

EXECUTIVE SUMMARY

- It is understood the subject project is located at 534 Mandalay Avenue, Clearwater, Pinellas County, Florida and is known as the Clearwater Fire Station No. 46. The property was observed to currently consist of undeveloped property containing grass-surfaced areas and vegetation. This property is located adjacent to the Gulf-of-Mexico. It is understood that this property is within 300 feet of the Coastal Construction Control Line and it has been stipulated that a deep foundation system will be used for structure support.
- This property is expected to be developed with a two-story fire station structure having an elevated fire truck pavement area, and an adjacent stormwater management area. It is anticipated the proposed building will be supported by columns and/or load-bearing walls. The bottom floor of the proposed structure is expected to be constructed as a concrete slab-on-grade. The finished grades of the development area are expected to be elevated approximately nine feet above the existing grade levels. The maximum loadings associated with the proposed structure are expected to be as follows:

Wall Load:	4 kips/linear ft
Column Loads:	180 kips
Floor Load:	100 lbs/sq ft

- The borings indicate the subsurface soils were generally arranged in four soil layers. The initial soil layer encountered generally consisted of approximately seven feet of very loose to medium dense grayish brown fine SAND (SP) with traces of marine shell fragments. The second soil layer encountered generally consisted of very loose to very dense gray fine SAND (SP) with traces of marine shell fragments that extended to an approximate depth of 27 feet below the existing ground surface. The third soil layer encountered generally consisted of very soft to stiff gray CLAY (CH) that extended to an approximate depth of 37 feet below the existing ground surface. The final soil layer generally consisted of hard highly weathered LIMESTONE that extended to the maximum boring termination depths of 54 feet below the existing ground surface elevations. Notable losses of drilling circulation were generally encountered near the limestone interface.
- As recorded immediately after drilling during the time of our subsurface exploration, measurable groundwater was encountered at an approximate depth of five to six feet below the existing ground surface elevations. The normal seasonal high groundwater level (NSHGWL) is expected to be tidally influenced and generally be encountered at least four feet below the existing ground surface elevations.
- Based on the site location and the expected structural characteristics, timber piles are believed to be an attractive deep foundation system to provide support of the proposed structure. Timber piles are expected to attain the following allowable capacities:

Pile Tip Diameter (Inch)	Embedment Depth (Feet)	Compressive Capacity (Tons)	Uplift Capacity (Tons)	Lateral Capacity (Pounds)
8	25	18	4	500
10	25	25	5	800
12	25	30	6	1000

- Two DRI tests were performed at an approximate depth range of two to three feet below the existing ground surfaces. The DRI locations were determined in the field based on ground surface features. The DRI test results indicated the measured vertical infiltration rates ranged from less than 0.1 to 48.3 inches per hour. The porosity of the near-surface soils encountered within the DRI locations is expected to be on the order of 0.28. Following the removal of any near-surface cemented material, the “confining” soil layer is expected to be encountered at least twenty feet below the existing ground surface elevations in the proposed stormwater management area.

GULF COAST TESTING LABORATORY INC.

5671 70th AVENUE NORTH

PINELLAS PARK, FL 33781

CONSTRUCTION MATERIALS ENGINEERING COUNCIL CERTIFIED

CERTIFICATE of AUTHORIZATION # 00002370

PHONE: (727) 544-4080 FAX: (727) 544-7532

Email: info@gctlfl.com

GULF COAST TESTING LABORATORY INC.

PINELLAS PARK, FL 33781

CONSTRUCTION MATERIALS ENGINEERING COUNCIL CERTIFIED

September 21, 2020

Mr. Jeff McDowell, Associate, AIA
Wannemacher Jensen Architects, Inc.

180 Mirror Lake Drive North
St. Petersburg, FL 33701

Subject: Report of Geotechnical Exploration
Clearwater Fire Station No. 46
Pinellas County, FL
GCTL Project No. 26059

Dear Mr. McDowell:

In response to your request, **Gulf Coast Testing Laboratory, Inc. (GCTL)** has conducted a subsurface exploration at the subject site. Please find attached an electronically signed copy of the subsurface exploration report.

GCTL appreciates the opportunity to provide Geotechnical Engineering services for this important project. Should you need additional services on this or any other project, **GCTL** offers the expertise of a selected collection of highly experienced, and motivated, Professional Engineers providing Geotechnical Engineering, Environmental Assessment services, as well as Construction Materials Engineering and Testing services.

Please do not hesitate to call should there be any questions about the subsurface exploration. We look forward to the opportunity to work for your organization on this and future projects.

Sincerely,

GULF COAST TESTING LABORATORY, INC.

Don R. Stites

Don R. Stites, P.E.
Principal Geotechnical Engineer
Florida Registration No. 42290

Rick Davis

Rick Davis
President

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**REPORT OF
GEOTECHNICAL EXPLORATION
FOR
CLEARWATER FIRE STATION NO. 46
PINELLAS COUNTY, FLORIDA**

Prepared for:



Prepared by:

Gulf Coast Testing Laboratory, Inc.

GCTL Project No. 26059

September 21, 2020

State of Florida Certificate of Authorization Number 00002370

GULF COAST TESTING LABORATORY INC.

PINELLAS PARK, FL 33781

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Subject: Report of Geotechnical Exploration
Clearwater Fire Station No. 46
Pinellas County, FL
GCTL Project No. 26059

Dear Mr. McDowell:

Gulf Coast Testing Laboratory, Inc. (GCTL) has completed the requested geotechnical exploration for the above-referenced project. The results of the subsurface exploration have been evaluated and are presented in this Report of Geotechnical Exploration.

This report presents a review of the project information provided to us, a description of the site and subsurface conditions encountered as well as our foundation and earthwork recommendations. The Appendices to the report contain site and boring location figures, USDA soil survey information, boring logs, site photographs, Double-Ring Infiltration (DRI) Test results, and selected Ground Penetrating Radar (GPR) profiles.

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PHONE: (727) 544-4080 FAX: (727) 544-7532

Email: info@gctlfl.com

We appreciate this opportunity to provide our services to you and we look forward to serving as your geotechnical consultant throughout this project. Should you have any questions in regard to the information presented in this report, please do not hesitate to contact us at your earliest convenience.

Sincerely,

GULF COAST TESTING LABORATORY, INC.

Rick Davis

Don R. Stites, P.E.
Principal Geotechnical Engineer
Florida Registration No. 42290

Rick Davis
President

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 - **10-Inch Tip Diameter Timber Pile**

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Wall Load:	4 kips/linear ft
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- Two DRI tests were performed at an approximate depth range of two to three feet below the existing ground surfaces. The DRI locations were determined in the field based on ground surface features. The DRI test results indicated the measured vertical infiltration rates ranged from less than 0.1 to 48.3 inches per hour. The porosity of the near-surface soils encountered within the DRI locations is expected to be on the order of 0.28. Following the removal of any near-surface cemented material, the “confining” soil layer is expected to be encountered at least twenty feet below the existing ground surface elevations in the proposed stormwater management area.

2.0 INTRODUCTION

2.1 PROJECT CHARACTERISTICS

This property is expected to be developed with a two-story fire station structure having an elevated fire truck pavement area, and an adjacent stormwater management area. It is anticipated the proposed building will be supported by columns and/or load-bearing walls. The bottom floor of the proposed structure is expected to be



constructed as a concrete slab-on-grade. The finished grades of the development area are expected to be elevated approximately nine feet above the existing grade levels (see illustration).

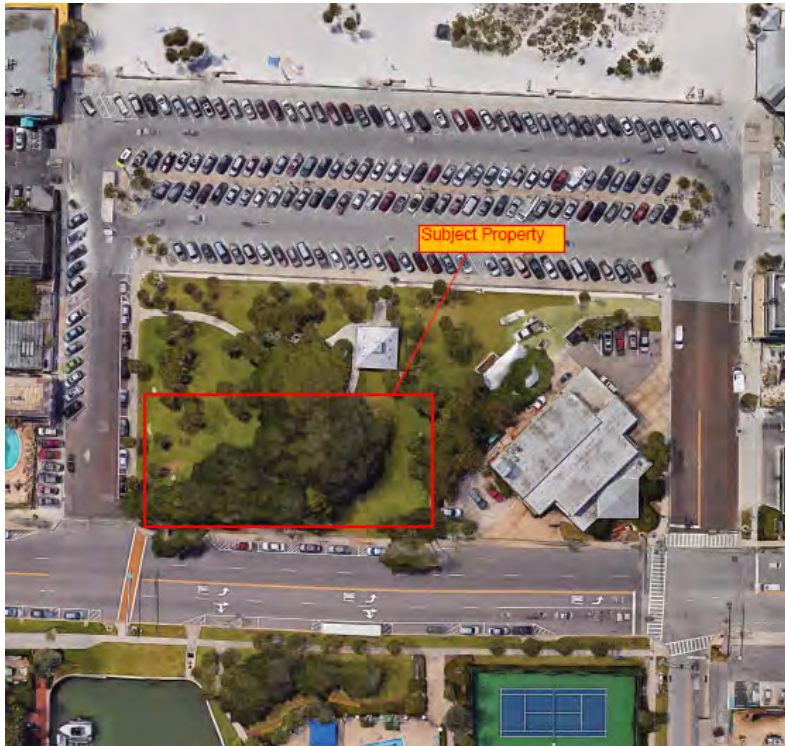
It is understood the maximum structural loadings are expected to be as follows:

Wall Load:	3 kips/linear ft
Column Loads:	180 kips
Floor Load:	100 lbs/sq ft

2.2 SITE DESCRIPTION

It is understood the subject project is located at 534 Mandalay Avenue, Clearwater, Pinellas County, Florida and is known as the Clearwater Fire Station No. 46.

The property was observed to currently consist of undeveloped property containing grass-surfaced areas and vegetation. This property is located adjacent to the Gulf-of-Mexico (see photograph).



It is understood that this property is within 300 feet of the Coastal Construction Control Line and it has been stipulated that a deep foundation system will be used for structure support.

The approximate site location is illustrated on Figures in the Appendix of this report. Photographs of the subject property have been included in the Appendix of this report.

2.3 PURPOSE AND SCOPE

The purpose of this study was to obtain information on the general subsurface conditions at the proposed project site. The subsurface materials encountered were then evaluated with respect to the available project characteristics. In this regard, engineering assessments for the following items were formulated:

- General location and description of potentially deleterious materials encountered in the borings, which may interfere with construction progress or structure performance, including existing fills or surficial/subsurface organics.
- Identification of the existing groundwater levels and estimated normal seasonal high groundwater fluctuations.
- Evaluate a ground penetrating radar (GPR) survey for the purpose of determining the lateral extent of subsurface soils and sediments at the proposed site. Isolated discontinuities in the subsurface materials may be evaluated to represent sites where karst erosion might have occurred during the geologic past.
- Identification of possible subsurface utilities, structures, and/or obstructions within the immediate area of the proposed project.
- Evaluate a GPR survey for the purpose of determining the location of underground utilities and/or structures.
- Evaluate active raveling (“sinkhole-type”) activity, if any, in the borings performed.
- Evaluation of an appropriate foundation system to be used for support of the proposed structure, with a slab-on-grade floor member. Identification of recommended foundation design parameters, including allowable bearing pressures, foundation levels and expected total and differential settlements.
- Pavement design and construction suggestions, considering the encountered subgrade soils and the measured groundwater conditions. Development of the vertical modulus of subgrade reaction.
- Determination of the vertical infiltration characteristics of the upper soils in the designated areas.
- Recommended soil subgrade preparation operations, including stripping, grubbing and compaction. Recommended engineering criteria for placement and compaction of approved structural fill materials.
- Evaluation of the suitability and availability of materials on-site that may be moved during site grading for use as structural fill in the building area, as pavement subgrade fill, and as general backfill.
- Presentation of construction recommendations, including expected ground water control measures, temporary slope stability recommendations, and unsuitable soil removal guidelines.

The following services were provided in order to achieve the preceding objectives:

- Reviewed readily-available published geologic information. This included information from available soil survey information published by the United States Department of Agriculture (USDA) Soil Conservation Service (SCS).
- Reviewed readily-available aerial photographs of the subject property obtained from Google Earth Pro and the Florida Department of Transportation (FDOT).
- Coordinate underground utility location services through Sunshine State One Call of Florida, Inc.
- Performed two Double Ring Infiltration (DRI) tests in general accordance with the American Society of Testing and Materials (ASTM) test designation D-3385.
- Perform a deep Ground Penetrating Radar (GPR) survey for the purpose of determining the lateral extent of subsurface soils and sediments at the proposed site.
- Perform a Quality Level A Subsurface Utility Engineering (SUE) survey within the immediate area of the subject project. This includes:
 - A shallow GPR survey for the purpose of determining possible shallow utilities and/or subsurface structures/obstructions at the proposed site.
 - Physically locate identified shallow subsurface utilities/structures/obstructions by manual augering.
 - Perform a maximum of one day of on-site surveying in order to establish the top of utility horizontally and vertically.
- Executed a program of subsurface exploration consisting of subsurface sampling and field testing.
 - Performed a total of five SPT borings within the designated development area. The SPT borings extended to maximum depth of 54 feet below the existing ground surface elevations. Steel casing to maintain drilling fluid circulation was required to maintain borehole integrity. The deep boreholes were grout/bentonite sealed.
 - Performed nine auger borings within the development area. The auger borings extended to maximum depths of ten feet below the existing ground surface elevations. The shallow boreholes were backfilled with on-site soils.
 - Containerize and dispose of excess drilling fluid and soil cuttings off-site.

- Visually classified and stratified representative soil samples in the laboratory using the Unified Soil Classification System (USCS). Identified soil conditions at each boring location and formed an opinion of the site soil stratigraphy.
- Collected groundwater level measurements and estimated normal wet seasonal high groundwater levels.
- The results of the field exploration and laboratory tests were used in the engineering analyses and in the formulation of the recommendations. The results of the subsurface exploration, including the recommendations and the data upon which they are based, are presented in this formal written report prepared by an experienced Professional Engineer.

The scope of our services does not include a thorough environmental assessment or investigation for the presence or absence of hazardous or toxic materials in the soil, groundwater, or surface water within or beyond the site studied.

3.0 FIELD EXPLORATION

The general foundation soil types and associated design parameters were developed by drilling a total of five soil test borings and nine auger borings within the proposed development area. It is important to note that the original scope of services predicated three soil test borings were to be performed, however, based on the soil test results, two additional soil test borings were included in the scope of services and the borings were required to use steel casing and be extended to additional depths.

The boring locations were determined in the field from existing ground surface features. The ground surface elevations at the boring locations were neither furnished nor determined. The boring locations illustrated in the Appendix should be considered accurate only to the degree implied by the method used. If more precise locations are desired, we suggest that you contact a Registered Surveyor. The approximate locations of the borings are illustrated in the Appendix of this report.

The soil test borings were advanced with a track-mounted drill rig using “Mud” Rotary drilling procedures to approximate maximum depths of 54 feet below the existing ground surface elevations (see photograph). It is noted the steel casing was utilized and soil boring depths were extended due to the very loose soil conditions and drilling circulation loss conditions encountered.



The soil sampling was performed in general accordance with ASTM Test Designation D-1586, entitled "Penetration Test and Split-Barrel Sampling of Soils." Samples were obtained at intervals of two feet to a depth of ten feet, and at intervals of five feet thereafter. Representative portions of these soil samples were sealed in “air-tight” containers, labeled and transferred to our laboratory for classification and testing.

The auger borings were performed with the track-mounted drill rig with the use of a solid-stem steel auger and/or manually performed with the use of a 3-inch nominal diameter solid stem bucket auger. The soil sampling was performed in general accordance with ASTM Test Designation D-1452, titled "Soil Investigation and Sampling by Auger Borings." These samples were taken "continuously" from the ground surface to an approximate maximum depth of ten feet below the existing ground surface elevations. Representative portions of these soil samples were sealed in "air-tight" containers, labeled and transferred to our laboratory for classification and testing.

3.1 DOUBLE RING INFILTRATION (DRI) TESTS

Two DRI tests were performed following ground saturation in general accordance with ASTM Test Designation D-3385, titled "Infiltration Rate of Soils in Field Using Double-Ring Infiltrometers" (see photograph).

The DRI test results have been tabulated and are presented below:



DRI Test Number	Depth* (Feet)	Near-Surface Porosity (Percent)	Measured Vertical Infiltration Rate (In/Hr)	"Confining" Soil Depth* (Feet)	Estimated Seasonal High Groundwater Depth* (Feet)
1	2.0	20	<0.1	>20	4.0
2	3.0	30	48.3	>20	4.0

*Depth below existing ground surface elevations following the removal of any near-surface cemented material

The DRI test results have been provided in the Appendix of this report.

3.2 GROUND PENETRATING RADAR SURVEY

Two Ground Penetrating Radar (GPR) surveys were performed across the accessible portions of the property in general accordance with the ASTM D 6432 publication entitled, “Standard Guide for Using the Surface Penetrating Radar Method for Sub-surface Investigation” to explore the shallow soil conditions. The second GPR survey performed for the purpose of determining possible shallow utilities and/or subsurface structures/obstructions at the proposed site. The results of the second GPR survey has been provided as a separate report.

GPR is a geophysical technique that is used to image subsurface anomalies and/or variations in the shallow soil profile. Subsurface features that can be identified with GPR may include natural variations in stratigraphy and unnatural features such as underground utilities, drain fields, buried debris, petroleum contamination, backfilled trenches, and disturbed soils.

The GPR antenna transmits short-duration electromagnetic waves into the ground with the profiling recorder digitally processing the reflected signals and continuously recording a graphic representation of the soil profile. The reflected signals vary in intensity, depending on the soil strata encountered.

The GPR unit used for this report was manufactured by Mala Geoscience, Inc. of Sweden. The X3M RAMAC system consists of a profile recorder unit that is connected to a 100, 250 and/or 500-megahertz (MHz) shielded antenna by a control cable. The monitor provides for real-time or playback viewing of the data, which is saved on the internal hard drive. Interpretation of the data is performed using Reflex and/or GroundVision software packages.

Horizontal Scaling

The locations of the GPR transects were spaced where applicable. The spacing was executed to allow for a degree of coverage of the survey area for the intended target.

Data Collection

GPR transect lines were positioned in the field from a point of reference with measurements by fiberglass tape or survey wheel. Data is collected along these paths and a subsurface profile is produced. The transect lines were located at an approximate spacing of ten feet. Transects were assigned specific numbers to indicate the line and direction of data collection.

Geophysical Analysis

Based on the intended geophysical target, the characteristics of the selected antenna are tabulated below.

Antenna Frequency (Mega Hertz)	Time Range (Nanoseconds)	Effective Depth of Penetration (Nanoseconds)	Maximum Depth GPR Signal (Feet)
250	120	48	20

The GPR profiles were orientated from west to east and north to south directions. The GPR signal extended to an approximate depth of 20 feet below the existing ground surface, after which some attenuation of GPR signal occurred. The depth of penetration of the radar signal is based on factors such as the location of the water table, depth to clay layers, and signal attenuation.

The geophysical data was generally consistent across transects that were performed at the subject property. The GPR survey with the 250 Mhz antenna did not indicate geophysical anomalies that would be considered consistent with deeper geologic conditions, such as sinkhole activity.

Copies of selected GPR profiles attained at the subject property have been included in the Appendix of this report.

4.0 LABORATORY TESTING

The soil samples were transported to our laboratory and were classified by the Geotechnical Engineer using the Unified Soil Classification System (USCS) in general accordance with ASTM Test Designation D-2488. Based on the subsurface materials encountered with respect to the proposed project, refined laboratory testing was not deemed necessary.

It should be noted that all soil samples will be properly disposed of 30 days following the submittal of the **GCTL** subsurface exploration report.

5.0 GENERALIZED SUBSURFACE CONDITIONS

5.1 AERIAL PHOTOGRAPH

The Aerial Photographs dated 2019, 2015, 2007, 2002, 1995, 1986, 1980, 1975, 1970, and 1962 were reviewed for the subject property. Based on this review, the aerial photographs appeared to illustrate the subject property to be similar to the conditions observed during the time of our field services. An elevated water storage structure does appear to be located northwest of the subject property in the aerial photographs dated from 1995 through 1962. Copies of the aerial photographs have been included in the Appendix of this report.

5.2 COUNTY SOIL SURVEY

The “Soil Survey of Pinellas County, Florida”, published by the United States Department of Agriculture (USDA) Soil Conservation Service (SCS), was reviewed for general near-surface soil information within the general vicinity of the subject project. This information indicates that there are two primary soil mapping units within the proposed project area. The soil map unit characteristics are tabulated below:

SOIL SERIES	DEPTH (INCHES)	UNIFIED SOIL CLASS	PERMEABILITY RATING (INCHES/HOUR)	USDA SEASONAL HIGH GROUNDWATER TABLE	
				DEPTH (FEET)	MONTHS
Matlacha and St. Augustine Soils and Urban Land (16)	0 – 42	SP, SP-SM	2.0 – 6.0	2.0 – 3.0	June- October
	42 – 80	SP, SP-SM	6.0 – 20.0		
	0 – 22		6.0 – 20.0	1.5 – 3.0	
	22 – 33		2.0 – 20.0		
	33 – 48	SP, SP-SM	6.0 – 20.0		
	48 – 63	SM, SP-SM	2.0 – 20.0		
	63 – 80		6.0 – 20.0		

A copy of the soil survey map has been included in the Appendix of this report.

5.3 MAPPED SINKHOLES OF PINELLAS COUNTY

The illustration entitled “Sinkholes of Pinellas County, Florida, 2008”, published by Florida Center for Instructional Technology, was reviewed for the subject property. Based on this review, the subject property does not appear to have a mapped sinkhole. In addition, mapped sinkholes do appear within the immediate vicinity of the subject property. A copy of the referenced illustration has been included in the Appendix of this report.

5.4 SEISMIC SITE CLASSIFICATION

Based on our review of the International Building Code, dated 2006, and our knowledge of the general subsurface conditions at the site, we believe the site should be considered to be a Site Class D. It should be noted that this classification is based on the subsurface exploration results and our experience in the area. A soil test boring extending to a depth of at least 100 feet may be performed to verify this site classification.

5.5 SUBSURFACE CONDITIONS

Soil stratification was based on visual observation of the recovered soil samples, laboratory testing and interpretation of the field boring logs by an experienced **GCTL** Engineering Technician. The boring stratification lines represent the approximate boundaries between soil types of significantly different engineering properties; however, the actual transition may be gradual. In some cases, small variations in properties not considered pertinent to our engineering evaluation may have been abbreviated or omitted for clarity. The boring profiles present the conditions at the particular boring location and variations do occur among the borings and between soil samples. The borings indicate the subsurface soils were generally arranged in four soil layers.

The initial soil layer encountered generally consisted of approximately seven feet of very loose to medium dense grayish brown fine SAND (SP) with traces of marine shell fragments. Standard Penetration Test (SPT) results within this soil stratum were measured to range from 2 to 13 blows per foot (bpf).

The second soil layer encountered generally consisted of very loose to very dense gray fine SAND (SP) with traces of marine shell fragments that extended to an approximate depth of 27 feet below the existing ground surface. SPT results within this soil stratum were measured to range from 2 to 55 bpf.

The third soil layer encountered generally consisted of very soft to stiff gray CLAY (CH) that extended to an approximate depth of 37 feet below the existing ground surface. SPT results within this soil stratum were measured to range from Weight-of-Rod (WR) for a depth of five feet to 13 bpf.

The final soil layer generally consisted of hard highly weathered LIMESTONE that extended to the maximum boring termination depths of 54 feet below the existing ground surface elevations. Notable losses of drilling circulation were generally encountered near the limestone interface. SPT results within this soil stratum were measured to range from 20 bpf to 50 blows per zero inches of penetration.

The subsurface exploration indicated the subsurface material was generally consistent across the subject property. It is notable that Weight of Rod (WR) material was encountered in boring B-2 at an approximate depth range of 38 to 47 feet below the existing ground surface elevations. In addition, circulation losses were encountered in borings B-1, B-2, and B-4 near and within the highly weathered LIMESTONE during the subsurface exploration. Based on our extensive experience with similar subsurface conditions, the conditions encountered are not believed to represent conditions indicative of sinkhole type activity.

5.6 GROUNDWATER CONDITIONS

As recorded immediately after drilling during the time of our subsurface exploration, measurable groundwater was encountered at an approximate depth of five to six feet below the existing ground surface elevations.

Groundwater levels tend to fluctuate during periods of prolonged drought and extended rainfall and may be affected by man-made influences. In addition, a seasonal effect may also occur during which higher groundwater levels are normally recorded in rainy seasons. Based on our review of the subsurface conditions, including the soil coloring characteristics, available published information, and the reported rainfall events, the normal seasonal high groundwater level (NSHGWL) is expected to generally be encountered at least four feet below the existing ground surface elevations.

If the ground water level is critical to design or construction, ground water observation wells should be installed on-site to monitor ground water fluctuations over a period of time and to permit more accurate determinations of wet season and dry season levels.

6.0 DESIGN RECOMMENDATIONS

The following design recommendations have been developed on the basis of the previously described project characteristics and subsurface conditions encountered during this exploration. The test boring data was evaluated utilizing correlations between the measured standard penetration test resistances and the engineering performance characteristics of similar subsurface conditions. Once the final building characteristics have been identified, including project building locations on the site, and structural loading conditions, a review must be made by **GCTL** to determine if any modifications to the recommendations will be required.

6.1 GENERAL

Based on our review of the GPR results, the GPR survey with the 250 Mhz antenna did not indicate geophysical anomalies that would be considered consistent with deeper geologic conditions, such as sinkhole activity. Although circulation losses and Weight of Rod (WR) material was encountered near and within the highly weathered LIMESTONE during the subsurface exploration, based on our extensive experience with similar subsurface conditions, the conditions encountered are not believed to represent conditions indicative of sinkhole type activity.

It is understood that this property is within 300 feet of the Coastal Construction Control Line and it has been stipulated that a deep foundation system will be used for structure support. Due to the circulation losses encountered during the subsurface exploration, auger cast-in-place piles may experience significant grout losses; in this regard, auger cast-in-place piles are not considered an attractive foundation alternative. Based on our extensive experience with similar subsurface conditions, timber piles tend to be a cost-effective foundation system and are believed to be an attractive deep foundation system to provide support of the proposed structure.

Following clearing and grading, the exposed ground surface should be proofrolled and compacted with a vibratory drum roller having a static drum weight on the order of eight tons (such as Caterpillar CS44B or approved equivalent) under the direction of an experienced Professional Engineer in order to confirm the ability of the soils to properly support the expected development. It is recommended that twelve passes of the roller be performed, with successive passes aligned perpendicular to the proceeding pass. Areas which are evaluated to be unstable, if any, should be remediated in accordance with the recommendations of the Geotechnical Engineer. Care should be used in areas in which the vibratory roller is within 50 feet of existing structures in order to prevent vibrations which could be detrimental to existing structures.

6.2 TIMBER PILES

Timber piles have the advantages of being easy to handle, easy to cut off, relatively inexpensive, readily available and naturally tapered. They have the disadvantages of decaying above the water table (if not treated), having low capacities, being prone to damage by hard driving and being difficult to splice. It is noted that timber pile driving operations may create vibrations that could cause settlement damage, cracking or disturb occupants of nearby residences.

Driven piles have the advantage that the installation procedure provides a means to confirm pile capacity, by monitoring blow counts, and does not produce excessive debris in the form of auger cuttings or concrete spills. Installation of driven piles does, however, produce significant noise and vibration levels that may affect adjacent structures. In order to reduce the transmission of vibrations, and assist in obtaining minimum embedment depths, predrilling to depths ranging from five to fifteen feet below the existing ground surface elevations may become necessary and vibration monitoring should be provided.

6.2.1 Compressive and Uplift Capacities

The allowable axial capacities for timber piles having 8, 10, and 12-inch tip diameters have been evaluated using the computer program FB-Deep (version 2.05) developed by the Florida Bridge Software Institute (FBSI), and our extensive experience with similar conditions. In this regard, the compressive and uplift capacities of the piles are tabulated below.

Pile Tip Diameter (Inch)	Estimated Embedment Depth (Feet)	Compressive Capacity (Tons)	Uplift Capacity (Tons)
8	25	18	4
10	25	25	5
12	25	30	6

The uplift and lateral capacities of the piles are based on achieving a minimum embedment length of 18 feet below the existing ground surface. The static pile bearing capacity analysis using the FBSI design program FB-Deep has been attached in the Appendix of this report.

6.2.2 Lateral Capacity

The lateral deflection of a single pile under working load conditions has been determined for timber piles having 8, 10, and 12-inch tip diameters, respectively. The analyses were conducted using the computer program (LPILE) developed by Ensoft, Inc. The program uses a finite difference technique to model pile behavior under lateral loads, axial loads and moments applied at the pile head. In performing the analyses, the following information was utilized in the computer program LPILE developed by Reese (1984).

Area (In ²)	50, 78, and 113
Timber Compressive Strength (psi)	1200
Minimum Pile Length (Ft.)	18
Distance From Top of Pile to Ground Surface (Ft.)	1
Loading Condition	Static free-head

Lateral capacity analyses for the timber pile were performed by applying the load cases to the minimum pile length. The results of the analyses have been included in the Appendix of this report, with a summary tabulated below.

Lateral Stability Analysis 8-Inch Diameter Timber Piles				
Pile Tip Diameter (In)	Axial Load (Tons)	Lateral Load (pounds)	Pile Head Deflection (In.)	Maximum Moment (In-K)
8	20	400	0.08	12.3
		600	0.12	18.6
		800	0.17	25.6
		1000	0.24	33.6

Lateral Stability Analysis 10-Inch Diameter Timber Piles				
Pile Tip Diameter (In)	Axial Load (Tons)	Lateral Load (pounds)	Pile Head Deflection (In.)	Maximum Moment (In-K)
10	25	1500	0.17	50.1
		2000	0.24	69.8
		2200	0.29	78.8
		2400	0.37	88.5

Lateral Stability Analysis 12-Inch Diameter Timber Piles				
Pile Tip Diameter (In)	Axial Load (Tons)	Lateral Load (pounds)	Pile Head Deflection (In.)	Maximum Moment (In-K)
12	30	3000	0.22	110.1
		3500	0.29	132.2
		3800	0.35	146.7
		4000	0.42	157.0

6.2.3 Settlement

Settlement is expected to primarily consist of elastic shortening of the pile material and associated settlement required to mobilize resistance. Total settlement at these capacities is expected to be on the order of ½ inch with differential settlement of ¼ inch.

6.2.4 Pile Characteristics

It is recommended that the timber piles meet the requirements of ASTM D-25 for round timber tip bearing piles. The pile should be clean peeled and pressure treated in accordance with the requirements of the American Wood Protection Association (AWPA) Use Category 4C and the current Florida Building Code. In this regard, we recommend the timber piles be treated with CCA (Chromated copper arsenate) due to the location of the proposed structure in a temperature zone coastal environment.

The timer pile design stresses should be established in accordance with ASTM D-2899 and the Florida Building Code. Prior to driving, it is recommended that timber piles be relatively free of defects and have a water content greater than approximately 20 percent (to minimize breaking) and less than about 50 percent (to minimize "brooming").

6.2.5 Pile Installation

The timber piles are expected to achieve satisfactory capacities at an approximate embedment depth of 25 feet below the expected finished ground surface elevations: these piles should be installed to minimum embedment depths of 18 feet below the expected finished ground surface. Piling lengths should be expected to vary on the order five feet from the expected pile length.

Predrilling to depths ranging from five to fifteen feet below the existing ground surface elevations may become necessary; the least necessary predrilling should be performed to achieve the intent of the installation recommendations. The piles should then be driven to the dynamic driving resistance as determined by an acceptable pile driving formula, such as ENR or WEAP methods, or to practical refusal, whichever comes first. It is essential that driving be terminated immediately if "refusal" is reached to prevent damage to the piles. The pile driving hammer should have a rated energy on the order of 30,000 foot-pounds per blow.

In order to minimize driving difficulties due to densification of the soils and the reduction in capacity due to group action of the piles, it is recommended that the piles be driven with a center-to-center spacing of at least three feet.

A Pre-Construction meeting with the Owner/Owner's representative, Structural Engineer, Geotechnical Engineer, Contractor and Piling Contractor should be held on-site, prior to initializing pile driving operations. The installation of all deep foundation systems should be in accordance with the Florida Building Code requirements. In addition, the installation of all piles should be monitored by an experienced **GCTL** Professional Engineer or his representative. The Engineer should verify and record all aspects of the installation. In general, the Engineer or his representative should:

1. Be familiar with all aspects of the installation.
2. Be present continuously during driving.
3. Record and approve the dimensions of each pile, locate and report any obvious defects.
4. Count and record the blows for each foot of driving.
5. Record the energy rating of hammer and adjust where appropriate for chamber pressure.
6. Have knowledge of soil conditions at the site and the minimum required penetration of each pile.
7. Be cognizant of intended support mechanisms of piles on which to base approval or rejection or pre-drilling, etc.
8. Have authority to stop pile driving when unanticipated difficulties or conditions are encountered.

6.2.6 Pile Load Test Program

Based on the conservativeness provided in the foundation recommendations, pile load testing is not considered to be necessary. However, should unusual pile installation be encountered, at least one pile may be tested to two times the allowable compression design capacity. The compression load test should be performed in general accordance with ASTM Standard D 1143 and under the direct supervision of a geotechnical engineer; the Quick Loading Procedure is recommended for performing the compression tests.

7.0 FLOOR SLAB

It is expected that the floor slabs may be safely supported as slab-on-grade members provided that any undesirable materials are removed and replaced with controlled structural fill. It is also recommended that the floor slab bearing soils be covered by a lapped polyethylene sheeting of in order to reduce the potential for floor dampness which can affect the performance of glued tile and carpet, if any are used.

This membrane should consist of a 10-mil single layer of non-corroding, non-deteriorating polyethylene sheeting material placed so as to minimize seams and to cover all of the soil below the building floor slab. This membrane should be cut in a “cross shape” to allow for pipes or other penetrations and the membrane should extend to within ½ inch of all such pipes or penetrations. All seams of the membrane should be lapped at least 12 inches. Punctures or tears in the membrane should be repaired with the same or comparable material and sealed in a waterproof manner.

The performance of concrete floor slabs is also affected by the concrete mix that is used. A relatively high water-cement ratio of the mix can cause aesthetic disruptions, such as unsightly slab “curling” and shrinkage cracking. Also, an additional waiting period may be required prior to installing moisture-sensitive floor covering because of the moisture loss from the concrete floor slabs.

8.0 PAVEMENT THICKNESS DESIGN CONSIDERATIONS

It is understood that a rigid (Portland Cement) pavement section is to be utilized within the proposed pavement areas. The following pavement recommendations presented in the following sections are considered minimum for the site, soil and limited traffic conditions expected. The final pavement thickness design should be determined by the project civil engineer using information obtained during the subsurface exploration program and an analysis of anticipated traffic conditions.

8.1 SUBGRADE

The borings indicate the subsurface soils generally consisted of very loose to medium dense fine SAND (SP) with traces of marine shell fragments. Based upon our evaluation and analyses, the subgrade soils should be acceptable for construction and support of a rigid type pavement section after proper subgrade preparation, provided that drainage controls are implemented.

The existing surface soils should be proofrolled with a vibratory drum roller having a static drum weight on the order of eight tons (such as Caterpillar CS44B or approved equivalent) under the direction of a Geotechnical Engineer in order to confirm the ability of the soils to properly support the expected building development. Following approval of the Geotechnical Engineer, the pavement subgrade should be compacted to a minimum depth of 12 inches to at least 98 percent of the Modified Proctor maximum dry density (ASTM D1557). Any fill used to elevate the cleared pavement areas to subgrade elevation should consist of reasonably clean well-graded to fine sands, uniformly compacted to a minimum density of 98 percent of the soil Modified Proctor maximum dry density (ASTM D1557).

8.2 MODULUS OF SUBGRADE REACTION

Based upon the soil conditions encountered at the proposed site and the recommended site preparation operations presented in the Construction Considerations section of this report, the modulus of vertical subgrade reaction (k) for the shallow soil is expected to be on the order of 300 pounds per square inch per inch of vertical deflection (pci).

8.3 RIGID CONCRETE PAVEMENT

The following pavement thickness designs are based upon the design procedure described in the American Association of State Highway and Transportation Officials (AASHTO) publication titled “Design of Pavement Structures” (dated 1993). This design method considers the following pavement characteristics:

- The concrete has a minimum flexural strength of 470 psi.
- Continuously reinforced concrete pavement
- Excellent drainage
- Design serviceability loss of 2.5
- Reliability of 95% with an overall standard deviation of .35

Based upon our experience, it is recommended a minimum thickness of seven inches should be utilized for heavy duty applications, such as fire truck access. It is further recommended that a reinforcing steel mat, preferably size No. 3 steel bars, be placed sixteen inches on center. However, the steel reinforcement within the concrete pavement should be designed by the project Civil Engineer.

The following table summarizes the results of our rigid pavement evaluation for “light duty”, “medium duty”, and “heavy duty” pavement sections.

Pavement Duty	Pavement Structural Section		Subgrade Support	Modulus of Rupture	Estimated Total 18-kip Equivalent Single Axel (ESAL) Load Applications
Light	5" Concrete	12" Compacted Subgrade	High	470	200,000
Medium	6" Concrete	12" Compacted Subgrade	High	470	450,000
Heavy	7" Concrete	12" Compacted Subgrade	High	470	1,000,000

9.0 CONSTRUCTION CONSIDERATIONS

9.1 FILL PLACEMENT AND SUBGRADE PREPARATION

The following are our recommendations for overall site preparation and mechanical densification work for construction of the proposed development, based on the anticipated construction and our boring results. These recommendations should be used as a guideline for the project general specifications prepared by the Design Engineer.

1. The location of any existing underground utility lines within the construction area should be established. Provision should then be made to relocate any interfering utility lines from the construction area to appropriate locations. In this regard, it should be noted that if underground pipes are not properly removed or plugged, they may serve as conduits for subsurface erosion which subsequently may result in excessive settlements.
2. Following clearing and grading, the exposed ground surface should be proofrolled and compacted with a vibratory drum roller under the direction of an experienced Professional Engineer in order to confirm the ability of the soils to properly support the expected development on shallow foundations. It is recommended the roller have a static drum weight on the order of eight tons (such as Caterpillar CS44B or approved equivalent). Careful observations should be made during proofrolling to help identify any areas of soft yielding soils that may require over-excavation and replacement.
3. It is recommended that the natural ground be compacted to a dry density of at least 95 percent of the Modified Proctor Test maximum dry density (ASTM D-1557) to a minimum depth of one foot below the stripped grade within the building floor slab area.
4. It is recommended that the natural ground be compacted to a dry density of at least 98 percent of the Modified Proctor Test maximum dry density to a minimum depth of one foot below stripped grade within the pavement areas.
5. Following satisfactory completion of the proofrolling and compaction operations, the proposed structure area may be brought up to finished subgrade levels, if required. It is recommended that off-site fill consist of soils having less than eight percent passing the No. 200 sieve, and be free of rubble, organics, clay, debris and other unsuitable material. Fill should be tested and approved by **GCTL** prior to acquisition. Approved sand fill should be placed in loose lifts not exceeding twelve inches in thickness. The fill soils should be compacted to a dry density of at least 95 percent of the Modified Proctor Test maximum dry density within the building areas and 98 percent of the Modified Proctor Test maximum dry density within the pavement areas.

6. Soil moisture content may need to be controlled in order to facilitate proper compaction. If additional moisture is necessary to achieve the compaction objectives of imported fill, then water should be applied in such a way that will not cause erosion or removal of the subgrade soils. A moisture content within two percentage points of the optimum indicated by the Modified Proctor Test (ASTM D-1557) is recommended prior to compaction of the natural ground and fill.
7. It is recommended that all foundation excavations be observed by the Geotechnical Engineer. Foundation bearing soils approved by the Geotechnical Engineer as load bearing materials should be compacted to develop a minimum density requirement of 95 percent of the maximum Modified Proctor dry density with ASTM D-1557, for a minimum depth of one foot below the bottom of the footing depths. Soils placed adjacent to footings or walls should be carefully compacted with a light rubber-tired roller or vibratory plate compactor to avoid damaging the footings or walls.
8. A representative from **GCTL** should be retained to provide on-site observation of earthwork and ground modification activities. It is important that **GCTL** be retained to observe that the subsurface conditions are as we have discussed and reported herein, and that foundation construction, ground modification and fill placement are in accordance with our recommendations.

9.2 GROUNDWATER CONTROL

Measurable groundwater was encountered at an approximate depth of five to six feet below the existing ground surface elevations. Groundwater levels tend to fluctuate during periods of prolonged drought and extended rainfall and may be affected by man-made influences. The normal seasonal high groundwater level (NSHGWL) is expected to generally be encountered at least four feet below the existing ground surface elevations.

Soils exposed in the bases of all satisfactory foundation excavations should be protected against any detrimental change in conditions, such as physical disturbance or rain water. Surface runoff water should be drained away from the excavations and not be allowed to pond. If possible, all foundation concrete should be placed the same day that the excavations are made. If this is not possible, the foundation excavations should be adequately protected in the interim.

9.3 TEMPORARY SIDE SLOPES

The side slopes for temporary excavations are expected to remain stable at two horizontal to one vertical (2H:1V) to a maximum excavation depth of six feet. Where restrictions do not permit slopes to be constructed as recommended above, the excavation should be shored and braced in accordance with current OSHA requirements. Excavated materials should not be stockpiled at the top of any slope within a horizontal distance equal to the excavation depth.

9.4 ON-SITE SOIL SUITABILITY

All materials to be used for backfill or compacted fill construction should be evaluated and, if necessary, tested by **GCTL** prior to placement to determine if they are suitable for the intended use. In general, the near surface soil strata are expected to consist of fine SAND that tends to be moderately moisture sensitive. In this regard, the near-surface soils are expected to be SUITABLE for use as structural fill. Partially cemented soils tend to be moisture sensitive and are expected to be generally UNSUITABLE for use as structural fill.

It is recommended that off-site structural fill materials consist of soils having less than eight percent passing the No. 200 sieve, and be free of rubble, organics, clay, debris and other unsuitable material. Any off-site materials used as fill should be approved by an experienced Professional Engineer prior to acquisition.

10.0 BASIS FOR RECOMMENDATIONS

Our professional services have been performed, our findings obtained and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. This company is not responsible for the conclusions, opinions or recommendations made by others based upon this data.

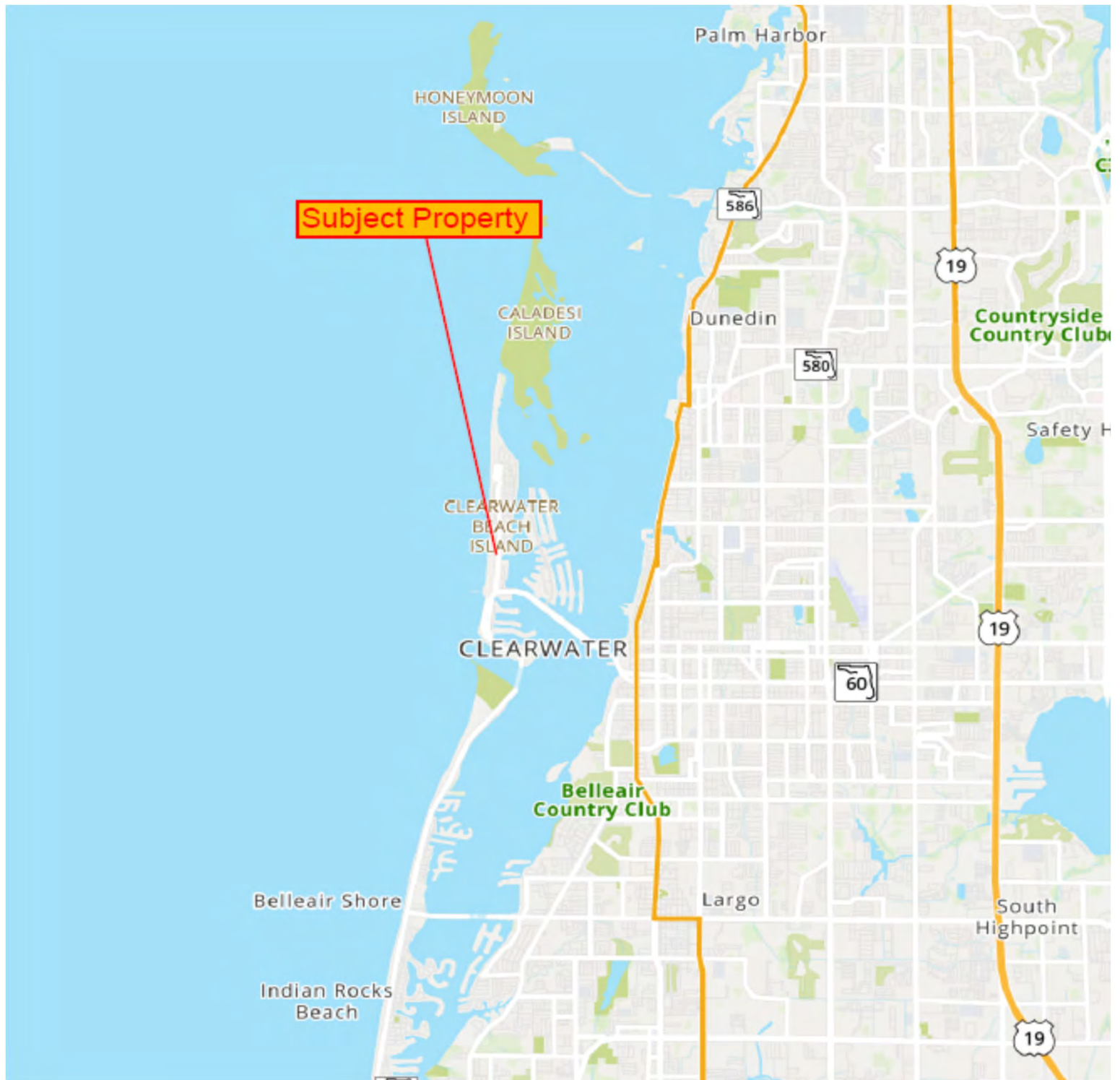
The analysis and recommendations submitted in this report are based upon the data obtained from the soil borings performed at the locations indicated. Regardless of the thoroughness of a geotechnical exploration, there is always a possibility that conditions between borings will be different from those at specific boring locations and that conditions will not be as anticipated by the designers or contractors. In addition, the construction process itself may alter soil conditions.

If any subsoil variations become evident during the course of this project, a re-evaluation of the recommendations contained in this report will be necessary after we have had an opportunity to observe the characteristics of the conditions encountered. The applicability of this report should also be reviewed in the event that significant changes occur in the design, nature or location of the proposed construction.

The recommendations provided herein are based in part upon project information provided to us and they apply only to the specific project and site discussed in this report. Once complete project information is available, the proposed facility structure characteristics should be conveyed to us for review. Our recommendations may then be modified, if necessary. Experienced geotechnical personnel should observe and document the construction procedures used and the conditions encountered. Unanticipated conditions and inadequate procedures should be reported to the design team. We recommend that the owner retain **GCTL** to provide these services based upon our familiarity with the project, the subsurface conditions, and the intent of the recommendations and design criteria.

APPENDIX

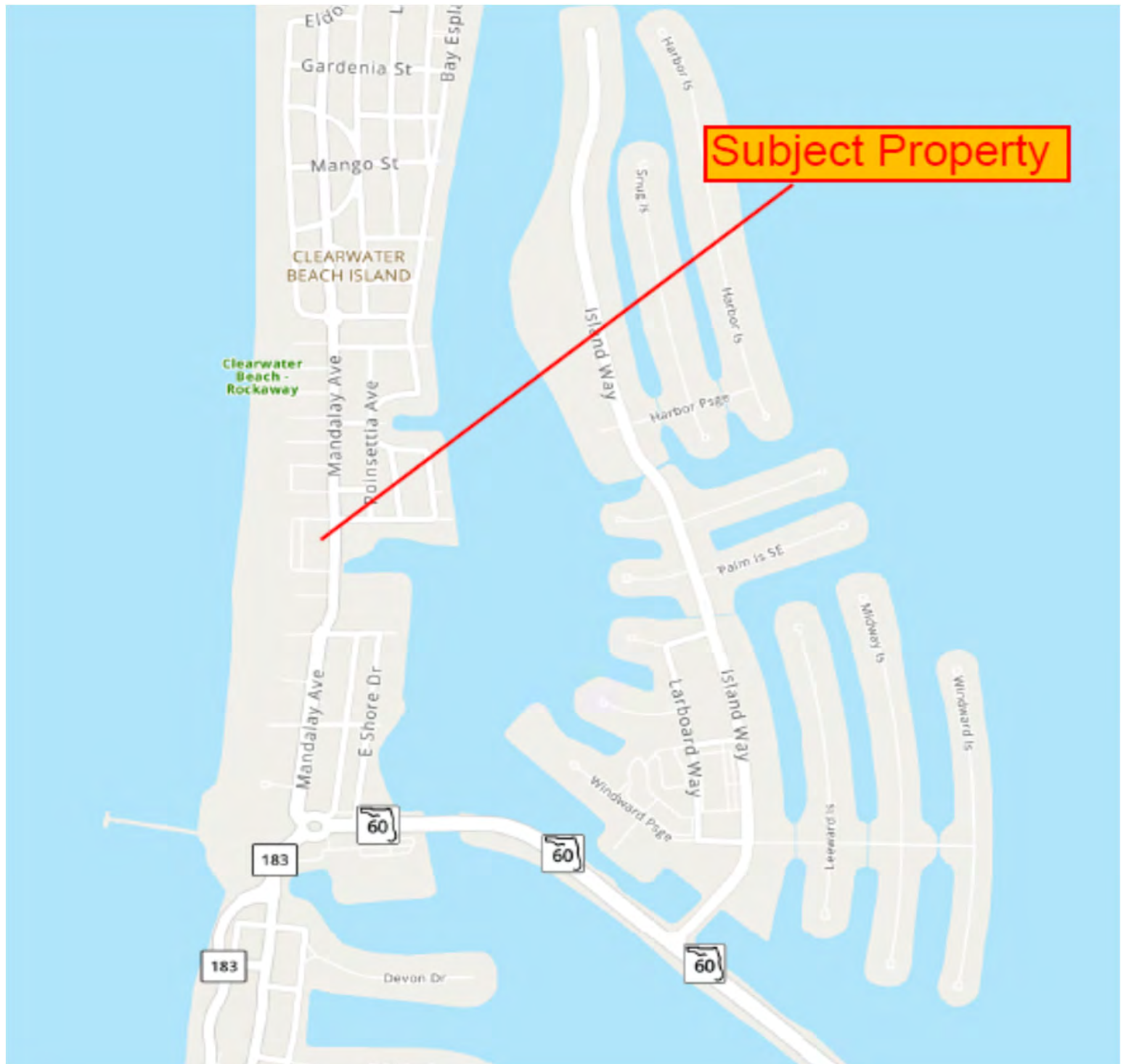
FIGURES



General Site Vicinity Map
 Subject Property
 Pinellas County, Florida

Project No.:
 26059
 Scale:
 As Shown
 Figure No.:
 1

Gulf Coast Testing Laboratory, Inc.
 5671 70th Avenue North
 Pinellas Park, Florida
 PH: (727)-544-4080
 FX: (727)-544-7532



Local Site Vicinity Map
Subject Property
Pinellas County, Florida

Project No.:
26059
Scale:
As Shown
Figure No.:
2

Gulf Coast Testing Laboratory, Inc.
5671 70th Avenue North
Pinellas Park, Florida
PH: (727)-544-4080
FX: (727)-544-7532



2019 Aerial Photograph
Subject Property
Pinellas County, Florida

Project No.:
26059
Scale:
As Shown
Figure No.:
3

Gulf Coast Testing Laboratory, Inc.
5671 70th Avenue North
Pinellas Park, Florida
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FX: (727)-544-7532



2015 Aerial Photograph
Subject Property
Pinellas County, Florida

Project No.:
26059
Scale:
As Shown
Figure No.:
4

Gulf Coast Testing Laboratory, Inc.
5671 70th Avenue North
Pinellas Park, Florida
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FX: (727)-544-7532



2007 Aerial Photograph
Subject Property
Pinellas County, Florida

Project No.:
26059
Scale:
As Shown
Figure No.:
5

Gulf Coast Testing Laboratory, Inc.
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Pinellas Park, Florida
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2002 Aerial Photograph
Subject Property
Pinellas County, Florida

Project No.:
26059
Scale:
As Shown
Figure No.:
6

Gulf Coast Testing Laboratory, Inc.
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1995 Aerial Photograph
Subject Property
Pinellas County, Florida

Project No.:
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Scale:
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Figure No.:
7

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1986 Aerial Photograph
Subject Property
Pinellas County, Florida

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26059
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Figure No.:
8

Gulf Coast Testing Laboratory, Inc.
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1980 Aerial Photograph
Subject Property
Pinellas County, Florida

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26059
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Figure No.:
9

Gulf Coast Testing Laboratory, Inc.
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1975 Aerial Photograph
Subject Property
Pinellas County, Florida

Project No.: 26059
Scale: As Shown
Figure No.: 10

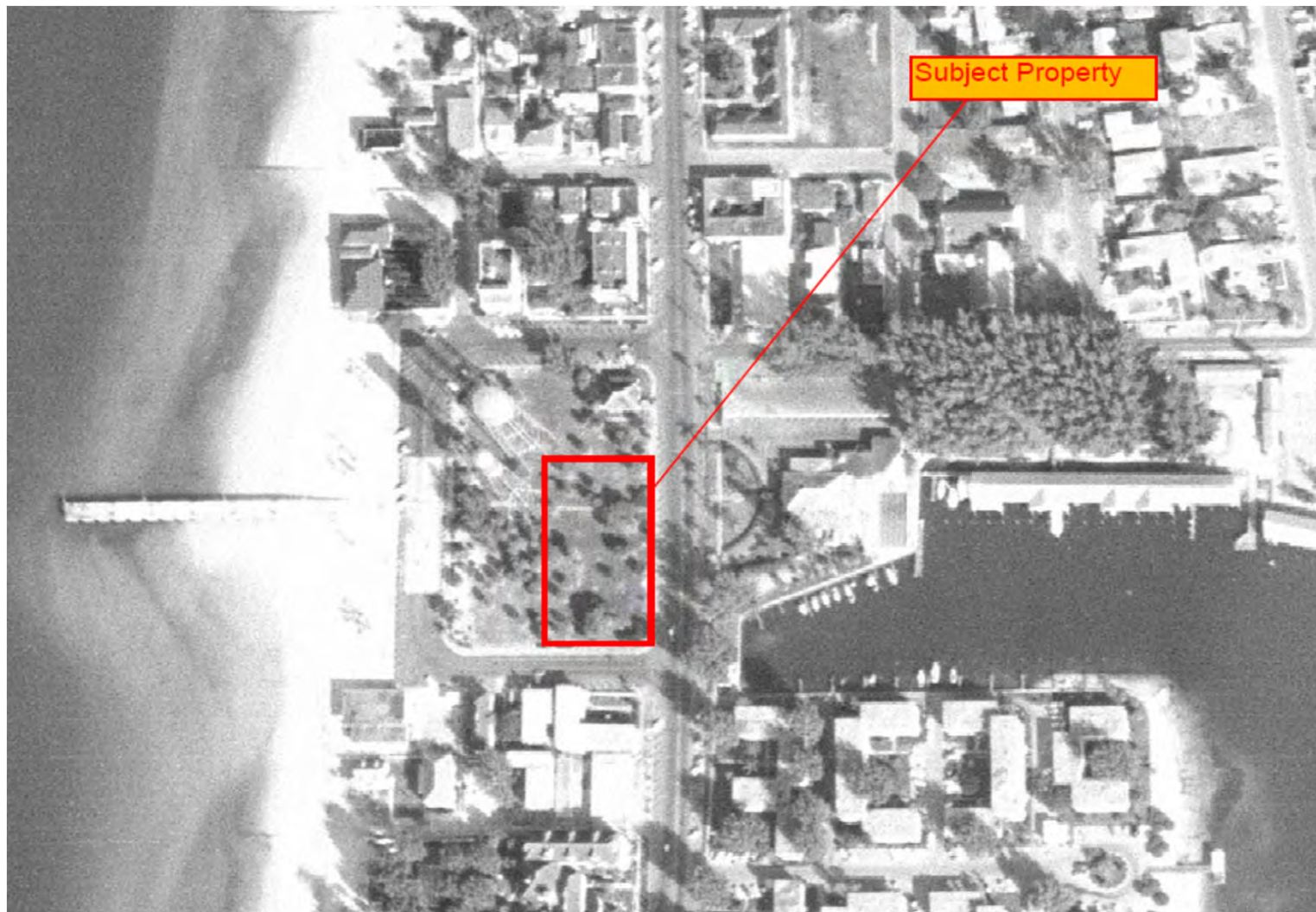
Gulf Coast Testing Laboratory, Inc.
5671 70th Avenue North
Pinellas Park, Florida
PH: (727)-544-4080
FX: (727)-544-7532



1970 Aerial Photograph
Subject Property
Pinellas County, Florida

Project No.: 26059
Scale: As Shown
Figure No.: 11

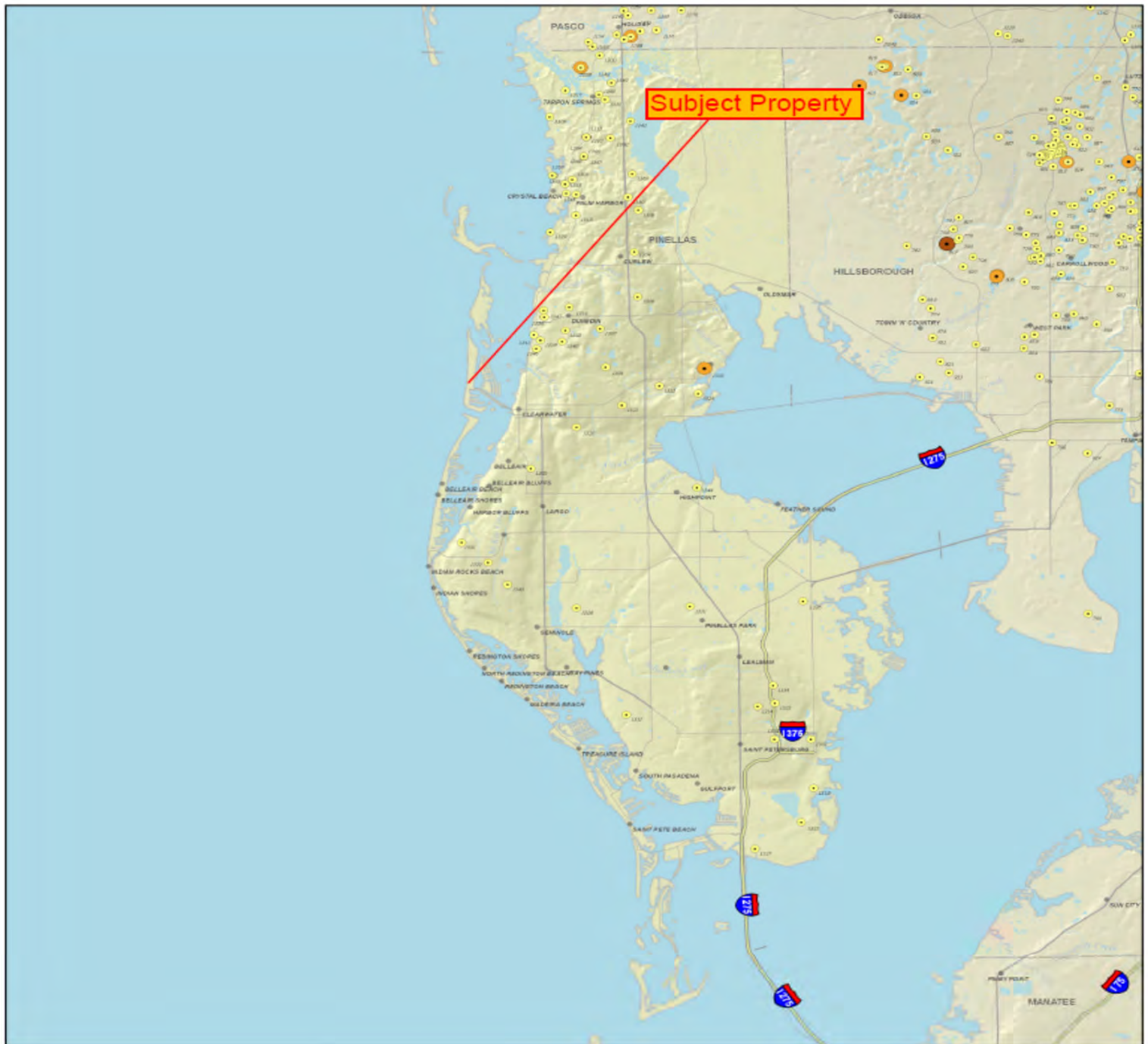
Gulf Coast Testing Laboratory, Inc.
5671 70th Avenue North
Pinellas Park, Florida
PH: (727)-544-4080
FX: (727)-544-7532



1962 Aerial Photograph
Subject Property
Pinellas County, Florida

Project No.:
26059
Scale:
As Shown
Figure No.:
12

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Legend

- | | |
|----------|-------------------|
| < 10 | Lake |
| 11 - 30 | Swamp or Marsh |
| 31 - 60 | Rivers/Streams |
| 61 - 200 | County Boundaries |
| > 200 | US Interstate Hwy |
| | Roads |
| | Other Towns |

Pinellas County Sinkholes

Produced in 2008 by the Florida Center for Instructional Technology (FCIT)
using data from the Florida Department of Environmental Protection and the Florida Geological Survey.



0 2 4 6 Miles

Mapped Sinkholes
Subject Property
Pinellas County, Florida

Project No.:

26059

Scale:

As Shown

Figure No.

13

Gulf Coast Testing Laboratory, Inc.
5671 70th Avenue North
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National Flood Hazard Layer FIRMette



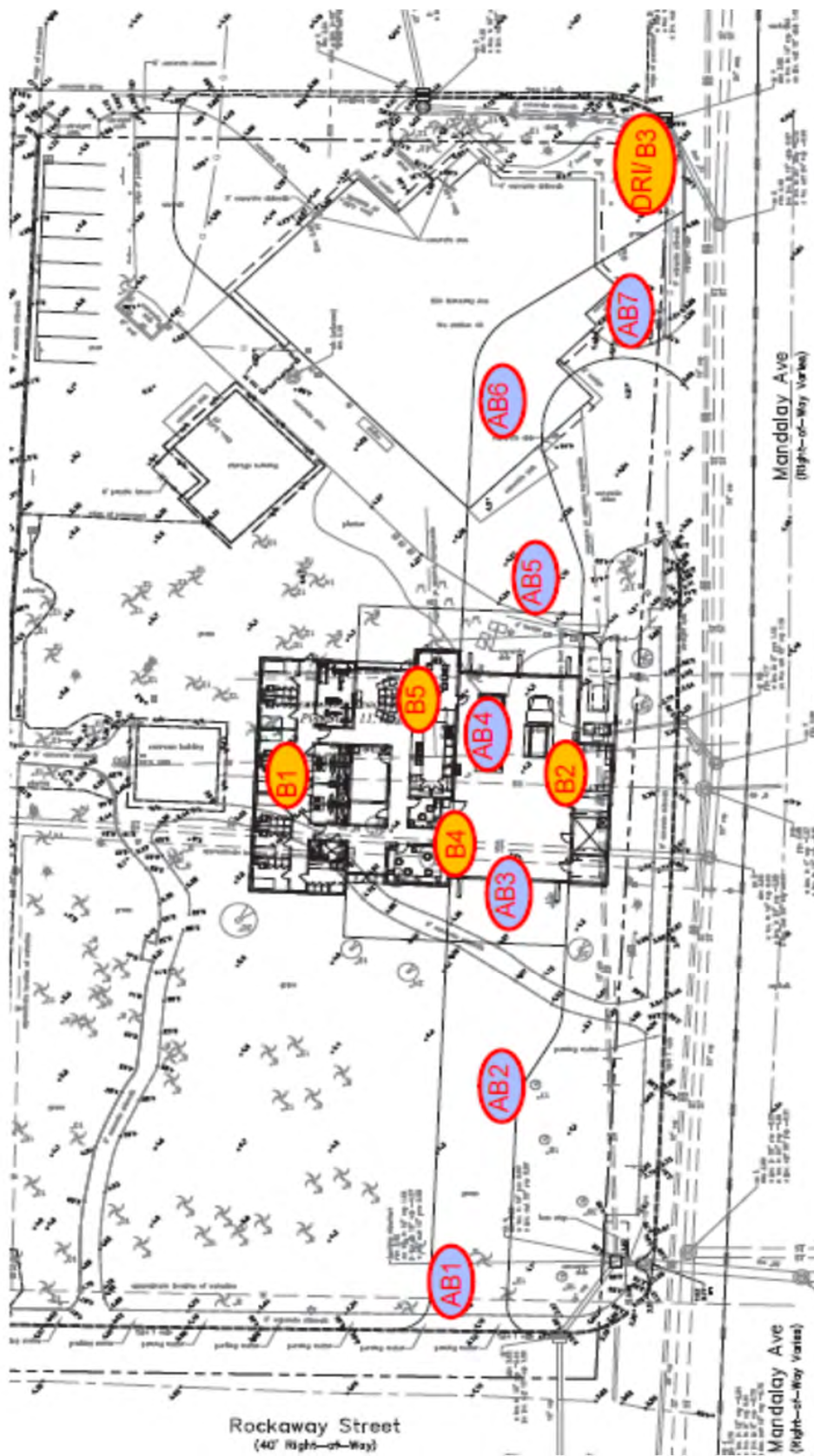
27°59'18.74"N



FEMA FIRM Map
Subject Property
Pinellas County, Florida

Project No.:
26059
Scale:
As Shown
Figure No.
14

Gulf Coast Testing Laboratory, Inc.
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FX: (727)-544-7532



Field Exploration Plan
Subject Property
Pinellas County, Florida

Project No.:
26059
Scale:
As Shown
Figure No.
15

Gulf Coast Testing Laboratory, Inc.
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FX: (727)-544-7532



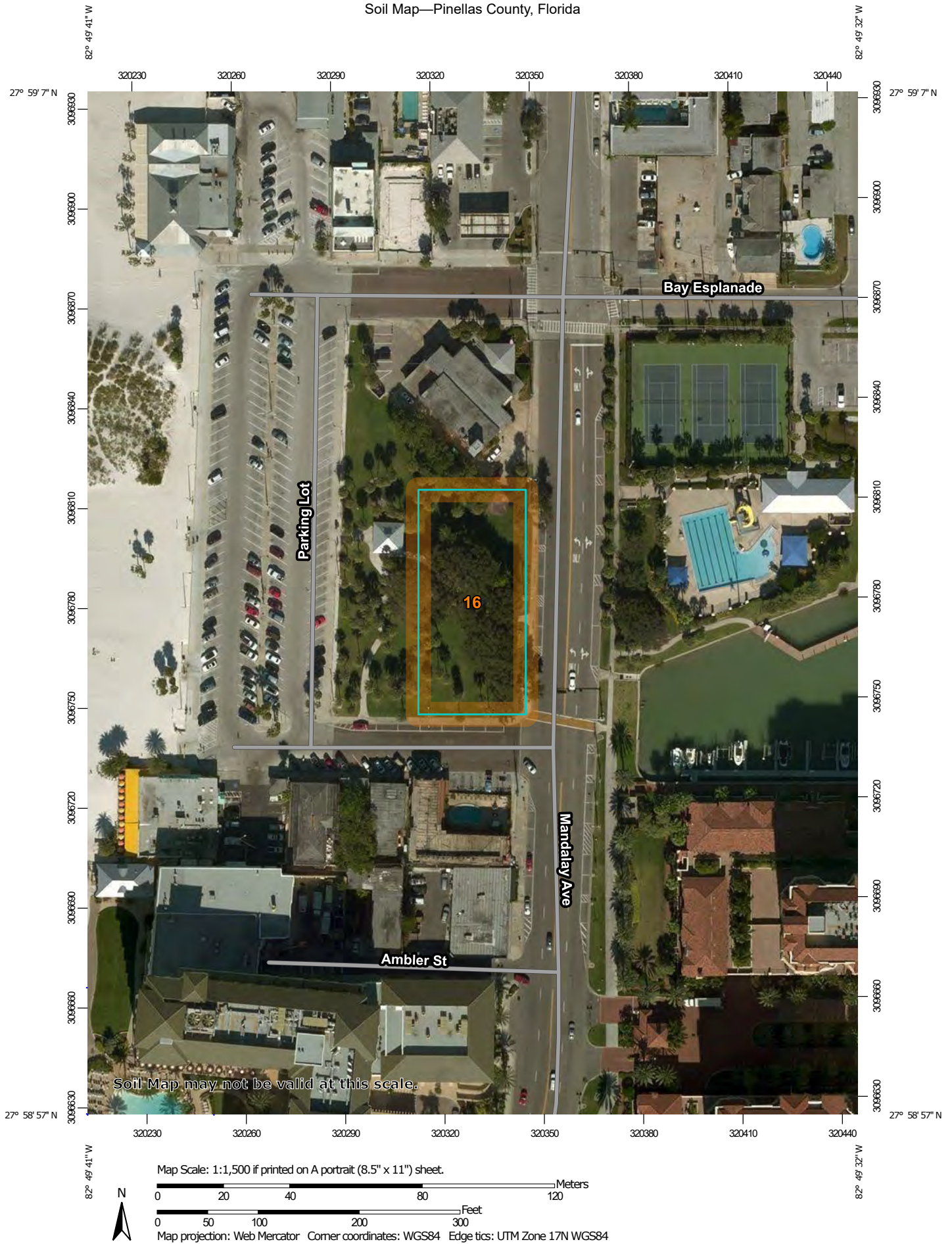
Aerial Field Exploration Plan
Subject Property
Pinellas County, Florida

Project No.:
26059
Scale:
As Shown
Figure No.:
16

Gulf Coast Testing Laboratory, Inc.
5671 70th Avenue North
Pinellas Park, Florida
PH: (727)-544-4080
FX: (727)-544-7532

USDA SOIL SURVEY INFORMATION

Soil Map—Pinellas County, Florida



**Natural Resources
Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

4/15/2020
Page 1 of 3

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Pinellas County, Florida

Survey Area Data: Version 16, Sep 17, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 17, 2013—Feb 28, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
16	Matlacha and St. Augustine soils and Urban land	0.5	100.0%
Totals for Area of Interest		0.5	100.0%

SOIL BORING LOGS

GULF COAST TESTING LABORATORY INC.**5671 70th Avenue North
Pinellas Park, FL 33781****Soil Boring Log**GCTL Project No. : 26059Project Name: Fire Station No. 46Boring Number: B-1Site Location: Pinellas County, FLStart Date: 03/20/20Drilling Method: MRCompletion Date: 03/20/20

	FEET (BLS)	SAMPLE TYPE	SAMPLE INTERVAL (BLS)	BLOW COUNT	N-Value	MATERIAL DESCRIPTION	COMMENTS
—	0	HA	0 - 1.0	NA	NA	Grayish Brown SAND (SP) Trace Roots	Groundwater Encountered 5.0 Feet BLS
—		HA	1.0 - 2.0	NA	NA		
—		HA	2.0 - 3.0	NA	NA		
—		HA	3.0 - 4.0	NA	NA		
—	5	SS	4.0 - 5.0	4-4	8	Pale Brown Fine SAND (SP) Trace Marine Shell Fragments	
—		SS	5.0 - 6.0	5-6	11		
—		SS	6.0 - 7.0	6-7	13		
—		SS	7.0 - 8.0	3-1	4		
—		SS	8.0 - 9.0	1-1	2	Gray to Brown Fine SAND (SP) with Marine Shell Fragments	
—	10	SS	9.0 - 10.0	2-9	11		
—							
—							
—	15	SS	13.5 - 15.0	15-8-7	15		
—							
—							
—							
—	20	SS	18.5 - 20.0	11-10-10	20		
—							
—							
—							
—	25	SS	23.5 - 25.0	3-4-6	10	Dark Gray Silty SAND (SM) Trace Marine Shell Fragments	
—						Gray Silty CLAY (CH)	
—							
—							
—	30	SS	28.5 - 30.0	1/12"-1	1		
—						Pale Yellow Highly Weathered LIMESTONE	
—							
—	35	SS	33.5 - 35.0	3-1-50/5"	51/11"		
—							
—						100% LOC	
—							
—							
—	40	SS	38.5 - 40.0	35-34-15	49		
—						EOB 45.0 Feet BLS Boring Grout Sealed	
—							
—							
—	45	SS	43.5 - 45.0	23-33-45	78		

(HA) = HAND AUGER

(MR) = MUD ROTARY

(SS) = SPLIT SPOON

(WR) = WEIGHT OF ROD

(WH) = WEIGHT OF HAMMER

(BLS) = BELOW LAND SURFACE

(EOB) = END OF BORING

(NR) = NOT RECORDED

(NA) = NOT APPLICABLE

GULF COAST TESTING LABORATORY INC.**5671 70th Avenue North
Pinellas Park, FL 33781****Soil Boring Log**GCTL Project No. : 26059Project Name: Fire Station No. 46Boring Number: B-2Site Location: Pinellas County, FLStart Date: 03/23/20Drilling Method: MRCompletion Date: 04/03/20

	FEET (BLS)	SAMPLE TYPE	SAMPLE INTERVAL (BLS)	BLOW COUNT	N-Value	MATERIAL DESCRIPTION	COMMENTS
	0	HA	0 - 1.0	NA	NA	Pale Grayish Brown Fine SAND (SP) Trace Marine Shell Fragments	Trace Organics
—		HA	1.0 - 2.0	NA	NA		
—		HA	2.0 - 3.0	NA	NA		
—		HA	3.0 - 4.0	NA	NA		
5		SS	4.0 - 5.0	3-3	6		
—		SS	5.0 - 6.0	3-1	4		
—		SS	6.0 - 7.0	1-1	2		
—		SS	7.0 - 8.0	1-2	3		
—		SS	8.0 - 9.0	2-2	4	Gray Silty SAND (SM) Trace Marine Shell Fragments	Groundwater Encountered 6.0 Feet BLS
10		SS	9.0 - 10.0	4-6	10		
—						Pale Brown to Gray Fine SAND (SP) with Marine Shell Fragments	
—							
15		SS	13.5 - 15.0	8-9-6	15		
—							
—							
20		SS	18.5 - 20.0	12-25-25	50		
—							
—							
25		SS	23.5 - 25.0	3-9-15	24	Pale Yellow Highly Weathered LIMESTONE	Presumed Strata Based on Drilling
—							
30		SS	28.5 - 30.0	5-2-2	4	Gray Silty CLAY (CH)	100% LOC 40 Feet Casing
—							
35		SS	33.5 - 35.0	1-2-2	4		
—							
40		SS	38.5 - 40.0	WR/5ft	WR/5ft	Pale Yellow Highly Weathered LIMESTONE	Chert Fragments 100% LOC EOB 54.0 Feet BLS Drill Rig Refusal Boring Grout Sealed
—							
45		SS	42.5 - 43.5	6-4	10		
—		SS	43.5 - 45.0	2-WR/3'	WR/3ft		
—						Pale Yellow Highly Weathered LIMESTONE	
—							
50		SS	47.5 - 48.5	3-4	7		
—							
—							
—		SS	48.5 - 49;3	3-50/3"	50/3"		
—							
—							
—		SS	53.0 - 53.0	50/0"	50/0"		
—		SS	54.0 - 54.0	50/0"	50/0"		
55							

(HA) = HAND AUGER
(MR) = MUD ROTARY
(SS) = SPLIT SPOON
(WR) = WEIGHT OF ROD
(WH) = WEIGHT OF HAMMER

(BLS) = BELOW LAND SURFACE
(EOB) = END OF BORING
(NR) = NOT RECORDED
(NA) = NOT APPLICABLE

GULF COAST TESTING LABORATORY INC.

5671 70th Avenue North
Pinellas Park, FL 33781

Soil Boring Log

GCTL Project No. : 26059

Project Name: Fire Station No. 46

Boring Number: B-3

Site Location: Pinellas County, FL

Start Date: 03/23/20

Drilling Method: MR

Completion Date: 03/23/20

FEET (BLS)	SAMPLE TYPE	SAMPLE INTERVAL (BLS)	BLOW COUNT	N-Value	MATERIAL DESCRIPTION	COMMENTS
0	HA	0 - 1.0	NA	NA	Gray Fine SAND (SP) Trace Marine Shell Fragments	Groundwater Encountered 5.0 Feet BLS
—	HA	1.0 - 2.0	NA	NA		
—	HA	2.0 - 3.0	NA	NA		
—	HA	3.0 - 4.0	NA	NA		
5	SS	4.0 - 5.0	5-8	13		
—	SS	5.0 - 6.0	8-5	13	Gray to Brown Silty SAND (SM)	
—	SS	6.0 - 7.0	2-2	4		
—	SS	7.0 - 8.0	2-2	4	Gray to Brown Fine SAND (SP) with Marine Shell Fragments	
—	SS	8.0 - 9.0	2-1	3		
10	SS	9.0 - 10.0	1-8	9		
—						EOB 20 Feet BLS Boring Backfilled
—						
—						
—						
15	SS	13.5 - 15.0	7-6-8	14		
—					EOB 20 Feet BLS Boring Backfilled	
—						
—						
—						
20	SS	18.5 - 20.0	4-4-5	9		

(HA) = HAND AUGER

(MR) = MUD ROTARY

(SS) = SPLIT SPOON

(WR) = WEIGHT OF ROD

(WH) = WEIGHT OF HAMMER

(BLS) = BELOW LAND SURFACE

(EOB) = END OF BORING

(NR) = NOT RECORDED

(NA) = NOT APPLICABLE

GULF COAST TESTING LABORATORY INC.**5671 70th Avenue North
Pinellas Park, FL 33781****Soil Boring Log**GCTL Project No. : 26059Project Name: Fire Station No. 46Boring Number: B-4Site Location: Pinellas County, FLStart Date: 06/11/20Drilling Method: MRCompletion Date: 06/11/20

	FEET (BLS)	SAMPLE TYPE	SAMPLE INTERVAL (BLS)	BLOW COUNT	N-Value	MATERIAL DESCRIPTION	COMMENTS	
—	0	HA	0 - 1.0	NA	NA	Pale Grayish Brown Fine SAND (SP) Trace Marine Shell Fragments	Trace Roots	
—		HA	1.0 - 2.0	NA	NA			
—		HA	2.0 - 3.0	NA	NA			
—		HA	3.0 - 4.0	NA	NA			
	5	SS	4.0 - 5.0	3-3	6			Groundwater Encountered 5.0 Feet BLS
—		SS	5.0 - 6.0	4-3	7			
—		SS	6.0 - 7.0	4-5	9			
—		SS	7.0 - 8.0	5-7	12			
—		SS	8.0 - 9.0	7-6	13			
	10	SS	9.0 - 10.0	7-8	15	Gray Fine SAND (SP)		
—								
—								
	15	SS	13.5 - 15.0	10-12-10	22	Pale Brown to Gray Fine SAND (SP) with Marine Shell Fragments		
—								
—								
—								
	20	SS	18.5 - 20.0	12-15-15	30			
—								
—								
—								
	25	SS	23.5 - 25.0	18-20-22	42	Gray Silty CLAY (CH)		
—								
—								
—								
	30	SS	28.5 - 30.0	3-2-4	6			
—								
—								
—								
	35	SS	33.5 - 35.0	5-5-8	13	Pale Yellow Highly Weathered LIMESTONE	100% LOC 40 Feet Casing	
—								
—								
—								
	40	SS	38.5 - 40.0	18-10-10	20			
—								
—								
—								
	45	SS	43.5 - 45.0	25-50	50/6"		100% LOC EOB 48.7 Feet BLS Boring Grout Sealed	
—								
—								
—								
	50	SS	48.5 - 48.7	50/2"	50/2"			
—								
—								
—								

(HA) = HAND AUGER
(MR) = MUD ROTARY
(SS) = SPLIT SPOON
(WR) = WEIGHT OF ROD
(WH) = WEIGHT OF HAMMER

(BLS) = BELOW LAND SURFACE
(EOB) = END OF BORING
(NR) = NOT RECORDED
(NA) = NOT APPLICABLE

GULF COAST TESTING LABORATORY INC.**5671 70th Avenue North
Pinellas Park, FL 33781****Soil Boring Log**GCTL Project No. : 26059Project Name: Fire Station No. 46Boring Number: B-5Site Location: Pinellas County, FLStart Date: 06/11/20Drilling Method: MRCompletion Date: 06/11/20

FEET (BLS)	SAMPLE TYPE	SAMPLE INTERVAL (BLS)	BLOW COUNT	N-Value	MATERIAL DESCRIPTION	COMMENTS	
0	HA	0 - 1.0	NA	NA	Pale Grayish Brown Fine SAND (SP) Trace Marine Shell Fragments	Trace Roots	
—	HA	1.0 - 2.0	NA	NA		Groundwater Encountered 5.0 Feet BLS	
—	HA	2.0 - 3.0	NA	NA			
—	HA	3.0 - 4.0	NA	NA			
5	SS	4.0 - 5.0	3-3	6			
—	SS	5.0 - 6.0	4-3	7			
—	SS	6.0 - 7.0	6-6	12			
—	SS	7.0 - 8.0	7-7	14			
—	SS	8.0 - 9.0	7-6	13			
10	SS	9.0 - 10.0	8-7	15			
—							
—							
15	SS	13.5 - 15.0	17-20-35	55	Pale Gray Fine SAND (SP)		
—							
—							
20	SS	18.5 - 20.0	5-7-7	14	Gray Silty SAND (SM)		
—							
—							
25	SS	23.5 - 25.0	18-15-20	35	Pale Yellow Highly Weathered LIMESTONE		
—							
—							
—							
30	SS	28.5 - 30.0	20-21-22	43			
—							
—							
35	SS	33.5 - 35.0	25-25-22	47			
—							
—							
40	SS	38.5 - 39.1	35-50/1"	50/1"			
—							
—							
45	SS	43.5 - 43.8	50/3"	50/3"			
					EOB 43.8 Feet BLS Boring Grout Sealed		

(HA) = HAND AUGER
(MR) = MUD ROTARY
(SS) = SPLIT SPOON
(WR) = WEIGHT OF ROD
(WH) = WEIGHT OF HAMMER(BLS) = BELOW LAND SURFACE
(EOB) = END OF BORING
(NR) = NOT RECORDED
(NA) = NOT APPLICABLE

GULF COAST TESTING LABORATORY INC.**5671 70th Avenue North
Pinellas Park, FL 33781****Soil Boring Log**GCTL Project No. : 26059Project Name: Fire Station No. 46Boring Number: AB-1Site Location: Pinellas County, FLStart Date: 06/11/20Drilling Method: MRCompletion Date: 06/11/20

FEET (BLS)	SAMPLE TYPE	SAMPLE INTERVAL (BLS)			MATERIAL DESCRIPTION	COMMENTS
0					Gray Fine SAND (SP)	
1	Auger	0 - 1.0				
2	Auger	1.0 - 2.0			Light Brown Fine SAND (SP)	Groundwater Encountered 6.0 Feet BLS
3	Auger	2.0 - 3.0				with Shell Fragments
4	Auger	3.0 - 4.0				
5	Auger	4.0 - 5.0			Light Gray Fine SAND (SP)	
6	Auger	5.0 - 6.0				
7	Auger	6.0 - 7.0				
8	Auger	7.0 - 8.0			Light Gray to Brown Fine SAND (SP)	
9	Auger	8.0 - 9.0				with Shell Fragments
10	Auger	9.0 - 10.0				EOB 10.0 Feet BLS

(HA) = HAND AUGER

(MR) = MUD ROTARY

(SS) = SPLIT SPOON

(WR) = WEIGHT OF ROD

(WH) = WEIGHT OF HAMMER

(BLS) = BELOW LAND SURFACE

(EOB) = END OF BORING

(NR) = NOT RECORDED

(NA) = NOT APPLICABLE

(LOC) = LOSS OF CIRCULATION

GULF COAST TESTING LABORATORY INC.**5671 70th Avenue North
Pinellas Park, FL 33781****Soil Boring Log**GCTL Project No. : 26059Project Name: Fire Station No. 46Boring Number: AB-2Site Location: Pinellas County, FLStart Date: 06/11/20Drilling Method: MRCompletion Date: 06/11/20

FEET (BLS)	SAMPLE TYPE	SAMPLE INTERVAL (BLS)			MATERIAL DESCRIPTION	COMMENTS
0					Gray Fine SAND (SP)	Groundwater Encountered 6.0 Feet BLS
1	Auger	0 - 1.0				
2	Auger	1.0 - 2.0				
3	Auger	2.0 - 3.0				
4	Auger	3.0 - 4.0				
5	Auger	4.0 - 5.0			Light Brown Fine SAND (SP) with Shell Fragments	
6	Auger	5.0 - 6.0				
7	Auger	6.0 - 7.0				
8	Auger	7.0 - 8.0				
9	Auger	8.0 - 9.0				
10	Auger	9.0 - 10.0				EOB 10.0 Feet BLS

(HA) = HAND AUGER

(MR) = MUD ROTARY

(SS) = SPLIT SPOON

(WR) = WEIGHT OF ROD

(WH) = WEIGHT OF HAMMER

(BLS) = BELOW LAND SURFACE

(EOB) = END OF BORING

(NR) = NOT RECORDED

(NA) = NOT APPLICABLE

(LOC) = LOSS OF CIRCULATION

GULF COAST TESTING LABORATORY INC.**5671 70th Avenue North
Pinellas Park, FL 33781****Soil Boring Log**GCTL Project No. : 26059Project Name: Fire Station No. 46Boring Number: AB-3Site Location: Pinellas County, FLStart Date: 06/11/20Drilling Method: MRCompletion Date: 06/11/20

	FEET (BLS)	SAMPLE TYPE	SAMPLE INTERVAL (BLS)			MATERIAL DESCRIPTION	COMMENTS
	0					Gray Fine SAND (SP)	Groundwater Encountered 6.0 Feet BLS
—	1	Auger	0 - 1.0				
—							
—	2	Auger	1.0 - 2.0				
—							
—							
—	3	Auger	2.0 - 3.0			Light Brown Fine SAND (SP) Trace Shell Fragments	
—							
—							
—	4	Auger	3.0 - 4.0				
—							
—							
—	5	Auger	4.0 - 5.0				
—							
—							
—	6	Auger	5.0 - 6.0				
—							
—							
—	7	Auger	6.0 - 7.0				
—							
—							
—	8	Auger	7.0 - 8.0				
—							
—							
—	9	Auger	8.0 - 9.0			Gray SAND (SP) with some Organics	
—							
—							
—							
—	10	Auger	9.0 - 10.0				
							EOB 10.0 Feet BLS

(HA) = HAND AUGER

(MR) = MUD ROTARY

(SS) = SPLIT SPOON

(WR) = WEIGHT OF ROD

(WH) = WEIGHT OF HAMMER

(BLS) = BELOW LAND SURFACE

(EOB) = END OF BORING

(NR) = NOT RECORDED

(NA) = NOT APPLICABLE

(LOC) = LOSS OF CIRCULATION

GULF COAST TESTING LABORATORY INC.**5671 70th Avenue North
Pinellas Park, FL 33781****Soil Boring Log**GCTL Project No. : 26059Project Name: Fire Station No. 46Boring Number: AB-4Site Location: Pinellas County, FLStart Date: 06/11/20Drilling Method: MRCompletion Date: 06/11/20

FEET (BLS)	SAMPLE TYPE	SAMPLE INTERVAL (BLS)			MATERIAL DESCRIPTION	COMMENTS
0						
1	Auger	0 - 1.0				
2	Auger	1.0 - 2.0				
3	Auger	2.0 - 3.0				
4	Auger	3.0 - 4.0				
5	Auger	4.0 - 5.0				
6	Auger	5.0 - 6.0				
7	Auger	6.0 - 7.0				
8	Auger	7.0 - 8.0				
9	Auger	8.0 - 9.0				
10	Auger	9.0 - 10.0				

**Groundwater
Encountered
6.0 Feet BLS****Light Brown
Fine SAND (SP)
Trace Shell Fragments****Gray SAND (SP)
with some Organics****EOB 10.0 Feet BLS**(HA) = HAND AUGER
(MR) = MUD ROTARY
(SS) = SPLIT SPOON
(WR) = WEIGHT OF ROD
(WH) = WEIGHT OF HAMMER(BLS) = BELOW LAND SURFACE
(EOB) = END OF BORING
(NR) = NOT RECORDED
(NA) = NOT APPLICABLE
(LOC) = LOSS OF CIRCULATION

GULF COAST TESTING LABORATORY INC.**5671 70th Avenue North
Pinellas Park, FL 33781****Soil Boring Log**GCTL Project No. : 26059Project Name: Fire Station No. 46Boring Number: AB-5Site Location: Pinellas County, FLStart Date: 06/11/20Drilling Method: MRCompletion Date: 06/11/20

FEET (BLS)	SAMPLE TYPE	SAMPLE INTERVAL (BLS)			MATERIAL DESCRIPTION	COMMENTS
0					Gray Fine SAND (SP)	Groundwater Encountered 6.0 Feet BLS
1	Auger	0 - 1.0				
2	Auger	1.0 - 2.0			Light Brown Fine SAND (SP) with Shell Fragments	
3	Auger	2.0 - 3.0				
4	Auger	3.0 - 4.0			Dark Brown Organic Silty SAND (SM)	
5	Auger	4.0 - 5.0				EOB 10.0 Feet BLS
6	Auger	5.0 - 6.0			Light Brown Fine SAND (SP) with Shell Fragments	
7	Auger	6.0 - 7.0				
8	Auger	7.0 - 8.0				
9	Auger	8.0 - 9.0				
10	Auger	9.0 - 10.0				

(HA) = HAND AUGER

(MR) = MUD ROTARY

(SS) = SPLIT SPOON

(WR) = WEIGHT OF ROD

(WH) = WEIGHT OF HAMMER

(BLS) = BELOW LAND SURFACE

(EOB) = END OF BORING

(NR) = NOT RECORDED

(NA) = NOT APPLICABLE

(LOC) = LOSS OF CIRCULATION

**5671 70th Avenue North
Pinellas Park, FL 33781**

Boring Number:	AB-6
Start Date:	06/11/20
Completion Date:	06/11/20

(BLS) = BELOW LAND SURFACE
(EOB) = END OF BORING
(NR) = NOT RECORDED
(NA) = NOT APPLICABLE
(LOC) = LOSS OF CIRCULATION

GULF COAST TESTING LABORATORY INC.**5671 70th Avenue North
Pinellas Park, FL 33781****Soil Boring Log**GCTL Project No. : 26059Project Name: Fire Station No. 46Boring Number: AB-7Site Location: Pinellas County, FLStart Date: 06/11/20Drilling Method: MRCompletion Date: 06/11/20

FEET (BLS)	SAMPLE TYPE	SAMPLE INTERVAL (BLS)			MATERIAL DESCRIPTION	COMMENTS
0					Gray Fine SAND (SP)	Groundwater Encountered 6.0 Feet BLS
1	Auger	0 - 1.0				
2	Auger	1.0 - 2.0				
3	Auger	2.0 - 3.0				
4	Auger	3.0 - 4.0			Light Brown Fine SAND (SP) with Shell Fragments	
5	Auger	4.0 - 5.0				
6	Auger	5.0 - 6.0				
7	Auger	6.0 - 7.0			Dark Brown Fine SAND (SP) Trace Organics	
8	Auger	7.0 - 8.0				
9	Auger	8.0 - 9.0			Dark Brown to Gray Fine SAND (SP)	
10	Auger	9.0 - 10.0				EOB 10.0 Feet BLS

(HA) = HAND AUGER

(MR) = MUD ROTARY

(SS) = SPLIT SPOON

(WR) = WEIGHT OF ROD

(WH) = WEIGHT OF HAMMER

(BLS) = BELOW LAND SURFACE

(EOB) = END OF BORING

(NR) = NOT RECORDED

(NA) = NOT APPLICABLE

(LOC) = LOSS OF CIRCULATION

SITE PHOTOGRAPHS



Photograph No. 1: View of subject property during GPR services.



Photograph No. 2: View of subject property during GPR services. Note flagged locations.



Photograph No. 3: View of subject property during GPR services. Note marked lines.



Photograph No. 4: View of subject property during GPR services. Note marked lines.



Photograph No. 5: View of subject property during GPR services.



Photograph No. 6: View of subject property during GPR services.



Photograph No. 7: View of subject property during GPR services. Note marked lines.



Photograph No. 8: View of subject property during GPR services. Note marked lines.



Photograph No. 9: View of subject property during GPR services. Note marked lines.



Photograph No. 10: View of subject property during GPR services. Note marked lines.



Photograph No. 11: View of subject property during GPR services. Note marked lines.



Photograph No. 12: View of subject property during GPR services. Note marked lines.



Photograph No. 13: View of subject property during GPR services. Note marked lines.



Photograph No. 14: View of subject property during GPR services. Note marked lines.

Fire Station No. 46
Pinellas County, Florida



Photograph No. 15: View of subject property during field services.



Photograph No. 16: View of subject property during auger boring services (AB-1 location).



Photograph No. 17: View of subject property during auger boring services (AB-3 location).



Photograph No. 18: View of subject property during auger boring services (AB-7 location).



Photograph No. 19: View of subject property during SPT boring services (B-1 location).



Photograph No. 20: View of subject property during SPT boring services (B-2 location).



Photograph No. 21: View of subject property during SPT boring services (B-3 location).



Photograph No. 22: View of subject property during DRI services.

DOUBLE-RING INFILTRATION TEST RESULTS

GULF COAST TESTING LABORATORY, INC.

5671 70th AVENUE NORTH
PINELLAS PARK, FL 33781
CONSTRUCTION MATERIALS ENGINEERING COUNCIL CERTIFIED
CERTIFICATE of AUTHORIZATION # 00002370

PHONE: (727) 544-4080

FAX: (727) 544-7532

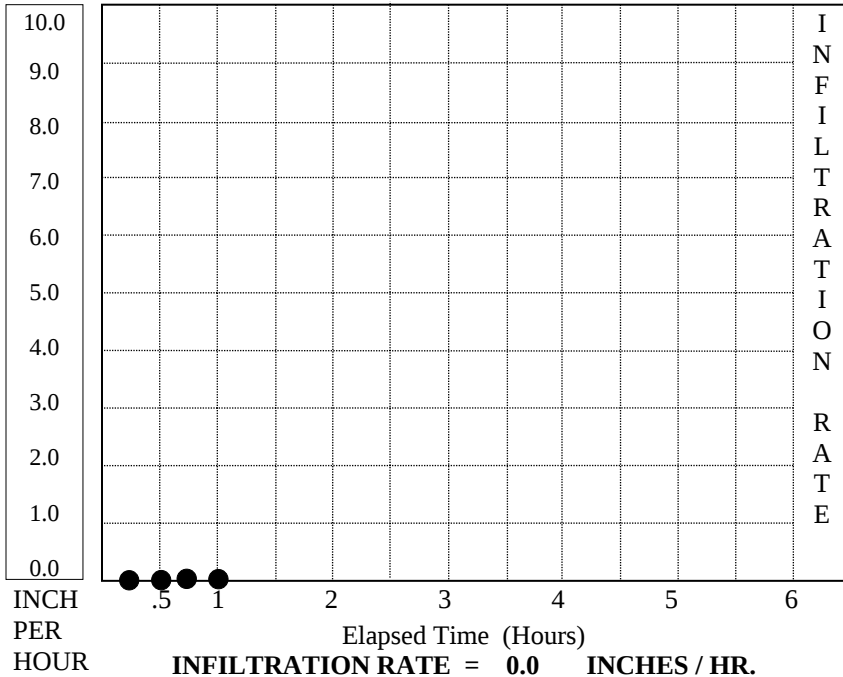
INFILTRATION RATE OF SOILS IN FIELD USING DOUBLE RING INFILTROMETER

CLIENT: Wannamacher Jensen Architects Inc.
PROJECT: Clearwater Fire Station #46, 534 Mandalay Avenue, Clearwater, Florida
DATE TESTED: 3/24/20
LOCATION OF TEST: See Site Plan
DEPTH TO EXISTING WATER TABLE: **4' 10" Below the Existing Ground Surface**

LAB NO: 26059 Test #1
DATE REPORTED: 4/9/20

REMARKS: Test Performed at Approximately 2' 0" Below Existing Grade

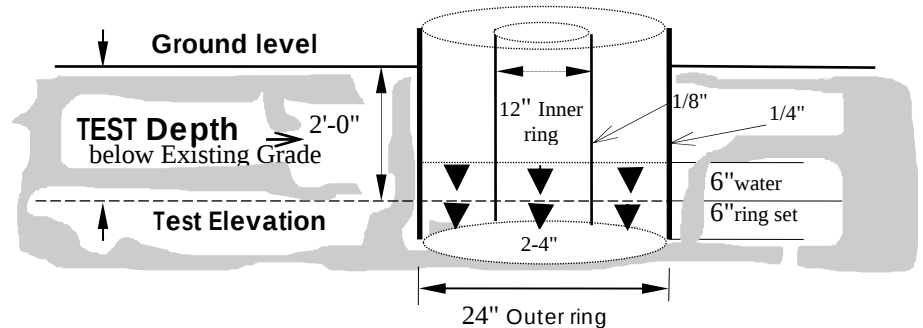
● = INNER RING READINGS



SOIL PROFILE

Depth in feet.	CLASSIFICATION (EXISTING SURFACE APPROX. ELEV.)
1' 0"	Dark Grayish Brown SAND w/ Shell Fragments & Occ. Roots
3' 0"	Grayish Brown SAND w/ Shell & Shell Fragments
4' 0"	Very Light Gray SAND w/ Fine Shell Fragments
5' 0"	Grayish Brown SAND w/ Fine Shell Fragments & Trace Silt Nodules

Hole Terminated at 60"



GULF COAST TESTING LABORATORY, INC.

5671 70th AVENUE NORTH
PINELLAS PARK, FL 33781
CONSTRUCTION MATERIALS ENGINEERING COUNCIL CERTIFIED
CERTIFICATE of AUTHORIZATION # 00002370

PHONE: (727) 544-4080

FAX: (727) 544-7532

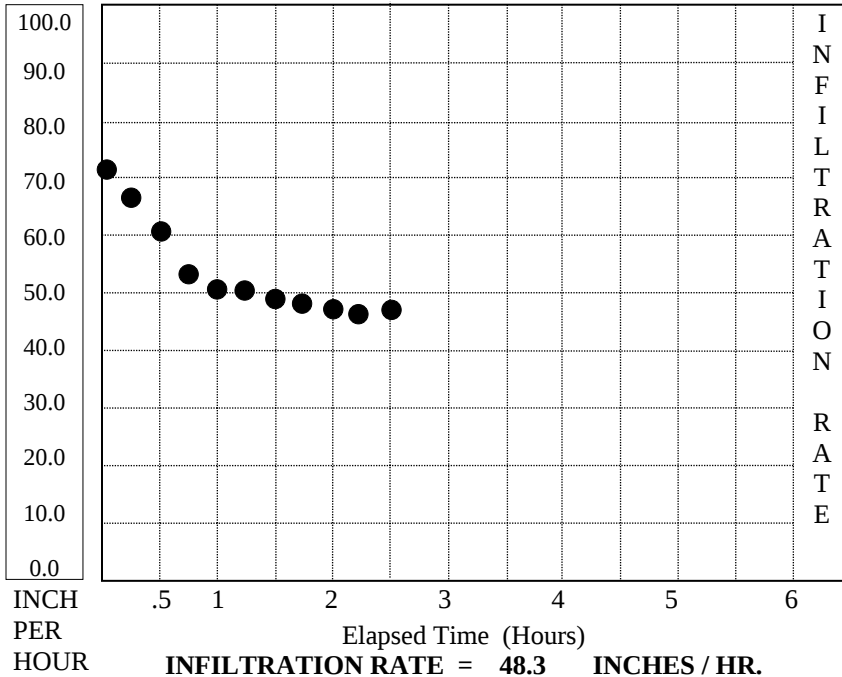
INFILTRATION RATE OF SOILS IN FIELD USING DOUBLE RING INFILTROMETER

CLIENT: Wannamacher Jensen Architects Inc.
PROJECT: Clearwater Fire Station #46, 534 Mandalay Avenue, Clearwater, Florida
DATE TESTED: 3/31/20
LOCATION OF TEST: See Site Plan
DEPTH TO EXISTING WATER TABLE: **4' 10" Below the Existing Ground Surface**

LAB NO: 26059 Test #2
DATE REPORTED: 4/9/20

REMARKS: Test Performed at Approximately 3' 0" Below Existing Grade

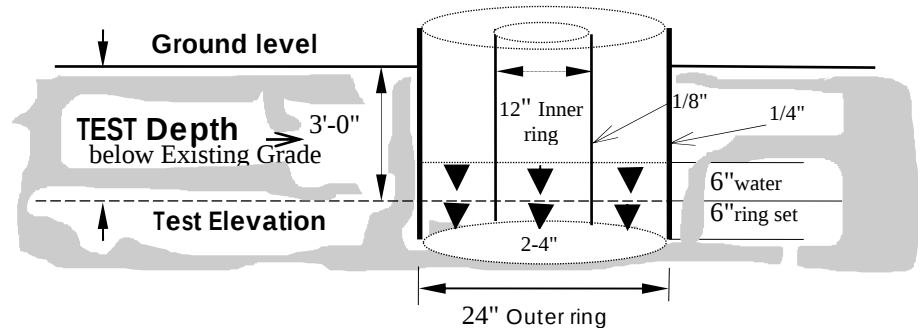
● = INNER RING READINGS



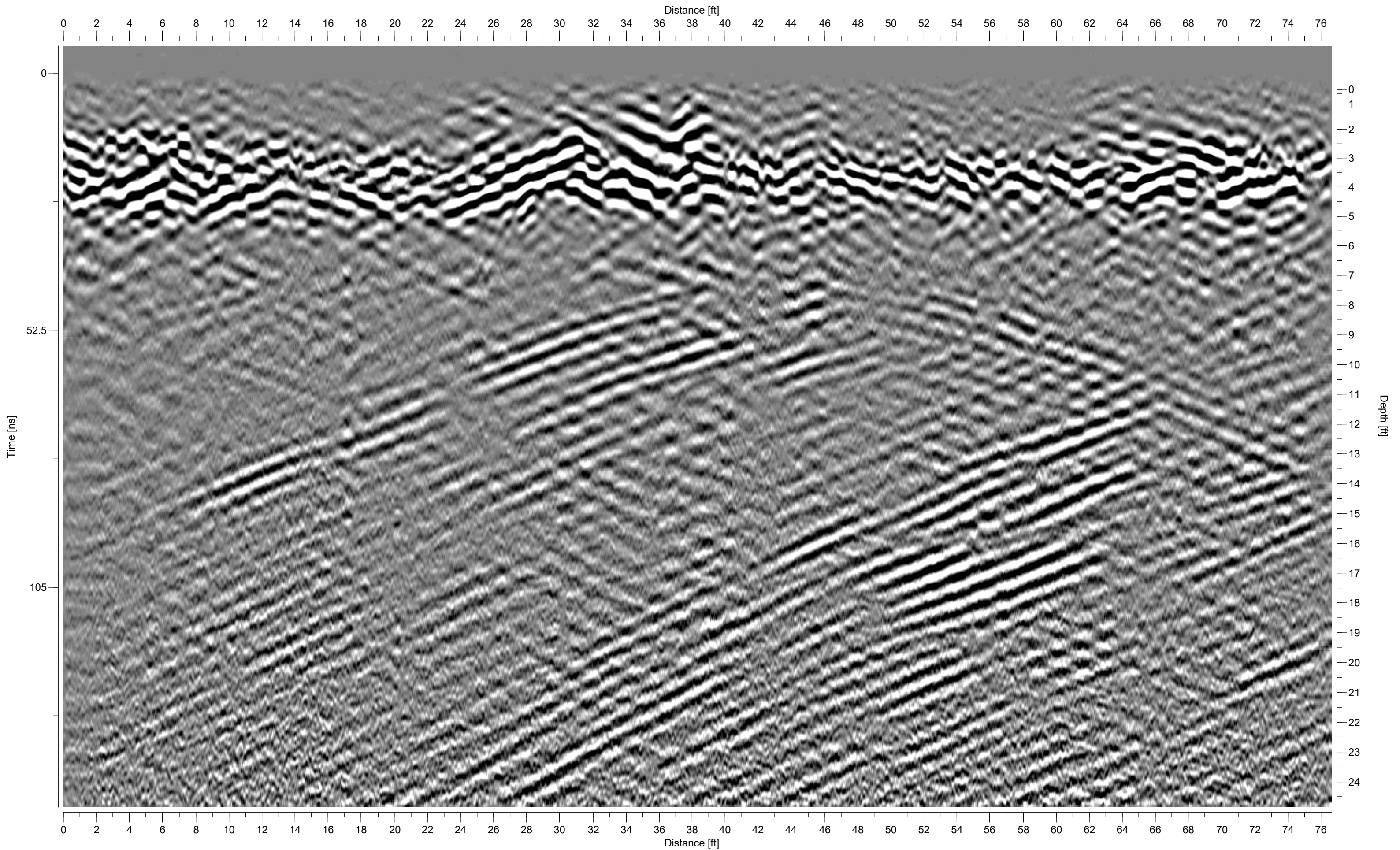
SOIL PROFILE

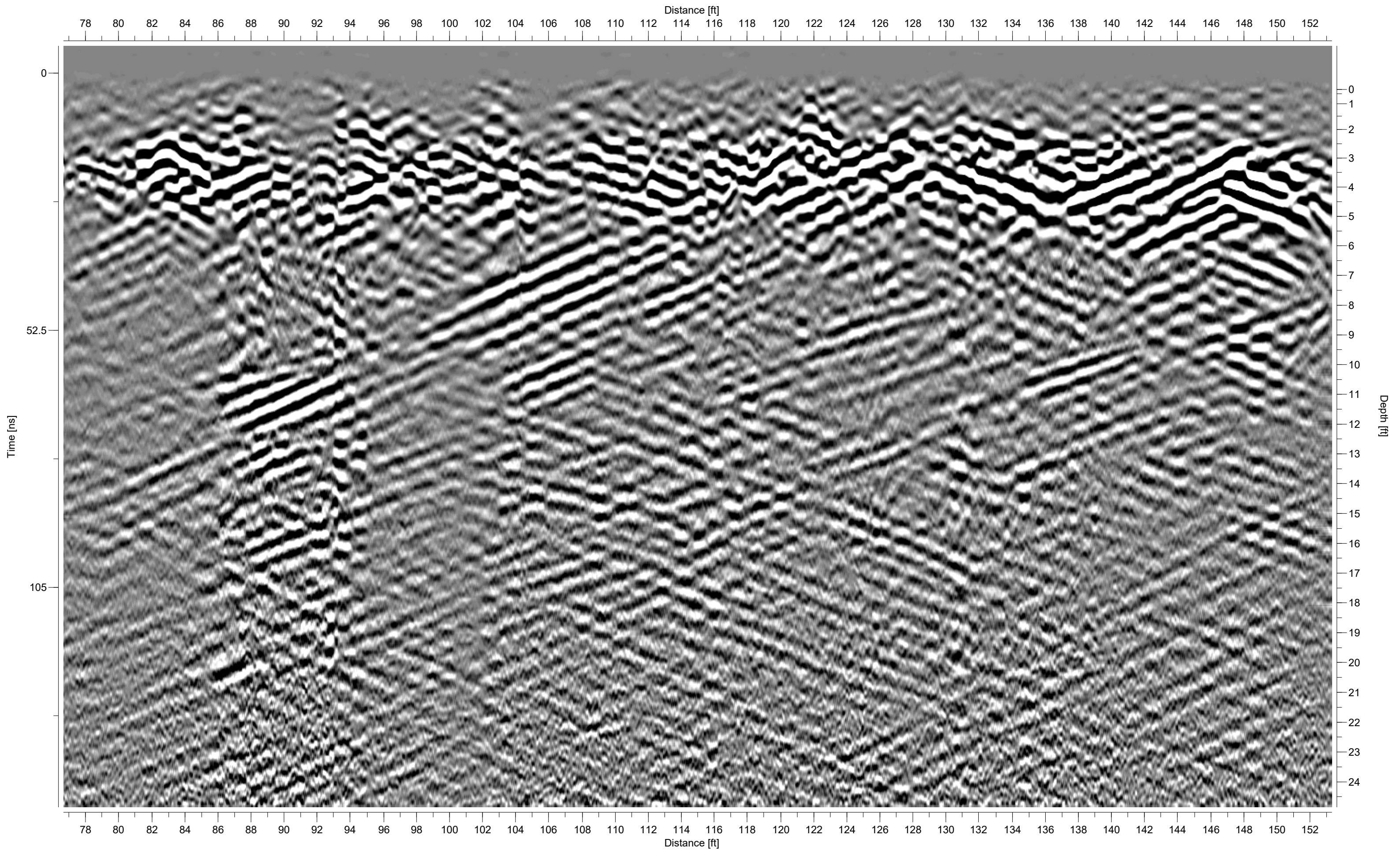
Depth in feet.	CLASSIFICATION (EXISTING SURFACE APPROX. ELEV.)
1' 0"	Dark Grayish Brown SAND w/ Shell Fragments & Occ. Roots
3' 0"	Grayish Brown SAND w/ Shell & Shell Fragments
4' 0"	Very Light Gray SAND w/ Fine Shell Fragments
5' 0"	Grayish Brown SAND w/ Fine Shell Fragments & Trace Silt Nodules

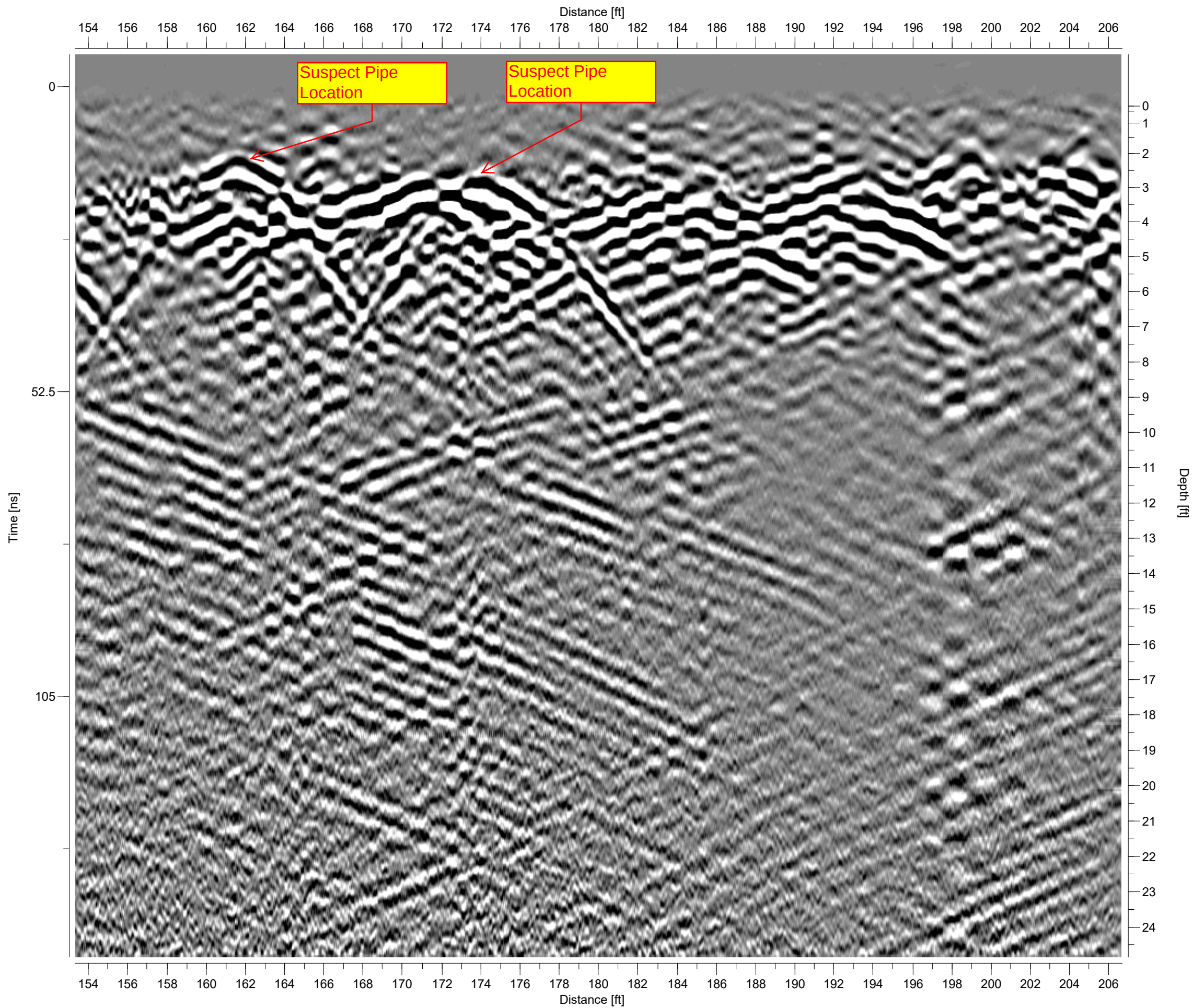
Hole Terminated at 60"

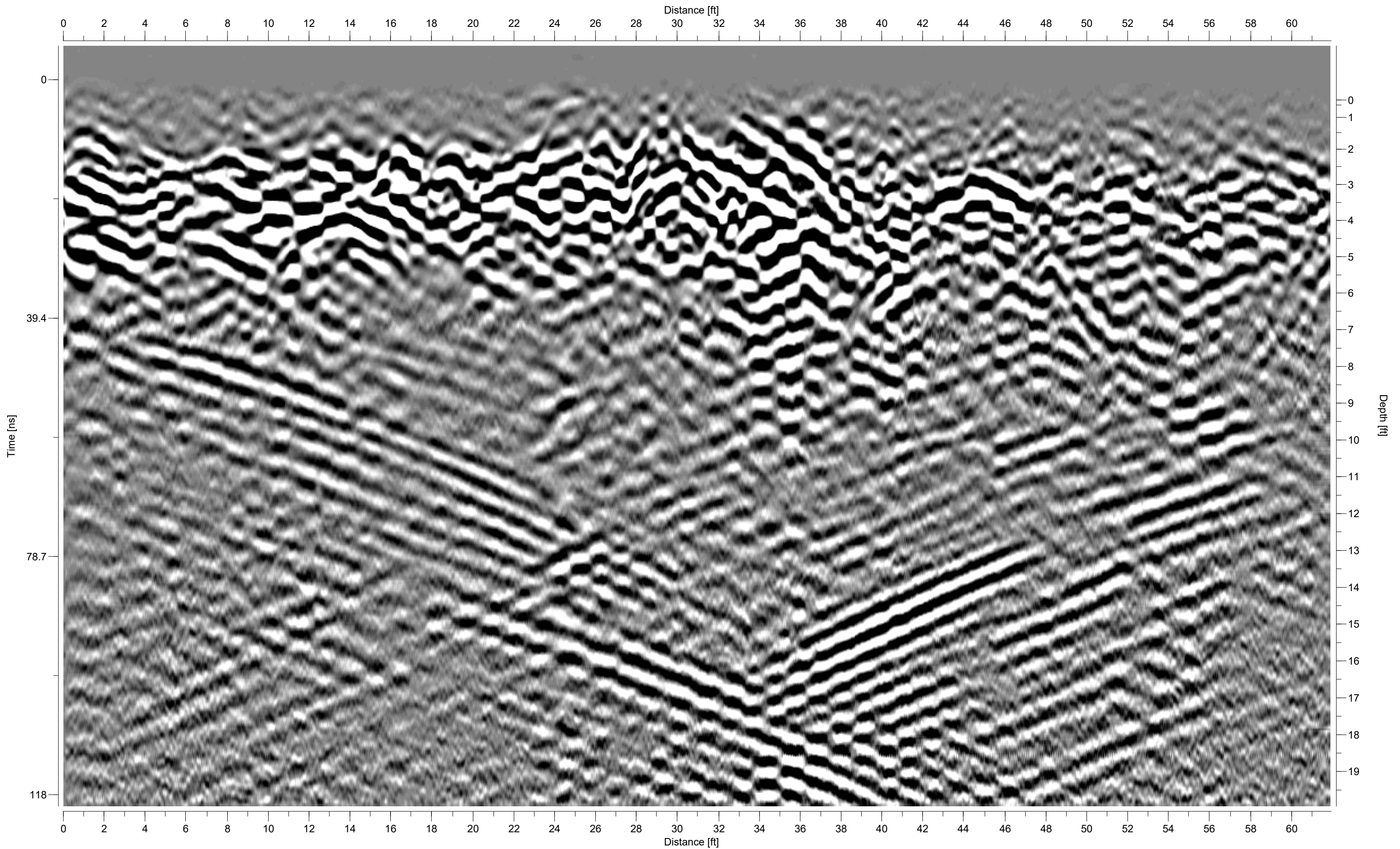


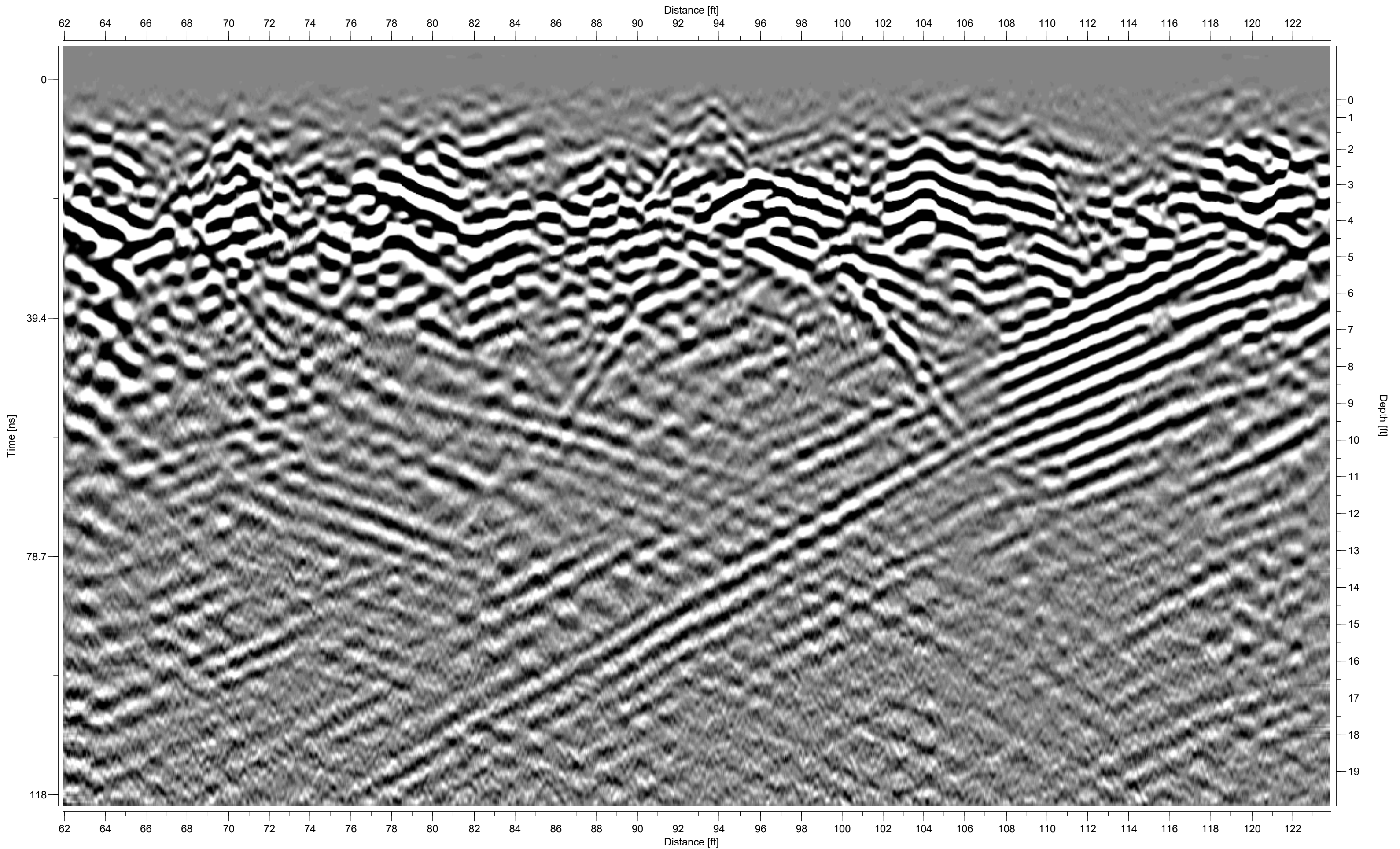
SELECTED GROUND PENETRATING RADAR PROFILES

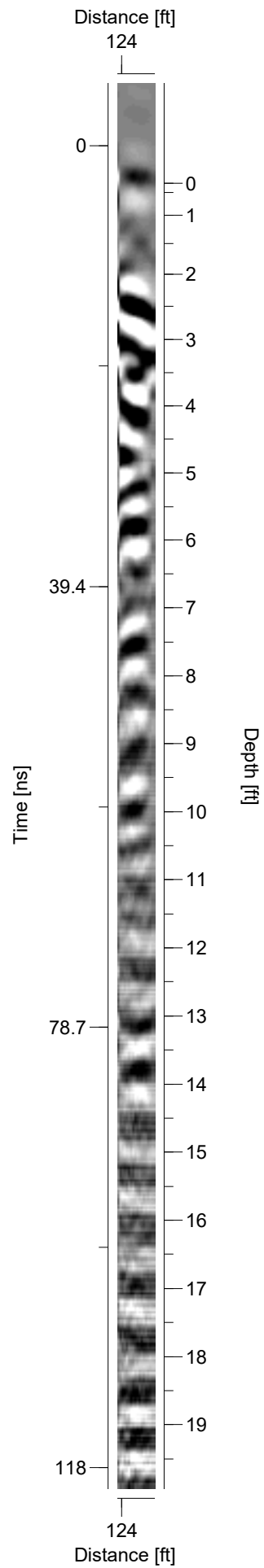






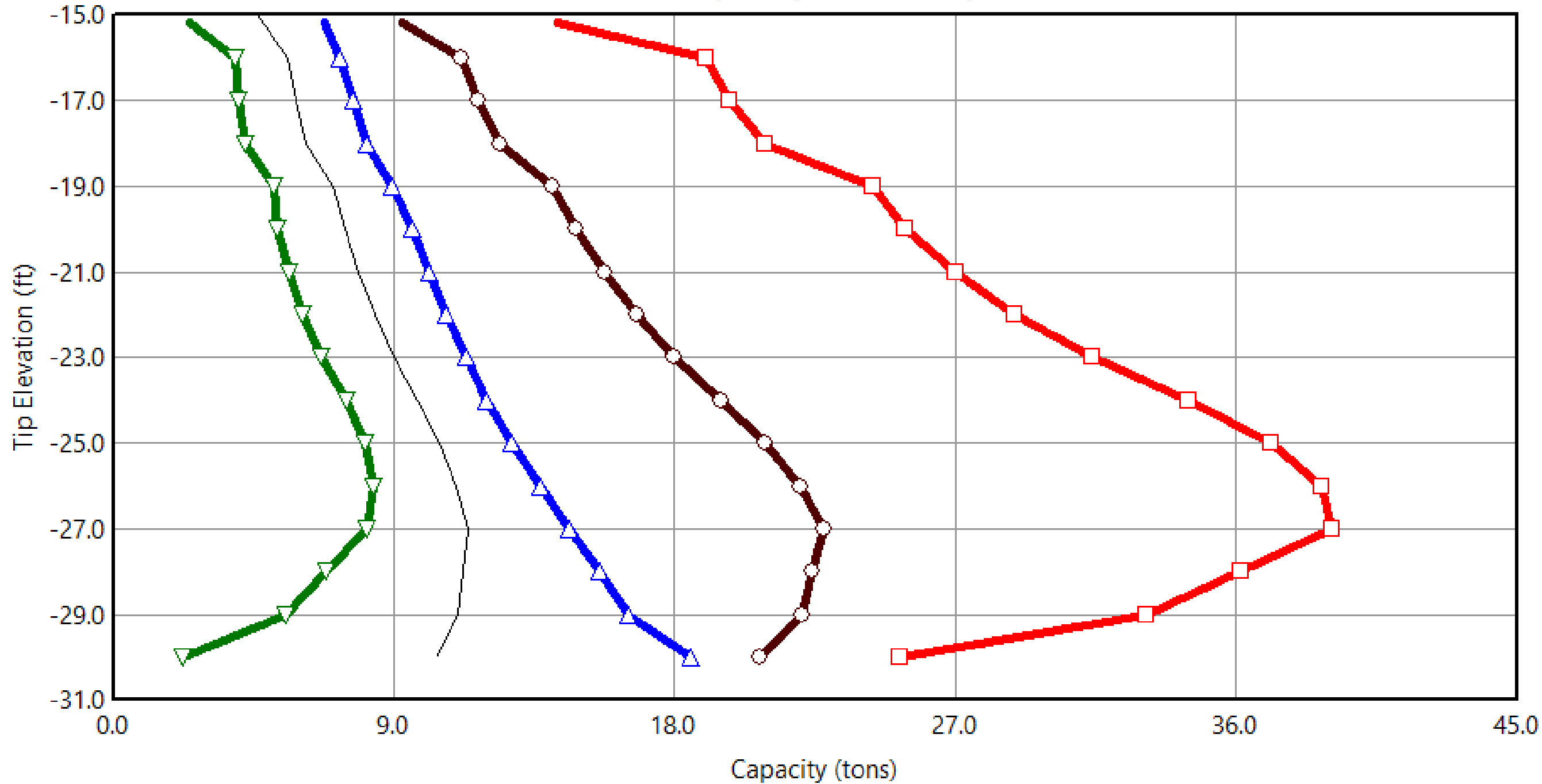




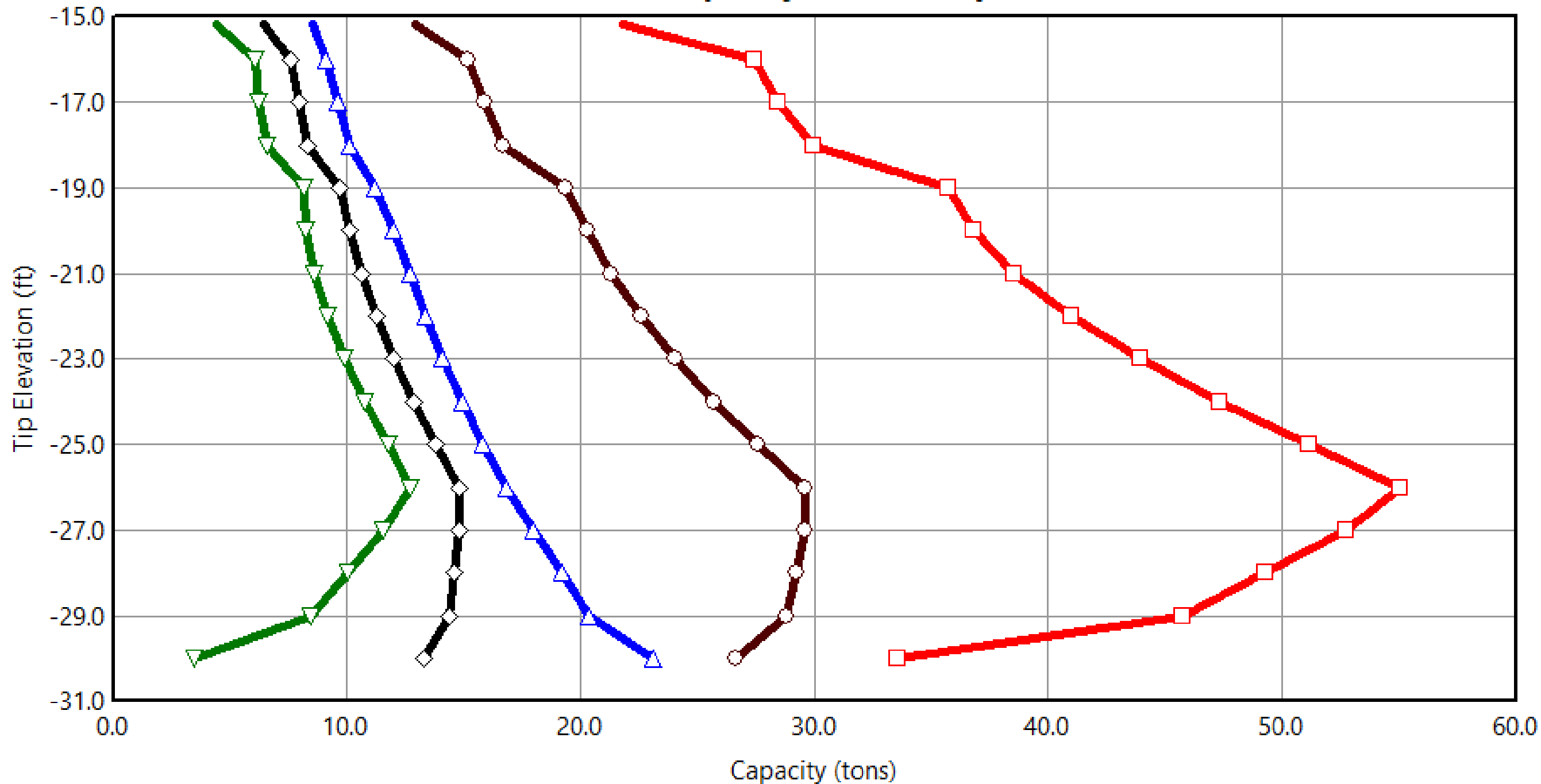


**COMPRESSIVE AND UPLIFT STATIC
PILE BEARING CAPACITY ANALYSES**

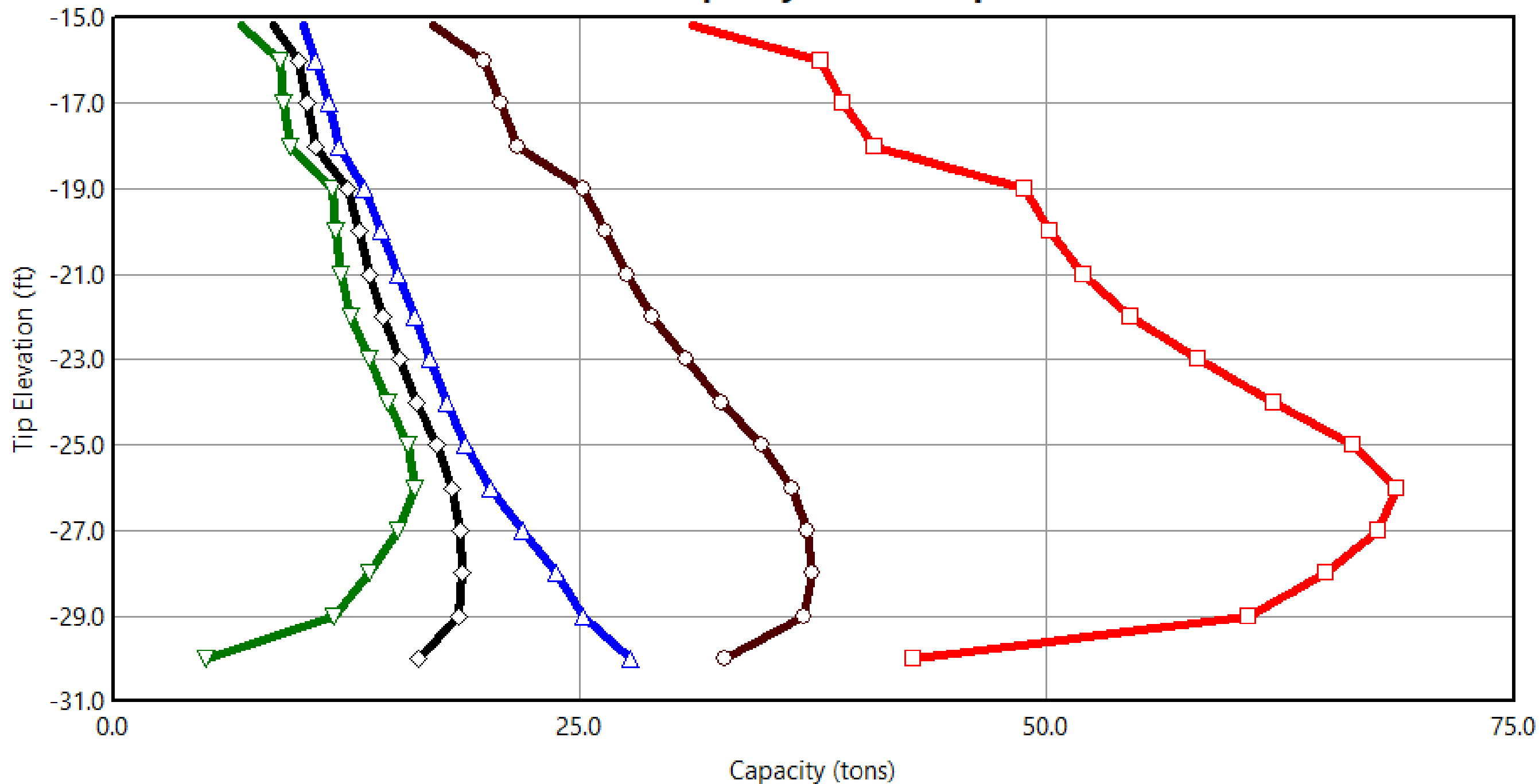
Driven Pile Capacity: 8-inch tip diameter



Driven Pile Capacity: 10-inch tip diameter



Driven Pile Capacity: 12-inch tip diameter



General Information:

=====

Input file:26059 Fire Station No. 46 Timber Piles\Timber Pile Capacity.in
Project number: 26059
Job name: Fire Station No. 46
Engineer: DRS
Units: English

Analysis Information:

=====

Analysis Type: SPT

Soil Information:

=====

Boring date: 3/20/20, Boring Number: B-1

Station number: Offset:

Ground Elevation: 0.000(ft)

Hammer type: Safety Hammer

ID	Depth (ft)	No. of Blows (Blows/ft)	Soil Type
1	0.00	15.00	3- Clean sand
2	6.00	15.00	3- Clean sand
3	6.10	8.00	2- Clay and silty sand
4	6.20	8.00	3- Clean sand
5	11.00	8.00	3- Clean sand
6	12.00	11.00	3- Clean sand
7	13.00	13.00	3- Clean sand
8	13.50	13.00	2- Clay and silty sand
9	13.60	5.00	3- Clean sand
10	14.00	5.00	3- Clean sand
11	15.00	5.00	3- Clean sand
12	15.50	5.00	2- Clay and silty sand
13	15.60	13.00	3- Clean sand
14	16.00	13.00	3- Clean sand
15	18.50	13.00	3- Clean sand
16	18.60	13.00	2- Clay and silty sand
17	18.70	18.00	3- Clean sand
18	21.00	18.00	3- Clean sand
19	26.00	24.00	3- Clean sand
20	29.00	24.00	3- Clean sand
21	29.10	12.00	2- Clay and silty sand
22	29.20	12.00	2- Clay and silty sand
23	34.00	12.00	2- Clay and silty sand
24	34.10	1.00	1- Plastic Clay
25	36.00	1.00	1- Plastic Clay
26	38.00	1.00	1- Plastic Clay
27	38.10	55.00	4- Lime Stone/Very shelly sand
28	41.00	55.00	4- Lime Stone/Very shelly sand
29	46.00	49.00	4- Lime Stone/Very shelly sand
30	51.00	78.00	4- Lime Stone/Very shelly sand
31	52.00	0.00	5- Cavity layer

Blowcount Average Per Soil Layer

Layer Num.	Starting Elevation (ft)	Bottom Elevation (ft)	Thickness (ft)	Average Blowcount (Blows/ft)	Soil Type

-					
1	0.00	-6.10	6.10	15.00	3-Clean Sand
2	-6.10	-6.20	0.10	8.00	2-Clay and Silty Sand
3	-6.20	-13.50	7.30	8.75	3-Clean Sand
4	-13.50	-13.60	0.10	13.00	2-Clay and Silty Sand
5	-13.60	-15.50	1.90	5.00	3-Clean Sand
6	-15.50	-15.60	0.10	5.00	2-Clay and Silty Sand
7	-15.60	-18.60	3.00	13.00	3-Clean Sand
8	-18.60	-18.70	0.10	13.00	2-Clay and Silty Sand
9	-18.70	-29.10	10.40	19.79	3-Clean Sand
10	-29.10	-34.10	5.00	12.00	2-Clay and Silty Sand
11	-34.10	-38.10	4.00	1.00	1-Plastic Clay
12	-38.10	-52.00	13.90	54.50	4-Limestone, Very Shelly
Sand					
13	-52.00	-52.00	0.00	0.00	5-

Driven Pile Data:

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Pile unit weight = 45.00(pcf), Section Type: Round

Pile Geometry:

Width (in)	Length (ft)	Tip Elev. (ft)

8.00	15.00	-15.00
8.00	16.00	-16.00
8.00	17.00	-17.00
8.00	18.00	-18.00
8.00	19.00	-19.00
8.00	20.00	-20.00
8.00	21.00	-21.00
8.00	22.00	-22.00
8.00	23.00	-23.00
8.00	24.00	-24.00
8.00	25.00	-25.00
8.00	26.00	-26.00
8.00	27.00	-27.00
8.00	28.00	-28.00
8.00	29.00	-29.00
8.00	30.00	-30.00
10.00	15.00	-15.00
10.00	16.00	-16.00
10.00	17.00	-17.00
10.00	18.00	-18.00
10.00	19.00	-19.00
10.00	20.00	-20.00
10.00	21.00	-21.00
10.00	22.00	-22.00
10.00	23.00	-23.00
10.00	24.00	-24.00
10.00	25.00	-25.00
10.00	26.00	-26.00
10.00	27.00	-27.00
10.00	28.00	-28.00
10.00	29.00	-29.00
10.00	30.00	-30.00
12.00	15.00	-15.00
12.00	16.00	-16.00
12.00	17.00	-17.00
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12.00	19.00	-19.00
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12.00	21.00	-21.00
12.00	22.00	-22.00
12.00	23.00	-23.00
12.00	24.00	-24.00
12.00	25.00	-25.00
12.00	26.00	-26.00
12.00	27.00	-27.00
12.00	28.00	-28.00
12.00	29.00	-29.00
12.00	30.00	-30.00

Driven Pile Capacity:

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Section Type: Round
Pile Width: 8.00 (in)

Test Pile Length (ft)	Pile Width (in)	Ultimate Side Friction (tons)	Mobilized End Bearing (tons)	Estimated Davisson Capacity (tons)	Allowable Pile Capacity (tons)	Ultimate Pile Capacity (tons)
15.00	8.0	6.79	2.48	9.27	4.64	14.23
16.00	8.0	7.27	3.91	11.18	5.59	18.99
17.00	8.0	7.73	4.01	11.73	5.87	19.74
18.00	8.0	8.12	4.26	12.39	6.19	20.91
19.00	8.0	8.96	5.14	14.10	7.05	24.38
20.00	8.0	9.58	5.28	14.86	7.43	25.42
21.00	8.0	10.13	5.63	15.75	7.88	27.01
22.00	8.0	10.70	6.07	16.77	8.39	28.92
23.00	8.0	11.32	6.69	18.00	9.00	31.37
24.00	8.0	11.99	7.50	19.49	9.75	34.49
25.00	8.0	12.80	8.11	20.91	10.45	37.12
26.00	8.0	13.71	8.34	22.05	11.03	38.74
27.00	8.0	14.64	8.14	22.78	11.39	39.05
28.00	8.0	15.58	6.86	22.44	11.22	36.16
29.00	8.0	16.53	5.54	22.07	11.03	33.15
30.00	8.0	18.51	2.23	20.74	10.37	25.21

Section Type: Round
 Pile Width: 10.00 (in)

Test Pile Length (ft)	Pile Width (in)	Ultimate Side Friction (tons)	Mobilized End Bearing (tons)	Estimated Davisson Capacity (tons)	Allowable Pile Capacity (tons)	Ultimate Pile Capacity (tons)
15.00	10.0	8.53	4.42	12.95	6.48	21.79
16.00	10.0	9.09	6.11	15.20	7.60	27.41
17.00	10.0	9.64	6.26	15.90	7.95	28.42
18.00	10.0	10.12	6.61	16.72	8.36	29.94
19.00	10.0	11.20	8.17	19.37	9.68	35.71
20.00	10.0	12.03	8.26	20.29	10.15	36.81
21.00	10.0	12.74	8.59	21.33	10.66	38.51
22.00	10.0	13.40	9.20	22.59	11.30	40.99
23.00	10.0	14.13	9.93	24.06	12.03	43.93
24.00	10.0	14.93	10.80	25.73	12.87	47.34
25.00	10.0	15.82	11.79	27.61	13.81	51.19
26.00	10.0	16.85	12.75	29.59	14.80	55.09
27.00	10.0	18.02	11.58	29.60	14.80	52.75
28.00	10.0	19.19	10.04	29.23	14.62	49.31
29.00	10.0	20.36	8.46	28.83	14.41	45.76
30.00	10.0	23.13	3.49	26.62	13.31	33.60

Section Type: Round
 Pile Width: 12.00 (in)

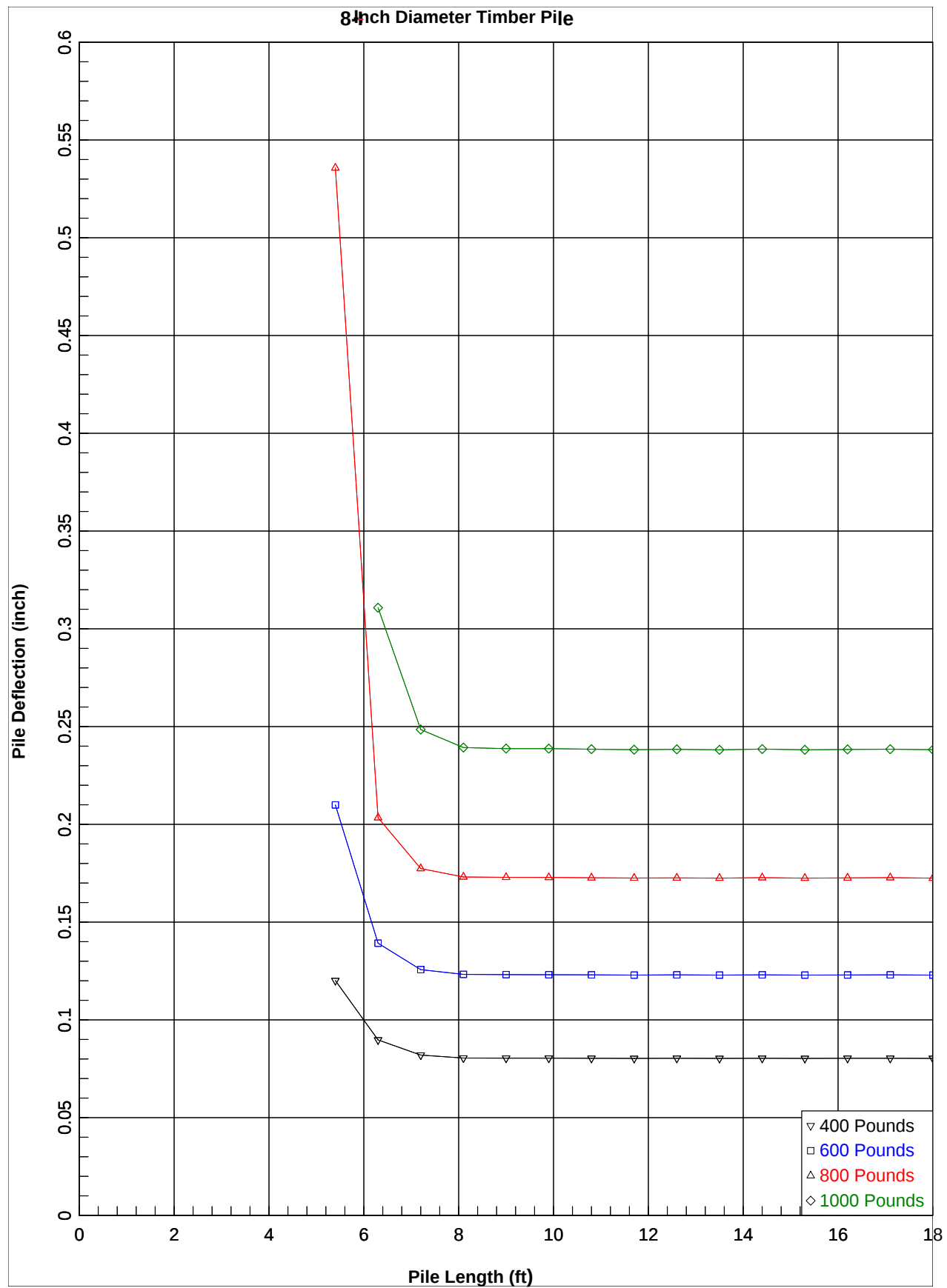
Test Pile Length (ft)	Pile Width (in)	Ultimate Side Friction (tons)	Mobilized End Bearing (tons)	Estimated Davisson Capacity (tons)	Allowable Pile Capacity (tons)	Ultimate Pile Capacity (tons)
15.00	12.0	10.27	6.92	17.20	8.60	31.04
16.00	12.0	10.90	8.99	19.89	9.95	37.88
17.00	12.0	11.57	9.16	20.74	10.37	39.07
18.00	12.0	12.16	9.53	21.69	10.85	40.76
19.00	12.0	13.44	11.78	25.22	12.61	48.78
20.00	12.0	14.42	11.91	26.33	13.17	50.15
21.00	12.0	15.32	12.21	27.53	13.76	51.94
22.00	12.0	16.14	12.79	28.93	14.47	54.52
23.00	12.0	16.96	13.70	30.66	15.33	58.07
24.00	12.0	17.85	14.77	32.62	16.31	62.16
25.00	12.0	18.89	15.82	34.71	17.36	66.36
26.00	12.0	20.22	16.18	36.40	18.20	68.75
27.00	12.0	21.95	15.27	37.23	18.61	67.78
28.00	12.0	23.74	13.73	37.47	18.73	64.92
29.00	12.0	25.16	11.89	37.04	18.52	60.82
30.00	12.0	27.76	5.03	32.78	16.39	42.84

NOTES

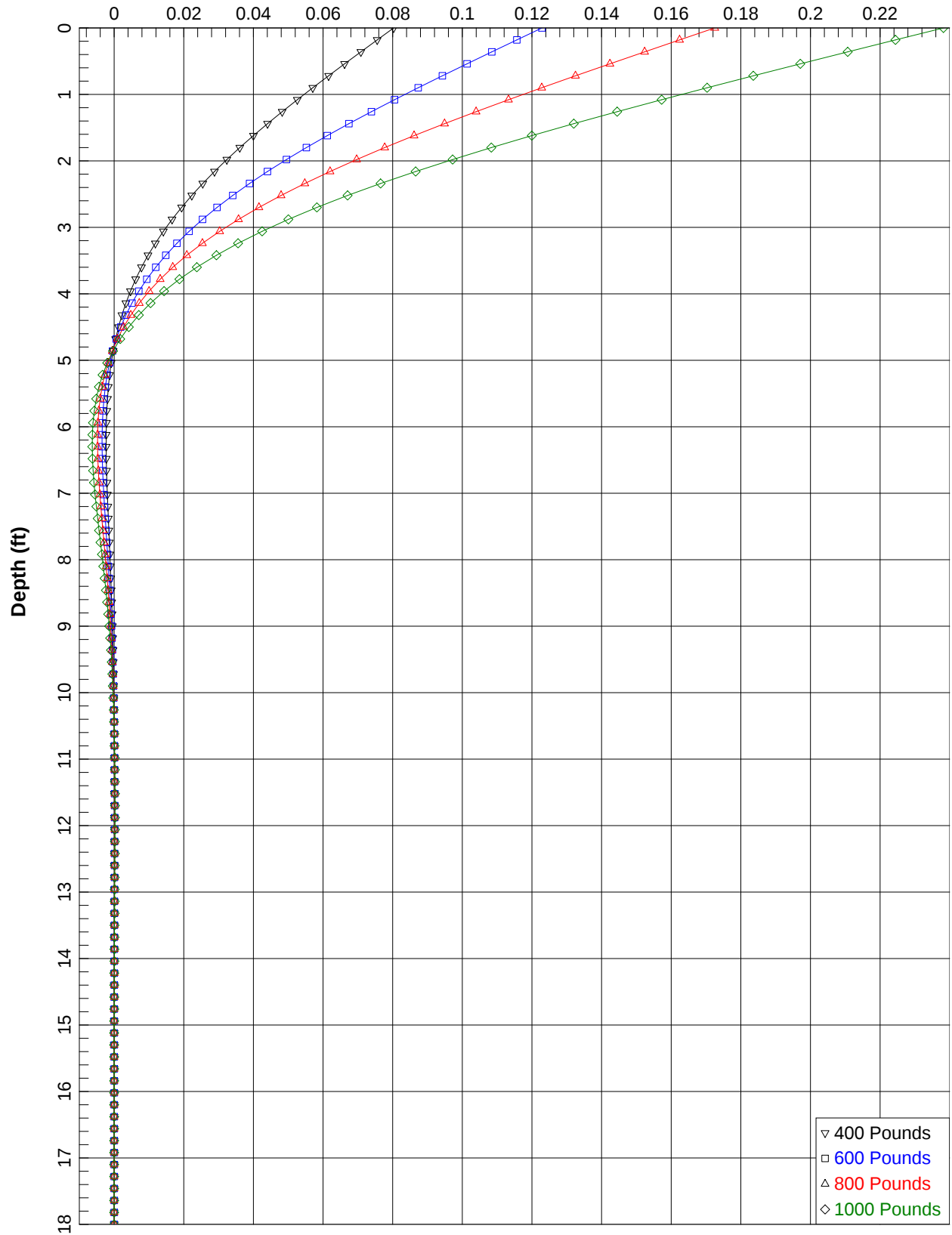
1. MOBILIZED END BEARING IS 1/3 OF THE ORIGINAL RB-121 VALUES.
2. DAVISSON PILE CAPACITY IS AN ESTIMATE BASED ON FAILURE CRITERIA, AND EQUALS ULTIMATE SIDE FRICTION PLUS MOBILIZED END BEARING.
3. ALLOWABLE PILE CAPACITY IS 1/2 THE DAVISSON PILE CAPACITY.
4. ULTIMATE PILE CAPACITY IS ULTIMATE SIDE FRICTION PLUS 3 x THE MOBILIZED END BEARING.
 EXCEPTION: FOR H-PILES TIPPED IN SAND OR LIMESTONE, THE ULTIMATE PILE CAPACITY IS ULTIMATE SIDE FRICTION PLUS 2 x THE MOBILIZED END BEARING.

LATERAL PILE CAPACITY ANALYSES

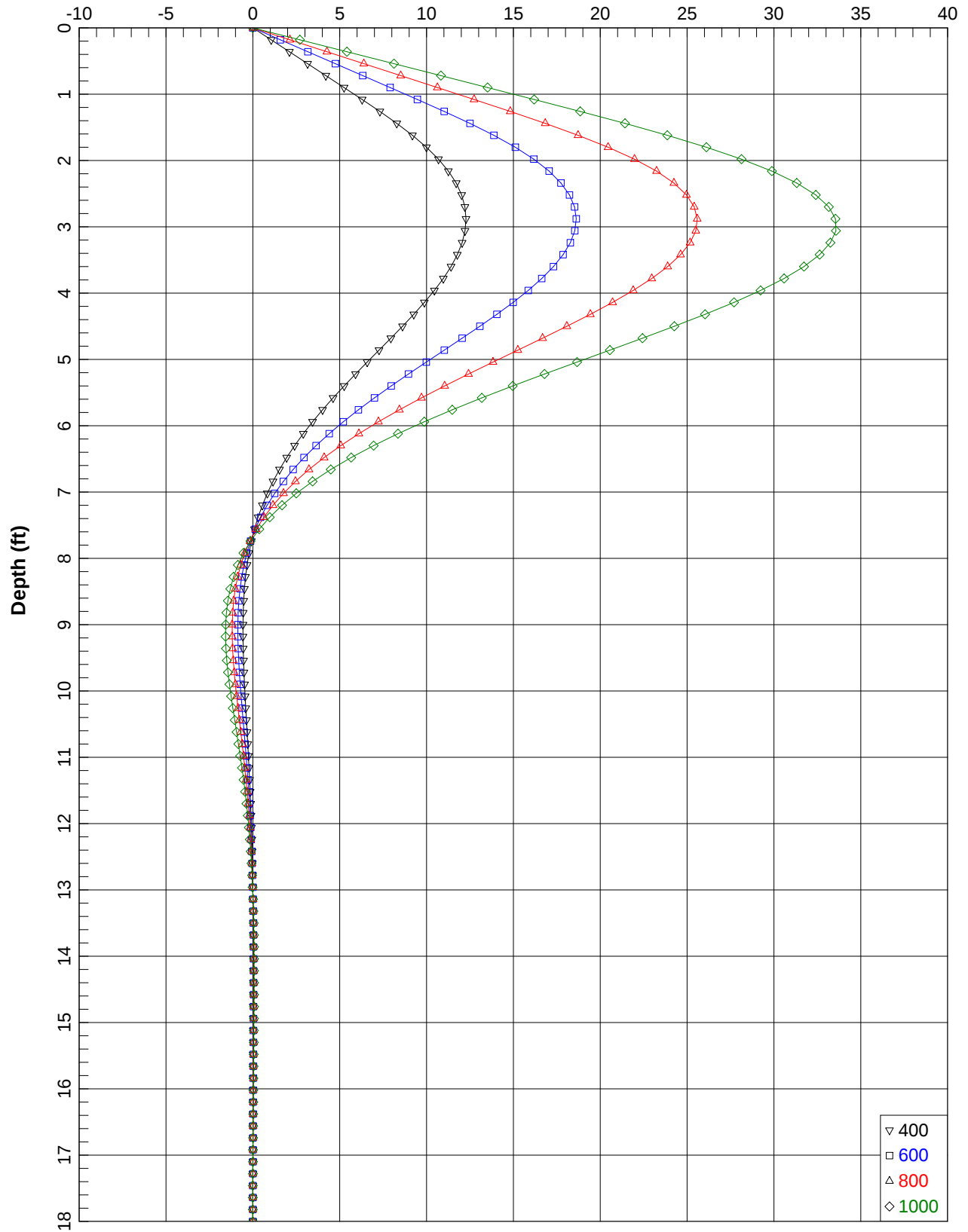
8-Inch Diameter Timber Pile

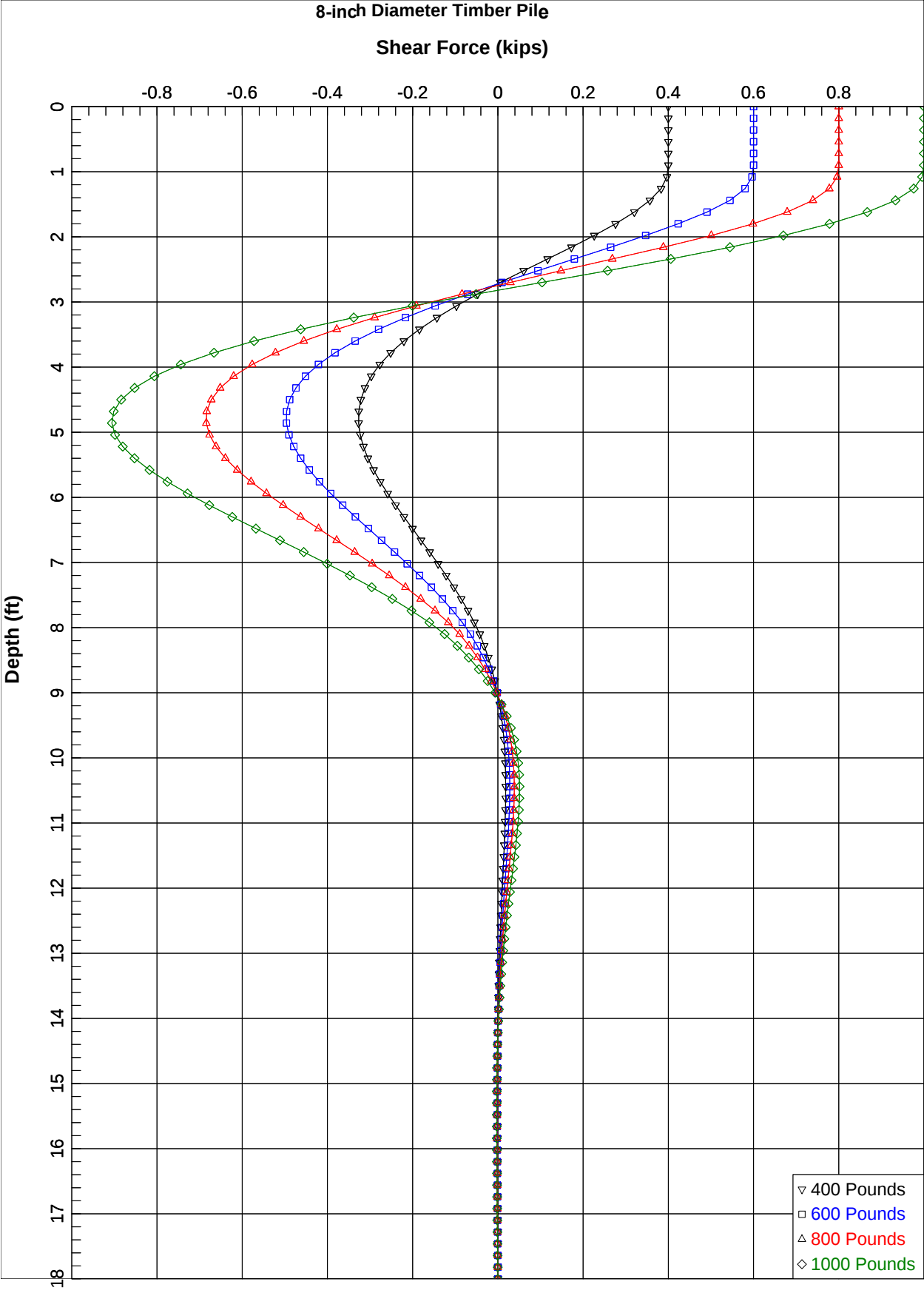


8-Inch Diameter Timber Pile
Lateral Deflection (inches)



8-Inch Diameter Timber Pile
Bending Moment (in-kips)





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LPIle Plus for Windows, Version 2012-06.037

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

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This copy of LPIle is licensed to:

Don Stites, PE
Odessa, FL

Serial Number of Security Device: 160773735
Company Name Stored in Security Device: Don Stites

Files Used for Analysis

Path to file locations: C:\Documents\! Gulf Coast Engineering\2020 Projects\26059 Fire
Station No. 46 Timber Piles\
Name of input data file: New LPIle (USCS units).lp6d
Name of output report file: New LPIle (USCS units).lp6o
Name of plot output file: New LPIle (USCS units).lp6p
Name of runtime message file: New LPIle (USCS units).lp6r

Date and Time of Analysis

Date: September 20, 2020 Time: 21:14:11

Problem Title

Fire Station No. 46
26059

DRS
Timber Piles 8-inch Diameter

Program Options

Engineering units are US Customary Units: pounds, inches, feet

Basic Program Options:

This analysis computes pile response to lateral loading and will compute nonlinear moment-curvature and nominal moment capacity for section types with nonlinear properties.

Computation Options:

- Analysis does not use p-y multipliers (individual pile or shaft only)
- Analysis assumes no shear resistance at pile tip
- Analysis for fixed-length pile or shaft only
- No computation of foundation stiffness matrix values
- Report pile response for full length of pile
- Analysis assumes no loading by soil movements acting on pile
- No p-y curves to be computed and reported for user-specified depths

Solution Control Parameters:

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

Pile Response Output Options:

- 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

Pile Structural Properties and Geometry

- Total number of pile sections = 1
- Total length of pile = 18.00 ft
- Depth of ground surface below top of pile = 1.00 ft

Pile diameter values 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.

Point	Depth X ft	Pile Diameter in
-----	-----	-----
1	0.00000	8.0000000
2	18.000000	8.0000000

Input Structural Properties:

Pile Section No. 1:

Section Type	=	Drilled Shaft (Bored Pile)
Section Length	=	18.00000000 ft
Section Diameter	=	8.00000000 in

Ground Slope and Pile Batter Angles

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

Soil and Rock Layering Information

The soil profile is modelled using 7 layers

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

Distance from top of pile to top of layer	=	1.00000 ft
Distance from top of pile to bottom of layer	=	8.00000 ft
Effective unit weight at top of layer	=	118.00000 pcf
Effective unit weight at bottom of layer	=	118.00000 pcf
Friction angle at top of layer	=	34.00000 deg.
Friction angle at bottom of layer	=	34.00000 deg.
Subgrade k at top of layer	=	0.0000 pci
Subgrade k at bottom of layer	=	0.0000 pci

NOTE: Internal default values for subgrade k will be computed for the above soil layer.

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

Distance from top of pile to top of layer	=	8.00000	ft
Distance from top of pile to bottom of layer	=	15.00000	ft
Effective unit weight at top of layer	=	118.00000	pcf
Effective unit weight at bottom of layer	=	118.00000	pcf
Friction angle at top of layer	=	33.00000	deg.
Friction angle at bottom of layer	=	33.00000	deg.
Subgrade k at top of layer	=	0.0000	pci
Subgrade k at bottom of layer	=	0.0000	pci

NOTE: Internal default values for subgrade k will be computed for the above soil layer.

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

Distance from top of pile to top of layer	=	15.00000	ft
Distance from top of pile to bottom of layer	=	17.00000	ft
Effective unit weight at top of layer	=	115.00000	pcf
Effective unit weight at bottom of layer	=	115.00000	pcf
Friction angle at top of layer	=	30.00000	deg.
Friction angle at bottom of layer	=	30.00000	deg.
Subgrade k at top of layer	=	0.0000	pci
Subgrade k at bottom of layer	=	0.0000	pci

NOTE: Internal default values for subgrade k will be computed for the above soil layer.

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

Distance from top of pile to top of layer	=	17.00000	ft
Distance from top of pile to bottom of layer	=	30.00000	ft
Effective unit weight at top of layer	=	118.00000	pcf
Effective unit weight at bottom of layer	=	118.00000	pcf
Friction angle at top of layer	=	33.00000	deg.
Friction angle at bottom of layer	=	33.00000	deg.
Subgrade k at top of layer	=	0.0000	pci
Subgrade k at bottom of layer	=	0.0000	pci

NOTE: Internal default values for subgrade k will be computed for the above soil layer.

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

Distance from top of pile to top of layer	=	30.00000	ft
Distance from top of pile to bottom of layer	=	35.00000	ft
Effective unit weight at top of layer	=	115.00000	pcf
Effective unit weight at bottom of layer	=	115.00000	pcf
Friction angle at top of layer	=	32.00000	deg.
Friction angle at bottom of layer	=	32.00000	deg.
Subgrade k at top of layer	=	0.0000	pci
Subgrade k at bottom of layer	=	0.0000	pci

NOTE: Internal default values for subgrade k will be computed for the above soil layer.

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

Distance from top of pile to top of layer	=	35.00000	ft
Distance from top of pile to bottom of layer	=	40.00000	ft
Effective unit weight at top of layer	=	110.00000	pcf
Effective unit weight at bottom of layer	=	110.00000	pcf
Friction angle at top of layer	=	28.00000	deg.
Friction angle at bottom of layer	=	28.00000	deg.
Subgrade k at top of layer	=	0.0000	pci
Subgrade k at bottom of layer	=	0.0000	pci

NOTE: Internal default values for subgrade k will be computed for the above soil layer.

Layer 7 is weak rock, p-y criteria by Reese, 1997

Distance from top of pile to top of layer	=	40.00000	ft
Distance from top of pile to bottom of layer	=	53.00000	ft
Effective unit weight at top of layer	=	130.00000	pcf
Effective unit weight at bottom of layer	=	130.00000	pcf
Uniaxial compressive strength at top of layer	=	500.00000	psi
Uniaxial compressive strength at bottom of layer	=	500.00000	psi
Initial modulus of rock at top of layer	=	100.00000	psi
Initial modulus of rock at bottom of layer	=	100.00000	psi
RQD of rock at top of layer	=	10.00000	%
RQD of rock at bottom of layer	=	0.0000	%
k _{rm} of rock at top of layer	=	0.00500	
k _{rm} of rock at bottom of layer	=	0.00500	

(Depth of lowest soil layer extends 35.00 ft below pile tip)

Summary of Soil Properties

Layer Num.	Layer Soil Type (p-y Curve Criteria)	Layer Depth ft	Effective Unit Wt. pcf	Angle of Friction deg.	Uniaxial qu psi	RQD % or GSI	kpy pci	Rock Mass Rock Emass psi	krm
1	Sand (Reese, et al.)	1.000	118.000	34.000	--	--	default	--	--
		8.000	118.000	34.000	--	--	default	--	--
2	Sand (Reese, et al.)	8.000	118.000	33.000	--	--	default	--	--
		15.000	118.000	33.000	--	--	default	--	--
3	Sand (Reese, et al.)	15.000	115.000	30.000	--	--	default	--	--
		17.000	115.000	30.000	--	--	default	--	--
4	Sand (Reese, et al.)	17.000	118.000	33.000	--	--	default	--	--
		30.000	118.000	33.000	--	--	default	--	--
5	Sand (Reese, et al.)	30.000	115.000	32.000	--	--	default	--	--
		35.000	115.000	32.000	--	--	default	--	--
6	Sand (Reese, et al.)	35.000	110.000	28.000	--	--	default	--	--
		40.000	110.000	28.000	--	--	default	--	--
7	Weak Rock	40.000	130.000	--	500.000	10.000	--	100.000	0.00500
		53.000	130.000	--	500.000	0.00	--	100.000	0.00500

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 = 4

Load No.	Load Type	Condition 1	Condition 2	Axial Thrust Force, lbs	Compute Top y vs. Pile Length
1	1	V = 400.00000 lbs	M = 0.0000 in-lbs	40000.	Yes
2	1	V = 600.00000 lbs	M = 0.0000 in-lbs	40000.	Yes
3	1	V = 800.00000 lbs	M = 0.0000 in-lbs	40000.	Yes
4	1	V = 1000.00000 lbs	M = 0.0000 in-lbs	40000.	Yes

V = perpendicular shear force applied to pile head

M = bending moment applied to pile head

y = lateral deflection relative to pile axis

S = pile slope relative to original pile batter angle

R = rotational stiffness applie to pile head

Axial thrust 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	=	18.00000000 ft
Shaft Diameter	=	8.00000000 in
Concrete Cover Thickness	=	3.00000000 in
Number of Reinforcing Bars	=	1 bar
Yield Stress of Reinforcing Bars	=	1.50000000 ksi
Modulus of Elasticity of Reinforcing Bars	=	1500.00000000 ksi
Gross Area of Shaft	=	50.26548246 sq. in.
Total Area of Reinforcing Steel	=	0.31000000 sq. in.
Area Ratio of Steel Reinforcement	=	0.62 percent
Edge-to-Edge Bar Spacing	=	-0.62500000 in
Maximum Concrete Aggregate Size	=	0.10000000 in
Ratio of Bar Spacing to Aggregate Size	=	-6.25
Offset of Rebar Cage Center from Center of Pile	=	0.00000000 in

Axial Structural Capacities:

Nom. Axial Structural Capacity = $0.85 F_c A_c + F_y A_s$	=	51.420 kips
Tensile Load for Cracking of Concrete	=	-11.759 kips
Nominal Axial Tensile Capacity	=	-0.465 kips

Reinforcing Bar Dimensions and Positions Used in Computations:

Bar Number	Bar Diam. inches	Bar Area sq. in.	X inches	Y inches
-----	-----	-----	-----	-----
1	0.62500	0.31000	0.00000	0.00000

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

Concrete Properties:

Compressive Strength of Concrete	=	1.20000000 ksi
Modulus of Elasticity of Concrete	=	1974.53792063 ksi
Modulus of Rupture of Concrete	=	-0.25980762 ksi
Compression Strain at Peak Stress	=	0.00103315
Tensile Strain at Fracture of Concrete	=	-0.00011866
Maximum Coarse Aggregate Size	=	0.10000000 in

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

Number	Axial Thrust Force kips
-----	-----
1	40.000

Definitions of Run Messages and Notes:

- C = concrete in section has cracked in tension.
- Y = stress in reinforcing steel has reached yield stress.
- T = ACI 318-08 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 318-08, Section 10.3.4.
- Z = depth of tensile zone in concrete section is less than 10 percent of section depth.

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

Axial Thrust Force = 40.000 kips

Bending Curvature rad/in.	Bending Moment in-kip	Bending Stiffness kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in	Max Concrete Stress ksi	Max Steel Stress ksi	Run Msg
0.000001250	0.3385836	270867.	351.3523200	0.0004392	0.0004292	0.8033172	0.6587106	
0.000002500	0.6770789	270832.	177.6824176	0.0004442	0.0004242	0.8099216	0.6661591	
0.000003750	1.0155388	270810.	119.7952312	0.0004492	0.0004192	0.8164843	0.6736232	
0.000005000	1.3539456	270789.	90.8537242	0.0004543	0.0004143	0.8230049	0.6811029	
0.000006250	1.6922817	270765.	73.4904892	0.0004593	0.0004093	0.8294830	0.6885983	
0.000007500	2.0305294	270737.	61.9163905	0.0004644	0.0004044	0.8359183	0.6961094	
0.000008750	2.3686709	270705.	53.6503700	0.0004694	0.0003994	0.8423105	0.7036361	
0.0000100	2.7066886	270669.	47.4518988	0.0004745	0.0003945	0.8486592	0.7111785	
0.0000113	3.0445647	270628.	42.6317942	0.0004796	0.0003896	0.8549641	0.7187365	
0.0000125	3.3822814	270583.	38.7765465	0.0004847	0.0003847	0.8612248	0.7263102	
0.0000138	3.7198212	270532.	35.6230133	0.0004898	0.0003798	0.8674410	0.7338997	
0.0000150	4.0571661	270478.	32.9957663	0.0004949	0.0003749	0.8736122	0.7415047	
0.0000163	4.3942984	270418.	30.7733554	0.0005001	0.0003701	0.8797383	0.7491255	
0.0000175	4.7312002	270354.	28.8690302	0.0005052	0.0003652	0.8858187	0.7567620	
0.0000188	5.0678539	270286.	27.2191741	0.0005104	0.0003604	0.8918532	0.7644143	
0.0000200	5.4042415	270212.	25.7760744	0.0005155	0.0003555	0.8978415	0.7720822	
0.0000213	5.7403451	270134.	24.5032452	0.0005207	0.0003507	0.9037831	0.7797659	
0.0000225	6.0761470	270051.	23.3723085	0.0005259	0.0003459	0.9096776	0.7874654	
0.0000238	6.4116290	269963.	22.3608605	0.0005311	0.0003411	0.9155249	0.7951807	
0.0000250	6.7467734	269871.	21.4509784	0.0005363	0.0003363	0.9213244	0.8029117	
0.0000263	7.0815622	269774.	20.6281531	0.0005415	0.0003315	0.9270759	0.8106585	
0.0000275	7.4159773	269672.	19.8805137	0.0005467	0.0003267	0.9327790	0.8184212	
0.0000288	7.7500006	269565.	19.1982538	0.0005519	0.0003219	0.9384333	0.8261997	
0.0000300	8.0836142	269454.	18.5732013	0.0005572	0.0003172	0.9440385	0.8339941	
0.0000313	8.4167999	269338.	17.9984917	0.0005625	0.0003125	0.9495942	0.8418043	
0.0000325	8.7495396	269217.	17.4683167	0.0005677	0.0003077	0.9551001	0.8496304	
0.0000338	9.0818150	269091.	16.9777284	0.0005730	0.0003030	0.9605558	0.8574725	
0.0000350	9.4136080	268960.	16.5224858	0.0005783	0.0002983	0.9659610	0.8653305	
0.0000363	9.7449003	268825.	16.0989329	0.0005836	0.0002936	0.9713152	0.8732045	
0.0000375	10.0756735	268685.	15.7039011	0.0005889	0.0002889	0.9766181	0.8810944	
0.0000388	10.4059093	268540.	15.3346307	0.0005942	0.0002842	0.9818695	0.8890004	
0.0000400	10.7355894	268390.	14.9887071	0.0005995	0.0002795	0.9870688	0.8969224	
0.0000413	11.0646951	268235.	14.6640082	0.0006049	0.0002749	0.9922158	0.9048605	
0.0000425	11.3932080	268075.	14.3586617	0.0006102	0.0002702	0.9973100	0.9128147	
0.0000438	11.7211096	267911.	14.0710093	0.0006156	0.0002656	1.0023512	0.9207850	
0.0000450	12.0483812	267742.	13.7995769	0.0006210	0.0002610	1.0073388	0.9287714	
0.0000463	12.3750042	267568.	13.5430497	0.0006264	0.0002564	1.0122727	0.9367741	
0.0000475	12.7009597	267389.	13.3002516	0.0006318	0.0002518	1.0171524	0.9447929	
0.0000488	13.0262290	267205.	13.0701268	0.0006372	0.0002472	1.0219775	0.9528280	
0.0000513	13.6746335	266822.	12.6441899	0.0006480	0.0002380	1.0314625	0.9689471	
0.0000538	14.3200659	266420.	12.2586861	0.0006589	0.0002289	1.0407248	0.9851316	
0.0000563	14.9623734	265998.	11.9082280	0.0006698	0.0002198	1.0497613	1.0013817	
0.0000588	15.6014019	265556.	11.5883451	0.0006808	0.0002108	1.0585690	1.0176979	
0.0000613	16.2369962	265094.	11.2952971	0.0006918	0.0002018	1.0671449	1.0340804	
0.0000638	16.8689998	264612.	11.0259305	0.0007029	0.0001929	1.0754859	1.0505296	
0.0000663	17.4972545	264110.	10.7775682	0.0007140	0.0001840	1.0835888	1.0670458	
0.0000688	18.1216011	263587.	10.5479223	0.0007252	0.0001752	1.0914505	1.0836295	
0.0000713	18.7418785	263044.	10.3350265	0.0007364	0.0001664	1.0990678	1.1002810	
0.0000738	19.3579241	262480.	10.1371812	0.0007476	0.0001576	1.1064376	1.1170007	
0.0000763	19.9695736	261896.	9.9529098	0.0007589	0.0001489	1.1135566	1.1337891	
0.0000788	20.5766609	261291.	9.7809235	0.0007702	0.0001402	1.1204214	1.1506466	
0.0000813	21.1790180	260665.	9.6200921	0.0007816	0.0001316	1.1270289	1.1675737	
0.0000838	21.7764750	260018.	9.4694206	0.0007931	0.0001231	1.1333757	1.1845710	
0.0000863	22.3688597	259349.	9.3280297	0.0008045	0.0001145	1.1394583	1.2016389	
0.0000888	22.9559980	258659.	9.1951392	0.0008161	0.0001061	1.1452734	1.2187779	
0.0000913	23.5377135	257948.	9.0700545	0.0008276	0.0000976	1.1508174	1.2359887	Y
0.0000938	24.1138271	257214.	8.9521553	0.0008393	0.0000893	1.1560868	1.2532719	Y
0.0000963	24.6841575	256459.	8.8408860	0.0008509	0.0000809	1.1610781	1.2706279	Y
0.0000988	25.2485208	255681.	8.7357475	0.0008627	0.0000727	1.1657876	1.2880576	Y
0.0001013	25.8067300	254881.	8.6362900	0.0008744	0.0000644	1.1702116	1.3055616	Y
0.0001038	26.3585957	254059.	8.5421072	0.0008862	0.0000562	1.1743464	1.3231405	Y
0.0001063	26.9039251	253213.	8.4528315	0.0008981	0.0000481	1.1781883	1.3407950	Y
0.0001088	27.4425223	252345.	8.3681289	0.0009100	0.0000400	1.1817332	1.3585260	Y
0.0001113	27.9741883	251453.	8.2876960	0.0009220	0.0000320	1.1849774	1.3763343	Y

0.0001138	28.4987204	250538.	8.2112560	0.0009340	0.0000240	1.1879168	1.3942206	Y
0.0001163	29.0159123	249599.	8.1385562	0.0009461	0.0000161	1.1905474	1.4121857	Y
0.0001188	29.5255540	248636.	8.0693653	0.0009582	0.000008237	1.1928649	1.4302307	Y
0.0001213	30.0274312	247649.	8.0034714	0.0009704	0.000000421	1.1948653	1.4483564	Y
0.0001238	30.5213224	246637.	7.9406796	0.0009827	-0.000007341	1.1965441	1.4665637	Y
0.0001263	31.0069570	245600.	7.8808091	0.0009950	-0.0000150	1.1978970	1.4848532	Y
0.0001288	31.4840404	244536.	7.8236919	0.0010073	-0.0000227	1.1989194	1.5000000	Y
0.0001313	31.9522692	243446.	7.7691731	0.0010197	-0.0000303	1.1996069	1.5000000	Y
0.0001338	32.4113217	242328.	7.7171086	0.0010322	-0.0000378	1.1999548	1.5000000	Y
0.0001363	32.8607346	241180.	7.6673690	0.0010447	-0.0000453	1.1999738	1.5000000	Y
0.0001388	33.2999866	240000.	7.6198370	0.0010573	-0.0000527	1.1999850	1.5000000	Y
0.0001413	33.7288056	238788.	7.5743961	0.0010699	-0.0000601	1.1999911	1.5000000	Y
0.0001438	34.1471386	237545.	7.5309362	0.0010826	-0.0000674	1.1999939	1.5000000	Y
0.0001463	34.5549815	236273.	7.4893508	0.0010953	-0.0000747	1.1999946	1.5000000	Y
0.0001488	34.9524372	234974.	7.4495414	0.0011081	-0.0000819	1.1999936	1.5000000	Y
0.0001588	36.4412666	229551.	7.3062658	0.0011599	-0.0001101	1.1999505	1.5000000	Y
0.0001688	36.8989247	218660.	7.1453080	0.0012058	-0.0001442	1.1998957	1.5000000	CY
0.0001788	37.7653633	211275.	7.0257893	0.0012559	-0.0001741	1.1999313	1.5000000	CY
0.0001888	38.4971705	203959.	6.9199769	0.0013061	-0.0002039	1.1999546	1.5000000	CY
0.0001988	39.1080290	196770.	6.8252150	0.0013565	-0.0002335	1.1999924	1.5000000	CY
0.0002088	39.6231460	189811.	6.7402684	0.0014070	-0.0002630	1.1999961	1.5000000	CY
0.0002188	40.0569984	183118.	6.6637470	0.0014577	-0.0002923	1.1999801	1.5000000	CY
0.0002288	40.4224929	176710.	6.5945655	0.0015085	-0.0003215	1.1998965	1.5000000	CY
0.0002388	40.7265464	170582.	6.5315127	0.0015594	-0.0003506	1.1999352	1.5000000	CY
0.0002488	40.9785441	164738.	6.4739369	0.0016104	-0.0003796	1.1998918	1.5000000	CY
0.0002588	41.1902447	159189.	6.4214923	0.0016616	-0.0004084	1.1999903	1.5000000	CY
0.0002688	41.3635285	153911.	6.3733712	0.0017128	-0.0004372	1.1998412	1.5000000	CY
0.0002788	41.5017963	148885.	6.3289241	0.0017642	-0.0004658	1.1997116	1.5000000	CY
0.0002888	41.6152771	144122.	6.2883198	0.0018158	-0.0004942	1.1997685	1.5000000	CY
0.0002988	41.6992079	139579.	6.2503749	0.0018673	-0.0005227	1.1997700	1.5000000	CY
0.0003088	41.7643399	135269.	6.2156006	0.0019191	-0.0005509	1.1997251	1.5000000	CY
0.0003188	41.8086963	131165.	6.1832267	0.0019709	-0.0005791	1.1996153	1.5000000	CY
0.0003288	41.8345242	127253.	6.1530329	0.0020228	-0.0006072	1.1997784	1.5000000	CY
0.0003388	41.8488862	123539.	6.1254342	0.0020750	-0.0006350	1.1999974	1.5000000	CY
0.0003488	41.8488862	119997.	6.0991755	0.0021271	-0.0006629	1.1999260	1.5000000	CY
0.0003588	41.8488862	116652.	6.0748155	0.0021793	-0.0006907	1.1997063	1.5000000	CY
0.0003688	41.8488862	113489.	6.0524175	0.0022318	-0.0007182	1.1997446	1.5000000	CY
0.0003788	41.8488862	110492.	6.0313568	0.0022844	-0.0007456	1.1999564	1.5000000	CY
0.0003888	41.8488862	107650.	6.0112949	0.0023369	-0.0007731	1.1996353	1.5000000	CY
0.0003988	41.8488862	104950.	5.9927500	0.0023896	-0.0008004	1.1999541	1.5000000	CY
0.0004088	41.8488862	102383.	5.9756486	0.0024425	-0.0008275	1.1998083	1.5000000	CY
0.0004188	41.8488862	99938.	5.9598078	0.0024957	-0.0008543	1.1996574	1.5000000	CY
0.0004288	41.8488862	97607.	5.9442137	0.0025486	-0.0008814	1.1998659	1.5000000	CY
0.0004388	41.8488862	95382.	5.9297481	0.0026017	-0.0009083	1.1995723	1.5000000	CY
0.0004488	41.8488862	93257.	5.9163348	0.0026550	-0.0009350	1.1998475	1.5000000	CY
0.0004588	41.8488862	91224.	5.9038877	0.0027084	-0.0009616	1.1996483	1.5000000	CY
0.0004688	41.8488862	89278.	5.8923977	0.0027621	-0.0009879	1.1997524	1.5000000	CY
0.0004788	41.8488862	87413.	5.8817135	0.0028159	-0.0010141	1.1998850	1.5000000	CY
0.0004888	41.8488862	85624.	5.8712827	0.0028696	-0.0010404	1.1995130	1.5000000	CY
0.0004988	41.8488862	83908.	5.8614567	0.0029234	-0.0010666	1.1999719	1.5000000	CY
0.0005088	41.8488862	82258.	5.8523823	0.0029774	-0.0010926	1.1992846	1.5000000	CY
0.0005188	41.8488862	80673.	5.8440428	0.0030316	-0.0011184	1.1997699	1.5000000	CY
0.0005288	41.8488862	79147.	5.8362949	0.0030859	-0.0011441	1.1999195	1.5000000	CY
0.0005388	41.8488862	77678.	5.8292161	0.0031405	-0.0011695	1.1992334	1.5000000	CY
0.0005488	41.8488862	76262.	5.8227119	0.0031952	-0.0011948	1.1998642	1.5000000	CY
0.0006088	41.8488862	68746.	5.7934459	0.0035268	-0.0013432	1.1997655	1.5000000	CY
0.0006688	41.8488862	62578.	5.7885227	0.0038711	-0.0014789	1.1993346	1.5000000	CY

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

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

Load No.	Axial Thrust kips	Nominal Mom. Cap. in-kip	Max. Comp. Strain
-----	-----	-----	-----
1	40.000	41.849	0.00300000

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

In ACI 318-08, the value of the strength reduction factor depends on whether
the transverse reinforcing steel bars are tied hoops (0.65) or spirals (0.70).

The above values should be multiplied by the appropriate strength reduction
factor to compute ultimate moment capacity according to ACI 318-08, Section
9.3.2.2 or the value required by the design standard being followed.

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

Axial Load No.	Resistance Factor for Moment	Nominal Moment Capacity in-kip	Ultimate (Factored) Axial Thrust kips	Ultimate (Factored) Moment Capacity in-kip	Bending Stiffness at Ult. Mom. Cap. kip-in ²
-----	-----	-----	-----	-----	-----
1	0.65	41.849	26.000	27.202	252733.190
1	0.70	41.849	28.000	29.294	249073.365
1	0.75	41.849	30.000	31.387	244753.287

 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 = 400.000 lbs
 Applied moment at pile head = 0.000 in-lbs
 Axial thrust load on pile head = 40000.000 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. p lb/in	Soil Spr. Es*h lb/inch	Distrib. Lat. Load lb/inch
0.00	0.0803	-8.057E-09	400.0000	-0.002184	0.000	2.709E+08	0.000	0.000	0.000
0.180	0.0756	1052.6866	400.0000	-0.002180	0.000	2.709E+08	0.000	0.000	0.000
0.360	0.0709	2104.6478	400.0000	-0.002167	0.000	2.707E+08	0.000	0.000	0.000
0.540	0.0662	3155.1583	400.0000	-0.002146	0.000	2.706E+08	0.000	0.000	0.000
0.720	0.0616	4203.4929	400.0000	-0.002117	0.000	2.705E+08	0.000	0.000	0.000
0.900	0.0570	5248.9268	400.0000	-0.002079	0.000	2.702E+08	0.000	0.000	0.000
1.080	0.0526	6290.7360	396.7212	-0.002033	0.000	2.700E+08	-3.0359	124.6597	0.000
1.260	0.0483	7314.0324	383.0929	-0.001978	0.000	2.697E+08	-9.5829	428.8348	0.000
1.440	0.0441	8287.5580	356.7565	-0.001916	0.000	2.694E+08	-14.8027	725.7205	0.000
1.620	0.0400	9186.2788	320.3219	-0.001846	0.000	2.690E+08	-18.9331	1022.6062	0.000
1.800	0.0361	9990.2933	276.0677	-0.001769	0.000	2.687E+08	-22.0430	1319.4918	0.000
1.980	0.0324	10685.	226.1158	-0.001686	0.000	2.684E+08	-24.2087	1616.3775	0.000
2.160	0.0288	11258.	172.4170	-0.001597	0.000	2.681E+08	-25.5125	1913.2632	0.000
2.340	0.0255	11705.	116.7388	-0.001505	0.000	2.679E+08	-26.0414	2210.1488	0.000
2.520	0.0223	12023.	60.6578	-0.001409	0.000	2.678E+08	-25.8854	2507.0345	0.000
2.700	0.0194	12211.	5.5546	-0.001311	0.000	2.677E+08	-25.1360	2803.9201	0.000
2.880	0.0166	12273.	-47.3873	-0.001212	0.000	2.676E+08	-23.8843	3100.8058	0.000
3.060	0.0141	12216.	-97.1796	-0.001114	0.000	2.677E+08	-22.2198	3397.6915	0.000
3.240	0.0118	12046.	-143.0243	-0.001016	0.000	2.677E+08	-20.2290	3694.5771	0.000
3.420	0.009738	11773.	-184.3052	-0.000920	0.000	2.679E+08	-17.9941	3991.4628	0.000
3.600	0.007854	11409.	-220.5783	-0.000826	0.000	2.681E+08	-15.5921	4288.3485	0.000
3.780	0.006168	10963.	-251.5588	-0.000736	0.000	2.683E+08	-13.0936	4585.2341	0.000
3.960	0.004673	10449.	-277.1076	-0.000650	0.000	2.685E+08	-10.5627	4882.1198	0.000
4.140	0.003360	9878.4500	-297.2162	-0.000568	0.000	2.688E+08	-8.0563	5179.0054	0.000
4.320	0.002218	9263.3404	-311.9904	-0.000491	0.000	2.690E+08	-5.6236	5475.8911	0.000
4.500	0.001237	8615.5673	-321.6347	-0.000420	0.000	2.693E+08	-3.3063	5772.7768	0.000
4.680	0.000405	7946.3968	-326.4355	-0.000353	0.000	2.695E+08	-1.1389	6069.6624	0.000
4.860	-0.000289	7266.4100	-326.7456	-0.000292	0.000	2.697E+08	0.8518	6366.5481	0.000
5.040	-0.000858	6585.3694	-322.9686	-0.000237	0.000	2.699E+08	2.6455	6663.4338	0.000
5.220	-0.001312	5912.1182	-315.5445	-0.000187	0.000	2.701E+08	4.2287	6960.3194	0.000
5.400	-0.001665	5254.5112	-304.9363	-0.000142	0.000	2.702E+08	5.5938	7257.2051	0.000
5.580	-0.001927	4619.3739	-291.6174	-0.000103	0.000	2.704E+08	6.7385	7554.0907	0.000
5.760	-0.002109	4012.4874	-276.0610	-6.832E-05	0.000	2.705E+08	7.6656	7850.9764	0.000
5.940	-0.002222	3438.5968	-258.7301	-3.858E-05	0.000	2.706E+08	8.3816	8147.8621	0.000
6.120	-0.002276	2901.4396	-240.0694	-1.327E-05	0.000	2.706E+08	8.8968	8444.7477	0.000
6.300	-0.002279	2403.7908	-220.4984	7.895E-06	0.000	2.707E+08	9.2245	8741.6334	0.000
6.480	-0.002242	1947.5224	-200.4059	2.525E-05	0.000	2.707E+08	9.3797	9038.5191	0.000
6.660	-0.002170	1533.6736	-180.1459	3.914E-05	0.000	2.708E+08	9.3795	9335.4047	0.000
6.840	-0.002072	1162.5287	-160.0348	4.989E-05	0.000	2.708E+08	9.2419	9632.2904	0.000
7.020	-0.001955	833.7016	-140.3495	5.785E-05	0.000	2.708E+08	8.9853	9929.1760	0.000
7.200	-0.001823	546.2219	-121.3267	6.336E-05	0.000	2.708E+08	8.6284	10226.	0.000
7.380	-0.001681	298.6221	-103.1637	6.673E-05	0.000	2.709E+08	8.1892	10523.	0.000
7.560	-0.001534	89.0244	-86.0191	6.827E-05	0.000	2.709E+08	7.6854	10820.	0.000
7.740	-0.001386	-84.7776	-70.0147	6.829E-05	0.000	2.709E+08	7.1334	11117.	0.000
7.920	-0.001239	-225.2395	-55.2384	6.705E-05	0.000	2.709E+08	6.5484	11414.	0.000
8.100	-0.001096	-334.9941	-42.5910	6.482E-05	0.000	2.709E+08	5.1622	10170.	0.000
8.280	-0.000959	-420.4330	-32.0177	6.181E-05	0.000	2.709E+08	4.6278	10421.	0.000
8.460	-0.000829	-483.9905	-22.5944	5.820E-05	0.000	2.708E+08	4.0974	10671.	0.000
8.640	-0.000708	-528.0977	-14.3038	5.416E-05	0.000	2.708E+08	3.5790	10922.	0.000
8.820	-0.000595	-555.1426	-7.1126	4.984E-05	0.000	2.708E+08	3.0795	11172.	0.000
9.000	-0.000492	-567.4373	-0.9739	4.537E-05	0.000	2.708E+08	2.6045	11423.	0.000
9.180	-0.000399	-567.1896	4.1700	4.084E-05	0.000	2.708E+08	2.1584	11673.	0.000
9.360	-0.000316	-556.4809	8.3853	3.636E-05	0.000	2.708E+08	1.7447	11924.	0.000

9.540	-0.000242	-537.2487	11.7445	3.200E-05	0.000	2.708E+08	1.3657	12174.	0.000
9.720	-0.000178	-511.2747	14.3240	2.782E-05	0.000	2.708E+08	1.0228	12425.	0.000
9.900	-0.000122	-480.1765	16.2025	2.387E-05	0.000	2.708E+08	0.7166	12675.	0.000
10.080	-7.470E-05	-445.4042	17.4592	2.018E-05	0.000	2.708E+08	0.4470	12926.	0.000
10.260	-3.496E-05	-408.2393	18.1723	1.677E-05	0.000	2.709E+08	0.2132	13176.	0.000
10.440	-2.245E-06	-369.7982	18.4176	1.367E-05	0.000	2.709E+08	0.0140	13426.	0.000
10.620	2.410E-05	-331.0373	18.2679	1.088E-05	0.000	2.709E+08	-0.1526	13677.	0.000
10.800	4.474E-05	-292.7602	17.7916	8.389E-06	0.000	2.709E+08	-0.2885	13927.	0.000
10.980	6.034E-05	-255.6272	17.0523	6.202E-06	0.000	2.709E+08	-0.3960	14178.	0.000
11.160	7.153E-05	-220.1659	16.1086	4.305E-06	0.000	2.709E+08	-0.4778	14428.	0.000
11.340	7.893E-05	-186.7821	15.0132	2.682E-06	0.000	2.709E+08	-0.5364	14679.	0.000
11.520	8.312E-05	-155.7724	13.8134	1.317E-06	0.000	2.709E+08	-0.5745	14929.	0.000
11.700	8.462E-05	-127.3357	12.5507	1.877E-07	0.000	2.709E+08	-0.5947	15180.	0.000
11.880	8.393E-05	-101.5858	11.2609	-7.250E-07	0.000	2.709E+08	-0.5996	15430.	0.000
12.060	8.149E-05	-78.5633	9.9745	-1.443E-06	0.000	2.709E+08	-0.5916	15681.	0.000
12.240	7.769E-05	-58.2467	8.7167	-1.989E-06	0.000	2.709E+08	-0.5730	15931.	0.000
12.420	7.290E-05	-40.5636	7.5080	-2.383E-06	0.000	2.709E+08	-0.5461	16182.	0.000
12.600	6.740E-05	-25.4005	6.3644	-2.646E-06	0.000	2.709E+08	-0.5128	16432.	0.000
12.780	6.147E-05	-12.6122	5.2979	-2.797E-06	0.000	2.709E+08	-0.4747	16683.	0.000
12.960	5.532E-05	-2.0301	4.3169	-2.856E-06	0.000	2.709E+08	-0.4336	16933.	0.000
13.140	4.913E-05	6.5301	3.4264	-2.838E-06	0.000	2.709E+08	-0.3909	17184.	0.000
13.320	4.306E-05	13.2623	2.6289	-2.759E-06	0.000	2.709E+08	-0.3475	17434.	0.000
13.500	3.721E-05	18.3639	1.9246	-2.633E-06	0.000	2.709E+08	-0.3047	17684.	0.000
13.680	3.168E-05	22.0314	1.3114	-2.472E-06	0.000	2.709E+08	-0.2631	17935.	0.000
13.860	2.653E-05	24.4563	0.7860	-2.286E-06	0.000	2.709E+08	-0.2234	18185.	0.000
14.040	2.181E-05	25.8220	0.3437	-2.086E-06	0.000	2.709E+08	-0.1861	18436.	0.000
14.220	1.752E-05	26.3016	-0.0210	-1.878E-06	0.000	2.709E+08	-0.1516	18686.	0.000
14.400	1.369E-05	26.0558	-0.3144	-1.669E-06	0.000	2.709E+08	-0.1201	18937.	0.000
14.580	1.031E-05	25.2319	-0.5430	-1.465E-06	0.000	2.709E+08	-0.0916	19187.	0.000
14.760	7.365E-06	23.9632	-0.7135	-1.269E-06	0.000	2.709E+08	-0.0663	19438.	0.000
14.940	4.832E-06	22.3688	-0.8326	-1.084E-06	0.000	2.709E+08	-0.0440	19688.	0.000
15.120	2.683E-06	20.5535	-0.8973	-9.128E-07	0.000	2.709E+08	-0.0158	12714.	0.000
15.300	8.883E-07	18.6503	-0.9200	-7.565E-07	0.000	2.709E+08	-0.005288	12859.	0.000
15.480	-5.851E-07	16.7097	-0.9219	-6.155E-07	0.000	2.709E+08	0.003522	13005.	0.000
15.660	-1.771E-06	14.7739	-0.9065	-4.900E-07	0.000	2.709E+08	0.0108	13151.	0.000
15.840	-2.702E-06	12.8783	-0.8769	-3.797E-07	0.000	2.709E+08	0.0166	13296.	0.000
16.020	-3.411E-06	11.0514	-0.8360	-2.843E-07	0.000	2.709E+08	0.0212	13442.	0.000
16.200	-3.930E-06	9.3159	-0.7864	-2.031E-07	0.000	2.709E+08	0.0247	13587.	0.000
16.380	-4.288E-06	7.6893	-0.7302	-1.353E-07	0.000	2.709E+08	0.0273	13733.	0.000
16.560	-4.514E-06	6.1846	-0.6695	-7.996E-08	0.000	2.709E+08	0.0290	13878.	0.000
16.740	-4.634E-06	4.8110	-0.6057	-3.611E-08	0.000	2.709E+08	0.0301	14024.	0.000
16.920	-4.670E-06	3.5745	-0.5401	-2.680E-09	0.000	2.709E+08	0.0306	14170.	0.000
17.100	-4.645E-06	2.4784	-0.4600	2.145E-08	0.000	2.709E+08	0.0435	20223.	0.000
17.280	-4.577E-06	1.5835	-0.3662	3.765E-08	0.000	2.709E+08	0.0434	20474.	0.000
17.460	-4.483E-06	0.8899	-0.2729	4.751E-08	0.000	2.709E+08	0.0430	20724.	0.000
17.640	-4.372E-06	0.3964	-0.1806	5.264E-08	0.000	2.709E+08	0.0425	20975.	0.000
17.820	-4.255E-06	0.1007	-0.0896	5.462E-08	0.000	2.709E+08	0.0418	21225.	0.000
18.000	-4.136E-06	0.0000	0.0000	5.502E-08	0.000	2.709E+08	0.0411	10738.	0.000

* This analysis makes computations of pile response using nonlinear moment-curvature relationships.

The above values of total stress are computed for combined axial and bending stress in elastic

sections and do not equal actual stresses in concrete and steel in the range of nonlinear bending.

Output Summary for Load Case No. 1:

Pile-head deflection = 0.0802728 inches
Computed slope at pile head = -0.0021839 radians
Maximum bending moment = 12273. inch-lbs
Maximum shear force = 400.0000000 lbs
Depth of maximum bending moment = 34.5600000 inches below pile head
Depth of maximum shear force = 2.1600000 inches below pile head
Number of iterations = 6
Number of zero deflection points = 3

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

Boundary Condition Type 1, Shear and Moment

Shear = 400. lbs
Moment = 0. in-lbs
Axial Load = 40000. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
18.0000	0.0802728	12273.	400.0000000
17.1000	0.0803743	12286.	400.0000000
16.2000	0.0803375	12280.	400.0000000
15.3000	0.0802744	12272.	400.0000000
14.4000	0.0803830	12288.	400.0000000
13.5000	0.0802801	12269.	400.0000000
12.6000	0.0803612	12283.	400.0000000
11.7000	0.0802915	12268.	400.0000000
10.8000	0.0803560	12272.	400.0000000
9.9000	0.0804432	12279.	400.0000000
9.0000	0.0804485	12279.	400.0000000
8.1000	0.0805032	12259.	400.0000000
7.2000	0.0819945	12174.	400.0000000
6.3000	0.0897551	11957.	-449.7386515
5.4000	0.1201317	11957.	-595.4081035

 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 = 600.000 lbs
 Applied moment at pile head = 0.000 in-lbs
 Axial thrust load on pile head = 40000.000 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. p lb/in	Soil Spr. Es*h lb/inch	Distrib. Lat. Load lb/inch
0.00	0.1229	-1.289E-08	600.0000	-0.003342	0.000	2.709E+08	0.000	0.000	0.000
0.180	0.1157	1584.7347	600.0000	-0.003336	0.000	2.709E+08	0.000	0.000	0.000
0.360	0.1085	3168.3775	600.0000	-0.003317	0.000	2.706E+08	0.000	0.000	0.000
0.540	0.1013	4749.8353	600.0000	-0.003285	0.000	2.704E+08	0.000	0.000	0.000
0.720	0.0943	6328.0143	600.0000	-0.003241	0.000	2.700E+08	0.000	0.000	0.000
0.900	0.0873	7901.8191	600.0000	-0.003184	0.000	2.695E+08	0.000	0.000	0.000
1.080	0.0805	9470.1523	596.3318	-0.003114	0.000	2.689E+08	-3.3965	91.1021	0.000
1.260	0.0739	11016.	579.8645	-0.003032	0.000	2.683E+08	-11.8511	346.4612	0.000
1.440	0.0674	12499.	544.6015	-0.002937	0.000	2.675E+08	-20.7998	666.2593	0.000
1.620	0.0612	13876.	490.8470	-0.002830	0.000	2.667E+08	-28.9730	1022.6062	0.000
1.800	0.0552	15109.	423.1339	-0.002713	0.000	2.659E+08	-33.7243	1319.4918	0.000
1.980	0.0495	16173.	346.7226	-0.002585	0.000	2.651E+08	-37.0269	1616.3775	0.000
2.160	0.0440	17053.	264.6055	-0.002450	0.000	2.645E+08	-39.0074	1913.2632	0.000
2.340	0.0389	17739.	179.4937	-0.002308	0.000	2.639E+08	-39.7998	2210.1488	0.000
2.520	0.0341	18227.	93.8035	-0.002160	0.000	2.635E+08	-39.5429	2507.0345	0.000
2.700	0.0296	18518.	9.6489	-0.002010	0.000	2.632E+08	-38.3780	2803.9201	0.000
2.880	0.0254	18616.	-71.1608	-0.001857	0.000	2.632E+08	-36.4458	3100.8058	0.000
3.060	0.0215	18531.	-147.1178	-0.001705	0.000	2.632E+08	-33.8847	3397.6915	0.000
3.240	0.0180	18275.	-217.0077	-0.001554	0.000	2.634E+08	-30.8281	3694.5771	0.000
3.420	0.0148	17862.	-279.8967	-0.001406	0.000	2.638E+08	-27.4025	3991.4628	0.000
3.600	0.0120	17309.	-335.1153	-0.001262	0.000	2.643E+08	-23.7259	4288.3485	0.000
3.780	0.009378	16633.	-382.2387	-0.001123	0.000	2.648E+08	-19.9068	4585.2341	0.000
3.960	0.007098	15852.	-421.0643	-0.000991	0.000	2.654E+08	-16.0428	4882.1198	0.000
4.140	0.005097	14985.	-451.5886	-0.000866	0.000	2.660E+08	-12.2204	5179.0054	0.000
4.320	0.003359	14051.	-473.9821	-0.000748	0.000	2.666E+08	-8.5143	5475.8911	0.000
4.500	0.001866	13067.	-488.5640	-0.000638	0.000	2.672E+08	-4.9875	5772.7768	0.000
4.680	0.000602	12050.	-495.7775	-0.000537	0.000	2.677E+08	-1.6917	6069.6624	0.000
4.860	-0.000452	11018.	-496.1651	-0.000444	0.000	2.683E+08	1.3328	6366.5481	0.000
5.040	-0.001315	9983.4493	-490.3453	-0.000359	0.000	2.687E+08	4.0559	6663.4338	0.000
5.220	-0.002004	8961.3339	-478.9909	-0.000283	0.000	2.691E+08	6.4575	6960.3194	0.000
5.400	-0.002538	7963.1327	-462.8080	-0.000215	0.000	2.695E+08	8.5267	7257.2051	0.000
5.580	-0.002934	6999.1990	-442.5179	-0.000155	0.000	2.698E+08	10.2605	7554.0907	0.000
5.760	-0.003209	6078.2951	-418.8404	-0.000103	0.000	2.701E+08	11.6632	7850.9764	0.000
5.940	-0.003379	5207.6063	-392.4792	-5.788E-05	0.000	2.703E+08	12.7453	8147.8621	0.000
6.120	-0.003459	4392.7860	-364.1096	-1.952E-05	0.000	2.704E+08	13.5228	8444.7477	0.000
6.300	-0.003463	3638.0260	-334.3683	1.255E-05	0.000	2.705E+08	14.0155	8741.6334	0.000
6.480	-0.003405	2946.1469	-303.8451	3.882E-05	0.000	2.706E+08	14.2468	9038.5191	0.000
6.660	-0.003295	2318.7062	-273.0766	5.983E-05	0.000	2.707E+08	14.2426	9335.4047	0.000
6.840	-0.003146	1756.1169	-242.5422	7.609E-05	0.000	2.708E+08	14.0301	9632.2904	0.000
7.020	-0.002967	1257.7760	-212.6612	8.811E-05	0.000	2.708E+08	13.6375	9929.1760	0.000
7.200	-0.002766	822.1952	-183.7924	9.640E-05	0.000	2.708E+08	13.0929	10226.	0.000
7.380	-0.002550	447.1343	-156.2340	0.000101	0.000	2.708E+08	12.4241	10523.	0.000
7.560	-0.002327	129.7310	-130.2259	0.000104	0.000	2.709E+08	11.6575	10820.	0.000
7.740	-0.002102	-133.3724	-105.9523	0.000104	0.000	2.709E+08	10.8181	11117.	0.000
7.920	-0.001879	-345.9112	-83.5456	0.000102	0.000	2.709E+08	9.9289	11414.	0.000
8.100	-0.001662	-511.8875	-64.3708	9.842E-05	0.000	2.708E+08	7.8256	10170.	0.000
8.280	-0.001454	-641.0001	-48.3441	9.382E-05	0.000	2.708E+08	7.0140	10421.	0.000
8.460	-0.001257	-736.9465	-34.0637	8.833E-05	0.000	2.708E+08	6.2086	10671.	0.000
8.640	-0.001072	-803.4181	-21.5028	8.218E-05	0.000	2.708E+08	5.4218	10922.	0.000
8.820	-0.000902	-844.0402	-10.6105	7.562E-05	0.000	2.708E+08	4.6637	11172.	0.000
9.000	-0.000746	-862.3217	-1.3153	6.881E-05	0.000	2.708E+08	3.9430	11423.	0.000
9.180	-0.000604	-861.6125	6.4709	6.194E-05	0.000	2.708E+08	3.2664	11673.	0.000
9.360	-0.000478	-845.0701	12.8486	5.513E-05	0.000	2.708E+08	2.6389	11924.	0.000

9.540	-0.000366	-815.6331	17.9280	4.851E-05	0.000	2.708E+08	2.0642	12174.	0.000
9.720	-0.000269	-776.0031	21.8254	4.216E-05	0.000	2.708E+08	1.5444	12425.	0.000
9.900	-0.000184	-728.6326	24.6603	3.616E-05	0.000	2.708E+08	1.0804	12675.	0.000
10.080	-0.000112	-675.7191	26.5529	3.056E-05	0.000	2.708E+08	0.6720	12926.	0.000
10.260	-5.211E-05	-619.2048	27.6219	2.540E-05	0.000	2.708E+08	0.3179	13176.	0.000
10.440	-2.587E-06	-560.7809	27.9825	2.069E-05	0.000	2.708E+08	0.0161	13426.	0.000
10.620	3.727E-05	-501.8956	27.7450	1.645E-05	0.000	2.708E+08	-0.2360	13677.	0.000
10.800	6.849E-05	-443.7656	27.0132	1.268E-05	0.000	2.709E+08	-0.4416	13927.	0.000
10.980	9.206E-05	-387.3901	25.8836	9.367E-06	0.000	2.709E+08	-0.6042	14178.	0.000
11.160	0.000109	-333.5670	24.4450	6.493E-06	0.000	2.709E+08	-0.7278	14428.	0.000
11.340	0.000120	-282.9095	22.7775	4.035E-06	0.000	2.709E+08	-0.8162	14679.	0.000
11.520	0.000126	-235.8653	20.9526	1.966E-06	0.000	2.709E+08	-0.8735	14929.	0.000
11.700	0.000129	-192.7341	19.0331	2.573E-07	0.000	2.709E+08	-0.9038	15180.	0.000
11.880	0.000127	-153.6867	17.0734	-1.124E-06	0.000	2.709E+08	-0.9108	15430.	0.000
12.060	0.000124	-118.7828	15.1196	-2.210E-06	0.000	2.709E+08	-0.8983	15681.	0.000
12.240	0.000118	-87.9883	13.2098	-3.035E-06	0.000	2.709E+08	-0.8699	15931.	0.000
12.420	0.000111	-61.1919	11.3752	-3.630E-06	0.000	2.709E+08	-0.8288	16182.	0.000
12.600	0.000102	-38.2203	9.6398	-4.026E-06	0.000	2.709E+08	-0.7780	16432.	0.000
12.780	9.324E-05	-18.8522	8.0218	-4.253E-06	0.000	2.709E+08	-0.7202	16683.	0.000
12.960	8.389E-05	-2.8311	6.5338	-4.340E-06	0.000	2.709E+08	-0.6577	16933.	0.000
13.140	7.449E-05	10.1236	5.1835	-4.311E-06	0.000	2.709E+08	-0.5926	17184.	0.000
13.320	6.527E-05	20.3064	3.9745	-4.190E-06	0.000	2.709E+08	-0.5268	17434.	0.000
13.500	5.640E-05	28.0173	2.9069	-3.997E-06	0.000	2.709E+08	-0.4617	17684.	0.000
13.680	4.800E-05	33.5547	1.9777	-3.751E-06	0.000	2.709E+08	-0.3986	17935.	0.000
13.860	4.019E-05	37.2093	1.1818	-3.469E-06	0.000	2.709E+08	-0.3384	18185.	0.000
14.040	3.302E-05	39.2597	0.5121	-3.164E-06	0.000	2.709E+08	-0.2818	18436.	0.000
14.220	2.652E-05	39.9682	-0.0401	-2.848E-06	0.000	2.709E+08	-0.2294	18686.	0.000
14.400	2.071E-05	39.5788	-0.4839	-2.531E-06	0.000	2.709E+08	-0.1816	18937.	0.000
14.580	1.558E-05	38.3150	-0.8295	-2.221E-06	0.000	2.709E+08	-0.1384	19187.	0.000
14.760	1.112E-05	36.3789	-1.0871	-1.923E-06	0.000	2.709E+08	-0.1000	19438.	0.000
14.940	7.278E-06	33.9510	-1.2668	-1.642E-06	0.000	2.709E+08	-0.0663	19688.	0.000
15.120	4.022E-06	31.1902	-1.3640	-1.383E-06	0.000	2.709E+08	-0.0237	12714.	0.000
15.300	1.304E-06	28.2974	-1.3980	-1.146E-06	0.000	2.709E+08	-0.007765	12859.	0.000
15.480	-9.264E-07	25.3489	-1.4003	-9.316E-07	0.000	2.709E+08	0.005578	13005.	0.000
15.660	-2.720E-06	22.4090	-1.3764	-7.412E-07	0.000	2.709E+08	0.0166	13151.	0.000
15.840	-4.128E-06	19.5309	-1.3311	-5.740E-07	0.000	2.709E+08	0.0254	13296.	0.000
16.020	-5.200E-06	16.7579	-1.2687	-4.293E-07	0.000	2.709E+08	0.0324	13442.	0.000
16.200	-5.983E-06	14.1244	-1.1931	-3.062E-07	0.000	2.709E+08	0.0376	13587.	0.000
16.380	-6.523E-06	11.6567	-1.1077	-2.034E-07	0.000	2.709E+08	0.0415	13733.	0.000
16.560	-6.861E-06	9.3744	-1.0153	-1.195E-07	0.000	2.709E+08	0.0441	13878.	0.000
16.740	-7.039E-06	7.2914	-0.9183	-5.305E-08	0.000	2.709E+08	0.0457	14024.	0.000
16.920	-7.091E-06	5.4166	-0.8187	-2.386E-09	0.000	2.709E+08	0.0465	14170.	0.000
17.100	-7.049E-06	3.7550	-0.6972	3.418E-08	0.000	2.709E+08	0.0660	20223.	0.000
17.280	-6.943E-06	2.3988	-0.5548	5.872E-08	0.000	2.709E+08	0.0658	20474.	0.000
17.460	-6.795E-06	1.3480	-0.4134	7.366E-08	0.000	2.709E+08	0.0652	20724.	0.000
17.640	-6.625E-06	0.6004	-0.2735	8.143E-08	0.000	2.709E+08	0.0643	20975.	0.000
17.820	-6.444E-06	0.1525	-0.1356	8.443E-08	0.000	2.709E+08	0.0633	21225.	0.000
18.000	-6.260E-06	0.0000	0.0000	8.504E-08	0.000	2.709E+08	0.0622	10738.	0.000

* This analysis makes computations of pile response using nonlinear moment-curvature relationships.

The above values of total stress are computed for combined axial and bending stress in elastic

sections and do not equal actual stresses in concrete and steel in the range of nonlinear bending.

Output Summary for Load Case No. 2:

Pile-head deflection = 0.1228829 inches
Computed slope at pile head = -0.0033418 radians
Maximum bending moment = 18616. inch-lbs
Maximum shear force = 600.0000000 lbs
Depth of maximum bending moment = 34.5600000 inches below pile head
Depth of maximum shear force = 10.8000000 inches below pile head
Number of iterations = 6
Number of zero deflection points = 3

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

Boundary Condition Type 1, Shear and Moment

Shear = 600. lbs
Moment = 0. in-lbs
Axial Load = 40000. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
18.0000	0.1228829	18616.	600.0000000
17.1000	0.1230293	18633.	600.0000000
16.2000	0.1229879	18627.	600.0000000
15.3000	0.1228986	18616.	600.0000000
14.4000	0.1230025	18631.	600.0000000
13.5000	0.1228972	18609.	600.0000000
12.6000	0.1230159	18631.	600.0000000
11.7000	0.1229268	18611.	600.0000000
10.8000	0.1230116	18615.	600.0000000
9.9000	0.1231192	18621.	600.0000001
9.0000	0.1231558	18625.	600.0000000
8.1000	0.1232592	18599.	600.0000001
7.2000	0.1257228	18497.	600.0000000
6.3000	0.1391931	18333.	-692.1543598
5.4000	0.2099543	19417.	-1005.7017839

 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 = 800.000 lbs
 Applied moment at pile head = 0.000 in-lbs
 Axial thrust load on pile head = 40000.000 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. p lb/in	Soil Spr. Es*h lb/inch	Distrib. Lat. Load lb/inch
0.00	0.1725	1.450E-08	800.0000	-0.004670	0.000	2.709E+08	0.000	0.000	0.000
0.180	0.1624	2131.4460	800.0000	-0.004661	0.000	2.709E+08	0.000	0.000	0.000
0.360	0.1524	4261.4235	800.0000	-0.004635	0.000	2.704E+08	0.000	0.000	0.000
0.540	0.1424	6388.4602	800.0000	-0.004593	0.000	2.700E+08	0.000	0.000	0.000
0.720	0.1325	8511.0808	800.0000	-0.004533	0.000	2.693E+08	0.000	0.000	0.000
0.900	0.1228	10628.	800.0000	-0.004456	0.000	2.684E+08	0.000	0.000	0.000
1.080	0.1133	12737.	795.9867	-0.004362	0.000	2.674E+08	-3.7160	70.8660	0.000
1.260	0.1040	14820.	777.9013	-0.004251	0.000	2.661E+08	-13.0298	270.7425	0.000
1.440	0.0949	16832.	739.0456	-0.004122	0.000	2.646E+08	-22.9478	522.3041	0.000
1.620	0.0861	18725.	678.9674	-0.003976	0.000	2.631E+08	-32.6802	819.4090	0.000
1.800	0.0777	20452.	598.7152	-0.003815	0.000	2.614E+08	-41.6273	1156.8473	0.000
1.980	0.0697	21971.	500.7479	-0.003639	0.000	2.598E+08	-49.0831	1521.8071	0.000
2.160	0.0620	23244.	388.4231	-0.003450	0.000	2.583E+08	-54.9214	1913.2632	0.000
2.340	0.0548	24245.	268.5928	-0.003251	0.000	2.570E+08	-56.0326	2210.1488	0.000
2.520	0.0480	24967.	147.9610	-0.003044	0.000	2.561E+08	-55.6636	2507.0345	0.000
2.700	0.0416	25410.	29.5081	-0.002831	0.000	2.554E+08	-54.0150	2803.9201	0.000
2.880	0.0357	25583.	-84.2187	-0.002616	0.000	2.552E+08	-51.2876	3100.8058	0.000
3.060	0.0303	25498.	-191.1022	-0.002400	0.000	2.553E+08	-47.6786	3397.6915	0.000
3.240	0.0254	25172.	-289.4430	-0.002185	0.000	2.558E+08	-43.3777	3694.5771	0.000
3.420	0.0209	24626.	-377.9406	-0.001975	0.000	2.565E+08	-38.5645	3991.4628	0.000
3.600	0.0168	23881.	-455.6685	-0.001772	0.000	2.575E+08	-33.4059	4288.3485	0.000
3.780	0.0132	22963.	-522.0455	-0.001576	0.000	2.587E+08	-28.0543	4585.2341	0.000
3.960	0.0100	21898.	-576.8025	-0.001389	0.000	2.599E+08	-22.6465	4882.1198	0.000
4.140	0.007216	20711.	-619.9477	-0.001212	0.000	2.611E+08	-17.3027	5179.0054	0.000
4.320	0.004783	19429.	-651.7312	-0.001046	0.000	2.624E+08	-12.1264	5475.8911	0.000
4.500	0.002696	18077.	-672.6086	-0.000892	0.000	2.636E+08	-7.2045	5772.7768	0.000
4.680	0.000928	16678.	-683.2059	-0.000750	0.000	2.648E+08	-2.6078	6069.6624	0.000
4.860	-0.000546	15255.	-684.2850	-0.000620	0.000	2.658E+08	1.6087	6366.5481	0.000
5.040	-0.001752	13829.	-676.7112	-0.000502	0.000	2.667E+08	5.4041	6663.4338	0.000
5.220	-0.002716	12418.	-661.4229	-0.000396	0.000	2.675E+08	8.7516	6960.3194	0.000
5.400	-0.003463	11040.	-639.4037	-0.000302	0.000	2.682E+08	11.6366	7257.2051	0.000
5.580	-0.004019	9708.3603	-611.6563	-0.000218	0.000	2.688E+08	14.0555	7554.0907	0.000
5.760	-0.004406	8435.4532	-579.1806	-0.000145	0.000	2.693E+08	16.0147	7850.9764	0.000
5.940	-0.004647	7231.4189	-542.9534	-8.258E-05	0.000	2.697E+08	17.5290	8147.8621	0.000
6.120	-0.004763	6104.1648	-503.9118	-2.921E-05	0.000	2.700E+08	18.6206	8444.7477	0.000
6.300	-0.004773	5059.5684	-462.9389	1.541E-05	0.000	2.703E+08	19.3172	8741.6334	0.000
6.480	-0.004696	4101.6051	-420.8530	5.201E-05	0.000	2.705E+08	19.6512	9038.5191	0.000
6.660	-0.004548	3232.4964	-378.3987	8.129E-05	0.000	2.706E+08	19.6583	9335.4047	0.000
6.840	-0.004345	2452.8760	-336.2415	0.000104	0.000	2.707E+08	19.3762	9632.2904	0.000
7.020	-0.004099	1761.9661	-294.9639	0.000121	0.000	2.708E+08	18.8438	9929.1760	0.000
7.200	-0.003823	1157.7595	-255.0643	0.000132	0.000	2.708E+08	18.1002	10226.	0.000
7.380	-0.003527	637.2031	-216.9580	0.000140	0.000	2.708E+08	17.1835	10523.	0.000
7.560	-0.003220	196.3789	-180.9791	0.000143	0.000	2.709E+08	16.1304	10820.	0.000
7.740	-0.002910	-169.3228	-147.3848	0.000143	0.000	2.709E+08	14.9755	11117.	0.000
7.920	-0.002602	-465.0383	-116.3605	0.000140	0.000	2.708E+08	13.7507	11414.	0.000
8.100	-0.002303	-696.2781	-89.7996	0.000136	0.000	2.708E+08	10.8428	10170.	0.000
8.280	-0.002015	-876.4501	-67.5886	0.000130	0.000	2.708E+08	9.7229	10421.	0.000
8.460	-0.001743	-1010.6549	-47.7881	0.000122	0.000	2.708E+08	8.6110	10671.	0.000
8.640	-0.001488	-1103.9880	-30.3624	0.000114	0.000	2.708E+08	7.5239	10922.	0.000
8.820	-0.001252	-1161.4567	-15.2424	0.000105	0.000	2.708E+08	6.4761	11172.	0.000
9.000	-0.001036	-1187.9101	-2.3305	9.523E-05	0.000	2.708E+08	5.4794	11423.	0.000
9.180	-0.000841	-1187.9804	8.4938	8.575E-05	0.000	2.708E+08	4.5432	11673.	0.000
9.360	-0.000666	-1166.0353	17.3691	7.637E-05	0.000	2.708E+08	3.6746	11924.	0.000

9.540	-0.000511	-1126.1421	24.4468	6.723E-05	0.000	2.708E+08	2.8788	12174.	0.000
9.720	-0.000375	-1072.0418	29.8871	5.846E-05	0.000	2.708E+08	2.1585	12425.	0.000
9.900	-0.000258	-1007.1317	33.8548	5.017E-05	0.000	2.708E+08	1.5153	12675.	0.000
10.080	-0.000159	-934.4578	36.5159	4.242E-05	0.000	2.708E+08	0.9487	12926.	0.000
10.260	-7.496E-05	-856.7137	38.0344	3.528E-05	0.000	2.708E+08	0.4572	13176.	0.000
10.440	-6.130E-06	-776.2459	38.5693	2.877E-05	0.000	2.708E+08	0.0381	13426.	0.000
10.620	4.932E-05	-695.0654	38.2732	2.290E-05	0.000	2.708E+08	-0.3123	13677.	0.000
10.800	9.280E-05	-614.8631	37.2896	1.768E-05	0.000	2.708E+08	-0.5984	13927.	0.000
10.980	0.000126	-537.0288	35.7524	1.308E-05	0.000	2.708E+08	-0.8250	14178.	0.000
11.160	0.000149	-462.6737	33.7841	9.098E-06	0.000	2.708E+08	-0.9975	14428.	0.000
11.340	0.000165	-392.6536	31.4959	5.687E-06	0.000	2.709E+08	-1.1212	14679.	0.000
11.520	0.000174	-327.5942	28.9869	2.815E-06	0.000	2.709E+08	-1.2019	14929.	0.000
11.700	0.000177	-267.9167	26.3442	4.410E-07	0.000	2.709E+08	-1.2450	15180.	0.000
11.880	0.000176	-213.8633	23.6433	-1.480E-06	0.000	2.709E+08	-1.2559	15430.	0.000
12.060	0.000171	-165.5218	20.9482	-2.993E-06	0.000	2.709E+08	-1.2397	15681.	0.000
12.240	0.000163	-122.8500	18.3120	-4.142E-06	0.000	2.709E+08	-1.2013	15931.	0.000
12.420	0.000153	-85.6983	15.7778	-4.974E-06	0.000	2.709E+08	-1.1452	16182.	0.000
12.600	0.000141	-53.8305	13.3793	-5.530E-06	0.000	2.709E+08	-1.0756	16432.	0.000
12.780	0.000129	-26.9439	11.1419	-5.852E-06	0.000	2.709E+08	-0.9961	16683.	0.000
12.960	0.000116	-4.6863	9.0831	-5.978E-06	0.000	2.709E+08	-0.9102	16933.	0.000
13.140	0.000103	13.3280	7.2138	-5.944E-06	0.000	2.709E+08	-0.8206	17184.	0.000
13.320	9.042E-05	27.5046	5.5394	-5.781E-06	0.000	2.709E+08	-0.7298	17434.	0.000
13.500	7.817E-05	38.2571	4.0599	-5.519E-06	0.000	2.709E+08	-0.6400	17684.	0.000
13.680	6.658E-05	45.9971	2.7716	-5.183E-06	0.000	2.709E+08	-0.5529	17935.	0.000
13.860	5.578E-05	51.1260	1.6673	-4.796E-06	0.000	2.709E+08	-0.4697	18185.	0.000
14.040	4.587E-05	54.0285	0.7373	-4.377E-06	0.000	2.709E+08	-0.3915	18436.	0.000
14.220	3.688E-05	55.0674	-0.0301	-3.942E-06	0.000	2.709E+08	-0.3190	18686.	0.000
14.400	2.884E-05	54.5798	-0.6476	-3.504E-06	0.000	2.709E+08	-0.2528	18937.	0.000
14.580	2.174E-05	52.8751	-1.1292	-3.076E-06	0.000	2.709E+08	-0.1931	19187.	0.000
14.760	1.555E-05	50.2330	-1.4889	-2.665E-06	0.000	2.709E+08	-0.1399	19438.	0.000
14.940	1.023E-05	46.9034	-1.7407	-2.277E-06	0.000	2.709E+08	-0.0932	19688.	0.000
15.120	5.711E-06	43.1066	-1.8777	-1.919E-06	0.000	2.709E+08	-0.0336	12714.	0.000
15.300	1.938E-06	39.1232	-1.9265	-1.591E-06	0.000	2.709E+08	-0.0115	12859.	0.000
15.480	-1.161E-06	35.0591	-1.9314	-1.295E-06	0.000	2.709E+08	0.006989	13005.	0.000
15.660	-3.656E-06	31.0034	-1.8998	-1.032E-06	0.000	2.709E+08	0.0223	13151.	0.000
15.840	-5.617E-06	27.0303	-1.8384	-8.001E-07	0.000	2.709E+08	0.0346	13296.	0.000
16.020	-7.113E-06	23.1998	-1.7533	-5.999E-07	0.000	2.709E+08	0.0443	13442.	0.000
16.200	-8.209E-06	19.5598	-1.6497	-4.294E-07	0.000	2.709E+08	0.0516	13587.	0.000
16.380	-8.968E-06	16.1473	-1.5324	-2.870E-07	0.000	2.709E+08	0.0570	13733.	0.000
16.560	-9.448E-06	12.9896	-1.4052	-1.708E-07	0.000	2.709E+08	0.0607	13878.	0.000
16.740	-9.706E-06	10.1062	-1.2716	-7.875E-08	0.000	2.709E+08	0.0630	14024.	0.000
16.920	-9.789E-06	7.5099	-1.1342	-8.509E-09	0.000	2.709E+08	0.0642	14170.	0.000
17.100	-9.742E-06	5.2080	-0.9663	4.220E-08	0.000	2.709E+08	0.0912	20223.	0.000
17.280	-9.606E-06	3.3281	-0.7695	7.623E-08	0.000	2.709E+08	0.0911	20474.	0.000
17.460	-9.413E-06	1.8706	-0.5736	9.696E-08	0.000	2.709E+08	0.0903	20724.	0.000
17.640	-9.187E-06	0.8333	-0.3797	1.077E-07	0.000	2.709E+08	0.0892	20975.	0.000
17.820	-8.948E-06	0.2116	-0.1884	1.119E-07	0.000	2.709E+08	0.0879	21225.	0.000
18.000	-8.704E-06	0.0000	0.0000	1.128E-07	0.000	2.709E+08	0.0865	10738.	0.000

* This analysis makes computations of pile response using nonlinear moment-curvature relationships.

The above values of total stress are computed for combined axial and bending stress in elastic

sections and do not equal actual stresses in concrete and steel in the range of nonlinear bending.

Output Summary for Load Case No. 3:

Pile-head deflection = 0.1724918 inches
Computed slope at pile head = -0.0046695 radians
Maximum bending moment = 25583. inch-lbs
Maximum shear force = 800.0000000 lbs
Depth of maximum bending moment = 34.5600000 inches below pile head
Depth of maximum shear force = 10.8000000 inches below pile head
Number of iterations = 7
Number of zero deflection points = 3

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

Boundary Condition Type 1, Shear and Moment

Shear = 800. lbs
Moment = 0. in-lbs
Axial Load = 40000. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
18.0000	0.1724918	25583.	800.0000000
17.1000	0.1727042	25610.	800.0000000
16.2000	0.1726108	25601.	800.0000000
15.3000	0.1724705	25583.	800.0000000
14.4000	0.1726971	25606.	800.0000000
13.5000	0.1724945	25570.	800.0000000
12.6000	0.1726302	25600.	800.0000000
11.7000	0.1725381	25582.	800.0000000
10.8000	0.1726682	25587.	800.0000000
9.9000	0.1728758	25592.	800.0000000
9.0000	0.1728863	25595.	800.0000000
8.1000	0.1731013	25575.	800.0000000
7.2000	0.1773998	25515.	800.0000001
6.3000	0.2034184	25724.	-990.6823052
5.4000	0.5357257	31907.	-1961.8207075

 Computed Values of Pile Loading and Deflection
 for Lateral Loading for Load Case Number 4

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

Shear force at pile head = 1000.000 lbs
 Applied moment at pile head = 0.000 in-lbs
 Axial thrust load on pile head = 40000.000 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. p lb/in	Soil Spr. Es*h lb/inch	Distrib. Lat. Load lb/inch
0.00	0.2382	-1.611E-08	1000.0000	-0.006372	0.000	2.709E+08	0.000	0.000	0.000
0.180	0.2244	2710.5441	1000.0000	-0.006361	0.000	2.709E+08	0.000	0.000	0.000
0.360	0.2107	5419.2206	1000.0000	-0.006329	0.000	2.702E+08	0.000	0.000	0.000
0.540	0.1971	8124.1543	1000.0000	-0.006275	0.000	2.694E+08	0.000	0.000	0.000
0.720	0.1836	10823.	1000.0000	-0.006198	0.000	2.683E+08	0.000	0.000	0.000
0.900	0.1703	13515.	1000.0000	-0.006100	0.000	2.669E+08	0.000	0.000	0.000
1.080	0.1572	16198.	995.6125	-0.005979	0.000	2.651E+08	-4.0625	55.8068	0.000
1.260	0.1445	18850.	975.7961	-0.005836	0.000	2.629E+08	-14.2859	213.5972	0.000
1.440	0.1320	21421.	933.1152	-0.005670	0.000	2.604E+08	-25.2334	412.8239	0.000
1.620	0.1200	23860.	866.9561	-0.005481	0.000	2.575E+08	-36.0249	648.5954	0.000
1.800	0.1084	26114.	778.3706	-0.005270	0.000	2.544E+08	-45.9987	916.9995	0.000
1.980	0.0972	28134.	669.9589	-0.005038	0.000	2.512E+08	-54.3825	1208.4203	0.000
2.160	0.0866	29879.	544.6023	-0.004787	0.000	2.479E+08	-61.6884	1538.9092	0.000
2.340	0.0765	31313.	405.8121	-0.004519	0.000	2.449E+08	-66.8211	1886.0624	0.000
2.520	0.0671	32413.	257.4156	-0.004236	0.000	2.423E+08	-70.5831	2273.3449	0.000
2.700	0.0582	33158.	103.5216	-0.003943	0.000	2.404E+08	-71.9114	2667.7017	0.000
2.880	0.0500	33541.	-51.1493	-0.003643	0.000	2.393E+08	-71.3024	3078.3685	0.000
3.060	0.0425	33566.	-200.3397	-0.003340	0.000	2.392E+08	-66.8368	3397.6915	0.000
3.240	0.0356	33253.	-338.2935	-0.003039	0.000	2.401E+08	-60.8982	3694.5771	0.000
3.420	0.0294	32630.	-462.6649	-0.002743	0.000	2.418E+08	-54.2605	3991.4628	0.000
3.600	0.0238	31728.	-572.1963	-0.002457	0.000	2.440E+08	-47.1575	4288.3485	0.000
3.780	0.0187	30582.	-666.1106	-0.002183	0.000	2.465E+08	-39.8002	4585.2341	0.000
3.960	0.0143	29228.	-744.0606	-0.001922	0.000	2.492E+08	-32.3757	4882.1198	0.000
4.140	0.0104	27700.	-806.0770	-0.001676	0.000	2.519E+08	-25.0469	5179.0054	0.000
4.320	0.007082	26035.	-852.5165	-0.001447	0.000	2.545E+08	-17.9527	5475.8911	0.000
4.500	0.004194	24267.	-884.0110	-0.001235	0.000	2.570E+08	-11.2089	5772.7768	0.000
4.680	0.001747	22430.	-901.4186	-0.001039	0.000	2.593E+08	-4.9093	6069.6624	0.000
4.860	-0.000296	20553.	-905.7775	-0.000861	0.000	2.613E+08	0.8733	6366.5481	0.000
5.040	-0.001973	18665.	-898.2618	-0.000699	0.000	2.631E+08	6.0856	6663.4338	0.000
5.220	-0.003318	16793.	-880.1418	-0.000554	0.000	2.647E+08	10.6922	6960.3194	0.000
5.400	-0.004367	14959.	-852.7464	-0.000425	0.000	2.660E+08	14.6740	7257.2051	0.000
5.580	-0.005155	13183.	-817.4297	-0.000311	0.000	2.671E+08	18.0267	7554.0907	0.000
5.760	-0.005711	11481.	-775.5415	-0.000211	0.000	2.680E+08	20.7587	7850.9764	0.000
5.940	-0.006068	9868.9499	-728.4009	-0.000126	0.000	2.688E+08	22.8900	8147.8621	0.000
6.120	-0.006254	8356.4245	-677.2743	-5.241E-05	0.000	2.694E+08	24.4495	8444.7477	0.000
6.300	-0.006295	6952.1810	-623.3566	8.926E-06	0.000	2.698E+08	25.4743	8741.6334	0.000
6.480	-0.006215	5661.9816	-567.7565	5.939E-05	0.000	2.702E+08	26.0073	9038.5191	0.000
6.660	-0.006038	4489.2104	-511.4852	9.996E-05	0.000	2.704E+08	26.0958	9335.4047	0.000
6.840	-0.005783	3435.0932	-455.4484	0.000132	0.000	2.706E+08	25.7902	9632.2904	0.000
7.020	-0.005469	2498.9334	-400.4414	0.000155	0.000	2.707E+08	25.1423	9929.1760	0.000
7.200	-0.005113	1678.3545	-347.1472	0.000172	0.000	2.708E+08	24.2042	10226.	0.000
7.380	-0.004727	969.5459	-296.1373	0.000183	0.000	2.708E+08	23.0271	10523.	0.000
7.560	-0.004324	367.5045	-247.8750	0.000188	0.000	2.709E+08	21.6603	10820.	0.000
7.740	-0.003915	-133.7319	-202.7196	0.000189	0.000	2.709E+08	20.1502	11117.	0.000
7.920	-0.003509	-540.8634	-160.9343	0.000186	0.000	2.708E+08	18.5399	11414.	0.000
8.100	-0.003111	-861.1224	-125.0894	0.000180	0.000	2.708E+08	14.6498	10170.	0.000
8.280	-0.002729	-1112.4378	-95.0488	0.000173	0.000	2.708E+08	13.1656	10421.	0.000
8.460	-0.002366	-1301.5613	-68.2077	0.000163	0.000	2.708E+08	11.6873	10671.	0.000
8.640	-0.002025	-1435.2595	-44.5281	0.000152	0.000	2.708E+08	10.2382	10922.	0.000
8.820	-0.001709	-1520.2010	-23.9258	0.000140	0.000	2.708E+08	8.8380	11172.	0.000
9.000	-0.001419	-1562.8603	-6.2776	0.000128	0.000	2.708E+08	7.5029	11423.	0.000
9.180	-0.001156	-1569.4368	8.5714	0.000115	0.000	2.708E+08	6.2462	11673.	0.000
9.360	-0.000920	-1545.7894	20.8013	0.000103	0.000	2.708E+08	5.0777	11924.	0.000

9.540	-0.000711	-1497.3858	30.6103	9.093E-05	0.000	2.708E+08	4.0047	12174.	0.000
9.720	-0.000527	-1429.2660	38.2093	7.926E-05	0.000	2.708E+08	3.0315	12425.	0.000
9.900	-0.000368	-1346.0175	43.8164	6.819E-05	0.000	2.708E+08	2.1602	12675.	0.000
10.080	-0.000232	-1251.7625	47.6516	5.783E-05	0.000	2.708E+08	1.3909	12926.	0.000
10.260	-0.000118	-1150.1554	49.9333	4.825E-05	0.000	2.708E+08	0.7217	13176.	0.000
10.440	-2.400E-05	-1044.3885	50.8738	3.950E-05	0.000	2.708E+08	0.1492	13426.	0.000
10.620	5.232E-05	-937.2059	50.6771	3.160E-05	0.000	2.708E+08	-0.3313	13677.	0.000
10.800	0.000112	-830.9232	49.5359	2.454E-05	0.000	2.708E+08	-0.7254	13927.	0.000
10.980	0.000158	-727.4521	47.6300	1.833E-05	0.000	2.708E+08	-1.0394	14178.	0.000
11.160	0.000192	-628.3291	45.1246	1.292E-05	0.000	2.708E+08	-1.2804	14428.	0.000
11.340	0.000214	-534.7470	42.1698	8.285E-06	0.000	2.708E+08	-1.4555	14679.	0.000
11.520	0.000227	-447.5872	38.8999	4.368E-06	0.000	2.708E+08	-1.5722	14929.	0.000
11.700	0.000233	-367.4544	35.4330	1.118E-06	0.000	2.709E+08	-1.6378	15180.	0.000
11.880	0.000232	-294.7098	31.8719	-1.522E-06	0.000	2.709E+08	-1.6595	15430.	0.000
12.060	0.000226	-229.5047	28.3040	-3.641E-06	0.000	2.709E+08	-1.6441	15681.	0.000
12.240	0.000217	-171.8123	24.8022	-5.212E-06	0.000	2.709E+08	-1.5983	15931.	0.000
12.420	0.000204	-121.4584	21.4259	-6.381E-06	0.000	2.709E+08	-1.5280	16182.	0.000
12.600	0.000189	-78.1498	18.2217	-7.177E-06	0.000	2.709E+08	-1.4388	16432.	0.000
12.780	0.000173	-41.5003	15.2252	-7.654E-06	0.000	2.709E+08	-1.3358	16683.	0.000
12.960	0.000156	-11.0544	12.4612	-7.864E-06	0.000	2.709E+08	-1.2234	16933.	0.000
13.140	0.000139	13.6909	9.9457	-7.853E-06	0.000	2.709E+08	-1.1057	17184.	0.000
13.320	0.000122	33.2682	7.6870	-7.666E-06	0.000	2.709E+08	-0.9858	17434.	0.000
13.500	0.000106	48.2232	5.6862	-7.341E-06	0.000	2.709E+08	-0.8667	17684.	0.000
13.680	9.042E-05	59.1012	3.9393	-6.913E-06	0.000	2.709E+08	-0.7508	17935.	0.000
13.860	7.600E-05	66.4355	2.4374	-6.413E-06	0.000	2.709E+08	-0.6398	18185.	0.000
14.040	6.272E-05	70.7387	1.1682	-5.866E-06	0.000	2.709E+08	-0.5353	18436.	0.000
14.220	5.066E-05	72.4956	0.1167	-5.295E-06	0.000	2.709E+08	-0.4382	18686.	0.000
14.400	3.985E-05	72.1579	-0.7339	-4.718E-06	0.000	2.709E+08	-0.3493	18937.	0.000
14.580	3.028E-05	70.1406	-1.4016	-4.151E-06	0.000	2.709E+08	-0.2689	19187.	0.000
14.760	2.191E-05	66.8203	-1.9050	-3.605E-06	0.000	2.709E+08	-0.1972	19438.	0.000
14.940	1.470E-05	62.5337	-2.2628	-3.089E-06	0.000	2.709E+08	-0.1340	19688.	0.000
15.120	8.571E-06	57.5788	-2.4620	-2.610E-06	0.000	2.709E+08	-0.0505	12714.	0.000
15.300	3.430E-06	52.3487	-2.5386	-2.172E-06	0.000	2.709E+08	-0.0204	12859.	0.000
15.480	-8.100E-07	46.9874	-2.5554	-1.776E-06	0.000	2.709E+08	0.004877	13005.	0.000
15.660	-4.240E-06	41.6164	-2.5222	-1.422E-06	0.000	2.709E+08	0.0258	13151.	0.000
15.840	-6.954E-06	36.3372	-2.4481	-1.111E-06	0.000	2.709E+08	0.0428	13296.	0.000
16.020	-9.042E-06	31.2327	-2.3411	-8.420E-07	0.000	2.709E+08	0.0563	13442.	0.000
16.200	-1.059E-05	26.3692	-2.2084	-6.123E-07	0.000	2.709E+08	0.0666	13587.	0.000
16.380	-1.169E-05	21.7984	-2.0562	-4.203E-07	0.000	2.709E+08	0.0743	13733.	0.000
16.560	-1.241E-05	17.5592	-1.8898	-2.634E-07	0.000	2.709E+08	0.0797	13878.	0.000
16.740	-1.282E-05	13.6798	-1.7138	-1.388E-07	0.000	2.709E+08	0.0833	14024.	0.000
16.920	-1.301E-05	10.1795	-1.5317	-4.367E-08	0.000	2.709E+08	0.0853	14170.	0.000
17.100	-1.301E-05	7.0703	-1.3080	2.511E-08	0.000	2.709E+08	0.1218	20223.	0.000
17.280	-1.290E-05	4.5247	-1.0444	7.134E-08	0.000	2.709E+08	0.1223	20474.	0.000
17.460	-1.271E-05	2.5463	-0.7807	9.954E-08	0.000	2.709E+08	0.1219	20724.	0.000
17.640	-1.247E-05	1.1349	-0.5183	1.142E-07	0.000	2.709E+08	0.1211	20975.	0.000
17.820	-1.221E-05	0.2876	-0.2579	1.199E-07	0.000	2.709E+08	0.1200	21225.	0.000
18.000	-1.195E-05	0.0000	0.0000	1.210E-07	0.000	2.709E+08	0.1188	10738.	0.000

* This analysis makes computations of pile response using nonlinear moment-curvature relationships.

The above values of total stress are computed for combined axial and bending stress in elastic

sections and do not equal actual stresses in concrete and steel in the range of nonlinear bending.

Output Summary for Load Case No. 4:

Pile-head deflection = 0.2381790 inches
Computed slope at pile head = -0.0063720 radians
Maximum bending moment = 33566. inch-lbs
Maximum shear force = 1000.0000000 lbs
Depth of maximum bending moment = 36.7200000 inches below pile head
Depth of maximum shear force = 2.1600000 inches below pile head
Number of iterations = 11
Number of zero deflection points = 3

Pile-head Deflection vs. Pile Length for Load Case 4

Boundary Condition Type 1, Shear and Moment

Shear = 1000. lbs
Moment = 0. in-lbs
Axial Load = 40000. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
18.0000	0.2381790	33566.	1000.0000000
17.1000	0.2383953	33590.	1000.0000000
16.2000	0.2383041	33589.	1000.0000000
15.3000	0.2381229	33562.	1000.0000000
14.4000	0.2384646	33616.	1000.0000000
13.5000	0.2381315	33590.	1000.0000000
12.6000	0.2383822	33605.	1000.0000000
11.7000	0.2382107	33572.	1000.0000000
10.8000	0.2384145	33587.	1000.0000000
9.9000	0.2387362	33610.	1000.0000001
9.0000	0.2387343	33611.	1000.0000000
8.1000	0.2393015	33591.	1000.0000002
7.2000	0.2484776	33631.	-1046.1654205
6.3000	0.3108065	34367.	-1402.1883661

Summary of Pile Response(s)

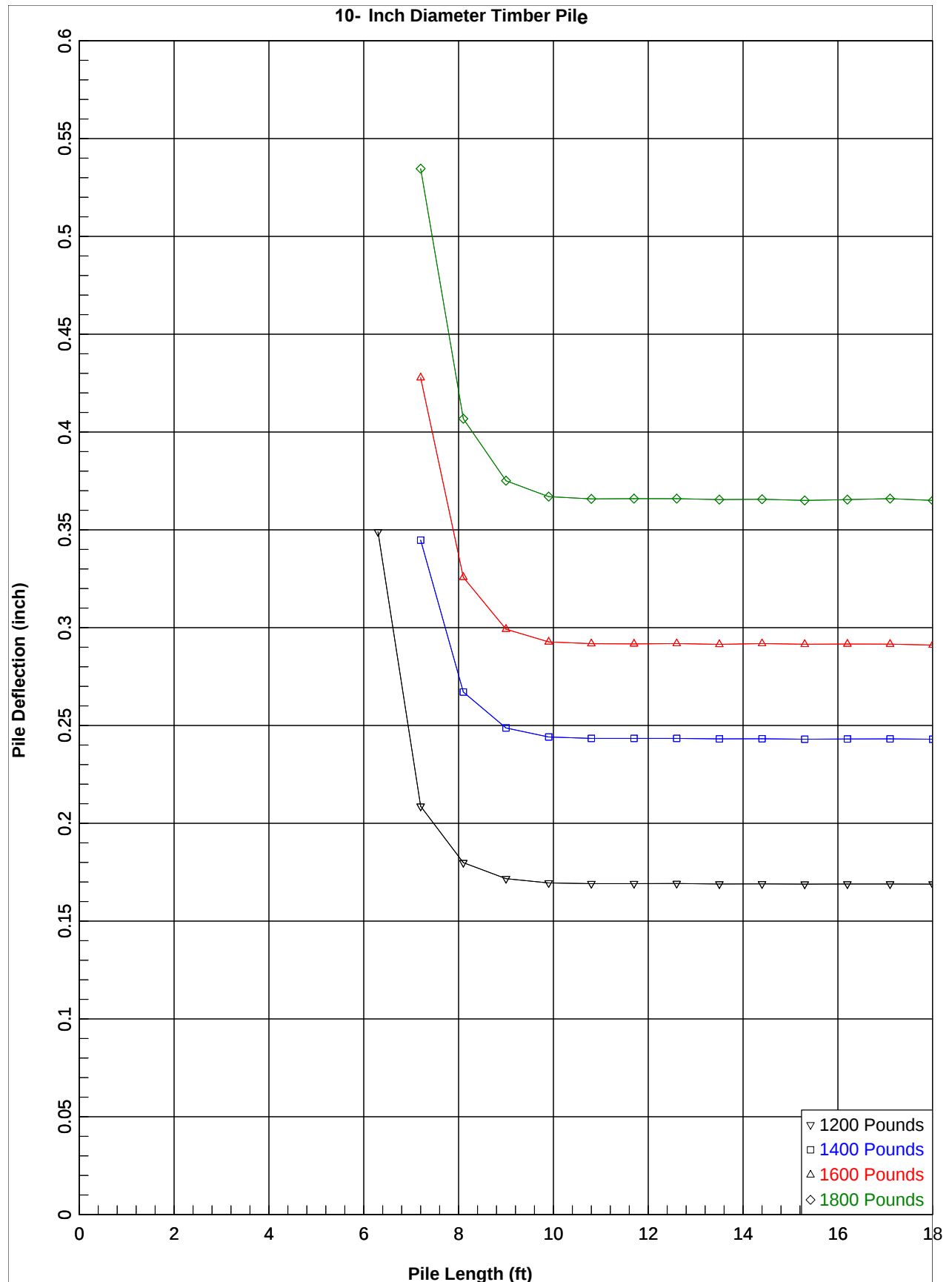
Definitions of Pile-head Loading Conditions:

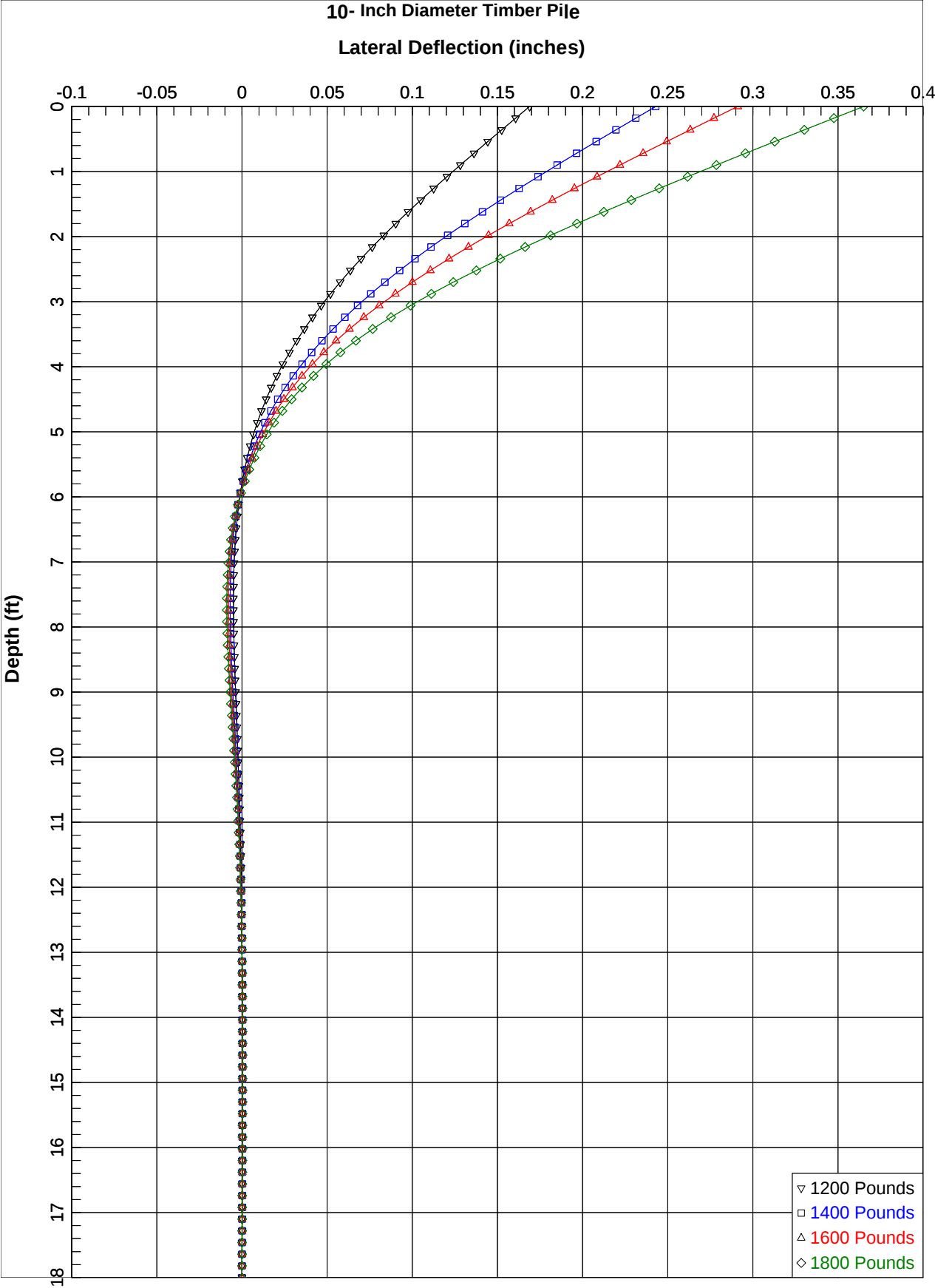
Load Type 1: Load 1 = Shear, lbs, and Load 2 = Moment, in-lbs
Load Type 2: Load 1 = Shear, lbs, and Load 2 = Slope, radians
Load Type 3: Load 1 = Shear, lbs, and Load 2 = Rotational Stiffness, in-lbs/radian
Load Type 4: Load 1 = Top Deflection, inches, and Load 2 = Moment, in-lbs
Load Type 5: Load 1 = Top Deflection, inches, and Load 2 = Slope, radians

Load Case No.	Load Type No.	Pile-head Condition 1 V(lbs) or y(inches)	Pile-head Condition 2 in-lb, rad., or in-lb/rad.	Axial Loading lbs	Pile-head Deflection inches	Maximum Moment in Pile in-lbs	Maximum Shear in Pile lbs	Pile-head Rotation radians
1	1	V = 400.0000	M = 0.000	40000.	0.08027283	12273.	400.0000	-0.00218387
2	1	V = 600.0000	M = 0.000	40000.	0.12288287	18616.	600.0000	-0.00334184
3	1	V = 800.0000	M = 0.000	40000.	0.17249175	25583.	800.0000	-0.00466951
4	1	V = 1000.0000	M = 0.000	40000.	0.23817899	33566.	1000.0000	-0.00637204

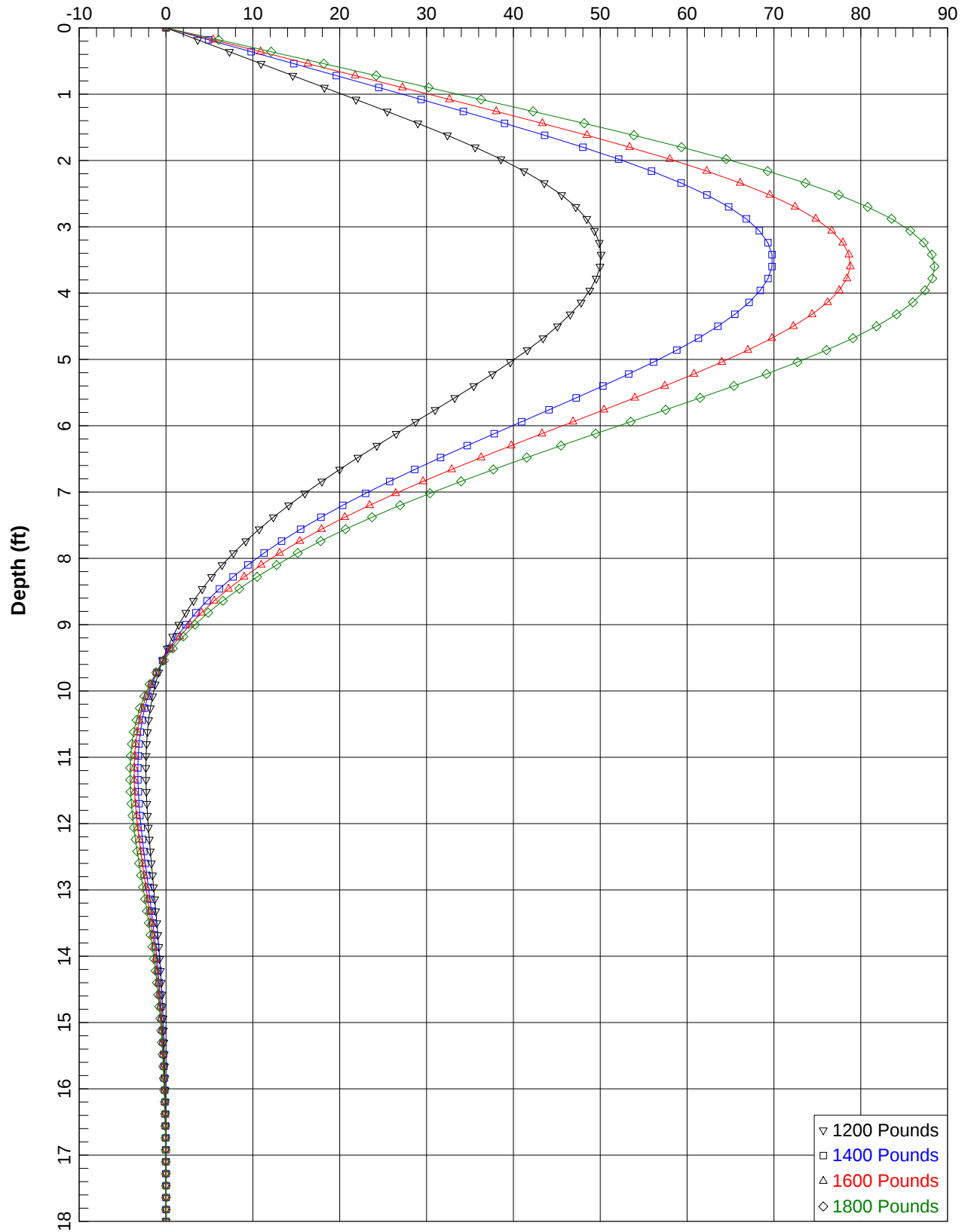
The analysis ended normally.

10-Inch Diameter Timber Pile

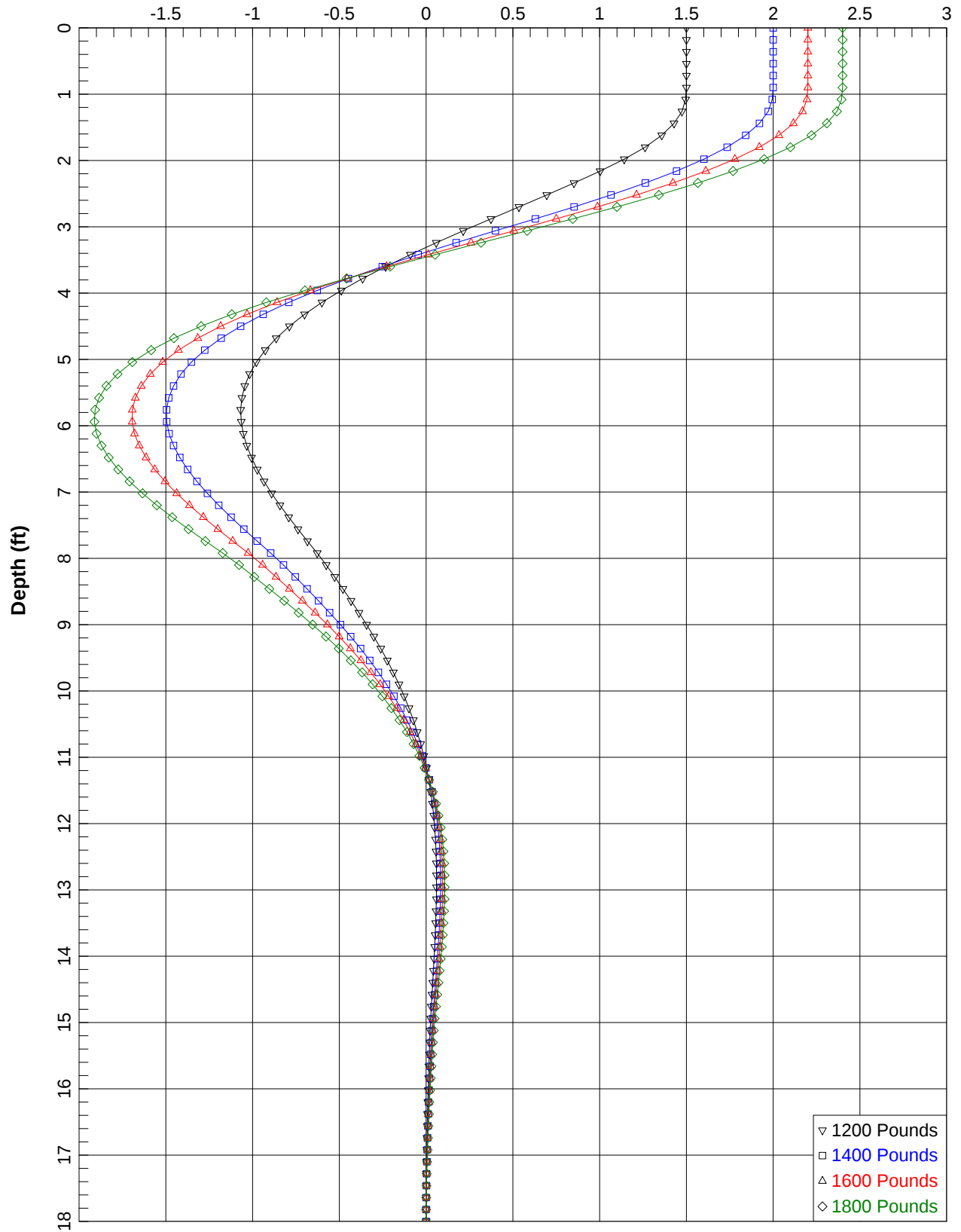




10-Inch Diameter Timber Pile
Bending Moment (in-kips)



10-Inch Diameter Timber Pile
Shear Force (kips)



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LPIle Plus for Windows, Version 2012-06.037

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

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Don Stites, PE
Odessa, FL

Serial Number of Security Device: 160773735
Company Name Stored in Security Device: Don Stites

Files Used for Analysis

Path to file locations: C:\Documents\! Gulf Coast Engineering\2020 Projects\26059
Fire Station No. 46 Timber Piles\Report Files\Lateral Capacity\10 inch Diameter\
Name of input data file: New LPIle (USCS units).lp6d
Name of output report file: New LPIle (USCS units).lp6o
Name of plot output file: New LPIle (USCS units).lp6p
Name of runtime message file: New LPIle (USCS units).lp6r

Date and Time of Analysis

Date: September 20, 2020 Time: 22:13:27

Problem Title

Fire Station No. 46
26059

DRS
Timber Piles 10-inch Diameter

Program Options

Engineering units are US Customary Units: pounds, inches, feet

Basic Program Options:

This analysis computes pile response to lateral loading and will compute nonlinear moment-curvature and nominal moment capacity for section types with nonlinear properties.

Computation Options:

- Analysis does not use p-y multipliers (individual pile or shaft only)
- Analysis assumes no shear resistance at pile tip
- Analysis for fixed-length pile or shaft only
- No computation of foundation stiffness matrix values
- Report pile response for full length of pile
- Analysis assumes no loading by soil movements acting on pile
- No p-y curves to be computed and reported for user-specified depths

Solution Control Parameters:

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

Pile Response Output Options:

- 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

Pile Structural Properties and Geometry

- Total number of pile sections = 1
- Total length of pile = 18.00 ft
- Depth of ground surface below top of pile = 1.00 ft

Pile diameter values 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.

Point	Depth X ft	Pile Diameter in
-----	-----	-----
1	0.00000	10.0000000
2	18.000000	10.0000000

Input Structural Properties:

Pile Section No. 1:

Section Type	=	Drilled Shaft (Bored Pile)
Section Length	=	18.00000000 ft
Section Diameter	=	10.00000000 in

Ground Slope and Pile Batter Angles

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

Soil and Rock Layering Information

The soil profile is modelled using 7 layers

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

Distance from top of pile to top of layer	=	1.00000 ft
Distance from top of pile to bottom of layer	=	8.00000 ft
Effective unit weight at top of layer	=	118.00000 pcf
Effective unit weight at bottom of layer	=	118.00000 pcf
Friction angle at top of layer	=	34.00000 deg.
Friction angle at bottom of layer	=	34.00000 deg.
Subgrade k at top of layer	=	0.0000 pci
Subgrade k at bottom of layer	=	0.0000 pci

NOTE: Internal default values for subgrade k will be computed for the above soil layer.

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

Distance from top of pile to top of layer	=	8.00000	ft
Distance from top of pile to bottom of layer	=	15.00000	ft
Effective unit weight at top of layer	=	118.00000	pcf
Effective unit weight at bottom of layer	=	118.00000	pcf
Friction angle at top of layer	=	33.00000	deg.
Friction angle at bottom of layer	=	33.00000	deg.
Subgrade k at top of layer	=	0.0000	pci
Subgrade k at bottom of layer	=	0.0000	pci

NOTE: Internal default values for subgrade k will be computed for the above soil layer.

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

Distance from top of pile to top of layer	=	15.00000	ft
Distance from top of pile to bottom of layer	=	17.00000	ft
Effective unit weight at top of layer	=	115.00000	pcf
Effective unit weight at bottom of layer	=	115.00000	pcf
Friction angle at top of layer	=	30.00000	deg.
Friction angle at bottom of layer	=	30.00000	deg.
Subgrade k at top of layer	=	0.0000	pci
Subgrade k at bottom of layer	=	0.0000	pci

NOTE: Internal default values for subgrade k will be computed for the above soil layer.

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

Distance from top of pile to top of layer	=	17.00000	ft
Distance from top of pile to bottom of layer	=	30.00000	ft
Effective unit weight at top of layer	=	118.00000	pcf
Effective unit weight at bottom of layer	=	118.00000	pcf
Friction angle at top of layer	=	33.00000	deg.
Friction angle at bottom of layer	=	33.00000	deg.
Subgrade k at top of layer	=	0.0000	pci
Subgrade k at bottom of layer	=	0.0000	pci

NOTE: Internal default values for subgrade k will be computed for the above soil layer.

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

Distance from top of pile to top of layer	=	30.00000	ft
Distance from top of pile to bottom of layer	=	35.00000	ft
Effective unit weight at top of layer	=	115.00000	pcf
Effective unit weight at bottom of layer	=	115.00000	pcf
Friction angle at top of layer	=	32.00000	deg.
Friction angle at bottom of layer	=	32.00000	deg.
Subgrade k at top of layer	=	0.0000	pci
Subgrade k at bottom of layer	=	0.0000	pci

NOTE: Internal default values for subgrade k will be computed for the above soil layer.

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

Distance from top of pile to top of layer	=	35.00000	ft
Distance from top of pile to bottom of layer	=	40.00000	ft
Effective unit weight at top of layer	=	110.00000	pcf
Effective unit weight at bottom of layer	=	110.00000	pcf
Friction angle at top of layer	=	28.00000	deg.
Friction angle at bottom of layer	=	28.00000	deg.
Subgrade k at top of layer	=	0.0000	pci
Subgrade k at bottom of layer	=	0.0000	pci

NOTE: Internal default values for subgrade k will be computed for the above soil layer.

Layer 7 is weak rock, p-y criteria by Reese, 1997

Distance from top of pile to top of layer	=	40.00000	ft
Distance from top of pile to bottom of layer	=	53.00000	ft
Effective unit weight at top of layer	=	130.00000	pcf
Effective unit weight at bottom of layer	=	130.00000	pcf
Uniaxial compressive strength at top of layer	=	500.00000	psi
Uniaxial compressive strength at bottom of layer	=	500.00000	psi
Initial modulus of rock at top of layer	=	100.00000	psi
Initial modulus of rock at bottom of layer	=	100.00000	psi
RQD of rock at top of layer	=	10.00000	%
RQD of rock at bottom of layer	=	0.0000	%
k _{rm} of rock at top of layer	=	0.00500	
k _{rm} of rock at bottom of layer	=	0.00500	

(Depth of lowest soil layer extends 35.00 ft below pile tip)

Summary of Soil Properties

Layer Num.	Layer Soil Type (p-y Curve Criteria)	Layer Depth ft	Effective Unit Wt. pcf	Angle of Friction deg.	Uniaxial q_u psi	RQD % or GSI	kpy pci	Rock Mass Rock Emass psi	krm
1	Sand (Reese, et al.)	1.000	118.000	34.000	--	--	default	--	--
		8.000	118.000	34.000	--	--	default	--	--
2	Sand (Reese, et al.)	8.000	118.000	33.000	--	--	default	--	--
		15.000	118.000	33.000	--	--	default	--	--
3	Sand (Reese, et al.)	15.000	115.000	30.000	--	--	default	--	--
		17.000	115.000	30.000	--	--	default	--	--
4	Sand (Reese, et al.)	17.000	118.000	33.000	--	--	default	--	--
		30.000	118.000	33.000	--	--	default	--	--
5	Sand (Reese, et al.)	30.000	115.000	32.000	--	--	default	--	--
		35.000	115.000	32.000	--	--	default	--	--
6	Sand (Reese, et al.)	35.000	110.000	28.000	--	--	default	--	--
		40.000	110.000	28.000	--	--	default	--	--
7	Weak Rock	40.000	130.000	--	500.000	10.000	--	100.000	0.00500
		53.000	130.000	--	500.000	0.00	--	100.000	0.00500

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 = 4

Load No.	Load Type	Condition 1	Condition 2	Axial Thrust Force, lbs	Compute Top y vs. Pile Length
1	1	V = 1500.00000 lbs	M = 0.0000 in-lbs	50000.	Yes
2	1	V = 2000.00000 lbs	M = 0.0000 in-lbs	50000.	Yes
3	1	V = 2200.00000 lbs	M = 0.0000 in-lbs	50000.	Yes
4	1	V = 2400.00000 lbs	M = 0.0000 in-lbs	50000.	Yes

V = perpendicular shear force applied to pile head

M = bending moment applied to pile head

y = lateral deflection relative to pile axis

S = pile slope relative to original pile batter angle

R = rotational stiffness applied to pile head

Axial thrust 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	=	18.00000000	ft
Shaft Diameter	=	10.00000000	in
Concrete Cover Thickness	=	3.00000000	in
Number of Reinforcing Bars	=	1	bar
Yield Stress of Reinforcing Bars	=	1.50000000	ksi
Modulus of Elasticity of Reinforcing Bars	=	1500.00000000	ksi
Gross Area of Shaft	=	78.53981634	sq. in.
Total Area of Reinforcing Steel	=	0.44000000	sq. in.
Area Ratio of Steel Reinforcement	=	0.56	percent
Edge-to-Edge Bar Spacing	=	-0.75000000	in
Maximum Concrete Aggregate Size	=	0.10000000	in
Ratio of Bar Spacing to Aggregate Size	=	-7.50	
Offset of Rebar Cage Center from Center of Pile	=	0.00000000	in

Axial Structural Capacities:

Nom. Axial Structural Capacity = $0.85 F_c A_c + F_y A_s$	=	80.322	kips
Tensile Load for Cracking of Concrete	=	-18.376	kips
Nominal Axial Tensile Capacity	=	-0.660	kips

Reinforcing Bar Dimensions and Positions Used in Computations:

Bar Number	Bar Diam. inches	Bar Area sq. in.	X inches	Y inches
-----	-----	-----	-----	-----
1	0.75000	0.44000	0.00000	0.00000

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

Concrete Properties:

Compressive Strength of Concrete	=	1.20000000	ksi
Modulus of Elasticity of Concrete	=	1974.53792063	ksi
Modulus of Rupture of Concrete	=	-0.25980762	ksi
Compression Strain at Peak Stress	=	0.00103315	
Tensile Strain at Fracture of Concrete	=	-0.00011866	
Maximum Coarse Aggregate Size	=	0.10000000	in

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

Number	Axial Thrust Force kips
-----	-----
1	50.000

Definitions of Run Messages and Notes:

C = concrete in section has cracked in tension.
Y = stress in reinforcing steel has reached yield stress.
T = ACI 318-08 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 318-08, Section 10.3.4.
Z = depth of tensile zone in concrete section is less than 10 percent of section depth.

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

Axial Thrust Force = 50.000 kips

Bending Curvature rad/in.	Bending Moment in-kip	Bending Stiffness kip-in ²	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in	Max Concrete Stress ksi	Max Steel Stress ksi	Run Msg
0.000001250	0.9759780	780782.	265.6232974	0.0003320	0.0003195	0.6472625	0.4979499	
0.000002500	1.9519480	780779.	135.3199356	0.0003383	0.0003133	0.6570069	0.5072623	
0.000003750	2.9278037	780748.	91.8891650	0.0003446	0.0003071	0.6666860	0.5165953	
0.000005000	3.9034878	780698.	70.1765426	0.0003509	0.0003009	0.6762993	0.5259491	
0.000006250	4.8789432	780631.	57.1511800	0.0003572	0.0002947	0.6858462	0.5353236	
0.000007500	5.8541126	780548.	48.4694477	0.0003635	0.0002885	0.6953260	0.5447188	
0.000008750	6.8289388	780450.	42.2697904	0.0003699	0.0002824	0.7047383	0.5541348	
0.0000100	7.8033646	780336.	37.6214305	0.0003762	0.0002762	0.7140825	0.5635715	
0.0000113	8.7773325	780207.	34.0072695	0.0003826	0.0002701	0.7233579	0.5730289	
0.0000125	9.7507852	780063.	31.1170481	0.0003890	0.0002640	0.7325640	0.5825072	
0.0000138	10.7236654	779903.	28.7533289	0.0003954	0.0002579	0.7417002	0.5920062	
0.0000150	11.6959154	779728.	26.7844868	0.0004018	0.0002518	0.7507659	0.6015260	
0.0000163	12.6674779	779537.	25.1193971	0.0004082	0.0002457	0.7597606	0.6110666	
0.0000175	13.6382951	779331.	23.6929704	0.0004146	0.0002396	0.7686837	0.6206280	
0.0000188	14.6083095	779110.	22.4574747	0.0004211	0.0002336	0.7775345	0.6302102	
0.0000200	15.5774632	778873.	21.3771111	0.0004275	0.0002275	0.7863126	0.6398133	
0.0000213	16.5456984	778621.	20.4245039	0.0004340	0.0002215	0.7950173	0.6494373	
0.0000225	17.5129572	778354.	19.5783610	0.0004405	0.0002155	0.8036480	0.6590822	
0.0000238	18.4791815	778071.	18.8218728	0.0004470	0.0002095	0.8122042	0.6687480	
0.0000250	19.4443133	777773.	18.1415917	0.0004535	0.0002035	0.8206852	0.6784347	
0.0000263	20.4082943	777459.	17.5266316	0.0004601	0.0001976	0.8290905	0.6881424	
0.0000275	21.3710661	777130.	16.9680858	0.0004666	0.0001916	0.8374195	0.6978710	
0.0000288	22.3325703	776785.	16.4585963	0.0004732	0.0001857	0.8456716	0.7076207	
0.0000300	23.2927482	776425.	15.9920319	0.0004798	0.0001798	0.8538462	0.7173914	
0.0000313	24.2515412	776049.	15.5632421	0.0004864	0.0001739	0.8619428	0.7271832	
0.0000325	25.2088904	775658.	15.1678689	0.0004930	0.0001680	0.8699606	0.7369961	
0.0000338	26.1647367	775251.	14.8022001	0.0004996	0.0001621	0.8778992	0.7468301	
0.0000350	27.1190211	774829.	14.4630536	0.0005062	0.0001562	0.8857579	0.7566853	
0.0000363	28.0716841	774391.	14.1476863	0.0005129	0.0001504	0.8935362	0.7665617	
0.0000375	29.0226663	773938.	13.8537211	0.0005195	0.0001445	0.9012334	0.7764593	
0.0000388	29.9719080	773469.	13.5790873	0.0005262	0.0001387	0.9088489	0.7863782	
0.0000400	30.9193494	772984.	13.3219733	0.0005329	0.0001329	0.9163821	0.7963184	
0.0000413	31.8649306	772483.	13.0807870	0.0005396	0.0001271	0.9238325	0.8062800	

0.0000425	32.8085912	771967.	12.8541237	0.0005463	0.0001213	0.9311994	0.8162629
0.0000438	33.7502708	771435.	12.6407392	0.0005530	0.0001155	0.9384822	0.8262673
0.0000450	34.6899089	770887.	12.4395276	0.0005598	0.0001098	0.9456802	0.8362931
0.0000463	35.6274447	770323.	12.2495025	0.0005665	0.0001040	0.9527930	0.8463405
0.0000475	36.5628171	769744.	12.0697816	0.0005733	0.0000983	0.9598198	0.8564094
0.0000488	37.4959647	769148.	11.8995727	0.0005801	0.0000926	0.9667601	0.8665000
0.0000513	39.3553399	767909.	11.5849099	0.0005937	0.0000812	0.9803785	0.8867462
0.0000538	41.2050753	766606.	11.3005983	0.0006074	0.0000699	0.9936433	0.9070795
0.0000563	43.0446718	765239.	11.0425964	0.0006211	0.0000586	1.0065493	0.9275003
0.0000588	44.8736261	763806.	10.8075508	0.0006349	0.0000474	1.0190915	0.9480092
0.0000613	46.6914342	762309.	10.5926558	0.0006488	0.0000363	1.0312647	0.9686064
0.0000638	48.4975749	760746.	10.3955463	0.0006627	0.0000252	1.0430639	0.9892928
0.0000663	50.2915348	759118.	10.2142143	0.0006767	0.0000142	1.0544838	1.0100687
0.0000688	52.0727904	757422.	10.0469442	0.0006907	0.000003227	1.0655191	1.0309348
0.0000713	53.8407909	755660.	9.8922608	0.0007048	-0.000007676	1.0761644	1.0518916
0.0000738	55.5946578	753826.	9.7488808	0.0007190	-0.0000185	1.0864138	1.0729387
0.0000763	57.3331428	751910.	9.6156791	0.0007332	-0.0000293	1.0962610	1.0940746
0.0000788	59.0549158	749904.	9.4916706	0.0007475	-0.0000400	1.1056996	1.1152973
0.0000813	60.7586972	747799.	9.3759916	0.0007618	-0.0000507	1.1147231	1.1366052
0.0000838	62.4432746	745591.	9.2678825	0.0007762	-0.0000613	1.1233256	1.1579965
0.0000863	64.1075194	743276.	9.1666731	0.0007906	-0.0000719	1.1315012	1.1794696
0.0000888	65.7503915	740849.	9.0717701	0.0008051	-0.0000824	1.1392439	1.2010232
0.0000913	67.3709354	738312.	8.9826471	0.0008197	-0.0000928	1.1465484	1.2226561
0.0000938	68.9682712	735662.	8.8988355	0.0008343	-0.0001032	1.1534092	1.2443675
0.0000963	70.5415830	732900.	8.8199163	0.0008489	-0.0001136	1.1598210	1.2661567
0.0000988	70.5415830	714345.	8.6826293	0.0008574	-0.0001301	1.1632991	1.2787082
0.0001013	70.6254880	697536.	8.6024226	0.0008710	-0.0001415	1.1685638	1.2988992
0.0001038	71.6826067	690917.	8.5257536	0.0008845	-0.0001530	1.1734094	1.3190392
0.0001063	72.6984460	684221.	8.4524089	0.0008981	-0.0001644	1.1778401	1.3391339
0.0001088	73.6624841	677356.	8.3817982	0.0009115	-0.0001760	1.1818474	1.3591246
0.0001113	74.5910258	670481.	8.3141935	0.0009250	-0.0001875	1.1854507	1.3790873
0.0001138	75.4876132	663627.	8.2494996	0.0009384	-0.0001991	1.1886541	1.3990396
0.0001163	76.3337212	656634.	8.1869156	0.0009517	-0.0002108	1.1914444	1.4188747
0.0001188	77.1522831	649703.	8.1269954	0.0009651	-0.0002224	1.1938421	1.4387148
0.0001213	77.9352125	642765.	8.0693125	0.0009784	-0.0002341	1.1958426	1.4585125
0.0001238	78.6819371	635814.	8.0136778	0.0009917	-0.0002458	1.1974476	1.4782577
0.0001263	79.4031108	628936.	7.9603125	0.0010050	-0.0002575	1.1986637	1.4980155
0.0001288	80.0842523	622014.	7.9085769	0.0010182	-0.0002693	1.1994870	1.5000000
0.0001313	80.7451735	615201.	7.8590344	0.0010315	-0.0002810	1.1999241	1.5000000
0.0001338	81.3667693	608350.	7.8109011	0.0010447	-0.0002928	1.1999186	1.5000000
0.0001363	81.9683103	601602.	7.7647706	0.0010579	-0.0003046	1.1999035	1.5000000
0.0001388	82.5358615	594853.	7.7200253	0.0010712	-0.0003163	1.1998746	1.5000000
0.0001413	83.0799119	588176.	7.6769399	0.0010844	-0.0003281	1.1998844	1.5000000
0.0001438	83.6006902	581570.	7.6354006	0.0010976	-0.0003399	1.1999999	1.5000000
0.0001463	84.0903688	574977.	7.5950234	0.0011108	-0.0003517	1.1999911	1.5000000
0.0001488	84.5674613	568521.	7.5563880	0.0011240	-0.0003635	1.1999618	1.5000000
0.0001588	86.2360070	543219.	7.4128512	0.0011768	-0.0004107	1.1999421	1.5000000
0.0001688	87.6229463	519247.	7.2866480	0.0012296	-0.0004579	1.1998435	1.5000000
0.0001788	88.7764496	496651.	7.1748907	0.0012825	-0.0005050	1.1998914	1.5000000
0.0001888	89.7361720	475423.	7.0752237	0.0013354	-0.0005521	1.1999060	1.5000000
0.0001988	90.5359240	455527.	6.9858675	0.0013884	-0.0005991	1.1998272	1.5000000
0.0002088	91.2052593	436911.	6.9054726	0.0014415	-0.0006460	1.1999153	1.5000000
0.0002188	91.7683372	419512.	6.8330766	0.0014947	-0.0006928	1.1999143	1.5000000
0.0002288	92.2354886	403215.	6.7671879	0.0015480	-0.0007395	1.1999900	1.5000000
0.0002388	92.6200231	387937.	6.7070019	0.0016013	-0.0007862	1.1996829	1.5000000
0.0002488	92.9492962	373666.	6.6527520	0.0016549	-0.0008326	1.1998217	1.5000000
0.0002588	93.2057393	360215.	6.6020671	0.0017083	-0.0008792	1.1998747	1.5000000
0.0002688	93.4271551	347636.	6.5565033	0.0017621	-0.0009254	1.1998841	1.5000000
0.0002788	93.5931774	335760.	6.5136874	0.0018157	-0.0009718	1.1998408	1.5000000
0.0002888	93.7290521	324603.	6.4747309	0.0018696	-0.0010179	1.1997338	1.5000000
0.0002988	93.8340462	314089.	6.4388749	0.0019236	-0.0010639	1.1995170	1.5000000
0.0003088	93.9020519	304136.	6.4050021	0.0019775	-0.0011100	1.1998241	1.5000000
0.0003188	93.9513737	294749.	6.3742084	0.0020318	-0.0011557	1.1999668	1.5000000
0.0003288	93.9808150	285873.	6.3459151	0.0020862	-0.0012013	1.1997344	1.5000000
0.0003388	93.9808150	277434.	6.3185911	0.0021404	-0.0012471	1.1995881	1.5000000
0.0003488	93.9808150	269479.	6.2935845	0.0021949	-0.0012926	1.1999514	1.5000000
0.0003588	93.9808150	261967.	6.2706859	0.0022496	-0.0013379	1.1994932	1.5000000
0.0003688	93.9808150	254863.	6.2496254	0.0023045	-0.0013830	1.1999993	1.5000000
0.0003788	93.9808150	248134.	6.2288717	0.0023592	-0.0014283	1.1996140	1.5000000
0.0003888	93.9808150	241751.	6.2097122	0.0024140	-0.0014735	1.1999473	1.5000000
0.0003988	93.9808150	235689.	6.1921019	0.0024691	-0.0015184	1.1995730	1.5000000

0.0004088	93.9808150	229922.	6.1758157	0.0025244	-0.0015631	1.1999994	1.5000000	CY
0.0004188	93.9808150	224432.	6.1608435	0.0025799	-0.0016076	1.1993732	1.5000000	CY
0.0004288	93.9808150	219197.	6.1467129	0.0026354	-0.0016521	1.1999652	1.5000000	CY
0.0004388	93.9808150	214201.	6.1327800	0.0026908	-0.0016967	1.1992004	1.5000000	CY
0.0004488	93.9808150	209428.	6.1198642	0.0027463	-0.0017412	1.1997619	1.5000000	CY
0.0004588	93.9808150	204863.	6.1078934	0.0028020	-0.0017855	1.1998272	1.5000000	CY
0.0004688	93.9808150	200492.	6.0968532	0.0028579	-0.0018296	1.1991916	1.5000000	CY
0.0004788	93.9808150	196305.	6.0865974	0.0029140	-0.0018735	1.1998817	1.5000000	CY
0.0004888	93.9808150	192288.	6.0771222	0.0029702	-0.0019173	1.1995786	1.5000000	CY
0.0004988	93.9808150	188433.	6.0683761	0.0030266	-0.0019609	1.1992112	1.5000000	CY
0.0005088	93.9808150	184729.	6.0602614	0.0030832	-0.0020043	1.1998776	1.5000000	CY
0.0005188	93.9808150	181168.	6.0527810	0.0031399	-0.0020476	1.1996234	1.5000000	CY
0.0005288	93.9808150	177741.	6.0454276	0.0031965	-0.0020910	1.1989234	1.5000000	CY
0.0005388	93.9808150	174442.	6.0383043	0.0032531	-0.0021344	1.1997183	1.5000000	CY
0.0005488	93.9808150	171263.	6.0317074	0.0033099	-0.0021776	1.1999996	1.5000000	CY
0.0006088	93.9808150	154383.	6.0020726	0.0036538	-0.0024337	1.1991526	1.5000000	CY
0.0006688	93.9808150	140532.	6.0857463	0.0040698	-0.0026177	1.1999579	1.5000000	CY

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

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

Load No.	Axial Thrust kips	Nominal Mom. Cap. in-kip	Max. Comp. Strain
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1	50.000	93.981	0.00300000

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

In ACI 318-08, the value of the strength reduction factor depends on whether the transverse reinforcing steel bars are tied hoops (0.65) or spirals (0.70).

The above values should be multiplied by the appropriate strength reduction factor to compute ultimate moment capacity according to ACI 318-08, Section 9.3.2.2 or the value required by the design standard being followed.

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

Axial Load No.	Resistance Factor for Moment	Nominal Moment Capacity in-kip	Ultimate (Factored) Axial Thrust kips	Ultimate (Factored) Moment Capacity in-kip	Bending Stiffness at Ult. Mom. Cap. kip-in^2
1	0.65	93.981	32.500	61.088	747368.345
1	0.70	93.981	35.000	65.787	740792.825
1	0.75	93.981	37.500	70.486	732997.823

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 = 1500.000 lbs
Applied moment at pile head = 0.000 in-lbs
Axial thrust load on pile head = 50000.000 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. p lb/in	Soil Spr. Es*h lb/inch	Distrib. Lat. Load lb/inch
0.00	0.1689	7.432E-08	1500.0000	-0.003808	0.000	7.808E+08	0.000	0.000	0.000
0.180	0.1607	3651.2318	1500.0000	-0.003803	0.000	7.808E+08	0.000	0.000	0.000
0.360	0.1525	7301.3727	1500.0000	-0.003787	0.000	7.804E+08	0.000	0.000	0.000
0.540	0.1443	10949.	1500.0000	-0.003762	0.000	7.799E+08	0.000	0.000	0.000
0.720	0.1362	14594.	1500.0000	-0.003727	0.000	7.791E+08	0.000	0.000	0.000
0.900	0.1282	18234.	1500.0000	-0.003681	0.000	7.781E+08	0.000	0.000	0.000
1.080	0.1203	21869.	1495.2458	-0.003626	0.000	7.769E+08	-4.4020	79.0207	0.000
1.260	0.1126	25477.	1473.9827	-0.003560	0.000	7.755E+08	-15.2861	293.3309	0.000
1.440	0.1049	29006.	1428.4313	-0.003484	0.000	7.739E+08	-26.8912	553.4550	0.000
1.620	0.0975	32400.	1357.5143	-0.003398	0.000	7.722E+08	-38.7726	858.8561	0.000
1.800	0.0903	35604.	1261.4601	-0.003303	0.000	7.703E+08	-50.1664	1200.3873	0.000
1.980	0.0832	38563.	1141.6076	-0.003199	0.000	7.684E+08	-60.8081	1577.8300	0.000
2.160	0.0765	41227.	1002.7981	-0.003086	0.000	7.666E+08	-67.7193	1913.2632	0.000
2.340	0.0699	43562.	852.4040	-0.002967	0.000	7.648E+08	-71.5345	2210.1488	0.000
2.520	0.0636	45550.	695.3778	-0.002841	0.000	7.632E+08	-73.8601	2507.0345	0.000
2.700	0.0576	47180.	534.8009	-0.002709	0.000	7.619E+08	-74.8222	2803.9201	0.000
2.880	0.0519	48446.	373.4785	-0.002574	0.000	7.608E+08	-74.5504	3100.8058	0.000
3.060	0.0465	49349.	213.9328	-0.002435	0.000	7.600E+08	-73.1770	3397.6915	0.000
3.240	0.0414	49896.	58.4006	-0.002294	0.000	7.595E+08	-70.8343	3694.5771	0.000
3.420	0.0366	50097.	-91.1668	-0.002152	0.000	7.593E+08	-67.6540	3991.4628	0.000
3.600	0.0321	49967.	-233.0992	-0.002009	0.000	7.594E+08	-63.7649	4288.3485	0.000
3.780	0.0279	49524.	-366.0009	-0.001868	0.000	7.598E+08	-59.2923	4585.2341	0.000
3.960	0.0240	48789.	-488.7411	-0.001728	0.000	7.605E+08	-54.3561	4882.1198	0.000
4.140	0.0205	47786.	-600.4417	-0.001591	0.000	7.613E+08	-49.0704	5179.0054	0.000
4.320	0.0172	46539.	-700.4631	-0.001457	0.000	7.624E+08	-43.5421	5475.8911	0.000
4.500	0.0142	45074.	-788.3886	-0.001328	0.000	7.636E+08	-37.8704	5772.7768	0.000
4.680	0.0114	43420.	-864.0066	-0.001203	0.000	7.649E+08	-32.1464	6069.6624	0.000
4.860	0.008975	41602.	-927.2933	-0.001083	0.000	7.663E+08	-26.4524	6366.5481	0.000
5.040	0.006763	39648.	-978.3931	-0.000968	0.000	7.677E+08	-20.8622	6663.4338	0.000
5.220	0.004792	37584.	-1017.5999	-0.000860	0.000	7.691E+08	-15.4404	6960.3194	0.000
5.400	0.003049	35437.	-1045.3376	-0.000757	0.000	7.704E+08	-10.2427	7257.2051	0.000
5.580	0.001520	33232.	-1062.1416	-0.000661	0.000	7.717E+08	-5.3165	7554.0907	0.000
5.760	0.000193	30992.	-1068.6398	-0.000571	0.000	7.729E+08	-0.7003	7850.9764	0.000
5.940	-0.000948	28739.	-1065.5351	-0.000488	0.000	7.741E+08	3.5751	8147.8621	0.000
6.120	-0.001915	26494.	-1053.5883	-0.000411	0.000	7.751E+08	7.4868	8444.7477	0.000
6.300	-0.002723	24276.	-1033.6021	-0.000340	0.000	7.760E+08	11.0190	8741.6334	0.000
6.480	-0.003385	22102.	-1006.4061	-0.000276	0.000	7.769E+08	14.1625	9038.5191	0.000
6.660	-0.003914	19988.	-972.8433	-0.000217	0.000	7.776E+08	16.9142	9335.4047	0.000

6.840	-0.004323	17946.	-933.7572	-0.000165	0.000	7.782E+08	19.2766	9632.2904	0.000
7.020	-0.004624	15989.	-889.9811	-0.000117	0.000	7.788E+08	21.2568	9929.1760	0.000
7.200	-0.004830	14127.	-842.3279	-7.567E-05	0.000	7.792E+08	22.8665	10226.	0.000
7.380	-0.004951	12367.	-791.5819	-3.896E-05	0.000	7.796E+08	24.1206	10523.	0.000
7.560	-0.004998	10716.	-738.4914	-6.987E-06	0.000	7.799E+08	25.0373	10820.	0.000
7.740	-0.004981	9178.2034	-683.7632	2.056E-05	0.000	7.801E+08	25.6370	11117.	0.000
7.920	-0.004909	7757.4882	-628.0580	4.400E-05	0.000	7.803E+08	25.9420	11414.	0.000
8.100	-0.004791	6455.4888	-575.6662	6.367E-05	0.000	7.805E+08	22.5689	10175.	0.000
8.280	-0.004634	5256.8575	-527.1347	7.988E-05	0.000	7.806E+08	22.3676	10425.	0.000
8.460	-0.004446	4161.0136	-479.2451	9.291E-05	0.000	7.807E+08	21.9747	10676.	0.000
8.640	-0.004233	3166.4513	-432.3872	0.000103	0.000	7.807E+08	21.4123	10926.	0.000
8.820	-0.004001	2270.8440	-386.9032	0.000111	0.000	7.808E+08	20.7025	11176.	0.000
9.000	-0.003755	1471.1479	-343.0879	0.000116	0.000	7.808E+08	19.8672	11427.	0.000
9.180	-0.003501	763.7046	-301.1898	0.000119	0.000	7.808E+08	18.9274	11677.	0.000
9.360	-0.003242	144.3406	-261.4126	0.000120	0.000	7.808E+08	17.9033	11928.	0.000
9.540	-0.002982	-391.5366	-223.9175	0.000120	0.000	7.808E+08	16.8144	12178.	0.000
9.720	-0.002725	-848.8477	-188.8250	0.000118	0.000	7.808E+08	15.6787	12429.	0.000
9.900	-0.002472	-1232.7548	-156.2180	0.000115	0.000	7.808E+08	14.5130	12679.	0.000
10.080	-0.002227	-1548.5818	-126.1445	0.000111	0.000	7.808E+08	13.3329	12930.	0.000
10.260	-0.001992	-1801.7403	-98.6204	0.000107	0.000	7.808E+08	12.1524	13180.	0.000
10.440	-0.001767	-1997.6624	-73.6330	0.000101	0.000	7.808E+08	10.9842	13431.	0.000
10.620	-0.001553	-2141.7399	-51.1436	9.569E-05	0.000	7.808E+08	9.8394	13681.	0.000
10.800	-0.001353	-2239.2711	-31.0912	8.963E-05	0.000	7.808E+08	8.7277	13932.	0.000
10.980	-0.001166	-2295.4133	-13.3953	8.335E-05	0.000	7.808E+08	7.6574	14182.	0.000
11.160	-0.000993	-2315.1433	2.0410	7.698E-05	0.000	7.808E+08	6.6355	14433.	0.000
11.340	-0.000834	-2303.2231	15.3281	7.059E-05	0.000	7.808E+08	5.6674	14683.	0.000
11.520	-0.000688	-2264.1730	26.5870	6.427E-05	0.000	7.808E+08	4.7575	14934.	0.000
11.700	-0.000556	-2202.2499	35.9467	5.809E-05	0.000	7.808E+08	3.9090	15184.	0.000
11.880	-0.000437	-2121.4310	43.5422	5.211E-05	0.000	7.808E+08	3.1238	15435.	0.000
12.060	-0.000331	-2025.4038	49.5114	4.638E-05	0.000	7.808E+08	2.4032	15685.	0.000
12.240	-0.000237	-1917.5590	53.9938	4.092E-05	0.000	7.808E+08	1.7472	15935.	0.000
12.420	-0.000154	-1800.9897	57.1284	3.578E-05	0.000	7.808E+08	1.1552	16186.	0.000
12.600	-8.227E-05	-1678.4923	59.0522	3.096E-05	0.000	7.808E+08	0.6260	16436.	0.000
12.780	-2.040E-05	-1552.5727	59.8985	2.650E-05	0.000	7.808E+08	0.1576	16687.	0.000
12.960	3.219E-05	-1425.4540	59.7960	2.238E-05	0.000	7.808E+08	-0.2524	16937.	0.000
13.140	7.627E-05	-1299.0871	58.8680	1.861E-05	0.000	7.808E+08	-0.6069	17188.	0.000
13.320	0.000113	-1175.1636	57.2309	1.519E-05	0.000	7.808E+08	-0.9089	17438.	0.000
13.500	0.000142	-1055.1294	54.9946	1.210E-05	0.000	7.808E+08	-1.1618	17689.	0.000
13.680	0.000165	-940.2004	52.2613	9.340E-06	0.000	7.808E+08	-1.3691	17939.	0.000
13.860	0.000182	-831.3781	49.1254	6.890E-06	0.000	7.808E+08	-1.5345	18190.	0.000
14.040	0.000195	-729.4666	45.6739	4.731E-06	0.000	7.808E+08	-1.6614	18440.	0.000
14.220	0.000203	-635.0888	41.9857	2.843E-06	0.000	7.808E+08	-1.7536	18691.	0.000
14.400	0.000207	-548.7026	38.1324	1.206E-06	0.000	7.808E+08	-1.8143	18941.	0.000
14.580	0.000208	-470.6170	34.1785	-2.044E-07	0.000	7.808E+08	-1.8468	19192.	0.000
14.760	0.000206	-401.0074	30.1813	-1.410E-06	0.000	7.808E+08	-1.8543	19442.	0.000
14.940	0.000202	-339.9294	26.1920	-2.435E-06	0.000	7.808E+08	-1.8395	19693.	0.000
15.120	0.000195	-287.3323	22.9433	-3.303E-06	0.000	7.808E+08	-1.1685	12911.	0.000
15.300	0.000188	-240.1010	20.4573	-4.032E-06	0.000	7.808E+08	-1.1334	13056.	0.000
15.480	0.000178	-198.0859	18.0578	-4.638E-06	0.000	7.808E+08	-1.0884	13202.	0.000
15.660	0.000167	-161.0896	15.7647	-5.135E-06	0.000	7.808E+08	-1.0348	13348.	0.000
15.840	0.000156	-128.8733	13.5953	-5.536E-06	0.000	7.808E+08	-0.9738	13493.	0.000
16.020	0.000144	-101.1619	11.5647	-5.854E-06	0.000	7.808E+08	-0.9064	13639.	0.000
16.200	0.000131	-77.6492	9.6857	-6.102E-06	0.000	7.808E+08	-0.8334	13784.	0.000
16.380	0.000117	-58.0016	7.9694	-6.289E-06	0.000	7.808E+08	-0.7557	13930.	0.000
16.560	0.000103	-41.8628	6.4253	-6.427E-06	0.000	7.808E+08	-0.6740	14075.	0.000
16.740	8.942E-05	-28.8560	5.0616	-6.525E-06	0.000	7.808E+08	-0.5887	14221.	0.000
16.920	7.524E-05	-18.5873	3.8853	-6.591E-06	0.000	7.808E+08	-0.5004	14367.	0.000
17.100	6.095E-05	-10.6479	2.6964	-6.631E-06	0.000	7.808E+08	-0.6004	21278.	0.000
17.280	4.659E-05	-5.5066	1.5464	-6.654E-06	0.000	7.808E+08	-0.4644	21528.	0.000
17.460	3.220E-05	-2.5302	0.6942	-6.665E-06	0.000	7.808E+08	-0.3247	21779.	0.000
17.640	1.780E-05	-1.0679	0.1475	-6.670E-06	0.000	7.808E+08	-0.1815	22029.	0.000
17.820	3.391E-06	-0.4524	-0.0864	-6.672E-06	0.000	7.808E+08	-0.0350	22280.	0.000
18.000	-1.102E-05	0.0000	0.0000	-6.672E-06	0.000	7.808E+08	0.1150	11265.	0.000

* This analysis makes computations of pile response using nonlinear moment-curvature relationships.
 The above values of total stress are computed for combined axial and bending stress in elastic sections and do not equal actual stresses in concrete and steel in the range of nonlinear bending.

Output Summary for Load Case No. 1:

Pile-head deflection = 0.1689111 inches
 Computed slope at pile head = -0.0038077 radians
 Maximum bending moment = 50097. inch-lbs
 Maximum shear force = 1500.0000000 lbs
 Depth of maximum bending moment = 41.0400000 inches below pile head
 Depth of maximum shear force = 4.3200000 inches below pile head
 Number of iterations = 6
 Number of zero deflection points = 3

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

Boundary Condition Type 1, Shear and Moment

Shear = 1500. lbs
 Moment = 0. in-lbs
 Axial Load = 50000. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
18.0000	0.1689111	50097.	1500.0000000
17.1000	0.1689673	50111.	1500.0000000
16.2000	0.1689851	50110.	1500.0000000
15.3000	0.1689111	50068.	1500.0000000
14.4000	0.1690557	50120.	1500.0000000
13.5000	0.1689878	50066.	1500.0000001
12.6000	0.1691843	50104.	1500.0000000
11.7000	0.1691660	50082.	1500.0000001
10.8000	0.1691609	50091.	1500.0000001
9.9000	0.1694969	50044.	1500.0000001
9.0000	0.1716796	49830.	1500.0000000
8.1000	0.1798684	49382.	1500.0000000
7.2000	0.2087201	49087.	-1631.8389662
6.3000	0.3490042	51321.	-2311.3809611

 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 = 2000.000 lbs
 Applied moment at pile head = 0.000 in-lbs
 Axial thrust load on pile head = 50000.000 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. p lb/in	Soil Spr. Es*h lb/inch	Distrib. Lat. Load lb/inch
0.00	0.2430	-1.115E-07	2000.0000	-0.005417	0.000	7.808E+08	0.000	0.000	0.000
0.180	0.2313	4904.9910	2000.0000	-0.005410	0.000	7.808E+08	0.000	0.000	0.000
0.360	0.2196	9808.5166	2000.0000	-0.005389	0.000	7.801E+08	0.000	0.000	0.000
0.540	0.2080	14709.	2000.0000	-0.005355	0.000	7.791E+08	0.000	0.000	0.000
0.720	0.1965	19605.	2000.0000	-0.005308	0.000	7.777E+08	0.000	0.000	0.000
0.900	0.1850	24496.	2000.0000	-0.005247	0.000	7.759E+08	0.000	0.000	0.000
1.080	0.1738	29379.	1994.7635	-0.005171	0.000	7.738E+08	-4.8486	60.2630	0.000
1.260	0.1627	34230.	1971.2689	-0.005082	0.000	7.712E+08	-16.9057	224.4301	0.000
1.440	0.1518	38992.	1920.7481	-0.004980	0.000	7.681E+08	-29.8728	424.9778	0.000
1.620	0.1412	43603.	1841.8747	-0.004863	0.000	7.648E+08	-43.1581	660.2361	0.000
1.800	0.1308	48000.	1734.8172	-0.004734	0.000	7.612E+08	-55.9691	924.1013	0.000
1.980	0.1207	52120.	1600.9463	-0.004591	0.000	7.574E+08	-67.9855	1216.1881	0.000
2.160	0.1110	55907.	1442.7191	-0.004437	0.000	7.535E+08	-78.5212	1528.1378	0.000
2.340	0.1016	59311.	1263.1578	-0.004271	0.000	7.496E+08	-87.7393	1865.7243	0.000
2.520	0.0925	62287.	1065.1777	-0.004096	0.000	7.458E+08	-95.5756	2230.9249	0.000
2.700	0.0839	64797.	852.5800	-0.003911	0.000	7.422E+08	-101.2742	2607.7448	0.000
2.880	0.0756	66815.	628.9733	-0.003719	0.000	7.392E+08	-105.7690	3020.3171	0.000
3.060	0.0678	68318.	399.5288	-0.003521	0.000	7.367E+08	-106.6796	3397.6915	0.000
3.240	0.0604	69301.	172.6846	-0.003319	0.000	7.351E+08	-103.3613	3694.5771	0.000
3.420	0.0535	69781.	-45.6758	-0.003115	0.000	7.342E+08	-98.8243	3991.4628	0.000
3.600	0.0470	69777.	-253.1239	-0.002910	0.000	7.342E+08	-93.2572	4288.3485	0.000
3.780	0.0409	69316.	-447.6320	-0.002705	0.000	7.350E+08	-86.8428	4585.2341	0.000
3.960	0.0353	68427.	-627.5588	-0.002503	0.000	7.365E+08	-79.7561	4882.1198	0.000
4.140	0.0301	67145.	-791.6312	-0.002304	0.000	7.387E+08	-72.1629	5179.0054	0.000
4.320	0.0253	65505.	-938.9228	-0.002111	0.000	7.412E+08	-64.2182	5475.8911	0.000
4.500	0.0210	63545.	-1068.8294	-0.001923	0.000	7.440E+08	-56.0656	5772.7768	0.000
4.680	0.0170	61303.	-1181.0429	-0.001742	0.000	7.471E+08	-47.8359	6069.6624	0.000
4.860	0.0135	58819.	-1275.5250	-0.001569	0.000	7.502E+08	-39.6475	6366.5481	0.000
5.040	0.0102	56132.	-1352.4786	-0.001404	0.000	7.532E+08	-31.6058	6663.4338	0.000
5.220	0.007387	53280.	-1412.3202	-0.001247	0.000	7.562E+08	-23.8031	6960.3194	0.000
5.400	0.004857	50300.	-1455.6522	-0.001100	0.000	7.591E+08	-16.3191	7257.2051	0.000
5.580	0.002637	47229.	-1483.2354	-0.000961	0.000	7.618E+08	-9.2209	7554.0907	0.000
5.760	0.000705	44100.	-1495.9626	-0.000832	0.000	7.644E+08	-2.5636	7850.9764	0.000
5.940	-0.000957	40946.	-1494.8332	-0.000712	0.000	7.668E+08	3.6093	8147.8621	0.000
6.120	-0.002370	37796.	-1480.9289	-0.000601	0.000	7.689E+08	9.2650	8444.7477	0.000
6.300	-0.003553	34678.	-1455.3910	-0.000499	0.000	7.709E+08	14.3811	8741.6334	0.000
6.480	-0.004527	31617.	-1419.3996	-0.000407	0.000	7.726E+08	18.9443	9038.5191	0.000
6.660	-0.005310	28634.	-1374.1539	-0.000322	0.000	7.741E+08	22.9500	9335.4047	0.000
6.840	-0.005920	25750.	-1320.8545	-0.000247	0.000	7.754E+08	26.4013	9632.2904	0.000
7.020	-0.006376	22981.	-1260.6884	-0.000179	0.000	7.765E+08	29.3081	9929.1760	0.000
7.200	-0.006693	20343.	-1194.8143	-0.000119	0.000	7.775E+08	31.6864	10226.	0.000
7.380	-0.006888	17845.	-1124.3511	-6.560E-05	0.000	7.783E+08	33.5573	10523.	0.000
7.560	-0.006976	15500.	-1050.3677	-1.934E-05	0.000	7.789E+08	34.9459	10820.	0.000
7.740	-0.006972	13312.	-973.8749	-2.059E-05	0.000	7.794E+08	35.8808	11117.	0.000
7.920	-0.006887	11288.	-895.8186	5.467E-05	0.000	7.798E+08	36.3935	11414.	0.000
8.100	-0.006736	9430.3233	-822.2480	8.336E-05	0.000	7.801E+08	31.7275	10175.	0.000
8.280	-0.006527	7717.8683	-753.9587	0.000107	0.000	7.803E+08	31.5033	10425.	0.000
8.460	-0.006273	6150.0880	-686.4521	0.000126	0.000	7.805E+08	31.0028	10676.	0.000
8.640	-0.005982	4725.1163	-620.2910	0.000141	0.000	7.806E+08	30.2574	10926.	0.000
8.820	-0.005662	3439.9014	-555.9709	0.000153	0.000	7.807E+08	29.2983	11176.	0.000
9.000	-0.005322	2290.3528	-493.9199	0.000161	0.000	7.808E+08	28.1563	11427.	0.000
9.180	-0.004969	1271.4860	-434.5006	0.000165	0.000	7.808E+08	26.8616	11677.	0.000
9.360	-0.004607	377.5646	-378.0119	0.000168	0.000	7.808E+08	25.4428	11928.	0.000

9.540	-0.004244	-397.7636	-324.6919	0.000168	0.000	7.808E+08	23.9276	12178.	0.000
9.720	-0.003883	-1061.3365	-274.7211	0.000166	0.000	7.808E+08	22.3417	12429.	0.000
9.900	-0.003528	-1620.3550	-228.2261	0.000162	0.000	7.808E+08	20.7093	12679.	0.000
10.080	-0.003183	-2082.2681	-185.2833	0.000157	0.000	7.808E+08	19.0525	12930.	0.000
10.260	-0.002850	-2454.6675	-145.9235	0.000151	0.000	7.808E+08	17.3917	13180.	0.000
10.440	-0.002532	-2745.1908	-110.1359	0.000143	0.000	7.808E+08	15.7449	13431.	0.000
10.620	-0.002231	-2961.4343	-77.8729	0.000136	0.000	7.807E+08	14.1283	13681.	0.000
10.800	-0.001947	-3110.8761	-49.0540	0.000127	0.000	7.807E+08	12.5559	13932.	0.000
10.980	-0.001681	-3200.8076	-23.5708	0.000118	0.000	7.807E+08	11.0396	14182.	0.000
11.160	-0.001435	-3238.2762	-1.2911	0.000109	0.000	7.807E+08	9.5897	14433.	0.000
11.340	-0.001208	-3230.0355	17.9372	0.000101	0.000	7.807E+08	8.2142	14683.	0.000
11.520	-0.001001	-3182.5052	34.2817	9.167E-05	0.000	7.807E+08	6.9196	14934.	0.000
11.700	-0.000812	-3101.7399	47.9223	8.298E-05	0.000	7.807E+08	5.7105	15184.	0.000
11.880	-0.000642	-2993.4047	59.0471	7.455E-05	0.000	7.807E+08	4.5902	15435.	0.000
12.060	-0.000490	-2862.7591	67.8497	6.645E-05	0.000	7.807E+08	3.5603	15685.	0.000
12.240	-0.000355	-2714.6469	74.5260	5.873E-05	0.000	7.808E+08	2.6214	15935.	0.000
12.420	-0.000237	-2553.4931	79.2717	5.145E-05	0.000	7.808E+08	1.7728	16186.	0.000
12.600	-0.000133	-2383.3054	82.2800	4.462E-05	0.000	7.808E+08	1.0127	16436.	0.000
12.780	-4.383E-05	-2207.6808	83.7394	3.827E-05	0.000	7.808E+08	0.3386	16687.	0.000
12.960	3.223E-05	-2029.8168	83.8321	3.240E-05	0.000	7.808E+08	-0.2527	16937.	0.000
13.140	9.616E-05	-1852.5255	82.7328	2.703E-05	0.000	7.808E+08	-0.7652	17188.	0.000
13.320	0.000149	-1678.2506	80.6071	2.215E-05	0.000	7.808E+08	-1.2031	17438.	0.000
13.500	0.000192	-1509.0872	77.6110	1.774E-05	0.000	7.808E+08	-1.5711	17689.	0.000
13.680	0.000226	-1346.8030	73.8902	1.379E-05	0.000	7.808E+08	-1.8742	17939.	0.000
13.860	0.000251	-1192.8606	69.5794	1.028E-05	0.000	7.808E+08	-2.1173	18190.	0.000
14.040	0.000270	-1048.4402	64.8027	7.178E-06	0.000	7.808E+08	-2.3056	18440.	0.000
14.220	0.000282	-914.4635	59.6732	4.463E-06	0.000	7.808E+08	-2.4439	18691.	0.000
14.400	0.000289	-791.6160	54.2935	2.103E-06	0.000	7.808E+08	-2.5373	18941.	0.000
14.580	0.000292	-680.3698	48.7559	6.699E-08	0.000	7.808E+08	-2.5902	19192.	0.000
14.760	0.000290	-581.0051	43.1429	-1.678E-06	0.000	7.808E+08	-2.6070	19442.	0.000
14.940	0.000284	-493.6299	37.5284	-3.164E-06	0.000	7.808E+08	-2.5917	19693.	0.000
15.120	0.000276	-418.1990	32.9479	-4.426E-06	0.000	7.808E+08	-1.6495	12911.	0.000
15.300	0.000265	-350.3392	29.4354	-5.489E-06	0.000	7.808E+08	-1.6028	13056.	0.000
15.480	0.000252	-289.8525	26.0393	-6.374E-06	0.000	7.808E+08	-1.5418	13202.	0.000
15.660	0.000238	-236.4726	22.7884	-7.102E-06	0.000	7.808E+08	-1.4684	13348.	0.000
15.840	0.000222	-189.8728	19.7077	-7.692E-06	0.000	7.808E+08	-1.3841	13493.	0.000
16.020	0.000204	-149.6739	16.8190	-8.162E-06	0.000	7.808E+08	-1.2906	13639.	0.000
16.200	0.000186	-115.4516	14.1411	-8.528E-06	0.000	7.808E+08	-1.1890	13784.	0.000
16.380	0.000168	-86.7422	11.6901	-8.808E-06	0.000	7.808E+08	-1.0805	13930.	0.000
16.560	0.000148	-63.0480	9.4797	-9.015E-06	0.000	7.808E+08	-0.9661	14075.	0.000
16.740	0.000129	-43.8427	7.5218	-9.163E-06	0.000	7.808E+08	-0.8467	14221.	0.000
16.920	0.000109	-28.5746	5.8267	-9.263E-06	0.000	7.808E+08	-0.7228	14367.	0.000
17.100	8.859E-05	-16.6704	4.1036	-9.326E-06	0.000	7.808E+08	-0.8726	21278.	0.000
17.280	6.839E-05	-8.8326	2.4250	-9.361E-06	0.000	7.808E+08	-0.6816	21528.	0.000
17.460	4.815E-05	-4.1725	1.1645	-9.379E-06	0.000	7.808E+08	-0.4854	21779.	0.000
17.640	2.787E-05	-1.7761	0.3332	-9.387E-06	0.000	7.808E+08	-0.2843	22029.	0.000
17.820	7.593E-06	-0.7054	-0.0584	-9.391E-06	0.000	7.808E+08	-0.0783	22280.	0.000
18.000	-1.269E-05	0.0000	0.0000	-9.392E-06	0.000	7.808E+08	0.1324	11265.	0.000

* This analysis makes computations of pile response using nonlinear moment-curvature relationships.

The above values of total stress are computed for combined axial and bending stress in elastic

sections and do not equal actual stresses in concrete and steel in the range of nonlinear bending.

Output Summary for Load Case No. 2:

Pile-head deflection = 0.2429594 inches
Computed slope at pile head = -0.0054166 radians
Maximum bending moment = 69781. inch-lbs
Maximum shear force = 2000.0000000 lbs
Depth of maximum bending moment = 41.0400000 inches below pile head
Depth of maximum shear force = 2.1600000 inches below pile head
Number of iterations = 9
Number of zero deflection points = 3

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

Boundary Condition Type 1, Shear and Moment

Shear = 2000. lbs
Moment = 0. in-lbs
Axial Load = 50000. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
18.0000	0.2429594	69781.	2000.0000000
17.1000	0.2431330	69824.	2000.0000000
16.2000	0.2430863	69842.	2000.0000000
15.3000	0.2429646	69832.	2000.0000000
14.4000	0.2431839	69851.	2000.0000001
13.5000	0.2431270	69830.	2000.0000000
12.6000	0.2434221	69861.	2000.0000001
11.7000	0.2433907	69839.	2000.0000001
10.8000	0.2434094	69825.	2000.0000001
9.9000	0.2441371	69802.	2000.0000002
9.0000	0.2487474	69673.	2000.0000000
8.1000	0.2671174	69537.	2000.0000000
7.2000	0.3447259	69928.	-2482.9701611

 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 = 2200.000 lbs
 Applied moment at pile head = 0.000 in-lbs
 Axial thrust load on pile head = 50000.000 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. p lb/in	Soil Spr. Es*h lb/inch	Distrib. Lat. Load lb/inch
0.00	0.2911	1.858E-07	2200.0000	-0.006461	0.000	7.808E+08	0.000	0.000	0.000
0.180	0.2771	5449.7880	2200.0000	-0.006453	0.000	7.808E+08	0.000	0.000	0.000
0.360	0.2632	10898.	2200.0000	-0.006431	0.000	7.799E+08	0.000	0.000	0.000
0.540	0.2493	16343.	2200.0000	-0.006393	0.000	7.787E+08	0.000	0.000	0.000
0.720	0.2356	21783.	2200.0000	-0.006340	0.000	7.770E+08	0.000	0.000	0.000
0.900	0.2220	27216.	2200.0000	-0.006272	0.000	7.748E+08	0.000	0.000	0.000
1.080	0.2085	32642.	2194.4806	-0.006188	0.000	7.721E+08	-5.1106	52.9455	0.000
1.260	0.1952	38033.	2169.7218	-0.006089	0.000	7.688E+08	-17.8142	197.0973	0.000
1.440	0.1822	43330.	2116.4734	-0.005975	0.000	7.650E+08	-31.4898	373.3366	0.000
1.620	0.1694	48467.	2033.3275	-0.005845	0.000	7.608E+08	-45.4971	580.0718	0.000
1.800	0.1569	53376.	1920.4095	-0.005700	0.000	7.561E+08	-59.0566	812.8052	0.000
1.980	0.1448	57994.	1779.0922	-0.005540	0.000	7.511E+08	-71.7927	1070.9831	0.000
2.160	0.1330	62259.	1611.9321	-0.005366	0.000	7.458E+08	-82.9852	1347.6475	0.000
2.340	0.1216	66117.	1422.0725	-0.005180	0.000	7.403E+08	-92.8108	1648.4585	0.000
2.520	0.1106	69521.	1212.5424	-0.004981	0.000	7.347E+08	-101.1986	1975.8332	0.000
2.700	0.1001	72431.	987.3329	-0.004765	0.000	6.860E+08	-107.3287	2316.1527	0.000
2.880	0.0900	74815.	750.3122	-0.004530	0.000	6.688E+08	-112.1349	2689.8383	0.000
3.060	0.0805	76651.	505.7925	-0.004283	0.000	6.539E+08	-114.2722	3065.3141	0.000
3.240	0.0715	77926.	258.3137	-0.004025	0.000	6.429E+08	-114.8749	3468.1261	0.000
3.420	0.0631	78636.	12.5728	-0.003761	0.000	6.363E+08	-112.6630	3854.5167	0.000
3.600	0.0553	78792.	-227.4851	-0.003493	0.000	6.348E+08	-109.6128	4281.4941	0.000
3.780	0.0480	78408.	-456.0122	-0.003227	0.000	6.384E+08	-101.9864	4585.2341	0.000
3.960	0.0414	77519.	-667.1215	-0.002964	0.000	6.465E+08	-93.4851	4882.1198	0.000
4.140	0.0352	76166.	-859.3328	-0.002710	0.000	6.580E+08	-84.4882	5179.0054	0.000
4.320	0.0297	74392.	-1031.7714	-0.002465	0.000	6.719E+08	-75.1772	5475.8911	0.000
4.500	0.0246	72241.	-1183.9315	-0.002232	0.000	6.872E+08	-65.7118	5772.7768	0.000
4.680	0.0200	69760.	-1315.6306	-0.002016	0.000	7.343E+08	-56.2318	6069.6624	0.000
4.860	0.0159	66993.	-1426.9054	-0.001816	0.000	7.389E+08	-46.8004	6366.5481	0.000
5.040	0.0122	63988.	-1517.9905	-0.001625	0.000	7.434E+08	-37.5377	6663.4338	0.000
5.220	0.008860	60787.	-1589.3645	-0.001444	0.000	7.478E+08	-28.5493	6960.3194	0.000
5.400	0.005931	57433.	-1641.7174	-0.001274	0.000	7.518E+08	-19.9256	7257.2051	0.000
5.580	0.003358	53970.	-1675.9199	-0.001114	0.000	7.555E+08	-11.7433	7554.0907	0.000
5.760	0.001118	50434.	-1692.9930	-0.000965	0.000	7.590E+08	-4.0652	7850.9764	0.000
5.940	-0.000811	46864.	-1694.0795	-0.000827	0.000	7.622E+08	3.0591	8147.8621	0.000
6.120	-0.002453	43294.	-1680.4161	-0.000699	0.000	7.650E+08	9.5922	8444.7477	0.000
6.300	-0.003832	39756.	-1653.3076	-0.000582	0.000	7.676E+08	15.5082	8741.6334	0.000
6.480	-0.004969	36278.	-1614.1032	-0.000475	0.000	7.699E+08	20.7921	9038.5191	0.000
6.660	-0.005886	32886.	-1564.1744	-0.000379	0.000	7.719E+08	25.4383	9335.4047	0.000
6.840	-0.006604	29602.	-1504.8948	-0.000291	0.000	7.736E+08	29.4502	9632.2904	0.000
7.020	-0.007144	26447.	-1437.6224	-0.000213	0.000	7.751E+08	32.8390	9929.1760	0.000
7.200	-0.007524	23438.	-1363.6841	-0.000144	0.000	7.764E+08	35.6224	10226.	0.000
7.380	-0.007764	20587.	-1284.3616	-8.236E-05	0.000	7.774E+08	37.8243	10523.	0.000
7.560	-0.007880	17907.	-1200.8803	-2.891E-05	0.000	7.782E+08	39.4732	10820.	0.000
7.740	-0.007889	15406.	-1114.3998	-1.730E-05	0.000	7.789E+08	40.6014	11117.	0.000
7.920	-0.007805	13089.	-1026.0063	-5.680E-05	0.000	7.794E+08	41.2445	11414.	0.000
8.100	-0.007644	10961.	-942.5771	-9.011E-05	0.000	7.799E+08	36.0048	10175.	0.000
8.280	-0.007416	8997.7723	-865.0350	0.000118	0.000	7.802E+08	35.7934	10425.	0.000
8.460	-0.007135	7198.7336	-788.2936	0.000140	0.000	7.804E+08	35.2634	10676.	0.000
8.640	-0.006811	5562.0679	-713.0027	0.000158	0.000	7.806E+08	34.4505	10926.	0.000
8.820	-0.006453	4084.4720	-639.7347	0.000171	0.000	7.807E+08	33.3903	11176.	0.000
9.000	-0.006071	2761.4413	-568.9857	0.000181	0.000	7.808E+08	32.1181	11427.	0.000
9.180	-0.005673	1587.4356	-501.1767	0.000187	0.000	7.808E+08	30.6680	11677.	0.000
9.360	-0.005265	556.0403	-436.6561	0.000190	0.000	7.808E+08	29.0732	11928.	0.000

9.540	-0.004854	-339.8771	-375.7027	0.000190	0.000	7.808E+08	27.3651	12178.	0.000
9.720	-0.004444	-1108.0184	-318.5293	0.000188	0.000	7.808E+08	25.5732	12429.	0.000
9.900	-0.004042	-1756.5141	-265.2868	0.000184	0.000	7.808E+08	23.7254	12679.	0.000
10.080	-0.003650	-2293.7919	-216.0687	0.000178	0.000	7.808E+08	21.8470	12930.	0.000
10.260	-0.003271	-2728.4551	-170.9158	0.000171	0.000	7.808E+08	19.9613	13180.	0.000
10.440	-0.002909	-3069.1718	-129.8213	0.000163	0.000	7.807E+08	18.0892	13431.	0.000
10.620	-0.002565	-3324.5746	-92.7358	0.000155	0.000	7.807E+08	16.2493	13681.	0.000
10.800	-0.002242	-3503.1713	-59.5721	0.000145	0.000	7.807E+08	14.4578	13932.	0.000
10.980	-0.001939	-3613.2668	-30.2106	0.000135	0.000	7.807E+08	12.7287	14182.	0.000
11.160	-0.001657	-3662.8955	-4.5041	0.000125	0.000	7.807E+08	11.0736	14433.	0.000
11.340	-0.001398	-3659.7647	17.7177	0.000115	0.000	7.807E+08	9.5021	14683.	0.000
11.520	-0.001160	-3611.2073	36.6432	0.000105	0.000	7.807E+08	8.0216	14934.	0.000
11.700	-0.000944	-3524.1454	52.4752	9.513E-05	0.000	7.807E+08	6.6377	15184.	0.000
11.880	-0.000749	-3405.0618	65.4264	8.554E-05	0.000	7.807E+08	5.3542	15435.	0.000
12.060	-0.000575	-3259.9803	75.7160	7.632E-05	0.000	7.807E+08	4.1732	15685.	0.000
12.240	-0.000420	-3094.4541	83.5663	6.753E-05	0.000	7.807E+08	3.0955	15935.	0.000
12.420	-0.000283	-2913.5609	89.1994	5.922E-05	0.000	7.807E+08	2.1204	16186.	0.000
12.600	-0.000164	-2721.9042	92.8352	5.143E-05	0.000	7.808E+08	1.2461	16436.	0.000
12.780	-6.081E-05	-2523.6206	94.6883	4.417E-05	0.000	7.808E+08	0.4698	16687.	0.000
12.960	2.706E-05	-2322.3913	94.9665	3.747E-05	0.000	7.808E+08	-0.2122	16937.	0.000
13.140	0.000101	-2121.4580	93.8690	3.132E-05	0.000	7.808E+08	-0.8040	17188.	0.000
13.320	0.000162	-1923.6422	91.5850	2.572E-05	0.000	7.808E+08	-1.3107	17438.	0.000
13.500	0.000212	-1731.3671	88.2929	2.067E-05	0.000	7.808E+08	-1.7375	17689.	0.000
13.680	0.000252	-1546.6812	84.1593	1.613E-05	0.000	7.808E+08	-2.0899	17939.	0.000
13.860	0.000282	-1371.2839	79.3386	1.210E-05	0.000	7.808E+08	-2.3736	18190.	0.000
14.040	0.000304	-1206.5513	73.9731	8.531E-06	0.000	7.808E+08	-2.5944	18440.	0.000
14.220	0.000319	-1053.5629	68.1925	5.405E-06	0.000	7.808E+08	-2.7579	18691.	0.000
14.400	0.000327	-913.1271	62.1147	2.685E-06	0.000	7.808E+08	-2.8697	18941.	0.000
14.580	0.000330	-785.8072	55.8458	3.348E-07	0.000	7.808E+08	-2.9349	19192.	0.000
14.760	0.000329	-671.9456	49.4808	-1.682E-06	0.000	7.808E+08	-2.9586	19442.	0.000
14.940	0.000323	-571.6869	43.1046	-3.402E-06	0.000	7.808E+08	-2.9453	19693.	0.000
15.120	0.000314	-484.9988	37.8967	-4.863E-06	0.000	7.808E+08	-1.8769	12911.	0.000
15.300	0.000302	-406.9225	33.8979	-6.097E-06	0.000	7.808E+08	-1.8258	13056.	0.000
15.480	0.000288	-337.2429	30.0272	-7.127E-06	0.000	7.808E+08	-1.7582	13202.	0.000
15.660	0.000271	-275.6656	26.3180	-7.974E-06	0.000	7.808E+08	-1.6762	13348.	0.000
15.840	0.000253	-221.8265	22.7994	-8.662E-06	0.000	7.808E+08	-1.5818	13493.	0.000
16.020	0.000234	-175.3011	19.4965	-9.212E-06	0.000	7.808E+08	-1.4765	13639.	0.000
16.200	0.000213	-135.6121	16.4310	-9.642E-06	0.000	7.808E+08	-1.3619	13784.	0.000
16.380	0.000192	-102.2368	13.6215	-9.971E-06	0.000	7.808E+08	-1.2394	13930.	0.000
16.560	0.000170	-74.6134	11.0841	-1.022E-05	0.000	7.808E+08	-1.1100	14075.	0.000
16.740	0.000148	-52.1467	8.8326	-1.039E-05	0.000	7.808E+08	-0.9748	14221.	0.000
16.920	0.000125	-34.2122	6.8787	-1.051E-05	0.000	7.808E+08	-0.8344	14367.	0.000
17.100	0.000103	-20.1606	4.8854	-1.059E-05	0.000	7.808E+08	-1.0112	21278.	0.000
17.280	7.972E-05	-10.8206	2.9352	-1.063E-05	0.000	7.808E+08	-0.7946	21528.	0.000
17.460	5.673E-05	-5.1847	1.4592	-1.065E-05	0.000	7.808E+08	-0.5720	21779.	0.000
17.640	3.371E-05	-2.2162	0.4701	-1.066E-05	0.000	7.808E+08	-0.3438	22029.	0.000
17.820	1.068E-05	-0.8512	-0.0202	-1.066E-05	0.000	7.808E+08	-0.1102	22280.	0.000
18.000	-1.236E-05	0.0000	0.0000	-1.067E-05	0.000	7.808E+08	0.1289	11265.	0.000

* This analysis makes computations of pile response using nonlinear moment-curvature relationships.

The above values of total stress are computed for combined axial and bending stress in elastic

sections and do not equal actual stresses in concrete and steel in the range of nonlinear bending.

Output Summary for Load Case No. 3:

Pile-head deflection = 0.2910867 inches
Computed slope at pile head = -0.0064610 radians
Maximum bending moment = 78792. inch-lbs
Maximum shear force = 2200.0000000 lbs
Depth of maximum bending moment = 43.2000000 inches below pile head
Depth of maximum shear force = 10.8000000 inches below pile head
Number of iterations = 16
Number of zero deflection points = 3

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

Boundary Condition Type 1, Shear and Moment

Shear = 2200. lbs
Moment = 0. in-lbs
Axial Load = 50000. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
18.0000	0.2910867	78792.	2200.0000000
17.1000	0.2915616	78838.	2200.0000000
16.2000	0.2916087	78843.	2200.0000000
15.3000	0.2915357	78792.	2200.0000001
14.4000	0.2918854	78841.	2200.0000000
13.5000	0.2914833	78774.	2200.0000000
12.6000	0.2918603	78829.	2200.0000001
11.7000	0.2916884	78783.	2200.0000000
10.8000	0.2918397	78819.	2200.0000002
9.9000	0.2927445	78781.	2200.0000000
9.0000	0.2992046	78648.	2200.0000001
8.1000	0.3257297	78463.	-2241.9535215
7.2000	0.4277436	78992.	-2878.9472279

 Computed Values of Pile Loading and Deflection
 for Lateral Loading for Load Case Number 4

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

Shear force at pile head = 2400.000 lbs
 Applied moment at pile head = 0.000 in-lbs
 Axial thrust load on pile head = 50000.000 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. p lb/in	Soil Spr. Es*h lb/inch	Distrib. Lat. Load lb/inch
0.00	0.3650	2.601E-07	2400.0000	-0.008072	0.000	7.808E+08	0.000	0.000	0.000
0.180	0.3476	6055.8233	2400.0000	-0.008064	0.000	7.808E+08	0.000	0.000	0.000
0.360	0.3302	12110.	2400.0000	-0.008039	0.000	7.796E+08	0.000	0.000	0.000
0.540	0.3128	18160.	2400.0000	-0.007997	0.000	7.782E+08	0.000	0.000	0.000
0.720	0.2956	24205.	2400.0000	-0.007938	0.000	7.761E+08	0.000	0.000	0.000
0.900	0.2786	30243.	2400.0000	-0.007862	0.000	7.733E+08	0.000	0.000	0.000
1.080	0.2617	36271.	2394.0471	-0.007769	0.000	7.699E+08	-5.5119	45.5002	0.000
1.260	0.2450	42263.	2367.3551	-0.007659	0.000	7.658E+08	-19.2030	169.3051	0.000
1.440	0.2286	48153.	2309.9814	-0.007531	0.000	7.610E+08	-33.9208	320.5418	0.000
1.620	0.2125	53869.	2220.5541	-0.007385	0.000	7.556E+08	-48.8822	496.9668	0.000
1.800	0.1967	59341.	2099.3908	-0.007223	0.000	7.495E+08	-63.3060	695.2664	0.000
1.980	0.1813	64498.	1948.0179	-0.007043	0.000	7.427E+08	-76.8541	915.8499	0.000
2.160	0.1662	69277.	1769.0708	-0.006848	0.000	7.351E+08	-88.8376	1154.2460	0.000
2.340	0.1517	73620.	1565.7341	-0.006629	0.000	6.777E+08	-99.4370	1416.0817	0.000
2.520	0.1376	77473.	1341.1403	-0.006382	0.000	6.468E+08	-108.5202	1703.3902	0.000
2.700	0.1241	80792.	1099.5340	-0.006111	0.000	6.147E+08	-115.1894	2004.8400	0.000
2.880	0.1112	83543.	845.1418	-0.005814	0.000	5.823E+08	-120.3589	2337.6658	0.000
3.060	0.0990	85699.	582.6823	-0.005491	0.000	5.510E+08	-122.6592	2676.5199	0.000
3.240	0.0875	87246.	316.8037	-0.005144	0.000	5.256E+08	-123.5247	3049.6302	0.000
3.420	0.0768	88179.	52.2565	-0.004777	0.000	5.082E+08	-121.4264	3416.5741	0.000
3.600	0.0669	88504.	-206.8310	-0.004399	0.000	5.019E+08	-118.4695	3827.6802	0.000
3.780	0.0578	88235.	-458.4676	-0.004021	0.000	5.071E+08	-114.5274	4282.6923	0.000
3.960	0.0495	87392.	-698.4985	-0.003653	0.000	5.231E+08	-107.7234	4702.2386	0.000
4.140	0.0420	86007.	-920.8821	-0.003302	0.000	5.465E+08	-98.1873	5051.6069	0.000
4.320	0.0352	84127.	-1120.0416	-0.002974	0.000	5.745E+08	-86.2195	5288.0328	0.000
4.500	0.0291	81811.	-1297.2557	-0.002669	0.000	6.034E+08	-77.8676	5772.7768	0.000
4.680	0.0237	79099.	-1453.2356	-0.002388	0.000	6.318E+08	-66.5583	6069.6624	0.000
4.860	0.0188	76048.	-1585.0290	-0.002128	0.000	6.590E+08	-55.4726	6366.5481	0.000
5.040	0.0145	72712.	-1693.2266	-0.001889	0.000	6.841E+08	-44.7104	6663.4338	0.000
5.220	0.0107	69142.	-1778.6190	-0.001672	0.000	7.354E+08	-34.3566	6960.3194	0.000
5.400	0.007269	65389.	-1842.1016	-0.001475	0.000	7.414E+08	-24.4235	7257.2051	0.000
5.580	0.004288	61502.	-1884.6757	-0.001291	0.000	7.468E+08	-14.9970	7554.0907	0.000
5.760	0.001691	57526.	-1907.5117	-0.001120	0.000	7.517E+08	-6.1475	7850.9764	0.000
5.940	-0.000548	53504.	-1911.9166	-0.000961	0.000	7.560E+08	2.0690	8147.8621	0.000
6.120	-0.002458	49474.	-1899.3031	-0.000814	0.000	7.598E+08	9.6102	8444.7477	0.000
6.300	-0.004064	45475.	-1871.1615	-0.000679	0.000	7.633E+08	16.4469	8741.6334	0.000
6.480	-0.005392	41538.	-1829.0321	-0.000556	0.000	7.663E+08	22.5619	9038.5191	0.000
6.660	-0.006467	37693.	-1774.4803	-0.000445	0.000	7.690E+08	27.9490	9335.4047	0.000
6.840	-0.007313	33968.	-1709.0746	-0.000344	0.000	7.713E+08	32.6118	9632.2904	0.000
7.020	-0.007954	30384.	-1634.3661	-0.000254	0.000	7.733E+08	36.5627	9929.1760	0.000
7.200	-0.008411	26962.	-1551.8708	-0.000174	0.000	7.749E+08	39.8219	10226.	0.000
7.380	-0.008707	23718.	-1463.0540	-0.000104	0.000	7.763E+08	42.4159	10523.	0.000
7.560	-0.008859	20664.	-1369.3177	-4.194E-05	0.000	7.774E+08	44.3770	10820.	0.000
7.740	-0.008888	17812.	-1271.9896	-1.149E-05	0.000	7.783E+08	45.7417	11117.	0.000
7.920	-0.008809	15167.	-1172.3145	5.723E-05	0.000	7.790E+08	46.5500	11414.	0.000
8.100	-0.008640	12735.	-1078.0839	9.591E-05	0.000	7.795E+08	40.7005	10175.	0.000
8.280	-0.008395	10489.	-990.3671	0.000128	0.000	7.799E+08	40.5187	10425.	0.000
8.460	-0.008087	8428.8262	-903.4393	0.000154	0.000	7.803E+08	39.9699	10676.	0.000
8.640	-0.007729	6552.7185	-818.0495	0.000175	0.000	7.805E+08	39.0947	10926.	0.000
8.820	-0.007331	4857.0526	-734.8588	0.000191	0.000	7.806E+08	37.9337	11176.	0.000
9.000	-0.006905	3336.9188	-654.4412	0.000202	0.000	7.807E+08	36.5270	11427.	0.000
9.180	-0.006458	1986.2083	-577.2855	0.000209	0.000	7.808E+08	34.9134	11677.	0.000
9.360	-0.006000	797.7964	-503.7977	0.000213	0.000	7.808E+08	33.1308	11928.	0.000

9.540	-0.005536	-236.2786	-434.3043	0.000214	0.000	7.808E+08	31.2150	12178.	0.000
9.720	-0.005075	-1124.6463	-369.0562	0.000212	0.000	7.808E+08	29.1999	12429.	0.000
9.900	-0.004620	-1876.4431	-308.2338	0.000208	0.000	7.808E+08	27.1171	12679.	0.000
10.080	-0.004176	-2501.1616	-251.9517	0.000202	0.000	7.808E+08	24.9959	12930.	0.000
10.260	-0.003747	-3008.5118	-200.2641	0.000194	0.000	7.807E+08	22.8630	13180.	0.000
10.440	-0.003336	-3408.2934	-153.1702	0.000186	0.000	7.807E+08	20.7424	13431.	0.000
10.620	-0.002945	-3710.2808	-110.6205	0.000176	0.000	7.807E+08	18.6555	13681.	0.000
10.800	-0.002577	-3924.1204	-72.5217	0.000165	0.000	7.807E+08	16.6211	13932.	0.000
10.980	-0.002232	-4059.2401	-38.7434	0.000154	0.000	7.807E+08	14.6552	14182.	0.000
11.160	-0.001911	-4124.7717	-9.1228	0.000143	0.000	7.807E+08	12.7714	14433.	0.000
11.340	-0.001615	-4129.4847	16.5295	0.000131	0.000	7.807E+08	10.9807	14683.	0.000
11.520	-0.001344	-4081.7320	38.4242	0.000120	0.000	7.807E+08	9.2921	14934.	0.000
11.700	-0.001097	-3989.4064	56.7886	0.000109	0.000	7.807E+08	7.7120	15184.	0.000
11.880	-0.000874	-3859.9075	71.8623	9.795E-05	0.000	7.807E+08	6.2450	15435.	0.000
12.060	-0.000674	-3700.1184	83.8922	8.749E-05	0.000	7.807E+08	4.8938	15685.	0.000
12.240	-0.000496	-3516.3912	93.1296	7.751E-05	0.000	7.807E+08	3.6593	15935.	0.000
12.420	-0.000339	-3314.5403	99.8259	6.806E-05	0.000	7.807E+08	2.5410	16186.	0.000
12.600	-0.000202	-3099.8437	104.2303	5.918E-05	0.000	7.807E+08	1.5371	16436.	0.000
12.780	-8.342E-05	-2877.0493	106.5864	5.092E-05	0.000	7.807E+08	0.6445	16687.	0.000
12.960	1.796E-05	-2650.3886	107.1303	4.327E-05	0.000	7.808E+08	-0.1409	16937.	0.000
13.140	0.000104	-2423.5932	106.0886	3.625E-05	0.000	7.808E+08	-0.8237	17188.	0.000
13.320	0.000175	-2199.9165	103.6769	2.986E-05	0.000	7.808E+08	-1.4094	17438.	0.000
13.500	0.000232	-1982.1582	100.0985	2.407E-05	0.000	7.808E+08	-1.9039	17689.	0.000
13.680	0.000279	-1772.6906	95.5436	1.888E-05	0.000	7.808E+08	-2.3135	17939.	0.000
13.860	0.000314	-1573.4874	90.1888	1.425E-05	0.000	7.808E+08	-2.6446	18190.	0.000
14.040	0.000340	-1386.1528	84.1967	1.016E-05	0.000	7.808E+08	-2.9037	18440.	0.000
14.220	0.000358	-1211.9515	77.7158	6.562E-06	0.000	7.808E+08	-3.0971	18691.	0.000
14.400	0.000368	-1051.8378	70.8814	3.431E-06	0.000	7.808E+08	-3.2311	18941.	0.000
14.580	0.000373	-906.4850	63.8150	7.217E-07	0.000	7.808E+08	-3.3118	19192.	0.000
14.760	0.000372	-776.3127	56.6261	-1.606E-06	0.000	7.808E+08	-3.3446	19442.	0.000
14.940	0.000366	-661.5133	49.4121	-3.595E-06	0.000	7.808E+08	-3.3350	19693.	0.000
15.120	0.000356	-562.0759	43.5118	-5.287E-06	0.000	7.808E+08	-2.1283	12911.	0.000
15.300	0.000343	-472.4001	38.9744	-6.718E-06	0.000	7.808E+08	-2.0731	13056.	0.000
15.480	0.000327	-392.2553	34.5767	-7.914E-06	0.000	7.808E+08	-1.9989	13202.	0.000
15.660	0.000309	-321.3191	30.3573	-8.901E-06	0.000	7.808E+08	-1.9080	13348.	0.000
15.840	0.000289	-259.1890	26.3497	-9.704E-06	0.000	7.808E+08	-1.8027	13493.	0.000
16.020	0.000267	-205.3922	22.5831	-1.035E-05	0.000	7.808E+08	-1.6849	13639.	0.000
16.200	0.000244	-159.3952	19.0825	-1.085E-05	0.000	7.808E+08	-1.5564	13784.	0.000
16.380	0.000220	-120.6119	15.8695	-1.124E-05	0.000	7.808E+08	-1.4186	13930.	0.000
16.560	0.000195	-88.4111	12.9628	-1.153E-05	0.000	7.808E+08	-1.2729	14075.	0.000
16.740	0.000170	-62.1226	10.3781	-1.174E-05	0.000	7.808E+08	-1.1203	14221.	0.000
16.920	0.000145	-41.0426	8.1292	-1.188E-05	0.000	7.808E+08	-0.9620	14367.	0.000
17.100	0.000119	-24.4384	5.8259	-1.197E-05	0.000	7.808E+08	-1.1708	21278.	0.000
17.280	9.292E-05	-13.2894	3.5612	-1.202E-05	0.000	7.808E+08	-0.9262	21528.	0.000
17.460	6.692E-05	-6.4574	1.8323	-1.205E-05	0.000	7.808E+08	-0.6747	21779.	0.000
17.640	4.087E-05	-2.7714	0.6534	-1.206E-05	0.000	7.808E+08	-0.4168	22029.	0.000
17.820	1.481E-05	-1.0295	0.0382	-1.207E-05	0.000	7.808E+08	-0.1528	22280.	0.000
18.000	-1.126E-05	0.0000	0.0000	-1.207E-05	0.000	7.808E+08	0.1174	11265.	0.000

* This analysis makes computations of pile response using nonlinear moment-curvature relationships.

The above values of total stress are computed for combined axial and bending stress in elastic

sections and do not equal actual stresses in concrete and steel in the range of nonlinear bending.

Output Summary for Load Case No. 4:

Pile-head deflection = 0.3650112 inches
Computed slope at pile head = -0.0080724 radians
Maximum bending moment = 88504. inch-lbs
Maximum shear force = 2400.0000000 lbs
Depth of maximum bending moment = 43.2000000 inches below pile head
Depth of maximum shear force = 10.8000000 inches below pile head
Number of iterations = 32
Number of zero deflection points = 3

Pile-head Deflection vs. Pile Length for Load Case 4

Boundary Condition Type 1, Shear and Moment

Shear = 2400. lbs
Moment = 0. in-lbs
Axial Load = 50000. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
18.0000	0.3650112	88504.	2400.0000000
17.1000	0.3659457	88566.	2400.0000000
16.2000	0.3654652	88531.	2400.0000000
15.3000	0.3650309	88465.	2400.0000000
14.4000	0.3656634	88555.	2400.0000000
13.5000	0.3654829	88487.	2400.0000001
12.6000	0.3659388	88532.	2400.0000001
11.7000	0.3659350	88516.	2400.0000000
10.8000	0.3657955	88504.	2400.0000001
9.9000	0.3669871	88459.	2400.0000002
9.0000	0.3750673	88287.	2400.0000001
8.1000	0.4068096	88031.	-2557.3570617
7.2000	0.5346115	88739.	-3298.8060637

Summary of Pile Response(s)

Definitions of Pile-head Loading Conditions:

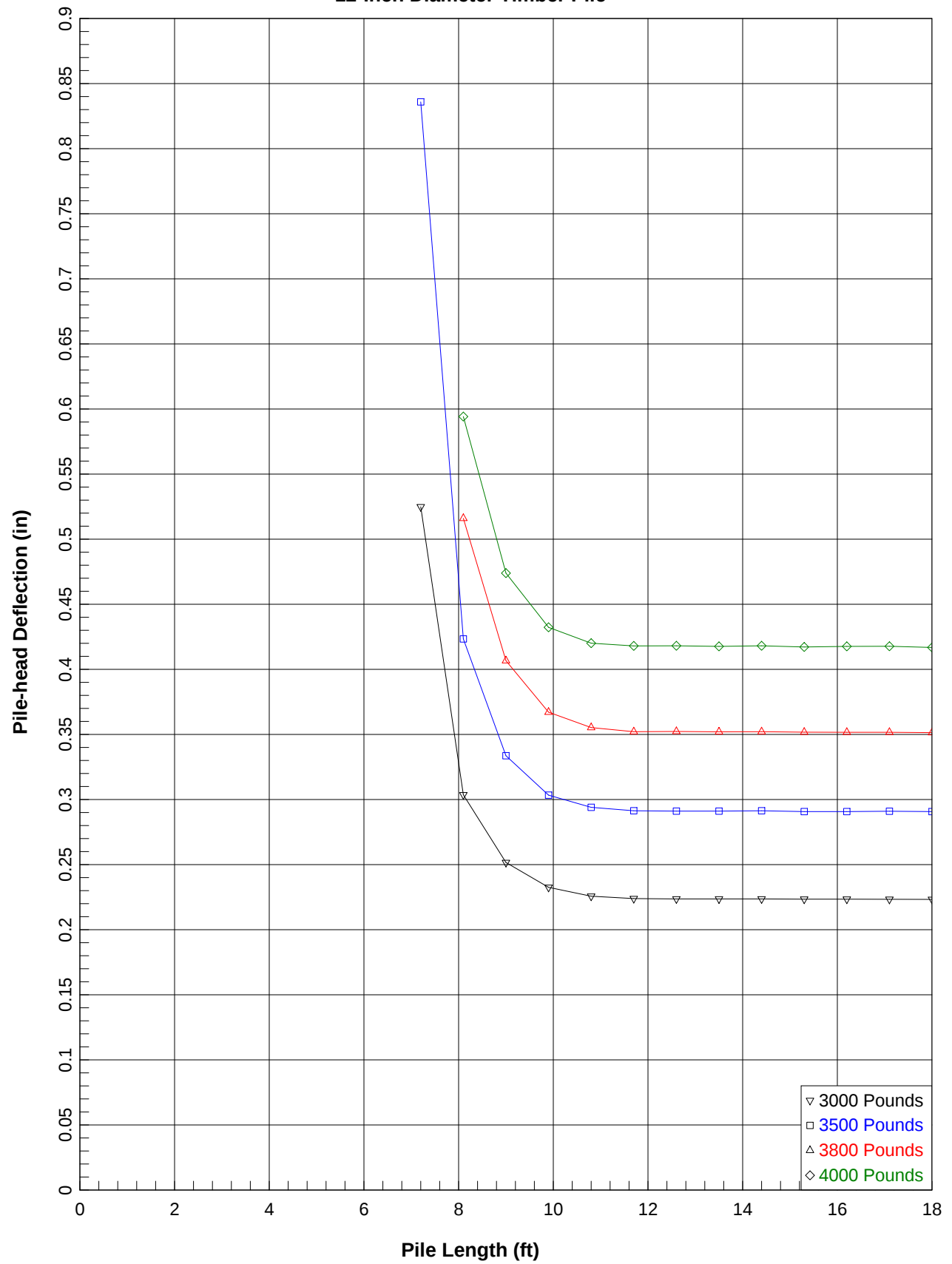
Load Type 1: Load 1 = Shear, lbs, and Load 2 = Moment, in-lbs
Load Type 2: Load 1 = Shear, lbs, and Load 2 = Slope, radians
Load Type 3: Load 1 = Shear, lbs, and Load 2 = Rotational Stiffness, in-lbs/radian
Load Type 4: Load 1 = Top Deflection, inches, and Load 2 = Moment, in-lbs
Load Type 5: Load 1 = Top Deflection, inches, and Load 2 = Slope, radians

Load Case No.	Load Type No.	Pile-head Condition 1 V(lbs) or y(inches)	Pile-head Condition 2 in-lb, rad., or in-lb/rad.	Axial Loading lbs	Pile-head Deflection inches	Maximum Moment in Pile in-lbs	Maximum Shear in Pile lbs	Pile-head Rotation radians
1	1	V = 1500.0000	M = 0.000	50000.	0.16891110	50097.	1500.0000	-0.00380770
2	1	V = 2000.0000	M = 0.000	50000.	0.24295936	69781.	2000.0000	-0.00541658
3	1	V = 2200.0000	M = 0.000	50000.	0.29108673	78792.	2200.0000	-0.00646100
4	1	V = 2400.0000	M = 0.000	50000.	0.36501117	88504.	2400.0000	-0.00807244

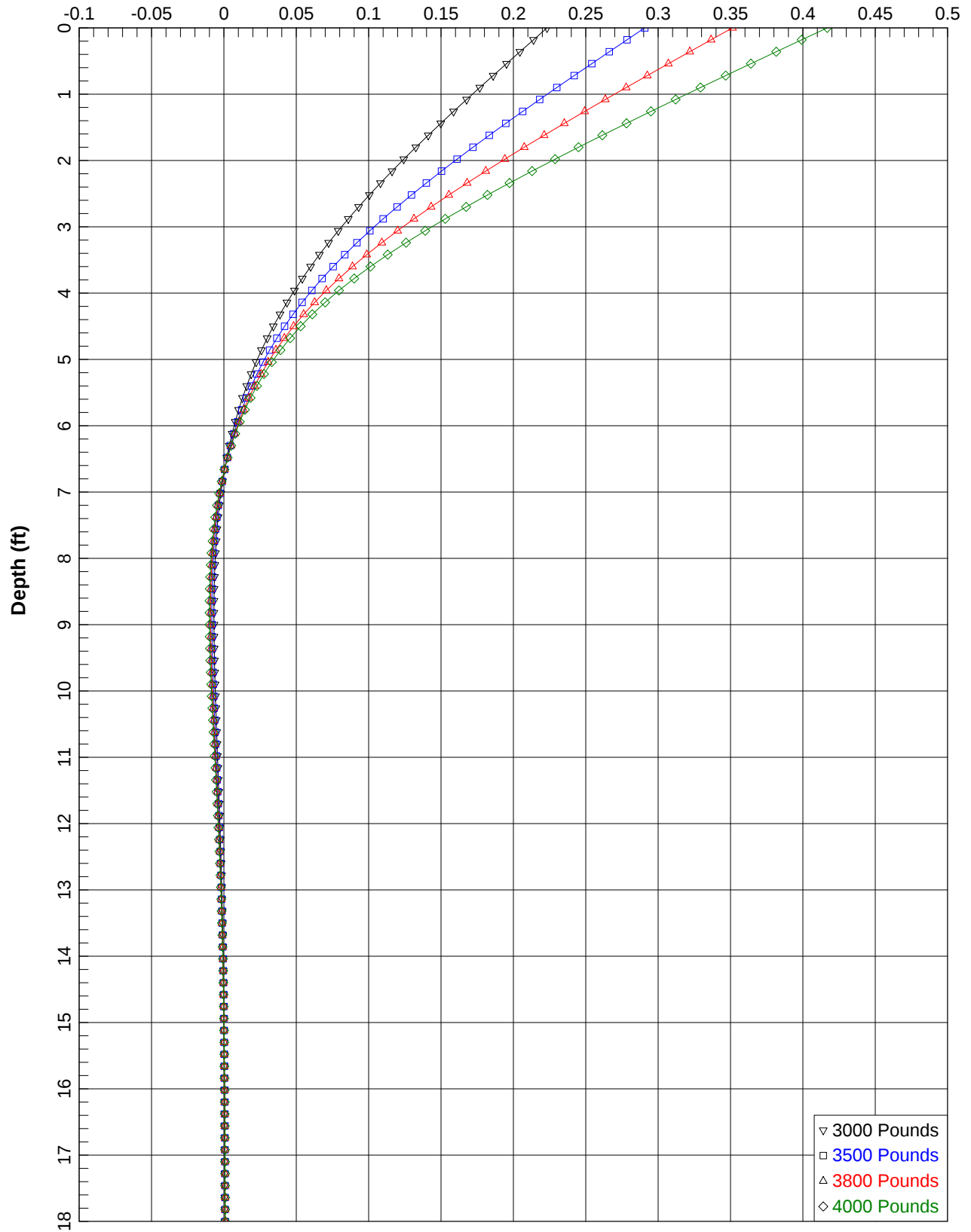
The analysis ended normally.

12-Inch Diameter Timber Pile

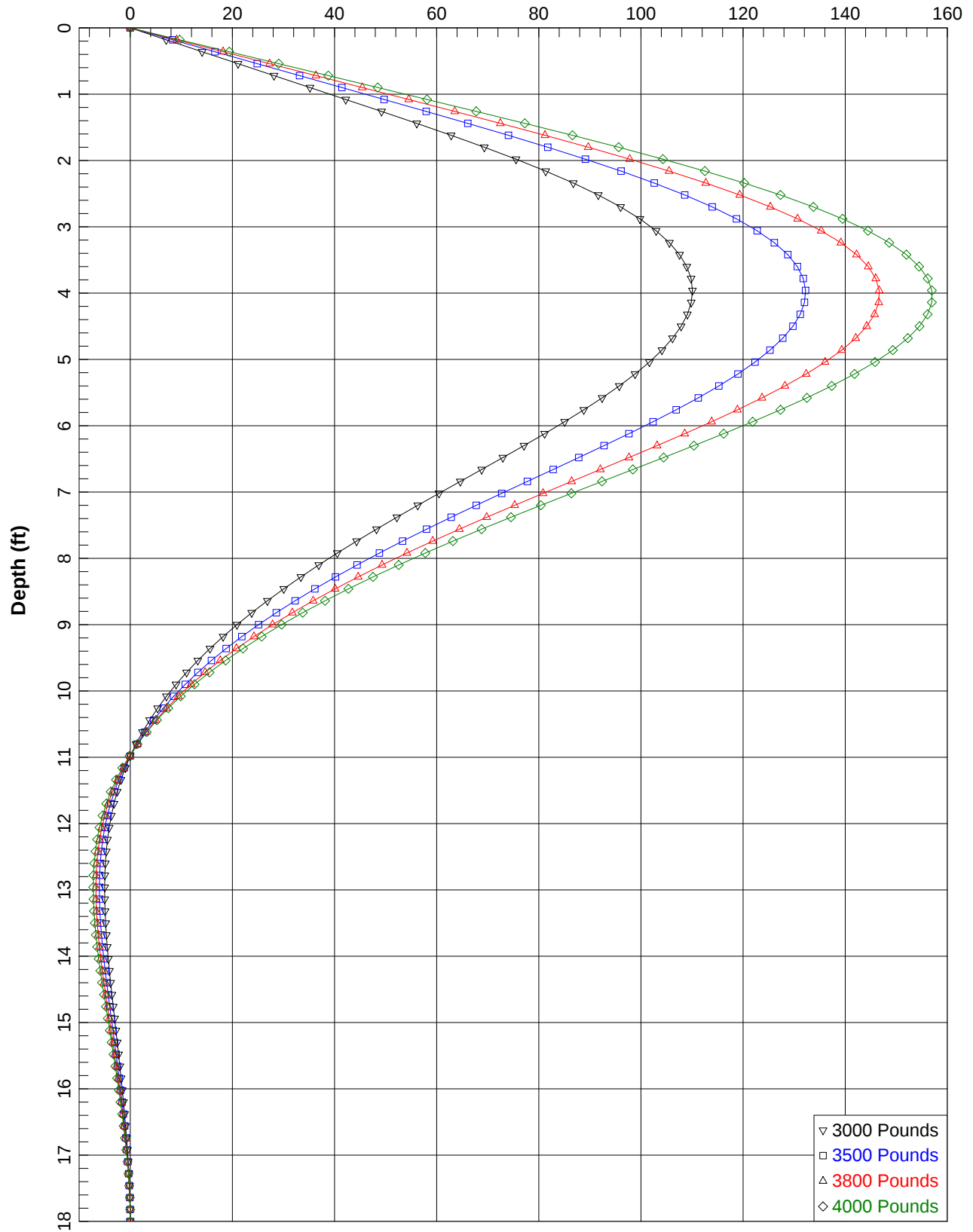
12-Inch Diameter Timber Pile



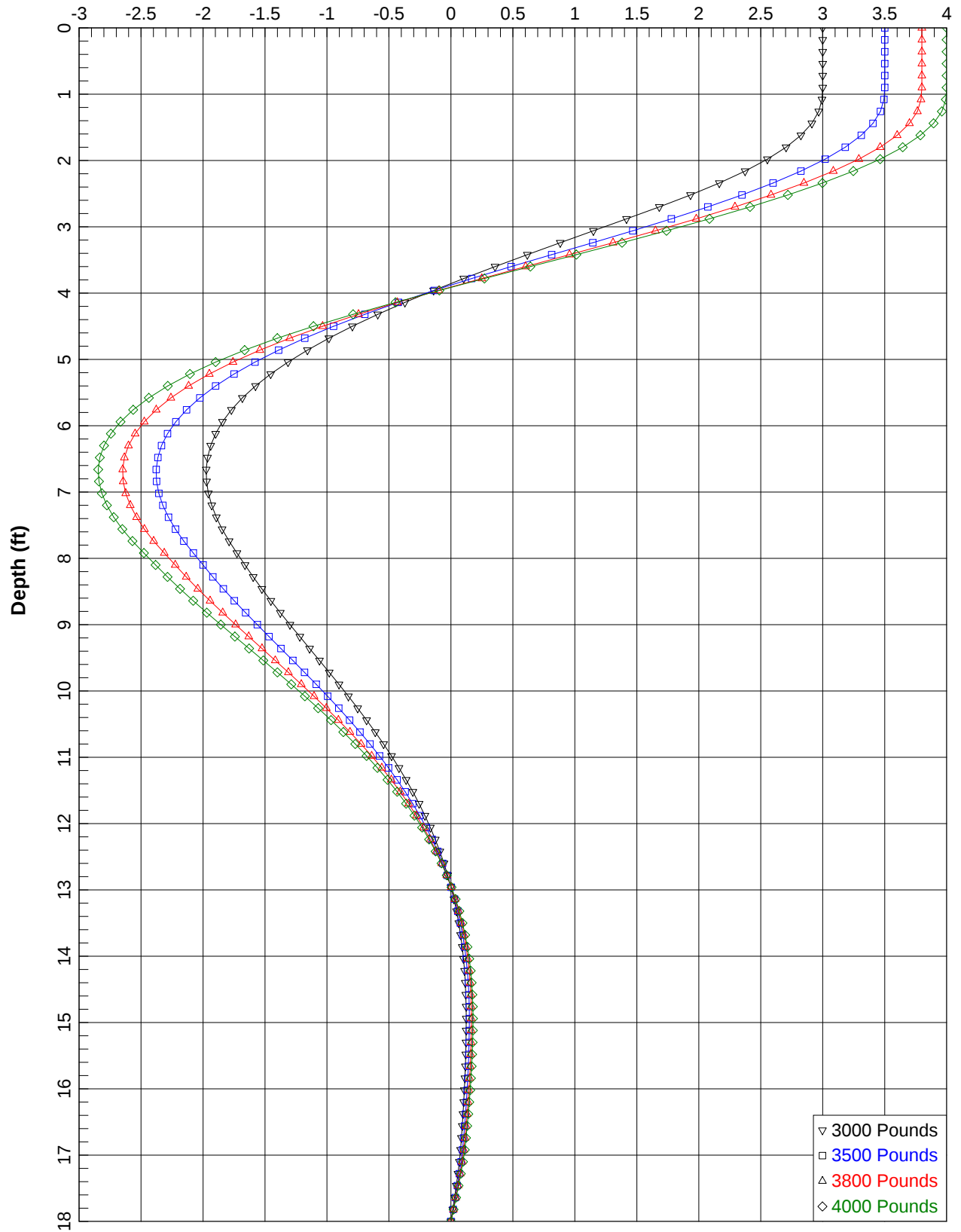
12-Inch Diameter Timber Pile
Lateral Deflection (inches)



12-inch Timber Pile
Bending Moment (in-kips)



12-inch Diameter Timber Pile
Shear Force (kips)



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LPIle Plus for Windows, Version 2012-06.037

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

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Don Stites, PE
Odessa, FL

Serial Number of Security Device: 160773735
Company Name Stored in Security Device: Don Stites

Files Used for Analysis

Path to file locations: C:\Documents\! Gulf Coast Engineering\2020 Projects\26059
Fire Station No. 46 Timber Piles\Report Files\Lateral Capacity\8 inch Diameter\
Name of input data file: New LPIle (USCS units).lp6d
Name of output report file: New LPIle (USCS units).lp6o
Name of plot output file: New LPIle (USCS units).lp6p
Name of runtime message file: New LPIle (USCS units).lp6r

Date and Time of Analysis

Date: September 20, 2020 Time: 22:59:09

Problem Title

Fire Station No. 46
26059

DRS
Timber Piles 12-inch Diameter

Program Options

Engineering units are US Customary Units: pounds, inches, feet

Basic Program Options:

This analysis computes pile response to lateral loading and will compute nonlinear moment-curvature and nominal moment capacity for section types with nonlinear properties.

Computation Options:

- Analysis does not use p-y multipliers (individual pile or shaft only)
- Analysis assumes no shear resistance at pile tip
- Analysis for fixed-length pile or shaft only
- No computation of foundation stiffness matrix values
- Report pile response for full length of pile
- Analysis assumes no loading by soil movements acting on pile
- No p-y curves to be computed and reported for user-specified depths

Solution Control Parameters:

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

Pile Response Output Options:

- 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

Pile Structural Properties and Geometry

- Total number of pile sections = 1
- Total length of pile = 18.00 ft
- Depth of ground surface below top of pile = 1.00 ft

Pile diameter values 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.

Point	Depth X ft	Pile Diameter in
-----	-----	-----
1	0.00000	12.0000000
2	18.000000	12.0000000

Input Structural Properties:

Pile Section No. 1:

Section Type	=	Drilled Shaft (Bored Pile)
Section Length	=	18.00000000 ft
Section Diameter	=	12.00000000 in

Ground Slope and Pile Batter Angles

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

Soil and Rock Layering Information

The soil profile is modelled using 7 layers

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

Distance from top of pile to top of layer	=	1.00000 ft
Distance from top of pile to bottom of layer	=	8.00000 ft
Effective unit weight at top of layer	=	118.00000 pcf
Effective unit weight at bottom of layer	=	118.00000 pcf
Friction angle at top of layer	=	34.00000 deg.
Friction angle at bottom of layer	=	34.00000 deg.
Subgrade k at top of layer	=	0.0000 pci
Subgrade k at bottom of layer	=	0.0000 pci

NOTE: Internal default values for subgrade k will be computed for the above soil layer.

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

Distance from top of pile to top of layer	=	8.00000	ft
Distance from top of pile to bottom of layer	=	15.00000	ft
Effective unit weight at top of layer	=	118.00000	pcf
Effective unit weight at bottom of layer	=	118.00000	pcf
Friction angle at top of layer	=	33.00000	deg.
Friction angle at bottom of layer	=	33.00000	deg.
Subgrade k at top of layer	=	0.0000	pci
Subgrade k at bottom of layer	=	0.0000	pci

NOTE: Internal default values for subgrade k will be computed for the above soil layer.

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

Distance from top of pile to top of layer	=	15.00000	ft
Distance from top of pile to bottom of layer	=	17.00000	ft
Effective unit weight at top of layer	=	115.00000	pcf
Effective unit weight at bottom of layer	=	115.00000	pcf
Friction angle at top of layer	=	30.00000	deg.
Friction angle at bottom of layer	=	30.00000	deg.
Subgrade k at top of layer	=	0.0000	pci
Subgrade k at bottom of layer	=	0.0000	pci

NOTE: Internal default values for subgrade k will be computed for the above soil layer.

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

Distance from top of pile to top of layer	=	17.00000	ft
Distance from top of pile to bottom of layer	=	30.00000	ft
Effective unit weight at top of layer	=	118.00000	pcf
Effective unit weight at bottom of layer	=	118.00000	pcf
Friction angle at top of layer	=	33.00000	deg.
Friction angle at bottom of layer	=	33.00000	deg.
Subgrade k at top of layer	=	0.0000	pci
Subgrade k at bottom of layer	=	0.0000	pci

NOTE: Internal default values for subgrade k will be computed for the above soil layer.

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

Distance from top of pile to top of layer	=	30.00000	ft
Distance from top of pile to bottom of layer	=	35.00000	ft
Effective unit weight at top of layer	=	115.00000	pcf
Effective unit weight at bottom of layer	=	115.00000	pcf
Friction angle at top of layer	=	32.00000	deg.
Friction angle at bottom of layer	=	32.00000	deg.
Subgrade k at top of layer	=	0.0000	pci
Subgrade k at bottom of layer	=	0.0000	pci

NOTE: Internal default values for subgrade k will be computed for the above soil layer.

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

Distance from top of pile to top of layer	=	35.00000	ft
Distance from top of pile to bottom of layer	=	40.00000	ft
Effective unit weight at top of layer	=	110.00000	pcf
Effective unit weight at bottom of layer	=	110.00000	pcf
Friction angle at top of layer	=	28.00000	deg.
Friction angle at bottom of layer	=	28.00000	deg.
Subgrade k at top of layer	=	0.0000	pci
Subgrade k at bottom of layer	=	0.0000	pci

NOTE: Internal default values for subgrade k will be computed for the above soil layer.

Layer 7 is weak rock, p-y criteria by Reese, 1997

Distance from top of pile to top of layer	=	40.00000	ft
Distance from top of pile to bottom of layer	=	53.00000	ft
Effective unit weight at top of layer	=	130.00000	pcf
Effective unit weight at bottom of layer	=	130.00000	pcf
Uniaxial compressive strength at top of layer	=	500.00000	psi
Uniaxial compressive strength at bottom of layer	=	500.00000	psi
Initial modulus of rock at top of layer	=	100.00000	psi
Initial modulus of rock at bottom of layer	=	100.00000	psi
RQD of rock at top of layer	=	10.00000	%
RQD of rock at bottom of layer	=	0.0000	%
k _{rm} of rock at top of layer	=	0.00500	
k _{rm} of rock at bottom of layer	=	0.00500	

(Depth of lowest soil layer extends 35.00 ft below pile tip)

Summary of Soil Properties

Layer Num.	Layer Soil Type (p-y Curve Criteria)	Layer Depth ft	Effective Unit Wt. pcf	Angle of Friction deg.	Uniaxial qu psi	RQD % or GSI	kpy pci	Rock Mass Rock E mass psi	krm
1	Sand (Reese, et al.)	1.000	118.000	34.000	--	--	default	--	--
		8.000	118.000	34.000	--	--	default	--	--
2	Sand (Reese, et al.)	8.000	118.000	33.000	--	--	default	--	--
		15.000	118.000	33.000	--	--	default	--	--
3	Sand (Reese, et al.)	15.000	115.000	30.000	--	--	default	--	--
		17.000	115.000	30.000	--	--	default	--	--
4	Sand (Reese, et al.)	17.000	118.000	33.000	--	--	default	--	--
		30.000	118.000	33.000	--	--	default	--	--
5	Sand (Reese, et al.)	30.000	115.000	32.000	--	--	default	--	--
		35.000	115.000	32.000	--	--	default	--	--
6	Sand (Reese, et al.)	35.000	110.000	28.000	--	--	default	--	--
		40.000	110.000	28.000	--	--	default	--	--
7	Weak Rock	40.000	130.000	--	500.000	10.000	--	100.000	0.00500
		53.000	130.000	--	500.000	0.00	--	100.000	0.00500

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 = 4

Load No.	Load Type	Condition 1	Condition 2	Axial Thrust Force, lbs	Compute Top y vs. Pile Length
1	1	V = 3000.00000 lbs	M = 0.0000 in-lbs	60000.	Yes
2	1	V = 3500.00000 lbs	M = 0.0000 in-lbs	60000.	Yes
3	1	V = 3800.00000 lbs	M = 0.0000 in-lbs	60000.	Yes
4	1	V = 4000.00000 lbs	M = 0.0000 in-lbs	60000.	Yes

V = perpendicular shear force applied to pile head

M = bending moment applied to pile head

y = lateral deflection relative to pile axis

S = pile slope relative to original pile batter angle

R = rotational stiffness applied to pile head

Axial thrust 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	=	18.00000000	ft
Shaft Diameter	=	12.00000000	in
Concrete Cover Thickness	=	3.00000000	in
Number of Reinforcing Bars	=	1	bar
Yield Stress of Reinforcing Bars	=	1.50000000	ksi
Modulus of Elasticity of Reinforcing Bars	=	1500.00000000	ksi
Gross Area of Shaft	=	113.09733553	sq. in.
Total Area of Reinforcing Steel	=	0.60000000	sq. in.
Area Ratio of Steel Reinforcement	=	0.53	percent
Edge-to-Edge Bar Spacing	=	-0.87500000	in
Maximum Concrete Aggregate Size	=	0.10000000	in
Ratio of Bar Spacing to Aggregate Size	=	-8.75	
Offset of Rebar Cage Center from Center of Pile	=	0.00000000	in

Axial Structural Capacities:

Nom. Axial Structural Capacity = $0.85 F_c A_c + F_y A_s$	=	115.647	kips
Tensile Load for Cracking of Concrete	=	-26.464	kips
Nominal Axial Tensile Capacity	=	-0.900	kips

Reinforcing Bar Dimensions and Positions Used in Computations:

Bar Number	Bar Diam. inches	Bar Area sq. in.	X inches	Y inches
-----	-----	-----	-----	-----
1	0.87500	0.60000	0.00000	0.00000

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

Concrete Properties:

Compressive Strength of Concrete	=	1.20000000 ksi
Modulus of Elasticity of Concrete	=	1974.53792063 ksi
Modulus of Rupture of Concrete	=	-0.25980762 ksi
Compression Strain at Peak Stress	=	0.00103315
Tensile Strain at Fracture of Concrete	=	-0.00011866
Maximum Coarse Aggregate Size	=	0.10000000 in

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

Number	Axial Thrust Force kips
-----	-----
1	60.000

Definitions of Run Messages and Notes:

C = concrete in section has cracked in tension.

Y = stress in reinforcing steel has reached yield stress.

T = ACI 318-08 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 318-08, Section 10.3.4.

Z = depth of tensile zone in concrete section is less than 10 percent of section depth.

Bending Stiffness (EI) = Computed Bending Moment / Curvature.

Position of neutral axis is measured from edge of compression side of pile.

Compressive stresses and strains are positive in sign.

Tensile stresses and strains are negative in sign.

Axial Thrust Force = 60.000 kips

Bending Curvature rad/in.	Bending Moment in-kip	Bending Stiffness kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in	Max Concrete Stress ksi	Max Steel Stress ksi	Run Msg
0.000001250	2.2066303	1765304.	215.5148594	0.0002694	0.0002544	0.5440806	0.4039779	
0.000002500	4.4131439	1765258.	110.7683788	0.0002769	0.0002469	0.5568172	0.4151564	
0.000003750	6.6193442	1765158.	75.8577520	0.0002845	0.0002395	0.5694596	0.4263624	
0.000005000	8.8250746	1765015.	58.4060893	0.0002920	0.0002320	0.5820069	0.4375957	
0.000006250	11.0301782	1764829.	47.9380130	0.0002996	0.0002246	0.5944583	0.4488564	
0.000007500	13.2344984	1764600.	40.9617307	0.0003072	0.0002172	0.6068128	0.4601445	
0.000008750	15.4378782	1764329.	35.9807600	0.0003148	0.0002098	0.6190695	0.4714600	
0.0000100	17.6401605	1764016.	32.2468599	0.0003225	0.0002025	0.6312275	0.4828029	
0.0000113	19.8411882	1763661.	29.3443411	0.0003301	0.0001951	0.6432859	0.4941733	
0.0000125	22.0408041	1763264.	27.0237900	0.0003378	0.0001878	0.6552436	0.5055711	
0.0000138	24.2388507	1762826.	25.1264892	0.0003455	0.0001805	0.6671000	0.5169963	
0.0000150	26.4351702	1762345.	23.5466268	0.0003532	0.0001732	0.6788539	0.5284491	
0.0000163	28.6296050	1761822.	22.2109489	0.0003609	0.0001659	0.6905045	0.5399294	
0.0000175	30.8219969	1761257.	21.0671312	0.0003687	0.0001587	0.7020509	0.5514372	
0.0000188	33.0121875	1760650.	20.0768024	0.0003764	0.0001514	0.7134921	0.5629726	
0.0000200	35.2000183	1760001.	19.2111844	0.0003842	0.0001442	0.7248273	0.5745355	
0.0000213	37.3853305	1759310.	18.4482704	0.0003920	0.0001370	0.7360554	0.5861261	
0.0000225	39.5679649	1758576.	17.7709440	0.0003998	0.0001298	0.7471756	0.5977444	
0.0000238	41.7477619	1757801.	17.1656923	0.0004077	0.0001227	0.7581869	0.6093903	
0.0000250	43.9245618	1756982.	16.6217051	0.0004155	0.0001155	0.7690884	0.6210639	
0.0000263	46.0982044	1756122.	16.1302312	0.0004234	0.0001084	0.7798792	0.6327654	
0.0000275	48.2685291	1755219.	15.6841109	0.0004313	0.0001013	0.7905582	0.6444946	
0.0000288	50.4353767	1754274.	15.2774293	0.0004392	0.0000942	0.8011247	0.6562516	
0.0000300	52.5985821	1753286.	14.9052577	0.0004472	0.0000872	0.8115776	0.6680366	
0.0000313	54.7579855	1752256.	14.5634558	0.0004551	0.0000801	0.8219160	0.6798495	
0.0000325	56.9134245	1751182.	14.2485205	0.0004631	0.0000731	0.8321390	0.6916904	
0.0000338	59.0647362	1750066.	13.9574675	0.0004711	0.0000661	0.8422456	0.7035593	
0.0000350	61.2117576	1748907.	13.6877392	0.0004791	0.0000591	0.8522348	0.7154563	
0.0000363	63.3543246	1747706.	13.4371304	0.0004871	0.0000521	0.8621057	0.7273815	
0.0000375	65.4922730	1746461.	13.2037304	0.0004951	0.0000451	0.8718573	0.7393348	
0.0000388	67.6254378	1745173.	12.9858747	0.0005032	0.0000382	0.8814887	0.7513165	
0.0000400	69.7536534	1743841.	12.7821071	0.0005113	0.0000313	0.8909989	0.7633264	
0.0000413	71.8767537	1742467.	12.5911479	0.0005194	0.0000244	0.9003870	0.7753648	
0.0000425	73.9945719	1741049.	12.4118680	0.0005275	0.0000175	0.9096519	0.7874316	
0.0000438	76.1069405	1739587.	12.2432675	0.0005356	0.0000106	0.9187926	0.7995269	
0.0000450	78.2136913	1738082.	12.0845573	0.0005438	0.000003801	0.9278083	0.8116509	
0.0000463	80.3146554	1736533.	11.9346448	0.0005520	-0.000003023	0.9366979	0.8238035	
0.0000475	82.4095439	1734938.	11.7931183	0.0005602	-0.000009827	0.9454603	0.8359847	
0.0000488	84.4978399	1733289.	11.6592343	0.0005684	-0.0000166	0.9540941	0.8481940	
0.0000513	88.6521865	1729799.	11.4121256	0.0005849	-0.0000301	0.9709704	0.8726946	
0.0000538	92.7727157	1726004.	11.1893047	0.0006014	-0.0000436	0.9873152	0.8973002	
0.0000563	96.8547611	1721862.	10.9874723	0.0006180	-0.0000570	1.0031175	0.9220055	
0.0000588	100.8942245	1717349.	10.8038972	0.0006347	-0.0000703	1.0183673	0.9468059	
0.0000613	104.8875064	1712449.	10.6362997	0.0006515	-0.0000835	1.0330550	0.9716975	
0.0000638	108.8315540	1707162.	10.4827655	0.0006683	-0.0000967	1.0471722	0.9966770	
0.0000663	112.7236745	1701489.	10.3416738	0.0006851	-0.0001099	1.0607106	1.0217413	
0.0000688	112.7236745	1639617.	10.1064124	0.0006948	-0.0001302	1.0681508	1.0360363	C
0.0000713	113.0977214	1587336.	9.9659338	0.0007101	-0.0001449	1.0795267	1.0586967	C
0.0000738	115.4992045	1566091.	9.8335417	0.0007252	-0.0001598	1.0903150	1.0811981	C
0.0000763	117.7790813	1544644.	9.7084793	0.0007403	-0.0001747	1.1005284	1.1035448	C
0.0000788	119.9446086	1523106.	9.5901017	0.0007552	-0.0001898	1.1101800	1.1257433	C
0.0000813	122.0032277	1501578.	9.4778591	0.0007701	-0.0002049	1.1192828	1.1478016	C
0.0000838	123.9624996	1480149.	9.3712837	0.0007848	-0.0002202	1.1278501	1.1697300	C
0.0000863	125.8300468	1458899.	9.2699787	0.0007995	-0.0002355	1.1358948	1.1915410	C
0.0000888	127.6135029	1437899.	9.1736094	0.0008142	-0.0002508	1.1434296	1.2132493	C
0.0000913	129.3018671	1417007.	9.0814382	0.0008287	-0.0002663	1.1504469	1.2348094	C
0.0000938	130.9113520	1396388.	8.9934250	0.0008431	-0.0002819	1.1569684	1.2562629	C
0.0000963	132.4548510	1376154.	8.9095054	0.0008575	-0.0002975	1.1630112	1.2776474	C
0.0000988	133.9312844	1356266.	8.8293106	0.0008719	-0.0003131	1.1685776	1.2989541	C
0.0001013	135.3252687	1336546.	8.7521196	0.0008862	-0.0003288	1.1736569	1.3201157	C
0.0001038	136.6709920	1317311.	8.6785072	0.0009004	-0.0003446	1.1782842	1.3412552	C
0.0001063	137.9491448	1298345.	8.6077188	0.0009146	-0.0003604	1.1824458	1.3622927	C
0.0001088	139.1693202	1279718.	8.5397384	0.0009287	-0.0003763	1.1861531	1.3832573	C
0.0001113	140.3438229	1261518.	8.4746785	0.0009428	-0.0003922	1.1894178	1.4041995	C

0.0001138	141.4518743	1243533.	8.4117602	0.0009568	-0.0004082	1.1922290	1.4250191	C
0.0001163	142.5264392	1226034.	8.3516884	0.0009709	-0.0004241	1.1946096	1.4458632	C
0.0001188	143.5354455	1208720.	8.2933972	0.0009848	-0.0004402	1.1965449	1.4665739	C
0.0001213	144.5137996	1191866.	8.2376927	0.0009988	-0.0004562	1.1980537	1.4873179	C
0.0001238	145.4364058	1175244.	8.1837062	0.0010127	-0.0004723	1.1991284	1.5000000	CY
0.0001263	146.3222622	1158988.	8.1318448	0.0010266	-0.0004884	1.1997770	1.5000000	CY
0.0001288	147.1705930	1143073.	8.0819383	0.0010405	-0.0005045	1.1999999	1.5000000	CY
0.0001313	147.9669210	1127367.	8.0334835	0.0010544	-0.0005206	1.1999936	1.5000000	CY
0.0001338	148.7434842	1112101.	7.9873073	0.0010683	-0.0005367	1.1999722	1.5000000	CY
0.0001363	149.4614126	1096964.	7.9421121	0.0010821	-0.0005529	1.1999232	1.5000000	CY
0.0001388	150.1533419	1082186.	7.8987627	0.0010960	-0.0005690	1.1998347	1.5000000	CY
0.0001413	150.8245163	1067784.	7.8572874	0.0011098	-0.0005852	1.1999731	1.5000000	CY
0.0001438	151.4376026	1053479.	7.8164330	0.0011236	-0.0006014	1.1999781	1.5000000	CY
0.0001463	152.0343477	1039551.	7.7773750	0.0011374	-0.0006176	1.1998923	1.5000000	CY
0.0001488	152.6154073	1025986.	7.7400135	0.0011513	-0.0006337	1.1998602	1.5000000	CY
0.0001588	154.6159616	973959.	7.6002909	0.0012065	-0.0006985	1.1999354	1.5000000	CY
0.0001688	156.2703797	926047.	7.4772957	0.0012618	-0.0007632	1.1999798	1.5000000	CY
0.0001788	157.6429326	881919.	7.3683824	0.0013171	-0.0008279	1.1999644	1.5000000	CY
0.0001888	158.7773300	841204.	7.2710950	0.0013724	-0.0008926	1.1998432	1.5000000	CY
0.0001988	159.7110030	803577.	7.1834334	0.0014277	-0.0009573	1.1999331	1.5000000	CY
0.0002088	160.4958083	768842.	7.1049327	0.0014832	-0.0010218	1.1997974	1.5000000	CY
0.0002188	161.1533790	736701.	7.0341819	0.0015387	-0.0010863	1.1999554	1.5000000	CY
0.0002288	161.6847893	706819.	6.9692265	0.0015942	-0.0011508	1.1999969	1.5000000	CY
0.0002388	162.1404074	679122.	6.9110227	0.0016500	-0.0012150	1.1999428	1.5000000	CY
0.0002488	162.4967943	653253.	6.8568506	0.0017056	-0.0012794	1.1999438	1.5000000	CY
0.0002588	162.7963965	629165.	6.8078787	0.0017615	-0.0013435	1.1999981	1.5000000	CY
0.0002688	163.0374880	606651.	6.7629699	0.0018175	-0.0014075	1.1999631	1.5000000	CY
0.0002788	163.2151502	585525.	6.7209202	0.0018735	-0.0014715	1.1998195	1.5000000	CY
0.0002888	163.3620728	565756.	6.6829893	0.0019297	-0.0015353	1.1994723	1.5000000	CY
0.0002988	163.4691696	547177.	6.6478490	0.0019860	-0.0015990	1.1998135	1.5000000	CY
0.0003088	163.5278031	529645.	6.6144449	0.0020422	-0.0016628	1.1998916	1.5000000	CY
0.0003188	163.5646677	513144.	6.5840737	0.0020987	-0.0017263	1.1993194	1.5000000	CY
0.0003288	163.5822364	497589.	6.5563900	0.0021554	-0.0017896	1.1999952	1.5000000	CY
0.0003388	163.5822364	482900.	6.5304409	0.0022122	-0.0018528	1.1995439	1.5000000	CY
0.0003488	163.5822364	469053.	6.5053617	0.0022687	-0.0019163	1.1999339	1.5000000	CY
0.0003588	163.5822364	455978.	6.4824367	0.0023256	-0.0019794	1.1995227	1.5000000	CY
0.0003688	163.5822364	443613.	6.4613492	0.0023826	-0.0020424	1.2000000	1.5000000	CY
0.0003788	163.5822364	431900.	6.4420597	0.0024399	-0.0021051	1.1993031	1.5000000	CY
0.0003888	163.5822364	420790.	6.4242855	0.0024974	-0.0021676	1.1999698	1.5000000	CY
0.0003988	163.5822364	410238.	6.4067773	0.0025547	-0.0022303	1.1990714	1.5000000	CY
0.0004088	163.5822364	400201.	6.3902043	0.0026120	-0.0022930	1.1997374	1.5000000	CY
0.0004188	163.5822364	390644.	6.3748996	0.0026695	-0.0023555	1.1997911	1.5000000	CY
0.0004288	163.5822364	381533.	6.3608237	0.0027272	-0.0024178	1.1990200	1.5000000	CY
0.0004388	163.5822364	372837.	6.3477850	0.0027851	-0.0024799	1.1998425	1.5000000	CY
0.0004488	163.5822364	364529.	6.3357649	0.0028432	-0.0025418	1.1996066	1.5000000	CY
0.0004588	163.5822364	356583.	6.3247002	0.0029015	-0.0026035	1.1989251	1.5000000	CY
0.0004688	163.5822364	348975.	6.3144538	0.0029599	-0.0026651	1.1997835	1.5000000	CY
0.0004788	163.5822364	341686.	6.3050080	0.0030185	-0.0027265	1.1997824	1.5000000	CY
0.0004888	163.5822364	334695.	6.2958976	0.0030771	-0.0027879	1.1986636	1.5000000	CY
0.0004988	163.5822364	327984.	6.2868687	0.0031356	-0.0028494	1.1994433	1.5000000	CY
0.0005088	163.5822364	321538.	6.2785078	0.0031942	-0.0029108	1.1999563	1.5000000	CY
0.0005188	163.5822364	315339.	6.2708479	0.0032530	-0.0029720	1.1993511	1.5000000	CY
0.0005288	163.5822364	309375.	6.2637922	0.0033120	-0.0030330	1.1984528	1.5000000	CY
0.0005388	163.5822364	303633.	6.2572706	0.0033711	-0.0030939	1.1994670	1.5000000	CY
0.0005488	163.5822364	298100.	6.2512650	0.0034304	-0.0031546	1.1999554	1.5000000	CY
0.0006088	163.5822364	268718.	6.2250501	0.0037895	-0.0035155	1.1988959	1.5000000	CY
0.0006688	163.5822364	244609.	6.4355835	0.0043038	-0.0037212	1.1986652	1.5000000	CY

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

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

Load No.	Axial Thrust kips	Nominal Mom. Cap. in-kip	Max. Comp. Strain
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1	60.000	163.582	0.00300000

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

In ACI 318-08, the value of the strength reduction factor depends on whether
the transverse reinforcing steel bars are tied hoops (0.65) or spirals (0.70).

The above values should be multiplied by the appropriate strength reduction
factor to compute ultimate moment capacity according to ACI 318-08, Section
9.3.2.2 or the value required by the design standard being followed.

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

Axial Load No.	Resistance Factor for Moment	Nominal Moment Capacity in-kip	Ultimate (Factored) Axial Thrust kips	Ultimate (Factored) Moment Capacity in-kip	Bending Stiffness at Ult. Mom. Cap. kip-in^2
-----	-----	-----	-----	-----	-----
1	0.65	163.582	39.000	106.328	1710517.333
1	0.70	163.582	42.000	114.508	1574863.796
1	0.75	163.582	45.000	122.687	1494103.166

 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 = 3000.000 lbs
 Applied moment at pile head = 0.000 in-lbs
 Axial thrust load on pile head = 60000.000 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. p lb/in	Soil Spr. Es*h lb/inch	Distrib. Lat. Load lb/inch
0.00	0.2233	-4.201E-08	3000.0000	-0.004339	0.000	1.765E+09	0.000	0.000	0.000
0.180	0.2139	7042.3102	3000.0000	-0.004335	0.000	1.765E+09	0.000	0.000	0.000
0.360	0.2045	14084.	3000.0000	-0.004322	0.000	1.764E+09	0.000	0.000	0.000
0.540	0.1952	21122.	3000.0000	-0.004300	0.000	1.763E+09	0.000	0.000	0.000
0.720	0.1860	28158.	3000.0000	-0.004270	0.000	1.762E+09	0.000	0.000	0.000
0.900	0.1768	35189.	3000.0000	-0.004231	0.000	1.760E+09	0.000	0.000	0.000
1.080	0.1677	42215.	2994.1114	-0.004183	0.000	1.758E+09	-5.4524	70.2347	0.000
1.260	0.1587	49208.	2967.8894	-0.004127	0.000	1.755E+09	-18.8273	256.2468	0.000
1.440	0.1499	56106.	2911.7384	-0.004062	0.000	1.752E+09	-33.1644	478.0366	0.000
1.620	0.1412	62840.	2824.0925	-0.003989	0.000	1.748E+09	-47.9892	734.3575	0.000
1.800	0.1326	69340.	2704.4612	-0.003907	0.000	1.744E+09	-62.7804	1022.5081	0.000
1.980	0.1243	75536.	2553.5947	-0.003817	0.000	1.740E+09	-76.9108	1336.7823	0.000
2.160	0.1161	81361.	2372.9966	-0.003720	0.000	1.736E+09	-90.3097	1679.7482	0.000
2.340	0.1082	86751.	2164.9720	-0.003615	0.000	1.731E+09	-102.3057	2042.2480	0.000
2.520	0.1005	91650.	1932.8786	-0.003504	0.000	1.727E+09	-112.5956	2419.6578	0.000
2.700	0.0931	96009.	1680.7969	-0.003386	0.000	1.723E+09	-120.8134	2803.9201	0.000
2.880	0.0859	99789.	1417.1627	-0.003263	0.000	1.719E+09	-123.2923	3100.8058	0.000
3.060	0.0790	102977.	1149.8467	-0.003136	0.000	1.715E+09	-124.2225	3397.6915	0.000
3.240	0.0723	105569.	882.0563	-0.003004	0.000	1.712E+09	-123.7315	3694.5771	0.000
3.420	0.0660	107567.	616.7213	-0.002870	0.000	1.709E+09	-121.9490	3991.4628	0.000
3.600	0.0599	108977.	356.4907	-0.002733	0.000	1.707E+09	-119.0053	4288.3485	0.000
3.780	0.0542	109815.	103.7321	-0.002594	0.000	1.706E+09	-115.0304	4585.2341	0.000
3.960	0.0487	110098.	-139.4657	-0.002455	0.000	1.705E+09	-110.1528	4882.1198	0.000
4.140	0.0436	109849.	-371.2889	-0.002316	0.000	1.706E+09	-104.4984	5179.0054	0.000
4.320	0.0387	109094.	-590.1917	-0.002177	0.000	1.707E+09	-98.1894	5475.8911	0.000
4.500	0.0342	107863.	-794.8877	-0.002040	0.000	1.708E+09	-91.3439	5772.7768	0.000
4.680	0.0299	106189.	-984.3394	-0.001905	0.000	1.711E+09	-84.0744	6069.6624	0.000
4.860	0.0260	104105.	-1157.7465	-0.001772	0.000	1.713E+09	-76.4878	6366.5481	0.000
5.040	0.0223	101647.	-1314.5327	-0.001642	0.000	1.716E+09	-68.6847	6663.4338	0.000
5.220	0.0189	98852.	-1454.3316	-0.001516	0.000	1.720E+09	-60.7587	6960.3194	0.000
5.400	0.0157	95757.	-1576.9714	-0.001394	0.000	1.723E+09	-52.7967	7257.2051	0.000
5.580	0.0128	92401.	-1682.4600	-0.001276	0.000	1.726E+09	-44.8780	7554.0907	0.000
5.760	0.0102	88820.	-1770.9690	-0.001163	0.000	1.730E+09	-37.0748	7850.9764	0.000
5.940	0.007808	85051.	-1842.8178	-0.001055	0.000	1.733E+09	-29.4518	8147.8621	0.000
6.120	0.005644	81132.	-1898.4575	-0.000951	0.000	1.736E+09	-22.0664	8444.7477	0.000
6.300	0.003699	77097.	-1938.4556	-0.000853	0.000	1.739E+09	-14.9688	8741.6334	0.000
6.480	0.001960	72979.	-1963.4801	-0.000760	0.000	1.742E+09	-8.2020	9038.5191	0.000
6.660	0.000417	68811.	-1974.2847	-0.000672	0.000	1.744E+09	-1.8022	9335.4047	0.000
6.840	-0.000942	64624.	-1971.6938	-0.000589	0.000	1.747E+09	4.2011	9632.2904	0.000
7.020	-0.002129	60446.	-1956.5892	-0.000512	0.000	1.749E+09	9.7847	9929.1760	0.000
7.200	-0.003154	56304.	-1929.8962	-0.000440	0.000	1.751E+09	14.9311	10226.	0.000
7.380	-0.004029	52223.	-1892.5716	-0.000373	0.000	1.753E+09	19.6287	10523.	0.000
7.560	-0.004765	48225.	-1845.5921	-0.000311	0.000	1.755E+09	23.8708	10820.	0.000
7.740	-0.005374	44331.	-1789.9434	-0.000254	0.000	1.757E+09	27.6557	11117.	0.000
7.920	-0.005864	40559.	-1726.6109	-0.000202	0.000	1.758E+09	30.9856	11414.	0.000
8.100	-0.006247	36924.	-1661.3458	-0.000155	0.000	1.759E+09	29.4451	10182.	0.000
8.280	-0.006532	33422.	-1595.4762	-0.000111	0.000	1.761E+09	31.5452	10432.	0.000
8.460	-0.006728	30061.	-1525.4721	-7.244E-05	0.000	1.761E+09	33.2734	10682.	0.000
8.640	-0.006845	26850.	-1452.1212	-3.756E-05	0.000	1.762E+09	34.6441	10933.	0.000
8.820	-0.006890	23797.	-1376.1779	-6.523E-06	0.000	1.763E+09	35.6738	11183.	0.000
9.000	-0.006873	20907.	-1298.3592	2.086E-05	0.000	1.763E+09	36.3806	11434.	0.000
9.180	-0.006800	18183.	-1219.3411	4.480E-05	0.000	1.764E+09	36.7843	11684.	0.000
9.360	-0.006679	15628.	-1139.7564	6.550E-05	0.000	1.764E+09	36.9053	11935.	0.000

9.540	-0.006517	13242.	-1060.1924	8.317E-05	0.000	1.765E+09	36.7651	12185.	0.000
9.720	-0.006320	11026.	-981.1894	9.802E-05	0.000	1.765E+09	36.3858	12436.	0.000
9.900	-0.006094	8978.1613	-903.2401	0.000110	0.000	1.765E+09	35.7895	12686.	0.000
10.080	-0.005844	7095.6507	-826.7888	0.000120	0.000	1.765E+09	34.9987	12937.	0.000
10.260	-0.005575	5375.3046	-752.2322	0.000128	0.000	1.765E+09	34.0353	13187.	0.000
10.440	-0.005292	3812.9010	-679.9192	0.000133	0.000	1.765E+09	32.9212	13438.	0.000
10.620	-0.004999	2403.4898	-610.1525	0.000137	0.000	1.765E+09	31.6776	13688.	0.000
10.800	-0.004699	1141.4926	-543.1896	0.000139	0.000	1.765E+09	30.3251	13939.	0.000
10.980	-0.004397	20.7989	-479.2447	0.000140	0.000	1.765E+09	28.8832	14189.	0.000
11.160	-0.004094	-965.1405	-418.4902	0.000139	0.000	1.765E+09	27.3709	14440.	0.000
11.340	-0.003794	-1823.2250	-361.0593	0.000138	0.000	1.765E+09	25.8058	14690.	0.000
11.520	-0.003499	-2560.6208	-307.0482	0.000135	0.000	1.765E+09	24.2044	14941.	0.000
11.700	-0.003211	-3184.6824	-256.5186	0.000132	0.000	1.765E+09	22.5822	15191.	0.000
11.880	-0.002931	-3702.8793	-209.5002	0.000127	0.000	1.765E+09	20.9533	15441.	0.000
12.060	-0.002661	-4122.7291	-165.9936	0.000123	0.000	1.765E+09	19.3306	15692.	0.000
12.240	-0.002402	-4451.7364	-125.9729	0.000117	0.000	1.765E+09	17.7256	15942.	0.000
12.420	-0.002154	-4697.3371	-89.3886	0.000112	0.000	1.765E+09	16.1487	16193.	0.000
12.600	-0.001919	-4866.8493	-56.1703	0.000106	0.000	1.765E+09	14.6090	16443.	0.000
12.780	-0.001697	-4967.4302	-26.2294	9.984E-05	0.000	1.765E+09	13.1141	16694.	0.000
12.960	-0.001488	-5006.0382	0.5381	9.374E-05	0.000	1.765E+09	11.6707	16944.	0.000
13.140	-0.001292	-4989.4017	24.2493	8.762E-05	0.000	1.765E+09	10.2841	17195.	0.000
13.320	-0.001109	-4923.9925	45.0314	8.155E-05	0.000	1.765E+09	8.9586	17445.	0.000
13.500	-0.000940	-4816.0052	63.0198	7.560E-05	0.000	1.765E+09	7.6974	17696.	0.000
13.680	-0.000783	-4671.3414	78.3557	6.979E-05	0.000	1.765E+09	6.5025	17946.	0.000
13.860	-0.000638	-4495.5985	91.1838	6.418E-05	0.000	1.765E+09	5.3753	18197.	0.000
14.040	-0.000505	-4294.0636	101.6505	5.881E-05	0.000	1.765E+09	4.3161	18447.	0.000
14.220	-0.000384	-4071.7107	109.9021	5.369E-05	0.000	1.765E+09	3.3243	18698.	0.000
14.400	-0.000273	-3833.2024	116.0829	4.885E-05	0.000	1.765E+09	2.3987	18948.	0.000
14.580	-0.000173	-3582.8946	120.3342	4.431E-05	0.000	1.765E+09	1.5376	19199.	0.000
14.760	-8.201E-05	-3324.8447	122.7924	4.009E-05	0.000	1.765E+09	0.7385	19449.	0.000
14.940	1.818E-07	-3062.8222	123.5881	3.618E-05	0.000	1.765E+09	-0.001658	19700.	0.000
15.120	7.428E-05	-2800.3218	123.1120	3.259E-05	0.000	1.765E+09	-0.4392	12771.	0.000
15.300	0.000141	-2539.4263	121.7272	2.933E-05	0.000	1.765E+09	-0.8430	12916.	0.000
15.480	0.000201	-2282.0614	119.5042	2.638E-05	0.000	1.765E+09	-1.2153	13062.	0.000
15.660	0.000255	-2030.0046	116.5083	2.374E-05	0.000	1.765E+09	-1.5587	13207.	0.000
15.840	0.000304	-1784.8983	112.7984	2.140E-05	0.000	1.765E+09	-1.8763	13353.	0.000
16.020	0.000347	-1548.2631	108.4274	1.936E-05	0.000	1.765E+09	-2.1709	13499.	0.000
16.200	0.000387	-1321.5111	103.4415	1.761E-05	0.000	1.765E+09	-2.4456	13644.	0.000
16.380	0.000423	-1105.9598	97.8806	1.612E-05	0.000	1.765E+09	-2.7034	13790.	0.000
16.560	0.000457	-902.8461	91.7780	1.489E-05	0.000	1.765E+09	-2.9472	13935.	0.000
16.740	0.000488	-713.3396	85.1607	1.391E-05	0.000	1.765E+09	-3.1799	14081.	0.000
16.920	0.000517	-538.5561	78.0497	1.314E-05	0.000	1.765E+09	-3.4044	14226.	0.000
17.100	0.000545	-379.5709	68.4381	1.258E-05	0.000	1.765E+09	-5.4952	21797.	0.000
17.280	0.000571	-246.1638	56.2063	1.220E-05	0.000	1.765E+09	-5.8305	22047.	0.000
17.460	0.000597	-139.9205	43.2508	1.196E-05	0.000	1.765E+09	-6.1653	22298.	0.000
17.640	0.000623	-62.4200	29.5698	1.184E-05	0.000	1.765E+09	-6.5023	22548.	0.000
17.820	0.000648	-15.2467	15.1563	1.179E-05	0.000	1.765E+09	-6.8435	22798.	0.000
18.000	0.000674	0.0000	0.0000	1.178E-05	0.000	1.765E+09	-7.1902	11524.	0.000

* This analysis makes computations of pile response using nonlinear moment-curvature relationships.

The above values of total stress are computed for combined axial and bending stress in elastic

sections and do not equal actual stresses in concrete and steel in the range of nonlinear bending.

Output Summary for Load Case No. 1:

Pile-head deflection = 0.2232613 inches
Computed slope at pile head = -0.0043388 radians
Maximum bending moment = 110098. inch-lbs
Maximum shear force = 3000.0000000 lbs
Depth of maximum bending moment = 47.5200000 inches below pile head
Depth of maximum shear force = 10.8000000 inches below pile head
Number of iterations = 7
Number of zero deflection points = 2

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

Boundary Condition Type 1, Shear and Moment

Shear = 3000. lbs
Moment = 0. in-lbs
Axial Load = 60000. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
18.0000	0.2232613	110098.	3000.0000000
17.1000	0.2234048	110127.	3000.0000000
16.2000	0.2234385	110070.	3000.0000000
15.3000	0.2234461	110079.	3000.0000001
14.4000	0.2236672	110093.	3000.0000000
13.5000	0.2236059	110070.	3000.0000001
12.6000	0.2236790	110091.	3000.0000000
11.7000	0.2238925	110006.	3000.0000002
10.8000	0.2257548	109706.	3000.0000002
9.9000	0.2325238	109071.	3000.0000001
9.0000	0.2516638	108172.	3000.0000004
8.1000	0.3036675	107800.	-3245.2492393
7.2000	0.5249324	109970.	-4344.2157414

 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 = 3500.000 lbs
 Applied moment at pile head = 0.000 in-lbs
 Axial thrust load on pile head = 60000.000 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. p lb/in	Soil Spr. Es*h lb/inch	Distrib. Lat. Load lb/inch
0.00	0.2907	-2.940E-07	3500.0000	-0.005659	0.000	1.765E+09	0.000	0.000	0.000
0.180	0.2785	8293.4384	3500.0000	-0.005654	0.000	1.765E+09	0.000	0.000	0.000
0.360	0.2663	16586.	3500.0000	-0.005639	0.000	1.764E+09	0.000	0.000	0.000
0.540	0.2541	24875.	3500.0000	-0.005614	0.000	1.763E+09	0.000	0.000	0.000
0.720	0.2420	33161.	3500.0000	-0.005578	0.000	1.761E+09	0.000	0.000	0.000
0.900	0.2300	41441.	3500.0000	-0.005532	0.000	1.758E+09	0.000	0.000	0.000
1.080	0.2181	49715.	3493.6872	-0.005476	0.000	1.755E+09	-5.8452	57.8782	0.000
1.260	0.2064	57953.	3465.5410	-0.005410	0.000	1.751E+09	-20.2161	211.5861	0.000
1.440	0.1948	66088.	3405.1560	-0.005333	0.000	1.746E+09	-35.6959	395.8662	0.000
1.620	0.1833	74046.	3310.7412	-0.005246	0.000	1.741E+09	-51.7252	609.3958	0.000
1.800	0.1721	81750.	3181.7359	-0.005150	0.000	1.735E+09	-67.7243	849.9634	0.000
1.980	0.1611	89125.	3018.9085	-0.005043	0.000	1.729E+09	-83.0418	1113.4534	0.000
2.160	0.1503	96099.	2823.8478	-0.004927	0.000	1.723E+09	-97.5700	1402.0073	0.000
2.340	0.1398	102602.	2599.0270	-0.004802	0.000	1.715E+09	-110.5974	1708.6937	0.000
2.520	0.1296	108571.	2348.0404	-0.004669	0.000	1.707E+09	-121.7976	2030.3430	0.000
2.700	0.1196	113955.	2073.5151	-0.004522	0.000	1.580E+09	-132.3925	2390.2561	0.000
2.880	0.1100	118701.	1778.5496	-0.004361	0.000	1.535E+09	-140.7238	2762.3240	0.000
3.060	0.1008	122769.	1467.7056	-0.004189	0.000	1.493E+09	-147.0948	3152.0403	0.000
3.240	0.0919	126127.	1144.4647	-0.004006	0.000	1.455E+09	-152.2024	3575.6221	0.000
3.420	0.0835	128752.	813.4570	-0.003815	0.000	1.424E+09	-154.2862	3991.4628	0.000
3.600	0.0755	130630.	485.0214	-0.003617	0.000	1.400E+09	-149.8209	4288.3485	0.000
3.780	0.0679	131784.	167.6166	-0.003413	0.000	1.385E+09	-144.0725	4585.2341	0.000
3.960	0.0607	132239.	-136.2008	-0.003207	0.000	1.379E+09	-137.2399	4882.1198	0.000
4.140	0.0540	132027.	-424.2956	-0.003000	0.000	1.382E+09	-129.5146	5179.0054	0.000
4.320	0.0478	131184.	-694.9343	-0.002795	0.000	1.393E+09	-121.0768	5475.8911	0.000
4.500	0.0419	129749.	-946.7582	-0.002594	0.000	1.411E+09	-112.0935	5772.7768	0.000
4.680	0.0366	127766.	-1178.7527	-0.002399	0.000	1.436E+09	-102.7163	6069.6624	0.000
4.860	0.0316	125279.	-1390.2141	-0.002210	0.000	1.465E+09	-93.0813	6366.5481	0.000
5.040	0.0270	122333.	-1580.7166	-0.002030	0.000	1.498E+09	-83.3099	6663.4338	0.000
5.220	0.0228	118976.	-1750.0808	-0.001858	0.000	1.533E+09	-73.5088	6960.3194	0.000
5.400	0.0190	115254.	-1898.3441	-0.001694	0.000	1.568E+09	-63.7719	7257.2051	0.000
5.580	0.0155	111215.	-2025.7333	-0.001544	0.000	1.704E+09	-54.1810	7554.0907	0.000
5.760	0.0123	106904.	-2132.5660	-0.001406	0.000	1.710E+09	-44.7382	7850.9764	0.000
5.940	0.009417	102366.	-2219.2456	-0.001274	0.000	1.715E+09	-35.5207	8147.8621	0.000
6.120	0.006803	97647.	-2286.3322	-0.001149	0.000	1.721E+09	-26.5965	8444.7477	0.000
6.300	0.004454	92787.	-2334.5238	-0.001029	0.000	1.726E+09	-18.0253	8741.6334	0.000
6.480	0.002356	87828.	-2364.6377	-0.000917	0.000	1.730E+09	-9.8579	9038.5191	0.000
6.660	0.000494	82810.	-2377.5923	-0.000810	0.000	1.735E+09	-2.1372	9335.4047	0.000
6.840	-0.001144	77767.	-2374.3904	-0.000710	0.000	1.738E+09	5.1020	9632.2904	0.000
7.020	-0.002574	72736.	-2356.1016	-0.000617	0.000	1.742E+09	11.8321	9929.1760	0.000
7.200	-0.003809	67749.	-2323.8473	-0.000530	0.000	1.745E+09	18.0330	10226.	0.000
7.380	-0.004863	62835.	-2278.7855	-0.000449	0.000	1.748E+09	23.6909	10523.	0.000
7.560	-0.005749	58021.	-2222.0970	-0.000374	0.000	1.751E+09	28.7985	10820.	0.000
7.740	-0.006481	53332.	-2154.9725	-0.000306	0.000	1.753E+09	33.3538	11117.	0.000
7.920	-0.007070	48791.	-2078.6015	-0.000243	0.000	1.755E+09	37.3602	11414.	0.000
8.100	-0.007530	44416.	-1999.9177	-0.000186	0.000	1.757E+09	35.4951	10182.	0.000
8.280	-0.007872	40199.	-1920.5215	-0.000134	0.000	1.758E+09	38.0199	10432.	0.000
8.460	-0.008107	36154.	-1836.1560	-8.674E-05	0.000	1.760E+09	40.0964	10682.	0.000
8.640	-0.008247	32289.	-1747.7703	-4.475E-05	0.000	1.761E+09	41.7423	10933.	0.000
8.820	-0.008301	28615.	-1656.2729	-7.402E-06	0.000	1.762E+09	42.9775	11183.	0.000
9.000	-0.008279	25136.	-1562.5271	2.554E-05	0.000	1.763E+09	43.8241	11434.	0.000
9.180	-0.008190	21858.	-1467.3468	5.433E-05	0.000	1.763E+09	44.3058	11684.	0.000
9.360	-0.008044	18783.	-1371.4934	7.922E-05	0.000	1.764E+09	44.4473	11935.	0.000

9.540	-0.007848	15913.	-1275.6736	0.000100	0.000	1.764E+09	44.2747	12185.	0.000
9.720	-0.007610	13246.	-1180.5375	0.000118	0.000	1.765E+09	43.8143	12436.	0.000
9.900	-0.007337	10782.	-1086.6775	0.000133	0.000	1.765E+09	43.0931	12686.	0.000
10.080	-0.007036	8517.3496	-994.6283	0.000145	0.000	1.765E+09	42.1377	12937.	0.000
10.260	-0.006711	6447.8068	-904.8665	0.000154	0.000	1.765E+09	40.9750	13187.	0.000
10.440	-0.006370	4568.4144	-817.8119	0.000161	0.000	1.765E+09	39.6311	13438.	0.000
10.620	-0.006017	2873.2005	-733.8282	0.000165	0.000	1.765E+09	38.1316	13688.	0.000
10.800	-0.005656	1355.4377	-653.2248	0.000168	0.000	1.765E+09	36.5011	13939.	0.000
10.980	-0.005292	7.7597	-576.2590	0.000169	0.000	1.765E+09	34.7635	14189.	0.000
11.160	-0.004928	-1177.7271	-503.1380	0.000168	0.000	1.765E+09	32.9412	14440.	0.000
11.340	-0.004566	-2209.3366	-434.0215	0.000166	0.000	1.765E+09	31.0556	14690.	0.000
11.520	-0.004211	-3095.7029	-369.0248	0.000163	0.000	1.765E+09	29.1265	14941.	0.000
11.700	-0.003864	-3845.6855	-308.2217	0.000158	0.000	1.765E+09	27.1726	15191.	0.000
11.880	-0.003527	-4468.2818	-251.6476	0.000153	0.000	1.765E+09	25.2108	15441.	0.000
12.060	-0.003201	-4972.5459	-199.3028	0.000148	0.000	1.765E+09	23.2566	15692.	0.000
12.240	-0.002889	-5367.5153	-151.1557	0.000141	0.000	1.765E+09	21.3240	15942.	0.000
12.420	-0.002591	-5662.1442	-107.1464	0.000134	0.000	1.765E+09	19.4254	16193.	0.000
12.600	-0.002308	-5865.2441	-67.1897	0.000127	0.000	1.765E+09	17.5715	16443.	0.000
12.780	-0.002041	-5985.4321	-31.1788	0.000120	0.000	1.765E+09	15.7719	16694.	0.000
12.960	-0.001789	-6031.0855	1.0119	0.000113	0.000	1.765E+09	14.0343	16944.	0.000
13.140	-0.001553	-6010.3040	29.5235	0.000105	0.000	1.765E+09	12.3653	17195.	0.000
13.320	-0.001333	-5930.8778	54.5095	9.815E-05	0.000	1.765E+09	10.7699	17445.	0.000
13.500	-0.001129	-5800.2631	76.1330	9.097E-05	0.000	1.765E+09	9.2519	17696.	0.000
13.680	-0.000940	-5625.5628	94.5642	8.398E-05	0.000	1.765E+09	7.8140	17946.	0.000
13.860	-0.000767	-5413.5135	109.9774	7.723E-05	0.000	1.765E+09	6.4575	18197.	0.000
14.040	-0.000607	-5170.4776	122.5490	7.075E-05	0.000	1.765E+09	5.1829	18447.	0.000
14.220	-0.000461	-4902.4405	132.4552	6.459E-05	0.000	1.765E+09	3.9895	18698.	0.000
14.400	-0.000328	-4615.0123	139.8700	5.876E-05	0.000	1.765E+09	2.8760	18948.	0.000
14.580	-0.000207	-4313.4341	144.9633	5.330E-05	0.000	1.765E+09	1.8400	19199.	0.000
14.760	-9.758E-05	-4002.5870	147.8994	4.821E-05	0.000	1.765E+09	0.8787	19449.	0.000
14.940	1.269E-06	-3687.0057	148.8359	4.351E-05	0.000	1.765E+09	-0.0116	19700.	0.000
15.120	9.038E-05	-3370.8937	148.2463	3.919E-05	0.000	1.765E+09	-0.5344	12771.	0.000
15.300	0.000171	-3056.7402	146.5676	3.526E-05	0.000	1.765E+09	-1.0200	12916.	0.000
15.480	0.000243	-2746.8611	143.8809	3.171E-05	0.000	1.765E+09	-1.4676	13062.	0.000
15.660	0.000308	-2443.3938	140.2648	2.853E-05	0.000	1.765E+09	-1.8806	13207.	0.000
15.840	0.000366	-2148.3131	135.7904	2.572E-05	0.000	1.765E+09	-2.2624	13353.	0.000
16.020	0.000419	-1863.4471	130.5211	2.327E-05	0.000	1.765E+09	-2.6165	13499.	0.000
16.200	0.000466	-1590.4934	124.5128	2.116E-05	0.000	1.765E+09	-2.9467	13644.	0.000
16.380	0.000510	-1331.0356	117.8134	1.937E-05	0.000	1.765E+09	-3.2565	13790.	0.000
16.560	0.000550	-1086.5600	110.4631	1.789E-05	0.000	1.765E+09	-3.5494	13935.	0.000
16.740	0.000587	-858.4723	102.4943	1.670E-05	0.000	1.765E+09	-3.8290	14081.	0.000
16.920	0.000622	-648.1133	93.9323	1.578E-05	0.000	1.765E+09	-4.0987	14226.	0.000
17.100	0.000656	-456.7745	82.3615	1.510E-05	0.000	1.765E+09	-6.6150	21797.	0.000
17.280	0.000688	-296.2264	67.6379	1.464E-05	0.000	1.765E+09	-7.0179	22047.	0.000
17.460	0.000719	-168.3738	52.0450	1.436E-05	0.000	1.765E+09	-7.4200	22298.	0.000
17.640	0.000750	-75.1134	35.5806	1.421E-05	0.000	1.765E+09	-7.8248	22548.	0.000
17.820	0.000780	-18.3485	18.2365	1.415E-05	0.000	1.765E+09	-8.2346	22798.	0.000
18.000	0.000811	0.0000	0.0000	1.414E-05	0.000	1.765E+09	-8.6510	11524.	0.000

* This analysis makes computations of pile response using nonlinear moment-curvature relationships.

The above values of total stress are computed for combined axial and bending stress in elastic

sections and do not equal actual stresses in concrete and steel in the range of nonlinear bending.

Output Summary for Load Case No. 2:

Pile-head deflection = 0.2907164 inches
Computed slope at pile head = -0.0056592 radians
Maximum bending moment = 132239. inch-lbs
Maximum shear force = 3500.0000001 lbs
Depth of maximum bending moment = 47.5200000 inches below pile head
Depth of maximum shear force = 2.1600000 inches below pile head
Number of iterations = 16
Number of zero deflection points = 2

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

Boundary Condition Type 1, Shear and Moment

Shear = 3500. lbs
Moment = 0. in-lbs
Axial Load = 60000. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
18.0000	0.2907164	132239.	3500.0000001
17.1000	0.2910096	132251.	3500.0000000
16.2000	0.2907563	132235.	3500.0000001
15.3000	0.2907383	132232.	3500.0000001
14.4000	0.2913514	132279.	3500.0000000
13.5000	0.2910926	132215.	3500.0000001
12.6000	0.2911184	132267.	3500.0000000
11.7000	0.2914006	132186.	3500.0000008
10.8000	0.2939621	131977.	3500.0000000
9.9000	0.3033472	131548.	3500.0000000
9.0000	0.3336299	130907.	3500.0000007
8.1000	0.4233548	130377.	-4091.7430127
7.2000	0.8358874	136378.	-5704.3691862

 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 = 3800.000 lbs
 Applied moment at pile head = 0.000 in-lbs
 Axial thrust load on pile head = 60000.000 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. p lb/in	Soil Spr. Es*h lb/inch	Distrib. Lat. Load lb/inch
0.00	0.3513	-2.100E-07	3800.0000	-0.006842	0.000	1.765E+09	0.000	0.000	0.000
0.180	0.3366	9094.7593	3800.0000	-0.006837	0.000	1.765E+09	0.000	0.000	0.000
0.360	0.3218	18188.	3800.0000	-0.006820	0.000	1.764E+09	0.000	0.000	0.000
0.540	0.3071	27279.	3800.0000	-0.006792	0.000	1.762E+09	0.000	0.000	0.000
0.720	0.2925	36365.	3800.0000	-0.006753	0.000	1.760E+09	0.000	0.000	0.000
0.900	0.2779	45445.	3800.0000	-0.006703	0.000	1.756E+09	0.000	0.000	0.000
1.080	0.2635	54518.	3793.3212	-0.006641	0.000	1.752E+09	-6.1840	50.6908	0.000
1.260	0.2492	63553.	3763.5541	-0.006568	0.000	1.748E+09	-21.3781	185.2729	0.000
1.440	0.2351	72479.	3699.7124	-0.006484	0.000	1.742E+09	-37.7345	346.6396	0.000
1.620	0.2212	81217.	3599.9433	-0.006389	0.000	1.736E+09	-54.6443	533.5379	0.000
1.800	0.2075	89687.	3463.6823	-0.006282	0.000	1.729E+09	-71.5233	744.4090	0.000
1.980	0.1941	97808.	3291.6751	-0.006165	0.000	1.721E+09	-87.7426	976.4975	0.000
2.160	0.1809	105505.	3085.5255	-0.006037	0.000	1.712E+09	-103.1366	1231.4671	0.000
2.340	0.1680	112703.	2847.8292	-0.005899	0.000	1.702E+09	-116.9526	1503.6181	0.000
2.520	0.1554	119336.	2582.3677	-0.005743	0.000	1.529E+09	-128.8451	1790.6702	0.000
2.700	0.1432	125347.	2291.8908	-0.005566	0.000	1.464E+09	-140.1149	2113.5071	0.000
2.880	0.1314	130680.	1979.6494	-0.005373	0.000	1.399E+09	-148.9975	2449.7601	0.000
3.060	0.1200	135292.	1650.4881	-0.005163	0.000	1.337E+09	-155.7814	2804.3809	0.000
3.240	0.1091	139148.	1308.1920	-0.004936	0.000	1.280E+09	-161.1595	3191.5365	0.000
3.420	0.0987	142223.	957.2264	-0.004694	0.000	1.231E+09	-163.8086	3586.2171	0.000
3.600	0.0888	144500.	602.5809	-0.004438	0.000	1.192E+09	-164.5668	4003.2594	0.000
3.780	0.0795	145976.	248.6841	-0.004172	0.000	1.165E+09	-163.1154	4432.3704	0.000
3.960	0.0708	146656.	-98.6873	-0.003899	0.000	1.153E+09	-158.5248	4838.3502	0.000
4.140	0.0626	146560.	-432.1131	-0.003625	0.000	1.155E+09	-150.2028	5179.0054	0.000
4.320	0.0551	145729.	-745.2236	-0.003353	0.000	1.170E+09	-139.7143	5475.8911	0.000
4.500	0.0482	144210.	-1035.1194	-0.003089	0.000	1.197E+09	-128.7078	5772.7768	0.000
4.680	0.0418	142058.	-1300.8829	-0.002834	0.000	1.234E+09	-117.3694	6069.6624	0.000
4.860	0.0359	139325.	-1541.9684	-0.002592	0.000	1.277E+09	-105.8579	6366.5481	0.000
5.040	0.0306	136068.	-1758.1466	-0.002363	0.000	1.326E+09	-94.3072	6663.4338	0.000
5.220	0.0257	132342.	-1949.4551	-0.002149	0.000	1.378E+09	-82.8303	6960.3194	0.000
5.400	0.0213	128203.	-2116.1552	-0.001948	0.000	1.430E+09	-71.5217	7257.2051	0.000
5.580	0.0173	123706.	-2258.6969	-0.001761	0.000	1.483E+09	-60.4613	7554.0907	0.000
5.760	0.0137	118902.	-2377.6884	-0.001588	0.000	1.533E+09	-49.7161	7850.9764	0.000
5.940	0.0104	113846.	-2473.8726	-0.001426	0.000	1.581E+09	-39.3433	8147.8621	0.000
6.120	0.007518	108585.	-2548.1062	-0.001280	0.000	1.707E+09	-29.3915	8444.7477	0.000
6.300	0.004902	103169.	-2601.2760	-0.001146	0.000	1.715E+09	-19.8399	8741.6334	0.000
6.480	0.002568	97644.	-2634.3067	-0.001020	0.000	1.721E+09	-10.7441	9038.5191	0.000
6.660	0.000498	92053.	-2648.2329	-0.000901	0.000	1.727E+09	-2.1506	9335.4047	0.000
6.840	-0.001324	86438.	-2644.1806	-0.000789	0.000	1.732E+09	5.9027	9632.2904	0.000
7.020	-0.002912	80835.	-2623.3488	-0.000685	0.000	1.736E+09	13.3861	9929.1760	0.000
7.200	-0.004283	75282.	-2586.9920	-0.000588	0.000	1.740E+09	20.2776	10226.	0.000
7.380	-0.005452	69812.	-2536.4045	-0.000498	0.000	1.744E+09	26.5627	10523.	0.000
7.560	-0.006435	64454.	-2472.9044	-0.000415	0.000	1.747E+09	32.2336	10820.	0.000
7.740	-0.007245	59236.	-2397.8202	-0.000339	0.000	1.750E+09	37.2888	11117.	0.000
7.920	-0.007898	54183.	-2312.4776	-0.000269	0.000	1.753E+09	41.7322	11414.	0.000
8.100	-0.008406	49316.	-2224.6143	-0.000205	0.000	1.755E+09	39.6228	10182.	0.000
8.280	-0.008783	44626.	-2136.0096	-0.000147	0.000	1.757E+09	42.4186	10432.	0.000
8.460	-0.009042	40127.	-2041.9045	-9.505E-05	0.000	1.758E+09	44.7157	10682.	0.000
8.640	-0.009194	35830.	-1943.3548	-4.842E-05	0.000	1.760E+09	46.5339	10933.	0.000
8.820	-0.009251	31744.	-1841.3710	-6.958E-06	0.000	1.761E+09	47.8955	11183.	0.000
9.000	-0.009224	27877.	-1736.9126	2.960E-05	0.000	1.762E+09	48.8252	11434.	0.000
9.180	-0.009123	24233.	-1630.8841	6.153E-05	0.000	1.763E+09	49.3493	11684.	0.000
9.360	-0.008958	20815.	-1524.1315	8.912E-05	0.000	1.763E+09	49.4956	11935.	0.000

9.540	-0.008738	17626.	-1417.4397	0.000113	0.000	1.764E+09	49.2930	12185.	0.000
9.720	-0.008471	14663.	-1311.5305	0.000132	0.000	1.764E+09	48.7710	12436.	0.000
9.900	-0.008166	11925.	-1207.0616	0.000149	0.000	1.765E+09	47.9594	12686.	0.000
10.080	-0.007829	9409.7998	-1104.6262	0.000162	0.000	1.765E+09	46.8882	12937.	0.000
10.260	-0.007467	7111.4777	-1004.7531	0.000172	0.000	1.765E+09	45.5869	13187.	0.000
10.440	-0.007086	5024.7181	-907.9077	0.000179	0.000	1.765E+09	44.0848	13438.	0.000
10.620	-0.006692	3142.8436	-814.4931	0.000184	0.000	1.765E+09	42.4102	13688.	0.000
10.800	-0.006290	1458.3399	-724.8521	0.000187	0.000	1.765E+09	40.5907	13939.	0.000
10.980	-0.005884	-37.0151	-639.2693	0.000188	0.000	1.765E+09	38.6526	14189.	0.000
11.160	-0.005478	-1352.0268	-557.9739	0.000187	0.000	1.765E+09	36.6209	14440.	0.000
11.340	-0.005076	-2495.9655	-481.1423	0.000185	0.000	1.765E+09	34.5194	14690.	0.000
11.520	-0.004680	-3478.4544	-408.9015	0.000181	0.000	1.765E+09	32.3702	14941.	0.000
11.700	-0.004293	-4309.3652	-341.3322	0.000176	0.000	1.765E+09	30.1939	15191.	0.000
11.880	-0.003918	-4998.7199	-278.4727	0.000171	0.000	1.765E+09	28.0093	15441.	0.000
12.060	-0.003556	-5556.6016	-220.3222	0.000164	0.000	1.765E+09	25.8337	15692.	0.000
12.240	-0.003209	-5993.0723	-166.8447	0.000157	0.000	1.765E+09	23.6825	15942.	0.000
12.420	-0.002877	-6318.0992	-117.9724	0.000150	0.000	1.765E+09	21.5696	16193.	0.000
12.600	-0.002562	-6541.4892	-73.6098	0.000142	0.000	1.765E+09	19.5069	16443.	0.000
12.780	-0.002265	-6672.8306	-33.6373	0.000134	0.000	1.765E+09	17.5048	16694.	0.000
12.960	-0.001985	-6721.4436	2.0856	0.000125	0.000	1.765E+09	15.5720	16944.	0.000
13.140	-0.001723	-6696.3378	33.7165	0.000117	0.000	1.765E+09	13.7158	17195.	0.000
13.320	-0.001479	-6606.1776	61.4266	0.000109	0.000	1.765E+09	11.9418	17445.	0.000
13.500	-0.001252	-6459.2541	85.3982	0.000101	0.000	1.765E+09	10.2541	17696.	0.000
13.680	-0.001042	-6263.4649	105.8207	9.332E-05	0.000	1.765E+09	8.6556	17946.	0.000
13.860	-0.000848	-6026.2985	122.8886	8.581E-05	0.000	1.765E+09	7.1480	18197.	0.000
14.040	-0.000671	-5754.8269	136.7984	7.860E-05	0.000	1.765E+09	5.7315	18447.	0.000
14.220	-0.000509	-5455.7016	147.7465	7.174E-05	0.000	1.765E+09	4.4056	18698.	0.000
14.400	-0.000361	-5135.1564	155.9266	6.526E-05	0.000	1.765E+09	3.1686	18948.	0.000
14.580	-0.000227	-4799.0136	161.5280	5.918E-05	0.000	1.765E+09	2.0179	19199.	0.000
14.760	-0.000106	-4452.6950	164.7337	5.352E-05	0.000	1.765E+09	0.9503	19449.	0.000
14.940	4.177E-06	-4101.2365	165.7189	4.829E-05	0.000	1.765E+09	-0.0381	19700.	0.000
15.120	0.000103	-3749.3053	165.0197	4.348E-05	0.000	1.765E+09	-0.6093	12771.	0.000
15.300	0.000192	-3399.6224	163.1215	3.911E-05	0.000	1.765E+09	-1.1483	12916.	0.000
15.480	0.000272	-3054.7578	160.1049	3.516E-05	0.000	1.765E+09	-1.6449	13062.	0.000
15.660	0.000344	-2717.0832	156.0572	3.163E-05	0.000	1.765E+09	-2.1029	13207.	0.000
15.840	0.000409	-2388.7893	151.0576	2.851E-05	0.000	1.765E+09	-2.5263	13353.	0.000
16.020	0.000467	-2071.9031	145.1768	2.578E-05	0.000	1.765E+09	-2.9189	13499.	0.000
16.200	0.000520	-1768.3068	138.4769	2.343E-05	0.000	1.765E+09	-3.2848	13644.	0.000
16.380	0.000568	-1479.7555	131.0111	2.144E-05	0.000	1.765E+09	-3.6280	13790.	0.000
16.560	0.000613	-1207.8962	122.8243	1.980E-05	0.000	1.765E+09	-3.9524	13935.	0.000
16.740	0.000654	-954.2859	113.9526	1.847E-05	0.000	1.765E+09	-4.2621	14081.	0.000
16.920	0.000692	-720.4092	104.4241	1.745E-05	0.000	1.765E+09	-4.5606	14226.	0.000
17.100	0.000729	-507.6964	91.5519	1.670E-05	0.000	1.765E+09	-7.3581	21797.	0.000
17.280	0.000765	-329.2333	75.1768	1.619E-05	0.000	1.765E+09	-7.8040	22047.	0.000
17.460	0.000799	-187.1282	57.8395	1.587E-05	0.000	1.765E+09	-8.2491	22298.	0.000
17.640	0.000833	-83.4802	39.5378	1.570E-05	0.000	1.765E+09	-8.6970	22548.	0.000
17.820	0.000867	-20.3956	20.2626	1.564E-05	0.000	1.765E+09	-9.1504	22798.	0.000
18.000	0.000901	0.0000	0.0000	1.563E-05	0.000	1.765E+09	-9.6112	11524.	0.000

* This analysis makes computations of pile response using nonlinear moment-curvature relationships.

The above values of total stress are computed for combined axial and bending stress in elastic

sections and do not equal actual stresses in concrete and steel in the range of nonlinear bending.

Output Summary for Load Case No. 3:

Pile-head deflection = 0.3513423 inches
Computed slope at pile head = -0.0068423 radians
Maximum bending moment = 146656. inch-lbs
Maximum shear force = 3800.0000001 lbs
Depth of maximum bending moment = 47.5200000 inches below pile head
Depth of maximum shear force = 2.1600000 inches below pile head
Number of iterations = 24
Number of zero deflection points = 2

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

Boundary Condition Type 1, Shear and Moment

Shear = 3800. lbs
Moment = 0. in-lbs
Axial Load = 60000. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
18.0000	0.3513423	146656.	3800.0000001
17.1000	0.3516283	146705.	3800.0000000
16.2000	0.3515976	146747.	3800.0000001
15.3000	0.3517075	146676.	3800.0000002
14.4000	0.3521229	146776.	3800.0000000
13.5000	0.3519904	146713.	3800.0000002
12.6000	0.3522588	146771.	3800.0000001
11.7000	0.3521116	146630.	3800.0000001
10.8000	0.3552558	146468.	3800.0000002
9.9000	0.3670647	146010.	3800.0000002
9.0000	0.4066588	145133.	3800.0000005
8.1000	0.5159552	144452.	-4626.9576284

 Computed Values of Pile Loading and Deflection
 for Lateral Loading for Load Case Number 4

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

Shear force at pile head = 4000.000 lbs
 Applied moment at pile head = 0.000 in-lbs
 Axial thrust load on pile head = 60000.000 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. p lb/in	Soil Spr. Es*h lb/inch	Distrib. Lat. Load lb/inch
0.00	0.4168	-2.940E-07	4000.0000	-0.008150	0.000	1.765E+09	0.000	0.000	0.000
0.180	0.3992	9696.2404	4000.0000	-0.008144	0.000	1.765E+09	0.000	0.000	0.000
0.360	0.3816	19391.	4000.0000	-0.008126	0.000	1.764E+09	0.000	0.000	0.000
0.540	0.3641	29083.	4000.0000	-0.008097	0.000	1.762E+09	0.000	0.000	0.000
0.720	0.3466	38770.	4000.0000	-0.008055	0.000	1.759E+09	0.000	0.000	0.000
0.900	0.3293	48450.	4000.0000	-0.008001	0.000	1.755E+09	0.000	0.000	0.000
1.080	0.3121	58124.	3992.9295	-0.007936	0.000	1.751E+09	-6.5467	45.3129	0.000
1.260	0.2950	67757.	3961.4305	-0.007858	0.000	1.745E+09	-22.6191	165.6128	0.000
1.440	0.2781	77274.	3893.9064	-0.007768	0.000	1.739E+09	-39.9032	309.8985	0.000
1.620	0.2615	86592.	3788.4930	-0.007666	0.000	1.731E+09	-57.7018	476.7075	0.000
1.800	0.2450	95627.	3644.7665	-0.007552	0.000	1.723E+09	-75.3783	664.5338	0.000
1.980	0.2288	104295.	3463.6791	-0.007426	0.000	1.713E+09	-92.2951	871.2153	0.000
2.160	0.2129	112515.	3246.9897	-0.007289	0.000	1.702E+09	-108.3432	1099.0617	0.000
2.340	0.1973	120211.	2997.3361	-0.007132	0.000	1.520E+09	-122.8176	1344.3231	0.000
2.520	0.1821	127312.	2718.5482	-0.006952	0.000	1.441E+09	-135.3193	1604.9587	0.000
2.700	0.1673	133757.	2413.4675	-0.006750	0.000	1.359E+09	-147.1628	1899.9259	0.000
2.880	0.1530	139488.	2085.5270	-0.006525	0.000	1.275E+09	-156.4858	2209.8246	0.000
3.060	0.1391	144458.	1739.8798	-0.006276	0.000	1.193E+09	-163.5579	2539.4597	0.000
3.240	0.1258	148631.	1380.6485	-0.006001	0.000	1.114E+09	-169.0637	2901.8298	0.000
3.420	0.1132	151978.	1012.6606	-0.005700	0.000	1.041E+09	-171.6658	3275.8365	0.000
3.600	0.1012	154483.	641.1242	-0.005371	0.000	9.774E+08	-172.3494	3677.8387	0.000
3.780	0.0900	156140.	270.5516	-0.005019	0.000	9.299E+08	-170.7734	4099.1229	0.000
3.960	0.0795	156953.	-93.0594	-0.004650	0.000	9.041E+08	-165.9034	4505.4276	0.000
4.140	0.0699	156943.	-446.8950	-0.004276	0.000	9.044E+08	-161.7221	4997.5870	0.000
4.320	0.0611	156130.	-788.7539	-0.003907	0.000	9.301E+08	-154.8139	5475.8911	0.000
4.500	0.0530	154548.	-1108.9895	-0.003554	0.000	9.757E+08	-141.7006	5772.7768	0.000
4.680	0.0457	152261.	-1400.7540	-0.003224	0.000	1.034E+09	-128.4517	6069.6624	0.000
4.860	0.0391	149333.	-1663.9176	-0.002919	0.000	1.100E+09	-115.2183	6366.5481	0.000
5.040	0.0331	145829.	-1898.6423	-0.002637	0.000	1.168E+09	-102.1193	6663.4338	0.000
5.220	0.0277	141814.	-2105.3227	-0.002379	0.000	1.238E+09	-89.2514	6960.3194	0.000
5.400	0.0228	137351.	-2284.5438	-0.002141	0.000	1.307E+09	-76.6940	7257.2051	0.000
5.580	0.0184	132500.	-2437.0465	-0.001924	0.000	1.376E+09	-64.5122	7554.0907	0.000
5.760	0.0145	127322.	-2563.7001	-0.001724	0.000	1.441E+09	-52.7597	7850.9764	0.000
5.940	0.0110	121872.	-2665.4807	-0.001541	0.000	1.503E+09	-41.4815	8147.8621	0.000
6.120	0.007856	116206.	-2743.4529	-0.001373	0.000	1.559E+09	-30.7150	8444.7477	0.000
6.300	0.005064	110376.	-2798.7570	-0.001223	0.000	1.705E+09	-20.4925	8741.6334	0.000
6.480	0.002573	104433.	-2832.5164	-0.001087	0.000	1.713E+09	-10.7662	9038.5191	0.000
6.660	0.000367	98422.	-2845.8554	-0.000960	0.000	1.720E+09	-1.5846	9335.4047	0.000
6.840	-0.001573	92387.	-2839.9927	-0.000840	0.000	1.726E+09	7.0130	9632.2904	0.000
7.020	-0.003262	86371.	-2816.2231	-0.000728	0.000	1.732E+09	14.9959	9929.1760	0.000
7.200	-0.004719	80410.	-2775.8986	-0.000624	0.000	1.736E+09	22.3416	10226.	0.000
7.380	-0.005960	74541.	-2720.4116	-0.000528	0.000	1.741E+09	29.0353	10523.	0.000
7.560	-0.007001	68795.	-2651.1788	-0.000439	0.000	1.744E+09	35.0692	10820.	0.000
7.740	-0.007858	63201.	-2569.6263	-0.000358	0.000	1.748E+09	40.4423	11117.	0.000
7.920	-0.008546	57787.	-2477.1762	-0.000283	0.000	1.751E+09	45.1596	11414.	0.000
8.100	-0.009081	52573.	-2382.1761	-0.000215	0.000	1.753E+09	42.8035	10182.	0.000
8.280	-0.009475	47551.	-2286.5260	-0.000153	0.000	1.756E+09	45.7614	10432.	0.000
8.460	-0.009743	42735.	-2185.0629	-9.784E-05	0.000	1.757E+09	48.1859	10682.	0.000
8.640	-0.009898	38137.	-2078.9161	-4.816E-05	0.000	1.759E+09	50.0982	10933.	0.000
8.820	-0.009951	33767.	-1969.1655	-4.030E-06	0.000	1.760E+09	51.5227	11183.	0.000
9.000	-0.009915	29631.	-1856.8363	3.485E-05	0.000	1.762E+09	52.4859	11434.	0.000
9.180	-0.009801	25736.	-1742.8941	6.879E-05	0.000	1.762E+09	53.0161	11684.	0.000
9.360	-0.009618	22084.	-1628.2419	9.809E-05	0.000	1.763E+09	53.1434	11935.	0.000

9.540	-0.009377	18677.	-1513.7165	0.000123	0.000	1.764E+09	52.8986	12185.	0.000
9.720	-0.009086	15513.	-1400.0874	0.000144	0.000	1.764E+09	52.3135	12436.	0.000
9.900	-0.008755	12591.	-1288.0551	0.000161	0.000	1.765E+09	51.4201	12686.	0.000
10.080	-0.008390	9906.9942	-1178.2508	0.000175	0.000	1.765E+09	50.2505	12937.	0.000
10.260	-0.007999	7455.7372	-1071.2371	0.000186	0.000	1.765E+09	48.8363	13187.	0.000
10.440	-0.007588	5231.1483	-967.5084	0.000193	0.000	1.765E+09	47.2088	13438.	0.000
10.620	-0.007164	3225.9875	-867.4924	0.000199	0.000	1.765E+09	45.3985	13688.	0.000
10.800	-0.006731	1432.1264	-771.5525	0.000201	0.000	1.765E+09	43.4347	13939.	0.000
10.980	-0.006294	-159.3126	-679.9897	0.000202	0.000	1.765E+09	41.3457	14189.	0.000
11.160	-0.005858	-1557.8241	-593.0456	0.000201	0.000	1.765E+09	39.1581	14440.	0.000
11.340	-0.005425	-2773.3927	-510.9059	0.000198	0.000	1.765E+09	36.8973	14690.	0.000
11.520	-0.005000	-3816.3735	-433.7029	0.000194	0.000	1.765E+09	34.5869	14941.	0.000
11.700	-0.004585	-4697.3804	-361.5202	0.000189	0.000	1.765E+09	32.2489	15191.	0.000
11.880	-0.004183	-5427.1817	-294.3956	0.000183	0.000	1.765E+09	29.9035	15441.	0.000
12.060	-0.003795	-6016.6045	-232.3253	0.000176	0.000	1.765E+09	27.5689	15692.	0.000
12.240	-0.003423	-6476.4475	-175.2682	0.000168	0.000	1.765E+09	25.2617	15942.	0.000
12.420	-0.003068	-6817.4023	-123.1492	0.000160	0.000	1.765E+09	22.9965	16193.	0.000
12.600	-0.002730	-7049.9832	-75.8639	0.000152	0.000	1.765E+09	20.7862	16443.	0.000
12.780	-0.002412	-7184.4662	-33.2819	0.000143	0.000	1.765E+09	18.6416	16694.	0.000
12.960	-0.002113	-7230.8354	4.7490	0.000134	0.000	1.765E+09	16.5722	16944.	0.000
13.140	-0.001832	-7198.7385	38.3993	0.000125	0.000	1.765E+09	14.5855	17195.	0.000
13.320	-0.001571	-7097.4498	67.8541	0.000117	0.000	1.765E+09	12.6874	17445.	0.000
13.500	-0.001328	-6935.8410	93.3096	0.000108	0.000	1.765E+09	10.8825	17696.	0.000
13.680	-0.001104	-6722.3590	114.9701	9.969E-05	0.000	1.765E+09	9.1736	17946.	0.000
13.860	-0.000898	-6465.0108	133.0449	9.163E-05	0.000	1.765E+09	7.5623	18197.	0.000
14.040	-0.000708	-6171.3543	147.7454	8.389E-05	0.000	1.765E+09	6.0492	18447.	0.000
14.220	-0.000535	-5848.4961	159.2825	7.654E-05	0.000	1.765E+09	4.6333	18698.	0.000
14.400	-0.000378	-5503.0932	167.8644	6.959E-05	0.000	1.765E+09	3.3129	18948.	0.000
14.580	-0.000235	-5141.3609	173.6943	6.308E-05	0.000	1.765E+09	2.0852	19199.	0.000
14.760	-0.000105	-4769.0845	176.9688	5.702E-05	0.000	1.765E+09	0.9467	19449.	0.000
14.940	1.171E-05	-4391.6348	177.8759	5.141E-05	0.000	1.765E+09	-0.1068	19700.	0.000
15.120	0.000117	-4013.9872	177.0136	4.627E-05	0.000	1.765E+09	-0.6915	12771.	0.000
15.300	0.000212	-3638.9294	174.9002	4.159E-05	0.000	1.765E+09	-1.2654	12916.	0.000
15.480	0.000297	-3269.1983	171.5963	3.736E-05	0.000	1.765E+09	-1.7938	13062.	0.000
15.660	0.000373	-2907.3177	167.1958	3.358E-05	0.000	1.765E+09	-2.2808	13207.	0.000
15.840	0.000442	-2555.6174	161.7834	3.024E-05	0.000	1.765E+09	-2.7306	13353.	0.000
16.020	0.000504	-2216.2520	155.4350	2.732E-05	0.000	1.765E+09	-3.1475	13499.	0.000
16.200	0.000560	-1891.2202	148.2171	2.481E-05	0.000	1.765E+09	-3.5358	13644.	0.000
16.380	0.000611	-1582.3849	140.1868	2.268E-05	0.000	1.765E+09	-3.8996	13790.	0.000
16.560	0.000658	-1291.4928	131.3924	2.093E-05	0.000	1.765E+09	-4.2434	13935.	0.000
16.740	0.000701	-1020.1939	121.8725	1.951E-05	0.000	1.765E+09	-4.5713	14081.	0.000
16.920	0.000742	-770.0609	111.6573	1.842E-05	0.000	1.765E+09	-4.8872	14226.	0.000
17.100	0.000781	-542.6077	97.8699	1.761E-05	0.000	1.765E+09	-7.8789	21797.	0.000
17.280	0.000818	-351.8285	80.3421	1.707E-05	0.000	1.765E+09	-8.3505	22047.	0.000
17.460	0.000855	-199.9535	61.7968	1.673E-05	0.000	1.765E+09	-8.8211	22298.	0.000
17.640	0.000890	-89.2025	42.2318	1.655E-05	0.000	1.765E+09	-9.2946	22548.	0.000
17.820	0.000926	-21.8022	21.6377	1.648E-05	0.000	1.765E+09	-9.7740	22798.	0.000
18.000	0.000962	0.000	0.000	1.647E-05	0.000	1.765E+09	-10.2610	11524.	0.000

* This analysis makes computations of pile response using nonlinear moment-curvature relationships.

The above values of total stress are computed for combined axial and bending stress in elastic

sections and do not equal actual stresses in concrete and steel in the range of nonlinear bending.

Output Summary for Load Case No. 4:

Pile-head deflection = 0.4167975 inches
Computed slope at pile head = -0.0081500 radians
Maximum bending moment = 156953. inch-lbs
Maximum shear force = 4000.0000001 lbs
Depth of maximum bending moment = 47.5200000 inches below pile head
Depth of maximum shear force = 2.1600000 inches below pile head
Number of iterations = 44
Number of zero deflection points = 2

Pile-head Deflection vs. Pile Length for Load Case 4

Boundary Condition Type 1, Shear and Moment

Shear = 4000. lbs
Moment = 0. in-lbs
Axial Load = 60000. lbs

Pile Length feet	Pile Head Deflection inches	Maximum Moment ln-lbs	Maximum Shear lbs
18.0000	0.4167975	156953.	4000.0000001
17.1000	0.4177070	157078.	4000.0000001
16.2000	0.4176172	157094.	4000.0000000
15.3000	0.4171643	156981.	4000.0000001
14.4000	0.4181164	157118.	4000.0000001
13.5000	0.4176698	157055.	4000.0000002
12.6000	0.4181290	157112.	4000.0000002
11.7000	0.4179832	156962.	4000.0000007
10.8000	0.4201080	156752.	4000.0000000
9.9000	0.4322642	156202.	4000.0000000
9.0000	0.4738882	155186.	-4074.8745161
8.1000	0.5942263	154359.	-4994.2497169

Summary of Pile Response(s)

Definitions of Pile-head Loading Conditions:

Load Type 1: Load 1 = Shear, lbs, and Load 2 = Moment, in-lbs
Load Type 2: Load 1 = Shear, lbs, and Load 2 = Slope, radians
Load Type 3: Load 1 = Shear, lbs, and Load 2 = Rotational Stiffness, in-lbs/radian
Load Type 4: Load 1 = Top Deflection, inches, and Load 2 = Moment, in-lbs
Load Type 5: Load 1 = Top Deflection, inches, and Load 2 = Slope, radians

Load Case No.	Load Type No.	Pile-head Condition 1 V(lbs) or y(inches)	Pile-head Condition 2 in-lb, rad., or in-lb/rad.	Axial Loading lbs	Pile-head Deflection inches	Maximum Moment in Pile in-lbs	Maximum Shear in Pile lbs	Pile-head Rotation radians
1	1	V = 3000.0000	M = 0.000	60000.	0.22326131	110098.	3000.0000	-0.00433881
2	1	V = 3500.0000	M = 0.000	60000.	0.29071644	132239.	3500.0000	-0.00565925
3	1	V = 3800.0000	M = 0.000	60000.	0.35134227	146656.	3800.0000	-0.00684228
4	1	V = 4000.0000	M = 0.000	60000.	0.41679746	156953.	4000.0000	-0.00815000

The analysis ended normally.