Exhibit X. T.O. Allen Industrial Park South
Preliminary Geotechnical Engineering Report

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T.O. Allen Industrial Park South Preliminary Geotechnical Engineering Report

November 18, 2016

One Acadiana
804 East St. Mary Boulevard
Lafayette, LA 70503

Attention : Mr. Zach Hager
Email: zach@oneacadiana.com
Phone: (337) 735 - 4192

Re: **Preliminary Geotechnical Investigation**
Allen Estates – South Site
Jefferson Davis Parish, Louisiana
PSI Project No. 0254862

Dear Mr. Hager:

Professional Service Industries, Inc. (PSI) is pleased to submit this Preliminary Geotechnical Evaluation for the above-referenced project in Jefferson Davis Parish, Louisiana. This report presents the results of the field exploration and laboratory testing, preliminary estimates of axial pile capacities for common deep foundations, and preliminary estimates of allowable bearing capacity for shallow foundation, for the proposed construction site. The discussion provided herein is intended for use in feasibility studies and cost estimating and to be utilized to support the Louisiana Economic Development (LED) site certification process and are not intended for use in any formal design or construction.

We appreciate the opportunity to perform this geotechnical evaluation and look forward to continuing participation during the design and construction phases of this project. If you have any questions pertaining to this report, please contact our office.

Respectfully submitted,
PROFESSIONAL SERVICE INDUSTRIES, INC.

Matthew Champagne
Staff Scientist
Geotechnical Services

Reda M. Bakeer, Ph.D., P.E.
Chief Engineer
Geotechnical Services

PRELIMINARY GEOTECHNICAL EVALUATION

ALLEN ESTATES – SOUTH SITE
LOUISIAN HIGHWAY 90
JEFFERSON DAVIS PARISH, LOUISIANA

PSI PROJECT NO. 0254862

PREPARED FOR

ONE ACADIANA
804 EAST ST. MARY BOULEVARD
LAFAYETTE, LOUISIANA 70503

NOVEMBER 18, 2016

BY

PROFESSIONAL SERVICE INDUSTRIES, INC.
11950 INDUSTRIPLEX BOULEVARD
BATON ROUGE, LOUISIANA 70809
PHONE: (225)293-8378
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Name: Reda M. Bakeer, Ph.D., P.E.
Date: November 18, 2016
License No.: 27123
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PROJECT INFORMATION

Project Authorization

Professional Service Industries, Inc. (PSI) has completed a preliminary geotechnical exploration for the general characterization of the Allen Estate – South Site on Highway 90 in Jefferson Davis Parish, Louisiana. This exploration was performed in general accordance with PSI Proposal No. 0254-180981, dated May 23, 2016. The proposal was authorized by Jim Bourgeois with One Acadiana on September 19, 2016.

Project Description

Information about the proposed project was provided to PSI by Mr. Joseph Yarbrough with CSRS, Inc. via an e-mail; dated May 16, 2016, containing a Request for Proposal (RFP). Based on the information provided, it is understood that the purpose of this study is to perform a preliminary geotechnical evaluation to develop a "General Geotechnical Site Characterization" for the subject site. The site consists of approximately 143 acres. It is also understood that no specific development is presently being planned for the site and that the Client is only interested in obtaining preliminary geotechnical guidelines with regard to individual pile capacities for deep foundations and bearing capacity for shallow foundations if practical. It is also understood that the site is currently undeveloped and is used for agricultural purposes.

PSI understands that this preliminary report will not be used for the construction of structures or foundations, but will be limited to providing general characterization of the subsoil types and stratification at the subject site as indicated by a limited number of borings considering the site size. PSI has been requested to provide preliminary recommendations for spread footings (if feasible) and estimates of axial capacity of concrete, timber, or pipe piles. It should be noted that only a small number of borings were made in the readily accessible and some variations should be expected to exist away from the boring locations. This is particularly important considering the relatively large area of the site of about 143 acres as well as its present use.

The opinions and information to be presented in this report are estimates for preliminary consideration only, based on limited geotechnical exploration, and not to be used for final design or construction. A detailed geotechnical exploration and analyses should be performed once design and function of the proposed development have been finalized.

Purpose and Scope of Services

The purposes of PSI's geotechnical services are to:

- Drill three (3) soil borings at readily accessible area of the site as per the request of the Client;
- Evaluate general subsurface soil conditions and groundwater depth at the boring locations;
- Perform limited laboratory testing on selected soil samples recovered from the borings; and,
- Provide a general discussion regarding the suitability of this site for development, preliminary estimates of pile capacities for up to two (2) pile types and sizes, and preliminary estimates of soil bearing capacity for shallow foundation spread footings (if practical.)

The scope of services did not include an environmental assessment for determining the presence or absence of wetlands, or hazardous or toxic materials in the soil, surface water, groundwater, or air on or below, or around this site. Any statements in this report or on the boring logs regarding

odors, colors, and unusual or suspicious items or conditions are strictly for informational purposes. Prior to development of this site, an environmental assessment is advisable. Additionally, PSI did not provide any service to investigate or detect the presence of moisture, mold or other biological contaminants in or around any structure, or any service that was designed or intended to prevent or lower the risk of the occurrence or the amplification of the same. Client acknowledges that mold is ubiquitous to the environment with mold amplification occurring when building materials are impacted by moisture. Client further acknowledges that site conditions are outside of PSI's control, and that mold amplification will likely occur, or continue to occur, in the presence of moisture. As such, PSI cannot and shall not be held responsible for the occurrence or recurrence of mold amplification.

FIELD EXPLORATION AND LABORATORY TESTING PROCEDURES

The subsurface conditions were explored by drilling three (3) soil borings as per the Client's request. Borings SB-1 and SB-3 were drilled to a depth of approximately 50 feet below existing ground surface, while boring SB-2 was drilled to an approximate depth of 100 feet. The approximate boring locations are shown on the Boring Location Plan given in the Appendix and based on the latest Google Earth Image dated January 24, 2015.

The soil borings were performed with a track-mounted drilling rig using solid stem auger and wet rotary drilling techniques. Samples were generally obtained at two (2) foot intervals from the ground surface to a depth of ten (10) feet and at maximum five (5) foot intervals thereafter to the boring termination depths. Drilling and sampling were accomplished in general accordance with ASTM Standard Procedures.

Undisturbed samples of cohesive soils were generally obtained using thin-walled tubes in general accordance with the procedures for "Thin-Walled Tube Geotechnical Sampling of Soils" (ASTM D1587). These samples were extruded in the field with a hydraulic ram.

For cohesionless soils and semi-cohesive soils, Standard Penetration Test (SPT) was performed to obtain standard penetration values of the soil. The standard penetration value (N) is defined as the number of blows of a 140-pound hammer falling 30 inches that is required to advance the split-barrel sampler one (1) foot into the soil. To perform the test and obtain a sample, the sampler is lowered to the bottom of the previously cleaned drill hole and advanced by blows from the hammer. The number of blows is recorded for each of three (3) successive increments of six (6)-inch penetration. The "N" value is obtained by adding the second and third incremental numbers. The results of the standard penetration test indicate the relative density of cohesionless soils and thereby provide a basis for estimating the relative strength of the soil profile components. Samples of granular soils were obtained utilizing a two (2)-inch O.D. split-barrel sampler in general accordance with procedures for "Penetration Test and Split-Barrel Sampling of Soils" (ASTM D1586).

The samples were identified according to the project number, boring number and depth, and placed in polyethylene plastic wrapping to protect against moisture loss. In addition, undisturbed samples were wrapped in aluminum foil prior to placing in the plastic wrapping and were transported to the laboratory in containers to minimize further disturbance.

Laboratory Testing

Selected soil samples were tested in the laboratory to evaluate the subsurface soil properties. Testing on selected samples included natural moisture content, percent passing number 200 sieve, sieve analyses, Atterberg limits, unconfined compression, and unconsolidated-undrained triaxial tests.

The laboratory testing was conducted in general accordance with applicable ASTM procedures. The results of the laboratory tests are presented on the boring logs in the Appendix of this report. The samples which were not altered by laboratory testing will be retained for 60 days from the date of this report and then will be discarded without further notice.

SITE AND SUBSURFACE CONDITIONS

Site Description

The approximately 143 acre site is located on the north side of LA Highway 90 in Jefferson Davis Parish, Louisiana. The site is a rural tract of land primarily used for agricultural purposes. The site begins approximately 1 mile east of Pousson Road. It includes a road frontage along US highway 90 of approximately 1,350 feet and extends southward by approximately 4,400 feet. In the southernmost portion of the site, a narrow strip of land measuring approximately 400 feet wide extends outward to the east for approximately 1,350 feet in an "L" shaped configuration. A Site Vicinity Map based on Google Earth Image dated January 24, 2015 is presented in the Appendix.

Subsurface Conditions

Based on the field observations and the results of the laboratory testing, the soils were classified and the boring logs were developed. The boring logs are presented in the Appendix along with a key to the terms and symbols used on the boring logs. It should be noted that some variations existed between the subsoil conditions encountered in borings SB-1 and SB-2 and those detected in boring SB-3. Therefor it is our opinion that the 143-acre site could be divided into a Northern and a Southern Portion as indicted on the Boring Location Plan given in the Appendix. In view of the site size and the limited number of borings made at this time, generalized subsurface profiles for the Northern Portion and Southern Portion are presented in Table 1 and Table 2. As previously discussed, the borings were made within the presently accessible areas to our drill rig.

Table 1: Generalized Soil Profile Northern Portion

Approximate Depth Range (feet)[(1)]	Consistency/Relative Density	Material Description
0 - 2	Firm to Stiff	Brown Crust
2 – 12	Stiff to Very Stiff	Grey and Tan Lean (CL) or Fat Clay (CH)
12 – 17[(2)]	Medium Dense	Orange and Red/Tan Silty Sand (SM)/ Clayey Sand (SC)
17 – 87[(3)]	Stiff to Very Stiff	Light Gray Fat Clay
87 – 100	Hard	Reddish Brown Fat Clay

[(1)]Referenced from the existing grade at the boring locations
[(2)]Silty Sand/ Clayey Sand layer found at 17 – 22 feet in boring SB-2
[(3)]Fat Clay layer in SB-1 was found to have to be firm at 27-30' and 47-50'

Table 2: Generalized Soil Profile

Approximate Depth Range (feet)[1]	Consistency/Relative Density	Material Description
0 - 2	Firm to Stiff	Brown Crust
2 – 12	Stiff	Grey and Tan Lean (CL) or Fat Clay (CH)
12 – 17[2]	Medium Dense	Orange and Red/Tan Silty Sand (SM)/ Clayey Sand (SC)
17 – 25	Stiff	Light Gray Fat Clay
25 – 35	Very Soft to Soft	Light Gray Fat Clay
35 – 45	Stiff	Light Gray Fat Clay
45 – 50	Soft	Light Gray Fat Clay

[1]Referenced from the existing grade at the boring locations

The above subsurface descriptions are of a generalized nature to highlight the major subsurface stratification features and material characteristics throughout the 143-acre site. It should be noted that samples in boring SB-3 between 27 and 50 feet were found to have shear strength values significantly less that values seen in borings SB-1 and SB-2. The boring logs included in the Appendix should be reviewed for specific information at the boring locations. These boring logs also include soil descriptions, stratification, penetration resistances, and locations of the samples and laboratory test data. The stratification shown on the logs represents the conditions only at the actual exploration locations and within that particular area. Therefore, variation may occur, and should be expected across the site. The stratification represents the approximate boundary between subsurface materials, but the actual transition may be gradual. Groundwater level information obtained during field operations is also shown on the boring logs. As previously discussed, this report is intended for general site characterization and not for use in any formal designs. This is particularly important considering the limited number of borings drilled at the relatively large subject site and its former/present use.

Groundwater Conditions

Table 2 presents groundwater levels observed during the time of drilling.

Table 2: Groundwater Levels at the time of Field Exploration Activities

Boring	Groundwater Depth During Drilling (feet)*
Northern Portion, SB-1	15
Northern Portion, SB-2	13
Southern Portion, SB-3	15

**Referenced from the existing ground surface.*

It is possible that seasonal variations (temperature, rainfall, etc) as well as the water level or stage in the nearby water bodies will cause fluctuations in the groundwater level. Additionally, perched water may be encountered in discontinuous zones within the overburden. In addition a perched condition develops as rainwater in entrapped in the more pervious surface sandy and silty clays (CL-ML) underlain by less pervious cohesive fat clay soils. The groundwater levels presented in this report are the levels that were measured at the time of our field activities. It is recommended that the Contractor determine the actual groundwater levels at the site at the time of the construction activities to determine the impact, if any, on the construction procedures.

EVALUATION AND DISCUSSIONS

The type and depth of foundation suitable for a given structure primarily depends on several factors including the subsurface conditions, the function of the structure, the loads it may carry, the cost of the foundation and the criteria set by the Design Engineer with respect to vertical and differential movements which the structure can withstand without damage. Detailed column loads for specific structures and grading plans were not provided at the time of this preliminary evaluation.

As stated previously, PSI's opinions and information presented in this site evaluation report are provided for planning purposes and preliminary considerations only; they are based on a very limited geotechnical exploration, and are not to be used for final design and construction.

Shallow Foundations Preliminary Guidance

The near surface sandy/silty clays (CL-ML) that extend down to about the 2 foot depth in borings SB-1, SB-2, and SB-3 are potentially unstable. They are susceptible to loss in strength when they become moist and a perch groundwater condition develops. Therefore, they are not suitable for structural support and should be excavated and removed or bypassed by the structure foundations. It should be noted that the depth of these potentially unstable soils could vary away from the limited exploration locations.

The underlying clays (CL and CH) are fair to good in bearing quality and are suitable for support of lightly to moderately loaded structures provided that some movements due to settlement and volumetric change could be tolerated.

Alternately, the upper CL-ML soils could be fully excavated and replaced with structural fill. In either case, the footings could be placed in the naturally occurring clays encountered at about the 2 foot depth in borings Sb-1, SB-2, and SB-3 or in structural fill placed over these clays.

Footings can be designed for net allowable soil bearing pressure of 1,500 pounds per square foot (psf) for square spread footings and 1,100 psf for continuous footings. In general, footings should bear at least 2 feet below the finished grade in stiff to very stiff naturally occurring clays or structural fill. The foregoing bearing capacities are based on the results of the limited number of borings made at the subject site. They are intended for use in feasibility studies and cost estimating purposes and not for formal design or construction. They include a factor of safety of at least 3.0, which is believed adequate for design of lightly to moderately loaded structures. These do not consider the effect of footing size, settlement, etc. These values should be confirmed/revised as necessary through a full geotechnical investigation and analyses once a specific design/layout of the proposed construction has been finalized.

In general, the foundation excavations should be observed by a representative of PSI prior to reinforcing steel or concrete placement to assess that the foundation materials are capable of supporting the design loads and are consistent with the materials discussed in this report. Soft or loose soil zones encountered at the bottom of the footing excavations should be removed to the level of firm soils or adequately compacted fill as directed by the Geotechnical Engineer. Cavities formed as a result of excavation of soft or loose soil zones or tree stump removal should be backfilled with structural fill or graded compacted crushed stone, as determined by the Geotechnical Engineer.

After opening, isolated spread footing excavations should be observed and concrete placed as quickly as possible to avoid exposure of the footing bottoms to wetting and drying. Surface run-off water should be drained away from the excavations and not be allowed to pond prior to or after concrete placement. The foundation concrete should be placed during the same day the excavation is made. If it is required that footing excavations be left open for more than one day, they should be protected to reduce evaporation or entry of moisture.

Deep Foundation Preliminary Guidance

It should be noted that below a depth of 27 feet below existing ground surface, the strength profile of boring SB-3 (the Southern Portion of the site) was observed to have significant variations from the rest of the site. When determining preliminary pile capacities for the subject site, boring SB-3 was analyzed separately. Due to the limited depth of the boring in that location, preliminary pile recommendations are only given to a depth of 45 feet below existing ground surface for driven square precast, pre-stressed concrete (PPC) piles or round timber piles. Recommendations utilizing both boring SB-1 and SB-2 (the Northern Portion of the site) are given to 80 feet below existing grade for driven precast, pre-stressed concrete (PPC) piles or round timber piles (ASTM D-25.) Preliminary axial capacities for PPC piles and timber piles are provided herein. PPC piles should be used for support of heavily loaded and industrial structures whereas small timber piles (6'' tip and 8'' butt) are suitable for support of lightly loaded structures. Large timber, or composite timber piles (7'' tip and 12'' butt) are suitable for support of moderately and somewhat heavy structures.

Axial Capacity: The axial load carrying capacity of a shaft or pile can be computed using the static method of analysis. According to this method, axial capacity, Q, at a given penetration is taken as the sum of the skin friction on the side of the shaft/pile, Q_s, and the end (tip) or point bearing at the shaft/pile tip, Q_p, so that:

$$Q = Q_s + Q_p = fA_s + qA_p$$

where A_s and A_p represent, respectively, the embedded surface area and the end area of the shaft; f and q represent, respectively, the unit skin friction and the unit end or point bearing.

The total axial capacity in compression will be the summation of the frictional resistance and the end bearing resistance. The total ultimate axial capacity in tension, or uplift, will be the ultimate frictional resistance alone neglecting end bearing component. Using the static method analyses and soil profile, engineering analyses were performed to estimate the axial capacity for 8 inch butt/6 inch tip and 12 inch butt/ 7 inch tip timber piles and 12-inch and 18-inch square PPC driven piles. The pile will derive their compression and tension support through "skin friction" along their embedded lengths with a relatively small end bearing contribution in compression.

The axial capacity curves for the timber piles and square PPC piles are included in the Appendix of this report. **The curves on the plates show the (compression and tension) ultimate axial pile capacity in tons versus depth in feet and do not contain a factor of safety against failure.** Further, they do not consider lateral loads, drag load, group effect or settlements. Pile capacities are given to a depth of only +/- 80 feet in the northern portion of the site based on laboratory testing of borings SB-1 and SB-2. Due to the difference in shear strength values below 27 feet in boring SB-3, pile capacities were calculated separately. Due to the lack of deeper borings in the area, pile capacities are only determined to a depth of +/- 45 feet for the southern portion of the site.

Factors of Safety: Recommended Factors of Safety to be applied to the ultimate pile capacities provided in the Appendix are required for determination of the allowable pile capacities. For

timber piles, PSI recommends that a Factor of Safety of at least 2.0 in compression and 3.0 in tension be applied to arrive at the allowable values. The design Factor of Safety will depend on the structure type, function, and the anticipated loads. They will also depend on the nature and permeance (duration) of the anticipated live loads.

The Factors of Safety for square PPC piles are a function of the pile testing program that may be selected and are shown in Table 4.

Table 3: Factor of Safety Value Conditions for PPC Piles*

Pile Capacity	Factor of Safety with Static Load Test	Factor of Safety with PDA (no Static Load Test)	Factor of Safety with no Load Testing or PDA
Compression	2.0	2.5	3.0
Tension	3.0	3.0	3.0

* Factor of Safety values must be applied to the ultimate capacities presented in the Appendix.

PSI will be available to perform the pile load test and PDA monitoring upon request.

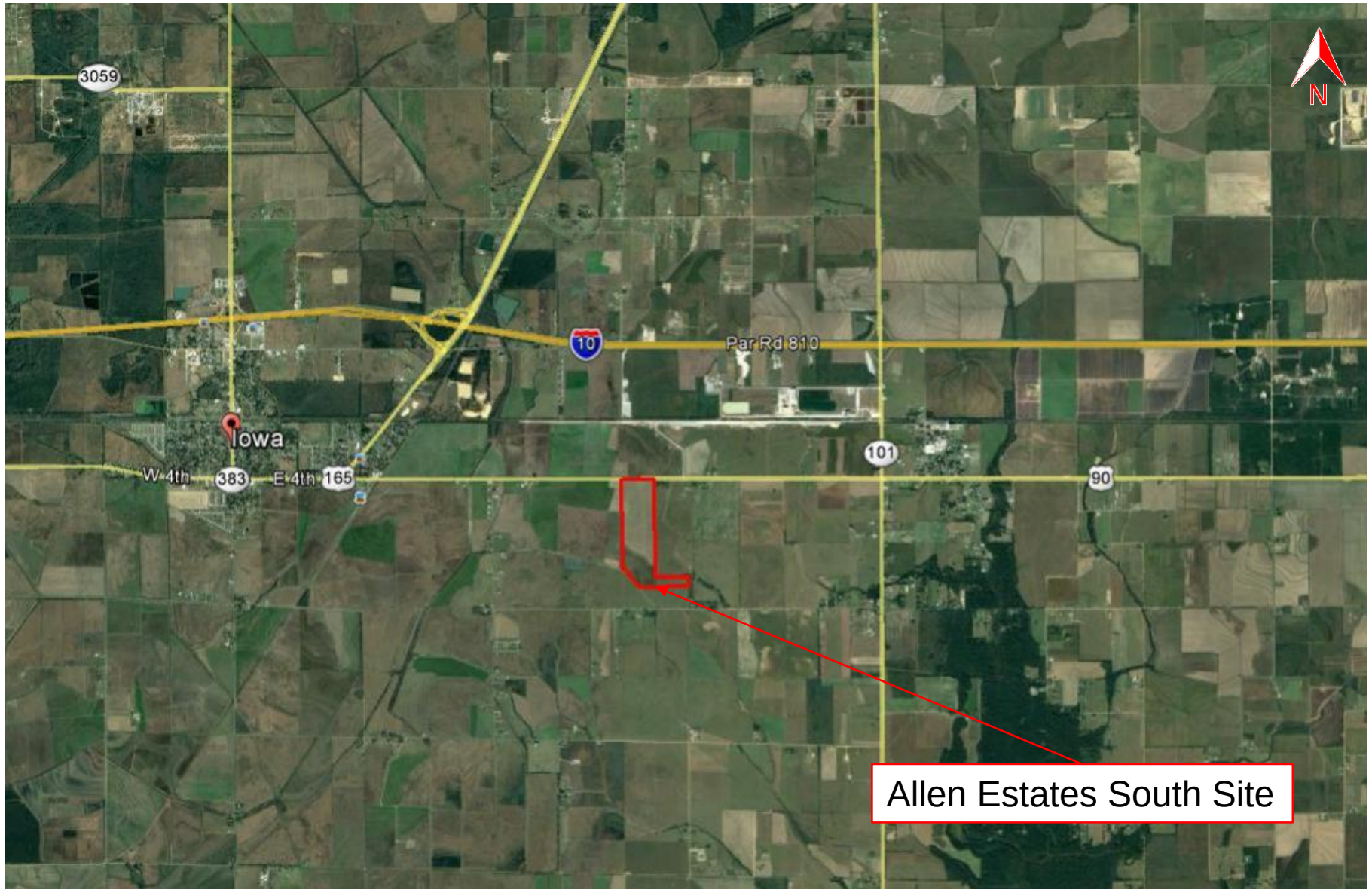
Additional recommendations will be provided in the detailed geotechnical investigations with regard to lateral loads, drag load, group effect, and settlement of deep foundation since no specific details of the proposed construction is available at this time.

REPORT LIMITATIONS

The preliminary information submitted in this report is based on the available subsurface data obtained by PSI at the time of our field exploration performed according to the request of the Client. PSI warrants that the preliminary findings contained herein have been made in accordance with generally accepted drilling procedures and visual soil classification methods in the local area. No other warranties are implied or expressed. This report has been prepared for the exclusive use of the One Acadiana for the specific purpose of determining general subsurface information at the subject site to develop a general geotechnical site characterization.

APPENDIX

Site Vicinity Map
Boring Location Plan
Boring Logs
Key to Terms and Symbols Used on Boring Logs
Axial Capacity Plots



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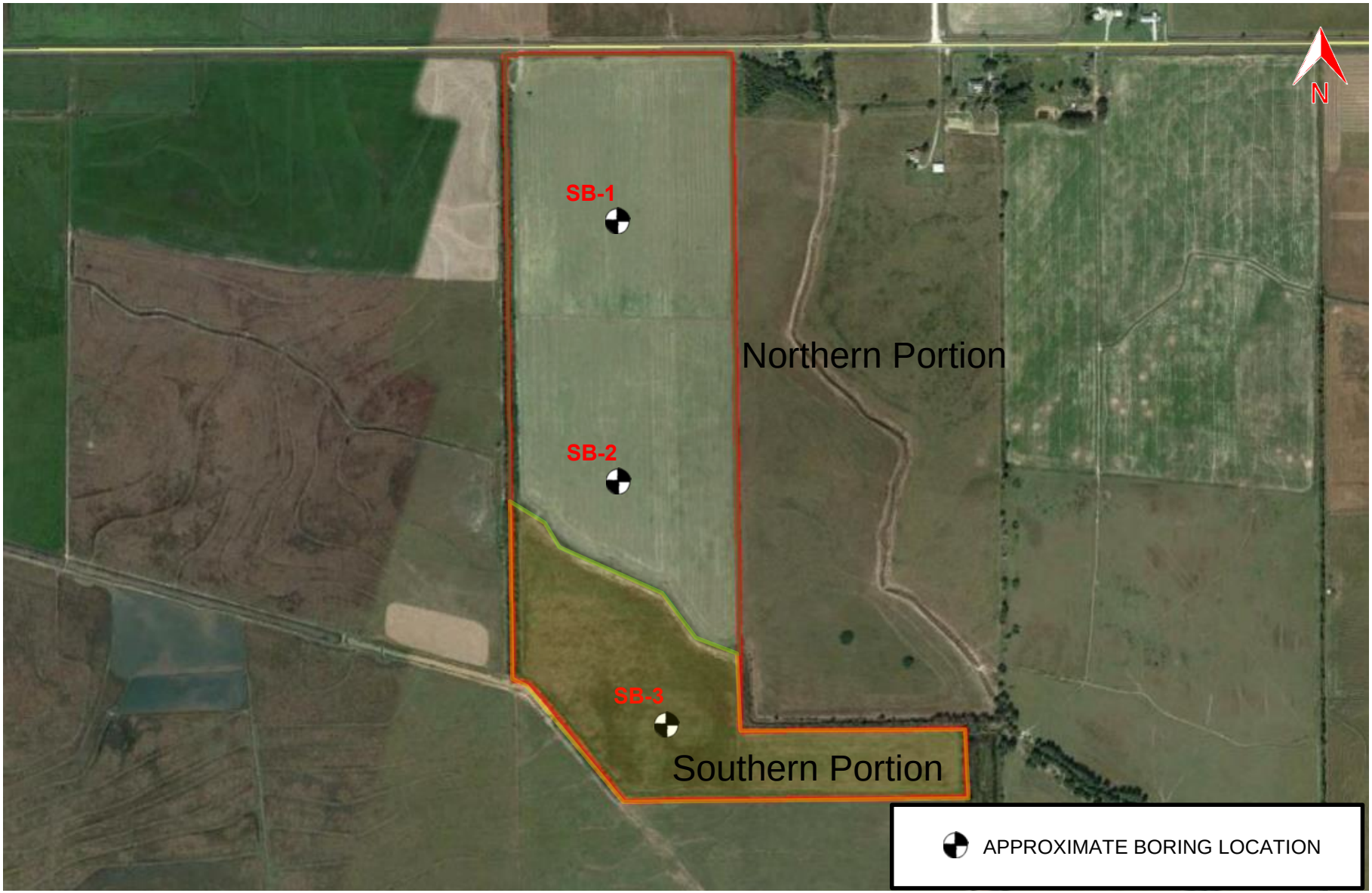
SITE VICINITY MAP

PSI PROJECT NO.: 0254862

GOOGLE EARTH IMAGE DATED JANUARY 24, 2015

GEOTECHNICAL SITE CHARACTERIZATION
ALLEN ESTATES SOUTH
JEFFERSON DAVIS PARISH, LOUISIANA



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BORING LOCATION PLAN

PSI PROJECT NO.: 0254862

GOOGLE EARTH IMAGE DATED JANUARY 24, 2015

GEOTECHNICAL SITE CHARACTERIZATION

ALLEN ESTATES SOUTH

JEFFERSON DAVIS PARISH, LOUISIANA

LOG OF BORING SB-1

ALLEN ESTATES SOUTH
US HIGHWAY 90
IOWA, LOUISIANA

TYPE OF BORING: SOLID STEM AUGER TO WET ROTARY LOCATION: SOUTH SITE PSI Project No.: 0254862

DEPTH, FT.	SOIL TYPE	USCS SYMBOL	SAMPLES	SOIL DESCRIPTION	N-BLOWS/FT.	MOISTURE CONTENT (%)	LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	% PASSING No. 200 SIEVE	SHEAR STRENGTH (tsf) ○ HP ● UC △ TV ▲ UU 0.0 0.5 1.0 1.5	SHEAR STRENGTH (tsf) HAND PEN (tsf)	SHEAR STRENGTH (tsf) UC (tsf)	SHEAR STRENGTH (tsf) TORVANE (tsf)	SHEAR STRENGTH (tsf) UU (tsf)	UNIT DRY WEIGHT (pcf)
		CL-ML		Brown **SANDY SILTY CLAY**		14				59						
2.5		CL		Very stiff light gray and tan **LEAN CLAY**		18	48	13	35			0.92	1.17			109
5.0						18						0.58				
		CH		Stiff light gray and tan **FAT CLAY**		21	61	14	47			0.75				
7.5																
						18						0.83				
10.0																
12.5		SM		Medium dense orange and red **SILTY SAND** ▽	14	22				16						
15.0																
17.5		CH		Firm to stiff light gray and tan **FAT CLAY**												
						26	55	17	38					0.40	0.51	95
20.0																
22.5																
						34						0.58				
25.0																
27.5																
						37								0.15	0.30	83
30.0																
32.5																
						24	50	17	33			0.75				
35.0																
37.5																
						28						0.50			0.78	98
40.0																
42.5																
						28						0.92				
45.0																
47.5																
						29	50	18	32					0.55	0.36	92
50.0				Boring terminated at 50 feet												

DEPTH OF BORING: 50 FEET
DATE DRILLED: 10/4/16
NOTE:

▽ GROUNDWATER DURING DRILLING: 15 FEET
▼ GROUNDWATER UPON COMPLETION: N /A
▼ DELAYED GROUNDWATER: N / A

BORINGLOG_BATONROUGE - PSIHOUSTON.GDT - 11/18/16 11:13 - 0254

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(225) 293-8378

LOG OF BORING SB-2

ALLEN ESTATES SOUTH
US HIGHWAY 90
IOWA, LOUISIANA

TYPE OF BORING: SOLID STEM AUGER TO WET ROTARY LOCATION: SOUTH SITE PSI Project No.: 0254862

DEPTH, FT.	SOIL TYPE	USCS SYMBOL	SAMPLES	SOIL DESCRIPTION	N-BLOWS/FT.	MOISTURE CONTENT (%)	LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	% PASSING No. 200 SIEVE	SHEAR STRENGTH (tsf) ○ HP ● UC △ TV ▲ UU 0.0 0.5 1.0 1.5	SHEAR STRENGTH (tsf) HAND PEN (tsf)	SHEAR STRENGTH (tsf) UC (tsf)	SHEAR STRENGTH (tsf) TORVANE (tsf)	SHEAR STRENGTH (tsf) UU (tsf)	UNIT DRY WEIGHT (pcf)
		CL-ML		Stiff brown **SILTY CLAY**		17	22	16	6			0.83				
2.5		CH		Stiff to very stiff light gray and tan **FAT CLAY**		20						0.75	1.03			109
5.0						18	51	14	37			0.50	0.65			106
7.5						18						1.00				
10.0						19						0.93				
12.5				▽												
15.0						20						0.67			0.53	101
17.5		SC		Orange and red **CLAYEY SAND**												
20.0						25				27				0.10		
22.5		CH		Stiff to very stiff light gray **FAT CLAY**												
25.0						31						0.67				
27.5																
30.0						33	68	21	47			1.08				
32.5																
35.0						39						0.67				
37.5																
40.0						27	65	23	42			0.75				
42.5																
45.0						21						1.08			1.78	110
47.5																
50.0						22						1.00				

DEPTH OF BORING: 100 FEET
DATE DRILLED: 10/5/16
NOTE:

▽ GROUNDWATER DURING DRILLING: 13 FEET
▼ GROUNDWATER UPON COMPLETION: N /A
▼ DELAYED GROUNDWATER: N / A

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LOG OF BORING SB-2

ALLEN ESTATES SOUTH
US HIGHWAY 90
IOWA, LOUISIANA

TYPE OF BORING: SOLID STEM AUGER TO WET ROTARY LOCATION: SOUTH SITE PSI Project No.: 0254862

DEPTH, FT.	SOIL TYPE	USCS SYMBOL	SAMPLES	SOIL DESCRIPTION	N-BLOWS/FT.	MOISTURE CONTENT (%)	LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	% PASSING No. 200 SIEVE	SHEAR STRENGTH (tsf) ○ HP ● UC △ TV ▲ UU 0.0 0.5 1.0 1.5	SHEAR STRENGTH (tsf) HAND PEN (tsf)	SHEAR STRENGTH (tsf) UC (tsf)	SHEAR STRENGTH (tsf) TORVANE (tsf)	SHEAR STRENGTH (tsf) UU (tsf)	UNIT DRY WEIGHT (pcf)
52.5		CH		Stiff to very stiff light gray **FAT CLAY**												
55.0						27						0.42				
57.5																
60.0						29	53	21	32			0.83			1.24	97
62.5																
65.0						35						1.00				
67.5																
70.0						23						0.50			0.74	99
72.5																
75.0						23						1.00				
77.5																
80.0						21						0.67				
82.5																
85.0						38								0.20		
87.5		CH		Hard reddish brown **FAT CLAY**												
90.0					59	24	52	20	32							
92.5																
95.0					61	27										
97.5																
100.0					65	25										
				Boring terminated at 100 feet												

DEPTH OF BORING: 100 FEET
DATE DRILLED: 10/5/16
NOTE:

BORINGLOG_BATONROUGE - PSIHOUSTON.GDT - 11/18/16 11:13 - 0254

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LOG OF BORING SB-3

ALLEN ESTATES SOUTH
US HIGHWAY 90
IOWA, LOUISIANA

TYPE OF BORING: SOLID STEM AUGER TO WET ROTARY LOCATION: SOUTH SITE PSI Project No.: 0254862

DEPTH, FT.	SOIL TYPE	USCS SYMBOL	SAMPLES	SOIL DESCRIPTION	N-BLOWS/FT.	MOISTURE CONTENT (%)	LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	% PASSING No. 200 SIEVE	SHEAR STRENGTH (tsf) ○ HP ● UC △ TV ▲ UU 0.0 0.5 1.0 1.5	SHEAR STRENGTH (tsf) HAND PEN (tsf)	SHEAR STRENGTH (tsf) UC (tsf)	SHEAR STRENGTH (tsf) TORVANE (tsf)	SHEAR STRENGTH (tsf) UU (tsf)	UNIT DRY WEIGHT (pcf)
		CL-ML		Brown **SILTY CLAY**		12										
2.5		CL		Stiff light gray and tan **LEAN CLAY**		17						1.00	0.98			113
5.0						18	45	12	33			1.00				
7.5						18						1.08				
10.0						16						0.58				
12.5		SM		Tan **SILTY SAND**												
15.0				▽		17				13						
17.5		CH		Stiff light gray and tan **FAT CLAY**												
20.0						27	55	17	38					0.50	0.52	93
22.5																
25.0						20						0.58				
27.5		CH		Very soft to soft light gray and tan **FAT CLAY**												
30.0						32						0.08				
32.5																
35.0						32	64	20	44					0.35	0.16	89
37.5																
40.0						32						0.92				
42.5																
45.0						18						0.92				
47.5																
50.0				Boring terminated at 50 feet		36								0.15		

DEPTH OF BORING: 50 FEET
DATE DRILLED: 10/6/16
NOTE:

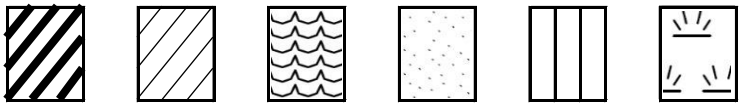
▽ GROUNDWATER DURING DRILLING: 15 FEET
▼ GROUNDWATER UPON COMPLETION: N /A
▼ DELAYED GROUNDWATER: N / A

BORINGLOG_BATONROUGE - PSIHOUSTON.GDT - 11/18/16 11:13 - 0254

psi Information To Build On
Engineering • Consulting • Testing
Professional Service Industries, Inc.
11950 Industriplex Blvd
Baton Rouge, Louisiana 70809
(225) 293-8378

KEY TO TERMS AND SYMBOLS USED ON LOGS

SOIL TYPE

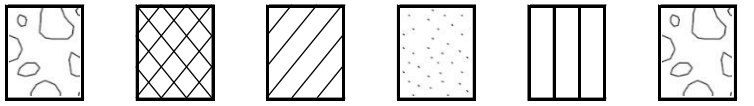


FAT CLAY | LEAN CLAY | ORGANIC CLAY | SAND | SILT | PEAT

SAMPLER TYPE

NO RECOVERY | AUGER SAMPLE | SHELBY TUBE | SPLIT SPOON

SOIL TYPE / MODIFIERS



GRAVEL | FILL | CLAYEY | SANDY | SILTY | GRAVELY

GROUNDWATER DURING DRILLING

GROUNDWATER UPON COMPLETION

UNIFIED SOIL CLASSIFICATION SYSTEM - ASTM D 2487 (1980)

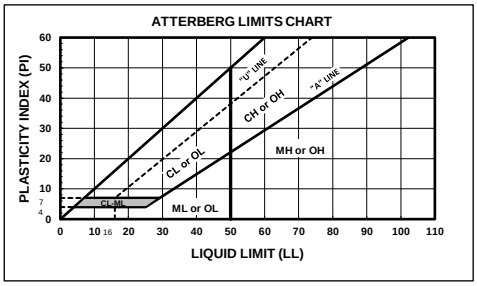
MAJOR DIVISIONS			LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE-GRAINED SOILS LESS THAN 50% PASSING NO. 200 SIEVE	GRAVEL & GRAVELLY SOILS LESS THAN 50% PASSING NO. 4 SIEVE	CLEAN GRAVEL (LITTLE OR NO FINES)	GW	WELL-GRADED GRAVEL, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
			GP	POORLY GRADED GRAVEL, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
		WITH APPRECIABLE FINES	GM	SILTY GRAVEL, GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SANDS MORE THAN 50% PASSING NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)	SW	WELL-GRADED SAND
			SP	POORLY-GRADED SANDS
		WITH APPRECIABLE FINES	SM	SILTY SANDS
			SC	CLAYEY SANDS
FINE-GRAINED SOILS MORE THAN 50% PASSING NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT < 50		ML	INORGANIC SILTS & VERY FINE SANDS, CLAYEY SILT W/ LOW PLASTICITY INDEX
			CL	INORGANIC LEAN CLAYS GRAVELLY, SANDY, OR SILTY LEAN CLAYS
			OL	ORGANIC SILTS & ORGANIC SILTY CLAYS W/LOW PLASTICITY INDEX
	SILTS AND CLAYS LIQUID LIMIT ≥ 50		MH	INORGANIC SILTS W/ HIGH PLASTICITY INDEX, ELASTIC SILTS
			CH	INORGANIC FAT CLAYS GRAVELLY, SANDY, OR SILTY FAT CLAYS
			OH	ORGANIC CLAYS OF MED TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOIL			PT	PEAT AND OTHER HIGHLY ORGANIC SOILS
UNCLASSIFIED FILL MATERIALS				ARTIFICIALLY DEPOSITED AND OTHER UNCLASSIFIED SOILS AND MAN-MADE SOIL MIXTURES

CONSISTENCY OF COHESIVE SOILS

CONSISTENCY	SHEAR STRENGTH IN TONS/FT^2
VERY SOFT	0 TO 0.125
SOFT	0.125 TO 0.25
FIRM	0.25 TO .50
STIFF	0.50 TO 1.00
VERY STIFF	1.00 TO 2.00
HARD	> 2.00 OR 2.00+

RELATIVE DENSITY - GRANULAR SOILS

CONSISTENCY	N-VALUE (BLOWS/FOOT)
VERY LOOSE	0-4
LOOSE	4-9
MEDIUM DENSE	10-29
DENSE	30-49
VERY DENSE	> 50 OR 50+



ABBREVIATIONS

HP - HAND PENETROMETER

TV - MINIATURE TORVANE

FV - FIELD TORVANE

UC - UNCONFINED COMPRESSION TEST

UU - UNCONSOLIDATED UNDRAINED TRAIXIAL

CU - CONSOLIDATED UNDRAINED

NOTE: BORING LOGS INDICATE SHEAR STRENGTH AS OBTAINED BY ABOVE TESTS

CLASSIFICATION OF GRANULAR SOILS

U.S. STANDARD SIEVE SIZE(S)

6"	3"	3/4"	4	10	40	200

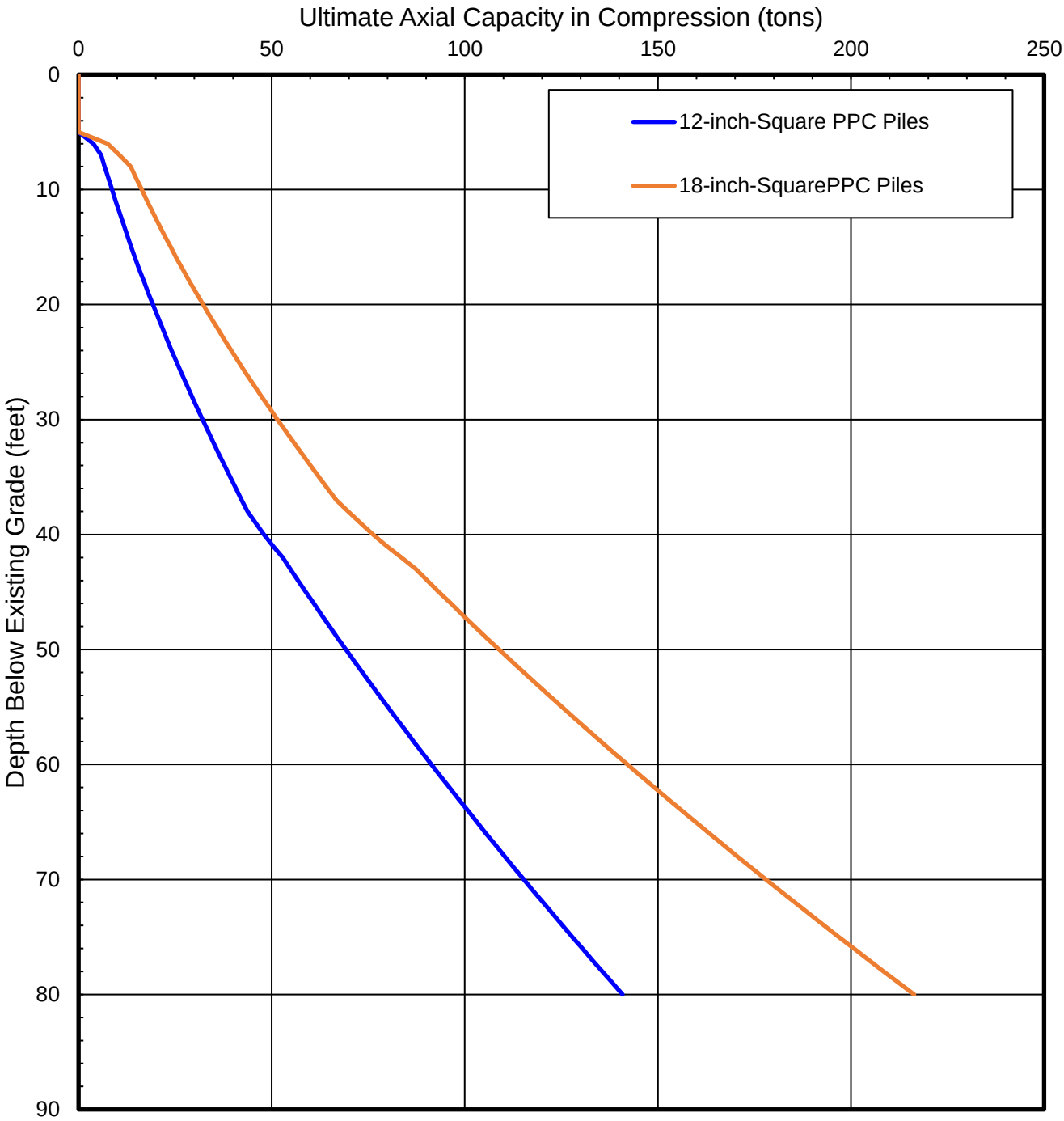
BOULDERS	COBBLES	GRAVEL		SAND			SILT OR CLAY	CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE		

152	76.2	19.1	4.76	2.0	0.42	0.074	0.002

GRAIN SIZE IN MM

PPC PILE PRELIMINARY CAPACITY CURVES

ULTIMATE AXIAL CAPACITY IN COMPRESSION



Notes:
1. Axial capacity at the top 5 feet was neglected.
2. Design factor of safety should be selected based on final project in formation (structure, loading cases, design requirements, etc.)

Allen Estates South (North Side)

HIGHWAY 90, JEFFERSON DAVIS PARISH, LOUISIANA

PSI Project No. 0254862

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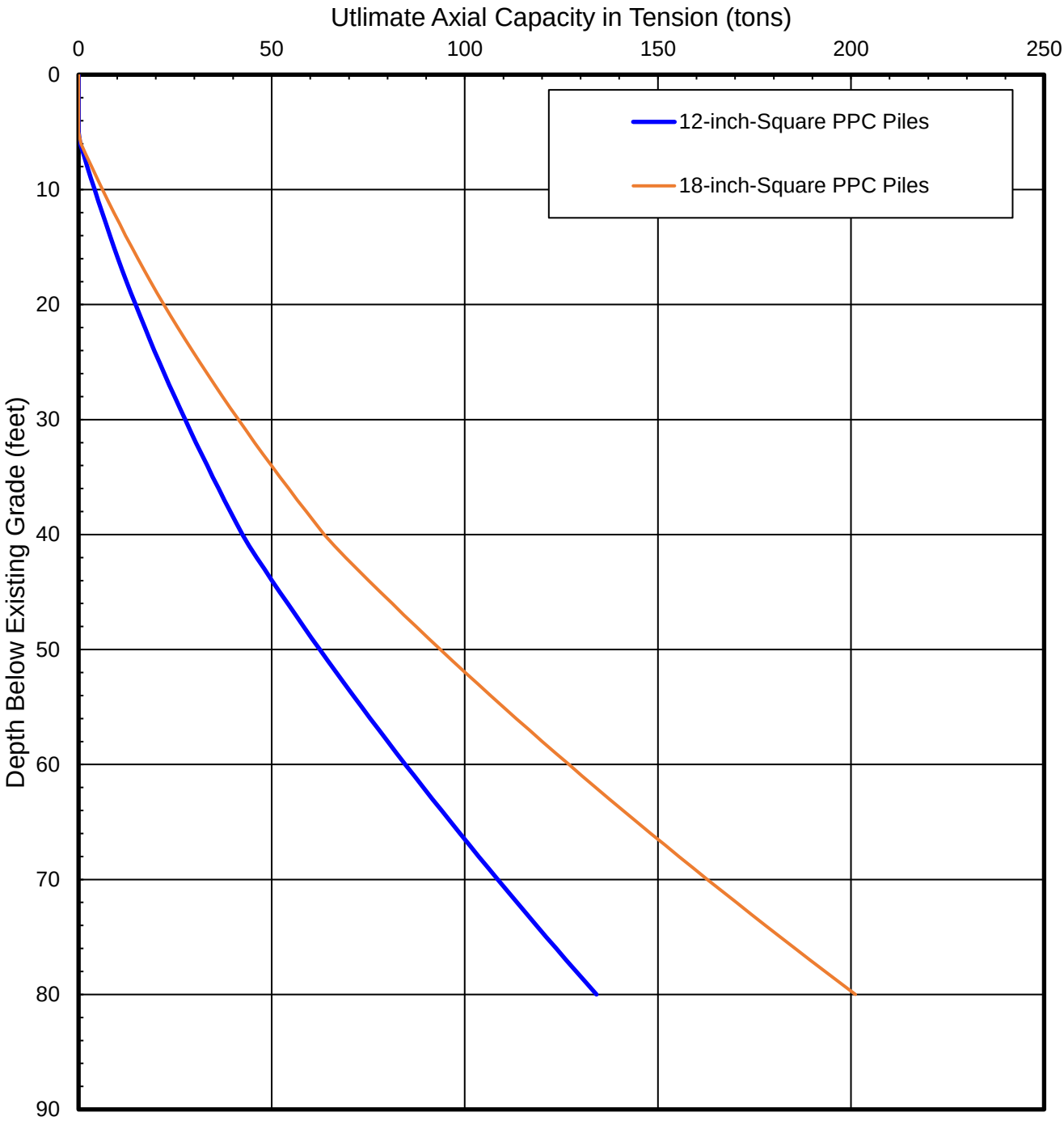
ULTIMATE AXIAL CAPACITY IN TENSION



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TIMBER PILE PRELIMINARY CAPACITY CURVES

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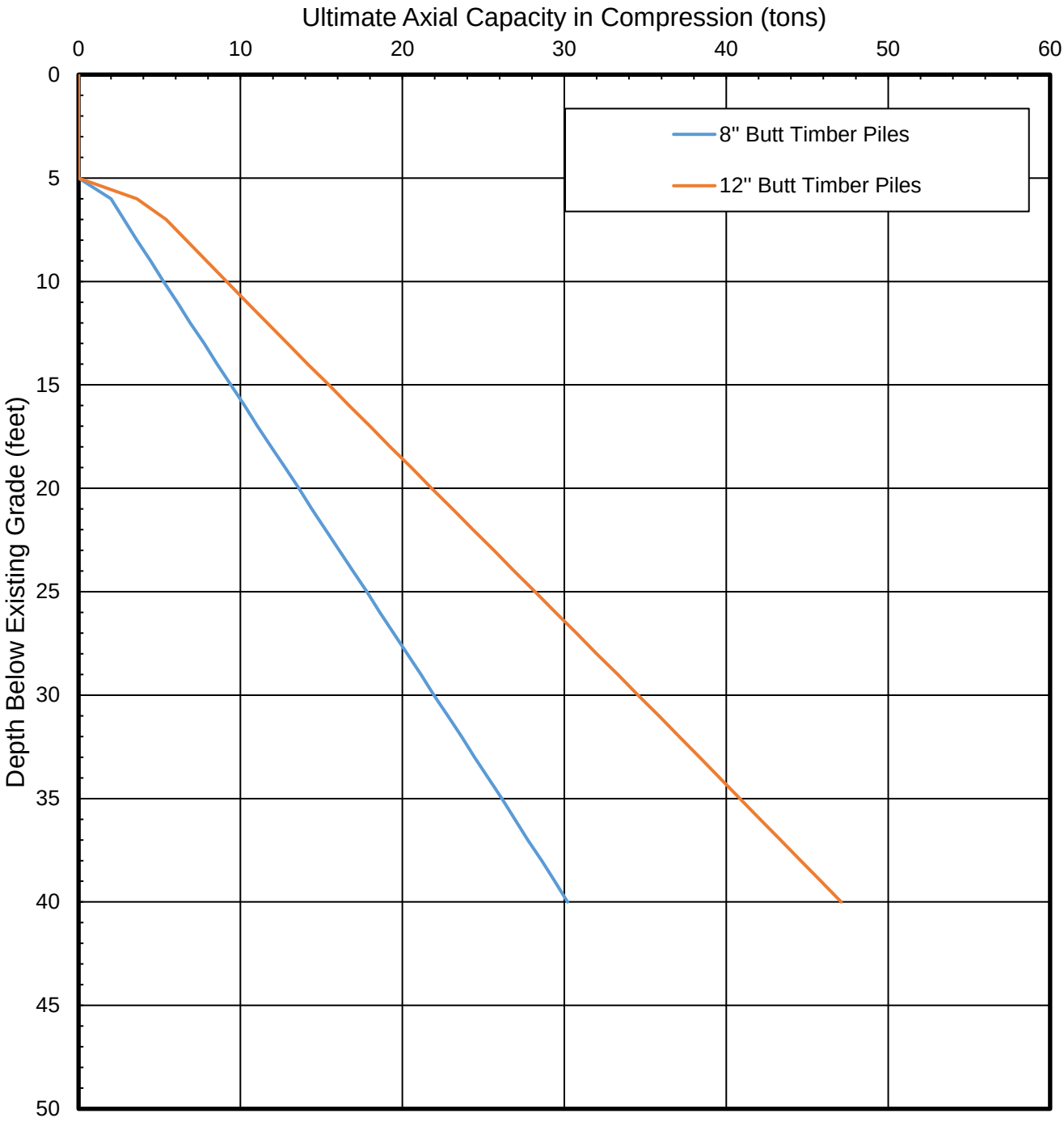

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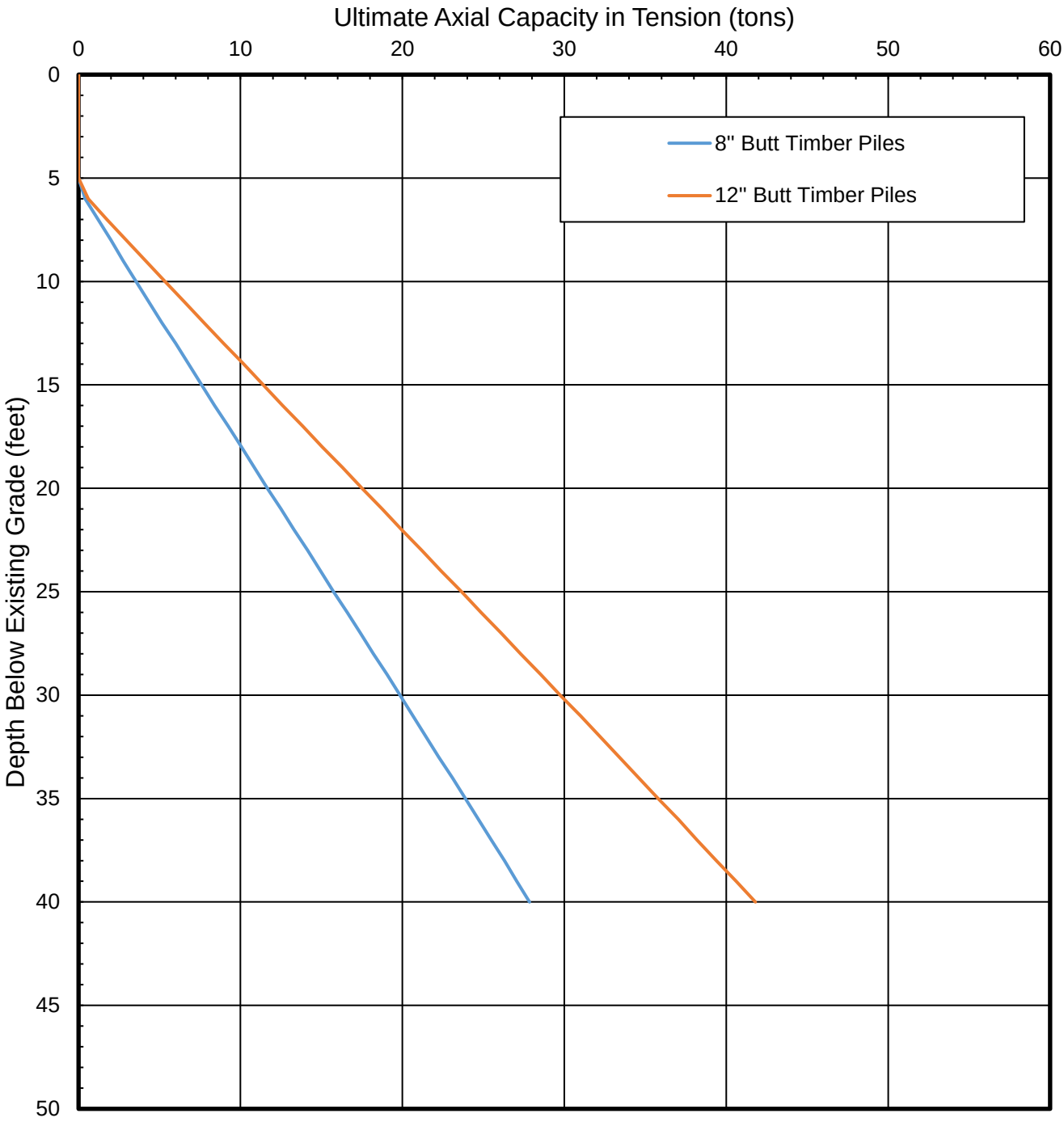

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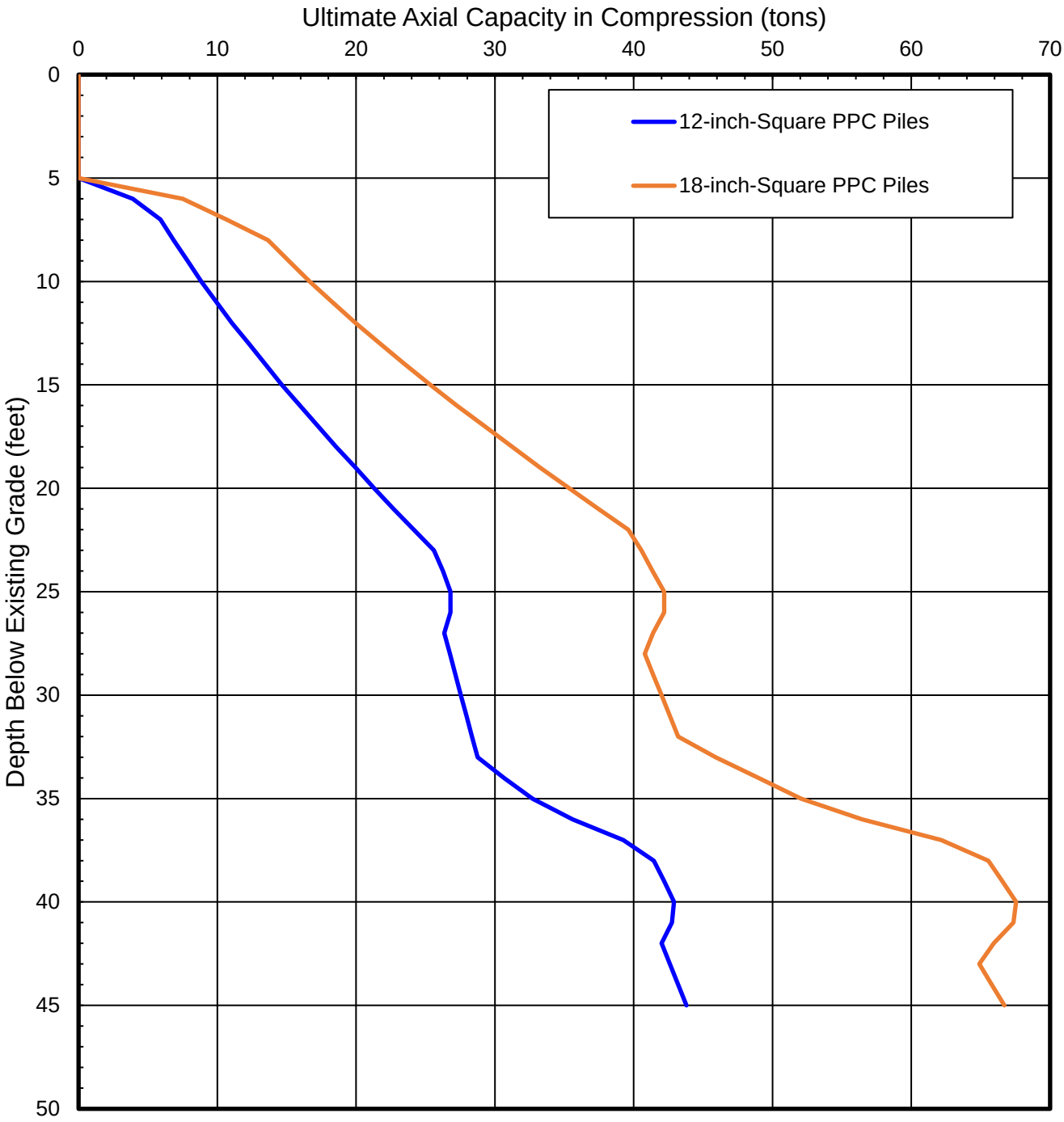

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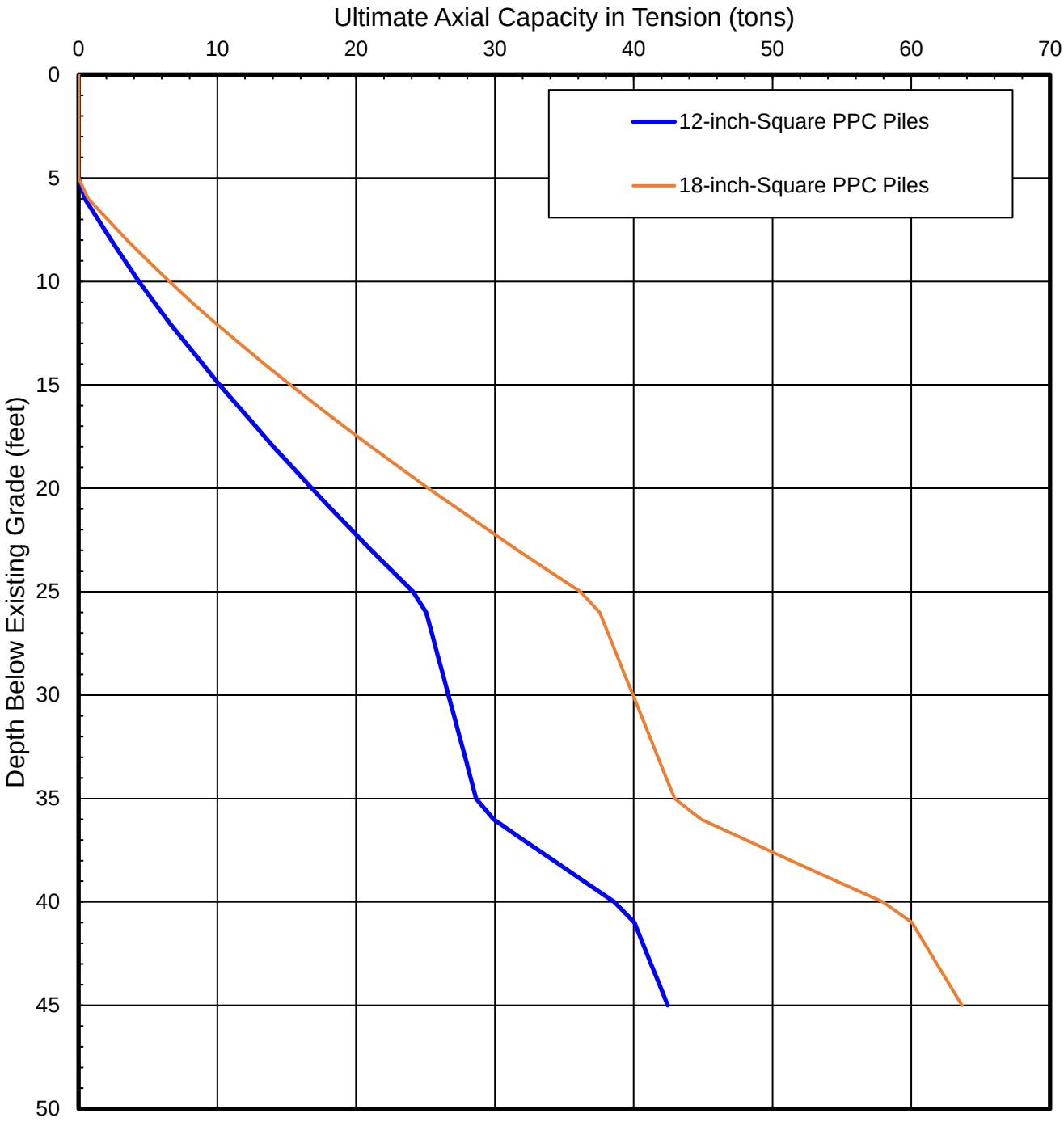

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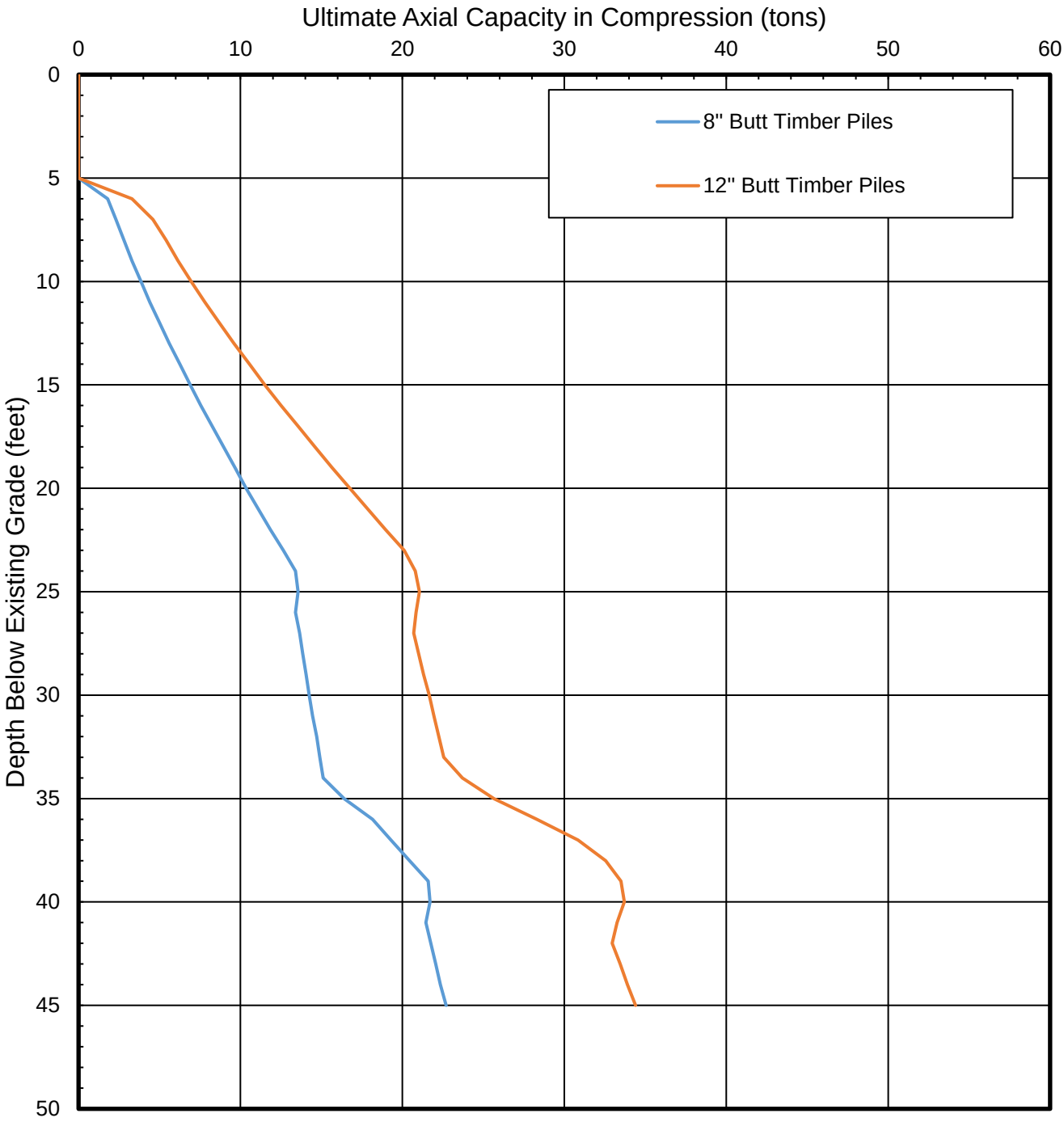

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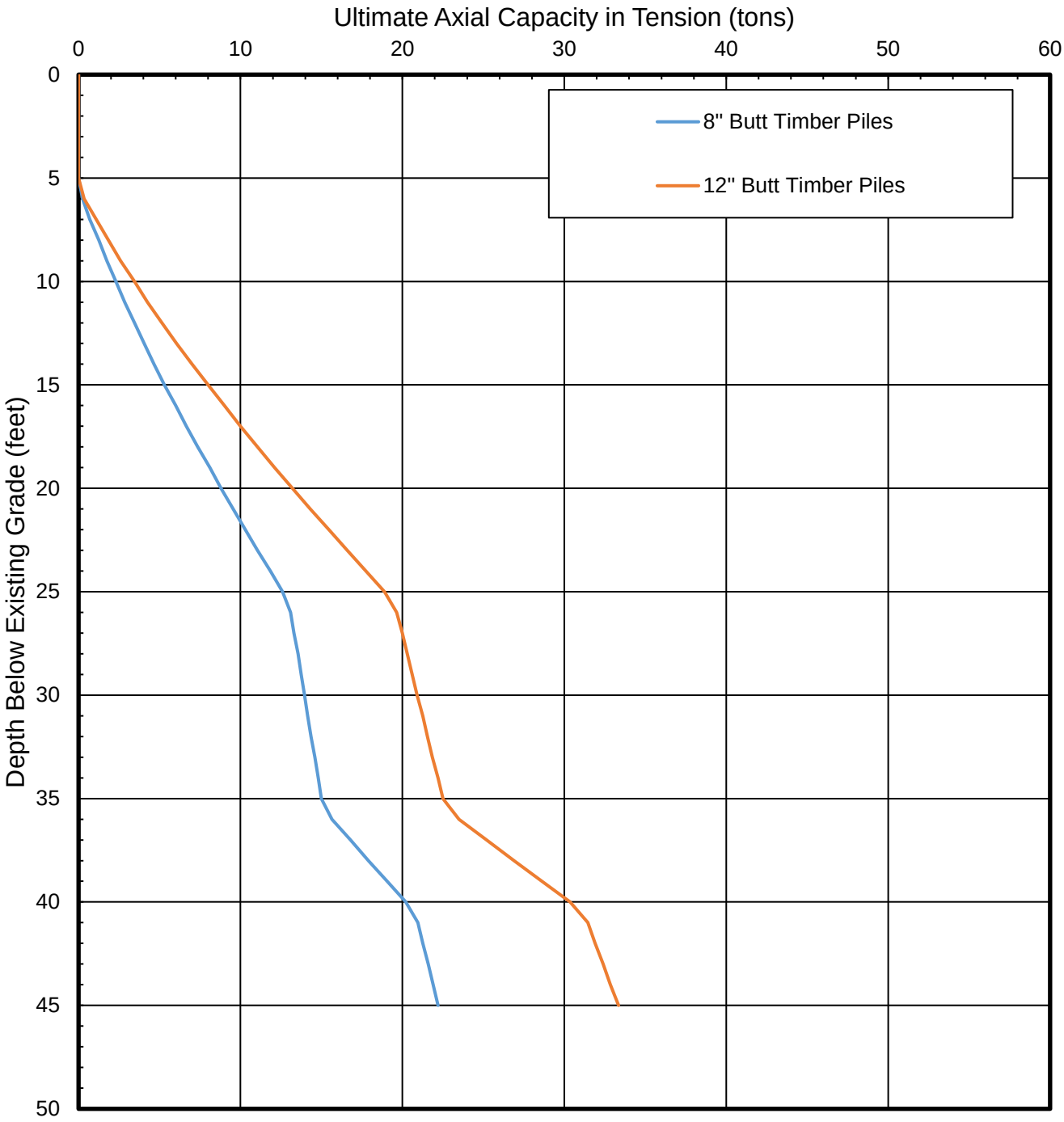

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