Roadway & Light Tower Exploration Report (Final)
TP 26 NE Ohio Site 13 MAH-11 Vacant Rest Area
Mahoning County, Ohio
S&ME Project No. 24170232E

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Attention: Mr. Brian Hughes, PE

Reference: **Roadway & Light Tower Exploration Report (Final)**
TP 26 NE Ohio Site 13 MAH-11 Vacant Rest Area (PID 122881)
Mahoning County, Ohio
S&ME Project No. 24170232E

Mr. Hughes:

In accordance with our revised proposal dated February 11, 2026, which was advanced authorized on February 16, 2026, and fully authorized on March 16, 2026, by an ms consultants, inc. (ms) Task Order Agreement, S&ME has completed a geotechnical exploration for a proposed truck parking facility at the vacant rest area along SR 11 northbound approximately 0.5 miles north of SR 165 (S. Range Rd) in Mahoning County, Ohio. The MAH-11 Vacant Rest Area is known as Site 13 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 June 11, 2026, "draft" report. This final report also addresses comments received on July 13, 2026, from the ODOT Office of Geotechnical Engineering (OGE) on the Stage 3 plans. 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.

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Table of Contents

Page

1.0 Executive Summary 1
2.0 Introduction 2
3.0 Geology and Observations of the Project 2
3.1 Geology 2
3.2 Reconnaissance 2
3.3 Available Information 3
4.0 Exploration 3
4.1 Field Investigation 3
4.2 Laboratory Testing 4
5.0 Findings 5
5.1 Existing Surficial Materials 5
5.2 Subsurface Stratigraphy 5
5.3 Groundwater Observations 6
5.4 Soil Sulfate Test Results 6
6.0 Analysis and Recommendations 7
6.1 General Discussion 7
6.2 Subgrade Assessment 7
6.2.1 Subgrade Support Parameters 7
6.2.2 Subgrade Remediation Assessment 8
6.2.3 Subgrade Remediation Recommendations 9
6.2.4 Additional Subgrade Remediation Considerations 9
6.3 General Roadway/Pavement Construction Considerations 10
6.3.1 Subgrade/Embankment Foundation Preparation 10
6.3.2 "Fill" Areas 10
6.3.3 Benching 11
6.3.4 Borrow Requirements and Compaction Criteria 11
6.3.5 Moisture Conditioning and Subgrade Protection 12
6.3.6 Final Subgrade Preparation 12
6.4 Groundwater Considerations for Subgrade/Embankment Construction 12

7.0 High Mast Light Towers Foundations 13
7.1 Foundation Design Approach 13
7.2 Lateral (LPILE) Analysis Parameters 13
7.3 Lateral Load Analysis Summary 14
7.4 Foundation Plan Notes 15
7.5 Groundwater Considerations for Light Tower Foundations 16
8.0 Limitations and Final Considerations 16

List of Tables

Table 4-1 – Summary of Project Borings 3
Table 5-1 – Existing Pavement or Rootmat Thicknesses 5
Table 5-2 – Seepage and Groundwater Observations During Drilling 6
Table 7-1 – Summary of Lateral Load Analysis Results 15

Appendices

Appendix I – General Information

Plate
Vicinity Map 1
Plan of Explorations 2A-2D
Explanation of Symbols and Terms Used on Boring Logs for Soil 3
Boring Logs 4-18
Pavement Core Photos 19-20
Sulfate Content Test Results 21
Important Information about Your Geotechnical Report 22

Appendix II – Subgrade Analysis Results

Plate
Subgrade Spreadsheet – Northbound Parking Area 1-6

Appendix III – Light Tower Foundation Analysis Results

Plate
LPILE Soil Parameter Tables – Northbound Parking Area Light Towers 1-3
Lateral Load Analysis (LPILE) Output – Northbound Parking Area Light Towers 4-268

Appendix IV – OGE Geotechnical Checklists

Plate
OGE Geotechnical Checklists 1-8

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 a new truck parking area at a vacant rest area along northbound SR 11, approximately 0.5 miles north of SR 165 (S. Range Rd). The project also includes constructing new entrance and exit ramps.
Exploration Program *(Section 4.0)*	Fifteen (15) borings and two (2) pavement cores were performed for the truck parking area, ramps, and proposed light towers. See Table 4-1.
Subsurface Conditions *(Section 5.0)*	*Surface Materials*: Nine (9) borings and one (1) offset pavement core were advanced through existing pavement, whereas rootmat was encountered in the remaining six (6) borings. Table 5-1 summarizes the type and thicknesses of surficial materials encountered. *Overburden Soil*: All borings encountered existing fill or possible fill materials consisting of predominantly cohesive soil (A-4a, A-4b, A-6a, A-6b, A-7-6), ranging widely in consistency from medium-stiff to hard. Layers of loose to medium dense granular soil (A-1-b, A-2-6) were encountered in Borings B-009-0-26 and Boring B-010-0-26. Nine (9) of the borings were terminated in fill materials. Non-soil materials (i.e., asphalt, brick, cinders, etc.) were observed in the fill. Natural soils were encountered in the remaining six (6) borings at depths ranging from 6.0 to 15.5 feet and consisted of discontinuous layers of stiff to hard cohesive soil (A-4a, A-6a) or loose to medium dense granular soil (A-1-b, A-4b). *Groundwater*: During drilling, groundwater was not encountered in 9 of the 15 borings. Variable amounts of free water were noted during or after drilling in six (6) borings. See Table 5-2.
Subgrade Support Parameters *(Section 6.2.1)*	Average California Bearing Ratio (CBR) of 7%. Resilient Modulus (M_R) of 8,400 psi.
Subgrade Remediation *(Sections 6.2.2, 6.2.3 and 6.2.4)*	Six (6) of 15 borings, and 35% of the proposed subgrade, encountered unstable soil that the ODOT Subgrade Analysis spreadsheet indicated may require subgrade remediation. As the spreadsheet indicates more than 30 percent of the subgrade area requires remediation, S&ME recommends a 12-inch deep global chemical stabilization using cement. See Section 6.2.3 for additional remediation details.
Groundwater Considerations *(Sections 6.4 and 7.4)*	Significant groundwater issues are not anticipated in connection with construction of the proposed ramps, the truck parking area, or the light tower foundations. The pavement subgrade surface and light tower foundation excavations 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 bear 8 feet below proposed grade with reinforcement as detailed in ODOT SCD HL-20.21.

2.0 Introduction

This project includes the construction of a new truck parking area (Site 13) in the existing vacant rest area along the northbound (NB) direction of SR 11 approximately 0.5 miles north of SR 165 (S. Range Rd) in Mahoning County, Ohio. The new entrance/exit ramps for the truck parking facility will be paved with full-depth asphalt to the north and south of the gores with mainline SR 11, whereas full-depth non-reinforced concrete pavement will be provided in the truck parking area and drive lanes between the gores. New high mast light towers will surround the parking area and standard highway light poles will be installed along the ramps. This parking area is proposed to accommodate 52 full-size truck parking spaces.

This geotechnical exploration was performed in general accordance with the January 2026 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 the 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 Wisconsinan-age clayey glacial till.

Bedrock is anticipated to be Pennsylvanian-age shale, siltstone, sandstone, conglomerate, and coal of the Allegheny and Pottsville Groups Undivided. Bedrock topography mapping indicates bedrock is expected to be encountered near El. 1100 (approximately 60 to 75 feet below existing grade) at the northbound parking area. Bedrock was not encountered in any of the borings performed at the site.

The primary groundwater aquifer is anticipated to be within Pennsylvanian-age interbedded sedimentary 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. The stie is not within an area of the state subject to severe slope failure. Additionally, no known active or abandoned mines (surface or below ground) are located within the vicinity of the project area.

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 visited Site 13 on May 15, 2025, accompanied by representatives from 2LMN, and returned to the site on February 18, 2026, to mark proposed boring locations. 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.

- The bottom of the swale adjacent to the NB outside shoulder of SR 11 was roughly 3 to 4 feet below the SR 11 pavement.

- In the NB parking area, significant areas of asphalt and concrete pavement have been left in place following the closure of the rest areas.
- A few isolated areas of potential wetlands were noted within the wooded areas outside the NB parking 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, 1962 soil plan and profile sheets were located and these sheets included subgrade borings drilled within the limits of the NB parking area of Site 13. These borings generally encountered layers of cohesive soils (A-4a, A-6a) with occasional layers of sand/gravel (A-1-b, A-3a).

4.0 Exploration

4.1 Field Investigation

On March 12, 13, 16 and 26, 2026, a total of 15 explorations, identified as Borings B-001-0-26 through B-015-0-26, were performed at Site 13. The borings were performed to assess the soil at the proposed subgrade level of the proposed ramps and the parking area. Four (4) of these borings were also performed to obtain information for use during design of the foundations for the planned high mast light towers. Table 4-1 summarizes the borings performed for Site 13, including their purpose and termination depth. For the remainder of this report, the borings will generally be referred to without the offset or two-year designation (i.e., B-001).

Table 4-1 – Summary of Project Borings

Boring ID	Termination Depth (ft)	Purpose	Boring ID	Termination Depth (ft)	Purpose
B-001-0-26	8.5	Subgrade	B-009-0-26	7.5	Subgrade
B-002-0-26	7.5	Subgrade	B-010-0-26	8.0	Subgrade
B-003-0-26	7.5	Subgrade	B-011-0-26	8.0	Subgrade
B-004-0-26	25.0	Subgrade/Light Tower	B-012-0-26	7.0	Subgrade
B-005-0-26	25.0	Subgrade/Light Tower	B-013-0-26	7.5	Subgrade
B-006-0-26	7.5	Subgrade	B-014-0-26	7.5	Subgrade
B-007-0-26	25.0	Subgrade/Light Tower	B-015-0-26	7.5	Subgrade
B-008-0-26	25.0	Subgrade/Light Tower			

The approximate locations of the borings performed at the site are shown on the Plans of Borings included as Plates 2A through 2D in Appendix I.

The borings were performed by truck- and ATV-mounted drilling rigs using a 3¼-inch I.D. hollow-stem auger to advance the borings through the soil overburden. Disturbed but representative soil samples were obtained by lowering a 2-inch O.D. split-barrel sampler through the auger stem 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). In each boring, six (6) feet of continuous sampling was performed below the proposed subgrade, followed by 2.5-foot sampling intervals in the four (4) borings drilled near proposed light towers. SPT samples were examined immediately after recovery and representative portions were preserved in airtight jars.

In accordance with the ODOT *SGE*, the hammer systems on the drill rigs used for this exploration were calibrated in accordance with ASTM D4633 on December 30, 2024. The Mobile B-57 truck rig has a drill rod energy of 98.0% and the Mobile B-57 ATV has a drill rod energy of 91.0%. In accordance with the ODOT *SGE*, the drill rod energy for both rigs has been limited to 90%.

On March 13, 2026, the existing concrete pavement at Boring B-006 was cored prior to drilling. An additional pavement core at an offset location to Boring B-012 (see marker for X-012-1-26 on the Plan of Borings in Appendix I) was performed on March 26, 2026. The pavement cores were performed with a diamond-impregnated bit and portable coring rig. Photographs of the recovered cores were taken in the field and have been included as Plates 19 and 20 in 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 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 or quickset concrete.

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 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 Manager 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 content testing was performed on a representative specimen obtained from within 3 feet of the approximate proposed pavement subgrade level. The results of these laboratory tests are recorded numerically on the individual boring logs.

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 4 through 18 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 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. 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

Existing pavement materials were encountered at the ground surface at nine (9) boring locations and offset pavement core. The remaining six (6) borings were performed in grassy areas outside of the existing pavement and encountered rootmat. The thicknesses of these existing surficial materials are presented in Table 5-1.

Table 5-1 – Existing Pavement or Rootmat Thicknesses

Boring No.	Asphalt (in.)	Concrete (in.)	Granular Base (in.)	Rootmat (in.)
B-001-0-26	5	10¼	11[2]	-
B-002-0-26	-	-	-	14
B-003-0-26	-	-	-	9[3]
B-004-0-26	-	-	-	6[3]
B-005-0-26	-	-	-	6
B-006-0-26	-	10½	3[2]	-
B-007-0-26	-	-	-	5
B-008-0-26	11	-	4	-
B-009-0-26	11[1]	-	7	-
B-010-0-26	8½[1]	-	-	-
B-011-0-26	6	7	7	-
B-012-0-26	-	-	-	5
X-012-1-26	5	10	-	-
B-013-0-26	16	-	4	-
B-014-0-26	11	-	7[2]	-
B-015-0-26	11	-	4	-

[1] Asphalt was fragmented.
[2] Noted as probable/possible cemented slag base.
[3] Underlain by 5 to 9 inches of possible cemented slag in B-002 and B-003, respectively.

5.2 Subsurface Stratigraphy

Beneath the surficial materials summarized in Table 5-1, all of the borings encountered existing fill or possible fill materials consisting of predominantly cohesive brown and/or gray SANDY SILT (A-4a), SILT (A-4b), SILT AND CLAY

(A-6a), SILTY CLAY (A-6b), and CLAY (A-7-6), widely ranging from medium stiff to hard. Layers of loose to medium dense brown, gray and/or black GRAVEL WITH SAND (A-1-b) were encountered in Boring B-009 and GRAVEL WITH SAND, SILT AND CLAY (A-2-6) in Boring B-010. Cinders, wood, slag, asphalt fragments and quartz gravel were encountered in variable quantities within the fill. Borings B-001, B-003, B-006, and B-010 through B-015 were terminated within these fill materials.

Natural soils were encountered in six (6) borings at depths ranging from 6.0 to 15.5 feet and consisted of discontinuous layers of stiff to hard brown or gray SANDY SILT (A-4a) and SILT AND CLAY (A-6a), or loose to medium dense brown or gray GRAVEL WITH SAND (A-1-b) and SILT (A-4b).

5.3 Groundwater Observations

During drilling, groundwater was not encountered in 9 of the 15 borings. The depths at which seepage or groundwater were noted in the remaining six (6) borings (B-003, B-004, B-005, B-007, B-008 and B-009) are summarized in Table 5-2 below.

Table 5-2 – Seepage and Groundwater Observations During Drilling

Boring No.	Seepage Depth (ft)	Groundwater Depth (ft)	Water Level after Drilling (ft)
B-003-0-26	3.0	-	-
B-004-0-26	-	16.0	17.0
B-005-0-26	16.0	-	-
B-007-0-26	-	16.0	17.5
B-008-0-26	-	13.0	17.5
B-009-0-26	1.5	3.0	6.5

Please refer to the individual boring 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 120 parts per million (ppm) to 500 ppm, except at Boring B-009 where the sulfate concentration is 5,200 ppm. This elevated sulfate concentration at Boring B-009 was re-run to confirm the sulfate concentration was above 5,000 ppm after the initial test on this sample was measured to be 6,200 ppm. The results for all tests except that from Boring B-009 are below the threshold value of 5,000 ppm identified in the ODOT *GDM* as the sulfate concentration above which chemical stabilization should not be performed. The results of the sulfate tests are reported on the individual boring logs and on Plates 22 in Appendix I.

6.0 Analysis and Recommendations

6.1 General Discussion

Based on a status set of Stage 3 plans dated June 8, 2026, and provided by 2LMN, the following improvements are being proposed at Site 13, MAH-11 Truck Parking Area:

- Construction of an approximate 208-foot wide and 575-foot-long parking area with 52 full-size truck parking spaces.
- Six (6), 45-foot-tall high mast light towers are proposed around the parking area.
- Construction of new entrance/exit ramps which overlap with portions of the original rest area ramps.
- Proposed profile information indicates the vertical profile of the parking areas and entry/exit drives will be generally within 1 foot of the existing ground surface, except from approximately Sta. 86+80 to Sta. 92+40 of the baseline (BL) of the northbound (NB) Exit Ramp, where the profile will be lowered by as much as 2.5 feet.
- At the direction of ODOT, the proposed pavement section for the ramps north and south of the gores with the mainline SR 11 will consist of full-depth asphalt pavement (10 inches of asphalt over 6 inches of aggregate base). The ramp pavement between the SR 11 gores, including the parking area, will consist of 8 inches of non-reinforced concrete pavement over 6 inches of aggregate base.

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. 14.86, updated 4/22/2026) 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 6 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 the parking area based on the anticipated subgrade soils encountered in the borings performed for this project.

$$CBR = 7\%$$

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.

$$M_R = 8{,}400 \text{ psi}$$

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 ($M_{R\text{-}GCS}$) may be considered for use during replacement pavement design:

$$M_{R\text{-}GCS} = 11{,}400 \text{ psi}$$

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 the parking area and presented in Appendix II (Plates 1 through 6) 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, six (6) borings encountered soil at or slightly below the proposed subgrade elevation which was identified as being potentially unstable (low N_{60}, low hand penetrometer value and/or high moisture content) and which may require remediation by the procedures recommended in the Subgrade Analysis.

The Subgrade Analysis spreadsheet indicates 35% of the proposed subgrade surface encountered soil identified as being potentially unstable (low N_{60}, low hand penetrometer value and/or and high moisture content) and which may require remediation by the procedures recommended in the subgrade analysis. When the percentage of the subgrade area requiring remediation exceeds 30%, the ODOT GDM indicates that global stabilization of the subgrade should be considered. Typical options for subgrade remediation include Item 204 "Excavate and Replace", either with or without geogrid, or Item 206 Chemical Stabilization.

6.2.3 Subgrade Remediation Recommendations

S&ME recommends that 12 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 ($M_{R\text{-}GCS}$) 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 and has a sulfate content less than 5,000 ppm. We also recommend that lab testing of the borrow soils be performed prior to importing the borrow to the site.

Additionally, due to the high sulfate content in the subgrade soil at Boring B-009, we recommend that the subgrade soil between Sta. 292+61.86 and Sta. 297+20.31 NB Entrance Ramp be undercut a depth of 12 inches and replaced with Item 204 Embankment prior to performing chemical (cement) stabilization. Item 204 Embankment may be used to replace the undercut soil provided it meets the requirements discussed above regarding CBR support, maximum plasticity index, and acceptable sulfate content.

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. This includes the removal of all slag or possible slag base as encountered in Borings B-001, B-002, B-003, B-006 and B-015. 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 3 plans indicates the inclination of the existing ground surface ranges from approximately 3H:1V to 10H:1V (or flatter) and that the proposed side slopes of the new fill embankments are no steeper than 4H:1V. 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 12 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, and a sulfate content less than 5,000 ppm.

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 12 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 the NB parking area, 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 near the 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 May 18, 2026, the high mast light towers proposed at the 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 ODOT *GDM* Section 1202, 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 through 3 for high mast light towers. 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 April 29, 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

Table 7-1 provides 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. Based on the results of our analyses, S&ME recommends a minimum 8-foot embedment length for all high mast light tower foundations. LPILE output from each analysis is provided in Appendix III.

Table 7-1 – Summary of Lateral Load Analysis Results

Light Tower Location & Boring ID	Limit State*	Embed-ment 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)
TP1-7 (B-004-0-26)	SER-I	8	0.0119	0.000181	0.098	0.11	---	---
	EXT-I (+)		---	---	---	---	801.9	24.1
	EXT-I (-)		---	---	---	---	801.8	24.1
TP1-8 (B-005-0-26)	SER-I	8	0.0829	0.001271	0.686	0.77	---	---
	EXT-I (+)		---	---	---	---	792.6	21.5
	EXT-I (-)		---	---	---	---	792.3	21.5
TP1-9 (B-008-0-26)	SER-I	8	0.0073	0.000127	0.069	0.076	---	---
	EXT-I (+)		---	---	---	---	809.0	25.5
	EXT-I (-)		---	---	---	---	809.0	25.5
TP2-1 (B-005-0-26)	SER-I	8	0.3459	0.005025	2.714	3.06	---	---
	EXT-I (+)		---	---	---	---	782.3	22.8
	EXT-I (-)		---	---	---	---	780.3	22.6
TP2-2 (B-005-0-26)	SER-I	8	0.6616	0.008308	4.487	5.15	---	---
	EXT-I (+)		---	---	---	---	784.0	24.7
	EXT-I (-)		---	---	---	---	780.8	24.4
TP2-3 (B-007-0-26)	SER-I	8	0.0159	0.000232	0.125	0.14	---	---
	EXT-I (+)		---	---	---	---	798.3	24.2
	EXT-I (-)		---	---	---	---	798.2	24.2

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

7.4 Foundation Plan Notes

Based on the results of our analyses and the conditions encountered in the borings, we recommend the following notes be provided in the project 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. However, granular soil was encountered in Borings B-004-0-26, B-005-0-26 and B-008-0-26 which may be encountered in some tower foundations. 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; however, water may be present in granular layers. 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, groundwater was encountered in light tower Borings B-004, B-005 and B-008 at elevations higher than the bottom of the anticipated light tower foundations. The groundwater was encountered within the discontinuous layers of gravel with sand (A-1-b) encountered in the lower 1 to 2 feet of the light tower foundations nearest to Borings B-004, B-005 and B-008. Accordingly, it should be anticipated that water may enter the foundation excavations through these gravelly layers or 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 predominantly cohesive soil in the walls and at the bottom of the light tower excavations will become soft and weaken when 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 we can modify our recommendations based on this additional information if necessary.

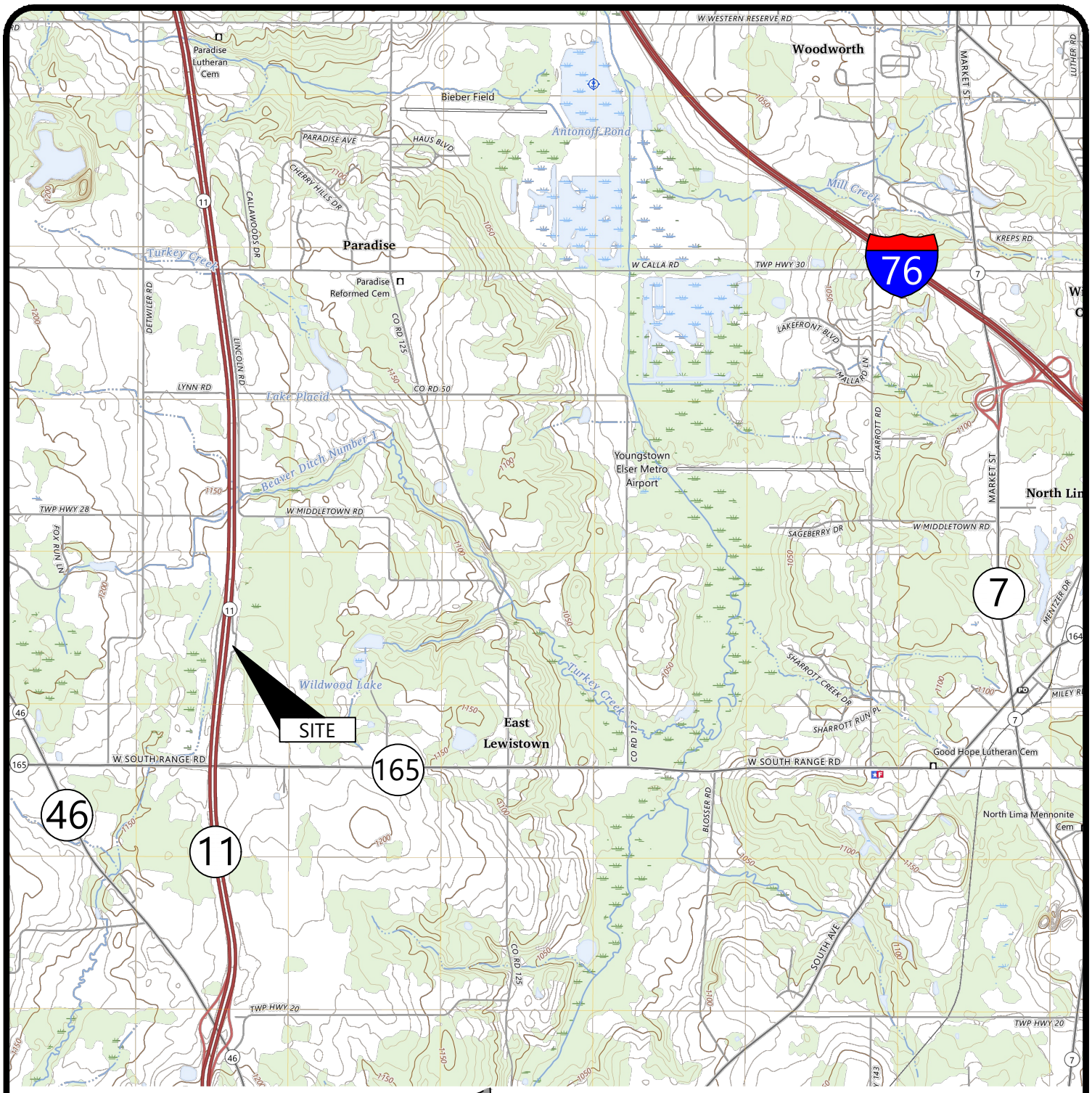
Our conclusions and recommendations are based on limited data from a field exploration program. Subsurface conditions can vary widely between explored areas. Some variations may not become evident until construction. If conditions are encountered which appear different than those described in our report, 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



Vicinity Map

Roadway & Structure Foundation Exploration
TP 26 NE Ohio Site 13 - MAH-11 Vacant Rest Area
Mahoning County, Ohio

SCALE:	FIGURE NO.
GRAPHIC	1
DATE:	
06-10-2026	
PROJECT NUMBER	
24170232E	

Drawing Path: T:\Columbus-1170\Projects\2024\24170232_ms_TP 26 NE Ohio\GEO\CAD\DWG\Site 13 MAH-11 VMAP & POB.dwg

PLAN OF BORINGS
S.R. 11 - STA. 171+00 TO STA. 183+50

HORIZONTAL SCALE IN FEET
0 25 50 100

LEGEND

B-001-0-26
Soil Boring Location

X-001-1-26
Pavement Core Location

0.5 MILES

MATCH LINE (SEE BELOW)

TRUCK PARKING 1 MILE
D4-H4-108
S1

TRUCK PARKING NEXT RIGHT
D4-H5a-132
S2

TRUCK PARKING
D4-H5-144
STA. 63+26
S3

N

MATCH LINE STA. 171+00 (SEE ABOVE)

171 172 173 174 175 176 177 178 179 180 181 182 183

MATCH LINE STA. 183+50

B-001-0-26
B-002-0-26
B-003-0-26

+05 +50 +40 +51 +00 +50

12' 16'

73 75 76 77 79 80 81 82 83

WE WD CH CH YE

LEGEND

YE	ITEM 807 - EDGE LINE, 6", YELLOW
WE	ITEM 807 - EDGE LINE, 6", WHITE
CH	ITEM 807 - CHANNELIZING LINE, 12"
WD	ITEM 807 - DOTTED LINE, 6", WHITE
LA	ITEM 646 - LANE ARROW
PLS	ITEM 646 - PARKING LOT STALL MARKING

PROPOSED SIGN
EXISTING SIGN TO REMAIN
EXISTING SIGN TO BE REMOVED

DESIGN AGENCY

DESIGNER JJR
REVIEWER AMT 04/21/26
PROJECT ID 122881
SHEET P.84 TOTAL P.92

PLATE 2A

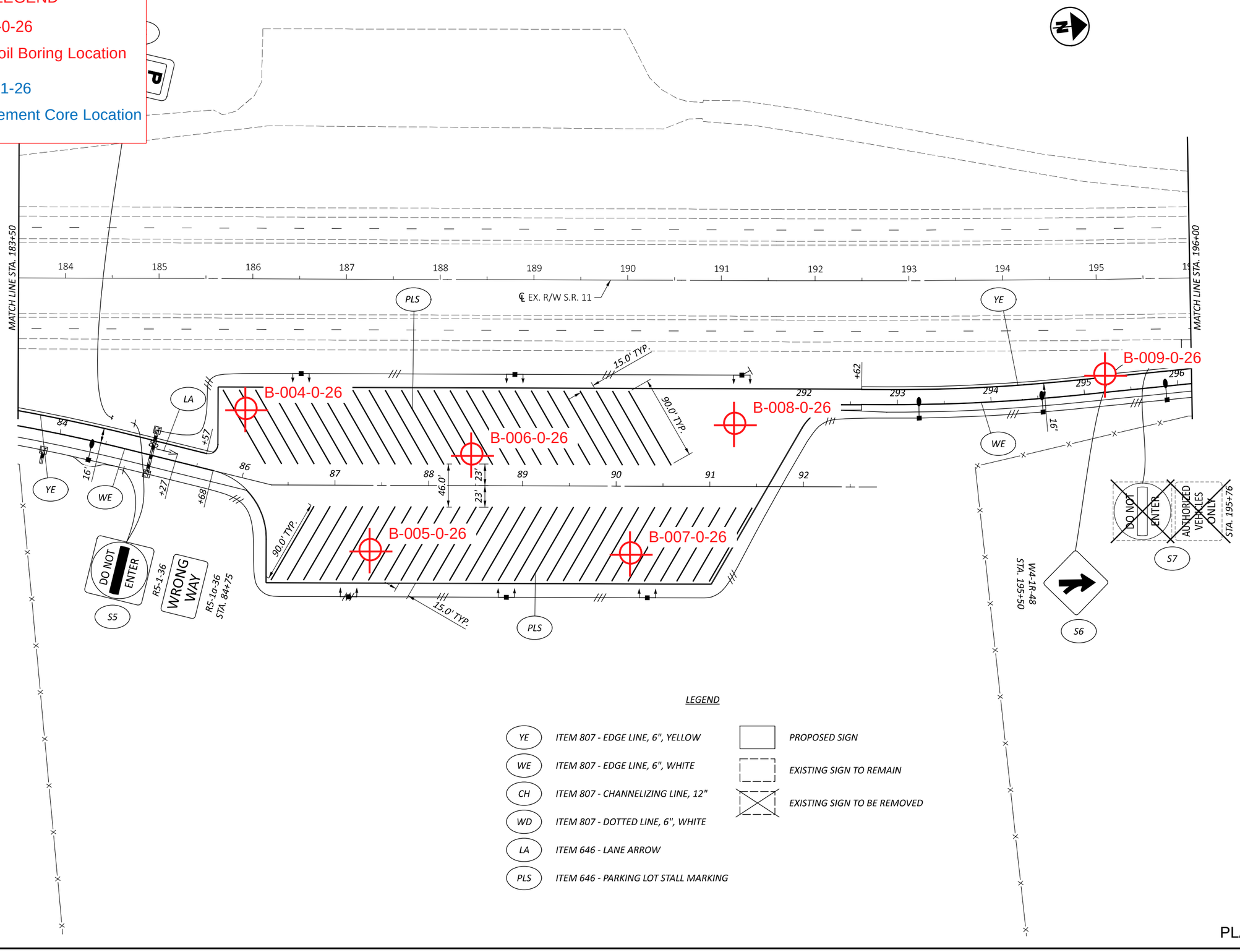
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LEGEND

B-001-0-26
Soil Boring Location

X-001-1-26
Pavement Core Location



LEGEND

YE	*ITEM 807 - EDGE LINE, 6", YELLOW*
WE	*ITEM 807 - EDGE LINE, 6", WHITE*
CH	*ITEM 807 - CHANNELIZING LINE, 12"*
WD	*ITEM 807 - DOTTED LINE, 6", WHITE*
LA	*ITEM 646 - LANE ARROW*
PLS	*ITEM 646 - PARKING LOT STALL MARKING*

PROPOSED SIGN
EXISTING SIGN TO REMAIN
EXISTING SIGN TO BE REMOVED

HORIZONTAL SCALE IN FEET
0 25 50 100

PLAN OF BORINGS
S.R. 11 - STA. 183+50 TO STA. 196+00

DESIGN AGENCY

DESIGNER JJR
REVIEWER AMT 04/21/26
PROJECT ID 122881
SHEET P.85 TOTAL P.92

PLATE 2B

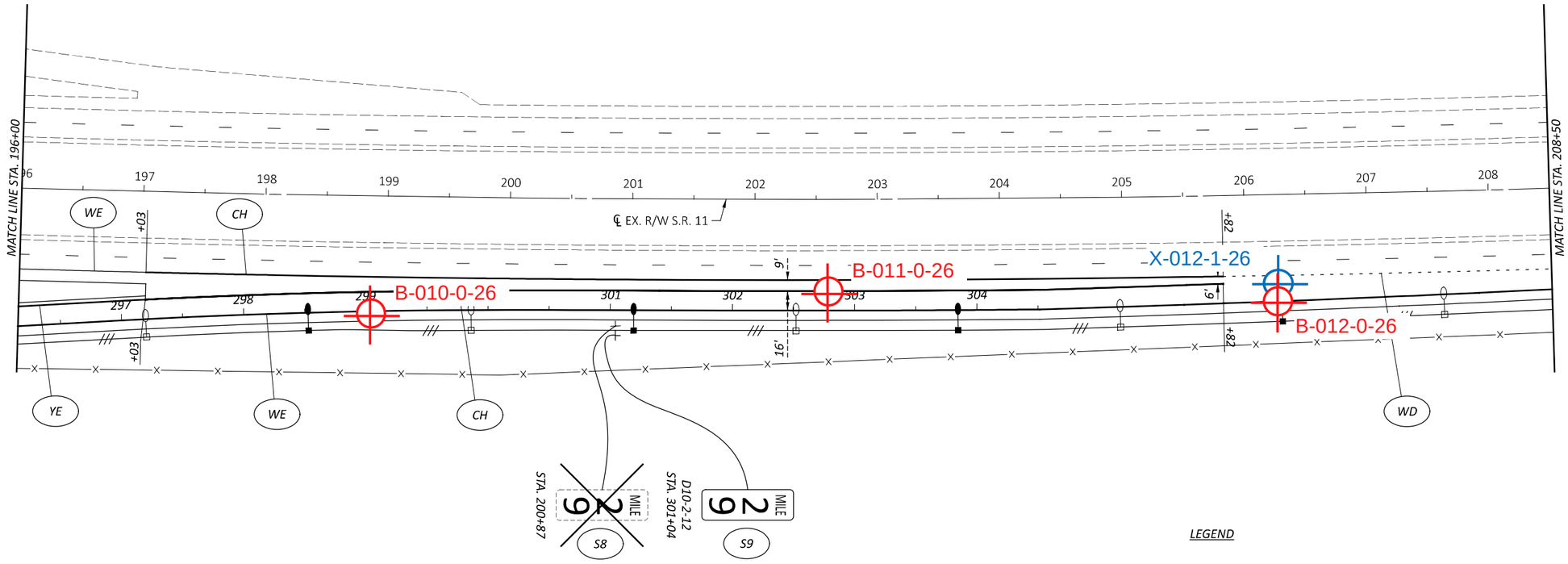
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LEGEND

B-001-0-26
Soil Boring Location

X-001-1-26
Pavement Core Location



LEGEND

YE	*ITEM 807 - EDGE LINE, 6", YELLOW*
WE	*ITEM 807 - EDGE LINE, 6", WHITE*
CH	*ITEM 807 - CHANNELIZING LINE, 12"*
WD	*ITEM 807 - DOTTED LINE, 6", WHITE*
LA	*ITEM 646 - LANE ARROW*
PLS	*ITEM 646 - PARKING LOT STALL MARKING*

PROPOSED SIGN

EXISTING SIGN TO REMAIN

EXISTING SIGN TO BE REMOVED

HORIZONTAL SCALE IN FEET
0 25 50 100

PLAN OF BORINGS
S.R. 11 - STA. 196+00 TO STA. 208+50

MAH-SR11-VACANT REST AREAS TP

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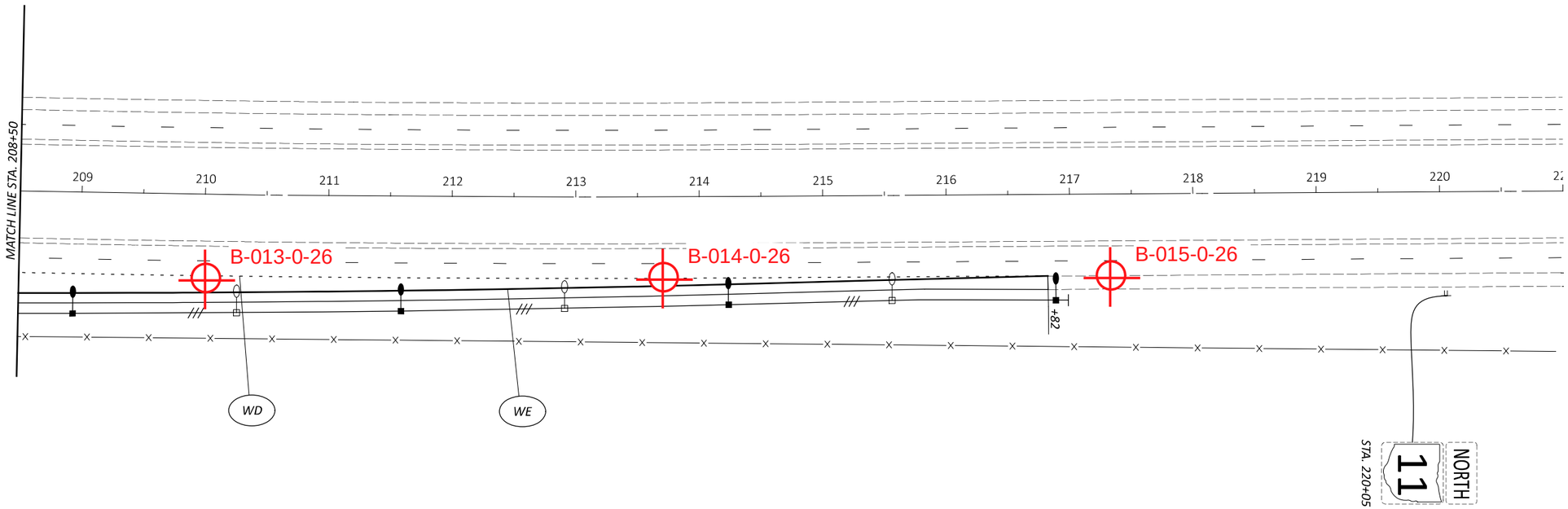
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REVIEWER AMT 04/21/26
PROJECT ID 122881
SHEET P.86 TOTAL P.92

PLATE 2C

LEGEND

B-001-0-26
Soil Boring Location

X-001-1-26
Pavement Core Location



LEGEND

YE	*ITEM 807 - EDGE LINE, 6", YELLOW*
WE	*ITEM 807 - EDGE LINE, 6", WHITE*
CH	*ITEM 807 - CHANNELIZING LINE, 12"*
WD	*ITEM 807 - DOTTED LINE, 6", WHITE*
LA	*ITEM 646 - LANE ARROW*
PLS	*ITEM 646 - PARKING LOT STALL MARKING*

PROPOSED SIGN

EXISTING SIGN TO REMAIN

EXISTING SIGN TO BE REMOVED

HORIZONTAL SCALE IN FEET
0 25 50 100

PLAN OF BORINGS
S.R. 11 - STA. 208+50 TO STA. 221+00

MAH-SR11-VACANT REST AREAS TP

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DESIGN AGENCY

DESIGNER JJR

REVIEWER AMT 04/21/26

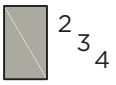
PROJECT ID 122881

SHEET P.87 TOTAL P.92

PLATE 2D

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: $N_{60} = N * [$ 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)
- **GRAVEL WITH SAND** (A-1-B)
- **FINE SAND** (A-3)
- **COARSE AND FINE SAND** (A-3a)
- **GRAVEL WITH SAND AND SILT** (A-2-4 OR A-2-5)
- **GRAVEL WITH SAND, SILT AND CLAY** (A-2-6 OR A-2-7)
- **SANDY SILT** (A-4a)
- **SILT** (A-4b)
- **ELASTIC SILT AND CLAY** (A-5)
- **SILT AND CLAY** (A-6a)
- **SILTY CLAY** (A-6b)
- **ELASTIC CLAY** (A-7-5)
- **CLAY** (A-7-6)
- **ORGANIC SILT** (A-8a)
- **ORGANIC CLAY** (A-8b)
- **PEAT**
- **UNCONTROLLED FILL**
- **BOULDERY ZONE**
- **SOD/ROOTMAT/ TOPSOIL**
- **PAVEMENT OR BASE**
- **CONCRETE**

SOIL LOG SYMBOLS

SS - Split-Spoon Sample

ST - Shelby Tube Sample

TR - Top of Rock

REC - Sample Recovery, %

HP - Hand Penetrometer Value, tsf

LOI - Loss on Ignition Test, %

Qu - Unconfined Compressive Strength

γd - Dry Unit Weight, pcf

γm - Moist Unit Weight, pcf

GR - Gravel Content, %

CS - Coarse Sand Content, %

FS - Fine Sand Content, %

SI - Silt Content, %

CL - Clay Content, %

LL - Liquid Limit

PL - Plastic Limit

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)

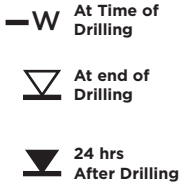
	Percentage
Trace	0% - 10%
Little	>10% - 20%
Some	>20% - 35%
"And"	≥ 35%

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



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)

S&ME JOB: 24170232E

PROJECT: MAH-11 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / C. SVITAK	DRILL RIG: OTB MOBILE B-57	STATION / OFFSET: 174+11, 67' RT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / M. ANSARI	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: CL EX. R/W SR 11
PID: 122881 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1165.5 (MSL) EOB: 8.5 ft.
START: 3/13/26 END: 3/13/26	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	COORD: 40.947609 N, 80.720201 W

EXPLORATION ID **B-001-0-26**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1165.5	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 5 INCHES	1165.1																		
CONCRETE - 10-1/4 INCHES	1164.2																		
POSSIBLE CEMENTED SLAG BASE - 11 INCHES	1163.3																		
Fill: Hard dark brown **SANDY SILT**, some clay, little fine to coarse gravel, few iron oxide stains, moist.	1161.5		4 9 10	29	100	SS-1	4.5+	16	10	20	32	22	23	14	9	8	A-4a (4)	420	
Fill: Hard dark brown **SILT AND CLAY**, some fine to coarse sand, little fine to coarse gravel, few iron oxide stains, damp.	1158.5		10 11 9	30	100	SS-2	4.5+	15	8	20	35	22	26	14	12	10	A-6a (5)	-	
			5 7 6	20	78	SS-3	4.5+	-	-	-	-	-	-	-	-	11	A-6a (V)	-	
Fill: Very stiff brown and gray **SILT AND CLAY**, some fine to coarse sand, trace to little fine gravel, few iron oxide stains and cinders, moist.	1157.0	EOB	3 4 5	14	100	SS-4	3.0-3.2	-	-	-	-	-	-	-	-	12	A-6a (V)	-	

NOTES:
- No water encountered during drilling.

NOTES: SEE ABOVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: ASPHALT PATCH; SOIL CUTTINGS MIXED WITH BENTONITE

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT.GDT - 6/9/26 14:08 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINT\WPROJECTS\24170232E-MAH-11 TP-FINAL.GPJ

PLATE 4

S&ME JOB: 24170232E

PROJECT: MAH-11 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / D. HEPNER	DRILL RIG: OTB ATV B-57	STATION / OFFSET: 178+11, 81' RT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: CL EX. R/W SR 11
PID: 122881 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1167.1 (MSL) EOB: 7.5 ft.
START: 3/26/26 END: 3/26/26	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	COORD: 40.948695 N, 80.719999 W

EXPLORATION ID **B-002-0-26**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1167.1	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ROOTMAT - 14 INCHES	1166.5																		
POSSIBLE CEMENTED SLAG BASE - 5 INCHES	1165.8																		
Fill: Very stiff brown **SILT AND CLAY**, little fine to coarse sand, trace fine gravel, damp.	1164.1	1 2 3	5 8 9	26	61	SS-1	3.5	26	15	18	26	15	29	18	11	14	A-6a (1)	460	
Fill: Hard brown **SANDY SILT**, some clay, trace fine gravel, few cinders, damp.	1161.1	4 5	7 6 5	17	100	SS-2	4.5+	6	10	24	39	21	23	14	9	10	A-4a (5)	-	
			4 6 12	27	100	SS-3	4.5+	-	-	-	-	-	-	-	-	11	A-4a (V)	-	
Hard brown **SANDY SILT**, little clay, trace fine gravel, damp.	1159.6	6 7 EOB	6 21 18	59	100	SS-4	4.5+	-	-	-	-	-	-	-	-	4	A-4a (V)	-	

NOTES:
- No water encountered during drilling.

NOTES: SEE ABOVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SOIL CUTTINGS MIXED WITH BENTONITE

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT.GDT - 6/9/26 14:08 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTWPROJECTS\24170232E-MAH-11 TP-FINAL.GPJ

PLATE 5

S&ME JOB: 24170232E

PROJECT: MAH-11 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / D. HEPNER	DRILL RIG: OTB ATV B-57	STATION / OFFSET: 182+15, 121' RT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: CL EX. R/W SR 11
PID: 122881 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1167.4 (MSL) EOB: 7.5 ft.
START: 3/26/26 END: 3/26/26	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	COORD: 40.949788 N, 80.719699 W

EXPLORATION ID **B-003-0-26**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1167.4	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ROOTMAT - 9 INCHES	1166.6																		
POSSIBLE CEMENTED SLAG BASE - 9 INCHES	1165.9																		
Fill: Hard brown **SILT AND CLAY**, some fine to coarse sand, trace fine gravel, damp.	1164.4	W 1164.4	8 6 9	23	100	SS-1	4.5+	8	12	23	36	21	26	15	11	12	A-6a (5)	500	
Possible Fill: Very stiff to hard brown **SANDY SILT**, little clay, trace to some fine to coarse gravel, few iron oxide stains and silt seams, moist.			9 8 8	24	100	SS-2	-	25	12	19	28	16	26	16	10	12	A-4a (2)	-	
			5 8 11	29	100	SS-3	4.5+	-	-	-	-	-	-	-	-	13	A-4a (V)	-	
	1159.9	EOB	4 5 5	15	100	SS-4	2.8-4.2	9	12	31	31	17	24	15	9	12	A-4a (3)	-	

NOTES:
- Encountered seepage at 3.0' during drilling.
- Boring dry and completion.

NOTES: SEE ABOVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SOIL CUTTINGS MIXED WITH BENTONITE

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT.GDT - 6/9/26 14:08 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTWPROJECTS\24170232E-MAH-11 TP-FINAL.GPJ

PLATE 6

S&ME JOB: 24170232E

PROJECT: MAH-11 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / C. SVITAK	DRILL RIG: OTB MOBILE B-57	STATION / OFFSET: 185+94, 142' RT
TYPE: SUBGRADE/LIGHT TOWER	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: CL EX. R/W SR 11
PID: 122881 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1168.6 (MSL) EOB: 25.0 ft.
START: 3/16/26 END: 3/16/26	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	COORD: 40.950814 N, 80.719479 W

EXPLORATION ID **B-004-0-26**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1168.6	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ROOTMAT - 6 INCHES	1168.1																		
Fill: Very stiff to hard brown and brown with gray **SILT AND CLAY**, little to some fine to coarse sand, trace fine gravel, few roots, damp.	1163.1		1 5 5	15	100	SS-1	3.0	-	-	-	-	-	-	-	-	14	A-6a (V)	-	
			2 4 3	11	100	SS-2	3.0	4	7	18	45	26	29	16	13	17	A-6a (8)	160	
			3 5 5	15	100	SS-3	4.5+	2	5	14	49	30	31	20	11	17	A-6a (8)	-	
Fill: Very stiff to hard brown and gray **CLAY**, "and" silt, little fine to coarse sand, trace fine gravel, few iron oxide stains, damp.	1158.1		2 4 5	14	100	SS-4	4.5+	-	-	-	-	-	-	-	-	22	A-7-6 (V)	-	
			2 2 8	15	100	SS-5	3.0	1	3	9	50	37	45	19	26	24	A-7-6 (15)	-	
Fill: Very stiff brown **SANDY SILT**, little fine to coarse gravel, little clay, few cinders and iron oxide stains, damp.	1153.1		4 6 8	21	100	SS-6	4.0	-	-	-	-	-	-	-	-	14	A-4a (V)	-	
			2 4 10	21	100	SS-7	3.2-3.5	16	10	28	34	12	21	16	5	17	A-4a (2)	-	
Loose to medium dense gray **GRAVEL WITH SAND**, trace silt, trace clay, wet.	1145.6	W 1152.6 ▼ 1151.6	1 1 2	5	72	SS-8	-	-	-	-	-	-	-	-	-	20	A-1-b (V)	-	
			4 5 3	12	61	SS-9	-	41	24	26	7	2	NP	NP	NP	18	A-1-b (0)	-	
			5 5 4	14	100	SS-10	-	-	-	-	-	-	-	-	-	24	A-1-b (V)	-	
Very stiff gray **SILT AND CLAY**, some fine to coarse sand, trace fine gravel, moist.	1143.6	EOB	3 4 5	14	100	SS-11	3.5	-	-	-	-	-	-	-	-	14	A-6a (V)	-	

NOTES:
- Encountered water at 16.0' during drilling.
- Water measured at 17.0' inside augers at completion.

NOTES: SEE ABOVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SOIL CUTTINGS MIXED WITH BENTONITE

PLATE 7

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT.GDT - 6/9/26 14:08 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINT\WPROJECTS\24170232E-MAH-11 TP-FINAL.GPJ

S&ME JOB: 24170232E

PROJECT: MAH-11 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / C. SVITAK	DRILL RIG: OTB MOBILE B-57	STATION / OFFSET: 187+25, 290' RT
TYPE: SUBGRADE/LIGHT TOWER	SAMPLING FIRM / LOGGER: S&ME / M. ANSARI	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: CL EX. R/W SR 11
PID: 122881 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1173.6 (MSL) EOB: 25.0 ft.
START: 3/12/26 END: 3/12/26	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	COORD: 40.951131 N, 80.718896 W

EXPLORATION ID **B-005-0-26**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1173.6	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ROOTMAT - 6 INCHES	1173.1																		
Fill: Medium stiff to stiff dark brown, brown and gray **SILT AND CLAY**, some fine to coarse sand, trace fine gravel, slight organic odor, few wood fragments, moist.	1169.6		4 4 2	9	100	SS-1	0.7-1.7	-	-	-	-	-	-	-	-	18	A-6a (V)	-	
			1 2 3	8	100	SS-2	1.0-1.2	-	-	-	-	-	-	-	-	19	A-6a (V)	-	
Fill: Very stiff brown and gray **SILT AND CLAY**, some fine to coarse sand, trace fine gravel, moist.	1168.1		3 5 8	20	100	SS-3	2.0-3.7	8	6	15	43	28	31	17	14	16	A-6a (9)	120	
Fill: Medium stiff to stiff brown and gray **SANDY SILT**, little clay, trace fine gravel, few very stiff zones, few cinders, moist.	1163.1		3 4 4	12	100	SS-4	0.7-1.5	9	11	22	38	20	24	15	9	14	A-4a (5)	-	
			3 3 5	12	100	SS-5	1.0-2.7	-	-	-	-	-	-	-	-	16	A-4a (V)	-	
Fill: Very stiff to hard brown **SILT**, some fine to coarse sand, little clay, trace fine gravel, few slag fragments, moist.	1160.6		5 7 8	23	100	SS-6	3.7-4.5+	3	6	19	53	19	22	15	7	15	A-4b (7)	-	
Stiff gray **SANDY SILT**, little clay, trace fine gravel, damp.	1158.1		3 4 4	12	72	SS-7	1.2-1.7	-	-	-	-	-	-	-	-	13	A-4a (V)	-	
Medium dense gray **GRAVEL WITH SAND**, trace silt, trace clay, wet.	1155.6	W 1157.6	4 3 4	11	78	SS-8	-	34	27	27	9	3	NP	NP	NP	15	A-1-b (0)	-	
Stiff to very stiff gray **SANDY SILT**, some fine to coarse sand, little fine to coarse gravel, damp to moist.			3 3 4	11	100	SS-9	1.5-1.7	-	-	-	-	-	-	-	-	12	A-4a (V)	-	
			3 6 5	17	100	SS-10	1.7-2.5	11	9	19	35	26	23	14	9	14	A-4a (5)	-	
	1148.6	EOB	4 6 6	18	100	SS-11	1.5-2.2	-	-	-	-	-	-	-	-	13	A-4a (V)	-	

NOTES:
- Encountered slight seepage at 16.0'.
- Dry inside augers at the completion of drilling.
- Boring dry after augers pulled.

NOTES: SEE ABOVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SOIL CUTTINGS MIXED WITH BENTONITE

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT.GDT - 6/9/26 14:08 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINT\WPROJECTS\24170232E-MAH-11 TP-FINAL.GPJ

PLATE 8

S&ME JOB: 24170232E

PROJECT: MAH-11 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / C. SVITAK	DRILL RIG: OTB MOBILE B-57	STATION / OFFSET: 188+32, 187' RT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / M. ANSARI	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: CL EX. R/W SR 11
PID: 122881 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1170.6 (MSL) EOB: 7.5 ft.
START: 3/13/26 END: 3/13/26	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	COORD: 40.951451 N, 80.719225 W

EXPLORATION ID **B-006-0-26**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1170.6	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
CONCRETE - 10-1/2 INCHES	1169.7																		
CEMENTED SLAG BASE - 3 INCHES	1169.5																		
Fill: Medium stiff to stiff brown **SANDY SILT**, some clay, trace fine gravel, few cinders, moist.	1167.6	1	3 2 4	9	100	SS-1	0.5-1.7	-	-	-	-	-	-	-	-	15	A-4a (V)	-	
Fill: Very stiff brown **SANDY SILT**, some clay, trace fine to coarse gravel, few cobbles in SS-3, few iron oxide stains, moist.	1164.6	2	2 4 4	12	100	SS-2	3.0-3.7	4	5	12	46	33	23	15	8	17	A-4a (8)	200	
		3	13 6 9	23	22	SS-3	2.0-2.3	-	-	-	-	-	-	-	-	17	A-4a (V)	-	
Possible Fill: Very stiff brown **SANDY SILT**, little clay, little fine to coarse gravel, 2" thick sand seam, few iron oxide stains, moist.	1163.1	4	4 4 6	15	100	SS-4	3.5-3.7	16	11	23	33	17	19	13	6	13	A-4a (3)	-	
		EOB 5 6 7																	

NOTES:
- No water encountered during drilling.

NOTES: SEE ABOVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: CONCRETE PATCH; SOIL CUTTINGS MIXED WITH BENTONITE

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT.GDT - 6/9/26 14:08 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTWPROJECTS\24170232E-MAH-11 TP-FINAL.GPJ

PLATE 9

S&ME JOB: 24170232E

PROJECT: MAH-11 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / C. SVITAK	DRILL RIG: OTB MOBILE B-57	STATION / OFFSET: 190+01, 293' RT
TYPE: SUBGRADE/LIGHT TOWER	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: CL EX. R/W SR 11
PID: 122881 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1174.1 (MSL) EOB: 25.0 ft.
START: 3/16/26 END: 3/16/26	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	COORD: 40.951883 N, 80.718777 W

EXPLORATION ID **B-007-0-26**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1174.1	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ROOTMAT - 5 INCHES	1173.7																		
Fill: Very stiff brown **SILT AND CLAY**, some fine to coarse sand, trace fine gravel, few roots and iron oxide stains, damp.			2 3 3	9	100	SS-1	3.0	-	-	-	-	-	-	-	-	18	A-6a (V)	-	
	1170.1		3 6 6	18	100	SS-2	3.5	7	7	17	45	24	29	17	12	16	A-6a (8)	180	
Fill: Very stiff brown **SANDY SILT**, little to some clay, little fine to coarse gravel, few cinders, fine to coarse gravel-size quartz fragments in SS-6, damp.			3 5 8	20	100	SS-3	4.0	12	7	19	40	22	24	15	9	13	A-4a (5)	-	
			3 4 6	15	100	SS-4	3.5	-	-	-	-	-	-	-	-	16	A-4a (V)	-	
			2 5 6	17	100	SS-5	2.5	12	10	23	37	18	22	15	7	14	A-4a (4)	-	
	1161.1		3 7 7	21	100	SS-6	4.5+	-	-	-	-	-	-	-	-	13	A-4a (V)	-	
Hard gray **SANDY SILT**, some clay, trace fine gravel, damp to moist.			4 5 14	29	89	SS-7	4.5+	-	-	-	-	-	-	-	-	14	A-4a (V)	-	
		W 1158.1																	
		▼ 1156.6	3 3 7	15	72	SS-8	4.5+	-	-	-	-	-	-	-	-	14	A-4a (V)	-	
			3 3 5	12	100	SS-9	4.5+	9	8	20	39	24	24	14	10	13	A-4a (6)	-	
			3 3 29	48	100	SS-10	4.5+	-	-	-	-	-	-	-	-	13	A-4a (V)	-	
	1149.1	EOB	11 13 11	36	33	SS-11	4.5+	-	-	-	-	-	-	-	-	15	A-4a (V)	-	

NOTES:
- Encountered water at 16.0' during drilling.
- Water measured at 17.5' inside augers at completion.

NOTES: SEE ABOVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SOIL CUTTINGS MIXED WITH BENTONITE

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT.GDT - 6/9/26 14:08 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINT\WPROJECTS\24170232E-MAH-11 TP-FINAL.GPJ

PLATE 10

S&ME JOB: 24170232E

PROJECT: MAH-11 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / C. SVITAK	DRILL RIG: OTB MOBILE B-57	STATION / OFFSET: 191+14, 154' RT
TYPE: SUBGRADE/LIGHT TOWER	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: CL EX. R/W SR 11
PID: 122881 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1171.5 (MSL) EOB: 25.0 ft.
START: 3/16/26 END: 3/16/26	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	COORD: 40.952231 N, 80.719234 W

EXPLORATION ID **B-008-0-26**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1171.5	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 11 INCHES	1170.6																		
GRANULAR BASE - 4 INCHES	1170.2					SS-1A	-	-	-	-	-	-	-	-	-	-	A-1-a (V)	-	
Fill: Loose brown **SANDY SILT**, little clay, trace fine gravel, few slag fragments, moist.	1169.0		2 2 1	5	22	SS-1B	-	-	-	-	-	-	-	-	-	21	A-4a (V)	-	
Fill: Hard brown **SANDY SILT**, little clay, trace fine gravel, few cinders, damp.			4 3 3	9	78	SS-2	4.5+	10	8	22	42	18	22	15	7	14	A-4a (5)	220	
			3 3 3	9	100	SS-3	4.0	-	-	-	-	-	-	-	-	12	A-4a (V)	-	
	1164.0		2 3 4	11	100	SS-4	2.5	7	12	25	39	17	21	14	7	13	A-4a (4)	-	
Fill: Hard brown becoming gray **SANDY SILT**, some clay, trace fine gravel, few iron oxide stains and silt seams, damp.			3 5 6	17	100	SS-5	4.5+	8	9	19	42	22	24	16	8	12	A-4a (6)	-	
	1158.5	W 1158.5	3 7 5	18	100	SS-6	4.5+	-	-	-	-	-	-	-	-	11	A-4a (V)	-	
Medium dense brown **GRAVEL WITH SAND**, little silt, trace fine gravel, trace clay, wet.	1156.0		2 3 5	12	100	SS-7	-	44	22	20	10	4	NP	NP	NP	15	A-1-b (0)	-	
Medium dense gray **SILT**, some fine sand, trace clay, wet.	1153.5	▼ 1154.0	4 5 5	15	89	SS-8	-	1	1	21	67	10	NP	NP	NP	23	A-4b (8)	-	
Very stiff to hard gray **SANDY SILT**, some clay, trace fine gravel, damp to moist.			2 3 5	12	100	SS-9	4.5+	-	-	-	-	-	-	-	-	16	A-4a (V)	-	
			2 3 3	9	100	SS-10	3.0	10	11	23	35	21	21	14	7	13	A-4a (4)	-	
	1146.5	EOB	4 5 5	15	100	SS-11	4.5+	-	-	-	-	-	-	-	-	14	A-4a (V)	-	

NOTES:
- Encountered water at 13.0' during drilling.
- Water measured at 17.5' inside augers at completion.

NOTES: SEE ABOVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: ASPHALT PATCH; SOIL CUTTINGS MIXED WITH BENTONITE

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT.GDT - 6/9/26 14:08 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTWPROJECTS\24170232E-MAH-11 TP-FINAL.GPJ

PLATE 11

S&ME JOB: 24170232E

PROJECT: MAH-11 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / C. SVITAK	DRILL RIG: OTB MOBILE B-57	STATION / OFFSET: 195+07, 103' RT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / M. ANSARI	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: CL EX. R/W SR 11
PID: 122881 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1163.7 (MSL) EOB: 7.5 ft.
START: 3/13/26 END: 3/13/26	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	COORD: 40.953323 N, 80.719279 W

EXPLORATION ID **B-009-0-26**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1163.7	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 11 INCHES	1162.8																		
GRANULAR BASE - 7 INCHES	1162.2	W 1162.2																	
Fill: Medium dense gray and black **GRAVEL WITH SAND**, trace silt, trace clay, wet.		W 1160.7	10 8 5	20	100	SS-1	-	26	49	13	9	3	NP	NP	NP	21	A-1-b (0)	5200	
	1159.2		3 5 8	20	100	SS-2	-	23	55	15	5	2	NP	NP	NP	21	A-1-b (0)	-	
Fill: Loose gray **GRAVEL WITH SAND**, trace to little silt, trace clay, few brick fragments, wet.	1157.7		4 3 2	8	33	SS-3	-	-	-	-	-	-	-	-	-	13	A-1-b (V)	-	
Very stiff gray **SANDY SILT**, little to some clay, trace fine gravel, moist.	1156.2	▼ 1157.2	2 4 4	12	33	SS-4	2.7-3.0	-	-	-	-	-	-	-	-	12	A-4a (V)	-	
		EOB																	

NOTES:
- Encountered slight seepage at 1.5'.
- Encountered water at 3.0' during drilling.
- Water measured at 6.5' inside augers at completion.
- After augers pulled, water measured at 2.0' and boring caved at 3.4'.

NOTES: SEE ABOVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: ASPHALT PATCH; SOIL CUTTINGS MIXED WITH BENTONITE

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT.GDT - 6/9/26 14:08 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINT\WPROJECTS\24170232E-MAH-11 TP-FINAL.GPJ

PLATE 12

S&ME JOB: 24170232E

PROJECT: MAH-11 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / C. SVITAK	DRILL RIG: OTB MOBILE B-57	STATION / OFFSET: 198+88, 99' RT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / M. ANSARI	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: CL EX. R/W SR 11
PID: 122881 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1161.3 (MSL) EOB: 8.0 ft.
START: 3/13/26 END: 3/13/26	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	COORD: 40.954372 N, 80.719180 W

EXPLORATION ID **B-010-0-26**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1161.3	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 8-1/2 INCHES	1160.6																		
Fill: Loose to medium dense brown *(est.)* **GRAVEL WITH SAND, SILT AND CLAY**, dry to damp.	1159.5	1																	
Fill: Very stiff to hard gray **SILTY CLAY**, little fine to coarse sand, trace fine gravel, few iron oxide stains, moist.	1157.8	2	3 3 5	12	100	SS-1	3.7-4.5+	3	4	11	48	34	39	20	19	19	A-6b (12)	487	
Fill: Stiff to very stiff brown and gray **SILT AND CLAY**, some fine to coarse sand, trace to little fine gravel, few hard zones, few iron oxide stains, roots, cinders and slag fragments, moist.		3	3 3 4	11	100	SS-2	1.0-1.5	12	10	16	39	23	30	16	14	14	A-6a (7)	-	
		4	3 4 4	12	94	SS-3	3.7-4.5+	-	-	-	-	-	-	-	-	13	A-6a (V)	-	
		5	2 4 5	14	33	SS-4	3.7-4.0	-	-	-	-	-	-	-	-	12	A-6a (V)	-	
	1153.3	EOB 6 7 8																	

NOTES:
- Boring B-010-0-26 was initially attempted at STA 198+88, 88' RT of SR 11 centerline, but was abandoned after encountering auger refusal on apparent concrete beneath the asphalt.
- No water encountered during drilling.

NOTES: SEE ABOVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: ASPHALT PATCH; SOIL CUTTINGS MIXED WITH BENTONITE

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT.GDT - 6/9/26 14:08 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINT\WPROJECTS\24170232E-MAH-11 TP-FINAL.GPJ

S&ME JOB: 24170232E

PROJECT: MAH-11 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / C. SVITAK	DRILL RIG: OTB MOBILE B-57	STATION / OFFSET: 202+59, 77' RT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / M. ANSARI	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: CL EX. R/W SR 11
PID: 122881 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1159.9 (MSL) EOB: 8.0 ft.
START: 3/13/26 END: 3/13/26	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	COORD: 40.955396 N, 80.719175 W

EXPLORATION ID **B-011-0-26**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1159.9	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 6 INCHES	1159.4																		
CONCRETE - 7 INCHES	1158.8																		
GRANULAR BASE - 7 INCHES	1158.2																		
Fill: Very stiff dark brown **SANDY SILT**, little clay, trace fine gravel, damp.	1156.4		2 9 10	29	56	SS-1	2.5-2.7	9	14	24	36	17	20	14	6	11	A-4a (4)	300	
Fill: Stiff brown and gray **SILTY CLAY**, little fine to coarse sand, trace fine gravel, slightly organic, few very stiff zones and cinders, many iron oxide stains below 5.0', moist. - SS-2; LOI = 3.2%			3 5 3	12	67	SS-2	1.5-1.7	2	5	15	46	32	35	17	18	19	A-6b (11)	-	
			2 3 3	9	100	SS-3	1.0-1.2	-	-	-	-	-	-	-	-	27	A-6b (V)	-	
	1151.9	EOB	2 3 4	11	100	SS-4	1.0-3.2	-	-	-	-	-	-	-	-	21	A-6b (V)	-	

NOTES:
- No water encountered during drilling.

NOTES: SEE ABOVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: ASPHALT PATCH; SOIL CUTTINGS MIXED WITH BENTONITE

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT.GDT - 6/9/26 14:08 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINT\WPROJECTS\24170232E-MAH-11 TP-FINAL.GPJ

PLATE 14

S&ME JOB: 24170232E

PROJECT: MAH-11 TRUCK PARKING
TYPE: SUBGRADE
PID: 122881 BR ID: N/A
START: 3/26/26 END: 3/26/26

DRILLING FIRM / OPERATOR: OTB / D. HEPNER
SAMPLING FIRM / LOGGER: S&ME / K. HARPER
DRILLING METHOD: 3-1/4" HSA
SAMPLING METHOD: SPT

DRILL RIG: OTB ATV B-57
HAMMER: AUTOMATIC HAMMER
CALIBRATION DATE: 12/30/24
ENERGY RATIO (%): 90*

STATION / OFFSET: 206+27, 86' RT
ALIGNMENT: CL EX. R/W SR 11
ELEVATION: 1157.7 (MSL) EOB: 7.0 ft.
COORD: 40.956407 N, 80.719079 W

EXPLORATION ID
B-012-0-26

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1157.7	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ROOTMAT - 5 INCHES	1157.3																		
Fill: Very stiff brown **SANDY SILT**, some clay, trace fine gravel, few iron oxide stains, moist.	1155.2	1	2 3 4	11	100	SS-1	3.5	1	5	20	48	26	25	15	10	16	A-4a (8)	360	
Fill: Hard brown **SILT AND CLAY**, some fine to coarse sand, trace fine gravel, few cinders, damp.	1152.2	2 3 4 5	3 6 7	20	100	SS-2	4.5+	4	7	20	41	28	30	18	12	14	A-6a (8)	-	
			3 6 7	20	100	SS-3	4.5+	-	-	-	-	-	-	-	-	12	A-6a (V)	-	
Fill: Hard brown **SILTY CLAY**, little to some fine to coarse sand, trace fine gravel, few cinders, moist.	1150.7	6 EOB 7	4 5 8	20	100	SS-4	4.5+	-	-	-	-	-	-	-	-	19	A-6b (V)	-	

NOTES:
- No water encountered during drilling.

NOTES: SEE ABOVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SOIL CUTTINGS MIXED WITH BENTONITE

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT.GDT - 6/9/26 14:08 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTWPROJECTS\24170232E-MAH-11 TP-FINAL.GPJ

PLATE 15

S&ME JOB: 24170232E

PROJECT: MAH-11 TRUCK PARKING
TYPE: SUBGRADE
PID: 122881 BR ID: N/A
START: 3/26/26 END: 3/26/26

DRILLING FIRM / OPERATOR: OTB / D. HEPNER
SAMPLING FIRM / LOGGER: S&ME / K. HARPER
DRILLING METHOD: 3-1/4" HSA
SAMPLING METHOD: SPT

DRILL RIG: OTB ATV B-57
HAMMER: AUTOMATIC HAMMER
CALIBRATION DATE: 12/30/24
ENERGY RATIO (%): 90*

STATION / OFFSET: 210+01, 70' RT
ALIGNMENT: CL EX. R/W SR 11
ELEVATION: 1156.3 (MSL) EOB: 7.5 ft.
COORD: 40.957439 N, 80.719098 W

EXPLORATION ID
B-013-0-26

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1156.3	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 16 INCHES	1155.0																		
GRANULAR BASE - 4 INCHES	1154.6																		
Fill: Very stiff brown **SANDY SILT**, little clay, trace fine gravel, few asphalt fragments and cinders, damp.		1 2 3 4 5 6 7	6 3 7	15	100	SS-1	3.5	5	20	18	37	20	25	16	9	13	A-4a (4)	200	
	1151.8		2 3 4	11	100	SS-2	4.0	6	25	19	31	19	28	19	9	16	A-4a (3)	-	
Fill: Very stiff brown and gray **SANDY SILT**, little to some clay, trace fine gravel, few cinders, slight organic odor, damp to moist.			2 2 4	9	100	SS-3	3.0	-	-	-	-	-	-	-	-	17	A-4a (V)	-	
	1148.8	EOB	3 4 7	17	100	SS-4	4.0	-	-	-	-	-	-	-	-	14	A-4a (V)	-	

NOTES:
- No water encountered during drilling.

NOTES: SEE ABOVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: ASPHALT PATCH; SOIL CUTTINGS MIXED WITH BENTONITE

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT.GDT - 6/9/26 14:08 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\24170232E-MAH-11 TP-FINAL.GPJ

PLATE 16

S&ME JOB: 24170232E

PROJECT: MAH-11 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / D. HEPNER	DRILL RIG: OTB ATV B-57	STATION / OFFSET: 213+70, 69' RT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: CL EX. R/W SR 11
PID: 122881 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1154.3 (MSL) EOB: 7.5 ft.
START: 3/26/26 END: 3/26/26	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	COORD: 40.958453 N, 80.719086 W

EXPLORATION ID **B-014-0-26**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1154.3	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 11 INCHES	1153.4																		
GRANULAR BASE - 7 INCHES	1152.8																		
Fill: Very stiff to hard brown **SANDY SILT**, some clay, trace to little fine gravel, few roots and cinders, damp to moist.		1																	
		2	10 4 5	14	100	SS-1	3.5	6	8	23	41	22	26	16	10	12	A-4a (6)	400	
		3	3 4 5	14	100	SS-2	4.5+	-	-	-	-	-	-	-	-	18	A-4a (V)	-	
		4	9 7 7	21	100	SS-3	4.5+	12	12	19	35	22	26	17	9	10	A-4a (4)	-	
		5																	
		6	3 6 7	20	100	SS-4	4.5+	-	-	-	-	-	-	-	-	14	A-4a (V)	-	
	1146.8	7 EOB																	

NOTES:
- No water encountered during drilling.

NOTES: SEE ABOVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: ASPHALT PATCH; SOIL CUTTINGS MIXED WITH BENTONITE

PLATE 17

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT.GDT - 6/9/26 14:08 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINT\WPROJECTS\24170232E-MAH-11 TP-FINAL.GPJ

S&ME JOB: 24170232E

PROJECT: MAH-11 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / D. HEPNER	DRILL RIG: OTB ATV B-57	STATION / OFFSET: 217+34, 69' RT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: CL EX. R/W SR 11
PID: 122881 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1153.2 (MSL) EOB: 7.5 ft.
START: 3/26/26 END: 3/26/26	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	COORD: 40.959453 N, 80.719086 W

EXPLORATION ID **B-015-0-26**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1153.2	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 11 INCHES	1152.3																		
POSSIBLE CEMENTED SLAG BASE - 7 INCHES	1151.7																		
Fill: Medium dense brown **GRAVEL WITH SAND AND SILT**, trace clay, many slag fragments, damp.	1150.2	1	14 9 11	30	100	SS-1	-	30	18	25	19	8	25	22	3	16	A-2-4 (0)	420	
Fill: Hard brown becoming gray **SANDY SILT**, some clay, trace fine gravel, few cinders and iron oxide stains, damp.		2	5 6 7	20	100	SS-2	4.5+	4	9	23	42	22	24	16	8	10	A-4a (6)	-	
		3	3 5 5	15	100	SS-3	4.5+	-	-	-	-	-	-	-	-	12	A-4a (V)	-	
		4	4 6 7	20	100	SS-4	4.5+	-	-	-	-	-	-	-	-	14	A-4a (V)	-	
	1145.7	EOB																	

NOTES:
- No water encountered during drilling.

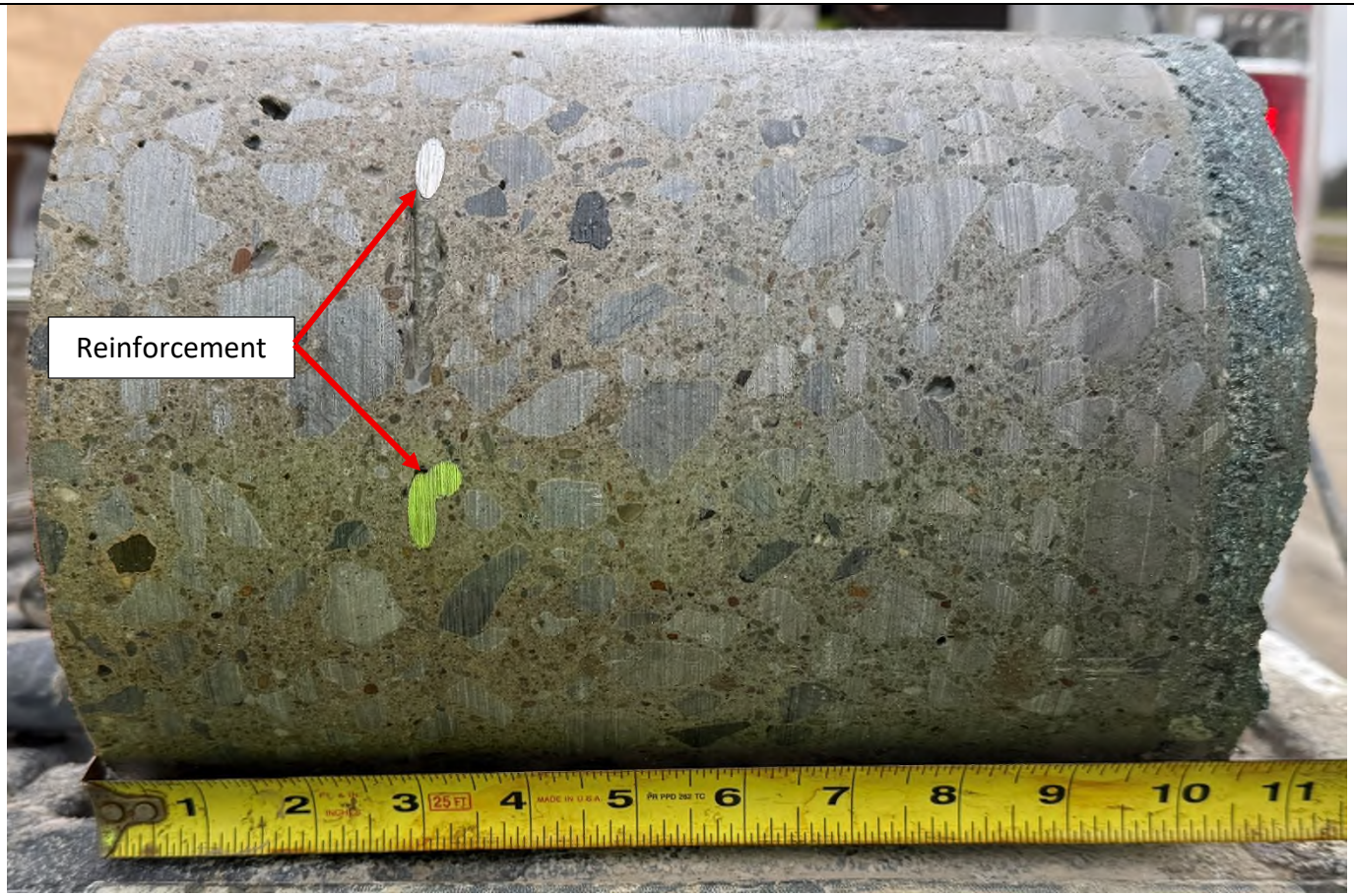
NOTES: SEE ABOVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: ASPHALT PATCH; SOIL CUTTINGS MIXED WITH BENTONITE

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT.GDT - 6/9/26 14:08 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTWPROJECTS\24170232E-MAH-11 TP-FINAL.GPJ

PLATE 18

PAVEMENT CORE B-006-0-26



Material Type	Material Thickness	Comments
Concrete	10½“	Reinforcement at 3 inches from top of core
Cemented Slag	3” total (~½“ shown)	Lower ~2½“ of cemented slag base not recovered
MAH-11 TRUCK PARKING (PID 122881)		

PAVEMENT CORE X-012-1-26



Material Type	Material Thickness	Comments
Asphalt	5”	
Concrete	10”	Reinforcement at approx. 4” to 4½“ below top of concrete
MAH-11 TRUCK PARKING (PID 122881)		

OHIO DEPARTMENT OF TRANSPORTATION

DETERMINING SULFATE CONTENT IN SOILS
SUPPLEMENT 1122

Project C-R-S:	TP 26 Site 13 MAH-11 Vacant Rest Area
PID No:	122881
Report Date:	4/28/2026
Consultant:	S&ME, Inc.
Technician:	EM/KL (Resource International)

Sample or Boring ID	Alignment	Station	Offset	Latitude & Longitude or Ohio County Coordinates		Elev. (ft)	Soaking Time (hr)	Replicate Sample Readings						Sulfate Content (ppm)
								1		2		3		
								Dilution	Reading	Dilution	Reading	Dilution	Reading	
B-001-0-26	CL EX. SR 11	174+11	67' RT	40.947609	-80.720201	1163.0	24	20	21	20	21	20	21	420
B-002-0-26	CL EX. SR 11	178+11	81' RT	40.948695	-80.719999	1165.6	24	20	23	20	23	20	23	460
B-003-0-26	CL EX. SR 11	182+15	121' RT	40.949788	-80.719699	1165.9	24	20	25	20	25	20	25	500
B-004-0-26	CL EX. SR 11	185+94	142' RT	40.950814	-80.719479	1166.1	24	20	8	20	8	20	8	160
B-005-0-26	CL EX. SR 11	187+25	290' RT	40.951131	-80.718896	1169.6	24	20	6	20	6	20	6	120
B-006-0-26	CL EX. SR 11	188+32	187' RT	40.951451	-80.719225	1167.6	24	20	10	20	10	20	10	200
B-007-0-26	CL EX. SR 11	190+01	293' RT	40.951883	-80.718777	1171.6	24	20	9	20	9	20	9	180
B-008-0-26	CL EX. SR 11	191+14	154' RT	40.952231	-80.719234	1169.0	24	20	11	20	11	20	11	220
B-009-0-26	CL EX. SR 11	195+07	103' RT	40.953323	-80.719279	1162.2	24	80	65	80	65	80	65	5200*
B-010-0-26	CL EX. SR 11	198+88	99' RT	40.954372	-80.719180	1159.3	24	20	25	20	25	20	25	487
B-011-0-26	CL EX. SR 11	202+59	77' RT	40.955396	-80.719175	1157.9	24	20	15	20	15	20	15	300
B-012-0-26	CL EX. SR 11	206+27	86' RT	40.956407	-80.719079	1156.7	24	20	18	20	18	20	18	360
B-013-0-26	CL EX. SR 11	210+01	70' RT	40.957439	-80.719098	1154.8	24	20	10	20	10	20	10	200
B-014-0-26	CL EX. SR 11	213+70	69' RT	40.958453	-80.719086	1152.8	24	20	20	20	20	20	20	400
B-015-0-26	CL EX. SR 11	217+34	69' RT	40.959453	-80.719086	1151.7	24	20	21	20	21	20	21	420

*This sample had an initial test result of 6,000 ppm. Requested retest of sample which resulted in a value of 5,200 ppm.

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.

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Appendix II – Subgrade Analyses

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.86 4/22/2026

OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF GEOTECHNICAL ENGINEERING

PLAN SUBGRADES
Geotechnical Design Manual Section 600

TP 26 MAH-11 Vacant Rest Area
122881
Truck parking area along Northbound SR 11 in Mahoning County, approximately 0.5 miles north of Range Road.

S&ME, Inc.

Prepared By: Brian K. Sears, PE
Date prepared: Wednesday, June 10, 2026

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

614-793-2226
bsears@smeinc.com

NO. OF BORINGS: 15

NO. OF DCPS: 0

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.86 4/22/2026

Add DCP Test Data Worksheets

#	Boring ID	Alignment	Station	Offset	Dir	Drill Rig	ER	Boring EL.	Proposed Subgrade EL	Cut Fill
1	B-001-0-26	CL Ex. R/W SR 11	174+11	67	RT	OTB Mobile B-57	90	1165.5	1164.2	1.3 C
2	B-002-0-26	CL Ex. R/W SR 11	178+11	81	RT	OTB ATV B-57	90	1167.1	1166.0	1.1 C
3	B-003-0-26	CL Ex. R/W SR 11	182+15	121	RT	OTB ATV B-57	90	1167.4	1167.6	0.2 F
4	B-004-0-26	CL Ex. R/W SR 11	185+94	142	RT	OTB Mobile B-57	90	1168.6	1165.7	2.9 C
5	B-005-0-26	CL Ex. R/W SR 11	187+25	290	RT	OTB Mobile B-57	90	1173.6	1169.7	3.9 C
6	B-006-0-26	CL Ex. R/W SR 11	188+32	187	RT	OTB Mobile B-57	90	1170.6	1168.1	2.4 C
7	B-007-0-26	CL Ex. R/W SR 11	190+01	293	RT	OTB Mobile B-57	90	1174.1	1171.2	3.0 C
8	B-008-0-26	CL Ex. R/W SR 11	191+14	154	RT	OTB Mobile B-57	90	1171.5	1168.6	3.0 C
9	B-009-0-26	CL Ex. R/W SR 11	195+07	103	RT	OTB Mobile B-57	90	1163.7	1161.9	1.8 C
10	B-010-0-26	CL Ex. R/W SR 11	198+88	99	RT	OTB Mobile B-57	90	1161.3	1160.1	1.2 C
11	B-011-0-26	CL Ex. R/W SR 11	202+59	77	RT	OTB Mobile B-57	90	1159.9	1158.5	1.3 C
12	B-012-0-26	CL Ex. R/W SR 11	206+27	86	RT	OTB ATV B-57	90	1157.7	1156.7	1.0 C
13	B-013-0-26	CL Ex. R/W SR 11	210+01	70	RT	OTB ATV B-57	90	1156.3	1155.2	1.0 C
14	B-014-0-26	CL Ex. R/W SR 11	213+70	69	RT	OTB ATV B-57	90	1154.3	1153.2	1.1 C
15	B-015-0-26	CL Ex. R/W SR 11	217+34	69	RT	OTB ATV B-57	90	1153.2	1151.9	1.3 C

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.86 4/22/2026

#	Boring ID	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	1	2.5	4.0	1.2	2.7	29		4.50	23	14	9	32	22	54	8	10	A-4a	4	420					
	001-0	2	4.0	5.5	2.7	4.2	30		4.50	26	14	12	35	22	57	10	14	A-6a	5						
	26	3	5.5	7.0	4.2	5.7	20		4.50							11	14	A-6a	10						
		4	7.0	8.5	5.7	7.2	14	14	3.00							12	14	A-6a							
2	B	1	1.5	3.0	0.4	1.9	26		3.50	29	18	11	26	15	41	14	14	A-6a	1	460					
	002-0	2	3.0	4.5	1.9	3.4	17		4.50	23	14	9	39	21	60	10	10	A-4a	5						
	26	3	4.5	6.0	3.4	4.9	27		4.50							11	10	A-4a	8						
		4	6.0	7.5	4.9	6.4	59	17	4.50							4	10	A-4a	8						
3	B	1	1.5	3.0	1.7	3.2	23		4.50	26	15	11	36	21	57	12	14	A-6a	5	500					
	003-0	2	3.0	4.5	3.2	4.7	24			26	16	10	28	16	44	12	11	A-4a	2						
	26	3	4.5	6.0	4.7	6.2	29		4.50							13	10	A-4a	8						
		4	6.0	7.5	6.2	7.7	15	23	2.80	24	15	9	31	17	48	12	10	A-4a							
4	B	2	2.5	4.0	-0.4	1.1	11		3.00	29	16	13	45	26	71	17	14	A-6a	8	160		N_{60} & Mc		12"	Exc. & Rep. - 12"
	004-0	3	4.0	5.5	1.1	2.6	15		4.50	31	20	11	49	30	79	17	15	A-6a	8						204 Geotextile
	26	4	5.5	7.0	2.6	4.1	14		4.50							22	18	A-7-6	16						or
		5	8.5	10.0	5.6	7.1	15	11	3.00	45	19	26	50	37	87	24	18	A-7-6							12" Cement Stab.
5	B	3	4.0	5.5	0.1	1.6	20		2.00	31	17	14	43	28	71	16	14	A-6a	9	120					
	005-0	4	5.5	7.0	1.6	3.1	12		0.70	24	15	9	38	20	58	14	10	A-4a	5			HP & Mc			
	26	5	8.5	10.0	4.6	6.1	12		1.00							16	10	A-4a	8						
		6	11.0	12.5	7.1	8.6	23	12	3.70	22	15	7	53	19	72	15	10	A-4b							
6	B	1	1.5	3.0	-0.9	0.6	9		0.50							15	10	A-4a	8			HP & Mc		24"	Exc. & Rep. - 12"
	006-0	2	3.0	4.5	0.6	2.1	12		3.00	23	15	8	46	33	79	17	10	A-4a	8	200		N_{60} & Mc		12"	204 Geotextile
	26	3	4.5	6.0	2.1	3.6	23		2.00							17	10	A-4a	8						or
		4	6.0	7.5	3.6	5.1	15	9	3.50	19	13	6	33	17	50	13	10	A-4a	3						14" Cement Stab.
7	B	2	2.5	4.0	-0.5	1.0	18		3.50	29	17	12	45	24	69	16	14	A-6a	8	180					
	007-0	3	4.0	5.5	1.0	2.5	20		4.00	24	15	9	40	22	62	13	10	A-4a	5			Mc			
	26	4	5.5	7.0	2.5	4.0	15		3.50							16	10	A-4a	8						
		5	8.5	10.0	5.5	7.0	17	15	2.50	22	15	7	37	18	55	14	10	A-4a							
8	B	2	2.5	4.0	-0.5	1.0	9		4.50	22	15	7	42	18	60	14	10	A-4a	5	220		N_{60} & Mc		12"	Exc. & Rep. - 12"
	008-0	3	4.0	5.5	1.0	2.5	9		4.00							12	10	A-4a	8			N_{60}		12"	204 Geotextile
	26	4	5.5	7.0	2.5	4.0	11		2.50	21	14	7	39	17	56	13	10	A-4a	4						or
		5	8.5	10.0	5.5	7.0	17	9	4.50	24	16	8	42	22	64	12	11	A-4a							14" Cement Stab.
9	B	1	1.5	3.0	-0.3	1.2	20			0	0	NP	9	3	12	21	6	A-1-b	0	5200					Exc. & Rep. - 12"
	009-0	2	3.0	4.5	1.2	2.7	20			0	0	NP	5	2	7	21	6	A-1-b	0						
	26	3	4.5	6.0	2.7	4.2	8									13	6	A-1-b	0						THEN
		4	6.0	7.5	4.2	5.7	12	8	2.70							12	10	A-4a	8						12" Cement Stab.

PLATE 3

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.86 4/22/2026

#	Boring ID	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	
10	B	1	2.0	3.5	0.8	2.3	12		3.70	39	20	19	48	34	82	19	16	A-6b	12	487		N_{60} & Mc		12"	Exc. & Rep. - 12"
	010-0	2	3.5	5.0	2.3	3.8	11		1.00	30	16	14	39	23	62	14	14	A-6a	7						204 Geotextile
	26	3	5.0	6.5	3.8	5.3	12		3.70							13	14	A-6a	10						or
		4	6.5	8.0	5.3	6.8	14	11	3.70							12	14	A-6a							12" Cement Stab.
11	B	1	2.0	3.5	0.7	2.2	29		2.50	20	14	6	36	17	53	11	10	A-4a	4	300					
	011-0	2	3.5	5.0	2.2	3.7	12		1.50	35	17	18	46	32	78	19	16	A-6b	11						
	26	3	5.0	6.5	3.7	5.2	9		1.00							27	16	A-6b	16						
		4	6.5	8.0	5.2	6.7	11	9	1.00							21	16	A-6b							
12	B	1	1.0	2.5	0.0	1.5	11		3.50	25	15	10	48	26	74	16	10	A-4a	8	360		N_{60} & Mc		12"	Exc. & Rep. - 12"
	012-0	2	2.5	4.0	1.5	3.0	20		4.50	30	18	12	41	28	69	14	14	A-6a	8						204 Geotextile
	26	3	4.0	5.5	3.0	4.5	20		4.50							12	14	A-6a	10						or
		4	5.5	7.0	4.5	6.0	20	11	4.50							19	14	A-6a	10						12" Cement Stab.
13	B	1	1.5	3.0	0.5	2.0	11		3.50	25	16	9	37	20	57	13	11	A-4a	4	200		N_{60}		12"	Exc. & Rep. - 12"
	013-0	2	3.0	4.5	2.0	3.5	20		4.00	28	19	9	31	19	50	16	14	A-4a	3						204 Geotextile
	26	3	4.5	6.0	3.5	5.0	20		3.00							17	10	A-4a	8						or
		4	6.0	7.5	5.0	6.5	20	11	4.00							14	10	A-4a	8						12" Cement Stab.
14	B	1	1.5	3.0	0.4	1.9	14		3.50	26	16	10	41	22	63	12	11	A-4a	6	400					
	014-0	2	3.0	4.5	1.9	3.4	14		4.50							18	10	A-4a	8			N_{60} & Mc			
	26	3	4.5	6.0	3.4	4.9	21		4.50	26	17	9	35	22	57	10	12	A-4a	4						
		4	6.0	7.5	4.9	6.4	20	14	4.50							14	10	A-4a	8						
15	B	1	1.5	3.0	0.2	1.7	30			25	22	3	19	8	27	16	10	A-2-4	0	420		Mc			
	015-0	2	3.0	4.5	1.7	3.2	20		4.50	24	16	8	42	22	64	10	11	A-4a	6						
	26	3	4.5	6.0	3.2	4.7	15		4.50							12	10	A-4a	8						
		4	6.0	7.5	4.7	6.2	20	15	4.50							14	10	A-4a	8						

PID: 122881 58

County-Route-Section: TP 26 MAH-11 Vacant Rest Area
No. of Borings: 15

Geotechnical Consultant: S&ME, Inc.
Prepared By: Brian K. Sears, PE
Date prepared: 6/10/2026

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

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

Design CBR	7

% Samples within 3 feet of subgrade			
$N_{60} \leq 5$	0%	HP ≤ 0.5	2%
$N_{60} < 12$	16%	0.5 < HP ≤ 1	3%
$12 \leq N_{60} < 15$	12%	1 < HP ≤ 2	5%
$N_{60} \geq 20$	26%	HP > 2	43%
M+	17%		
Rock	0%		
Unsuitable Soil	0%		

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

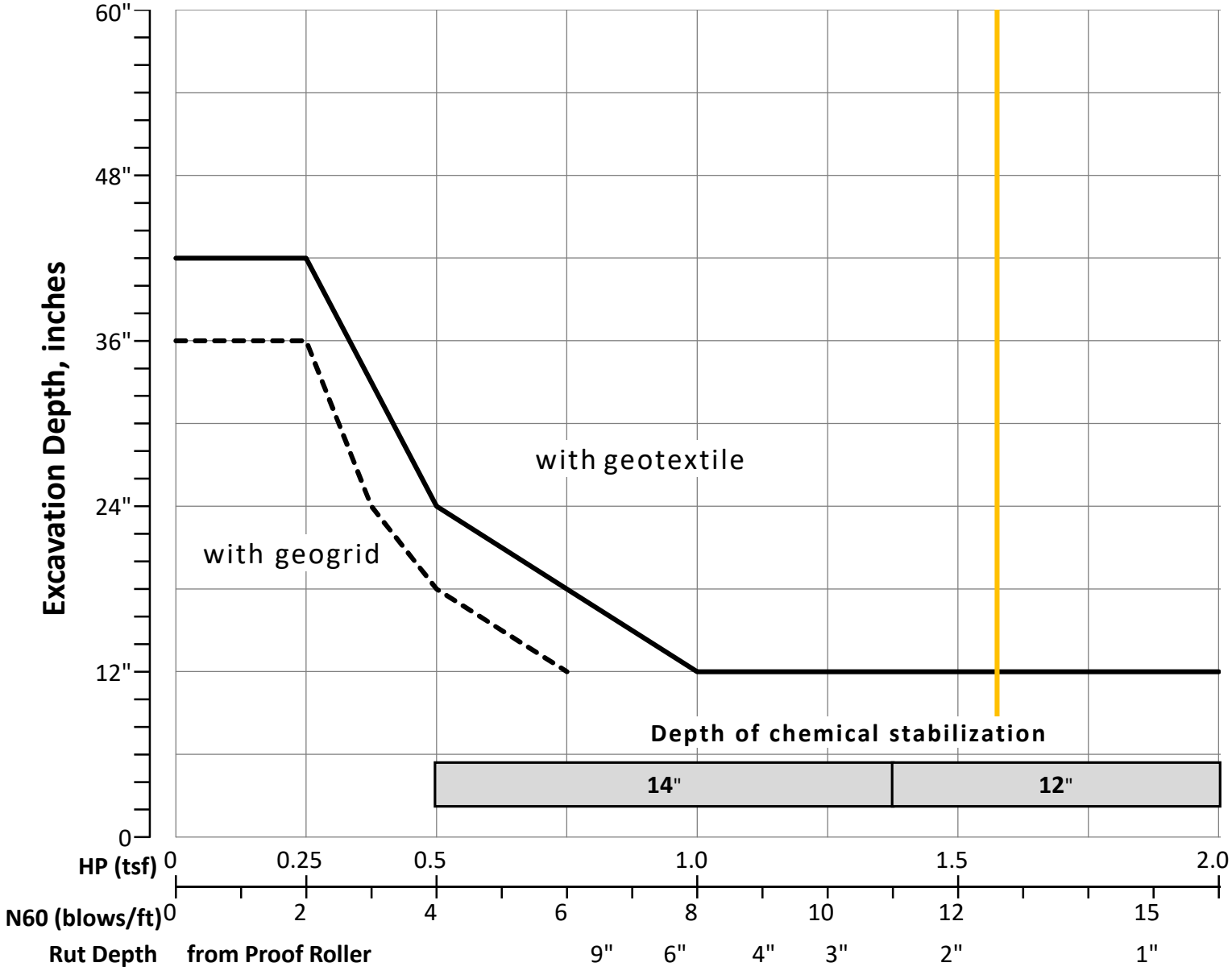
% Proposed Subgrade Surface	
Unstable & Unsuitable	35%
Unstable	35%
Unsuitable (Soil & Rock)	0%

	N_{60}	N_{60L}	HP	LL	PL	PI	Silt	Clay	P 200	M_C	M_{OPT}	GI
Average	18	13	3.43	25	15	10	37	21	59	15	12	7
Maximum	59	23	4.50	45	22	26	53	37	87	27	18	16
Minimum	8	8	0.50	0	0	3	5	2	7	4	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	3	1	0	0	0	0	0	34	1	0	15	4	0	2	0	0	60
Percent	0%	0%	0%	5%	2%	0%	0%	0%	0%	0%	57%	2%	0%	25%	7%	0%	3%	0%	0%	100%
% Rock|Granular|Cohesive	0%	0%	63%									37%								100%
Surface Class Count	0	0	0	3	1	0	0	0	0	0	18	0	0	9	2	0	1	0	0	34
Surface Class Percent	0%	0%	0%	9%	3%	0%	0%	0%	0%	0%	53%	0%	0%	26%	6%	0%	3%	0%	0%	100%

Fig. 600-1 – Subgrade Stabilization



OVERRIDE TABLE

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

Average HP
Average N_{60L}

PLATE 6

Appendix III – Light Tower Foundation Analyses

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

LPILE Parameters for Lateral Analyses – MAH-11 Truck 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 TP1-7 (Boring B-004-0-26)

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	1,164.3 – 1,161.3	Soft Clay (Matlock)	98 pcf	---	250	0.02
Clay (A-7-6)	3.0 – 6.2	1,161.3 – 1,158.1	Stiff Clay w/o Free Water	60 pcf	---	3,250	0.005
Sandy Silt (A-4a)	6.2 – 11.2	1,158.1 – 1,153.1	Stiff Clay w/o Free Water	63 pcf	---	4,000	0.005
Gravel with Sand (A-1-b)	11.2 – 18.7	1,153.1 – 1,145.6	Sand (Reese)	60 pcf	20 pci	34°	---
Silt and Clay (A-6a)	18.7 – 20.7	1,145.6 – 1,143.6	Stiff Clay w/o Free Water	60 pcf	---	3,500	0.005

*Below proposed ground surface at light tower, estimated to be at El. 1,164.25.

Table 2 – LPile Input Parameters at Light Tower TP1-8 (Boring B-005-0-26)

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	1,165.1 – 1,162.1	Soft Clay (Matlock)	98 pcf	---	250	0.02
Silt (A-4b)	3.0 – 4.5	1,162.1 – 1,160.6	Stiff Clay w/o Free Water	63 pcf	---	3,750	0.005
Sandy Silt (A-4a)	4.5 – 7.0	1,160.6 – 1,158.1	Stiff Clay w/o Free Water	58 pcf	---	1,300	0.007
Gravel with Sand (A-1-b)	7.0 – 9.5	1,158.1 – 1,155.6	Sand (Reese)	60 pcf	60 pci	34°	---
Sandy Silt (A-4a)	9.5 – 16.5	1,155.6 – 1,148.6	Stiff Clay w/o Free Water	60 pcf	---	1,600	0.007

*Below proposed ground surface at light tower, estimated to be at El. 1,165.09.

Table 3 – LPile Input Parameters at Light Tower TP1-9 (Boring B-008-0-26)

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	1,166.3 – 1,163.3	Soft Clay (Matlock)	98 pcf	---	250	0.02
Sandy Silt (A-4a)	3.0 – 7.8	1,163.3 – 1,158.5	Stiff Clay w/o Free Water	60 pcf	---	4,500	0.004
Gravel with Sand (A-1-b)	7.8 – 10.3	1,158.5 – 1,156.0	Sand (Reese)	60 pcf	60 pci	34°	---
Silt (A-4b)	10.3 – 12.8	1,156.0 – 1,153.5	Sand (Reese)	63 pcf	60 pci	31°	---
Sandy Silt (A-4a)	12.8 – 19.8	1,153.5 – 1,146.5	Stiff Clay w/o Free Water	58 pcf	---	3,750	0.005

*Below proposed ground surface at light tower, estimated to be at El. 1,166.26.

Table 4 – LPile Input Parameters at Light Tower TP2-1 (Boring B-005-0-26)

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	1,173.0 – 1,170.0	Soft Clay (Matlock)	98 pcf	---	250	0.02
Silt and Clay (A-6a)	3.0 – 3.4	1,170.0 – 1,169.6	Soft Clay (Matlock)	56 pcf	---	950	0.01
Silt and Clay (A-6a)	3.4 – 4.9	1,169.6 – 1,168.1	Stiff Clay w/o Free Water	63 pcf	---	2,250	0.005
Sandy Silt (A-4a)	4.9 – 9.9	1,168.1 – 1,163.1	Soft Clay (Matlock)	58 pcf	---	1,000	0.01
Silt (A-4b)	9.9 – 12.4	1,163.1 – 1,160.6	Stiff Clay w/o Free Water	63 pcf	---	3,750	0.005
Sandy Silt (A-4a)	12.4 – 14.9	1,160.6 – 1,158.1	Stiff Clay w/o Free Water	58 pcf	---	1,300	0.007
Gravel with Sand (A-1-b)	14.9 – 17.4	1,158.1 – 1,155.6	Sand (Reese)	60 pcf	60 pci	34°	---
Sandy Silt (A-4a)	17.4 – 24.4	1,155.6 – 1,148.6	Stiff Clay w/o Free Water	60 pcf	---	1,600	0.007

*Below proposed ground surface at light tower, estimated to be at El. 1,173.03.

Table 5 – LPile Input Parameters at Light Tower TP2-2 (Boring B-005-0-26)

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	1,174.6 – 1,171.6	Soft Clay (Matlock)	98 pcf	---	250	0.02
Silt and Clay (A-6a)	3.0 – 5.0	1,171.6 – 1,169.6	Soft Clay (Matlock)	56 pcf	---	950	0.01
Silt and Clay (A-6a)	5.0 – 6.5	1,169.6 – 1,168.1	Stiff Clay w/o Free Water	63 pcf	---	2,250	0.005
Sandy Silt (A-4a)	6.5 – 11.5	1,168.1 – 1,163.1	Soft Clay (Matlock)	58 pcf	---	1,000	0.01
Silt (A-4b)	11.5 – 14.0	1,163.1 – 1,160.6	Stiff Clay w/o Free Water	63 pcf	---	3,750	0.005
Sandy Silt (A-4a)	14.0 – 16.5	1,160.6 – 1,158.1	Stiff Clay w/o Free Water	58 pcf	---	1,300	0.007
Gravel with Sand (A-1-b)	16.5 – 19.0	1,158.1 – 1,155.6	Sand (Reese)	60 pcf	60 pci	34°	---
Sandy Silt (A-4a)	19.0 – 26.0	1,155.6 – 1,148.6	Stiff Clay w/o Free Water	60 pcf	---	1,600	0.007

*Below proposed ground surface at light tower, estimated to be at El. 1,174.63.

Table 6 – LPile Input Parameters at Light Tower TP2-3 (Boring B-007-0-26)

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	1,174.1 – 1,171.1	Soft Clay (Matlock)	98 pcf	---	250	0.02
Silt and Clay (A-6a)	3.0 – 4.0	1,171.1 – 1,170.1	Stiff Clay w/o Free Water	58 pcf	---	3,000	0.005
Sandy Silt (A-4a)	4.0 – 13.0	1,170.1 – 1,161.1	Stiff Clay w/o Free Water	60 pcf	---	3,250	0.005
Sandy Silt (A-4a)	13.0 – 25.0	1,161.1 – 1,149.1	Stiff Clay w/o Free Water	60 pcf	---	4,500	0.004

*Below proposed ground surface at light tower, estimated to be at El. 1,174.05.

LATERAL LOAD (LPILE) ANALYSES
NORTHBOUND PARKING AREA
LIGHT TOWER TP1-7 (B-004-0-26)

TP 26 NE Ohio Site 13 MAH-11 Vacant Rest Area - Northbound Parking Area
Light Tower TP1-7 (Boring B-004-0-26) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

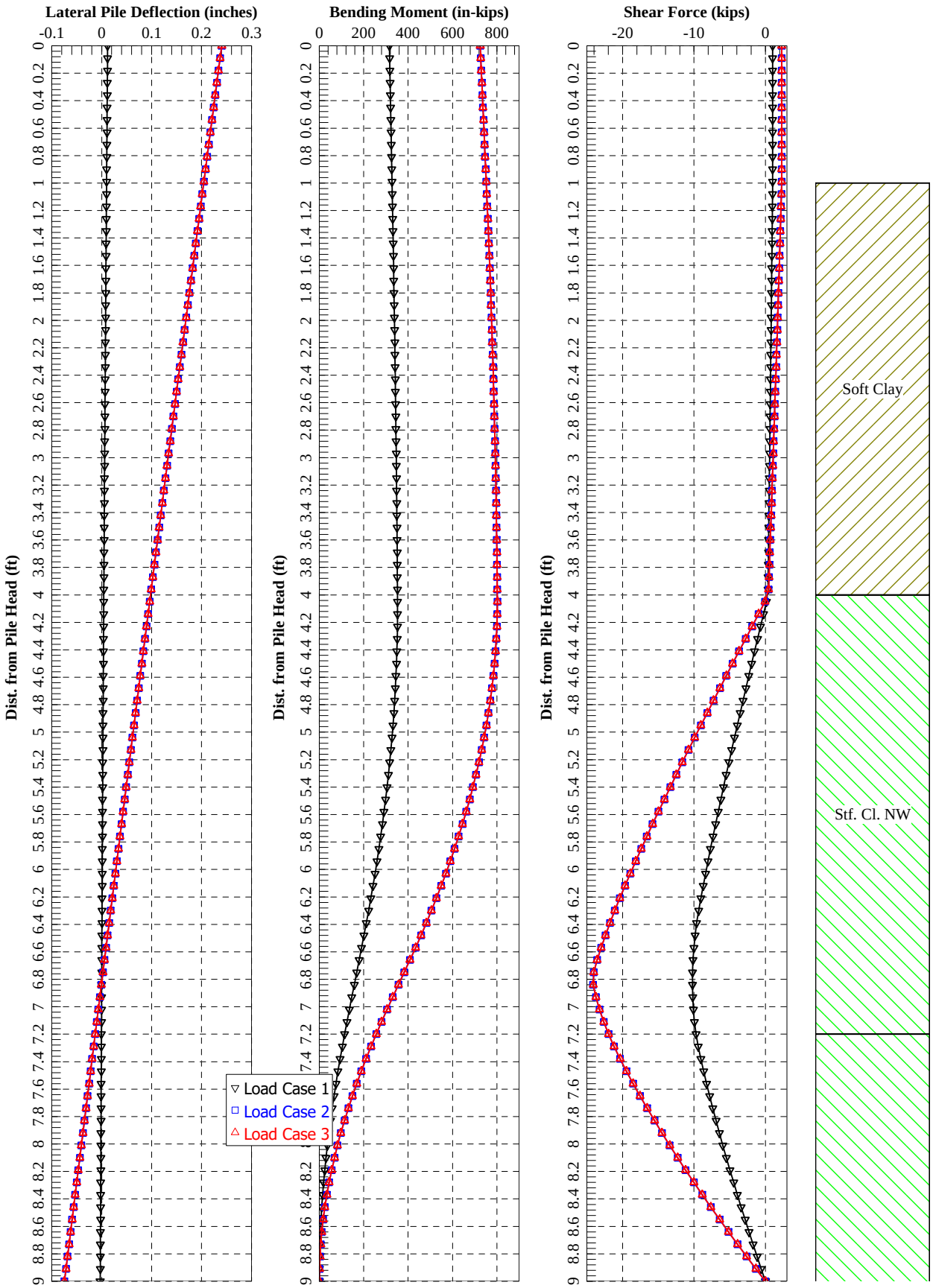


PLATE 4

```
================================================================================

                            LPile Version 2022-12.013

                              License ID : 228746630
                          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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                                       S&ME, Inc.
                                     Dublin, Ohio

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


This model was prepared by:
LGH




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

Path to file locations:
\\EgnyteDrive\Ops\Columbus-1170\Projects\2024\24170232_ms_TP 26 NE Ohio\GEO\Project
Docs\Site 13_MAH-11 (2LMN)\Calcs\Light Towers\LPILE Files\

Name of input data file:
Tower TP1-7 (B-004-0-26).lp12d

Name of output report file:
Tower TP1-7 (B-004-0-26).lp12o

Name of plot output file:
Tower TP1-7 (B-004-0-26).lp12p

Name of runtime message file:
Tower TP1-7 (B-004-0-26).lp12r



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

Date: May 20, 2026 Time: 15:59:05

Problem Title

Project Name: TP 26 NE Ohio Site 13 MAH-11 NB Vacant Rest Area

Job Number: 24170232E

Client: ms consultants, inc.

Engineer: BKS

Description: Light Tower TP1-7 (B-004-0-26)

Program Options and Settings

Computational Options:
- Conventional Analysis

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

Analysis Control Options:

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

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

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

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



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

Number of pile sections defined                        =            1
Total length of pile                                   =        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.

            Depth Below           Pile
Point        Pile Head          Diameter
 No.            feet             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
```

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	=	7.200000 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	=	3250. psf
Undrained cohesion at bottom of layer	=	3250. 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	=	7.200000 ft
Distance from top of pile to bottom of layer	=	12.200000 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	=	4000. psf
Undrained cohesion at bottom of layer	=	4000. 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	=	12.200000 ft
Distance from top of pile to bottom of layer	=	19.700000 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                          =    20.000000 pci
   Subgrade k at bottom of layer                       =    20.000000 pci


Layer 5 is stiff clay without free water

   Distance from top of pile to top of layer           =    19.700000 ft
   Distance from top of pile to bottom of layer        =    21.700000 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                  =        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


 (Depth of the lowest soil layer extends 12.700 ft below the pile tip)



--------------------------------------------------------------------------------
                        Summary of Input Soil Properties
--------------------------------------------------------------------------------

Layer         Soil Type          Layer      Effective    Cohesion     Angle of
 E50
 Num.           Name             Depth       Unit Wt.                 Friction
 or            kpy
          (p-y Curve Type)        ft           pcf          psf          deg.
 krm           pci
-----   -------------------   ----------   ----------   ----------   ----------
----------   ----------
  1             Soft              1.0000      98.0000     250.0000       --
0.02000       --
                Clay              4.0000      98.0000     250.0000       --
0.02000       --
  2           Stiff Clay          4.0000      60.0000        3250.       --
0.00500       --
          w/o Free Water          7.2000      60.0000        3250.       --
0.00500       --
  3           Stiff Clay          7.2000      63.0000        4000.       --
0.00500       --
          w/o Free Water         12.2000      63.0000        4000.       --
0.00500       --
  4             Sand             12.2000      60.0000       --          34.0000
 --           20.0000
          (Reese, et al.)        19.7000      60.0000       --          34.0000
```

```
 --          20.0000
  5         Stiff Clay           19.7000      60.0000        3500.       --
0.00500       --
          w/o Free Water         21.7000      60.0000        3500.       --
0.00500       --
```

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 No.	Load Type	Condition 1	Condition 2	Axial Thrust Force, lbs	Compute Top y vs. Pile Length	Run Analysis
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
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 Fc Ac + Fy As	=	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	0.00000
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	0.00000	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	0.00000
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.
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 Curvature rad/in.	Bending Moment in-kip	Bending Stiffness kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in	Max Conc Stress ksi	Max Steel Stress ksi	Run Msg
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
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
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1.0904832    -17.790458 C
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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
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0.00004813         4489.     93284807.    10.0991050     0.0004860     -0.001246
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1.8476620    -31.934476 C
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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
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2.1153313    -37.395383 C
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2.2253083    -39.728581 C
0.00006438        5948.     92398455.    10.1631088     0.0006543     -0.001663
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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
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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
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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
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3.6937845    -60.000000 CY
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3.7851328    -60.000000 CY
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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
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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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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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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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3.9991770    -60.000000 CY
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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
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  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       Bending       Bending      Depth to      Max Comp      Max Tens
  Max Conc      Max Steel  Run
   Curvature      Moment       Stiffness      N Axis        Strain        Strain
   Stress        Stress    Msg
    rad/in.       in-kip        kip-in2         in           in/in         in/in
     ksi           ksi
------------ ------------ ------------ ------------ ------------ ------------
------------ ------------ ---
  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
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0.00000750         2366.    315456672.    10.2575513    0.00007693     -0.000193
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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
0.00002063         2366.    114711517.    10.0637168     0.0002076     -0.000535
0.8178551    -13.036882 C
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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
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0.9560005    -15.411276 C
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1.2244416    -20.149010 C
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2.3682931    -42.823550 C
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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
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0.00009938        8982.     90387473.    10.3258078     0.0010261     -0.002551
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 0.0001044        9308.     89176212.    10.3143071     0.0010766     -0.002681
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3.3122821    -60.000000 CY
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  3.9992162    -60.000000 CY
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  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       Bending       Bending      Depth to      Max Comp      Max Tens
  Max Conc      Max Steel  Run
   Curvature      Moment       Stiffness      N Axis        Strain        Strain
   Stress        Stress    Msg
    rad/in.       in-kip        kip-in2         in           in/in         in/in
     ksi           ksi
------------ ------------ ------------ ------------ ------------ ------------
------------ ------------ ---
  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
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0.00000375         1430.    381333494.    18.2638891    0.00006849   -0.00006651
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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
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
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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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 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           Axial Thrust        Nominal Mom. Cap.      Max. Comp.      Max.
```

Tens. No.	kips	in-kip	Strain	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 Load No.	Resist. Factor	Nominal Ax. Thrust kips	Nominal Moment Cap in-kips	Ult. (Fac) Ax. Thrust kips	Ult. (Fac) Moment Cap in-kips	Bend. Stiff. at Ult Mom kip-in^2
1	0.65	3.800000	12169.	2.470000	7910.	91219895.
2	0.65	4.200000	12173.	2.730000	7913.	91253873.
3	0.65	4.600000	12177.	2.990000	7915.	91287886.
1	0.75	3.800000	12169.	2.850000	9127.	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	8793.
2	4.0000	0.2977	No	No	8793.	104881.
3	7.2000	2.8971	Yes	No	113674.	80012.
4	12.2000	11.2000	No	No	193686.	0.00
5	19.7000	18.7000	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 X	Deflect. y	Bending Moment	Shear Force	Slope S	Total Stress	Bending Stiffness	Soil Res. Es*H	Soil Spr. Lat. Load	Distrib. p
feet	inches	in-lbs	lbs	radians	psi*	lb-in^2	lb/inch	lb/inch	lb/inch
----------	----------	----------	----------	----------	----------	----------			

0.00	0.01191	315600.	1000.0000	-1.81E-04	0.00	3.84E+11	
0.00	0.00	0.00					
0.09000	0.01171	316681.	1000.	-1.80E-04	0.00	3.84E+11	
0.00	0.00	0.00					
0.1800	0.01152	317762.	1000.0000	-1.79E-04	0.00	3.84E+11	
0.00	0.00	0.00					
0.2700	0.01132	318842.	1000.0000	-1.78E-04	0.00	3.84E+11	
0.00	0.00	0.00					
0.3600	0.01113	319923.	1000.	-1.77E-04	0.00	3.84E+11	
0.00	0.00	0.00					
0.4500	0.01094	321004.	1000.0000	-1.76E-04	0.00	3.84E+11	
0.00	0.00	0.00					
0.5400	0.01075	322085.	1000.0000	-1.76E-04	0.00	3.84E+11	
0.00	0.00	0.00					
0.6300	0.01056	323166.	1000.0000	-1.75E-04	0.00	3.84E+11	
0.00	0.00	0.00					
0.7200	0.01037	324246.	1000.	-1.74E-04	0.00	3.84E+11	
0.00	0.00	0.00					
0.8100	0.01019	325327.	1000.0000	-1.73E-04	0.00	3.84E+11	
0.00	0.00	0.00					
0.9000	0.01000	326408.	1000.	-1.72E-04	0.00	3.84E+11	
0.00	0.00	0.00					
0.9900	0.00982	327489.	1000.	-1.71E-04	0.00	3.84E+11	
0.00	0.00	0.00					
1.0800	0.00963	328570.	991.0086	-1.70E-04	0.00	3.84E+11	
-16.651	1867.	0.00					
1.1700	0.00945	329631.	972.9355	-1.69E-04	0.00	3.84E+11	
-16.818	1922.	0.00					
1.2600	0.00927	330673.	954.6843	-1.68E-04	0.00	3.84E+11	
-16.981	1979.	0.00					
1.3500	0.00909	331695.	936.2598	-1.67E-04	0.00	3.84E+11	
-17.139	2037.	0.00					
1.4400	0.00891	332696.	917.6667	-1.66E-04	0.00	3.84E+11	
-17.293	2097.	0.00					
1.5300	0.00873	333678.	898.9099	-1.65E-04	0.00	3.84E+11	
-17.442	2159.	0.00					
1.6200	0.00855	334640.	879.9942	-1.64E-04	0.00	3.84E+11	
-17.587	2222.	0.00					
1.7100	0.00837	335580.	860.9246	-1.64E-04	0.00	3.84E+11	
-17.727	2287.	0.00					
1.8000	0.00819	336501.	841.7063	-1.63E-04	0.00	3.84E+11	
-17.862	2354.	0.00					
1.8900	0.00802	337400.	822.3443	-1.62E-04	0.00	3.84E+11	
-17.993	2423.	0.00					
1.9800	0.00785	338278.	802.8439	-1.61E-04	0.00	3.84E+11	
-18.119	2494.	0.00					
2.0700	0.00767	339136.	783.2104	-1.60E-04	0.00	3.84E+11	
-18.240	2567.	0.00					
2.1600	0.00750	339972.	763.4492	-1.59E-04	0.00	3.84E+11	

-18.355	2643.	0.00				
2.2500	0.00733	340786.	743.5658	-1.58E-04	0.00	3.84E+11
-18.466	2721.	0.00				
2.3400	0.00716	341579.	723.5659	-1.57E-04	0.00	3.84E+11
-18.571	2801.	0.00				
2.4300	0.00699	342350.	703.4551	-1.56E-04	0.00	3.84E+11
-18.671	2884.	0.00				
2.5200	0.00682	343100.	683.2392	-1.55E-04	0.00	3.84E+11
-18.766	2970.	0.00				
2.6100	0.00666	343828.	662.9243	-1.54E-04	0.00	3.84E+11
-18.855	3059.	0.00				
2.7000	0.00649	344533.	642.5163	-1.53E-04	0.00	3.84E+11
-18.938	3151.	0.00				
2.7900	0.00633	345217.	622.0216	-1.52E-04	0.00	3.84E+11
-19.015	3246.	0.00				
2.8800	0.00616	345878.	601.4463	-1.51E-04	0.00	3.84E+11
-19.087	3345.	0.00				
2.9700	0.00600	346517.	580.7971	-1.50E-04	0.00	3.84E+11
-19.152	3448.	0.00				
3.0600	0.00584	347134.	560.0805	-1.49E-04	0.00	3.84E+11
-19.212	3554.	0.00				
3.1500	0.00568	347729.	539.3033	-1.48E-04	0.00	3.84E+11
-19.265	3665.	0.00				
3.2400	0.00552	348300.	518.4726	-1.47E-04	0.00	3.84E+11
-19.311	3780.	0.00				
3.3300	0.00536	348850.	497.5954	-1.46E-04	0.00	3.84E+11
-19.351	3899.	0.00				
3.4200	0.00520	349377.	476.6791	-1.45E-04	0.00	3.84E+11
-19.383	4024.	0.00				
3.5100	0.00505	349881.	455.7313	-1.44E-04	0.00	3.84E+11
-19.409	4154.	0.00				
3.6000	0.00489	350362.	434.7598	-1.43E-04	0.00	3.84E+11
-19.427	4290.	0.00				
3.6900	0.00474	350821.	413.7725	-1.42E-04	0.00	3.84E+11
-19.438	4432.	0.00				
3.7800	0.00458	351257.	392.7778	-1.41E-04	0.00	3.84E+11
-19.441	4581.	0.00				
3.8700	0.00443	351671.	371.7842	-1.40E-04	0.00	3.84E+11
-19.436	4737.	0.00				
3.9600	0.00428	352062.	350.8005	-1.39E-04	0.00	3.84E+11
-19.423	4900.	0.00				
4.0500	0.00413	352430.	131.8227	-1.38E-04	0.00	3.84E+11
-386.092	100946.	0.00				
4.1400	0.00398	352348.	-284.435	-1.37E-04	0.00	3.84E+11
-384.755	104357.	0.00				
4.2300	0.00383	351817.	-699.184	-1.36E-04	0.00	3.84E+11
-383.298	107968.	0.00				
4.3200	0.00369	350839.	-1112.	-1.35E-04	0.00	3.84E+11
-381.714	111799.	0.00				
4.4100	0.00354	349415.	-1524.	-1.34E-04	0.00	3.84E+11

-379.998	115872.	0.00				
4.5000	0.00340	347549.	-1933.	-1.33E-04	0.00	3.84E+11
-378.143	120213.	0.00				
4.5900	0.00325	345241.	-2340.	-1.32E-04	0.00	3.84E+11
-376.141	124851.	0.00				
4.6800	0.00311	342495.	-2745.	-1.31E-04	0.00	3.84E+11
-373.984	129819.	0.00				
4.7700	0.00297	339312.	-3148.	-1.30E-04	0.00	3.84E+11
-371.662	135156.	0.00				
4.8600	0.00283	335696.	-3548.	-1.30E-04	0.00	3.84E+11
-369.165	140909.	0.00				
4.9500	0.00269	331650.	-3945.	-1.29E-04	0.00	3.84E+11
-366.480	147132.	0.00				
5.0400	0.00255	327176.	-4340.	-1.28E-04	0.00	3.84E+11
-363.593	153888.	0.00				
5.1300	0.00241	322277.	-4731.	-1.27E-04	0.00	3.84E+11
-360.487	161255.	0.00				
5.2200	0.00228	316959.	-5118.	-1.26E-04	0.00	3.84E+11
-357.145	169326.	0.00				
5.3100	0.00214	311223.	-5502.	-1.25E-04	0.00	3.84E+11
-353.544	178214.	0.00				
5.4000	0.00201	305076.	-5882.	-1.24E-04	0.00	3.85E+11
-349.659	188061.	0.00				
5.4900	0.00187	298520.	-6257.	-1.23E-04	0.00	3.85E+11
-345.459	199041.	0.00				
5.5800	0.00174	291562.	-6628.	-1.22E-04	0.00	3.85E+11
-340.910	211380.	0.00				
5.6700	0.00161	284206.	-6993.	-1.22E-04	0.00	3.85E+11
-335.967	225365.	0.00				
5.7600	0.00148	276458.	-7353.	-1.21E-04	0.00	3.85E+11
-330.579	241378.	0.00				
5.8500	0.00135	268324.	-7707.	-1.20E-04	0.00	3.85E+11
-324.679	259928.	0.00				
5.9400	0.00122	259812.	-8054.	-1.19E-04	0.00	3.85E+11
-318.184	281722.	0.00				
6.0300	0.00109	250929.	-8394.	-1.19E-04	0.00	3.85E+11
-310.987	307766.	0.00				
6.1200	9.64E-04	241682.	-8725.	-1.18E-04	0.00	3.85E+11
-302.946	339544.	0.00				
6.2100	8.37E-04	232083.	-9048.	-1.17E-04	0.00	3.85E+11
-293.864	379357.	0.00				
6.3000	7.10E-04	222141.	-9358.	-1.17E-04	0.00	3.85E+11
-280.404	426331.	0.00				
6.3900	5.85E-04	211871.	-9634.	-1.16E-04	0.00	3.85E+11
-231.941	428398.	0.00				
6.4800	4.60E-04	201332.	-9859.	-1.15E-04	0.00	3.85E+11
-183.252	430464.	0.00				
6.5700	3.35E-04	190578.	-10030.	-1.15E-04	0.00	3.85E+11
-134.330	432529.	0.00				
6.6600	2.12E-04	179668.	-10149.	-1.14E-04	0.00	3.85E+11

-85.164	434592.	0.00				
6.7500	8.84E-05	168658.	-10214.	-1.14E-04	0.00	3.85E+11
-35.745	436655.	0.00				
6.8400	-3.43E-05	157607.	-10226.	-1.13E-04	0.00	3.85E+11
13.9363	438716.	0.00				
6.9300	-1.57E-04	146572.	-10184.	-1.13E-04	0.00	3.85E+11
63.8913	440777.	0.00				
7.0200	-2.78E-04	135611.	-10087.	-1.13E-04	0.00	3.85E+11
114.1303	442837.	0.00				
7.1100	-4.00E-04	124784.	-9937.	-1.12E-04	0.00	3.85E+11
164.6643	444896.	0.00				
7.2000	-5.21E-04	114148.	-9723.	-1.12E-04	0.00	3.85E+11
232.3853	481965.	0.00				
7.2900	-6.41E-04	103784.	-9426.	-1.12E-04	0.00	3.85E+11
316.7976	533432.	0.00				
7.3800	-7.62E-04	93789.	-9059.	-1.11E-04	0.00	3.85E+11
362.6224	514127.	0.00				
7.4700	-8.82E-04	84217.	-8659.	-1.11E-04	0.00	3.85E+11
377.8828	462816.	0.00				
7.5600	-0.00100	75086.	-8244.	-1.11E-04	0.00	3.85E+11
391.9138	422586.	0.00				
7.6500	-0.00112	66412.	-7813.	-1.11E-04	0.00	3.85E+11
404.9745	390097.	0.00				
7.7400	-0.00124	58211.	-7369.	-1.10E-04	0.00	3.85E+11
417.2493	363245.	0.00				
7.8300	-0.00136	50496.	-6912.	-1.10E-04	0.00	3.85E+11
428.8742	340635.	0.00				
7.9200	-0.00148	43281.	-6443.	-1.10E-04	0.00	3.85E+11
439.9528	321304.	0.00				
8.0100	-0.00160	36580.	-5962.	-1.10E-04	0.00	3.85E+11
450.5657	304563.	0.00				
8.1000	-0.00172	30404.	-5470.	-1.10E-04	0.00	3.85E+11
460.7770	289908.	0.00				
8.1900	-0.00184	24765.	-4967.	-1.10E-04	0.00	3.85E+11
470.6387	276959.	0.00				
8.2800	-0.00195	19676.	-4454.	-1.10E-04	0.00	3.85E+11
480.1933	265423.	0.00				
8.3700	-0.00207	15146.	-3930.	-1.10E-04	0.00	3.85E+11
489.4760	255074.	0.00				
8.4600	-0.00219	11188.	-3397.	-1.10E-04	0.00	3.85E+11
498.5167	245731.	0.00				
8.5500	-0.00231	7811.	-2853.	-1.10E-04	0.00	3.85E+11
507.3403	237249.	0.00				
8.6400	-0.00243	5025.	-2301.	-1.10E-04	0.00	3.85E+11
515.9685	229510.	0.00				
8.7300	-0.00255	2842.	-1739.	-1.10E-04	0.00	3.85E+11
524.4197	222418.	0.00				
8.8200	-0.00266	1270.	-1168.	-1.10E-04	0.00	3.85E+11
532.7099	215891.	0.00				
8.9100	-0.00278	319.5985	-588.446	-1.10E-04	0.00	3.85E+11

```
540.8531    209863.       0.00
    9.0000   -0.00290       0.00       0.00  -1.10E-04       0.00   3.85E+11
548.8614    102139.       0.00

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


Output Summary for Load Case No. 1:

Pile-head deflection             =     0.01190670 inches
Computed slope at pile head      =     -0.0001809 radians
Maximum bending moment           =        352430. inch-lbs
Maximum shear force              =        -10226. lbs
Depth of maximum bending moment  =     4.05000000 feet below pile head
Depth of maximum shear force     =     6.84000000 feet below pile head
Number of iterations             =             20
Number of zero deflection points =              1
Pile deflection at ground        =     0.00979571 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       Pile Head       Maximum       Maximum
   Length      Deflection      Moment         Shear
    feet         inches        ln-lbs          lbs
------------  ------------  ------------  ------------
    9.00000    0.01190670       352430.       -10226.
    8.55000    0.02131466       349336.       -11196.
    8.10000    0.04889911       345187.       -12358.
    7.65000    0.12704906       341103.       -13519.
    7.20000    0.35695974       337263.       -14876.
    6.75000    1.07952739       335671.       -16463.
    6.30000    3.58457923       337102.       -18483.
```

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--------------------------------------------------------------------------------
                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.
     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     0.2404    724800.      2250.   -0.00302       0.00   3.83E+11
0.00       0.00       0.00
   0.09000     0.2371    727245.      2250.   -0.00301       0.00   3.83E+11
0.00       0.00       0.00
    0.1800     0.2339    729690.      2250.   -0.00301       0.00   3.83E+11
0.00       0.00       0.00
    0.2700     0.2306    732135.      2250.   -0.00301       0.00   3.83E+11
0.00       0.00       0.00
    0.3600     0.2274    734580.      2250.   -0.00301       0.00   3.83E+11
0.00       0.00       0.00
    0.4500     0.2241    737025.      2250.   -0.00301       0.00   3.83E+11
0.00       0.00       0.00
    0.5400     0.2209    739470.      2250.   -0.00300       0.00   3.83E+11
0.00       0.00       0.00
    0.6300     0.2176    741915.      2250.   -0.00300       0.00   3.83E+11
0.00       0.00       0.00
    0.7200     0.2144    744360.      2250.   -0.00300       0.00   3.83E+11
0.00       0.00       0.00
    0.8100     0.2111    746804.      2250.   -0.00300       0.00   3.83E+11
0.00       0.00       0.00
    0.9000     0.2079    749249.      2250.   -0.00300       0.00   3.83E+11
0.00       0.00       0.00
    0.9900     0.2047    751694.      2250.   -0.00299       0.00   3.83E+11
0.00       0.00       0.00
    1.0800     0.2014    754139.      2225.   -0.00299       0.00   3.83E+11
-45.852   245.8417       0.00
    1.1700     0.1982    756531.      2175.   -0.00299       0.00   3.83E+11
-46.358   252.6095       0.00
    1.2600     0.1950    758868.      2125.   -0.00299       0.00   3.83E+11
-46.854   259.5390       0.00
    1.3500     0.1917    761150.      2074.   -0.00299       0.00   3.83E+11
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-47.339   266.6370       0.00
    1.4400     0.1885    763378.      2023.   -0.00298       0.00   3.83E+11
-47.813   273.9107       0.00
    1.5300     0.1853    765549.      1971.   -0.00298       0.00   3.83E+11
-48.276   281.3679       0.00
    1.6200     0.1821    767665.      1919.   -0.00298       0.00   3.83E+11
-48.727   289.0165       0.00
    1.7100     0.1789    769723.      1866.   -0.00298       0.00   3.83E+11
-49.166   296.8653       0.00
    1.8000     0.1757    771724.      1812.   -0.00297       0.00   3.83E+11
-49.593   304.9235       0.00
    1.8900     0.1724    773668.      1759.   -0.00297       0.00   3.83E+11
-50.008   313.2008       0.00
    1.9800     0.1692    775552.      1704.   -0.00297       0.00   3.83E+11
-50.410   321.7078       0.00
    2.0700     0.1660    777379.      1650.   -0.00297       0.00   3.83E+11
-50.800   330.4555       0.00
    2.1600     0.1628    779145.      1595.   -0.00297       0.00   3.83E+11
-51.176   339.4559       0.00
    2.2500     0.1596    780853.      1539.   -0.00296       0.00   3.83E+11
-51.539   348.7219       0.00
    2.3400     0.1564    782500.      1483.   -0.00296       0.00   3.83E+11
-51.888   358.2670       0.00
    2.4300     0.1532    784086.      1427.   -0.00296       0.00   3.83E+11
-52.224   368.1062       0.00
    2.5200     0.1500    785612.      1371.   -0.00296       0.00   3.83E+11
-52.544   378.2550       0.00
    2.6100     0.1468    787076.      1314.   -0.00296       0.00   3.83E+11
-52.850   388.7307       0.00
    2.7000     0.1436    788478.      1256.   -0.00295       0.00   3.83E+11
-53.141   399.5516       0.00
    2.7900     0.1405    789819.      1199.   -0.00295       0.00   3.83E+11
-53.417   410.7376       0.00
    2.8800     0.1373    791097.      1141.   -0.00295       0.00   3.83E+11
-53.676   422.3101       0.00
    2.9700     0.1341    792313.      1083.   -0.00295       0.00   3.83E+11
-53.919   434.2925       0.00
    3.0600     0.1309    793466.      1025.   -0.00294       0.00   3.83E+11
-54.145   446.7101       0.00
    3.1500     0.1277    794555.   965.9949   -0.00294       0.00   3.83E+11
-54.354   459.5904       0.00
    3.2400     0.1246    795581.   907.1895   -0.00294       0.00   3.83E+11
-54.545   472.9635       0.00
    3.3300     0.1214    796544.   848.1880   -0.00294       0.00   3.83E+11
-54.717   486.8622       0.00
    3.4200     0.1182    797443.   789.0107   -0.00293       0.00   3.83E+11
-54.870   501.3225       0.00
    3.5100     0.1150    798277.   729.6786   -0.00293       0.00   3.83E+11
-55.004   516.3838       0.00
    3.6000     0.1119    799048.   670.2133   -0.00293       0.00   3.83E+11
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-55.117   532.0898       0.00
    3.6900     0.1087    799754.   610.6373   -0.00293       0.00   3.83E+11
-55.209   548.4882       0.00
    3.7800     0.1055    800396.   550.9738   -0.00293       0.00   3.83E+11
-55.279   565.6322       0.00
    3.8700     0.1024    800973.   491.2469   -0.00292       0.00   3.83E+11
-55.326   583.5807       0.00
    3.9600    0.09923    801486.   431.4819   -0.00292       0.00   3.83E+11
-55.350   602.3994       0.00
    4.0500    0.09608    801934.    -55.981   -0.00292       0.00   3.83E+11
-847.359      9525.       0.00
    4.1400    0.09293    801394.   -969.925   -0.00292       0.00   3.83E+11
-845.130      9822.       0.00
    4.2300    0.08978    799868.     -1881.   -0.00291       0.00   3.83E+11
-842.630     10137.       0.00
    4.3200    0.08663    797360.     -2790.   -0.00291       0.00   3.83E+11
-839.846     10470.       0.00
    4.4100    0.08349    793871.     -3695.   -0.00291       0.00   3.83E+11
-836.763     10824.       0.00
    4.5000    0.08035    789407.     -4597.   -0.00291       0.00   3.83E+11
-833.366     11202.       0.00
    4.5900    0.07721    783970.     -5495.   -0.00291       0.00   3.83E+11
-829.637     11605.       0.00
    4.6800    0.07407    777566.     -6389.   -0.00290       0.00   3.83E+11
-825.557     12037.       0.00
    4.7700    0.07094    770199.     -7278.   -0.00290       0.00   3.83E+11
-821.103     12501.       0.00
    4.8600    0.06780    761874.     -8162.   -0.00290       0.00   3.83E+11
-816.251     13002.       0.00
    4.9500    0.06467    752597.     -9041.   -0.00290       0.00   3.83E+11
-810.971     13543.       0.00
    5.0400    0.06155    742375.     -9914.   -0.00289       0.00   3.83E+11
-805.232     14130.       0.00
    5.1300    0.05842    731213.    -10780.   -0.00289       0.00   3.83E+11
-798.996     14771.       0.00
    5.2200    0.05530    719119.    -11639.   -0.00289       0.00   3.83E+11
-792.222     15473.       0.00
    5.3100    0.05218    706100.    -12491.   -0.00289       0.00   3.83E+11
-784.860     16246.       0.00
    5.4000    0.04906    692167.    -13334.   -0.00289       0.00   3.83E+11
-776.853     17103.       0.00
    5.4900    0.04594    677327.    -14169.   -0.00288       0.00   3.84E+11
-768.134     18058.       0.00
    5.5800    0.04283    661592.    -14993.   -0.00288       0.00   3.84E+11
-758.623     19131.       0.00
    5.6700    0.03971    644971.    -15807.   -0.00288       0.00   3.84E+11
-748.224     20348.       0.00
    5.7600    0.03660    627478.    -16609.   -0.00288       0.00   3.84E+11
-736.819     21741.       0.00
    5.8500    0.03349    609125.    -17398.   -0.00288       0.00   3.84E+11
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-724.264     23354.       0.00
    5.9400    0.03039    589928.    -18172.   -0.00288       0.00   3.84E+11
-710.374     25248.       0.00
    6.0300    0.02728    569902.    -18931.   -0.00287       0.00   3.84E+11
-694.914     27510.       0.00
    6.1200    0.02418    549065.    -19672.   -0.00287       0.00   3.84E+11
-677.572     30266.       0.00
    6.2100    0.02108    527438.    -20393.   -0.00287       0.00   3.84E+11
-657.919     33713.       0.00
    6.3000    0.01798    505044.    -21092.   -0.00287       0.00   3.84E+11
-635.346     38171.       0.00
    6.3900    0.01488    481908.    -21764.   -0.00287       0.00   3.84E+11
-608.934     44204.       0.00
    6.4800    0.01178    458063.    -22404.   -0.00287       0.00   3.84E+11
-577.188     52914.       0.00
    6.5700    0.00868    433544.    -23006.   -0.00287       0.00   3.84E+11
-537.396     66827.       0.00
    6.6600    0.00559    408398.    -23557.   -0.00286       0.00   3.84E+11
-483.652     93434.       0.00
    6.7500    0.00250    382688.    -24033.   -0.00286       0.00   3.84E+11
-397.279    171809.       0.00
    6.8400  -5.95E-04    356515.    -24117.   -0.00286       0.00   3.84E+11
241.5784    438716.       0.00
    6.9300   -0.00369    330623.    -23748.   -0.00286       0.00   3.84E+11
442.0124    129523.       0.00
    7.0200   -0.00678    305247.    -23230.   -0.00286       0.00   3.85E+11
517.0919     82423.       0.00
    7.1100   -0.00986    280474.    -22643.   -0.00286       0.00   3.85E+11
570.6444     62476.       0.00
    7.2000   -0.01295    256367.    -21977.   -0.00286       0.00   3.85E+11
661.7496     55177.       0.00
    7.2900   -0.01604    233032.    -21203.   -0.00286       0.00   3.85E+11
772.6256     52022.       0.00
    7.3800   -0.01913    210598.    -20348.   -0.00286       0.00   3.85E+11
811.1470     45802.       0.00
    7.4700   -0.02221    189110.    -19453.   -0.00286       0.00   3.85E+11
845.9640     41131.       0.00
    7.5600   -0.02530    168608.    -18522.   -0.00286       0.00   3.85E+11
877.9620     37481.       0.00
    7.6500   -0.02838    149131.    -17557.   -0.00286       0.00   3.85E+11
907.7384     34540.       0.00
    7.7400   -0.03147    130712.    -16562.   -0.00286       0.00   3.85E+11
935.7165     32115.       0.00
    7.8300   -0.03455    113385.    -15537.   -0.00286       0.00   3.85E+11
962.2077     30076.       0.00
    7.9200   -0.03764     97181.    -14484.   -0.00286       0.00   3.85E+11
987.4486     28336.       0.00
    8.0100   -0.04072     82128.    -13405.   -0.00285       0.00   3.85E+11
1012.     26832.       0.00
    8.1000   -0.04380     68255.    -12300.   -0.00285       0.00   3.85E+11
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1035.     25516.       0.00
    8.1900   -0.04689     55589.    -11170.   -0.00285       0.00   3.85E+11
1057.     24356.       0.00
    8.2800   -0.04997     44156.    -10016.   -0.00285       0.00   3.85E+11
1079.     23323.       0.00
    8.3700   -0.05305     33982.     -8839.   -0.00285       0.00   3.85E+11
1100.     22398.       0.00
    8.4600   -0.05613     25091.     -7640.   -0.00285       0.00   3.85E+11
1121.     21563.       0.00
    8.5500   -0.05922     17507.     -6419.   -0.00285       0.00   3.85E+11
1141.     20807.       0.00
    8.6400   -0.06230     11255.     -5176.   -0.00285       0.00   3.85E+11
1160.     20117.       0.00
    8.7300   -0.06538      6355.     -3913.   -0.00285       0.00   3.85E+11
1180.     19486.       0.00
    8.8200   -0.06846      2832.     -2628.   -0.00285       0.00   3.85E+11
1198.     18906.       0.00
    8.9100   -0.07155   706.1417     -1324.   -0.00285       0.00   3.85E+11
1217.     18370.       0.00
    9.0000   -0.07463      0.00       0.00   -0.00285       0.00   3.85E+11
1235.      8937.       0.00

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


Output Summary for Load Case No. 2:

Pile-head deflection             =     0.24036915 inches
Computed slope at pile head      =     -0.0030170 radians
Maximum bending moment           =        801934. inch-lbs
Maximum shear force              =        -24117. lbs
Depth of maximum bending moment  =     4.05000000 feet below pile head
Depth of maximum shear force     =     6.84000000 feet below pile head
Number of iterations             =             36
Number of zero deflection points =              1
Pile deflection at ground        =     0.20430277 inches



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

Boundary Condition Type 1, Shear and Moment
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```
Shear      =          2250. lbs
Moment     =        724800. in-lbs
Axial Load =          4600. lbs


    Pile       Pile Head       Maximum       Maximum
   Length      Deflection      Moment         Shear
    feet         inches        ln-lbs          lbs
-----------  ------------  ------------  ------------
    9.00000    0.24036915       801934.       -24117.
    8.55000    0.47650301       793259.       -25665.
    8.10000    1.14912239       785781.       -27901.
    7.65000    3.08640181       781949.       -30666.
    7.20000    9.63093755       785126.       -34714.


--------------------------------------------------------------------------------
                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    Deflect.    Bending     Shear      Slope      Total     Bending   Soil
Res.  Soil Spr.  Distrib.
     X          y       Moment      Force        S       Stress    Stiffness      p
      Es*H     Lat. Load
   feet      inches     in-lbs       lbs      radians     psi*      lb-in^2
lb/inch    lb/inch    lb/inch
---------- ---------- ---------- ---------- ---------- ---------- ----------
---------- ---------- ----------
      0.00     0.2401    724800.      2250.   -0.00301       0.00   3.83E+11
0.00       0.00       0.00
   0.09000     0.2369    727242.      2250.   -0.00301       0.00   3.83E+11
0.00       0.00       0.00
    0.1800     0.2336    729685.      2250.   -0.00301       0.00   3.83E+11
0.00       0.00       0.00
    0.2700     0.2304    732127.      2250.   -0.00301       0.00   3.83E+11
0.00       0.00       0.00
    0.3600     0.2271    734569.      2250.   -0.00301       0.00   3.83E+11
0.00       0.00       0.00
    0.4500     0.2239    737012.      2250.   -0.00300       0.00   3.83E+11
0.00       0.00       0.00
    0.5400     0.2206    739454.      2250.   -0.00300       0.00   3.83E+11
0.00       0.00       0.00
    0.6300     0.2174    741896.      2250.   -0.00300       0.00   3.83E+11
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0.00       0.00       0.00
    0.7200     0.2141    744339.      2250.   -0.00300       0.00   3.83E+11
0.00       0.00       0.00
    0.8100     0.2109    746781.      2250.   -0.00300       0.00   3.83E+11
0.00       0.00       0.00
    0.9000     0.2077    749223.      2250.   -0.00299       0.00   3.83E+11
0.00       0.00       0.00
    0.9900     0.2044    751666.      2250.   -0.00299       0.00   3.83E+11
0.00       0.00       0.00
    1.0800     0.2012    754108.      2225.   -0.00299       0.00   3.83E+11
-45.835   246.0149       0.00
    1.1700     0.1980    756497.      2175.   -0.00299       0.00   3.83E+11
-46.342   252.7874       0.00
    1.2600     0.1948    758831.      2125.   -0.00298       0.00   3.83E+11
-46.838   259.7219       0.00
    1.3500     0.1915    761111.      2074.   -0.00298       0.00   3.83E+11
-47.323   266.8249       0.00
    1.4400     0.1883    763336.      2023.   -0.00298       0.00   3.83E+11
-47.796   274.1039       0.00
    1.5300     0.1851    765505.      1971.   -0.00298       0.00   3.83E+11
-48.259   281.5663       0.00
    1.6200     0.1819    767618.      1919.   -0.00298       0.00   3.83E+11
-48.710   289.2204       0.00
    1.7100     0.1787    769674.      1866.   -0.00297       0.00   3.83E+11
-49.149   297.0748       0.00
    1.8000     0.1755    771673.      1813.   -0.00297       0.00   3.83E+11
-49.576   305.1388       0.00
    1.8900     0.1723    773614.      1759.   -0.00297       0.00   3.83E+11
-49.990   313.4220       0.00
    1.9800     0.1691    775496.      1705.   -0.00297       0.00   3.83E+11
-50.392   321.9350       0.00
    2.0700     0.1658    777320.      1650.   -0.00297       0.00   3.83E+11
-50.782   330.6890       0.00
    2.1600     0.1626    779085.      1595.   -0.00296       0.00   3.83E+11
-51.158   339.6958       0.00
    2.2500     0.1594    780789.      1539.   -0.00296       0.00   3.83E+11
-51.521   348.9684       0.00
    2.3400     0.1563    782434.      1484.   -0.00296       0.00   3.83E+11
-51.870   358.5204       0.00
    2.4300     0.1531    784018.      1427.   -0.00296       0.00   3.83E+11
-52.205   368.3665       0.00
    2.5200     0.1499    785542.      1371.   -0.00295       0.00   3.83E+11
-52.526   378.5226       0.00
    2.6100     0.1467    787004.      1314.   -0.00295       0.00   3.83E+11
-52.832   389.0058       0.00
    2.7000     0.1435    788404.      1257.   -0.00295       0.00   3.83E+11
-53.123   399.8344       0.00
    2.7900     0.1403    789742.      1199.   -0.00295       0.00   3.83E+11
-53.398   411.0283       0.00
    2.8800     0.1371    791019.      1141.   -0.00295       0.00   3.83E+11
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-53.657   422.6091       0.00
    2.9700     0.1339    792232.      1083.   -0.00294       0.00   3.83E+11
-53.900   434.6001       0.00
    3.0600     0.1308    793383.      1025.   -0.00294       0.00   3.83E+11
-54.126   447.0265       0.00
    3.1500     0.1276    794470.   966.4485   -0.00294       0.00   3.83E+11
-54.335   459.9160       0.00
    3.2400     0.1244    795494.   907.6640   -0.00294       0.00   3.83E+11
-54.525   473.2986       0.00
    3.3300     0.1212    796455.   848.6834   -0.00293       0.00   3.83E+11
-54.698   487.2073       0.00
    3.4200     0.1181    797352.   789.5271   -0.00293       0.00   3.83E+11
-54.851   501.6779       0.00
    3.5100     0.1149    798184.   730.2161   -0.00293       0.00   3.83E+11
-54.984   516.7500       0.00
    3.6000     0.1118    798953.   670.7719   -0.00293       0.00   3.83E+11
-55.097   532.4671       0.00
    3.6900     0.1086    799657.   611.2170   -0.00293       0.00   3.83E+11
-55.189   548.8773       0.00
    3.7800     0.1054    800297.   551.5746   -0.00292       0.00   3.83E+11
-55.259   566.0335       0.00
    3.8700     0.1023    800873.   491.8690   -0.00292       0.00   3.83E+11
-55.307   583.9948       0.00
    3.9600    0.09913    801384.   432.1252   -0.00292       0.00   3.83E+11
-55.330   602.8269       0.00
    4.0500    0.09598    801830.    -55.205   -0.00292       0.00   3.83E+11
-847.133      9533.       0.00
    4.1400    0.09283    801288.   -968.906   -0.00291       0.00   3.83E+11
-844.905      9830.       0.00
    4.2300    0.08968    799761.     -1880.   -0.00291       0.00   3.83E+11
-842.406     10145.       0.00
    4.3200    0.08654    797251.     -2788.   -0.00291       0.00   3.83E+11
-839.622     10478.       0.00
    4.4100    0.08340    793762.     -3693.   -0.00291       0.00   3.83E+11
-836.540     10833.       0.00
    4.5000    0.08026    789297.     -4595.   -0.00290       0.00   3.83E+11
-833.144     11211.       0.00
    4.5900    0.07712    783861.     -5493.   -0.00290       0.00   3.83E+11
-829.416     11615.       0.00
    4.6800    0.07399    777456.     -6386.   -0.00290       0.00   3.83E+11
-825.337     12047.       0.00
    4.7700    0.07086    770090.     -7275.   -0.00290       0.00   3.83E+11
-820.885     12511.       0.00
    4.8600    0.06773    761765.     -8159.   -0.00290       0.00   3.83E+11
-816.033     13012.       0.00
    4.9500    0.06460    752489.     -9038.   -0.00289       0.00   3.83E+11
-810.755     13554.       0.00
    5.0400    0.06148    742267.     -9910.   -0.00289       0.00   3.83E+11
-805.017     14142.       0.00
    5.1300    0.05836    731107.    -10776.   -0.00289       0.00   3.83E+11
```

-798.783	14783.	0.00				
5.2200	0.05524	719014.	-11635.	-0.00289	0.00	3.83E+11
-792.011	15485.	0.00				
5.3100	0.05212	705998.	-12487.	-0.00289	0.00	3.83E+11
-784.651	16259.	0.00				
5.4000	0.04900	692066.	-13330.	-0.00288	0.00	3.83E+11
-776.646	17116.	0.00				
5.4900	0.04589	677229.	-14164.	-0.00288	0.00	3.84E+11
-767.930	18072.	0.00				
5.5800	0.04278	661496.	-14988.	-0.00288	0.00	3.84E+11
-758.422	19147.	0.00				
5.6700	0.03967	644878.	-15802.	-0.00288	0.00	3.84E+11
-748.025	20364.	0.00				
5.7600	0.03656	627388.	-16603.	-0.00288	0.00	3.84E+11
-736.624	21758.	0.00				
5.8500	0.03346	609038.	-17392.	-0.00287	0.00	3.84E+11
-724.072	23372.	0.00				
5.9400	0.03035	589844.	-18167.	-0.00287	0.00	3.84E+11
-710.186	25268.	0.00				
6.0300	0.02725	569822.	-18925.	-0.00287	0.00	3.84E+11
-694.731	27531.	0.00				
6.1200	0.02415	548989.	-19666.	-0.00287	0.00	3.84E+11
-677.393	30290.	0.00				
6.2100	0.02105	527366.	-20387.	-0.00287	0.00	3.84E+11
-657.746	33740.	0.00				
6.3000	0.01796	504976.	-21085.	-0.00287	0.00	3.84E+11
-635.180	38201.	0.00				
6.3900	0.01486	481845.	-21757.	-0.00287	0.00	3.84E+11
-608.776	44238.	0.00				
6.4800	0.01177	458004.	-22398.	-0.00286	0.00	3.84E+11
-577.039	52955.	0.00				
6.5700	0.00868	433490.	-22999.	-0.00286	0.00	3.84E+11
-537.260	66878.	0.00				
6.6600	0.00559	408349.	-23550.	-0.00286	0.00	3.84E+11
-483.534	93503.	0.00				
6.7500	0.00250	382645.	-24026.	-0.00286	0.00	3.84E+11
-397.195	171918.	0.00				
6.8400	-5.93E-04	356477.	-24110.	-0.00286	0.00	3.84E+11
241.0799	438716.	0.00				
6.9300	-0.00368	330590.	-23742.	-0.00286	0.00	3.84E+11
441.8755	129643.	0.00				
7.0200	-0.00677	305218.	-23224.	-0.00286	0.00	3.85E+11
516.9412	82495.	0.00				
7.1100	-0.00985	280450.	-22637.	-0.00286	0.00	3.85E+11
570.4818	62529.	0.00				
7.2000	-0.01294	256347.	-21971.	-0.00286	0.00	3.85E+11
661.5634	55223.	0.00				
7.2900	-0.01602	233015.	-21197.	-0.00286	0.00	3.85E+11
772.4099	52065.	0.00				
7.3800	-0.01911	210585.	-20342.	-0.00285	0.00	3.85E+11

```
810.9217     45840.       0.00
    7.4700   -0.02219    189100.    -19447.   -0.00285       0.00   3.85E+11
845.7298     41165.       0.00
    7.5600   -0.02527    168602.    -18517.   -0.00285       0.00   3.85E+11
877.7197     37512.       0.00
    7.6500   -0.02835    149127.    -17553.   -0.00285       0.00   3.85E+11
907.4884     34569.       0.00
    7.7400   -0.03143    130711.    -16557.   -0.00285       0.00   3.85E+11
935.4592     32141.       0.00
    7.8300   -0.03451    113387.    -15533.   -0.00285       0.00   3.85E+11
961.9436     30101.       0.00
    7.9200   -0.03759     97184.    -14480.   -0.00285       0.00   3.85E+11
987.1779     28359.       0.00
    8.0100   -0.04067     82132.    -13401.   -0.00285       0.00   3.85E+11
1011.     26854.       0.00
    8.1000   -0.04375     68261.    -12296.   -0.00285       0.00   3.85E+11
1035.     25537.       0.00
    8.1900   -0.04683     55596.    -11167.   -0.00285       0.00   3.85E+11
1057.     24376.       0.00
    8.2800   -0.04991     44164.    -10014.   -0.00285       0.00   3.85E+11
1079.     23342.       0.00
    8.3700   -0.05299     33990.     -8837.   -0.00285       0.00   3.85E+11
1100.     22416.       0.00
    8.4600   -0.05607     25099.     -7638.   -0.00285       0.00   3.85E+11
1120.     21581.       0.00
    8.5500   -0.05915     17515.     -6417.   -0.00285       0.00   3.85E+11
1141.     20824.       0.00
    8.6400   -0.06223     11261.     -5175.   -0.00285       0.00   3.85E+11
1160.     20134.       0.00
    8.7300   -0.06531      6361.     -3912.   -0.00285       0.00   3.85E+11
1179.     19502.       0.00
    8.8200   -0.06839      2836.     -2628.   -0.00285       0.00   3.85E+11
1198.     18921.       0.00
    8.9100   -0.07147   708.4241     -1324.   -0.00285       0.00   3.85E+11
1217.     18385.       0.00
    9.0000   -0.07455      0.00       0.00   -0.00285       0.00   3.85E+11
1235.      8944.       0.00

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


Output Summary for Load Case No. 3:

Pile-head deflection              =     0.24011629 inches
Computed slope at pile head       =     -0.0030139 radians
```

```
Maximum bending moment           =        801830. inch-lbs
Maximum shear force              =        -24110. lbs
Depth of maximum bending moment  =     4.05000000 feet below pile head
Depth of maximum shear force     =     6.84000000 feet below pile head
Number of iterations             =             36
Number of zero deflection points =              1
Pile deflection at ground        =     0.20408712 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	0.24011629	801830.	-24110.
8.55000	0.47549123	793053.	-25651.
8.10000	1.14321817	785332.	-27862.
7.65000	3.04283866	780807.	-30550.
7.20000	9.17608731	781402.	-34271.

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	Load Pile-head Load 1	Load Type	Load Pile-head Load 2	Axial Loading lbs	Pile-head Deflection inches	Pile-head Rotation radians	Max Shear in Pile lbs	Max Moment in Pile in-lbs

```
---- ----- ---------- ---------- ---------- ---------- ---------- ----------
---------- ----------
  1  V, lb  1000.0000  M, in-lb     315600.      4200.    0.01191  -1.81E-04
-10226.    352430.
  2  V, lb      2250.  M, in-lb     724800.      4600.     0.2404   -0.00302
-24117.    801934.
  3  V, lb      2250.  M, in-lb     724800.      3800.     0.2401   -0.00301
-24110.    801830.


Maximum pile-head deflection = 0.2403691539 inches
Maximum pile-head rotation   = -0.0030170258 radians = -0.172863 deg.

The analysis ended normally.
```

LATERAL LOAD (LPILE) ANALYSES
NORTHBOUND PARKING AREA
LIGHT TOWER TP1-8 (B-005-0-26)

TP 26 NE Ohio Site 13 MAH-11 Vacant Rest Area - Northbound Parking Area
Light Tower TP1-8 (Boring B-005-0-26) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

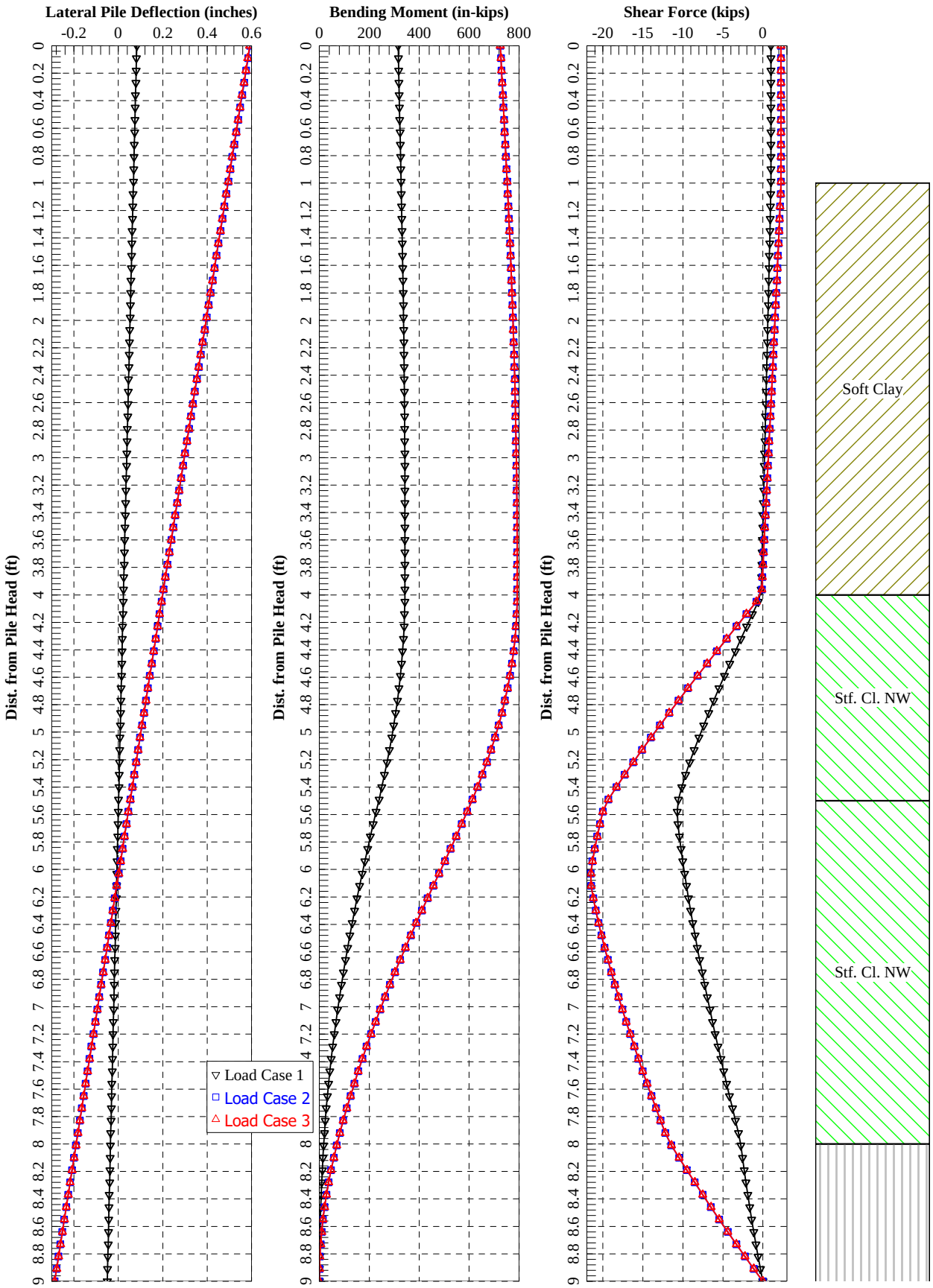


PLATE 48

```
================================================================================

                          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
                           © 1985-2024 by Ensoft, Inc.
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                                 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
13_MAH-11 (2LMN)\Calcs\Light Towers\LPILE Files\

Name of input data file:
Tower TP1-8 (B-005-0-26).lp12d

Name of output report file:
Tower TP1-8 (B-005-0-26).lp12o

Name of plot output file:
Tower TP1-8 (B-005-0-26).lp12p

Name of runtime message file:
Tower TP1-8 (B-005-0-26).lp12r



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

Date: May 27, 2026 Time: 17:09:23

Problem Title

Project Name: TP 26 NE Ohio Site 13 MAH-11 NB Vacant Rest Area

Job Number: 24170232E

Client: ms consultants, inc.

Engineer: BKS

Description: Light Tower TP1-8 (B-005-0-26)

Program Options and Settings

Computational Options:
- Conventional Analysis

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

Analysis Control Options:

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

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

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

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



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

Number of pile sections defined                        =            1
Total length of pile                                   =        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.

            Depth Below           Pile
Point        Pile Head          Diameter
 No.            feet             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
```

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	=	5.500000 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	=	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 stiff clay without free water

Distance from top of pile to top of layer	=	5.500000 ft
Distance from top of pile to bottom of layer	=	8.000000 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	=	1300. psf
Undrained cohesion at bottom of layer	=	1300. psf
Epsilon-50 at top of layer	=	0.007000
Epsilon-50 at bottom of layer	=	0.007000

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

Distance from top of pile to top of layer	=	8.000000 ft
Distance from top of pile to bottom of layer	=	10.500000 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 5 is stiff clay without free water

   Distance from top of pile to top of layer           =    10.500000 ft
   Distance from top of pile to bottom of layer        =    17.500000 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                  =        1600. psf
   Undrained cohesion at bottom of layer               =        1600. psf
   Epsilon-50 at top of layer                          =     0.007000
   Epsilon-50 at bottom of layer                       =     0.007000


 (Depth of the lowest soil layer extends 8.500 ft below the pile tip)



--------------------------------------------------------------------------------
                        Summary of Input Soil Properties
--------------------------------------------------------------------------------

Layer         Soil Type          Layer      Effective    Cohesion     Angle of
 E50
 Num.           Name             Depth       Unit Wt.                 Friction
 or            kpy
          (p-y Curve Type)        ft           pcf          psf          deg.
 krm           pci
-----   -------------------   ----------   ----------   ----------   ----------
----------   ----------
  1             Soft              1.0000      98.0000     250.0000       --
0.02000       --
                Clay              4.0000      98.0000     250.0000       --
0.02000       --
  2           Stiff Clay          4.0000      63.0000        3750.       --
0.00500       --
          w/o Free Water          5.5000      63.0000        3750.       --
0.00500       --
  3           Stiff Clay          5.5000      58.0000        1300.       --
0.00700       --
          w/o Free Water          8.0000      58.0000        1300.       --
0.00700       --
  4             Sand              8.0000      60.0000       --          34.0000
 --           60.0000
          (Reese, et al.)        10.5000      60.0000       --          34.0000
```

```
 --          60.0000
  5         Stiff Clay           10.5000      60.0000        1600.       --
0.00700       --
          w/o Free Water         17.5000      60.0000        1600.       --
0.00700       --
```

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 No.	Load Type	Condition 1	Condition 2	Axial Thrust Force, lbs	Compute Top y vs. Pile Length	Run Analysis
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
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 Fc Ac + Fy As	=	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	0.00000
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	0.00000	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	0.00000
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.
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 Stress Moment in-kip ksi	Run Msg	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				
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				

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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
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
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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
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
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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
 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
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 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
 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
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   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       Bending       Bending      Depth to      Max Comp      Max Tens
  Max Conc      Max Steel  Run
   Curvature      Moment       Stiffness      N Axis        Strain        Strain
   Stress        Stress    Msg
    rad/in.       in-kip        kip-in2         in           in/in         in/in
     ksi           ksi
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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
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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
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
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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
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1.0466496    -16.992174 C
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1.0915372    -17.782007 C
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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
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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
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0.00004688         4379.     93422358.    10.1011630     0.0004735     -0.001214
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0.00004938         4606.     93276544.    10.1096634     0.0004992     -0.001278
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2.4714639    -45.146185 C
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2.5051976    -45.919366 C
0.00007438        6836.     91910797.    10.2120017     0.0007595     -0.001918
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2.9130226    -55.924331 C
0.00009438        8573.     90843621.    10.3077273     0.0009728     -0.002425
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3.1332951    -60.000000 CY
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3.3122821    -60.000000 CY
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3.4649106    -60.000000 CY
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3.5287895    -60.000000 CY
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3.5876602    -60.000000 CY
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3.6428308    -60.000000 CY
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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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3.8245440    -60.000000 CY
 0.0001594        11012.     69097838.     9.7838573     0.0015593     -0.004178
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3.9972564    -60.000000 CY
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3.9998723    -60.000000 CY
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3.9998931    -60.000000 CY
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3.9970558    -60.000000 CY
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3.9997330    -60.000000 CY
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3.9990203    -60.000000 CY
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  3.9965958    -60.000000 CY
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  3.9992162    -60.000000 CY
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  3.9993713    -60.000000 CY
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  3.9955701    -60.000000 CY
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  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       Bending       Bending      Depth to      Max Comp      Max Tens
  Max Conc      Max Steel  Run
   Curvature      Moment       Stiffness      N Axis        Strain        Strain
   Stress        Stress    Msg
    rad/in.       in-kip        kip-in2         in           in/in         in/in
     ksi           ksi
------------ ------------ ------------ ------------ ------------ ------------
------------ ------------ ---
  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
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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
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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
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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
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0.7489100    -11.839998 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
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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
 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
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 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
--------------------------------------------------------------------------------

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

 Load           Axial Thrust        Nominal Mom. Cap.      Max. Comp.      Max.
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Tens. No.	kips	in-kip	Strain	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 Load No.	Resist. Factor	Nominal Ax. Thrust kips	Nominal Moment Cap in-kips	Ult. (Fac) Ax. Thrust kips	Ult. (Fac) Moment Cap in-kips	Bend. Stiff. at Ult Mom kip-in^2
1	0.65	3.800000	12169.	2.470000	7910.	91219895.
2	0.65	4.200000	12173.	2.730000	7913.	91253873.
3	0.65	4.600000	12177.	2.990000	7915.	91287886.
1	0.75	3.800000	12169.	2.850000	9127.	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.

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   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	8819.
2	4.0000	0.2591	No	No	8819.	53731.
3	5.5000	4.5441	Yes	No	62551.	42265.
4	8.0000	8.5929	No	No	104815.	24582.
5	10.5000	9.5000	No	No	129397.	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 X	Deflect. y	Bending Moment	Shear Force	Slope S	Total Stress	Bending Stiffness	Soil Res. Es*H	Soil Spr. Lat. Load	Distrib. p
feet	inches	in-lbs	lbs	radians	psi*	lb-in^2	lb/inch	lb/inch	lb/inch
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0.00	0.08290	315600.	1000.0000	-0.00127	0.00	3.84E+11	
0.00	0.00	0.00					
0.09000	0.08153	316686.	1000.0000	-0.00127	0.00	3.84E+11	
0.00	0.00	0.00					
0.1800	0.08016	317772.	1000.0000	-0.00127	0.00	3.84E+11	
0.00	0.00	0.00					
0.2700	0.07879	318857.	1000.0000	-0.00127	0.00	3.84E+11	
0.00	0.00	0.00					
0.3600	0.07742	319943.	1000.0000	-0.00127	0.00	3.84E+11	
0.00	0.00	0.00					
0.4500	0.07605	321029.	1000.0000	-0.00127	0.00	3.84E+11	
0.00	0.00	0.00					
0.5400	0.07469	322115.	1000.	-0.00127	0.00	3.84E+11	
0.00	0.00	0.00					
0.6300	0.07332	323200.	1000.	-0.00126	0.00	3.84E+11	
0.00	0.00	0.00					
0.7200	0.07195	324286.	1000.	-0.00126	0.00	3.84E+11	
0.00	0.00	0.00					
0.8100	0.07059	325372.	1000.	-0.00126	0.00	3.84E+11	
0.00	0.00	0.00					
0.9000	0.06923	326457.	1000.	-0.00126	0.00	3.84E+11	
0.00	0.00	0.00					
0.9900	0.06786	327543.	1000.	-0.00126	0.00	3.84E+11	
0.00	0.00	0.00					
1.0800	0.06650	328629.	982.8864	-0.00126	0.00	3.84E+11	
-31.692	514.6710	0.00					
1.1700	0.06514	329678.	948.4960	-0.00126	0.00	3.84E+11	
-31.994	530.4290	0.00					
1.2600	0.06378	330689.	913.7847	-0.00126	0.00	3.84E+11	
-32.286	546.6785	0.00					
1.3500	0.06243	331663.	878.7636	-0.00126	0.00	3.84E+11	
-32.568	563.4464	0.00					
1.4400	0.06107	332599.	843.4441	-0.00126	0.00	3.84E+11	
-32.839	580.7618	0.00					
1.5300	0.05971	333496.	807.8380	-0.00126	0.00	3.84E+11	
-33.099	598.6562	0.00					
1.6200	0.05836	334355.	771.9572	-0.00125	0.00	3.84E+11	
-33.347	617.1635	0.00					
1.7100	0.05700	335175.	735.8140	-0.00125	0.00	3.84E+11	
-33.585	636.3206	0.00					
1.8000	0.05565	335956.	699.4210	-0.00125	0.00	3.84E+11	
-33.810	656.1677	0.00					
1.8900	0.05430	336697.	662.7914	-0.00125	0.00	3.84E+11	
-34.023	676.7482	0.00					
1.9800	0.05294	337399.	625.9384	-0.00125	0.00	3.84E+11	
-34.223	698.1097	0.00					
2.0700	0.05159	338060.	588.8760	-0.00125	0.00	3.84E+11	
-34.411	720.3042	0.00					
2.1600	0.05025	338682.	551.6183	-0.00125	0.00	3.84E+11	

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-34.585   743.3885       0.00
    2.2500    0.04890    339263.   514.1801   -0.00125       0.00   3.84E+11
-34.745   767.4251       0.00
    2.3400    0.04755    339804.   476.5765   -0.00125       0.00   3.84E+11
-34.891   792.4828       0.00
    2.4300    0.04620    340304.   438.8232   -0.00125       0.00   3.84E+11
-35.022   818.6375       0.00
    2.5200    0.04486    340763.   400.9366   -0.00124       0.00   3.84E+11
-35.138   845.9731       0.00
    2.6100    0.04351    341181.   362.9335   -0.00124       0.00   3.84E+11
-35.238   874.5828       0.00
    2.7000    0.04217    341558.   324.8315   -0.00124       0.00   3.84E+11
-35.321   904.5704       0.00
    2.7900    0.04083    341894.   286.6487   -0.00124       0.00   3.84E+11
-35.387   936.0519       0.00
    2.8800    0.03949    342189.   248.4042   -0.00124       0.00   3.84E+11
-35.436   969.1573       0.00
    2.9700    0.03815    342442.   210.1177   -0.00124       0.00   3.84E+11
-35.465      1004.       0.00
    3.0600    0.03681    342654.   171.8099   -0.00124       0.00   3.84E+11
-35.475      1041.       0.00
    3.1500    0.03547    342824.   133.5025   -0.00124       0.00   3.84E+11
-35.465      1080.       0.00
    3.2400    0.03414    342953.    95.2182   -0.00124       0.00   3.84E+11
-35.432      1121.       0.00
    3.3300    0.03280    343041.    56.9808   -0.00124       0.00   3.84E+11
-35.378      1165.       0.00
    3.4200    0.03146    343088.    18.8154   -0.00124       0.00   3.84E+11
-35.299      1212.       0.00
    3.5100    0.03013    343093.    -19.251   -0.00123       0.00   3.84E+11
-35.195      1262.       0.00
    3.6000    0.02880    343057.    -57.192   -0.00123       0.00   3.84E+11
-35.064      1315.       0.00
    3.6900    0.02747    342981.    -94.975   -0.00123       0.00   3.84E+11
-34.905      1372.       0.00
    3.7800    0.02614    342863.   -132.570   -0.00123       0.00   3.84E+11
-34.716      1435.       0.00
    3.8700    0.02481    342706.   -169.944   -0.00123       0.00   3.84E+11
-34.494      1502.       0.00
    3.9600    0.02348    342507.   -207.058   -0.00123       0.00   3.84E+11
-34.237      1575.       0.00
    4.0500    0.02215    342269.   -590.380   -0.00123       0.00   3.84E+11
-675.619     32941.       0.00
    4.1400    0.02082    341243.     -1316.   -0.00123       0.00   3.84E+11
-669.020     34697.       0.00
    4.2300    0.01950    339437.     -2035.   -0.00123       0.00   3.84E+11
-661.792     36655.       0.00
    4.3200    0.01817    336859.     -2746.   -0.00123       0.00   3.84E+11
-653.867     38855.       0.00
    4.4100    0.01685    333518.     -3447.   -0.00122       0.00   3.84E+11
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-645.161	41349.	0.00				
4.5000	0.01553	329424.	-4139.	-0.00122	0.00	3.84E+11
-635.574	44203.	0.00				
4.5900	0.01421	324589.	-4819.	-0.00122	0.00	3.84E+11
-624.978	47508.	0.00				
4.6800	0.01289	319025.	-5488.	-0.00122	0.00	3.84E+11
-613.216	51390.	0.00				
4.7700	0.01157	312746.	-6143.	-0.00122	0.00	3.84E+11
-600.083	56025.	0.00				
4.8600	0.01025	305767.	-6783.	-0.00122	0.00	3.85E+11
-585.307	61675.	0.00				
4.9500	0.00893	298106.	-7406.	-0.00122	0.00	3.85E+11
-568.517	68741.	0.00				
5.0400	0.00762	289781.	-8010.	-0.00122	0.00	3.85E+11
-549.182	77884.	0.00				
5.1300	0.00630	280815.	-8591.	-0.00122	0.00	3.85E+11
-526.505	90262.	0.00				
5.2200	0.00498	271236.	-9145.	-0.00122	0.00	3.85E+11
-499.185	108151.	0.00				
5.3100	0.00367	261074.	-9665.	-0.00122	0.00	3.85E+11
-464.863	136767.	0.00				
5.4000	0.00236	250370.	-10142.	-0.00122	0.00	3.85E+11
-418.394	191661.	0.00				
5.4900	0.00105	239178.	-10554.	-0.00121	0.00	3.85E+11
-343.461	354907.	0.00				
5.5800	-2.67E-04	227585.	-10715.	-0.00121	0.00	3.85E+11
45.0895	182674.	0.00				
5.6700	-0.00158	216045.	-10610.	-0.00121	0.00	3.85E+11
148.6998	101796.	0.00				
5.7600	-0.00289	204678.	-10436.	-0.00121	0.00	3.85E+11
173.8564	65015.	0.00				
5.8500	-0.00420	193515.	-10238.	-0.00121	0.00	3.85E+11
191.8139	49349.	0.00				
5.9400	-0.00551	182574.	-10023.	-0.00121	0.00	3.85E+11
206.2475	40448.	0.00				
6.0300	-0.00682	171875.	-9794.	-0.00121	0.00	3.85E+11
218.5476	34631.	0.00				
6.1200	-0.00812	161430.	-9552.	-0.00121	0.00	3.85E+11
229.4039	30498.	0.00				
6.2100	-0.00943	151253.	-9299.	-0.00121	0.00	3.85E+11
239.2123	27393.	0.00				
6.3000	-0.01074	141355.	-9036.	-0.00121	0.00	3.85E+11
248.2231	24964.	0.00				
6.3900	-0.01205	131747.	-8763.	-0.00121	0.00	3.85E+11
256.6051	23008.	0.00				
6.4800	-0.01335	122437.	-8482.	-0.00121	0.00	3.85E+11
264.4781	21393.	0.00				
6.5700	-0.01466	113437.	-8192.	-0.00121	0.00	3.85E+11
271.9300	20036.	0.00				
6.6600	-0.01596	104753.	-7895.	-0.00121	0.00	3.85E+11

279.0279	18878.	0.00				
6.7500	-0.01727	96395.	-7590.	-0.00121	0.00	3.85E+11
285.8238	17876.	0.00				
6.8400	-0.01857	88370.	-7277.	-0.00121	0.00	3.85E+11
292.3589	17000.	0.00				
6.9300	-0.01988	80687.	-6958.	-0.00121	0.00	3.85E+11
298.6667	16227.	0.00				
7.0200	-0.02118	73351.	-6632.	-0.00121	0.00	3.85E+11
304.7745	15539.	0.00				
7.1100	-0.02249	66371.	-6300.	-0.00121	0.00	3.85E+11
310.7052	14922.	0.00				
7.2000	-0.02379	59754.	-5961.	-0.00121	0.00	3.85E+11
316.4778	14367.	0.00				
7.2900	-0.02510	53506.	-5617.	-0.00121	0.00	3.85E+11
322.1086	13862.	0.00				
7.3800	-0.02640	47633.	-5266.	-0.00121	0.00	3.85E+11
327.6115	13403.	0.00				
7.4700	-0.02770	42142.	-4909.	-0.00121	0.00	3.85E+11
332.9984	12982.	0.00				
7.5600	-0.02901	37040.	-4547.	-0.00121	0.00	3.85E+11
338.2799	12595.	0.00				
7.6500	-0.03031	32333.	-4178.	-0.00121	0.00	3.85E+11
343.4649	12239.	0.00				
7.7400	-0.03161	28026.	-3805.	-0.00121	0.00	3.85E+11
348.5616	11908.	0.00				
7.8300	-0.03292	24126.	-3426.	-0.00121	0.00	3.85E+11
353.5770	11601.	0.00				
7.9200	-0.03422	20638.	-3041.	-0.00121	0.00	3.85E+11
358.5175	11315.	0.00				
8.0100	-0.03552	17568.	-2751.	-0.00121	0.00	3.85E+11
179.2856	5451.	0.00				
8.1000	-0.03682	14707.	-2552.	-0.00121	0.00	3.85E+11
188.2483	5521.	0.00				
8.1900	-0.03813	12066.	-2344.	-0.00121	0.00	3.85E+11
197.3795	5591.	0.00				
8.2800	-0.03943	9656.	-2126.	-0.00121	0.00	3.85E+11
206.6795	5661.	0.00				
8.3700	-0.04073	7486.	-1897.	-0.00121	0.00	3.85E+11
216.1482	5731.	0.00				
8.4600	-0.04204	5568.	-1659.	-0.00121	0.00	3.85E+11
225.7856	5801.	0.00				
8.5500	-0.04334	3914.	-1410.	-0.00121	0.00	3.85E+11
235.5917	5871.	0.00				
8.6400	-0.04464	2534.	-1150.	-0.00121	0.00	3.85E+11
245.5666	5941.	0.00				
8.7300	-0.04594	1441.	-879.076	-0.00121	0.00	3.85E+11
255.7104	6011.	0.00				
8.8200	-0.04725	646.5081	-597.340	-0.00121	0.00	3.85E+11
266.0229	6081.	0.00				
8.9100	-0.04855	161.9967	-304.376	-0.00121	0.00	3.85E+11

```
276.5043      6151.       0.00
    9.0000   -0.04985       0.00       0.00   -0.00121       0.00   3.85E+11
287.1545      3110.       0.00

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


Output Summary for Load Case No. 1:

Pile-head deflection             =     0.08290456 inches
Computed slope at pile head      =     -0.0012709 radians
Maximum bending moment           =        343093. inch-lbs
Maximum shear force              =        -10715. lbs
Depth of maximum bending moment  =     3.51000000 feet below pile head
Depth of maximum shear force     =     5.58000000 feet below pile head
Number of iterations             =             22
Number of zero deflection points =              1
Pile deflection at ground        =     0.06771326 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       Pile Head       Maximum       Maximum
   Length      Deflection      Moment         Shear
    feet         inches        ln-lbs          lbs
------------  ------------  ------------  ------------
    9.00000    0.08290456       343093.       -10715.
    8.55000    0.11517695       341125.       -11171.
    8.10000    0.21084690       339292.       -11976.
    7.65000    0.52115680       337295.       -13518.
    7.20000    1.21054246       335678.       -15388.
    6.75000    3.36280472       337075.       -17746.
    6.30000    9.92245186       345087.       -21272.
```

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 X	Deflect. y	Bending Moment	Shear Force	Slope S	Total Stress	Bending Stiffness	Soil Res. Es*H	Soil Spr. Lat. Load	Distrib. p
feet	inches	in-lbs	lbs	radians	psi*	lb-in^2	lb/inch	lb/inch	lb/inch
0.00	0.5934	724800.	2250.	-0.00825	0.00	3.83E+11	0.00	0.00	0.00
0.09000	0.5845	727271.	2250.	-0.00825	0.00	3.83E+11	0.00	0.00	0.00
0.1800	0.5756	729742.	2250.	-0.00825	0.00	3.83E+11	0.00	0.00	0.00
0.2700	0.5667	732213.	2250.	-0.00825	0.00	3.83E+11	0.00	0.00	0.00
0.3600	0.5578	734684.	2250.	-0.00825	0.00	3.83E+11	0.00	0.00	0.00
0.4500	0.5489	737155.	2250.	-0.00824	0.00	3.83E+11	0.00	0.00	0.00
0.5400	0.5400	739626.	2250.	-0.00824	0.00	3.83E+11	0.00	0.00	0.00
0.6300	0.5311	742097.	2250.	-0.00824	0.00	3.83E+11	0.00	0.00	0.00
0.7200	0.5222	744568.	2250.	-0.00824	0.00	3.83E+11	0.00	0.00	0.00
0.8100	0.5133	747039.	2250.	-0.00824	0.00	3.83E+11	0.00	0.00	0.00
0.9000	0.5044	749510.	2250.	-0.00823	0.00	3.83E+11	0.00	0.00	0.00
0.9900	0.4955	751980.	2250.	-0.00823	0.00	3.83E+11	0.00	0.00	0.00
1.0800	0.4866	754451.	2217.	-0.00823	0.00	3.83E+11	-61.523	136.5444	0.00
1.1700	0.4777	756850.	2150.	-0.00823	0.00	3.83E+11	-62.156	140.5152	0.00
1.2600	0.4688	759177.	2083.	-0.00822	0.00	3.83E+11	-62.771	144.5962	0.00
1.3500	0.4600	761430.	2014.	-0.00822	0.00	3.83E+11			

```
-63.370   148.7928       0.00
    1.4400     0.4511    763610.      1946.   -0.00822       0.00   3.83E+11
-63.950   153.1109       0.00
    1.5300     0.4422    765715.      1876.   -0.00822       0.00   3.83E+11
-64.512   157.5566       0.00
    1.6200     0.4333    767744.      1806.   -0.00822       0.00   3.83E+11
-65.055   162.1367       0.00
    1.7100     0.4245    769698.      1736.   -0.00821       0.00   3.83E+11
-65.578   166.8582       0.00
    1.8000     0.4156    771575.      1665.   -0.00821       0.00   3.83E+11
-66.082   171.7291       0.00
    1.8900     0.4067    773375.      1593.   -0.00821       0.00   3.83E+11
-66.566   176.7575       0.00
    1.9800     0.3979    775098.      1521.   -0.00821       0.00   3.83E+11
-67.029   181.9525       0.00
    2.0700     0.3890    776742.      1448.   -0.00821       0.00   3.83E+11
-67.470   187.3238       0.00
    2.1600     0.3801    778308.      1375.   -0.00820       0.00   3.83E+11
-67.890   192.8819       0.00
    2.2500     0.3713    779794.      1302.   -0.00820       0.00   3.83E+11
-68.286   198.6384       0.00
    2.3400     0.3624    781201.      1228.   -0.00820       0.00   3.83E+11
-68.660   204.6056       0.00
    2.4300     0.3536    782527.      1153.   -0.00820       0.00   3.83E+11
-69.010   210.7972       0.00
    2.5200     0.3447    783773.      1079.   -0.00819       0.00   3.83E+11
-69.335   217.2278       0.00
    2.6100     0.3359    784939.      1004.   -0.00819       0.00   3.83E+11
-69.634   223.9138       0.00
    2.7000     0.3270    786023.   928.2651   -0.00819       0.00   3.83E+11
-69.907   230.8730       0.00
    2.7900     0.3182    787025.   852.6325   -0.00819       0.00   3.83E+11
-70.153   238.1248       0.00
    2.8800     0.3093    787946.   776.7495   -0.00819       0.00   3.83E+11
-70.371   245.6910       0.00
    2.9700     0.3005    788784.   700.6473   -0.00818       0.00   3.83E+11
-70.559   253.5952       0.00
    3.0600     0.2917    789540.   624.3579   -0.00818       0.00   3.83E+11
-70.717   261.8641       0.00
    3.1500     0.2828    790214.   547.9149   -0.00818       0.00   3.83E+11
-70.844   270.5269       0.00
    3.2400     0.2740    790805.   471.3529   -0.00818       0.00   3.83E+11
-70.938   279.6166       0.00
    3.3300     0.2652    791313.   394.7082   -0.00817       0.00   3.83E+11
-70.997   289.1698       0.00
    3.4200     0.2563    791739.   318.0184   -0.00817       0.00   3.83E+11
-71.021   299.2279       0.00
    3.5100     0.2475    792082.   241.3231   -0.00817       0.00   3.83E+11
-71.007   309.8376       0.00
    3.6000     0.2387    792341.   164.6635   -0.00817       0.00   3.83E+11
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-70.955   321.0515       0.00
    3.6900     0.2299    792518.    88.0829   -0.00817       0.00   3.83E+11
-70.861   332.9299       0.00
    3.7800     0.2211    792613.    11.6268   -0.00816       0.00   3.83E+11
-70.724   345.5414       0.00
    3.8700     0.2122    792625.    -64.657   -0.00816       0.00   3.83E+11
-70.542   358.9650       0.00
    3.9600     0.2034    792554.   -140.718   -0.00816       0.00   3.83E+11
-70.311   373.2922       0.00
    4.0500     0.1946    792402.   -806.729   -0.00816       0.00   3.83E+11
-1163.      6454.       0.00
    4.1400     0.1858    790893.     -2059.   -0.00815       0.00   3.83E+11
-1156.      6720.       0.00
    4.2300     0.1770    788035.     -3304.   -0.00815       0.00   3.83E+11
-1149.      7008.       0.00
    4.3200     0.1682    783838.     -4540.   -0.00815       0.00   3.83E+11
-1140.      7322.       0.00
    4.4100     0.1594    778311.     -5766.   -0.00815       0.00   3.83E+11
-1131.      7665.       0.00
    4.5000     0.1506    771464.     -6983.   -0.00815       0.00   3.83E+11
-1121.      8042.       0.00
    4.5900     0.1418    763309.     -8188.   -0.00814       0.00   3.83E+11
-1111.      8459.       0.00
    4.6800     0.1330    753858.     -9381.   -0.00814       0.00   3.83E+11
-1099.      8923.       0.00
    4.7700     0.1242    743126.    -10561.   -0.00814       0.00   3.83E+11
-1086.      9443.       0.00
    4.8600     0.1154    731127.    -11726.   -0.00814       0.00   3.83E+11
-1072.     10030.       0.00
    4.9500     0.1066    717878.    -12876.   -0.00813       0.00   3.83E+11
-1057.     10700.       0.00
    5.0400    0.09786    703396.    -14008.   -0.00813       0.00   3.83E+11
-1040.     11472.       0.00
    5.1300    0.08907    687702.    -15120.   -0.00813       0.00   3.83E+11
-1021.     12375.       0.00
    5.2200    0.08029    670817.    -16211.   -0.00813       0.00   3.84E+11
-999.657    13446.       0.00
    5.3100    0.07152    652767.    -17278.   -0.00813       0.00   3.84E+11
-976.138    14741.       0.00
    5.4000    0.06274    633577.    -18318.   -0.00813       0.00   3.84E+11
-949.541    16345.       0.00
    5.4900    0.05396    613280.    -19327.   -0.00812       0.00   3.84E+11
-919.098    18394.       0.00
    5.5800    0.04519    591912.    -20008.   -0.00812       0.00   3.84E+11
-342.796     8192.       0.00
    5.6700    0.03642    570143.    -20370.   -0.00812       0.00   3.84E+11
-326.311     9676.       0.00
    5.7600    0.02765    547993.    -20711.   -0.00812       0.00   3.84E+11
-306.014    11952.       0.00
    5.8500    0.01889    525487.    -21027.   -0.00812       0.00   3.84E+11
```

-279.479	15983.	0.00				
5.9400	0.01012	502655.	-21308.	-0.00812	0.00	3.84E+11
-240.230	25639.	0.00				
6.0300	0.00136	479542.	-21517.	-0.00811	0.00	3.84E+11
-146.118	116444.	0.00				
6.1200	-0.00741	456259.	-21475.	-0.00811	0.00	3.84E+11
224.1679	32683.	0.00				
6.2100	-0.01617	433238.	-21206.	-0.00811	0.00	3.84E+11
273.7372	18284.	0.00				
6.3000	-0.02493	410536.	-20892.	-0.00811	0.00	3.84E+11
306.4142	13275.	0.00				
6.3900	-0.03369	388191.	-20548.	-0.00811	0.00	3.84E+11
331.8597	10639.	0.00				
6.4800	-0.04245	366233.	-20178.	-0.00811	0.00	3.84E+11
353.1723	8986.	0.00				
6.5700	-0.05120	344687.	-19786.	-0.00811	0.00	3.84E+11
371.7776	7842.	0.00				
6.6600	-0.05996	323575.	-19376.	-0.00811	0.00	3.84E+11
388.4595	6997.	0.00				
6.7500	-0.06871	302916.	-18948.	-0.00811	0.00	3.85E+11
403.6989	6345.	0.00				
6.8400	-0.07747	282728.	-18504.	-0.00810	0.00	3.85E+11
417.8136	5825.	0.00				
6.9300	-0.08622	263027.	-18046.	-0.00810	0.00	3.85E+11
431.0253	5399.	0.00				
7.0200	-0.09497	243829.	-17574.	-0.00810	0.00	3.85E+11
443.4951	5043.	0.00				
7.1100	-0.104	225148.	-17088.	-0.00810	0.00	3.85E+11
455.3443	4741.	0.00				
7.2000	-0.112	206999.	-16591.	-0.00810	0.00	3.85E+11
466.6664	4481.	0.00				
7.2900	-0.121	189393.	-16081.	-0.00810	0.00	3.85E+11
477.5351	4254.	0.00				
7.3800	-0.130	172345.	-15559.	-0.00810	0.00	3.85E+11
488.0097	4055.	0.00				
7.4700	-0.139	155866.	-15027.	-0.00810	0.00	3.85E+11
498.1385	3878.	0.00				
7.5600	-0.147	139967.	-14483.	-0.00810	0.00	3.85E+11
507.9616	3720.	0.00				
7.6500	-0.156	124662.	-13930.	-0.00810	0.00	3.85E+11
517.5125	3578.	0.00				
7.7400	-0.165	109960.	-13366.	-0.00810	0.00	3.85E+11
526.8195	3449.	0.00				
7.8300	-0.174	95872.	-12792.	-0.00810	0.00	3.85E+11
535.9068	3332.	0.00				
7.9200	-0.182	82410.	-12208.	-0.00810	0.00	3.85E+11
544.7952	3225.	0.00				
8.0100	-0.191	69583.	-11439.	-0.00810	0.00	3.85E+11
880.3687	4973.	0.00				
8.1000	-0.200	57782.	-10480.	-0.00810	0.00	3.85E+11

```
894.8430      4833.       0.00
    8.1900     -0.209     47026.     -9506.   -0.00810       0.00   3.85E+11
908.8489      4703.       0.00
    8.2800     -0.217     37330.     -8517.   -0.00810       0.00   3.85E+11
922.3999      4581.       0.00
    8.3700     -0.226     28709.     -7514.   -0.00810       0.00   3.85E+11
935.5073      4467.       0.00
    8.4600     -0.235     21180.     -6495.   -0.00810       0.00   3.85E+11
951.0206      4372.       0.00
    8.5500     -0.244     14760.     -5459.   -0.00810       0.00   3.85E+11
968.3225      4292.       0.00
    8.6400     -0.252      9469.     -4404.   -0.00810       0.00   3.85E+11
985.4928      4216.       0.00
    8.7300     -0.261      5328.     -3330.   -0.00810       0.00   3.85E+11
1003.      4146.       0.00
    8.8200     -0.270      2357.     -2238.   -0.00810       0.00   3.85E+11
1019.      4079.       0.00
    8.9100     -0.279   573.8857     -1128.   -0.00810       0.00   3.85E+11
1036.      4016.       0.00
    9.0000     -0.287       0.00       0.00   -0.00810       0.00   3.85E+11
1053.      1978.       0.00

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


Output Summary for Load Case No. 2:

Pile-head deflection             =     0.59342675 inches
Computed slope at pile head      =     -0.0082541 radians
Maximum bending moment           =        792625. inch-lbs
Maximum shear force              =        -21517. lbs
Depth of maximum bending moment  =     3.87000000 feet below pile head
Depth of maximum shear force     =     6.03000000 feet below pile head
Number of iterations             =             34
Number of zero deflection points =              1
Pile deflection at ground        =     0.49451551 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       Pile Head       Maximum       Maximum
   Length      Deflection      Moment         Shear
    feet         inches        ln-lbs          lbs
------------  ------------  ------------  ------------
    9.00000    0.59342675       792625.       -21517.
    8.55000    1.23827042       785154.       -23473.
    8.10000    4.58684977       782489.       -27024.
    7.65000   18.19249775       801927.       -33934.


--------------------------------------------------------------------------------
                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    Deflect.    Bending     Shear      Slope      Total     Bending   Soil
Res.  Soil Spr.  Distrib.
     X          y       Moment      Force        S       Stress    Stiffness      p
      Es*H     Lat. Load
   feet      inches     in-lbs       lbs      radians     psi*      lb-in^2
lb/inch    lb/inch    lb/inch
---------- ---------- ---------- ---------- ---------- ---------- ----------
---------- ---------- ----------
      0.00     0.5919    724800.      2250.   -0.00823       0.00   3.83E+11
0.00       0.00       0.00
   0.09000     0.5830    727264.      2250.   -0.00823       0.00   3.83E+11
0.00       0.00       0.00
    0.1800     0.5741    729728.      2250.   -0.00823       0.00   3.83E+11
0.00       0.00       0.00
    0.2700     0.5653    732191.      2250.   -0.00823       0.00   3.83E+11
0.00       0.00       0.00
    0.3600     0.5564    734655.      2250.   -0.00823       0.00   3.83E+11
0.00       0.00       0.00
    0.4500     0.5475    737119.      2250.   -0.00822       0.00   3.83E+11
0.00       0.00       0.00
    0.5400     0.5386    739583.      2250.   -0.00822       0.00   3.83E+11
0.00       0.00       0.00
    0.6300     0.5297    742046.      2250.   -0.00822       0.00   3.83E+11
0.00       0.00       0.00
```

```
    0.7200     0.5209    744510.      2250.   -0.00822       0.00   3.83E+11
0.00       0.00       0.00
    0.8100     0.5120    746974.      2250.   -0.00822       0.00   3.83E+11
0.00       0.00       0.00
    0.9000     0.5031    749437.      2250.   -0.00821       0.00   3.83E+11
0.00       0.00       0.00
    0.9900     0.4942    751901.      2250.   -0.00821       0.00   3.83E+11
0.00       0.00       0.00
    1.0800     0.4854    754365.      2217.   -0.00821       0.00   3.83E+11
-61.471   136.7755       0.00
    1.1700     0.4765    756757.      2150.   -0.00821       0.00   3.83E+11
-62.103   140.7531       0.00
    1.2600     0.4677    759076.      2083.   -0.00820       0.00   3.83E+11
-62.718   144.8411       0.00
    1.3500     0.4588    761323.      2015.   -0.00820       0.00   3.83E+11
-63.316   149.0450       0.00
    1.4400     0.4499    763495.      1946.   -0.00820       0.00   3.83E+11
-63.896   153.3704       0.00
    1.5300     0.4411    765593.      1877.   -0.00820       0.00   3.83E+11
-64.457   157.8238       0.00
    1.6200     0.4322    767616.      1807.   -0.00820       0.00   3.83E+11
-64.999   162.4118       0.00
    1.7100     0.4234    769563.      1736.   -0.00819       0.00   3.83E+11
-65.523   167.1415       0.00
    1.8000     0.4145    771434.      1665.   -0.00819       0.00   3.83E+11
-66.026   172.0207       0.00
    1.8900     0.4057    773227.      1594.   -0.00819       0.00   3.83E+11
-66.509   177.0578       0.00
    1.9800     0.3968    774943.      1522.   -0.00819       0.00   3.83E+11
-66.972   182.2617       0.00
    2.0700     0.3880    776581.      1449.   -0.00818       0.00   3.83E+11
-67.413   187.6423       0.00
    2.1600     0.3792    778140.      1376.   -0.00818       0.00   3.83E+11
-67.832   193.2101       0.00
    2.2500     0.3703    779620.      1302.   -0.00818       0.00   3.83E+11
-68.228   198.9766       0.00
    2.3400     0.3615    781020.      1229.   -0.00818       0.00   3.83E+11
-68.602   204.9541       0.00
    2.4300     0.3527    782341.      1154.   -0.00818       0.00   3.83E+11
-68.951   211.1564       0.00
    2.5200     0.3438    783581.      1080.   -0.00817       0.00   3.83E+11
-69.276   217.5982       0.00
    2.6100     0.3350    784740.      1005.   -0.00817       0.00   3.83E+11
-69.575   224.2959       0.00
    2.7000     0.3262    785818.    929.3869  -0.00817       0.00   3.83E+11
-69.848   231.2672       0.00
    2.7900     0.3174    786814.    853.8187  -0.00817       0.00   3.83E+11
-70.093   238.5317       0.00
    2.8800     0.3085    787729.    778.0005  -0.00817       0.00   3.83E+11
-70.311   246.1110       0.00
```

```
    2.9700     0.2997    788562.   701.9633   -0.00816       0.00   3.83E+11
-70.499   254.0291       0.00
    3.0600     0.2909    789312.   625.7392   -0.00816       0.00   3.83E+11
-70.657   262.3124       0.00
    3.1500     0.2821    789981.   549.3615   -0.00816       0.00   3.83E+11
-70.783   270.9905       0.00
    3.2400     0.2733    790566.   472.8651   -0.00816       0.00   3.83E+11
-70.877   280.0961       0.00
    3.3300     0.2645    791069.   396.2861   -0.00815       0.00   3.83E+11
-70.936   289.6662       0.00
    3.4200     0.2557    791489.   319.6621   -0.00815       0.00   3.83E+11
-70.960   299.7421       0.00
    3.5100     0.2469    791826.   243.0327   -0.00815       0.00   3.83E+11
-70.946   310.3705       0.00
    3.6000     0.2381    792081.   166.4389   -0.00815       0.00   3.83E+11
-70.894   321.6043       0.00
    3.6900     0.2293    792253.    89.9242   -0.00814       0.00   3.83E+11
-70.800   333.5038       0.00
    3.7800     0.2205    792342.    13.5340   -0.00814       0.00   3.83E+11
-70.663   346.1377       0.00
    3.8700     0.2117    792349.    -62.684   -0.00814       0.00   3.83E+11
-70.481   359.5854       0.00
    3.9600     0.2029    792273.   -138.679   -0.00814       0.00   3.83E+11
-70.251   373.9382       0.00
    4.0500     0.1941    792116.   -804.250   -0.00814       0.00   3.83E+11
-1162.      6467.       0.00
    4.1400     0.1853    790603.     -2056.   -0.00813       0.00   3.83E+11
-1155.      6733.       0.00
    4.2300     0.1765    787742.     -3300.   -0.00813       0.00   3.83E+11
-1148.      7022.       0.00
    4.3200     0.1678    783543.     -4535.   -0.00813       0.00   3.83E+11
-1140.      7336.       0.00
    4.4100     0.1590    778014.     -5761.   -0.00813       0.00   3.83E+11
-1131.      7680.       0.00
    4.5000     0.1502    771167.     -6976.   -0.00813       0.00   3.83E+11
-1121.      8058.       0.00
    4.5900     0.1414    763012.     -8181.   -0.00812       0.00   3.83E+11
-1110.      8476.       0.00
    4.6800     0.1327    753563.     -9373.   -0.00812       0.00   3.83E+11
-1098.      8941.       0.00
    4.7700     0.1239    742833.    -10552.   -0.00812       0.00   3.83E+11
-1085.      9462.       0.00
    4.8600     0.1151    730837.    -11717.   -0.00812       0.00   3.83E+11
-1071.     10050.       0.00
    4.9500     0.1064    717591.    -12865.   -0.00811       0.00   3.83E+11
-1056.     10721.       0.00
    5.0400    0.09759    703114.    -13997.   -0.00811       0.00   3.83E+11
-1039.     11496.       0.00
    5.1300    0.08883    687425.    -15108.   -0.00811       0.00   3.83E+11
-1020.     12400.       0.00
```

```
    5.2200    0.08008    670546.    -16199.   -0.00811       0.00   3.84E+11
-998.976     13473.       0.00
    5.3100    0.07132    652503.    -17265.   -0.00811       0.00   3.84E+11
-975.467     14772.       0.00
    5.4000    0.06257    633321.    -18304.   -0.00810       0.00   3.84E+11
-948.881     16380.       0.00
    5.4900    0.05381    613033.    -19312.   -0.00810       0.00   3.84E+11
-918.448     18433.       0.00
    5.5800    0.04506    591673.    -19993.   -0.00810       0.00   3.84E+11
-342.549      8210.       0.00
    5.6700    0.03631    569914.    -20354.   -0.00810       0.00   3.84E+11
-326.068      9698.       0.00
    5.7600    0.02757    547774.    -20695.   -0.00810       0.00   3.84E+11
-305.775     11980.       0.00
    5.8500    0.01882    525278.    -21011.   -0.00810       0.00   3.84E+11
-279.241     16023.       0.00
    5.9400    0.01008    502456.    -21292.   -0.00810       0.00   3.84E+11
-239.980     25719.       0.00
    6.0300    0.00134    479355.    -21500.   -0.00809       0.00   3.84E+11
-145.576    117747.       0.00
    6.1200   -0.00741    456083.    -21457.   -0.00809       0.00   3.84E+11
224.1531     32690.       0.00
    6.2100   -0.01614    433073.    -21189.   -0.00809       0.00   3.84E+11
273.6355     18305.       0.00
    6.3000   -0.02488    410382.    -20876.   -0.00809       0.00   3.84E+11
306.2726     13293.       0.00
    6.3900   -0.03362    388048.    -20531.   -0.00809       0.00   3.84E+11
331.6919     10655.       0.00
    6.4800   -0.04236    366101.    -20161.   -0.00809       0.00   3.84E+11
352.9847      9001.       0.00
    6.5700   -0.05109    344566.    -19770.   -0.00809       0.00   3.84E+11
371.5738      7855.       0.00
    6.6600   -0.05982    323464.    -19360.   -0.00809       0.00   3.84E+11
388.2419      7009.       0.00
    6.7500   -0.06856    302815.    -18932.   -0.00809       0.00   3.85E+11
403.4692      6356.       0.00
    6.8400   -0.07729    282637.    -18489.   -0.00808       0.00   3.85E+11
417.5730      5835.       0.00
    6.9300   -0.08602    262946.    -18031.   -0.00808       0.00   3.85E+11
430.7747      5409.       0.00
    7.0200   -0.09475    243757.    -17559.   -0.00808       0.00   3.85E+11
443.2353      5052.       0.00
    7.1100     -0.103    225085.    -17074.   -0.00808       0.00   3.85E+11
455.0759      4750.       0.00
    7.2000     -0.112    206944.    -16576.   -0.00808       0.00   3.85E+11
466.3898      4489.       0.00
    7.2900     -0.121    189347.    -16067.   -0.00808       0.00   3.85E+11
477.2508      4262.       0.00
    7.3800     -0.130    172307.    -15545.   -0.00808       0.00   3.85E+11
487.7180      4062.       0.00
```

```
    7.4700     -0.138    155835.    -15013.   -0.00808       0.00   3.85E+11
497.8397      3885.       0.00
    7.5600     -0.147    139944.    -14470.   -0.00808       0.00   3.85E+11
507.6560      3727.       0.00
    7.6500     -0.156    124646.    -13917.   -0.00808       0.00   3.85E+11
517.2003      3584.       0.00
    7.7400     -0.165    109950.    -13353.   -0.00808       0.00   3.85E+11
526.5009      3455.       0.00
    7.8300     -0.173     95869.    -12780.   -0.00808       0.00   3.85E+11
535.5820      3338.       0.00
    7.9200     -0.182     82412.    -12197.   -0.00808       0.00   3.85E+11
544.4644      3231.       0.00
    8.0100     -0.191     69591.    -11428.   -0.00808       0.00   3.85E+11
879.5568      4980.       0.00
    8.1000     -0.199     57795.    -10470.   -0.00808       0.00   3.85E+11
894.0093      4841.       0.00
    8.1900     -0.208     47042.     -9497.   -0.00808       0.00   3.85E+11
907.9934      4710.       0.00
    8.2800     -0.217     37348.     -8509.   -0.00808       0.00   3.85E+11
921.5226      4588.       0.00
    8.3700     -0.226     28729.     -7506.   -0.00808       0.00   3.85E+11
934.6083      4473.       0.00
    8.4600     -0.234     21201.     -6489.   -0.00808       0.00   3.85E+11
950.0971      4378.       0.00
    8.5500     -0.243     14780.     -5453.   -0.00808       0.00   3.85E+11
967.3724      4298.       0.00
    8.6400     -0.252      9488.     -4399.   -0.00808       0.00   3.85E+11
984.5157      4223.       0.00
    8.7300     -0.261      5344.     -3327.   -0.00808       0.00   3.85E+11
1002.      4152.       0.00
    8.8200     -0.269      2368.     -2236.   -0.00808       0.00   3.85E+11
1018.      4085.       0.00
    8.9100     -0.278   580.3313     -1127.   -0.00808       0.00   3.85E+11
1035.      4022.       0.00
    9.0000     -0.287       0.00       0.00   -0.00808       0.00   3.85E+11
1052.      1981.       0.00

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


Output Summary for Load Case No. 3:

Pile-head deflection              =     0.59192880 inches
Computed slope at pile head       =     -0.0082337 radians
Maximum bending moment            =        792349. inch-lbs
```

```
Maximum shear force                =       -21500. lbs
Depth of maximum bending moment    =     3.87000000 feet below pile head
Depth of maximum shear force       =     6.03000000 feet below pile head
Number of iterations               =             34
Number of zero deflection points   =              1
Pile deflection at ground          =     0.49326283 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	0.59192880	792349.	-21500.
8.55000	1.23129737	784632.	-23434.
8.10000	4.45554972	780656.	-26832.
7.65000	15.99718981	792259.	-32787.

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 Pile-head	Load Type	Load Pile-head	Axial Loading	Pile-head Deflection	Pile-head Rotation	Max Shear in Pile	Max Moment 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.    0.08290   -0.00127
-10715.    343093.
  2  V, lb      2250.  M, in-lb     724800.      4600.     0.5934   -0.00825
-21517.    792625.
  3  V, lb      2250.  M, in-lb     724800.      3800.     0.5919   -0.00823
-21500.    792349.


Maximum pile-head deflection = 0.5934267547 inches
Maximum pile-head rotation   = -0.0082540987 radians = -0.472925 deg.

The analysis ended normally.
```

LATERAL LOAD (LPILE) ANALYSES
NORTHBOUND PARKING AREA
LIGHT TOWER TP1-9 (B-008-0-26)

TP 26 NE Ohio Site 13 MAH-11 Vacant Rest Area - Northbound Parking Area
Light Tower TP1-9 (Boring B-008-0-26) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

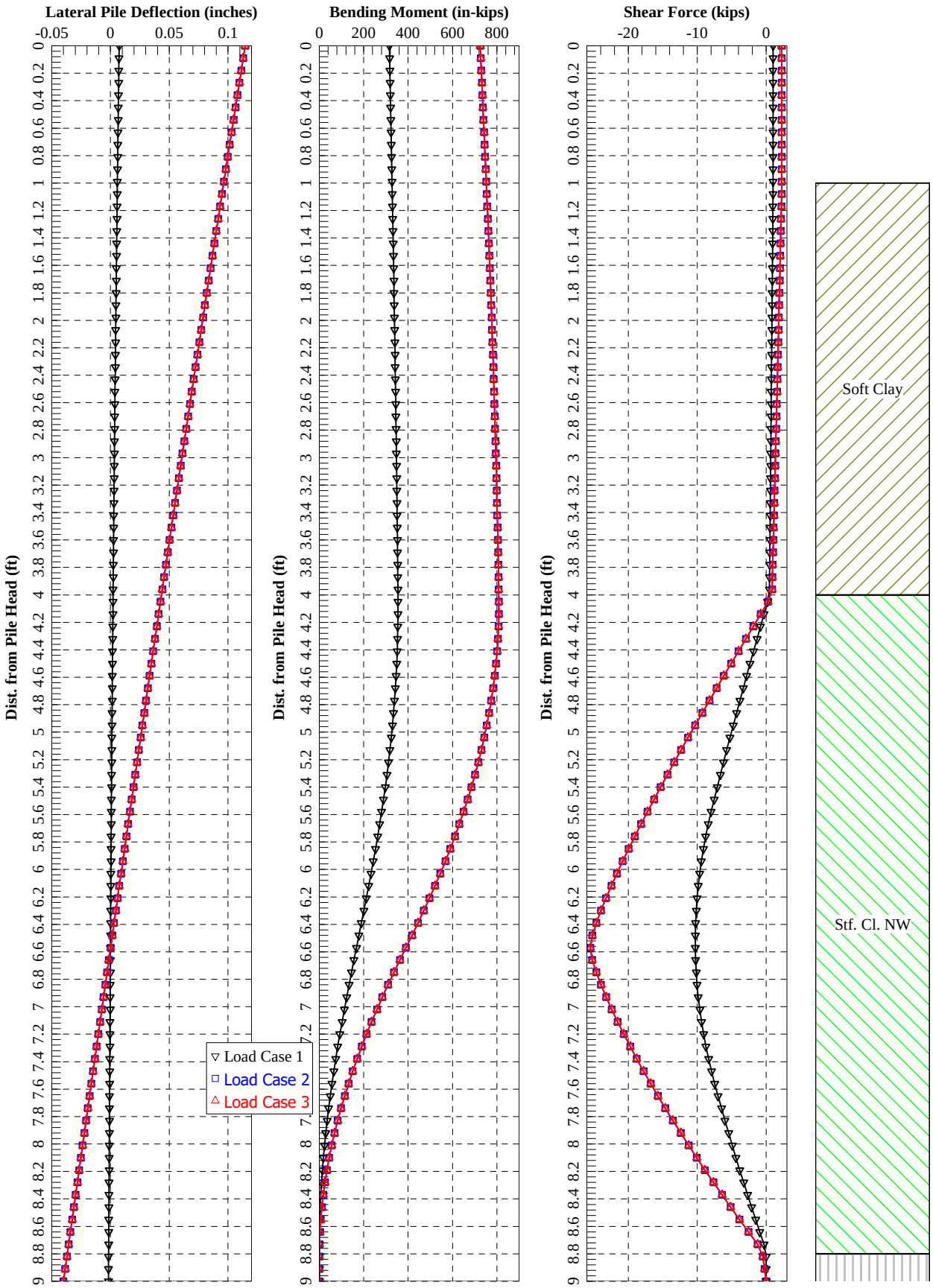


PLATE 92

```
================================================================================

                          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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                               All Rights Reserved

                 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
13_MAH-11 (2LMN)\Calcs\Light Towers\LPILE Files\

Name of input data file:
Tower TP1-9 (B-008-0-26).lp12d

Name of output report file:
Tower TP1-9 (B-008-0-26).lp12o

Name of plot output file:
Tower TP1-9 (B-008-0-26).lp12p

Name of runtime message file:
Tower TP1-9 (B-008-0-26).lp12r



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

Date: May 27, 2026 Time: 17:14:25

Problem Title

Project Name: TP 26 NE Ohio Site 13 MAH-11 NB Vacant Rest Area

Job Number: 24170232E

Client: ms consultants, inc.

Engineer: BKS

Description: Light Tower TP1-9 (B-008-0-26)

Program Options and Settings

Computational Options:
- Conventional Analysis

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

Analysis Control Options:

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

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

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

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



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

Number of pile sections defined                        =            1
Total length of pile                                   =        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.

            Depth Below           Pile
Point        Pile Head          Diameter
 No.            feet             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
```

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	=	8.800000 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 3 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer	=	8.800000 ft
Distance from top of pile to bottom of layer	=	11.300000 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 sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer	=	11.300000 ft
Distance from top of pile to bottom of layer	=	13.800000 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                      =    31.000000 deg.
   Friction angle at bottom of layer                   =    31.000000 deg.
   Subgrade k at top of layer                          =    60.000000 pci
   Subgrade k at bottom of layer                       =    60.000000 pci


Layer 5 is stiff clay without free water

   Distance from top of pile to top of layer           =    13.800000 ft
   Distance from top of pile to bottom of layer        =    20.800000 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


 (Depth of the lowest soil layer extends 11.800 ft below the pile tip)



--------------------------------------------------------------------------------
                        Summary of Input Soil Properties
--------------------------------------------------------------------------------

Layer         Soil Type          Layer      Effective    Cohesion     Angle of
 E50
 Num.           Name             Depth       Unit Wt.                 Friction
 or            kpy
          (p-y Curve Type)        ft           pcf          psf          deg.
 krm           pci
-----   -------------------   ----------   ----------   ----------   ----------
----------   ----------
  1             Soft              1.0000      98.0000     250.0000       --
0.02000       --
                Clay              4.0000      98.0000     250.0000       --
0.02000       --
  2           Stiff Clay          4.0000      60.0000        4500.       --
0.00400       --
          w/o Free Water          8.8000      60.0000        4500.       --
0.00400       --
  3             Sand              8.8000      60.0000       --          34.0000
 --           60.0000
          (Reese, et al.)        11.3000      60.0000       --          34.0000
 --           60.0000
  4             Sand             11.3000      63.0000       --          31.0000
 --           60.0000
          (Reese, et al.)        13.8000      63.0000       --          31.0000
```

```
 --          60.0000
  5         Stiff Clay           13.8000      58.0000        3750.       --
0.00500       --
          w/o Free Water         20.8000      58.0000        3750.       --
0.00500       --
```

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 No.	Load Type	Condition 1	Condition 2	Axial Thrust Force, lbs	Compute Top y vs. Pile Length	Run Analysis
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

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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 Fc Ac + Fy As	=	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	0.00000
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	0.00000	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	0.00000
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.
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 Stress Moment in-kip ksi	Run Msg	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				
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				

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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
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
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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
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
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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
 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
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 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
 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
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   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       Bending       Bending      Depth to      Max Comp      Max Tens
  Max Conc      Max Steel  Run
   Curvature      Moment       Stiffness      N Axis        Strain        Strain
   Stress        Stress    Msg
    rad/in.       in-kip        kip-in2         in           in/in         in/in
     ksi           ksi
------------ ------------ ------------ ------------ ------------ ------------
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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
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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
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
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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
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
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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
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
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 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
 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
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   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       Bending       Bending      Depth to      Max Comp      Max Tens
  Max Conc      Max Steel  Run
   Curvature      Moment       Stiffness      N Axis        Strain        Strain
   Stress        Stress    Msg
    rad/in.       in-kip        kip-in2         in           in/in         in/in
     ksi           ksi
------------ ------------ ------------ ------------ ------------ ------------
------------ ------------ ---
  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
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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
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
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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
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
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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
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
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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
 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
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 0.0002094        11592.     55366642.     9.3266817     0.0019528     -0.005585
3.9975630    -60.000000 CY
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3.9999044    -60.000000 CY
 0.0002194        11698.     53322120.     9.2675435     0.0020331     -0.005864
3.9971169    -60.000000 CY
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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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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           Axial Thrust        Nominal Mom. Cap.      Max. Comp.      Max.
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Tens. No.	kips	in-kip	Strain	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 Load No.	Resist. Factor	Nominal Ax. Thrust kips	Nominal Moment Cap in-kips	Ult. (Fac) Ax. Thrust kips	Ult. (Fac) Moment Cap in-kips	Bend. Stiff. at Ult Mom kip-in^2
1	0.65	3.800000	12169.	2.470000	7910.	91219895.
2	0.65	4.200000	12173.	2.730000	7913.	91253873.
3	0.65	4.600000	12177.	2.990000	7915.	91287886.
1	0.75	3.800000	12169.	2.850000	9127.	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.

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   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.	225350.
3	8.8000	13.0415	No	No	234209.	7795.
4	11.3000	10.3000	No	No	242004.	0.00
5	13.8000	12.8000	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 X	Deflect. y	Bending Moment	Shear Force	Slope S	Total Stress	Bending Stiffness	Soil Res. Es*H	Soil Spr. Lat. Load	Distrib. p
feet	inches	in-lbs	lbs	radians	psi*	lb-in^2	lb/inch	lb/inch	lb/inch
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      0.00    0.00732    315600.  1000.0000  -1.27E-04       0.00   3.84E+11
0.00       0.00       0.00
   0.09000    0.00718    316681.  1000.0000  -1.26E-04       0.00   3.84E+11
0.00       0.00       0.00
    0.1800    0.00704    317761.      1000.  -1.26E-04       0.00   3.84E+11
0.00       0.00       0.00
    0.2700    0.00691    318842.      1000.  -1.25E-04       0.00   3.84E+11
0.00       0.00       0.00
    0.3600    0.00677    319922.      1000.  -1.24E-04       0.00   3.84E+11
0.00       0.00       0.00
    0.4500    0.00664    321003.  1000.0000  -1.23E-04       0.00   3.84E+11
0.00       0.00       0.00
    0.5400    0.00651    322083.      1000.  -1.22E-04       0.00   3.84E+11
0.00       0.00       0.00
    0.6300    0.00638    323164.      1000.  -1.21E-04       0.00   3.84E+11
0.00       0.00       0.00
    0.7200    0.00625    324244.  1000.0000  -1.20E-04       0.00   3.84E+11
0.00       0.00       0.00
    0.8100    0.00612    325325.      1000.  -1.19E-04       0.00   3.84E+11
0.00       0.00       0.00
    0.9000    0.00599    326406.      1000.  -1.18E-04       0.00   3.84E+11
0.00       0.00       0.00
    0.9900    0.00586    327486.  1000.0000  -1.17E-04       0.00   3.84E+11
0.00       0.00       0.00
    1.0800    0.00574    328567.   992.4333  -1.17E-04       0.00   3.84E+11
-14.012      2638.       0.00
    1.1700    0.00561    329631.   977.2314  -1.16E-04       0.00   3.84E+11
-14.139      2722.       0.00
    1.2600    0.00549    330679.   961.8946  -1.15E-04       0.00   3.84E+11
-14.262      2808.       0.00
    1.3500    0.00536    331710.   946.4273  -1.14E-04       0.00   3.84E+11
-14.381      2896.       0.00
    1.4400    0.00524    332724.   930.8343  -1.13E-04       0.00   3.84E+11
-14.495      2987.       0.00
    1.5300    0.00512    333721.   915.1199  -1.12E-04       0.00   3.84E+11
-14.605      3081.       0.00
    1.6200    0.00500    334701.   899.2890  -1.11E-04       0.00   3.84E+11
-14.711      3178.       0.00
    1.7100    0.00488    335665.   883.3462  -1.10E-04       0.00   3.84E+11
-14.813      3278.       0.00
    1.8000    0.00476    336611.   867.2963  -1.09E-04       0.00   3.84E+11
-14.909      3382.       0.00
    1.8900    0.00464    337539.   851.1442  -1.08E-04       0.00   3.84E+11
-15.002      3489.       0.00
    1.9800    0.00453    338450.   834.8949  -1.07E-04       0.00   3.84E+11
-15.090      3599.       0.00
    2.0700    0.00441    339343.   818.5534  -1.06E-04       0.00   3.84E+11
-15.173      3713.       0.00
    2.1600    0.00430    340219.   802.1247  -1.05E-04       0.00   3.84E+11
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-15.251      3832.       0.00
    2.2500    0.00419    341077.   785.6141  -1.04E-04       0.00   3.84E+11
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    2.3400    0.00407    341917.   769.0269  -1.03E-04       0.00   3.84E+11
-15.393      4081.       0.00
    2.4300    0.00396    342739.   752.3684  -1.02E-04       0.00   3.84E+11
-15.456      4213.       0.00
    2.5200    0.00385    343543.   735.6442  -1.01E-04       0.00   3.84E+11
-15.515      4350.       0.00
    2.6100    0.00374    344329.   718.8597  -1.00E-04       0.00   3.84E+11
-15.568      4491.       0.00
    2.7000    0.00364    345097.   702.0208  -9.95E-05       0.00   3.84E+11
-15.615      4639.       0.00
    2.7900    0.00353    345846.   685.1333  -9.85E-05       0.00   3.84E+11
-15.658      4793.       0.00
    2.8800    0.00342    346577.   668.2030  -9.75E-05       0.00   3.84E+11
-15.695      4952.       0.00
    2.9700    0.00332    347290.   651.2361  -9.65E-05       0.00   3.84E+11
-15.726      5119.       0.00
    3.0600    0.00321    347985.   634.2388  -9.56E-05       0.00   3.84E+11
-15.751      5293.       0.00
    3.1500    0.00311    348661.   617.2174  -9.46E-05       0.00   3.84E+11
-15.770      5474.       0.00
    3.2400    0.00301    349319.   600.1785  -9.36E-05       0.00   3.84E+11
-15.783      5663.       0.00
    3.3300    0.00291    349958.   583.1288  -9.26E-05       0.00   3.84E+11
-15.790      5862.       0.00
    3.4200    0.00281    350579.   566.0751  -9.16E-05       0.00   3.84E+11
-15.791      6070.       0.00
    3.5100    0.00271    351182.   549.0245  -9.07E-05       0.00   3.84E+11
-15.784      6287.       0.00
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-15.771      6516.       0.00
    3.6900    0.00252    352332.   514.9622  -8.87E-05       0.00   3.84E+11
-15.751      6757.       0.00
    3.7800    0.00242    352879.   497.9657  -8.77E-05       0.00   3.84E+11
-15.724      7010.       0.00
    3.8700    0.00233    353408.   481.0028  -8.67E-05       0.00   3.84E+11
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    4.1400    0.00205    354347.  -315.932   -8.37E-05       0.00   3.84E+11
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    4.2300    0.00196    353730.  -827.025   -8.27E-05       0.00   3.84E+11
-471.882    259708.       0.00
    4.3200    0.00187    352562.    -1335.   -8.17E-05       0.00   3.84E+11
-468.995    270352.       0.00
    4.4100    0.00179    350847.    -1840.   -8.07E-05       0.00   3.84E+11
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5.3100	9.65E-04	304532.	-6656.	-7.14E-05	0.00	3.85E+11
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5.4000	8.89E-04	297099.	-7107.	-7.06E-05	0.00	3.85E+11
-414.334	503453.	0.00				
5.4900	8.13E-04	289182.	-7550.	-6.97E-05	0.00	3.85E+11
-407.242	540941.	0.00				
5.5800	7.38E-04	280791.	-7986.	-6.89E-05	0.00	3.85E+11
-399.508	584495.	0.00				
5.6700	6.64E-04	271934.	-8400.	-6.82E-05	0.00	3.85E+11
-367.587	597735.	0.00				
5.7600	5.91E-04	262647.	-8776.	-6.74E-05	0.00	3.85E+11
-328.683	600676.	0.00				
5.8500	5.19E-04	252978.	-9110.	-6.67E-05	0.00	3.85E+11
-289.824	603616.	0.00				
5.9400	4.47E-04	242970.	-9402.	-6.60E-05	0.00	3.85E+11
-251.001	606554.	0.00				
6.0300	3.76E-04	232670.	-9652.	-6.53E-05	0.00	3.85E+11
-212.204	609490.	0.00				
6.1200	3.06E-04	222122.	-9860.	-6.47E-05	0.00	3.85E+11
-173.420	612424.	0.00				
6.2100	2.36E-04	211372.	-10027.	-6.41E-05	0.00	3.85E+11
-134.638	615357.	0.00				
6.3000	1.67E-04	200465.	-10151.	-6.35E-05	0.00	3.85E+11
-95.845	618289.	0.00				
6.3900	9.91E-05	189446.	-10234.	-6.30E-05	0.00	3.85E+11
-57.028	621219.	0.00				
6.4800	3.14E-05	178360.	-10274.	-6.24E-05	0.00	3.85E+11
-18.172	624148.	0.00				
6.5700	-3.57E-05	167253.	-10273.	-6.20E-05	0.00	3.85E+11
20.7376	627076.	0.00				
6.6600	-1.02E-04	156171.	-10230.	-6.15E-05	0.00	3.85E+11

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59.7153    630002.       0.00
    6.7500  -1.69E-04    145158.    -10144.  -6.11E-05       0.00   3.85E+11
98.7765    632928.       0.00
    6.8400  -2.34E-04    134260.    -10016.  -6.07E-05       0.00   3.85E+11
137.9370    635852.       0.00
    6.9300  -3.00E-04    123524.     -9846.  -6.03E-05       0.00   3.85E+11
177.2126    638775.       0.00
    7.0200  -3.65E-04    112993.     -9633.  -6.00E-05       0.00   3.85E+11
216.6190    641698.       0.00
    7.1100  -4.29E-04    102716.     -9378.  -5.97E-05       0.00   3.85E+11
256.1721    644619.       0.00
    7.2000  -4.93E-04     92737.     -9080.  -5.94E-05       0.00   3.85E+11
295.8878    647539.       0.00
    7.2900  -5.58E-04     83104.     -8739.  -5.92E-05       0.00   3.85E+11
335.7814    650459.       0.00
    7.3800  -6.21E-04     73862.     -8355.  -5.89E-05       0.00   3.85E+11
375.8684    653378.       0.00
    7.4700  -6.85E-04     65059.     -7927.  -5.87E-05       0.00   3.85E+11
416.1635    656296.       0.00
    7.5600  -7.48E-04     56741.     -7462.  -5.86E-05       0.00   3.85E+11
444.2387    641253.       0.00
    7.6500  -8.11E-04     48941.     -6976.  -5.84E-05       0.00   3.85E+11
455.3436    606102.       0.00
    7.7400  -8.74E-04     41672.     -6479.  -5.83E-05       0.00   3.85E+11
465.9872    575559.       0.00
    7.8300  -9.37E-04     34947.     -5970.  -5.82E-05       0.00   3.85E+11
476.2327    548738.       0.00
    7.9200   -0.00100     28777.     -5450.  -5.81E-05       0.00   3.85E+11
486.1316    524971.       0.00
    8.0100   -0.00106     23174.     -4920.  -5.80E-05       0.00   3.85E+11
495.7261    503745.       0.00
    8.1000   -0.00113     18150.     -4380.  -5.80E-05       0.00   3.85E+11
505.0513    484657.       0.00
    8.1900   -0.00119     13714.     -3829.  -5.79E-05       0.00   3.85E+11
514.1368    467385.       0.00
    8.2800   -0.00125      9879.     -3269.  -5.79E-05       0.00   3.85E+11
523.0077    451671.       0.00
    8.3700   -0.00131      6653.     -2700.  -5.79E-05       0.00   3.85E+11
531.6853    437305.       0.00
    8.4600   -0.00138      4047.     -2121.  -5.79E-05       0.00   3.85E+11
540.1880    424114.       0.00
    8.5500   -0.00144      2072.     -1533.  -5.78E-05       0.00   3.85E+11
548.5318    411953.       0.00
    8.6400   -0.00150   736.2375   -936.325  -5.78E-05       0.00   3.85E+11
556.7304    400702.       0.00
    8.7300   -0.00156    49.9539   -330.701  -5.78E-05       0.00   3.85E+11
564.7959    390259.       0.00
    8.8200   -0.00163    22.4483    -20.769  -5.78E-05       0.00   3.85E+11
9.1521      6081.       0.00
    8.9100   -0.00169     5.6177    -10.636  -5.78E-05       0.00   3.85E+11
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9.6132      6151.       0.00
    9.0000   -0.00175       0.00       0.00  -5.78E-05       0.00   3.85E+11
10.0825      3110.       0.00

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


Output Summary for Load Case No. 1:

Pile-head deflection             =     0.00731689 inches
Computed slope at pile head      =     -0.0001274 radians
Maximum bending moment           =        354411. inch-lbs
Maximum shear force              =        -10274. lbs
Depth of maximum bending moment  =     4.05000000 feet below pile head
Depth of maximum shear force     =     6.48000000 feet below pile head
Number of iterations             =             14
Number of zero deflection points =              1
Pile deflection at ground        =     0.00584831 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       Pile Head       Maximum       Maximum
   Length      Deflection      Moment         Shear
    feet         inches        ln-lbs          lbs
------------  ------------  ------------  ------------
    9.00000    0.00731689       354411.       -10274.
    8.55000    0.00894435       353193.       -10937.
    8.10000    0.01806367       350595.       -12597.
    7.65000    0.04287887       346315.       -14146.
    7.20000    0.10957620       341129.       -15620.
    6.75000    0.35369400       337437.       -17510.
    6.30000    1.21896636       335710.       -19609.
    5.85000    6.13311046       341001.       -23087.
```

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--------------------------------------------------------------------------------
                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.
     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     0.1146    724800.      2250.   -0.00153       0.00   3.83E+11
0.00       0.00       0.00
   0.09000     0.1129    727238.      2250.   -0.00153       0.00   3.83E+11
0.00       0.00       0.00
    0.1800     0.1113    729675.      2250.   -0.00153       0.00   3.83E+11
0.00       0.00       0.00
    0.2700     0.1096    732113.      2250.   -0.00153       0.00   3.83E+11
0.00       0.00       0.00
    0.3600     0.1080    734550.      2250.   -0.00152       0.00   3.83E+11
0.00       0.00       0.00
    0.4500     0.1063    736988.      2250.   -0.00152       0.00   3.83E+11
0.00       0.00       0.00
    0.5400     0.1047    739425.      2250.   -0.00152       0.00   3.83E+11
0.00       0.00       0.00
    0.6300     0.1031    741863.      2250.   -0.00152       0.00   3.83E+11
0.00       0.00       0.00
    0.7200     0.1014    744301.      2250.   -0.00151       0.00   3.83E+11
0.00       0.00       0.00
    0.8100    0.09978    746738.      2250.   -0.00151       0.00   3.83E+11
0.00       0.00       0.00
    0.9000    0.09815    749176.      2250.   -0.00151       0.00   3.83E+11
0.00       0.00       0.00
    0.9900    0.09652    751613.      2250.   -0.00151       0.00   3.83E+11
0.00       0.00       0.00
    1.0800    0.09489    754051.      2231.   -0.00151       0.00   3.83E+11
-35.677   406.0745       0.00
    1.1700    0.09326    756446.      2192.   -0.00150       0.00   3.83E+11
-36.058   417.5639       0.00
    1.2600    0.09164    758800.      2153.   -0.00150       0.00   3.83E+11
-36.430   429.3448       0.00
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    1.3500    0.09002    761112.      2113.    -0.00150       0.00    3.83E+11
-36.793   441.4300       0.00
    1.4400    0.08840    763380.      2073.    -0.00150       0.00    3.83E+11
-37.146   453.8333       0.00
    1.5300    0.08678    765605.      2033.    -0.00150       0.00    3.83E+11
-37.491   466.5692       0.00
    1.6200    0.08517    767786.      1992.    -0.00149       0.00    3.83E+11
-37.825   479.6530       0.00
    1.7100    0.08356    769923.      1951.    -0.00149       0.00    3.83E+11
-38.150   493.1014       0.00
    1.8000    0.08195    772016.      1910.    -0.00149       0.00    3.83E+11
-38.464   506.9318       0.00
    1.8900    0.08034    774064.      1868.    -0.00149       0.00    3.83E+11
-38.768   521.1632       0.00
    1.9800    0.07873    776066.      1826.    -0.00148       0.00    3.83E+11
-39.062   535.8156       0.00
    2.0700    0.07713    778023.      1784.    -0.00148       0.00    3.83E+11
-39.345   550.9107       0.00
    2.1600    0.07553    779934.      1741.    -0.00148       0.00    3.83E+11
-39.617   566.4715       0.00
    2.2500    0.07393    781799.      1698.    -0.00148       0.00    3.83E+11
-39.878   582.5231       0.00
    2.3400    0.07234    783618.      1655.    -0.00148       0.00    3.83E+11
-40.127   599.0922       0.00
    2.4300    0.07075    785389.      1612.    -0.00147       0.00    3.83E+11
-40.365   616.2077       0.00
    2.5200    0.06916    787113.      1568.    -0.00147       0.00    3.83E+11
-40.590   633.9009       0.00
    2.6100    0.06757    788791.      1524.    -0.00147       0.00    3.83E+11
-40.803   652.2054       0.00
    2.7000    0.06598    790420.      1480.    -0.00147       0.00    3.83E+11
-41.003   671.1579       0.00
    2.7900    0.06440    792002.      1435.    -0.00146       0.00    3.83E+11
-41.191   690.7980       0.00
    2.8800    0.06282    793535.      1391.    -0.00146       0.00    3.83E+11
-41.364   711.1690       0.00
    2.9700    0.06124    795020.      1346.    -0.00146       0.00    3.83E+11
-41.524   732.3178       0.00
    3.0600    0.05966    796457.      1301.    -0.00146       0.00    3.83E+11
-41.669   754.2961       0.00
    3.1500    0.05809    797846.      1256.    -0.00146       0.00    3.83E+11
-41.800   777.1599       0.00
    3.2400    0.05652    799185.      1211.    -0.00145       0.00    3.83E+11
-41.915   800.9711       0.00
    3.3300    0.05495    800476.      1166.    -0.00145       0.00    3.83E+11
-42.015   825.7977       0.00
    3.4200    0.05338    801717.      1120.    -0.00145       0.00    3.83E+11
-42.098   851.7144       0.00
    3.5100    0.05182    802910.      1075.    -0.00145       0.00    3.83E+11
-42.165   878.8042       0.00
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    3.6000    0.05026    804053.      1029.   -0.00144       0.00   3.83E+11
-42.213   907.1590       0.00
    3.6900    0.04870    805147.   983.5157   -0.00144       0.00   3.83E+11
-42.244   936.8809       0.00
    3.7800    0.04714    806192.   937.8859   -0.00144       0.00   3.83E+11
-42.256   968.0840       0.00
    3.8700    0.04559    807187.   892.2541   -0.00144       0.00   3.83E+11
-42.248      1001.       0.00
    3.9600    0.04403    808133.   846.6423   -0.00144       0.00   3.83E+11
-42.219      1035.       0.00
    4.0500    0.04249    809030.   280.7564   -0.00143       0.00   3.83E+11
-1006.     25566.       0.00
    4.1400    0.04094    808754.   -803.382   -0.00143       0.00   3.83E+11
-1002.     26432.       0.00
    4.2300    0.03939    807309.     -1883.   -0.00143       0.00   3.83E+11
-997.803     27355.       0.00
    4.3200    0.03785    804700.     -2958.   -0.00143       0.00   3.83E+11
-993.272     28340.       0.00
    4.4100    0.03631    800933.     -4028.   -0.00142       0.00   3.83E+11
-988.329     29394.       0.00
    4.5000    0.03478    796013.     -5093.   -0.00142       0.00   3.83E+11
-982.948     30526.       0.00
    4.5900    0.03324    789946.     -6151.   -0.00142       0.00   3.83E+11
-977.100     31745.       0.00
    4.6800    0.03171    782740.     -7203.   -0.00142       0.00   3.83E+11
-970.753     33063.       0.00
    4.7700    0.03018    774401.     -8248.   -0.00142       0.00   3.83E+11
-963.869     34493.       0.00
    4.8600    0.02865    764938.     -9285.   -0.00141       0.00   3.83E+11
-956.406     36050.       0.00
    4.9500    0.02713    754360.    -10313.   -0.00141       0.00   3.83E+11
-948.314     37755.       0.00
    5.0400    0.02560    742675.    -11333.   -0.00141       0.00   3.83E+11
-939.538     39630.       0.00
    5.1300    0.02408    729895.    -12342.   -0.00141       0.00   3.83E+11
-930.011     41705.       0.00
    5.2200    0.02257    716030.    -13341.   -0.00140       0.00   3.83E+11
-919.656     44015.       0.00
    5.3100    0.02105    701092.    -14328.   -0.00140       0.00   3.83E+11
-908.381     46607.       0.00
    5.4000    0.01954    685094.    -15303.   -0.00140       0.00   3.83E+11
-896.077     49539.       0.00
    5.4900    0.01802    668052.    -16263.   -0.00140       0.00   3.84E+11
-882.608     52887.       0.00
    5.5800    0.01651    649979.    -17209.   -0.00140       0.00   3.84E+11
-867.811     56755.       0.00
    5.6700    0.01501    630895.    -18137.   -0.00140       0.00   3.84E+11
-851.477     61283.       0.00
    5.7600    0.01350    610818.    -19047.   -0.00139       0.00   3.84E+11
-833.339     66668.       0.00
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    5.8500    0.01200    589768.    -19936.   -0.00139       0.00   3.84E+11
-813.049     73201.       0.00
    5.9400    0.01049    567770.    -20802.   -0.00139       0.00   3.84E+11
-790.128     81322.       0.00
    6.0300    0.00899    544851.    -21641.   -0.00139       0.00   3.84E+11
-763.905     91743.       0.00
    6.1200    0.00749    521040.    -22449.   -0.00139       0.00   3.84E+11
-733.378    105695.       0.00
    6.2100    0.00600    496374.    -23222.   -0.00139       0.00   3.84E+11
-696.949    125528.       0.00
    6.3000    0.00450    470895.    -23950.   -0.00138       0.00   3.84E+11
-651.792    156414.       0.00
    6.3900    0.00301    444656.    -24622.   -0.00138       0.00   3.84E+11
-592.037    212706.       0.00
    6.4800    0.00151    417726.    -25212.   -0.00138       0.00   3.84E+11
-501.020    357649.       0.00
    6.5700   2.11E-05    390212.    -25489.   -0.00138       0.00   3.84E+11
-12.265    627076.       0.00
    6.6600   -0.00147    362684.    -25225.   -0.00138       0.00   3.84E+11
502.0192    368954.       0.00
    6.7500   -0.00296    335741.    -24629.   -0.00138       0.00   3.84E+11
600.8055    219284.       0.00
    6.8400   -0.00445    309499.    -23944.   -0.00138       0.00   3.84E+11
668.3142    162287.       0.00
    6.9300   -0.00594    284036.    -23193.   -0.00138       0.00   3.85E+11
721.6076    131309.       0.00
    7.0200   -0.00742    259415.    -22390.   -0.00138       0.00   3.85E+11
766.5747    111549.       0.00
    7.1100   -0.00891    235689.    -21540.   -0.00138       0.00   3.85E+11
806.0127     97723.       0.00
    7.2000   -0.01039    212902.    -20651.   -0.00137       0.00   3.85E+11
841.4885     87444.       0.00
    7.2900   -0.01188    191097.    -19724.   -0.00137       0.00   3.85E+11
873.9746     79469.       0.00
    7.3800   -0.01336    170311.    -18764.   -0.00137       0.00   3.85E+11
904.1195     73079.       0.00
    7.4700   -0.01485    150580.    -17772.   -0.00137       0.00   3.85E+11
932.3786     67832.       0.00
    7.5600   -0.01633    131936.    -16751.   -0.00137       0.00   3.85E+11
959.0845     63438.       0.00
    7.6500   -0.01781    114411.    -15702.   -0.00137       0.00   3.85E+11
984.4885     59697.       0.00
    7.7400   -0.01929     98035.    -14625.   -0.00137       0.00   3.85E+11
1009.     56471.       0.00
    7.8300   -0.02077     82835.    -13523.   -0.00137       0.00   3.85E+11
1032.     53656.       0.00
    7.9200   -0.02226     68838.    -12396.   -0.00137       0.00   3.85E+11
1055.     51176.       0.00
    8.0100   -0.02374     56072.    -11245.   -0.00137       0.00   3.85E+11
1076.     48974.       0.00
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    8.1000   -0.02522     44562.    -10071.   -0.00137       0.00   3.85E+11
1098.     47002.       0.00
    8.1900   -0.02670     34332.     -8875.   -0.00137       0.00   3.85E+11
1118.     45227.       0.00
    8.2800   -0.02818     25406.     -7657.   -0.00137       0.00   3.85E+11
1138.     43618.       0.00
    8.3700   -0.02966     17807.     -6417.   -0.00137       0.00   3.85E+11
1158.     42153.       0.00
    8.4600   -0.03114     11559.     -5156.   -0.00137       0.00   3.85E+11
1177.     40813.       0.00
    8.5500   -0.03262      6684.     -3875.   -0.00137       0.00   3.85E+11
1196.     39583.       0.00
    8.6400   -0.03411      3203.     -2573.   -0.00137       0.00   3.85E+11
1214.     38448.       0.00
    8.7300   -0.03559      1139.     -1252.   -0.00137       0.00   3.85E+11
1232.     37397.       0.00
    8.8200   -0.03707   511.3825   -474.311   -0.00137       0.00   3.85E+11
208.7044      6081.       0.00
    8.9100   -0.03855   127.6553   -243.059   -0.00137       0.00   3.85E+11
219.5404      6151.       0.00
    9.0000   -0.04003       0.00       0.00   -0.00137       0.00   3.85E+11
230.5683      3110.       0.00

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


Output Summary for Load Case No. 2:

Pile-head deflection             =     0.11457448 inches
Computed slope at pile head      =     -0.0015314 radians
Maximum bending moment           =        809030. inch-lbs
Maximum shear force              =        -25489. 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             =             32
Number of zero deflection points =              1
Pile deflection at ground        =     0.09633515 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       Pile Head       Maximum       Maximum
   Length      Deflection      Moment         Shear
    feet         inches        ln-lbs          lbs
------------  ------------  ------------  ------------
    9.00000    0.11457448       809030.       -25489.
    8.55000    0.16858686       804629.       -26567.
    8.10000    0.40413133       796390.       -29145.
    7.65000    1.02073948       787636.       -32082.
    7.20000    2.68673095       781091.       -35411.
    6.75000    9.69170804       786306.       -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    Deflect.    Bending     Shear      Slope      Total     Bending   Soil
Res.  Soil Spr.  Distrib.
     X          y       Moment      Force        S       Stress    Stiffness      p
      Es*H     Lat. Load
   feet      inches     in-lbs       lbs      radians     psi*      lb-in^2
lb/inch    lb/inch    lb/inch
---------- ---------- ---------- ---------- ---------- ---------- ----------
---------- ---------- ----------
      0.00     0.1145    724800.      2250.   -0.00153       0.00   3.83E+11
0.00       0.00       0.00
   0.09000     0.1129    727236.      2250.   -0.00153       0.00   3.83E+11
0.00       0.00       0.00
    0.1800     0.1112    729673.      2250.   -0.00153       0.00   3.83E+11
0.00       0.00       0.00
    0.2700     0.1096    732109.      2250.   -0.00152       0.00   3.83E+11
0.00       0.00       0.00
    0.3600     0.1079    734545.      2250.   -0.00152       0.00   3.83E+11
0.00       0.00       0.00
    0.4500     0.1063    736981.      2250.   -0.00152       0.00   3.83E+11
0.00       0.00       0.00
    0.5400     0.1046    739418.      2250.   -0.00152       0.00   3.83E+11
```

```
0.00       0.00       0.00
    0.6300     0.1030    741854.      2250.   -0.00152       0.00   3.83E+11
0.00       0.00       0.00
    0.7200     0.1014    744290.      2250.   -0.00151       0.00   3.83E+11
0.00       0.00       0.00
    0.8100    0.09973    746726.      2250.   -0.00151       0.00   3.83E+11
0.00       0.00       0.00
    0.9000    0.09810    749162.      2250.   -0.00151       0.00   3.83E+11
0.00       0.00       0.00
    0.9900    0.09647    751599.      2250.   -0.00151       0.00   3.83E+11
0.00       0.00       0.00
    1.0800    0.09484    754035.      2231.   -0.00151       0.00   3.83E+11
-35.672   406.2077       0.00
    1.1700    0.09322    756429.      2192.   -0.00150       0.00   3.83E+11
-36.052   417.7009       0.00
    1.2600    0.09159    758782.      2153.   -0.00150       0.00   3.83E+11
-36.424   429.4857       0.00
    1.3500    0.08997    761092.      2113.   -0.00150       0.00   3.83E+11
-36.787   441.5751       0.00
    1.4400    0.08835    763359.      2073.   -0.00150       0.00   3.83E+11
-37.140   453.9825       0.00
    1.5300    0.08674    765583.      2033.   -0.00150       0.00   3.83E+11
-37.484   466.7227       0.00
    1.6200    0.08513    767763.      1992.   -0.00149       0.00   3.83E+11
-37.819   479.8109       0.00
    1.7100    0.08351    769899.      1951.   -0.00149       0.00   3.83E+11
-38.143   493.2638       0.00
    1.8000    0.08191    771990.      1910.   -0.00149       0.00   3.83E+11
-38.458   507.0989       0.00
    1.8900    0.08030    774037.      1868.   -0.00149       0.00   3.83E+11
-38.762   521.3351       0.00
    1.9800    0.07870    776038.      1826.   -0.00148       0.00   3.83E+11
-39.056   535.9924       0.00
    2.0700    0.07709    777994.      1784.   -0.00148       0.00   3.83E+11
-39.339   551.0926       0.00
    2.1600    0.07549    779904.      1741.   -0.00148       0.00   3.83E+11
-39.611   566.6587       0.00
    2.2500    0.07390    781767.      1698.   -0.00148       0.00   3.83E+11
-39.871   582.7157       0.00
    2.3400    0.07230    783584.      1655.   -0.00148       0.00   3.83E+11
-40.121   599.2904       0.00
    2.4300    0.07071    785355.      1612.   -0.00147       0.00   3.83E+11
-40.358   616.4117       0.00
    2.5200    0.06912    787078.      1568.   -0.00147       0.00   3.83E+11
-40.584   634.1109       0.00
    2.6100    0.06753    788754.      1524.   -0.00147       0.00   3.83E+11
-40.796   652.4216       0.00
    2.7000    0.06595    790382.      1480.   -0.00147       0.00   3.83E+11
-40.997   671.3805       0.00
    2.7900    0.06437    791963.      1436.   -0.00146       0.00   3.83E+11
```

```
-41.184   691.0273       0.00
    2.8800    0.06279    793495.      1391.   -0.00146       0.00   3.83E+11
-41.357   711.4051       0.00
    2.9700    0.06121    794979.      1346.   -0.00146       0.00   3.83E+11
-41.517   732.5612       0.00
    3.0600    0.05963    796415.      1301.   -0.00146       0.00   3.83E+11
-41.662   754.5469       0.00
    3.1500    0.05806    797802.      1256.   -0.00146       0.00   3.83E+11
-41.793   777.4185       0.00
    3.2400    0.05649    799141.      1211.   -0.00145       0.00   3.83E+11
-41.908   801.2378       0.00
    3.3300    0.05492    800430.      1166.   -0.00145       0.00   3.83E+11
-42.008   826.0728       0.00
    3.4200    0.05336    801671.      1120.   -0.00145       0.00   3.83E+11
-42.091   851.9983       0.00
    3.5100    0.05179    802862.      1075.   -0.00145       0.00   3.83E+11
-42.158   879.0973       0.00
    3.6000    0.05023    804004.      1029.   -0.00144       0.00   3.83E+11
-42.206   907.4617       0.00
    3.6900    0.04867    805097.   983.7255   -0.00144       0.00   3.83E+11
-42.237   937.1937       0.00
    3.7800    0.04712    806141.   938.1033   -0.00144       0.00   3.83E+11
-42.249   968.4075       0.00
    3.8700    0.04556    807135.   892.4792   -0.00144       0.00   3.83E+11
-42.240      1001.       0.00
    3.9600    0.04401    808081.   846.8750   -0.00143       0.00   3.83E+11
-42.212      1036.       0.00
    4.0500    0.04246    808976.   281.0612   -0.00143       0.00   3.83E+11
-1006.     25575.       0.00
    4.1400    0.04092    808699.   -802.941   -0.00143       0.00   3.83E+11
-1002.     26442.       0.00
    4.2300    0.03937    807254.     -1883.   -0.00143       0.00   3.83E+11
-997.678     27365.       0.00
    4.3200    0.03783    804645.     -2958.   -0.00143       0.00   3.83E+11
-993.147     28350.       0.00
    4.4100    0.03629    800877.     -4028.   -0.00142       0.00   3.83E+11
-988.204     29405.       0.00
    4.5000    0.03476    795957.     -5092.   -0.00142       0.00   3.83E+11
-982.824     30538.       0.00
    4.5900    0.03322    789890.     -6150.   -0.00142       0.00   3.83E+11
-976.977     31757.       0.00
    4.6800    0.03169    782684.     -7202.   -0.00142       0.00   3.83E+11
-970.631     33076.       0.00
    4.7700    0.03016    774345.     -8247.   -0.00141       0.00   3.83E+11
-963.748     34506.       0.00
    4.8600    0.02864    764883.     -9283.   -0.00141       0.00   3.83E+11
-956.285     36064.       0.00
    4.9500    0.02711    754305.    -10312.   -0.00141       0.00   3.83E+11
-948.195     37769.       0.00
    5.0400    0.02559    742621.    -11331.   -0.00141       0.00   3.83E+11
```

```
-939.419     39645.       0.00
    5.1300    0.02407    729841.    -12341.   -0.00141       0.00   3.83E+11
-929.894     41721.       0.00
    5.2200    0.02255    715977.    -13339.   -0.00140       0.00   3.83E+11
-919.540     44032.       0.00
    5.3100    0.02104    701040.    -14326.   -0.00140       0.00   3.83E+11
-908.267     46625.       0.00
    5.4000    0.01953    685043.    -15301.   -0.00140       0.00   3.83E+11
-895.963     49558.       0.00
    5.4900    0.01801    668002.    -16261.   -0.00140       0.00   3.84E+11
-882.497     52907.       0.00
    5.5800    0.01651    649931.    -17206.   -0.00140       0.00   3.84E+11
-867.701     56777.       0.00
    5.6700    0.01500    630849.    -18134.   -0.00139       0.00   3.84E+11
-851.369     61306.       0.00
    5.7600    0.01349    610773.    -19044.   -0.00139       0.00   3.84E+11
-833.234     66694.       0.00
    5.8500    0.01199    589725.    -19933.   -0.00139       0.00   3.84E+11
-812.946     73229.       0.00
    5.9400    0.01049    567729.    -20799.   -0.00139       0.00   3.84E+11
-790.028     81353.       0.00
    6.0300    0.00899    544812.    -21638.   -0.00139       0.00   3.84E+11
-763.809     91778.       0.00
    6.1200    0.00749    521003.    -22446.   -0.00139       0.00   3.84E+11
-733.286    105735.       0.00
    6.2100    0.00599    496339.    -23218.   -0.00139       0.00   3.84E+11
-696.861    125575.       0.00
    6.3000    0.00450    470863.    -23947.   -0.00138       0.00   3.84E+11
-651.711    156472.       0.00
    6.3900    0.00300    444626.    -24618.   -0.00138       0.00   3.84E+11
-591.964    212785.       0.00
    6.4800    0.00151    417699.    -25208.   -0.00138       0.00   3.84E+11
-500.961    357777.       0.00
    6.5700   2.12E-05    390188.    -25485.   -0.00138       0.00   3.84E+11
-12.289    627076.       0.00
    6.6600   -0.00147    362662.    -25221.   -0.00138       0.00   3.84E+11
501.9506    369105.       0.00
    6.7500   -0.00296    335722.    -24626.   -0.00138       0.00   3.84E+11
600.7260    219371.       0.00
    6.8400   -0.00445    309482.    -23940.   -0.00138       0.00   3.85E+11
668.2267    162350.       0.00
    6.9300   -0.00593    284022.    -23190.   -0.00138       0.00   3.85E+11
721.5137    131360.       0.00
    7.0200   -0.00742    259403.    -22386.   -0.00138       0.00   3.85E+11
766.4752    111593.       0.00
    7.1100   -0.00890    235678.    -21537.   -0.00137       0.00   3.85E+11
805.9083     97761.       0.00
    7.2000   -0.01039    212894.    -20648.   -0.00137       0.00   3.85E+11
841.3796     87478.       0.00
    7.2900   -0.01187    191090.    -19722.   -0.00137       0.00   3.85E+11
```

```
873.8617     79499.       0.00
    7.3800   -0.01335    170306.    -18761.   -0.00137       0.00   3.85E+11
904.0028     73107.       0.00
    7.4700   -0.01484    150577.    -17770.   -0.00137       0.00   3.85E+11
932.2583     67858.       0.00
    7.5600   -0.01632    131935.    -16749.   -0.00137       0.00   3.85E+11
958.9608     63462.       0.00
    7.6500   -0.01780    114411.    -15699.   -0.00137       0.00   3.85E+11
984.3616     59720.       0.00
    7.7400   -0.01928     98035.    -14623.   -0.00137       0.00   3.85E+11
1009.     56493.       0.00
    7.8300   -0.02076     82836.    -13521.   -0.00137       0.00   3.85E+11
1032.     53677.       0.00
    7.9200   -0.02225     68841.    -12394.   -0.00137       0.00   3.85E+11
1055.     51196.       0.00
    8.0100   -0.02373     56076.    -11244.   -0.00137       0.00   3.85E+11
1076.     48992.       0.00
    8.1000   -0.02521     44566.    -10070.   -0.00137       0.00   3.85E+11
1097.     47020.       0.00
    8.1900   -0.02669     34336.     -8874.   -0.00137       0.00   3.85E+11
1118.     45244.       0.00
    8.2800   -0.02817     25410.     -7655.   -0.00137       0.00   3.85E+11
1138.     43635.       0.00
    8.3700   -0.02965     17812.     -6416.   -0.00137       0.00   3.85E+11
1158.     42170.       0.00
    8.4600   -0.03113     11563.     -5155.   -0.00137       0.00   3.85E+11
1177.     40829.       0.00
    8.5500   -0.03261      6688.     -3874.   -0.00137       0.00   3.85E+11
1196.     39598.       0.00
    8.6400   -0.03409      3207.     -2573.   -0.00137       0.00   3.85E+11
1214.     38462.       0.00
    8.7300   -0.03557      1142.     -1252.   -0.00137       0.00   3.85E+11
1232.     37412.       0.00
    8.8200   -0.03705   513.4877   -474.067   -0.00137       0.00   3.85E+11
208.5971      6081.       0.00
    8.9100   -0.03853   128.7738   -242.934   -0.00137       0.00   3.85E+11
219.4275      6151.       0.00
    9.0000   -0.04001       0.00       0.00   -0.00137       0.00   3.85E+11
230.4497      3110.       0.00

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


Output Summary for Load Case No. 3:
```

```
Pile-head deflection             =     0.11451858 inches
Computed slope at pile head      =     -0.0015307 radians
Maximum bending moment           =        808976. inch-lbs
Maximum shear force              =        -25485. 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             =             32
Number of zero deflection points =              1
Pile deflection at ground        =     0.09628780 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
   Length      Deflection      Moment         Shear
    feet         inches        ln-lbs          lbs
------------  ------------  ------------  ------------
    9.00000    0.11451858       808976.       -25485.
    8.55000    0.16845984       804550.       -26562.
    8.10000    0.40339273       796198.       -29131.
    7.65000    1.01601236       787199.       -32043.
    7.20000    2.65376715       780059.       -35296.
    6.75000    9.23764541       782379.       -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 Load                Load                  Axial    Pile-head  Pile-head  Max
Shear Max Moment
Case Type   Pile-head    Type     Pile-head   Loading  Deflection  Rotation    in
```

Pile No.	in Pile 1 Load 1		2 Load 2		lbs	inches	radians	lbs in-lbs
1	V, lb	1000.0000	M, in-lb	315600.	4200.	0.00732	-1.27E-04	-10274. 354411.
2	V, lb	2250.	M, in-lb	724800.	4600.	0.1146	-0.00153	-25489. 809030.
3	V, lb	2250.	M, in-lb	724800.	3800.	0.1145	-0.00153	-25485. 808976.

Maximum pile-head deflection = 0.1145744817 inches
Maximum pile-head rotation = -0.0015314378 radians = -0.087745 deg.

The analysis ended normally.

LATERAL LOAD (LPILE) ANALYSES
NORTHBOUND PARKING AREA
LIGHT TOWER TP2-1 (B-005-0-26)

TP 26 NE Ohio Site 13 MAH-11 Vacant Rest Area - Northbound Parking Area
Light Tower TP2-1 (Boring B-005-0-26) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

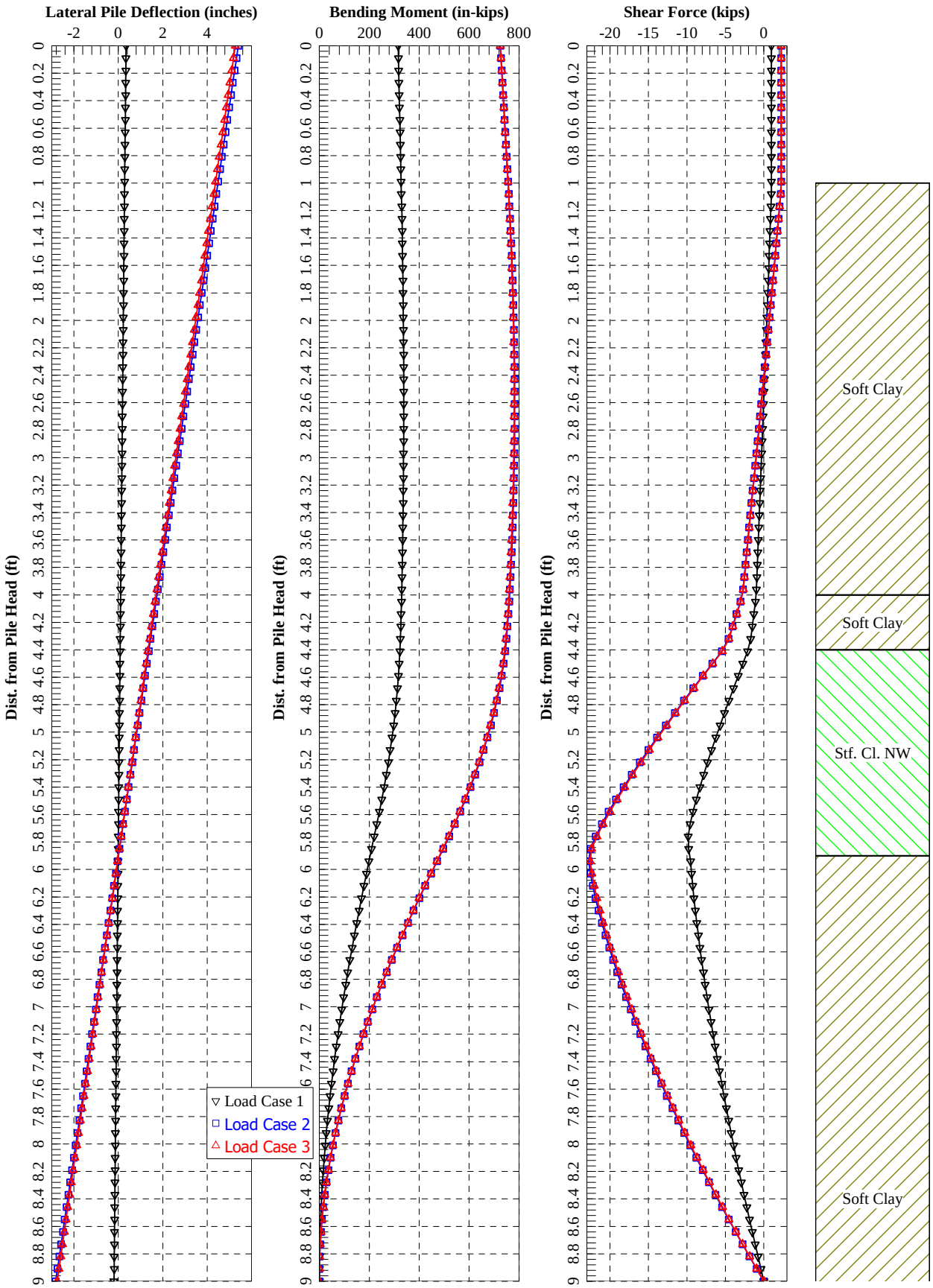


PLATE 136

```
================================================================================

                          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
                           © 1985-2024 by Ensoft, Inc.
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                                 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
13_MAH-11 (2LMN)\Calcs\Light Towers\LPILE Files\

Name of input data file:
Tower TP2-1 (B-005-0-26).lp12d

Name of output report file:
Tower TP2-1 (B-005-0-26).lp12o

Name of plot output file:
Tower TP2-1 (B-005-0-26).lp12p

Name of runtime message file:
Tower TP2-1 (B-005-0-26).lp12r



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

Date: May 27, 2026 Time: 17:39:52

Problem Title

Project Name: TP 26 NE Ohio Site 13 MAH-11 NB Vacant Rest Area

Job Number: 24170232E

Client: ms consultants, inc.

Engineer: BKS

Description: Light Tower TP2-1 (B-005-0-26)

Program Options and Settings

Computational Options:
- Conventional Analysis

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

Analysis Control Options:

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

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

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

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



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

Number of pile sections defined                        =            1
Total length of pile                                   =        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.

            Depth Below           Pile
Point        Pile Head          Diameter
 No.            feet             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
```

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	=	4.400000 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	=	950.000000 psf
Undrained cohesion at bottom of layer	=	950.000000 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	=	4.400000 ft
Distance from top of pile to bottom of layer	=	5.900000 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	=	2250. psf
Undrained cohesion at bottom of layer	=	2250. psf
Epsilon-50 at top of layer	=	0.005000
Epsilon-50 at bottom of layer	=	0.005000

Layer 4 is soft clay, p-y criteria by Matlock, 1970

Distance from top of pile to top of layer	=	5.900000 ft
Distance from top of pile to bottom of layer	=	10.900000 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                  =  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 5 is stiff clay without free water

   Distance from top of pile to top of layer           =    10.900000 ft
   Distance from top of pile to bottom of layer        =    13.400000 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                  =        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 6 is stiff clay without free water

   Distance from top of pile to top of layer           =    13.400000 ft
   Distance from top of pile to bottom of layer        =    15.900000 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                  =        1300. psf
   Undrained cohesion at bottom of layer               =        1300. psf
   Epsilon-50 at top of layer                          =     0.007000
   Epsilon-50 at bottom of layer                       =     0.007000


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

   Distance from top of pile to top of layer           =    15.900000 ft
   Distance from top of pile to bottom of layer        =    18.400000 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 8 is stiff clay without free water

   Distance from top of pile to top of layer           =    18.400000 ft
   Distance from top of pile to bottom of layer        =    25.400000 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                  =        1600. psf
```

```
   Undrained cohesion at bottom of layer               =        1600. psf
   Epsilon-50 at top of layer                          =     0.007000
   Epsilon-50 at bottom of layer                       =     0.007000


 (Depth of the lowest soil layer extends 16.400 ft below the pile tip)



--------------------------------------------------------------------------------
                        Summary of Input Soil Properties
--------------------------------------------------------------------------------

Layer         Soil Type          Layer      Effective    Cohesion     Angle of
 E50
 Num.           Name             Depth       Unit Wt.                  Friction
 or            kpy
          (p-y Curve Type)        ft           pcf          psf          deg.
 krm           pci
-----   -------------------   ----------   ----------   ----------   ----------
----------   ----------
  1             Soft              1.0000      98.0000     250.0000       --
0.02000       --
                Clay              4.0000      98.0000     250.0000       --
0.02000       --
  2             Soft              4.0000      56.0000     950.0000       --
0.01000       --
                Clay              4.4000      56.0000     950.0000       --
0.01000       --
  3           Stiff Clay          4.4000      63.0000        2250.       --
0.00500       --
          w/o Free Water          5.9000      63.0000        2250.       --
0.00500       --
  4             Soft              5.9000      58.0000    1000.0000       --
0.01000       --
                Clay             10.9000      58.0000    1000.0000       --
0.01000       --
  5           Stiff Clay         10.9000      63.0000        3750.       --
0.00500       --
          w/o Free Water         13.4000      63.0000        3750.       --
0.00500       --
  6           Stiff Clay         13.4000      58.0000        1300.       --
0.00700       --
          w/o Free Water         15.9000      58.0000        1300.       --
0.00700       --
  7             Sand             15.9000      60.0000       --          34.0000
 --           60.0000
          (Reese, et al.)        18.4000      60.0000       --          34.0000
 --           60.0000
  8           Stiff Clay         18.4000      60.0000        1600.       --
```

```
0.00700       --
          w/o Free Water         25.4000      60.0000        1600.       --
0.00700       --


---------------------------------------------------------------------------
                              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
Compute Top y     Run Analysis
 No.    Type            1                       2                 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.
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 Fc Ac + Fy As	=	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	0.00000
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	0.00000	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	0.00000
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.
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.	Bending Max Steel Stress Moment ksi	Bending Stiffness kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in	Run Msg ksi in-kip
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
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
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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
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
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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
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3.2276850    -60.000000 CY
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 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
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 0.0001294        10287.     79513660.    10.0756441     0.0013035     -0.003354
3.5871212    -60.000000 CY
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3.7414497    -60.000000 CY
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 0.0001794        11250.     62716278.     9.5601863     0.0017149     -0.004743
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   3.9984635    -60.000000 CY
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   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       Bending       Bending      Depth to      Max Comp      Max Tens
  Max Conc      Max Steel  Run
   Curvature      Moment       Stiffness      N Axis        Strain        Strain
   Stress        Stress    Msg
    rad/in.       in-kip        kip-in2         in           in/in         in/in
     ksi           ksi
------------- ------------- ------------- ------------- ------------- -------------
------------- ------------- ---
  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
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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
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
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0.00002688        2548.     94810571.    10.0576469     0.0002703     -0.000697
1.0466496    -16.992174 C
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1.0915372    -17.782007 C
0.00002938        2779.     94598964.    10.0593353     0.0002955     -0.000762
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0.00003063        2894.     94499555.    10.0607664     0.0003081     -0.000794
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0.00003438        3239.     94221082.    10.0669675     0.0003461     -0.000891
1.3115700    -21.724908 C
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   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       Bending       Bending      Depth to      Max Comp      Max Tens
  Max Conc      Max Steel  Run
   Curvature      Moment       Stiffness      N Axis        Strain        Strain
   Stress        Stress    Msg
    rad/in.       in-kip        kip-in2         in           in/in         in/in
     ksi           ksi
------------- ------------- ------------- ------------- ------------- -------------
------------- ------------- ---
  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
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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
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
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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
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
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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
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
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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
3.9998845    -60.000000 CY
 0.0002094        11592.     55366642.     9.3266817     0.0019528     -0.005585
3.9975630    -60.000000 CY
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   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
-------------------------------------------------------------------------------

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

 Load           Axial Thrust        Nominal Mom. Cap.      Max. Comp.      Max.
Tens.
  No.              kips                 in-kip               Strain
```

				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 Load No.	Resist. Factor	Nominal Ax. Thrust kips	Nominal Moment Cap in-kips	Ult. (Fac) Ax. Thrust kips	Ult. (Fac) Moment Cap in-kips	Bend. Stiff. at Ult Mom kip-in^2
1	0.65	3.800000	12169.	2.470000	7910.	91219895.
2	0.65	4.200000	12173.	2.730000	7913.	91253873.
3	0.65	4.600000	12177.	2.990000	7915.	91287886.
1	0.75	3.800000	12169.	2.850000	9127.	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	8672.
2	4.0000	0.9718	Yes	No	8672.	3781.
3	4.4000	0.6024	No	No	12453.	33125.
4	5.9000	4.2943	No	No	45578.	41248.
5	10.9000	9.9000	No	No	86827.	0.00
6	13.4000	12.4000	No	No	0.00	0.00
7	15.9000	14.9000	No	No	0.00	0.00
8	18.4000	17.4000	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 X	Deflect. y	Bending Moment	Shear Force	Slope S	Total Stress	Bending Stiffness	Soil Res. Es*H	Soil Spr. p Distrib. Lat. Load
feet	inches	in-lbs	lbs	radians	psi*	lb-in^2	lb/inch	lb/inch lb/inch

0.00	0.3459	315600.	1000.	-0.00502	0.00	3.84E+11	0.00	0.00	0.00		
0.09000	0.3405	316703.	1000.	-0.00502	0.00	3.84E+11	0.00	0.00	0.00		
0.1800	0.3350	317806.	1000.0000	-0.00502	0.00	3.84E+11	0.00	0.00	0.00		
0.2700	0.3296	318908.	1000.0000	-0.00502	0.00	3.84E+11	0.00	0.00	0.00		
0.3600	0.3242	320011.	1000.	-0.00502	0.00	3.84E+11	0.00	0.00	0.00		
0.4500	0.3188	321114.	1000.	-0.00502	0.00	3.84E+11	0.00	0.00	0.00		
0.5400	0.3133	322217.	1000.0000	-0.00502	0.00	3.84E+11	0.00	0.00	0.00		
0.6300	0.3079	323319.	1000.0000	-0.00502	0.00	3.84E+11	0.00	0.00	0.00		
0.7200	0.3025	324422.	1000.	-0.00502	0.00	3.84E+11	0.00	0.00	0.00		
0.8100	0.2971	325525.	1000.	-0.00502	0.00	3.84E+11	0.00	0.00	0.00		
0.9000	0.2917	326628.	1000.	-0.00502	0.00	3.84E+11	0.00	0.00	0.00		
0.9900	0.2862	327730.	1000.	-0.00501	0.00	3.84E+11	0.00	0.00	0.00		
1.0800	0.2808	328833.	972.3402	-0.00501	0.00	3.84E+11	-51.222	196.9873	0.00		
1.1700	0.2754	329876.	916.7457	-0.00501	0.00	3.84E+11	-51.731	202.8563	0.00		
1.2600	0.2700	330859.	860.6096	-0.00501	0.00	3.84E+11	-52.225	208.8983	0.00		
1.3500	0.2646	331781.	803.9489	-0.00501	0.00	3.84E+11	-52.703	215.1225	0.00		
1.4400	0.2592	332641.	746.7808	-0.00501	0.00	3.84E+11	-53.164	221.5385	0.00		
1.5300	0.2538	333439.	689.1229	-0.00501	0.00	3.84E+11	-53.610	228.1568	0.00		
1.6200	0.2484	334175.	630.9933	-0.00501	0.00	3.84E+11	-54.038	234.9887	0.00		
1.7100	0.2429	334847.	572.4106	-0.00501	0.00	3.84E+11	-54.449	242.0465	0.00		
1.8000	0.2375	335457.	513.3940	-0.00501	0.00	3.84E+11	-54.842	249.3432	0.00		
1.8900	0.2321	336002.	453.9628	-0.00501	0.00	3.84E+11	-55.216	256.8934	0.00		
1.9800	0.2267	336483.	394.1373	-0.00500	0.00	3.84E+11	-55.572	264.7123	0.00		
2.0700	0.2213	336899.	333.9382	-0.00500	0.00	3.84E+11	-55.908	272.8170	0.00		

```
    2.1600     0.2159    337249.   273.3867   -0.00500       0.00   3.84E+11
-56.224   281.2259       0.00
    2.2500     0.2105    337534.   212.5050   -0.00500       0.00   3.84E+11
-56.520   289.9590       0.00
    2.3400     0.2051    337754.   151.3156   -0.00500       0.00   3.84E+11
-56.794   299.0384       0.00
    2.4300     0.1997    337907.    89.8420   -0.00500       0.00   3.84E+11
-57.046   308.4881       0.00
    2.5200     0.1943    337993.    28.1083   -0.00500       0.00   3.84E+11
-57.275   318.3348       0.00
    2.6100     0.1889    338013.    -33.860   -0.00500       0.00   3.84E+11
-57.481   328.6077       0.00
    2.7000     0.1835    337965.    -96.038   -0.00500       0.00   3.84E+11
-57.663   339.3393       0.00
    2.7900     0.1781    337851.   -158.398   -0.00500       0.00   3.84E+11
-57.819   350.5653       0.00
    2.8800     0.1727    337669.   -220.912   -0.00500       0.00   3.84E+11
-57.948   362.3258       0.00
    2.9700     0.1673    337419.   -283.551   -0.00499       0.00   3.84E+11
-58.050   374.6653       0.00
    3.0600     0.1619    337101.   -346.285   -0.00499       0.00   3.84E+11
-58.124   387.6338       0.00
    3.1500     0.1565    336716.   -409.082   -0.00499       0.00   3.84E+11
-58.168   401.2873       0.00
    3.2400     0.1512    336263.   -471.910   -0.00499       0.00   3.84E+11
-58.180   415.6893       0.00
    3.3300     0.1458    335742.   -534.734   -0.00499       0.00   3.84E+11
-58.160   430.9114       0.00
    3.4200     0.1404    335153.   -597.517   -0.00499       0.00   3.84E+11
-58.106   447.0353       0.00
    3.5100     0.1350    334497.   -660.223   -0.00499       0.00   3.84E+11
-58.015   464.1544       0.00
    3.6000     0.1296    333772.   -722.809   -0.00499       0.00   3.84E+11
-57.887   482.3763       0.00
    3.6900     0.1242    332981.   -785.236   -0.00499       0.00   3.84E+11
-57.718   501.8251       0.00
    3.7800     0.1188    332122.   -847.457   -0.00499       0.00   3.84E+11
-57.506   522.6452       0.00
    3.8700     0.1134    331195.   -909.425   -0.00498       0.00   3.84E+11
-57.250   545.0060       0.00
    3.9600     0.1081    330202.   -971.090   -0.00498       0.00   3.84E+11
-56.945   569.1070       0.00
    4.0500     0.1027    329143.     -1104.   -0.00498       0.00   3.84E+11
-188.625      1984.       0.00
    4.1400    0.09730    327864.     -1306.   -0.00498       0.00   3.84E+11
-186.562      2071.       0.00
    4.2300    0.09192    326367.     -1507.   -0.00498       0.00   3.84E+11
-184.318      2166.       0.00
    4.3200    0.08654    324655.     -1704.   -0.00498       0.00   3.84E+11
-181.877      2270.       0.00
```

4.4100	0.08116	322731.	-2112.	-0.00498	0.00	3.84E+11
-573.213	7627.	0.00				
4.5000	0.07579	320138.	-2728.	-0.00498	0.00	3.84E+11
-566.803	8077.	0.00				
4.5900	0.07041	316884.	-3336.	-0.00498	0.00	3.84E+11
-559.732	8585.	0.00				
4.6800	0.06504	312977.	-3936.	-0.00498	0.00	3.84E+11
-551.917	9165.	0.00				
4.7700	0.05966	308427.	-4528.	-0.00498	0.00	3.85E+11
-543.257	9834.	0.00				
4.8600	0.05429	303242.	-5109.	-0.00497	0.00	3.85E+11
-533.624	10616.	0.00				
4.9500	0.04892	297436.	-5680.	-0.00497	0.00	3.85E+11
-522.852	11544.	0.00				
5.0400	0.04354	291019.	-6238.	-0.00497	0.00	3.85E+11
-510.727	12667.	0.00				
5.1300	0.03817	284007.	-6782.	-0.00497	0.00	3.85E+11
-496.957	14060.	0.00				
5.2200	0.03280	276415.	-7310.	-0.00497	0.00	3.85E+11
-481.131	15840.	0.00				
5.3100	0.02743	268262.	-7820.	-0.00497	0.00	3.85E+11
-462.643	18212.	0.00				
5.4000	0.02207	259570.	-8308.	-0.00497	0.00	3.85E+11
-440.530	21561.	0.00				
5.4900	0.01670	250363.	-8768.	-0.00497	0.00	3.85E+11
-413.116	26717.	0.00				
5.5800	0.01133	240675.	-9195.	-0.00497	0.00	3.85E+11
-376.983	35926.	0.00				
5.6700	0.00597	230547.	-9573.	-0.00497	0.00	3.85E+11
-322.851	58434.	0.00				
5.7600	6.02E-04	220042.	-9834.	-0.00497	0.00	3.85E+11
-159.911	286937.	0.00				
5.8500	-0.00476	209351.	-9754.	-0.00497	0.00	3.85E+11
308.4039	69936.	0.00				
5.9400	-0.01013	199020.	-9525.	-0.00497	0.00	3.85E+11
114.4203	12203.	0.00				
6.0300	-0.01549	188822.	-9392.	-0.00497	0.00	3.85E+11
132.4970	9238.	0.00				
6.1200	-0.02085	178778.	-9241.	-0.00497	0.00	3.85E+11
147.0299	7615.	0.00				
6.2100	-0.02621	168906.	-9075.	-0.00496	0.00	3.85E+11
159.4722	6570.	0.00				
6.3000	-0.03158	159220.	-8897.	-0.00496	0.00	3.85E+11
170.5151	5832.	0.00				
6.3900	-0.03694	149733.	-8708.	-0.00496	0.00	3.85E+11
180.5479	5279.	0.00				
6.4800	-0.04230	140457.	-8508.	-0.00496	0.00	3.85E+11
189.8134	4847.	0.00				
6.5700	-0.04766	131402.	-8298.	-0.00496	0.00	3.85E+11
198.4746	4498.	0.00				

6.6600	-0.05302	122578.	-8079.	-0.00496	0.00	3.85E+11
206.6464	4209.	0.00				
6.7500	-0.05838	113996.	-7852.	-0.00496	0.00	3.85E+11
214.4135	3967.	0.00				
6.8400	-0.06374	105663.	-7616.	-0.00496	0.00	3.85E+11
221.8399	3759.	0.00				
6.9300	-0.06910	97590.	-7373.	-0.00496	0.00	3.85E+11
228.9755	3579.	0.00				
7.0200	-0.07445	89783.	-7122.	-0.00496	0.00	3.85E+11
235.8598	3421.	0.00				
7.1100	-0.07981	82252.	-6863.	-0.00496	0.00	3.85E+11
242.5249	3282.	0.00				
7.2000	-0.08517	75003.	-6598.	-0.00496	0.00	3.85E+11
248.9971	3157.	0.00				
7.2900	-0.09053	68045.	-6326.	-0.00496	0.00	3.85E+11
255.2983	3046.	0.00				
7.3800	-0.09589	61384.	-6047.	-0.00496	0.00	3.85E+11
261.4468	2945.	0.00				
7.4700	-0.101	55029.	-5761.	-0.00496	0.00	3.85E+11
267.4583	2853.	0.00				
7.5600	-0.107	48985.	-5469.	-0.00496	0.00	3.85E+11
273.3462	2769.	0.00				
7.6500	-0.112	43261.	-5171.	-0.00496	0.00	3.85E+11
279.1220	2693.	0.00				
7.7400	-0.117	37862.	-4866.	-0.00496	0.00	3.85E+11
284.7960	2622.	0.00				
7.8300	-0.123	32795.	-4556.	-0.00496	0.00	3.85E+11
290.3768	2556.	0.00				
7.9200	-0.128	28066.	-4239.	-0.00496	0.00	3.85E+11
295.8724	2496.	0.00				
8.0100	-0.133	23683.	-3917.	-0.00496	0.00	3.85E+11
301.2896	2440.	0.00				
8.1000	-0.139	19652.	-3588.	-0.00496	0.00	3.85E+11
306.6344	2387.	0.00				
8.1900	-0.144	15978.	-3254.	-0.00496	0.00	3.85E+11
311.9125	2338.	0.00				
8.2800	-0.149	12667.	-2915.	-0.00496	0.00	3.85E+11
317.1288	2292.	0.00				
8.3700	-0.155	9727.	-2569.	-0.00496	0.00	3.85E+11
322.2877	2248.	0.00				
8.4600	-0.160	7163.	-2218.	-0.00496	0.00	3.85E+11
327.3931	2208.	0.00				
8.5500	-0.166	4980.	-1862.	-0.00496	0.00	3.85E+11
332.4489	2169.	0.00				
8.6400	-0.171	3185.	-1500.	-0.00496	0.00	3.85E+11
337.4583	2133.	0.00				
8.7300	-0.176	1784.	-1133.	-0.00496	0.00	3.85E+11
342.4242	2098.	0.00				
8.8200	-0.182	782.3642	-760.812	-0.00496	0.00	3.85E+11
347.3496	2066.	0.00				

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    8.9100     -0.187   185.7575   -383.036   -0.00496       0.00   3.85E+11
352.2369      2035.       0.00
    9.0000     -0.192     0.00       0.00   -0.00496       0.00   3.85E+11
357.0885      1003.       0.00

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


Output Summary for Load Case No. 1:

Pile-head deflection             =     0.34588100 inches
Computed slope at pile head      =     -0.0050249 radians
Maximum bending moment           =        338013. inch-lbs
Maximum shear force              =         -9834. lbs
Depth of maximum bending moment  =     2.61000000 feet below pile head
Depth of maximum shear force     =     5.76000000 feet below pile head
Number of iterations             =             32
Number of zero deflection points =              1
Pile deflection at ground        =     0.28564245 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       Pile Head       Maximum       Maximum
   Length      Deflection      Moment         Shear
    feet         inches        ln-lbs          lbs
------------  ------------  ------------  ------------
    9.00000    0.34588100       338013.        -9834.
    8.55000    0.63404534       336210.       -10810.
    8.10000    1.25566007       335931.       -11823.
    7.65000    2.49135270       336657.       -13313.
    7.20000    5.32684164       338475.       -14724.
    6.75000   13.98027464       349172.       -17563.
```

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 X	Deflect. y	Bending Moment	Shear Force	Slope S	Total Stress	Bending Stiffness	Soil Res. Es*H	Soil Spr. p Distrib. Lat. Load
feet	inches	in-lbs	lbs	radians	psi*	lb-in^2	lb/inch	lb/inch
0.00	5.4014	724800.	2250.	-0.07628	0.00	3.83E+11	0.00	0.00
0.09000	5.3190	727609.	2250.	-0.07627	0.00	3.83E+11	0.00	0.00
0.1800	5.2366	730418.	2250.	-0.07627	0.00	3.83E+11	0.00	0.00
0.2700	5.1543	733227.	2250.	-0.07627	0.00	3.83E+11	0.00	0.00
0.3600	5.0719	736036.	2250.	-0.07627	0.00	3.83E+11	0.00	0.00
0.4500	4.9895	738845.	2250.	-0.07627	0.00	3.83E+11	0.00	0.00
0.5400	4.9072	741653.	2250.	-0.07626	0.00	3.83E+11	0.00	0.00
0.6300	4.8248	744462.	2250.	-0.07626	0.00	3.83E+11	0.00	0.00
0.7200	4.7424	747271.	2250.	-0.07626	0.00	3.83E+11	0.00	0.00
0.8100	4.6601	750080.	2250.	-0.07626	0.00	3.83E+11	0.00	0.00
0.9000	4.5777	752889.	2250.	-0.07625	0.00	3.83E+11	0.00	0.00
0.9900	4.4954	755698.	2250.	-0.07625	0.00	3.83E+11	0.00	0.00
1.0800	4.4130	758507.	2181.	-0.07625	0.00	3.83E+11	-128.297	31.3981 0.00
1.1700	4.3307	761166.	2041.	-0.07625	0.00	3.83E+11	-129.599	32.3199 0.00
1.2600	4.2483	763674.	1901.	-0.07625	0.00	3.83E+11	-130.864	33.2681 0.00
1.3500	4.1660	766029.	1759.	-0.07624	0.00	3.83E+11		

-132.092	34.2438	0.00				
1.4400	4.0836	768230.	1616.	-0.07624	0.00	3.83E+11
-133.280	35.2487	0.00				
1.5300	4.0013	770276.	1471.	-0.07624	0.00	3.83E+11
-134.429	36.2841	0.00				
1.6200	3.9190	772165.	1325.	-0.07624	0.00	3.83E+11
-135.537	37.3518	0.00				
1.7100	3.8366	773896.	1178.	-0.07624	0.00	3.83E+11
-136.603	38.4535	0.00				
1.8000	3.7543	775467.	1030.	-0.07623	0.00	3.83E+11
-137.626	39.5911	0.00				
1.8900	3.6720	776878.	880.9600	-0.07623	0.00	3.83E+11
-138.606	40.7669	0.00				
1.9800	3.5896	778128.	730.7614	-0.07623	0.00	3.83E+11
-139.540	41.9829	0.00				
2.0700	3.5073	779214.	579.5789	-0.07623	0.00	3.83E+11
-140.427	43.2416	0.00				
2.1600	3.4250	780137.	427.4643	-0.07622	0.00	3.83E+11
-141.267	44.5457	0.00				
2.2500	3.3427	780895.	274.4696	-0.07622	0.00	3.83E+11
-142.057	45.8981	0.00				
2.3400	3.2603	781487.	120.6487	-0.07622	0.00	3.83E+11
-142.797	47.3019	0.00				
2.4300	3.1780	781913.	-33.942	-0.07622	0.00	3.83E+11
-143.484	48.7606	0.00				
2.5200	3.0957	782171.	-189.247	-0.07622	0.00	3.83E+11
-144.117	50.2779	0.00				
2.6100	3.0134	782261.	-345.204	-0.07621	0.00	3.83E+11
-144.693	51.8581	0.00				
2.7000	2.9311	782183.	-501.754	-0.07621	0.00	3.83E+11
-145.212	53.5055	0.00				
2.7900	2.8488	781935.	-658.831	-0.07621	0.00	3.83E+11
-145.671	55.2254	0.00				
2.8800	2.7665	781517.	-816.370	-0.07621	0.00	3.83E+11
-146.068	57.0232	0.00				
2.9700	2.6842	780929.	-974.303	-0.07620	0.00	3.83E+11
-146.400	58.9053	0.00				
3.0600	2.6019	780170.	-1133.	-0.07620	0.00	3.83E+11
-146.665	60.8784	0.00				
3.1500	2.5196	779240.	-1291.	-0.07620	0.00	3.83E+11
-146.859	62.9503	0.00				
3.2400	2.4373	778138.	-1450.	-0.07620	0.00	3.83E+11
-146.981	65.1298	0.00				
3.3300	2.3550	776865.	-1608.	-0.07620	0.00	3.83E+11
-147.026	67.4264	0.00				
3.4200	2.2727	775421.	-1767.	-0.07619	0.00	3.83E+11
-146.992	69.8514	0.00				
3.5100	2.1904	773805.	-1926.	-0.07619	0.00	3.83E+11
-146.873	72.4171	0.00				
3.6000	2.1081	772018.	-2084.	-0.07619	0.00	3.83E+11

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-146.667    75.1380       0.00
    3.6900     2.0258    770059.     -2243.   -0.07619       0.00   3.83E+11
-146.368    78.0303       0.00
    3.7800     1.9436    767931.     -2401.   -0.07618       0.00   3.83E+11
-145.971    81.1131       0.00
    3.8700     1.8613    765631.     -2558.   -0.07618       0.00   3.83E+11
-145.470    84.4082       0.00
    3.9600     1.7790    763162.     -2715.   -0.07618       0.00   3.83E+11
-144.859    87.9411       0.00
    4.0500     1.6967    760524.     -3052.   -0.07618       0.00   3.83E+11
-480.432   305.8030       0.00
    4.1400     1.6145    757326.     -3569.   -0.07618       0.00   3.83E+11
-475.833   318.3095       0.00
    4.2300     1.5322    753573.     -4080.   -0.07617       0.00   3.83E+11
-470.826   331.8721       0.00
    4.3200     1.4499    749270.     -4586.   -0.07617       0.00   3.83E+11
-465.385   346.6491       0.00
    4.4100     1.3677    744425.     -5464.   -0.07617       0.00   3.83E+11
-1161.   917.0812       0.00
    4.5000     1.2854    738225.     -6712.   -0.07617       0.00   3.83E+11
-1150.   966.4329       0.00
    4.5900     1.2031    730683.     -7948.   -0.07617       0.00   3.83E+11
-1138.      1022.       0.00
    4.6800     1.1209    721814.     -9170.   -0.07616       0.00   3.83E+11
-1125.      1084.       0.00
    4.7700     1.0386    711634.    -10376.   -0.07616       0.00   3.83E+11
-1110.      1154.       0.00
    4.8600     0.9564    700159.    -11566.   -0.07616       0.00   3.83E+11
-1093.      1235.       0.00
    4.9500     0.8741    687409.    -12736.   -0.07616       0.00   3.83E+11
-1075.      1328.       0.00
    5.0400     0.7919    673405.    -13886.   -0.07616       0.00   3.84E+11
-1055.      1438.       0.00
    5.1300     0.7096    658170.    -15013.   -0.07615       0.00   3.84E+11
-1032.      1570.       0.00
    5.2200     0.6274    641733.    -16114.   -0.07615       0.00   3.84E+11
-1006.      1732.       0.00
    5.3100     0.5451    624121.    -17185.   -0.07615       0.00   3.84E+11
-976.766      1935.       0.00
    5.4000     0.4629    605371.    -18221.   -0.07615       0.00   3.84E+11
-942.771      2200.       0.00
    5.4900     0.3807    585520.    -19218.   -0.07615       0.00   3.84E+11
-902.659      2561.       0.00
    5.5800     0.2984    564617.    -20166.   -0.07615       0.00   3.84E+11
-853.959      3091.       0.00
    5.6700     0.2162    542718.    -21055.   -0.07614       0.00   3.84E+11
-792.065      3957.       0.00
    5.7600     0.1339    519895.    -21864.   -0.07614       0.00   3.84E+11
-706.481      5696.       0.00
    5.8500    0.05172    496248.    -22548.   -0.07614       0.00   3.84E+11
```

-559.850	11691.	0.00				
5.9400	-0.03051	471948.	-22761.	-0.07614	0.00	3.84E+11
165.2612	5849.	0.00				
6.0300	-0.113	447840.	-22533.	-0.07614	0.00	3.84E+11
256.7731	2460.	0.00				
6.1200	-0.195	424032.	-22227.	-0.07614	0.00	3.84E+11
309.7461	1716.	0.00				
6.2100	-0.277	400586.	-21871.	-0.07614	0.00	3.84E+11
350.0229	1364.	0.00				
6.3000	-0.359	377547.	-21475.	-0.07613	0.00	3.84E+11
383.5667	1153.	0.00				
6.3900	-0.442	354956.	-21045.	-0.07613	0.00	3.84E+11
412.8494	1010.	0.00				
6.4800	-0.524	332847.	-20585.	-0.07613	0.00	3.84E+11
439.1614	905.3601	0.00				
6.5700	-0.606	311250.	-20097.	-0.07613	0.00	3.84E+11
463.2703	825.4990	0.00				
6.6600	-0.688	290193.	-19585.	-0.07613	0.00	3.85E+11
485.6738	762.0425	0.00				
6.7500	-0.771	269702.	-19049.	-0.07613	0.00	3.85E+11
506.7145	710.2194	0.00				
6.8400	-0.853	249803.	-18491.	-0.07613	0.00	3.85E+11
526.6397	666.9773	0.00				
6.9300	-0.935	230518.	-17912.	-0.07613	0.00	3.85E+11
545.6337	630.2653	0.00				
7.0200	-1.017	211869.	-17313.	-0.07613	0.00	3.85E+11
563.8382	598.6503	0.00				
7.1100	-1.099	193878.	-16695.	-0.07613	0.00	3.85E+11
581.3646	571.0982	0.00				
7.2000	-1.182	176566.	-16058.	-0.07613	0.00	3.85E+11
598.3023	546.8423	0.00				
7.2900	-1.264	159951.	-15403.	-0.07613	0.00	3.85E+11
614.7239	525.3016	0.00				
7.3800	-1.346	144052.	-14730.	-0.07613	0.00	3.85E+11
630.6897	506.0266	0.00				
7.4700	-1.428	128890.	-14040.	-0.07613	0.00	3.85E+11
646.2499	488.6642	0.00				
7.5600	-1.510	114482.	-13334.	-0.07613	0.00	3.85E+11
661.4471	472.9325	0.00				
7.6500	-1.593	100844.	-12612.	-0.07613	0.00	3.85E+11
676.3176	458.6034	0.00				
7.7400	-1.675	87996.	-11874.	-0.07612	0.00	3.85E+11
690.8926	445.4905	0.00				
7.8300	-1.757	75954.	-11120.	-0.07612	0.00	3.85E+11
705.1992	433.4399	0.00				
7.9200	-1.839	64734.	-10351.	-0.07612	0.00	3.85E+11
719.2611	422.3229	0.00				
8.0100	-1.922	54353.	-9566.	-0.07612	0.00	3.85E+11
733.0992	412.0314	0.00				
8.1000	-2.004	44827.	-8767.	-0.07612	0.00	3.85E+11

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746.7317   402.4737       0.00
    8.1900     -2.086     36172.     -7953.   -0.07612       0.00   3.85E+11
760.1750   393.5714       0.00
    8.2800     -2.168     28404.     -7125.   -0.07612       0.00   3.85E+11
773.4437   385.2573       0.00
    8.3700     -2.250     21538.     -6283.   -0.07612       0.00   3.85E+11
786.5509   377.4731       0.00
    8.4600     -2.333     15590.     -5426.   -0.07612       0.00   3.85E+11
799.5082   370.1683       0.00
    8.5500     -2.415     10574.     -4556.   -0.07612       0.00   3.85E+11
812.3263   363.2986       0.00
    8.6400     -2.497      6505.     -3672.   -0.07612       0.00   3.85E+11
825.0147   356.8252       0.00
    8.7300     -2.579      3399.     -2774.   -0.07612       0.00   3.85E+11
837.5823   350.7138       0.00
    8.8200     -2.661      1270.     -1863.   -0.07612       0.00   3.85E+11
850.0370   344.9342       0.00
    8.9100     -2.744   131.9051   -937.991   -0.07612       0.00   3.85E+11
862.3860   339.4594       0.00
    9.0000     -2.826       0.00       0.00   -0.07612       0.00   3.85E+11
874.6361   167.1327       0.00

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


Output Summary for Load Case No. 2:

Pile-head deflection             =     5.40138094 inches
Computed slope at pile head      =     -0.0762754 radians
Maximum bending moment           =        782261. inch-lbs
Maximum shear force              =        -22761. lbs
Depth of maximum bending moment  =     2.61000000 feet below pile head
Depth of maximum shear force     =     5.94000000 feet below pile head
Number of iterations             =             45
Number of zero deflection points =              1
Pile deflection at ground        =     4.48621450 inches



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

Boundary Condition Type 1, Shear and Moment
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```
Shear      =           2250. lbs
Moment     =         724800. in-lbs
Axial Load =           4600. lbs


    Pile       Pile Head       Maximum       Maximum
   Length      Deflection      Moment         Shear
    feet         inches        ln-lbs          lbs
------------  ------------  ------------  ------------
    9.00000    5.40138094       782261.       -22761.
    8.55000   10.85309894       786157.       -25381.


--------------------------------------------------------------------------------
                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    Deflect.    Bending     Shear      Slope      Total     Bending   Soil
Res.  Soil Spr.  Distrib.
     X          y       Moment      Force        S       Stress    Stiffness      p
      Es*H     Lat. Load
   feet      inches     in-lbs       lbs      radians     psi*      lb-in^2
lb/inch    lb/inch    lb/inch
---------- ---------- ---------- ---------- ---------- ---------- ----------
---------- ---------- ----------
      0.00     5.2654    724800.      2250.   -0.07437       0.00   3.83E+11
0.00       0.00       0.00
   0.09000     5.1851    727535.      2250.   -0.07437       0.00   3.83E+11
0.00       0.00       0.00
    0.1800     5.1048    730270.      2250.   -0.07437       0.00   3.83E+11
0.00       0.00       0.00
    0.2700     5.0245    733005.      2250.   -0.07436       0.00   3.83E+11
0.00       0.00       0.00
    0.3600     4.9442    735741.      2250.   -0.07436       0.00   3.83E+11
0.00       0.00       0.00
    0.4500     4.8639    738476.      2250.   -0.07436       0.00   3.83E+11
0.00       0.00       0.00
    0.5400     4.7836    741211.      2250.   -0.07436       0.00   3.83E+11
0.00       0.00       0.00
    0.6300     4.7033    743946.      2250.   -0.07436       0.00   3.83E+11
0.00       0.00       0.00
    0.7200     4.6230    746681.      2250.   -0.07435       0.00   3.83E+11
0.00       0.00       0.00
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    0.8100     4.5427    749416.      2250.   -0.07435       0.00   3.83E+11
0.00       0.00       0.00
    0.9000     4.4624    752151.      2250.   -0.07435       0.00   3.83E+11
0.00       0.00       0.00
    0.9900     4.3821    754887.      2250.   -0.07435       0.00   3.83E+11
0.00       0.00       0.00
    1.0800     4.3018    757622.      2181.   -0.07434       0.00   3.83E+11
-127.209    31.9371       0.00
    1.1700     4.2215    760208.      2043.   -0.07434       0.00   3.83E+11
-128.501    32.8749       0.00
    1.2600     4.1412    762645.      1904.   -0.07434       0.00   3.83E+11
-129.755    33.8394       0.00
    1.3500     4.0609    764931.      1763.   -0.07434       0.00   3.83E+11
-130.972    34.8320       0.00
    1.4400     3.9806    767063.      1621.   -0.07434       0.00   3.83E+11
-132.150    35.8542       0.00
    1.5300     3.9003    769042.      1478.   -0.07433       0.00   3.83E+11
-133.289    36.9075       0.00
    1.6200     3.8201    770865.      1333.   -0.07433       0.00   3.83E+11
-134.387    37.9937       0.00
    1.7100     3.7398    772531.      1187.   -0.07433       0.00   3.83E+11
-135.444    39.1144       0.00
    1.8000     3.6595    774040.      1040.   -0.07433       0.00   3.83E+11
-136.458    40.2718       0.00
    1.8900     3.5792    775389.   892.5706   -0.07433       0.00   3.83E+11
-137.429    41.4679       0.00
    1.9800     3.4990    776578.   743.6471   -0.07432       0.00   3.83E+11
-138.355    42.7050       0.00
    2.0700     3.4187    777605.   593.7486   -0.07432       0.00   3.83E+11
-139.235    43.9856       0.00
    2.1600     3.3384    778470.   442.9256   -0.07432       0.00   3.83E+11
-140.067    45.3123       0.00
    2.2500     3.2582    779172.   291.2304   -0.07432       0.00   3.83E+11
-140.850    46.6882       0.00
    2.3400     3.1779    779709.   138.7165   -0.07431       0.00   3.83E+11
-141.583    48.1164       0.00
    2.4300     3.0977    780082.    -14.560   -0.07431       0.00   3.83E+11
-142.264    49.6005       0.00
    2.5200     3.0174    780288.   -168.544   -0.07431       0.00   3.83E+11
-142.891    51.1442       0.00
    2.6100     2.9371    780327.   -323.175   -0.07431       0.00   3.83E+11
-143.463    52.7518       0.00
    2.7000     2.8569    780200.   -478.392   -0.07431       0.00   3.83E+11
-143.977    54.4280       0.00
    2.7900     2.7766    779904.   -634.132   -0.07430       0.00   3.83E+11
-144.431    56.1778       0.00
    2.8800     2.6964    779440.   -790.329   -0.07430       0.00   3.83E+11
-144.824    58.0071       0.00
    2.9700     2.6162    778807.   -946.917   -0.07430       0.00   3.83E+11
-145.153    59.9220       0.00
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    3.0600     2.5359    778004.     -1104.   -0.07430       0.00   3.83E+11
-145.415    61.9296       0.00
    3.1500     2.4557    777032.     -1261.   -0.07429       0.00   3.83E+11
-145.607    64.0378       0.00
    3.2400     2.3754    775890.     -1418.   -0.07429       0.00   3.83E+11
-145.727    66.2554       0.00
    3.3300     2.2952    774579.     -1576.   -0.07429       0.00   3.83E+11
-145.772    68.5924       0.00
    3.4200     2.2150    773097.     -1733.   -0.07429       0.00   3.83E+11
-145.737    71.0600       0.00
    3.5100     2.1347    771445.     -1890.   -0.07429       0.00   3.83E+11
-145.618    73.6708       0.00
    3.6000     2.0545    769623.     -2048.   -0.07428       0.00   3.83E+11
-145.413    76.4396       0.00
    3.6900     1.9743    767632.     -2204.   -0.07428       0.00   3.83E+11
-145.115    79.3830       0.00
    3.7800     1.8941    765471.     -2361.   -0.07428       0.00   3.83E+11
-144.721    82.5203       0.00
    3.8700     1.8138    763142.     -2517.   -0.07428       0.00   3.83E+11
-144.223    85.8737       0.00
    3.9600     1.7336    760644.     -2672.   -0.07427       0.00   3.83E+11
-143.617    89.4694       0.00
    4.0500     1.6534    757979.     -3007.   -0.07427       0.00   3.83E+11
-476.308   311.1224       0.00
    4.1400     1.5732    754758.     -3519.   -0.07427       0.00   3.83E+11
-471.743   323.8524       0.00
    4.2300     1.4930    750987.     -4026.   -0.07427       0.00   3.83E+11
-466.776   337.6579       0.00
    4.3200     1.4128    746671.     -4527.   -0.07427       0.00   3.83E+11
-461.376   352.7006       0.00
    4.4100     1.3326    741818.     -5399.   -0.07426       0.00   3.83E+11
-1154.   935.1378       0.00
    4.5000     1.2524    735618.     -6640.   -0.07426       0.00   3.83E+11
-1143.   985.4926       0.00
    4.5900     1.1722    728086.     -7867.   -0.07426       0.00   3.83E+11
-1131.      1042.       0.00
    4.6800     1.0920    719235.     -9081.   -0.07426       0.00   3.83E+11
-1117.      1105.       0.00
    4.7700     1.0118    709080.    -10280.   -0.07426       0.00   3.83E+11
-1102.      1177.       0.00
    4.8600     0.9316    697640.    -11461.   -0.07425       0.00   3.83E+11
-1086.      1259.       0.00
    4.9500     0.8514    684933.    -12625.   -0.07425       0.00   3.83E+11
-1068.      1355.       0.00
    5.0400     0.7712    670981.    -13767.   -0.07425       0.00   3.84E+11
-1048.      1467.       0.00
    5.1300     0.6910    655806.    -14886.   -0.07425       0.00   3.84E+11
-1025.      1602.       0.00
    5.2200     0.6108    639436.    -15979.   -0.07425       0.00   3.84E+11
-999.430      1767.       0.00
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5.3100	0.5306	621900.	-17043.	-0.07424	0.00	3.84E+11
-970.198	1975.	0.00				
5.4000	0.4504	603232.	-18073.	-0.07424	0.00	3.84E+11
-936.363	2245.	0.00				
5.4900	0.3703	583473.	-19062.	-0.07424	0.00	3.84E+11
-896.430	2615.	0.00				
5.5800	0.2901	562667.	-20004.	-0.07424	0.00	3.84E+11
-847.927	3157.	0.00				
5.6700	0.2099	540873.	-20887.	-0.07424	0.00	3.84E+11
-786.244	4046.	0.00				
5.7600	0.1297	518161.	-21690.	-0.07424	0.00	3.84E+11
-700.840	5835.	0.00				
5.8500	0.04955	494632.	-22367.	-0.07424	0.00	3.84E+11
-553.885	12074.	0.00				
5.9400	-0.03063	470457.	-22577.	-0.07423	0.00	3.84E+11
165.4638	5835.	0.00				
6.0300	-0.111	446475.	-22350.	-0.07423	0.00	3.84E+11
255.2876	2488.	0.00				
6.1200	-0.191	422791.	-22046.	-0.07423	0.00	3.84E+11
307.6116	1740.	0.00				
6.2100	-0.271	399465.	-21692.	-0.07423	0.00	3.84E+11
347.4530	1384.	0.00				
6.3000	-0.351	376545.	-21299.	-0.07423	0.00	3.84E+11
380.6568	1170.	0.00				
6.3900	-0.431	354069.	-20872.	-0.07423	0.00	3.84E+11
409.6539	1025.	0.00				
6.4800	-0.512	332070.	-20416.	-0.07423	0.00	3.84E+11
435.7159	919.7332	0.00				
6.5700	-0.592	310580.	-19932.	-0.07423	0.00	3.84E+11
459.6000	838.7345	0.00				
6.6600	-0.672	289626.	-19424.	-0.07423	0.00	3.85E+11
481.7976	774.3522	0.00				
6.7500	-0.752	269234.	-18892.	-0.07422	0.00	3.85E+11
502.6471	721.7591	0.00				
6.8400	-0.832	249428.	-18339.	-0.07422	0.00	3.85E+11
522.3928	677.8653	0.00				
6.9300	-0.912	230231.	-17764.	-0.07422	0.00	3.85E+11
541.2169	640.5937	0.00				
7.0200	-0.993	211666.	-17170.	-0.07422	0.00	3.85E+11
559.2595	608.4923	0.00				
7.1100	-1.073	193753.	-16557.	-0.07422	0.00	3.85E+11
576.6309	580.5128	0.00				
7.2000	-1.153	176513.	-15925.	-0.07422	0.00	3.85E+11
593.4194	555.8782	0.00				
7.2900	-1.233	159965.	-15275.	-0.07422	0.00	3.85E+11
609.6970	533.9992	0.00				
7.3800	-1.313	144127.	-14608.	-0.07422	0.00	3.85E+11
625.5231	514.4201	0.00				
7.4700	-1.393	129020.	-13924.	-0.07422	0.00	3.85E+11
640.9477	496.7825	0.00				

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    7.5600     -1.474    114660.    -13224.   -0.07422       0.00   3.85E+11
656.0127   480.8004       0.00
    7.6500     -1.554    101065.    -12508.   -0.07422       0.00   3.85E+11
670.7541   466.2425       0.00
    7.7400     -1.634     88253.    -11775.   -0.07422       0.00   3.85E+11
685.2028   452.9196       0.00
    7.8300     -1.714     76240.    -11028.   -0.07422       0.00   3.85E+11
699.3857   440.6754       0.00
    7.9200     -1.794     65043.    -10265.   -0.07422       0.00   3.85E+11
713.3263   429.3794       0.00
    8.0100     -1.874     54677.     -9487.   -0.07422       0.00   3.85E+11
727.0451   418.9218       0.00
    8.1000     -1.955     45160.     -8694.   -0.07422       0.00   3.85E+11
740.5603   409.2095       0.00
    8.1900     -2.035     36506.     -7887.   -0.07422       0.00   3.85E+11
753.8880   400.1630       0.00
    8.2800     -2.115     28732.     -7066.   -0.07422       0.00   3.85E+11
767.0428   391.7139       0.00
    8.3700     -2.195     21853.     -6231.   -0.07422       0.00   3.85E+11
780.0375   383.8032       0.00
    8.4600     -2.275     15883.     -5381.   -0.07422       0.00   3.85E+11
792.8838   376.3794       0.00
    8.5500     -2.355     10838.     -4518.   -0.07422       0.00   3.85E+11
805.5922   369.3977       0.00
    8.6400     -2.435      6733.     -3641.   -0.07422       0.00   3.85E+11
818.1721   362.8186       0.00
    8.7300     -2.516      3582.     -2751.   -0.07422       0.00   3.85E+11
830.6323   356.6074       0.00
    8.8200     -2.596      1400.     -1847.   -0.07422       0.00   3.85E+11
842.9805   350.7332       0.00
    8.9100     -2.676   201.2578   -930.200   -0.07422       0.00   3.85E+11
855.2242   345.1687       0.00
    9.0000     -2.756      0.00       0.00   -0.07422       0.00   3.85E+11
867.3697   169.9447       0.00

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


Output Summary for Load Case No. 3:

Pile-head deflection              =     5.26544259 inches
Computed slope at pile head       =     -0.0743697 radians
Maximum bending moment            =        780327. inch-lbs
Maximum shear force               =        -22577. lbs
Depth of maximum bending moment   =     2.61000000 feet below pile head
```

```
Depth of maximum shear force     =     5.94000000 feet below pile head
Number of iterations             =             43
Number of zero deflection points =              1
Pile deflection at ground        =     4.37314374 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	5.26544259	780327.	-22577.
8.55000	10.28875182	782092.	-24959.

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	Pile-head	Load Type	Load 2	Axial Pile-head Loading lbs	Pile-head Deflection inches	Pile-head Rotation radians	Max Shear in Pile lbs	Max Moment in Pile in-lbs
1	V, lb	1000.0000	M, in-lb	315600.	4200.	0.3459	-0.00502	-9834.	338013.	
2	V, lb	2250.	M, in-lb	724800.	4600.	5.4014	-0.07628	-22761.	782261.	

```
  3  V, lb      2250.  M, in-lb     724800.      3800.     5.2654   -0.07437
-22577.    780327.


Maximum pile-head deflection = 5.4013809428 inches
Maximum pile-head rotation   = -0.0762753854 radians = -4.370258 deg.

The analysis ended normally.
```

LATERAL LOAD (LPILE) ANALYSES
NORTHBOUND PARKING AREA
LIGHT TOWER TP2-2 (B-005-0-26)

TP 26 NE Ohio Site 13 MAH-11 Vacant Rest Area - Northbound Parking Area
Light Tower TP2-2 (Boring B-005-0-26) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

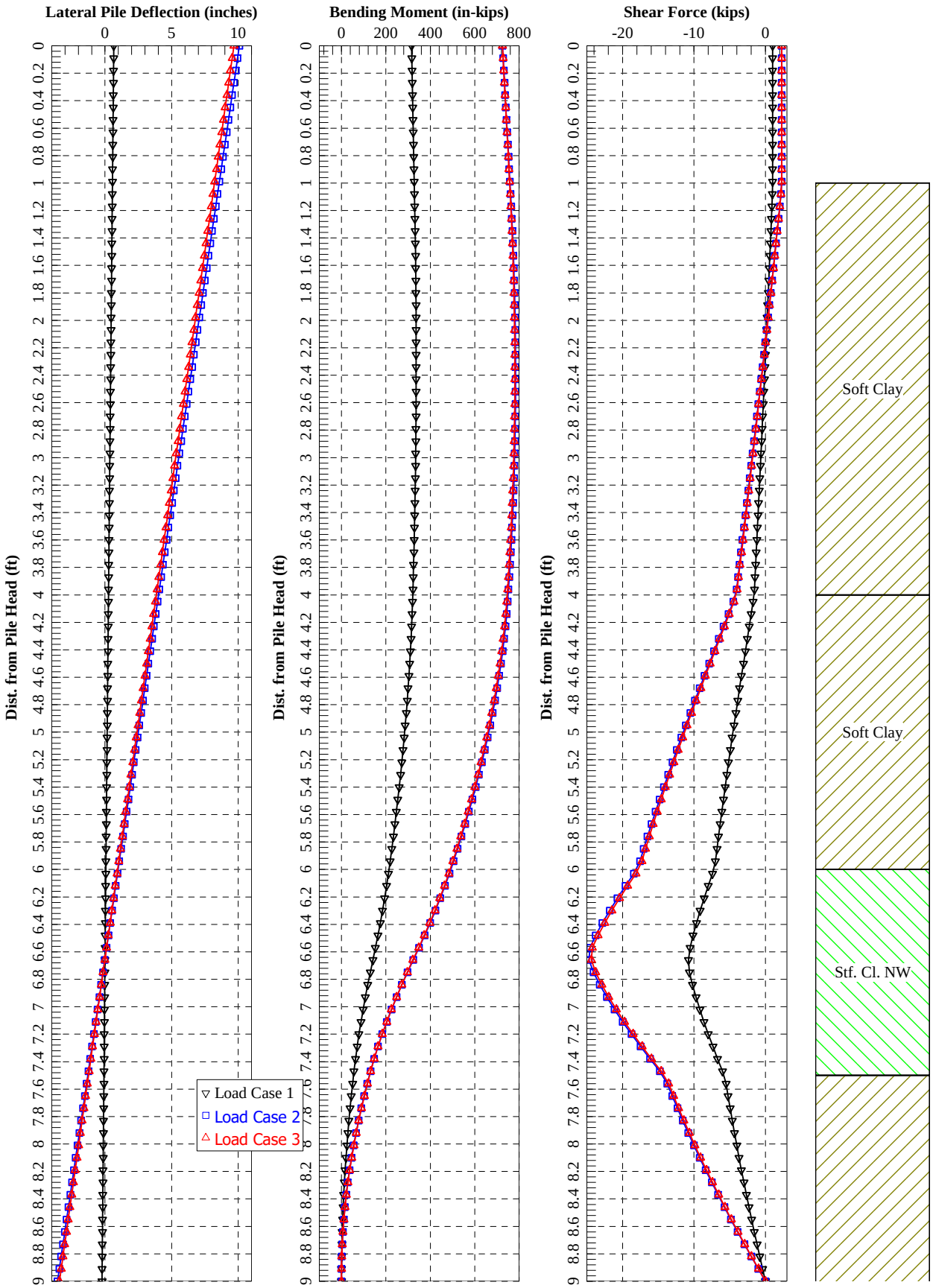


PLATE 181

```
================================================================================

                          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
                            © 1985-2024 by Ensoft, Inc.
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                                  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
13_MAH-11 (2LMN)\Calcs\Light Towers\LPILE Files\

Name of input data file:
Tower TP2-2 (B-005-0-26).lp12d

Name of output report file:
Tower TP2-2 (B-005-0-26).lp12o

Name of plot output file:
Tower TP2-2 (B-005-0-26).lp12p

Name of runtime message file:
Tower TP2-2 (B-005-0-26).lp12r



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

Date: May 27, 2026 Time: 17:33:32

Problem Title

Project Name: TP 26 NE Ohio Site 13 MAH-11 NB Vacant Rest Area

Job Number: 24170232E

Client: ms consultants, inc.

Engineer: BKS

Description: Light Tower TP2-2 (B-005-0-26)

Program Options and Settings

Computational Options:
- Conventional Analysis

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

Analysis Control Options:

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

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

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

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



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

Number of pile sections defined                        =            1
Total length of pile                                   =        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.

            Depth Below           Pile
Point        Pile Head          Diameter
 No.            feet             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
```

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	=	6.000000 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	=	950.000000 psf
Undrained cohesion at bottom of layer	=	950.000000 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	=	6.000000 ft
Distance from top of pile to bottom of layer	=	7.500000 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	=	2250. psf
Undrained cohesion at bottom of layer	=	2250. psf
Epsilon-50 at top of layer	=	0.005000
Epsilon-50 at bottom of layer	=	0.005000

Layer 4 is soft clay, p-y criteria by Matlock, 1970

Distance from top of pile to top of layer	=	7.500000 ft
Distance from top of pile to bottom of layer	=	12.500000 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                  =  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 5 is stiff clay without free water

   Distance from top of pile to top of layer           =    12.500000 ft
   Distance from top of pile to bottom of layer        =    15.000000 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                  =        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 6 is stiff clay without free water

   Distance from top of pile to top of layer           =    15.000000 ft
   Distance from top of pile to bottom of layer        =    17.500000 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                  =        1300. psf
   Undrained cohesion at bottom of layer               =        1300. psf
   Epsilon-50 at top of layer                          =     0.007000
   Epsilon-50 at bottom of layer                       =     0.007000


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

   Distance from top of pile to top of layer           =    17.500000 ft
   Distance from top of pile to bottom of layer        =    20.000000 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 8 is stiff clay without free water

   Distance from top of pile to top of layer           =    20.000000 ft
   Distance from top of pile to bottom of layer        =    27.000000 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                  =        1600. psf
```

```
   Undrained cohesion at bottom of layer               =        1600. psf
   Epsilon-50 at top of layer                          =     0.007000
   Epsilon-50 at bottom of layer                       =     0.007000


 (Depth of the lowest soil layer extends 18.000 ft below the pile tip)



--------------------------------------------------------------------------------
                        Summary of Input Soil Properties
--------------------------------------------------------------------------------

Layer         Soil Type          Layer      Effective    Cohesion     Angle of
 E50
 Num.           Name             Depth       Unit Wt.                  Friction
 or            kpy
          (p-y Curve Type)        ft           pcf          psf          deg.
 krm           pci
-----   -------------------   ----------   ----------   ----------   ----------
----------   ----------
  1             Soft              1.0000      98.0000     250.0000       --
0.02000       --
                Clay              4.0000      98.0000     250.0000       --
0.02000       --
  2             Soft              4.0000      56.0000     950.0000       --
0.01000       --
                Clay              6.0000      56.0000     950.0000       --
0.01000       --
  3           Stiff Clay          6.0000      63.0000        2250.       --
0.00500       --
          w/o Free Water          7.5000      63.0000        2250.       --
0.00500       --
  4             Soft              7.5000      58.0000    1000.0000       --
0.01000       --
                Clay             12.5000      58.0000    1000.0000       --
0.01000       --
  5           Stiff Clay          12.5000      63.0000        3750.       --
0.00500       --
          w/o Free Water          15.0000      63.0000        3750.       --
0.00500       --
  6           Stiff Clay          15.0000      58.0000        1300.       --
0.00700       --
          w/o Free Water          17.5000      58.0000        1300.       --
0.00700       --
  7             Sand              17.5000      60.0000       --          34.0000
 --           60.0000
          (Reese, et al.)         20.0000      60.0000       --          34.0000
 --           60.0000
  8           Stiff Clay          20.0000      60.0000        1600.       --
```

```
0.00700       --
          w/o Free Water         27.0000      60.0000        1600.       --
0.00700       --


--------------------------------------------------------------------------------
                              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
Compute Top y     Run Analysis
 No.    Type            1                       2                  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.
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 Fc Ac + Fy As	=	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	0.00000
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	0.00000	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	0.00000
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.
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.	Bending Max Steel Stress Moment ksi	Run Msg	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				
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
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
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1.0904832    -17.790458 C
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1.1350844    -18.579893 C
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1.2234058    -20.157511 C
0.00003313         3121.     94215891.    10.0557483     0.0003331     -0.000859
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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
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1.7683810    -30.370013 C
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1.8476620    -31.934476 C
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1.8868384    -32.716016 C
0.00005313         4941.     93005082.    10.1174399     0.0005375     -0.001375
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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
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2.0780361    -36.616679 C
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2.3674485    -42.832591 C
0.00006938         6392.     92134020.    10.1849998     0.0007066     -0.001791
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2.7930345    -52.863415 C
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3.1326575    -60.000000 CY
 0.0001044         9304.     89144470.    10.3110511     0.0010762     -0.002681
3.2276850    -60.000000 CY
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3.3116704    -60.000000 CY
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3.3907664    -60.000000 CY
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3.4643165    -60.000000 CY
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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
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3.7414497    -60.000000 CY
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 0.0001594        11008.     69072220.     9.7809580     0.0015588     -0.004179
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 0.0001644        11071.     67351790.     9.7204156     0.0015978     -0.004320
3.8862696    -60.000000 CY
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3.9118664    -60.000000 CY
 0.0001744        11191.     64176802.     9.6094393     0.0016756     -0.004602
3.9342902    -60.000000 CY
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3.9535015    -60.000000 CY
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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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3.9998812    -60.000000 CY
 0.0002194        11690.     53285909.     9.2626721     0.0020320     -0.005866
3.9969940    -60.000000 CY
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3.9997138    -60.000000 CY
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3.9955528    -60.000000 CY
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3.9989818    -60.000000 CY
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3.9994466    -60.000000 CY
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3.9965160    -60.000000 CY
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3.9991770    -60.000000 CY
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3.9995775    -60.000000 CY
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3.9954763    -60.000000 CY
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3.9998981    -60.000000 CY
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   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       Bending       Bending      Depth to      Max Comp      Max Tens
  Max Conc      Max Steel  Run
   Curvature      Moment       Stiffness      N Axis        Strain        Strain
   Stress        Stress    Msg
    rad/in.       in-kip        kip-in2         in           in/in         in/in
     ksi           ksi
------------- ------------- ------------- ------------- ------------- -------------
------------- ------------- ---
  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
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0.00000813         2366.    291190774.    10.2300378    0.00008312     -0.000209
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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
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
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0.00002313         2366.    102310272.    10.0590817     0.0002326     -0.000600
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0.00002688        2548.     94810571.    10.0576469     0.0002703     -0.000697
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1.0915372    -17.782007 C
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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
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3.3913727    -60.000000 CY
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 0.0001294        10291.     79542859.    10.0787027     0.0013039     -0.003354
3.5876602    -60.000000 CY
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3.6428308    -60.000000 CY
 0.0001394        10554.     75720878.     9.9720357     0.0013899     -0.003628
3.6942550    -60.000000 CY
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3.7855535    -60.000000 CY
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3.8578061    -60.000000 CY
 0.0001644        11075.     67376662.     9.7232508     0.0015983     -0.004319
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3.9121613    -60.000000 CY
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3.9992468    -60.000000 CY
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  3.9992162    -60.000000 CY
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  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       Bending       Bending      Depth to      Max Comp      Max Tens
  Max Conc      Max Steel  Run
   Curvature      Moment       Stiffness      N Axis        Strain        Strain
   Stress        Stress    Msg
    rad/in.       in-kip        kip-in2         in           in/in         in/in
     ksi           ksi
------------- ------------- ------------- ------------- ------------- -------------
------------- ------------- ---
  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
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0.00000438        1665.    380637159.    18.2267166    0.00007974   -0.00007776
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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
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
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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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1.0025364    -16.193510 C
0.00002688         2551.     94928657.    10.0684718     0.0002706     -0.000697
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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
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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           Axial Thrust        Nominal Mom. Cap.      Max. Comp.      Max.
Tens.
  No.              kips                 in-kip               Strain
```

				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 Load No.	Resist. Factor	Nominal Ax. Thrust kips	Nominal Moment Cap in-kips	Ult. (Fac) Ax. Thrust kips	Ult. (Fac) Moment Cap in-kips	Bend. Stiff. at Ult Mom kip-in^2
1	0.65	3.800000	12169.	2.470000	7910.	91219895.
2	0.65	4.200000	12173.	2.730000	7913.	91253873.
3	0.65	4.600000	12177.	2.990000	7915.	91287886.
1	0.75	3.800000	12169.	2.850000	9127.	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	8672.
2	4.0000	0.9718	Yes	No	8672.	20023.
3	6.0000	1.3550	No	No	28696.	34608.
4	7.5000	5.7098	No	No	63304.	20563.
5	12.5000	11.5000	No	No	83867.	0.00
6	15.0000	14.0000	No	No	0.00	0.00
7	17.5000	16.5000	No	No	0.00	0.00
8	20.0000	19.0000	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 X	Deflect. y	Bending Moment	Shear Force	Slope S	Total Stress	Bending Stiffness	Soil Res. Es*H	p Soil Spr. Lat. Load Distrib.
feet	inches	in-lbs	lbs	radians	psi*	lb-in^2	lb/inch	lb/inch lb/inch

0.00	0.6616	315600.	1000.0000	-0.00831	0.00	3.84E+11
0.00	0.00	0.00				
0.09000	0.6526	316718.	999.9979	-0.00831	0.00	3.84E+11
0.00	0.00	0.00				
0.1800	0.6436	317835.	1000.	-0.00831	0.00	3.84E+11
0.00	0.00	0.00				
0.2700	0.6346	318953.	1000.0000	-0.00830	0.00	3.84E+11
0.00	0.00	0.00				
0.3600	0.6257	320071.	1000.0000	-0.00830	0.00	3.84E+11
0.00	0.00	0.00				
0.4500	0.6167	321188.	999.9999	-0.00830	0.00	3.84E+11
0.00	0.00	0.00				
0.5400	0.6077	322306.	999.9999	-0.00830	0.00	3.84E+11
0.00	0.00	0.00				
0.6300	0.5988	323424.	999.9999	-0.00830	0.00	3.84E+11
0.00	0.00	0.00				
0.7200	0.5898	324541.	1000.0000	-0.00830	0.00	3.84E+11
0.00	0.00	0.00				
0.8100	0.5809	325659.	999.9999	-0.00830	0.00	3.84E+11
0.00	0.00	0.00				
0.9000	0.5719	326777.	999.9998	-0.00830	0.00	3.84E+11
0.00	0.00	0.00				
0.9900	0.5629	327894.	999.9999	-0.00830	0.00	3.84E+11
0.00	0.00	0.00				
1.0800	0.5540	329012.	965.3107	-0.00830	0.00	3.84E+11
-64.239	125.2397	0.00				
1.1700	0.5450	330055.	895.5507	-0.00830	0.00	3.84E+11
-64.946	128.6995	0.00				
1.2600	0.5360	331022.	825.0355	-0.00829	0.00	3.84E+11
-65.638	132.2436	0.00				
1.3500	0.5271	331912.	753.7820	-0.00829	0.00	3.84E+11
-66.313	135.8756	0.00				
1.4400	0.5181	332725.	681.8075	-0.00829	0.00	3.84E+11
-66.973	139.5996	0.00				
1.5300	0.5092	333460.	609.1294	-0.00829	0.00	3.84E+11
-67.616	143.4196	0.00				
1.6200	0.5002	334116.	535.7656	-0.00829	0.00	3.84E+11
-68.243	147.3400	0.00				
1.7100	0.4913	334692.	461.7341	-0.00829	0.00	3.84E+11
-68.852	151.3656	0.00				
1.8000	0.4823	335188.	387.0538	-0.00829	0.00	3.84E+11
-69.445	155.5013	0.00				
1.8900	0.4734	335604.	311.7435	-0.00829	0.00	3.84E+11
-70.019	159.7524	0.00				
1.9800	0.4644	335937.	235.8228	-0.00829	0.00	3.84E+11
-70.575	164.1248	0.00				
2.0700	0.4555	336188.	159.3115	-0.00829	0.00	3.84E+11
-71.113	168.6245	0.00				

```
    2.1600     0.4465    336356.    82.2300   -0.00829       0.00   3.84E+11
-71.631   173.2580       0.00
    2.2500     0.4376    336441.     4.5991   -0.00828       0.00   3.84E+11
-72.130   178.0325       0.00
    2.3400     0.4286    336441.    -73.560   -0.00828       0.00   3.84E+11
-72.609   182.9554       0.00
    2.4300     0.4197    336357.   -152.225   -0.00828       0.00   3.84E+11
-73.067   188.0349       0.00
    2.5200     0.4107    336188.   -231.374   -0.00828       0.00   3.84E+11
-73.504   193.2799       0.00
    2.6100     0.4018    335933.   -310.983   -0.00828       0.00   3.84E+11
-73.920   198.6997       0.00
    2.7000     0.3928    335591.   -391.029   -0.00828       0.00   3.84E+11
-74.314   204.3047       0.00
    2.7900     0.3839    335163.   -471.488   -0.00828       0.00   3.84E+11
-74.684   210.1060       0.00
    2.8800     0.3750    334648.   -552.334   -0.00828       0.00   3.84E+11
-75.031   216.1157       0.00
    2.9700     0.3660    334045.   -633.542   -0.00828       0.00   3.84E+11
-75.354   222.3469       0.00
    3.0600     0.3571    333354.   -715.086   -0.00828       0.00   3.84E+11
-75.652   228.8139       0.00
    3.1500     0.3481    332576.   -796.937   -0.00828       0.00   3.84E+11
-75.924   235.5324       0.00
    3.2400     0.3392    331708.   -879.068   -0.00827       0.00   3.84E+11
-76.170   242.5196       0.00
    3.3300     0.3303    330752.   -961.449   -0.00827       0.00   3.84E+11
-76.388   249.7942       0.00
    3.4200     0.3213    329706.     -1044.   -0.00827       0.00   3.84E+11
-76.577   257.3770       0.00
    3.5100     0.3124    328572.     -1127.   -0.00827       0.00   3.84E+11
-76.737   265.2907       0.00
    3.6000     0.3035    327348.     -1210.   -0.00827       0.00   3.84E+11
-76.867   273.5606       0.00
    3.6900     0.2945    326034.     -1293.   -0.00827       0.00   3.84E+11
-76.965   282.2148       0.00
    3.7800     0.2856    324630.     -1376.   -0.00827       0.00   3.84E+11
-77.030   291.2844       0.00
    3.8700     0.2767    323136.     -1459.   -0.00827       0.00   3.84E+11
-77.060   300.8042       0.00
    3.9600     0.2677    321553.     -1542.   -0.00827       0.00   3.84E+11
-77.054   310.8132       0.00
    4.0500     0.2588    319880.     -1723.   -0.00827       0.00   3.84E+11
-256.701      1071.       0.00
    4.1400     0.2499    317907.     -1999.   -0.00827       0.00   3.84E+11
-255.484      1104.       0.00
    4.2300     0.2410    315636.     -2274.   -0.00826       0.00   3.84E+11
-254.142      1139.       0.00
    4.3200     0.2320    313069.     -2548.   -0.00826       0.00   3.84E+11
-252.670      1176.       0.00
```

4.4100	0.2231	310207.	-2820.	-0.00826	0.00	3.84E+11
-251.063	1215.	0.00				
4.5000	0.2142	307053.	-3090.	-0.00826	0.00	3.85E+11
-249.314	1257.	0.00				
4.5900	0.2053	303607.	-3359.	-0.00826	0.00	3.85E+11
-247.416	1302.	0.00				
4.6800	0.1963	299873.	-3625.	-0.00826	0.00	3.85E+11
-245.361	1350.	0.00				
4.7700	0.1874	295853.	-3888.	-0.00826	0.00	3.85E+11
-243.140	1401.	0.00				
4.8600	0.1785	291549.	-4150.	-0.00826	0.00	3.85E+11
-240.742	1457.	0.00				
4.9500	0.1696	286964.	-4408.	-0.00826	0.00	3.85E+11
-238.155	1517.	0.00				
5.0400	0.1607	282102.	-4664.	-0.00826	0.00	3.85E+11
-235.364	1582.	0.00				
5.1300	0.1518	276965.	-4917.	-0.00826	0.00	3.85E+11
-232.354	1654.	0.00				
5.2200	0.1428	271557.	-5166.	-0.00826	0.00	3.85E+11
-229.107	1732.	0.00				
5.3100	0.1339	265881.	-5411.	-0.00825	0.00	3.85E+11
-225.599	1819.	0.00				
5.4000	0.1250	259943.	-5653.	-0.00825	0.00	3.85E+11
-221.806	1916.	0.00				
5.4900	0.1161	253746.	-5890.	-0.00825	0.00	3.85E+11
-217.695	2025.	0.00				
5.5800	0.1072	247295.	-6123.	-0.00825	0.00	3.85E+11
-213.231	2149.	0.00				
5.6700	0.09827	240595.	-6351.	-0.00825	0.00	3.85E+11
-208.366	2290.	0.00				
5.7600	0.08936	233652.	-6573.	-0.00825	0.00	3.85E+11
-203.044	2454.	0.00				
5.8500	0.08045	226473.	-6789.	-0.00825	0.00	3.85E+11
-197.192	2647.	0.00				
5.9400	0.07154	219063.	-6998.	-0.00825	0.00	3.85E+11
-190.714	2879.	0.00				
6.0300	0.06263	211431.	-7406.	-0.00825	0.00	3.85E+11
-563.596	9718.	0.00				
6.1200	0.05372	203141.	-8005.	-0.00825	0.00	3.85E+11
-545.370	10963.	0.00				
6.2100	0.04482	194216.	-8582.	-0.00825	0.00	3.85E+11
-524.051	12629.	0.00				
6.3000	0.03591	184679.	-9134.	-0.00825	0.00	3.85E+11
-498.501	14993.	0.00				
6.3900	0.02700	174561.	-9655.	-0.00825	0.00	3.85E+11
-466.715	18667.	0.00				
6.4800	0.01810	163898.	-10137.	-0.00825	0.00	3.85E+11
-424.542	25337.	0.00				
6.5700	0.00919	152740.	-10561.	-0.00825	0.00	3.85E+11
-360.302	42338.	0.00				

```
    6.6600   2.86E-04    141162.    -10796.   -0.00825       0.00   3.85E+11
-76.017    287437.       0.00
    6.7500   -0.00862    129495.    -10644.   -0.00825       0.00   3.85E+11
358.3179     44898.       0.00
    6.8400   -0.01752    118246.    -10218.   -0.00824       0.00   3.85E+11
430.1040     26508.       0.00
    6.9300   -0.02643    107499.     -9727.   -0.00824       0.00   3.85E+11
479.1097     19579.       0.00
    7.0200   -0.03533     97311.     -9189.   -0.00824       0.00   3.85E+11
517.8454     15829.       0.00
    7.1100   -0.04423     87726.     -8612.   -0.00824       0.00   3.85E+11
550.5894     13443.       0.00
    7.2000   -0.05314     78784.     -8002.   -0.00824       0.00   3.85E+11
579.3650     11775.       0.00
    7.2900   -0.06204     70518.     -7362.   -0.00824       0.00   3.85E+11
605.3022     10537.       0.00
    7.3800   -0.07094     62957.     -6695.   -0.00824       0.00   3.85E+11
629.1011      9577.       0.00
    7.4700   -0.07985     56131.     -6004.   -0.00824       0.00   3.85E+11
651.2278      8808.       0.00
    7.5600   -0.08875     50064.     -5515.   -0.00824       0.00   3.85E+11
254.3841      3096.       0.00
    7.6500   -0.09765     44294.     -5235.   -0.00824       0.00   3.85E+11
263.8377      2918.       0.00
    7.7400    -0.107     38831.     -4945.   -0.00824       0.00   3.85E+11
272.8762      2766.       0.00
    7.8300    -0.115     33687.     -4646.   -0.00824       0.00   3.85E+11
281.5597      2634.       0.00
    7.9200    -0.124     28871.     -4337.   -0.00824       0.00   3.85E+11
289.9363      2518.       0.00
    8.0100    -0.133     24393.     -4020.   -0.00824       0.00   3.85E+11
298.0448      2416.       0.00
    8.1000    -0.142     20263.     -3694.   -0.00824       0.00   3.85E+11
305.9170      2324.       0.00
    8.1900    -0.151     16490.     -3359.   -0.00824       0.00   3.85E+11
313.5794      2242.       0.00
    8.2800    -0.160     13083.     -3016.   -0.00824       0.00   3.85E+11
321.0545      2168.       0.00
    8.3700    -0.169     10050.     -2666.   -0.00824       0.00   3.85E+11
328.3613      2100.       0.00
    8.4600    -0.178      7400.     -2307.   -0.00824       0.00   3.85E+11
335.5161      2038.       0.00
    8.5500    -0.187      5141.     -1941.   -0.00824       0.00   3.85E+11
342.5331      1982.       0.00
    8.6400    -0.196      3282.     -1567.   -0.00824       0.00   3.85E+11
349.4244      1930.       0.00
    8.7300    -0.204      1831.     -1186.   -0.00824       0.00   3.85E+11
356.2010      1881.       0.00
    8.8200    -0.213   794.6371   -797.957   -0.00824       0.00   3.85E+11
362.8723      1837.       0.00
```

```
    8.9100     -0.222   181.8572   -402.504   -0.00824       0.00   3.85E+11
369.4467      1795.       0.00
    9.0000     -0.231     0.00       0.00   -0.00824       0.00   3.85E+11
375.9318   878.1332       0.00

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


Output Summary for Load Case No. 1:

Pile-head deflection             =     0.66156172 inches
Computed slope at pile head      =     -0.0083077 radians
Maximum bending moment           =        336441. inch-lbs
Maximum shear force              =        -10796. lbs
Depth of maximum bending moment  =     2.34000000 feet below pile head
Depth of maximum shear force     =     6.66000000 feet below pile head
Number of iterations             =             33
Number of zero deflection points =              1
Pile deflection at ground        =     0.56192960 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       Pile Head       Maximum       Maximum
   Length      Deflection      Moment         Shear
    feet         inches        ln-lbs          lbs
------------  ------------  ------------  ------------
    9.00000    0.66156172       336441.       -10796.
    8.55000    0.99936912       335344.       -11133.
    8.10000    1.54043740       335498.       -11627.
    7.65000    2.16035078       335912.       -11984.
    7.20000    3.85653916       336266.       -12110.
    6.75000   10.23332312       343379.       -13384.
```

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 X	Deflect. y	Bending Moment	Shear Force	Slope S	Total Stress	Bending Stiffness	Soil Res. Es*H	Soil Spr. Lat. Load	Distrib. p
feet	inches	in-lbs	lbs	radians	psi*	lb-in^2	lb/inch	lb/inch	lb/inch
0.00	10.0866	724800.	2250.	-0.127	0.00	3.83E+11	0.00	0.00	0.00
0.09000	9.9499	727858.	2250.	-0.127	0.00	3.83E+11	0.00	0.00	0.00
0.1800	9.8133	730917.	2250.	-0.127	0.00	3.83E+11	0.00	0.00	0.00
0.2700	9.6767	733975.	2250.	-0.127	0.00	3.83E+11	0.00	0.00	0.00
0.3600	9.5400	737034.	2250.	-0.127	0.00	3.83E+11	0.00	0.00	0.00
0.4500	9.4034	740093.	2250.	-0.127	0.00	3.83E+11	0.00	0.00	0.00
0.5400	9.2668	743151.	2250.	-0.127	0.00	3.83E+11	0.00	0.00	0.00
0.6300	9.1301	746210.	2250.	-0.127	0.00	3.83E+11	0.00	0.00	0.00
0.7200	8.9935	749268.	2250.	-0.127	0.00	3.83E+11	0.00	0.00	0.00
0.8100	8.8569	752327.	2250.	-0.127	0.00	3.83E+11	0.00	0.00	0.00
0.9000	8.7202	755385.	2250.	-0.127	0.00	3.83E+11	0.00	0.00	0.00
0.9900	8.5836	758443.	2250.	-0.127	0.00	3.83E+11	0.00	0.00	0.00
1.0800	8.4470	761502.	2164.	-0.127	0.00	3.83E+11	-159.295	20.3669	0.00
1.1700	8.3104	764375.	1991.	-0.126	0.00	3.83E+11	-161.048	20.9295	0.00
1.2600	8.1738	767059.	1816.	-0.126	0.00	3.83E+11	-162.763	21.5059	0.00
1.3500	8.0371	769554.	1639.	-0.126	0.00	3.83E+11			

-164.438	22.0966	0.00				
1.4400	7.9005	771857.	1461.	-0.126	0.00	3.83E+11
-166.074	22.7023	0.00				
1.5300	7.7639	773967.	1281.	-0.126	0.00	3.83E+11
-167.669	23.3236	0.00				
1.6200	7.6273	775881.	1099.	-0.126	0.00	3.83E+11
-169.222	23.9613	0.00				
1.7100	7.4907	777597.	915.2458	-0.126	0.00	3.83E+11
-170.733	24.6161	0.00				
1.8000	7.3541	779114.	730.0616	-0.126	0.00	3.83E+11
-172.201	25.2889	0.00				
1.8900	7.2175	780431.	543.3162	-0.126	0.00	3.83E+11
-173.624	25.9805	0.00				
1.9800	7.0809	781545.	355.0587	-0.126	0.00	3.83E+11
-175.002	26.6919	0.00				
2.0700	6.9443	782454.	165.3373	-0.126	0.00	3.83E+11
-176.334	27.4240	0.00				
2.1600	6.8077	783158.	-25.798	-0.126	0.00	3.83E+11
-177.618	28.1780	0.00				
2.2500	6.6711	783655.	-218.294	-0.126	0.00	3.83E+11
-178.854	28.9550	0.00				
2.3400	6.5345	783943.	-412.097	-0.126	0.00	3.83E+11
-180.040	29.7562	0.00				
2.4300	6.3980	784022.	-607.153	-0.126	0.00	3.83E+11
-181.174	30.5830	0.00				
2.5200	6.2614	783889.	-803.405	-0.126	0.00	3.83E+11
-182.257	31.4367	0.00				
2.6100	6.1248	783543.	-1001.	-0.126	0.00	3.83E+11
-183.285	32.3191	0.00				
2.7000	5.9882	782983.	-1199.	-0.126	0.00	3.83E+11
-184.258	33.2317	0.00				
2.7900	5.8516	782209.	-1399.	-0.126	0.00	3.83E+11
-185.174	34.1764	0.00				
2.8800	5.7151	781219.	-1599.	-0.126	0.00	3.83E+11
-186.031	35.1552	0.00				
2.9700	5.5785	780011.	-1801.	-0.126	0.00	3.83E+11
-186.828	36.1701	0.00				
3.0600	5.4419	778586.	-2003.	-0.126	0.00	3.83E+11
-187.563	37.2237	0.00				
3.1500	5.3054	776942.	-2206.	-0.126	0.00	3.83E+11
-188.234	38.3183	0.00				
3.2400	5.1688	775078.	-2409.	-0.126	0.00	3.83E+11
-188.838	39.4570	0.00				
3.3300	5.0322	772994.	-2614.	-0.126	0.00	3.83E+11
-189.373	40.6427	0.00				
3.4200	4.8957	770689.	-2818.	-0.126	0.00	3.83E+11
-189.838	41.8789	0.00				
3.5100	4.7591	768163.	-3024.	-0.126	0.00	3.83E+11
-190.229	43.1692	0.00				
3.6000	4.6226	765415.	-3229.	-0.126	0.00	3.83E+11

-190.543	44.5180	0.00				
3.6900	4.4860	762444.	-3435.	-0.126	0.00	3.83E+11
-190.779	45.9298	0.00				
3.7800	4.3494	759251.	-3641.	-0.126	0.00	3.83E+11
-190.931	47.4096	0.00				
3.8700	4.2129	755835.	-3847.	-0.126	0.00	3.83E+11
-190.998	48.9634	0.00				
3.9600	4.0764	752197.	-4054.	-0.126	0.00	3.83E+11
-190.975	50.5975	0.00				
4.0500	3.9398	748336.	-4500.	-0.126	0.00	3.83E+11
-636.188	174.3948	0.00				
4.1400	3.8033	743732.	-5186.	-0.126	0.00	3.83E+11
-633.135	179.7890	0.00				
4.2300	3.6667	738391.	-5868.	-0.126	0.00	3.83E+11
-629.770	185.4927	0.00				
4.3200	3.5302	732314.	-6546.	-0.126	0.00	3.83E+11
-626.080	191.5379	0.00				
4.4100	3.3937	725508.	-7220.	-0.126	0.00	3.83E+11
-622.050	197.9616	0.00				
4.5000	3.2571	717975.	-7889.	-0.126	0.00	3.83E+11
-617.666	204.8059	0.00				
4.5900	3.1206	709723.	-8554.	-0.126	0.00	3.83E+11
-612.908	212.1198	0.00				
4.6800	2.9841	700755.	-9213.	-0.126	0.00	3.83E+11
-607.756	219.9601	0.00				
4.7700	2.8475	691079.	-9866.	-0.126	0.00	3.83E+11
-602.186	228.3937	0.00				
4.8600	2.7110	680700.	-10513.	-0.126	0.00	3.83E+11
-596.172	237.4995	0.00				
4.9500	2.5745	669625.	-11154.	-0.126	0.00	3.84E+11
-589.682	247.3713	0.00				
5.0400	2.4380	657863.	-11787.	-0.126	0.00	3.84E+11
-582.682	258.1221	0.00				
5.1300	2.3015	645422.	-12412.	-0.126	0.00	3.84E+11
-575.129	269.8892	0.00				
5.2200	2.1649	632309.	-13029.	-0.126	0.00	3.84E+11
-566.977	282.8408	0.00				
5.3100	2.0284	618535.	-13636.	-0.126	0.00	3.84E+11
-558.169	297.1863	0.00				
5.4000	1.8919	604110.	-14234.	-0.126	0.00	3.84E+11
-548.638	313.1895	0.00				
5.4900	1.7554	589045.	-14821.	-0.126	0.00	3.84E+11
-538.307	331.1882	0.00				
5.5800	1.6189	573353.	-15396.	-0.126	0.00	3.84E+11
-527.077	351.6232	0.00				
5.6700	1.4824	557045.	-15959.	-0.126	0.00	3.84E+11
-514.832	375.0812	0.00				
5.7600	1.3459	540137.	-16508.	-0.126	0.00	3.84E+11
-501.423	402.3634	0.00				
5.8500	1.2094	522644.	-17041.	-0.126	0.00	3.84E+11

-486.662	434.5959	0.00				
5.9400	1.0729	504583.	-17558.	-0.126	0.00	3.84E+11
-470.301	473.4191	0.00				
6.0300	0.9364	485974.	-18411.	-0.126	0.00	3.84E+11
-1108.	1278.	0.00				
6.1200	0.7999	466072.	-19587.	-0.126	0.00	3.84E+11
-1071.	1446.	0.00				
6.2100	0.6634	444921.	-20721.	-0.126	0.00	3.84E+11
-1028.	1673.	0.00				
6.3000	0.5269	422571.	-21803.	-0.126	0.00	3.84E+11
-975.642	2000.	0.00				
6.3900	0.3904	399082.	-22821.	-0.126	0.00	3.84E+11
-910.066	2518.	0.00				
6.4800	0.2539	374533.	-23756.	-0.126	0.00	3.84E+11
-821.647	3495.	0.00				
6.5700	0.1174	349024.	-24568.	-0.126	0.00	3.84E+11
-681.167	6265.	0.00				
6.6600	-0.01908	322722.	-24701.	-0.126	0.00	3.84E+11
434.7628	24614.	0.00				
6.7500	-0.156	296926.	-24067.	-0.126	0.00	3.85E+11
738.5459	5127.	0.00				
6.8400	-0.292	271992.	-23199.	-0.126	0.00	3.85E+11
869.0210	3214.	0.00				
6.9300	-0.429	248071.	-22211.	-0.126	0.00	3.85E+11
961.4247	2423.	0.00				
7.0200	-0.565	225272.	-21132.	-0.126	0.00	3.85E+11
1036.	1979.	0.00				
7.1100	-0.702	203681.	-19980.	-0.126	0.00	3.85E+11
1099.	1692.	0.00				
7.2000	-0.838	183371.	-18763.	-0.126	0.00	3.85E+11
1155.	1488.	0.00				
7.2900	-0.974	164408.	-17489.	-0.126	0.00	3.85E+11
1205.	1335.	0.00				
7.3800	-1.111	146851.	-16163.	-0.126	0.00	3.85E+11
1251.	1217.	0.00				
7.4700	-1.247	130753.	-14788.	-0.126	0.00	3.85E+11
1295.	1121.	0.00				
7.5600	-1.384	116165.	-13745.	-0.126	0.00	3.85E+11
635.5338	495.9565	0.00				
7.6500	-1.520	102319.	-13046.	-0.126	0.00	3.85E+11
658.8146	467.9730	0.00				
7.7400	-1.657	89241.	-12323.	-0.126	0.00	3.85E+11
681.0934	443.9466	0.00				
7.8300	-1.793	76957.	-11576.	-0.126	0.00	3.85E+11
702.5138	423.0604	0.00				
7.9200	-1.930	65493.	-10806.	-0.126	0.00	3.85E+11
723.1903	404.7121	0.00				
8.0100	-2.066	54873.	-10014.	-0.126	0.00	3.85E+11
743.2159	388.4474	0.00				
8.1000	-2.203	45119.	-9201.	-0.126	0.00	3.85E+11

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762.6674   373.9167       0.00
    8.1900     -2.339     36255.     -8367.     -0.126       0.00   3.85E+11
781.6085   360.8460       0.00
    8.2800     -2.476     28302.     -7513.     -0.126       0.00   3.85E+11
800.0934   349.0173       0.00
    8.3700     -2.612     21283.     -6639.     -0.126       0.00   3.85E+11
818.1678   338.2550       0.00
    8.4600     -2.749     15218.     -5746.     -0.126       0.00   3.85E+11
835.8715   328.4157       0.00
    8.5500     -2.885     10128.     -4833.     -0.126       0.00   3.85E+11
853.2384   319.3813       0.00
    8.6400     -3.022      6034.     -3903.     -0.126       0.00   3.85E+11
870.2985   311.0533       0.00
    8.7300     -3.158      2954.     -2954.     -0.126       0.00   3.85E+11
887.0780   303.3491       0.00
    8.8200     -3.295   909.0083     -1987.     -0.126       0.00   3.85E+11
903.5999   296.1988       0.00
    8.9100     -3.431    -81.972     -1002.     -0.126       0.00   3.85E+11
919.8848   289.5428       0.00
    9.0000     -3.568       0.00       0.00     -0.126       0.00   3.85E+11
935.9509   141.6649       0.00

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


Output Summary for Load Case No. 2:

Pile-head deflection              =    10.08659364 inches
Computed slope at pile head       =     -0.1265252 radians
Maximum bending moment            =        784022. inch-lbs
Maximum shear force               =        -24701. lbs
Depth of maximum bending moment   =     2.43000000 feet below pile head
Depth of maximum shear force      =     6.66000000 feet below pile head
Number of iterations              =             45
Number of zero deflection points  =              1
Pile deflection at ground         =     8.56842933 inches



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

Boundary Condition Type 1, Shear and Moment
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Shear      =          2250. lbs
Moment     =        724800. in-lbs
Axial Load =          4600. lbs


    Pile       Pile Head       Maximum       Maximum
   Length      Deflection      Moment         Shear
    feet         inches        ln-lbs          lbs
------------  ------------  ------------  ------------
    9.00000   10.08659364       784022.       -24701.
    8.55000   17.35527568       790600.       -26550.


--------------------------------------------------------------------------------
                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    Deflect.    Bending     Shear      Slope      Total     Bending   Soil
Res.  Soil Spr.  Distrib.
     X          y       Moment      Force        S       Stress    Stiffness      p
      Es*H     Lat. Load
   feet      inches     in-lbs       lbs      radians     psi*      lb-in^2
lb/inch    lb/inch    lb/inch
---------- ---------- ---------- ---------- ---------- ---------- ----------
---------- ---------- ----------
      0.00     9.6756    724800.      2250.     -0.121       0.00   3.83E+11
0.00       0.00       0.00
   0.09000     9.5446    727728.      2250.     -0.121       0.00   3.83E+11
0.00       0.00       0.00
    0.1800     9.4135    730656.      2250.     -0.121       0.00   3.83E+11
0.00       0.00       0.00
    0.2700     9.2825    733584.      2250.     -0.121       0.00   3.83E+11
0.00       0.00       0.00
    0.3600     9.1514    736512.      2250.     -0.121       0.00   3.83E+11
0.00       0.00       0.00
    0.4500     9.0204    739440.      2250.     -0.121       0.00   3.83E+11
0.00       0.00       0.00
    0.5400     8.8893    742368.      2250.     -0.121       0.00   3.83E+11
0.00       0.00       0.00
    0.6300     8.7583    745296.      2250.     -0.121       0.00   3.83E+11
0.00       0.00       0.00
    0.7200     8.6273    748224.      2250.     -0.121       0.00   3.83E+11
0.00       0.00       0.00
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    0.8100     8.4962    751152.      2250.     -0.121       0.00   3.83E+11
0.00       0.00       0.00
    0.9000     8.3652    754080.      2250.     -0.121       0.00   3.83E+11
0.00       0.00       0.00
    0.9900     8.2342    757008.      2250.     -0.121       0.00   3.83E+11
0.00       0.00       0.00
    1.0800     8.1031    759935.      2165.     -0.121       0.00   3.83E+11
-157.104    20.9391       0.00
    1.1700     7.9721    762680.      1995.     -0.121       0.00   3.83E+11
-158.833    21.5175       0.00
    1.2600     7.8411    765239.      1822.     -0.121       0.00   3.83E+11
-160.524    22.1100       0.00
    1.3500     7.7101    767612.      1648.     -0.121       0.00   3.83E+11
-162.177    22.7172       0.00
    1.4400     7.5790    769795.      1472.     -0.121       0.00   3.83E+11
-163.790    23.3398       0.00
    1.5300     7.4480    771786.      1294.     -0.121       0.00   3.83E+11
-165.363    23.9785       0.00
    1.6200     7.3170    773585.      1115.     -0.121       0.00   3.83E+11
-166.896    24.6340       0.00
    1.7100     7.1860    775190.   933.6075     -0.121       0.00   3.83E+11
-168.386    25.3071       0.00
    1.8000     7.0550    776598.   750.9697     -0.121       0.00   3.83E+11
-169.834    25.9987       0.00
    1.8900     6.9240    777808.   566.7916     -0.121       0.00   3.83E+11
-171.238    26.7097       0.00
    1.9800     6.7930    778818.   381.1199     -0.121       0.00   3.83E+11
-172.597    27.4409       0.00
    2.0700     6.6620    779626.   194.0043     -0.121       0.00   3.83E+11
-173.911    28.1935       0.00
    2.1600     6.5310    780232.     5.4964     -0.121       0.00   3.83E+11
-175.178    28.9685       0.00
    2.2500     6.4000    780634.   -184.354     -0.121       0.00   3.83E+11
-176.397    29.7672       0.00
    2.3400     6.2690    780830.   -375.494     -0.121       0.00   3.83E+11
-177.567    30.5907       0.00
    2.4300     6.1380    780818.   -567.871     -0.121       0.00   3.83E+11
-178.686    31.4405       0.00
    2.5200     6.0070    780599.   -761.430     -0.121       0.00   3.83E+11
-179.754    32.3181       0.00
    2.6100     5.8760    780169.   -956.113     -0.121       0.00   3.83E+11
-180.769    33.2250       0.00
    2.7000     5.7450    779529.     -1152.     -0.121       0.00   3.83E+11
-181.729    34.1631       0.00
    2.7900     5.6140    778677.     -1349.     -0.121       0.00   3.83E+11
-182.633    35.1340       0.00
    2.8800     5.4830    777611.     -1546.     -0.121       0.00   3.83E+11
-183.479    36.1400       0.00
    2.9700     5.3521    776332.     -1745.     -0.121       0.00   3.83E+11
-184.266    37.1832       0.00
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    3.0600     5.2211    774838.     -1944.     -0.121       0.00   3.83E+11
-184.991    38.2660       0.00
    3.1500     5.0901    773128.     -2144.     -0.121       0.00   3.83E+11
-185.653    39.3911       0.00
    3.2400     4.9591    771201.     -2345.     -0.121       0.00   3.83E+11
-186.249    40.5613       0.00
    3.3300     4.8282    769057.     -2547.     -0.121       0.00   3.83E+11
-186.778    41.7799       0.00
    3.4200     4.6972    766696.     -2749.     -0.121       0.00   3.83E+11
-187.237    43.0503       0.00
    3.5100     4.5662    764116.     -2951.     -0.121       0.00   3.83E+11
-187.624    44.3764       0.00
    3.6000     4.4353    761317.     -3154.     -0.121       0.00   3.83E+11
-187.935    45.7625       0.00
    3.6900     4.3043    758298.     -3357.     -0.121       0.00   3.83E+11
-188.168    47.2132       0.00
    3.7800     4.1734    755061.     -3560.     -0.121       0.00   3.83E+11
-188.319    48.7340       0.00
    3.8700     4.0424    751603.     -3764.     -0.121       0.00   3.83E+11
-188.386    50.3306       0.00
    3.9600     3.9115    747926.     -3967.     -0.121       0.00   3.83E+11
-188.365    52.0098       0.00
    4.0500     3.7805    744030.     -4408.     -0.121       0.00   3.83E+11
-627.495   179.2603       0.00
    4.1400     3.6496    739401.     -5084.     -0.121       0.00   3.83E+11
-624.489   184.8026       0.00
    4.2300     3.5186    734044.     -5756.     -0.121       0.00   3.83E+11
-621.174   190.6626       0.00
    4.3200     3.3877    727962.     -6425.     -0.121       0.00   3.83E+11
-617.538   196.8734       0.00
    4.4100     3.2567    721160.     -7090.     -0.121       0.00   3.83E+11
-613.569   203.4726       0.00
    4.5000     3.1258    713643.     -7750.     -0.121       0.00   3.83E+11
-609.249   210.5037       0.00
    4.5900     2.9948    705414.     -8406.     -0.121       0.00   3.83E+11
-604.562   218.0168       0.00
    4.6800     2.8639    696481.     -9056.     -0.121       0.00   3.83E+11
-599.487   226.0704       0.00
    4.7700     2.7330    686848.     -9701.     -0.121       0.00   3.83E+11
-594.000   234.7329       0.00
    4.8600     2.6020    676523.    -10339.     -0.121       0.00   3.84E+11
-588.075   244.0851       0.00
    4.9500     2.4711    665511.    -10971.     -0.121       0.00   3.84E+11
-581.681   254.2235       0.00
    5.0400     2.3402    653821.    -11595.     -0.121       0.00   3.84E+11
-574.785   265.2638       0.00
    5.1300     2.2093    641461.    -12212.     -0.121       0.00   3.84E+11
-567.345   277.3467       0.00
    5.2200     2.0783    628439.    -12820.     -0.121       0.00   3.84E+11
-559.314   290.6446       0.00
```

```
    5.3100     1.9474    614764.    -13420.     -0.121       0.00   3.84E+11
-550.637   305.3722       0.00
    5.4000     1.8165    600447.    -14009.     -0.121       0.00   3.84E+11
-541.249   321.7996       0.00
    5.4900     1.6856    585499.    -14588.     -0.121       0.00   3.84E+11
-531.072   340.2729       0.00
    5.5800     1.5547    569931.    -15156.     -0.121       0.00   3.84E+11
-520.012   361.2433       0.00
    5.6700     1.4238    553757.    -15711.     -0.121       0.00   3.84E+11
-507.952   385.3114       0.00
    5.7600     1.2928    536991.    -16252.     -0.121       0.00   3.84E+11
-494.747   413.2968       0.00
    5.8500     1.1619    519647.    -16779.     -0.121       0.00   3.84E+11
-480.211   446.3509       0.00
    5.9400     1.0310    501743.    -17289.     -0.121       0.00   3.84E+11
-464.102   486.1501       0.00
    6.0300     0.9001    483298.    -18132.     -0.121       0.00   3.84E+11
-1097.      1317.        0.00
    6.1200     0.7692     463573.    -19297.     -0.121       0.00   3.84E+11
-1061.      1489.        0.00
    6.2100     0.6383     442610.    -20420.     -0.121       0.00   3.84E+11
-1018.      1723.        0.00
    6.3000     0.5074     420461.    -21492.     -0.121       0.00   3.84E+11
-966.489      2057.        0.00
    6.3900     0.3765     397183.    -22501.     -0.121       0.00   3.84E+11
-901.852      2587.        0.00
    6.4800     0.2456     372854.    -23428.     -0.121       0.00   3.84E+11
-814.837      3583.        0.00
    6.5700     0.1147     347575.    -24233.     -0.121       0.00   3.84E+11
-677.185      6377.        0.00
    6.6600   -0.01621     321505.    -24374.     -0.121       0.00   3.84E+11
417.3934     27817.        0.00
    6.7500     -0.147     295922.    -23755.     -0.121       0.00   3.85E+11
728.2901      5347.        0.00
    6.8400     -0.278     271189.    -22898.     -0.121       0.00   3.85E+11
858.3719      3335.        0.00
    6.9300     -0.409     247457.    -21921.     -0.121       0.00   3.85E+11
950.2109      2510.        0.00
    7.0200     -0.540     224834.    -20856.     -0.121       0.00   3.85E+11
1024.      2048.        0.00
    7.1100     -0.671     203404.    -19716.     -0.121       0.00   3.85E+11
1086.      1750.        0.00
    7.2000     -0.802     183242.    -18513.     -0.121       0.00   3.85E+11
1142.      1538.        0.00
    7.2900     -0.932     164412.    -17253.     -0.121       0.00   3.85E+11
1192.      1380.        0.00
    7.3800     -1.063     146971.    -15941.     -0.121       0.00   3.85E+11
1238.      1257.        0.00
    7.4700     -1.194     130975.    -14581.     -0.121       0.00   3.85E+11
1281.      1158.        0.00
```

```
    7.5600     -1.325    116472.    -13551.     -0.121       0.00   3.85E+11
626.4041   510.5195       0.00
    7.6500     -1.456    102700.    -12862.     -0.121       0.00   3.85E+11
649.3810   481.6689       0.00
    7.7400     -1.587     89685.    -12149.     -0.121       0.00   3.85E+11
671.3672   456.9034       0.00
    7.8300     -1.718     77454.    -11412.     -0.121       0.00   3.85E+11
692.5048   435.3785       0.00
    7.9200     -1.849     66030.    -10653.     -0.121       0.00   3.85E+11
712.9072   416.4721       0.00
    8.0100     -1.980     55437.     -9873.     -0.121       0.00   3.85E+11
732.6663   399.7149       0.00
    8.1000     -2.111     45700.     -9071.     -0.121       0.00   3.85E+11
751.8580   384.7460       0.00
    8.1900     -2.241     36839.     -8249.     -0.121       0.00   3.85E+11
770.5455   371.2824       0.00
    8.2800     -2.372     28877.     -7407.     -0.121       0.00   3.85E+11
788.7822   359.0994       0.00
    8.3700     -2.503     21835.     -6545.     -0.121       0.00   3.85E+11
806.6135   348.0155       0.00
    8.4600     -2.634     15734.     -5665.     -0.121       0.00   3.85E+11
824.0785   337.8830       0.00
    8.5500     -2.765     10594.     -4765.     -0.121       0.00   3.85E+11
841.2109   328.5799       0.00
    8.6400     -2.896      6435.     -3848.     -0.121       0.00   3.85E+11
858.0403   320.0048       0.00
    8.7300     -3.027      3277.     -2912.     -0.121       0.00   3.85E+11
874.5925   312.0724       0.00
    8.8200     -3.158      1139.     -1959.     -0.121       0.00   3.85E+11
890.8904   304.7107       0.00
    8.9100     -3.289    40.7950   -988.068     -0.121       0.00   3.85E+11
906.9542   297.8581       0.00
    9.0000     -3.419       0.00       0.00     -0.121       0.00   3.85E+11
922.8019   145.7310       0.00

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


Output Summary for Load Case No. 3:

Pile-head deflection              =     9.67561832 inches
Computed slope at pile head       =     -0.1213467 radians
Maximum bending moment            =        780830. inch-lbs
Maximum shear force               =        -24374. lbs
Depth of maximum bending moment   =     2.34000000 feet below pile head
```

```
Depth of maximum shear force     =     6.66000000 feet below pile head
Number of iterations             =             44
Number of zero deflection points =              1
Pile deflection at ground        =     8.21959611 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	9.67561832	780830.	-24374.
8.55000	16.06851500	784514.	-25906.

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	Pile-head Load 1	Load Type 2	Pile-head Load 2	Axial Loading lbs	Pile-head Deflection inches	Pile-head Rotation radians	Max Shear in Pile lbs	Max Moment in Pile in-lbs
1	V, lb	1000.0000	M, in-lb	315600.	4200.	0.6616	-0.00831	-10796.	336441.
2	V, lb	2250.	M, in-lb	724800.	4600.	10.0866	-0.127	-24701.	784022.

```
  3  V, lb      2250.  M, in-lb     724800.      3800.     9.6756     -0.121
-24374.    780830.


Maximum pile-head deflection = 10.0865936429 inches
Maximum pile-head rotation   = -0.1265252223 radians = -7.249361 deg.

The analysis ended normally.
```

LATERAL LOAD (LPILE) ANALYSES
NORTHBOUND PARKING AREA
LIGHT TOWER TP2-3 (B-007-0-26)

TP 26 NE Ohio Site 13 MAH-11 Vacant Rest Area - Northbound Parking Area
Light Tower TP2-3 (Boring B-007-0-26) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

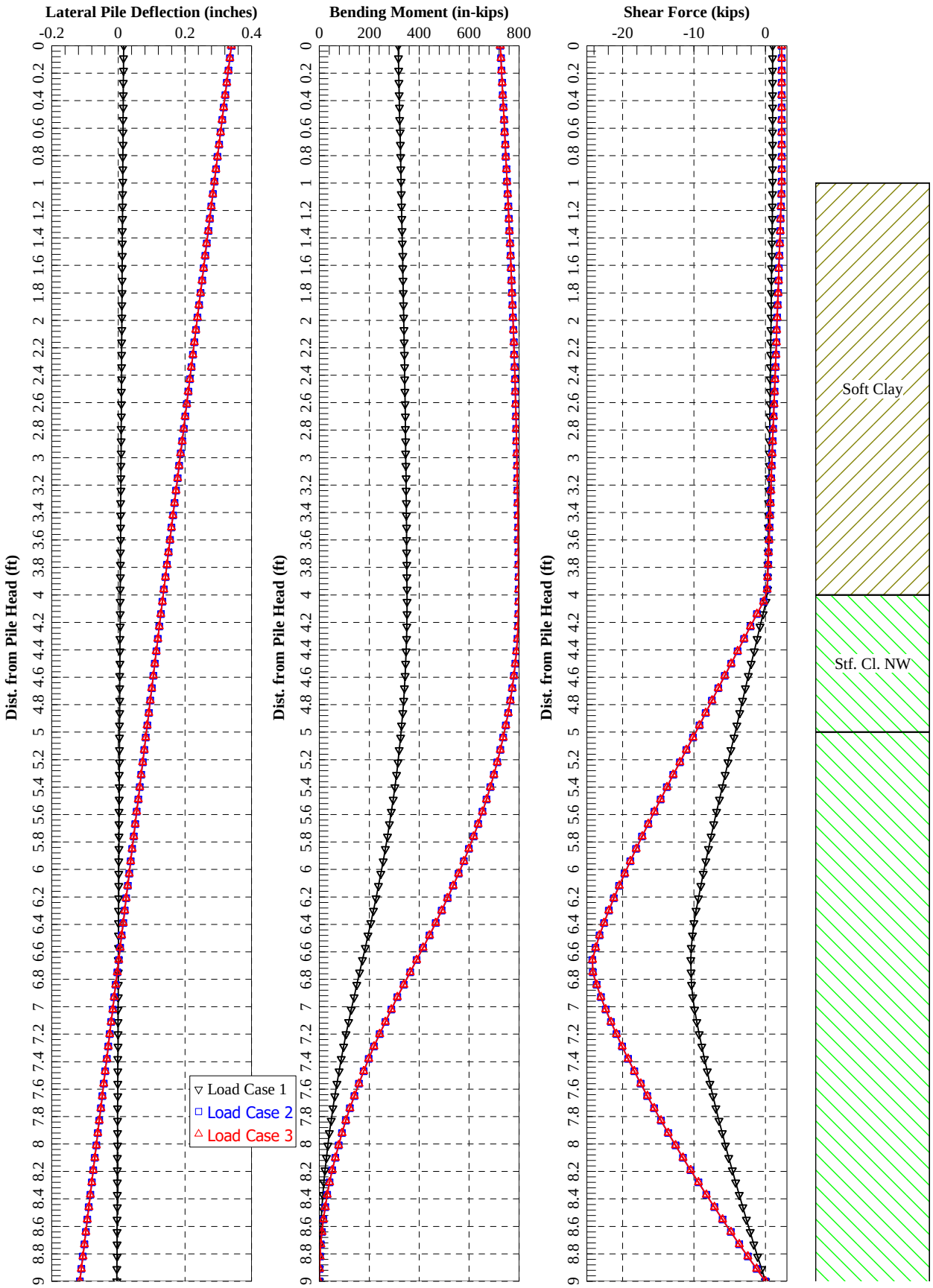


PLATE 226

```
================================================================================

                          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
                           © 1985-2024 by Ensoft, Inc.
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                                 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
13_MAH-11 (2LMN)\Calcs\Light Towers\LPILE Files\

Name of input data file:
Tower TP2-3 (B-007-0-26).lp12d

Name of output report file:
Tower TP2-3 (B-007-0-26).lp12o

Name of plot output file:
Tower TP2-3 (B-007-0-26).lp12p

Name of runtime message file:
Tower TP2-3 (B-007-0-26).lp12r



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

Date: May 27, 2026 Time: 17:36:58

Problem Title

Project Name: TP 26 NE Ohio Site 13 MAH-11 NB Vacant Rest Area

Job Number: 24170232E

Client: ms consultants, inc.

Engineer: BKS

Description: Light Tower TP2-3 (B-007-0-26)

Program Options and Settings

Computational Options:
- Conventional Analysis

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

Analysis Control Options:

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

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

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

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

Pile Structural Properties and Geometry

```
Number of pile sections defined                        =            1
Total length of pile                                   =        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
```

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	=	5.000000 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	=	5.000000 ft
Distance from top of pile to bottom of layer	=	14.000000 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	=	3250. psf
Undrained cohesion at bottom of layer	=	3250. psf
Epsilon-50 at top of layer	=	0.005000
Epsilon-50 at bottom of layer	=	0.005000

Layer 4 is stiff clay without free water

Distance from top of pile to top of layer	=	14.000000 ft
Distance from top of pile to bottom of layer	=	26.000000 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


 (Depth of the lowest soil layer extends 17.000 ft below the pile tip)
```

Summary of Input Soil Properties

Layer Num.	Soil Type Name (p-y Curve Type)	Layer Depth ft	Effective Unit Wt. pcf	Cohesion 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 5.0000	58.0000 58.0000	3000. 3000.	0.00500 0.00500
3	Stiff Clay w/o Free Water	5.0000 14.0000	60.0000 60.0000	3250. 3250.	0.00500 0.00500
4	Stiff Clay w/o Free Water	14.0000 26.0000	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 Top y vs. Pile Length No.	Load 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
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 Fc Ac + Fy As = 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	0.00000
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	0.00000	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	0.00000
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.
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 Stress ksi	Bending Max Steel Stress ksi	Bending Curvature rad/in.	Bending Stiffness kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in	Run Msg
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
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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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
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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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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       Bending       Bending      Depth to      Max Comp      Max Tens
  Max Conc      Max Steel  Run
   Curvature      Moment       Stiffness      N Axis        Strain        Strain
   Stress        Stress    Msg
    rad/in.       in-kip        kip-in2         in           in/in         in/in
     ksi           ksi
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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
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0.00001625         2366.    145595387.    10.0834069     0.0001639     -0.000421
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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
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0.00003938        3697.     93883511.    10.0786392     0.0003968     -0.001021
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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
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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
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2.3332503    -42.048320 C
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2.4030104    -43.598274 C
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2.4714639    -45.146185 C
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 0.0002194        11694.     53304015.     9.2651074     0.0020325     -0.005865
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3.9997330    -60.000000 CY
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3.9996505    -60.000000 CYT
 0.0004244        12335.     29066055.     8.4694819     0.0035942     -0.011683
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3.9875919    -60.000000 CYT
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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				
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
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0.00002000         2366.    118296180.    10.0798824     0.0002016     -0.000518
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0.8421464    -13.424502 C
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0.8652759    -13.820378 C
0.00002250         2366.    105152160.    10.0727554     0.0002266     -0.000583
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 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
-------------------------------------------------------------------------------

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

 Load           Axial Thrust        Nominal Mom. Cap.      Max. Comp.      Max.
Tens.
  No.              kips                 in-kip               Strain
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     Resist.       Nominal        Nominal     Ult. (Fac)    Ult. (Fac)   Bend.
Stiff.
```

Load No.	Factor	Ax. Thrust kips	Moment Cap in-kips	Ax. Thrust kips	Moment Cap in-kips	at Ult Mom kip-in^2
1	0.65	3.800000	12169.	2.470000	7910.	91219895.
2	0.65	4.200000	12173.	2.730000	7913.	91253873.
3	0.65	4.600000	12177.	2.990000	7915.	91287886.
1	0.75	3.800000	12169.	2.850000	9127.	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.	28420.
3	5.0000	1.2235	Yes	No	37200.	140955.
4	14.0000	13.0000	No	No	178155.	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
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    0.01588    315600.      1000.  -2.32E-04       0.00   3.84E+11
0.00       0.00       0.00
   0.09000    0.01563    316681.      1000.  -2.31E-04       0.00   3.84E+11
0.00       0.00       0.00
    0.1800    0.01538    317762.      1000.  -2.31E-04       0.00   3.84E+11
0.00       0.00       0.00
    0.2700    0.01513    318843.      1000.  -2.30E-04       0.00   3.84E+11
0.00       0.00       0.00
    0.3600    0.01488    319924.      1000.  -2.29E-04       0.00   3.84E+11
0.00       0.00       0.00
    0.4500    0.01464    321005.      1000.  -2.28E-04       0.00   3.84E+11
0.00       0.00       0.00
    0.5400    0.01439    322086.      1000.  -2.27E-04       0.00   3.84E+11
0.00       0.00       0.00
    0.6300    0.01415    323167.      1000.  -2.26E-04       0.00   3.84E+11
0.00       0.00       0.00
    0.7200    0.01390    324248.      1000.  -2.25E-04       0.00   3.84E+11
0.00       0.00       0.00
    0.8100    0.01366    325329.      1000.  -2.24E-04       0.00   3.84E+11
0.00       0.00       0.00
    0.9000    0.01342    326410.      1000.  -2.23E-04       0.00   3.84E+11
0.00       0.00       0.00
    0.9900    0.01318    327491.      1000.  -2.22E-04       0.00   3.84E+11
0.00       0.00       0.00
    1.0800    0.01294    328572.   990.0813  -2.22E-04       0.00   3.84E+11
-18.368      1533.       0.00
    1.1700    0.01270    329632.   970.1423  -2.21E-04       0.00   3.84E+11
-18.556      1578.       0.00
```

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    1.2600    0.01246    330670.   950.0032  -2.20E-04       0.00   3.84E+11
-18.739      1624.       0.00
    1.3500    0.01222    331686.   929.6690  -2.19E-04       0.00   3.84E+11
-18.917      1671.       0.00
    1.4400    0.01199    332680.   909.1449  -2.18E-04       0.00   3.84E+11
-19.090      1720.       0.00
    1.5300    0.01175    333652.   888.4363  -2.17E-04       0.00   3.84E+11
-19.259      1770.       0.00
    1.6200    0.01152    334601.   867.5485  -2.16E-04       0.00   3.84E+11
-19.422      1821.       0.00
    1.7100    0.01129    335528.   846.4871  -2.15E-04       0.00   3.84E+11
-19.580      1874.       0.00
    1.8000    0.01106    336431.   825.2577  -2.14E-04       0.00   3.84E+11
-19.733      1928.       0.00
    1.8900    0.01082    337312.   803.8660  -2.13E-04       0.00   3.84E+11
-19.881      1984.       0.00
    1.9800    0.01059    338170.   782.3177  -2.12E-04       0.00   3.84E+11
-20.023      2041.       0.00
    2.0700    0.01037    339004.   760.6188  -2.11E-04       0.00   3.84E+11
-20.160      2100.       0.00
    2.1600    0.01014    339814.   738.7753  -2.10E-04       0.00   3.84E+11
-20.291      2161.       0.00
    2.2500    0.00991    340601.   716.7934  -2.09E-04       0.00   3.84E+11
-20.416      2224.       0.00
    2.3400    0.00969    341365.   694.6793  -2.08E-04       0.00   3.84E+11
-20.536      2290.       0.00
    2.4300    0.00946    342104.   672.4395  -2.07E-04       0.00   3.84E+11
-20.649      2357.       0.00
    2.5200    0.00924    342819.   650.0804  -2.06E-04       0.00   3.84E+11
-20.757      2426.       0.00
    2.6100    0.00902    343510.   627.6088  -2.05E-04       0.00   3.84E+11
-20.858      2498.       0.00
    2.7000    0.00880    344176.   605.0316  -2.04E-04       0.00   3.84E+11
-20.952      2573.       0.00
    2.7900    0.00857    344819.   582.3556  -2.04E-04       0.00   3.84E+11
-21.040      2650.       0.00
    2.8800    0.00836    345436.   559.5882  -2.03E-04       0.00   3.84E+11
-21.122      2730.       0.00
    2.9700    0.00814    346029.   536.7367  -2.02E-04       0.00   3.84E+11
-21.196      2813.       0.00
    3.0600    0.00792    346597.   513.8087  -2.01E-04       0.00   3.84E+11
-21.263      2900.       0.00
    3.1500    0.00770    347141.   490.8119  -2.00E-04       0.00   3.84E+11
-21.323      2989.       0.00
    3.2400    0.00749    347659.   467.7543  -1.99E-04       0.00   3.84E+11
-21.376      3083.       0.00
    3.3300    0.00727    348153.   444.6441  -1.98E-04       0.00   3.84E+11
-21.421      3180.       0.00
    3.4200    0.00706    348622.   421.4898  -1.97E-04       0.00   3.84E+11
-21.458      3282.       0.00
```

```
    3.5100    0.00685    349065.   398.3002  -1.96E-04       0.00   3.84E+11
-21.486      3388.       0.00
    3.6000    0.00664    349484.   375.0843  -1.95E-04       0.00   3.84E+11
-21.506      3498.       0.00
    3.6900    0.00643    349877.   351.8513  -1.94E-04       0.00   3.84E+11
-21.518      3614.       0.00
    3.7800    0.00622    350245.   328.6110  -1.93E-04       0.00   3.84E+11
-21.520      3736.       0.00
    3.8700    0.00601    350589.   305.3733  -1.92E-04       0.00   3.84E+11
-21.513      3864.       0.00
    3.9600    0.00581    350907.   282.1486  -1.91E-04       0.00   3.84E+11
-21.496      3998.       0.00
    4.0500    0.00560    351200.    62.5338  -1.90E-04       0.00   3.84E+11
-385.198     74275.       0.00
    4.1400    0.00540    351044.   -352.745  -1.89E-04       0.00   3.84E+11
-383.837     76817.       0.00
    4.2300    0.00519    350440.   -766.484  -1.88E-04       0.00   3.84E+11
-382.344     79515.       0.00
    4.3200    0.00499    349390.     -1179.  -1.87E-04       0.00   3.84E+11
-380.713     82385.       0.00
    4.4100    0.00479    347896.     -1589.  -1.86E-04       0.00   3.84E+11
-378.935     85447.       0.00
    4.5000    0.00459    345960.     -1997.  -1.85E-04       0.00   3.84E+11
-377.004     88720.       0.00
    4.5900    0.00439    343584.     -2403.  -1.84E-04       0.00   3.84E+11
-374.910     92229.       0.00
    4.6800    0.00419    340771.     -2807.  -1.83E-04       0.00   3.84E+11
-372.644     96004.       0.00
    4.7700    0.00399    337523.     -3208.  -1.82E-04       0.00   3.84E+11
-370.193    100078.       0.00
    4.8600    0.00380    333844.     -3606.  -1.81E-04       0.00   3.84E+11
-367.544    104490.       0.00
    4.9500    0.00360    329735.     -4002.  -1.80E-04       0.00   3.84E+11
-364.683    109287.       0.00
    5.0400    0.00341    325202.     -4409.  -1.79E-04       0.00   3.84E+11
-389.076    123232.       0.00
    5.1300    0.00322    320215.     -4827.  -1.78E-04       0.00   3.84E+11
-385.478    129420.       0.00
    5.2200    0.00302    314778.     -5241.  -1.77E-04       0.00   3.84E+11
-381.587    136250.       0.00
    5.3100    0.00283    308895.     -5651.  -1.77E-04       0.00   3.85E+11
-377.373    143834.       0.00
    5.4000    0.00264    302573.     -6056.  -1.76E-04       0.00   3.85E+11
-372.801    152315.       0.00
    5.4900    0.00245    295816.     -6456.  -1.75E-04       0.00   3.85E+11
-367.829    161875.       0.00
    5.5800    0.00227    288630.     -6850.  -1.74E-04       0.00   3.85E+11
-362.407    172749.       0.00
    5.6700    0.00208    281021.     -7238.  -1.73E-04       0.00   3.85E+11
-356.473    185251.       0.00
```

5.7600	0.00189	272996.	-7620.	-1.72E-04	0.00	3.85E+11	
-349.949	199806.	0.00					
5.8500	0.00171	264563.	-7994.	-1.72E-04	0.00	3.85E+11	
-342.736	217006.	0.00					
5.9400	0.00152	255731.	-8360.	-1.71E-04	0.00	3.85E+11	
-334.707	237706.	0.00					
6.0300	0.00134	246508.	-8716.	-1.70E-04	0.00	3.85E+11	
-325.686	263187.	0.00					
6.1200	0.00115	236905.	-9063.	-1.70E-04	0.00	3.85E+11	
-315.435	295472.	0.00					
6.2100	9.70E-04	226934.	-9397.	-1.69E-04	0.00	3.85E+11	
-303.601	337964.	0.00					
6.3000	7.88E-04	216609.	-9717.	-1.68E-04	0.00	3.85E+11	
-289.638	396918.	0.00					
6.3900	6.07E-04	205946.	-10003.	-1.68E-04	0.00	3.85E+11	
-239.646	426628.	0.00					
6.4800	4.26E-04	195004.	-10224.	-1.67E-04	0.00	3.85E+11	
-169.036	428694.	0.00					
6.5700	2.46E-04	183865.	-10368.	-1.67E-04	0.00	3.85E+11	
-97.969	430759.	0.00					
6.6600	6.60E-05	172611.	-10435.	-1.66E-04	0.00	3.85E+11	
-26.436	432823.	0.00					
6.7500	-1.13E-04	161326.	-10425.	-1.66E-04	0.00	3.85E+11	
45.5724	434886.	0.00					
6.8400	-2.92E-04	150095.	-10336.	-1.65E-04	0.00	3.85E+11	
118.0673	436947.	0.00					
6.9300	-4.70E-04	139001.	-10169.	-1.65E-04	0.00	3.85E+11	
191.0590	439008.	0.00					
7.0200	-6.48E-04	128130.	-9923.	-1.64E-04	0.00	3.85E+11	
264.5581	441068.	0.00					
7.1100	-8.25E-04	117568.	-9615.	-1.64E-04	0.00	3.85E+11	
305.7993	400230.	0.00					
7.2000	-0.00100	107362.	-9276.	-1.64E-04	0.00	3.85E+11	
322.5166	347549.	0.00					
7.2900	-0.00118	97533.	-8920.	-1.63E-04	0.00	3.85E+11	
337.4318	309119.	0.00					
7.3800	-0.00136	88097.	-8548.	-1.63E-04	0.00	3.85E+11	
351.0097	279704.	0.00					
7.4700	-0.00153	79070.	-8162.	-1.63E-04	0.00	3.85E+11	
363.5536	256380.	0.00					
7.5600	-0.00171	70468.	-7763.	-1.63E-04	0.00	3.85E+11	
375.2725	237379.	0.00					
7.6500	-0.00188	62303.	-7352.	-1.63E-04	0.00	3.85E+11	
386.3178	221567.	0.00					
7.7400	-0.00206	54589.	-6929.	-1.62E-04	0.00	3.85E+11	
396.8021	208178.	0.00					
7.8300	-0.00223	47338.	-6495.	-1.62E-04	0.00	3.85E+11	
406.8120	196678.	0.00					
7.9200	-0.00241	40561.	-6051.	-1.62E-04	0.00	3.85E+11	
416.4155	186680.	0.00					

```
    8.0100   -0.00258     34270.     -5596.  -1.62E-04       0.00   3.85E+11
425.6671    177900.       0.00
    8.1000   -0.00276     28476.     -5131.  -1.62E-04       0.00   3.85E+11
434.6110    170120.       0.00
    8.1900   -0.00293     23188.     -4657.  -1.62E-04       0.00   3.85E+11
443.2836    163172.       0.00
    8.2800   -0.00311     18418.     -4174.  -1.62E-04       0.00   3.85E+11
451.7155    156926.       0.00
    8.3700   -0.00328     14174.     -3682.  -1.62E-04       0.00   3.85E+11
459.9322    151277.       0.00
    8.4600   -0.00346     10467.     -3181.  -1.62E-04       0.00   3.85E+11
467.9557    146140.       0.00
    8.5500   -0.00363      7305.     -2671.  -1.62E-04       0.00   3.85E+11
475.8047    141447.       0.00
    8.6400   -0.00381      4699.     -2153.  -1.62E-04       0.00   3.85E+11
483.4954    137140.       0.00
    8.7300   -0.00398      2656.     -1627.  -1.62E-04       0.00   3.85E+11
491.0418    133173.       0.00
    8.8200   -0.00416      1187.     -1092.  -1.62E-04       0.00   3.85E+11
498.4564    129504.       0.00
    8.9100   -0.00433   298.4083   -550.088  -1.62E-04       0.00   3.85E+11
505.7498    126102.       0.00
    9.0000   -0.00451       0.00       0.00  -1.62E-04       0.00   3.85E+11
512.9317     61468.       0.00

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


Output Summary for Load Case No. 1:

Pile-head deflection              =     0.01587862 inches
Computed slope at pile head       =     -0.0002324 radians
Maximum bending moment            =        351200. inch-lbs
Maximum shear force               =        -10435. 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              =             23
Number of zero deflection points  =              1
Pile deflection at ground         =     0.01315003 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	0.01587862	351200.	-10435.
8.55000	0.02929214	347710.	-11404.
8.10000	0.06672685	343605.	-12544.
7.65000	0.16166578	340218.	-13698.
7.20000	0.39860392	336990.	-14873.
6.75000	1.20387919	335604.	-16424.
6.30000	3.97718430	337451.	-18361.

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 X feet	Deflect. y inches	Bending Moment in-lbs	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness lb-in^2	Soil Res. Es*H lb/inch	Soil Spr. Lat. Load lb/inch	Distrib. p lb/inch
0.00	0.3398	724800.	2250.	-0.00432	0.00	3.83E+11	0.00	0.00	0.00
0.09000	0.3351	727251.	2250.	-0.00432	0.00	3.83E+11	0.00	0.00	0.00
0.1800	0.3304	729703.	2250.	-0.00431	0.00	3.83E+11	0.00	0.00	0.00
0.2700	0.3258	732154.	2250.	-0.00431	0.00	3.83E+11	0.00	0.00	0.00
0.3600	0.3211	734606.	2250.	-0.00431	0.00	3.83E+11	0.00	0.00	0.00

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    0.4500     0.3165    737057.      2250.   -0.00431       0.00   3.83E+11
0.00       0.00       0.00
    0.5400     0.3118    739509.      2250.   -0.00430       0.00   3.83E+11
0.00       0.00       0.00
    0.6300     0.3072    741960.      2250.   -0.00430       0.00   3.83E+11
0.00       0.00       0.00
    0.7200     0.3025    744411.      2250.   -0.00430       0.00   3.83E+11
0.00       0.00       0.00
    0.8100     0.2979    746863.      2250.   -0.00430       0.00   3.83E+11
0.00       0.00       0.00
    0.9000     0.2932    749314.      2250.   -0.00430       0.00   3.83E+11
0.00       0.00       0.00
    0.9900     0.2886    751765.      2250.   -0.00429       0.00   3.83E+11
0.00       0.00       0.00
    1.0800     0.2840    754217.      2222.   -0.00429       0.00   3.83E+11
-51.412   195.5353       0.00
    1.1700     0.2793    756608.      2166.   -0.00429       0.00   3.83E+11
-51.975   200.9568       0.00
    1.2600     0.2747    758939.      2110.   -0.00429       0.00   3.83E+11
-52.526   206.5108       0.00
    1.3500     0.2701    761208.      2053.   -0.00429       0.00   3.83E+11
-53.064   212.2032       0.00
    1.4400     0.2654    763416.      1995.   -0.00428       0.00   3.83E+11
-53.589   218.0399       0.00
    1.5300     0.2608    765561.      1937.   -0.00428       0.00   3.83E+11
-54.101   224.0274       0.00
    1.6200     0.2562    767643.      1879.   -0.00428       0.00   3.83E+11
-54.600   230.1727       0.00
    1.7100     0.2516    769661.      1819.   -0.00428       0.00   3.83E+11
-55.085   236.4830       0.00
    1.8000     0.2470    771615.      1760.   -0.00427       0.00   3.83E+11
-55.557   242.9662       0.00
    1.8900     0.2423    773504.      1699.   -0.00427       0.00   3.83E+11
-56.014   249.6306       0.00
    1.9800     0.2377    775328.      1639.   -0.00427       0.00   3.83E+11
-56.456   256.4851       0.00
    2.0700     0.2331    777086.      1577.   -0.00427       0.00   3.83E+11
-56.884   263.5393       0.00
    2.1600     0.2285    778777.      1516.   -0.00427       0.00   3.83E+11
-57.296   270.8034       0.00
    2.2500     0.2239    780402.      1454.   -0.00426       0.00   3.83E+11
-57.693   278.2884       0.00
    2.3400     0.2193    781959.      1391.   -0.00426       0.00   3.83E+11
-58.074   286.0060       0.00
    2.4300     0.2147    783449.      1328.   -0.00426       0.00   3.83E+11
-58.438   293.9690       0.00
    2.5200     0.2101    784870.      1265.   -0.00426       0.00   3.83E+11
-58.786   302.1910       0.00
    2.6100     0.2055    786223.      1201.   -0.00426       0.00   3.83E+11
-59.116   310.6869       0.00
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    2.7000     0.2009    787507.      1137.   -0.00425       0.00   3.83E+11
-59.429   319.4725       0.00
    2.7900     0.1963    788722.      1073.   -0.00425       0.00   3.83E+11
-59.723   328.5652       0.00
    2.8800     0.1917    789867.      1008.   -0.00425       0.00   3.83E+11
-59.999   337.9839       0.00
    2.9700     0.1871    790942.   943.2614   -0.00425       0.00   3.83E+11
-60.255   347.7488       0.00
    3.0600     0.1825    791947.   878.0580   -0.00424       0.00   3.83E+11
-60.492   357.8823       0.00
    3.1500     0.1780    792881.   812.6102   -0.00424       0.00   3.83E+11
-60.708   368.4086       0.00
    3.2400     0.1734    793744.   746.9404   -0.00424       0.00   3.83E+11
-60.903   379.3544       0.00
    3.3300     0.1688    794536.   681.0718   -0.00424       0.00   3.83E+11
-61.076   390.7488       0.00
    3.4200     0.1642    795257.   615.0284   -0.00424       0.00   3.83E+11
-61.227   402.6239       0.00
    3.5100     0.1597    795907.   548.8350   -0.00423       0.00   3.83E+11
-61.354   415.0151       0.00
    3.6000     0.1551    796485.   482.5175   -0.00423       0.00   3.83E+11
-61.457   427.9614       0.00
    3.6900     0.1505    796991.   416.1024   -0.00423       0.00   3.83E+11
-61.534   441.5061       0.00
    3.7800     0.1460    797426.   349.6174   -0.00423       0.00   3.83E+11
-61.586   455.6976       0.00
    3.8700     0.1414    797788.   283.0914   -0.00422       0.00   3.83E+11
-61.610   470.5894       0.00
    3.9600     0.1368    798079.   216.5544   -0.00422       0.00   3.83E+11
-61.606   486.2418       0.00
    4.0500     0.1323    798298.   -275.073   -0.00422       0.00   3.83E+11
-848.814      6930.       0.00
    4.1400     0.1277    797527.     -1190.   -0.00422       0.00   3.83E+11
-846.267      7156.       0.00
    4.2300     0.1232    795768.     -2103.   -0.00421       0.00   3.83E+11
-843.420      7396.       0.00
    4.3200     0.1186    793026.     -3012.   -0.00421       0.00   3.83E+11
-840.259      7651.       0.00
    4.4100     0.1141    789304.     -3918.   -0.00421       0.00   3.83E+11
-836.766      7922.       0.00
    4.5000     0.1095    784606.     -4819.   -0.00421       0.00   3.83E+11
-832.924      8213.       0.00
    4.5900     0.1050    778937.     -5717.   -0.00421       0.00   3.83E+11
-828.710      8526.       0.00
    4.6800     0.1004    772300.     -6609.   -0.00420       0.00   3.83E+11
-824.102      8862.       0.00
    4.7700    0.09590    764703.     -7496.   -0.00420       0.00   3.83E+11
-819.071      9224.       0.00
    4.8600    0.09136    756150.     -8378.   -0.00420       0.00   3.83E+11
-813.589      9617.       0.00
```

4.9500	0.08683	746648.	-9253.	-0.00420	0.00	3.83E+11
-807.618	10045.	0.00				
5.0400	0.08230	736204.	-10155.	-0.00420	0.00	3.83E+11
-862.013	11313.	0.00				
5.1300	0.07777	724755.	-11082.	-0.00419	0.00	3.83E+11
-854.398	11866.	0.00				
5.2200	0.07324	712309.	-12000.	-0.00419	0.00	3.83E+11
-846.107	12477.	0.00				
5.3100	0.06871	698876.	-12909.	-0.00419	0.00	3.83E+11
-837.075	13157.	0.00				
5.4000	0.06419	684467.	-13808.	-0.00419	0.00	3.83E+11
-827.218	13918.	0.00				
5.4900	0.05967	669093.	-14695.	-0.00419	0.00	3.84E+11
-816.442	14777.	0.00				
5.5800	0.05515	652766.	-15571.	-0.00418	0.00	3.84E+11
-804.630	15757.	0.00				
5.6700	0.05063	635501.	-16433.	-0.00418	0.00	3.84E+11
-791.637	16886.	0.00				
5.7600	0.04612	617313.	-17280.	-0.00418	0.00	3.84E+11
-777.284	18203.	0.00				
5.8500	0.04160	598218.	-18111.	-0.00418	0.00	3.84E+11
-761.342	19764.	0.00				
5.9400	0.03709	578235.	-18923.	-0.00418	0.00	3.84E+11
-743.510	21648.	0.00				
6.0300	0.03258	557385.	-19716.	-0.00417	0.00	3.84E+11
-723.385	23978.	0.00				
6.1200	0.02807	535691.	-20484.	-0.00417	0.00	3.84E+11
-700.400	26943.	0.00				
6.2100	0.02357	513180.	-21226.	-0.00417	0.00	3.84E+11
-673.724	30873.	0.00				
6.3000	0.01906	489883.	-21937.	-0.00417	0.00	3.84E+11
-642.053	36374.	0.00				
6.3900	0.01456	465838.	-22609.	-0.00417	0.00	3.84E+11
-603.143	44739.	0.00				
6.4800	0.01006	441088.	-23233.	-0.00417	0.00	3.84E+11
-552.529	59329.	0.00				
6.5700	0.00556	415695.	-23790.	-0.00417	0.00	3.84E+11
-478.662	93021.	0.00				
6.6600	0.00106	389743.	-24220.	-0.00417	0.00	3.84E+11
-317.677	324279.	0.00				
6.7500	-0.00344	363420.	-24160.	-0.00416	0.00	3.84E+11
428.6599	134572.	0.00				
6.8400	-0.00794	337598.	-23642.	-0.00416	0.00	3.84E+11
530.8041	72225.	0.00				
6.9300	-0.01243	312394.	-23033.	-0.00416	0.00	3.84E+11
596.6306	51825.	0.00				
7.0200	-0.01693	287887.	-22362.	-0.00416	0.00	3.85E+11
647.5083	41310.	0.00				
7.1100	-0.02142	264134.	-21639.	-0.00416	0.00	3.85E+11
689.9728	34784.	0.00				

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    7.2000   -0.02592    241187.    -20874.   -0.00416       0.00   3.85E+11
726.9732     30295.       0.00
    7.2900   -0.03041    219087.    -20071.   -0.00416       0.00   3.85E+11
760.1131     26996.       0.00
    7.3800   -0.03490    197875.    -19234.   -0.00416       0.00   3.85E+11
790.3690     24458.       0.00
    7.4700   -0.03939    177583.    -18365.   -0.00416       0.00   3.85E+11
818.3827     22437.       0.00
    7.5600   -0.04388    158247.    -17467.   -0.00416       0.00   3.85E+11
844.6004     20786.       0.00
    7.6500   -0.04837    139896.    -16542.   -0.00416       0.00   3.85E+11
869.3455     19409.       0.00
    7.7400   -0.05286    122558.    -15590.   -0.00416       0.00   3.85E+11
892.8605     18241.       0.00
    7.8300   -0.05735    106262.    -14614.   -0.00416       0.00   3.85E+11
915.3320     17236.       0.00
    7.9200   -0.06184     91034.    -13613.   -0.00416       0.00   3.85E+11
936.9071     16362.       0.00
    8.0100   -0.06633     76899.    -12590.   -0.00416       0.00   3.85E+11
957.7038     15593.       0.00
    8.1000   -0.07082     63880.    -11545.   -0.00416       0.00   3.85E+11
977.8182     14912.       0.00
    8.1900   -0.07531     52002.    -10479.   -0.00416       0.00   3.85E+11
997.3297     14303.       0.00
    8.2800   -0.07980     41288.     -9391.   -0.00416       0.00   3.85E+11
1016.     13755.       0.00
    8.3700   -0.08429     31759.     -8284.   -0.00416       0.00   3.85E+11
1035.     13259.       0.00
    8.4600   -0.08877     23436.     -7156.   -0.00416       0.00   3.85E+11
1053.     12809.       0.00
    8.5500   -0.09326     16342.     -6010.   -0.00416       0.00   3.85E+11
1071.     12397.       0.00
    8.6400   -0.09775     10497.     -4844.   -0.00416       0.00   3.85E+11
1088.     12019.       0.00
    8.7300     -0.102      5920.     -3660.   -0.00416       0.00   3.85E+11
1105.     11671.       0.00
    8.8200     -0.107      2632.     -2458.   -0.00416       0.00   3.85E+11
1122.     11349.       0.00
    8.9100     -0.111   652.4417     -1238.   -0.00416       0.00   3.85E+11
1138.     11051.       0.00
    9.0000     -0.116       0.00       0.00   -0.00416       0.00   3.85E+11
1154.      5386.       0.00
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* 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	=	0.33975177 inches
Computed slope at pile head	=	-0.0043171 radians
Maximum bending moment	=	798298. inch-lbs
Maximum shear force	=	-24220. 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	=	38
Number of zero deflection points	=	1
Pile deflection at ground	=	0.28808439 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	0.33975177	798298.	-24220.
8.55000	0.67108179	789611.	-25928.
8.10000	1.58064184	783700.	-28301.
7.65000	3.97081099	781749.	-31144.
7.20000	10.95614595	786576.	-34949.

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	Deflect.	Bending	Shear	Slope	Total	Bending	Soil Res.	Soil Spr.	Distrib.

TP 26 NE Ohio Site 13 MAH-11 Vacant Rest Area - Northbound Parking Area
Light Tower TP2-3 (Boring B-007-0-26) Lateral Load Analysis
36" Diameter, 8' Embedment Light Tower Drilled Shaft Foundation

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	0.3392	724800.	2250.	-0.00431	0.00	3.83E+11	0.00	0.00	0.00
0.09000	0.3346	727248.	2250.	-0.00431	0.00	3.83E+11	0.00	0.00	0.00
0.1800	0.3299	729695.	2250.	-0.00431	0.00	3.83E+11	0.00	0.00	0.00
0.2700	0.3253	732143.	2250.	-0.00430	0.00	3.83E+11	0.00	0.00	0.00
0.3600	0.3206	734591.	2250.	-0.00430	0.00	3.83E+11	0.00	0.00	0.00
0.4500	0.3160	737038.	2250.	-0.00430	0.00	3.83E+11	0.00	0.00	0.00
0.5400	0.3113	739486.	2250.	-0.00430	0.00	3.83E+11	0.00	0.00	0.00
0.6300	0.3067	741934.	2250.	-0.00430	0.00	3.83E+11	0.00	0.00	0.00
0.7200	0.3021	744381.	2250.	-0.00429	0.00	3.83E+11	0.00	0.00	0.00
0.8100	0.2974	746829.	2250.	-0.00429	0.00	3.83E+11	0.00	0.00	0.00
0.9000	0.2928	749276.	2250.	-0.00429	0.00	3.83E+11	0.00	0.00	0.00
0.9900	0.2882	751724.	2250.	-0.00429	0.00	3.83E+11	0.00	0.00	0.00
1.0800	0.2835	754172.	2222.	-0.00429	0.00	3.83E+11	-51.386	195.7355	0.00
1.1700	0.2789	756559.	2166.	-0.00428	0.00	3.83E+11	-51.948	201.1626	0.00
1.2600	0.2743	758886.	2110.	-0.00428	0.00	3.83E+11	-52.499	206.7223	0.00
1.3500	0.2697	761152.	2053.	-0.00428	0.00	3.83E+11	-53.037	212.4205	0.00
1.4400	0.2650	763356.	1995.	-0.00428	0.00	3.83E+11	-53.562	218.2632	0.00
1.5300	0.2604	765498.	1937.	-0.00427	0.00	3.83E+11	-54.074	224.2570	0.00
1.6200	0.2558	767576.	1879.	-0.00427	0.00	3.83E+11	-54.572	230.4085	0.00
1.7100	0.2512	769591.	1820.	-0.00427	0.00	3.83E+11	-55.057	236.7254	0.00
1.8000	0.2466	771541.	1760.	-0.00427	0.00	3.83E+11	-55.528	243.2152	0.00
1.8900	0.2420	773427.	1700.	-0.00427	0.00	3.83E+11	-55.985	249.8865	0.00

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    1.9800     0.2374    775247.      1639.   -0.00426       0.00   3.83E+11
-56.427   256.7480       0.00
    2.0700     0.2328    777002.      1578.   -0.00426       0.00   3.83E+11
-56.855   263.8095       0.00
    2.1600     0.2282    778690.      1516.   -0.00426       0.00   3.83E+11
-57.267   271.0811       0.00
    2.2500     0.2236    780311.      1454.   -0.00426       0.00   3.83E+11
-57.663   278.5737       0.00
    2.3400     0.2190    781866.      1392.   -0.00426       0.00   3.83E+11
-58.044   286.2993       0.00
    2.4300     0.2144    783352.      1329.   -0.00425       0.00   3.83E+11
-58.408   294.2705       0.00
    2.5200     0.2098    784770.      1265.   -0.00425       0.00   3.83E+11
-58.755   302.5009       0.00
    2.6100     0.2052    786120.      1202.   -0.00425       0.00   3.83E+11
-59.086   311.0055       0.00
    2.7000     0.2006    787401.      1138.   -0.00425       0.00   3.83E+11
-59.398   319.8002       0.00
    2.7900     0.1960    788613.      1073.   -0.00424       0.00   3.83E+11
-59.692   328.9022       0.00
    2.8800     0.1914    789755.      1009.   -0.00424       0.00   3.83E+11
-59.968   338.3305       0.00
    2.9700     0.1868    790826.   943.9309   -0.00424       0.00   3.83E+11
-60.224   348.1054       0.00
    3.0600     0.1823    791828.   878.7609   -0.00424       0.00   3.83E+11
-60.461   358.2493       0.00
    3.1500     0.1777    792759.   813.3467   -0.00424       0.00   3.83E+11
-60.677   368.7864       0.00
    3.2400     0.1731    793620.   747.7105   -0.00423       0.00   3.83E+11
-60.872   379.7434       0.00
    3.3300     0.1686    794409.   681.8757   -0.00423       0.00   3.83E+11
-61.045   391.1495       0.00
    3.4200     0.1640    795127.   615.8662   -0.00423       0.00   3.83E+11
-61.195   403.0367       0.00
    3.5100     0.1594    795774.   549.7068   -0.00423       0.00   3.83E+11
-61.322   415.4406       0.00
    3.6000     0.1549    796349.   483.4232   -0.00422       0.00   3.83E+11
-61.425   428.4001       0.00
    3.6900     0.1503    796853.   417.0421   -0.00422       0.00   3.83E+11
-61.503   441.9587       0.00
    3.7800     0.1457    797285.   350.5912   -0.00422       0.00   3.83E+11
-61.554   456.1646       0.00
    3.8700     0.1412    797645.   284.0992   -0.00422       0.00   3.83E+11
-61.579   471.0716       0.00
    3.9600     0.1366    797933.   217.5964   -0.00422       0.00   3.83E+11
-61.575   486.7400       0.00
    4.0500     0.1321    798150.   -273.838   -0.00421       0.00   3.83E+11
-848.488      6938.        0.00
    4.1400     0.1275    797376.     -1189.   -0.00421       0.00   3.83E+11
-845.942      7164.        0.00
```

4.2300	0.1230	795616.	-2101.	-0.00421	0.00	3.83E+11
-843.096	7404.	0.00				
4.3200	0.1184	792873.	-3010.	-0.00421	0.00	3.83E+11
-839.936	7659.	0.00				
4.4100	0.1139	789150.	-3915.	-0.00420	0.00	3.83E+11
-836.445	7932.	0.00				
4.5000	0.1094	784451.	-4816.	-0.00420	0.00	3.83E+11
-832.604	8223.	0.00				
4.5900	0.1048	778781.	-5713.	-0.00420	0.00	3.83E+11
-828.393	8535.	0.00				
4.6800	0.1003	772145.	-6605.	-0.00420	0.00	3.83E+11
-823.786	8872.	0.00				
4.7700	0.09575	764548.	-7492.	-0.00420	0.00	3.83E+11
-818.758	9235.	0.00				
4.8600	0.09122	755996.	-8374.	-0.00419	0.00	3.83E+11
-813.277	9629.	0.00				
4.9500	0.08670	746495.	-9249.	-0.00419	0.00	3.83E+11
-807.310	10057.	0.00				
5.0400	0.08217	736053.	-10150.	-0.00419	0.00	3.83E+11
-861.684	11325.	0.00				
5.1300	0.07765	724605.	-11077.	-0.00419	0.00	3.83E+11
-854.072	11879.	0.00				
5.2200	0.07313	712162.	-11994.	-0.00418	0.00	3.83E+11
-845.785	12491.	0.00				
5.3100	0.06861	698732.	-12903.	-0.00418	0.00	3.83E+11
-836.756	13172.	0.00				
5.4000	0.06409	684326.	-13801.	-0.00418	0.00	3.83E+11
-826.904	13934.	0.00				
5.4900	0.05958	668955.	-14689.	-0.00418	0.00	3.84E+11
-816.133	14794.	0.00				
5.5800	0.05507	652632.	-15564.	-0.00418	0.00	3.84E+11
-804.325	15775.	0.00				
5.6700	0.05056	635372.	-16425.	-0.00418	0.00	3.84E+11
-791.338	16905.	0.00				
5.7600	0.04605	617188.	-17272.	-0.00417	0.00	3.84E+11
-776.992	18223.	0.00				
5.8500	0.04154	598098.	-18103.	-0.00417	0.00	3.84E+11
-761.057	19786.	0.00				
5.9400	0.03704	578120.	-18915.	-0.00417	0.00	3.84E+11
-743.233	21672.	0.00				
6.0300	0.03253	557275.	-19707.	-0.00417	0.00	3.84E+11
-723.117	24004.	0.00				
6.1200	0.02803	535587.	-20476.	-0.00417	0.00	3.84E+11
-700.143	26973.	0.00				
6.2100	0.02353	513082.	-21217.	-0.00417	0.00	3.84E+11
-673.480	30906.	0.00				
6.3000	0.01904	489792.	-21928.	-0.00416	0.00	3.84E+11
-641.825	36413.	0.00				
6.3900	0.01454	465753.	-22600.	-0.00416	0.00	3.84E+11
-602.936	44785.	0.00				

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    6.4800    0.01005    441011.    -23224.   -0.00416       0.00   3.84E+11
-552.351     59386.       0.00
    6.5700    0.00555    415624.    -23780.   -0.00416       0.00   3.84E+11
-478.535     93096.       0.00
    6.6600    0.00106    389680.    -24210.   -0.00416       0.00   3.84E+11
-317.760    324023.       0.00
    6.7500   -0.00343    363364.    -24150.   -0.00416       0.00   3.84E+11
428.4057    134812.       0.00
    6.8400   -0.00792    337549.    -23633.   -0.00416       0.00   3.84E+11
530.5499     72329.       0.00
    6.9300   -0.01241    312352.    -23024.   -0.00416       0.00   3.84E+11
596.3637     51895.       0.00
    7.0200   -0.01690    287851.    -22353.   -0.00416       0.00   3.85E+11
647.2283     41363.       0.00
    7.1100   -0.02139    264104.    -21631.   -0.00415       0.00   3.85E+11
689.6804     34828.       0.00
    7.2000   -0.02587    241163.    -20866.   -0.00415       0.00   3.85E+11
726.6691     30333.       0.00
    7.2900   -0.03036    219068.    -20063.   -0.00415       0.00   3.85E+11
759.7981     27030.       0.00
    7.3800   -0.03484    197860.    -19226.   -0.00415       0.00   3.85E+11
790.0438     24488.       0.00
    7.4700   -0.03933    177574.    -18358.   -0.00415       0.00   3.85E+11
818.0478     22465.       0.00
    7.5600   -0.04381    158241.    -17460.   -0.00415       0.00   3.85E+11
844.2562     20812.       0.00
    7.6500   -0.04830    139894.    -16535.   -0.00415       0.00   3.85E+11
868.9925     19433.       0.00
    7.7400   -0.05278    122560.    -15584.   -0.00415       0.00   3.85E+11
892.4990     18263.       0.00
    7.8300   -0.05726    106267.    -14608.   -0.00415       0.00   3.85E+11
914.9623     17257.       0.00
    7.9200   -0.06174     91041.    -13608.   -0.00415       0.00   3.85E+11
936.5296     16382.       0.00
    8.0100   -0.06623     76908.    -12585.   -0.00415       0.00   3.85E+11
957.3186     15612.       0.00
    8.1000   -0.07071     63891.    -11541.   -0.00415       0.00   3.85E+11
977.4255     14930.       0.00
    8.1900   -0.07519     52014.    -10474.   -0.00415       0.00   3.85E+11
996.9297     14320.       0.00
    8.2800   -0.07967     41300.     -9387.   -0.00415       0.00   3.85E+11
1016.     13771.       0.00
    8.3700   -0.08415     31771.     -8280.   -0.00415       0.00   3.85E+11
1034.     13275.       0.00
    8.4600   -0.08863     23449.     -7153.   -0.00415       0.00   3.85E+11
1052.     12824.       0.00
    8.5500   -0.09311     16354.     -6007.   -0.00415       0.00   3.85E+11
1070.     12412.       0.00
    8.6400   -0.09759     10507.     -4842.   -0.00415       0.00   3.85E+11
1087.     12034.       0.00
```

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    8.7300     -0.102      5929.     -3659.   -0.00415       0.00   3.85E+11
1104.     11685.       0.00
    8.8200     -0.107      2638.     -2457.   -0.00415       0.00   3.85E+11
1121.     11363.       0.00
    8.9100     -0.111   655.7910     -1237.   -0.00415       0.00   3.85E+11
1138.     11064.       0.00
    9.0000     -0.116       0.00       0.00   -0.00415       0.00   3.85E+11
1154.      5393.       0.00

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


Output Summary for Load Case No. 3:

Pile-head deflection             =     0.33923140 inches
Computed slope at pile head      =     -0.0043106 radians
Maximum bending moment           =        798150. inch-lbs
Maximum shear force              =        -24210. 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             =             38
Number of zero deflection points =              1
Pile deflection at ground        =     0.28764242 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
   Length      Deflection      Moment         Shear
    feet         inches        ln-lbs          lbs
------------  ------------  ------------  ------------
    9.00000    0.33923140       798150.       -24210.
    8.55000    0.66903468       789334.       -25907.
    8.10000    1.56926191       783112.       -28246.
    7.65000    3.89784926       780324.       -30991.
```

```
    7.20000   10.36143469       782309.       -34434.

--------------------------------------------------------------------------------
            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 Load                Load                  Axial    Pile-head  Pile-head  Max
Shear Max Moment
Case Type   Pile-head    Type     Pile-head   Loading  Deflection  Rotation    in
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.    0.01588  -2.32E-04
-10435.    351200.
  2  V, lb      2250.  M, in-lb     724800.      4600.     0.3398   -0.00432
-24220.    798298.
  3  V, lb      2250.  M, in-lb     724800.      3800.     0.3392   -0.00431
-24210.    798150.


Maximum pile-head deflection = 0.3397517673 inches
Maximum pile-head rotation   = -0.0043171088 radians = -0.247352 deg.

The analysis ended normally.
```

Appendix IV – OGE Geotechnical Checklists

I. Geotechnical Design Checklists	
Project: MAH-11 Vacant Rest Area	**PDP Path:**
PID: 122881	**Review Stage: Final**

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: MAH-11 Vacant Rest Area	PID: 122881	Reviewer: BKS	Date: 8/5/2026

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 the 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:	MAH-11 Vacant Rest Area	PID:	122881	Reviewer:	BKS	Date:	8/5/2026

Use this Checklist in conjunction with the Subgrade design guidance in GDM Section 600
If you do not have any subgrade work on the project, you do not have to fill out this checklist.

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 chemcial 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?	X	
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	
8 Has a design CBR value been provided?	Y	

VI.B. Geotechnical Reports

C-R-S:	MAH-11 Vacant Rest Area	PID:	122881	Reviewer:	BKS	Date:	8/5/2026

General		(Y/N/X)	Notes:
1	Has an electronic copy of all geotechnical submissions been provided to the District Geotechnical Engineer (DGE)?	Y	
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) compatable? 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	