.00				
5.2200	0.01939	731096.	-12068.	-0.00111	0.00	3.83E+11
-883.282	49203.	0.00				
5.3100	0.01819	717553.	-13017.	-0.00110	0.00	3.83E+11
-873.794	51868.	0.00				
5.4000	0.01700	702991.	-13955.	-0.00110	0.00	3.83E+11
-863.479	54846.	0.00				
5.4900	0.01581	687421.	-14881.	-0.00110	0.00	3.83E+11
-852.241	58203.	0.00				

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5.5800	0.01463	670858.	-15795.	-0.00110	0.00	3.84E+11
-839.963	62021.	0.00				
5.6700	0.01344	653314.	-16695.	-0.00110	0.00	3.84E+11
-826.504	66407.	0.00				
5.7600	0.01226	634807.	-17580.	-0.00109	0.00	3.84E+11
-811.686	71511.	0.00				
5.8500	0.01108	615353.	-18448.	-0.00109	0.00	3.84E+11
-795.284	77537.	0.00				
5.9400	0.00990	594971.	-19297.	-0.00109	0.00	3.84E+11
-777.006	84780.	0.00				
6.0300	0.00872	573683.	-20125.	-0.00109	0.00	3.84E+11
-756.459	93683.	0.00				
6.1200	0.00754	551513.	-20929.	-0.00109	0.00	3.84E+11
-733.098	104938.	0.00				
6.2100	0.00637	528487.	-21706.	-0.00109	0.00	3.84E+11
-706.135	119706.	0.00				
6.3000	0.00520	504638.	-22452.	-0.00108	0.00	3.84E+11
-674.349	140100.	0.00				
6.3900	0.00403	480003.	-23159.	-0.00108	0.00	3.84E+11
-635.687	170465.	0.00				
6.4800	0.00286	454626.	-23819.	-0.00108	0.00	3.84E+11
-586.217	221523.	0.00				
6.5700	0.00169	428565.	-24414.	-0.00108	0.00	3.84E+11
-516.484	330075.	0.00				
6.6600	5.23E-04	401901.	-24858.	-0.00108	0.00	3.84E+11
-304.589	628807.	0.00				
6.7500	-6.42E-04	374883.	-24819.	-0.00108	0.00	3.84E+11
375.7843	631748.	0.00				
6.8400	-0.00181	348302.	-24329.	-0.00108	0.00	3.84E+11
532.6007	318350.	0.00				
6.9300	-0.00297	322343.	-23714.	-0.00108	0.00	3.84E+11
605.8636	220298.	0.00				
7.0200	-0.00413	297091.	-23030.	-0.00108	0.00	3.85E+11
661.0446	172755.	0.00				
7.1100	-0.00529	272610.	-22291.	-0.00108	0.00	3.85E+11
706.4963	144126.	0.00				
7.2000	-0.00645	248952.	-21507.	-0.00107	0.00	3.85E+11
745.7782	124783.	0.00				
7.2900	-0.00761	226165.	-20683.	-0.00107	0.00	3.85E+11
780.7656	110737.	0.00				
7.3800	-0.00877	204288.	-19822.	-0.00107	0.00	3.85E+11
812.5778	100022.	0.00				
7.4700	-0.00993	183359.	-18929.	-0.00107	0.00	3.85E+11
841.9401	91548.	0.00				
7.5600	-0.01109	163412.	-18005.	-0.00107	0.00	3.85E+11
869.3514	84658.	0.00				
7.6500	-0.01225	144479.	-17052.	-0.00107	0.00	3.85E+11
895.1707	78934.	0.00				
7.7400	-0.01341	126590.	-16072.	-0.00107	0.00	3.85E+11
919.6652	74094.	0.00				

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7.8300	-0.01456	109774.	-15066.	-0.00107	0.00	3.85E+11
943.0396	69942.	0.00				
7.9200	-0.01572	94058.	-14036.	-0.00107	0.00	3.85E+11
965.4545	66336.	0.00				
8.0100	-0.01687	79468.	-12981.	-0.00107	0.00	3.85E+11
987.0382	63173.	0.00				
8.1000	-0.01803	66029.	-11904.	-0.00107	0.00	3.85E+11
1008.	60372.	0.00				
8.1900	-0.01919	53766.	-10805.	-0.00107	0.00	3.85E+11
1028.	57874.	0.00				
8.2800	-0.02034	42702.	-9684.	-0.00107	0.00	3.85E+11
1048.	55629.	0.00				
8.3700	-0.02150	32860.	-8542.	-0.00107	0.00	3.85E+11
1067.	53601.	0.00				
8.4600	-0.02265	24263.	-7379.	-0.00107	0.00	3.85E+11
1086.	51758.	0.00				
8.5500	-0.02381	16932.	-6197.	-0.00107	0.00	3.85E+11
1104.	50075.	0.00				
8.6400	-0.02496	10888.	-4995.	-0.00107	0.00	3.85E+11
1122.	48532.	0.00				
8.7300	-0.02612	6153.	-3774.	-0.00107	0.00	3.85E+11
1139.	47111.	0.00				
8.8200	-0.02727	2746.	-2535.	-0.00107	0.00	3.85E+11
1157.	45798.	0.00				
8.9100	-0.02843	688.7798	-1276.	-0.00107	0.00	3.85E+11
1173.	44581.	0.00				
9.0000	-0.02958	0.00	0.00	-0.00107	0.00	3.85E+11
1190.	21725.	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	=	0.09270519 inches
Computed slope at pile head	=	-0.0012331 radians
Maximum bending moment	=	810828. inch-lbs
Maximum shear force	=	-24858. lbs
Depth of maximum bending moment	=	4.14000000 feet below pile head
Depth of maximum shear force	=	6.66000000 feet below pile head
Number of iterations	=	32
Number of zero deflection points	=	1
Pile deflection at ground	=	0.07804617 inches

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 Pile-head Deflection vs. Pile Length for Load Case 2

Boundary Condition Type 1, Shear and Moment

Shear = 2250. lbs
 Moment = 724800. in-lbs
 Axial Load = 4600. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	0.09270519	810828.	-24858.
8.55000	0.18895796	803524.	-26862.
8.10000	0.43869380	795393.	-29363.
7.65000	1.11196276	786937.	-32307.
7.20000	3.05555443	780754.	-35739.
6.75000	11.28267642	788227.	-41530.

 Computed Values of Pile Loading and Deflection
 for Lateral Loading for Load Case Number 3

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

Shear force at pile head = 2250.0 lbs
 Applied moment at pile head = 724800.0 in-lbs
 Axial thrust load on pile head = 3800.0 lbs

Depth Res.	Soil X	Deflect. Spr.	Bending Distrib.	Shear Force	Slope S	Total Stress	Bending Stiffness	Soil p
	Es*H feet lb/inch	y inches lb/inch	Moment Lat. Load in-lbs lb/inch	lbs	radians	psi*	lb-in^2	
0.00	0.00	0.09267	724800.	2250.	-0.00123	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.09000	0.00	0.09134	727235.	2250.	-0.00123	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.1800	0.00	0.09001	729670.	2250.	-0.00123	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.2700	0.00	0.08868	732105.	2250.	-0.00123	0.00	3.83E+11	

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0.00	0.00	0.00				
0.3600	0.08736	734540.	2250.	-0.00122	0.00	3.83E+11
0.00	0.00	0.00				
0.4500	0.08604	736975.	2250.	-0.00122	0.00	3.83E+11
0.00	0.00	0.00				
0.5400	0.08472	739410.	2250.	-0.00122	0.00	3.83E+11
0.00	0.00	0.00				
0.6300	0.08340	741845.	2250.	-0.00122	0.00	3.83E+11
0.00	0.00	0.00				
0.7200	0.08209	744280.	2250.	-0.00122	0.00	3.83E+11
0.00	0.00	0.00				
0.8100	0.08078	746715.	2250.	-0.00121	0.00	3.83E+11
0.00	0.00	0.00				
0.9000	0.07947	749150.	2250.	-0.00121	0.00	3.83E+11
0.00	0.00	0.00				
0.9900	0.07816	751585.	2250.	-0.00121	0.00	3.83E+11
0.00	0.00	0.00				
1.0800	0.07685	754020.	2232.	-0.00121	0.00	3.83E+11
-33.257	467.3508	0.00				
1.1700	0.07555	756416.	2196.	-0.00121	0.00	3.83E+11
-33.614	480.5156	0.00				
1.2600	0.07425	758773.	2159.	-0.00120	0.00	3.83E+11
-33.963	494.0086	0.00				
1.3500	0.07295	761091.	2123.	-0.00120	0.00	3.83E+11
-34.304	507.8439	0.00				
1.4400	0.07166	763368.	2085.	-0.00120	0.00	3.83E+11
-34.636	522.0364	0.00				
1.5300	0.07036	765605.	2048.	-0.00120	0.00	3.83E+11
-34.960	536.6021	0.00				
1.6200	0.06907	767801.	2010.	-0.00119	0.00	3.83E+11
-35.274	551.5577	0.00				
1.7100	0.06778	769956.	1972.	-0.00119	0.00	3.83E+11
-35.580	566.9213	0.00				
1.8000	0.06649	772069.	1933.	-0.00119	0.00	3.83E+11
-35.877	582.7121	0.00				
1.8900	0.06521	774141.	1894.	-0.00119	0.00	3.83E+11
-36.164	598.9503	0.00				
1.9800	0.06393	776170.	1855.	-0.00119	0.00	3.83E+11
-36.442	615.6580	0.00				
2.0700	0.06265	778157.	1815.	-0.00118	0.00	3.83E+11
-36.711	632.8584	0.00				
2.1600	0.06137	780101.	1776.	-0.00118	0.00	3.83E+11
-36.969	650.5765	0.00				
2.2500	0.06010	782002.	1736.	-0.00118	0.00	3.83E+11
-37.217	668.8392	0.00				
2.3400	0.05882	783860.	1695.	-0.00118	0.00	3.83E+11
-37.455	687.6754	0.00				
2.4300	0.05755	785673.	1655.	-0.00118	0.00	3.83E+11
-37.682	707.1159	0.00				
2.5200	0.05629	787443.	1614.	-0.00117	0.00	3.83E+11

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-37.898	727.1942	0.00				
2.6100	0.05502	789169.	1573.	-0.00117	0.00	3.83E+11
-38.104	747.9463	0.00				
2.7000	0.05376	790850.	1532.	-0.00117	0.00	3.83E+11
-38.297	769.4112	0.00				
2.7900	0.05250	792487.	1490.	-0.00117	0.00	3.83E+11
-38.479	791.6311	0.00				
2.8800	0.05124	794078.	1448.	-0.00116	0.00	3.83E+11
-38.649	814.6515	0.00				
2.9700	0.04998	795625.	1407.	-0.00116	0.00	3.83E+11
-38.806	838.5223	0.00				
3.0600	0.04873	797126.	1365.	-0.00116	0.00	3.83E+11
-38.951	863.2976	0.00				
3.1500	0.04748	798582.	1322.	-0.00116	0.00	3.83E+11
-39.083	889.0364	0.00				
3.2400	0.04623	799992.	1280.	-0.00115	0.00	3.83E+11
-39.201	915.8032	0.00				
3.3300	0.04498	801356.	1238.	-0.00115	0.00	3.83E+11
-39.305	943.6689	0.00				
3.4200	0.04374	802675.	1195.	-0.00115	0.00	3.83E+11
-39.394	972.7111	0.00				
3.5100	0.04250	803948.	1153.	-0.00115	0.00	3.83E+11
-39.469	1003.	0.00				
3.6000	0.04126	805174.	1110.	-0.00115	0.00	3.83E+11
-39.528	1035.	0.00				
3.6900	0.04002	806355.	1067.	-0.00114	0.00	3.83E+11
-39.571	1068.	0.00				
3.7800	0.03879	807489.	1025.	-0.00114	0.00	3.83E+11
-39.597	1103.	0.00				
3.8700	0.03756	808577.	981.8180	-0.00114	0.00	3.83E+11
-39.606	1139.	0.00				
3.9600	0.03633	809619.	939.0479	-0.00114	0.00	3.83E+11
-39.597	1177.	0.00				
4.0500	0.03510	810615.	535.1320	-0.00113	0.00	3.83E+11
-708.395	21795.	0.00				
4.1400	0.03388	810784.	-228.705	-0.00113	0.00	3.83E+11
-706.118	22510.	0.00				
4.2300	0.03266	810130.	-1123.	-0.00113	0.00	3.83E+11
-949.507	31401.	0.00				
4.3200	0.03144	808369.	-2146.	-0.00113	0.00	3.83E+11
-945.662	32487.	0.00				
4.4100	0.03022	805504.	-3165.	-0.00113	0.00	3.83E+11
-941.461	33645.	0.00				
4.5000	0.02901	801541.	-4179.	-0.00112	0.00	3.83E+11
-936.885	34882.	0.00				
4.5900	0.02780	796485.	-5189.	-0.00112	0.00	3.83E+11
-931.909	36210.	0.00				
4.6800	0.02659	790343.	-6192.	-0.00112	0.00	3.83E+11
-926.508	37637.	0.00				
4.7700	0.02538	783119.	-7190.	-0.00112	0.00	3.83E+11

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-920.651	39178.	0.00				
4.8600	0.02417	774822.	-8181.	-0.00111	0.00	3.83E+11
-914.306	40847.	0.00				
4.9500	0.02297	765459.	-9164.	-0.00111	0.00	3.83E+11
-907.434	42661.	0.00				
5.0400	0.02177	755037.	-10140.	-0.00111	0.00	3.83E+11
-899.993	44643.	0.00				
5.1300	0.02058	743565.	-11108.	-0.00111	0.00	3.83E+11
-891.931	46818.	0.00				
5.2200	0.01938	731053.	-12066.	-0.00111	0.00	3.83E+11
-883.190	49218.	0.00				
5.3100	0.01819	717510.	-13015.	-0.00110	0.00	3.83E+11
-873.703	51884.	0.00				
5.4000	0.01700	702949.	-13953.	-0.00110	0.00	3.83E+11
-863.389	54864.	0.00				
5.4900	0.01581	687380.	-14880.	-0.00110	0.00	3.83E+11
-852.152	58222.	0.00				
5.5800	0.01462	670818.	-15793.	-0.00110	0.00	3.84E+11
-839.876	62040.	0.00				
5.6700	0.01344	653276.	-16693.	-0.00110	0.00	3.84E+11
-826.418	66428.	0.00				
5.7600	0.01225	634770.	-17578.	-0.00109	0.00	3.84E+11
-811.602	71533.	0.00				
5.8500	0.01107	615317.	-18445.	-0.00109	0.00	3.84E+11
-795.202	77561.	0.00				
5.9400	0.00989	594937.	-19294.	-0.00109	0.00	3.84E+11
-776.926	84807.	0.00				
6.0300	0.00872	573650.	-20122.	-0.00109	0.00	3.84E+11
-756.381	93712.	0.00				
6.1200	0.00754	551482.	-20927.	-0.00109	0.00	3.84E+11
-733.023	104970.	0.00				
6.2100	0.00637	528458.	-21704.	-0.00109	0.00	3.84E+11
-706.063	119742.	0.00				
6.3000	0.00520	504611.	-22449.	-0.00108	0.00	3.84E+11
-674.280	140143.	0.00				
6.3900	0.00403	479977.	-23156.	-0.00108	0.00	3.84E+11
-635.623	170516.	0.00				
6.4800	0.00286	454602.	-23816.	-0.00108	0.00	3.84E+11
-586.160	221588.	0.00				
6.5700	0.00169	428543.	-24412.	-0.00108	0.00	3.84E+11
-516.436	330167.	0.00				
6.6600	5.23E-04	401882.	-24855.	-0.00108	0.00	3.84E+11
-304.513	628807.	0.00				
6.7500	-6.42E-04	374865.	-24816.	-0.00108	0.00	3.84E+11
375.5716	631748.	0.00				
6.8400	-0.00181	348287.	-24326.	-0.00108	0.00	3.84E+11
532.5373	318464.	0.00				
6.9300	-0.00297	322330.	-23711.	-0.00108	0.00	3.84E+11
605.7945	220374.	0.00				
7.0200	-0.00413	297079.	-23027.	-0.00108	0.00	3.85E+11

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660.9706	172813.	0.00				
7.1100	-0.00529	272600.	-22289.	-0.00107	0.00	3.85E+11
706.4181	144174.	0.00				
7.2000	-0.00645	248944.	-21505.	-0.00107	0.00	3.85E+11
745.6961	124824.	0.00				
7.2900	-0.00761	226158.	-20681.	-0.00107	0.00	3.85E+11
780.6801	110774.	0.00				
7.3800	-0.00877	204283.	-19820.	-0.00107	0.00	3.85E+11
812.4891	100055.	0.00				
7.4700	-0.00993	183355.	-18927.	-0.00107	0.00	3.85E+11
841.8484	91578.	0.00				
7.5600	-0.01109	163409.	-18003.	-0.00107	0.00	3.85E+11
869.2569	84685.	0.00				
7.6500	-0.01224	144478.	-17050.	-0.00107	0.00	3.85E+11
895.0736	78959.	0.00				
7.7400	-0.01340	126590.	-16070.	-0.00107	0.00	3.85E+11
919.5655	74118.	0.00				
7.8300	-0.01456	109775.	-15065.	-0.00107	0.00	3.85E+11
942.9375	69964.	0.00				
7.9200	-0.01571	94059.	-14034.	-0.00107	0.00	3.85E+11
965.3501	66358.	0.00				
8.0100	-0.01687	79470.	-12980.	-0.00107	0.00	3.85E+11
986.9315	63193.	0.00				
8.1000	-0.01802	66032.	-11903.	-0.00107	0.00	3.85E+11
1008.	60392.	0.00				
8.1900	-0.01918	53769.	-10803.	-0.00107	0.00	3.85E+11
1028.	57892.	0.00				
8.2800	-0.02033	42705.	-9682.	-0.00107	0.00	3.85E+11
1048.	55647.	0.00				
8.3700	-0.02149	32863.	-8541.	-0.00107	0.00	3.85E+11
1067.	53618.	0.00				
8.4600	-0.02264	24266.	-7379.	-0.00107	0.00	3.85E+11
1085.	51774.	0.00				
8.5500	-0.02380	16935.	-6196.	-0.00107	0.00	3.85E+11
1104.	50091.	0.00				
8.6400	-0.02495	10891.	-4995.	-0.00107	0.00	3.85E+11
1122.	48547.	0.00				
8.7300	-0.02611	6155.	-3774.	-0.00107	0.00	3.85E+11
1139.	47126.	0.00				
8.8200	-0.02726	2748.	-2534.	-0.00107	0.00	3.85E+11
1156.	45813.	0.00				
8.9100	-0.02842	689.6310	-1276.	-0.00107	0.00	3.85E+11
1173.	44595.	0.00				
9.0000	-0.02957	0.00	0.00	-0.00107	0.00	3.85E+11
1190.	21732.	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 inter-

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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. 3:

Pile-head deflection = 0.09266816 inches
 Computed slope at pile head = -0.0012326 radians
 Maximum bending moment = 810784. inch-lbs
 Maximum shear force = -24855. lbs
 Depth of maximum bending moment = 4.14000000 feet below pile head
 Depth of maximum shear force = 6.66000000 feet below pile head
 Number of iterations = 32
 Number of zero deflection points = 1
 Pile deflection at ground = 0.07801471 inches

 Pile-head Deflection vs. Pile Length for Load Case 3

Boundary Condition Type 1, Shear and Moment

Shear = 2250. lbs
 Moment = 724800. in-lbs
 Axial Load = 3800. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	0.09266816	810784.	-24855.
8.55000	0.18879881	803437.	-26856.
8.10000	0.43782593	795186.	-29347.
7.65000	1.10638111	786470.	-32264.
7.20000	3.01313801	779592.	-35607.
6.75000	10.65873662	783577.	-40912.

 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

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-15 (Boring B-015-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Load Type 5: Load 1 = Top Deflection, y, inches, and Load 2 = Slope, S, radians

Load Case	Load Type	Load 1 Pile-head in-lbs	Load 2 Type	Load 2 Pile-head Load 2	Axial Loading lbs	Pile-head Deflection inches	Pile-head Rotation radians	Max in lbs
No. 1	1	Load 1	2	Load 2	lbs	inches	radians	lbs
-----	-----	-----	-----	-----	-----	-----	-----	-----
1	V, lb	1000.0000	M, in-lb	315600.	4200.	0.00641	-1.15E-04	
-9721.		354995.						
2	V, lb	2250.	M, in-lb	724800.	4600.	0.09271	-0.00123	
-24858.		810828.						
3	V, lb	2250.	M, in-lb	724800.	3800.	0.09267	-0.00123	
-24855.		810784.						

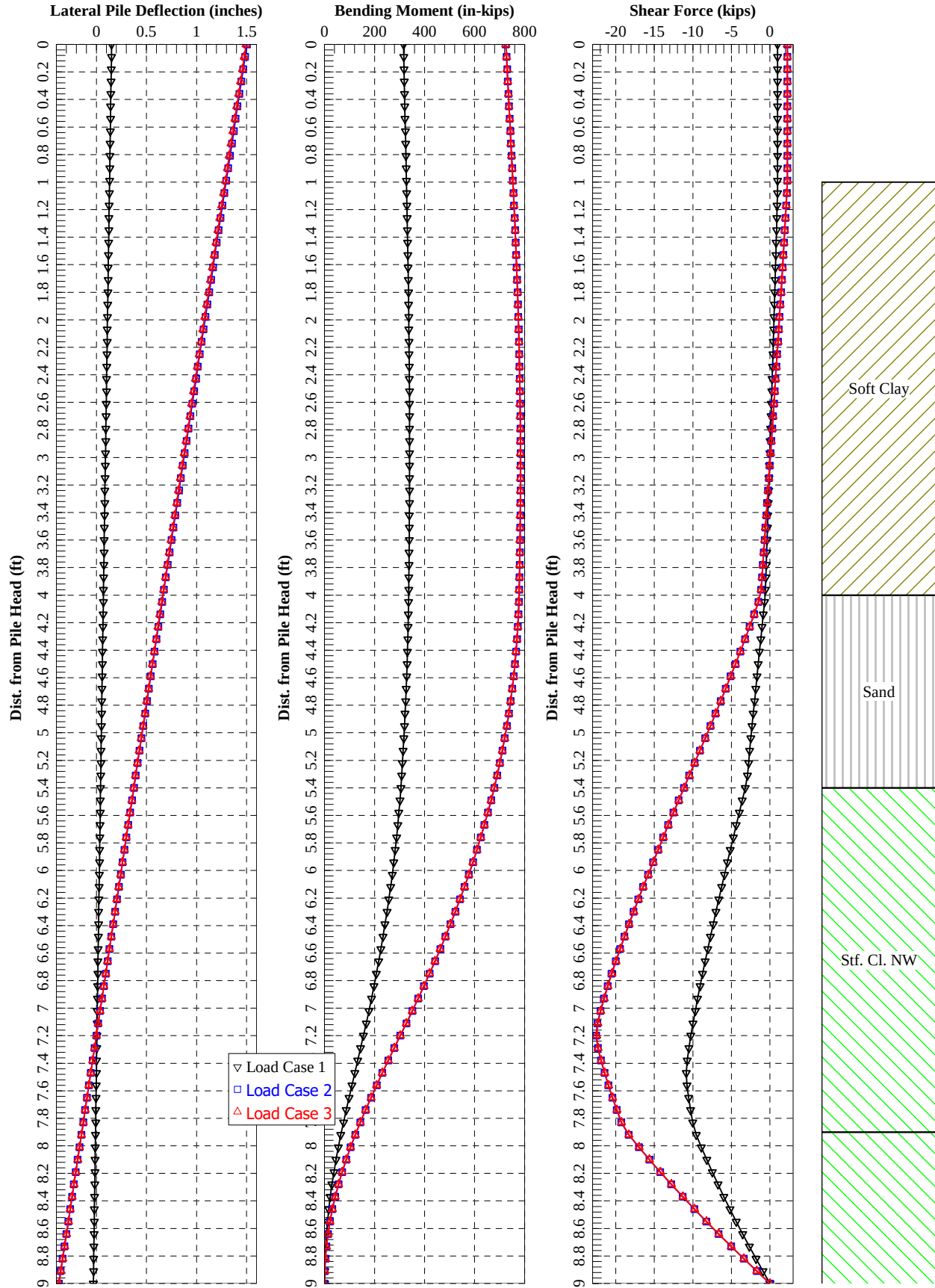
Maximum pile-head deflection = 0.0927051900 inches

Maximum pile-head rotation = -0.0012330784 radians = -0.070650 deg.

The analysis ended normally.

LATERAL LOAD (LPILE) ANALYSES
SOUTHBOUND PARKING AREA
LIGHT TOWER SC1-16 (B-008-0-25)

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-16 (Boring B-008-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation



TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-16 (Boring B-008-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

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

This model was prepared by:
BSears

Files Used for Analysis

Path to file locations:
\Columbus-1170\Projects\2024\24170232_ms_TP 26 NE Ohio\GEO\Project Docs\Site
15_SUM-271 (2LMN)\Calcs\Light Towers\LPILE (Final Report)\SB\

Name of input data file:
Tower SC1-16 (B-008).lp12d

Name of output report file:
Tower SC1-16 (B-008).lp12o

Name of plot output file:
Tower SC1-16 (B-008).lp12p

Name of runtime message file:
Tower SC1-16 (B-008).lp12r

Date and Time of Analysis

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-16 (Boring B-008-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Date: April 8, 2026

Time: 20:34:52

Problem Title

Project Name: TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas

Job Number: 24170232F

Client: ms consultants, inc.

Engineer: BKS

Description: Light Tower SC1-16 (B-008-0-25)

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

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-16 (Boring B-008-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

- 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	=	9.000 ft
Depth of ground surface below top of pile	=	1.0000 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.

Point No.	Depth Below Pile Head feet	Pile Diameter inches
-----	-----	-----
1	0.000	36.0000
2	9.000	36.0000

Input Structural Properties for Pile Sections:

Pile Section No. 1:

Section 1 is a round drilled shaft, bored pile, or CIDH pile	
Length of section	= 9.000000 ft
Shaft Diameter	= 36.000000 in

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-16 (Boring B-008-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Soil and Rock Layering Information

The soil profile is modelled using 7 layers

Layer 1 is soft clay, p-y criteria by Matlock, 1970

Distance from top of pile to top of layer	=	1.000000	ft
Distance from top of pile to bottom of layer	=	4.000000	ft
Effective unit weight at top of layer	=	98.000000	pcf
Effective unit weight at bottom of layer	=	98.000000	pcf
Undrained cohesion at top of layer	=	250.000000	psf
Undrained cohesion at bottom of layer	=	250.000000	psf
Epsilon-50 at top of layer	=	0.020000	
Epsilon-50 at bottom of layer	=	0.020000	

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

Distance from top of pile to top of layer	=	4.000000	ft
Distance from top of pile to bottom of layer	=	5.400000	ft
Effective unit weight at top of layer	=	63.000000	pcf
Effective unit weight at bottom of layer	=	63.000000	pcf
Friction angle at top of layer	=	34.000000	deg.
Friction angle at bottom of layer	=	34.000000	deg.
Subgrade k at top of layer	=	60.000000	pci
Subgrade k at bottom of layer	=	60.000000	pci

Layer 3 is stiff clay without free water

Distance from top of pile to top of layer	=	5.400000	ft
Distance from top of pile to bottom of layer	=	7.900000	ft
Effective unit weight at top of layer	=	58.000000	pcf
Effective unit weight at bottom of layer	=	58.000000	pcf
Undrained cohesion at top of layer	=	1750.	psf
Undrained cohesion at bottom of layer	=	1750.	psf
Epsilon-50 at top of layer	=	0.007000	
Epsilon-50 at bottom of layer	=	0.007000	

Layer 4 is stiff clay without free water

Distance from top of pile to top of layer	=	7.900000	ft
Distance from top of pile to bottom of layer	=	10.400000	ft
Effective unit weight at top of layer	=	60.000000	pcf

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-16 (Boring B-008-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Effective unit weight at bottom of layer	=	60.000000	pcf
Undrained cohesion at top of layer	=	3750.	psf
Undrained cohesion at bottom of layer	=	3750.	psf
Epsilon-50 at top of layer	=	0.005000	
Epsilon-50 at bottom of layer	=	0.005000	

Layer 5 is stiff clay without free water

Distance from top of pile to top of layer	=	10.400000	ft
Distance from top of pile to bottom of layer	=	12.900000	ft
Effective unit weight at top of layer	=	63.000000	pcf
Effective unit weight at bottom of layer	=	63.000000	pcf
Undrained cohesion at top of layer	=	4500.	psf
Undrained cohesion at bottom of layer	=	4500.	psf
Epsilon-50 at top of layer	=	0.004000	
Epsilon-50 at bottom of layer	=	0.004000	

Layer 6 is stiff clay without free water

Distance from top of pile to top of layer	=	12.900000	ft
Distance from top of pile to bottom of layer	=	22.900000	ft
Effective unit weight at top of layer	=	68.000000	pcf
Effective unit weight at bottom of layer	=	68.000000	pcf
Undrained cohesion at top of layer	=	4500.	psf
Undrained cohesion at bottom of layer	=	4500.	psf
Epsilon-50 at top of layer	=	0.004000	
Epsilon-50 at bottom of layer	=	0.004000	

Layer 7 is stiff clay without free water

Distance from top of pile to top of layer	=	22.900000	ft
Distance from top of pile to bottom of layer	=	27.400000	ft
Effective unit weight at top of layer	=	63.000000	pcf
Effective unit weight at bottom of layer	=	63.000000	pcf
Undrained cohesion at top of layer	=	4500.	psf
Undrained cohesion at bottom of layer	=	4500.	psf
Epsilon-50 at top of layer	=	0.004000	
Epsilon-50 at bottom of layer	=	0.004000	

(Depth of the lowest soil layer extends 18.400 ft below the pile tip)

Summary of Input Soil Properties

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-16 (Boring B-008-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Layer E50 Num. or krm	Soil Type Name kpy (p-y Curve Type) pci	Layer Depth ft	Effective Unit Wt. pcf	Cohesion psf	Angle of Friction deg.
1 0.02000	Soft --	1.0000	98.0000	250.0000	--
0.02000	Clay --	4.0000	98.0000	250.0000	--
2 --	Sand 60.0000	4.0000	63.0000	--	34.0000
--	(Reese, et al.) 60.0000	5.4000	63.0000	--	34.0000
3 0.00700	Stiff Clay --	5.4000	58.0000	1750.	--
0.00700	w/o Free Water --	7.9000	58.0000	1750.	--
4 0.00500	Stiff Clay --	7.9000	60.0000	3750.	--
0.00500	w/o Free Water --	10.4000	60.0000	3750.	--
5 0.00400	Stiff Clay --	10.4000	63.0000	4500.	--
0.00400	w/o Free Water --	12.9000	63.0000	4500.	--
6 0.00400	Stiff Clay --	12.9000	68.0000	4500.	--
0.00400	w/o Free Water --	22.9000	68.0000	4500.	--
7 0.00400	Stiff Clay --	22.9000	63.0000	4500.	--
0.00400	w/o Free Water --	27.4000	63.0000	4500.	--

 Static Loading Type

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

 Pile-head Loading and Pile-head Fixity Conditions

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-16 (Boring B-008-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Number of loads specified = 3

Load Compute No. vs. Pile Length	Load Top y Type	Condition Run Analysis 1	Condition 2	Axial Thrust Force, lbs
1	1	V = 1000.000000 lbs	M = 315600. in-lbs	4200.
Yes		Yes		
2	1	V = 2250. lbs	M = 724800. in-lbs	4600.
Yes		Yes		
3	1	V = 2250. lbs	M = 724800. in-lbs	3800.
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:

 Dimensions and Properties of Drilled Shaft (Bored Pile):

Length of Section	=	9.000000 ft
Shaft Diameter	=	36.000000 in
Concrete Cover Thickness (to edge of trans. reinf.)	=	3.500000 in
Number of Reinforcing Bars	=	16 bars
Yield Stress of Reinforcing Bars	=	60000. psi
Modulus of Elasticity of Reinforcing Bars	=	29000000. psi
Gross Area of Shaft	=	1018. sq. in.
Total Area of Reinforcing Steel	=	16.000000 sq. in.
Area Ratio of Steel Reinforcement	=	1.57 percent

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-16 (Boring B-008-0-25) Lateral Load Analysis
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Edge-to-Edge Bar Spacing	=	4.114467 in
Maximum Concrete Aggregate Size	=	0.750000 in
Ratio of Bar Spacing to Aggregate Size	=	5.49
Offset of Center of Rebar Cage from Center of Pile	=	0.0000 in
Transverse Reinforcement		
Type: Spiral		
Number of Transverse Reinf. (per spacing)	=	1
Spacing of Transverse Reinf.	=	4.500000 in
Yield Stress of Transverse Reinf.	=	60000. psi
Diameter of Transverse Reinf.	=	0.500000 in

Axial Structural Capacities:

Nom. Axial Structural Capacity = $0.85 F_c A_c + F_y A_s$	=	4366.378 kips
Tensile Load for Cracking of Concrete	=	-470.222 kips
Nominal Axial Tensile Capacity	=	-960.000 kips

Reinforcing Bar Dimensions and Positions Used in Computations:

Bar Number	Bar Diam. inches	Bar Area sq. in.	X inches	Y inches
-----	-----	-----	-----	-----
1	1.128000	1.000000	13.436000	0.000000
2	1.128000	1.000000	12.413245	5.141735
3	1.128000	1.000000	9.500687	9.500687
4	1.128000	1.000000	5.141735	12.413245
5	1.128000	1.000000	0.000000	13.436000
6	1.128000	1.000000	-5.14173	12.413245
7	1.128000	1.000000	-9.50069	9.500687
8	1.128000	1.000000	-12.41325	5.141735
9	1.128000	1.000000	-13.43600	0.000000
10	1.128000	1.000000	-12.41325	-5.14173
11	1.128000	1.000000	-9.50069	-9.50069
12	1.128000	1.000000	-5.14173	-12.41325
13	1.128000	1.000000	0.000000	-13.43600
14	1.128000	1.000000	5.141735	-12.41325
15	1.128000	1.000000	9.500687	-9.50069
16	1.128000	1.000000	12.413245	-5.14173

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

Minimum spacing between any two bars not equal to zero = 4.114 inches
 between bars 11 and 12.

Ratio of bar spacing to maximum aggregate size = 5.49

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-16 (Boring B-008-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Concrete Properties:

Compressive Strength of Concrete	=	4000. psi
Modulus of Elasticity of Concrete	=	3604997. psi
Modulus of Rupture of Concrete	=	-474.34165 psi
Compression Strain at Peak Stress	=	0.001886
Tensile Strain at Fracture of Concrete	=	-0.0001154
Maximum Coarse Aggregate Size	=	0.750000 in

Number of Axial Thrust Force Values Determined from Pile-head Loadings = 3

Number	Axial Thrust Force kips
-----	-----
1	3.800
2	4.200
3	4.600

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 318-14, Section 21.2.3.
 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 = 3.800 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
-----	-----	-----	-----	-----	-----
6.25000E-07 0.0505030	240.5062135 0.2746478	384809942.	19.2929823	0.00001206	-0.00001044

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 Light Tower SC1-16 (Boring B-008-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00000125	480.1472468	384117797.	18.6479768	0.00002331	-0.00002169
0.0973082	0.5259142				
0.00000188	718.9174733	383422652.	18.4329804	0.00003456	-0.00003294
0.1438345	0.7771808				
0.00000250	956.8168886	382726755.	18.3254857	0.00004581	-0.00004419
0.1900818	1.0284477				
0.00000313	1194.	382030558.	18.2609917	0.00005707	-0.00005543
0.2360502	1.2797149				
0.00000375	1430.	381334209.	18.2179981	0.00006832	-0.00006668
0.2817396	1.5309823				
0.00000438	1665.	380637775.	18.1872904	0.00007957	-0.00007793
0.3271500	1.7822500				
0.00000500	1900.	379941287.	18.1642614	0.00009082	-0.00008918
0.3722815	2.0335179				
0.00000563	2133.	379244764.	18.1463515	0.0001021	-0.000100
0.4171340	2.2847861				
0.00000625	2366.	378548215.	18.1320251	0.0001133	-0.000112
0.4617075	2.5360546				
0.00000688	2366.	344134741.	10.2494785	0.00007047	-0.000177
0.2882187	-4.308598 C				
0.00000750	2366.	315456846.	10.2198771	0.00007665	-0.000193
0.3129821	-4.706727 C				
0.00000813	2366.	291190934.	10.1952302	0.00008284	-0.000210
0.3376758	-5.104761 C				
0.00000875	2366.	270391582.	10.1744772	0.00008903	-0.000226
0.3622998	-5.502701 C				
0.00000938	2366.	252365477.	10.1568402	0.00009522	-0.000242
0.3868539	-5.900547 C				
0.00001000	2366.	236592634.	10.1417358	0.0001014	-0.000259
0.4113380	-6.298297 C				
0.00001063	2366.	222675420.	10.1287027	0.0001076	-0.000275
0.4357521	-6.695951 C				
0.00001125	2366.	210304564.	10.1174231	0.0001138	-0.000291
0.4600960	-7.093510 C				
0.00001188	2366.	199235903.	10.1076093	0.0001200	-0.000307
0.4843696	-7.490973 C				
0.00001250	2366.	189274107.	10.0990420	0.0001262	-0.000324
0.5085729	-7.888340 C				
0.00001313	2366.	180261055.	10.0915439	0.0001325	-0.000340
0.5327056	-8.285611 C				
0.00001375	2366.	172067370.	10.0849699	0.0001387	-0.000356
0.5567678	-8.682785 C				
0.00001438	2366.	164586180.	10.0792000	0.0001449	-0.000373
0.5807594	-9.079861 C				
0.00001500	2366.	157728423.	10.0741344	0.0001511	-0.000389
0.6046801	-9.476841 C				
0.00001563	2366.	151419286.	10.0696892	0.0001573	-0.000405
0.6285300	-9.873723 C				
0.00001625	2366.	145595467.	10.0657933	0.0001636	-0.000421
0.6523089	-10.270507 C				

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 Light Tower SC1-16 (Boring B-008-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00001688	2366.	140203043.	10.0623863	0.0001698	-0.000438
0.6760167	-10.667193 C				
0.00001750	2366.	135195791.	10.0594163	0.0001760	-0.000454
0.6996534	-11.063781 C				
0.00001813	2366.	130533867.	10.0568387	0.0001823	-0.000470
0.7232187	-11.460271 C				
0.00001875	2366.	126182738.	10.0546147	0.0001885	-0.000486
0.7467127	-11.856661 C				
0.00001938	2366.	122112327.	10.0527107	0.0001948	-0.000503
0.7701352	-12.252952 C				
0.00002000	2366.	118296317.	10.0510970	0.0002010	-0.000519
0.7934860	-12.649144 C				
0.00002063	2366.	114711580.	10.0497478	0.0002073	-0.000535
0.8167652	-13.045236 C				
0.00002125	2366.	111337710.	10.0486401	0.0002135	-0.000551
0.8399726	-13.441228 C				
0.00002188	2366.	108156633.	10.0477539	0.0002198	-0.000568
0.8631080	-13.837120 C				
0.00002250	2366.	105152282.	10.0470709	0.0002261	-0.000584
0.8861714	-14.232911 C				
0.00002313	2366.	102310328.	10.0465752	0.0002323	-0.000600
0.9091627	-14.628602 C				
0.00002375	2366.	99617951.	10.0462524	0.0002386	-0.000616
0.9320817	-15.024191 C				
0.00002438	2366.	97063645.	10.0460897	0.0002449	-0.000633
0.9549284	-15.419678 C				
0.00002563	2429.	94800037.	10.0461990	0.0002574	-0.000665
1.0004043	-16.210348 C				
0.00002688	2545.	94692477.	10.0468231	0.0002700	-0.000697
1.0455896	-17.000609 C				
0.00002813	2660.	94589756.	10.0479254	0.0002826	-0.000730
1.0904832	-17.790458 C				
0.00002938	2776.	94491232.	10.0493946	0.0002952	-0.000762
1.1350844	-18.579893 C				
0.00003063	2891.	94396370.	10.0512127	0.0003078	-0.000795
1.1793922	-19.368912 C				
0.00003188	3006.	94304718.	10.0533415	0.0003205	-0.000827
1.2234058	-20.157511 C				
0.00003313	3121.	94215891.	10.0557483	0.0003331	-0.000859
1.2671243	-20.945689 C				
0.00003438	3236.	94129561.	10.0584054	0.0003458	-0.000892
1.3105466	-21.733443 C				
0.00003563	3350.	94045446.	10.0612887	0.0003584	-0.000924
1.3536720	-22.520771 C				
0.00003688	3465.	93963300.	10.0643778	0.0003711	-0.000956
1.3964994	-23.307669 C				
0.00003813	3579.	93882912.	10.0676547	0.0003838	-0.000989
1.4390279	-24.094136 C				
0.00003938	3694.	93804096.	10.0711039	0.0003965	-0.001021
1.4812567	-24.880169 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-16 (Boring B-008-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00004063	3808.	93726688.	10.0747116	0.0004093	-0.001053
1.5231846	-25.665765 C				
0.00004188	3922.	93650546.	10.0784659	0.0004220	-0.001085
1.5648108	-26.450921 C				
0.00004313	4035.	93575540.	10.0823562	0.0004348	-0.001118
1.6061342	-27.235635 C				
0.00004438	4149.	93501560.	10.0863731	0.0004476	-0.001150
1.6471540	-28.019904 C				
0.00004563	4263.	93428502.	10.0905084	0.0004604	-0.001182
1.6878690	-28.803725 C				
0.00004688	4376.	93356279.	10.0947545	0.0004732	-0.001214
1.7282784	-29.587096 C				
0.00004813	4489.	93284807.	10.0991050	0.0004860	-0.001246
1.7683810	-30.370013 C				
0.00004938	4602.	93214014.	10.1035538	0.0004989	-0.001279
1.8081759	-31.152474 C				
0.00005063	4715.	93143835.	10.1080956	0.0005117	-0.001311
1.8476620	-31.934476 C				
0.00005188	4828.	93074209.	10.1127258	0.0005246	-0.001343
1.8868384	-32.716016 C				
0.00005313	4941.	93005082.	10.1174399	0.0005375	-0.001375
1.9257039	-33.497091 C				
0.00005438	5053.	92936405.	10.1222340	0.0005504	-0.001407
1.9642575	-34.277698 C				
0.00005563	5166.	92868132.	10.1271047	0.0005633	-0.001439
2.0024981	-35.057833 C				
0.00005688	5278.	92800222.	10.1320488	0.0005763	-0.001471
2.0404247	-35.837495 C				
0.00005813	5390.	92732637.	10.1370633	0.0005892	-0.001503
2.0780361	-36.616679 C				
0.00005938	5502.	92665342.	10.1421457	0.0006022	-0.001535
2.1153313	-37.395383 C				
0.00006063	5614.	92598305.	10.1472935	0.0006152	-0.001567
2.1523092	-38.173604 C				
0.00006188	5725.	92531497.	10.1525046	0.0006282	-0.001599
2.1889685	-38.951338 C				
0.00006313	5837.	92464888.	10.1577769	0.0006412	-0.001631
2.2253083	-39.728581 C				
0.00006438	5948.	92398455.	10.1631088	0.0006543	-0.001663
2.2613274	-40.505332 C				
0.00006563	6059.	92332173.	10.1684984	0.0006673	-0.001695
2.2970245	-41.281586 C				
0.00006688	6170.	92266020.	10.1739444	0.0006804	-0.001727
2.3323987	-42.057340 C				
0.00006813	6281.	92199976.	10.1794453	0.0006935	-0.001759
2.3674485	-42.832591 C				
0.00006938	6392.	92134020.	10.1849998	0.0007066	-0.001791
2.4021730	-43.607335 C				
0.00007063	6502.	92068136.	10.1906070	0.0007197	-0.001823
2.4365708	-44.381568 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
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36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00007188	6613.	92002305.	10.1962656	0.0007329	-0.001855
2.4706408	-45.155288 C				
0.00007313	6723.	91936511.	10.2020028	0.0007460	-0.001886
2.5043818	-45.928490 C				
0.00007438	6833.	91870742.	10.2077616	0.0007592	-0.001918
2.5377924	-46.701172 C				
0.00007938	7271.	91607617.	10.2312788	0.0008121	-0.002045
2.6681070	-49.786612 C				
0.00008438	7707.	91343844.	10.2555391	0.0008653	-0.002172
2.7930345	-52.863415 C				
0.00008938	8140.	91079227.	10.2796933	0.0009187	-0.002299
2.9123325	-55.933382 C				
0.00009438	8570.	90813004.	10.3043877	0.0009725	-0.002425
3.0260259	-58.995009 C				
0.00009938	8979.	90357411.	10.3225581	0.0010258	-0.002552
3.1326575	-60.000000 CY				
0.0001044	9304.	89144470.	10.3110511	0.0010762	-0.002681
3.2276850	-60.000000 CY				
0.0001094	9546.	87273573.	10.2718035	0.0011235	-0.002814
3.3116704	-60.000000 CY				
0.0001144	9782.	85523680.	10.2357064	0.0011707	-0.002947
3.3907664	-60.000000 CY				
0.0001194	10004.	83800225.	10.1987328	0.0012175	-0.003080
3.4643165	-60.000000 CY				
0.0001244	10154.	81641326.	10.1374818	0.0012608	-0.003217
3.5282172	-60.000000 CY				
0.0001294	10287.	79513660.	10.0756441	0.0013035	-0.003354
3.5871212	-60.000000 CY				
0.0001344	10419.	77536664.	10.0197410	0.0013464	-0.003491
3.6423258	-60.000000 CY				
0.0001394	10550.	75693983.	9.9691573	0.0013895	-0.003628
3.6937845	-60.000000 CY				
0.0001444	10680.	73971519.	9.9233661	0.0014327	-0.003765
3.7414497	-60.000000 CY				
0.0001494	10808.	72355946.	9.8810316	0.0014760	-0.003902
3.7851328	-60.000000 CY				
0.0001544	10925.	70772035.	9.8368433	0.0015186	-0.004039
3.8241552	-60.000000 CY				
0.0001594	11008.	69072220.	9.7809580	0.0015588	-0.004179
3.8574366	-60.000000 CY				
0.0001644	11071.	67351790.	9.7204156	0.0015978	-0.004320
3.8862696	-60.000000 CY				
0.0001694	11131.	65719446.	9.6635689	0.0016368	-0.004461
3.9118664	-60.000000 CY				
0.0001744	11191.	64176802.	9.6094393	0.0016756	-0.004602
3.9342902	-60.000000 CY				
0.0001794	11250.	62716278.	9.5601863	0.0017149	-0.004743
3.9535015	-60.000000 CY				
0.0001844	11308.	61329164.	9.5136161	0.0017541	-0.004883
3.9693617	-60.000000 CY				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0001894	11364.	60009896.	9.4690774	0.0017932	-0.005024
3.9819050	-60.000000 CY				
0.0001944	11420.	58754909.	9.4280227	0.0018326	-0.005165
3.9911986	-60.000000 CY				
0.0001994	11476.	57559296.	9.3897594	0.0018721	-0.005305
3.9971986	-60.000000 CY				
0.0002044	11531.	56418622.	9.3531932	0.0019116	-0.005446
3.9998595	-60.000000 CY				
0.0002094	11584.	55328385.	9.3201259	0.0019514	-0.005586
3.9974517	-60.000000 CY				
0.0002144	11637.	54285454.	9.2909722	0.0019918	-0.005726
3.9998812	-60.000000 CY				
0.0002194	11690.	53285909.	9.2626721	0.0020320	-0.005866
3.9969940	-60.000000 CY				
0.0002244	11740.	52321336.	9.2356724	0.0020723	-0.006005
3.9997138	-60.000000 CY				
0.0002294	11786.	51384137.	9.2093226	0.0021124	-0.006145
3.9955528	-60.000000 CY				
0.0002344	11823.	50445667.	9.1796872	0.0021515	-0.006286
3.9989818	-60.000000 CY				
0.0002394	11855.	49524943.	9.1473565	0.0021896	-0.006428
3.9994466	-60.000000 CY				
0.0002444	11876.	48598228.	9.1109548	0.0022265	-0.006571
3.9965160	-60.000000 CY				
0.0002494	11895.	47701101.	9.0745971	0.0022630	-0.006715
3.9991770	-60.000000 CY				
0.0002544	11912.	46829816.	9.0405915	0.0022997	-0.006858
3.9995775	-60.000000 CY				
0.0002594	11929.	45990067.	9.0077660	0.0023364	-0.007001
3.9954763	-60.000000 CY				
0.0002644	11945.	45181124.	8.9766457	0.0023732	-0.007144
3.9984997	-60.000000 CY				
0.0002694	11961.	44401256.	8.9468563	0.0024101	-0.007287
3.9998981	-60.000000 CY				
0.0002744	11976.	43648250.	8.9191370	0.0024472	-0.007430
3.9944635	-60.000000 CY				
0.0003044	12062.	39628140.	8.7757363	0.0026711	-0.008286
3.9984635	-60.000000 CY				
0.0003344	12138.	36300180.	8.6628609	0.0028966	-0.009141
3.9998209	-60.000000 CY				
0.0003644	12207.	33502446.	8.5793723	0.0031261	-0.009991
3.9999551	-60.000000 CYT				
0.0003944	12272.	31117026.	8.5161103	0.0033585	-0.010839
3.9996166	-60.000000 CYT				
0.0004244	12331.	29056485.	8.4674428	0.0035934	-0.011684
3.9972132	-60.000000 CYT				
0.0004544	12377.	27238942.	8.4178614	0.0038249	-0.012533
3.9873462	-60.000000 CYT				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Axial Thrust Force = 4.200 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
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6.25000E-07	240.5049676	384807948.	19.4290859	0.00001214	-0.00001036
0.0508615	0.2771147				
0.00000125	480.1459926	384116794.	18.7161837	0.00002340	-0.00002160
0.0976654	0.5283867				
0.00000188	718.9162127	383421980.	18.4785558	0.00003465	-0.00003285
0.1441903	0.7796589				
0.00000250	956.8156222	382726249.	18.3597458	0.00004590	-0.00004410
0.1904363	1.0309315				
0.00000313	1194.	382030150.	18.2884629	0.00005715	-0.00005535
0.2364034	1.2822044				
0.00000375	1430.	381333869.	18.2409436	0.00006840	-0.00006660
0.2820914	1.5334776				
0.00000438	1665.	380637482.	18.2070035	0.00007966	-0.00007784
0.3275005	1.7847511				
0.00000500	1900.	379941029.	18.1815504	0.00009091	-0.00008909
0.3726306	2.0360248				
0.00000563	2133.	379244533.	18.1617553	0.0001022	-0.000100
0.4174818	2.2872988				
0.00000625	2366.	378548006.	18.1459208	0.0001134	-0.000112
0.4620539	2.5385732				
0.00000688	2366.	344134551.	10.2895004	0.00007074	-0.000177
0.2893429	-4.300617 C				
0.00000750	2366.	315456672.	10.2575513	0.00007693	-0.000193
0.3141325	-4.698533 C				
0.00000813	2366.	291190774.	10.2300378	0.00008312	-0.000209
0.3388235	-5.096560 C				
0.00000875	2366.	270391433.	10.2068278	0.00008931	-0.000226
0.3634446	-5.494492 C				
0.00000938	2366.	252365338.	10.1870615	0.00009550	-0.000242
0.3879959	-5.892330 C				
0.00001000	2366.	236592504.	10.1700940	0.0001017	-0.000258
0.4124772	-6.290073 C				
0.00001063	2366.	222675298.	10.1554324	0.0001079	-0.000275
0.4368884	-6.687720 C				
0.00001125	2366.	210304448.	10.1426931	0.0001141	-0.000291
0.4612294	-7.085271 C				
0.00001188	2366.	199235793.	10.1315564	0.0001203	-0.000307
0.4855002	-7.482727 C				
0.00001250	2366.	189274003.	10.1218127	0.0001265	-0.000323
0.5097005	-7.880086 C				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00001313	2366.	180260955.	10.1132503	0.0001327	-0.000340
0.5338304	-8.277349 C				
0.00001375	2366.	172067276.	10.1057088	0.0001390	-0.000356
0.5578898	-8.674515 C				
0.00001438	2366.	164586090.	10.0990556	0.0001452	-0.000372
0.5818784	-9.071585 C				
0.00001500	2366.	157728336.	10.0931803	0.0001514	-0.000389
0.6057963	-9.468556 C				
0.00001563	2366.	151419203.	10.0879903	0.0001576	-0.000405
0.6296433	-9.865431 C				
0.00001625	2366.	145595387.	10.0834069	0.0001639	-0.000421
0.6534193	-10.262207 C				
0.00001688	2366.	140202965.	10.0793634	0.0001701	-0.000437
0.6771242	-10.658886 C				
0.00001750	2366.	135195717.	10.0758025	0.0001763	-0.000454
0.7007579	-11.055466 C				
0.00001813	2366.	130533795.	10.0726747	0.0001826	-0.000470
0.7243204	-11.451947 C				
0.00001875	2366.	126182669.	10.0699372	0.0001888	-0.000486
0.7478114	-11.848330 C				
0.00001938	2366.	122112260.	10.0675528	0.0001951	-0.000502
0.7712309	-12.244613 C				
0.00002000	2366.	118296252.	10.0654889	0.0002013	-0.000519
0.7945789	-12.640797 C				
0.00002063	2366.	114711517.	10.0637168	0.0002076	-0.000535
0.8178551	-13.036882 C				
0.00002125	2366.	111337649.	10.0622112	0.0002138	-0.000551
0.8410595	-13.432866 C				
0.00002188	2366.	108156573.	10.0609497	0.0002201	-0.000567
0.8641920	-13.828750 C				
0.00002250	2366.	105152224.	10.0599125	0.0002263	-0.000584
0.8872524	-14.224533 C				
0.00002313	2366.	102310272.	10.0590817	0.0002326	-0.000600
0.9102407	-14.620215 C				
0.00002375	2366.	99617896.	10.0584414	0.0002389	-0.000616
0.9331568	-15.015796 C				
0.00002438	2366.	97063591.	10.0579776	0.0002452	-0.000632
0.9560005	-15.411276 C				
0.00002563	2432.	94924068.	10.0575288	0.0002577	-0.000665
1.0014704	-16.201930 C				
0.00002688	2548.	94810571.	10.0576469	0.0002703	-0.000697
1.0466496	-16.992174 C				
0.00002813	2664.	94702439.	10.0582592	0.0002829	-0.000730
1.0915372	-17.782007 C				
0.00002938	2779.	94598964.	10.0593353	0.0002955	-0.000762
1.1361324	-18.571425 C				
0.00003063	2894.	94499555.	10.0607664	0.0003081	-0.000794
1.1804341	-19.360427 C				
0.00003188	3009.	94403710.	10.0625387	0.0003207	-0.000827
1.2244416	-20.149010 C				

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0.00003313	3124.	94311007.	10.0646159	0.0003334	-0.000859
1.2681539	-20.937171 C				
0.00003438	3239.	94221082.	10.0669675	0.0003461	-0.000891
1.3115700	-21.724908 C				
0.00003563	3354.	94133623.	10.0695670	0.0003587	-0.000924
1.3546892	-22.512219 C				
0.00003688	3468.	94048359.	10.0723915	0.0003714	-0.000956
1.3975103	-23.299100 C				
0.00003813	3582.	93965057.	10.0754214	0.0003841	-0.000988
1.4400326	-24.085550 C				
0.00003938	3697.	93883511.	10.0786392	0.0003968	-0.001021
1.4822550	-24.871565 C				
0.00004063	3811.	93803541.	10.0820299	0.0004096	-0.001053
1.5241766	-25.657144 C				
0.00004188	3925.	93724988.	10.0855803	0.0004223	-0.001085
1.5657965	-26.442282 C				
0.00004313	4039.	93647711.	10.0892786	0.0004351	-0.001117
1.6071135	-27.226979 C				
0.00004438	4152.	93571586.	10.0931145	0.0004479	-0.001150
1.6481268	-28.011230 C				
0.00004563	4266.	93496502.	10.0970787	0.0004607	-0.001182
1.6888354	-28.795033 C				
0.00004688	4379.	93422358.	10.1011630	0.0004735	-0.001214
1.7292383	-29.578385 C				
0.00004813	4492.	93349066.	10.1053601	0.0004863	-0.001246
1.7693344	-30.361284 C				
0.00004938	4606.	93276544.	10.1096634	0.0004992	-0.001278
1.8091228	-31.143727 C				
0.00005063	4718.	93204721.	10.1140670	0.0005120	-0.001310
1.8486023	-31.925710 C				
0.00005188	4831.	93133529.	10.1185657	0.0005249	-0.001343
1.8877721	-32.707231 C				
0.00005313	4944.	93062909.	10.1231546	0.0005378	-0.001375
1.9266309	-33.488287 C				
0.00005438	5056.	92992807.	10.1278294	0.0005507	-0.001407
1.9651778	-34.268875 C				
0.00005563	5169.	92923173.	10.1325862	0.0005636	-0.001439
2.0034117	-35.048992 C				
0.00005688	5281.	92853961.	10.1374215	0.0005766	-0.001471
2.0413316	-35.828634 C				
0.00005813	5393.	92785130.	10.1423320	0.0005895	-0.001503
2.0789362	-36.607799 C				
0.00005938	5505.	92716640.	10.1473148	0.0006025	-0.001535
2.1162246	-37.386484 C				
0.00006063	5617.	92648458.	10.1523672	0.0006155	-0.001567
2.1531956	-38.164685 C				
0.00006188	5728.	92580549.	10.1574868	0.0006285	-0.001599
2.1898481	-38.942399 C				
0.00006313	5840.	92512883.	10.1626714	0.0006415	-0.001631
2.2261809	-39.719622 C				

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0.00006438	5951.	92445433.	10.1679189	0.0006546	-0.001663
2.2621930	-40.496353 C				
0.00006563	6062.	92378172.	10.1732276	0.0006676	-0.001695
2.2978832	-41.272587 C				
0.00006688	6173.	92311077.	10.1785957	0.0006807	-0.001727
2.3332503	-42.048320 C				
0.00006813	6284.	92244124.	10.1840217	0.0006938	-0.001759
2.3682931	-42.823550 C				
0.00006938	6395.	92177292.	10.1895041	0.0007069	-0.001791
2.4030104	-43.598274 C				
0.00007063	6505.	92110561.	10.1950417	0.0007200	-0.001822
2.4374011	-44.372486 C				
0.00007188	6616.	92043913.	10.2006608	0.0007332	-0.001854
2.4714639	-45.146185 C				
0.00007313	6726.	91977331.	10.2063053	0.0007463	-0.001886
2.5051976	-45.919366 C				
0.00007438	6836.	91910797.	10.2120017	0.0007595	-0.001918
2.5386010	-46.692026 C				
0.00007938	7274.	91644853.	10.2352897	0.0008124	-0.002045
2.6688860	-49.777380 C				
0.00008438	7710.	91378587.	10.2593338	0.0008656	-0.002172
2.7937834	-52.854093 C				
0.00008938	8143.	91111830.	10.2831857	0.0009191	-0.002298
2.9130226	-55.924331 C				
0.00009438	8573.	90843621.	10.3077273	0.0009728	-0.002425
3.0266854	-58.985869 C				
0.00009938	8982.	90387473.	10.3258078	0.0010261	-0.002551
3.1332951	-60.000000 CY				
0.0001044	9308.	89176212.	10.3143071	0.0010766	-0.002681
3.2283182	-60.000000 CY				
0.0001094	9549.	87304848.	10.2749831	0.0011238	-0.002814
3.3122821	-60.000000 CY				
0.0001144	9785.	85553556.	10.2389100	0.0011711	-0.002946
3.3913727	-60.000000 CY				
0.0001194	10007.	83830919.	10.2019402	0.0012179	-0.003080
3.4649106	-60.000000 CY				
0.0001244	10158.	81671814.	10.1406407	0.0012612	-0.003216
3.5287895	-60.000000 CY				
0.0001294	10291.	79542859.	10.0787027	0.0013039	-0.003354
3.5876602	-60.000000 CY				
0.0001344	10423.	77564670.	10.0227059	0.0013468	-0.003491
3.6428308	-60.000000 CY				
0.0001394	10554.	75720878.	9.9720357	0.0013899	-0.003628
3.6942550	-60.000000 CY				
0.0001444	10683.	73997378.	9.9261646	0.0014331	-0.003764
3.7418850	-60.000000 CY				
0.0001494	10812.	72381005.	9.8838986	0.0014764	-0.003901
3.7855535	-60.000000 CY				
0.0001544	10929.	70796718.	9.8396771	0.0015190	-0.004038
3.8245440	-60.000000 CY				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0001594	11012.	69097838.	9.7838573	0.0015593	-0.004178
3.8578061	-60.000000 CY				
0.0001644	11075.	67376662.	9.7232508	0.0015983	-0.004319
3.8866026	-60.000000 CY				
0.0001694	11135.	65743511.	9.6663364	0.0016372	-0.004460
3.9121613	-60.000000 CY				
0.0001744	11195.	64200103.	9.6121495	0.0016761	-0.004601
3.9345463	-60.000000 CY				
0.0001794	11254.	62738857.	9.5628376	0.0017153	-0.004742
3.9537182	-60.000000 CY				
0.0001844	11312.	61351278.	9.5162917	0.0017546	-0.004883
3.9695496	-60.000000 CY				
0.0001894	11368.	60031354.	9.4717005	0.0017937	-0.005024
3.9820503	-60.000000 CY				
0.0001944	11425.	58775745.	9.4305957	0.0018331	-0.005164
3.9913005	-60.000000 CY				
0.0001994	11480.	57579537.	9.3922863	0.0018726	-0.005305
3.9972564	-60.000000 CY				
0.0002044	11535.	56438298.	9.3556780	0.0019121	-0.005445
3.9998723	-60.000000 CY				
0.0002094	11588.	55347517.	9.3241700	0.0019522	-0.005585
3.9975077	-60.000000 CY				
0.0002144	11641.	54304067.	9.2934428	0.0019923	-0.005725
3.9998931	-60.000000 CY				
0.0002194	11694.	53304015.	9.2651074	0.0020325	-0.005865
3.9970558	-60.000000 CY				
0.0002244	11744.	52339157.	9.2380944	0.0020728	-0.006005
3.9997330	-60.000000 CY				
0.0002294	11790.	51401489.	9.2117130	0.0021129	-0.006145
3.9956300	-60.000000 CY				
0.0002344	11827.	50463153.	9.1821360	0.0021521	-0.006285
3.9990203	-60.000000 CY				
0.0002394	11859.	49542728.	9.1500193	0.0021903	-0.006427
3.9992468	-60.000000 CY				
0.0002444	11880.	48615611.	9.1135780	0.0022271	-0.006570
3.9965958	-60.000000 CY				
0.0002494	11900.	47718283.	9.0771076	0.0022636	-0.006714
3.9992162	-60.000000 CY				
0.0002544	11917.	46846598.	9.0431776	0.0023004	-0.006857
3.9993713	-60.000000 CY				
0.0002594	11933.	46006491.	9.0103157	0.0023371	-0.007000
3.9955701	-60.000000 CY				
0.0002644	11949.	45197204.	8.9791598	0.0023739	-0.007144
3.9985538	-60.000000 CY				
0.0002694	11965.	44417005.	8.9493437	0.0024107	-0.007287
3.9999119	-60.000000 CY				
0.0002744	11980.	43663657.	8.9215934	0.0024479	-0.007430
3.9942523	-60.000000 CY				
0.0003044	12066.	39641995.	8.7782176	0.0026719	-0.008286
3.9985257	-60.000000 CY				

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0.0003344	12142.	36312646.	8.6652203	0.0028974	-0.009140
3.9998424	-60.000000 CY				
0.0003644	12212.	33513765.	8.5815911	0.0031269	-0.009991
3.9999658	-60.000000 CYT				
0.0003944	12276.	31127384.	8.5182268	0.0033594	-0.010838
3.9996505	-60.000000 CYT				
0.0004244	12335.	29066055.	8.4694819	0.0035942	-0.011683
3.9973093	-60.000000 CYT				
0.0004544	12381.	27248100.	8.4201387	0.0038259	-0.012532
3.9875919	-60.000000 CYT				

Axial Thrust Force = 4.600 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
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6.25000E-07	240.5035986	384805758.	19.5651901	0.00001223	-0.00001027
0.0512199	0.2795816				
0.00000125	480.1446137	384115691.	18.7843907	0.00002348	-0.00002152
0.0980225	0.5308592				
0.00000188	718.9148267	383421241.	18.5241312	0.00003473	-0.00003277
0.1445462	0.7821371				
0.00000250	956.8142298	382725692.	18.3940059	0.00004599	-0.00004401
0.1907908	1.0334154				
0.00000313	1194.	382029703.	18.3159341	0.00005724	-0.00005526
0.2367565	1.2846940				
0.00000375	1430.	381333494.	18.2638891	0.00006849	-0.00006651
0.2824433	1.5359729				
0.00000438	1665.	380637159.	18.2267166	0.00007974	-0.00007776
0.3278510	1.7872522				
0.00000500	1900.	379940746.	18.1988394	0.00009099	-0.00008901
0.3729798	2.0385317				
0.00000563	2133.	379244280.	18.1771590	0.0001022	-0.000100
0.4178295	2.2898116				
0.00000625	2366.	378547777.	18.1598165	0.0001135	-0.000112
0.4624003	2.5410917				
0.00000688	2366.	344134343.	10.3291778	0.00007101	-0.000176
0.2904571	-4.292706 C				
0.00000750	2366.	315456481.	10.2940289	0.00007721	-0.000193
0.3152465	-4.690597 C				
0.00000813	2366.	291190598.	10.2646762	0.00008340	-0.000209
0.3399656	-5.088396 C				
0.00000875	2366.	270391269.	10.2391817	0.00008959	-0.000225
0.3645893	-5.486283 C				

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0.00000938	2366.	252365185.	10.2172859	0.00009579	-0.000242
0.3891378	-5.884113 C				
0.00001000	2366.	236592361.	10.1984552	0.0001020	-0.000258
0.4136162	-6.281848 C				
0.00001063	2366.	222675163.	10.1821496	0.0001082	-0.000274
0.4380246	-6.679488 C				
0.00001125	2366.	210304321.	10.1679490	0.0001144	-0.000291
0.4623628	-7.077032 C				
0.00001188	2366.	199235672.	10.1555219	0.0001206	-0.000307
0.4866307	-7.474480 C				
0.00001250	2366.	189273889.	10.1446030	0.0001268	-0.000323
0.5108282	-7.871831 C				
0.00001313	2366.	180260846.	10.1349589	0.0001330	-0.000339
0.5349552	-8.269087 C				
0.00001375	2366.	172067171.	10.1264498	0.0001392	-0.000356
0.5590117	-8.666245 C				
0.00001438	2366.	164585990.	10.1189132	0.0001455	-0.000372
0.5829974	-9.063307 C				
0.00001500	2366.	157728241.	10.1122282	0.0001517	-0.000388
0.6069124	-9.460271 C				
0.00001563	2366.	151419111.	10.1062933	0.0001579	-0.000405
0.6307565	-9.857138 C				
0.00001625	2366.	145595299.	10.1010224	0.0001641	-0.000421
0.6545296	-10.253907 C				
0.00001688	2366.	140202880.	10.0963423	0.0001704	-0.000437
0.6782316	-10.650577 C				
0.00001750	2366.	135195635.	10.0921903	0.0001766	-0.000453
0.7018624	-11.047150 C				
0.00001813	2366.	130533716.	10.0885122	0.0001829	-0.000470
0.7254219	-11.443623 C				
0.00001875	2366.	126182592.	10.0852613	0.0001891	-0.000486
0.7489100	-11.839998 C				
0.00001938	2366.	122112186.	10.0823966	0.0001953	-0.000502
0.7723266	-12.236274 C				
0.00002000	2366.	118296180.	10.0798824	0.0002016	-0.000518
0.7956716	-12.632450 C				
0.00002063	2366.	114711448.	10.0776874	0.0002079	-0.000535
0.8189449	-13.028526 C				
0.00002125	2366.	111337582.	10.0757837	0.0002141	-0.000551
0.8421464	-13.424502 C				
0.00002188	2366.	108156508.	10.0741470	0.0002204	-0.000567
0.8652759	-13.820378 C				
0.00002250	2366.	105152160.	10.0727554	0.0002266	-0.000583
0.8883333	-14.216153 C				
0.00002313	2366.	102310210.	10.0715894	0.0002329	-0.000600
0.9113187	-14.611828 C				
0.00002375	2366.	99617836.	10.0706317	0.0002392	-0.000616
0.9342318	-15.007401 C				
0.00002438	2366.	97063533.	10.0698667	0.0002455	-0.000632
0.9570725	-15.402873 C				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00002563	2436.	95048091.	10.0688598	0.0002580	-0.000664
1.0025364	-16.193510 C				
0.00002688	2551.	94928657.	10.0684718	0.0002706	-0.000697
1.0477096	-16.983738 C				
0.00002813	2667.	94815115.	10.0686232	0.0002832	-0.000729
1.0925912	-17.773555 C				
0.00002938	2782.	94706690.	10.0692479	0.0002958	-0.000762
1.1371802	-18.562957 C				
0.00003063	2897.	94602733.	10.0703211	0.0003084	-0.000794
1.1814759	-19.351942 C				
0.00003188	3012.	94502697.	10.0717368	0.0003210	-0.000826
1.2254772	-20.140508 C				
0.00003313	3127.	94406117.	10.0734845	0.0003337	-0.000859
1.2691834	-20.928652 C				
0.00003438	3242.	94312597.	10.0755306	0.0003463	-0.000891
1.3125933	-21.716373 C				
0.00003563	3357.	94221794.	10.0778462	0.0003590	-0.000923
1.3557063	-22.503666 C				
0.00003688	3471.	94133413.	10.0804061	0.0003717	-0.000956
1.3985212	-23.290530 C				
0.00003813	3586.	94047197.	10.0831888	0.0003844	-0.000988
1.4410372	-24.076963 C				
0.00003938	3700.	93962921.	10.0861753	0.0003971	-0.001020
1.4832533	-24.862961 C				
0.00004063	3814.	93880388.	10.0893491	0.0004099	-0.001053
1.5251686	-25.648521 C				
0.00004188	3928.	93799425.	10.0926956	0.0004226	-0.001085
1.5667821	-26.433642 C				
0.00004313	4042.	93719877.	10.0962019	0.0004354	-0.001117
1.6080927	-27.218321 C				
0.00004438	4155.	93641609.	10.0998566	0.0004482	-0.001149
1.6490996	-28.002554 C				
0.00004563	4269.	93564497.	10.1036497	0.0004610	-0.001182
1.6898018	-28.786339 C				
0.00004688	4382.	93488434.	10.1075722	0.0004738	-0.001214
1.7301982	-29.569674 C				
0.00004813	4496.	93413321.	10.1116159	0.0004866	-0.001246
1.7702878	-30.352554 C				
0.00004938	4609.	93339070.	10.1157737	0.0004995	-0.001278
1.8100696	-31.134978 C				
0.00005063	4722.	93265602.	10.1200391	0.0005123	-0.001310
1.8495425	-31.916943 C				
0.00005188	4834.	93192845.	10.1244063	0.0005252	-0.001342
1.8887057	-32.698446 C				
0.00005313	4947.	93120733.	10.1288700	0.0005381	-0.001374
1.9275579	-33.479483 C				
0.00005438	5060.	93049206.	10.1334255	0.0005510	-0.001406
1.9660981	-34.260052 C				
0.00005563	5172.	92978211.	10.1380684	0.0005639	-0.001439
2.0043253	-35.040149 C				

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0.00005688	5284.	92907697.	10.1427948	0.0005769	-0.001471
2.0422384	-35.819772 C				
0.00005813	5396.	92837619.	10.1476012	0.0005898	-0.001503
2.0798362	-36.598918 C				
0.00005938	5508.	92767935.	10.1524844	0.0006028	-0.001535
2.1171178	-37.377583 C				
0.00006063	5620.	92698606.	10.1574414	0.0006158	-0.001567
2.1540819	-38.155764 C				
0.00006188	5731.	92629597.	10.1624696	0.0006288	-0.001599
2.1907275	-38.933458 C				
0.00006313	5843.	92560874.	10.1675664	0.0006418	-0.001631
2.2270535	-39.710662 C				
0.00006438	5954.	92492407.	10.1727297	0.0006549	-0.001663
2.2630586	-40.487373 C				
0.00006563	6065.	92424168.	10.1779574	0.0006679	-0.001695
2.2987417	-41.263586 C				
0.00006688	6176.	92356130.	10.1832476	0.0006810	-0.001726
2.3341018	-42.039299 C				
0.00006813	6287.	92288268.	10.1885986	0.0006941	-0.001758
2.3691375	-42.814509 C				
0.00006938	6398.	92220560.	10.1940089	0.0007072	-0.001790
2.4038477	-43.589211 C				
0.00007063	6508.	92152983.	10.1995039	0.0007203	-0.001822
2.4382312	-44.363403 C				
0.00007188	6619.	92085519.	10.2050285	0.0007335	-0.001854
2.4722868	-45.137081 C				
0.00007313	6729.	92018147.	10.2106084	0.0007467	-0.001886
2.5060133	-45.910241 C				
0.00007438	6839.	91950850.	10.2162424	0.0007598	-0.001918
2.5394094	-46.682880 C				
0.00007938	7277.	91682087.	10.2393011	0.0008127	-0.002045
2.6696649	-49.768146 C				
0.00008438	7713.	91413389.	10.2630109	0.0008659	-0.002172
2.7945082	-52.845065 C				
0.00008938	8146.	91144431.	10.2866786	0.0009194	-0.002298
2.9137126	-55.915279 C				
0.00009438	8576.	90874234.	10.3110673	0.0009731	-0.002424
3.0273448	-58.976728 C				
0.00009938	8985.	90417533.	10.3290580	0.0010265	-0.002551
3.1339327	-60.000000 CY				
0.0001044	9311.	89207952.	10.3175636	0.0010769	-0.002681
3.2289512	-60.000000 CY				
0.0001094	9552.	87336121.	10.2781631	0.0011242	-0.002813
3.3128936	-60.000000 CY				
0.0001144	9789.	85583430.	10.2421143	0.0011714	-0.002946
3.3919789	-60.000000 CY				
0.0001194	10011.	83861611.	10.2051482	0.0012182	-0.003079
3.4655044	-60.000000 CY				
0.0001244	10162.	81702300.	10.1438002	0.0012616	-0.003216
3.5293615	-60.000000 CY				

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0.0001294	10295.	79572057.	10.0817619	0.0013043	-0.003353
3.5881988	-60.000000 CY				
0.0001344	10427.	77592674.	10.0256713	0.0013472	-0.003490
3.6433355	-60.000000 CY				
0.0001394	10557.	75747771.	9.9749147	0.0013903	-0.003627
3.6947252	-60.000000 CY				
0.0001444	10687.	74023236.	9.9289636	0.0014335	-0.003764
3.7423201	-60.000000 CY				
0.0001494	10816.	72406063.	9.8867661	0.0014768	-0.003901
3.7859739	-60.000000 CY				
0.0001544	10933.	70821400.	9.8425115	0.0015194	-0.004038
3.8249324	-60.000000 CY				
0.0001594	11017.	69123456.	9.7867573	0.0015598	-0.004178
3.8581753	-60.000000 CY				
0.0001644	11079.	67401534.	9.7260868	0.0015987	-0.004319
3.8869352	-60.000000 CY				
0.0001694	11139.	65767574.	9.6691048	0.0016377	-0.004460
3.9124557	-60.000000 CY				
0.0001744	11199.	64223403.	9.6148605	0.0016766	-0.004601
3.9348020	-60.000000 CY				
0.0001794	11258.	62761436.	9.5654896	0.0017158	-0.004742
3.9539345	-60.000000 CY				
0.0001844	11316.	61373390.	9.5189681	0.0017551	-0.004882
3.9697370	-60.000000 CY				
0.0001894	11373.	60052811.	9.4743244	0.0017942	-0.005023
3.9821950	-60.000000 CY				
0.0001944	11429.	58796578.	9.4331695	0.0018336	-0.005164
3.9914019	-60.000000 CY				
0.0001994	11484.	57599778.	9.3948139	0.0018731	-0.005304
3.9973136	-60.000000 CY				
0.0002044	11539.	56457972.	9.3581635	0.0019126	-0.005445
3.9998845	-60.000000 CY				
0.0002094	11592.	55366642.	9.3266817	0.0019528	-0.005585
3.9975630	-60.000000 CY				
0.0002144	11645.	54322678.	9.2959142	0.0019928	-0.005725
3.9999044	-60.000000 CY				
0.0002194	11698.	53322120.	9.2675435	0.0020331	-0.005864
3.9971169	-60.000000 CY				
0.0002244	11748.	52356977.	9.2405172	0.0020733	-0.006004
3.9997515	-60.000000 CY				
0.0002294	11794.	51418840.	9.2141042	0.0021135	-0.006144
3.9957066	-60.000000 CY				
0.0002344	11831.	50480617.	9.1845645	0.0021526	-0.006285
3.9990577	-60.000000 CY				
0.0002394	11864.	49560513.	9.1526832	0.0021909	-0.006427
3.9990468	-60.000000 CY				
0.0002444	11885.	48632992.	9.1162023	0.0022278	-0.006570
3.9966747	-60.000000 CY				
0.0002494	11904.	47735462.	9.0796192	0.0022642	-0.006713
3.9992545	-60.000000 CY				

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0.0002544	11921.	46863378.	9.0457647	0.0023010	-0.006856
3.9991650	-60.000000 CY				
0.0002594	11937.	46022914.	9.0128664	0.0023377	-0.007000
3.9956629	-60.000000 CY				
0.0002644	11953.	45213284.	8.9816750	0.0023745	-0.007143
3.9986069	-60.000000 CY				
0.0002694	11969.	44432753.	8.9518321	0.0024114	-0.007286
3.9999247	-60.000000 CY				
0.0002744	11984.	43679063.	8.9240509	0.0024485	-0.007429
3.9940409	-60.000000 CY				
0.0003044	12070.	39655848.	8.7807001	0.0026726	-0.008285
3.9985866	-60.000000 CY				
0.0003344	12146.	36325110.	8.6675807	0.0028982	-0.009139
3.9998625	-60.000000 CY				
0.0003644	12216.	33525083.	8.5838110	0.0031277	-0.009990
3.9999751	-60.000000 CYT				
0.0003944	12280.	31137740.	8.5203443	0.0033602	-0.010837
3.9996828	-60.000000 CYT				
0.0004244	12339.	29075625.	8.4715220	0.0035951	-0.011682
3.9974037	-60.000000 CYT				
0.0004544	12385.	27257253.	8.4224181	0.0038269	-0.012531
3.9878351	-60.000000 CYT				

 Summary of Results for Nominal 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 Tens. No. Strain	Axial Thrust kips	Nominal Mom. Cap. in-kip	Max. Comp. Strain	Max.
----	-----	-----	-----	
1 -0.00952396	3.800	12169.214	0.00300000	
2 -0.00952020	4.200	12173.120	0.00300000	
3 -0.00951645	4.600	12177.027	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 (0.75).

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The above values should be multiplied by the appropriate strength reduction factor to compute ultimate moment capacity according to ACI 318, 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 Stiff. Load Ult Mom No. kip-in ²	Resist. Factor	Nominal Ax. Thrust kips	Nominal Moment Cap in-kips	Ult. (Fac) Ax. Thrust kips	Ult. (Fac) Moment Cap in-kips	Bend. at
1 91219895.	0.65	3.800000	12169.	2.470000	7910.	
2 91253873.	0.65	4.200000	12173.	2.730000	7913.	
3 91287886.	0.65	4.600000	12177.	2.990000	7915.	
1 89806706.	0.75	3.800000	12169.	2.850000	9127.	
2 89838295.	0.75	4.200000	12173.	3.150000	9130.	
3 89869877.	0.75	4.600000	12177.	3.450000	9133.	
1 70221645.	0.90	3.800000	12169.	3.420000	10952.	
2 70254444.	0.90	4.200000	12173.	3.780000	10956.	
3 70287179.	0.90	4.600000	12177.	4.140000	10959.	

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	1.0000	0.00	N.A.	No	0.00	8636.

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2	4.0000	2.2838	No	No	8636.	14158.
3	5.4000	1.3787	No	No	22794.	46795.
4	7.9000	1.9441	Yes	No	69588.	42851.
5	10.4000	9.4000	No	No	112439.	0.00
6	12.9000	11.9000	No	No	0.00	0.00
7	22.9000	21.9000	No	No	0.00	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.

 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 = 1000.0 lbs
 Applied moment at pile head = 315600.0 in-lbs
 Axial thrust load on pile head = 4200.0 lbs

Depth Res.	Deflect. Soil Spr.	Bending Distrib.	Shear	Slope	Total	Bending	Soil
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	0.1523	315600.	1000.0000	-0.00174	0.00	3.84E+11	
0.00	0.00	0.00					
0.09000	0.1504	316688.	1000.	-0.00173	0.00	3.84E+11	
0.00	0.00	0.00					
0.1800	0.1486	317776.	1000.0000	-0.00173	0.00	3.84E+11	
0.00	0.00	0.00					
0.2700	0.1467	318864.	1000.0000	-0.00173	0.00	3.84E+11	
0.00	0.00	0.00					
0.3600	0.1448	319951.	1000.0000	-0.00173	0.00	3.84E+11	
0.00	0.00	0.00					
0.4500	0.1430	321039.	1000.0000	-0.00173	0.00	3.84E+11	
0.00	0.00	0.00					
0.5400	0.1411	322127.	999.9999	-0.00173	0.00	3.84E+11	
0.00	0.00	0.00					
0.6300	0.1392	323215.	999.9999	-0.00173	0.00	3.84E+11	

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0.00	0.00	0.00				
0.7200	0.1373	324303.	999.9999	-0.00173	0.00	3.84E+11
0.00	0.00	0.00				
0.8100	0.1355	325391.	999.9999	-0.00173	0.00	3.84E+11
0.00	0.00	0.00				
0.9000	0.1336	326479.	999.9999	-0.00173	0.00	3.84E+11
0.00	0.00	0.00				
0.9900	0.1318	327566.	999.9999	-0.00173	0.00	3.84E+11
0.00	0.00	0.00				
1.0800	0.1299	328654.	978.6088	-0.00172	0.00	3.84E+11
-39.613	329.3744	0.00				
1.1700	0.1280	329696.	935.5776	-0.00172	0.00	3.84E+11
-40.074	338.0523	0.00				
1.2600	0.1262	330691.	892.0530	-0.00172	0.00	3.84E+11
-40.527	346.9144	0.00				
1.3500	0.1243	331638.	848.0440	-0.00172	0.00	3.84E+11
-40.971	355.9675	0.00				
1.4400	0.1224	332538.	803.5594	-0.00172	0.00	3.84E+11
-41.407	365.2190	0.00				
1.5300	0.1206	333390.	758.6084	-0.00172	0.00	3.84E+11
-41.835	374.6765	0.00				
1.6200	0.1187	334192.	713.2002	-0.00172	0.00	3.84E+11
-42.254	384.3480	0.00				
1.7100	0.1169	334946.	667.3442	-0.00172	0.00	3.84E+11
-42.664	394.2423	0.00				
1.8000	0.1150	335649.	621.0500	-0.00172	0.00	3.84E+11
-43.066	404.3683	0.00				
1.8900	0.1132	336303.	574.3274	-0.00172	0.00	3.84E+11
-43.458	414.7355	0.00				
1.9800	0.1113	336905.	527.1863	-0.00172	0.00	3.84E+11
-43.841	425.3541	0.00				
2.0700	0.1095	337457.	479.6367	-0.00171	0.00	3.84E+11
-44.214	436.2348	0.00				
2.1600	0.1076	337957.	431.6891	-0.00171	0.00	3.84E+11
-44.578	447.3890	0.00				
2.2500	0.1058	338405.	383.3540	-0.00171	0.00	3.84E+11
-44.932	458.8288	0.00				
2.3400	0.1039	338801.	334.6420	-0.00171	0.00	3.84E+11
-45.276	470.5670	0.00				
2.4300	0.1021	339143.	285.5641	-0.00171	0.00	3.84E+11
-45.609	482.6173	0.00				
2.5200	0.1002	339433.	236.1316	-0.00171	0.00	3.84E+11
-45.933	494.9943	0.00				
2.6100	0.09837	339669.	186.3557	-0.00171	0.00	3.84E+11
-46.245	507.7135	0.00				
2.7000	0.09653	339851.	136.2481	-0.00171	0.00	3.84E+11
-46.547	520.7914	0.00				
2.7900	0.09468	339979.	85.8209	-0.00171	0.00	3.84E+11
-46.837	534.2459	0.00				
2.8800	0.09284	340052.	35.0861	-0.00171	0.00	3.84E+11

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-47.116	548.0959	0.00				
2.9700	0.09100	340070.	-15.944	-0.00170	0.00	3.84E+11
-47.384	562.3617	0.00				
3.0600	0.08916	340033.	-67.256	-0.00170	0.00	3.84E+11
-47.639	577.0652	0.00				
3.1500	0.08732	339940.	-118.837	-0.00170	0.00	3.84E+11
-47.882	592.2299	0.00				
3.2400	0.08548	339792.	-170.674	-0.00170	0.00	3.84E+11
-48.113	607.8810	0.00				
3.3300	0.08364	339587.	-222.753	-0.00170	0.00	3.84E+11
-48.330	624.0458	0.00				
3.4200	0.08181	339326.	-275.060	-0.00170	0.00	3.84E+11
-48.535	640.7538	0.00				
3.5100	0.07997	339008.	-327.581	-0.00170	0.00	3.84E+11
-48.725	658.0367	0.00				
3.6000	0.07814	338634.	-380.300	-0.00170	0.00	3.84E+11
-48.902	675.9291	0.00				
3.6900	0.07630	338202.	-433.201	-0.00170	0.00	3.84E+11
-49.064	694.4685	0.00				
3.7800	0.07447	337713.	-486.271	-0.00170	0.00	3.84E+11
-49.212	713.6956	0.00				
3.8700	0.07264	337167.	-539.491	-0.00170	0.00	3.84E+11
-49.344	733.6548	0.00				
3.9600	0.07081	336563.	-592.845	-0.00169	0.00	3.84E+11
-49.460	754.3947	0.00				
4.0500	0.06898	335902.	-701.352	-0.00169	0.00	3.84E+11
-151.477	2372.	0.00				
4.1400	0.06715	335064.	-865.129	-0.00169	0.00	3.84E+11
-151.814	2442.	0.00				
4.2300	0.06532	334049.	-1029.	-0.00169	0.00	3.84E+11
-151.915	2512.	0.00				
4.3200	0.06350	332856.	-1193.	-0.00169	0.00	3.84E+11
-151.783	2582.	0.00				
4.4100	0.06167	331487.	-1357.	-0.00169	0.00	3.84E+11
-151.416	2652.	0.00				
4.5000	0.05985	329941.	-1520.	-0.00169	0.00	3.84E+11
-150.815	2722.	0.00				
4.5900	0.05802	328219.	-1683.	-0.00169	0.00	3.84E+11
-149.980	2792.	0.00				
4.6800	0.05620	326322.	-1844.	-0.00169	0.00	3.84E+11
-148.912	2862.	0.00				
4.7700	0.05438	324251.	-2004.	-0.00169	0.00	3.84E+11
-147.610	2932.	0.00				
4.8600	0.05256	322009.	-2163.	-0.00169	0.00	3.84E+11
-146.075	3002.	0.00				
4.9500	0.05074	319595.	-2319.	-0.00168	0.00	3.84E+11
-144.306	3072.	0.00				
5.0400	0.04892	317014.	-2474.	-0.00168	0.00	3.84E+11
-142.305	3142.	0.00				
5.1300	0.04710	314266.	-2627.	-0.00168	0.00	3.84E+11

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-140.071	3211.	0.00				
5.2200	0.04529	311355.	-2777.	-0.00168	0.00	3.84E+11
-137.604	3281.	0.00				
5.3100	0.04347	308284.	-2924.	-0.00168	0.00	3.85E+11
-134.905	3351.	0.00				
5.4000	0.04166	305055.	-3194.	-0.00168	0.00	3.85E+11
-365.868	9485.	0.00				
5.4900	0.03984	301400.	-3588.	-0.00168	0.00	3.85E+11
-363.901	9864.	0.00				
5.5800	0.03803	297320.	-3980.	-0.00168	0.00	3.85E+11
-361.743	10272.	0.00				
5.6700	0.03622	292818.	-4370.	-0.00168	0.00	3.85E+11
-359.380	10716.	0.00				
5.7600	0.03441	287897.	-4756.	-0.00168	0.00	3.85E+11
-356.796	11199.	0.00				
5.8500	0.03260	282560.	-5140.	-0.00168	0.00	3.85E+11
-353.973	11727.	0.00				
5.9400	0.03079	276810.	-5521.	-0.00167	0.00	3.85E+11
-350.889	12308.	0.00				
6.0300	0.02898	270650.	-5898.	-0.00167	0.00	3.85E+11
-347.521	12950.	0.00				
6.1200	0.02717	264086.	-6271.	-0.00167	0.00	3.85E+11
-343.839	13666.	0.00				
6.2100	0.02537	257120.	-6640.	-0.00167	0.00	3.85E+11
-339.809	14467.	0.00				
6.3000	0.02356	249758.	-7005.	-0.00167	0.00	3.85E+11
-335.389	15374.	0.00				
6.3900	0.02176	242004.	-7365.	-0.00167	0.00	3.85E+11
-330.531	16408.	0.00				
6.4800	0.01995	233865.	-7719.	-0.00167	0.00	3.85E+11
-325.173	17602.	0.00				
6.5700	0.01815	225347.	-8067.	-0.00167	0.00	3.85E+11
-319.237	18998.	0.00				
6.6600	0.01634	216457.	-8408.	-0.00167	0.00	3.85E+11
-312.625	20657.	0.00				
6.7500	0.01454	207201.	-8741.	-0.00167	0.00	3.85E+11
-305.207	22667.	0.00				
6.8400	0.01274	197590.	-9067.	-0.00167	0.00	3.85E+11
-296.807	25160.	0.00				
6.9300	0.01094	187633.	-9382.	-0.00167	0.00	3.85E+11
-287.178	28353.	0.00				
7.0200	0.00914	177340.	-9686.	-0.00167	0.00	3.85E+11
-275.953	32613.	0.00				
7.1100	0.00734	166726.	-9977.	-0.00167	0.00	3.85E+11
-262.548	38640.	0.00				
7.2000	0.00554	155806.	-10251.	-0.00167	0.00	3.85E+11
-245.942	47956.	0.00				
7.2900	0.00374	144598.	-10505.	-0.00167	0.00	3.85E+11
-224.038	64702.	0.00				
7.3800	0.00194	133130.	-10729.	-0.00167	0.00	3.85E+11

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-191.053	106307.	0.00				
7.4700	1.43E-04	121438.	-10848.	-0.00166	0.00	3.85E+11
-29.707	224898.	0.00				
7.5600	-0.00166	109712.	-10764.	-0.00166	0.00	3.85E+11
185.6794	121149.	0.00				
7.6500	-0.00345	98203.	-10543.	-0.00166	0.00	3.85E+11
224.1587	70114.	0.00				
7.7400	-0.00525	86955.	-10287.	-0.00166	0.00	3.85E+11
250.1043	51449.	0.00				
7.8300	-0.00705	75998.	-10006.	-0.00166	0.00	3.85E+11
270.4983	41455.	0.00				
7.9200	-0.00884	65357.	-9540.	-0.00166	0.00	3.85E+11
591.1066	72184.	0.00				
8.0100	-0.01064	55406.	-8885.	-0.00166	0.00	3.85E+11
622.1367	63146.	0.00				
8.1000	-0.01244	46180.	-8198.	-0.00166	0.00	3.85E+11
650.0632	56450.	0.00				
8.1900	-0.01423	37713.	-7482.	-0.00166	0.00	3.85E+11
675.6558	51268.	0.00				
8.2800	-0.01603	30033.	-6740.	-0.00166	0.00	3.85E+11
699.4255	47124.	0.00				
8.3700	-0.01783	23169.	-5972.	-0.00166	0.00	3.85E+11
721.7300	43728.	0.00				
8.4600	-0.01962	17148.	-5182.	-0.00166	0.00	3.85E+11
742.8301	40887.	0.00				
8.5500	-0.02142	11992.	-4368.	-0.00166	0.00	3.85E+11
762.9219	38471.	0.00				
8.6400	-0.02321	7727.	-3534.	-0.00166	0.00	3.85E+11
782.1573	36390.	0.00				
8.7300	-0.02501	4374.	-2679.	-0.00166	0.00	3.85E+11
800.6560	34575.	0.00				
8.8200	-0.02681	1954.	-1805.	-0.00166	0.00	3.85E+11
818.5143	32978.	0.00				
8.9100	-0.02860	489.6999	-911.748	-0.00166	0.00	3.85E+11
835.8108	31561.	0.00				
9.0000	-0.03040	0.00	0.00	-0.00166	0.00	3.85E+11
852.6107	15147.	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 = 0.15231184 inches
 Computed slope at pile head = -0.0017355 radians

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Maximum bending moment = 340070. inch-lbs
 Maximum shear force = -10848. lbs
 Depth of maximum bending moment = 2.97000000 feet below pile head
 Depth of maximum shear force = 7.47000000 feet below pile head
 Number of iterations = 24
 Number of zero deflection points = 1
 Pile deflection at ground = 0.13154584 inches

 Pile-head Deflection vs. Pile Length for Load Case 1

Boundary Condition Type 1, Shear and Moment

Shear = 1000. lbs
 Moment = 315600. in-lbs
 Axial Load = 4200. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	0.15231184	340070.	-10848.
8.55000	0.26332686	337862.	-10698.
8.10000	0.54080369	336627.	-11058.
7.65000	1.40206739	335994.	-12175.
7.20000	3.04673137	336112.	-13104.
6.75000	8.83113359	342502.	-14885.

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

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

Shear force at pile head = 2250.0 lbs
 Applied moment at pile head = 724800.0 in-lbs
 Axial thrust load on pile head = 4600.0 lbs

Depth Res. Soil X Es*H feet lb/inch	Deflect. Spr. Distrib. y Lat. Load inches lb/inch	Bending Moment in-lbs lb/inch	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness lb-in^2	Soil p
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TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-16 (Boring B-008-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00	1.5045	724800.	2250.	-0.01750	0.00	3.83E+11
0.00	0.00	0.00				
0.09000	1.4856	727317.	2250.	-0.01750	0.00	3.83E+11
0.00	0.00	0.00				
0.1800	1.4667	729834.	2250.	-0.01750	0.00	3.83E+11
0.00	0.00	0.00				
0.2700	1.4478	732351.	2250.	-0.01749	0.00	3.83E+11
0.00	0.00	0.00				
0.3600	1.4289	734868.	2250.	-0.01749	0.00	3.83E+11
0.00	0.00	0.00				
0.4500	1.4100	737385.	2250.	-0.01749	0.00	3.83E+11
0.00	0.00	0.00				
0.5400	1.3911	739901.	2250.	-0.01749	0.00	3.83E+11
0.00	0.00	0.00				
0.6300	1.3722	742418.	2250.	-0.01749	0.00	3.83E+11
0.00	0.00	0.00				
0.7200	1.3534	744935.	2250.	-0.01748	0.00	3.83E+11
0.00	0.00	0.00				
0.8100	1.3345	747452.	2250.	-0.01748	0.00	3.83E+11
0.00	0.00	0.00				
0.9000	1.3156	749969.	2250.	-0.01748	0.00	3.83E+11
0.00	0.00	0.00				
0.9900	1.2967	752486.	2250.	-0.01748	0.00	3.83E+11
0.00	0.00	0.00				
1.0800	1.2779	755003.	2204.	-0.01748	0.00	3.83E+11
-84.878	71.7366	0.00				
1.1700	1.2590	757420.	2112.	-0.01747	0.00	3.83E+11
-85.853	73.6482	0.00				
1.2600	1.2401	759738.	2019.	-0.01747	0.00	3.83E+11
-86.810	75.6020	0.00				
1.3500	1.2212	761954.	1924.	-0.01747	0.00	3.83E+11
-87.748	77.5996	0.00				
1.4400	1.2024	764068.	1829.	-0.01747	0.00	3.83E+11
-88.668	79.6429	0.00				
1.5300	1.1835	766079.	1733.	-0.01746	0.00	3.83E+11
-89.568	81.7337	0.00				
1.6200	1.1647	767985.	1636.	-0.01746	0.00	3.83E+11
-90.448	83.8739	0.00				
1.7100	1.1458	769786.	1538.	-0.01746	0.00	3.83E+11
-91.309	86.0657	0.00				
1.8000	1.1269	771480.	1439.	-0.01746	0.00	3.83E+11
-92.150	88.3113	0.00				
1.8900	1.1081	773066.	1339.	-0.01746	0.00	3.83E+11
-92.970	90.6129	0.00				
1.9800	1.0892	774545.	1238.	-0.01745	0.00	3.83E+11
-93.768	92.9731	0.00				
2.0700	1.0704	775913.	1136.	-0.01745	0.00	3.83E+11
-94.546	95.3946	0.00				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-16 (Boring B-008-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

2.1600	1.0515	777172.	1034.	-0.01745	0.00	3.83E+11
-95.301	97.8800	0.00				
2.2500	1.0327	778319.	930.2029	-0.01745	0.00	3.83E+11
-96.034	100.4325	0.00				
2.3400	1.0139	779354.	826.1027	-0.01744	0.00	3.83E+11
-96.744	103.0553	0.00				
2.4300	0.9950	780277.	721.2485	-0.01744	0.00	3.83E+11
-97.430	105.7517	0.00				
2.5200	0.9762	781086.	615.6657	-0.01744	0.00	3.83E+11
-98.093	108.5254	0.00				
2.6100	0.9573	781780.	509.3805	-0.01744	0.00	3.83E+11
-98.731	111.3803	0.00				
2.7000	0.9385	782359.	402.4198	-0.01744	0.00	3.83E+11
-99.344	114.3206	0.00				
2.7900	0.9197	782822.	294.8110	-0.01743	0.00	3.83E+11
-99.931	117.3508	0.00				
2.8800	0.9009	783169.	186.5822	-0.01743	0.00	3.83E+11
-100.492	120.4757	0.00				
2.9700	0.8820	783399.	77.7623	-0.01743	0.00	3.83E+11
-101.026	123.7006	0.00				
3.0600	0.8632	783510.	-31.619	-0.01743	0.00	3.83E+11
-101.532	127.0311	0.00				
3.1500	0.8444	783504.	-141.532	-0.01742	0.00	3.83E+11
-102.010	130.4732	0.00				
3.2400	0.8256	783378.	-251.945	-0.01742	0.00	3.83E+11
-102.458	134.0336	0.00				
3.3300	0.8068	783132.	-362.825	-0.01742	0.00	3.83E+11
-102.876	137.7192	0.00				
3.4200	0.7879	782767.	-474.140	-0.01742	0.00	3.83E+11
-103.263	141.5379	0.00				
3.5100	0.7691	782281.	-585.856	-0.01742	0.00	3.83E+11
-103.618	145.4981	0.00				
3.6000	0.7503	781675.	-697.938	-0.01741	0.00	3.83E+11
-103.940	149.6089	0.00				
3.6900	0.7315	780947.	-810.349	-0.01741	0.00	3.83E+11
-104.229	153.8804	0.00				
3.7800	0.7127	780097.	-923.053	-0.01741	0.00	3.83E+11
-104.482	158.3236	0.00				
3.8700	0.6939	779126.	-1036.	-0.01741	0.00	3.83E+11
-104.698	162.9503	0.00				
3.9600	0.6751	778033.	-1149.	-0.01741	0.00	3.83E+11
-104.877	167.7741	0.00				
4.0500	0.6563	776817.	-1488.	-0.01740	0.00	3.83E+11
-523.335	861.1647	0.00				
4.1400	0.6375	774990.	-2060.	-0.01740	0.00	3.83E+11
-535.733	907.5541	0.00				
4.2300	0.6187	772539.	-2645.	-0.01740	0.00	3.83E+11
-547.676	955.9634	0.00				
4.3200	0.5999	769449.	-3243.	-0.01740	0.00	3.83E+11
-559.157	1007.	0.00				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

4.4100	0.5812	765707.	-3853.	-0.01739	0.00	3.83E+11
-570.109	1059.	0.00				
4.5000	0.5624	761300.	-4474.	-0.01739	0.00	3.83E+11
-580.453	1115.	0.00				
4.5900	0.5436	756216.	-5106.	-0.01739	0.00	3.83E+11
-590.163	1173.	0.00				
4.6800	0.5248	750443.	-5749.	-0.01739	0.00	3.83E+11
-599.213	1233.	0.00				
4.7700	0.5060	743972.	-6400.	-0.01739	0.00	3.83E+11
-607.871	1297.	0.00				
4.8600	0.4873	736791.	-7061.	-0.01738	0.00	3.83E+11
-616.038	1365.	0.00				
4.9500	0.4685	728892.	-7731.	-0.01738	0.00	3.83E+11
-623.487	1437.	0.00				
5.0400	0.4497	720266.	-8408.	-0.01738	0.00	3.83E+11
-630.183	1513.	0.00				
5.1300	0.4309	710904.	-9091.	-0.01738	0.00	3.83E+11
-636.089	1594.	0.00				
5.2200	0.4122	700801.	-9781.	-0.01738	0.00	3.83E+11
-641.166	1680.	0.00				
5.3100	0.3934	689950.	-10476.	-0.01737	0.00	3.83E+11
-645.368	1772.	0.00				
5.4000	0.3747	678346.	-11166.	-0.01737	0.00	3.84E+11
-633.581	1826.	0.00				
5.4900	0.3559	666003.	-11848.	-0.01737	0.00	3.84E+11
-629.096	1909.	0.00				
5.5800	0.3371	652926.	-12525.	-0.01737	0.00	3.84E+11
-624.181	2000.	0.00				
5.6700	0.3184	639121.	-13196.	-0.01737	0.00	3.84E+11
-618.799	2099.	0.00				
5.7600	0.2996	624595.	-13861.	-0.01736	0.00	3.84E+11
-612.906	2209.	0.00				
5.8500	0.2809	609353.	-14520.	-0.01736	0.00	3.84E+11
-606.450	2332.	0.00				
5.9400	0.2621	593404.	-15171.	-0.01736	0.00	3.84E+11
-599.369	2470.	0.00				
6.0300	0.2434	576756.	-15814.	-0.01736	0.00	3.84E+11
-591.590	2625.	0.00				
6.1200	0.2246	559418.	-16448.	-0.01736	0.00	3.84E+11
-583.022	2803.	0.00				
6.2100	0.2059	541400.	-17073.	-0.01736	0.00	3.84E+11
-573.555	3009.	0.00				
6.3000	0.1871	522713.	-17687.	-0.01735	0.00	3.84E+11
-563.050	3249.	0.00				
6.3900	0.1684	503369.	-18289.	-0.01735	0.00	3.84E+11
-551.327	3536.	0.00				
6.4800	0.1497	483382.	-18877.	-0.01735	0.00	3.84E+11
-538.151	3884.	0.00				
6.5700	0.1309	462768.	-19450.	-0.01735	0.00	3.84E+11
-523.202	4316.	0.00				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

6.6600	0.1122	441543.	-20006.	-0.01735	0.00	3.84E+11
-506.028	4872.	0.00				
6.7500	0.09344	419728.	-20541.	-0.01735	0.00	3.84E+11
-485.953	5616.	0.00				
6.8400	0.07471	397346.	-21053.	-0.01735	0.00	3.84E+11
-461.899	6677.	0.00				
6.9300	0.05598	374425.	-21536.	-0.01735	0.00	3.84E+11
-431.953	8334.	0.00				
7.0200	0.03724	351000.	-21981.	-0.01734	0.00	3.84E+11
-392.119	11371.	0.00				
7.1100	0.01851	327118.	-22371.	-0.01734	0.00	3.84E+11
-330.921	19307.	0.00				
7.2000	-2.19E-04	302851.	-22526.	-0.01734	0.00	3.85E+11
44.9290	221554.	0.00				
7.2900	-0.01895	278635.	-22320.	-0.01734	0.00	3.85E+11
336.2278	19164.	0.00				
7.3800	-0.03768	254812.	-21922.	-0.01734	0.00	3.85E+11
401.2617	11502.	0.00				
7.4700	-0.05641	231456.	-21464.	-0.01734	0.00	3.85E+11
446.0604	8541.	0.00				
7.5600	-0.07513	208621.	-20963.	-0.01734	0.00	3.85E+11
481.5758	6922.	0.00				
7.6500	-0.09386	186348.	-20427.	-0.01734	0.00	3.85E+11
511.6332	5887.	0.00				
7.7400	-0.113	164671.	-19860.	-0.01734	0.00	3.85E+11
538.0591	5161.	0.00				
7.8300	-0.131	143623.	-19266.	-0.01734	0.00	3.85E+11
561.8796	4621.	0.00				
7.9200	-0.150	123229.	-18315.	-0.01734	0.00	3.85E+11
1199.	8634.	0.00				
8.0100	-0.169	104234.	-16997.	-0.01734	0.00	3.85E+11
1241.	7944.	0.00				
8.1000	-0.187	86688.	-15635.	-0.01734	0.00	3.85E+11
1281.	7378.	0.00				
8.1900	-0.206	70635.	-14232.	-0.01734	0.00	3.85E+11
1318.	6903.	0.00				
8.2800	-0.225	56119.	-12789.	-0.01734	0.00	3.85E+11
1354.	6499.	0.00				
8.3700	-0.244	43183.	-11309.	-0.01734	0.00	3.85E+11
1388.	6150.	0.00				
8.4600	-0.262	31865.	-9793.	-0.01734	0.00	3.85E+11
1420.	5846.	0.00				
8.5500	-0.281	22203.	-8242.	-0.01734	0.00	3.85E+11
1452.	5578.	0.00				
8.6400	-0.300	14235.	-6657.	-0.01734	0.00	3.85E+11
1483.	5341.	0.00				
8.7300	-0.319	7996.	-5039.	-0.01734	0.00	3.85E+11
1512.	5128.	0.00				
8.8200	-0.337	3522.	-3390.	-0.01734	0.00	3.85E+11
1541.	4936.	0.00				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

8.9100	-0.356	845.5223	-1710.	-0.01734	0.00	3.85E+11
1570.	4762.	0.00				
9.0000	-0.375	0.00	0.00	-0.01734	0.00	3.85E+11
1597.	2302.	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	=	1.50449140 inches
Computed slope at pile head	=	-0.0175000 radians
Maximum bending moment	=	783510. inch-lbs
Maximum shear force	=	-22526. lbs
Depth of maximum bending moment	=	3.06000000 feet below pile head
Depth of maximum shear force	=	7.20000000 feet below pile head
Number of iterations	=	40
Number of zero deflection points	=	1
Pile deflection at ground	=	1.29462902 inches

 Pile-head Deflection vs. Pile Length for Load Case 2

Boundary Condition Type 1, Shear and Moment

Shear	=	2250. lbs
Moment	=	724800. in-lbs
Axial Load	=	4600. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	1.50449140	783510.	-22526.
8.55000	3.13935724	779448.	-23266.
8.10000	14.02797266	788881.	-26613.

 Computed Values of Pile Loading and Deflection
 for Lateral Loading for Load Case Number 3

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-16 (Boring B-008-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

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

Shear force at pile head = 2250.0 lbs
 Applied moment at pile head = 724800.0 in-lbs
 Axial thrust load on pile head = 3800.0 lbs

Depth Res.	Soil X Es*H feet lb/inch	Deflect. Spr. y Lat. inches lb/inch	Bending Distrib. Moment Load in-lbs lb/inch	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness lb-in^2	Soil p
0.00	0.00	1.4957	724800.	2250.	-0.01740	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.09000	0.00	1.4769	727301.	2250.	-0.01740	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.1800	0.00	1.4581	729803.	2250.	-0.01739	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.2700	0.00	1.4393	732304.	2250.	-0.01739	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.3600	0.00	1.4205	734806.	2250.	-0.01739	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.4500	0.00	1.4017	737307.	2250.	-0.01739	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.5400	0.00	1.3830	739808.	2250.	-0.01739	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.6300	0.00	1.3642	742310.	2250.	-0.01738	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.7200	0.00	1.3454	744811.	2250.	-0.01738	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.8100	0.00	1.3266	747312.	2250.	-0.01738	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.9000	0.00	1.3079	749814.	2250.	-0.01738	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.9900	0.00	1.2891	752315.	2250.	-0.01737	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
1.0800	0.00	1.2704	754816.	2204.	-0.01737	0.00	3.83E+11	
-84.712	72.0188	0.00	0.00					
1.1700	0.00	1.2516	757219.	2112.	-0.01737	0.00	3.83E+11	
-85.685	73.9379	0.00	0.00					
1.2600	0.00	1.2328	759521.	2019.	-0.01737	0.00	3.83E+11	
-86.640	75.8994	0.00	0.00					
1.3500	0.00	1.2141	761723.	1925.	-0.01737	0.00	3.83E+11	
-87.576	77.9049	0.00	0.00					
1.4400	0.00	1.1953	763822.	1830.	-0.01736	0.00	3.83E+11	
-88.494	79.9562	0.00	0.00					

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 Light Tower SC1-16 (Boring B-008-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

1.5300	1.1766	765818.	1734.	-0.01736	0.00	3.83E+11
-89.392	82.0552	0.00				
1.6200	1.1578	767710.	1637.	-0.01736	0.00	3.83E+11
-90.271	84.2039	0.00				
1.7100	1.1391	769496.	1539.	-0.01736	0.00	3.83E+11
-91.130	86.4043	0.00				
1.8000	1.1203	771177.	1440.	-0.01736	0.00	3.83E+11
-91.969	88.6587	0.00				
1.8900	1.1016	772749.	1340.	-0.01735	0.00	3.83E+11
-92.787	90.9693	0.00				
1.9800	1.0828	774214.	1240.	-0.01735	0.00	3.83E+11
-93.585	93.3388	0.00				
2.0700	1.0641	775570.	1138.	-0.01735	0.00	3.83E+11
-94.360	95.7698	0.00				
2.1600	1.0454	776815.	1036.	-0.01735	0.00	3.83E+11
-95.114	98.2650	0.00				
2.2500	1.0266	777950.	932.7894	-0.01734	0.00	3.83E+11
-95.846	100.8276	0.00				
2.3400	1.0079	778972.	828.8934	-0.01734	0.00	3.83E+11
-96.554	103.4606	0.00				
2.4300	0.9892	779882.	724.2447	-0.01734	0.00	3.83E+11
-97.240	106.1676	0.00				
2.5200	0.9705	780679.	618.8688	-0.01734	0.00	3.83E+11
-97.901	108.9522	0.00				
2.6100	0.9517	781361.	512.7920	-0.01734	0.00	3.83E+11
-98.538	111.8183	0.00				
2.7000	0.9330	781929.	406.0409	-0.01733	0.00	3.83E+11
-99.150	114.7701	0.00				
2.7900	0.9143	782381.	298.6428	-0.01733	0.00	3.83E+11
-99.736	117.8122	0.00				
2.8800	0.8956	782716.	190.6260	-0.01733	0.00	3.83E+11
-100.295	120.9495	0.00				
2.9700	0.8769	782935.	82.0192	-0.01733	0.00	3.83E+11
-100.828	124.1870	0.00				
3.0600	0.8581	783036.	-27.148	-0.01732	0.00	3.83E+11
-101.333	127.5306	0.00				
3.1500	0.8394	783018.	-136.845	-0.01732	0.00	3.83E+11
-101.810	130.9862	0.00				
3.2400	0.8207	782882.	-247.042	-0.01732	0.00	3.83E+11
-102.257	134.5605	0.00				
3.3300	0.8020	782627.	-357.705	-0.01732	0.00	3.83E+11
-102.675	138.2606	0.00				
3.4200	0.7833	782252.	-468.802	-0.01732	0.00	3.83E+11
-103.061	142.0943	0.00				
3.5100	0.7646	781756.	-580.300	-0.01731	0.00	3.83E+11
-103.415	146.0700	0.00				
3.6000	0.7459	781140.	-692.162	-0.01731	0.00	3.83E+11
-103.737	150.1969	0.00				
3.6900	0.7272	780403.	-804.353	-0.01731	0.00	3.83E+11
-104.025	154.4851	0.00				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-16 (Boring B-008-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

3.7800	0.7085	779545.	-916.836	-0.01731	0.00	3.83E+11
-104.277	158.9456	0.00				
3.8700	0.6898	778565.	-1030.	-0.01730	0.00	3.83E+11
-104.493	163.5905	0.00				
3.9600	0.6712	777463.	-1143.	-0.01730	0.00	3.83E+11
-104.672	168.4331	0.00				
4.0500	0.6525	776239.	-1481.	-0.01730	0.00	3.83E+11
-522.388	864.6734	0.00				
4.1400	0.6338	774406.	-2052.	-0.01730	0.00	3.83E+11
-534.780	911.2801	0.00				
4.2300	0.6151	771949.	-2636.	-0.01730	0.00	3.83E+11
-546.720	959.9187	0.00				
4.3200	0.5964	768854.	-3233.	-0.01729	0.00	3.83E+11
-558.197	1011.	0.00				
4.4100	0.5778	765108.	-3841.	-0.01729	0.00	3.83E+11
-569.128	1064.	0.00				
4.5000	0.5591	760699.	-4462.	-0.01729	0.00	3.83E+11
-579.452	1119.	0.00				
4.5900	0.5404	755613.	-5093.	-0.01729	0.00	3.83E+11
-589.143	1177.	0.00				
4.6800	0.5217	749840.	-5734.	-0.01729	0.00	3.83E+11
-598.174	1238.	0.00				
4.7700	0.5031	743370.	-6385.	-0.01728	0.00	3.83E+11
-606.815	1303.	0.00				
4.8600	0.4844	736191.	-7044.	-0.01728	0.00	3.83E+11
-614.966	1371.	0.00				
4.9500	0.4657	728296.	-7712.	-0.01728	0.00	3.83E+11
-622.400	1443.	0.00				
5.0400	0.4471	719674.	-8388.	-0.01728	0.00	3.83E+11
-629.082	1520.	0.00				
5.1300	0.4284	710319.	-9071.	-0.01727	0.00	3.83E+11
-634.976	1601.	0.00				
5.2200	0.4098	700223.	-9759.	-0.01727	0.00	3.83E+11
-640.041	1687.	0.00				
5.3100	0.3911	689381.	-10453.	-0.01727	0.00	3.83E+11
-644.234	1779.	0.00				
5.4000	0.3725	677787.	-11142.	-0.01727	0.00	3.84E+11
-632.655	1834.	0.00				
5.4900	0.3538	665455.	-11823.	-0.01727	0.00	3.84E+11
-628.177	1917.	0.00				
5.5800	0.3352	652390.	-12499.	-0.01727	0.00	3.84E+11
-623.271	2008.	0.00				
5.6700	0.3165	638598.	-13169.	-0.01726	0.00	3.84E+11
-617.897	2108.	0.00				
5.7600	0.2979	624086.	-13833.	-0.01726	0.00	3.84E+11
-612.014	2219.	0.00				
5.8500	0.2792	608860.	-14491.	-0.01726	0.00	3.84E+11
-605.568	2342.	0.00				
5.9400	0.2606	592927.	-15141.	-0.01726	0.00	3.84E+11
-598.498	2480.	0.00				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-16 (Boring B-008-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

6.0300	0.2420	576297.	-15783.	-0.01726	0.00	3.84E+11
-590.731	2637.	0.00				
6.1200	0.2233	558977.	-16417.	-0.01726	0.00	3.84E+11
-582.177	2815.	0.00				
6.2100	0.2047	540978.	-17040.	-0.01725	0.00	3.84E+11
-572.725	3022.	0.00				
6.3000	0.1861	522312.	-17653.	-0.01725	0.00	3.84E+11
-562.237	3264.	0.00				
6.3900	0.1674	502989.	-18254.	-0.01725	0.00	3.84E+11
-550.533	3551.	0.00				
6.4800	0.1488	483024.	-18842.	-0.01725	0.00	3.84E+11
-537.379	3900.	0.00				
6.5700	0.1302	462433.	-19414.	-0.01725	0.00	3.84E+11
-522.455	4335.	0.00				
6.6600	0.1115	441232.	-19969.	-0.01725	0.00	3.84E+11
-505.309	4893.	0.00				
6.7500	0.09292	419442.	-20504.	-0.01725	0.00	3.84E+11
-485.269	5640.	0.00				
6.8400	0.07429	397085.	-21015.	-0.01724	0.00	3.84E+11
-461.257	6705.	0.00				
6.9300	0.05567	374191.	-21497.	-0.01724	0.00	3.84E+11
-431.365	8368.	0.00				
7.0200	0.03705	350794.	-21941.	-0.01724	0.00	3.84E+11
-391.608	11416.	0.00				
7.1100	0.01843	326939.	-22331.	-0.01724	0.00	3.84E+11
-330.549	19372.	0.00				
7.2000	-1.92E-04	302699.	-22489.	-0.01724	0.00	3.85E+11
39.3041	221554.	0.00				
7.2900	-0.01881	278505.	-22286.	-0.01724	0.00	3.85E+11
335.6141	19269.	0.00				
7.3800	-0.03743	254703.	-21889.	-0.01724	0.00	3.85E+11
400.5983	11559.	0.00				
7.4700	-0.05605	231368.	-21432.	-0.01724	0.00	3.85E+11
445.3487	8582.	0.00				
7.5600	-0.07466	208552.	-20932.	-0.01724	0.00	3.85E+11
480.8214	6955.	0.00				
7.6500	-0.09328	186297.	-20396.	-0.01724	0.00	3.85E+11
510.8406	5915.	0.00				
7.7400	-0.112	164638.	-19830.	-0.01724	0.00	3.85E+11
537.2318	5185.	0.00				
7.8300	-0.131	143605.	-19237.	-0.01724	0.00	3.85E+11
561.0203	4643.	0.00				
7.9200	-0.149	123227.	-18287.	-0.01724	0.00	3.85E+11
1198.	8673.	0.00				
8.0100	-0.168	104246.	-16971.	-0.01724	0.00	3.85E+11
1239.	7980.	0.00				
8.1000	-0.186	86710.	-15612.	-0.01723	0.00	3.85E+11
1279.	7411.	0.00				
8.1900	-0.205	70666.	-14210.	-0.01723	0.00	3.85E+11
1316.	6934.	0.00				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-16 (Boring B-008-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

8.2800	-0.224	56157.	-12770.	-0.01723	0.00	3.85E+11
1352.	6528.	0.00				
8.3700	-0.242	43225.	-11292.	-0.01723	0.00	3.85E+11
1386.	6178.	0.00				
8.4600	-0.261	31908.	-9778.	-0.01723	0.00	3.85E+11
1418.	5873.	0.00				
8.5500	-0.279	22246.	-8229.	-0.01723	0.00	3.85E+11
1450.	5604.	0.00				
8.6400	-0.298	14275.	-6647.	-0.01723	0.00	3.85E+11
1480.	5365.	0.00				
8.7300	-0.317	8030.	-5032.	-0.01723	0.00	3.85E+11
1510.	5151.	0.00				
8.8200	-0.335	3547.	-3385.	-0.01723	0.00	3.85E+11
1539.	4958.	0.00				
8.9100	-0.354	859.5269	-1708.	-0.01723	0.00	3.85E+11
1567.	4784.	0.00				
9.0000	-0.372	0.00	0.00	-0.01723	0.00	3.85E+11
1595.	2312.	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. 3:

Pile-head deflection	=	1.49566117 inches
Computed slope at pile head	=	-0.0173975 radians
Maximum bending moment	=	783036. inch-lbs
Maximum shear force	=	-22489. lbs
Depth of maximum bending moment	=	3.06000000 feet below pile head
Depth of maximum shear force	=	7.20000000 feet below pile head
Number of iterations	=	39
Number of zero deflection points	=	1
Pile deflection at ground	=	1.28702946 inches

 Pile-head Deflection vs. Pile Length for Load Case 3

Boundary Condition Type 1, Shear and Moment

Shear	=	2250. lbs
Moment	=	724800. in-lbs
Axial Load	=	3800. lbs

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 Light Tower SC1-16 (Boring B-008-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Pile Length feet	Pile Head Deflection inches	Maximum Moment In-lbs	Maximum Shear lbs
9.00000	1.49566117	783036.	-22489.
8.55000	3.10301389	778457.	-23183.
8.10000	12.57414070	783450.	-26045.

 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 Pile No.	Load Type 1	Load Max Moment Pile-head Load 1 in-lbs	Load Type 2	Load Max Moment Pile-head Load 2 in-lbs	Axial Loading lbs	Pile-head Deflection inches	Pile-head Rotation radians	Max in lbs
1	V, lb	1000.0000	M, in-lb	315600.	4200.	0.1523	-0.00174	
-10848.		340070.						
2	V, lb	2250.	M, in-lb	724800.	4600.	1.5045	-0.01750	
-22526.		783510.						
3	V, lb	2250.	M, in-lb	724800.	3800.	1.4957	-0.01740	
-22489.		783036.						

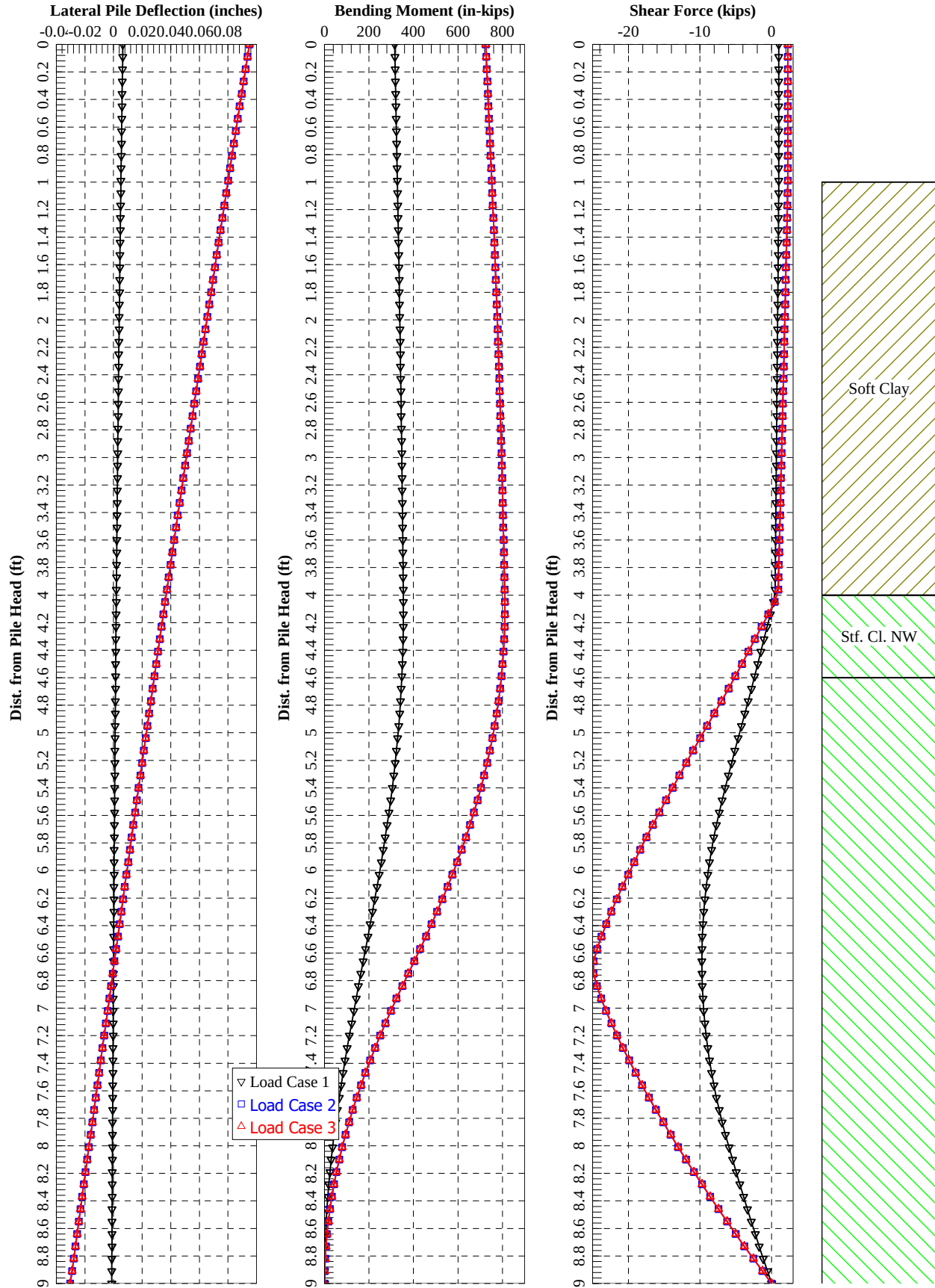
Maximum pile-head deflection = 1.5044913962 inches

Maximum pile-head rotation = -0.0175000292 radians = -1.002678 deg.

The analysis ended normally.

LATERAL LOAD (LPILE) ANALYSES
SOUTHBOUND PARKING AREA
LIGHT TOWER SC1-17 (B-009-0-25)

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-17 (Boring B-008 & 009-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation



TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-17 (Boring B-008 & 009-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

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Analysis of Individual Piles and Drilled Shafts
Subjected to Lateral Loading Using the p-y Method
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This model was prepared by:
BSears

Files Used for Analysis

Path to file locations:
\Columbus-1170\Projects\2024\24170232_ms_TP 26 NE Ohio\GEO\Project Docs\Site
15_SUM-271 (2LMN)\Calcs\Light Towers\LPILE (Final Report)\SB\

Name of input data file:
Tower SC1-17 (B-008 & B-009).lp12d

Name of output report file:
Tower SC1-17 (B-008 & B-009).lp12o

Name of plot output file:
Tower SC1-17 (B-008 & B-009).lp12p

Name of runtime message file:
Tower SC1-17 (B-008 & B-009).lp12r

Date and Time of Analysis

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-17 (Boring B-008 & 009-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Date: April 8, 2026

Time: 20:31:30

Problem Title

Project Name: TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas

Job Number: 24170232F

Client: ms consultants, inc.

Engineer: BKS

Description: Light Tower SC1-17 (B-008-0-25 & B-009-0-25)

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

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-17 (Boring B-008 & 009-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

- 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	=	9.000 ft
Depth of ground surface below top of pile	=	1.0000 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.

Point No.	Depth Below Pile Head feet	Pile Diameter inches
-----	-----	-----
1	0.000	36.0000
2	9.000	36.0000

Input Structural Properties for Pile Sections:

Pile Section No. 1:

Section 1 is a round drilled shaft, bored pile, or CIDH pile	
Length of section	= 9.000000 ft
Shaft Diameter	= 36.000000 in

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-17 (Boring B-008 & 009-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Soil and Rock Layering Information

The soil profile is modelled using 4 layers

Layer 1 is soft clay, p-y criteria by Matlock, 1970

Distance from top of pile to top of layer	=	1.000000 ft
Distance from top of pile to bottom of layer	=	4.000000 ft
Effective unit weight at top of layer	=	98.000000 pcf
Effective unit weight at bottom of layer	=	98.000000 pcf
Undrained cohesion at top of layer	=	250.000000 psf
Undrained cohesion at bottom of layer	=	250.000000 psf
Epsilon-50 at top of layer	=	0.020000
Epsilon-50 at bottom of layer	=	0.020000

Layer 2 is stiff clay without free water

Distance from top of pile to top of layer	=	4.000000 ft
Distance from top of pile to bottom of layer	=	4.600000 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	=	4000. psf
Undrained cohesion at bottom of layer	=	4000. psf
Epsilon-50 at top of layer	=	0.004000
Epsilon-50 at bottom of layer	=	0.004000

Layer 3 is stiff clay without free water

Distance from top of pile to top of layer	=	4.600000 ft
Distance from top of pile to bottom of layer	=	17.100000 ft
Effective unit weight at top of layer	=	68.000000 pcf
Effective unit weight at bottom of layer	=	68.000000 pcf
Undrained cohesion at top of layer	=	4500. psf
Undrained cohesion at bottom of layer	=	4500. psf
Epsilon-50 at top of layer	=	0.004000
Epsilon-50 at bottom of layer	=	0.004000

Layer 4 is stiff clay without free water

Distance from top of pile to top of layer	=	17.100000 ft
Distance from top of pile to bottom of layer	=	21.600000 ft
Effective unit weight at top of layer	=	63.000000 pcf

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Effective unit weight at bottom of layer	=	63.000000 pcf
Undrained cohesion at top of layer	=	4500. psf
Undrained cohesion at bottom of layer	=	4500. psf
Epsilon-50 at top of layer	=	0.004000
Epsilon-50 at bottom of layer	=	0.004000

(Depth of the lowest soil layer extends 12.600 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 psf	E50 or krm
1	Soft Clay	1.0000	98.0000	250.0000	0.02000
2	Stiff Clay w/o Free Water	4.0000 4.6000	98.0000 60.0000	250.0000 4000.	0.02000 0.00400
3	Stiff Clay w/o Free Water	4.6000 17.1000	60.0000 68.0000	4000. 4500.	0.00400 0.00400
4	Stiff Clay w/o Free Water	17.1000 21.6000	68.0000 63.0000	4500. 4500.	0.00400 0.00400

 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 = 3

Load Compute No.	Load Top y Type	Condition Run Analysis 1	Condition 2	Axial Thrust Force, lbs
1	1	V = 1000.000000 lbs	M = 315600. in-lbs	4200.

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-17 (Boring B-008 & 009-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Yes		Yes				
2	1	V =	2250. lbs	M =	724800. in-lbs	4600.
Yes		Yes				
3	1	V =	2250. lbs	M =	724800. in-lbs	3800.
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:

 Dimensions and Properties of Drilled Shaft (Bored Pile):

Length of Section	=	9.000000 ft
Shaft Diameter	=	36.000000 in
Concrete Cover Thickness (to edge of trans. reinf.)	=	3.500000 in
Number of Reinforcing Bars	=	16 bars
Yield Stress of Reinforcing Bars	=	60000. psi
Modulus of Elasticity of Reinforcing Bars	=	29000000. psi
Gross Area of Shaft	=	1018. sq. in.
Total Area of Reinforcing Steel	=	16.000000 sq. in.
Area Ratio of Steel Reinforcement	=	1.57 percent
Edge-to-Edge Bar Spacing	=	4.114467 in
Maximum Concrete Aggregate Size	=	0.750000 in
Ratio of Bar Spacing to Aggregate Size	=	5.49
Offset of Center of Rebar Cage from Center of Pile	=	0.0000 in
Transverse Reinforcement		
Type: Spiral		
Number of Transverse Reinf. (per spacing)	=	1
Spacing of Transverse Reinf.	=	4.500000 in
Yield Stress of Transverse Reinf.	=	60000. psi
Diameter of Transverse Reinf.	=	0.500000 in

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-17 (Boring B-008 & 009-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Axial Structural Capacities:

Nom. Axial Structural Capacity = $0.85 F_c A_c + F_y A_s$ = 4366.378 kips
 Tensile Load for Cracking of Concrete = -470.222 kips
 Nominal Axial Tensile Capacity = -960.000 kips

Reinforcing Bar Dimensions and Positions Used in Computations:

Bar Number	Bar Diam. inches	Bar Area sq. in.	X inches	Y inches
1	1.128000	1.000000	13.436000	0.000000
2	1.128000	1.000000	12.413245	5.141735
3	1.128000	1.000000	9.500687	9.500687
4	1.128000	1.000000	5.141735	12.413245
5	1.128000	1.000000	0.000000	13.436000
6	1.128000	1.000000	-5.14173	12.413245
7	1.128000	1.000000	-9.50069	9.500687
8	1.128000	1.000000	-12.41325	5.141735
9	1.128000	1.000000	-13.43600	0.000000
10	1.128000	1.000000	-12.41325	-5.14173
11	1.128000	1.000000	-9.50069	-9.50069
12	1.128000	1.000000	-5.14173	-12.41325
13	1.128000	1.000000	0.000000	-13.43600
14	1.128000	1.000000	5.141735	-12.41325
15	1.128000	1.000000	9.500687	-9.50069
16	1.128000	1.000000	12.413245	-5.14173

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

Minimum spacing between any two bars not equal to zero = 4.114 inches
 between bars 11 and 12.

Ratio of bar spacing to maximum aggregate size = 5.49

Concrete Properties:

Compressive Strength of Concrete = 4000. psi
 Modulus of Elasticity of Concrete = 3604997. psi
 Modulus of Rupture of Concrete = -474.34165 psi
 Compression Strain at Peak Stress = 0.001886
 Tensile Strain at Fracture of Concrete = -0.0001154
 Maximum Coarse Aggregate Size = 0.750000 in

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-17 (Boring B-008 & 009-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Number of Axial Thrust Force Values Determined from Pile-head Loadings = 3

Number	Axial Thrust Force kips
-----	-----
1	3.800
2	4.200
3	4.600

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 318-14, Section 21.2.3.
 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 = 3.800 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
-----	-----	-----	-----	-----	-----
6.25000E-07	240.5062135	384809942.	19.2929823	0.00001206	-0.00001044
0.0505030	0.2746478				
0.00000125	480.1472468	384117797.	18.6479768	0.00002331	-0.00002169
0.0973082	0.5259142				
0.00000188	718.9174733	383422652.	18.4329804	0.00003456	-0.00003294
0.1438345	0.7771808				
0.00000250	956.8168886	382726755.	18.3254857	0.00004581	-0.00004419
0.1900818	1.0284477				
0.00000313	1194.	382030558.	18.2609917	0.00005707	-0.00005543
0.2360502	1.2797149				
0.00000375	1430.	381334209.	18.2179981	0.00006832	-0.00006668
0.2817396	1.5309823				

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0.00000438	1665.	380637775.	18.1872904	0.00007957	-0.00007793
0.3271500	1.7822500				
0.00000500	1900.	379941287.	18.1642614	0.00009082	-0.00008918
0.3722815	2.0335179				
0.00000563	2133.	379244764.	18.1463515	0.0001021	-0.000100
0.4171340	2.2847861				
0.00000625	2366.	378548215.	18.1320251	0.0001133	-0.000112
0.4617075	2.5360546				
0.00000688	2366.	344134741.	10.2494785	0.00007047	-0.000177
0.2882187	-4.308598 C				
0.00000750	2366.	315456846.	10.2198771	0.00007665	-0.000193
0.3129821	-4.706727 C				
0.00000813	2366.	291190934.	10.1952302	0.00008284	-0.000210
0.3376758	-5.104761 C				
0.00000875	2366.	270391582.	10.1744772	0.00008903	-0.000226
0.3622998	-5.502701 C				
0.00000938	2366.	252365477.	10.1568402	0.00009522	-0.000242
0.3868539	-5.900547 C				
0.00001000	2366.	236592634.	10.1417358	0.0001014	-0.000259
0.4113380	-6.298297 C				
0.00001063	2366.	222675420.	10.1287027	0.0001076	-0.000275
0.4357521	-6.695951 C				
0.00001125	2366.	210304564.	10.1174231	0.0001138	-0.000291
0.4600960	-7.093510 C				
0.00001188	2366.	199235903.	10.1076093	0.0001200	-0.000307
0.4843696	-7.490973 C				
0.00001250	2366.	189274107.	10.0990420	0.0001262	-0.000324
0.5085729	-7.888340 C				
0.00001313	2366.	180261055.	10.0915439	0.0001325	-0.000340
0.5327056	-8.285611 C				
0.00001375	2366.	172067370.	10.0849699	0.0001387	-0.000356
0.5567678	-8.682785 C				
0.00001438	2366.	164586180.	10.0792000	0.0001449	-0.000373
0.5807594	-9.079861 C				
0.00001500	2366.	157728423.	10.0741344	0.0001511	-0.000389
0.6046801	-9.476841 C				
0.00001563	2366.	151419286.	10.0696892	0.0001573	-0.000405
0.6285300	-9.873723 C				
0.00001625	2366.	145595467.	10.0657933	0.0001636	-0.000421
0.6523089	-10.270507 C				
0.00001688	2366.	140203043.	10.0623863	0.0001698	-0.000438
0.6760167	-10.667193 C				
0.00001750	2366.	135195791.	10.0594163	0.0001760	-0.000454
0.6996534	-11.063781 C				
0.00001813	2366.	130533867.	10.0568387	0.0001823	-0.000470
0.7232187	-11.460271 C				
0.00001875	2366.	126182738.	10.0546147	0.0001885	-0.000486
0.7467127	-11.856661 C				
0.00001938	2366.	122112327.	10.0527107	0.0001948	-0.000503
0.7701352	-12.252952 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-17 (Boring B-008 & 009-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00002000	2366.	118296317.	10.0510970	0.0002010	-0.000519
0.7934860	-12.649144 C				
0.00002063	2366.	114711580.	10.0497478	0.0002073	-0.000535
0.8167652	-13.045236 C				
0.00002125	2366.	111337710.	10.0486401	0.0002135	-0.000551
0.8399726	-13.441228 C				
0.00002188	2366.	108156633.	10.0477539	0.0002198	-0.000568
0.8631080	-13.837120 C				
0.00002250	2366.	105152282.	10.0470709	0.0002261	-0.000584
0.8861714	-14.232911 C				
0.00002313	2366.	102310328.	10.0465752	0.0002323	-0.000600
0.9091627	-14.628602 C				
0.00002375	2366.	99617951.	10.0462524	0.0002386	-0.000616
0.9320817	-15.024191 C				
0.00002438	2366.	97063645.	10.0460897	0.0002449	-0.000633
0.9549284	-15.419678 C				
0.00002563	2429.	94800037.	10.0461990	0.0002574	-0.000665
1.0004043	-16.210348 C				
0.00002688	2545.	94692477.	10.0468231	0.0002700	-0.000697
1.0455896	-17.000609 C				
0.00002813	2660.	94589756.	10.0479254	0.0002826	-0.000730
1.0904832	-17.790458 C				
0.00002938	2776.	94491232.	10.0493946	0.0002952	-0.000762
1.1350844	-18.579893 C				
0.00003063	2891.	94396370.	10.0512127	0.0003078	-0.000795
1.1793922	-19.368912 C				
0.00003188	3006.	94304718.	10.0533415	0.0003205	-0.000827
1.2234058	-20.157511 C				
0.00003313	3121.	94215891.	10.0557483	0.0003331	-0.000859
1.2671243	-20.945689 C				
0.00003438	3236.	94129561.	10.0584054	0.0003458	-0.000892
1.3105466	-21.733443 C				
0.00003563	3350.	94045446.	10.0612887	0.0003584	-0.000924
1.3536720	-22.520771 C				
0.00003688	3465.	93963300.	10.0643778	0.0003711	-0.000956
1.3964994	-23.307669 C				
0.00003813	3579.	93882912.	10.0676547	0.0003838	-0.000989
1.4390279	-24.094136 C				
0.00003938	3694.	93804096.	10.0711039	0.0003965	-0.001021
1.4812567	-24.880169 C				
0.00004063	3808.	93726688.	10.0747116	0.0004093	-0.001053
1.5231846	-25.665765 C				
0.00004188	3922.	93650546.	10.0784659	0.0004220	-0.001085
1.5648108	-26.450921 C				
0.00004313	4035.	93575540.	10.0823562	0.0004348	-0.001118
1.6061342	-27.235635 C				
0.00004438	4149.	93501560.	10.0863731	0.0004476	-0.001150
1.6471540	-28.019904 C				
0.00004563	4263.	93428502.	10.0905084	0.0004604	-0.001182
1.6878690	-28.803725 C				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00004688	4376.	93356279.	10.0947545	0.0004732	-0.001214
1.7282784	-29.587096 C				
0.00004813	4489.	93284807.	10.0991050	0.0004860	-0.001246
1.7683810	-30.370013 C				
0.00004938	4602.	93214014.	10.1035538	0.0004989	-0.001279
1.8081759	-31.152474 C				
0.00005063	4715.	93143835.	10.1080956	0.0005117	-0.001311
1.8476620	-31.934476 C				
0.00005188	4828.	93074209.	10.1127258	0.0005246	-0.001343
1.8868384	-32.716016 C				
0.00005313	4941.	93005082.	10.1174399	0.0005375	-0.001375
1.9257039	-33.497091 C				
0.00005438	5053.	92936405.	10.1222340	0.0005504	-0.001407
1.9642575	-34.277698 C				
0.00005563	5166.	92868132.	10.1271047	0.0005633	-0.001439
2.0024981	-35.057833 C				
0.00005688	5278.	92800222.	10.1320488	0.0005763	-0.001471
2.0404247	-35.837495 C				
0.00005813	5390.	92732637.	10.1370633	0.0005892	-0.001503
2.0780361	-36.616679 C				
0.00005938	5502.	92665342.	10.1421457	0.0006022	-0.001535
2.1153313	-37.395383 C				
0.00006063	5614.	92598305.	10.1472935	0.0006152	-0.001567
2.1523092	-38.173604 C				
0.00006188	5725.	92531497.	10.1525046	0.0006282	-0.001599
2.1889685	-38.951338 C				
0.00006313	5837.	92464888.	10.1577769	0.0006412	-0.001631
2.2253083	-39.728581 C				
0.00006438	5948.	92398455.	10.1631088	0.0006543	-0.001663
2.2613274	-40.505332 C				
0.00006563	6059.	92332173.	10.1684984	0.0006673	-0.001695
2.2970245	-41.281586 C				
0.00006688	6170.	92266020.	10.1739444	0.0006804	-0.001727
2.3323987	-42.057340 C				
0.00006813	6281.	92199976.	10.1794453	0.0006935	-0.001759
2.3674485	-42.832591 C				
0.00006938	6392.	92134020.	10.1849998	0.0007066	-0.001791
2.4021730	-43.607335 C				
0.00007063	6502.	92068136.	10.1906070	0.0007197	-0.001823
2.4365708	-44.381568 C				
0.00007188	6613.	92002305.	10.1962656	0.0007329	-0.001855
2.4706408	-45.155288 C				
0.00007313	6723.	91936511.	10.2020028	0.0007460	-0.001886
2.5043818	-45.928490 C				
0.00007438	6833.	91870742.	10.2077616	0.0007592	-0.001918
2.5377924	-46.701172 C				
0.00007938	7271.	91607617.	10.2312788	0.0008121	-0.002045
2.6681070	-49.786612 C				
0.00008438	7707.	91343844.	10.2555391	0.0008653	-0.002172
2.7930345	-52.863415 C				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00008938	8140.	91079227.	10.2796933	0.0009187	-0.002299
2.9123325	-55.933382 C				
0.00009438	8570.	90813004.	10.3043877	0.0009725	-0.002425
3.0260259	-58.995009 C				
0.00009938	8979.	90357411.	10.3225581	0.0010258	-0.002552
3.1326575	-60.000000 CY				
0.0001044	9304.	89144470.	10.3110511	0.0010762	-0.002681
3.2276850	-60.000000 CY				
0.0001094	9546.	87273573.	10.2718035	0.0011235	-0.002814
3.3116704	-60.000000 CY				
0.0001144	9782.	85523680.	10.2357064	0.0011707	-0.002947
3.3907664	-60.000000 CY				
0.0001194	10004.	83800225.	10.1987328	0.0012175	-0.003080
3.4643165	-60.000000 CY				
0.0001244	10154.	81641326.	10.1374818	0.0012608	-0.003217
3.5282172	-60.000000 CY				
0.0001294	10287.	79513660.	10.0756441	0.0013035	-0.003354
3.5871212	-60.000000 CY				
0.0001344	10419.	77536664.	10.0197410	0.0013464	-0.003491
3.6423258	-60.000000 CY				
0.0001394	10550.	75693983.	9.9691573	0.0013895	-0.003628
3.6937845	-60.000000 CY				
0.0001444	10680.	73971519.	9.9233661	0.0014327	-0.003765
3.7414497	-60.000000 CY				
0.0001494	10808.	72355946.	9.8810316	0.0014760	-0.003902
3.7851328	-60.000000 CY				
0.0001544	10925.	70772035.	9.8368433	0.0015186	-0.004039
3.8241552	-60.000000 CY				
0.0001594	11008.	69072220.	9.7809580	0.0015588	-0.004179
3.8574366	-60.000000 CY				
0.0001644	11071.	67351790.	9.7204156	0.0015978	-0.004320
3.8862696	-60.000000 CY				
0.0001694	11131.	65719446.	9.6635689	0.0016368	-0.004461
3.9118664	-60.000000 CY				
0.0001744	11191.	64176802.	9.6094393	0.0016756	-0.004602
3.9342902	-60.000000 CY				
0.0001794	11250.	62716278.	9.5601863	0.0017149	-0.004743
3.9535015	-60.000000 CY				
0.0001844	11308.	61329164.	9.5136161	0.0017541	-0.004883
3.9693617	-60.000000 CY				
0.0001894	11364.	60009896.	9.4690774	0.0017932	-0.005024
3.9819050	-60.000000 CY				
0.0001944	11420.	58754909.	9.4280227	0.0018326	-0.005165
3.9911986	-60.000000 CY				
0.0001994	11476.	57559296.	9.3897594	0.0018721	-0.005305
3.9971986	-60.000000 CY				
0.0002044	11531.	56418622.	9.3531932	0.0019116	-0.005446
3.9998595	-60.000000 CY				
0.0002094	11584.	55328385.	9.3201259	0.0019514	-0.005586
3.9974517	-60.000000 CY				

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0.0002144	11637.	54285454.	9.2909722	0.0019918	-0.005726
3.9998812	-60.000000 CY				
0.0002194	11690.	53285909.	9.2626721	0.0020320	-0.005866
3.9969940	-60.000000 CY				
0.0002244	11740.	52321336.	9.2356724	0.0020723	-0.006005
3.9997138	-60.000000 CY				
0.0002294	11786.	51384137.	9.2093226	0.0021124	-0.006145
3.9955528	-60.000000 CY				
0.0002344	11823.	50445667.	9.1796872	0.0021515	-0.006286
3.9989818	-60.000000 CY				
0.0002394	11855.	49524943.	9.1473565	0.0021896	-0.006428
3.9994466	-60.000000 CY				
0.0002444	11876.	48598228.	9.1109548	0.0022265	-0.006571
3.9965160	-60.000000 CY				
0.0002494	11895.	47701101.	9.0745971	0.0022630	-0.006715
3.9991770	-60.000000 CY				
0.0002544	11912.	46829816.	9.0405915	0.0022997	-0.006858
3.9995775	-60.000000 CY				
0.0002594	11929.	45990067.	9.0077660	0.0023364	-0.007001
3.9954763	-60.000000 CY				
0.0002644	11945.	45181124.	8.9766457	0.0023732	-0.007144
3.9984997	-60.000000 CY				
0.0002694	11961.	44401256.	8.9468563	0.0024101	-0.007287
3.9998981	-60.000000 CY				
0.0002744	11976.	43648250.	8.9191370	0.0024472	-0.007430
3.9944635	-60.000000 CY				
0.0003044	12062.	39628140.	8.7757363	0.0026711	-0.008286
3.9984635	-60.000000 CY				
0.0003344	12138.	36300180.	8.6628609	0.0028966	-0.009141
3.9998209	-60.000000 CY				
0.0003644	12207.	33502446.	8.5793723	0.0031261	-0.009991
3.9999551	-60.000000 CYT				
0.0003944	12272.	31117026.	8.5161103	0.0033585	-0.010839
3.9996166	-60.000000 CYT				
0.0004244	12331.	29056485.	8.4674428	0.0035934	-0.011684
3.9972132	-60.000000 CYT				
0.0004544	12377.	27238942.	8.4178614	0.0038249	-0.012533
3.9873462	-60.000000 CYT				

Axial Thrust Force = 4.200 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
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6.25000E-07	240.5049676	384807948.	19.4290859	0.00001214	-0.00001036
0.0508615	0.2771147				
0.00000125	480.1459926	384116794.	18.7161837	0.00002340	-0.00002160
0.0976654	0.5283867				
0.00000188	718.9162127	383421980.	18.4785558	0.00003465	-0.00003285
0.1441903	0.7796589				
0.00000250	956.8156222	382726249.	18.3597458	0.00004590	-0.00004410
0.1904363	1.0309315				
0.00000313	1194.	382030150.	18.2884629	0.00005715	-0.00005535
0.2364034	1.2822044				
0.00000375	1430.	381333869.	18.2409436	0.00006840	-0.00006660
0.2820914	1.5334776				
0.00000438	1665.	380637482.	18.2070035	0.00007966	-0.00007784
0.3275005	1.7847511				
0.00000500	1900.	379941029.	18.1815504	0.00009091	-0.00008909
0.3726306	2.0360248				
0.00000563	2133.	379244533.	18.1617553	0.0001022	-0.000100
0.4174818	2.2872988				
0.00000625	2366.	378548006.	18.1459208	0.0001134	-0.000112
0.4620539	2.5385732				
0.00000688	2366.	344134551.	10.2895004	0.00007074	-0.000177
0.2893429	-4.300617 C				
0.00000750	2366.	315456672.	10.2575513	0.00007693	-0.000193
0.3141325	-4.698533 C				
0.00000813	2366.	291190774.	10.2300378	0.00008312	-0.000209
0.3388235	-5.096560 C				
0.00000875	2366.	270391433.	10.2068278	0.00008931	-0.000226
0.3634446	-5.494492 C				
0.00000938	2366.	252365338.	10.1870615	0.00009550	-0.000242
0.3879959	-5.892330 C				
0.00001000	2366.	236592504.	10.1700940	0.0001017	-0.000258
0.4124772	-6.290073 C				
0.00001063	2366.	222675298.	10.1554324	0.0001079	-0.000275
0.4368884	-6.687720 C				
0.00001125	2366.	210304448.	10.1426931	0.0001141	-0.000291
0.4612294	-7.085271 C				
0.00001188	2366.	199235793.	10.1315564	0.0001203	-0.000307
0.4855002	-7.482727 C				
0.00001250	2366.	189274003.	10.1218127	0.0001265	-0.000323
0.5097005	-7.880086 C				
0.00001313	2366.	180260955.	10.1132503	0.0001327	-0.000340
0.5338304	-8.277349 C				
0.00001375	2366.	172067276.	10.1057088	0.0001390	-0.000356
0.5578898	-8.674515 C				
0.00001438	2366.	164586090.	10.0990556	0.0001452	-0.000372
0.5818784	-9.071585 C				
0.00001500	2366.	157728336.	10.0931803	0.0001514	-0.000389
0.6057963	-9.468556 C				
0.00001563	2366.	151419203.	10.0879903	0.0001576	-0.000405
0.6296433	-9.865431 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-17 (Boring B-008 & 009-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00001625	2366.	145595387.	10.0834069	0.0001639	-0.000421
0.6534193	-10.262207 C				
0.00001688	2366.	140202965.	10.0793634	0.0001701	-0.000437
0.6771242	-10.658886 C				
0.00001750	2366.	135195717.	10.0758025	0.0001763	-0.000454
0.7007579	-11.055466 C				
0.00001813	2366.	130533795.	10.0726747	0.0001826	-0.000470
0.7243204	-11.451947 C				
0.00001875	2366.	126182669.	10.0699372	0.0001888	-0.000486
0.7478114	-11.848330 C				
0.00001938	2366.	122112260.	10.0675528	0.0001951	-0.000502
0.7712309	-12.244613 C				
0.00002000	2366.	118296252.	10.0654889	0.0002013	-0.000519
0.7945789	-12.640797 C				
0.00002063	2366.	114711517.	10.0637168	0.0002076	-0.000535
0.8178551	-13.036882 C				
0.00002125	2366.	111337649.	10.0622112	0.0002138	-0.000551
0.8410595	-13.432866 C				
0.00002188	2366.	108156573.	10.0609497	0.0002201	-0.000567
0.8641920	-13.828750 C				
0.00002250	2366.	105152224.	10.0599125	0.0002263	-0.000584
0.8872524	-14.224533 C				
0.00002313	2366.	102310272.	10.0590817	0.0002326	-0.000600
0.9102407	-14.620215 C				
0.00002375	2366.	99617896.	10.0584414	0.0002389	-0.000616
0.9331568	-15.015796 C				
0.00002438	2366.	97063591.	10.0579776	0.0002452	-0.000632
0.9560005	-15.411276 C				
0.00002563	2432.	94924068.	10.0575288	0.0002577	-0.000665
1.0014704	-16.201930 C				
0.00002688	2548.	94810571.	10.0576469	0.0002703	-0.000697
1.0466496	-16.992174 C				
0.00002813	2664.	94702439.	10.0582592	0.0002829	-0.000730
1.0915372	-17.782007 C				
0.00002938	2779.	94598964.	10.0593353	0.0002955	-0.000762
1.1361324	-18.571425 C				
0.00003063	2894.	94499555.	10.0607664	0.0003081	-0.000794
1.1804341	-19.360427 C				
0.00003188	3009.	94403710.	10.0625387	0.0003207	-0.000827
1.2244416	-20.149010 C				
0.00003313	3124.	94311007.	10.0646159	0.0003334	-0.000859
1.2681539	-20.937171 C				
0.00003438	3239.	94221082.	10.0669675	0.0003461	-0.000891
1.3115700	-21.724908 C				
0.00003563	3354.	94133623.	10.0695670	0.0003587	-0.000924
1.3546892	-22.512219 C				
0.00003688	3468.	94048359.	10.0723915	0.0003714	-0.000956
1.3975103	-23.299100 C				
0.00003813	3582.	93965057.	10.0754214	0.0003841	-0.000988
1.4400326	-24.085550 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-17 (Boring B-008 & 009-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00003938	3697.	93883511.	10.0786392	0.0003968	-0.001021
1.4822550	-24.871565 C				
0.00004063	3811.	93803541.	10.0820299	0.0004096	-0.001053
1.5241766	-25.657144 C				
0.00004188	3925.	93724988.	10.0855803	0.0004223	-0.001085
1.5657965	-26.442282 C				
0.00004313	4039.	93647711.	10.0892786	0.0004351	-0.001117
1.6071135	-27.226979 C				
0.00004438	4152.	93571586.	10.0931145	0.0004479	-0.001150
1.6481268	-28.011230 C				
0.00004563	4266.	93496502.	10.0970787	0.0004607	-0.001182
1.6888354	-28.795033 C				
0.00004688	4379.	93422358.	10.1011630	0.0004735	-0.001214
1.7292383	-29.578385 C				
0.00004813	4492.	93349066.	10.1053601	0.0004863	-0.001246
1.7693344	-30.361284 C				
0.00004938	4606.	93276544.	10.1096634	0.0004992	-0.001278
1.8091228	-31.143727 C				
0.00005063	4718.	93204721.	10.1140670	0.0005120	-0.001310
1.8486023	-31.925710 C				
0.00005188	4831.	93133529.	10.1185657	0.0005249	-0.001343
1.8877721	-32.707231 C				
0.00005313	4944.	93062909.	10.1231546	0.0005378	-0.001375
1.9266309	-33.488287 C				
0.00005438	5056.	92992807.	10.1278294	0.0005507	-0.001407
1.9651778	-34.268875 C				
0.00005563	5169.	92923173.	10.1325862	0.0005636	-0.001439
2.0034117	-35.048992 C				
0.00005688	5281.	92853961.	10.1374215	0.0005766	-0.001471
2.0413316	-35.828634 C				
0.00005813	5393.	92785130.	10.1423320	0.0005895	-0.001503
2.0789362	-36.607799 C				
0.00005938	5505.	92716640.	10.1473148	0.0006025	-0.001535
2.1162246	-37.386484 C				
0.00006063	5617.	92648458.	10.1523672	0.0006155	-0.001567
2.1531956	-38.164685 C				
0.00006188	5728.	92580549.	10.1574868	0.0006285	-0.001599
2.1898481	-38.942399 C				
0.00006313	5840.	92512883.	10.1626714	0.0006415	-0.001631
2.2261809	-39.719622 C				
0.00006438	5951.	92445433.	10.1679189	0.0006546	-0.001663
2.2621930	-40.496353 C				
0.00006563	6062.	92378172.	10.1732276	0.0006676	-0.001695
2.2978832	-41.272587 C				
0.00006688	6173.	92311077.	10.1785957	0.0006807	-0.001727
2.3332503	-42.048320 C				
0.00006813	6284.	92244124.	10.1840217	0.0006938	-0.001759
2.3682931	-42.823550 C				
0.00006938	6395.	92177292.	10.1895041	0.0007069	-0.001791
2.4030104	-43.598274 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-17 (Boring B-008 & 009-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00007063	6505.	92110561.	10.1950417	0.0007200	-0.001822
2.4374011	-44.372486 C				
0.00007188	6616.	92043913.	10.2006608	0.0007332	-0.001854
2.4714639	-45.146185 C				
0.00007313	6726.	91977331.	10.2063053	0.0007463	-0.001886
2.5051976	-45.919366 C				
0.00007438	6836.	91910797.	10.2120017	0.0007595	-0.001918
2.5386010	-46.692026 C				
0.00007938	7274.	91644853.	10.2352897	0.0008124	-0.002045
2.6688860	-49.777380 C				
0.00008438	7710.	91378587.	10.2593338	0.0008656	-0.002172
2.7937834	-52.854093 C				
0.00008938	8143.	91111830.	10.2831857	0.0009191	-0.002298
2.9130226	-55.924331 C				
0.00009438	8573.	90843621.	10.3077273	0.0009728	-0.002425
3.0266854	-58.985869 C				
0.00009938	8982.	90387473.	10.3258078	0.0010261	-0.002551
3.1332951	-60.000000 CY				
0.0001044	9308.	89176212.	10.3143071	0.0010766	-0.002681
3.2283182	-60.000000 CY				
0.0001094	9549.	87304848.	10.2749831	0.0011238	-0.002814
3.3122821	-60.000000 CY				
0.0001144	9785.	85553556.	10.2389100	0.0011711	-0.002946
3.3913727	-60.000000 CY				
0.0001194	10007.	83830919.	10.2019402	0.0012179	-0.003080
3.4649106	-60.000000 CY				
0.0001244	10158.	81671814.	10.1406407	0.0012612	-0.003216
3.5287895	-60.000000 CY				
0.0001294	10291.	79542859.	10.0787027	0.0013039	-0.003354
3.5876602	-60.000000 CY				
0.0001344	10423.	77564670.	10.0227059	0.0013468	-0.003491
3.6428308	-60.000000 CY				
0.0001394	10554.	75720878.	9.9720357	0.0013899	-0.003628
3.6942550	-60.000000 CY				
0.0001444	10683.	73997378.	9.9261646	0.0014331	-0.003764
3.7418850	-60.000000 CY				
0.0001494	10812.	72381005.	9.8838986	0.0014764	-0.003901
3.7855535	-60.000000 CY				
0.0001544	10929.	70796718.	9.8396771	0.0015190	-0.004038
3.8245440	-60.000000 CY				
0.0001594	11012.	69097838.	9.7838573	0.0015593	-0.004178
3.8578061	-60.000000 CY				
0.0001644	11075.	67376662.	9.7232508	0.0015983	-0.004319
3.8866026	-60.000000 CY				
0.0001694	11135.	65743511.	9.6663364	0.0016372	-0.004460
3.9121613	-60.000000 CY				
0.0001744	11195.	64200103.	9.6121495	0.0016761	-0.004601
3.9345463	-60.000000 CY				
0.0001794	11254.	62738857.	9.5628376	0.0017153	-0.004742
3.9537182	-60.000000 CY				

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 Light Tower SC1-17 (Boring B-008 & 009-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0001844	11312.	61351278.	9.5162917	0.0017546	-0.004883
3.9695496	-60.000000 CY				
0.0001894	11368.	60031354.	9.4717005	0.0017937	-0.005024
3.9820503	-60.000000 CY				
0.0001944	11425.	58775745.	9.4305957	0.0018331	-0.005164
3.9913005	-60.000000 CY				
0.0001994	11480.	57579537.	9.3922863	0.0018726	-0.005305
3.9972564	-60.000000 CY				
0.0002044	11535.	56438298.	9.3556780	0.0019121	-0.005445
3.9998723	-60.000000 CY				
0.0002094	11588.	55347517.	9.3241700	0.0019522	-0.005585
3.9975077	-60.000000 CY				
0.0002144	11641.	54304067.	9.2934428	0.0019923	-0.005725
3.9998931	-60.000000 CY				
0.0002194	11694.	53304015.	9.2651074	0.0020325	-0.005865
3.9970558	-60.000000 CY				
0.0002244	11744.	52339157.	9.2380944	0.0020728	-0.006005
3.9997330	-60.000000 CY				
0.0002294	11790.	51401489.	9.2117130	0.0021129	-0.006145
3.9956300	-60.000000 CY				
0.0002344	11827.	50463153.	9.1821360	0.0021521	-0.006285
3.9990203	-60.000000 CY				
0.0002394	11859.	49542728.	9.1500193	0.0021903	-0.006427
3.9992468	-60.000000 CY				
0.0002444	11880.	48615611.	9.1135780	0.0022271	-0.006570
3.9965958	-60.000000 CY				
0.0002494	11900.	47718283.	9.0771076	0.0022636	-0.006714
3.9992162	-60.000000 CY				
0.0002544	11917.	46846598.	9.0431776	0.0023004	-0.006857
3.9993713	-60.000000 CY				
0.0002594	11933.	46006491.	9.0103157	0.0023371	-0.007000
3.9955701	-60.000000 CY				
0.0002644	11949.	45197204.	8.9791598	0.0023739	-0.007144
3.9985538	-60.000000 CY				
0.0002694	11965.	44417005.	8.9493437	0.0024107	-0.007287
3.9999119	-60.000000 CY				
0.0002744	11980.	43663657.	8.9215934	0.0024479	-0.007430
3.9942523	-60.000000 CY				
0.0003044	12066.	39641995.	8.7782176	0.0026719	-0.008286
3.9985257	-60.000000 CY				
0.0003344	12142.	36312646.	8.6652203	0.0028974	-0.009140
3.9998424	-60.000000 CY				
0.0003644	12212.	33513765.	8.5815911	0.0031269	-0.009991
3.9999658	-60.000000 CYT				
0.0003944	12276.	31127384.	8.5182268	0.0033594	-0.010838
3.9996505	-60.000000 CYT				
0.0004244	12335.	29066055.	8.4694819	0.0035942	-0.011683
3.9973093	-60.000000 CYT				
0.0004544	12381.	27248100.	8.4201387	0.0038259	-0.012532
3.9875919	-60.000000 CYT				

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36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Axial Thrust Force = 4.600 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
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6.25000E-07	240.5035986	384805758.	19.5651901	0.00001223	-0.00001027
0.0512199	0.2795816				
0.00000125	480.1446137	384115691.	18.7843907	0.00002348	-0.00002152
0.0980225	0.5308592				
0.00000188	718.9148267	383421241.	18.5241312	0.00003473	-0.00003277
0.1445462	0.7821371				
0.00000250	956.8142298	382725692.	18.3940059	0.00004599	-0.00004401
0.1907908	1.0334154				
0.00000313	1194.	382029703.	18.3159341	0.00005724	-0.00005526
0.2367565	1.2846940				
0.00000375	1430.	381333494.	18.2638891	0.00006849	-0.00006651
0.2824433	1.5359729				
0.00000438	1665.	380637159.	18.2267166	0.00007974	-0.00007776
0.3278510	1.7872522				
0.00000500	1900.	379940746.	18.1988394	0.00009099	-0.00008901
0.3729798	2.0385317				
0.00000563	2133.	379244280.	18.1771590	0.0001022	-0.000100
0.4178295	2.2898116				
0.00000625	2366.	378547777.	18.1598165	0.0001135	-0.000112
0.4624003	2.5410917				
0.00000688	2366.	344134343.	10.3291778	0.00007101	-0.000176
0.2904571	-4.292706 C				
0.00000750	2366.	315456481.	10.2940289	0.00007721	-0.000193
0.3152465	-4.690597 C				
0.00000813	2366.	291190598.	10.2646762	0.00008340	-0.000209
0.3399656	-5.088396 C				
0.00000875	2366.	270391269.	10.2391817	0.00008959	-0.000225
0.3645893	-5.486283 C				
0.00000938	2366.	252365185.	10.2172859	0.00009579	-0.000242
0.3891378	-5.884113 C				
0.00001000	2366.	236592361.	10.1984552	0.0001020	-0.000258
0.4136162	-6.281848 C				
0.00001063	2366.	222675163.	10.1821496	0.0001082	-0.000274
0.4380246	-6.679488 C				
0.00001125	2366.	210304321.	10.1679490	0.0001144	-0.000291
0.4623628	-7.077032 C				
0.00001188	2366.	199235672.	10.1555219	0.0001206	-0.000307
0.4866307	-7.474480 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00001250	2366.	189273889.	10.1446030	0.0001268	-0.000323
0.5108282	-7.871831 C				
0.00001313	2366.	180260846.	10.1349589	0.0001330	-0.000339
0.5349552	-8.269087 C				
0.00001375	2366.	172067171.	10.1264498	0.0001392	-0.000356
0.5590117	-8.666245 C				
0.00001438	2366.	164585990.	10.1189132	0.0001455	-0.000372
0.5829974	-9.063307 C				
0.00001500	2366.	157728241.	10.1122282	0.0001517	-0.000388
0.6069124	-9.460271 C				
0.00001563	2366.	151419111.	10.1062933	0.0001579	-0.000405
0.6307565	-9.857138 C				
0.00001625	2366.	145595299.	10.1010224	0.0001641	-0.000421
0.6545296	-10.253907 C				
0.00001688	2366.	140202880.	10.0963423	0.0001704	-0.000437
0.6782316	-10.650577 C				
0.00001750	2366.	135195635.	10.0921903	0.0001766	-0.000453
0.7018624	-11.047150 C				
0.00001813	2366.	130533716.	10.0885122	0.0001829	-0.000470
0.7254219	-11.443623 C				
0.00001875	2366.	126182592.	10.0852613	0.0001891	-0.000486
0.7489100	-11.839998 C				
0.00001938	2366.	122112186.	10.0823966	0.0001953	-0.000502
0.7723266	-12.236274 C				
0.00002000	2366.	118296180.	10.0798824	0.0002016	-0.000518
0.7956716	-12.632450 C				
0.00002063	2366.	114711448.	10.0776874	0.0002079	-0.000535
0.8189449	-13.028526 C				
0.00002125	2366.	111337582.	10.0757837	0.0002141	-0.000551
0.8421464	-13.424502 C				
0.00002188	2366.	108156508.	10.0741470	0.0002204	-0.000567
0.8652759	-13.820378 C				
0.00002250	2366.	105152160.	10.0727554	0.0002266	-0.000583
0.8883333	-14.216153 C				
0.00002313	2366.	102310210.	10.0715894	0.0002329	-0.000600
0.9113187	-14.611828 C				
0.00002375	2366.	99617836.	10.0706317	0.0002392	-0.000616
0.9342318	-15.007401 C				
0.00002438	2366.	97063533.	10.0698667	0.0002455	-0.000632
0.9570725	-15.402873 C				
0.00002563	2436.	95048091.	10.0688598	0.0002580	-0.000664
1.0025364	-16.193510 C				
0.00002688	2551.	94928657.	10.0684718	0.0002706	-0.000697
1.0477096	-16.983738 C				
0.00002813	2667.	94815115.	10.0686232	0.0002832	-0.000729
1.0925912	-17.773555 C				
0.00002938	2782.	94706690.	10.0692479	0.0002958	-0.000762
1.1371802	-18.562957 C				
0.00003063	2897.	94602733.	10.0703211	0.0003084	-0.000794
1.1814759	-19.351942 C				

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0.00003188	3012.	94502697.	10.0717368	0.0003210	-0.000826
1.2254772	-20.140508 C				
0.00003313	3127.	94406117.	10.0734845	0.0003337	-0.000859
1.2691834	-20.928652 C				
0.00003438	3242.	94312597.	10.0755306	0.0003463	-0.000891
1.3125933	-21.716373 C				
0.00003563	3357.	94221794.	10.0778462	0.0003590	-0.000923
1.3557063	-22.503666 C				
0.00003688	3471.	94133413.	10.0804061	0.0003717	-0.000956
1.3985212	-23.290530 C				
0.00003813	3586.	94047197.	10.0831888	0.0003844	-0.000988
1.4410372	-24.076963 C				
0.00003938	3700.	93962921.	10.0861753	0.0003971	-0.001020
1.4832533	-24.862961 C				
0.00004063	3814.	93880388.	10.0893491	0.0004099	-0.001053
1.5251686	-25.648521 C				
0.00004188	3928.	93799425.	10.0926956	0.0004226	-0.001085
1.5667821	-26.433642 C				
0.00004313	4042.	93719877.	10.0962019	0.0004354	-0.001117
1.6080927	-27.218321 C				
0.00004438	4155.	93641609.	10.0998566	0.0004482	-0.001149
1.6490996	-28.002554 C				
0.00004563	4269.	93564497.	10.1036497	0.0004610	-0.001182
1.6898018	-28.786339 C				
0.00004688	4382.	93488434.	10.1075722	0.0004738	-0.001214
1.7301982	-29.569674 C				
0.00004813	4496.	93413321.	10.1116159	0.0004866	-0.001246
1.7702878	-30.352554 C				
0.00004938	4609.	93339070.	10.1157737	0.0004995	-0.001278
1.8100696	-31.134978 C				
0.00005063	4722.	93265602.	10.1200391	0.0005123	-0.001310
1.8495425	-31.916943 C				
0.00005188	4834.	93192845.	10.1244063	0.0005252	-0.001342
1.8887057	-32.698446 C				
0.00005313	4947.	93120733.	10.1288700	0.0005381	-0.001374
1.9275579	-33.479483 C				
0.00005438	5060.	93049206.	10.1334255	0.0005510	-0.001406
1.9660981	-34.260052 C				
0.00005563	5172.	92978211.	10.1380684	0.0005639	-0.001439
2.0043253	-35.040149 C				
0.00005688	5284.	92907697.	10.1427948	0.0005769	-0.001471
2.0422384	-35.819772 C				
0.00005813	5396.	92837619.	10.1476012	0.0005898	-0.001503
2.0798362	-36.598918 C				
0.00005938	5508.	92767935.	10.1524844	0.0006028	-0.001535
2.1171178	-37.377583 C				
0.00006063	5620.	92698606.	10.1574414	0.0006158	-0.001567
2.1540819	-38.155764 C				
0.00006188	5731.	92629597.	10.1624696	0.0006288	-0.001599
2.1907275	-38.933458 C				

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0.00006313	5843.	92560874.	10.1675664	0.0006418	-0.001631
2.2270535	-39.710662 C				
0.00006438	5954.	92492407.	10.1727297	0.0006549	-0.001663
2.2630586	-40.487373 C				
0.00006563	6065.	92424168.	10.1779574	0.0006679	-0.001695
2.2987417	-41.263586 C				
0.00006688	6176.	92356130.	10.1832476	0.0006810	-0.001726
2.3341018	-42.039299 C				
0.00006813	6287.	92288268.	10.1885986	0.0006941	-0.001758
2.3691375	-42.814509 C				
0.00006938	6398.	92220560.	10.1940089	0.0007072	-0.001790
2.4038477	-43.589211 C				
0.00007063	6508.	92152983.	10.1995039	0.0007203	-0.001822
2.4382312	-44.363403 C				
0.00007188	6619.	92085519.	10.2050285	0.0007335	-0.001854
2.4722868	-45.137081 C				
0.00007313	6729.	92018147.	10.2106084	0.0007467	-0.001886
2.5060133	-45.910241 C				
0.00007438	6839.	91950850.	10.2162424	0.0007598	-0.001918
2.5394094	-46.682880 C				
0.00007938	7277.	91682087.	10.2393011	0.0008127	-0.002045
2.6696649	-49.768146 C				
0.00008438	7713.	91413389.	10.2630109	0.0008659	-0.002172
2.7945082	-52.845065 C				
0.00008938	8146.	91144431.	10.2866786	0.0009194	-0.002298
2.9137126	-55.915279 C				
0.00009438	8576.	90874234.	10.3110673	0.0009731	-0.002424
3.0273448	-58.976728 C				
0.00009938	8985.	90417533.	10.3290580	0.0010265	-0.002551
3.1339327	-60.000000 CY				
0.0001044	9311.	89207952.	10.3175636	0.0010769	-0.002681
3.2289512	-60.000000 CY				
0.0001094	9552.	87336121.	10.2781631	0.0011242	-0.002813
3.3128936	-60.000000 CY				
0.0001144	9789.	85583430.	10.2421143	0.0011714	-0.002946
3.3919789	-60.000000 CY				
0.0001194	10011.	83861611.	10.2051482	0.0012182	-0.003079
3.4655044	-60.000000 CY				
0.0001244	10162.	81702300.	10.1438002	0.0012616	-0.003216
3.5293615	-60.000000 CY				
0.0001294	10295.	79572057.	10.0817619	0.0013043	-0.003353
3.5881988	-60.000000 CY				
0.0001344	10427.	77592674.	10.0256713	0.0013472	-0.003490
3.6433355	-60.000000 CY				
0.0001394	10557.	75747771.	9.9749147	0.0013903	-0.003627
3.6947252	-60.000000 CY				
0.0001444	10687.	74023236.	9.9289636	0.0014335	-0.003764
3.7423201	-60.000000 CY				
0.0001494	10816.	72406063.	9.8867661	0.0014768	-0.003901
3.7859739	-60.000000 CY				

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0.0001544	10933.	70821400.	9.8425115	0.0015194	-0.004038
3.8249324	-60.000000 CY				
0.0001594	11017.	69123456.	9.7867573	0.0015598	-0.004178
3.8581753	-60.000000 CY				
0.0001644	11079.	67401534.	9.7260868	0.0015987	-0.004319
3.8869352	-60.000000 CY				
0.0001694	11139.	65767574.	9.6691048	0.0016377	-0.004460
3.9124557	-60.000000 CY				
0.0001744	11199.	64223403.	9.6148605	0.0016766	-0.004601
3.9348020	-60.000000 CY				
0.0001794	11258.	62761436.	9.5654896	0.0017158	-0.004742
3.9539345	-60.000000 CY				
0.0001844	11316.	61373390.	9.5189681	0.0017551	-0.004882
3.9697370	-60.000000 CY				
0.0001894	11373.	60052811.	9.4743244	0.0017942	-0.005023
3.9821950	-60.000000 CY				
0.0001944	11429.	58796578.	9.4331695	0.0018336	-0.005164
3.9914019	-60.000000 CY				
0.0001994	11484.	57599778.	9.3948139	0.0018731	-0.005304
3.9973136	-60.000000 CY				
0.0002044	11539.	56457972.	9.3581635	0.0019126	-0.005445
3.9998845	-60.000000 CY				
0.0002094	11592.	55366642.	9.3266817	0.0019528	-0.005585
3.9975630	-60.000000 CY				
0.0002144	11645.	54322678.	9.2959142	0.0019928	-0.005725
3.9999044	-60.000000 CY				
0.0002194	11698.	53322120.	9.2675435	0.0020331	-0.005864
3.9971169	-60.000000 CY				
0.0002244	11748.	52356977.	9.2405172	0.0020733	-0.006004
3.9997515	-60.000000 CY				
0.0002294	11794.	51418840.	9.2141042	0.0021135	-0.006144
3.9957066	-60.000000 CY				
0.0002344	11831.	50480617.	9.1845645	0.0021526	-0.006285
3.9990577	-60.000000 CY				
0.0002394	11864.	49560513.	9.1526832	0.0021909	-0.006427
3.9990468	-60.000000 CY				
0.0002444	11885.	48632992.	9.1162023	0.0022278	-0.006570
3.9966747	-60.000000 CY				
0.0002494	11904.	47735462.	9.0796192	0.0022642	-0.006713
3.9992545	-60.000000 CY				
0.0002544	11921.	46863378.	9.0457647	0.0023010	-0.006856
3.9991650	-60.000000 CY				
0.0002594	11937.	46022914.	9.0128664	0.0023377	-0.007000
3.9956629	-60.000000 CY				
0.0002644	11953.	45213284.	8.9816750	0.0023745	-0.007143
3.9986069	-60.000000 CY				
0.0002694	11969.	44432753.	8.9518321	0.0024114	-0.007286
3.9999247	-60.000000 CY				
0.0002744	11984.	43679063.	8.9240509	0.0024485	-0.007429
3.9940409	-60.000000 CY				

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0.0003044	12070.	39655848.	8.7807001	0.0026726	-0.008285
3.9985866	-60.000000 CY				
0.0003344	12146.	36325110.	8.6675807	0.0028982	-0.009139
3.9998625	-60.000000 CY				
0.0003644	12216.	33525083.	8.5838110	0.0031277	-0.009990
3.9999751	-60.000000 CYT				
0.0003944	12280.	31137740.	8.5203443	0.0033602	-0.010837
3.9996828	-60.000000 CYT				
0.0004244	12339.	29075625.	8.4715220	0.0035951	-0.011682
3.9974037	-60.000000 CYT				
0.0004544	12385.	27257253.	8.4224181	0.0038269	-0.012531
3.9878351	-60.000000 CYT				

 Summary of Results for Nominal 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 Tens. No. Strain	Axial Thrust kips	Nominal Mom. Cap. in-kip	Max. Comp. Strain	Max.
----	-----	-----	-----	
1 -0.00952396	3.800	12169.214	0.00300000	
2 -0.00952020	4.200	12173.120	0.00300000	
3 -0.00951645	4.600	12177.027	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 (0.75).

The above values should be multiplied by the appropriate strength reduction factor to compute ultimate moment capacity according to ACI 318, 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 Stiff.	Resist.	Nominal	Nominal	Ult. (Fac)	Ult. (Fac)	Bend.
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Load Ult Mom No. kip-in ²	Factor	Ax. Thrust kips	Moment Cap in-kips	Ax. Thrust kips	Moment Cap in-kips	at
-----	-----	-----	-----	-----	-----	
1 91219895.	0.65	3.800000	12169.	2.470000	7910.	
2 91253873.	0.65	4.200000	12173.	2.730000	7913.	
3 91287886.	0.65	4.600000	12177.	2.990000	7915.	
1 89806706.	0.75	3.800000	12169.	2.850000	9127.	
2 89838295.	0.75	4.200000	12173.	3.150000	9130.	
3 89869877.	0.75	4.600000	12177.	3.450000	9133.	
1 70221645.	0.90	3.800000	12169.	3.420000	10952.	
2 70254444.	0.90	4.200000	12173.	3.780000	10956.	
3 70287179.	0.90	4.600000	12177.	4.140000	10959.	

 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	1.0000	0.00	N.A.	No	0.00	8832.
2	4.0000	0.2434	No	No	8832.	22315.
3	4.6000	0.7515	Yes	No	31147.	210578.
4	17.1000	16.1000	No	No	241725.	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.

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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 = 1000.0 lbs
 Applied moment at pile head = 315600.0 in-lbs
 Axial thrust load on pile head = 4200.0 lbs

Depth Res.	Soil X Es*H feet lb/inch	Deflect. Spr. y Lat. inches lb/inch	Bending Distrib. Moment in-lbs lb/inch	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness lb-in^2	Soil p
0.00	0.00	0.00650	315600.	1000.	-1.16E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.09000	0.00	0.00637	316681.	1000.	-1.15E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.1800	0.00	0.00625	317761.	1000.	-1.14E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.2700	0.00	0.00613	318842.	1000.	-1.13E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.3600	0.00	0.00600	319922.	1000.	-1.12E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.4500	0.00	0.00588	321003.	1000.	-1.11E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.5400	0.00	0.00576	322083.	1000.	-1.11E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.6300	0.00	0.00564	323164.	1000.	-1.10E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.7200	0.00	0.00553	324244.	1000.	-1.09E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.8100	0.00	0.00541	325325.	1000.	-1.08E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.9000	0.00	0.00529	326405.	1000.	-1.07E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.9900	0.00	0.00518	327486.	1000.	-1.06E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
1.0800	0.00	0.00507	328566.	992.7407	-1.05E-04	0.00	3.84E+11	
-13.443		2866.	0.00					
1.1700	0.00	0.00495	329631.	978.1576	-1.04E-04	0.00	3.84E+11	
-13.563		2958.	0.00					

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1.2600	0.00484	330680.	963.4473	-1.03E-04	0.00	3.84E+11
-13.678	3052.	0.00				
1.3500	0.00473	331713.	948.6142	-1.02E-04	0.00	3.84E+11
-13.790	3149.	0.00				
1.4400	0.00462	332730.	933.6627	-1.01E-04	0.00	3.84E+11
-13.898	3249.	0.00				
1.5300	0.00451	333730.	918.5972	-1.00E-04	0.00	3.84E+11
-14.001	3353.	0.00				
1.6200	0.00440	334715.	903.4221	-9.95E-05	0.00	3.84E+11
-14.101	3459.	0.00				
1.7100	0.00430	335683.	888.1421	-9.85E-05	0.00	3.84E+11
-14.196	3569.	0.00				
1.8000	0.00419	336634.	872.7616	-9.76E-05	0.00	3.84E+11
-14.287	3683.	0.00				
1.8900	0.00408	337569.	857.2855	-9.67E-05	0.00	3.84E+11
-14.373	3800.	0.00				
1.9800	0.00398	338487.	841.7183	-9.57E-05	0.00	3.84E+11
-14.455	3922.	0.00				
2.0700	0.00388	339388.	826.0648	-9.48E-05	0.00	3.84E+11
-14.533	4048.	0.00				
2.1600	0.00378	340272.	810.3301	-9.38E-05	0.00	3.84E+11
-14.606	4178.	0.00				
2.2500	0.00368	341139.	794.5188	-9.28E-05	0.00	3.84E+11
-14.674	4312.	0.00				
2.3400	0.00358	341989.	778.6362	-9.19E-05	0.00	3.84E+11
-14.738	4452.	0.00				
2.4300	0.00348	342822.	762.6872	-9.09E-05	0.00	3.84E+11
-14.797	4597.	0.00				
2.5200	0.00338	343637.	746.6771	-9.00E-05	0.00	3.84E+11
-14.851	4747.	0.00				
2.6100	0.00328	344435.	730.6111	-8.90E-05	0.00	3.84E+11
-14.901	4903.	0.00				
2.7000	0.00319	345216.	714.4946	-8.80E-05	0.00	3.84E+11
-14.945	5065.	0.00				
2.7900	0.00309	345979.	698.3330	-8.70E-05	0.00	3.84E+11
-14.984	5233.	0.00				
2.8800	0.00300	346725.	682.1319	-8.61E-05	0.00	3.84E+11
-15.018	5409.	0.00				
2.9700	0.00291	347454.	665.8969	-8.51E-05	0.00	3.84E+11
-15.047	5591.	0.00				
3.0600	0.00281	348164.	649.6339	-8.41E-05	0.00	3.84E+11
-15.070	5782.	0.00				
3.1500	0.00272	348858.	633.3487	-8.31E-05	0.00	3.84E+11
-15.088	5981.	0.00				
3.2400	0.00264	349533.	617.0474	-8.22E-05	0.00	3.84E+11
-15.100	6188.	0.00				
3.3300	0.00255	350191.	600.7362	-8.12E-05	0.00	3.84E+11
-15.106	6405.	0.00				
3.4200	0.00246	350831.	584.4214	-8.02E-05	0.00	3.84E+11
-15.107	6632.	0.00				

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3.5100	0.00237	351454.	568.1094	-7.92E-05	0.00	3.84E+11
-15.101	6870.	0.00				
3.6000	0.00229	352059.	551.8070	-7.82E-05	0.00	3.84E+11
-15.089	7120.	0.00				
3.6900	0.00220	352647.	535.5209	-7.72E-05	0.00	3.84E+11
-15.071	7382.	0.00				
3.7800	0.00212	353217.	519.2582	-7.62E-05	0.00	3.84E+11
-15.046	7657.	0.00				
3.8700	0.00204	353769.	503.0261	-7.52E-05	0.00	3.84E+11
-15.014	7947.	0.00				
3.9600	0.00196	354304.	486.8321	-7.42E-05	0.00	3.84E+11
-14.975	8253.	0.00				
4.0500	0.00188	354821.	256.6852	-7.33E-05	0.00	3.84E+11
-411.223	236244.	0.00				
4.1400	0.00180	354859.	-186.309	-7.23E-05	0.00	3.84E+11
-409.136	245297.	0.00				
4.2300	0.00172	354420.	-626.975	-7.13E-05	0.00	3.84E+11
-406.912	254931.	0.00				
4.3200	0.00165	353505.	-1065.	-7.03E-05	0.00	3.84E+11
-404.544	265205.	0.00				
4.4100	0.00157	352119.	-1501.	-6.93E-05	0.00	3.84E+11
-402.026	276186.	0.00				
4.5000	0.00150	350264.	-1933.	-6.83E-05	0.00	3.84E+11
-399.349	287952.	0.00				
4.5900	0.00142	347944.	-2363.	-6.73E-05	0.00	3.84E+11
-396.504	300596.	0.00				
4.6800	0.00135	345161.	-2815.	-6.63E-05	0.00	3.84E+11
-439.950	351328.	0.00				
4.7700	0.00128	341864.	-3288.	-6.54E-05	0.00	3.84E+11
-436.353	367795.	0.00				
4.8600	0.00121	338059.	-3757.	-6.44E-05	0.00	3.84E+11
-432.530	385666.	0.00				
4.9500	0.00114	333749.	-4222.	-6.35E-05	0.00	3.84E+11
-428.464	405137.	0.00				
5.0400	0.00107	328939.	-4683.	-6.25E-05	0.00	3.84E+11
-424.135	426446.	0.00				
5.1300	0.00101	323635.	-5138.	-6.16E-05	0.00	3.84E+11
-419.519	449884.	0.00				
5.2200	9.41E-04	317841.	-5589.	-6.07E-05	0.00	3.84E+11
-414.589	475806.	0.00				
5.3100	8.76E-04	311564.	-6034.	-5.98E-05	0.00	3.84E+11
-409.312	504659.	0.00				
5.4000	8.12E-04	304810.	-6473.	-5.90E-05	0.00	3.85E+11
-403.650	537004.	0.00				
5.4900	7.49E-04	297584.	-6905.	-5.81E-05	0.00	3.85E+11
-397.555	573565.	0.00				
5.5800	6.86E-04	289895.	-7323.	-5.73E-05	0.00	3.85E+11
-376.636	592731.	0.00				
5.6700	6.25E-04	281766.	-7713.	-5.65E-05	0.00	3.85E+11
-344.627	595691.	0.00				

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5.7600	5.64E-04	273236.	-8068.	-5.57E-05	0.00	3.85E+11
-312.754	598649.	0.00				
5.8500	5.04E-04	264341.	-8388.	-5.50E-05	0.00	3.85E+11
-281.010	601605.	0.00				
5.9400	4.46E-04	255118.	-8675.	-5.42E-05	0.00	3.85E+11
-249.387	604561.	0.00				
6.0300	3.87E-04	245604.	-8927.	-5.35E-05	0.00	3.85E+11
-217.876	607515.	0.00				
6.1200	3.30E-04	235836.	-9145.	-5.29E-05	0.00	3.85E+11
-186.467	610467.	0.00				
6.2100	2.73E-04	225850.	-9330.	-5.22E-05	0.00	3.85E+11
-155.150	613419.	0.00				
6.3000	2.17E-04	215683.	-9481.	-5.16E-05	0.00	3.85E+11
-123.913	616369.	0.00				
6.3900	1.62E-04	205372.	-9598.	-5.10E-05	0.00	3.85E+11
-92.745	619319.	0.00				
6.4800	1.07E-04	194953.	-9681.	-5.04E-05	0.00	3.85E+11
-61.633	622267.	0.00				
6.5700	5.28E-05	184462.	-9731.	-4.99E-05	0.00	3.85E+11
-30.564	625215.	0.00				
6.6600	-8.18E-07	173935.	-9747.	-4.94E-05	0.00	3.85E+11
0.4758	628161.	0.00				
6.7500	-5.39E-05	163409.	-9730.	-4.89E-05	0.00	3.85E+11
31.4999	631107.	0.00				
6.8400	-1.06E-04	152919.	-9679.	-4.85E-05	0.00	3.85E+11
62.5227	634052.	0.00				
6.9300	-1.59E-04	142503.	-9595.	-4.81E-05	0.00	3.85E+11
93.5588	636996.	0.00				
7.0200	-2.10E-04	132195.	-9477.	-4.77E-05	0.00	3.85E+11
124.6230	639940.	0.00				
7.1100	-2.62E-04	122033.	-9325.	-4.73E-05	0.00	3.85E+11
155.7303	642882.	0.00				
7.2000	-3.13E-04	112053.	-9140.	-4.70E-05	0.00	3.85E+11
186.8957	645824.	0.00				
7.2900	-3.63E-04	102290.	-8922.	-4.67E-05	0.00	3.85E+11
218.1344	648766.	0.00				
7.3800	-4.13E-04	92782.	-8669.	-4.64E-05	0.00	3.85E+11
249.4612	651706.	0.00				
7.4700	-4.63E-04	83565.	-8383.	-4.62E-05	0.00	3.85E+11
280.8911	654647.	0.00				
7.5600	-5.13E-04	74676.	-8062.	-4.60E-05	0.00	3.85E+11
312.4388	657586.	0.00				
7.6500	-5.63E-04	66151.	-7708.	-4.58E-05	0.00	3.85E+11
344.1184	660525.	0.00				
7.7400	-6.12E-04	58027.	-7319.	-4.56E-05	0.00	3.85E+11
375.9441	663464.	0.00				
7.8300	-6.61E-04	50342.	-6896.	-4.54E-05	0.00	3.85E+11
407.9293	666402.	0.00				
7.9200	-7.10E-04	43133.	-6438.	-4.53E-05	0.00	3.85E+11
440.0869	669339.	0.00				

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8.0100	-7.59E-04	36437.	-5955.	-4.52E-05	0.00	3.85E+11
454.6781	647016.	0.00				
8.1000	-8.08E-04	30271.	-5459.	-4.51E-05	0.00	3.85E+11
463.8319	620208.	0.00				
8.1900	-8.56E-04	24646.	-4953.	-4.50E-05	0.00	3.85E+11
472.7160	596175.	0.00				
8.2800	-9.05E-04	19573.	-4438.	-4.50E-05	0.00	3.85E+11
481.3614	574489.	0.00				
8.3700	-9.53E-04	15061.	-3913.	-4.49E-05	0.00	3.85E+11
489.7938	554806.	0.00				
8.4600	-0.00100	11121.	-3380.	-4.49E-05	0.00	3.85E+11
498.0356	536848.	0.00				
8.5500	-0.00105	7761.	-2838.	-4.48E-05	0.00	3.85E+11
506.1055	520388.	0.00				
8.6400	-0.00110	4992.	-2287.	-4.48E-05	0.00	3.85E+11
514.0198	505237.	0.00				
8.7300	-0.00115	2822.	-1727.	-4.48E-05	0.00	3.85E+11
521.7927	491238.	0.00				
8.8200	-0.00120	1261.	-1160.	-4.48E-05	0.00	3.85E+11
529.4364	478259.	0.00				
8.9100	-0.00124	317.2776	-583.923	-4.48E-05	0.00	3.85E+11
536.9615	466189.	0.00				
9.0000	-0.00129	0.00	0.00	-4.48E-05	0.00	3.85E+11
544.3774	227466.	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	=	0.00649768 inches
Computed slope at pile head	=	-0.0001159 radians
Maximum bending moment	=	354859. inch-lbs
Maximum shear force	=	-9747. lbs
Depth of maximum bending moment	=	4.14000000 feet below pile head
Depth of maximum shear force	=	6.66000000 feet below pile head
Number of iterations	=	12
Number of zero deflection points	=	1
Pile deflection at ground	=	0.00516635 inches

 Pile-head Deflection vs. Pile Length for Load Case 1

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Boundary Condition Type 1, Shear and Moment

Shear = 1000. lbs
 Moment = 315600. in-lbs
 Axial Load = 4200. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	0.00649768	354859.	-9747.
8.55000	0.00967847	352877.	-11112.
8.10000	0.01995789	350108.	-12736.
7.65000	0.04840099	345611.	-14266.
7.20000	0.12404239	340618.	-15737.
6.75000	0.40383548	337117.	-17579.
6.30000	1.40317591	335673.	-19658.
5.85000	7.17714548	342227.	-23172.

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

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

Shear force at pile head = 2250.0 lbs
 Applied moment at pile head = 724800.0 in-lbs
 Axial thrust load on pile head = 4600.0 lbs

Depth Res. Soil X Es*H feet lb/inch	Deflect. Spr. y Lat. Load inches lb/inch	Bending Distrib. Moment in-lbs lb/inch	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness lb-in^2	Soil p
0.00	0.09499	724800.	2250.	-0.00126	0.00	3.83E+11	
0.00	0.00	0.00					
0.09000	0.09363	727236.	2250.	-0.00126	0.00	3.83E+11	
0.00	0.00	0.00					
0.1800	0.09227	729673.	2250.	-0.00126	0.00	3.83E+11	
0.00	0.00	0.00					
0.2700	0.09092	732109.	2250.	-0.00125	0.00	3.83E+11	
0.00	0.00	0.00					
0.3600	0.08956	734545.	2250.	-0.00125	0.00	3.83E+11	

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0.00	0.00	0.00				
0.4500	0.08821	736981.	2250.	-0.00125	0.00	3.83E+11
0.00	0.00	0.00				
0.5400	0.08686	739417.	2250.	-0.00125	0.00	3.83E+11
0.00	0.00	0.00				
0.6300	0.08552	741854.	2250.	-0.00125	0.00	3.83E+11
0.00	0.00	0.00				
0.7200	0.08417	744290.	2250.	-0.00124	0.00	3.83E+11
0.00	0.00	0.00				
0.8100	0.08283	746726.	2250.	-0.00124	0.00	3.83E+11
0.00	0.00	0.00				
0.9000	0.08149	749162.	2250.	-0.00124	0.00	3.83E+11
0.00	0.00	0.00				
0.9900	0.08015	751598.	2250.	-0.00124	0.00	3.83E+11
0.00	0.00	0.00				
1.0800	0.07882	754034.	2232.	-0.00124	0.00	3.83E+11
-33.538	459.5627	0.00				
1.1700	0.07748	756431.	2195.	-0.00123	0.00	3.83E+11
-33.899	472.4945	0.00				
1.2600	0.07615	758789.	2159.	-0.00123	0.00	3.83E+11
-34.251	485.7481	0.00				
1.3500	0.07482	761106.	2121.	-0.00123	0.00	3.83E+11
-34.595	499.3372	0.00				
1.4400	0.07350	763384.	2084.	-0.00123	0.00	3.83E+11
-34.930	513.2765	0.00				
1.5300	0.07217	765620.	2046.	-0.00122	0.00	3.83E+11
-35.257	527.5815	0.00				
1.6200	0.07085	767815.	2008.	-0.00122	0.00	3.83E+11
-35.575	542.2687	0.00				
1.7100	0.06953	769969.	1969.	-0.00122	0.00	3.83E+11
-35.884	557.3557	0.00				
1.8000	0.06822	772081.	1930.	-0.00122	0.00	3.83E+11
-36.184	572.8613	0.00				
1.8900	0.06690	774150.	1891.	-0.00122	0.00	3.83E+11
-36.475	588.8054	0.00				
1.9800	0.06559	776178.	1852.	-0.00121	0.00	3.83E+11
-36.756	605.2095	0.00				
2.0700	0.06428	778162.	1812.	-0.00121	0.00	3.83E+11
-37.027	622.0963	0.00				
2.1600	0.06297	780103.	1772.	-0.00121	0.00	3.83E+11
-37.288	639.4903	0.00				
2.2500	0.06167	782000.	1731.	-0.00121	0.00	3.83E+11
-37.539	657.4179	0.00				
2.3400	0.06037	783854.	1690.	-0.00120	0.00	3.83E+11
-37.780	675.9071	0.00				
2.4300	0.05907	785664.	1650.	-0.00120	0.00	3.83E+11
-38.009	694.9884	0.00				
2.5200	0.05777	787429.	1608.	-0.00120	0.00	3.83E+11
-38.228	714.6943	0.00				
2.6100	0.05647	789150.	1567.	-0.00120	0.00	3.83E+11

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-38.436	735.0600	0.00					
2.7000	0.05518	790826.	1525.	-0.00120	0.00	3.83E+11	
-38.632	756.1237	0.00					
2.7900	0.05389	792456.	1484.	-0.00119	0.00	3.83E+11	
-38.817	777.9267	0.00					
2.8800	0.05260	794042.	1442.	-0.00119	0.00	3.83E+11	
-38.989	800.5134	0.00					
2.9700	0.05132	795582.	1399.	-0.00119	0.00	3.83E+11	
-39.149	823.9326	0.00					
3.0600	0.05003	797076.	1357.	-0.00119	0.00	3.83E+11	
-39.295	848.2372	0.00					
3.1500	0.04875	798525.	1314.	-0.00118	0.00	3.83E+11	
-39.429	873.4847	0.00					
3.2400	0.04747	799927.	1272.	-0.00118	0.00	3.83E+11	
-39.549	899.7383	0.00					
3.3300	0.04620	801284.	1229.	-0.00118	0.00	3.83E+11	
-39.655	927.0670	0.00					
3.4200	0.04492	802594.	1186.	-0.00118	0.00	3.83E+11	
-39.746	955.5469	0.00					
3.5100	0.04365	803857.	1143.	-0.00118	0.00	3.83E+11	
-39.823	985.2614	0.00					
3.6000	0.04238	805075.	1100.	-0.00117	0.00	3.83E+11	
-39.884	1016.	0.00					
3.6900	0.04112	806245.	1057.	-0.00117	0.00	3.83E+11	
-39.928	1049.	0.00					
3.7800	0.03985	807369.	1014.	-0.00117	0.00	3.83E+11	
-39.956	1083.	0.00					
3.8700	0.03859	808447.	970.7531	-0.00117	0.00	3.83E+11	
-39.967	1118.	0.00					
3.9600	0.03733	809478.	927.5933	-0.00116	0.00	3.83E+11	
-39.959	1156.	0.00					
4.0500	0.03608	810462.	441.7255	-0.00116	0.00	3.83E+11	
-859.796	25739.	0.00					
4.1400	0.03482	810444.	-485.340	-0.00116	0.00	3.83E+11	
-856.991	26579.	0.00					
4.2300	0.03357	809425.	-1409.	-0.00116	0.00	3.83E+11	
-853.896	27470.	0.00					
4.3200	0.03232	807411.	-2330.	-0.00116	0.00	3.83E+11	
-850.496	28418.	0.00					
4.4100	0.03108	804405.	-3246.	-0.00115	0.00	3.83E+11	
-846.776	29429.	0.00					
4.5000	0.02983	800411.	-4158.	-0.00115	0.00	3.83E+11	
-842.716	30509.	0.00					
4.5900	0.02859	795434.	-5066.	-0.00115	0.00	3.83E+11	
-838.296	31667.	0.00					
4.6800	0.02735	789479.	-6022.	-0.00115	0.00	3.83E+11	
-931.923	36799.	0.00					
4.7700	0.02611	782438.	-7025.	-0.00114	0.00	3.83E+11	
-926.082	38300.	0.00					
4.8600	0.02488	774316.	-8022.	-0.00114	0.00	3.83E+11	

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-919.753	39926.	0.00				
4.9500	0.02365	765121.	-9012.	-0.00114	0.00	3.83E+11
-912.898	41693.	0.00				
5.0400	0.02242	754862.	-9994.	-0.00114	0.00	3.83E+11
-905.473	43623.	0.00				
5.1300	0.02119	743546.	-10967.	-0.00114	0.00	3.83E+11
-897.429	45739.	0.00				
5.2200	0.01996	731184.	-11932.	-0.00113	0.00	3.83E+11
-888.708	48075.	0.00				
5.3100	0.01874	717785.	-12887.	-0.00113	0.00	3.83E+11
-879.242	50666.	0.00				
5.4000	0.01752	703360.	-13831.	-0.00113	0.00	3.83E+11
-868.950	53562.	0.00				
5.4900	0.01630	687922.	-14763.	-0.00113	0.00	3.83E+11
-857.739	56823.	0.00				
5.5800	0.01509	671483.	-15683.	-0.00113	0.00	3.84E+11
-845.492	60529.	0.00				
5.6700	0.01387	654058.	-16589.	-0.00112	0.00	3.84E+11
-832.070	64784.	0.00				
5.7600	0.01266	635663.	-17479.	-0.00112	0.00	3.84E+11
-817.296	69729.	0.00				
5.8500	0.01145	616314.	-18353.	-0.00112	0.00	3.84E+11
-800.950	75560.	0.00				
5.9400	0.01024	596032.	-19208.	-0.00112	0.00	3.84E+11
-782.742	82559.	0.00				
6.0300	0.00903	574836.	-20043.	-0.00112	0.00	3.84E+11
-762.287	91145.	0.00				
6.1200	0.00783	552751.	-20853.	-0.00112	0.00	3.84E+11
-739.053	101973.	0.00				
6.2100	0.00662	529804.	-21637.	-0.00111	0.00	3.84E+11
-712.269	116134.	0.00				
6.3000	0.00542	506026.	-22389.	-0.00111	0.00	3.84E+11
-680.753	135599.	0.00				
6.3900	0.00422	481454.	-23104.	-0.00111	0.00	3.84E+11
-642.529	164376.	0.00				
6.4800	0.00302	456133.	-23771.	-0.00111	0.00	3.84E+11
-593.862	212183.	0.00				
6.5700	0.00183	430119.	-24376.	-0.00111	0.00	3.84E+11
-525.976	311225.	0.00				
6.6600	6.29E-04	403491.	-24858.	-0.00111	0.00	3.84E+11
-365.860	628161.	0.00				
6.7500	-5.66E-04	376437.	-24877.	-0.00111	0.00	3.84E+11
330.7155	631107.	0.00				
6.8400	-0.00176	349768.	-24413.	-0.00110	0.00	3.84E+11
528.5697	324391.	0.00				
6.9300	-0.00295	323716.	-23801.	-0.00110	0.00	3.84E+11
604.3630	221068.	0.00				
7.0200	-0.00414	298369.	-23118.	-0.00110	0.00	3.85E+11
660.8669	172220.	0.00				
7.1100	-0.00534	273793.	-22379.	-0.00110	0.00	3.85E+11

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-17 (Boring B-008 & 009-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

707.1810	143154.	0.00				
7.2000	-0.00653	250041.	-21594.	-0.00110	0.00	3.85E+11
747.0934	123652.	0.00				
7.2900	-0.00771	227161.	-20768.	-0.00110	0.00	3.85E+11
782.5760	109557.	0.00				
7.3800	-0.00890	205194.	-19905.	-0.00110	0.00	3.85E+11
814.7960	98839.	0.00				
7.4700	-0.01009	184177.	-19009.	-0.00110	0.00	3.85E+11
844.5060	90383.	0.00				
7.5600	-0.01128	164145.	-18082.	-0.00110	0.00	3.85E+11
872.2216	83521.	0.00				
7.6500	-0.01247	145131.	-17126.	-0.00110	0.00	3.85E+11
898.3124	77829.	0.00				
7.7400	-0.01365	127164.	-16142.	-0.00110	0.00	3.85E+11
923.0530	73022.	0.00				
7.8300	-0.01484	110274.	-15133.	-0.00110	0.00	3.85E+11
946.6535	68903.	0.00				
7.9200	-0.01602	94489.	-14098.	-0.00110	0.00	3.85E+11
969.2782	65329.	0.00				
8.0100	-0.01721	79833.	-13040.	-0.00110	0.00	3.85E+11
991.0582	62196.	0.00				
8.1000	-0.01839	66334.	-11958.	-0.00110	0.00	3.85E+11
1012.	59423.	0.00				
8.1900	-0.01958	54015.	-10854.	-0.00110	0.00	3.85E+11
1032.	56952.	0.00				
8.2800	-0.02076	42901.	-9728.	-0.00110	0.00	3.85E+11
1052.	54732.	0.00				
8.3700	-0.02195	33014.	-8581.	-0.00110	0.00	3.85E+11
1072.	52728.	0.00				
8.4600	-0.02313	24376.	-7414.	-0.00110	0.00	3.85E+11
1090.	50907.	0.00				
8.5500	-0.02432	17011.	-6226.	-0.00110	0.00	3.85E+11
1109.	49245.	0.00				
8.6400	-0.02550	10939.	-5019.	-0.00110	0.00	3.85E+11
1127.	47722.	0.00				
8.7300	-0.02669	6182.	-3792.	-0.00110	0.00	3.85E+11
1145.	46319.	0.00				
8.8200	-0.02787	2759.	-2547.	-0.00110	0.00	3.85E+11
1162.	45024.	0.00				
8.9100	-0.02906	691.9680	-1282.	-0.00110	0.00	3.85E+11
1179.	43824.	0.00				
9.0000	-0.03024	0.00	0.00	-0.00110	0.00	3.85E+11
1196.	21354.	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.

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-17 (Boring B-008 & 009-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Output Summary for Load Case No. 2:

Pile-head deflection	=	0.09498929 inches
Computed slope at pile head	=	-0.0012603 radians
Maximum bending moment	=	810462. inch-lbs
Maximum shear force	=	-24877. lbs
Depth of maximum bending moment	=	4.05000000 feet below pile head
Depth of maximum shear force	=	6.75000000 feet below pile head
Number of iterations	=	32
Number of zero deflection points	=	1
Pile deflection at ground	=	0.08000329 inches

Pile-head Deflection vs. Pile Length for Load Case 2

Boundary Condition Type 1, Shear and Moment

Shear	=	2250. lbs
Moment	=	724800. in-lbs
Axial Load	=	4600. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	0.09498929	810462.	-24877.
8.55000	0.18712306	803619.	-26790.
8.10000	0.44988428	795075.	-29369.
7.65000	1.15343396	786638.	-32302.
7.20000	3.04736796	780755.	-35629.
6.75000	11.33583919	788295.	-41370.

Computed Values of Pile Loading and Deflection
for Lateral Loading for Load Case Number 3

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

Shear force at pile head	=	2250.0 lbs
Applied moment at pile head	=	724800.0 in-lbs
Axial thrust load on pile head	=	3800.0 lbs

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Depth Res.	Soil X Es*H feet lb/inch	Deflect. Spr. y Lat. inches lb/inch	Bending Distrib. Moment Load in-lbs lb/inch	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness lb-in^2	Soil p
	0.00	0.09495	724800.	2250.	-0.00126	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
	0.09000	0.09359	727235.	2250.	-0.00126	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
	0.1800	0.09223	729670.	2250.	-0.00126	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
	0.2700	0.09088	732105.	2250.	-0.00125	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
	0.3600	0.08953	734541.	2250.	-0.00125	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
	0.4500	0.08817	736976.	2250.	-0.00125	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
	0.5400	0.08683	739411.	2250.	-0.00125	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
	0.6300	0.08548	741846.	2250.	-0.00125	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
	0.7200	0.08414	744281.	2250.	-0.00124	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
	0.8100	0.08279	746716.	2250.	-0.00124	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
	0.9000	0.08146	749151.	2250.	-0.00124	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
	0.9900	0.08012	751586.	2250.	-0.00124	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
	1.0800	0.07878	754021.	2232.	-0.00123	0.00	3.83E+11	
-33.533	459.6892	0.00	0.00					
	1.1700	0.07745	756417.	2195.	-0.00123	0.00	3.83E+11	
-33.894	472.6247	0.00	0.00					
	1.2600	0.07612	758774.	2159.	-0.00123	0.00	3.83E+11	
-34.246	485.8821	0.00	0.00					
	1.3500	0.07479	761090.	2122.	-0.00123	0.00	3.83E+11	
-34.590	499.4750	0.00	0.00					
	1.4400	0.07347	763366.	2084.	-0.00123	0.00	3.83E+11	
-34.926	513.4183	0.00	0.00					
	1.5300	0.07214	765602.	2046.	-0.00122	0.00	3.83E+11	
-35.252	527.7273	0.00	0.00					
	1.6200	0.07082	767796.	2008.	-0.00122	0.00	3.83E+11	
-35.570	542.4187	0.00	0.00					
	1.7100	0.06951	769949.	1969.	-0.00122	0.00	3.83E+11	
-35.879	557.5100	0.00	0.00					
	1.8000	0.06819	772060.	1930.	-0.00122	0.00	3.83E+11	
-36.179	573.0200	0.00	0.00					

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 Light Tower SC1-17 (Boring B-008 & 009-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

1.8900	0.06687	774128.	1891.	-0.00122	0.00	3.83E+11
-36.470	588.9687	0.00				
1.9800	0.06556	776154.	1852.	-0.00121	0.00	3.83E+11
-36.751	605.3774	0.00				
2.0700	0.06425	778138.	1812.	-0.00121	0.00	3.83E+11
-37.022	622.2690	0.00				
2.1600	0.06295	780078.	1772.	-0.00121	0.00	3.83E+11
-37.283	639.6681	0.00				
2.2500	0.06164	781974.	1731.	-0.00121	0.00	3.83E+11
-37.534	657.6007	0.00				
2.3400	0.06034	783827.	1691.	-0.00120	0.00	3.83E+11
-37.774	676.0953	0.00				
2.4300	0.05904	785636.	1650.	-0.00120	0.00	3.83E+11
-38.004	695.1819	0.00				
2.5200	0.05774	787400.	1608.	-0.00120	0.00	3.83E+11
-38.223	714.8935	0.00				
2.6100	0.05645	789120.	1567.	-0.00120	0.00	3.83E+11
-38.431	735.2651	0.00				
2.7000	0.05516	790795.	1525.	-0.00120	0.00	3.83E+11
-38.627	756.3348	0.00				
2.7900	0.05387	792425.	1484.	-0.00119	0.00	3.83E+11
-38.811	778.1440	0.00				
2.8800	0.05258	794009.	1442.	-0.00119	0.00	3.83E+11
-38.983	800.7372	0.00				
2.9700	0.05129	795548.	1399.	-0.00119	0.00	3.83E+11
-39.143	824.1631	0.00				
3.0600	0.05001	797042.	1357.	-0.00119	0.00	3.83E+11
-39.290	848.4746	0.00				
3.1500	0.04873	798489.	1315.	-0.00118	0.00	3.83E+11
-39.424	873.7294	0.00				
3.2400	0.04745	799891.	1272.	-0.00118	0.00	3.83E+11
-39.544	899.9905	0.00				
3.3300	0.04618	801246.	1229.	-0.00118	0.00	3.83E+11
-39.650	927.3271	0.00				
3.4200	0.04490	802556.	1186.	-0.00118	0.00	3.83E+11
-39.741	955.8151	0.00				
3.5100	0.04363	803818.	1143.	-0.00118	0.00	3.83E+11
-39.817	985.5381	0.00				
3.6000	0.04237	805035.	1100.	-0.00117	0.00	3.83E+11
-39.878	1017.	0.00				
3.6900	0.04110	806205.	1057.	-0.00117	0.00	3.83E+11
-39.923	1049.	0.00				
3.7800	0.03984	807328.	1014.	-0.00117	0.00	3.83E+11
-39.951	1083.	0.00				
3.8700	0.03858	808405.	970.9317	-0.00117	0.00	3.83E+11
-39.961	1119.	0.00				
3.9600	0.03732	809435.	927.7779	-0.00116	0.00	3.83E+11
-39.953	1156.	0.00				
4.0500	0.03606	810418.	441.9624	-0.00116	0.00	3.83E+11
-859.705	25747.	0.00				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-17 (Boring B-008 & 009-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

4.1400	0.03481	810399.	-485.004	-0.00116	0.00	3.83E+11
-856.900	26587.	0.00				
4.2300	0.03356	809380.	-1409.	-0.00116	0.00	3.83E+11
-853.805	27479.	0.00				
4.3200	0.03231	807366.	-2329.	-0.00115	0.00	3.83E+11
-850.406	28427.	0.00				
4.4100	0.03106	804359.	-3245.	-0.00115	0.00	3.83E+11
-846.686	29438.	0.00				
4.5000	0.02982	800365.	-4158.	-0.00115	0.00	3.83E+11
-842.626	30519.	0.00				
4.5900	0.02858	795388.	-5065.	-0.00115	0.00	3.83E+11
-838.207	31677.	0.00				
4.6800	0.02734	789433.	-6021.	-0.00115	0.00	3.83E+11
-931.824	36811.	0.00				
4.7700	0.02610	782391.	-7024.	-0.00114	0.00	3.83E+11
-925.983	38312.	0.00				
4.8600	0.02487	774270.	-8021.	-0.00114	0.00	3.83E+11
-919.655	39939.	0.00				
4.9500	0.02364	765075.	-9011.	-0.00114	0.00	3.83E+11
-912.801	41706.	0.00				
5.0400	0.02241	754816.	-9992.	-0.00114	0.00	3.83E+11
-905.377	43636.	0.00				
5.1300	0.02118	743501.	-10966.	-0.00114	0.00	3.83E+11
-897.334	45754.	0.00				
5.2200	0.01996	731139.	-11930.	-0.00113	0.00	3.83E+11
-888.613	48090.	0.00				
5.3100	0.01873	717741.	-12885.	-0.00113	0.00	3.83E+11
-879.148	50682.	0.00				
5.4000	0.01751	703317.	-13829.	-0.00113	0.00	3.83E+11
-868.858	53579.	0.00				
5.4900	0.01630	687880.	-14761.	-0.00113	0.00	3.83E+11
-857.648	56841.	0.00				
5.5800	0.01508	671443.	-15681.	-0.00113	0.00	3.84E+11
-845.403	60548.	0.00				
5.6700	0.01387	654019.	-16587.	-0.00112	0.00	3.84E+11
-831.982	64804.	0.00				
5.7600	0.01265	635625.	-17477.	-0.00112	0.00	3.84E+11
-817.210	69751.	0.00				
5.8500	0.01144	616278.	-18351.	-0.00112	0.00	3.84E+11
-800.865	75584.	0.00				
5.9400	0.01024	595996.	-19206.	-0.00112	0.00	3.84E+11
-782.659	82585.	0.00				
6.0300	0.00903	574802.	-20040.	-0.00112	0.00	3.84E+11
-762.207	91174.	0.00				
6.1200	0.00782	552719.	-20851.	-0.00111	0.00	3.84E+11
-738.975	102005.	0.00				
6.2100	0.00662	529773.	-21634.	-0.00111	0.00	3.84E+11
-712.195	116170.	0.00				
6.3000	0.00542	505997.	-22387.	-0.00111	0.00	3.84E+11
-680.682	135641.	0.00				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

6.3900	0.00422	481427.	-23101.	-0.00111	0.00	3.84E+11
-642.464	164426.	0.00				
6.4800	0.00302	456108.	-23769.	-0.00111	0.00	3.84E+11
-593.802	212246.	0.00				
6.5700	0.00182	430096.	-24373.	-0.00111	0.00	3.84E+11
-525.927	311312.	0.00				
6.6600	6.29E-04	403471.	-24855.	-0.00111	0.00	3.84E+11
-365.766	628161.	0.00				
6.7500	-5.66E-04	376419.	-24874.	-0.00111	0.00	3.84E+11
330.5072	631107.	0.00				
6.8400	-0.00176	349752.	-24410.	-0.00110	0.00	3.84E+11
528.5038	324512.	0.00				
6.9300	-0.00295	323702.	-23798.	-0.00110	0.00	3.84E+11
604.2915	221146.	0.00				
7.0200	-0.00414	298357.	-23115.	-0.00110	0.00	3.85E+11
660.7905	172280.	0.00				
7.1100	-0.00533	273782.	-22377.	-0.00110	0.00	3.85E+11
707.1002	143203.	0.00				
7.2000	-0.00652	250033.	-21591.	-0.00110	0.00	3.85E+11
747.0088	123694.	0.00				
7.2900	-0.00771	227154.	-20765.	-0.00110	0.00	3.85E+11
782.4878	109594.	0.00				
7.3800	-0.00890	205189.	-19903.	-0.00110	0.00	3.85E+11
814.7046	98872.	0.00				
7.4700	-0.01009	184173.	-19007.	-0.00110	0.00	3.85E+11
844.4115	90413.	0.00				
7.5600	-0.01127	164143.	-18080.	-0.00110	0.00	3.85E+11
872.1242	83549.	0.00				
7.6500	-0.01246	145129.	-17124.	-0.00110	0.00	3.85E+11
898.2123	77855.	0.00				
7.7400	-0.01365	127164.	-16141.	-0.00110	0.00	3.85E+11
922.9503	73047.	0.00				
7.8300	-0.01483	110275.	-15131.	-0.00110	0.00	3.85E+11
946.5483	68926.	0.00				
7.9200	-0.01602	94489.	-14097.	-0.00110	0.00	3.85E+11
969.1706	65351.	0.00				
8.0100	-0.01720	79835.	-13038.	-0.00110	0.00	3.85E+11
990.9484	62216.	0.00				
8.1000	-0.01839	66336.	-11957.	-0.00110	0.00	3.85E+11
1012.	59443.	0.00				
8.1900	-0.01957	54018.	-10853.	-0.00110	0.00	3.85E+11
1032.	56971.	0.00				
8.2800	-0.02076	42903.	-9727.	-0.00110	0.00	3.85E+11
1052.	54751.	0.00				
8.3700	-0.02194	33017.	-8580.	-0.00110	0.00	3.85E+11
1071.	52745.	0.00				
8.4600	-0.02312	24379.	-7413.	-0.00110	0.00	3.85E+11
1090.	50924.	0.00				
8.5500	-0.02431	17014.	-6225.	-0.00110	0.00	3.85E+11
1109.	49261.	0.00				

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8.6400	-0.02549	10942.	-5018.	-0.00110	0.00	3.85E+11
1127.	47737.	0.00				
8.7300	-0.02668	6184.	-3792.	-0.00110	0.00	3.85E+11
1144.	46335.	0.00				
8.8200	-0.02786	2761.	-2546.	-0.00110	0.00	3.85E+11
1162.	45039.	0.00				
8.9100	-0.02904	692.8405	-1282.	-0.00110	0.00	3.85E+11
1179.	43838.	0.00				
9.0000	-0.03023	0.00	0.00	-0.00110	0.00	3.85E+11
1196.	21361.	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. 3:

Pile-head deflection	=	0.09495041 inches
Computed slope at pile head	=	-0.0012598 radians
Maximum bending moment	=	810418. inch-lbs
Maximum shear force	=	-24874. lbs
Depth of maximum bending moment	=	4.05000000 feet below pile head
Depth of maximum shear force	=	6.75000000 feet below pile head
Number of iterations	=	32
Number of zero deflection points	=	1
Pile deflection at ground	=	0.07997025 inches

 Pile-head Deflection vs. Pile Length for Load Case 3

Boundary Condition Type 1, Shear and Moment

Shear	=	2250. lbs
Moment	=	724800. in-lbs
Axial Load	=	3800. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
-----	-----	-----	-----
9.00000	0.09495041	810418.	-24874.
8.55000	0.18696698	803532.	-26784.

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-17 (Boring B-008 & 009-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

8.10000	0.44897341	794863.	-29353.
7.65000	1.14743828	786155.	-32257.
7.20000	3.00521103	779596.	-35499.
6.75000	10.70574085	783619.	-40751.

 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	Load Type	Load 1	Load 2	Axial Loading	Pile-head Deflection	Pile-head Rotation	Max
No.		in-lbs	in-lb	lbs	inches	radians	in lbs
1	V, lb	1000.0000	M, in-lb	4200.	0.00650	-1.16E-04	
		-9747.					
2	V, lb	2250.	M, in-lb	4600.	0.09499	-0.00126	
		-24877.					
3	V, lb	2250.	M, in-lb	3800.	0.09495	-0.00126	
		-24874.					

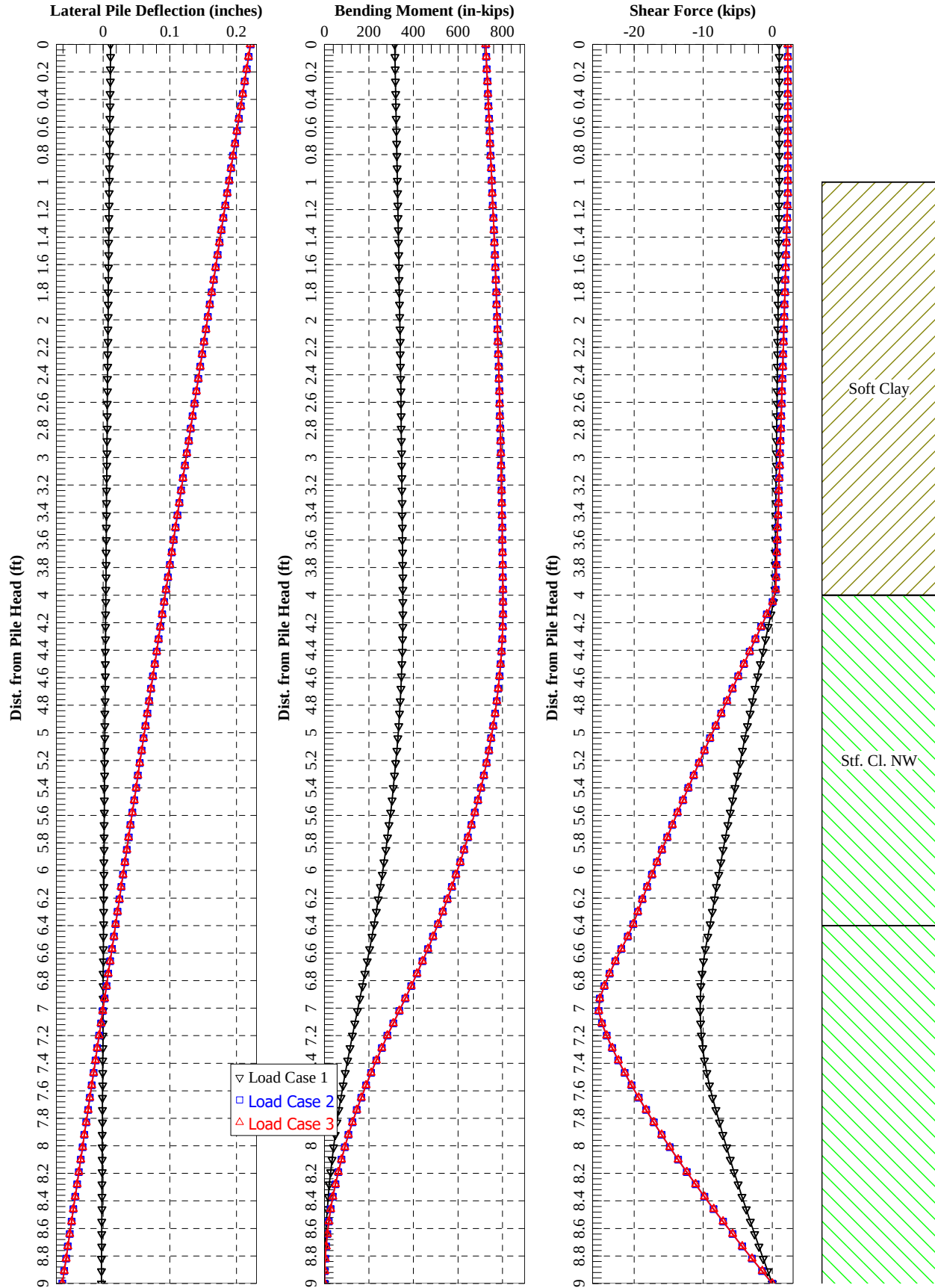
Maximum pile-head deflection = 0.0949892860 inches

Maximum pile-head rotation = -0.0012603264 radians = -0.072211 deg.

The analysis ended normally.

LATERAL LOAD (LPILE) ANALYSES
SOUTHBOUND PARKING AREA
LIGHT TOWER SC1-18
(B-009-0-25 & B-011-0-25)

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-18 (Boring B-009 & 011-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation



TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-18 (Boring B-009 & 011-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

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

This model was prepared by:
BSears

Files Used for Analysis

Path to file locations:
\Columbus-1170\Projects\2024\24170232_ms_TP 26 NE Ohio\GEO\Project Docs\Site
15_SUM-271 (2LMN)\Calcs\Light Towers\LPILE (Final Report)\SB\

Name of input data file:
Tower SC1-18 (B-009 & B-011).lp12d

Name of output report file:
Tower SC1-18 (B-009 & B-011).lp12o

Name of plot output file:
Tower SC1-18 (B-009 & B-011).lp12p

Name of runtime message file:
Tower SC1-18 (B-009 & B-011).lp12r

Date and Time of Analysis

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-18 (Boring B-009 & 011-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Date: April 8, 2026

Time: 20:40:01

Problem Title

Project Name: TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas

Job Number: 24170232F

Client: ms consultants, inc.

Engineer: BKS

Description: Light Tower SC1-18 (B-009-0-25 & B-011-0-25)

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

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-18 (Boring B-009 & 011-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

- 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	=	9.000 ft
Depth of ground surface below top of pile	=	1.0000 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.

Point No.	Depth Below Pile Head feet	Pile Diameter inches
-----	-----	-----
1	0.000	36.0000
2	9.000	36.0000

Input Structural Properties for Pile Sections:

Pile Section No. 1:

Section 1 is a round drilled shaft, bored pile, or CIDH pile	
Length of section	= 9.000000 ft
Shaft Diameter	= 36.000000 in

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-18 (Boring B-009 & 011-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Soil and Rock Layering Information

The soil profile is modelled using 3 layers

Layer 1 is soft clay, p-y criteria by Matlock, 1970

Distance from top of pile to top of layer	=	1.000000	ft
Distance from top of pile to bottom of layer	=	4.000000	ft
Effective unit weight at top of layer	=	98.000000	pcf
Effective unit weight at bottom of layer	=	98.000000	pcf
Undrained cohesion at top of layer	=	250.000000	psf
Undrained cohesion at bottom of layer	=	250.000000	psf
Epsilon-50 at top of layer	=	0.020000	
Epsilon-50 at bottom of layer	=	0.020000	

Layer 2 is stiff clay without free water

Distance from top of pile to top of layer	=	4.000000	ft
Distance from top of pile to bottom of layer	=	6.400000	ft
Effective unit weight at top of layer	=	58.000000	pcf
Effective unit weight at bottom of layer	=	58.000000	pcf
Undrained cohesion at top of layer	=	3000.	psf
Undrained cohesion at bottom of layer	=	3000.	psf
Epsilon-50 at top of layer	=	0.005000	
Epsilon-50 at bottom of layer	=	0.005000	

Layer 3 is stiff clay without free water

Distance from top of pile to top of layer	=	6.400000	ft
Distance from top of pile to bottom of layer	=	17.600000	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	=	4500.	psf
Undrained cohesion at bottom of layer	=	4500.	psf
Epsilon-50 at top of layer	=	0.004000	
Epsilon-50 at bottom of layer	=	0.004000	

(Depth of the lowest soil layer extends 8.600 ft below the pile tip)

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-18 (Boring B-009 & 011-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Summary of Input Soil Properties

Layer Num.	Soil Type Name (p-y Curve Type)	Layer Depth ft	Effective Unit Wt. pcf	Cohesion psf	E50 or krm
1	Soft Clay	1.0000	98.0000	250.0000	0.02000
2	Stiff Clay w/o Free Water	4.0000	98.0000	250.0000	0.02000
		4.0000	58.0000	3000.	0.00500
3	Stiff Clay w/o Free Water	6.4000	58.0000	3000.	0.00500
		6.4000	60.0000	4500.	0.00400
		17.6000	60.0000	4500.	0.00400

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 = 3

Load Compute No.	Load Top y Type	Condition Run Analysis 1	Condition 2	Axial Thrust Force, lbs
1	1	V = 1000.000000 lbs	M = 315600. in-lbs	4200.
Yes		Yes		
2	1	V = 2250. lbs	M = 724800. in-lbs	4600.
Yes		Yes		
3	1	V = 2250. lbs	M = 724800. in-lbs	3800.
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.

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-18 (Boring B-009 & 011-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

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:

Dimensions and Properties of Drilled Shaft (Bored Pile):

Length of Section	=	9.000000 ft
Shaft Diameter	=	36.000000 in
Concrete Cover Thickness (to edge of trans. reinf.)	=	3.500000 in
Number of Reinforcing Bars	=	16 bars
Yield Stress of Reinforcing Bars	=	60000. psi
Modulus of Elasticity of Reinforcing Bars	=	29000000. psi
Gross Area of Shaft	=	1018. sq. in.
Total Area of Reinforcing Steel	=	16.000000 sq. in.
Area Ratio of Steel Reinforcement	=	1.57 percent
Edge-to-Edge Bar Spacing	=	4.114467 in
Maximum Concrete Aggregate Size	=	0.750000 in
Ratio of Bar Spacing to Aggregate Size	=	5.49
Offset of Center of Rebar Cage from Center of Pile	=	0.0000 in
Transverse Reinforcement		
Type: Spiral		
Number of Transverse Reinf. (per spacing)	=	1
Spacing of Transverse Reinf.	=	4.500000 in
Yield Stress of Transverse Reinf.	=	60000. psi
Diameter of Transverse Reinf.	=	0.500000 in

Axial Structural Capacities:

Nom. Axial Structural Capacity = $0.85 F_c A_c + F_y A_s$	=	4366.378 kips
Tensile Load for Cracking of Concrete	=	-470.222 kips
Nominal Axial Tensile Capacity	=	-960.000 kips

Reinforcing Bar Dimensions and Positions Used in Computations:

Bar Number	Bar Diam. inches	Bar Area sq. in.	X inches	Y inches
-----	-----	-----	-----	-----

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-18 (Boring B-009 & 011-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

1	1.128000	1.000000	13.436000	0.000000
2	1.128000	1.000000	12.413245	5.141735
3	1.128000	1.000000	9.500687	9.500687
4	1.128000	1.000000	5.141735	12.413245
5	1.128000	1.000000	0.000000	13.436000
6	1.128000	1.000000	-5.14173	12.413245
7	1.128000	1.000000	-9.50069	9.500687
8	1.128000	1.000000	-12.41325	5.141735
9	1.128000	1.000000	-13.43600	0.000000
10	1.128000	1.000000	-12.41325	-5.14173
11	1.128000	1.000000	-9.50069	-9.50069
12	1.128000	1.000000	-5.14173	-12.41325
13	1.128000	1.000000	0.000000	-13.43600
14	1.128000	1.000000	5.141735	-12.41325
15	1.128000	1.000000	9.500687	-9.50069
16	1.128000	1.000000	12.413245	-5.14173

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

Minimum spacing between any two bars not equal to zero = 4.114 inches
 between bars 11 and 12.

Ratio of bar spacing to maximum aggregate size = 5.49

Concrete Properties:

Compressive Strength of Concrete	=	4000. psi
Modulus of Elasticity of Concrete	=	3604997. psi
Modulus of Rupture of Concrete	=	-474.34165 psi
Compression Strain at Peak Stress	=	0.001886
Tensile Strain at Fracture of Concrete	=	-0.0001154
Maximum Coarse Aggregate Size	=	0.750000 in

Number of Axial Thrust Force Values Determined from Pile-head Loadings = 3

Number	Axial Thrust Force kips
-----	-----
1	3.800
2	4.200
3	4.600

Definitions of Run Messages and Notes:

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-18 (Boring B-009 & 011-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

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 318-14, Section 21.2.3.
 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 = 3.800 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
6.25000E-07	240.5062135	384809942.	19.2929823	0.00001206	-0.00001044
0.0505030	0.2746478				
0.00000125	480.1472468	384117797.	18.6479768	0.00002331	-0.00002169
0.0973082	0.5259142				
0.00000188	718.9174733	383422652.	18.4329804	0.00003456	-0.00003294
0.1438345	0.7771808				
0.00000250	956.8168886	382726755.	18.3254857	0.00004581	-0.00004419
0.1900818	1.0284477				
0.00000313	1194.	382030558.	18.2609917	0.00005707	-0.00005543
0.2360502	1.2797149				
0.00000375	1430.	381334209.	18.2179981	0.00006832	-0.00006668
0.2817396	1.5309823				
0.00000438	1665.	380637775.	18.1872904	0.00007957	-0.00007793
0.3271500	1.7822500				
0.00000500	1900.	379941287.	18.1642614	0.00009082	-0.00008918
0.3722815	2.0335179				
0.00000563	2133.	379244764.	18.1463515	0.0001021	-0.000100
0.4171340	2.2847861				
0.00000625	2366.	378548215.	18.1320251	0.0001133	-0.000112
0.4617075	2.5360546				
0.00000688	2366.	344134741.	10.2494785	0.00007047	-0.000177
0.2882187	-4.308598 C				
0.00000750	2366.	315456846.	10.2198771	0.00007665	-0.000193
0.3129821	-4.706727 C				
0.00000813	2366.	291190934.	10.1952302	0.00008284	-0.000210
0.3376758	-5.104761 C				

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 Light Tower SC1-18 (Boring B-009 & 011-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00000875	2366.	270391582.	10.1744772	0.00008903	-0.000226
0.3622998	-5.502701 C				
0.00000938	2366.	252365477.	10.1568402	0.00009522	-0.000242
0.3868539	-5.900547 C				
0.00001000	2366.	236592634.	10.1417358	0.0001014	-0.000259
0.4113380	-6.298297 C				
0.00001063	2366.	222675420.	10.1287027	0.0001076	-0.000275
0.4357521	-6.695951 C				
0.00001125	2366.	210304564.	10.1174231	0.0001138	-0.000291
0.4600960	-7.093510 C				
0.00001188	2366.	199235903.	10.1076093	0.0001200	-0.000307
0.4843696	-7.490973 C				
0.00001250	2366.	189274107.	10.0990420	0.0001262	-0.000324
0.5085729	-7.888340 C				
0.00001313	2366.	180261055.	10.0915439	0.0001325	-0.000340
0.5327056	-8.285611 C				
0.00001375	2366.	172067370.	10.0849699	0.0001387	-0.000356
0.5567678	-8.682785 C				
0.00001438	2366.	164586180.	10.0792000	0.0001449	-0.000373
0.5807594	-9.079861 C				
0.00001500	2366.	157728423.	10.0741344	0.0001511	-0.000389
0.6046801	-9.476841 C				
0.00001563	2366.	151419286.	10.0696892	0.0001573	-0.000405
0.6285300	-9.873723 C				
0.00001625	2366.	145595467.	10.0657933	0.0001636	-0.000421
0.6523089	-10.270507 C				
0.00001688	2366.	140203043.	10.0623863	0.0001698	-0.000438
0.6760167	-10.667193 C				
0.00001750	2366.	135195791.	10.0594163	0.0001760	-0.000454
0.6996534	-11.063781 C				
0.00001813	2366.	130533867.	10.0568387	0.0001823	-0.000470
0.7232187	-11.460271 C				
0.00001875	2366.	126182738.	10.0546147	0.0001885	-0.000486
0.7467127	-11.856661 C				
0.00001938	2366.	122112327.	10.0527107	0.0001948	-0.000503
0.7701352	-12.252952 C				
0.00002000	2366.	118296317.	10.0510970	0.0002010	-0.000519
0.7934860	-12.649144 C				
0.00002063	2366.	114711580.	10.0497478	0.0002073	-0.000535
0.8167652	-13.045236 C				
0.00002125	2366.	111337710.	10.0486401	0.0002135	-0.000551
0.8399726	-13.441228 C				
0.00002188	2366.	108156633.	10.0477539	0.0002198	-0.000568
0.8631080	-13.837120 C				
0.00002250	2366.	105152282.	10.0470709	0.0002261	-0.000584
0.8861714	-14.232911 C				
0.00002313	2366.	102310328.	10.0465752	0.0002323	-0.000600
0.9091627	-14.628602 C				
0.00002375	2366.	99617951.	10.0462524	0.0002386	-0.000616
0.9320817	-15.024191 C				

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 Light Tower SC1-18 (Boring B-009 & 011-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00002438	2366.	97063645.	10.0460897	0.0002449	-0.000633
0.9549284	-15.419678 C				
0.00002563	2429.	94800037.	10.0461990	0.0002574	-0.000665
1.0004043	-16.210348 C				
0.00002688	2545.	94692477.	10.0468231	0.0002700	-0.000697
1.0455896	-17.000609 C				
0.00002813	2660.	94589756.	10.0479254	0.0002826	-0.000730
1.0904832	-17.790458 C				
0.00002938	2776.	94491232.	10.0493946	0.0002952	-0.000762
1.1350844	-18.579893 C				
0.00003063	2891.	94396370.	10.0512127	0.0003078	-0.000795
1.1793922	-19.368912 C				
0.00003188	3006.	94304718.	10.0533415	0.0003205	-0.000827
1.2234058	-20.157511 C				
0.00003313	3121.	94215891.	10.0557483	0.0003331	-0.000859
1.2671243	-20.945689 C				
0.00003438	3236.	94129561.	10.0584054	0.0003458	-0.000892
1.3105466	-21.733443 C				
0.00003563	3350.	94045446.	10.0612887	0.0003584	-0.000924
1.3536720	-22.520771 C				
0.00003688	3465.	93963300.	10.0643778	0.0003711	-0.000956
1.3964994	-23.307669 C				
0.00003813	3579.	93882912.	10.0676547	0.0003838	-0.000989
1.4390279	-24.094136 C				
0.00003938	3694.	93804096.	10.0711039	0.0003965	-0.001021
1.4812567	-24.880169 C				
0.00004063	3808.	93726688.	10.0747116	0.0004093	-0.001053
1.5231846	-25.665765 C				
0.00004188	3922.	93650546.	10.0784659	0.0004220	-0.001085
1.5648108	-26.450921 C				
0.00004313	4035.	93575540.	10.0823562	0.0004348	-0.001118
1.6061342	-27.235635 C				
0.00004438	4149.	93501560.	10.0863731	0.0004476	-0.001150
1.6471540	-28.019904 C				
0.00004563	4263.	93428502.	10.0905084	0.0004604	-0.001182
1.6878690	-28.803725 C				
0.00004688	4376.	93356279.	10.0947545	0.0004732	-0.001214
1.7282784	-29.587096 C				
0.00004813	4489.	93284807.	10.0991050	0.0004860	-0.001246
1.7683810	-30.370013 C				
0.00004938	4602.	93214014.	10.1035538	0.0004989	-0.001279
1.8081759	-31.152474 C				
0.00005063	4715.	93143835.	10.1080956	0.0005117	-0.001311
1.8476620	-31.934476 C				
0.00005188	4828.	93074209.	10.1127258	0.0005246	-0.001343
1.8868384	-32.716016 C				
0.00005313	4941.	93005082.	10.1174399	0.0005375	-0.001375
1.9257039	-33.497091 C				
0.00005438	5053.	92936405.	10.1222340	0.0005504	-0.001407
1.9642575	-34.277698 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-18 (Boring B-009 & 011-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00005563	5166.	92868132.	10.1271047	0.0005633	-0.001439
2.0024981	-35.057833 C				
0.00005688	5278.	92800222.	10.1320488	0.0005763	-0.001471
2.0404247	-35.837495 C				
0.00005813	5390.	92732637.	10.1370633	0.0005892	-0.001503
2.0780361	-36.616679 C				
0.00005938	5502.	92665342.	10.1421457	0.0006022	-0.001535
2.1153313	-37.395383 C				
0.00006063	5614.	92598305.	10.1472935	0.0006152	-0.001567
2.1523092	-38.173604 C				
0.00006188	5725.	92531497.	10.1525046	0.0006282	-0.001599
2.1889685	-38.951338 C				
0.00006313	5837.	92464888.	10.1577769	0.0006412	-0.001631
2.2253083	-39.728581 C				
0.00006438	5948.	92398455.	10.1631088	0.0006543	-0.001663
2.2613274	-40.505332 C				
0.00006563	6059.	92332173.	10.1684984	0.0006673	-0.001695
2.2970245	-41.281586 C				
0.00006688	6170.	92266020.	10.1739444	0.0006804	-0.001727
2.3323987	-42.057340 C				
0.00006813	6281.	92199976.	10.1794453	0.0006935	-0.001759
2.3674485	-42.832591 C				
0.00006938	6392.	92134020.	10.1849998	0.0007066	-0.001791
2.4021730	-43.607335 C				
0.00007063	6502.	92068136.	10.1906070	0.0007197	-0.001823
2.4365708	-44.381568 C				
0.00007188	6613.	92002305.	10.1962656	0.0007329	-0.001855
2.4706408	-45.155288 C				
0.00007313	6723.	91936511.	10.2020028	0.0007460	-0.001886
2.5043818	-45.928490 C				
0.00007438	6833.	91870742.	10.2077616	0.0007592	-0.001918
2.5377924	-46.701172 C				
0.00007938	7271.	91607617.	10.2312788	0.0008121	-0.002045
2.6681070	-49.786612 C				
0.00008438	7707.	91343844.	10.2555391	0.0008653	-0.002172
2.7930345	-52.863415 C				
0.00008938	8140.	91079227.	10.2796933	0.0009187	-0.002299
2.9123325	-55.933382 C				
0.00009438	8570.	90813004.	10.3043877	0.0009725	-0.002425
3.0260259	-58.995009 C				
0.00009938	8979.	90357411.	10.3225581	0.0010258	-0.002552
3.1326575	-60.000000 CY				
0.0001044	9304.	89144470.	10.3110511	0.0010762	-0.002681
3.2276850	-60.000000 CY				
0.0001094	9546.	87273573.	10.2718035	0.0011235	-0.002814
3.3116704	-60.000000 CY				
0.0001144	9782.	85523680.	10.2357064	0.0011707	-0.002947
3.3907664	-60.000000 CY				
0.0001194	10004.	83800225.	10.1987328	0.0012175	-0.003080
3.4643165	-60.000000 CY				

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0.0001244	10154.	81641326.	10.1374818	0.0012608	-0.003217
3.5282172	-60.000000 CY				
0.0001294	10287.	79513660.	10.0756441	0.0013035	-0.003354
3.5871212	-60.000000 CY				
0.0001344	10419.	77536664.	10.0197410	0.0013464	-0.003491
3.6423258	-60.000000 CY				
0.0001394	10550.	75693983.	9.9691573	0.0013895	-0.003628
3.6937845	-60.000000 CY				
0.0001444	10680.	73971519.	9.9233661	0.0014327	-0.003765
3.7414497	-60.000000 CY				
0.0001494	10808.	72355946.	9.8810316	0.0014760	-0.003902
3.7851328	-60.000000 CY				
0.0001544	10925.	70772035.	9.8368433	0.0015186	-0.004039
3.8241552	-60.000000 CY				
0.0001594	11008.	69072220.	9.7809580	0.0015588	-0.004179
3.8574366	-60.000000 CY				
0.0001644	11071.	67351790.	9.7204156	0.0015978	-0.004320
3.8862696	-60.000000 CY				
0.0001694	11131.	65719446.	9.6635689	0.0016368	-0.004461
3.9118664	-60.000000 CY				
0.0001744	11191.	64176802.	9.6094393	0.0016756	-0.004602
3.9342902	-60.000000 CY				
0.0001794	11250.	62716278.	9.5601863	0.0017149	-0.004743
3.9535015	-60.000000 CY				
0.0001844	11308.	61329164.	9.5136161	0.0017541	-0.004883
3.9693617	-60.000000 CY				
0.0001894	11364.	60009896.	9.4690774	0.0017932	-0.005024
3.9819050	-60.000000 CY				
0.0001944	11420.	58754909.	9.4280227	0.0018326	-0.005165
3.9911986	-60.000000 CY				
0.0001994	11476.	57559296.	9.3897594	0.0018721	-0.005305
3.9971986	-60.000000 CY				
0.0002044	11531.	56418622.	9.3531932	0.0019116	-0.005446
3.9998595	-60.000000 CY				
0.0002094	11584.	55328385.	9.3201259	0.0019514	-0.005586
3.9974517	-60.000000 CY				
0.0002144	11637.	54285454.	9.2909722	0.0019918	-0.005726
3.9998812	-60.000000 CY				
0.0002194	11690.	53285909.	9.2626721	0.0020320	-0.005866
3.9969940	-60.000000 CY				
0.0002244	11740.	52321336.	9.2356724	0.0020723	-0.006005
3.9997138	-60.000000 CY				
0.0002294	11786.	51384137.	9.2093226	0.0021124	-0.006145
3.9955528	-60.000000 CY				
0.0002344	11823.	50445667.	9.1796872	0.0021515	-0.006286
3.9989818	-60.000000 CY				
0.0002394	11855.	49524943.	9.1473565	0.0021896	-0.006428
3.9994466	-60.000000 CY				
0.0002444	11876.	48598228.	9.1109548	0.0022265	-0.006571
3.9965160	-60.000000 CY				

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0.0002494	11895.	47701101.	9.0745971	0.0022630	-0.006715
3.9991770	-60.000000 CY				
0.0002544	11912.	46829816.	9.0405915	0.0022997	-0.006858
3.9995775	-60.000000 CY				
0.0002594	11929.	45990067.	9.0077660	0.0023364	-0.007001
3.9954763	-60.000000 CY				
0.0002644	11945.	45181124.	8.9766457	0.0023732	-0.007144
3.9984997	-60.000000 CY				
0.0002694	11961.	44401256.	8.9468563	0.0024101	-0.007287
3.9998981	-60.000000 CY				
0.0002744	11976.	43648250.	8.9191370	0.0024472	-0.007430
3.9944635	-60.000000 CY				
0.0003044	12062.	39628140.	8.7757363	0.0026711	-0.008286
3.9984635	-60.000000 CY				
0.0003344	12138.	36300180.	8.6628609	0.0028966	-0.009141
3.9998209	-60.000000 CY				
0.0003644	12207.	33502446.	8.5793723	0.0031261	-0.009991
3.9999551	-60.000000 CYT				
0.0003944	12272.	31117026.	8.5161103	0.0033585	-0.010839
3.9996166	-60.000000 CYT				
0.0004244	12331.	29056485.	8.4674428	0.0035934	-0.011684
3.9972132	-60.000000 CYT				
0.0004544	12377.	27238942.	8.4178614	0.0038249	-0.012533
3.9873462	-60.000000 CYT				

Axial Thrust Force = 4.200 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in

6.25000E-07	240.5049676	384807948.	19.4290859	0.00001214	-0.00001036
0.0508615	0.2771147				
0.00000125	480.1459926	384116794.	18.7161837	0.00002340	-0.00002160
0.0976654	0.5283867				
0.00000188	718.9162127	383421980.	18.4785558	0.00003465	-0.00003285
0.1441903	0.7796589				
0.00000250	956.8156222	382726249.	18.3597458	0.00004590	-0.00004410
0.1904363	1.0309315				
0.00000313	1194.	382030150.	18.2884629	0.00005715	-0.00005535
0.2364034	1.2822044				
0.00000375	1430.	381333869.	18.2409436	0.00006840	-0.00006660
0.2820914	1.5334776				
0.00000438	1665.	380637482.	18.2070035	0.00007966	-0.00007784
0.3275005	1.7847511				

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0.00000500	1900.	379941029.	18.1815504	0.00009091	-0.00008909
0.3726306	2.0360248				
0.00000563	2133.	379244533.	18.1617553	0.0001022	-0.000100
0.4174818	2.2872988				
0.00000625	2366.	378548006.	18.1459208	0.0001134	-0.000112
0.4620539	2.5385732				
0.00000688	2366.	344134551.	10.2895004	0.00007074	-0.000177
0.2893429	-4.300617 C				
0.00000750	2366.	315456672.	10.2575513	0.00007693	-0.000193
0.3141325	-4.698533 C				
0.00000813	2366.	291190774.	10.2300378	0.00008312	-0.000209
0.3388235	-5.096560 C				
0.00000875	2366.	270391433.	10.2068278	0.00008931	-0.000226
0.3634446	-5.494492 C				
0.00000938	2366.	252365338.	10.1870615	0.00009550	-0.000242
0.3879959	-5.892330 C				
0.00001000	2366.	236592504.	10.1700940	0.0001017	-0.000258
0.4124772	-6.290073 C				
0.00001063	2366.	222675298.	10.1554324	0.0001079	-0.000275
0.4368884	-6.687720 C				
0.00001125	2366.	210304448.	10.1426931	0.0001141	-0.000291
0.4612294	-7.085271 C				
0.00001188	2366.	199235793.	10.1315564	0.0001203	-0.000307
0.4855002	-7.482727 C				
0.00001250	2366.	189274003.	10.1218127	0.0001265	-0.000323
0.5097005	-7.880086 C				
0.00001313	2366.	180260955.	10.1132503	0.0001327	-0.000340
0.5338304	-8.277349 C				
0.00001375	2366.	172067276.	10.1057088	0.0001390	-0.000356
0.5578898	-8.674515 C				
0.00001438	2366.	164586090.	10.0990556	0.0001452	-0.000372
0.5818784	-9.071585 C				
0.00001500	2366.	157728336.	10.0931803	0.0001514	-0.000389
0.6057963	-9.468556 C				
0.00001563	2366.	151419203.	10.0879903	0.0001576	-0.000405
0.6296433	-9.865431 C				
0.00001625	2366.	145595387.	10.0834069	0.0001639	-0.000421
0.6534193	-10.262207 C				
0.00001688	2366.	140202965.	10.0793634	0.0001701	-0.000437
0.6771242	-10.658886 C				
0.00001750	2366.	135195717.	10.0758025	0.0001763	-0.000454
0.7007579	-11.055466 C				
0.00001813	2366.	130533795.	10.0726747	0.0001826	-0.000470
0.7243204	-11.451947 C				
0.00001875	2366.	126182669.	10.0699372	0.0001888	-0.000486
0.7478114	-11.848330 C				
0.00001938	2366.	122112260.	10.0675528	0.0001951	-0.000502
0.7712309	-12.244613 C				
0.00002000	2366.	118296252.	10.0654889	0.0002013	-0.000519
0.7945789	-12.640797 C				

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0.00002063	2366.	114711517.	10.0637168	0.0002076	-0.000535
0.8178551	-13.036882 C				
0.00002125	2366.	111337649.	10.0622112	0.0002138	-0.000551
0.8410595	-13.432866 C				
0.00002188	2366.	108156573.	10.0609497	0.0002201	-0.000567
0.8641920	-13.828750 C				
0.00002250	2366.	105152224.	10.0599125	0.0002263	-0.000584
0.8872524	-14.224533 C				
0.00002313	2366.	102310272.	10.0590817	0.0002326	-0.000600
0.9102407	-14.620215 C				
0.00002375	2366.	99617896.	10.0584414	0.0002389	-0.000616
0.9331568	-15.015796 C				
0.00002438	2366.	97063591.	10.0579776	0.0002452	-0.000632
0.9560005	-15.411276 C				
0.00002563	2432.	94924068.	10.0575288	0.0002577	-0.000665
1.0014704	-16.201930 C				
0.00002688	2548.	94810571.	10.0576469	0.0002703	-0.000697
1.0466496	-16.992174 C				
0.00002813	2664.	94702439.	10.0582592	0.0002829	-0.000730
1.0915372	-17.782007 C				
0.00002938	2779.	94598964.	10.0593353	0.0002955	-0.000762
1.1361324	-18.571425 C				
0.00003063	2894.	94499555.	10.0607664	0.0003081	-0.000794
1.1804341	-19.360427 C				
0.00003188	3009.	94403710.	10.0625387	0.0003207	-0.000827
1.2244416	-20.149010 C				
0.00003313	3124.	94311007.	10.0646159	0.0003334	-0.000859
1.2681539	-20.937171 C				
0.00003438	3239.	94221082.	10.0669675	0.0003461	-0.000891
1.3115700	-21.724908 C				
0.00003563	3354.	94133623.	10.0695670	0.0003587	-0.000924
1.3546892	-22.512219 C				
0.00003688	3468.	94048359.	10.0723915	0.0003714	-0.000956
1.3975103	-23.299100 C				
0.00003813	3582.	93965057.	10.0754214	0.0003841	-0.000988
1.4400326	-24.085550 C				
0.00003938	3697.	93883511.	10.0786392	0.0003968	-0.001021
1.4822550	-24.871565 C				
0.00004063	3811.	93803541.	10.0820299	0.0004096	-0.001053
1.5241766	-25.657144 C				
0.00004188	3925.	93724988.	10.0855803	0.0004223	-0.001085
1.5657965	-26.442282 C				
0.00004313	4039.	93647711.	10.0892786	0.0004351	-0.001117
1.6071135	-27.226979 C				
0.00004438	4152.	93571586.	10.0931145	0.0004479	-0.001150
1.6481268	-28.011230 C				
0.00004563	4266.	93496502.	10.0970787	0.0004607	-0.001182
1.6888354	-28.795033 C				
0.00004688	4379.	93422358.	10.1011630	0.0004735	-0.001214
1.7292383	-29.578385 C				

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0.00004813	4492.	93349066.	10.1053601	0.0004863	-0.001246
1.7693344	-30.361284 C				
0.00004938	4606.	93276544.	10.1096634	0.0004992	-0.001278
1.8091228	-31.143727 C				
0.00005063	4718.	93204721.	10.1140670	0.0005120	-0.001310
1.8486023	-31.925710 C				
0.00005188	4831.	93133529.	10.1185657	0.0005249	-0.001343
1.8877721	-32.707231 C				
0.00005313	4944.	93062909.	10.1231546	0.0005378	-0.001375
1.9266309	-33.488287 C				
0.00005438	5056.	92992807.	10.1278294	0.0005507	-0.001407
1.9651778	-34.268875 C				
0.00005563	5169.	92923173.	10.1325862	0.0005636	-0.001439
2.0034117	-35.048992 C				
0.00005688	5281.	92853961.	10.1374215	0.0005766	-0.001471
2.0413316	-35.828634 C				
0.00005813	5393.	92785130.	10.1423320	0.0005895	-0.001503
2.0789362	-36.607799 C				
0.00005938	5505.	92716640.	10.1473148	0.0006025	-0.001535
2.1162246	-37.386484 C				
0.00006063	5617.	92648458.	10.1523672	0.0006155	-0.001567
2.1531956	-38.164685 C				
0.00006188	5728.	92580549.	10.1574868	0.0006285	-0.001599
2.1898481	-38.942399 C				
0.00006313	5840.	92512883.	10.1626714	0.0006415	-0.001631
2.2261809	-39.719622 C				
0.00006438	5951.	92445433.	10.1679189	0.0006546	-0.001663
2.2621930	-40.496353 C				
0.00006563	6062.	92378172.	10.1732276	0.0006676	-0.001695
2.2978832	-41.272587 C				
0.00006688	6173.	92311077.	10.1785957	0.0006807	-0.001727
2.3332503	-42.048320 C				
0.00006813	6284.	92244124.	10.1840217	0.0006938	-0.001759
2.3682931	-42.823550 C				
0.00006938	6395.	92177292.	10.1895041	0.0007069	-0.001791
2.4030104	-43.598274 C				
0.00007063	6505.	92110561.	10.1950417	0.0007200	-0.001822
2.4374011	-44.372486 C				
0.00007188	6616.	92043913.	10.2006608	0.0007332	-0.001854
2.4714639	-45.146185 C				
0.00007313	6726.	91977331.	10.2063053	0.0007463	-0.001886
2.5051976	-45.919366 C				
0.00007438	6836.	91910797.	10.2120017	0.0007595	-0.001918
2.5386010	-46.692026 C				
0.00007938	7274.	91644853.	10.2352897	0.0008124	-0.002045
2.6688860	-49.777380 C				
0.00008438	7710.	91378587.	10.2593338	0.0008656	-0.002172
2.7937834	-52.854093 C				
0.00008938	8143.	91111830.	10.2831857	0.0009191	-0.002298
2.9130226	-55.924331 C				

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0.00009438	8573.	90843621.	10.3077273	0.0009728	-0.002425
3.0266854	-58.985869 C				
0.00009938	8982.	90387473.	10.3258078	0.0010261	-0.002551
3.1332951	-60.000000 CY				
0.0001044	9308.	89176212.	10.3143071	0.0010766	-0.002681
3.2283182	-60.000000 CY				
0.0001094	9549.	87304848.	10.2749831	0.0011238	-0.002814
3.3122821	-60.000000 CY				
0.0001144	9785.	85553556.	10.2389100	0.0011711	-0.002946
3.3913727	-60.000000 CY				
0.0001194	10007.	83830919.	10.2019402	0.0012179	-0.003080
3.4649106	-60.000000 CY				
0.0001244	10158.	81671814.	10.1406407	0.0012612	-0.003216
3.5287895	-60.000000 CY				
0.0001294	10291.	79542859.	10.0787027	0.0013039	-0.003354
3.5876602	-60.000000 CY				
0.0001344	10423.	77564670.	10.0227059	0.0013468	-0.003491
3.6428308	-60.000000 CY				
0.0001394	10554.	75720878.	9.9720357	0.0013899	-0.003628
3.6942550	-60.000000 CY				
0.0001444	10683.	73997378.	9.9261646	0.0014331	-0.003764
3.7418850	-60.000000 CY				
0.0001494	10812.	72381005.	9.8838986	0.0014764	-0.003901
3.7855535	-60.000000 CY				
0.0001544	10929.	70796718.	9.8396771	0.0015190	-0.004038
3.8245440	-60.000000 CY				
0.0001594	11012.	69097838.	9.7838573	0.0015593	-0.004178
3.8578061	-60.000000 CY				
0.0001644	11075.	67376662.	9.7232508	0.0015983	-0.004319
3.8866026	-60.000000 CY				
0.0001694	11135.	65743511.	9.6663364	0.0016372	-0.004460
3.9121613	-60.000000 CY				
0.0001744	11195.	64200103.	9.6121495	0.0016761	-0.004601
3.9345463	-60.000000 CY				
0.0001794	11254.	62738857.	9.5628376	0.0017153	-0.004742
3.9537182	-60.000000 CY				
0.0001844	11312.	61351278.	9.5162917	0.0017546	-0.004883
3.9695496	-60.000000 CY				
0.0001894	11368.	60031354.	9.4717005	0.0017937	-0.005024
3.9820503	-60.000000 CY				
0.0001944	11425.	58775745.	9.4305957	0.0018331	-0.005164
3.9913005	-60.000000 CY				
0.0001994	11480.	57579537.	9.3922863	0.0018726	-0.005305
3.9972564	-60.000000 CY				
0.0002044	11535.	56438298.	9.3556780	0.0019121	-0.005445
3.9998723	-60.000000 CY				
0.0002094	11588.	55347517.	9.3241700	0.0019522	-0.005585
3.9975077	-60.000000 CY				
0.0002144	11641.	54304067.	9.2934428	0.0019923	-0.005725
3.9998931	-60.000000 CY				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-18 (Boring B-009 & 011-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0002194	11694.	53304015.	9.2651074	0.0020325	-0.005865
3.9970558	-60.000000 CY				
0.0002244	11744.	52339157.	9.2380944	0.0020728	-0.006005
3.9997330	-60.000000 CY				
0.0002294	11790.	51401489.	9.2117130	0.0021129	-0.006145
3.9956300	-60.000000 CY				
0.0002344	11827.	50463153.	9.1821360	0.0021521	-0.006285
3.9990203	-60.000000 CY				
0.0002394	11859.	49542728.	9.1500193	0.0021903	-0.006427
3.9992468	-60.000000 CY				
0.0002444	11880.	48615611.	9.1135780	0.0022271	-0.006570
3.9965958	-60.000000 CY				
0.0002494	11900.	47718283.	9.0771076	0.0022636	-0.006714
3.9992162	-60.000000 CY				
0.0002544	11917.	46846598.	9.0431776	0.0023004	-0.006857
3.9993713	-60.000000 CY				
0.0002594	11933.	46006491.	9.0103157	0.0023371	-0.007000
3.9955701	-60.000000 CY				
0.0002644	11949.	45197204.	8.9791598	0.0023739	-0.007144
3.9985538	-60.000000 CY				
0.0002694	11965.	44417005.	8.9493437	0.0024107	-0.007287
3.9999119	-60.000000 CY				
0.0002744	11980.	43663657.	8.9215934	0.0024479	-0.007430
3.9942523	-60.000000 CY				
0.0003044	12066.	39641995.	8.7782176	0.0026719	-0.008286
3.9985257	-60.000000 CY				
0.0003344	12142.	36312646.	8.6652203	0.0028974	-0.009140
3.9998424	-60.000000 CY				
0.0003644	12212.	33513765.	8.5815911	0.0031269	-0.009991
3.9999658	-60.000000 CYT				
0.0003944	12276.	31127384.	8.5182268	0.0033594	-0.010838
3.9996505	-60.000000 CYT				
0.0004244	12335.	29066055.	8.4694819	0.0035942	-0.011683
3.9973093	-60.000000 CYT				
0.0004544	12381.	27248100.	8.4201387	0.0038259	-0.012532
3.9875919	-60.000000 CYT				

Axial Thrust Force = 4.600 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
<hr/>					
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6.25000E-07 0.0512199	240.5035986 0.2795816	384805758.	19.5651901	0.00001223	-0.00001027

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-18 (Boring B-009 & 011-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00000125	480.1446137	384115691.	18.7843907	0.00002348	-0.00002152
0.0980225	0.5308592				
0.00000188	718.9148267	383421241.	18.5241312	0.00003473	-0.00003277
0.1445462	0.7821371				
0.00000250	956.8142298	382725692.	18.3940059	0.00004599	-0.00004401
0.1907908	1.0334154				
0.00000313	1194.	382029703.	18.3159341	0.00005724	-0.00005526
0.2367565	1.2846940				
0.00000375	1430.	381333494.	18.2638891	0.00006849	-0.00006651
0.2824433	1.5359729				
0.00000438	1665.	380637159.	18.2267166	0.00007974	-0.00007776
0.3278510	1.7872522				
0.00000500	1900.	379940746.	18.1988394	0.00009099	-0.00008901
0.3729798	2.0385317				
0.00000563	2133.	379244280.	18.1771590	0.0001022	-0.000100
0.4178295	2.2898116				
0.00000625	2366.	378547777.	18.1598165	0.0001135	-0.000112
0.4624003	2.5410917				
0.00000688	2366.	344134343.	10.3291778	0.00007101	-0.000176
0.2904571	-4.292706 C				
0.00000750	2366.	315456481.	10.2940289	0.00007721	-0.000193
0.3152465	-4.690597 C				
0.00000813	2366.	291190598.	10.2646762	0.00008340	-0.000209
0.3399656	-5.088396 C				
0.00000875	2366.	270391269.	10.2391817	0.00008959	-0.000225
0.3645893	-5.486283 C				
0.00000938	2366.	252365185.	10.2172859	0.00009579	-0.000242
0.3891378	-5.884113 C				
0.00001000	2366.	236592361.	10.1984552	0.0001020	-0.000258
0.4136162	-6.281848 C				
0.00001063	2366.	222675163.	10.1821496	0.0001082	-0.000274
0.4380246	-6.679488 C				
0.00001125	2366.	210304321.	10.1679490	0.0001144	-0.000291
0.4623628	-7.077032 C				
0.00001188	2366.	199235672.	10.1555219	0.0001206	-0.000307
0.4866307	-7.474480 C				
0.00001250	2366.	189273889.	10.1446030	0.0001268	-0.000323
0.5108282	-7.871831 C				
0.00001313	2366.	180260846.	10.1349589	0.0001330	-0.000339
0.5349552	-8.269087 C				
0.00001375	2366.	172067171.	10.1264498	0.0001392	-0.000356
0.5590117	-8.666245 C				
0.00001438	2366.	164585990.	10.1189132	0.0001455	-0.000372
0.5829974	-9.063307 C				
0.00001500	2366.	157728241.	10.1122282	0.0001517	-0.000388
0.6069124	-9.460271 C				
0.00001563	2366.	151419111.	10.1062933	0.0001579	-0.000405
0.6307565	-9.857138 C				
0.00001625	2366.	145595299.	10.1010224	0.0001641	-0.000421
0.6545296	-10.253907 C				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00001688	2366.	140202880.	10.0963423	0.0001704	-0.000437
0.6782316	-10.650577 C				
0.00001750	2366.	135195635.	10.0921903	0.0001766	-0.000453
0.7018624	-11.047150 C				
0.00001813	2366.	130533716.	10.0885122	0.0001829	-0.000470
0.7254219	-11.443623 C				
0.00001875	2366.	126182592.	10.0852613	0.0001891	-0.000486
0.7489100	-11.839998 C				
0.00001938	2366.	122112186.	10.0823966	0.0001953	-0.000502
0.7723266	-12.236274 C				
0.00002000	2366.	118296180.	10.0798824	0.0002016	-0.000518
0.7956716	-12.632450 C				
0.00002063	2366.	114711448.	10.0776874	0.0002079	-0.000535
0.8189449	-13.028526 C				
0.00002125	2366.	111337582.	10.0757837	0.0002141	-0.000551
0.8421464	-13.424502 C				
0.00002188	2366.	108156508.	10.0741470	0.0002204	-0.000567
0.8652759	-13.820378 C				
0.00002250	2366.	105152160.	10.0727554	0.0002266	-0.000583
0.8883333	-14.216153 C				
0.00002313	2366.	102310210.	10.0715894	0.0002329	-0.000600
0.9113187	-14.611828 C				
0.00002375	2366.	99617836.	10.0706317	0.0002392	-0.000616
0.9342318	-15.007401 C				
0.00002438	2366.	97063533.	10.0698667	0.0002455	-0.000632
0.9570725	-15.402873 C				
0.00002563	2436.	95048091.	10.0688598	0.0002580	-0.000664
1.0025364	-16.193510 C				
0.00002688	2551.	94928657.	10.0684718	0.0002706	-0.000697
1.0477096	-16.983738 C				
0.00002813	2667.	94815115.	10.0686232	0.0002832	-0.000729
1.0925912	-17.773555 C				
0.00002938	2782.	94706690.	10.0692479	0.0002958	-0.000762
1.1371802	-18.562957 C				
0.00003063	2897.	94602733.	10.0703211	0.0003084	-0.000794
1.1814759	-19.351942 C				
0.00003188	3012.	94502697.	10.0717368	0.0003210	-0.000826
1.2254772	-20.140508 C				
0.00003313	3127.	94406117.	10.0734845	0.0003337	-0.000859
1.2691834	-20.928652 C				
0.00003438	3242.	94312597.	10.0755306	0.0003463	-0.000891
1.3125933	-21.716373 C				
0.00003563	3357.	94221794.	10.0778462	0.0003590	-0.000923
1.3557063	-22.503666 C				
0.00003688	3471.	94133413.	10.0804061	0.0003717	-0.000956
1.3985212	-23.290530 C				
0.00003813	3586.	94047197.	10.0831888	0.0003844	-0.000988
1.4410372	-24.076963 C				
0.00003938	3700.	93962921.	10.0861753	0.0003971	-0.001020
1.4832533	-24.862961 C				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00004063	3814.	93880388.	10.0893491	0.0004099	-0.001053
1.5251686	-25.648521 C				
0.00004188	3928.	93799425.	10.0926956	0.0004226	-0.001085
1.5667821	-26.433642 C				
0.00004313	4042.	93719877.	10.0962019	0.0004354	-0.001117
1.6080927	-27.218321 C				
0.00004438	4155.	93641609.	10.0998566	0.0004482	-0.001149
1.6490996	-28.002554 C				
0.00004563	4269.	93564497.	10.1036497	0.0004610	-0.001182
1.6898018	-28.786339 C				
0.00004688	4382.	93488434.	10.1075722	0.0004738	-0.001214
1.7301982	-29.569674 C				
0.00004813	4496.	93413321.	10.1116159	0.0004866	-0.001246
1.7702878	-30.352554 C				
0.00004938	4609.	93339070.	10.1157737	0.0004995	-0.001278
1.8100696	-31.134978 C				
0.00005063	4722.	93265602.	10.1200391	0.0005123	-0.001310
1.8495425	-31.916943 C				
0.00005188	4834.	93192845.	10.1244063	0.0005252	-0.001342
1.8887057	-32.698446 C				
0.00005313	4947.	93120733.	10.1288700	0.0005381	-0.001374
1.9275579	-33.479483 C				
0.00005438	5060.	93049206.	10.1334255	0.0005510	-0.001406
1.9660981	-34.260052 C				
0.00005563	5172.	92978211.	10.1380684	0.0005639	-0.001439
2.0043253	-35.040149 C				
0.00005688	5284.	92907697.	10.1427948	0.0005769	-0.001471
2.0422384	-35.819772 C				
0.00005813	5396.	92837619.	10.1476012	0.0005898	-0.001503
2.0798362	-36.598918 C				
0.00005938	5508.	92767935.	10.1524844	0.0006028	-0.001535
2.1171178	-37.377583 C				
0.00006063	5620.	92698606.	10.1574414	0.0006158	-0.001567
2.1540819	-38.155764 C				
0.00006188	5731.	92629597.	10.1624696	0.0006288	-0.001599
2.1907275	-38.933458 C				
0.00006313	5843.	92560874.	10.1675664	0.0006418	-0.001631
2.2270535	-39.710662 C				
0.00006438	5954.	92492407.	10.1727297	0.0006549	-0.001663
2.2630586	-40.487373 C				
0.00006563	6065.	92424168.	10.1779574	0.0006679	-0.001695
2.2987417	-41.263586 C				
0.00006688	6176.	92356130.	10.1832476	0.0006810	-0.001726
2.3341018	-42.039299 C				
0.00006813	6287.	92288268.	10.1885986	0.0006941	-0.001758
2.3691375	-42.814509 C				
0.00006938	6398.	92220560.	10.1940089	0.0007072	-0.001790
2.4038477	-43.589211 C				
0.00007063	6508.	92152983.	10.1995039	0.0007203	-0.001822
2.4382312	-44.363403 C				

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0.00007188	6619.	92085519.	10.2050285	0.0007335	-0.001854
2.4722868	-45.137081 C				
0.00007313	6729.	92018147.	10.2106084	0.0007467	-0.001886
2.5060133	-45.910241 C				
0.00007438	6839.	91950850.	10.2162424	0.0007598	-0.001918
2.5394094	-46.682880 C				
0.00007938	7277.	91682087.	10.2393011	0.0008127	-0.002045
2.6696649	-49.768146 C				
0.00008438	7713.	91413389.	10.2630109	0.0008659	-0.002172
2.7945082	-52.845065 C				
0.00008938	8146.	91144431.	10.2866786	0.0009194	-0.002298
2.9137126	-55.915279 C				
0.00009438	8576.	90874234.	10.3110673	0.0009731	-0.002424
3.0273448	-58.976728 C				
0.00009938	8985.	90417533.	10.3290580	0.0010265	-0.002551
3.1339327	-60.000000 CY				
0.0001044	9311.	89207952.	10.3175636	0.0010769	-0.002681
3.2289512	-60.000000 CY				
0.0001094	9552.	87336121.	10.2781631	0.0011242	-0.002813
3.3128936	-60.000000 CY				
0.0001144	9789.	85583430.	10.2421143	0.0011714	-0.002946
3.3919789	-60.000000 CY				
0.0001194	10011.	83861611.	10.2051482	0.0012182	-0.003079
3.4655044	-60.000000 CY				
0.0001244	10162.	81702300.	10.1438002	0.0012616	-0.003216
3.5293615	-60.000000 CY				
0.0001294	10295.	79572057.	10.0817619	0.0013043	-0.003353
3.5881988	-60.000000 CY				
0.0001344	10427.	77592674.	10.0256713	0.0013472	-0.003490
3.6433355	-60.000000 CY				
0.0001394	10557.	75747771.	9.9749147	0.0013903	-0.003627
3.6947252	-60.000000 CY				
0.0001444	10687.	74023236.	9.9289636	0.0014335	-0.003764
3.7423201	-60.000000 CY				
0.0001494	10816.	72406063.	9.8867661	0.0014768	-0.003901
3.7859739	-60.000000 CY				
0.0001544	10933.	70821400.	9.8425115	0.0015194	-0.004038
3.8249324	-60.000000 CY				
0.0001594	11017.	69123456.	9.7867573	0.0015598	-0.004178
3.8581753	-60.000000 CY				
0.0001644	11079.	67401534.	9.7260868	0.0015987	-0.004319
3.8869352	-60.000000 CY				
0.0001694	11139.	65767574.	9.6691048	0.0016377	-0.004460
3.9124557	-60.000000 CY				
0.0001744	11199.	64223403.	9.6148605	0.0016766	-0.004601
3.9348020	-60.000000 CY				
0.0001794	11258.	62761436.	9.5654896	0.0017158	-0.004742
3.9539345	-60.000000 CY				
0.0001844	11316.	61373390.	9.5189681	0.0017551	-0.004882
3.9697370	-60.000000 CY				

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0.0001894	11373.	60052811.	9.4743244	0.0017942	-0.005023
3.9821950	-60.000000 CY				
0.0001944	11429.	58796578.	9.4331695	0.0018336	-0.005164
3.9914019	-60.000000 CY				
0.0001994	11484.	57599778.	9.3948139	0.0018731	-0.005304
3.9973136	-60.000000 CY				
0.0002044	11539.	56457972.	9.3581635	0.0019126	-0.005445
3.9998845	-60.000000 CY				
0.0002094	11592.	55366642.	9.3266817	0.0019528	-0.005585
3.9975630	-60.000000 CY				
0.0002144	11645.	54322678.	9.2959142	0.0019928	-0.005725
3.9999044	-60.000000 CY				
0.0002194	11698.	53322120.	9.2675435	0.0020331	-0.005864
3.9971169	-60.000000 CY				
0.0002244	11748.	52356977.	9.2405172	0.0020733	-0.006004
3.9997515	-60.000000 CY				
0.0002294	11794.	51418840.	9.2141042	0.0021135	-0.006144
3.9957066	-60.000000 CY				
0.0002344	11831.	50480617.	9.1845645	0.0021526	-0.006285
3.9990577	-60.000000 CY				
0.0002394	11864.	49560513.	9.1526832	0.0021909	-0.006427
3.9990468	-60.000000 CY				
0.0002444	11885.	48632992.	9.1162023	0.0022278	-0.006570
3.9966747	-60.000000 CY				
0.0002494	11904.	47735462.	9.0796192	0.0022642	-0.006713
3.9992545	-60.000000 CY				
0.0002544	11921.	46863378.	9.0457647	0.0023010	-0.006856
3.9991650	-60.000000 CY				
0.0002594	11937.	46022914.	9.0128664	0.0023377	-0.007000
3.9956629	-60.000000 CY				
0.0002644	11953.	45213284.	8.9816750	0.0023745	-0.007143
3.9986069	-60.000000 CY				
0.0002694	11969.	44432753.	8.9518321	0.0024114	-0.007286
3.9999247	-60.000000 CY				
0.0002744	11984.	43679063.	8.9240509	0.0024485	-0.007429
3.9940409	-60.000000 CY				
0.0003044	12070.	39655848.	8.7807001	0.0026726	-0.008285
3.9985866	-60.000000 CY				
0.0003344	12146.	36325110.	8.6675807	0.0028982	-0.009139
3.9998625	-60.000000 CY				
0.0003644	12216.	33525083.	8.5838110	0.0031277	-0.009990
3.9999751	-60.000000 CYT				
0.0003944	12280.	31137740.	8.5203443	0.0033602	-0.010837
3.9996828	-60.000000 CYT				
0.0004244	12339.	29075625.	8.4715220	0.0035951	-0.011682
3.9974037	-60.000000 CYT				
0.0004544	12385.	27257253.	8.4224181	0.0038269	-0.012531
3.9878351	-60.000000 CYT				

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 Summary of Results for Nominal 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 Tens. No. Strain	Axial Thrust kips	Nominal Mom. Cap. in-kip	Max. Comp. Strain	Max.
----- -----	----- -----	----- -----	----- -----	
1 -0.00952396	3.800	12169.214	0.00300000	
2 -0.00952020	4.200	12173.120	0.00300000	
3 -0.00951645	4.600	12177.027	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 (0.75).

The above values should be multiplied by the appropriate strength reduction
 factor to compute ultimate moment capacity according to ACI 318,
 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 Stiff. Load Ult Mom No. kip-in^2	Resist. Factor	Nominal Ax. Thrust kips	Nominal Moment Cap in-kips	Ult. (Fac) Ax. Thrust kips	Ult. (Fac) Moment Cap in-kips	Bend. at
----- -----	----- -----	----- -----	----- -----	----- -----	----- -----	
1 91219895.	0.65	3.800000	12169.	2.470000	7910.	
2 91253873.	0.65	4.200000	12173.	2.730000	7913.	
3 91287886.	0.65	4.600000	12177.	2.990000	7915.	
1	0.75	3.800000	12169.	2.850000	9127.	

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89806706.					
2	0.75	4.200000	12173.	3.150000	9130.
89838295.					
3	0.75	4.600000	12177.	3.450000	9133.
89869877.					
1	0.90	3.800000	12169.	3.420000	10952.
70221645.					
2	0.90	4.200000	12173.	3.780000	10956.
70254444.					
3	0.90	4.600000	12177.	4.140000	10959.
70287179.					

 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	1.0000	0.00	N.A.	No	0.00	8780.
2	4.0000	0.3217	No	No	8780.	71172.
3	6.4000	1.8670	Yes	No	79952.	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.

 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 = 1000.0 lbs
 Applied moment at pile head = 315600.0 in-lbs
 Axial thrust load on pile head = 4200.0 lbs

Depth	Deflect.	Bending	Shear	Slope	Total	Bending	Soil
-------	----------	---------	-------	-------	-------	---------	------

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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	0.01134	315600.		1000.	-1.71E-04	0.00	3.84E+11	
0.00	0.00	0.00						
0.09000	0.01116	316681.		1000.0000	-1.70E-04	0.00	3.84E+11	
0.00	0.00	0.00						
0.1800	0.01097	317762.		1000.	-1.70E-04	0.00	3.84E+11	
0.00	0.00	0.00						
0.2700	0.01079	318842.		1000.	-1.69E-04	0.00	3.84E+11	
0.00	0.00	0.00						
0.3600	0.01061	319923.		1000.	-1.68E-04	0.00	3.84E+11	
0.00	0.00	0.00						
0.4500	0.01043	321004.		1000.0000	-1.67E-04	0.00	3.84E+11	
0.00	0.00	0.00						
0.5400	0.01025	322085.		1000.0000	-1.66E-04	0.00	3.84E+11	
0.00	0.00	0.00						
0.6300	0.01007	323165.		1000.0000	-1.65E-04	0.00	3.84E+11	
0.00	0.00	0.00						
0.7200	0.00989	324246.		1000.0000	-1.64E-04	0.00	3.84E+11	
0.00	0.00	0.00						
0.8100	0.00972	325327.		1000.0000	-1.63E-04	0.00	3.84E+11	
0.00	0.00	0.00						
0.9000	0.00954	326408.		1000.0000	-1.62E-04	0.00	3.84E+11	
0.00	0.00	0.00						
0.9900	0.00937	327488.		1000.0000	-1.61E-04	0.00	3.84E+11	
0.00	0.00	0.00						
1.0800	0.00919	328569.		991.1473	-1.60E-04	0.00	3.84E+11	
-16.394	1926.	0.00						
1.1700	0.00902	329631.		973.3525	-1.60E-04	0.00	3.84E+11	
-16.560	1983.	0.00						
1.2600	0.00885	330673.		955.3809	-1.59E-04	0.00	3.84E+11	
-16.721	2041.	0.00						
1.3500	0.00868	331696.		937.2372	-1.58E-04	0.00	3.84E+11	
-16.878	2101.	0.00						
1.4400	0.00851	332699.		918.9259	-1.57E-04	0.00	3.84E+11	
-17.031	2162.	0.00						
1.5300	0.00834	333682.		900.4516	-1.56E-04	0.00	3.84E+11	
-17.180	2225.	0.00						
1.6200	0.00817	334645.		881.8190	-1.55E-04	0.00	3.84E+11	
-17.325	2290.	0.00						
1.7100	0.00800	335588.		863.0329	-1.54E-04	0.00	3.84E+11	
-17.464	2357.	0.00						
1.8000	0.00784	336511.		844.0982	-1.53E-04	0.00	3.84E+11	
-17.600	2425.	0.00						
1.8900	0.00767	337413.		825.0198	-1.52E-04	0.00	3.84E+11	

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-17.731	2496.	0.00				
1.9800	0.00751	338294.	805.8025	-1.51E-04	0.00	3.84E+11
-17.857	2568.	0.00				
2.0700	0.00735	339155.	786.4516	-1.50E-04	0.00	3.84E+11
-17.978	2643.	0.00				
2.1600	0.00719	339994.	766.9721	-1.49E-04	0.00	3.84E+11
-18.095	2720.	0.00				
2.2500	0.00702	340813.	747.3693	-1.48E-04	0.00	3.84E+11
-18.207	2799.	0.00				
2.3400	0.00687	341610.	727.6485	-1.47E-04	0.00	3.84E+11
-18.313	2881.	0.00				
2.4300	0.00671	342386.	707.8150	-1.46E-04	0.00	3.84E+11
-18.415	2965.	0.00				
2.5200	0.00655	343140.	687.8745	-1.45E-04	0.00	3.84E+11
-18.512	3053.	0.00				
2.6100	0.00639	343873.	667.8325	-1.44E-04	0.00	3.84E+11
-18.603	3143.	0.00				
2.7000	0.00624	344584.	647.6948	-1.43E-04	0.00	3.84E+11
-18.689	3236.	0.00				
2.7900	0.00608	345273.	627.4671	-1.42E-04	0.00	3.84E+11
-18.770	3332.	0.00				
2.8800	0.00593	345941.	607.1555	-1.41E-04	0.00	3.84E+11
-18.845	3432.	0.00				
2.9700	0.00578	346586.	586.7660	-1.40E-04	0.00	3.84E+11
-18.914	3536.	0.00				
3.0600	0.00563	347209.	566.3047	-1.40E-04	0.00	3.84E+11
-18.977	3643.	0.00				
3.1500	0.00548	347810.	545.7781	-1.39E-04	0.00	3.84E+11
-19.035	3754.	0.00				
3.2400	0.00533	348389.	525.1927	-1.38E-04	0.00	3.84E+11
-19.086	3869.	0.00				
3.3300	0.00518	348946.	504.5551	-1.37E-04	0.00	3.84E+11
-19.132	3989.	0.00				
3.4200	0.00503	349480.	483.8721	-1.36E-04	0.00	3.84E+11
-19.170	4114.	0.00				
3.5100	0.00489	349992.	463.1507	-1.35E-04	0.00	3.84E+11
-19.203	4244.	0.00				
3.6000	0.00474	350482.	442.3981	-1.34E-04	0.00	3.84E+11
-19.228	4380.	0.00				
3.6900	0.00460	350949.	421.6217	-1.33E-04	0.00	3.84E+11
-19.247	4521.	0.00				
3.7800	0.00445	351394.	400.8290	-1.32E-04	0.00	3.84E+11
-19.258	4669.	0.00				
3.8700	0.00431	351816.	380.0279	-1.31E-04	0.00	3.84E+11
-19.262	4823.	0.00				
3.9600	0.00417	352216.	359.2265	-1.30E-04	0.00	3.84E+11
-19.259	4985.	0.00				
4.0500	0.00403	352593.	157.1595	-1.29E-04	0.00	3.84E+11
-354.939	95046.	0.00				
4.1400	0.00389	352557.	-225.606	-1.28E-04	0.00	3.84E+11

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-353.886	98132.	0.00				
4.2300	0.00376	352107.	-607.179	-1.27E-04	0.00	3.84E+11
-352.731	101388.	0.00				
4.3200	0.00362	351246.	-987.447	-1.26E-04	0.00	3.84E+11
-351.471	104829.	0.00				
4.4100	0.00349	349975.	-1366.	-1.25E-04	0.00	3.84E+11
-350.102	108472.	0.00				
4.5000	0.00335	348296.	-1744.	-1.24E-04	0.00	3.84E+11
-348.618	112337.	0.00				
4.5900	0.00322	346210.	-2119.	-1.23E-04	0.00	3.84E+11
-347.015	116445.	0.00				
4.6800	0.00309	343720.	-2493.	-1.22E-04	0.00	3.84E+11
-345.287	120823.	0.00				
4.7700	0.00296	340826.	-2865.	-1.21E-04	0.00	3.84E+11
-343.426	125500.	0.00				
4.8600	0.00283	337532.	-3235.	-1.20E-04	0.00	3.84E+11
-341.425	130509.	0.00				
4.9500	0.00270	333840.	-3602.	-1.19E-04	0.00	3.84E+11
-339.275	135891.	0.00				
5.0400	0.00257	329752.	-3968.	-1.18E-04	0.00	3.84E+11
-336.967	141690.	0.00				
5.1300	0.00244	325271.	-4330.	-1.17E-04	0.00	3.84E+11
-334.488	147961.	0.00				
5.2200	0.00232	320400.	-4690.	-1.16E-04	0.00	3.84E+11
-331.827	154769.	0.00				
5.3100	0.00219	315142.	-5047.	-1.15E-04	0.00	3.84E+11
-328.968	162191.	0.00				
5.4000	0.00207	309500.	-5400.	-1.14E-04	0.00	3.84E+11
-325.895	170321.	0.00				
5.4900	0.00194	303478.	-5751.	-1.14E-04	0.00	3.85E+11
-322.587	179272.	0.00				
5.5800	0.00182	297080.	-6097.	-1.13E-04	0.00	3.85E+11
-319.023	189185.	0.00				
5.6700	0.00170	290310.	-6440.	-1.12E-04	0.00	3.85E+11
-315.174	200237.	0.00				
5.7600	0.00158	283172.	-6778.	-1.11E-04	0.00	3.85E+11
-311.009	212652.	0.00				
5.8500	0.00146	275671.	-7111.	-1.10E-04	0.00	3.85E+11
-306.487	226719.	0.00				
5.9400	0.00134	267813.	-7439.	-1.10E-04	0.00	3.85E+11
-301.562	242819.	0.00				
6.0300	0.00122	259603.	-7762.	-1.09E-04	0.00	3.85E+11
-296.174	261462.	0.00				
6.1200	0.00111	251047.	-8079.	-1.08E-04	0.00	3.85E+11
-290.248	283355.	0.00				
6.2100	9.90E-04	242153.	-8389.	-1.07E-04	0.00	3.85E+11
-283.687	309500.	0.00				
6.3000	8.74E-04	232928.	-8691.	-1.07E-04	0.00	3.85E+11
-276.363	341378.	0.00				
6.3900	7.59E-04	223381.	-8985.	-1.06E-04	0.00	3.85E+11

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-268.098	381278.	0.00				
6.4800	6.45E-04	213521.	-9323.	-1.05E-04	0.00	3.85E+11
-358.054	599364.	0.00				
6.5700	5.32E-04	203243.	-9677.	-1.05E-04	0.00	3.85E+11
-296.465	602300.	0.00				
6.6600	4.19E-04	192620.	-9964.	-1.04E-04	0.00	3.85E+11
-234.604	605234.	0.00				
6.7500	3.06E-04	181723.	-10183.	-1.04E-04	0.00	3.85E+11
-172.456	608167.	0.00				
6.8400	1.94E-04	170625.	-10336.	-1.03E-04	0.00	3.85E+11
-110.010	611099.	0.00				
6.9300	8.31E-05	159398.	-10421.	-1.03E-04	0.00	3.85E+11
-47.251	614029.	0.00				
7.0200	-2.77E-05	148117.	-10438.	-1.02E-04	0.00	3.85E+11
15.8364	616958.	0.00				
7.1100	-1.38E-04	136853.	-10386.	-1.02E-04	0.00	3.85E+11
79.2671	619886.	0.00				
7.2000	-2.48E-04	125683.	-10266.	-1.02E-04	0.00	3.85E+11
143.0568	622813.	0.00				
7.2900	-3.58E-04	114679.	-10077.	-1.01E-04	0.00	3.85E+11
207.2215	625739.	0.00				
7.3800	-4.67E-04	103917.	-9819.	-1.01E-04	0.00	3.85E+11
271.7772	628664.	0.00				
7.4700	-5.76E-04	93472.	-9490.	-1.01E-04	0.00	3.85E+11
336.7398	631588.	0.00				
7.5600	-6.84E-04	83419.	-9091.	-1.00E-04	0.00	3.85E+11
402.1252	634511.	0.00				
7.6500	-7.93E-04	73836.	-8639.	-1.00E-04	0.00	3.85E+11
435.6500	593436.	0.00				
7.7400	-9.01E-04	64761.	-8159.	-1.00E-04	0.00	3.85E+11
451.8671	541634.	0.00				
7.8300	-0.00101	56213.	-7663.	-9.99E-05	0.00	3.85E+11
466.9566	499828.	0.00				
7.9200	-0.00112	48209.	-7151.	-9.97E-05	0.00	3.85E+11
481.1336	465292.	0.00				
8.0100	-0.00122	40767.	-6624.	-9.96E-05	0.00	3.85E+11
494.5565	436223.	0.00				
8.1000	-0.00133	33901.	-6083.	-9.95E-05	0.00	3.85E+11
507.3459	411378.	0.00				
8.1900	-0.00144	27628.	-5529.	-9.94E-05	0.00	3.85E+11
519.5957	389867.	0.00				
8.2800	-0.00155	21960.	-4961.	-9.94E-05	0.00	3.85E+11
531.3801	371039.	0.00				
8.3700	-0.00165	16912.	-4381.	-9.93E-05	0.00	3.85E+11
542.7596	354405.	0.00				
8.4600	-0.00176	12497.	-3789.	-9.93E-05	0.00	3.85E+11
553.7835	339589.	0.00				
8.5500	-0.00187	8729.	-3185.	-9.92E-05	0.00	3.85E+11
564.4926	326298.	0.00				
8.6400	-0.00198	5618.	-2570.	-9.92E-05	0.00	3.85E+11

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574.9212	314300.	0.00				
8.7300	-0.00208	3178.	-1944.	-9.92E-05	0.00	3.85E+11
585.0986	303409.	0.00				
8.8200	-0.00219	1421.	-1306.	-9.92E-05	0.00	3.85E+11
595.0494	293473.	0.00				
8.9100	-0.00230	357.8411	-658.340	-9.92E-05	0.00	3.85E+11
604.7949	284368.	0.00				
9.0000	-0.00240	0.00	0.00	-9.92E-05	0.00	3.85E+11
614.3537	137995.	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	=	0.01134229 inches
Computed slope at pile head	=	-0.0001713 radians
Maximum bending moment	=	352593. inch-lbs
Maximum shear force	=	-10438. lbs
Depth of maximum bending moment	=	4.05000000 feet below pile head
Depth of maximum shear force	=	7.02000000 feet below pile head
Number of iterations	=	19
Number of zero deflection points	=	1
Pile deflection at ground	=	0.00934657 inches

 Pile-head Deflection vs. Pile Length for Load Case 1

Boundary Condition Type 1, Shear and Moment

Shear	=	1000. lbs
Moment	=	315600. in-lbs
Axial Load	=	4200. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	0.01134229	352593.	-10438.
8.55000	0.01989362	349608.	-11510.
8.10000	0.04445960	345609.	-12594.

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7.65000	0.10600133	341745.	-13691.
7.20000	0.27073518	337930.	-14612.
6.75000	0.95161946	335727.	-15956.
6.30000	4.48044097	337990.	-18289.

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

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

Shear force at pile head	=	2250.0 lbs
Applied moment at pile head	=	724800.0 in-lbs
Axial thrust load on pile head	=	4600.0 lbs

Depth Res. Soil	Deflect. Spr. Distrib.	Bending Moment	Shear Force	Slope S	Total Stress	Bending Stiffness	Soil p
X Es*H feet lb/inch	y Lat. Load inches lb/inch	in-lbs lb/inch	lbs	radians	psi*	lb-in^2	
-----	-----	-----	-----	-----	-----	-----	-----
0.00	0.2210	724800.	2250.	-0.00271	0.00	3.83E+11	
0.00	0.00	0.00					
0.09000	0.2181	727243.	2250.	-0.00271	0.00	3.83E+11	
0.00	0.00	0.00					
0.1800	0.2152	729687.	2250.	-0.00271	0.00	3.83E+11	
0.00	0.00	0.00					
0.2700	0.2122	732130.	2250.	-0.00271	0.00	3.83E+11	
0.00	0.00	0.00					
0.3600	0.2093	734574.	2250.	-0.00270	0.00	3.83E+11	
0.00	0.00	0.00					
0.4500	0.2064	737017.	2250.	-0.00270	0.00	3.83E+11	
0.00	0.00	0.00					
0.5400	0.2035	739461.	2250.	-0.00270	0.00	3.83E+11	
0.00	0.00	0.00					
0.6300	0.2006	741904.	2250.	-0.00270	0.00	3.83E+11	
0.00	0.00	0.00					
0.7200	0.1976	744347.	2250.	-0.00270	0.00	3.83E+11	
0.00	0.00	0.00					
0.8100	0.1947	746791.	2250.	-0.00269	0.00	3.83E+11	
0.00	0.00	0.00					
0.9000	0.1918	749234.	2250.	-0.00269	0.00	3.83E+11	
0.00	0.00	0.00					
0.9900	0.1889	751678.	2250.	-0.00269	0.00	3.83E+11	
0.00	0.00	0.00					
1.0800	0.1860	754121.	2226.	-0.00269	0.00	3.83E+11	

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-18 (Boring B-009 & 011-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

-44.651	259.2398	0.00				
1.1700	0.1831	756512.	2177.	-0.00269	0.00	3.83E+11
-45.151	266.2967	0.00				
1.2600	0.1802	758851.	2128.	-0.00268	0.00	3.83E+11
-45.641	273.5170	0.00				
1.3500	0.1773	761136.	2079.	-0.00268	0.00	3.83E+11
-46.121	280.9073	0.00				
1.4400	0.1744	763368.	2029.	-0.00268	0.00	3.83E+11
-46.591	288.4746	0.00				
1.5300	0.1715	765545.	1978.	-0.00268	0.00	3.83E+11
-47.049	296.2263	0.00				
1.6200	0.1686	767667.	1927.	-0.00267	0.00	3.83E+11
-47.497	304.1705	0.00				
1.7100	0.1658	769734.	1876.	-0.00267	0.00	3.83E+11
-47.934	312.3153	0.00				
1.8000	0.1629	771745.	1824.	-0.00267	0.00	3.83E+11
-48.360	320.6697	0.00				
1.8900	0.1600	773700.	1771.	-0.00267	0.00	3.83E+11
-48.774	329.2432	0.00				
1.9800	0.1571	775597.	1718.	-0.00267	0.00	3.83E+11
-49.177	338.0458	0.00				
2.0700	0.1542	777437.	1665.	-0.00266	0.00	3.83E+11
-49.568	347.0883	0.00				
2.1600	0.1514	779220.	1611.	-0.00266	0.00	3.83E+11
-49.946	356.3820	0.00				
2.2500	0.1485	780944.	1557.	-0.00266	0.00	3.83E+11
-50.312	365.9392	0.00				
2.3400	0.1456	782610.	1503.	-0.00266	0.00	3.83E+11
-50.665	375.7729	0.00				
2.4300	0.1427	784216.	1448.	-0.00265	0.00	3.83E+11
-51.005	385.8972	0.00				
2.5200	0.1399	785763.	1392.	-0.00265	0.00	3.83E+11
-51.332	396.3270	0.00				
2.6100	0.1370	787250.	1337.	-0.00265	0.00	3.83E+11
-51.646	407.0784	0.00				
2.7000	0.1342	788677.	1281.	-0.00265	0.00	3.83E+11
-51.945	418.1687	0.00				
2.7900	0.1313	790043.	1225.	-0.00265	0.00	3.83E+11
-52.230	429.6166	0.00				
2.8800	0.1284	791348.	1168.	-0.00264	0.00	3.83E+11
-52.500	441.4421	0.00				
2.9700	0.1256	792592.	1111.	-0.00264	0.00	3.83E+11
-52.755	453.6670	0.00				
3.0600	0.1227	793774.	1054.	-0.00264	0.00	3.83E+11
-52.995	466.3148	0.00				
3.1500	0.1199	794895.	996.7077	-0.00264	0.00	3.83E+11
-53.218	479.4109	0.00				
3.2400	0.1170	795953.	939.1198	-0.00263	0.00	3.83E+11
-53.426	492.9831	0.00				
3.3300	0.1142	796949.	881.3171	-0.00263	0.00	3.83E+11

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-18 (Boring B-009 & 011-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

-53.616	507.0613	0.00					
3.4200	0.1114	797883.	823.3183	-0.00263	0.00	3.83E+11	
-53.789	521.6785	0.00					
3.5100	0.1085	798754.	765.1423	-0.00263	0.00	3.83E+11	
-53.944	536.8705	0.00					
3.6000	0.1057	799562.	706.8088	-0.00263	0.00	3.83E+11	
-54.081	552.6766	0.00					
3.6900	0.1028	800307.	648.3384	-0.00262	0.00	3.83E+11	
-54.198	569.1400	0.00					
3.7800	0.1000	800988.	589.7519	-0.00262	0.00	3.83E+11	
-54.295	586.3081	0.00					
3.8700	0.09718	801607.	531.0712	-0.00262	0.00	3.83E+11	
-54.372	604.2334	0.00					
3.9600	0.09436	802162.	472.3189	-0.00262	0.00	3.83E+11	
-54.428	622.9737	0.00					
4.0500	0.09153	802653.	24.8713	-0.00261	0.00	3.83E+11	
-774.179	9135.	0.00					
4.1400	0.08871	802241.	-810.376	-0.00261	0.00	3.83E+11	
-772.576	9406.	0.00					
4.2300	0.08589	800928.	-1644.	-0.00261	0.00	3.83E+11	
-770.747	9691.	0.00					
4.3200	0.08307	798717.	-2475.	-0.00261	0.00	3.83E+11	
-768.683	9993.	0.00					
4.4100	0.08026	795608.	-3304.	-0.00261	0.00	3.83E+11	
-766.375	10313.	0.00					
4.5000	0.07745	791606.	-4130.	-0.00260	0.00	3.83E+11	
-763.809	10651.	0.00					
4.5900	0.07464	786713.	-4954.	-0.00260	0.00	3.83E+11	
-760.975	11011.	0.00					
4.6800	0.07183	780932.	-5774.	-0.00260	0.00	3.83E+11	
-757.856	11395.	0.00					
4.7700	0.06902	774267.	-6590.	-0.00260	0.00	3.83E+11	
-754.437	11805.	0.00					
4.8600	0.06622	766722.	-7403.	-0.00259	0.00	3.83E+11	
-750.701	12243.	0.00					
4.9500	0.06342	758302.	-8212.	-0.00259	0.00	3.83E+11	
-746.627	12714.	0.00					
5.0400	0.06062	749010.	-9016.	-0.00259	0.00	3.83E+11	
-742.191	13222.	0.00					
5.1300	0.05783	738853.	-9815.	-0.00259	0.00	3.83E+11	
-737.370	13772.	0.00					
5.2200	0.05503	727836.	-10608.	-0.00259	0.00	3.83E+11	
-732.133	14368.	0.00					
5.3100	0.05224	715965.	-11396.	-0.00258	0.00	3.83E+11	
-726.447	15018.	0.00					
5.4000	0.04945	703247.	-12177.	-0.00258	0.00	3.83E+11	
-720.274	15730.	0.00					
5.4900	0.04666	689688.	-12951.	-0.00258	0.00	3.83E+11	
-713.569	16515.	0.00					
5.5800	0.04388	675297.	-13718.	-0.00258	0.00	3.84E+11	

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-18 (Boring B-009 & 011-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

-706.282	17384.	0.00				
5.6700	0.04110	660083.	-14477.	-0.00258	0.00	3.84E+11
-698.350	18352.	0.00				
5.7600	0.03832	644053.	-15226.	-0.00257	0.00	3.84E+11
-689.702	19441.	0.00				
5.8500	0.03554	627220.	-15966.	-0.00257	0.00	3.84E+11
-680.251	20674.	0.00				
5.9400	0.03276	609593.	-16695.	-0.00257	0.00	3.84E+11
-669.892	22085.	0.00				
6.0300	0.02998	591184.	-17412.	-0.00257	0.00	3.84E+11
-658.493	23719.	0.00				
6.1200	0.02721	572007.	-18117.	-0.00257	0.00	3.84E+11
-645.889	25636.	0.00				
6.2100	0.02444	552077.	-18807.	-0.00257	0.00	3.84E+11
-631.868	27924.	0.00				
6.3000	0.02167	531410.	-19481.	-0.00256	0.00	3.84E+11
-616.149	30710.	0.00				
6.3900	0.01890	510025.	-20136.	-0.00256	0.00	3.84E+11
-598.347	34192.	0.00				
6.4800	0.01613	487941.	-20929.	-0.00256	0.00	3.84E+11
-869.373	58200.	0.00				
6.5700	0.01337	464843.	-21849.	-0.00256	0.00	3.84E+11
-833.513	67343.	0.00				
6.6600	0.01060	440773.	-22726.	-0.00256	0.00	3.84E+11
-790.446	80511.	0.00				
6.7500	0.00784	415782.	-23550.	-0.00256	0.00	3.84E+11
-736.544	101454.	0.00				
6.8400	0.00508	389931.	-24306.	-0.00256	0.00	3.84E+11
-663.970	141181.	0.00				
6.9300	0.00232	363305.	-24961.	-0.00256	0.00	3.84E+11
-548.404	255407.	0.00				
7.0200	-4.40E-04	336040.	-25121.	-0.00255	0.00	3.84E+11
251.4698	616958.	0.00				
7.1100	-0.00320	309068.	-24662.	-0.00255	0.00	3.84E+11
599.9709	202595.	0.00				
7.2000	-0.00596	282796.	-23957.	-0.00255	0.00	3.85E+11
704.1665	127696.	0.00				
7.2900	-0.00871	257346.	-23157.	-0.00255	0.00	3.85E+11
778.0521	96454.	0.00				
7.3800	-0.01147	232803.	-22285.	-0.00255	0.00	3.85E+11
837.2838	78855.	0.00				
7.4700	-0.01422	209236.	-21353.	-0.00255	0.00	3.85E+11
887.6949	67409.	0.00				
7.5600	-0.01698	186705.	-20371.	-0.00255	0.00	3.85E+11
932.1564	59301.	0.00				
7.6500	-0.01973	165261.	-19342.	-0.00255	0.00	3.85E+11
972.3103	53223.	0.00				
7.7400	-0.02248	144951.	-18272.	-0.00255	0.00	3.85E+11
1009.	48477.	0.00				
7.8300	-0.02524	125819.	-17164.	-0.00255	0.00	3.85E+11

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 Light Tower SC1-18 (Boring B-009 & 011-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

1043.	44657.	0.00					
	7.9200	-0.02799	107903.	-16019.	-0.00255	0.00	3.85E+11
1076.	41509.	0.00					
	8.0100	-0.03074	91242.	-14841.	-0.00255	0.00	3.85E+11
1106.	38864.	0.00					
	8.1000	-0.03349	75872.	-13631.	-0.00255	0.00	3.85E+11
1135.	36608.	0.00					
	8.1900	-0.03624	61826.	-12390.	-0.00255	0.00	3.85E+11
1163.	34657.	0.00					
	8.2800	-0.03899	49136.	-11119.	-0.00255	0.00	3.85E+11
1190.	32953.	0.00					
	8.3700	-0.04175	37834.	-9820.	-0.00255	0.00	3.85E+11
1216.	31449.	0.00					
	8.4600	-0.04450	27950.	-8494.	-0.00255	0.00	3.85E+11
1241.	30112.	0.00					
	8.5500	-0.04725	19513.	-7141.	-0.00255	0.00	3.85E+11
1265.	28913.	0.00					
	8.6400	-0.05000	12551.	-5762.	-0.00255	0.00	3.85E+11
1289.	27833.	0.00					
	8.7300	-0.05275	7092.	-4358.	-0.00255	0.00	3.85E+11
1312.	26853.	0.00					
	8.8200	-0.05550	3164.	-2929.	-0.00255	0.00	3.85E+11
1334.	25961.	0.00					
	8.9100	-0.05825	790.8794	-1476.	-0.00255	0.00	3.85E+11
1356.	25144.	0.00					
	9.0000	-0.06100	0.00	0.00	-0.00255	0.00	3.85E+11
1378.	12196.	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	=	0.22100574 inches
Computed slope at pile head	=	-0.0027121 radians
Maximum bending moment	=	802653. inch-lbs
Maximum shear force	=	-25121. lbs
Depth of maximum bending moment	=	4.05000000 feet below pile head
Depth of maximum shear force	=	7.02000000 feet below pile head
Number of iterations	=	36
Number of zero deflection points	=	1
Pile deflection at ground	=	0.18859797 inches

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

 Pile-head Deflection vs. Pile Length for Load Case 2

Boundary Condition Type 1, Shear and Moment

Shear = 2250. lbs
 Moment = 724800. in-lbs
 Axial Load = 4600. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	0.22100574	802653.	-25121.
8.55000	0.43726908	794032.	-26582.
8.10000	1.03156677	786346.	-28430.
7.65000	2.52455045	782083.	-30896.
7.20000	6.85055547	781715.	-33541.

 Computed Values of Pile Loading and Deflection
 for Lateral Loading for Load Case Number 3

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

Shear force at pile head = 2250.0 lbs
 Applied moment at pile head = 724800.0 in-lbs
 Axial thrust load on pile head = 3800.0 lbs

Depth Res. Soil X Es*H feet lb/inch	Deflect. Spr. y Lat. Load inches lb/inch	Bending Distrib. Moment in-lbs lb/inch	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness lb-in^2	Soil p
0.00	0.2208	724800.	2250.	-0.00271	0.00	3.83E+11	
0.00	0.00	0.00					
0.09000	0.2179	727241.	2250.	-0.00271	0.00	3.83E+11	
0.00	0.00	0.00					
0.1800	0.2150	729682.	2250.	-0.00271	0.00	3.83E+11	
0.00	0.00	0.00					
0.2700	0.2120	732123.	2250.	-0.00270	0.00	3.83E+11	
0.00	0.00	0.00					
0.3600	0.2091	734564.	2250.	-0.00270	0.00	3.83E+11	

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00	0.00	0.00				
0.4500	0.2062	737005.	2250.	-0.00270	0.00	3.83E+11
0.00	0.00	0.00				
0.5400	0.2033	739447.	2250.	-0.00270	0.00	3.83E+11
0.00	0.00	0.00				
0.6300	0.2004	741888.	2250.	-0.00270	0.00	3.83E+11
0.00	0.00	0.00				
0.7200	0.1975	744329.	2250.	-0.00269	0.00	3.83E+11
0.00	0.00	0.00				
0.8100	0.1946	746770.	2250.	-0.00269	0.00	3.83E+11
0.00	0.00	0.00				
0.9000	0.1916	749211.	2250.	-0.00269	0.00	3.83E+11
0.00	0.00	0.00				
0.9900	0.1887	751652.	2250.	-0.00269	0.00	3.83E+11
0.00	0.00	0.00				
1.0800	0.1858	754093.	2226.	-0.00268	0.00	3.83E+11
-44.637	259.4020	0.00				
1.1700	0.1829	756482.	2177.	-0.00268	0.00	3.83E+11
-45.137	266.4634	0.00				
1.2600	0.1800	758818.	2128.	-0.00268	0.00	3.83E+11
-45.627	273.6883	0.00				
1.3500	0.1772	761101.	2079.	-0.00268	0.00	3.83E+11
-46.107	281.0833	0.00				
1.4400	0.1743	763330.	2029.	-0.00268	0.00	3.83E+11
-46.576	288.6554	0.00				
1.5300	0.1714	765505.	1978.	-0.00267	0.00	3.83E+11
-47.035	296.4121	0.00				
1.6200	0.1685	767625.	1927.	-0.00267	0.00	3.83E+11
-47.482	304.3612	0.00				
1.7100	0.1656	769690.	1876.	-0.00267	0.00	3.83E+11
-47.919	312.5112	0.00				
1.8000	0.1627	771699.	1824.	-0.00267	0.00	3.83E+11
-48.345	320.8709	0.00				
1.8900	0.1598	773651.	1771.	-0.00267	0.00	3.83E+11
-48.759	329.4499	0.00				
1.9800	0.1570	775547.	1718.	-0.00266	0.00	3.83E+11
-49.161	338.2581	0.00				
2.0700	0.1541	777385.	1665.	-0.00266	0.00	3.83E+11
-49.552	347.3063	0.00				
2.1600	0.1512	779165.	1611.	-0.00266	0.00	3.83E+11
-49.930	356.6059	0.00				
2.2500	0.1483	780887.	1557.	-0.00266	0.00	3.83E+11
-50.296	366.1692	0.00				
2.3400	0.1455	782551.	1503.	-0.00265	0.00	3.83E+11
-50.649	376.0092	0.00				
2.4300	0.1426	784155.	1448.	-0.00265	0.00	3.83E+11
-50.989	386.1399	0.00				
2.5200	0.1397	785700.	1393.	-0.00265	0.00	3.83E+11
-51.316	396.5763	0.00				
2.6100	0.1369	787185.	1337.	-0.00265	0.00	3.83E+11

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 Light Tower SC1-18 (Boring B-009 & 011-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

-51.629	407.3346	0.00				
2.7000	0.1340	788610.	1281.	-0.00265	0.00	3.83E+11
-51.929	418.4320	0.00				
2.7900	0.1312	789974.	1225.	-0.00264	0.00	3.83E+11
-52.213	429.8871	0.00				
2.8800	0.1283	791277.	1168.	-0.00264	0.00	3.83E+11
-52.483	441.7202	0.00				
2.9700	0.1255	792519.	1112.	-0.00264	0.00	3.83E+11
-52.739	453.9529	0.00				
3.0600	0.1226	793700.	1054.	-0.00264	0.00	3.83E+11
-52.978	466.6087	0.00				
3.1500	0.1198	794818.	997.1017	-0.00263	0.00	3.83E+11
-53.202	479.7132	0.00				
3.2400	0.1169	795875.	939.5320	-0.00263	0.00	3.83E+11
-53.409	493.2940	0.00				
3.3300	0.1141	796869.	881.7476	-0.00263	0.00	3.83E+11
-53.599	507.3812	0.00				
3.4200	0.1113	797801.	823.7670	-0.00263	0.00	3.83E+11
-53.772	522.0077	0.00				
3.5100	0.1084	798670.	765.6094	-0.00263	0.00	3.83E+11
-53.927	537.2094	0.00				
3.6000	0.1056	799476.	707.2944	-0.00262	0.00	3.83E+11
-54.064	553.0255	0.00				
3.6900	0.1027	800220.	648.8424	-0.00262	0.00	3.83E+11
-54.181	569.4994	0.00				
3.7800	0.09992	800899.	590.2744	-0.00262	0.00	3.83E+11
-54.278	586.6785	0.00				
3.8700	0.09709	801516.	531.6123	-0.00262	0.00	3.83E+11
-54.355	604.6151	0.00				
3.9600	0.09427	802069.	472.8786	-0.00261	0.00	3.83E+11
-54.411	623.3674	0.00				
4.0500	0.09145	802559.	25.5393	-0.00261	0.00	3.83E+11
-773.995	9141.	0.00				
4.1400	0.08863	802146.	-809.510	-0.00261	0.00	3.83E+11
-772.392	9412.	0.00				
4.2300	0.08581	800832.	-1643.	-0.00261	0.00	3.83E+11
-770.564	9698.	0.00				
4.3200	0.08300	798619.	-2474.	-0.00261	0.00	3.83E+11
-768.501	10000.	0.00				
4.4100	0.08018	795510.	-3303.	-0.00260	0.00	3.83E+11
-766.193	10320.	0.00				
4.5000	0.07737	791507.	-4129.	-0.00260	0.00	3.83E+11
-763.628	10659.	0.00				
4.5900	0.07457	786613.	-4952.	-0.00260	0.00	3.83E+11
-760.794	11019.	0.00				
4.6800	0.07176	780832.	-5772.	-0.00260	0.00	3.83E+11
-757.676	11403.	0.00				
4.7700	0.06896	774167.	-6588.	-0.00259	0.00	3.83E+11
-754.258	11813.	0.00				
4.8600	0.06616	766623.	-7401.	-0.00259	0.00	3.83E+11

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-18 (Boring B-009 & 011-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

-750.523	12252.	0.00				
4.9500	0.06336	758203.	-8209.	-0.00259	0.00	3.83E+11
-746.449	12724.	0.00				
5.0400	0.06056	748912.	-9013.	-0.00259	0.00	3.83E+11
-742.015	13232.	0.00				
5.1300	0.05777	738756.	-9812.	-0.00259	0.00	3.83E+11
-737.195	13781.	0.00				
5.2200	0.05498	727740.	-10605.	-0.00258	0.00	3.83E+11
-731.959	14378.	0.00				
5.3100	0.05219	715870.	-11393.	-0.00258	0.00	3.83E+11
-726.275	15029.	0.00				
5.4000	0.04940	703154.	-12174.	-0.00258	0.00	3.83E+11
-720.103	15742.	0.00				
5.4900	0.04662	689597.	-12948.	-0.00258	0.00	3.83E+11
-713.400	16527.	0.00				
5.5800	0.04384	675208.	-13714.	-0.00258	0.00	3.84E+11
-706.114	17396.	0.00				
5.6700	0.04106	659995.	-14473.	-0.00257	0.00	3.84E+11
-698.184	18366.	0.00				
5.7600	0.03828	643968.	-15222.	-0.00257	0.00	3.84E+11
-689.539	19455.	0.00				
5.8500	0.03550	627137.	-15961.	-0.00257	0.00	3.84E+11
-680.090	20689.	0.00				
5.9400	0.03273	609513.	-16690.	-0.00257	0.00	3.84E+11
-669.733	22101.	0.00				
6.0300	0.02996	591107.	-17408.	-0.00257	0.00	3.84E+11
-658.337	23736.	0.00				
6.1200	0.02718	571933.	-18112.	-0.00256	0.00	3.84E+11
-645.736	25654.	0.00				
6.2100	0.02442	552006.	-18802.	-0.00256	0.00	3.84E+11
-631.719	27944.	0.00				
6.3000	0.02165	531343.	-19475.	-0.00256	0.00	3.84E+11
-616.003	30732.	0.00				
6.3900	0.01888	509961.	-20131.	-0.00256	0.00	3.84E+11
-598.206	34216.	0.00				
6.4800	0.01612	487881.	-20923.	-0.00256	0.00	3.84E+11
-869.170	58240.	0.00				
6.5700	0.01335	464787.	-21843.	-0.00256	0.00	3.84E+11
-833.319	67390.	0.00				
6.6600	0.01059	440722.	-22719.	-0.00256	0.00	3.84E+11
-790.263	80566.	0.00				
6.7500	0.00783	415734.	-23544.	-0.00256	0.00	3.84E+11
-736.376	101524.	0.00				
6.8400	0.00507	389888.	-24300.	-0.00255	0.00	3.84E+11
-663.823	141275.	0.00				
6.9300	0.00232	363267.	-24955.	-0.00255	0.00	3.84E+11
-548.294	255560.	0.00				
7.0200	-4.39E-04	336007.	-25115.	-0.00255	0.00	3.84E+11
251.0159	616958.	0.00				
7.1100	-0.00319	309040.	-24656.	-0.00255	0.00	3.85E+11

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-18 (Boring B-009 & 011-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

599.8092	202759.	0.00				
7.2000	-0.00595	282772.	-23952.	-0.00255	0.00	3.85E+11
703.9862	127794.	0.00				
7.2900	-0.00870	257325.	-23151.	-0.00255	0.00	3.85E+11
777.8567	96527.	0.00				
7.3800	-0.01146	232786.	-22279.	-0.00255	0.00	3.85E+11
837.0756	78914.	0.00				
7.4700	-0.01421	209223.	-21348.	-0.00255	0.00	3.85E+11
887.4757	67459.	0.00				
7.5600	-0.01696	186695.	-20366.	-0.00255	0.00	3.85E+11
931.9271	59345.	0.00				
7.6500	-0.01971	165254.	-19337.	-0.00255	0.00	3.85E+11
972.0718	53262.	0.00				
7.7400	-0.02246	144947.	-18268.	-0.00255	0.00	3.85E+11
1009.	48513.	0.00				
7.8300	-0.02521	125817.	-17159.	-0.00255	0.00	3.85E+11
1043.	44690.	0.00				
7.9200	-0.02796	107904.	-16015.	-0.00255	0.00	3.85E+11
1075.	41539.	0.00				
8.0100	-0.03071	91245.	-14837.	-0.00255	0.00	3.85E+11
1106.	38893.	0.00				
8.1000	-0.03346	75876.	-13627.	-0.00255	0.00	3.85E+11
1135.	36635.	0.00				
8.1900	-0.03621	61830.	-12387.	-0.00255	0.00	3.85E+11
1163.	34683.	0.00				
8.2800	-0.03896	49142.	-11116.	-0.00254	0.00	3.85E+11
1190.	32977.	0.00				
8.3700	-0.04171	37840.	-9818.	-0.00254	0.00	3.85E+11
1215.	31472.	0.00				
8.4600	-0.04445	27956.	-8492.	-0.00254	0.00	3.85E+11
1240.	30133.	0.00				
8.5500	-0.04720	19519.	-7139.	-0.00254	0.00	3.85E+11
1265.	28934.	0.00				
8.6400	-0.04995	12557.	-5760.	-0.00254	0.00	3.85E+11
1288.	27853.	0.00				
8.7300	-0.05270	7097.	-4357.	-0.00254	0.00	3.85E+11
1311.	26873.	0.00				
8.8200	-0.05545	3167.	-2928.	-0.00254	0.00	3.85E+11
1334.	25980.	0.00				
8.9100	-0.05820	792.8954	-1476.	-0.00254	0.00	3.85E+11
1356.	25162.	0.00				
9.0000	-0.06094	0.00	0.00	-0.00254	0.00	3.85E+11
1377.	12205.	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.

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-18 (Boring B-009 & 011-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Output Summary for Load Case No. 3:

Pile-head deflection = 0.22079923 inches
 Computed slope at pile head = -0.0027097 radians
 Maximum bending moment = 802559. inch-lbs
 Maximum shear force = -25115. lbs
 Depth of maximum bending moment = 4.05000000 feet below pile head
 Depth of maximum shear force = 7.02000000 feet below pile head
 Number of iterations = 36
 Number of zero deflection points = 1
 Pile deflection at ground = 0.18842106 inches

 Pile-head Deflection vs. Pile Length for Load Case 3

Boundary Condition Type 1, Shear and Moment

Shear = 2250. lbs
 Moment = 724800. in-lbs
 Axial Load = 3800. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	0.22079923	802559.	-25115.
8.55000	0.43645365	793845.	-26569.
8.10000	1.02703922	785957.	-28397.
7.65000	2.49699466	781173.	-30805.
7.20000	6.63736636	779254.	-33258.

 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

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-18 (Boring B-009 & 011-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Load Shear	Load Max	Moment Pile-head	Load Type	Pile-head Load	Axial Loading	Pile-head Deflection	Pile-head Rotation	Max in
Case	Type	in Pile						
Pile	No.	1	2	Load 2	lbs	inches	radians	lbs
		in-lbs						

1	V, lb	1000.0000	M, in-lb	315600.	4200.	0.01134	-1.71E-04	
-10438.		352593.						
2	V, lb	2250.	M, in-lb	724800.	4600.	0.2210	-0.00271	
-25121.		802653.						
3	V, lb	2250.	M, in-lb	724800.	3800.	0.2208	-0.00271	
-25115.		802559.						

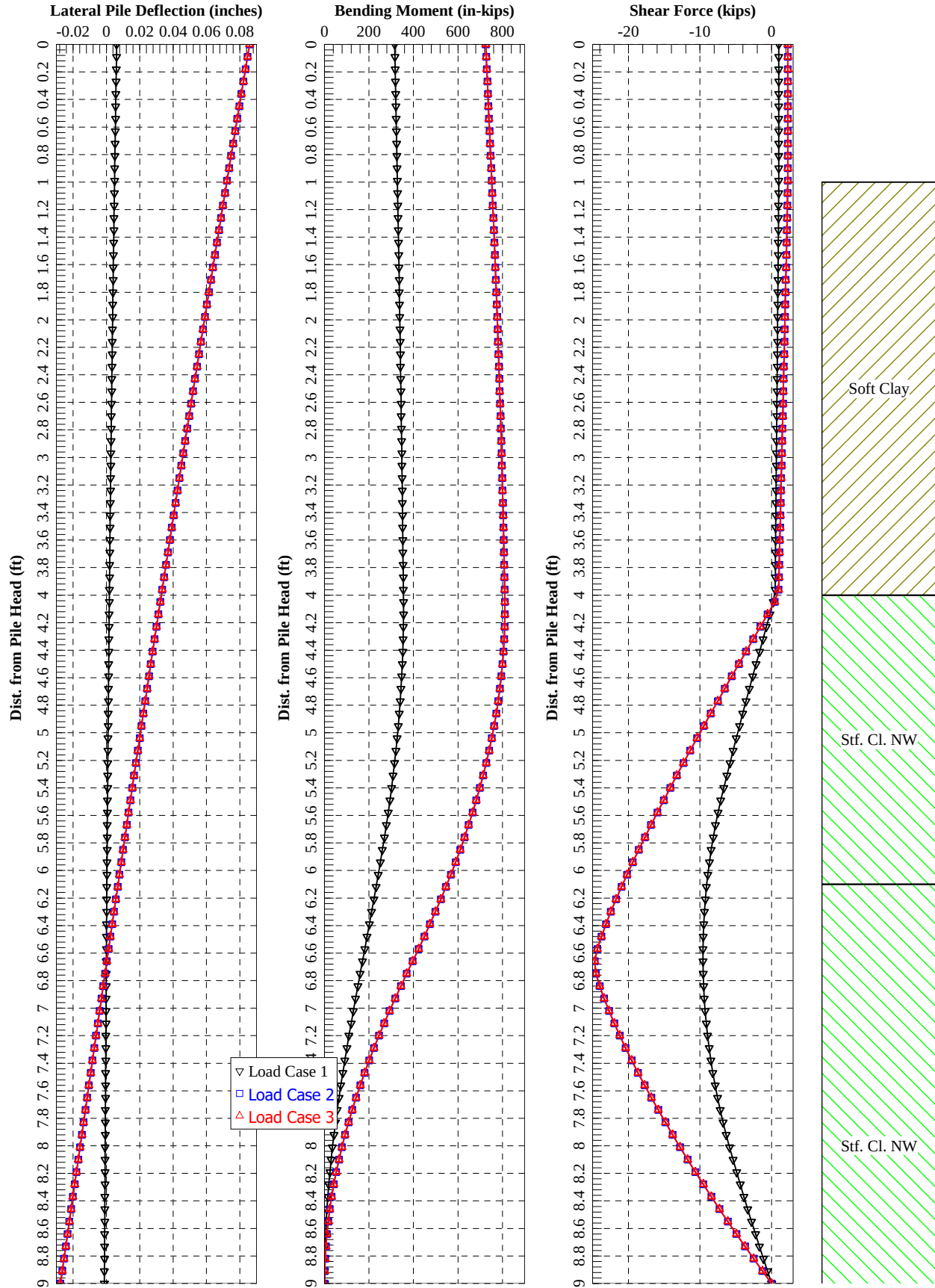
Maximum pile-head deflection = 0.2210057442 inches

Maximum pile-head rotation = -0.0027121416 radians = -0.155394 deg.

The analysis ended normally.

LATERAL LOAD (LPILE) ANALYSES
SOUTHBOUND PARKING AREA
LIGHT TOWER SC1-19 (B-011-0-25)

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-19 (Boring B-011-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation



TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-19 (Boring B-011-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

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

This model was prepared by:
BSears

Files Used for Analysis

Path to file locations:
\Columbus-1170\Projects\2024\24170232_ms_TP 26 NE Ohio\GEO\Project Docs\Site
15_SUM-271 (2LMN)\Calcs\Light Towers\LPILE Files\SB\

Name of input data file:
Tower SC1-19 (B-011).lp12d

Name of output report file:
Tower SC1-19 (B-011).lp12o

Name of plot output file:
Tower SC1-19 (B-011).lp12p

Name of runtime message file:
Tower SC1-19 (B-011).lp12r

Date and Time of Analysis

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-19 (Boring B-011-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Date: February 11, 2026

Time: 19:44:12

Problem Title

Project Name: TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas

Job Number: 24170232F

Client: ms consultants, inc.

Engineer: BKS

Description: Light Tower SC1-19 (B-011-0-25)

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

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-19 (Boring B-011-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

- 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	=	9.000 ft
Depth of ground surface below top of pile	=	1.0000 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.

Point No.	Depth Below Pile Head feet	Pile Diameter inches
-----	-----	-----
1	0.000	36.0000
2	9.000	36.0000

Input Structural Properties for Pile Sections:

Pile Section No. 1:

Section 1 is a round drilled shaft, bored pile, or CIDH pile	
Length of section	= 9.000000 ft
Shaft Diameter	= 36.000000 in

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-19 (Boring B-011-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Soil and Rock Layering Information

The soil profile is modelled using 4 layers

Layer 1 is soft clay, p-y criteria by Matlock, 1970

Distance from top of pile to top of layer	=	1.000000 ft
Distance from top of pile to bottom of layer	=	4.000000 ft
Effective unit weight at top of layer	=	98.000000 pcf
Effective unit weight at bottom of layer	=	98.000000 pcf
Undrained cohesion at top of layer	=	250.000000 psf
Undrained cohesion at bottom of layer	=	250.000000 psf
Epsilon-50 at top of layer	=	0.020000
Epsilon-50 at bottom of layer	=	0.020000

Layer 2 is stiff clay without free water

Distance from top of pile to top of layer	=	4.000000 ft
Distance from top of pile to bottom of layer	=	6.500000 ft
Effective unit weight at top of layer	=	63.000000 pcf
Effective unit weight at bottom of layer	=	63.000000 pcf
Undrained cohesion at top of layer	=	4500. psf
Undrained cohesion at bottom of layer	=	4500. psf
Epsilon-50 at top of layer	=	0.004000
Epsilon-50 at bottom of layer	=	0.004000

Layer 3 is stiff clay without free water

Distance from top of pile to top of layer	=	6.500000 ft
Distance from top of pile to bottom of layer	=	10.300000 ft
Effective unit weight at top of layer	=	66.000000 pcf
Effective unit weight at bottom of layer	=	66.000000 pcf
Undrained cohesion at top of layer	=	4500. psf
Undrained cohesion at bottom of layer	=	4500. psf
Epsilon-50 at top of layer	=	0.004000
Epsilon-50 at bottom of layer	=	0.004000

Layer 4 is stiff clay without free water

Distance from top of pile to top of layer	=	10.300000 ft
Distance from top of pile to bottom of layer	=	23.500000 ft
Effective unit weight at top of layer	=	60.000000 pcf

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-19 (Boring B-011-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Effective unit weight at bottom of layer	=	60.000000 pcf
Undrained cohesion at top of layer	=	4500. psf
Undrained cohesion at bottom of layer	=	4500. psf
Epsilon-50 at top of layer	=	0.004000
Epsilon-50 at bottom of layer	=	0.004000

(Depth of the lowest soil layer extends 14.500 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 psf	E50 or krm
1	Soft Clay	1.0000 4.0000	98.0000 98.0000	250.0000 250.0000	0.02000 0.02000
2	Stiff Clay w/o Free Water	4.0000 6.5000	63.0000 63.0000	4500. 4500.	0.00400 0.00400
3	Stiff Clay w/o Free Water	6.5000 10.3000	66.0000 66.0000	4500. 4500.	0.00400 0.00400
4	Stiff Clay w/o Free Water	10.3000 23.5000	60.0000 60.0000	4500. 4500.	0.00400 0.00400

 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 = 3

Load Compute No.	Load Top y Type vs. Pile Length	Condition Run Analysis 1	Condition 2	Axial Thrust Force, lbs
1	1	V = 1000.000000 lbs	M = 315600. in-lbs	4200.

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 Light Tower SC1-19 (Boring B-011-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Yes		Yes				
2	1	V =	2250. lbs	M =	724800. in-lbs	4600.
Yes		Yes				
3	1	V =	2250. lbs	M =	724800. in-lbs	3800.
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:

 Dimensions and Properties of Drilled Shaft (Bored Pile):

Length of Section	=	9.000000 ft
Shaft Diameter	=	36.000000 in
Concrete Cover Thickness (to edge of trans. reinf.)	=	3.500000 in
Number of Reinforcing Bars	=	16 bars
Yield Stress of Reinforcing Bars	=	60000. psi
Modulus of Elasticity of Reinforcing Bars	=	29000000. psi
Gross Area of Shaft	=	1018. sq. in.
Total Area of Reinforcing Steel	=	16.000000 sq. in.
Area Ratio of Steel Reinforcement	=	1.57 percent
Edge-to-Edge Bar Spacing	=	4.114467 in
Maximum Concrete Aggregate Size	=	0.750000 in
Ratio of Bar Spacing to Aggregate Size	=	5.49
Offset of Center of Rebar Cage from Center of Pile	=	0.0000 in
Transverse Reinforcement		
Type: Spiral		
Number of Transverse Reinf. (per spacing)	=	1
Spacing of Transverse Reinf.	=	4.500000 in
Yield Stress of Transverse Reinf.	=	60000. psi
Diameter of Transverse Reinf.	=	0.500000 in

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-19 (Boring B-011-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Axial Structural Capacities:

Nom. Axial Structural Capacity = $0.85 F_c A_c + F_y A_s$ = 4366.378 kips
 Tensile Load for Cracking of Concrete = -470.222 kips
 Nominal Axial Tensile Capacity = -960.000 kips

Reinforcing Bar Dimensions and Positions Used in Computations:

Bar Number	Bar Diam. inches	Bar Area sq. in.	X inches	Y inches
1	1.128000	1.000000	13.436000	0.000000
2	1.128000	1.000000	12.413245	5.141735
3	1.128000	1.000000	9.500687	9.500687
4	1.128000	1.000000	5.141735	12.413245
5	1.128000	1.000000	0.000000	13.436000
6	1.128000	1.000000	-5.14173	12.413245
7	1.128000	1.000000	-9.50069	9.500687
8	1.128000	1.000000	-12.41325	5.141735
9	1.128000	1.000000	-13.43600	0.000000
10	1.128000	1.000000	-12.41325	-5.14173
11	1.128000	1.000000	-9.50069	-9.50069
12	1.128000	1.000000	-5.14173	-12.41325
13	1.128000	1.000000	0.000000	-13.43600
14	1.128000	1.000000	5.141735	-12.41325
15	1.128000	1.000000	9.500687	-9.50069
16	1.128000	1.000000	12.413245	-5.14173

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

Minimum spacing between any two bars not equal to zero = 4.114 inches
 between bars 11 and 12.

Ratio of bar spacing to maximum aggregate size = 5.49

Concrete Properties:

Compressive Strength of Concrete = 4000. psi
 Modulus of Elasticity of Concrete = 3604997. psi
 Modulus of Rupture of Concrete = -474.34165 psi
 Compression Strain at Peak Stress = 0.001886
 Tensile Strain at Fracture of Concrete = -0.0001154
 Maximum Coarse Aggregate Size = 0.750000 in

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-19 (Boring B-011-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Number of Axial Thrust Force Values Determined from Pile-head Loadings = 3

Number	Axial Thrust Force kips
-----	-----
1	3.800
2	4.200
3	4.600

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 318-14, Section 21.2.3.
 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 = 3.800 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
-----	-----	-----	-----	-----	-----
6.25000E-07	240.5062135	384809942.	19.2929823	0.00001206	-0.00001044
0.0505030	0.2746478				
0.00000125	480.1472468	384117797.	18.6479768	0.00002331	-0.00002169
0.0973082	0.5259142				
0.00000188	718.9174733	383422652.	18.4329804	0.00003456	-0.00003294
0.1438345	0.7771808				
0.00000250	956.8168886	382726755.	18.3254857	0.00004581	-0.00004419
0.1900818	1.0284477				
0.00000313	1194.	382030558.	18.2609917	0.00005707	-0.00005543
0.2360502	1.2797149				
0.00000375	1430.	381334209.	18.2179981	0.00006832	-0.00006668
0.2817396	1.5309823				

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0.00000438	1665.	380637775.	18.1872904	0.00007957	-0.00007793
0.3271500	1.7822500				
0.00000500	1900.	379941287.	18.1642614	0.00009082	-0.00008918
0.3722815	2.0335179				
0.00000563	2133.	379244764.	18.1463515	0.0001021	-0.000100
0.4171340	2.2847861				
0.00000625	2366.	378548215.	18.1320251	0.0001133	-0.000112
0.4617075	2.5360546				
0.00000688	2366.	344134741.	10.2494785	0.00007047	-0.000177
0.2882187	-4.308598 C				
0.00000750	2366.	315456846.	10.2198771	0.00007665	-0.000193
0.3129821	-4.706727 C				
0.00000813	2366.	291190934.	10.1952302	0.00008284	-0.000210
0.3376758	-5.104761 C				
0.00000875	2366.	270391582.	10.1744772	0.00008903	-0.000226
0.3622998	-5.502701 C				
0.00000938	2366.	252365477.	10.1568402	0.00009522	-0.000242
0.3868539	-5.900547 C				
0.00001000	2366.	236592634.	10.1417358	0.0001014	-0.000259
0.4113380	-6.298297 C				
0.00001063	2366.	222675420.	10.1287027	0.0001076	-0.000275
0.4357521	-6.695951 C				
0.00001125	2366.	210304564.	10.1174231	0.0001138	-0.000291
0.4600960	-7.093510 C				
0.00001188	2366.	199235903.	10.1076093	0.0001200	-0.000307
0.4843696	-7.490973 C				
0.00001250	2366.	189274107.	10.0990420	0.0001262	-0.000324
0.5085729	-7.888340 C				
0.00001313	2366.	180261055.	10.0915439	0.0001325	-0.000340
0.5327056	-8.285611 C				
0.00001375	2366.	172067370.	10.0849699	0.0001387	-0.000356
0.5567678	-8.682785 C				
0.00001438	2366.	164586180.	10.0792000	0.0001449	-0.000373
0.5807594	-9.079861 C				
0.00001500	2366.	157728423.	10.0741344	0.0001511	-0.000389
0.6046801	-9.476841 C				
0.00001563	2366.	151419286.	10.0696892	0.0001573	-0.000405
0.6285300	-9.873723 C				
0.00001625	2366.	145595467.	10.0657933	0.0001636	-0.000421
0.6523089	-10.270507 C				
0.00001688	2366.	140203043.	10.0623863	0.0001698	-0.000438
0.6760167	-10.667193 C				
0.00001750	2366.	135195791.	10.0594163	0.0001760	-0.000454
0.6996534	-11.063781 C				
0.00001813	2366.	130533867.	10.0568387	0.0001823	-0.000470
0.7232187	-11.460271 C				
0.00001875	2366.	126182738.	10.0546147	0.0001885	-0.000486
0.7467127	-11.856661 C				
0.00001938	2366.	122112327.	10.0527107	0.0001948	-0.000503
0.7701352	-12.252952 C				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00002000	2366.	118296317.	10.0510970	0.0002010	-0.000519
0.7934860	-12.649144 C				
0.00002063	2366.	114711580.	10.0497478	0.0002073	-0.000535
0.8167652	-13.045236 C				
0.00002125	2366.	111337710.	10.0486401	0.0002135	-0.000551
0.8399726	-13.441228 C				
0.00002188	2366.	108156633.	10.0477539	0.0002198	-0.000568
0.8631080	-13.837120 C				
0.00002250	2366.	105152282.	10.0470709	0.0002261	-0.000584
0.8861714	-14.232911 C				
0.00002313	2366.	102310328.	10.0465752	0.0002323	-0.000600
0.9091627	-14.628602 C				
0.00002375	2366.	99617951.	10.0462524	0.0002386	-0.000616
0.9320817	-15.024191 C				
0.00002438	2366.	97063645.	10.0460897	0.0002449	-0.000633
0.9549284	-15.419678 C				
0.00002563	2429.	94800037.	10.0461990	0.0002574	-0.000665
1.0004043	-16.210348 C				
0.00002688	2545.	94692477.	10.0468231	0.0002700	-0.000697
1.0455896	-17.000609 C				
0.00002813	2660.	94589756.	10.0479254	0.0002826	-0.000730
1.0904832	-17.790458 C				
0.00002938	2776.	94491232.	10.0493946	0.0002952	-0.000762
1.1350844	-18.579893 C				
0.00003063	2891.	94396370.	10.0512127	0.0003078	-0.000795
1.1793922	-19.368912 C				
0.00003188	3006.	94304718.	10.0533415	0.0003205	-0.000827
1.2234058	-20.157511 C				
0.00003313	3121.	94215891.	10.0557483	0.0003331	-0.000859
1.2671243	-20.945689 C				
0.00003438	3236.	94129561.	10.0584054	0.0003458	-0.000892
1.3105466	-21.733443 C				
0.00003563	3350.	94045446.	10.0612887	0.0003584	-0.000924
1.3536720	-22.520771 C				
0.00003688	3465.	93963300.	10.0643778	0.0003711	-0.000956
1.3964994	-23.307669 C				
0.00003813	3579.	93882912.	10.0676547	0.0003838	-0.000989
1.4390279	-24.094136 C				
0.00003938	3694.	93804096.	10.0711039	0.0003965	-0.001021
1.4812567	-24.880169 C				
0.00004063	3808.	93726688.	10.0747116	0.0004093	-0.001053
1.5231846	-25.665765 C				
0.00004188	3922.	93650546.	10.0784659	0.0004220	-0.001085
1.5648108	-26.450921 C				
0.00004313	4035.	93575540.	10.0823562	0.0004348	-0.001118
1.6061342	-27.235635 C				
0.00004438	4149.	93501560.	10.0863731	0.0004476	-0.001150
1.6471540	-28.019904 C				
0.00004563	4263.	93428502.	10.0905084	0.0004604	-0.001182
1.6878690	-28.803725 C				

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0.00004688	4376.	93356279.	10.0947545	0.0004732	-0.001214
1.7282784	-29.587096 C				
0.00004813	4489.	93284807.	10.0991050	0.0004860	-0.001246
1.7683810	-30.370013 C				
0.00004938	4602.	93214014.	10.1035538	0.0004989	-0.001279
1.8081759	-31.152474 C				
0.00005063	4715.	93143835.	10.1080956	0.0005117	-0.001311
1.8476620	-31.934476 C				
0.00005188	4828.	93074209.	10.1127258	0.0005246	-0.001343
1.8868384	-32.716016 C				
0.00005313	4941.	93005082.	10.1174399	0.0005375	-0.001375
1.9257039	-33.497091 C				
0.00005438	5053.	92936405.	10.1222340	0.0005504	-0.001407
1.9642575	-34.277698 C				
0.00005563	5166.	92868132.	10.1271047	0.0005633	-0.001439
2.0024981	-35.057833 C				
0.00005688	5278.	92800222.	10.1320488	0.0005763	-0.001471
2.0404247	-35.837495 C				
0.00005813	5390.	92732637.	10.1370633	0.0005892	-0.001503
2.0780361	-36.616679 C				
0.00005938	5502.	92665342.	10.1421457	0.0006022	-0.001535
2.1153313	-37.395383 C				
0.00006063	5614.	92598305.	10.1472935	0.0006152	-0.001567
2.1523092	-38.173604 C				
0.00006188	5725.	92531497.	10.1525046	0.0006282	-0.001599
2.1889685	-38.951338 C				
0.00006313	5837.	92464888.	10.1577769	0.0006412	-0.001631
2.2253083	-39.728581 C				
0.00006438	5948.	92398455.	10.1631088	0.0006543	-0.001663
2.2613274	-40.505332 C				
0.00006563	6059.	92332173.	10.1684984	0.0006673	-0.001695
2.2970245	-41.281586 C				
0.00006688	6170.	92266020.	10.1739444	0.0006804	-0.001727
2.3323987	-42.057340 C				
0.00006813	6281.	92199976.	10.1794453	0.0006935	-0.001759
2.3674485	-42.832591 C				
0.00006938	6392.	92134020.	10.1849998	0.0007066	-0.001791
2.4021730	-43.607335 C				
0.00007063	6502.	92068136.	10.1906070	0.0007197	-0.001823
2.4365708	-44.381568 C				
0.00007188	6613.	92002305.	10.1962656	0.0007329	-0.001855
2.4706408	-45.155288 C				
0.00007313	6723.	91936511.	10.2020028	0.0007460	-0.001886
2.5043818	-45.928490 C				
0.00007438	6833.	91870742.	10.2077616	0.0007592	-0.001918
2.5377924	-46.701172 C				
0.00007938	7271.	91607617.	10.2312788	0.0008121	-0.002045
2.6681070	-49.786612 C				
0.00008438	7707.	91343844.	10.2555391	0.0008653	-0.002172
2.7930345	-52.863415 C				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00008938	8140.	91079227.	10.2796933	0.0009187	-0.002299
2.9123325	-55.933382 C				
0.00009438	8570.	90813004.	10.3043877	0.0009725	-0.002425
3.0260259	-58.995009 C				
0.00009938	8979.	90357411.	10.3225581	0.0010258	-0.002552
3.1326575	-60.000000 CY				
0.0001044	9304.	89144470.	10.3110511	0.0010762	-0.002681
3.2276850	-60.000000 CY				
0.0001094	9546.	87273573.	10.2718035	0.0011235	-0.002814
3.3116704	-60.000000 CY				
0.0001144	9782.	85523680.	10.2357064	0.0011707	-0.002947
3.3907664	-60.000000 CY				
0.0001194	10004.	83800225.	10.1987328	0.0012175	-0.003080
3.4643165	-60.000000 CY				
0.0001244	10154.	81641326.	10.1374818	0.0012608	-0.003217
3.5282172	-60.000000 CY				
0.0001294	10287.	79513660.	10.0756441	0.0013035	-0.003354
3.5871212	-60.000000 CY				
0.0001344	10419.	77536664.	10.0197410	0.0013464	-0.003491
3.6423258	-60.000000 CY				
0.0001394	10550.	75693983.	9.9691573	0.0013895	-0.003628
3.6937845	-60.000000 CY				
0.0001444	10680.	73971519.	9.9233661	0.0014327	-0.003765
3.7414497	-60.000000 CY				
0.0001494	10808.	72355946.	9.8810316	0.0014760	-0.003902
3.7851328	-60.000000 CY				
0.0001544	10925.	70772035.	9.8368433	0.0015186	-0.004039
3.8241552	-60.000000 CY				
0.0001594	11008.	69072220.	9.7809580	0.0015588	-0.004179
3.8574366	-60.000000 CY				
0.0001644	11071.	67351790.	9.7204156	0.0015978	-0.004320
3.8862696	-60.000000 CY				
0.0001694	11131.	65719446.	9.6635689	0.0016368	-0.004461
3.9118664	-60.000000 CY				
0.0001744	11191.	64176802.	9.6094393	0.0016756	-0.004602
3.9342902	-60.000000 CY				
0.0001794	11250.	62716278.	9.5601863	0.0017149	-0.004743
3.9535015	-60.000000 CY				
0.0001844	11308.	61329164.	9.5136161	0.0017541	-0.004883
3.9693617	-60.000000 CY				
0.0001894	11364.	60009896.	9.4690774	0.0017932	-0.005024
3.9819050	-60.000000 CY				
0.0001944	11420.	58754909.	9.4280227	0.0018326	-0.005165
3.9911986	-60.000000 CY				
0.0001994	11476.	57559296.	9.3897594	0.0018721	-0.005305
3.9971986	-60.000000 CY				
0.0002044	11531.	56418622.	9.3531932	0.0019116	-0.005446
3.9998595	-60.000000 CY				
0.0002094	11584.	55328385.	9.3201259	0.0019514	-0.005586
3.9974517	-60.000000 CY				

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0.0002144	11637.	54285454.	9.2909722	0.0019918	-0.005726
3.9998812	-60.000000 CY				
0.0002194	11690.	53285909.	9.2626721	0.0020320	-0.005866
3.9969940	-60.000000 CY				
0.0002244	11740.	52321336.	9.2356724	0.0020723	-0.006005
3.9997138	-60.000000 CY				
0.0002294	11786.	51384137.	9.2093226	0.0021124	-0.006145
3.9955528	-60.000000 CY				
0.0002344	11823.	50445667.	9.1796872	0.0021515	-0.006286
3.9989818	-60.000000 CY				
0.0002394	11855.	49524943.	9.1473565	0.0021896	-0.006428
3.9994466	-60.000000 CY				
0.0002444	11876.	48598228.	9.1109548	0.0022265	-0.006571
3.9965160	-60.000000 CY				
0.0002494	11895.	47701101.	9.0745971	0.0022630	-0.006715
3.9991770	-60.000000 CY				
0.0002544	11912.	46829816.	9.0405915	0.0022997	-0.006858
3.9995775	-60.000000 CY				
0.0002594	11929.	45990067.	9.0077660	0.0023364	-0.007001
3.9954763	-60.000000 CY				
0.0002644	11945.	45181124.	8.9766457	0.0023732	-0.007144
3.9984997	-60.000000 CY				
0.0002694	11961.	44401256.	8.9468563	0.0024101	-0.007287
3.9998981	-60.000000 CY				
0.0002744	11976.	43648250.	8.9191370	0.0024472	-0.007430
3.9944635	-60.000000 CY				
0.0003044	12062.	39628140.	8.7757363	0.0026711	-0.008286
3.9984635	-60.000000 CY				
0.0003344	12138.	36300180.	8.6628609	0.0028966	-0.009141
3.9998209	-60.000000 CY				
0.0003644	12207.	33502446.	8.5793723	0.0031261	-0.009991
3.9999551	-60.000000 CYT				
0.0003944	12272.	31117026.	8.5161103	0.0033585	-0.010839
3.9996166	-60.000000 CYT				
0.0004244	12331.	29056485.	8.4674428	0.0035934	-0.011684
3.9972132	-60.000000 CYT				
0.0004544	12377.	27238942.	8.4178614	0.0038249	-0.012533
3.9873462	-60.000000 CYT				

Axial Thrust Force = 4.200 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
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6.25000E-07	240.5049676	384807948.	19.4290859	0.00001214	-0.00001036
0.0508615	0.2771147				
0.00000125	480.1459926	384116794.	18.7161837	0.00002340	-0.00002160
0.0976654	0.5283867				
0.00000188	718.9162127	383421980.	18.4785558	0.00003465	-0.00003285
0.1441903	0.7796589				
0.00000250	956.8156222	382726249.	18.3597458	0.00004590	-0.00004410
0.1904363	1.0309315				
0.00000313	1194.	382030150.	18.2884629	0.00005715	-0.00005535
0.2364034	1.2822044				
0.00000375	1430.	381333869.	18.2409436	0.00006840	-0.00006660
0.2820914	1.5334776				
0.00000438	1665.	380637482.	18.2070035	0.00007966	-0.00007784
0.3275005	1.7847511				
0.00000500	1900.	379941029.	18.1815504	0.00009091	-0.00008909
0.3726306	2.0360248				
0.00000563	2133.	379244533.	18.1617553	0.0001022	-0.000100
0.4174818	2.2872988				
0.00000625	2366.	378548006.	18.1459208	0.0001134	-0.000112
0.4620539	2.5385732				
0.00000688	2366.	344134551.	10.2895004	0.00007074	-0.000177
0.2893429	-4.300617 C				
0.00000750	2366.	315456672.	10.2575513	0.00007693	-0.000193
0.3141325	-4.698533 C				
0.00000813	2366.	291190774.	10.2300378	0.00008312	-0.000209
0.3388235	-5.096560 C				
0.00000875	2366.	270391433.	10.2068278	0.00008931	-0.000226
0.3634446	-5.494492 C				
0.00000938	2366.	252365338.	10.1870615	0.00009550	-0.000242
0.3879959	-5.892330 C				
0.00001000	2366.	236592504.	10.1700940	0.0001017	-0.000258
0.4124772	-6.290073 C				
0.00001063	2366.	222675298.	10.1554324	0.0001079	-0.000275
0.4368884	-6.687720 C				
0.00001125	2366.	210304448.	10.1426931	0.0001141	-0.000291
0.4612294	-7.085271 C				
0.00001188	2366.	199235793.	10.1315564	0.0001203	-0.000307
0.4855002	-7.482727 C				
0.00001250	2366.	189274003.	10.1218127	0.0001265	-0.000323
0.5097005	-7.880086 C				
0.00001313	2366.	180260955.	10.1132503	0.0001327	-0.000340
0.5338304	-8.277349 C				
0.00001375	2366.	172067276.	10.1057088	0.0001390	-0.000356
0.5578898	-8.674515 C				
0.00001438	2366.	164586090.	10.0990556	0.0001452	-0.000372
0.5818784	-9.071585 C				
0.00001500	2366.	157728336.	10.0931803	0.0001514	-0.000389
0.6057963	-9.468556 C				
0.00001563	2366.	151419203.	10.0879903	0.0001576	-0.000405
0.6296433	-9.865431 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-19 (Boring B-011-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00001625	2366.	145595387.	10.0834069	0.0001639	-0.000421
0.6534193	-10.262207 C				
0.00001688	2366.	140202965.	10.0793634	0.0001701	-0.000437
0.6771242	-10.658886 C				
0.00001750	2366.	135195717.	10.0758025	0.0001763	-0.000454
0.7007579	-11.055466 C				
0.00001813	2366.	130533795.	10.0726747	0.0001826	-0.000470
0.7243204	-11.451947 C				
0.00001875	2366.	126182669.	10.0699372	0.0001888	-0.000486
0.7478114	-11.848330 C				
0.00001938	2366.	122112260.	10.0675528	0.0001951	-0.000502
0.7712309	-12.244613 C				
0.00002000	2366.	118296252.	10.0654889	0.0002013	-0.000519
0.7945789	-12.640797 C				
0.00002063	2366.	114711517.	10.0637168	0.0002076	-0.000535
0.8178551	-13.036882 C				
0.00002125	2366.	111337649.	10.0622112	0.0002138	-0.000551
0.8410595	-13.432866 C				
0.00002188	2366.	108156573.	10.0609497	0.0002201	-0.000567
0.8641920	-13.828750 C				
0.00002250	2366.	105152224.	10.0599125	0.0002263	-0.000584
0.8872524	-14.224533 C				
0.00002313	2366.	102310272.	10.0590817	0.0002326	-0.000600
0.9102407	-14.620215 C				
0.00002375	2366.	99617896.	10.0584414	0.0002389	-0.000616
0.9331568	-15.015796 C				
0.00002438	2366.	97063591.	10.0579776	0.0002452	-0.000632
0.9560005	-15.411276 C				
0.00002563	2432.	94924068.	10.0575288	0.0002577	-0.000665
1.0014704	-16.201930 C				
0.00002688	2548.	94810571.	10.0576469	0.0002703	-0.000697
1.0466496	-16.992174 C				
0.00002813	2664.	94702439.	10.0582592	0.0002829	-0.000730
1.0915372	-17.782007 C				
0.00002938	2779.	94598964.	10.0593353	0.0002955	-0.000762
1.1361324	-18.571425 C				
0.00003063	2894.	94499555.	10.0607664	0.0003081	-0.000794
1.1804341	-19.360427 C				
0.00003188	3009.	94403710.	10.0625387	0.0003207	-0.000827
1.2244416	-20.149010 C				
0.00003313	3124.	94311007.	10.0646159	0.0003334	-0.000859
1.2681539	-20.937171 C				
0.00003438	3239.	94221082.	10.0669675	0.0003461	-0.000891
1.3115700	-21.724908 C				
0.00003563	3354.	94133623.	10.0695670	0.0003587	-0.000924
1.3546892	-22.512219 C				
0.00003688	3468.	94048359.	10.0723915	0.0003714	-0.000956
1.3975103	-23.299100 C				
0.00003813	3582.	93965057.	10.0754214	0.0003841	-0.000988
1.4400326	-24.085550 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-19 (Boring B-011-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00003938	3697.	93883511.	10.0786392	0.0003968	-0.001021
1.4822550	-24.871565 C				
0.00004063	3811.	93803541.	10.0820299	0.0004096	-0.001053
1.5241766	-25.657144 C				
0.00004188	3925.	93724988.	10.0855803	0.0004223	-0.001085
1.5657965	-26.442282 C				
0.00004313	4039.	93647711.	10.0892786	0.0004351	-0.001117
1.6071135	-27.226979 C				
0.00004438	4152.	93571586.	10.0931145	0.0004479	-0.001150
1.6481268	-28.011230 C				
0.00004563	4266.	93496502.	10.0970787	0.0004607	-0.001182
1.6888354	-28.795033 C				
0.00004688	4379.	93422358.	10.1011630	0.0004735	-0.001214
1.7292383	-29.578385 C				
0.00004813	4492.	93349066.	10.1053601	0.0004863	-0.001246
1.7693344	-30.361284 C				
0.00004938	4606.	93276544.	10.1096634	0.0004992	-0.001278
1.8091228	-31.143727 C				
0.00005063	4718.	93204721.	10.1140670	0.0005120	-0.001310
1.8486023	-31.925710 C				
0.00005188	4831.	93133529.	10.1185657	0.0005249	-0.001343
1.8877721	-32.707231 C				
0.00005313	4944.	93062909.	10.1231546	0.0005378	-0.001375
1.9266309	-33.488287 C				
0.00005438	5056.	92992807.	10.1278294	0.0005507	-0.001407
1.9651778	-34.268875 C				
0.00005563	5169.	92923173.	10.1325862	0.0005636	-0.001439
2.0034117	-35.048992 C				
0.00005688	5281.	92853961.	10.1374215	0.0005766	-0.001471
2.0413316	-35.828634 C				
0.00005813	5393.	92785130.	10.1423320	0.0005895	-0.001503
2.0789362	-36.607799 C				
0.00005938	5505.	92716640.	10.1473148	0.0006025	-0.001535
2.1162246	-37.386484 C				
0.00006063	5617.	92648458.	10.1523672	0.0006155	-0.001567
2.1531956	-38.164685 C				
0.00006188	5728.	92580549.	10.1574868	0.0006285	-0.001599
2.1898481	-38.942399 C				
0.00006313	5840.	92512883.	10.1626714	0.0006415	-0.001631
2.2261809	-39.719622 C				
0.00006438	5951.	92445433.	10.1679189	0.0006546	-0.001663
2.2621930	-40.496353 C				
0.00006563	6062.	92378172.	10.1732276	0.0006676	-0.001695
2.2978832	-41.272587 C				
0.00006688	6173.	92311077.	10.1785957	0.0006807	-0.001727
2.3332503	-42.048320 C				
0.00006813	6284.	92244124.	10.1840217	0.0006938	-0.001759
2.3682931	-42.823550 C				
0.00006938	6395.	92177292.	10.1895041	0.0007069	-0.001791
2.4030104	-43.598274 C				

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 Light Tower SC1-19 (Boring B-011-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00007063	6505.	92110561.	10.1950417	0.0007200	-0.001822
2.4374011	-44.372486 C				
0.00007188	6616.	92043913.	10.2006608	0.0007332	-0.001854
2.4714639	-45.146185 C				
0.00007313	6726.	91977331.	10.2063053	0.0007463	-0.001886
2.5051976	-45.919366 C				
0.00007438	6836.	91910797.	10.2120017	0.0007595	-0.001918
2.5386010	-46.692026 C				
0.00007938	7274.	91644853.	10.2352897	0.0008124	-0.002045
2.6688860	-49.777380 C				
0.00008438	7710.	91378587.	10.2593338	0.0008656	-0.002172
2.7937834	-52.854093 C				
0.00008938	8143.	91111830.	10.2831857	0.0009191	-0.002298
2.9130226	-55.924331 C				
0.00009438	8573.	90843621.	10.3077273	0.0009728	-0.002425
3.0266854	-58.985869 C				
0.00009938	8982.	90387473.	10.3258078	0.0010261	-0.002551
3.1332951	-60.000000 CY				
0.0001044	9308.	89176212.	10.3143071	0.0010766	-0.002681
3.2283182	-60.000000 CY				
0.0001094	9549.	87304848.	10.2749831	0.0011238	-0.002814
3.3122821	-60.000000 CY				
0.0001144	9785.	85553556.	10.2389100	0.0011711	-0.002946
3.3913727	-60.000000 CY				
0.0001194	10007.	83830919.	10.2019402	0.0012179	-0.003080
3.4649106	-60.000000 CY				
0.0001244	10158.	81671814.	10.1406407	0.0012612	-0.003216
3.5287895	-60.000000 CY				
0.0001294	10291.	79542859.	10.0787027	0.0013039	-0.003354
3.5876602	-60.000000 CY				
0.0001344	10423.	77564670.	10.0227059	0.0013468	-0.003491
3.6428308	-60.000000 CY				
0.0001394	10554.	75720878.	9.9720357	0.0013899	-0.003628
3.6942550	-60.000000 CY				
0.0001444	10683.	73997378.	9.9261646	0.0014331	-0.003764
3.7418850	-60.000000 CY				
0.0001494	10812.	72381005.	9.8838986	0.0014764	-0.003901
3.7855535	-60.000000 CY				
0.0001544	10929.	70796718.	9.8396771	0.0015190	-0.004038
3.8245440	-60.000000 CY				
0.0001594	11012.	69097838.	9.7838573	0.0015593	-0.004178
3.8578061	-60.000000 CY				
0.0001644	11075.	67376662.	9.7232508	0.0015983	-0.004319
3.8866026	-60.000000 CY				
0.0001694	11135.	65743511.	9.6663364	0.0016372	-0.004460
3.9121613	-60.000000 CY				
0.0001744	11195.	64200103.	9.6121495	0.0016761	-0.004601
3.9345463	-60.000000 CY				
0.0001794	11254.	62738857.	9.5628376	0.0017153	-0.004742
3.9537182	-60.000000 CY				

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36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0001844	11312.	61351278.	9.5162917	0.0017546	-0.004883
3.9695496	-60.000000 CY				
0.0001894	11368.	60031354.	9.4717005	0.0017937	-0.005024
3.9820503	-60.000000 CY				
0.0001944	11425.	58775745.	9.4305957	0.0018331	-0.005164
3.9913005	-60.000000 CY				
0.0001994	11480.	57579537.	9.3922863	0.0018726	-0.005305
3.9972564	-60.000000 CY				
0.0002044	11535.	56438298.	9.3556780	0.0019121	-0.005445
3.9998723	-60.000000 CY				
0.0002094	11588.	55347517.	9.3241700	0.0019522	-0.005585
3.9975077	-60.000000 CY				
0.0002144	11641.	54304067.	9.2934428	0.0019923	-0.005725
3.9998931	-60.000000 CY				
0.0002194	11694.	53304015.	9.2651074	0.0020325	-0.005865
3.9970558	-60.000000 CY				
0.0002244	11744.	52339157.	9.2380944	0.0020728	-0.006005
3.9997330	-60.000000 CY				
0.0002294	11790.	51401489.	9.2117130	0.0021129	-0.006145
3.9956300	-60.000000 CY				
0.0002344	11827.	50463153.	9.1821360	0.0021521	-0.006285
3.9990203	-60.000000 CY				
0.0002394	11859.	49542728.	9.1500193	0.0021903	-0.006427
3.9992468	-60.000000 CY				
0.0002444	11880.	48615611.	9.1135780	0.0022271	-0.006570
3.9965958	-60.000000 CY				
0.0002494	11900.	47718283.	9.0771076	0.0022636	-0.006714
3.9992162	-60.000000 CY				
0.0002544	11917.	46846598.	9.0431776	0.0023004	-0.006857
3.9993713	-60.000000 CY				
0.0002594	11933.	46006491.	9.0103157	0.0023371	-0.007000
3.9955701	-60.000000 CY				
0.0002644	11949.	45197204.	8.9791598	0.0023739	-0.007144
3.9985538	-60.000000 CY				
0.0002694	11965.	44417005.	8.9493437	0.0024107	-0.007287
3.9999119	-60.000000 CY				
0.0002744	11980.	43663657.	8.9215934	0.0024479	-0.007430
3.9942523	-60.000000 CY				
0.0003044	12066.	39641995.	8.7782176	0.0026719	-0.008286
3.9985257	-60.000000 CY				
0.0003344	12142.	36312646.	8.6652203	0.0028974	-0.009140
3.9998424	-60.000000 CY				
0.0003644	12212.	33513765.	8.5815911	0.0031269	-0.009991
3.9999658	-60.000000 CYT				
0.0003944	12276.	31127384.	8.5182268	0.0033594	-0.010838
3.9996505	-60.000000 CYT				
0.0004244	12335.	29066055.	8.4694819	0.0035942	-0.011683
3.9973093	-60.000000 CYT				
0.0004544	12381.	27248100.	8.4201387	0.0038259	-0.012532
3.9875919	-60.000000 CYT				

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36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Axial Thrust Force = 4.600 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
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6.25000E-07	240.5035986	384805758.	19.5651901	0.00001223	-0.00001027
0.0512199	0.2795816				
0.00000125	480.1446137	384115691.	18.7843907	0.00002348	-0.00002152
0.0980225	0.5308592				
0.00000188	718.9148267	383421241.	18.5241312	0.00003473	-0.00003277
0.1445462	0.7821371				
0.00000250	956.8142298	382725692.	18.3940059	0.00004599	-0.00004401
0.1907908	1.0334154				
0.00000313	1194.	382029703.	18.3159341	0.00005724	-0.00005526
0.2367565	1.2846940				
0.00000375	1430.	381333494.	18.2638891	0.00006849	-0.00006651
0.2824433	1.5359729				
0.00000438	1665.	380637159.	18.2267166	0.00007974	-0.00007776
0.3278510	1.7872522				
0.00000500	1900.	379940746.	18.1988394	0.00009099	-0.00008901
0.3729798	2.0385317				
0.00000563	2133.	379244280.	18.1771590	0.0001022	-0.000100
0.4178295	2.2898116				
0.00000625	2366.	378547777.	18.1598165	0.0001135	-0.000112
0.4624003	2.5410917				
0.00000688	2366.	344134343.	10.3291778	0.00007101	-0.000176
0.2904571	-4.292706 C				
0.00000750	2366.	315456481.	10.2940289	0.00007721	-0.000193
0.3152465	-4.690597 C				
0.00000813	2366.	291190598.	10.2646762	0.00008340	-0.000209
0.3399656	-5.088396 C				
0.00000875	2366.	270391269.	10.2391817	0.00008959	-0.000225
0.3645893	-5.486283 C				
0.00000938	2366.	252365185.	10.2172859	0.00009579	-0.000242
0.3891378	-5.884113 C				
0.00001000	2366.	236592361.	10.1984552	0.0001020	-0.000258
0.4136162	-6.281848 C				
0.00001063	2366.	222675163.	10.1821496	0.0001082	-0.000274
0.4380246	-6.679488 C				
0.00001125	2366.	210304321.	10.1679490	0.0001144	-0.000291
0.4623628	-7.077032 C				
0.00001188	2366.	199235672.	10.1555219	0.0001206	-0.000307
0.4866307	-7.474480 C				

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0.00001250	2366.	189273889.	10.1446030	0.0001268	-0.000323
0.5108282	-7.871831 C				
0.00001313	2366.	180260846.	10.1349589	0.0001330	-0.000339
0.5349552	-8.269087 C				
0.00001375	2366.	172067171.	10.1264498	0.0001392	-0.000356
0.5590117	-8.666245 C				
0.00001438	2366.	164585990.	10.1189132	0.0001455	-0.000372
0.5829974	-9.063307 C				
0.00001500	2366.	157728241.	10.1122282	0.0001517	-0.000388
0.6069124	-9.460271 C				
0.00001563	2366.	151419111.	10.1062933	0.0001579	-0.000405
0.6307565	-9.857138 C				
0.00001625	2366.	145595299.	10.1010224	0.0001641	-0.000421
0.6545296	-10.253907 C				
0.00001688	2366.	140202880.	10.0963423	0.0001704	-0.000437
0.6782316	-10.650577 C				
0.00001750	2366.	135195635.	10.0921903	0.0001766	-0.000453
0.7018624	-11.047150 C				
0.00001813	2366.	130533716.	10.0885122	0.0001829	-0.000470
0.7254219	-11.443623 C				
0.00001875	2366.	126182592.	10.0852613	0.0001891	-0.000486
0.7489100	-11.839998 C				
0.00001938	2366.	122112186.	10.0823966	0.0001953	-0.000502
0.7723266	-12.236274 C				
0.00002000	2366.	118296180.	10.0798824	0.0002016	-0.000518
0.7956716	-12.632450 C				
0.00002063	2366.	114711448.	10.0776874	0.0002079	-0.000535
0.8189449	-13.028526 C				
0.00002125	2366.	111337582.	10.0757837	0.0002141	-0.000551
0.8421464	-13.424502 C				
0.00002188	2366.	108156508.	10.0741470	0.0002204	-0.000567
0.8652759	-13.820378 C				
0.00002250	2366.	105152160.	10.0727554	0.0002266	-0.000583
0.8883333	-14.216153 C				
0.00002313	2366.	102310210.	10.0715894	0.0002329	-0.000600
0.9113187	-14.611828 C				
0.00002375	2366.	99617836.	10.0706317	0.0002392	-0.000616
0.9342318	-15.007401 C				
0.00002438	2366.	97063533.	10.0698667	0.0002455	-0.000632
0.9570725	-15.402873 C				
0.00002563	2436.	95048091.	10.0688598	0.0002580	-0.000664
1.0025364	-16.193510 C				
0.00002688	2551.	94928657.	10.0684718	0.0002706	-0.000697
1.0477096	-16.983738 C				
0.00002813	2667.	94815115.	10.0686232	0.0002832	-0.000729
1.0925912	-17.773555 C				
0.00002938	2782.	94706690.	10.0692479	0.0002958	-0.000762
1.1371802	-18.562957 C				
0.00003063	2897.	94602733.	10.0703211	0.0003084	-0.000794
1.1814759	-19.351942 C				

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0.00003188	3012.	94502697.	10.0717368	0.0003210	-0.000826
1.2254772	-20.140508 C				
0.00003313	3127.	94406117.	10.0734845	0.0003337	-0.000859
1.2691834	-20.928652 C				
0.00003438	3242.	94312597.	10.0755306	0.0003463	-0.000891
1.3125933	-21.716373 C				
0.00003563	3357.	94221794.	10.0778462	0.0003590	-0.000923
1.3557063	-22.503666 C				
0.00003688	3471.	94133413.	10.0804061	0.0003717	-0.000956
1.3985212	-23.290530 C				
0.00003813	3586.	94047197.	10.0831888	0.0003844	-0.000988
1.4410372	-24.076963 C				
0.00003938	3700.	93962921.	10.0861753	0.0003971	-0.001020
1.4832533	-24.862961 C				
0.00004063	3814.	93880388.	10.0893491	0.0004099	-0.001053
1.5251686	-25.648521 C				
0.00004188	3928.	93799425.	10.0926956	0.0004226	-0.001085
1.5667821	-26.433642 C				
0.00004313	4042.	93719877.	10.0962019	0.0004354	-0.001117
1.6080927	-27.218321 C				
0.00004438	4155.	93641609.	10.0998566	0.0004482	-0.001149
1.6490996	-28.002554 C				
0.00004563	4269.	93564497.	10.1036497	0.0004610	-0.001182
1.6898018	-28.786339 C				
0.00004688	4382.	93488434.	10.1075722	0.0004738	-0.001214
1.7301982	-29.569674 C				
0.00004813	4496.	93413321.	10.1116159	0.0004866	-0.001246
1.7702878	-30.352554 C				
0.00004938	4609.	93339070.	10.1157737	0.0004995	-0.001278
1.8100696	-31.134978 C				
0.00005063	4722.	93265602.	10.1200391	0.0005123	-0.001310
1.8495425	-31.916943 C				
0.00005188	4834.	93192845.	10.1244063	0.0005252	-0.001342
1.8887057	-32.698446 C				
0.00005313	4947.	93120733.	10.1288700	0.0005381	-0.001374
1.9275579	-33.479483 C				
0.00005438	5060.	93049206.	10.1334255	0.0005510	-0.001406
1.9660981	-34.260052 C				
0.00005563	5172.	92978211.	10.1380684	0.0005639	-0.001439
2.0043253	-35.040149 C				
0.00005688	5284.	92907697.	10.1427948	0.0005769	-0.001471
2.0422384	-35.819772 C				
0.00005813	5396.	92837619.	10.1476012	0.0005898	-0.001503
2.0798362	-36.598918 C				
0.00005938	5508.	92767935.	10.1524844	0.0006028	-0.001535
2.1171178	-37.377583 C				
0.00006063	5620.	92698606.	10.1574414	0.0006158	-0.001567
2.1540819	-38.155764 C				
0.00006188	5731.	92629597.	10.1624696	0.0006288	-0.001599
2.1907275	-38.933458 C				

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0.00006313	5843.	92560874.	10.1675664	0.0006418	-0.001631
2.2270535	-39.710662 C				
0.00006438	5954.	92492407.	10.1727297	0.0006549	-0.001663
2.2630586	-40.487373 C				
0.00006563	6065.	92424168.	10.1779574	0.0006679	-0.001695
2.2987417	-41.263586 C				
0.00006688	6176.	92356130.	10.1832476	0.0006810	-0.001726
2.3341018	-42.039299 C				
0.00006813	6287.	92288268.	10.1885986	0.0006941	-0.001758
2.3691375	-42.814509 C				
0.00006938	6398.	92220560.	10.1940089	0.0007072	-0.001790
2.4038477	-43.589211 C				
0.00007063	6508.	92152983.	10.1995039	0.0007203	-0.001822
2.4382312	-44.363403 C				
0.00007188	6619.	92085519.	10.2050285	0.0007335	-0.001854
2.4722868	-45.137081 C				
0.00007313	6729.	92018147.	10.2106084	0.0007467	-0.001886
2.5060133	-45.910241 C				
0.00007438	6839.	91950850.	10.2162424	0.0007598	-0.001918
2.5394094	-46.682880 C				
0.00007938	7277.	91682087.	10.2393011	0.0008127	-0.002045
2.6696649	-49.768146 C				
0.00008438	7713.	91413389.	10.2630109	0.0008659	-0.002172
2.7945082	-52.845065 C				
0.00008938	8146.	91144431.	10.2866786	0.0009194	-0.002298
2.9137126	-55.915279 C				
0.00009438	8576.	90874234.	10.3110673	0.0009731	-0.002424
3.0273448	-58.976728 C				
0.00009938	8985.	90417533.	10.3290580	0.0010265	-0.002551
3.1339327	-60.000000 CY				
0.0001044	9311.	89207952.	10.3175636	0.0010769	-0.002681
3.2289512	-60.000000 CY				
0.0001094	9552.	87336121.	10.2781631	0.0011242	-0.002813
3.3128936	-60.000000 CY				
0.0001144	9789.	85583430.	10.2421143	0.0011714	-0.002946
3.3919789	-60.000000 CY				
0.0001194	10011.	83861611.	10.2051482	0.0012182	-0.003079
3.4655044	-60.000000 CY				
0.0001244	10162.	81702300.	10.1438002	0.0012616	-0.003216
3.5293615	-60.000000 CY				
0.0001294	10295.	79572057.	10.0817619	0.0013043	-0.003353
3.5881988	-60.000000 CY				
0.0001344	10427.	77592674.	10.0256713	0.0013472	-0.003490
3.6433355	-60.000000 CY				
0.0001394	10557.	75747771.	9.9749147	0.0013903	-0.003627
3.6947252	-60.000000 CY				
0.0001444	10687.	74023236.	9.9289636	0.0014335	-0.003764
3.7423201	-60.000000 CY				
0.0001494	10816.	72406063.	9.8867661	0.0014768	-0.003901
3.7859739	-60.000000 CY				

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0.0001544	10933.	70821400.	9.8425115	0.0015194	-0.004038
3.8249324	-60.000000 CY				
0.0001594	11017.	69123456.	9.7867573	0.0015598	-0.004178
3.8581753	-60.000000 CY				
0.0001644	11079.	67401534.	9.7260868	0.0015987	-0.004319
3.8869352	-60.000000 CY				
0.0001694	11139.	65767574.	9.6691048	0.0016377	-0.004460
3.9124557	-60.000000 CY				
0.0001744	11199.	64223403.	9.6148605	0.0016766	-0.004601
3.9348020	-60.000000 CY				
0.0001794	11258.	62761436.	9.5654896	0.0017158	-0.004742
3.9539345	-60.000000 CY				
0.0001844	11316.	61373390.	9.5189681	0.0017551	-0.004882
3.9697370	-60.000000 CY				
0.0001894	11373.	60052811.	9.4743244	0.0017942	-0.005023
3.9821950	-60.000000 CY				
0.0001944	11429.	58796578.	9.4331695	0.0018336	-0.005164
3.9914019	-60.000000 CY				
0.0001994	11484.	57599778.	9.3948139	0.0018731	-0.005304
3.9973136	-60.000000 CY				
0.0002044	11539.	56457972.	9.3581635	0.0019126	-0.005445
3.9998845	-60.000000 CY				
0.0002094	11592.	55366642.	9.3266817	0.0019528	-0.005585
3.9975630	-60.000000 CY				
0.0002144	11645.	54322678.	9.2959142	0.0019928	-0.005725
3.9999044	-60.000000 CY				
0.0002194	11698.	53322120.	9.2675435	0.0020331	-0.005864
3.9971169	-60.000000 CY				
0.0002244	11748.	52356977.	9.2405172	0.0020733	-0.006004
3.9997515	-60.000000 CY				
0.0002294	11794.	51418840.	9.2141042	0.0021135	-0.006144
3.9957066	-60.000000 CY				
0.0002344	11831.	50480617.	9.1845645	0.0021526	-0.006285
3.9990577	-60.000000 CY				
0.0002394	11864.	49560513.	9.1526832	0.0021909	-0.006427
3.9990468	-60.000000 CY				
0.0002444	11885.	48632992.	9.1162023	0.0022278	-0.006570
3.9966747	-60.000000 CY				
0.0002494	11904.	47735462.	9.0796192	0.0022642	-0.006713
3.9992545	-60.000000 CY				
0.0002544	11921.	46863378.	9.0457647	0.0023010	-0.006856
3.9991650	-60.000000 CY				
0.0002594	11937.	46022914.	9.0128664	0.0023377	-0.007000
3.9956629	-60.000000 CY				
0.0002644	11953.	45213284.	8.9816750	0.0023745	-0.007143
3.9986069	-60.000000 CY				
0.0002694	11969.	44432753.	8.9518321	0.0024114	-0.007286
3.9999247	-60.000000 CY				
0.0002744	11984.	43679063.	8.9240509	0.0024485	-0.007429
3.9940409	-60.000000 CY				

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0.0003044	12070.	39655848.	8.7807001	0.0026726	-0.008285
3.9985866	-60.000000 CY				
0.0003344	12146.	36325110.	8.6675807	0.0028982	-0.009139
3.9998625	-60.000000 CY				
0.0003644	12216.	33525083.	8.5838110	0.0031277	-0.009990
3.9999751	-60.000000 CYT				
0.0003944	12280.	31137740.	8.5203443	0.0033602	-0.010837
3.9996828	-60.000000 CYT				
0.0004244	12339.	29075625.	8.4715220	0.0035951	-0.011682
3.9974037	-60.000000 CYT				
0.0004544	12385.	27257253.	8.4224181	0.0038269	-0.012531
3.9878351	-60.000000 CYT				

 Summary of Results for Nominal 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 Tens. No. Strain	Axial Thrust kips	Nominal Mom. Cap. in-kip	Max. Comp. Strain	Max.
----	-----	-----	-----	
1 -0.00952396	3.800	12169.214	0.00300000	
2 -0.00952020	4.200	12173.120	0.00300000	
3 -0.00951645	4.600	12177.027	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 (0.75).

The above values should be multiplied by the appropriate strength reduction factor to compute ultimate moment capacity according to ACI 318, 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 Stiff.	Resist.	Nominal	Nominal	Ult. (Fac)	Ult. (Fac)	Bend.
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Load Ult Mom No. kip-in ²	Factor	Ax. Thrust kips	Moment Cap in-kips	Ax. Thrust kips	Moment Cap in-kips	at
1 91219895.	0.65	3.800000	12169.	2.470000	7910.	
2 91253873.	0.65	4.200000	12173.	2.730000	7913.	
3 91287886.	0.65	4.600000	12177.	2.990000	7915.	
1 89806706.	0.75	3.800000	12169.	2.850000	9127.	
2 89838295.	0.75	4.200000	12173.	3.150000	9130.	
3 89869877.	0.75	4.600000	12177.	3.450000	9133.	
1 70221645.	0.90	3.800000	12169.	3.420000	10952.	
2 70254444.	0.90	4.200000	12173.	3.780000	10956.	
3 70287179.	0.90	4.600000	12177.	4.140000	10959.	

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	1.0000	0.00	N.A.	No	0.00	8859.
2	4.0000	0.2172	No	No	8859.	110291.
3	6.5000	2.7148	Yes	No	119150.	125901.
4	10.3000	9.3000	No	No	245051.	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.

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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 = 1000.0 lbs
 Applied moment at pile head = 315600.0 in-lbs
 Axial thrust load on pile head = 4200.0 lbs

Depth Res.	Soil X Es*H feet lb/inch	Deflect. Spr. y Lat. inches lb/inch	Bending Distrib. Moment in-lbs lb/inch	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness lb-in^2	Soil p
0.00	0.00	0.00615	315600.	1000.0000	-1.12E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.09000	0.00	0.00603	316681.	1000.	-1.11E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.1800	0.00	0.00591	317761.	1000.	-1.10E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.2700	0.00	0.00580	318842.	1000.0000	-1.09E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.3600	0.00	0.00568	319922.	1000.0000	-1.08E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.4500	0.00	0.00556	321002.	1000.0000	-1.07E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.5400	0.00	0.00545	322083.	1000.0000	-1.06E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.6300	0.00	0.00533	323163.	1000.0000	-1.06E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.7200	0.00	0.00522	324244.	1000.0000	-1.05E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.8100	0.00	0.00511	325324.	1000.0000	-1.04E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.9000	0.00	0.00499	326405.	1000.0000	-1.03E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
0.9900	0.00	0.00488	327485.	1000.0000	-1.02E-04	0.00	3.84E+11	
0.00	0.00	0.00	0.00					
1.0800	0.00	0.00477	328566.	992.8819	-1.01E-04	0.00	3.84E+11	
-13.182		2982.	0.00					
1.1700	0.00	0.00467	329631.	978.5834	-1.00E-04	0.00	3.84E+11	
-13.297		3078.	0.00					

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1.2600	0.00456	330680.	964.1624	-9.92E-05	0.00	3.84E+11
-13.408	3177.	0.00				
1.3500	0.00445	331714.	949.6233	-9.82E-05	0.00	3.84E+11
-13.516	3279.	0.00				
1.4400	0.00435	332733.	934.9704	-9.73E-05	0.00	3.84E+11
-13.619	3385.	0.00				
1.5300	0.00424	333735.	920.2080	-9.64E-05	0.00	3.84E+11
-13.718	3494.	0.00				
1.6200	0.00414	334721.	905.3408	-9.54E-05	0.00	3.84E+11
-13.813	3606.	0.00				
1.7100	0.00403	335691.	890.3732	-9.45E-05	0.00	3.84E+11
-13.904	3722.	0.00				
1.8000	0.00393	336645.	875.3098	-9.35E-05	0.00	3.84E+11
-13.991	3842.	0.00				
1.8900	0.00383	337583.	860.1552	-9.26E-05	0.00	3.84E+11
-14.073	3966.	0.00				
1.9800	0.00373	338504.	844.9141	-9.16E-05	0.00	3.84E+11
-14.151	4094.	0.00				
2.0700	0.00363	339409.	829.5914	-9.07E-05	0.00	3.84E+11
-14.224	4226.	0.00				
2.1600	0.00354	340297.	814.1919	-8.97E-05	0.00	3.84E+11
-14.293	4364.	0.00				
2.2500	0.00344	341168.	798.7204	-8.88E-05	0.00	3.84E+11
-14.358	4506.	0.00				
2.3400	0.00335	342023.	783.1821	-8.78E-05	0.00	3.84E+11
-14.417	4654.	0.00				
2.4300	0.00325	342860.	767.5819	-8.68E-05	0.00	3.84E+11
-14.472	4807.	0.00				
2.5200	0.00316	343681.	751.9250	-8.59E-05	0.00	3.84E+11
-14.522	4966.	0.00				
2.6100	0.00307	344485.	736.2166	-8.49E-05	0.00	3.84E+11
-14.567	5132.	0.00				
2.7000	0.00297	345272.	720.4622	-8.39E-05	0.00	3.84E+11
-14.608	5303.	0.00				
2.7900	0.00288	346042.	704.6671	-8.30E-05	0.00	3.84E+11
-14.643	5482.	0.00				
2.8800	0.00280	346795.	688.8368	-8.20E-05	0.00	3.84E+11
-14.673	5669.	0.00				
2.9700	0.00271	347531.	672.9771	-8.10E-05	0.00	3.84E+11
-14.697	5863.	0.00				
3.0600	0.00262	348250.	657.0936	-8.00E-05	0.00	3.84E+11
-14.717	6065.	0.00				
3.1500	0.00253	348951.	641.1922	-7.91E-05	0.00	3.84E+11
-14.730	6277.	0.00				
3.2400	0.00245	349635.	625.2789	-7.81E-05	0.00	3.84E+11
-14.739	6498.	0.00				
3.3300	0.00237	350302.	609.3600	-7.71E-05	0.00	3.84E+11
-14.741	6729.	0.00				
3.4200	0.00228	350952.	593.4416	-7.61E-05	0.00	3.84E+11
-14.738	6971.	0.00				

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3.5100	0.00220	351585.	577.5302	-7.51E-05	0.00	3.84E+11
-14.728	7225.	0.00				
3.6000	0.00212	352200.	561.6325	-7.41E-05	0.00	3.84E+11
-14.712	7492.	0.00				
3.6900	0.00204	352799.	545.7551	-7.32E-05	0.00	3.84E+11
-14.690	7772.	0.00				
3.7800	0.00196	353380.	529.9052	-7.22E-05	0.00	3.84E+11
-14.662	8067.	0.00				
3.8700	0.00189	353944.	514.0898	-7.12E-05	0.00	3.84E+11
-14.626	8378.	0.00				
3.9600	0.00181	354491.	498.3163	-7.02E-05	0.00	3.84E+11
-14.584	8706.	0.00				
4.0500	0.00173	355021.	246.0385	-6.92E-05	0.00	3.84E+11
-452.597	281915.	0.00				
4.1400	0.00166	355023.	-241.450	-6.82E-05	0.00	3.84E+11
-450.160	292927.	0.00				
4.2300	0.00159	354500.	-726.224	-6.72E-05	0.00	3.84E+11
-447.569	304658.	0.00				
4.3200	0.00151	353455.	-1208.	-6.62E-05	0.00	3.84E+11
-444.819	317182.	0.00				
4.4100	0.00144	351891.	-1687.	-6.52E-05	0.00	3.84E+11
-441.900	330586.	0.00				
4.5000	0.00137	349812.	-2163.	-6.42E-05	0.00	3.84E+11
-438.805	344967.	0.00				
4.5900	0.00130	347221.	-2635.	-6.32E-05	0.00	3.84E+11
-435.522	360441.	0.00				
4.6800	0.00124	344122.	-3103.	-6.23E-05	0.00	3.84E+11
-432.039	377142.	0.00				
4.7700	0.00117	340518.	-3568.	-6.13E-05	0.00	3.84E+11
-428.344	395229.	0.00				
4.8600	0.00110	336416.	-4028.	-6.03E-05	0.00	3.84E+11
-424.421	414891.	0.00				
4.9500	0.00104	331818.	-4484.	-5.94E-05	0.00	3.84E+11
-420.251	436353.	0.00				
5.0400	9.76E-04	326730.	-4936.	-5.85E-05	0.00	3.84E+11
-415.814	459890.	0.00				
5.1300	9.14E-04	321157.	-5382.	-5.76E-05	0.00	3.84E+11
-411.085	485838.	0.00				
5.2200	8.52E-04	315105.	-5824.	-5.67E-05	0.00	3.84E+11
-406.035	514609.	0.00				
5.3100	7.91E-04	308579.	-6259.	-5.58E-05	0.00	3.85E+11
-400.631	546726.	0.00				
5.4000	7.32E-04	301585.	-6689.	-5.49E-05	0.00	3.85E+11
-394.830	582850.	0.00				
5.4900	6.73E-04	294131.	-7101.	-5.41E-05	0.00	3.85E+11
-368.698	591913.	0.00				
5.5800	6.15E-04	286247.	-7483.	-5.33E-05	0.00	3.85E+11
-338.596	594865.	0.00				
5.6700	5.58E-04	277969.	-7833.	-5.25E-05	0.00	3.85E+11
-308.656	597815.	0.00				

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5.7600	5.01E-04	269330.	-8150.	-5.17E-05	0.00	3.85E+11
-278.872	600763.	0.00				
5.8500	4.46E-04	260366.	-8435.	-5.10E-05	0.00	3.85E+11
-249.237	603710.	0.00				
5.9400	3.91E-04	251111.	-8688.	-5.03E-05	0.00	3.85E+11
-219.742	606654.	0.00				
6.0300	3.37E-04	241599.	-8910.	-4.96E-05	0.00	3.85E+11
-190.377	609598.	0.00				
6.1200	2.84E-04	231866.	-9099.	-4.89E-05	0.00	3.85E+11
-161.134	612539.	0.00				
6.2100	2.32E-04	221945.	-9258.	-4.83E-05	0.00	3.85E+11
-132.002	615480.	0.00				
6.3000	1.80E-04	211870.	-9385.	-4.77E-05	0.00	3.85E+11
-102.969	618419.	0.00				
6.3900	1.29E-04	201675.	-9480.	-4.71E-05	0.00	3.85E+11
-74.023	621357.	0.00				
6.4800	7.81E-05	191393.	-9545.	-4.65E-05	0.00	3.85E+11
-45.152	624293.	0.00				
6.5700	2.81E-05	181059.	-9578.	-4.60E-05	0.00	3.85E+11
-16.341	627153.	0.00				
6.6600	-2.13E-05	170705.	-9580.	-4.55E-05	0.00	3.85E+11
12.4160	630093.	0.00				
6.7500	-7.02E-05	160366.	-9551.	-4.51E-05	0.00	3.85E+11
41.1387	633032.	0.00				
6.8400	-1.19E-04	150075.	-9491.	-4.46E-05	0.00	3.85E+11
69.8412	635971.	0.00				
6.9300	-1.67E-04	139866.	-9400.	-4.42E-05	0.00	3.85E+11
98.5380	638908.	0.00				
7.0200	-2.14E-04	129772.	-9278.	-4.38E-05	0.00	3.85E+11
127.2436	641845.	0.00				
7.1100	-2.61E-04	119825.	-9125.	-4.35E-05	0.00	3.85E+11
155.9726	644780.	0.00				
7.2000	-3.08E-04	110061.	-8941.	-4.32E-05	0.00	3.85E+11
184.7400	647716.	0.00				
7.2900	-3.54E-04	100513.	-8726.	-4.29E-05	0.00	3.85E+11
213.5605	650650.	0.00				
7.3800	-4.01E-04	91213.	-8480.	-4.26E-05	0.00	3.85E+11
242.4487	653584.	0.00				
7.4700	-4.46E-04	82196.	-8202.	-4.24E-05	0.00	3.85E+11
271.4194	656517.	0.00				
7.5600	-4.92E-04	73496.	-7894.	-4.21E-05	0.00	3.85E+11
300.4868	659450.	0.00				
7.6500	-5.38E-04	65146.	-7553.	-4.19E-05	0.00	3.85E+11
329.6651	662382.	0.00				
7.7400	-5.83E-04	57181.	-7182.	-4.18E-05	0.00	3.85E+11
358.9679	665314.	0.00				
7.8300	-6.28E-04	49635.	-6778.	-4.16E-05	0.00	3.85E+11
388.4086	668245.	0.00				
7.9200	-6.73E-04	42541.	-6342.	-4.15E-05	0.00	3.85E+11
417.9999	671176.	0.00				

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8.0100	-7.17E-04	35935.	-5875.	-4.14E-05	0.00	3.85E+11
447.7538	674106.	0.00				
8.1000	-7.62E-04	29852.	-5386.	-4.13E-05	0.00	3.85E+11
458.4235	649740.	0.00				
8.1900	-8.07E-04	24303.	-4886.	-4.12E-05	0.00	3.85E+11
467.0001	625338.	0.00				
8.2800	-8.51E-04	19298.	-4377.	-4.12E-05	0.00	3.85E+11
475.3540	603260.	0.00				
8.3700	-8.95E-04	14849.	-3859.	-4.11E-05	0.00	3.85E+11
483.5089	583174.	0.00				
8.4600	-9.40E-04	10963.	-3333.	-4.11E-05	0.00	3.85E+11
491.4852	564808.	0.00				
8.5500	-9.84E-04	7650.	-2798.	-4.10E-05	0.00	3.85E+11
499.3006	547939.	0.00				
8.6400	-0.00103	4920.	-2254.	-4.10E-05	0.00	3.85E+11
506.9700	532384.	0.00				
8.7300	-0.00107	2781.	-1703.	-4.10E-05	0.00	3.85E+11
514.5065	517987.	0.00				
8.8200	-0.00112	1243.	-1143.	-4.10E-05	0.00	3.85E+11
521.9215	504618.	0.00				
8.9100	-0.00116	312.6574	-575.451	-4.10E-05	0.00	3.85E+11
529.2250	492167.	0.00				
9.0000	-0.00121	0.00	0.00	-4.10E-05	0.00	3.85E+11
536.4255	240270.	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	=	0.00615365 inches
Computed slope at pile head	=	-0.0001119 radians
Maximum bending moment	=	355023. inch-lbs
Maximum shear force	=	-9580. lbs
Depth of maximum bending moment	=	4.14000000 feet below pile head
Depth of maximum shear force	=	6.66000000 feet below pile head
Number of iterations	=	11
Number of zero deflection points	=	1
Pile deflection at ground	=	0.00487120 inches

 Pile-head Deflection vs. Pile Length for Load Case 1

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Boundary Condition Type 1, Shear and Moment

Shear = 1000. lbs
 Moment = 315600. in-lbs
 Axial Load = 4200. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	0.00615365	355023.	-9580.
8.55000	0.00893972	353195.	-10936.
8.10000	0.01805349	350598.	-12597.
7.65000	0.04285864	346317.	-14146.
7.20000	0.10953642	341131.	-15620.
6.75000	0.35358506	337438.	-17510.
6.30000	1.21862964	335710.	-19609.
5.85000	6.13154690	340997.	-23086.

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

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

Shear force at pile head = 2250.0 lbs
 Applied moment at pile head = 724800.0 in-lbs
 Axial thrust load on pile head = 4600.0 lbs

Depth Res. Soil X Es*H feet lb/inch	Deflect. Spr. y Lat. Load inches lb/inch	Bending Distrib. Moment in-lbs lb/inch	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness lb-in^2	Soil p
0.00	0.08583	724800.	2250.	-0.00115	0.00	3.83E+11	
0.00	0.00	0.00					
0.09000	0.08459	727236.	2250.	-0.00115	0.00	3.83E+11	
0.00	0.00	0.00					
0.1800	0.08335	729671.	2250.	-0.00115	0.00	3.83E+11	
0.00	0.00	0.00					
0.2700	0.08211	732107.	2250.	-0.00114	0.00	3.83E+11	
0.00	0.00	0.00					
0.3600	0.08088	734543.	2250.	-0.00114	0.00	3.83E+11	

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0.00	0.00	0.00				
0.4500	0.07965	736978.	2250.	-0.00114	0.00	3.83E+11
0.00	0.00	0.00				
0.5400	0.07842	739414.	2250.	-0.00114	0.00	3.83E+11
0.00	0.00	0.00				
0.6300	0.07719	741850.	2250.	-0.00114	0.00	3.83E+11
0.00	0.00	0.00				
0.7200	0.07596	744285.	2250.	-0.00113	0.00	3.83E+11
0.00	0.00	0.00				
0.8100	0.07474	746721.	2250.	-0.00113	0.00	3.83E+11
0.00	0.00	0.00				
0.9000	0.07352	749157.	2250.	-0.00113	0.00	3.83E+11
0.00	0.00	0.00				
0.9900	0.07230	751592.	2250.	-0.00113	0.00	3.83E+11
0.00	0.00	0.00				
1.0800	0.07108	754028.	2233.	-0.00113	0.00	3.83E+11
-32.403	492.3126	0.00				
1.1700	0.06987	756426.	2197.	-0.00112	0.00	3.83E+11
-32.750	506.2238	0.00				
1.2600	0.06866	758785.	2162.	-0.00112	0.00	3.83E+11
-33.088	520.4838	0.00				
1.3500	0.06745	761106.	2126.	-0.00112	0.00	3.83E+11
-33.419	535.1078	0.00				
1.4400	0.06624	763388.	2090.	-0.00112	0.00	3.83E+11
-33.741	550.1115	0.00				
1.5300	0.06504	765631.	2053.	-0.00111	0.00	3.83E+11
-34.054	565.5120	0.00				
1.6200	0.06383	767834.	2016.	-0.00111	0.00	3.83E+11
-34.359	581.3273	0.00				
1.7100	0.06263	769996.	1979.	-0.00111	0.00	3.83E+11
-34.656	597.5765	0.00				
1.8000	0.06144	772119.	1941.	-0.00111	0.00	3.83E+11
-34.943	614.2801	0.00				
1.8900	0.06024	774200.	1903.	-0.00111	0.00	3.83E+11
-35.221	631.4599	0.00				
1.9800	0.05905	776241.	1865.	-0.00110	0.00	3.83E+11
-35.490	649.1391	0.00				
2.0700	0.05786	778240.	1827.	-0.00110	0.00	3.83E+11
-35.750	667.3429	0.00				
2.1600	0.05667	780197.	1788.	-0.00110	0.00	3.83E+11
-35.999	686.0978	0.00				
2.2500	0.05548	782113.	1749.	-0.00110	0.00	3.83E+11
-36.239	705.4325	0.00				
2.3400	0.05430	783986.	1710.	-0.00109	0.00	3.83E+11
-36.468	725.3779	0.00				
2.4300	0.05312	785817.	1670.	-0.00109	0.00	3.83E+11
-36.688	745.9672	0.00				
2.5200	0.05194	787604.	1630.	-0.00109	0.00	3.83E+11
-36.896	767.2359	0.00				
2.6100	0.05076	789349.	1590.	-0.00109	0.00	3.83E+11

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-37.094	789.2226	0.00					
2.7000	0.04959	791050.	1550.	-0.00109	0.00	3.83E+11	
-37.280	811.9691	0.00					
2.7900	0.04841	792708.	1510.	-0.00108	0.00	3.83E+11	
-37.455	835.5205	0.00					
2.8800	0.04725	794323.	1469.	-0.00108	0.00	3.83E+11	
-37.618	859.9257	0.00					
2.9700	0.04608	795893.	1429.	-0.00108	0.00	3.83E+11	
-37.769	885.2380	0.00					
3.0600	0.04491	797419.	1388.	-0.00108	0.00	3.83E+11	
-37.907	911.5153	0.00					
3.1500	0.04375	798901.	1347.	-0.00107	0.00	3.83E+11	
-38.032	938.8210	0.00					
3.2400	0.04259	800339.	1306.	-0.00107	0.00	3.83E+11	
-38.144	967.2244	0.00					
3.3300	0.04143	801732.	1264.	-0.00107	0.00	3.83E+11	
-38.243	996.8013	0.00					
3.4200	0.04028	803081.	1223.	-0.00107	0.00	3.83E+11	
-38.327	1028.	0.00					
3.5100	0.03913	804385.	1182.	-0.00107	0.00	3.83E+11	
-38.396	1060.	0.00					
3.6000	0.03798	805644.	1140.	-0.00106	0.00	3.83E+11	
-38.451	1093.	0.00					
3.6900	0.03683	806858.	1099.	-0.00106	0.00	3.83E+11	
-38.489	1129.	0.00					
3.7800	0.03569	808027.	1057.	-0.00106	0.00	3.83E+11	
-38.512	1166.	0.00					
3.8700	0.03454	809152.	1015.	-0.00106	0.00	3.83E+11	
-38.517	1204.	0.00					
3.9600	0.03340	810231.	973.8188	-0.00105	0.00	3.83E+11	
-38.504	1245.	0.00					
4.0500	0.03227	811265.	446.0313	-0.00105	0.00	3.83E+11	
-938.880	31427.	0.00					
4.1400	0.03113	811205.	-566.219	-0.00105	0.00	3.83E+11	
-935.658	32461.	0.00					
4.2300	0.03000	810053.	-1575.	-0.00105	0.00	3.83E+11	
-932.117	33559.	0.00					
4.3200	0.02887	807814.	-2579.	-0.00105	0.00	3.83E+11	
-928.241	34728.	0.00					
4.4100	0.02774	804492.	-3580.	-0.00104	0.00	3.83E+11	
-924.012	35975.	0.00					
4.5000	0.02661	800092.	-4575.	-0.00104	0.00	3.83E+11	
-919.409	37309.	0.00					
4.5900	0.02549	794620.	-5565.	-0.00104	0.00	3.83E+11	
-914.408	38741.	0.00					
4.6800	0.02437	788081.	-6550.	-0.00104	0.00	3.83E+11	
-908.983	40281.	0.00					
4.7700	0.02325	780482.	-7528.	-0.00103	0.00	3.83E+11	
-903.105	41945.	0.00					
4.8600	0.02214	771830.	-8500.	-0.00103	0.00	3.83E+11	

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-896.740	43748.	0.00				
4.9500	0.02102	762132.	-9465.	-0.00103	0.00	3.83E+11
-889.849	45711.	0.00				
5.0400	0.01991	751395.	-10422.	-0.00103	0.00	3.83E+11
-882.390	47856.	0.00				
5.1300	0.01880	739630.	-11371.	-0.00103	0.00	3.83E+11
-874.310	50214.	0.00				
5.2200	0.01770	726845.	-12310.	-0.00102	0.00	3.83E+11
-865.552	52818.	0.00				
5.3100	0.01659	713050.	-13240.	-0.00102	0.00	3.83E+11
-856.045	55714.	0.00				
5.4000	0.01549	698256.	-14159.	-0.00102	0.00	3.83E+11
-845.709	58957.	0.00				
5.4900	0.01439	682477.	-15066.	-0.00102	0.00	3.83E+11
-834.445	62617.	0.00				
5.5800	0.01329	665724.	-15961.	-0.00102	0.00	3.84E+11
-822.136	66788.	0.00				
5.6700	0.01220	648011.	-16841.	-0.00101	0.00	3.84E+11
-808.634	71593.	0.00				
5.7600	0.01110	629356.	-17707.	-0.00101	0.00	3.84E+11
-793.758	77198.	0.00				
5.8500	0.01001	609775.	-18555.	-0.00101	0.00	3.84E+11
-777.275	83839.	0.00				
5.9400	0.00892	589287.	-19385.	-0.00101	0.00	3.84E+11
-758.880	91855.	0.00				
6.0300	0.00783	567914.	-20193.	-0.00101	0.00	3.84E+11
-738.164	101758.	0.00				
6.1200	0.00675	545681.	-20977.	-0.00101	0.00	3.84E+11
-714.551	114365.	0.00				
6.2100	0.00566	522613.	-21734.	-0.00100	0.00	3.84E+11
-687.198	131058.	0.00				
6.3000	0.00458	498744.	-22459.	-0.00100	0.00	3.84E+11
-654.783	154415.	0.00				
6.3900	0.00350	474112.	-23145.	-0.00100	0.00	3.84E+11
-615.030	189898.	0.00				
6.4800	0.00242	448762.	-23781.	-1.00E-03	0.00	3.84E+11
-563.421	251706.	0.00				
6.5700	0.00134	422754.	-24349.	-9.98E-04	0.00	3.84E+11
-488.232	393946.	0.00				
6.6600	2.61E-04	396178.	-24695.	-9.97E-04	0.00	3.84E+11
-152.141	630093.	0.00				
6.7500	-8.16E-04	369424.	-24542.	-9.96E-04	0.00	3.84E+11
435.4516	576522.	0.00				
6.8400	-0.00189	343177.	-24015.	-9.95E-04	0.00	3.84E+11
539.8014	308275.	0.00				
6.9300	-0.00297	317561.	-23396.	-9.94E-04	0.00	3.84E+11
606.8426	221007.	0.00				
7.0200	-0.00404	292652.	-22713.	-9.93E-04	0.00	3.85E+11
658.5786	176106.	0.00				
7.1100	-0.00511	268511.	-21978.	-9.93E-04	0.00	3.85E+11

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701.7110	148268.	0.00				
7.2000	-0.00618	245189.	-21200.	-9.92E-04	0.00	3.85E+11
739.2593	129128.	0.00				
7.2900	-0.00725	222729.	-20383.	-9.91E-04	0.00	3.85E+11
772.8643	115067.	0.00				
7.3800	-0.00832	201171.	-19532.	-9.91E-04	0.00	3.85E+11
803.5244	104251.	0.00				
7.4700	-0.00939	180549.	-18649.	-9.90E-04	0.00	3.85E+11
831.8958	95642.	0.00				
7.5600	-0.01046	160899.	-17736.	-9.90E-04	0.00	3.85E+11
858.4345	88609.	0.00				
7.6500	-0.01153	142249.	-16796.	-9.89E-04	0.00	3.85E+11
883.4710	82742.	0.00				
7.7400	-0.01260	124630.	-15829.	-9.89E-04	0.00	3.85E+11
907.2532	77766.	0.00				
7.8300	-0.01367	108069.	-14837.	-9.89E-04	0.00	3.85E+11
929.9718	73485.	0.00				
7.9200	-0.01474	92593.	-13820.	-9.88E-04	0.00	3.85E+11
951.7771	69760.	0.00				
8.0100	-0.01580	78227.	-12781.	-9.88E-04	0.00	3.85E+11
972.7895	66485.	0.00				
8.1000	-0.01687	64995.	-11720.	-9.88E-04	0.00	3.85E+11
993.1072	63581.	0.00				
8.1900	-0.01794	52922.	-10636.	-9.88E-04	0.00	3.85E+11
1013.	60986.	0.00				
8.2800	-0.01900	42030.	-9532.	-9.88E-04	0.00	3.85E+11
1032.	58651.	0.00				
8.3700	-0.02007	32342.	-8408.	-9.87E-04	0.00	3.85E+11
1051.	56539.	0.00				
8.4600	-0.02114	23880.	-7263.	-9.87E-04	0.00	3.85E+11
1069.	54618.	0.00				
8.5500	-0.02220	16664.	-6099.	-9.87E-04	0.00	3.85E+11
1087.	52862.	0.00				
8.6400	-0.02327	10716.	-4916.	-9.87E-04	0.00	3.85E+11
1104.	51251.	0.00				
8.7300	-0.02433	6055.	-3714.	-9.87E-04	0.00	3.85E+11
1121.	49766.	0.00				
8.8200	-0.02540	2703.	-2494.	-9.87E-04	0.00	3.85E+11
1138.	48393.	0.00				
8.9100	-0.02647	678.0417	-1256.	-9.87E-04	0.00	3.85E+11
1155.	47120.	0.00				
9.0000	-0.02753	0.00	0.00	-9.87E-04	0.00	3.85E+11
1171.	22967.	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.

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-19 (Boring B-011-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Output Summary for Load Case No. 2:

Pile-head deflection	=	0.08583101 inches
Computed slope at pile head	=	-0.0011503 radians
Maximum bending moment	=	811265. inch-lbs
Maximum shear force	=	-24695. lbs
Depth of maximum bending moment	=	4.05000000 feet below pile head
Depth of maximum shear force	=	6.66000000 feet below pile head
Number of iterations	=	32
Number of zero deflection points	=	1
Pile deflection at ground	=	0.07216518 inches

Pile-head Deflection vs. Pile Length for Load Case 2

Boundary Condition Type 1, Shear and Moment

Shear	=	2250. lbs
Moment	=	724800. in-lbs
Axial Load	=	4600. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	0.08583101	811265.	-24695.
8.55000	0.16845467	804636.	-26567.
8.10000	0.40387037	796397.	-29145.
7.65000	1.02022706	787640.	-32082.
7.20000	2.68570847	781091.	-35412.
6.75000	9.68813330	786301.	-40874.

Computed Values of Pile Loading and Deflection
for Lateral Loading for Load Case Number 3

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

Shear force at pile head	=	2250.0 lbs
Applied moment at pile head	=	724800.0 in-lbs
Axial thrust load on pile head	=	3800.0 lbs

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area

Light Tower SC1-19 (Boring B-011-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Depth Res.	Soil X Es*H feet lb/inch	Deflect. Spr. y Lat. inches lb/inch	Bending Distrib. Moment Load in-lbs lb/inch	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness lb-in^2	Soil p
	0.00	0.08580	724800.	2250.	-0.00115	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
	0.09000	0.08456	727235.	2250.	-0.00115	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
	0.1800	0.08332	729669.	2250.	-0.00115	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
	0.2700	0.08208	732104.	2250.	-0.00114	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
	0.3600	0.08085	734539.	2250.	-0.00114	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
	0.4500	0.07962	736973.	2250.	-0.00114	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
	0.5400	0.07839	739408.	2250.	-0.00114	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
	0.6300	0.07716	741843.	2250.	-0.00114	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
	0.7200	0.07594	744277.	2250.	-0.00113	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
	0.8100	0.07471	746712.	2250.	-0.00113	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
	0.9000	0.07349	749147.	2250.	-0.00113	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
	0.9900	0.07227	751581.	2250.	-0.00113	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
	1.0800	0.07106	754016.	2233.	-0.00112	0.00	3.83E+11	
-32.399	492.4350	0.00	0.00					
	1.1700	0.06984	756413.	2197.	-0.00112	0.00	3.83E+11	
-32.746	506.3498	0.00	0.00					
	1.2600	0.06863	758771.	2162.	-0.00112	0.00	3.83E+11	
-33.084	520.6135	0.00	0.00					
	1.3500	0.06742	761091.	2126.	-0.00112	0.00	3.83E+11	
-33.414	535.2412	0.00	0.00					
	1.4400	0.06622	763373.	2090.	-0.00112	0.00	3.83E+11	
-33.736	550.2488	0.00	0.00					
	1.5300	0.06501	765614.	2053.	-0.00111	0.00	3.83E+11	
-34.050	565.6533	0.00	0.00					
	1.6200	0.06381	767816.	2016.	-0.00111	0.00	3.83E+11	
-34.355	581.4726	0.00	0.00					
	1.7100	0.06261	769978.	1979.	-0.00111	0.00	3.83E+11	
-34.651	597.7260	0.00	0.00					
	1.8000	0.06141	772099.	1941.	-0.00111	0.00	3.83E+11	
-34.939	614.4338	0.00	0.00					

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1.8900	0.06022	774180.	1903.	-0.00111	0.00	3.83E+11
-35.217	631.6180	0.00				
1.9800	0.05902	776220.	1865.	-0.00110	0.00	3.83E+11
-35.486	649.3019	0.00				
2.0700	0.05783	778218.	1827.	-0.00110	0.00	3.83E+11
-35.745	667.5103	0.00				
2.1600	0.05665	780174.	1788.	-0.00110	0.00	3.83E+11
-35.995	686.2701	0.00				
2.2500	0.05546	782089.	1749.	-0.00110	0.00	3.83E+11
-36.234	705.6098	0.00				
2.3400	0.05428	783961.	1710.	-0.00109	0.00	3.83E+11
-36.464	725.5604	0.00				
2.4300	0.05310	785791.	1670.	-0.00109	0.00	3.83E+11
-36.683	746.1549	0.00				
2.5200	0.05192	787578.	1630.	-0.00109	0.00	3.83E+11
-36.891	767.4291	0.00				
2.6100	0.05074	789322.	1591.	-0.00109	0.00	3.83E+11
-37.089	789.4216	0.00				
2.7000	0.04957	791022.	1550.	-0.00109	0.00	3.83E+11
-37.275	812.1740	0.00				
2.7900	0.04840	792679.	1510.	-0.00108	0.00	3.83E+11
-37.450	835.7314	0.00				
2.8800	0.04723	794293.	1469.	-0.00108	0.00	3.83E+11
-37.613	860.1430	0.00				
2.9700	0.04606	795862.	1429.	-0.00108	0.00	3.83E+11
-37.764	885.4618	0.00				
3.0600	0.04490	797388.	1388.	-0.00108	0.00	3.83E+11
-37.902	911.7459	0.00				
3.1500	0.04373	798869.	1347.	-0.00107	0.00	3.83E+11
-38.027	939.0587	0.00				
3.2400	0.04258	800306.	1306.	-0.00107	0.00	3.83E+11
-38.140	967.4694	0.00				
3.3300	0.04142	801698.	1265.	-0.00107	0.00	3.83E+11
-38.238	997.0540	0.00				
3.4200	0.04026	803046.	1223.	-0.00107	0.00	3.83E+11
-38.322	1028.	0.00				
3.5100	0.03911	804349.	1182.	-0.00107	0.00	3.83E+11
-38.392	1060.	0.00				
3.6000	0.03796	805607.	1140.	-0.00106	0.00	3.83E+11
-38.446	1094.	0.00				
3.6900	0.03682	806821.	1099.	-0.00106	0.00	3.83E+11
-38.484	1129.	0.00				
3.7800	0.03567	807989.	1057.	-0.00106	0.00	3.83E+11
-38.507	1166.	0.00				
3.8700	0.03453	809113.	1016.	-0.00106	0.00	3.83E+11
-38.512	1205.	0.00				
3.9600	0.03339	810192.	973.9798	-0.00105	0.00	3.83E+11
-38.499	1245.	0.00				
4.0500	0.03225	811225.	446.2434	-0.00105	0.00	3.83E+11
-938.790	31436.	0.00				

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4.1400	0.03112	811164.	-565.910	-0.00105	0.00	3.83E+11
-935.568	32470.	0.00				
4.2300	0.02999	810012.	-1574.	-0.00105	0.00	3.83E+11
-932.028	33569.	0.00				
4.3200	0.02886	807772.	-2579.	-0.00104	0.00	3.83E+11
-928.152	34738.	0.00				
4.4100	0.02773	804450.	-3579.	-0.00104	0.00	3.83E+11
-923.924	35985.	0.00				
4.5000	0.02660	800050.	-4574.	-0.00104	0.00	3.83E+11
-919.321	37320.	0.00				
4.5900	0.02548	794578.	-5565.	-0.00104	0.00	3.83E+11
-914.320	38752.	0.00				
4.6800	0.02436	788039.	-6549.	-0.00104	0.00	3.83E+11
-908.896	40293.	0.00				
4.7700	0.02324	780440.	-7528.	-0.00103	0.00	3.83E+11
-903.018	41957.	0.00				
4.8600	0.02213	771788.	-8499.	-0.00103	0.00	3.83E+11
-896.654	43761.	0.00				
4.9500	0.02102	762090.	-9464.	-0.00103	0.00	3.83E+11
-889.764	45724.	0.00				
5.0400	0.01991	751354.	-10421.	-0.00103	0.00	3.83E+11
-882.305	47870.	0.00				
5.1300	0.01880	739589.	-11369.	-0.00103	0.00	3.83E+11
-874.226	50228.	0.00				
5.2200	0.01769	726805.	-12309.	-0.00102	0.00	3.83E+11
-865.469	52833.	0.00				
5.3100	0.01659	713010.	-13238.	-0.00102	0.00	3.83E+11
-855.963	55730.	0.00				
5.4000	0.01549	698218.	-14157.	-0.00102	0.00	3.83E+11
-845.628	58974.	0.00				
5.4900	0.01439	682439.	-15065.	-0.00102	0.00	3.83E+11
-834.366	62635.	0.00				
5.5800	0.01329	665687.	-15959.	-0.00102	0.00	3.84E+11
-822.057	66807.	0.00				
5.6700	0.01219	647976.	-16840.	-0.00101	0.00	3.84E+11
-808.557	71613.	0.00				
5.7600	0.01110	629322.	-17705.	-0.00101	0.00	3.84E+11
-793.683	77220.	0.00				
5.8500	0.01001	609742.	-18553.	-0.00101	0.00	3.84E+11
-777.201	83863.	0.00				
5.9400	0.00892	589256.	-19382.	-0.00101	0.00	3.84E+11
-758.809	91881.	0.00				
6.0300	0.00783	567884.	-20191.	-0.00101	0.00	3.84E+11
-738.094	101787.	0.00				
6.1200	0.00675	545652.	-20975.	-0.00100	0.00	3.84E+11
-714.484	114397.	0.00				
6.2100	0.00566	522586.	-21732.	-0.00100	0.00	3.84E+11
-687.134	131094.	0.00				
6.3000	0.00458	498719.	-22457.	-0.00100	0.00	3.84E+11
-654.723	154457.	0.00				

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6.3900	0.00350	474088.	-23142.	-0.00100	0.00	3.84E+11
-614.976	189949.	0.00				
6.4800	0.00242	448740.	-23779.	-9.99E-04	0.00	3.84E+11
-563.374	251770.	0.00				
6.5700	0.00134	422734.	-24346.	-9.98E-04	0.00	3.84E+11
-488.197	394032.	0.00				
6.6600	2.61E-04	396160.	-24692.	-9.97E-04	0.00	3.84E+11
-152.161	630093.	0.00				
6.7500	-8.15E-04	369407.	-24539.	-9.96E-04	0.00	3.84E+11
435.3904	576764.	0.00				
6.8400	-0.00189	343163.	-24013.	-9.95E-04	0.00	3.84E+11
539.7383	308383.	0.00				
6.9300	-0.00296	317548.	-23394.	-9.94E-04	0.00	3.84E+11
606.7756	221081.	0.00				
7.0200	-0.00404	292641.	-22710.	-9.93E-04	0.00	3.85E+11
658.5078	176162.	0.00				
7.1100	-0.00511	268502.	-21976.	-9.92E-04	0.00	3.85E+11
701.6368	148315.	0.00				
7.2000	-0.00618	245181.	-21198.	-9.92E-04	0.00	3.85E+11
739.1820	129168.	0.00				
7.2900	-0.00725	222723.	-20381.	-9.91E-04	0.00	3.85E+11
772.7841	115103.	0.00				
7.3800	-0.00832	201166.	-19530.	-9.90E-04	0.00	3.85E+11
803.4414	104283.	0.00				
7.4700	-0.00939	180546.	-18647.	-9.90E-04	0.00	3.85E+11
831.8102	95671.	0.00				
7.5600	-0.01046	160896.	-17734.	-9.89E-04	0.00	3.85E+11
858.3465	88636.	0.00				
7.6500	-0.01153	142247.	-16794.	-9.89E-04	0.00	3.85E+11
883.3807	82767.	0.00				
7.7400	-0.01259	124629.	-15827.	-9.88E-04	0.00	3.85E+11
907.1607	77790.	0.00				
7.8300	-0.01366	108069.	-14835.	-9.88E-04	0.00	3.85E+11
929.8772	73508.	0.00				
7.9200	-0.01473	92594.	-13819.	-9.88E-04	0.00	3.85E+11
951.6804	69781.	0.00				
8.0100	-0.01580	78228.	-12780.	-9.88E-04	0.00	3.85E+11
972.6908	66505.	0.00				
8.1000	-0.01686	64997.	-11718.	-9.87E-04	0.00	3.85E+11
993.0066	63600.	0.00				
8.1900	-0.01793	52924.	-10635.	-9.87E-04	0.00	3.85E+11
1013.	61004.	0.00				
8.2800	-0.01899	42033.	-9531.	-9.87E-04	0.00	3.85E+11
1032.	58669.	0.00				
8.3700	-0.02006	32345.	-8407.	-9.87E-04	0.00	3.85E+11
1051.	56556.	0.00				
8.4600	-0.02113	23883.	-7262.	-9.87E-04	0.00	3.85E+11
1069.	54635.	0.00				
8.5500	-0.02219	16667.	-6098.	-9.87E-04	0.00	3.85E+11
1087.	52878.	0.00				

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1104.	8.6400	-0.02326	10718.	-4915.	-9.87E-04	0.00	3.85E+11
	51266.	0.00					
1121.	8.7300	-0.02432	6057.	-3714.	-9.87E-04	0.00	3.85E+11
	49781.	0.00					
1138.	8.8200	-0.02539	2704.	-2494.	-9.87E-04	0.00	3.85E+11
	48408.	0.00					
1155.	8.9100	-0.02646	678.8275	-1256.	-9.87E-04	0.00	3.85E+11
	47134.	0.00					
1171.	9.0000	-0.02752	0.00	0.00	-9.87E-04	0.00	3.85E+11
	22974.	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. 3:

Pile-head deflection = 0.08579931 inches
 Computed slope at pile head = -0.0011499 radians
 Maximum bending moment = 811225. inch-lbs
 Maximum shear force = -24692. lbs
 Depth of maximum bending moment = 4.05000000 feet below pile head
 Depth of maximum shear force = 6.66000000 feet below pile head
 Number of iterations = 32
 Number of zero deflection points = 1
 Pile deflection at ground = 0.07213828 inches

 Pile-head Deflection vs. Pile Length for Load Case 3

Boundary Condition Type 1, Shear and Moment

Shear = 2250. lbs
 Moment = 724800. in-lbs
 Axial Load = 3800. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	0.08579931	811225.	-24692.
8.55000	0.16832785	804557.	-26562.

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8.10000	0.40313274	796206.	-29131.
7.65000	1.01550476	787203.	-32043.
7.20000	2.65277139	780060.	-35297.
6.75000	9.23443472	782377.	-40361.

 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	Load Type	Load 1	Load 2	Axial Loading	Pile-head Deflection	Pile-head Rotation	Max
No.		in-lbs	in-lb	lbs	inches	radians	in lbs
1	V, lb	1000.0000	M, in-lb	4200.	0.00615	-1.12E-04	
-9580.		355023.					
2	V, lb	2250.	M, in-lb	4600.	0.08583	-0.00115	
-24695.		811265.					
3	V, lb	2250.	M, in-lb	3800.	0.08580	-0.00115	
-24692.		811225.					

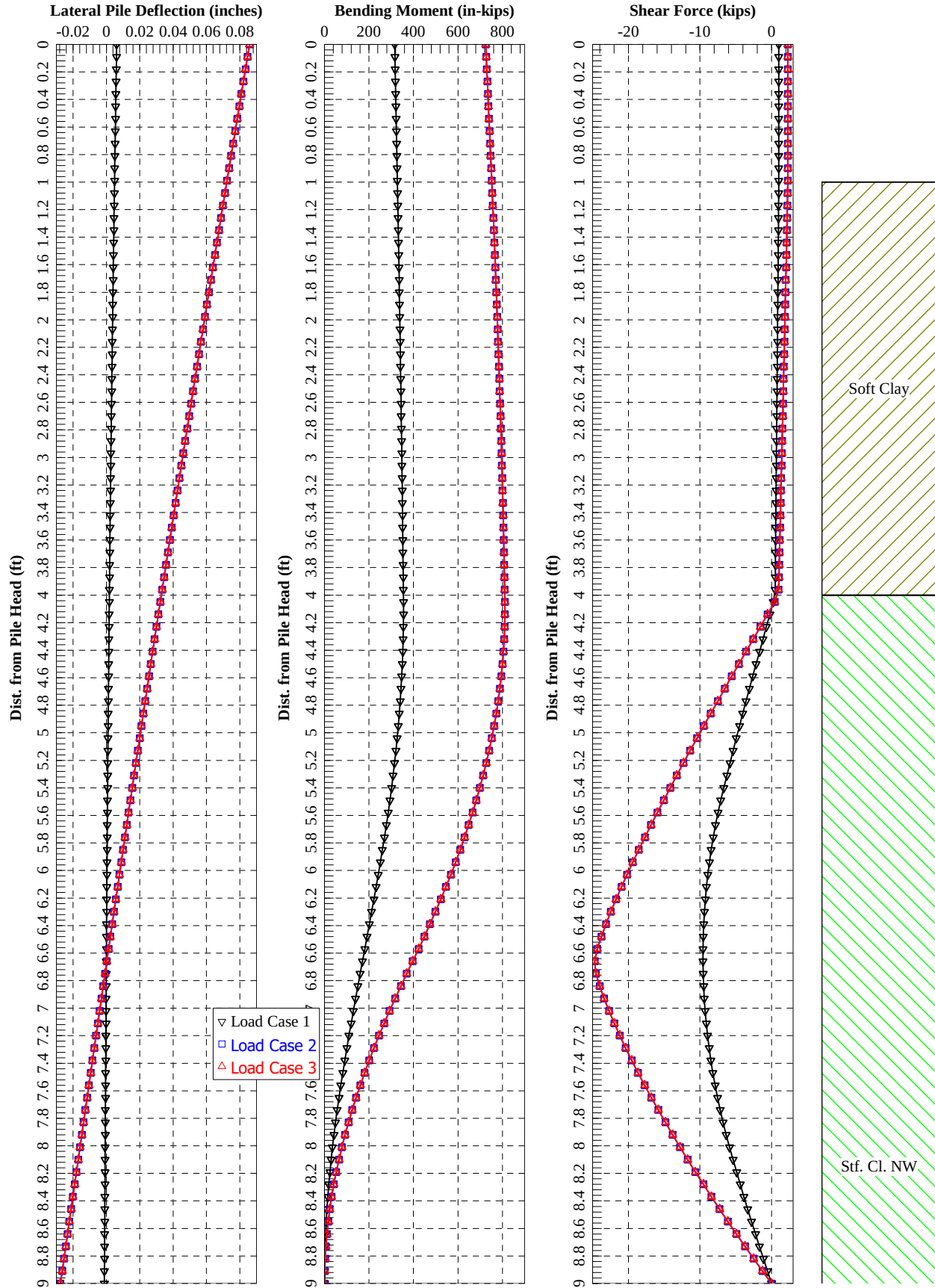
Maximum pile-head deflection = 0.0858310135 inches

Maximum pile-head rotation = -0.0011503123 radians = -0.065908 deg.

The analysis ended normally.

LATERAL LOAD (LPILE) ANALYSES
SOUTHBOUND PARKING AREA
LIGHT TOWER SC1-20 (B-014-0-25)

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-20 (Boring B-011 & 014-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation



TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-20 (Boring B-011 & 014-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

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

=====

This model was prepared by:
BSears

Files Used for Analysis

Path to file locations:
\Columbus-1170\Projects\2024\24170232_ms_TP 26 NE Ohio\GEO\Project Docs\Site
15_SUM-271 (2LMN)\Calcs\Light Towers\LPILE Files\SB\

Name of input data file:
Tower SC1-20 (B-011 & B-014).lp12d

Name of output report file:
Tower SC1-20 (B-011 & B-014).lp12o

Name of plot output file:
Tower SC1-20 (B-011 & B-014).lp12p

Name of runtime message file:
Tower SC1-20 (B-011 & B-014).lp12r

Date and Time of Analysis

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-20 (Boring B-011 & 014-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Date: February 11, 2026

Time: 19:49:21

Problem Title

Project Name: TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas

Job Number: 24170232F

Client: ms consultants, inc.

Engineer: BKS

Description: Light Tower SC1-20 (B-011-0-25 & B-014-0-25)

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

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-20 (Boring B-011 & 014-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

- 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	=	9.000 ft
Depth of ground surface below top of pile	=	1.0000 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.

Point No.	Depth Below Pile Head feet	Pile Diameter inches
-----	-----	-----
1	0.000	36.0000
2	9.000	36.0000

Input Structural Properties for Pile Sections:

Pile Section No. 1:

Section 1 is a round drilled shaft, bored pile, or CIDH pile	
Length of section	= 9.000000 ft
Shaft Diameter	= 36.000000 in

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-20 (Boring B-011 & 014-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Soil and Rock Layering Information

The soil profile is modelled using 3 layers

Layer 1 is soft clay, p-y criteria by Matlock, 1970

Distance from top of pile to top of layer	=	1.000000	ft
Distance from top of pile to bottom of layer	=	4.000000	ft
Effective unit weight at top of layer	=	98.000000	pcf
Effective unit weight at bottom of layer	=	98.000000	pcf
Undrained cohesion at top of layer	=	250.000000	psf
Undrained cohesion at bottom of layer	=	250.000000	psf
Epsilon-50 at top of layer	=	0.020000	
Epsilon-50 at bottom of layer	=	0.020000	

Layer 2 is stiff clay without free water

Distance from top of pile to top of layer	=	4.000000	ft
Distance from top of pile to bottom of layer	=	12.300000	ft
Effective unit weight at top of layer	=	63.000000	pcf
Effective unit weight at bottom of layer	=	63.000000	pcf
Undrained cohesion at top of layer	=	4500.	psf
Undrained cohesion at bottom of layer	=	4500.	psf
Epsilon-50 at top of layer	=	0.004000	
Epsilon-50 at bottom of layer	=	0.004000	

Layer 3 is stiff clay without free water

Distance from top of pile to top of layer	=	12.300000	ft
Distance from top of pile to bottom of layer	=	16.100000	ft
Effective unit weight at top of layer	=	66.000000	pcf
Effective unit weight at bottom of layer	=	66.000000	pcf
Undrained cohesion at top of layer	=	4500.	psf
Undrained cohesion at bottom of layer	=	4500.	psf
Epsilon-50 at top of layer	=	0.004000	
Epsilon-50 at bottom of layer	=	0.004000	

(Depth of the lowest soil layer extends 7.100 ft below the pile tip)

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-20 (Boring B-011 & 014-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Summary of Input Soil Properties

Layer Num.	Soil Type Name (p-y Curve Type)	Layer Depth ft	Effective Unit Wt. pcf	Cohesion psf	E50 or krm
1	Soft Clay	1.0000 4.0000	98.0000 98.0000	250.0000 250.0000	0.02000 0.02000
2	Stiff Clay w/o Free Water	4.0000 12.3000	63.0000 63.0000	4500. 4500.	0.00400 0.00400
3	Stiff Clay w/o Free Water	12.3000 16.1000	66.0000 66.0000	4500. 4500.	0.00400 0.00400

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 = 3

Load Compute No.	Load Top y Type vs. Pile Length	Condition Run Analysis 1	Condition 2	Axial Thrust Force, lbs
1	1	V = 1000.000000 lbs	M = 315600. in-lbs	4200.
Yes		Yes		
2	1	V = 2250. lbs	M = 724800. in-lbs	4600.
Yes		Yes		
3	1	V = 2250. lbs	M = 724800. in-lbs	3800.
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.

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-20 (Boring B-011 & 014-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

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:

Dimensions and Properties of Drilled Shaft (Bored Pile):

Length of Section	=	9.000000 ft
Shaft Diameter	=	36.000000 in
Concrete Cover Thickness (to edge of trans. reinf.)	=	3.500000 in
Number of Reinforcing Bars	=	16 bars
Yield Stress of Reinforcing Bars	=	60000. psi
Modulus of Elasticity of Reinforcing Bars	=	29000000. psi
Gross Area of Shaft	=	1018. sq. in.
Total Area of Reinforcing Steel	=	16.000000 sq. in.
Area Ratio of Steel Reinforcement	=	1.57 percent
Edge-to-Edge Bar Spacing	=	4.114467 in
Maximum Concrete Aggregate Size	=	0.750000 in
Ratio of Bar Spacing to Aggregate Size	=	5.49
Offset of Center of Rebar Cage from Center of Pile	=	0.0000 in
Transverse Reinforcement		
Type: Spiral		
Number of Transverse Reinf. (per spacing)	=	1
Spacing of Transverse Reinf.	=	4.500000 in
Yield Stress of Transverse Reinf.	=	60000. psi
Diameter of Transverse Reinf.	=	0.500000 in

Axial Structural Capacities:

Nom. Axial Structural Capacity = $0.85 F_c A_c + F_y A_s$	=	4366.378 kips
Tensile Load for Cracking of Concrete	=	-470.222 kips
Nominal Axial Tensile Capacity	=	-960.000 kips

Reinforcing Bar Dimensions and Positions Used in Computations:

Bar Number	Bar Diam. inches	Bar Area sq. in.	X inches	Y inches
-----	-----	-----	-----	-----

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-20 (Boring B-011 & 014-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

1	1.128000	1.000000	13.436000	0.000000
2	1.128000	1.000000	12.413245	5.141735
3	1.128000	1.000000	9.500687	9.500687
4	1.128000	1.000000	5.141735	12.413245
5	1.128000	1.000000	0.000000	13.436000
6	1.128000	1.000000	-5.14173	12.413245
7	1.128000	1.000000	-9.50069	9.500687
8	1.128000	1.000000	-12.41325	5.141735
9	1.128000	1.000000	-13.43600	0.000000
10	1.128000	1.000000	-12.41325	-5.14173
11	1.128000	1.000000	-9.50069	-9.50069
12	1.128000	1.000000	-5.14173	-12.41325
13	1.128000	1.000000	0.000000	-13.43600
14	1.128000	1.000000	5.141735	-12.41325
15	1.128000	1.000000	9.500687	-9.50069
16	1.128000	1.000000	12.413245	-5.14173

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

Minimum spacing between any two bars not equal to zero = 4.114 inches
 between bars 11 and 12.

Ratio of bar spacing to maximum aggregate size = 5.49

Concrete Properties:

Compressive Strength of Concrete	=	4000. psi
Modulus of Elasticity of Concrete	=	3604997. psi
Modulus of Rupture of Concrete	=	-474.34165 psi
Compression Strain at Peak Stress	=	0.001886
Tensile Strain at Fracture of Concrete	=	-0.0001154
Maximum Coarse Aggregate Size	=	0.750000 in

Number of Axial Thrust Force Values Determined from Pile-head Loadings = 3

Number	Axial Thrust Force kips
-----	-----
1	3.800
2	4.200
3	4.600

Definitions of Run Messages and Notes:

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-20 (Boring B-011 & 014-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

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 318-14, Section 21.2.3.
 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 = 3.800 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
6.25000E-07	240.5062135	384809942.	19.2929823	0.00001206	-0.00001044
0.0505030	0.2746478				
0.00000125	480.1472468	384117797.	18.6479768	0.00002331	-0.00002169
0.0973082	0.5259142				
0.00000188	718.9174733	383422652.	18.4329804	0.00003456	-0.00003294
0.1438345	0.7771808				
0.00000250	956.8168886	382726755.	18.3254857	0.00004581	-0.00004419
0.1900818	1.0284477				
0.00000313	1194.	382030558.	18.2609917	0.00005707	-0.00005543
0.2360502	1.2797149				
0.00000375	1430.	381334209.	18.2179981	0.00006832	-0.00006668
0.2817396	1.5309823				
0.00000438	1665.	380637775.	18.1872904	0.00007957	-0.00007793
0.3271500	1.7822500				
0.00000500	1900.	379941287.	18.1642614	0.00009082	-0.00008918
0.3722815	2.0335179				
0.00000563	2133.	379244764.	18.1463515	0.0001021	-0.000100
0.4171340	2.2847861				
0.00000625	2366.	378548215.	18.1320251	0.0001133	-0.000112
0.4617075	2.5360546				
0.00000688	2366.	344134741.	10.2494785	0.00007047	-0.000177
0.2882187	-4.308598 C				
0.00000750	2366.	315456846.	10.2198771	0.00007665	-0.000193
0.3129821	-4.706727 C				
0.00000813	2366.	291190934.	10.1952302	0.00008284	-0.000210
0.3376758	-5.104761 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-20 (Boring B-011 & 014-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00000875	2366.	270391582.	10.1744772	0.00008903	-0.000226
0.3622998	-5.502701 C				
0.00000938	2366.	252365477.	10.1568402	0.00009522	-0.000242
0.3868539	-5.900547 C				
0.00001000	2366.	236592634.	10.1417358	0.0001014	-0.000259
0.4113380	-6.298297 C				
0.00001063	2366.	222675420.	10.1287027	0.0001076	-0.000275
0.4357521	-6.695951 C				
0.00001125	2366.	210304564.	10.1174231	0.0001138	-0.000291
0.4600960	-7.093510 C				
0.00001188	2366.	199235903.	10.1076093	0.0001200	-0.000307
0.4843696	-7.490973 C				
0.00001250	2366.	189274107.	10.0990420	0.0001262	-0.000324
0.5085729	-7.888340 C				
0.00001313	2366.	180261055.	10.0915439	0.0001325	-0.000340
0.5327056	-8.285611 C				
0.00001375	2366.	172067370.	10.0849699	0.0001387	-0.000356
0.5567678	-8.682785 C				
0.00001438	2366.	164586180.	10.0792000	0.0001449	-0.000373
0.5807594	-9.079861 C				
0.00001500	2366.	157728423.	10.0741344	0.0001511	-0.000389
0.6046801	-9.476841 C				
0.00001563	2366.	151419286.	10.0696892	0.0001573	-0.000405
0.6285300	-9.873723 C				
0.00001625	2366.	145595467.	10.0657933	0.0001636	-0.000421
0.6523089	-10.270507 C				
0.00001688	2366.	140203043.	10.0623863	0.0001698	-0.000438
0.6760167	-10.667193 C				
0.00001750	2366.	135195791.	10.0594163	0.0001760	-0.000454
0.6996534	-11.063781 C				
0.00001813	2366.	130533867.	10.0568387	0.0001823	-0.000470
0.7232187	-11.460271 C				
0.00001875	2366.	126182738.	10.0546147	0.0001885	-0.000486
0.7467127	-11.856661 C				
0.00001938	2366.	122112327.	10.0527107	0.0001948	-0.000503
0.7701352	-12.252952 C				
0.00002000	2366.	118296317.	10.0510970	0.0002010	-0.000519
0.7934860	-12.649144 C				
0.00002063	2366.	114711580.	10.0497478	0.0002073	-0.000535
0.8167652	-13.045236 C				
0.00002125	2366.	111337710.	10.0486401	0.0002135	-0.000551
0.8399726	-13.441228 C				
0.00002188	2366.	108156633.	10.0477539	0.0002198	-0.000568
0.8631080	-13.837120 C				
0.00002250	2366.	105152282.	10.0470709	0.0002261	-0.000584
0.8861714	-14.232911 C				
0.00002313	2366.	102310328.	10.0465752	0.0002323	-0.000600
0.9091627	-14.628602 C				
0.00002375	2366.	99617951.	10.0462524	0.0002386	-0.000616
0.9320817	-15.024191 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-20 (Boring B-011 & 014-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00002438	2366.	97063645.	10.0460897	0.0002449	-0.000633
0.9549284	-15.419678 C				
0.00002563	2429.	94800037.	10.0461990	0.0002574	-0.000665
1.0004043	-16.210348 C				
0.00002688	2545.	94692477.	10.0468231	0.0002700	-0.000697
1.0455896	-17.000609 C				
0.00002813	2660.	94589756.	10.0479254	0.0002826	-0.000730
1.0904832	-17.790458 C				
0.00002938	2776.	94491232.	10.0493946	0.0002952	-0.000762
1.1350844	-18.579893 C				
0.00003063	2891.	94396370.	10.0512127	0.0003078	-0.000795
1.1793922	-19.368912 C				
0.00003188	3006.	94304718.	10.0533415	0.0003205	-0.000827
1.2234058	-20.157511 C				
0.00003313	3121.	94215891.	10.0557483	0.0003331	-0.000859
1.2671243	-20.945689 C				
0.00003438	3236.	94129561.	10.0584054	0.0003458	-0.000892
1.3105466	-21.733443 C				
0.00003563	3350.	94045446.	10.0612887	0.0003584	-0.000924
1.3536720	-22.520771 C				
0.00003688	3465.	93963300.	10.0643778	0.0003711	-0.000956
1.3964994	-23.307669 C				
0.00003813	3579.	93882912.	10.0676547	0.0003838	-0.000989
1.4390279	-24.094136 C				
0.00003938	3694.	93804096.	10.0711039	0.0003965	-0.001021
1.4812567	-24.880169 C				
0.00004063	3808.	93726688.	10.0747116	0.0004093	-0.001053
1.5231846	-25.665765 C				
0.00004188	3922.	93650546.	10.0784659	0.0004220	-0.001085
1.5648108	-26.450921 C				
0.00004313	4035.	93575540.	10.0823562	0.0004348	-0.001118
1.6061342	-27.235635 C				
0.00004438	4149.	93501560.	10.0863731	0.0004476	-0.001150
1.6471540	-28.019904 C				
0.00004563	4263.	93428502.	10.0905084	0.0004604	-0.001182
1.6878690	-28.803725 C				
0.00004688	4376.	93356279.	10.0947545	0.0004732	-0.001214
1.7282784	-29.587096 C				
0.00004813	4489.	93284807.	10.0991050	0.0004860	-0.001246
1.7683810	-30.370013 C				
0.00004938	4602.	93214014.	10.1035538	0.0004989	-0.001279
1.8081759	-31.152474 C				
0.00005063	4715.	93143835.	10.1080956	0.0005117	-0.001311
1.8476620	-31.934476 C				
0.00005188	4828.	93074209.	10.1127258	0.0005246	-0.001343
1.8868384	-32.716016 C				
0.00005313	4941.	93005082.	10.1174399	0.0005375	-0.001375
1.9257039	-33.497091 C				
0.00005438	5053.	92936405.	10.1222340	0.0005504	-0.001407
1.9642575	-34.277698 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-20 (Boring B-011 & 014-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00005563	5166.	92868132.	10.1271047	0.0005633	-0.001439
2.0024981	-35.057833 C				
0.00005688	5278.	92800222.	10.1320488	0.0005763	-0.001471
2.0404247	-35.837495 C				
0.00005813	5390.	92732637.	10.1370633	0.0005892	-0.001503
2.0780361	-36.616679 C				
0.00005938	5502.	92665342.	10.1421457	0.0006022	-0.001535
2.1153313	-37.395383 C				
0.00006063	5614.	92598305.	10.1472935	0.0006152	-0.001567
2.1523092	-38.173604 C				
0.00006188	5725.	92531497.	10.1525046	0.0006282	-0.001599
2.1889685	-38.951338 C				
0.00006313	5837.	92464888.	10.1577769	0.0006412	-0.001631
2.2253083	-39.728581 C				
0.00006438	5948.	92398455.	10.1631088	0.0006543	-0.001663
2.2613274	-40.505332 C				
0.00006563	6059.	92332173.	10.1684984	0.0006673	-0.001695
2.2970245	-41.281586 C				
0.00006688	6170.	92266020.	10.1739444	0.0006804	-0.001727
2.3323987	-42.057340 C				
0.00006813	6281.	92199976.	10.1794453	0.0006935	-0.001759
2.3674485	-42.832591 C				
0.00006938	6392.	92134020.	10.1849998	0.0007066	-0.001791
2.4021730	-43.607335 C				
0.00007063	6502.	92068136.	10.1906070	0.0007197	-0.001823
2.4365708	-44.381568 C				
0.00007188	6613.	92002305.	10.1962656	0.0007329	-0.001855
2.4706408	-45.155288 C				
0.00007313	6723.	91936511.	10.2020028	0.0007460	-0.001886
2.5043818	-45.928490 C				
0.00007438	6833.	91870742.	10.2077616	0.0007592	-0.001918
2.5377924	-46.701172 C				
0.00007938	7271.	91607617.	10.2312788	0.0008121	-0.002045
2.6681070	-49.786612 C				
0.00008438	7707.	91343844.	10.2555391	0.0008653	-0.002172
2.7930345	-52.863415 C				
0.00008938	8140.	91079227.	10.2796933	0.0009187	-0.002299
2.9123325	-55.933382 C				
0.00009438	8570.	90813004.	10.3043877	0.0009725	-0.002425
3.0260259	-58.995009 C				
0.00009938	8979.	90357411.	10.3225581	0.0010258	-0.002552
3.1326575	-60.000000 CY				
0.0001044	9304.	89144470.	10.3110511	0.0010762	-0.002681
3.2276850	-60.000000 CY				
0.0001094	9546.	87273573.	10.2718035	0.0011235	-0.002814
3.3116704	-60.000000 CY				
0.0001144	9782.	85523680.	10.2357064	0.0011707	-0.002947
3.3907664	-60.000000 CY				
0.0001194	10004.	83800225.	10.1987328	0.0012175	-0.003080
3.4643165	-60.000000 CY				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0001244	10154.	81641326.	10.1374818	0.0012608	-0.003217
3.5282172	-60.000000 CY				
0.0001294	10287.	79513660.	10.0756441	0.0013035	-0.003354
3.5871212	-60.000000 CY				
0.0001344	10419.	77536664.	10.0197410	0.0013464	-0.003491
3.6423258	-60.000000 CY				
0.0001394	10550.	75693983.	9.9691573	0.0013895	-0.003628
3.6937845	-60.000000 CY				
0.0001444	10680.	73971519.	9.9233661	0.0014327	-0.003765
3.7414497	-60.000000 CY				
0.0001494	10808.	72355946.	9.8810316	0.0014760	-0.003902
3.7851328	-60.000000 CY				
0.0001544	10925.	70772035.	9.8368433	0.0015186	-0.004039
3.8241552	-60.000000 CY				
0.0001594	11008.	69072220.	9.7809580	0.0015588	-0.004179
3.8574366	-60.000000 CY				
0.0001644	11071.	67351790.	9.7204156	0.0015978	-0.004320
3.8862696	-60.000000 CY				
0.0001694	11131.	65719446.	9.6635689	0.0016368	-0.004461
3.9118664	-60.000000 CY				
0.0001744	11191.	64176802.	9.6094393	0.0016756	-0.004602
3.9342902	-60.000000 CY				
0.0001794	11250.	62716278.	9.5601863	0.0017149	-0.004743
3.9535015	-60.000000 CY				
0.0001844	11308.	61329164.	9.5136161	0.0017541	-0.004883
3.9693617	-60.000000 CY				
0.0001894	11364.	60009896.	9.4690774	0.0017932	-0.005024
3.9819050	-60.000000 CY				
0.0001944	11420.	58754909.	9.4280227	0.0018326	-0.005165
3.9911986	-60.000000 CY				
0.0001994	11476.	57559296.	9.3897594	0.0018721	-0.005305
3.9971986	-60.000000 CY				
0.0002044	11531.	56418622.	9.3531932	0.0019116	-0.005446
3.9998595	-60.000000 CY				
0.0002094	11584.	55328385.	9.3201259	0.0019514	-0.005586
3.9974517	-60.000000 CY				
0.0002144	11637.	54285454.	9.2909722	0.0019918	-0.005726
3.9998812	-60.000000 CY				
0.0002194	11690.	53285909.	9.2626721	0.0020320	-0.005866
3.9969940	-60.000000 CY				
0.0002244	11740.	52321336.	9.2356724	0.0020723	-0.006005
3.9997138	-60.000000 CY				
0.0002294	11786.	51384137.	9.2093226	0.0021124	-0.006145
3.9955528	-60.000000 CY				
0.0002344	11823.	50445667.	9.1796872	0.0021515	-0.006286
3.9989818	-60.000000 CY				
0.0002394	11855.	49524943.	9.1473565	0.0021896	-0.006428
3.9994466	-60.000000 CY				
0.0002444	11876.	48598228.	9.1109548	0.0022265	-0.006571
3.9965160	-60.000000 CY				

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0.0002494	11895.	47701101.	9.0745971	0.0022630	-0.006715
3.9991770	-60.000000 CY				
0.0002544	11912.	46829816.	9.0405915	0.0022997	-0.006858
3.9995775	-60.000000 CY				
0.0002594	11929.	45990067.	9.0077660	0.0023364	-0.007001
3.9954763	-60.000000 CY				
0.0002644	11945.	45181124.	8.9766457	0.0023732	-0.007144
3.9984997	-60.000000 CY				
0.0002694	11961.	44401256.	8.9468563	0.0024101	-0.007287
3.9998981	-60.000000 CY				
0.0002744	11976.	43648250.	8.9191370	0.0024472	-0.007430
3.9944635	-60.000000 CY				
0.0003044	12062.	39628140.	8.7757363	0.0026711	-0.008286
3.9984635	-60.000000 CY				
0.0003344	12138.	36300180.	8.6628609	0.0028966	-0.009141
3.9998209	-60.000000 CY				
0.0003644	12207.	33502446.	8.5793723	0.0031261	-0.009991
3.9999551	-60.000000 CYT				
0.0003944	12272.	31117026.	8.5161103	0.0033585	-0.010839
3.9996166	-60.000000 CYT				
0.0004244	12331.	29056485.	8.4674428	0.0035934	-0.011684
3.9972132	-60.000000 CYT				
0.0004544	12377.	27238942.	8.4178614	0.0038249	-0.012533
3.9873462	-60.000000 CYT				

Axial Thrust Force = 4.200 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in

6.25000E-07	240.5049676	384807948.	19.4290859	0.00001214	-0.00001036
0.0508615	0.2771147				
0.00000125	480.1459926	384116794.	18.7161837	0.00002340	-0.00002160
0.0976654	0.5283867				
0.00000188	718.9162127	383421980.	18.4785558	0.00003465	-0.00003285
0.1441903	0.7796589				
0.00000250	956.8156222	382726249.	18.3597458	0.00004590	-0.00004410
0.1904363	1.0309315				
0.00000313	1194.	382030150.	18.2884629	0.00005715	-0.00005535
0.2364034	1.2822044				
0.00000375	1430.	381333869.	18.2409436	0.00006840	-0.00006660
0.2820914	1.5334776				
0.00000438	1665.	380637482.	18.2070035	0.00007966	-0.00007784
0.3275005	1.7847511				

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0.00000500	1900.	379941029.	18.1815504	0.00009091	-0.00008909
0.3726306	2.0360248				
0.00000563	2133.	379244533.	18.1617553	0.0001022	-0.000100
0.4174818	2.2872988				
0.00000625	2366.	378548006.	18.1459208	0.0001134	-0.000112
0.4620539	2.5385732				
0.00000688	2366.	344134551.	10.2895004	0.00007074	-0.000177
0.2893429	-4.300617 C				
0.00000750	2366.	315456672.	10.2575513	0.00007693	-0.000193
0.3141325	-4.698533 C				
0.00000813	2366.	291190774.	10.2300378	0.00008312	-0.000209
0.3388235	-5.096560 C				
0.00000875	2366.	270391433.	10.2068278	0.00008931	-0.000226
0.3634446	-5.494492 C				
0.00000938	2366.	252365338.	10.1870615	0.00009550	-0.000242
0.3879959	-5.892330 C				
0.00001000	2366.	236592504.	10.1700940	0.0001017	-0.000258
0.4124772	-6.290073 C				
0.00001063	2366.	222675298.	10.1554324	0.0001079	-0.000275
0.4368884	-6.687720 C				
0.00001125	2366.	210304448.	10.1426931	0.0001141	-0.000291
0.4612294	-7.085271 C				
0.00001188	2366.	199235793.	10.1315564	0.0001203	-0.000307
0.4855002	-7.482727 C				
0.00001250	2366.	189274003.	10.1218127	0.0001265	-0.000323
0.5097005	-7.880086 C				
0.00001313	2366.	180260955.	10.1132503	0.0001327	-0.000340
0.5338304	-8.277349 C				
0.00001375	2366.	172067276.	10.1057088	0.0001390	-0.000356
0.5578898	-8.674515 C				
0.00001438	2366.	164586090.	10.0990556	0.0001452	-0.000372
0.5818784	-9.071585 C				
0.00001500	2366.	157728336.	10.0931803	0.0001514	-0.000389
0.6057963	-9.468556 C				
0.00001563	2366.	151419203.	10.0879903	0.0001576	-0.000405
0.6296433	-9.865431 C				
0.00001625	2366.	145595387.	10.0834069	0.0001639	-0.000421
0.6534193	-10.262207 C				
0.00001688	2366.	140202965.	10.0793634	0.0001701	-0.000437
0.6771242	-10.658886 C				
0.00001750	2366.	135195717.	10.0758025	0.0001763	-0.000454
0.7007579	-11.055466 C				
0.00001813	2366.	130533795.	10.0726747	0.0001826	-0.000470
0.7243204	-11.451947 C				
0.00001875	2366.	126182669.	10.0699372	0.0001888	-0.000486
0.7478114	-11.848330 C				
0.00001938	2366.	122112260.	10.0675528	0.0001951	-0.000502
0.7712309	-12.244613 C				
0.00002000	2366.	118296252.	10.0654889	0.0002013	-0.000519
0.7945789	-12.640797 C				

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0.00002063	2366.	114711517.	10.0637168	0.0002076	-0.000535
0.8178551	-13.036882 C				
0.00002125	2366.	111337649.	10.0622112	0.0002138	-0.000551
0.8410595	-13.432866 C				
0.00002188	2366.	108156573.	10.0609497	0.0002201	-0.000567
0.8641920	-13.828750 C				
0.00002250	2366.	105152224.	10.0599125	0.0002263	-0.000584
0.8872524	-14.224533 C				
0.00002313	2366.	102310272.	10.0590817	0.0002326	-0.000600
0.9102407	-14.620215 C				
0.00002375	2366.	99617896.	10.0584414	0.0002389	-0.000616
0.9331568	-15.015796 C				
0.00002438	2366.	97063591.	10.0579776	0.0002452	-0.000632
0.9560005	-15.411276 C				
0.00002563	2432.	94924068.	10.0575288	0.0002577	-0.000665
1.0014704	-16.201930 C				
0.00002688	2548.	94810571.	10.0576469	0.0002703	-0.000697
1.0466496	-16.992174 C				
0.00002813	2664.	94702439.	10.0582592	0.0002829	-0.000730
1.0915372	-17.782007 C				
0.00002938	2779.	94598964.	10.0593353	0.0002955	-0.000762
1.1361324	-18.571425 C				
0.00003063	2894.	94499555.	10.0607664	0.0003081	-0.000794
1.1804341	-19.360427 C				
0.00003188	3009.	94403710.	10.0625387	0.0003207	-0.000827
1.2244416	-20.149010 C				
0.00003313	3124.	94311007.	10.0646159	0.0003334	-0.000859
1.2681539	-20.937171 C				
0.00003438	3239.	94221082.	10.0669675	0.0003461	-0.000891
1.3115700	-21.724908 C				
0.00003563	3354.	94133623.	10.0695670	0.0003587	-0.000924
1.3546892	-22.512219 C				
0.00003688	3468.	94048359.	10.0723915	0.0003714	-0.000956
1.3975103	-23.299100 C				
0.00003813	3582.	93965057.	10.0754214	0.0003841	-0.000988
1.4400326	-24.085550 C				
0.00003938	3697.	93883511.	10.0786392	0.0003968	-0.001021
1.4822550	-24.871565 C				
0.00004063	3811.	93803541.	10.0820299	0.0004096	-0.001053
1.5241766	-25.657144 C				
0.00004188	3925.	93724988.	10.0855803	0.0004223	-0.001085
1.5657965	-26.442282 C				
0.00004313	4039.	93647711.	10.0892786	0.0004351	-0.001117
1.6071135	-27.226979 C				
0.00004438	4152.	93571586.	10.0931145	0.0004479	-0.001150
1.6481268	-28.011230 C				
0.00004563	4266.	93496502.	10.0970787	0.0004607	-0.001182
1.6888354	-28.795033 C				
0.00004688	4379.	93422358.	10.1011630	0.0004735	-0.001214
1.7292383	-29.578385 C				

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0.00004813	4492.	93349066.	10.1053601	0.0004863	-0.001246
1.7693344	-30.361284 C				
0.00004938	4606.	93276544.	10.1096634	0.0004992	-0.001278
1.8091228	-31.143727 C				
0.00005063	4718.	93204721.	10.1140670	0.0005120	-0.001310
1.8486023	-31.925710 C				
0.00005188	4831.	93133529.	10.1185657	0.0005249	-0.001343
1.8877721	-32.707231 C				
0.00005313	4944.	93062909.	10.1231546	0.0005378	-0.001375
1.9266309	-33.488287 C				
0.00005438	5056.	92992807.	10.1278294	0.0005507	-0.001407
1.9651778	-34.268875 C				
0.00005563	5169.	92923173.	10.1325862	0.0005636	-0.001439
2.0034117	-35.048992 C				
0.00005688	5281.	92853961.	10.1374215	0.0005766	-0.001471
2.0413316	-35.828634 C				
0.00005813	5393.	92785130.	10.1423320	0.0005895	-0.001503
2.0789362	-36.607799 C				
0.00005938	5505.	92716640.	10.1473148	0.0006025	-0.001535
2.1162246	-37.386484 C				
0.00006063	5617.	92648458.	10.1523672	0.0006155	-0.001567
2.1531956	-38.164685 C				
0.00006188	5728.	92580549.	10.1574868	0.0006285	-0.001599
2.1898481	-38.942399 C				
0.00006313	5840.	92512883.	10.1626714	0.0006415	-0.001631
2.2261809	-39.719622 C				
0.00006438	5951.	92445433.	10.1679189	0.0006546	-0.001663
2.2621930	-40.496353 C				
0.00006563	6062.	92378172.	10.1732276	0.0006676	-0.001695
2.2978832	-41.272587 C				
0.00006688	6173.	92311077.	10.1785957	0.0006807	-0.001727
2.3332503	-42.048320 C				
0.00006813	6284.	92244124.	10.1840217	0.0006938	-0.001759
2.3682931	-42.823550 C				
0.00006938	6395.	92177292.	10.1895041	0.0007069	-0.001791
2.4030104	-43.598274 C				
0.00007063	6505.	92110561.	10.1950417	0.0007200	-0.001822
2.4374011	-44.372486 C				
0.00007188	6616.	92043913.	10.2006608	0.0007332	-0.001854
2.4714639	-45.146185 C				
0.00007313	6726.	91977331.	10.2063053	0.0007463	-0.001886
2.5051976	-45.919366 C				
0.00007438	6836.	91910797.	10.2120017	0.0007595	-0.001918
2.5386010	-46.692026 C				
0.00007938	7274.	91644853.	10.2352897	0.0008124	-0.002045
2.6688860	-49.777380 C				
0.00008438	7710.	91378587.	10.2593338	0.0008656	-0.002172
2.7937834	-52.854093 C				
0.00008938	8143.	91111830.	10.2831857	0.0009191	-0.002298
2.9130226	-55.924331 C				

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0.00009438	8573.	90843621.	10.3077273	0.0009728	-0.002425
3.0266854	-58.985869 C				
0.00009938	8982.	90387473.	10.3258078	0.0010261	-0.002551
3.1332951	-60.000000 CY				
0.0001044	9308.	89176212.	10.3143071	0.0010766	-0.002681
3.2283182	-60.000000 CY				
0.0001094	9549.	87304848.	10.2749831	0.0011238	-0.002814
3.3122821	-60.000000 CY				
0.0001144	9785.	85553556.	10.2389100	0.0011711	-0.002946
3.3913727	-60.000000 CY				
0.0001194	10007.	83830919.	10.2019402	0.0012179	-0.003080
3.4649106	-60.000000 CY				
0.0001244	10158.	81671814.	10.1406407	0.0012612	-0.003216
3.5287895	-60.000000 CY				
0.0001294	10291.	79542859.	10.0787027	0.0013039	-0.003354
3.5876602	-60.000000 CY				
0.0001344	10423.	77564670.	10.0227059	0.0013468	-0.003491
3.6428308	-60.000000 CY				
0.0001394	10554.	75720878.	9.9720357	0.0013899	-0.003628
3.6942550	-60.000000 CY				
0.0001444	10683.	73997378.	9.9261646	0.0014331	-0.003764
3.7418850	-60.000000 CY				
0.0001494	10812.	72381005.	9.8838986	0.0014764	-0.003901
3.7855535	-60.000000 CY				
0.0001544	10929.	70796718.	9.8396771	0.0015190	-0.004038
3.8245440	-60.000000 CY				
0.0001594	11012.	69097838.	9.7838573	0.0015593	-0.004178
3.8578061	-60.000000 CY				
0.0001644	11075.	67376662.	9.7232508	0.0015983	-0.004319
3.8866026	-60.000000 CY				
0.0001694	11135.	65743511.	9.6663364	0.0016372	-0.004460
3.9121613	-60.000000 CY				
0.0001744	11195.	64200103.	9.6121495	0.0016761	-0.004601
3.9345463	-60.000000 CY				
0.0001794	11254.	62738857.	9.5628376	0.0017153	-0.004742
3.9537182	-60.000000 CY				
0.0001844	11312.	61351278.	9.5162917	0.0017546	-0.004883
3.9695496	-60.000000 CY				
0.0001894	11368.	60031354.	9.4717005	0.0017937	-0.005024
3.9820503	-60.000000 CY				
0.0001944	11425.	58775745.	9.4305957	0.0018331	-0.005164
3.9913005	-60.000000 CY				
0.0001994	11480.	57579537.	9.3922863	0.0018726	-0.005305
3.9972564	-60.000000 CY				
0.0002044	11535.	56438298.	9.3556780	0.0019121	-0.005445
3.9998723	-60.000000 CY				
0.0002094	11588.	55347517.	9.3241700	0.0019522	-0.005585
3.9975077	-60.000000 CY				
0.0002144	11641.	54304067.	9.2934428	0.0019923	-0.005725
3.9998931	-60.000000 CY				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0002194	11694.	53304015.	9.2651074	0.0020325	-0.005865
3.9970558	-60.000000 CY				
0.0002244	11744.	52339157.	9.2380944	0.0020728	-0.006005
3.9997330	-60.000000 CY				
0.0002294	11790.	51401489.	9.2117130	0.0021129	-0.006145
3.9956300	-60.000000 CY				
0.0002344	11827.	50463153.	9.1821360	0.0021521	-0.006285
3.9990203	-60.000000 CY				
0.0002394	11859.	49542728.	9.1500193	0.0021903	-0.006427
3.9992468	-60.000000 CY				
0.0002444	11880.	48615611.	9.1135780	0.0022271	-0.006570
3.9965958	-60.000000 CY				
0.0002494	11900.	47718283.	9.0771076	0.0022636	-0.006714
3.9992162	-60.000000 CY				
0.0002544	11917.	46846598.	9.0431776	0.0023004	-0.006857
3.9993713	-60.000000 CY				
0.0002594	11933.	46006491.	9.0103157	0.0023371	-0.007000
3.9955701	-60.000000 CY				
0.0002644	11949.	45197204.	8.9791598	0.0023739	-0.007144
3.9985538	-60.000000 CY				
0.0002694	11965.	44417005.	8.9493437	0.0024107	-0.007287
3.9999119	-60.000000 CY				
0.0002744	11980.	43663657.	8.9215934	0.0024479	-0.007430
3.9942523	-60.000000 CY				
0.0003044	12066.	39641995.	8.7782176	0.0026719	-0.008286
3.9985257	-60.000000 CY				
0.0003344	12142.	36312646.	8.6652203	0.0028974	-0.009140
3.9998424	-60.000000 CY				
0.0003644	12212.	33513765.	8.5815911	0.0031269	-0.009991
3.9999658	-60.000000 CYT				
0.0003944	12276.	31127384.	8.5182268	0.0033594	-0.010838
3.9996505	-60.000000 CYT				
0.0004244	12335.	29066055.	8.4694819	0.0035942	-0.011683
3.9973093	-60.000000 CYT				
0.0004544	12381.	27248100.	8.4201387	0.0038259	-0.012532
3.9875919	-60.000000 CYT				

Axial Thrust Force = 4.600 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
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6.25000E-07 0.0512199	240.5035986 0.2795816	384805758.	19.5651901	0.00001223	-0.00001027

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0.00000125	480.1446137	384115691.	18.7843907	0.00002348	-0.00002152
0.0980225	0.5308592				
0.00000188	718.9148267	383421241.	18.5241312	0.00003473	-0.00003277
0.1445462	0.7821371				
0.00000250	956.8142298	382725692.	18.3940059	0.00004599	-0.00004401
0.1907908	1.0334154				
0.00000313	1194.	382029703.	18.3159341	0.00005724	-0.00005526
0.2367565	1.2846940				
0.00000375	1430.	381333494.	18.2638891	0.00006849	-0.00006651
0.2824433	1.5359729				
0.00000438	1665.	380637159.	18.2267166	0.00007974	-0.00007776
0.3278510	1.7872522				
0.00000500	1900.	379940746.	18.1988394	0.00009099	-0.00008901
0.3729798	2.0385317				
0.00000563	2133.	379244280.	18.1771590	0.0001022	-0.000100
0.4178295	2.2898116				
0.00000625	2366.	378547777.	18.1598165	0.0001135	-0.000112
0.4624003	2.5410917				
0.00000688	2366.	344134343.	10.3291778	0.00007101	-0.000176
0.2904571	-4.292706 C				
0.00000750	2366.	315456481.	10.2940289	0.00007721	-0.000193
0.3152465	-4.690597 C				
0.00000813	2366.	291190598.	10.2646762	0.00008340	-0.000209
0.3399656	-5.088396 C				
0.00000875	2366.	270391269.	10.2391817	0.00008959	-0.000225
0.3645893	-5.486283 C				
0.00000938	2366.	252365185.	10.2172859	0.00009579	-0.000242
0.3891378	-5.884113 C				
0.00001000	2366.	236592361.	10.1984552	0.0001020	-0.000258
0.4136162	-6.281848 C				
0.00001063	2366.	222675163.	10.1821496	0.0001082	-0.000274
0.4380246	-6.679488 C				
0.00001125	2366.	210304321.	10.1679490	0.0001144	-0.000291
0.4623628	-7.077032 C				
0.00001188	2366.	199235672.	10.1555219	0.0001206	-0.000307
0.4866307	-7.474480 C				
0.00001250	2366.	189273889.	10.1446030	0.0001268	-0.000323
0.5108282	-7.871831 C				
0.00001313	2366.	180260846.	10.1349589	0.0001330	-0.000339
0.5349552	-8.269087 C				
0.00001375	2366.	172067171.	10.1264498	0.0001392	-0.000356
0.5590117	-8.666245 C				
0.00001438	2366.	164585990.	10.1189132	0.0001455	-0.000372
0.5829974	-9.063307 C				
0.00001500	2366.	157728241.	10.1122282	0.0001517	-0.000388
0.6069124	-9.460271 C				
0.00001563	2366.	151419111.	10.1062933	0.0001579	-0.000405
0.6307565	-9.857138 C				
0.00001625	2366.	145595299.	10.1010224	0.0001641	-0.000421
0.6545296	-10.253907 C				

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0.00001688	2366.	140202880.	10.0963423	0.0001704	-0.000437
0.6782316	-10.650577 C				
0.00001750	2366.	135195635.	10.0921903	0.0001766	-0.000453
0.7018624	-11.047150 C				
0.00001813	2366.	130533716.	10.0885122	0.0001829	-0.000470
0.7254219	-11.443623 C				
0.00001875	2366.	126182592.	10.0852613	0.0001891	-0.000486
0.7489100	-11.839998 C				
0.00001938	2366.	122112186.	10.0823966	0.0001953	-0.000502
0.7723266	-12.236274 C				
0.00002000	2366.	118296180.	10.0798824	0.0002016	-0.000518
0.7956716	-12.632450 C				
0.00002063	2366.	114711448.	10.0776874	0.0002079	-0.000535
0.8189449	-13.028526 C				
0.00002125	2366.	111337582.	10.0757837	0.0002141	-0.000551
0.8421464	-13.424502 C				
0.00002188	2366.	108156508.	10.0741470	0.0002204	-0.000567
0.8652759	-13.820378 C				
0.00002250	2366.	105152160.	10.0727554	0.0002266	-0.000583
0.8883333	-14.216153 C				
0.00002313	2366.	102310210.	10.0715894	0.0002329	-0.000600
0.9113187	-14.611828 C				
0.00002375	2366.	99617836.	10.0706317	0.0002392	-0.000616
0.9342318	-15.007401 C				
0.00002438	2366.	97063533.	10.0698667	0.0002455	-0.000632
0.9570725	-15.402873 C				
0.00002563	2436.	95048091.	10.0688598	0.0002580	-0.000664
1.0025364	-16.193510 C				
0.00002688	2551.	94928657.	10.0684718	0.0002706	-0.000697
1.0477096	-16.983738 C				
0.00002813	2667.	94815115.	10.0686232	0.0002832	-0.000729
1.0925912	-17.773555 C				
0.00002938	2782.	94706690.	10.0692479	0.0002958	-0.000762
1.1371802	-18.562957 C				
0.00003063	2897.	94602733.	10.0703211	0.0003084	-0.000794
1.1814759	-19.351942 C				
0.00003188	3012.	94502697.	10.0717368	0.0003210	-0.000826
1.2254772	-20.140508 C				
0.00003313	3127.	94406117.	10.0734845	0.0003337	-0.000859
1.2691834	-20.928652 C				
0.00003438	3242.	94312597.	10.0755306	0.0003463	-0.000891
1.3125933	-21.716373 C				
0.00003563	3357.	94221794.	10.0778462	0.0003590	-0.000923
1.3557063	-22.503666 C				
0.00003688	3471.	94133413.	10.0804061	0.0003717	-0.000956
1.3985212	-23.290530 C				
0.00003813	3586.	94047197.	10.0831888	0.0003844	-0.000988
1.4410372	-24.076963 C				
0.00003938	3700.	93962921.	10.0861753	0.0003971	-0.001020
1.4832533	-24.862961 C				

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36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00004063	3814.	93880388.	10.0893491	0.0004099	-0.001053
1.5251686	-25.648521 C				
0.00004188	3928.	93799425.	10.0926956	0.0004226	-0.001085
1.5667821	-26.433642 C				
0.00004313	4042.	93719877.	10.0962019	0.0004354	-0.001117
1.6080927	-27.218321 C				
0.00004438	4155.	93641609.	10.0998566	0.0004482	-0.001149
1.6490996	-28.002554 C				
0.00004563	4269.	93564497.	10.1036497	0.0004610	-0.001182
1.6898018	-28.786339 C				
0.00004688	4382.	93488434.	10.1075722	0.0004738	-0.001214
1.7301982	-29.569674 C				
0.00004813	4496.	93413321.	10.1116159	0.0004866	-0.001246
1.7702878	-30.352554 C				
0.00004938	4609.	93339070.	10.1157737	0.0004995	-0.001278
1.8100696	-31.134978 C				
0.00005063	4722.	93265602.	10.1200391	0.0005123	-0.001310
1.8495425	-31.916943 C				
0.00005188	4834.	93192845.	10.1244063	0.0005252	-0.001342
1.8887057	-32.698446 C				
0.00005313	4947.	93120733.	10.1288700	0.0005381	-0.001374
1.9275579	-33.479483 C				
0.00005438	5060.	93049206.	10.1334255	0.0005510	-0.001406
1.9660981	-34.260052 C				
0.00005563	5172.	92978211.	10.1380684	0.0005639	-0.001439
2.0043253	-35.040149 C				
0.00005688	5284.	92907697.	10.1427948	0.0005769	-0.001471
2.0422384	-35.819772 C				
0.00005813	5396.	92837619.	10.1476012	0.0005898	-0.001503
2.0798362	-36.598918 C				
0.00005938	5508.	92767935.	10.1524844	0.0006028	-0.001535
2.1171178	-37.377583 C				
0.00006063	5620.	92698606.	10.1574414	0.0006158	-0.001567
2.1540819	-38.155764 C				
0.00006188	5731.	92629597.	10.1624696	0.0006288	-0.001599
2.1907275	-38.933458 C				
0.00006313	5843.	92560874.	10.1675664	0.0006418	-0.001631
2.2270535	-39.710662 C				
0.00006438	5954.	92492407.	10.1727297	0.0006549	-0.001663
2.2630586	-40.487373 C				
0.00006563	6065.	92424168.	10.1779574	0.0006679	-0.001695
2.2987417	-41.263586 C				
0.00006688	6176.	92356130.	10.1832476	0.0006810	-0.001726
2.3341018	-42.039299 C				
0.00006813	6287.	92288268.	10.1885986	0.0006941	-0.001758
2.3691375	-42.814509 C				
0.00006938	6398.	92220560.	10.1940089	0.0007072	-0.001790
2.4038477	-43.589211 C				
0.00007063	6508.	92152983.	10.1995039	0.0007203	-0.001822
2.4382312	-44.363403 C				

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0.00007188	6619.	92085519.	10.2050285	0.0007335	-0.001854
2.4722868	-45.137081 C				
0.00007313	6729.	92018147.	10.2106084	0.0007467	-0.001886
2.5060133	-45.910241 C				
0.00007438	6839.	91950850.	10.2162424	0.0007598	-0.001918
2.5394094	-46.682880 C				
0.00007938	7277.	91682087.	10.2393011	0.0008127	-0.002045
2.6696649	-49.768146 C				
0.00008438	7713.	91413389.	10.2630109	0.0008659	-0.002172
2.7945082	-52.845065 C				
0.00008938	8146.	91144431.	10.2866786	0.0009194	-0.002298
2.9137126	-55.915279 C				
0.00009438	8576.	90874234.	10.3110673	0.0009731	-0.002424
3.0273448	-58.976728 C				
0.00009938	8985.	90417533.	10.3290580	0.0010265	-0.002551
3.1339327	-60.000000 CY				
0.0001044	9311.	89207952.	10.3175636	0.0010769	-0.002681
3.2289512	-60.000000 CY				
0.0001094	9552.	87336121.	10.2781631	0.0011242	-0.002813
3.3128936	-60.000000 CY				
0.0001144	9789.	85583430.	10.2421143	0.0011714	-0.002946
3.3919789	-60.000000 CY				
0.0001194	10011.	83861611.	10.2051482	0.0012182	-0.003079
3.4655044	-60.000000 CY				
0.0001244	10162.	81702300.	10.1438002	0.0012616	-0.003216
3.5293615	-60.000000 CY				
0.0001294	10295.	79572057.	10.0817619	0.0013043	-0.003353
3.5881988	-60.000000 CY				
0.0001344	10427.	77592674.	10.0256713	0.0013472	-0.003490
3.6433355	-60.000000 CY				
0.0001394	10557.	75747771.	9.9749147	0.0013903	-0.003627
3.6947252	-60.000000 CY				
0.0001444	10687.	74023236.	9.9289636	0.0014335	-0.003764
3.7423201	-60.000000 CY				
0.0001494	10816.	72406063.	9.8867661	0.0014768	-0.003901
3.7859739	-60.000000 CY				
0.0001544	10933.	70821400.	9.8425115	0.0015194	-0.004038
3.8249324	-60.000000 CY				
0.0001594	11017.	69123456.	9.7867573	0.0015598	-0.004178
3.8581753	-60.000000 CY				
0.0001644	11079.	67401534.	9.7260868	0.0015987	-0.004319
3.8869352	-60.000000 CY				
0.0001694	11139.	65767574.	9.6691048	0.0016377	-0.004460
3.9124557	-60.000000 CY				
0.0001744	11199.	64223403.	9.6148605	0.0016766	-0.004601
3.9348020	-60.000000 CY				
0.0001794	11258.	62761436.	9.5654896	0.0017158	-0.004742
3.9539345	-60.000000 CY				
0.0001844	11316.	61373390.	9.5189681	0.0017551	-0.004882
3.9697370	-60.000000 CY				

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0.0001894	11373.	60052811.	9.4743244	0.0017942	-0.005023
3.9821950	-60.000000 CY				
0.0001944	11429.	58796578.	9.4331695	0.0018336	-0.005164
3.9914019	-60.000000 CY				
0.0001994	11484.	57599778.	9.3948139	0.0018731	-0.005304
3.9973136	-60.000000 CY				
0.0002044	11539.	56457972.	9.3581635	0.0019126	-0.005445
3.9998845	-60.000000 CY				
0.0002094	11592.	55366642.	9.3266817	0.0019528	-0.005585
3.9975630	-60.000000 CY				
0.0002144	11645.	54322678.	9.2959142	0.0019928	-0.005725
3.9999044	-60.000000 CY				
0.0002194	11698.	53322120.	9.2675435	0.0020331	-0.005864
3.9971169	-60.000000 CY				
0.0002244	11748.	52356977.	9.2405172	0.0020733	-0.006004
3.9997515	-60.000000 CY				
0.0002294	11794.	51418840.	9.2141042	0.0021135	-0.006144
3.9957066	-60.000000 CY				
0.0002344	11831.	50480617.	9.1845645	0.0021526	-0.006285
3.9990577	-60.000000 CY				
0.0002394	11864.	49560513.	9.1526832	0.0021909	-0.006427
3.9990468	-60.000000 CY				
0.0002444	11885.	48632992.	9.1162023	0.0022278	-0.006570
3.9966747	-60.000000 CY				
0.0002494	11904.	47735462.	9.0796192	0.0022642	-0.006713
3.9992545	-60.000000 CY				
0.0002544	11921.	46863378.	9.0457647	0.0023010	-0.006856
3.9991650	-60.000000 CY				
0.0002594	11937.	46022914.	9.0128664	0.0023377	-0.007000
3.9956629	-60.000000 CY				
0.0002644	11953.	45213284.	8.9816750	0.0023745	-0.007143
3.9986069	-60.000000 CY				
0.0002694	11969.	44432753.	8.9518321	0.0024114	-0.007286
3.9999247	-60.000000 CY				
0.0002744	11984.	43679063.	8.9240509	0.0024485	-0.007429
3.9940409	-60.000000 CY				
0.0003044	12070.	39655848.	8.7807001	0.0026726	-0.008285
3.9985866	-60.000000 CY				
0.0003344	12146.	36325110.	8.6675807	0.0028982	-0.009139
3.9998625	-60.000000 CY				
0.0003644	12216.	33525083.	8.5838110	0.0031277	-0.009990
3.9999751	-60.000000 CYT				
0.0003944	12280.	31137740.	8.5203443	0.0033602	-0.010837
3.9996828	-60.000000 CYT				
0.0004244	12339.	29075625.	8.4715220	0.0035951	-0.011682
3.9974037	-60.000000 CYT				
0.0004544	12385.	27257253.	8.4224181	0.0038269	-0.012531
3.9878351	-60.000000 CYT				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

 Summary of Results for Nominal 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 Tens. No. Strain	Axial Thrust kips	Nominal Mom. Cap. in-kip	Max. Comp. Strain	Max.
----- -----	----- -----	----- -----	----- -----	
1 -0.00952396	3.800	12169.214	0.00300000	
2 -0.00952020	4.200	12173.120	0.00300000	
3 -0.00951645	4.600	12177.027	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 (0.75).

The above values should be multiplied by the appropriate strength reduction factor to compute ultimate moment capacity according to ACI 318, 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 Stiff. Load Ult Mom No. kip-in^2	Resist. Factor	Nominal Ax. Thrust kips	Nominal Moment Cap in-kips	Ult. (Fac) Ax. Thrust kips	Ult. (Fac) Moment Cap in-kips	Bend. at
----- -----	----- -----	----- -----	----- -----	----- -----	----- -----	
1 91219895.	0.65	3.800000	12169.	2.470000	7910.	
2 91253873.	0.65	4.200000	12173.	2.730000	7913.	
3 91287886.	0.65	4.600000	12177.	2.990000	7915.	
1	0.75	3.800000	12169.	2.850000	9127.	

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89806706.					
2	0.75	4.200000	12173.	3.150000	9130.
89838295.					
3	0.75	4.600000	12177.	3.450000	9133.
89869877.					
1	0.90	3.800000	12169.	3.420000	10952.
70221645.					
2	0.90	4.200000	12173.	3.780000	10956.
70254444.					
3	0.90	4.600000	12177.	4.140000	10959.
70287179.					

 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	1.0000	0.00	N.A.	No	0.00	8859.
2	4.0000	0.2172	No	No	8859.	236029.
3	12.3000	11.3000	No	No	244888.	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.

 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 = 1000.0 lbs
 Applied moment at pile head = 315600.0 in-lbs
 Axial thrust load on pile head = 4200.0 lbs

Depth	Deflect.	Bending	Shear	Slope	Total	Bending	Soil
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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	0.00615	315600.		1000.	-1.12E-04	0.00	3.84E+11	
0.00	0.00	0.00						
0.09000	0.00603	316681.		1000.0000	-1.11E-04	0.00	3.84E+11	
0.00	0.00	0.00						
0.1800	0.00591	317761.		1000.0000	-1.10E-04	0.00	3.84E+11	
0.00	0.00	0.00						
0.2700	0.00580	318842.		1000.0000	-1.09E-04	0.00	3.84E+11	
0.00	0.00	0.00						
0.3600	0.00568	319922.		1000.0000	-1.08E-04	0.00	3.84E+11	
0.00	0.00	0.00						
0.4500	0.00556	321002.		1000.0000	-1.07E-04	0.00	3.84E+11	
0.00	0.00	0.00						
0.5400	0.00545	322083.		1000.	-1.06E-04	0.00	3.84E+11	
0.00	0.00	0.00						
0.6300	0.00533	323163.		1000.0000	-1.06E-04	0.00	3.84E+11	
0.00	0.00	0.00						
0.7200	0.00522	324244.		1000.0000	-1.05E-04	0.00	3.84E+11	
0.00	0.00	0.00						
0.8100	0.00511	325324.		1000.0000	-1.04E-04	0.00	3.84E+11	
0.00	0.00	0.00						
0.9000	0.00499	326405.		1000.0000	-1.03E-04	0.00	3.84E+11	
0.00	0.00	0.00						
0.9900	0.00488	327485.		1000.0000	-1.02E-04	0.00	3.84E+11	
0.00	0.00	0.00						
1.0800	0.00477	328566.		992.8818	-1.01E-04	0.00	3.84E+11	
-13.182	2982.	0.00						
1.1700	0.00467	329631.		978.5830	-1.00E-04	0.00	3.84E+11	
-13.297	3078.	0.00						
1.2600	0.00456	330680.		964.1618	-9.92E-05	0.00	3.84E+11	
-13.409	3177.	0.00						
1.3500	0.00445	331714.		949.6224	-9.82E-05	0.00	3.84E+11	
-13.516	3279.	0.00						
1.4400	0.00435	332733.		934.9692	-9.73E-05	0.00	3.84E+11	
-13.619	3385.	0.00						
1.5300	0.00424	333735.		920.2066	-9.64E-05	0.00	3.84E+11	
-13.719	3493.	0.00						
1.6200	0.00414	334721.		905.3390	-9.54E-05	0.00	3.84E+11	
-13.814	3606.	0.00						
1.7100	0.00404	335691.		890.3711	-9.45E-05	0.00	3.84E+11	
-13.905	3722.	0.00						
1.8000	0.00393	336645.		875.3074	-9.35E-05	0.00	3.84E+11	
-13.991	3841.	0.00						
1.8900	0.00383	337583.		860.1525	-9.26E-05	0.00	3.84E+11	

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-14.073	3965.	0.00				
1.9800	0.00373	338504.	844.9112	-9.16E-05	0.00	3.84E+11
-14.151	4094.	0.00				
2.0700	0.00364	339409.	829.5882	-9.07E-05	0.00	3.84E+11
-14.225	4226.	0.00				
2.1600	0.00354	340297.	814.1884	-8.97E-05	0.00	3.84E+11
-14.294	4364.	0.00				
2.2500	0.00344	341168.	798.7166	-8.88E-05	0.00	3.84E+11
-14.358	4506.	0.00				
2.3400	0.00335	342023.	783.1780	-8.78E-05	0.00	3.84E+11
-14.417	4654.	0.00				
2.4300	0.00325	342860.	767.5774	-8.68E-05	0.00	3.84E+11
-14.472	4807.	0.00				
2.5200	0.00316	343681.	751.9202	-8.59E-05	0.00	3.84E+11
-14.522	4966.	0.00				
2.6100	0.00307	344485.	736.2116	-8.49E-05	0.00	3.84E+11
-14.568	5131.	0.00				
2.7000	0.00297	345272.	720.4568	-8.39E-05	0.00	3.84E+11
-14.608	5303.	0.00				
2.7900	0.00288	346042.	704.6614	-8.30E-05	0.00	3.84E+11
-14.643	5482.	0.00				
2.8800	0.00280	346795.	688.8308	-8.20E-05	0.00	3.84E+11
-14.673	5668.	0.00				
2.9700	0.00271	347531.	672.9707	-8.10E-05	0.00	3.84E+11
-14.698	5863.	0.00				
3.0600	0.00262	348250.	657.0869	-8.01E-05	0.00	3.84E+11
-14.717	6065.	0.00				
3.1500	0.00253	348951.	641.1852	-7.91E-05	0.00	3.84E+11
-14.731	6277.	0.00				
3.2400	0.00245	349635.	625.2716	-7.81E-05	0.00	3.84E+11
-14.739	6498.	0.00				
3.3300	0.00237	350302.	609.3523	-7.71E-05	0.00	3.84E+11
-14.741	6729.	0.00				
3.4200	0.00228	350952.	593.4336	-7.61E-05	0.00	3.84E+11
-14.738	6971.	0.00				
3.5100	0.00220	351585.	577.5219	-7.51E-05	0.00	3.84E+11
-14.728	7225.	0.00				
3.6000	0.00212	352200.	561.6238	-7.41E-05	0.00	3.84E+11
-14.713	7492.	0.00				
3.6900	0.00204	352799.	545.7461	-7.32E-05	0.00	3.84E+11
-14.691	7772.	0.00				
3.7800	0.00196	353380.	529.8958	-7.22E-05	0.00	3.84E+11
-14.662	8067.	0.00				
3.8700	0.00189	353944.	514.0801	-7.12E-05	0.00	3.84E+11
-14.627	8378.	0.00				
3.9600	0.00181	354491.	498.3063	-7.02E-05	0.00	3.84E+11
-14.584	8706.	0.00				
4.0500	0.00173	355021.	246.0243	-6.92E-05	0.00	3.84E+11
-452.605	281902.	0.00				
4.1400	0.00166	355023.	-241.472	-6.82E-05	0.00	3.84E+11

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-450.167	292913.	0.00				
4.2300	0.00159	354500.	-726.254	-6.72E-05	0.00	3.84E+11
-447.576	304643.	0.00				
4.3200	0.00151	353455.	-1208.	-6.62E-05	0.00	3.84E+11
-444.826	317167.	0.00				
4.4100	0.00144	351891.	-1687.	-6.52E-05	0.00	3.84E+11
-441.907	330570.	0.00				
4.5000	0.00137	349811.	-2163.	-6.42E-05	0.00	3.84E+11
-438.812	344951.	0.00				
4.5900	0.00131	347220.	-2635.	-6.32E-05	0.00	3.84E+11
-435.529	360424.	0.00				
4.6800	0.00124	344121.	-3103.	-6.23E-05	0.00	3.84E+11
-432.047	377124.	0.00				
4.7700	0.00117	340518.	-3568.	-6.13E-05	0.00	3.84E+11
-428.351	395211.	0.00				
4.8600	0.00110	336415.	-4028.	-6.03E-05	0.00	3.84E+11
-424.428	414871.	0.00				
4.9500	0.00104	331817.	-4484.	-5.94E-05	0.00	3.84E+11
-420.258	436333.	0.00				
5.0400	9.77E-04	326729.	-4936.	-5.85E-05	0.00	3.84E+11
-415.821	459869.	0.00				
5.1300	9.14E-04	321156.	-5382.	-5.76E-05	0.00	3.84E+11
-411.091	485816.	0.00				
5.2200	8.52E-04	315104.	-5824.	-5.67E-05	0.00	3.84E+11
-406.042	514586.	0.00				
5.3100	7.91E-04	308577.	-6259.	-5.58E-05	0.00	3.85E+11
-400.637	546702.	0.00				
5.4000	7.32E-04	301584.	-6689.	-5.49E-05	0.00	3.85E+11
-394.836	582825.	0.00				
5.4900	6.73E-04	294130.	-7101.	-5.41E-05	0.00	3.85E+11
-368.719	591913.	0.00				
5.5800	6.15E-04	286246.	-7483.	-5.33E-05	0.00	3.85E+11
-338.614	594865.	0.00				
5.6700	5.58E-04	277967.	-7833.	-5.25E-05	0.00	3.85E+11
-308.672	597815.	0.00				
5.7600	5.01E-04	269328.	-8150.	-5.17E-05	0.00	3.85E+11
-278.885	600763.	0.00				
5.8500	4.46E-04	260363.	-8435.	-5.10E-05	0.00	3.85E+11
-249.248	603710.	0.00				
5.9400	3.91E-04	251108.	-8688.	-5.03E-05	0.00	3.85E+11
-219.750	606654.	0.00				
6.0300	3.37E-04	241597.	-8910.	-4.96E-05	0.00	3.85E+11
-190.383	609598.	0.00				
6.1200	2.84E-04	231863.	-9100.	-4.89E-05	0.00	3.85E+11
-161.138	612539.	0.00				
6.2100	2.32E-04	221942.	-9258.	-4.83E-05	0.00	3.85E+11
-132.003	615480.	0.00				
6.3000	1.80E-04	211866.	-9385.	-4.77E-05	0.00	3.85E+11
-102.967	618419.	0.00				
6.3900	1.29E-04	201671.	-9480.	-4.71E-05	0.00	3.85E+11

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-74.018	621357.	0.00				
6.4800	7.81E-05	191389.	-9545.	-4.65E-05	0.00	3.85E+11
-45.145	624293.	0.00				
6.5700	2.81E-05	181054.	-9578.	-4.60E-05	0.00	3.85E+11
-16.333	627229.	0.00				
6.6600	-2.13E-05	170701.	-9580.	-4.55E-05	0.00	3.85E+11
12.4302	630163.	0.00				
6.7500	-7.02E-05	160362.	-9551.	-4.51E-05	0.00	3.85E+11
41.1585	633096.	0.00				
6.8400	-1.19E-04	150071.	-9491.	-4.46E-05	0.00	3.85E+11
69.8661	636029.	0.00				
6.9300	-1.67E-04	139861.	-9400.	-4.42E-05	0.00	3.85E+11
98.5674	638960.	0.00				
7.0200	-2.14E-04	129766.	-9278.	-4.38E-05	0.00	3.85E+11
127.2769	641891.	0.00				
7.1100	-2.61E-04	119820.	-9125.	-4.35E-05	0.00	3.85E+11
156.0094	644820.	0.00				
7.2000	-3.08E-04	110056.	-8941.	-4.32E-05	0.00	3.85E+11
184.7797	647749.	0.00				
7.2900	-3.55E-04	100507.	-8726.	-4.29E-05	0.00	3.85E+11
213.6024	650677.	0.00				
7.3800	-4.01E-04	91208.	-8480.	-4.26E-05	0.00	3.85E+11
242.4924	653605.	0.00				
7.4700	-4.47E-04	82191.	-8202.	-4.24E-05	0.00	3.85E+11
271.4642	656531.	0.00				
7.5600	-4.92E-04	73491.	-7893.	-4.21E-05	0.00	3.85E+11
300.5322	659457.	0.00				
7.6500	-5.38E-04	65142.	-7553.	-4.19E-05	0.00	3.85E+11
329.7104	662382.	0.00				
7.7400	-5.83E-04	57177.	-7181.	-4.18E-05	0.00	3.85E+11
359.0126	665307.	0.00				
7.8300	-6.28E-04	49631.	-6778.	-4.16E-05	0.00	3.85E+11
388.4520	668231.	0.00				
7.9200	-6.73E-04	42537.	-6342.	-4.15E-05	0.00	3.85E+11
418.0414	671154.	0.00				
8.0100	-7.17E-04	35932.	-5875.	-4.14E-05	0.00	3.85E+11
447.7929	674077.	0.00				
8.1000	-7.62E-04	29849.	-5385.	-4.13E-05	0.00	3.85E+11
458.4137	649642.	0.00				
8.1900	-8.07E-04	24300.	-4885.	-4.12E-05	0.00	3.85E+11
466.9850	625238.	0.00				
8.2800	-8.51E-04	19296.	-4377.	-4.12E-05	0.00	3.85E+11
475.3333	603158.	0.00				
8.3700	-8.96E-04	14847.	-3859.	-4.11E-05	0.00	3.85E+11
483.4825	583068.	0.00				
8.4600	-9.40E-04	10962.	-3332.	-4.11E-05	0.00	3.85E+11
491.4530	564700.	0.00				
8.5500	-9.84E-04	7649.	-2797.	-4.10E-05	0.00	3.85E+11
499.2623	547829.	0.00				
8.6400	-0.00103	4920.	-2254.	-4.10E-05	0.00	3.85E+11

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506.9255	532271.	0.00				
8.7300	-0.00107	2781.	-1703.	-4.10E-05	0.00	3.85E+11
514.4557	517872.	0.00				
8.8200	-0.00112	1242.	-1143.	-4.10E-05	0.00	3.85E+11
521.8643	504501.	0.00				
8.9100	-0.00116	312.6161	-575.379	-4.10E-05	0.00	3.85E+11
529.1611	492047.	0.00				
9.0000	-0.00121	0.00	0.00	-4.10E-05	0.00	3.85E+11
536.3549	240209.	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	=	0.00615396 inches
Computed slope at pile head	=	-0.0001119 radians
Maximum bending moment	=	355023. inch-lbs
Maximum shear force	=	-9580. lbs
Depth of maximum bending moment	=	4.14000000 feet below pile head
Depth of maximum shear force	=	6.66000000 feet below pile head
Number of iterations	=	11
Number of zero deflection points	=	1
Pile deflection at ground	=	0.00487146 inches

 Pile-head Deflection vs. Pile Length for Load Case 1

Boundary Condition Type 1, Shear and Moment

Shear	=	1000. lbs
Moment	=	315600. in-lbs
Axial Load	=	4200. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	0.00615396	355023.	-9580.
8.55000	0.00894004	353195.	-10937.
8.10000	0.01805322	350598.	-12597.

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7.65000	0.04285546	346318.	-14146.
7.20000	0.10952567	341131.	-15620.
6.75000	0.35356259	337438.	-17510.
6.30000	1.21862964	335710.	-19609.
5.85000	6.13154690	340997.	-23086.

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

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

Shear force at pile head	=	2250.0 lbs
Applied moment at pile head	=	724800.0 in-lbs
Axial thrust load on pile head	=	4600.0 lbs

Depth Res.	Soil X Es*H feet lb/inch	Deflect. Spr. y Lat. inches lb/inch	Distrib. Load Moment in-lbs lb/inch	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness lb-in^2	Soil p
0.00	0.00	0.08584	724800.	2250.	-0.00115	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.09000	0.00	0.08460	727236.	2250.	-0.00115	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.1800	0.00	0.08336	729671.	2250.	-0.00115	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.2700	0.00	0.08212	732107.	2250.	-0.00114	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.3600	0.00	0.08089	734543.	2250.	-0.00114	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.4500	0.00	0.07966	736978.	2250.	-0.00114	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.5400	0.00	0.07843	739414.	2250.	-0.00114	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.6300	0.00	0.07720	741850.	2250.	-0.00114	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.7200	0.00	0.07597	744285.	2250.	-0.00113	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.8100	0.00	0.07475	746721.	2250.	-0.00113	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.9000	0.00	0.07353	749157.	2250.	-0.00113	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.9900	0.00	0.07231	751592.	2250.	-0.00113	0.00	3.83E+11	
0.00	0.00	0.00	0.00					

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-20 (Boring B-011 & 014-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

1.0800	0.07109	754028.	2233.	-0.00113	0.00	3.83E+11
-32.404	492.2738	0.00				
1.1700	0.06988	756426.	2197.	-0.00112	0.00	3.83E+11
-32.751	506.1839	0.00				
1.2600	0.06867	758785.	2162.	-0.00112	0.00	3.83E+11
-33.090	520.4429	0.00				
1.3500	0.06746	761106.	2126.	-0.00112	0.00	3.83E+11
-33.420	535.0657	0.00				
1.4400	0.06625	763388.	2090.	-0.00112	0.00	3.83E+11
-33.742	550.0683	0.00				
1.5300	0.06504	765631.	2053.	-0.00111	0.00	3.83E+11
-34.056	565.4676	0.00				
1.6200	0.06384	767834.	2016.	-0.00111	0.00	3.83E+11
-34.361	581.2816	0.00				
1.7100	0.06264	769996.	1979.	-0.00111	0.00	3.83E+11
-34.657	597.5295	0.00				
1.8000	0.06144	772119.	1941.	-0.00111	0.00	3.83E+11
-34.944	614.2318	0.00				
1.8900	0.06025	774200.	1903.	-0.00111	0.00	3.83E+11
-35.223	631.4103	0.00				
1.9800	0.05905	776241.	1865.	-0.00110	0.00	3.83E+11
-35.491	649.0882	0.00				
2.0700	0.05786	778240.	1827.	-0.00110	0.00	3.83E+11
-35.751	667.2905	0.00				
2.1600	0.05667	780197.	1788.	-0.00110	0.00	3.83E+11
-36.001	686.0440	0.00				
2.2500	0.05549	782113.	1749.	-0.00110	0.00	3.83E+11
-36.240	705.3773	0.00				
2.3400	0.05430	783986.	1710.	-0.00110	0.00	3.83E+11
-36.470	725.3212	0.00				
2.4300	0.05312	785816.	1670.	-0.00109	0.00	3.83E+11
-36.689	745.9088	0.00				
2.5200	0.05194	787604.	1630.	-0.00109	0.00	3.83E+11
-36.898	767.1760	0.00				
2.6100	0.05077	789349.	1590.	-0.00109	0.00	3.83E+11
-37.095	789.1611	0.00				
2.7000	0.04959	791050.	1550.	-0.00109	0.00	3.83E+11
-37.281	811.9059	0.00				
2.7900	0.04842	792708.	1510.	-0.00108	0.00	3.83E+11
-37.456	835.4555	0.00				
2.8800	0.04725	794322.	1469.	-0.00108	0.00	3.83E+11
-37.619	859.8589	0.00				
2.9700	0.04608	795893.	1429.	-0.00108	0.00	3.83E+11
-37.770	885.1693	0.00				
3.0600	0.04492	797419.	1388.	-0.00108	0.00	3.83E+11
-37.908	911.4448	0.00				
3.1500	0.04376	798901.	1347.	-0.00107	0.00	3.83E+11
-38.034	938.7485	0.00				
3.2400	0.04260	800339.	1306.	-0.00107	0.00	3.83E+11
-38.146	967.1498	0.00				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-20 (Boring B-011 & 014-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

3.3300	0.04144	801732.	1264.	-0.00107	0.00	3.83E+11
-38.244	996.7246	0.00				
3.4200	0.04028	803080.	1223.	-0.00107	0.00	3.83E+11
-38.328	1028.	0.00				
3.5100	0.03913	804384.	1182.	-0.00107	0.00	3.83E+11
-38.398	1060.	0.00				
3.6000	0.03798	805643.	1140.	-0.00106	0.00	3.83E+11
-38.452	1093.	0.00				
3.6900	0.03683	806857.	1099.	-0.00106	0.00	3.83E+11
-38.491	1129.	0.00				
3.7800	0.03569	808026.	1057.	-0.00106	0.00	3.83E+11
-38.513	1165.	0.00				
3.8700	0.03455	809151.	1015.	-0.00106	0.00	3.83E+11
-38.518	1204.	0.00				
3.9600	0.03341	810230.	973.7692	-0.00105	0.00	3.83E+11
-38.506	1245.	0.00				
4.0500	0.03227	811265.	445.9667	-0.00105	0.00	3.83E+11
-938.906	31424.	0.00				
4.1400	0.03113	811204.	-566.312	-0.00105	0.00	3.83E+11
-935.684	32458.	0.00				
4.2300	0.03000	810052.	-1575.	-0.00105	0.00	3.83E+11
-932.143	33556.	0.00				
4.3200	0.02887	807812.	-2580.	-0.00105	0.00	3.83E+11
-928.267	34725.	0.00				
4.4100	0.02774	804490.	-3580.	-0.00104	0.00	3.83E+11
-924.038	35972.	0.00				
4.5000	0.02662	800090.	-4575.	-0.00104	0.00	3.83E+11
-919.434	37306.	0.00				
4.5900	0.02549	794618.	-5566.	-0.00104	0.00	3.83E+11
-914.433	38737.	0.00				
4.6800	0.02437	788079.	-6550.	-0.00104	0.00	3.83E+11
-909.008	40278.	0.00				
4.7700	0.02326	780480.	-7529.	-0.00103	0.00	3.83E+11
-903.129	41941.	0.00				
4.8600	0.02214	771827.	-8501.	-0.00103	0.00	3.83E+11
-896.763	43745.	0.00				
4.9500	0.02103	762129.	-9466.	-0.00103	0.00	3.83E+11
-889.873	45707.	0.00				
5.0400	0.01992	751392.	-10423.	-0.00103	0.00	3.83E+11
-882.412	47853.	0.00				
5.1300	0.01881	739626.	-11371.	-0.00103	0.00	3.83E+11
-874.332	50210.	0.00				
5.2200	0.01770	726840.	-12311.	-0.00102	0.00	3.83E+11
-865.573	52814.	0.00				
5.3100	0.01660	713045.	-13240.	-0.00102	0.00	3.83E+11
-856.066	55710.	0.00				
5.4000	0.01549	698251.	-14159.	-0.00102	0.00	3.83E+11
-845.729	58953.	0.00				
5.4900	0.01439	682471.	-15067.	-0.00102	0.00	3.83E+11
-834.464	62613.	0.00				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

5.5800	0.01330	665717.	-15961.	-0.00102	0.00	3.84E+11
-822.154	66784.	0.00				
5.6700	0.01220	648005.	-16842.	-0.00101	0.00	3.84E+11
-808.651	71588.	0.00				
5.7600	0.01111	629349.	-17707.	-0.00101	0.00	3.84E+11
-793.774	77193.	0.00				
5.8500	0.01001	609767.	-18556.	-0.00101	0.00	3.84E+11
-777.289	83834.	0.00				
5.9400	0.00892	589279.	-19385.	-0.00101	0.00	3.84E+11
-758.893	91850.	0.00				
6.0300	0.00783	567905.	-20194.	-0.00101	0.00	3.84E+11
-738.174	101754.	0.00				
6.1200	0.00675	545671.	-20978.	-0.00101	0.00	3.84E+11
-714.558	114361.	0.00				
6.2100	0.00566	522603.	-21735.	-0.00100	0.00	3.84E+11
-687.202	131055.	0.00				
6.3000	0.00458	498733.	-22460.	-0.00100	0.00	3.84E+11
-654.783	154415.	0.00				
6.3900	0.00350	474100.	-23145.	-0.00100	0.00	3.84E+11
-615.024	189904.	0.00				
6.4800	0.00242	448749.	-23782.	-1.00E-03	0.00	3.84E+11
-563.405	251729.	0.00				
6.5700	0.00134	422742.	-24350.	-9.99E-04	0.00	3.84E+11
-488.252	394088.	0.00				
6.6600	2.60E-04	396164.	-24695.	-9.97E-04	0.00	3.84E+11
-151.822	630163.	0.00				
6.7500	-8.16E-04	369410.	-24542.	-9.96E-04	0.00	3.84E+11
435.5919	576198.	0.00				
6.8400	-0.00189	343163.	-24015.	-9.95E-04	0.00	3.84E+11
539.9127	308198.	0.00				
6.9300	-0.00297	317547.	-23396.	-9.94E-04	0.00	3.84E+11
606.9441	220969.	0.00				
7.0200	-0.00404	292638.	-22712.	-9.94E-04	0.00	3.85E+11
658.6731	176081.	0.00				
7.1100	-0.00511	268498.	-21978.	-9.93E-04	0.00	3.85E+11
701.7991	148249.	0.00				
7.2000	-0.00618	245176.	-21200.	-9.92E-04	0.00	3.85E+11
739.3408	129112.	0.00				
7.2900	-0.00726	222717.	-20383.	-9.91E-04	0.00	3.85E+11
772.9388	115053.	0.00				
7.3800	-0.00833	201159.	-19532.	-9.91E-04	0.00	3.85E+11
803.5913	104238.	0.00				
7.4700	-0.00940	180538.	-18648.	-9.90E-04	0.00	3.85E+11
831.9547	95629.	0.00				
7.5600	-0.01047	160888.	-17736.	-9.90E-04	0.00	3.85E+11
858.4848	88597.	0.00				
7.6500	-0.01153	142239.	-16795.	-9.89E-04	0.00	3.85E+11
883.5123	82730.	0.00				
7.7400	-0.01260	124621.	-15828.	-9.89E-04	0.00	3.85E+11
907.2850	77754.	0.00				

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7.8300	-0.01367	108061.	-14836.	-9.89E-04	0.00	3.85E+11
929.9936	73474.	0.00				
7.9200	-0.01474	92585.	-13820.	-9.88E-04	0.00	3.85E+11
951.7884	69749.	0.00				
8.0100	-0.01581	78220.	-12780.	-9.88E-04	0.00	3.85E+11
972.7900	66473.	0.00				
8.1000	-0.01687	64989.	-11719.	-9.88E-04	0.00	3.85E+11
993.0964	63569.	0.00				
8.1900	-0.01794	52917.	-10636.	-9.88E-04	0.00	3.85E+11
1013.	60974.	0.00				
8.2800	-0.01901	42026.	-9531.	-9.88E-04	0.00	3.85E+11
1032.	58639.	0.00				
8.3700	-0.02007	32339.	-8407.	-9.88E-04	0.00	3.85E+11
1051.	56527.	0.00				
8.4600	-0.02114	23877.	-7262.	-9.87E-04	0.00	3.85E+11
1069.	54606.	0.00				
8.5500	-0.02221	16662.	-6098.	-9.87E-04	0.00	3.85E+11
1087.	52850.	0.00				
8.6400	-0.02327	10715.	-4915.	-9.87E-04	0.00	3.85E+11
1104.	51239.	0.00				
8.7300	-0.02434	6055.	-3714.	-9.87E-04	0.00	3.85E+11
1121.	49754.	0.00				
8.8200	-0.02540	2703.	-2494.	-9.87E-04	0.00	3.85E+11
1138.	48381.	0.00				
8.9100	-0.02647	677.9570	-1256.	-9.87E-04	0.00	3.85E+11
1155.	47107.	0.00				
9.0000	-0.02754	0.00	0.00	-9.87E-04	0.00	3.85E+11
1171.	22961.	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	=	0.08584115 inches
Computed slope at pile head	=	-0.0011504 radians
Maximum bending moment	=	811265. inch-lbs
Maximum shear force	=	-24695. lbs
Depth of maximum bending moment	=	4.05000000 feet below pile head
Depth of maximum shear force	=	6.66000000 feet below pile head
Number of iterations	=	32
Number of zero deflection points	=	1
Pile deflection at ground	=	0.07217371 inches

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 Pile-head Deflection vs. Pile Length for Load Case 2

Boundary Condition Type 1, Shear and Moment

Shear = 2250. lbs
 Moment = 724800. in-lbs
 Axial Load = 4600. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	0.08584115	811265.	-24695.
8.55000	0.16846322	804635.	-26567.
8.10000	0.40386306	796398.	-29146.
7.65000	1.02014475	787641.	-32082.
7.20000	2.68543165	781091.	-35412.
6.75000	9.68736518	786300.	-40874.

 Computed Values of Pile Loading and Deflection
 for Lateral Loading for Load Case Number 3

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

Shear force at pile head = 2250.0 lbs
 Applied moment at pile head = 724800.0 in-lbs
 Axial thrust load on pile head = 3800.0 lbs

Depth Res.	Soil X	Deflect. Spr. y	Bending Distrib. Lat. Load	Shear Force	Slope S	Total Stress	Bending Stiffness	Soil p
feet	Es*H	inches	in-lbs	lbs	radians	psi*	lb-in^2	
lb/inch		lb/inch	lb/inch					
0.00	0.00	0.08581	724800.	2250.	-0.00115	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.09000	0.00	0.08457	727235.	2250.	-0.00115	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.1800	0.00	0.08333	729669.	2250.	-0.00115	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.2700	0.00	0.08209	732104.	2250.	-0.00114	0.00	3.83E+11	

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0.00	0.00	0.00				
0.3600	0.08086	734539.	2250.	-0.00114	0.00	3.83E+11
0.00	0.00	0.00				
0.4500	0.07963	736973.	2250.	-0.00114	0.00	3.83E+11
0.00	0.00	0.00				
0.5400	0.07840	739408.	2250.	-0.00114	0.00	3.83E+11
0.00	0.00	0.00				
0.6300	0.07717	741843.	2250.	-0.00114	0.00	3.83E+11
0.00	0.00	0.00				
0.7200	0.07594	744277.	2250.	-0.00113	0.00	3.83E+11
0.00	0.00	0.00				
0.8100	0.07472	746712.	2250.	-0.00113	0.00	3.83E+11
0.00	0.00	0.00				
0.9000	0.07350	749147.	2250.	-0.00113	0.00	3.83E+11
0.00	0.00	0.00				
0.9900	0.07228	751581.	2250.	-0.00113	0.00	3.83E+11
0.00	0.00	0.00				
1.0800	0.07107	754016.	2233.	-0.00113	0.00	3.83E+11
-32.400	492.3963	0.00				
1.1700	0.06985	756413.	2197.	-0.00112	0.00	3.83E+11
-32.747	506.3099	0.00				
1.2600	0.06864	758771.	2162.	-0.00112	0.00	3.83E+11
-33.085	520.5725	0.00				
1.3500	0.06743	761091.	2126.	-0.00112	0.00	3.83E+11
-33.416	535.1991	0.00				
1.4400	0.06622	763373.	2090.	-0.00112	0.00	3.83E+11
-33.738	550.2055	0.00				
1.5300	0.06502	765614.	2053.	-0.00111	0.00	3.83E+11
-34.051	565.6088	0.00				
1.6200	0.06382	767816.	2016.	-0.00111	0.00	3.83E+11
-34.356	581.4269	0.00				
1.7100	0.06262	769978.	1979.	-0.00111	0.00	3.83E+11
-34.653	597.6790	0.00				
1.8000	0.06142	772099.	1941.	-0.00111	0.00	3.83E+11
-34.940	614.3856	0.00				
1.8900	0.06022	774180.	1903.	-0.00111	0.00	3.83E+11
-35.218	631.5685	0.00				
1.9800	0.05903	776220.	1865.	-0.00110	0.00	3.83E+11
-35.487	649.2509	0.00				
2.0700	0.05784	778218.	1827.	-0.00110	0.00	3.83E+11
-35.746	667.4580	0.00				
2.1600	0.05665	780174.	1788.	-0.00110	0.00	3.83E+11
-35.996	686.2163	0.00				
2.2500	0.05547	782089.	1749.	-0.00110	0.00	3.83E+11
-36.236	705.5546	0.00				
2.3400	0.05428	783961.	1710.	-0.00109	0.00	3.83E+11
-36.465	725.5036	0.00				
2.4300	0.05310	785791.	1670.	-0.00109	0.00	3.83E+11
-36.684	746.0966	0.00				
2.5200	0.05192	787578.	1630.	-0.00109	0.00	3.83E+11

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

-36.893	767.3692	0.00					
2.6100	0.05075	789321.	1590.	-0.00109	0.00	3.83E+11	
-37.090	789.3600	0.00					
2.7000	0.04957	791022.	1550.	-0.00109	0.00	3.83E+11	
-37.277	812.1107	0.00					
2.7900	0.04840	792679.	1510.	-0.00108	0.00	3.83E+11	
-37.452	835.6664	0.00					
2.8800	0.04723	794292.	1469.	-0.00108	0.00	3.83E+11	
-37.614	860.0762	0.00					
2.9700	0.04607	795862.	1429.	-0.00108	0.00	3.83E+11	
-37.765	885.3931	0.00					
3.0600	0.04490	797387.	1388.	-0.00108	0.00	3.83E+11	
-37.904	911.6754	0.00					
3.1500	0.04374	798869.	1347.	-0.00107	0.00	3.83E+11	
-38.029	938.9862	0.00					
3.2400	0.04258	800305.	1306.	-0.00107	0.00	3.83E+11	
-38.141	967.3949	0.00					
3.3300	0.04142	801698.	1264.	-0.00107	0.00	3.83E+11	
-38.239	996.9773	0.00					
3.4200	0.04027	803046.	1223.	-0.00107	0.00	3.83E+11	
-38.324	1028.	0.00					
3.5100	0.03912	804349.	1182.	-0.00107	0.00	3.83E+11	
-38.393	1060.	0.00					
3.6000	0.03797	805607.	1140.	-0.00106	0.00	3.83E+11	
-38.447	1094.	0.00					
3.6900	0.03682	806820.	1099.	-0.00106	0.00	3.83E+11	
-38.486	1129.	0.00					
3.7800	0.03568	807989.	1057.	-0.00106	0.00	3.83E+11	
-38.508	1166.	0.00					
3.8700	0.03453	809112.	1016.	-0.00106	0.00	3.83E+11	
-38.513	1204.	0.00					
3.9600	0.03339	810191.	973.9302	-0.00105	0.00	3.83E+11	
-38.501	1245.	0.00					
4.0500	0.03226	811225.	446.1789	-0.00105	0.00	3.83E+11	
-938.816	31433.	0.00					
4.1400	0.03112	811163.	-566.003	-0.00105	0.00	3.83E+11	
-935.594	32467.	0.00					
4.2300	0.02999	810011.	-1575.	-0.00105	0.00	3.83E+11	
-932.053	33566.	0.00					
4.3200	0.02886	807771.	-2579.	-0.00105	0.00	3.83E+11	
-928.178	34735.	0.00					
4.4100	0.02773	804448.	-3579.	-0.00104	0.00	3.83E+11	
-923.949	35982.	0.00					
4.5000	0.02661	800048.	-4575.	-0.00104	0.00	3.83E+11	
-919.346	37317.	0.00					
4.5900	0.02548	794576.	-5565.	-0.00104	0.00	3.83E+11	
-914.345	38749.	0.00					
4.6800	0.02436	788037.	-6549.	-0.00104	0.00	3.83E+11	
-908.920	40289.	0.00					
4.7700	0.02325	780438.	-7528.	-0.00103	0.00	3.83E+11	

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
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-903.042	41954.	0.00				
4.8600	0.02213	771785.	-8500.	-0.00103	0.00	3.83E+11
-896.677	43757.	0.00				
4.9500	0.02102	762087.	-9464.	-0.00103	0.00	3.83E+11
-889.787	45720.	0.00				
5.0400	0.01991	751351.	-10421.	-0.00103	0.00	3.83E+11
-882.328	47866.	0.00				
5.1300	0.01880	739585.	-11370.	-0.00103	0.00	3.83E+11
-874.248	50224.	0.00				
5.2200	0.01769	726800.	-12309.	-0.00102	0.00	3.83E+11
-865.490	52830.	0.00				
5.3100	0.01659	713006.	-13239.	-0.00102	0.00	3.83E+11
-855.984	55726.	0.00				
5.4000	0.01549	698213.	-14158.	-0.00102	0.00	3.83E+11
-845.648	58970.	0.00				
5.4900	0.01439	682433.	-15065.	-0.00102	0.00	3.83E+11
-834.385	62631.	0.00				
5.5800	0.01329	665681.	-15959.	-0.00102	0.00	3.84E+11
-822.075	66803.	0.00				
5.6700	0.01219	647969.	-16840.	-0.00101	0.00	3.84E+11
-808.574	71609.	0.00				
5.7600	0.01110	629315.	-17705.	-0.00101	0.00	3.84E+11
-793.698	77215.	0.00				
5.8500	0.01001	609734.	-18554.	-0.00101	0.00	3.84E+11
-777.215	83858.	0.00				
5.9400	0.00892	589247.	-19383.	-0.00101	0.00	3.84E+11
-758.821	91876.	0.00				
6.0300	0.00783	567875.	-20191.	-0.00101	0.00	3.84E+11
-738.104	101783.	0.00				
6.1200	0.00675	545642.	-20976.	-0.00101	0.00	3.84E+11
-714.491	114393.	0.00				
6.2100	0.00566	522576.	-21733.	-0.00100	0.00	3.84E+11
-687.139	131092.	0.00				
6.3000	0.00458	498708.	-22457.	-0.00100	0.00	3.84E+11
-654.723	154457.	0.00				
6.3900	0.00350	474076.	-23143.	-0.00100	0.00	3.84E+11
-614.970	189954.	0.00				
6.4800	0.00242	448728.	-23779.	-9.99E-04	0.00	3.84E+11
-563.357	251792.	0.00				
6.5700	0.00134	422722.	-24347.	-9.98E-04	0.00	3.84E+11
-488.216	394175.	0.00				
6.6600	2.60E-04	396146.	-24693.	-9.97E-04	0.00	3.84E+11
-151.842	630163.	0.00				
6.7500	-8.16E-04	369394.	-24539.	-9.96E-04	0.00	3.84E+11
435.5307	576440.	0.00				
6.8400	-0.00189	343149.	-24013.	-9.95E-04	0.00	3.84E+11
539.8496	308305.	0.00				
6.9300	-0.00297	317534.	-23394.	-9.94E-04	0.00	3.84E+11
606.8770	221042.	0.00				
7.0200	-0.00404	292627.	-22710.	-9.93E-04	0.00	3.85E+11

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658.6023	176137.	0.00				
7.1100	-0.00511	268489.	-21976.	-9.92E-04	0.00	3.85E+11
701.7249	148296.	0.00				
7.2000	-0.00618	245168.	-21197.	-9.92E-04	0.00	3.85E+11
739.2635	129152.	0.00				
7.2900	-0.00725	222710.	-20381.	-9.91E-04	0.00	3.85E+11
772.8585	115089.	0.00				
7.3800	-0.00832	201154.	-19530.	-9.90E-04	0.00	3.85E+11
803.5084	104270.	0.00				
7.4700	-0.00939	180534.	-18647.	-9.90E-04	0.00	3.85E+11
831.8691	95659.	0.00				
7.5600	-0.01046	160885.	-17734.	-9.89E-04	0.00	3.85E+11
858.3969	88624.	0.00				
7.6500	-0.01153	142237.	-16793.	-9.89E-04	0.00	3.85E+11
883.4220	82756.	0.00				
7.7400	-0.01260	124620.	-15826.	-9.89E-04	0.00	3.85E+11
907.1925	77778.	0.00				
7.8300	-0.01366	108061.	-14834.	-9.88E-04	0.00	3.85E+11
929.8990	73496.	0.00				
7.9200	-0.01473	92586.	-13818.	-9.88E-04	0.00	3.85E+11
951.6917	69770.	0.00				
8.0100	-0.01580	78221.	-12779.	-9.88E-04	0.00	3.85E+11
972.6912	66494.	0.00				
8.1000	-0.01687	64991.	-11718.	-9.88E-04	0.00	3.85E+11
992.9957	63588.	0.00				
8.1900	-0.01793	52920.	-10635.	-9.87E-04	0.00	3.85E+11
1013.	60992.	0.00				
8.2800	-0.01900	42029.	-9530.	-9.87E-04	0.00	3.85E+11
1032.	58657.	0.00				
8.3700	-0.02006	32342.	-8406.	-9.87E-04	0.00	3.85E+11
1050.	56544.	0.00				
8.4600	-0.02113	23880.	-7262.	-9.87E-04	0.00	3.85E+11
1069.	54623.	0.00				
8.5500	-0.02220	16665.	-6098.	-9.87E-04	0.00	3.85E+11
1087.	52866.	0.00				
8.6400	-0.02326	10717.	-4915.	-9.87E-04	0.00	3.85E+11
1104.	51254.	0.00				
8.7300	-0.02433	6057.	-3713.	-9.87E-04	0.00	3.85E+11
1121.	49769.	0.00				
8.8200	-0.02539	2704.	-2494.	-9.87E-04	0.00	3.85E+11
1138.	48395.	0.00				
8.9100	-0.02646	678.7429	-1256.	-9.87E-04	0.00	3.85E+11
1154.	47121.	0.00				
9.0000	-0.02753	0.00	0.00	-9.87E-04	0.00	3.85E+11
1171.	22968.	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 inter-

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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. 3:

Pile-head deflection = 0.08580944 inches
 Computed slope at pile head = -0.0011500 radians
 Maximum bending moment = 811225. inch-lbs
 Maximum shear force = -24693. lbs
 Depth of maximum bending moment = 4.05000000 feet below pile head
 Depth of maximum shear force = 6.66000000 feet below pile head
 Number of iterations = 32
 Number of zero deflection points = 1
 Pile deflection at ground = 0.07214680 inches

 Pile-head Deflection vs. Pile Length for Load Case 3

Boundary Condition Type 1, Shear and Moment

Shear = 2250. lbs
 Moment = 724800. in-lbs
 Axial Load = 3800. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	0.08580944	811225.	-24693.
8.55000	0.16833640	804557.	-26562.
8.10000	0.40312548	796206.	-29131.
7.65000	1.01542328	787204.	-32043.
7.20000	2.65250250	780060.	-35296.
6.75000	9.23377965	782377.	-40361.

 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

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Load Type 5: Load 1 = Top Deflection, y, inches, and Load 2 = Slope, S, radians

Load Case	Load Type	Load 1 Pile-head in-lbs	Load 2 Type	Load 2 Pile-head Load 2	Axial Loading lbs	Pile-head Deflection inches	Pile-head Rotation radians	Max in lbs
No.	1	Load 1	2	Load 2	lbs	inches	radians	lbs
-----	-----	-----	-----	-----	-----	-----	-----	-----
1	V, lb	1000.0000	M, in-lb	315600.	4200.	0.00615	-1.12E-04	
-9580.		355023.						
2	V, lb	2250.	M, in-lb	724800.	4600.	0.08584	-0.00115	
-24695.		811265.						
3	V, lb	2250.	M, in-lb	724800.	3800.	0.08581	-0.00115	
-24693.		811225.						

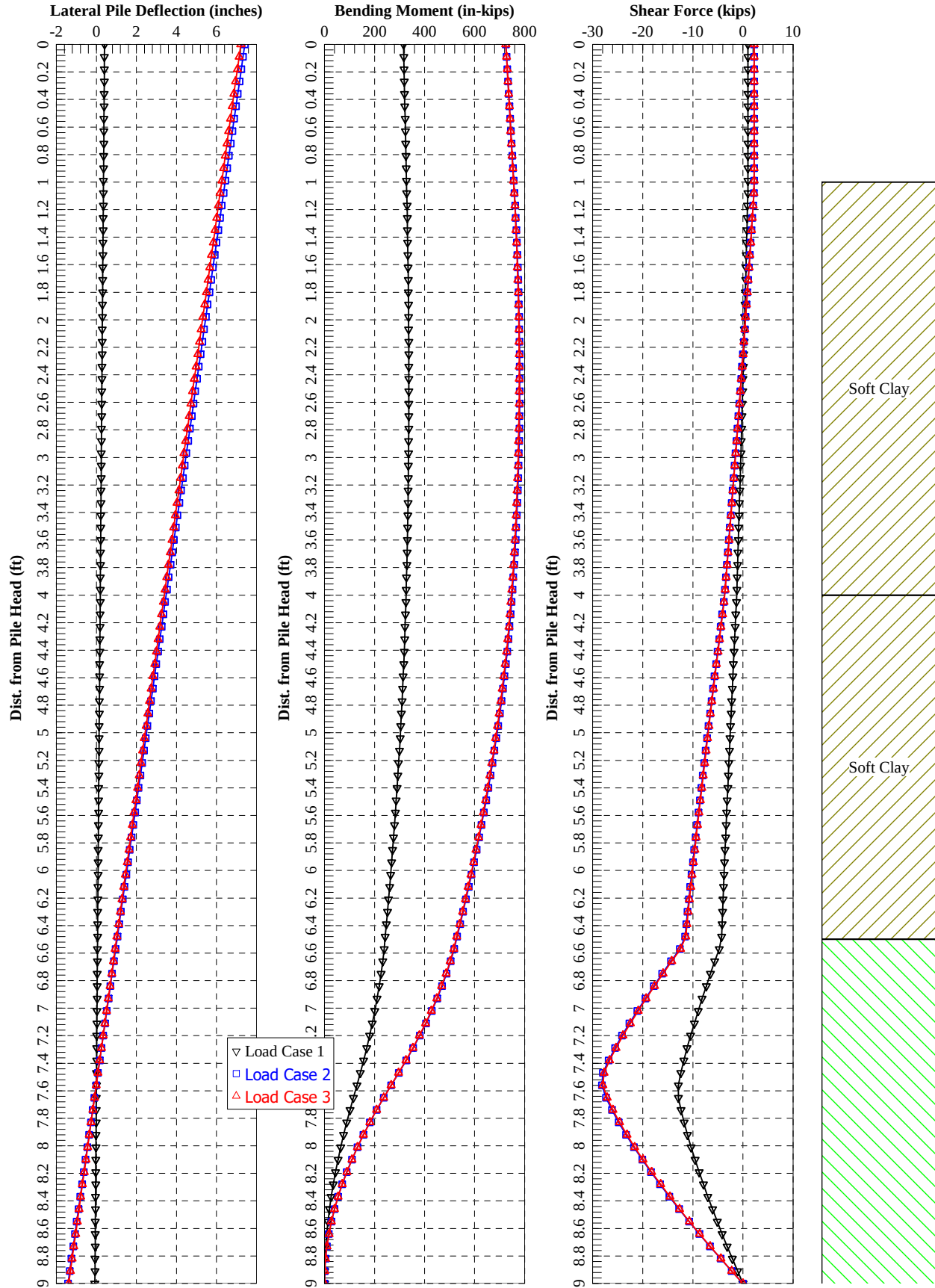
Maximum pile-head deflection = 0.0858411482 inches

Maximum pile-head rotation = -0.0011504463 radians = -0.065916 deg.

The analysis ended normally.

LATERAL LOAD (LPILE) ANALYSES
SOUTHBOUND PARKING AREA
LIGHT TOWER SC1-21 (B-016-0-25)

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
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Analysis of Individual Piles and Drilled Shafts
Subjected to Lateral Loading Using the p-y Method
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=====

This model was prepared by:
BSears

Files Used for Analysis

Path to file locations:
\Columbus-1170\Projects\2024\24170232_ms_TP 26 NE Ohio\GEO\Project Docs\Site
15_SUM-271 (2LMN)\Calcs\Light Towers\LPILE (Final Report)\SB\

Name of input data file:
Tower SC1-21 (B-016).lp12d

Name of output report file:
Tower SC1-21 (B-016).lp12o

Name of plot output file:
Tower SC1-21 (B-016).lp12p

Name of runtime message file:
Tower SC1-21 (B-016).lp12r

Date and Time of Analysis

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-21 (Boring B-016-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Date: April 8, 2026

Time: 20:47:22

Problem Title

Project Name: TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas

Job Number: 24170232F

Client: ms consultants, inc.

Engineer: BKS

Description: Light Tower SC1-21 (B-016-0-25)

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

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Light Tower SC1-21 (Boring B-016-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

- 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	=	9.000 ft
Depth of ground surface below top of pile	=	1.0000 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.

Point No.	Depth Below Pile Head feet	Pile Diameter inches
-----	-----	-----
1	0.000	36.0000
2	9.000	36.0000

Input Structural Properties for Pile Sections:

Pile Section No. 1:

Section 1 is a round drilled shaft, bored pile, or CIDH pile	
Length of section	= 9.000000 ft
Shaft Diameter	= 36.000000 in

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Soil and Rock Layering Information

The soil profile is modelled using 4 layers

Layer 1 is soft clay, p-y criteria by Matlock, 1970

Distance from top of pile to top of layer	=	1.000000	ft
Distance from top of pile to bottom of layer	=	4.000000	ft
Effective unit weight at top of layer	=	98.000000	pcf
Effective unit weight at bottom of layer	=	98.000000	pcf
Undrained cohesion at top of layer	=	250.000000	psf
Undrained cohesion at bottom of layer	=	250.000000	psf
Epsilon-50 at top of layer	=	0.020000	
Epsilon-50 at bottom of layer	=	0.020000	

Layer 2 is soft clay, p-y criteria by Matlock, 1970

Distance from top of pile to top of layer	=	4.000000	ft
Distance from top of pile to bottom of layer	=	6.500000	ft
Effective unit weight at top of layer	=	48.000000	pcf
Effective unit weight at bottom of layer	=	48.000000	pcf
Undrained cohesion at top of layer	=	500.000000	psf
Undrained cohesion at bottom of layer	=	500.000000	psf
Epsilon-50 at top of layer	=	0.020000	
Epsilon-50 at bottom of layer	=	0.020000	

Layer 3 is stiff clay without free water

Distance from top of pile to top of layer	=	6.500000	ft
Distance from top of pile to bottom of layer	=	14.000000	ft
Effective unit weight at top of layer	=	63.000000	pcf
Effective unit weight at bottom of layer	=	63.000000	pcf
Undrained cohesion at top of layer	=	3500.	psf
Undrained cohesion at bottom of layer	=	3500.	psf
Epsilon-50 at top of layer	=	0.005000	
Epsilon-50 at bottom of layer	=	0.005000	

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

Distance from top of pile to top of layer	=	14.000000	ft
Distance from top of pile to bottom of layer	=	17.800000	ft
Effective unit weight at top of layer	=	78.000000	pcf

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Effective unit weight at bottom of layer = 78.000000 pcf
 Friction angle at top of layer = 36.000000 deg.
 Friction angle at bottom of layer = 36.000000 deg.
 Subgrade k at top of layer = 125.000000 pci
 Subgrade k at bottom of layer = 125.000000 pci

(Depth of the lowest soil layer extends 8.800 ft below the pile tip)

 Summary of Input Soil Properties

Layer E50 Num. or krm	Soil Type Name kpy (p-y Curve Type) pci	Layer Depth ft	Effective Unit Wt. pcf	Cohesion psf	Angle of Friction deg.
1 0.02000	Soft --	1.0000	98.0000	250.0000	--
0.02000	Clay --	4.0000	98.0000	250.0000	--
2 0.02000	Soft --	4.0000	48.0000	500.0000	--
0.02000	Clay --	6.5000	48.0000	500.0000	--
3 0.00500	Stiff Clay --	6.5000	63.0000	3500.	--
0.00500	w/o Free Water --	14.0000	63.0000	3500.	--
4 --	Sand 125.0000	14.0000	78.0000	--	36.0000
--	(Reese, et al.) 125.0000	17.8000	78.0000	--	36.0000

 Static Loading Type

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

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 Light Tower SC1-21 (Boring B-016-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 3

Load Compute No.	Load Top y Type	Condition Run Analysis 1	Condition 2	Axial Thrust Force, lbs
vs. Pile Length				
1	1	V = 1000.000000 lbs	M = 315600. in-lbs	4200.
Yes		Yes		
2	1	V = 2250. lbs	M = 724800. in-lbs	4600.
Yes		Yes		
3	1	V = 2250. lbs	M = 724800. in-lbs	3800.
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:

Dimensions and Properties of Drilled Shaft (Bored Pile):

Length of Section	=	9.000000 ft
Shaft Diameter	=	36.000000 in
Concrete Cover Thickness (to edge of trans. reinf.)	=	3.500000 in
Number of Reinforcing Bars	=	16 bars
Yield Stress of Reinforcing Bars	=	60000. psi
Modulus of Elasticity of Reinforcing Bars	=	29000000. psi
Gross Area of Shaft	=	1018. sq. in.

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Total Area of Reinforcing Steel	=	16.000000 sq. in.
Area Ratio of Steel Reinforcement	=	1.57 percent
Edge-to-Edge Bar Spacing	=	4.114467 in
Maximum Concrete Aggregate Size	=	0.750000 in
Ratio of Bar Spacing to Aggregate Size	=	5.49
Offset of Center of Rebar Cage from Center of Pile	=	0.0000 in
Transverse Reinforcement		
Type: Spiral		
Number of Transverse Reinf. (per spacing)	=	1
Spacing of Transverse Reinf.	=	4.500000 in
Yield Stress of Transverse Reinf.	=	60000. psi
Diameter of Transverse Reinf.	=	0.500000 in

Axial Structural Capacities:

Nom. Axial Structural Capacity = $0.85 F_c A_c + F_y A_s$	=	4366.378 kips
Tensile Load for Cracking of Concrete	=	-470.222 kips
Nominal Axial Tensile Capacity	=	-960.000 kips

Reinforcing Bar Dimensions and Positions Used in Computations:

Bar Number	Bar Diam. inches	Bar Area sq. in.	X inches	Y inches
-----	-----	-----	-----	-----
1	1.128000	1.000000	13.436000	0.000000
2	1.128000	1.000000	12.413245	5.141735
3	1.128000	1.000000	9.500687	9.500687
4	1.128000	1.000000	5.141735	12.413245
5	1.128000	1.000000	0.000000	13.436000
6	1.128000	1.000000	-5.14173	12.413245
7	1.128000	1.000000	-9.50069	9.500687
8	1.128000	1.000000	-12.41325	5.141735
9	1.128000	1.000000	-13.43600	0.000000
10	1.128000	1.000000	-12.41325	-5.14173
11	1.128000	1.000000	-9.50069	-9.50069
12	1.128000	1.000000	-5.14173	-12.41325
13	1.128000	1.000000	0.000000	-13.43600
14	1.128000	1.000000	5.141735	-12.41325
15	1.128000	1.000000	9.500687	-9.50069
16	1.128000	1.000000	12.413245	-5.14173

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

Minimum spacing between any two bars not equal to zero = 4.114 inches
 between bars 11 and 12.

Ratio of bar spacing to maximum aggregate size = 5.49

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-21 (Boring B-016-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Concrete Properties:

Compressive Strength of Concrete	=	4000. psi
Modulus of Elasticity of Concrete	=	3604997. psi
Modulus of Rupture of Concrete	=	-474.34165 psi
Compression Strain at Peak Stress	=	0.001886
Tensile Strain at Fracture of Concrete	=	-0.0001154
Maximum Coarse Aggregate Size	=	0.750000 in

Number of Axial Thrust Force Values Determined from Pile-head Loadings = 3

Number	Axial Thrust Force kips
-----	-----
1	3.800
2	4.200
3	4.600

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 318-14, Section 21.2.3.
 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 = 3.800 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
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TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-21 (Boring B-016-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

6.25000E-07	240.5062135	384809942.	19.2929823	0.00001206	-0.00001044
0.0505030	0.2746478				
0.00000125	480.1472468	384117797.	18.6479768	0.00002331	-0.00002169
0.0973082	0.5259142				
0.00000188	718.9174733	383422652.	18.4329804	0.00003456	-0.00003294
0.1438345	0.7771808				
0.00000250	956.8168886	382726755.	18.3254857	0.00004581	-0.00004419
0.1900818	1.0284477				
0.00000313	1194.	382030558.	18.2609917	0.00005707	-0.00005543
0.2360502	1.2797149				
0.00000375	1430.	381334209.	18.2179981	0.00006832	-0.00006668
0.2817396	1.5309823				
0.00000438	1665.	380637775.	18.1872904	0.00007957	-0.00007793
0.3271500	1.7822500				
0.00000500	1900.	379941287.	18.1642614	0.00009082	-0.00008918
0.3722815	2.0335179				
0.00000563	2133.	379244764.	18.1463515	0.0001021	-0.000100
0.4171340	2.2847861				
0.00000625	2366.	378548215.	18.1320251	0.0001133	-0.000112
0.4617075	2.5360546				
0.00000688	2366.	344134741.	10.2494785	0.00007047	-0.000177
0.2882187	-4.308598 C				
0.00000750	2366.	315456846.	10.2198771	0.00007665	-0.000193
0.3129821	-4.706727 C				
0.00000813	2366.	291190934.	10.1952302	0.00008284	-0.000210
0.3376758	-5.104761 C				
0.00000875	2366.	270391582.	10.1744772	0.00008903	-0.000226
0.3622998	-5.502701 C				
0.00000938	2366.	252365477.	10.1568402	0.00009522	-0.000242
0.3868539	-5.900547 C				
0.00001000	2366.	236592634.	10.1417358	0.0001014	-0.000259
0.4113380	-6.298297 C				
0.00001063	2366.	222675420.	10.1287027	0.0001076	-0.000275
0.4357521	-6.695951 C				
0.00001125	2366.	210304564.	10.1174231	0.0001138	-0.000291
0.4600960	-7.093510 C				
0.00001188	2366.	199235903.	10.1076093	0.0001200	-0.000307
0.4843696	-7.490973 C				
0.00001250	2366.	189274107.	10.0990420	0.0001262	-0.000324
0.5085729	-7.888340 C				
0.00001313	2366.	180261055.	10.0915439	0.0001325	-0.000340
0.5327056	-8.285611 C				
0.00001375	2366.	172067370.	10.0849699	0.0001387	-0.000356
0.5567678	-8.682785 C				
0.00001438	2366.	164586180.	10.0792000	0.0001449	-0.000373
0.5807594	-9.079861 C				
0.00001500	2366.	157728423.	10.0741344	0.0001511	-0.000389
0.6046801	-9.476841 C				
0.00001563	2366.	151419286.	10.0696892	0.0001573	-0.000405
0.6285300	-9.873723 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-21 (Boring B-016-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00001625	2366.	145595467.	10.0657933	0.0001636	-0.000421
0.6523089	-10.270507 C				
0.00001688	2366.	140203043.	10.0623863	0.0001698	-0.000438
0.6760167	-10.667193 C				
0.00001750	2366.	135195791.	10.0594163	0.0001760	-0.000454
0.6996534	-11.063781 C				
0.00001813	2366.	130533867.	10.0568387	0.0001823	-0.000470
0.7232187	-11.460271 C				
0.00001875	2366.	126182738.	10.0546147	0.0001885	-0.000486
0.7467127	-11.856661 C				
0.00001938	2366.	122112327.	10.0527107	0.0001948	-0.000503
0.7701352	-12.252952 C				
0.00002000	2366.	118296317.	10.0510970	0.0002010	-0.000519
0.7934860	-12.649144 C				
0.00002063	2366.	114711580.	10.0497478	0.0002073	-0.000535
0.8167652	-13.045236 C				
0.00002125	2366.	111337710.	10.0486401	0.0002135	-0.000551
0.8399726	-13.441228 C				
0.00002188	2366.	108156633.	10.0477539	0.0002198	-0.000568
0.8631080	-13.837120 C				
0.00002250	2366.	105152282.	10.0470709	0.0002261	-0.000584
0.8861714	-14.232911 C				
0.00002313	2366.	102310328.	10.0465752	0.0002323	-0.000600
0.9091627	-14.628602 C				
0.00002375	2366.	99617951.	10.0462524	0.0002386	-0.000616
0.9320817	-15.024191 C				
0.00002438	2366.	97063645.	10.0460897	0.0002449	-0.000633
0.9549284	-15.419678 C				
0.00002563	2429.	94800037.	10.0461990	0.0002574	-0.000665
1.0004043	-16.210348 C				
0.00002688	2545.	94692477.	10.0468231	0.0002700	-0.000697
1.0455896	-17.000609 C				
0.00002813	2660.	94589756.	10.0479254	0.0002826	-0.000730
1.0904832	-17.790458 C				
0.00002938	2776.	94491232.	10.0493946	0.0002952	-0.000762
1.1350844	-18.579893 C				
0.00003063	2891.	94396370.	10.0512127	0.0003078	-0.000795
1.1793922	-19.368912 C				
0.00003188	3006.	94304718.	10.0533415	0.0003205	-0.000827
1.2234058	-20.157511 C				
0.00003313	3121.	94215891.	10.0557483	0.0003331	-0.000859
1.2671243	-20.945689 C				
0.00003438	3236.	94129561.	10.0584054	0.0003458	-0.000892
1.3105466	-21.733443 C				
0.00003563	3350.	94045446.	10.0612887	0.0003584	-0.000924
1.3536720	-22.520771 C				
0.00003688	3465.	93963300.	10.0643778	0.0003711	-0.000956
1.3964994	-23.307669 C				
0.00003813	3579.	93882912.	10.0676547	0.0003838	-0.000989
1.4390279	-24.094136 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-21 (Boring B-016-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00003938	3694.	93804096.	10.0711039	0.0003965	-0.001021
1.4812567	-24.880169 C				
0.00004063	3808.	93726688.	10.0747116	0.0004093	-0.001053
1.5231846	-25.665765 C				
0.00004188	3922.	93650546.	10.0784659	0.0004220	-0.001085
1.5648108	-26.450921 C				
0.00004313	4035.	93575540.	10.0823562	0.0004348	-0.001118
1.6061342	-27.235635 C				
0.00004438	4149.	93501560.	10.0863731	0.0004476	-0.001150
1.6471540	-28.019904 C				
0.00004563	4263.	93428502.	10.0905084	0.0004604	-0.001182
1.6878690	-28.803725 C				
0.00004688	4376.	93356279.	10.0947545	0.0004732	-0.001214
1.7282784	-29.587096 C				
0.00004813	4489.	93284807.	10.0991050	0.0004860	-0.001246
1.7683810	-30.370013 C				
0.00004938	4602.	93214014.	10.1035538	0.0004989	-0.001279
1.8081759	-31.152474 C				
0.00005063	4715.	93143835.	10.1080956	0.0005117	-0.001311
1.8476620	-31.934476 C				
0.00005188	4828.	93074209.	10.1127258	0.0005246	-0.001343
1.8868384	-32.716016 C				
0.00005313	4941.	93005082.	10.1174399	0.0005375	-0.001375
1.9257039	-33.497091 C				
0.00005438	5053.	92936405.	10.1222340	0.0005504	-0.001407
1.9642575	-34.277698 C				
0.00005563	5166.	92868132.	10.1271047	0.0005633	-0.001439
2.0024981	-35.057833 C				
0.00005688	5278.	92800222.	10.1320488	0.0005763	-0.001471
2.0404247	-35.837495 C				
0.00005813	5390.	92732637.	10.1370633	0.0005892	-0.001503
2.0780361	-36.616679 C				
0.00005938	5502.	92665342.	10.1421457	0.0006022	-0.001535
2.1153313	-37.395383 C				
0.00006063	5614.	92598305.	10.1472935	0.0006152	-0.001567
2.1523092	-38.173604 C				
0.00006188	5725.	92531497.	10.1525046	0.0006282	-0.001599
2.1889685	-38.951338 C				
0.00006313	5837.	92464888.	10.1577769	0.0006412	-0.001631
2.2253083	-39.728581 C				
0.00006438	5948.	92398455.	10.1631088	0.0006543	-0.001663
2.2613274	-40.505332 C				
0.00006563	6059.	92332173.	10.1684984	0.0006673	-0.001695
2.2970245	-41.281586 C				
0.00006688	6170.	92266020.	10.1739444	0.0006804	-0.001727
2.3323987	-42.057340 C				
0.00006813	6281.	92199976.	10.1794453	0.0006935	-0.001759
2.3674485	-42.832591 C				
0.00006938	6392.	92134020.	10.1849998	0.0007066	-0.001791
2.4021730	-43.607335 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-21 (Boring B-016-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00007063	6502.	92068136.	10.1906070	0.0007197	-0.001823
2.4365708	-44.381568 C				
0.00007188	6613.	92002305.	10.1962656	0.0007329	-0.001855
2.4706408	-45.155288 C				
0.00007313	6723.	91936511.	10.2020028	0.0007460	-0.001886
2.5043818	-45.928490 C				
0.00007438	6833.	91870742.	10.2077616	0.0007592	-0.001918
2.5377924	-46.701172 C				
0.00007938	7271.	91607617.	10.2312788	0.0008121	-0.002045
2.6681070	-49.786612 C				
0.00008438	7707.	91343844.	10.2555391	0.0008653	-0.002172
2.7930345	-52.863415 C				
0.00008938	8140.	91079227.	10.2796933	0.0009187	-0.002299
2.9123325	-55.933382 C				
0.00009438	8570.	90813004.	10.3043877	0.0009725	-0.002425
3.0260259	-58.995009 C				
0.00009938	8979.	90357411.	10.3225581	0.0010258	-0.002552
3.1326575	-60.000000 CY				
0.0001044	9304.	89144470.	10.3110511	0.0010762	-0.002681
3.2276850	-60.000000 CY				
0.0001094	9546.	87273573.	10.2718035	0.0011235	-0.002814
3.3116704	-60.000000 CY				
0.0001144	9782.	85523680.	10.2357064	0.0011707	-0.002947
3.3907664	-60.000000 CY				
0.0001194	10004.	83800225.	10.1987328	0.0012175	-0.003080
3.4643165	-60.000000 CY				
0.0001244	10154.	81641326.	10.1374818	0.0012608	-0.003217
3.5282172	-60.000000 CY				
0.0001294	10287.	79513660.	10.0756441	0.0013035	-0.003354
3.5871212	-60.000000 CY				
0.0001344	10419.	77536664.	10.0197410	0.0013464	-0.003491
3.6423258	-60.000000 CY				
0.0001394	10550.	75693983.	9.9691573	0.0013895	-0.003628
3.6937845	-60.000000 CY				
0.0001444	10680.	73971519.	9.9233661	0.0014327	-0.003765
3.7414497	-60.000000 CY				
0.0001494	10808.	72355946.	9.8810316	0.0014760	-0.003902
3.7851328	-60.000000 CY				
0.0001544	10925.	70772035.	9.8368433	0.0015186	-0.004039
3.8241552	-60.000000 CY				
0.0001594	11008.	69072220.	9.7809580	0.0015588	-0.004179
3.8574366	-60.000000 CY				
0.0001644	11071.	67351790.	9.7204156	0.0015978	-0.004320
3.8862696	-60.000000 CY				
0.0001694	11131.	65719446.	9.6635689	0.0016368	-0.004461
3.9118664	-60.000000 CY				
0.0001744	11191.	64176802.	9.6094393	0.0016756	-0.004602
3.9342902	-60.000000 CY				
0.0001794	11250.	62716278.	9.5601863	0.0017149	-0.004743
3.9535015	-60.000000 CY				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0001844	11308.	61329164.	9.5136161	0.0017541	-0.004883
3.9693617	-60.000000 CY				
0.0001894	11364.	60009896.	9.4690774	0.0017932	-0.005024
3.9819050	-60.000000 CY				
0.0001944	11420.	58754909.	9.4280227	0.0018326	-0.005165
3.9911986	-60.000000 CY				
0.0001994	11476.	57559296.	9.3897594	0.0018721	-0.005305
3.9971986	-60.000000 CY				
0.0002044	11531.	56418622.	9.3531932	0.0019116	-0.005446
3.9998595	-60.000000 CY				
0.0002094	11584.	55328385.	9.3201259	0.0019514	-0.005586
3.9974517	-60.000000 CY				
0.0002144	11637.	54285454.	9.2909722	0.0019918	-0.005726
3.9998812	-60.000000 CY				
0.0002194	11690.	53285909.	9.2626721	0.0020320	-0.005866
3.9969940	-60.000000 CY				
0.0002244	11740.	52321336.	9.2356724	0.0020723	-0.006005
3.9997138	-60.000000 CY				
0.0002294	11786.	51384137.	9.2093226	0.0021124	-0.006145
3.9955528	-60.000000 CY				
0.0002344	11823.	50445667.	9.1796872	0.0021515	-0.006286
3.9989818	-60.000000 CY				
0.0002394	11855.	49524943.	9.1473565	0.0021896	-0.006428
3.9994466	-60.000000 CY				
0.0002444	11876.	48598228.	9.1109548	0.0022265	-0.006571
3.9965160	-60.000000 CY				
0.0002494	11895.	47701101.	9.0745971	0.0022630	-0.006715
3.9991770	-60.000000 CY				
0.0002544	11912.	46829816.	9.0405915	0.0022997	-0.006858
3.9995775	-60.000000 CY				
0.0002594	11929.	45990067.	9.0077660	0.0023364	-0.007001
3.9954763	-60.000000 CY				
0.0002644	11945.	45181124.	8.9766457	0.0023732	-0.007144
3.9984997	-60.000000 CY				
0.0002694	11961.	44401256.	8.9468563	0.0024101	-0.007287
3.9998981	-60.000000 CY				
0.0002744	11976.	43648250.	8.9191370	0.0024472	-0.007430
3.9944635	-60.000000 CY				
0.0003044	12062.	39628140.	8.7757363	0.0026711	-0.008286
3.9984635	-60.000000 CY				
0.0003344	12138.	36300180.	8.6628609	0.0028966	-0.009141
3.9998209	-60.000000 CY				
0.0003644	12207.	33502446.	8.5793723	0.0031261	-0.009991
3.9999551	-60.000000 CYT				
0.0003944	12272.	31117026.	8.5161103	0.0033585	-0.010839
3.9996166	-60.000000 CYT				
0.0004244	12331.	29056485.	8.4674428	0.0035934	-0.011684
3.9972132	-60.000000 CYT				
0.0004544	12377.	27238942.	8.4178614	0.0038249	-0.012533
3.9873462	-60.000000 CYT				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
Light Tower SC1-21 (Boring B-016-0-25) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Axial Thrust Force = 4.200 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
-----	-----	-----	-----	-----	-----
6.25000E-07	240.5049676	384807948.	19.4290859	0.00001214	-0.00001036
0.0508615	0.2771147				
0.00000125	480.1459926	384116794.	18.7161837	0.00002340	-0.00002160
0.0976654	0.5283867				
0.00000188	718.9162127	383421980.	18.4785558	0.00003465	-0.00003285
0.1441903	0.7796589				
0.00000250	956.8156222	382726249.	18.3597458	0.00004590	-0.00004410
0.1904363	1.0309315				
0.00000313	1194.	382030150.	18.2884629	0.00005715	-0.00005535
0.2364034	1.2822044				
0.00000375	1430.	381333869.	18.2409436	0.00006840	-0.00006660
0.2820914	1.5334776				
0.00000438	1665.	380637482.	18.2070035	0.00007966	-0.00007784
0.3275005	1.7847511				
0.00000500	1900.	379941029.	18.1815504	0.00009091	-0.00008909
0.3726306	2.0360248				
0.00000563	2133.	379244533.	18.1617553	0.0001022	-0.000100
0.4174818	2.2872988				
0.00000625	2366.	378548006.	18.1459208	0.0001134	-0.000112
0.4620539	2.5385732				
0.00000688	2366.	344134551.	10.2895004	0.00007074	-0.000177
0.2893429	-4.300617 C				
0.00000750	2366.	315456672.	10.2575513	0.00007693	-0.000193
0.3141325	-4.698533 C				
0.00000813	2366.	291190774.	10.2300378	0.00008312	-0.000209
0.3388235	-5.096560 C				
0.00000875	2366.	270391433.	10.2068278	0.00008931	-0.000226
0.3634446	-5.494492 C				
0.00000938	2366.	252365338.	10.1870615	0.00009550	-0.000242
0.3879959	-5.892330 C				
0.00001000	2366.	236592504.	10.1700940	0.0001017	-0.000258
0.4124772	-6.290073 C				
0.00001063	2366.	222675298.	10.1554324	0.0001079	-0.000275
0.4368884	-6.687720 C				
0.00001125	2366.	210304448.	10.1426931	0.0001141	-0.000291
0.4612294	-7.085271 C				
0.00001188	2366.	199235793.	10.1315564	0.0001203	-0.000307
0.4855002	-7.482727 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-21 (Boring B-016-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00001250	2366.	189274003.	10.1218127	0.0001265	-0.000323
0.5097005	-7.880086 C				
0.00001313	2366.	180260955.	10.1132503	0.0001327	-0.000340
0.5338304	-8.277349 C				
0.00001375	2366.	172067276.	10.1057088	0.0001390	-0.000356
0.5578898	-8.674515 C				
0.00001438	2366.	164586090.	10.0990556	0.0001452	-0.000372
0.5818784	-9.071585 C				
0.00001500	2366.	157728336.	10.0931803	0.0001514	-0.000389
0.6057963	-9.468556 C				
0.00001563	2366.	151419203.	10.0879903	0.0001576	-0.000405
0.6296433	-9.865431 C				
0.00001625	2366.	145595387.	10.0834069	0.0001639	-0.000421
0.6534193	-10.262207 C				
0.00001688	2366.	140202965.	10.0793634	0.0001701	-0.000437
0.6771242	-10.658886 C				
0.00001750	2366.	135195717.	10.0758025	0.0001763	-0.000454
0.7007579	-11.055466 C				
0.00001813	2366.	130533795.	10.0726747	0.0001826	-0.000470
0.7243204	-11.451947 C				
0.00001875	2366.	126182669.	10.0699372	0.0001888	-0.000486
0.7478114	-11.848330 C				
0.00001938	2366.	122112260.	10.0675528	0.0001951	-0.000502
0.7712309	-12.244613 C				
0.00002000	2366.	118296252.	10.0654889	0.0002013	-0.000519
0.7945789	-12.640797 C				
0.00002063	2366.	114711517.	10.0637168	0.0002076	-0.000535
0.8178551	-13.036882 C				
0.00002125	2366.	111337649.	10.0622112	0.0002138	-0.000551
0.8410595	-13.432866 C				
0.00002188	2366.	108156573.	10.0609497	0.0002201	-0.000567
0.8641920	-13.828750 C				
0.00002250	2366.	105152224.	10.0599125	0.0002263	-0.000584
0.8872524	-14.224533 C				
0.00002313	2366.	102310272.	10.0590817	0.0002326	-0.000600
0.9102407	-14.620215 C				
0.00002375	2366.	99617896.	10.0584414	0.0002389	-0.000616
0.9331568	-15.015796 C				
0.00002438	2366.	97063591.	10.0579776	0.0002452	-0.000632
0.9560005	-15.411276 C				
0.00002563	2432.	94924068.	10.0575288	0.0002577	-0.000665
1.0014704	-16.201930 C				
0.00002688	2548.	94810571.	10.0576469	0.0002703	-0.000697
1.0466496	-16.992174 C				
0.00002813	2664.	94702439.	10.0582592	0.0002829	-0.000730
1.0915372	-17.782007 C				
0.00002938	2779.	94598964.	10.0593353	0.0002955	-0.000762
1.1361324	-18.571425 C				
0.00003063	2894.	94499555.	10.0607664	0.0003081	-0.000794
1.1804341	-19.360427 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-21 (Boring B-016-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00003188	3009.	94403710.	10.0625387	0.0003207	-0.000827
1.2244416	-20.149010 C				
0.00003313	3124.	94311007.	10.0646159	0.0003334	-0.000859
1.2681539	-20.937171 C				
0.00003438	3239.	94221082.	10.0669675	0.0003461	-0.000891
1.3115700	-21.724908 C				
0.00003563	3354.	94133623.	10.0695670	0.0003587	-0.000924
1.3546892	-22.512219 C				
0.00003688	3468.	94048359.	10.0723915	0.0003714	-0.000956
1.3975103	-23.299100 C				
0.00003813	3582.	93965057.	10.0754214	0.0003841	-0.000988
1.4400326	-24.085550 C				
0.00003938	3697.	93883511.	10.0786392	0.0003968	-0.001021
1.4822550	-24.871565 C				
0.00004063	3811.	93803541.	10.0820299	0.0004096	-0.001053
1.5241766	-25.657144 C				
0.00004188	3925.	93724988.	10.0855803	0.0004223	-0.001085
1.5657965	-26.442282 C				
0.00004313	4039.	93647711.	10.0892786	0.0004351	-0.001117
1.6071135	-27.226979 C				
0.00004438	4152.	93571586.	10.0931145	0.0004479	-0.001150
1.6481268	-28.011230 C				
0.00004563	4266.	93496502.	10.0970787	0.0004607	-0.001182
1.6888354	-28.795033 C				
0.00004688	4379.	93422358.	10.1011630	0.0004735	-0.001214
1.7292383	-29.578385 C				
0.00004813	4492.	93349066.	10.1053601	0.0004863	-0.001246
1.7693344	-30.361284 C				
0.00004938	4606.	93276544.	10.1096634	0.0004992	-0.001278
1.8091228	-31.143727 C				
0.00005063	4718.	93204721.	10.1140670	0.0005120	-0.001310
1.8486023	-31.925710 C				
0.00005188	4831.	93133529.	10.1185657	0.0005249	-0.001343
1.8877721	-32.707231 C				
0.00005313	4944.	93062909.	10.1231546	0.0005378	-0.001375
1.9266309	-33.488287 C				
0.00005438	5056.	92992807.	10.1278294	0.0005507	-0.001407
1.9651778	-34.268875 C				
0.00005563	5169.	92923173.	10.1325862	0.0005636	-0.001439
2.0034117	-35.048992 C				
0.00005688	5281.	92853961.	10.1374215	0.0005766	-0.001471
2.0413316	-35.828634 C				
0.00005813	5393.	92785130.	10.1423320	0.0005895	-0.001503
2.0789362	-36.607799 C				
0.00005938	5505.	92716640.	10.1473148	0.0006025	-0.001535
2.1162246	-37.386484 C				
0.00006063	5617.	92648458.	10.1523672	0.0006155	-0.001567
2.1531956	-38.164685 C				
0.00006188	5728.	92580549.	10.1574868	0.0006285	-0.001599
2.1898481	-38.942399 C				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-21 (Boring B-016-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00006313	5840.	92512883.	10.1626714	0.0006415	-0.001631
2.2261809	-39.719622 C				
0.00006438	5951.	92445433.	10.1679189	0.0006546	-0.001663
2.2621930	-40.496353 C				
0.00006563	6062.	92378172.	10.1732276	0.0006676	-0.001695
2.2978832	-41.272587 C				
0.00006688	6173.	92311077.	10.1785957	0.0006807	-0.001727
2.3332503	-42.048320 C				
0.00006813	6284.	92244124.	10.1840217	0.0006938	-0.001759
2.3682931	-42.823550 C				
0.00006938	6395.	92177292.	10.1895041	0.0007069	-0.001791
2.4030104	-43.598274 C				
0.00007063	6505.	92110561.	10.1950417	0.0007200	-0.001822
2.4374011	-44.372486 C				
0.00007188	6616.	92043913.	10.2006608	0.0007332	-0.001854
2.4714639	-45.146185 C				
0.00007313	6726.	91977331.	10.2063053	0.0007463	-0.001886
2.5051976	-45.919366 C				
0.00007438	6836.	91910797.	10.2120017	0.0007595	-0.001918
2.5386010	-46.692026 C				
0.00007938	7274.	91644853.	10.2352897	0.0008124	-0.002045
2.6688860	-49.777380 C				
0.00008438	7710.	91378587.	10.2593338	0.0008656	-0.002172
2.7937834	-52.854093 C				
0.00008938	8143.	91111830.	10.2831857	0.0009191	-0.002298
2.9130226	-55.924331 C				
0.00009438	8573.	90843621.	10.3077273	0.0009728	-0.002425
3.0266854	-58.985869 C				
0.00009938	8982.	90387473.	10.3258078	0.0010261	-0.002551
3.1332951	-60.000000 CY				
0.0001044	9308.	89176212.	10.3143071	0.0010766	-0.002681
3.2283182	-60.000000 CY				
0.0001094	9549.	87304848.	10.2749831	0.0011238	-0.002814
3.3122821	-60.000000 CY				
0.0001144	9785.	85553556.	10.2389100	0.0011711	-0.002946
3.3913727	-60.000000 CY				
0.0001194	10007.	83830919.	10.2019402	0.0012179	-0.003080
3.4649106	-60.000000 CY				
0.0001244	10158.	81671814.	10.1406407	0.0012612	-0.003216
3.5287895	-60.000000 CY				
0.0001294	10291.	79542859.	10.0787027	0.0013039	-0.003354
3.5876602	-60.000000 CY				
0.0001344	10423.	77564670.	10.0227059	0.0013468	-0.003491
3.6428308	-60.000000 CY				
0.0001394	10554.	75720878.	9.9720357	0.0013899	-0.003628
3.6942550	-60.000000 CY				
0.0001444	10683.	73997378.	9.9261646	0.0014331	-0.003764
3.7418850	-60.000000 CY				
0.0001494	10812.	72381005.	9.8838986	0.0014764	-0.003901
3.7855535	-60.000000 CY				

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36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.0001544	10929.	70796718.	9.8396771	0.0015190	-0.004038
3.8245440	-60.000000 CY				
0.0001594	11012.	69097838.	9.7838573	0.0015593	-0.004178
3.8578061	-60.000000 CY				
0.0001644	11075.	67376662.	9.7232508	0.0015983	-0.004319
3.8866026	-60.000000 CY				
0.0001694	11135.	65743511.	9.6663364	0.0016372	-0.004460
3.9121613	-60.000000 CY				
0.0001744	11195.	64200103.	9.6121495	0.0016761	-0.004601
3.9345463	-60.000000 CY				
0.0001794	11254.	62738857.	9.5628376	0.0017153	-0.004742
3.9537182	-60.000000 CY				
0.0001844	11312.	61351278.	9.5162917	0.0017546	-0.004883
3.9695496	-60.000000 CY				
0.0001894	11368.	60031354.	9.4717005	0.0017937	-0.005024
3.9820503	-60.000000 CY				
0.0001944	11425.	58775745.	9.4305957	0.0018331	-0.005164
3.9913005	-60.000000 CY				
0.0001994	11480.	57579537.	9.3922863	0.0018726	-0.005305
3.9972564	-60.000000 CY				
0.0002044	11535.	56438298.	9.3556780	0.0019121	-0.005445
3.9998723	-60.000000 CY				
0.0002094	11588.	55347517.	9.3241700	0.0019522	-0.005585
3.9975077	-60.000000 CY				
0.0002144	11641.	54304067.	9.2934428	0.0019923	-0.005725
3.9998931	-60.000000 CY				
0.0002194	11694.	53304015.	9.2651074	0.0020325	-0.005865
3.9970558	-60.000000 CY				
0.0002244	11744.	52339157.	9.2380944	0.0020728	-0.006005
3.9997330	-60.000000 CY				
0.0002294	11790.	51401489.	9.2117130	0.0021129	-0.006145
3.9956300	-60.000000 CY				
0.0002344	11827.	50463153.	9.1821360	0.0021521	-0.006285
3.9990203	-60.000000 CY				
0.0002394	11859.	49542728.	9.1500193	0.0021903	-0.006427
3.9992468	-60.000000 CY				
0.0002444	11880.	48615611.	9.1135780	0.0022271	-0.006570
3.9965958	-60.000000 CY				
0.0002494	11900.	47718283.	9.0771076	0.0022636	-0.006714
3.9992162	-60.000000 CY				
0.0002544	11917.	46846598.	9.0431776	0.0023004	-0.006857
3.9993713	-60.000000 CY				
0.0002594	11933.	46006491.	9.0103157	0.0023371	-0.007000
3.9955701	-60.000000 CY				
0.0002644	11949.	45197204.	8.9791598	0.0023739	-0.007144
3.9985538	-60.000000 CY				
0.0002694	11965.	44417005.	8.9493437	0.0024107	-0.007287
3.9999119	-60.000000 CY				
0.0002744	11980.	43663657.	8.9215934	0.0024479	-0.007430
3.9942523	-60.000000 CY				

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0.0003044	12066.	39641995.	8.7782176	0.0026719	-0.008286
3.9985257	-60.000000 CY				
0.0003344	12142.	36312646.	8.6652203	0.0028974	-0.009140
3.9998424	-60.000000 CY				
0.0003644	12212.	33513765.	8.5815911	0.0031269	-0.009991
3.9999658	-60.000000 CYT				
0.0003944	12276.	31127384.	8.5182268	0.0033594	-0.010838
3.9996505	-60.000000 CYT				
0.0004244	12335.	29066055.	8.4694819	0.0035942	-0.011683
3.9973093	-60.000000 CYT				
0.0004544	12381.	27248100.	8.4201387	0.0038259	-0.012532
3.9875919	-60.000000 CYT				

Axial Thrust Force = 4.600 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
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6.25000E-07	240.5035986	384805758.	19.5651901	0.00001223	-0.00001027
0.0512199	0.2795816				
0.00000125	480.1446137	384115691.	18.7843907	0.00002348	-0.00002152
0.0980225	0.5308592				
0.00000188	718.9148267	383421241.	18.5241312	0.00003473	-0.00003277
0.1445462	0.7821371				
0.00000250	956.8142298	382725692.	18.3940059	0.00004599	-0.00004401
0.1907908	1.0334154				
0.00000313	1194.	382029703.	18.3159341	0.00005724	-0.00005526
0.2367565	1.2846940				
0.00000375	1430.	381333494.	18.2638891	0.00006849	-0.00006651
0.2824433	1.5359729				
0.00000438	1665.	380637159.	18.2267166	0.00007974	-0.00007776
0.3278510	1.7872522				
0.00000500	1900.	379940746.	18.1988394	0.00009099	-0.00008901
0.3729798	2.0385317				
0.00000563	2133.	379244280.	18.1771590	0.0001022	-0.000100
0.4178295	2.2898116				
0.00000625	2366.	378547777.	18.1598165	0.0001135	-0.000112
0.4624003	2.5410917				
0.00000688	2366.	344134343.	10.3291778	0.00007101	-0.000176
0.2904571	-4.292706 C				
0.00000750	2366.	315456481.	10.2940289	0.00007721	-0.000193
0.3152465	-4.690597 C				
0.00000813	2366.	291190598.	10.2646762	0.00008340	-0.000209
0.3399656	-5.088396 C				

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0.00000875	2366.	270391269.	10.2391817	0.00008959	-0.000225
0.3645893	-5.486283 C				
0.00000938	2366.	252365185.	10.2172859	0.00009579	-0.000242
0.3891378	-5.884113 C				
0.00001000	2366.	236592361.	10.1984552	0.0001020	-0.000258
0.4136162	-6.281848 C				
0.00001063	2366.	222675163.	10.1821496	0.0001082	-0.000274
0.4380246	-6.679488 C				
0.00001125	2366.	210304321.	10.1679490	0.0001144	-0.000291
0.4623628	-7.077032 C				
0.00001188	2366.	199235672.	10.1555219	0.0001206	-0.000307
0.4866307	-7.474480 C				
0.00001250	2366.	189273889.	10.1446030	0.0001268	-0.000323
0.5108282	-7.871831 C				
0.00001313	2366.	180260846.	10.1349589	0.0001330	-0.000339
0.5349552	-8.269087 C				
0.00001375	2366.	172067171.	10.1264498	0.0001392	-0.000356
0.5590117	-8.666245 C				
0.00001438	2366.	164585990.	10.1189132	0.0001455	-0.000372
0.5829974	-9.063307 C				
0.00001500	2366.	157728241.	10.1122282	0.0001517	-0.000388
0.6069124	-9.460271 C				
0.00001563	2366.	151419111.	10.1062933	0.0001579	-0.000405
0.6307565	-9.857138 C				
0.00001625	2366.	145595299.	10.1010224	0.0001641	-0.000421
0.6545296	-10.253907 C				
0.00001688	2366.	140202880.	10.0963423	0.0001704	-0.000437
0.6782316	-10.650577 C				
0.00001750	2366.	135195635.	10.0921903	0.0001766	-0.000453
0.7018624	-11.047150 C				
0.00001813	2366.	130533716.	10.0885122	0.0001829	-0.000470
0.7254219	-11.443623 C				
0.00001875	2366.	126182592.	10.0852613	0.0001891	-0.000486
0.7489100	-11.839998 C				
0.00001938	2366.	122112186.	10.0823966	0.0001953	-0.000502
0.7723266	-12.236274 C				
0.00002000	2366.	118296180.	10.0798824	0.0002016	-0.000518
0.7956716	-12.632450 C				
0.00002063	2366.	114711448.	10.0776874	0.0002079	-0.000535
0.8189449	-13.028526 C				
0.00002125	2366.	111337582.	10.0757837	0.0002141	-0.000551
0.8421464	-13.424502 C				
0.00002188	2366.	108156508.	10.0741470	0.0002204	-0.000567
0.8652759	-13.820378 C				
0.00002250	2366.	105152160.	10.0727554	0.0002266	-0.000583
0.8883333	-14.216153 C				
0.00002313	2366.	102310210.	10.0715894	0.0002329	-0.000600
0.9113187	-14.611828 C				
0.00002375	2366.	99617836.	10.0706317	0.0002392	-0.000616
0.9342318	-15.007401 C				

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

0.00002438	2366.	97063533.	10.0698667	0.0002455	-0.000632
0.9570725	-15.402873 C				
0.00002563	2436.	95048091.	10.0688598	0.0002580	-0.000664
1.0025364	-16.193510 C				
0.00002688	2551.	94928657.	10.0684718	0.0002706	-0.000697
1.0477096	-16.983738 C				
0.00002813	2667.	94815115.	10.0686232	0.0002832	-0.000729
1.0925912	-17.773555 C				
0.00002938	2782.	94706690.	10.0692479	0.0002958	-0.000762
1.1371802	-18.562957 C				
0.00003063	2897.	94602733.	10.0703211	0.0003084	-0.000794
1.1814759	-19.351942 C				
0.00003188	3012.	94502697.	10.0717368	0.0003210	-0.000826
1.2254772	-20.140508 C				
0.00003313	3127.	94406117.	10.0734845	0.0003337	-0.000859
1.2691834	-20.928652 C				
0.00003438	3242.	94312597.	10.0755306	0.0003463	-0.000891
1.3125933	-21.716373 C				
0.00003563	3357.	94221794.	10.0778462	0.0003590	-0.000923
1.3557063	-22.503666 C				
0.00003688	3471.	94133413.	10.0804061	0.0003717	-0.000956
1.3985212	-23.290530 C				
0.00003813	3586.	94047197.	10.0831888	0.0003844	-0.000988
1.4410372	-24.076963 C				
0.00003938	3700.	93962921.	10.0861753	0.0003971	-0.001020
1.4832533	-24.862961 C				
0.00004063	3814.	93880388.	10.0893491	0.0004099	-0.001053
1.5251686	-25.648521 C				
0.00004188	3928.	93799425.	10.0926956	0.0004226	-0.001085
1.5667821	-26.433642 C				
0.00004313	4042.	93719877.	10.0962019	0.0004354	-0.001117
1.6080927	-27.218321 C				
0.00004438	4155.	93641609.	10.0998566	0.0004482	-0.001149
1.6490996	-28.002554 C				
0.00004563	4269.	93564497.	10.1036497	0.0004610	-0.001182
1.6898018	-28.786339 C				
0.00004688	4382.	93488434.	10.1075722	0.0004738	-0.001214
1.7301982	-29.569674 C				
0.00004813	4496.	93413321.	10.1116159	0.0004866	-0.001246
1.7702878	-30.352554 C				
0.00004938	4609.	93339070.	10.1157737	0.0004995	-0.001278
1.8100696	-31.134978 C				
0.00005063	4722.	93265602.	10.1200391	0.0005123	-0.001310
1.8495425	-31.916943 C				
0.00005188	4834.	93192845.	10.1244063	0.0005252	-0.001342
1.8887057	-32.698446 C				
0.00005313	4947.	93120733.	10.1288700	0.0005381	-0.001374
1.9275579	-33.479483 C				
0.00005438	5060.	93049206.	10.1334255	0.0005510	-0.001406
1.9660981	-34.260052 C				

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0.00005563	5172.	92978211.	10.1380684	0.0005639	-0.001439
2.0043253	-35.040149 C				
0.00005688	5284.	92907697.	10.1427948	0.0005769	-0.001471
2.0422384	-35.819772 C				
0.00005813	5396.	92837619.	10.1476012	0.0005898	-0.001503
2.0798362	-36.598918 C				
0.00005938	5508.	92767935.	10.1524844	0.0006028	-0.001535
2.1171178	-37.377583 C				
0.00006063	5620.	92698606.	10.1574414	0.0006158	-0.001567
2.1540819	-38.155764 C				
0.00006188	5731.	92629597.	10.1624696	0.0006288	-0.001599
2.1907275	-38.933458 C				
0.00006313	5843.	92560874.	10.1675664	0.0006418	-0.001631
2.2270535	-39.710662 C				
0.00006438	5954.	92492407.	10.1727297	0.0006549	-0.001663
2.2630586	-40.487373 C				
0.00006563	6065.	92424168.	10.1779574	0.0006679	-0.001695
2.2987417	-41.263586 C				
0.00006688	6176.	92356130.	10.1832476	0.0006810	-0.001726
2.3341018	-42.039299 C				
0.00006813	6287.	92288268.	10.1885986	0.0006941	-0.001758
2.3691375	-42.814509 C				
0.00006938	6398.	92220560.	10.1940089	0.0007072	-0.001790
2.4038477	-43.589211 C				
0.00007063	6508.	92152983.	10.1995039	0.0007203	-0.001822
2.4382312	-44.363403 C				
0.00007188	6619.	92085519.	10.2050285	0.0007335	-0.001854
2.4722868	-45.137081 C				
0.00007313	6729.	92018147.	10.2106084	0.0007467	-0.001886
2.5060133	-45.910241 C				
0.00007438	6839.	91950850.	10.2162424	0.0007598	-0.001918
2.5394094	-46.682880 C				
0.00007938	7277.	91682087.	10.2393011	0.0008127	-0.002045
2.6696649	-49.768146 C				
0.00008438	7713.	91413389.	10.2630109	0.0008659	-0.002172
2.7945082	-52.845065 C				
0.00008938	8146.	91144431.	10.2866786	0.0009194	-0.002298
2.9137126	-55.915279 C				
0.00009438	8576.	90874234.	10.3110673	0.0009731	-0.002424
3.0273448	-58.976728 C				
0.00009938	8985.	90417533.	10.3290580	0.0010265	-0.002551
3.1339327	-60.000000 CY				
0.0001044	9311.	89207952.	10.3175636	0.0010769	-0.002681
3.2289512	-60.000000 CY				
0.0001094	9552.	87336121.	10.2781631	0.0011242	-0.002813
3.3128936	-60.000000 CY				
0.0001144	9789.	85583430.	10.2421143	0.0011714	-0.002946
3.3919789	-60.000000 CY				
0.0001194	10011.	83861611.	10.2051482	0.0012182	-0.003079
3.4655044	-60.000000 CY				

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0.0001244	10162.	81702300.	10.1438002	0.0012616	-0.003216
3.5293615	-60.000000 CY				
0.0001294	10295.	79572057.	10.0817619	0.0013043	-0.003353
3.5881988	-60.000000 CY				
0.0001344	10427.	77592674.	10.0256713	0.0013472	-0.003490
3.6433355	-60.000000 CY				
0.0001394	10557.	75747771.	9.9749147	0.0013903	-0.003627
3.6947252	-60.000000 CY				
0.0001444	10687.	74023236.	9.9289636	0.0014335	-0.003764
3.7423201	-60.000000 CY				
0.0001494	10816.	72406063.	9.8867661	0.0014768	-0.003901
3.7859739	-60.000000 CY				
0.0001544	10933.	70821400.	9.8425115	0.0015194	-0.004038
3.8249324	-60.000000 CY				
0.0001594	11017.	69123456.	9.7867573	0.0015598	-0.004178
3.8581753	-60.000000 CY				
0.0001644	11079.	67401534.	9.7260868	0.0015987	-0.004319
3.8869352	-60.000000 CY				
0.0001694	11139.	65767574.	9.6691048	0.0016377	-0.004460
3.9124557	-60.000000 CY				
0.0001744	11199.	64223403.	9.6148605	0.0016766	-0.004601
3.9348020	-60.000000 CY				
0.0001794	11258.	62761436.	9.5654896	0.0017158	-0.004742
3.9539345	-60.000000 CY				
0.0001844	11316.	61373390.	9.5189681	0.0017551	-0.004882
3.9697370	-60.000000 CY				
0.0001894	11373.	60052811.	9.4743244	0.0017942	-0.005023
3.9821950	-60.000000 CY				
0.0001944	11429.	58796578.	9.4331695	0.0018336	-0.005164
3.9914019	-60.000000 CY				
0.0001994	11484.	57599778.	9.3948139	0.0018731	-0.005304
3.9973136	-60.000000 CY				
0.0002044	11539.	56457972.	9.3581635	0.0019126	-0.005445
3.9998845	-60.000000 CY				
0.0002094	11592.	55366642.	9.3266817	0.0019528	-0.005585
3.9975630	-60.000000 CY				
0.0002144	11645.	54322678.	9.2959142	0.0019928	-0.005725
3.9999044	-60.000000 CY				
0.0002194	11698.	53322120.	9.2675435	0.0020331	-0.005864
3.9971169	-60.000000 CY				
0.0002244	11748.	52356977.	9.2405172	0.0020733	-0.006004
3.9997515	-60.000000 CY				
0.0002294	11794.	51418840.	9.2141042	0.0021135	-0.006144
3.9957066	-60.000000 CY				
0.0002344	11831.	50480617.	9.1845645	0.0021526	-0.006285
3.9990577	-60.000000 CY				
0.0002394	11864.	49560513.	9.1526832	0.0021909	-0.006427
3.9990468	-60.000000 CY				
0.0002444	11885.	48632992.	9.1162023	0.0022278	-0.006570
3.9966747	-60.000000 CY				

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0.0002494	11904.	47735462.	9.0796192	0.0022642	-0.006713
3.9992545	-60.000000 CY				
0.0002544	11921.	46863378.	9.0457647	0.0023010	-0.006856
3.9991650	-60.000000 CY				
0.0002594	11937.	46022914.	9.0128664	0.0023377	-0.007000
3.9956629	-60.000000 CY				
0.0002644	11953.	45213284.	8.9816750	0.0023745	-0.007143
3.9986069	-60.000000 CY				
0.0002694	11969.	44432753.	8.9518321	0.0024114	-0.007286
3.9999247	-60.000000 CY				
0.0002744	11984.	43679063.	8.9240509	0.0024485	-0.007429
3.9940409	-60.000000 CY				
0.0003044	12070.	39655848.	8.7807001	0.0026726	-0.008285
3.9985866	-60.000000 CY				
0.0003344	12146.	36325110.	8.6675807	0.0028982	-0.009139
3.9998625	-60.000000 CY				
0.0003644	12216.	33525083.	8.5838110	0.0031277	-0.009990
3.9999751	-60.000000 CYT				
0.0003944	12280.	31137740.	8.5203443	0.0033602	-0.010837
3.9996828	-60.000000 CYT				
0.0004244	12339.	29075625.	8.4715220	0.0035951	-0.011682
3.9974037	-60.000000 CYT				
0.0004544	12385.	27257253.	8.4224181	0.0038269	-0.012531
3.9878351	-60.000000 CYT				

 Summary of Results for Nominal 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 Tens. No. Strain	Axial Thrust kips	Nominal Mom. Cap. in-kip	Max. Comp. Strain	Max.
----	-----	-----	-----	
1 -0.00952396	3.800	12169.214	0.00300000	
2 -0.00952020	4.200	12173.120	0.00300000	
3 -0.00951645	4.600	12177.027	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

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the transverse reinforcing steel bars are tied hoops (0.65) or spirals (0.75).

The above values should be multiplied by the appropriate strength reduction factor to compute ultimate moment capacity according to ACI 318, 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 Stiff. Load Ult Mom No. kip-in ²	Resist. Factor	Nominal Ax. Thrust kips	Nominal Moment Cap in-kips	Ult. (Fac) Ax. Thrust kips	Ult. (Fac) Moment Cap in-kips	Bend. at
-----	-----	-----	-----	-----	-----	
1 91219895.	0.65	3.800000	12169.	2.470000	7910.	
2 91253873.	0.65	4.200000	12173.	2.730000	7913.	
3 91287886.	0.65	4.600000	12177.	2.990000	7915.	
1 89806706.	0.75	3.800000	12169.	2.850000	9127.	
2 89838295.	0.75	4.200000	12173.	3.150000	9130.	
3 89869877.	0.75	4.600000	12177.	3.450000	9133.	
1 70221645.	0.90	3.800000	12169.	3.420000	10952.	
2 70254444.	0.90	4.200000	12173.	3.780000	10956.	
3 70287179.	0.90	4.600000	12177.	4.140000	10959.	

 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
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1	1.0000	0.00	N.A.	No	0.00	8649.
2	4.0000	1.7391	Yes	No	8649.	15104.
3	6.5000	0.7370	No	No	23753.	88410.
4	14.0000	13.0000	No	No	112162.	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.

 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 = 1000.0 lbs
 Applied moment at pile head = 315600.0 in-lbs
 Axial thrust load on pile head = 4200.0 lbs

Depth Res.	Soil	Deflect. Spr.	Bending Distrib.	Shear	Slope	Total	Bending	Soil
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		0.4084	315600.	1000.	-0.00452	0.00	3.84E+11	
0.00		0.00	0.00					
0.09000		0.4036	316700.	999.9999	-0.00451	0.00	3.84E+11	
0.00		0.00	0.00					
0.1800		0.3987	317801.	1000.0000	-0.00451	0.00	3.84E+11	
0.00		0.00	0.00					
0.2700		0.3938	318901.	999.9999	-0.00451	0.00	3.84E+11	
0.00		0.00	0.00					
0.3600		0.3889	320002.	999.9999	-0.00451	0.00	3.84E+11	
0.00		0.00	0.00					
0.4500		0.3841	321102.	999.9999	-0.00451	0.00	3.84E+11	
0.00		0.00	0.00					
0.5400		0.3792	322203.	999.9999	-0.00451	0.00	3.84E+11	
0.00		0.00	0.00					
0.6300		0.3743	323303.	999.9999	-0.00451	0.00	3.84E+11	
0.00		0.00	0.00					

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0.7200	0.3695	324404.	999.9999	-0.00451	0.00	3.84E+11
0.00	0.00	0.00				
0.8100	0.3646	325504.	999.9999	-0.00451	0.00	3.84E+11
0.00	0.00	0.00				
0.9000	0.3597	326605.	1000.0000	-0.00451	0.00	3.84E+11
0.00	0.00	0.00				
0.9900	0.3549	327705.	1000.0000	-0.00451	0.00	3.84E+11
0.00	0.00	0.00				
1.0800	0.3500	328805.	970.2340	-0.00450	0.00	3.84E+11
-55.122	170.0968	0.00				
1.1700	0.3451	329842.	910.3512	-0.00450	0.00	3.84E+11
-55.772	174.5266	0.00				
1.2600	0.3403	330813.	849.7729	-0.00450	0.00	3.84E+11
-56.410	179.0480	0.00				
1.3500	0.3354	331718.	788.5110	-0.00450	0.00	3.84E+11
-57.038	183.6641	0.00				
1.4400	0.3305	332557.	726.5775	-0.00450	0.00	3.84E+11
-57.654	188.3787	0.00				
1.5300	0.3257	333328.	663.9847	-0.00450	0.00	3.84E+11
-58.259	193.1953	0.00				
1.6200	0.3208	334032.	600.7451	-0.00450	0.00	3.84E+11
-58.852	198.1180	0.00				
1.7100	0.3160	334667.	536.8714	-0.00450	0.00	3.84E+11
-59.433	203.1510	0.00				
1.8000	0.3111	335232.	472.3765	-0.00450	0.00	3.84E+11
-60.002	208.2985	0.00				
1.8900	0.3062	335728.	407.2737	-0.00450	0.00	3.84E+11
-60.559	213.5652	0.00				
1.9800	0.3014	336153.	341.5762	-0.00450	0.00	3.84E+11
-61.103	218.9561	0.00				
2.0700	0.2965	336506.	275.2977	-0.00449	0.00	3.84E+11
-61.635	224.4762	0.00				
2.1600	0.2917	336788.	208.4523	-0.00449	0.00	3.84E+11
-62.153	230.1312	0.00				
2.2500	0.2868	336997.	141.0539	-0.00449	0.00	3.84E+11
-62.659	235.9267	0.00				
2.3400	0.2820	337134.	73.1172	-0.00449	0.00	3.84E+11
-63.150	241.8691	0.00				
2.4300	0.2771	337196.	4.6567	-0.00449	0.00	3.84E+11
-63.628	247.9649	0.00				
2.5200	0.2723	337184.	-64.312	-0.00449	0.00	3.84E+11
-64.092	254.2211	0.00				
2.6100	0.2674	337098.	-133.775	-0.00449	0.00	3.84E+11
-64.542	260.6450	0.00				
2.7000	0.2626	336936.	-203.715	-0.00449	0.00	3.84E+11
-64.977	267.2448	0.00				
2.7900	0.2577	336699.	-274.116	-0.00449	0.00	3.84E+11
-65.396	274.0287	0.00				
2.8800	0.2529	336385.	-344.962	-0.00449	0.00	3.84E+11
-65.801	281.0060	0.00				

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2.9700	0.2481	335994.	-416.237	-0.00448	0.00	3.84E+11
-66.190	288.1862	0.00				
3.0600	0.2432	335526.	-487.923	-0.00448	0.00	3.84E+11
-66.562	295.5798	0.00				
3.1500	0.2384	334981.	-560.003	-0.00448	0.00	3.84E+11
-66.918	303.1979	0.00				
3.2400	0.2335	334357.	-632.458	-0.00448	0.00	3.84E+11
-67.258	311.0524	0.00				
3.3300	0.2287	333655.	-705.270	-0.00448	0.00	3.84E+11
-67.580	319.1563	0.00				
3.4200	0.2238	332875.	-778.421	-0.00448	0.00	3.84E+11
-67.884	327.5234	0.00				
3.5100	0.2190	332015.	-851.890	-0.00448	0.00	3.84E+11
-68.170	336.1687	0.00				
3.6000	0.2142	331075.	-925.658	-0.00448	0.00	3.84E+11
-68.437	345.1084	0.00				
3.6900	0.2093	330056.	-999.704	-0.00448	0.00	3.84E+11
-68.685	354.3600	0.00				
3.7800	0.2045	328956.	-1074.	-0.00448	0.00	3.84E+11
-68.913	363.9425	0.00				
3.8700	0.1997	327777.	-1149.	-0.00448	0.00	3.84E+11
-69.121	373.8767	0.00				
3.9600	0.1948	326516.	-1223.	-0.00447	0.00	3.84E+11
-69.307	384.1851	0.00				
4.0500	0.1900	325175.	-1319.	-0.00447	0.00	3.84E+11
-107.693	612.1445	0.00				
4.1400	0.1852	323708.	-1435.	-0.00447	0.00	3.84E+11
-107.569	627.3907	0.00				
4.2300	0.1803	322116.	-1551.	-0.00447	0.00	3.84E+11
-107.409	643.2364	0.00				
4.3200	0.1755	320398.	-1667.	-0.00447	0.00	3.84E+11
-107.213	659.7282	0.00				
4.4100	0.1707	318555.	-1783.	-0.00447	0.00	3.84E+11
-106.980	676.9166	0.00				
4.5000	0.1659	316588.	-1898.	-0.00447	0.00	3.84E+11
-106.710	694.8574	0.00				
4.5900	0.1610	314496.	-2013.	-0.00447	0.00	3.84E+11
-106.401	713.6121	0.00				
4.6800	0.1562	312280.	-2128.	-0.00447	0.00	3.84E+11
-106.053	733.2487	0.00				
4.7700	0.1514	309940.	-2242.	-0.00447	0.00	3.84E+11
-105.664	753.8428	0.00				
4.8600	0.1466	307477.	-2356.	-0.00447	0.00	3.85E+11
-105.234	775.4788	0.00				
4.9500	0.1417	304891.	-2470.	-0.00446	0.00	3.85E+11
-104.760	798.2514	0.00				
5.0400	0.1369	302183.	-2582.	-0.00446	0.00	3.85E+11
-104.241	822.2669	0.00				
5.1300	0.1321	299354.	-2695.	-0.00446	0.00	3.85E+11
-103.675	847.6457	0.00				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
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5.2200	0.1273	296403.	-2806.	-0.00446	0.00	3.85E+11
-103.060	874.5246	0.00				
5.3100	0.1225	293332.	-2917.	-0.00446	0.00	3.85E+11
-102.393	903.0593	0.00				
5.4000	0.1176	290142.	-3027.	-0.00446	0.00	3.85E+11
-101.673	933.4288	0.00				
5.4900	0.1128	286833.	-3137.	-0.00446	0.00	3.85E+11
-100.895	965.8395	0.00				
5.5800	0.1080	283407.	-3245.	-0.00446	0.00	3.85E+11
-100.057	1001.	0.00				
5.6700	0.1032	279864.	-3353.	-0.00446	0.00	3.85E+11
-99.156	1038.	0.00				
5.7600	0.09838	276205.	-3460.	-0.00446	0.00	3.85E+11
-98.186	1078.	0.00				
5.8500	0.09356	272432.	-3565.	-0.00446	0.00	3.85E+11
-97.144	1121.	0.00				
5.9400	0.08875	268545.	-3669.	-0.00446	0.00	3.85E+11
-96.023	1169.	0.00				
6.0300	0.08394	264546.	-3772.	-0.00446	0.00	3.85E+11
-94.818	1220.	0.00				
6.1200	0.07913	260437.	-3874.	-0.00445	0.00	3.85E+11
-93.521	1276.	0.00				
6.2100	0.07432	256219.	-3974.	-0.00445	0.00	3.85E+11
-92.125	1339.	0.00				
6.3000	0.06951	251893.	-4073.	-0.00445	0.00	3.85E+11
-90.618	1408.	0.00				
6.3900	0.06470	247462.	-4170.	-0.00445	0.00	3.85E+11
-88.990	1486.	0.00				
6.4800	0.05989	242926.	-4265.	-0.00445	0.00	3.85E+11
-87.227	1573.	0.00				
6.5700	0.05508	238289.	-4753.	-0.00445	0.00	3.85E+11
-815.632	15992.	0.00				
6.6600	0.05028	232701.	-5626.	-0.00445	0.00	3.85E+11
-801.495	17217.	0.00				
6.7500	0.04547	226178.	-6483.	-0.00445	0.00	3.85E+11
-785.775	18664.	0.00				
6.8400	0.04067	218738.	-7322.	-0.00445	0.00	3.85E+11
-768.184	20402.	0.00				
6.9300	0.03586	210402.	-8141.	-0.00445	0.00	3.85E+11
-748.331	22537.	0.00				
7.0200	0.03106	201193.	-8937.	-0.00445	0.00	3.85E+11
-725.680	25235.	0.00				
7.1100	0.02625	191138.	-9707.	-0.00445	0.00	3.85E+11
-699.451	28773.	0.00				
7.2000	0.02145	180267.	-10445.	-0.00445	0.00	3.85E+11
-668.440	33654.	0.00				
7.2900	0.01665	168617.	-11147.	-0.00445	0.00	3.85E+11
-630.630	40908.	0.00				
7.3800	0.01185	156230.	-11802.	-0.00445	0.00	3.85E+11
-582.166	53069.	0.00				

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7.4700	0.00705	143165.	-12394.	-0.00445	0.00	3.85E+11
-513.840	78755.	0.00				
7.5600	0.00225	129501.	-12881.	-0.00444	0.00	3.85E+11
-387.985	186574.	0.00				
7.6500	-0.00255	115384.	-12873.	-0.00444	0.00	3.85E+11
402.8432	170324.	0.00				
7.7400	-0.00735	101736.	-12370.	-0.00444	0.00	3.85E+11
527.3149	77438.	0.00				
7.8300	-0.01215	88704.	-11761.	-0.00444	0.00	3.85E+11
600.8448	53391.	0.00				
7.9200	-0.01695	76373.	-11082.	-0.00444	0.00	3.85E+11
656.2054	41803.	0.00				
8.0100	-0.02175	64807.	-10349.	-0.00444	0.00	3.85E+11
701.8386	34846.	0.00				
8.1000	-0.02655	54060.	-9570.	-0.00444	0.00	3.85E+11
741.3206	30154.	0.00				
8.1900	-0.03135	44177.	-8750.	-0.00444	0.00	3.85E+11
776.5294	26751.	0.00				
8.2800	-0.03615	35200.	-7894.	-0.00444	0.00	3.85E+11
808.5831	24158.	0.00				
8.3700	-0.04095	27166.	-7005.	-0.00444	0.00	3.85E+11
838.2052	22108.	0.00				
8.4600	-0.04575	20110.	-6085.	-0.00444	0.00	3.85E+11
865.8929	20443.	0.00				
8.5500	-0.05054	14064.	-5135.	-0.00444	0.00	3.85E+11
892.0030	19060.	0.00				
8.6400	-0.05534	9058.	-4158.	-0.00444	0.00	3.85E+11
916.8013	17891.	0.00				
8.7300	-0.06014	5122.	-3156.	-0.00444	0.00	3.85E+11
940.4912	16889.	0.00				
8.8200	-0.06494	2283.	-2128.	-0.00444	0.00	3.85E+11
963.2318	16020.	0.00				
8.9100	-0.06974	566.7511	-1075.	-0.00444	0.00	3.85E+11
985.1506	15257.	0.00				
9.0000	-0.07454	0.00	0.00	-0.00444	0.00	3.85E+11
1006.	7291.	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	=	0.40843835 inches
Computed slope at pile head	=	-0.0045154 radians
Maximum bending moment	=	337196. inch-lbs

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Maximum shear force = -12881. lbs
 Depth of maximum bending moment = 2.43000000 feet below pile head
 Depth of maximum shear force = 7.56000000 feet below pile head
 Number of iterations = 34
 Number of zero deflection points = 1
 Pile deflection at ground = 0.35431399 inches

 Pile-head Deflection vs. Pile Length for Load Case 1

Boundary Condition Type 1, Shear and Moment

Shear = 1000. lbs
 Moment = 315600. in-lbs
 Axial Load = 4200. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	0.40843835	337196.	-12881.
8.55000	0.84400857	335332.	-12766.
8.10000	1.76300890	335231.	-12478.
7.65000	3.56937982	336330.	-11903.
7.20000	6.75465141	338098.	-10829.

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

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

Shear force at pile head = 2250.0 lbs
 Applied moment at pile head = 724800.0 in-lbs
 Axial thrust load on pile head = 4600.0 lbs

Depth Res. Soil X Es*H feet lb/inch	Deflect. Soil Spr. y Lat. Load inches lb/inch	Bending Moment in-lbs lb/inch	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness lb-in^2	Soil p
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0.00	7.4130	724800.	2250.	-0.08190	0.00	3.83E+11
0.00	0.00	0.00				
0.09000	7.3246	727637.	2250.	-0.08189	0.00	3.83E+11
0.00	0.00	0.00				
0.1800	7.2361	730474.	2250.	-0.08189	0.00	3.83E+11
0.00	0.00	0.00				
0.2700	7.1477	733310.	2250.	-0.08189	0.00	3.83E+11
0.00	0.00	0.00				
0.3600	7.0593	736147.	2250.	-0.08189	0.00	3.83E+11
0.00	0.00	0.00				
0.4500	6.9708	738984.	2250.	-0.08189	0.00	3.83E+11
0.00	0.00	0.00				
0.5400	6.8824	741821.	2250.	-0.08188	0.00	3.83E+11
0.00	0.00	0.00				
0.6300	6.7939	744658.	2250.	-0.08188	0.00	3.83E+11
0.00	0.00	0.00				
0.7200	6.7055	747494.	2250.	-0.08188	0.00	3.83E+11
0.00	0.00	0.00				
0.8100	6.6171	750331.	2250.	-0.08188	0.00	3.83E+11
0.00	0.00	0.00				
0.9000	6.5287	753168.	2250.	-0.08188	0.00	3.83E+11
0.00	0.00	0.00				
0.9900	6.4402	756005.	2250.	-0.08187	0.00	3.83E+11
0.00	0.00	0.00				
1.0800	6.3518	758841.	2172.	-0.08187	0.00	3.83E+11
-144.856	24.6299	0.00				
1.1700	6.2634	761509.	2014.	-0.08187	0.00	3.83E+11
-146.561	25.2717	0.00				
1.2600	6.1750	764006.	1855.	-0.08187	0.00	3.83E+11
-148.238	25.9268	0.00				
1.3500	6.0866	766330.	1694.	-0.08187	0.00	3.83E+11
-149.886	26.5958	0.00				
1.4400	5.9981	768479.	1531.	-0.08186	0.00	3.83E+11
-151.503	27.2790	0.00				
1.5300	5.9097	770451.	1367.	-0.08186	0.00	3.83E+11
-153.090	27.9772	0.00				
1.6200	5.8213	772245.	1201.	-0.08186	0.00	3.83E+11
-154.647	28.6908	0.00				
1.7100	5.7329	773858.	1033.	-0.08186	0.00	3.83E+11
-156.172	29.4206	0.00				
1.8000	5.6445	775290.	863.5091	-0.08185	0.00	3.83E+11
-157.665	30.1670	0.00				
1.8900	5.5561	776537.	692.4435	-0.08185	0.00	3.83E+11
-159.125	30.9308	0.00				
1.9800	5.4677	777599.	519.8177	-0.08185	0.00	3.83E+11
-160.552	31.7128	0.00				
2.0700	5.3793	778473.	345.6688	-0.08185	0.00	3.83E+11
-161.945	32.5137	0.00				
2.1600	5.2909	779159.	170.0344	-0.08185	0.00	3.83E+11
-163.304	33.3342	0.00				

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2.2500	5.2025	779654.	-7.049	-0.08184	0.00	3.83E+11
-164.628	34.1754	0.00				
2.3400	5.1141	779956.	-185.542	-0.08184	0.00	3.83E+11
-165.916	35.0380	0.00				
2.4300	5.0257	780066.	-365.406	-0.08184	0.00	3.83E+11
-167.167	35.9231	0.00				
2.5200	4.9374	779980.	-546.600	-0.08184	0.00	3.83E+11
-168.381	36.8316	0.00				
2.6100	4.8490	779698.	-729.086	-0.08183	0.00	3.83E+11
-169.556	37.7648	0.00				
2.7000	4.7606	779219.	-912.821	-0.08183	0.00	3.83E+11
-170.692	38.7237	0.00				
2.7900	4.6722	778540.	-1098.	-0.08183	0.00	3.83E+11
-171.789	39.7096	0.00				
2.8800	4.5838	777661.	-1284.	-0.08183	0.00	3.83E+11
-172.845	40.7239	0.00				
2.9700	4.4955	776580.	-1471.	-0.08183	0.00	3.83E+11
-173.858	41.7681	0.00				
3.0600	4.4071	775296.	-1659.	-0.08182	0.00	3.83E+11
-174.829	42.8435	0.00				
3.1500	4.3187	773808.	-1849.	-0.08182	0.00	3.83E+11
-175.756	43.9520	0.00				
3.2400	4.2304	772116.	-2039.	-0.08182	0.00	3.83E+11
-176.639	45.0953	0.00				
3.3300	4.1420	770217.	-2230.	-0.08182	0.00	3.83E+11
-177.474	46.2753	0.00				
3.4200	4.0536	768112.	-2422.	-0.08182	0.00	3.83E+11
-178.263	47.4941	0.00				
3.5100	3.9653	765798.	-2615.	-0.08181	0.00	3.83E+11
-179.002	48.7539	0.00				
3.6000	3.8769	763276.	-2809.	-0.08181	0.00	3.83E+11
-179.692	50.0571	0.00				
3.6900	3.7886	760544.	-3003.	-0.08181	0.00	3.83E+11
-180.330	51.4064	0.00				
3.7800	3.7002	757601.	-3198.	-0.08181	0.00	3.83E+11
-180.915	52.8046	0.00				
3.8700	3.6119	754448.	-3394.	-0.08180	0.00	3.83E+11
-181.445	54.2548	0.00				
3.9600	3.5235	751083.	-3590.	-0.08180	0.00	3.83E+11
-181.919	55.7605	0.00				
4.0500	3.4352	747506.	-3841.	-0.08180	0.00	3.83E+11
-282.648	88.8630	0.00				
4.1400	3.3468	743599.	-4146.	-0.08180	0.00	3.83E+11
-282.294	91.0944	0.00				
4.2300	3.2585	739362.	-4451.	-0.08180	0.00	3.83E+11
-281.844	93.4150	0.00				
4.3200	3.1701	734798.	-4755.	-0.08179	0.00	3.83E+11
-281.298	95.8319	0.00				
4.4100	3.0818	729904.	-5058.	-0.08179	0.00	3.83E+11
-280.653	98.3528	0.00				

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4.5000	2.9935	724684.	-5361.	-0.08179	0.00	3.83E+11
-279.907	100.9860	0.00				
4.5900	2.9051	719137.	-5663.	-0.08179	0.00	3.83E+11
-279.058	103.7409	0.00				
4.6800	2.8168	713265.	-5964.	-0.08179	0.00	3.83E+11
-278.103	106.6279	0.00				
4.7700	2.7285	707068.	-6264.	-0.08178	0.00	3.83E+11
-277.039	109.6584	0.00				
4.8600	2.6402	700548.	-6562.	-0.08178	0.00	3.83E+11
-275.861	112.8453	0.00				
4.9500	2.5518	693706.	-6859.	-0.08178	0.00	3.83E+11
-274.567	116.2032	0.00				
5.0400	2.4635	686544.	-7155.	-0.08178	0.00	3.83E+11
-273.150	119.7483	0.00				
5.1300	2.3752	679064.	-7449.	-0.08178	0.00	3.84E+11
-271.607	123.4991	0.00				
5.2200	2.2869	671266.	-7742.	-0.08177	0.00	3.84E+11
-269.930	127.4768	0.00				
5.3100	2.1986	663154.	-8032.	-0.08177	0.00	3.84E+11
-268.114	131.7053	0.00				
5.4000	2.1103	654729.	-8321.	-0.08177	0.00	3.84E+11
-266.151	136.2126	0.00				
5.4900	2.0219	645993.	-8607.	-0.08177	0.00	3.84E+11
-264.033	141.0306	0.00				
5.5800	1.9336	636950.	-8891.	-0.08177	0.00	3.84E+11
-261.751	146.1968	0.00				
5.6700	1.8453	627601.	-9172.	-0.08176	0.00	3.84E+11
-259.294	151.7551	0.00				
5.7600	1.7570	617950.	-9451.	-0.08176	0.00	3.84E+11
-256.651	157.7574	0.00				
5.8500	1.6687	607999.	-9727.	-0.08176	0.00	3.84E+11
-253.808	164.2653	0.00				
5.9400	1.5804	597753.	-9999.	-0.08176	0.00	3.84E+11
-250.750	171.3532	0.00				
6.0300	1.4921	587214.	-10268.	-0.08176	0.00	3.84E+11
-247.458	179.1112	0.00				
6.1200	1.4038	576386.	-10533.	-0.08176	0.00	3.84E+11
-243.914	187.6499	0.00				
6.2100	1.3155	565274.	-10795.	-0.08175	0.00	3.84E+11
-240.092	197.1068	0.00				
6.3000	1.2272	553881.	-11052.	-0.08175	0.00	3.84E+11
-235.963	207.6551	0.00				
6.3900	1.1389	542214.	-11304.	-0.08175	0.00	3.84E+11
-231.496	219.5163	0.00				
6.4800	1.0506	530276.	-11552.	-0.08175	0.00	3.84E+11
-226.647	232.9794	0.00				
6.5700	0.9624	518074.	-12575.	-0.08175	0.00	3.84E+11
-1668.	1871.	0.00				
6.6600	0.8741	503927.	-14359.	-0.08175	0.00	3.84E+11
-1637.	2022.	0.00				

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6.7500	0.7858	487871.	-16108.	-0.08175	0.00	3.84E+11
-1602.	2202.	0.00				
6.8400	0.6975	469947.	-17817.	-0.08174	0.00	3.84E+11
-1563.	2421.	0.00				
6.9300	0.6092	450199.	-19482.	-0.08174	0.00	3.84E+11
-1519.	2693.	0.00				
7.0200	0.5209	428679.	-21095.	-0.08174	0.00	3.84E+11
-1469.	3045.	0.00				
7.1100	0.4327	405446.	-22649.	-0.08174	0.00	3.84E+11
-1409.	3518.	0.00				
7.2000	0.3444	380569.	-24133.	-0.08174	0.00	3.84E+11
-1338.	4196.	0.00				
7.2900	0.2561	354132.	-25530.	-0.08174	0.00	3.84E+11
-1249.	5267.	0.00				
7.3800	0.1678	326237.	-26814.	-0.08174	0.00	3.84E+11
-1129.	7269.	0.00				
7.4700	0.07954	297026.	-27932.	-0.08174	0.00	3.85E+11
-941.886	12789.	0.00				
7.5600	-0.00874	266716.	-28147.	-0.08174	0.00	3.85E+11
544.9980	67379.	0.00				
7.6500	-0.09701	237041.	-27312.	-0.08174	0.00	3.85E+11
999.8552	11131.	0.00				
7.7400	-0.185	208533.	-26135.	-0.08173	0.00	3.85E+11
1181.	6886.	0.00				
7.8300	-0.274	181402.	-24790.	-0.08173	0.00	3.85E+11
1309.	5167.	0.00				
7.9200	-0.362	155798.	-23322.	-0.08173	0.00	3.85E+11
1410.	4210.	0.00				
8.0100	-0.450	131839.	-21752.	-0.08173	0.00	3.85E+11
1497.	3592.	0.00				
8.1000	-0.538	109626.	-20094.	-0.08173	0.00	3.85E+11
1573.	3156.	0.00				
8.1900	-0.627	89248.	-18358.	-0.08173	0.00	3.85E+11
1642.	2830.	0.00				
8.2800	-0.715	70785.	-16551.	-0.08173	0.00	3.85E+11
1705.	2576.	0.00				
8.3700	-0.803	54311.	-14677.	-0.08173	0.00	3.85E+11
1764.	2372.	0.00				
8.4600	-0.891	39894.	-12742.	-0.08173	0.00	3.85E+11
1819.	2204.	0.00				
8.5500	-0.980	27599.	-10749.	-0.08173	0.00	3.85E+11
1872.	2063.	0.00				
8.6400	-1.068	17487.	-8701.	-0.08173	0.00	3.85E+11
1922.	1943.	0.00				
8.7300	-1.156	9617.	-6600.	-0.08173	0.00	3.85E+11
1969.	1839.	0.00				
8.8200	-1.245	4043.	-4448.	-0.08173	0.00	3.85E+11
2015.	1749.	0.00				
8.9100	-1.333	820.3262	-2248.	-0.08173	0.00	3.85E+11
2060.	1669.	0.00				

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area

Light Tower SC1-21 (Boring B-016-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

9.0000 -1.421 0.00 0.00 -0.08173 0.00 3.85E+11
2103. 799.0589 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 = 7.41303242 inches
Computed slope at pile head = -0.0818970 radians
Maximum bending moment = 780066. inch-lbs
Maximum shear force = -28147. lbs
Depth of maximum bending moment = 2.43000000 feet below pile head
Depth of maximum shear force = 7.56000000 feet below pile head
Number of iterations = 47
Number of zero deflection points = 1
Pile deflection at ground = 6.43040622 inches

Pile-head Deflection vs. Pile Length for Load Case 2

Boundary Condition Type 1, Shear and Moment

Shear = 2250. lbs
Moment = 724800. in-lbs
Axial Load = 4600. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
9.00000	7.41303242	780066.	-28147.
8.55000	16.41219762	786325.	-28873.

Computed Values of Pile Loading and Deflection
for Lateral Loading for Load Case Number 3

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

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area

Light Tower SC1-21 (Boring B-016-0-25) Lateral Load Analysis

36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Shear force at pile head = 2250.0 lbs
 Applied moment at pile head = 724800.0 in-lbs
 Axial thrust load on pile head = 3800.0 lbs

Depth Res.	Soil X Es*H feet lb/inch	Deflect. Spr. y Lat. inches lb/inch	Bending Distrib. Moment Load in-lbs lb/inch	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness lb-in^2	Soil p
0.00	0.00	7.2118	724800.	2250.	-0.07967	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.09000	0.00	7.1258	727557.	2250.	-0.07966	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.1800	0.00	7.0398	730314.	2250.	-0.07966	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.2700	0.00	6.9537	733071.	2250.	-0.07966	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.3600	0.00	6.8677	735828.	2250.	-0.07966	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.4500	0.00	6.7817	738585.	2250.	-0.07965	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.5400	0.00	6.6956	741341.	2250.	-0.07965	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.6300	0.00	6.6096	744098.	2250.	-0.07965	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.7200	0.00	6.5236	746855.	2250.	-0.07965	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.8100	0.00	6.4376	749612.	2250.	-0.07965	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.9000	0.00	6.3516	752369.	2250.	-0.07964	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
0.9900	0.00	6.2656	755126.	2250.	-0.07964	0.00	3.83E+11	
0.00	0.00	0.00	0.00					
1.0800	0.00	6.1795	757883.	2172.	-0.07964	0.00	3.83E+11	
-143.534	25.0855	0.00	0.00					
1.1700	0.00	6.0935	760472.	2017.	-0.07964	0.00	3.83E+11	
-145.224	25.7391	0.00	0.00					
1.2600	0.00	6.0075	762892.	1859.	-0.07964	0.00	3.83E+11	
-146.886	26.4064	0.00	0.00					
1.3500	0.00	5.9215	765141.	1699.	-0.07963	0.00	3.83E+11	
-148.518	27.0876	0.00	0.00					
1.4400	0.00	5.8355	767216.	1538.	-0.07963	0.00	3.83E+11	
-150.121	27.7835	0.00	0.00					
1.5300	0.00	5.7495	769116.	1375.	-0.07963	0.00	3.83E+11	
-151.694	28.4946	0.00	0.00					
1.6200	0.00	5.6635	770840.	1210.	-0.07963	0.00	3.83E+11	

TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-21 (Boring B-016-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

-153.237	29.2213	0.00				
1.7100	5.5775	772385.	1044.	-0.07962	0.00	3.83E+11
-154.748	29.9645	0.00				
1.8000	5.4915	773749.	876.1555	-0.07962	0.00	3.83E+11
-156.227	30.7247	0.00				
1.8900	5.4055	774931.	706.6486	-0.07962	0.00	3.83E+11
-157.674	31.5026	0.00				
1.9800	5.3195	775929.	535.5971	-0.07962	0.00	3.83E+11
-159.089	32.2990	0.00				
2.0700	5.2336	776741.	363.0362	-0.07962	0.00	3.83E+11
-160.469	33.1146	0.00				
2.1600	5.1476	777366.	189.0016	-0.07961	0.00	3.83E+11
-161.816	33.9502	0.00				
2.2500	5.0616	777803.	13.5317	-0.07961	0.00	3.83E+11
-163.128	34.8068	0.00				
2.3400	4.9756	778049.	-163.335	-0.07961	0.00	3.83E+11
-164.404	35.6853	0.00				
2.4300	4.8896	778103.	-341.561	-0.07961	0.00	3.83E+11
-165.644	36.5867	0.00				
2.5200	4.8037	777965.	-521.105	-0.07961	0.00	3.83E+11
-166.847	37.5119	0.00				
2.6100	4.7177	777631.	-701.929	-0.07960	0.00	3.83E+11
-168.012	38.4622	0.00				
2.7000	4.6317	777102.	-883.990	-0.07960	0.00	3.83E+11
-169.138	39.4387	0.00				
2.7900	4.5457	776375.	-1067.	-0.07960	0.00	3.83E+11
-170.225	40.4428	0.00				
2.8800	4.4598	775450.	-1252.	-0.07960	0.00	3.83E+11
-171.271	41.4757	0.00				
2.9700	4.3738	774325.	-1437.	-0.07959	0.00	3.83E+11
-172.276	42.5390	0.00				
3.0600	4.2879	772999.	-1624.	-0.07959	0.00	3.83E+11
-173.238	43.6342	0.00				
3.1500	4.2019	771471.	-1811.	-0.07959	0.00	3.83E+11
-174.157	44.7630	0.00				
3.2400	4.1159	769740.	-2000.	-0.07959	0.00	3.83E+11
-175.031	45.9272	0.00				
3.3300	4.0300	767804.	-2189.	-0.07959	0.00	3.83E+11
-175.860	47.1288	0.00				
3.4200	3.9440	765664.	-2380.	-0.07958	0.00	3.83E+11
-176.642	48.3699	0.00				
3.5100	3.8581	763317.	-2571.	-0.07958	0.00	3.83E+11
-177.375	49.6527	0.00				
3.6000	3.7721	760764.	-2763.	-0.07958	0.00	3.83E+11
-178.058	50.9798	0.00				
3.6900	3.6862	758003.	-2955.	-0.07958	0.00	3.83E+11
-178.691	52.3537	0.00				
3.7800	3.6003	755033.	-3149.	-0.07957	0.00	3.83E+11
-179.271	53.7775	0.00				
3.8700	3.5143	751855.	-3343.	-0.07957	0.00	3.83E+11

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 Light Tower SC1-21 (Boring B-016-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

-179.797	55.2542	0.00				
3.9600	3.4284	748466.	-3537.	-0.07957	0.00	3.83E+11
-180.267	56.7873	0.00				
4.0500	3.3424	744867.	-3786.	-0.07957	0.00	3.83E+11
-280.081	90.4989	0.00				
4.1400	3.2565	740942.	-4088.	-0.07957	0.00	3.83E+11
-279.731	92.7709	0.00				
4.2300	3.1706	736690.	-4390.	-0.07956	0.00	3.83E+11
-279.287	95.1337	0.00				
4.3200	3.0847	732113.	-4691.	-0.07956	0.00	3.83E+11
-278.746	97.5945	0.00				
4.4100	2.9987	727211.	-4992.	-0.07956	0.00	3.83E+11
-278.108	100.1611	0.00				
4.5000	2.9128	721984.	-5292.	-0.07956	0.00	3.83E+11
-277.369	102.8421	0.00				
4.5900	2.8269	716433.	-5591.	-0.07956	0.00	3.83E+11
-276.529	105.6469	0.00				
4.6800	2.7410	710560.	-5889.	-0.07955	0.00	3.83E+11
-275.584	108.5860	0.00				
4.7700	2.6550	704366.	-6186.	-0.07955	0.00	3.83E+11
-274.530	111.6713	0.00				
4.8600	2.5691	697851.	-6482.	-0.07955	0.00	3.83E+11
-273.365	114.9158	0.00				
4.9500	2.4832	691017.	-6777.	-0.07955	0.00	3.83E+11
-272.083	118.3342	0.00				
5.0400	2.3973	683866.	-7070.	-0.07955	0.00	3.83E+11
-270.681	121.9431	0.00				
5.1300	2.3114	676400.	-7361.	-0.07954	0.00	3.84E+11
-269.153	125.7613	0.00				
5.2200	2.2255	668619.	-7651.	-0.07954	0.00	3.84E+11
-267.493	129.8104	0.00				
5.3100	2.1396	660527.	-7939.	-0.07954	0.00	3.84E+11
-265.695	134.1147	0.00				
5.4000	2.0537	652124.	-8225.	-0.07954	0.00	3.84E+11
-263.751	138.7026	0.00				
5.4900	1.9678	643414.	-8509.	-0.07954	0.00	3.84E+11
-261.654	143.6066	0.00				
5.5800	1.8819	634399.	-8790.	-0.07954	0.00	3.84E+11
-259.395	148.8648	0.00				
5.6700	1.7960	625081.	-9069.	-0.07953	0.00	3.84E+11
-256.963	154.5219	0.00				
5.7600	1.7101	615463.	-9345.	-0.07953	0.00	3.84E+11
-254.346	160.6305	0.00				
5.8500	1.6242	605549.	-9618.	-0.07953	0.00	3.84E+11
-251.531	167.2534	0.00				
5.9400	1.5383	595341.	-9888.	-0.07953	0.00	3.84E+11
-248.503	174.4661	0.00				
6.0300	1.4524	584843.	-10155.	-0.07953	0.00	3.84E+11
-245.244	182.3602	0.00				
6.1200	1.3665	574060.	-10418.	-0.07952	0.00	3.84E+11

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 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

-241.735	191.0481	0.00				
6.2100	1.2806	562994.	-10677.	-0.07952	0.00	3.84E+11
-237.951	200.6695	0.00				
6.3000	1.1948	551651.	-10931.	-0.07952	0.00	3.84E+11
-233.864	211.4002	0.00				
6.3900	1.1089	540035.	-11182.	-0.07952	0.00	3.84E+11
-229.441	223.4654	0.00				
6.4800	1.0230	528151.	-11427.	-0.07952	0.00	3.84E+11
-224.641	237.1583	0.00				
6.5700	0.9371	516006.	-12443.	-0.07952	0.00	3.84E+11
-1656.	1909.	0.00				
6.6600	0.8512	501928.	-14215.	-0.07952	0.00	3.84E+11
-1626.	2063.	0.00				
6.7500	0.7654	485954.	-15952.	-0.07951	0.00	3.84E+11
-1592.	2246.	0.00				
6.8400	0.6795	468123.	-17651.	-0.07951	0.00	3.84E+11
-1553.	2469.	0.00				
6.9300	0.5936	448481.	-19304.	-0.07951	0.00	3.84E+11
-1509.	2746.	0.00				
7.0200	0.5077	427079.	-20907.	-0.07951	0.00	3.84E+11
-1459.	3104.	0.00				
7.1100	0.4219	403974.	-22452.	-0.07951	0.00	3.84E+11
-1400.	3585.	0.00				
7.2000	0.3360	379236.	-23926.	-0.07951	0.00	3.84E+11
-1330.	4274.	0.00				
7.2900	0.2501	352947.	-25314.	-0.07951	0.00	3.84E+11
-1242.	5361.	0.00				
7.3800	0.1643	325209.	-26592.	-0.07951	0.00	3.84E+11
-1123.	7386.	0.00				
7.4700	0.07840	296161.	-27705.	-0.07951	0.00	3.85E+11
-938.505	12928.	0.00				
7.5600	-0.00746	266019.	-27929.	-0.07950	0.00	3.85E+11
523.9354	75835.	0.00				
7.6500	-0.09333	236488.	-27111.	-0.07950	0.00	3.85E+11
990.2230	11459.	0.00				
7.7400	-0.179	208111.	-25944.	-0.07950	0.00	3.85E+11
1171.	7061.	0.00				
7.8300	-0.265	181101.	-24610.	-0.07950	0.00	3.85E+11
1298.	5290.	0.00				
7.9200	-0.351	155606.	-23153.	-0.07950	0.00	3.85E+11
1400.	4308.	0.00				
8.0100	-0.437	131743.	-21595.	-0.07950	0.00	3.85E+11
1486.	3673.	0.00				
8.1000	-0.523	109613.	-19950.	-0.07950	0.00	3.85E+11
1561.	3227.	0.00				
8.1900	-0.609	89304.	-18227.	-0.07950	0.00	3.85E+11
1630.	2893.	0.00				
8.2800	-0.694	70896.	-16432.	-0.07950	0.00	3.85E+11
1693.	2633.	0.00				
8.3700	-0.780	54462.	-14573.	-0.07950	0.00	3.85E+11

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1751.	2424.	0.00					
8.4600	-0.866	40072.	-12652.	-0.07950	0.00	3.85E+11	
1806.	2252.	0.00					
8.5500	-0.952	27787.	-10673.	-0.07950	0.00	3.85E+11	
1858.	2108.	0.00					
8.6400	-1.038	17671.	-8639.	-0.07950	0.00	3.85E+11	
1908.	1985.	0.00					
8.7300	-1.124	9779.	-6553.	-0.07950	0.00	3.85E+11	
1955.	1879.	0.00					
8.8200	-1.210	4168.	-4417.	-0.07950	0.00	3.85E+11	
2001.	1787.	0.00					
8.9100	-1.295	891.4146	-2232.	-0.07950	0.00	3.85E+11	
2045.	1705.	0.00					
9.0000	-1.381	0.00	0.00	-0.07950	0.00	3.85E+11	
2088.	816.2808	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. 3:

Pile-head deflection	=	7.21183520 inches
Computed slope at pile head	=	-0.0796650 radians
Maximum bending moment	=	778103. inch-lbs
Maximum shear force	=	-27929. lbs
Depth of maximum bending moment	=	2.43000000 feet below pile head
Depth of maximum shear force	=	7.56000000 feet below pile head
Number of iterations	=	47
Number of zero deflection points	=	1
Pile deflection at ground	=	6.25599319 inches

 Pile-head Deflection vs. Pile Length for Load Case 3

Boundary Condition Type 1, Shear and Moment

Shear	=	2250. lbs
Moment	=	724800. in-lbs
Axial Load	=	3800. lbs

Pile	Pile Head	Maximum	Maximum
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TP 26 NE Ohio Site 15 SUM-271 Active Rest Areas - Southbound Parking Area
 Light Tower SC1-21 (Boring B-016-0-25) Lateral Load Analysis
 36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

Length feet	Deflection inches	Moment in-lbs	Shear lbs
9.00000	7.21183520	778103.	-27929.
8.55000	15.37261559	781536.	-28338.

 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 Shear	Load Max	Load Moment	Load Type	Load Pile-head	Axial Loading	Pile-head Deflection	Pile-head Rotation	Max in
Case	Type	Pile-head	Type	Pile-head				
Pile	in	Pile						
No.	1	Load 1	2	Load 2	lbs	inches	radians	lbs
	in-lbs							
1	V, lb	1000.0000	M, in-lb	315600.	4200.	0.4084	-0.00452	
-12881.		337196.						
2	V, lb	2250.	M, in-lb	724800.	4600.	7.4130	-0.08190	
-28147.		780066.						
3	V, lb	2250.	M, in-lb	724800.	3800.	7.2118	-0.07967	
-27929.		778103.						

Maximum pile-head deflection = 7.4130324232 inches

Maximum pile-head rotation = -0.0818970338 radians = -4.692354 deg.

The analysis ended normally.

Appendix IV – OGE Geotechnical Checklists

I. Geotechnical Design Checklists	
Project: SUM-271 Active Rest Areas	PDP Path:
PID: 122877	Review Stage: 3

Checklist	Included in This Submission
II. Reconnaissance and Planning	✓
III. A. Centerline Cuts III. B. Embankments III. C. Subgrade	✓
IV. A. Foundations of Structures IV. B. Retaining Wall	
V. A. Landslide Remediation V. B. Rockfall Remediation V. C. Wetland or Peat Remediation V. D. Underground Mine Remediation V. E. Surface Mine Remediation V. F. Karst Remediation	
VI. A. Geotechnical Profile VI. D. Geotechnical Reports	✓

II. Reconnaissance and Planning Checklist

C-R-S:	SUM-271 Active Rest Areas	PID:	122877	Reviewer:	BKS	Date:	4/9/2026
Reconnaissance				(Y/N/X)	Notes:		
1	Based on Section 302.1 in the SGE, have the necessary plans been developed in the following areas prior to the commencement of the subsurface exploration reconnaissance:			Y			
	Roadway plans			✓			
	Structures plans						
	Geohazards plans						
2	Have the resources listed in Section 302.2.1 of the SGE been reviewed as part of the office reconnaissance?			Y			
3	Have all the features listed in Section 302.3 of the SGE been observed and evaluated during the field reconnaissance?			Y			
4	If notable features were discovered in the field reconnaissance, were the GPS coordinates of these features recorded?			X			
Planning - General				(Y/N/X)	Notes:		
5	In planning the geotechnical exploration program for the project, have the specific geologic conditions, the proposed work, and historic subsurface exploration work been considered?			Y			
6	Has the ODOT Transportation Information Mapping System (TIMS) been accessed to find all available historic boring information and inventoried geohazards?			Y	TIMS was accessed and historic information was available at each site but was not able to be reused.		
7	Have the borings been located to develop the maximum subsurface information while using a minimum number of borings, utilizing historic geotechnical explorations to the fullest extent possible?			Y			
8	Have the topography, geologic origin of materials, surface manifestation of soil conditions, and any other special design considerations been utilized in determining the spacing and depth of borings?			Y			
9	Have the borings been located so as to provide adequate overhead clearance for the equipment, clearance of underground utilities, minimize damage to private property, and minimize disruption of traffic, without compromising the quality of the exploration?			Y			

II. Reconnaissance and Planning Checklist

Planning - General		(Y/N/X)	Notes:
10	Have the scaled boring plans, showing all project and historic borings, and a schedule of borings in tabular format, been submitted to the District Geotechnical Engineer?	Y	
The schedule of borings should present the following information for each boring:			
a.	exploration identification number	Y	
b.	location by station and offset	Y	
c.	estimated amount of rock and soil, including the total for each for the entire program.	Y	
Planning – Exploration Number		(Y/N/X)	Notes:
11	Have the coordinates, stations and offsets of all explorations (borings, soundings, test pits, etc.) been identified?	Y	
12	Has each exploration been assigned a unique identification number, in the following format X-ZZZ-W-YY, as per Section 303.2 of the SGE?	Y	
13	When referring to historic explorations that did not use the identification scheme in 12 above, have the historic explorations been assigned identification numbers according to Section 303.2 of the SGE?	X	

II. Reconnaissance and Planning Checklist

Planning – Boring Types		(Y/N/X)	Notes:
14	Based on Sections 303.3 to 303.7.6 of the SGE, have the location, depth, and sampling requirements for the following boring types been determined for the project?	Y	
	Check all boring types utilized for this project:		
	Existing Subgrades (Type A)		
	Roadway Borings (Type B)	✓	
	Embankment Foundations (Type B1)		
	Cut Sections (Type B2)		
	Sidehill Cut Sections (Type B3)		
	Sidehill Cut-Fill Sections (Type B4)		
	Sidehill Fill Sections on Unstable Slopes (Type B5)		
	Geohazard Borings (Type C)		
	Lakes, Ponds, and Low-Lying Areas (Type C1)		
	Peat Deposits, Compressible Soils, and Low Strength Soils (Type C2)		
	Uncontrolled Fills, Waste Pits, and Reclaimed Surface Mines (Type C3)		
	Underground Mines (C4)		
	Landslides (Type C5)		
	Rock Slope (Type C6)		
	Karst (Type C7)		
	Proposed Underground Utilities (Type D)		
	Structure Borings (Type E)		
	Bridges (Type E1)		
	Culverts (Type E2 a,b,c)		
	Retaining Walls (Type E3 a and b)		
	Noise Barrier (Type E4)		
	CCTV & High Mast Lighting Towers (Type E5)	✓	
	Buildings and Salt Domes (Type E6)		

III.C. Subgrade Checklist

C-R-S:	SUM-271 Active Rest Areas	PID:	122877	Reviewer:	BKS	Date:	4/9/2026
<p align="center"><i>Use this Checklist in conjunction with the Subgrade design guidance in GDM Section 600</i></p> <p align="center"><i>If you do not have any subgrade work on the project, you do not have to fill out this checklist.</i></p>							
Subgrade		(Y/N/X)	Notes:				
1	Has the subsurface exploration adequately characterized the soil or rock according to GDM Section 600?	Y					
a.	Has each sample been visually classified and inspected for the presence of gypsum? Has a moisture content been performed on each sample?	Y					
b.	Has mechanical classification (Plastic Limit (PL), Liquid Limit (LL), and gradation testing) been done on at least two samples from each boring within six feet of the proposed subgrade?	Y					
c.	Has the sulfate content of at least one sample from each boring within 3 feet of the proposed subgrade been determined, per Supplement 1122, Determining Sulfate Content in Soils?	Y					
d.	Has the sulfate content of all samples that exhibit gypsum crystals been determined?	X					
e.	Have A-2-5, A-4b, A-5, A-7-5, A-8a, or A-8b soils within the top 3 feet of the proposed subgrade been mechanically classified?	X					
2	If soils classified as A-2-5, A-4b, A-5, A-7-5, A-8a, or A-8b, or having a LL>65, are present at the proposed subgrade (geotechnical profile), do the plans specify that these materials need to be removed and replaced or chemically stabilized?	X					
a.	If these materials are to be removed and replaced, have the station limits, depth, and lateral limits for the planned removal been provided?	X					
3	If there is any rock, shale, or coal present at the proposed subgrade (C&MS 204.05), do the plans specify the removal of the material?	X					
a.	If removal of any rock, shale, or coal is required, have the station limits, depth, and lateral limits for the planned removal of the material at proposed subgrade been provided?	X					

III.C. Subgrade Checklist

Subgrade	(Y/N/X)	Notes:	
4 In accordance with GDM Section 600, do the SPT (N_{60})/HP values and existing moisture contents for the proposed subgrade soils indicate the need for subgrade stabilization?	Y		
a. If removal and replacement is applicable, has the detail of subgrade removal been shown on the plans, including depth of removal, station limits, lateral extent, replacement material, and plan notes (Item 204 - Subgrade Compaction and Proof Rolling)?	X		
b. If chemical stabilization is applicable, has the detail of this treatment been shown on the plans, including depth, percentage of chemical, station limits, lateral extent, and plan notes?	Y		
Indicate type of chemical stabilization specified:			
cement stabilization	✓		
lime stabilization			
5 If removal and replacement has been specified, do the plans include Plan Note G121 from L&D3?	X		
6 If drainage or groundwater is an issue with the proposed subgrade, has an appropriate drainage system (e.g., pipe, underdrains) been provided?	Y		
7 Has an appropriate quantity of Proof Rolling (C&MS 204.06) and has Plan Note G111 from L&D3 been included in the plans?	X	To be determined by others.	
8 Has a design CBR value been provided?	Y		

VI.B. Geotechnical Reports

C-R-S:	SUM-271 Active Rest Areas	PID:	122877	Reviewer:	BKS	Date:	4/9/2026
General		(Y/N/X)	Notes:				
1	Has an electronic copy of all geotechnical submissions been provided to the District Geotechnical Engineer (DGE)?	Y	Uploaded to ProjectWise.				
2	Has the first complete version of a geotechnical report being submitted been labeled as 'Draft'?	Y					
3	Subsequent to ODOT's review and approval, has the complete version of the revised geotechnical report being submitted been labeled 'Final'?	Y					
4	Has the boring data been submitted in a native format that is DIGGS (Data Interchange for Geotechnical and Geoenvironmental) compatible? gINT files meet this demand?	Y					
5	Does the report cover format follow ODOT's Brand and Identity Guidelines Report Standards found at http://www.dot.state.oh.us/brand/Pages/default.aspx ?	Y					
6	Have all geotechnical reports being submitted been titled correctly as prescribed in Section 706.1 of the SGE?	Y					
Report Body		(Y/N/X)	Notes:				
7	Do all geotechnical reports being submitted contain the following:	Y					
a.	an Executive Summary as described in Section 706.2 of the SGE?	Y					
b.	an Introduction as described in Section 706.3 of the SGE?	Y					
c.	a section titled "Geology and Observations of the Project," as described in Section 706.4 of the SGE?	Y					
d.	a section titled "Exploration," as described in Section 706.5 of the SGE?	Y					
e.	a section titled "Findings," as described in Section 706.6 of the SGE?	Y					
f.	a section titled "Analyses and Recommendations," as described in Section 706.7 of the SGE?	Y					
Appendices		(Y/N/X)	Notes:				
8	Do all geotechnical reports being submitted contain all applicable Appendices as described in Section 706.8 of the SGE?	Y					
9	Do the Appendices present a site Boring Plan showing all boring locations as described in Section 706.8.1 of the SGE?	Y					

VI.B. Geotechnical Reports

Appendices		(Y/N/X)	Notes:
10	Do the Appendices include boring logs and color pictures of rock, if applicable, as described in Section 706.8.2 of the SGE?	Y	
11	Do the Appendices include reports of undisturbed test data as described in Section 706.8.3 of the SGE?	X	
12	Do the Appendices include calculations in a logical format to support recommendations as described in Section 706.8.4 of the SGE?	Y	