Valley Transportation Authority

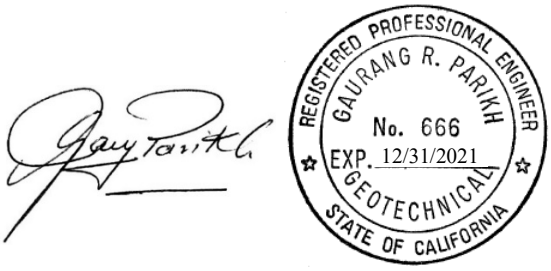
Solutions that move you

Eastridge to BART Regional Connector
Capitol Expressway Light Rail Project

Geotechnical Report

FINAL

Prepared by:



PARIKH CONSULTANTS, INC.

June 29, 2020

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1.0 Introduction

This "Geotechnical Report" presents the results of geotechnical engineering investigation for the proposed "Eastridge to BART Regional Connector Project" in San Jose, California, hereinafter referred to as "PROJECT". The work was performed in general accordance with the scope of work outlined in our proposal to BKF Engineers (Designer). This is a 'Final' Report based on the 95% Design Phase documents. It will require to be updated and finalized during the subsequent phases of the design work.

The geotechnical recommendations presented in this report are intended for design input only and are not intended to be used as specifications. In addition, the data provided in this report including these geotechnical recommendations should not be used for bidding purposes or directly for construction cost estimates. If the report is provided as a reference document, any interpretation of the data and recommendations should be the sole responsibility of the user and PARIKH Consultants, Inc. (PARIKH) shall not be liable for any consequences.

2.0 Scope of Work

The purpose of this geotechnical report is to evaluate the general subsurface soil conditions at the project site, to evaluate their engineering properties, and to provide geotechnical recommendations for the design of the proposed project. The general location of the project corridor and its vicinity are shown on the "Project Location Map", Plate 1.

The scope of work performed for this investigation included a review of the readily available soils and geologic literature pertaining to the project site including as-built "Log of Test Borings" (LOTB) available within the project limits, site reconnaissance, obtaining representative soil samples and logging soil materials encountered in the exploratory borings, laboratory testing of the representative soil samples, performing engineering analyses based on the field and laboratory data, and preparation of this geotechnical report.

3.0 Proposed Construction

Capitol Expressway Corridor (Corridor) is one of the elements of the transportation improvements plan proposed by the Santa Clara Valley Transportation Authority (VTA). In this project, the Corridor will be constructed for the Light Rail Transit (LRT) from the existing Alum Rock Light Rail Station (near Capitol Avenue) to Quimby Road. The project generally includes the following major elements:

(a) Structures supported on pile foundation

- An aerial guideway from Capitol Avenue to Tully Road.
- Story Road Pedestrian Overcrossing (POC).
- Story Road Station Access and Elevator Access.
- South Approach CIP Wall.
- Eastridge Station Shelter
- TES Poles.
- Sound Wall.
- Relocated Ocala Bus Canopy Columns.

(b) Structures supported on shallow foundation

- Eastridge Stations and POC access stairs.
- Eastridge Station Signals and Communication Rooms.
- Relocated Ocala Bus Canopy Glass Screen Wall.

(c) Retaining System

- Abutments Walls, Wing Walls and CIP Walls.
- Concrete Retaining Wall/Concrete Barrier.
- Mechanical Stabilized Embankment (MSE) Wall.
- TPSS #33 and TPSS #34.

(d) Others

- Structural Pavement Design.

Approach embankments and MSE walls are included in this project. The maximum height of the approach embankment is anticipated to be approximately 25 feet above the existing ground surface.

Two test piles are proposed near Bent 6 of the Aerial Guideway to investigate the levels of noise/vibration generated during pile driving where vibration to the residents/houses in the vicinity may be a concern during construction.

Our recommendations presented in this report are based on the above information. Any major deviation should be reported to PARIKH for further consideration.

4.0 Site Conditions

The project site is generally located along the corridor of Capitol Expressway between Capitol Avenue in the north and near Nieman Boulevard in the south.

The proposed corridor is generally along the median of the existing Capitol Expressway. The alignment will shift to the southbound shoulder north of Tully Road. The surface condition along the proposed corridor is generally unpaved at the median and paved with asphalt concrete/aggregate base along the existing roadway/shoulder. The ground elevation along the proposed corridor is generally level considering the approximate total length of the project to be 2.4 miles. The ground elevation varies between approximate Elevation 115.0 feet at the beginning of the corridor near Wilbur Avenue and Elevation 147.5 feet near the end of the proposed corridor (near Nieman Boulevard).

5.0 Pertinent Investigation, Reports and Published Maps

There is no as-built LOTB since there is no existing structure within the project limits. Published reports and maps that include the project area vary in focus and scale.

6.0 Exceptions to Policy

Normal procedures were assumed for construction of the proposed project throughout our analysis and represent one of the bases of recommendations presented herein. The investigation for the proposed foundations has followed Caltrans guidelines and policy. Exception to their policy is not needed.

7.0 Field Investigation and Testing Program

7.1 Field Exploration Performed

2005 and 2006 Field Exploration

As part of the exploration program, twenty-seven geotechnical soil borings were drilled and eleven Cone Penetration Tests (CPT) and two Seismic Cone Penetration Tests (SCPT) were conducted along the project alignment which included the previously proposed two separate, relatively short aerial structures. The field exploration was performed between March and April 2005 and in August through October 2006.

The soil borings were drilled to the approximate depths between 25 feet and 121.5 feet and the CPT were conducted to the approximate depths between 100 feet and 120 feet.

TABLE 1A–2005/2006 SUBSURFACE INVESTIGATION SUMMARY (AERIAL GUIDEWAY STRUCTURE)

Boring/CPT No.	Completion Date	Hammer Type	Hammer Efficiency (%)	Boring/CPT Depth (ft)	Approx. Ground Elev. (ft)
AS-1	04-13-2005	Automatic	60	121.5	115.0
AS-2	10-17-2006	Automatic	60	100.5	116.0
AS-4	04-14-2005	Automatic	60	121.5	117.5
AS-3	10-17-2006	Automatic	60	100.5	118.5
CPT-AS-6	04-02-2005	N/A	N/A	119.6	119.5
AS-5	10-16-2006	Automatic	60	100.5	120.0
CPT-AS-8	04-02-2005	N/A	N/A	119.5	118.0
AS-7	10-17-2006	Automatic	60	100.5	119.0
CPT-AS-9	09-01-2006	N/A	N/A	99.7	118.0
AS-11	04-02-2005	Automatic	60	121.5	118.0
CPT-AS-13	04-01-2005	N/A	N/A	119.6	116.5
CPT-AS-12	09-01-2006	N/A	N/A	99.7	115.5
AS-15	03-29-2005	Automatic	60	121.5	118.5
CPT-AS-14	09-01-2006	N/A	N/A	99.7	117.0
AS-17	03-31-2005	Automatic	60	121.5	119.0
AS-24	04-07-2005	Automatic	60	121.5	130.5
CPT-AS-22	08-21-2006	N/A	N/A	99.7	131.0
AS-25	10-20-2006	Automatic	60	100.5	129.5
CPT-AS-26	03-31-2005	N/A	N/A	119.6	132.0
CPT-AS-28	03-31-2005	N/A	N/A	119.6	132.0
AS-27	04-01-2005	Automatic	60	121.5	134.5
CPT-AS-48	05-02-2005	N/A	N/A	119.6	134.5
CPT-AS-30	08-31-2006	N/A	N/A	99.7	134.5
AS-29	04-08-2005	Automatic	60	121.5	134.0
AS-40	10-23-2006	Automatic	60	101.5	133.0

(1) Elevations are based on NAVD88 datum.
(2) Borings AS-29 and AS-40 were not used for the foundation recommendations of aerial guideway due to rearrangement of support for the aerial guideway structure.

TABLE 1B–2005/2006 SUBSURFACE INVESTIGATION SUMMARY (RETAINING WALLS/OTHER STRUCTURES)

Boring/CPT No.	Completion Date	Hammer Type	Hammer Efficiency (%)	Boring/CPT Depth (ft)	Approx. Ground Elev. (ft)
AS-29	04-08-2005	Automatic	60	121.5	134.0
AS-40	10-23-2006	Automatic	60	101.5	133.0
AS-39	04-11-2005	Automatic	60	121.5	139.0
CPT-AS-42	03-31-2005	N/A	N/A	119.6	141.0
CPT-AS-44	04-01-2005	N/A	N/A	119.6	145.5
TE-53	08-23-2006	Automatic	60	20.0	119.0
AG-18	04-05-2005	Automatic	60	25.0	120.0
TE-54	08-23-2006	Automatic	60	20.0	119.5
AG-19	04-05-2005	Automatic	60	25.0	121.5
RW-49	10-19-2006	Automatic	60	20.5	116.0
RW-50	09-11-2006	Automatic	60	20.0	119.0
RW-51	09-112006	Automatic	60	20.0	119.5
PS-59	08-23-2006	Aut0matic	60	20.0	115.0
PS-21	04-04-2005	Automatic	60	25.0	120.0
TE-55	08-23-2006	Automatic	60	20.0	122.0
TE-56	09-11-2006	Automatic	60	20.0	121.0
AG-23	04-05-2005	Automatic	60	25.0	125.0
AE-58	08-23-2006	Automatic	60	35.0	126.5

(1) Elevations are based on NAVD88 datum.
(2) Borings AS-45, AG46, PS-47 are not used.

2017 Field Exploration

Two piezometers were installed in November of 2017 in order to collect groundwater information and assist in the early design discussions.

TABLE 1C – 2017 SUBSURFACE INVESTIGATION SUMMARY (PIEZOMETER MONITORING)

Boring No.	Completion Date	Hammer Type	Hammer Efficiency (%)	Boring Depth (ft)	Approx. Ground Elev. (ft)
AS-65	11-22-2017	Automatic	60	41.5	117.0
AS-66	11-22-2017	Automatic	60	41.5	135.0

(1) Elevations are based on NAVD88 datum.

2018 Field Exploration

Eleven borings were drilled and sixteen CPTs were conducted in August/September 2018 for the proposed new aerial guideway structure between approximately Story Road and Tully Road. These borings were drilled to the approximate depth of 150 feet and the CPT probe was pushed to the approximate depth of 120 feet.

The date of drilling, drill rig type, hammer type, hammer energy ratio, depth of these borings and approximate ground elevation of the borings and CPTs are summarized in the tables below.

TABLE 1D - 2018 SUBSURFACE INVESTIGATION SUMMARY (AERIAL GUIDEWAY STRUCTURE)

Boring/CPT No.	Completion Date	Hammer Type	Hammer Efficiency (%)	Boring/CPT Depth (ft)	Approx. Ground Elev. (ft)
CPT-AS-91	08-09-2018	N/A	N/A	115.5	118.0
CPT-AS-92	08-21-2018	N/A	N/A	120.1	116.5
CPT-AS-93	08-10-2018	N/A	N/A	120.8	117.5
CPT-AS-67	08-10-2018	N/A	N/A	120.8	119.0
AS-68	08-21-2018	Automatic	72.1	151.5	119.5
CPT-AS-69	08-13-2018	N/A	N/A	125.2	119.5
AS-70	08-17-2018	Automatic	72.1	151.5	120.5
CPT-AS-71	08-13-2018	N/A	N/A	121.1	120.5
AS-72	08-15-2018	Automatic	72.1	149.5	121.5
CPT-AS-73	08-14-2018	N/A	N/A	120.1	121.5
AS-74	07-24-2018	Automatic	75.3	151.5	121.0
CPT-AS-75	08-14-2018	N/A	N/A	120.1	121.0
AS-76	08-14-2018	Automatic	72.1	151.5	120.5
CPT-AS-77	08-15-2018	N/A	N/A	104.7	114.5
AS-78	07-26-2018	Automatic	75.3	151.5	120.5
AS-80	08-09-2018	Automatic	72.1	150.3	121.5
CPT-AS-81	08-15-2018	N/A	N/A	120.8	122.5
AS-82	08-07-2018	Automatic	75.3	151.5	122.5
CPT-AS-83	08-16-2018	N/A	N/A	120.1	122.5
AS-84	07-30-2018	Automatic	75.3	151.5	124.0
CPT-AS-85	08-16-2018	N/A	N/A	114.8	119.7

Boring/CPT No.	Completion Date	Hammer Type	Hammer Efficiency (%)	Boring/CPT Depth (ft)	Approx. Ground Elev. (ft)
AS-86	08-03-2018	Automatic	75.3	151.5	126.5
CPT-AS-87	08-17-2018	N/A	N/A	113.1	120.0
AS-88	08-01-2018	Automatic	75.3	151.5	128.0
CPT-AS-89	08-17-2018	N/A	N/A	120.1	129.0
CPT-AS-94A	08-20-2018	N/A	N/A	120.1	131.0
CPT-AS-95A	08-20-2018	N/A	N/A	120.1	134.5

(1) Elevations are based on NAVD88 datum.

The approximate locations of the field explorations are shown on the "Boring/CPT Location Map" and Drawings HB301 through HB303. The details of the field exploration are included in Appendix II. The descriptions of the materials encountered in the field exploration are shown on the LOTB. The LOTBs are included in Appendix II and the "CPTs" are included in Appendix III.

The different borings/CPTs for different structures are summarized in the tables below:

TABLE 2A - SUMMARY OF BORINGS (FOR AERIAL GUIDEWAY STRUCTURE)

Support	Boring/CPT No.	"SB" Track Station (ft)	Offset (ft)	Boring/CPT Depth (ft)	Approx. Ground Elev. (ft)
Abutment 1	AS-1	971+30	20.0 Lt.	121.5	115.0
Bent 2 & Bent 3	AS-2	973+90	29.0 Lt.	100.5	116.0
Bent 4 & Bent 5	AS-4	976+10	23.0 Rt.	121.5	117.5
Bent 6	AS-3	978+65	69.0 Lt.	100.5	118.5
Bent 7 & Bent 8	CPT-AS-6	980+55	14.0 Lt.	119.6	119.5
Bent 9 & Bent 10	AS-5	983+65	82.0 Lt.	100.5	120.0
Bent 11	CPT-AS-8	985+95	14.0 Lt.	119.5	118.0
Bent 12	AS-7	987+55	3.0 Lt.	100.5	119.0
Bent 13	CPT-AS-91	988+75	9.0 Lt.	115.5	118.0
Bent 14	AS-9	989+05	6.0 Lt.	99.7	118.0
Bent 15	AS-11	990+65	14.0 Lt.	121.5	118.0
Bent 16 & Bent 17	CPT-AS-92	993+33	17.0 Lt.	120.1	116.5
Bent 18	CPT-AS-13	996+05	15.0 Lt.	119.6	116.5
Bent 19	CPT-AS-12	997+20	80.0 Lt.	99.7	115.5
Bent 20	CPT-AS-93	998+30	15.0 Lt.	120.8	117.5
Bent 21	AS-15	999+85	12.0 Lt.	121.5	118.5
Bent 22	CPT-AS-14	1000+85	14.0 Lt.	99.7	117.0
Bent 23	AS-17	1003+30	8.0 Lt.	121.5	119.0
Bent 24 & Bent 25	CPT-AS-67	1004+66	8.0 Lt.	120.8	119.0
Bent 26 & Bent 27	AS-68	1007+46	8.0 Lt.	151.5	119.5
Bent 28 & Bent 29	CPT-AS-69	1010+41	8.0 Lt.	125.2	119.5
Bent 30 & Bent 31	AS-70	1013+26	8.0 Lt.	151.5	120.5
Bent 32 & Bent 33	CPT-AS-71	1016+06	8.0 Lt.	121.1	120.5
Bent 34 & Bent 35	AS-72	1018+91	8.0 Lt.	149.5	121.5
Bent 36 & Bent 37	CPT-AS-73	1021+91	7.0 Lt.	120.1	121.5
Bent 38 & Bent 39	AS-74	1024+91	8.0 Lt.	151.5	121.0
Bent 40 & Bent 41	CPT-AS-75	1027+88	7.0 Lt.	120.1	121.0
Bent 42 & Bent 43	AS-76	1030+84	8.0 Lt.	151.5	120.5
Bent 44 & Bent 45	CPT-AS-77	1033+65	7.0 Lt.	104.7	114.5
Bent 46	AS-78	1035+10	8.0 Lt.	151.5	120.5
Bent 47 - Bent 49	AS-80	1040+60	8.0 Lt.	150.3	121.5

Support	Boring/CPT No.	"SB" Track Station (ft)	Offset (ft)	Boring/CPT Depth (ft)	Approx. Ground Elev. (ft)
Bent 50 & Bent 51	CPT-AS-81	1042+72	7.0 Lt.	120.8	122.5
Bent 52 & Bent 53	AS-82	1045+56	8.0 Lt.	151.5	122.5
Bent 54 & Bent 55	CPT-AS-83	1048+20	8.0 Lt.	120.1	122.5
Bent 56 & Bent 57	AS-84	1051+55	8.0 Lt.	151.5	124.0
Bent 58 & Bent 59	CPT-AS-85	1054+55	8.0 Lt.	114.8	119.7
Bent 60 & Bent 61	AS-86	1057+95	9.0 Lt.	151.5	126.5
Bent 62 & Bent 63	CPT-AS-87	1060+45	7.5 Lt.	113.1	120.0
Bent 64 & Bent 65	AS-88	1063+05	8.0 Lt.	151.4	128.0
Bent 66	CPT-AS-89	1065+10	8.0 Lt.	120.1	129.0
Bent 67	AS-24	1066+95	22.0 Lt.	121.5	130.5
Bent 68	CPT-AS-22	1067+90	39.0 Lt.	99.7	131.0
Bent 69	AS-25	1069+45	23.0 Rt.	100.5	129.5
Bent 70	CPT-AS-26	1070+35	60.0 Lt.	119.6	132.0
Bent 71 & Bent 72	CPT-AS-94A	1073+02	8.0 Lt.	120.1	131.0
Bent 73 & Bent 74	AS-27	1075+40	32.0 Rt.	121.5	134.5
Bent 75	CPT-AS-95A	1078+67	12.0 Lt.	120.1	134.5
Abutment 76	CPT-AS-30	1080+45	12.0 Lt.	99.7	134.5

(1) Elevations are based on NAVD88 datum.

TABLE 2B - SUMMARY OF BORINGS (EARTH RETAINING SYSTEMS/OTHER STRUCTURES)

Structures	Approximate "SB" Track Station	Reference Boring/CPT	"SB" Track Station (ft)	Offset (ft)	Boring/CPT Depth (ft)	Approx. Ground Elev. (ft)(1)
North Approach CIP Wall (RW No. 1)(Spread Footing)	966+88.31 – 969+59.13	AS-1	971+30	20 ft Lt.	121.5	115.0
North Approach MSE Wall (RW No. 2)	969+59.13 – 972+02.48	AS-1	971+30	20 ft Lt.	121.5	115.0
TES Pole	966+00 – 971+50	AS-1	971+30	20 ft Lt.	121.5	115.0
Sound Wall No. 1	Approx. 976+40 – 978+00	AS-4	976+10	25 ft Rt.	113.5	117.5
		AS-3	978+65	69 ft Lt.	100.5	118.5
Story Road POC	Near 997+00	CPT-AS-93	998+30	15 ft Lt.	120.8	117.5
TES Pole	1080+00 – 1080+95	CPT-AS-30	1080+45	12 ft Lt.	99.7	134.5
	1080+95 – 1082+15	AS-29	1081+45	0 ft Lt.	121.5	134.0
	1082+15 – 1088+80	AS-40	1082+85	18 ft Rt.	101.5	133.0
	1088+80 – 1095+50	AS-39	1094+75	3 ft. Rt.	121.5	139.0
Story Road Station POC Landings, Elevator Towers, Emergency Access Stairs at North End of Platform	North Access, South Access, Elevator South Access, Elevator West Access	CPT-AS-13	996+05	15' Lt.	119.6	116.5
	East Access, Elevator East Access	CPT-AS-12	997+20	80' Lt.	99.7	115.5
South Approach CIP Wall Supported on Pile (RW No. 5)	1080+05.87 – 1080+88.00	CPT-AS-30	1080+45	12 ft Lt.	99.7	134.5
	1080+88.00 – 1081+96.37	AS-29	1081+45	0 ft Lt.	121.5	134.0
South Approach CIP Wall (RW No. 5) (Spread Footing)(2)	1081+96.37 – 1084+00.00	AS-40	1082+85	18 ft Rt.	101.5	133.0
	1084+00.00 – 1088+23.33	T-32	1086+90	96 ft Rt.	27.5	135.0
	1088+23.33 – 1089+90.92	PS-63	1089+55	321 ft Rt.	37.5	132.0
	1089+90.92 – 1090+21.19	T-33	1090+10	115 ft Rt.	28.0	135.0
Eastridge Station Shelter Structure	1087+25.75 – 1088+64.75	T-32	1086+90	96 ft Rt.	27.5	135.0
TPSS #33	Approximately 1038+00	AS-80	1089+20	8 ft Lt.	149.8	121.0
TPSS #34	Approximately 1083+25	AS-40	1082+85	18 ft Rt.	101.5	133.0

(1) Elevations are based on NAVD88 datum.
(2) Borings AS-40 is used for the "Bearing Capacity Controlled by Settlement" for South Approach CIP Wall on Spread Footing.

TABLE 2C - SUMMARY OF BORINGS (FOR PAVEMENT DESIGN)

Boring No.	"SB" Track Station (ft)	Offset (ft)	Boring Depth (ft)	Ground Elev. (ft)	Bulk Sample Soil Description
AG-18	1013+85	4.0 Lt.	25.0	120.0	Sandy lean clay
AS-72	1018+91	8.0 Lt.	149.5	121.5	Sandy lean clay
AG-19	1024+50	9.0 Lt.	25.0	121.5	Sandy lean clay
AS-74	1024+91	8.0 Lt.	151.5	121.0	Fat clay
AS-76	1030+84	8.0 Lt.	151.5	120.5	Fat clay
AS-78	1035+10	8.0 Lt.	151.5	120.5	Sandy lean clay
AS-80	1039+20	8.0 Lt.	150.3	121.0	Lean clay
PS-21	1041+70	59.0 Rt.	25.0	120.0	Sandy lean clay
AS-82	1045+56	8.0 Lt.	151.5	122.5	Sandy lean clay
AS-84	1051+55	8.0 Lt.	151.5	124.0	Sandy lean clay
AG23	1055+95	12.0 Lt.	25.0	125.0	Sandy lean clay
AS-86	1057+95	9.0 Lt.	151.5	126.5	Lean clay
AS-88	1063+05	8.0 Lt.	151.5	128.0	Sandy lean clay

The descriptions of the soil materials encountered in the field exploration and relevant boring information are presented on the LOTB included in Appendix II.

7.2 Field Testing

a) Soil samples were obtained from the borings during drilling at various depths by driving a 2.5-inch Inside Diameter (I. D.) Modified California Sampler or a 1.375 inches I.D. Standard Penetration Sampler (ASTM Test Method No. 1586). The sampler was driven into the subsurface soils under the impact of a 140 pounds hammer having a free fall of 30 inches. The blow counts required to drive the sampler for the last 12 inches are presented on the LOTB, Appendix II. (When correlating standard penetration data in similar soils, the blow counts for the Modified California sampler can be converted to equivalent Standard Penetration Test sampler by multiplying a factor of 0.65).

b) Pocket penetration tests were also performed on clay samples to evaluate their consistency.

7.3 Details of Field Exploration

All the test borings were drilled with a truck-mounted drill rig using 4-inch diameter solid-stem auger and switched to rotary-wash drilling method with 4.5-inch diameter drilling bit. The borings were drilled under the technical supervision of our engineers, who classified and continuously logged the soils encountered during drilling and supervised the collection of soil samples at various depths for visual examination and laboratory testing. The soil samples were visually classified in the field according to the Caltrans "Soil and Rock Logging, Classification and Presentation Manual" (2010 Edition) and then transported to our laboratory for further evaluation and testing. Upon completion of drilling, the boreholes were backfilled with cement grout.

The logs presented in Appendix II were prepared from the field logs which were edited after visual re-examination of the soil samples in the laboratory and results of classification tests on selected soil samples as indicated on the logs.

8.0 Laboratory Testing Program

The following laboratory tests were performed on selected soil samples collected during field exploration to evaluate the physical and engineering properties of the subsurface soils at the project site to support the geotechnical recommendations:

a) Laboratory determination of Moisture-Density (California Test Method T-226).
b) Atterberg Limits Test (California Test Method T-204).
c) Grain Size Distribution Test (California Test Method T-202).
d) Unconfined Compression Test (California Test Method T-221).
e) Corrosion Test (California Test Method T-643).
f) Consolidation Test (American Standard Test Method D2415).
g) R-Value Test (California Test Method T-301)

The laboratory test methods and test results are presented on plates and summarized in tables included in Appendix IV. Laboratory test results for moisture content, dry density, unconfined compression test, Plasticity Index and grain size classification of the soil samples are presented in Appendix II.

It should be noted that the descriptions of the soils encountered, and relevant boring information presented on the LOTB depict subsurface conditions only at the locations indicated on the plan and on the particular date noted on the LOTB. Because of the variability from place to place within soil/rock in general, subsurface soil conditions at other locations may differ from conditions occurring at the boring locations explored. The abrupt stratum changes shown on the logs may be gradational and relatively minor changes in soil types within a stratum may not be noted on the logs due to field limitations. Also, the passage of time may result in a change in the subsurface soil conditions at these locations due to environmental changes.

9.0 Site Geology and Subsurface Soil Conditions

9.1 Regional Geologic Setting

The project site is located along the eastern side of the San Francisco Bay in the Coast Ranges geomorphic province of California. The axes of the mountain ranges and valleys trend in northwest direction. The crests of the Coast Ranges Mountains range from 2000 to 4000 feet, occasionally 6000 feet elevation above sea level. The valleys between the ridges range from sea level to several hundred feet above sea level. San Francisco Bay occupies a broad partially submerged valley between the San Francisco Peninsula and the East Bay.

Much of the geologic framework of the San Francisco Bay Region is the result of plate tectonics. The region is located at the boundary between two large crustal plates that are separated by the north-northwest trending San Andreas Fault (and related sub-parallel faults including the

Hayward and Calaveras Faults). The Pacific Plate (located west of the San Andreas Fault) is slowly moving northwestward relative to the North American Plate (located east of the San Andreas Fault). The strain that accumulates in the rocks on either side of the fault is occasionally released in the form of earthquakes. Some earthquakes are accompanied by surface rupture where the active faults intersect the ground surface.

Witter, et al (2007) mapped various units of Quaternary-age deposits exposed at the ground surface in San Francisco Bay Region. Plate 6 show portions of that mapping along the project alignment. Descriptions of those units follow.

9.2 Site Geology

General geologic features pertaining to the site and its vicinity were evaluated with reference to the "Quaternary Geologic Map of Santa Clara Valley, Santa Clara, Alameda, and San Mateo Counties, California compiled by E.J. Helley, R.W. Graymer, G.A.Phelps, P.K.Showalter, and C.M.Wentworth (May 1994) Open File Report 97-710. Based on the map, the subsoils of the site consist of mainly Flood Basin Deposits (Qhb) (Holocene) and Alluvial Fan and Fluvial Deposits (Holocene) (Qhaf). A geologic map of the general project area is shown on "General Geologic Map", Plate 3. Description of the main geologic units is as follows:

Qhb -Flood Basin Deposits (Holocene) – Mud, silt and sand, locally thin laminated, deposited in closed nonmarine depressions and related lacustrine settings

Qhaf- Alluvial Fan and Fluvial Deposits (Holocene) – Alluvial fan deposits are brown or tan, medium dense to dense, gravely sand or sandy gravel that generally grades upward, to sandy or silty clay

9.3 Subsurface Soil Conditions

The subsurface soil conditions along the proposed corridor generally consist of soft to very stiff lean clay/sandy silt with pockets/lens of medium

dense silty sand/clayey sand, underlain by very stiff to hard lean clay and denes to very denes silty sand to the bottom of borings with the following additional information:

2005 and 2006 Borings

- Relatively thick stratum of soft to firm (Standard Penetration Blow Counts between 7 and 11) clay was retrieved at or near the top of the borings in Borings AS-3, AS-6, AS-7, AS-8, AS-9, AS-11, AS-13, AS-12, AS-15, PS-21, AS-22, AS-24 through AS-30.
- Isolated lenses/pockets of medium dense to very dense silty/clayey sand and clayey/well-graded gravel were encountered at various depths in all the borings. The sand/gravel lenses and pockets are more prominent in Borings AS-1, AS-2, AS-3, AS-5, AS-7, AS-15, AS-22, AS-26, AS-27, AS-29, AS-39 and AS-45.

2018 Borings

- Soft to medium stiff lean/fat clay and silt was encountered within the top 50 feet of the borings.
- Soft to medium stiff lean/fat clay and silt is more prominent in Borings AS-80 and AS-82.
- Except for Boring AS-68, the medium dense silty sand exists in form of isolated relatively small pockets/lenses and appears to be discontinuous.

The descriptions of the subsurface soils/rock encountered in the geotechnical explorations are consistent with the published geologic maps. Detail description of the subsurface soil conditions encountered in each boring/CPT should be referred to the LOTBs in Appendix II.

It should be noted that as discussed and agreed upon with the client and the project sponsor, the borings/CPTs are not conducted at every support location, rather they are spread out along the corridor to obtain data that can be reasonably used in developing the engineering design

recommendations. Variations in subsurface soil conditions should be expected from location to location and in between these explorations.

Due to limitations inherent in geotechnical investigations, it is neither uncommon to encounter unforeseen variations in the subsurface soil conditions during construction nor is it practical to determine all such variations during an acceptable program of drilling and sampling for a project of this scope. Such variations, when encountered, generally require additional engineering services to attain properly constructed project. We, therefore, recommend that a contingency fund be provided to accommodate any additional charges resulting from technical services that may be required during construction.

9.4 Groundwater

The drilling of the soil boring was started with solid-stem auger to measure groundwater if there was no soil caving in. The drilling was converted to rotary wash drilling method once the groundwater was measured and/or soil caving in was encountered.

Groundwater level varied along the corridor and the deepest and shallowest depths were noted at approximate elevations between +90.5 feet (approximate depth of 40.5 feet below existing ground surface) in CPT-AS-94 and +126.4 feet (approximate depth of 8.5 feet below existing ground surface) in Boring AS-66 during drilling in 2018; respectively.

The following Table 3 presents the depths below existing grade and the corresponding elevations of groundwater encountered in each of the boring/CPT. The ground elevations were interpreted from the available topographic maps provided for the project.

TABLE 3 - SUMMARY OF MEASURED GROUNDWATER LEVEL

Boring/CPT No.	"SB" Track Station	Off-Set	Boring Elev. (ft)	Groundwater Depth (ft)	Groundwater Elev. (ft)	Date Measured
AS-1	971+30	20' Lt.	115.0	15.0	100.0	4/13/2005
AS-2	973+90	29' Lt.	116.0	18.0	98.0	10/17/2006
AS-4	976+10	23' Rt.	117.5	15.0	102.5	4/14/2005
RW-49	977+40	31' Lt.	116.0	19.0	97.0	10/19/2006

Boring/CPT No.	"SB" Track Station	Off-Set	Boring Elev. (ft)	Groundwater Depth (ft)	Groundwater Elev. (ft)	Date Measured
AS-65	978+20	117' Lt.	117.0	16.7	100.3	8/8/2018
AS-3	978+65	69' Lt.	118.5	16.0	102.5	10/17/2006
CPT-AS-6	980+55	14' Lt.	119.5	9.0	110.5	4/2/2005
AS-5	983+65	82' Lt.	120.0	13.0	107.0	10/16/2006
CPT-AS-8	985+95	14' Lt.	118.0	7.0	111.0	4/2/2005
AS-7	987+55	3' Lt.	119.0	11.0	108.0	10/17/2006
CPT-AS-91	988+75	9' Lt.	118.0	13.2	104.8	8/9/2018
CPT-AS-9	989+05	6' Lt.	118.0	13.5	104.5	9/1/2006
AS-11	990+65	14' Lt.	118.0	9.8	108.2	4/2/2005
CPT-AS-92	993+33	17' Lt.	116.5	13.0	103.5	8/21/2018
CPT-AS-13	996+05	15' Lt.	116.5	5.0	111.5	4/1/2005
CPT-AS-12	997+20	80' Lt.	115.5	7.8	107.7	9/1/2006
CPT-AS-93	998+30	15' Lt.	117.5	10.2	107.3	8/10/2018
AS-15	999+85	12' Lt.	118.5	5.5	113.0	3/29/2005
CPT-AS-14	1000+85	14' Lt.	117.0	8.3	108.7	9/1/2006
AS-17	1003+30	8' Lt.	119.0	6.6	112.4	3/31/2005
CPT-AS-67	1004+66	8' Lt.	119.0	11.3	107.7	8/10/2018
TE-53	1006+55	8' Lt.	119.0	14.0	105.0	8/23/2006
AS-68	1007+46	8' Lt.	119.5	10.0	109.5	8/20/2018
CPT-AS-69	1010+41	8' Lt.	119.5	21.5	98.0	8/13/2018
AS-70	1013+26	8' Lt.	120.5	10.0	110.5	8/16/2018
AG-18	1013+85	4' Lt.	120.0	8.5	111.5	4/5/2005
CPT-AS-71	1016+06	8' Lt.	120.5	7.8	112.7	8/13/2018
TE-54	1017+95	8' Lt.	119.5	13.0	106.5	8/23/2006
AS-72	1018+91	8' Lt.	121.5	10.0	111.5	8/14/2018
CPT-AS-73	1021+91	7' Lt.	121.5	7.8	113.7	8/14/2018
AG-19	1024+50	9' Lt.	121.5	13.0	108.5	4/5/2005
AS-74	1024+91	8' Lt.	121.0	10.0	111.0	7/24/2018
CPT-AS-75	1027+88	7' Lt.	121.0	6.2	114.8	8/14/2018
AS-76	1030+84	8' Lt.	120.5	9.5	111.0	8/14/2018
RW-50	1031+20	59' Rt.	119.0	7.5	111.5	9/11/2006
CPT-AS-77	1033+65	7' Lt.	120.0	5.5	114.5	8/15/2018
RW-51	1033+95	45' Rt.	119.5	9.0	110.5	9/11/2006
AS-78	1035+10	8' Lt.	120.5	11.0	109.5	7/25/2018
AS-80	1039+20	8' Lt.	121.0	9.5	112.0	8/8/2018
PS-59	1040+50	65' Rt.	115.0	8.0	107.0	8/23/2006
PS-21	1041+65	59' Rt.	120.0	18.0	102.0	4/4/2005

Boring/CPT No.	"SB" Track Station	Off-Set	Boring Elev. (ft)	Groundwater Depth (ft)	Groundwater Elev. (ft)	Date Measured
CPT-AS-81	1042+72	7' Lt.	122.5	5.2	117.3	8/15/2018
AS-82	1045+56	8' Lt.	122.5	9.0	113.5	8/7/2018
TE-55	1047+45	61' Rt.	122.0	15.0	107.0	8/23/2006
CPT-AS-83	1048+20	8' Lt.	122.5	7.3	115.2	8/16/2018
AS-84	1051+55	8' Lt.	124.0	9.0	115.0	7/30/2018
TE-56	1052+20	70' Rt.	121.0	10.0	111.0	9/11/2006
CPT-AS-85	1054+55	8' Lt.	125.0	5.3	119.7	8/16/2018
AG-23	1055+95	12' Lt.	125.0	8.0	117.0	4/5/2005
AS-86	1057+95	9' Lt.	126.5	11.0	115.5	8/3/2018
CPT-AS-87	1060+45	7.5' Lt.	127.0	7.0	120.0	8/17/2018
AS-88	1063+05	8' Lt.	128.0	11.5	116.5	8/1/2018
AE-58	1063+10	57' Rt.	126.5	8.0	118.5	8/23/2006
CPT-AS-89	1065+10	8' Lt.	129.0	7.4	121.6	8/17/2018
AS-24	1066+95	22' Lt.	130.5	7.0	123.5	4/7/2005
CPT-AS-22	1067+90	29' Lt.	131.0	15.2	115.8	8/31/2018
AS-25	1069+45	22' Rt.	129.5	8.5	121.0	10/20/2006
CPT-AS-26	1070+35	60' Lt.	132.0	8.0	124.0	3/31/2005
CPT-AS-94	1073+02	8' Lt.	131.0	40.5	90.5	8/20/2018
CPT-AS-28	1075+10	44' Lt.	132.0	8.1	123.9	8/31/2006
AS-27	1076+40	32' Rt.	134.5	12.0	122.5	4/1/2005
CPT-AS-48	1076+55	28' Rt.	134.5	10.0	124.5	5/2/2005
CPT-AS-95	1078+67	12' Lt.	134.5	8.8	125.7	8/20/2018
CPT-AS-30	1080+45	12' Lt.	134.5	12.9	121.6	8/31/2006
AS-29	1081+45	0' Lt.	134.0	8.0	126.0	4/8/2005
AS-40	1082+85	18' Rt.	133.0	11.5	121.5	10/23/2006
AS-66	1083+00	27' Rt.	135.0	8.6	126.4	8/8/2018
T-32	1086+90	96' Rt.	135.0	12.0	123.0	9/5/2005
R-37	1088+85	258' Rt.	134.5	14.0	120.5	9/6/2005
PS-63	1089+55	321' Rt.	132.0	9.5	122.5	9/11/2005
T-33	1090+10	115' Rt.	135.0	11.0	124.0	9/6/2005
P-35	1093+35	28' Rt.	136.5	14.0	122.5	9/6/2005
AS-39	1094+75	3' Rt.	139.0	Not	Not	4/11/2005

The groundwater level is anticipated to vary with the passage of time due to seasonal groundwater fluctuations, variations in yearly rainfall, water elevations in the nearby creeks, surface and subsurface flows, ground

surface run-off, and other environmental factors that may not be present at the time of the investigation.

9.5 Groundwater Monitoring

Vibrating wire piezometers were installed in Borings AS-2 and AS-40 upon completion of drilling in October 2006. Vibrating wire pressure transducers were installed at the depths of 20 feet, 55 feet and 80 feet in the two borings to monitor the hydraulic heads at each boring location. Standpipe piezometers were installed in Borings AS-65 and AS-66 in November 2017. The piezometers were monitored twice in the first month since their installation and thereafter at periodic intervals.

The plot of monitoring reading for piezometer installed in Borings AS-2 and AS-40 (10/2006 – 11/2007) and the summary of monitoring reading for piezometer installed in Borings AS-65 and AS-66 (11/2017 – 8/2018) are included in Appendix III. In addition to preconstruction pile testing, the Contractor is allowed to perform his own subsurface exploration to supplement geotechnical information provided in this report. Groundwater monitoring is recommended as part of the subsurface exploration to investigate the updated groundwater level.

10.0 Scour Evaluation

The "Scour Evaluation" is considered irrelevant for the proposed project since there is no water body such as creek, stream or river crossing in proximity of the structures.

11.0 Corrosion Evaluation

The corrosion investigation for this project was performed on the selected samples from borings drilled in 2003 and 2018 in general accordance with the provisions of California Test Methods 417, 422 and 643. A summary of the corrosion test results is presented in the table below, and the test results are presented in Appendix IV.

TABLE 4 –SUMMARY OF CORROSION TEST RESULTS

Boring No.	"SB" Track Station	Sample Depth (ft)	Minimum Resistivity (ohms-cm)	pH	Chloride Content (ppm)	Sulfate Content (ppm)
AS-1	971+30	26	2090	7.1	33.8	30.1
AS-2	973+90	20	1,100	7.69	44.9	85.0
AS-4	976+10	11	1980	7.95	31.6	38.8
AS-7	987+55	25	560	8.18	39.7	110.2
AS-11	990+65	16	1340	7.85	26.3	37.8
AS-15	999+85	6	860	7.52	53.8	6.2
AS-17	1003+30	11	1850	8.21	44.9	30.1
PS-21	1041+65	14.5	130	8.35	1216.7	1785.1
AS-24	1066+95	16	460	7.63	371.2	19.4
AS-25	1069+45	20	780	8.51	193.8	148.4
AS-29	1081+45	~~16~~	1020	7.98	97.4	94.9
AS-39	1094+75	11	1820	7.75	44.1	37.5
AS-40	1082+85	25	1,130	8.21	71.2	66.5
AS-68	1007+46	11	750	8.48	38.3	232.4
AS-70	1013+26	11	1,050	8.07	35.8	102.5
AS-72	1018+91	11	1,230	8.76	23.3	42.3
AS-74	1024+91	21	1,100	8.14	31.5	102.9
AS-76	1030+84	16	120	8.15	984.1	2754.4
AS-78	1035+10	11	60	7.91	1,380.8	5698.6
AS-80	1039+20	11	60	8.04	2124.0	7928.0
AS-82	1045+56	11	60	8.38	1784.0	3580.4
AS-84	1051+55	6	270	9.09	238.7	1058.6
AS-86	1057+95	11	480	8.19	116.8	211.6
AS-88	1057+95	16	320	8.42	356.0	377.4

According to the Section 10.7.5. of the AASHTO LRFD Bridge Design Specifications (BDS) – Sixth Edition (2012) with Caltrans Amendment, the following soil, water or site conditions shall be considered as indicators of potential pile corrosion or deterioration:

- Minimum resistivity equal to or less than 1,000 ohm-cm,
- Chloride concentration equal to or greater than 500 ppm,
- Sulfate concentration equal to or greater than 2,000 ppm,
- pH equals to or less than 5.5,
- Landfills and cinder fills,
- Mines or industrial drainage,
- Suspected chemical wastes, and

- Stray currents.

Per Caltrans Corrosion Guidelines (Version 3.0, March 2018), Caltrans considers a project site to be corrosive for structural elements if one or more of the following conditions exist for the representative soil and/or water samples taken at the project site:

- Chloride concentration equal to or greater than 500 ppm, or
- Sulfate concentration equal to or greater than 1,500 ppm, or
- pH equals to or less than 5.5.

The on-site soil materials should be considered as non-corrosive according to the criteria above except in the vicinity of Boring PS-21 ("SB" Track Station 1041+70), AS-76 ("SB" Track Station 1030+84), AS-78 ("SB" Track Station 1035+10), AS-80 ("SB" Track Station 1039+20) and AS-82 ("SB" Track Station 1045+56). Cone Penetration Tests, AS-75 (CPT), AS-77 (CPT), AS-79 (CPT), AS-81 (CPT) and AS-83 (CPT) were conducted in the vicinity of the above borings. No soil sample was obtained from the CPT for the corrosion test in all the CPT of this project.

It appears that corrosive soil was consistently encountered between Borings AS-76 and AS-82, it is reasonable to assume corrosive environment at the bent supports where CPT was pushed in the vicinity of Borings AS-76, AS-78, AS-80 and AS-82. It is recommended that piles at Capitol Aerial Guideway Bent 40 through Bent 55 should be considered in a corrosive environment.

Some of the corrosion mitigation measures for reinforced concrete are recommended below:

a) Increase clear concrete cover over the reinforced steel. Additional thickness of clear cover over the reinforcing steel increase the time it takes for chlorides to reach the level of the reinforcement.
b) Use of "Epoxy Coated Reinforcement" for corrosion protection.
c) "Supplementary Cementitious Materials" are required when concrete is exposed to corrosive condition.
d) A low water-to-cement material ratio leads to a denser concrete which helps to protect the concrete in corrosive environment.

12.0 Site Seismicity and Analysis

12.1 Seismic Sources

The project is in a seismically active part of northern California. Many faults exist in the regional area. These faults are capable of producing earthquakes and may cause strong ground shaking at the site.

Maximum magnitudes (M_{max}) of some of the closest faults in the area are based on Caltrans ARS Online Website. These maximum moment magnitudes represent the largest earthquake a fault is capable of generating and is related to the seismic moment. The earthquake data of the active faults in the project vicinity are summarized in the table below.

TABLE 5- ARS DATA

Fault (Fault ID)	Maximum Magnitude of Fault, M_{Max}	Fault Type	Site-to-Fault Distance, R_{rup}* (miles)
Silver Creek (148)	6.9	Strike Slip	2.05
Hayward (Southern Extension) (149)	6.7	Strike Slip	2.26
Calaveras (Central) 2011 CFM (151)	6.9	Strike Slip	4.87
San Andreas (Santa Cruz Mts) 2011 CFM (158)	8.0	Strike Slip	15.2

*Closest distance (miles) to the fault rupture plane as obtained from Caltrans ARS Online Website.

12.2 Seismic Design Criteria

The development of the Acceleration Response Spectrum (ARS) followed the standard Caltrans procedure by using Caltrans ARS Online webtool (Ver. 2.3.09). The ARS curve is based on several input parameters, including site location (longitude/latitude), average shear wave velocity for the top 100 feet (Vs_{30m}), and other site parameters, such as fault characteristics and site-to-fault distances.

Average shear wave velocities (Vs_{30m}) for the top 100 feet at the project site was calculated by using established correlations and the procedure provided in the "Caltrans Design Manual (Version 2.0, 2012)". The design method incorporates both deterministic and probabilistic seismic hazards to produce the design response spectrum.

Based on all the available direct measurement from CPT data, we have calculated the Vs_{30m}. The Vs_{30m} are summarized in the following table.

TABLE 6- SUMMARY OF CALCULATED Vs_{30m}

CPT No.	CPT Depth	Rock Depth (ft)	Vs_{30m} (m/s)
CPT-AS-67	119.7	Not encountered	219
CPT-AS-71	119.6	Not encountered	219
CPT-AS-75	119.7	Not encountered	214
CPT-AS-77	109.4	Not encountered	211
CPT-AS-83	119.7	Not encountered	214
CPT-AS-87	119.7	Not encountered	220
CPT-AS-91	115.2	Not encountered	229
CPT-AS-92	119.7	Not encountered	225
CPT-AS-93	119.7	Not encountered	216
CPT-AS-94	119.7	Not encountered	218

The ARS was developed based on the shear wave velocity of 720 feet/sec. Average shear wave velocity calculation is included in Appendix VI. After checking the ARS at 3 different locations (North End, Middle, South End), a point near south end of the project alignment was selected for design due to the relatively higher spectral values.

The site location and the relevant parameters are summarized as follows, and the recommended design curve is presented on Appendix V.

Input

- Site Location: 37.3554°N/121.8326°W (North End of Project near Excalibur Drive)
- Average V_{S30m}: 720 ft/s
- Depth to rock with a shear wave velocity of 1.0 km/sec ($Z_{1.0}$) = N/A
- Depth to rock with a shear wave velocity of 2.5 km/sec ($Z_{2.5}$) = N/A

Output

- The recommended ARS curve is based on the maximum of the comparison of the deterministic data and Caltrans Probabilistic data. The recommended ARS curve at this site is based on the Probabilistic curve.

- An adjustment factor for the near-fault effect was applied to the calculated spectral acceleration values. The increase of 20% to the spectral acceleration values corresponds to period longer than 1 second and linearly tapes to zero at a period of 0.5 seconds.
- Anticipated Peak Ground Acceleration (PGA): 0.682 g
- Near Fault Effect: Yes
- Basin Effect: No. The project site is not located within the limit of the $Z_{2.5}$ contour map for Northern California.
- Governing Fault is the Silver Creek Fault (Fault I.D.=148, Mmax=6.9)

12.3 Seismic Hazard

Primary seismic hazards include ground shaking and surface fault rupture. Secondary seismic effects resulting from soil responses to ground shaking includes liquefaction. These hazards may cause deformation of man-made structures. These hazards are discussed in the following paragraphs.

Primary Seismic Hazards

12.3.1 Seismic Ground Shaking

As shown on the ARS Online Map, Plate No. 4, the closest active fault is the Silver Creek fault, which is located approximately 2.1 miles northeast from the project site. Based on available geological and seismic data, the possibility of the project site to experience strong ground shaking may be considered high. A peak ground acceleration of 0.682 g was calculated for the site.

12.3.2 Surface Fault Rupture

The project site is not within the "Earthquake Fault Zone" per "Earthquake Zones of Required Investigations" by California Department of Conservation and no known/mapped active fault passes through the project site. Therefore, the potential for ground surface rupture due to faulting does not exist.

Secondary Seismic Hazards

12.3.3 Liquefaction Potential

Liquefaction is a phenomenon in which saturated cohesionless soils are subject to a temporary but essentially total loss of shear strength under the reversing, cyclic shear stresses associated with earthquake shaking. Submerged cohesionless sands and silts of low relative density are the type of soils, which usually are susceptible to liquefaction. Clays are generally not susceptible to liquefaction.

The liquefaction potential was evaluated in accordance with the methods proposed by Youd (Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCCER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al. ASCE Journal of Geotechnical and Geo-environmental Engineering, October 2001, Vol. 127 No. 10). We have reviewed and compared the available data from the boring at each location in the evaluation. The evaluation was primarily using the boring data with an Earthquake Magnitude 6.9 and a peak ground acceleration of about 0.68g (Caltrans Online Probabilistic ARS). This method compares the estimates of the earthquake-induced shear stress to the susceptibility of soil liquefaction. According to Bray (2006), liquefaction appears to occur in soils where these fines are either non-plastic or are low plasticity silts and/or silty clays (PI<12%, and LL<37%), and with high water content relative to their liquid limit (w>0.85 LL).

Based on Caltrans "Guidelines on Foundation Loading and Deformation Due to Liquefaction Induced Lateral Spreading (January 2012)", residual shear strengths were estimated using the equation by Kramer and Wang (2007). The soil strengths in the liquefiable layer are modeled as soft clay with shear strength equal to the residual strength of the liquefied soil.

In general, liquefaction hazards are most severe in the upper 50 feet of the surface as mentioned in Special Publication 117A (CGS, 2008). In our opinion, the impact due to the potential liquefiable soils below 50 feet is

considered insignificant, especially when the layer is relatively thin and discontinuous.

Based on our analysis, the subsurface soil with liquefaction potential exists at various depths of some of the borings and CPTs along the project alignment. The results of our liquefaction analysis are summarized in the table below:

TABLE 7–SUMMARY OF LIQUEFACTION ANALYSIS RESULTS

Boring No.	Average $(N_1)_{60,cs}$	Approx. Depth of Liquefiable Soils (ft)	Approx. Thickness of Liquefiable Soils (ft)	Estimated Post-Liquefaction Settlement (inch)
AS-68	21	33.5	7.5	1.2
	15	43.0	8.0	1.7
AS-70	6	8.5	4.5	1.8
	14	68.5	4.5	1.0
AS-72	5	13.0	3.5	1.6
AS-74	24	8.0	5.5	0.8
AS-76	12	8.5	15.0	3.6
AS-78	18	13.0	5.5	1.0
AS-80	-	13.5	10.0	3.3
AS-86	-	48.5	8.0	1.6
AS-88	12	13.5	5.0	1.2
	20	43.5	15.0	2.5

The liquefaction analysis calculations are included in Appendix VI.

The impact of the liquefaction potential on the foundation design is discussed in Section 13.9.

Lateral Spreading

Liquefaction-induced spreading has been defined as the "*lateral displacement of large surficial blocks of soil as a result of liquefaction in a subsurface layer*". Lateral spreading refers to the more moderate movements of gently sloping ground due to soil liquefaction. As described by Bartlett and Youd (1992a; 1992b), liquefaction-induced lateral spreading occurs on mild slopes of 0.3% to 5% underlain by loose sand and shallow water. The geologic conditions conducive to lateral spreading

(gentle surface slope, shallow water table, and liquefiable cohesionless soils) are frequently found along streams and other waterfronts in recent alluvial or deltaic deposits, as well as in loosely-packed, saturated, sandy fills.

In our opinion, the potential for lateral spreading does not exist because it appears that there is no continuous layer of liquefiable soil at the project site. Also, there is no water course with open face in proximity of the project alignment.

13.0 Foundation Recommendations

13.1 General

Based on the findings of our investigation, it is our opinion that the project site is feasible for the proposed project from a geotechnical standpoint provided the recommendations presented in this report are incorporated into the final design and construction.

This report was prepared specifically for the proposed project. Normal construction procedures were assumed throughout our analysis and represent one of the bases of recommendations presented herein. Therefore, we should be notified in the event that these conditions are changed, so as to modify or amend our recommendations. Our design recommendations have been based upon the materials and subsurface soil conditions encountered in the soil borings and CPTs at the project site.

Detail soil descriptions are discussed in pertinent recommendation section or with reference to the relevant boring/CPT summarized in Tables 2A, 2B and 2C for each project element.

The following sections discuss foundation design recommendations that were developed in general accordance with the 2017 AASHTO LRFD Bridge Design Specifications (8th Edition) with CA Amendments.

13.2 Earthwork and Grading

All earthwork and grading operations should be performed in accordance with the project specifications and "Caltrans Standard Specifications" for Earthwork (Section 19, 2018). The prepared subgrade and compacted fill materials should be tested for their moisture content and density. All grading should be performed in accordance with the project plans and specifications. A Geotechnical Engineer or representative from Regulating Agency should observe all excavated areas during grading and perform moisture and density tests on prepared subgrade and compacted fill materials.

Prior to the commencement of grading operations, it will be necessary to completely remove any trees, shrubs and their root systems, and strip all existing vegetation from areas to be developed. Areas to receive engineered fill should be excavated to remove any loose/soft soil materials. The resulting surface upon which fill is to be placed should be observed by the Geotechnical Engineer or the Regulatory Agency. Areas receiving fill should be scarified to a depth of 6 inches, moisture conditioned and compacted to 95% relative compaction as determined by the California Test Method 216.

Engineered Fill

In general, all engineered fill materials should be as per Caltrans Standard Specifications. Engineered fill imported to the site should be

- Relatively non-expansive granular material with Plasticity Index (P.I.) less than 15;
- Free of organic and inorganic debris;
- Rocks or cobbles in the engineered fill should be broken down and shall not exceed 3 inches in size.

The imported engineered fill should be reviewed by the Geotechnical Engineer. The native materials exposed after the excavation may be used for engineered fill provided that they meet the above criteria (P.I. and SE) and are not contaminated.

Fill material for MSE wall shall be in accordance with the Caltrans specifications. These materials have a requirement of high friction value, low cohesion and should be non-corrosive. On site soil materials can be used if they meet the criteria required for the MSE fill material.

Compaction of Engineered Fill and Subgrade

The recommendations for required compaction as per California Test Method 216 are as follows:

- 90% backfilling after removing trees, buried utilities and structures, depressions caused due to other construction activities, etc.
- 95% for subgrade receiving engineered fill, under the footing and slabs-on-grade.
- 95% for upper 6 inches of pavement subgrade
- Placement and compaction requirement for the MSE walls shall be in accordance with the specialty contractor's design and the Special Provisions.

The engineered fill should be compacted in lifts that do not exceed 8 inches in loose thickness. The compaction moisture content of the fill material should be within a range of 2% dry of optimum moisture content to 3% wet of optimum moisture content.

13.3 Aerial Guideway Structure

Description

The proposed aerial guideway structure will be from Capitol Avenue to Tully Road. The total length of the aerial guideway measured along the centerline of the "SB" Track is on the order of 10,790 feet according to Biggs Cardosa Associates (BCA).

Subsurface Soil Conditions

In general, the subsurface soil conditions along the aerial guideway consist of stiff to very stiff lean clay/sandy silt with pockets/lens of medium dense silty sand/clayey sand, underlain by very stiff to hard lean clay and denes to very denes silty sand. Localized dense to very dense sand lenses

and layers are likely to be encountered at depth during pile driving. Relatively hard driving conditions may be anticipated during installation of the piles.

Pile Type Selection

Different foundation systems have been evaluated with respect to their design capacity and construction considerations for the proposed new aerial guideway structure. Based on the available boring information and considering the pile drivability, relatively high groundwater table, estimated construction cost, impact of noise and vibration on the nearby residences, Cast-In-Drilled Hole (CIDH) concrete piles (24-inch or larger diameter), steel pipes pile and precast concrete piles appear to be the feasible foundation system for the abutments and bents of the proposed new bridge structure. 18-inch diameter steel pipe piles with the upper portion filled with concrete is used at Bent 58 where vertical clearance during construction is limited by the presence of existing overhead power lines. Segments of steel pipe piles will be spliced in the field as the driving progresses.

TABLE 8 – SUMMARY OF PILE TYPE FOR AERIAL GUIDEWAY STRUCTURE

Bridge Support	Recommended Pile Type
Abutment 1	30-inch Diameter CIDH Concrete Pile
Bent 2 through Bent 6E	36-inch Diameter CIDH Concrete Pile
Bent 6W through Bent 75 (except Bent 58)	18-inch Square Precast Concrete Pile
Bent 58	18-inch Steel Pipe Pile
Abutment 76	14-inch Square Precast Concrete Pile

Vertical Pile Capacity

"Eighteen-inch Square Precast Concrete Pile" and "Caltrans Standard Class 200 Alternate "X"" piles may be designed for the foundation loads at the abutments and bents to the indicated pile tip elevations as shown in Table 10. Pertinent foundation design information provided by the structural designer, including Foundation Design Data and Foundation Loads, are presented in the following tables.

TABLE 9 - FOUNDATION DESIGN DATA (AERIAL GUIDEWAY)

Support No	Design Method	Pile Type	Finish Grade Elev. (ft)	Pile Cut-off Elev. (ft)	Pile Cap Size (ft)		Permissible Settlement Under Service Load (in)	No. of Piles per Support
					B	L		
Abut 1	LRFD	30" Diameter CIDH Concrete	114.92	109.67	15	32.25	1.00	10
Bent 2	LRFD	36" Diameter CIDH Concrete	115.14	104.89	23.5	23.5	1.00	9
Bent 3	LRFD	36" Diameter CIDH Concrete	115.66	106.55	23.5	23.5	1.00	9
Bent 4	LRFD	36" Diameter CIDH Concrete	115.79	107.04	23.5	23.5	1.00	9
Bent 5	LRFD	36" Diameter CIDH Concrete	116.32	107.57	23.5	23.5	1.00	9
Bent 6 E	LRFD	36" Diameter CIDH Concrete	119.38	109.63	23.5	23.5	1.00	9
Bent 6 W	LRFD	18" Square Precast Concrete	117.79	107.75	22	22	1.00	25
Bent 7	LRFD	18" Square Precast Concrete	118.79	108.33	24	24	1.00	25
Bent 8	LRFD	18" Square Precast Concrete	118.88	109.25	22	22	1.00	25
Bent 9	LRFD	18" Square Precast Concrete	118.66	109.27	22	22	1.00	25
Bent 10	LRFD	18" Square Precast Concrete	118.57	108.74	22	22	1.00	25
Bent 11	LRFD	18" Square Precast Concrete	118.43	108.25	22	22	1.00	25
Bent 12	LRFD	18" Square Precast Concrete	118.19	108.41	23.5	28	1.00	30
Bent 13	LRFD	18" Square Precast Concrete	118.00	108.55	25.5	25.5	1.00	25
Bent 14	LRFD	18" Square Precast Concrete	117.82	108.21	23.5	28	1.00	30
Bent 15	LRFD	18" Square Precast Concrete	117.56	108.06	23.5	28	1.00	30
Bent 16	LRFD	18" Square Precast Concrete	116.80	108.05	28	30.5	1.00	36
Bent 17	LRFD	18" Square Precast Concrete	116.40	101.90	37	37	1.00	64
Bent 18	LRFD	18" Square Precast Concrete	116.14	105.39	37	37	1.00	64
Bent 19	LRFD	18" Square Precast Concrete	116.56	107.80	23.5	28	1.00	30
Bent 20	LRFD	18" Square Precast Concrete	117.04	106.94	23.5	28	1.00	30
Bent 21	LRFD	18" Square Precast Concrete	117.96	109.21	23.5	30.5	1.00	30
Bent 22	LRFD	18" Square Precast Concrete	118.16	108.15	23.5	28	1.00	30
Bent 23	LRFD	18" Square Precast Concrete	118.51	108.69	22	22	1.00	25
Bent 24	LRFD	18" Square Precast Concrete	118.71	108.95	22	22	1.00	25
Bent 25	LRFD	18" Square Precast Concrete	118.87	108.58	22	22	1.00	25
Bent 26	LRFD	18" Square Precast Concrete	119.04	109.19	22	22	1.00	25
Bent 27	LRFD	18" Square Precast Concrete	119.45	109.35	22	22	1.00	25
Bent 28	LRFD	18" Square Precast Concrete	119.74	109.95	22	22	1.00	25
Bent 29	LRFD	18" Square Precast Concrete	119.89	109.75	22	22	1.00	25
Bent 30	LRFD	18" Square Precast Concrete	120.02	110.06	22	22	1.00	25
Bent 31	LRFD	18" Square Precast Concrete	120.15	110.45	22	22	1.00	25

Support No	Design Method	Pile Type	Finish Grade Elev. (ft)	Pile Cut-off Elev. (ft)	Pile Cap Size (ft)		Permissible Settlement Under Service Load (in)	No. of Piles per Support
					B	L		
Bent 32	LRFD	18" Square Precast Concrete	120.24	110.50	22	22	1.00	25
Bent 33	LRFD	18" Square Precast Concrete	120.49	110.96	22	22	1.00	25
Bent 34	LRFD	18" Square Precast Concrete	121.59	111.05	22	22	1.00	25
Bent 35	LRFD	18" Square Precast Concrete	120.82	110.83	22	22	1.00	25
Bent 36	LRFD	18" Square Precast Concrete	120.93	110.82	22	22	1.00	25
Bent 37	LRFD	18" Square Precast Concrete	121.50	111.45	22	22	1.00	25
Bent 38	LRFD	18" Square Precast Concrete	120.96	111.55	22	22	1.00	25
Bent 39	LRFD	18" Square Precast Concrete	120.78	111.30	22	22	1.00	25
Bent 40	LRFD	18" Square Precast Concrete	120.60	110.95	26	26.5	1.00	30
Bent 41	LRFD	18" Square Precast Concrete	120.44	111.20	26	26.5	1.00	30
Bent 42	LRFD	18" Square Precast Concrete	120.31	110.15	26	26.5	1.00	30
Bent 43	LRFD	18" Square Precast Concrete	120.13	110.39	28	28	1.00	36
Bent 44	LRFD	18" Square Precast Concrete	120.06	109.77	22	22	1.00	25
Bent 45	LRFD	18" Square Precast Concrete	120.36	109.29	27	27	1.00	25
Bent 46	LRFD	18" Square Precast Concrete	120.52	110.52	32.5	32.5	1.00	49
Bent 47	LRFD	18" Square Precast Concrete	121.08	110.08	32.5	32.5	1.00	49
Bent 48	LRFD	18" Square Precast Concrete	120.79	110.04	22	26.5	1.00	30
Bent 49	LRFD	18" Square Precast Concrete	121.19	110.49	22	26.5	1.00	30
Bent 50	LRFD	18" Square Precast Concrete	121.35	112.05	22	26.5	1.00	30
Bent 51	LRFD	18" Square Precast Concrete	121.79	111.79	27	27	1.00	25
Bent 52	LRFD	18" Square Precast Concrete	121.89	109.87	28	28	1.00	36
Bent 53	LRFD	18" Square Precast Concrete	122.66	111.82	22	22	1.00	25
Bent 54	LRFD	18" Square Precast Concrete	122.33	111.77	32.5	32.5	1.00	42
Bent 55	LRFD	18" Square Precast Concrete	122.32	113.57	22	22	1.00	25
Bent 56	LRFD	18" Square Precast Concrete	122.92	114.17	22	22	1.00	25
Bent 57	LRFD	18" Square Precast Concrete	123.51	113.28	22	22	1.00	25
Bent 58	LRFD	18" Diameter Steel Pipe Pile	124.13	113.72	23.5	28	1.00	30
Bent 59	LRFD	18" Square Precast Concrete	124.72	115.28	22	22	1.00	25
Bent 60	LRFD	18" Square Precast Concrete	125.51	115.91	22	22	1.00	25
Bent 61	LRFD	18" Square Precast Concrete	126.00	115.91	22	22	1.00	25
Bent 62	LRFD	18" Square Precast Concrete	126.83	116.75	22	22	1.00	25
Bent 63	LRFD	18" Square Precast Concrete	127.26	117.55	22	22	1.00	25
Bent 64	LRFD	18" Square Precast Concrete	127.98	117.85	22	22	1.00	25

Support No	Design Method	Pile Type	Finish Grade Elev. (ft)	Pile Cut-off Elev. (ft)	Pile Cap Size (ft)		Permissible Settlement Under Service Load (in)	No. of Piles per Support
					B	L		
Bent 65	LRFD	18" Square Precast Concrete	128.68	118.55	22	22	1.00	25
Bent 66	LRFD	18" Square Precast Concrete	129.17	119.05	22	22	1.00	25
Bent 67	LRFD	18" Square Precast Concrete	129.65	120.75	25.5	25.5	1.00	25
Bent 68 E	LRFD	18" Square Precast Concrete	130.26	117.01	22	22	1.00	25
Bent 68 W	LRFD	18" Square Precast Concrete	129.32	116.07	22	22	1.00	25
Bent 69 E	LRFD	18" Square Precast Concrete	130.77	116.27	22	22	1.00	25
Bent 69 W	LRFD	18" Square Precast Concrete	130.18	115.68	22	22	1.00	25
Bent 70	LRFD	18" Square Precast Concrete	131.02	122.27	22	22	1.00	25
Bent 71	LRFD	18" Square Precast Concrete	131.39	121.64	22	26.5	1.00	30
Bent 72	LRFD	18" Square Precast Concrete	131.29	121.54	22	22	1.00	25
Bent 73	LRFD	18" Square Precast Concrete	132.99	119.99	22	26.5	1.00	30
Bent 74	LRFD	18" Square Precast Concrete	132.92	121.17	23.5	32.5	1.00	35
Bent 75	LRFD	18" Square Precast Concrete	133.01	122.26	22	26.5	1.00	30
Abut 76	LRFD	14" Square Precast Concrete	134.10	128.85	14	38	1.00	15

Load and Resistance Factor Design (LRFD) was used for both bent and abutment foundations, per AASHTO LRFD Bridge Design Specifications–6th Edition, with Caltrans Amendments.

The pile cut-off elevations are shown in Table 9. The evaluation of Load Demands on the piles, based upon LRFD is presented in Table 10 below. The estimated specified tip elevations for the anticipated design loading of the piles are shown in Table 11 below.

TABLE 10 - FOUNDATION DESIGN LOADS DEAMND (AERIAL GUIDEWAY)

Support No.	Service-I Limit State (kips)			Strength Limit State (Controlling Group, kips)				Extreme Limit State (Controlling Group, kips)			
	Total Load		Permanent Loads	Compression		Tension		Compression		Tension	
	Per Support	Max Per Pile	Per Support	Per Support	Max. Per Pile	Per Support	Max. Per Pile	Per Support	Max. Per Pile	Per Support	Max. Per Pile.
Abut 1	1,810	280	1,670	2,360	390	0	30	1,740	380	0	150
Bent 2	2,590	460	2,160	3,340	540	0	0	2,380	980	0	450
Bent 3	2,800	510	2,350	3,490	580	0	0	2,510	1000	0	450
Bent 4	2,590	530	2,140	3,340	640	0	70	2,390	1090	0	560
Bent 5	3,100	570	2,580	3,870	700	0	20	2,790	1060	0	440
Bent 6 E	2,240	480	2,020	3,010	560	0	20	1,900	750	0	330
Bent 6 W	2,770	230	2,410	3,610	260	0	60	2,620	400	0	190
Bent 7	3,220	270	2,680	4,040	300	0	30	2,670	500	0	250
Bent 8	2,900	250	2,380	3,730	330	0	70	2,460	500	0	290
Bent 9	3,190	240	2,660	3,990	290	0	50	2,690	490	0	260
Bent 10	2,900	250	2,380	3,730	310	0	70	2,460	500	0	290
Bent 11	3,080	250	2,570	3,850	310	0	60	2,780	510	0	290
Bent 12	3,470	220	2,930	4,630	270	0	40	3,010	420	0	220
Bent 13	3,670	260	3,150	4,600	310	0	20	3,160	470	0	220
Bent 14	3,570	200	3,090	4,630	260	0	10	3,130	420	0	210
Bent 15	3,730	220	3,260	4,870	280	0	10	3,300	430	0	210
Bent 16	4,850	270	4,260	6,360	300	0	10	4,310	480	0	240
Bent 17	7,360	180	6,550	9,630	240	0	10	6,560	450	0	250
Bent 18	6,400	150	5,560	8,300	210	0	10	5,580	440	0	270
Bent 19	3,620	220	3,090	4,660	290	0	20	3,170	420	0	210
Bent 20	3,780	220	3,290	4,930	290	0	20	3,370	430	0	200
Bent 21	3,830	280	3,310	4,870	280	0	20	3,340	470	0	250
Bent 22	3,340	220	2,830	4,300	270	0	50	2,910	430	0	240
Bent 23	3,320	250	2,800	4,160	280	0	30	2,820	460	0	230
Bent 24	3,320	250	2,800	4,160	280	0	30	2,820	460	0	230
Bent 25	3,320	250	2,800	4,160	280	0	30	2,820	460	0	230
Bent 26	3,320	250	2,800	4,160	280	0	30	2,820	460	0	230
Bent 27	3,300	230	2,780	4,140	290	0	40	2,770	450	0	240
Bent 28	3,240	240	2,700	4,160	290	0	30	2,760	450	0	230
Bent 29	3,320	250	2,800	4,160	280	0	30	2,820	460	0	230
Bent 30	3,080	240	2,570	3,950	290	0	50	2,620	460	0	250
Bent 31	3,320	250	2,800	4,160	280	0	30	2,820	460	0	230

Support No.	Service-I Limit State (kips)			Strength Limit State (Controlling Group, kips)				Extreme Limit State (Controlling Group, kips)			
	Total Load		Permanent Loads	Compression		Tension		Compression		Tension	
	Per Support	Max Per Pile	Per Support	Per Support	Max. Per Pile	Per Support	Max. Per Pile	Per Support	Max. Per Pile	Per Support	Max. Per Pile.
Bent 32	3,320	250	2,800	4,160	280	0	30	2,820	460	0	230
Bent 33	3,340	250	2,800	4,180	300	0	40	2,820	460	0	240
Bent 34	3,200	240	2,670	4,110	300	0	40	2,650	450	0	240
Bent 35	3,330	220	2,840	4,210	290	0	30	2,870	480	0	260
Bent 36	3,200	250	2,670	4,100	300	0	50	2,750	480	0	260
Bent 37	3,200	250	2,670	4,100	300	0	50	2,750	480	0	260
Bent 38	3,220	250	2,670	4,120	300	0	50	2,730	480	0	260
Bent 39	3,340	250	2,800	4,180	300	0	40	2,820	460	0	240
Bent 40	3,200	250	2,670	4,100	300	0	50	3,030	470	0	270
Bent 41	3,340	250	2,800	4,180	300	0	40	3,100	470	0	260
Bent 42	3,200	250	2,670	4,100	300	0	50	3,020	470	0	270
Bent 43	3,560	260	3,020	4,170	270	0	40	3,190	460	0	280
Bent 44	3,210	190	2,700	3,690	290	0	30	2,750	480	0	260
Bent 45	3,540	270	3,010	4,160	300	0	10	3,040	470	0	230
Bent 46	4,360	140	3,750	5,250	200	0	0	3,810	450	0	300
Bent 47	4,440	130	3,870	5,600	190	0	0	3,810	450	0	300
Bent 48	3,290	220	2,750	3,900	260	0	40	2,970	560	0	360
Bent 49	3,410	220	2,900	3,990	250	0	30	2,970	560	0	360
Bent 50	3,110	200	2,600	3,450	250	0	40	2,680	430	0	250
Bent 51	3,490	220	2,960	4,160	320	0	30	3,030	470	0	230
Bent 52	3,850	260	3,290	4,520	280	0	50	3,310	430	0	250
Bent 53	3,160	200	2,660	3,630	290	0	30	2,730	470	0	250
Bent 54	4,170	180	3,620	4,870	200	0	0	3,660	380	0	210
Bent 55	3,120	250	2,580	4,000	280	0	40	2,650	560	0	350
Bent 56	3,120	250	2,580	4,000	280	0	40	2,650	460	0	250
Bent 57	3,120	250	2,580	4,000	280	0	40	2,650	460	0	250
Bent 58	3,150	270	2,600	4,030	290	0	50	2,460	570	0	370
Bent 59	3,150	270	2,600	4,030	290	0	50	2,690	590	0	380
Bent 60	3,120	250	2,580	4,000	280	0	40	2,650	460	0	250
Bent 61	3,120	250	2,580	4,000	280	0	40	2,650	460	0	250
Bent 62	3,130	240	2,630	3,930	260	0	30	2,620	570	0	360
Bent 63	2,770	230	2,290	3,530	250	0	30	2,340	550	0	360

Support No.	Service-I Limit State (kips)			Strength Limit State (Controlling Group, kips)				Extreme Limit State (Controlling Group, kips)			
	Total Load		Permanent Loads	Compression		Tension		Compression		Tension	
	Per Support	Max Per Pile	Per Support	Per Support	Max. Per Pile	Per Support	Max. Per Pile	Per Support	Max. Per Pile	Per Support	Max. Per Pile.
Bent 64	2,980	230	2,500	3,730	250	0	20	2,520	560	0	360
Bent 65	3,010	230	2,530	3,760	260	0	30	2,450	440	0	240
Bent 66	3,010	230	2,530	3,760	260	0	30	2,450	570	0	380
Bent 67	3,080	240	2,560	3,970	270	0	30	2,660	580	0	360
Bent 68 E	3,070	250	2,680	3,910	280	0	30	2,650	410	0	200
Bent 68 W	2,140	170	1,960	2,860	200	0	20	1,600	320	0	200
Bent 69 E	2,320	180	2,100	3,080	180	0	0	1,850	340	0	190
Bent 69 W	2,990	230	2,620	3,870	230	0	0	2,040	360	0	200
Bent 70	3,150	250	2,610	4,030	300	0	50	2,650	460	0	250
Bent 71	3,610	290	3,040	4,550	290	0	50	2,770	580	0	390
Bent 72	3,490	200	2,940	4,400	310	0	30	2,900	620	0	380
Bent 73	4,000	300	3,410	5,080	310	0	40	3,220	470	0	250
Bent 74	4,300	220	3,710	5,540	270	0	20	3,680	430	0	220
Bent 75	3,890	240	3,330	4,970	290	0	20	3,240	430	0	220
Abut 76	1,970	180	1,790	2,580	240	0	0	1,880	220	0	0

TABLE 11 - FOUNDATION RECOMMENDATIONS (AERIAL GUIDEWAY)

Model No.	Location	Pile Cut-off Elev. (ft)	Service-I Limit State Load per Support (kips)		Total Permissible Support Settlement (inches)	Nominal Resistance[iii], [iv] (kips)				Design Tip Elev.[i] (ft)	Specified Tip Elev. (ft)	Required Nominal Driving Resistance (kips)[ii]
						Strength Limit (φ_{qs}&φ_{qp} = 0.7)		Extreme Event (φ_{qs}&φ_{qp} = 1.0)				
			Total	Permanent		Comp	Tension	Comp	Tension			
1	Abut 1	109.67	1810	1670	1	560	50	380	150	45 (a-I), 59 (a-II), 90 (b-I), 82 (b-II), 92 (c), 74.7(d)	45	N/A
	Bent 2	104.89	2590	2160	1	780	0	980	450	42 (a-I), 31 (a-II), 59 (b-II), 53 (c), 54.9 (d)	31	N/A
	Bent 3	106.55	2800	2350	1	830	0	1000	450	38 (a-I), 29 (a-II), 59 (b-II), 54 (c), 56.6 (d)	29	N/A
	Bent 4	107.04	2590	2140	1	920	100	1090	560	22 (a-I), 12 (a-II), 64 (b-I), 42 (b-II), 78 (c), 52.0 (d)	12	N/A
	Bent 5	107.57	3100	2580	1	1000	30	1060	440	19 (a-I), 17 (a-II), 92 (b-I), 52 (b-II), 79 (c), 52.6 (d)	17	N/A
	Bent 6 E	109.63	2050	1830	1	800	30	750	330	37 (a-I), 40 (a-II), 94 (b-I), 69 (b-II), 52 (c), 54.6 (d)	37	N/A
	Bent 6 W	107.75	2770	2410	1	380	90	400	190	66 (a-I), 65 (a-II), 93 (b-I), 83 (b-II), 49 (c), 67.8 (d)	49	880
	Bent 7	108.33	3220	2630	1	430	50	500	250	58 (a-I), 50 (a-II), 90 (b-I), 60 (b-II), 58 (c), 53.8 (d)	50	570
	Bent 8	109.25	2900	2380	1	480	100	500	290	58 (a-I), 53 (a-II), 82 (b-I), 59 (b-II), 59 (c), 64.3 (d)	53	540
	Bent 9	109.27	3190	2660	1	420	80	490	260	58 (a-I), 53 (a-II), 84 (b-I), 59 (b-II), 58 (c), 55.1 (d)	53	530
	Bent 10	108.74	2900	2380	1	450	100	500	290	56 (a-I), 53 (a-II), 81 (b-I), 58 (b-II), 58 (c), 65.7 (d)	53	540
	Bent 11	108.25	3080	2570	1	450	90	510	290	58 (a-I), 54 (a-II), 90 (b-I), 67 (b-II), 58 (c), 63.3 (d)	54	680
2	Bent 12	108.41	3470	2930	1	390	60	420	220	63 (a-I), 62 (a-II), 95 (b-I), 78 (b-II), 50 (c), 64.3 (d)	50	660
	Bent 13	108.55	3670	3150	1	450	30	470	220	55 (a-I), 22 (a-II), 87 (b-I), 64 (b-II), 50 (c), 30.6 (d)	22	740
	Bent 14	108.21	3570	3090	1	380	20	420	210	65 (a-I), 62 (a-II), 99 (b-I), 77 (b-II), 46 (c), 63.7 (d)	46	640
	Bent 15	108.06	3730	3260	1	400	20	430	210	64 (a-I), 61 (a-II), 101 (b-I), 79 (b-II), 46 (c), 59.7 (d)	46	640
	Bent 16	108.05	4850	4260	1	430	20	480	240	63 (a-I), 30 (a-II), 101 (b-I), 65 (b-II), 40 (c), 58.0 (d)	30	760

Model No.	Location	Pile Cut-off Elev. (ft)	Service-I Limit State Load per Support (kips)		Total Permissible Support Settlement (inches)	Nominal Resistance[iii], [iv] (kips)				Design Tip Elev.[i] (ft)	Specified Tip Elev. (ft)	Required Nominal Driving Resistance (kips)[ii]
			Total	Permanent		Strength Limit (φ_{qs}&φ_{qp} = 0.7)		Extreme Event (φ_{qs}&φ_{qp} = 1.0)				
						Comp	Tension	Comp	Tension			
2	Bent 17	101.90	7360	6550	1	350	20	450	250	67 (a-I), 34 (a-II), 95 (b-I), 62 (b-II), 16 (c), 37.9 (d)	16	840
	Bent 18	105.39	6400	5560	1	300	20	440	270	71 (a-I), 58 (a-II), 99 (b-I), 70 (b-II), 30 (c), 58.1 (d)	30	980
	Bent 19	107.80	3620	3090	1	420	30	420	210	56 (a-I), 55 (a-II), 81 (b-I), 76 (b-II), 39 (c), 61.8 (d)	39	600
	Bent 20	106.94	3780	3290	1	420	30	430	200	55 (a-I), 55 (a-II), 99 (b-I), 75 (b-II), 38 (c), 56.9 (d)	38	600
	Bent 21	109.21	3830	3310	1	400	30	470	250	70 (a-I), 67 (a-II), 99 (b-I), 73 (b-II), 70 (c), 69.2 (d)	67	660
	Bent 22	108.15	3340	2830	1	390	80	430	240	70 (a-I), 68 (a-II), 92 (b-I), 74 (b-II), 77 (c), 68.2 (d)	68	670
3	Bent 23	108.69	3320	2800	1	400	50	460	230	65 (a-I), 60 (a-II), 98 (b-I), 76 (b-II), 49 (c), 68.7 (d)	49	580
	Bent 24	108.95	3320	2800	1	400	50	460	230	65 (a-I), 60 (a-II), 98 (b-I), 76 (b-II), 49 (c), 69.0 (d)	49	580
	Bent 25	108.58	3320	2800	1	400	50	460	230	65 (a-I), 60 (a-II), 98 (b-I), 76 (b-II), 49 (c), 68.6 (d)	49	580
	Bent 26	109.19	3320	2800	1	400	50	460	230	63 (a-I), 15 (a-II), 95 (b-I), 55 (b-II), 37 (c), 49.2 (d)	15	830
	Bent 27	109.35	3300	2780	1	420	60	450	230	61 (a-I), 16 (a-II), 94 (b-I), 55 (b-II), 38 (c) , 54.4 (d)	16	830
	Bent 28	109.95	3240	2700	1	420	50	450	230	64 (a-I), 38 (a-II), 100 (b-I), 62 (b-II), 58 (c), 70.0 (d)	38	720
	Bent 29	109.75	3320	2800	1	400	50	460	230	65 (a-I), 37 (a-II), 100 (b-I), 62 (b-II), 58 (c), 69.8 (d)	37	740
	Bent 30	110.06	3080	2570	1	420	80	460	250	58 (a-I), 56 (a-II), 87 (b-I), 68 (b-II), 45 (c), 65.1 (d)	45	920
	Bent 31	110.45	3320	2800	1	400	50	460	230	59 (a-I), 56 (a-II), 95 (b-I), 71 (b-II), 46 (c), 65.5 (d)	46	920
	Bent 32	110.50	3320	2800	1	400	50	460	230	70 (a-I), 65 (a-II), 98 (b-I), 76 (b-II), 66 (c), 75.5 (d)	65	820
4	Bent 33	110.96	3340	2800	1	430	60	460	240	68 (a-I), 66 (a-II), 98 (b-I), 74 (b-II), 54 (c), 71.0 (d)	54	780
	Bent 34	111.05	3200	2670	1	430	60	450	240	67 (a-I), 66 (a-II), 97 (b-I), 76 (b-II), 54 (c), 76.1 (d)	54	790
	Bent 35	110.83	3330	2840	1	420	50	480	260	68 (a-I), 66 (a-II), 99 (b-I), 74 (b-II), 54 (c), 70.8 (d)	54	800

Model No.	Location	Pile Cut-off Elev. (ft)	Service-I Limit State Load per Support (kips)		Total Permissible Support Settlement (inches)	Nominal Resistance[iii], [iv] (kips)				Design Tip Elev.[i] (ft)	Specified Tip Elev. (ft)	Required Nominal Driving Resistance (kips)[ii]
						Strength Limit (φ_{qs}&φ_{qp} = 0.7)		Extreme Event (φ_{qs}&φ_{qp} = 1.0)				
			Total	Permanent		Comp	Tension	Comp	Tension			
4	Bent 36	110.82	3200	2670	1	430	80	480	260	53 (a-I), 48 (a-II), 96 (b-I), 62 (b-II), 57 (c), 60.8 (d)	48	620
	Bent 37	111.45	3200	2670	1	430	80	480	260	55 (a-I), 48 (a-II), 97 (b-I), 63 (b-II), 59 (c), 61.5 (d)	48	600
	Bent 38	111.55	3220	2670	1	430	80	480	260	54 (a-I), 48 (a-II), 95 (b-I), 62 (b-II), 57 (c), 61.6 (d)	48	640
	Bent 39	111.30	3340	2800	1	430	60	460	240	52 (a-I), 48 (a-II), 99 (b-I), 64 (b-II), 57 (c), 61.1 (d)	48	620
	Bent 40	110.95	3200	2670	1	430	80	470	270	61 (a-I), 47 (a-II), 95 (b-I), 59 (b-II), 35 (c), 57.0 (d)	35	700
	Bent 41	111.20	3340	2800	1	430	60	470	260	61 (a-I), 45 (a-II), 96 (b-I), 58 (b-II), 35 (c), 57.0 (d)	35	700
	Bent 42	110.15	3200	2670	1	430	80	470	270	59 (a-I), 45 (a-II), 94 (b-I), 58 (b-II), 36 (c), 56.7 (d)	36	700
5	Bent 43	110.39	3560	3020	1	390	60	460	280	62 (a-I), 47 (a-II), 98 (b-I), 59 (b-II), 35 (c), 47.4 (d)	35	700
	Bent 44	109.77	3210	2700	1	420	50	480	260	73 (a-I), 57 (a-II), 100 (b-I), 69 (b-II), 47 (c), 59.9 (d)	47	1280
	Bent 45	109.29	3540	3010	1	430	20	470	230	72 (a-I), 57 (a-II), 103 (b-I), 70 (b-II), 50 (c), 54.8 (d)	50	1360
	Bent 46	110.52	4360	3750	1	290	0	450	300	62 (a-I), 44 (a-II), 59 (b-I), 50 (b-II), 41 (c), 56.5 (d)	41	660
	Bent 47	110.08	4440	3870	1	280	0	450	300	61 (a-I), 44 (a-II), 59 (b-I), 50 (b-II), 40 (c), 56.1 (d)	40	680
	Bent 48	110.04	3290	2750	1	380	60	560	360	51 (a-I), 35 (a-II), 97 (b-I), 46 (b-II), 41 (c), 56.5 (d)	35	680
	Bent 49	110.49	3410	2900	1	360	50	560	360	53 (a-I), 37 (a-II), 100 (b-I), 45 (b-II), 41 (c), 56.5 (d)	37	680
	Bent 50	112.05	3110	2600	1	360	60	430	250	66 (a-I), 18 (a-II), 99 (b-I), 62 (b-II), 54 (c), 45.1 (d)	18	1060
	Bent 51	111.79	3490	2960	1	460	50	470	230	56 (a-I), 17 (a-II), 102 (b-I), 65 (b-II), 53 (c), 35.8 (d)	17	1160
	Bent 52	109.87	3850	3290	1	400	80	430	250	44 (a-I), 36 (a-II), 89 (b-I), 55 (b-II), 29 (c), 49.9 (d)	29	580
	Bent 53	111.82	3160	2660	1	420	50	470	250	43 (a-I), 36 (a-II), 95 (b-I), 57 (b-II), 29 (c), 41.8 (d)	29	570
	Bent 54	111.77	4170	3620	1	290	0	380	210	62 (a-I), 45 (a-II), 62 (b-I), 61 (b-II), 40 (c), 57.8 (d)	40	640

Model No.	Location	Pile Cut-off Elev. (ft)	Service-I Limit State Load per Support (kips)		Total Permissible Support Settlement (inches)	Nominal Resistance[iii], [iv] (kips)				Design Tip Elev.[i] (ft)	Specified Tip Elev. (ft)	Required Nominal Driving Resistance (kips)[ii]
			Total	Permanent		Strength Limit (φ_{qs}&φ_{qp} = 0.7)		Extreme Event (φ_{qs}&φ_{qp} = 1.0)				
						Comp	Tension	Comp	Tension			
6	Bent 55	113.57	3120	2580	1	400	60	560	350	51 (a-I), 34 (a-II), 100 (b-I), 46 (b-II), 40 (c), 58.6 (d)	34	680
	Bent 56	114.17	3120	2580	1	400	60	460	250	62 (a-I), 54 (a-II), 99 (b-I), 69 (b-II), 52 (c), 69.2 (d)	52	530
	Bent 57	113.28	3120	2580	1	400	60	460	250	63 (a-I), 55 (a-II), 100 (b-I), 72 (b-II), 52 (c), 68.3 (d)	52	550
	Bent 58	113.72	3150	2600	1	420	80	570	370	32 (a-I), 15 (a-II), 77 (b-I), 37 (b-II), 60 (c), 63.7 (d)	15	630
	Bent 59	115.28	3150	2600	1	420	80	590	380	59 (a-I), 21 (a-II), 97 (b-I), 48 (b-II), 56 (c), 70.3 (d)	21	790
	Bent 60	115.91	3120	2580	1	400	60	460	250	57 (a-I), 43 (a-II), 78 (b-I), 56 (b-II), 45 (c), 60.9 (d)	43	780
	Bent 61	115.91	3120	2580	1	400	60	460	250	57 (a-I), 43 (a-II), 78 (b-I), 56 (b-II), 45 (c), 60.9 (d)	43	780
	Bent 62	116.75	3130	2630	1	380	50	570	360	77 (a-I), 47 (a-II), 102 (b-I), 66 (b-II), 58 (c), 71.8 (d)	47	770
	Bent 63	117.55	2270	2290	1	360	50	550	360	77 (a-I), 49 (a-II), 103 (b-I), 67 (b-II), 59 (c), 62.6 (d)	49	750
	Bent 64	117.85	2980	2500	1	360	30	560	360	69 (a-I), 43 (a-II), 86 (b-I), 51 (b-II), 79 (c), 62.9 (d)	43	1300
7	Bent 65	118.55	3010	2530	1	380	50	440	240	70 (a-I), 47 (a-II), 87 (b-I), 59 (b-II), 79 (c), 55.6 (d)	47	1300
	Bent 66	119.05	3010	2530	1	380	50	570	380	74 (a-I), 44 (a-II), 107 (b-I), 55 (b-II), 61(c), 74.1 (d)	44	1100
	Bent 67	120.75	3080	2560	1	390	50	580	360	69 (a-I), 60 (a-II), 101 (b-I), 68 (b-II), 72 (c), 74.8 (d)	60	610
	Bent 68-LT E	117.01	3070	2680	1	400	50	410	200	68 (a-I), 68 (a-II), 100 (b-I), 79 (b-II), 64 (c), 76.0 (d)	64	610
	Bent 68-RT W	116.07	2140	1960	1	290	30	320	200	70 (a-I), 73 (a-II), 104 (b-I), 78 (b-II), 77 (c), 76.1 (d)	70	490
	Bent 69-LT E	116.27	2320	2100	1	260	0	340	190	87 (a-I), 79 (a-II), N/A (b-I), 91 (b-II), 105 (c), 84.3 (d)	79	370
	Bent 69-RT W	115.68	2990	2620	1	330	0	360	200	79 (a-I), 76 (a-II), N/A (b-I), 89 (b-II), 98 (c), 83.7 (d)	76	390
	Bent 70	122.27	3150	2610	1	430	80	460	250	73 (a-I), 70 (a-II), 107 (b-I), 88 (b-II), 100 (c), 82.3 (7)	70	510
	Bent 71	121.64	3610	3040	1	420	80	580	390	60 (a-I), 34 (a-II), 84 (b-I), 45 (b-II), 60 (c), 53.6 (d)	34	1200

Model No.	Location	Pile Cut-off Elev. (ft)	Service-I Limit State Load per Support (kips)		Total Permissible Support Settlement (inches)	Nominal Resistance[iii], [iv] (kips)				Design Tip Elev.[i] (ft)	Specified Tip Elev. (ft)	Required Nominal Driving Resistance (kips)[ii]
			Total	Permanent		Strength Limit (φ_{qs}&φ_{qp} = 0.7)		Extreme Event (φ_{qs}&φ_{qp} = 1.0)				
						Comp	Tension	Comp	Tension			
7	Bent 72	121.54	3490	2940	1	450	50	620	380	56 (a-I), 35 (a-II), 87 (b-I), 46 (b-II), 60 (c), 56.0 (d)	35	1140
	Bent 73	119.99	4000	3410	1	450	60	470	250	73 (a-I), 73 (a-II), 109 (b-I), 88 (b-II), 64 (c), 80.0 (d)	64	700
	Bent 74	121.17	4300	3710	1	390	30	430	220	81 (a-I), 79 (a-II), 117 (b-I), 94 (b-II), 65 (c), 80.7 (d)	65	650
	Bent 75	122.26	3890	3330	1	420	30	430	220	75 (a-I), 73 (a-II), 116 (b-I), 85 (b-II), 56 (c), 70.3 (d)	56	680
	Abut 76	128.85	2320	1400	1	350	0	220	0	65 (a-I), 81 (a-II), 92 (c), 98.9 (d)	65	380

(i) Design tip elevations are controlled by (a-I) Compression (Strength Limit), (a-II) Compression (Extreme Event), (b-I) Tension (Strength Limit), (b-II) Tension (Extreme Event), (c) Settlement, (d) Lateral Load.

(ii) The nominal driving resistance required is equal to the nominal resistance needed to support the factored load plus driving resistance from the penetrated soil layers, if any, which do not contribute to the design resistance.

(iii) *Resistance* factor for φ_{qs} is for skin friction and φ_{qp} is for end bearing.

(iv) Lateral Pile Capacity Analysis would be performed by BCA.

(v) Specified Tip Elevation is based on the Design Tip Elevation of Compression (Strength Limit), Compression (Extreme Event), Tension (Strength Limit), Tension (Extreme Event) and settlement and subject to the checking of the design tip elevation based on the lateral load. The design tip elevation based on the lateral normally does not control the specified tip elevation.

TABLE 12 – PILE DATA TABLE (AERIAL GUIDEWAY)

Model No.	Location	Pile Type	Pile Cut-off Elev. (ft)	Nominal Resistance (kips)		Design Tip Elev. (ft)	Specified Tip Elev. (ft)	Required Nominal Driving Resistance (kips)
				Compression	Tension			
1	Abut 1	30" Diameter CIDH Concrete	109.67	560	150	45 (a), 82 (b), 92 (c), 74 (d)	45	N/A
	Bent 2	36" Diameter CIDH Concrete	104.89	980	450	31 (a), 59 (b), 53 (c), 54 (d)	31	N/A
	Bent 3	36" Diameter CIDH Concrete	106.55	1,000	450	29 (a), 59 (b), 54 (c), 56 (d)	29	N/A
	Bent 4	36" Diameter CIDH Concrete	107.04	1,090	560	12 (a), 42 (b), 78 (c), 52 (d)	12	N/A
	Bent 5	36" Diameter CIDH Concrete	107.57	1,060	440	17 (a), 52 (b), 29 (c), 52 (d)	17	N/A
	Bent 6E	36" Diameter CIDH Concrete	109.63	800	330	31 (a), 69 (b), 52 (c), 54 (d)	31	N/A
	Bent 6W	18" Square Precast Concrete Pile	107.75	400	190	64 (a), 83 (b) 49 (c), 67 (d)	49	880
	Bent 7	18" Square Precast Concrete Pile	108.33	500	250	50 (a), 58 (b), 58 (c), 53 (d)	50	570
	Bent 8	18" Square Precast Concrete Pile	109.25	500	290	53 (a), 59 (b), 59 (c), 64 (d)	53	540
	Bent 9	18" Square Precast Concrete Pile	109.27	490	260	53 (a), 59 (b), 58 (c), 55 (d)	53	530
	Bent 10	18" Square Precast Concrete Pile	108.74	500	290	53 (a), 58 (b), 58 (c), 65 (d)	53	540
	Bent 11	18" Square Precast Concrete Pile	108.25	510	290	54 (a), 67 (b), 58 (c), 63 (d)	54	680
2	Bent 12	18" Square Precast Concrete Pile	108.41	420	220	62 (a), 78 (b), 50 (c), 64 (d)	50	660
	Bent 13	18" Square Precast Concrete Pile	108.55	470	220	22 (a), 64 (b), 50 (c), 30 (d)	22	740
	Bent 14	18" Square Precast Concrete Pile	108.21	420	210	62 (a), 77 (b), 46 (c), 63 (d)	46	640
	Bent 15	18" Square Precast Concrete Pile	108.06	430	210	61 (a), 79 (b), 46 (c), 59 (d)	46	640
	Bent 16	18" Square Precast Concrete Pile	108.05	480	240	30 (a), 65 (b), 40 (c), 58 (d)	30	760
	Bent 17	18" Square Precast Concrete Pile	101.90	450	250	34 (a), 62 (b), 16 (c), 37 (d)	16	840
	Bent 18	18" Square Precast Concrete Pile	105.39	440	270	58 (a), 70 (b), 30 (c), 58 (d)	30	980
	Bent 19	18" Square Precast Concrete Pile	107.80	420	210	55 (a), 76 (b), 39 (c), 61 (d)	39	600

Model No.	Location	Pile Type	Pile Cut-off Elev. (ft)	Nominal Resistance (kips)		Design Tip Elev. (ft)	Specified Tip Elev. (ft)	Required Nominal Driving Resistance (kips)
				Compression	Tension			
2	Bent 20	18" Square Precast Concrete Pile	106.94	430	200	55 (a), 75 (b), 38 (c), 56 (d)	38	600
	Bent 21	18" Square Precast Concrete Pile	109.21	470	250	67 (a), 73 (b), 70 (c), 69 (d)	67	660
	Bent 22	18" Square Precast Concrete Pile	108.15	430	240	68 (a), 74 (b), 77 (c), 68 (d)	68	670
3	Bent 23	18" Square Precast Concrete Pile	108.69	460	230	60 (a), 76 (b), 49 (c), 68(d)	49	580
	Bent 24	18" Square Precast Concrete Pile	108.95	460	230	60 (a), 76 (b), 49 (c), 69 (d)	49	580
	Bent 25	18" Square Precast Concrete Pile	108.58	460	230	60 (a), 76 (b), 49 (c), 68 (d)	49	580
	Bent 26	18" Square Precast Concrete Pile	109.19	460	230	15 (a), 55 (b), 37 (c), 49 (d)	15	830
	Bent 27	18" Square Precast Concrete Pile	109.35	450	230	16 (a), 55 (b), 38 (c), 54 (d)	16	830
	Bent 28	18" Square Precast Concrete Pile	109.95	450	230	38 (a), 62 (b), 58 (c), 70 (d)	38	720
	Bent 29	18" Square Precast Concrete Pile	109.75	460	230	37 (a), 62 (b), 58 (c), 69 (d)	37	740
	Bent 30	18" Square Precast Concrete Pile	110.06	460	250	56 (a), 68 (b), 45 (c), 65 (d)	45	920
	Bent 31	18" Square Precast Concrete Pile	110.45	460	230	56 (a), 71 (b), 46 (c), 65 (d)	46	920
	Bent 32	18" Square Precast Concrete Pile	110.50	460	230	65 (a), 76 (b), 66 (c), 75 (d)	65	820
4	Bent 33	18" Square Precast Concrete Pile	110.96	460	240	66 (a), 74 (b), 54 (c), 71 (d)	54	780
	Bent 34	18" Square Precast Concrete Pile	111.05	450	240	66 (a), 76 (b), 54 (c), 76 (d)	54	790
	Bent 35	18" Square Precast Concrete Pile	110.83	480	260	66 (a), 74 (b), 54 (c), 70 (d)	54	800
	Bent 36	18" Square Precast Concrete Pile	110.82	480	260	48 (a), 62 (b), 57 (c), 60 (d)	48	620
	Bent 37	18" Square Precast Concrete Pile	111.45	480	260	48 (a), 63 (b), 59 (c), 61 (d)	48	600
	Bent 38	18" Square Precast Concrete Pile	111.55	480	260	48 (a), 62 (b), 57 (c), 61 (d)	48	640
	Bent 39	18" Square Precast Concrete Pile	111.30	460	240	48 (a), 64 (b), 57 (c), 61 (d)	48	620
	Bent 40	18" Square Precast Concrete Pile	110.95	470	270	47 (a), 59 (b), 35 (c), 57 (d)	35	700

Model No.	Location	Pile Type	Pile Cut-off Elev. (ft)	Nominal Resistance (kips)		Design Tip Elev. (ft)	Specified Tip Elev. (ft)	Required Nominal Driving Resistance (kips)
				Compression	Tension			
4	Bent 41	18" Square Precast Concrete Pile	111.20	470	260	45 (a), 58 (b), 35 (c), 57 (d)	35	700
	Bent 42	18" Square Precast Concrete Pile	110.15	470	270	45 (a), 58 (b), 36 (c), 56 (d)	36	700
5	Bent 43	18" Square Precast Concrete Pile	110.39	460	280	47 (a), 59 (b), 35 (c), 47 (d)	35	700
	Bent 44	18" Square Precast Concrete Pile	109.77	480	260	57 (a), 69 (b), 47 (c), 59 (d)	47	1280
	Bent 45	18" Square Precast Concrete Pile	109.29	470	230	57 (a), 70 (b), 50 (c), 54 (d)	50	1360
	Bent 46	18" Square Precast Concrete Pile	110.52	450	300	44 (a), 50 (b), 41 (c), 56 (d)	41	660
	Bent 47	18" Square Precast Concrete Pile	110.08	450	300	44 (a), 50 (b), 40 (c), 56 (d)	40	680
	Bent 48	18" Square Precast Concrete Pile	110.04	560	360	35 (a), 46 (b), 41 (c), 56 (d)	35	680
	Bent 49	18" Square Precast Concrete Pile	110.49	560	360	37 (a), 45 (b), 41 (c), 56 (d)	37	680
	Bent 50	18" Square Precast Concrete Pile	112.05	430	250	18 (a), 62 (b), 54 (c), 45 (d)	18	1060
	Bent 51	18" Square Precast Concrete Pile	111.79	470	230	17 (a), 65 (b), 53 (c), 35 (d)	17	1160
	Bent 52	18" Square Precast Concrete Pile	109.87	430	250	36 (a), 55 (b), 29 (c), 49 (d)	29	580
	Bent 53	18" Square Precast Concrete Pile	111.82	470	250	36 (a), 57 (b), 29 (c), 41 (d)	29	570
	Bent 54	18" Square Precast Concrete Pile	111.77	380	210	45 (a), 61 (b), 40 (c), 57 (d)	40	640
6	Bent 55	18" Square Precast Concrete Pile	113.57	560	350	34 (a), 46 (b), 40 (c), 58 (d)	34	680
	Bent 56	18" Square Precast Concrete Pile	114.17	460	250	54 (a), 69 (b), 52 (c), 69 (d)	52	530
	Bent 57	18" Square Precast Concrete Pile	113.28	460	250	55 (a), 72 (b), 52 (c), 68 (d)	52	550
	Bent 58	18" Diameter Steel Pipe Pile	113.72	570	370	15 (a), 37 (b), 60 (c), 63 (d)	15	630
	Bent 59	18" Square Precast Concrete Pile	115.28	590	380	21 (a), 48 (b), 56 (c), 70 (d)	21	790
	Bent 60	18" Square Precast Concrete Pile	115.91	460	250	43 (a), 56 (b), 45 (c), 60 (d)	43	780
	Bent 61	18" Square Precast Concrete Pile	115.91	460	250	43 (a), 56 (b), 45 (c), 60 (d)	43	780

Model No.	Location	Pile Type	Pile Cut-off Elev. (ft)	Nominal Resistance (kips)		Design Tip Elev. (ft)	Specified Tip Elev. (ft)	Required Nominal Driving Resistance (kips)
				Compression	Tension			
6	Bent 62	18" Square Precast Concrete Pile	116.75	570	360	47 (a), 66 (b), 58 (c), 71 (d)	47	770
	Bent 63	18" Square Precast Concrete Pile	117.55	550	360	49 (a), 67 (b), 59 (c), 62 (d)	49	750
	Bent 64	18" Square Precast Concrete Pile	117.85	560	360	43 (a), 51 (b), 79 (c), 62 (d)	43	1300
7	Bent 65	18" Square Precast Concrete Pile	118.55	440	240	47 (a), 59 (b), 79 (c), 55 (d)	47	1300
	Bent 66	18" Square Precast Concrete Pile	119.05	570	380	44 (a), 55 (b), 61 (c), 74 (d)	44	1100
	Bent 67	18" Square Precast Concrete Pile	120.75	580	360	60 (a), 68 (b), 72 (c), 74 (d)	60	610
	Bent 68 L	18" Square Precast Concrete Pile	117.01	410	200	68 (a), 79 (b), 64 (c), 76 (d)	64	610
	Bent 68 R	18" Square Precast Concrete Pile	116.07	320	200	70 (a), 78 (b), 77 (c), 76 (d)	70	490
	Bent 69 L	18" Square Precast Concrete Pile	116.27	340	190	79 (a), 91 (b), 105 (c), 84 (d)	79	370
	Bent 69 R	18" Square Precast Concrete Pile	115.68	360	200	76 (a), 89 (b), 98 (c), 83 (d)	76	390
	Bent 70	18" Square Precast Concrete Pile	122.27	460	250	70 (a), 88 (b), 100 (c), 82 (d)	70	510
	Bent 71	18" Square Precast Concrete Pile	121.64	580	390	34 (a), 45 (b), 60 (c), 53 (d)	34	1200
	Bent 72	18" Square Precast Concrete Pile	121.54	620	380	35 (a), 46 (b), 60 (c), 56 (d)	35	1140
	Bent 73	18" Square Precast Concrete Pile	119.99	470	250	73 (a), 88 (b), 64 (c), 80 (d)	64	700
	Bent 74	18" Square Precast Concrete Pile	121.17	430	220	79 (a), 94 (b), 65 (c), 80 (d)	65	650
	Bent 75	18" Square Precast Concrete Pile	122.26	430	220	73 (a), 85 (b), 56 (c), 70 (d)	56	680
	Abut 76	14" Square Precast Concrete Pile	128.85	350	0	65 (a), 92 (c), 98 (d)	65	380

(i) Design tip elevations for Abutments and Bents are controlled by: (a) Compression (b) Tension (c) Settlement (d) Lateral Load
(ii) The Specified Tip Elevation shall not be raised above the design tip elevations for tension load, lateral load, and tolerable settlement.
(iii) Lateral pile capacity analysis is performed by BCA. The design tip elevation controlled by lateral load will be provided by BCA.
(iv) Unsuitable liquefiable soil layers do not contribute to the nominal resistance exist at some of the support locations.

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Oversize predrilling is recommended for the piles at the following bents of the aerial guideway to minimize the downdrag due to potential post-liquefaction settlement onto the pile.

TABLE 13 – SUMMARY OF PREDRILLED DEPTH FOR AERIAL GUIDEWAY

Model No.	Support No.	Pile Type	Predrilled Depth (ft)
6	Bent 60	18-inch Square Precast Concrete Pile	25'
	Bent 61	18-inch Square Precast Concrete Pile	25'
	Bent 64	18-inch Square Precast Concrete Pile	25'
7	Bent 65	18-inch Square Precast Concrete Pile	25'
	Bent 71	18-inch Square Precast Concrete Pile	25'
	Bent 72	18-inch Square Precast Concrete Pile	25'

13.3.1 Abutment Walls and Wing Walls

Abutment walls and wing walls to be backfilled with Caltrans engineered fill should be designed to resist the following applied lateral earth pressures.

***Applied* Lateral Earth Pressures**

Active Condition 36.0 pcf EFP for Caltrans engineered fill.

At-Rest Condition 55.0 pcf EFP for Caltrans engineered fill.

Passive Resistance 320.0 pcf EFP with a maximum value of 3200.0 psf. 5000 psf x h/5.5 (ultimate) for seismic design of the abutment wall per Caltrans SDC v.1.7, where h is the height of the abutment wall. A minimum lateral wall movement of 2% of wall height to mobilize the full ultimate passive resistance is required.

Light Rail Transit Load Surcharge For aerial guideway abutment walls perpendicular to the tracks, a uniform vertical distributed load of an equivalent soil height of 3 feet at a soil unit weight of 120 pcf applies. A coefficient of 0.3 may be used to determine lateral earth pressure resulting from the live load surcharge.

The following are generally recommended for the design of the retaining walls:

- The recommended applied lateral earth pressure values assume no hydrostatic pore pressure build-up behind the wall and are based on well-drained backfill behind the walls.
- Cantilever walls which are free to rotate at least (0.004*H) feet, where H is the wall height, may be assumed flexible for the active condition. Walls that are not capable of this movement should be assumed rigid and designed for the at-rest condition.
- The effect of any surcharge (dead or live load) should be added to the preceding lateral earth pressures. A coefficient of 0.3 and 0.5 may be used to determine the additional earth pressure resulting from the surcharge for cantilever flexible walls and rigid walls, respectively.

Abutment Wall/Earth Retaining Syetem Seismic Earth Pressure

The proposed cantilever retaining walls will experience increased lateral loads during earthquake shaking. The additional horizontal forces recommended to simulate earthquake loads are dependent upon the magnitude of ground surface accelerations and the retained height of the retaining walls, together with the weight and type of material retained by the retaining walls.

The foundation soil for the abutments is considered "Not Competent" according to Caltrans SDC 1.7 and per AASHTO LRFD C11.6.5. This type of soil is not exempt from "Extreme Event (Seismic)" design.

The abutment wall/retaining wall is assumed to be un-restrained; 50% PGA is used to calculate the seismic earth pressure K_{AE} and K_a under the static condition. The following are the recommended values for lateral soil pressure coefficients for rigid foundation:

γ = 120 pcf

K_a = 0.30 (In-Situ Lateral Coefficient)

K_{ae} = 0.45 (Seismic Active Coefficient per AASHTO)

ΔK_{ae} = 0.15 (Incremental Seismic Active Coefficient)

Based on the above, incremental seismic force can be calculated as $0.5*H*(\Delta K_{AE}* \gamma*H) = 9.00 *H^2$lb/ft.

It is recommended that the dynamic lateral force be considered to act at a distance 0.3 h (h = height of the wall) above the base of the wall. The dynamic lateral force will act in addition to the static earth pressures recommended above.

The loading diagram for the seismic earth pressure is included in Appendix VI.

13.4 Story Road Pedestrian Overcrossing

Description

The proposed Story Road Pedestrian Overcrossing (POC) will provide the access for the pedestrians over the Capitol Expressway to the aerial guideway structure. The centerline of the Story Road POC is at Station "SB" 996+80.16. The total length of the POC is approximately 157 feet. The bridge will be supported on Bent 1 through Bent 4.

Subsurface Soil Conditions

The subsurface soil conditions generally consist of approximately 12 feet of medium dense to dense sands, underlain by medium stiff to very stiff lean clay based on CPT-AS-93. Medium dense to dense sands may be anticipated below the bottom of the proposed pile cap. Relatively hard driving conditions may be anticipated during installation of the piles.

Pile Type Selection

Based on the available boring information and considering the pile drivability, relatively high groundwater table, and discussion with the design team about estimated construction cost and impact of noise and vibration on the nearby residences, both CIDH concrete piles (24-inch or larger diameter) and precast concrete piles were considered as feasible foundation system for the support. The final consensus was to use a driven pile foundation system.

TABLE 14 – SUMMARY OF PILE TYPE (STORY ROAD POC)

Bridge Support	Recommended Pile Type
Bent 1 through Bent 4	18-inch Square Precast Concrete Pile

Vertical Pile Capacity

Load and Resistance Factor Design (LRFD) was used for the bent foundations, per AASHTO LRFD Bridge Design Specifications–6th Edition, with Caltrans Amendments.

"Eighteen-inch Square Precast Concrete Pile" piles may be used for the support of the POC structure. The pile cut-off elevations are shown in Table 15. The evaluation of Load Demands on the piles, based upon LRFD is presented in Table 16 below. The estimated specified tip elevations for the anticipated design loading of the piles are shown in Table 17 below.

TABLE 15 - FOUNDATION DESIGN DATA (STORY ROAD POC)

Support No	Design Method	Pile Type	Finish Grade Elev. (ft)	Pile Cut-off Elev. (ft)	Pile Cap Size (ft)		Permissible Settlement (in)	No. of Piles per Footing
					B	L		
Bent 1	LRFD	18" Square Precast Concrete	115.50	108.25	12	12	1.00	4
Bent 2	LRFD	18" Square Precast Concrete	116.91	108.25	17.5	17.5	1.00	16
Bent 3	LRFD	18" Square Precast Concrete	115.20	108.25	12	12	1.00	4
Bent 4	LRFD	18" Square Precast Concrete	115.20	108.25	12	12	1.00	4

TABLE 16 - FOUNDATION DESIGN LOADS (STORY ROAD POC)

Support No.	Service-I Limit State (kips)			Strength Limit State (Controlling Group, kips)				Extreme Limit State (Controlling Group, kips)			
	Total Load		Permanent Loads	Compression		Tension		Compression		Tension	
	Per Support	Per Pile	Per Support	Per Support	Max. Per Pile.	Per Support	Max. Per Pile.	Per Support	Max. Per Pile.	Per Support	Max. Per Pile.
Bent 1	470	200	400	620	260	N/A	N/A	400	440	N/A	-240
Bent 2	970	90	800	1100	120	N/A	N/A	1040	470	N/A	-370
Bent 3	500	190	430	700	240	N/A	N/A	440	480	N/A	-260
Bent 4	260	100	260	310	170	N/A	-50	300	420	N/A	-280

TABLE 17 - FOUNDATION RECOMMENDATIONS (STORY ROAD POC)

Location	Pile Cut-off Elev. (ft)	Service-I Limit State Load per Support (kips)		Total Permissible Support Settlement (inches)	Nominal Resistance[iii], [iv] (kips)				Design Tip Elev.[i] (ft)	Specified Tip Elev. (ft)	Required Nominal Driving Resistance (kips)[ii]
		Total	Permanent		Strength Limit (φ_{qs}&φ_{qp} = 0.7)		Extreme Event (φ_{qs}&φ_{qp} = 1.0)				
					Comp.	Tension	Comp.	Tension			
Bent 1	108.25	470	400	1	380	N/A	440	240	60 (a-I), 56 (a-II), 75 (b-II), 99 (c)	56	470
Bent 2	108.25	970	800	1	180	N/A	470	370	81 (a-I), 53 (a-II), 59 (b-II), 93 (c)	53	490
Bent 3	108.25	500	430	1	350	N/A	480	260	64 (a-I), 51 (a-II), 73 (b-II), (99 (c)	51	500
Bent 4	108.25	260	260	1	250	-50	420	280	76 (a-I), 57 (a-II), 91 (b-I), 71 (b-II), 99 (c)	57	460

(i) Design tip elevations are controlled by (a-I) Compression (Strength Limit), (a-II) Compression (Extreme Event), (b-I)Tension (Strength Limit), (b-II)Tension (Extreme Event), (c) Settlement, (d) Lateral Load.
(ii) The nominal driving resistance required is equal to the nominal resistance needed to support the factored load plus driving resistance from the penetrated soil layers, if any, which do not contribute to the design resistance.
(iii) Column heading modified from *Required Factored Nominal Resistance* to **Nominal Resistance**
(iv) *Resistance* factor for φ_{qs} is for skin friction and φ_{qp} is for end bearing.
(v) Lateral Pile Capacity Analysis was performed by BCA.

TABLE 18- PILE DATA TABLE (STORY ROAD POC)

Location	Pile Type	Pile Cut-off Elev. (ft)	Nominal Resistance (kips)		Design Tip Elev. (ft)[i][ii]	Specified Tip Elev. (ft)	Nominal Driving Resistance (kips)
			Compression	Tension			
Bent 1	18" Square Precast Concrete Pile	108.25	440	240	56 (a), 75 (b), 99 (c)	56	470
Bent 2	18" Square Precast Concrete Pile	108.25	470	370	53 (a), 59 (b), 93 (c)	53	490
Bent 3	18" Square Precast Concrete Pile	108.25	480	260	51 (a), 73 (b), 99 (c)	51	500
Bent 4	18" Square Precast Concrete Pile	108.25	420	280	57 (a), 71 (b), 99 (c)	57	460

(i) Design tip elevations for Abutments and Bents are controlled by: (a) Compression (b) Tension (c) Settlement (d) Lateral Load
(ii) Lateral pile capacity analysis is performed by BCA. The design tip elevation controlled by lateral load will be provided by BCA.

13.5 Story Road Station POC Landings, Elevator Towers, Emergency Access Stairs at North End of Platform

There are three elevator towers that will provide access to the Story Road POC. To the north of the Story Road Station platform is an emergency stair structure supported on pile foundation.

"Eighteen-inch Square Precast Concrete Pile" piles may be used for the support of the access structures. The pile cut-off elevations are shown in Table 19. The evaluation of Load Demands on the piles provided by the Sierra Engineering Group (SEG), based upon LRFD is presented in Table 20 below. The estimated specified tip elevations for the anticipated design loading of the piles are shown in Table 21 below.

TABLE 19 - FOUNDATION DESIGN DATA (STORY ROAD POC LANDINGS, ELEVATOR TOWER, EMERGENCY ACCESS STAIRS)

Support No	Pile Type	Finish Grade Elev. (ft)	Pile Cut-off Elev. (ft)	Pile Cap Size (ft)		Permissible Settlement Under Service Load (in)	No. of Piles per Support
				B	L		
South Access	18" Square Precast Concrete	116.00	114.25	15.00	62.50	1.00	14
North Access	18" Square Precast Concrete	116.25	111.50	21.50	35.50	1.00	18
East Access	18" Square Precast Concrete	114.50	112.75	22.00	30.375	1.00	8
Elevator East Access	18" Square Precast Concrete	114.50	108.42	9.70	11.20	1.00	6
Elevator West Access	18" Square Precast Concrete	114,50	108.42	9.70	11.20	1.00	6
Elevator South Access	18" Square Precast Concrete	116.00	109.92	9.70	11.20	1.00	6

TABLE 20 - FOUNDATION DESIGN LOADS (STORY ROAD POC LANDINGS, ELEVATOR TOWER, EMERGENCY ACCESS STAIRS)

Support No.	Service-I Limit State (kips)		Strength Limit State (Controlling Group, kips)				Extreme Limit State (Controlling Group, kips)			
	Total Load Per Support	Permanent Loads Per Support	Compression		Tension		Compression		Tension	
			Per Support	Max. Per Pile	Per Support	Max. Per Pile	Per Support	Max. Per Pile	Per Support	Max. Per Pile.
South Access	1,058	901	2,607	292	619	97	2,118	231	677	94
North Access	1,339	1,270	5,122	346	2,620	212	3.930	263	1,915	152
East Access	586	532	936	140	0	0	826	123	23	8
Elevator East Access	259	249	472	79	16	4	435	73	36	8
Elevator West Access	259	249	472	79	16	4	435	73	36	8
Elevator South Access	340	330	634	106	48	9	527	88	3	2

TABLE 21 - FOUNDATION RECOMMENDATIONS (STORY ROAD POC LANDING, ELEVATOR TOWERS, EMERGENCY ACCESS STAIR)

Location	Pile Cut-off Elev. (ft)	Service-I Limit State Load per Support (kips)		Total Permissible Support Settlement (inches)	Nominal Resistance[iii], [iv] (kips)				Design Tip Elev.[i] (ft)	Specified Tip Elev. (ft)	Required Nominal Driving Resistance (kips)[ii]
					Strength Limit (φ_{qs}&φ_{qp} = 0.7)		Extreme Event (φ_{qs}&φ_{qp} = 1.0)				
		Total	Permanent		Comp.	Tension	Comp.	Tension			
South Access	114.25	1,058	901	1	420	140	240	100	65 (a-I), 82 (a-II) 89 (b-I), 94 (b-II), 101 (c)	65	460
North Access	111.50	1,339	1,270	1	500	310	270	160	54 (a-I), 79 (a-II) 70 (b-I), 85 (b-II), 85 (c)	54	560
East Access	112.75	586	532	1	200	0	130	10	76 (a-I), 83 (a-II), 98 (b-II), 104 (c)	76	230
Elevator East Access	108.42	259	249	1	120	10	80	10	83 (a-I), 88 (a-II) 98 (b-I), 98 (b-II), 98 (c)	83	160
Elevator West Access	108.42	259	249	1	120	10	80	10	83 (a-I), 87 (a-II) 100 (b-I), 100 (b-II), 98 (c)	83	160
Elevator South Access	109.92	340	330	1	160	20	90	10	86 (a-I), 94 (a-II) 101 (b-I), 103 (b-II), 95 (c)	86	200

(i) Design tip elevations are controlled by (a-I) Compression (Strength Limit), (a-II) Compression (Extreme Event), (b-I) Tension (Strength Limit), (b-II) Tension (Extreme Event), (c) Settlement, (d) Lateral Load.

(ii) The nominal driving resistance required is equal to the nominal resistance needed to support the factored load plus driving resistance from the penetrated soil layers, if any, which do not contribute to the design resistance.

(iii) Column heading modified from *Required Factored Nominal Resistance* to **Nominal Resistance**

(iv) *Resistance* factor for φ_{qs} is for skin friction and φ_{qp} is for end bearing.

(v) Lateral Pile Capacity Analysis is performed by SEG.

TABLE 22 – PILE DATA TABLE (STORY ROAD POC LANDING, ELEVATOR TOWERS, EMERGENCY ACCESS STAIR)

Location	Pile Type	Pile Cut-Off Elev. (ft)	Nominal Resistance (kips)		Design Tip Elev. (ft)[i][ii]	Specified Tip Elev. (ft)	Nominal Driving Resistance (kips)
			Compression	Tension			
South Access	18" Square Precast Concrete Pile	114.25	420	240	65 (a), 89 (b), 101 (c)	65	460
North Access	18" Square Precast Concrete Pile	111.50	500	310	54 (a), 70 (b), 85 (c)	54	560
East Access	18" Square Precast Concrete Pile	112.75	200	10	76 (a), 98 (b), 104 (c)	76	230
Elevator East Access	18" Square Precast Concrete Pile	108.42	120	10	83 (a), 98 (b), 98 (c)	83	160
Elevator West Access	18" Square Precast Concrete Pile	108.42	120	10	83 (a), 100 (b), 98 (c)	83	160
Elevator South Access	18" Square Precast Concrete Pile	109.92	160	20	86 (a), 101 (b), 95 (c)	86	200

(i) Design tip elevations for Abutments and Bents are controlled by: (a) Compression (b) Tension (c) Settlement (d) Lateral Load

(ii) Lateral pile capacity analysis is performed by SEG. The design tip elevation controlled by lateral load will be provided by SEG.

13.6 South Approach CIP Wall

Segment of the South Approach CIP Wall will be supported on piles due to its retained height. The evaluation of Load Demands on the piles provided by SEG, based upon LRFD is presented in Tables 24A and 24B below.

TABLE 23 – FOUNDATION DESIGN LOADS (CIP WALL SUPPORED ON PILES)

Rail Line Side	Start ("SB" Station)	End ("SB" Station)	Service-I Limit State		Strength Limit State		Extreme Limit State	
			Front Pile (kips)	Back Pile (kips)	Front Pile (kips)	Back Pile (kips)	Front Pile (kips)	Back Pile (kips)
Southbound	1080+05.87	1080+88.00	175.2	81.1	251	121	181.1	152.4
Southbound	1080+88.00	1081+60.00	139	94	198	133	146	143.4
Southbound	1081+60.00	1081+96.37	107.5	96.2	153	129	114	128
Northbound	1080+05.87	1080+88.00	175.2	81.1	251	121	181.1	152.4
Northbound	1080+88.00	1081+60.00	139	94	198	133	146	143.4
Northbound	1081+60.00	1081+96.37	107.5	96.2	153	129	114	128

TABLE 24A - FOUNDATION RECOMMENDATIONS (CIP WALL SUPPORTED ON FRONT PILE)

Rail Line Side	Start ("SB" Station)	End ("SB" Station)	Total Permissible Support Settlement (inches)	Nominal Resistance[iii], [iv] (kips)				Design Tip Elev.[i] (ft)	Specified Tip Elev. (ft)	Required Nominal Driving Resistance (kips)[ii]
				Strength Limit (φ_{qs}&φ_{qp} = 0.7)		Extreme Event (φ_{qs}&φ_{qp} = 1.0)				
				Comp.	Tension	Comp.	Tension			
Southbound and Northbound	1080+05.87	1080+88.00	1	360	0	190	0	69 (a-I), 86 (a-II), 92 (b)	69	385
Southbound and Northbound	1080+88.00	1081+60.00	1	290	0	150	0	88 (a-I), 103(a-II), 118 (b)	88	340
Southbound and Northbound	1081+60.00	1081+96.37	1	220	0	120	0	93 (a-I), 107 (a-II), 120 (b)	93	260

(i) Design tip elevations are controlled by (a-I) Compression (Strength Limit), (a-II) Compression (Extreme Event), (b) Settlement.

(ii) The nominal driving resistance required is equal to the nominal resistance needed to support the factored load plus driving resistance from the penetrated soil layers, if any, which do not contribute to the design resistance.

(iii) Column heading modified from *Required Factored Nominal Resistance* to **Nominal Resistance**

(iv) *Resistance* factor for φ_{qs} is for skin friction and φ_{qp} is for end bearing.

TABLE 24B - FOUNDATION RECOMMENDATIONS (CIP WALL SUPPORTED ON BACK PILE)

Rail Line Side	Start ("SB" Station)	End ("SB" Station)	Total Permissible Support Settlement (inches)	Nominal Resistance[iii], [iv] (kips)				Design Tip Elev.[i] (ft)	Specified Tip Elev. (ft)	Required Nominal Driving Resistance (kips)[ii]
				Strength Limit (φ_{qs}&φ_{qp} = 0.7)		Extreme Event (φ_{qs}&φ_{qp} = 1.0)				
				Comp.	Tension	Comp.	Tension			
Southbound and Northbound	1080+05.87	1080+88.00	1	180	0	160	100	87 (a-I), 89 (a-II)	87	210
Southbound and Northbound	1080+88.00	1081+96.37	1	190	0	150	0	97 (a-I), 103 (a-II)	97	210

(i) Design tip elevations are controlled by (a-I) Compression (Strength Limit), (a-II) Compression (Extreme Event).
(ii) The nominal driving resistance required is equal to the nominal resistance needed to support the factored load plus driving resistance from the penetrated soil layers, if any, which do not contribute to the design resistance.
(iii) Column heading modified from *Required Factored Nominal Resistance* to **Nominal Resistance**
(iv) *Resistance* factor for φ_{qs} is for skin friction and φ_{qp} is for end bearing.(v)

Based on the "South Approach Walls Retaining Wall Details No. 4 (Drawing No. SD 394)" and discussions with SEG, the retaining wall is supported by two rows of piles. The front pile will be battered piles [3(V): 1(H)]. The lateral load will be taken by the battered pile. The estimated specified tip elevations for the anticipated design loading of the piles are shown in Tables 25A and 25B below.

TABLE 25A - PILE DATA TABLE (CIP WALL SUPPORTED ON FRONT PILES)

Location (Both Northbound and Southbound)	Pile Type	Bottom of Footing Elev. (ft)	Nominal Resistance (kips) Compression	Design Tip Elev. (ft)	Specified Tip Elev. (ft)	Nominal Driving Resistance (kips)
1080+05.87 to 1080+88.00	18" Square Precast Concrete Pile	129.74	360	69 (a), 92 (b)	69	385
1080+88.00 to 1081+60.00	18" Square Precast Concrete Pile	129.74	290	88 (a), 118 (b)	88	340
1081+60.00 to 1081+96.37	18" Square Precast Concrete Pile	129.74	220	93 (a), 120 (b)	93	260

(i) Design tip elevations are controlled by: (a) Compression and (b) Settlement.

TABLE 25B - PILE DATA TABLE (CIP WALL SUPPORTED ON BACK PILES)

Location (Both Northbound and Southbound)	Pile Type	Bottom of Footing Elev. (ft)	Nominal Resistance (kips) Compression	Design Tip Elev. (ft)	Specified Tip Elev. (ft)	Nominal Driving Resistance (kips)
1080+05.87 to 1080+88.00	18" Square Precast Concrete Pile	129.74	180	87 (a)	87	210
1080+88.00 to 1081+96.37	18" Square Precast Concrete Pile	129.74	190	97 (a)	97	210

(i) Design tip elevations are controlled by: (a) Compression.

13.7 Eastridge Station Shelter

Based on the "South Approach Walls Retaining Wall Plan No. 5 (Drawing No. SP395)" and "Story Station And Access Structures Shelter Canopy and TVM Shelter Canopy Details No. 1 (Drawing No. SD812)" provided by SEG, a total of 10 CIDH concrete pile is proposed to support the steel column of the Eastridge Station shelter. Based on Drawing No. SD812, the diameter of the CIDH concrete pile will be 30 inches.

The available boring nearest to the shelter is Boring T-32. Based on the boring information, the subsurface soil conditions generally consist of stiff to hard lean/fat clay. Groundwater was encountered at the depth of 12 feet (Elev. 123.0 feet) during the drilling on September 6, 2005.

The foundation design data and foundation design load provided by SEG and design tip elevations are summarized in the table below:

TABLE 26 - FOUNDATION DESIGN LOAD (EASTRIDGE STATION SHELTER)

Pile Type	Top of Pile Elev. (ft)	Nominal Resistance[iii], [iv] (kips)					
		Service Limit		Strength Limit (φ_{qs}&φ_{qp} = 0.7)		Extreme Event (φ_{qs}&φ_{qp} = 1.0)	
		Comp.	Tension	Comp.	Tension	Comp.	Tension
30" CIDH Concrete Pile	127.74	14.1	0	19.825	0	10.5	3

TABLE 27 – PILE DATA TABLE (EASTRIDGE STATION SHELTER)

Pile Type	Nominal Resistance (kips)		Design Tip Elev. (ft)[i][ii]	Specified Tip Elev. (ft)
	Compression	Tension		
30" CIDH Concrete Pile	30	10	86 (a), 101 (b), 95 (c)	86

(i) Design tip elevations are controlled by: (a) Compression (b) Tension (c) Lateral Load.
(ii) Lateral pile capacity analysis is performed by SEG. The design tip elevation controlled by lateral load will be provided by SEG.

13.8 TES Poles

The following are the reference borings and CPT for the foundation design of the TES poles:

TABLE 28 – SUMMARY OF REEFRENCE BORING AND CPT FOR TES POLES

Approximate Stations	Reference Boring	Station
966+00	AS-1	971+30
971+50		
1080+00	CPT-AS-30	1080+45
1080+95		
1080+95	AS-29	1081+45
102+15		
1082+15	AS-40	1082+85
1088+80		
1088+80	AS-39	1094+75
1095+50		

The recommended LPILE geotechnical parameters for the TES Poles are included in Appendix VI.

Caltrans standard specification for "Cast-in-drilled-hole" should be used for the construction of CIDH concrete piles. Groundwater should be anticipated during pile construction. Raveling or caving is expected due to presence of sand layers and groundwater. This may require additional drilling and cleaning effort and may increase the concrete volume for the piles. Temporary steel casing and/or slurry should be used to maintain the integrity of the pile excavation. All pile excavations should be observed by the Geotechnical Engineer prior to the placement of reinforcement and concrete so that if conditions differ from those anticipated, appropriate recommendations can be made.

13.9 Retaining Walls at TPSS #33 and TPS #34

The following information for the freestanding retaining walls was provided by SEG:

TABLE 29 – TPSS #33 AND TPSS #34 WALL INFORMATION

Structure	Station "SB" Track Line	Wall Type	Reference Boring
TPSS #33	Approximately 1038+00	8 feet high Pilaster /Walls	AS-80
TPSS #34	Approximately 1083+25	8 feet high CMU Wall	AS-40

The TPSS #33 and TPSS #34 will be supported on CIDH Concrete pile foundation to reduce the footing size to avoid conflict with any of the electrical in the substation according to SEG.

The foundation design data and foundation design load provided by SEG and design tip elevations are summarized in the table below:

TABLE 30 - FOUNDATION DESIGN LOAD (TPSS #33 ANS TPSS #34)

TPSS #	Pile Type	Finish Grade Elev. (ft)	Pile Cut-off Elev. (ft)	Nominal Resistance (kips)					
				Service Limit		Strength Limit (φ_{qs}&φ_{qp} = 0.7)		Extreme Event (φ_{qs}&φ_{qp} = 1.0)	
				Comp	Tension	Comp	Tension	Comp	Tension
33	24" CIDH Concrete Pile	134.00	132.67	11.0	0	13.75	0	13.2	0
34	24" CIDH Concrete Pile	119.01	117.67	11.0	0	13.75	0	13.2	0

TABLE 31 – PILE DATA TABLE (TPSS #33 ANS TPSS #34)

TPSS #	Pile Type	Nominal Resistance (kips)		Design Tip Elev. (ft)[(i)]	Specified Tip Elev. (ft)
		Compression	Tension		
33	24" CIDH Concrete Pile	20	0	106.67	106.67
34	24" CIDH Concrete Pile	20	0	121.67	121.67

(i) Design tip elevations are not controlled by lateral moment and controlled by vertical compression.

The TPSS #33 and TPSS #34 can also be supported on spread footing. The following are recommended bearing capacities for the TPSS #33 and TPSS #34,

TABLE 32 – TPSS RECOMMENDED PARAMETERS

Structure	Active EFP (pcf)	Passive EFP (pcf)	Friction Coefficient	Allowable Bearing Capacity (psf)
TPSS #33	45.0	250.00	0.35	1,500.0
TPSS #34	45.0	250.00	0.35	2,200.0

13.10 Estimation of Vertical Pile Capacities

The estimation of the driven pile capacity in clay and sand is based on the adhesion factors per FHWA manual (FHWA-NHI-16-009). Both frictional

resistance along the pile shafts and end bearing were considered in the pile capacity calculations.

The estimation of the capacity of CIDH concrete pile is based on procedures published by AASHTO LRFD Bridge Design Specifications – Sixth Edition (Section 10.8) with Caltrans Amendments. Per these specifications, resistance through skin friction of the top five feet and the bottom one diameter of CIDH pile are not considered in pile capacity calculations. Moreover, the pile capacity of the CIDH pile is derived primarily from frictional resistance along the pile shafts, and end bearing capacity is not included when estimating the pile capacity.

Based on the pile data tables above, the pile tip elevation is mostly controlled by the demand in compression on the pile. The pile capacity calculations are provided in Appendix VI.

Potential liquefaction-induced ground settlement (more than 0.6 inches) tends to cause down drag load on the foundation piles at various bridge supports. The foundation design needs to consider the impact of liquefaction and additional downdrag load due to liquefaction. For soil layers above liquefiable zone, downdrag load is considered as additional ultimate structural demands (Factor of Safety = 1.0) for extreme event. The evaluation of downdrag load due to liquefaction is performed in accordance with NAVFAC DM 7.2. Per DM 7.2, the downdrag load does not exceed the total weight of the soil enclosed in the pile group. The design and specified pile tip elevations presented in the pile data tables above have included the additional loads due to the downdrag from potential liquefaction.

The piles should not be spaced closer than 3 times the pile diameter measured center-to-center. According to "Bridge Design Specifications" Section 4.5.6.4 "Group Pile Loading", the "Division of Structural Foundations" of Caltrans should be consulted to determine the efficiency factors for friction piles in cohesive soils. Based on our previous project experience with Caltrans, there is no group effect for pile vertical capacity for piles spaced at center-to-center distance greater than or equal to 3 times the pile diameter.

The estimated design tip elevations and specified tip elevations are based on the general plan, foundation plan, "Foundation Design Data" and "Foundation Design Loads" provided by the structural designer. In the event that these footing bottom elevations are changed, the design pile tip elevations may have to be revised accordingly. The axial pile capacity calculations are presented in Appendix VI.

13.11 Sound Wall

According to the "Story Station and Access Structures North Median Access Structure Elevation" (Drawing SP901), "Sound Wall" is proposed at the southeast quadrant of the "Capitol Avenue/ Intersection" (Wall No. 1) ("W1" Station 13+50 to "W1" Station 14+06.952). The approximate height of the "Precast Concrete Panel" wall near the "Capitol Avenue/Capitol Expressway Intersection" will be approximately 8 feet. These walls will be supported on "Structural Steel Tube Post" with concrete backfill.

The pile foundation for the wall may be designed by using an approximate method outlined in the California Building Code 2013 Section 1807. For lateral design, a lateral bearing pressure of 150 psf can be used for checking of the embedment depth. For the vertical pile capacity, only allowable skin friction should be considered in the calculation of pile capacity. An allowable skin friction value of 300 psf is recommended for the design of the pile.

13.12 Lateral Design for Piles

The piles under the lateral demand using L-PILE software will be performed by BCA and SEG. The L-PILE results will be provided by BCA and SEG. The recommended geotechnical parameters to be used in the LPILE Program for the aerial guideway, Story Road POC, Story Road Access and Access Structure, Eastridge Station Shelter, TES Poles and Relocated Ocala Bus Canopy are included in Appendix VI. The recommended passive resistance for seismic design and P-Multiplier are summarized in the tables below. Except for the aerial guideway, the design tip elevation due to the lateral load from the lateral pile analyses are not included in pile data tables above at the 95% Submittal.

Passive Resistance (Ultimate) for Seismic Design and Soil Classifications

The following are the passive resistance (ultimate) for seismic design of the lateral resistance at the pile cap and the soil classifications according to Caltrans Seismic Design Criteria.

TABLE 33 – PASSIVE RESISTANCE (ULTIMATE) FOR SEISMIC DESIGN

Support	Average Bottom of Footing Elev.	Average Top of Footing Elev. (ft)	Passive Resistance	Soil Classification
Abut 1	108.70	113.70	3,500	Marginal
Bent 2 & Bent 3	105.65	110.65	3,000	Marginal
Bent 4 & Bent 5	107.05	112.05	3,000	Marginal
Bent 6	108.85	113.85	2,500	Marginal
Bent 7 through Bent 10	108.71	113.71	1,500	Marginal
Bent 11 & Bent 12	108.03	113.03	2,000	Marginal
Bent 13	108.30	113.30	3,000	Marginal
Bent 14 & Bent 15	107.71	112.71	1,700	Marginal
Bent 16 & Bent 17	104.85	109.85	1,600	Marginal
Bent 18	102.15	107.15	2,000	Marginal
Bent 19 & Bent 20	107.03	112.03	1,600	Marginal
Bent 21 & Bent 22	108.38	113.38	3,000	Marginal
Bent 23 through Bent 25	108.49	113.49	2,000	Marginal
Bent 26 & Bent 27	109.02	114.02	1,600	Marginal
Bent 28 & Bent 29	109.60	114.60	1,400	Marginal
Bent 30 & Bent 31	110.00	115.00	300	Marginal
Bent 32 through Bent 35	110.58	115.58	2,400	Marginal
Bent 36 through Bent 39	110.97	115.97	800	Marginal
Bent 40 through Bent 43	110.48	115.48	300	Poor Soil
Bent 44 & Bent 45	109.36	114.36	600	Marginal
Bent 46 through Bent 49 & Bent 54 & Bent 55	111.50	116.50	2,000	Marginal
Bent 50 & Bent 51	111.67	116.67	1,200	Marginal
Bent 52 & Bent 53	111.22	116.22	1,400	Marginal
Bent 56 & Bent 57	113.48	118.48	1,400	Marginal
Bent 58 & Bent 59	114.16	119.16	900	Marginal
Bent 60 & Bent 61	115.66	120.66	1,400	Marginal
Bent 62 & Bent 63	116.90	121.90	1,200	Marginal
Bent 64 & Bent 65	117.95	122.95	1,600	Marginal

Support	Average Bottom of Footing Elev.	Average Top of Footing Elev. (ft)	Passive Resistance	Soil Classification
Bent 66	118.80	123.80	500	Marginal
Bent 67 & Bent 68	118.00	123.00	1,000	Marginal
Bent 69 & Bent 70	118.32	123.32	1,500	Marginal
Bent 71 & Bent 72	121.88	126.88	300	Marginal
Bent 73 & Bent 74	120.93	125.93	4,000	Marginal
Bent 75	123.09	128.09	1,400	Marginal
Abutment 76	125.95	130.95	1,500	Marginal

The piles should not be spaced closer than 3 times the pile diameter measured center-to-center. For piles spaced at center-to-center distance greater than or equal to 3 times the pile diameter, The P-Multiplier for group effect should follow AASHTO Section 10.7.3. 9 (8th Edition).

P-Multipliers

The P-Multipliers for the bridge supports based on the pile layout are provided in the table below. The values are based on AASHTO LRFD Specifications.

TABLE 34 – P-MULTIPLIER FOR BRIDGE SUPPORTS

Support	Footing Detail	P-Multipliers	
		Longitudinal	Transverse
Abut 1	-	0.76	0.46
Bent 2 through Bent 6 Rt.	SC332A	0.50	0.50
Bent 6 Lt.	SC334F	0.52	0.50
Bent 7	SC335A	0.55	0.55
Bent 8 through Bent 11	SC332A	0.50	0.50
Bent 12 & Bent 13	SC335B	0.53	0.48
Bent 14 & Bent 15	SC335C	0.53	0.48
Bent 16	SC335D	0.50	0.47
Bent 17	SC336A	0.46	0.48
Bent 18	SC336B	0.46	0.46
Bent 19 & Bent 20	SC335C	0.53	0.48
Bent 21	SC335E	0.48	0.48
Bent 22	SC335F	0.62	0.48
Bent 23 through Bent 42	SC332A	0.50	0.50
Bent 43	SC332B	0.50	0.48

Support	Footing Detail	P-Multipliers	
		Longitudinal	Transverse
Bent 44	SC333A	0.61	0.48
Bent 45	SC333B	0.62	0.62
Bent 46	SC333C	0.56	0.47
Bent 47	SC333D	0.53	0.53
Bent 48	SC334A	0.62	0.62
Bent 49	SC334B	0.48	0.48
Bent 50 & Bent 51	SC332A	0.50	0.50
Bent 52	SC332B	0.50	0.48
Bent 53	SC334B	0.48	0.48
Bent 54	SC334C	0.50	0.48
Bent 55 through Bent 70	SC332A	0.50	0.50
Bent 71	SC332B	0.50	0.48
Bent 72	SC332A	0.50	0.50
Bent 73	SC332B	0.50	0.48
Bent 74	SC334D	0.58	0.47
Bent 75	SC334E	0.58	0.48
Abutment 76	-	1.00	0.68

13.13 Eastridge Station and POC Access Stairs

The platform stations at Eastridge are to be supported on shallow footings. The access structure stairs (Access Structures A, B, C on south end of platform) to the POC are to be supported on spread footing/grade beam foundations. The design loads for the proposed platform stations and access stairs are anticipated to be relatively light. The following are recommended:

- An allowable bearing capacity of 2000 psf is recommended for dead plus live loads. The bearing capacity may be increased by one-third for transient or seismic loads.
- Sliding resistance should be calculated using recommended friction coefficient of 0.35 (100% of the base friction resistance) plus 250 pcf Equivalent Fluid Pressure (EFP) (50% of the available passive resistance).

13.14 Eastridge Station Signals and Communication Rooms

Based on the "Eastridge Station Eastridge Signals/Comm House Plans" provided

by SEG, the foundation of the structure is 24-inch thick mat slab to be supported on shallow footing. The following are recommended:

- An allowable bearing capacity of 2000 psf is recommended for dead plus live loads. The bearing capacity may be increased by one-third for transient or seismic loads.
- Sliding resistance should be calculated using recommended friction coefficient of 0.35 (100% of the base friction resistance) plus 250 pcf EFP (50% of the available passive resistance).

13.15 CIP Walls

CIP walls to be backfilled with Caltrans engineered fill should be designed to resist the following applied lateral earth pressures.

***Applied* Lateral Earth Pressures**

Active Condition 36.0 pcf EFP for Caltrans engineered fill.

At-Rest Condition 55.0 pcf EFP for Caltrans engineered fill.

Passive Resistance 320.0 pcf EFP with a maximum value of 3200.0 psf.

Light Rail Transit Load Surcharge Use a uniform vertical distributed load of 485 psf for both the maximum 8 feet high wall and the maximum 12 feet high wall. Plots of the lateral pressure due to the light rail transit load surcharge versus depth are included in Appendix VI.

The following are generally recommended for the design of the CIP walls:

- The recommended applied lateral earth pressure values assume no hydrostatic pore pressure build-up behind the wall and are based on well-drained backfill behind the walls.
- Cantilever walls which are free to rotate at least (0.004*H) feet, where H is the wall height, may be assumed flexible for the active condition. Walls

that are not capable of this movement should be assumed rigid and designed for the at-rest condition.

- The effect of any surcharge (dead or live load) should be added to the preceding lateral earth pressures. A coefficient of 0.3 and 0.5 may be used to determine the additional earth pressure resulting from the surcharge for cantilever walls and rigid walls, respectively.

Seismic Earth Pressures

The recommended seismic earth pressure is the same as that for the abutment wall/retaining wall in Section 13.3.1.

Recommended Bearing Capacity for CIP Wall

The recommended bearing capacities for various CIP Walls are summarized in the table below:

TABLE 35 – BEARING CAPACITY OF CIP WALL

Location	"SB" Track Start and End Station	Bearing Resistance					
		Footing Width B' (ft)	Effective Footing Width B' (ft)	Ultimate, q_{ult} (ksf)	Service Limit State Permissible Net Contact Stress(1) (ksf)	Strength Factored Gross Nominal Bearing Resistance for Controlling Load Case, φ_h(2) = 0.55 (ksf)	Extreme Event Factored Gross Nominal Bearing Resistance φ_h(3) = 0.80 (ksf)
North Approach SB/NB	968+54.75 – 968+94.20	10.50	7.60	6.5	2.1	3.5	5.2
North Approach SB/NB	968+94.20 – 969+59.13	15.00	11.40	6.4	1.6	3.5	5.1
South Approach	1081+96.37 – 1082+29.00	15.00	11.40	4.1	0.6	2.3	3.3
	1082+29.00 – 1084+00.00	10.50	7.60	4.6	0.7	2.5	3.7
	1084+00.00 – 1088+23.23	7.50	6.60	14.7	3.0	8.0	11.7
	1088+23.33– 1089+90.92	5.00	3.40	7.4	4.0	4.0	5.9
	1089+90.92 – 1090+21.19	4.50	1.60	14.1	10.3	7.7	11.3

Notes:
(1) The tolerable settlement under service load is assumed to be 1 inch.
(2) Per Table 11.5.7-1 of the AASHTO LRFD BDS with California Amendment.
(3) Per Section 11.5.8 of the AASHTO LRFD.

13.16 Mechanical Stabilized Embankment (MSE) Wall

The project will require the construction of Mechanical Stabilized Embankment (MSE) walls based on the plan provided by the structural designer. MSE walls are proposed at the North Approach between the Cast-In-Place (CIP) Wall and

the aerial guideways. The structural designer has provided the approximate stations of the MSE wall, design loading cases, length and the retained height of the proposed MSE walls which are summarized in Table 35 below.

TABLE 36 - SUMMARY OF PROPOSED NORTH APPROACH MSE WALLS

Rail Line Side	Design Loading Case	"SB" Track Start Station (ft)	"SB" Track End Station (ft)	Top of Wall Elev. Start (ft)	Top of Wall Elev. Start (ft)	Top of Footing Elev. (ft)	Wall Height (ft)	Approx. Length (ft)
Southbound	1	969+57.48	972+00.47	124.5	137.0	112.0	12.5-25.0	246
Northbound	1	969+57.48	972+00.48	124.5	137.0	112.0	12.5-25.0	246

In our opinion, Standard Caltrans Type MSE wall can be used for these locations. The following are the geotechnical recommendations for the proposed MSE wall:

a) Internal Design: $\phi = 34°$, $\gamma = 120$ pcf

b) External Design:

- ϕ(Retained Backfill) = $34°/\gamma = 120$ pcf
- ϕ(Foundation) = $30°$

c) Traffic Surcharge = Extra 2 feet of soil with a unit weight of 120 lb/ft^3

d) Average Soil Friction Angle of Embankment: $\phi = 34°$ (MSE wall backfill)

e) Active Earth Pressure: A minimum active earth pressure of 36 pcf Equivalent Fluid Pressure (EFP) is recommended for design for level backslope per Caltrans Standard design practice. An active earth pressure coefficient (Ka) of 0.28 (based on ϕ of 34°) can be used to estimate additional loads due to the potential surcharge.

f) Passive earth pressure should be ignored for the MSE Wall.

g) Incremental Seismic Lateral Pressure Coefficient: $\Delta K_{AE} = 0.15$ ($\Delta K_{AE} = K_{AE} - K_A = 0.43 - 0.28$), based on AASHTO LRFD Specifications (6th Edition), with ϕ of 34°, c=150 psf, and a seismic coefficient, $k_h = 0.34$ (~1/2*PGA).

h) In accordance with AASHTO LRFD Section 11.10.5.3, the lateral resistance at the base of the MSE walls was estimated using the friction angle of the foundation soil. We recommend an ultimate friction coefficient of 0.58. Appropriate resistance factors should be applied per AASHTO LRFD BDS with California Amendments.

i) Horizontal berm in front of the MSE wall founded on slopes to provide access for future maintenance activity or to act as a buffer to minor erosion should not be required for this project from geotechnical standpoint.

j) The base width as recommended for Load Case 1 (BW ≥ 0.7H +18 inches) in Caltrans Bridge Design Aids (2011) is appropriate and can be used. "H", the design height is the maximum height of a given section of the MSE.

According to Caltrans "Bridge Design Aids 3-8 (April 2013)", the embedment depth for the MSE wall should be a minimum of 0.1 H (H is the retained height of the MSE wall measured to the top of MSE panels) but not less than 2 feet. Based on the retained height of the proposed MSE walls, the embedment depth should be 2.5 feet minimum for this project. The recommended minimum base width for the MSE will vary with the height of the embankment and should be in accordance with the Caltrans 'Bridge Design Aids". Based on the available boring information and anticipated embedment depth, the subsurface soil conditions generally consist of interbedded layers of stiff to very stiff lean/fat clay and silt, underlain by medium dense to dense sand and occasional silty sand with gravel layers.

13.16.1 Bearing Capacity

The recommended bearing capacities for various effective footing width are summarized in the table below:

TABLE 37 – BEARING CAPACITY OF MSE WALL

H(4) (ft)	Bearing Resistance				
	Effective Width B'(4) (ft)	Ultimate, q_{ult} (ksf)	Service Limit State Permissible Net Contact Stress(1) (ksf)	Strength Factored Gross Nominal Bearing Resistance for Controlling Load Case, φ_h(2) = 0.65 (ksf)	Extreme Event Factored Gross Nominal Bearing Resistance φ_h(3) = 0.90 (ksf)
25.0	18.5	6.19	3.90	4.03	5.57

Notes:
(1) The settlement under service load is assumed to be 3 inches.
(2) Per Table 11.5.7-1 of the AASHTO LRFD BDS with California Amendment.
(3) Per Section 11.5.8 of the AASHTO LRFD.
(4) Based on Retaining Wall Plans dated 06/2020

13.16.2 Settlement

Consolidation settlements are anticipated due to the consolidation of the compressible clay layer under the additional weight of the embankment fill. The MSE wall supporting the approach embankment is anticipated to settle together with the embankment.

The following parameters were assumed for the settlement evaluation based on the empirical correlations, consolidation test results and our engineering judgments.

a) Site-specific laboratory test results are used in the settlement calculations (as shown in the calculations spreadsheet where appropriate).

b) The pre-consolidation pressure (Pc) for the samples were estimated by using a factor of 0.25 (Su/p, Skempton 1954, 1957) and dividing the undrained strength (correlated/lab) with this factor. OCR is then calculated by dividing in-situ effective stress to Pc. Over-consolidated clays can be considered settling elastically per ASHTO LFRD Section C10.6.2.4.3. Clays with OCR greater than or equal to 2.5 is considered to be settling elastically and not considered in primary consolidation settlement calculations.

c) In addition, the $C_c/(1+e0)$ values are calculated based on our calibration/refitting of the original Lambe & Whitman correlations based on in-house lab results from previous projects. The water content from laboratory tests is used as an input to this correlation.

d) For site-specific consolidation tests, the parameters calculated from the consolidation tests were verified with correlation and used for settlement calculations.

Results of Settlement Evaluations

Settlement analyses indicate that the upper-bound total settlement (elastic & consolidation) may be about 3.0 inches. The consolidation settlement by itself is about 1.5 inches. The estimated settlements consist of settlement in the over-consolidated (OC) range for clay and elastic settlements for sands and clays (with OCR greater than or equal to 2.5) and normally-consolidated (NC) range

for clays/silts. A consolidation coefficient of 0.067 ft^2/day was used in the calculation based on the laboratory consolidation test results. Based on our calculations, a waiting period of 60 days is recommended after the placement of fill prior to the pavement construction.

The estimated settlements consist of settlement in the NC range for clay/silt and OC range for clay and elastic settlements for sands and clays. It is anticipated that some of the estimated settlement should have been completed during the fill placement and construction of MSE wall panels.

The final grade of the MSE wall is recommended to be overbuilt to allow for the estimated settlement. This should be included in the plans and Standard Special Provisions.

Settlement Monitoring

It is recommended that settlement platforms be installed, and settlement be monitored (per California Test 112) by the contractor during construction. Based on this, the settlement period may have to be modified. A minimum of four settlement platforms are recommended to be installed along the approach embankment. These settlement platforms should be evenly distributed along the length of the approach embankment. The settlement period may have to be adjusted base on the results of settlement monitoring.

The settlement calculations are included in Appendix VI.

13.16.3 Global Stability

The global stability of the proposed MSE wall was evaluated under the static long-term drained condition and short-term undrained pseudo-static condition. A commercial software "Slope/W 2012" Program by Geo-Slope International was used for the stability analyses with Spencer Method.

Per Caltrans "Guidelines for Foundation Investigations and Reports", pseudo-static analyses may be performed using a seismic coefficient equal to one third of the horizontal peak ground acceleration (1/3 x 0.682 g = 0.23g). A minimum factor of safety of 1.5 is required for the static condition and 1.1 is required for the pseudo-static condition.

Minimum Factor of Safety of obtained under the static and "pseudo-static" conditions are summarized in the table below.

TABLE 38 - SUMMARY OF PROPOSED MSE WALL STABILITY

Wall Type/Wall No.	Minimum Factor of Safety	
	Static (Short-Term)	Pseudo-static
North Approach MSE Wall/RW 2	4.16	2.20
South Approach CIP Wall/RW 5	6.56	2.13

Based on the results of the stability analyses, the proposed MSE walls have the adequate global stability under static short-term condition and pseudo-static conditions.

The global stability analyses are included in Appendix VI.

13.17 Relocated Ocala Bus Canopy

The existing bus stop canopy at the Ocala Bus Station conflicts with the proposed roadway widening and the structure is to be relocated approximately 10 feet further away from the current location to accommodate the roadway widening.

Subsurface Soil Conditions and Measured Groundwater Level

We refer to two borings (PS-59 and PS-21) drilled in the vicinity of "Relocated Ocala Bus Stop Canopy" (Relocated Bus Canopy). The subsurface soil conditions encountered in Boring PS-59 consist of interbedded layers of loose silty sand and stiff to very stiff of lean clay to the boring depth of 20 feet. The subsurface soil conditions encountered in Boring PS-21 consist of approximately 20 feet of stiff to very stiff lean clay, underlain by approximately 5 feet of medium dense of silty sand to the boring depth of 25 feet.

Groundwater was measured at the depth of 8 feet (Elevation 107.0 feet) during drilling for Boring PS-59 in August 2006 and at the depth of 18 feet (Elevation 102.0 feet) during drilling for Boring PS-21 in April 2005.

13.17.1 Seismic Design Criteria

The existing bus stop canopy was designed in 2013 in accordance with the 2010 California Building Code (CBC 2010) and ASCE 7-05. It is our understanding that

seismic design of the relocated bus canopy will follow the 2016 California Building Code (CBC). Based on the subsurface data, it is our opinion that the subsoil can be categorized as Soil Type D per NEHRP criteria. The Soil Type D is determined based on Boring AS-80 that was previously drilled relatively close to the relocated bus canopy. The shear wave velocity for individual layers were estimated based on the formulations given in Appendix A of "Caltrans Methodology for Developing Design Response Spectrum for Use in Seismic Design Recommendations (2012)". The average shear wave velocity of Boring AS-80 in the upper 100 feet was estimated as 199 m/s. Based on Chapter 16 of the 2016 California Building Code (CBC), and existing boring data, the relevant seismic coefficients per 2016 CBC seismic criteria are shown as follows:

TABLE 39 – SEISMIC DESIGN CRITERIA PER CBC 2016

Coefficient	Recommended Value
Site Coefficient, F_a (Table 1613.3.3 (1))	1.0
Site Coefficient, F_v (Table 1613.3.3 (2))	1.5
S_S (Figure 1613.3.1(1))	1.5
S_1 (Figure 1613.3.1(2))	0.6
$S_{MS} = F_a \times S_S$ (Equation 16-37)	1.5
$S_{M1} = F_v \times S_1$ (Equation 16-38)	0.9
$S_{DS} = 2/3 \times S_{MS}$ (Equation 16-39)	1.0
$S_{D1} = 2/3 \times S_{M1}$ (Equation 16-40)	0.6
PGA (ASCE 7-10 Figure 22-7 per CBC 1803.5.12)	0.532
F_{PGA} (ASCE 7-10 Table 11.8-1)	1.0
PGA_M (ASCE 7-10 Equation 11.8-1)	0.532

*Approx. site latitude=37.339841& longitude=-121.819745

13.17.2 CIDH Concrete Pile Foundation

It is our understanding that the canopy columns of the relocated bus canopy will be supported on 30-inch diameter CIDH concrete piles/drilled shafts. We have evaluated the required embedment length of the CIDH concrete pile based on the demand in the vertical compression provided by the structural designer.

The recommended CIDH concrete pile length for the relocated bus canopy is presented in Table 40 below.

TABLE 40 – SUMMARY OF RECOMMENDED CIDH CONCRETE PILE FOUNDATION

Vertical Compression (kips)	Recommended CIDH Concrete Pile Length (feet)
6.5	9.5

Lateral pile capacity analyses is performed by BCA. The evaluation of CIDH concrete pile lengths for vertical capacity is included in Appendix VI of the report.

We have discussed with BCA and understood that the shaft length of the CIDH concrete pile will be increased to 13 ft, based on the lateral load analyses.

13.17.3 Spread Footing Foundation

The glass screen wall of the relocated bus canopy will be supported on spread footing. The following design information was provided by the structural designer:

a) Bottom of the spread footing is 4'-6" to 5'-6" below the top of the concrete slab.
b) Width of the spread footing is 3'-0" to 4'-0".

The recommended allowable bearing capacity for the spread footing is 2,200 lb/ft^2.

13.17.4 Slab-On-Grade Construction

Per the structural designer, the main section of relocated bus canopy consists of concrete slab-on-grade. A layer of engineered fill over geotextile fabric is recommended below the slab-on-grade on prepared/compacted subgrade. The engineered fill should consist of Aggregate Base (Class 2 AB) at minimum 95% relative compaction per the project specifications. Based on the boring data of Boring PS-59, the foundation subgrade is anticipated to be loose sand and/or lean clay. The thickness of the engineering fill is recommended to be 12 inches.

The subgrade should be prepared per the project specifications. The geotextile fabric should conform to the Subgrade Enhancement Geotextile (Class B2) of Caltrans 2018 Standard Specifications (Section 96-1.02O).

Minor cracking and maintenance problems may be anticipated for slab-on-grade construction; however, separation from structure with concentrated loads and keeping the subgrade moist during construction may reduce the amount of eventual cracking. Prior to concrete placement, any dry cracked subgrade should be sealed with appropriate watering or should be excavated and recompacted. These conditions and construction procedures should be observed by the project Geotechnical Engineer.

13.17.5 Liquefaction Potential

Based on the liquefaction analyses, liquefaction potential exists for isolated pocket/lens of the loose silty sand encountered at the depth of 11.5 feet in Boring PS-59. The potential post-liquefaction settlement is estimated to be on the order of 1 inch.

The liquefaction potential should not be a geotechnical concern for the foundation design of the relocated bus canopy from our standpoint considering:

a) The potentially liquefiable silty sand has a high fine content of 47% fines and the soil classification is at a borderline between silty sand and sandy silt.
b) No potentially liquefiable soil material is encountered in the nearby Boring PS-21. The potentially liquefiable silty sand appears to be existing in the form of isolated pocket/lens. Any post-liquefaction settlement probably would be random and localized.
c) The potentially liquefiable soil pocket/lens is covered by cohesive soils, which serve as a "soil mat" and should minimize the potential impact of liquefaction.

14.0 Structural Pavement Design

Existing Pavement

Based on the available boring data, eight borings were drilled in the vicinity of the proposed layover area. This work was part of the investigation program in 2006 for the new construction at the project site. The thickness of the "Asphalt Concrete" (AC) and "Aggregate Base" (AB) recorded in different borings are summarized in the following table.

TABLE 41 - SUMMARY OF EXISTING PAVEMENT SECTION

Boring No.	AC Thickness (ft)	AB Thickness (ft)
T-32	0.33	0.33
P-34	0.33	-
R-37	0.33	0.67
R-38	0.33	0.50
PA-60	0.25	0.33
PA-61	0.25	0.33
PA-62	0.25	0.33
PS-63	0.25	0.33

The existing pavement is assumed to consist of minimum 0.25 feet of asphalt concrete underlain by 0.33 feet of aggregate base. However, no aggregate base was encountered in Boring P-34.

New Pavement

R-value tests were conducted on representative samples collected at subgrade level. The test results are summarized in Table 42.

TABLE 42 - SUMMARY OF R-VALUE AND PLASTICITY INDEX TEST RESULTS

Test Boring	"SB" Track Station	Approx. Existing Ground Elev.(ft)	Plasticity Index	R-value
AG-18	1013+85	120.0	-	12
AS-72	1018+91	121.5	10.0	20
AG-19	1024+50	121.5	-	17
AS-74	1024+91	121.0	49.8	<5
AS-76	1030+84	120.5	19.1	<5
AS-78	1035+10	120.5	14.2	9
AS-80	1039+20	121.0	20.6	29

PS-21	1041+65	120.0	-	16
AS-82	1045+56	122.5	-	18
AS-84	1051+55	124.0	14.4	16
AG23	1055+95	125.0	-	12
AS-86	1057+95	126.5	-	9
AS-88	1063+05	128.0	14.1	10

Findings and Recommendations:

The brief summaries of the design assumptions and recommendations for the structural pavement are discussed below:

- Based on the R-value test results, the R-values of the subsurface soils from the soil borings within the project limits range from less than 5 to 29. An R-Value of 5 is assumed for the pavement recommendations.
- Based on the laboratory test results, low R-Value (< 5) was obtained from the bulk sample at Borings AS-74 and AS-76 and high Plasticity Index was obtained from the bulk sample at Boring AS-74. It appears that extent of the basement soil with low R-value should be localized. Lime treatment was not considered practical for a small segment of the project and its impact on the traffic during construction.
- Based on Section 614.5 of the Highway Design Manual, a SEG_T (Class B2) is required for flexible pavements when the R-value of the basement soil is less than 5.
- Mitigation measure is recommended between "SB" Track Station 1024+70 (approximately midpoint between Borings AG-19 and AS-74) and "SB" Track Station 1037+15 (approximately midpoint between Borings AS-78 and AS-80). The mitigation measure consists of a) minimum thickness of 12 inches of basement soil to be over-excavated; b) a layer of Subgrade Enhancement Geotextile (SEG_T) to be placed at the bottom of over-excavation; and c) the over-excavation to be backfilled with Aggregate Base. The design R-value remains as 5.
- The design Traffic Index is 10.5 for the Capitol Expressway and 9.5 for Capitol Avenue and other Local Roads according to the designer.

- The proposed park-and-ride lot will be paved with asphalt concrete. Since the traffic index for the park-and-ride lot is unknown at this stage, the structural pavement recommendation for various traffic indices of 7 and 8 are provided in the tables below.
- The new pavement design is according to the guidelines of the Caltrans Highway Design Manual (HDM), using HMA; Aggregate Base (AB); and Aggregate Subbase (AS).
- The Santa Clara County prefers to use Gap-Graded Rubberized Asphalt (RHMA-G) concrete which can be substituted for the HMA section. Two inches of RHMA-G is used as a surface course for the new pavement in Capitol Expressway.
- The recommended minimum R-value for Class 2 AS is 50.
- If soft and/or plastic clays are encountered during construction, the soft/plastic clays are recommended to be removed and backfilled with compacted Class 2 Aggregate Base (placed on SEG_T).
- Based on the Traffic Indices provided by the designer and the design R-value, the recommended structural pavement sections are shown in the tables below.

TABLE 43A - Recommended Pavement Section
(Capitol Expressway except Between "SB" Station 1024+70 and "SB" Station 1037+15)

Design Life	Traffic Index (TI)	Design R-Value	Structural Pavement Section (inches)			
			RHMA-G	HMA-A	AB (Cl 2)	Total Thickness (inches)
20	5.0	10	2.0	15.0	-	17.0
		10	2.0	5.0	25.0	32.0

TABLE 43B - Recommended Pavement Section(Capitol Expressway between "SB" Station 1024+70 and "SB" Station 1037+15)

Design Life	Traffic Index (TI)	Design R-Value	Structural Pavement Section (inches)[(1)(2)]				
			RHMA-G	HMA-A	AB (Cl 2)	AS (Cl 2)	Total Thickness (inches)
20	10.5	5	2.0	15.0	-	12.0	29.0
		5	2.0	5.0	25.0	12.0	44.0

(1) A layer of SEG_T (Class B2) is recommended at the pavement subgrade.
(2) Twelve inches of AS (Class 2) is placed on top of the SEG_T.

TABLE 43C - Recommended Pavement Section (Capitol Avenue and other Local Roads)

Design Life	Traffic Index (TI)	Design R-Value	Structural Pavement Section (inches)		
			HMA-A	AB (Cl 2)	Total Thickness (inches)
20	9.5	5	15.0	-	15.0
		5	6.0	22.0	28.0

TABLE 43D – Recommended Pavement Section- (Park-and-Ride Lot TI=7)

Design Life	Traffic Index (TI)	Design R-Value	Structural Pavement Section (inches)			
			RHMA-G	HMA-A	AB (Cl 2)	Total Thickness (inches)
20	7.0	10	2.0	8.5	-	10.5
		10	1.5	3.0	14.5	19.0

TABLE 43E - Recommended Pavement Section- (Park-and-Ride Lot TI=8)

Design Life	Traffic Index (TI)	Design R-Value	Structural Pavement Section (inches)			
			RHMA-G	HMA-A	AB (Cl 2)	Total Thickness (inches)
20	8.0	10	2.0	10.0	-	12.0
		10	2.0	3.0	17.0	22.0

RHMA-G: Rubberized Hot Mix Asphalt (Type G); HMA-A: Hot Mix Asphalt (Type A);
AB (2):Aggregate Base (Class 2); AS(2): Aggregate Subbase (Class 2).

15.0 Notes to Designer

It is our understanding that the pile structural capacity will be verified by the designer based on the output from the lateral pile analysis. It is recommended that the structural engineer verify the pile tip elevations when finalizing the pile data table. Should the specified pile tip elevation required to meet lateral load demands exceed the specified pile tip elevation given within this report, the Geotechnical Engineer must be contacted for further recommendations.

16.0 Construction Considerations

16.1 General Consideration

A safe working distance from underground and overhead utilities should be provided during construction work. If this is not possible, the utility lines may need to be cleared from the site or de-energized before the start of construction work.

16.2 18-inch Square Precast Concrete Pile, 14-inch Square Precast Concrete Pile and 18-inch Steel Pipe Pile

a) Medium stiff to hard cohesive soils with interbedded layers of medium dense to dense sands are generally encountered at the project site. Local hard driving is expected.

b) There are houses in close proximity to the proposed structures, contractor should take every precaution to minimize the impact due to the noise and vibration to the nearby residence in the vicinity.

c) In sensitive areas, it is recommended to conduct a pre-construction crack or damage survey of the property before beginning of the construction. This can help resolve potential issues related to property damage and resulting claims.

d) "Drilling and jetting" and "Oversize Predrilling" will not be allowed for the pile installation in this project. Oversize predrilling is recommended for the piles at some of the bents of the aerial guideway to minimize the downdrag due to potential post-liquefaction settlement.

e) In general, a pile may be considered to have reached "practical refusal" if pile can only advance less than 1 inch under 10 blows or a foot under 100 blows.

f) It is anticipated that the pile capacity will develop after driving as a result of soil "freeze" and dissipation of excess pore water pressures. The final pile capacity can be verified and the gain of pile capacity after initial driving may be evaluated based on "re-driving" after 24-hour (min.) set up. The 2018 Caltrans Standard Specifications (Section 49-2.01A (4)(c)) "Department Acceptance" may be used as the pile driving acceptance criteria.

g) As an option, Pile Driving Analyzer (PDA) may be used to evaluate the pile capacity of the driven piles when unanticipated conditions arise. Typical applications of the PDA include capacity evaluation (for both during driving and re-driving) and integrity testing for precast concrete

piles that have experienced hard driving. Typical applications of the PDA include capacity (both compression and tension) evaluation (for both during driving and re-driving) and integrity testing for pile that has experienced hard driving.

h) It is prudent to make the contractor aware of these conditions so that appropriate steps can be taken to comply with the standards and maintain the integrity of the piles.

i) Available boring information indicates medium dense to very dense sands are likely to be encountered at depth during pile driving. Relatively hard driving conditions may be anticipated during installation of the piles. If such conditions are encountered, pile driving may be allowed to terminate short of the specified tip elevation provided the following conditions are satisfied:

- Other requirements including tension, lateral demands and settlement are met;
- Pile attaining its capacity and refusal within 5 feet above the specified tip elevation.
- Review and approval by the Design Team.

16.2.1 Test Pile Program

Due to over 2,000 piles required for the aerial guideway, the design team recommends that a preconstruction pile testing program be implemented prior to fabrication of the production piles. The purpose of the preconstruction testing is to:

- determine/verify the required pile lengths for the production piles
- evaluate the driving equipment proposed by the Contractor
- determine pile drivability
- establish pile driving criteria for use by the Engineer in evaluating pile capacities
- potentially reduce pile length requirement (and thus cost) prior to fabrication of production piles

Proposed Pile Testing Program

The following are the brief notes of the proposed pile testing program.

1. Preconstruction pile testing will be implemented on driven piles only since driven concrete/steel pipe piles account for over 95% of all piles on the project. Indicator piles and load test piles are proposed.
2. An indicator pile is an individual pile driven and observed prior to pile production in order to evaluate the proposed pile driving equipment, determine pile length, and to observe pile behavior during and/or after initial driving.
3. Indicator piles may be incorporated into the production piles of the final guideway foundation.
4. Indicator piles (dynamically tested using a Pile Driving Analyzer) used also for load testing (under static axial compression or axial tension) would not be incorporated into the production piles of the final foundation.
5. A load test pile is an individual pile which is tested and observed under static axial compression or axial tension load, lateral load, or under dynamic load tests. Load test piles may be load tested to failure and are therefore considered sacrificial and not part of the final foundation.
6. A total of thirty-five (35) indicator piles and four (4) axial load test piles be furnished and installed by the Contractor.

16.3 Cast-In-Drilled-Hole (CIDH) Concrete Pile

a) Caltrans standard specifications and standard special provisions (SSP) for "Cast-in-Place Concrete Piling" should be used for the construction of CIDH concrete piles. Access tubes for acceptance testing should be provided in all CIDH concrete piles that are 24 inches in diameter or larger for construction quality control, except when the holes are dry or when the holes are dewatered without the use of temporary casing to control groundwater. The acceptance test should include Gamma- Gamma Logging and may also include cross-hole sonic logging. Gamma-

Gamma Logging should be performed in accordance with California Test Method 233 Standard (CT-233) to check the homogeneity of CIDH concrete piles.

b) Due to the presence of granular material and groundwater, raveling or caving is anticipated, which may require additional drilling and cleaning effort and may increase the concrete volume for the piles. It is prudent to make the contractor aware of these conditions so that appropriate steps can be taken to comply with the standards and maintain the integrity of the CIDH concrete pile.

c) The use of temporary steel casing and/or slurry displacement method of construction is anticipated during pile foundation construction. This should be consistent with any other special conditions required by the Regulatory Agency. Caltrans Standard Specifications and SSPs should be used for construction and quality assurance procedures.

d) In several of the borings, the granular material flowed into the auger. This could be due to the fine material and the temporary upward flowing water under high hydrostatic pressures. These conditions may present challenge in keeping the hole intact during drilling. Special measures such as backfilling with sand-cement slurry and coming back to re-drill may be required to maintain integrity of the pile excavation and to allow concreting under a controlled condition.

e) The proposed structures are within the median of the busy expressway. Contractor should study the available data including the challenging subsurface soil conditions and groundwater conditions before starting the construction at these locations to avoid long-term closure and traffic impacts.

f) It is recommended that the specifications set certain criteria for qualifications and previous work experience requirements to pre-qualify the potential contractors. The intent is to help select qualified contractors who have the man-power and equipment to address such issue in a timely manner and reduce construction issues.

g) All pile excavations should be observed by the geotechnical engineer or regulatory agency prior to the placement of reinforcement and concrete so that if conditions differ from those anticipated, appropriate recommendations can be made.

17.0 Plan Review

This report is prepared for the proposed "Eastridge to BART Regional Connector Project" 95% design phase. We recommend that final report (through 100% design) be prepared and foundation plans for the proposed project to be reviewed by PARIKH prior to construction so that the intent of our recommendations is included in the project plans and specifications and to further see that no misunderstandings or misinterpretations have occurred. However, design-build elements should be reviewed only from overall compliance standpoint.

18.0 Construction Observation

To a degree, the performance of any structure is dependent upon construction procedures and quality control measures. Hence, geotechnical observation and testing of grading operations, foundation excavations, and observation of pile installations should be carried out by the Geotechnical Engineer. If the subsurface conditions different from those forming the basis of our recommendations are encountered, this office should be informed in order to assess the need for design changes. Therefore, the recommendations presented in this report are contingent upon good quality control and these geotechnical observations during construction.

19.0 Investigation Limitations

Our services consist of professional opinions and recommendations made in accordance with generally accepted geotechnical engineering principles and practices and are based on our site reconnaissance and the assumption that the subsurface conditions do not deviate from observed conditions. All work done is in accordance with generally accepted geotechnical

engineering principles and practices. No warranty, expressed or implied, of merchantability or fitness, is made or intended in connection with our work or by the furnishing of oral or written reports or findings.

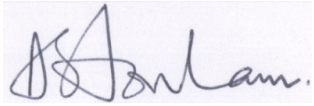
The scope of our services did not include any environmental assessment or investigation for the presence or absence of hazardous or toxic materials in structures, soil, surface water, groundwater or air, below or around this site. Unanticipated soil conditions are commonly encountered and cannot be fully determined by taking soil samples and excavating test borings; different soil conditions may require that additional expenditures be made during construction to attain a properly constructed project. Some contingency fund is thus recommended to accommodate these possible extra costs.

This report has been prepared for the proposed project as described earlier, to assist the engineer in the design of this project. In the event any changes in the design or location of the facilities are planned, or if any variations or undesirable conditions are encountered during construction, our conclusions and recommendations shall not be considered valid unless the changes or variations are reviewed, and our recommendations modified or approved by us in writing.

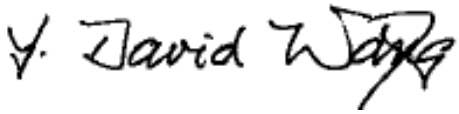
This report is issued with the understanding that it is the designer's responsibility to ensure that the information and recommendations contained herein are incorporated into the project and that necessary steps are also taken to see that the recommendations are carried out in the field.

The findings in this report are valid as of the present date. However, changes in the subsurface conditions can occur with the passage of time, whether they are due to natural processes or to the works of man, on this or adjacent properties. In addition, changes in applicable or appropriate standards occur, whether they result from legislation or from the broadening of knowledge. Accordingly, the findings in this report might be invalidated, wholly or partially, by changes outside of our control.

Respectfully submitted,
PARIKH CONSULTANTS, INC.



Alston Lam, P.E., G.E. 2605
Project Engineer



Y. David Wang, Ph.D., P.E. 52911
Senior Project Engineer

Gary Parikh, P.E., G.E. 666
Project Manager

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Source: Google Earth

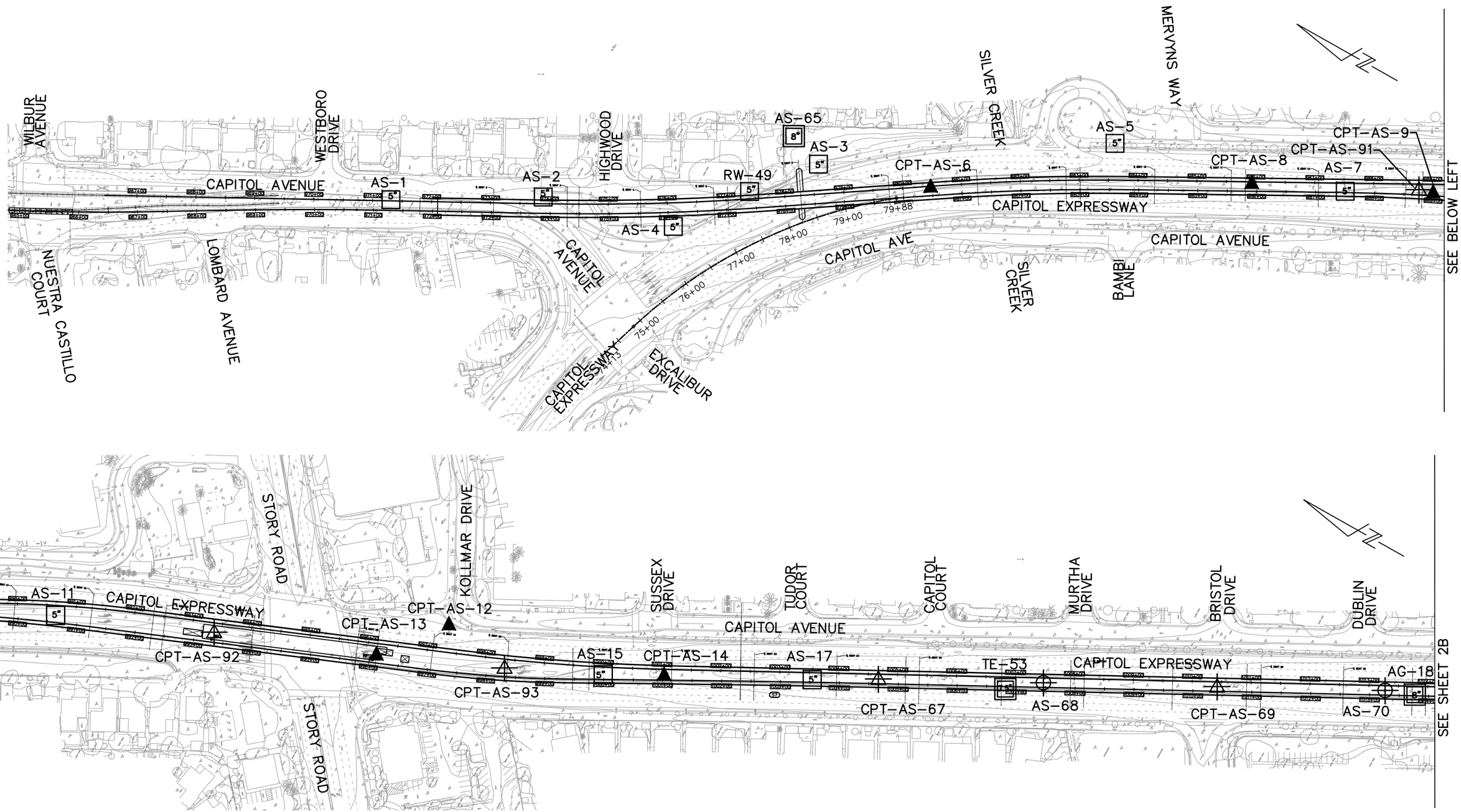
Scale 1 mile.

PROJECT LOCATION MAP

PARIKH
Practicing in the Geosciences

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO	**PLATE NO.: 1**



LEGEND

AS-1 — SIZE — ROTARY WASH BORING (BEFORE 2008)

CPT-AS-6 — ELECTRONIC CONE PENETROMETER (BEFORE 2008)

TE-53 — SIZE — AUGER BORING (DRY BEFORE 2008)

AS-68 — ROTARY WASH BORING (2018)

CPT-AS-91 — ELECTRONIC CONE PENETROMETER (2018)

SCALE 1 inch = 80 feet

Note: All units are in feet unless otherwise specified
Reference Map was provided by BKF Engineers.

80' 0' 80' 160'

GRAPHIC SCALE

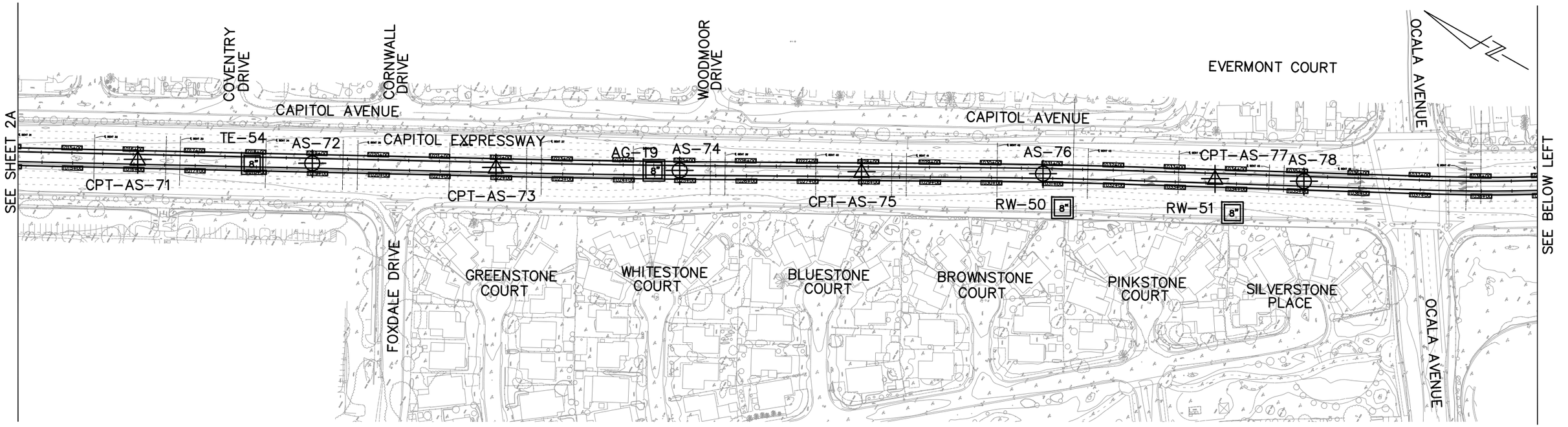
BORING/CPT LOCATION MAP

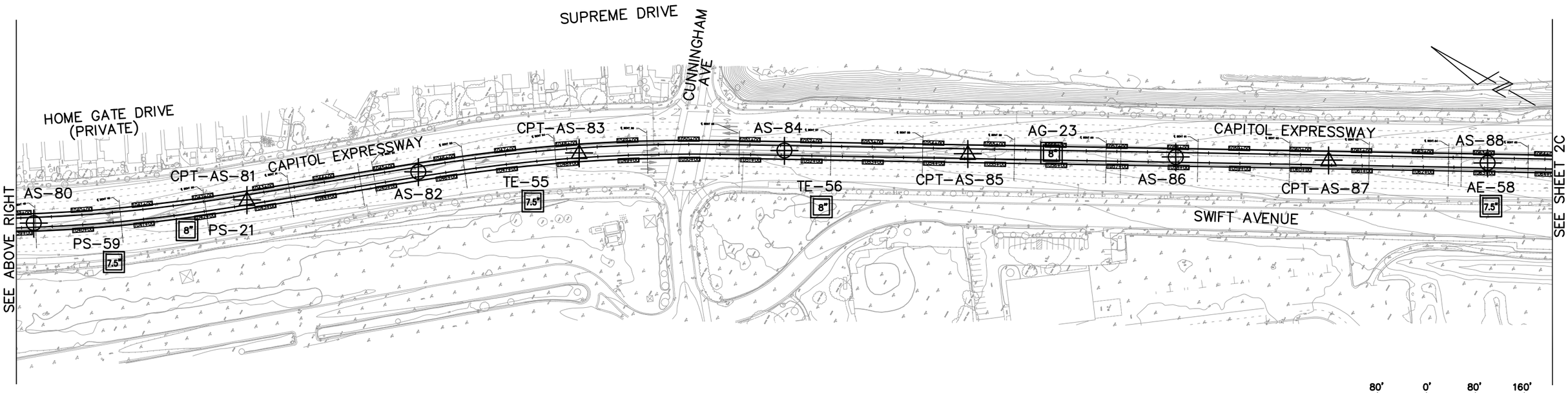
PARIKH
Practicing in the Geosciences

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
SANTA CLARA COUNTY, CALIFORNIA

JOB NO.: 2017-125-GEO

PLATE NO: 2A





80' 0' 80' 160'

GRAPHIC SCALE

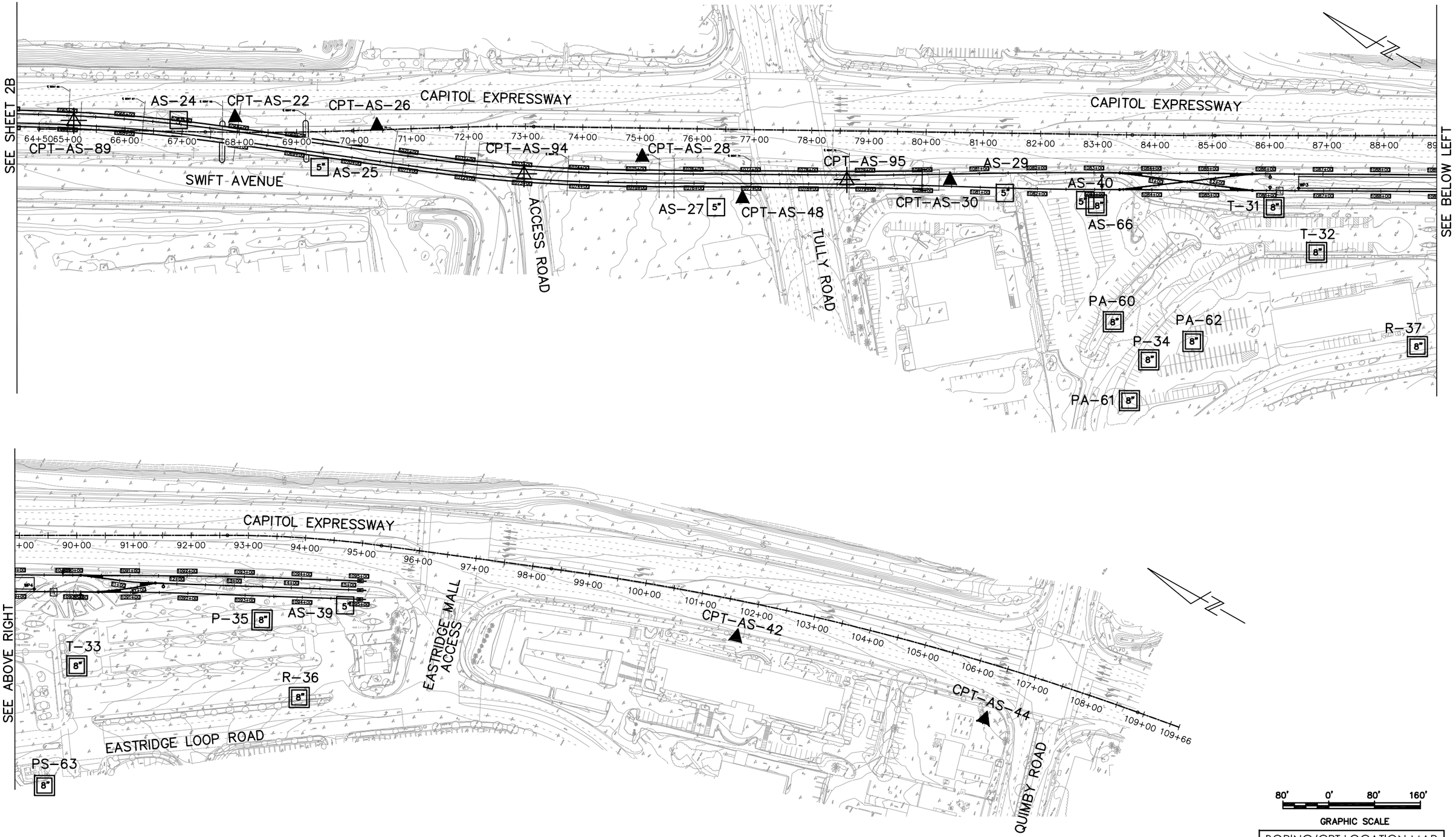
BORING/CPT LOCATION MAP

PARIKH
Practicing in the Geosciences

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
SANTA CLARA COUNTY, CALIFORNIA

JOB NO.: 2017-125-GEO

PLATE NO: 2B



BORING/CPT LOCATION MAP

PARIKH
Practicing in the Geosciences

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
SANTA CLARA COUNTY, CALIFORNIA

JOB NO.: 2017-125-GEO | PLATE NO: 2C

Source: Dibblee, T.W., and Minch, J.A., 2005, Geologic map of the San Jose East quadrangle, Santa Clara County, California: Dibblee Geological Foundation, Dibblee Foundation Map DF-155, scale 1:24,000

Legend:

Qg: Surficial Sediments; Sand and gravel of Coyote Creek channel (Holocene)

Qa: Surficial Sediments; Alluvial gravel, sand and clay soil of valley areas, includes low-sloping alluvial fan gravel and sand near foothills (Holocene)

Qls: Landslide Rubble; Rubble of mostly siliceous shale (Tm) detritus (Pleistocene)

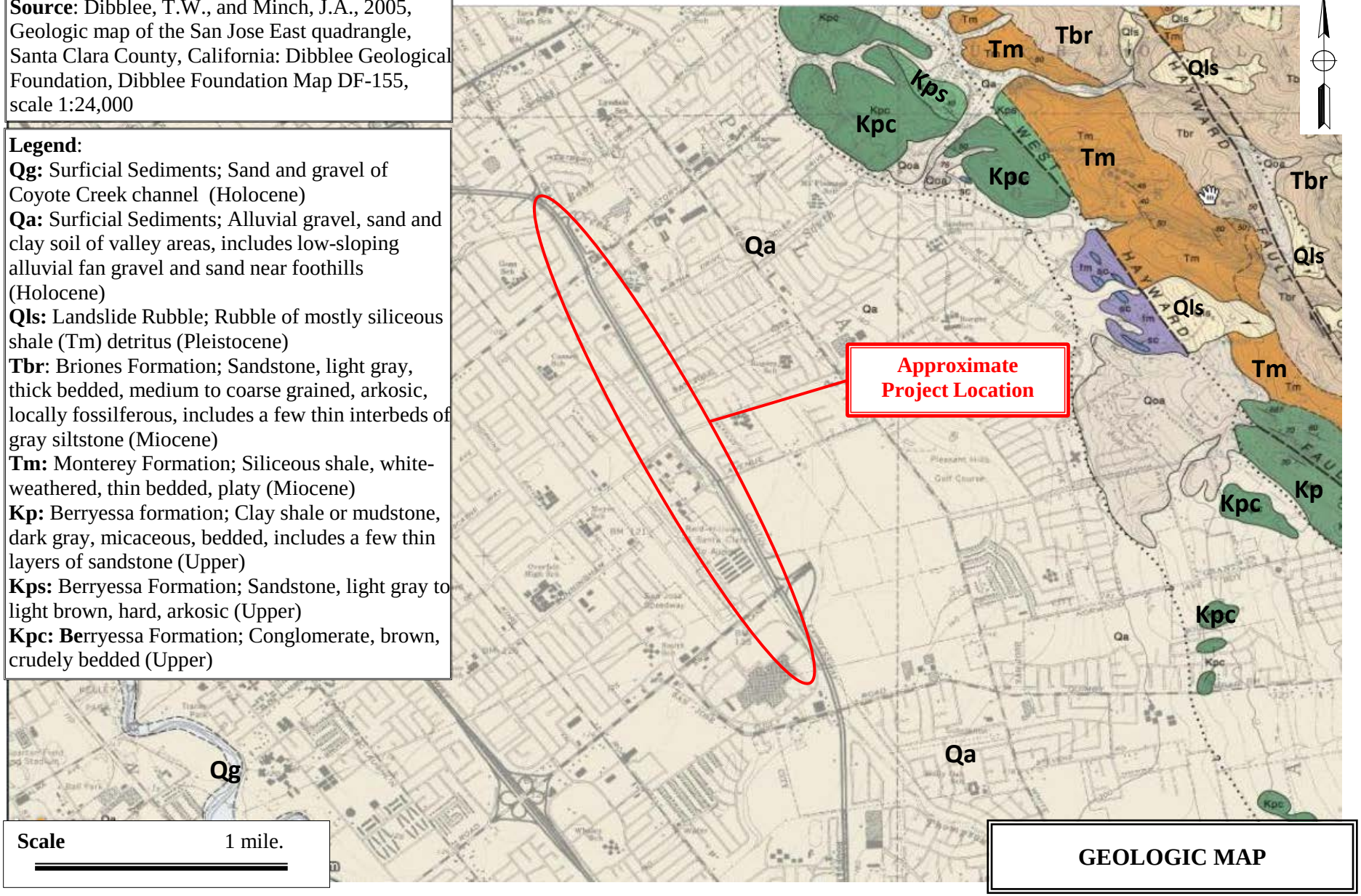
Tbr: Briones Formation; Sandstone, light gray, thick bedded, medium to coarse grained, arkosic, locally fossilferous, includes a few thin interbeds of gray siltstone (Miocene)

Tm: Monterey Formation; Siliceous shale, white-weathered, thin bedded, platy (Miocene)

Kp: Berryessa formation; Clay shale or mudstone, dark gray, micaceous, bedded, includes a few thin layers of sandstone (Upper)

Kps: Berryessa Formation; Sandstone, light gray to light brown, hard, arkosic (Upper)

Kpc: Berryessa Formation; Conglomerate, brown, crudely bedded (Upper)



Scale 1 mile.

GEOLOGIC MAP

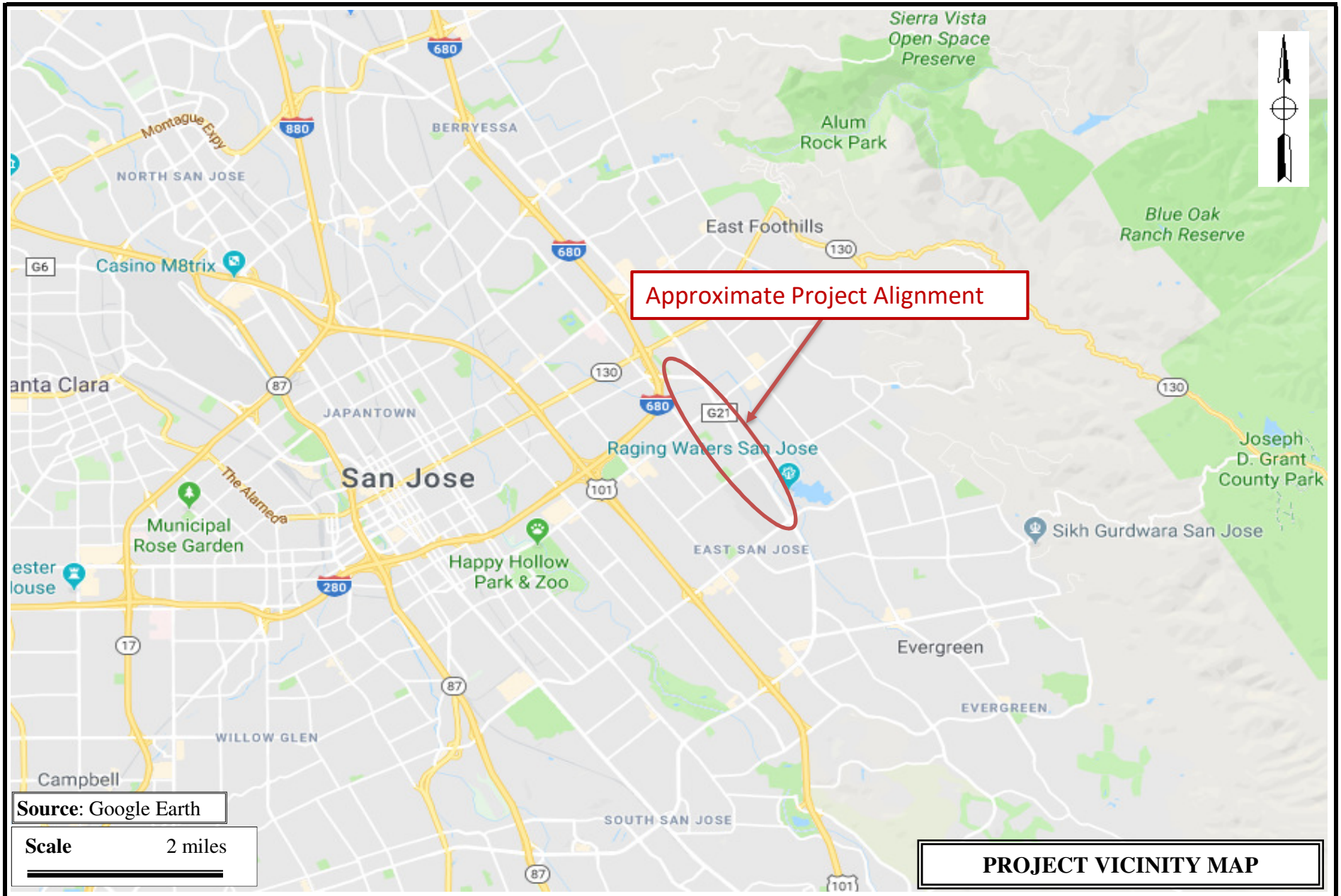
PARIKH Practicing in the Geosciences

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO

PLATE NO.: 3

APPENDIX I



Source: Google Earth

Scale 2 miles

PROJECT VICINITY MAP

PARIKH
Practicing in the Geosciences

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **APPENDIX I**

APPENDIX II

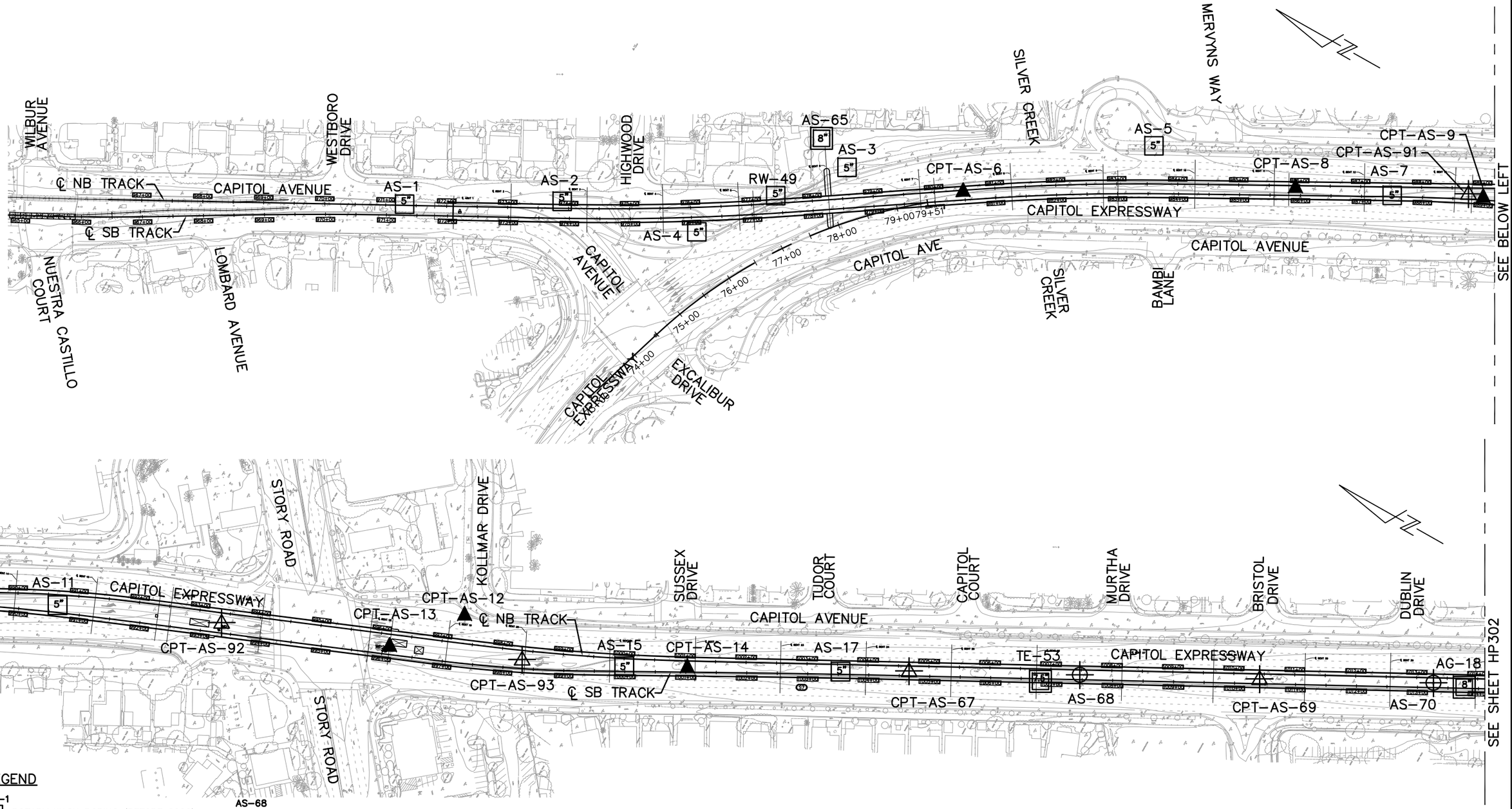
APPENDIX II FIELD EXPLORATION

All the test borings were drilled with a truck-mounted drill rig using 5-inch diameter casing with rotary-wash drilling method. The soil samples were obtained from the borings during drilling at various depths by driving a 2.5 inches Inside Diameter (I. D.) Modified California Sampler or a 1.375 inches I.D. Standard Penetration Sampler (ASTM Test Method No. 1586). The sampler was driven into the subsurface soils under the impact of a 140 pounds hammer having a free fall of 30 inches. The blow counts required to drive the sampler for the last 12 inches are presented on the Logs of Test Borings, Appendix II. (When correlating standard penetration data in similar soils, the blow counts for the Modified California sampler can be taken as roughly twice that for the Standard Penetration Test sampler in similar soils.). Pocket penetration tests were also performed on clay samples to evaluate their consistency. Upon completion of drilling, the boreholes were backfilled with cement grout.

The borings were drilled under the technical supervision of our engineers, who classified and continuously logged the soils encountered during drilling and supervised the collection of soil samples at various depths for visual examination and laboratory testing. The soil samples were visually classified in the field according to the Unified Soil Classification System and then transported to our laboratory for further evaluation and testing.

The descriptions of the soils encountered and relevant boring information are presented on the Log of Test Borings attached in Appendix II. The laboratory test methods and results are presented in Appendix IV. The logs presented in Appendix II were prepared from the field logs which were edited after visual re-examination of the soil samples in the laboratory and results of classification tests on selected soil samples as indicated on the logs.

The descriptions and related information presented on these logs of test borings depict subsurface conditions only at the locations indicated on the plan and on the particular date noted on the logs. Because of the variability from place to place within soil/rock in general, subsurface conditions at other locations may differ from conditions occurring at the locations explored. The abrupt stratum changes shown on the logs may be gradational and relatively minor changes in soil types within a stratum may not be noted on the logs due to field limitations. Also, the passage of time may result in a change in the soil conditions at these locations due to environmental changes.



LEGEND

- AS-1 — SIZE — ROTARY WASH BORING (BEFORE 2008)
- CPT-AS-6 — ELECTRONIC CONE PENETROMETER (BEFORE 2008)
- TE-53 — SIZE — AUGER BORING (DRY BEFORE 2008)
- AS-68 — ROTARY WASH BORING (2018)
- CPT-AS-91 — ELECTRONIC CONE PENETROMETER (2018)

80' 0' 80' 160'

GRAPHIC SCALE

NO.	DATE	REVISIONS
C	06/20	95% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
A	06/18	35% SUBMITTAL SET

REGISTERED PROFESSIONAL ENGINEER — GARY PARIKH — No. 666 — Exp. 12-31-21 — GEOTECHNICAL — STATE OF CALIFORNIA

SUBMITTED: PARIKH, Practicing in the Geosciences, 1497 N MILPITAS BLVD., MILPITAS, CA 95035

DESIGNED	CHECKED
E. Ortakci	A. Lam
DRAWN	CADD FILE NAME
K. Ouyang	801HP301.dwg

Santa Clara Valley Transportation Authority

APPROVED: BKF 100+ YEARS — ENGINEERS / SURVEYORS / PLANNERS

CADD FILE DATE	SCALE
03/26/20	1:80
SUBMITTAL DATE	BOARD APPROVAL DATE
06/29/20	

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
SITE PLAN
STA 964+80 TO STA 1014+00

SHEET OF
DRAWING NO. HP301
REVISION C

PCA NO.	CONTRACT NO.	FILE LOCATION
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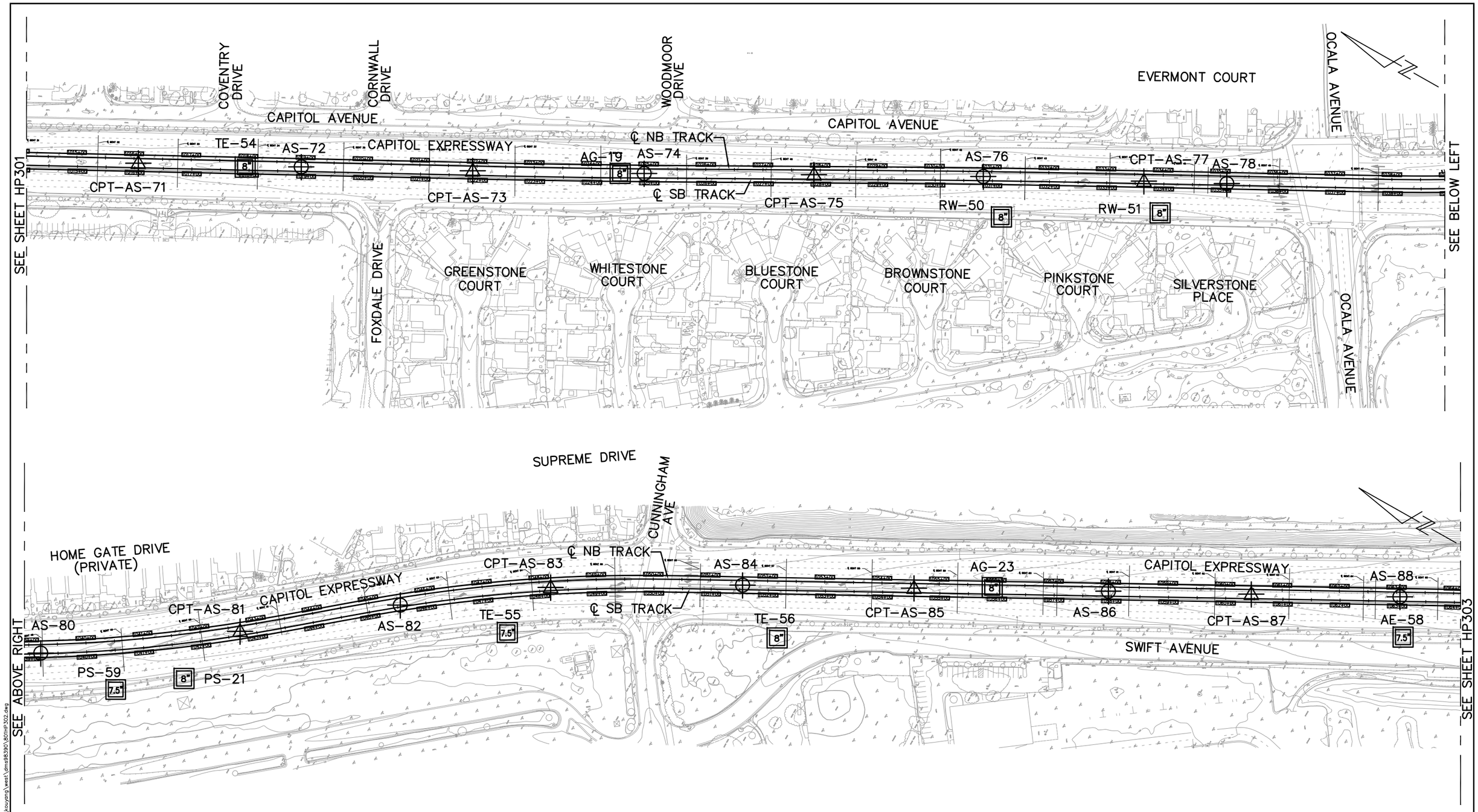

NO.	DATE	REVISIONS
C	06/20	95% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
A	06/18	35% SUBMITTAL SET

REGISTERED PROFESSIONAL ENGINEER
GARY PARIKH
No. 666
Exp. 12-31-21
GEOTECHNICAL
STATE OF CALIFORNIA

SUBMITTED
PARIKH
Practicing in the Geosciences
1497 N MILPITAS BLVD.
MILPITAS, CA 95035

DESIGNED	CHECKED
E. Ortakci	A. Lam
DRAWN	CADD FILE NAME
K. Ouyang	801HP302.dwg

Santa Clara Valley Transportation Authority

APPROVED
BKF 100+ YEARS
ENGINEERS / SURVEYORS / PLANNERS

CADD FILE DATE	SCALE
03/26/20	1:80
SUBMITTAL DATE	BOARD APPROVAL DATE
06/29/20	

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
SITE PLAN
STA 1014+00 TO STA 1064+10

SHEET OF
DRAWING NO. HP302
REVISION C

PCA NO.	CONTRACT NO.	FILE LOCATION
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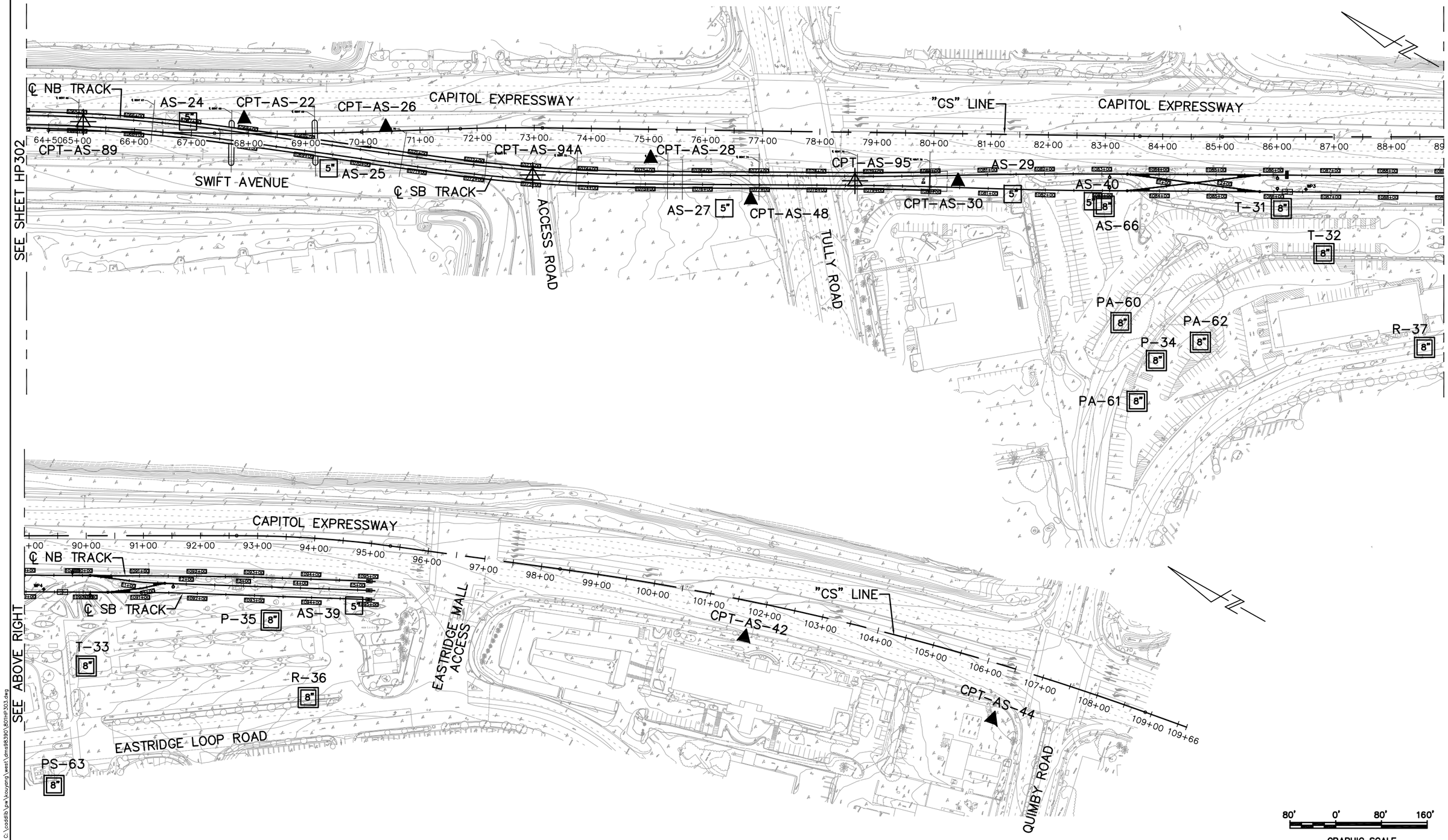

NO.	DATE	REVISIONS
C	06/20	95% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
A	06/18	35% SUBMITTAL SET

REGISTERED PROFESSIONAL ENGINEER — GARY PARIKH — No. 666 — Exp. 12-31-21 — GEOTECHNICAL — STATE OF CALIFORNIA

SUBMITTED: PARIKH, Practicing in the Geosciences, 1497 N MILPITAS BLVD., MILPITAS, CA 95035

DESIGNED	CHECKED
E. Ortakci	A. Lam
DRAWN	CADD FILE NAME
K. Ouyang	801HP302.dwg

Santa Clara Valley Transportation Authority

APPROVED: BkF 100+ YEARS — ENGINEERS / SURVEYORS / PLANNERS

CADD FILE DATE	SCALE
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SUBMITTAL DATE	BOARD APPROVAL DATE
06/29/20	

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
SITE PLAN
STA 1064+10 TO STA 1095+05

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DRAWING NO.	HP303
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CONTRACT NO.	C801
FILE LOCATION	PROJECTWISE

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NO.	DATE	REVISIONS
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B	03/19	65% SUBMITTAL SET
C	06/20	95% SUBMITTAL SET

REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA — GARY PARIKH — No. 666 — Exp. 12-31-21 GEOTECHNICAL

SUBMITTED

PARIKH
Practicing in the Geosciences
1497 N MILPITAS BLVD.
MILPITAS, CA 95035

DESIGNED E. Ortakci
DRAWN K. Ouyang
CHECKED A. Lam
CADD FILE NAME 801HP304.dwg

APPROVED

BKF ENGINEERS / SURVEYORS / PLANNERS 100+ YEARS

CADD FILE DATE 03/26/20
SUBMITTAL DATE 06/29/20
SCALE 1:30
BOARD APPROVAL DATE

Santa Clara Valley Transportation Authority

PCA NO. 000
CONTRACT NO. C801
FILE LOCATION PROJECTWISE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 971+00 TO STA 976+60

SHEET OF
DRAWING NO. HP304
REVISION C

CONSISTENCY CLASSIFICATION FOR SOILS
According to the Standard Penetration Test (ASTM D-1586)

SPT N-Value (Blows/ 305mm)	Granular	SPT N-Value (Blows/ 305mm)	Cohesive
0–4	Very loose	<2	Very soft
5–10	Loose	2–4	Soft
11–30	Medium Dense	5–8	Firm
31–50	Dense	9–15	Stiff
>50	Very Dense	16–30	Very Stiff
		>31	Hard

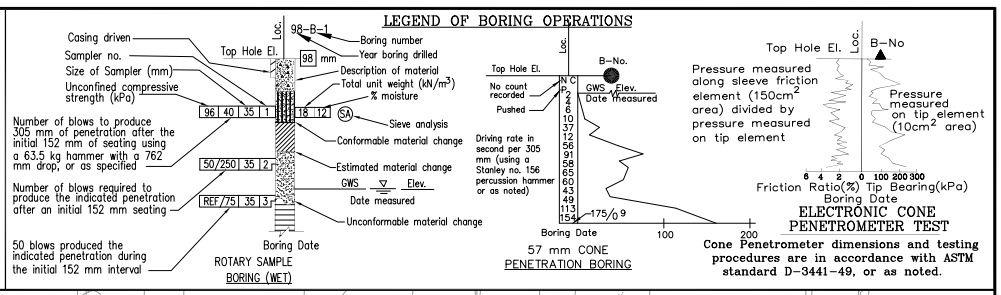
NOTE: Visual classifications of earth materials are based on field inspection and or a confirmed or revised with laboratory test results as necessary.

LEGEND OF EARTH MATERIALS (USCS) BASED ON ASTM D2487, D2488
FILL MATERIAL; CLAY (CL or CH); SILT (ML or MH); PEAT and/or ORGANIC MATTER; WELL-GRADED GRAVEL (GW); POORLY-GRADED GRAVEL (GP); SILTY GRAVEL (GM); CLAYEY GRAVEL (GC); POORLY-GRADED SAND (SP); WELL-GRADED SAND (SW); SILTY SAND (SM) or SANDY SILT; CLAYEY SAND (SC) or SANDY CLAY; COBBLES/BOULDERS; IGNEOUS ROCK; SEDIMENTARY ROCK; METAMORPHIC ROCK

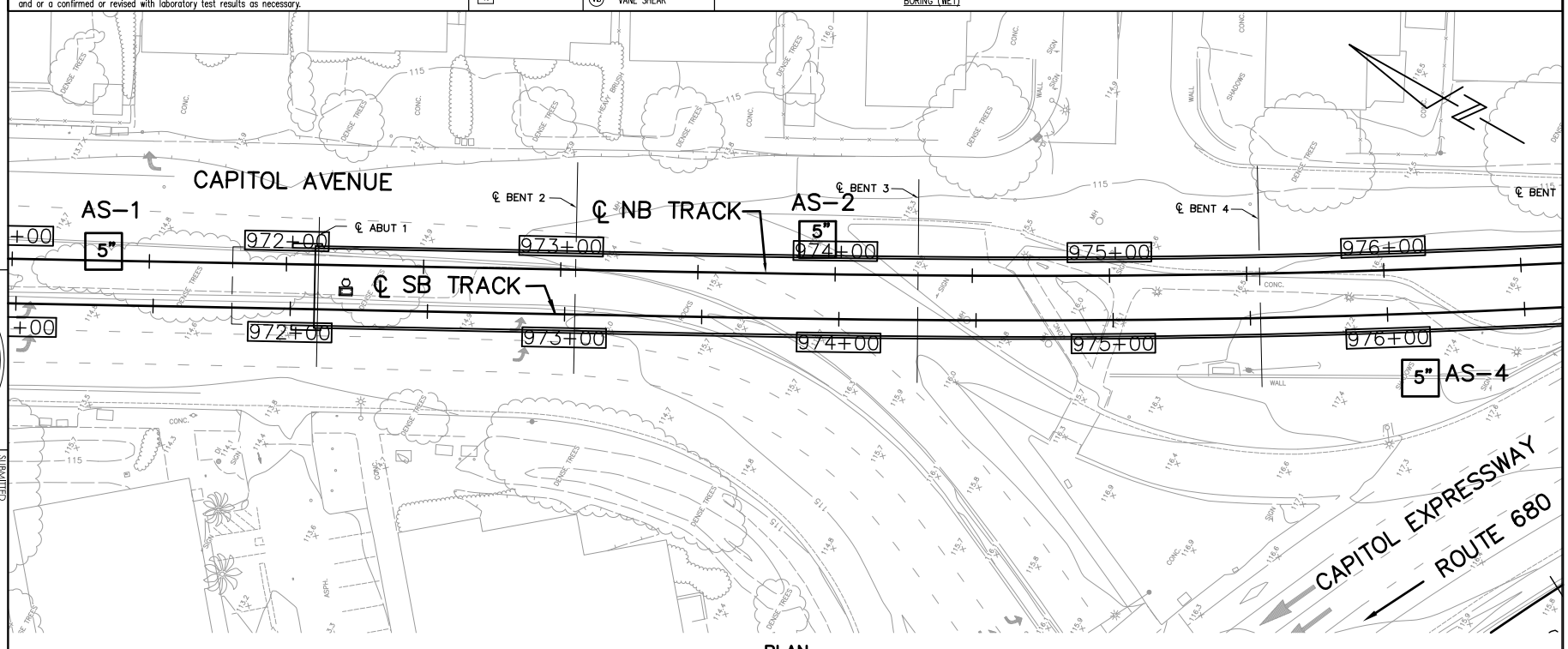
TYPES OF BORINGS
57 mm CONE PENETRATION; ROTARY WASH; ELECTRONIC CONE PENETROMETER; AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; SOIL TUBE

IN-SITU, LAB & FIELD TEST DESIGNATIONS
(AL) ATTERBERG LIMITS; (CA) CHEMICAL ANALYSIS; (CN) CONSOLIDATION; (CU) CONSOLIDATED UNDRAINED TRIAXIAL; (DS) DIRECT SHEAR; (MD) MAX. DRY DENSITY; (PP) POCKET PENETROMETER; (SA) SIEVE ANALYSIS; (TV) TORVANE UNCONFINED COMPRESSION; (UC) UNCONSOLIDATED UNDRAINED TRIAXIAL; (VS) VANE SHEAR

LEGEND OF BORING OPERATIONS



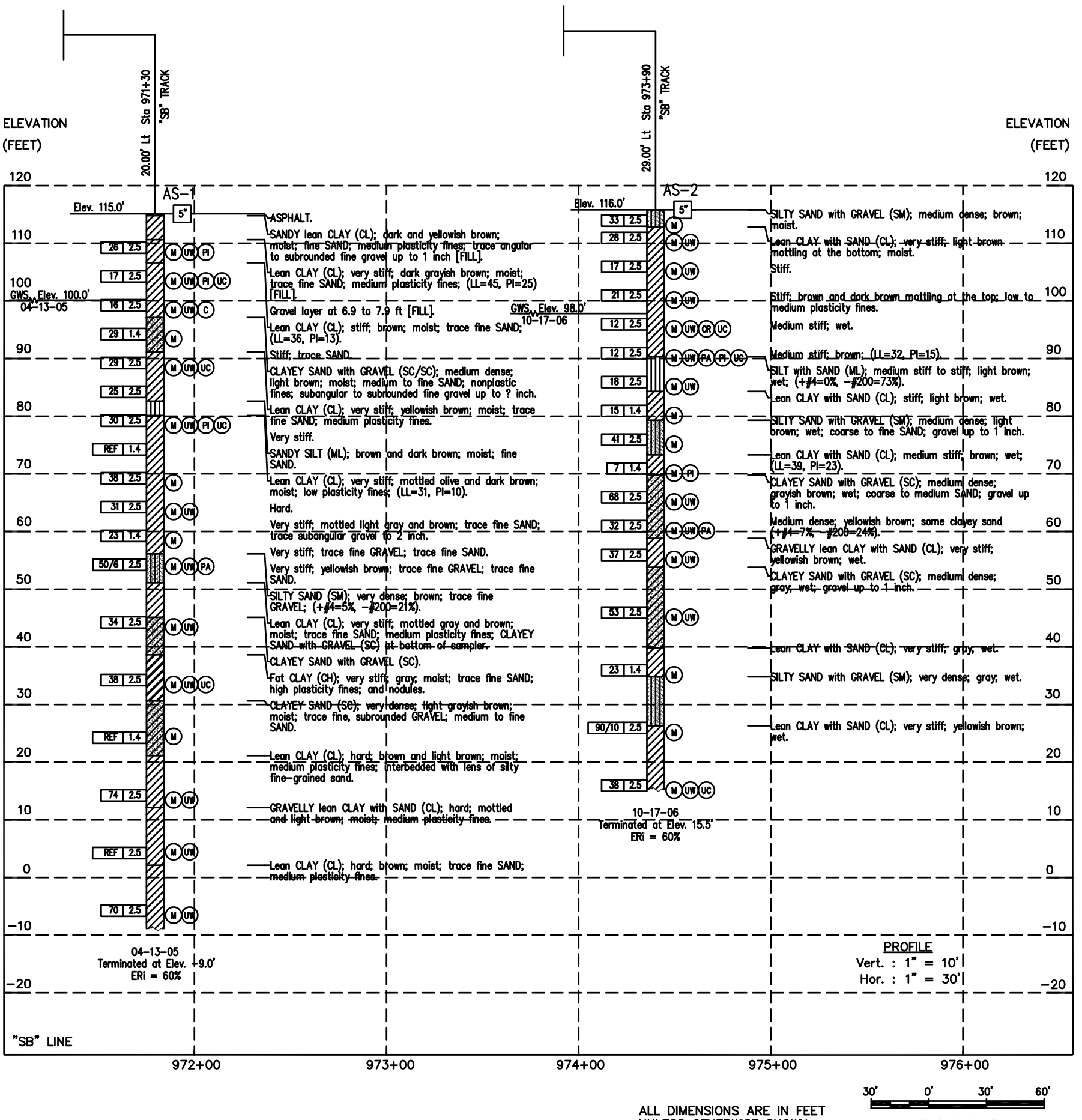
Cone Penetrometer dimensions and testing procedures are in accordance with ASTM standard D-3441-49, or as noted.



PLAN
1"=30'

NOTES:
Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2" Modified California Sampler: I.D. = 2.5"; O.D. = 3" Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

BENCHMARK:
The Horizontal datum is NAD 83 – Epoch 1991.35. Coordinates are on the California State Plane, Zone 0403. To obtain ground distances, multiply grid distances by 0.9999541. The Vertical datum is NAVD 88. Elevations and boring locations are interpreted from topo map.



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NO.	DATE	REVISIONS
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B	03/19	65% SUBMITTAL SET
C	06/20	95% SUBMITTAL SET

CONSISTENCY CLASSIFICATION FOR SOILS
According to the Standard Penetration Test (ASTM D–1586)

SPT N–Value (Blows/ 305mm)	Granular	SPT N–Value (Blows/ 305mm)	Cohesive
0–4	Very loose	<2	Very soft
5–10	Loose	2–4	Soft
11–30	Medium Dense	5–8	Firm
31–50	Dense	9–15	Stiff
>50	Very Dense	16–30	Very Stiff
		>31	Hard

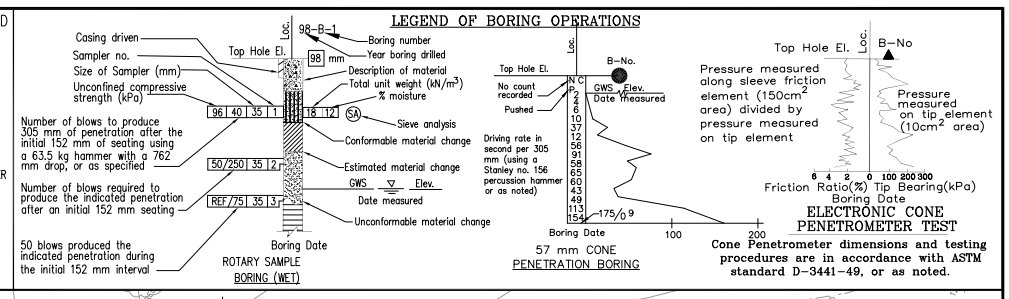
NOTE: Visual classifications of earth materials are based on field inspection and or a confirmed or revised with laboratory test results as necessary.

LEGEND OF EARTH MATERIALS (USCS) BASED ON ASTM D2487, D2488
FILL MATERIAL; CLAY (CL or CH); SILT (ML or MH); PEAT and/or ORGANIC MATTER; WELL–GRADED GRAVEL (GW); POORLY–GRADED GRAVEL (GP); SILTY GRAVEL (GM); CLAYEY GRAVEL (GC); POORLY–GRADED SAND (SP); WELL–GRADED SAND (SW); SILTY SAND (SM) or SANDY SILT; CLAYEY SAND (SC) or SANDY CLAY; COBBLES/BOULDERS; IGNEOUS ROCK; SEDIMENTARY ROCK; METAMORPHIC ROCK

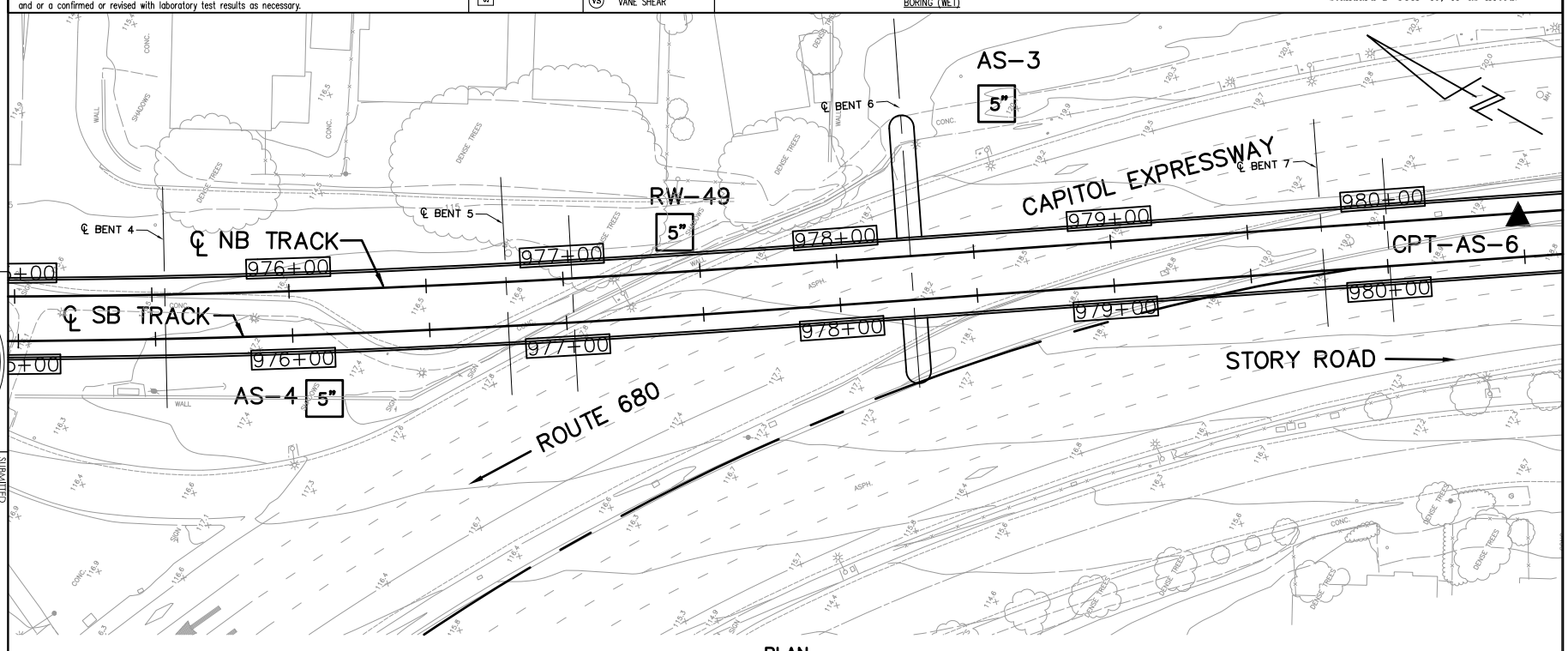
TYPES OF BORINGS
57 mm CONE PENETRATION; ROTARY WASH; ELECTRONIC CONE PENETROMETER; AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; SOIL TUBE

IN–SITU, LAB & FIELD TEST DESIGNATIONS
AL ATTERBERG LIMITS; CA CHEMICAL ANALYSIS; CN CONSOLIDATION; CU CONSOLIDATED UNDRAINED TRIAXIAL; DS DIRECT SHEAR; MD MAX. DRY DENSITY; PP POCKET PENETROMETER; SA SIEVE ANALYSIS; TV TORVANE UNCONFINED COMPRESSION; UC UNCONSOLIDATED UNDRAINED TRIAXIAL; VS VANE SHEAR

LEGEND OF BORING OPERATIONS



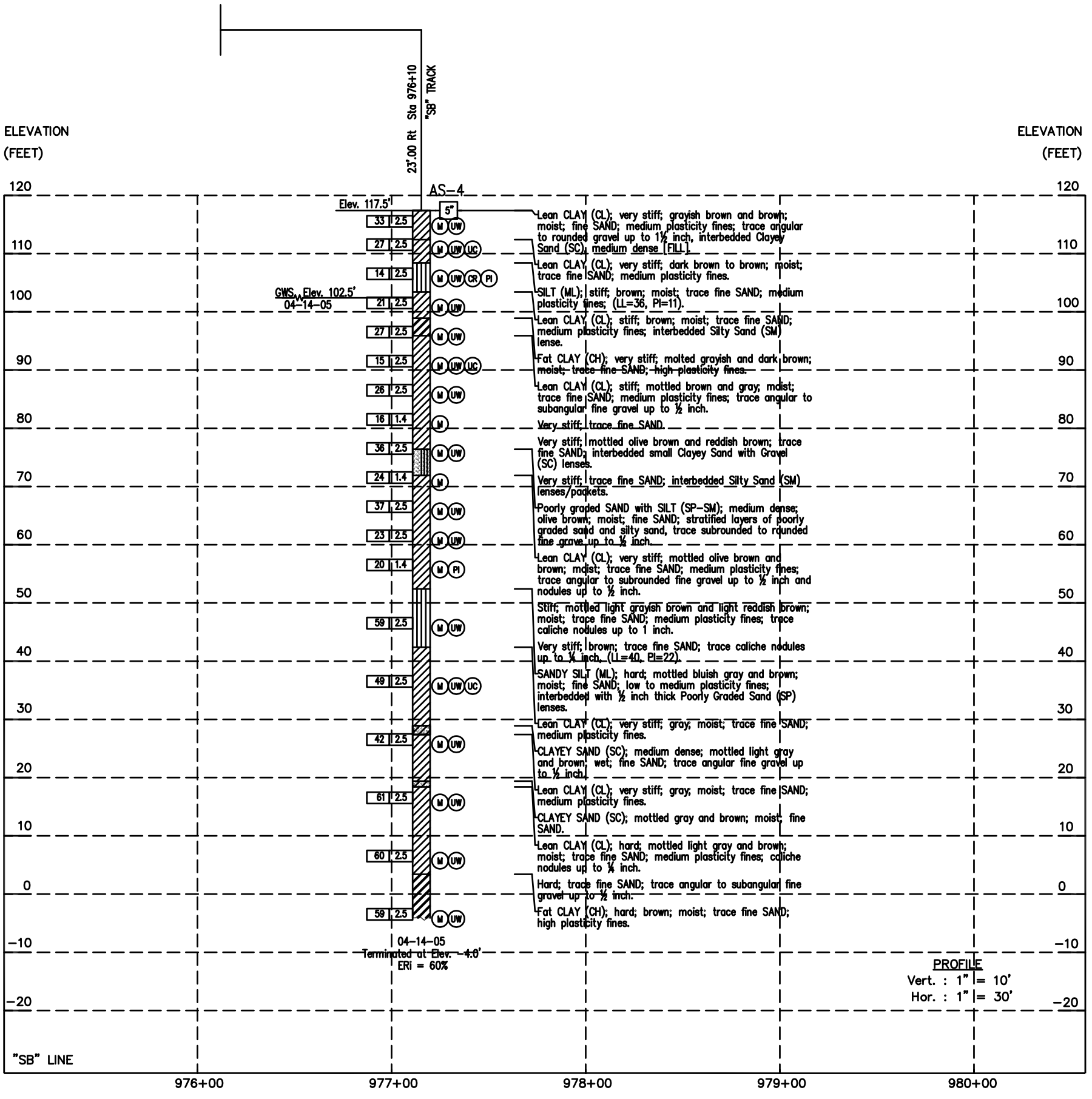
Cone Penetrometer dimensions and testing procedures are in accordance with ASTM standard D–3441–49, or as noted.



PLAN
1"=30'

NOTES:
Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2" Modified California Sampler: I.D. = 2.5"; O.D. = 3" Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

BENCHMARK:
The Horizontal datum is NAD 83 – Epoch 1991.35. Coordinates are on the California State Plane, Zone 0403. To obtain ground distances, multiply grid distances by 0.9999541. The Vertical datum is NAVD 88. Elevations and boring locations are interpreted from topo map.



PROFILE
Vert. : 1" = 10'
Hor. : 1" = 30'

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

30' 0' 30' 60'
GRAPHIC SCALE

REGISTERED PROFESSIONAL ENGINEER — GARY PARIKH — No. 666 — Exp. 12-31-21 — GEOTECHNICAL — STATE OF CALIFORNIA

PARIKH — Practicing in the Geosciences — 1497 N MILPITAS BLVD. MILPITAS, CA 95035

DESIGNED E. Ortakci
DRAWN K. Ouyang
CHECKED A. Lam
CADD FILE NAME 801HP305.dwg

SUBMITTED
APPROVED
BKF 100+ YEARS — ENGINEERS / SURVEYORS / PLANNERS
CADD FILE DATE 03/26/20
SUBMITTAL DATE 06/29/20
SCALE 1:30
BOARD APPROVAL DATE

Santa Clara Valley Transportation Authority

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 975+00 TO STA 980+60

PCA NO. 000
CONTRACT NO. C801
FILE LOCATION PROJECTWISE
SHEET OF
DRAWING NO. HP305
REVISION C

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NO.	DATE	REVISIONS
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B	03/19	65% SUBMITTAL SET
C	06/20	95% SUBMITTAL SET

CONSISTENCY CLASSIFICATION FOR SOILS
According to the Standard Penetration Test (ASTM D-1586)

SPT N-Value (Blows/ 305mm)	Granular	SPT N-Value (Blows/ 305mm)	Cohesive
0–4	Very loose	<2	Very soft
5–10	Loose	2–4	Soft
11–30	Medium Dense	5–8	Firm
31–50	Dense	9–15	Stiff
>50	Very Dense	16–30	Very Stiff
		>31	Hard

NOTE: Visual classifications of earth materials are based on field inspection and or a confirmed or revised with laboratory test results as necessary.

LEGEND OF EARTH MATERIALS (USCS) BASED ON ASTM D2487, D2488
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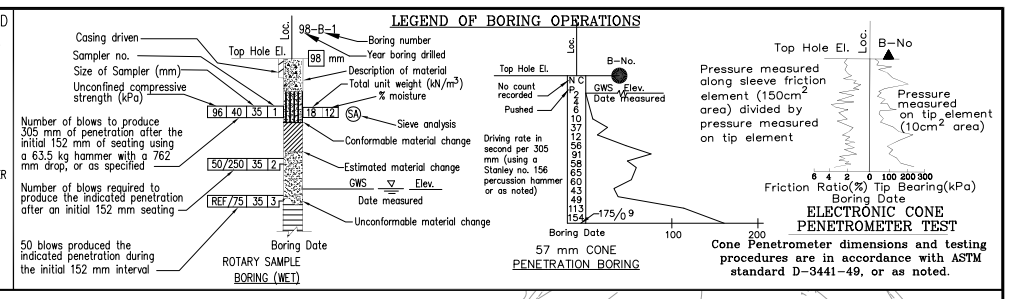
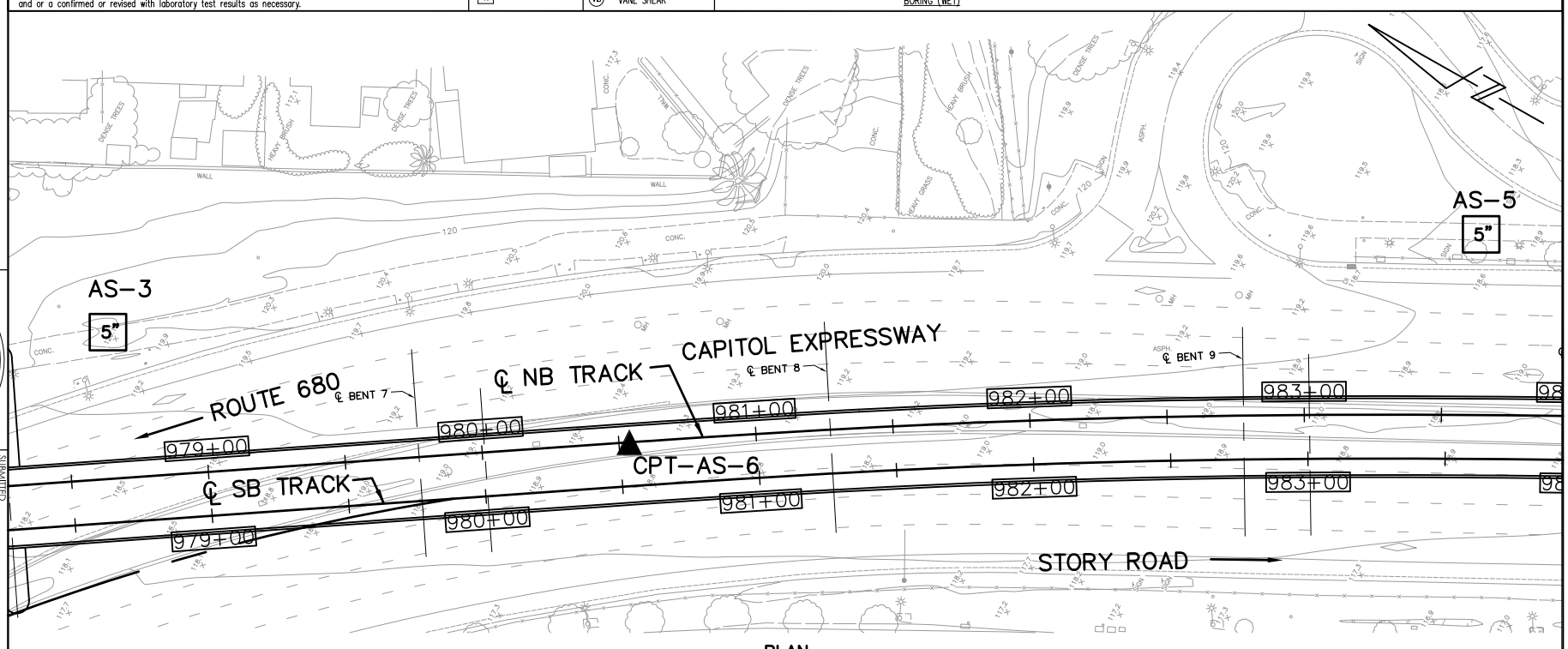
TYPES OF BORINGS
57 mm CONE PENETRATION; ROTARY WASH; ELECTRONIC CONE PENETROMETER; AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; SOIL TUBE

IN-SITU, LAB & FIELD TEST DESIGNATIONS
(AL) ATTERBERG LIMITS; (CA) CHEMICAL ANALYSIS; (CN) CONSOLIDATION; (CU) CONSOLIDATED UNDRAINED TRIAXIAL; (DS) DIRECT SHEAR; (MD) MAX. DRY DENSITY; (PP) POCKET PENETROMETER; (SA) SIEVE ANALYSIS; (TV) TORVANE UNCONFINED COMPRESSION; (UC) UNCONSOLIDATED UNDRAINED TRIAXIAL; (VS) VANE SHEAR

LEGEND OF BORING OPERATIONS



Cone Penetrometer dimensions and testing procedures are in accordance with ASTM standard D-3441-49, or as noted.



PLAN
1"=30'

NOTES:
Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2" Modified California Sampler: I.D. = 2.5"; O.D. = 3" Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

BENCHMARK:
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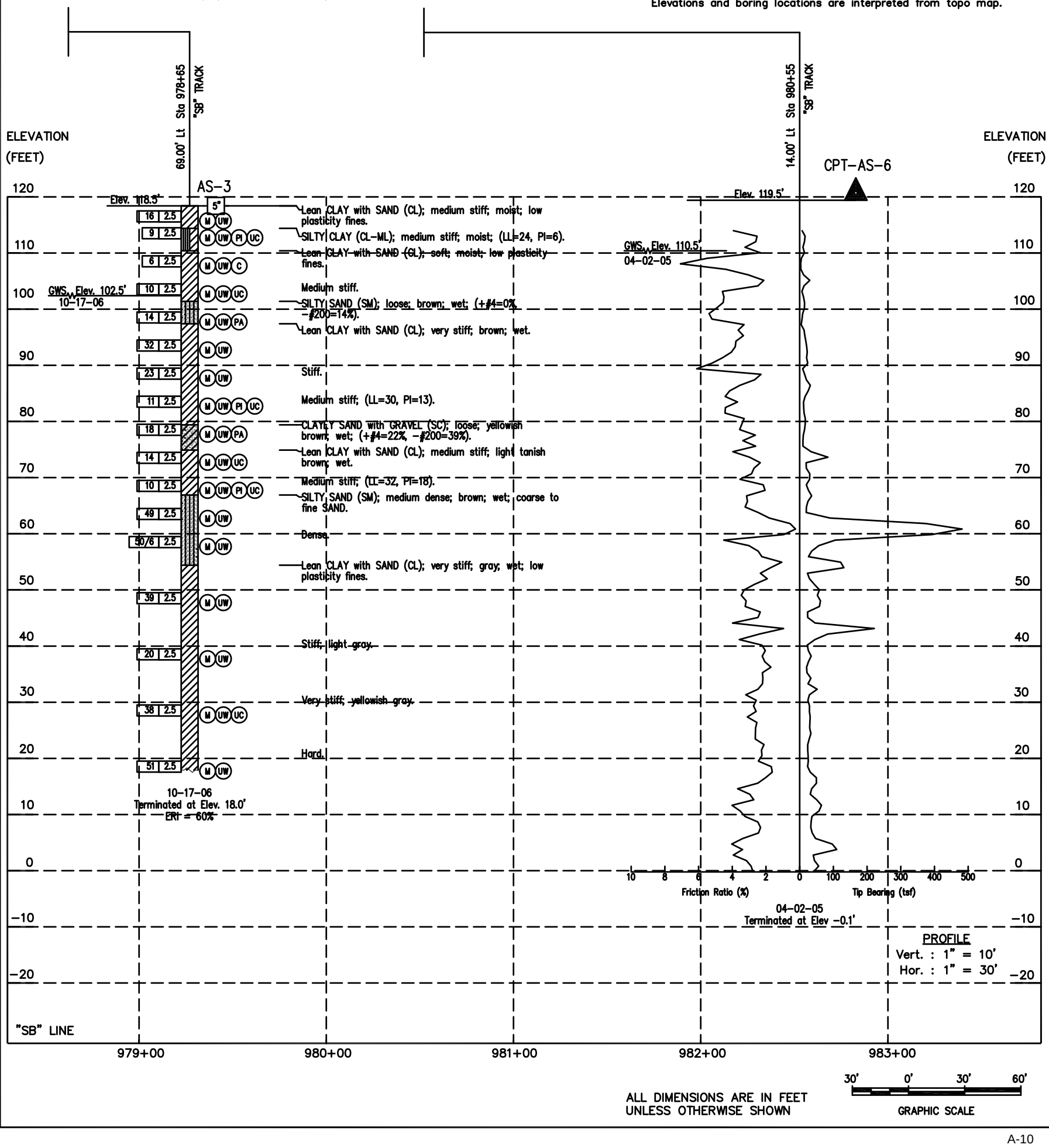

REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA — GARY PARIKH — No. 666 — Exp. 12-31-21 — GEOTECHNICAL

SUBMITTED

PARIKH — Practicing in the Geosciences — 1497 N MILPITAS BLVD. MILPITAS, CA 95035

DESIGNED E. Ortakci
DRAWN K. Ouyang
CHECKED A. Lam
CADD FILE NAME 801HP306.dwg

Santa Clara Valley Transportation Authority

APPROVED

BKF 100+ YEARS — ENGINEERS / SURVEYORS / PLANNERS

CADD FILE DATE 03/26/20
SUBMITTAL DATE 06/29/20
SCALE 1:30
BOARD APPROVAL DATE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 978+25 TO STA 984+00

PCA NO. 000
CONTRACT NO. C801
FILE LOCATION PROJECTWISE
SHEET OF
DRAWING NO. HP306
REVISION C

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NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
C	06/20	95% SUBMITTAL SET

CONSISTENCY CLASSIFICATION FOR SOILS
According to the Standard Penetration Test (ASTM D-1586)

SPT N-Value (Blows/ 305mm)	Granular	SPT N-Value (Blows/ 305mm)	Cohesive
0–4	Very loose	<2	Very soft
5–10	Loose	2–4	Soft
11–30	Medium Dense	5–8	Firm
31–50	Dense	9–15	Stiff
>50	Very Dense	16–30	Very Stiff
		>31	Hard

NOTE: Visual classifications of earth materials are based on field inspection and or a confirmed or revised with laboratory test results as necessary.

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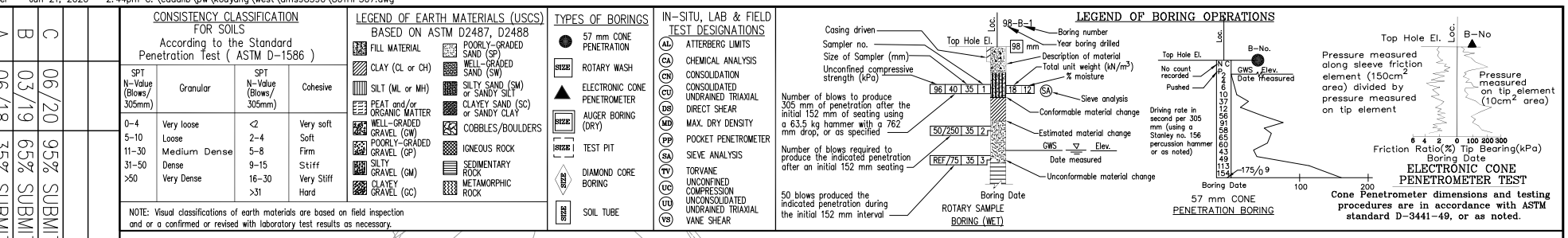
TYPES OF BORINGS

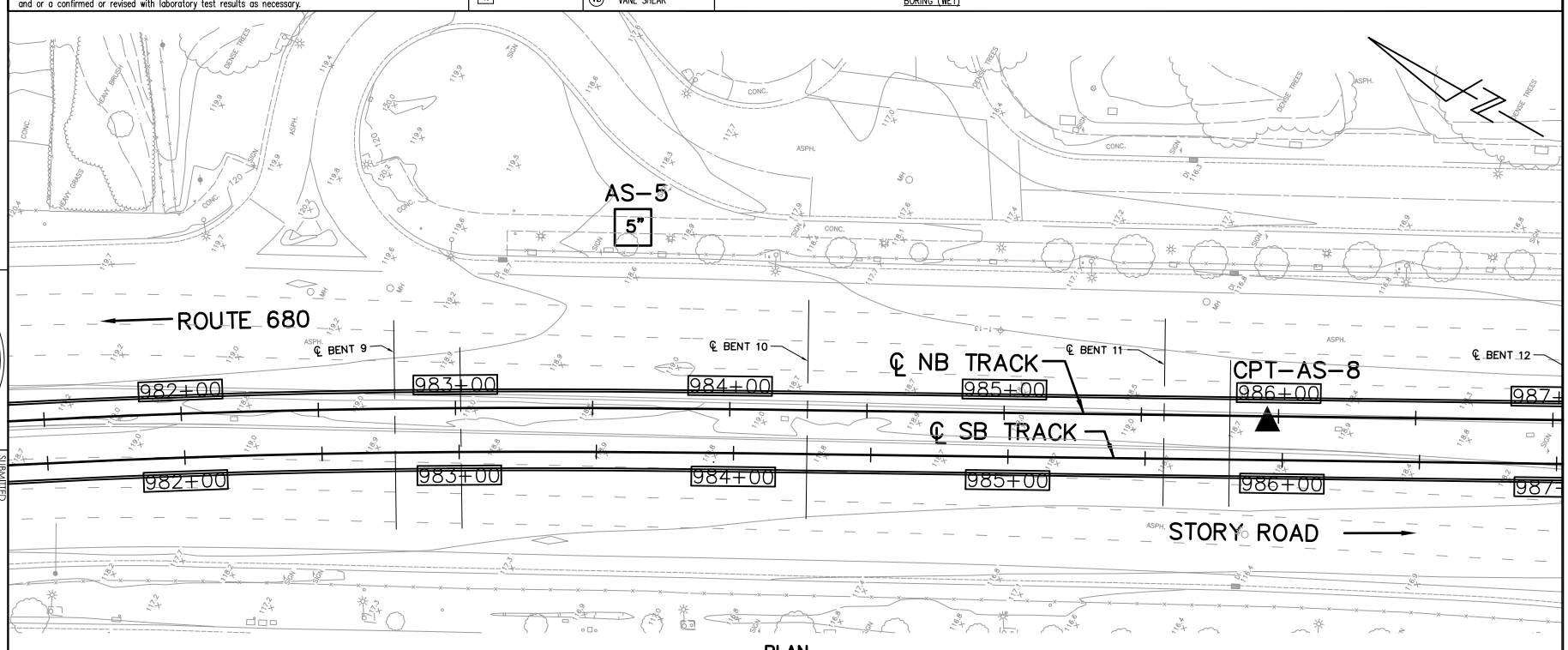
57 mm CONE PENETRATION; ROTARY WASH; ELECTRONIC CONE PENETROMETER; AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; SOIL TUBE

IN-SITU, LAB & FIELD TEST DESIGNATIONS

AL ATTERBERG LIMITS; CA CHEMICAL ANALYSIS; CN CONSOLIDATION; CU CONSOLIDATED UNDRAINED TRIAXIAL; DS DIRECT SHEAR; MD MAX. DRY DENSITY; PP POCKET PENETROMETER; SA SIEVE ANALYSIS; TV TORVANE UNCONFINED COMPRESSION; UC UNCONSOLIDATED UNDRAINED TRIAXIAL; VS VANE SHEAR

LEGEND OF BORING OPERATIONS





PLAN
1"=30'

NOTES:

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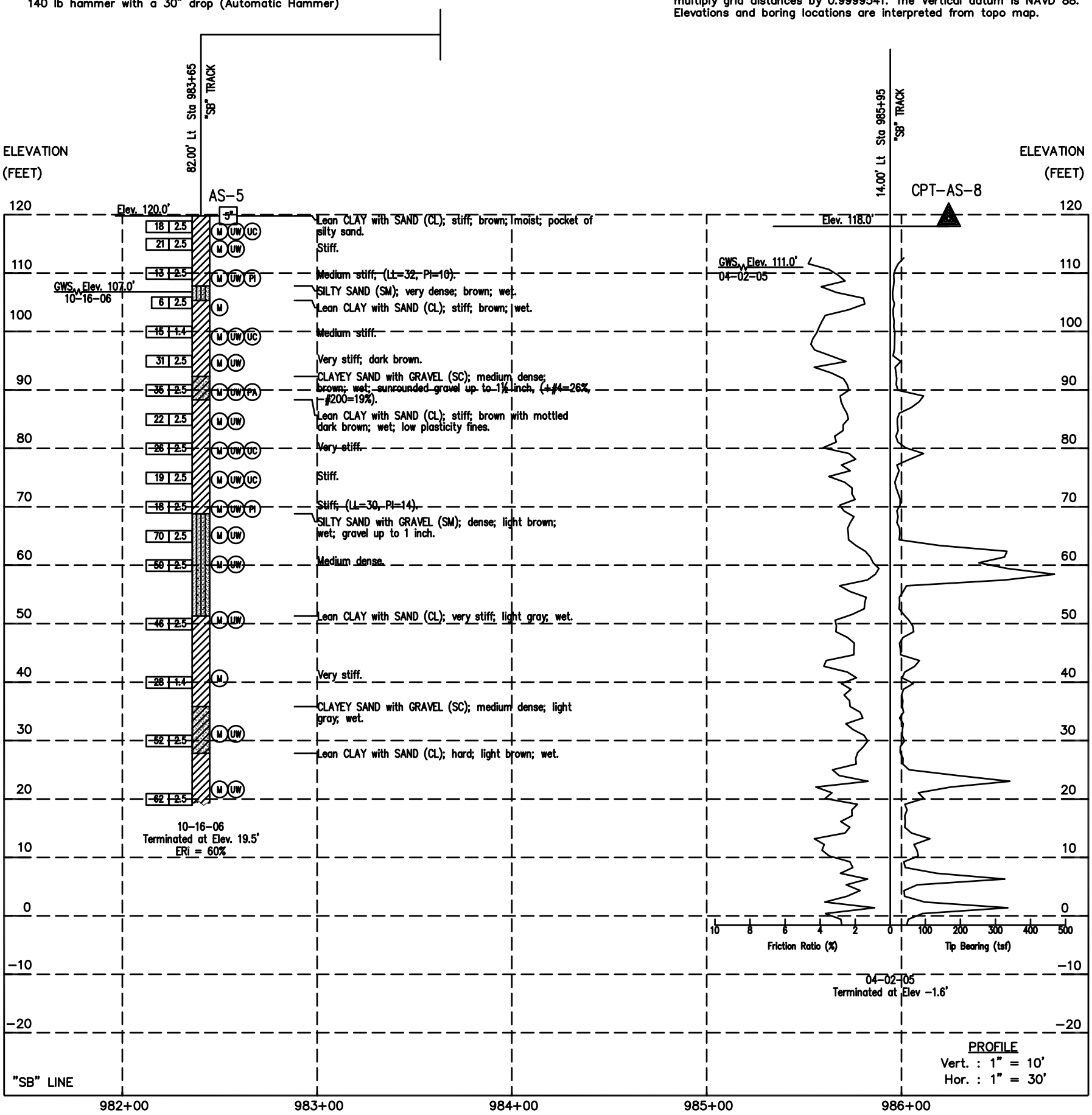

REGISTERED PROFESSIONAL ENGINEER — GARY PARIKH — No. 666 — Exp. 12-31-21 — STATE OF CALIFORNIA GEOTECHNICAL

SUBMITTED

PARIKH — Practicing in the Geosciences — 1497 N MILPITAS BLVD. MILPITAS, CA 95035

DESIGNED E. Ortakci
DRAWN K. Ouyang
CHECKED A. Lam
CADD FILE NAME 801HP307.dwg

Santa Clara Valley Transportation Authority

APPROVED

BKF 100+ YEARS — ENGINEERS / SURVEYORS / PLANNERS

CADD FILE DATE 03/26/20
SUBMITTAL DATE 06/29/20
SCALE 1:30
BOARD APPROVAL DATE

PCA NO. 000
CONTRACT NO. C801
FILE LOCATION PROJECTWISE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 981+35 TO STA 987+00

SHEET OF
DRAWING NO. HP307
REVISION C

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NO.	DATE	REVISIONS
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DESIGNED E. Ortakci | DRAWN K. Ouyang | CHECKED A. Lam | CADD FILE NAME 801HP308.dwg

SUBMITTED

PARIKH — Practicing in the Geosciences — 1497 N MILPITAS BLVD. MILPITAS, CA 95035

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57 mm CONE PENETRATION; ROTARY WASH; ELECTRONIC CONE PENETROMETER; AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; SOIL TUBE

IN-SITU, LAB & FIELD TEST DESIGNATIONS
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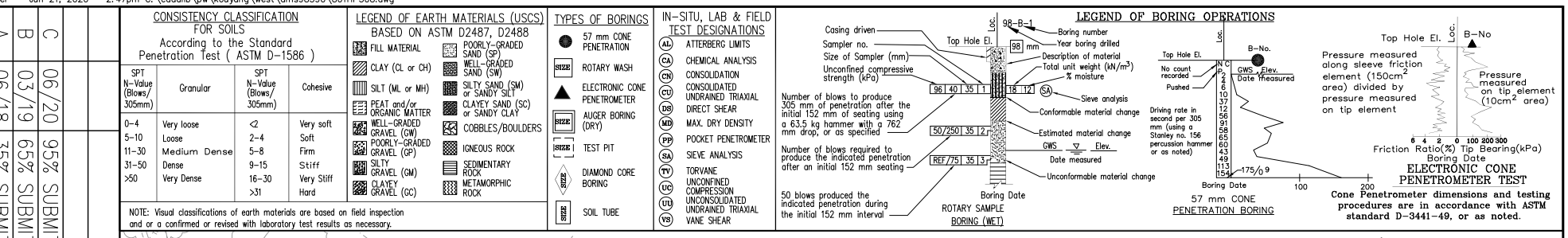
LEGEND OF BORING OPERATIONS



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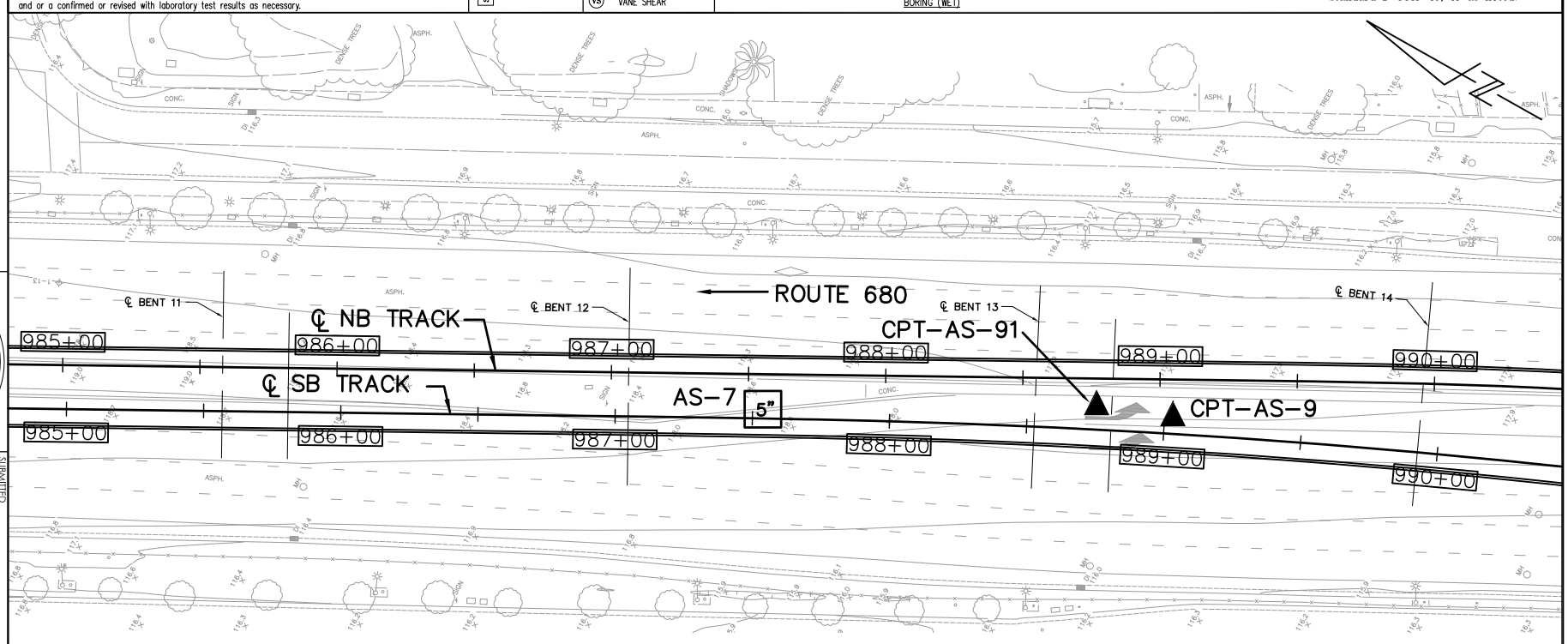

PLAN
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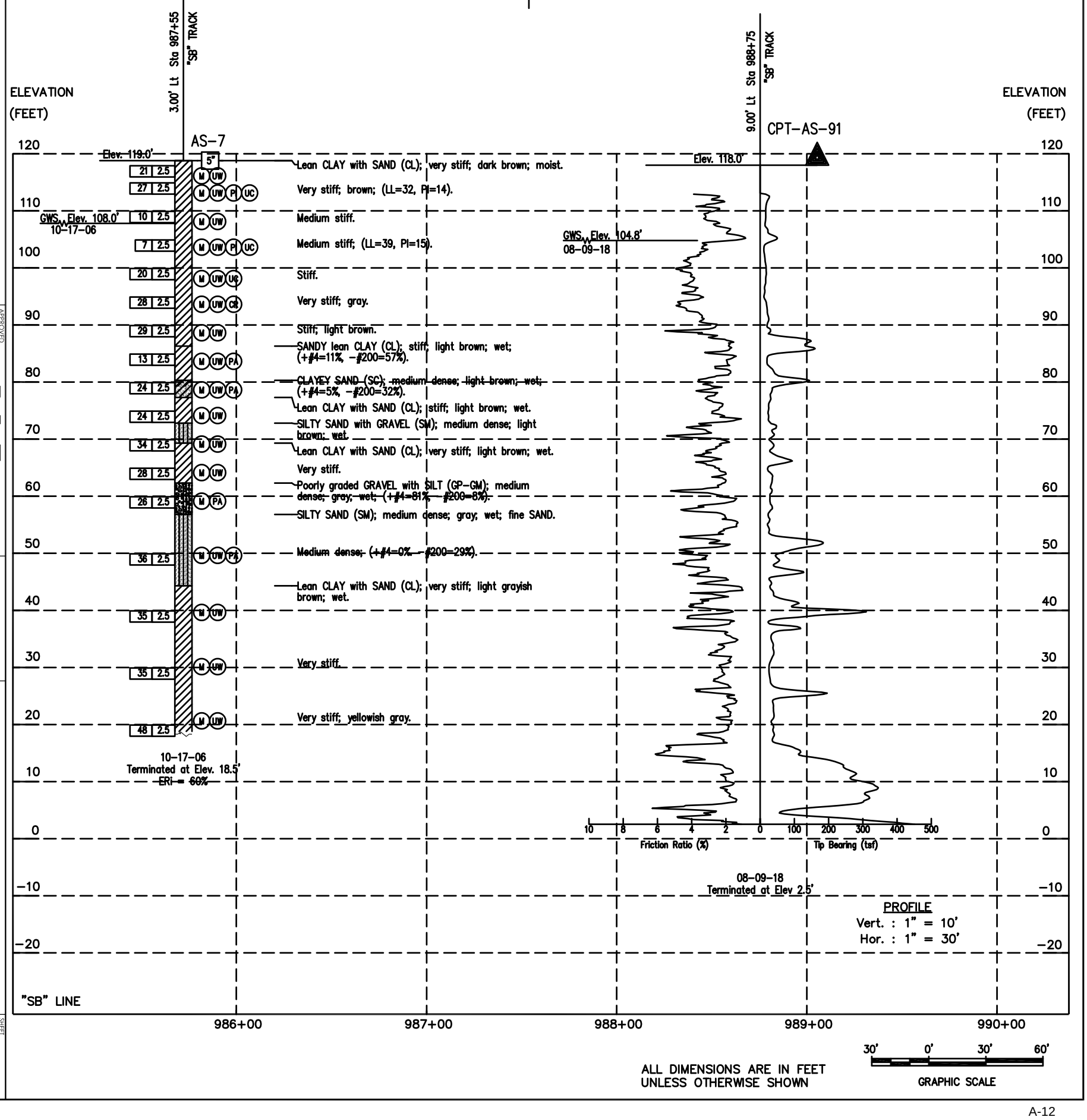

Santa Clara Valley Transportation Authority

APPROVED BKF 100+ YEARS ENGINEERS / SURVEYORS / PLANNERS

CADD FILE DATE 03/26/20 | SUBMITTAL DATE 06/29/20 | SCALE 1:30 | BOARD APPROVAL DATE

PCA NO. 000 | CONTRACT NO. C801 | FILE LOCATION PROJECTWISE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 984+80 TO STA 990+45

REVISION C | DRAWING NO. HP308 | SHEET OF

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NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
C	06/20	95% SUBMITTAL SET

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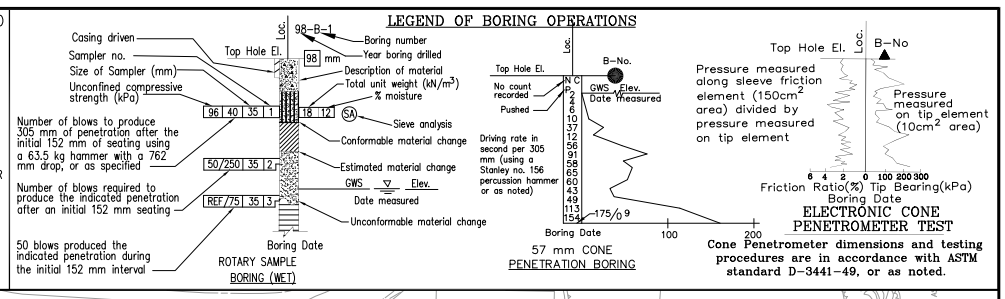
LEGEND OF BORING OPERATIONS



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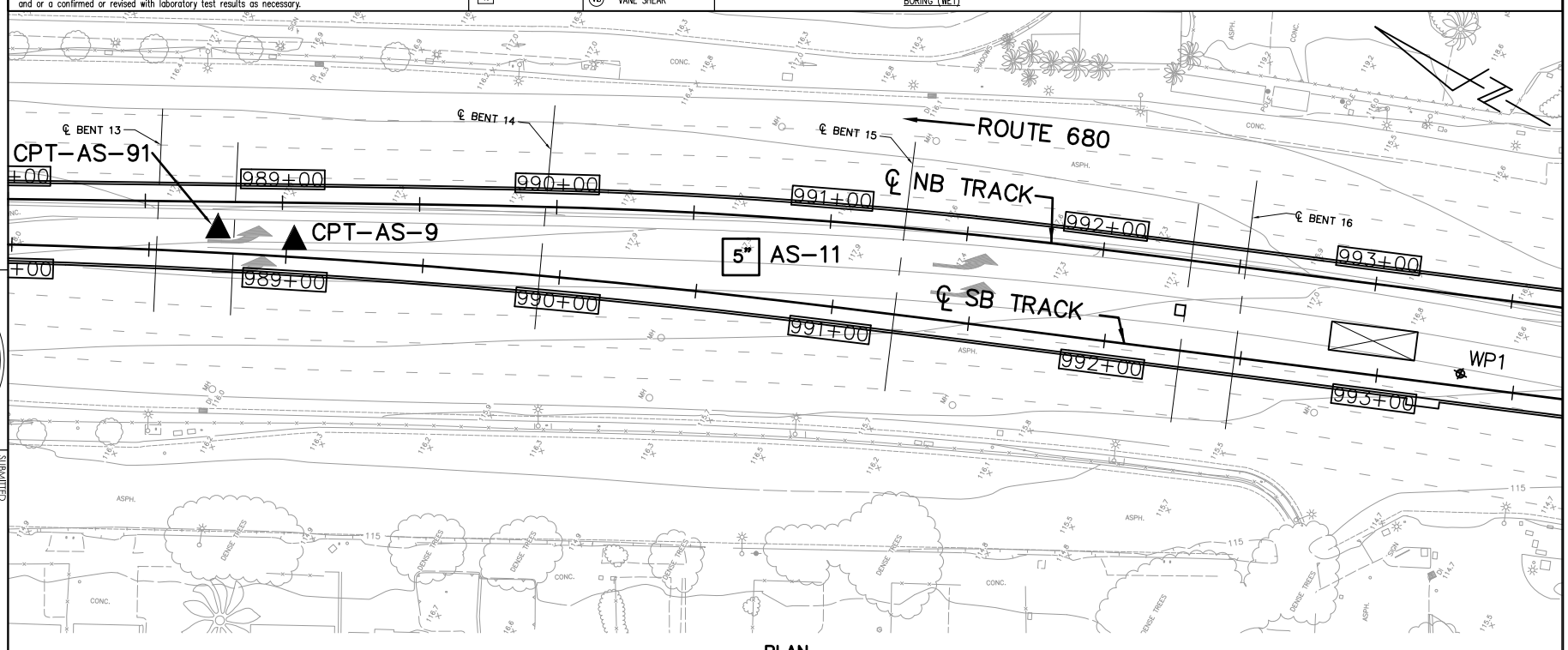

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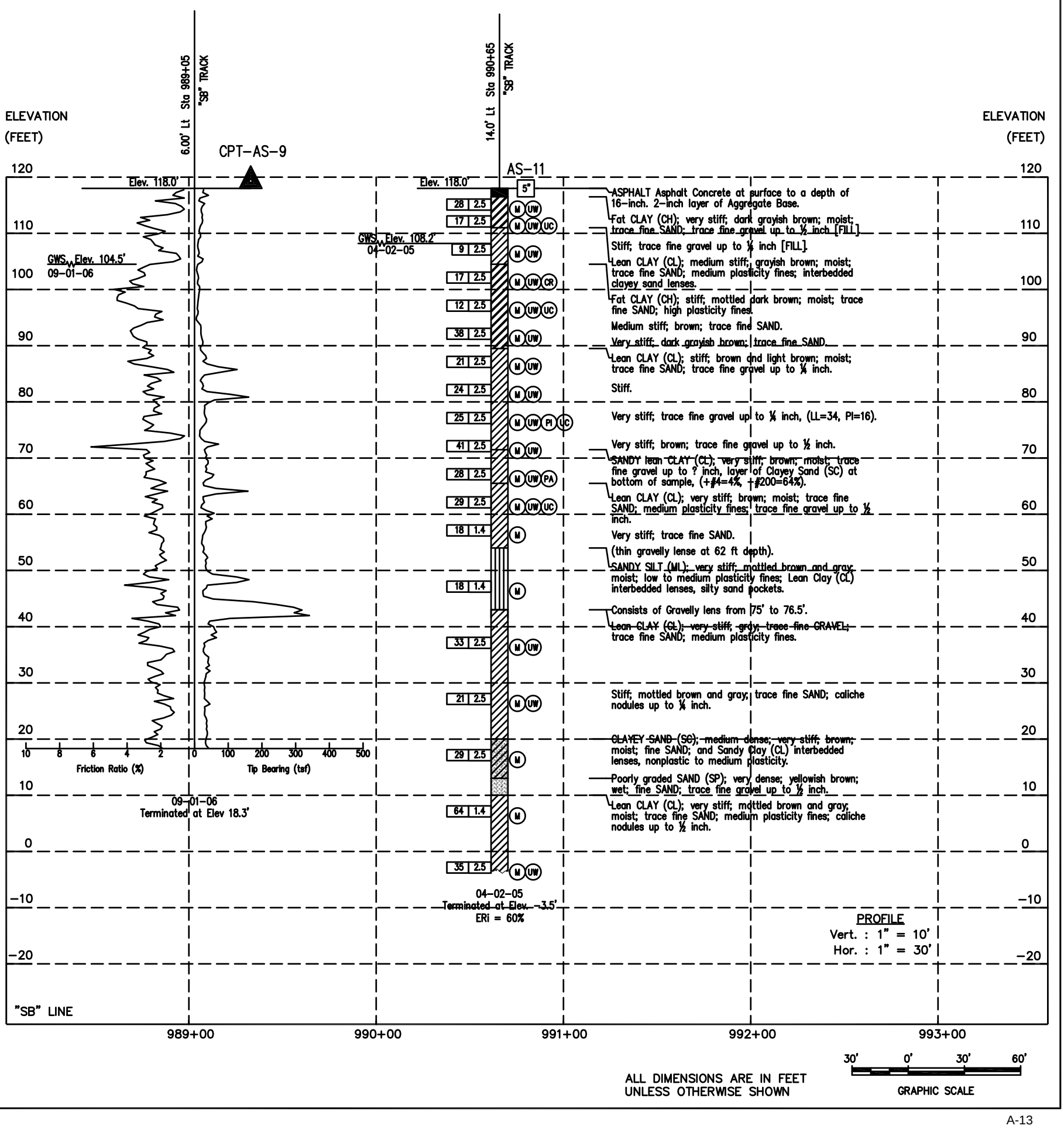

REGISTERED PROFESSIONAL ENGINEER — GARY PARIKH — No. 666 — Exp. 12-31-21 — STATE OF CALIFORNIA GEOTECHNICAL

SUBMITTED

PARIKH
Practicing in the Geosciences
1497 N MILPITAS BLVD.
MILPITAS, CA 95035

DESIGNED E. Ortakci
DRAWN K.Ouyang
CHECKED A. Lam
CADD FILE NAME 801HP309.dwg

Santa Clara Valley Transportation Authority

APPROVED
BKF 100+ YEARS
ENGINEERS / SURVEYORS / PLANNERS

CADD FILE DATE 03/26/20
SUBMITTAL DATE 06/29/20
SCALE 1:30
BOARD APPROVAL DATE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 988+00 TO STA 993+65

PCA NO. 000
CONTRACT NO. C801
FILE LOCATION PROJECTWISE
SHEET OF
DRAWING NO. HP309
REVISION C

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NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
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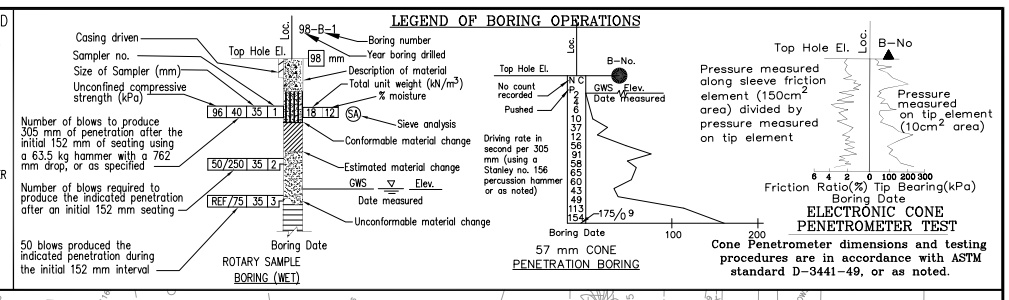
LEGEND OF BORING OPERATIONS



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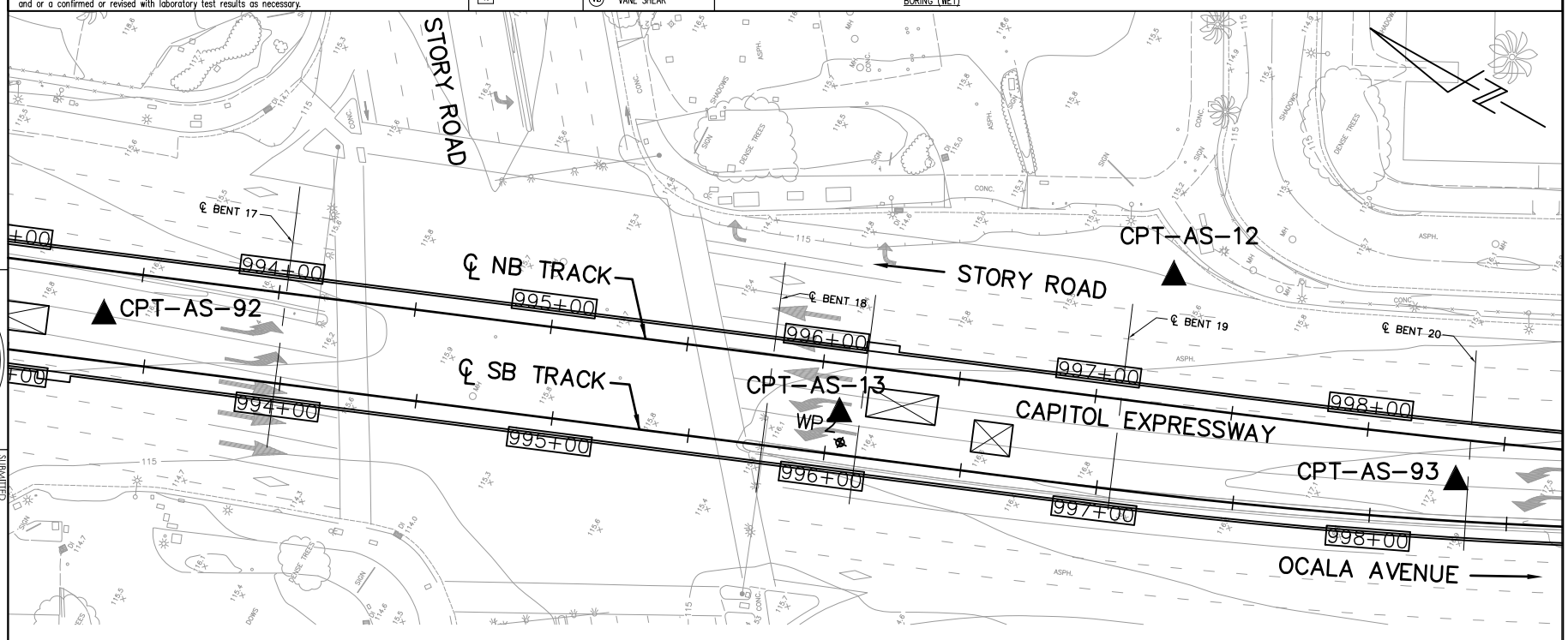

PLAN
1"=30'

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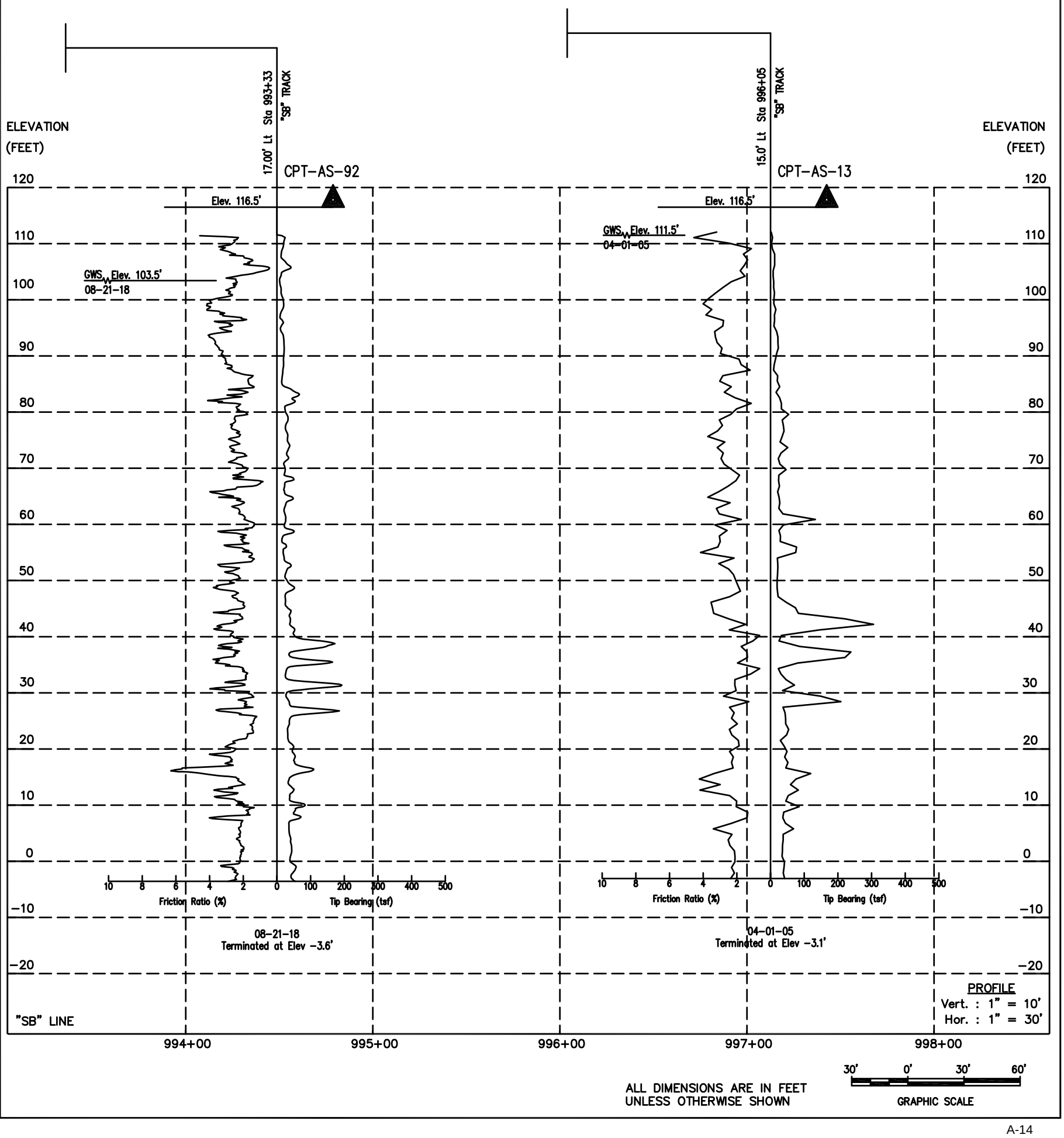

PROFILE
Vert. : 1" = 10'
Hor. : 1" = 30'

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

30' 0' 30' 60'
GRAPHIC SCALE

REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA — GARY PARIKH — No. 666 — Exp. 12-31-21 GEOTECHNICAL

PARIKH — Practicing in the Geosciences — 1497 N. MILPITAS BLVD. MILPITAS, CA 95035

DESIGNED E. Ortakci
DRAWN K. Ouyang
CHECKED A. Lam
CADD FILE NAME 801HP310.dwg

Santa Clara Valley Transportation Authority

APPROVED BKF 100+ YEARS ENGINEERS / SURVEYORS / PLANNERS

CADD FILE DATE 03/26/20
SUBMITTAL DATE 06/29/20
SCALE 1:30
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EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 993+00 TO STA 998+70

PCA NO. 000
CONTRACT NO. C801
FILE LOCATION PROJECTWISE
SHEET OF
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REVISION C

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SHEET OF
DRAWING NO. HP311
REVISION C

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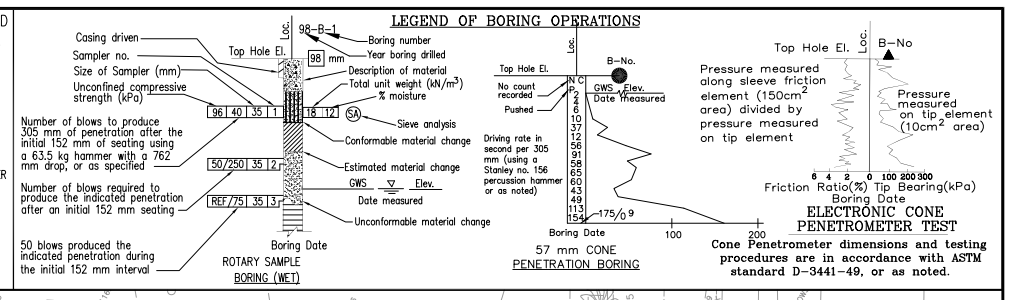
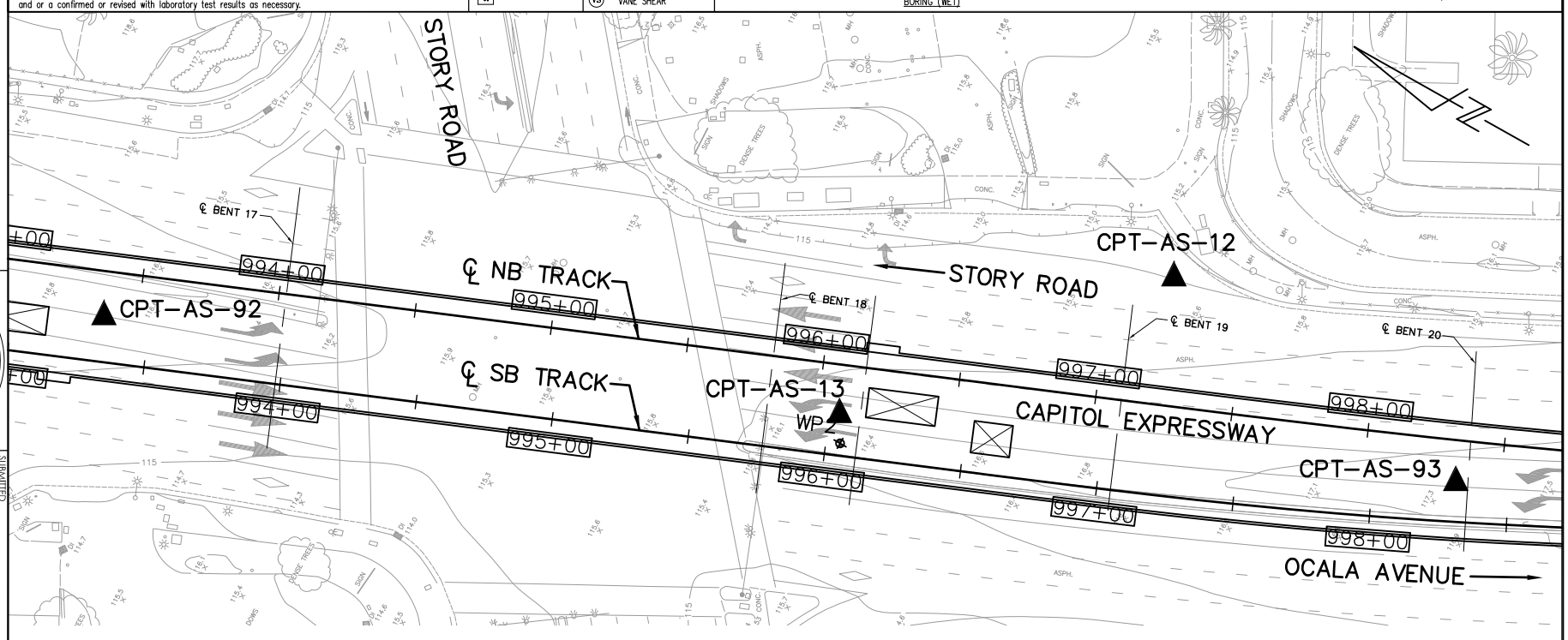
TYPES OF BORINGS
57 mm CONE PENETRATION; ROTARY WASH; ELECTRONIC CONE PENETROMETER; AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; SOIL TUBE

IN-SITU, LAB & FIELD TEST DESIGNATIONS
AL ATTERBERG LIMITS; CA CHEMICAL ANALYSIS; CN CONSOLIDATION; CU CONSOLIDATED UNDRAINED TRIAXIAL; DS DIRECT SHEAR; MD MAX. DRY DENSITY; PP POCKET PENETROMETER; SA SIEVE ANALYSIS; TV TORVANE UNCONFINED COMPRESSION; UC UNCONSOLIDATED UNDRAINED TRIAXIAL; VS VANE SHEAR

LEGEND OF BORING OPERATIONS


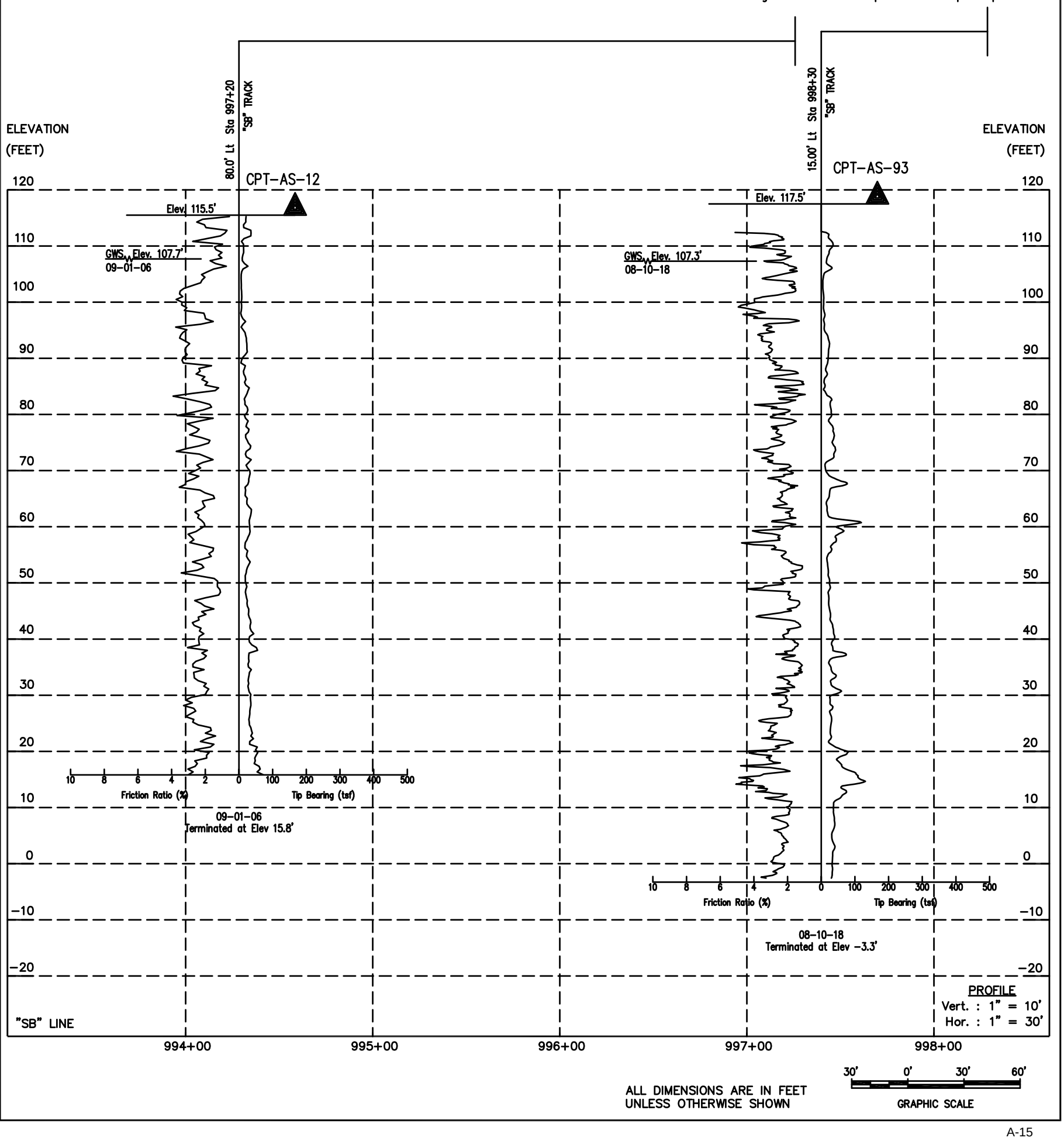
Cone Penetrometer dimensions and testing procedures are in accordance with ASTM standard D-3441-49, or as noted.



PLAN
1"=30'

NOTES:
Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2" Modified California Sampler: I.D. = 2.5"; O.D. = 3" Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

BENCHMARK:
The Horizontal datum is NAD 83 – Epoch 1991.35. Coordinates are on the California State Plane, Zone 0403. To obtain ground distances, multiply grid distances by 0.9999541. The Vertical datum is NAVD 88. Elevations and boring locations are interpreted from topo map.



ogouthier Jun 21, 2020 – 3:05pm C:\caddlib\pw\kouyang\west\dms98390\801HP312.dwg

NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
C	06/20	95% SUBMITTAL SET

CONSISTENCY CLASSIFICATION FOR SOILS
According to the Standard Penetration Test (ASTM D-1586)

SPT N-Value (Blows/ 305mm)	Granular	SPT N-Value (Blows/ 305mm)	Cohesive
0-4	Very loose	<2	Very soft
5-10	Loose	2-4	Soft
11-30	Medium Dense	5-8	Firm
31-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very Stiff
		>31	Hard

NOTE: Visual classifications of earth materials are based on field inspection and or a confirmed or revised with laboratory test results as necessary.

LEGEND OF EARTH MATERIALS (USCS)
BASED ON ASTM D2487, D2488

FILL MATERIAL; CLAY (CL or CH); SILT (ML or MH); PEAT and/or ORGANIC MATTER; WELL-GRADED GRAVEL (GW); POORLY-GRADED GRAVEL (GP); SILTY GRAVEL (GM); CLAYEY GRAVEL (GC); POORLY-GRADED SAND (SP); WELL-GRADED SAND (SW); SILTY SAND (SM) or SANDY SILT; CLAYEY SAND (SC) or SANDY CLAY; COBBLES/BOULDERS; IGNEOUS ROCK; SEDIMENTARY ROCK; METAMORPHIC ROCK

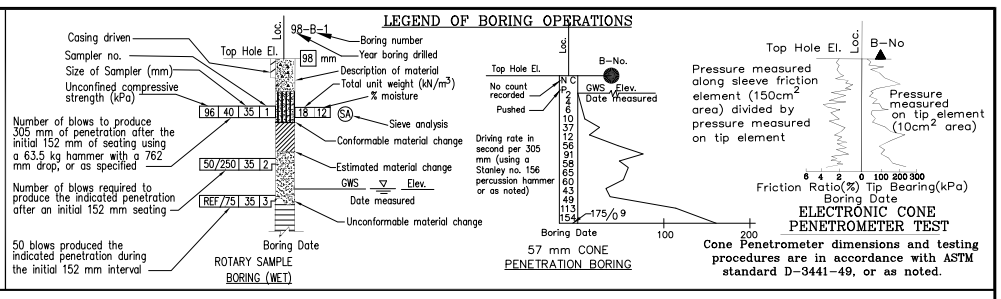
TYPES OF BORINGS

57 mm CONE PENETRATION; ROTARY WASH; ELECTRONIC CONE PENETROMETER; AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; SOIL TUBE

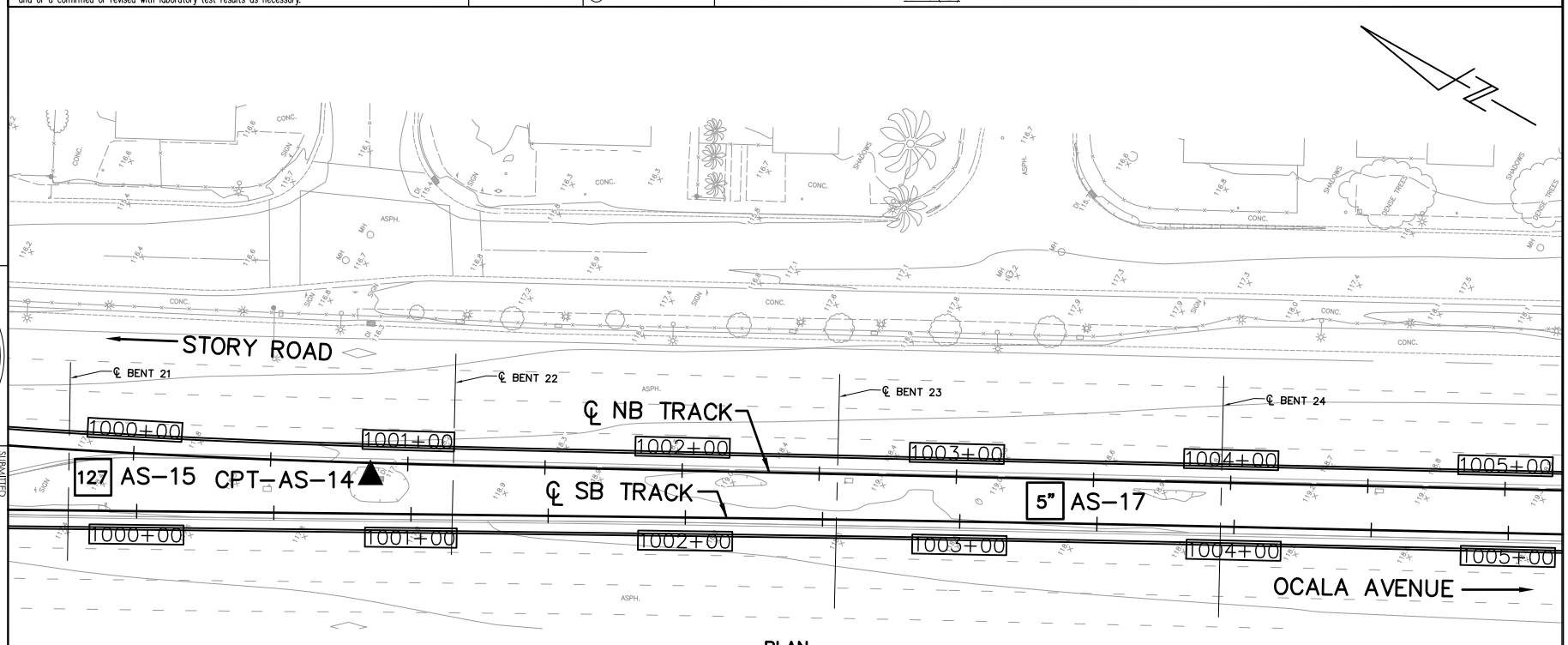
IN-SITU, LAB & FIELD TEST DESIGNATIONS

(AL) ATTERBERG LIMITS; (CA) CHEMICAL ANALYSIS; (CN) CONSOLIDATION; (CU) CONSOLIDATED UNDRAINED TRIAXIAL; (DS) DIRECT SHEAR; (MD) MAX. DRY DENSITY; (PP) POCKET PENETROMETER; (SA) SIEVE ANALYSIS; (TV) TORVANE; (UC) UNCONFINED COMPRESSION; (UU) UNCONSOLIDATED UNDRAINED TRIAXIAL; (VS) VANE SHEAR

LEGEND OF BORING OPERATIONS



Cone Penetrometer dimensions and testing procedures are in accordance with ASTM standard D-3441-49, or as noted.



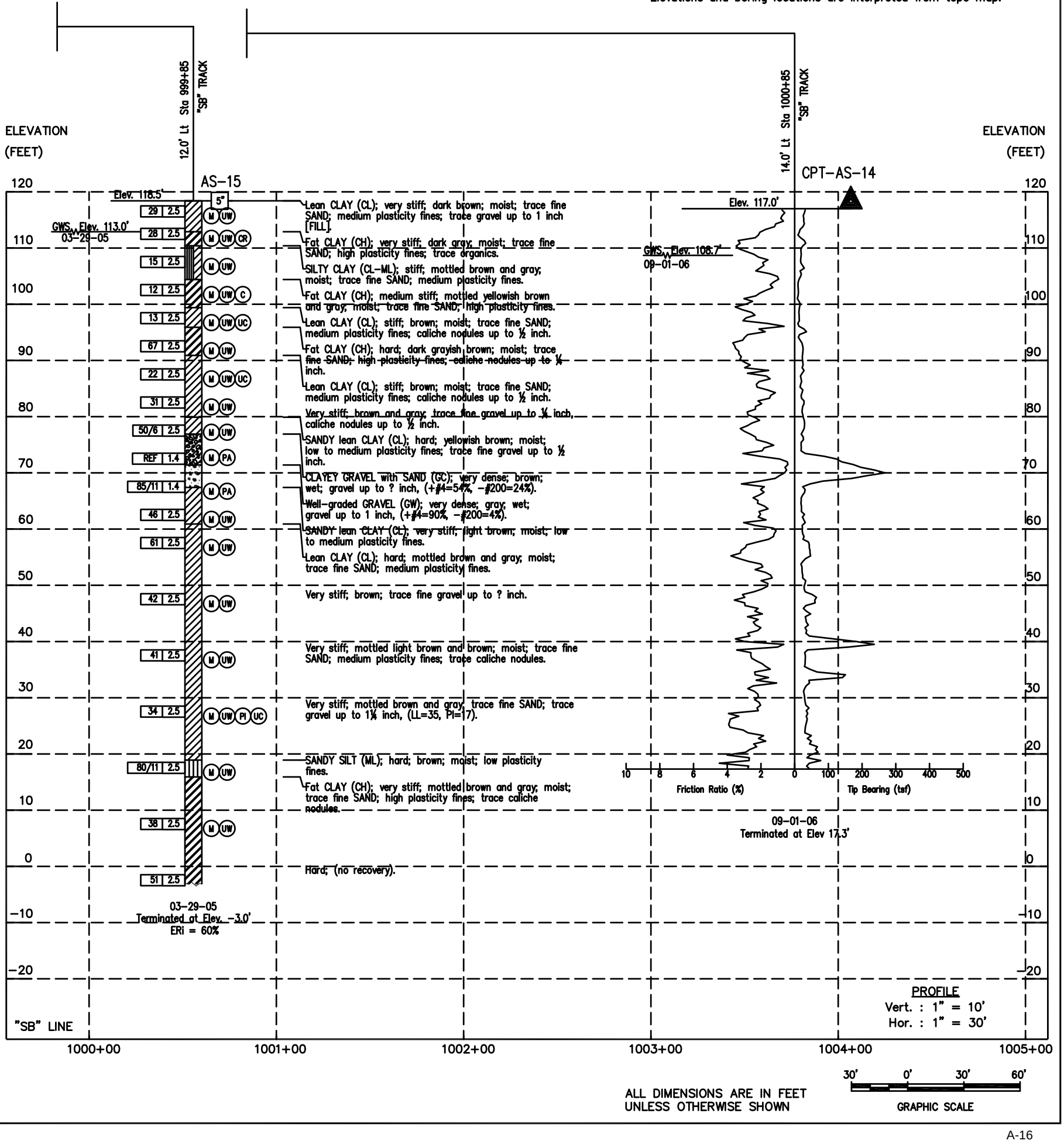
PLAN
1"=30'

NOTES:

Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2" Modified California Sampler: I.D. = 2.5"; O.D. = 3" Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

BENCHMARK:

The Horizontal datum is NAD 83 – Epoch 1991.35. Coordinates are on the California State Plane, Zone 0403. To obtain ground distances, multiply grid distances by 0.9999541. The Vertical datum is NAVD 88. Elevations and boring locations are interpreted from topo map.



PROFILE
Vert. : 1" = 10'
Hor. : 1" = 30'

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

30' 0' 30' 60'
GRAPHIC SCALE

REGISTERED PROFESSIONAL ENGINEER
STATE OF CALIFORNIA
GARY PARIKH
No. 666
Exp. 12-31-21
GEOTECHNICAL

PARIKH
Practicing in the Geosciences
1497 N MILPITAS BLVD.
MILPITAS, CA 95035

DESIGNED E. Ortakci
DRAWN K. Ouyang
CHECKED A. Lam
CADD FILE NAME 801HP312.dwg

SUBMITTED
APPROVED
BKF 100+ YEARS
ENGINEERS / SURVEYORS / PLANNERS
CADD FILE DATE 03/26/20
SUBMITTAL DATE 06/29/20
SCALE 1:30
BOARD APPROVAL DATE

Santa Clara Valley Transportation Authority

PCA NO. 000
CONTRACT NO. C801
FILE LOCATION PROJECTWISE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 999+50 TO STA 1005+20

SHEET OF
DRAWING NO. HP312
REVISION C

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NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
C	06/20	95% SUBMITTAL SET

REGISTERED PROFESSIONAL ENGINEER — GARY PARIKH — No. 666 — Exp. 12-31-21 — GEOTECHNICAL — STATE OF CALIFORNIA

SUBMITTED

PARIKH — Practicing in the Geosciences — 1497 N MILPITAS BLVD. MILPITAS, CA 95035

DESIGNED E. Ortakci | DRAWN K. Ouyang | CHECKED A. Lam | CADD FILE NAME 801HP313.dwg

BKF ENGINEERS / SURVEYORS / PLANNERS — 100+ YEARS

APPROVED

CADD FILE DATE 03/26/20 | SUBMITTAL DATE 06/29/20 | SCALE 1:30 | BOARD APPROVAL DATE

Santa Clara Valley Transportation Authority

PCA NO. 000 | CONTRACT NO. C801 | FILE LOCATION PROJECTWISE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 1001+00 TO STA 1006+65

SHEET OF | DRAWING NO. HP313 | REVISION C

CONSISTENCY CLASSIFICATION FOR SOILS
According to the Standard Penetration Test (ASTM D-1586)

SPT N-Value (Blows/ 305mm)	Granular	SPT N-Value (Blows/ 305mm)	Cohesive
0–4	Very loose	<2	Very soft
5–10	Loose	2–4	Soft
11–30	Medium Dense	5–8	Firm
31–50	Dense	9–15	Stiff
>50	Very Dense	16–30	Very Stiff
		>31	Hard

NOTE: Visual classifications of earth materials are based on field inspection and or a confirmed or revised with laboratory test results as necessary.

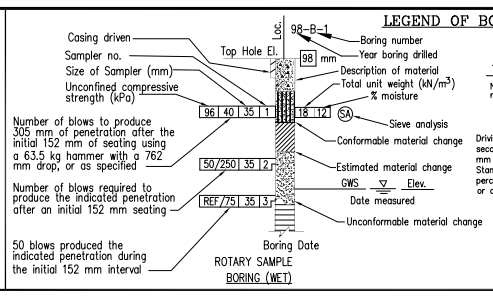
LEGEND OF EARTH MATERIALS (USCS)
BASED ON ASTM D2487, D2488

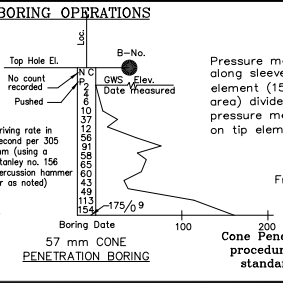
FILL MATERIAL; CLAY (CL or CH); SILT (ML or MH); PEAT and/or ORGANIC MATTER; WELL-GRADED GRAVEL (GW); POORLY-GRADED GRAVEL (GP); SILTY GRAVEL (GM); CLAYEY GRAVEL (GC); POORLY-GRADED SAND (SP); WELL-GRADED SAND (SW); SILTY SAND (SM) or SANDY SILT; CLAYEY SAND (SC) or SANDY CLAY; COBBLES/BOULDERS; IGNEOUS ROCK; SEDIMENTARY ROCK; METAMORPHIC ROCK

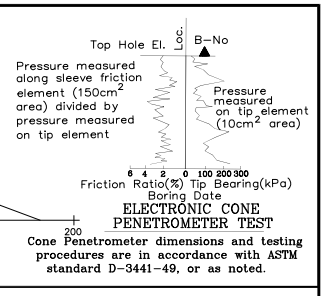
TYPES OF BORINGS
57 mm CONE PENETRATION; ROTARY WASH; ELECTRONIC CONE PENETROMETER; AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; SOIL TUBE

IN-SITU, LAB & FIELD TEST DESIGNATIONS
(AL) ATTERBERG LIMITS; (CA) CHEMICAL ANALYSIS; (CN) CONSOLIDATION; (CU) CONSOLIDATED UNDRAINED TRIAXIAL; (DS) DIRECT SHEAR; (MD) MAX. DRY DENSITY; (PP) POCKET PENETROMETER; (SA) SIEVE ANALYSIS; (TV) TORVANE UNCONFINED COMPRESSION; (UC) UNCONSOLIDATED UNDRAINED TRIAXIAL; (VS) VANE SHEAR

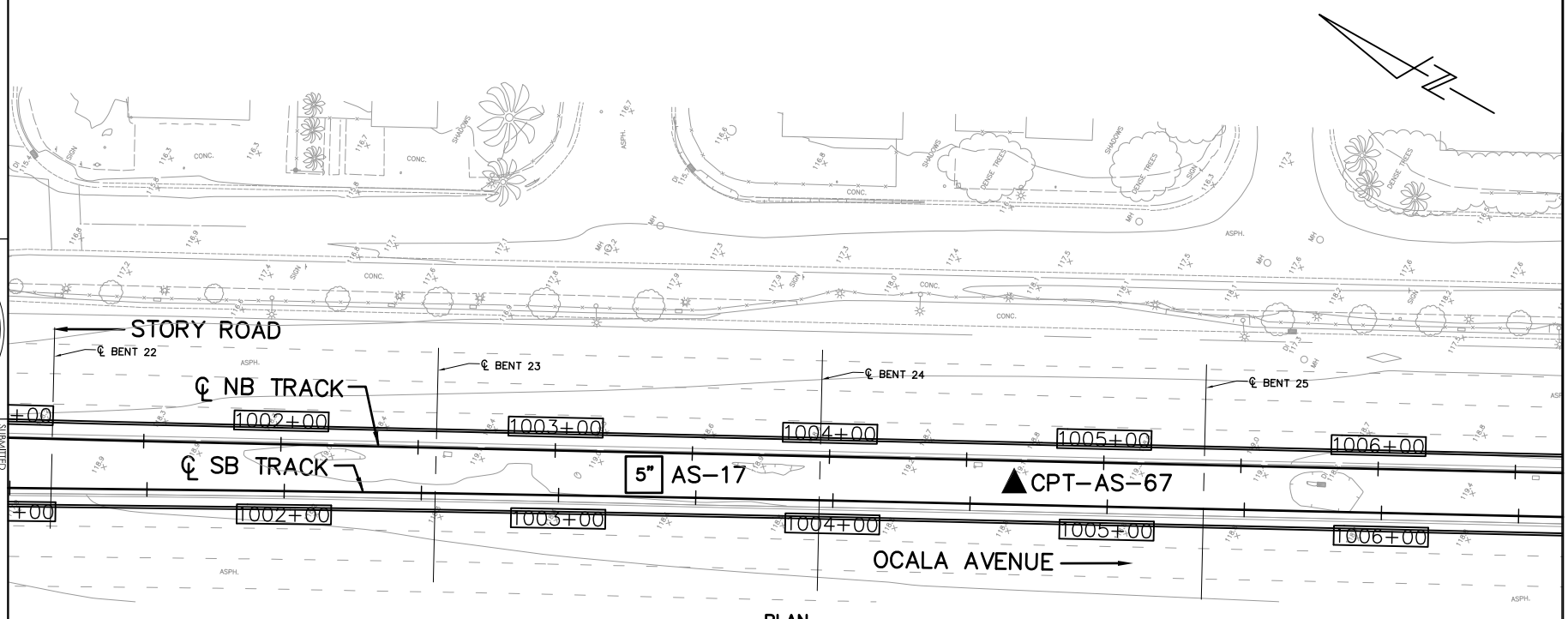
LEGEND OF BORING OPERATIONS







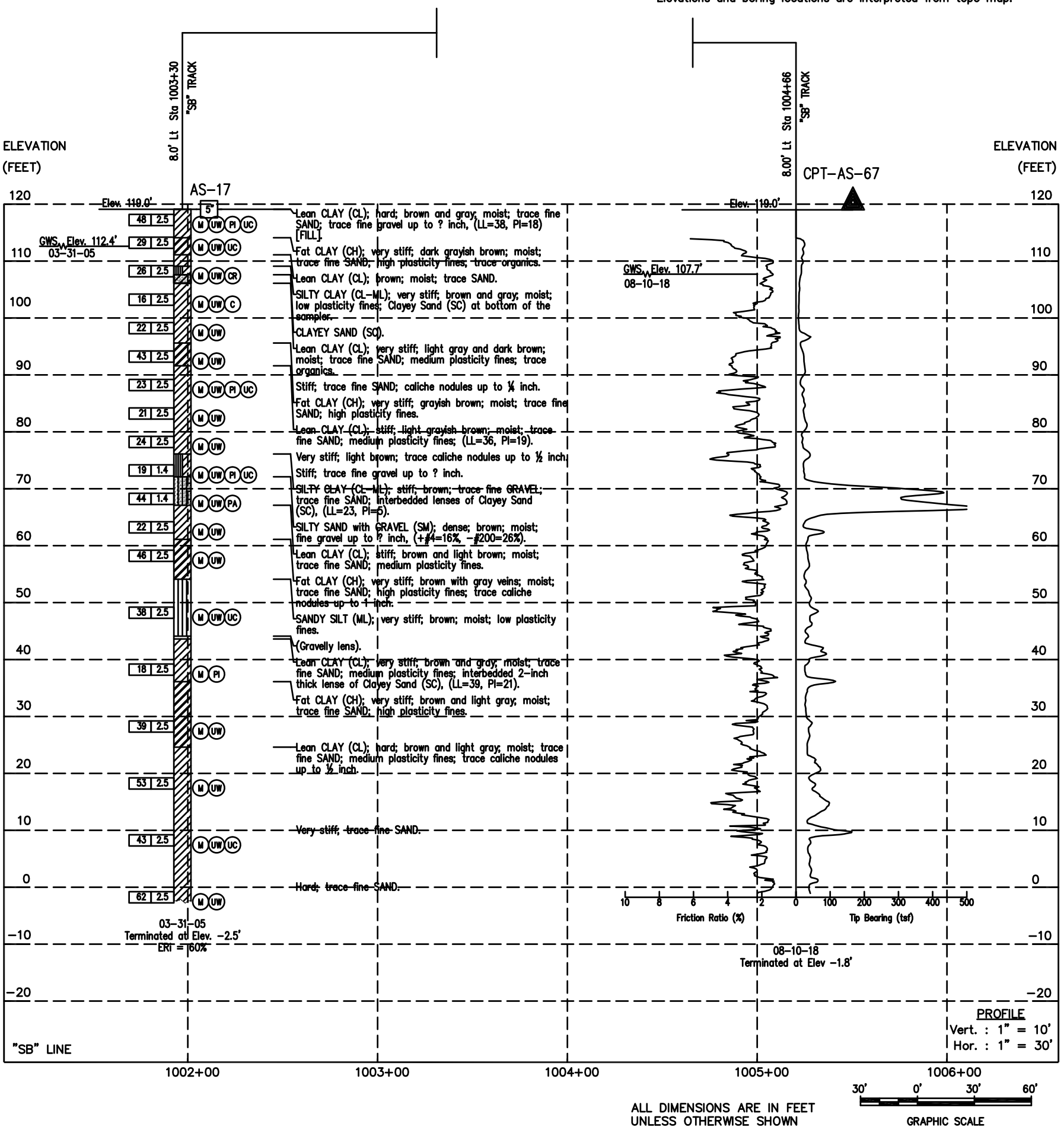
Cone Penetrometer dimensions and testing procedures are in accordance with ASTM standard D-3441-49, or as noted.



PLAN
1"=30'

NOTES:
Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2" Modified California Sampler: I.D. = 2.5"; O.D. = 3" Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

BENCHMARK:
The Horizontal datum is NAD 83 – Epoch 1991.35. Coordinates are on the California State Plane, Zone 0403. To obtain ground distances, multiply grid distances by 0.9999541. The Vertical datum is NAVD 88. Elevations and boring locations are interpreted from topo map.



PROFILE
Vert. : 1" = 10'
Hor. : 1" = 30'

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

30' 0' 30' 60'
GRAPHIC SCALE

ogouthier Jun 21, 2020 – 3:10pm C:\caddlib\pw\kouyang\west\dms98390\801HP314.dwg

NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
C	06/20	95% SUBMITTAL SET

CONSISTENCY CLASSIFICATION FOR SOILS
According to the Standard Penetration Test (ASTM D-1586)

SPT N-Value (Blows/ 305mm)	Granular	SPT N-Value (Blows/ 305mm)	Cohesive
0–4	Very loose	<2	Very soft
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11–30	Medium Dense	5–8	Firm
31–50	Dense	9–15	Stiff
>50	Very Dense	16–30	Very Stiff
		>31	Hard

NOTE: Visual classifications of earth materials are based on field inspection and or a confirmed or revised with laboratory test results as necessary.

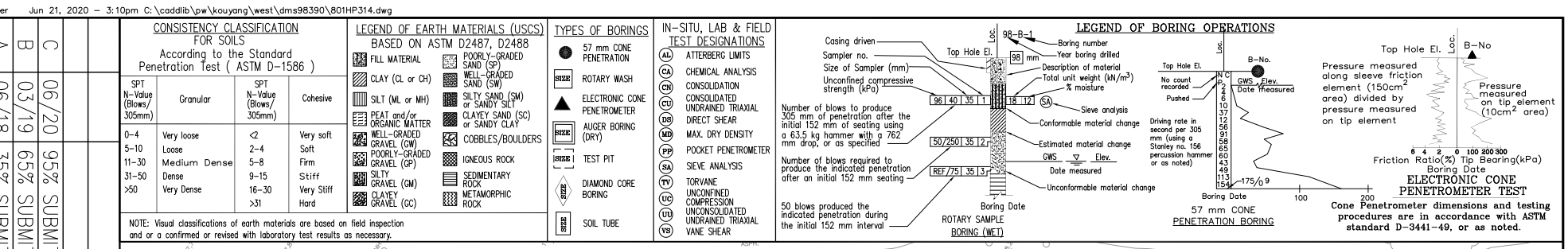
LEGEND OF EARTH MATERIALS (USCS)
BASED ON ASTM D2487, D2488

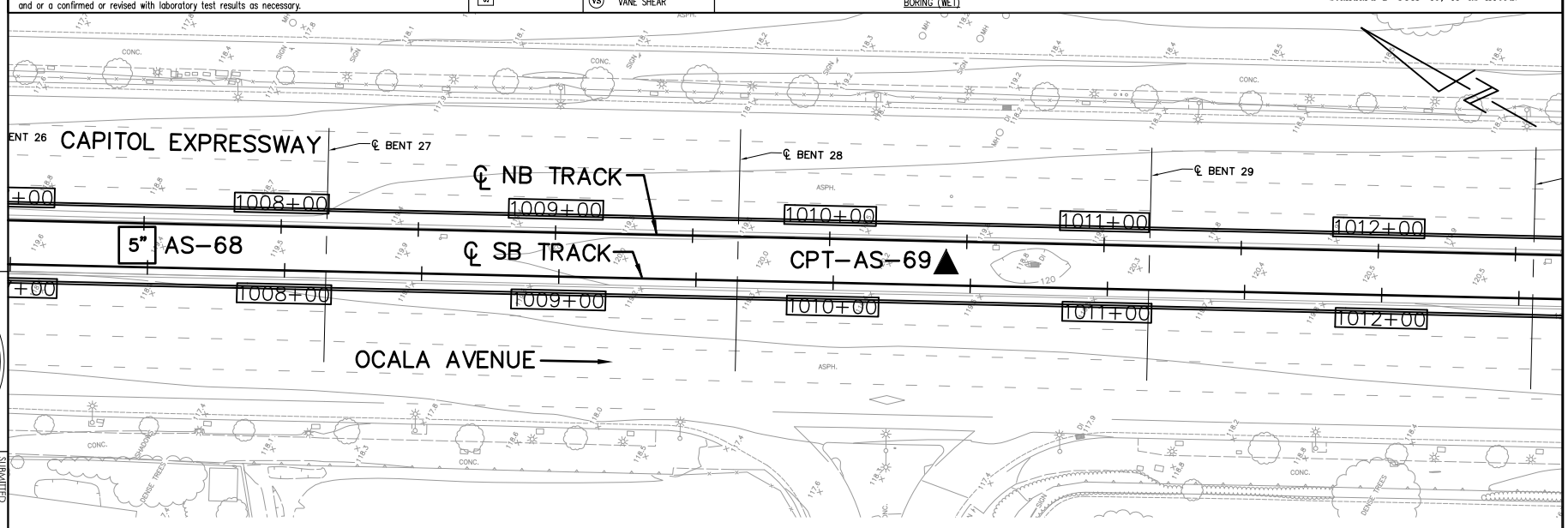
FILL MATERIAL; CLAY (CL or CH); SILT (ML or MH); PEAT and/or ORGANIC MATTER; WELL-GRADED GRAVEL (GW); POORLY-GRADED GRAVEL (GP); SILTY GRAVEL (GM); CLAYEY GRAVEL (GC); POORLY-GRADED SAND (SP); WELL-GRADED SAND (SW); SILTY SAND (SM) or SANDY SILT; CLAYEY SAND (SC) or SANDY CLAY; COBBLES/BOULDERS; IGNEOUS ROCK; SEDIMENTARY ROCK; METAMORPHIC ROCK

TYPES OF BORINGS
57 mm CONE PENETRATION; ROTARY WASH; ELECTRONIC CONE PENETROMETER; AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; SOIL TUBE

IN-SITU, LAB & FIELD TEST DESIGNATIONS
(AL) ATTERBERG LIMITS; (CA) CHEMICAL ANALYSIS; (CN) CONSOLIDATION; (CU) CONSOLIDATED UNDRAINED TRIAXIAL; (DS) DIRECT SHEAR; (MD) MAX. DRY DENSITY; (PP) POCKET PENETROMETER; (SA) SIEVE ANALYSIS; (TV) TORVANE UNCONFINED COMPRESSION; (UC) UNCONSOLIDATED UNDRAINED TRIAXIAL; (VS) VANE SHEAR

LEGEND OF BORING OPERATIONS

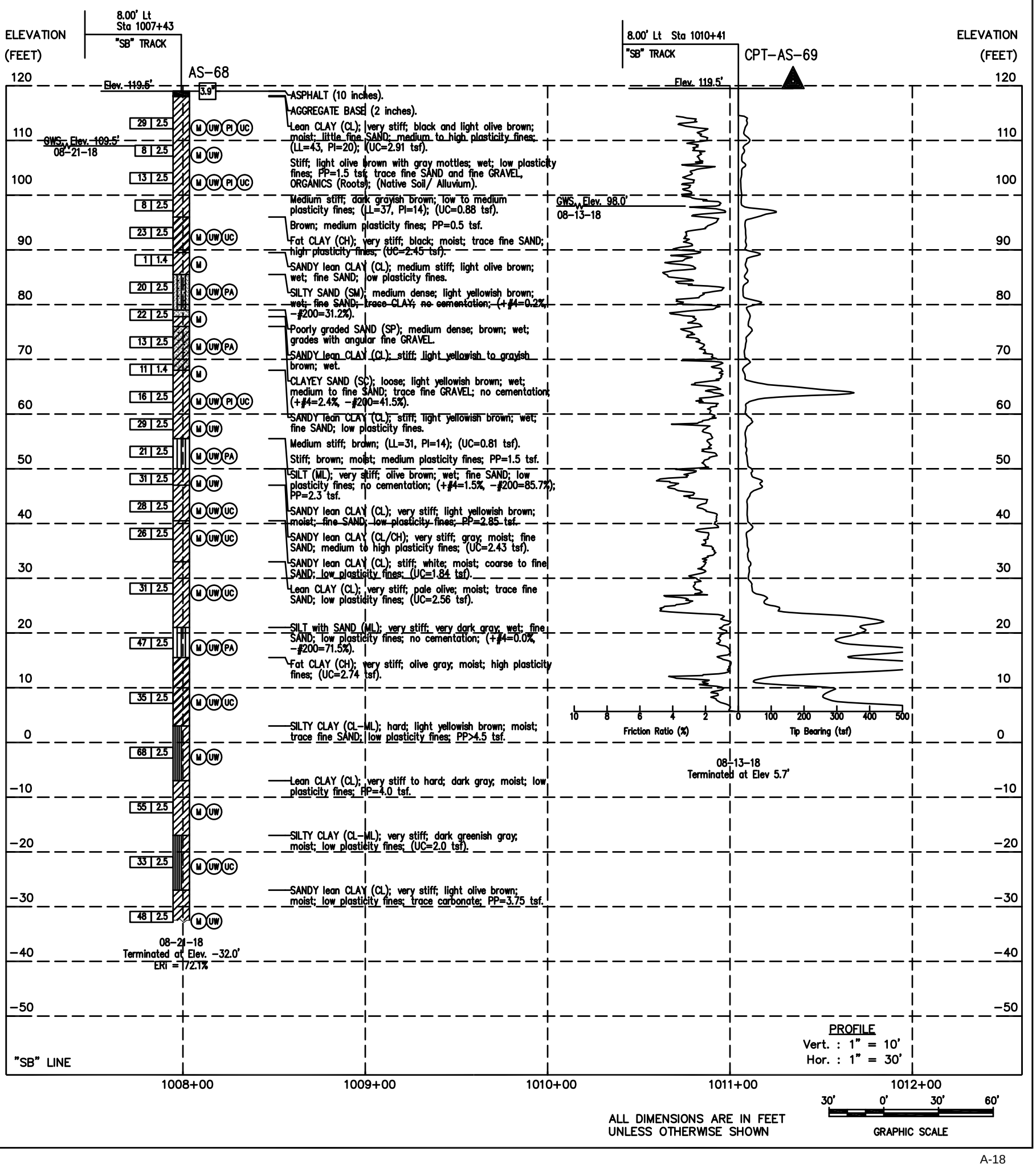




PLAN
1"=30'

NOTES:
Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2" Modified California Sampler: I.D. = 2.5"; O.D. = 3" Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

BENCHMARK:
The Horizontal datum is NAD 83 – Epoch 1991.35. Coordinates are on the California State Plane, Zone 0403. To obtain ground distances, multiply grid distances by 0.9999541. The Vertical datum is NAVD 88. Elevations and boring locations are interpreted from topo map.



REGISTERED PROFESSIONAL ENGINEER — GARY PARIKH — No. 666 — Exp. 12-31-21 — STATE OF CALIFORNIA GEOTECHNICAL

SUBMITTED

DESIGNED E. Ortakci
DRAWN K. Ouyang
CHECKED A. Lam
CADD FILE NAME 801HP314.dwg

PARIKH
Practicing in the Geosciences
1497 N MILPITAS BLVD.
MILPITAS, CA 95035

Santa Clara Valley Transportation Authority

APPROVED

BKF ENGINEERS / SURVEYORS / PLANNERS 100+ YEARS

CADD FILE DATE 03/26/20
SUBMITTAL DATE 06/29/20
SCALE 1:30
BOARD APPROVAL DATE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 1007+00 TO STA 1012+65

PCA NO. 000
CONTRACT NO. C801
FILE LOCATION PROJECTWISE
SHEET OF
DRAWING NO. HP314
REVISION C

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NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
C	06/20	95% SUBMITTAL SET

CONSISTENCY CLASSIFICATION FOR SOILS
According to the Standard Penetration Test (ASTM D-1586)

SPT N-Value (Blows/ 305mm)	Granular	SPT N-Value (Blows/ 305mm)	Cohesive
0–4	Very loose	<2	Very soft
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11–30	Medium Dense	5–8	Firm
31–50	Dense	9–15	Stiff
>50	Very Dense	16–30	Very Stiff
		>31	Hard

NOTE: Visual classifications of earth materials are based on field inspection and or a confirmed or revised with laboratory test results as necessary.

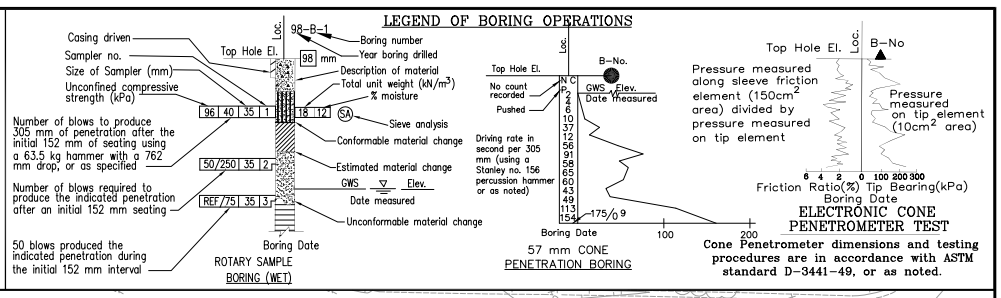
LEGEND OF EARTH MATERIALS (USCS)
BASED ON ASTM D2487, D2488

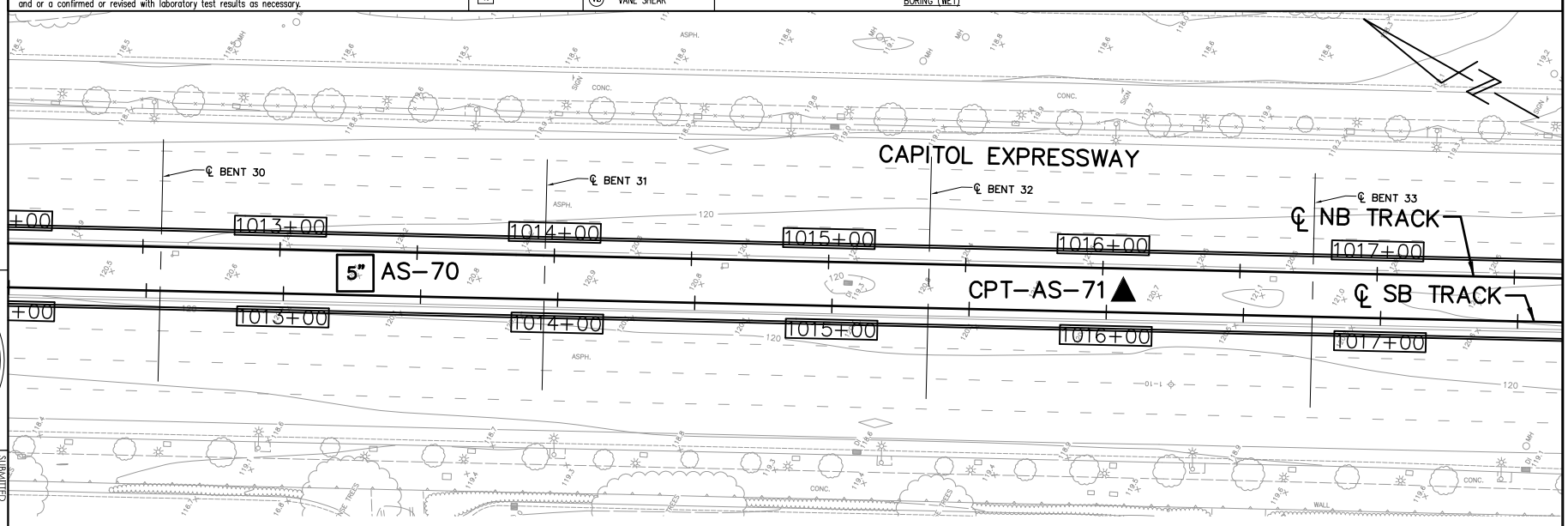
FILL MATERIAL; CLAY (CL or CH); SILT (ML or MH); PEAT and/or ORGANIC MATTER; WELL-GRADED GRAVEL (GW); POORLY-GRADED GRAVEL (GP); SILTY GRAVEL (GM); CLAYEY GRAVEL (GC); POORLY-GRADED SAND (SP); WELL-GRADED SAND (SW); SILTY SAND (SM) or SANDY SILT; CLAYEY SAND (SC) or SANDY CLAY; COBBLES/BOULDERS; IGNEOUS ROCK; SEDIMENTARY ROCK; METAMORPHIC ROCK

TYPES OF BORINGS
57 mm CONE PENETRATION; ROTARY WASH; ELECTRONIC CONE PENETROMETER; AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; SOIL TUBE

IN-SITU, LAB & FIELD TEST DESIGNATIONS
(AL) ATTERBERG LIMITS; (CA) CHEMICAL ANALYSIS; (CN) CONSOLIDATION; (CU) CONSOLIDATED UNDRAINED TRIAXIAL; (DS) DIRECT SHEAR; (MD) MAX. DRY DENSITY; (PP) POCKET PENETROMETER; (SA) SIEVE ANALYSIS; (TV) TORVANE UNCONFINED COMPRESSION; (UC) UNCONSOLIDATED UNDRAINED TRIAXIAL; (VS) VANE SHEAR

LEGEND OF BORING OPERATIONS





PLAN
1"=30'

NOTES:
Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2" Modified California Sampler: I.D. = 2.5"; O.D. = 3" Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

BENCHMARK:
The Horizontal datum is NAD 83 – Epoch 1991.35. Coordinates are on the California State Plane, Zone 0403. To obtain ground distances, multiply grid distances by 0.9999541. The Vertical datum is NAVD 88. Elevations and boring locations are interpreted from topo map.

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 1012+00 TO STA 1017+65

PCA NO. 000 | CONTRACT NO. C801 | FILE LOCATION PROJECTWISE | SHEET OF | DRAWING NO. HP315 | REVISION C

SUBMITTED | APPROVED | SCALE 1:30 | BOARD APPROVAL DATE | SUBMITTAL DATE 06/29/20 | CADD FILE DATE 03/26/20

DESIGNED E. Ortakci | DRAWN K. Ouyang | CHECKED A. Lam | CADD FILE NAME 801HP315.dwg

REGISTERED PROFESSIONAL ENGINEER — GARY PARIKH — No. 666 — Exp. 12-31-21 — GEOTECHNICAL — STATE OF CALIFORNIA

PARIKH — Practicing in the Geosciences — 1497 N MILPITAS BLVD. MILPITAS, CA 95035

Santa Clara Valley Transportation Authority

BKF ENGINEERS / SURVEYORS / PLANNERS — 100+ YEARS

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NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
C	06/20	95% SUBMITTAL SET

REGISTERED PROFESSIONAL ENGINEER — GARY PARIKH — No. 666 — Exp. 12-31-21 — GEOTECHNICAL — STATE OF CALIFORNIA

DESIGNED E. Ortakci
DRAWN K. Ouyang
CHECKED A. Lam
CADD FILE NAME 801HP316.dwg

PARIKH — Practicing in the Geosciences — 1497 N. MILPITAS BLVD. MILPITAS, CA 95035

SUBMITTED

Santa Clara Valley Transportation Authority

APPROVED

BKF 100+ YEARS — ENGINEERS / SURVEYORS / PLANNERS

CADD FILE DATE 03/26/20
SUBMITTAL DATE 06/29/20
SCALE 1:30
BOARD APPROVAL DATE

PCA NO. 000
CONTRACT NO. C801
FILE LOCATION PROJECTWISE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 1018+00 TO STA 1023+65

SHEET OF
DRAWING NO. HP316
REVISION C

CONSISTENCY CLASSIFICATION FOR SOILS

According to the Standard Penetration Test (ASTM D-1586)

SPT N-Value (Blows/ 305mm)	Granular	SPT N-Value (Blows/ 305mm)	Cohesive
0–4	Very loose	<2	Very soft
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LEGEND OF EARTH MATERIALS (USCS) BASED ON ASTM D2487, D2488

FILL MATERIAL; CLAY (CL or CH); SILT (ML or MH); PEAT and/or ORGANIC MATTER; WELL-GRADED GRAVEL (GW); POORLY-GRADED GRAVEL (GP); SILTY GRAVEL (GM); CLAYEY GRAVEL (GC); POORLY-GRADED SAND (SP); WELL-GRADED SAND (SW); SILTY SAND (SM) or SANDY SILT; CLAYEY SAND (SC) or SANDY CLAY; COBBLES/BOULDERS; IGNEOUS ROCK; SEDIMENTARY ROCK; METAMORPHIC ROCK

TYPES OF BORINGS

57 mm CONE PENETRATION; ROTARY WASH; ELECTRONIC CONE PENETROMETER; AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; SOIL TUBE

IN-SITU, LAB & FIELD TEST DESIGNATIONS

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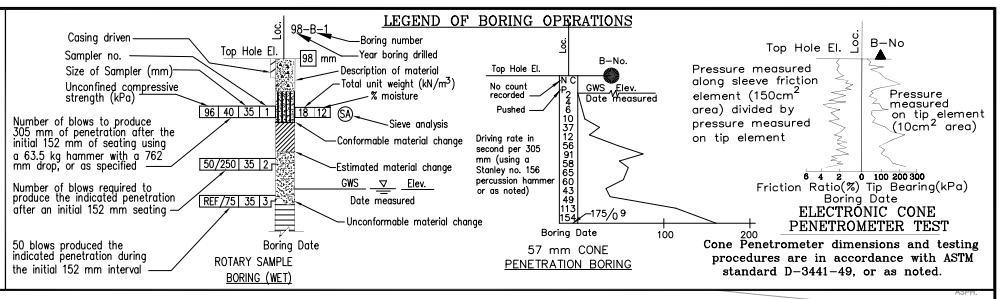
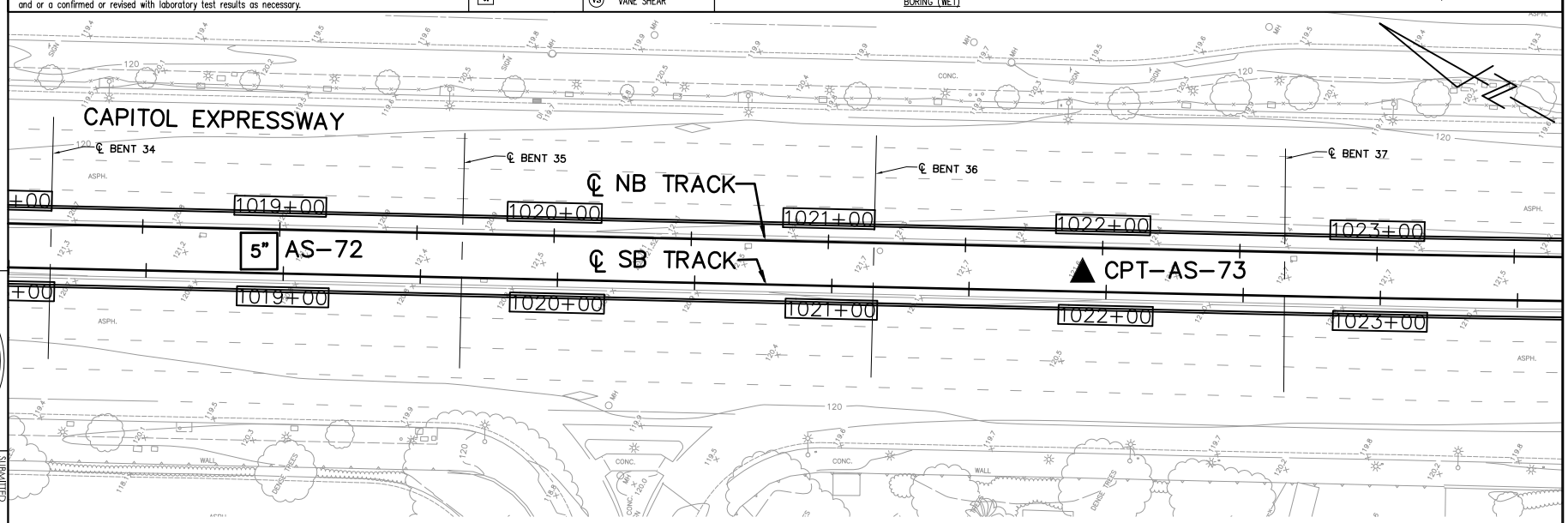
LEGEND OF BORING OPERATIONS





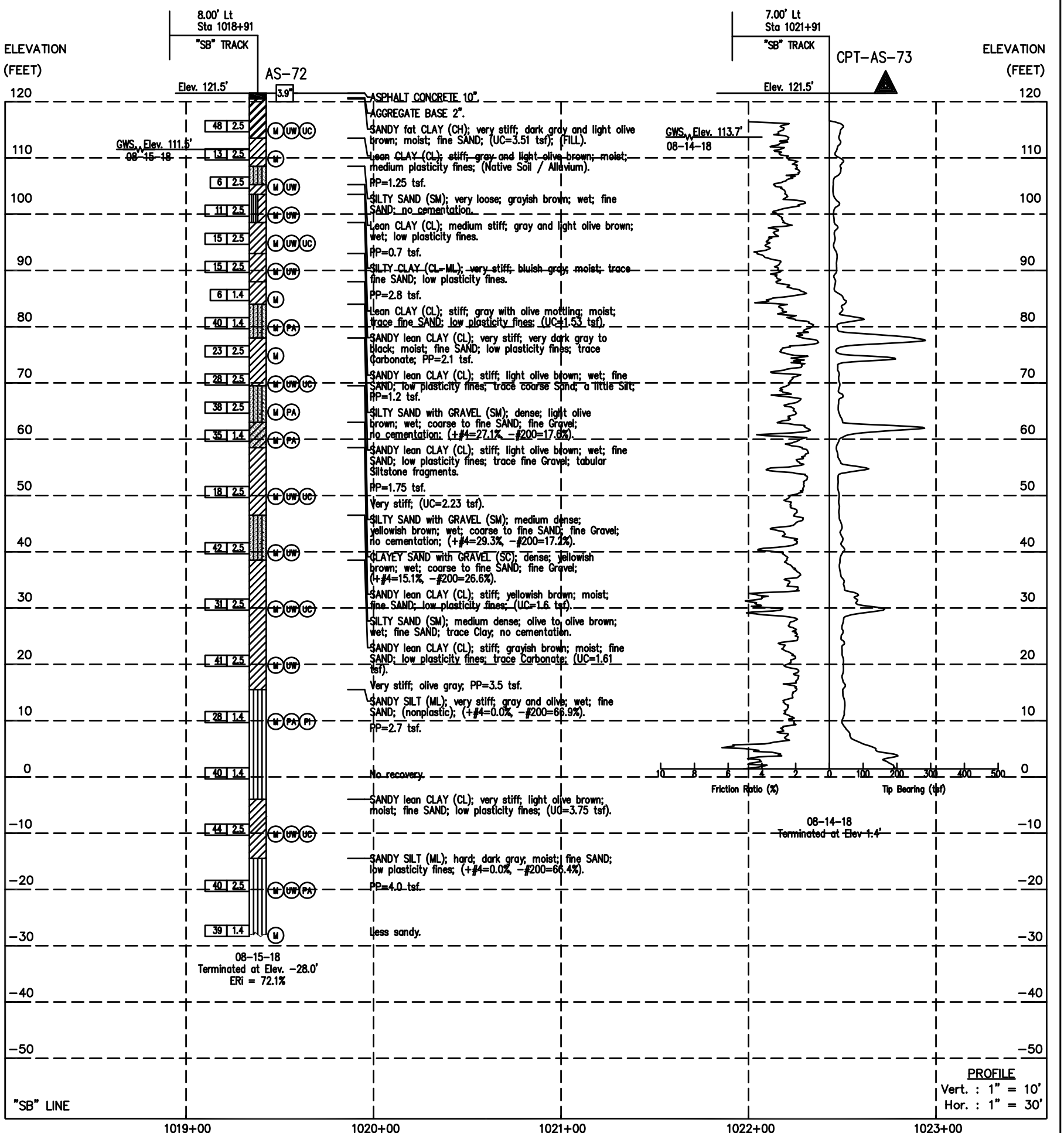
PLAN
1"=30'

NOTES:

Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2" Modified California Sampler: I.D. = 2.5"; O.D. = 3" Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

BENCHMARK:

The Horizontal datum is NAD 83 – Epoch 1991.35. Coordinates are on the California State Plane, Zone 0403. To obtain ground distances, multiply grid distances by 0.9999541. The Vertical datum is NAVD 88. Elevations and boring locations are interpreted from topo map.



ogouthier Jun 21, 2020 – 3:18pm C:\caddlib\pw\kouyang\west\dms98390\801HP317.dwg

NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
C	06/20	95% SUBMITTAL SET

REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA — GARY PARIKH — No. 666 — Exp. 12-31-21 — GEOTECHNICAL

DESIGNED E. Ortakci
DRAWN K. Ouyang
CHECKED A. Lam
CADD FILE NAME 801HP317.dwg

PARIKH — Practicing in the Geosciences — 1497 N MILPITAS BLVD. MILPITAS, CA 95035

SUBMITTED

Santa Clara Valley Transportation Authority

APPROVED

BKF ENGINEERS / SURVEYORS / PLANNERS — 100+ YEARS

CADD FILE DATE 03/26/20
SUBMITTAL DATE 06/29/20
SCALE 1:30
BOARD APPROVAL DATE

PCA NO. 000
CONTRACT NO. C801
FILE LOCATION PROJECTWISE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 1024+00 TO STA 1029+65

SHEET OF
DRAWING NO. HP317
REVISION C

CONSISTENCY CLASSIFICATION FOR SOILS

According to the Standard Penetration Test (ASTM D-1586)

SPT N-Value (Blows/ 305mm)	Granular	SPT N-Value (Blows/ 305mm)	Cohesive
0–4	Very loose	<2	Very soft
5–10	Loose	2–4	Soft
11–30	Medium Dense	5–8	Firm
31–50	Dense	9–15	Stiff
>50	Very Dense	16–30	Very Stiff
		>31	Hard

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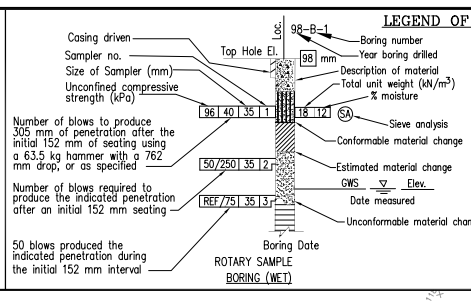
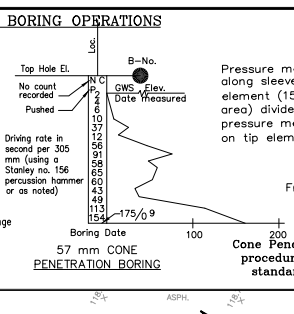
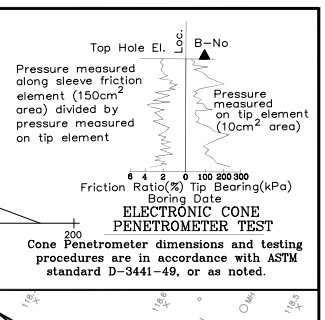
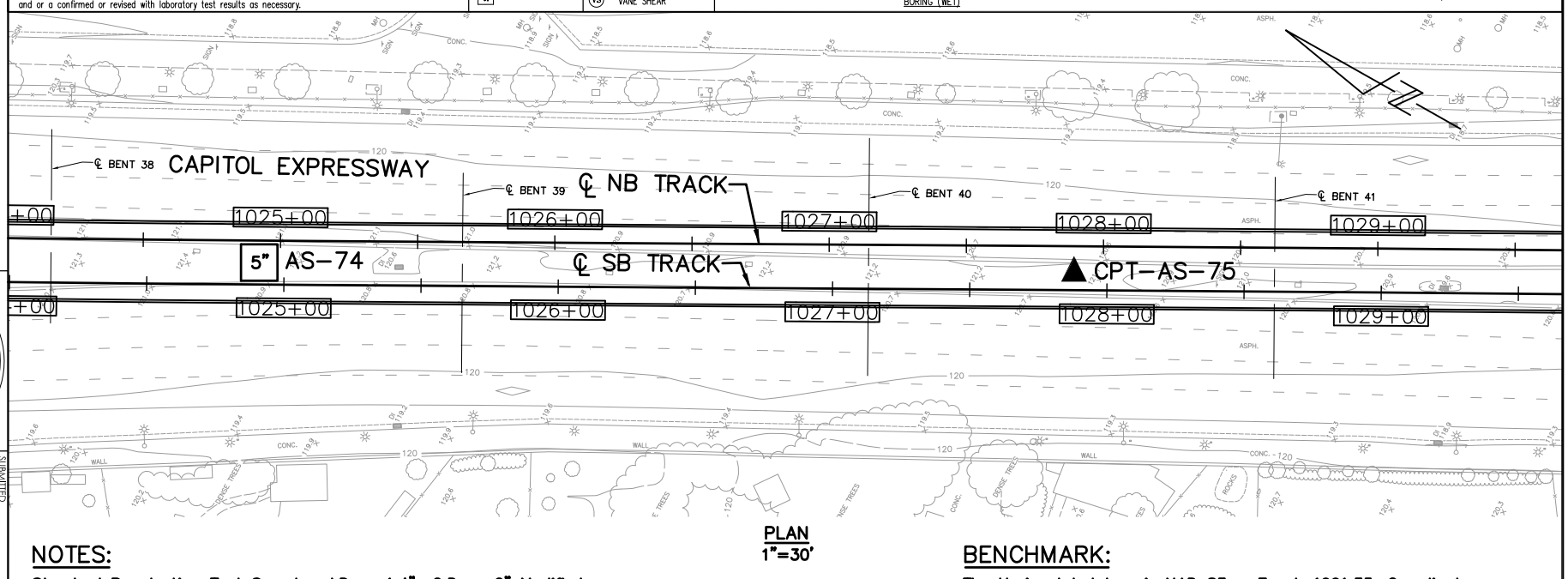
LEGEND OF BORING OPERATIONS







Cone Penetrometer dimensions and testing procedures are in accordance with ASTM standard D-3441-49, or as noted.



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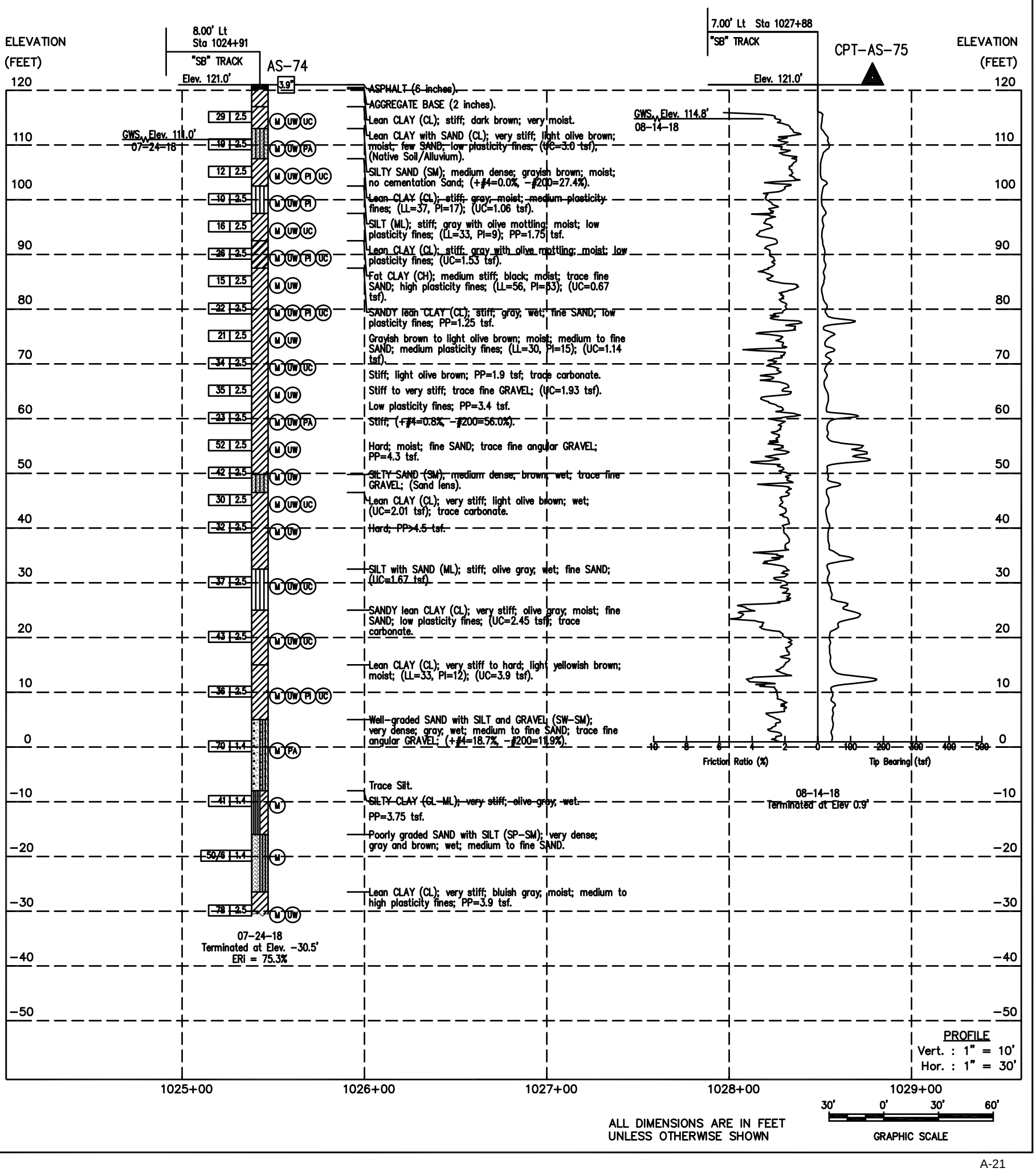

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NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
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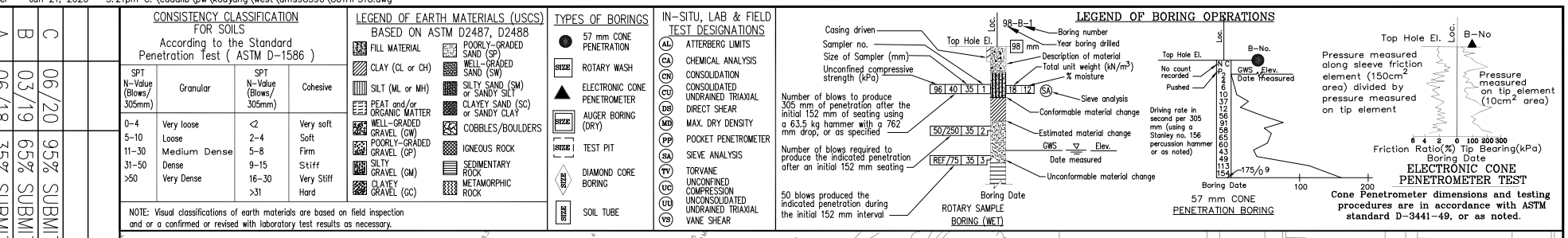
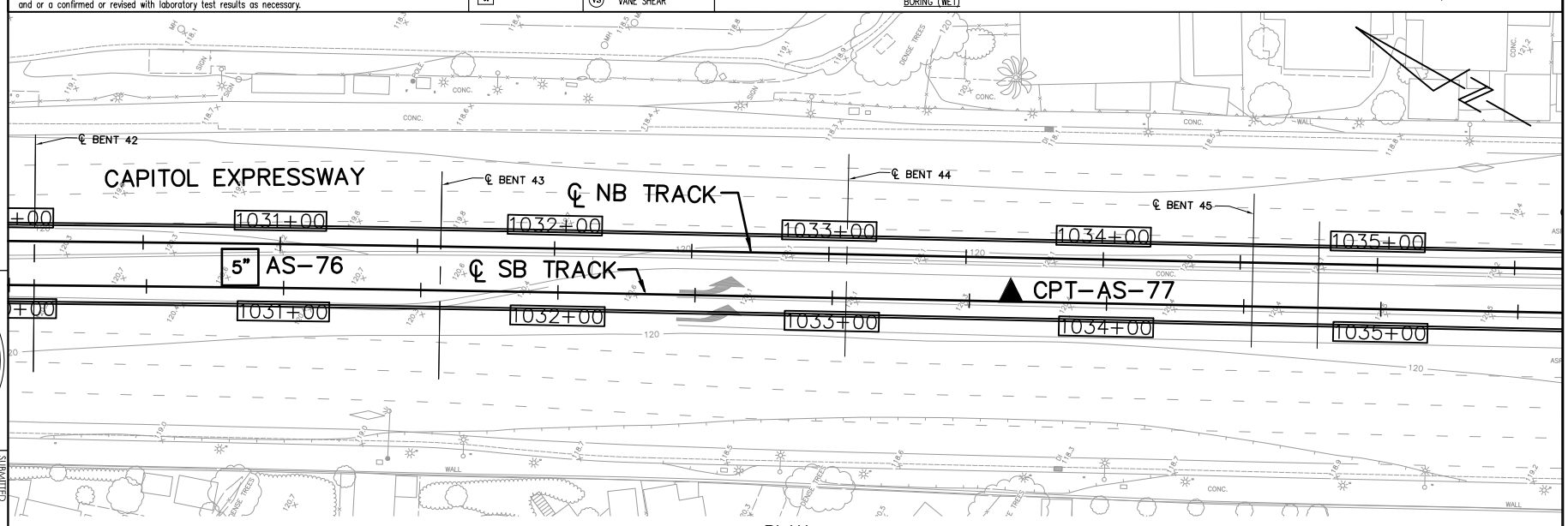
LEGEND OF BORING OPERATIONS





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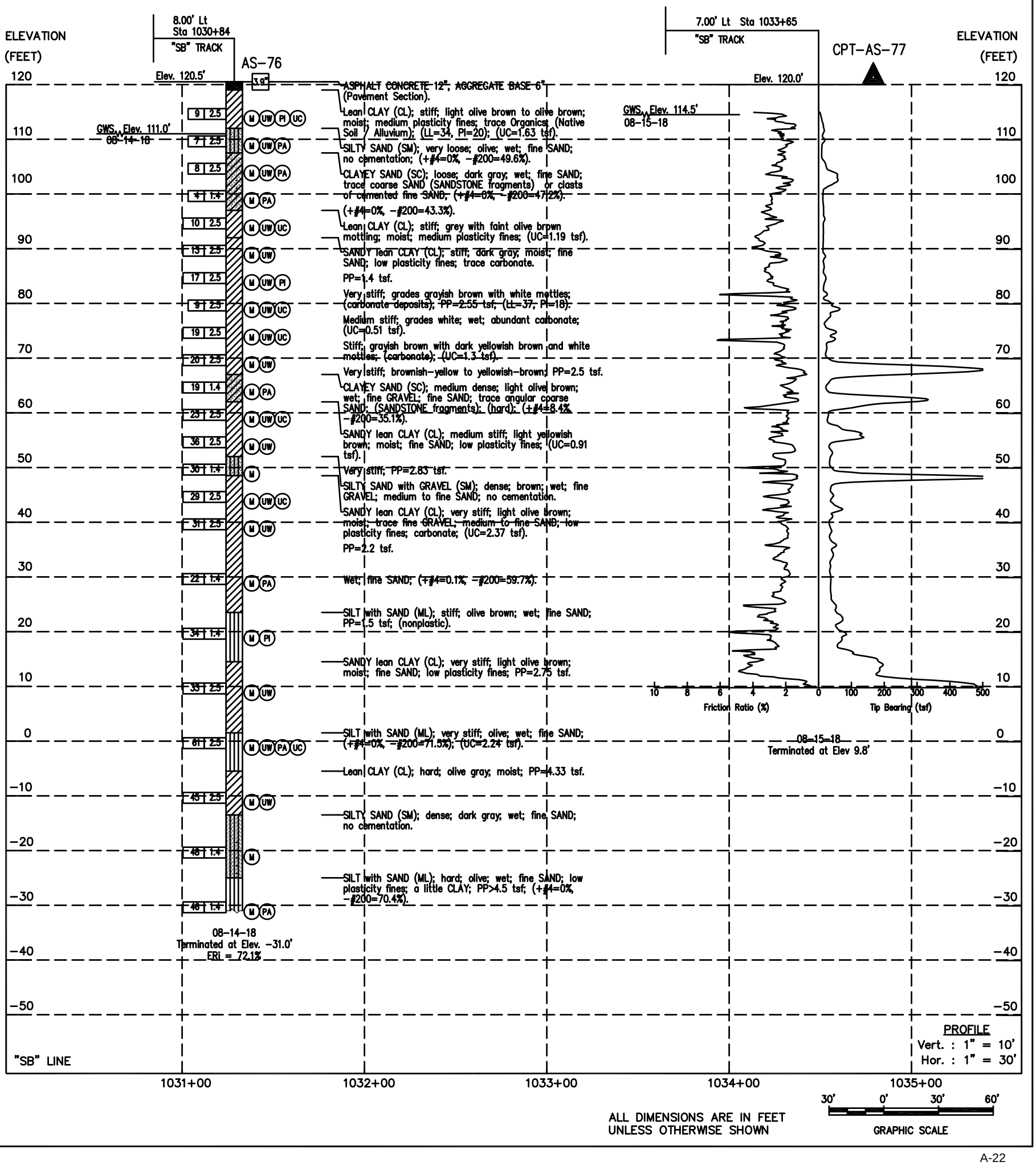

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

REGISTERED PROFESSIONAL ENGINEER — GARY PARIKH — No. 666 — Exp. 12-31-21 — GEOTECHNICAL — STATE OF CALIFORNIA

SUBMITTED

DESIGNED E. Ortakci
DRAWN K. Ouyang
CHECKED A. Lam
CADD FILE NAME 801HP318.dwg

PARIKH — Practicing in the Geosciences — 1497 N. MILPITAS BLVD. MILPITAS, CA 95035

Santa Clara Valley Transportation Authority

APPROVED

BKF 100+ YEARS — ENGINEERS / SURVEYORS / PLANNERS

CADD FILE DATE 03/26/20
SUBMITTAL DATE 06/29/20
SCALE 1:30
BOARD APPROVAL DATE

PCA NO. 000
CONTRACT NO. C801
FILE LOCATION PROJECTWISE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 1030+00 TO STA 1035+65

SHEET OF
DRAWING NO. HP318
REVISION C

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A	06/18	35% SUBMITTAL SET
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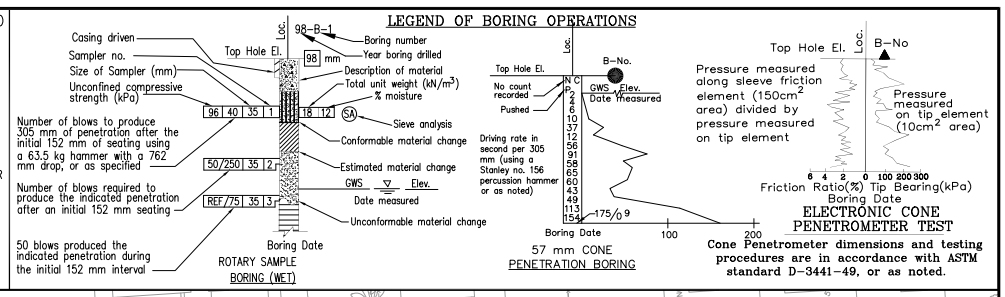
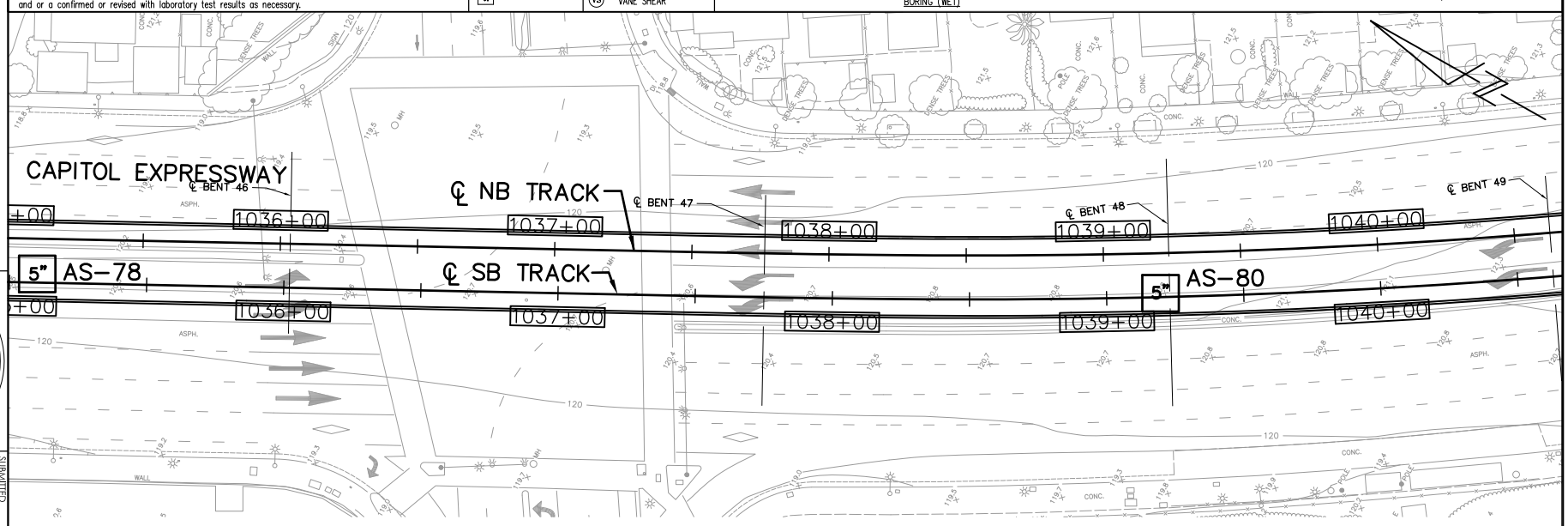
LEGEND OF BORING OPERATIONS





PLAN
1"=30'

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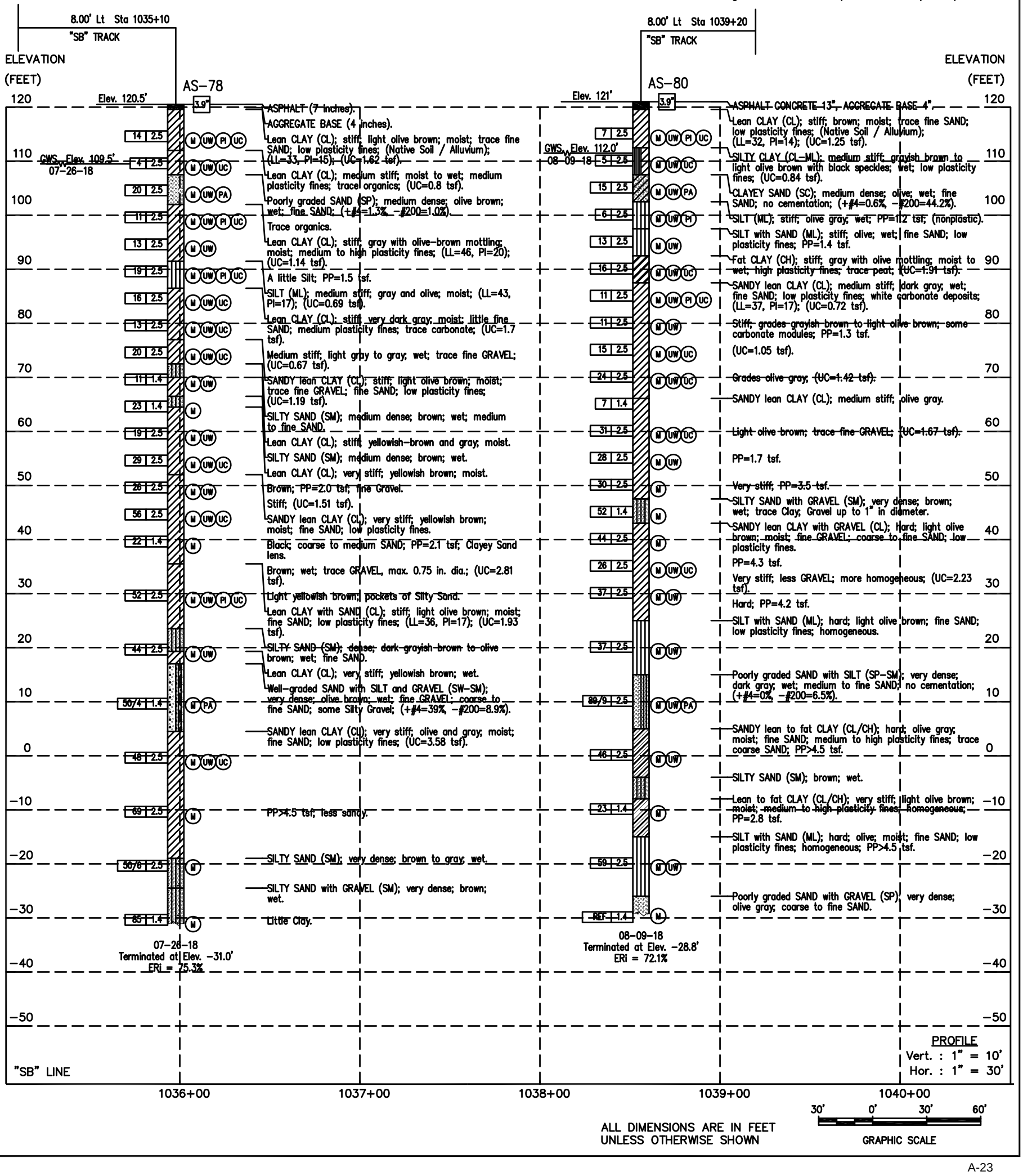

REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA — GARY PARIKH — No. 666 — Exp. 12-31-21 GEOTECHNICAL

SUBMITTED — PARIKH — Practicing in the Geosciences — 1497 N. MILPITAS BLVD. MILPITAS, CA 95035

DESIGNED E. Ortakci
DRAWN K. Ouyang
CHECKED A. Lam
CADD FILE NAME 801HP319.dwg

Santa Clara Valley Transportation Authority

APPROVED — BKF ENGINEERS / SURVEYORS / PLANNERS — 100+ YEARS

CADD FILE DATE 03/26/20
SUBMITTAL DATE 06/29/20
SCALE 1:30
BOARD APPROVAL DATE

PCA NO. 000
CONTRACT NO. C801
FILE LOCATION PROJECTWISE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 1035+00 TO STA 1040+65

SHEET OF
DRAWING NO. HP319
REVISION C

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NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
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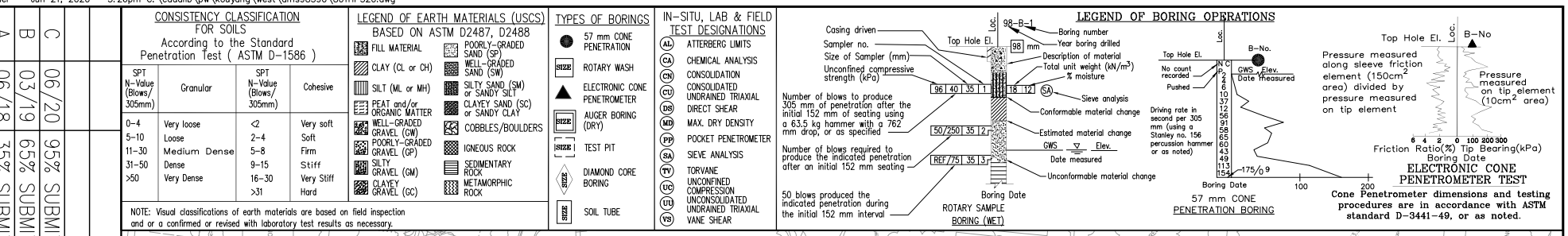
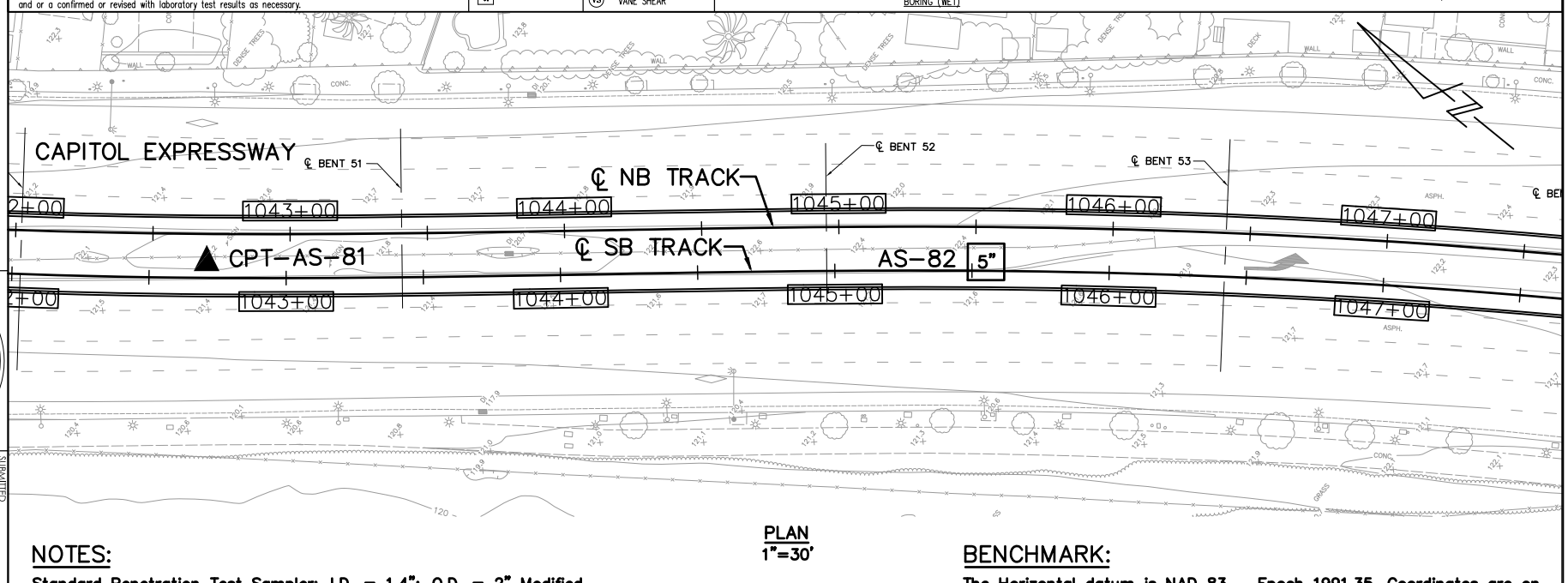
LEGEND OF BORING OPERATIONS





PLAN
1"=30'

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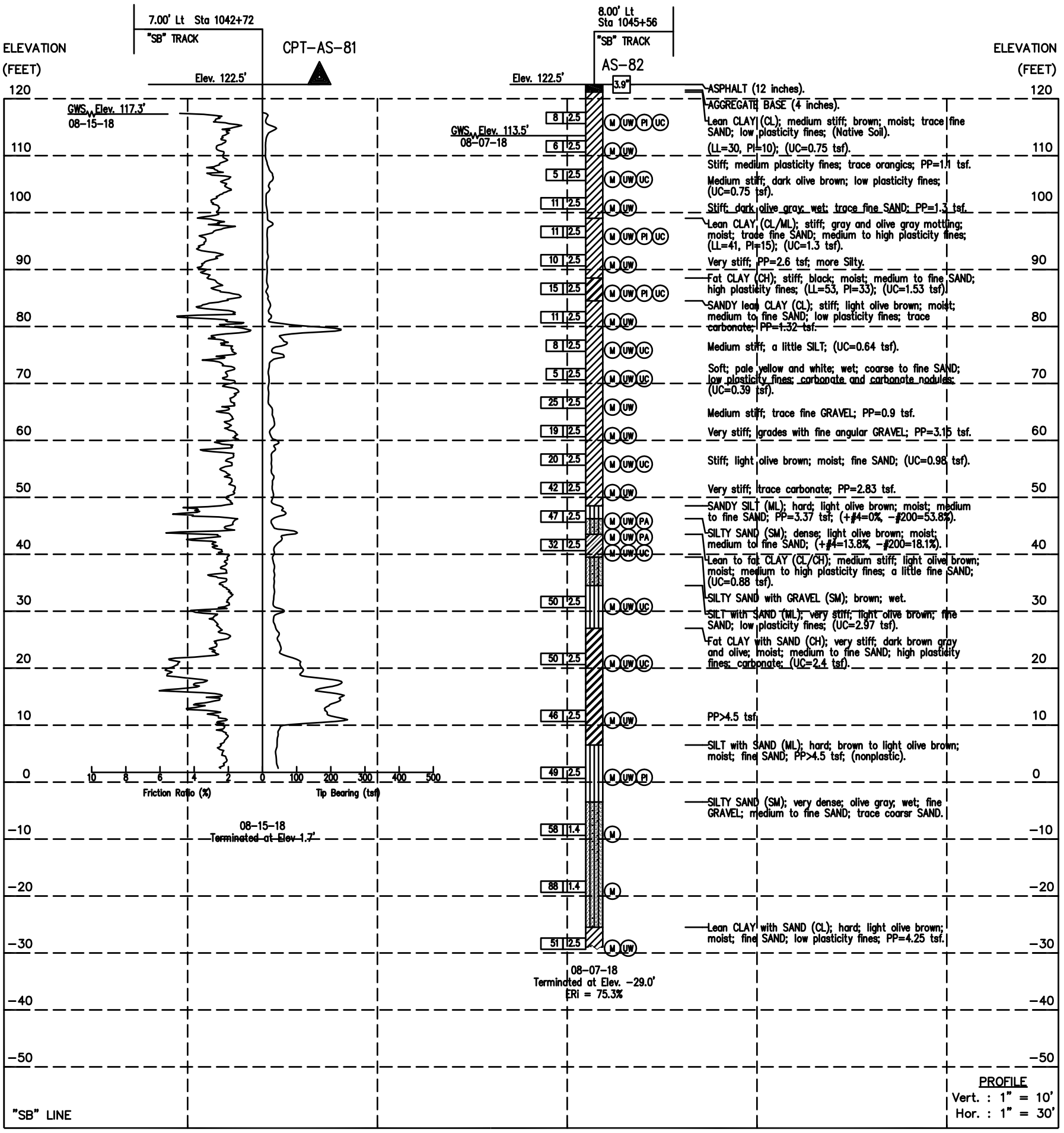

REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA — GARY PARIKH — No. 666 — Exp. 12-31-21 — GEOTECHNICAL

DESIGNED E. Ortakci
DRAWN K. Ouyang
CHECKED A. Lam
CADD FILE NAME 801HP320.dwg

PARIKH — Practicing in the Geosciences — 1497 N. MILPITAS BLVD. MILPITAS, CA 95035

SUBMITTED

Santa Clara Valley Transportation Authority

APPROVED

BKF ENGINEERS / SURVEYORS / PLANNERS — 100+ YEARS

CADD FILE DATE 03/26/20
SUBMITTAL DATE 06/29/20
SCALE 1:30
BOARD APPROVAL DATE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 1042+00 TO STA 1047+65

PCA NO. 000
CONTRACT NO. C801
FILE LOCATION PROJECTWISE
SHEET OF
DRAWING NO. HP320
REVISION C

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NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
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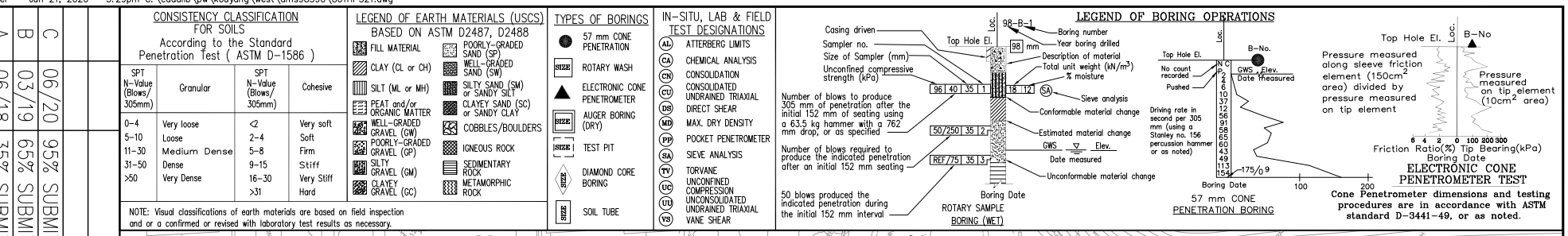
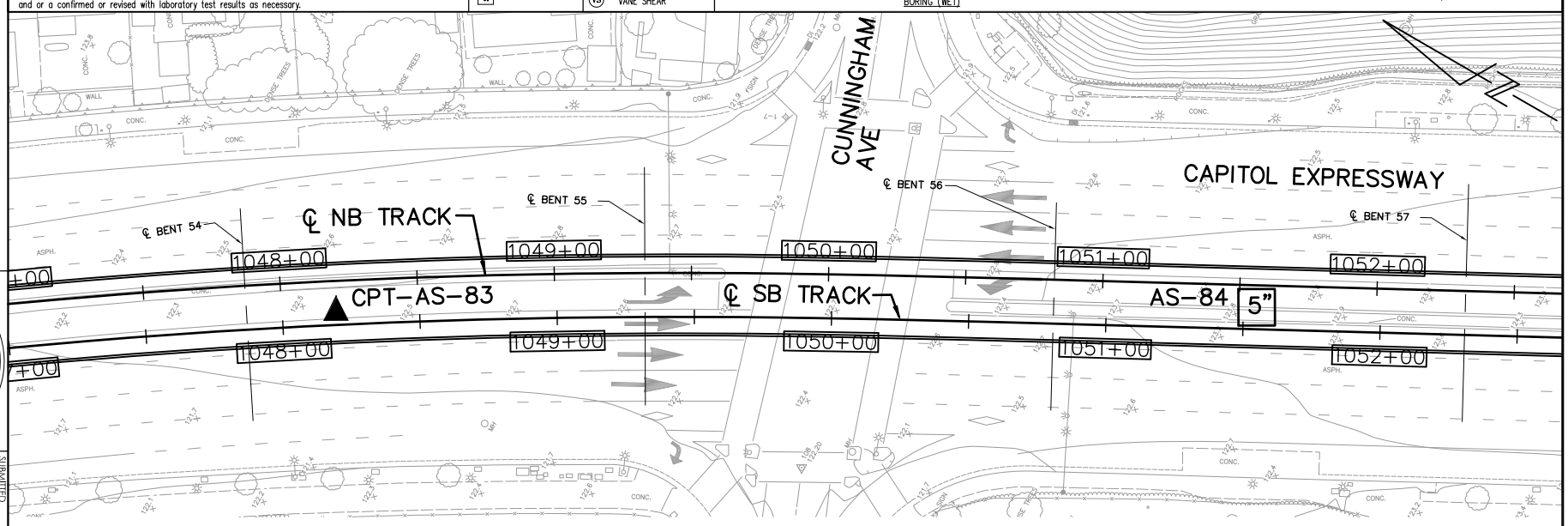
IN-SITU, LAB & FIELD TEST DESIGNATIONS
AL ATTERBERG LIMITS; CA CHEMICAL ANALYSIS; CN CONSOLIDATION; CU CONSOLIDATED UNDRAINED TRIAXIAL; DS DIRECT SHEAR; MD MAX. DRY DENSITY; PP POCKET PENETROMETER; SA SIEVE ANALYSIS; TV TORVANE UNCONFINED COMPRESSION; UC UNCONSOLIDATED UNDRAINED TRIAXIAL; VS VANE SHEAR

LEGEND OF BORING OPERATIONS

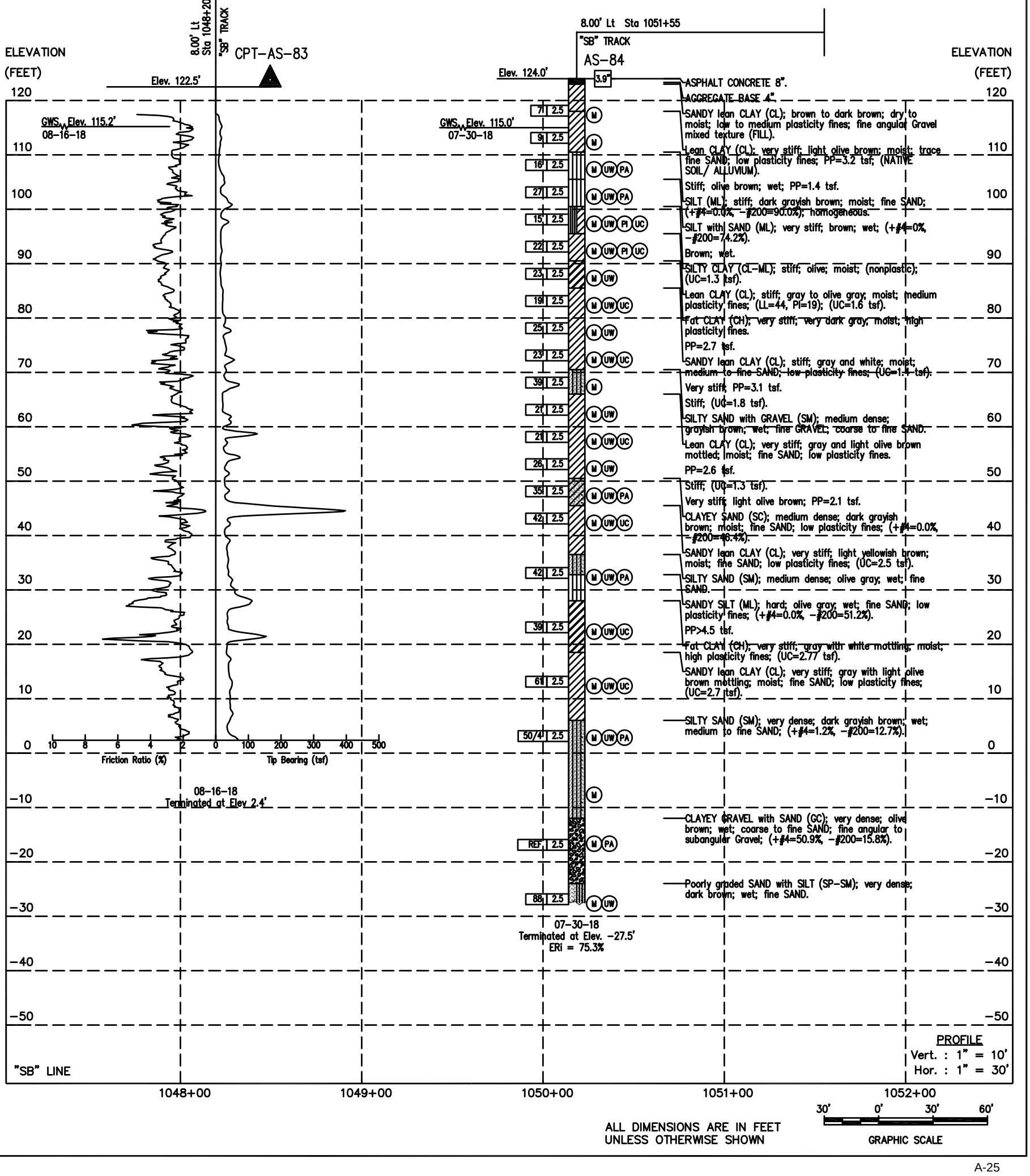




PLAN
1"=30'

NOTES:
Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2" Modified California Sampler: I.D. = 2.5"; O.D. = 3" Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

BENCHMARK:
The Horizontal datum is NAD 83 – Epoch 1991.35. Coordinates are on the California State Plane, Zone 0403. To obtain ground distances, multiply grid distances by 0.9999541. The Vertical datum is NAVD 88. Elevations and boring locations are interpreted from topo map.



EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 1047+00 TO STA 1052+65

REGISTERED PROFESSIONAL ENGINEER — GARY PARIKH — No. 666 — Exp. 12-31-21 — GEOTECHNICAL — STATE OF CALIFORNIA

SUBMITTED: PARIKH — Practicing in the Geosciences — 1497 N. MILPITAS BLVD. MILPITAS, CA 95035

DESIGNED E. Ortakci
DRAWN K. Ouyang
CHECKED A. Lam
CADD FILE NAME 801HP321.dwg

Santa Clara Valley Transportation Authority

APPROVED: BKF ENGINEERS / SURVEYORS / PLANNERS — 100+ YEARS

CADD FILE DATE 03/26/20
SUBMITTAL DATE 06/29/20
SCALE 1:30
BOARD APPROVAL DATE

PCA NO. 000
CONTRACT NO. C801
FILE LOCATION PROJECTWISE
REVISION C
DRAWING NO. HP321
SHEET OF

ogouthier Jun 21, 2020 – 3:31pm C:\caddlib\pw\kouyang\west\dms98390\801HP322.dwg

NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
C	06/20	95% SUBMITTAL SET

CONSISTENCY CLASSIFICATION FOR SOILS
According to the Standard Penetration Test (ASTM D-1586)

SPT N-Value (Blows/ 305mm)	Granular	SPT N-Value (Blows/ 305mm)	Cohesive
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5–10	Loose	2–4	Soft
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31–50	Dense	9–15	Stiff
>50	Very Dense	16–30	Very Stiff
		>31	Hard

NOTE: Visual classifications of earth materials are based on field inspection and or a confirmed or revised with laboratory test results as necessary.

LEGEND OF EARTH MATERIALS (USCS)
BASED ON ASTM D2487, D2488

FILL MATERIAL
CLAY (CL or CH)
SILT (ML or MH)
PEAT and/or ORGANIC MATTER
WELL-GRADED GRAVEL (GW)
POORLY-GRADED GRAVEL (GP)
SILTY GRAVEL (GM)
CLAYEY GRAVEL (GC)
POORLY-GRADED SAND (SP)
WELL-GRADED SAND (SW)
SILTY SAND (SM) or SANDY SILT
CLAYEY SAND (SC) or SANDY CLAY
COBBLES/BOULDERS
IGNEOUS ROCK
SEDIMENTARY ROCK
METAMORPHIC ROCK

TYPES OF BORINGS

57 mm CONE PENETRATION
ROTARY WASH
ELECTRONIC CONE PENETROMETER
AUGER BORING (DRY)
TEST PIT
DIAMOND CORE BORING
SOIL TUBE

IN-SITU, LAB & FIELD TEST DESIGNATIONS

AL ATTERBERG LIMITS
CA CHEMICAL ANALYSIS
CN CONSOLIDATION
CU CONSOLIDATED UNDRAINED TRIAXIAL
DS DIRECT SHEAR
MD MAX. DRY DENSITY
PP POCKET PENETROMETER
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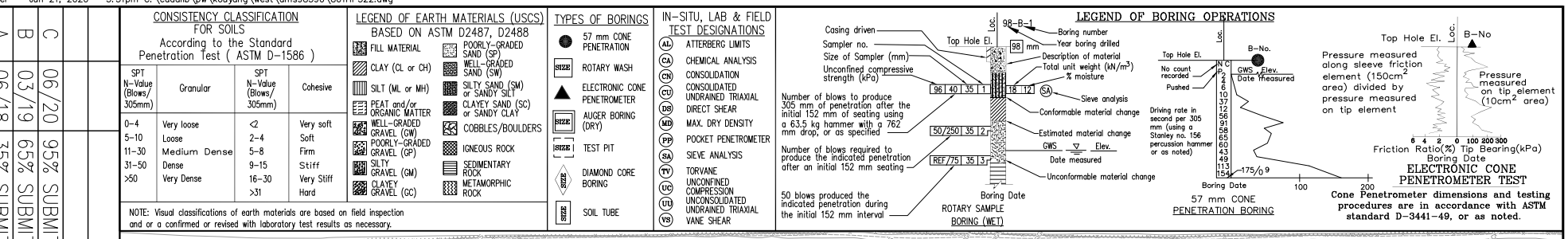
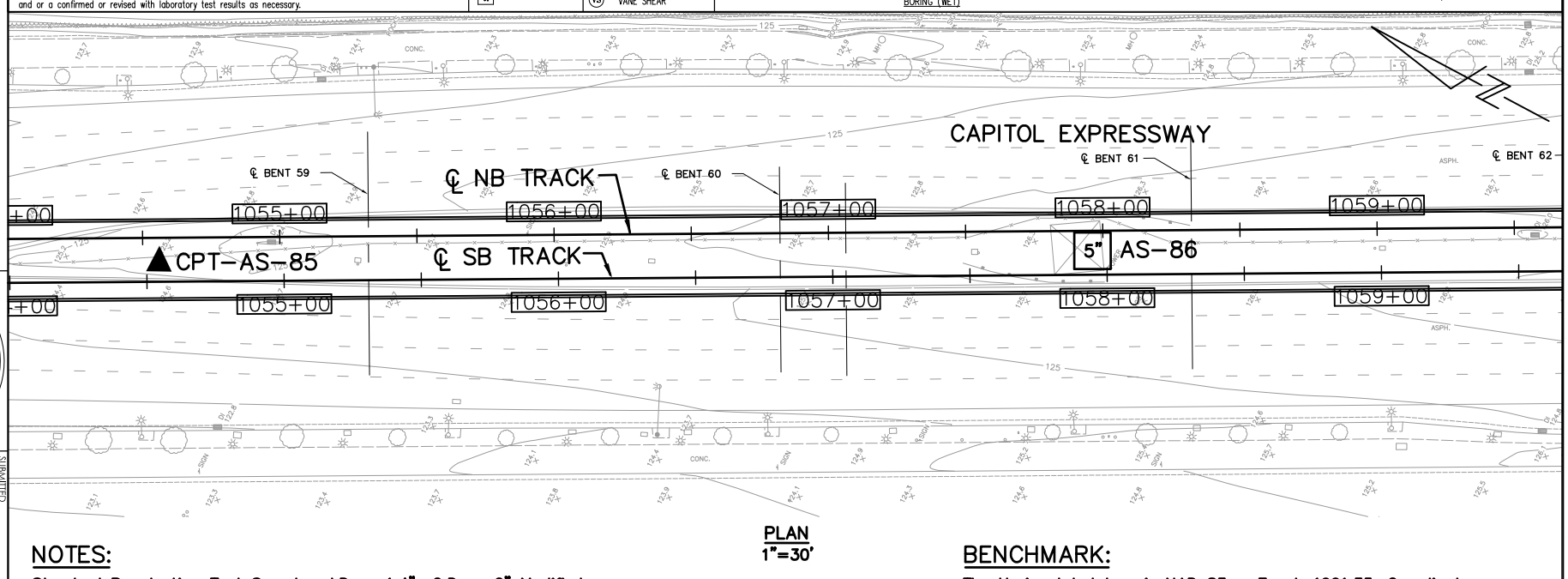
UC UNCONSOLIDATED UNDRAINED TRIAXIAL
VS VANE SHEAR

LEGEND OF BORING OPERATIONS





PLAN
1"=30'

NOTES:

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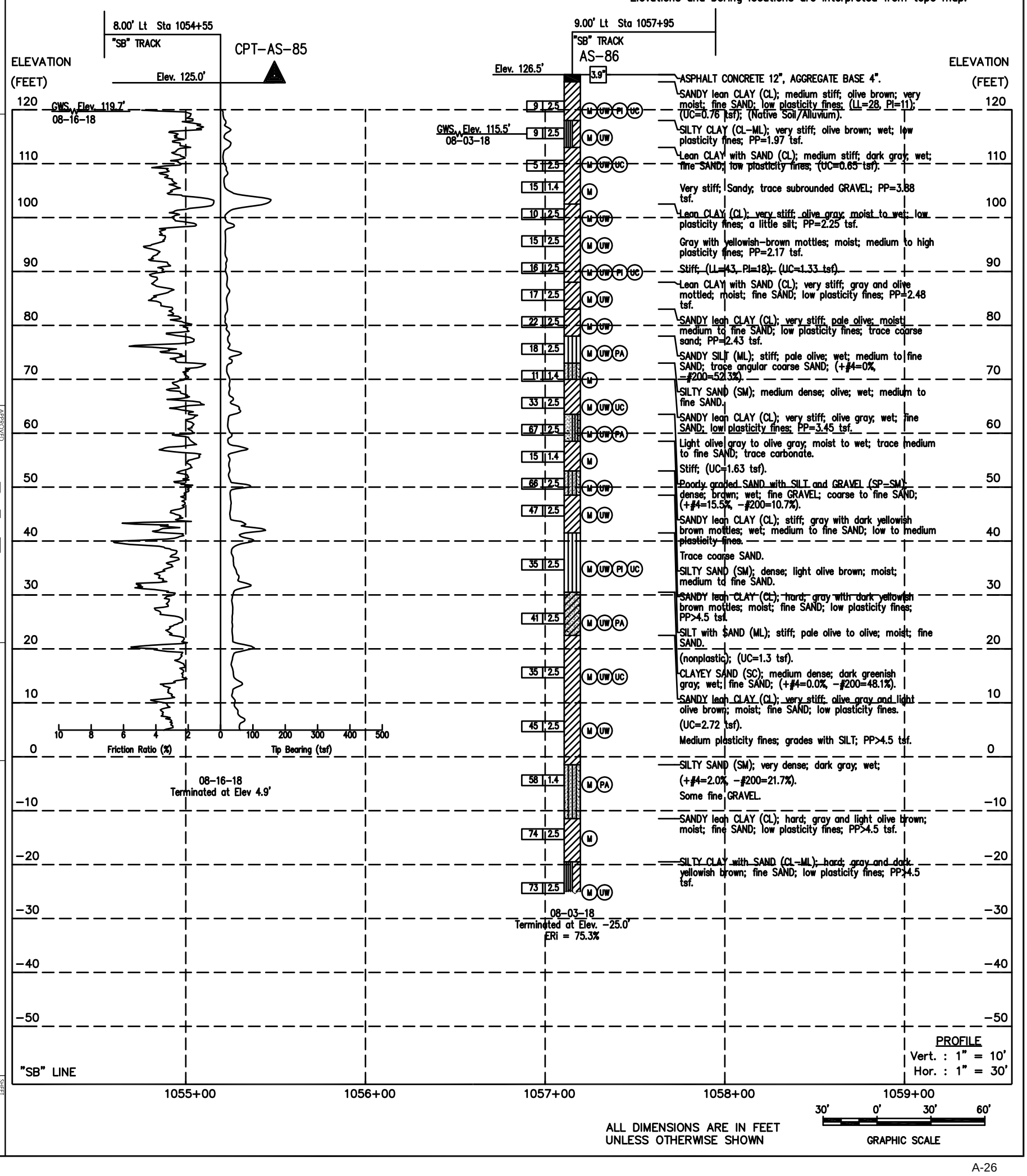

ASPHALT CONCRETE 12", AGGREGATE BASE 4".

SANDY lean CLAY (CL); medium stiff; olive brown; very moist; fine SAND; low plasticity fines; (LL=28, PI=11); (UC=0.76 tsf); (Native Soil/Alluvium).

SILTY CLAY (CL-ML); very stiff; olive brown; wet; low plasticity fines; PP=1.97 tsf.

Lean CLAY with SAND (CL); medium stiff; dark gray; wet; fine SAND; low plasticity fines; (UC=0.65 tsf).

Very stiff; Sandy; trace subrounded GRAVEL; PP=3.88 tsf.

Lean CLAY (CL); very stiff; olive gray; moist to wet; low plasticity fines; a little silt; PP=2.25 tsf.

Gray with yellowish-brown mottles; moist; medium to high plasticity fines; PP=2.17 tsf.

Stiff; (LL=43, PI=18); (UC=1.33 tsf).

Lean CLAY with SAND (CL); very stiff; gray and olive mottled; moist; fine SAND; low plasticity fines; PP=2.48 tsf.

SANDY lean CLAY (CL); very stiff; pale olive; moist; medium to fine SAND; low plasticity fines; trace coarse sand; PP=2.43 tsf.

SANDY SILT (ML); stiff; pale olive; wet; medium to fine SAND; trace angular coarse SAND; (+#4=0%, -#200=52.3%).

SILTY SAND (SM); medium dense; olive; wet; medium to fine SAND.

SANDY lean CLAY (CL); very stiff; olive gray; wet; fine SAND; low plasticity fines; PP=3.45 tsf.

Light olive gray to olive gray; moist to wet; trace medium to fine SAND; trace carbonate.

Stiff; (UC=1.63 tsf).

Poorly graded SAND with SILT and GRAVEL (SP-SM); dense; brown; wet; fine GRAVEL; coarse to fine SAND; (+#4=15.5%, -#200=10.7%).

SANDY lean CLAY (CL); stiff; gray with dark yellowish brown mottles; wet; medium to fine SAND; low to medium plasticity fines.

Trace coarse SAND.

SILTY SAND (SM); dense; light olive brown; moist; medium to fine SAND.

SANDY lean CLAY (CL); hard; gray with dark yellowish brown mottles; moist; fine SAND; low plasticity fines; PP>4.5 tsf.

SILT with SAND (ML); stiff; pale olive to olive; moist; fine SAND.

(nonplastic); (UC=1.3 tsf).

CLAYEY SAND (SC); medium dense; dark greenish gray; wet; fine SAND; (+#4=0.0%, -#200=48.1%).

SANDY lean CLAY (CL); very stiff; olive gray and light olive brown; moist; fine SAND; low plasticity fines.

(UC=2.72 tsf).

Medium plasticity fines; grades with SILT; PP>4.5 tsf.

SILTY SAND (SM); very dense; dark gray; wet; (+#4=2.0%, -#200=21.7%).

Some fine GRAVEL.

SANDY lean CLAY (CL); hard; gray and light olive brown; moist; fine SAND; low plasticity fines; PP>4.5 tsf.

SILTY CLAY with SAND (CL-ML); hard; gray and dark yellowish brown; fine SAND; low plasticity fines; PP>4.5 tsf.

PROFILE
Vert. : 1" = 10'
Hor. : 1" = 30'

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

30' 0' 30' 60'
GRAPHIC SCALE

REGISTERED PROFESSIONAL ENGINEER
GARY PARIKH
No. 666
Exp. 12-31-21
GEOTECHNICAL
STATE OF CALIFORNIA

DESIGNED E. Ortakci
DRAWN K. Ouyang
CHECKED A. Lam
CADD FILE NAME 801HP322.dwg

PARIKH
Practicing in the Geosciences
1497 N MILPITAS BLVD.
MILPITAS, CA 95035

SUBMITTED

Santa Clara Valley Transportation Authority

APPROVED

BKF 100+ YEARS
ENGINEERS / SURVEYORS / PLANNERS

CADD FILE DATE 03/26/20
SUBMITTAL DATE 06/29/20
SCALE 1:30
BOARD APPROVAL DATE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 1054+00 TO STA 1059+65

PCA NO. 000
CONTRACT NO. C801
FILE LOCATION PROJECTWISE
SHEET OF
DRAWING NO. HP322
REVISION C

ogouthier Jun 21, 2020 – 3:34pm C:\caddlib\pw\kouyang\west\dms98390\801HP323.dwg

NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
C	06/20	95% SUBMITTAL SET

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TYPES OF BORINGS
57 mm CONE PENETRATION; ROTARY WASH; ELECTRONIC CONE PENETROMETER; AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; SOIL TUBE

IN-SITU, LAB & FIELD TEST DESIGNATIONS
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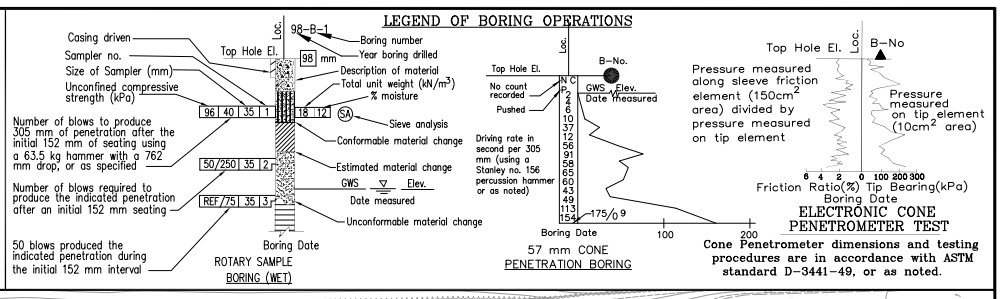
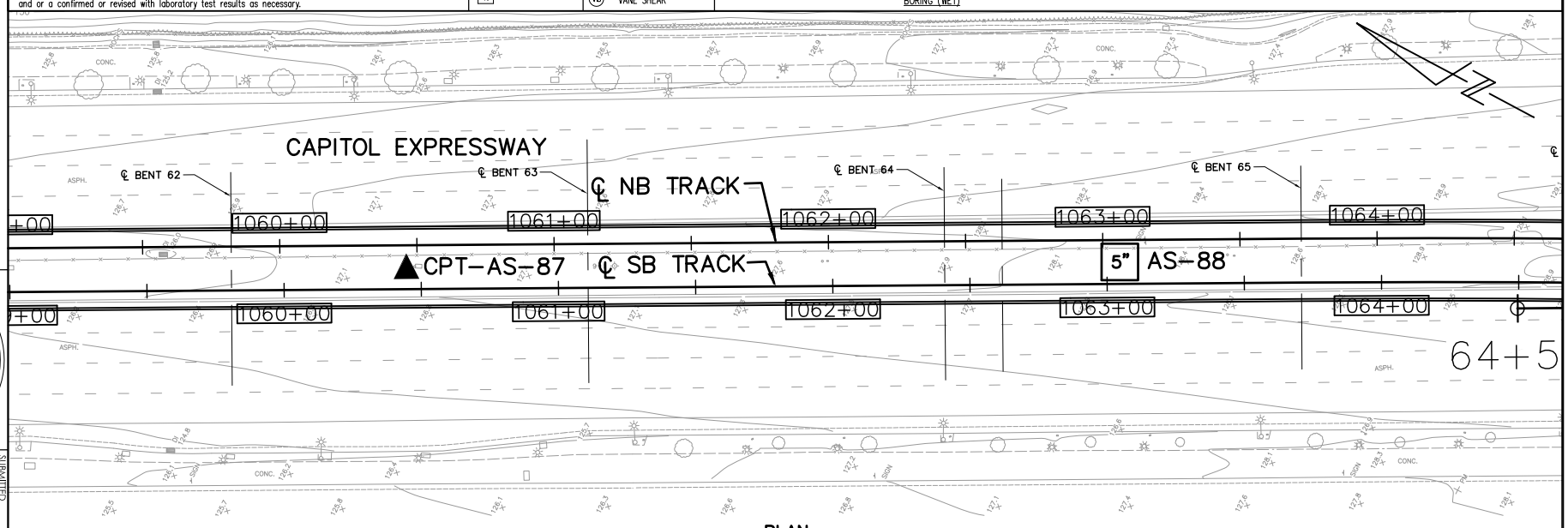
LEGEND OF BORING OPERATIONS





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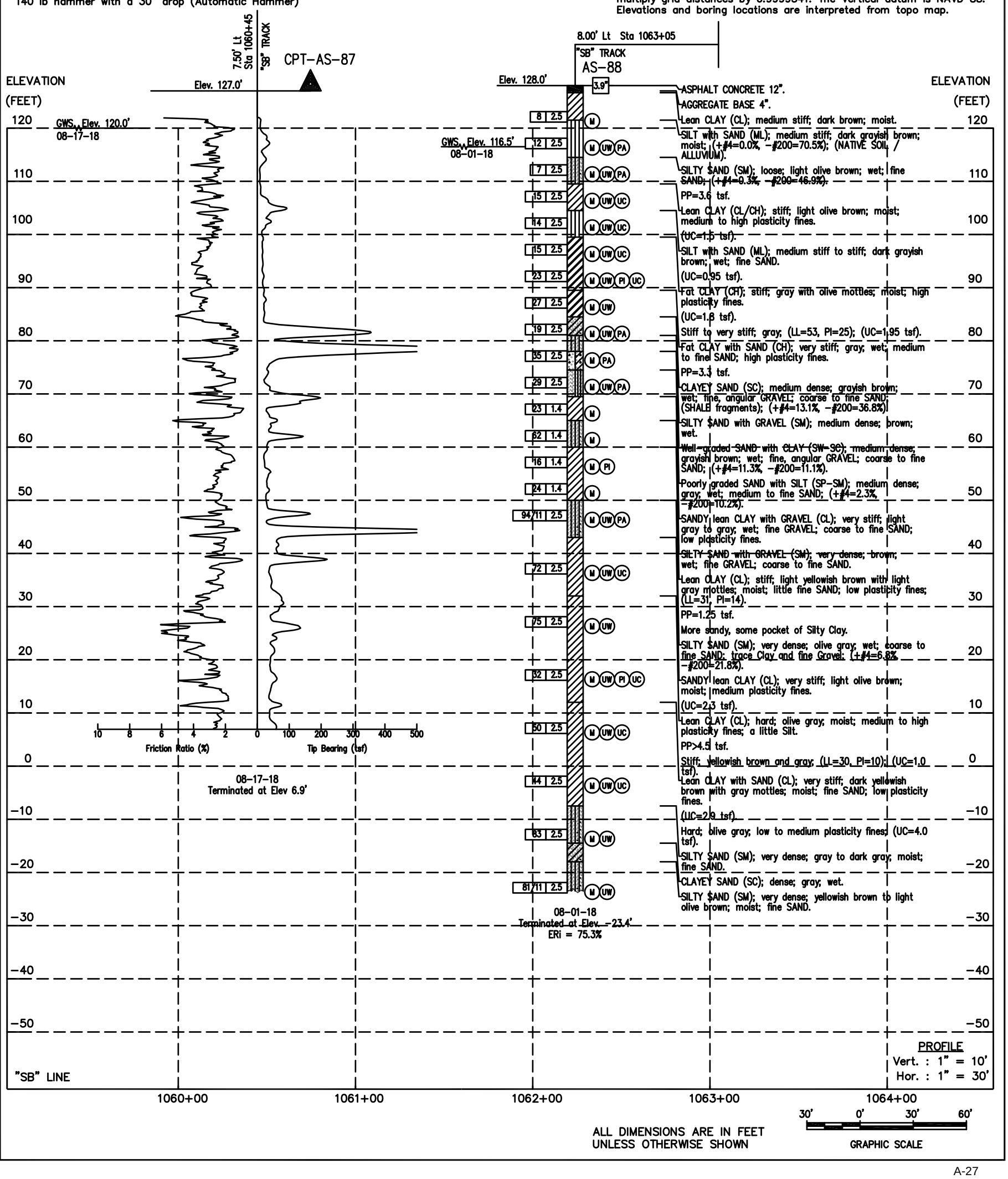

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

REGISTERED PROFESSIONAL ENGINEER — GARY PARIKH — No. 666 — Exp. 12-31-21 — STATE OF CALIFORNIA GEOTECHNICAL

PARIKH — Practicing in the Geosciences — 1497 N MILPITAS BLVD. MILPITAS, CA 95035

DRAWN K. Ouyang | DESIGNED E. Ortakci | CHECKED A. Lam | CADD FILE NAME 801HP323.dwg

SUBMITTED

Santa Clara Valley Transportation Authority

APPROVED

BKF ENGINEERS / SURVEYORS / PLANNERS — 100+ YEARS

CADD FILE DATE 03/26/20 | SCALE 1:30

SUBMITTAL DATE 06/29/20 | BOARD APPROVAL DATE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 1059+00 TO STA 1064+65

PCA NO. 000 | CONTRACT NO. C801 | FILE LOCATION PROJECTWISE

DRAWING NO. HP323 | REVISION C | SHEET | OF

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NO.	DATE	REVISIONS
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57 mm CONE PENETRATION; ROTARY WASH; ELECTRONIC CONE PENETROMETER; AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; SOIL TUBE

IN-SITU, LAB & FIELD TEST DESIGNATIONS

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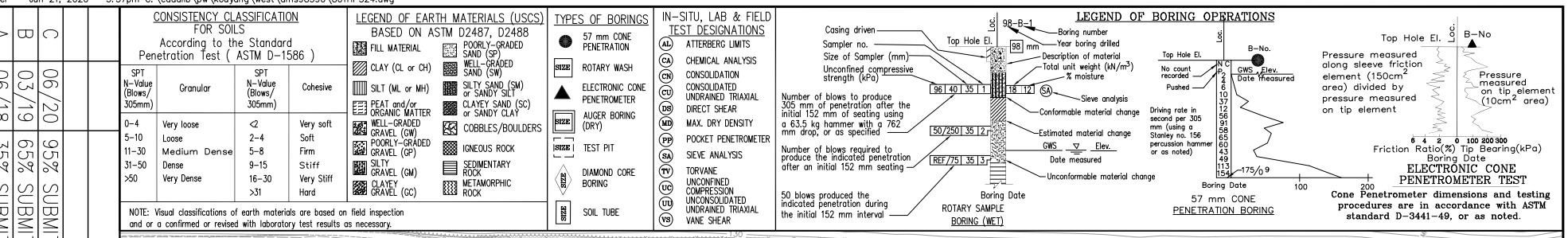
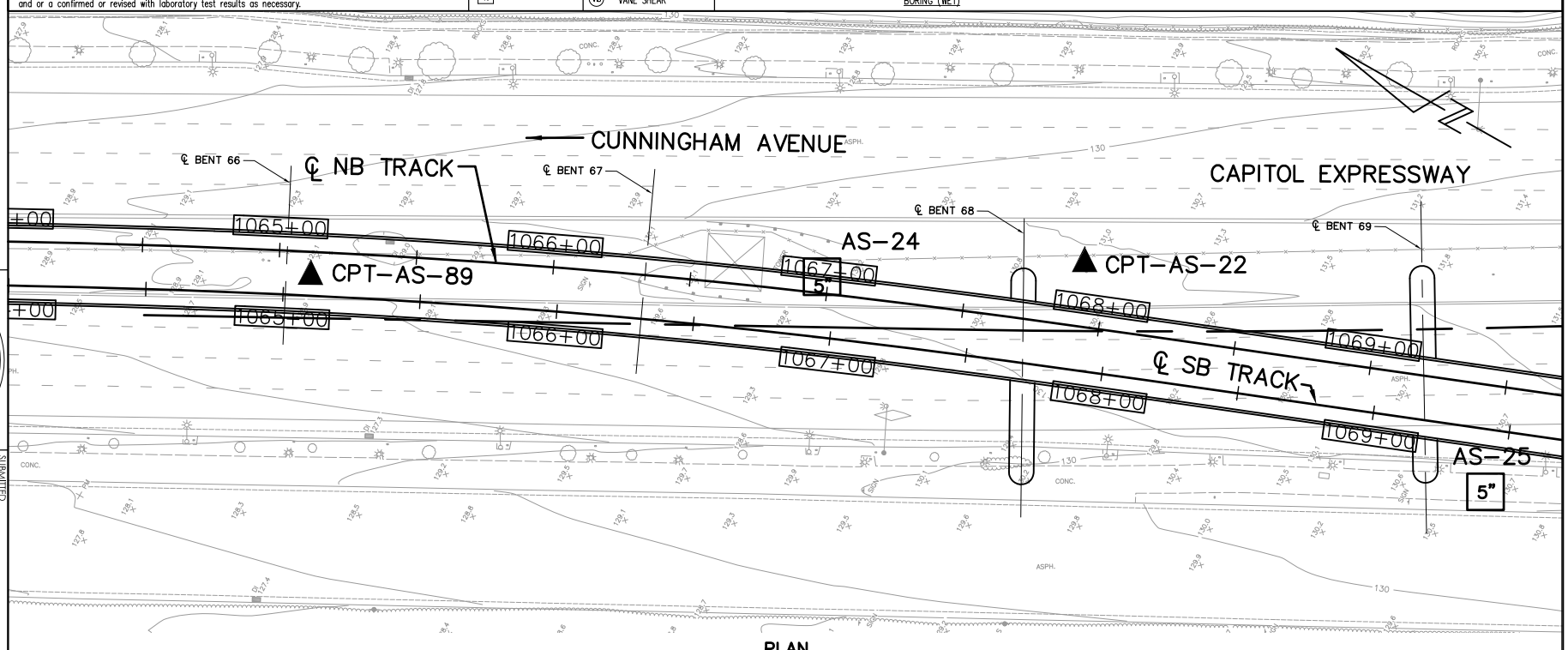
LEGEND OF BORING OPERATIONS



Cone Penetrometer dimensions and testing procedures are in accordance with ASTM standard D-3441-49, or as noted.



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30' 0' 30' 60'
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EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 1064+00 TO STA 1069+65

REGISTERED PROFESSIONAL ENGINEER — GARY PARIKH — No. 666 — Exp. 12-31-21 — STATE OF CALIFORNIA — GEOTECHNICAL

PARIKH — Practicing in the Geosciences — 1497 N MILPITAS BLVD. MILPITAS, CA 95035

BKF ENGINEERS / SURVEYORS / PLANNERS — 100+ YEARS

Santa Clara Valley Transportation Authority

SUBMITTED — APPROVED

DESIGNED E. Ortakci
DRAWN K. Ouyang
CHECKED A. Lam
CADD FILE NAME 801HP324.dwg
CADD FILE DATE 03/26/20
SUBMITTAL DATE 06/29/20
SCALE 1:30
BOARD APPROVAL DATE
PCA NO. 000
CONTRACT NO. C801
FILE LOCATION PROJECTWISE
REVISION C
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SHEET OF

ogouthier Jun 21, 2020 – 3:39pm C:\caddlib\pw\kouyang\west\dms98390\801HP325.dwg

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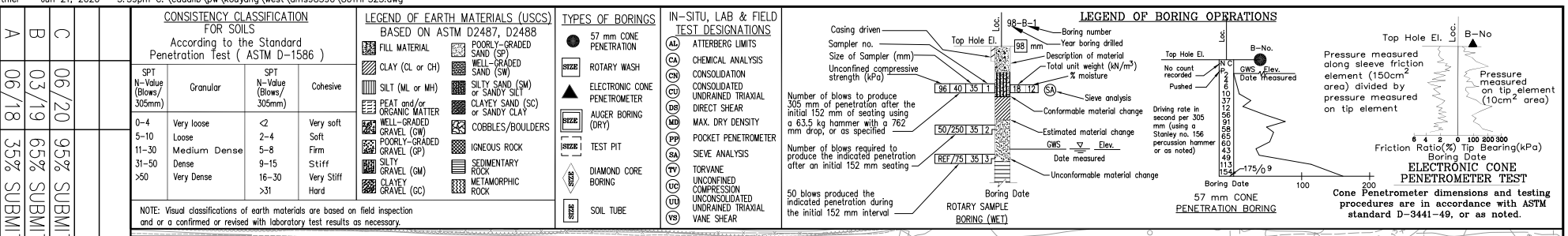

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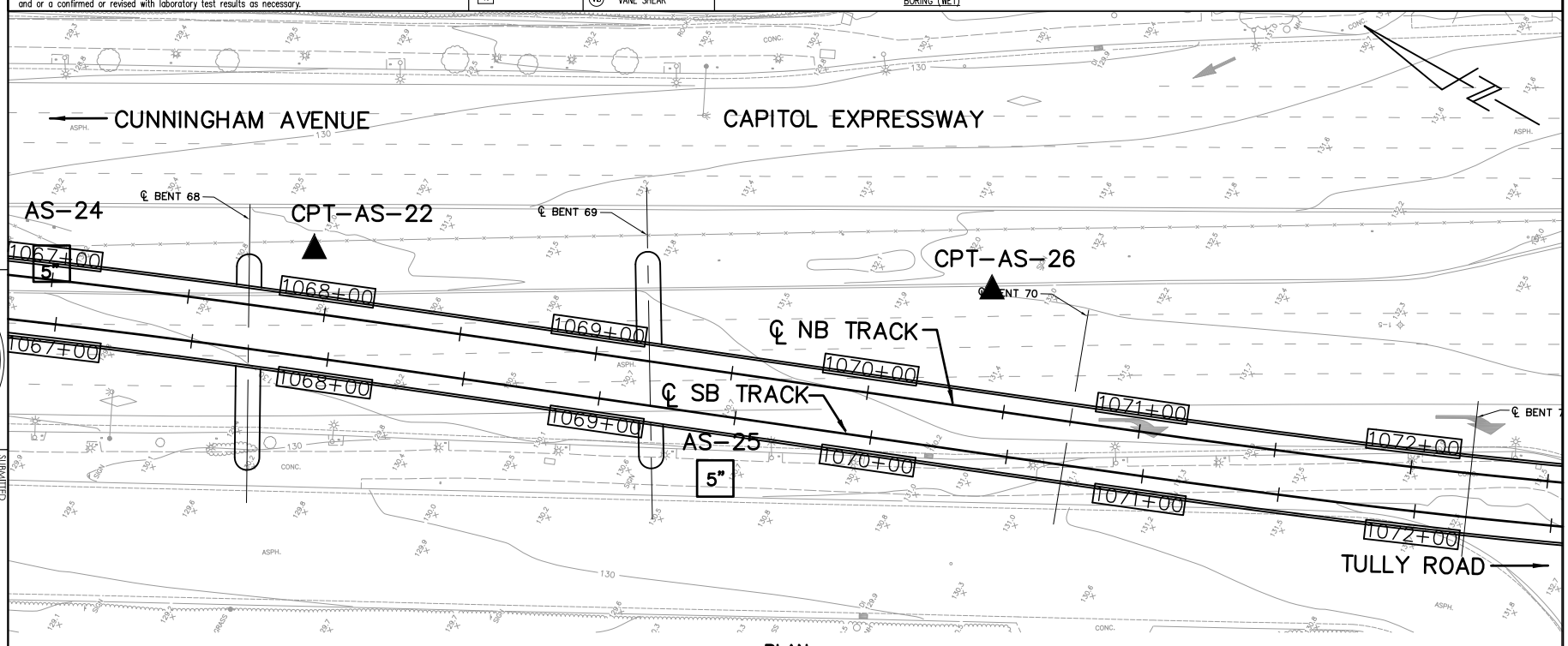

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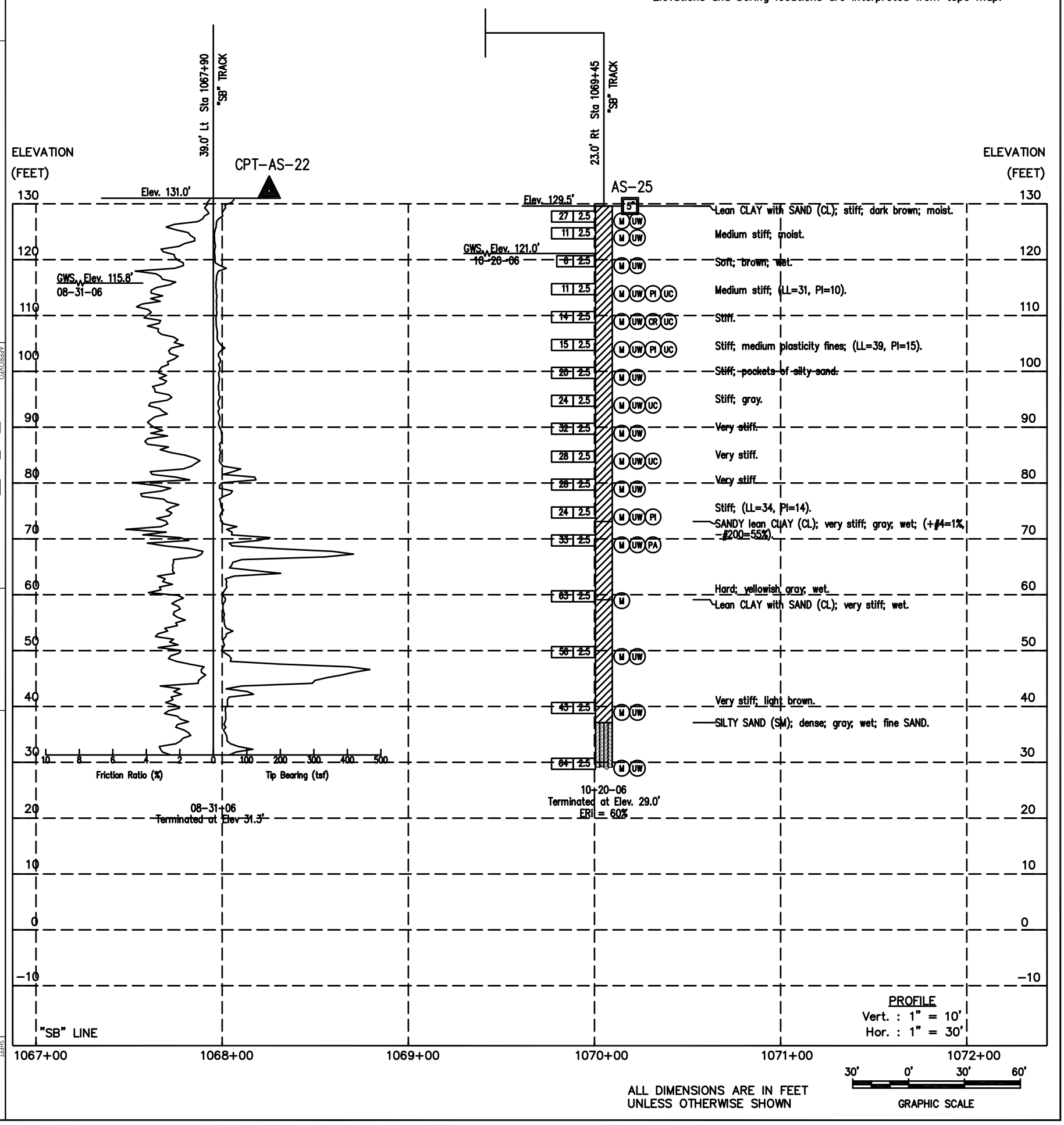

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CADD FILE DATE 03/26/20
SUBMITTAL DATE 06/29/20
SCALE 1:30
BOARD APPROVAL DATE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 1066+80 TO STA 1072+50

PCA NO. 000
CONTRACT NO. C801
FILE LOCATION PROJECTWISE
SHEET OF
DRAWING NO. HP325
REVISION C

ogouthier Jun 21, 2020 – 3:42pm C:\caddlib\pw\kouyang\west\dms98390\801HP326.dwg

NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
C	06/20	95% SUBMITTAL SET

CONSISTENCY CLASSIFICATION FOR SOILS
According to the Standard Penetration Test (ASTM D-1586)

SPT N-Value (Blows/ 305mm)	Granular	SPT N-Value (Blows/ 305mm)	Cohesive
0-4	Very loose	<2	Very soft
5-10	Loose	2-4	Soft
11-30	Medium Dense	5-8	Firm
31-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very Stiff
		>31	Hard

NOTE: Visual classifications of earth materials are based on field inspection and or a confirmed or revised with laboratory test results as necessary.

LEGEND OF EARTH MATERIALS (USCS)
BASED ON ASTM D2487, D2488

FILL MATERIAL; CLAY (CL or CH); SILT (ML or MH); PEAT and/or ORGANIC MATTER; WELL-GRADED GRAVEL (GW); POORLY-GRADED GRAVEL (GP); SILTY GRAVEL (GM); CLAYEY GRAVEL (GC); POORLY-GRADED SAND (SP); WELL-GRADED SAND (SW); SILTY SAND (SM) or SANDY SILT; CLAYEY SAND (SC) or SANDY CLAY; COBBLES/BOULDERS; IGNEOUS ROCK; SEDIMENTARY ROCK; METAMORPHIC ROCK

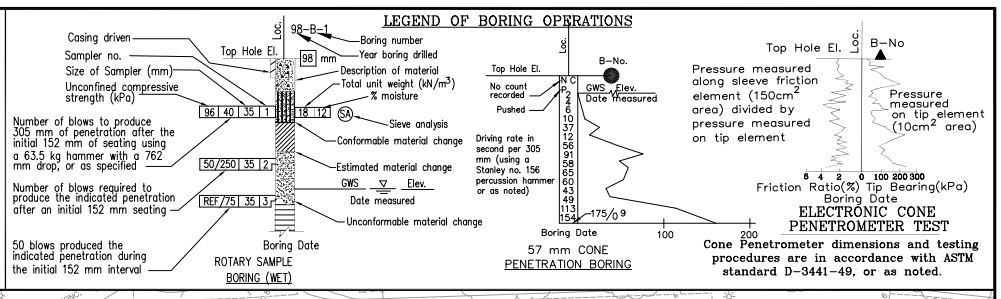
TYPES OF BORINGS

57 mm CONE PENETRATION; ROTARY WASH; ELECTRONIC CONE PENETROMETER; AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; SOIL TUBE

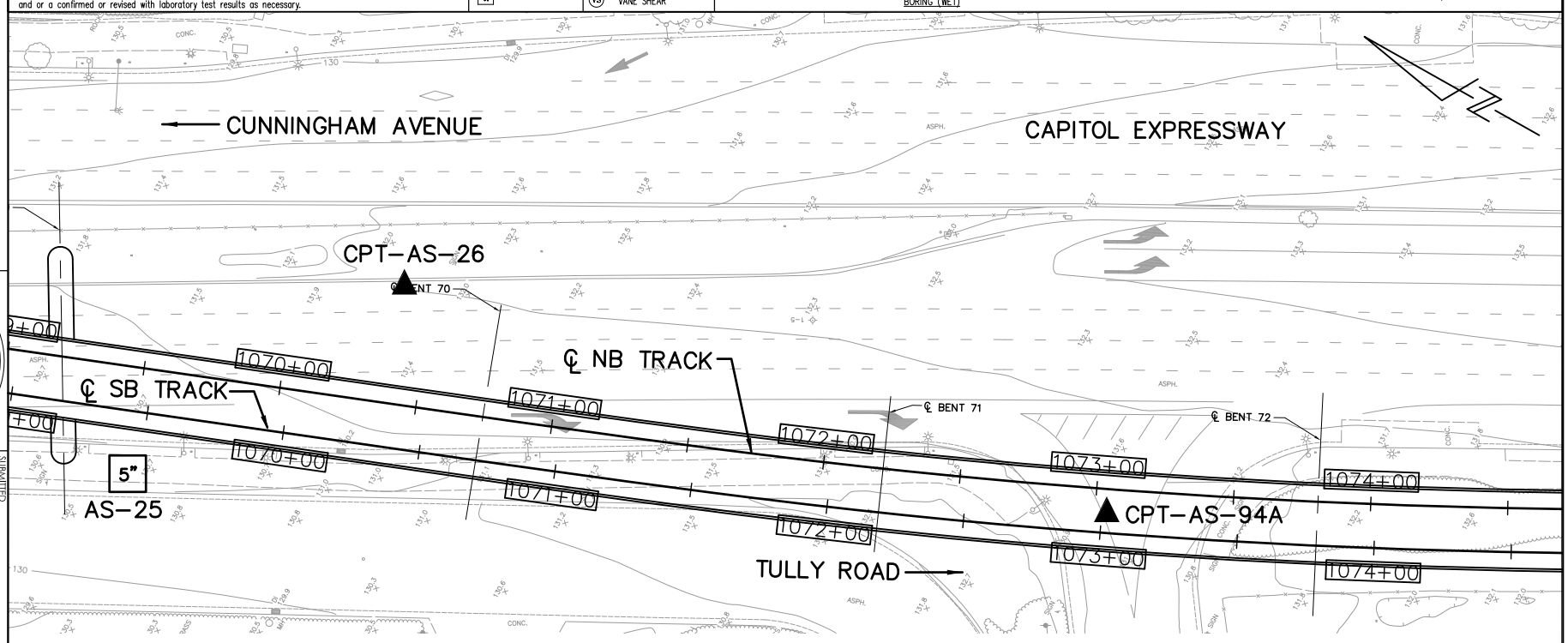
IN-SITU, LAB & FIELD TEST DESIGNATIONS

AL ATTERBERG LIMITS; CA CHEMICAL ANALYSIS; CN CONSOLIDATION; CU CONSOLIDATED UNDRAINED TRIAXIAL; DS DIRECT SHEAR; MD MAX. DRY DENSITY; PP POCKET PENETROMETER; SA SIEVE ANALYSIS; TV TORVANE; UC UNCONFINED COMPRESSION; UU UNCONSOLIDATED UNDRAINED TRIAXIAL; VS VANE SHEAR

LEGEND OF BORING OPERATIONS



Cone Penetrometer dimensions and testing procedures are in accordance with ASTM standard D-3441-49, or as noted.



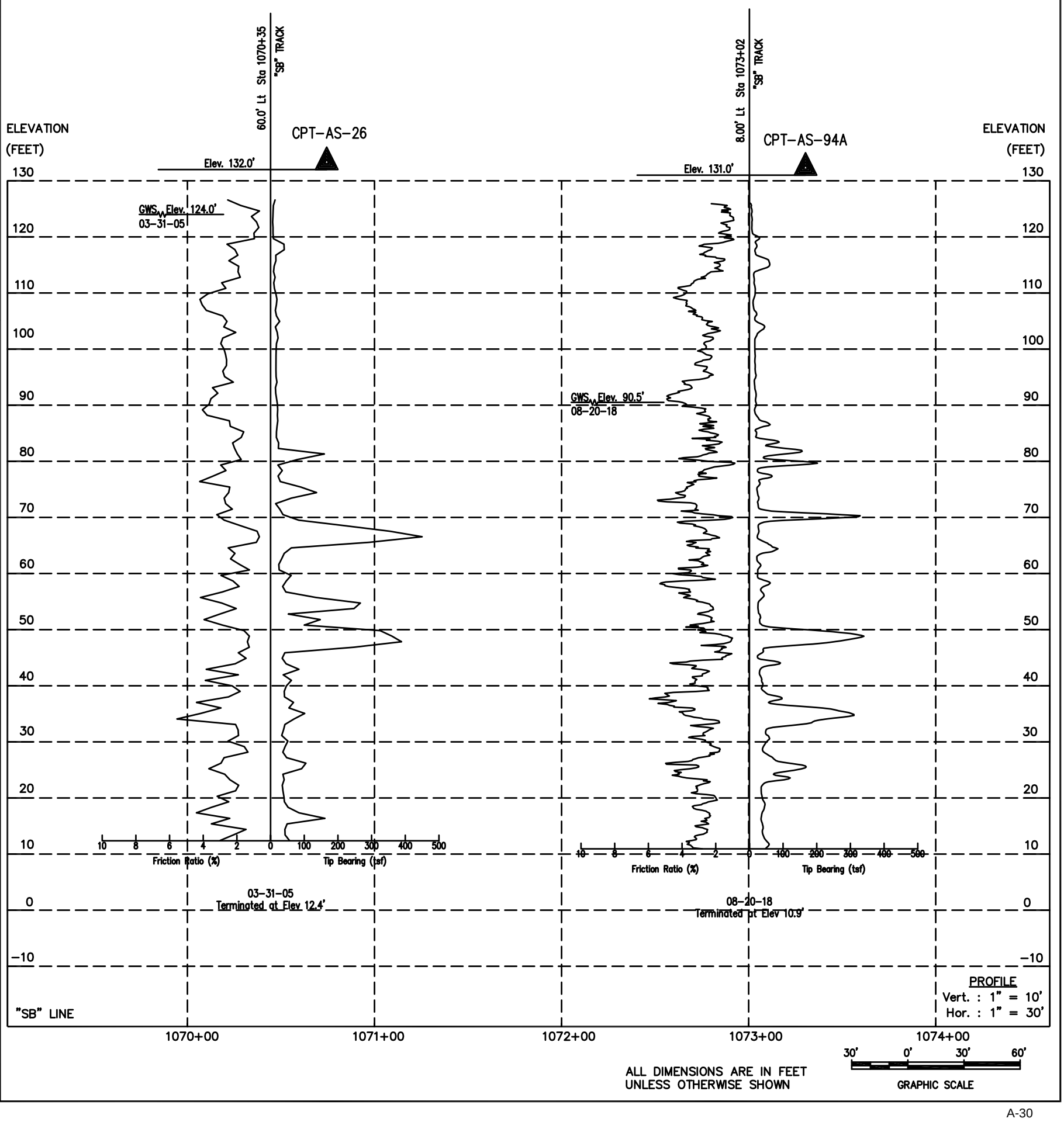
PLAN
1"=30'

NOTES:

Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2" Modified California Sampler: I.D. = 2.5"; O.D. = 3" Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

BENCHMARK:

The Horizontal datum is NAD 83 – Epoch 1991.35. Coordinates are on the California State Plane, Zone 0403. To obtain ground distances, multiply grid distances by 0.9999541. The Vertical datum is NAVD 88. Elevations and boring locations are interpreted from topo map.



ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA — GARY PARIKH — No. 666 — Exp. 12-31-21 GEOTECHNICAL

PARIKH — Practicing in the Geosciences — 1497 N MILPITAS BLVD. MILPITAS, CA 95035

DESIGNED E. Ortakci
DRAWN K. Ouyang
CHECKED A. Lam
CADD FILE NAME 801HP326.dwg

Santa Clara Valley Transportation Authority

BKF ENGINEERS / SURVEYORS / PLANNERS — 100+ YEARS

APPROVED
CADD FILE DATE 03/26/20
SUBMITTAL DATE 06/29/20
SCALE 1:30
BOARD APPROVAL DATE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 1069+00 TO STA 1074+65

PCA NO. 000
CONTRACT NO. C801
FILE LOCATION PROJECTWISE
SHEET OF
DRAWING NO. HP326
REVISION C

ogouthier Jun 21, 2020 – 3:44pm C:\caddlib\pw\kouyang\west\dms98390\801HP327.dwg

NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
C	06/20	95% SUBMITTAL SET

REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA — GARY PARIKH — No. 666 — Exp. 12-31-21 — GEOTECHNICAL

SUBMITTED

PARIKH — Practicing in the Geosciences — 1497 N MILPITAS BLVD. MILPITAS, CA 95035

DESIGNED E. Ortakci | DRAWN K. Ouyang | CHECKED A. Lam | CADD FILE NAME 801HP327.dwg

Santa Clara Valley Transportation Authority

APPROVED BKF 100+ YEARS — ENGINEERS / SURVEYORS / PLANNERS

CADD FILE DATE 03/26/20 | SCALE 1:30 | SUBMITTAL DATE 06/29/20 | BOARD APPROVAL DATE

PCA NO. 000 | CONTRACT NO. C801 | FILE LOCATION PROJECTWISE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 1073+35 TO STA 1079+00

SHEET OF | DRAWING NO. HP327 | REVISION C

CONSISTENCY CLASSIFICATION FOR SOILS

According to the Standard Penetration Test (ASTM D-1586)

SPT N-Value (Blows/ 305mm)	Granular	SPT N-Value (Blows/ 305mm)	Cohesive
0–4	Very loose	<2	Very soft
5–10	Loose	2–4	Soft
11–30	Medium Dense	5–8	Firm
31–50	Dense	9–15	Stiff
>50	Very Dense	16–30	Very Stiff
		>31	Hard

NOTE: Visual classifications of earth materials are based on field inspection and or a confirmed or revised with laboratory test results as necessary.

LEGEND OF EARTH MATERIALS (USCS) BASED ON ASTM D2487, D2488

FILL MATERIAL; CLAY (CL or CH); SILT (ML or MH); PEAT and/or ORGANIC MATTER; WELL-GRADED GRAVEL (GW); POORLY-GRADED GRAVEL (GP); SILTY GRAVEL (GM); CLAYEY GRAVEL (GC); POORLY-GRADED SAND (SP); WELL-GRADED SAND (SW); SILTY SAND (SM) or SANDY SILT; CLAYEY SAND (SC) or SANDY CLAY; COBBLES/BOULDERS; IGNEOUS ROCK; SEDIMENTARY ROCK; METAMORPHIC ROCK

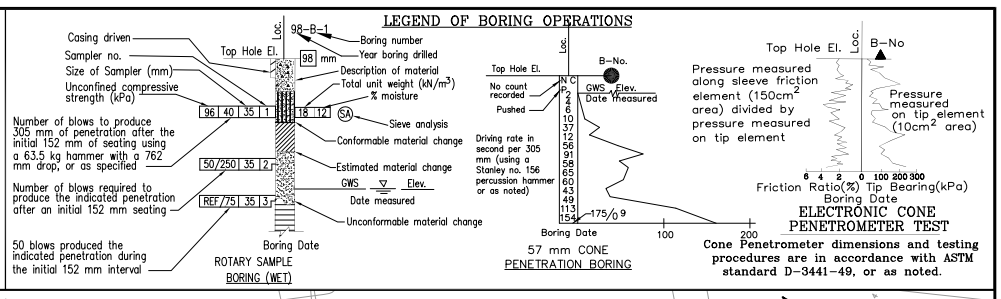
TYPES OF BORINGS

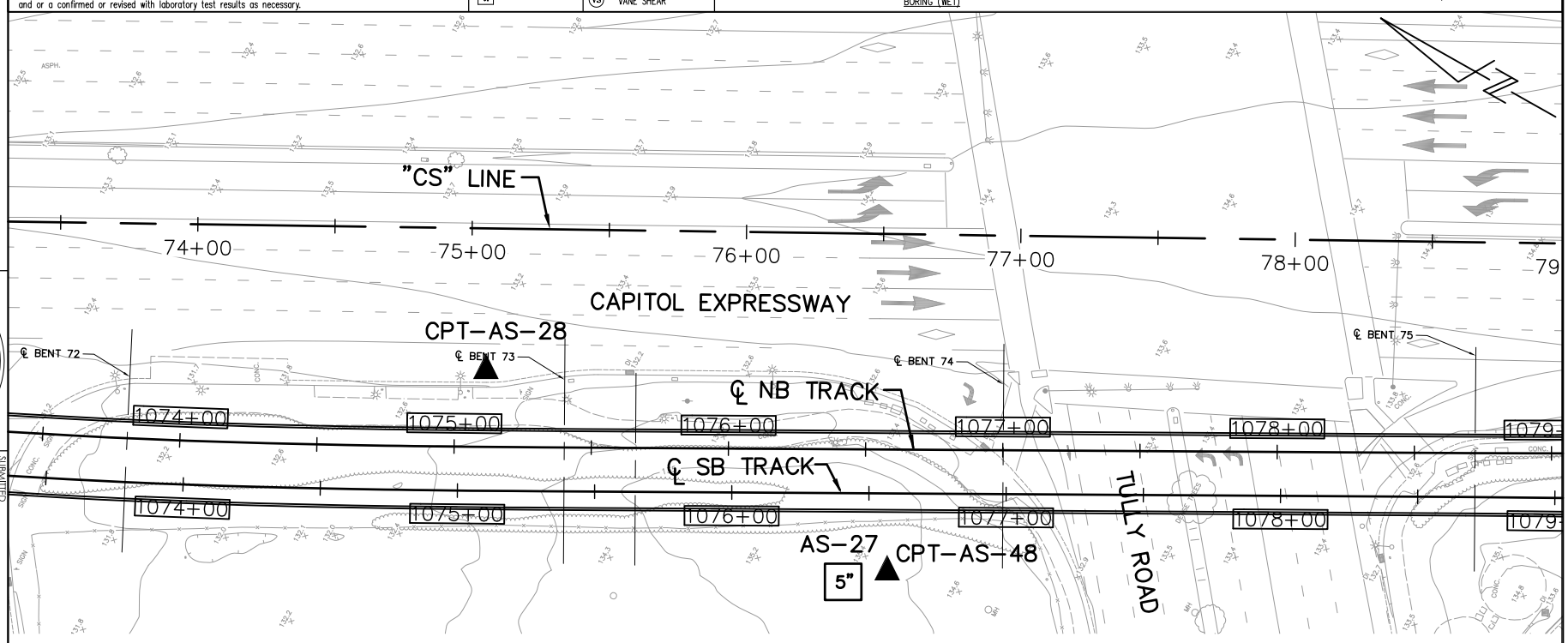
57 mm CONE PENETRATION; ROTARY WASH; ELECTRONIC CONE PENETROMETER; AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; SOIL TUBE

IN-SITU, LAB & FIELD TEST DESIGNATIONS

AL ATTERBERG LIMITS; CA CHEMICAL ANALYSIS; CN CONSOLIDATION; CU CONSOLIDATED UNDRAINED TRIAXIAL; DS DIRECT SHEAR; MD MAX. DRY DENSITY; PP POCKET PENETROMETER; SA SIEVE ANALYSIS; TV TORVANE; UC UNCONFINED COMPRESSION; UU UNCONSOLIDATED UNDRAINED TRIAXIAL; VS VANE SHEAR

LEGEND OF BORING OPERATIONS





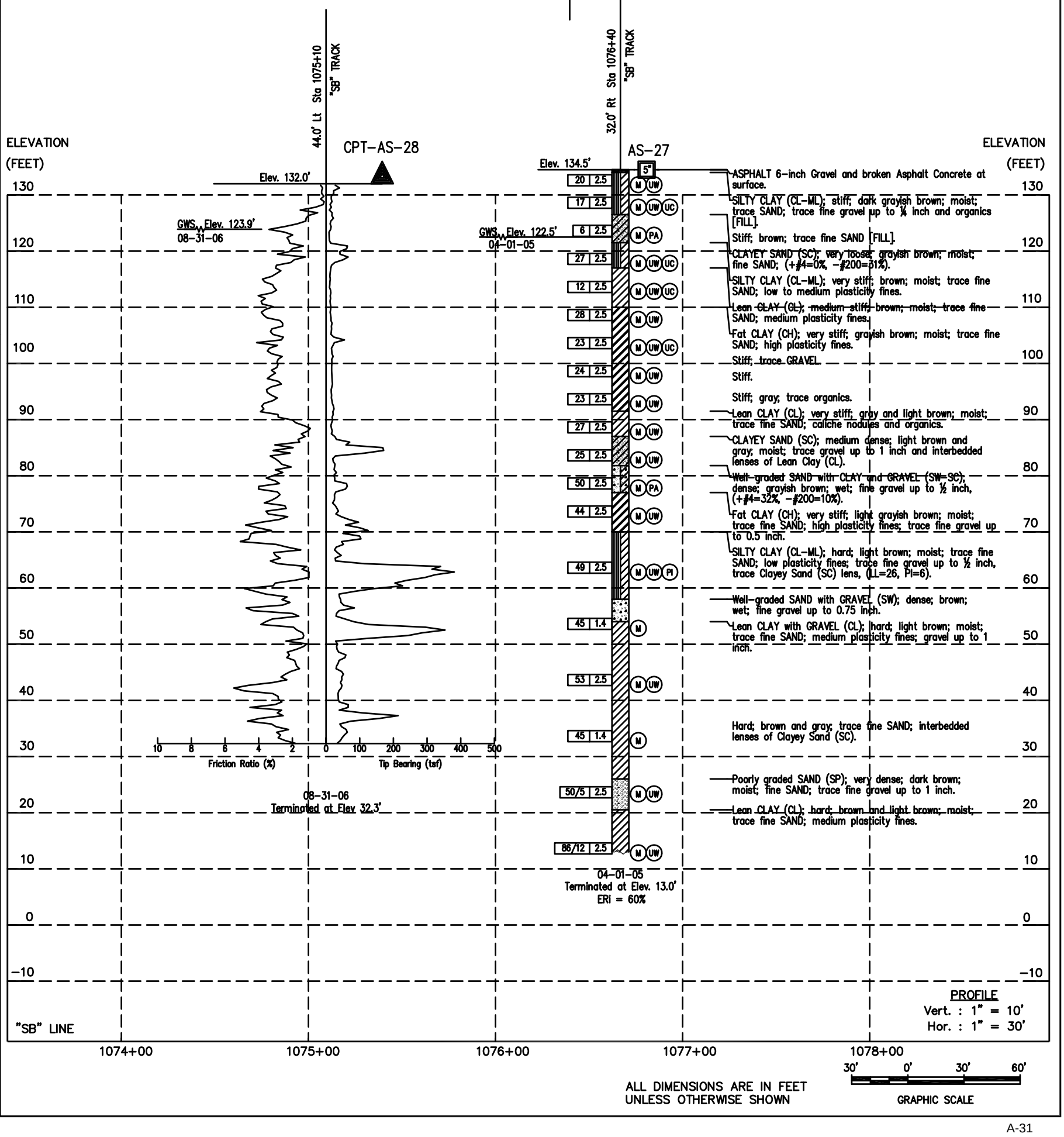
NOTES:

Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2" Modified California Sampler: I.D. = 2.5"; O.D. = 3" Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

BENCHMARK:

The Horizontal datum is NAD 83 – Epoch 1991.35. Coordinates are on the California State Plane, Zone 0403. To obtain ground distances, multiply grid distances by 0.9999541. The Vertical datum is NAVD 88. Elevations and boring locations are interpreted from topo map.

PLAN
1"=30'



PROFILE
Vert. : 1" = 10'
Hor. : 1" = 30'

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

30' 0' 30' 60'
GRAPHIC SCALE

ogouthier Jun 21, 2020 – 3:47pm C:\caddlib\pw\kouyang\west\dms98390\801HP328.dwg

NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
C	06/20	95% SUBMITTAL SET

REGISTERED PROFESSIONAL ENGINEER — GARY PARIKH — No. 666 — Exp. 12-31-21 — STATE OF CALIFORNIA GEOTECHNICAL

SUBMITTED

PARIKH — Practicing in the Geosciences — 1497 N MILPITAS BLVD. MILPITAS, CA 95035

DESIGNED E. Ortakci
DRAWN K. Ouyang
CHECKED A. Lam
CADD FILE NAME 801HP328.dwg

Santa Clara Valley Transportation Authority

APPROVED

BKF 100+ YEARS — ENGINEERS / SURVEYORS / PLANNERS

CADD FILE DATE 03/26/20
SUBMITTAL DATE 06/29/20
SCALE 1:30
BOARD APPROVAL DATE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 1076+00 TO STA 1081+65

PCA NO. 000
CONTRACT NO. C801
FILE LOCATION PROJECTWISE
REVISION C
DRAWING NO. HP328
SHEET OF

CONSISTENCY CLASSIFICATION FOR SOILS

According to the Standard Penetration Test (ASTM D-1586)

SPT N-Value (Blows/ 305mm)	Granular	SPT N-Value (Blows/ 305mm)	Cohesive
0–4	Very loose	<2	Very soft
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11–30	Medium Dense	5–8	Firm
31–50	Dense	9–15	Stiff
>50	Very Dense	16–30	Very Stiff
		>31	Hard

NOTE: Visual classifications of earth materials are based on field inspection and or a confirmed or revised with laboratory test results as necessary.

LEGEND OF EARTH MATERIALS (USCS)

BASED ON ASTM D2487, D2488

FILL MATERIAL; CLAY (CL or CH); SILT (ML or MH); PEAT and/or ORGANIC MATTER; WELL-GRADED GRAVEL (GW); POORLY-GRADED GRAVEL (GP); SILTY GRAVEL (GM); CLAYEY GRAVEL (GC); POORLY-GRADED SAND (SP); WELL-GRADED SAND (SW); SILTY SAND (SM) or SANDY SILT; CLAYEY SAND (SC) or SANDY CLAY; COBBLES/BOULDERS; IGNEOUS ROCK; SEDIMENTARY ROCK; METAMORPHIC ROCK

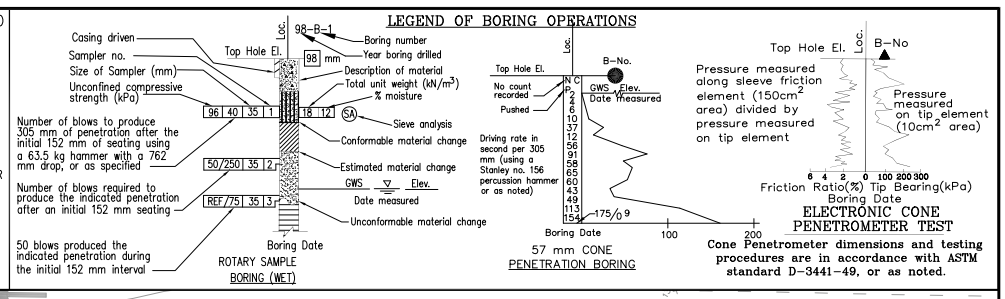
TYPES OF BORINGS

57 mm CONE PENETRATION; ROTARY WASH; ELECTRONIC CONE PENETROMETER; AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; SOIL TUBE

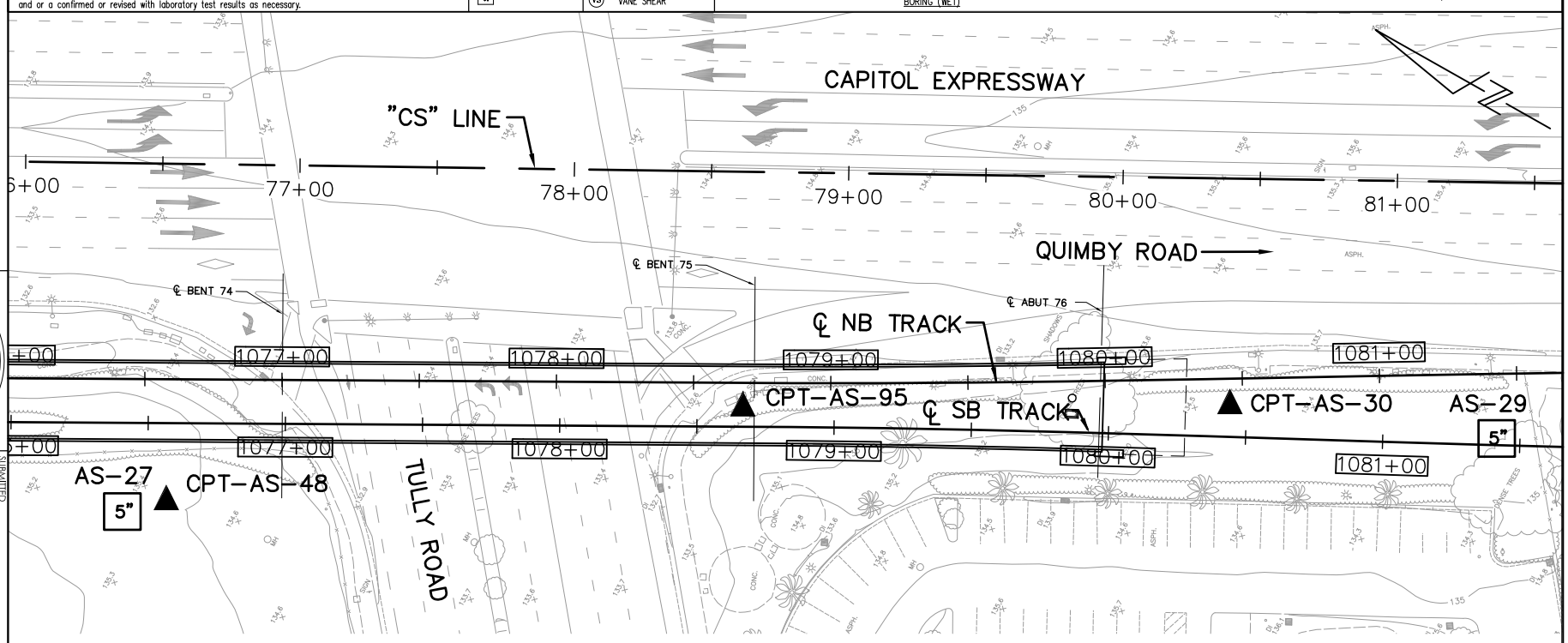
IN-SITU, LAB & FIELD TEST DESIGNATIONS

(AL) ATTERBERG LIMITS; (CA) CHEMICAL ANALYSIS; (CN) CONSOLIDATION; (CU) CONSOLIDATED UNDRAINED TRIAXIAL; (DS) DIRECT SHEAR; (MD) MAX. DRY DENSITY; (PP) POCKET PENETROMETER; (SA) SIEVE ANALYSIS; (TV) TORVANE UNCONFINED COMPRESSION; (UC) UNCONSOLIDATED UNDRAINED TRIAXIAL; (VS) VANE SHEAR

LEGEND OF BORING OPERATIONS



Cone Penetrometer dimensions and testing procedures are in accordance with ASTM standard D-3441-49, or as noted.



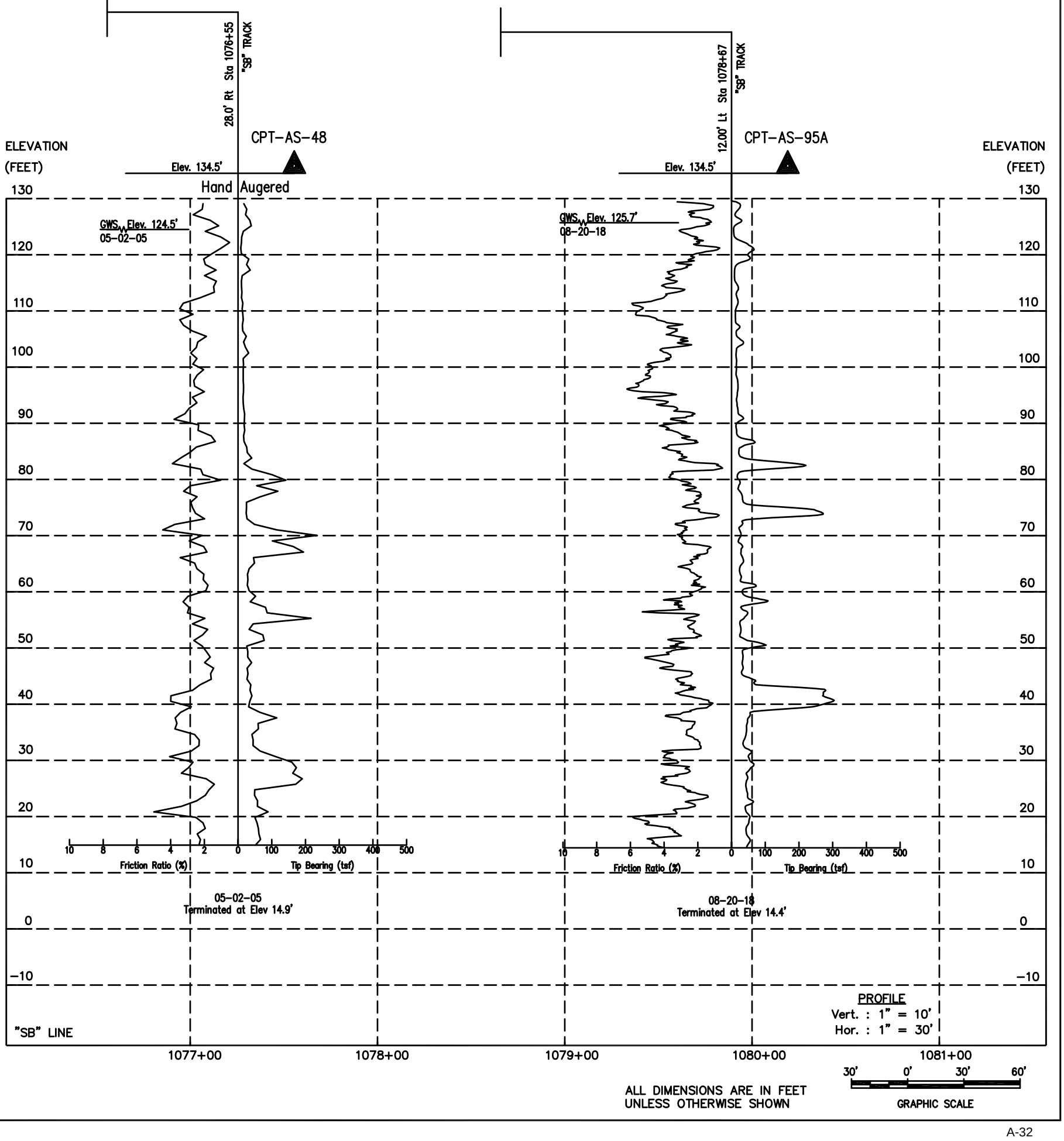
PLAN
1"=30'

NOTES:

Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2" Modified California Sampler: I.D. = 2.5"; O.D. = 3" Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

BENCHMARK:

The Horizontal datum is NAD 83 – Epoch 1991.35. Coordinates are on the California State Plane, Zone 0403. To obtain ground distances, multiply grid distances by 0.9999541. The Vertical datum is NAVD 88. Elevations and boring locations are interpreted from topo map.



ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

ogouthier Jun 21, 2020 – 3:50pm C:\caddlib\pw\kouyang\west\dms98390\801HP329.dwg

NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
C	06/20	95% SUBMITTAL SET

REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA — GARY PARIKH — No. 666 — Exp. 12-31-21 GEOTECHNICAL

DESIGNED E. Ortakci
DRAWN K. Ouyang
CHECKED A. Lam
CADD FILE NAME 801HP329.dwg

PARIKH — Practicing in the Geosciences — 1497 N MILPITAS BLVD. MILPITAS, CA 95035

SUBMITTED

BKF ENGINEERS / SURVEYORS / PLANNERS — 100+ YEARS

APPROVED

CADD FILE DATE 03/26/20
SUBMITTAL DATE 06/29/20
SCALE 1:30
BOARD APPROVAL DATE

Santa Clara Valley Transportation Authority

PCA NO. 000
CONTRACT NO. C801
FILE LOCATION PROJECTWISE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 1079+00 TO STA 1084+65

REVISION C
DRAWING NO. HP329
SHEET OF

CONSISTENCY CLASSIFICATION FOR SOILS
According to the Standard Penetration Test (ASTM D-1586)

SPT N-Value (Blows/ 305mm)	Granular	SPT N-Value (Blows/ 305mm)	Cohesive
0–4	Very loose	<2	Very soft
5–10	Loose	2–4	Soft
11–30	Medium Dense	5–8	Firm
31–50	Dense	9–15	Stiff
>50	Very Dense	16–30	Very Stiff
		>31	Hard

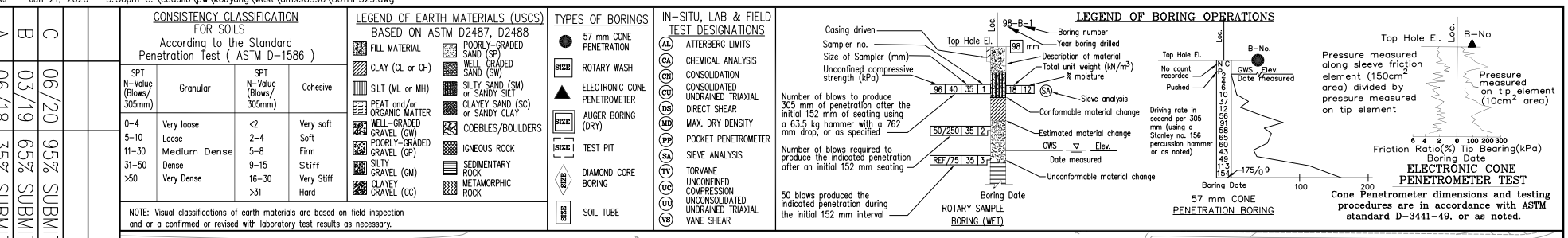
NOTE: Visual classifications of earth materials are based on field inspection and or a confirmed or revised with laboratory test results as necessary.

LEGEND OF EARTH MATERIALS (USCS) BASED ON ASTM D2487, D2488
FILL MATERIAL; CLAY (CL or CH); SILT (ML or MH); PEAT and/or ORGANIC MATTER; WELL-GRADED GRAVEL (GW); POORLY-GRADED GRAVEL (GP); SILTY GRAVEL (GM); CLAYEY GRAVEL (GC); POORLY-GRADED SAND (SP); WELL-GRADED SAND (SW); SILTY SAND (SM) or SANDY SILT; CLAYEY SAND (SC) or SANDY CLAY; COBBLES/BOULDERS; IGNEOUS ROCK; SEDIMENTARY ROCK; METAMORPHIC ROCK

TYPES OF BORINGS
57 mm CONE PENETRATION; ROTARY WASH; ELECTRONIC CONE PENETROMETER; AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; SOIL TUBE

IN-SITU, LAB & FIELD TEST DESIGNATIONS
AL ATTERBERG LIMITS; CA CHEMICAL ANALYSIS; CN CONSOLIDATION; CU CONSOLIDATED UNDRAINED TRIAXIAL; DS DIRECT SHEAR; MD MAX. DRY DENSITY; PP POCKET PENETROMETER; SA SIEVE ANALYSIS; TV TORVANE; UC UNCONFINED COMPRESSION; UU UNCONSOLIDATED UNDRAINED TRIAXIAL; VS VANE SHEAR

LEGEND OF BORING OPERATIONS



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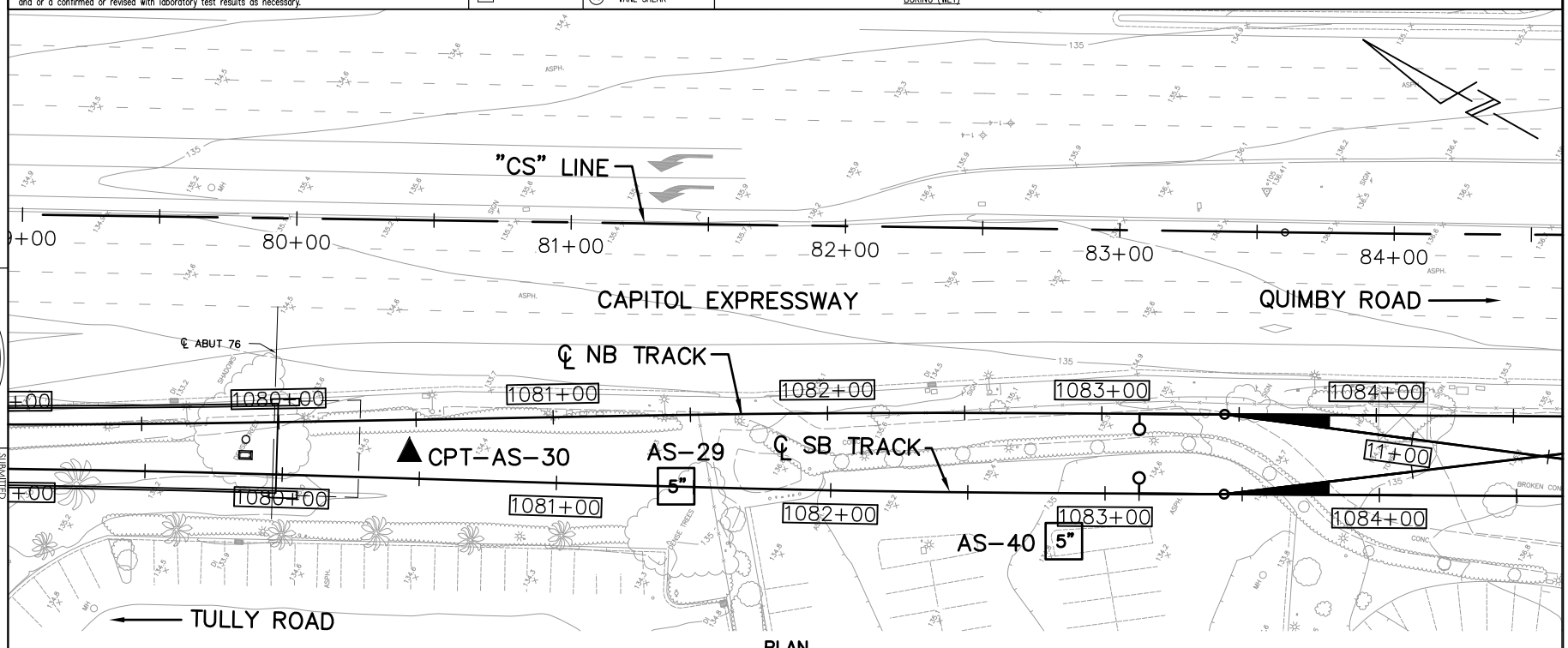

PLAN
1"=30'

NOTES:
Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2" Modified California Sampler: I.D. = 2.5"; O.D. = 3" Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

BENCHMARK:
The Horizontal datum is NAD 83 – Epoch 1991.35. Coordinates are on the California State Plane, Zone 0403. To obtain ground distances, multiply grid distances by 0.9999541. The Vertical datum is NAVD 88. Elevations and boring locations are interpreted from topo map.

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

ogouthier Jun 21, 2020 – 3:53pm C:\caddlib\pw\kouyang\west\dms98390\801HP330.dwg

NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
C	06/20	95% SUBMITTAL SET

CONSISTENCY CLASSIFICATION FOR SOILS
According to the Standard Penetration Test (ASTM D-1586)

SPT N-Value (Blows/ 305mm)	Granular	SPT N-Value (Blows/ 305mm)	Cohesive
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IN-SITU, LAB & FIELD TEST DESIGNATIONS

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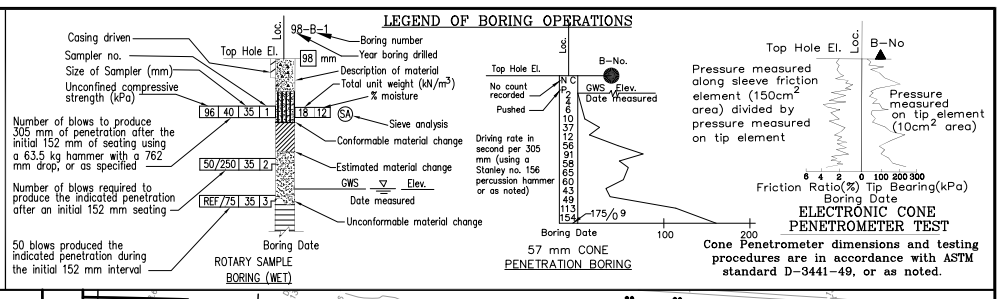
LEGEND OF BORING OPERATIONS



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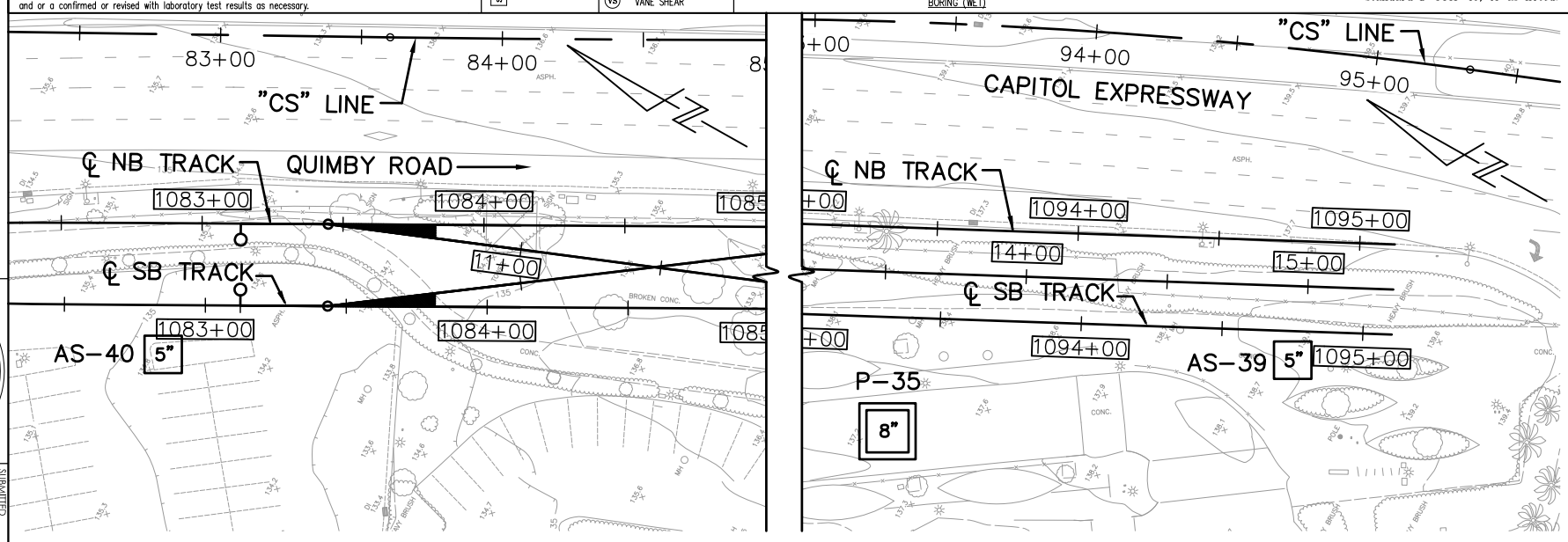

PLAN
1"=30'

NOTES:

Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2" Modified California Sampler: I.D. = 2.5"; O.D. = 3" Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

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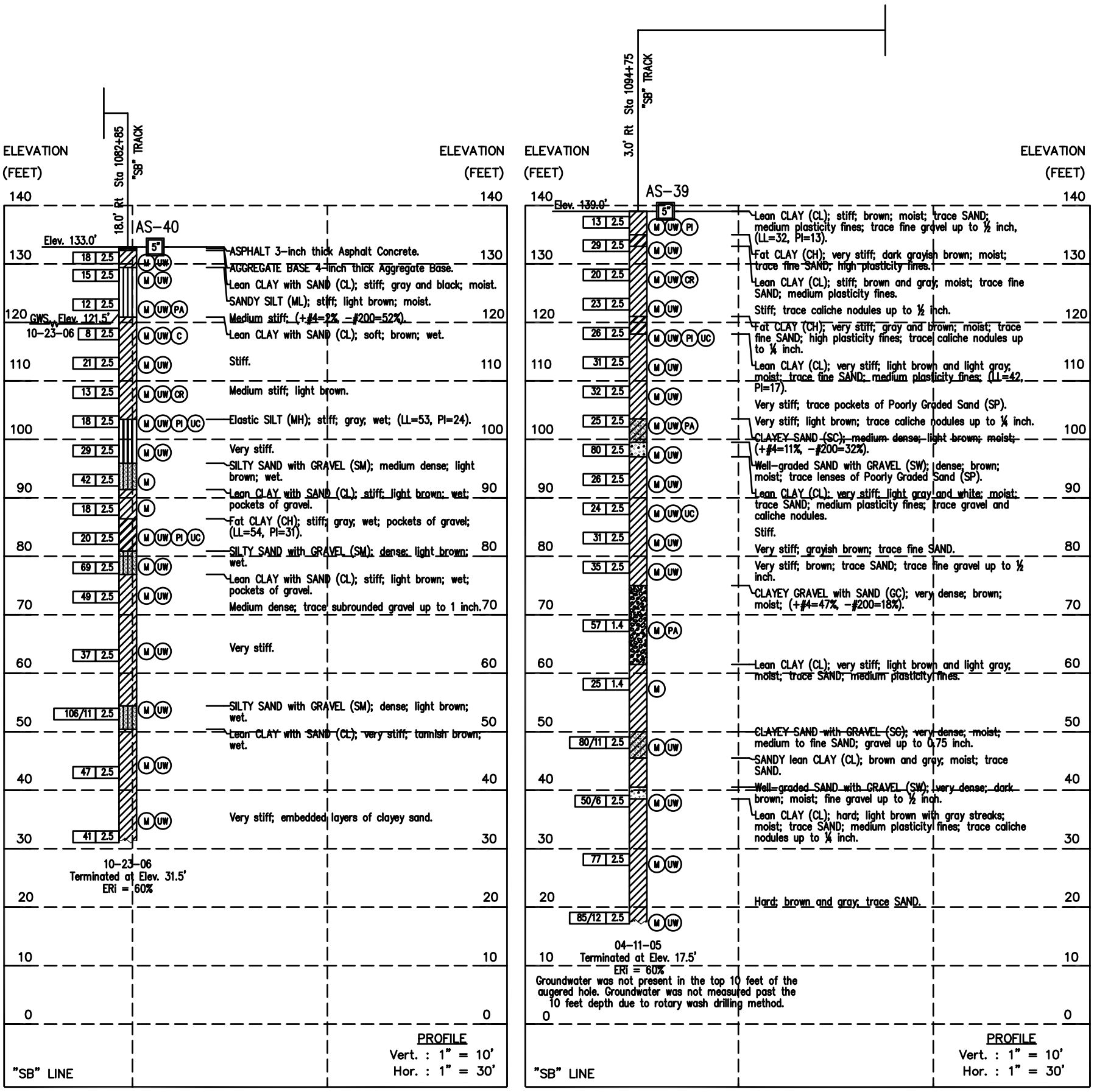

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

30' 0' 30' 60'
GRAPHIC SCALE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 1082+30 TO STA 1095+05

Santa Clara Valley Transportation Authority

REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA — GARY PARIKH — No. 666 — Exp. 12-31-21 GEOTECHNICAL

SUBMITTED — APPROVED

PARIKH — Practicing in the Geosciences — 1497 N MILPITAS BLVD. MILPITAS, CA 95035

BKF ENGINEERS / SURVEYORS / PLANNERS — 100+ YEARS

DESIGNED E. Ortakci
DRAWN K. Ouyang
CHECKED A. Lam
CADD FILE NAME 801HP330.dwg
CADD FILE DATE 03/26/20
SUBMITTAL DATE 06/29/20
SCALE 1:30
BOARD APPROVAL DATE
PCA NO. 000
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FILE LOCATION PROJECTWISE
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REVISION C
SHEET OF

ogouthier Jun 21, 2020 – 3:57pm C:\caddlib\pw\kouyang\west\dms98390\801HP331.dwg

NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
C	06/20	95% SUBMITTAL SET

CONSISTENCY CLASSIFICATION FOR SOILS
According to the Standard Penetration Test (ASTM D-1586)

SPT N-Value (Blows/ 305mm)	Granular	SPT N-Value (Blows/ 305mm)	Cohesive
0–4	Very loose	<2	Very soft
5–10	Loose	2–4	Soft
11–30	Medium Dense	5–8	Firm
31–50	Dense	9–15	Stiff
>50	Very Dense	16–30	Very Stiff
		>31	Hard

NOTE: Visual classifications of earth materials are based on field inspection and or a confirmed or revised with laboratory test results as necessary.

LEGEND OF EARTH MATERIALS (USCS) BASED ON ASTM D2487, D2488

FILL MATERIAL; CLAY (CL or CH); SILT (ML or MH); PEAT and/or ORGANIC MATTER; WELL-GRADED GRAVEL (GW); POORLY-GRADED GRAVEL (GP); SILTY GRAVEL (GM); CLAYEY GRAVEL (GC); POORLY-GRADED SAND (SP); WELL-GRADED SAND (SW); SILTY SAND (SM) or SANDY SILT; CLAYEY SAND (SC) or SANDY CLAY; COBBLES/BOULDERS; IGNEOUS ROCK; SEDIMENTARY ROCK; METAMORPHIC ROCK

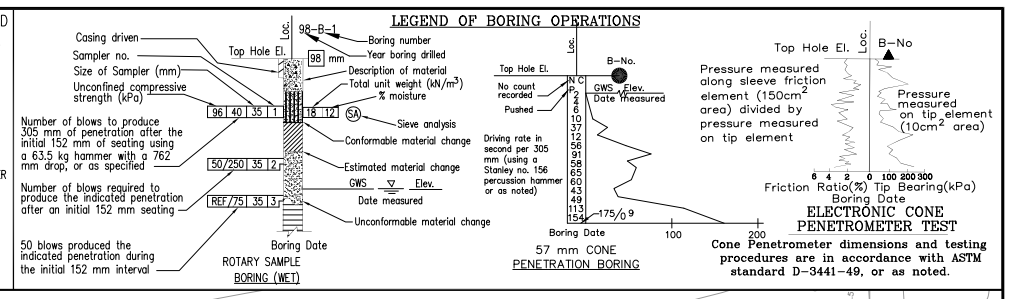
TYPES OF BORINGS

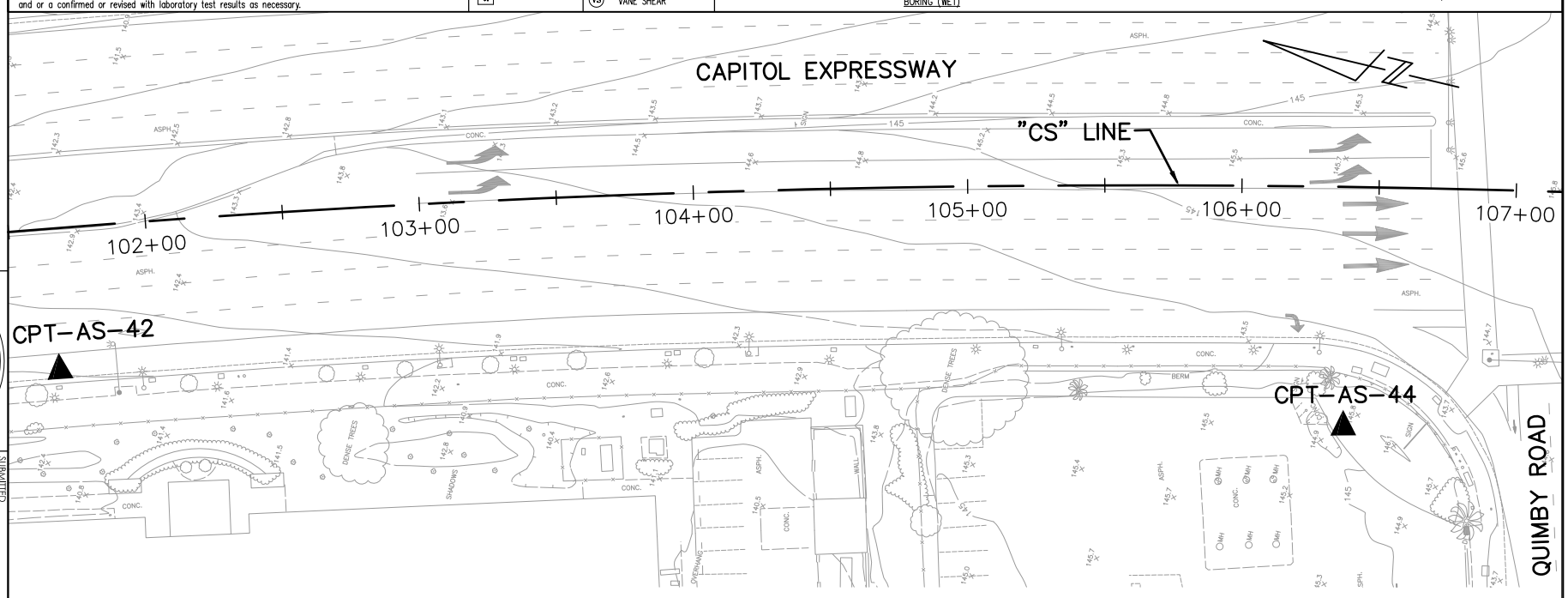
57 mm CONE PENETRATION; ROTARY WASH; ELECTRONIC CONE PENETROMETER; AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; SOIL TUBE

IN-SITU, LAB & FIELD TEST DESIGNATIONS

AL ATTERBERG LIMITS; CA CHEMICAL ANALYSIS; CN CONSOLIDATION; CU CONSOLIDATED UNDRAINED TRIAXIAL; DS DIRECT SHEAR; MD MAX. DRY DENSITY; PP POCKET PENETROMETER; SA SIEVE ANALYSIS; TV TORVANE; UC UNCONFINED COMPRESSION; UU UNCONSOLIDATED UNDRAINED TRIAXIAL; VS VANE SHEAR

LEGEND OF BORING OPERATIONS





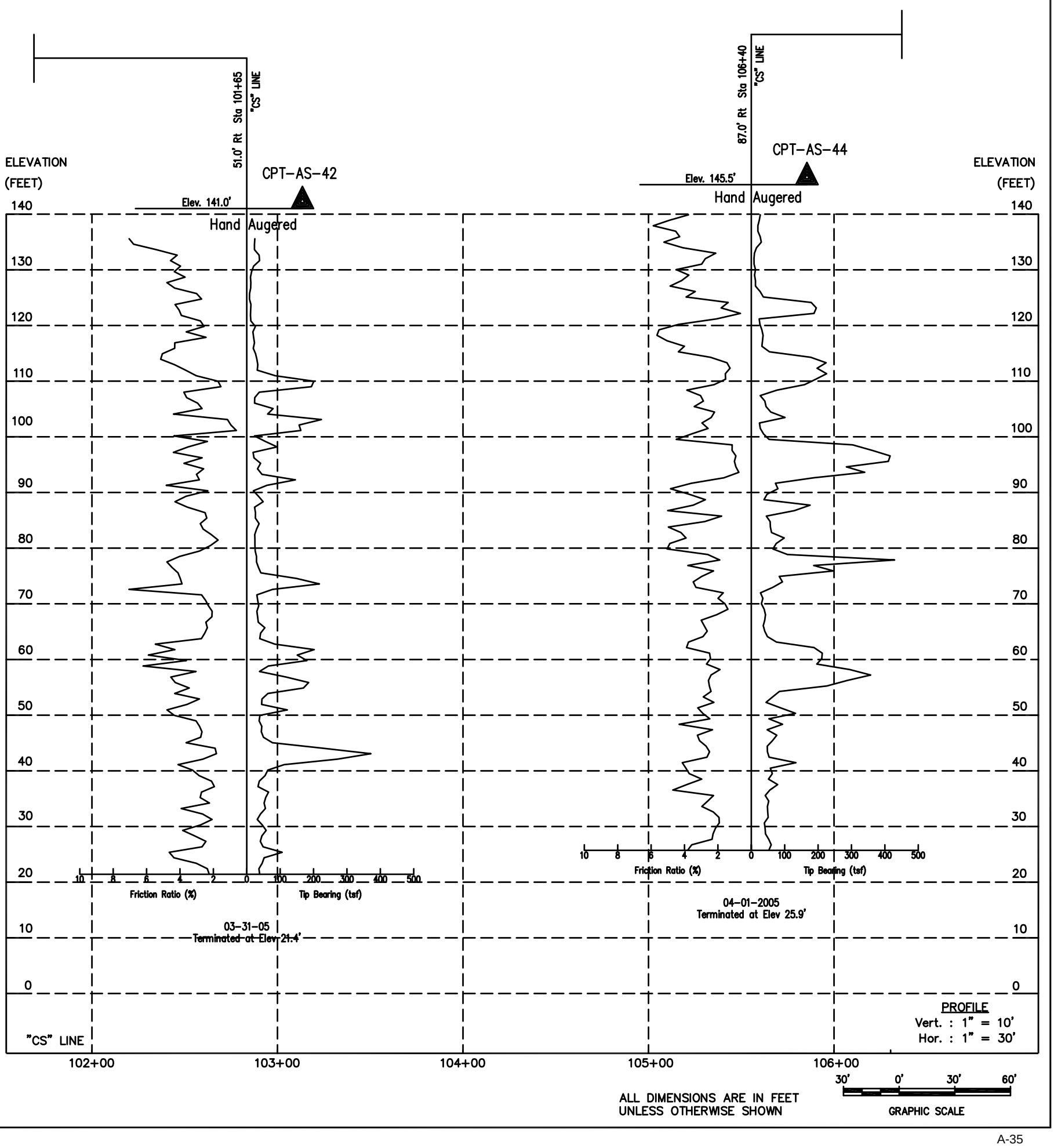
PLAN
1"=30'

NOTES:

Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2" Modified California Sampler: I.D. = 2.5"; O.D. = 3" Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

BENCHMARK:

The Horizontal datum is NAD 83 – Epoch 1991.35. Coordinates are on the California State Plane, Zone 0403. To obtain ground distances, multiply grid distances by 0.9999541. The Vertical datum is NAVD 88. Elevations and boring locations are interpreted from topo map.



SUBMITTED
PARIKH
Practicing in the Geosciences
1497 N MILPITAS BLVD.
MILPITAS, CA 95035

DESIGNED E. Ortakci
DRAWN K. Ouyang
CHECKED A. Lam
CADD FILE NAME 801HP331.dwg

REGISTERED PROFESSIONAL ENGINEER
GARY PARIKH
No. 666
Exp. 12-31-21
STATE OF CALIFORNIA GEOTECHNICAL

Santa Clara Valley Transportation Authority

APPROVED
BKF 100+ YEARS
ENGINEERS / SURVEYORS / PLANNERS

CADD FILE DATE 03/26/20
SUBMITTAL DATE 06/29/20
SCALE 1:30
BOARD APPROVAL DATE

PCA NO. 000
CONTRACT NO. C801
FILE LOCATION PROJECTWISE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 101+50 TO STA 107+15

SHEET OF
DRAWING NO. HP331
REVISION C

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NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
C	06/20	95% SUBMITTAL SET

CONSISTENCY CLASSIFICATION FOR SOILS
According to the Standard Penetration Test (ASTM D-1586)

SPT N-Value (Blows/ 305mm)	Granular	SPT N-Value (Blows/ 305mm)	Cohesive
0–4	Very loose	<2	Very soft
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11–30	Medium Dense	5–8	Firm
31–50	Dense	9–15	Stiff
>50	Very Dense	16–30	Very Stiff
		>31	Hard

NOTE: Visual classifications of earth materials are based on field inspection and or a confirmed or revised with laboratory test results as necessary.

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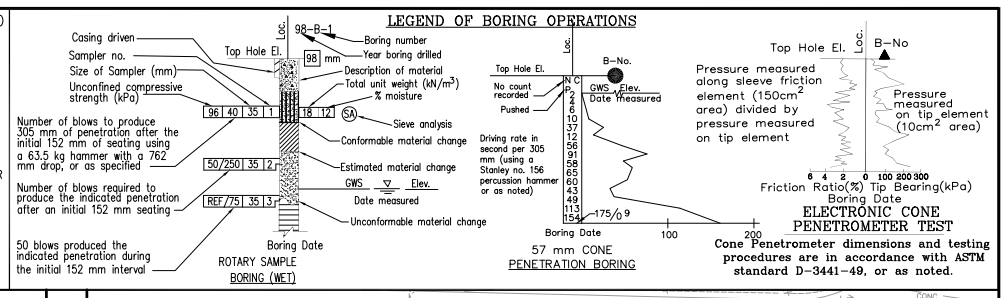
TYPES OF BORINGS

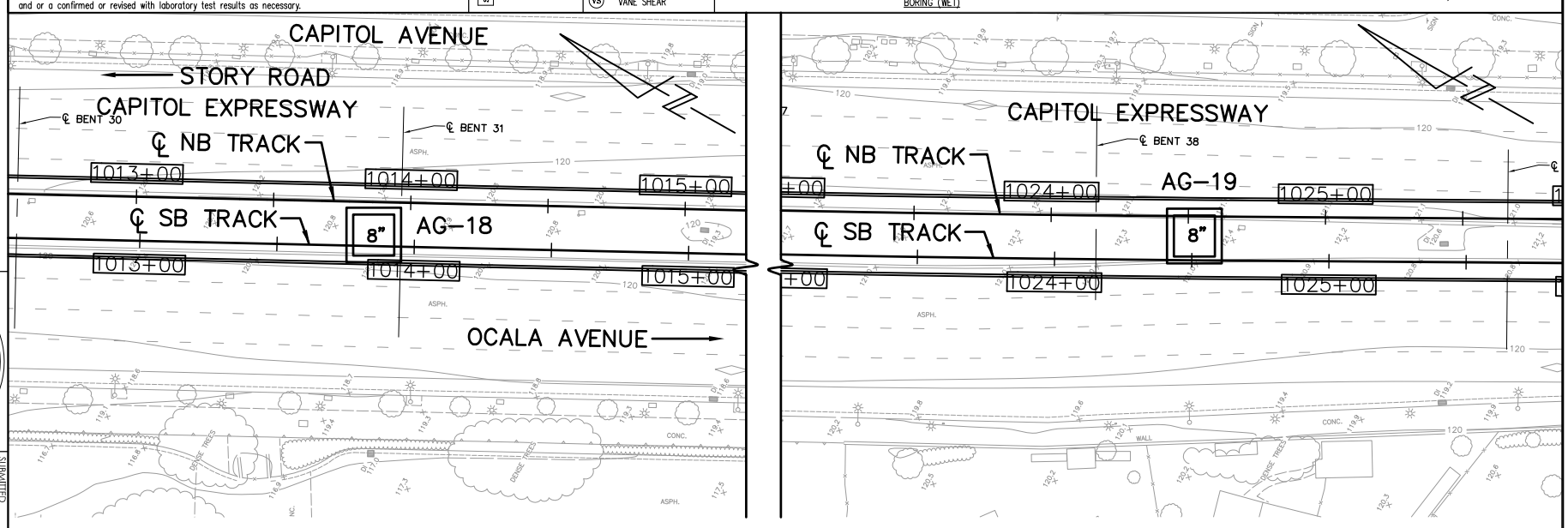
57 mm CONE PENETRATION; ROTARY WASH; ELECTRONIC CONE PENETROMETER; AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; SOIL TUBE

IN-SITU, LAB & FIELD TEST DESIGNATIONS

AL ATTERBERG LIMITS; CA CHEMICAL ANALYSIS; CN CONSOLIDATION; CU CONSOLIDATED UNDRAINED TRIAXIAL; DS DIRECT SHEAR; MD MAX. DRY DENSITY; PP POCKET PENETROMETER; SA SIEVE ANALYSIS; TV TORVANE; UC UNCONFINED COMPRESSION; UU UNCONSOLIDATED UNDRAINED TRIAXIAL; VS VANE SHEAR

LEGEND OF BORING OPERATIONS





PLAN
1"=30'

NOTES:

Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2" Modified California Sampler: I.D. = 2.5"; O.D. = 3" Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

BENCHMARK:

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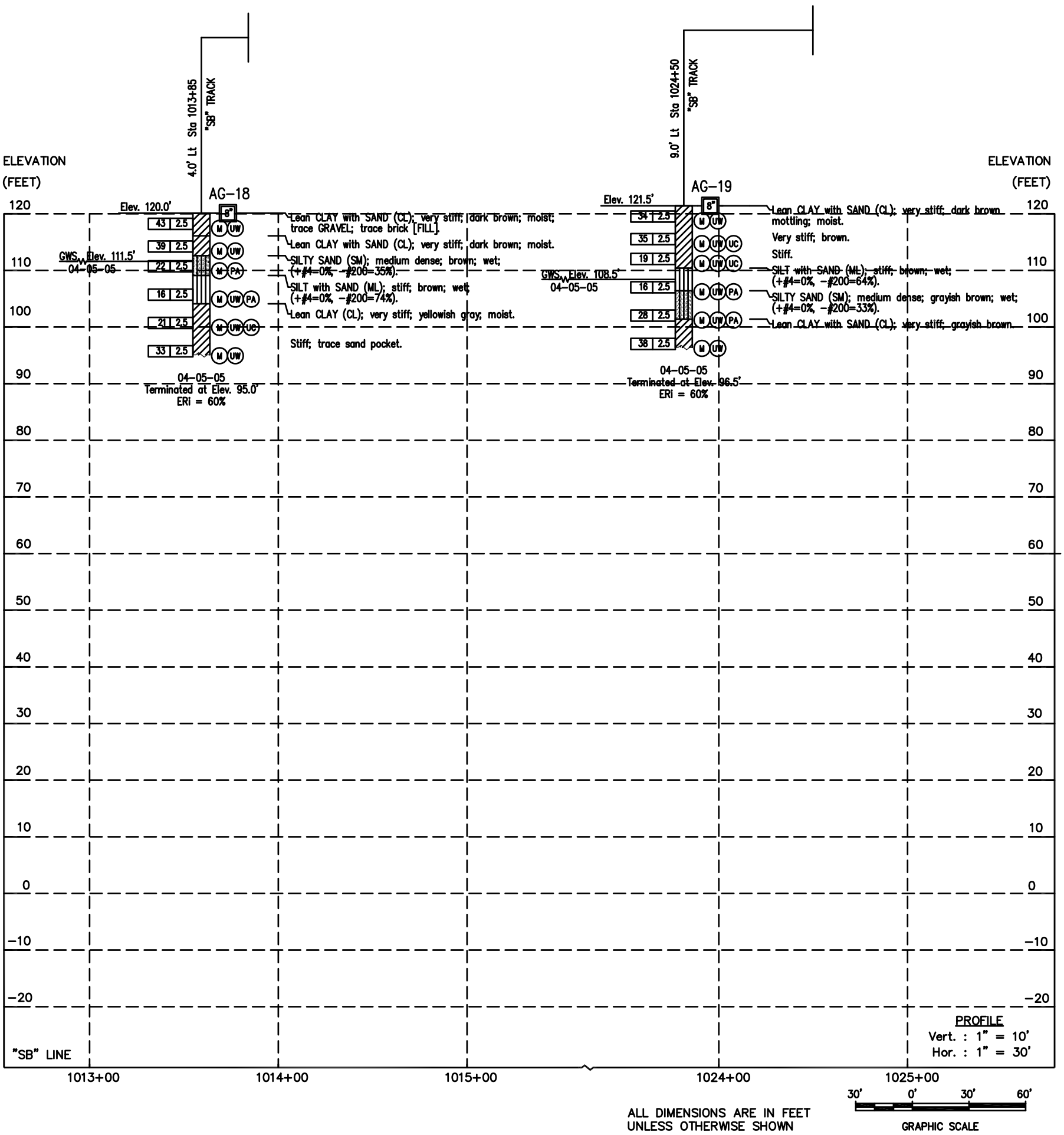

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

REGISTERED PROFESSIONAL ENGINEER — GARY PARIKH — No. 666 — Exp. 12-31-21 — STATE OF CALIFORNIA GEOTECHNICAL

SUBMITTED

PARIKH — Practicing in the Geosciences — 1497 N MILPITAS BLVD. MILPITAS, CA 95035

DESIGNED E. Ortakci
DRAWN K. Ouyang
CHECKED A. Lam
CADD FILE NAME 801HP332.dwg

Santa Clara Valley Transportation Authority

APPROVED

BKF 100+ YEARS — ENGINEERS / SURVEYORS / PLANNERS

CADD FILE DATE 03/26/20
SUBMITTAL DATE 06/29/20
SCALE 1:30
BOARD APPROVAL DATE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 1012+50 TO STA 1025+85

PCA NO. 000
CONTRACT NO. C801
FILE LOCATION PROJECTWISE
SHEET OF
DRAWING NO. HP332
REVISION C

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NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
C	06/20	95% SUBMITTAL SET

CONSISTENCY CLASSIFICATION FOR SOILS
According to the Standard Penetration Test (ASTM D-1586)

SPT N-Value (Blows/ 305mm)	Granular	SPT N-Value (Blows/ 305mm)	Cohesive
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>50	Very Dense	16–30	Very Stiff
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NOTE: Visual classifications of earth materials are based on field inspection and or a confirmed or revised with laboratory test results as necessary.

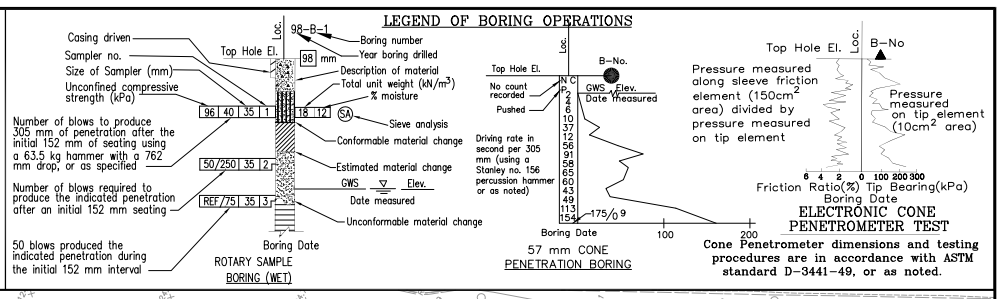
LEGEND OF EARTH MATERIALS (USCS)
BASED ON ASTM D2487, D2488

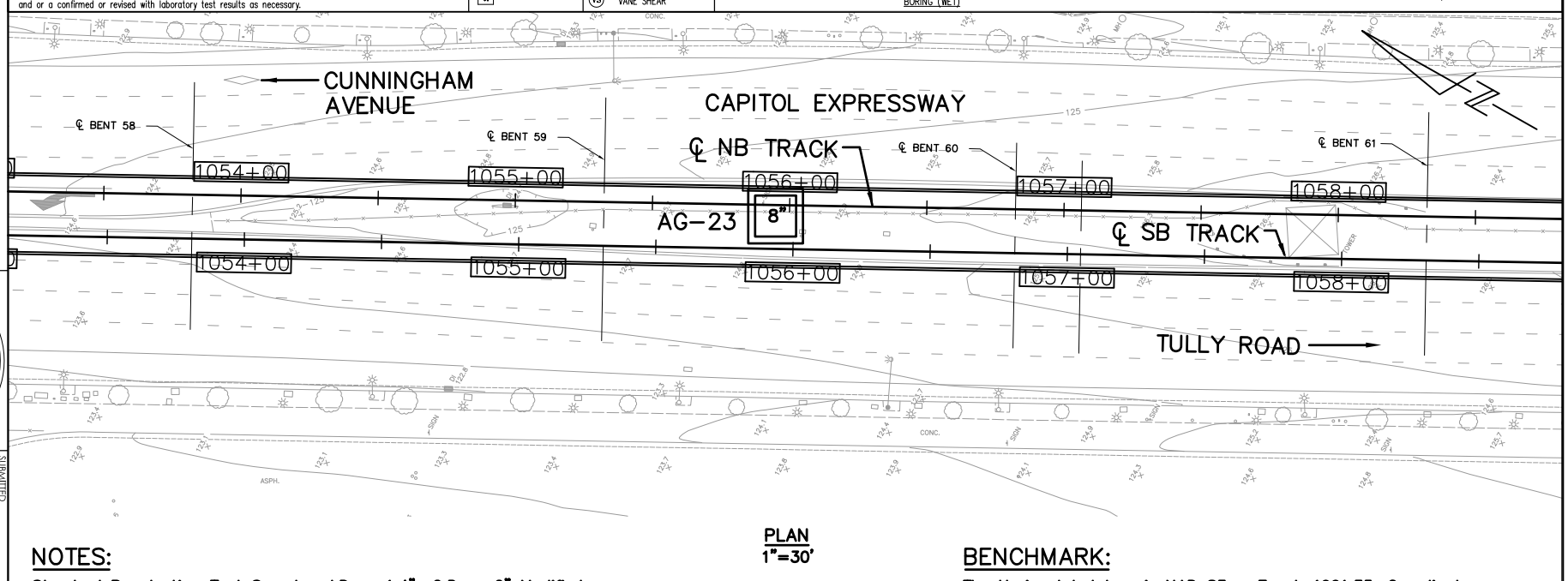
FILL MATERIAL; CLAY (CL or CH); SILT (ML or MH); PEAT and/or ORGANIC MATTER; WELL-GRADED GRAVEL (GW); POORLY-GRADED GRAVEL (GP); SILTY GRAVEL (GM); CLAYEY GRAVEL (GC); POORLY-GRADED SAND (SP); WELL-GRADED SAND (SW); SILTY SAND (SM) or SANDY SILT; CLAYEY SAND (SC) or SANDY CLAY; COBBLES/BOULDERS; IGNEOUS ROCK; SEDIMENTARY ROCK; METAMORPHIC ROCK

TYPES OF BORINGS
57 mm CONE PENETRATION; ROTARY WASH; ELECTRONIC CONE PENETROMETER; AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; SOIL TUBE

IN-SITU, LAB & FIELD TEST DESIGNATIONS
AL ATTERBERG LIMITS; CA CHEMICAL ANALYSIS; CN CONSOLIDATION; CU CONSOLIDATED UNDRAINED TRIAXIAL; DS DIRECT SHEAR; MD MAX. DRY DENSITY; PP POCKET PENETROMETER; SA SIEVE ANALYSIS; TV TORVANE UNCONFINED COMPRESSION; UC UNCONSOLIDATED UNDRAINED TRIAXIAL; VS VANE SHEAR

LEGEND OF BORING OPERATIONS





PLAN
1"=30'

NOTES:
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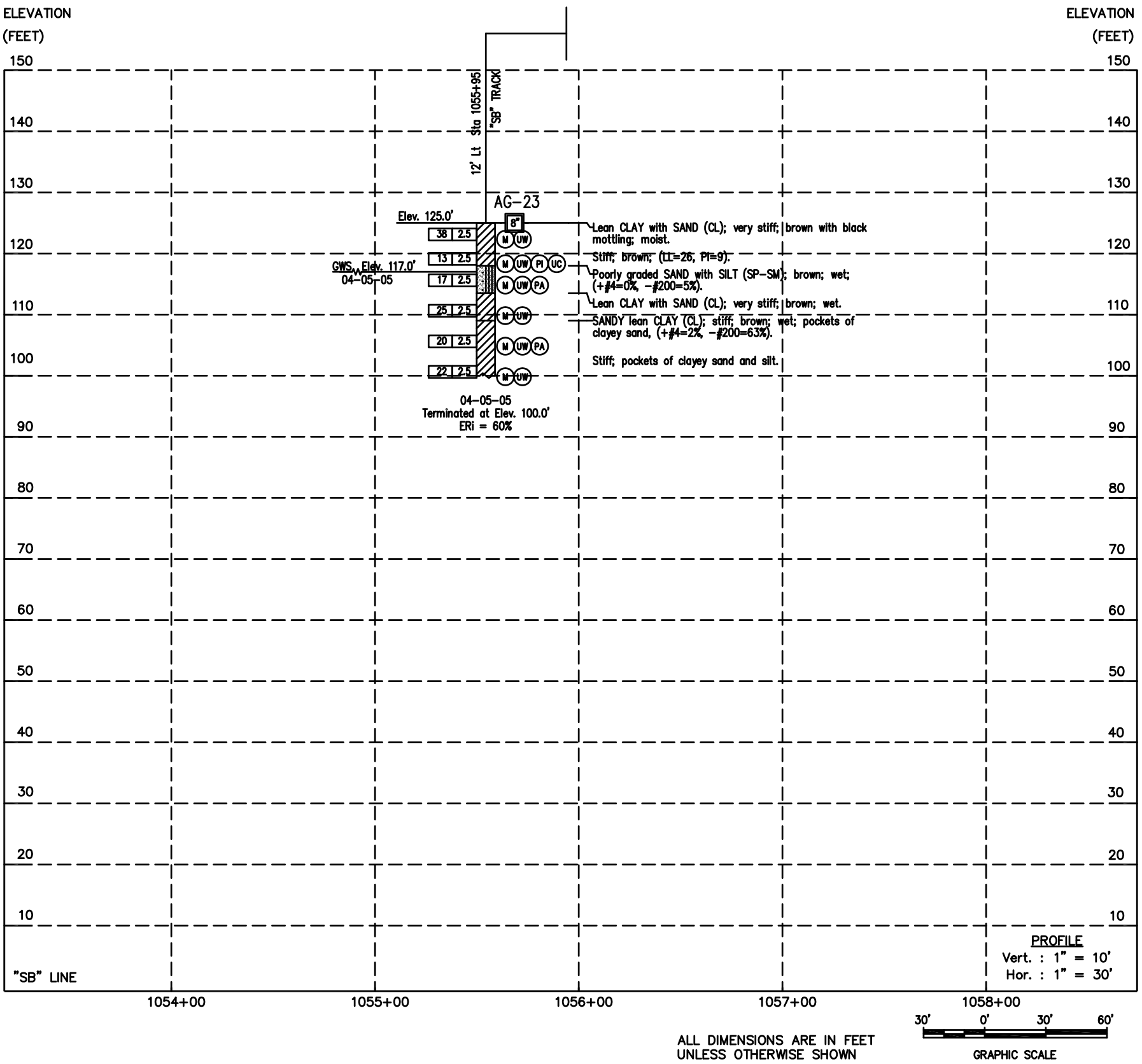

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA — GARY PARIKH — No. 666 — Exp. 12-31-21 GEOTECHNICAL

SUBMITTED
PARIKH — Practicing in the Geosciences — 1497 N MILPITAS BLVD. MILPITAS, CA 95035

DESIGNED	CHECKED
E. Ortakci	A. Lam
DRAWN	CADD FILE NAME
K.Ouyang	801HP333.dwg

Santa Clara Valley Transportation Authority

APPROVED
BKF ENGINEERS / SURVEYORS / PLANNERS — 100+ YEARS

CADD FILE DATE	SCALE
03/26/20	1:30
SUBMITTAL DATE	BOARD APPROVAL DATE
06/29/20	

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 1053+15 TO STA 1058+80

PCA NO.	CONTRACT NO.	FILE LOCATION
000	C801	PROJECTWISE

SHEET	OF	DRAWING NO.	REVISION
		HP333	C

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NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
C	06/20	95% SUBMITTAL SET

CONSISTENCY CLASSIFICATION FOR SOILS
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57 mm CONE PENETRATION; ROTARY WASH; ELECTRONIC CONE PENETROMETER; AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; SOIL TUBE

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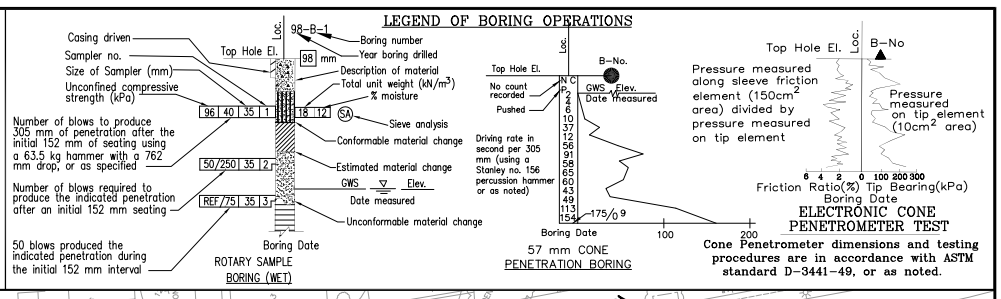
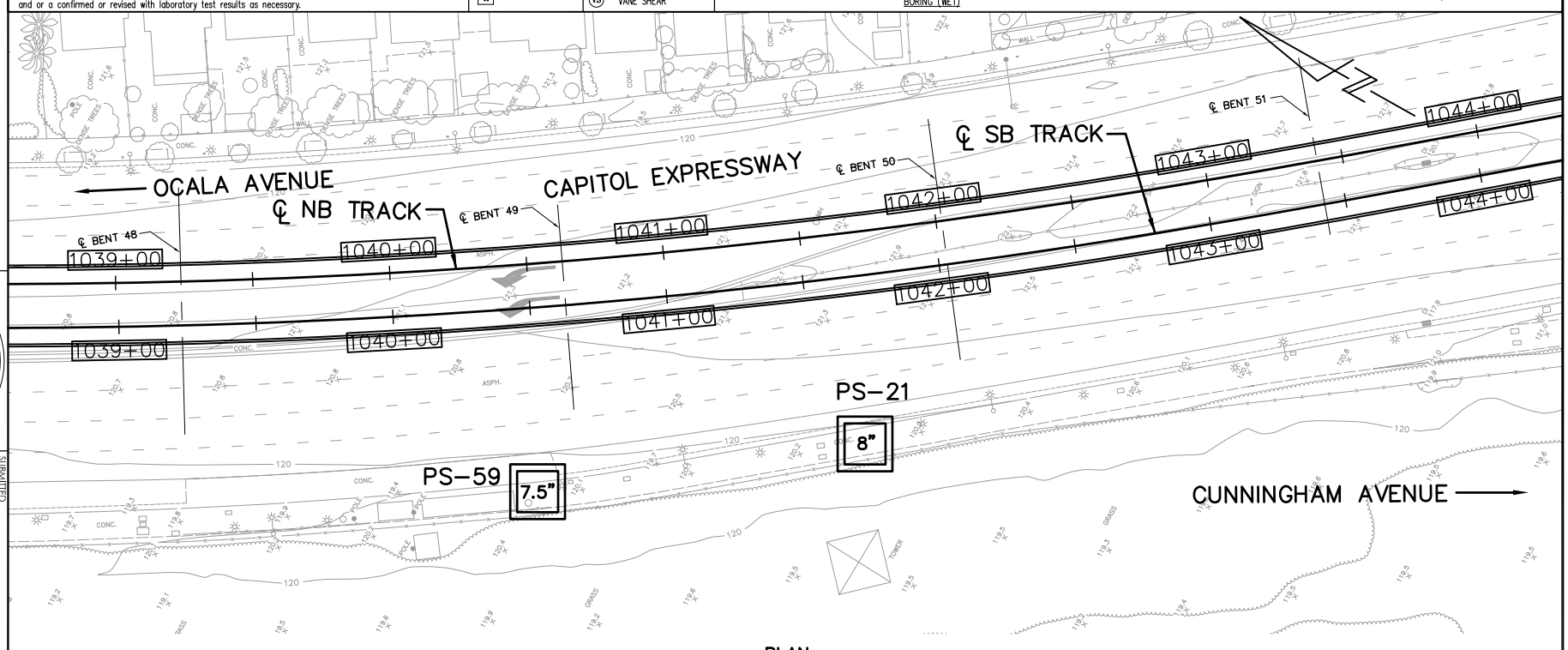
LEGEND OF BORING OPERATIONS



Cone Penetrometer dimensions and testing procedures are in accordance with ASTM standard D-3441-49, or as noted.



PLAN
1"=30'

NOTES:
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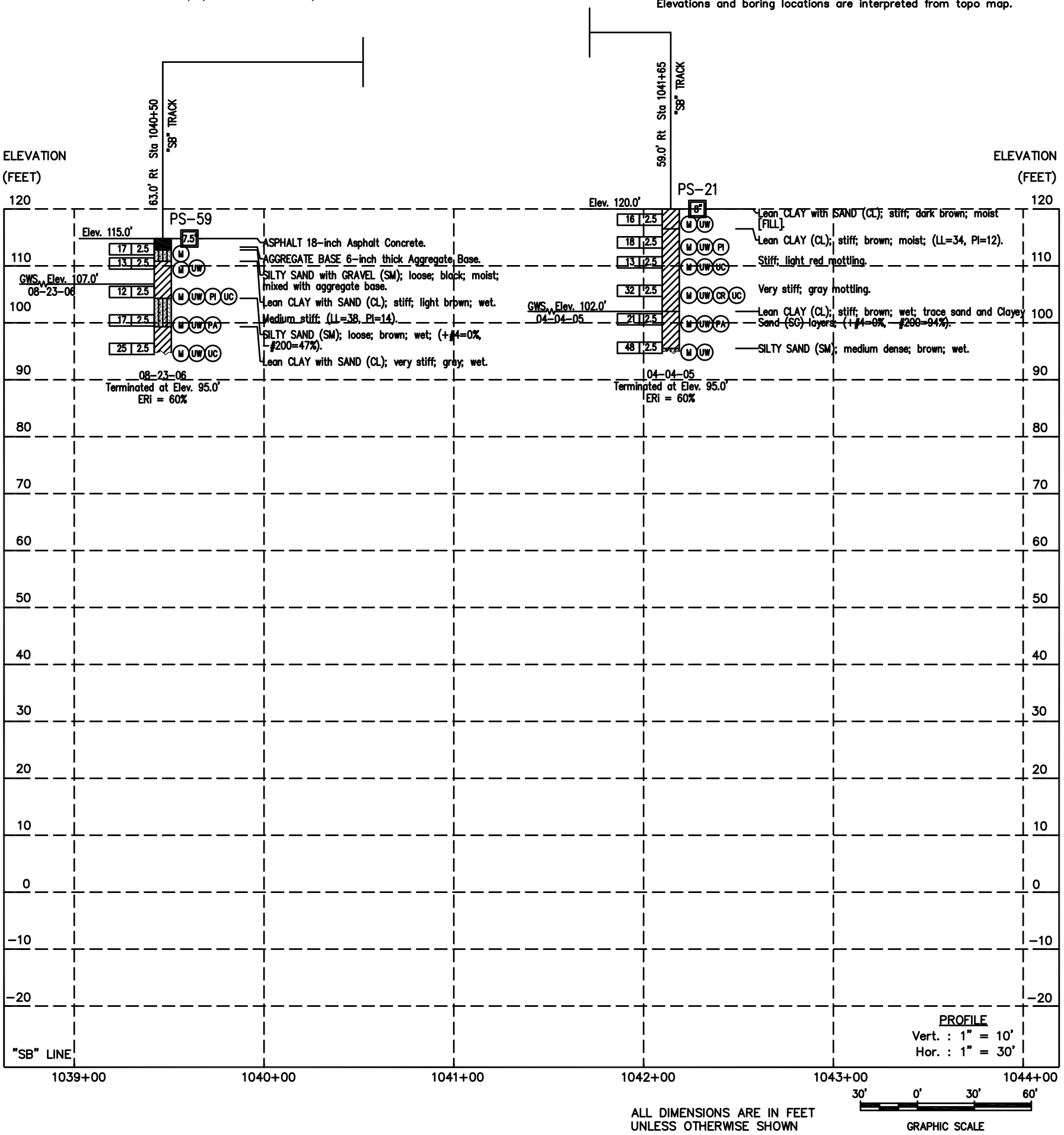

PROFILE
Vert. : 1" = 10'
Hor. : 1" = 30'

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

30' 0' 30' 60'
GRAPHIC SCALE

REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA — GARY PARIKH — No. 666 — Exp. 12-31-21 GEOTECHNICAL

PARIKH Consultants, Inc. — Practicing in the Geosciences — 1497 N MILPITAS BLVD. MILPITAS, CA 95035

DESIGNED E. Ortakci
DRAWN K. Ouyang
CHECKED A. Lam
CADD FILE NAME 801HP334.dwg

BKF 100+ YEARS — ENGINEERS / SURVEYORS / PLANNERS

APPROVED
CADD FILE DATE 03/26/20
SUBMITTAL DATE 06/29/20
SCALE 1:30
BOARD APPROVAL DATE

Santa Clara Valley Transportation Authority

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 1038+40 TO STA 1044+30

PCA NO. 000
CONTRACT NO. C801
FILE LOCATION PROJECTWISE
SHEET OF
DRAWING NO. HP334
REVISION C

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NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
C	06/20	95% SUBMITTAL SET

CONSISTENCY CLASSIFICATION FOR SOILS
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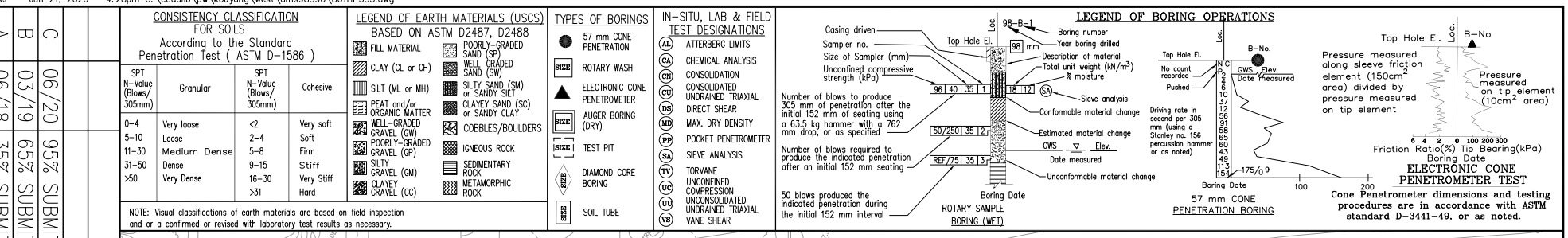
IN-SITU, LAB & FIELD TEST DESIGNATIONS
(AL) ATTERBERG LIMITS; (CA) CHEMICAL ANALYSIS; (CN) CONSOLIDATION; (CU) CONSOLIDATED UNDRAINED TRIAXIAL; (DS) DIRECT SHEAR; (MD) MAX. DRY DENSITY; (PP) POCKET PENETROMETER; (SA) SIEVE ANALYSIS; (TV) TORVANE UNCONFINED COMPRESSION; (UC) UNCONSOLIDATED UNDRAINED TRIAXIAL; (VS) VANE SHEAR

LEGEND OF BORING OPERATIONS



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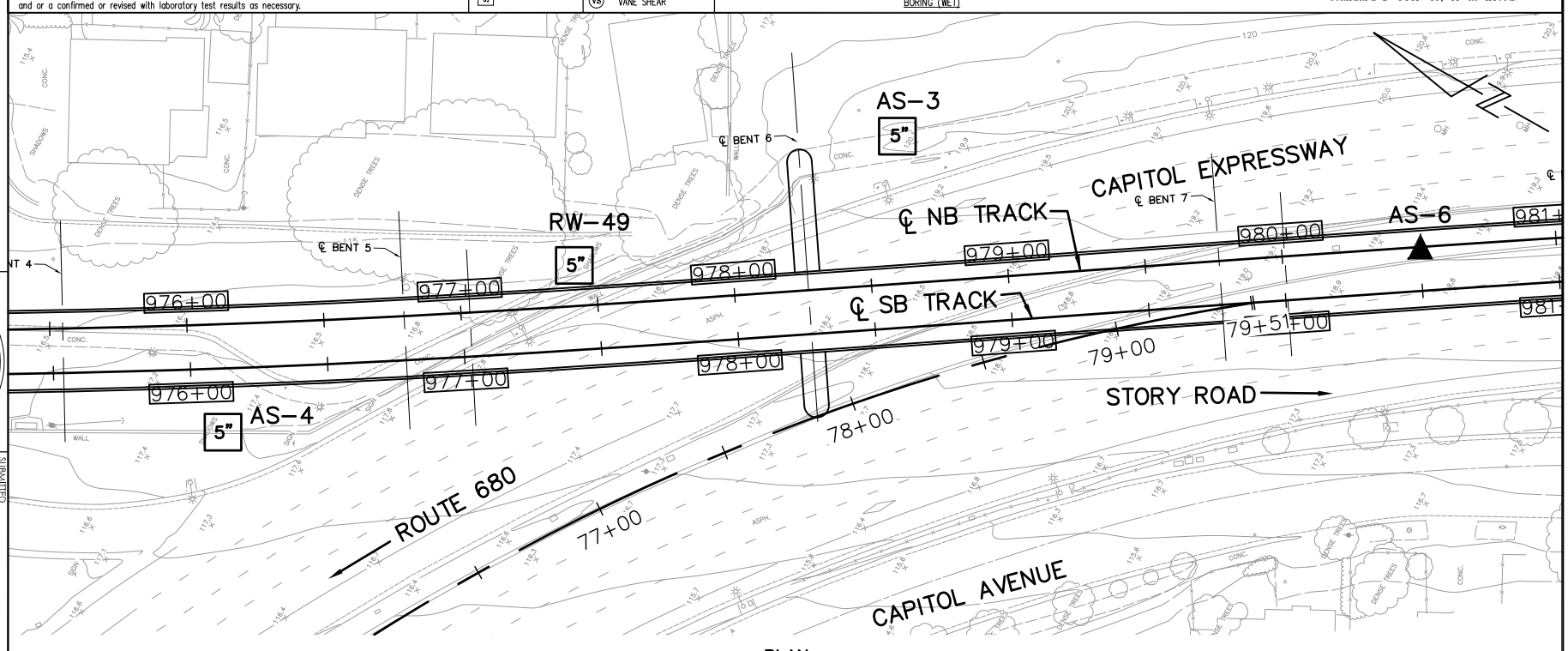

PLAN
1"=30'

NOTES:
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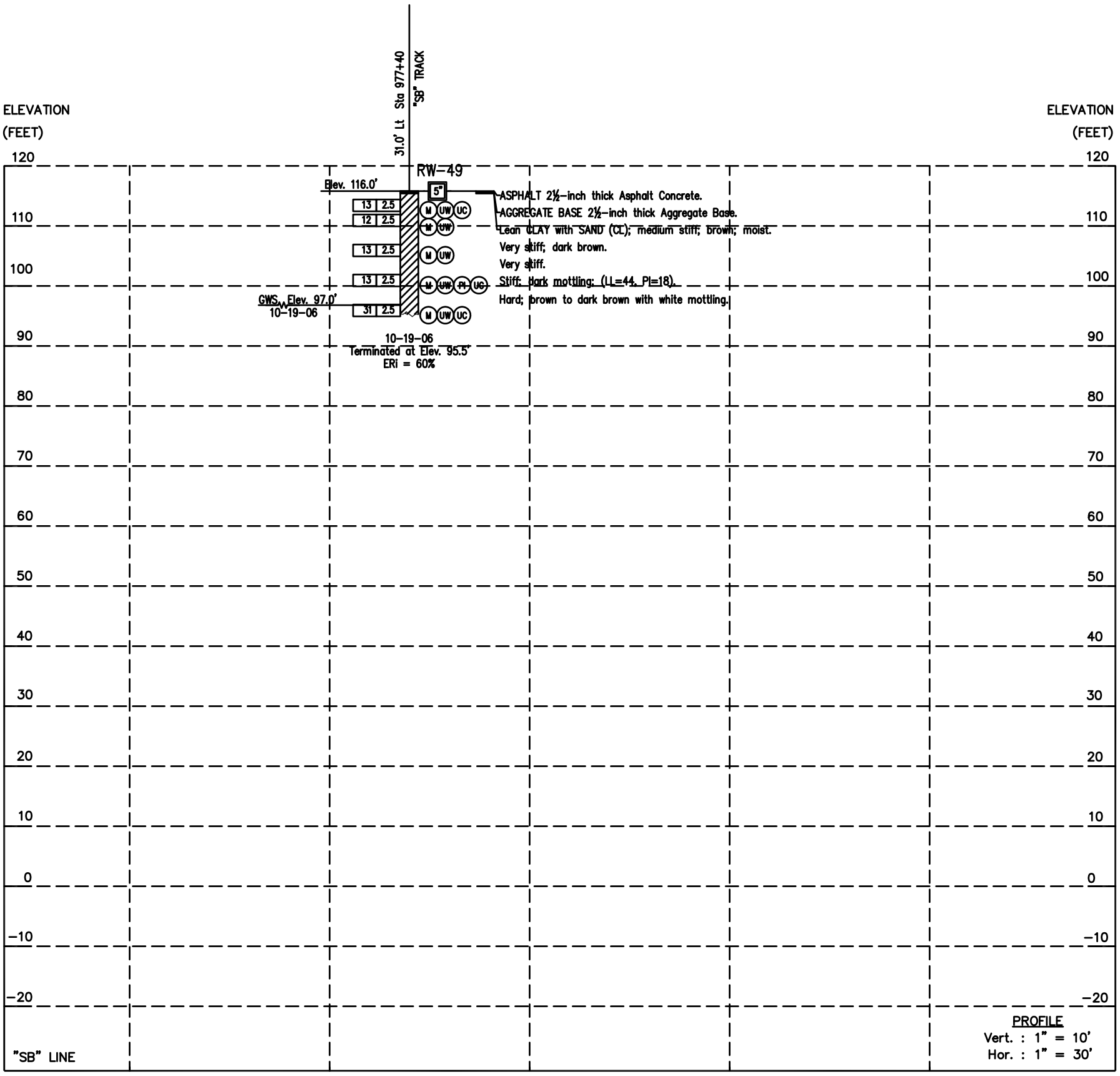

PROFILE
Vert. : 1" = 10'
Hor. : 1" = 30'

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

30' 0' 30' 60'
GRAPHIC SCALE

REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA — GARY PARIKH — No. 666 — Exp. 12-31-21 GEOTECHNICAL

SUBMITTED

PARIKH
Practicing in the Geosciences
1497 N MILPITAS BLVD.
MILPITAS, CA 95035

DESIGNED E. Ortakci
DRAWN K. Ouyang
CHECKED A. Lam
CADD FILE NAME 801HP335.dwg

APPROVED

BKF 100+ YEARS
ENGINEERS / SURVEYORS / PLANNERS

CADD FILE DATE 03/26/20
SUBMITTAL DATE 06/29/20
SCALE 1:30
BOARD APPROVAL DATE

Santa Clara Valley Transportation Authority

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 975+35 TO STA 981+00

PCA NO. 000
CONTRACT NO. C801
FILE LOCATION PROJECTWISE
SHEET OF
DRAWING NO. HP335
REVISION C

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NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
C	06/20	95% SUBMITTAL SET

REGISTERED PROFESSIONAL ENGINEER — GARY PARIKH — No. 666 — Exp. 12-31-21 — STATE OF CALIFORNIA GEOTECHNICAL

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BKF ENGINEERS / SURVEYORS / PLANNERS — 100+ YEARS

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Santa Clara Valley Transportation Authority

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 1029+65 TO STA1035+30

PCA NO. 000
CONTRACT NO. C801
FILE LOCATION PROJECTWISE
DRAWING NO. HP336
REVISION C
SHEET OF

CONSISTENCY CLASSIFICATION FOR SOILS
According to the Standard Penetration Test (ASTM D-1586)

SPT N-Value (Blows/ 305mm)	Granular	SPT N-Value (Blows/ 305mm)	Cohesive
0–4	Very loose	<2	Very soft
5–10	Loose	2–4	Soft
11–30	Medium Dense	5–8	Firm
31–50	Dense	9–15	Stiff
>50	Very Dense	16–30	Very Stiff
		>31	Hard

NOTE: Visual classifications of earth materials are based on field inspection and or a confirmed or revised with laboratory test results as necessary.

LEGEND OF EARTH MATERIALS (USCS)
BASED ON ASTM D2487, D2488

FILL MATERIAL; CLAY (CL or CH); SILT (ML or MH); PEAT and/or ORGANIC MATTER; WELL-GRADED GRAVEL (GW); POORLY-GRADED GRAVEL (GP); SILTY GRAVEL (GM); CLAYEY GRAVEL (GC); POORLY-GRADED SAND (SP); WELL-GRADED SAND (SW); SILTY SAND (SM) or SANDY SILT; CLAYEY SAND (SC) or SANDY CLAY; COBBLES/BOULDERS; IGNEOUS ROCK; SEDIMENTARY ROCK; METAMORPHIC ROCK

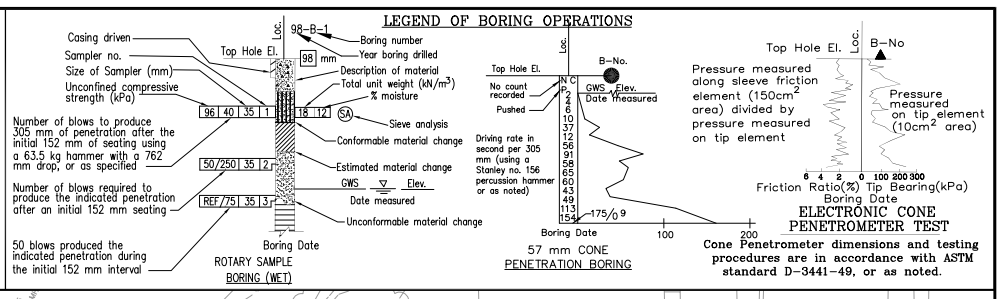
TYPES OF BORINGS

57 mm CONE PENETRATION; ROTARY WASH; ELECTRONIC CONE PENETROMETER; AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; SOIL TUBE

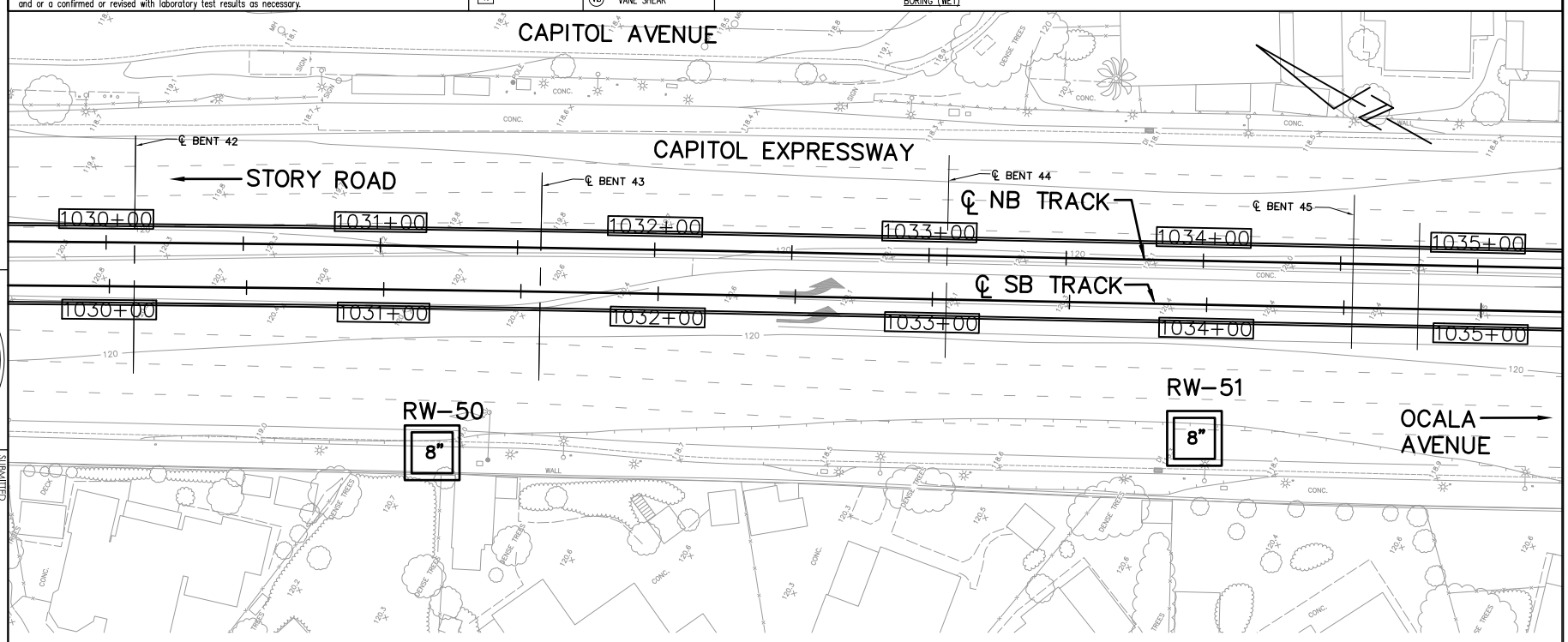
IN-SITU, LAB & FIELD TEST DESIGNATIONS

AL ATTERBERG LIMITS; CA CHEMICAL ANALYSIS; CN CONSOLIDATION; CU CONSOLIDATED UNDRAINED TRIAXIAL; DS DIRECT SHEAR; MD MAX. DRY DENSITY; PP POCKET PENETROMETER; SA SIEVE ANALYSIS; TV TORVANE; UC UNCONFINED COMPRESSION; UU UNCONSOLIDATED UNDRAINED TRIAXIAL; VS VANE SHEAR

LEGEND OF BORING OPERATIONS



Cone Penetrometer dimensions and testing procedures are in accordance with ASTM standard D-3441-49, or as noted.



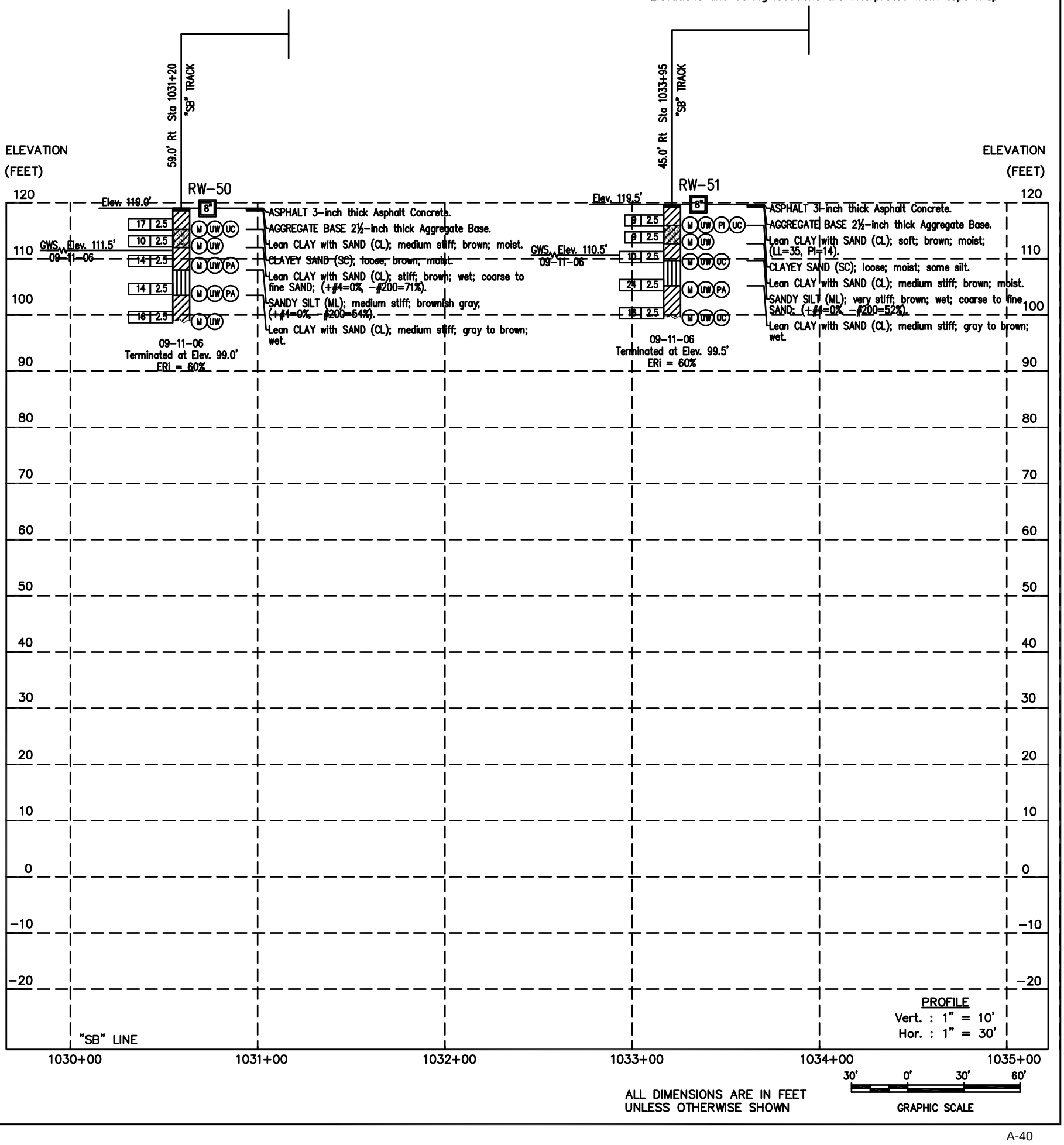
PLAN
1"=30'

NOTES:

Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2" Modified California Sampler: I.D. = 2.5"; O.D. = 3" Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

BENCHMARK:

The Horizontal datum is NAD 83 – Epoch 1991.35. Coordinates are on the California State Plane, Zone 0403. To obtain ground distances, multiply grid distances by 0.9999541. The Vertical datum is NAVD 88. Elevations and boring locations are interpreted from topo map.



PROFILE
Vert. : 1" = 10'
Hor. : 1" = 30'

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

30' 0' 30' 60'
GRAPHIC SCALE

ogouthier Jun 21, 2020 – 4:33pm C:\caddlib\pw\kouyang\west\dms98390\801HP337.dwg

NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
C	06/20	95% SUBMITTAL SET

REGISTERED PROFESSIONAL ENGINEER — GARY PARIKH — No. 666 — Exp. 12-31-21 — GEOTECHNICAL — STATE OF CALIFORNIA

SUBMITTED

PARIKH — Practicing in the Geosciences — 1497 N MILPITAS BLVD. MILPITAS, CA 95035

DESIGNED E. Ortakci — DRAWN K. Ouyang — CHECKED A. Lam — CADD FILE NAME 801HP337.dwg

Santa Clara Valley Transportation Authority

APPROVED

BKF 100+ YEARS — ENGINEERS / SURVEYORS / PLANNERS

CADD FILE DATE 03/26/20 — SUBMITTAL DATE 06/29/20 — SCALE 1:30 — BOARD APPROVAL DATE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 1005+00 TO STA 1019+50

PCA NO. 000 — CONTRACT NO. C801 — FILE LOCATION PROJECTWISE — SHEET OF — DRAWING NO. HP337 — REVISION C

CONSISTENCY CLASSIFICATION FOR SOILS

According to the Standard Penetration Test (ASTM D-1586)

SPT N-Value (Blows/ 305mm)	Granular	SPT N-Value (Blows/ 305mm)	Cohesive
0–4	Very loose	<2	Very soft
5–10	Loose	2–4	Soft
11–30	Medium Dense	5–8	Firm
31–50	Dense	9–15	Stiff
>50	Very Dense	16–30	Very Stiff
		>31	Hard

NOTE: Visual classifications of earth materials are based on field inspection and or a confirmed or revised with laboratory test results as necessary.

LEGEND OF EARTH MATERIALS (USCS) BASED ON ASTM D2487, D2488

FILL MATERIAL; CLAY (CL or CH); SILT (ML or MH); PEAT and/or ORGANIC MATTER; WELL-GRADED GRAVEL (GW); POORLY-GRADED GRAVEL (GP); SILTY GRAVEL (GM); CLAYEY GRAVEL (GC); POORLY-GRADED SAND (SP); WELL-GRADED SAND (SW); SILTY SAND (SM) or SANDY SILT; CLAYEY SAND (SC) or SANDY CLAY; COBBLES/BOULDERS; IGNEOUS ROCK; SEDIMENTARY ROCK; METAMORPHIC ROCK

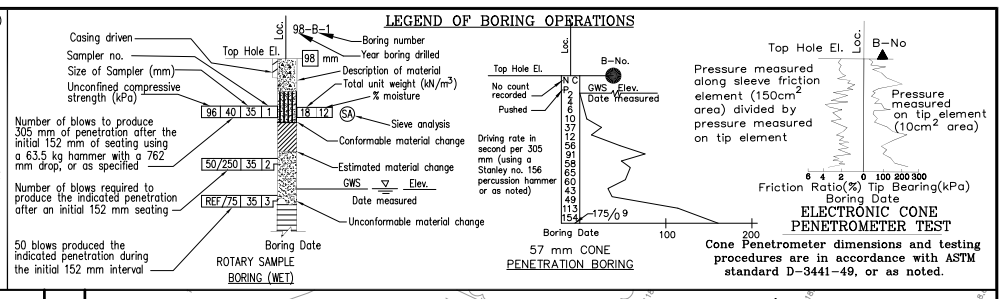
TYPES OF BORINGS

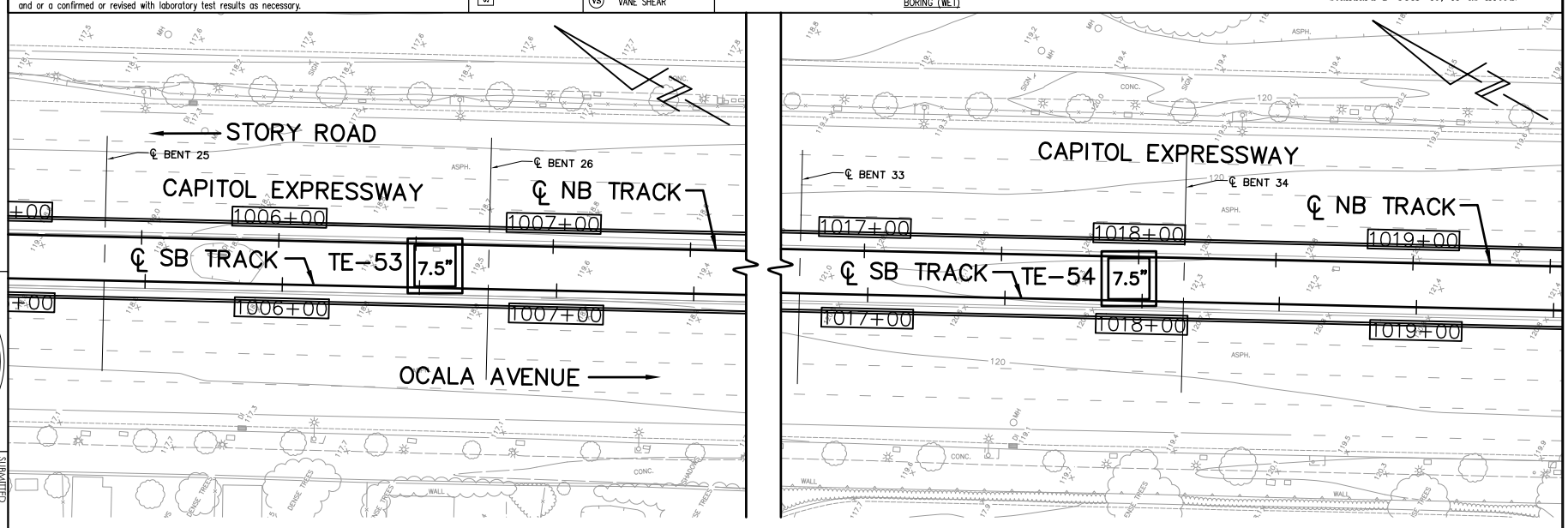
57 mm CONE PENETRATION; ROTARY WASH; ELECTRONIC CONE PENETROMETER; AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; SOIL TUBE

IN-SITU, LAB & FIELD TEST DESIGNATIONS

AL ATTERBERG LIMITS; CA CHEMICAL ANALYSIS; CN CONSOLIDATION; CU CONSOLIDATED UNDRAINED TRIAXIAL; DS DIRECT SHEAR; MD MAX. DRY DENSITY; PP POCKET PENETROMETER; SA SIEVE ANALYSIS; TV TORVANE; UC UNCONFINED COMPRESSION; UU UNCONSOLIDATED UNDRAINED TRIAXIAL; VS VANE SHEAR

LEGEND OF BORING OPERATIONS





PLAN
1"=30'

NOTES:

Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2" Modified California Sampler: I.D. = 2.5"; O.D. = 3" Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

BENCHMARK:

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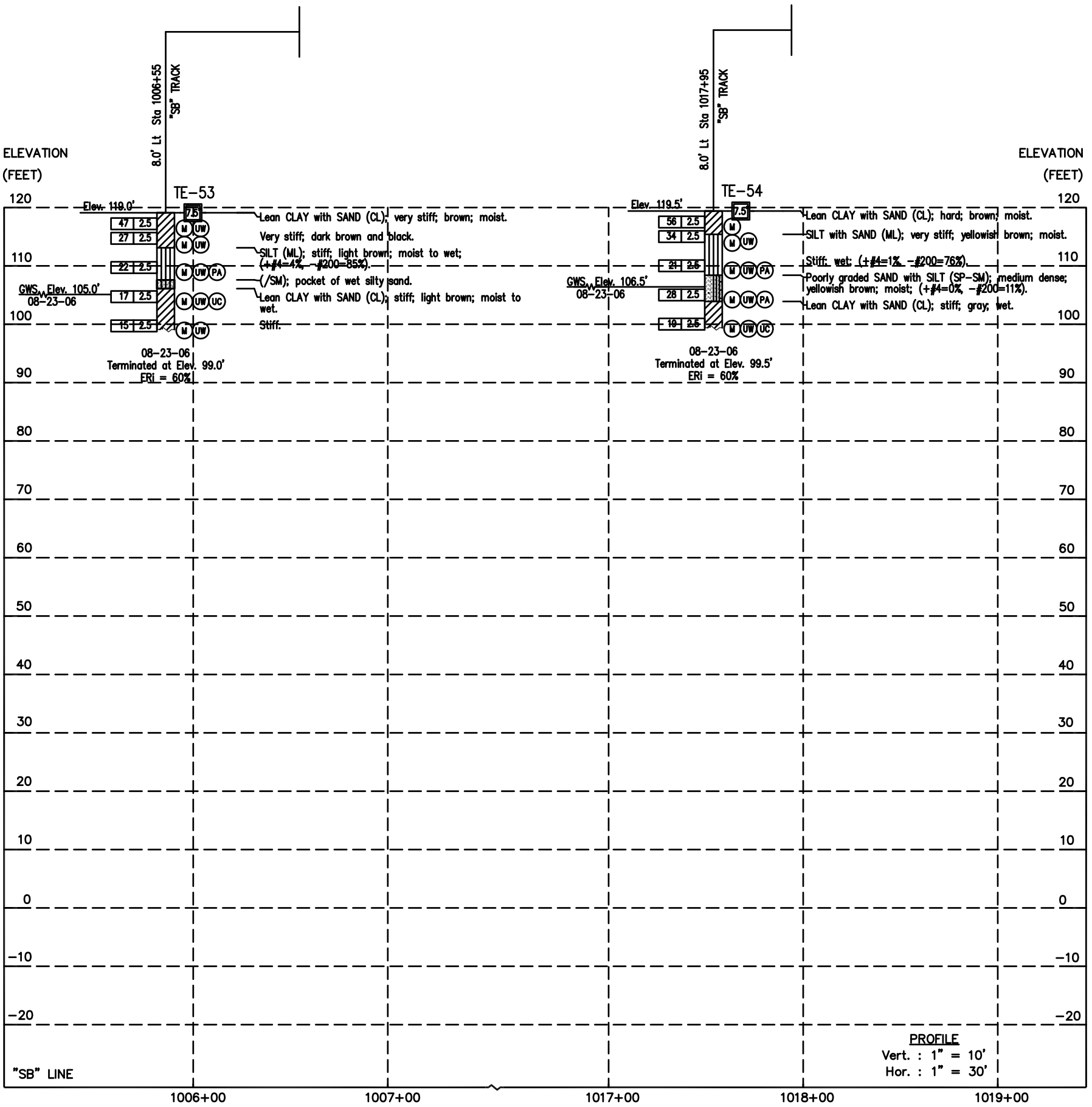

PROFILE
Vert. : 1" = 10'
Hor. : 1" = 30'

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

30' 0' 30' 60'
GRAPHIC SCALE

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NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
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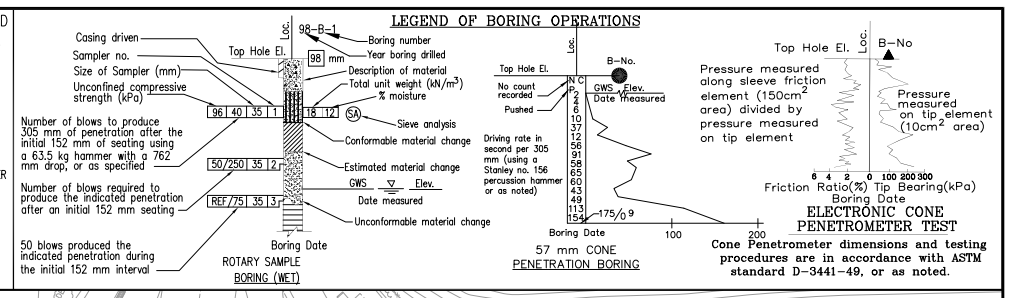
57 mm CONE PENETRATION; ROTARY WASH; ELECTRONIC CONE PENETROMETER; AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; SOIL TUBE

IN-SITU, LAB & FIELD TEST DESIGNATIONS

AL ATTERBERG LIMITS; CA CHEMICAL ANALYSIS; CN CONSOLIDATION; CU CONSOLIDATED UNDRAINED TRIAXIAL; DS DIRECT SHEAR; MD MAX. DRY DENSITY; PP POCKET PENETROMETER; SA SIEVE ANALYSIS; TV TORVANE; UC UNCONFINED COMPRESSION; UCU UNCONSOLIDATED UNDRAINED TRIAXIAL; VS VANE SHEAR

LEGEND OF BORING OPERATIONS



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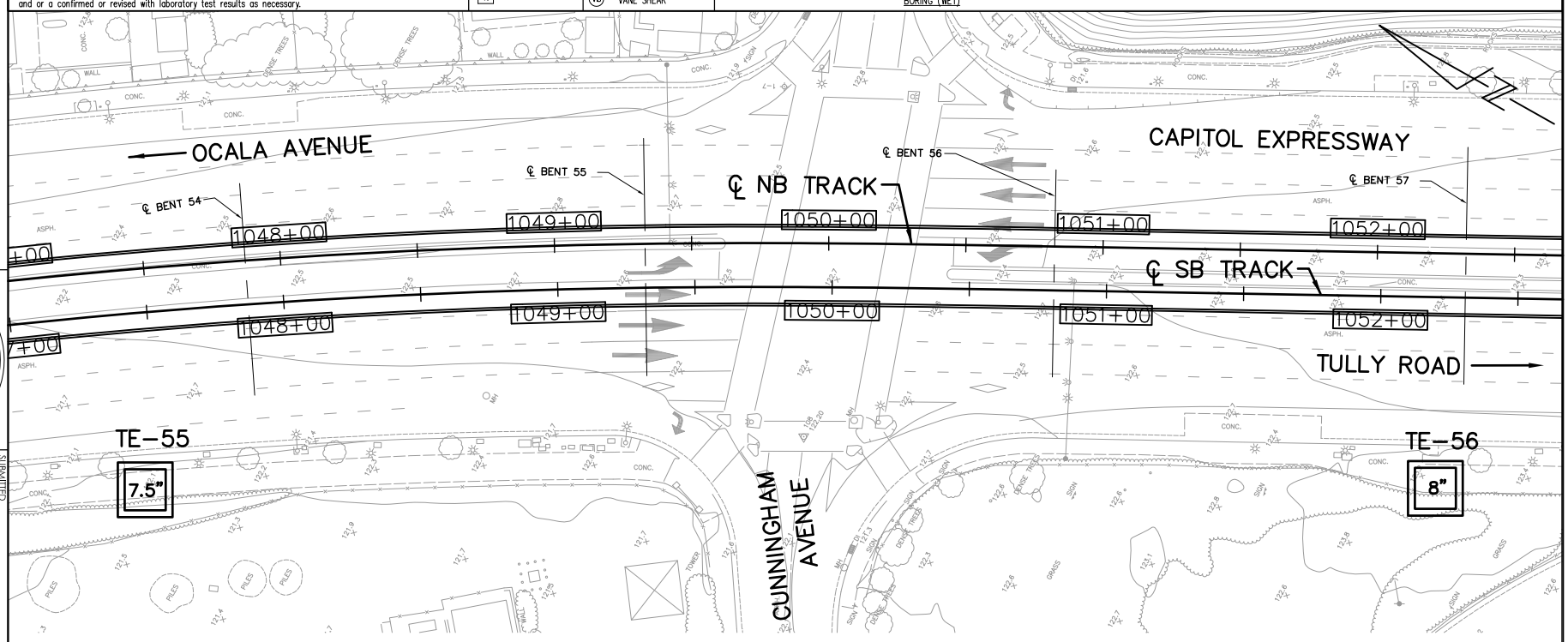

PLAN
1"=30'

NOTES:

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BENCHMARK:

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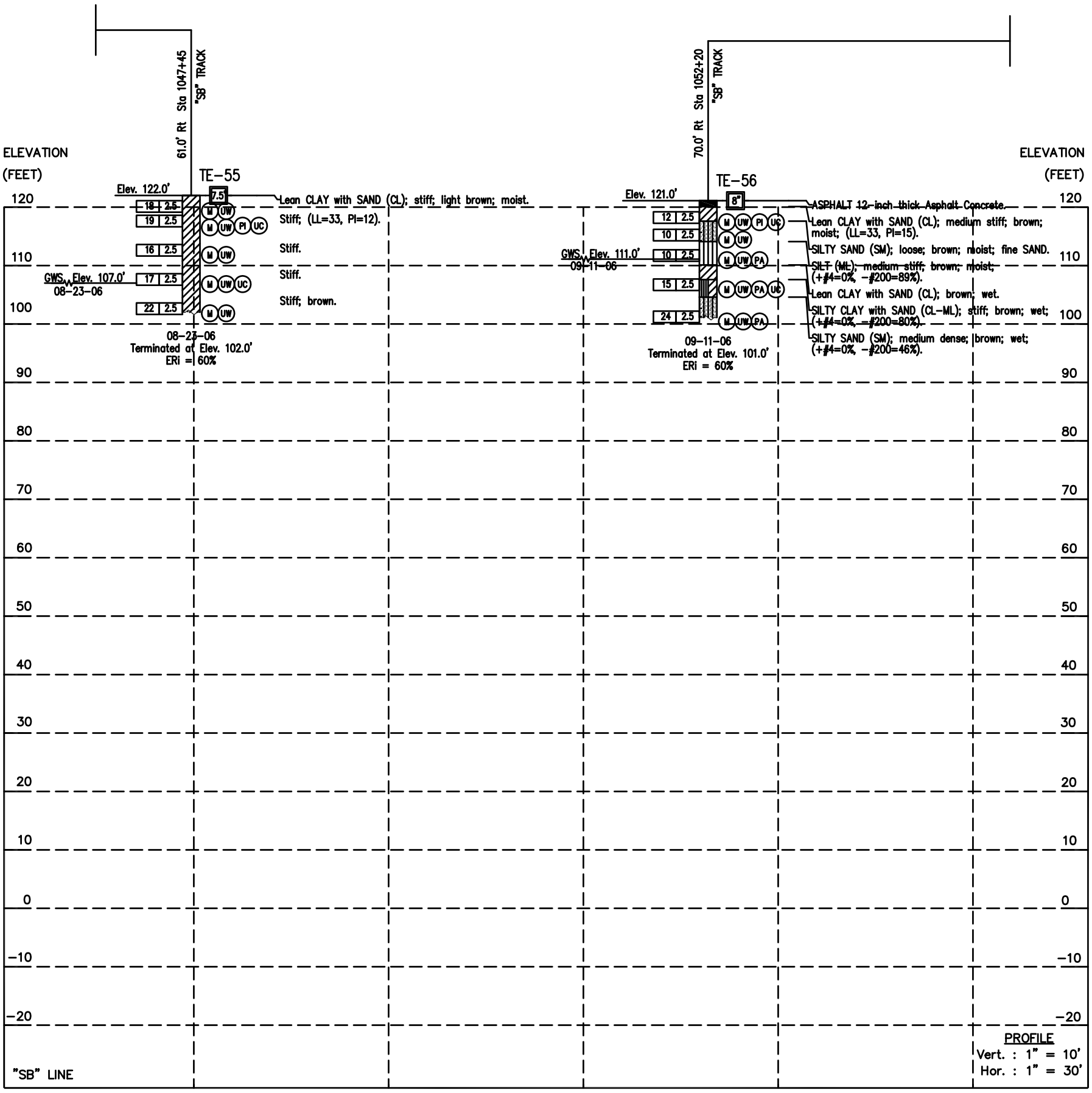

PROFILE
Vert. : 1" = 10'
Hor. : 1" = 30'

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

30' 0' 30' 60'
GRAPHIC SCALE

REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA — GARY PARIKH — No. 666 — Exp. 12-31-21 GEOTECHNICAL

SUBMITTED

PARIKH
Practicing in the Geosciences
1497 N MILPITAS BLVD.
MILPITAS, CA 95035

DESIGNED E. Ortakci
DRAWN K.Ouyang
CHECKED A. Lam
CADD FILE NAME 801HP338.dwg

Santa Clara Valley Transportation Authority

APPROVED

BKF 100+ YEARS
ENGINEERS / SURVEYORS / PLANNERS

CADD FILE DATE 03/26/20
SUBMITTAL DATE 06/29/20
SCALE 1:30
BOARD APPROVAL DATE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 1047+00 TO STA1052+65

PCA NO. 000
CONTRACT NO. C801
FILE LOCATION PROJECTWISE
SHEET OF
DRAWING NO. HP338
REVISION C

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NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
C	06/20	95% SUBMITTAL SET

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Santa Clara Valley Transportation Authority

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 1059+60 TO STA 1065+20

PCA NO. 000
CONTRACT NO. C801
FILE LOCATION PROJECTWISE
SHEET OF
DRAWING NO. HP339
REVISION C

CONSISTENCY CLASSIFICATION FOR SOILS
According to the Standard Penetration Test (ASTM D-1586)

SPT N-Value (Blows/ 305mm)	Granular	SPT N-Value (Blows/ 305mm)	Cohesive
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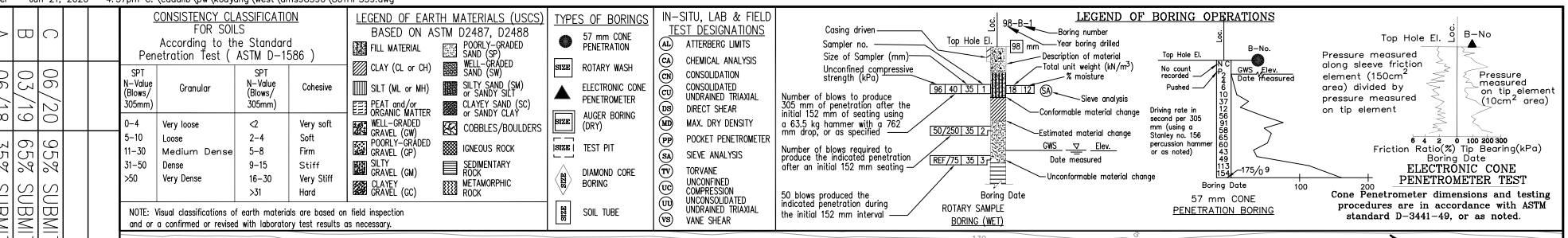
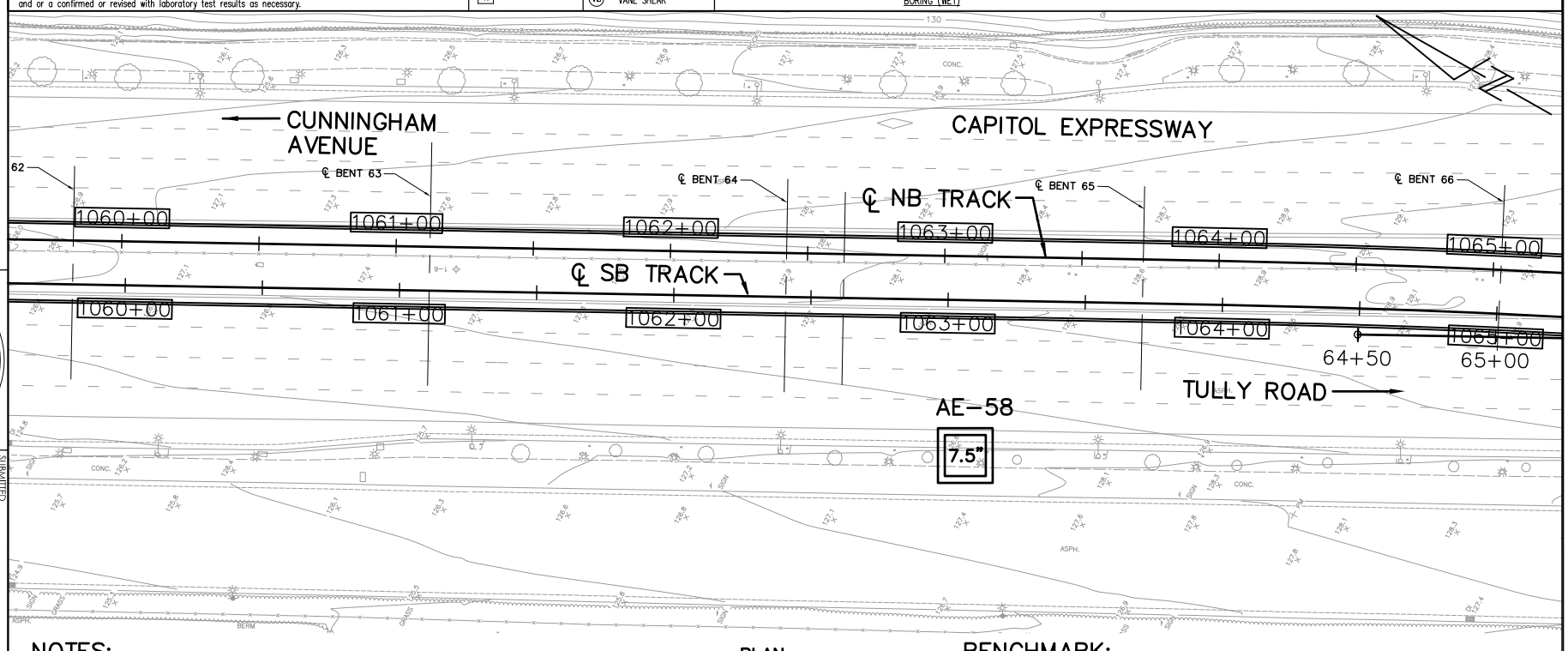
TYPES OF BORINGS
57 mm CONE PENETRATION; ROTARY WASH; ELECTRONIC CONE PENETROMETER; AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; SOIL TUBE

IN-SITU, LAB & FIELD TEST DESIGNATIONS
(AL) ATTERBERG LIMITS; (CA) CHEMICAL ANALYSIS; (CN) CONSOLIDATION; (CU) CONSOLIDATED UNDRAINED TRIAXIAL; (DS) DIRECT SHEAR; (MD) MAX. DRY DENSITY; (PP) POCKET PENETROMETER; (SA) SIEVE ANALYSIS; (TV) TORVANE UNCONFINED COMPRESSION; (UC) UNCONSOLIDATED UNDRAINED TRIAXIAL; (VS) VANE SHEAR

LEGEND OF BORING OPERATIONS



Cone Penetrometer dimensions and testing procedures are in accordance with ASTM standard D-3441-49, or as noted.



NOTES:
Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2" Modified California Sampler: I.D. = 2.5"; O.D. = 3" Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

PLAN
1"=30'

BENCHMARK:
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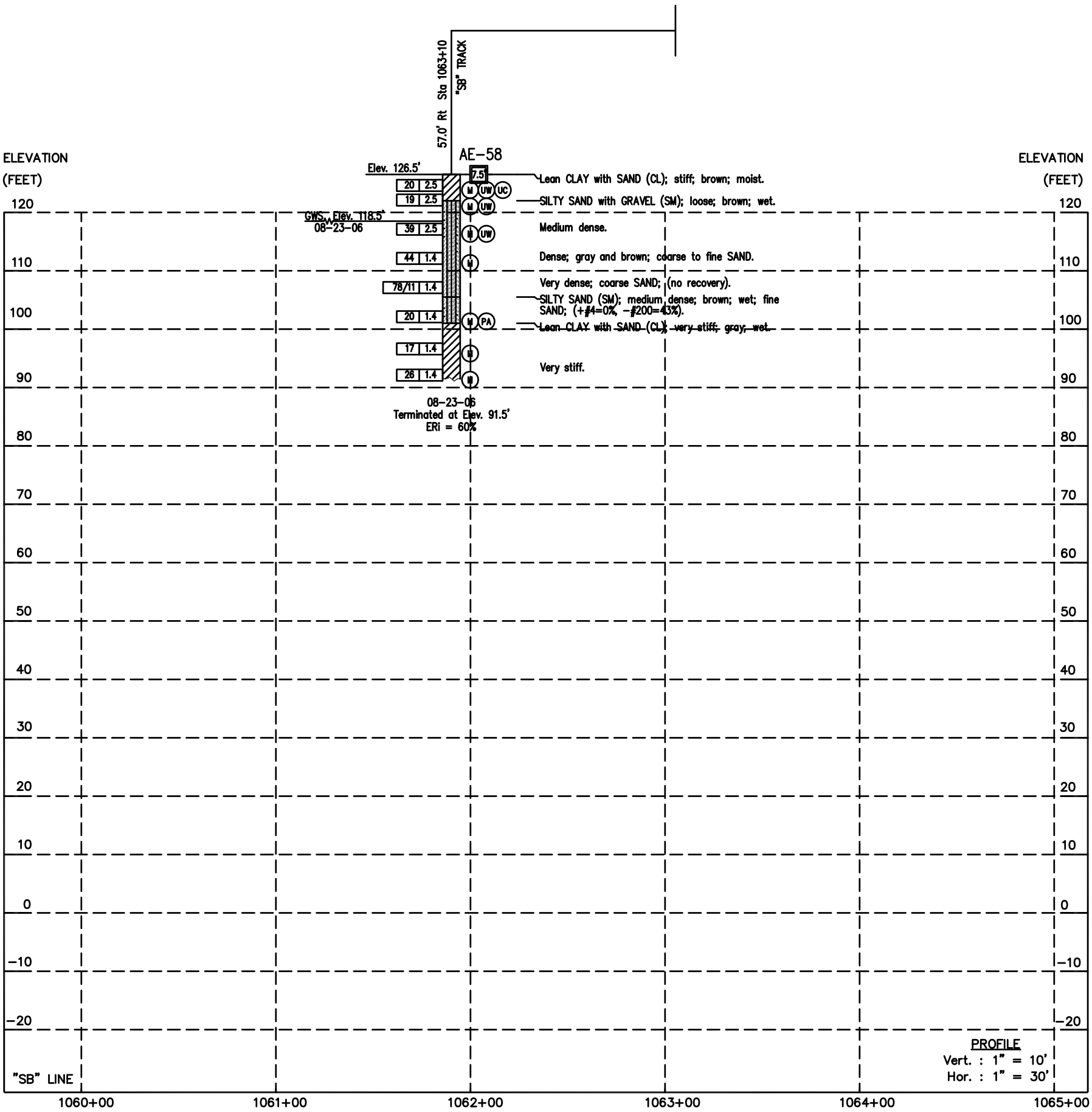

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

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NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
C	06/20	95% SUBMITTAL SET

REGISTERED PROFESSIONAL ENGINEER — GARY PARIKH — No. 666 — Exp. 12-31-21 — GEOTECHNICAL — STATE OF CALIFORNIA

SUBMITTED

PARIKH
Practicing in the Geosciences
1497 N MILPITAS BLVD.
MILPITAS, CA 95035

DESIGNED E. Ortakci
DRAWN K. Ouyang
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Santa Clara Valley Transportation Authority

APPROVED

BKF ENGINEERS / SURVEYORS / PLANNERS 100+ YEARS

CADD FILE DATE 03/26/20
SUBMITTAL DATE 06/29/20
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BOARD APPROVAL DATE

CONSISTENCY CLASSIFICATION FOR SOILS
According to the Standard Penetration Test (ASTM D-1586)

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57 mm CONE PENETRATION; ROTARY WASH; ELECTRONIC CONE PENETROMETER; AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; SOIL TUBE

IN-SITU, LAB & FIELD TEST DESIGNATIONS
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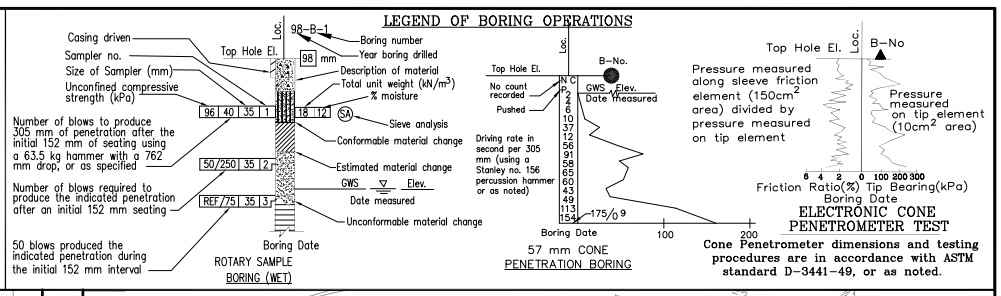
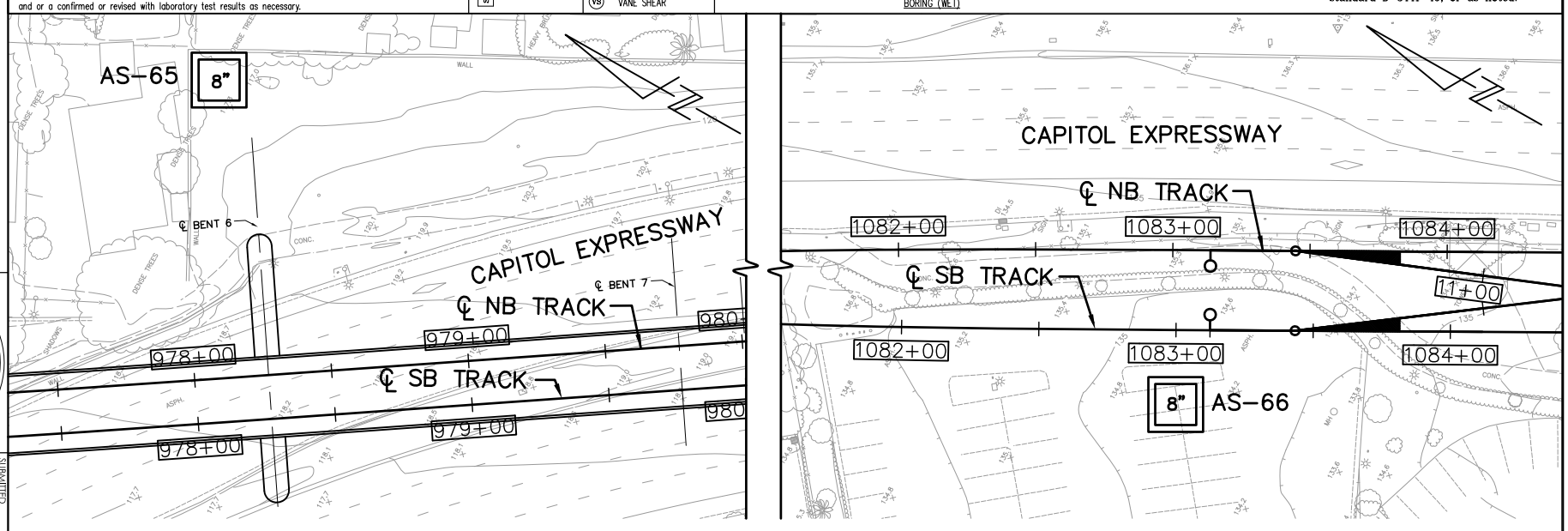
LEGEND OF BORING OPERATIONS





PLAN
1"=30'

NOTES:
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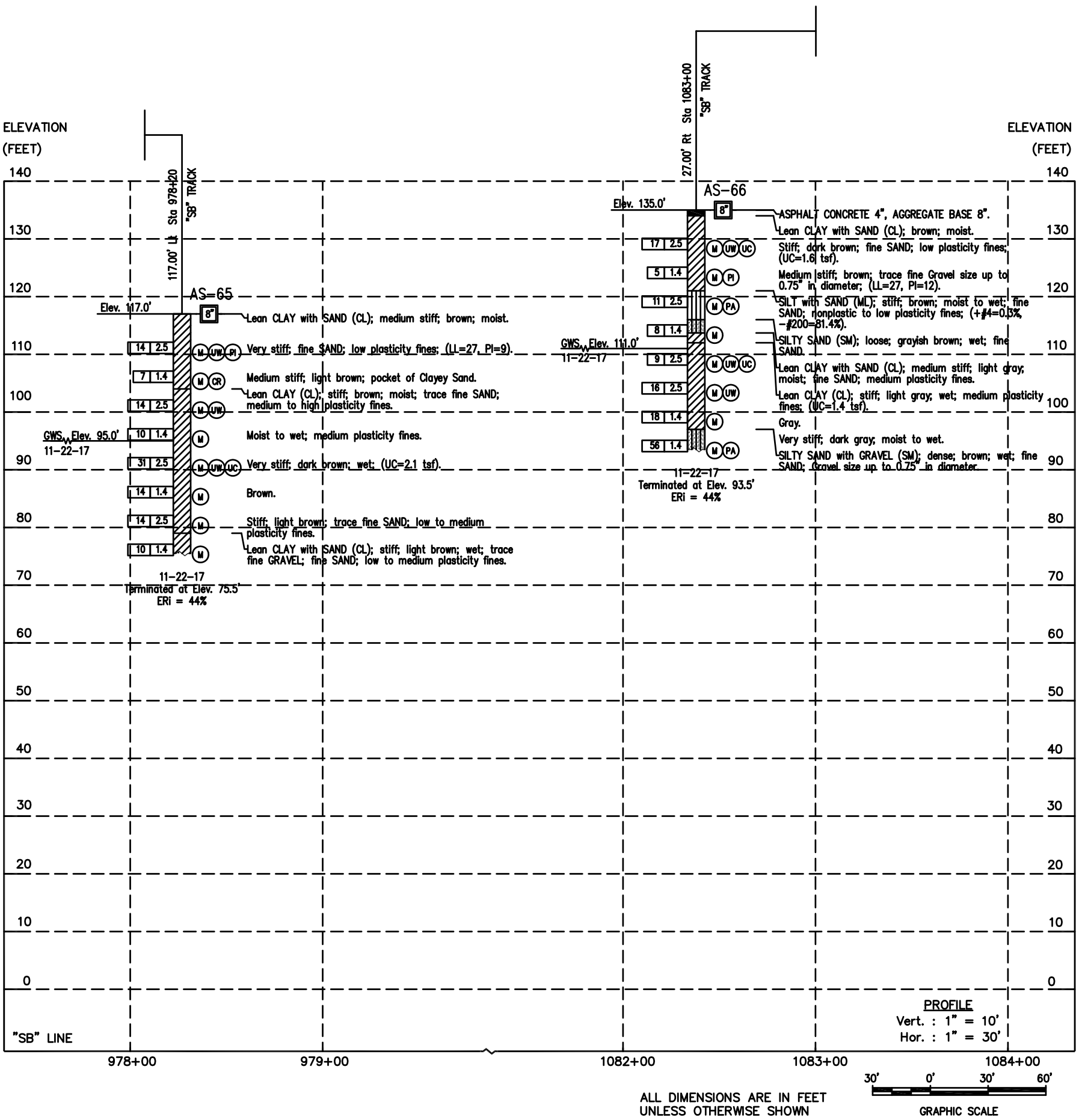

PROFILE
Vert. : 1" = 10'
Hor. : 1" = 30'

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

30' 0' 30' 60'
GRAPHIC SCALE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 977+30 TO STA 1084+40

PCA NO. 000
CONTRACT NO. C801
FILE LOCATION PROJECTWISE
SHEET OF
DRAWING NO. HP340
REVISION C

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NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
C	06/20	95% SUBMITTAL SET

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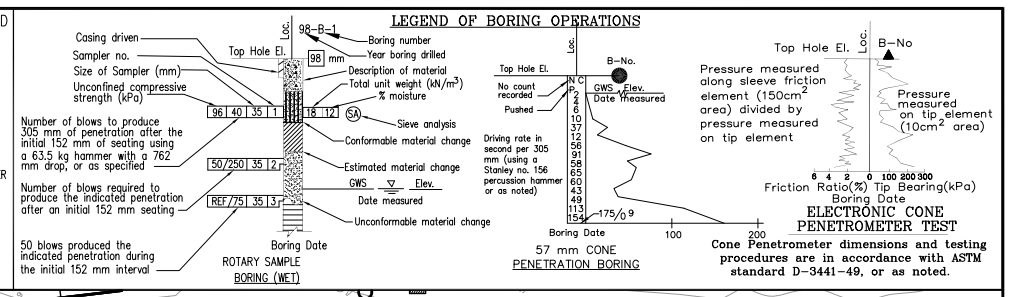
BASED ON ASTM D2487, D2488

FILL MATERIAL; CLAY (CL or CH); SILT (ML or MH); PEAT and/or ORGANIC MATTER; WELL-GRADED GRAVEL (GW); POORLY-GRADED GRAVEL (GP); SILTY GRAVEL (GM); CLAYEY GRAVEL (GC); POORLY-GRADED SAND (SP); WELL-GRADED SAND (SW); SILTY SAND (SM) or SANDY SILT; CLAYEY SAND (SC) or SANDY CLAY; COBBLES/BOULDERS; IGNEOUS ROCK; SEDIMENTARY ROCK; METAMORPHIC ROCK

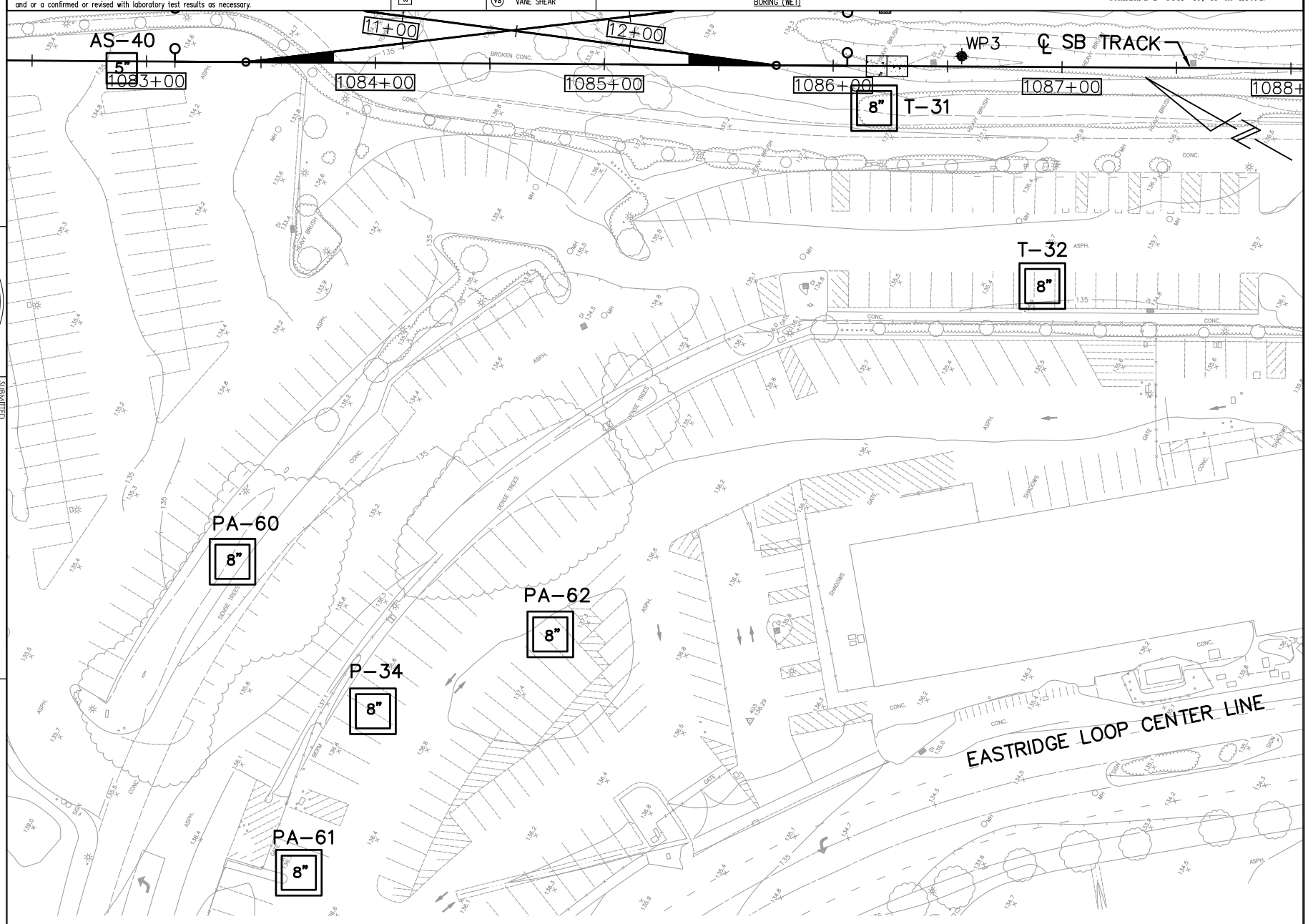
TYPES OF BORINGS
57 mm CONE PENETRATION; ROTARY WASH; ELECTRONIC CONE PENETROMETER; AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; SOIL TUBE

IN-SITU, LAB & FIELD TEST DESIGNATIONS
(AL) ATTERBERG LIMITS; (CA) CHEMICAL ANALYSIS; (CN) CONSOLIDATION; (CU) CONSOLIDATED UNDRAINED TRIAXIAL; (DS) DIRECT SHEAR; (MD) MAX. DRY DENSITY; (PP) POCKET PENETROMETER; (SA) SIEVE ANALYSIS; (TV) TORVANE UNCONFINED COMPRESSION; (UC) UNCONSOLIDATED UNDRAINED TRIAXIAL; (VS) VANE SHEAR

LEGEND OF BORING OPERATIONS



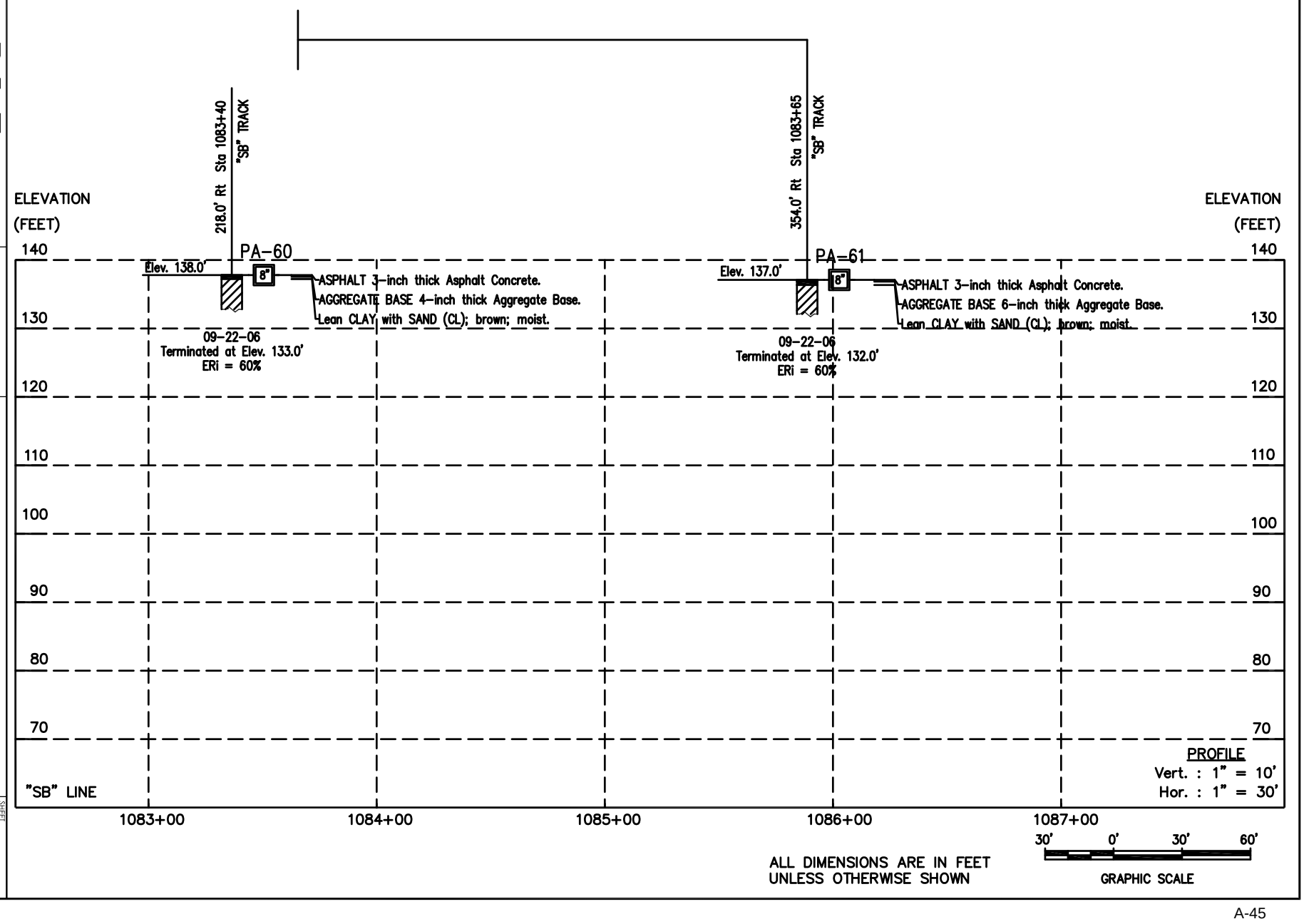
Cone Penetrometer dimensions and testing procedures are in accordance with ASTM standard D-3441-49, or as noted.



PLAN
1"=30'

NOTES:
Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2" Modified California Sampler: I.D. = 2.5"; O.D. = 3" Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

BENCHMARK:
The Horizontal datum is NAD 83 – Epoch 1991.35. Coordinates are on the California State Plane, Zone 0403. To obtain ground distances, multiply grid distances by 0.9999541. The Vertical datum is NAVD 88. Elevations and boring locations are interpreted from topo map.



ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

REGISTERED PROFESSIONAL ENGINEER — GARY PARIKH — No. 666 — Exp. 12-31-21 — GEOTECHNICAL — STATE OF CALIFORNIA

DRAWN K. Ouyang | DESIGNED E. Ortakci | CHECKED A. Lam | CADD FILE NAME 801HP341.dwg

PARIKH — Practicing in the Geosciences — 1497 N MILPITAS BLVD. MILPITAS, CA 95035

SUBMITTED

Santa Clara Valley Transportation Authority

APPROVED

BKF ENGINEERS / SURVEYORS / PLANNERS — 100+ YEARS

CADD FILE DATE 03/26/20
SUBMITTAL DATE 06/29/20
SCALE 1:30
BOARD APPROVAL DATE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 1082+40 TO STA 1088+05

PCA NO. 000 | CONTRACT NO. C801 | FILE LOCATION PROJECTWISE

REVISION C | DRAWING NO. HP341 | SHEET | OF

ogouthier Jun 21, 2020 – 4:45pm C:\caddlib\pw\kouyang\west\dms98390\801HP342.dwg

NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
C	06/20	95% SUBMITTAL SET

REGISTERED PROFESSIONAL ENGINEER — GARY PARIKH — No. 666 — Exp. 12-31-21 — GEOTECHNICAL — STATE OF CALIFORNIA

SUBMITTED: PARIKH — Practicing in the Geosciences — 1497 N. MILPITAS BLVD. MILPITAS, CA 95035

DESIGNED: E. Ortakci — DRAWN: K. Ouyang — CHECKED: A. Lam — CADD FILE NAME: 801HP342.dwg

Santa Clara Valley Transportation Authority

APPROVED: BKF ENGINEERS / SURVEYORS / PLANNERS — 100+ YEARS

CADD FILE DATE: 03/26/20 — SUBMITTAL DATE: 06/29/20 — SCALE: 1:30 — BOARD APPROVAL DATE:

PCA NO.: 000 — CONTRACT NO.: C801 — FILE LOCATION: PROJECTWISE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 1082+50 TO STA 1088+15

SHEET OF — DRAWING NO.: HP342 — REVISION: C

CONSISTENCY CLASSIFICATION FOR SOILS
According to the Standard Penetration Test (ASTM D-1586)

SPT N-Value (Blows/ 305mm)	Granular	SPT N-Value (Blows/ 305mm)	Cohesive
0–4	Very loose	<2	Very soft
5–10	Loose	2–4	Soft
11–30	Medium Dense	5–8	Firm
31–50	Dense	9–15	Stiff
>50	Very Dense	16–30	Very Stiff
		>31	Hard

NOTE: Visual classifications of earth materials are based on field inspection and or a confirmed or revised with laboratory test results as necessary.

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BASED ON ASTM D2487, D2488

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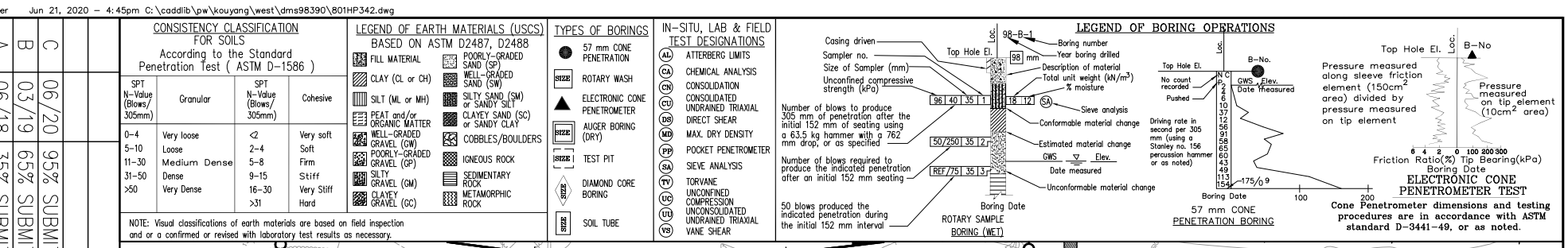
TYPES OF BORINGS
57 mm CONE PENETRATION; ROTARY WASH; ELECTRONIC CONE PENETROMETER; AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; SOIL TUBE

IN-SITU, LAB & FIELD TEST DESIGNATIONS
AL ATTERBERG LIMITS; CA CHEMICAL ANALYSIS; CN CONSOLIDATION; CU CONSOLIDATED UNDRAINED TRIAXIAL; DS DIRECT SHEAR; MD MAX. DRY DENSITY; PP POCKET PENETROMETER; SA SIEVE ANALYSIS; TV TORVANE; UC UNCONFINED COMPRESSION; UU UNCONSOLIDATED UNDRAINED TRIAXIAL; VS VANE SHEAR

LEGEND OF BORING OPERATIONS



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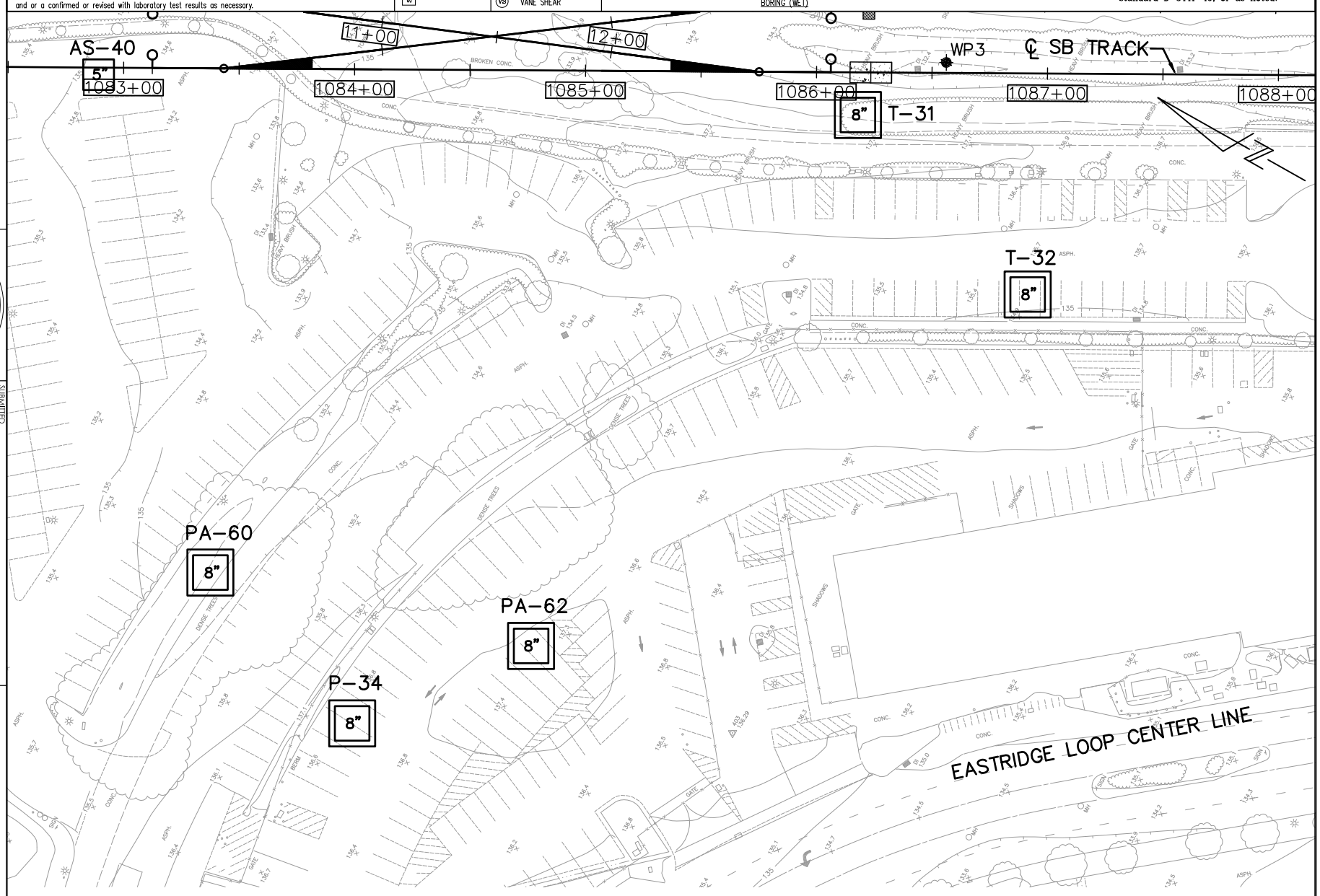

PLAN
1"=30'

NOTES:
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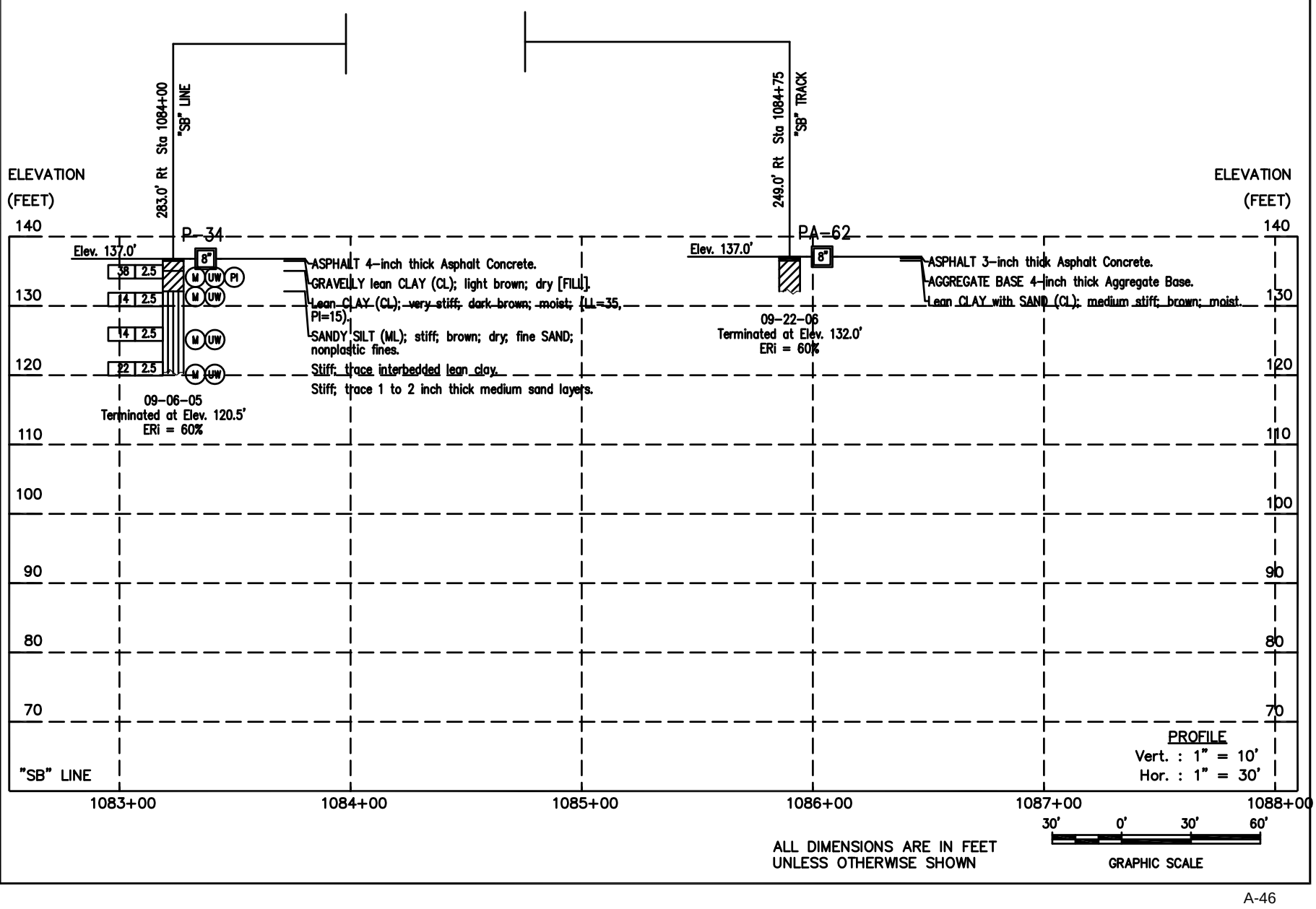

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

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NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
C	06/20	95% SUBMITTAL SET

REGISTERED PROFESSIONAL ENGINEER
STATE OF CALIFORNIA
GARY PARIKH
No. 666
Exp. 12-31-21
GEOTECHNICAL

SUBMITTED
PARIKH
Practicing in the Geosciences
1497 N. MILPITAS BLVD.
MILPITAS, CA 95035

DESIGNED E. Ortakci
DRAWN K. Ouyang
CHECKED A. Lam
CADD FILE NAME 801HP343.dwg

Santa Clara Valley Transportation Authority

APPROVED
BKF ENGINEERS / SURVEYORS / PLANNERS
100+ YEARS

CADD FILE DATE 03/26/20
SUBMITTAL DATE 06/29/20
SCALE 1:30
BOARD APPROVAL DATE

PCA NO. 000
CONTRACT NO. C801
FILE LOCATION PROJECTWISE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 1085+75 TO STA 1091+40

SHEET OF
DRAWING NO. HP343
REVISION C

CONSISTENCY CLASSIFICATION FOR SOILS
According to the Standard Penetration Test (ASTM D-1586)

SPT N-Value (Blows/ 305mm)	Granular	SPT N-Value (Blows/ 305mm)	Cohesive
0–4	Very loose	<2	Very soft
5–10	Loose	2–4	Soft
11–30	Medium Dense	5–8	Firm
31–50	Dense	9–15	Stiff
>50	Very Dense	16–30	Very Stiff
		>31	Hard

NOTE: Visual classifications of earth materials are based on field inspection and or a confirmed or revised with laboratory test results as necessary.

LEGEND OF EARTH MATERIALS (USCS)
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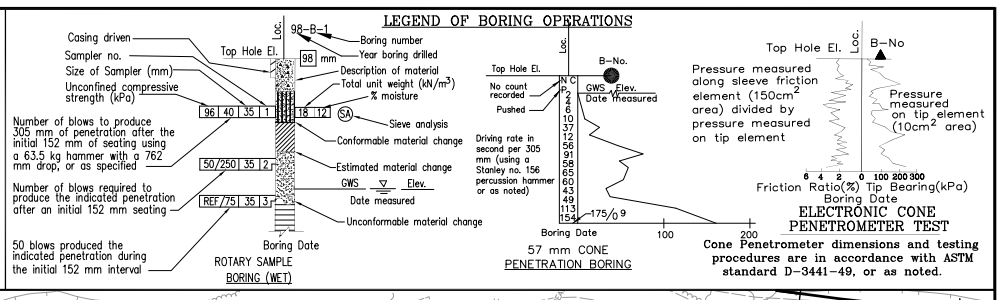
LEGEND OF BORING OPERATIONS



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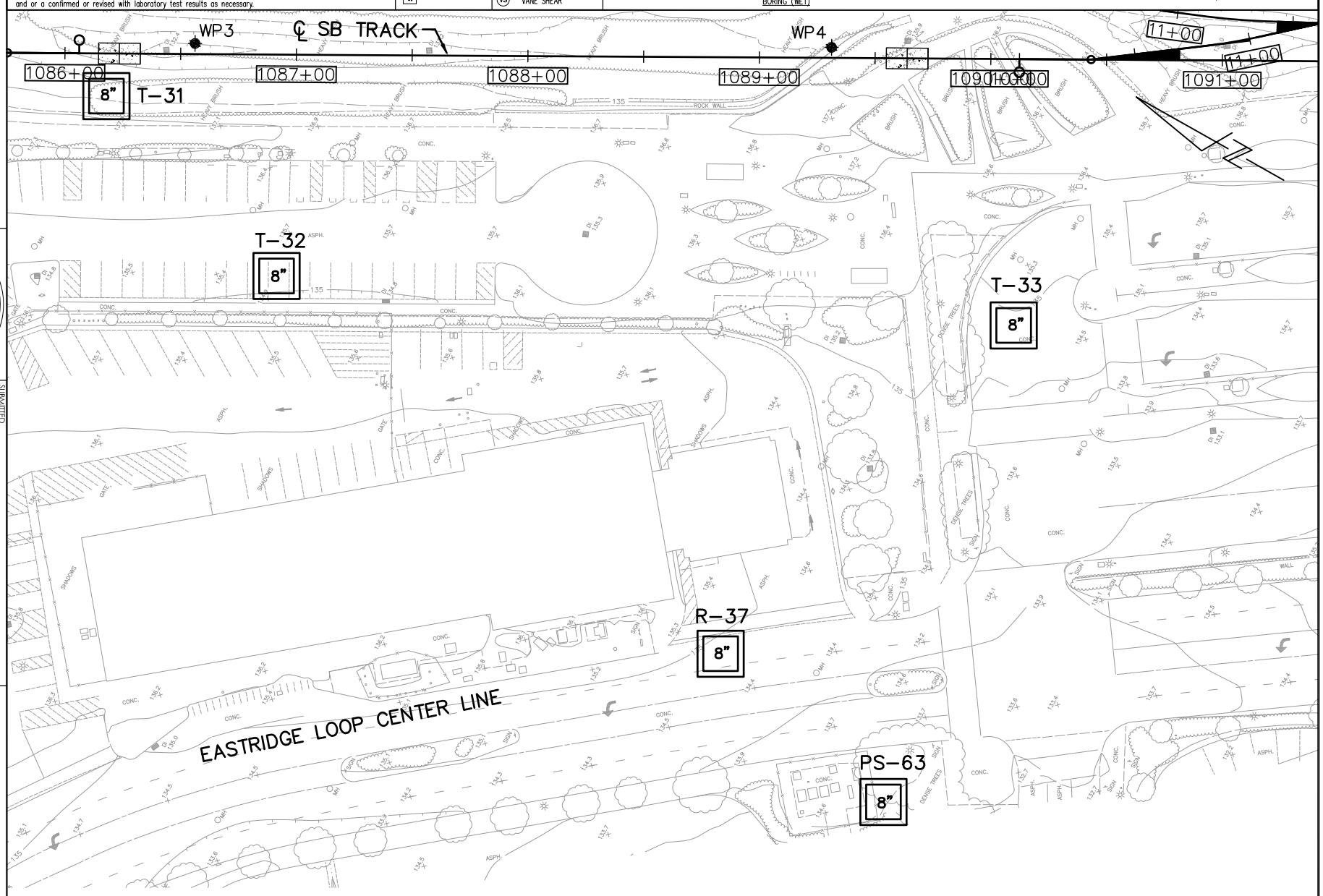

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1"=30'

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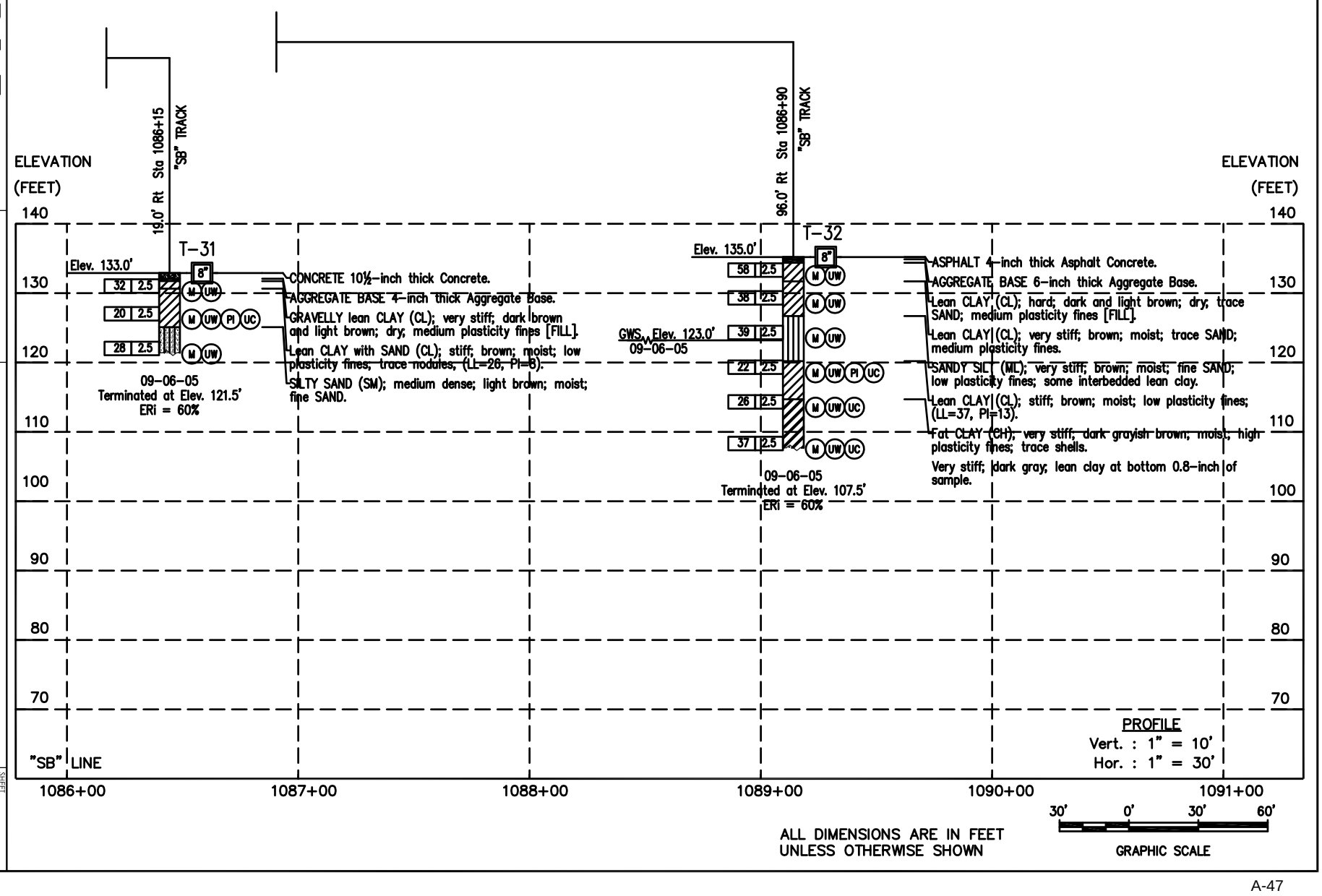

PROFILE
Vert. : 1" = 10'
Hor. : 1" = 30'

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

30' 0' 30' 60'
GRAPHIC SCALE

ogouthier Jun 21, 2020 – 4:50pm C:\caddlib\pw\kouyang\west\dms98390\801HP344.dwg

NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
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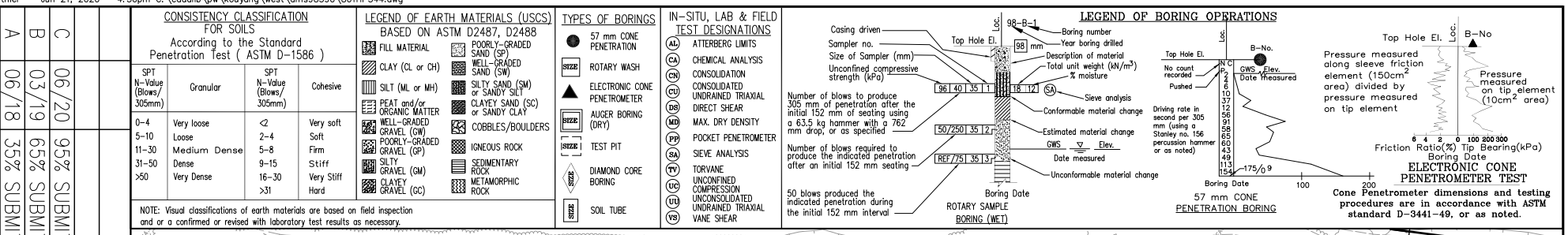
LEGEND OF BORING OPERATIONS



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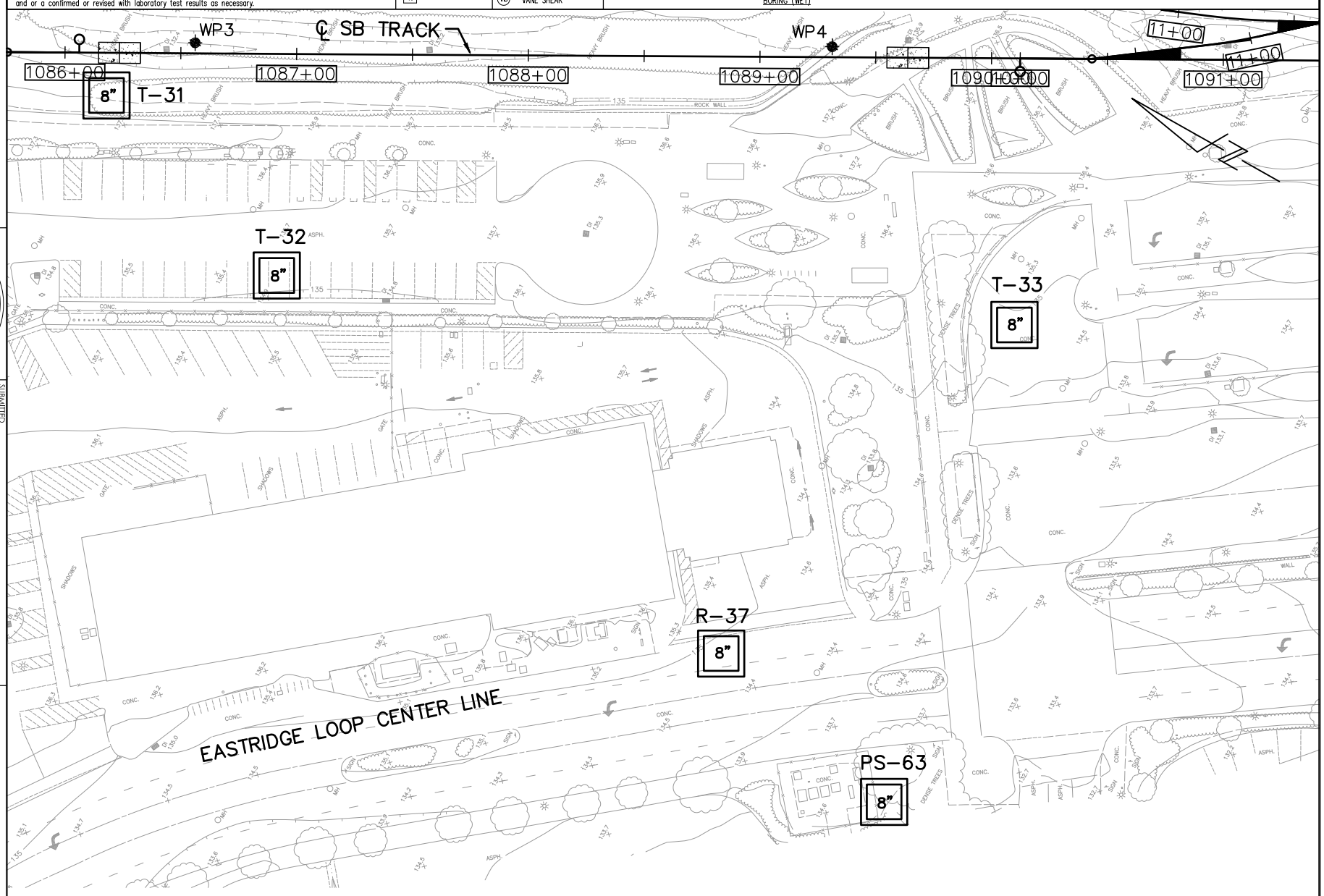

PLAN
1"=30'

NOTES:
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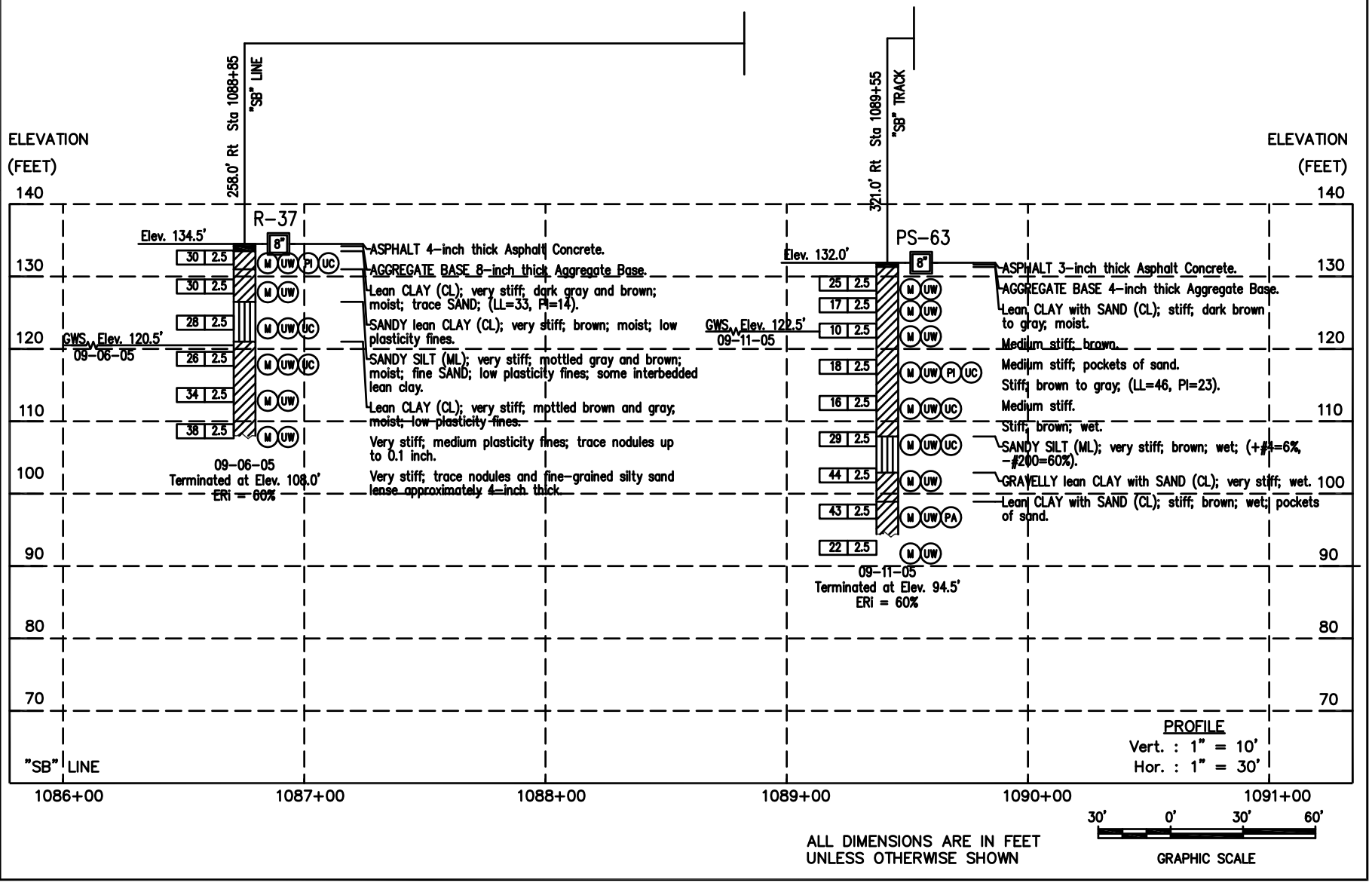

SUBMITTED
PARIKH
Practicing in the Geosciences
1497 N. MILPITAS BLVD.
MILPITAS, CA 95035

DESIGNED E. Ortakci
DRAWN K. Ouyang
CHECKED A. Lam
CADD FILE NAME 801HP344.dwg

REGISTERED PROFESSIONAL ENGINEER
GARY PARIKH
No. 666
Exp. 12-31-21
GEOTECHNICAL
STATE OF CALIFORNIA

Santa Clara Valley Transportation Authority

APPROVED
BKF 100+ YEARS
ENGINEERS / SURVEYORS / PLANNERS

CADD FILE DATE 03/26/20
SUBMITTAL DATE 06/29/20
SCALE 1:30
BOARD APPROVAL DATE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 1085+75 TO STA 1091+40

PCA NO. 000
CONTRACT NO. C801
FILE LOCATION PROJECTWISE
SHEET OF
DRAWING NO. HP344
REVISION C

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NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
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REGISTERED PROFESSIONAL ENGINEER — GARY PARIKH — No. 666 — Exp. 12-31-21 — GEOTECHNICAL — STATE OF CALIFORNIA

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GEOTECHNICAL
LOG OF TEST BORINGS
STA 1085+75 TO STA1091+40

REVISION C
DRAWING NO. HP345
SHEET OF

CONSISTENCY CLASSIFICATION FOR SOILS
According to the Standard Penetration Test (ASTM D-1586)

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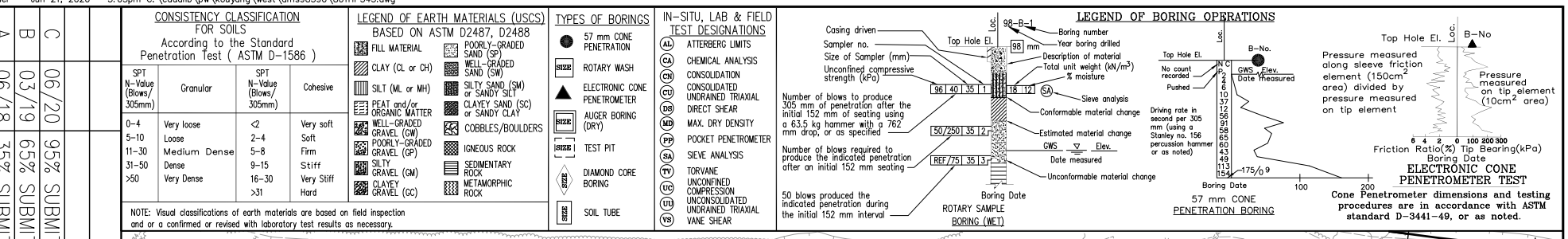

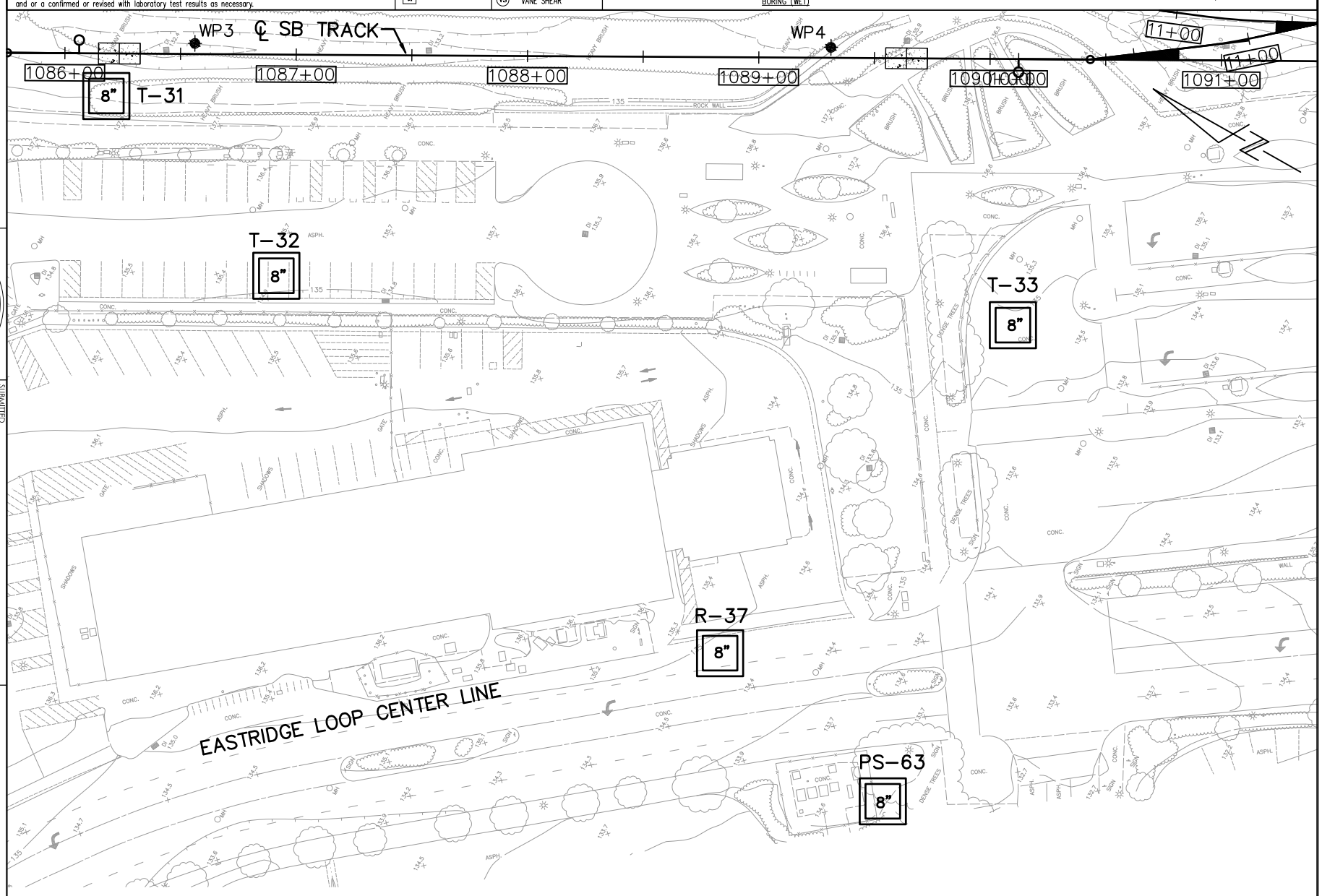

PLAN
1"=30'

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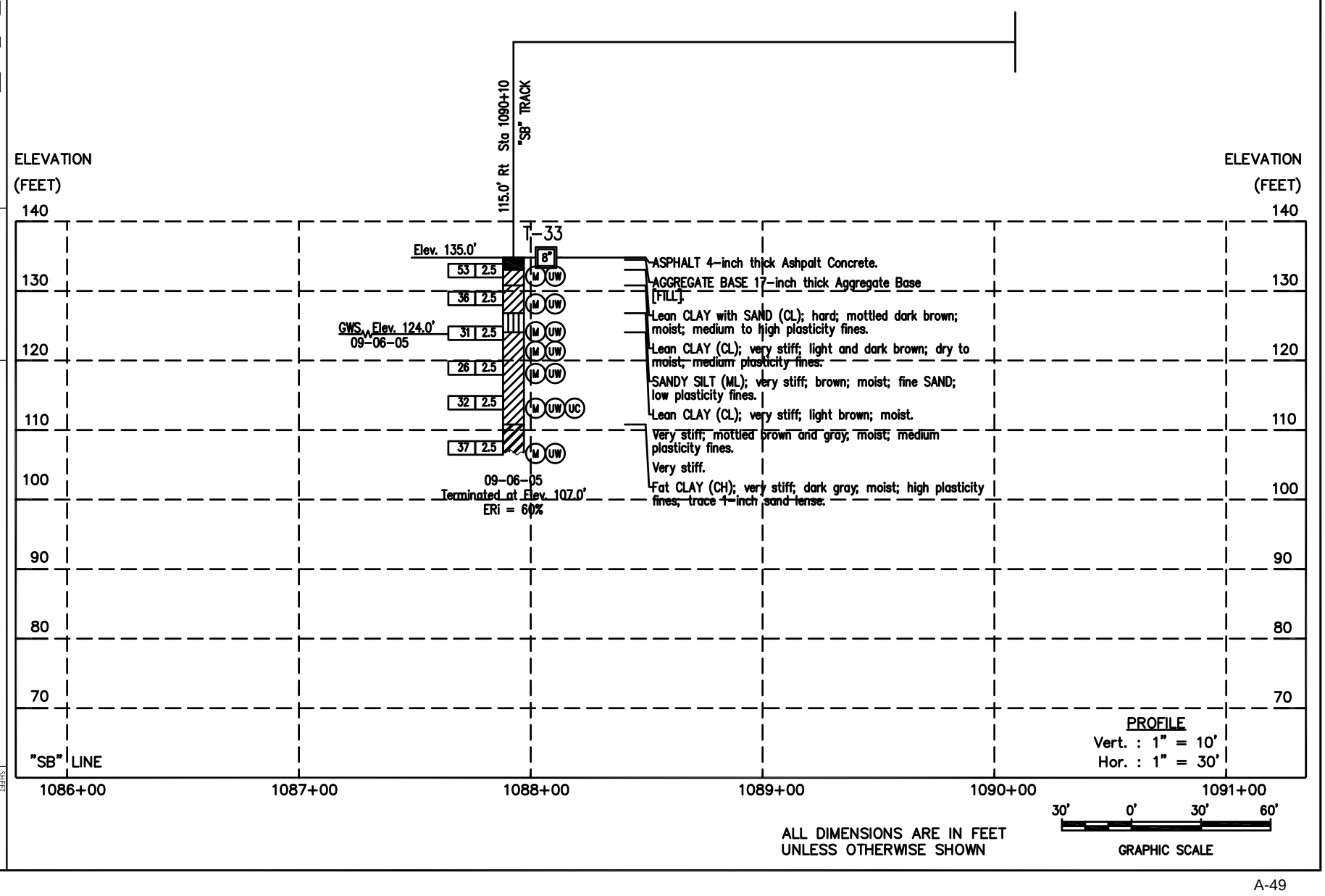

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NO.	DATE	REVISIONS
A	06/18	35% SUBMITTAL SET
B	03/19	65% SUBMITTAL SET
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REGISTERED PROFESSIONAL ENGINEER — GARY PARIKH — No. 666 — Exp. 12-31-21 — STATE OF CALIFORNIA GEOTECHNICAL

DESIGNED E. Ortakci | DRAWN K. Ouyang | CHECKED A. Lam | CADD FILE NAME 801HP346.dwg

PARIKH — Practicing in the Geosciences — 1497 N MILPITAS BLVD. MILPITAS, CA 95035

SUBMITTED

Santa Clara Valley Transportation Authority

APPROVED

BKF 100+ YEARS — ENGINEERS / SURVEYORS / PLANNERS

CADD FILE DATE 03/26/20 | SUBMITTAL DATE 06/29/20 | SCALE 1:30 | BOARD APPROVAL DATE

PCA NO. 000 | CONTRACT NO. C801 | FILE LOCATION PROJECTWISE

EASTRIDGE TO BART REGIONAL CONNECTOR
CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
GEOTECHNICAL
LOG OF TEST BORINGS
STA 1091+60 TO STA 1095+05

REVISION C | DRAWING NO. HP346 | SHEET OF

CONSISTENCY CLASSIFICATION FOR SOILS
According to the Standard Penetration Test (ASTM D-1586)

SPT N-Value (Blows/ 305mm)	Granular	SPT N-Value (Blows/ 305mm)	Cohesive
0–4	Very loose	<2	Very soft
5–10	Loose	2–4	Soft
11–30	Medium Dense	5–8	Firm
31–50	Dense	9–15	Stiff
>50	Very Dense	16–30	Very Stiff
		>31	Hard

NOTE: Visual classifications of earth materials are based on field inspection and or a confirmed or revised with laboratory test results as necessary.

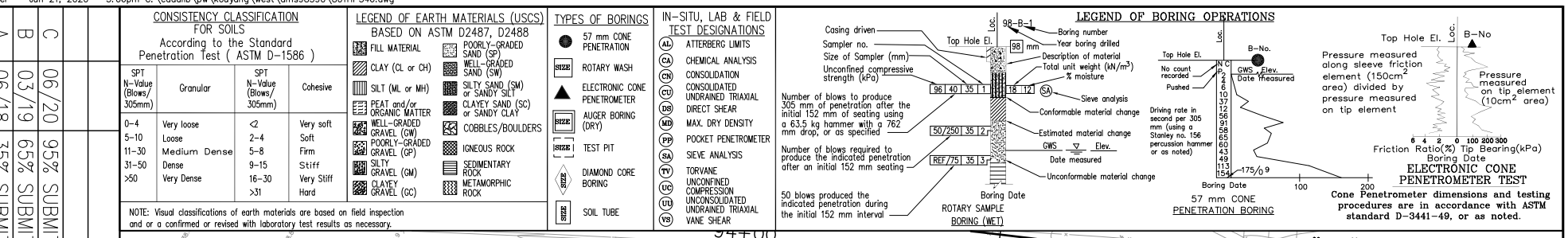
LEGEND OF EARTH MATERIALS (USCS)
BASED ON ASTM D2487, D2488

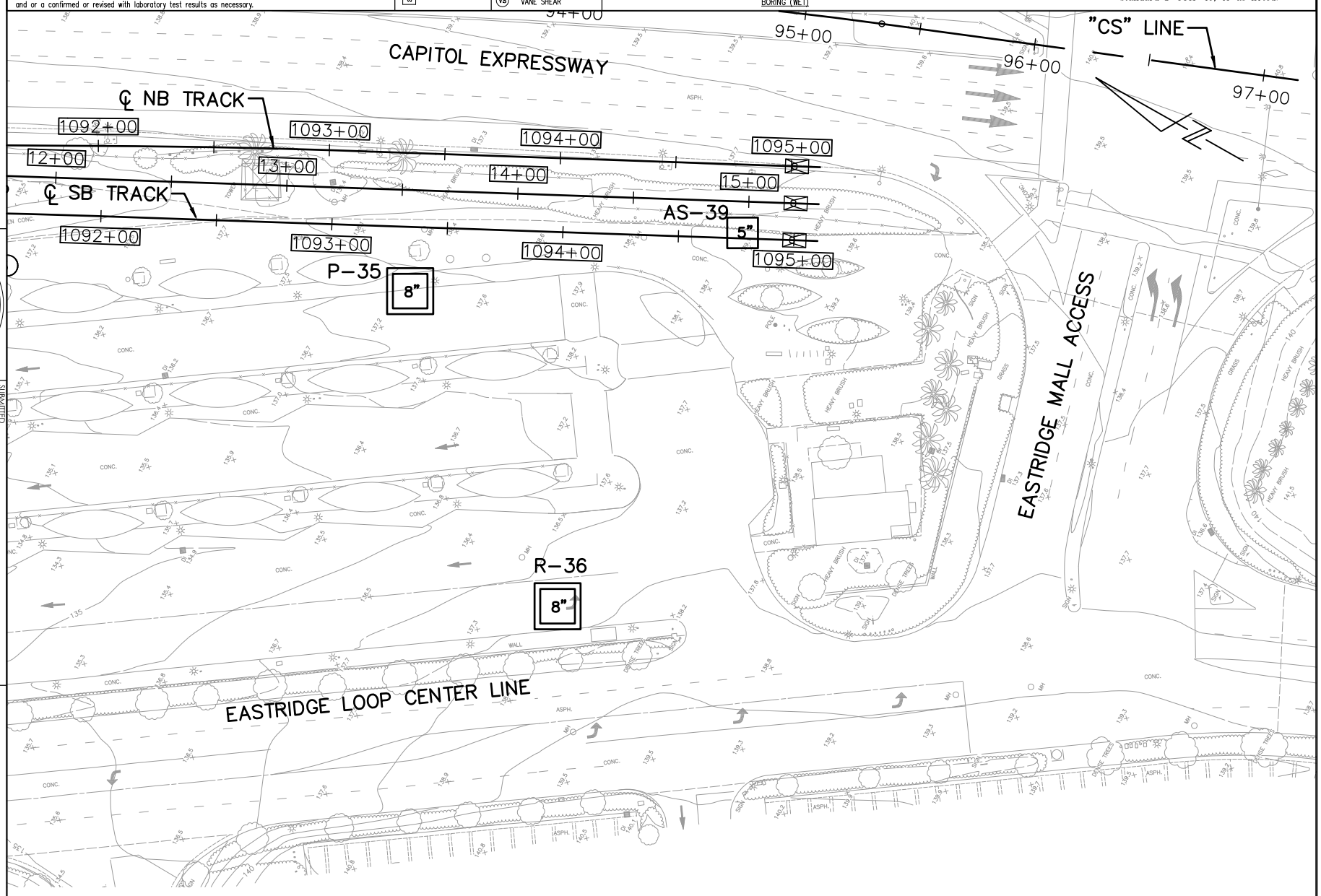
FILL MATERIAL; CLAY (CL or CH); SILT (ML or MH); PEAT and/or ORGANIC MATTER; WELL-GRADED GRAVEL (GW); POORLY-GRADED GRAVEL (GP); SILTY GRAVEL (GM); CLAYEY GRAVEL (GC); POORLY-GRADED SAND (SP); WELL-GRADED SAND (SW); SILTY SAND (SM) or SANDY SILT; CLAYEY SAND (SC) or SANDY CLAY; COBBLES/BOULDERS; IGNEOUS ROCK; SEDIMENTARY ROCK; METAMORPHIC ROCK

TYPES OF BORINGS
57 mm CONE PENETRATION; ROTARY WASH; ELECTRONIC CONE PENETROMETER; AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; SOIL TUBE

IN-SITU, LAB & FIELD TEST DESIGNATIONS
AL ATTERBERG LIMITS; CA CHEMICAL ANALYSIS; CN CONSOLIDATION; CU CONSOLIDATED UNDRAINED TRIAXIAL; DS DIRECT SHEAR; MD MAX. DRY DENSITY; PP POCKET PENETROMETER; SA SIEVE ANALYSIS; TV TORVANE UNCONFINED COMPRESSION; UC UNCONSOLIDATED UNDRAINED TRIAXIAL; VS VANE SHEAR

LEGEND OF BORING OPERATIONS

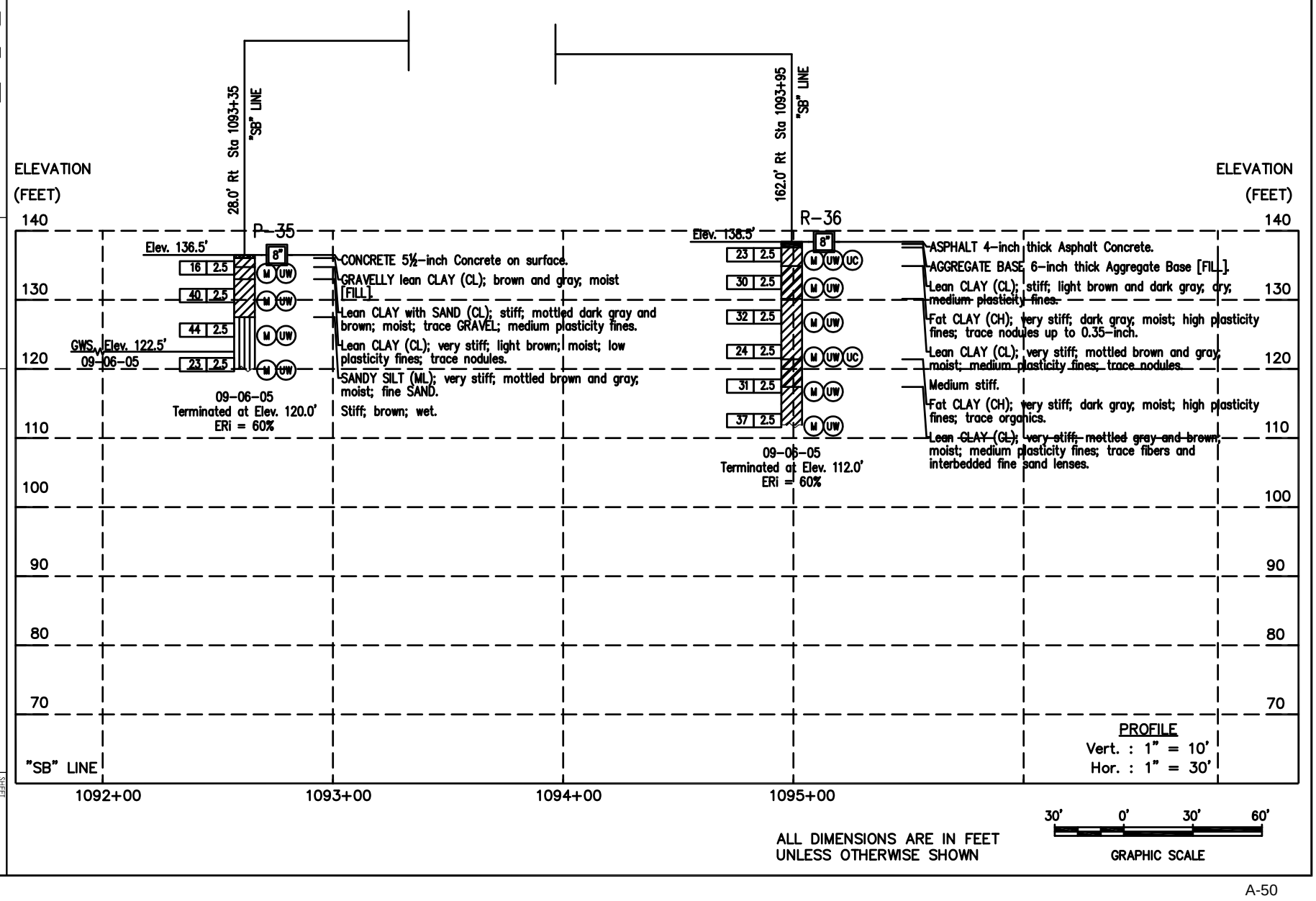




PLAN
1"=30'

NOTES:
Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2" Modified California Sampler: I.D. = 2.5"; O.D. = 3" Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

BENCHMARK:
The Horizontal datum is NAD 83 – Epoch 1991.35. Coordinates are on the California State Plane, Zone 0403. To obtain ground distances, multiply grid distances by 0.9999541. The Vertical datum is NAVD 88. Elevations and boring locations are interpreted from topo map.



ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

APPENDIX III

2005 AND 2006 CONE PENETRATION TESTS

2018 CONE PENETRATION TESTS

8/16/18

Parikh
Attn: Alston Lam

Subject: CPT Site Investigation
Eastridge to Bart Regional Connector
San Jose, California
GREGG Project Number: 18-139MA

Dear Mr. Lam:

The following report presents the results of GREGG Drilling & Testing's Cone Penetration Test investigation for the above referenced site. The following testing services were performed:

1	Cone Penetration Tests	(CPTU)	☒
2	Pore Pressure Dissipation Tests	(PPD)	☒
3	Seismic Cone Penetration Tests	(SCPTU)	☐
4	UVOST Laser Induced Fluorescence	(UVOST)	☐
5	Groundwater Sampling	(GWS)	☐
6	Soil Sampling	(SS)	☐
7	Vapor Sampling	(VS)	☐
8	Pressuremeter Testing	(PMT)	☐
9	Vane Shear Testing	(VST)	☐
10	Dilatometer Testing	(DMT)	☐

A list of reference papers providing additional background on the specific tests conducted is provided in the bibliography following the text of the report. If you would like a copy of any of these publications or should you have any questions or comments regarding the contents of this report, please do not hesitate to contact our office at (562) 427-6899.

Sincerely,
GREGG Drilling & Testing, Inc.

Mary Walden
Operations Manager

Cone Penetration Test Sounding Summary

-Table 1-

CPT Sounding Identification	Date	Termination Depth (feet)	Depth of Groundwater Samples (feet)	Depth of Soil Samples (feet)	Depth of Pore Pressure Dissipation Tests (feet)
AS-67	8/10/2018	120.08	-	-	83.0
AS-91	8/9/2018	115.49	-	-	31.0, 66.6
AS-93	8/10/2018	120.08	-	-	80.3

Cone Penetration Test Sounding Summary

-Table 1-

CPT Sounding Identification	Date	Termination Depth (feet)	Depth of Groundwater Samples (feet)	Depth of Soil Samples (feet)	Depth of Pore Pressure Dissipation Tests (feet)
AS-69	8/13/2018	113.85	-	-	22.6, 100.9
AS-71	8/13/2018	119.91	-	-	34.1
AS-73	8/14/2018	120.08	-	-	44.6
AS-75	8/14/2018	120.08	-	-	43.3
AS-77	8/15/2018	110.24	-	-	52.3
AS-81	8/15/2018	120.08	-	-	43.3
AS-83	8/16/2018	120.08	-	-	77.9
AS-85	8/16/2018	120.08	-	-	22.0
AS-87	8/17/2018	120.08	-	-	45.4
AS-89	8/17/2018	120.08	-	-	52.7

Cone Penetration Test Sounding Summary

-Table 1-

CPT Sounding Identification	Date	Termination Depth (feet)	Depth of Groundwater Samples (feet)	Depth of Soil Samples (feet)	Depth of Pore Pressure Dissipation Tests (feet)
AS-92	8/21/2018	120.08	-	-	85.4
AS-94	8/20/2018	60.7	-	-	45.4, 52.0
AS-94A	8/20/2018	120.08	-	-	-
AS-95	8/20/2018	51.18	-	-	51.5
AS-95A	8/20/2018	120.08	-	-	-

Bibliography

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Campanella, R.G. and I. Weemees, "Development and Use of An Electrical Resistivity Cone for Groundwater Contamination Studies", Canadian Geotechnical Journal, Vol. 27 No. 5, 1990 pp. 557-567.

DeGroot, D.J. and A.J. Lutenegger, "Reliability of Soil Gas Sampling and Characterization Techniques", International Site Characterization Conference - Atlanta, 1998.

Woeller, D.J., P.K. Robertson, T.J. Boyd and Dave Thomas, "Detection of Polyaromatic Hydrocarbon Contaminants Using the UVIF-CPT", 53rd Canadian Geotechnical Conference Montreal, QC October pp. 733-739, 2000.

Zemo, D.A., T.A. Delfino, J.D. Gallinatti, V.A. Baker and L.R. Hilpert, "Field Comparison of Analytical Results from Discrete-Depth Groundwater Samplers" BAT EnviroProbe and QED HydroPunch, Sixth national Outdoor Action Conference, Las Vegas, Nevada Proceedings, 1992, pp 299-312.

Copies of ASTM Standards are available through www.astm.org

Cone Penetration Testing Procedure (CPT)

Gregg Drilling carries out all Cone Penetration Tests (CPT) using an integrated electronic cone system, *Figure CPT*.

The cone takes measurements of tip resistance (q_c), sleeve resistance (f_s), and penetration pore water pressure (u_2). Measurements are taken at either 2.5 or 5 cm intervals during penetration to provide a nearly continuous profile. CPT data reduction and basic interpretation is performed in real time facilitating on-site decision making. The above mentioned parameters are stored electronically for further analysis and reference. All CPT soundings are performed in accordance with revised ASTM standards (D 5778-12).

The 5mm thick porous plastic filter element is located directly behind the cone tip in the u_2 location. A new saturated filter element is used on each sounding to measure both penetration pore pressures as well as measurements during a dissipation test (*PPDT*). Prior to each test, the filter element is fully saturated with oil under vacuum pressure to improve accuracy.

When the sounding is completed, the test hole is backfilled according to client specifications. If grouting is used, the procedure generally consists of pushing a hollow tremie pipe with a "knock out" plug to the termination depth of the CPT hole. Grout is then pumped under pressure as the tremie pipe is pulled from the hole. Disruption or further contamination to the site is therefore minimized.

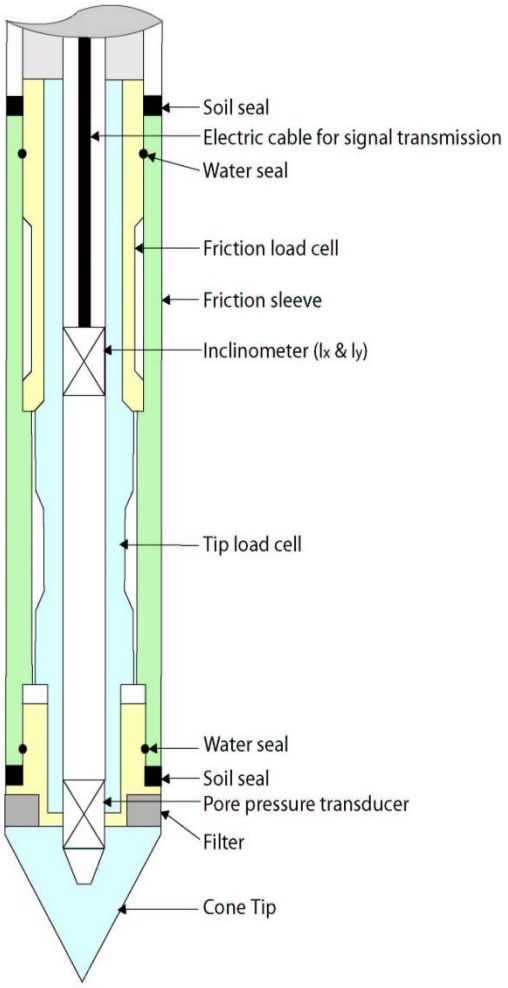


Figure CPT

Gregg 15cm^2 Standard Cone Specifications

Dimensions	
Cone base area	15 cm^2
Sleeve surface area	225 cm^2
Cone net area ratio	0.80
Specifications	
Cone load cell	
Full scale range	180 kN (20 tons)
Overload capacity	150%
Full scale tip stress	120 MPa (1,200 tsf)
Repeatability	120 kPa (1.2 tsf)
Sleeve load cell	
Full scale range	31 kN (3.5 tons)
Overload capacity	150%
Full scale sleeve stress	1,400 kPa (15 tsf)
Repeatability	1.4 kPa (0.015 tsf)
Pore pressure transducer	
Full scale range	7,000 kPa (1,000 psi)
Overload capacity	150%
Repeatability	7 kPa (1 psi)

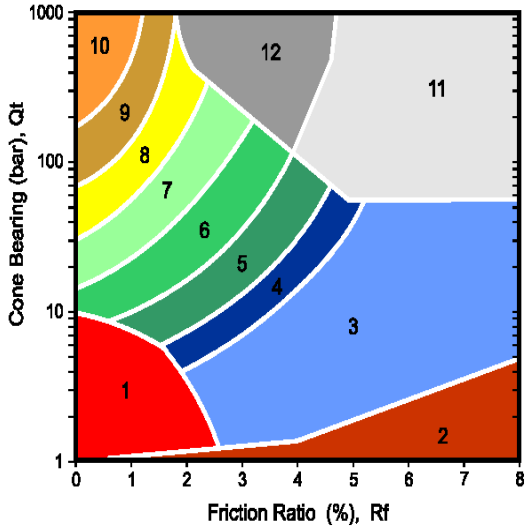
Note: The repeatability during field use will depend somewhat on ground conditions, abrasion, maintenance and zero load stability.

Cone Penetration Test Data & Interpretation

The Cone Penetration Test (CPT) data collected are presented in graphical and electronic form in the report. The plots include interpreted Soil Behavior Type (SBT) based on the charts described by Robertson (1990). Typical plots display SBT based on the non-normalized charts of Robertson et al (1986). For CPT soundings deeper than 30m, we recommend the use of the normalized charts of Robertson (1990) which can be displayed as SBTn, upon request. The report also includes spreadsheet output of computer calculations of basic interpretation in terms of SBT and SBTn and various geotechnical parameters using current published correlations based on the comprehensive review by Lunne, Robertson and Powell (1997), as well as recent updates by Professor Robertson (Guide to Cone Penetration Testing, 2015). The interpretations are presented only as a guide for geotechnical use and should be carefully reviewed. Gregg Drilling & Testing Inc. does not warranty the correctness or the applicability of any of the geotechnical parameters interpreted by the software and does not assume any liability for use of the results in any design or review. The user should be fully aware of the techniques and limitations of any method used in the software. Some interpretation methods require input of the groundwater level to calculate vertical effective stress. An estimate of the in-situ groundwater level has been made based on field observations and/or CPT results, but should be verified by the user.

A summary of locations and depths is available in Table 1. Note that all penetration depths referenced in the data are with respect to the existing ground surface.

Note that it is not always possible to clearly identify a soil type based solely on q_t, f_s, and u_2. In these situations, experience, judgment, and an assessment of the pore pressure dissipation data should be used to infer the correct soil behavior type.



ZONE		SBT
1		Sensitive, fine grained
2		Organic materials
3		Clay
4		Silty clay to clay
5		Clayey silt to silty clay
6		Sandy silt to clayey silt
7		Silty sand to sandy silt
8		Sand to silty sand
9		Sand
10		Gravely sand to sand
11		Very stiff fine grained*
12		Sand to clayey sand*

*over consolidated or cemented

Figure SBT (After Robertson et al., 1986) – Note: Colors may vary slightly compared to plots

Cone Penetration Test (CPT) Interpretation

Gregg uses a proprietary CPT interpretation and plotting software. The software takes the CPT data and performs basic interpretation in terms of soil behavior type (SBT) and various geotechnical parameters using current published empirical correlations based on the comprehensive review by Lunne, Robertson and Powell (1997). The interpretation is presented in tabular format using MS Excel. The interpretations are presented only as a guide for geotechnical use and should be carefully reviewed. Gregg does not warranty the correctness or the applicability of any of the geotechnical parameters interpreted by the software and does not assume any liability for any use of the results in any design or review. The user should be fully aware of the techniques and limitations of any method used in the software.

The following provides a summary of the methods used for the interpretation. Many of the empirical correlations to estimate geotechnical parameters have constants that have a range of values depending on soil type, geologic origin and other factors. The software uses 'default' values that have been selected to provide, in general, conservatively low estimates of the various geotechnical parameters.

Input:

1 Units for display (Imperial or metric) (atm. pressure, p_a = 0.96 tsf or 0.1 MPa)
2 Depth interval to average results (ft or m). Data are collected at either 0.02 or 0.05m and can be averaged every 1, 3 or 5 intervals.
3 Elevation of ground surface (ft or m)
4 Depth to water table, z_w (ft or m) – input required
5 Net area ratio for cone, a (default to 0.80)
6 Relative Density constant, C_{Dr} (default to 350)
7 Young's modulus number for sands, α (default to 5)
8 Small strain shear modulus number
  a. for sands, S_G (default to 180 for SBT_n 5, 6, 7)
  b. for clays, C_G (default to 50 for SBT_n 1, 2, 3 & 4)
9 Undrained shear strength cone factor for clays, N_{kt} (default to 15)
10 Over Consolidation ratio number, k_{ocr} (default to 0.3)
11 Unit weight of water, (default to γ_w = 62.4 lb/ft^3 or 9.81 kN/m^3)

Column

1 Depth, z, (m) – CPT data is collected in meters
2 Depth (ft)
3 Cone resistance, q_c (tsf or MPa)
4 Sleeve resistance, f_s (tsf or MPa)
5 Penetration pore pressure, u (psi or MPa), measured behind the cone (i.e. u_2)
6 Other – any additional data
7 Total cone resistance, q_t (tsf or MPa) $q_t = q_c + u\,(1\text{-}a)$

8	Friction Ratio, R_f (%)	$R_f = (f_s/q_t) \times 100\%$
9	Soil Behavior Type (non-normalized), SBT	see note
10	Unit weight, γ (pcf or kN/m^3)	based on SBT, see note
11	Total overburden stress, σ_v (tsf)	$\sigma_{vo} = \sigma\ z$
12	In-situ pore pressure, u_o (tsf)	$u_o = \gamma_w (z - z_w)$
13	Effective overburden stress, σ'_{vo} (tsf)	$\sigma'_{vo} = \sigma_{vo} - u_o$
14	Normalized cone resistance, Q_{t1}	$Q_{t1} = (q_t - \sigma_{vo}) / \sigma'_{vo}$
15	Normalized friction ratio, F_r (%)	$F_r = f_s / (q_t - \sigma_{vo}) \times 100\%$
16	Normalized Pore Pressure ratio, B_q	$B_q = u - u_o / (q_t - \sigma_{vo})$
17	Soil Behavior Type (normalized), SBT_n	see note
18	SBT_n Index, I_c	see note
19	Normalized Cone resistance, Q_{tn} (n varies with I_c)	see note
20	Estimated permeability, k_{SBT} (cm/sec or ft/sec)	see note
21	Equivalent SPT N_{60}, blows/ft	see note
22	Equivalent SPT $(N_1)_{60}$ blows/ft	see note
23	Estimated Relative Density, D_r, (%)	see note
24	Estimated Friction Angle, ϕ', (degrees)	see note
25	Estimated Young's modulus, E_s (tsf)	see note
26	Estimated small strain Shear modulus, Go (tsf)	see note
27	Estimated Undrained shear strength, s_u (tsf)	see note
28	Estimated Undrained strength ratio	s_u/σ_v'
29	Estimated Over Consolidation ratio, OCR	see note

Notes:

1 Soil Behavior Type (non-normalized), SBT (Lunne et al., 1997 and table below)

2 Unit weight, γ either constant at 119 pcf or based on Non-normalized SBT (Lunne et al., 1997 and table below)

3 Soil Behavior Type (Normalized), SBT_n Lunne et al. (1997)

4 SBT_n Index, I_c $I_c = ((3.47 - \log Q_{t1})^2 + (\log F_r + 1.22)^2)^{0.5}$

5 Normalized Cone resistance, Q_{tn} (n varies with Ic)

$Q_{tn} = ((q_t - \sigma_{vo})/pa)\ (pa/(\sigma'_{vo})^n$ and recalculate I_c, then iterate:

When $I_c < 1.64$, n = 0.5 (clean sand)
When $I_c > 3.30$, n = 1.0 (clays)
When $1.64 < I_c < 3.30$, $n = (I_c - 1.64)0.3 + 0.5$
Iterate until the change in n, $\Delta n < 0.01$

6 Estimated permeability, k_{SBT} based on Normalized SBT_n (Lunne et al., 1997 and table below)

7 Equivalent SPT N_{60}, blows/ft Lunne et al. (1997)

$$\frac{(q_t/p_a)}{N_{60}} = 8.5\left(1 - \frac{I_c}{4.6}\right)$$

8 Equivalent SPT $(N_1)_{60}$ blows/ft $(N_1)_{60} = N_{60}\, C_N$,
where $C_N = (pa/\sigma'_{vo})^{0.5}$

9 Relative Density, D_r, (%) $D_r^2 = Q_{tn} / C_{Dr}$
Only SBT_n 5, 6, 7 & 8 *Show 'N/A' in zones 1, 2, 3, 4 & 9*

10 Friction Angle, ϕ', (degrees) $\tan\phi' = \frac{1}{2.68}\left[\log\left(\frac{q_c}{\sigma'_{vo}}\right) + 0.29\right]$
Only SBT_n 5, 6, 7 & 8 *Show'N/A' in zones 1, 2, 3, 4 & 9*

11 Young's modulus, E_s $E_s = \alpha\, q_t$
Only SBT_n 5, 6, 7 & 8 *Show 'N/A' in zones 1, 2, 3, 4 & 9*

12 Small strain shear modulus, Go

a. $G_o = S_G (q_t\ \sigma'_{vo}\ pa)^{1/3}$ *For SBT_n 5, 6, 7*

b. $G_o = C_G\, q_t$ *For SBT_n 1, 2, 3& 4*

Show 'N/A' in zones 8 & 9

13 Undrained shear strength, s_u $s_u = (q_t - \sigma_{vo}) / N_{kt}$
Only SBT_n 1, 2, 3, 4 & 9 *Show 'N/A' in zones 5, 6, 7 & 8*

14 Over Consolidation ratio, OCR $OCR = k_{ocr}\, Q_{t1}$
Only SBT_n 1, 2, 3, 4 & 9 *Show 'N/A' in zones 5, 6, 7 & 8*

The following updated and simplified SBT descriptions have been used in the software:

SBT Zones		**SBT_n Zones**	
1	sensitive fine grained	1	sensitive fine grained
2	organic soil	2	organic soil
3	clay	3	clay
4	clay & silty clay	4	clay & silty clay
5	clay & silty clay		
6	sandy silt & clayey silt		

7	silty sand & sandy silt	5	silty sand & sandy silt
8	sand & silty sand	6	sand & silty sand
9	sand		
10	sand	7	sand
11	very dense/stiff soil*	8	very dense/stiff soil*
12	very dense/stiff soil*	9	very dense/stiff soil*

*heavily overconsolidated and/or cemented

Track when soils fall with zones of same description and print that description (i.e. if soils fall only within SBT zones 4 & 5, print 'clays & silty clays')

Estimated Permeability (see Lunne et al., 1997)

SBT_n	Permeability (ft/sec)	(m/sec)
1	$3x\ 10^{-8}$	$1x\ 10^{-8}$
2	$3x\ 10^{-7}$	$1x\ 10^{-7}$
3	$1x\ 10^{-9}$	$3x\ 10^{-10}$
4	$3x\ 10^{-8}$	$1x\ 10^{-8}$
5	$3x\ 10^{-6}$	$1x\ 10^{-6}$
6	$3x\ 10^{-4}$	$1x\ 10^{-4}$
7	$3x\ 10^{-2}$	$1x\ 10^{-2}$
8	$3x\ 10^{-6}$	$1x\ 10^{-6}$
9	$1x\ 10^{-8}$	$3x\ 10^{-9}$

Estimated Unit Weight (see Lunne et al., 1997)

SBT	Approximate Unit Weight (lb/ft^3)	(kN/m^3)
1	111.4	17.5
2	79.6	12.5
3	111.4	17.5
4	114.6	18.0
5	114.6	18.0
6	114.6	18.0
7	117.8	18.5
8	120.9	19.0
9	124.1	19.5
10	127.3	20.0
11	130.5	20.5
12	120.9	19.0

Pore Pressure Dissipation Tests (PPDT)

Pore Pressure Dissipation Tests (PPDT's) conducted at various intervals can be used to measure equilibrium water pressure (at the time of the CPT). If conditions are hydrostatic, the equilibrium water pressure can be used to determine the approximate depth of the ground water table. A PPDT is conducted when penetration is halted at specific intervals determined by the field representative. The variation of the penetration pore pressure (*u)* with time is measured behind the tip of the cone and recorded.

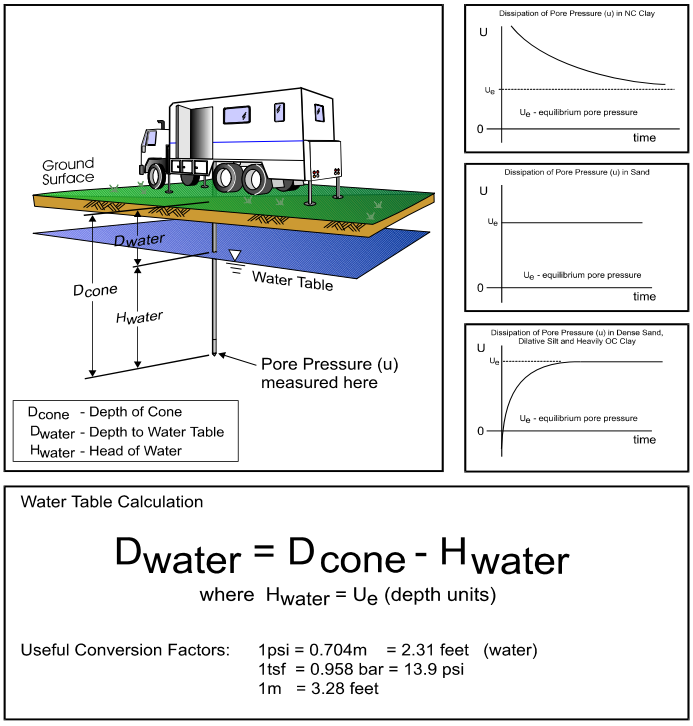
Pore pressure dissipation data can be interpreted to provide estimates of:

- Equilibrium piezometric pressure
- Phreatic Surface
- In situ horizontal coefficient of consolidation (c_h)
- In situ horizontal coefficient of permeability (k_h)

In order to correctly interpret the equilibrium piezometric pressure and/or the phreatic surface, the pore pressure must be monitored until it reaches equilibrium, *Figure PPDT*. This time is commonly referred to as t_{100}, the point at which 100% of the excess pore pressure has dissipated.

A complete reference on pore pressure dissipation tests is presented by Robertson et al. 1992 and Lunne et al. 1997.

A summary of the pore pressure dissipation tests are summarized in Table 1.



Water Table Calculation

$$D_{water} = D_{cone} - H_{water}$$

where $H_{water} = U_e$ (depth units)

Useful Conversion Factors: 1psi = 0.704m = 2.31 feet (water)
1tsf = 0.958 bar = 13.9 psi
1m = 3.28 feet

Figure PPDT

Seismic Cone Penetration Testing (SCPT)

Seismic Cone Penetration Testing (SCPT) can be conducted at various intervals during the Cone Penetration Test. Shear wave velocity (Vs) can then be calculated over a specified interval with depth. A small interval for seismic testing, such as 1-1.5m (3-5ft) allows for a detailed look at the shear wave profile with depth. Conversely, a larger interval such as 3-6m (10-20ft) allows for a more average shear wave velocity to be calculated. Gregg's cones have a horizontally active geophone located 0.2m (0.66ft) behind the tip.

To conduct the seismic shear wave test, the penetration of the cone is stopped and the rods are decoupled from the rig. An automatic hammer is triggered to send a shear wave into the soil. The distance from the source to the cone is calculated knowing the total depth of the cone and the horizontal offset distance between the source and the cone. To calculate an interval velocity, a minimum of two tests must be performed at two different depths. The arrival times between the two wave traces are compared to obtain the difference in time (Δt). The difference in depth is calculated (Δd) and velocity can be determined using the simple equation: v = Δd/Δt

Multiple wave traces can be recorded at the same depth to improve quality of the data.

A complete reference on seismic cone penetration tests is presented by Robertson et al. 1986 and Lunne et al. 1997.

A summary the shear wave velocities, arrival times and wave traces are provided with the report.

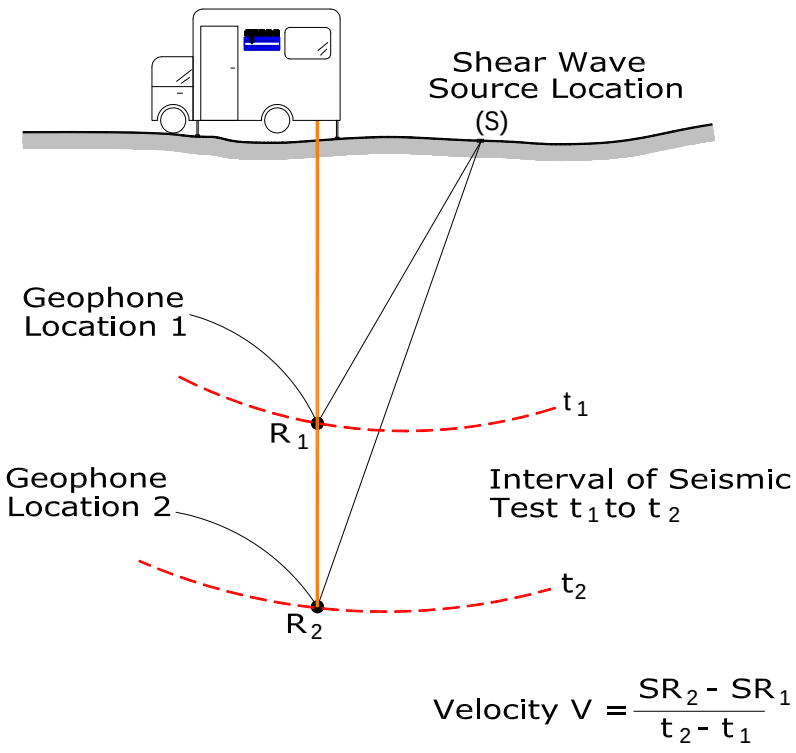


Figure SCPT

Groundwater Sampling

Gregg Drilling & Testing, Inc. conducts groundwater sampling using a sampler as shown in *Figure GWS*. The groundwater sampler has a retrievable stainless steel or disposable PVC screen with steel drop off tip. This allows for samples to be taken at multiple depth intervals within the same sounding location. In areas of slower water recharge, provisions may be made to set temporary PVC well screens during sampling to allow the pushing equipment to advance to the next sample location while the groundwater is allowed to infiltrate.

The groundwater sampler operates by advancing 44.5mm (1¾ inch) hollow push rods with the filter tip in a closed configuration to the base of the desired sampling interval. Once at the desired sample depth, the push rods are retracted; exposing the encased filter screen and allowing groundwater to infiltrate hydrostatically from the formation into the inlet screen. A small diameter bailer (approximately ½ or ¾ inch) is lowered through the push rods into the screen section for sample collection. The number of downhole trips with the bailer and time necessary to complete the sample collection at each depth interval is a function of sampling protocols, volume requirements, and the yield characteristics and storage capacity of the formation. Upon completion of sample collection, the push rods and sampler, with the exception of the PVC screen and steel drop off tip are retrieved to the ground surface, decontaminated and prepared for the next sampling event.

For a detailed reference on direct push groundwater sampling, refer to Zemo et. al., 1992.

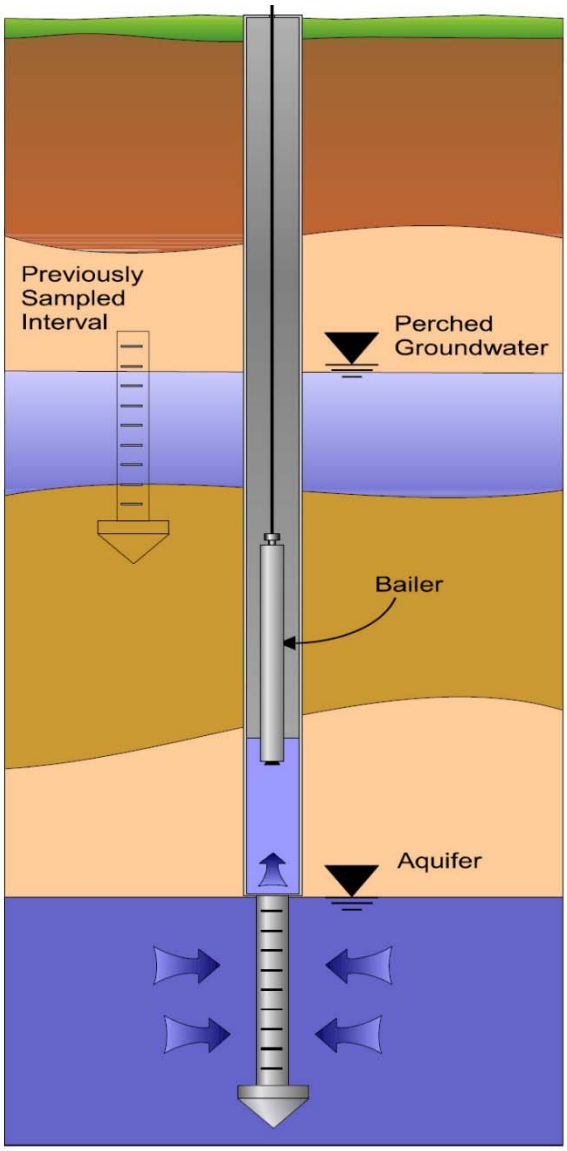


Figure GWS

Soil Sampling

Gregg Drilling & Testing, Inc. uses a piston-type push-in sampler to obtain small soil samples without generating any soil cuttings, *Figure SS*. Two different types of samplers (12 and 18 inch) are used depending on the soil type and density. The soil sampler is initially pushed in a "closed" position to the desired sampling interval using the CPT pushing equipment. Keeping the sampler closed minimizes the potential of cross contamination. The inner tip of the sampler is then retracted leaving a hollow soil sampler with inner 1¼" diameter sample tubes. The hollow sampler is then pushed in a locked "open" position to collect a soil sample. The filled sampler and push rods are then retrieved to the ground surface. Because the soil enters the sampler at a constant rate, the opportunity for 100% recovery is increased. For environmental analysis, the soil sample tube ends are sealed with Teflon and plastic caps. Often, a longer "split tube" can be used for geotechnical sampling.

For a detailed reference on direct push soil sampling, refer to Robertson et al, 1998.

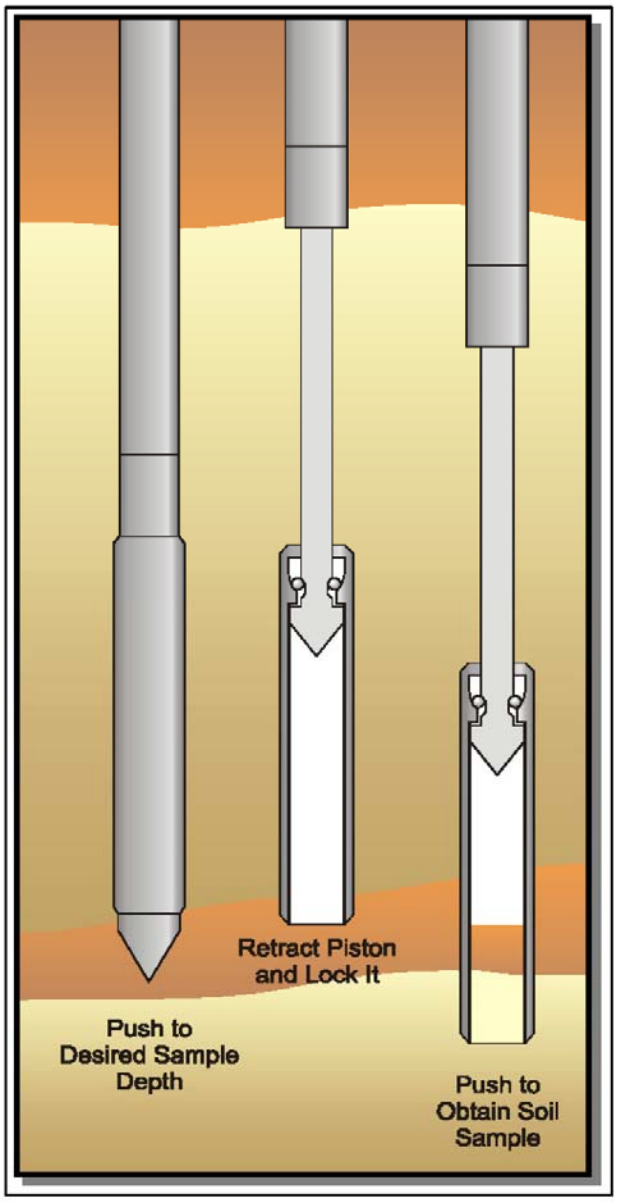


Figure SS

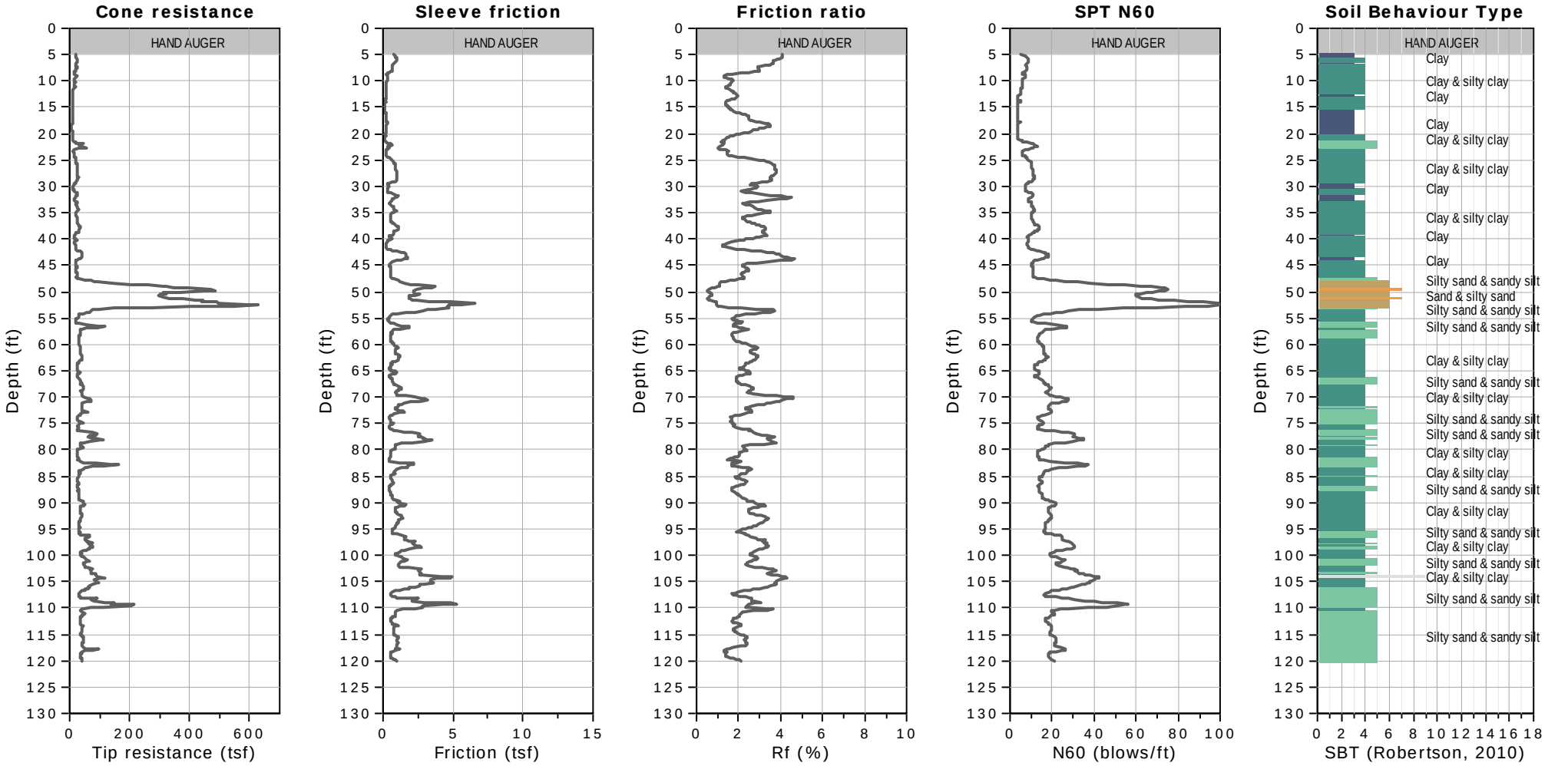
CPT: AS-67

CLIENT: PARIKH

Field Rep: VIRGIL SANTOS

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 120.08 ft, Date: 8/10/2018



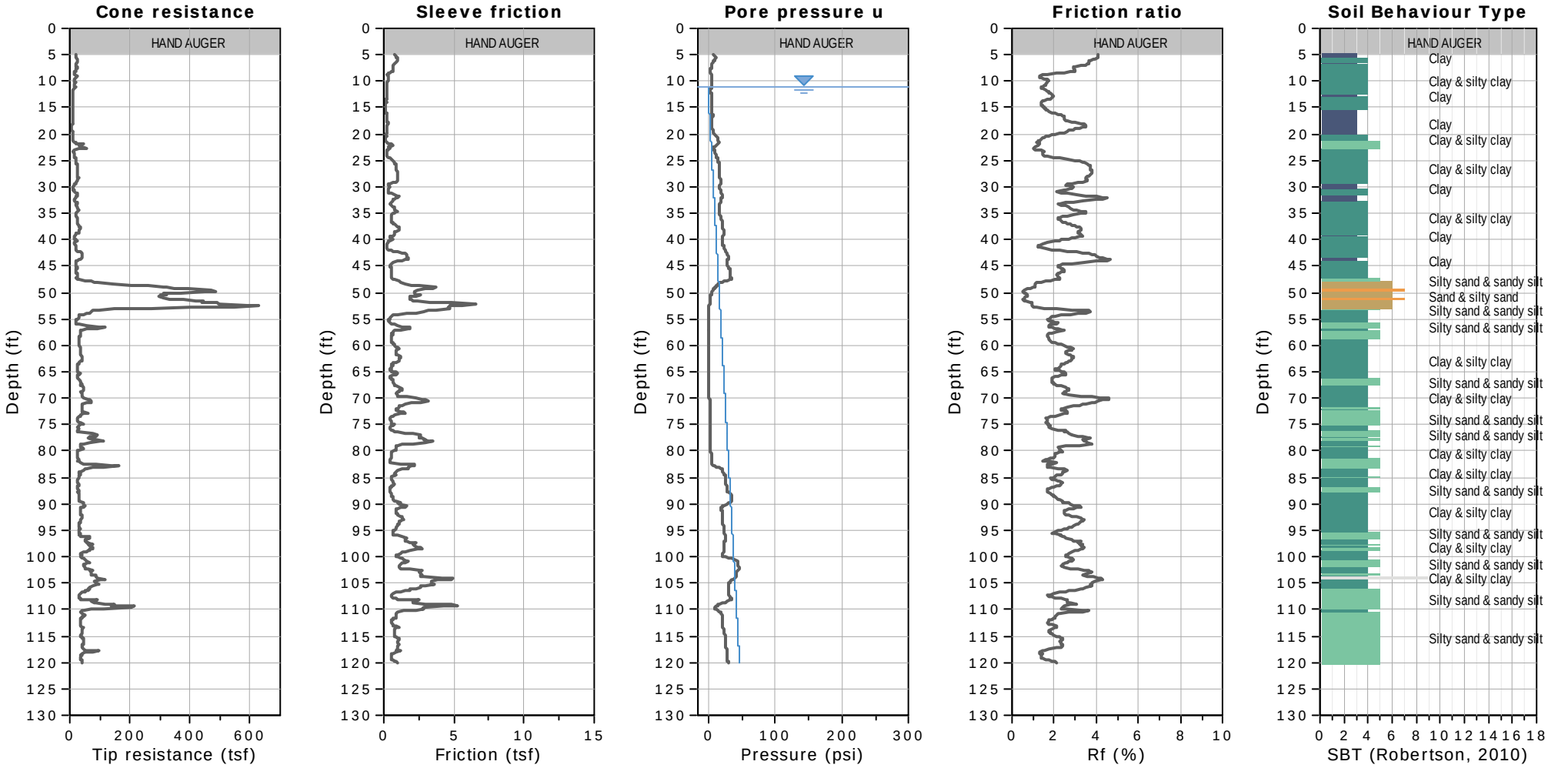
CPT: AS-67

CLIENT: PARIKH

Field Rep: VIRGIL SANTOS

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 120.08 ft, Date: 8/10/2018



WATER TABLE FOR ESTIMATING PURPOSES ONLY

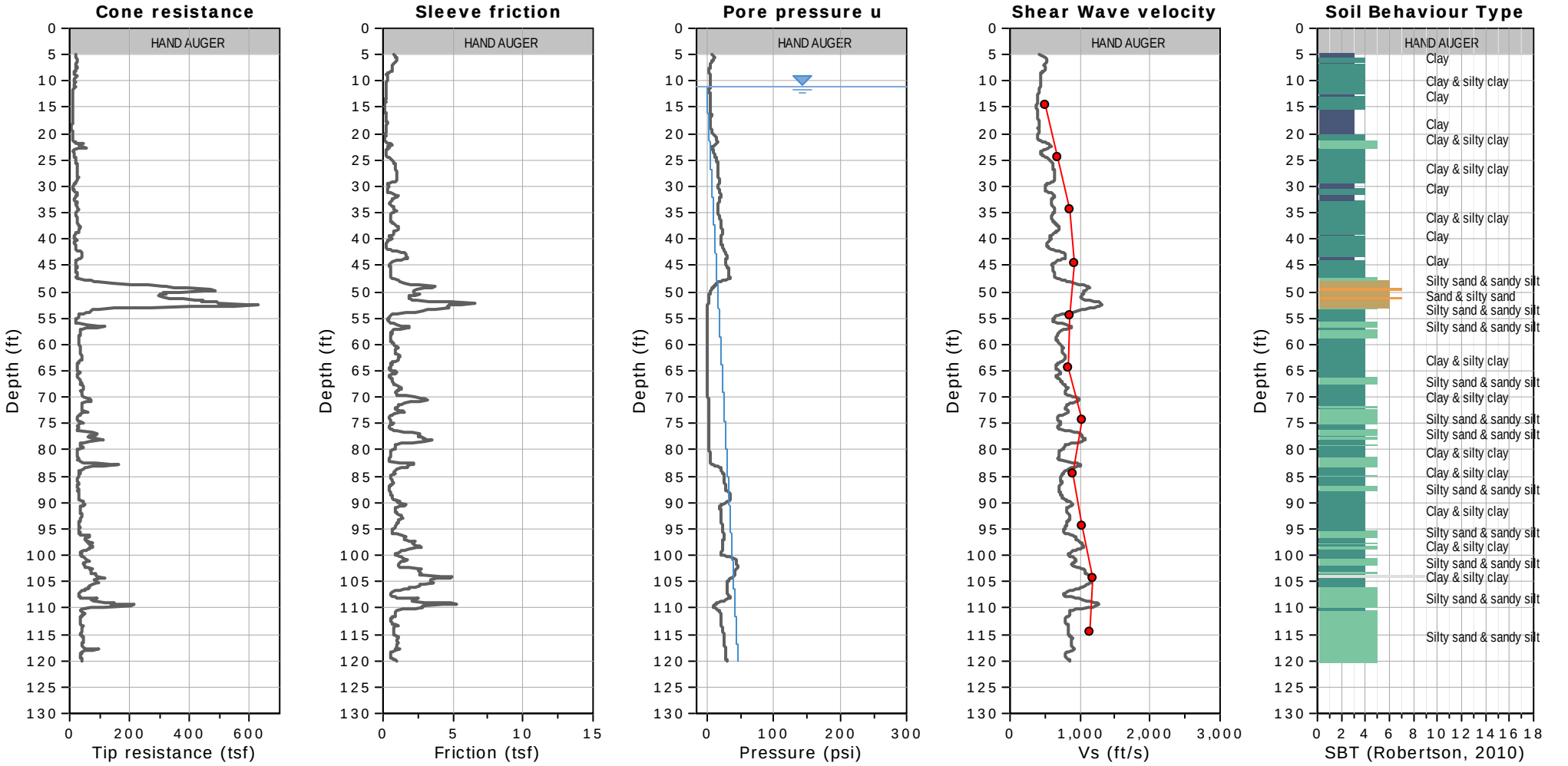
CPT: AS-67

CLIENT: PARIKH

Field Rep: VIRGIL SANTOS

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 120.08 ft, Date: 8/10/2018



WATER TABLE FOR ESTIMATING PURPOSES ONLY

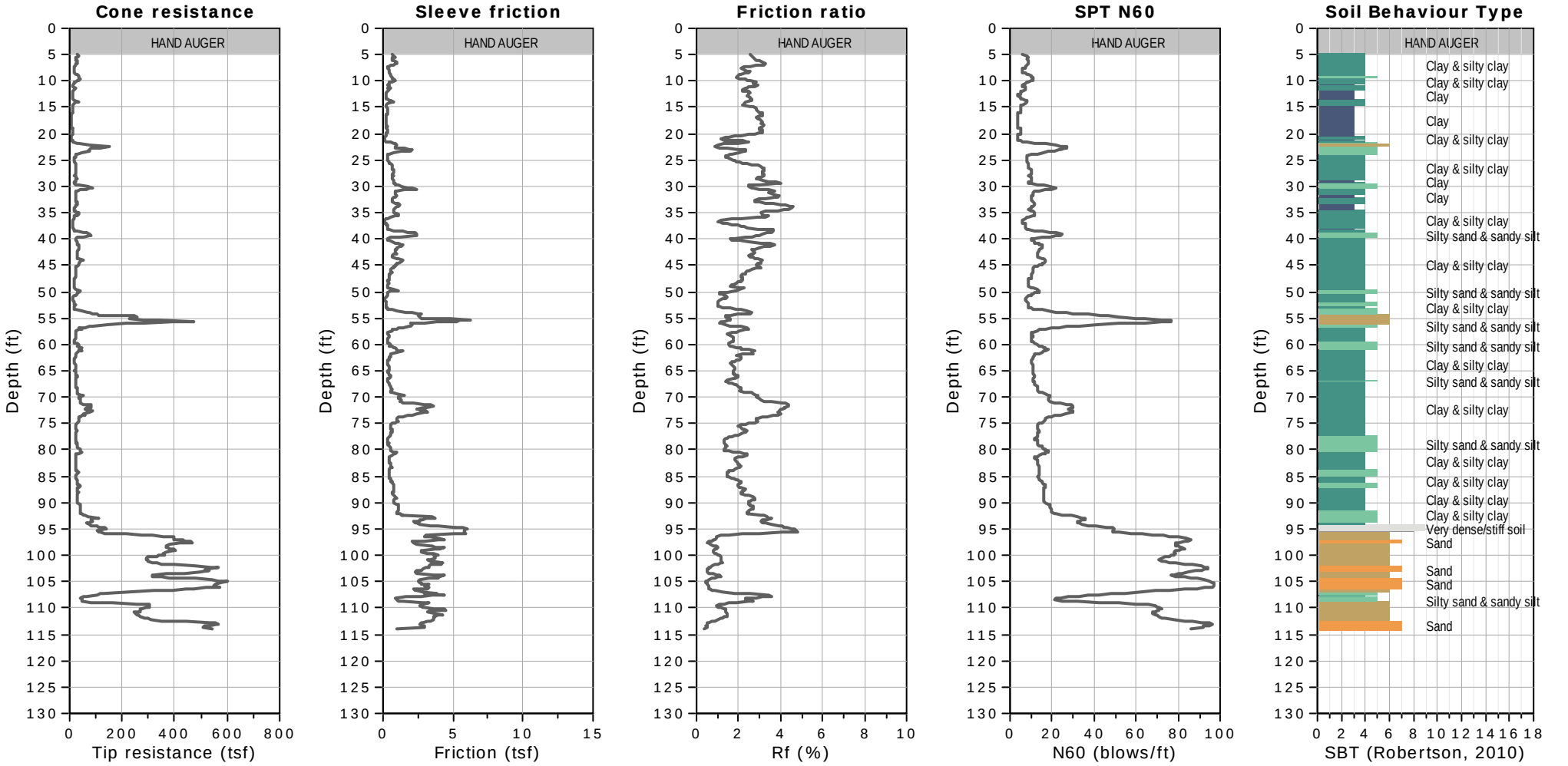
CPT: AS-69

CLIENT: PARIKH

Field Rep: JACKSON

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 113.85 ft, Date: 8/13/2018



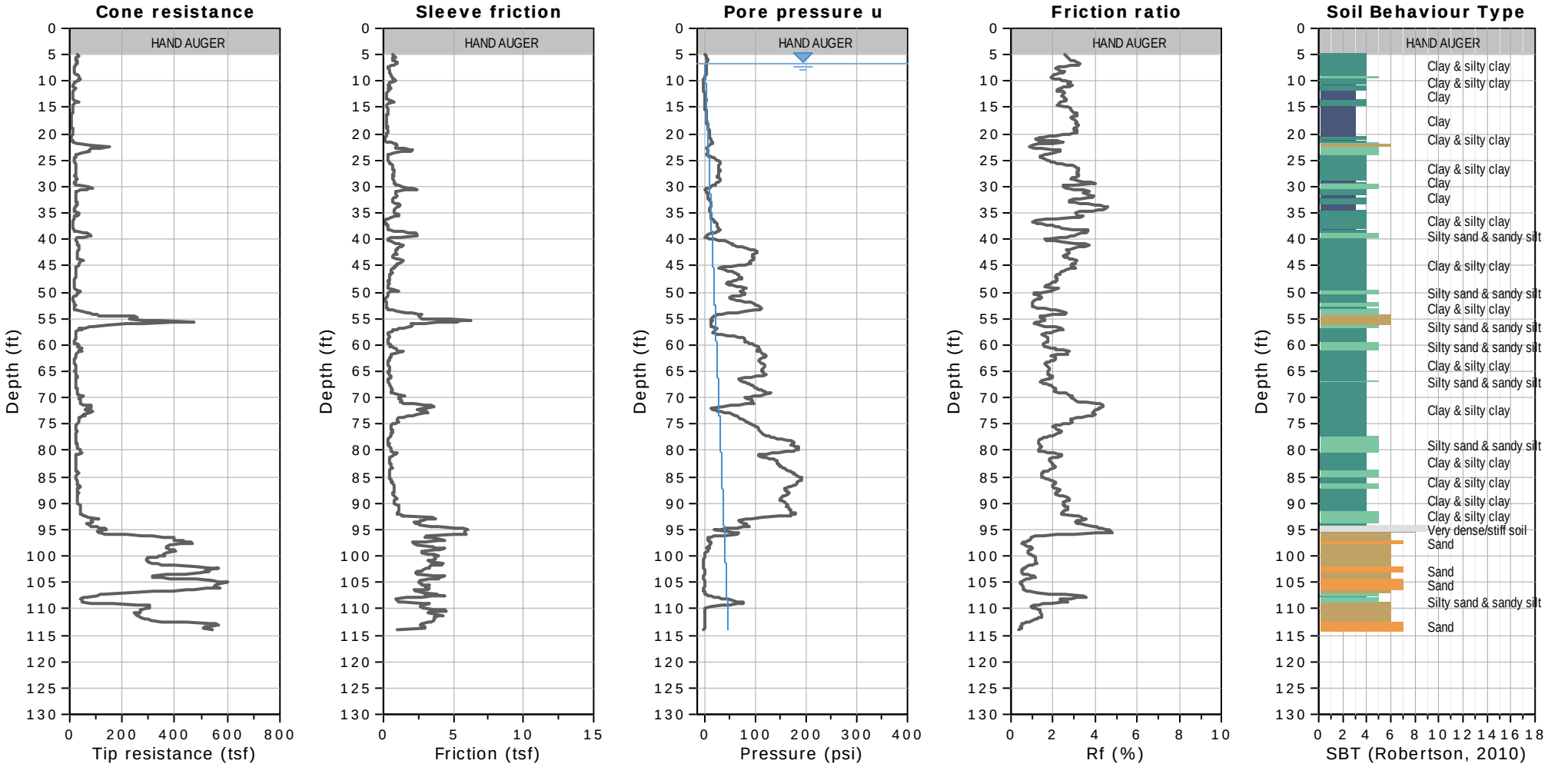
CPT: AS-69

CLIENT: PARIKH

Field Rep: JACKSON

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 113.85 ft, Date: 8/13/2018



WATER TABLE FOR ESTIMATING PURPOSES ONLY

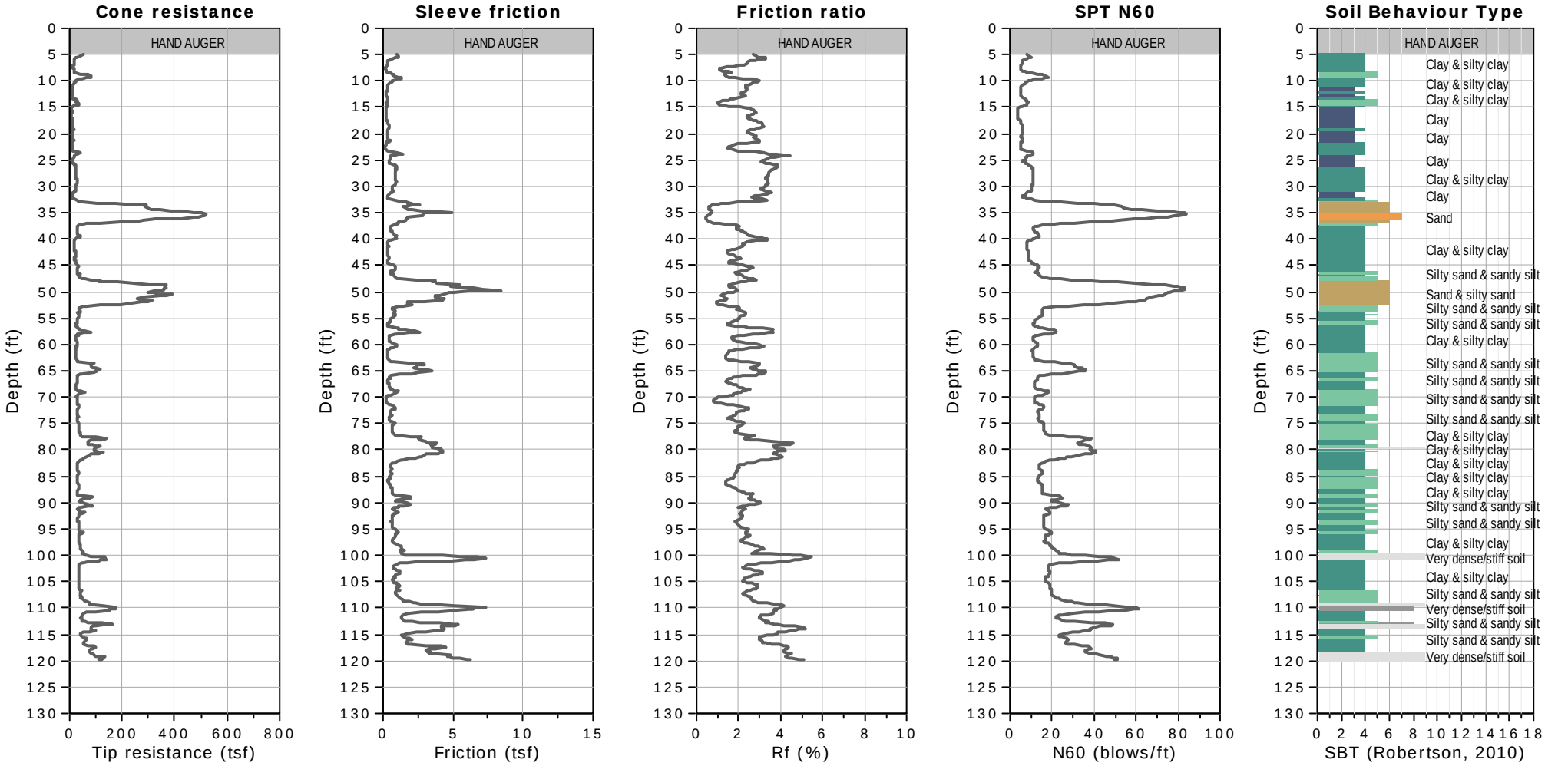
CPT: AS-71

CLIENT: PARIKH

Field Rep: JACKSON

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 119.91 ft, Date: 8/13/2018



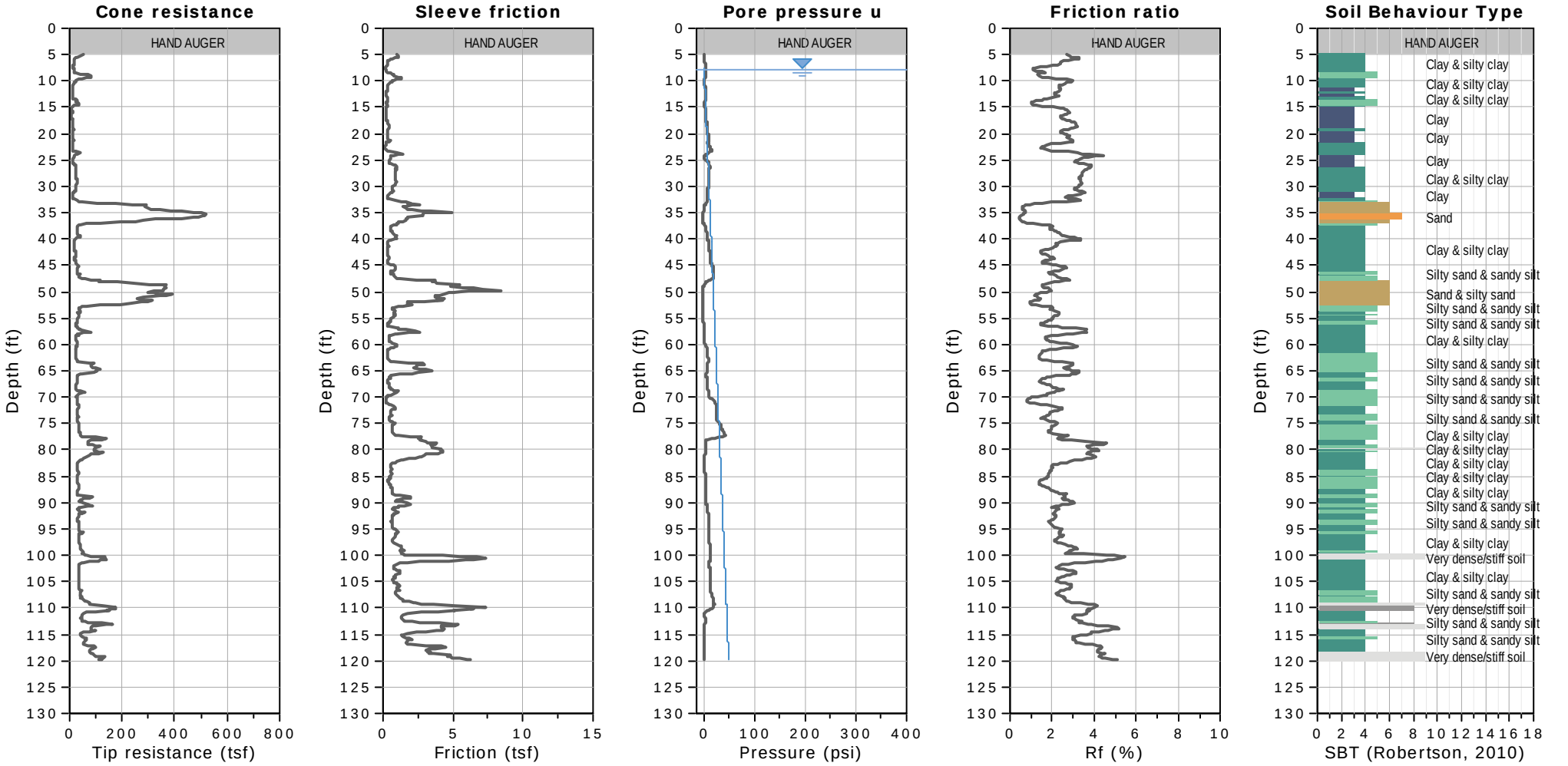
CPT: AS-71

CLIENT: PARIKH

Field Rep: JACKSON

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 119.91 ft, Date: 8/13/2018



WATER TABLE FOR ESTIMATING PURPOSES ONLY

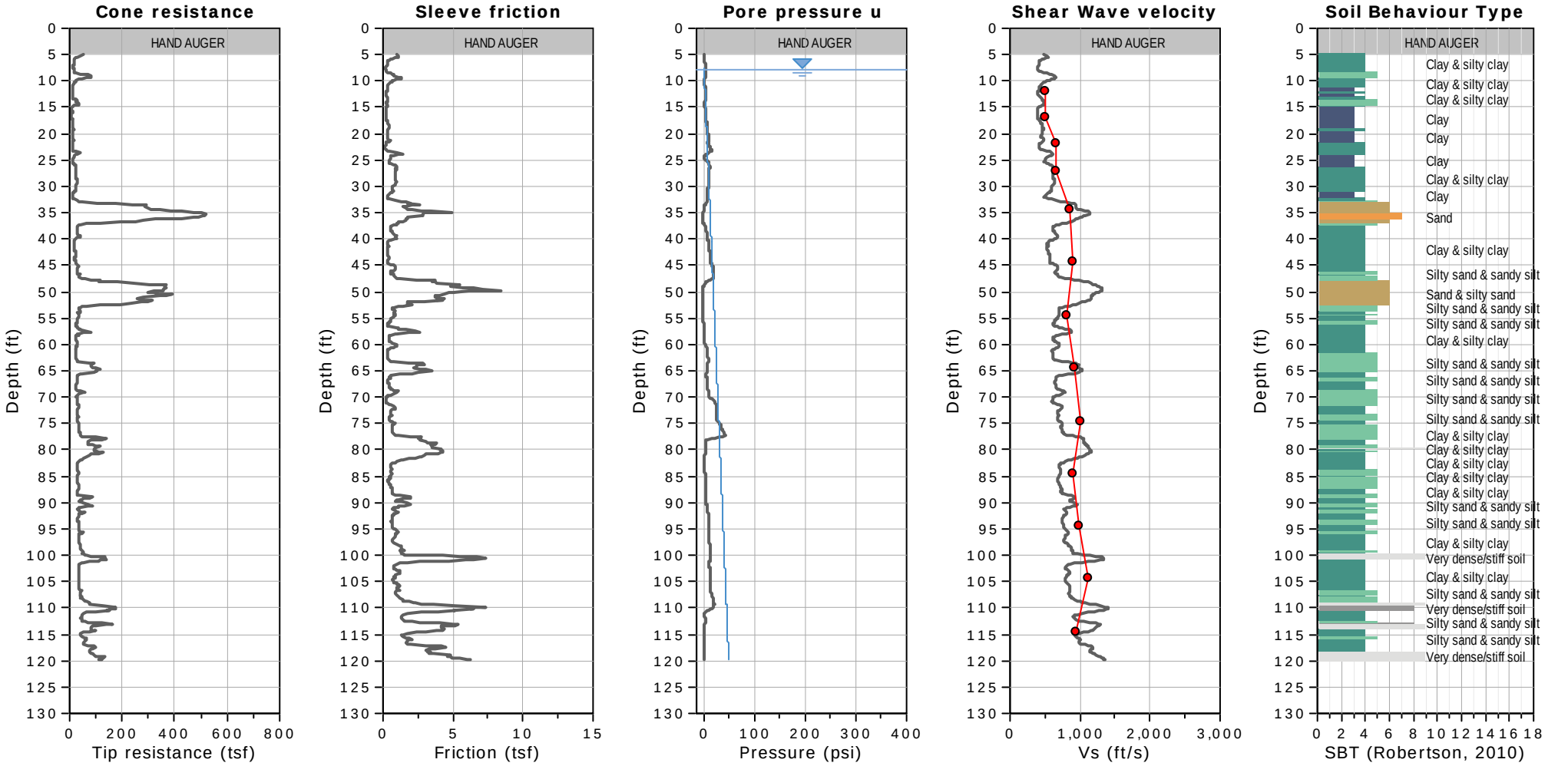
CPT: AS-71

CLIENT: PARIKH

Field Rep: JACKSON

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 119.91 ft, Date: 8/13/2018



WATER TABLE FOR ESTIMATING PURPOSES ONLY

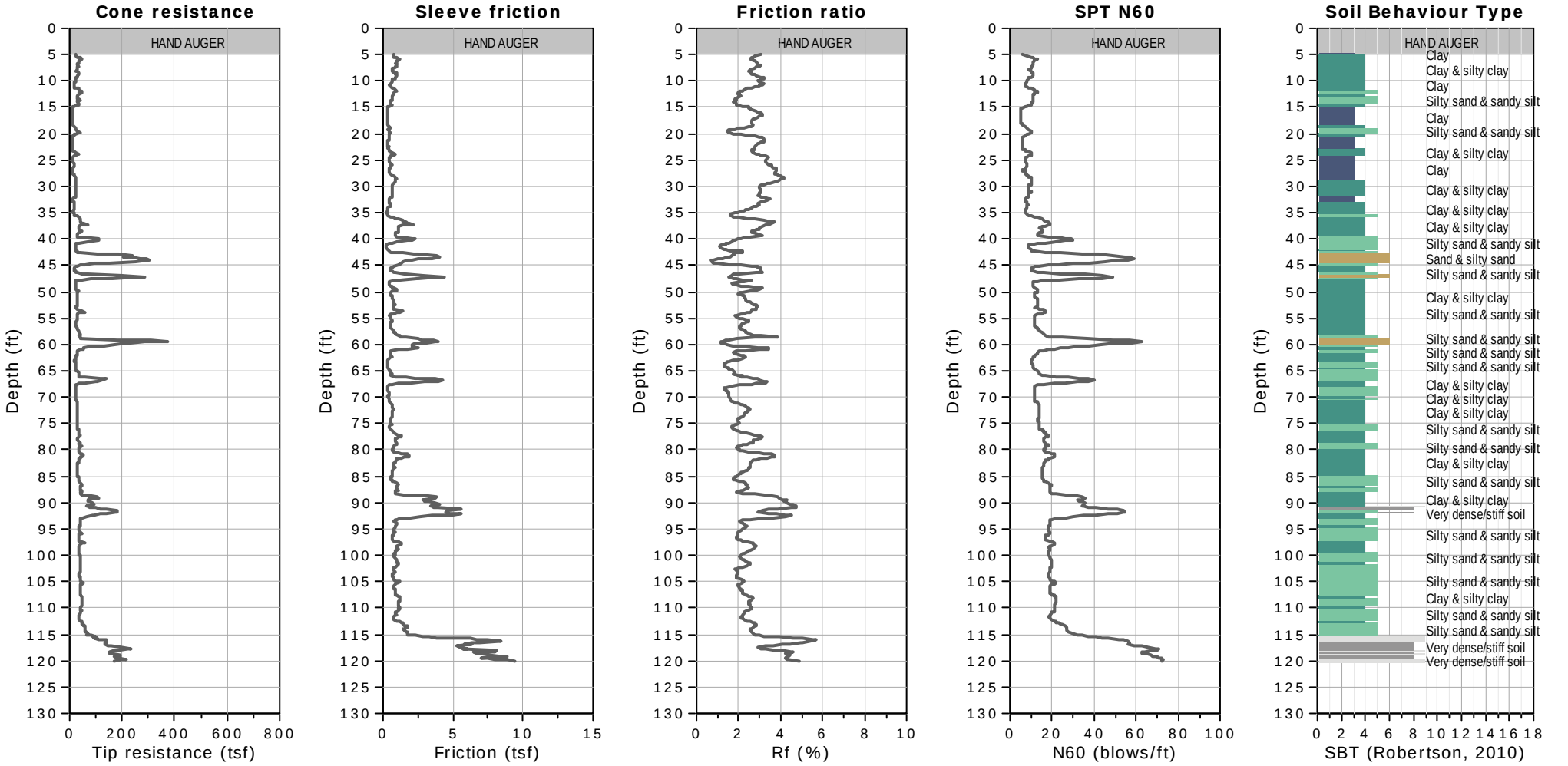
CPT: AS-73

CLIENT: PARIKH

Field Rep: JACKSON

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 120.08 ft, Date: 8/14/2018

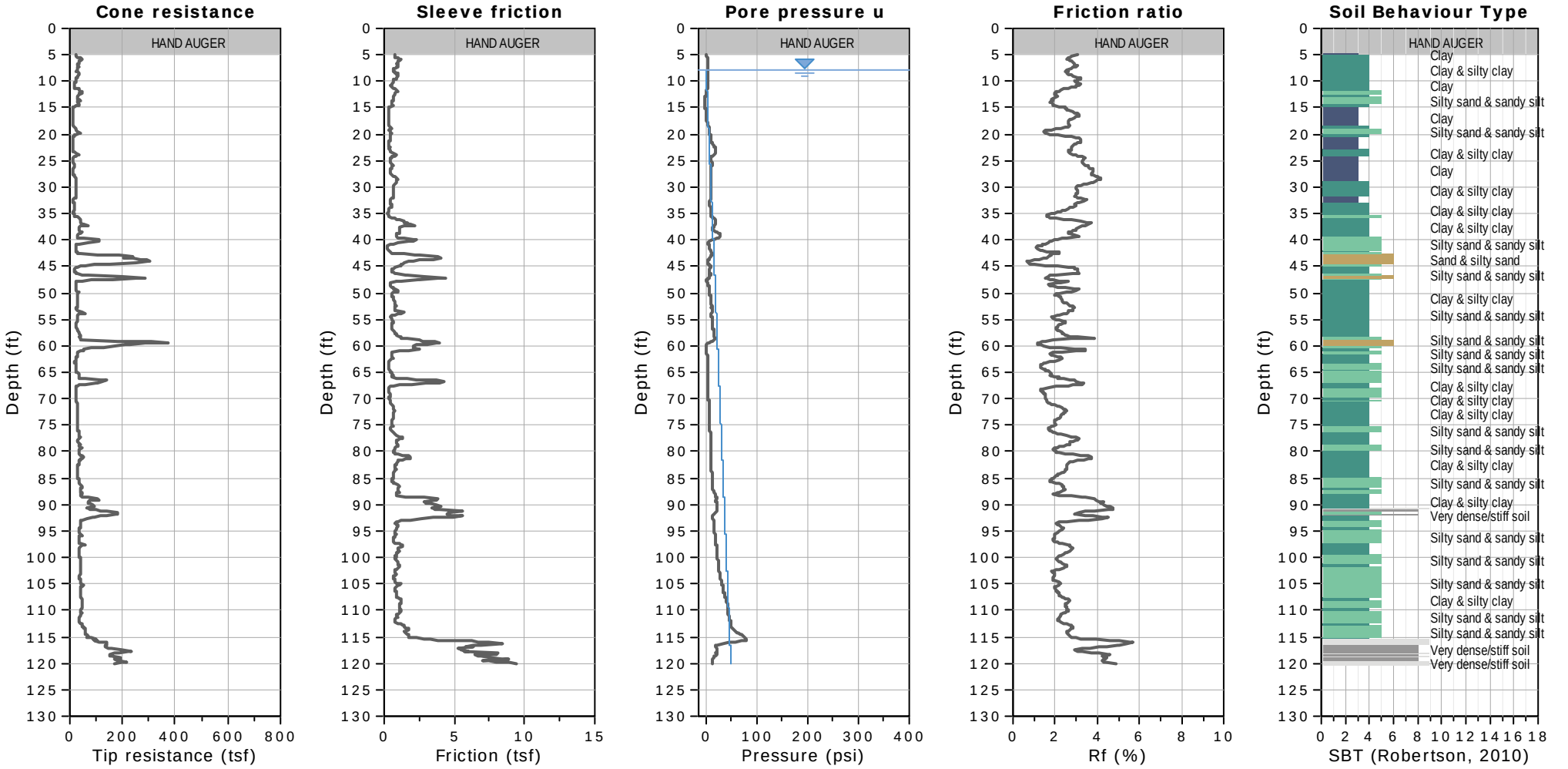


CLIENT: PARIKH

Field Rep: JACKSON

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 120.08 ft, Date: 8/14/2018



WATER TABLE FOR ESTIMATING PURPOSES ONLY

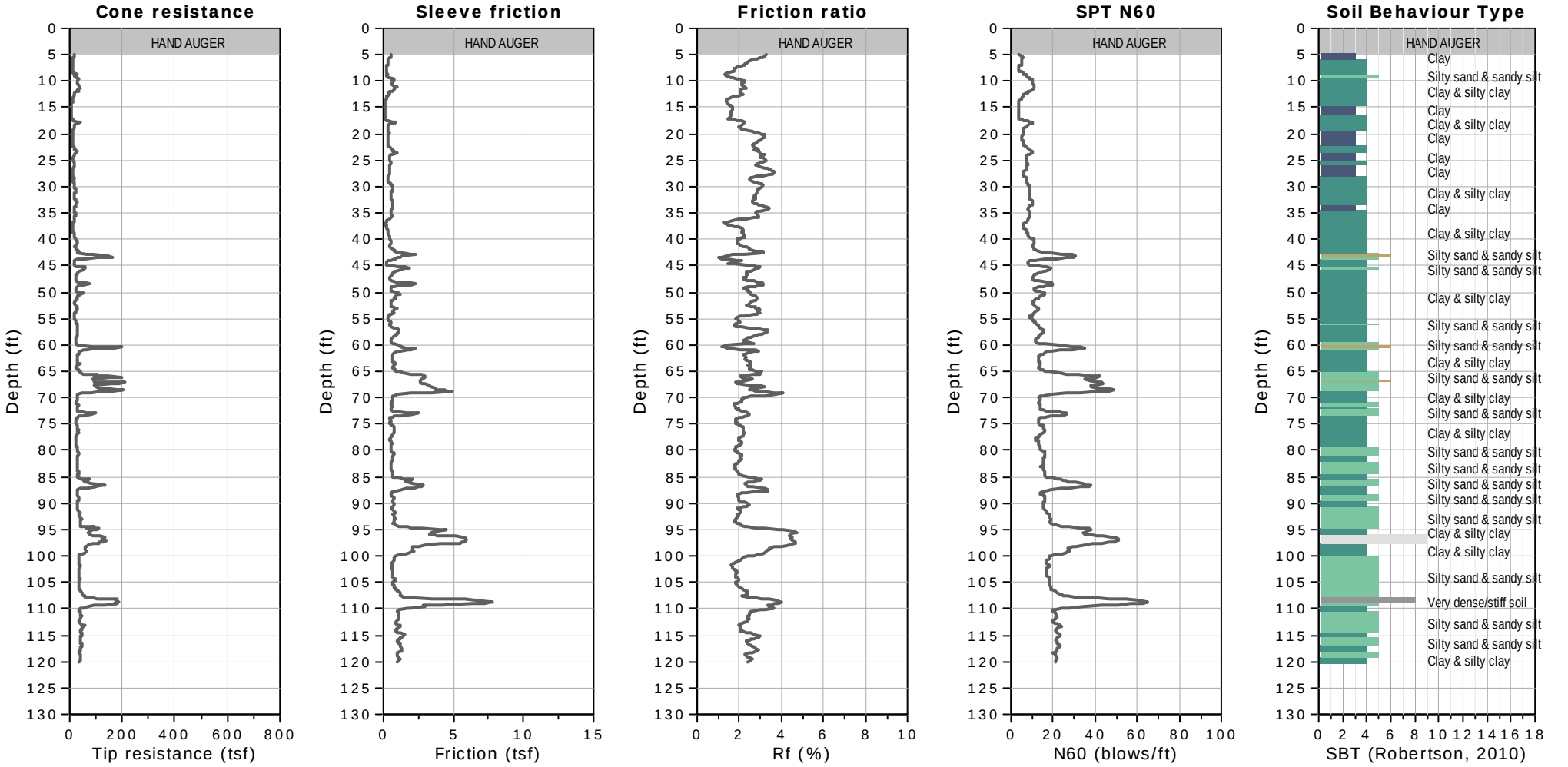
CPT: AS-75

CLIENT: PARIKH

Field Rep: JACKSON

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 120.08 ft, Date: 8/14/2018

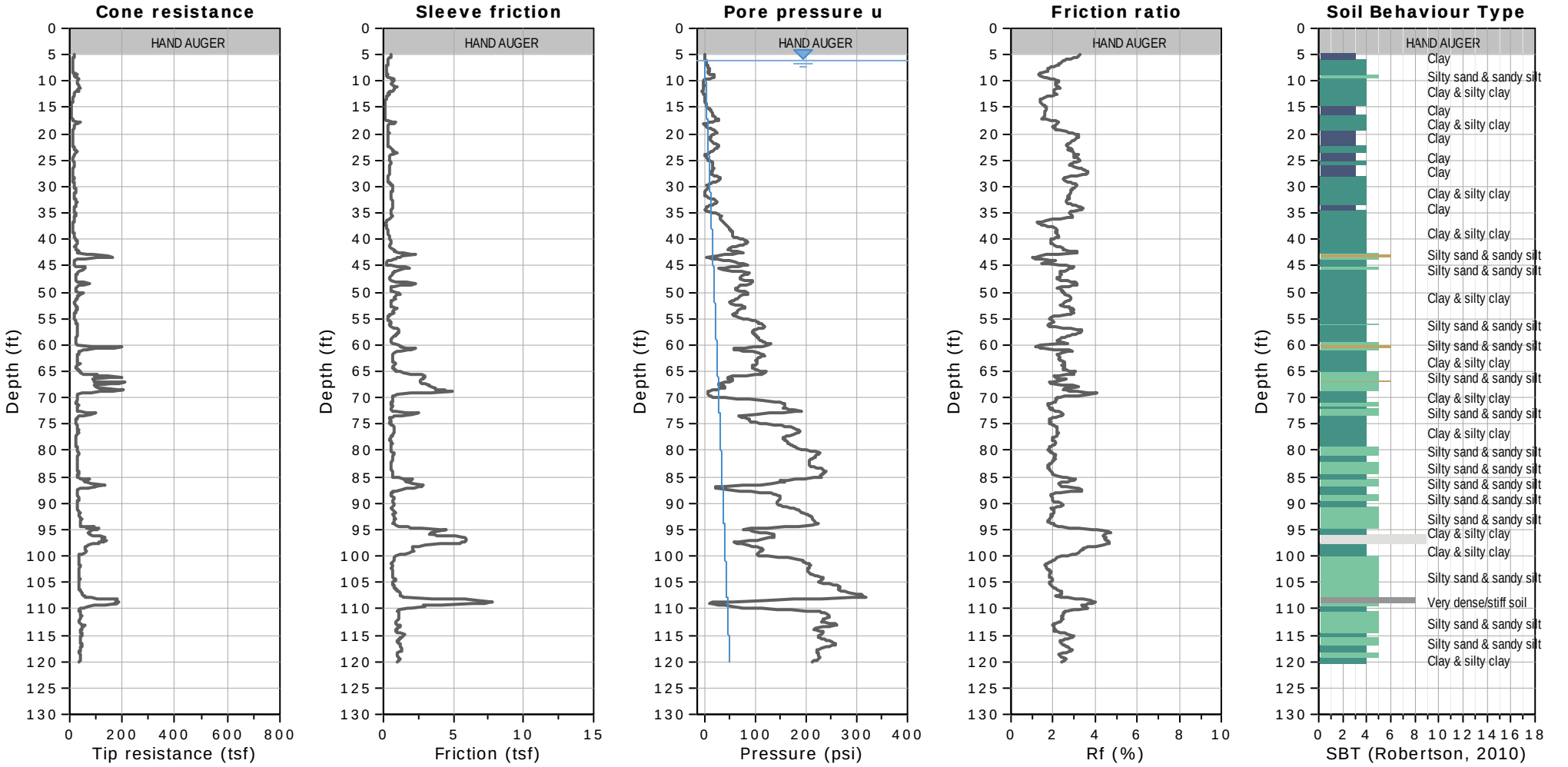


CLIENT: PARIKH

Field Rep: JACKSON

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 120.08 ft, Date: 8/14/2018



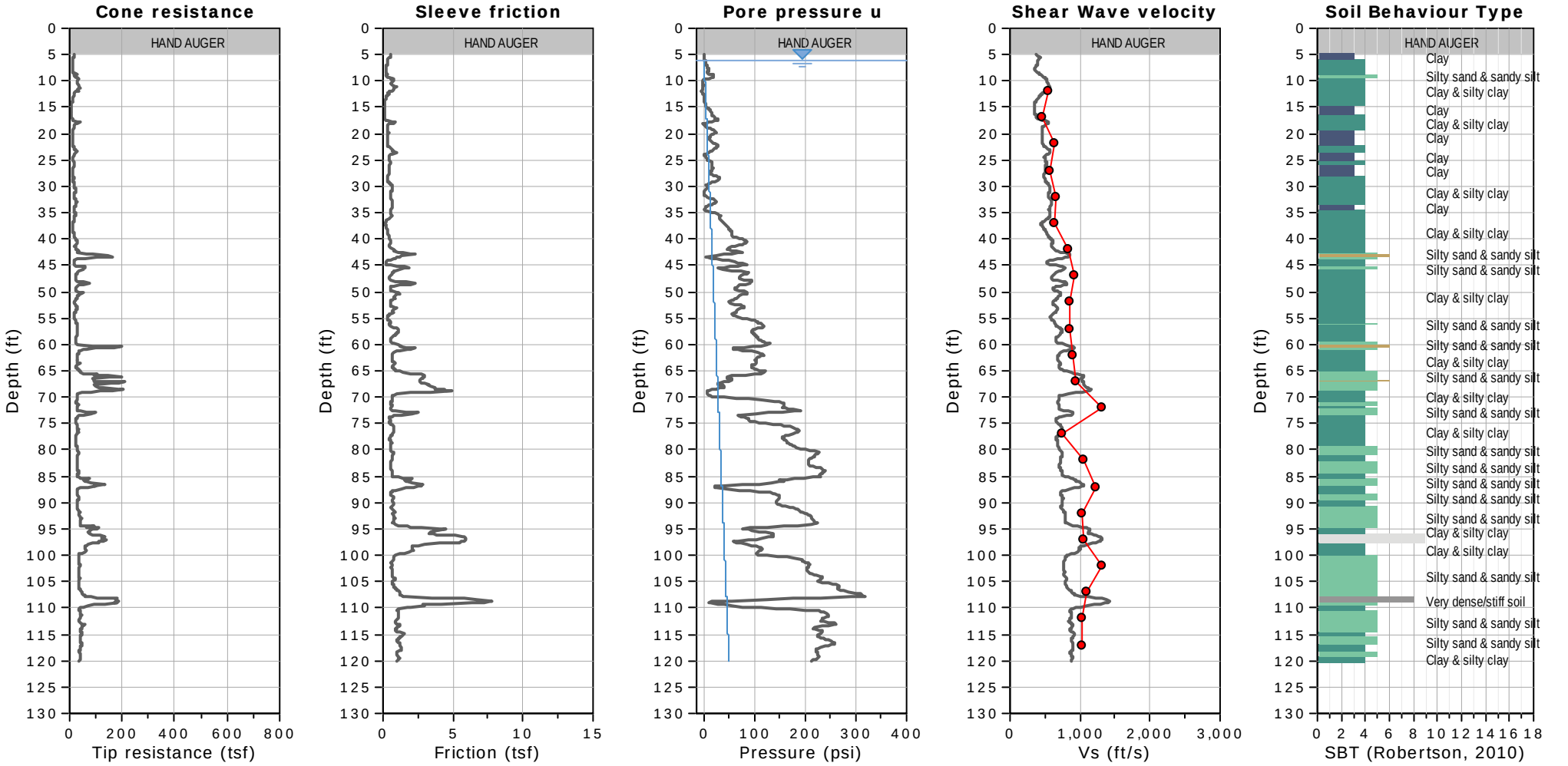
WATER TABLE FOR ESTIMATING PURPOSES ONLY

CLIENT: PARIKH

Field Rep: JACKSON

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 120.08 ft, Date: 8/14/2018



WATER TABLE FOR ESTIMATING PURPOSES ONLY

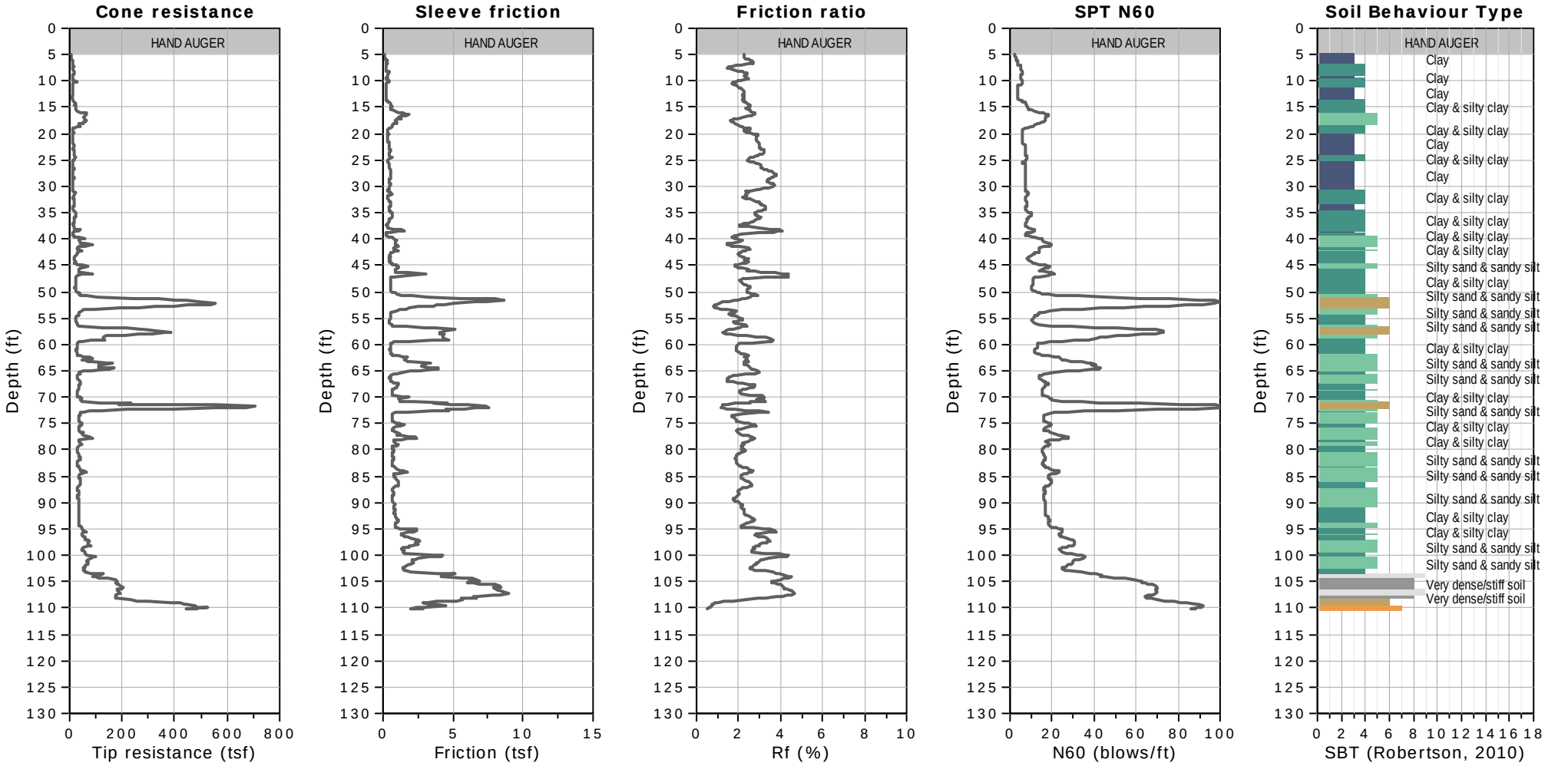
CPT: AS-77

CLIENT: PARIKH

Field Rep: SAMMY

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 110.24 ft, Date: 8/15/2018



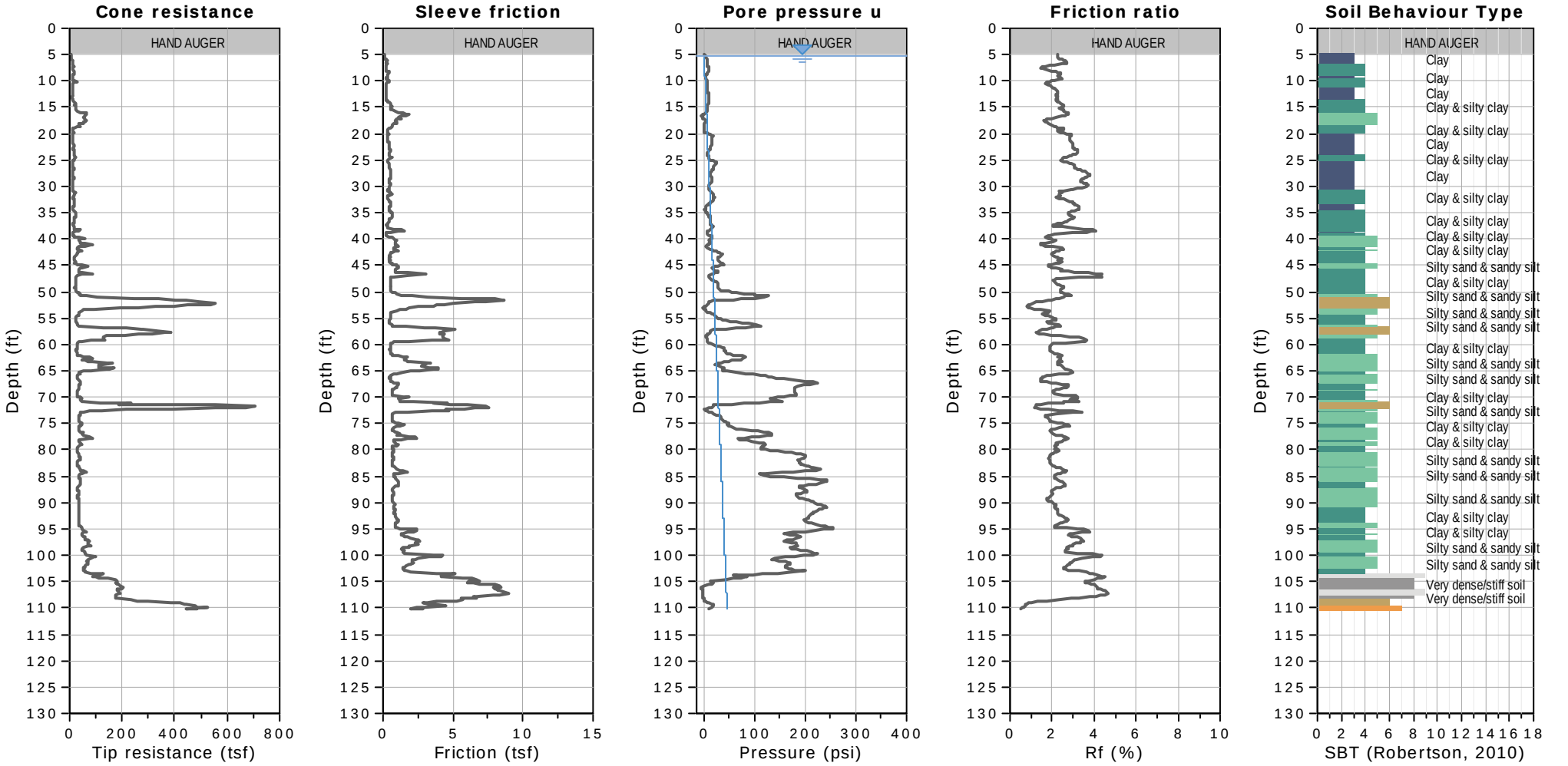
CPT: AS-77

CLIENT: PARIKH

Field Rep: SAMMY

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 110.24 ft, Date: 8/15/2018



WATER TABLE FOR ESTIMATING PURPOSES ONLY

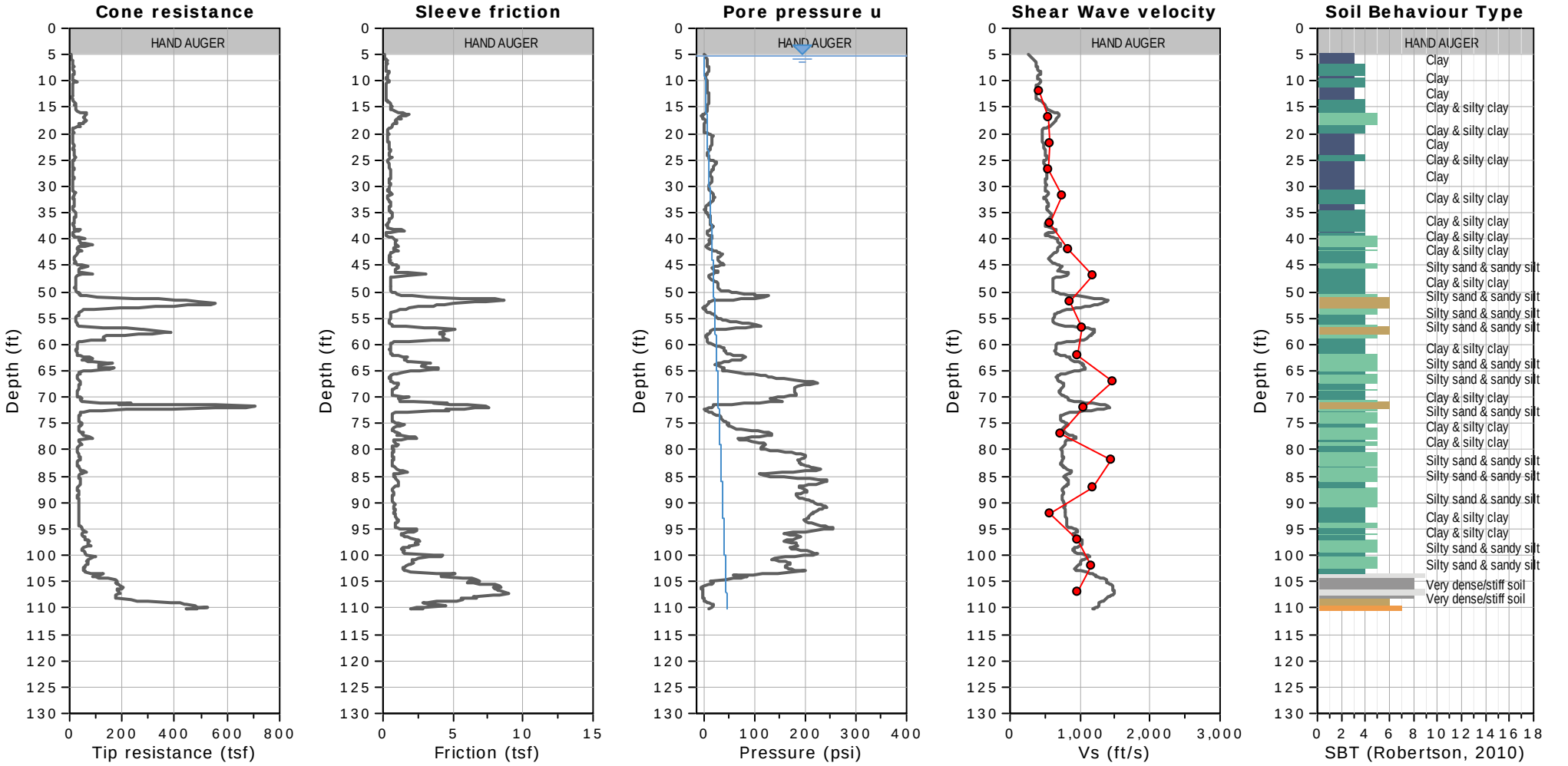
CPT: AS-77

CLIENT: PARIKH

Field Rep: SAMMY

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 110.24 ft, Date: 8/15/2018



WATER TABLE FOR ESTIMATING PURPOSES ONLY

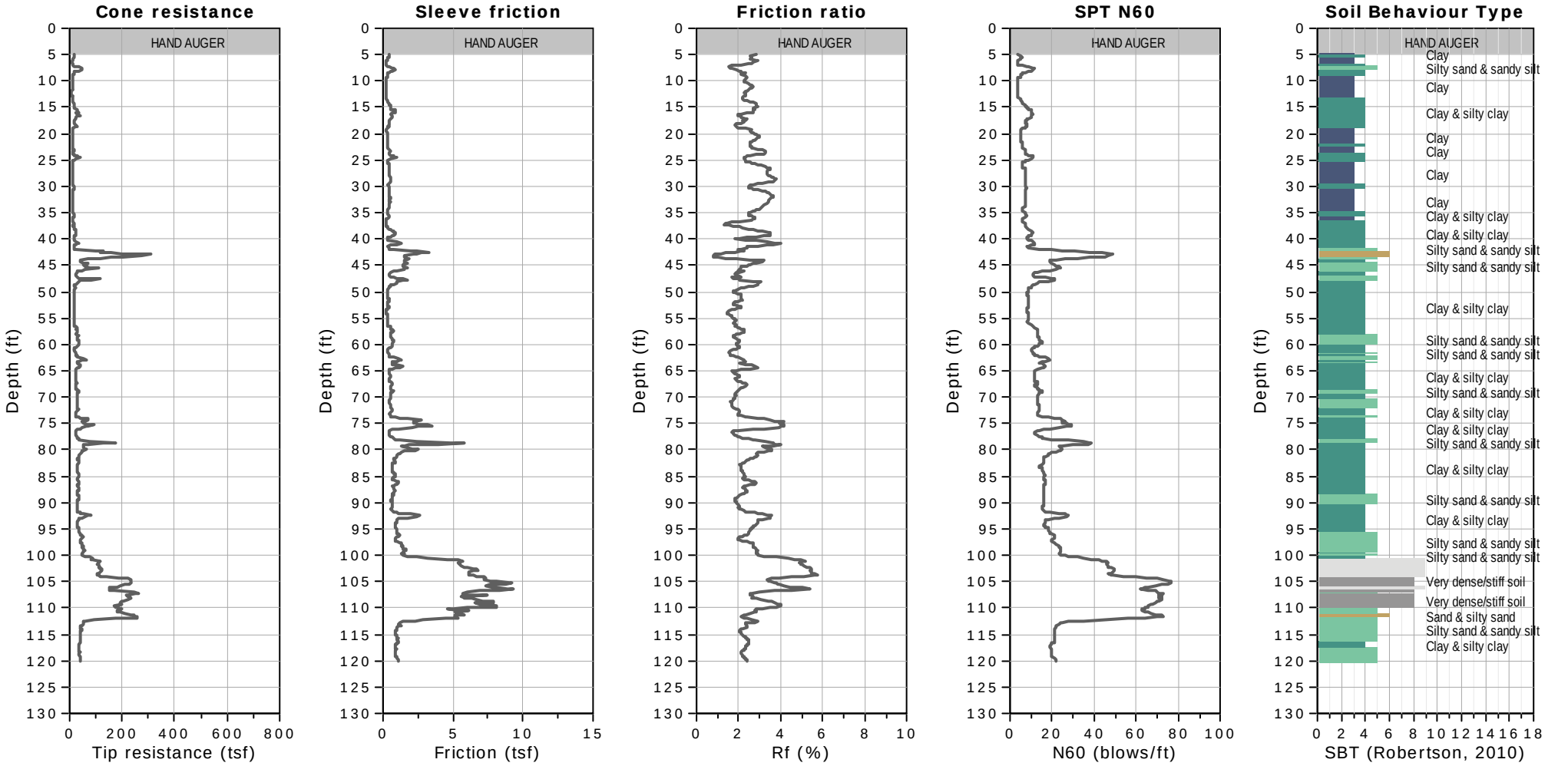
CPT: AS-81

CLIENT: PARIKH

Field Rep: SAMMY

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 120.08 ft, Date: 8/15/2018



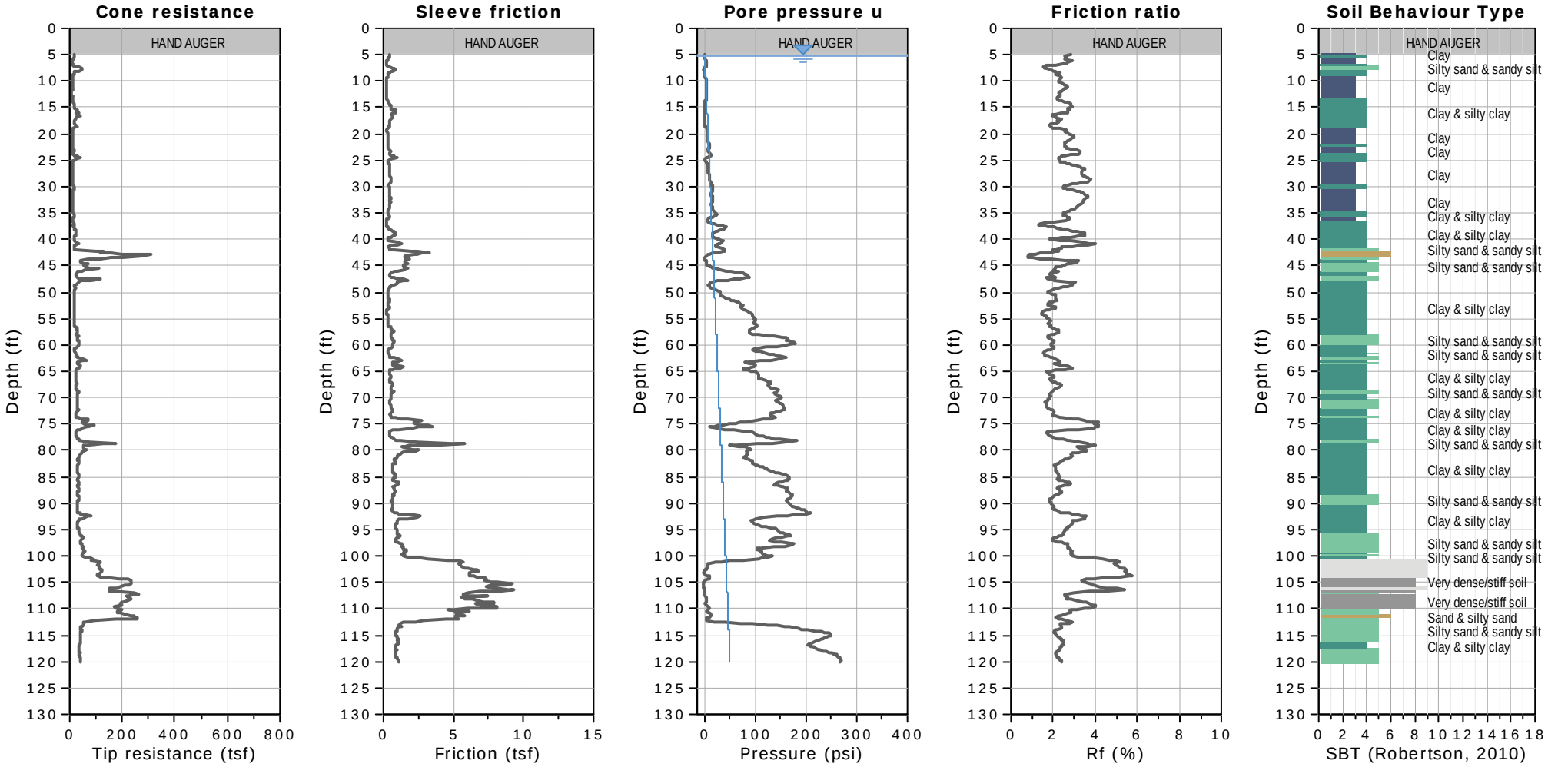
CPT: AS-81

CLIENT: PARIKH

Field Rep: SAMMY

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 120.08 ft, Date: 8/15/2018



SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

WATER TABLE FOR ESTIMATING PURPOSES ONLY

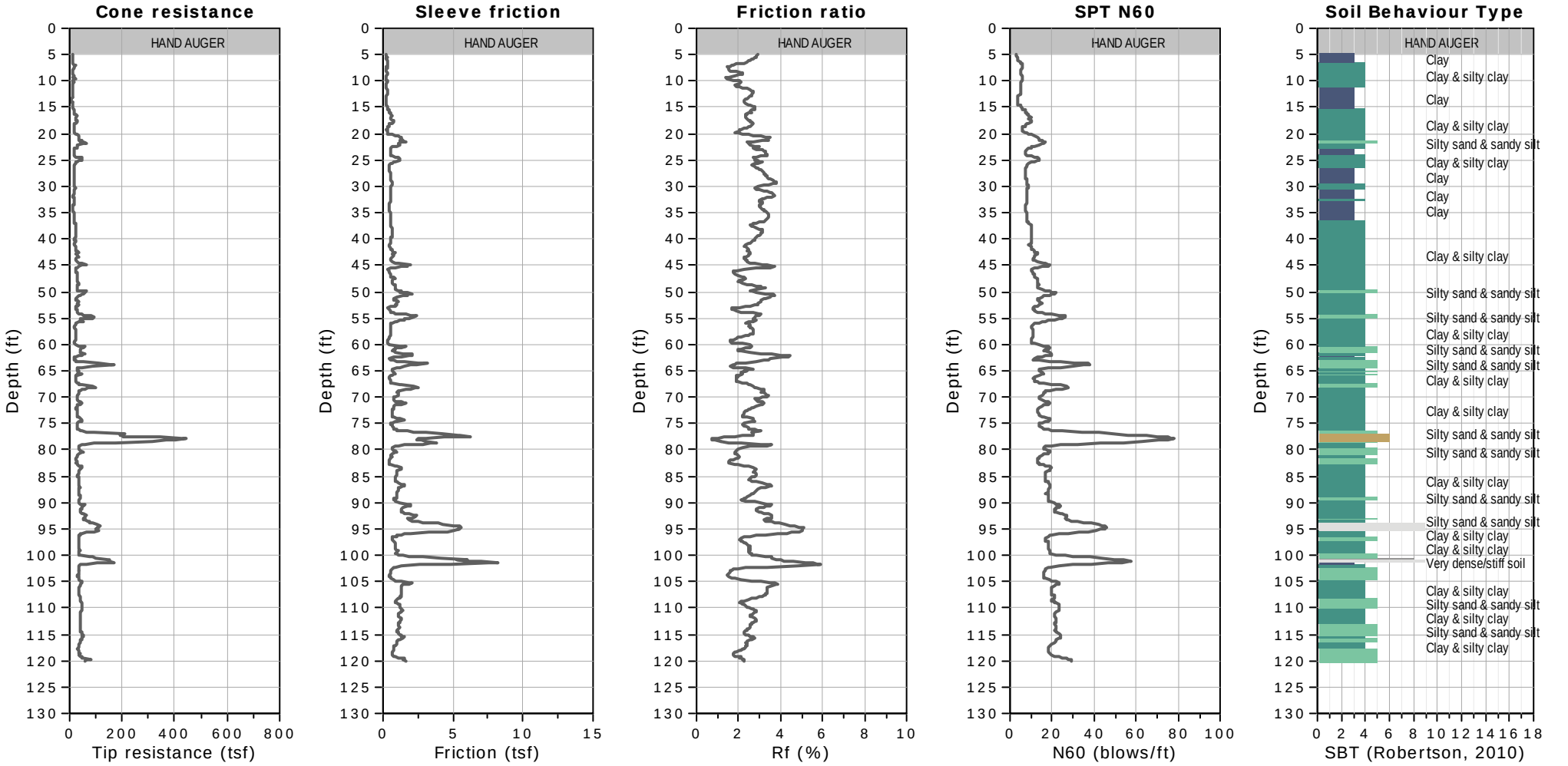
CPT: AS-83

CLIENT: PARIKH

Field Rep: SAMMY

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 120.08 ft, Date: 8/16/2018



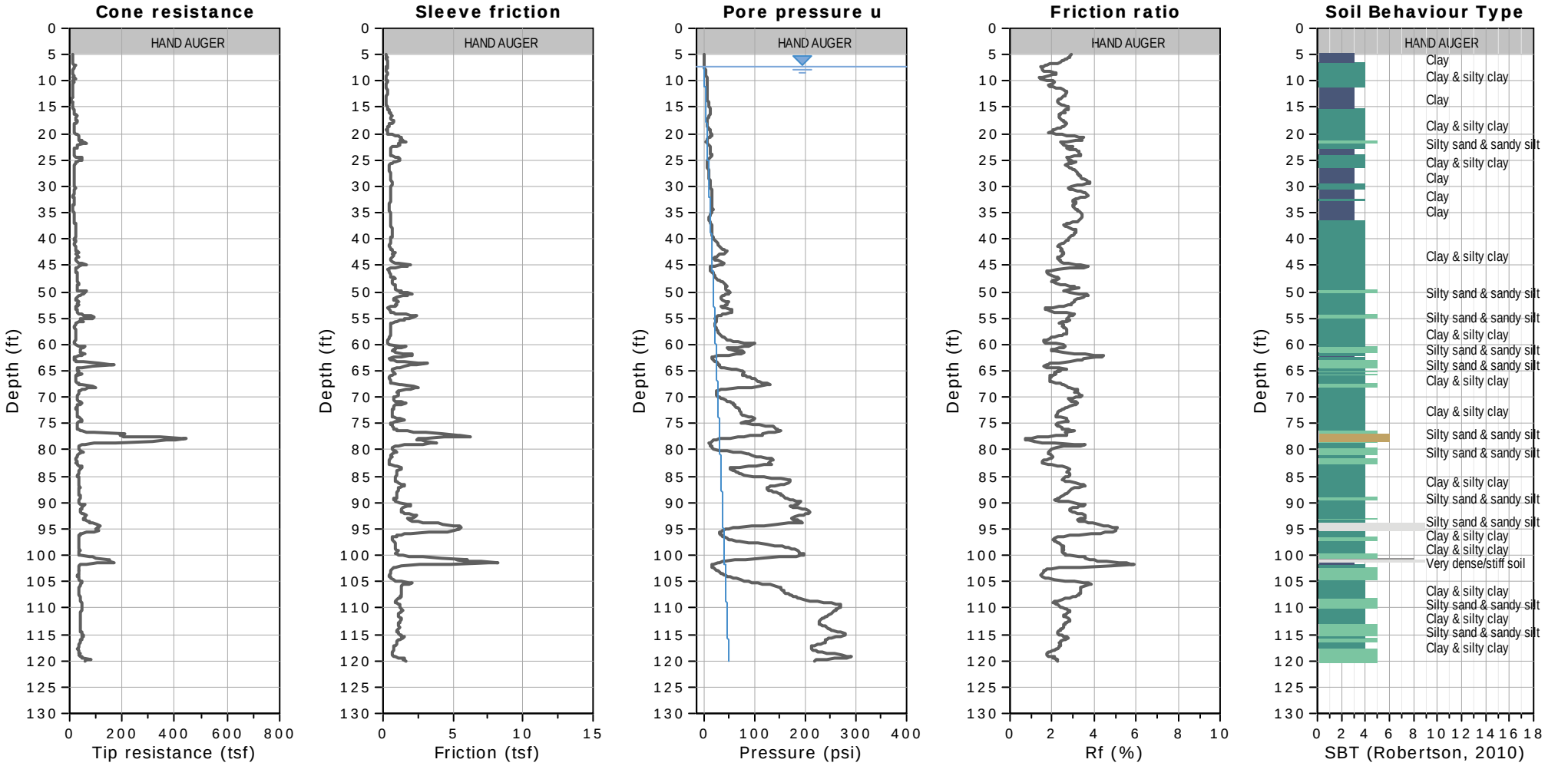
CPT: AS-83

CLIENT: PARIKH

Field Rep: SAMMY

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 120.08 ft, Date: 8/16/2018



WATER TABLE FOR ESTIMATING PURPOSES ONLY

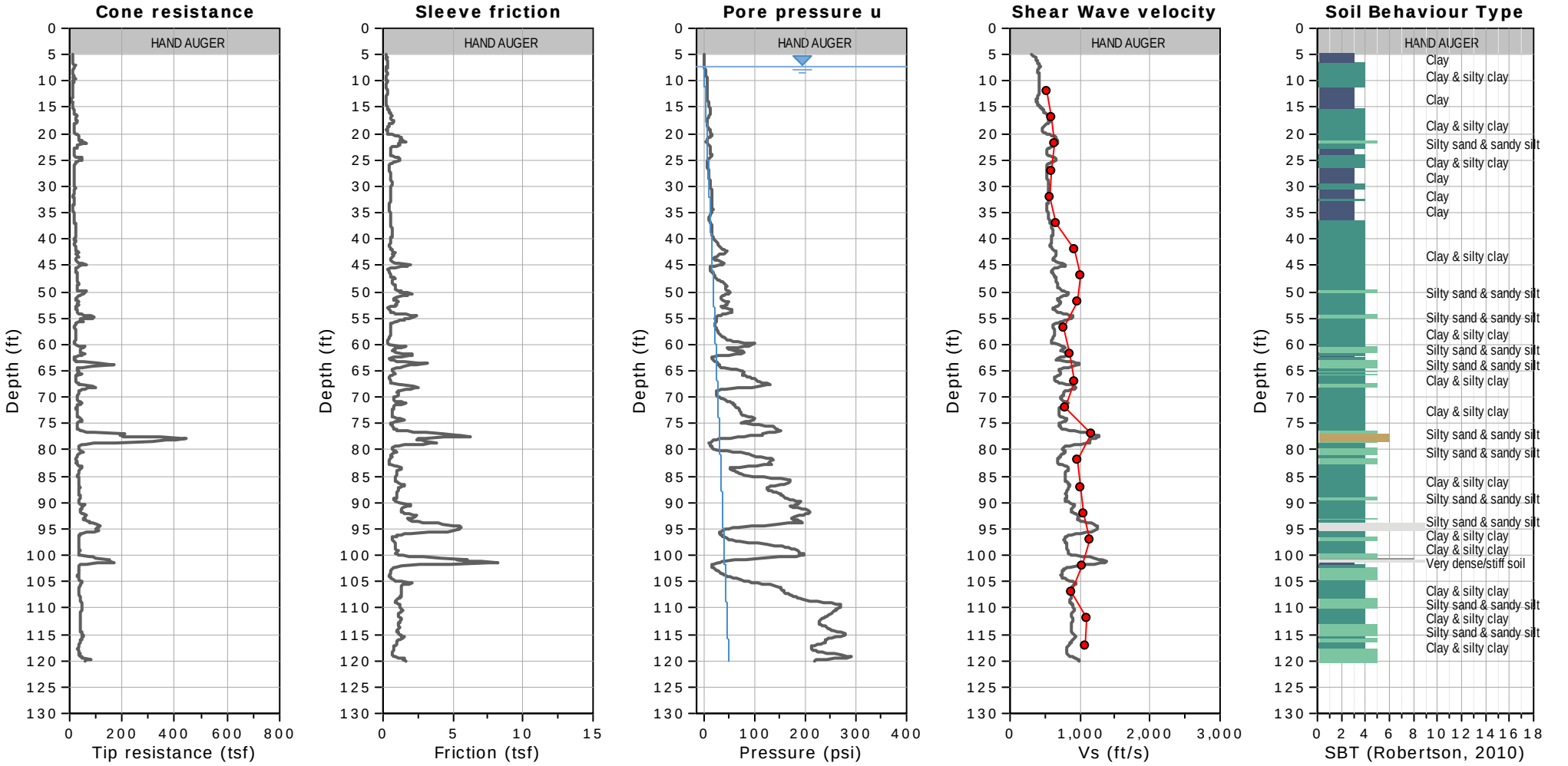
CPT: AS-83

CLIENT: PARIKH

Field Rep: SAMMY

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 120.08 ft, Date: 8/16/2018



WATER TABLE FOR ESTIMATING PURPOSES ONLY

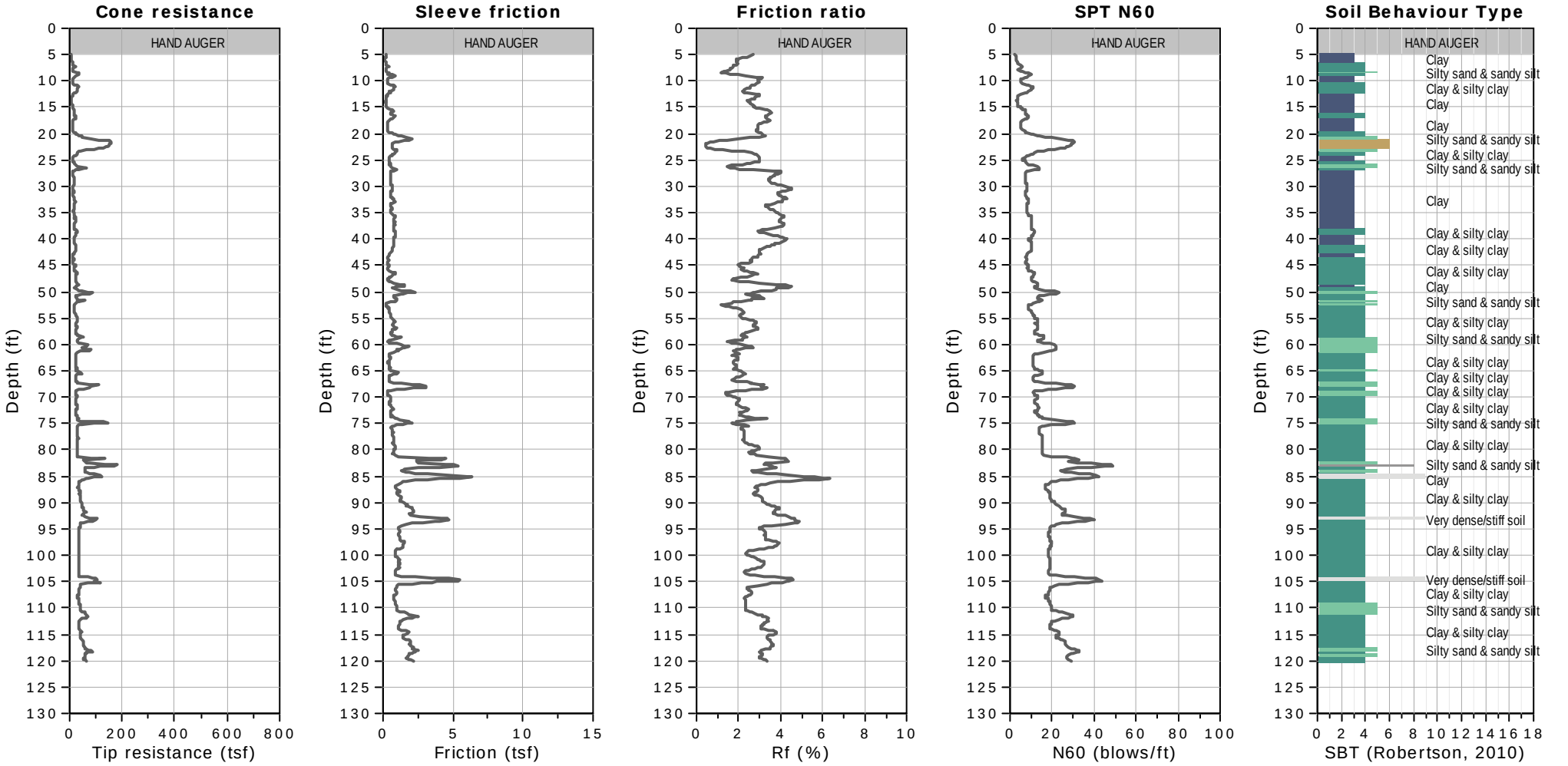
CPT: AS-85

CLIENT: PARIKH

Field Rep: SAMMY

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 120.08 ft, Date: 8/16/2018

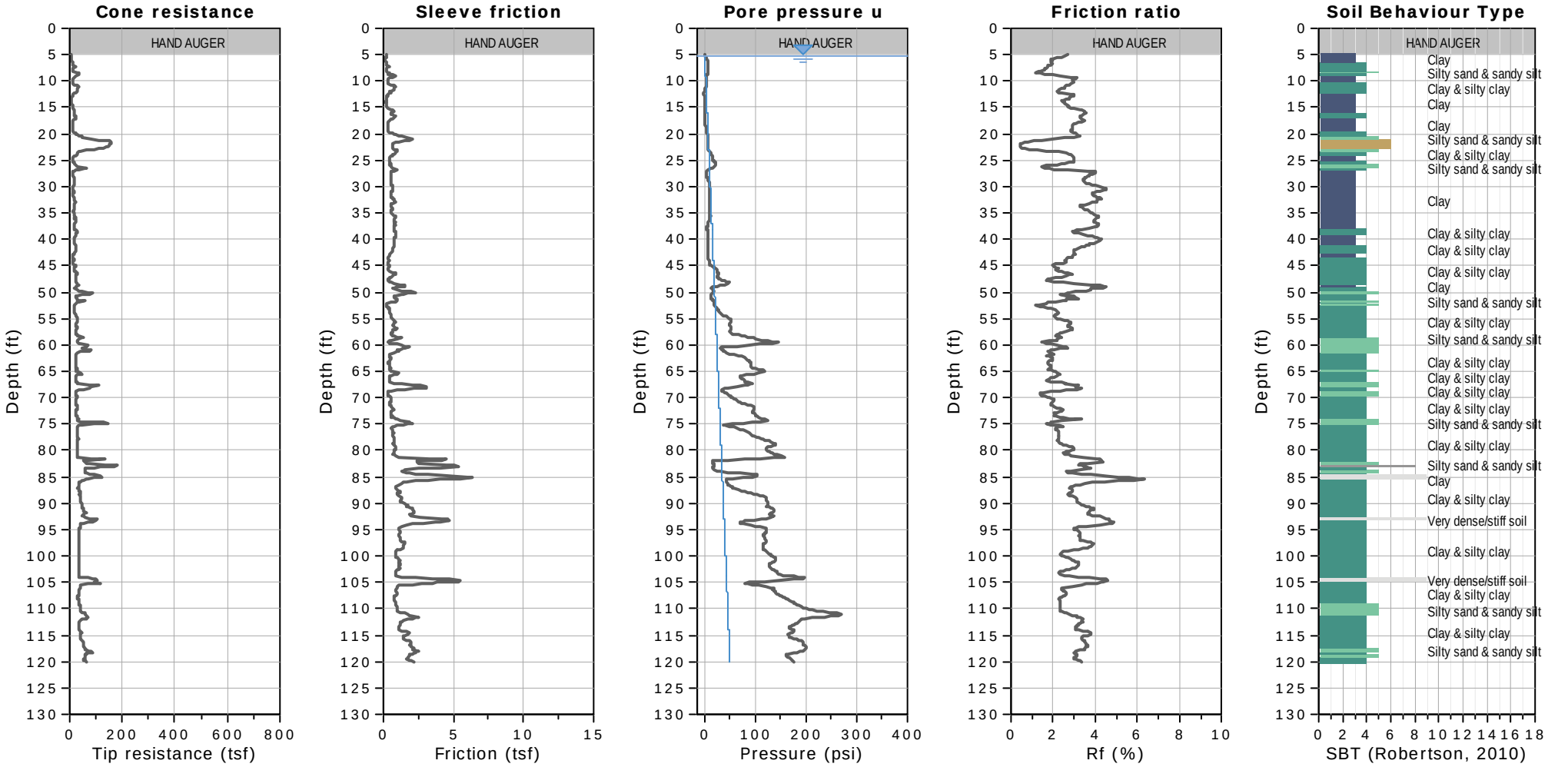


CLIENT: PARIKH

Field Rep: SAMMY

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 120.08 ft, Date: 8/16/2018



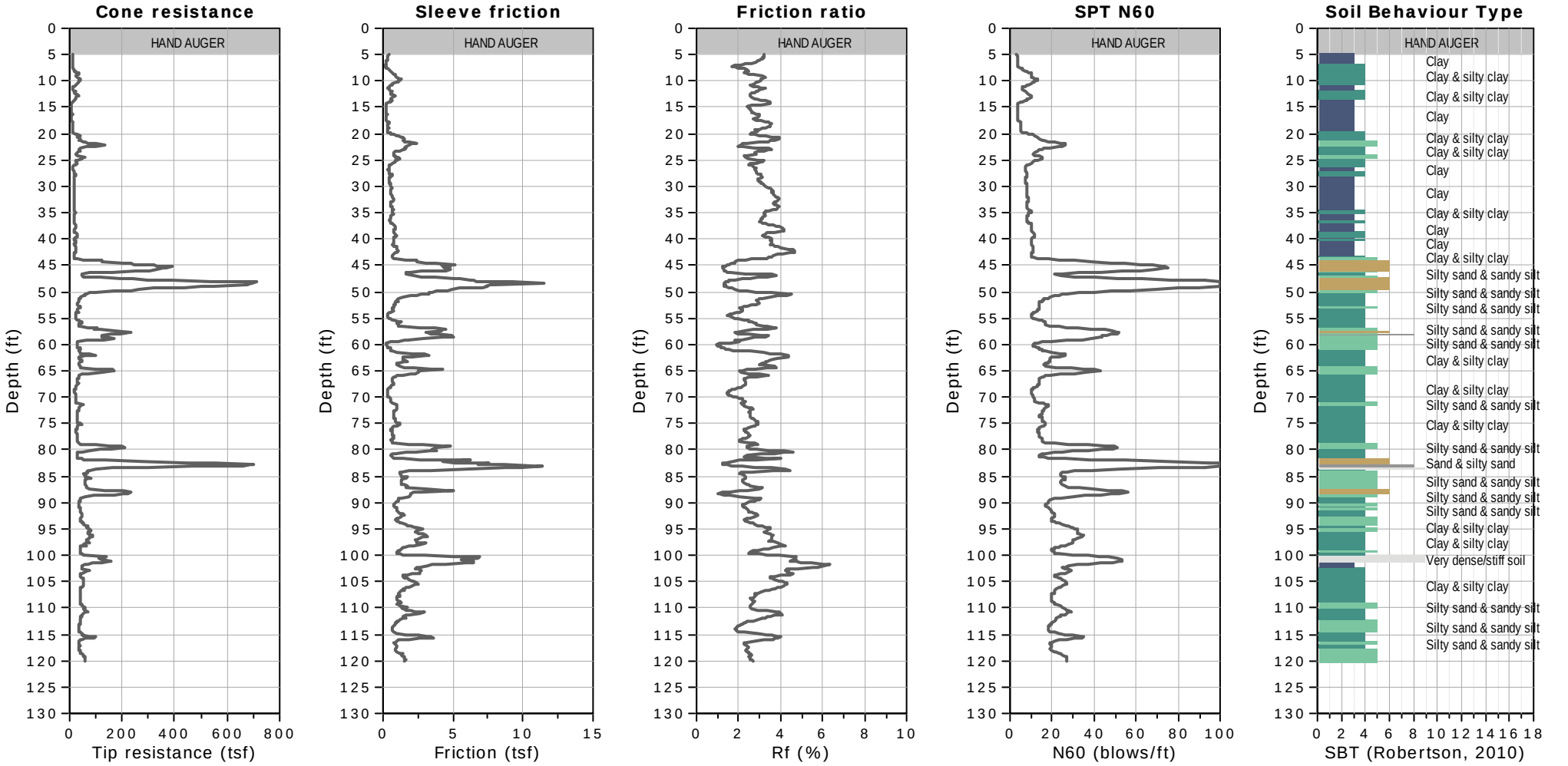
WATER TABLE FOR ESTIMATING PURPOSES ONLY

CLIENT: PARIKH

Field Rep: JACKSON

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 120.08 ft, Date: 8/17/2018



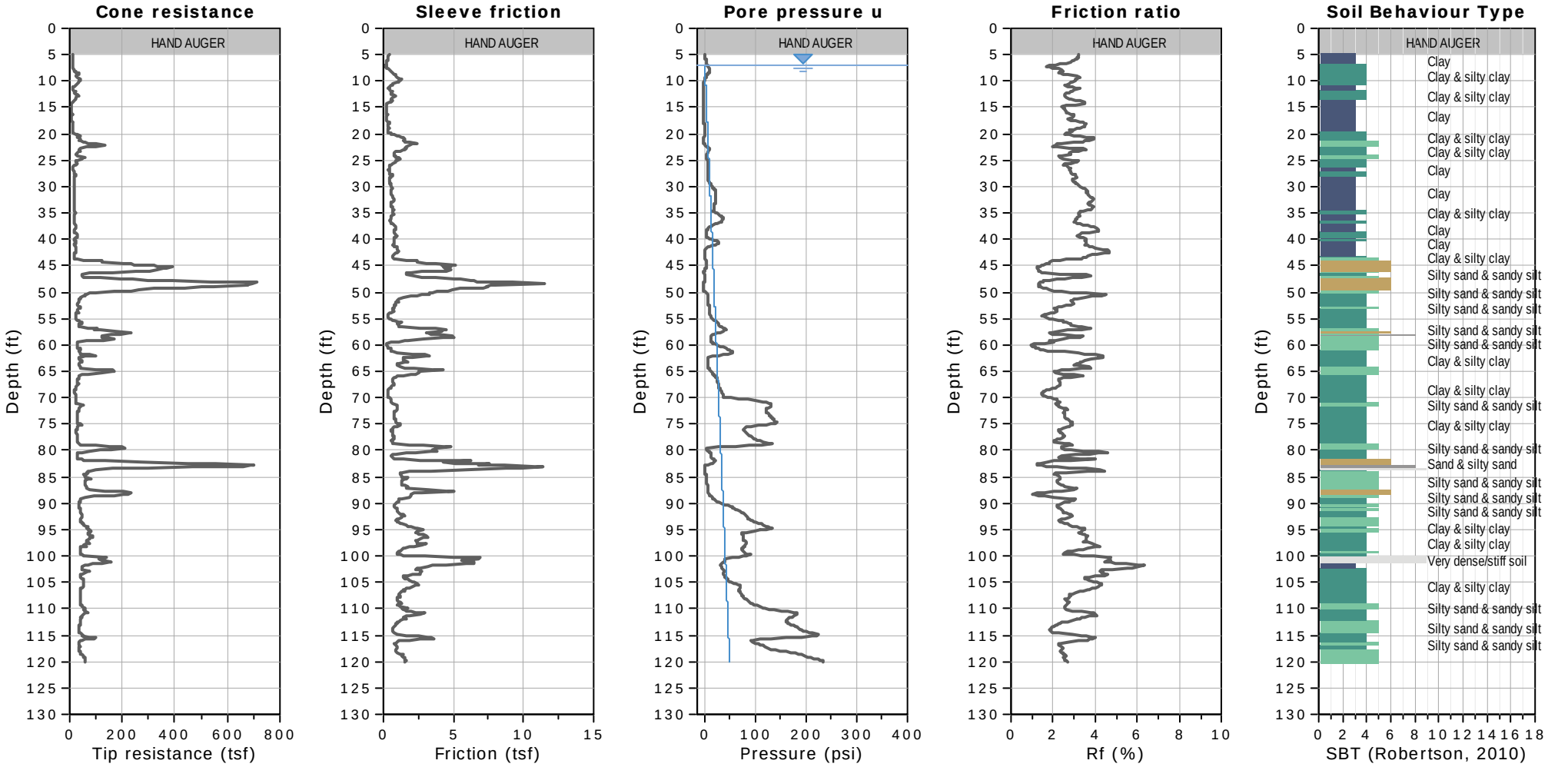
CPT: AS-87

CLIENT: PARIKH

Field Rep: JACKSON

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 120.08 ft, Date: 8/17/2018



WATER TABLE FOR ESTIMATING PURPOSES ONLY

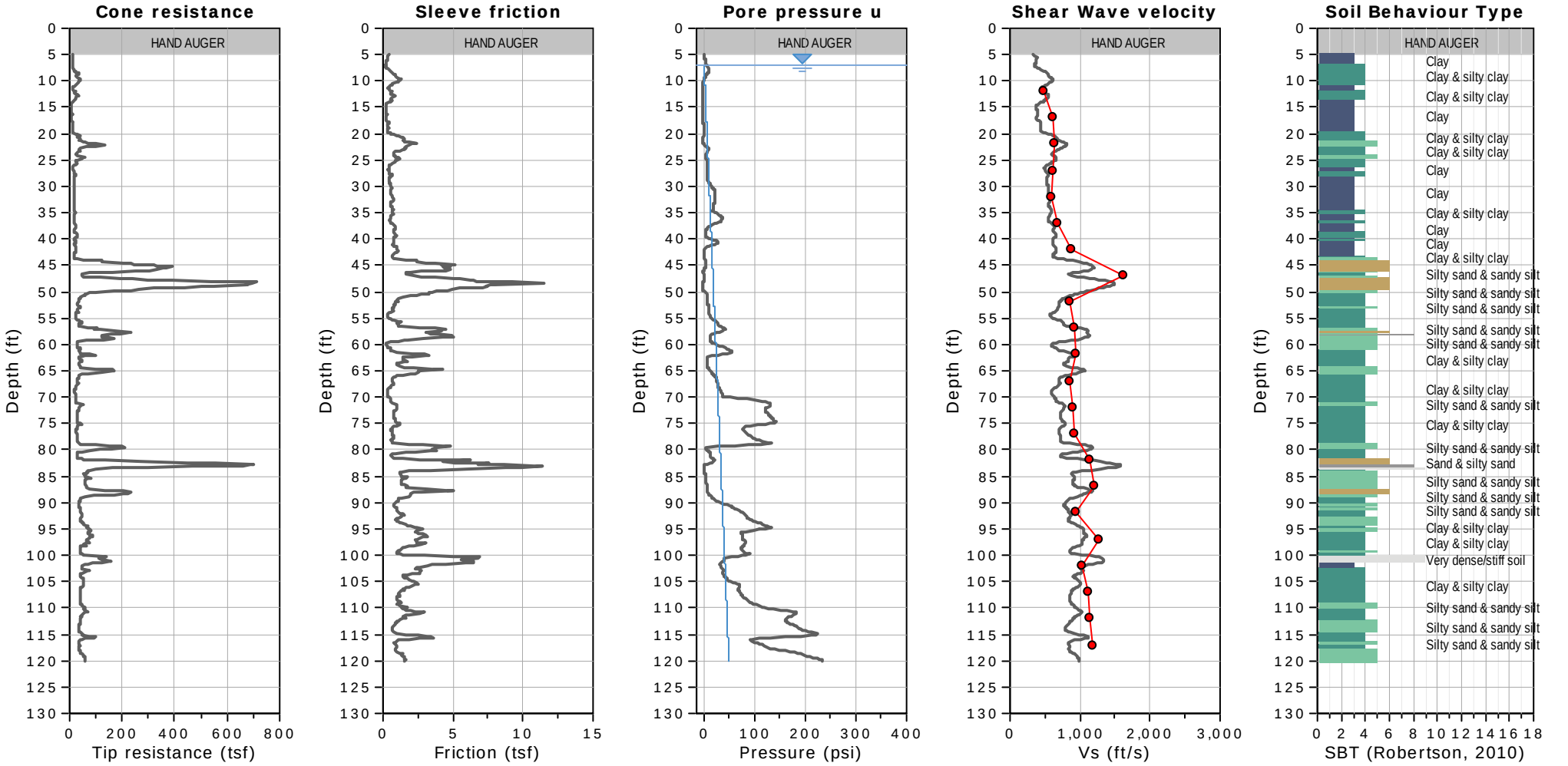
CPT: AS-87

CLIENT: PARIKH

Field Rep: JACKSON

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 120.08 ft, Date: 8/17/2018



WATER TABLE FOR ESTIMATING PURPOSES ONLY

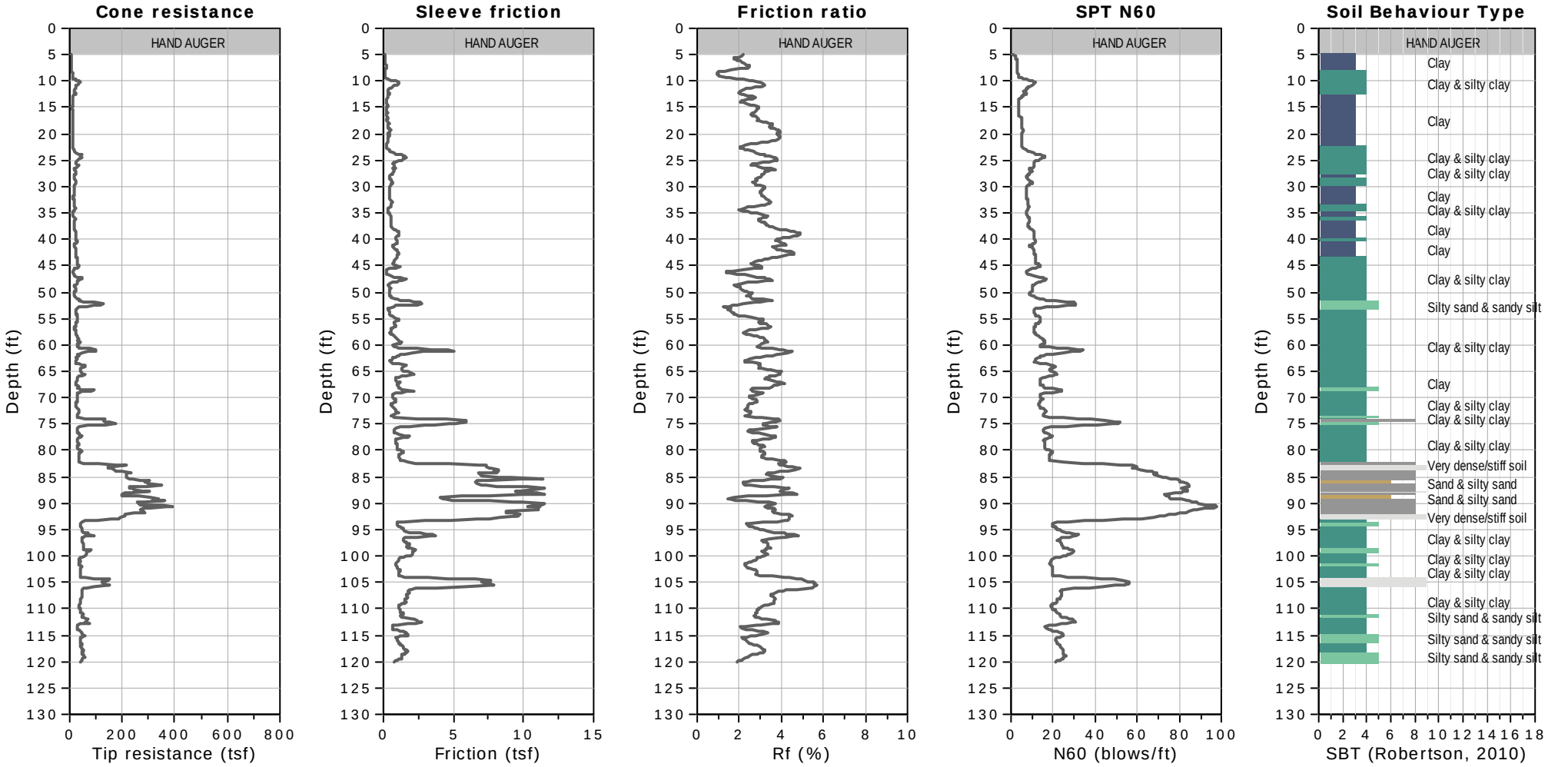
CPT: AS-89

CLIENT: PARIKH

Field Rep: JACKSON

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 120.08 ft, Date: 8/17/2018



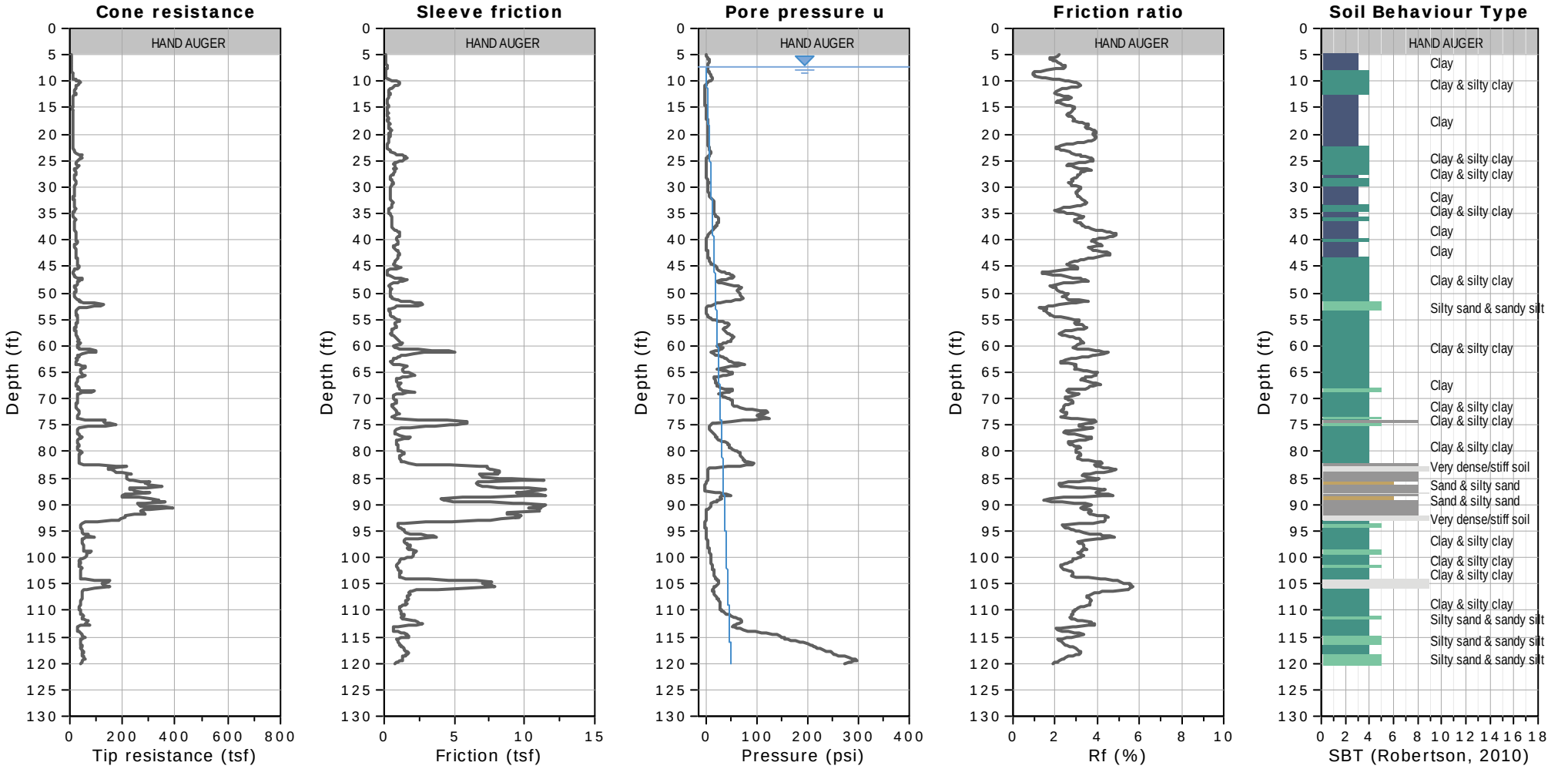
CPT: AS-89

CLIENT: PARIKH

Field Rep: JACKSON

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 120.08 ft, Date: 8/17/2018



SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

WATER TABLE FOR ESTIMATING PURPOSES ONLY

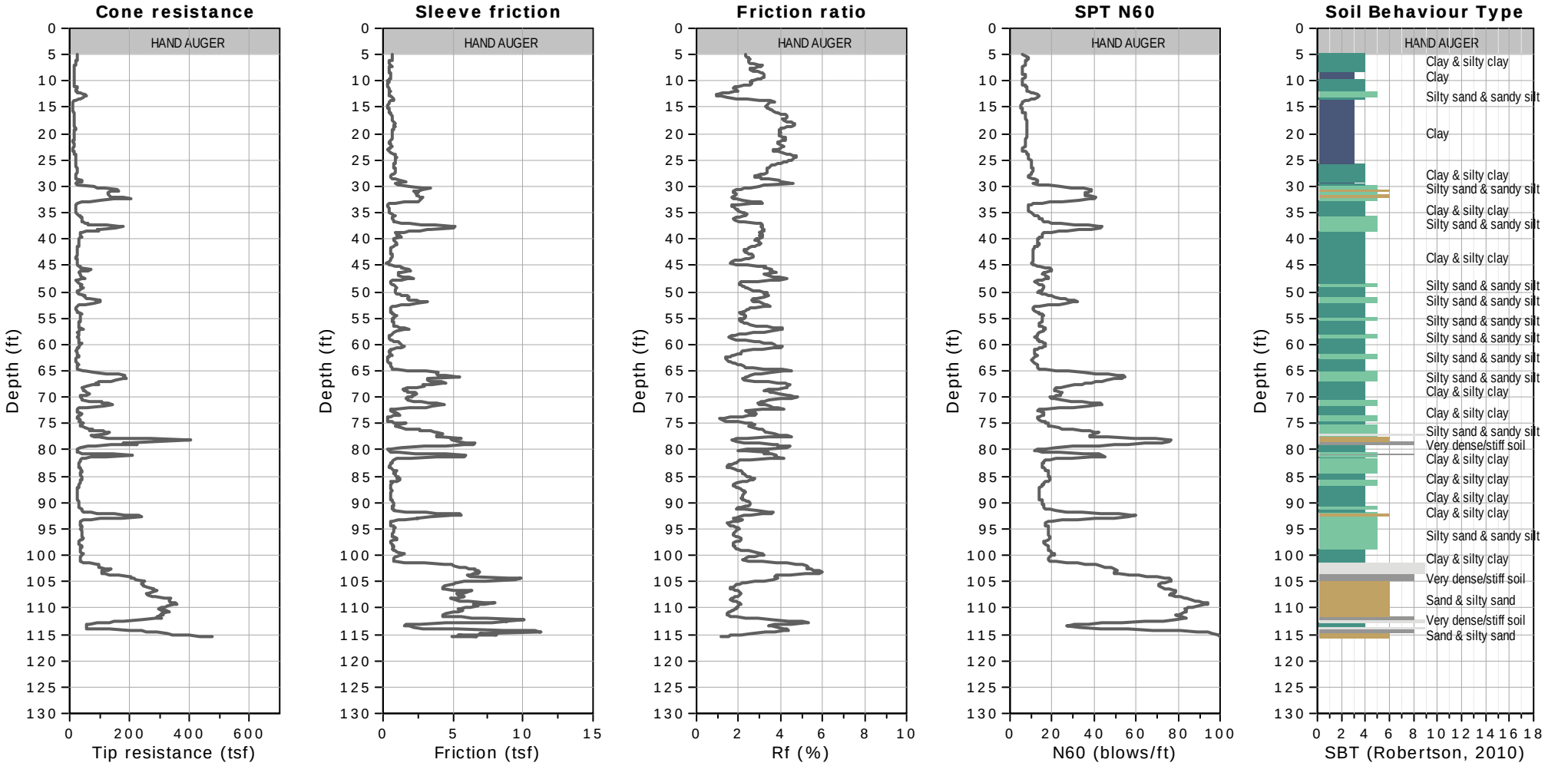
CPT: AS-91

CLIENT: PARIKH

Field Rep: VIRGIL SANTOS

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 115.49 ft, Date: 8/9/2018

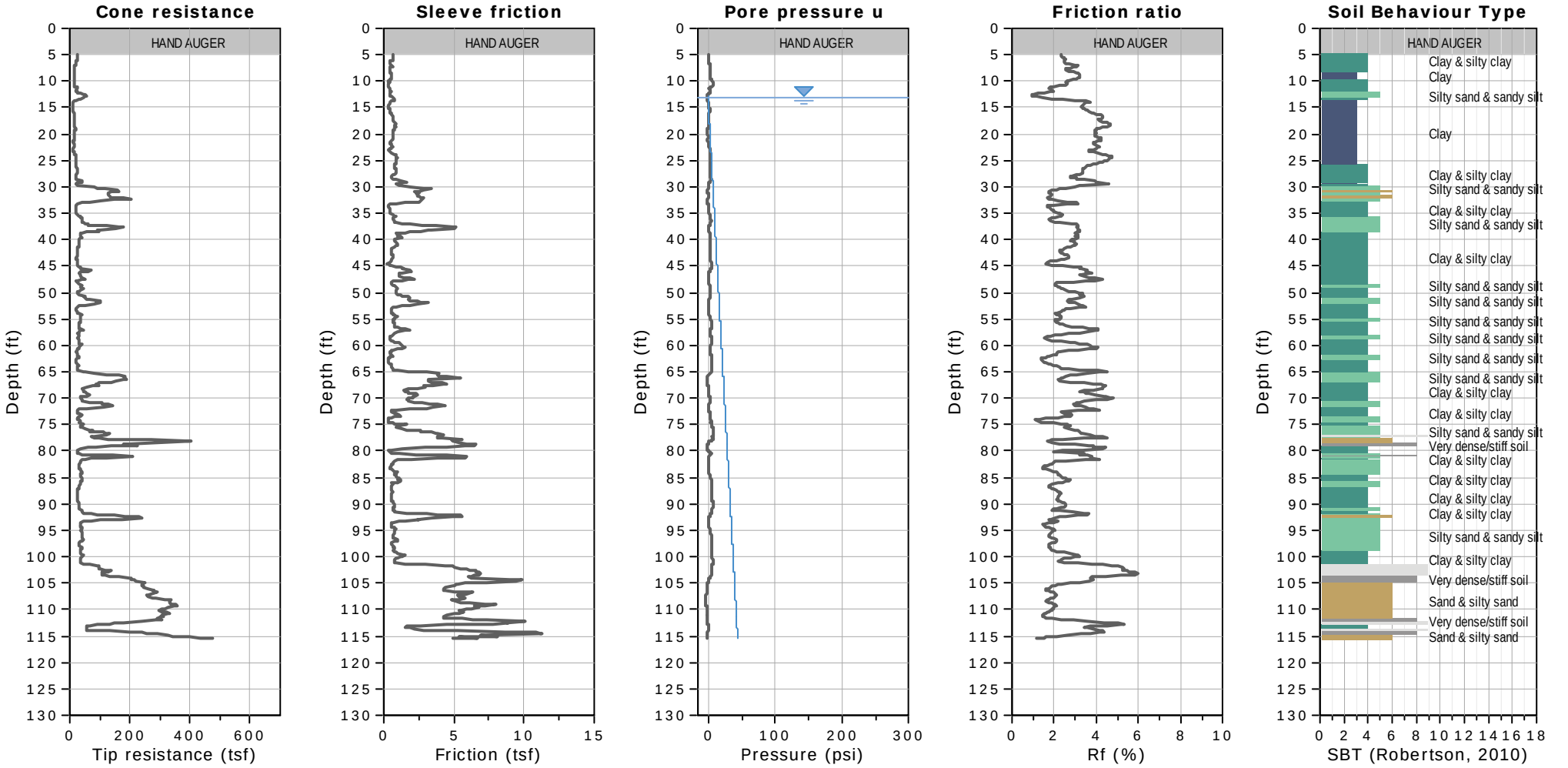


CLIENT: PARIKH

Field Rep: VIRGIL SANTOS

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 115.49 ft, Date: 8/9/2018



WATER TABLE FOR ESTIMATING PURPOSES ONLY

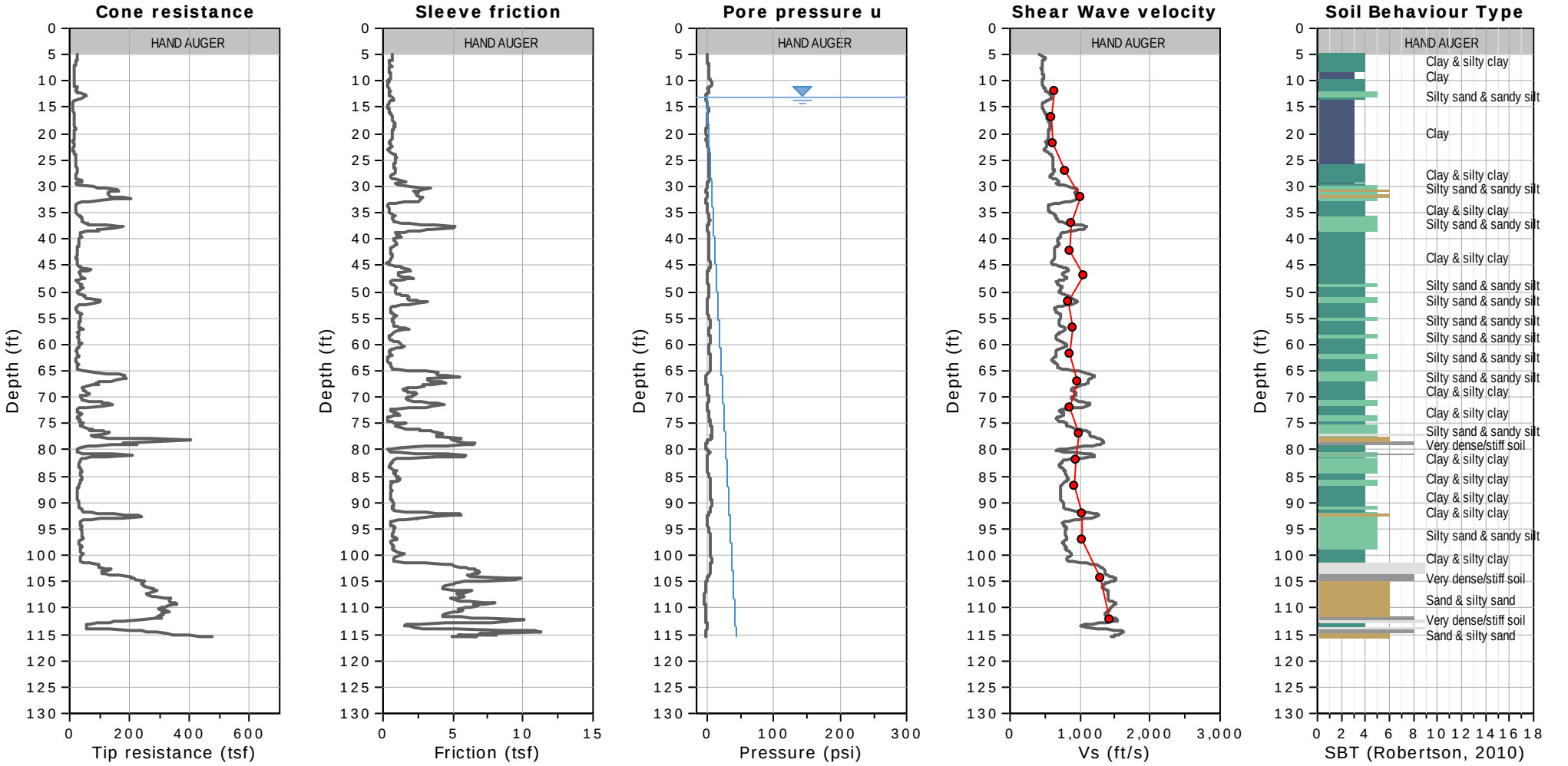
CPT: AS-91

CLIENT: PARIKH

Field Rep: VIRGIL SANTOS

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 115.49 ft, Date: 8/9/2018



WATER TABLE FOR ESTIMATING PURPOSES ONLY

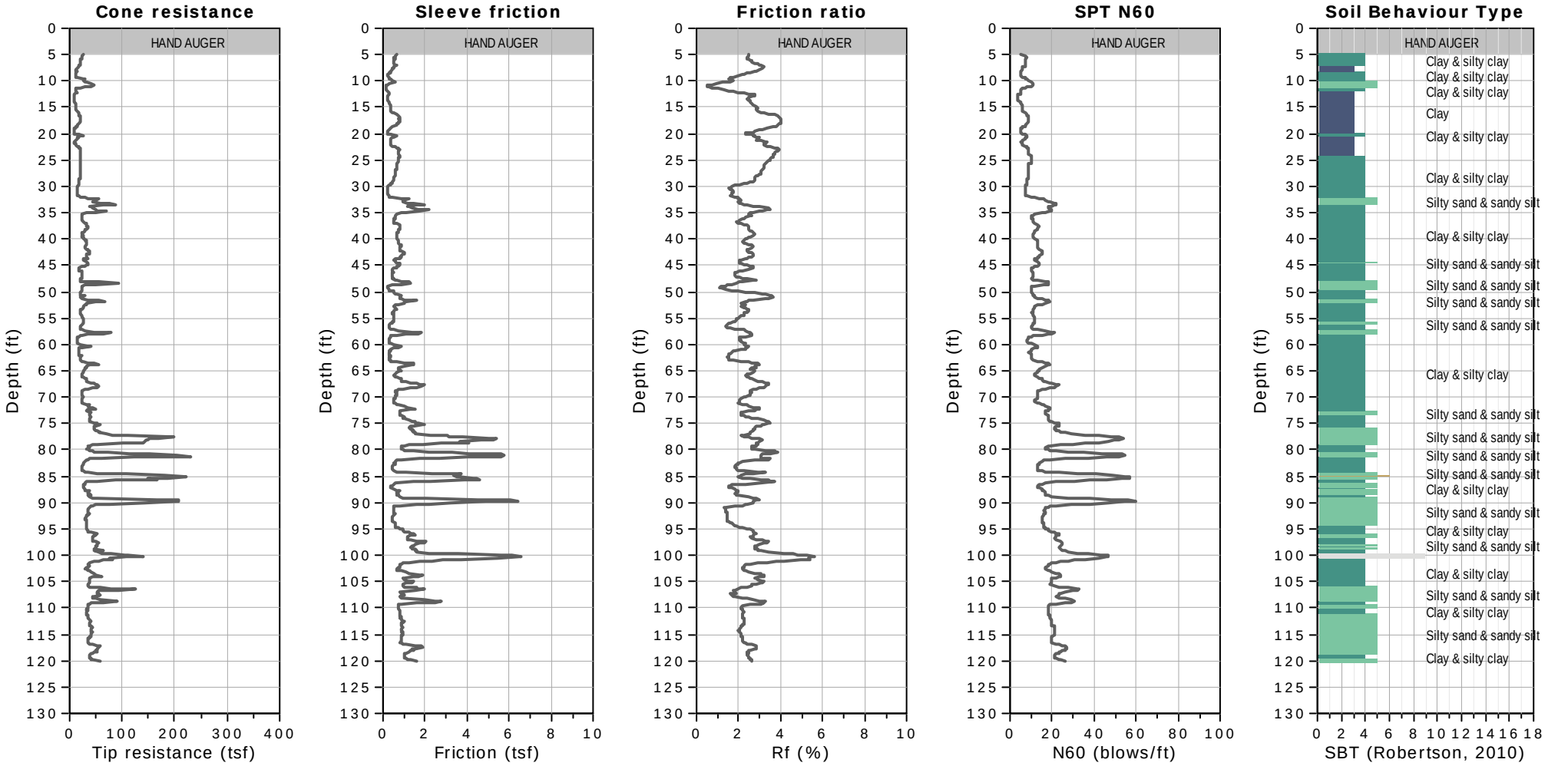
CPT: AS-92

CLIENT: PARIKH

Field Rep: SAMMY

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 120.08 ft, Date: 8/21/2018



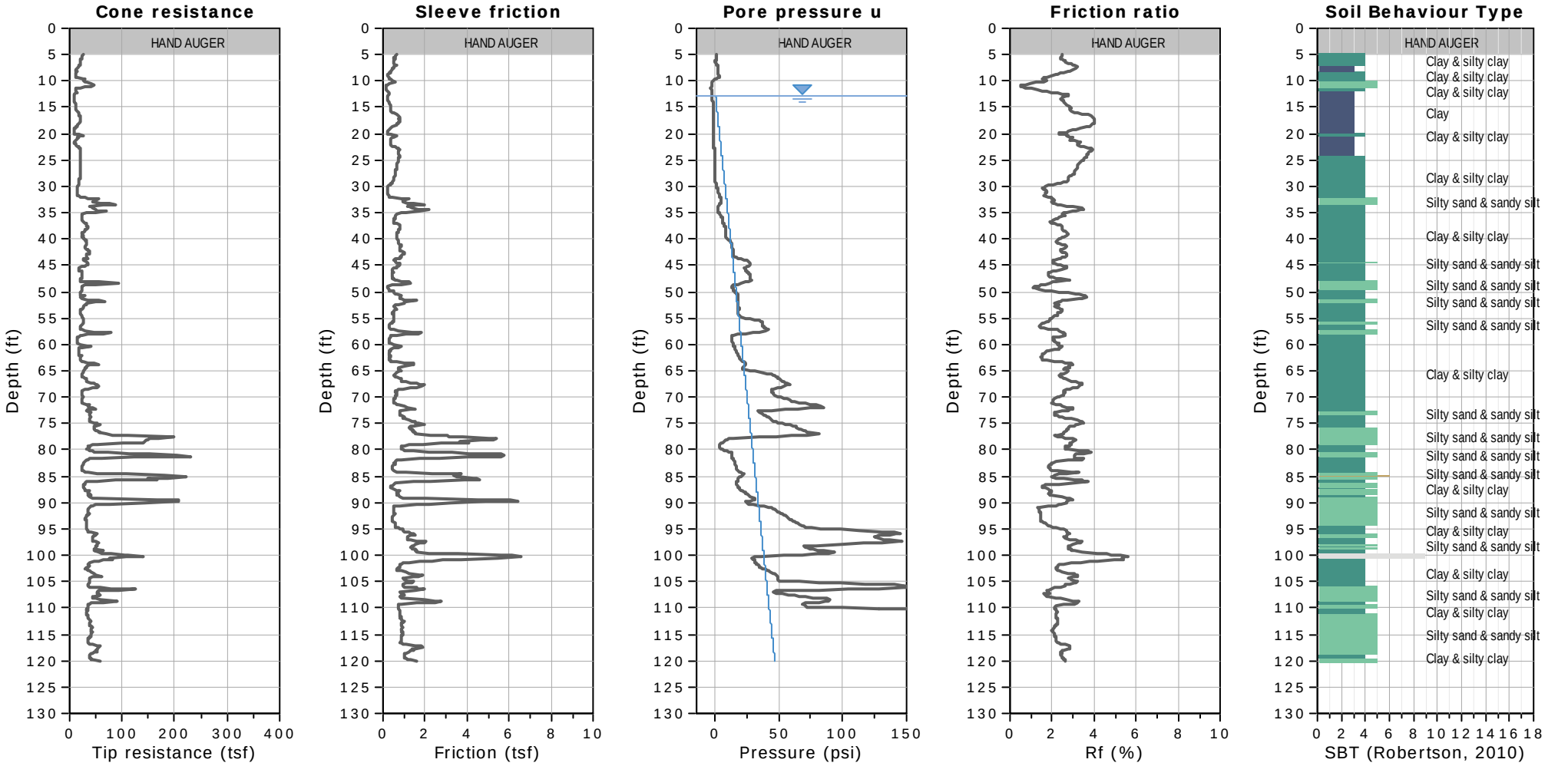
CPT: AS-92

CLIENT: PARIKH

Field Rep: SAMMY

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 120.08 ft, Date: 8/21/2018



WATER TABLE FOR ESTIMATING PURPOSES ONLY

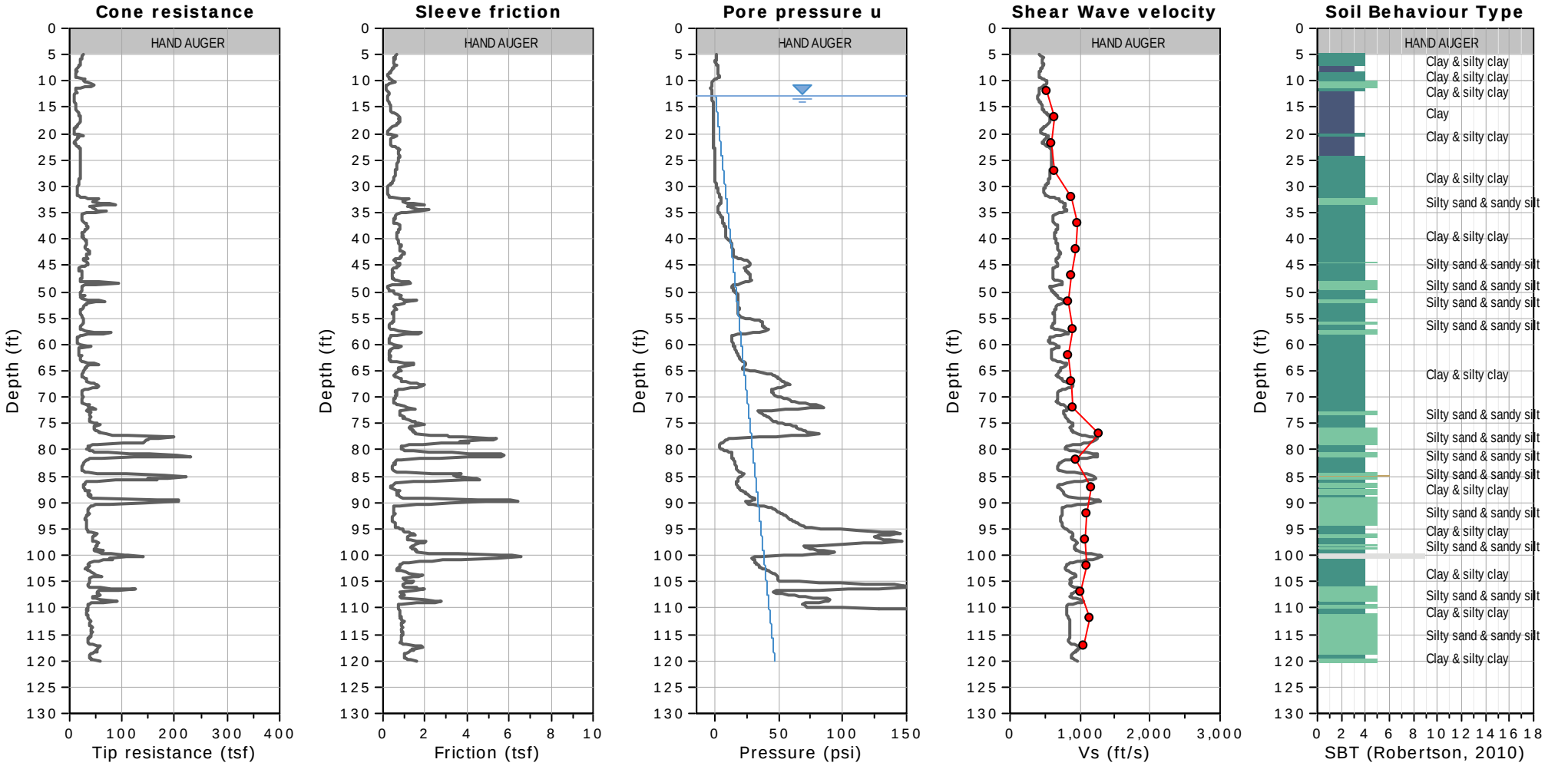
CPT: AS-92

CLIENT: PARIKH

Field Rep: SAMMY

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 120.08 ft, Date: 8/21/2018



WATER TABLE FOR ESTIMATING PURPOSES ONLY

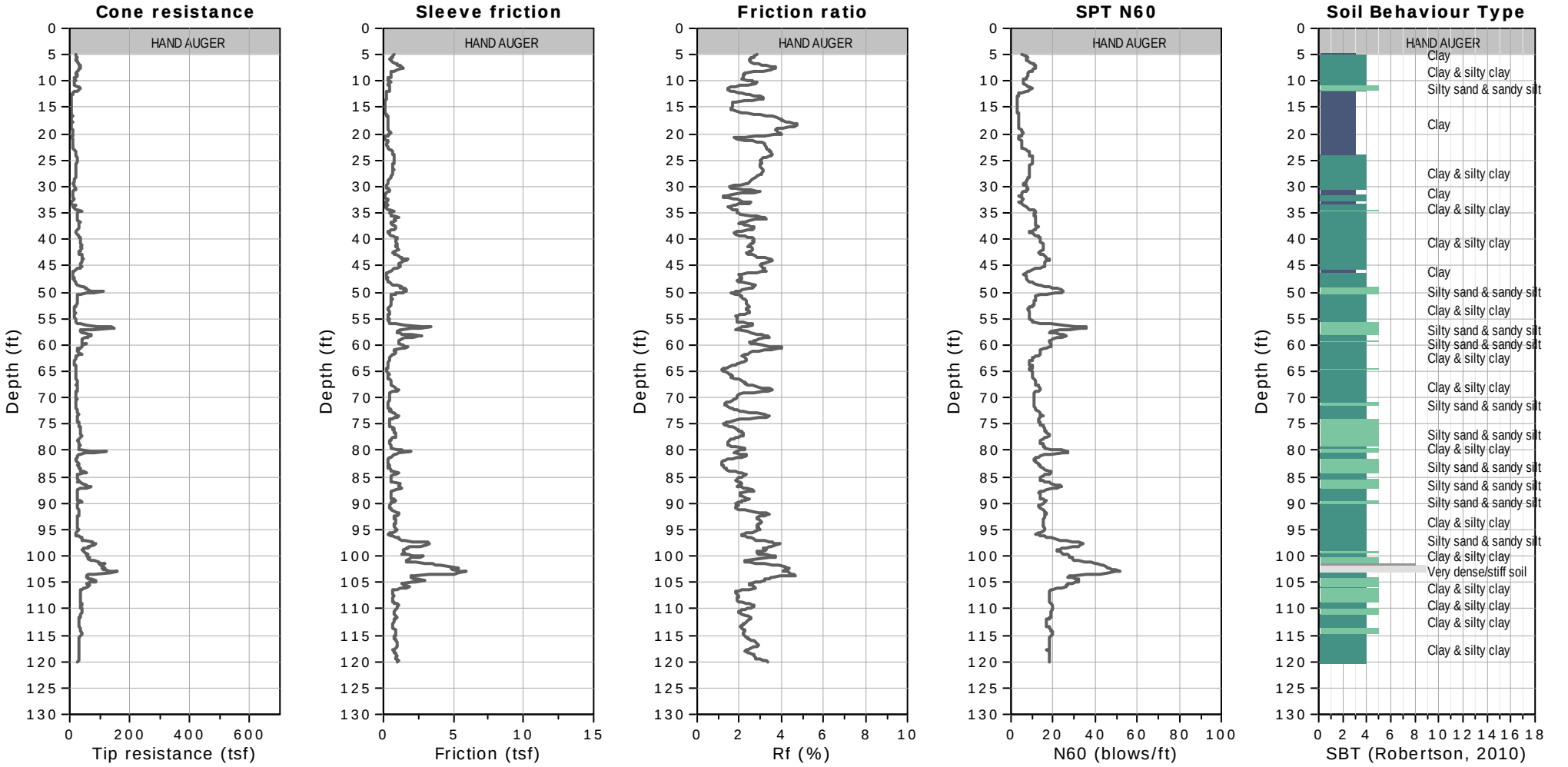
CPT: AS-93

CLIENT: PARIKH

Field Rep: VIRGIL SANTOS

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 120.08 ft, Date: 8/10/2018



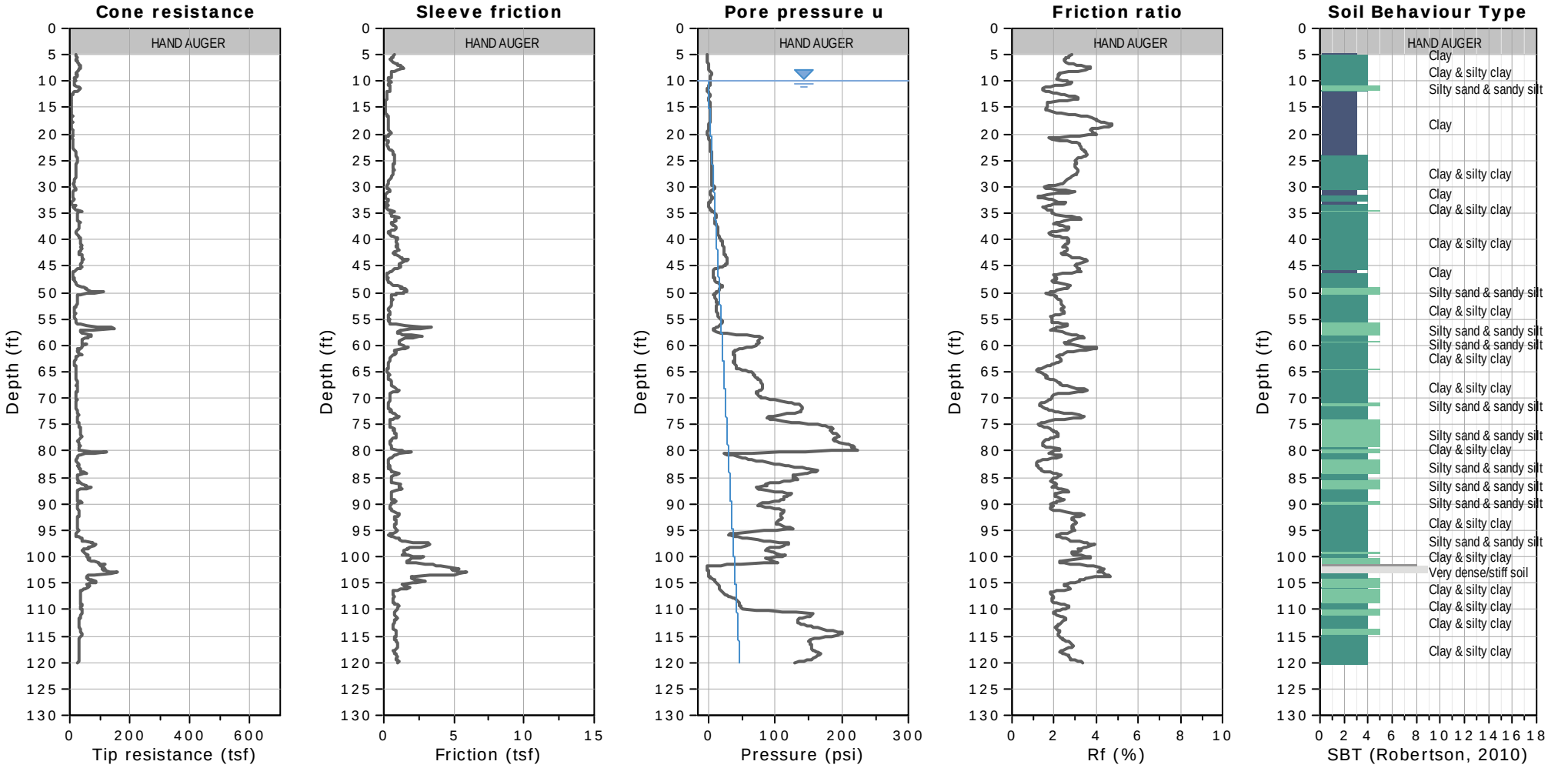
CPT: AS-93

CLIENT: PARIKH

Field Rep: VIRGIL SANTOS

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 120.08 ft, Date: 8/10/2018



SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

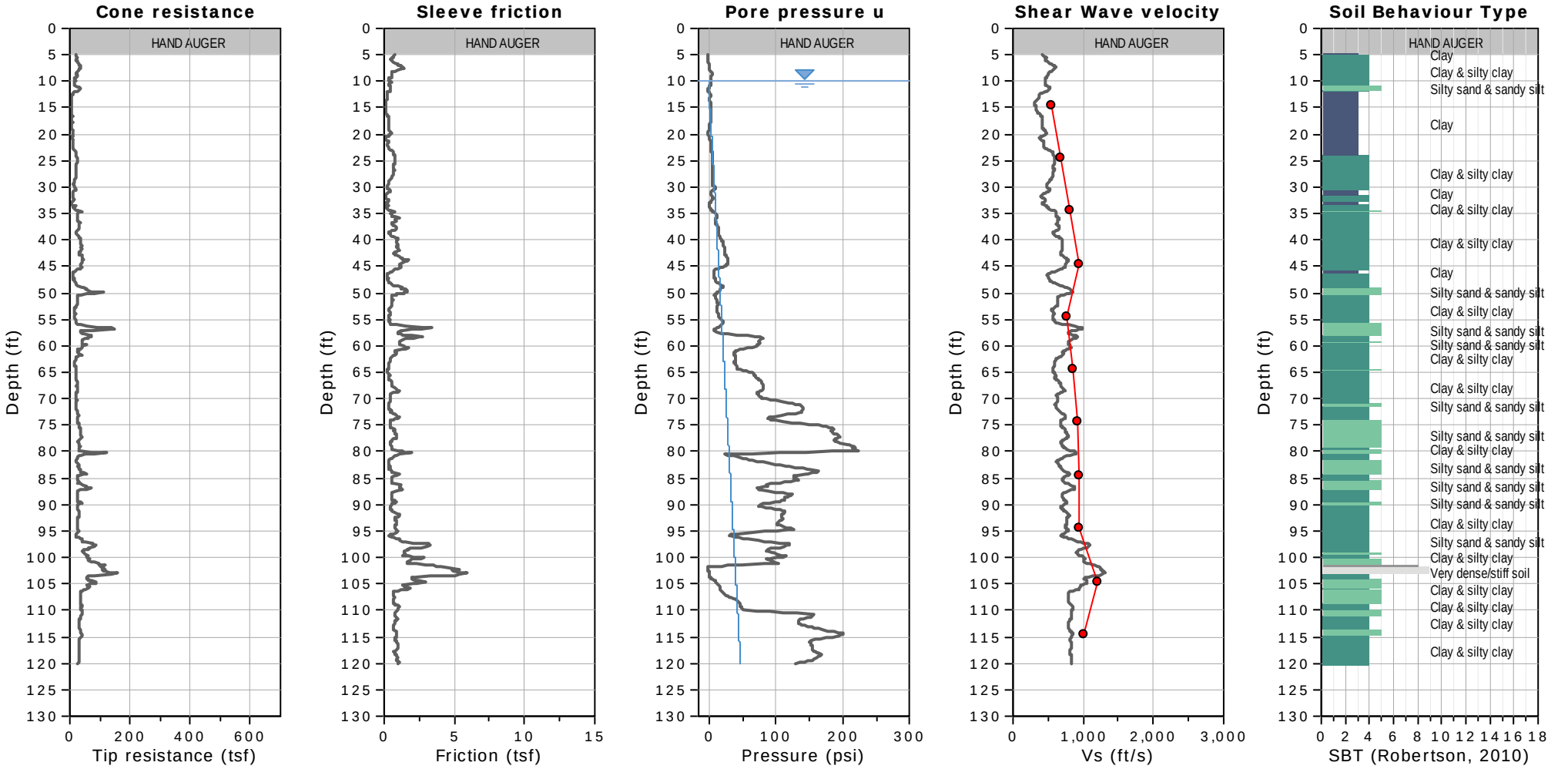
WATER TABLE FOR ESTIMATING PURPOSES ONLY

CLIENT: PARIKH

Field Rep: VIRGIL SANTOS

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 120.08 ft, Date: 8/10/2018



SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

WATER TABLE FOR ESTIMATING PURPOSES ONLY

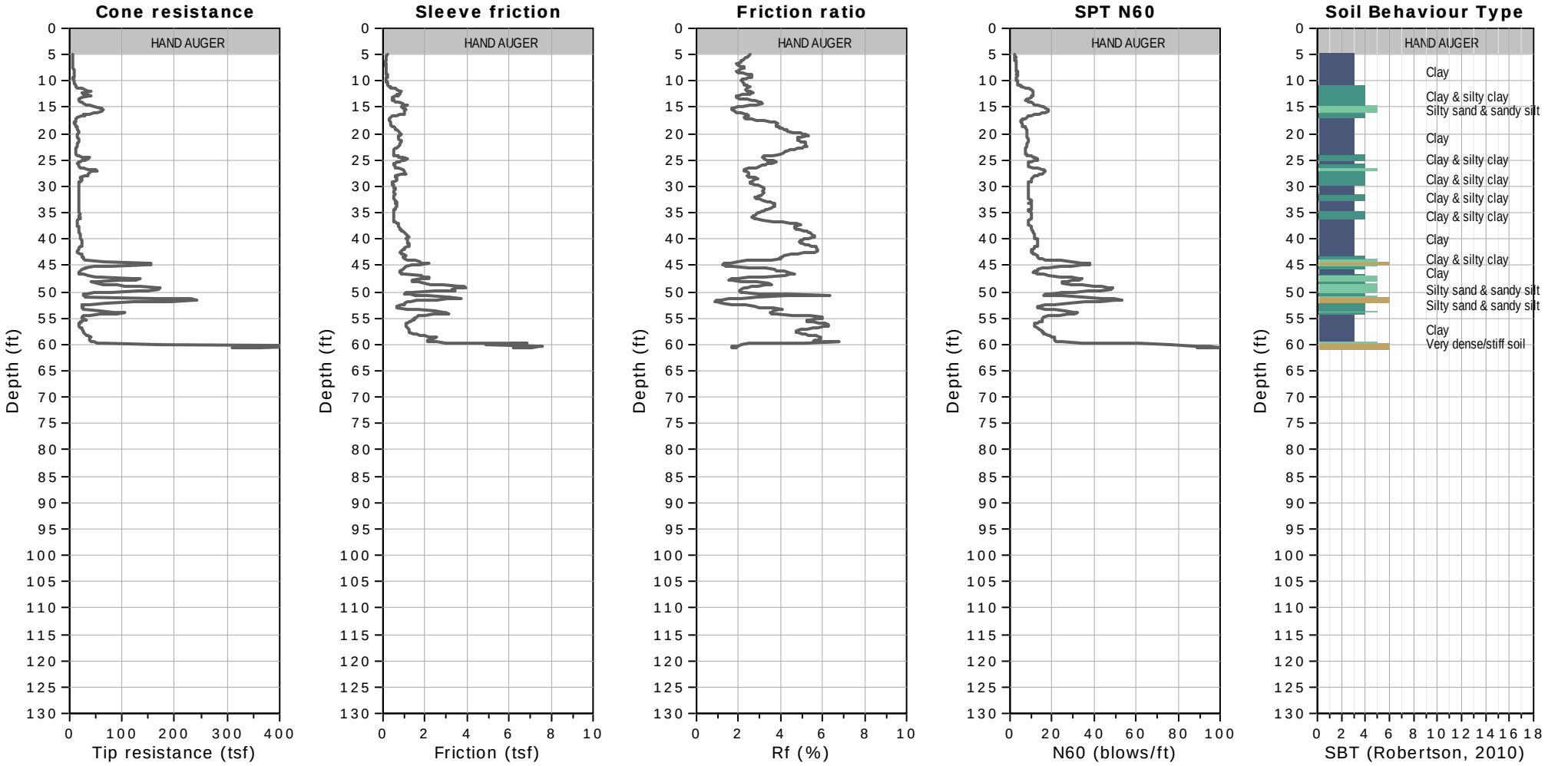
CPT: AS-94

CLIENT: PARIKH

Field Rep: SAMMY

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 60.70 ft, Date: 8/20/2018



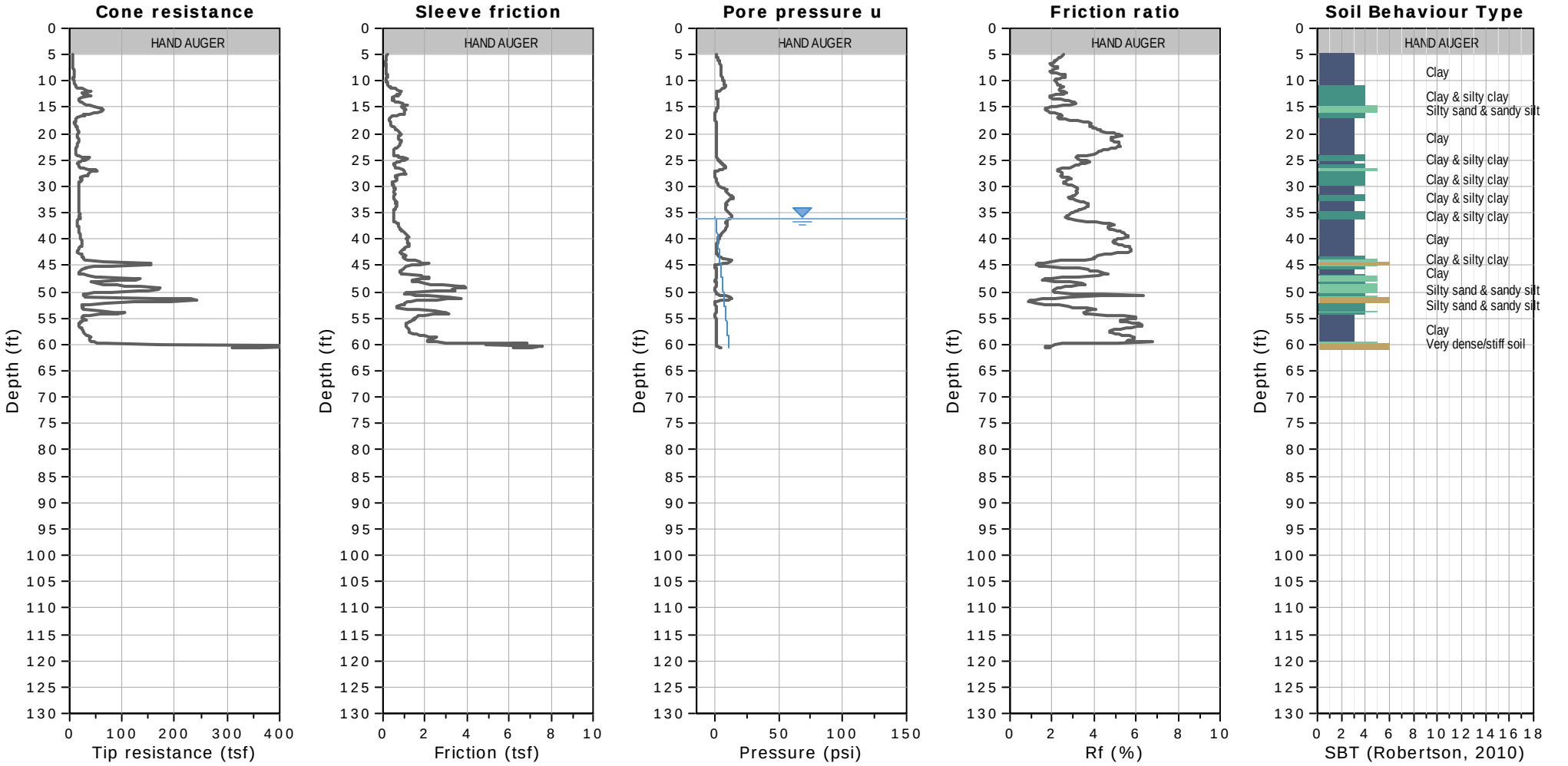
CPT: AS-94

CLIENT: PARIKH

Field Rep: SAMMY

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 60.70 ft, Date: 8/20/2018



SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

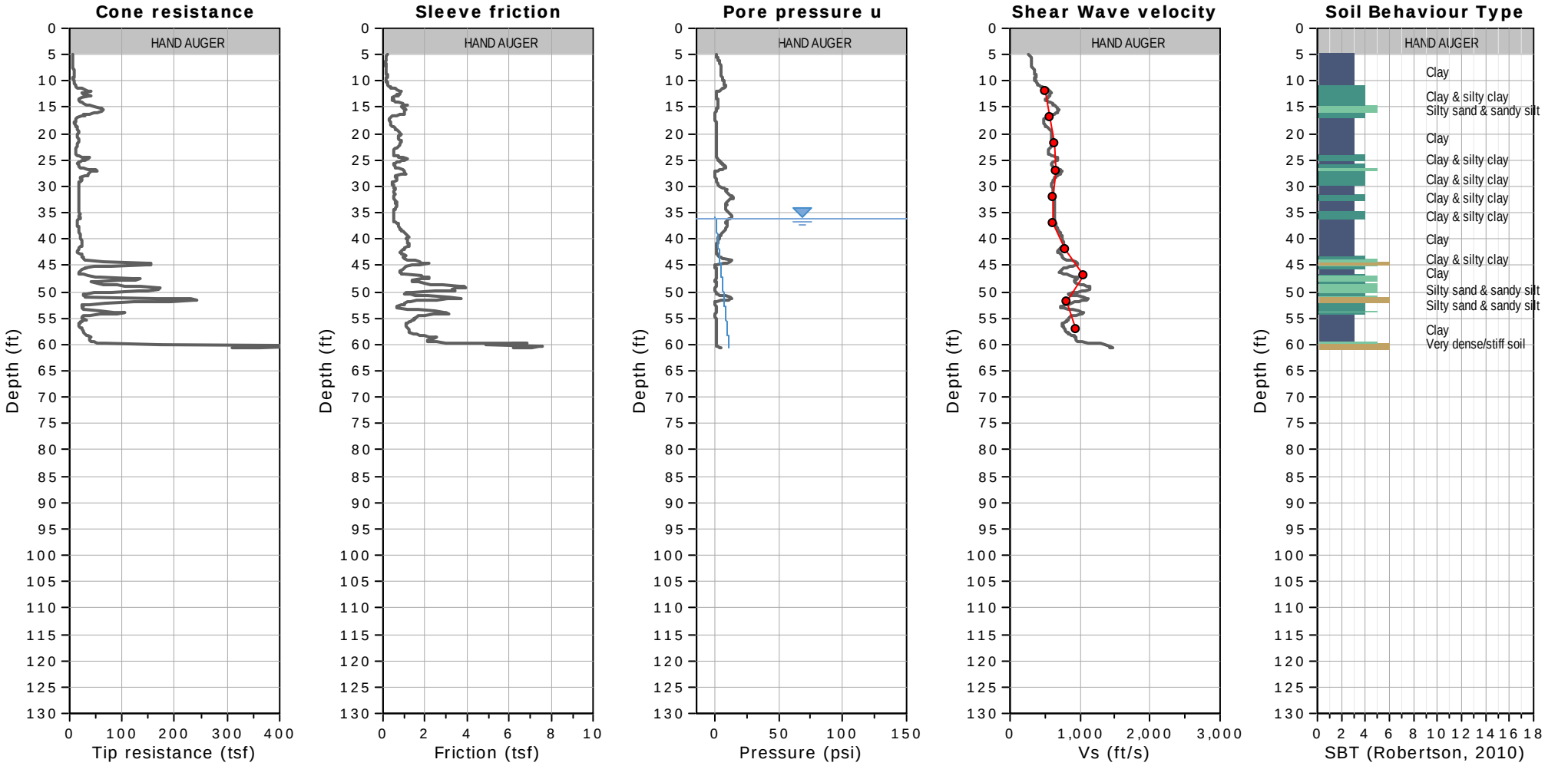
WATER TABLE FOR ESTIMATING PURPOSES ONLY

CLIENT: PARIKH

Field Rep: SAMMY

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 60.70 ft, Date: 8/20/2018



WATER TABLE FOR ESTIMATING PURPOSES ONLY

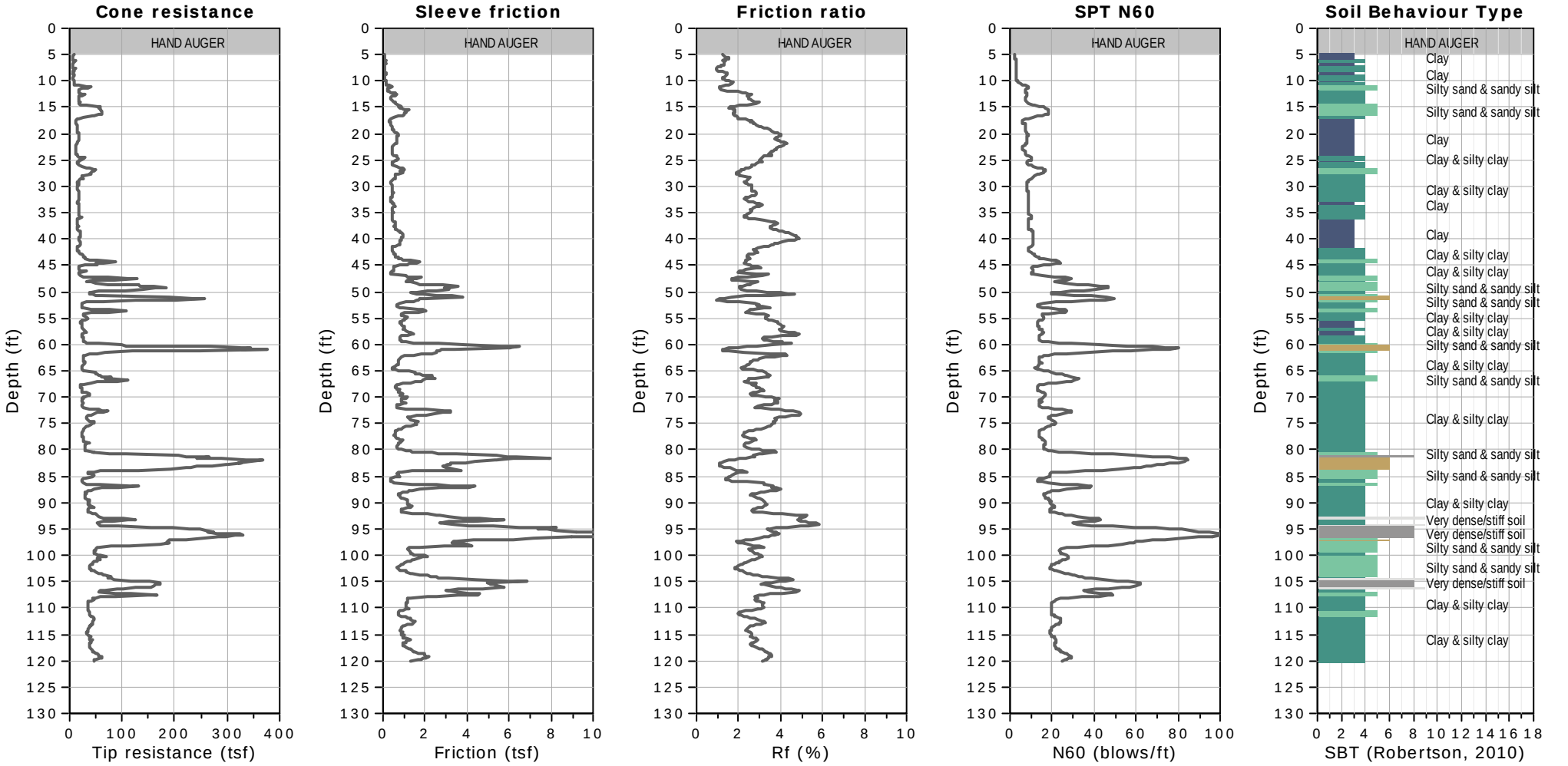
CPT: AS-94A

CLIENT: PARIKH

Field Rep: SAMMY

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 120.08 ft, Date: 8/20/2018



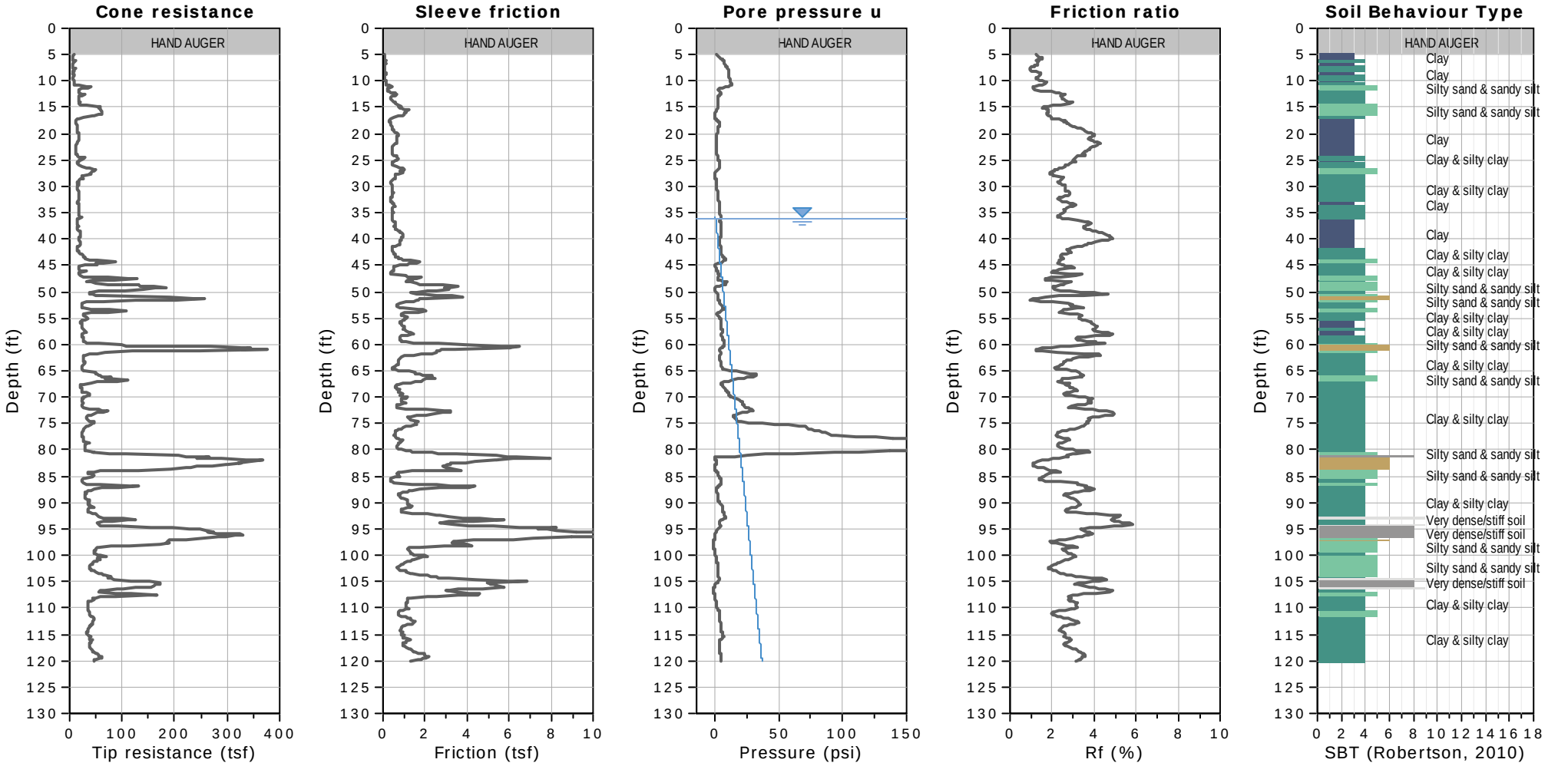
CPT: AS-94A

CLIENT: PARIKH

Field Rep: SAMMY

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 120.08 ft, Date: 8/20/2018



WATER TABLE FOR ESTIMATING PURPOSES ONLY

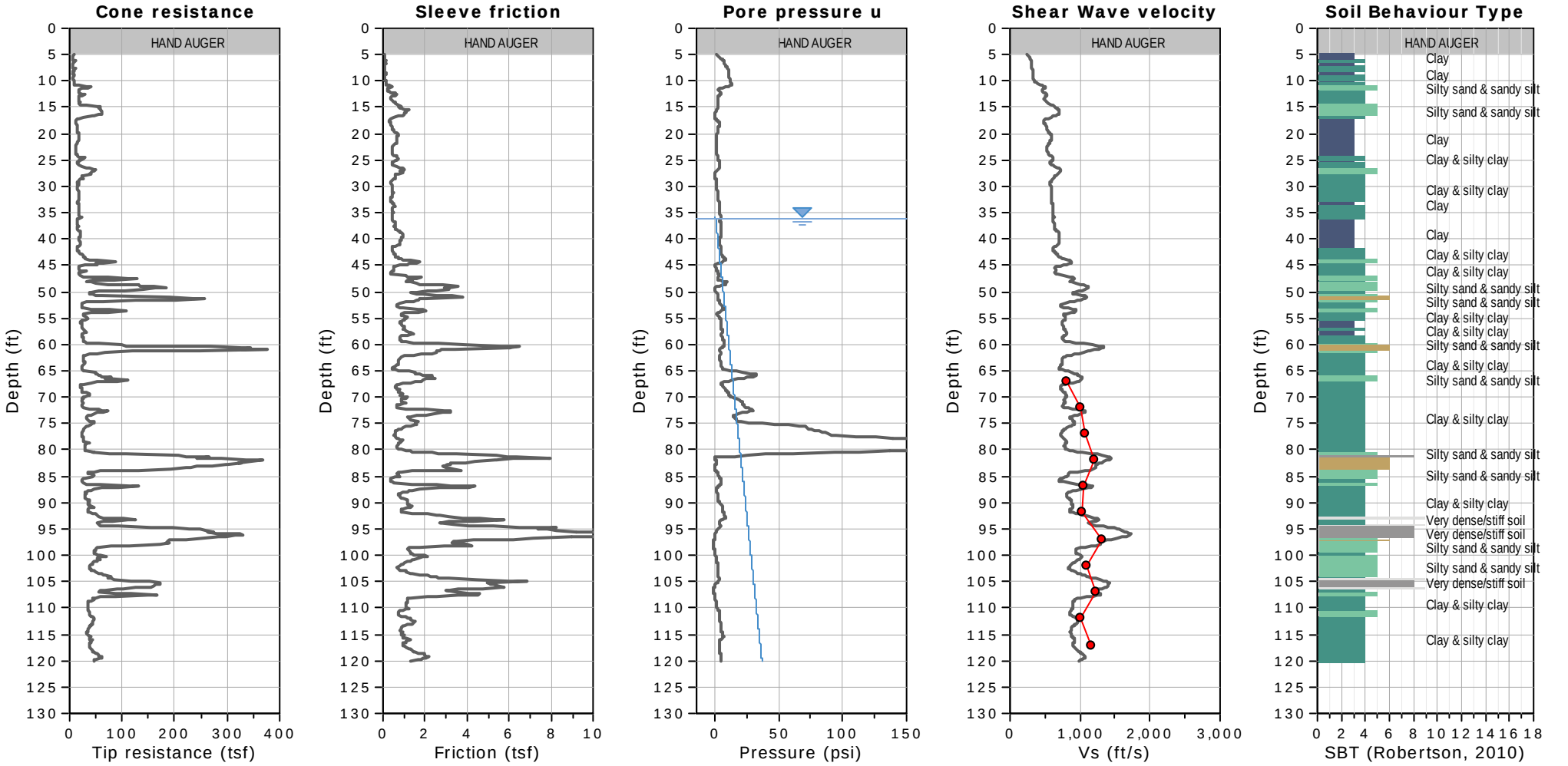
CPT: AS-94A

CLIENT: PARIKH

Field Rep: SAMMY

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 120.08 ft, Date: 8/20/2018



WATER TABLE FOR ESTIMATING PURPOSES ONLY

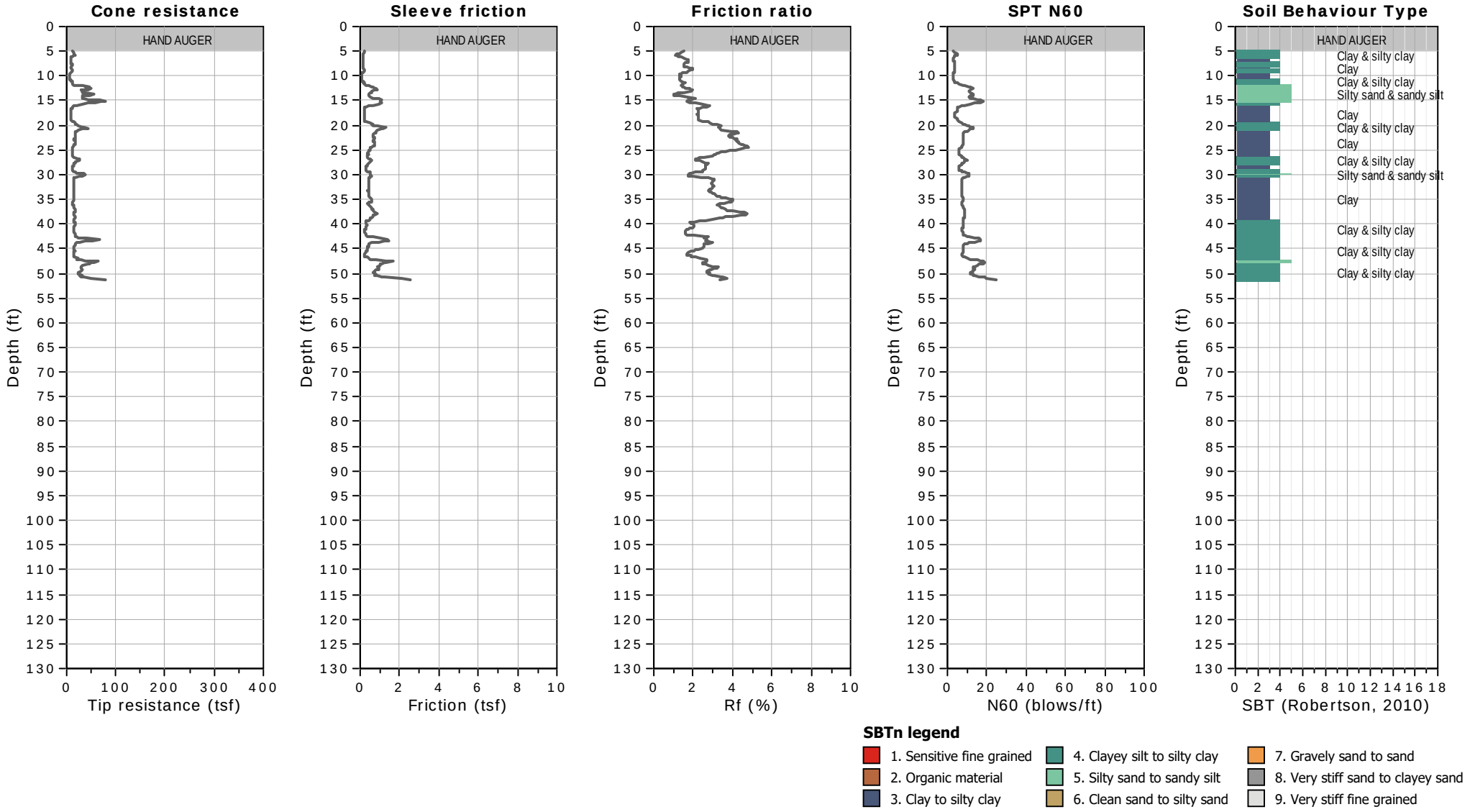
CPT: AS-95

CLIENT: PARIKH

Field Rep: SAMMY

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 51.18 ft, Date: 8/20/2018



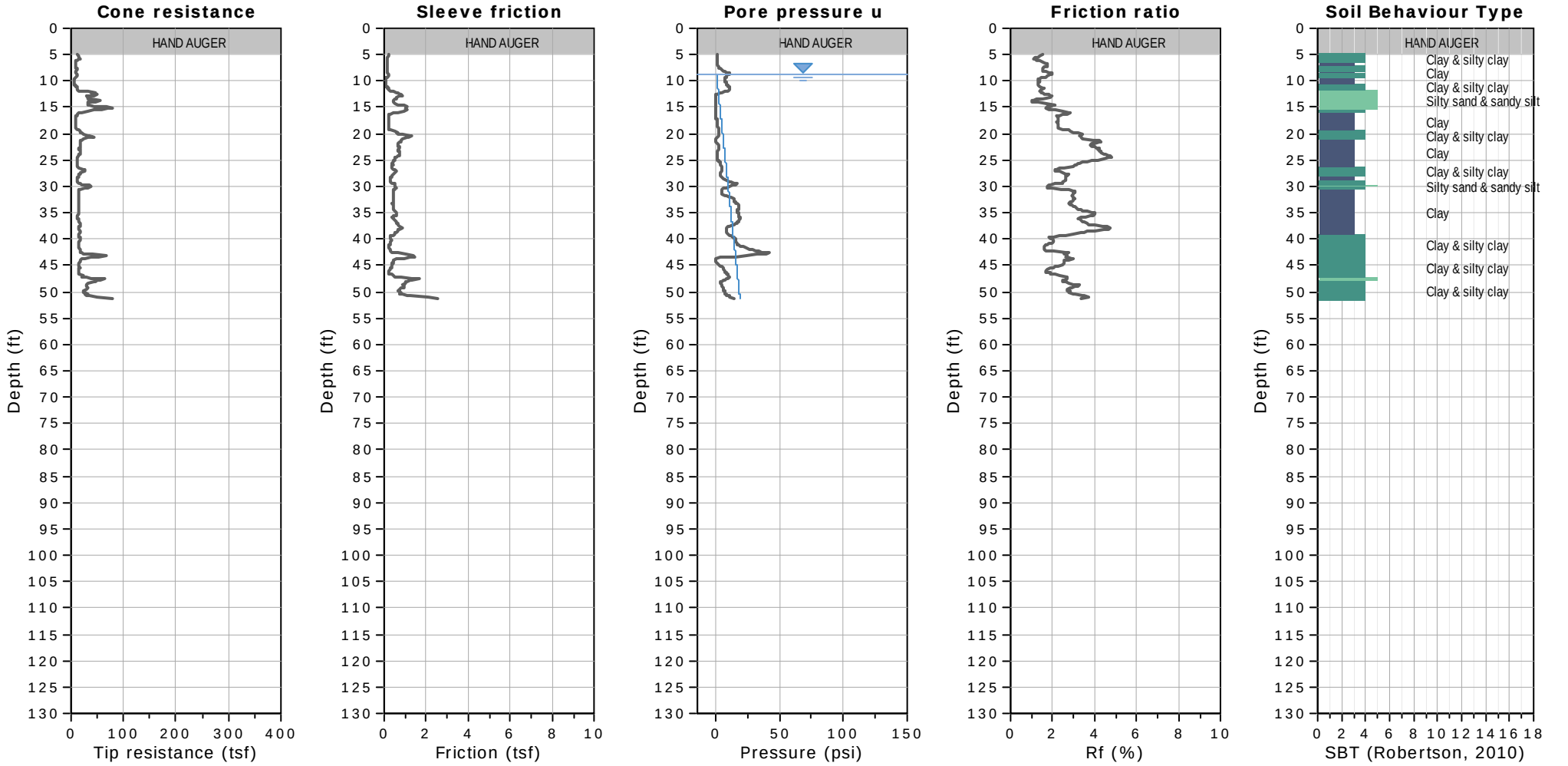
CPT: AS-95

CLIENT: PARIKH

Field Rep: SAMMY

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 51.18 ft, Date: 8/20/2018



WATER TABLE FOR ESTIMATING PURPOSES ONLY

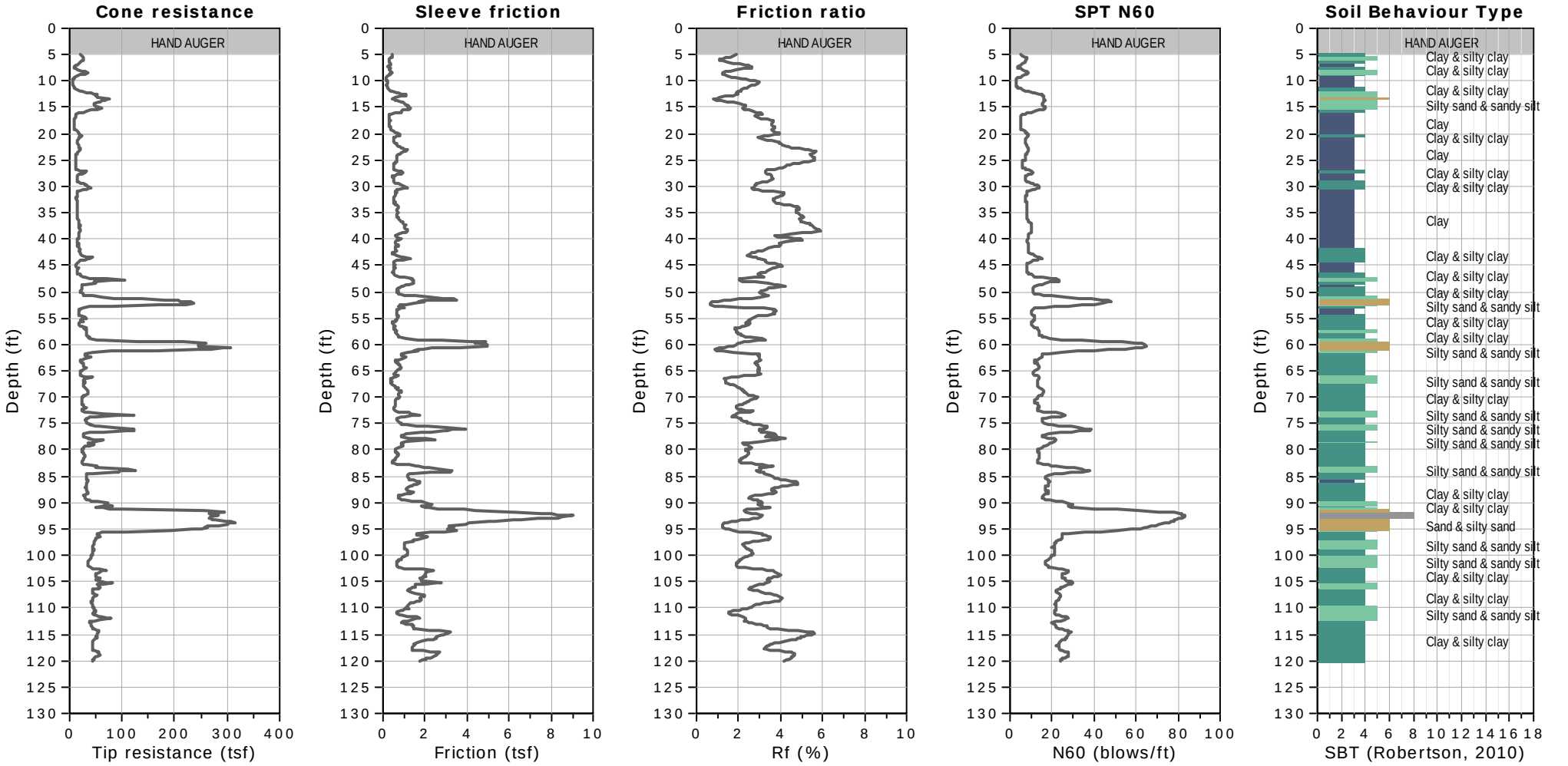
CPT: AS-95A

CLIENT: PARIKH

Field Rep: SAMMY

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

Total depth: 120.08 ft, Date: 8/20/2018



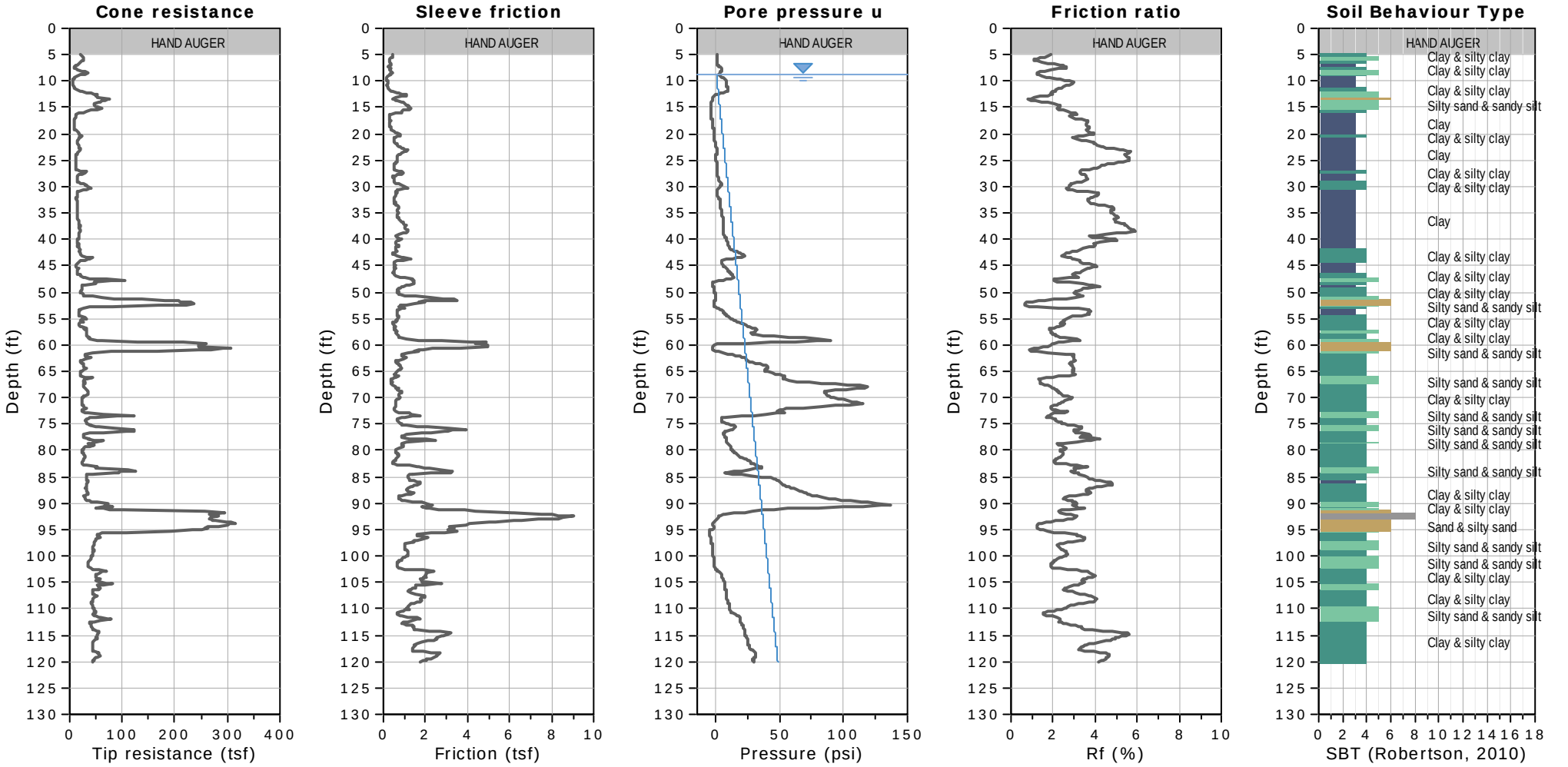
CPT: AS-95A

CLIENT: PARIKH

Field Rep: SAMMY

SITE: EASTRIDGE TO BART REGIONAL CONNECTOR - SAN JOSE, CA

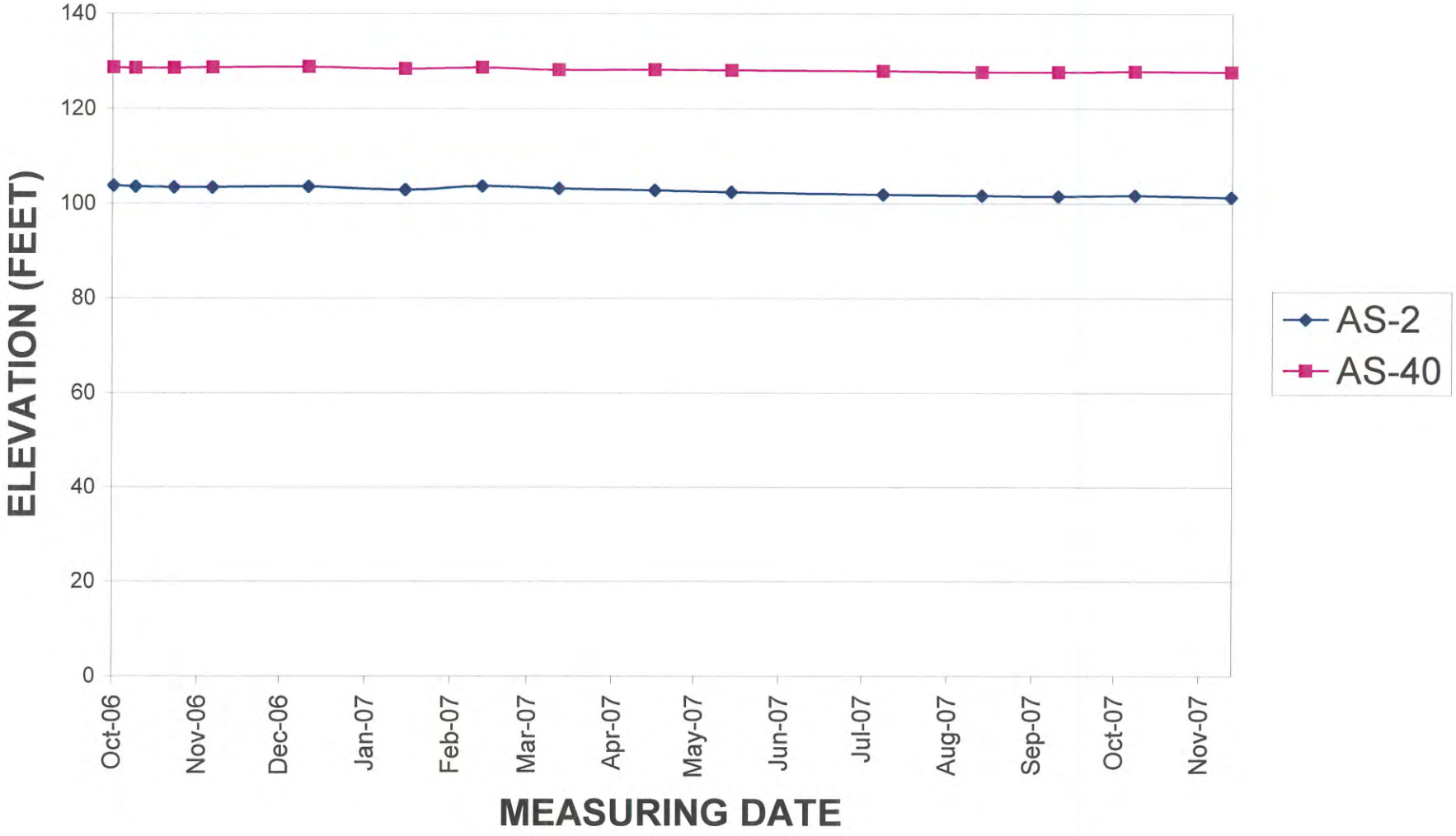
Total depth: 120.08 ft, Date: 8/20/2018



WATER TABLE FOR ESTIMATING PURPOSES ONLY

VIBRATING WIRE PIEZOMETERS MONITORING

CAPITOL EXPRESSWAY LIGHT RAIL PROJECT
MONITORING OF VIBRATING WIRE PIEZOMETERS



STANDPIPE PIEZOMETER MONITORING

Eastridge to BART Regional Connector Project – Groundwater Monitoring Well Measurement (Borings AS-65 and AS-66)

Date of Measurement	Boring Number	Boring Depth (ft)	Ground Elev. (ft)	Groundwater Depth (ft)	Groundwater Elev. (ft)
11/22/2017[(1)]	AS-65	41.5	117.0	22.0	95.0
	AS-66	41.5	135.0	24.0	111.0
12/12/2017	AS-65	41.5	117.0	16.8	100.2
	AS-66	41.5	135.0	12.9	122.1
1/10/2018	AS-65	41.5	117.0	15.9	101.1
	AS-66	41.5	135.0	8.4	126.6
2/2/2018	AS-65	41.5	117.0	16.2	100.8
	AS-66	41.5	135.0	8.5	126.5
3/15/2018	AS-65	41.5	117.0	16.1	100.9
	AS-66	41.5	135.0	8.5	126.5
4/03/2018	AS-65	41.5	117.0	15.75	101.25
	AS-66	41.5	135.0	8.4	126.6
5/7/2018	AS-65	41.5	117.0	15.7	101.3
	AS-66	41.5	135.0	8.0	127.0
6/8/2018	AS-65	41.5	117.0	16.1	100.9
	AS-66	41.5	135.0	8.6	126.4
7/9/2018	AS-65	41.5	117.0	16.6	100.4
	AS-66	41.5	135.0	8.6	126.4
8/8/2018	AS-65	41.5	117.0	16.7	100.3
	AS-66	41.5	135.0	8.6	126.4

(1) Date of the installation of the groundwater monitoring well.

AERIAL GUIDEWAY BORING LOG & CPT PROFILE

NORTHWEST

SOUTHEAST

Elevation (ft)

160 140 120 100 80 60 40 20 0 −20 −40

AS-1 (Projected 20' Left)

ASPHALT
CL
CL — PI LL=45, PI=25
CL
PI UC LL=36, PI=13
1.1 tsf
C
SC
CL — UC 1.5 tsf
ML
CL PI UC LL=31, PI=10
1 tsf
SM PA +#4=5%, −#200=21%
CL
SC
CH — UC 2 tsf
SC
CL
CL
CL

ABUT. 1

BENT 2

S. CAPITOL AVENUE

AS-2 (Projected 29' Left)

SM
CL
CR UC 0.9 tsf
ML PA PI UC LL=32, PI=15 (+#4=0%, −#200=73%), 0.9 tsf
CL
SM
CL PI LL=39, PI=23
SC PA +#4=7%, −#200=24%
CL
SC
CL
SM
CL — UC 1.44 tsf

BENT 3

BENT 4

AS-4 (Projected 23' Right)

CL
CL — UC 3.46 tsf
ML CR PI LL=36, PI=11
CH
CL
UC 0.56 tsf
SP-SM
CL
PI LL=40, PI=22
ML
CL
CL — UC 1.66 tsf
SC
CL
SC
CL
CH

BENT 5

BENT 6

AS-3 (Projected 69' Left)

CL
CL-ML PI UC LL=24, PI=6
0.46 tsf
CL
C
UC 0.8 tsf
SM
PA +#4=0%, −#200=14%
CL
PI UC LL=30, PI=13
0.5 tsf
SC PA +#4=22%, −#200=39%
CL
UC 1.06 tsf
PI UC LL=32, PI=18
0.9 tsf
SM
CL
CL — UC 3.2 tsf

BENT 7

AS-6 (Projected 14' Left)

Friction Ratio (%) 10 8 6 4 2 0 — Tip Bearing (tsf) 100 200 300 400 500

BENT 8

LEGEND

Exploration No.
SP — Soil Group Name
10
20* — Inferred Change
SC
Number of blows required to drive the Modified California (MC) Sampler 12 inches.
Number of blows required to drive the Standard Penetration Test (SPT) Sampler 12 inches.

- Groundwater Level
- (PA) Grain Size Distribution Test
  +#4: Percentage Retained by #4
  −#200: Percentage Passed Through #200
- (PI) Atterberg Limits Test
  LL: Liquid Limit
  PI: Plasticity Index
- (C) Corrosion Test
- (UC) Unconfined Compression Test
  1.1 tsf: Unconfined Shear Strength of 1.1 tsf

"SB" TRACK

STATION 971+00 972+00 973+00 974+00 975+00 976+00 977+00 978+00 979+00 980+00 981+00 982+00

Asphalt | USCS Lean Clay | USCS Clayey Sand | USCS Silt | USCS Silty Sand | USCS Fat Clay | USCS Silty Clay | USCS Poorly Graded Sand with silt

PARIKH
Practicing in the Geosciences
2360 QUME DRIVE, SUITE A, SAN JOSE, CA 95131

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

Project No.: 2017-125-GEO | Hor. Scale: 1" = 80' / Vert. Scale: 1" = 25'

AERIAL GUIDEWAY BORING LOG & CPT PROFILE: Station 971+00 to Station 982+00

Figure No. 1

NORTHWEST

SOUTHEAST

Elevation (ft)

160 140 120 100 80 60 40 20 0 −20 −40

BENT 9 BENT 10 BENT 11 BENT 12 BENT 13 BENT 14 BENT 15 BENT 16

AS-5 (Projected 82' Left)
AS-8 (Projected 14' Left)
AS-7 (Projected 3' Left)
AS-91 (Projected 9' Left)
AS-9 (Projected 6' Left)
AS-11 (Projected 14' Left)
AS-92 (Projected 17' Left)

AS-5 (Projected 82' Left):
- UC 1.96 tsf
- PI LL=32, PI=10
- UC 1.26 tsf
- PA +#4=26%, −#200=19%
- UC 0.5 tsf
- UC 0.7 tsf
- PI LL=30, PI=14

AS-7 (Projected 3' Left):
- PI UC LL=32, PI=14, 3.5 tsf
- PI UC LL=39, PI=15, 0.56 tsf
- UC 2.16 tsf
- CR
- PA +#4=11%, −#200=57%
- PA +#4=5%, −#200=32%
- PA +#4=81%, −#200=8%
- PA +#4=0%, −#200=29%

AS-11 (Projected 14' Left):
- ASPHALT
- UC 2.94 tsf
- CR
- UC 0.7 tsf
- PI UC LL=34, PI=16, 1.66 tsf
- PA +#4=4%, −#200=64%
- UC 0.76 tsf

LEGEND

- Groundwater Level
- (PA) Grain Size Distribution Test: +#4: Percentage Retained by #4; −#200: Percentage Passed Through #200
- (PI) Atterberg Limits Test: LL: Liquid Limit; PI: Plasticity Index
- (C) Corrosion Test
- (UC) Unconfined Compression Test: 1.1 tsf: Unconfined Shear Strength of 1.1 tsf
- Exploration No.
- Soil Group Name
- Inferred Change
- Number of blows required to drive the Modified California (MC) Sampler 12 inches.
- Number of blows required to drive the Standard Penetration Test (SPT) Sampler 12 inches.

"SB" TRACK

STATION 982+00 983+00 984+00 985+00 986+00 987+00 988+00 989+00 990+00 991+00 992+00 993+00 994+00

Asphalt | USCS Fat Clay | USCS Lean Clay | USCS Silt | USCS Clayey Sand | USCS Poorly Graded Sand | USCS Silty Sand | USCS Poorly Graded Gravel with silt

PARIKH
Practicing in the Geosciences
2360 QUME DRIVE, SUITE A, SAN JOSE, CA 95131

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

Project No.: 2017-125-GEO | Hor. Scale: 1" = 80' / Vert. Scale: 1" = 25'

AERIAL GUIDEWAY BORING LOG & CPT PROFILE: Station 982+00 to Station 994+00

Figure No. 2

NORTHWEST

SOUTHEAST

Elevation (ft)

160 140 120 100 80 60 40 20 0 −20 −40

AS-13 (Projected 15' Left)

AS-12 (Projected 80' Left)

AS-93 (Projected 15' Left)

AS-15 (Projected 12' Left)

AS-14 (Projected 14' Left)

AS-17 (Projected 8' Left)

AS-67 (Projected 8' Left)

BENT 18 BENT 19 BENT 20 BENT 21 BENT 22 BENT 23 BENT 24 BENT 25

29* CL
28* CH (CR) CL-ML
15*
12* CH (C)
CL (UC) 0.56 tsf
67* CH
CL
22* (UC) 0.4 tsf
31*
50/6* CL
REF GC
GW (PA) +#4=54%, −#200=24%
85 CL (PA) +#4=90%, −#200=4%
46* CL
61*
42*
41*
34* (PI) (UC) LL=35, PI=17 2.24 tsf
80* ML CH
38*
51*

48* CL (PI) (UC) LL=38, PI=18 4.6 tsf
29* CL
26* CL-ML SC (UC) 2.3 tsf
16* (CR)
22* (C)
43* CH
23* CL (PI) (UC) LL=36, PI=19 0.7 tsf
21*
24*
19 CL-ML (PI) (UC) LL=33, PI=5 0.43 tsf
44 SM (PA) +#4=16%, −#200=26%
22* CL
46* CH
ML
38* (UC) 0.8 tsf
CL
18* (PI) LL=39, PI=21
CH
39*
CL
53*
43* (UC) 2.8 tsf
62*

"SB" TRACK

STATION 994+00 995+00 996+00 997+00 998+00 999+00 1000+00 1001+00 1002+00 1003+00 1004+00 1005+00 1006+00

LEGEND

- Groundwater Level
- (PA) Grain Size Distribution Test
  +#4: Percentage Retained by #4
  −#200: Percentage Passed Through #200
- (PI) Atterberg Limits Test
  LL: Liquid Limit
  PI: Plasticity Index
- (C) Corrosion Test
- (UC) Unconfined Compression Test
  1.1 tsf: Unconfined Shear Strength of 1.1 tsf

Exploration No.
Soil Group Name
Inferred Change
Number of blows required to drive the Modified California (MC) Sampler 12 inches.
Number of blows required to drive the Standard Penetration Test (SPT) Sampler 12 inches.

USCS Lean Clay | USCS Fat Clay | USCS Silty Clay | USCS Clayey Gravel | USCS Well-graded Gravel | USCS Silt | USCS Clayey Sand | USCS Silty Sand

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EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

Project No.: 2017-125-GEO | Hor. Scale: 1" = 80' / Vert. Scale: 1" = 25'

AERIAL GUIDEWAY BORING LOG & CPT PROFILE: Station 994+00 to Station 1006+00

Figure No. 3

NORTHWEST

SOUTHEAST

Elevation (ft)

160 140 120 100 80 60 40 20 0 −20 −40

BENT 26 BENT 27 BENT 28 BENT 29 BENT 30 BENT 31 BENT 32 BENT 33

AS-68 (Projected 8' Left)

ASPHALT
AB
CL
29* PI UC LL=43, PI=20 2.91 tsf
8*
PI UC LL=37, PI=14 0.88 tsf
13*
8*
CH
23* UC 2.45 tsf
1
CL
SM
20* PA +#4=0.2%, −#200=31.2%
22*
SP
CL
SC
13* PA +#4=2.4%, −#200=41.5%
11
CL
16* PI UC LL=31, PI=14 0.81 tsf
29*
ML
21* PA +#4=1.5%, −#200=85.7%
31*
CL
CL
28* UC 2.43 tsf
CL
26* UC 1.84 tsf
CL
31* UC 2.56 tsf
ML
47* PA +#4=0.0%, −#200=71.5%
CH
35* UC 2.74 tsf
CL-ML
68*
CL
55*
CL-ML
33* UC 2.0 tsf
CL
48*

AS-69 (Projected 8' Left)

AS-70 (Projected 8' Left)

ASPHALT
AB
CL
20* PI UC LL=42, PI=24 3.14 tsf
7*
CH
4* UC 0.84 tsf
9*
7
CL
19* UC 1.73 tsf
15*
13
48* UC 2.68 tsf
11*
CL
16* UC 1.31 tsf
37
SM
24* PA +#4=3.3%, −#200=31.6%
CH
SM
26* PA +#4=0.3%, −#200=45.9%
29
CL
25* UC 0.56 tsf
31*
SW-SM
34 PA +#4=19.3%, −#200=12.0%
CH
46* UC 2.95 tsf
SP
CL
36*
ML
28* UC 3.12 tsf
19
GC
78*

AS-71 (Projected 8' Left)

LEGEND

- Groundwater Level
- (PA) Grain Size Distribution Test
  +#4: Percentage Retained by #4
  −#200: Percentage Passed Through #200
- (PI) Atterberg Limits Test
  LL: Liquid Limit
  PI: Plasticity Index
- (C) Corrosion Test
- (UC) Unconfined Compression Test
  1.1 tsf: Unconfined Shear Strength of 1.1 tsf

Exploration No.
Soil Group Name
Inferred Change
Number of blows required to drive the Modified California (MC) Sampler 12 inches.
Number of blows required to drive the Standard Penetration Test (SPT) Sampler 12 inches.

"SB" TRACK

STATION 1006+00 1007+00 1008+00 1009+00 1010+00 1011+00 1012+00 1013+00 1014+00 1015+00 1016+00 1017+00 1018+00

Asphalt | USCS Lean Clay | USCS Fat Clay | USCS Silty Sand | USCS Poorly Graded Sand
USCS Clayey Sand | USCS Silt | USCS Silty Clay | USCS Well-graded Sand with silt | USCS Clayey Gravel

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EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

Project No.: 2017-125-GEO | Hor. Scale: 1" = 80' / Vert. Scale: 1" = 25'

AERIAL GUIDEWAY BORING LOG & CPT PROFILE: Station 1006+00 to Station 1018+00

Figure No. 4

NORTHWEST

SOUTHEAST

Elevation (ft)

160 140 120 100 80 60 40 20 0 −20 −40

BENT 34 BENT 35 BENT 36 BENT 37 BENT 38 BENT 39 BENT 40 BENT 41

AS-72 (Projected 8' Left)

ASPHALT
AB
CH
48*
13*
6*
11*
15*
15*
6
40
23*
28*
38*
35
18*
42*
31*
41*
28
40
44*
40*
39

(UC) 3.51 tsf
SM
CL
CL-ML
(UC) 1.53 tsf
CL
CL
SM
(PA) +#4=27.1%, −#200=17.6%
CL
(UC) 2.23 tsf
SM
(PA) +#4=29.3%, −#200=17.2%
SC
(PA) +#4=15.1%, −#200=26.6%
CL
(UC) 1.6 tsf
SM
CL
(UC) 1.61 tsf
ML
(PA) (PI) +#4=0.0%, −#200=66.9% nonplastic
CL
(UC) 3.75 tsf
ML
(PA) +#4=0.6%, −#200=66.4%

AS-73 (Projected 7' Left)

AS-74 (Projected 8' Left)

ASPHALT
AB
CL
29*
19*
12*
10*
16*
26*
15*
22*
21*
34*
35*
23*
52*
42*
30*
32*
37*
43*
36*
70
41
50/6
78*

(UC) 3.0 tsf
CL
(PA) +#4=0.0%, −#200=27.4%
(PI) (UC) LL=37, PI=17 1.06 tsf
ML
(PI) LL=33, PI=9
CL
(UC) 1.53 tsf
CH
(PI) (UC) LL=56, PI=33 0.67 tsf
CL
(PI) (UC) LL=30, PI=15 1.14 tsf
(UC) 1.93 tsf
(PA) +#4=0.8%, −#200=56%
SM
CL
(UC) 2.01 tsf
ML
(UC) 1.67 tsf
CL
(UC) 2.45 tsf
CL
(PI) (UC) LL=33, PI=12 3.9 tsf
SW-SM
(PA) +#4=18.7%, −#200=11.9%
CL-ML
SP-SM
CL

AS-75 (Projected 7' Left)

LEGEND

Exploration No.
SP Soil Group Name
10
20*
Inferred Change
CL
Number of blows required to drive the Modified California (MC) Sampler 12 inches.
Number of blows required to drive the Standard Penetration Test (SPT) Sampler 12 inches.

Groundwater Level
(PA) Grain Size Distribution Test
+#4: Percentage Retained by #4
−#200: Percentage Passed Through #200
(PI) Atterberg Limits Test
LL: Liquid Limit
PI: Plasticity Index
(C) Corrosion Test
(UC) Unconfined Compression Test
1.1 tsf: Unconfined Shear Strength of 1.1 tsf

"SB" TRACK

STATION 1018+00 1019+00 1020+00 1021+00 1022+00 1023+00 1024+00 1025+00 1026+00 1027+00 1028+00 1029+00 1030+00

Asphalt
USCS Fat Clay
USCS Lean Clay
USCS Silty Sand
USCS Silty Clay
USCS Clayey Sand
USCS Silt
USCS Well-graded Sand with silt
USCS Poorly Graded Sand with silt

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EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

Project No.: 2017-125-GEO | Hor. Scale: 1" = 80' / Vert. Scale: 1" = 25'

AERIAL GUIDEWAY BORING LOG & CPT PROFILE: Station 1018+00 to Station 1030+00

Figure No. 5

NORTHWEST

SOUTHEAST

Elevation (ft)

160 140 120 100 80 60 40 20 0 −20 −40

AS-76 (Projected 8' Left)

ASPHALT
CL
PI UC LL=34, PI=20
1.63 tsf
PA +#4=0%, −#200=49.6%
SC
PA +#4=0%, −#200=47.2%
PA +#4=0%, −#200=43.3%
CL
UC 1.19 tsf
CL
PI LL=37, PI=18
UC 0.51 tsf
UC 1.3 tsf
SC
PA +#4=8.4%, −#200=35.1%
CL
UC 0.91 tsf
SM
CL
UC 2.37 tsf
PA +#4=0.1%, −#200=59.7%
ML
PI nonplastic
CL
ML
PA UC +#4=6%, −#200=71.5%
2.24 tsf
CL
SM
ML
PA +#4=0%, −#200=70.4%

BENT 43

BENT 44

AS-77 (Projected 7' Left)

Friction Ratio (%) 10 8 6 4 2 0 Tip Bearing (tsf) 100 200 300 400 500

BENT 45

AS-78 (Projected 8' Left)

ASPHALT
AB
CL
PI UC LL=33, PI=15
1.62 tsf
SP
UC 0.8 tsf
PA +#4=1.3%, −#200=1.0%
CL
PI UC LL=46, PI=29
1.14 tsf
ML
PI UC LL=43, PI=17
0.69 tsf
CL
UC 1.7 tsf
UC 0.67 tsf
CL
UC 1.19 tsf
SM
CL
SM
CL
UC 1.51 tsf
CL
UC 2.81 tsf
CL
PI UC LL=36, PI=17
1.93 tsf
SM
CL
SW-SM
PA +#4=39%, −#200=8.9%
CL
UC 3.58 tsf
SM
SM

BENT 46

PARABOLIC SOFFIT PROFILE BETWEEN BENTS 47 & 48

BENT 47

BENT 48

AS-80 (Projected 8' Left)

ASPHALT
CL
PI UC LL=32, PI=14
1.25 tsf
ML
UC 0.84 tsf
SC
PA +#4=0.6%, −#200=44.2%
ML
PI nonplastic
ML
CH
UC 1.91 tsf
CL
PI UC LL=37, PI=17
0.72 tsf
UC 1.05 tsf
UC 1.42 tsf
CL
UC 1.67 tsf
SM
CL
UC 2.23 tsf
ML
SP-SM
PA +#4=0%, −#200=6.5%
CL/CH
SM
CL/CH
ML
SP

BENT 49

LEGEND

Groundwater Level

PA Grain Size Distribution Test
+#4: Percentage Retained by #4
−#200: Percentage Passed Through #200

PI Atterberg Limits Test
LL: Liquid Limit
PI: Plasticity Index

C Corrosion Test

UC Unconfined Compression Test
1.1 tsf: Unconfined Shear Strength of 1.1 tsf

Exploration No.
Soil Group Name
Inferred Change
Number of blows required to drive the Modified California (MC) Sampler 12 inches.
Number of blows required to drive the Standard Penetration Test (SPT) Sampler 12 inches.

"SB" TRACK

STATION 1030+00 1031+00 1032+00 1033+00 1034+00 1035+00 1036+00 1037+00 1038+00 1039+00 1040+00 1041+00 1042+00

Asphalt
USCS Lean Clay
USCS Silty Sand
USCS Clayey Sand
USCS Silt
USCS Poorly Graded Sand
USCS Well-graded Sand with silt
USCS Silty Clay
USCS Fat Clay
USCS Poorly Graded Sand with silt
USCS Lean to Fat Clay (borderline CL/CH)

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EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
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AERIAL GUIDEWAY BORING LOG & CPT PROFILE: Station 1030+00 to Station 1042+00

Figure No. 6

NORTHWEST

SOUTHEAST

Elevation (ft)

160 140 120 100 80 60 40 20 0 −20 −40

AS-81 (Projected 7' Left)

AS-82 (Projected 8' Left)

AS-83 (Projected 8' Left)

AS-84 (Projected 8' Left)

BENT 51 BENT 52 BENT 53 BENT 54 BENT 55 BENT 56 BENT 57 BENT 58

ASPHALT
AB
CL
8* 6* 5* 11* 11* 10* 15* 11* 8* 5* 25* 19* 20* 42* 47* 32* 50* 50* 46* 49* 58 88 51*
CL CH CL ML SM CL/CH SM ML CH ML SM CL

(PI)(UC) LL=30, PI=10, 0.75 tsf
(UC) 0.75 tsf
(PI)(UC) LL=41, PI=15, 1.3 tsf
(PI)(UC) LL=53, PI=33, 1.53 tsf
(UC) 0.64 tsf
(UC) 0.39 tsf
(UC) 0.98 tsf
(PA) +#4=0%, −#200=53.8%
(PA) +#4=13.8%, −#200=18.1%
(UC) 0.88 tsf
(UC) 2.97 tsf
(UC) 2.4 tsf
(PI) nonplastic

ASPHALT
AB
CL
7* 9* 16* 27* 15* 22* 23* 19* 25* 23* 39* 21* 21* 26* 35* 42* 42* 39* 61* 50/4* 55 REF* 88*
ML ML CL-ML CL CH CL SM CL SC CL SM ML CH CL SM GC SP-SM

(PA) +#4=0%, −#200=90.0%
(PA) +#4=0%, −#200=74.2%
(PI)(UC) nonplastic, 1.3 tsf
(PI)(UC) LL=44, PI=19, 1.6 tsf
(UC) 1.4 tsf
(UC) 1.8 tsf
(UC) 1.3 tsf
(PA) +#4=0%, −#200=46.4%
(UC) 2.5 tsf
(PA) +#4=0%, −#200=51.2%
(UC) 2.77 tsf
(UC) 2.7 tsf
(PA) +#4=1.2%, −#200=12.7%
(PA) +#4=50.9%, −#200=15.8%

Friction Ratio (%) Tip Bearing (tsf)

Friction Ratio (%) Tip Bearing (tsf)

LEGEND

Groundwater Level

(PA) Grain Size Distribution Test
+#4: Percentage Retained by #4
−#200: Percentage Passed Through #200

(PI) Atterberg Limits Test
LL: Liquid Limit
PI: Plasticity Index

(C) Corrosion Test

(UC) Unconfined Compression Test
1.1 tsf: Unconfined Shear Strength of 1.1 tsf

Exploration No.
Soil Group Name
SP
10
20*
Inferred Change
GC
Number of blows required to drive the Modified California (MC) Sampler 12 inches.
Number of blows required to drive the Standard Penetration Test (SPT) Sampler 12 inches.

"SB" TRACK

STATION 1042+00 1043+00 1044+00 1045+00 1046+00 1047+00 1048+00 1049+00 1050+00 1051+00 1052+00 1053+00 1054+00

Asphalt
USCS Lean Clay
USCS Fat Clay
USCS Silt
USCS Silty Sand
USCS Lean to Fat Clay (borderline CL/CH)
USCS Silty Clay
USCS Clayey Sand
USCS Clayey Gravel
USCS Poorly Graded Sand with silt

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AERIAL GUIDEWAY BORING LOG & CPT PROFILE: Station 1042+00 to Station 1054+00

Figure No. 7

NORTHWEST

SOUTHEAST

AS-85 (Projected 8' Left)

AS-86 (Projected 9' Left)

AS-87 (Projected 7.5' Left)

AS-88 (Projected 8' Left)

AS-89 (Projected 8' Left)

BENT 59

BENT 60

BENT 61

BENT 62

BENT 63

BENT 64

BENT 65

BENT 66

Elevation (ft)

180, 160, 140, 120, 100, 80, 60, 40, 20, 0, −20, −40

ASPHALT
CL
9*
9*
ML
CL
5*
15
CL
10*
15*
16*
CL
17*
CL
22*
ML
18*
SM
11
CL
33*
SP-SM
67*
CL
15
66*
SM
CL
47*
ML
35*
SC
41*
CL
35*
45*
SM
58
CL
74*
CL-ML
73*

PI UC LL=28, PI=11
0.76 tsf

UC 0.65 tsf

PI UC LL=43, PI=18
1.33 tsf

PA +#4=0%, −#200=52.3%

UC 1.63 tsf

PA +#4=15.5%, −#200=10.7%

PI UC nonplastic
1.3 tsf

PA +#4=0%, −#200=48.1%

UC 2.72 tsf

PA +#4=2%, −#200=21.7%

ASPHALT
AB
CL
8*
ML
12*
SM
7*
CL
15*
ML
14*
CH
15*
UC 1.8 tsf
23*
PI UC LL=53, PI=25
1.95 tsf
CH
27*
SC
19*
SM
PA +#4=13.1%, −#200=36.8%
35*
SW-SC
PA +#4=11.3%, −#200=11.1%
29*
SP-SM
PA +#4=2.3%, −#200=10.2%
CL
25
SM
62
CL
16
PI LL=31, PI=14
24
SM
94/11*
PA +#4=6.8%, −#200=21.8%
CL
72*
UC 2.3 tsf
CL
75*
32*
PI UC LL=30, PI=10
1.0 tsf
CL
50*
UC 2.9 tsf
44*
SM
83*
SC
SM
81/11*

PA +#4=0%, −#200=70.5%

PA +#4=0.3%, −#200=46.9%

UC 1.5 tsf

UC 0.95 tsf

LEGEND

- Groundwater Level
- (PA) Grain Size Distribution Test
  +#4: Percentage Retained by #4
  −#200: Percentage Passed Through #200
- (PI) Atterberg Limits Test
  LL: Liquid Limit
  PI: Plasticity Index
- (C) Corrosion Test
- (UC) Unconfined Compression Test
  1.1 tsf: Unconfined Shear Strength of 1.1 tsf

Exploration No.
Soil Group Name
Inferred Change
Number of blows required to drive the Modified California (MC) Sampler 12 inches.
Number of blows required to drive the Standard Penetration Test (SPT) Sampler 12 inches.

"SB" TRACK

STATION 1054+00, 1055+00, 1056+00, 1057+00, 1058+00, 1059+00, 1060+00, 1061+00, 1062+00, 1063+00, 1064+00, 1065+00, 1066+00

Asphalt
USCS Lean Clay
USCS Silty Clay
USCS Silt
USCS Silty Sand
USCS Poorly Graded Sand with silt
USCS Clayey Sand
USCS Fat Clay
USCS Well-graded Sand with clay

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AERIAL GUIDEWAY BORING LOG & CPT PROFILE: Station 1054+00 to Station 1066+00

Figure No. 8

NORTHWEST

SOUTHEAST

Elevation (ft)

180 160 140 120 100 80 60 40 20 0 −20 −40

AS-24 (Projected 22' Left)
AS-22 (Projected 39' Left)
AS-25 (Projected 23' Right)
AS-26 (Projected 60' Left)
AS-94A (Projected 8' Left)
AS-28 (Projected 44' Left)
AS-27 (Projected 32' Right)
AS-48 (Projected 28' Right)

BENT 67 BENT 68 BENT 69 BENT 70 BENT 71 BENT 72 BENT 73 BENT 74

51* CL
10* CL-ML (TV)
12* (C)
15* CL (CR)
22* CH
22* CL
25* (PI) (UC) LL=37, PI=14, 1.46 tsf
29*
38* CH
36*
29 CL
33* SC
78* CH (UC) 1.5 tsf
SC
CL
50* (UC) 2.6 tsf
52* CH
65* CL
50/6 SC CL
84*
72*

27* CL
11*
6*
11*
14*
15* (PI) (UC) LL=31, PI=10, 0.66 tsf; (CR) (UC) 1.3 tsf; (PI) (UC) LL=39, PI=15, 1.1 tsf
20* (UC) 1.66 tsf
24*
32* (UC) 1.7 tsf
28*
28*
24* (PI) LL=34, PI=14
33* CL (PA) +#4=1%, −#200=55%
63*
56* CL
43* SM
64*

20* ASPHALT CL-ML (UC) 1.06 tsf; (PA) +#4=0%, −#200=31%
17* SC
6* CL-ML
27*
12* CL (UC) 1.44 tsf; (UC) 0.56 tsf
28* CH
23*
24* (UC) 1.18 tsf
23*
27* CL
25* SC
50* SW-SC (PA) +#4=32%, −#200=10%
44* CH
CL-ML
49* (PI) LL=26, PI=6
SW
45 CL
53*
45
50/5* SP
CL
60

LEGEND

Exploration No.
SP Soil Group Name
10
20* Inferred Change
50/6
Number of blows required to drive the Modified California (MC) Sampler 12 inches.
Number of blows required to drive the Standard Penetration Test (SPT) Sampler 12 inches;

- Groundwater Level
- (PA) Grain Size Distribution Test
  - +#4: Percentage Retained by #4
  - −#200: Percentage Passed Through #200
- (PI) Atterberg Limits Test
  - LL: Liquid Limit
  - PI: Plasticity Index
- (C) Corrosion Test
- (UC) Unconfined Compression Test
  - 1.1 tsf: Unconfined Shear Strength of 1.1 tsf

"SB" TRACK

STATION 1066+00 1067+00 1068+00 1069+00 1070+00 1071+00 1072+00 1073+00 1074+00 1075+00 1076+00 1077+00 1078+00

USCS Lean Clay | USCS Silty Clay | USCS Fat Clay | USCS Clayey Sand | USCS Silty Sand | Asphalt
USCS Well-graded Sand with clay | USCS Well-graded Sand | USCS Poorly Graded Sand

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AERIAL GUIDEWAY BORING LOG & CPT PROFILE: Station 1066+00 to Station 1078+00

Figure No. 9

NORTHWEST

SOUTHEAST

Elevation (ft)

AS-95A (Projected 12' Left)

AS-30 (Projected 12' Left)

AS-29 (Projected 0' Right)

AS-40 (Projected 18' Right)

BENT 75

ABUT 76

42* 17* 11* 18* 24* 23* 33* 36* 17 60 41* 43* REF 50/6* 53* 58 64* 77* 90/11*

ASPHALT
AB
CL-ML
CL
CH
CL
CH
SC
CL
SC
CL
SW
CL
GW
CL
CL
CL
CH
CL

PI UC LL=22, PI=2
0.6 tsf

C

CR UC 0.7 tsf

PI UC LL=44, PI=19
1.14 tsf

PA +#4=23% -#200=21%

UC 3.4 tsf

18* 15* 12* 8* 21* 13* 18* 29* 42* 18* 20* 69* 49* 37* 106/11* 47* 41*

ASPHALT
AB
CL
ML
CL
MH
SM
CL
CH
SM
CL
SM
CL

PA +#4=2%, -#200=52%

C

CR

PI UC LL=53, PI=24
1.96 tsf

PI UC LL=54, PI=31
1.3 tsf

LEGEND

Groundwater Level

PA Grain Size Distribution Test
+#4: Percentage Retained by #4
-#200: Percentage Passed Through #200

PI Atterberg Limits Test
LL: Liquid Limit
PI: Plasticity Index

C Corrosion Test

UC Unconfined Compression Test
1.1 tsf: Unconfined Shear Strength of 1.1 tsf

Exploration No.
Soil Group Name
Inferred Change
Number of blows required to drive the Modified California (MC) Sampler 12 inches.
Number of blows required to drive the Standard Penetration Test (SPT) Sampler 12 inches.

"SB" TRACK

STATION 1078+00 1079+00 1080+00 1081+00 1082+00 1083+00 1084+00 1085+00 1086+00 1087+00 1088+00 1089+00 1090+00

180 160 140 120 100 80 60 40 20 0 -20 -40

Asphalt
USCS Clayey Sand
USCS Well-graded Sand
USCS Well-graded Gravel
USCS Silty Clay
USCS Elastic Silt
USCS Silt
USCS Silty Sand
USCS Lean Clay
USCS Fat Clay

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SAN JOSE, CALIFORNIA

Project No.: 2017-125-GEO

Hor. Scale: 1" = 80' / Vert. Scale: 1" = 25'

AERIAL GUIDEWAY BORING LOG & CPT PROFILE: Station 1078+00 to Station 1090+00

Figure No. 10

APPENDIX IV

APPENDIX IV
LABORATORY TESTS

Classification Tests

The field classification of the samples was visually verified in the laboratory according to the Unified Soil Classification System. The results are presented on "Log of Test Borings", Appendix II.

Moisture-Density

The natural moisture contents were determined for selected undisturbed samples of the soils in accordance with American Standard Test Method (ASTM) D-2216 and dry unit weights were calculated based on natural moisture contents and total unit weights. This information was used to classify and correlate the soils. The results are presented on Plates IV-1A through 1Q, "Laboratory Test Summary ", Appendix IV.

Atterberg Limits Test

The Atterberg Limits were determined for selected samples of the fine-grained materials. These results were used to classify the soils, as well as to obtain an indication of the expansion potential with variations in moisture content. The Atterberg Limits were determined in accordance with ASTM D-4318. The results of the test are presented on Plates IV-2A through 2D, "Atterberg Limits Test", Appendix IV.

Grain Size Distribution Test

Grain size distribution tests (ASTM D-422) were performed on selected samples of granular soil to aid in the classification. The results are presented on Plates IV-3A through IV-3R, "Grain Size Distribution Tests", Appendix IV.

Unconfined Compression Test

Unconfined compression tests were performed on selected undisturbed samples using unconfined compression machine. Unconfined compression tests were performed in accordance with ASTM D 2166. The results are presented on Plates IV-4A through IV-4BP and Plates IV-4CA through 4FP, "Unconfined Compression Tests", Appendix IV.

Corrosion Test

Corrosion tests were performed on selected samples to determine the corrosion potential of the soils. The pH and minimum resistivity tests were performed according to California Test Method CT-643. Sulfate (California Test Method CT-417) and chloride (California Test Method CT-422) tests were performed by Sunland Analytical. The test results are presented on Plates IV-5A through IV-5AG, Appendix IV.

APPENDIX IV
LABORATORY TESTS

Consolidation Test

Consolidation tests were performed on selected samples to determine the consolidation potential of the soils. The consolidation test was performed according to ASTM D 2435. The test results are presented on Plates IV-6A through IV-6X, Appendix IV.

R-Value Test

R-Value tests were performed on selected samples to determine the R-Value. The R-Value test was performed according to California Test Method CT-301. The results are presented on Plates IV-7A through IV-7Z, Appendix IV.

LABORATORY TEST SUMMARY

Borehole	Sample Number	Depth	Classi-fication	Water Content	Dry Density	Liquid Limit	Plastic Limit	Plasticity Index	% > Sieve 4	% < Sieve 200	Unconfined Shear Strength (tsf)
AE-58	1	2.0	CL	20.0	107.7						1.02
AE-58	2	4.5	SM	23.0	107.2						
AE-58	3	9.5	SM	8.0	122.6						
AE-58	4	14.5	SM	8.0	-						
AE-58	5	19.5	SM	-	-						
AE-58	6	24.5	SM	22.0	-					43.0	
AE-58	7	30.0	CL	28.0	-						
AE-58	8	34.5	CL	29.0	-						
AG-18	1	2.0	CL	15.0	113.8						
AG-18	2	6.0	CL	19.0	108.5						
AG-18	3	9.5	SM	20.6	-				0.0	34.9	
AG-18	4	14.5	ML	26.9	96.7					74.2	
AG-18	5	19.5	CL	27.3	97.7						0.55
AG-18	6	24.5	CL	19.2	107.3						
AG-19	1	2.0	CL	13.8	118.6						
AG-19	2	6.0	CL	18.9	106.9						0.72
AG-19	3	9.5	CL	24.6	100.0						0.75
AG-19	4	14.5	ML	25.1	100.4					64.1	
AG-19	5	19.5	SM	19.4	109.4				0.0	32.6	
AG-19	6	24.5	CL	27.5	96.9						
AG-23	1	2.0	CL	20.4	106.5						
AG-23	2	6.0	CL	21.2	106.4	26	17	9			0.25
AG-23	3	9.5	SP-SM	23.0	96.6				0.0	5.0	
AG-23	4	14.5	CL	20.2	109.4						
AG-23	5	19.5	CL	19.2	114.6				2.2	63.0	
AG-23	6	24.5	CL	26.8	96.7						
AG-46	1	2.0	CL	19.6	86.7						
AG-46	2	6.0	CL	19.4	109.4						
AG-46	3	9.5	CL	26.0	100.6						
AG-46	4	14.5	CL	24.8	103.4						
AG-46	5	19.5	SM	17.3	117.4						
AG-46	6	24.5	CL	20.2	109.5						
AS-1	1	6.0	CL	23.0	102.7	45	20	25			
AS-1	2	11.0	CL	27.0	96.8	36	23	13			0.55
AS-1	3	16.0	CL	18.0	114.9						
AS-1	4	21.0	SC	14.0	-						
AS-1	5	26.0	CL	18.6	111.8						0.75
AS-1	-	31.0	CL	-	-						
AS-1	6	36.0	CL	27.6	94.3	31	21	10			0.5
AS-1	-	40.0	CL	-	-						
AS-1	7	46.0	CL	27.0	-						
AS-1	8	51.0	CL	17.6	114.7						
AS-1	9	56.0	CL	21.4	-						

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO: 2017-125-GEO | **PLATE NO: IV-1-A**

Borehole	Sample Number	Depth	Classi-fication	Water Content	Dry Density	Liquid Limit	Plastic Limit	Plasticity Index	% > Sieve 4	% < Sieve 200	Unconfined Shear Strength (tsf)
AS-1	10	60.5	SM	18.4	108.4				5.0	21.4	
AS-1	11	71.0	SC	25.6	99.1						
AS-1	12	81.0	CH	34.9	93.9						1
AS-1	13	90.0	SC	11.2	-						
AS-1	14	101.0	CL	9.1	115.8						
AS-1	15	110.0	CL	12.2	123.6						
AS-1	16	121.0	CL	18.7	110.7						
AS-11	1	3.0	CH	17.8	107.1						
AS-11	2	6.0	CH	19.5	104.3						1.47
AS-11	3	11.0	CL	28.2	89.4						
AS-11	4	16.0	CL	26.8	100.2						
AS-11	5	21.0	CL	28.8	94.2						0.35
AS-11	6	26.0	CL	24.1	103.6						
AS-11	7	31.0	CL	27.5	99.7						
AS-11	8	36.0	CL	19.9	110.9						
AS-11	9	41.0	CL	20.5	106.3	34	18	16			0.83
AS-11	10	46.0	CL	18.3	112.7						
AS-11	11	51.0	CL	20.9	103.8				4.2	63.6	
AS-11	12	56.0	CL	21.4	103.7						0.38
AS-11	13	61.0	CL	21.4	-						
AS-11	14	71.0	ML	21.8	-						
AS-11	15	81.0	CL	26.3	94.9						
AS-11	16	91.0	CL	13.8	110.4						
AS-11	17	101.0	SC	20.7	-						
AS-11	18	111.0	SP	17.6	-						
AS-11	19	121.0	CL	18.9	110.2						
AS-15	1	2.0	CL	21.0	104.2						
AS-15	2	6.0	CH	22.5	98.2						
AS-15	3	11.0	CL-ML	22.7	102.7						
AS-15	4	16.0	CH	32.0	93.1						
AS-15	5	21.0	CL	26.6	97.8						0.28
AS-15	6	26.0	CH	25.1	102.0						
AS-15	7	31.0	CL	25.9	96.2						0.2
AS-15	8	36.0	CL	23.1	98.4						
AS-15	9	40.5	CL	18.0	115.2						
AS-15	10	45.0	GC	15.4	-				53.8	23.6	
AS-15	11	51.0	GW	7.7	-				89.7	4.3	
AS-15	12	56.0	CL	26.5	99.2						
AS-15	13	61.0	CL	22.6	105.4						
AS-15	14	71.0	CL	24.4	97.7						
AS-15	15	81.0	CL	24.6	105.3						
AS-15	16	91.0	CL	21.5	105.7	35	18	17			1.12
AS-15	17	101.0	ML	22.6	108.6						

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EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO: 2017-125-GEO | **PLATE NO: IV-1-B**

Borehole	Sample Number	Depth	Classi-fication	Water Content	Dry Density	Liquid Limit	Plastic Limit	Plasticity Index	% > Sieve 4	% < Sieve 200	Unconfined Shear Strength (tsf)
AS-15	18	111.0	CH	23.5	101.9						
AS-15	19	121.0	CH	-	-						
AS-17	1	2.0	CL	18.5	108.8	38	20	18			2.3
AS-17	2	6.0	CH	21.4	102.5						1.15
AS-17	3	11.0	CL-ML	25.6	100.7						
AS-17	4	16.0	CL	34.0	90.7						
AS-17	5	21.0	CL	23.9	103.6						
AS-17	6	26.0	CH	25.6	99.9						
AS-17	7	31.0	CL	24.5	100.3	36	17	19			0.35
AS-17	8	36.0	CL	22.3	103.0						
AS-17	9	41.0	CL	22.8	103.3						
AS-17	10	46.0	CL-ML	19.7	109.8	23	18	5			0.43
AS-17	11	51.0	SM	12.6	133.5				15.9	25.6	
AS-17	12	56.0	CL	25.3	99.7						
AS-17	13	61.0	CH	19.6	107.9						
AS-17	14	71.0	ML	23.1	102.8						0.4
AS-17	15	81.0	CL	26.8	-	39	18	21			
AS-17	16	91.0	CH	21.8	105.2						
AS-17	17	101.0	CL	21.6	107.6						
AS-17	18	111.0	CL	18.7	110.4						1.4
AS-17	19	121.0	CL	21.7	106.3						
AS-2	1	2.0	SM	13.0	-						
AS-2	2	5.0	CL	20.0	106.1						
AS-2	3	10.0	CL	24.0	99.6						
AS-2	4	15.0	CL	29.0	95.7						
AS-2	5	20.0	CL	22.0	104.3						0.45
AS-2	6	25.0	CL	23.0	101.5	32	17	15	0.0	73.0	0.45
AS-2	7	30.0	ML	25.0	103.4						
AS-2	8	35.0	CL	26.0	-						
AS-2	9	40.0	SM	11.0	-						
AS-2	10	45.0	CL	23.0	-	39	16	23			
AS-2	11	50.0	SC	16.0	110.3						
AS-2	12	55.0	SC	14.0	122.3				7.0	24.0	
AS-2	13	60.0	CL	19.0	113.9						
AS-2	14	70.0	SC	14.0	122.3						
AS-2	15	80.0	CL	22.0	-						
AS-2	16	90.0	SM	18.0	-						
AS-2	17	100.0	CL	23.0	103.5						0.72
AS-24	1	2.0	CL	15.0	110.8						
AS-24	2	6.0	CL-ML	25.9	95.6						
AS-24	3	11.0	CL-ML	24.0	102.7						
AS-24	4	16.0	CL	26.5	96.7						
AS-24	5	21.0	CL	26.6	94.4						

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EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO: 2017-125-GEO | **PLATE NO: IV-1-C**

Borehole	Sample Number	Depth	Classi-fication	Water Content	Dry Density	Liquid Limit	Plastic Limit	Plasticity Index	% > Sieve 4	% < Sieve 200	Unconfined Shear Strength (tsf)
AS-24	6	26.0	CL	23.5	98.1						
AS-24	7	31.0	CL	25.3	98.9	37	23	14			0.73
AS-24	8	36.0	CL	27.7	96.1						
AS-24	9	41.0	CH	29.0	92.7						
AS-24	10	46.0	CH	24.9	99.0						
AS-24	11	51.0	CL	16.0	-						
AS-24	12	56.0	CH	27.8	94.8						0.75
AS-24	13	61.0	SC	10.2	135.1						
AS-24	14	71.0	CL	20.1	106.8						1.3
AS-24	15	81.0	CL	18.3	110.2						
AS-24	16	91.0	CH	23.4	104.3						
AS-24	17	100.5	SC	14.2	124.3						
AS-24	18	111.0	CL	23.5	99.8						
AS-24	19	121.0	CL	23.0	103.8						
AS-25	1	2.0	CL	15.0	114.0						
AS-25	2	5.0	CL	25.0	98.8						
AS-25	3	10.0	CL	24.0	101.1						
AS-25	4	15.0	CL	27.0	97.7	31	21	10			0.33
AS-25	5	20.0	CL	26.0	100.0						0.65
AS-25	6	25.0	CL	30.0	93.5	39	24	15			0.55
AS-25	7	30.0	CL	26.0	95.0						
AS-25	8	35.0	CL	30.0	93.5						0.83
AS-25	9	40.0	CL	27.0	96.8						
AS-25	10	45.0	CL	22.0	105.9						0.85
AS-25	11	50.0	CL	22.0	104.9						
AS-25	12	55.0	CL	22.0	104.3	34	20	14			
AS-25	13	60.0	CL	18.0	112.7				1.0	55.0	
AS-25	14	70.0	CL	9.0	-						
AS-25	15	80.0	CL	19.0	17.1						
AS-25	16	90.0	CL	21.0	16.8						
AS-25	17	100.0	SM	17.0	17.6						
AS-27	1	2.0	CL-ML	18.8	105.9						
AS-27	2	6.0	CL-ML	16.2	108.2						0.53
AS-27	3	11.0	SC	13.2	-				0.0	30.5	
AS-27	4	16.0	CL-ML	22.1	103.7						0.72
AS-27	5	21.0	CL	24.5	99.7						0.28
AS-27	6	26.0	CH	25.6	102.6						
AS-27	7	31.0	CH	32.3	89.4						0.59
AS-27	8	36.0	CH	25.6	98.1						
AS-27	9	41.0	CH	31.3	92.0						
AS-27	10	46.0	CL	21.4	106.0						
AS-27	11	51.0	SC	18.6	113.5						
AS-27	12	56.0	SW-SC	9.7	-				31.6	10.2	

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EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO: 2017-125-GEO | **PLATE NO: IV-1-D**

Borehole	Sample Number	Depth	Classi-fication	Water Content	Dry Density	Liquid Limit	Plastic Limit	Plasticity Index	% > Sieve 4	% < Sieve 200	Unconfined Shear Strength (tsf)
AS-27	13	61.0	CH	24.1	102.5						
AS-27	14	71.0	CL-ML	18.4	112.3	26	20	6			
AS-27	15	81.0	SW	10.4	-						
AS-27	16	91.0	CL	17.7	117.6						
AS-27	17	101.0	CL	17.0	-						
AS-27	18	110.5	SP	21.6	106.1						
AS-27	19	121.0	CL	20.3	106.6						
AS-29	1	2.0	CL-ML	15.0	115.1						
AS-29	2	6.0	ML	12.0	101.2	22	20	2			0.3
AS-29	3	11.0	ML	21.0	105.8						
AS-29	4	16.0	CL	28.0	94.0						0.35
AS-29	5	21.0	CH	18.0	111.7						
AS-29	6	26.0	CL	29.0	92.8	44	25	19			0.57
AS-29	7	31.0	CH	34.0	86.5						
AS-29	8	36.0	CH	27.0	96.2						
AS-29	9	41.0	CL	14.0	-				23.0	21.0	
AS-29	10	46.0	SC	12.0	-						
AS-29	11	51.0	CL	22.0	105.9						
AS-29	12	56.0	CL	22.0	104.9						
AS-29	13	60.0	SW	12.0	-						
AS-29	14	70.5	CL	14.0	125.1						
AS-29	15	81.0	CL	25.0	98.3						
AS-29	16	91.0	CL	18.0	-						
AS-29	17	101.0	CL	18.0	111.7						1.7
AS-29	18	111.0	CH	22.0	103.9						
AS-29	19	121.0	CL	20.0	106.1						
AS-3	1	2.0	CL	16.0	107.6						
AS-3	2	5.0	CL-ML	20.0	106.7	24	18	6			0.23
AS-3	3	10.0	CL	29.0	72.0						
AS-3	4	15.0	CL	29.0	95.3						0.4
AS-3	5	20.0	SM	21.0	105.2				0.0	14.0	
AS-3	6	25.0	CL	21.0	107.4						
AS-3	7	30.0	CL	20.0	109.3						
AS-3	8	35.0	CL	22.0	108.0	30	17	13			0.25
AS-3	9	40.0	SC	15.0	121.2				22.0	39.0	
AS-3	10	45.0	CL	24.0	101.1						0.53
AS-3	11	50.0	CL	23.0	103.5	32	14	18			0.45
AS-3	12	55.0	SM	16.0	115.3						
AS-3	13	60.0	SM	16.0	108.6						
AS-3	14	70.0	CL	23.0	104.1						
AS-3	15	80.0	CL	27.0	96.8						
AS-3	16	90.0	CL	25.0	98.8						1.6
AS-3	17	100.0	CL	18.0	110.6						

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EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO: 2017-125-GEO | **PLATE NO: IV-1-E**

Borehole	Sample Number	Depth	Classi-fication	Water Content	Dry Density	Liquid Limit	Plastic Limit	Plasticity Index	% > Sieve 4	% < Sieve 200	Unconfined Shear Strength (tsf)
AS-39	1	2.0	CL	20.0	102.9	32	19	13			
AS-39	2	6.0	CL	22.0	104.3						
AS-39	3	11.0	CL	24.0	102.2						
AS-39	4	16.0	CL	33.0	91.4						
AS-39	5	21.0	CL	27.0	96.2	42	25	17			0.66
AS-39	6	26.0	CL	27.0	99.8						
AS-39	7	31.0	CL	29.0	102.6						
AS-39	8	36.0	SC	15.0	120.1				11.0	32.0	
AS-39	9	41.0	SW	11.0	125.0						
AS-39	10	46.0	CL	27.0	97.2						
AS-39	11	51.0	CL	23.0	103.0						0.59
AS-39	12	56.0	CL	22.0	107.0						
AS-39	13	61.0	CL	16.0	117.4						
AS-39	14	71.0	GC	10.0	-				47.0	18.0	
AS-39	15	81.0	CL	18.0	-						
AS-39	16	91.0	SC	18.0	121.9						
AS-39	17	100.5	SW	18.0	115.4						
AS-39	18	111.0	CL	19.0	111.8						
AS-39	19	121.0	CL	20.0	111.9						
AS-4	1	2.0	CL	5.3	111.9						
AS-4	2	6.0	CL	15.4	114.1						1.73
AS-4	3	11.0	ML	25.7	97.6	36	25	11			
AS-4	4	16.0	CL	30.1	92.5						
AS-4	5	21.0	CH	26.0	100.0						
AS-4	6	26.0	CL	25.4	97.8						0.28
AS-4	7	31.0	CL	26.7	93.2						
AS-4	8	36.0	CL	21.3	-						
AS-4	9	41.0	SP-SM	21.0	107.4						
AS-4	10	46.0	CL	17.0	-						
AS-4	11	51.0	CL	16.1	119.2						
AS-4	12	56.0	CL	19.8	112.8						
AS-4	13	61.0	CL	24.2	-	40	18	22			
AS-4	14	71.0	ML	23.1	105.6						
AS-4	15	81.0	CL	22.5	102.9						0.83
AS-4	16	91.0	SC	22.4	101.2						
AS-4	17	101.0	SC	17.0	118.0						
AS-4	18	111.0	SC	13.4	124.3						
AS-4	19	121.0	CH	17.3	108.8						
AS-40	1	2.0	CL	22.0	104.9						
AS-40	2	5.0	ML	17.0	109.9						
AS-40	3	10.0	ML	20.0	109.8				2.0	52.0	
AS-40	4	14.5	CL	30.0	73.0						
AS-40	5	19.5	CL	19.0	113.9						

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EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO: 2017-125-GEO | **PLATE NO: IV-1-F**

Borehole	Sample Number	Depth	Classi-fication	Water Content	Dry Density	Liquid Limit	Plastic Limit	Plasticity Index	% > Sieve 4	% < Sieve 200	Unconfined Shear Strength (tsf)
AS-40	6	24.5	CL	28.0	98.4						
AS-40	7	29.5	MH	26.0	97.0	53	29	24			0.98
AS-40	8	34.5	MH	26.0	99.0						
AS-40	9	39.5	SM	11.0	-						
AS-40	10	44.0	CL	24.0	-						
AS-40	11	49.0	CH	27.0	96.8	54	23	31			0.65
AS-40	12	54.0	SM	17.0	114.8						
AS-40	13	59.0	CL	13.0	120.5						
AS-40	14	68.5	CL	18.0	114.9						
AS-40	15	78.5	SM	14.0	122.8						
AS-40	16	88.0	CL	21.0	105.2						
AS-40	17	97.5	CL	25.0	105.9						
AS-45	1	3.0	CH	14.6	112.8						
AS-45	2	6.0	CH	19.9	104.0						
AS-45	3	11.0	CL	20.8	106.4						
AS-45	4	16.0	CH	29.0	92.2						0.3
AS-45	5	21.0	SC	11.8	134.4				9.8	25.5	
AS-45	6	26.0	CH	22.3	103.4						
AS-45	7	31.0	SC	13.0	123.6				17.6	41.1	
AS-45	8	36.0	CL	26.0	-						
AS-45	9	41.0	CL	24.7	103.0						
AS-45	10	46.0	SC	9.6	148.2				39.0	21.3	
AS-45	11	51.0	CL	12.3	-						
AS-45	12	56.0	CL	21.7	105.7						
AS-45	13	61.0	CL	21.8	102.3						
AS-45	14	71.0	SC	11.9	128.0						
AS-45	15	81.0	CL	19.5	113.1						0.6
AS-45	16	91.0	CL	13.0	-						
AS-45	17	101.0	CL	16.7	114.0						
AS-45	18	110.5	CH	17.9	112.2						
AS-45	19	120.5	SC	12.7	120.6						
AS-5	1	2.0	CL	12.0	114.3						0.98
AS-5	2	5.0	CL	15.0	115.1						
AS-5	3	10.0	CL	24.0	90.9	32	22	10			
AS-5	4	15.0	CL	30.0	-						
AS-5	5	20.0	CL	24.0	102.2						0.63
AS-5	6	24.5	CL	23.0	104.1						
AS-5	7	29.5	SC	14.0	134.0				26.0	19.0	
AS-5	8	34.5	CL	20.0	113.5						
AS-5	9	39.5	CL	18.0	111.1						0.25
AS-5	10	44.5	CL	21.0	104.7						0.35
AS-5	11	49.5	CL	22.0	109.0	30	16	14			
AS-5	12	54.0	SM	20.0	109.8						

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EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO: 2017-125-GEO | **PLATE NO: IV-1-G**

Borehole	Sample Number	Depth	Classi-fication	Water Content	Dry Density	Liquid Limit	Plastic Limit	Plasticity Index	% > Sieve 4	% < Sieve 200	Unconfined Shear Strength (tsf)
AS-5	13	59.0	SM	9.0	142.5						
AS-5	14	68.5	CL	17.0	113.7						
AS-5	15	78.5	CL	22.0	-						
AS-5	16	88.0	SC	19.0	114.5						
AS-5	17	97.5	CL	19.0	111.8						
AS-65	1	6.0	CL	14.3	104.2	27	18	9			
AS-65	2	11.0	CL	20.6	-						
AS-65	3	16.0	CL	29.5	89.2						
AS-65	4	21.0	CL	28.0	-						
AS-65	5	26.0	CL	21.9	102.9						1.1
AS-65	6	31.0	CL	20.3	-						
AS-65	7	36.0	CL	23.3	-						
AS-65	8	41.0	CL	15.5	-						
AS-66	1	6.0	CL	15.1	112.1						0.8
AS-66	2	11.0	CL	18.1	-	27	15	12			
AS-66	3	16.0	ML	22.7	-				0.3	81.4	
AS-66	4	21.0	SM	20.1	-						
AS-66	5	26.0	CL	30.5	92.4						0.7
AS-66	6	31.0	CL	32.5	89.2						
AS-66	7	36.0	CL	25.1	-						
AS-66	8	41.0	SM	13.6	-				32.5	16.2	
AS-68	1	6.0	CL	22.9	100.7	43	23	20			1.45
AS-68	2	11.0	CL	29.1	96.9						
AS-68	3	16.0	CL	29.0	93.7	37	23	14			0.44
AS-68	4	21.0	CL	-	-						
AS-68	5	26.0	CH	24.7	99.8						1.23
AS-68	6	31.0	CL	25.1	-						
AS-68	7	36.0	SM	18.4	108.4				0.2	31.2	
AS-68	8	41.0	CL	20.0	-						
AS-68	9	46.0	SC	21.6	109.3				2.4	41.5	
AS-68	10	51.0	CL	19.2	-						
AS-68	11	56.0	CL	22.1	102.5	31	17	14			0.4
AS-68	12	61.0	CL	26.5	97.8						
AS-68	13	66.0	ML	25.8	98.3				1.5	85.7	
AS-68	14	71.0	CL	22.3	106.8						
AS-68	15	76.0	CL	21.8	104.0						1.22
AS-68	16	81.0	CL	21.7	104.8						0.92
AS-68	17	91.0	CL	26.0	97.9						1.28
AS-68	18	101.0	ML	32.5	97.3				0.0	71.5	
AS-68	19	111.0	CH	30.1	91.6						1.37
AS-68	20	121.0	CL-ML	19.2	109.2						
AS-68	21	131.0	CL	24.7	101.7						
AS-68	22	141.0	CL-ML	25.5	99.4						1

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EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO: 2017-125-GEO | **PLATE NO: IV-1-H**

Borehole	Sample Number	Depth	Classi-fication	Water Content	Dry Density	Liquid Limit	Plastic Limit	Plasticity Index	% > Sieve 4	% < Sieve 200	Unconfined Shear Strength (tsf)
AS-68	23	151.0	CL	19.5	108.5						
AS-7	1	2.0	CL	17.0	111.0						
AS-7	2	5.0	CL	20.0	108.8	2	18	NP			1.75
AS-7	3	10.0	CL	20.0	98.7						
AS-7	4	14.5	CL	33.0	88.0	39	24	15			0.28
AS-7	5	20.0	CL	28.0	95.0						1.08
AS-7	6	24.5	CL	25.0	100.3						
AS-7	7	29.5	CL	18.0	113.3						
AS-7	8	34.5	CL	19.0	114.5				11.0	57.0	
AS-7	9	39.5	CL	16.0	112.5				5.0	32.0	
AS-7	10	44.0	CL	27.0	95.7						
AS-7	11	49.0	CL	19.0	115.5						
AS-7	12	54.0	CL	17.0	116.4						
AS-7	13	59.0	GP-GM	9.0	-				82.0	8.0	
AS-7	14	68.5	SM	21.0	105.2				0.0	29.0	
AS-7	15	78.5	CL	24.0	103.7						
AS-7	16	88.0	CL	27.0	97.7						
AS-7	17	97.5	CL	20.0	112.5						
AS-70	1	6.0	CL	21.8	104.8	42	18	24			1.57
AS-70	2	11.0	SM	26.4	95.3						
AS-70	3	16.0	CH	30.6	91.3						0.42
AS-70	4	21.0	CH	30.0	94.2						
AS-70	5	26.0	CH	29.5	-						
AS-70	6	31.0	CL	22.8	102.4						0.86
AS-70	7	36.0	CL	19.7	107.1						
AS-70	8	41.0	CL	22.0	-						
AS-70	9	46.0	CL	17.9	111.4						1.34
AS-70	10	51.0	CL	21.7	102.9						
AS-70	11	56.0	CL	17.9	110.5						0.65
AS-70	12	61.0	SM	14.3	-				3.3	31.6	
AS-70	13	66.0	CH	24.1	100.1						
AS-70	14	71.0	SM	20.7	109.4						
AS-70	15	76.0	SM	23.6	-				0.3	45.3	
AS-70	16	81.0	CL	20.9	105.2						0.78
AS-70	17	91.0	CL	23.5	102.5						
AS-70	18	101.0	SW-SM	12.1	-				19.3	12.0	
AS-70	19	111.0	CH	23.6	101.9						1.47
AS-70	20	121.0	CL	21.4	107.2						
AS-70	21	131.0	ML	21.8	104.6						1.56
AS-70	22	141.0	ML	26.4	-						
AS-70	23	151.0	GC	17.7	111.9						
AS-72	1	6.0	-	18.2	108.2						1.76
AS-72	2	11.0	-	22.2	-						

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EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO: 2017-125-GEO | **PLATE NO: IV-1-I**

Borehole	Sample Number	Depth	Classi-fication	Water Content	Dry Density	Liquid Limit	Plastic Limit	Plasticity Index	% > Sieve 4	% < Sieve 200	Unconfined Shear Strength (tsf)
AS-72	3	16.0	-	31.3	95.6						
AS-72	4	21.0	-	36.2	93.0						
AS-72	5	26.0	-	25.6	99.7						0.77
AS-72	6	31.0	-	23.7	99.6						
AS-72	7	36.0	-	21.8	-						
AS-72	8	41.0	-	11.3	-				27.1	17.6	
AS-72	9	46.0	-	15.6	-						
AS-72	10	51.0	-	18.3	110.1						1.12
AS-72	11	56.0	-	13.1	-				29.3	17.2	
AS-72	12	61.0	-	18.2	-				15.1	26.6	
AS-72	13	71.0	-	18.9	109.1						0.8
AS-72	14	81.0	-	18.3	117.7						
AS-72	15	91.0	-	21.7	105.6						0.81
AS-72	16	101.0	-	20.5	110.4						
AS-72	17	111.0	ML	22.9	-	NP	NP	NP		66.9	
AS-72	18	120.0	-	-	-						
AS-72	19	131.0	-	18.8	109.3						1.87
AS-72	20	141.0	-	21.2	113.6					66.4	
AS-72	21	149.0	-	26.9	-						
AS-74	1	6.0	CL	24.1	102.6						1.53
AS-74	2	11.0	SM	27.7	100.0					27.4	
AS-74	3	16.0	CL	26.8	97.6	37	20	17			0.53
AS-74	4	21.0	ML	39.4	91.4	33	24	9			
AS-74	5	26.0	CL	36.5	93.6						0.77
AS-74	6	31.0	CH	24.9	94.9	56	23	33			0.34
AS-74	7	36.0	CL	23.0	98.0						
AS-74	8	41.0	CL	23.8	102.2	30	15	15			0.57
AS-74	9	46.0	CL	21.1	104.0						
AS-74	10	51.0	CL	23.7	101.6						0.97
AS-74	11	56.0	CL	20.3	105.8						
AS-74	12	61.0	CL	18.1	105.8				0.8	56.0	
AS-74	13	66.0	CL	16.6	125.2						
AS-74	14	71.0	SM	19.9	105.0						
AS-74	15	76.0	CL	22.9	100.9						1.0
AS-74	16	81.0	CL	19.3	108.3						
AS-74	17	91.0	ML	25.0	101.2						0.84
AS-74	18	101.0	CL	20.7	108.7						1.23
AS-74	19	111.0	CL	22.6	103.5	33	20	13			1.95
AS-74	20	121.0	SW-SM	16.9	-				18.7	11.9	
AS-74	21	131.0	CL-ML	22.8	-						
AS-74	22	140.5	SP-SM	16.3	-						
AS-74	23	151.0	CL	27.5	95.0						
AS-76	1	6.0	CL	24.0	100.0	34	14	20			0.82

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT

SAN JOSE, CALIFORNIA

JOB NO: 2017-125-GEO | **PLATE NO: IV-1-J**

Borehole	Sample Number	Depth	Classi-fication	Water Content	Dry Density	Liquid Limit	Plastic Limit	Plasticity Index	% > Sieve 4	% < Sieve 200	Unconfined Shear Strength (tsf)
AS-76	2	11.0	SM	23.5	105.7				0.0	49.6	
AS-76	3	16.0	SC	19.8	110.6				0.0	47.2	
AS-76	4	21.0	SC	17.5	-				0.0	43.3	
AS-76	5	26.0	CL	27.9	96.2						0.6
AS-76	6	31.0	CL	24.5	98.5						
AS-76	7	36.0	CL	24.0	102.6	37	19	18			
AS-76	8	41.0	CL	22.5	100.7						0.26
AS-76	9	46.0	CL	22.7	102.7						0.65
AS-76	10	51.0	CL	21.2	108.8						
AS-76	11	56.0	SC	17.9	-				8.4	35.1	
AS-76	12	61.0	CL	22.1	103.8						0.46
AS-76	13	66.0	CL	19.8	108.6						
AS-76	14	71.0	SM	16.4	-						
AS-76	15	76.0	CL	19.1	108.9						1.19
AS-76	16	81.0	CL	23.1	102.8						
AS-76	17	91.0	CL	24.2	-				0.1	59.7	
AS-76	18	101.0	ML	23.7	-	NP	NP	NP			
AS-76	19	111.0	CL	20.0	106.3						
AS-76	20	121.0	ML	17.6	112.8					71.5	1.12
AS-76	21	131.0	CL	20.7	107.0						
AS-76	22	141.0	SC	23.2	-						
AS-76	23	151.0	ML	18.2	-				0.0	70.4	
AS-78	1	6.0	CL	19.9	104.8	33	18	15			0.81
AS-78	2	11.0	CL	29.9	93.0						0.4
AS-78	3	16.0	SP	17.7	107.3				1.3	1.0	
AS-78	4	21.0	CL	30.1	92.4	46	26	20			0.57
AS-78	5	26.0	CL	30.0	87.5						
AS-78	6	31.0	ML	32.3	87.3	43	26	17			0.35
AS-78	7	36.0	CL	25.9	95.4						0.85
AS-78	8	41.0	CL	22.4	114.3						0.34
AS-78	9	46.0	CL	21.7	104.4						0.59
AS-78	10	51.0	CL	20.2	91.7						
AS-78	11	56.0	CL	19.9	-						
AS-78	12	61.0	CL	19.0	107.9						
AS-78	13	66.0	CL	22.5	102.0						0.75
AS-78	14	71.0	CL	17.6	109.2						
AS-78	15	76.0	CL	17.2	112.8						1.4
AS-78	16	81.0	CL	22.4	-						
AS-78	17	91.0	CL	21.2	105.4	36	19	17			0.96
AS-78	18	101.0	CL	20.1	121.9						
AS-78	19	110.5	SW-SM	8.2	-				39.0	8.9	
AS-78	20	121.0	CL	16.9	106.4						1.79
AS-78	21	131.0	CL	15.6	-						

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EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO: 2017-125-GEO | **PLATE NO: IV-1-K**

Borehole	Sample Number	Depth	Classi-fication	Water Content	Dry Density	Liquid Limit	Plastic Limit	Plasticity Index	% > Sieve 4	% < Sieve 200	Unconfined Shear Strength (tsf)
AS-78	22	140.5	SM	21.1	-						
AS-78	23	151.0	SM	9.3	-						
AS-80	1	6.0	CL	23.0	100.6	32	18	14			0.62
AS-80	2	11.0	CL-ML	32.5	89.5						0.42
AS-80	3	16.0	SC	18.3	115.6				0.6	44.2	
AS-80	4	21.0	ML	25.0	97.6	NP	NP	NP			
AS-80	5	26.0	ML	23.3	100.9						
AS-80	6	31.0	CH	26.3	97.7						0.96
AS-80	7	36.0	CL	29.1	91.6	37	20	17			0.36
AS-80	8	41.0	CL	25.7	97.4						
AS-80	9	46.0	CL	12.8	110.7						0.53
AS-80	10	51.0	CL	24.7	99.1						0.71
AS-80	11	56.0	CL	-	-						
AS-80	12	61.0	CL	18.4	109.4						0.84
AS-80	13	66.0	CL	21.2	100.8						
AS-80	14	71.0	CL	16.2	-						
AS-80	15	76.0	SM	17.7	-						
AS-80	16	81.0	CL	16.8	-						
AS-80	17	86.0	CL	24.0	102.1						1.12
AS-80	18	91.0	CL	20.7	105.8						
AS-80	19	101.0	ML	20.1	108.2						
AS-80	20	111.0	SP-SM	19.5	103.9				0.0	6.5	
AS-80	21	121.0	CL/CH	18.5	112.2						
AS-80	22	131.0	CL/CH	20.9	-						
AS-80	23	141.0	ML	17.4	117.1						
AS-80	24	150.0	SP	8.1	-						
AS-82	1	6.0	CL	23.2	102.7	30	20	10			0.38
AS-82	2	11.0	CL	30.2	94.6						
AS-82	3	16.0	CL	24.5	99.7						0.38
AS-82	4	21.0	CL	24.3	106.0						
AS-82	5	26.0	CL/CH	30.7	91.9	41	26	15			0.65
AS-82	6	31.0	CL/CH	26.5	103.7						
AS-82	7	36.0	CH	30.4	89.3	53	20	33			0.76
AS-82	8	41.0	CL	22.1	108.8						
AS-82	9	46.0	CL	27.0	95.5						0.32
AS-82	10	51.0	CL	27.7	93.9						0.20
AS-82	11	56.0	CL	23.8	100.7						
AS-82	12	61.0	CL	19.6	117.5						
AS-82	13	66.0	CL	24.3	99.8						0.49
AS-82	14	71.0	CL	19.8	107.5						
AS-82	15B	76.0	ML	19.3	110.6				0.0	53.8	
AS-82	15A	76.3	SM	12.3	117.5				13.8	18.1	
AS-82	16	81.0	CL/CH	22.2	105.9						0.44

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT

SAN JOSE, CALIFORNIA

JOB NO: 2017-125-GEO | **PLATE NO: IV-1-L**

Borehole	Sample Number	Depth	Classi-fication	Water Content	Dry Density	Liquid Limit	Plastic Limit	Plasticity Index	% > Sieve 4	% < Sieve 200	Unconfined Shear Strength (tsf)
AS-82	17	91.0	ML	20.7	108.4						1.49
AS-82	18	101.0	CH	25.1	96.6						1.2
AS-82	19	111.0	CH	26.3	95.4						
AS-82	20	121.0	ML	20.4	113.7	NP	NP	NP			
AS-82	21	131.0	SM	19.9	-						
AS-82	22	141.0	SM	13.0	-						
AS-82	23	151.0	CL	18.8	116.4						
AS-84	1	6.0	CL	12.9	-						
AS-84	2	11.0	CL	29.4	-						
AS-84	3	16.0	ML	22.2	108.2					90.0	
AS-84	4	21.0	ML	19.8	109.9					74.2	
AS-84	5	26.0	CL-ML	26.3	98.5	NP	NP	NP			0.63
AS-84	6	31.0	CL	24.6	97.4	44	25	19			0.79
AS-84	7	36.0	CH	29.1	93.0						
AS-84	8	41.0	CL	22.5	103.1						0.72
AS-84	9	46.0	CL	23.0	108.7						
AS-84	10	51.0	CL	19.9	107.3						0.89
AS-84	11	56.0	SM	14.0	-						
AS-84	12	61.0	CL	21.6	103.9						
AS-84	13	66.0	CL	21.3	104.5						0.67
AS-84	14	71.0	CL	30.1	93.5						
AS-84	15	76.0	SC	19.2	110.9					46.4	
AS-84	16	81.0	CL	23.2	102.7						1.25
AS-84	17	91.0	SM	17.2	115.4					51.2	
AS-84	18	101.0	CH	29.3	93.3						1.38
AS-84	19	111.0	CL	16.6	116.6						1.35
AS-84	20	120.5	SM	18.1	115.6				1.2	12.7	
AS-84	21	131.0	SM	22.1	-						
AS-84	22	140.0	GC	10.8	-				50.9	15.8	
AS-84	23	151.0	SP-SM	22.3	102.7						
AS-86	1	6.0	CL	19.2	106.3	28	17	11			0.38
AS-86	2	11.0	CL-ML	25.7	100.7						
AS-86	3	16.0	CL	22.7	101.5						0.32
AS-86	4	21.0	CL	20.0	-						
AS-86	5	26.0	CL	28.1	96.9						
AS-86	6	31.0	CL	29.3	92.1						
AS-86	7	36.0	CL	28.3	94.7	43	25	18			0.67
AS-86	8	41.0	CL	26.0	102.8						
AS-86	9	46.0	CL	20.4	110.0						
AS-86	10	51.0	ML	23.4	104.8				0.0	52.3	
AS-86	11	56.0	SM	20.3	-						
AS-86	12	61.0	CL	22.2	103.2						0.82
AS-86	13	66.0	SP-SM	15.6	112.9				15.5	10.7	

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EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO: 2017-125-GEO | **PLATE NO: IV-1-M**

Borehole	Sample Number	Depth	Classi-fication	Water Content	Dry Density	Liquid Limit	Plastic Limit	Plasticity Index	% > Sieve 4	% < Sieve 200	Unconfined Shear Strength (tsf)
AS-86	14	71.0	CL	25.0	-						
AS-86	15	76.0	SM	17.3	110.5						
AS-86	16	81.0	CL	18.6	112.3						
AS-86	17	91.0	ML	22.1	103.5	NP	NP	NP			0.65
AS-86	18	101.0	SC	18.8	113.3				0.0	48.1	
AS-86	19	111.0	CL	17.4	112.6						1.36
AS-86	20	121.0	CL	17.5	115.1						
AS-86	21	131.0	SM	19.2	-				2.0	21.7	
AS-86	22	141.0	CL	6.6	-						
AS-86	23	151.0	CL-ML	20.5	109.8						
AS-88	1	6.0	CL	16.2	-						
AS-88	2	11.0	ML	21.6	107.6				0.0	70.5	
AS-88	3	16.0	SM	22.6	106.1				0.3	46.9	
AS-88	4	21.0	CL	28.9	94.5						0.76
AS-88	5	26.0	ML	26.3	97.4						0.47
AS-88	6	31.0	CH	29.4	93.9						0.88
AS-88	7	36.0	CH	27.2	95.8	53	28	25			0.97
AS-88	8	41.0	CH	26.4	100.4						
AS-88	9	46.0	SC	15.0	114.3				13.1	36.8	
AS-88	10	51.0	SW-SC	13.8	-				11.3	11.1	
AS-88	11	56.0	SP-SM	19.4	110.1				2.3	10.2	
AS-88	12	61.0	CL	20.7	-						
AS-88	13	66.0	SM	10.5	-						
AS-88	14	71.0	CL	23.4	-	31	17	14			
AS-88	15	76.0	CL	21.3	-						
AS-88	16	81.0	SM	13.6	125.7				6.8	21.8	
AS-88	17	91.0	CL	17.8	112.5						1.17
AS-88	18	101.0	CL	20.3	106.9						
AS-88	19	111.0	CL	21.7	100.9	30	20	10			0.52
AS-88	20	121.0	CL	18.4	112.9						1.45
AS-88	21	131.0	CL	20.7	107.0						2.01
AS-88	22	141.0	SM	22.1	105.7						
AS-88	23	151.0	SM	15.9	116.6						
BF-64	1	3.0	CH	21.0	78.4	57	27	30			
BF-64	2	5.0	CL	21.0	83.1	41	24	17			
BF-64	3	10.0	CL	19.0	85.0	30	19	11			
BF-64	4	14.5	CL	28.0	75.1						0.75
BF-64	5	19.0	CL	32.0	67.5						0.58
BF-64	6	24.0	CL	29.0	75.0						
BF-64	7	28.5	CL	19.0	92.0						
BF-64	8	33.5	CL	11.0	-						
P-34	1	2.0	CL	22.0	102.8	35	20	15			
P-34	2	3.0	ML	11.0	95.2						

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EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO: 2017-125-GEO | **PLATE NO: IV-1-N**

Borehole	Sample Number	Depth	Classi-fication	Water Content	Dry Density	Liquid Limit	Plastic Limit	Plasticity Index	% > Sieve 4	% < Sieve 200	Unconfined Shear Strength (tsf)
P-34	3	11.0	ML	17.0	111.0						
P-34	4	16.0	ML	24.0	99.6						
P-35	1	2.0	CL	24.0	97.6						
P-35	2	6.0	CL	21.0	108.9						
P-35	3	11.0	ML	19.0	106.5						
P-35	4	16.0	ML	24.0	105.7						
PS-21	1	2.0	CL	21.2	104.4						
PS-21	2	6.0	CL	23.4	102.5	34	22	12			
PS-21	3	9.5	CL	28.9	94.6						0.45
PS-21	4	14.5	CL	17.4	113.5						0.63
PS-21	5	19.5	CL	38.8	89.3				0.0	93.5	
PS-21	6	24.5	SM	19.6	107.7						
PS-47	1	2.0	CL	28.1	92.0						
PS-47	2	6.0	CL	25.1	98.1						
PS-47	3	9.5	CL	30.3	90.4						
PS-47	4	14.5	CL	24.3	100.6						
PS-47	5	19.5	CL	17.6	120.2						
PS-47	6	24.5	CL	19.7	111.6						
PS-59	1	2.0	SM	4.0	-						
PS-59	2	4.5	CL	22.0	103.9						
PS-59	3	9.5	CL	33.0	90.0	38	24	14			0.35
PS-59	4	14.5	SM	20.0	108.8				0.0	47.0	
PS-59	5	19.5	CL	30.0	93.5						0.63
PS-63	1	3.0	CL	19.0	106.5						
PS-63	2	6.0	CL	17.0	113.2						
PS-63	3	9.5	CL	36.0	87.1						
PS-63	4	14.5	CL	29.0	94.7	46	23	23			0.52
PS-63	5	19.5	CL	28.0	96.5						0.52
PS-63	6	24.5	CL	29.0	94.3						0.55
PS-63	8	29.5	CL	19.0	111.8						
PS-63	7	34.5	ML	19.0	110.8				6.0	6.0	
PS-63	9	39.5	CL	24.0	103.7						
R-36	1	2.0	CL	18.0	112.2						0.72
R-36	2	6.0	CH	20.0	96.6						
R-36	3	11.0	CL	20.0	108.8						
R-36	4	16.0	CL	36.0	86.6						0.46
R-36	5	21.0	CH	34.0	90.7						
R-36	6	26.0	CL	29.0	96.2						
R-37	1	2.0	CL	24.0	105.2	33	19	14			1.36
R-37	2	6.0	CL	20.0	107.2						
R-37	3	11.0	ML	20.0	104.5						0.47
R-37	4	16.0	CL	33.0	88.0						0.49
R-37	5	21.0	CL	30.0	93.5						

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT

SAN JOSE, CALIFORNIA

JOB NO: 2017-125-GEO | **PLATE NO: IV-1-0**

Borehole	Sample Number	Depth	Classi-fication	Water Content	Dry Density	Liquid Limit	Plastic Limit	Plasticity Index	% > Sieve 4	% < Sieve 200	Unconfined Shear Strength (tsf)
R-37	6	26.0	CL	27.0	101.7						
R-38	1	2.0	CL	24.0	105.2						1.4
R-38	2	6.0	CL	20.0	107.2						
R-38	3	11.0	CL	20.0	104.5						0.31
R-38	4	16.0	SM	33.0	88.0					44.0	
R-38	5	21.0	ML	30.0	93.5						
R-38	6	26.0	CL	27.0	101.7						0.49
RW-49	1	2.5	CL	16.0	109.2						1.13
RW-49	2	5.0	CL	16.0	101.6						
RW-49	3	10.0	CL	21.0	106.3						
RW-49	4	15.0	CL	30.0	93.1	44	26	18			0.63
RW-49	5	20.0	CL	20.0	109.3						1.55
RW-50	1	3.0	CL	25.0	99.8						0.7
RW-50	2	6.0	SC	25.0	98.8						
RW-50	3	9.5	CL	23.0	105.6				0.0	71.0	
RW-50	4	14.5	ML	18.0	117.0				0.0	54.0	
RW-50	5	19.5	CL	29.0	94.3						
RW-51	1	3.0	CL	26.0	98.0	35	21	14			0.25
RW-51	2	6.0	SC	27.0	98.7						
RW-51	3	9.5	CL	36.0	85.2						0.35
RW-51	4	14.5	ML	19.0	112.4				0.0	52.0	
RW-51	5	19.5	CL	31.0	92.4						0.43
T-31	1	2.0	CL	16.0	115.3						
T-31	2	6.0	CL	19.0	110.8	26	18	8			0.64
T-31	3	11.0	SM	20.0	108.8						
T-32	1	2.0	CL	14.0	115.0						
T-32	2	6.0	CL	15.0	103.5						
T-32	3	11.0	ML	22.0	107.5						
T-32	4	16.0	CL	30.0	93.5	37	24	13			0.62
T-32	5	21.0	CL	33.0	89.5						0.66
T-32	6	27.0	CL	32.0	90.2						0.35
T-33	1	2.0	CL	23.0	108.7						
T-33	2	6.0	CL	18.0	109.5						
T-33	3	10.0	ML	23.0	106.6						
T-33	4	11.0	CL	28.0	99.0						
T-33	5	16.0	CL	33.0	89.5						
T-33	6	21.0	CL	29.0	95.3						0.56
T-33	7	27.5	CH	29.0	98.2						
TE-53	1	2.0	CL	20.0	106.1						
TE-53	2	4.5	CL	20.0	105.6						
TE-53	3	9.5	ML	24.0	105.2				4.0	85.0	
TE-53	4	14.5	CL	31.0	92.4						0.33
TE-53	5	19.5	CL	25.0	100.3						

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EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO: 2017-125-GEO | **PLATE NO: IV-1-P**

Borehole	Sample Number	Depth	Classi-fication	Water Content	Dry Density	Liquid Limit	Plastic Limit	Plasticity Index	% > Sieve 4	% < Sieve 200	Unconfined Shear Strength (tsf)
TE-54	1	2.0	CL	12.0	-						
TE-54	2	4.5	ML	18.0	116.5						
TE-54	3	9.5	ML	25.0	101.4				1.0	76.0	
TE-54	4	14.5	SP-SM	23.0	100.4				0.0	11.0	
TE-54	5	19.5	CL	25.0	102.4						0.4
TE-55	1	2.0	CL	21.0	105.2						
TE-55	2	4.5	CL	23.0	104.1	33	21	12			0.8
TE-55	3	9.5	CL	26.0	102.5						
TE-55	4	14.5	CL	22.0	105.9						0.6
TE-55	5	19.5	CL	20.0	113.0						
TE-56	1	3.0	CL	23.0	104.1	33	18	15			0.4
TE-56	2	6.0	SM	24.0	102.2						
TE-56	3	9.5	ML	25.0	101.8				0.0	89.0	
TE-56	4	14.5	CL-ML	22.0	106.5				0.0	80.0	0.4
TE-56	5	20.0	SM	16.0	117.4				0.0	46.0	

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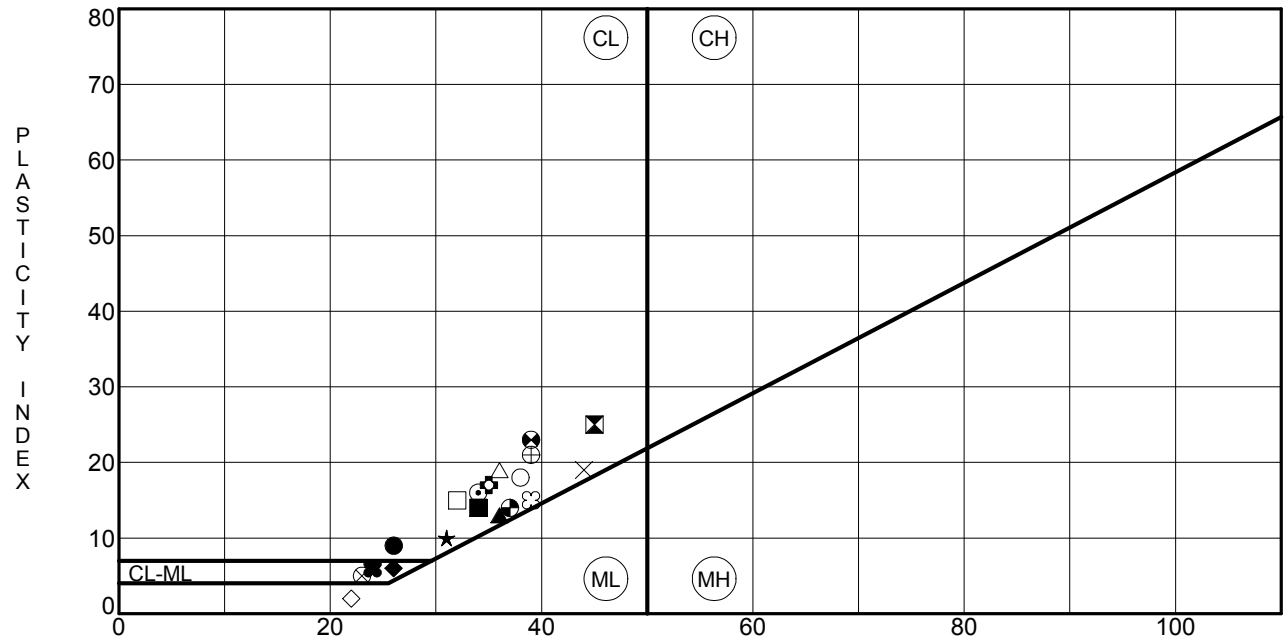
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO: 2017-125-GEO | **PLATE NO: IV-1-Q**

ATTERBERG LIMITS TEST



PLASTICITY

	BOREHOLE	SAMPLE #	DEPTH	LL	PL	PI	Fines	Classification
●	AG-23	2	6.0	26	17	9		Lean CLAY with SAND
⊠	AS-1	1	6.0	45	20	25		Lean CLAY
▲	AS-1	2	11.0	36	23	13		Lean CLAY
★	AS-1	6	36.0	31	21	10		Lean CLAY
⊙	AS-11	9	41.0	34	18	16		Lean CLAY
✿	AS-15	16	91.0	35	18	17		Lean CLAY
○	AS-17	1	2.0	38	20	18		Lean CLAY
△	AS-17	7	31.0	36	17	19		Lean CLAY
⊗	AS-17	10	46.0	23	18	5		SILTY CLAY
⊕	AS-17	15	81.0	39	18	21		Lean CLAY
□	AS-2	6	25.0	32	17	15	73	Lean CLAY with SAND
⊛	AS-2	10	45.0	39	16	23		Lean CLAY with SAND
◕	AS-24	7	31.0	37	23	14		Lean CLAY
☆	AS-25	4	15.0	31	21	10		Lean CLAY with SAND
⊠	AS-25	6	25.0	39	24	15		Lean CLAY with SAND
■	AS-25	12	55.0	34	20	14		Lean CLAY with SAND
◆	AS-27	14	71.0	26	20	6		SILTY CLAY
◇	AS-29	2	6.0	22	20	2		SANDY SILT
×	AS-29	6	26.0	44	25	19		Lean CLAY
✖	AS-3	2	5.0	24	18	6		SILTY CLAY

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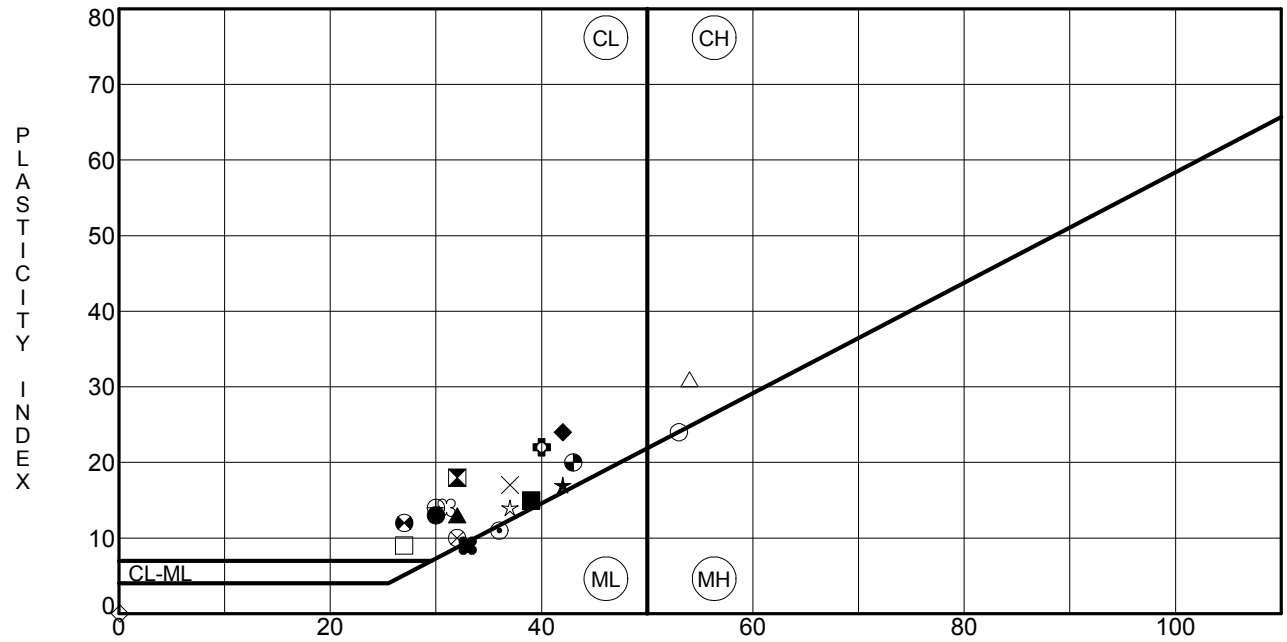
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO: 2017-125-GEO | PLATE NO: IV-2-A



PLASTICITY

	BOREHOLE	SAMPLE #	DEPTH	LL	PL	PI	Fines	Classification
●	AS-3	8	35.0	30	17	13		Lean CLAY with SAND
⊠	AS-3	11	50.0	32	14	18		Lean CLAY with SAND
▲	AS-39	1	2.0	32	19	13		Lean CLAY
★	AS-39	5	21.0	42	25	17		Lean CLAY
⊙	AS-4	3	11.0	36	25	11		SILT
✿	AS-4	13	61.0	40	18	22		Lean CLAY
○	AS-40	7	29.5	53	29	24		Elastic SILT
△	AS-40	11	49.0	54	23	31		Fat CLAY
⊗	AS-5	3	10.0	32	22	10		Lean CLAY with SAND
⊕	AS-5	11	49.5	30	16	14		Lean CLAY with SAND
□	AS-65	1	6.0	27	18	9		Lean CLAY with SAND
⊛	AS-66	2	11.0	27	15	12		Lean CLAY with SAND
◕	AS-68	1	6.0	43	23	20		Lean CLAY
☆	AS-68	3	16.0	37	23	14		Lean CLAY
⊠	AS-68	11	56.0	31	17	14		SANDY lean CLAY
■	AS-7	4	14.5	39	24	15		Lean CLAY with SAND
◆	AS-70	1	6.0	42	18	24		Lean CLAY
◇	AS-72	17	111.0	NP	NP	NP	67	SANDY SILT
⊗	AS-74	3	16.0	37	20	17		Lean CLAY
✖	AS-74	4	21.0	33	24	9		SILT

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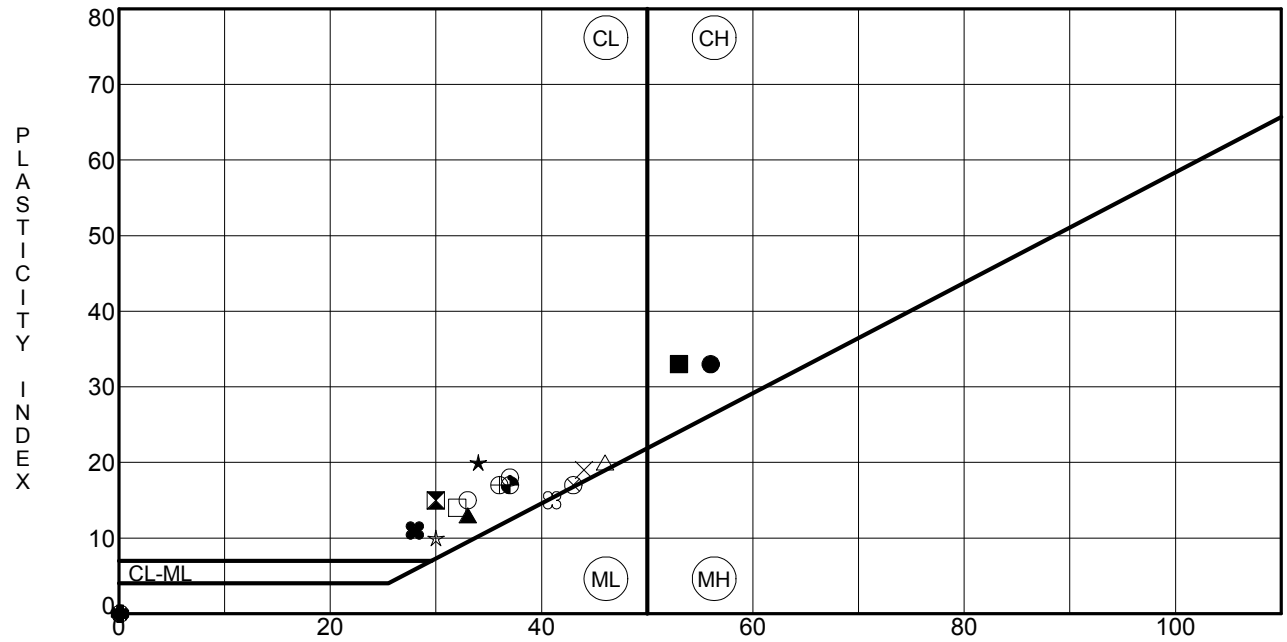
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO: 2017-125-GEO | PLATE NO: IV-2-B



PLASTICITY

	BOREHOLE	SAMPLE #	DEPTH	LL	PL	PI	Fines	Classification
●	AS-74	6	31.0	56	23	33		Fat CLAY
⊠	AS-74	8	41.0	30	15	15		SANDY lean CLAY
▲	AS-74	19	111.0	33	20	13		Lean CLAY
★	AS-76	1	6.0	34	14	20		Lean CLAY
⊙	AS-76	7	36.0	37	19	18		SANDY lean CLAY
✿	AS-76	18	101.0	NP	NP	NP		SILT with SAND
○	AS-78	1	6.0	33	18	15		Lean CLAY
△	AS-78	4	21.0	46	26	20		Lean CLAY
⊗	AS-78	6	31.0	43	26	17		SILT
⊕	AS-78	17	91.0	36	19	17		Lean CLAY with SAND
□	AS-80	1	6.0	32	18	14		Lean CLAY
❁	AS-80	4	21.0	NP	NP	NP		SILT
◕	AS-80	7	36.0	37	20	17		SANDY lean CLAY
☆	AS-82	1	6.0	30	20	10		Lean CLAY
⊠	AS-82	5	26.0	41	26	15		Lean to fat CLAY
■	AS-82	7	36.0	53	20	33		Fat CLAY
◆	AS-82	20	121.0	NP	NP	NP		SILT with SAND
◇	AS-84	5	26.0	NP	NP	NP		SILTY CLAY
⨯	AS-84	6	31.0	44	25	19		Lean CLAY
✖	AS-86	1	6.0	28	17	11		SANDY lean CLAY

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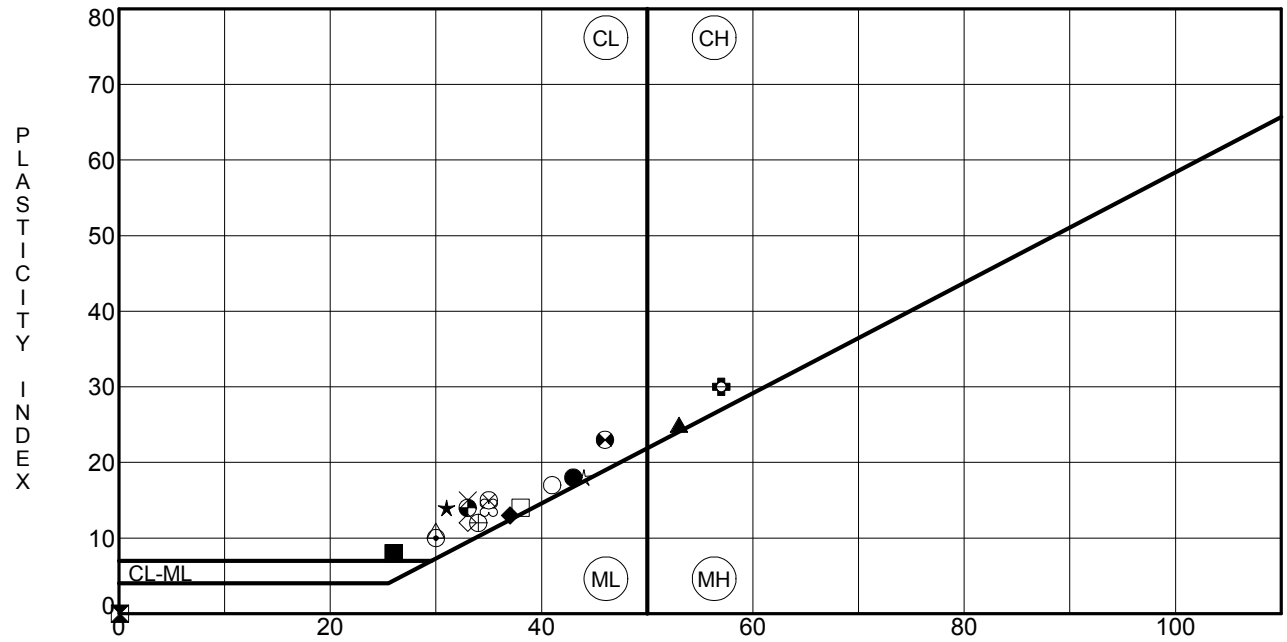
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO: 2017-125-GEO | PLATE NO: IV-2-C



PLASTICITY

	BOREHOLE	SAMPLE #	DEPTH	LL	PL	PI	Fines	Classification
●	AS-86	7	36.0	43	25	18		Lean CLAY
⊠	AS-86	17	91.0	NP	NP	NP		SILT with SAND
▲	AS-88	7	36.0	53	28	25		Fat CLAY
★	AS-88	14	71.0	31	17	14		Lean CLAY
⊙	AS-88	19	111.0	30	20	10		Lean CLAY
✿	BF-64	1	3.0	57	27	30		Fat CLAY
○	BF-64	2	5.0	41	24	17		Lean CLAY
△	BF-64	3	10.0	30	19	11		Lean CLAY
⊗	P-34	1	2.0	35	20	15		Lean CLAY
⊕	PS-21	2	6.0	34	22	12		Lean CLAY with SAND
□	PS-59	3	9.5	38	24	14		Lean CLAY with SAND
⊛	PS-63	4	14.5	46	23	23		Lean CLAY with SAND
◕	R-37	1	2.0	33	19	14		Lean CLAY
☆	RW-49	4	15.0	44	26	18		Lean CLAY with SAND
❀	RW-51	1	3.0	35	21	14		Lean CLAY with SAND
■	T-31	2	6.0	26	18	8		Lean CLAY with SAND
◆	T-32	4	16.0	37	24	13		Lean CLAY
◇	TE-55	2	4.5	33	21	12		Lean CLAY with SAND
×	TE-56	1	3.0	33	18	15		Lean CLAY with SAND

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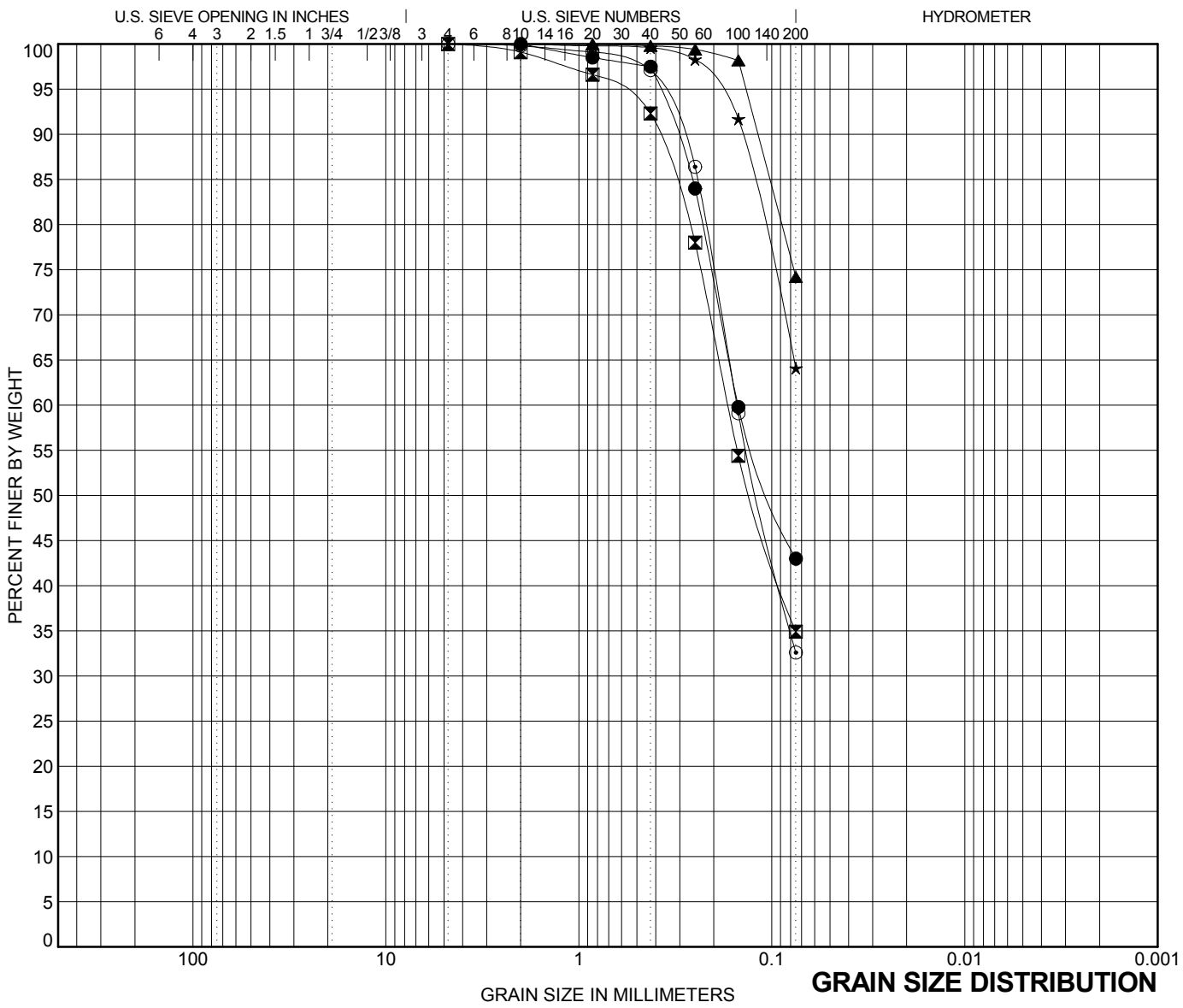
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO: 2017-125-GEO | PLATE NO: IV-2-D

GRAIN SIZE DISTRIBUTION TEST



GRAIN SIZE DISTRIBUTION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING	SAMPLE #	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**AE-58**	**6**	**24.5**	**SILTY SAND**					
⊠	**AG-18**	**3**	**9.5**	**SILTY SAND**					
▲	**AG-18**	**4**	**14.5**	**SILT with SAND**					
★	**AG-19**	**4**	**14.5**	**SILT with SAND**					
⊙	**AG-19**	**5**	**19.5**	**SILTY SAND**					

	BORING	SAMPLE #	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**AE-58**	**6**	**24.5**	**2**	**0.15**			**0.0**	**57.0**	**43.0**	
⊠	**AG-18**	**3**	**9.5**	**4.75**	**0.168**			**0.0**	**65.1**	**34.9**	
▲	**AG-18**	**4**	**14.5**	**0.85**				**0.0**	**25.8**	**74.2**	
★	**AG-19**	**4**	**14.5**	**2**				**0.0**	**35.9**	**64.1**	
⊙	**AG-19**	**5**	**19.5**	**4.75**	**0.152**			**0.0**	**67.4**	**32.6**	

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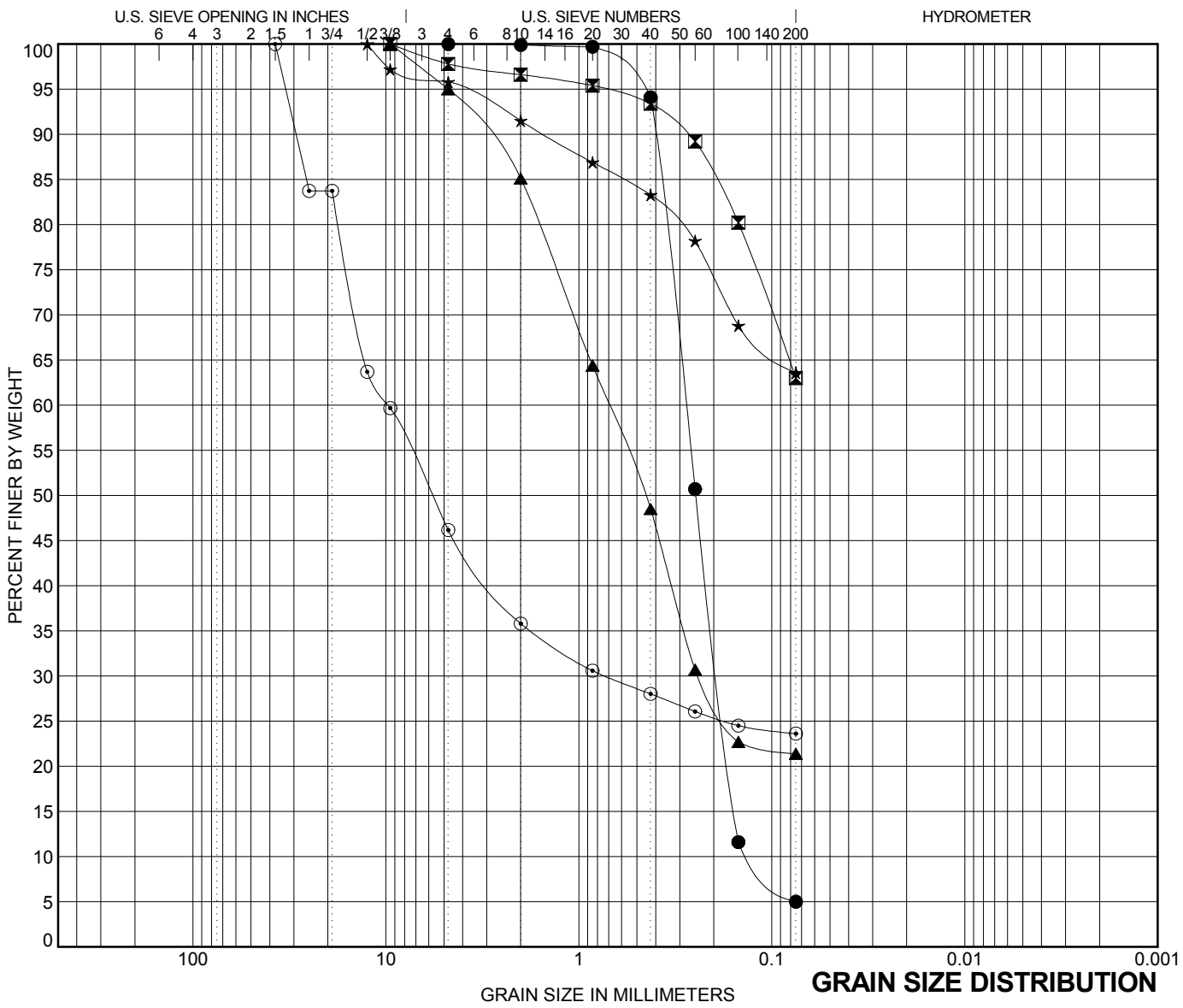
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO: 2017-125-GEO | **PLATE NO: IV-3-A**



GRAIN SIZE DISTRIBUTION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING	SAMPLE #	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	AG-23	3	9.5	Poorly graded SAND with SILT				1.02	2.22
⊠	AG-23	5	19.5	SANDY lean CLAY					
▲	AS-1	10	60.5	SILTY SAND					
★	AS-11	11	51.0	SANDY lean CLAY					
⊙	AS-15	10	45.0	CLAYEY GRAVEL with SAND					

	BORING	SAMPLE #	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AG-23	3	9.5	4.75	0.28	0.19	0.126	0.0	95.0	5.0	
⊠	AG-23	5	19.5	9.5				2.2	34.8	63.0	
▲	AS-1	10	60.5	9.5	0.702	0.239		5.0	73.6	21.4	
★	AS-11	11	51.0	12.5				4.2	32.2	63.6	
⊙	AS-15	10	45.0	37.5	9.716	0.725		53.8	22.5	23.6	

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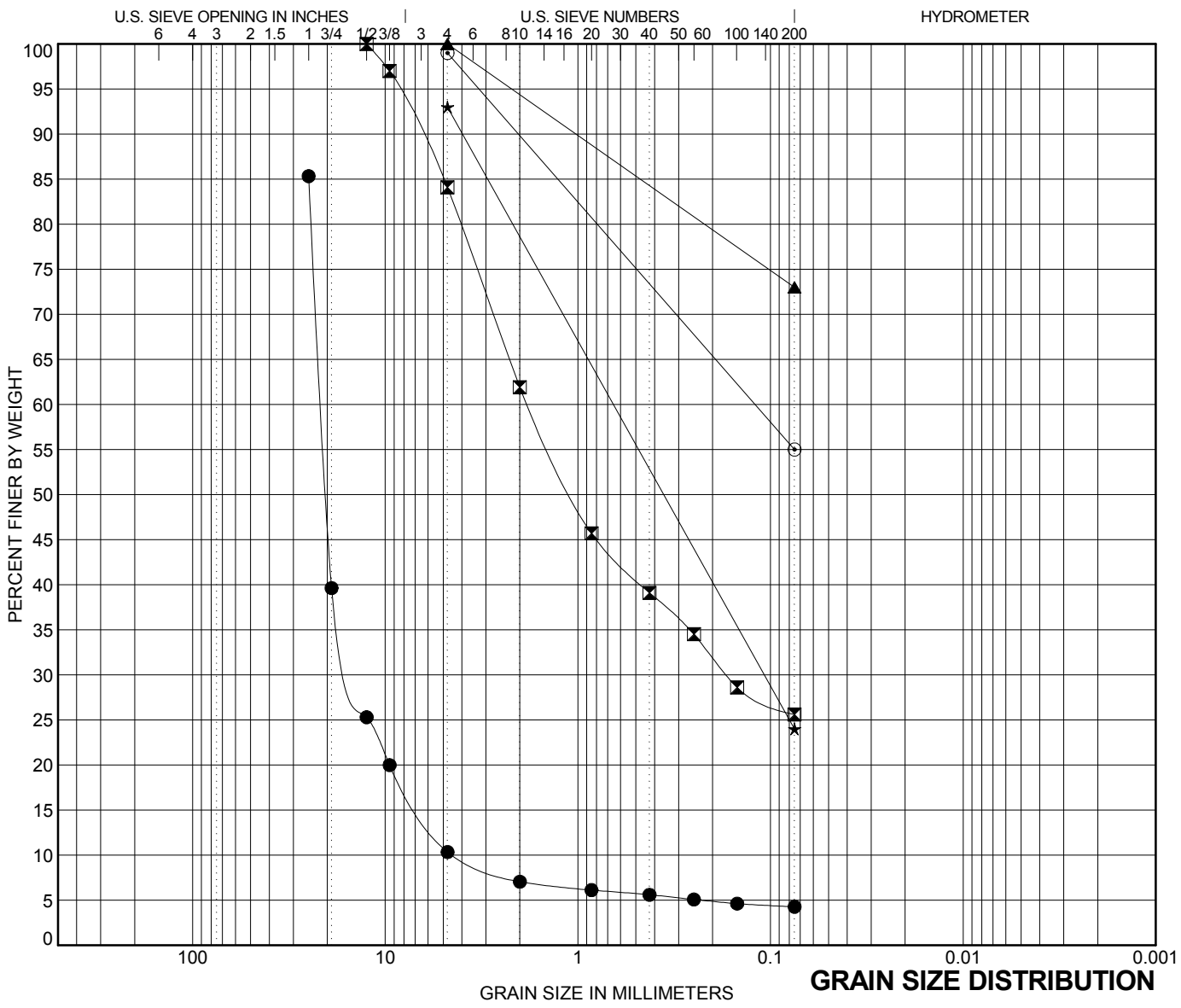
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO: 2017-125-GEO

PLATE NO: IV-3-B



GRAIN SIZE DISTRIBUTION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING	SAMPLE #	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	AS-15	11	51.0	Well-graded GRAVEL				2.20	4.94
⊠	AS-17	11	51.0	SILTY SAND with GRAVEL					
▲	AS-2	6	25.0	Lean CLAY with SAND	32	17	15		
★	AS-2	12	55.0	CLAYEY SAND with GRAVEL					
⊙	AS-25	13	60.0	SANDY lean CLAY					

	BORING	SAMPLE #	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AS-15	11	51.0	25	21.472	14.34	4.344	75.0	6.1	4.3	
⊠	AS-17	11	51.0	12.5	1.809	0.168		15.9	58.5	25.6	
▲	AS-2	6	25.0	4.75				0.0	27.0	73.0	
★	AS-2	12	55.0	4.75	0.653	0.108			69.0	24.0	
⊙	AS-25	13	60.0	4.75	0.12				44.0	55.0	

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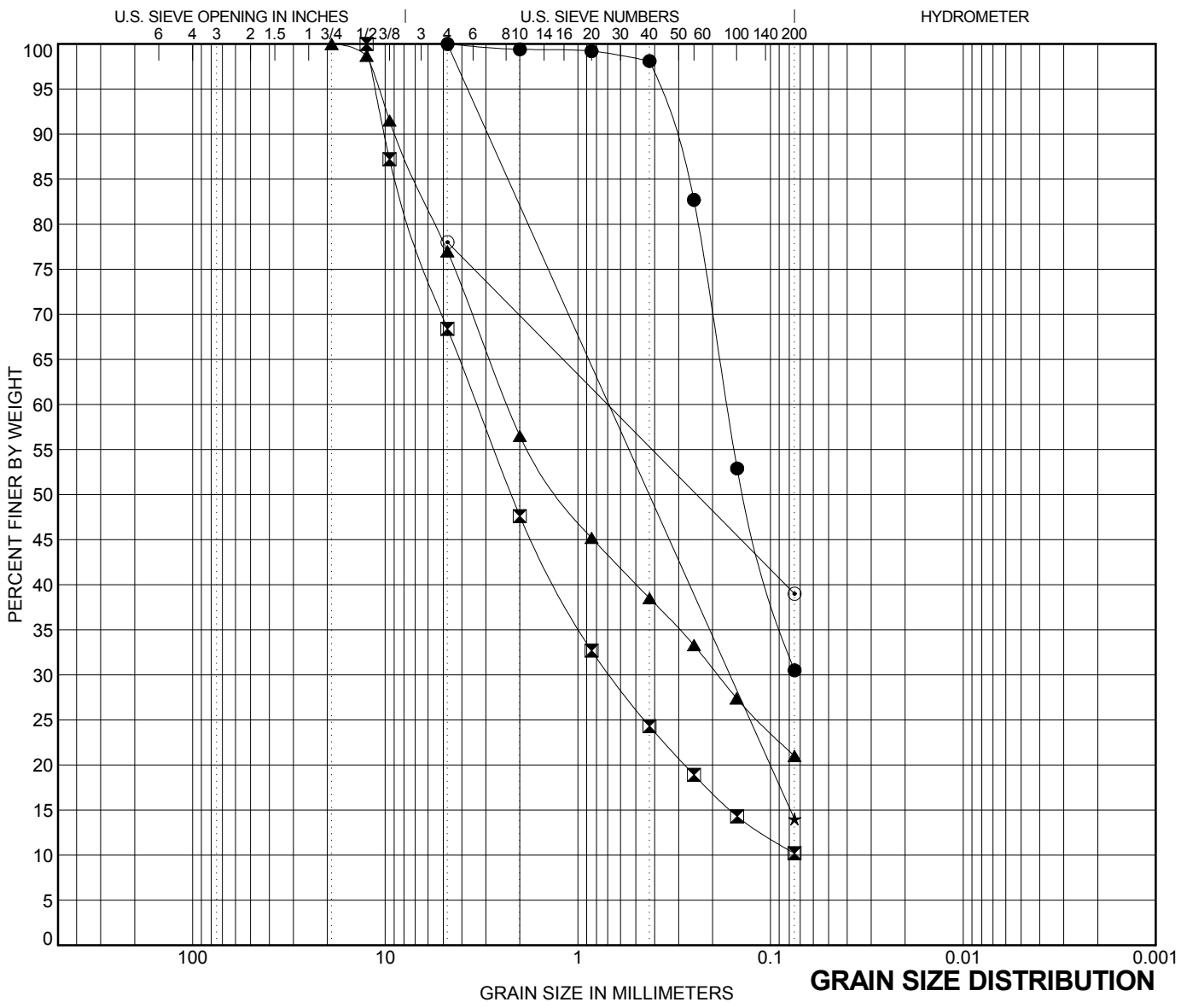
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO: 2017-125-GEO | **PLATE NO: IV-3-C**



GRAIN SIZE DISTRIBUTION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING	SAMPLE #	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	AS-27	3	11.0	CLAYEY SAND					
⊠	AS-27	12	56.0	Well-graded SAND with CLAY and GRAVEL				1.90	46.18
▲	AS-29	9	41.0	Lean CLAY					
★	AS-3	5	20.0	SILTY SAND					
⊙	AS-3	9	40.0	CLAYEY SAND with GRAVEL					

	BORING	SAMPLE #	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AS-27	3	11.0	4.75	0.169			0.0	69.5	30.5	
⊠	AS-27	12	56.0	12.5	3.35	0.68		31.6	58.2	10.2	
▲	AS-29	9	41.0	19	2.318	0.188		23.0	56.0	21.0	
★	AS-3	5	20.0	4.75	0.69	0.162		0.0	86.0	14.0	
⊙	AS-3	9	40.0	4.75	0.7				39.0	39.0	

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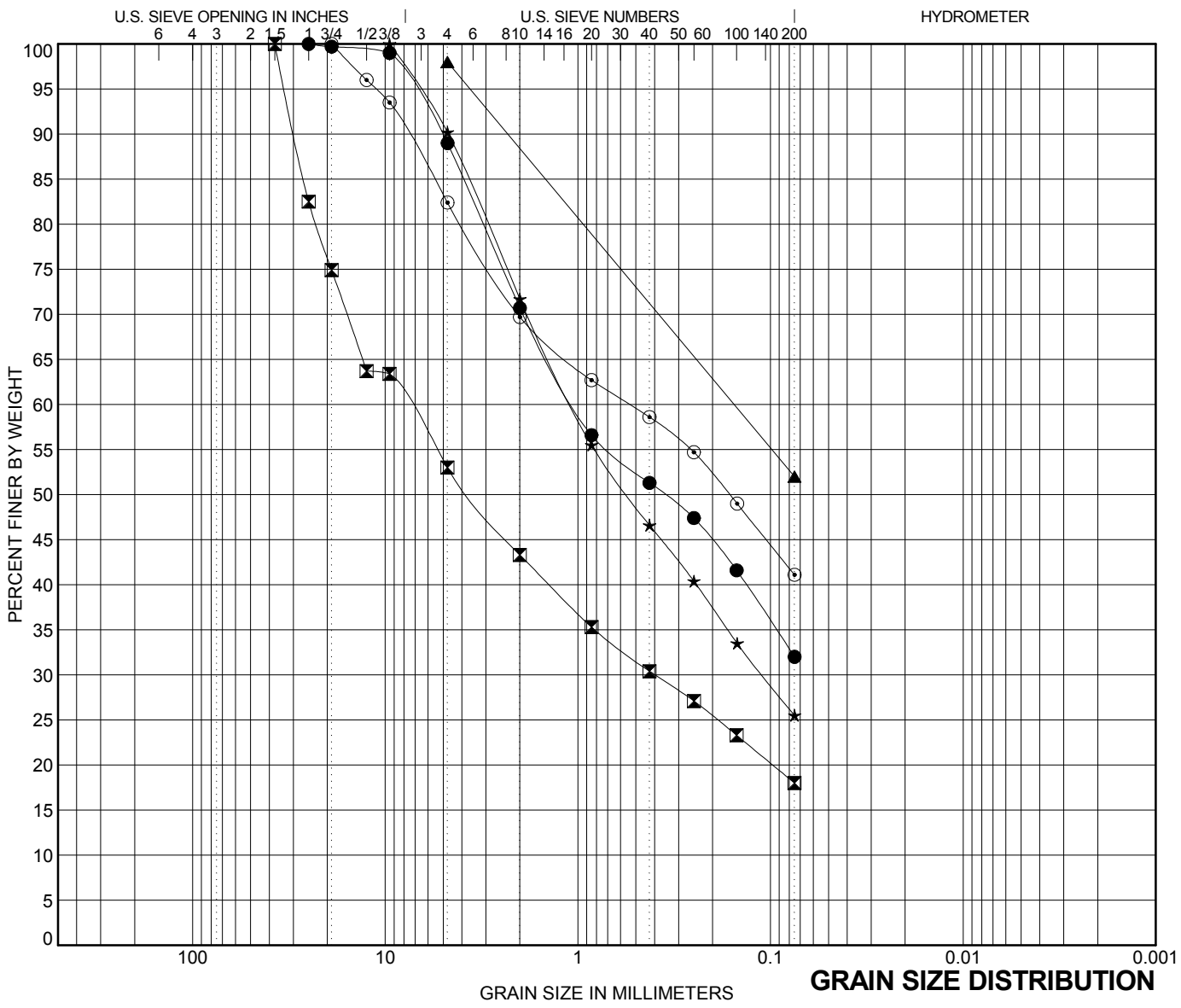
SAN JOSE, CALIFORNIA

JOB NO: 2017-125-GEO | **PLATE NO: IV-3-D**



GRAIN SIZE DISTRIBUTION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING	SAMPLE #	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	AS-39	8	36.0	CLAYEY SAND					
⊠	AS-39	14	71.0	CLAYEY GRAVEL with SAND					
▲	AS-40	3	10.0	SANDY SILT					
★	AS-45	5	21.0	CLAYEY SAND					
⊙	AS-45	7	31.0	CLAYEY SAND with GRAVEL					

	BORING	SAMPLE #	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AS-39	8	36.0	25	1.045			11.0	57.0	32.0	
⊠	AS-39	14	71.0	37.5	7.574	0.399		47.0	35.0	18.0	
▲	AS-40	3	10.0	4.75	0.154				46.0	52.0	
★	AS-45	5	21.0	9.5	1.078	0.11		9.8	64.7	25.5	
⊙	AS-45	7	31.0	19	0.538			17.6	41.3	41.1	

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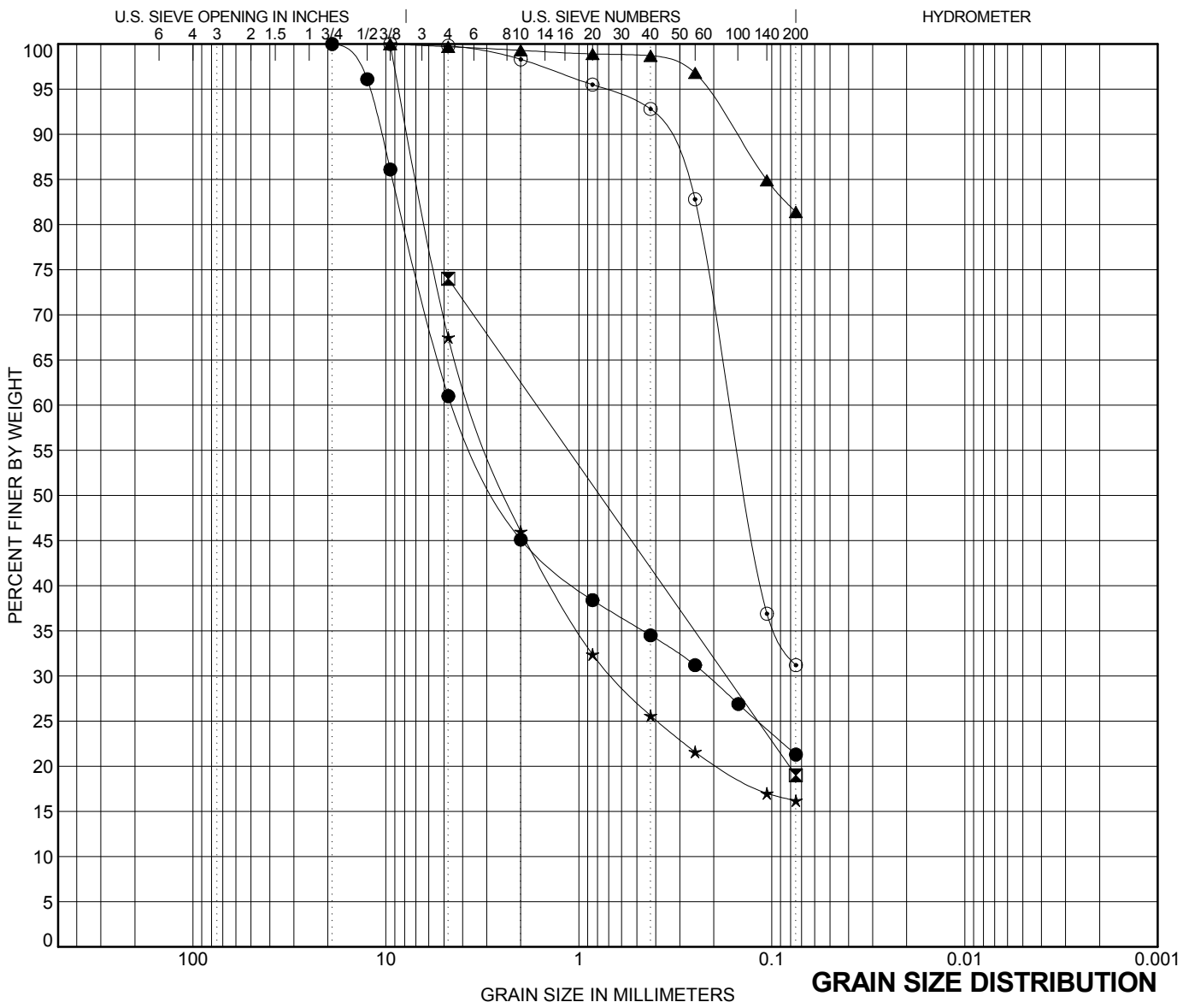
JOB NO: 2017-125-GEO | **PLATE NO: IV-3-E**



GRAIN SIZE DISTRIBUTION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING	SAMPLE #	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	AS-45	10	46.0	CLAYEY SAND with GRAVEL					
⊠	AS-5	7	29.5	CLAYEY SAND with GRAVEL					
▲	AS-66	3	16.0	SILT with SAND					
★	AS-66	8	41.0	SILTY SAND with GRAVEL					
⊙	AS-68	7	36.0	SILTY SAND					

	BORING	SAMPLE #	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AS-45	10	46.0	19	4.498	0.216		39.0	39.7	21.3	
⊠	AS-5	7	29.5	4.75	1.652	0.172			55.0	19.0	
▲	AS-66	3	16.0	9.5				0.3	18.3	81.4	
★	AS-66	8	41.0	9.5	3.513	0.666		32.5	51.3	16.2	
⊙	AS-68	7	36.0	9.5	0.163			0.2	68.6	31.2	

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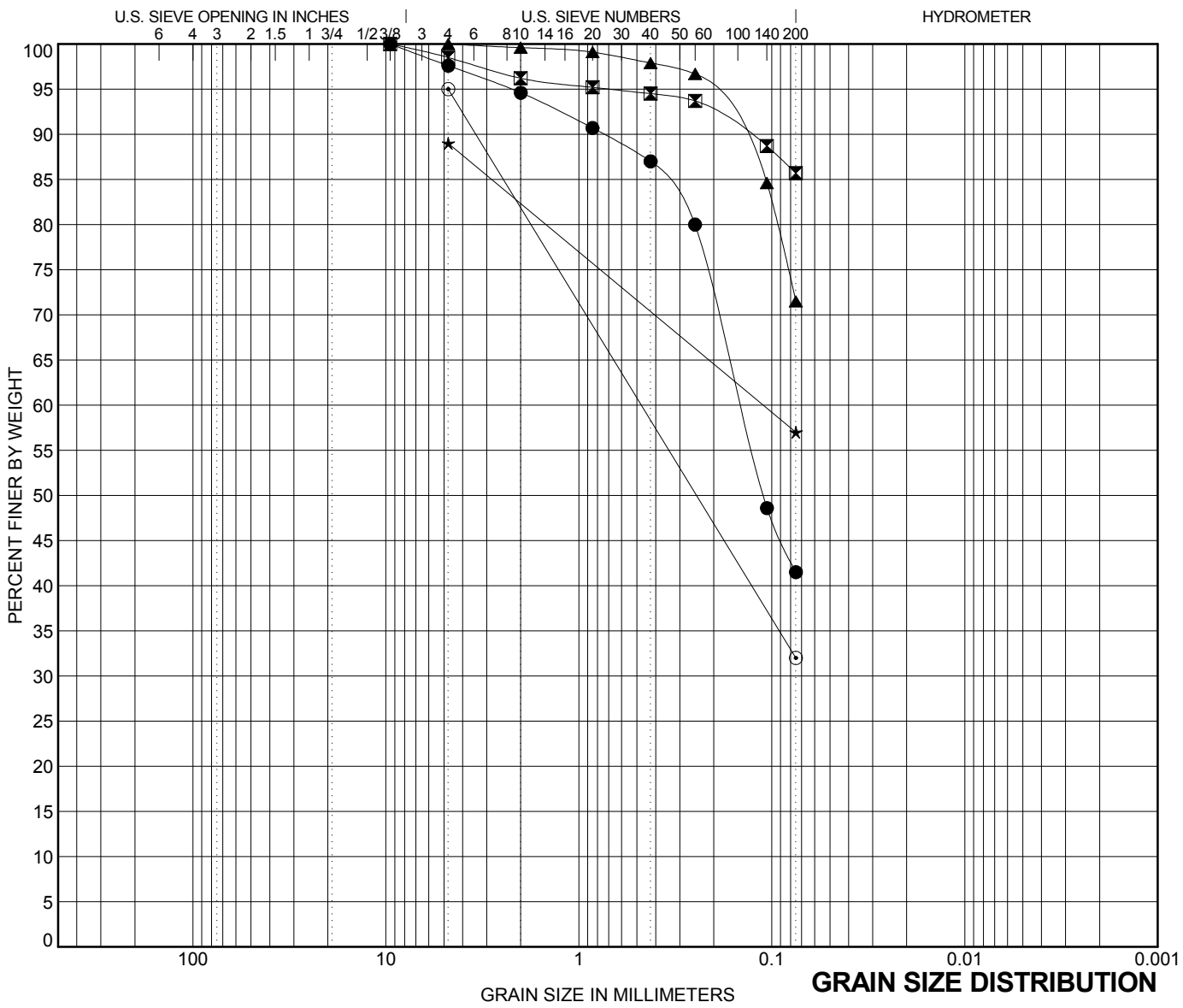
JOB NO: 2017-125-GEO

PLATE NO: IV-3-F



GRAIN SIZE DISTRIBUTION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING	SAMPLE #	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	AS-68	9	46.0	CLAYEY SAND					
⊠	AS-68	13	66.0	SILT					
▲	AS-68	18	101.0	SILT with SAND					
★	AS-7	8	34.5	SANDY lean CLAY					
⊙	AS-7	9	39.5	SANDY lean CLAY					

	BORING	SAMPLE #	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AS-68	9	46.0	9.5	0.145			2.4	56.1	41.5	
⊠	AS-68	13	66.0	9.5				1.5	12.8	85.7	
▲	AS-68	18	101.0	4.75				0.0	28.5	71.5	
★	AS-7	8	34.5	4.75	0.111				32.0	57.0	
⊙	AS-7	9	39.5	4.75	0.474				63.0	32.0	

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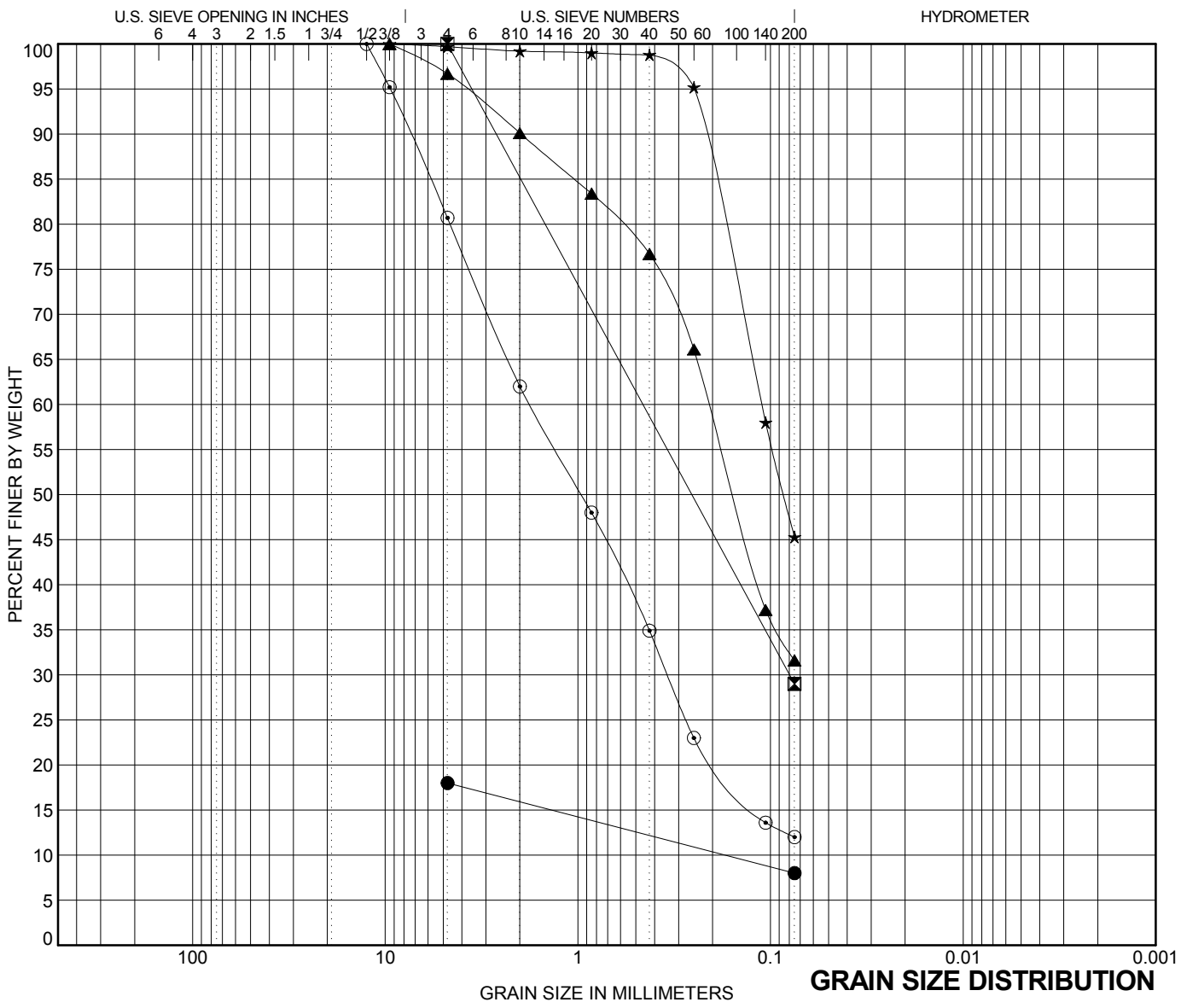
JOB NO: 2017-125-GEO | PLATE NO: IV-3-G



GRAIN SIZE DISTRIBUTION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING	SAMPLE #	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	AS-7	13	59.0	Poorly graded GRAVEL with SILT					
⊠	AS-7	14	68.5	SILTY SAND					
▲	AS-70	12	61.0	SILTY SAND					
★	AS-70	15	76.0	SILTY SAND					
⊙	AS-70	18	101.0	Well-graded SAND with SILT and GRAVEL				1.35	36.37

	BORING	SAMPLE #	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AS-7	13	59.0	4.75			0.172		10.0	8.0	
⊠	AS-7	14	68.5	4.75	0.459	0.08		0.0	71.0	29.0	
▲	AS-70	12	61.0	9.5	0.209			3.3	65.1	31.6	
★	AS-70	15	76.0	9.5	0.111			0.3	54.4	45.3	
⊙	AS-70	18	101.0	12.5	1.77	0.342		19.3	68.7	12.0	

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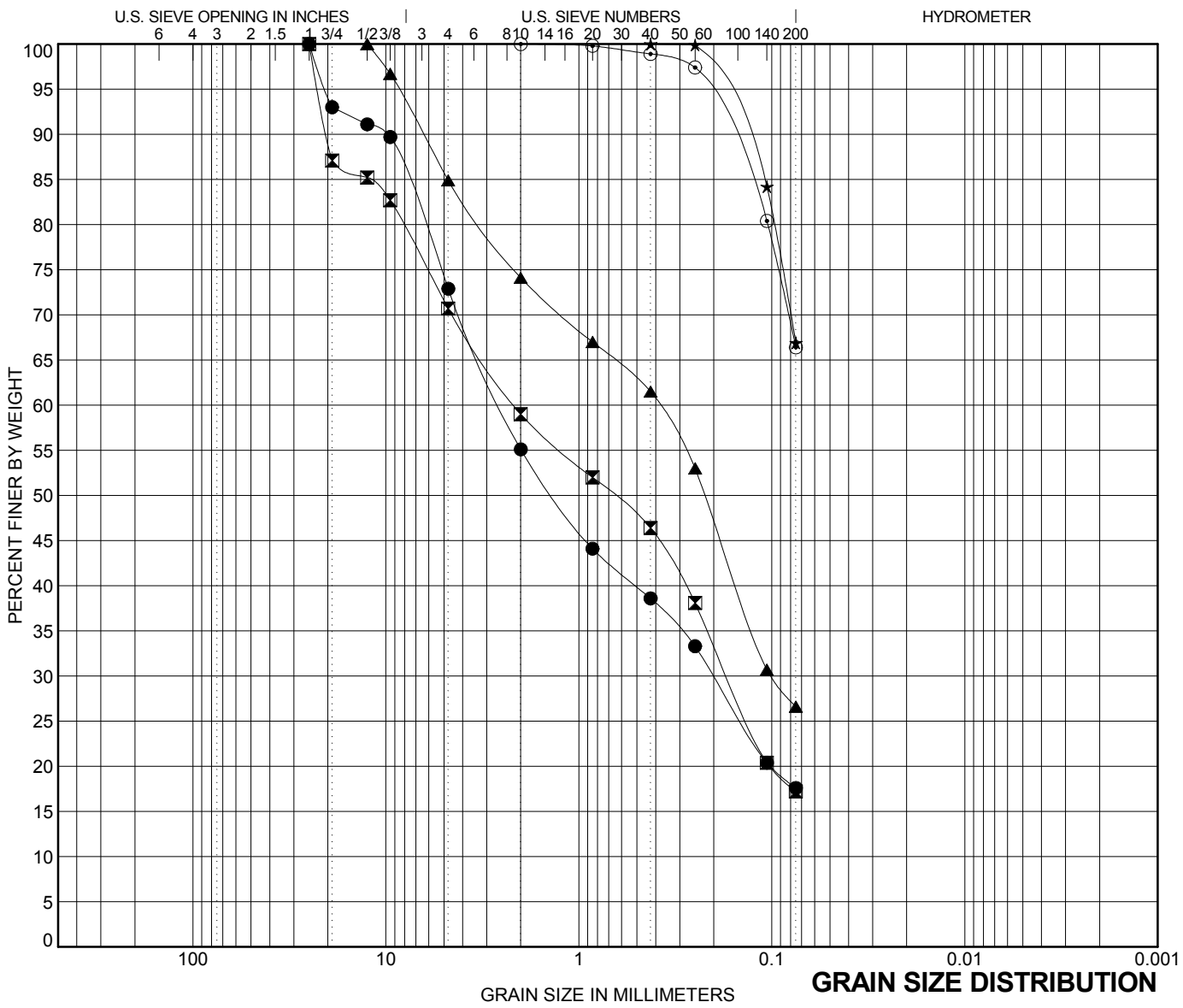
JOB NO: 2017-125-GEO

PLATE NO: IV-3-H



GRAIN SIZE DISTRIBUTION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING	SAMPLE #	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	AS-72	8	41.0	SILTY SAND with GRAVEL					
⊠	AS-72	11	56.0	SILTY SAND with GRAVEL					
▲	AS-72	12	61.0	CLAYEY SAND with GRAVEL					
★	AS-72	17	111.0	SANDY SILT	NP	NP	NP		
⊙	AS-72	20	141.0	SANDY SILT					

	BORING	SAMPLE #	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AS-72	8	41.0	25	2.538	0.201		27.1	55.3	17.6	
⊠	AS-72	11	56.0	25	2.153	0.169		29.3	53.5	17.2	
▲	AS-72	12	61.0	12.5	0.387	0.1		15.1	58.3	26.6	
★	AS-72	17	111.0	0.425				0.0	33.1	66.9	
⊙	AS-72	20	141.0	2				0.0	33.6	66.4	

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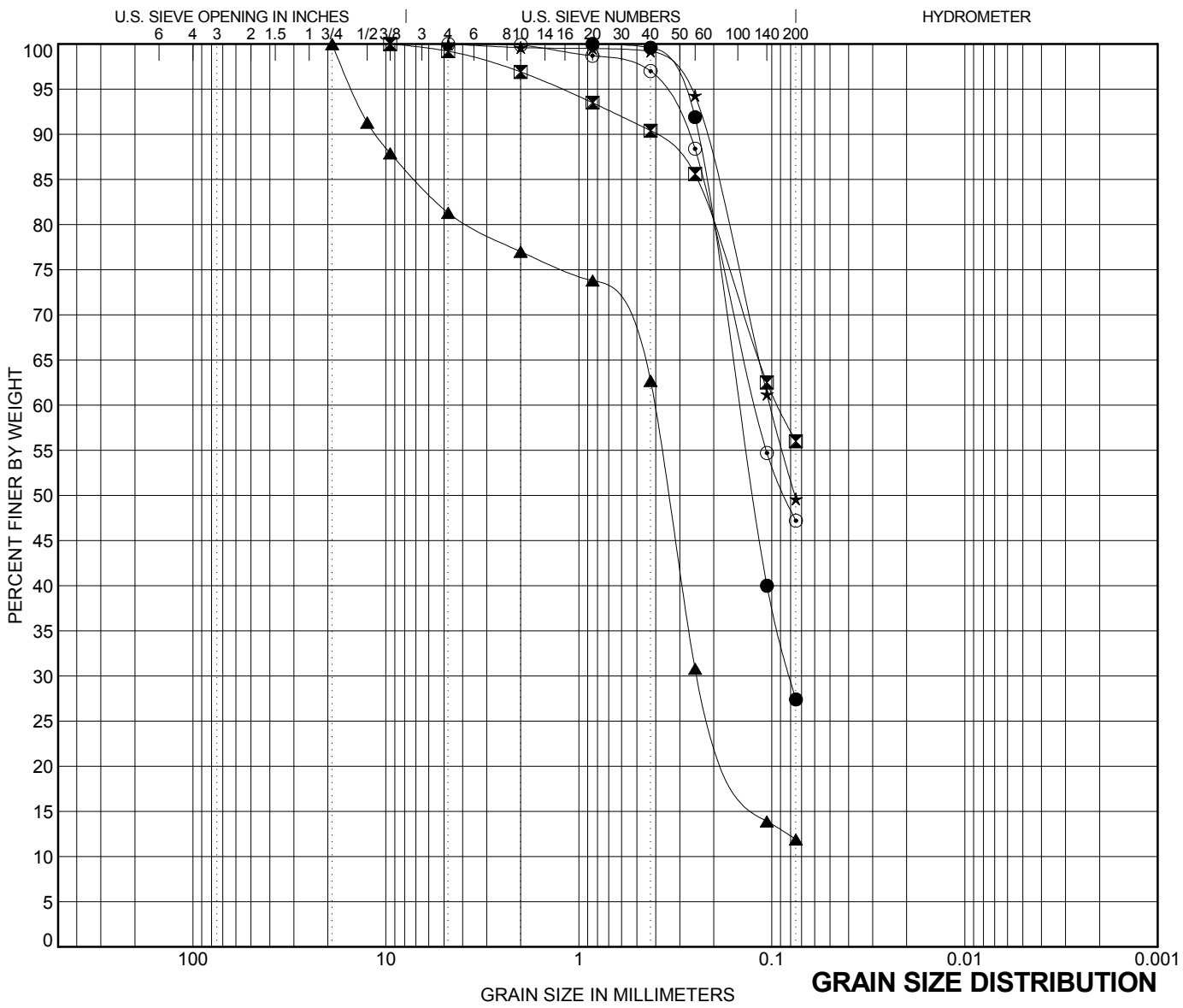
JOB NO: 2017-125-GEO

PLATE NO: IV-3-I



GRAIN SIZE DISTRIBUTION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING	SAMPLE #	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	AS-74	2	11.0	SILTY SAND					
⊠	AS-74	12	61.0	SANDY lean CLAY					
▲	AS-74	20	121.0	Well-graded SAND with SILT and GRAVEL				2.63	7.53
★	AS-76	2	11.0	SILTY SAND					
⊙	AS-76	3	16.0	CLAYEY SAND					

	BORING	SAMPLE #	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AS-74	2	11.0	0.85	0.148	0.081		0.0	72.6	27.4	
⊠	AS-74	12	61.0	9.5	0.093			0.8	43.2	56.0	
▲	AS-74	20	121.0	19	0.406	0.24		18.7	69.4	11.9	
★	AS-76	2	11.0	4.75	0.102			0.0	50.4	49.6	
⊙	AS-76	3	16.0	4.75	0.121			0.0	52.8	47.2	

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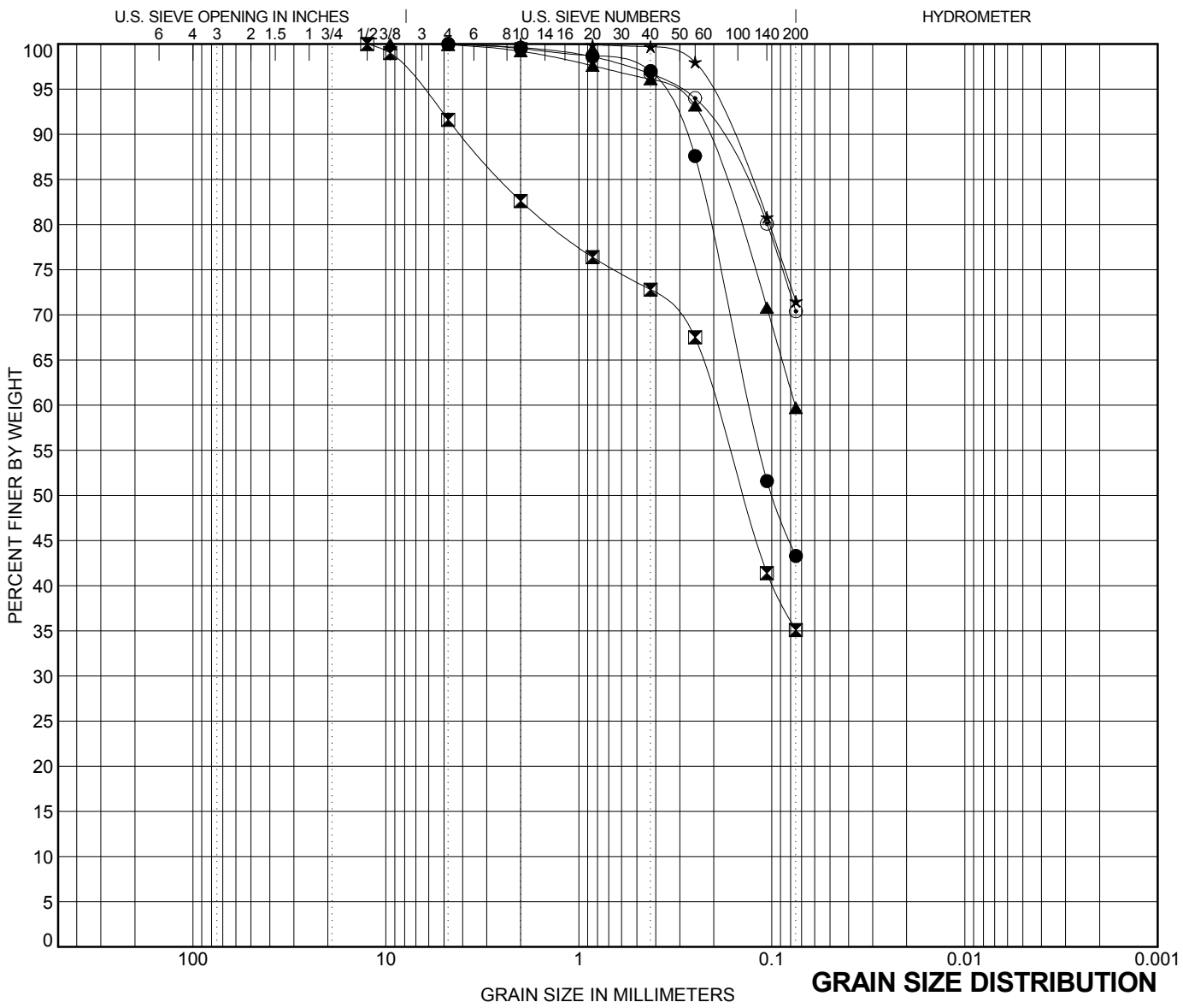
JOB NO: 2017-125-GEO | **PLATE NO: IV-3-J**



GRAIN SIZE DISTRIBUTION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING	SAMPLE #	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	AS-76	4	21.0	CLAYEY SAND					
⊠	AS-76	11	56.0	CLAYEY SAND					
▲	AS-76	17	91.0	SANDY lean CLAY					
★	AS-76	20	121.0	SILT with SAND					
⊙	AS-76	23	151.0	SILT with SAND					

	BORING	SAMPLE #	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AS-76	4	21.0	4.75	0.129			0.0	56.7	43.3	
⊠	AS-76	11	56.0	12.5	0.195			8.4	56.5	35.1	
▲	AS-76	17	91.0	9.5	0.076			0.1	40.2	59.7	
★	AS-76	20	121.0	2				0.0	28.5	71.5	
⊙	AS-76	23	151.0	4.75				0.0	29.6	70.4	

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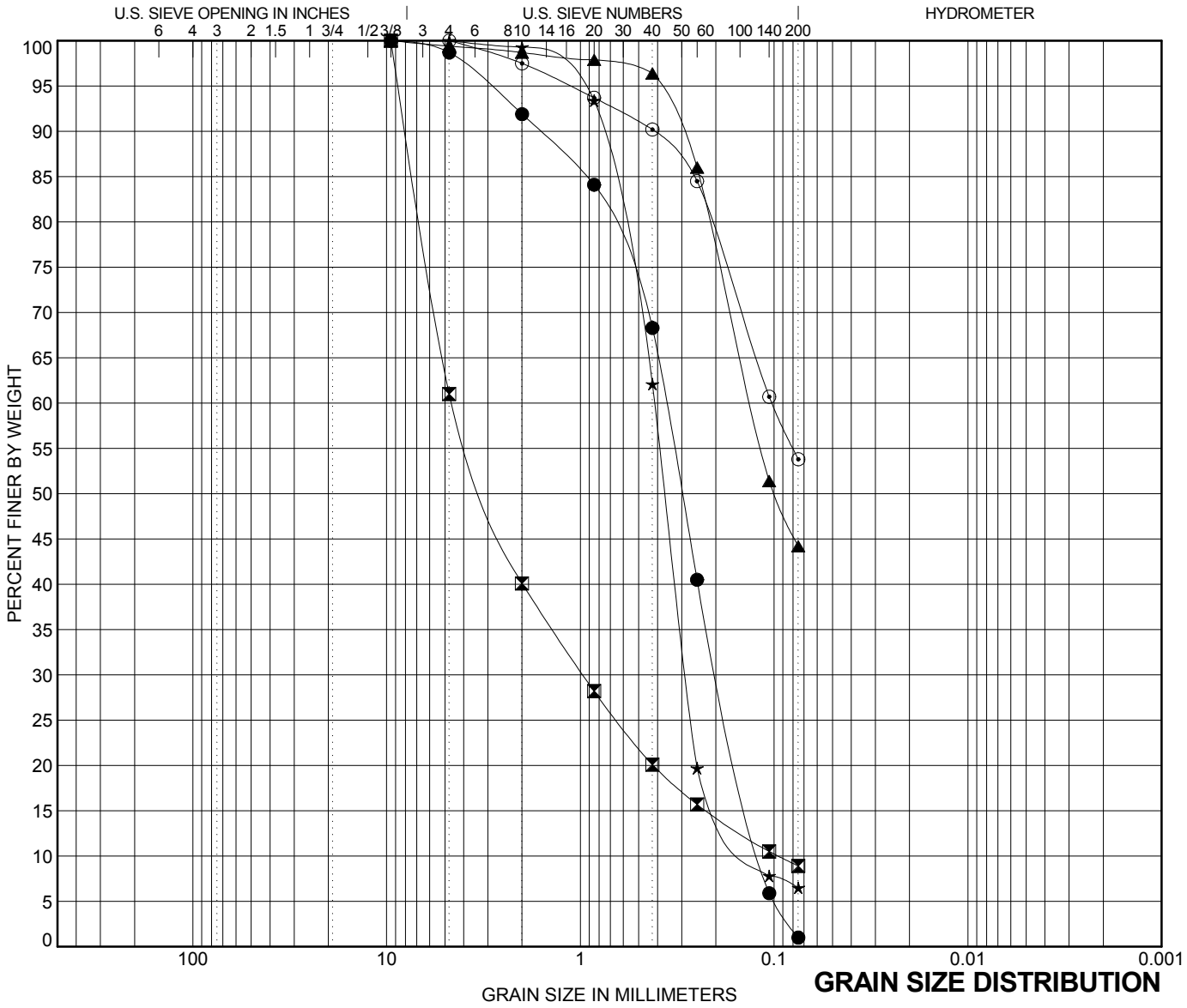
JOB NO: 2017-125-GEO

PLATE NO: IV-3-K



GRAIN SIZE DISTRIBUTION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING	SAMPLE #	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	AS-78	3	16.0	Poorly graded SAND				0.87	3.09
⊠	AS-78	19	110.5	Well-graded SAND with SILT and GRAVEL				2.16	47.90
▲	AS-80	3	16.0	CLAYEY SAND					
★	AS-80	20	111.0	Poorly graded SAND with SILT				1.57	3.33
⊙	AS-82	15B	76.0	SANDY SILT					

	BORING	SAMPLE #	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AS-78	3	16.0	9.5	0.363	0.193	0.117	1.3	97.7	1.0	
⊠	AS-78	19	110.5	9.5	4.557	0.967	0.095	39.0	52.1	8.9	
▲	AS-80	3	16.0	9.5	0.131			0.6	55.2	44.2	
★	AS-80	20	111.0	4.75	0.414	0.284	0.124	0.0	93.5	6.5	
⊙	AS-82	15B	76.0	4.75	0.102			0.0	46.2	53.8	

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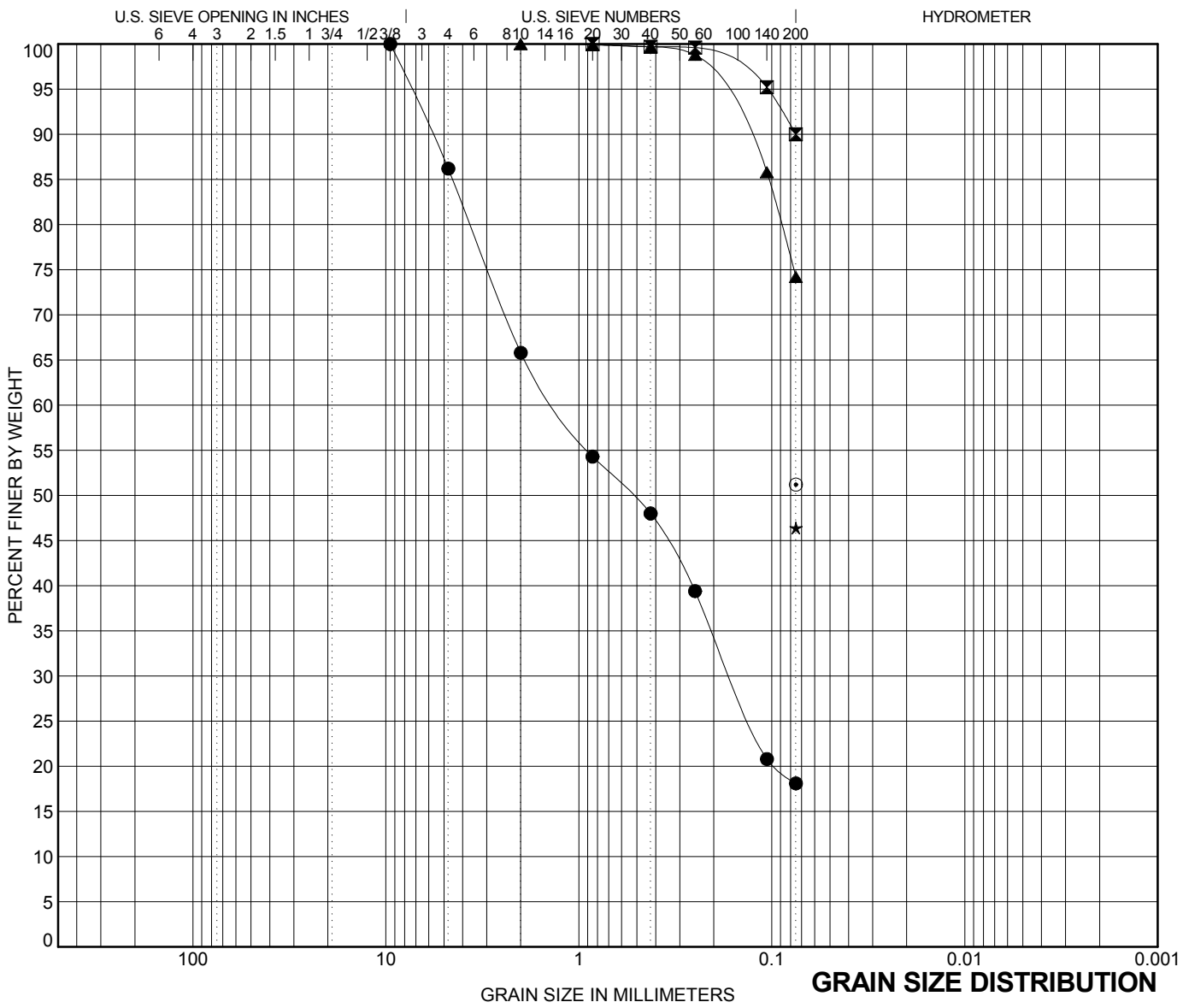
JOB NO: 2017-125-GEO | **PLATE NO: IV-3-L**



GRAIN SIZE DISTRIBUTION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING	SAMPLE #	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	AS-82	15A	76.3	SILTY SAND					
⊠	AS-84	3	16.0	SILT					
▲	AS-84	4	21.0	SILT with SAND					
★	AS-84	15	76.0	CLAYEY SAND					
⊙	AS-84	17	91.0	SILTY SAND					

	BORING	SAMPLE #	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AS-82	15A	76.3	9.5	1.299	0.162		13.8	68.1	18.1	
⊠	AS-84	3	16.0	0.85				0.0	10.0	90.0	
▲	AS-84	4	21.0	2				0.0	25.8	74.2	
★	AS-84	15	76.0	0.075						46.4	
⊙	AS-84	17	91.0	0.075						51.2	

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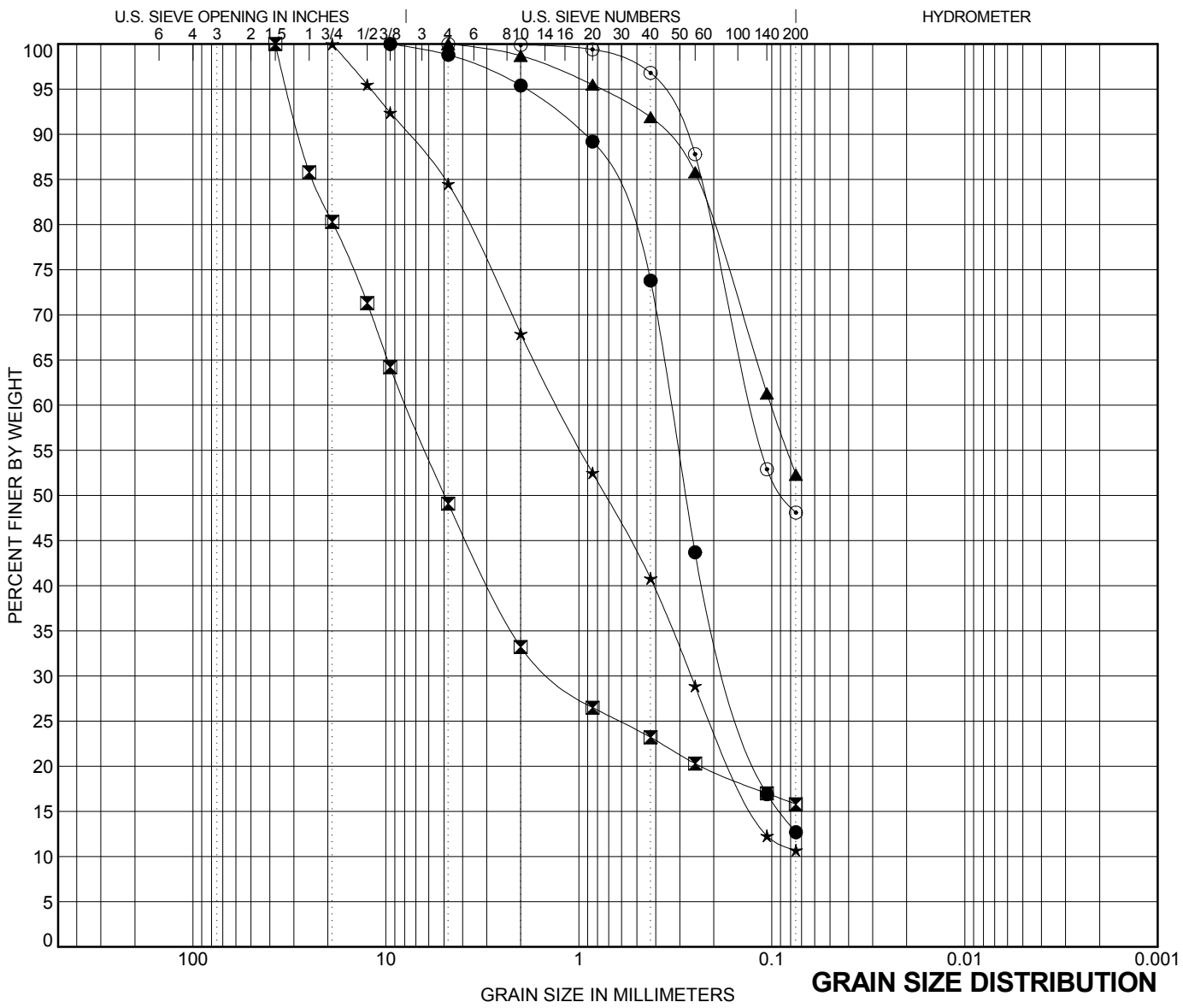
JOB NO: 2017-125-GEO | **PLATE NO: IV-3-M**



GRAIN SIZE DISTRIBUTION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING	SAMPLE #	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	AS-84	20	120.5	SILTY SAND					
⊠	AS-84	22	140.0	CLAYEY GRAVEL with SAND					
▲	AS-86	10	51.0	SANDY SILT					
★	AS-86	13	66.0	Poorly graded SAND with SILT and GRAVEL				0.83	20.00
⊙	AS-86	18	101.0	CLAYEY SAND					

	BORING	SAMPLE #	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AS-84	20	120.5	9.5	0.333	0.161		1.2	86.1	12.7	
⊠	AS-84	22	140.0	37.5	7.834	1.329		50.9	33.3	15.8	
▲	AS-86	10	51.0	4.75	0.101			0.0	47.7	52.3	
★	AS-86	13	66.0	19	1.289	0.263		15.5	73.8	10.7	
⊙	AS-86	18	101.0	4.75	0.126			0.0	51.9	48.1	

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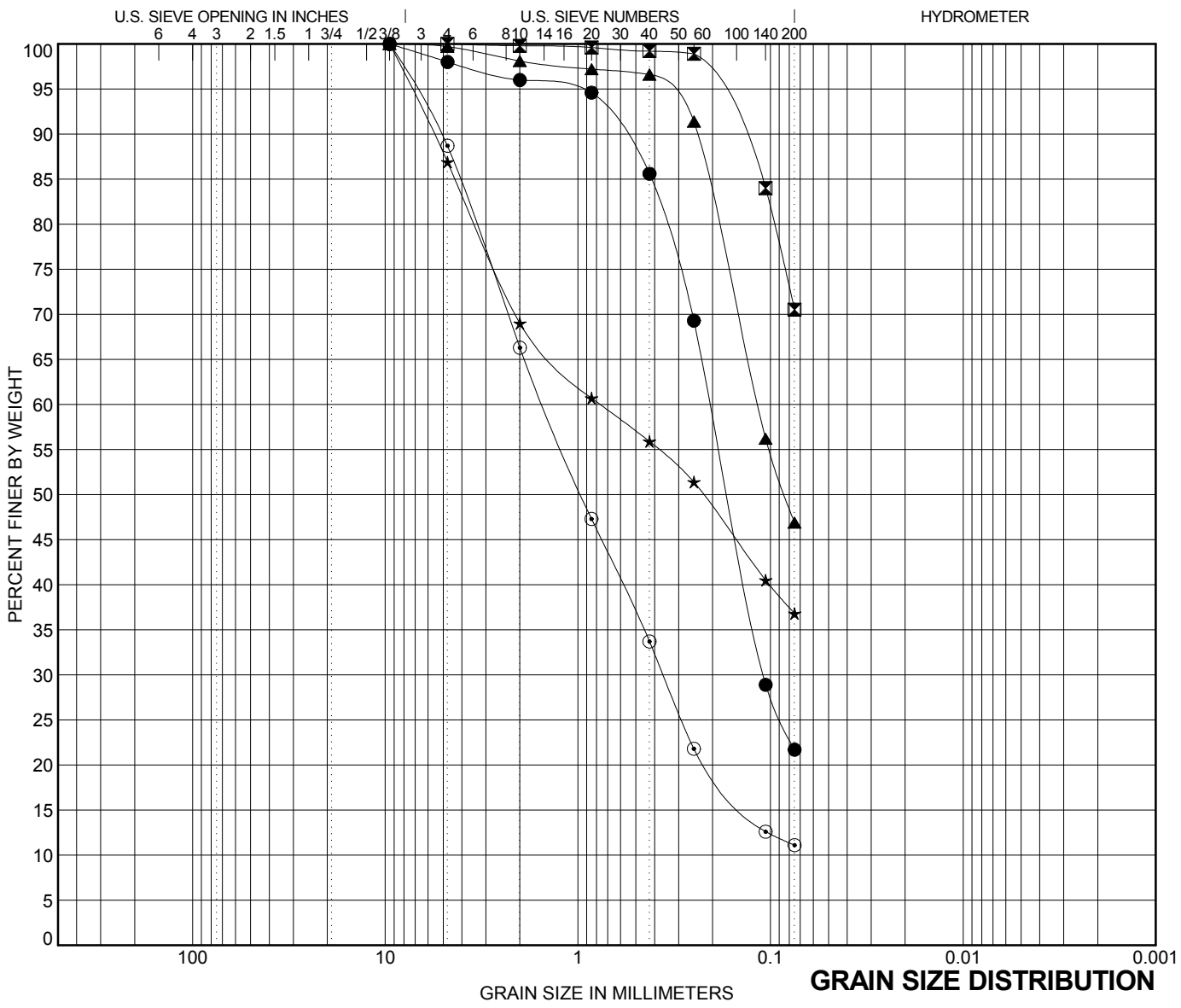
JOB NO: 2017-125-GEO | PLATE NO: IV-3-N



GRAIN SIZE DISTRIBUTION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING	SAMPLE #	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	AS-86	21	131.0	SILTY SAND					
⊠	AS-88	2	11.0	SILT with SAND					
▲	AS-88	3	16.0	SILTY SAND					
★	AS-88	9	46.0	CLAYEY SAND					
⊙	AS-88	10	51.0	Well-graded SAND with CLAY				1.48	25.88

	BORING	SAMPLE #	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AS-86	21	131.0	9.5	0.205	0.109		2.0	76.3	21.7	
⊠	AS-88	2	11.0	4.75				0.0	29.5	70.5	
▲	AS-88	3	16.0	9.5	0.116			0.3	52.8	46.9	
★	AS-88	9	46.0	9.5	0.768			13.1	50.1	36.8	
⊙	AS-88	10	51.0	9.5	1.506	0.36		11.3	77.6	11.1	

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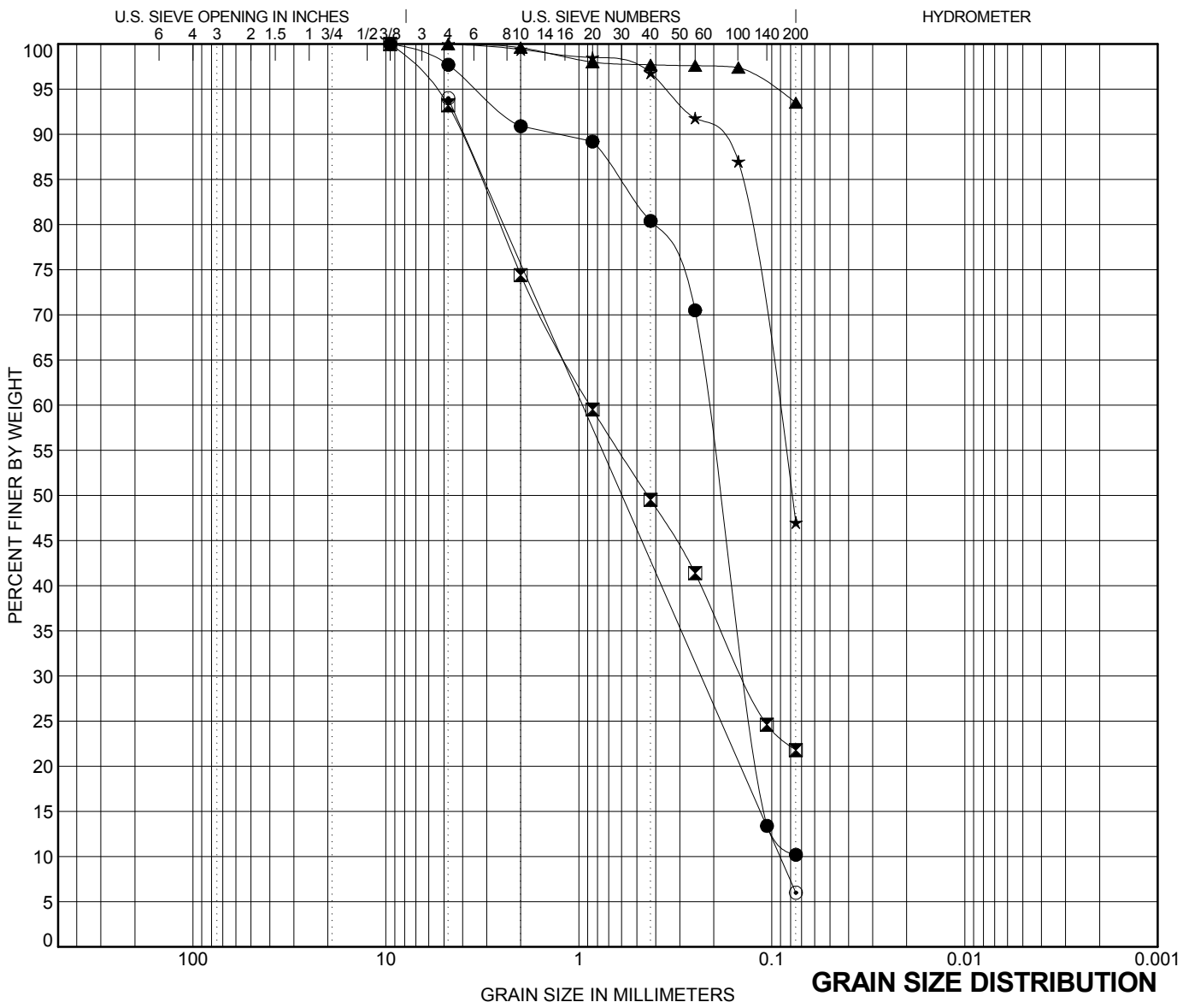
JOB NO: 2017-125-GEO

PLATE NO: IV-3-O



GRAIN SIZE DISTRIBUTION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING	SAMPLE #	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	AS-88	11	56.0	Poorly graded SAND with SILT				1.18	2.91
⊠	AS-88	16	81.0	SILTY SAND					
▲	PS-21	5	19.5	Lean CLAY					
★	PS-59	4	14.5	SILTY SAND					
⊙	PS-63	7	34.5	SANDY SILT				0.62	10.56

	BORING	SAMPLE #	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AS-88	11	56.0	9.5	0.214	0.136		2.3	87.5	10.2	
⊠	AS-88	16	81.0	9.5	0.875	0.14		6.8	71.4	21.8	
▲	PS-21	5	19.5	4.75				0.0	6.5	93.5	
★	PS-59	4	14.5	4.75	0.094			0.0	53.0	47.0	
⊙	PS-63	7	34.5	4.75	0.956	0.232	0.091		88.0	6.0	

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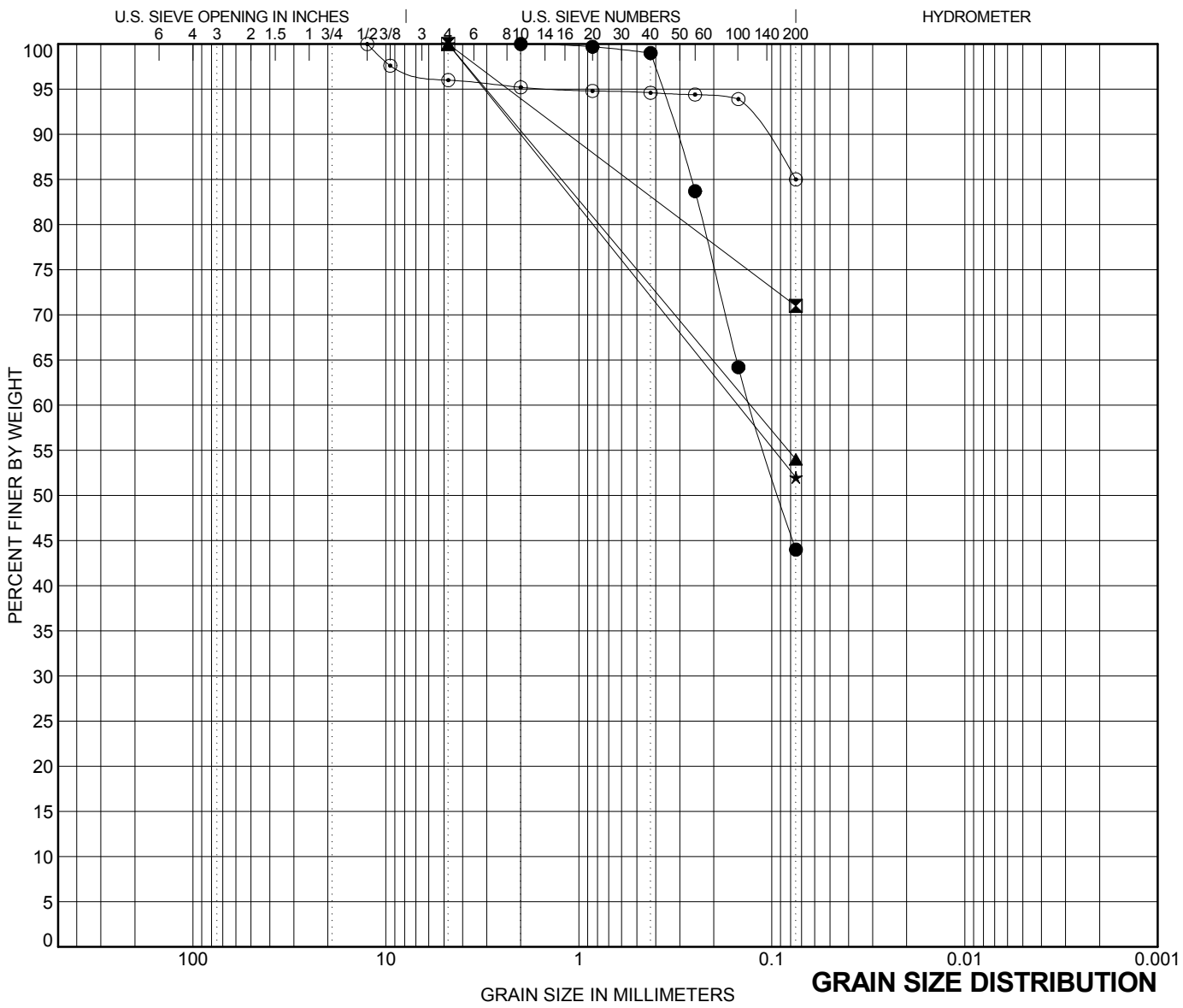
JOB NO: 2017-125-GEO | **PLATE NO: IV-3-P**



GRAIN SIZE DISTRIBUTION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING	SAMPLE #	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	R-38	4	16.0	SILTY SAND					
⊠	RW-50	3	9.5	Lean CLAY with SAND					
▲	RW-50	4	14.5	SANDY SILT					
★	RW-51	4	14.5	SANDY SILT					
⊙	TE-53	3	9.5	SILT					

	BORING	SAMPLE #	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	R-38	4	16.0	2	0.129			0.0	56.0	44.0	
⊠	RW-50	3	9.5	4.75				0.0	29.0	71.0	
▲	RW-50	4	14.5	4.75	0.129			0.0	46.0	54.0	
★	RW-51	4	14.5	4.75	0.15			0.0	48.0	52.0	
⊙	TE-53	3	9.5	12.5				4.0	11.0	85.0	

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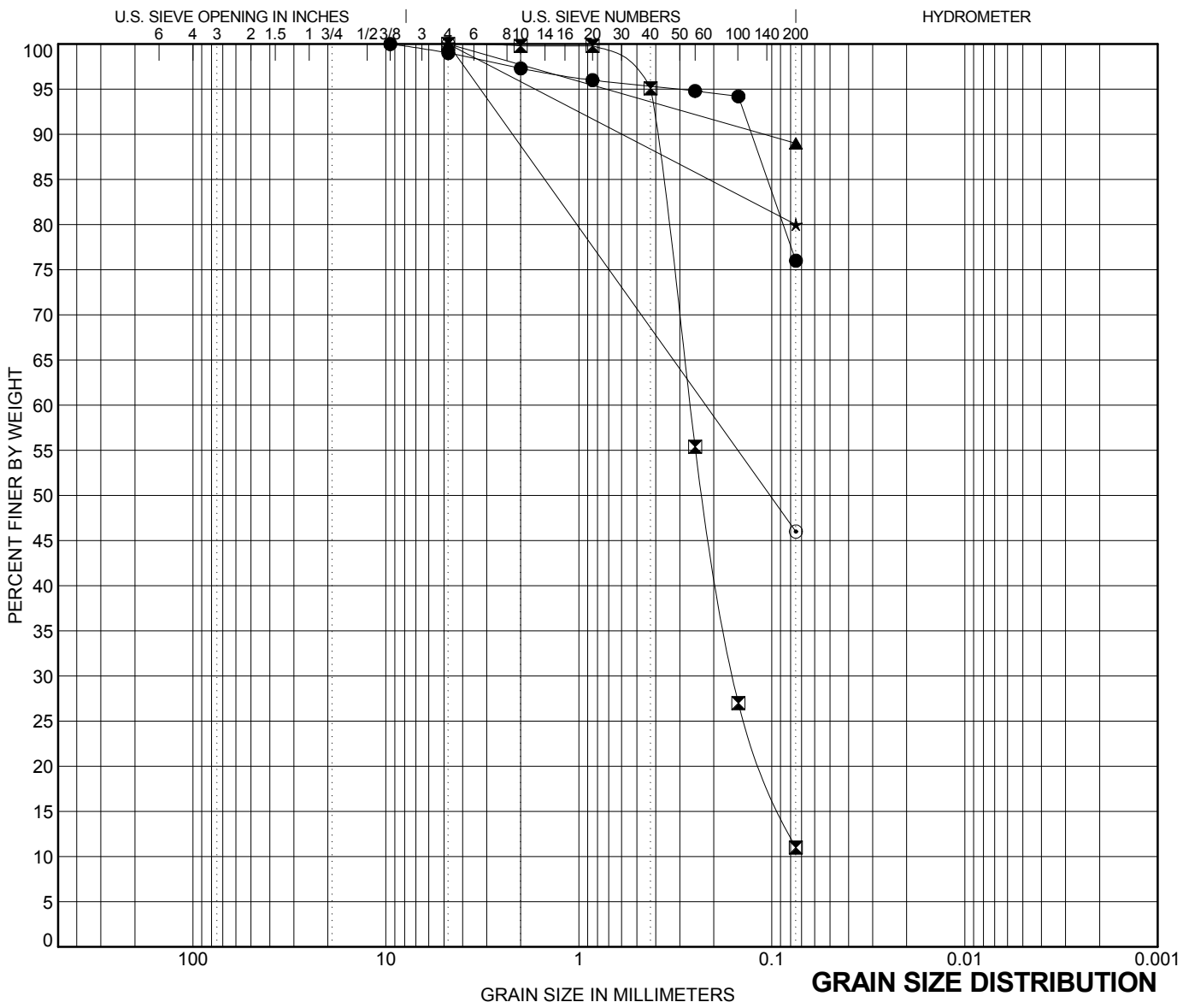
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO: 2017-125-GEO | **PLATE NO: IV-3-Q**



GRAIN SIZE DISTRIBUTION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BORING	SAMPLE #	DEPTH	Classification	LL	PL	PI	Cc	Cu
● TE-54	3	9.5	SILT with SAND					
⊠ TE-54	4	14.5	Poorly graded SAND with SILT				1.30	3.70
▲ TE-56	3	9.5	SILT					
★ TE-56	4	14.5	Lean CLAY with SAND					
⊙ TE-56	5	20.0	SILTY SAND					

BORING	SAMPLE #	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● TE-54	3	9.5	9.5				1.0	23.0	76.0	
⊠ TE-54	4	14.5	4.75	0.266	0.157		0.0	89.0	11.0	
▲ TE-56	3	9.5	4.75				0.0	11.0	89.0	
★ TE-56	4	14.5	4.75				0.0	20.0	80.0	
⊙ TE-56	5	20.0	4.75	0.22			0.0	54.0	46.0	

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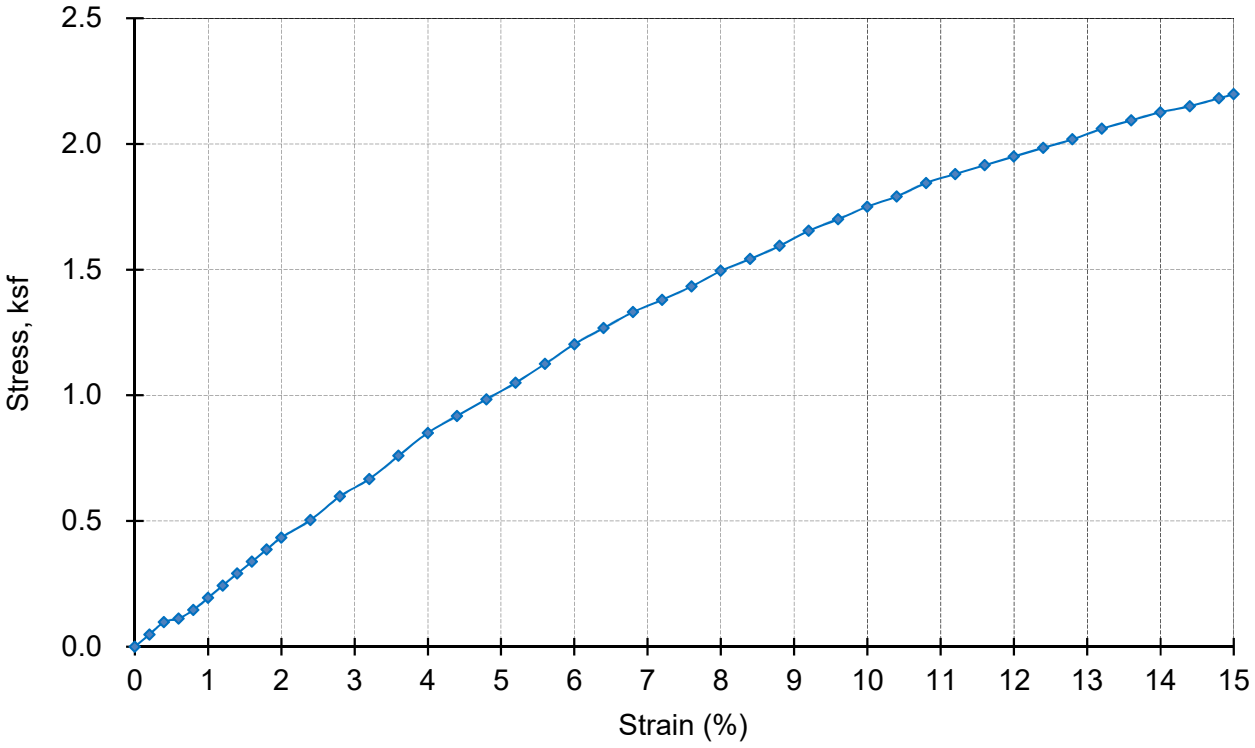
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO: 2017-125-GEO | **PLATE NO: IV-3-R**

UNCONFINED COMPRESSION TEST

UNCONFINED COMPRESSION TEST (BEFORE 2018)

UNCONFINED COMPRESSION TEST



Boring No.:	AS-1	**Unconfined Compressive Strength (ksf):**	2.20
Sample No. :	2	**Shear Strength (ksf)**	1.10
Depth (feet):	11	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	97
Test Method	ASTM D2166	**Water Content (%):**	27.0
Material Type:	CL		
Material Description:	Lean Clay, Yellowish Brown, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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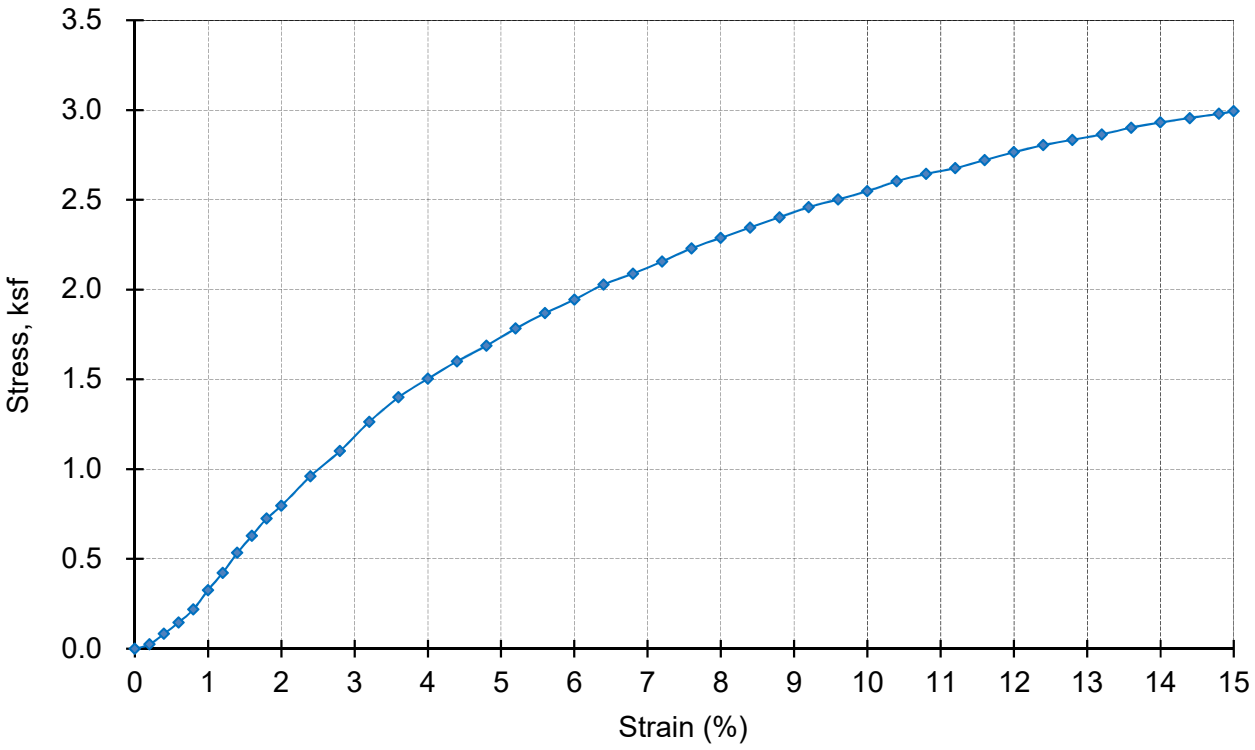
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4A

UNCONFINED COMPRESSION TEST



Boring No.:	AS-1	**Unconfined Compressive Strength (ksf):**	2.99
Sample No. :	5	**Shear Strength (ksf)**	1.50
Depth (feet):	26	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	112
Test Method	ASTM D2166	**Water Content (%):**	18.6
Material Type:	CL		
Material Description:	Sandy Lean Clay, Yellowish Brown, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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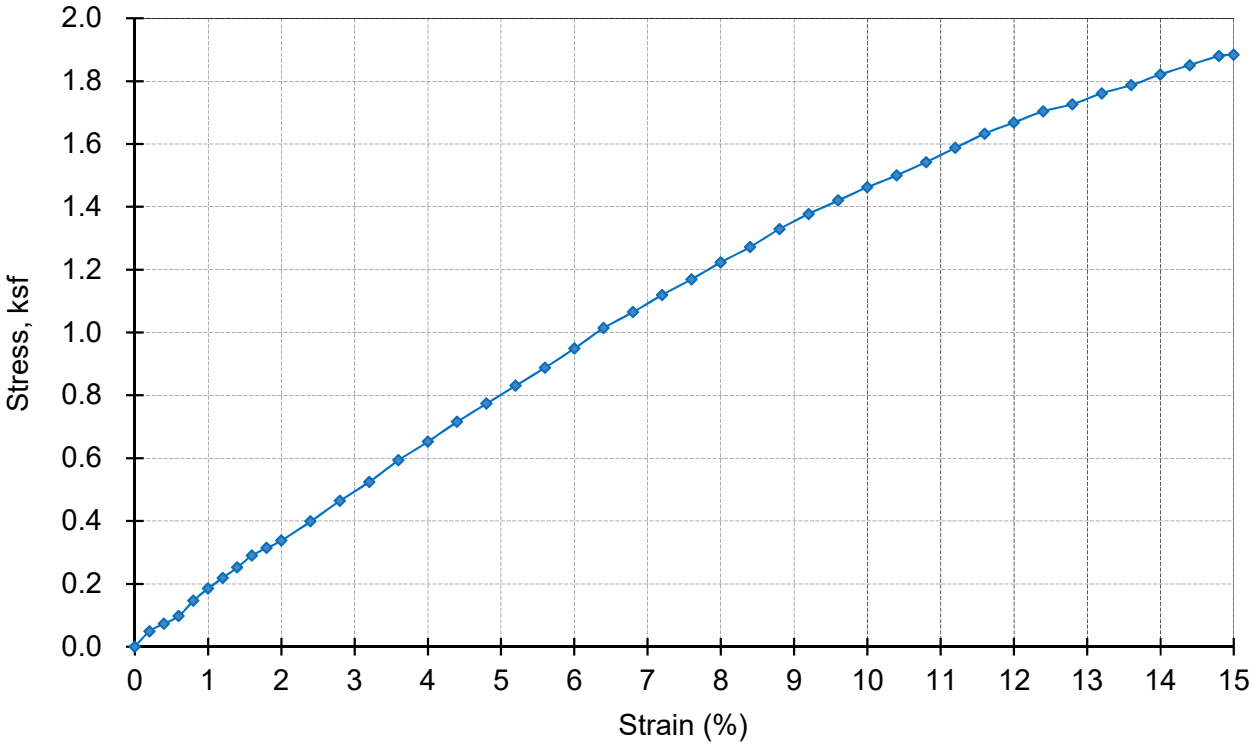
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4B

UNCONFINED COMPRESSION TEST



Boring No.:	AS-1	**Unconfined Compressive Strength (ksf):**	1.88
Sample No. :	6	**Shear Strength (ksf)**	0.94
Depth (feet):	36	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	94
Test Method	ASTM D2166	**Water Content (%):**	27.6
Material Type:	CL		
Material Description:	Sandy Lean Clay, Yellowish Brown, moist		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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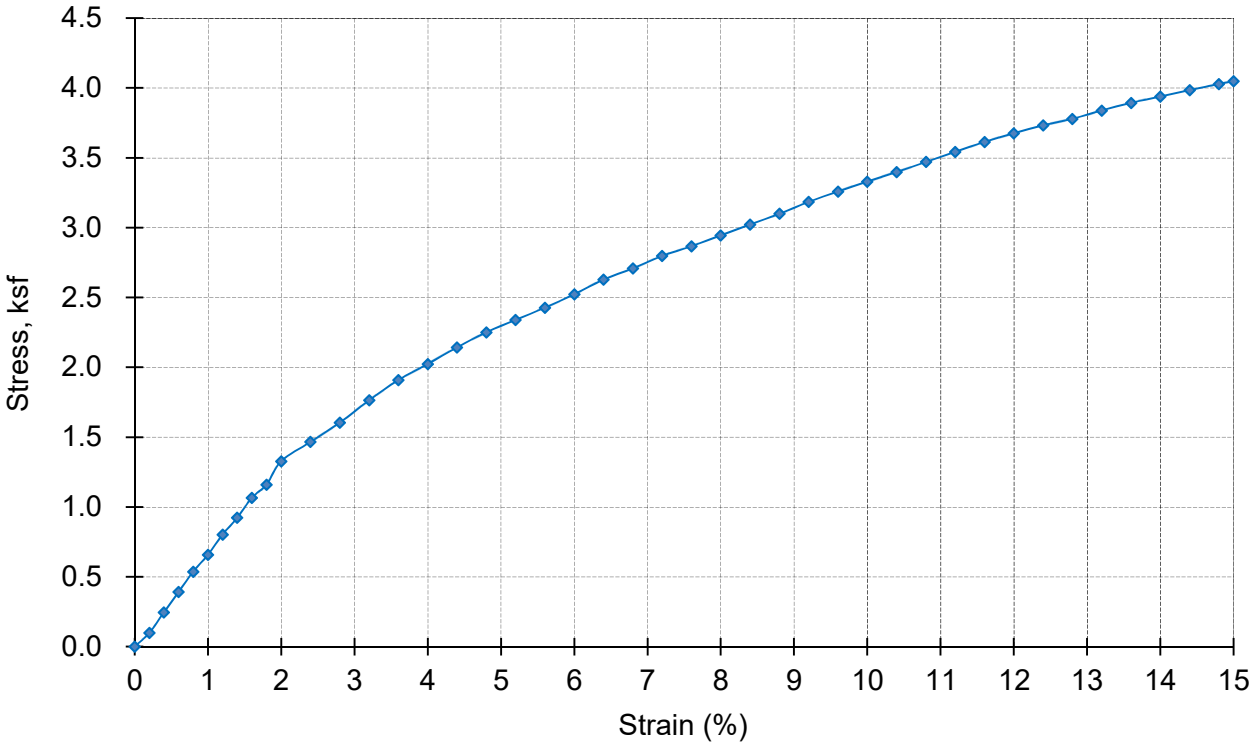
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4C

UNCONFINED COMPRESSION TEST



Boring No.:	AS-1	**Unconfined Compressive Strength (ksf):**	4.05
Sample No. :	12	**Shear Strength (ksf)**	2.02
Depth (feet):	81	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	94
Test Method	ASTM D2166	**Water Content (%):**	34.9
Material Type:	CL		
Material Description:	Sandy Lean Clay, Gray, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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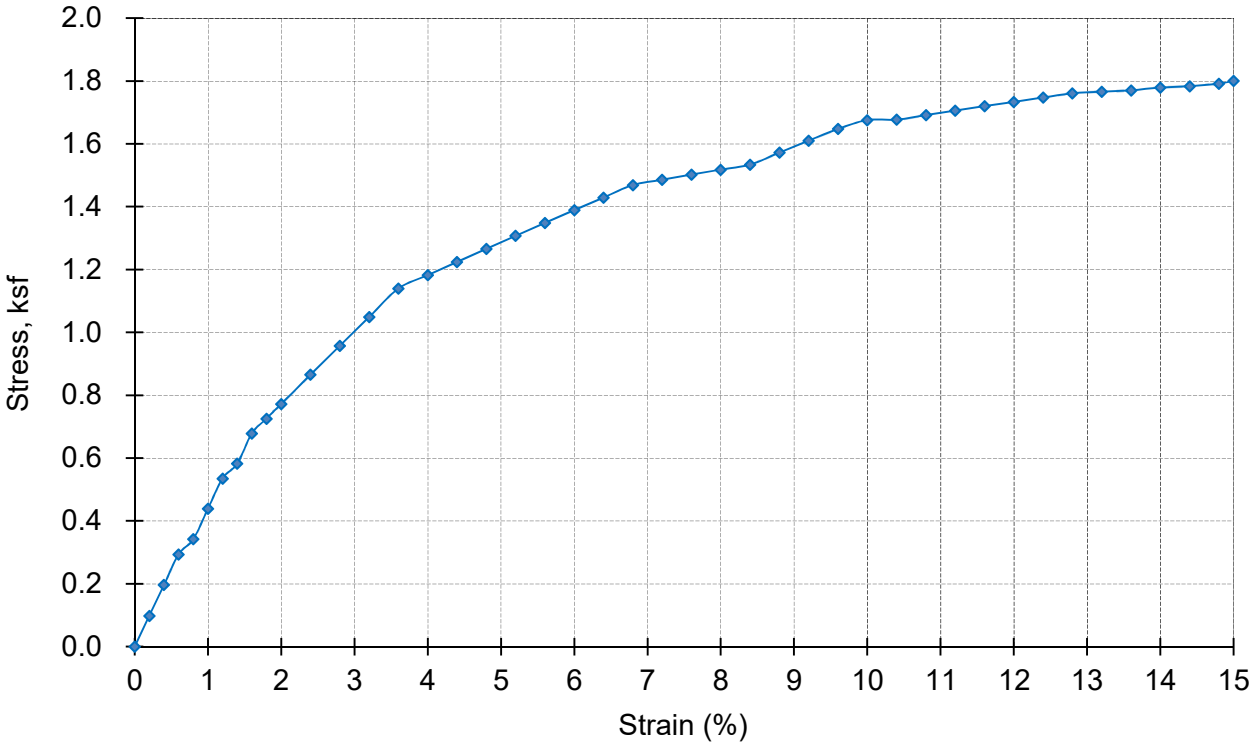
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4D

UNCONFINED COMPRESSION TEST



Boring No.:	AS-2	**Unconfined Compressive Strength (ksf):**	1.80
Sample No. :	5	**Shear Strength (ksf)**	0.90
Depth (feet):	20	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	105
Test Method	ASTM D2166	**Water Content (%):**	21.5
Material Type:	CL		
Material Description:	Lean Clay, Yellowish Brown, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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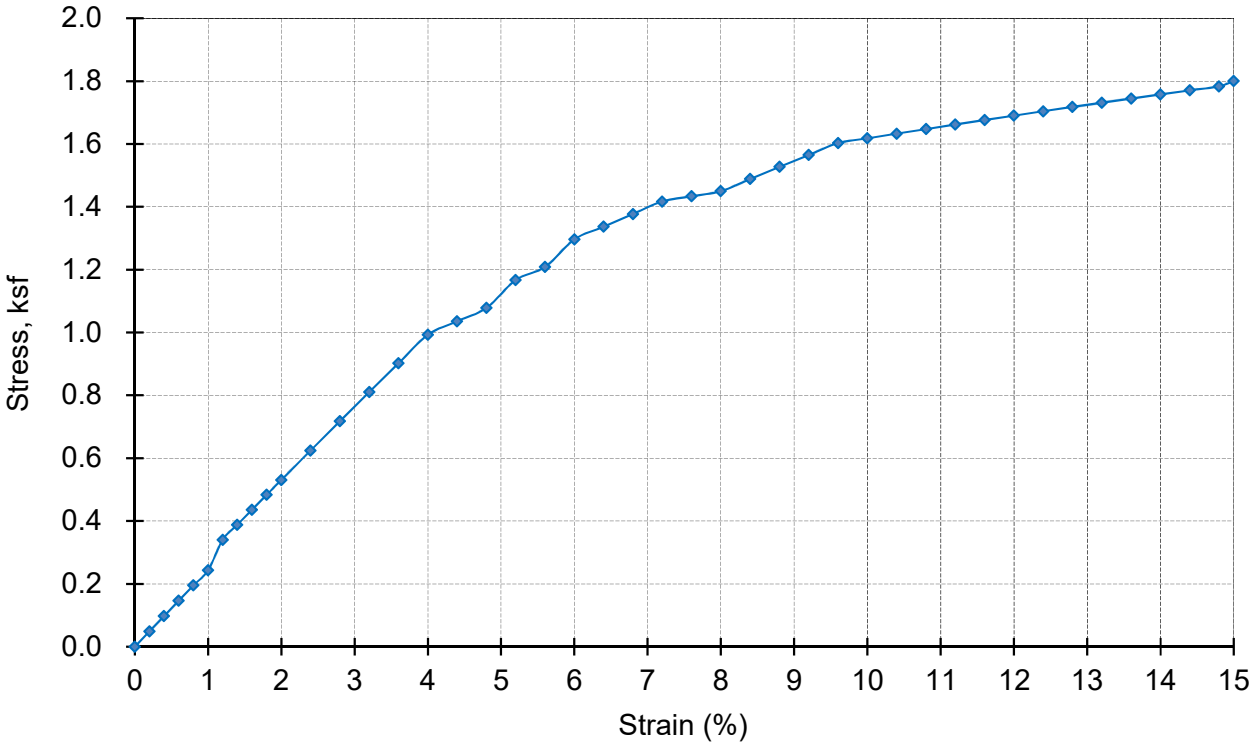
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4E

UNCONFINED COMPRESSION TEST



Boring No.:	AS-2	**Unconfined Compressive Strength (ksf):**	1.80
Sample No. :	6	**Shear Strength (ksf)**	0.90
Depth (feet):	25	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	101
Test Method	ASTM D2166	**Water Content (%):**	23.4
Material Type:	CL		
Material Description:	Lean Clay, Yellowish Brown, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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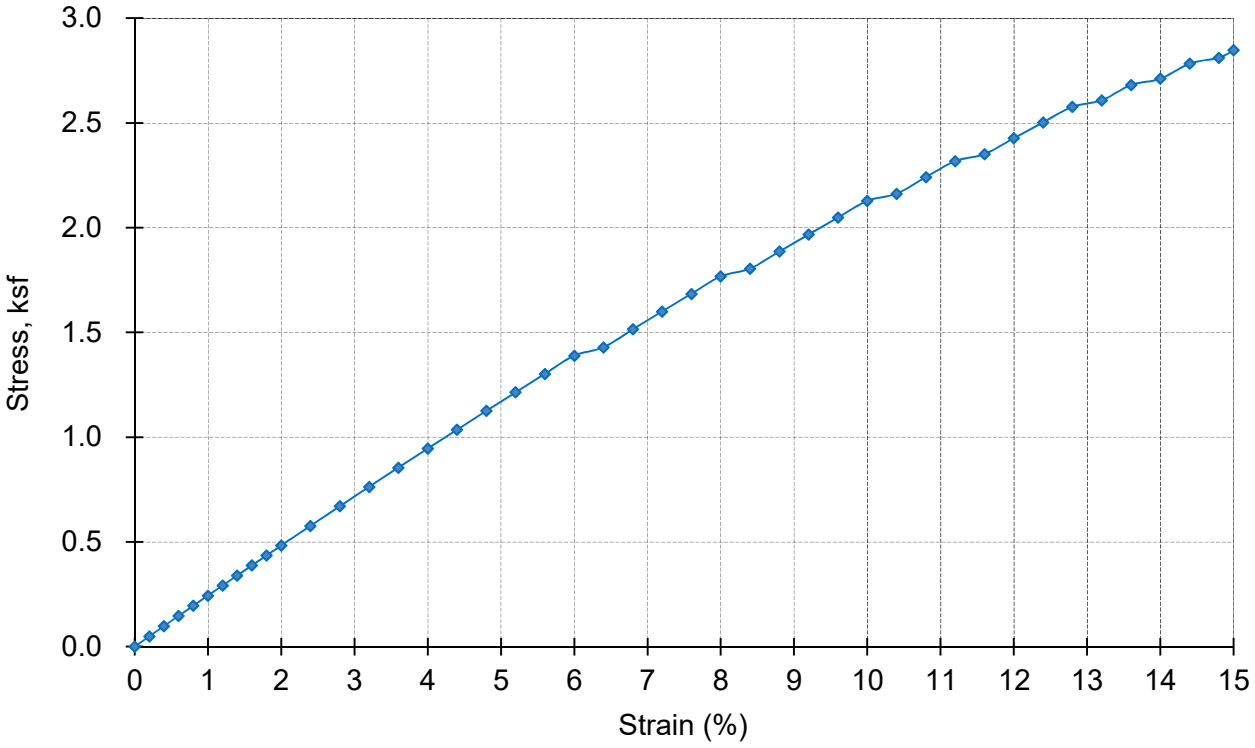
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4F

UNCONFINED COMPRESSION TEST



Boring No.:	AS-2	**Unconfined Compressive Strength (ksf):**	2.85
Sample No. :	17	**Shear Strength (ksf)**	1.42
Depth (feet):	100	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	104
Test Method	ASTM D2166	**Water Content (%):**	22.5
Material Type:	CL		
Material Description:	Lean Clay, Yellowish Brown, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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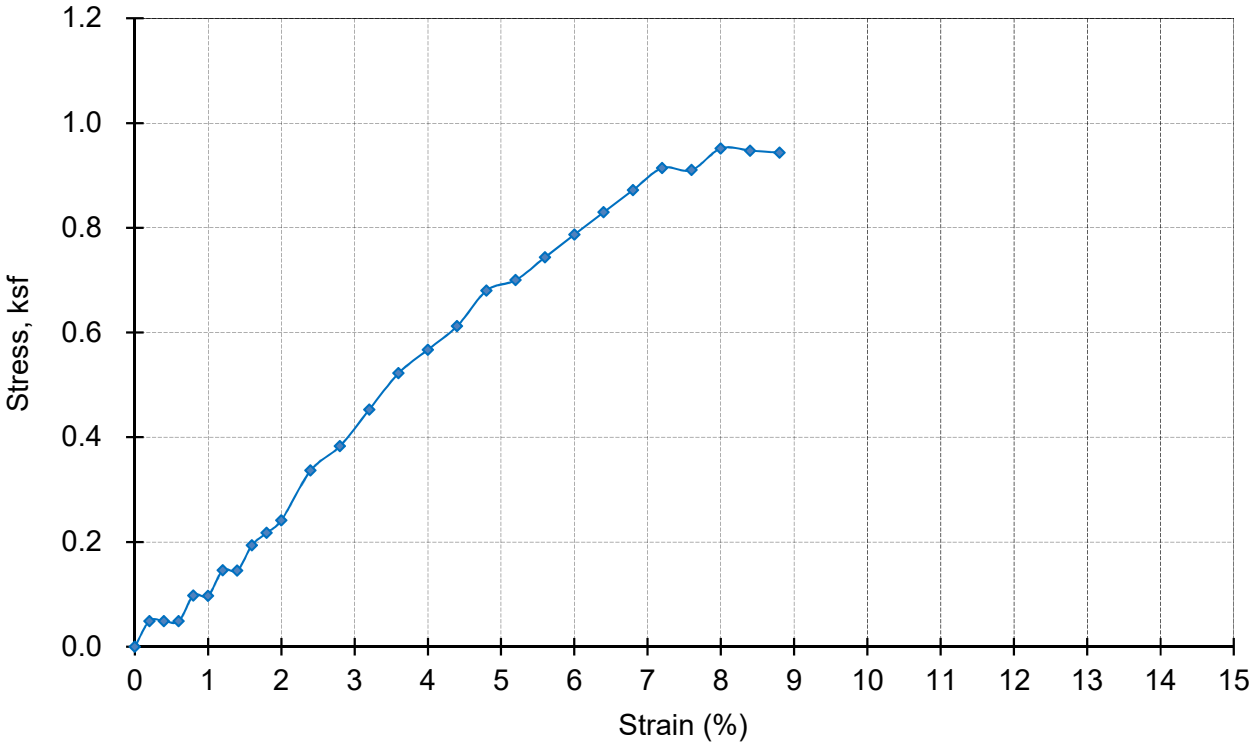
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4G

UNCONFINED COMPRESSION TEST



Boring No.:	AS-3	**Unconfined Compressive Strength (ksf):**	0.95
Sample No. :	2	**Shear Strength (ksf)**	0.48
Depth (feet):	5	**Strain @ Failure (%):**	8.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	107
Test Method	ASTM D2166	**Water Content (%):**	19.6
Material Type:	CL-ML		
Material Description:	Silty Clay, Brown, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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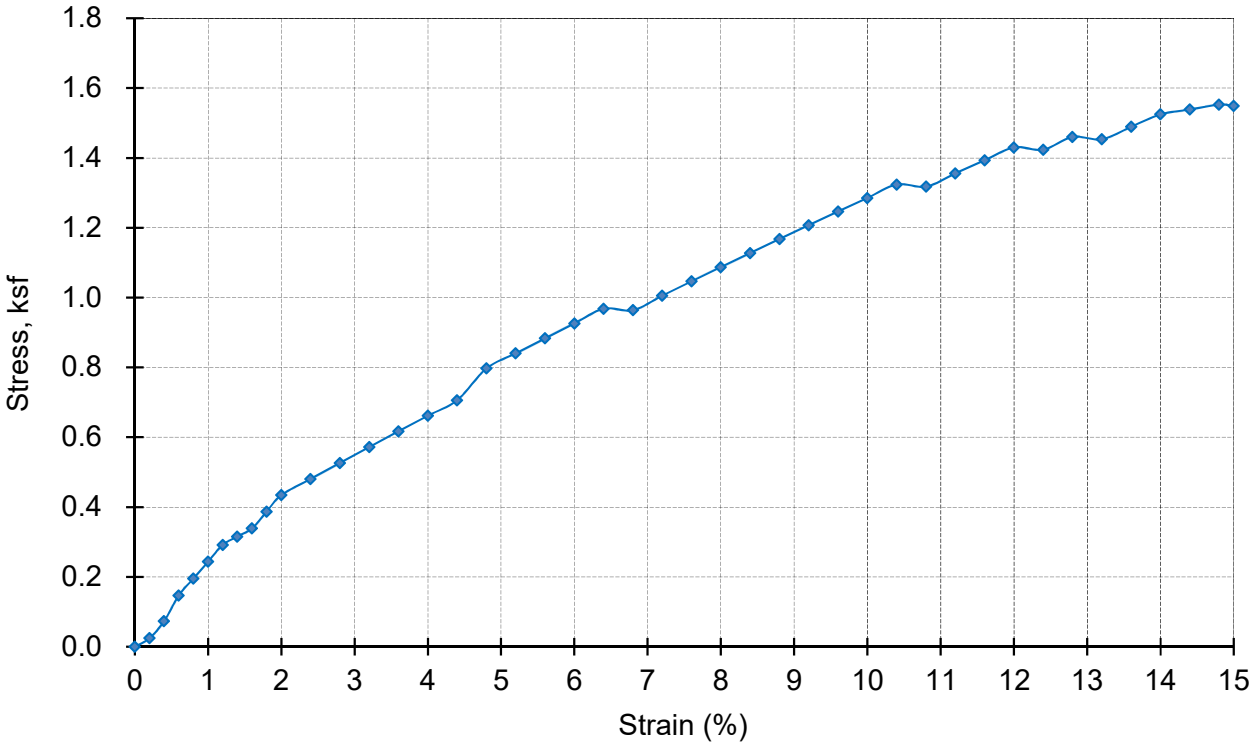
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4H

UNCONFINED COMPRESSION TEST



Boring No.:	AS-3	**Unconfined Compressive Strength (ksf):**	1.55
Sample No. :	4	**Shear Strength (ksf)**	0.78
Depth (feet):	15	**Strain @ Failure (%):**	14.8
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	96
Test Method	ASTM D2166	**Water Content (%):**	28.7
Material Type:	CL		
Material Description:	Lean Clay, Bluish Yellow, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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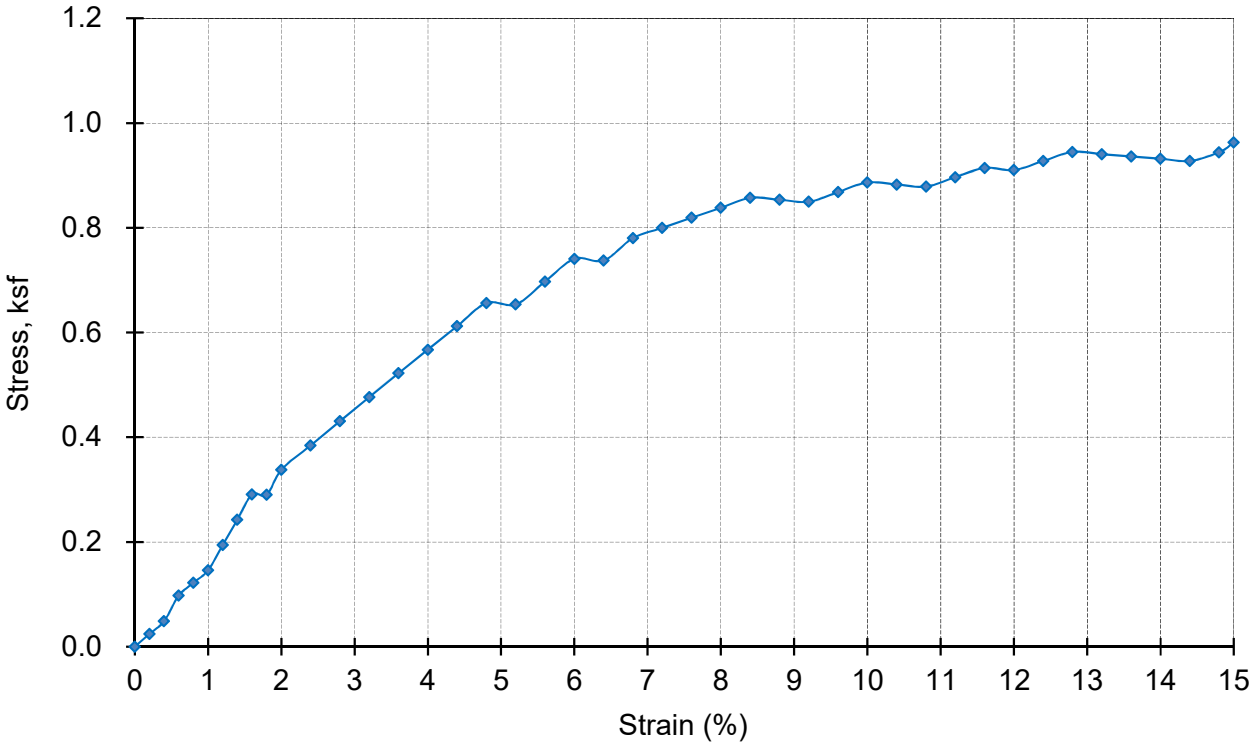
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4I

UNCONFINED COMPRESSION TEST



Boring No.:	AS-3	**Unconfined Compressive Strength (ksf):**	0.96
Sample No. :	8	**Shear Strength (ksf)**	0.48
Depth (feet):	35	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	108
Test Method	ASTM D2166	**Water Content (%):**	22.4
Material Type:	CL		
Material Description:	Lean Clay with Gravel, Light Brown, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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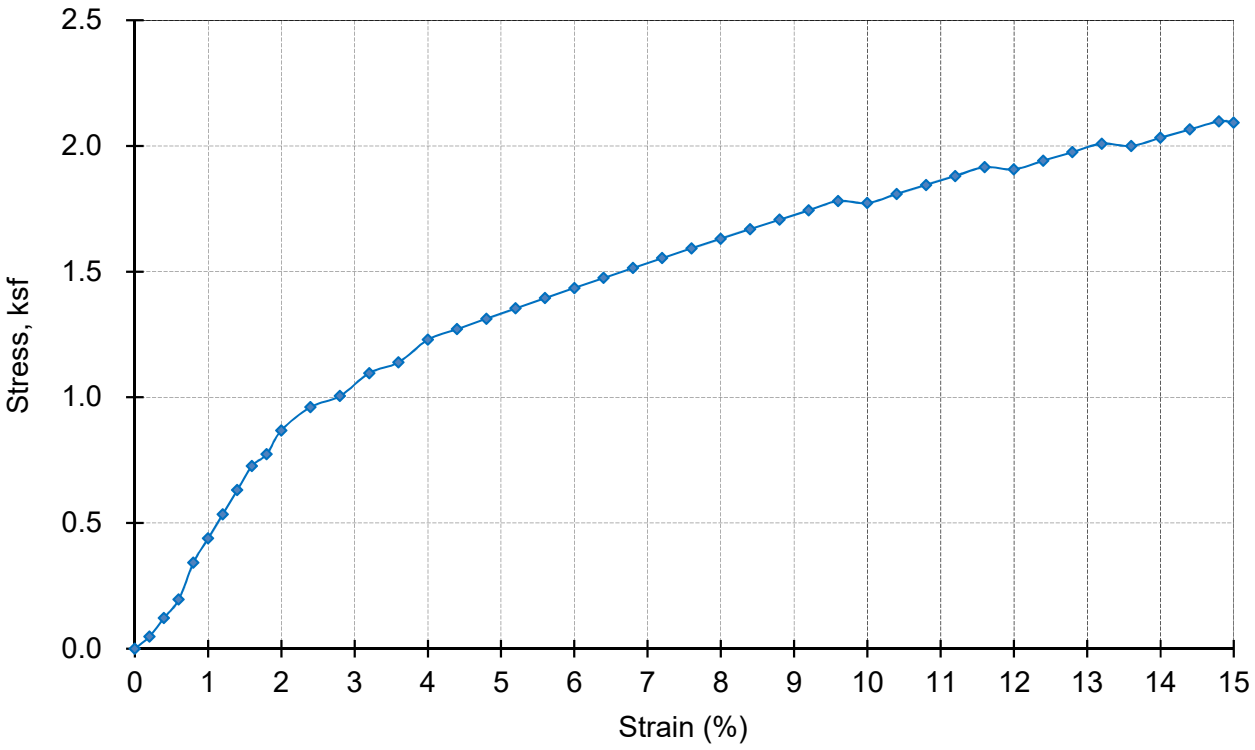
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4J

UNCONFINED COMPRESSION TEST



Boring No.:	AS-3	**Unconfined Compressive Strength (ksf):**	2.10
Sample No. :	10	**Shear Strength (ksf)**	1.05
Depth (feet):	45	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	101
Test Method	ASTM D2166	**Water Content (%):**	23.9
Material Type:	CL		
Material Description:	Lean Clay with Gravel, Bluish Gray, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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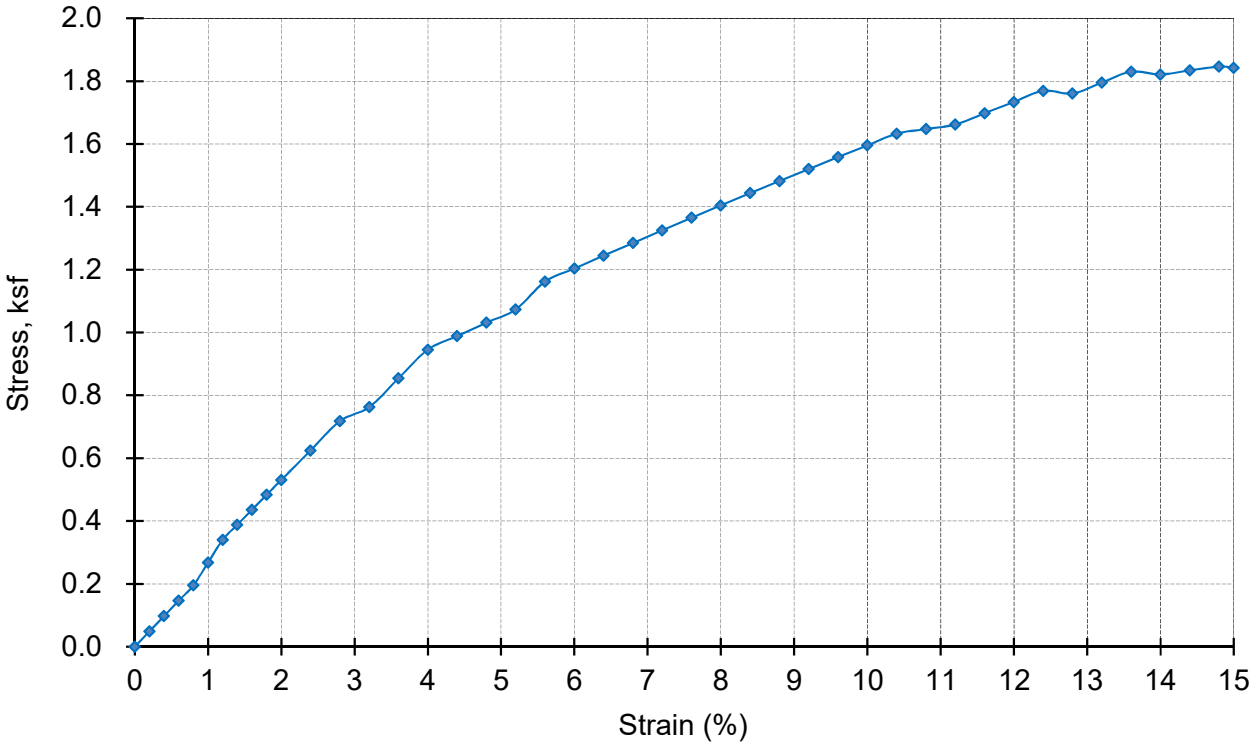
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4K

UNCONFINED COMPRESSION TEST



Boring No.:	AS-3	**Unconfined Compressive Strength (ksf):**	1.85
Sample No. :	11	**Shear Strength (ksf)**	0.92
Depth (feet):	50	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	104
Test Method	ASTM D2166	**Water Content (%):**	22.5
Material Type:	CL		
Material Description:	Lean Clay, Gray and White, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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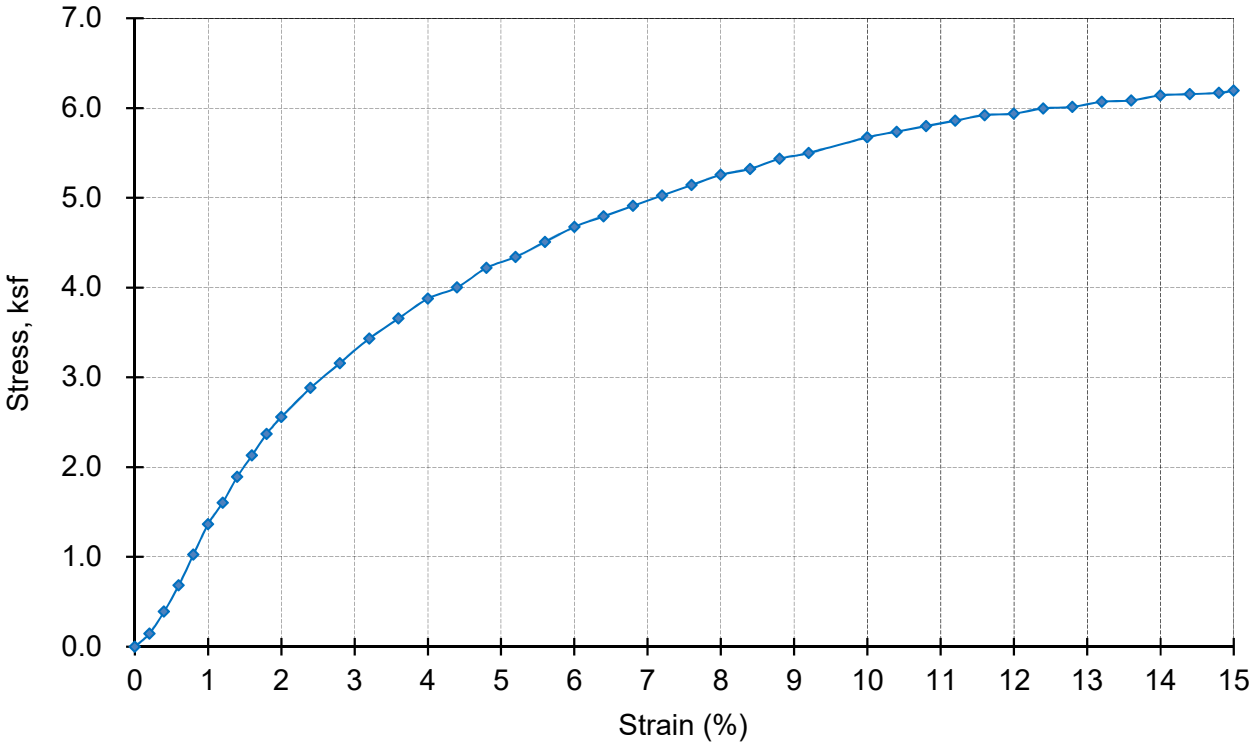
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4L

UNCONFINED COMPRESSION TEST



Boring No.:	AS-3	**Unconfined Compressive Strength (ksf):**	6.20
Sample No. :	16	**Shear Strength (ksf)**	3.10
Depth (feet):	90	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	99
Test Method	ASTM D2166	**Water Content (%):**	25.4
Material Type:	CL		
Material Description:	Lean Clay with Gravel, Gray, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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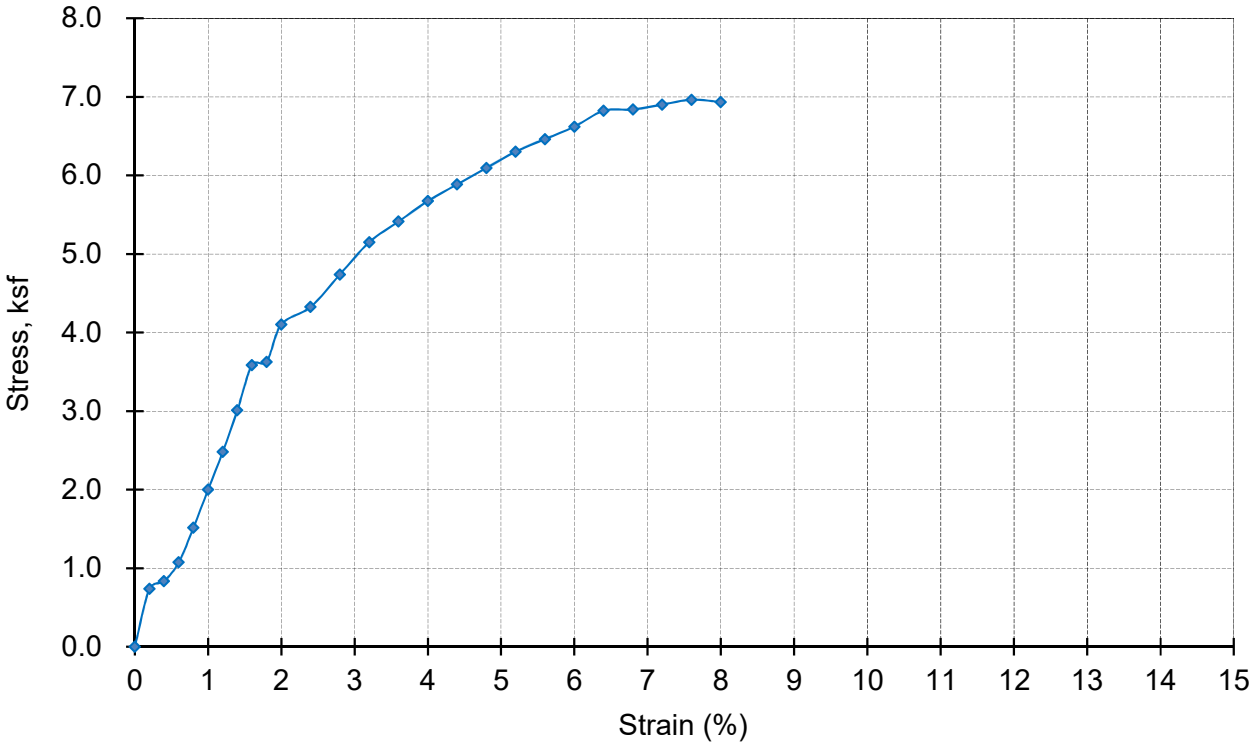
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4M

UNCONFINED COMPRESSION TEST



Boring No.:	AS-4	**Unconfined Compressive Strength (ksf):**	6.96
Sample No. :	2	**Shear Strength (ksf)**	3.48
Depth (feet):	6	**Strain @ Failure (%):**	7.6
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	114
Test Method	ASTM D2166	**Water Content (%):**	15.4
Material Type:	CL		
Material Description:	Lean Clay, Dark Brown, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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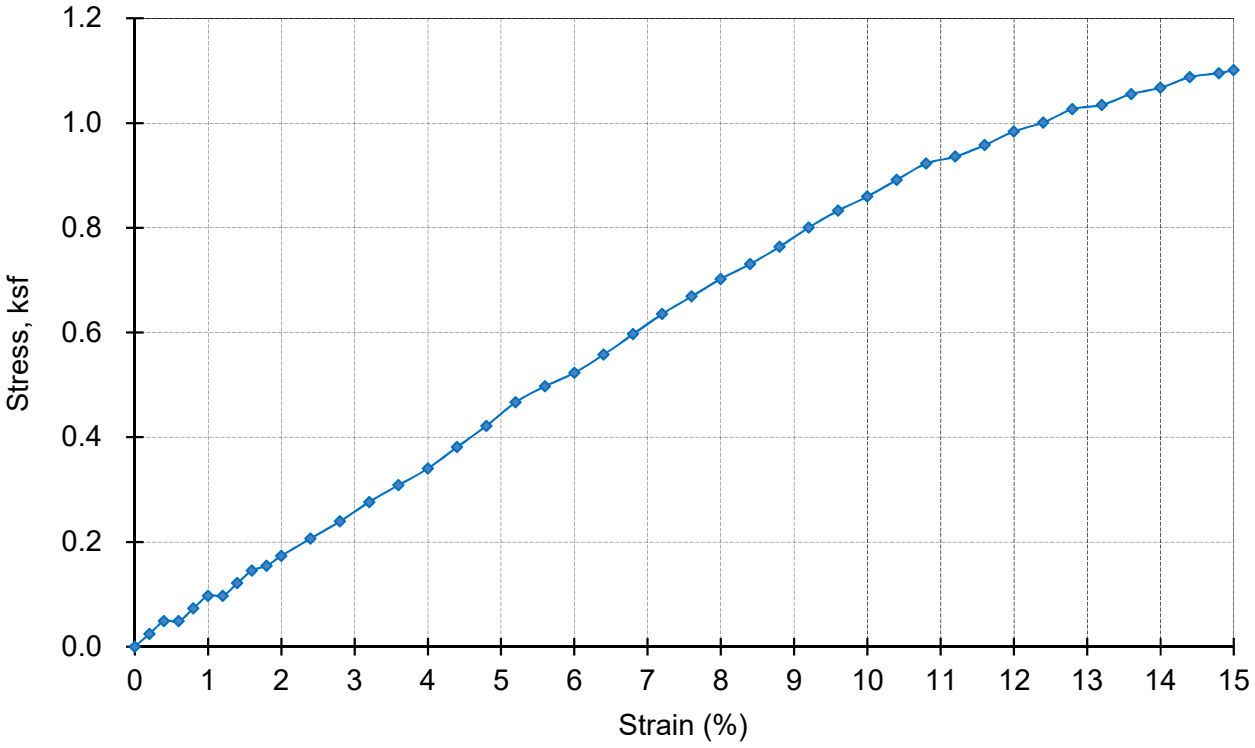
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4N

UNCONFINED COMPRESSION TEST



Boring No.:	AS-4	**Unconfined Compressive Strength (ksf):**	1.10
Sample No. :	6	**Shear Strength (ksf)**	0.55
Depth (feet):	26	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	98
Test Method	ASTM D2166	**Water Content (%):**	25.4
Material Type:	CL		
Material Description:	Sandy Lean Clay, Yellowish Gray, wet		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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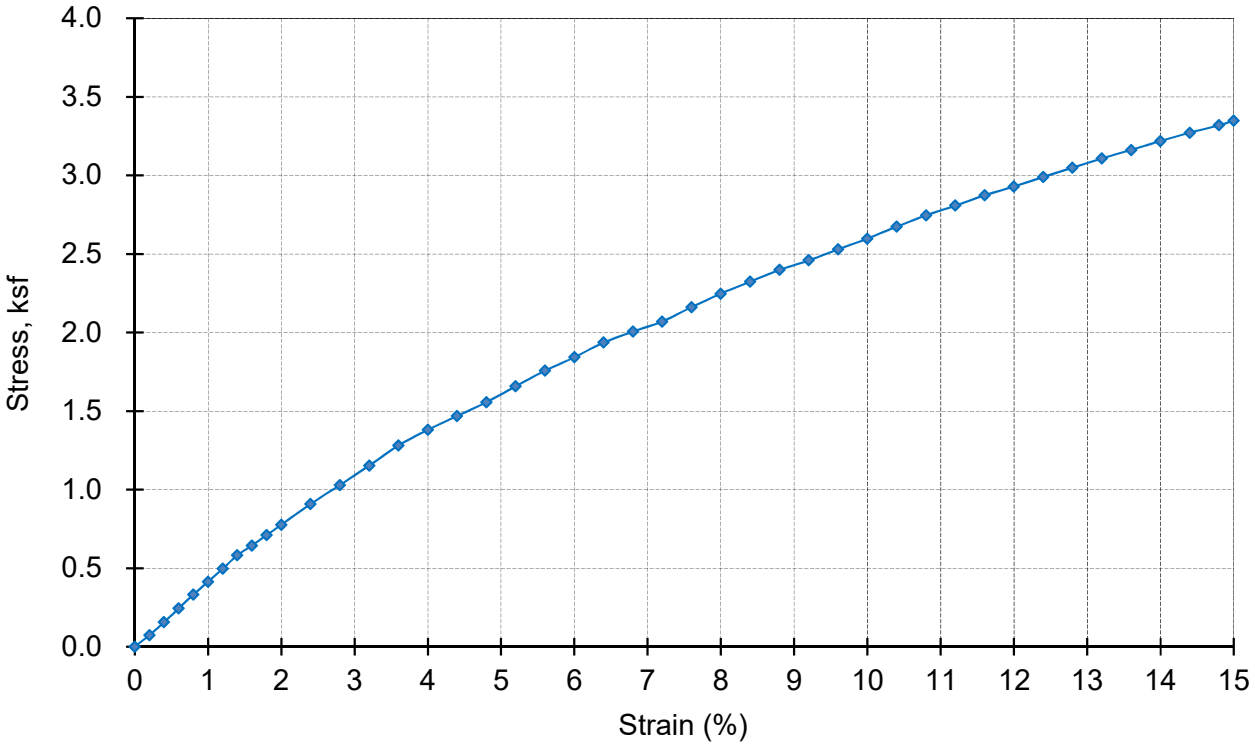
JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4O**

UNCONFINED COMPRESSION TEST



Boring No.:	AS-4	**Unconfined Compressive Strength (ksf):**	3.35
Sample No. :	15	**Shear Strength (ksf)**	1.67
Depth (feet):	81	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	103
Test Method	ASTM D2166	**Water Content (%):**	22.5
Material Type:	CL		
Material Description:	Sandy Lean Clay, Gray, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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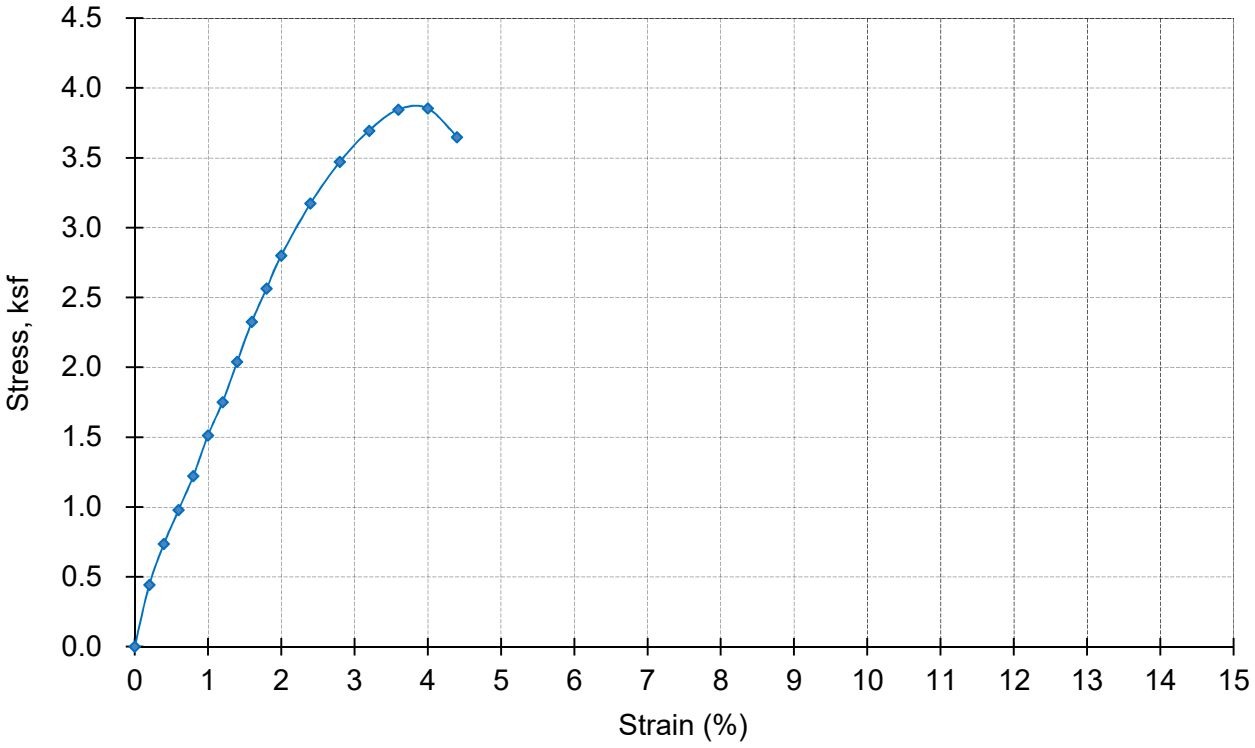
JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4P**

UNCONFINED COMPRESSION TEST



Boring No.:	AS-5A	**Unconfined Compressive Strength (ksf):**	3.85
Sample No. :	1	**Shear Strength (ksf)**	1.93
Depth (feet):	2	**Strain @ Failure (%):**	4.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	114
Test Method	ASTM D2166	**Water Content (%):**	12.3
Material Type:	CL		
Material Description:	Lean Clay, Dark Brownish Gray, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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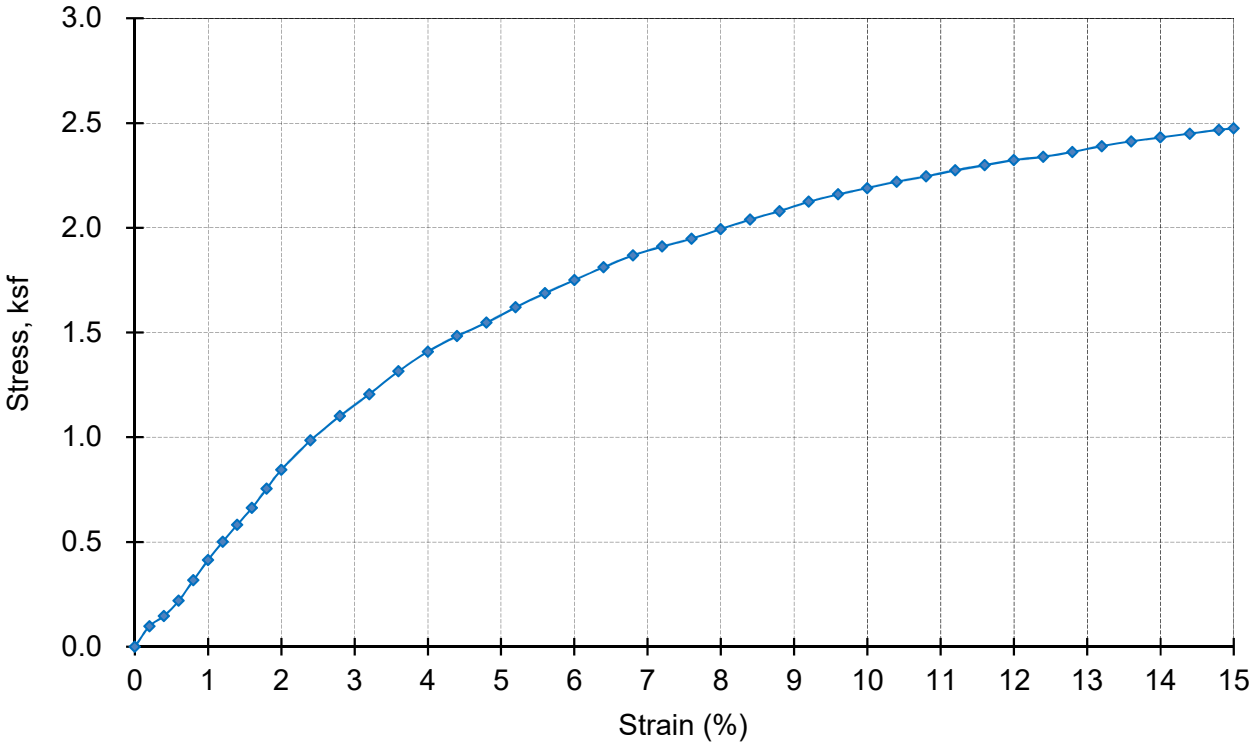
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4Q

UNCONFINED COMPRESSION TEST



Boring No.:	AS-5A	**Unconfined Compressive Strength (ksf):**	2.47
Sample No. :	5	**Shear Strength (ksf)**	1.24
Depth (feet):	20	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	102
Test Method	ASTM D2166	**Water Content (%):**	24.0
Material Type:	CL		
Material Description:	Lean Clay, Grayish Brown, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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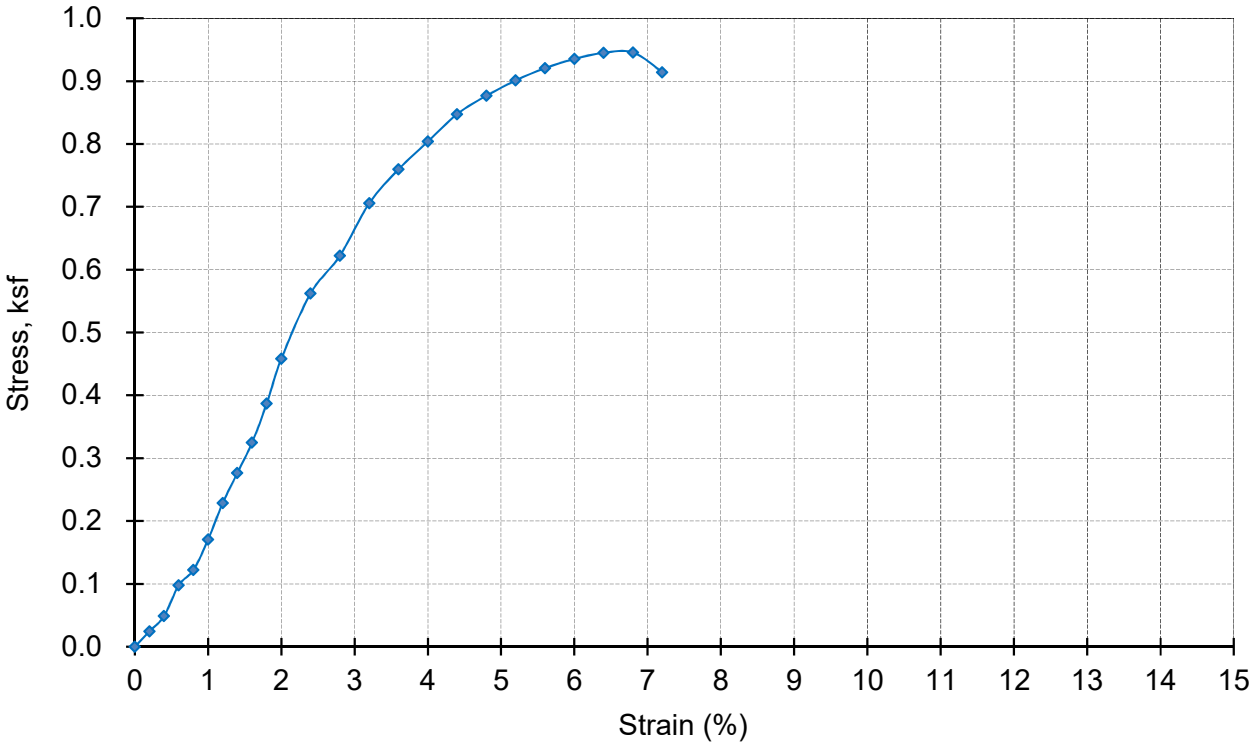
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4R**

UNCONFINED COMPRESSION TEST



Boring No.:	AS-5A	**Unconfined Compressive Strength (ksf):**	0.95
Sample No. :	9	**Shear Strength (ksf)**	0.47
Depth (feet):	40	**Strain @ Failure (%):**	6.8
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	111
Test Method	ASTM D2166	**Water Content (%):**	17.5
Material Type:	CL		
Material Description:	Lean Clay with Gravel, Grayish Brown, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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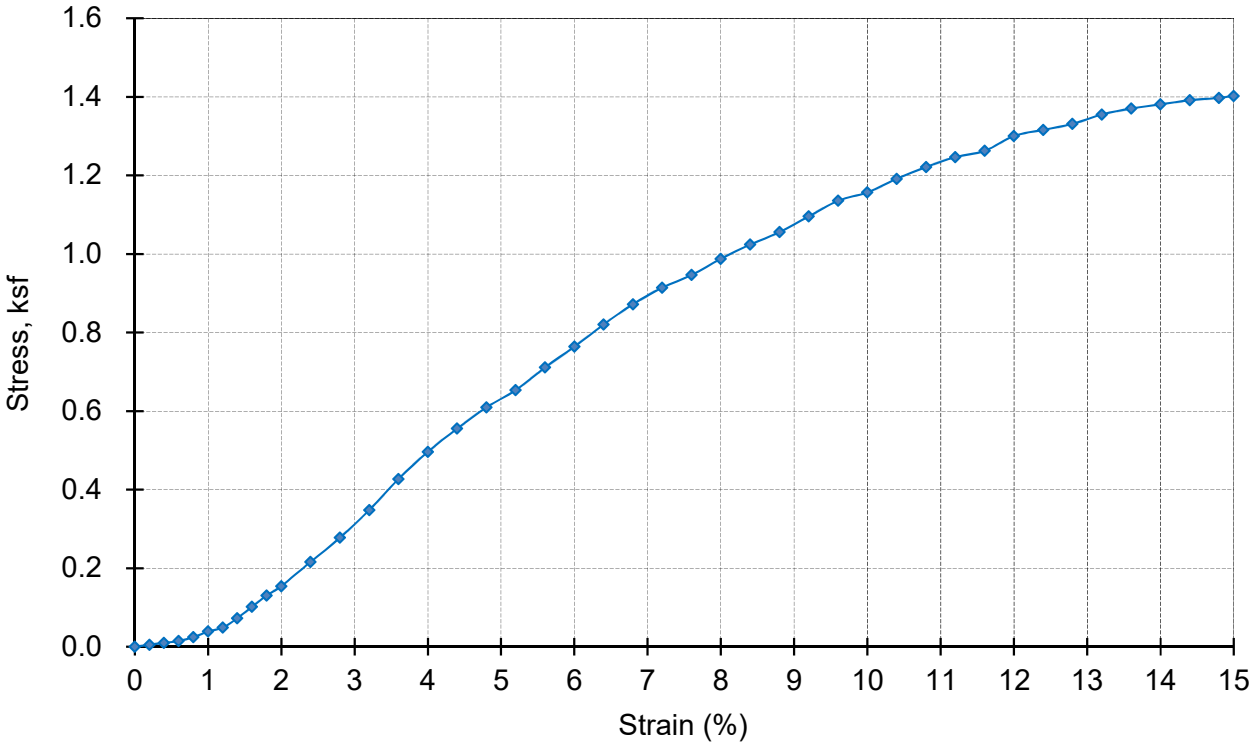
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4S

UNCONFINED COMPRESSION TEST



Boring No.:	AS-5A	**Unconfined Compressive Strength (ksf):**	1.40
Sample No. :	10	**Shear Strength (ksf)**	0.70
Depth (feet):	45	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	105
Test Method	ASTM D2166	**Water Content (%):**	20.5
Material Type:	CL		
Material Description:	Lean Clay with Gravel, Light Yellowish Gray, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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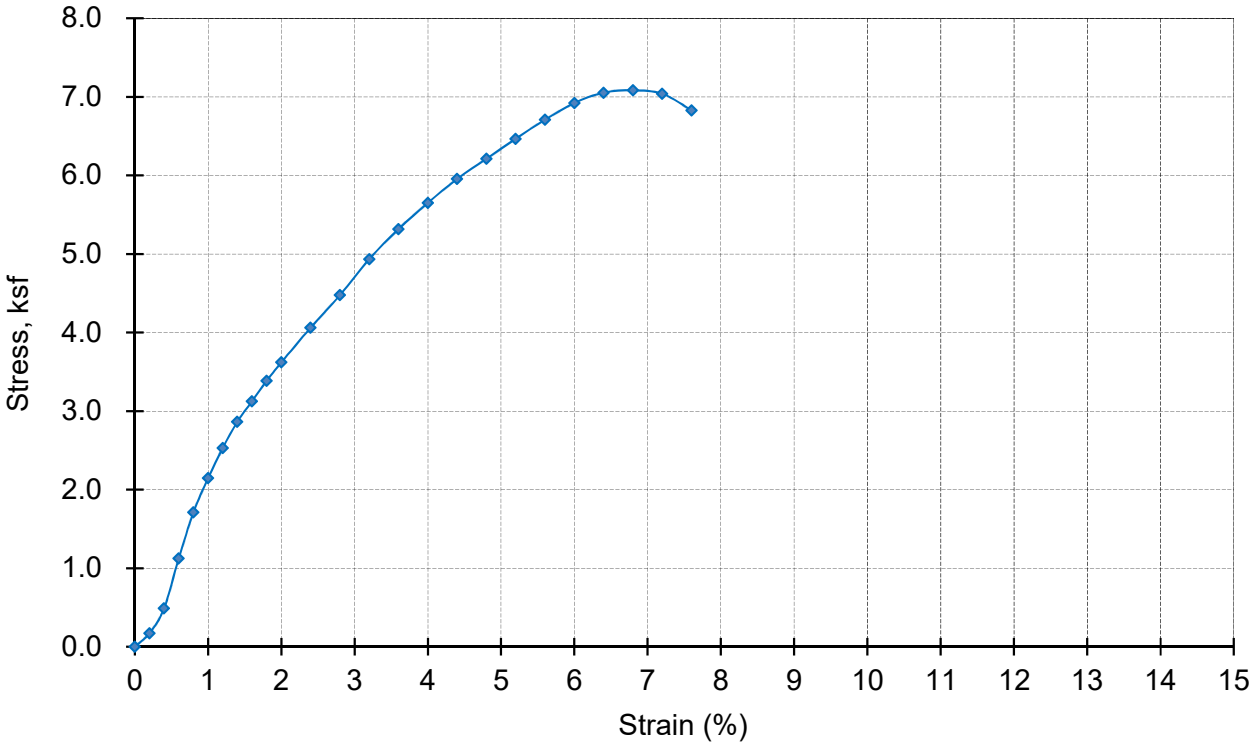
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4T

UNCONFINED COMPRESSION TEST



Boring No.:	AS-7	**Unconfined Compressive Strength (ksf):**	7.08
Sample No. :	2	**Shear Strength (ksf)**	3.54
Depth (feet):	5	**Strain @ Failure (%):**	6.8
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	109
Test Method	ASTM D2166	**Water Content (%):**	19.6
Material Type:	CL		
Material Description:	Lean Clay, Dark Gray, moist		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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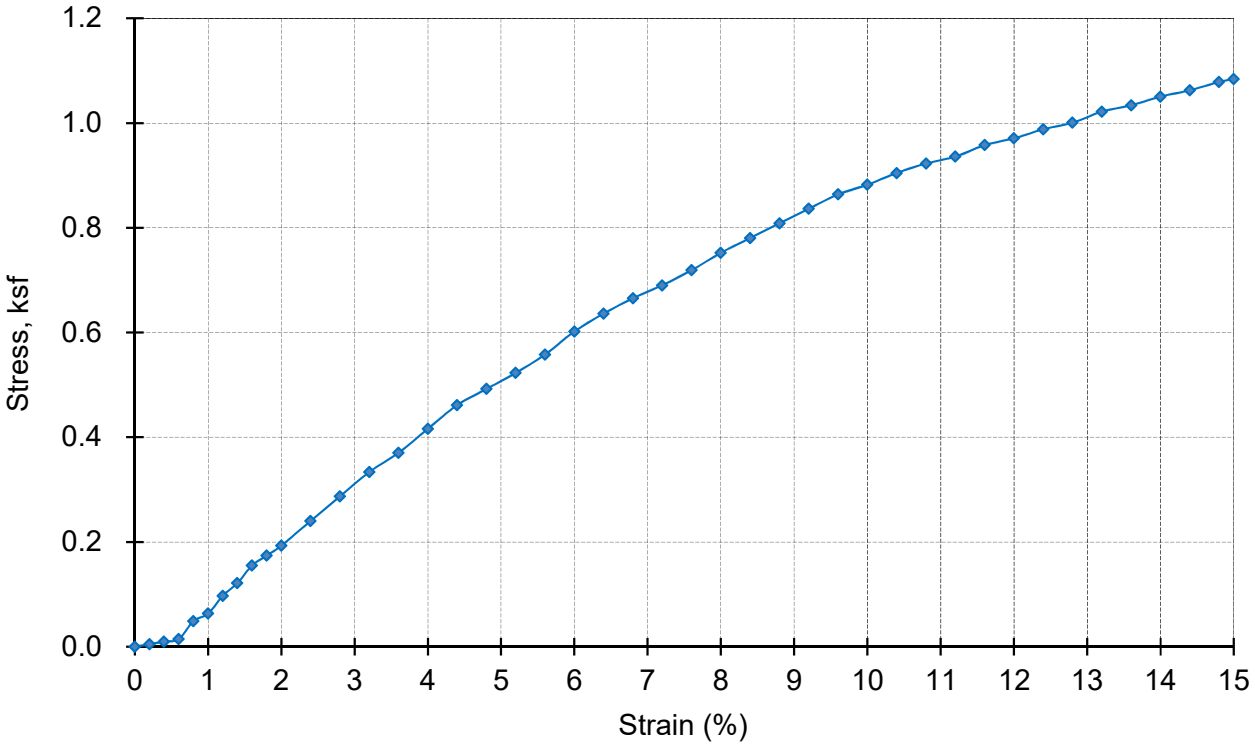
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4U

UNCONFINED COMPRESSION TEST



Boring No.:	AS-7	**Unconfined Compressive Strength (ksf):**	1.08
Sample No. :	4	**Shear Strength (ksf)**	0.54
Depth (feet):	15	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	88
Test Method	ASTM D2166	**Water Content (%):**	33.3
Material Type:	CL		
Material Description:	Lean Clay, Yellowish Gray, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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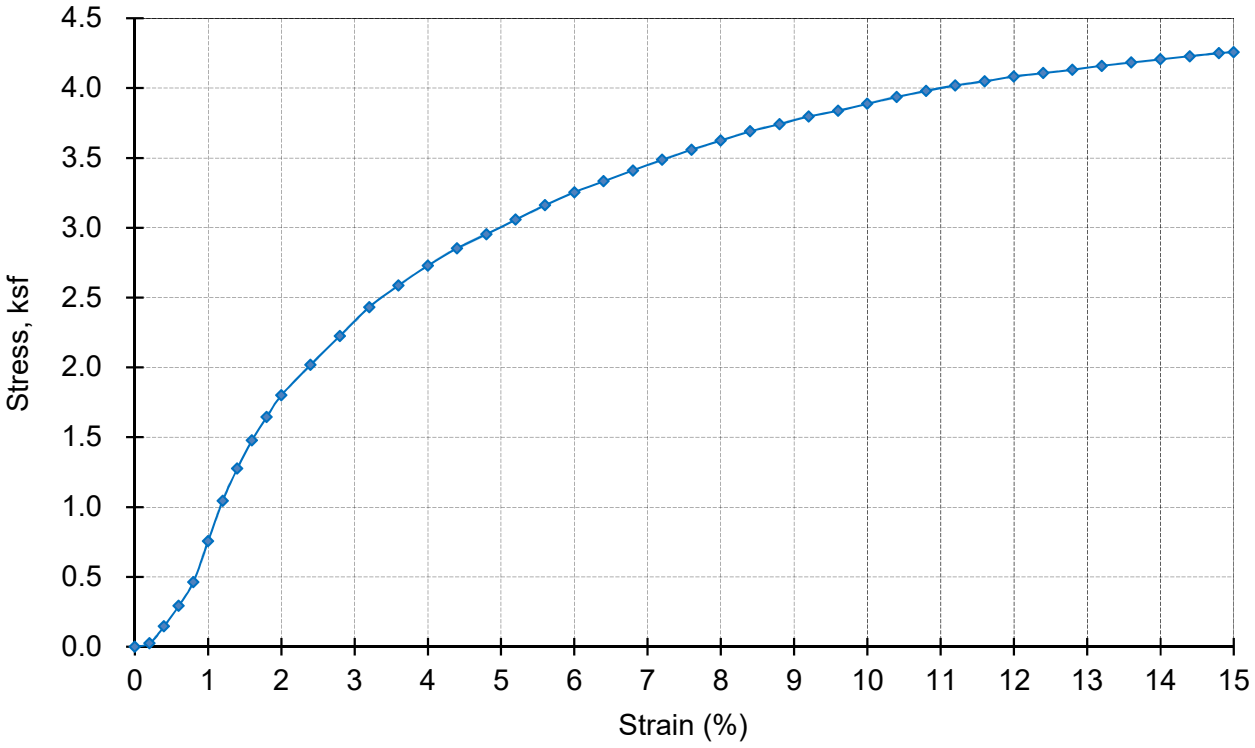
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4V**

UNCONFINED COMPRESSION TEST



Boring No.:	AS-7	**Unconfined Compressive Strength (ksf):**	4.26
Sample No. :	5	**Shear Strength (ksf)**	2.13
Depth (feet):	20	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	95
Test Method	ASTM D2166	**Water Content (%):**	27.5
Material Type:	CL		
Material Description:	Lean Clay, Yellowish Gray, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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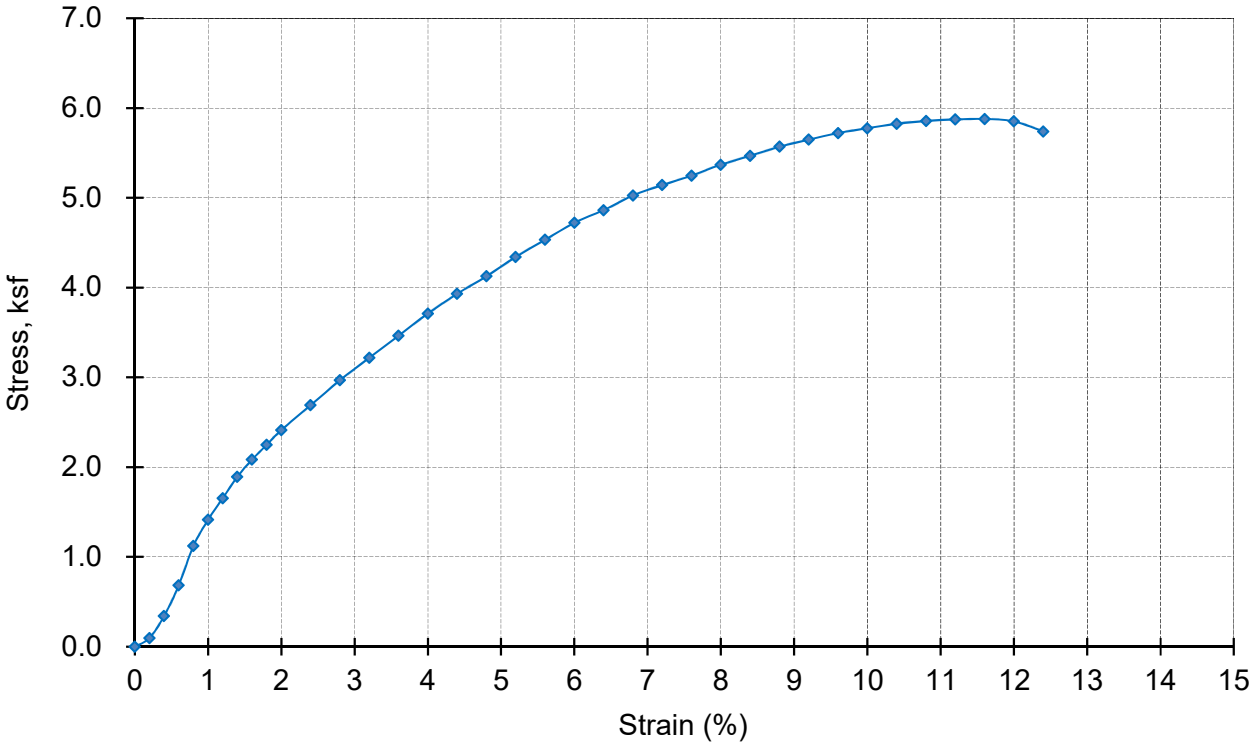
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4W

UNCONFINED COMPRESSION TEST



Boring No.:	AS-11	**Unconfined Compressive Strength (ksf):**	5.88
Sample No. :	2	**Shear Strength (ksf)**	2.94
Depth (feet):	6	**Strain @ Failure (%):**	11.6
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	104
Test Method	ASTM D2166	**Water Content (%):**	19.5
Material Type:	CH		
Material Description:	Fat Clay, Dark Gray, moist		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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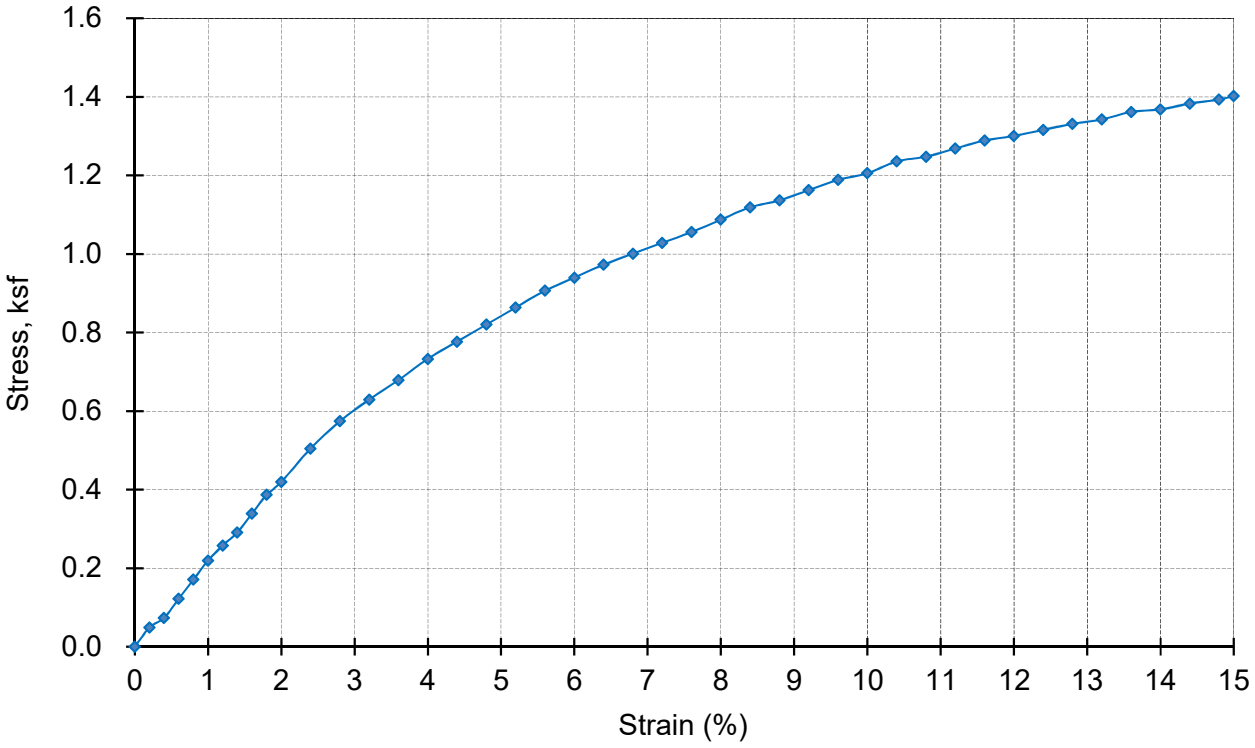
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4X**

UNCONFINED COMPRESSION TEST



Boring No.:	AS-11	**Unconfined Compressive Strength (ksf):**	1.40
Sample No. :	5	**Shear Strength (ksf)**	0.70
Depth (feet):	21	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	94
Test Method	ASTM D2166	**Water Content (%):**	28.8
Material Type:	CH		
Material Description:	Fat Clay, Yellowish Gray, wet		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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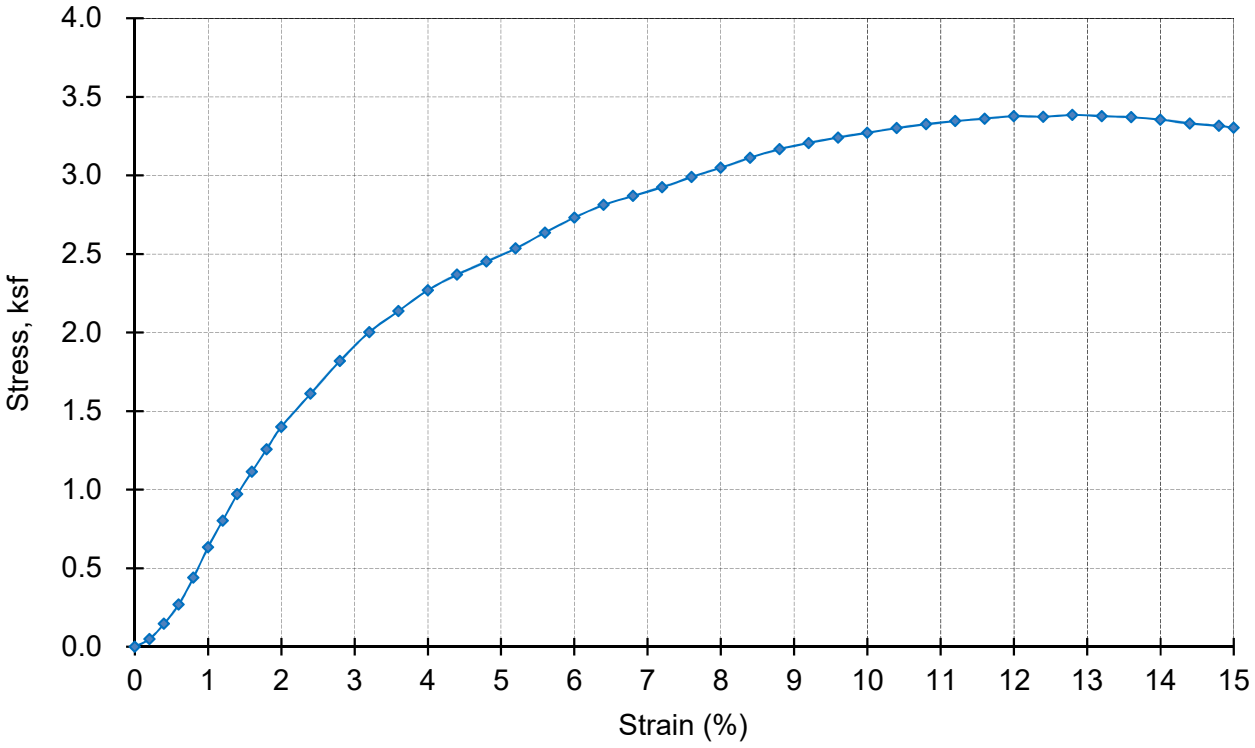
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4Y

UNCONFINED COMPRESSION TEST



Boring No.:	AS-11	**Unconfined Compressive Strength (ksf):**	3.38
Sample No. :	9	**Shear Strength (ksf)**	1.69
Depth (feet):	41	**Strain @ Failure (%):**	13.2
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	106
Test Method	ASTM D2166	**Water Content (%):**	20.5
Material Type:	CL		
Material Description:	Sandy Lean Clay with Gravel, Yellowish Brown, moist		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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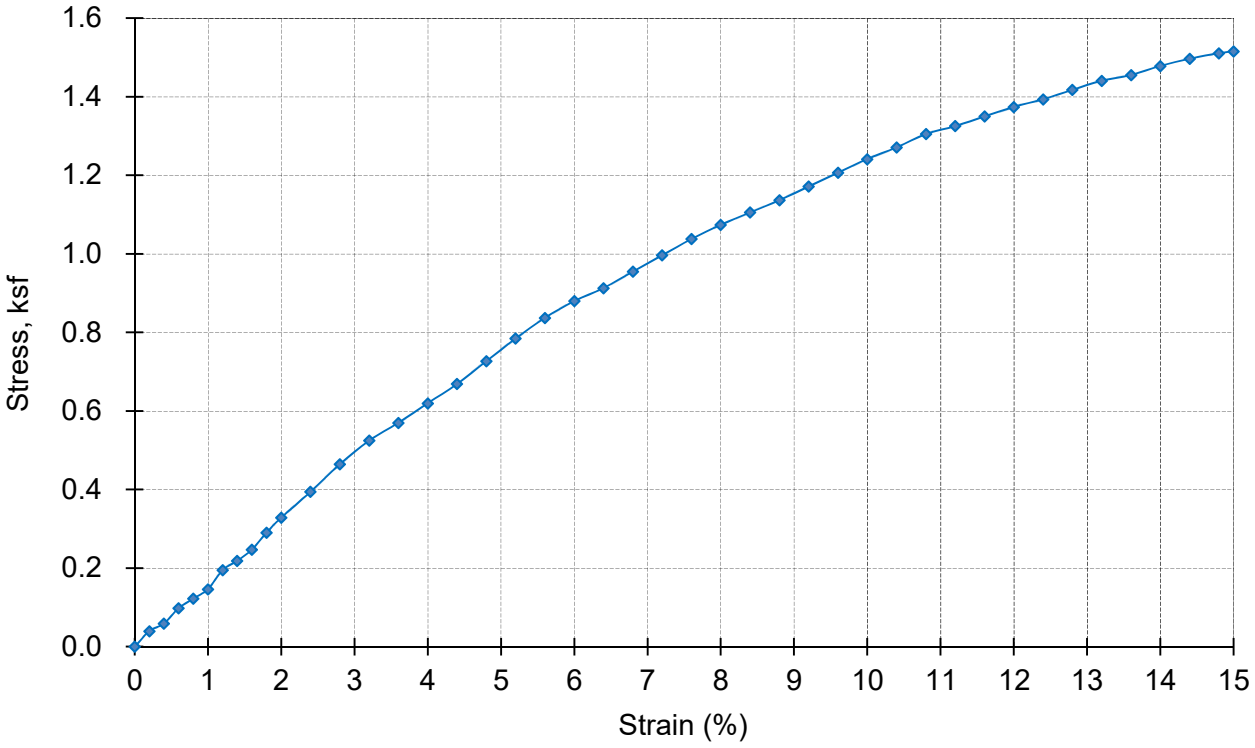
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4Z

UNCONFINED COMPRESSION TEST



Boring No.:	AS-11	**Unconfined Compressive Strength (ksf):**	1.52
Sample No. :	12	**Shear Strength (ksf)**	0.76
Depth (feet):	56	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	104
Test Method	ASTM D2166	**Water Content (%):**	21.4
Material Type:	CL		
Material Description:	Sandy Lean Clay with Gravel, Yellowish Brown, moist		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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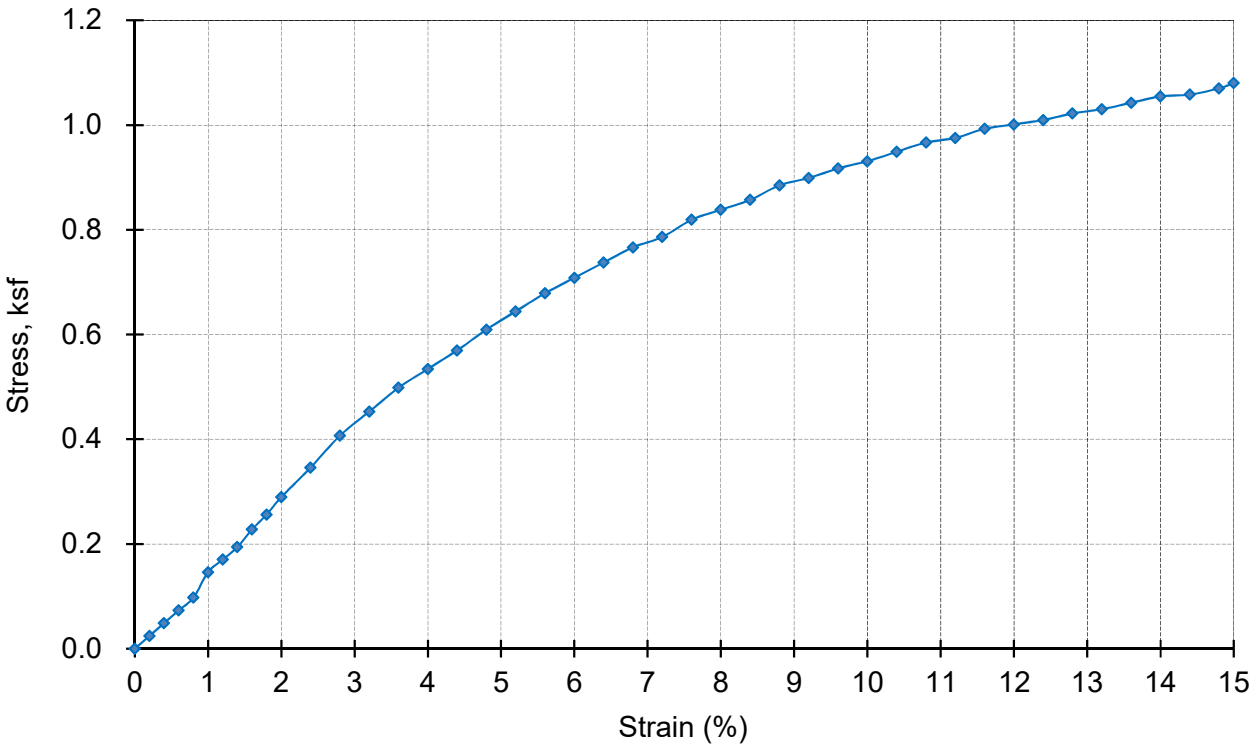
JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4AA**

UNCONFINED COMPRESSION TEST



Boring No.:	AS-15	**Unconfined Compressive Strength (ksf):**	1.08
Sample No. :	5	**Shear Strength (ksf)**	0.54
Depth (feet):	21	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	98
Test Method	ASTM D2166	**Water Content (%):**	26.6
Material Type:	CL		
Material Description:	Lean Clay, Yellowish Brown, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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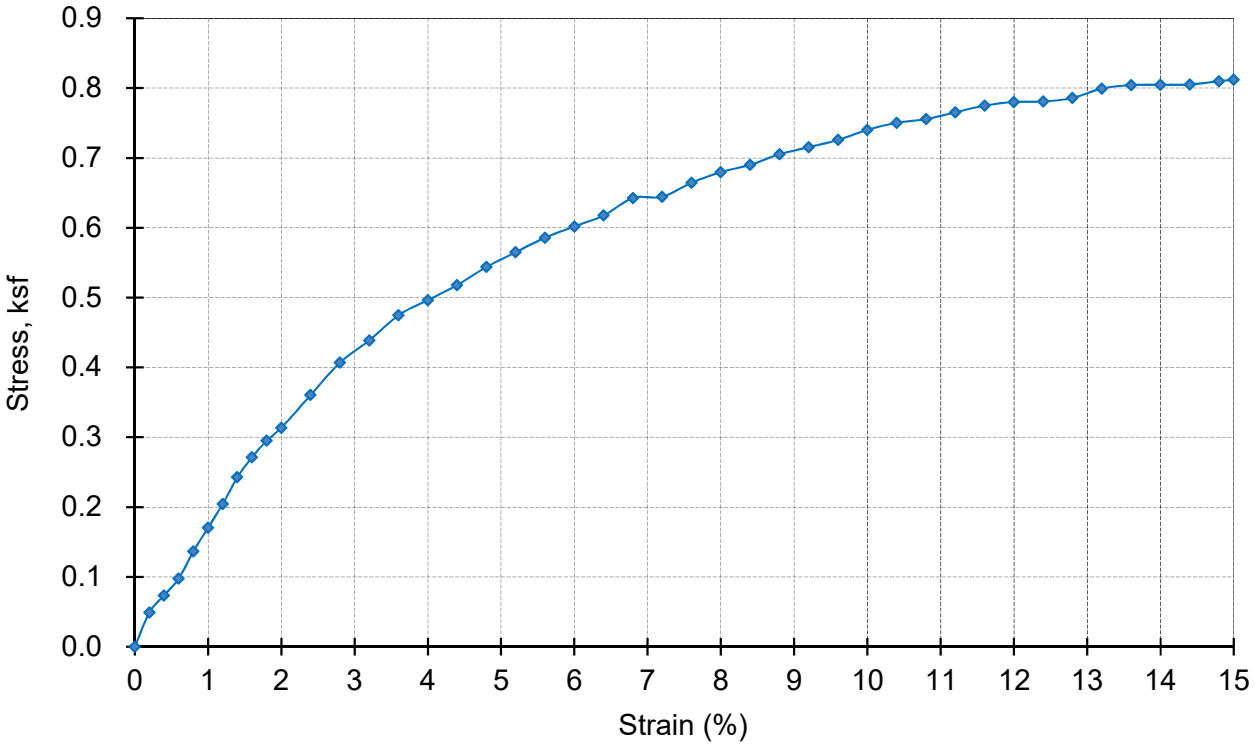
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4AB**

UNCONFINED COMPRESSION TEST



Boring No.:	AS-15	**Unconfined Compressive Strength (ksf):**	0.81
Sample No. :	7	**Shear Strength (ksf)**	0.41
Depth (feet):	31	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	96
Test Method	ASTM D2166	**Water Content (%):**	25.9
Material Type:	CL		
Material Description:	Lean Clay, Yellowish Brown, wet		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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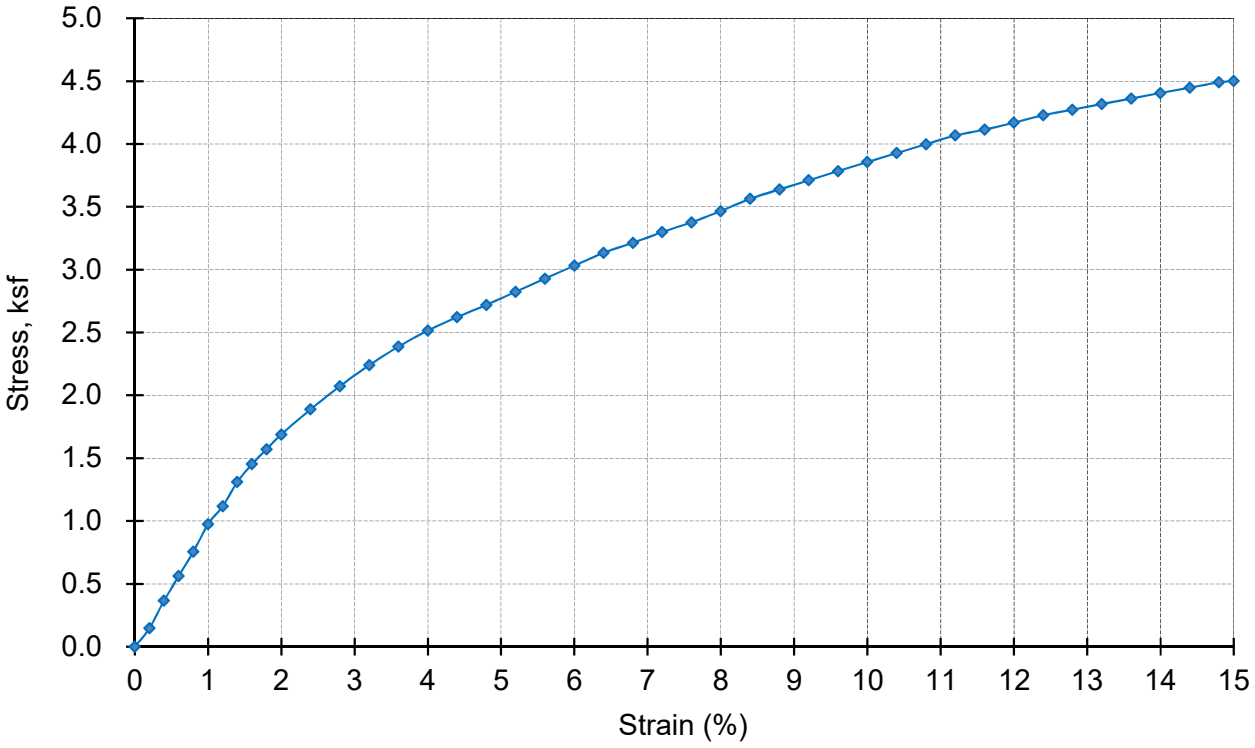
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4AC

UNCONFINED COMPRESSION TEST



Boring No.:	AS-15	**Unconfined Compressive Strength (ksf):**	4.50
Sample No. :	16	**Shear Strength (ksf)**	2.25
Depth (feet):	91	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	106
Test Method	ASTM D2166	**Water Content (%):**	21.5
Material Type:	CL		
Material Description:	Lean Clay with Gravel, Yellowish Gray, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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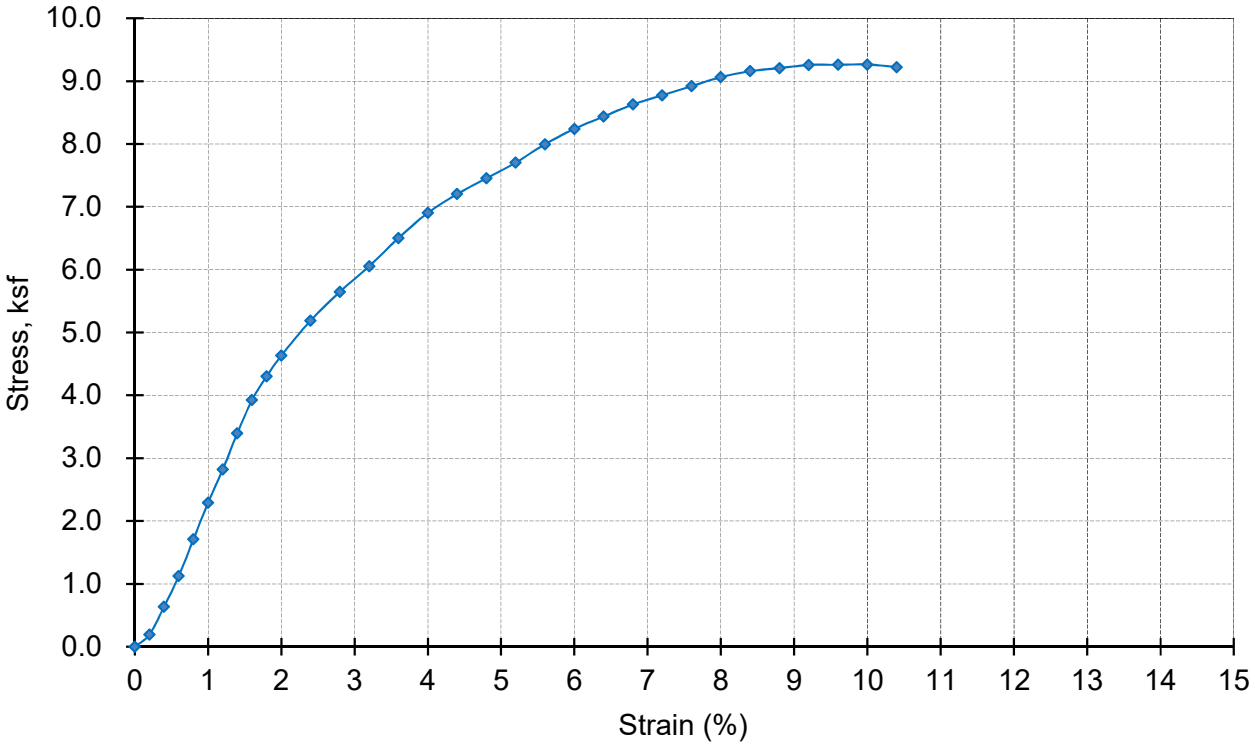
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4AD

UNCONFINED COMPRESSION TEST



Boring No.:	AS-17	**Unconfined Compressive Strength (ksf):**	9.26
Sample No. :	1	**Shear Strength (ksf)**	4.63
Depth (feet):	2	**Strain @ Failure (%):**	10.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	109
Test Method	ASTM D2166	**Water Content (%):**	18.5
Material Type:	CL		
Material Description:	Lean Clay, Brown, moist		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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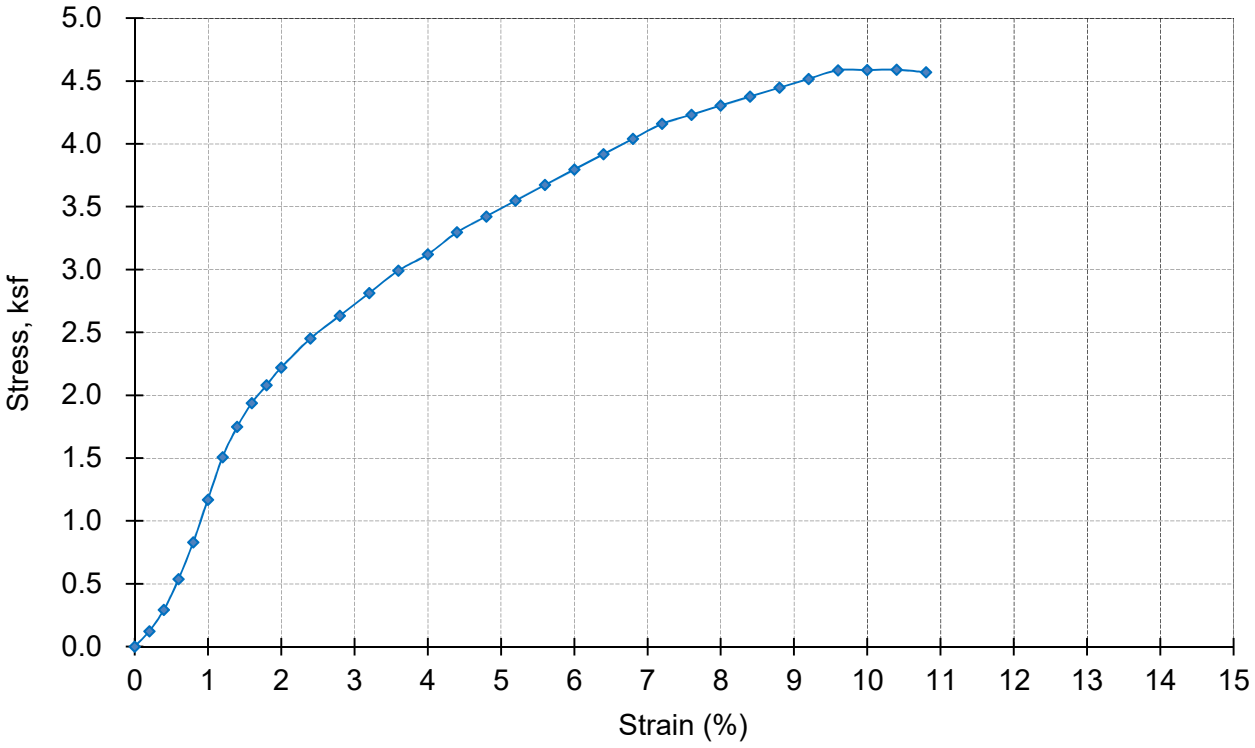
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4AE

UNCONFINED COMPRESSION TEST



Boring No.:	AS-17	**Unconfined Compressive Strength (ksf):**	4.59
Sample No. :	2	**Shear Strength (ksf)**	2.29
Depth (feet):	6	**Strain @ Failure (%):**	10.4
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	103
Test Method	ASTM D2166	**Water Content (%):**	21.4
Material Type:	CH		
Material Description:	Fat Clay, Dark Brown, moist		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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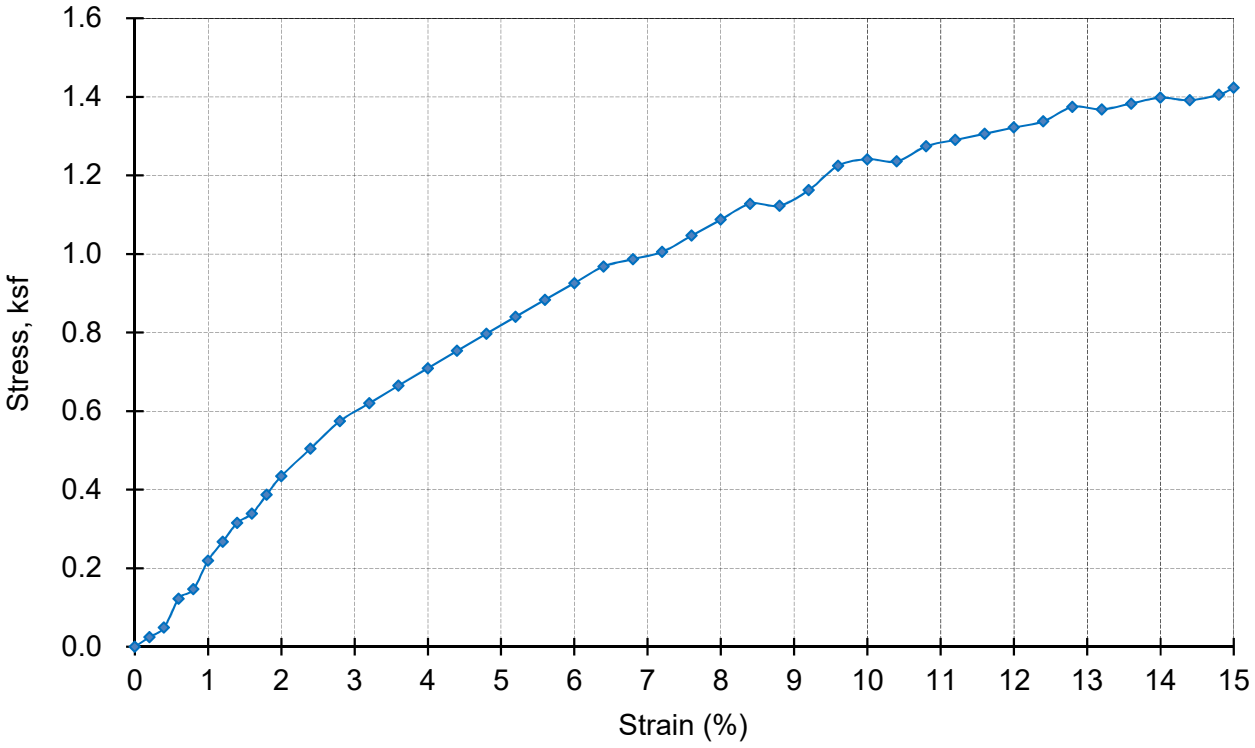
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4AF

UNCONFINED COMPRESSION TEST



Boring No.:	AS-17	**Unconfined Compressive Strength (ksf):**	1.42
Sample No. :	7	**Shear Strength (ksf)**	0.71
Depth (feet):	31	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	100
Test Method	ASTM D2166	**Water Content (%):**	24.5
Material Type:	CL		
Material Description:	Lean Clay, Light Brown, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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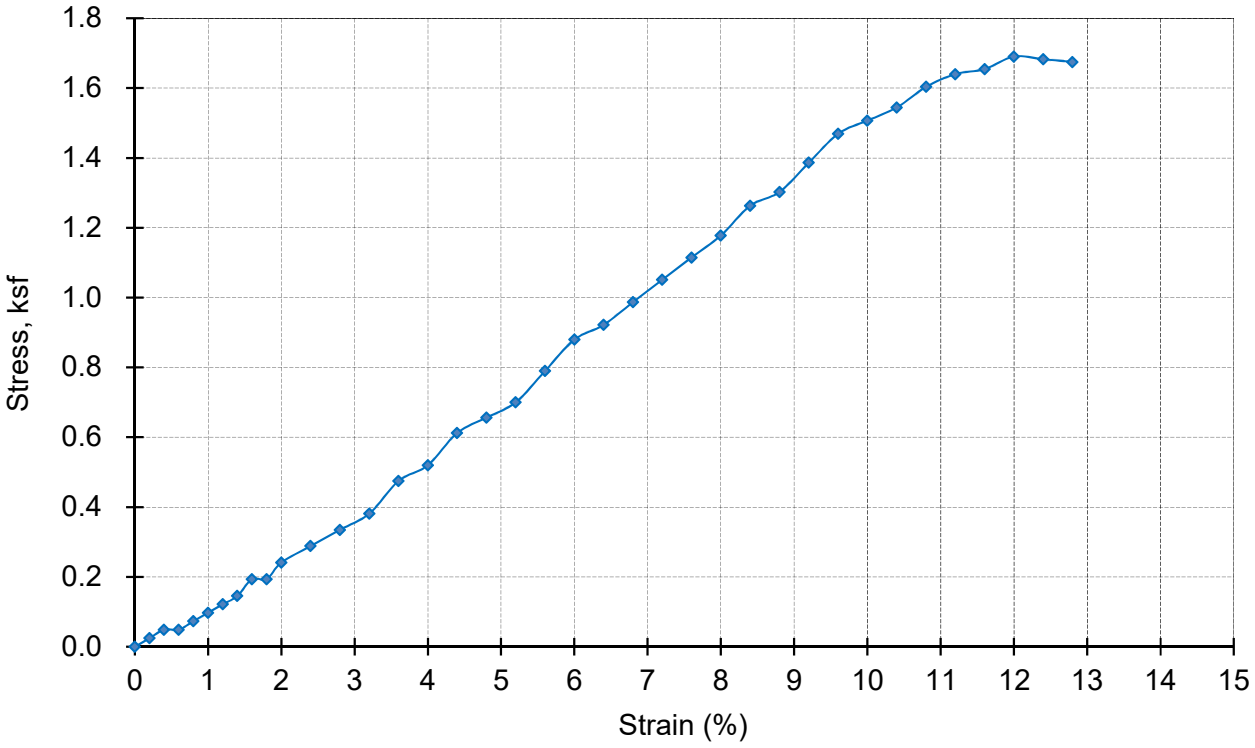
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4AG

UNCONFINED COMPRESSION TEST



Boring No.:	AS-17	**Unconfined Compressive Strength (ksf):**	1.69
Sample No. :	10	**Shear Strength (ksf)**	0.85
Depth (feet):	46	**Strain @ Failure (%):**	12.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	110
Test Method	ASTM D2166	**Water Content (%):**	19.7
Material Type:	CL-ML		
Material Description:	Silty Clay, Yellowish Brown, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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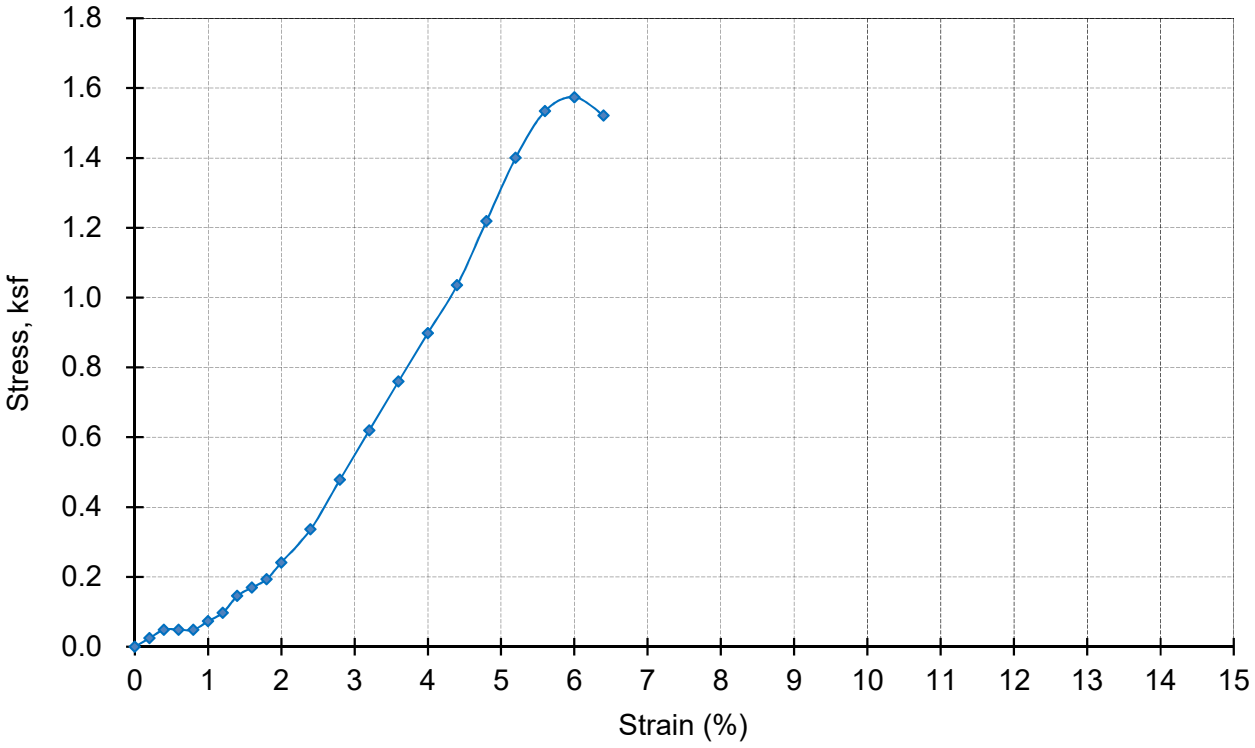
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4AH

UNCONFINED COMPRESSION TEST



Boring No.:	AS-17	**Unconfined Compressive Strength (ksf):**	1.57
Sample No. :	14	**Shear Strength (ksf)**	0.79
Depth (feet):	71	**Strain @ Failure (%):**	6.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	103
Test Method	ASTM D2166	**Water Content (%):**	23.1
Material Type:	ML		
Material Description:	Silt, Brown, moist		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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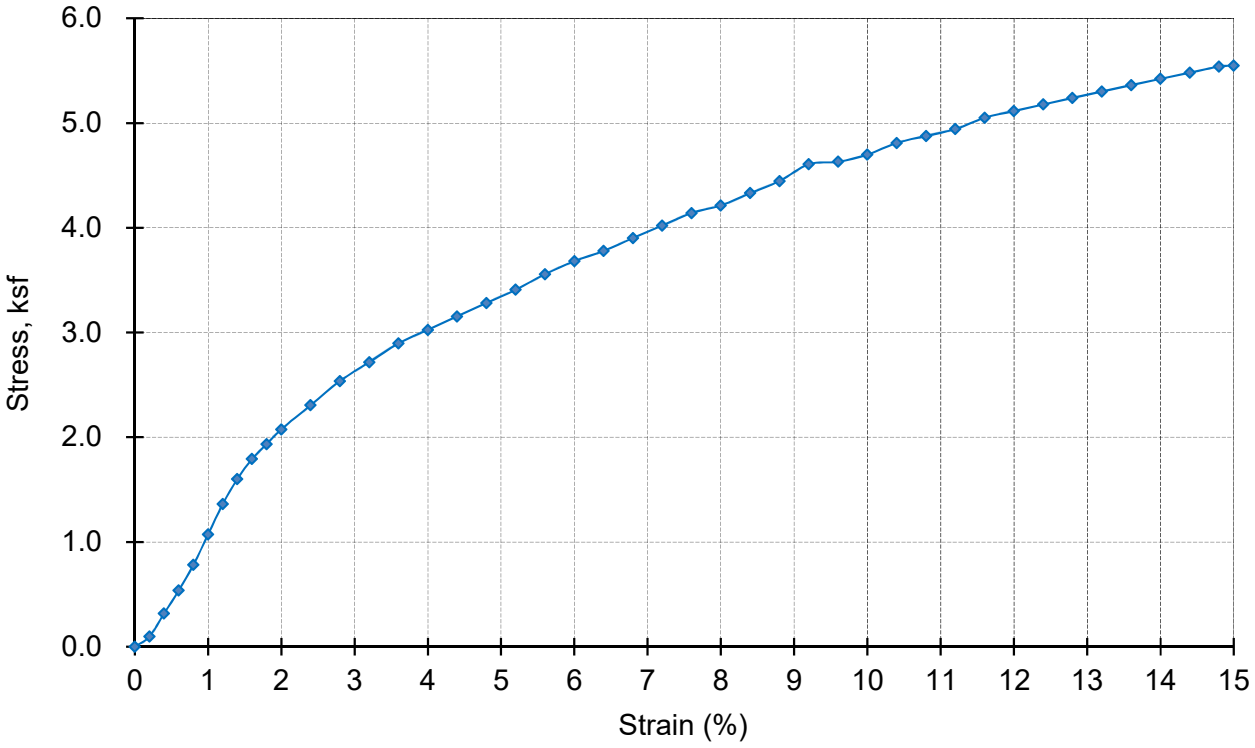
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4AI

UNCONFINED COMPRESSION TEST



Boring No.:	AS-17	**Unconfined Compressive Strength (ksf):**	5.55
Sample No. :	18	**Shear Strength (ksf)**	2.77
Depth (feet):	111	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	110
Test Method	ASTM D2166	**Water Content (%):**	18.7
Material Type:	CL		
Material Description:	Lean Clay, Greenish Gray, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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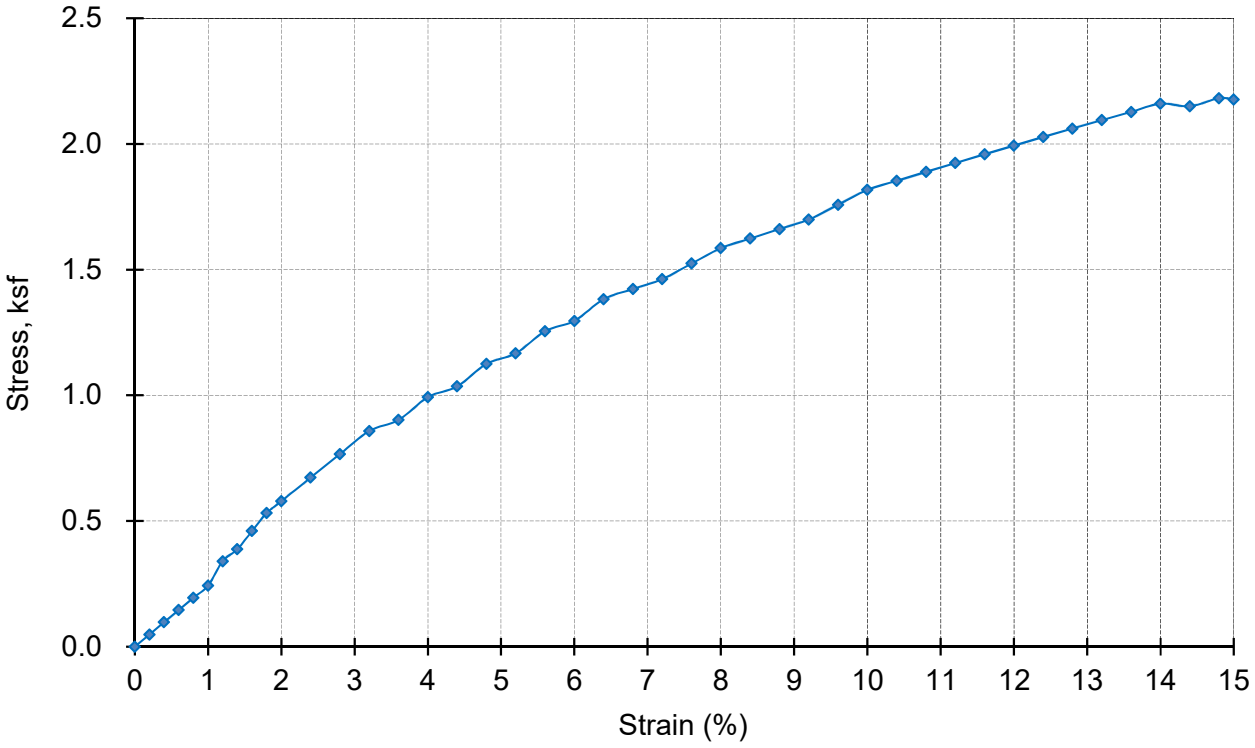
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4AJ

UNCONFINED COMPRESSION TEST



Boring No.:	AG-18	**Unconfined Compressive Strength (ksf):**	2.18
Sample No. :	5	**Shear Strength (ksf)**	1.09
Depth (feet):	19.5	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	98
Test Method	ASTM D2166	**Water Content (%):**	27.3
Material Type:	CL		
Material Description:	Lean Clay, Gray, moist		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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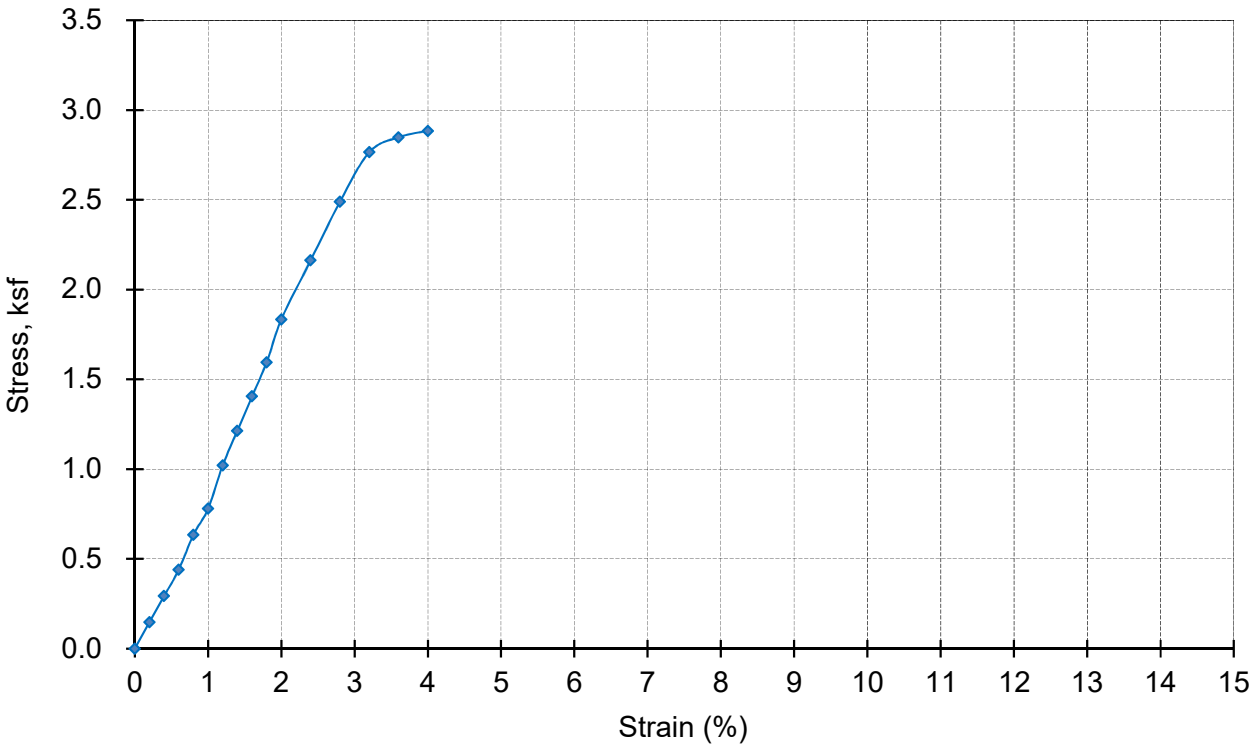
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4AK

UNCONFINED COMPRESSION TEST



Boring No.:	AG-19	**Unconfined Compressive Strength (ksf):**	2.88
Sample No. :	2	**Shear Strength (ksf)**	1.44
Depth (feet):	6	**Strain @ Failure (%):**	4.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	107
Test Method	ASTM D2166	**Water Content (%):**	18.9
Material Type:	CL		
Material Description:	Lean Clay, Brown, moist		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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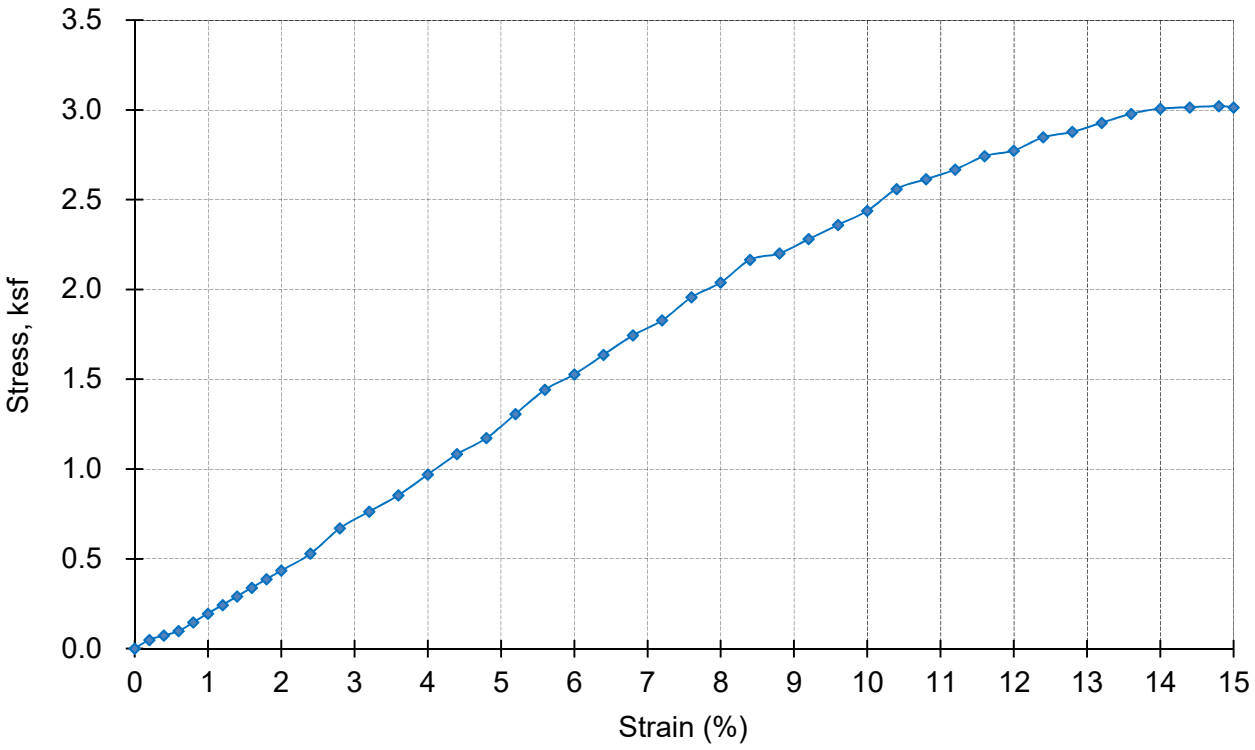
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4AL

UNCONFINED COMPRESSION TEST



Boring No.:	AG-19	**Unconfined Compressive Strength (ksf):**	3.02
Sample No. :	3	**Shear Strength (ksf)**	1.51
Depth (feet):	9.5	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	100
Test Method	ASTM D2166	**Water Content (%):**	24.6
Material Type:	CL		
Material Description:	Lean Clay, Yellowish Brown, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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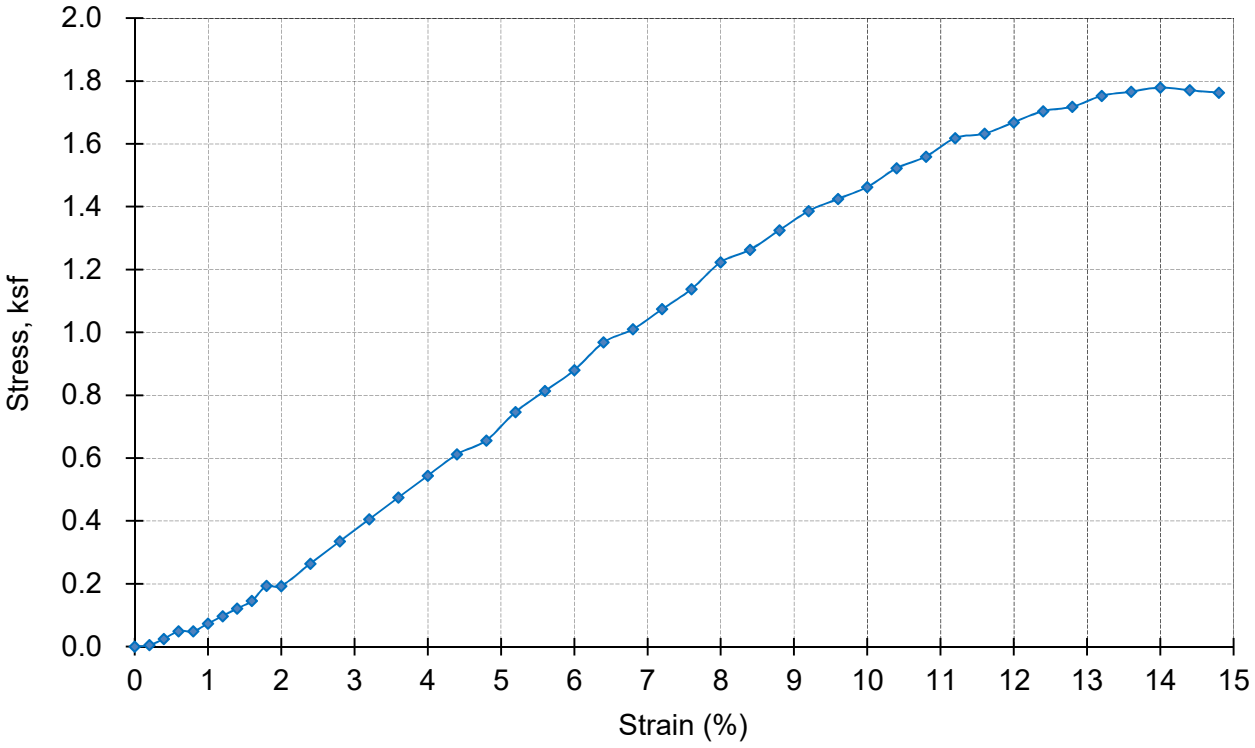
JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4AM**

UNCONFINED COMPRESSION TEST



Boring No.:	PS-21	**Unconfined Compressive Strength (ksf):**	1.78
Sample No. :	3	**Shear Strength (ksf)**	0.89
Depth (feet):	9.5	**Strain @ Failure (%):**	14.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	95
Test Method	ASTM D2166	**Water Content (%):**	28.9
Material Type:	CL		
Material Description:	Lean Clay, Yellowish Brown, Moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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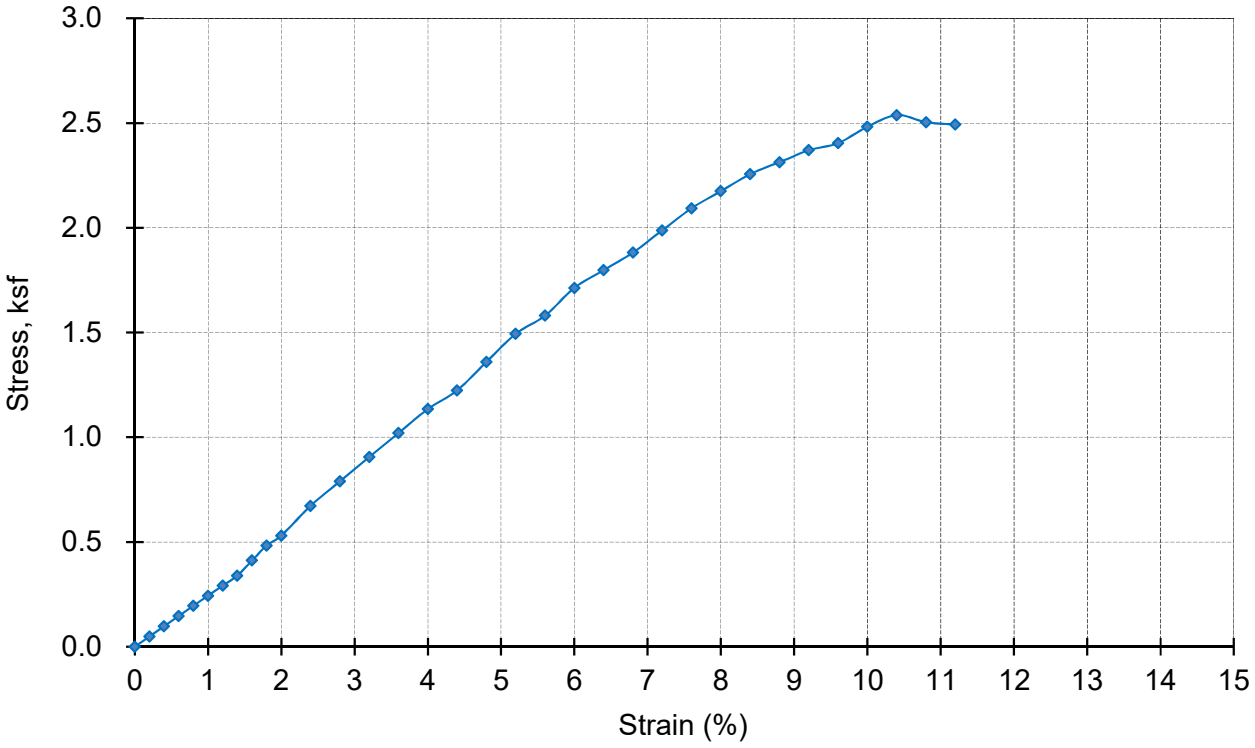
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4AN

UNCONFINED COMPRESSION TEST



Boring No.:	PS-21	**Unconfined Compressive Strength (ksf):**	2.54
Sample No. :	4	**Shear Strength (ksf)**	1.27
Depth (feet):	14.5	**Strain @ Failure (%):**	10.4
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	114
Test Method	ASTM D2166	**Water Content (%):**	17.4
Material Type:	CL		
Material Description:	Lean Clay, Grayish Brown, Moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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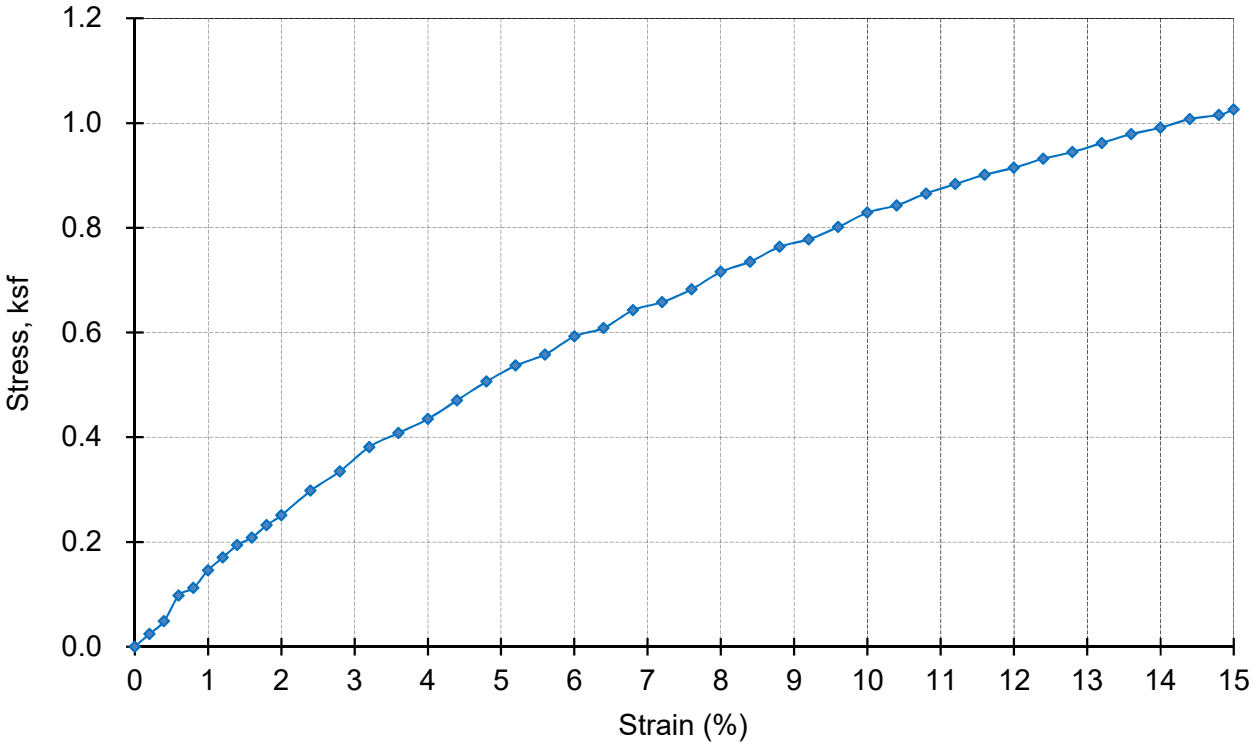
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4AO

UNCONFINED COMPRESSION TEST



Boring No.:	AG-23	**Unconfined Compressive Strength (ksf):**	1.03
Sample No. :	2	**Shear Strength (ksf)**	0.51
Depth (feet):	6	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	106
Test Method	ASTM D2166	**Water Content (%):**	21.2
Material Type:	CL		
Material Description:	Lean Clay, Yellowish Brown, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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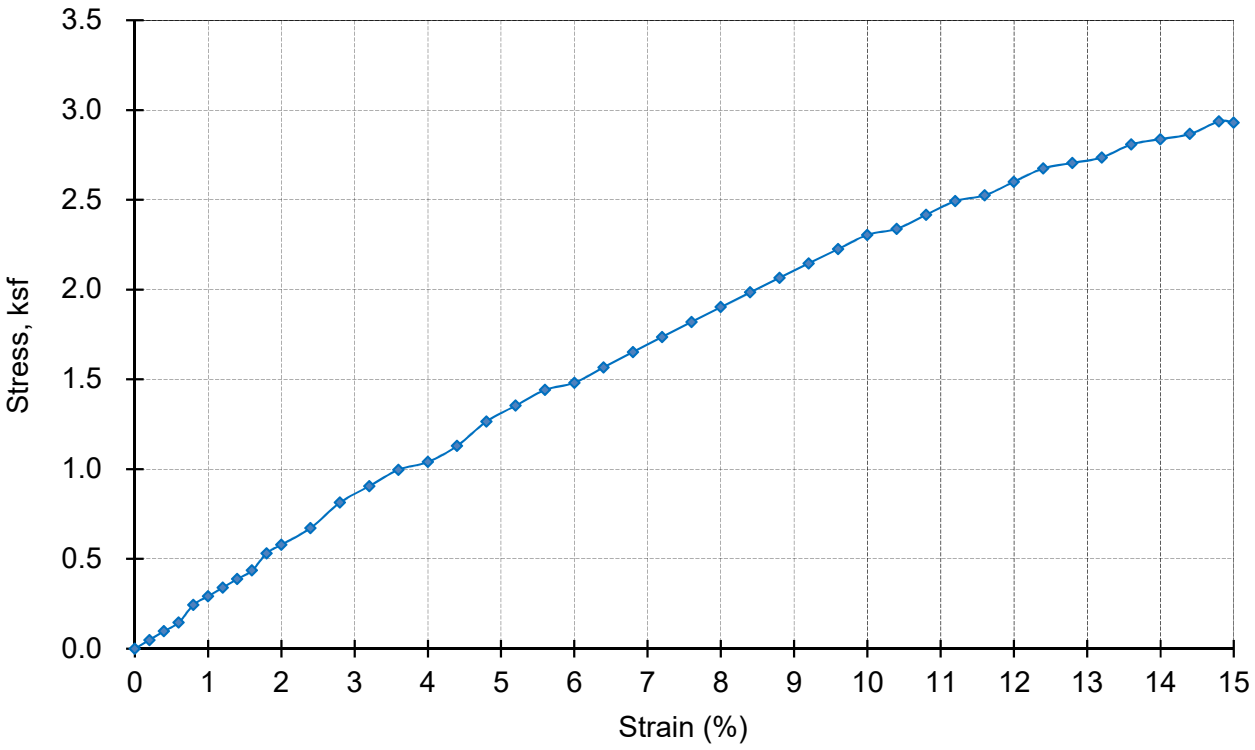
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4AP

UNCONFINED COMPRESSION TEST



Boring No.:	AS-24	**Unconfined Compressive Strength (ksf):**	2.94
Sample No. :	7	**Shear Strength (ksf)**	1.47
Depth (feet):	31	**Strain @ Failure (%):**	14.8
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	99
Test Method	ASTM D2166	**Water Content (%):**	25.3
Material Type:	CL		
Material Description:	Lean Clay, Gray, moist		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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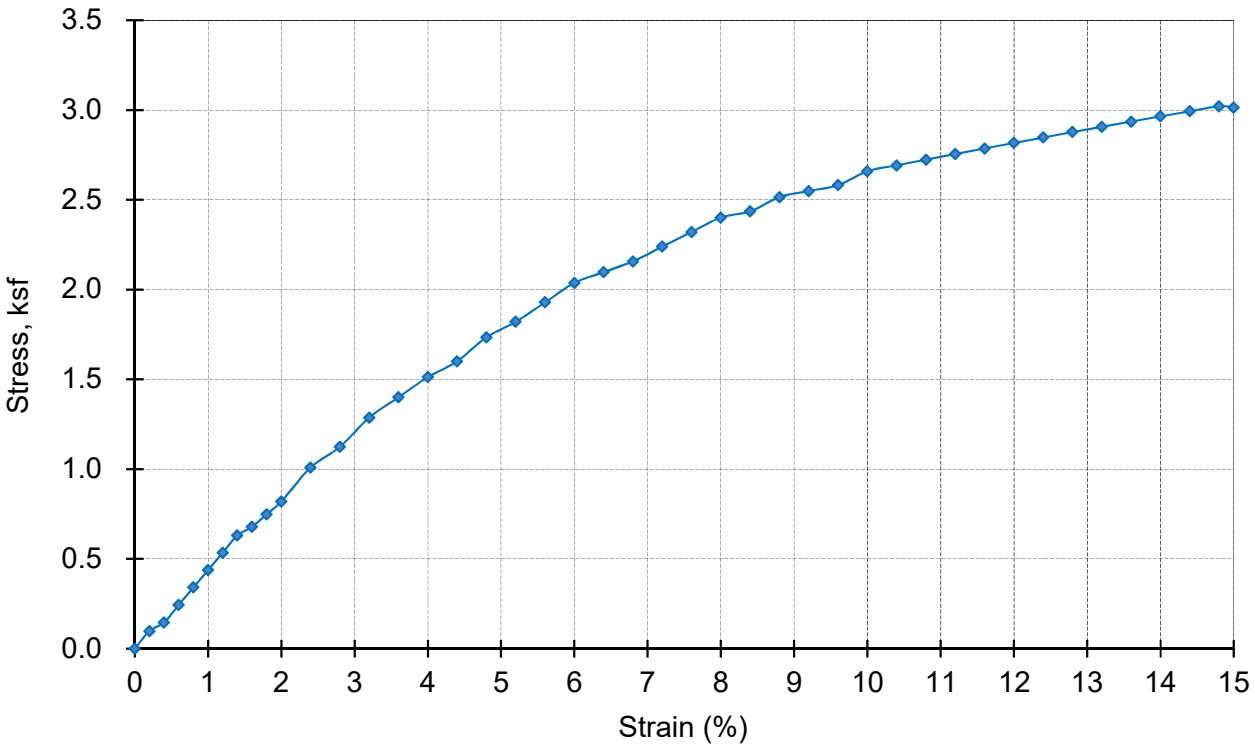
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4AQ

UNCONFINED COMPRESSION TEST



Boring No.:	AS-24	**Unconfined Compressive Strength (ksf):**	3.02
Sample No. :	12	**Shear Strength (ksf)**	1.51
Depth (feet):	56	**Strain @ Failure (%):**	14.8
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	95
Test Method	ASTM D2166	**Water Content (%):**	27.8
Material Type:	CH		
Material Description:	Fat Clay, Gray, moist		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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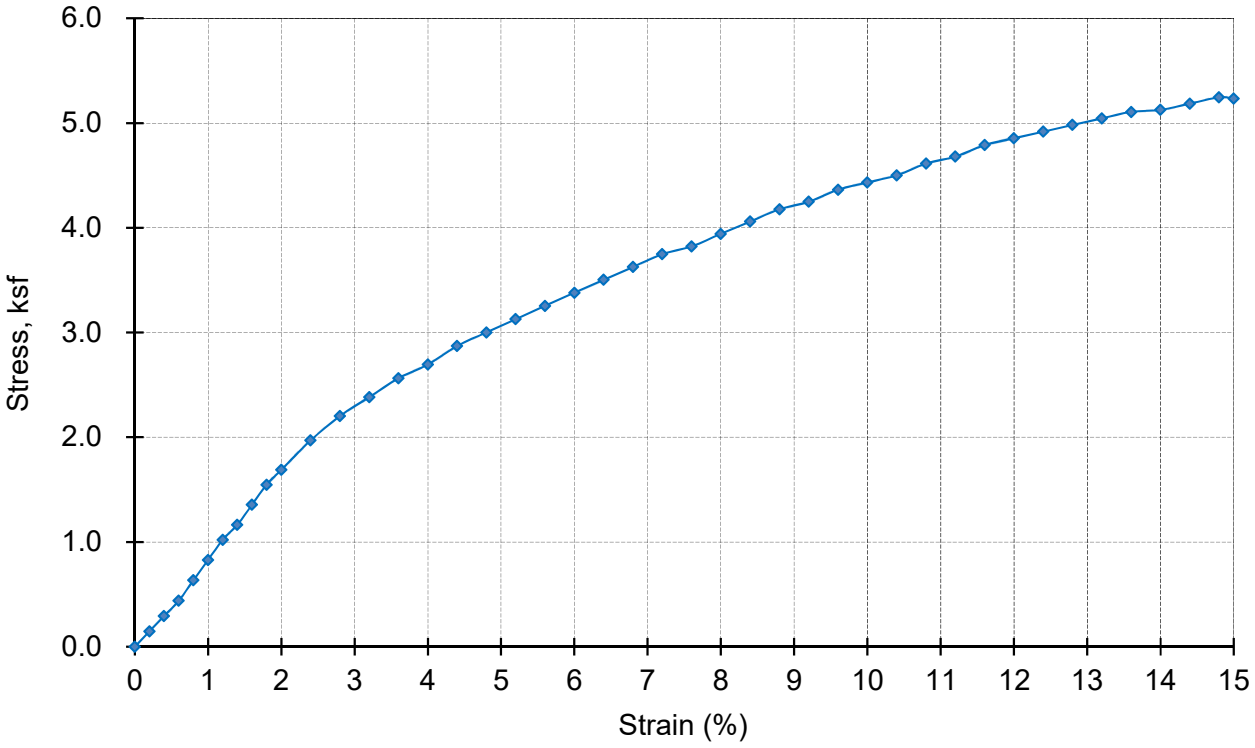
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** {IV-4AR}

UNCONFINED COMPRESSION TEST



Boring No.:	AS-24	**Unconfined Compressive Strength (ksf):**	5.25
Sample No. :	14	**Shear Strength (ksf)**	2.62
Depth (feet):	71	**Strain @ Failure (%):**	14.8
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	107
Test Method	ASTM D2166	**Water Content (%):**	20.1
Material Type:	CL		
Material Description:	Lean Clay, Gray, moist		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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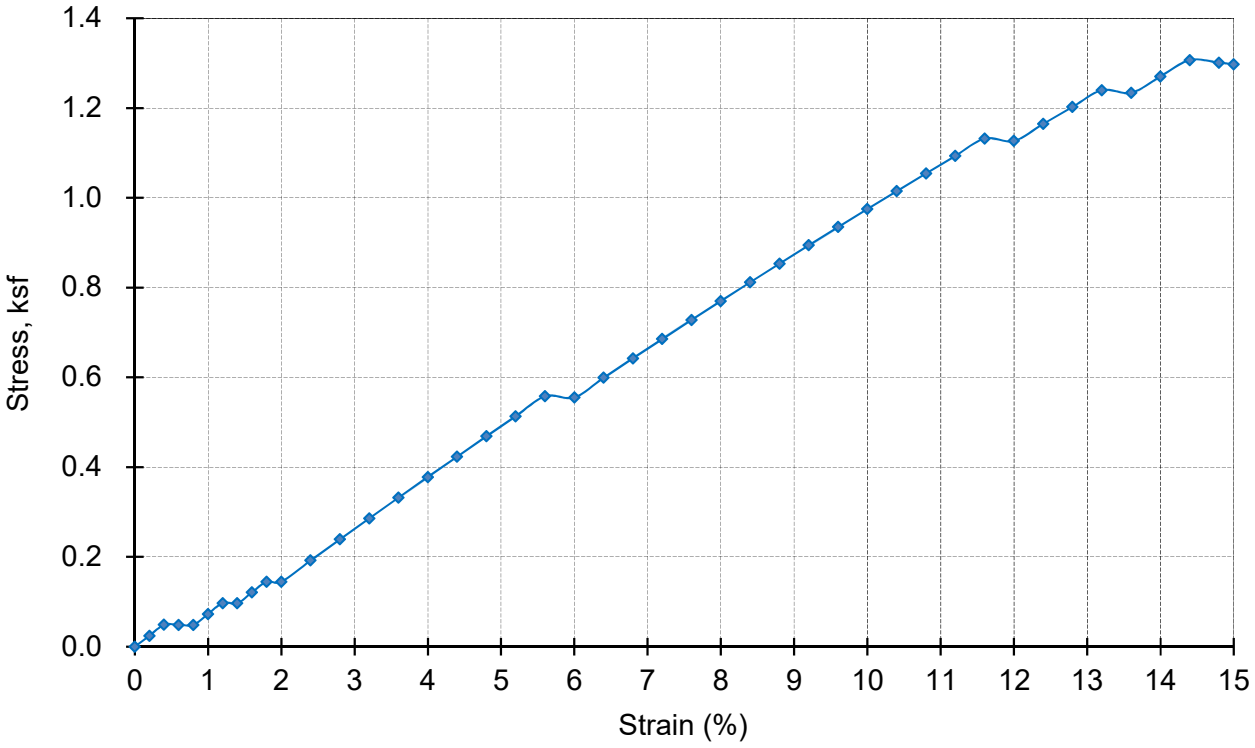
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4AS

UNCONFINED COMPRESSION TEST



Boring No.:	AS-25	**Unconfined Compressive Strength (ksf):**	1.31
Sample No. :	4	**Shear Strength (ksf)**	0.65
Depth (feet):	15	**Strain @ Failure (%):**	14.4
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	98
Test Method	ASTM D2166	**Water Content (%):**	27.4
Material Type:	CL		
Material Description:	Lean Clay, Brown, moist		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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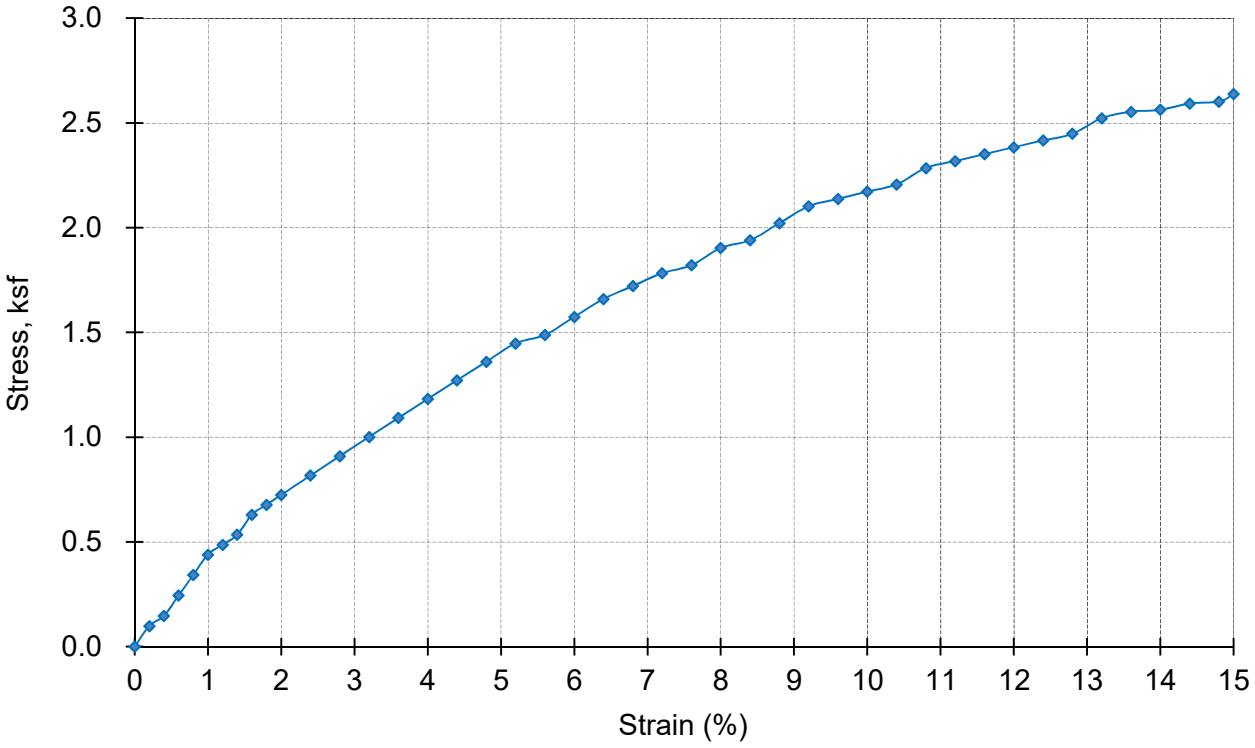
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4AT

UNCONFINED COMPRESSION TEST



Boring No.:	AS-25	**Unconfined Compressive Strength (ksf):**	2.64
Sample No. :	5	**Shear Strength (ksf)**	1.32
Depth (feet):	20	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	100
Test Method	ASTM D2166	**Water Content (%):**	25.9
Material Type:	CL		
Material Description:	Lean Clay, Brown, moist		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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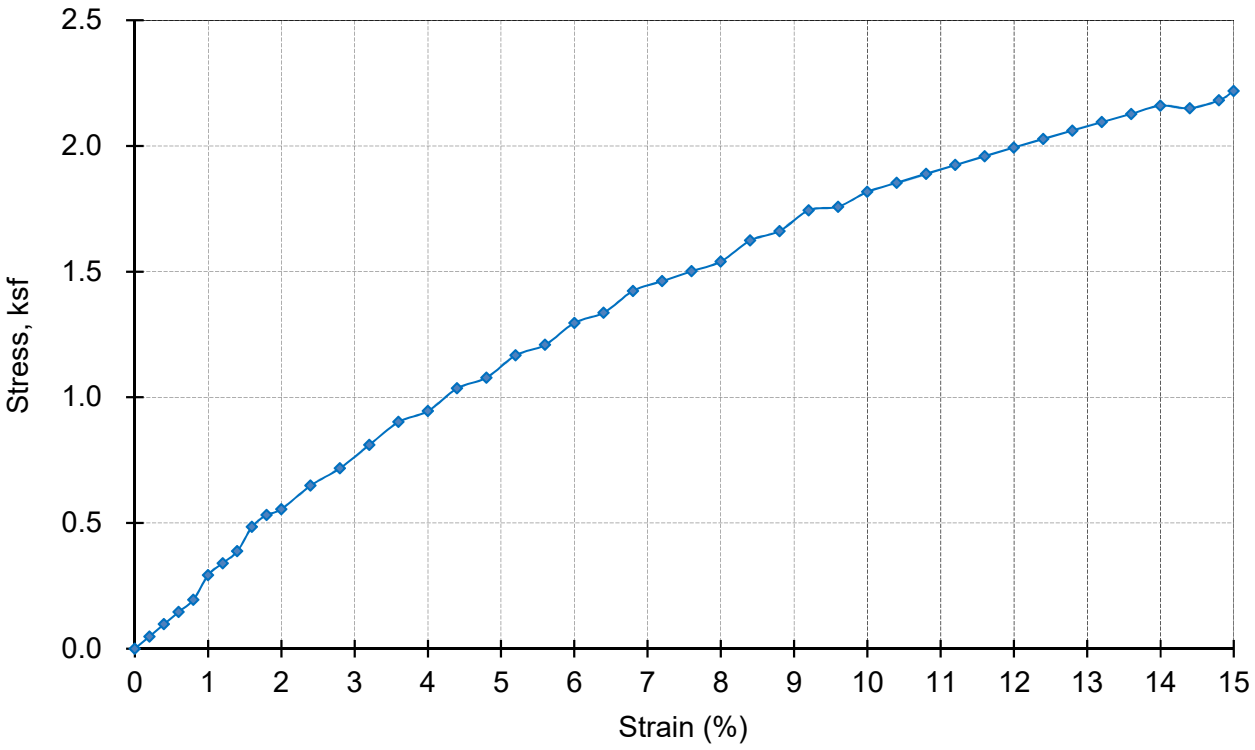
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4AU

UNCONFINED COMPRESSION TEST



Boring No.:	AS-25	**Unconfined Compressive Strength (ksf):**	2.22
Sample No. :	6	**Shear Strength (ksf)**	1.11
Depth (feet):	25	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	94
Test Method	ASTM D2166	**Water Content (%):**	29.9
Material Type:	CL		
Material Description:	Lean Clay, Brown, moist		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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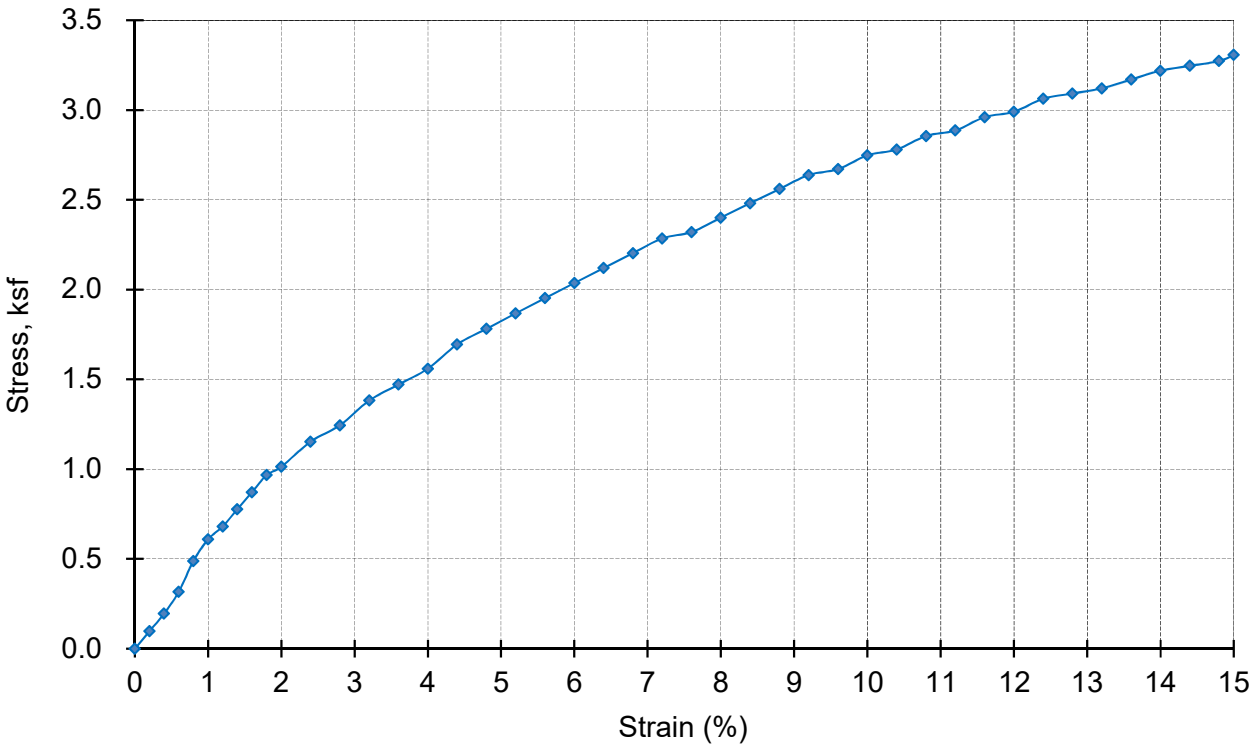
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4AV

UNCONFINED COMPRESSION TEST



Boring No.:	AS-25	**Unconfined Compressive Strength (ksf):**	3.31
Sample No. :	8	**Shear Strength (ksf)**	1.65
Depth (feet):	35	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	94
Test Method	ASTM D2166	**Water Content (%):**	29.9
Material Type:	CL		
Material Description:	Lean Clay, Dark Gray, moist		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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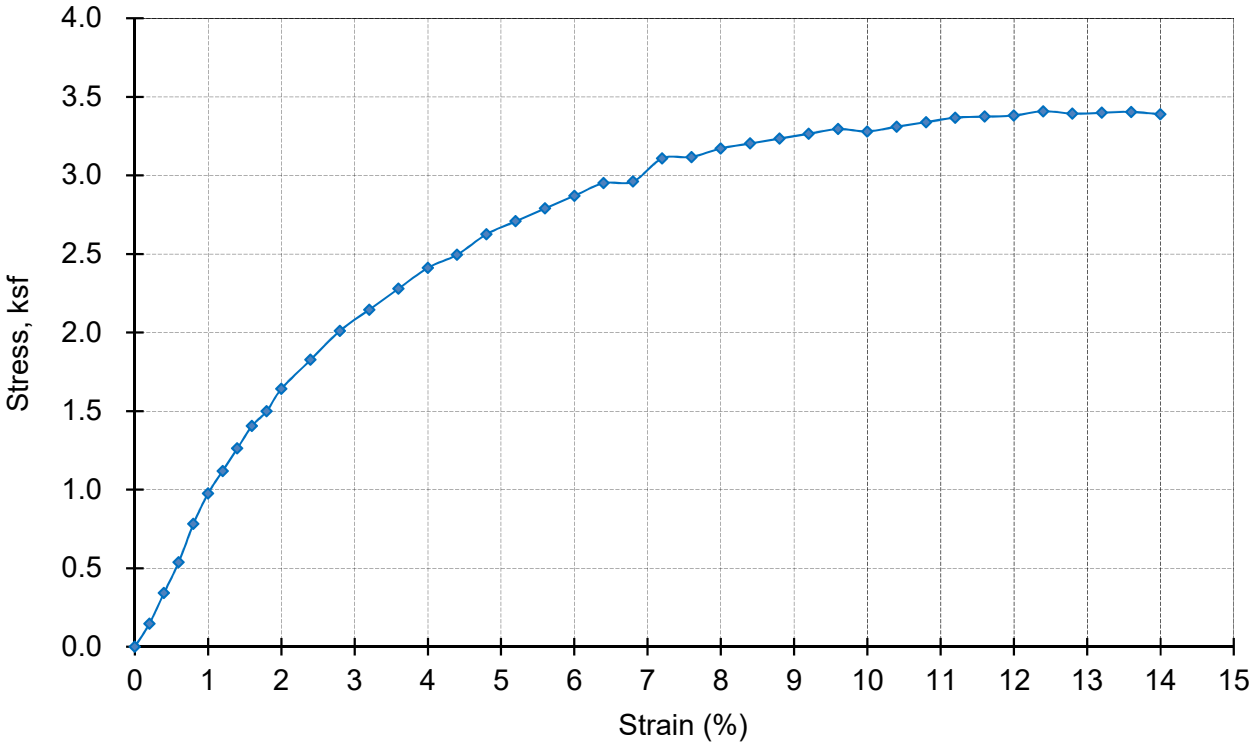
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4AW**

UNCONFINED COMPRESSION TEST



Boring No.:	AS-25	**Unconfined Compressive Strength (ksf):**	3.41
Sample No. :	10	**Shear Strength (ksf)**	1.70
Depth (feet):	45	**Strain @ Failure (%):**	13.4
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	107
Test Method	ASTM D2166	**Water Content (%):**	21.5
Material Type:	CL		
Material Description:	Lean Clay with Gravel, Gray, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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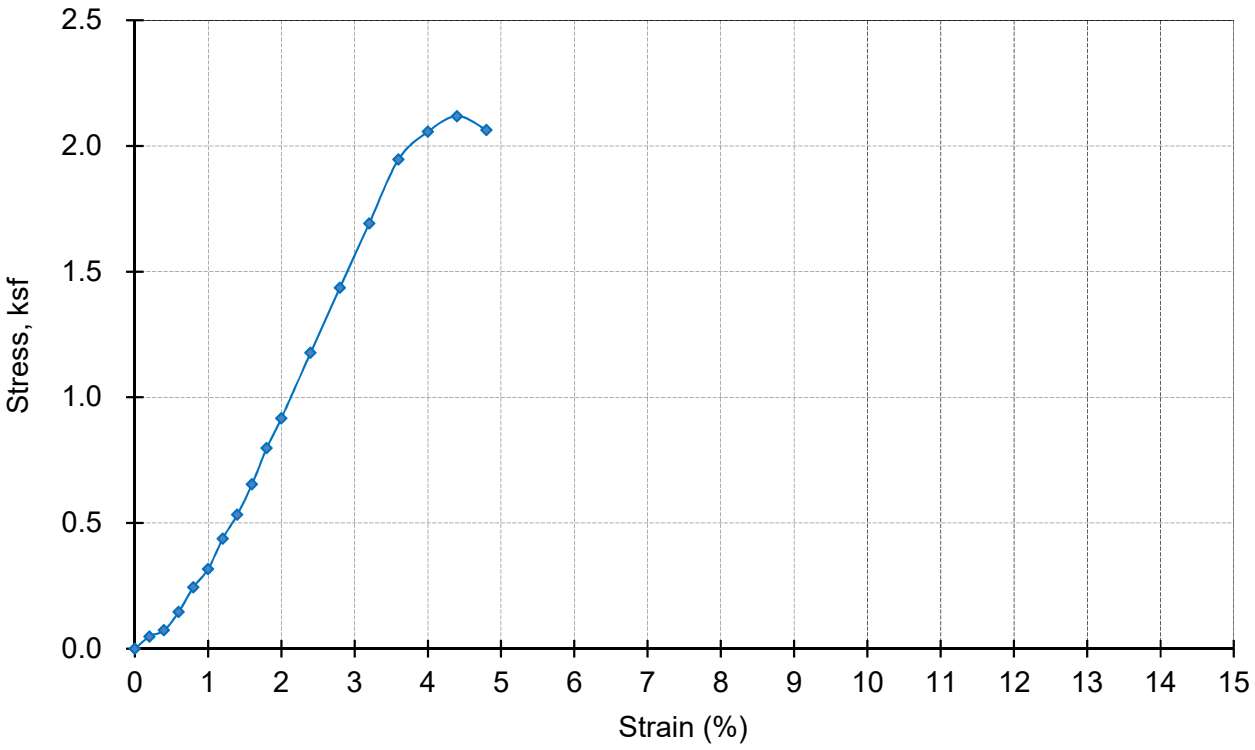
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4AX

UNCONFINED COMPRESSION TEST



Boring No.:	AS-27	**Unconfined Compressive Strength (ksf):**	2.12
Sample No. :	2	**Shear Strength (ksf)**	1.06
Depth (feet):	6	**Strain @ Failure (%):**	4.4
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	108
Test Method	ASTM D2166	**Water Content (%):**	16.2
Material Type:	ML		
Material Description:	Sandy Silt, Yellowish Brown, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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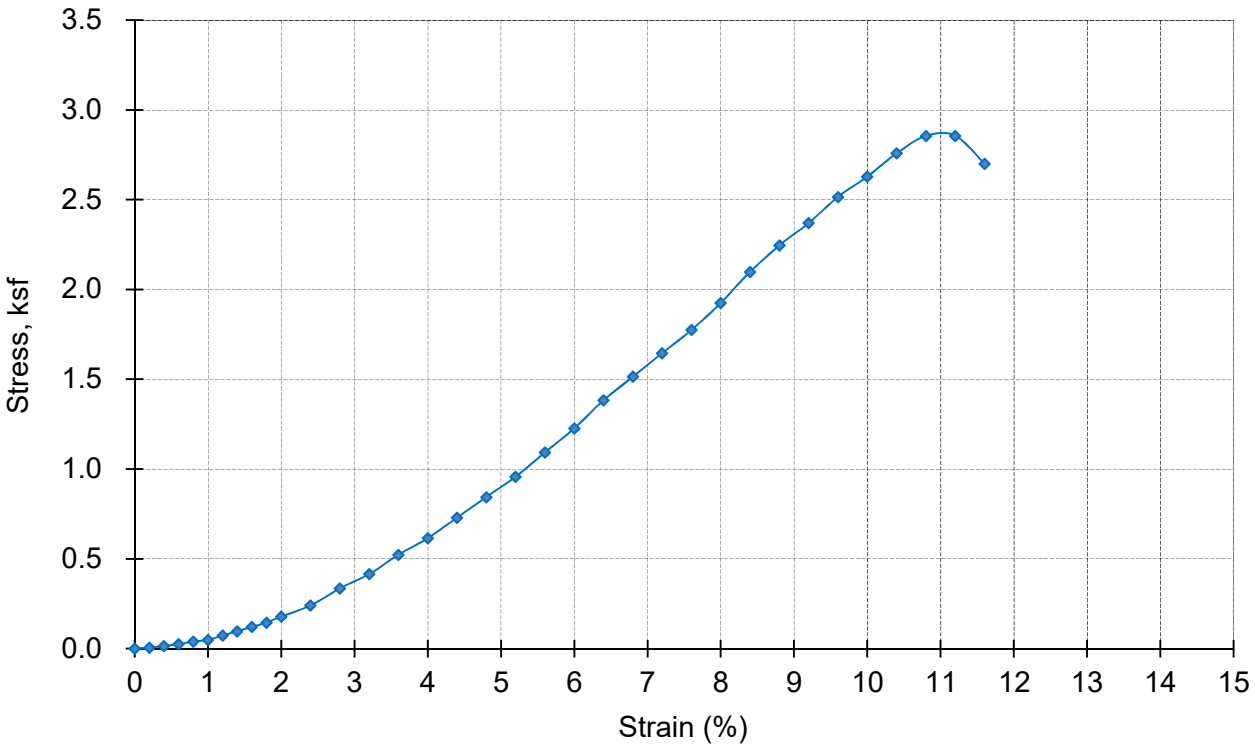
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4AY

UNCONFINED COMPRESSION TEST



Boring No.:	AS-27	**Unconfined Compressive Strength (ksf):**	2.86
Sample No. :	4	**Shear Strength (ksf)**	1.43
Depth (feet):	16	**Strain @ Failure (%):**	11.2
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	104
Test Method	ASTM D2166	**Water Content (%):**	22.1
Material Type:	CL-ML		
Material Description:	Silty Clay, Yellowish Brown, wet		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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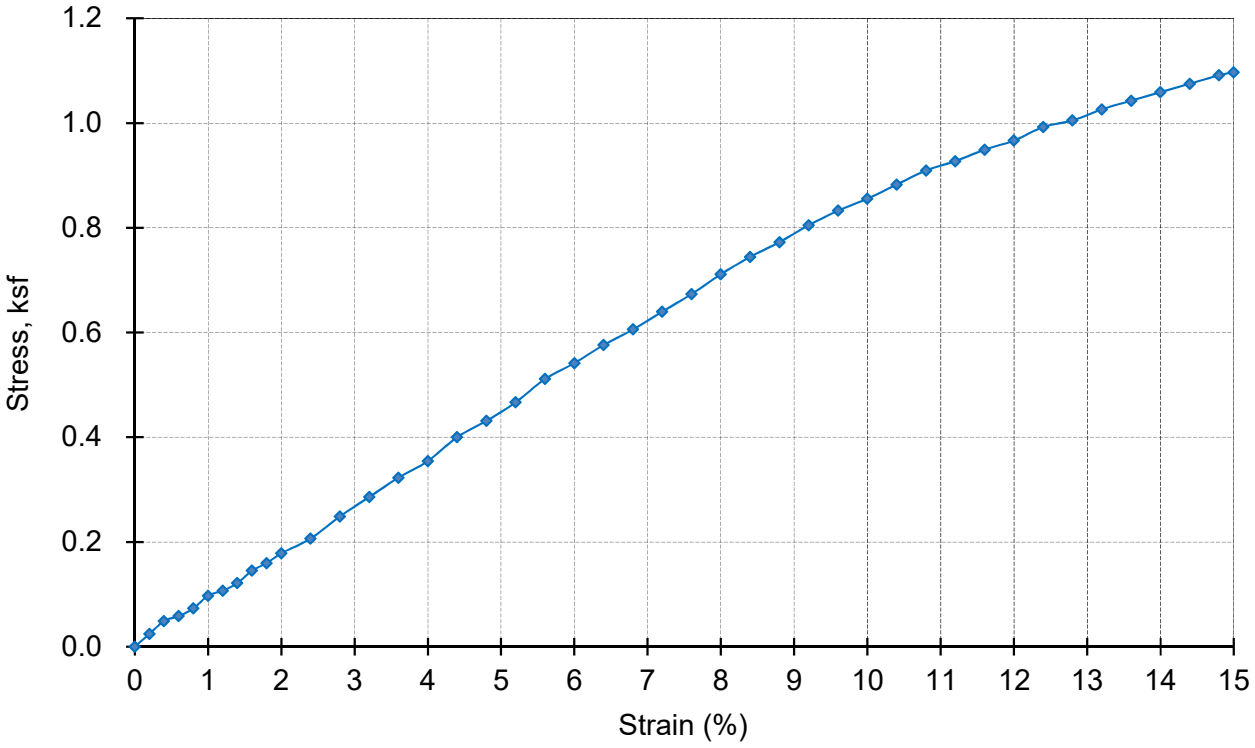
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4AZ

UNCONFINED COMPRESSION TEST



Boring No.:	AS-27	**Unconfined Compressive Strength (ksf):**	1.10
Sample No. :	5	**Shear Strength (ksf)**	0.55
Depth (feet):	21	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	100
Test Method	ASTM D2166	**Water Content (%):**	24.5
Material Type:	CL		
Material Description:	Sandy Lean Clay, Brownish Gray, wet		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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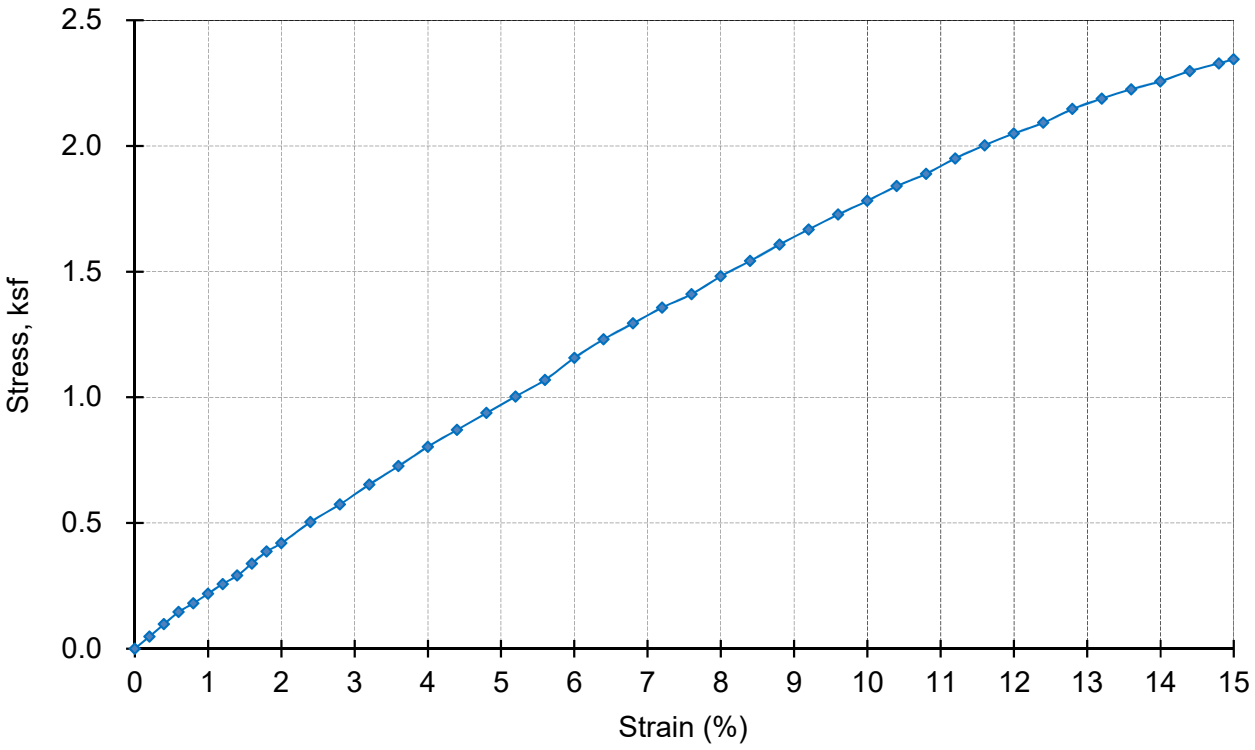
JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4BA**

UNCONFINED COMPRESSION TEST



Boring No.:	AS-27	**Unconfined Compressive Strength (ksf):**	2.34
Sample No. :	7	**Shear Strength (ksf)**	1.17
Depth (feet):	31	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	89
Test Method	ASTM D2166	**Water Content (%):**	32.3
Material Type:	CL		
Material Description:	Lean Clay with Gravel, Yellowish Gray, Moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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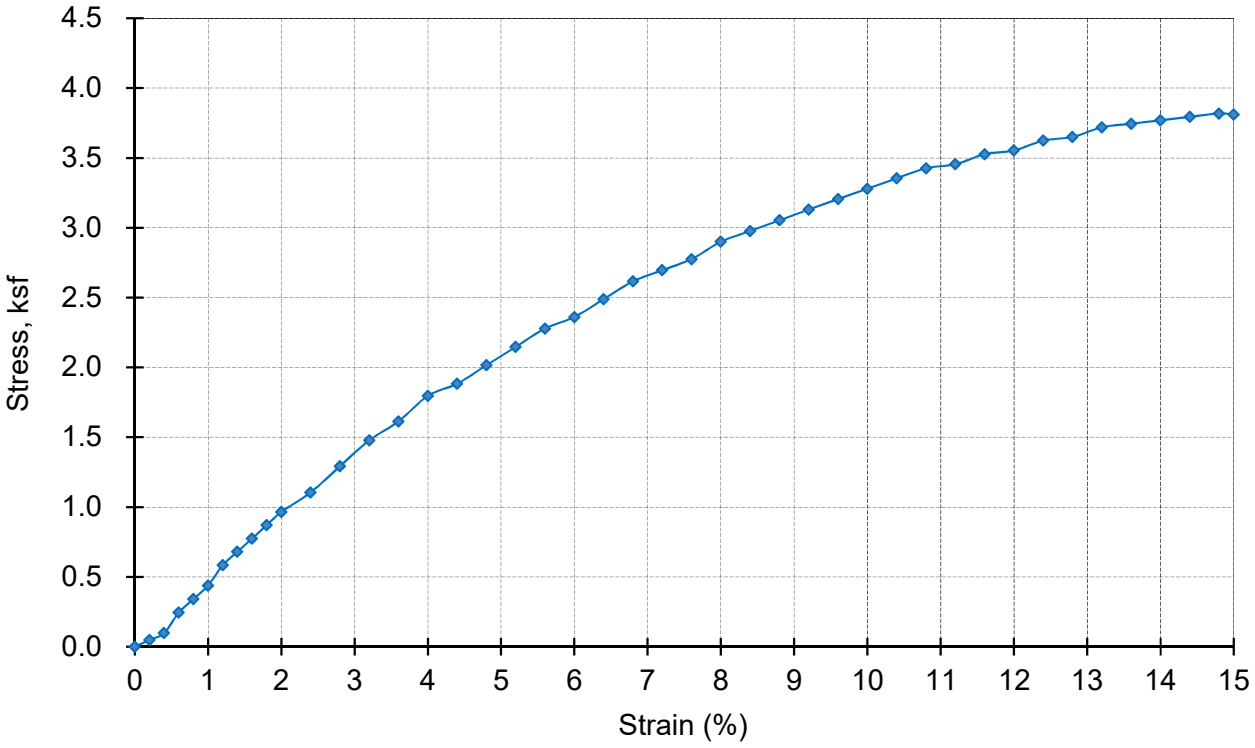
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4BB

UNCONFINED COMPRESSION TEST



Boring No.:	AS-40	**Unconfined Compressive Strength (ksf):**	3.82
Sample No. :	7	**Shear Strength (ksf)**	1.91
Depth (feet):	30	**Strain @ Failure (%):**	14.8
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	97
Test Method	ASTM D2166	**Water Content (%):**	26.1
Material Type:	MH		
Material Description:	Elastic Silt, Gray, moist		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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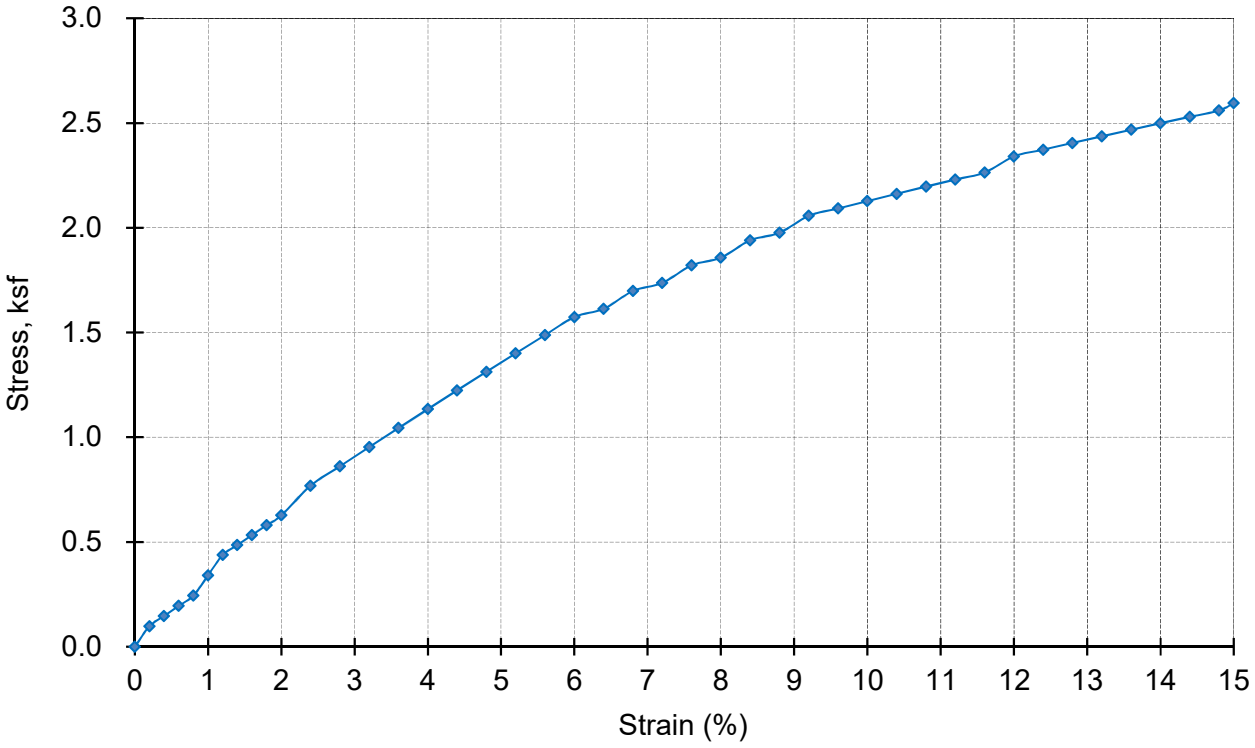
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4BC

UNCONFINED COMPRESSION TEST



Boring No.:	AS-40	**Unconfined Compressive Strength (ksf):**	2.60
Sample No. :	11	**Shear Strength (ksf)**	1.30
Depth (feet):	50	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	97
Test Method	ASTM D2166	**Water Content (%):**	26.7
Material Type:	CH		
Material Description:	Fat Clay, Gray, moist		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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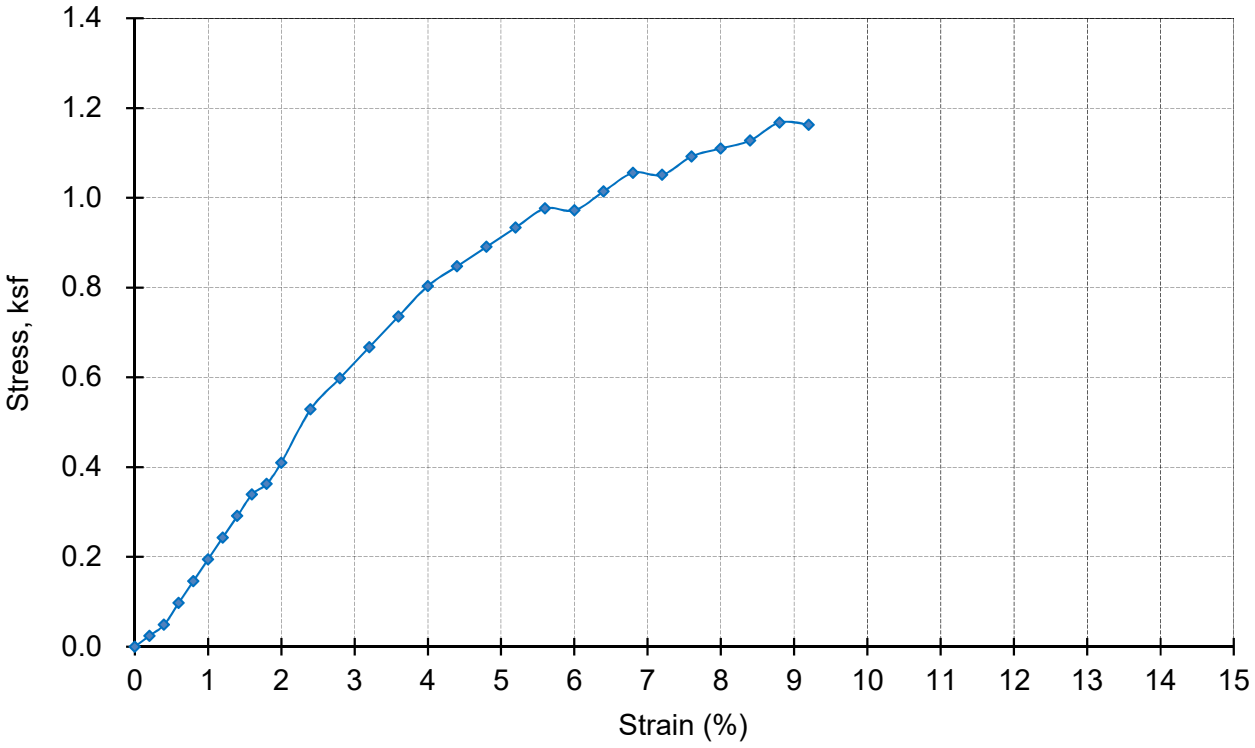
JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4BD**

UNCONFINED COMPRESSION TEST



Boring No.:	AS-45	**Unconfined Compressive Strength (ksf):**	1.17
Sample No. :	4	**Shear Strength (ksf)**	0.58
Depth (feet):	16	**Strain @ Failure (%):**	8.8
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	92
Test Method	ASTM D2166	**Water Content (%):**	29.0
Material Type:	CH		
Material Description:	Fat Clay, Gray, moist		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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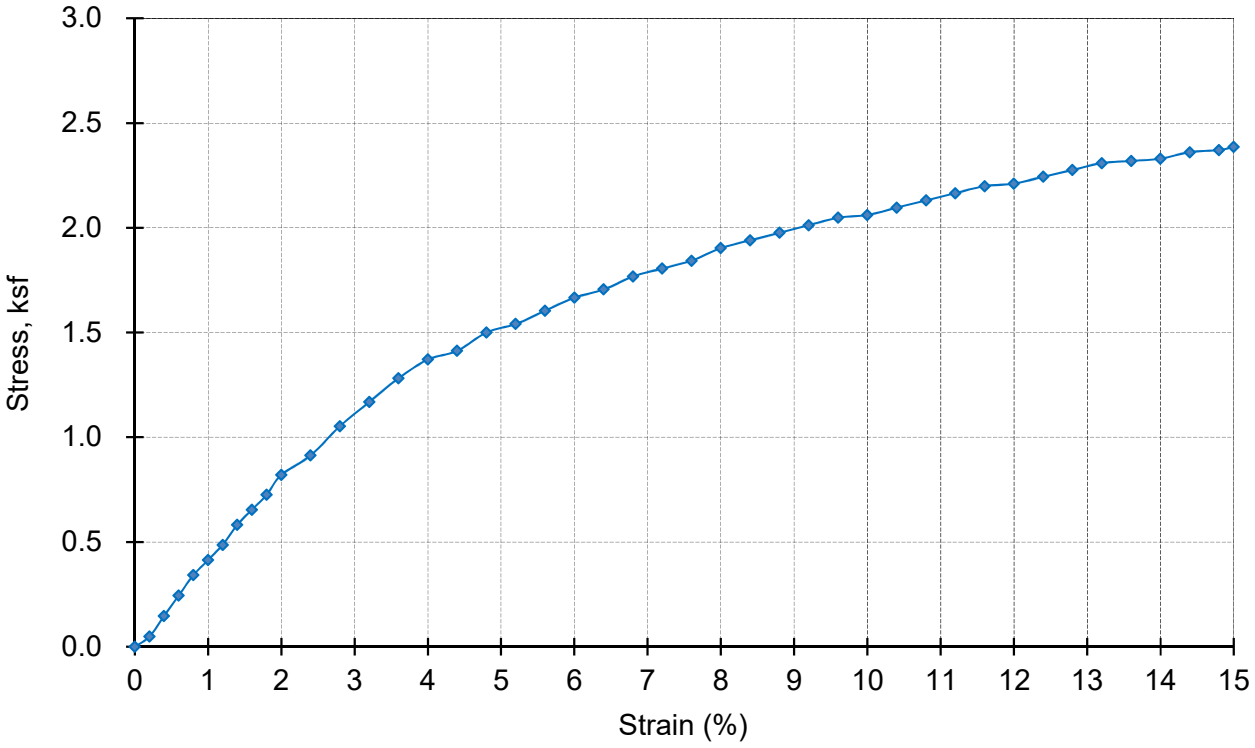
Practicing in the Geosciences

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4BE

UNCONFINED COMPRESSION TEST



Boring No.:	AS-45	**Unconfined Compressive Strength (ksf):**	2.39
Sample No. :	15	**Shear Strength (ksf)**	1.19
Depth (feet):	81	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	113
Test Method	ASTM D2166	**Water Content (%):**	17.5
Material Type:	CL		
Material Description:	Lean Clay with weathered Rock, Brown, Moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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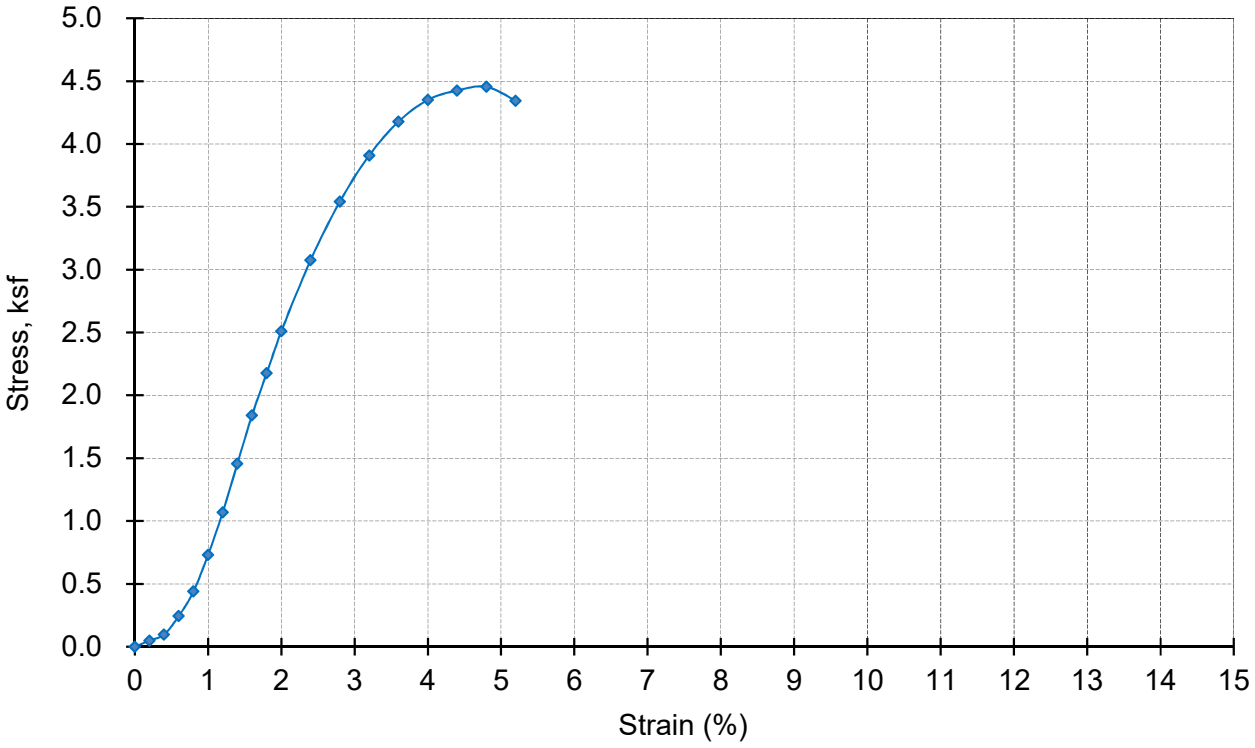
JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4BF**

UNCONFINED COMPRESSION TEST



Boring No.:	RW-49	**Unconfined Compressive Strength (ksf):**	4.45
Sample No. :	1	**Shear Strength (ksf)**	2.23
Depth (feet):	2.5	**Strain @ Failure (%):**	4.8
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	109
Test Method	ASTM D2166	**Water Content (%):**	15.7
Material Type:	CL		
Material Description:	Lean Clay, Dark Brown, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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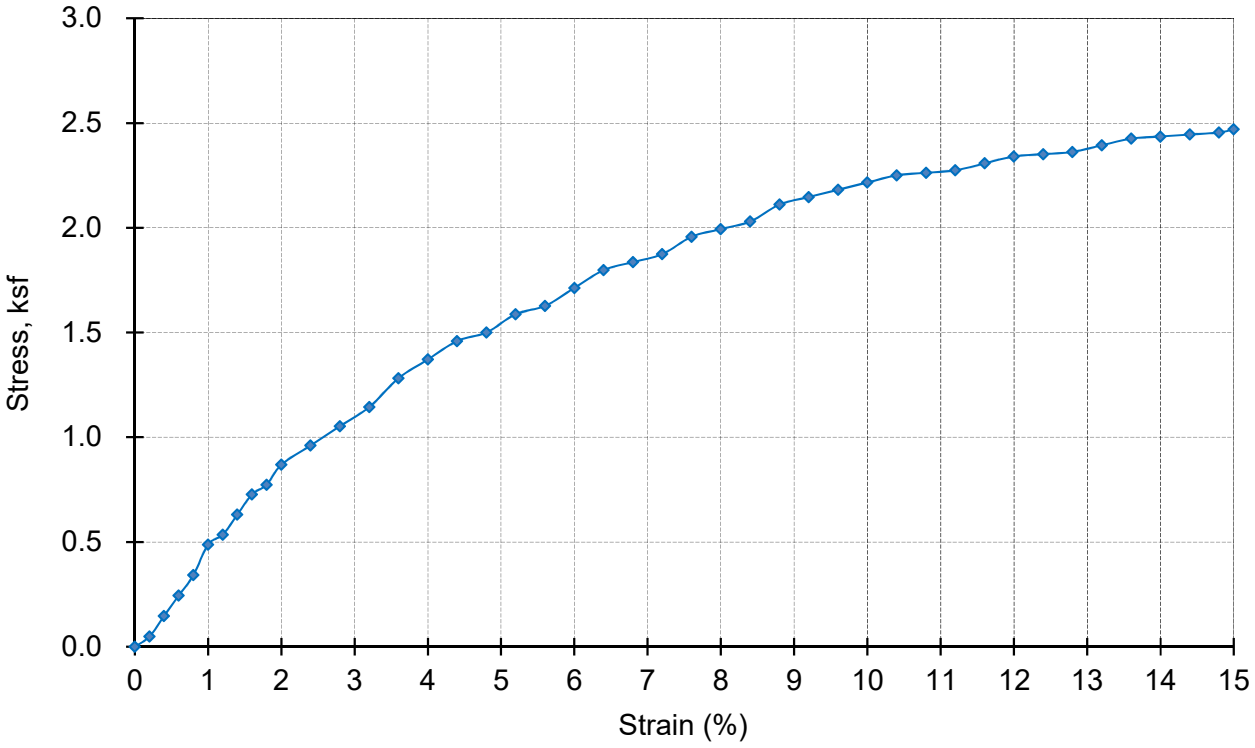
JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4BG**

UNCONFINED COMPRESSION TEST



Boring No.:	RW-49	**Unconfined Compressive Strength (ksf):**	2.47
Sample No. :	4	**Shear Strength (ksf)**	1.24
Depth (feet):	15	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	93
Test Method	ASTM D2166	**Water Content (%):**	29.6
Material Type:	CL		
Material Description:	Lean Clay, Yellowish Brown, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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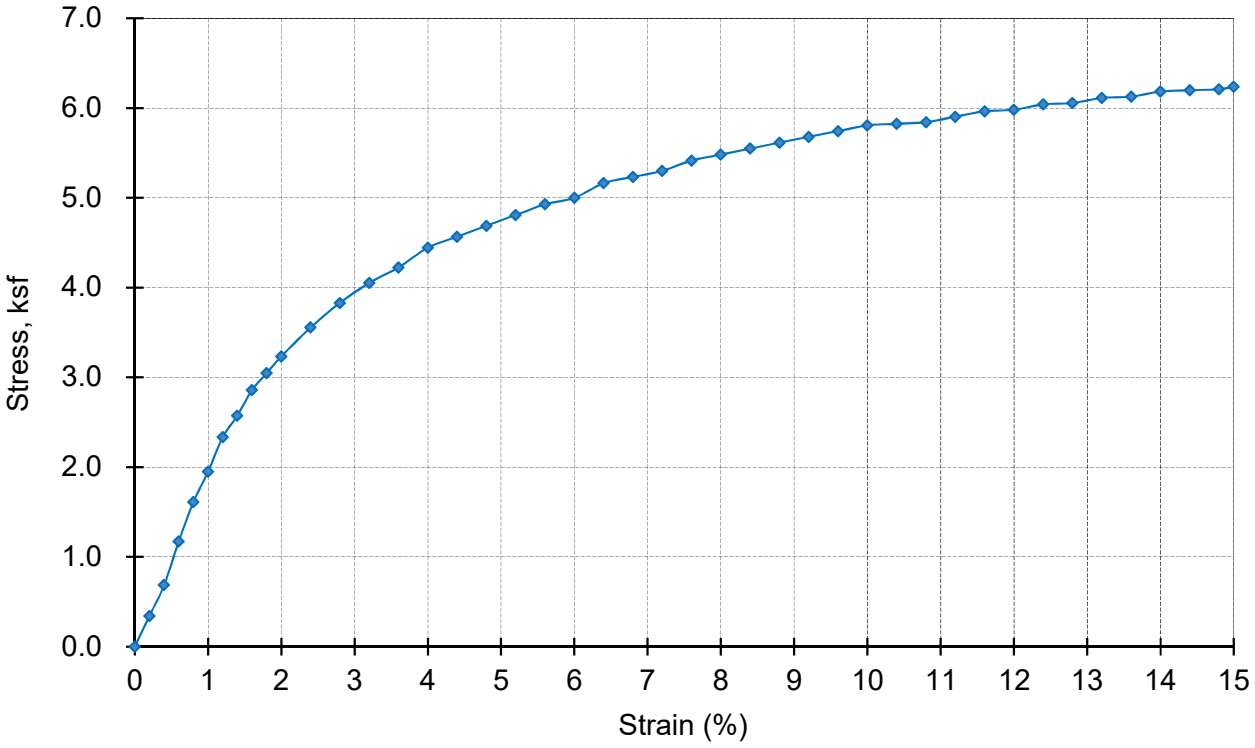
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4BH

UNCONFINED COMPRESSION TEST



Boring No.:	RW-49	**Unconfined Compressive Strength (ksf):**	6.24
Sample No. :	5	**Shear Strength (ksf)**	3.12
Depth (feet):	20	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	110
Test Method	ASTM D2166	**Water Content (%):**	19.5
Material Type:	CL		
Material Description:	Lean Clay, Dark Brown, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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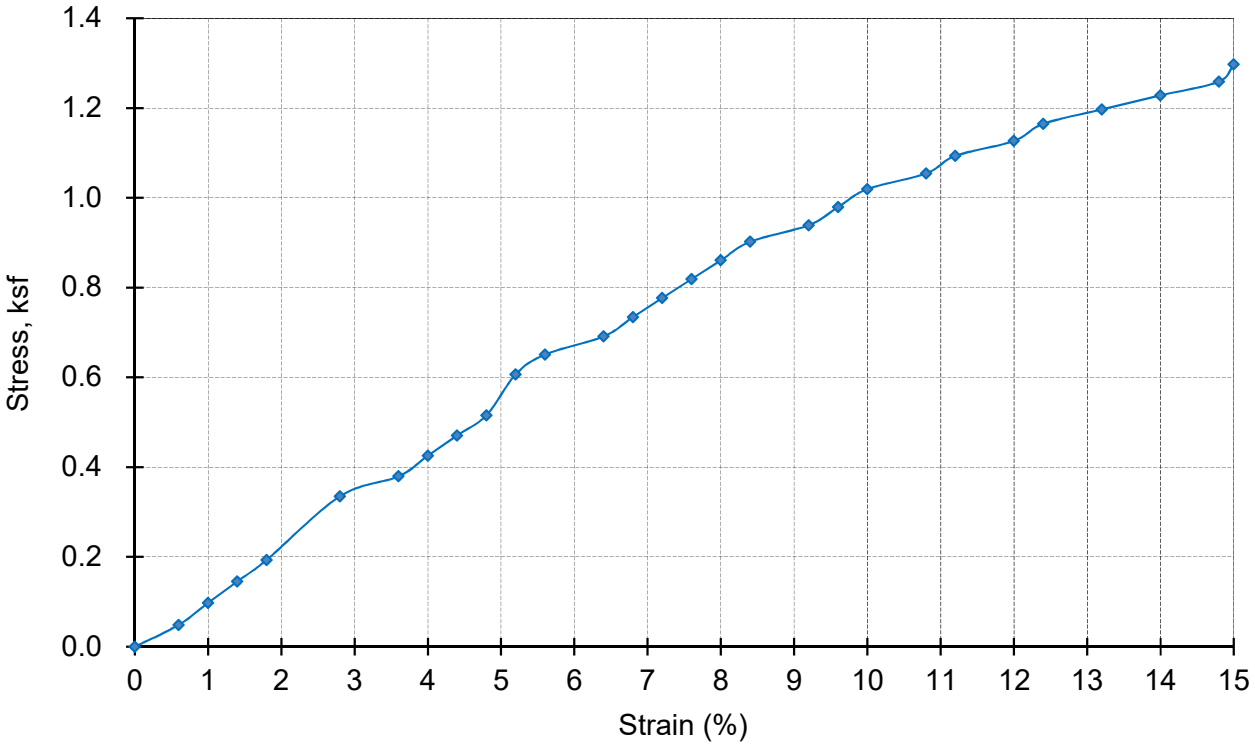
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4BI**

UNCONFINED COMPRESSION TEST



Boring No.:	TE-53	**Unconfined Compressive Strength (ksf):**	1.30
Sample No. :	4	**Shear Strength (ksf)**	0.65
Depth (feet):	14.5	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	92
Test Method	ASTM D2166	**Water Content (%):**	31.0
Material Type:	CL		
Material Description:	Sandy Lean Clay, Yellowish Brown, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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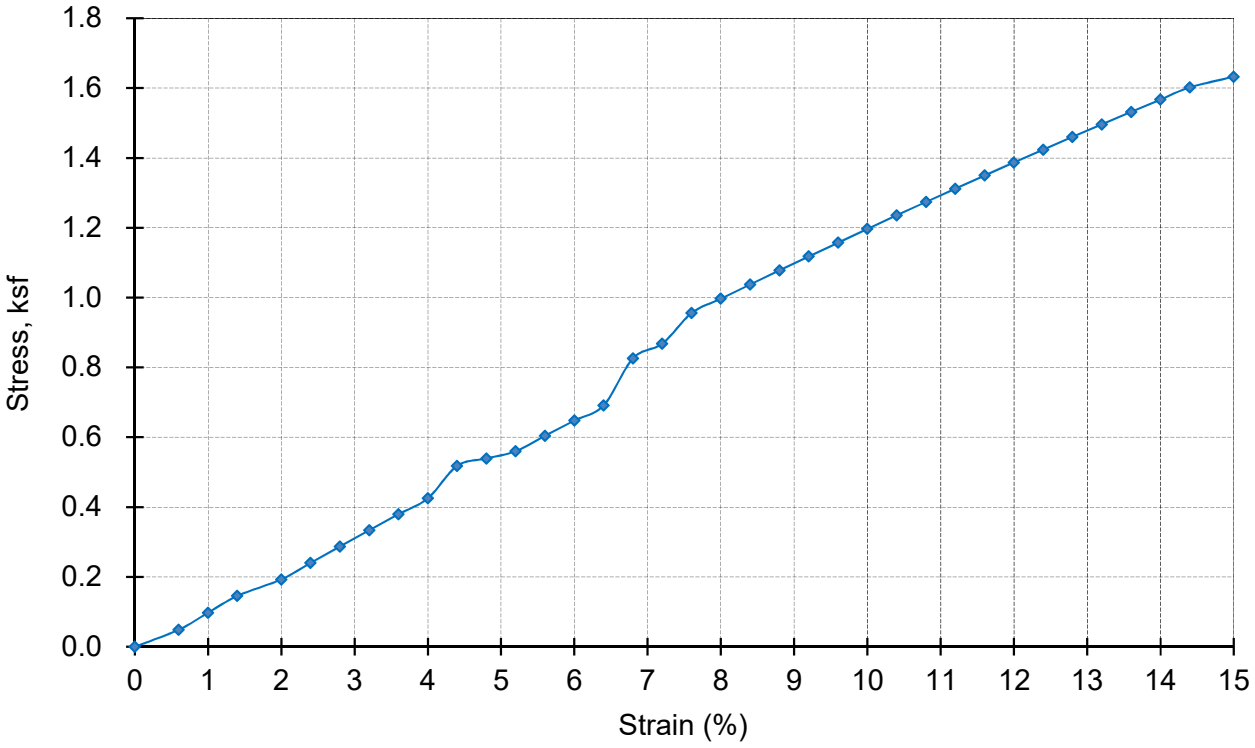
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4BJ

UNCONFINED COMPRESSION TEST



Boring No.:	TE-54	**Unconfined Compressive Strength (ksf):**	1.63
Sample No. :	5	**Shear Strength (ksf)**	0.82
Depth (feet):	19.5	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	103
Test Method	ASTM D2166	**Water Content (%):**	24.6
Material Type:	CL		
Material Description:	Lean Clay, Yellowish Brown, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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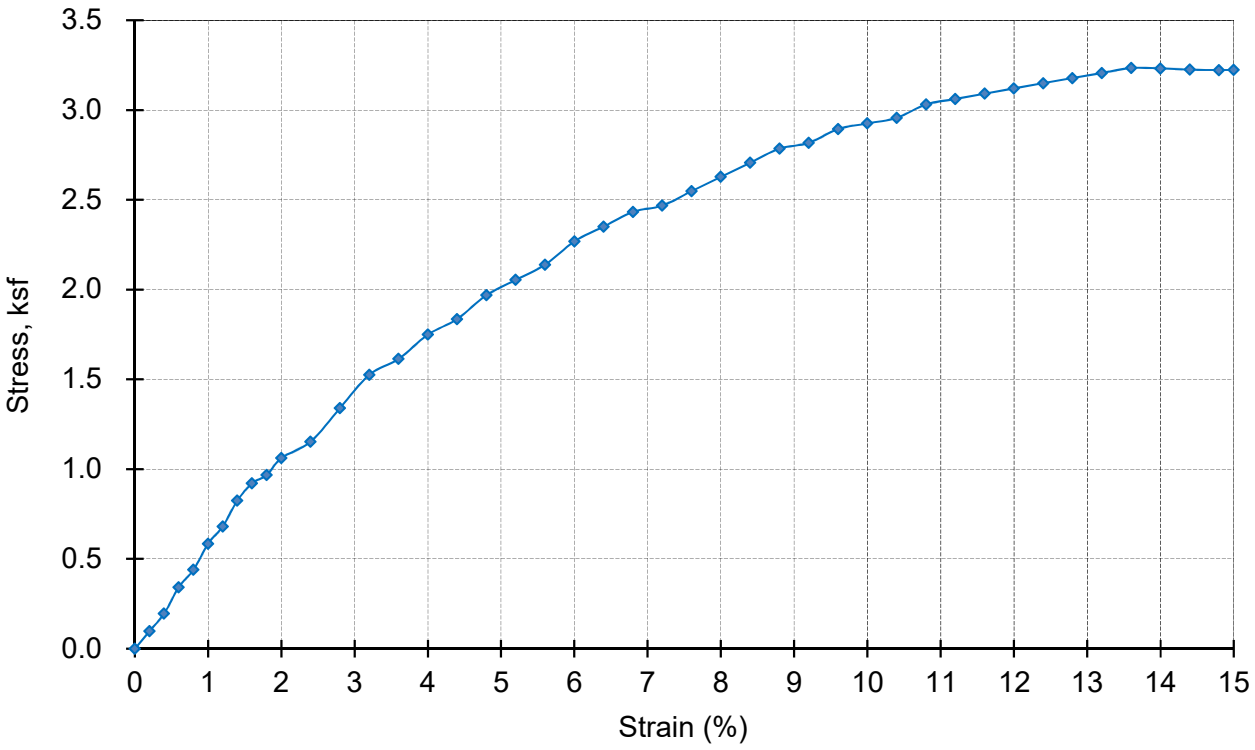
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4BK

UNCONFINED COMPRESSION TEST



Boring No.:	TE-55	**Unconfined Compressive Strength (ksf):**	3.23
Sample No. :	2	**Shear Strength (ksf)**	1.62
Depth (feet):	4.5	**Strain @ Failure (%):**	13.6
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	104
Test Method	ASTM D2166	**Water Content (%):**	28.1
Material Type:	CL		
Material Description:	Lean Clay, Brown, moist		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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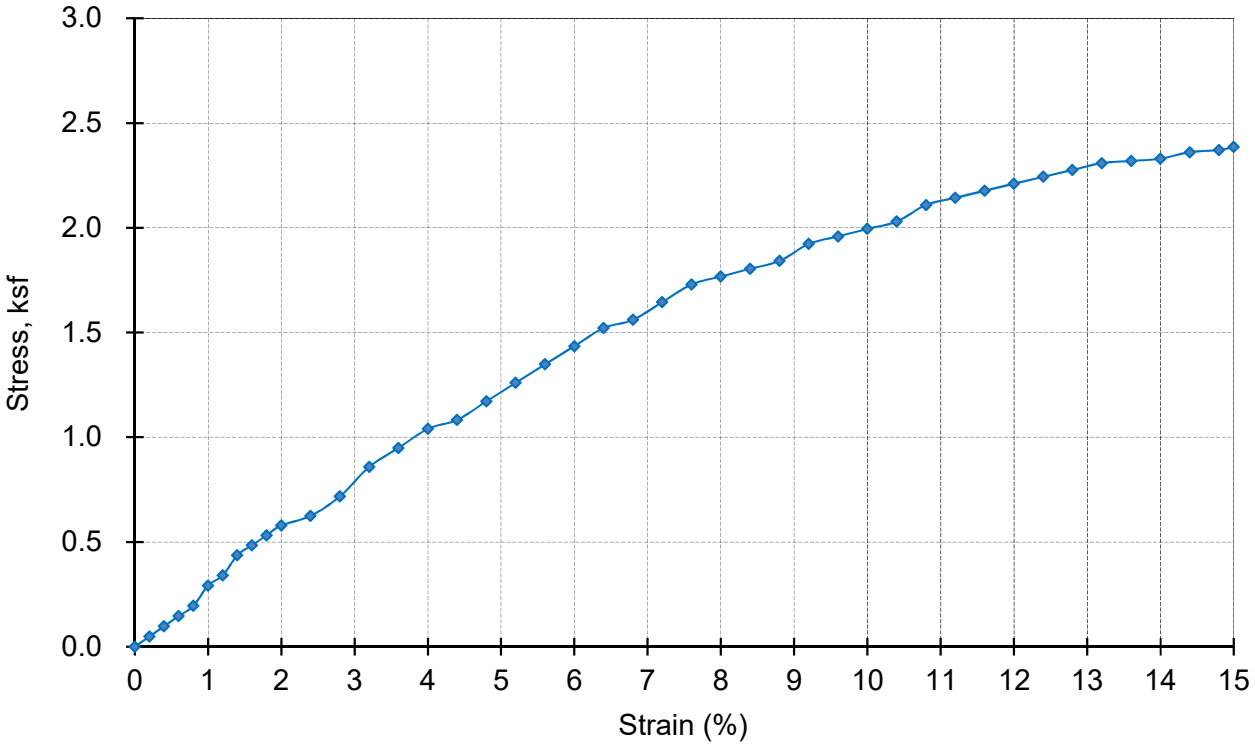
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4BL

UNCONFINED COMPRESSION TEST



Boring No.:	TE-55	**Unconfined Compressive Strength (ksf):**	2.39
Sample No. :	4	**Shear Strength (ksf)**	1.19
Depth (feet):	14.5	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	105
Test Method	ASTM D2166	**Water Content (%):**	22.4
Material Type:	CL		
Material Description:	Lean Clay, Brown, moist		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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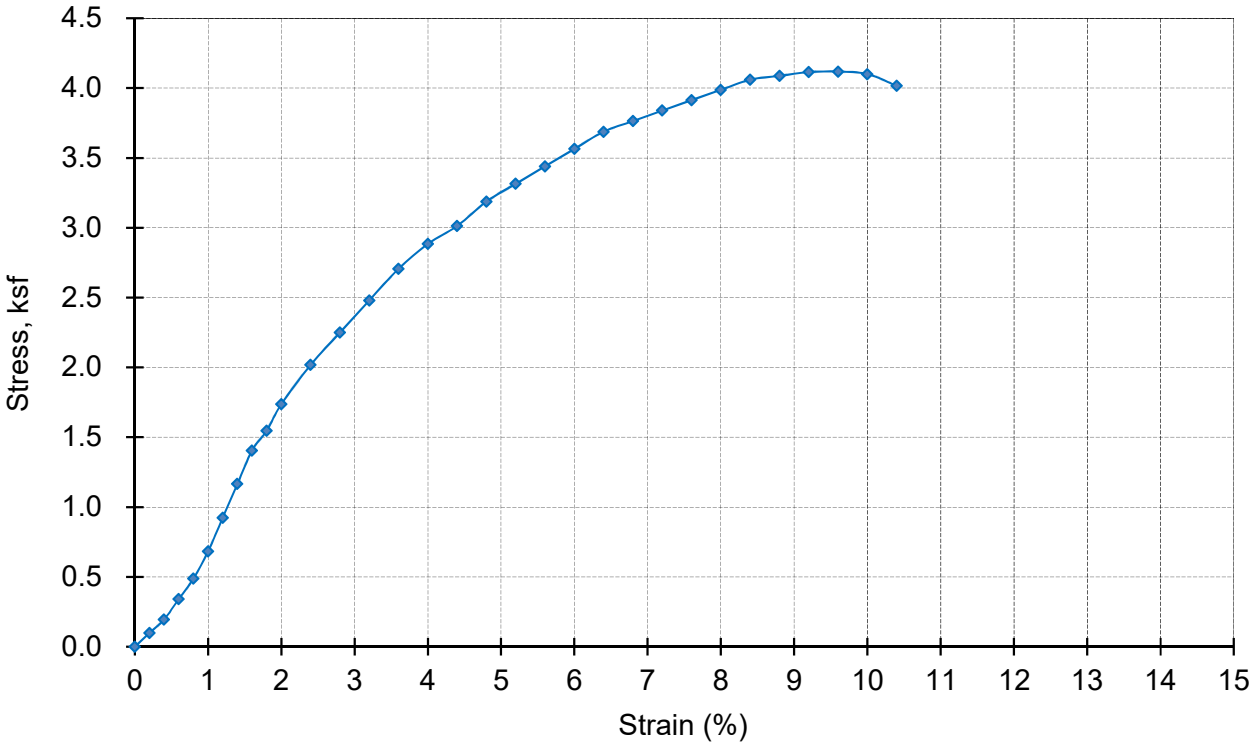
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4BM

UNCONFINED COMPRESSION TEST



Boring No.:	AE-58	**Unconfined Compressive Strength (ksf):**	4.12
Sample No. :	1	**Shear Strength (ksf)**	2.06
Depth (feet):	2	**Strain @ Failure (%):**	9.6
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	108
Test Method	ASTM D2166	**Water Content (%):**	19.5
Material Type:	CL		
Material Description:	Lean Clay with Sand, Brown, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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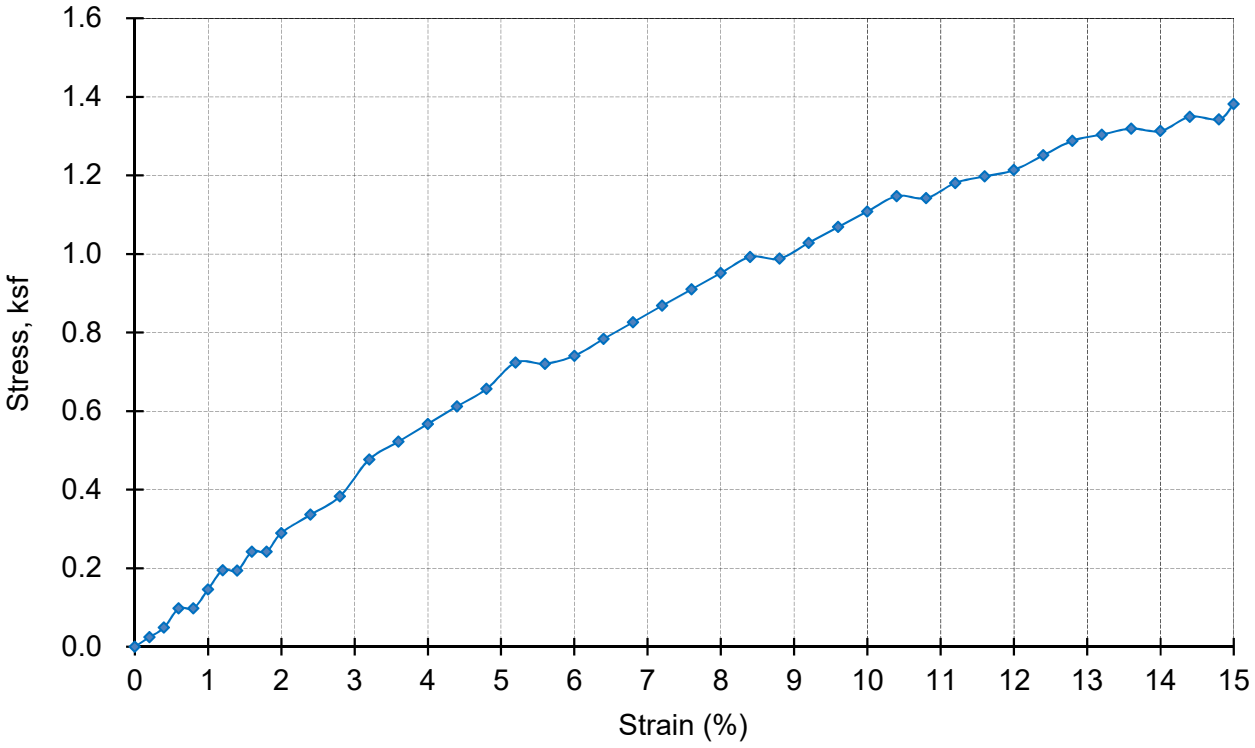
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4BN

UNCONFINED COMPRESSION TEST



Boring No.:	PS-59	**Unconfined Compressive Strength (ksf):**	1.38
Sample No. :	3	**Shear Strength (ksf)**	0.69
Depth (feet):	9.5	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	90
Test Method	ASTM D2166	**Water Content (%):**	33.1
Material Type:	CL		
Material Description:	Lean Clay with Sand, Brown, moist		

Initial Height (inch):	5.00
Initial Diameter (inch):	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min):	0.1

Remarks:

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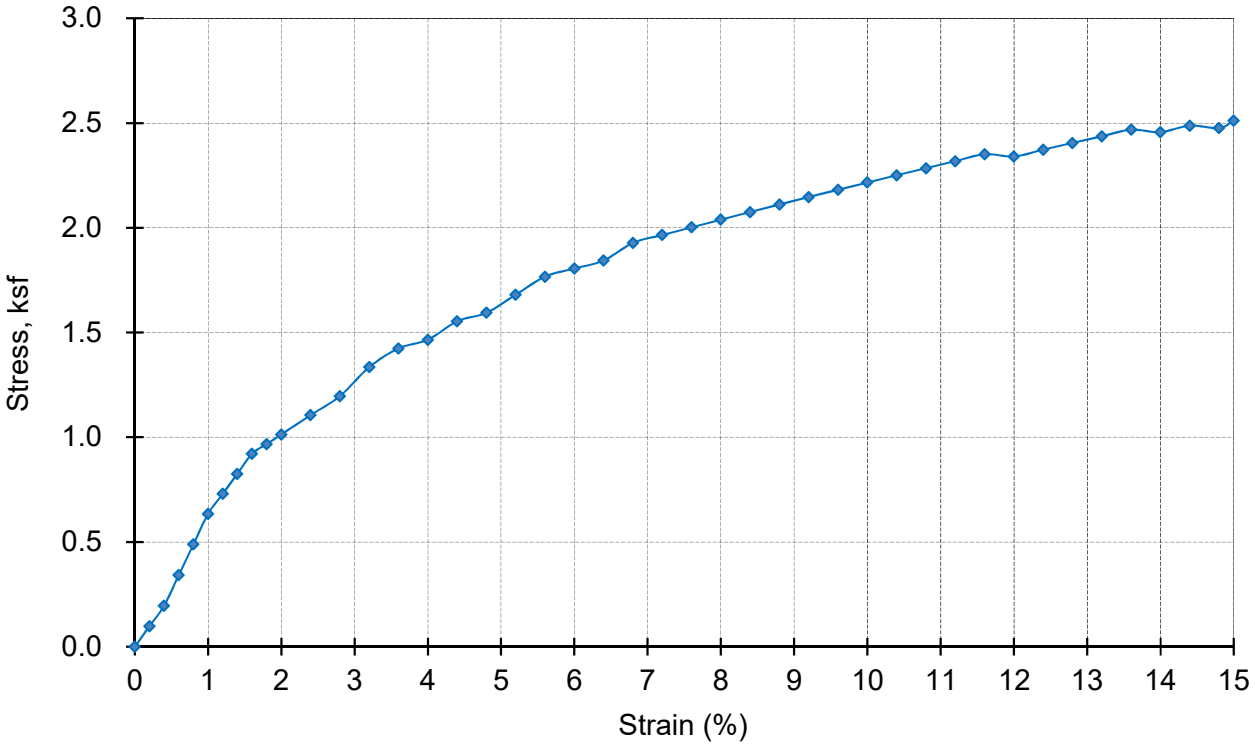
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4BO

UNCONFINED COMPRESSION TEST



Boring No.:	PS-59	**Unconfined Compressive Strength (ksf):**	2.51
Sample No. :	5	**Shear Strength (ksf)**	1.26
Depth (feet):	19.5	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	93
Test Method	ASTM D2166	**Water Content (%):**	29.9
Material Type:	CL		
Material Description:	Lean Clay, Brown, moist		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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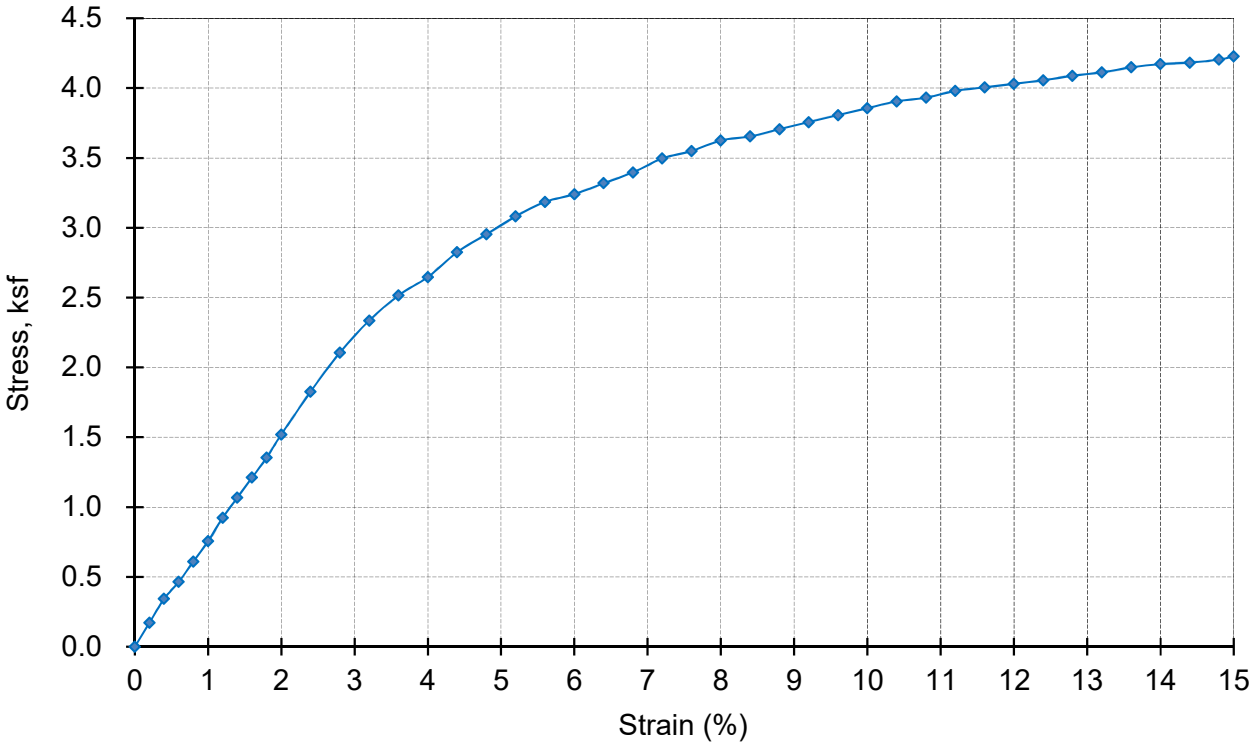
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4BP**

UNCONFINED COMPRESSION TEST (2018)

UNCONFINED COMPRESSION TEST



Boring No.:	AS-65	**Unconfined Compressive Strength (ksf):**	4.23
Sample No. :	5	**Shear Strength (ksf)**	2.11
Depth (feet):	26	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	103
Test Method	ASTM D2166	**Water Content (%):**	21.9
Material Type:	CL		
Material Description:	Brown, Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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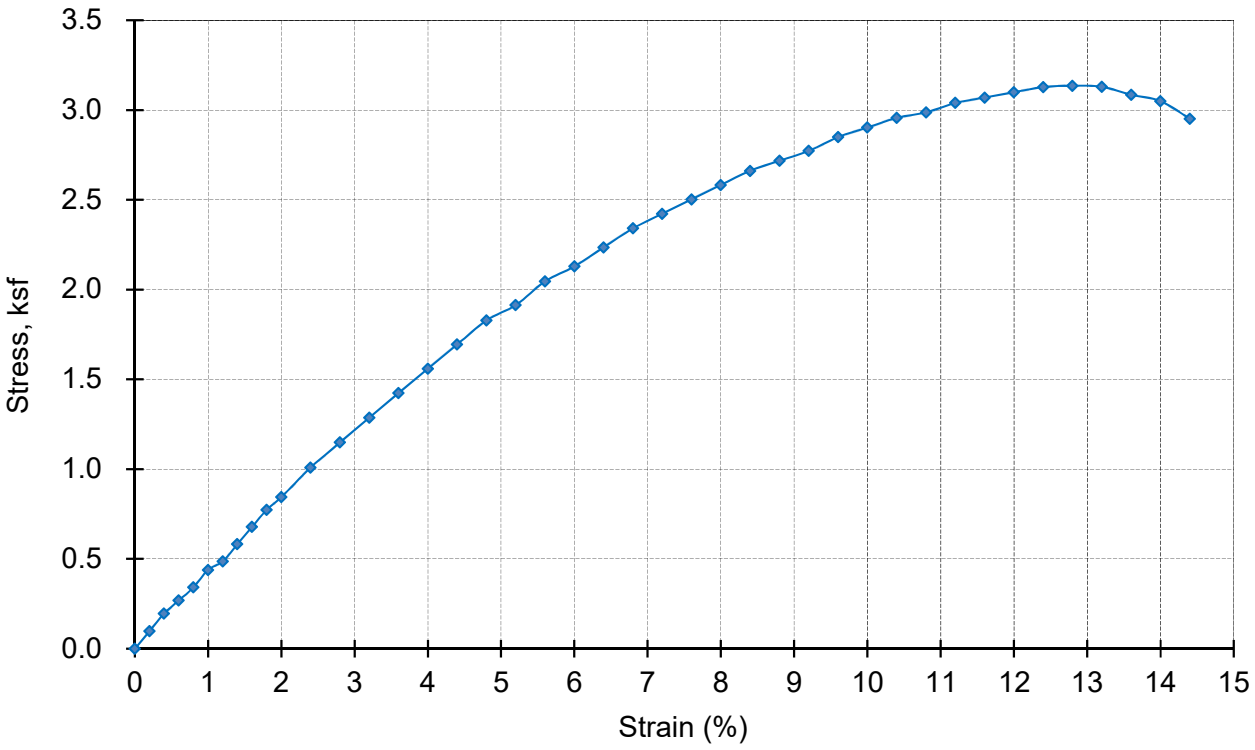
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4CA

UNCONFINED COMPRESSION TEST



Boring No.:	AS-66	**Unconfined Compressive Strength (ksf):**	3.14
Sample No. :	1	**Shear Strength (ksf)**	1.57
Depth (feet):	6	**Strain @ Failure (%):**	12.8
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	112
Test Method	ASTM D2166	**Water Content (%):**	15.1
Material Type:	CL		
Material Description:	Brown, Silty, Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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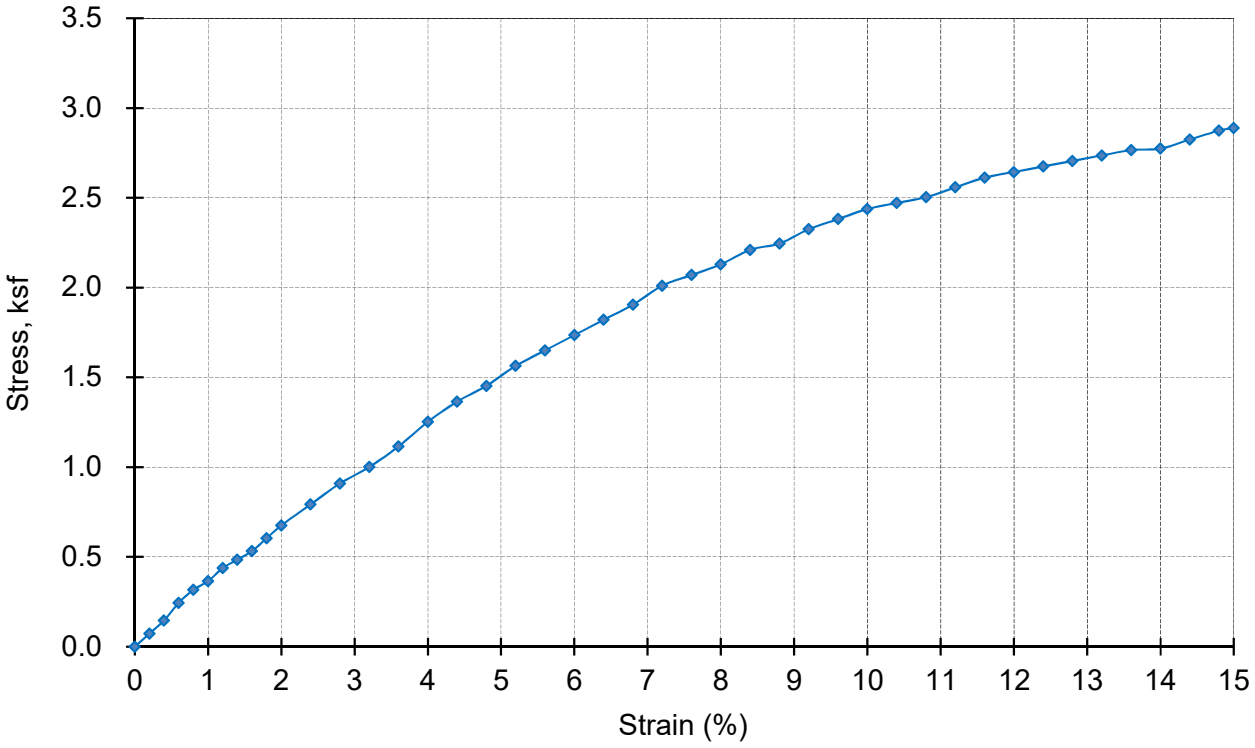
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4CB

UNCONFINED COMPRESSION TEST



Boring No.:	AS-66	**Unconfined Compressive Strength (ksf):**	2.89
Sample No. :	5	**Shear Strength (ksf)**	1.44
Depth (feet):	26	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	92
Test Method	ASTM D2166	**Water Content (%):**	30.5
Material Type:	CL		
Material Description:	Brown to Gray Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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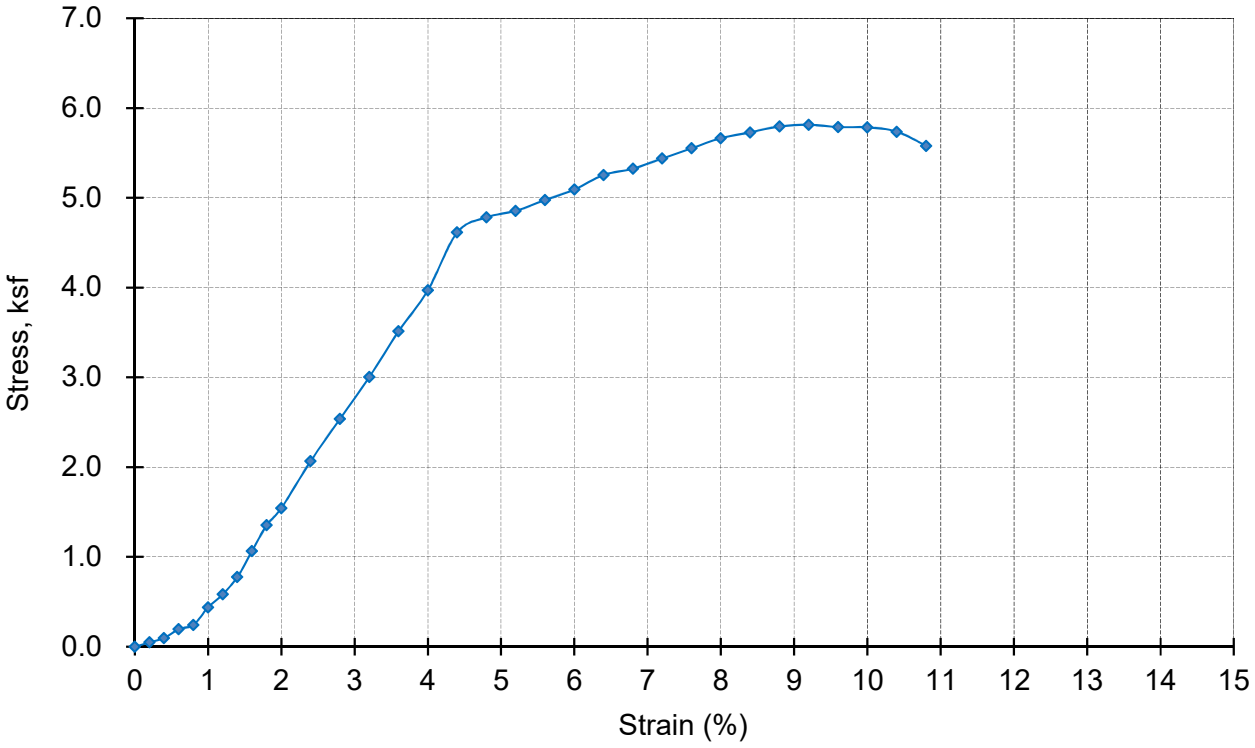
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4CC

UNCONFINED COMPRESSION TEST



Boring No.:	AS-68	**Unconfined Compressive Strength (ksf):**	5.81
Sample No. :	1	**Shear Strength (ksf)**	2.91
Depth (feet):	6	**Strain @ Failure (%):**	9.2
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	101
Test Method	ASTM D2166	**Water Content (%):**	22.9
Material Type:	CL		
Material Description:	Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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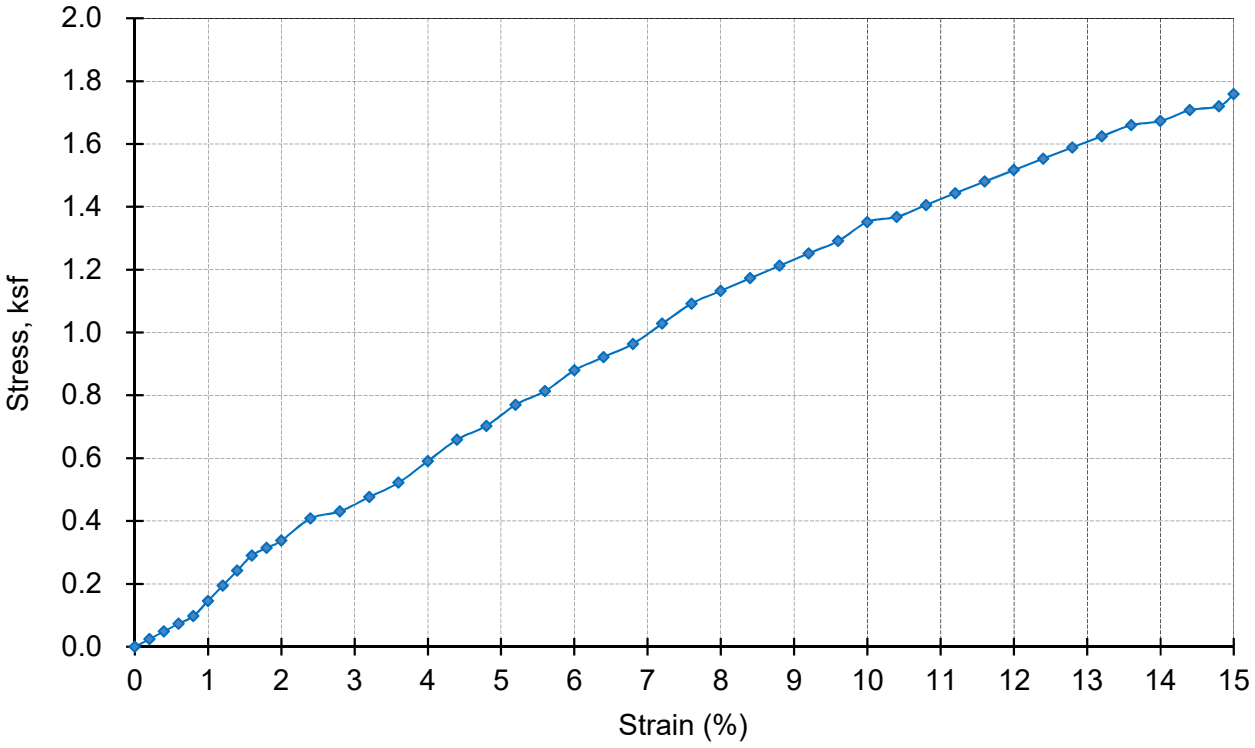
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4CD

UNCONFINED COMPRESSION TEST



Boring No.:	AS-68	**Unconfined Compressive Strength (ksf):**	1.76
Sample No. :	3	**Shear Strength (ksf)**	0.88
Depth (feet):	16	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	94
Test Method	ASTM D2166	**Water Content (%):**	29.0
Material Type:	CL		
Material Description:	Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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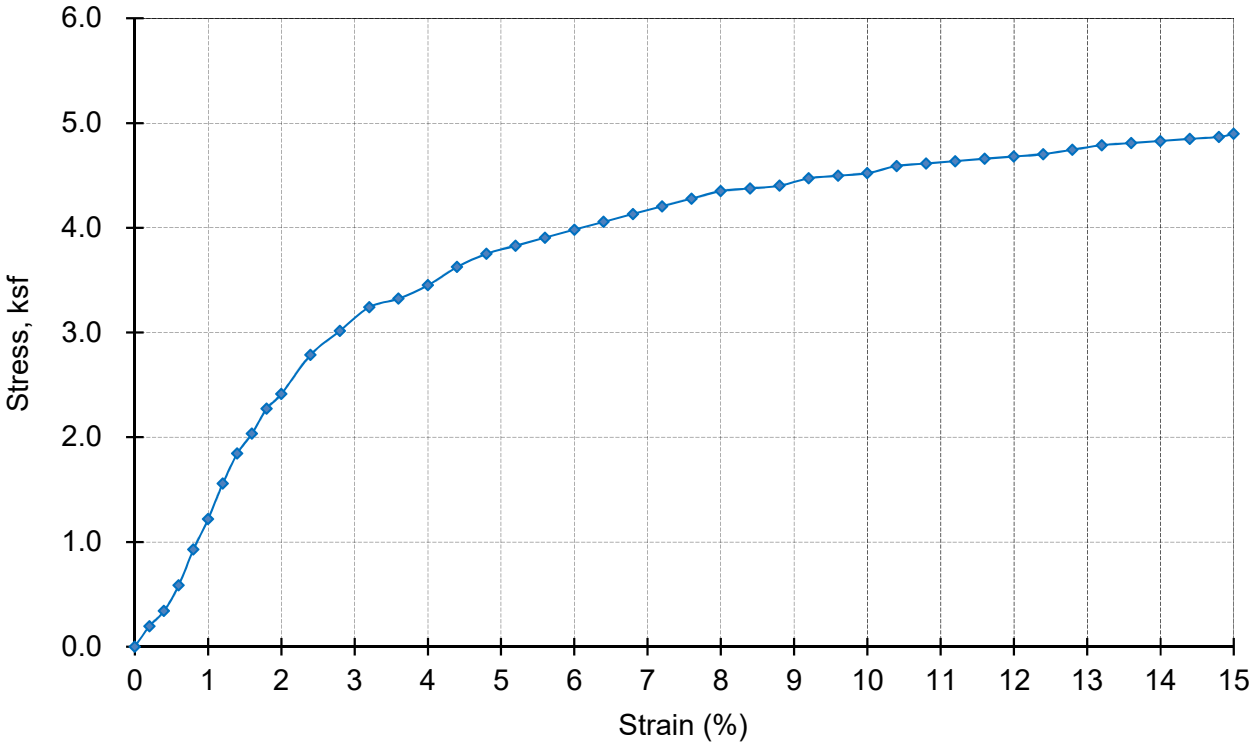
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4CE

UNCONFINED COMPRESSION TEST



Boring No.:	AS-68	**Unconfined Compressive Strength (ksf):**	4.90
Sample No. :	5	**Shear Strength (ksf)**	2.45
Depth (feet):	26	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	100
Test Method	ASTM D2166	**Water Content (%):**	25.0
Material Type:	CH		
Material Description:	Fat Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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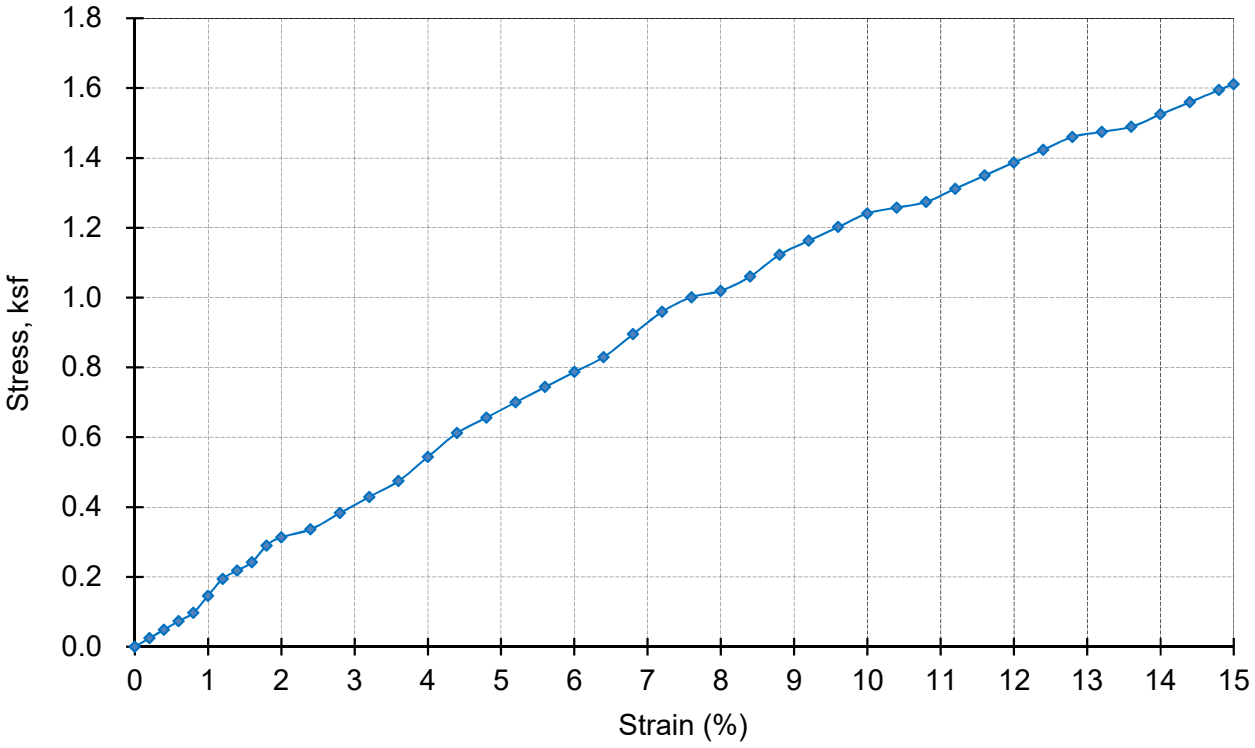
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4CF**

UNCONFINED COMPRESSION TEST



Boring No.:	AS-68	**Unconfined Compressive Strength (ksf):**	1.61
Sample No. :	11	**Shear Strength (ksf)**	0.81
Depth (feet):	56	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	103
Test Method	ASTM D2166	**Water Content (%):**	22.1
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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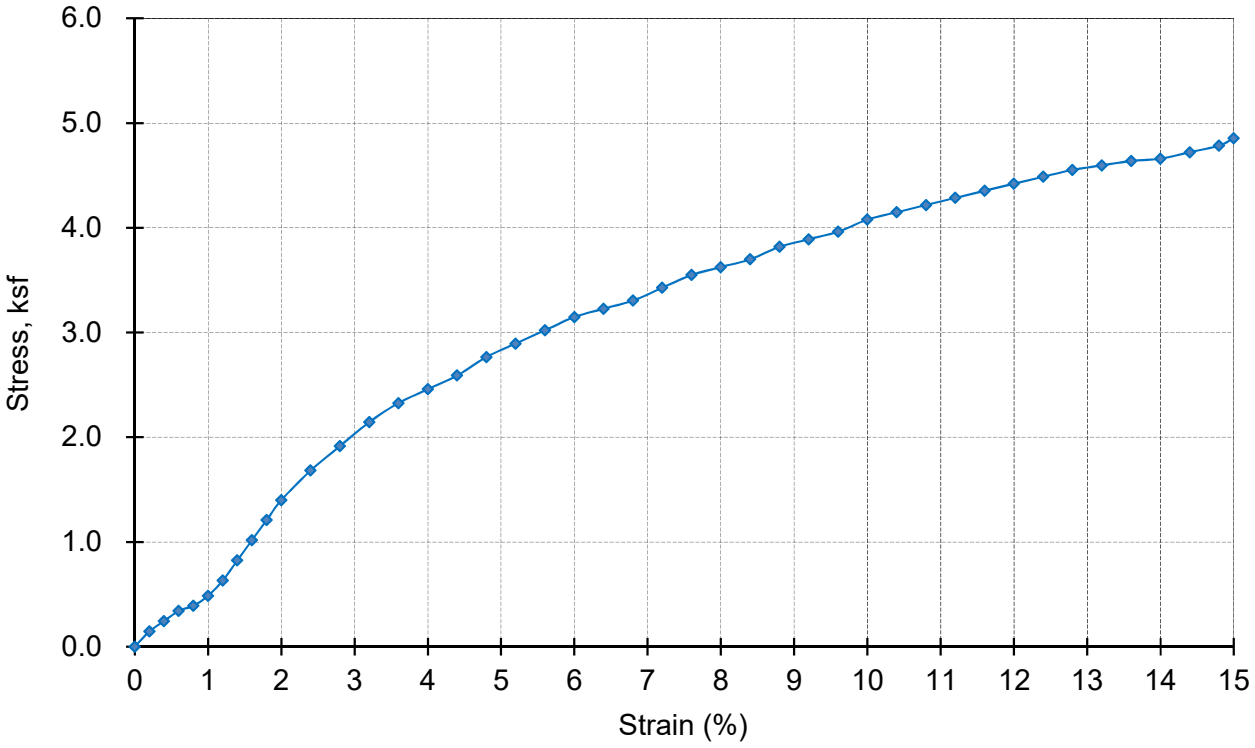
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4CG

UNCONFINED COMPRESSION TEST



Boring No.:	AS-68	**Unconfined Compressive Strength (ksf):**	4.86
Sample No. :	15	**Shear Strength (ksf)**	2.43
Depth (feet):	76	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	104
Test Method	ASTM D2166	**Water Content (%):**	21.8
Material Type:	CL/CH		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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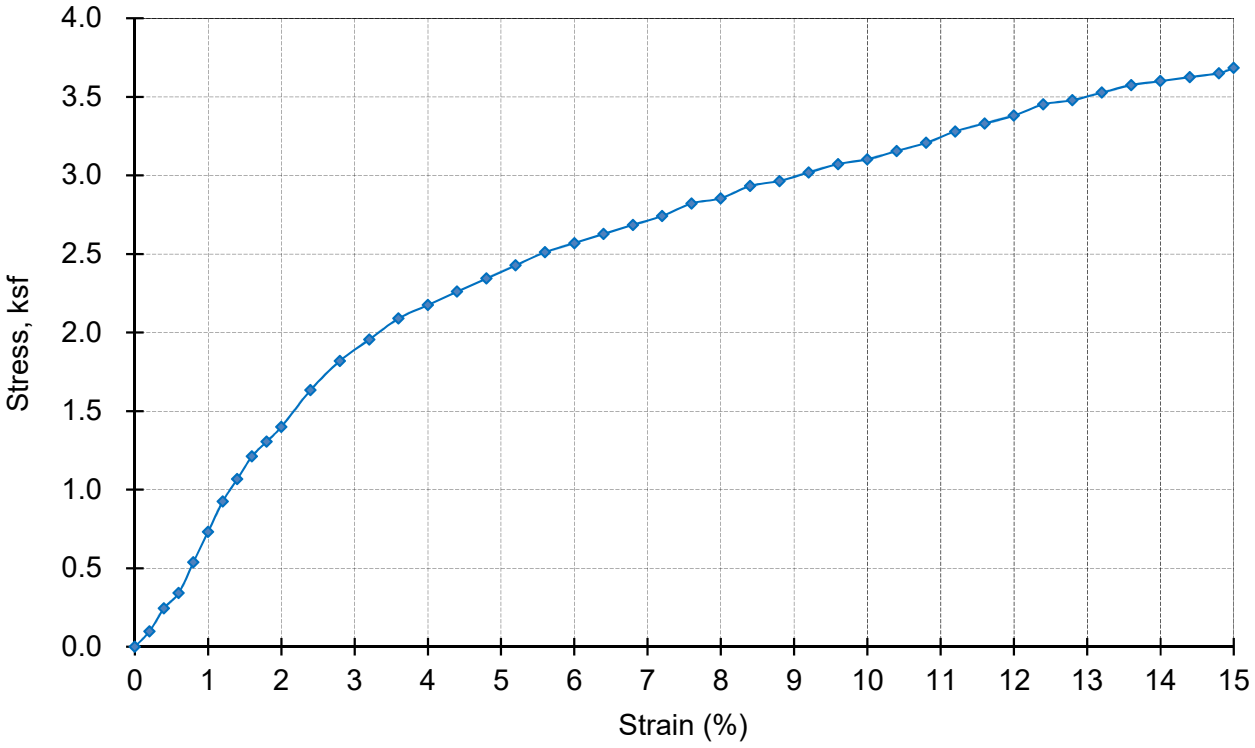
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4CH**

UNCONFINED COMPRESSION TEST



Boring No.:	AS-68	**Unconfined Compressive Strength (ksf):**	3.68
Sample No. :	16	**Shear Strength (ksf)**	1.84
Depth (feet):	81	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	105
Test Method	ASTM D2166	**Water Content (%):**	21.7
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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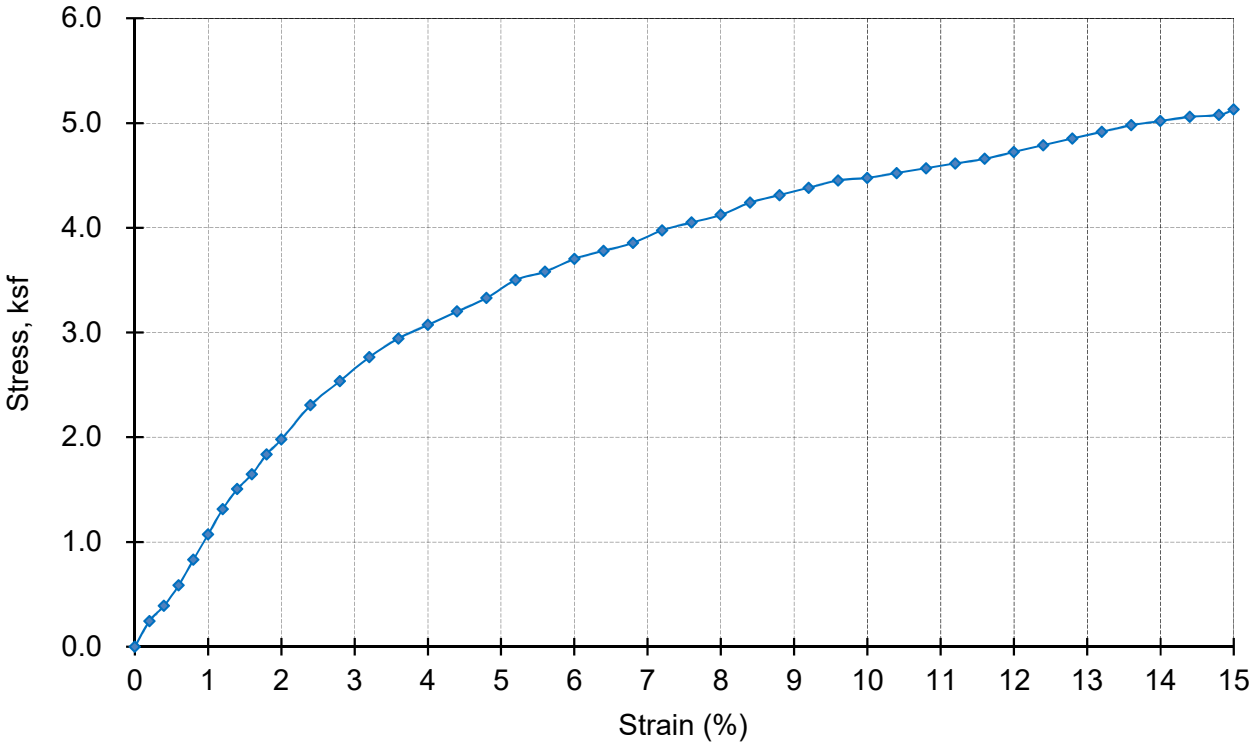
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4CI

UNCONFINED COMPRESSION TEST



Boring No.:	AS-68	**Unconfined Compressive Strength (ksf):**	5.13
Sample No. :	17	**Shear Strength (ksf)**	2.56
Depth (feet):	91	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	98
Test Method	ASTM D2166	**Water Content (%):**	26.0
Material Type:	CL		
Material Description:	Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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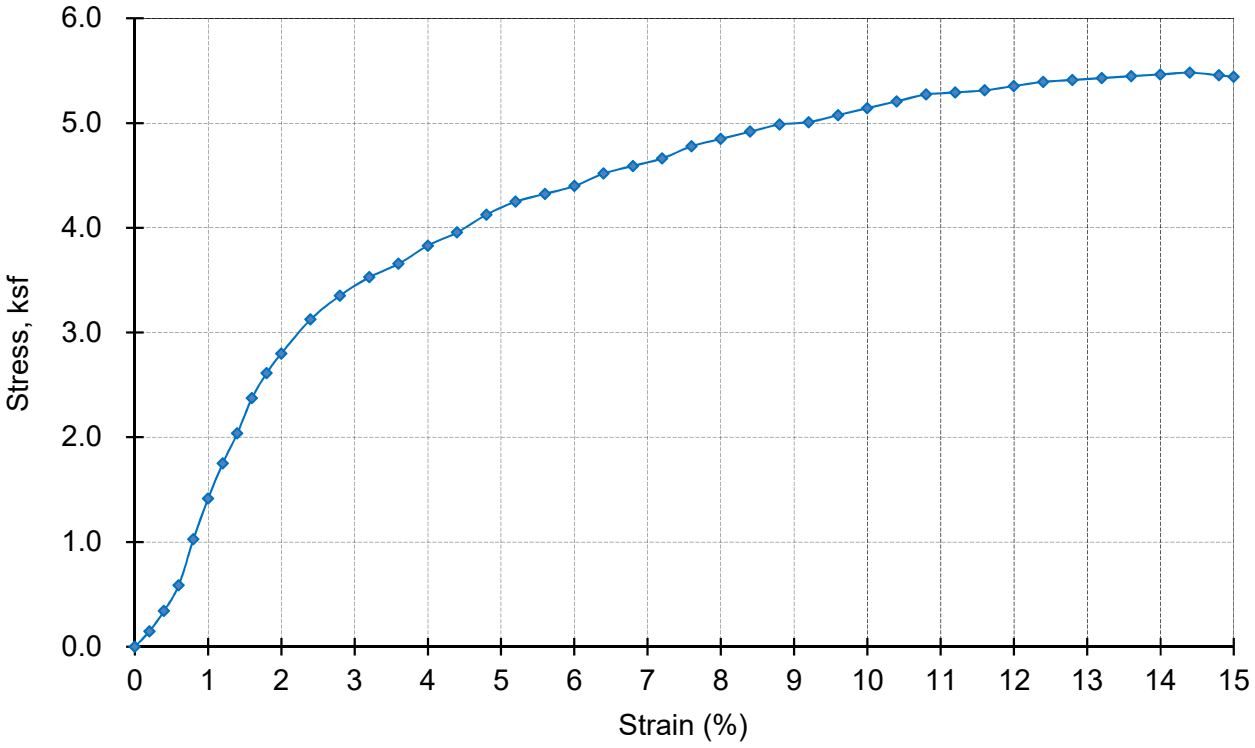
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4CJ

UNCONFINED COMPRESSION TEST



Boring No.:	AS-68	**Unconfined Compressive Strength (ksf):**	5.48
Sample No. :	19	**Shear Strength (ksf)**	2.74
Depth (feet):	111	**Strain @ Failure (%):**	14.4
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	92
Test Method	ASTM D2166	**Water Content (%):**	30.1
Material Type:	CH		
Material Description:	Fat Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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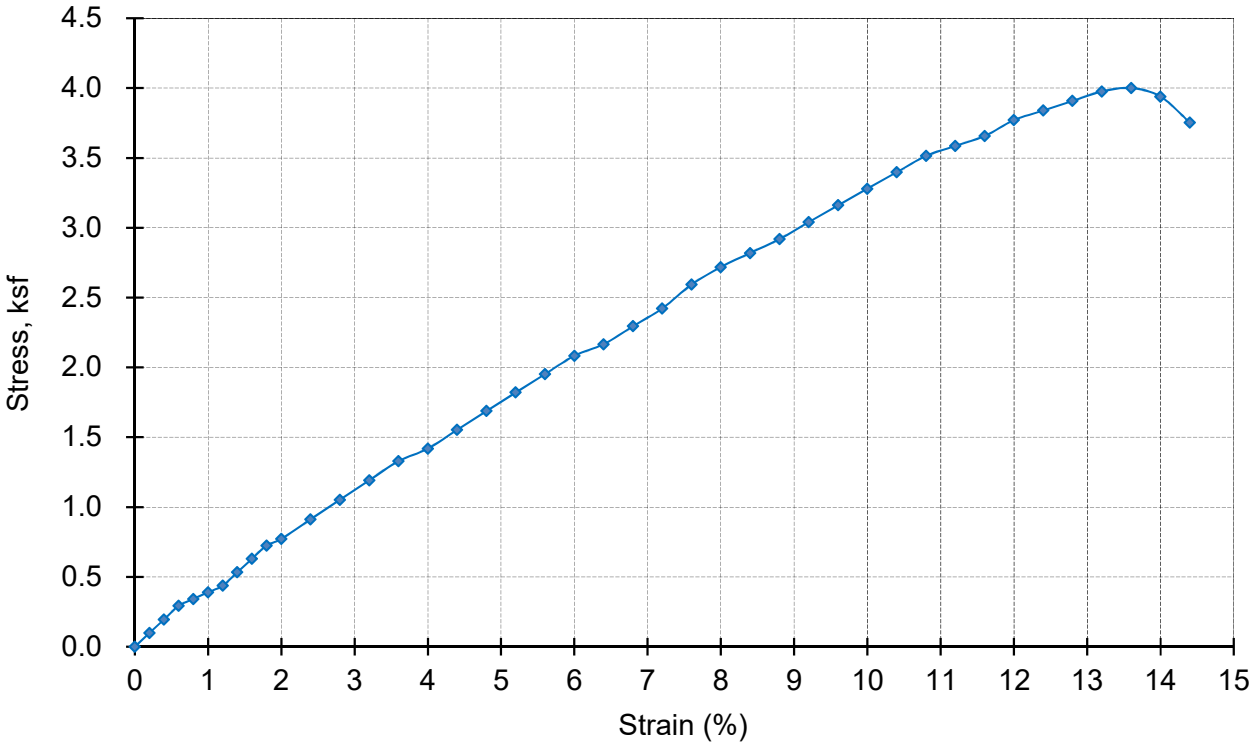
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4CK

UNCONFINED COMPRESSION TEST



Boring No.:	AS-68	**Unconfined Compressive Strength (ksf):**	4.00
Sample No. :	22	**Shear Strength (ksf)**	2.00
Depth (feet):	141	**Strain @ Failure (%):**	13.6
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	99
Test Method	ASTM D2166	**Water Content (%):**	25.5
Material Type:	CL-ML		
Material Description:	Silty Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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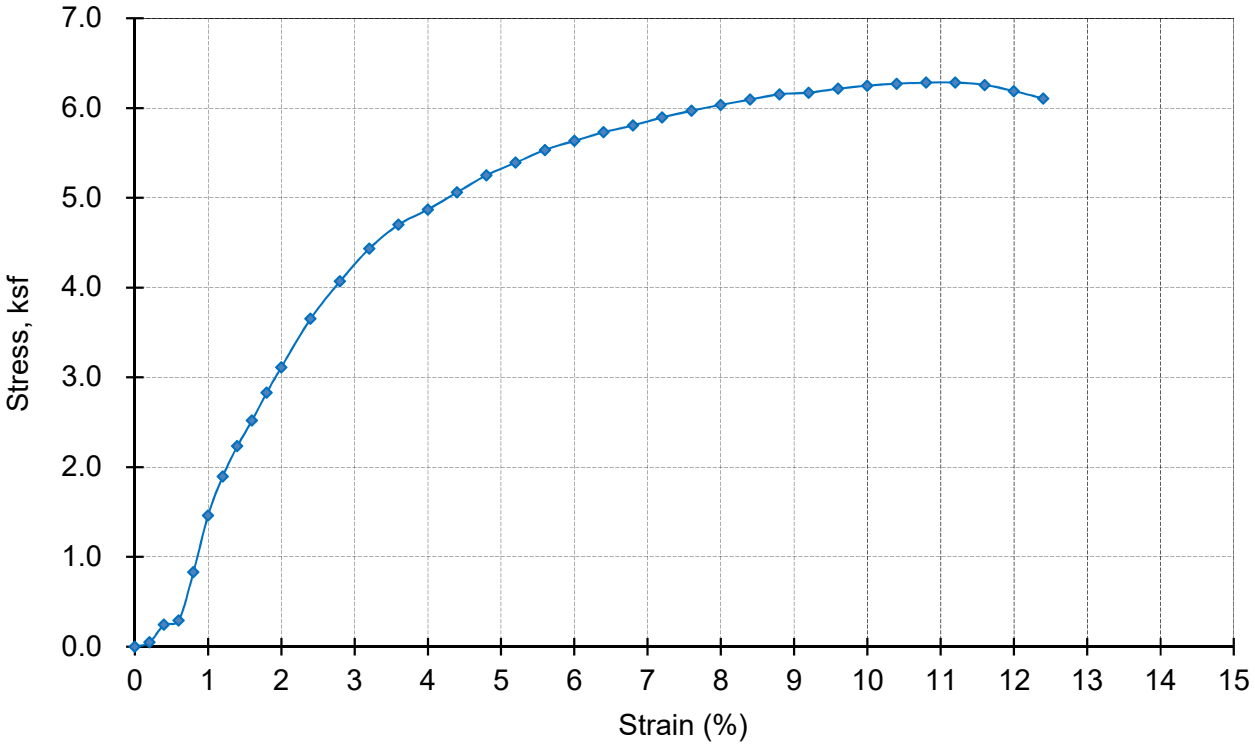
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4CL

UNCONFINED COMPRESSION TEST



Boring No.:	AS-70	**Unconfined Compressive Strength (ksf):**	6.29
Sample No. :	1	**Shear Strength (ksf)**	3.14
Depth (feet):	6	**Strain @ Failure (%):**	11.2
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	105
Test Method	ASTM D2166	**Water Content (%):**	21.8
Material Type:	CL		
Material Description:	Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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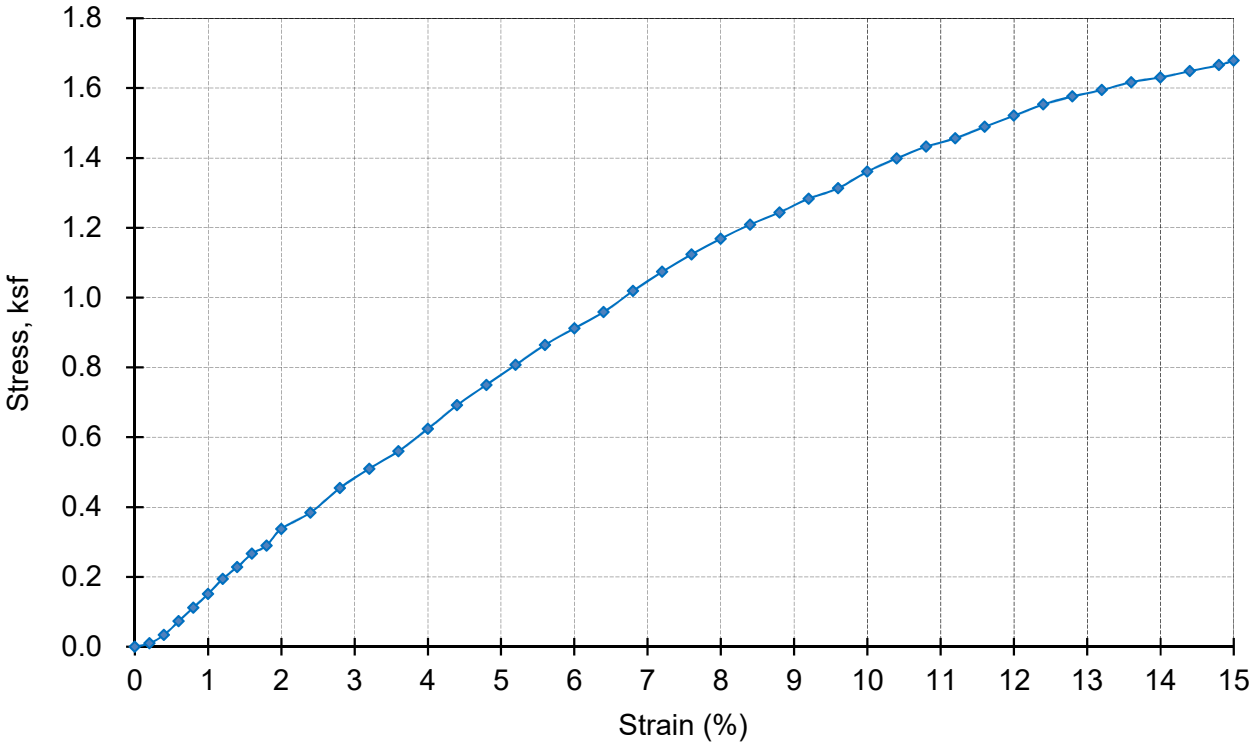
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4CM

UNCONFINED COMPRESSION TEST



Boring No.:	AS-70	**Unconfined Compressive Strength (ksf):**	1.68
Sample No. :	3	**Shear Strength (ksf)**	0.84
Depth (feet):	16	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	91
Test Method	ASTM D2166	**Water Content (%):**	30.6
Material Type:	CH		
Material Description:	Fat Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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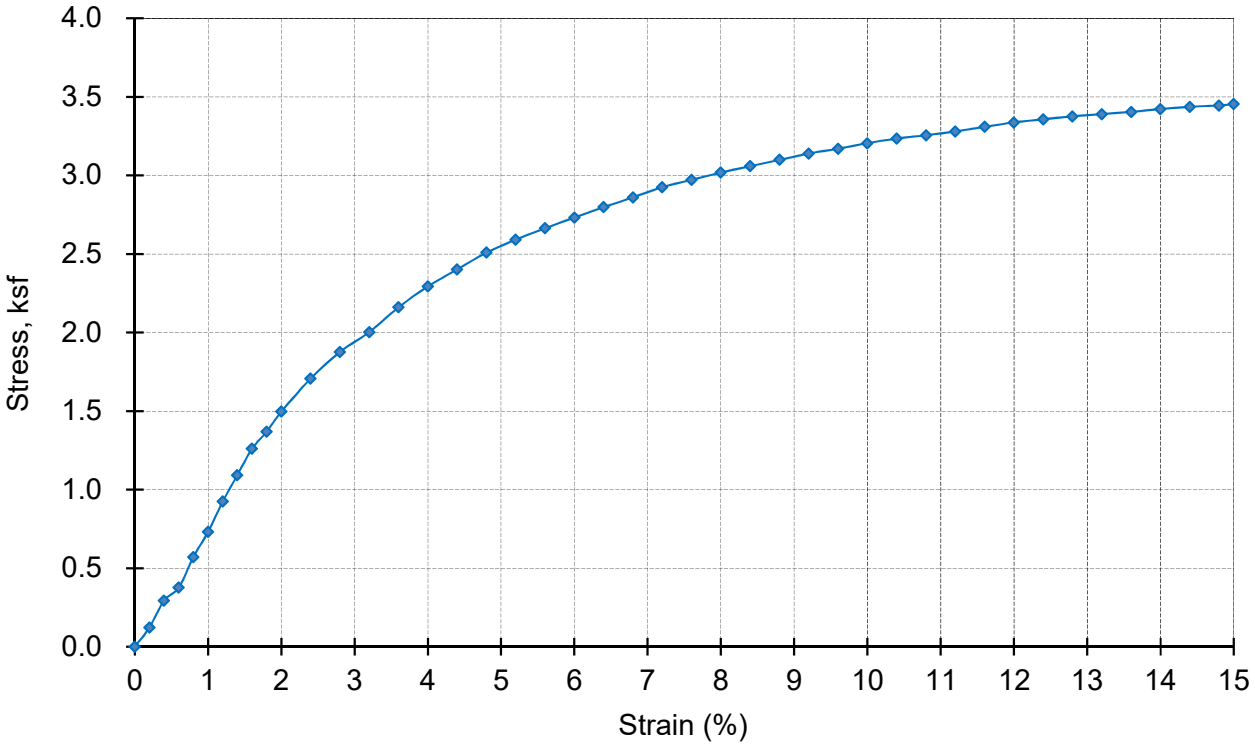
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4CN

UNCONFINED COMPRESSION TEST



Boring No.:	AS-70	**Unconfined Compressive Strength (ksf):**	3.45
Sample No. :	6	**Shear Strength (ksf)**	1.73
Depth (feet):	31	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	102
Test Method	ASTM D2166	**Water Content (%):**	22.8
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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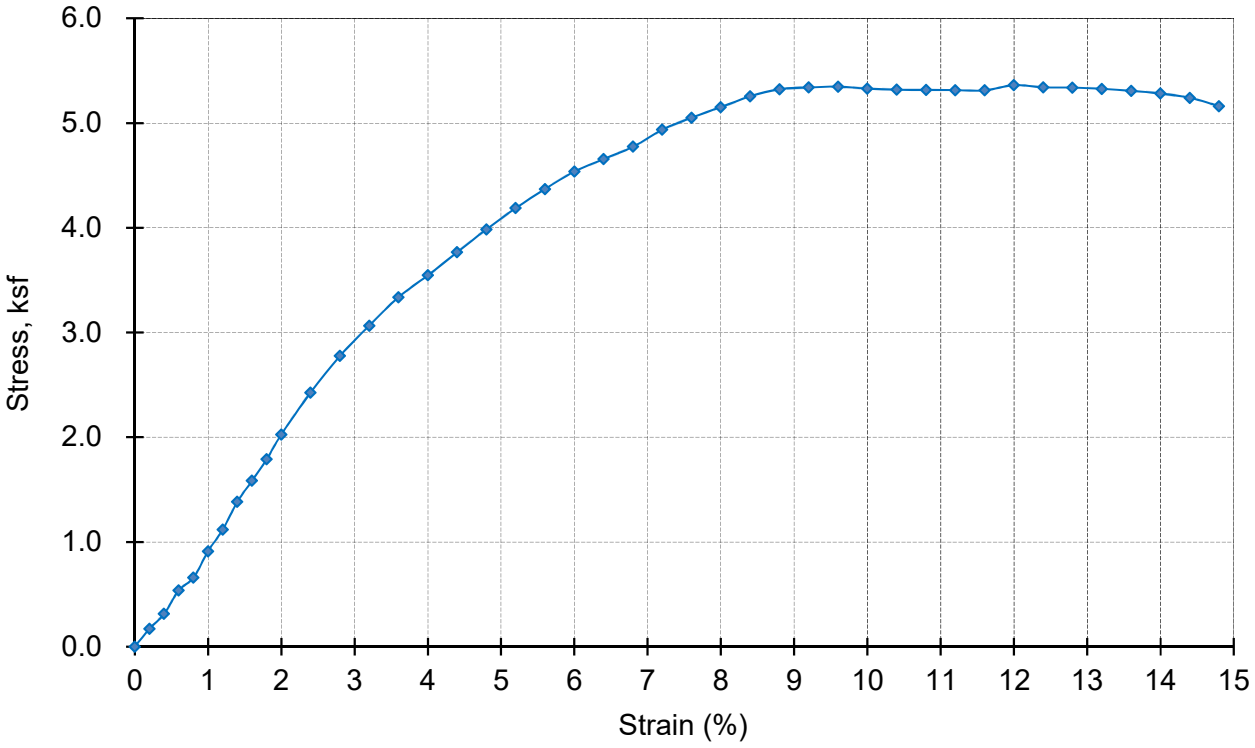
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4CO

UNCONFINED COMPRESSION TEST



Boring No.:	AS-70	**Unconfined Compressive Strength (ksf):**	5.36
Sample No. :	9	**Shear Strength (ksf)**	2.68
Depth (feet):	46	**Strain @ Failure (%):**	12.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	111
Test Method	ASTM D2166	**Water Content (%):**	17.9
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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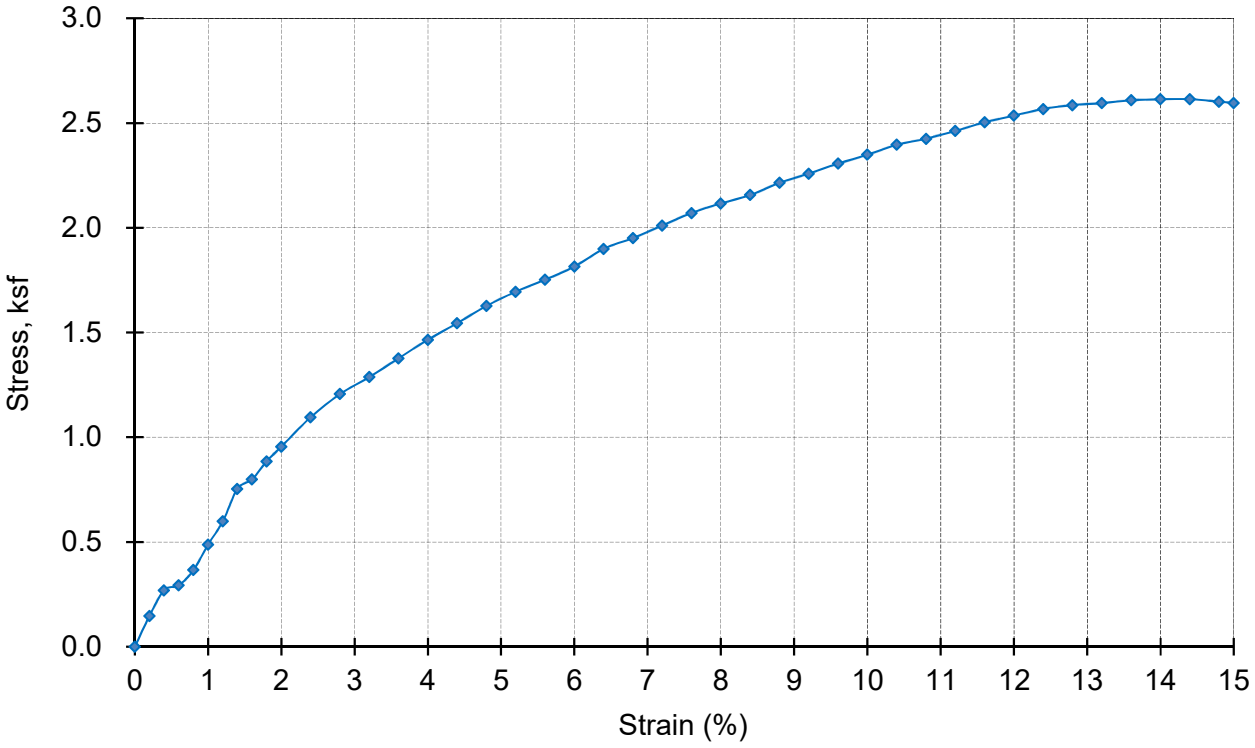
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4CP

UNCONFINED COMPRESSION TEST



Boring No.:	AS-70	**Unconfined Compressive Strength (ksf):**	2.61
Sample No. :	11	**Shear Strength (ksf)**	1.31
Depth (feet):	56	**Strain @ Failure (%):**	14.4
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	111
Test Method	ASTM D2166	**Water Content (%):**	17.9
Material Type:	CL		
Material Description:	Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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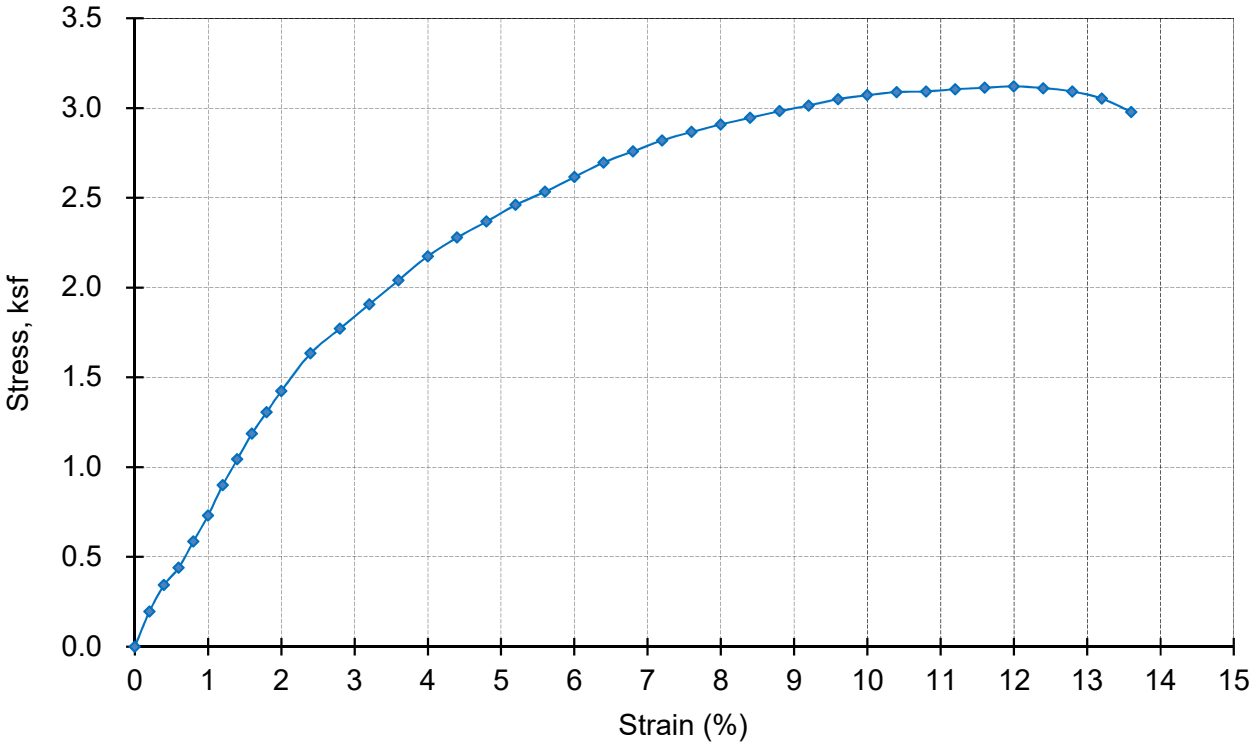
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4CQ

UNCONFINED COMPRESSION TEST



Boring No.:	AS-70	**Unconfined Compressive Strength (ksf):**	3.12
Sample No. :	16	**Shear Strength (ksf)**	1.56
Depth (feet):	81	**Strain @ Failure (%):**	12.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	105
Test Method	ASTM D2166	**Water Content (%):**	21.0
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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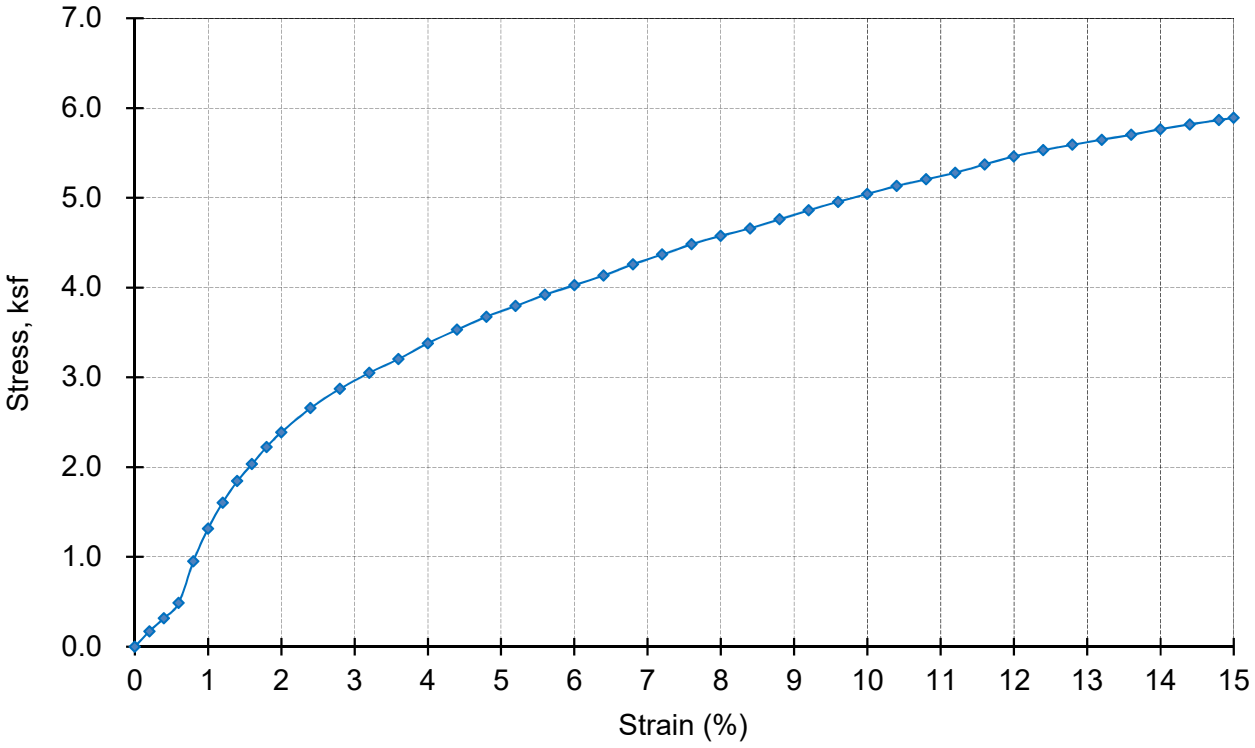
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4CR

UNCONFINED COMPRESSION TEST



Boring No.:	AS-70	**Unconfined Compressive Strength (ksf):**	5.89
Sample No. :	19	**Shear Strength (ksf)**	2.95
Depth (feet):	111	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	102
Test Method	ASTM D2166	**Water Content (%):**	23.6
Material Type:	CL		
Material Description:	Fat Clay with Sand		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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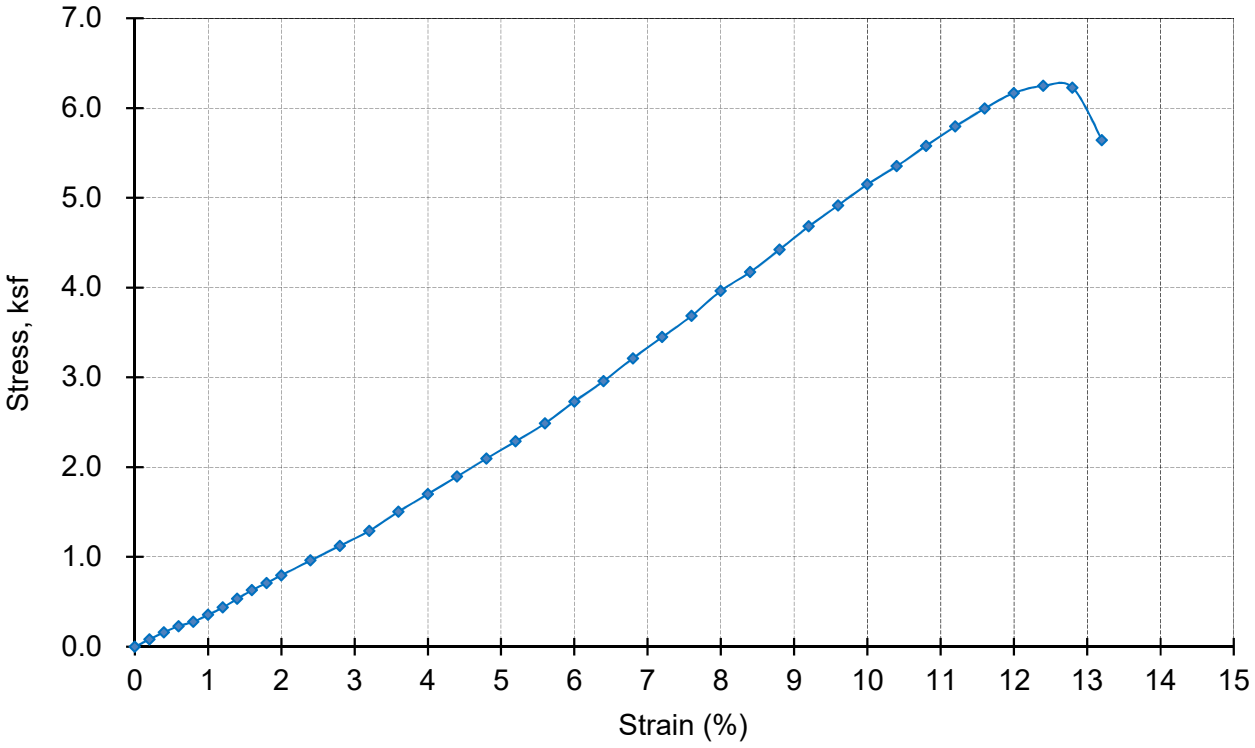
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4CS

UNCONFINED COMPRESSION TEST



Boring No.:	AS-70	**Unconfined Compressive Strength (ksf):**	6.25
Sample No. :	21	**Shear Strength (ksf)**	3.12
Depth (feet):	131	**Strain @ Failure (%):**	12.4
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	105
Test Method	ASTM D2166	**Water Content (%):**	21.8
Material Type:	ML		
Material Description:	Silt		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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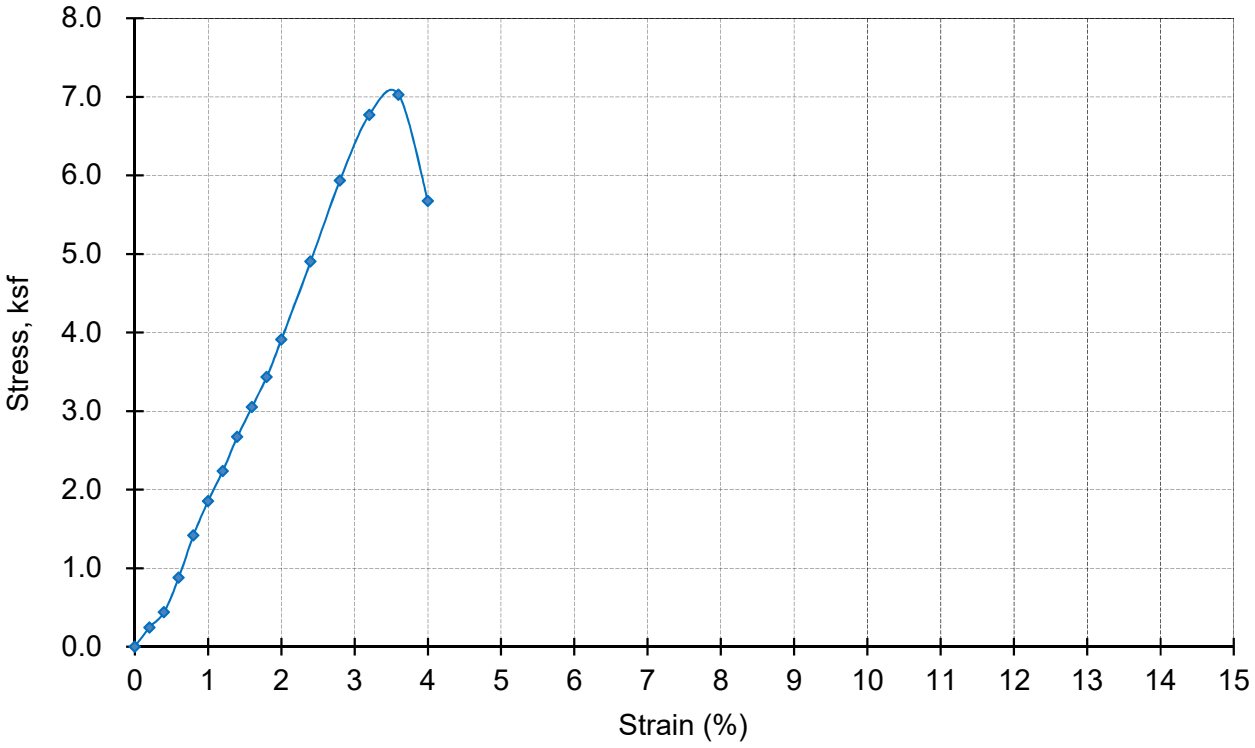
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4CT

UNCONFINED COMPRESSION TEST



Boring No.:	AS-72	**Unconfined Compressive Strength (ksf):**	7.03
Sample No. :	1	**Shear Strength (ksf)**	3.51
Depth (feet):	6	**Strain @ Failure (%):**	3.6
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	108
Test Method	ASTM D2166	**Water Content (%):**	18.0
Material Type:	CH		
Material Description:	Sandy Fat Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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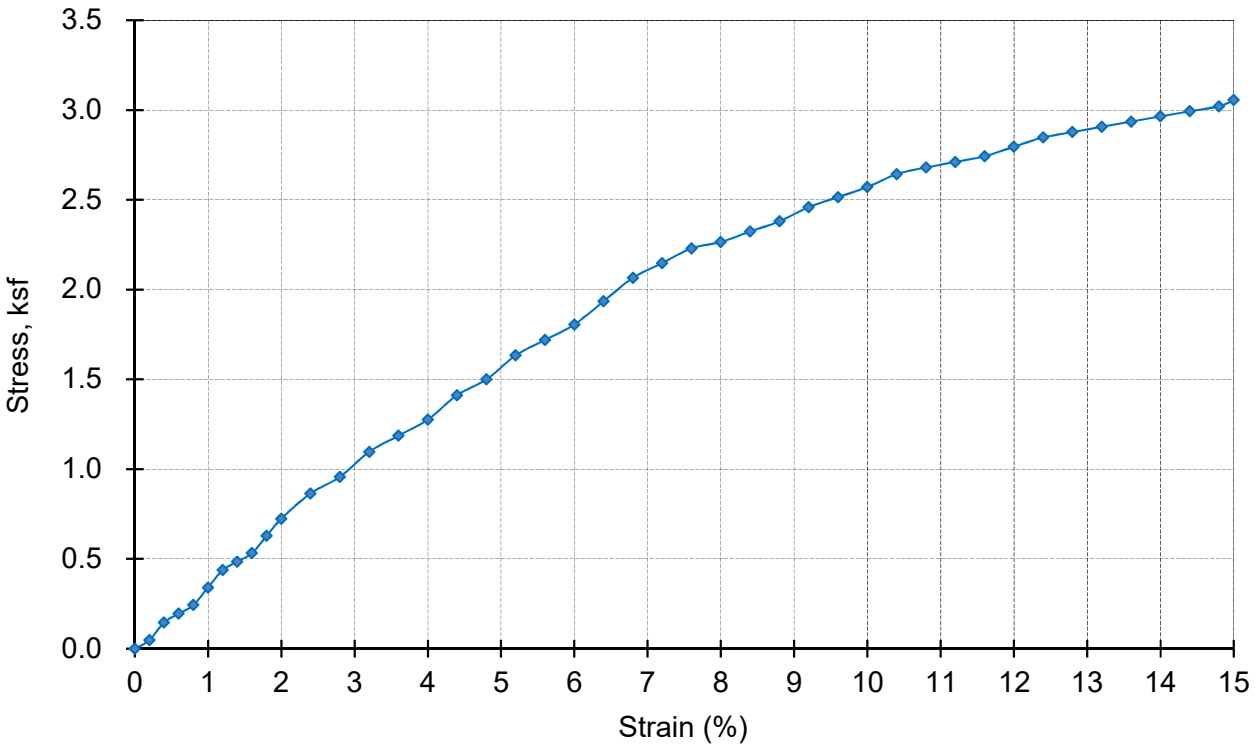
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4CU

UNCONFINED COMPRESSION TEST



Boring No.:	AS-72	**Unconfined Compressive Strength (ksf):**	3.06
Sample No. :	5	**Shear Strength (ksf)**	1.53
Depth (feet):	26	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	100
Test Method	ASTM D2166	**Water Content (%):**	26.0
Material Type:	CL		
Material Description:	Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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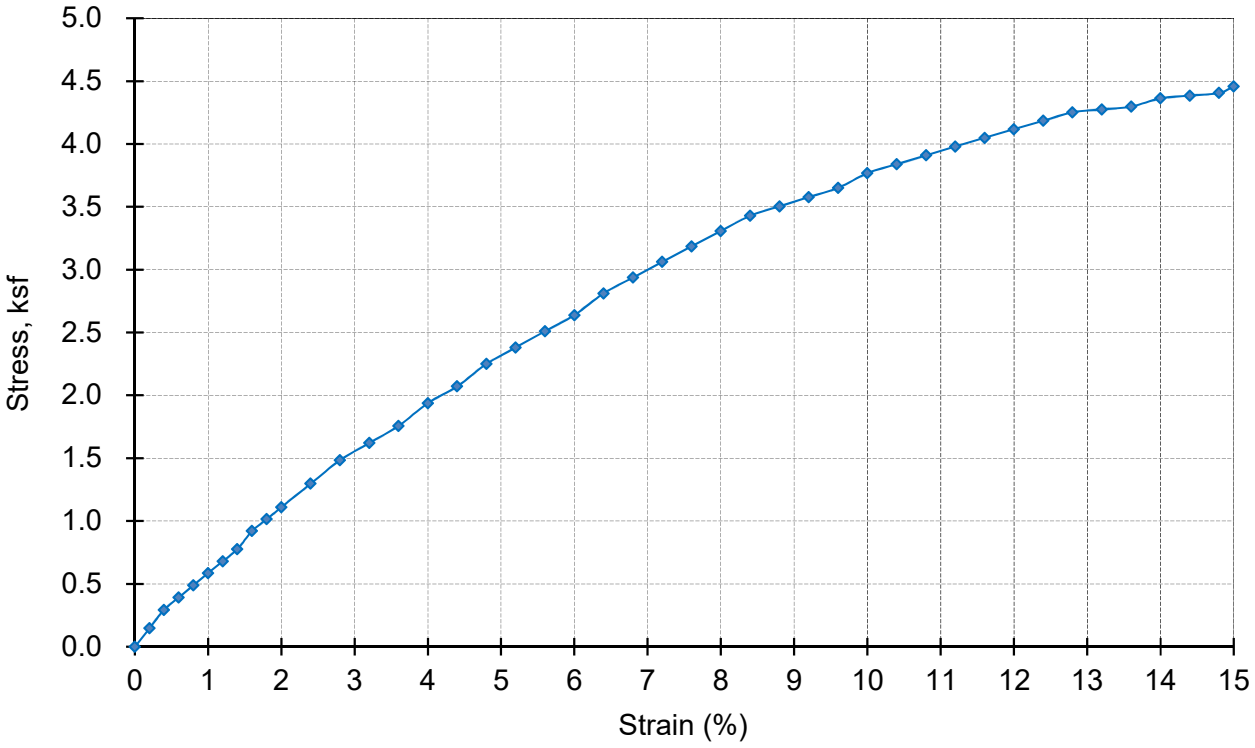
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4CV

UNCONFINED COMPRESSION TEST



Boring No.:	AS-72	**Unconfined Compressive Strength (ksf):**	4.46
Sample No. :	10	**Shear Strength (ksf)**	2.23
Depth (feet):	51	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	110
Test Method	ASTM D2166	**Water Content (%):**	18.3
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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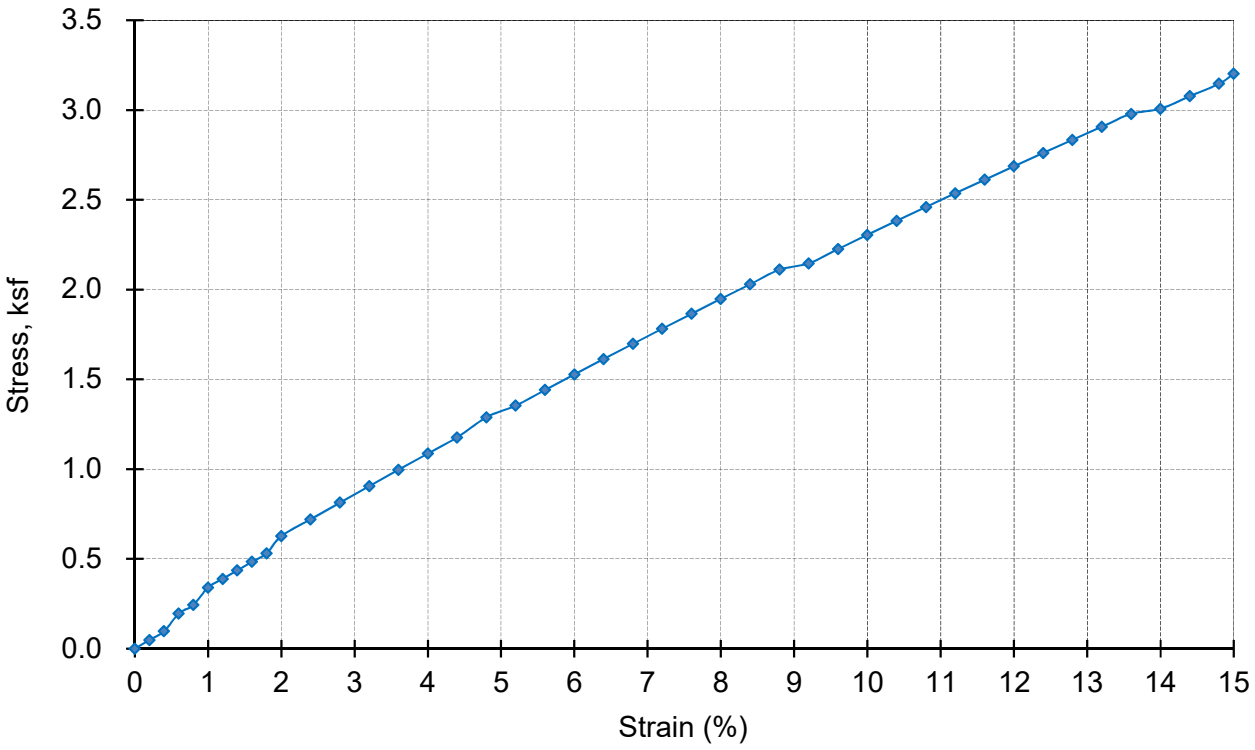
JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4CW**

UNCONFINED COMPRESSION TEST



Boring No.:	AS-72	**Unconfined Compressive Strength (ksf):**	3.20
Sample No. :	13	**Shear Strength (ksf)**	1.60
Depth (feet):	71	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	109
Test Method	ASTM D2166	**Water Content (%):**	19.0
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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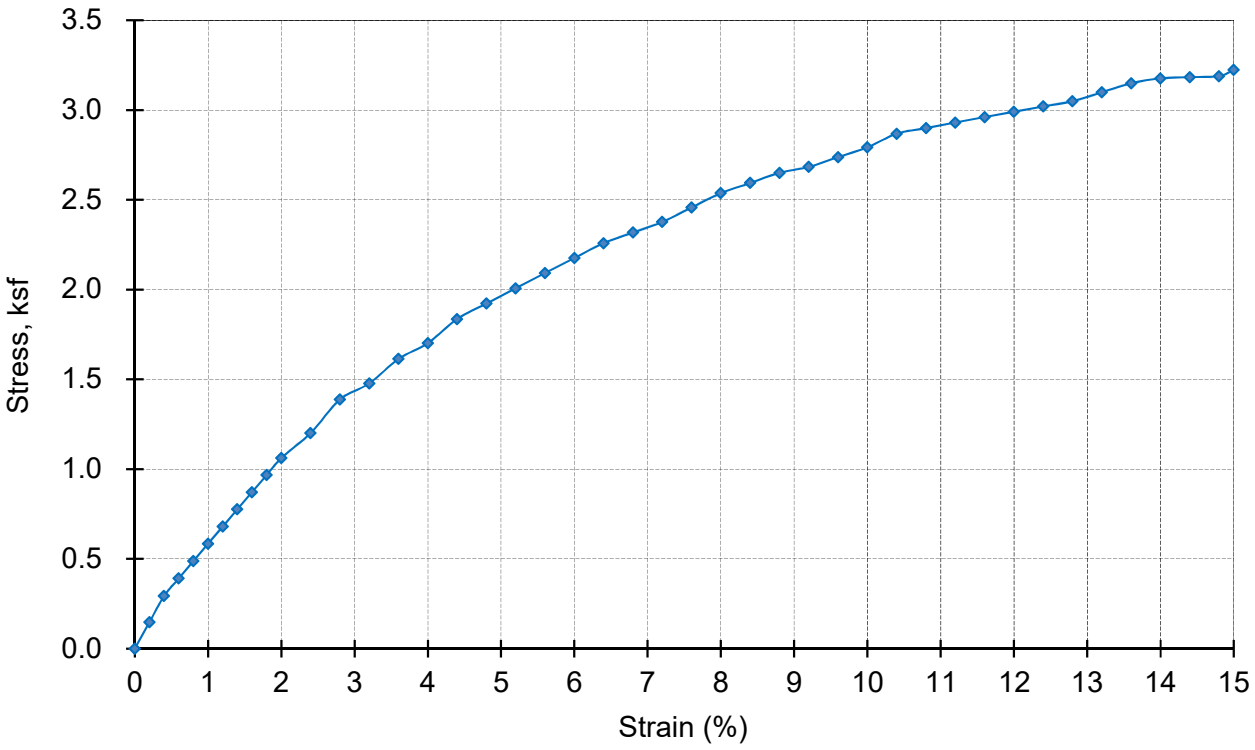
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4CX

UNCONFINED COMPRESSION TEST



Boring No.:	AS-72	**Unconfined Compressive Strength (ksf):**	3.22
Sample No. :	15	**Shear Strength (ksf)**	1.61
Depth (feet):	91	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	106
Test Method	ASTM D2166	**Water Content (%):**	21.7
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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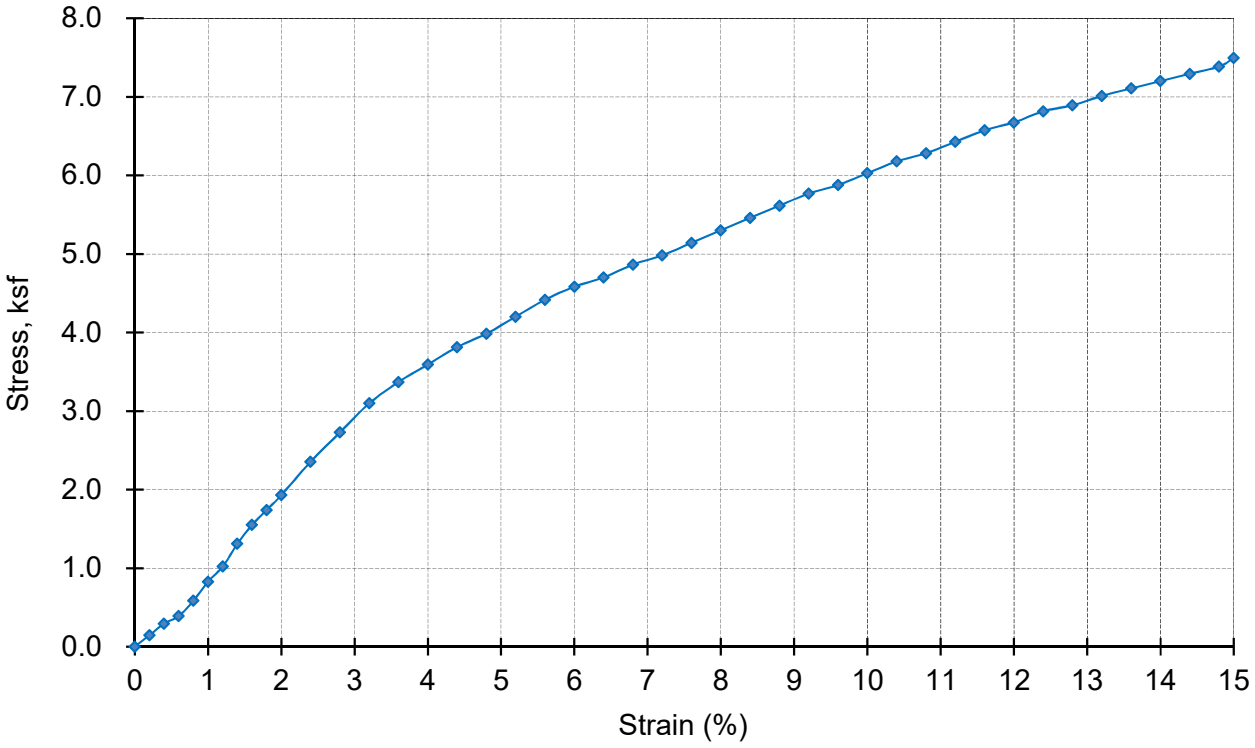
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4CY

UNCONFINED COMPRESSION TEST



Boring No.:	AS-72	**Unconfined Compressive Strength (ksf):**	7.49
Sample No. :	19	**Shear Strength (ksf)**	3.75
Depth (feet):	131	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	109
Test Method	ASTM D2166	**Water Content (%):**	18.8
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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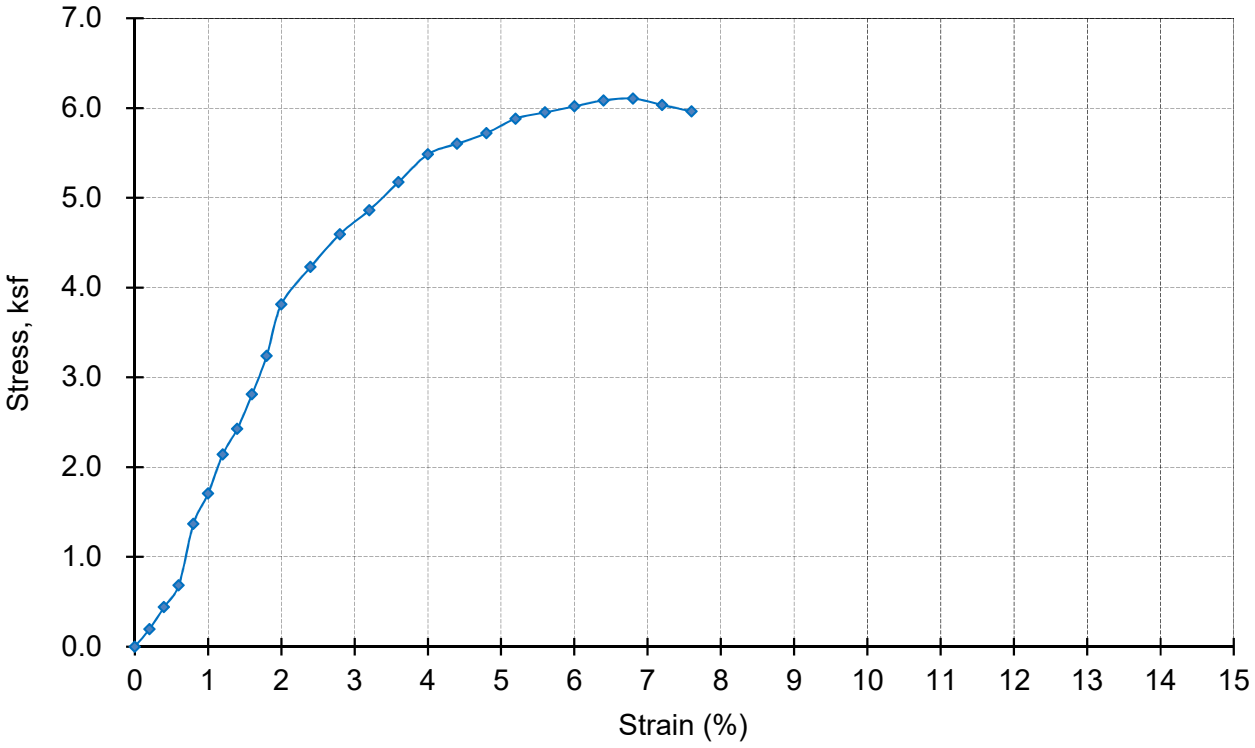
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4CZ

UNCONFINED COMPRESSION TEST



Boring No.:	AS-74	**Unconfined Compressive Strength (ksf):**	6.11
Sample No. :	1	**Shear Strength (ksf)**	3.05
Depth (feet):	6	**Strain @ Failure (%):**	6.8
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	103
Test Method	ASTM D2166	**Water Content (%):**	24.1
Material Type:	CL		
Material Description:	Lean Clay with Sand		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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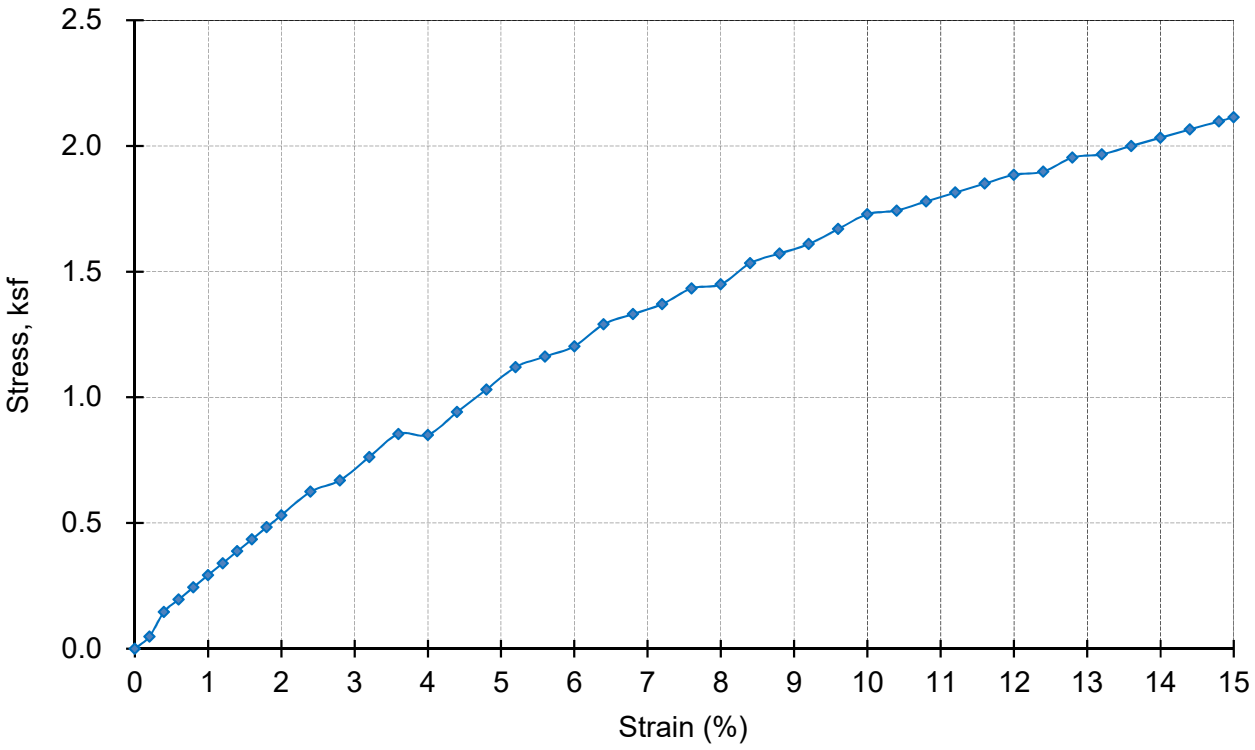
Practicing in the Geosciences

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4DA

UNCONFINED COMPRESSION TEST



Boring No.:	AS-74	**Unconfined Compressive Strength (ksf):**	2.11
Sample No. :	3	**Shear Strength (ksf)**	1.06
Depth (feet):	16	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	98
Test Method	ASTM D2166	**Water Content (%):**	27.0
Material Type:	CL		
Material Description:	Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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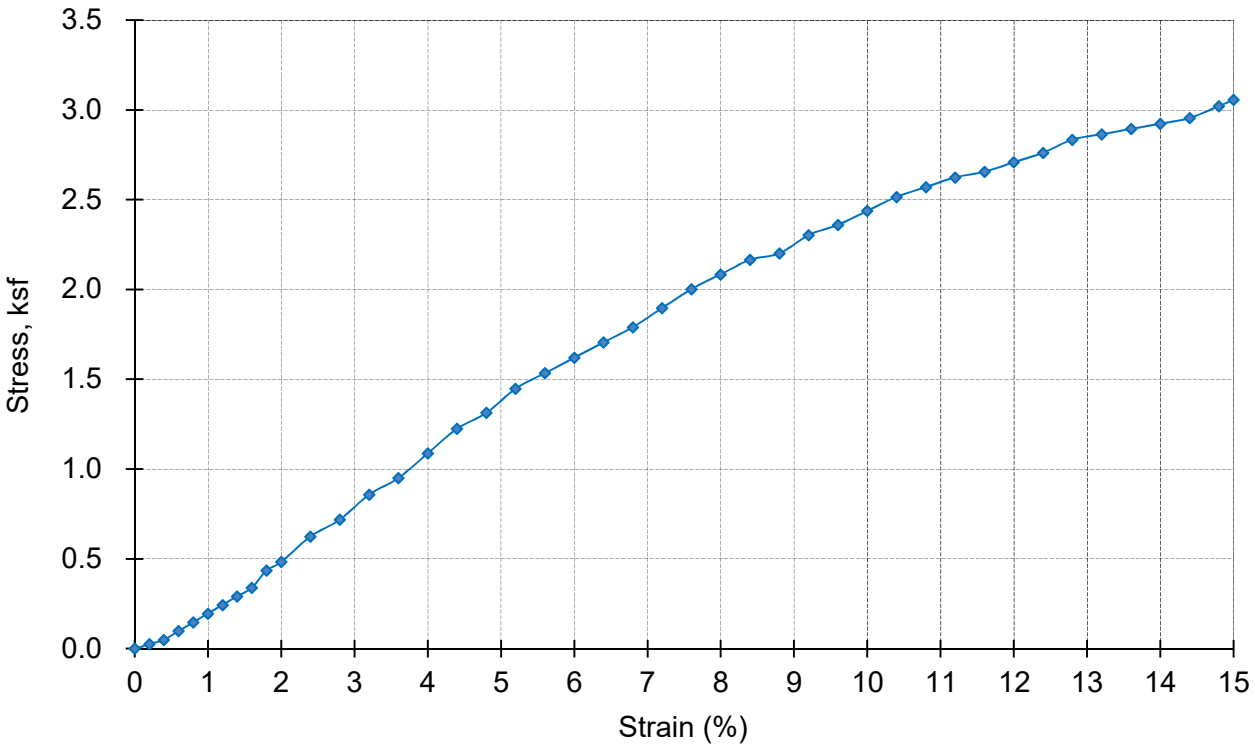
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4DB

UNCONFINED COMPRESSION TEST



Boring No.:	AS-74	**Unconfined Compressive Strength (ksf):**	3.06
Sample No. :	5	**Shear Strength (ksf)**	1.53
Depth (feet):	26	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	94
Test Method	ASTM D2166	**Water Content (%):**	36.5
Material Type:	CL		
Material Description:	Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
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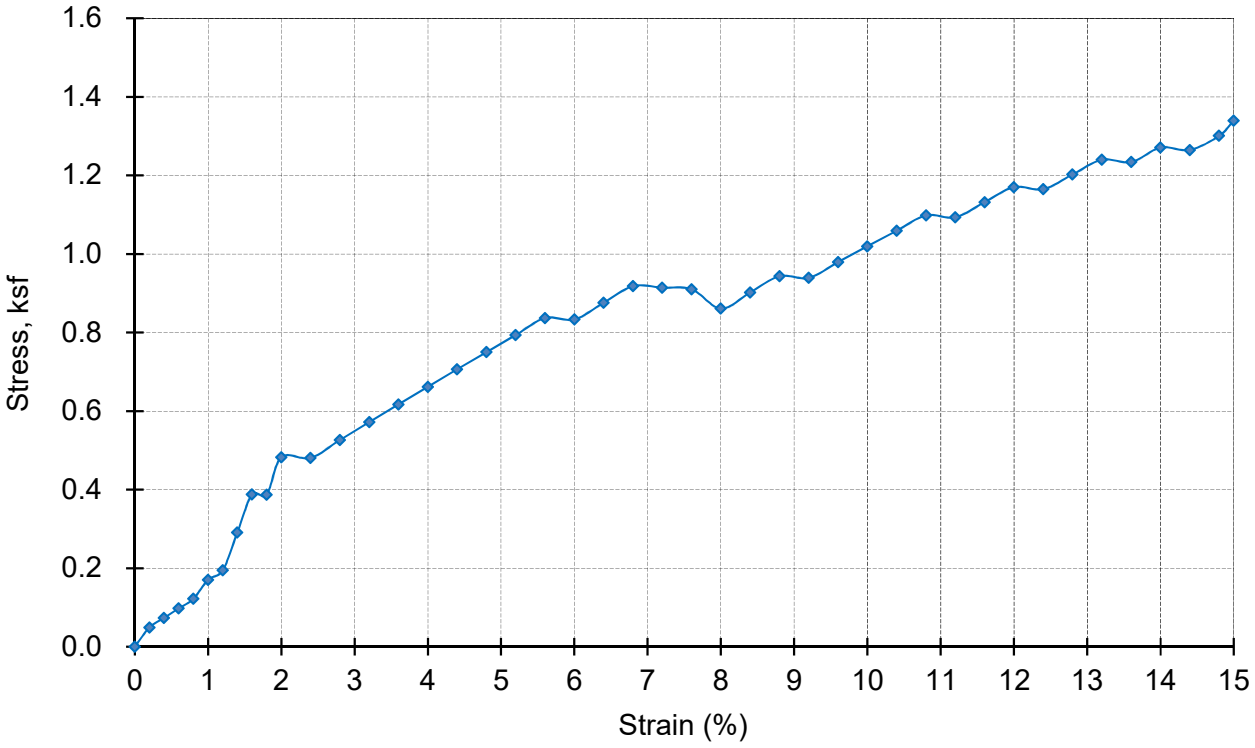
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4DC

UNCONFINED COMPRESSION TEST



Boring No.:	AS-74	**Unconfined Compressive Strength (ksf):**	1.34
Sample No. :	6	**Shear Strength (ksf)**	0.67
Depth (feet):	31	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	95
Test Method	ASTM D2166	**Water Content (%):**	24.9
Material Type:	CH		
Material Description:	Fat Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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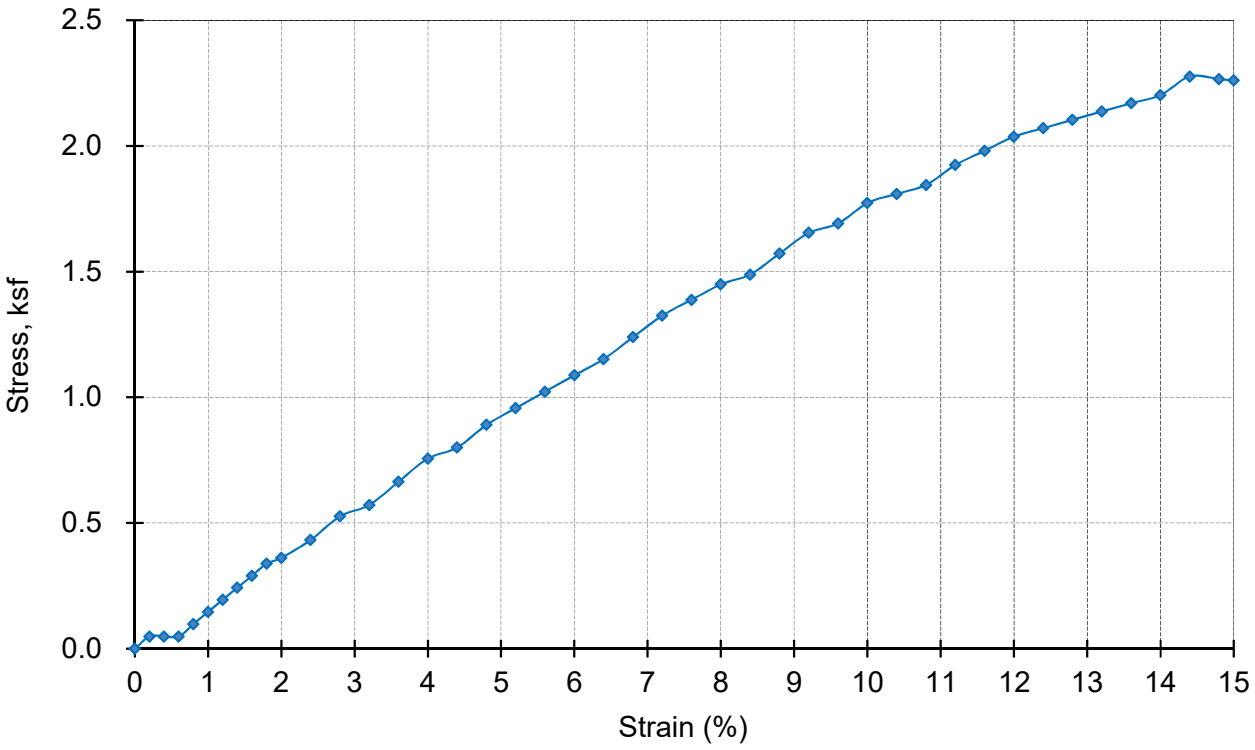
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4DD

UNCONFINED COMPRESSION TEST



Boring No.:	AS-74	**Unconfined Compressive Strength (ksf):**	2.28
Sample No. :	8	**Shear Strength (ksf)**	1.14
Depth (feet):	41	**Strain @ Failure (%):**	14.4
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	102
Test Method	ASTM D2166	**Water Content (%):**	23.8
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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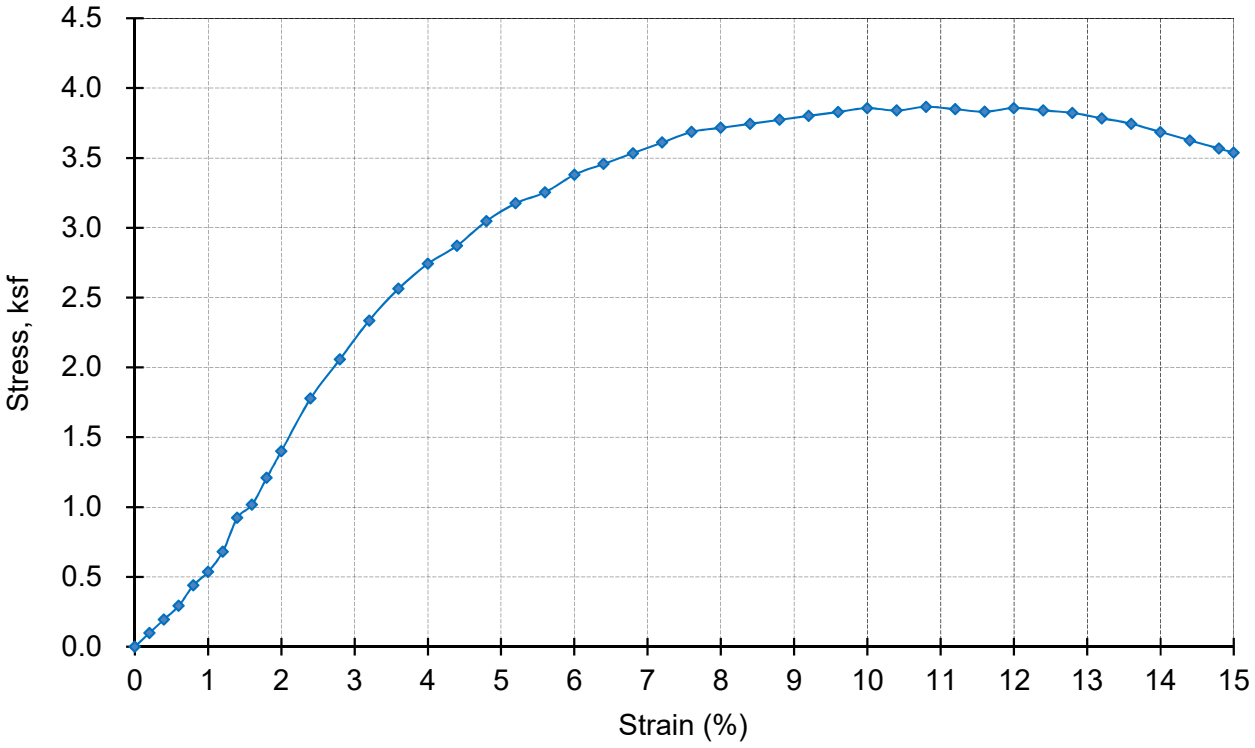
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4DE

UNCONFINED COMPRESSION TEST



Boring No.:	AS-74	**Unconfined Compressive Strength (ksf):**	3.87
Sample No. :	10	**Shear Strength (ksf)**	1.93
Depth (feet):	51	**Strain @ Failure (%):**	10.8
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	102
Test Method	ASTM D2166	**Water Content (%):**	24.0
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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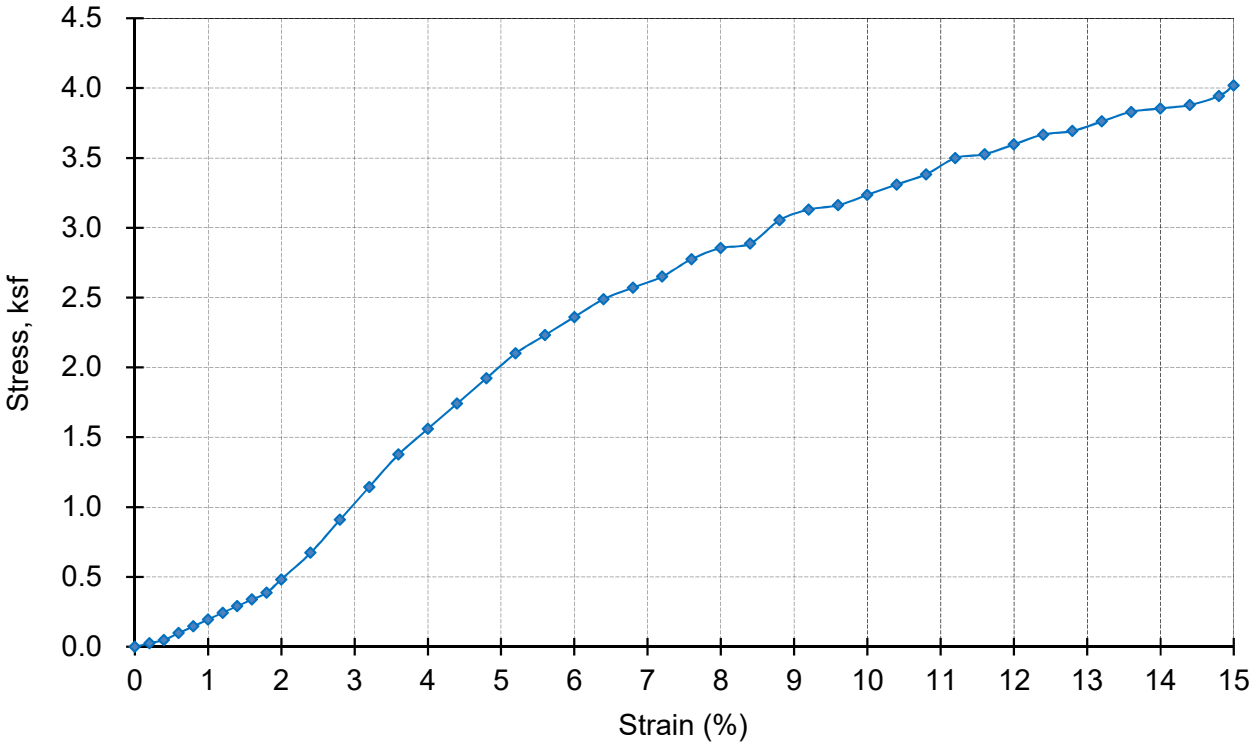
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4DF

UNCONFINED COMPRESSION TEST



Boring No.:	AS-74	**Unconfined Compressive Strength (ksf):**	4.02
Sample No. :	15	**Shear Strength (ksf)**	2.01
Depth (feet):	75	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	101
Test Method	ASTM D2166	**Water Content (%):**	22.9
Material Type:	CL		
Material Description:	Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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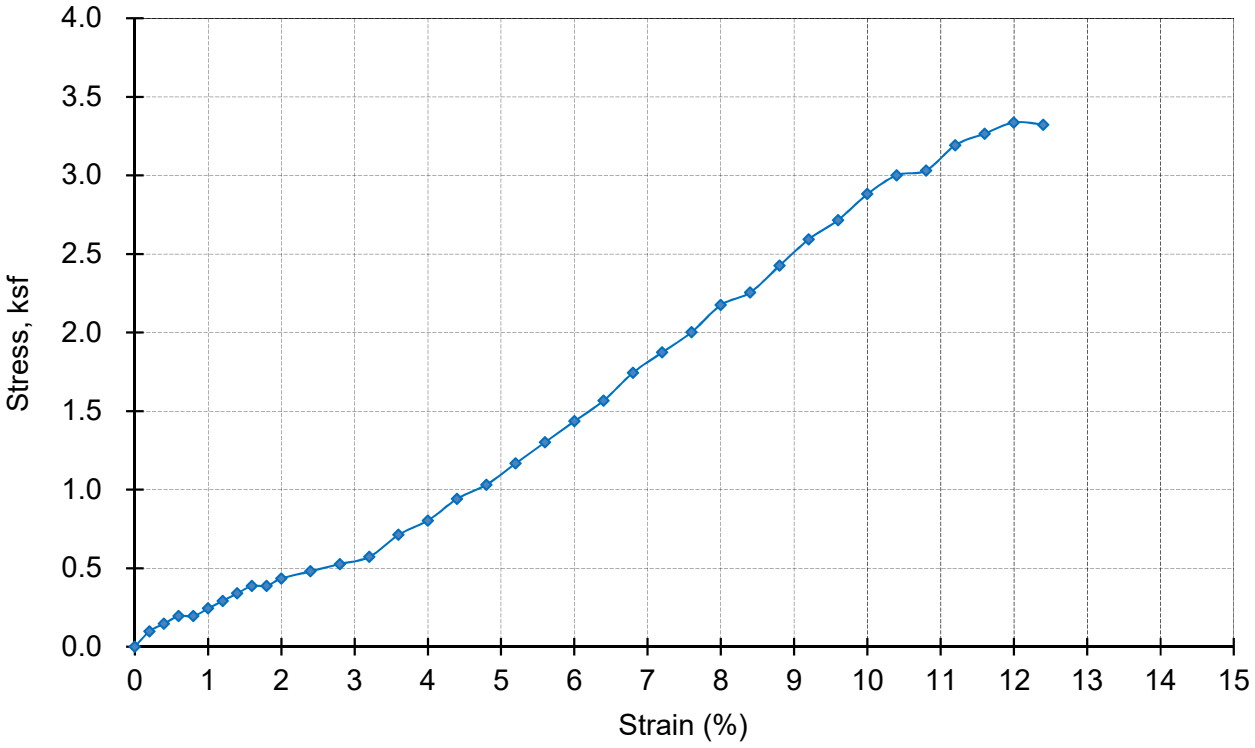
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4DG

UNCONFINED COMPRESSION TEST



Boring No.:	AS-74	**Unconfined Compressive Strength (ksf):**	3.34
Sample No. :	17	**Shear Strength (ksf)**	1.67
Depth (feet):	91	**Strain @ Failure (%):**	12.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	101
Test Method	ASTM D2166	**Water Content (%):**	25.0
Material Type:	ML		
Material Description:	Silt with Sand		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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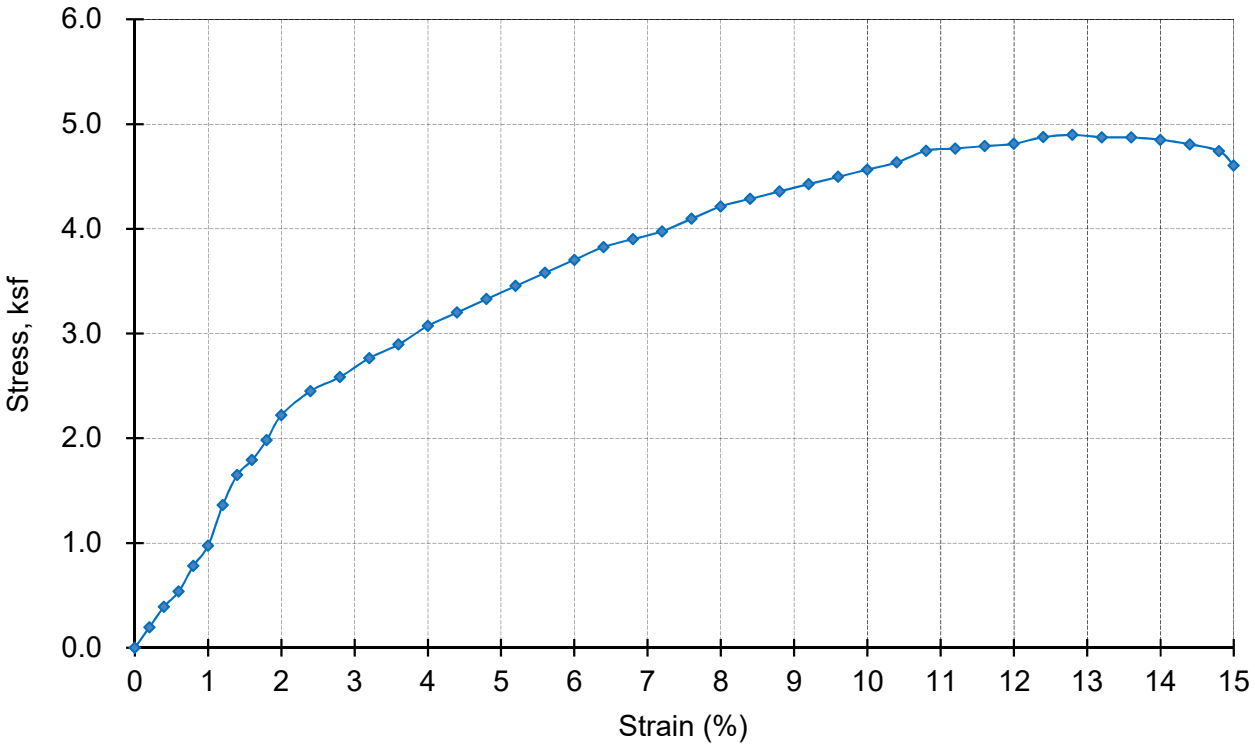
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4DH

UNCONFINED COMPRESSION TEST



Boring No.:	AS-74	**Unconfined Compressive Strength (ksf):**	4.90
Sample No. :	18	**Shear Strength (ksf)**	2.45
Depth (feet):	101	**Strain @ Failure (%):**	12.8
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	109
Test Method	ASTM D2166	**Water Content (%):**	20.7
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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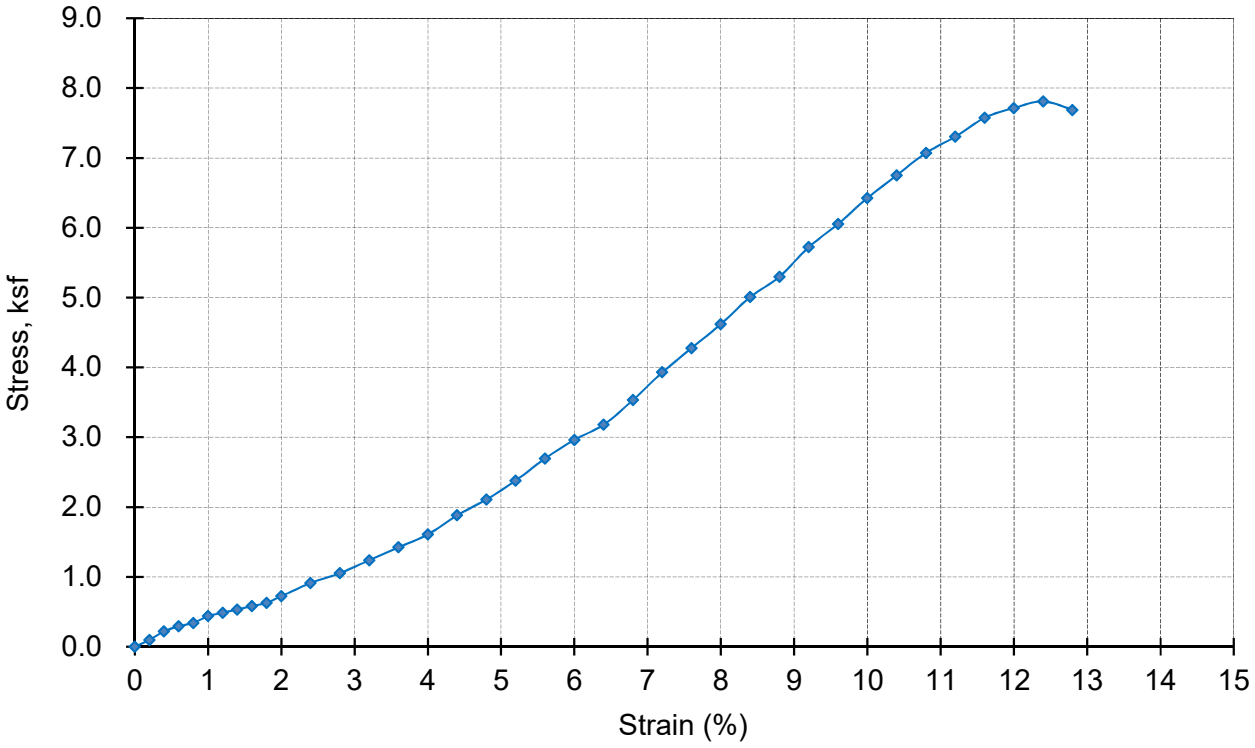
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4DI

UNCONFINED COMPRESSION TEST



Boring No.:	AS-74	**Unconfined Compressive Strength (ksf):**	7.81
Sample No. :	19	**Shear Strength (ksf)**	3.90
Depth (feet):	111	**Strain @ Failure (%):**	12.4
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	104
Test Method	ASTM D2166	**Water Content (%):**	22.6
Material Type:	CL		
Material Description:	Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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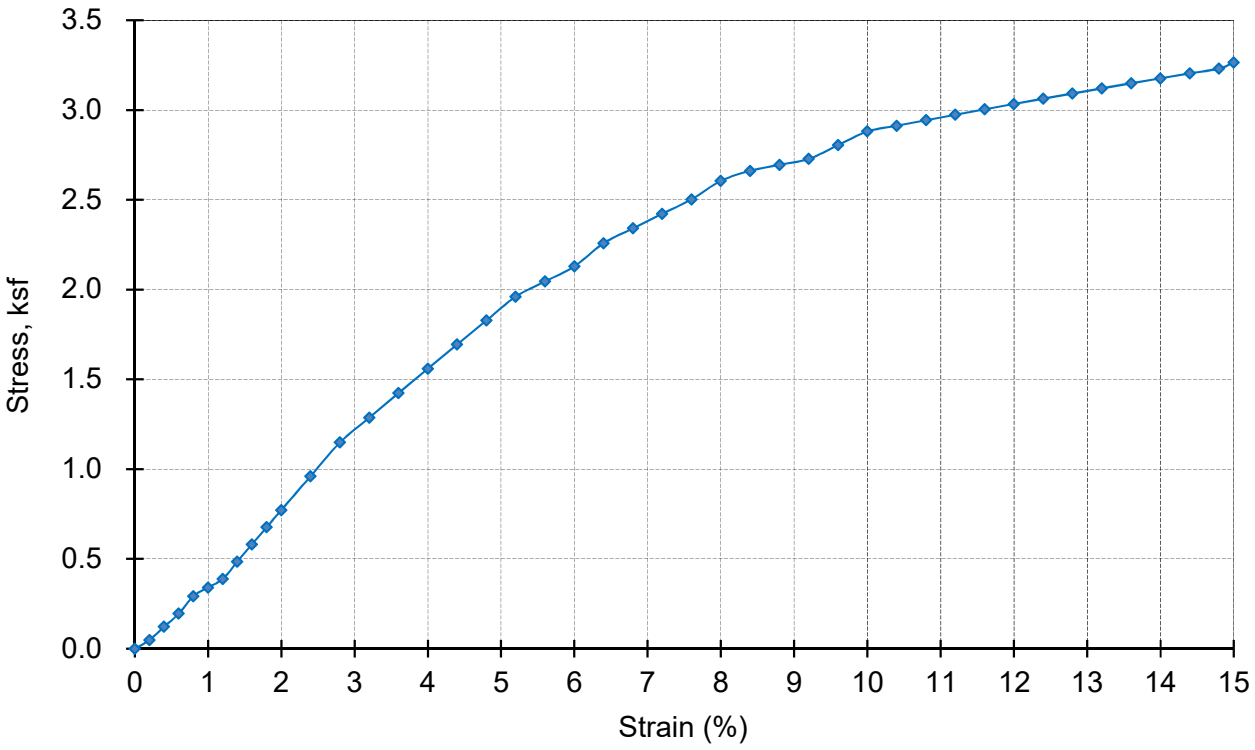
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4DJ

UNCONFINED COMPRESSION TEST



Boring No.:	AS-76	**Unconfined Compressive Strength (ksf):**	3.27
Sample No. :	1	**Shear Strength (ksf)**	1.63
Depth (feet):	6	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	100
Test Method	ASTM D2166	**Water Content (%):**	24.0
Material Type:	CL		
Material Description:	Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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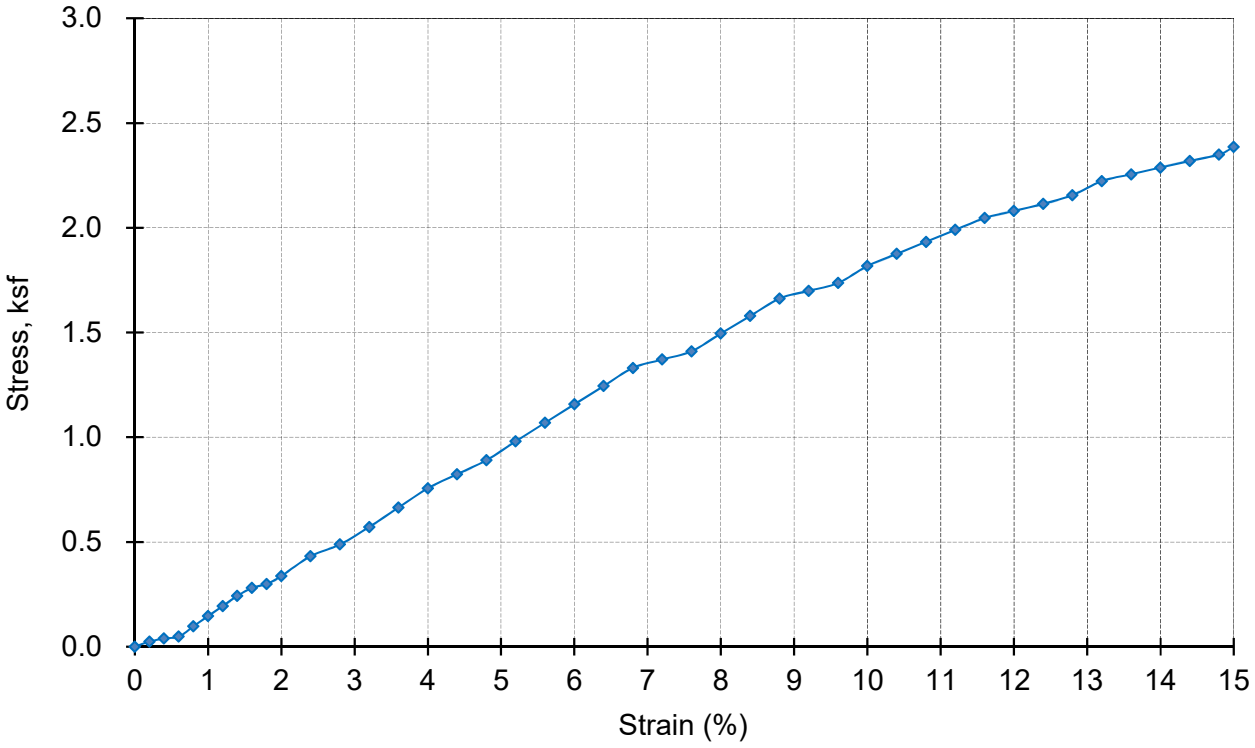
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4DK

UNCONFINED COMPRESSION TEST



Boring No.:	AS-76	**Unconfined Compressive Strength (ksf):**	2.39
Sample No. :	5	**Shear Strength (ksf)**	1.19
Depth (feet):	26	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	96
Test Method	ASTM D2166	**Water Content (%):**	27.9
Material Type:	CL		
Material Description:	Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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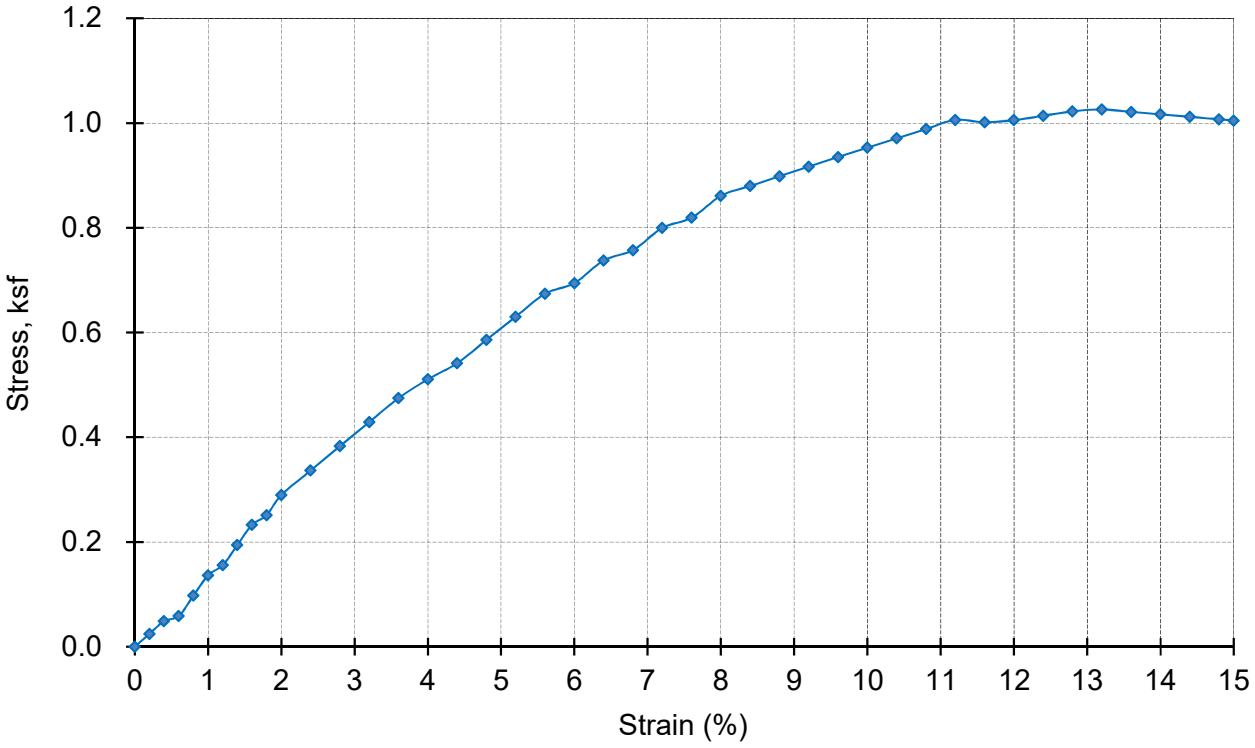
JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4DL**

UNCONFINED COMPRESSION TEST



Boring No.:	AS-76	**Unconfined Compressive Strength (ksf):**	1.03
Sample No. :	8	**Shear Strength (ksf)**	0.51
Depth (feet):	41	**Strain @ Failure (%):**	13.2
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	101
Test Method	ASTM D2166	**Water Content (%):**	23.0
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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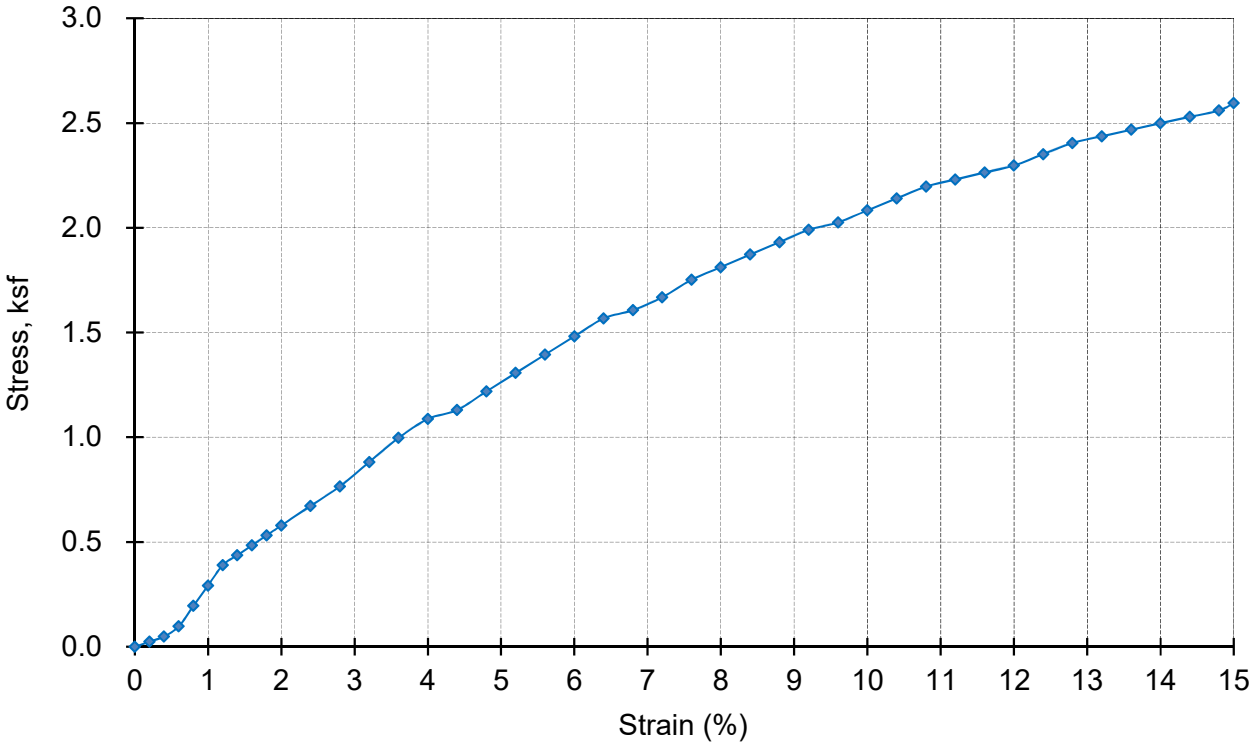
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4DM

UNCONFINED COMPRESSION TEST



Boring No.:	AS-76	**Unconfined Compressive Strength (ksf):**	2.60
Sample No. :	9	**Shear Strength (ksf)**	1.30
Depth (feet):	46	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	111
Test Method	ASTM D2166	**Water Content (%):**	13.0
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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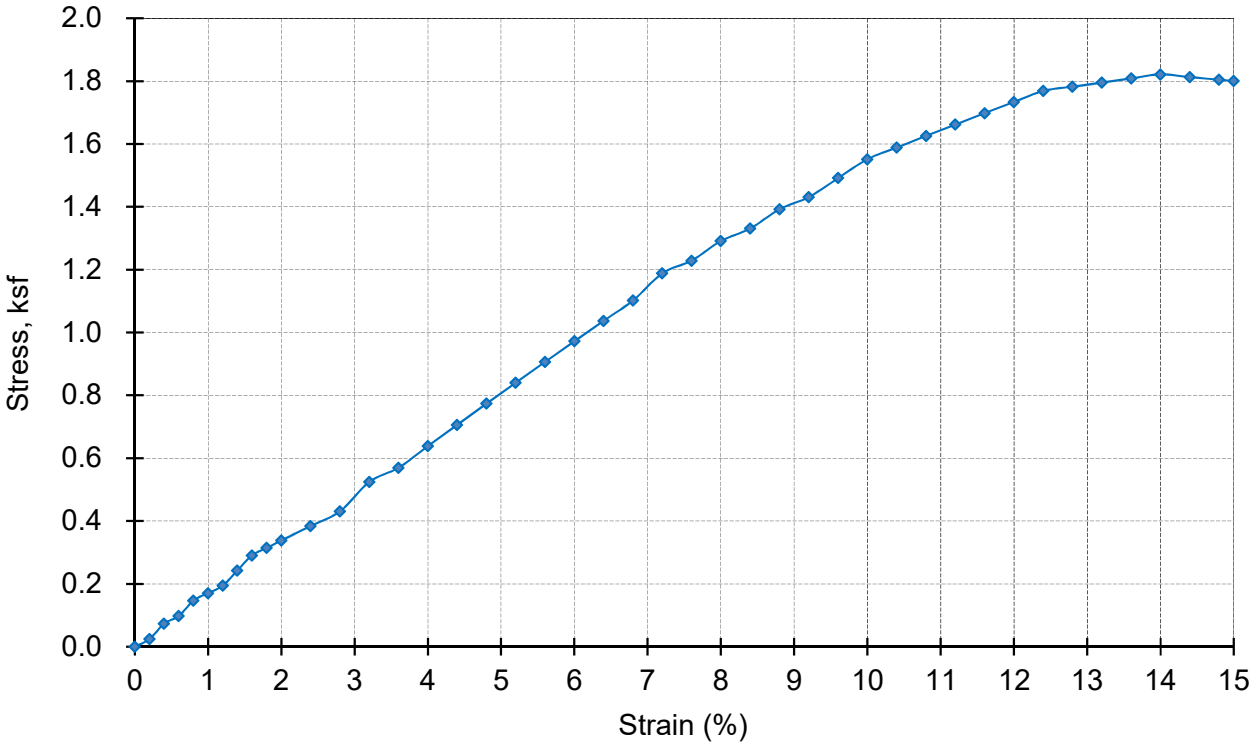
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4DN

UNCONFINED COMPRESSION TEST



Boring No.:	AS-76	**Unconfined Compressive Strength (ksf):**	1.82
Sample No. :	12	**Shear Strength (ksf)**	0.91
Depth (feet):	61	**Strain @ Failure (%):**	14.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	104
Test Method	ASTM D2166	**Water Content (%):**	22.1
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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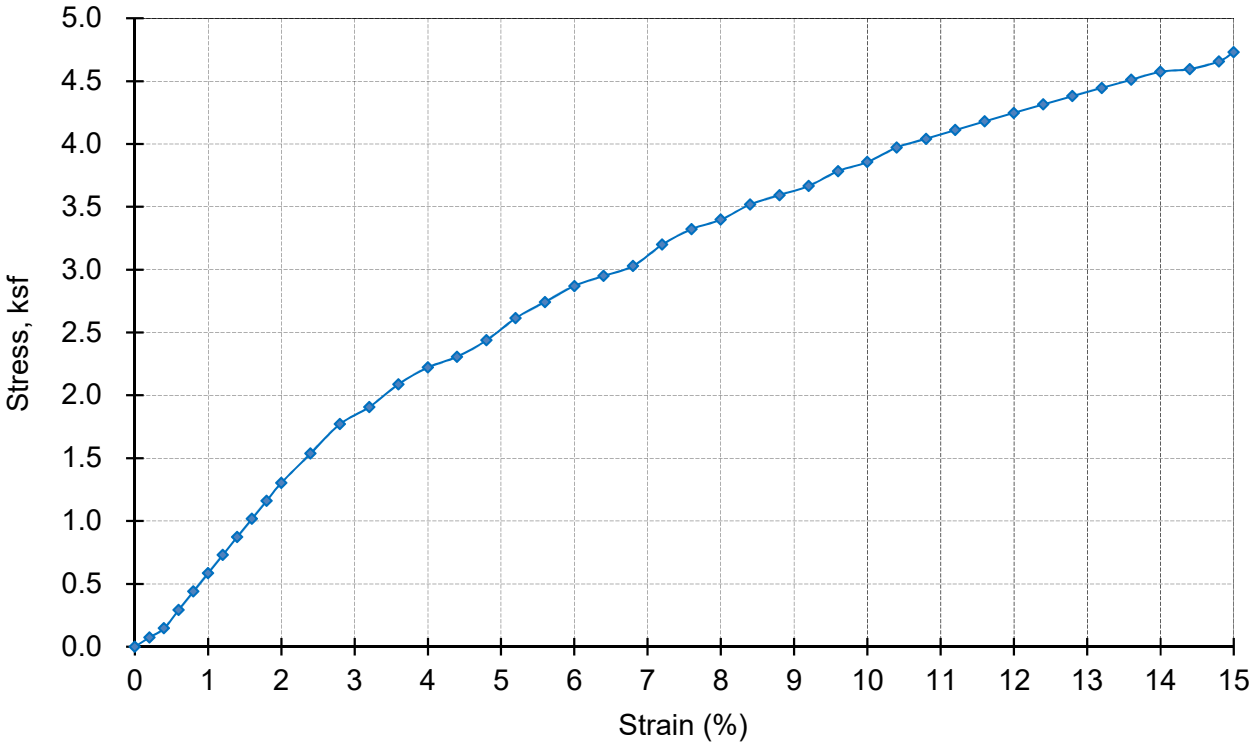
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4DO

UNCONFINED COMPRESSION TEST



Boring No.:	AS-76	**Unconfined Compressive Strength (ksf):**	4.73
Sample No. :	15	**Shear Strength (ksf)**	2.37
Depth (feet):	76	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	109
Test Method	ASTM D2166	**Water Content (%):**	19.1
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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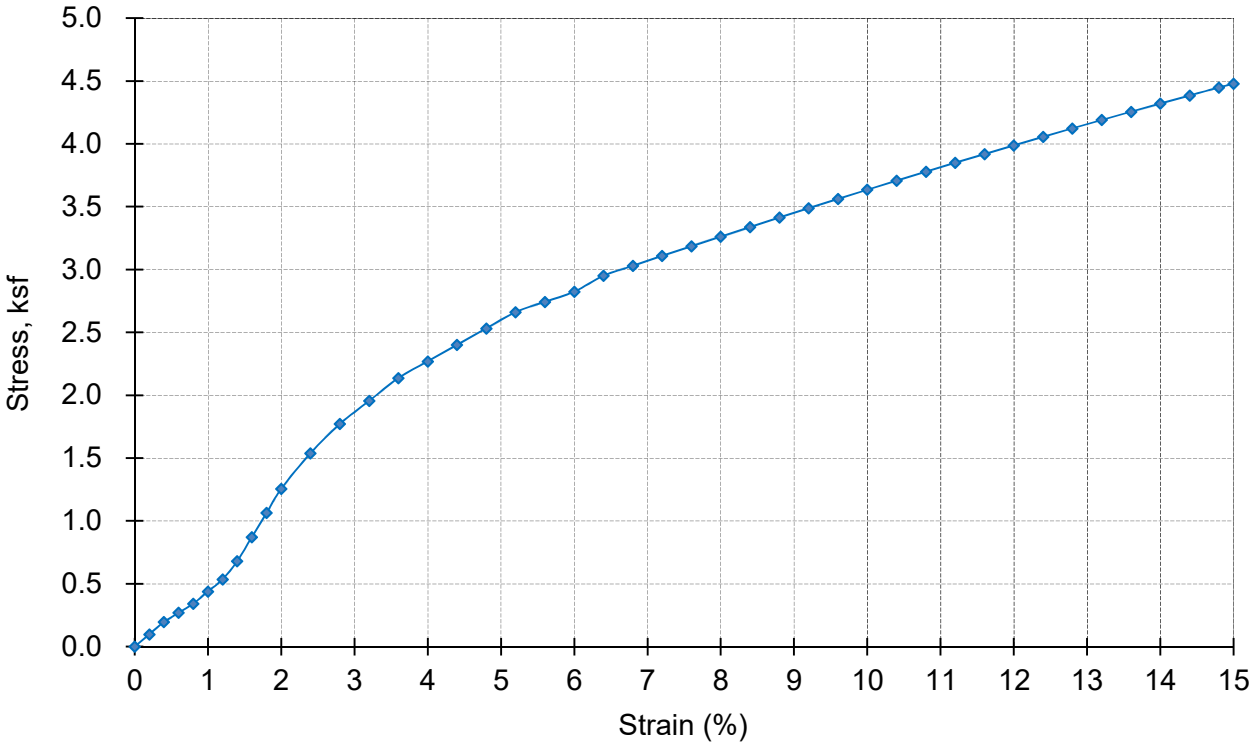
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4DP

UNCONFINED COMPRESSION TEST



Boring No.:	AS-76	**Unconfined Compressive Strength (ksf):**	4.48
Sample No. :	20	**Shear Strength (ksf)**	2.24
Depth (feet):	121	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	113
Test Method	ASTM D2166	**Water Content (%):**	17.6
Material Type:	ML		
Material Description:	Silt with Sand		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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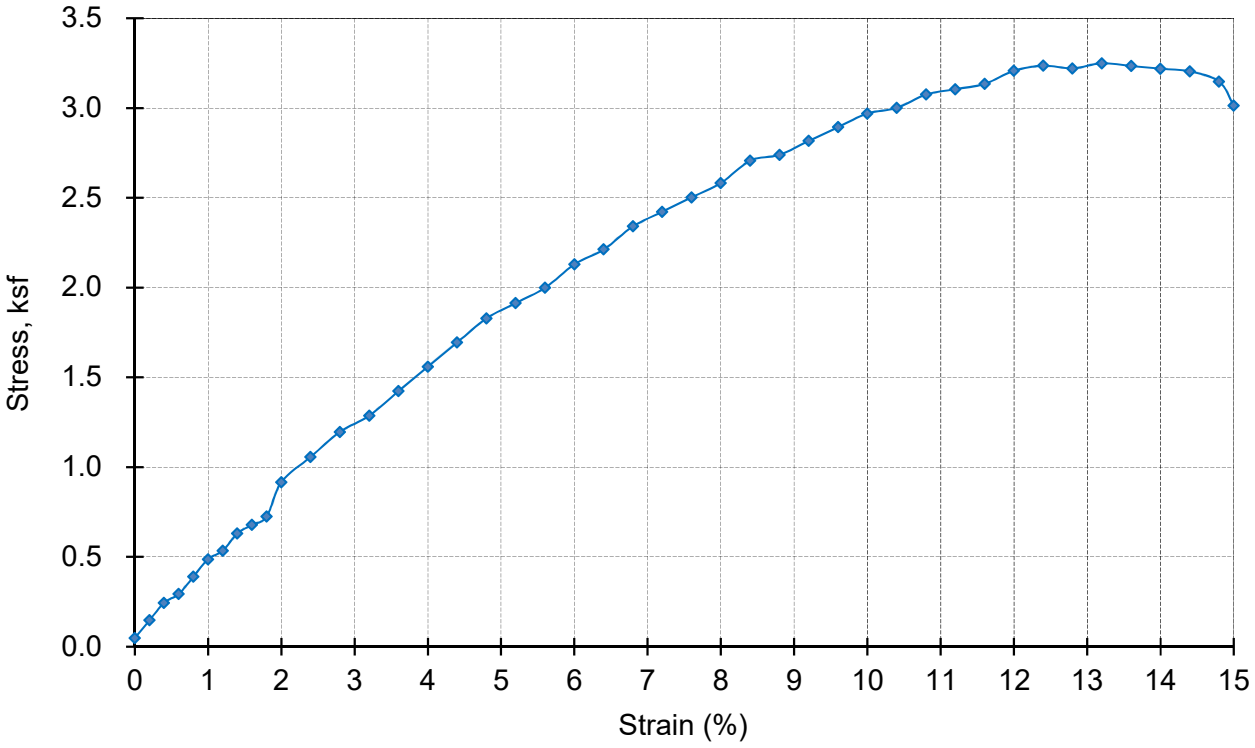
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4DQ

UNCONFINED COMPRESSION TEST



Boring No.:	AS-78	**Unconfined Compressive Strength (ksf):**	3.25
Sample No. :	1	**Shear Strength (ksf)**	1.62
Depth (feet):	6	**Strain @ Failure (%):**	13.2
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	105
Test Method	ASTM D2166	**Water Content (%):**	20.0
Material Type:	CL		
Material Description:	Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):			

Remarks:

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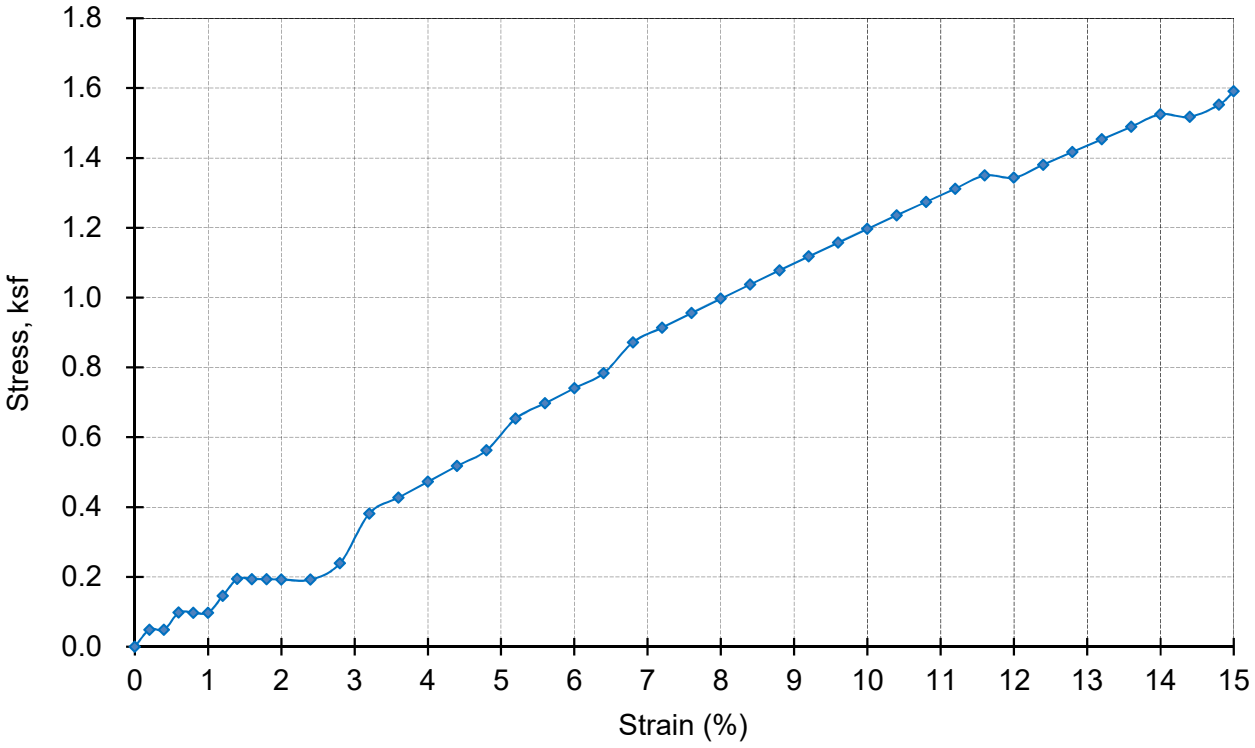
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4DR**

UNCONFINED COMPRESSION TEST



Boring No.:	AS-78	**Unconfined Compressive Strength (ksf):**	1.59
Sample No. :	2	**Shear Strength (ksf)**	0.80
Depth (feet):	11	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	93
Test Method	ASTM D2166	**Water Content (%):**	30.0
Material Type:	CL-ML		
Material Description:	Silty Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):			

Remarks:

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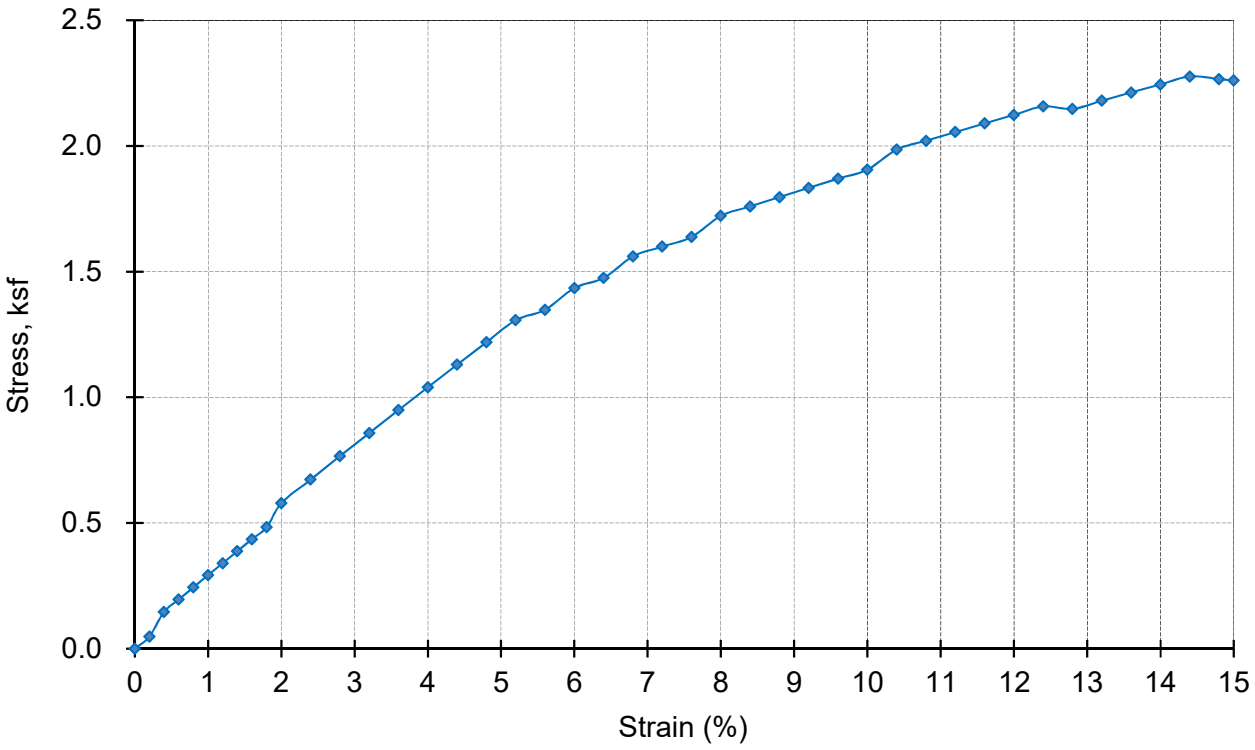
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4DS

UNCONFINED COMPRESSION TEST



Boring No.:	AS-78	**Unconfined Compressive Strength (ksf):**	2.28
Sample No. :	4	**Shear Strength (ksf)**	1.14
Depth (feet):	21	**Strain @ Failure (%):**	14.4
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	92
Test Method	ASTM D2166	**Water Content (%):**	30.0
Material Type:	CL-ML		
Material Description:	Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):			

Remarks:

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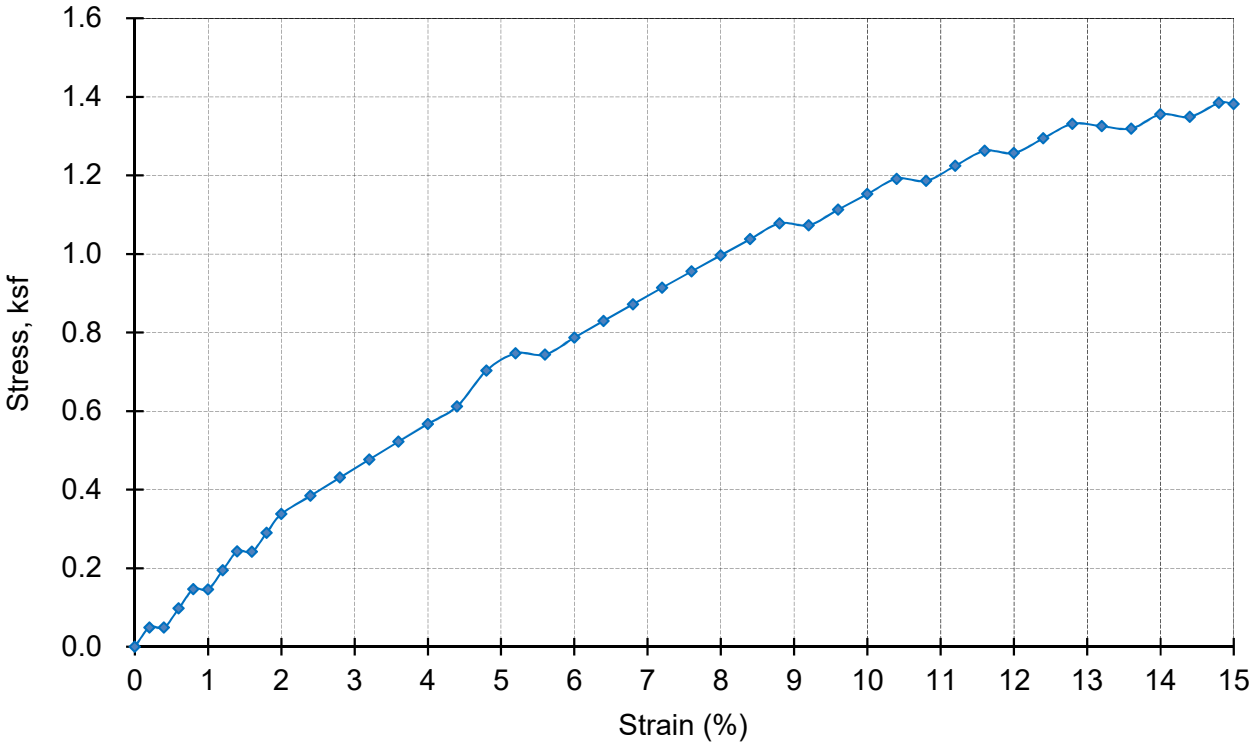
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4DT

UNCONFINED COMPRESSION TEST



Boring No.:	AS-78	**Unconfined Compressive Strength (ksf):**	1.38
Sample No. :	6	**Shear Strength (ksf)**	0.69
Depth (feet):	31	**Strain @ Failure (%):**	14.8
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	87
Test Method	ASTM D2166	**Water Content (%):**	32.0
Material Type:	ML		
Material Description:	Silt		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):			

Remarks:

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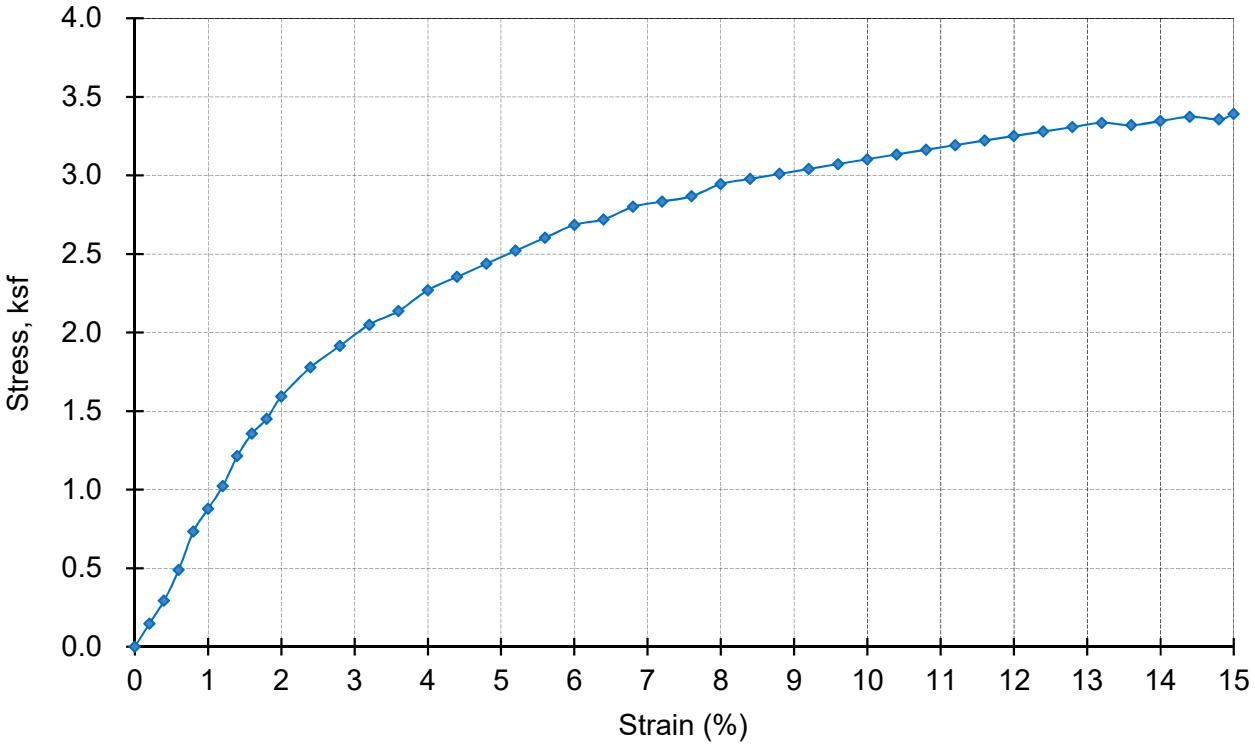
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4DU

UNCONFINED COMPRESSION TEST



Boring No.:	AS-78	**Unconfined Compressive Strength (ksf):**	3.39
Sample No. :	7	**Shear Strength (ksf)**	1.70
Depth (feet):	36	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	95
Test Method	ASTM D2166	**Water Content (%):**	26.0
Material Type:	CL		
Material Description:	Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):			

Remarks:

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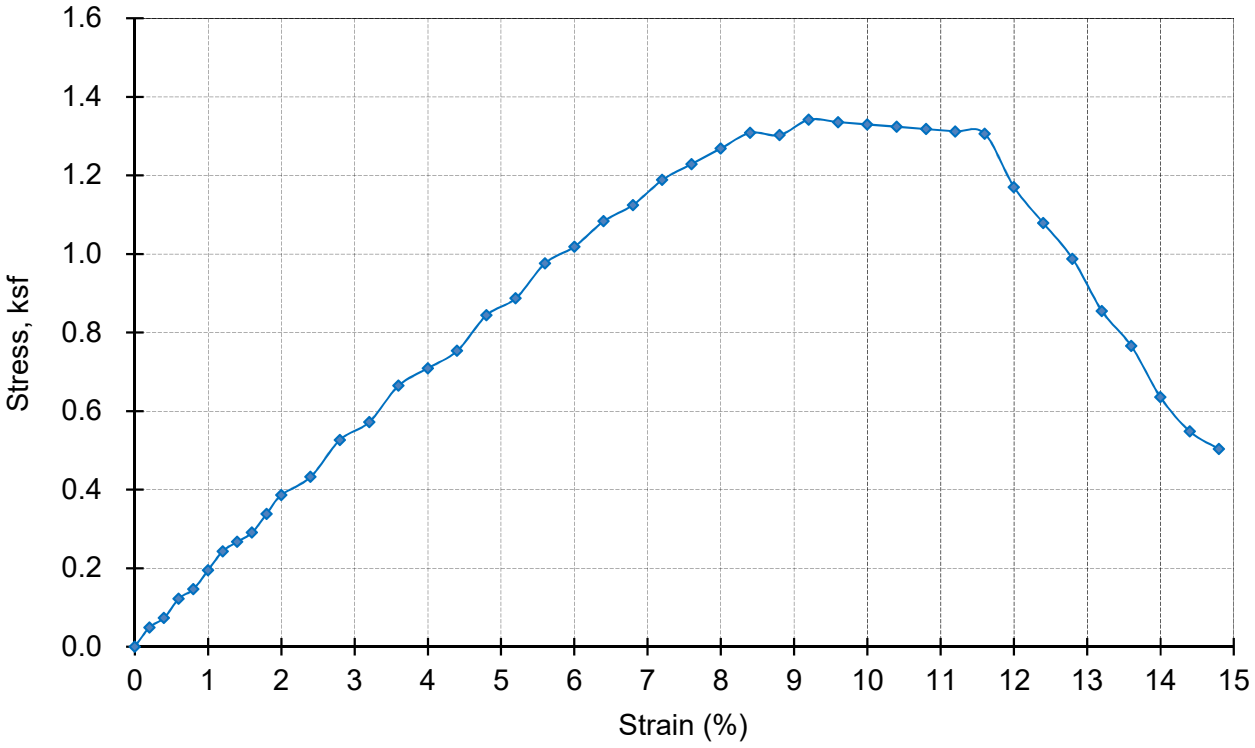
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4DV

UNCONFINED COMPRESSION TEST



Boring No.:	AS-78	**Unconfined Compressive Strength (ksf):**	1.34
Sample No. :	8	**Shear Strength (ksf)**	0.67
Depth (feet):	41	**Strain @ Failure (%):**	9.2
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	114
Test Method	ASTM D2166	**Water Content (%):**	22.0
Material Type:	CL		
Material Description:	Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):			

Remarks:

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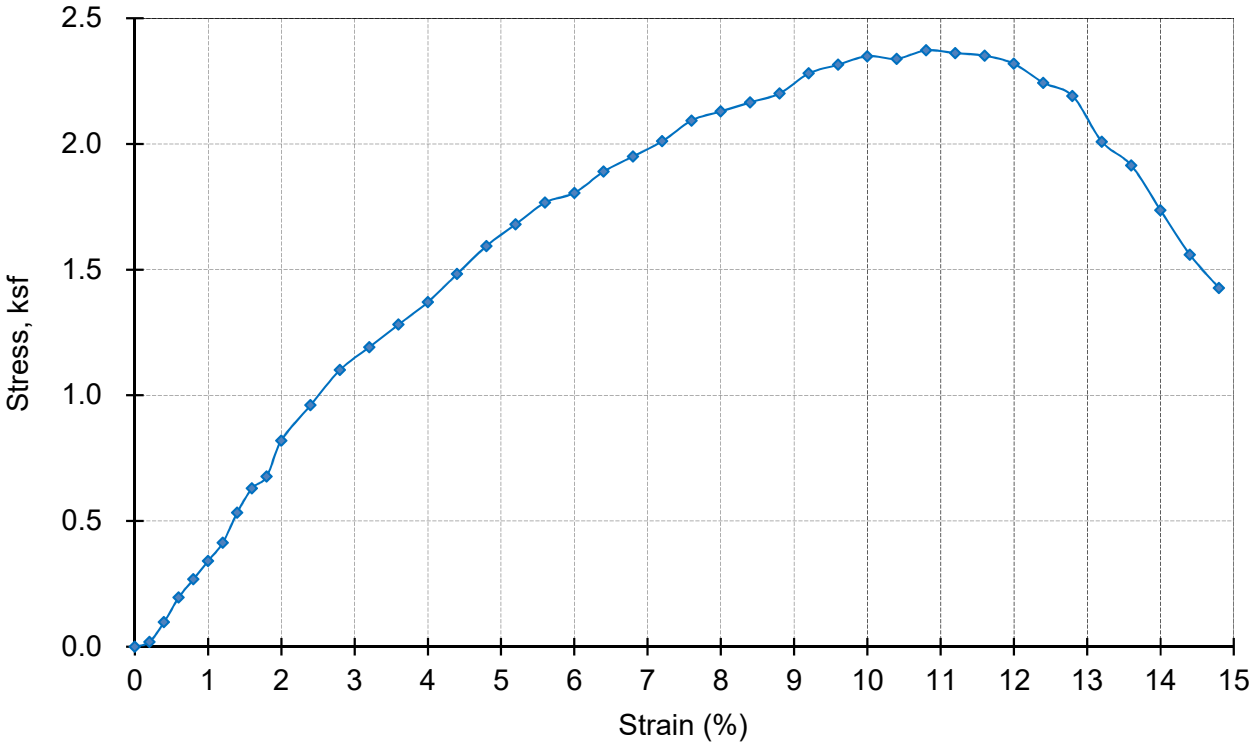
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4DW

UNCONFINED COMPRESSION TEST



Boring No.:	AS-78	**Unconfined Compressive Strength (ksf):**	2.37
Sample No. :	9	**Shear Strength (ksf)**	1.19
Depth (feet):	46	**Strain @ Failure (%):**	10.8
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	104
Test Method	ASTM D2166	**Water Content (%):**	22.0
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):			

Remarks:

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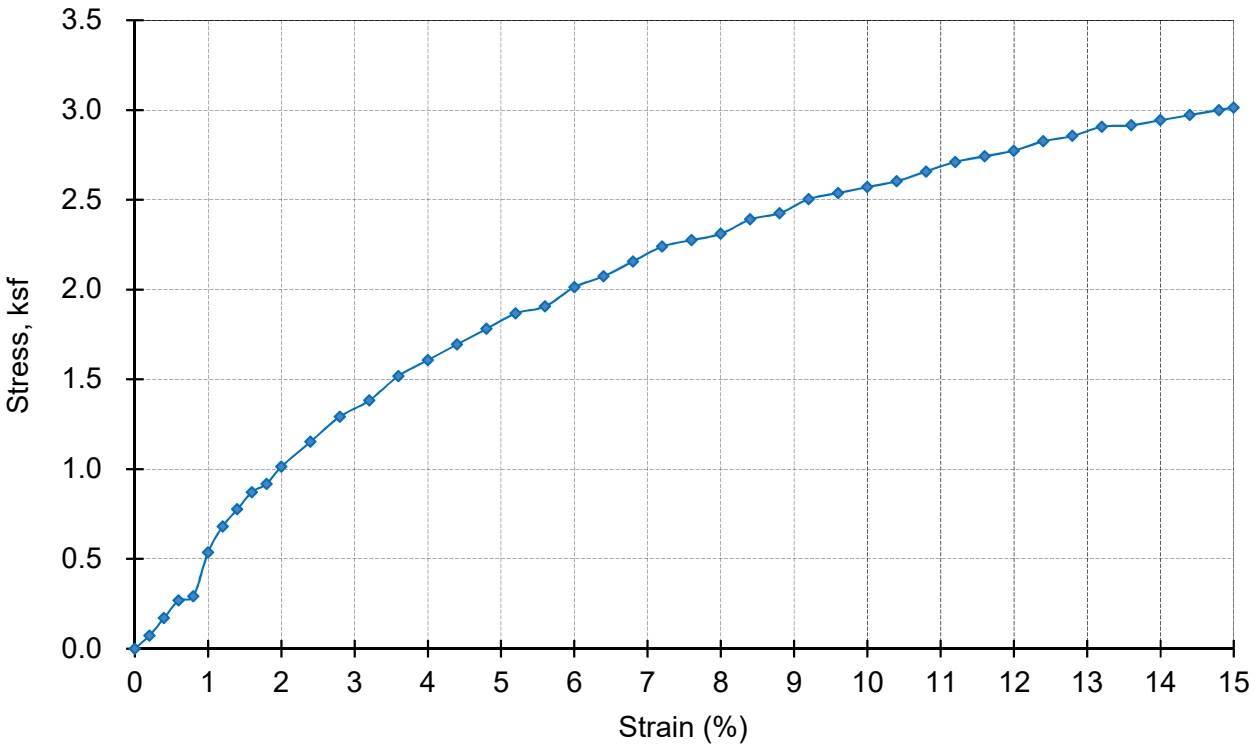
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4DX

UNCONFINED COMPRESSION TEST



Boring No.:	AS-78	**Unconfined Compressive Strength (ksf):**	3.01
Sample No. :	13	**Shear Strength (ksf)**	1.51
Depth (feet):	66	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	102
Test Method	ASTM D2166	**Water Content (%):**	22.0
Material Type:	CL		
Material Description:	Lean Clay with Gravel		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):			

Remarks:

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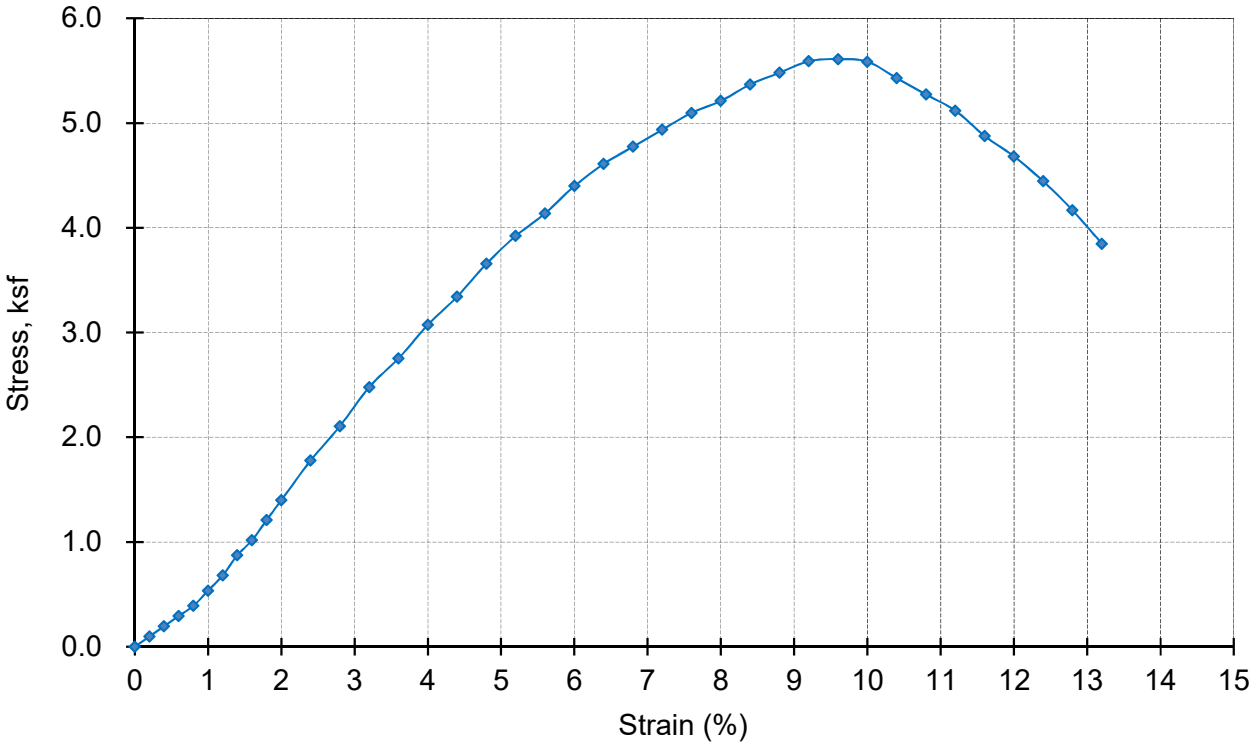
JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4DY**

UNCONFINED COMPRESSION TEST



Boring No.:	AS-78	**Unconfined Compressive Strength (ksf):**	5.61
Sample No. :	15	**Shear Strength (ksf)**	2.81
Depth (feet):	76	**Strain @ Failure (%):**	9.6
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	113
Test Method	ASTM D2166	**Water Content (%):**	17.0
Material Type:	#REF!		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):			

Remarks:

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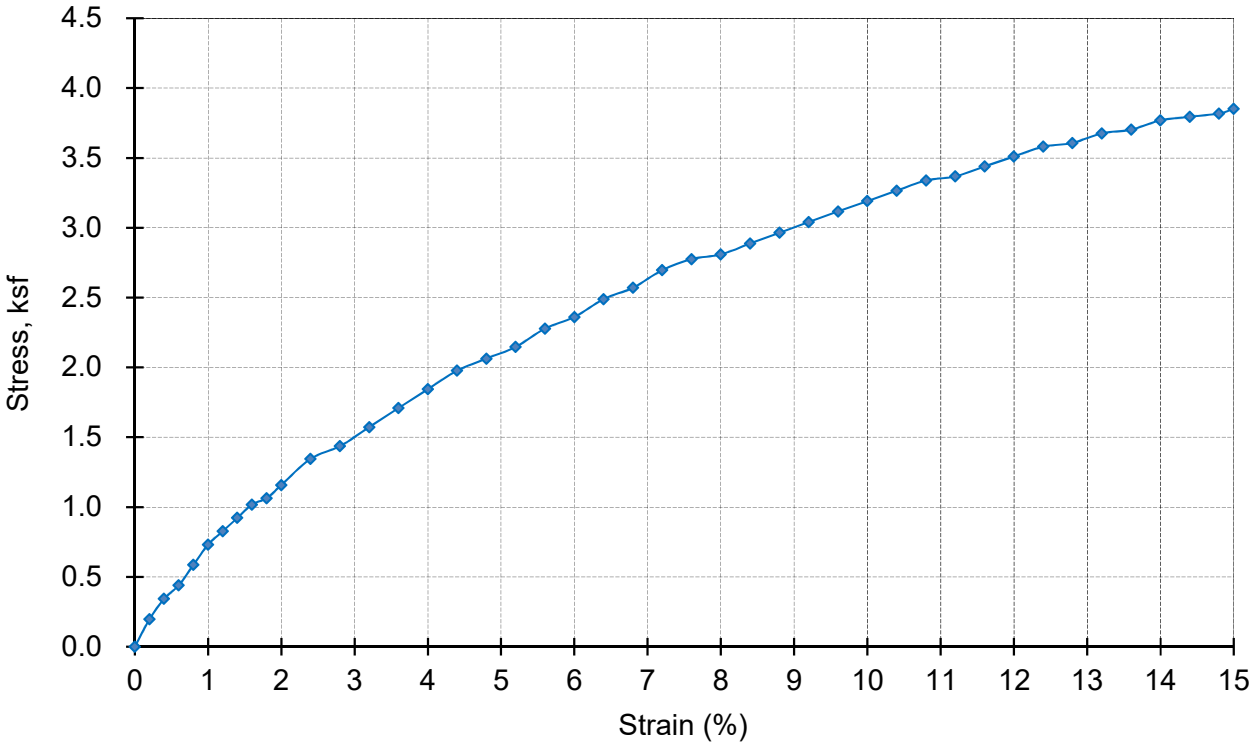
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4DZ

UNCONFINED COMPRESSION TEST



Boring No.:	AS-78	**Unconfined Compressive Strength (ksf):**	3.85
Sample No. :	17	**Shear Strength (ksf)**	1.93
Depth (feet):	91	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	105
Test Method	ASTM D2166	**Water Content (%):**	21.0
Material Type:	CL		
Material Description:	Lean Clay with Sand		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):			

Remarks:

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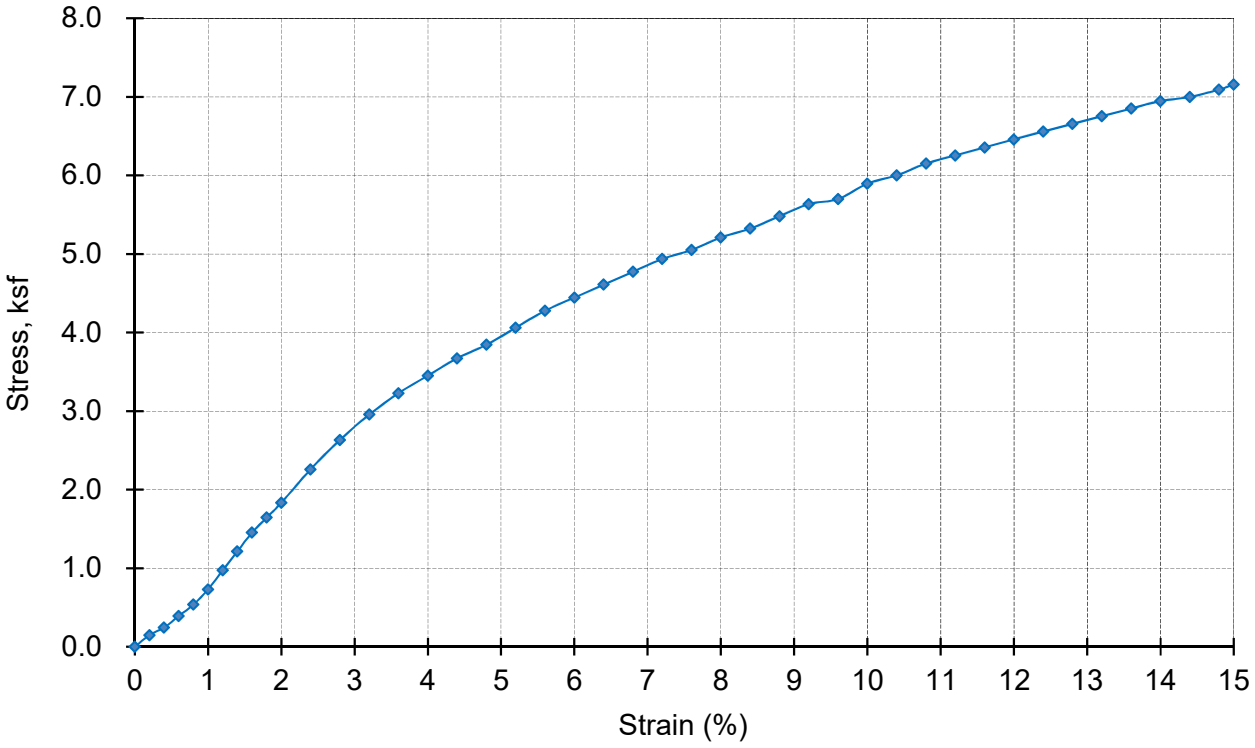
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4EA

UNCONFINED COMPRESSION TEST



Boring No.:	AS78	**Unconfined Compressive Strength (ksf):**	7.16
Sample No. :	20	**Shear Strength (ksf)**	3.58
Depth (feet):	121	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	106
Test Method	ASTM D2166	**Water Content (%):**	16.9
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):			

Remarks:

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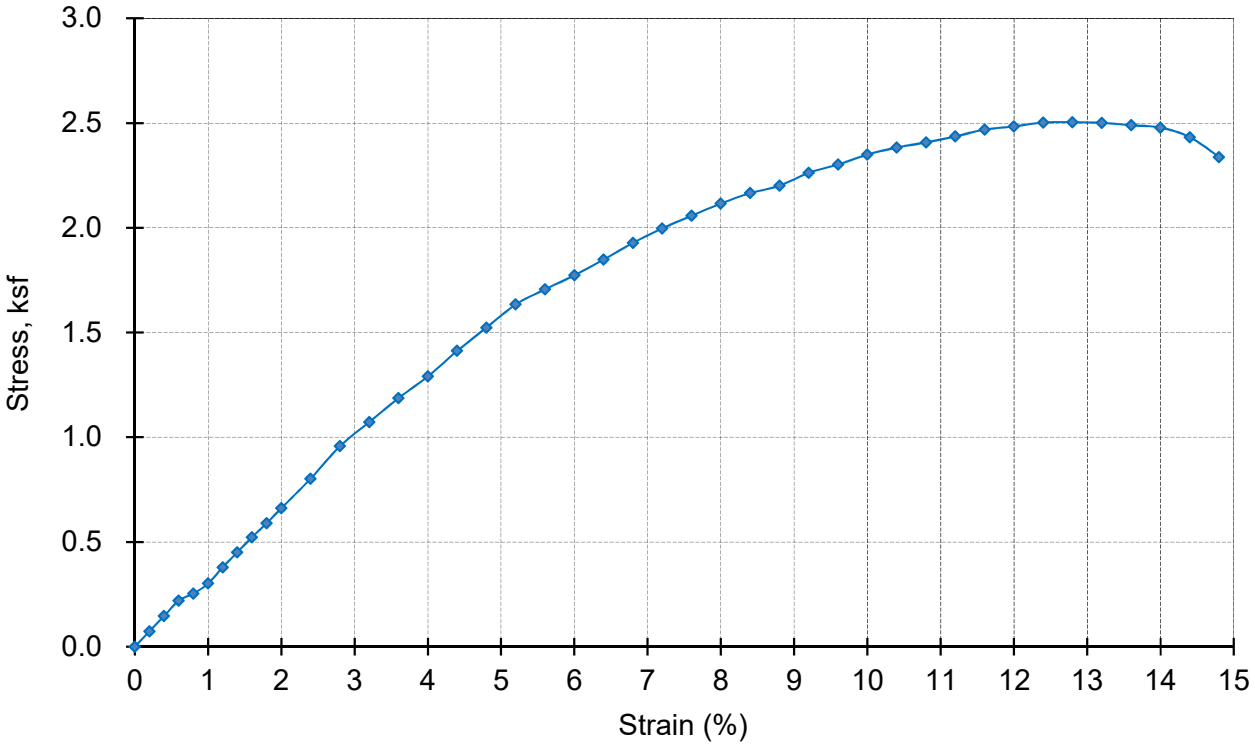
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4EB**

UNCONFINED COMPRESSION TEST



Boring No.:	AS-80	**Unconfined Compressive Strength (ksf):**	2.50
Sample No. :	1	**Shear Strength (ksf)**	1.25
Depth (feet):	6	**Strain @ Failure (%):**	12.8
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	101
Test Method	ASTM D2166	**Water Content (%):**	23.0
Material Type:	CL		
Material Description:	Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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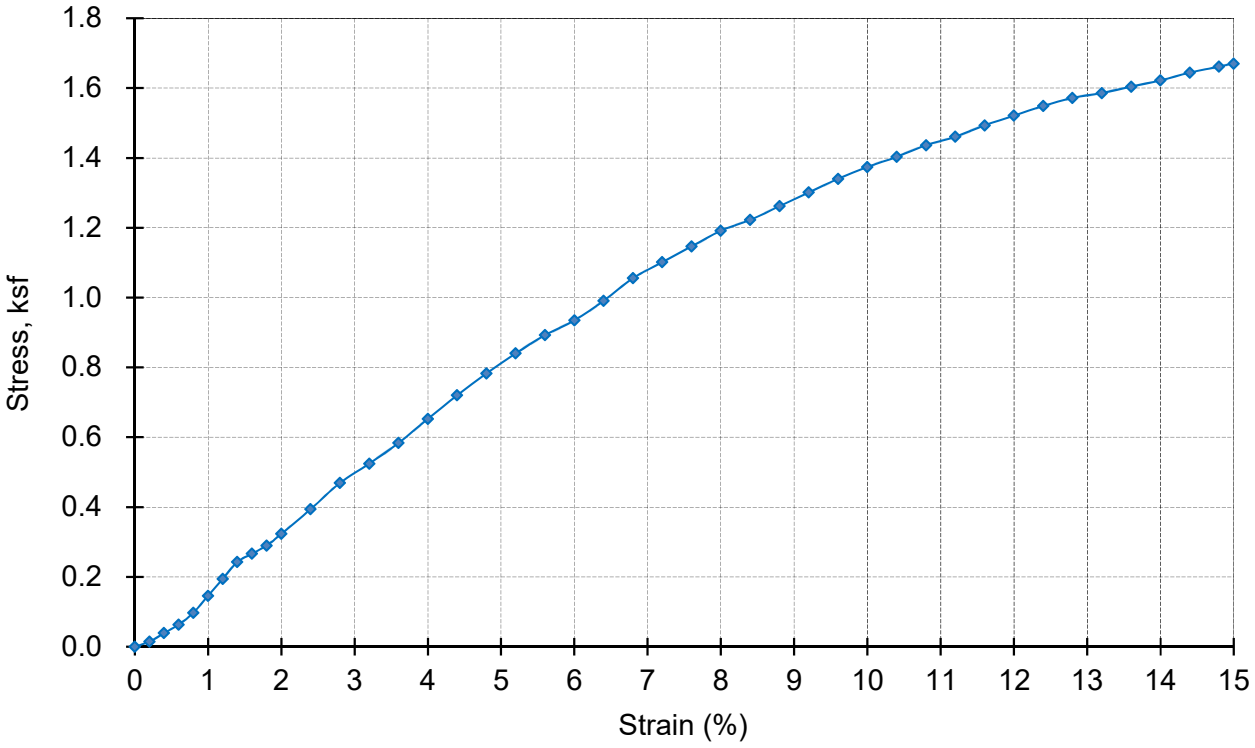
JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4EC**

UNCONFINED COMPRESSION TEST



Boring No.:	AS-80	**Unconfined Compressive Strength (ksf):**	1.67
Sample No. :	2	**Shear Strength (ksf)**	0.84
Depth (feet):	11	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	90
Test Method	ASTM D2166	**Water Content (%):**	32.5
Material Type:	CL-ML		
Material Description:	Silty Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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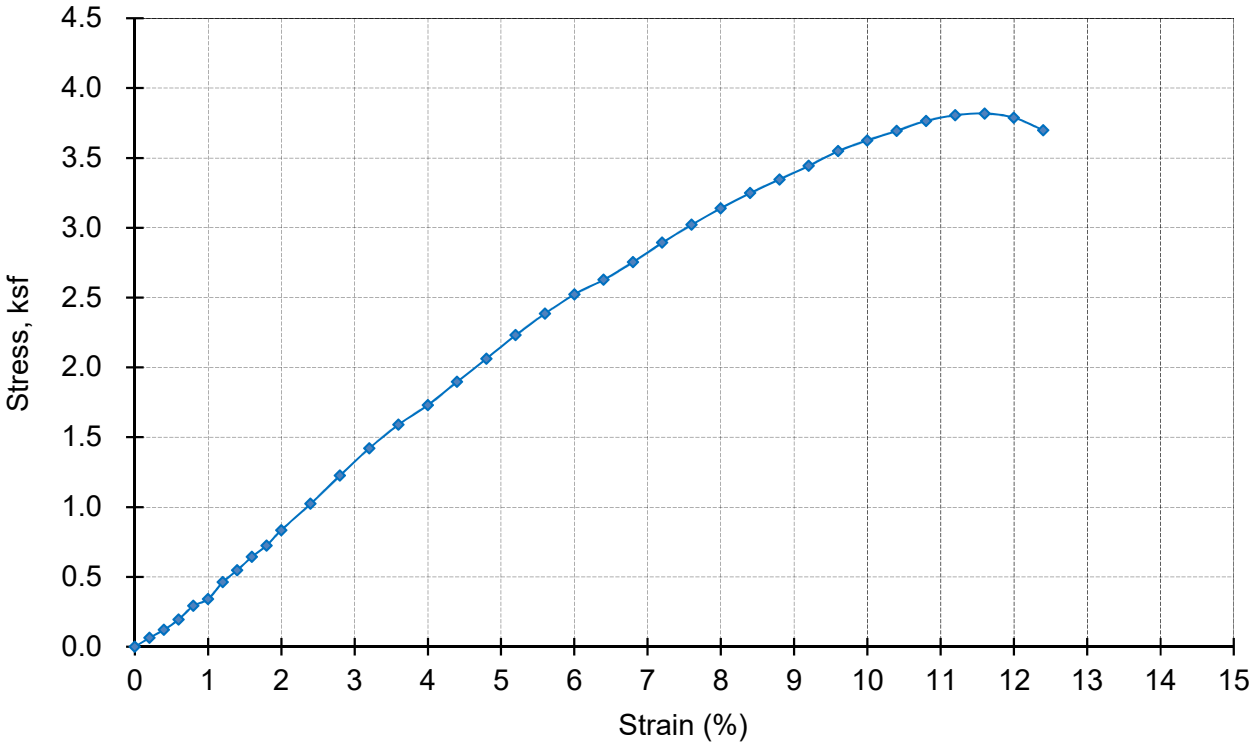
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4ED

UNCONFINED COMPRESSION TEST



Boring No.:	AS-80	**Unconfined Compressive Strength (ksf):**	3.82
Sample No. :	6	**Shear Strength (ksf)**	1.91
Depth (feet):	31	**Strain @ Failure (%):**	11.6
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	98
Test Method	ASTM D2166	**Water Content (%):**	26.3
Material Type:	CH		
Material Description:	Fat Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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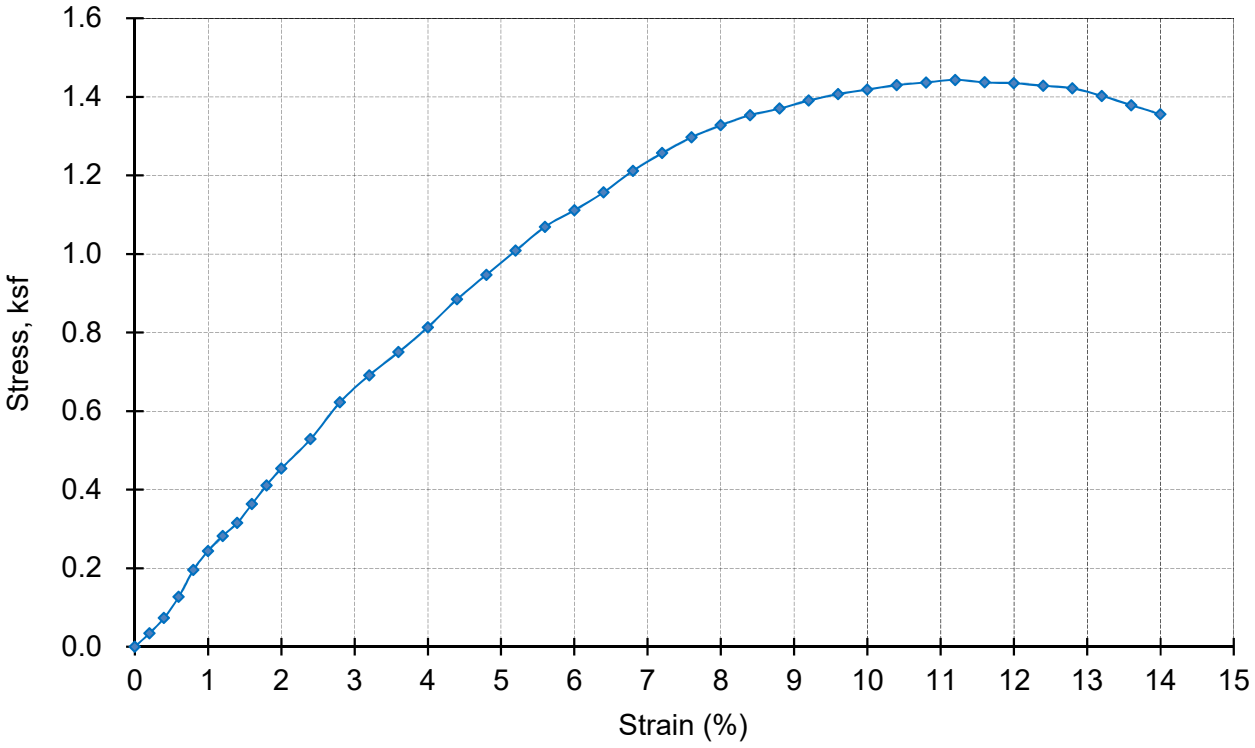
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4EE

UNCONFINED COMPRESSION TEST



Boring No.:	AS-80	**Unconfined Compressive Strength (ksf):**	1.44
Sample No. :	7	**Shear Strength (ksf)**	0.72
Depth (feet):	36	**Strain @ Failure (%):**	11.2
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	92
Test Method	ASTM D2166	**Water Content (%):**	29.1
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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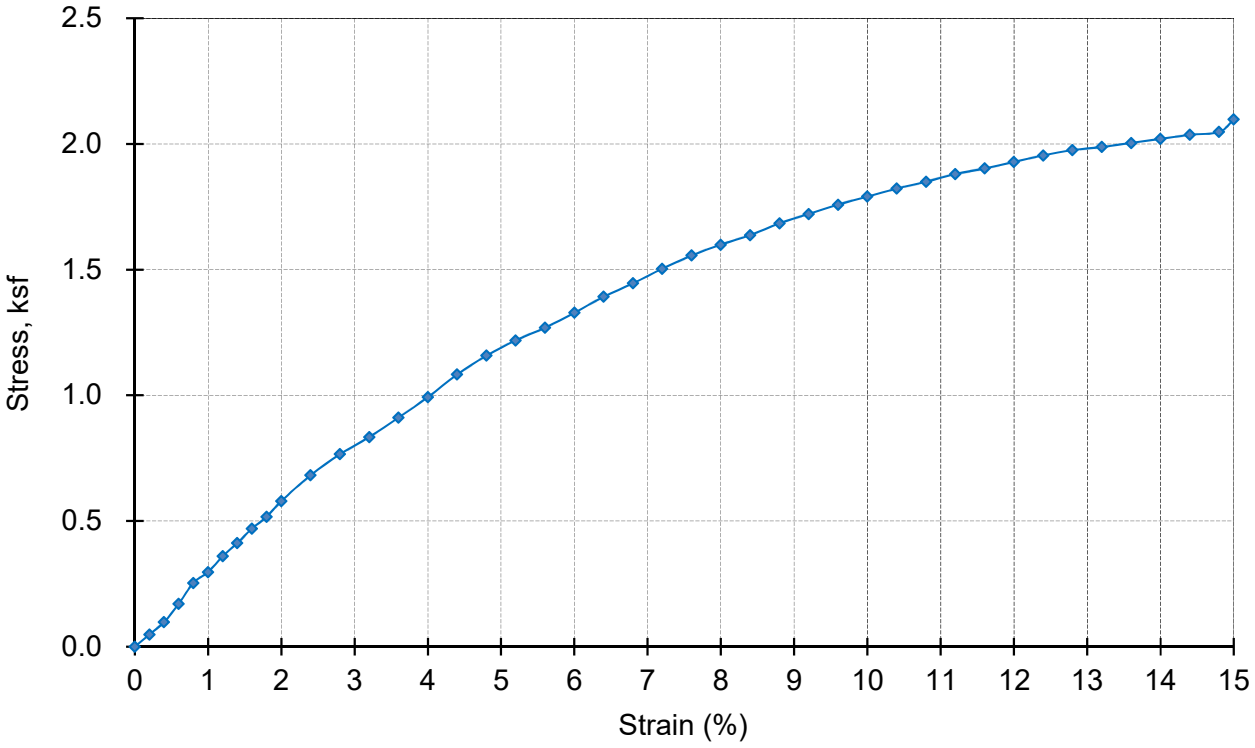
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4EF

UNCONFINED COMPRESSION TEST



Boring No.:	AS-80	**Unconfined Compressive Strength (ksf):**	2.10
Sample No. :	9	**Shear Strength (ksf)**	1.05
Depth (feet):	46	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	111
Test Method	ASTM D2166	**Water Content (%):**	12.8
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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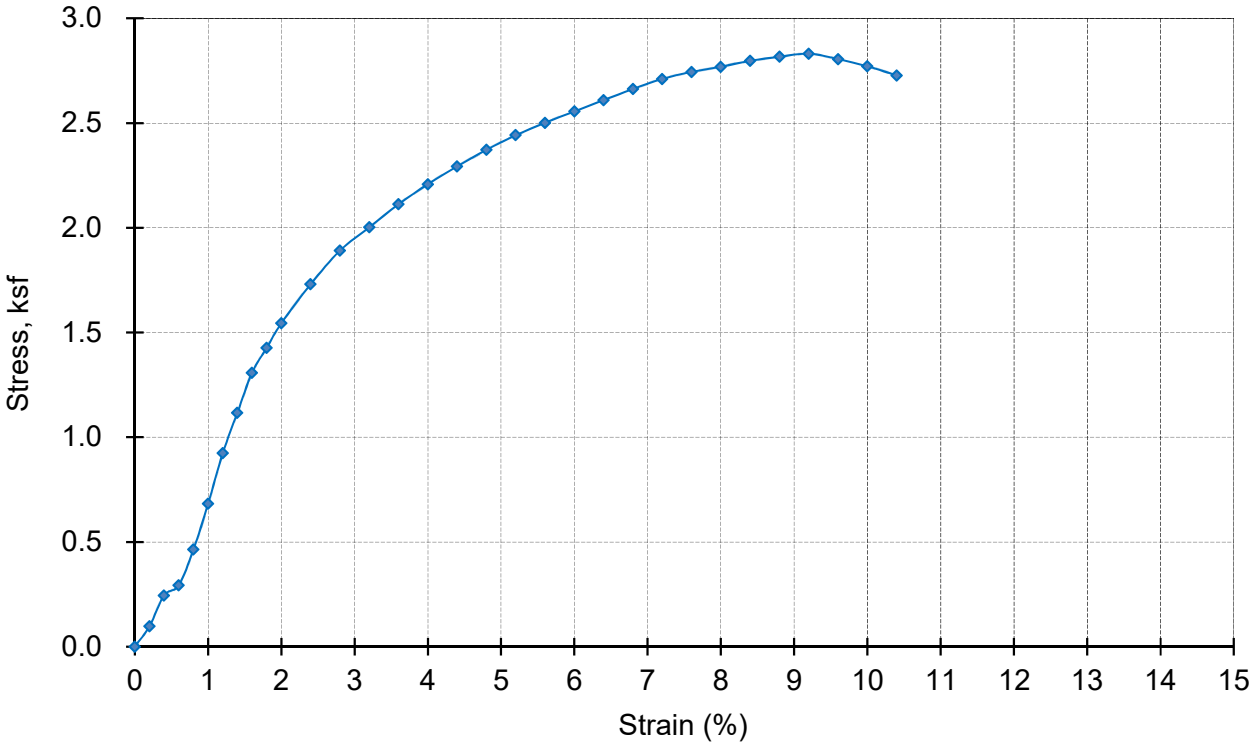
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4EG

UNCONFINED COMPRESSION TEST



Boring No.:	AS-80	**Unconfined Compressive Strength (ksf):**	2.83
Sample No. :	10	**Shear Strength (ksf)**	1.42
Depth (feet):	51	**Strain @ Failure (%):**	9.2
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	99
Test Method	ASTM D2166	**Water Content (%):**	24.7
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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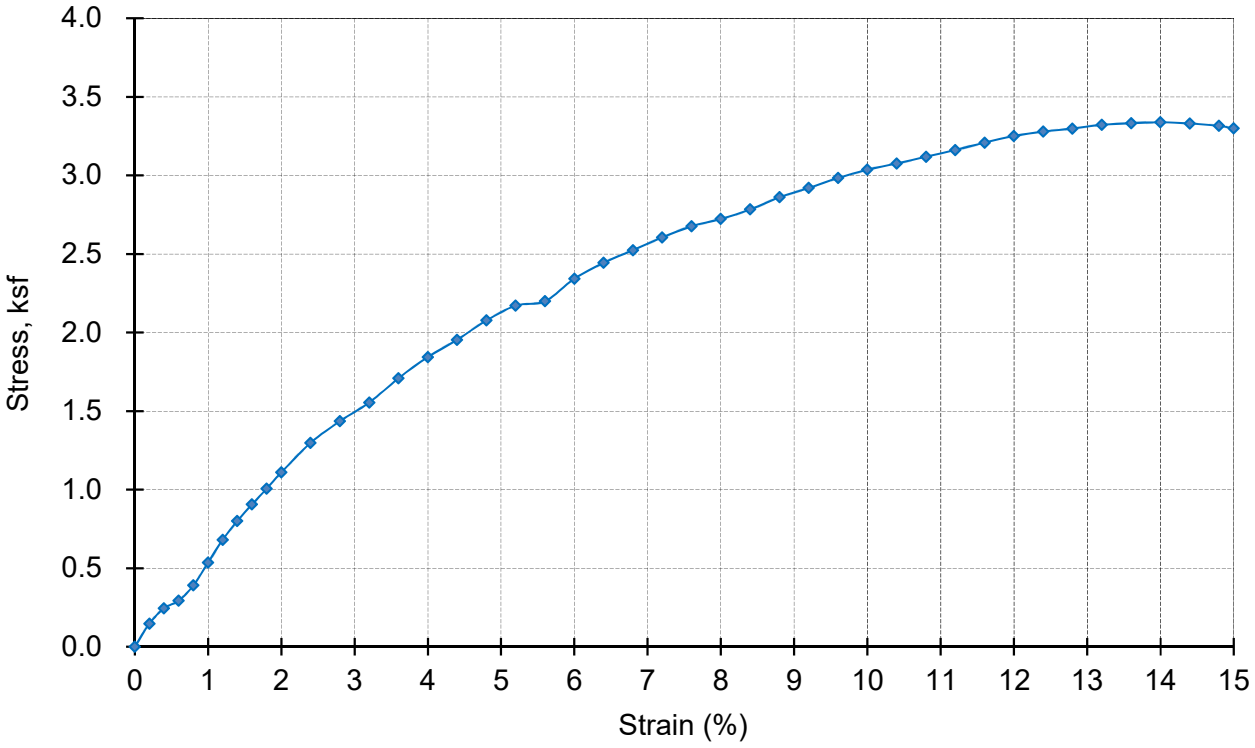
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4EH

UNCONFINED COMPRESSION TEST



Boring No.:	AS-80	**Unconfined Compressive Strength (ksf):**	3.34
Sample No. :	12	**Shear Strength (ksf)**	1.67
Depth (feet):	61	**Strain @ Failure (%):**	14.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	110
Test Method	ASTM D2166	**Water Content (%):**	18.4
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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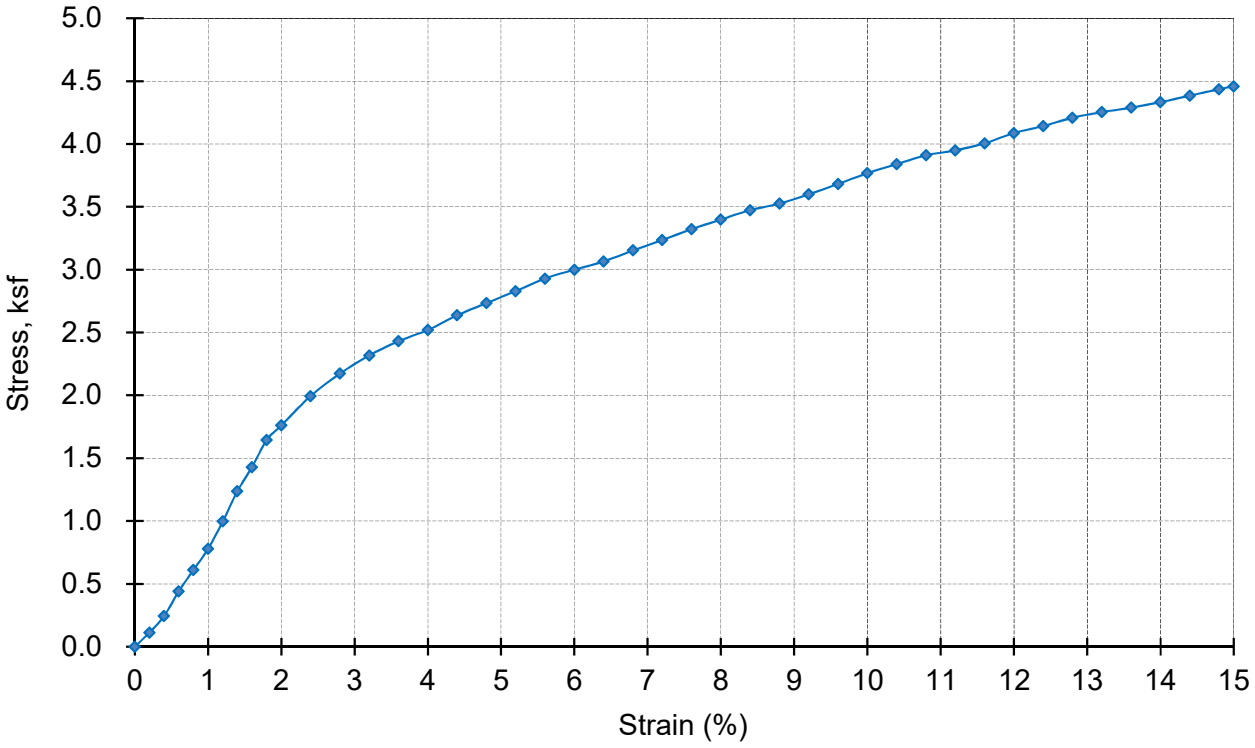
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4EI

UNCONFINED COMPRESSION TEST



Boring No.:	AS-80	**Unconfined Compressive Strength (ksf):**	4.46
Sample No. :	17	**Shear Strength (ksf)**	2.23
Depth (feet):	86	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	102
Test Method	ASTM D2166	**Water Content (%):**	24.0
Material Type:	CL		
Material Description:	Sandy Lean Clay with Gravel		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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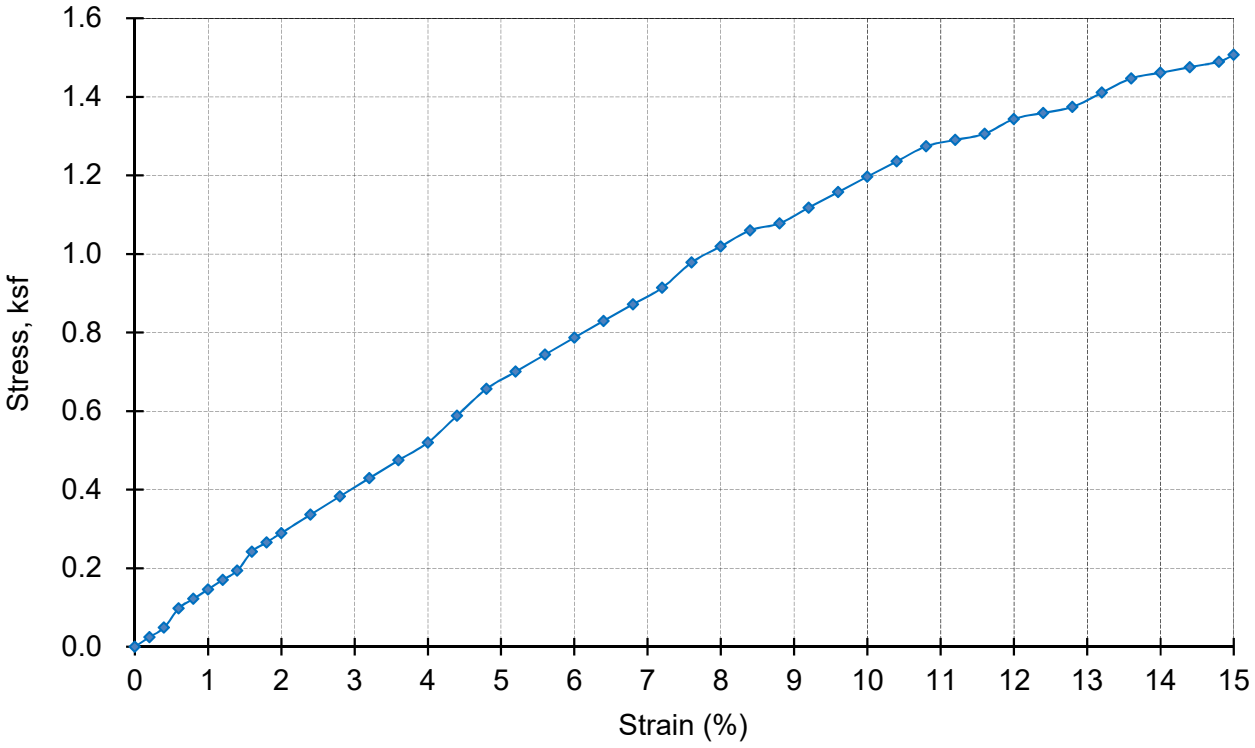
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4EJ**

UNCONFINED COMPRESSION TEST



Boring No.:	AS-82	**Unconfined Compressive Strength (ksf):**	1.51
Sample No. :	1	**Shear Strength (ksf)**	0.75
Depth (feet):	6	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	103
Test Method	ASTM D2166	**Water Content (%):**	23.2
Material Type:	CL		
Material Description:	Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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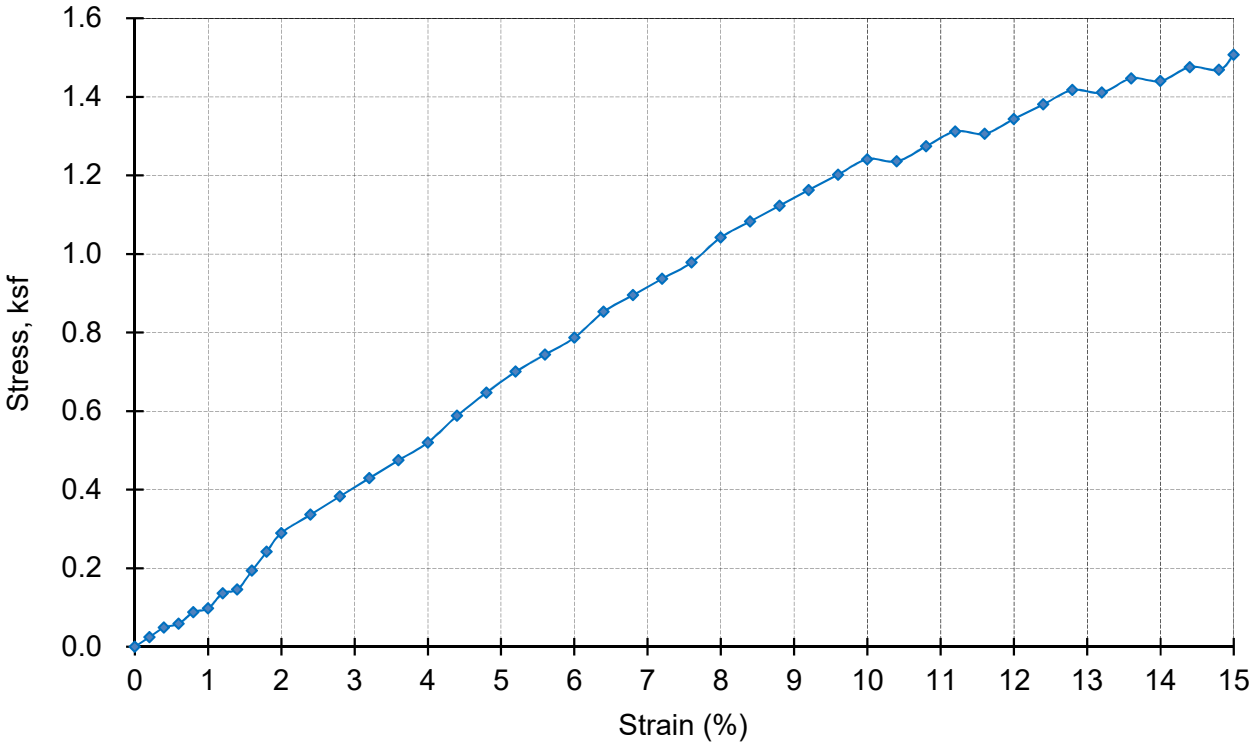
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4EK

UNCONFINED COMPRESSION TEST



Boring No.:	AS-82	**Unconfined Compressive Strength (ksf):**	1.51
Sample No. :	3	**Shear Strength (ksf)**	0.75
Depth (feet):	16	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	100
Test Method	ASTM D2166	**Water Content (%):**	24.5
Material Type:	CL		
Material Description:	Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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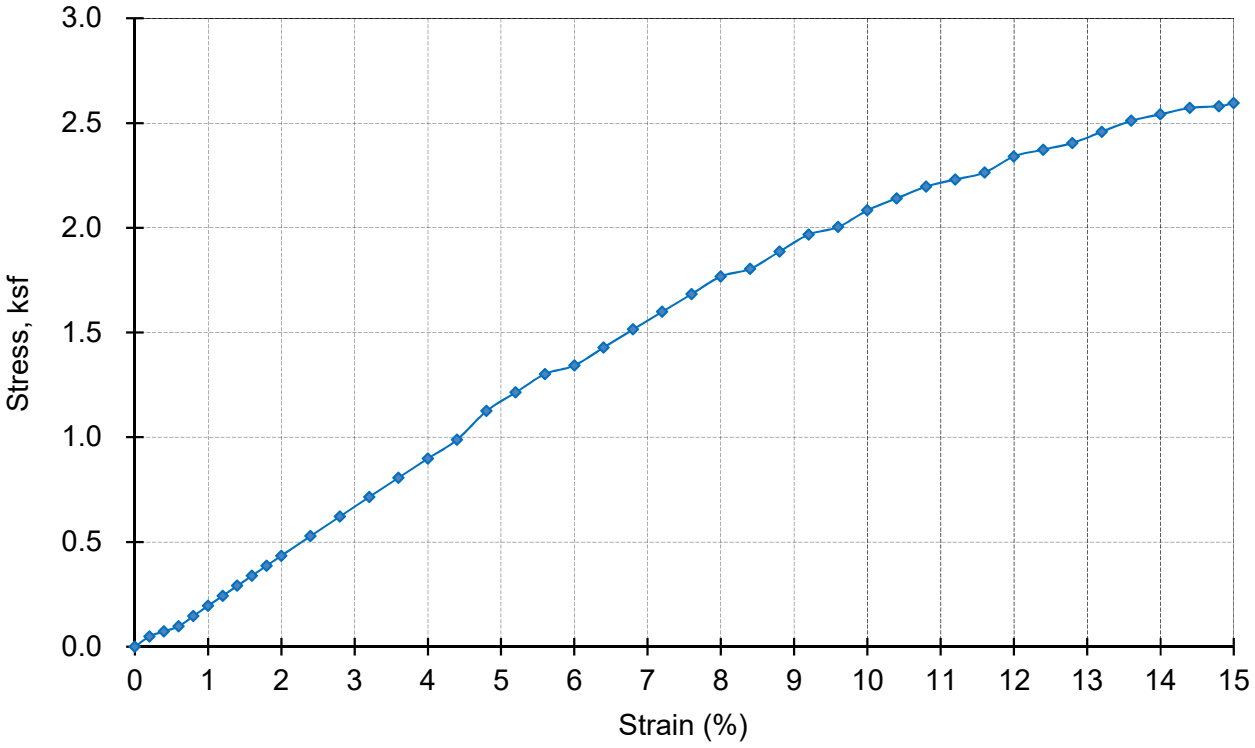
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4EL**

UNCONFINED COMPRESSION TEST



Boring No.:	AS-82	**Unconfined Compressive Strength (ksf):**	2.60
Sample No. :	5	**Shear Strength (ksf)**	1.30
Depth (feet):	26	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	92
Test Method	ASTM D2166	**Water Content (%):**	30.7
Material Type:	CL-ML		
Material Description:	Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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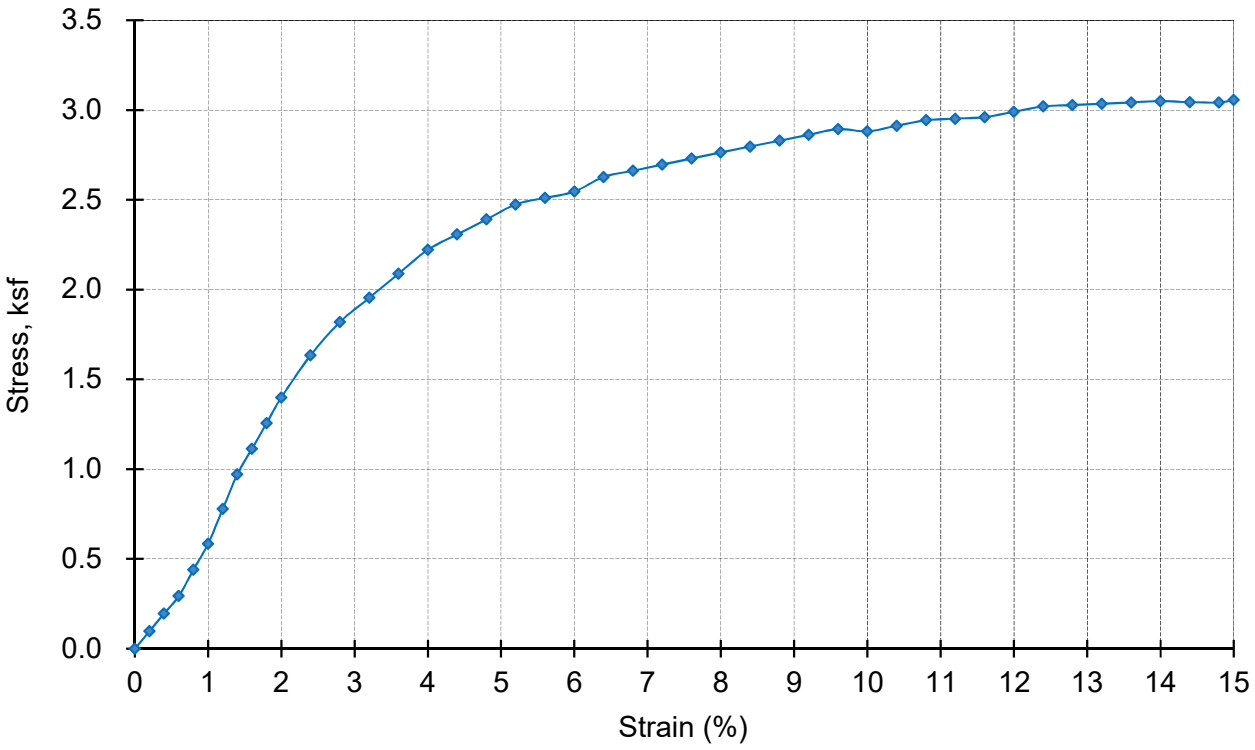
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4EM

UNCONFINED COMPRESSION TEST



Boring No.:	AS-82	**Unconfined Compressive Strength (ksf):**	3.06
Sample No. :	7	**Shear Strength (ksf)**	1.53
Depth (feet):	36	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	89
Test Method	ASTM D2166	**Water Content (%):**	30.4
Material Type:	CH		
Material Description:	Fat Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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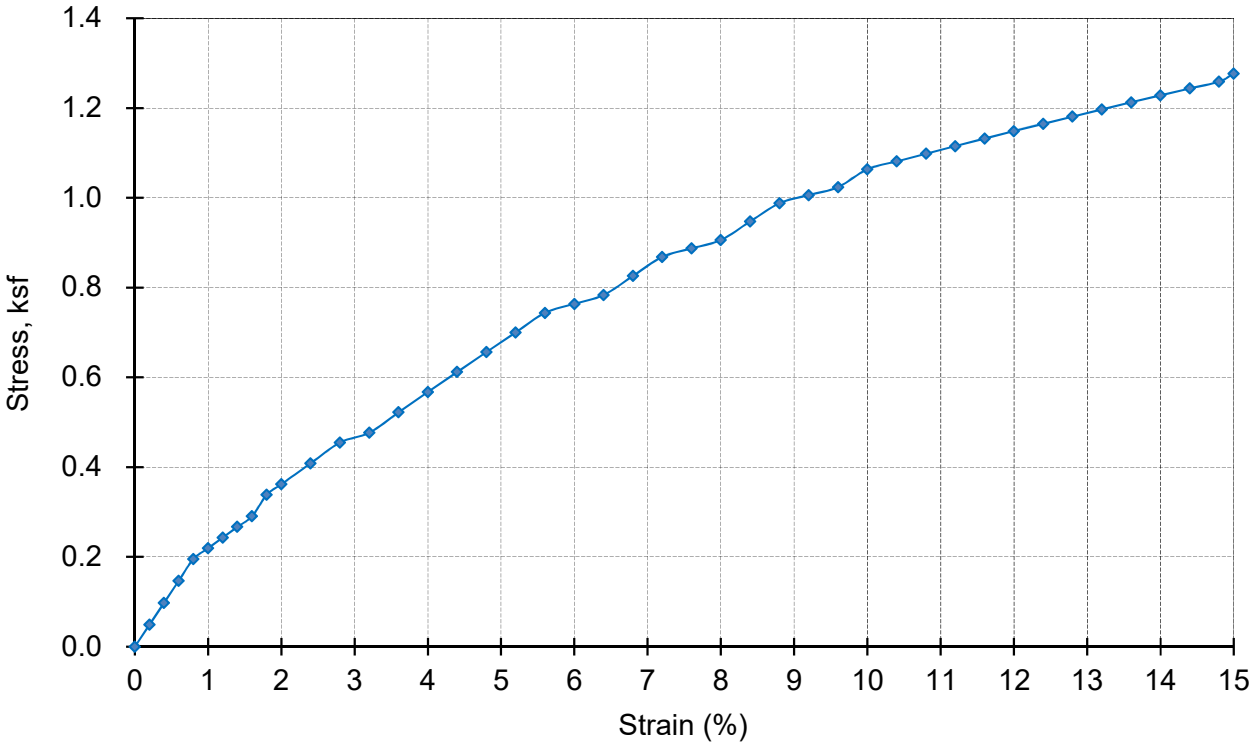
Practicing in the Geosciences

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4EN**

UNCONFINED COMPRESSION TEST



Boring No.:	AS-82	**Unconfined Compressive Strength (ksf):**	1.28
Sample No. :	9	**Shear Strength (ksf)**	0.64
Depth (feet):	46	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	96
Test Method	ASTM D2166	**Water Content (%):**	27.0
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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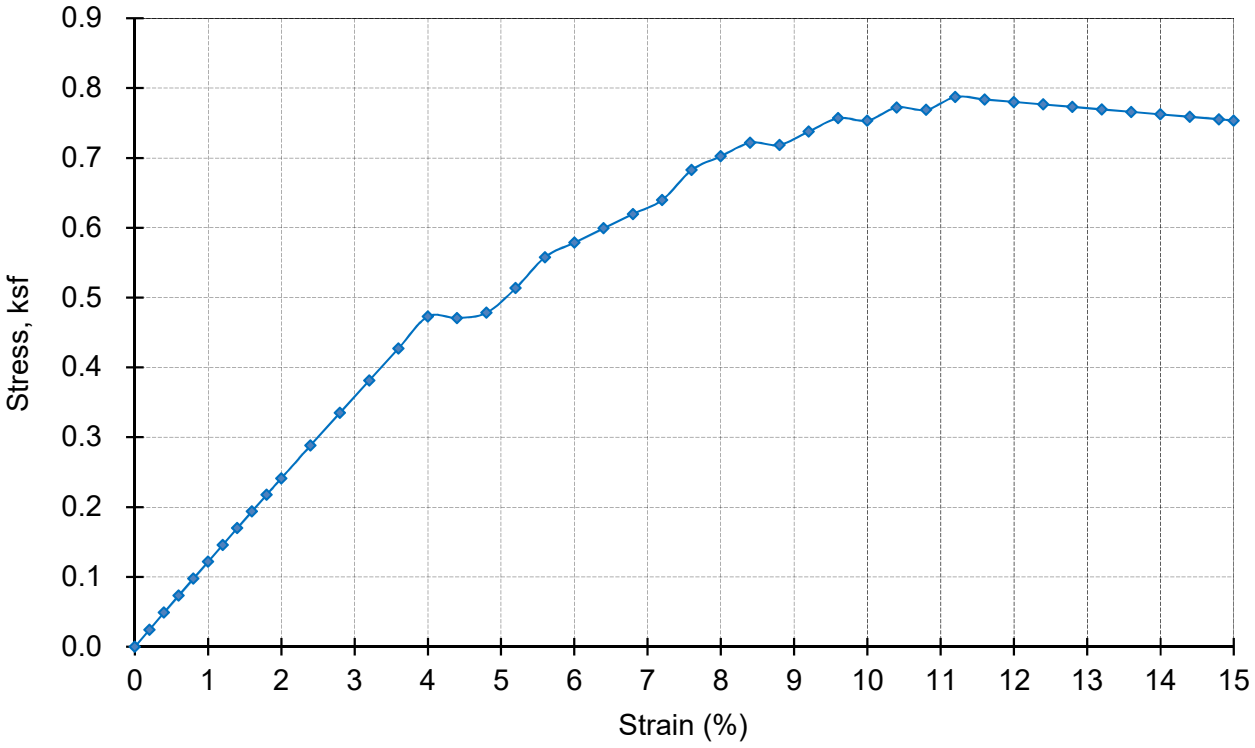
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4EO**

UNCONFINED COMPRESSION TEST



Boring No.:	AS-82	**Unconfined Compressive Strength (ksf):**	0.79
Sample No. :	10	**Shear Strength (ksf)**	0.39
Depth (feet):	51	**Strain @ Failure (%):**	11.2
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	94
Test Method	ASTM D2166	**Water Content (%):**	27.7
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
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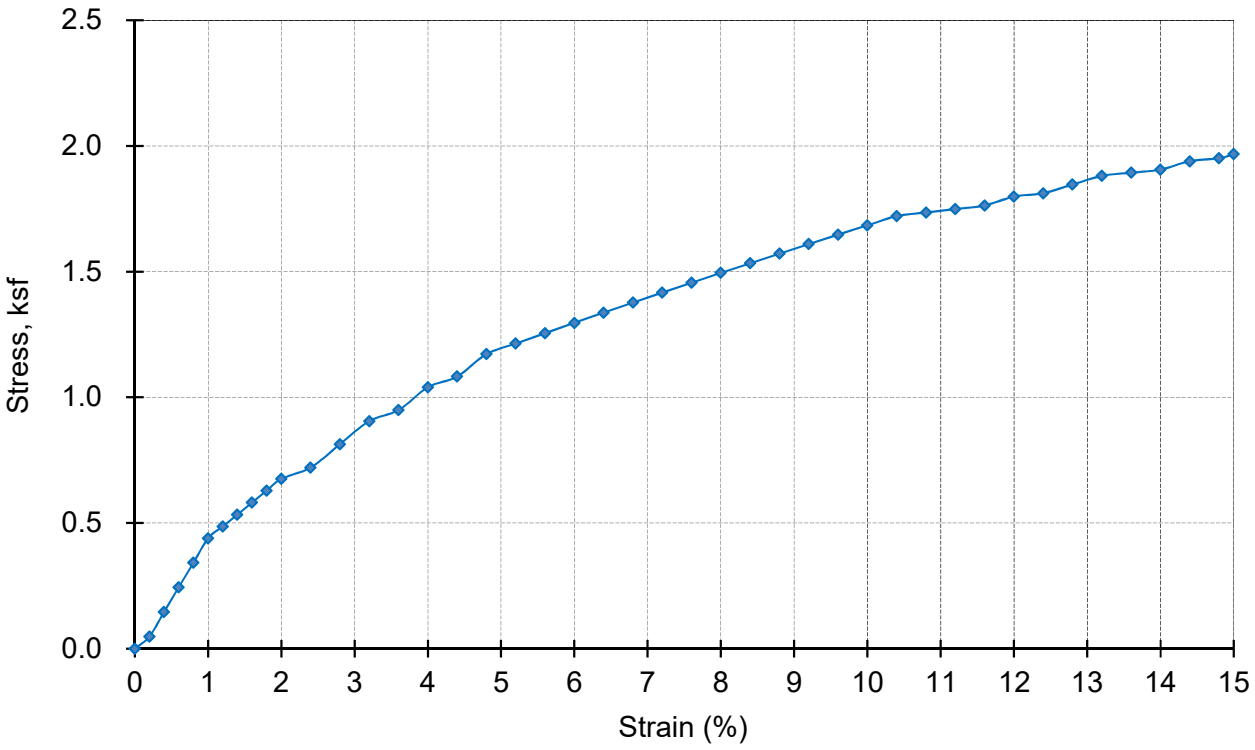
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4EP

UNCONFINED COMPRESSION TEST



Boring No.:	AS-82	**Unconfined Compressive Strength (ksf):**	1.97
Sample No. :	13	**Shear Strength (ksf)**	0.98
Depth (feet):	66	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	100
Test Method	ASTM D2166	**Water Content (%):**	24.3
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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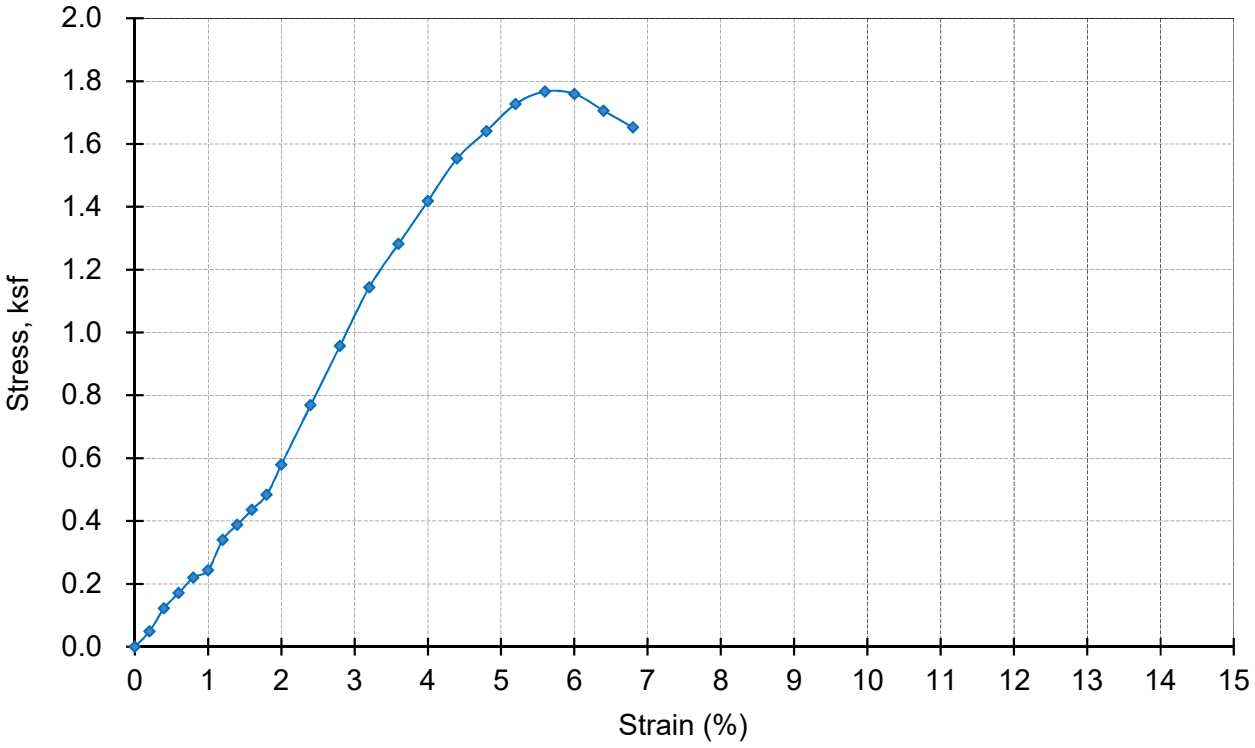
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4EQ

UNCONFINED COMPRESSION TEST



Boring No.:	AS-82	**Unconfined Compressive Strength (ksf):**	1.77
Sample No. :	16	**Shear Strength (ksf)**	0.88
Depth (feet):	81	**Strain @ Failure (%):**	5.6
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	106
Test Method	ASTM D2166	**Water Content (%):**	22.2
Material Type:	CL/CH		
Material Description:	Lean to Fat Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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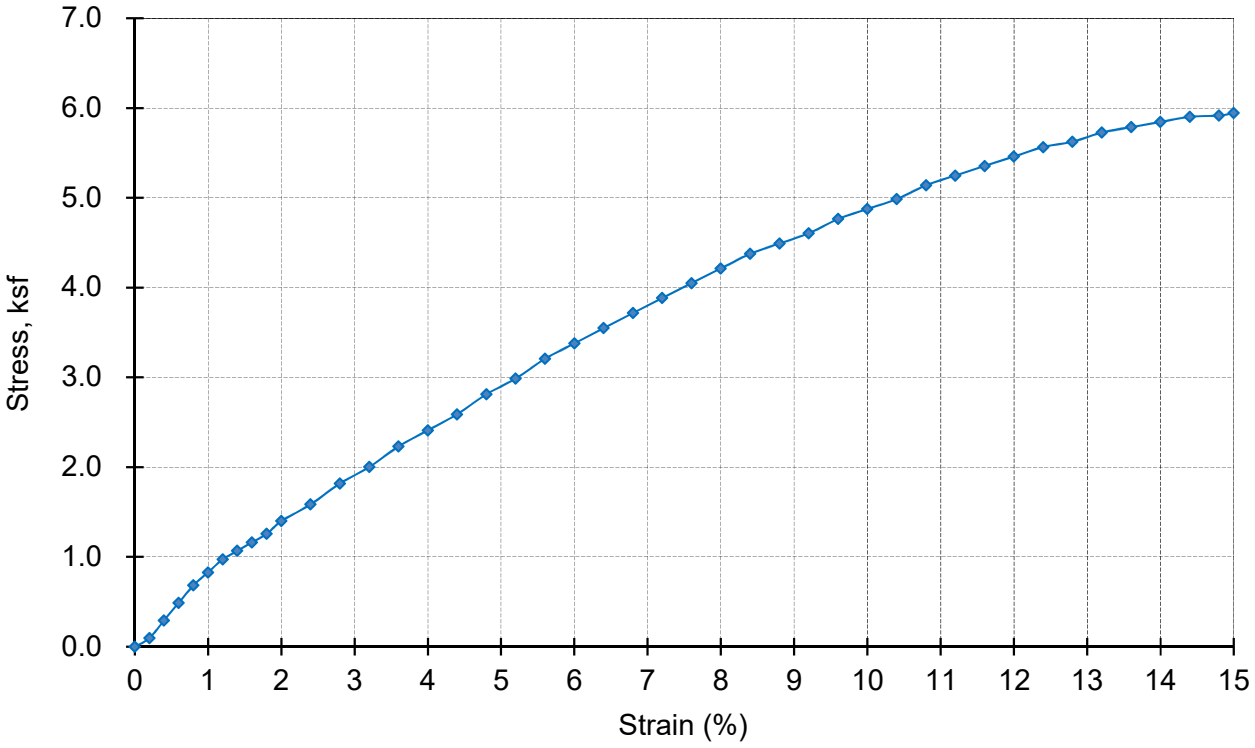
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4ER

UNCONFINED COMPRESSION TEST



Boring No.:	AS-82	**Unconfined Compressive Strength (ksf):**	5.95
Sample No. :	17	**Shear Strength (ksf)**	2.97
Depth (feet):	91	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	108
Test Method	ASTM D2166	**Water Content (%):**	20.7
Material Type:	ML		
Material Description:	Silt with Sand		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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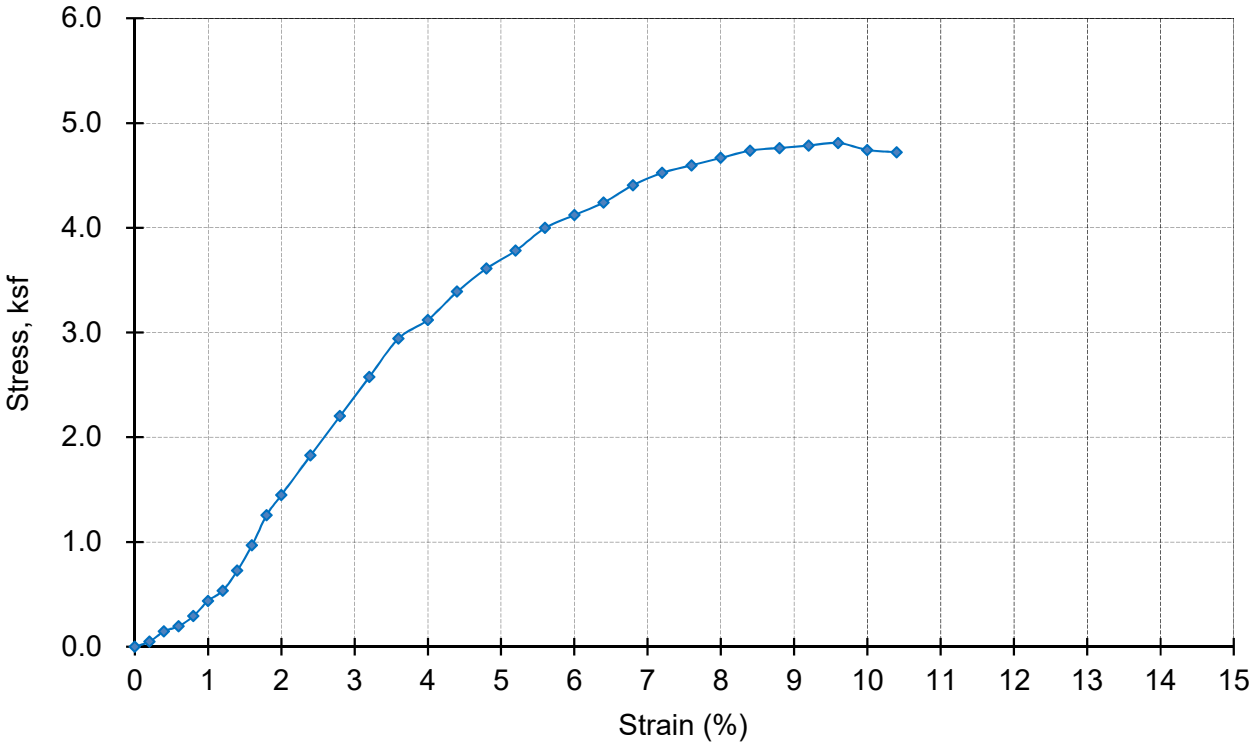
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4ES

UNCONFINED COMPRESSION TEST



Boring No.:	AS-82	**Unconfined Compressive Strength (ksf):**	4.81
Sample No. :	18	**Shear Strength (ksf)**	2.40
Depth (feet):	101	**Strain @ Failure (%):**	9.6
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	97
Test Method	ASTM D2166	**Water Content (%):**	25.1
Material Type:	CH		
Material Description:	Fat Clay with Sand		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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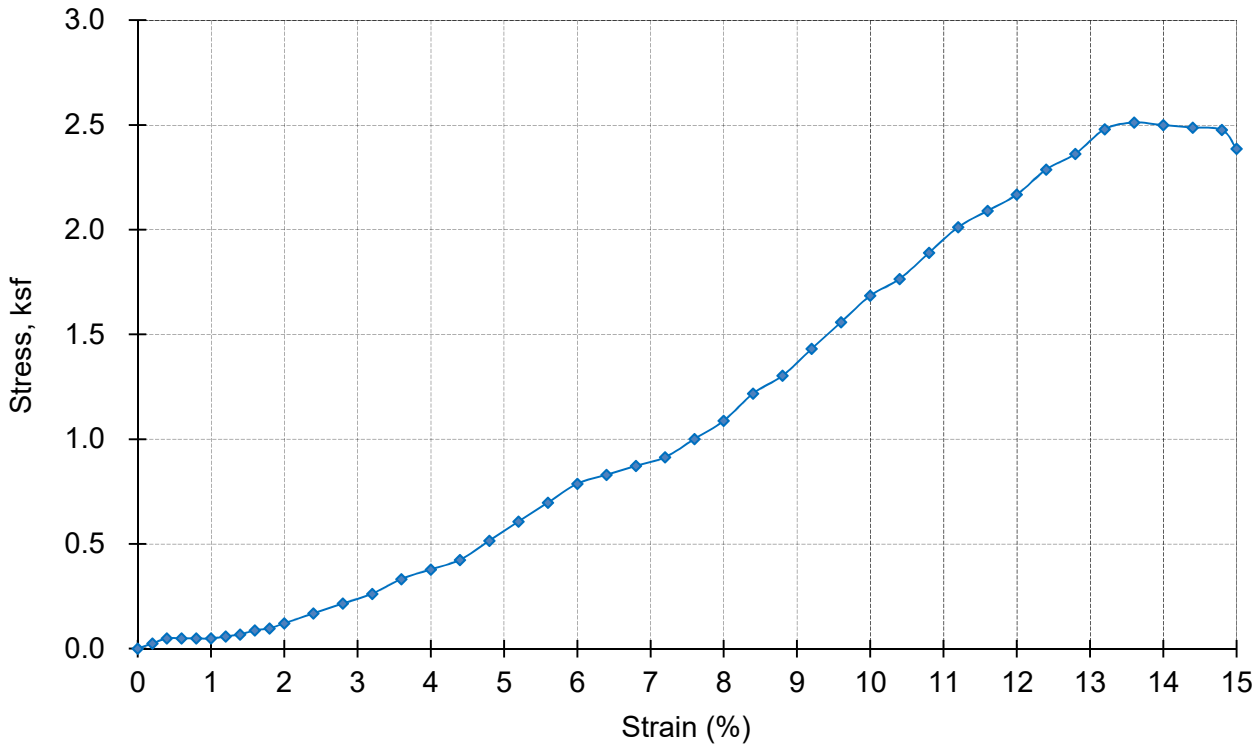
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4ET

UNCONFINED COMPRESSION TEST



Boring No.:	AS-84	**Unconfined Compressive Strength (ksf):**	2.51
Sample No. :	5	**Shear Strength (ksf)**	1.26
Depth (feet):	26	**Strain @ Failure (%):**	13.6
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	99
Test Method	ASTM D2166	**Water Content (%):**	26.0
Material Type:	CL-ML		
Material Description:	Silty Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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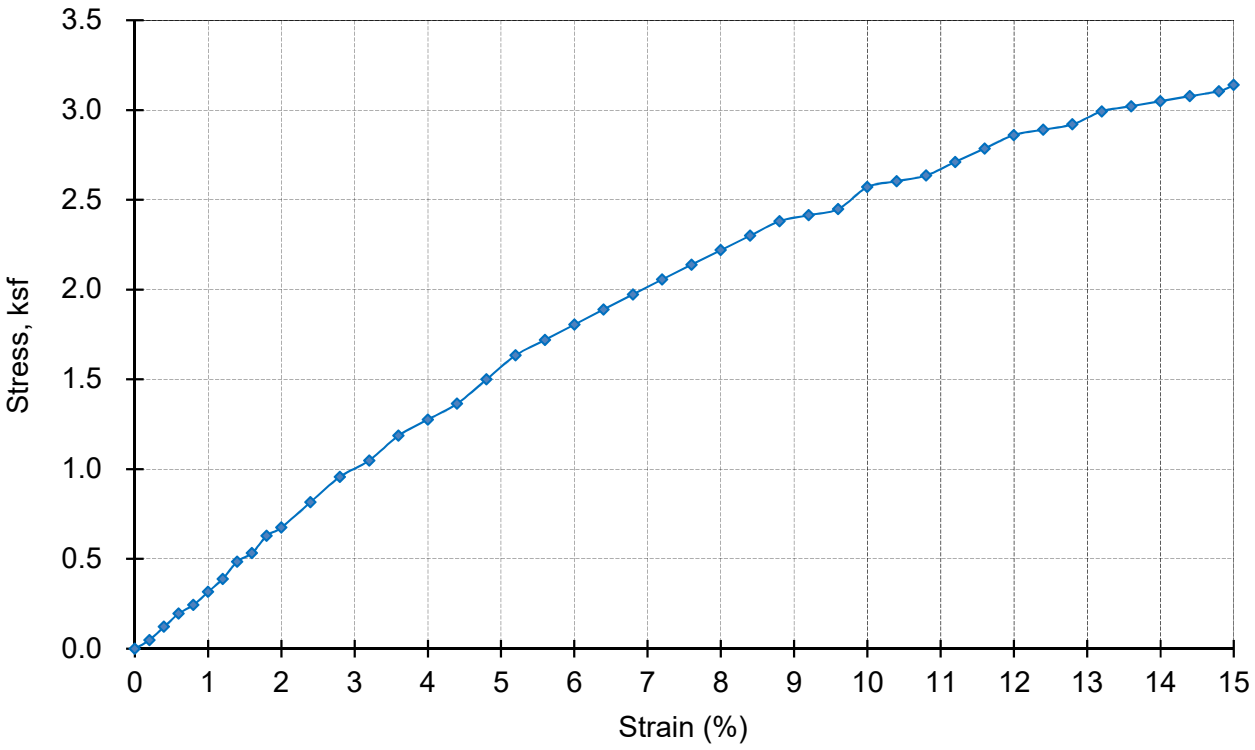
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4EU**

UNCONFINED COMPRESSION TEST



Boring No.:	AS-84	**Unconfined Compressive Strength (ksf):**	3.14
Sample No. :	6	**Shear Strength (ksf)**	1.57
Depth (feet):	31	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	97
Test Method	ASTM D2166	**Water Content (%):**	24.6
Material Type:	CL		
Material Description:	Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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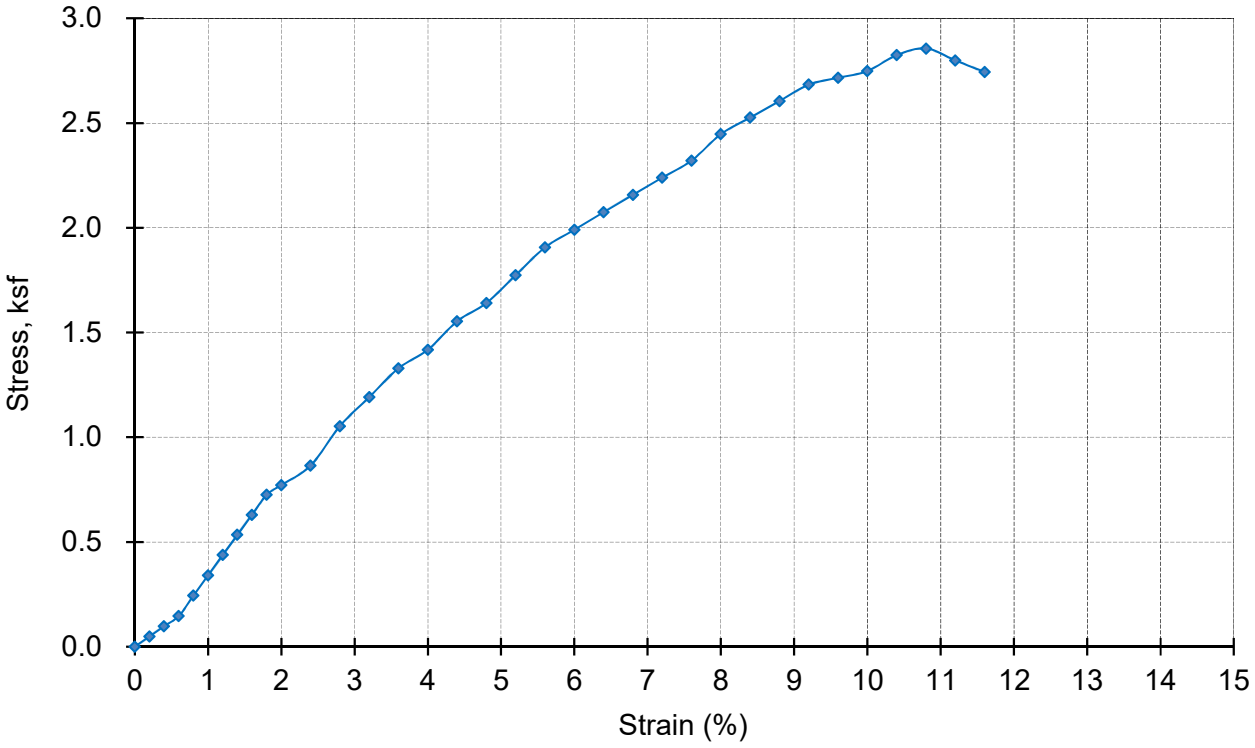
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4EV

UNCONFINED COMPRESSION TEST



Boring No.:	AS-84	**Unconfined Compressive Strength (ksf):**	2.86
Sample No. :	8	**Shear Strength (ksf)**	1.43
Depth (feet):	41	**Strain @ Failure (%):**	10.8
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	103
Test Method	ASTM D2166	**Water Content (%):**	22.5
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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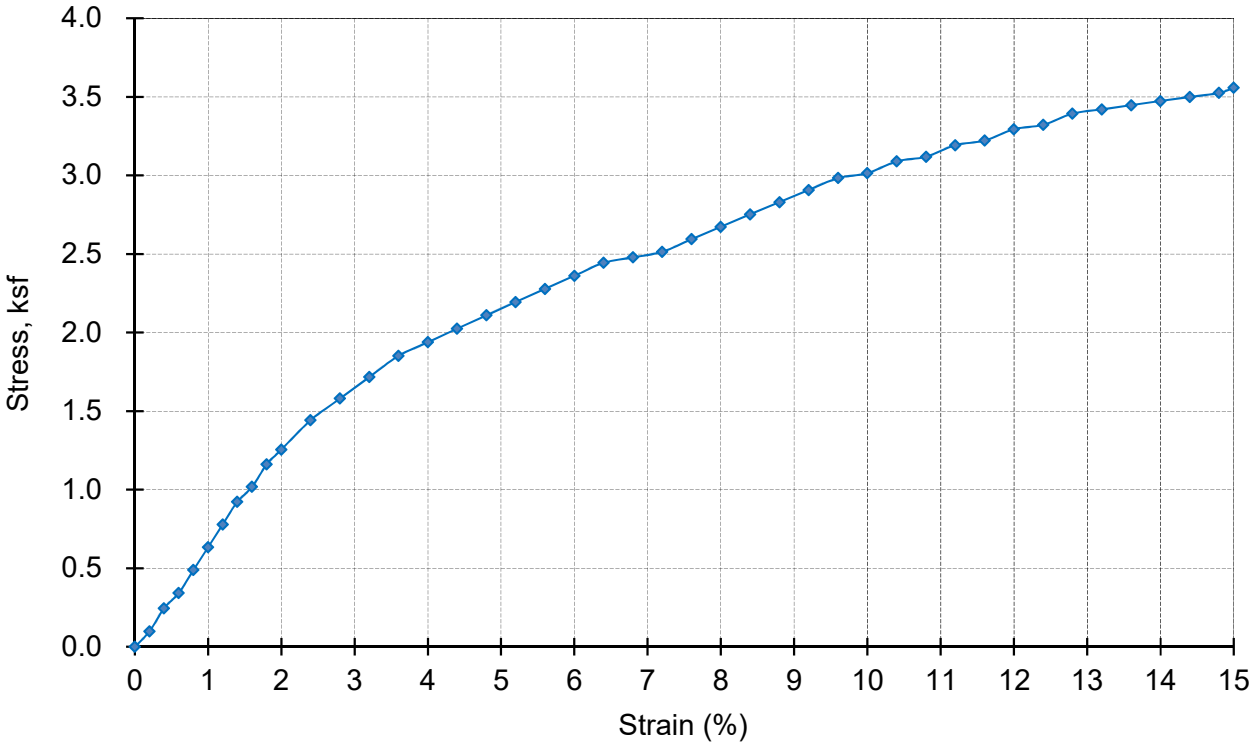
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4EW

UNCONFINED COMPRESSION TEST



Boring No.:	AS-84	**Unconfined Compressive Strength (ksf):**	3.56
Sample No. :	10	**Shear Strength (ksf)**	1.78
Depth (feet):	51	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	107
Test Method	ASTM D2166	**Water Content (%):**	19.9
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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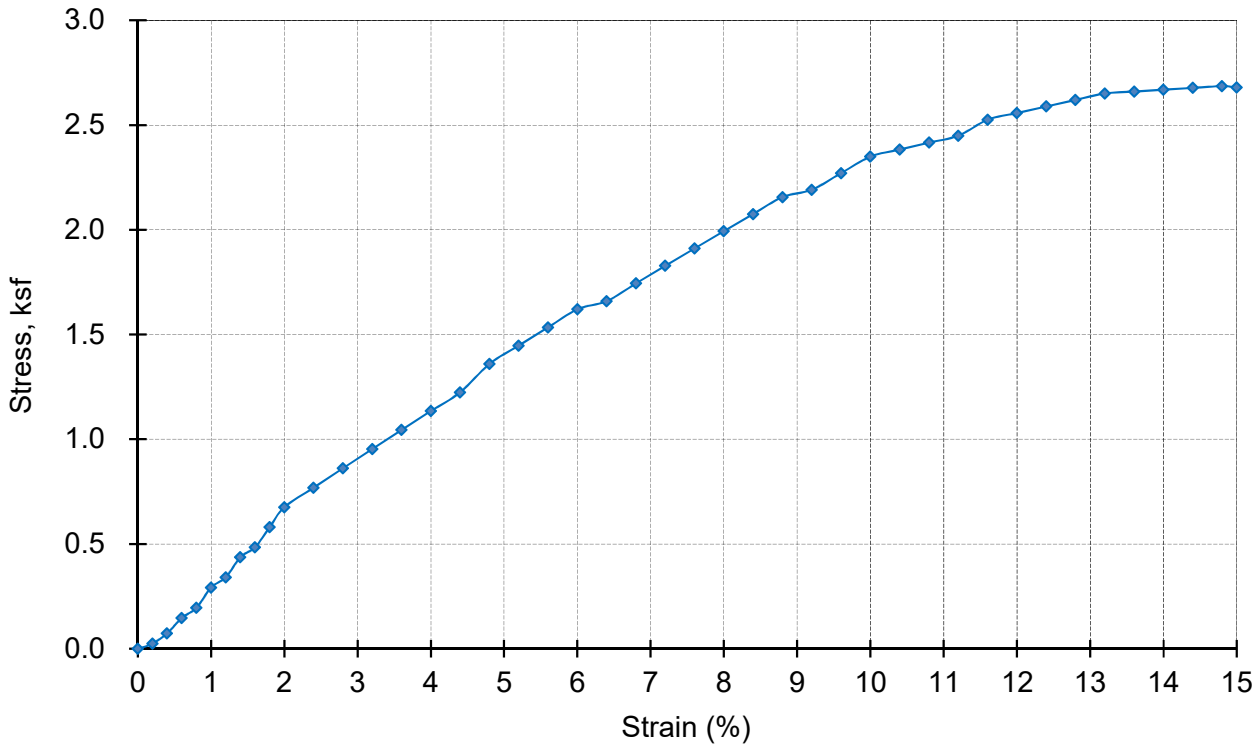
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4EX

UNCONFINED COMPRESSION TEST



Boring No.:	AS-84	**Unconfined Compressive Strength (ksf):**	2.69
Sample No. :	13	**Shear Strength (ksf)**	1.34
Depth (feet):	66	**Strain @ Failure (%):**	14.8
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	106
Test Method	ASTM D2166	**Water Content (%):**	21.3
Material Type:	CL		
Material Description:	Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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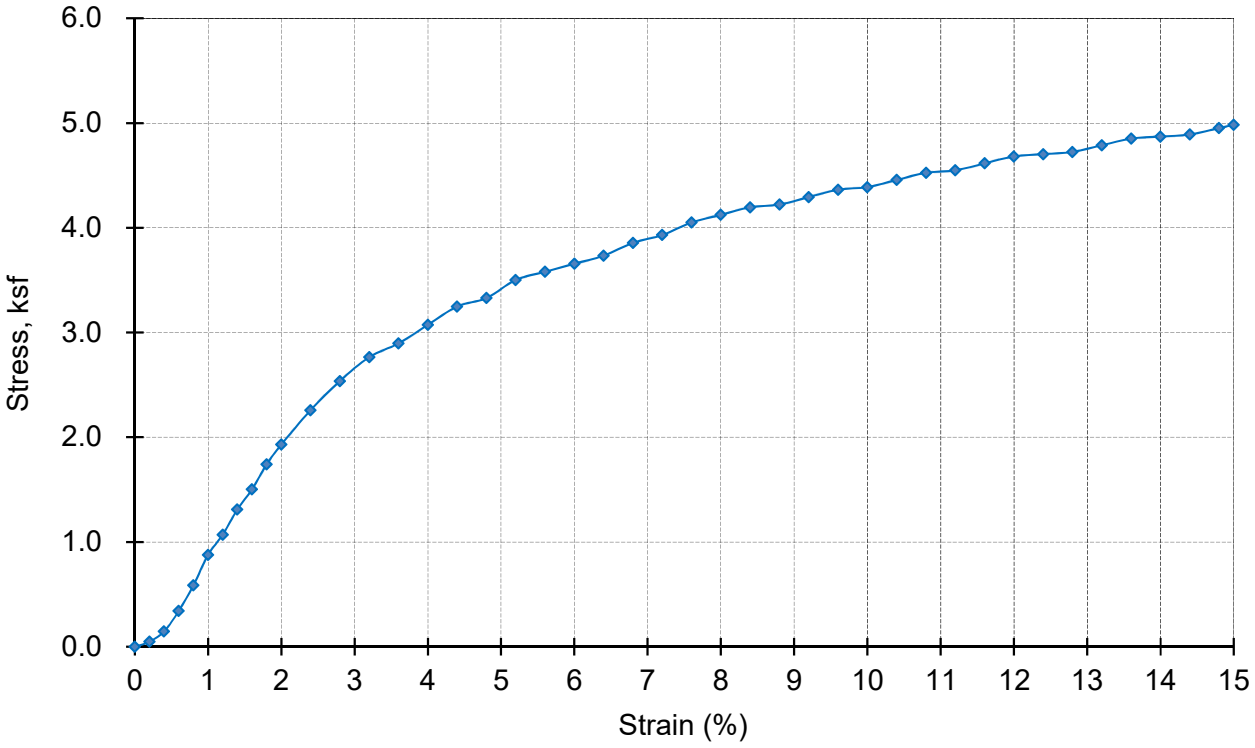
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4EY

UNCONFINED COMPRESSION TEST



Boring No.:	AS-84	**Unconfined Compressive Strength (ksf):**	4.98
Sample No. :	16	**Shear Strength (ksf)**	2.49
Depth (feet):	81	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	103
Test Method	ASTM D2166	**Water Content (%):**	23.2
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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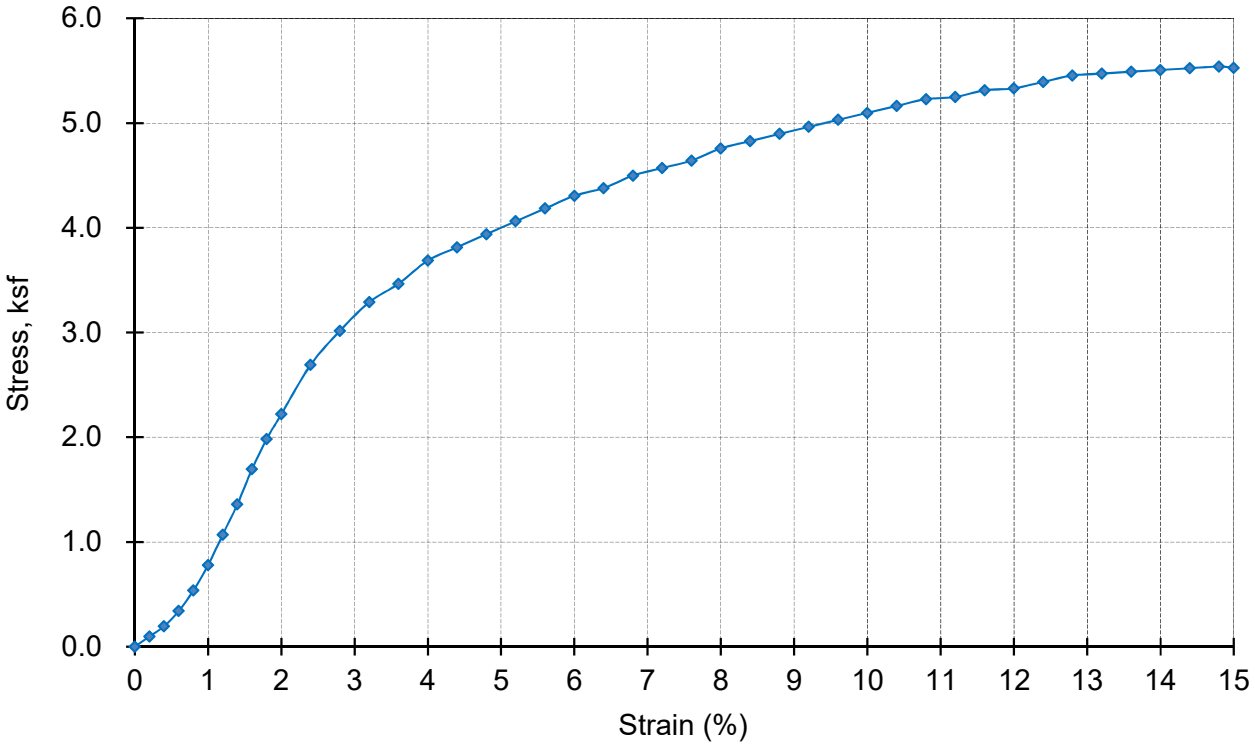
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4EZ

UNCONFINED COMPRESSION TEST



Boring No.:	AS-84	**Unconfined Compressive Strength (ksf):**	5.54
Sample No. :	18	**Shear Strength (ksf)**	2.77
Depth (feet):	101	**Strain @ Failure (%):**	14.8
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	93
Test Method	ASTM D2166	**Water Content (%):**	29.3
Material Type:	CH		
Material Description:	Fat Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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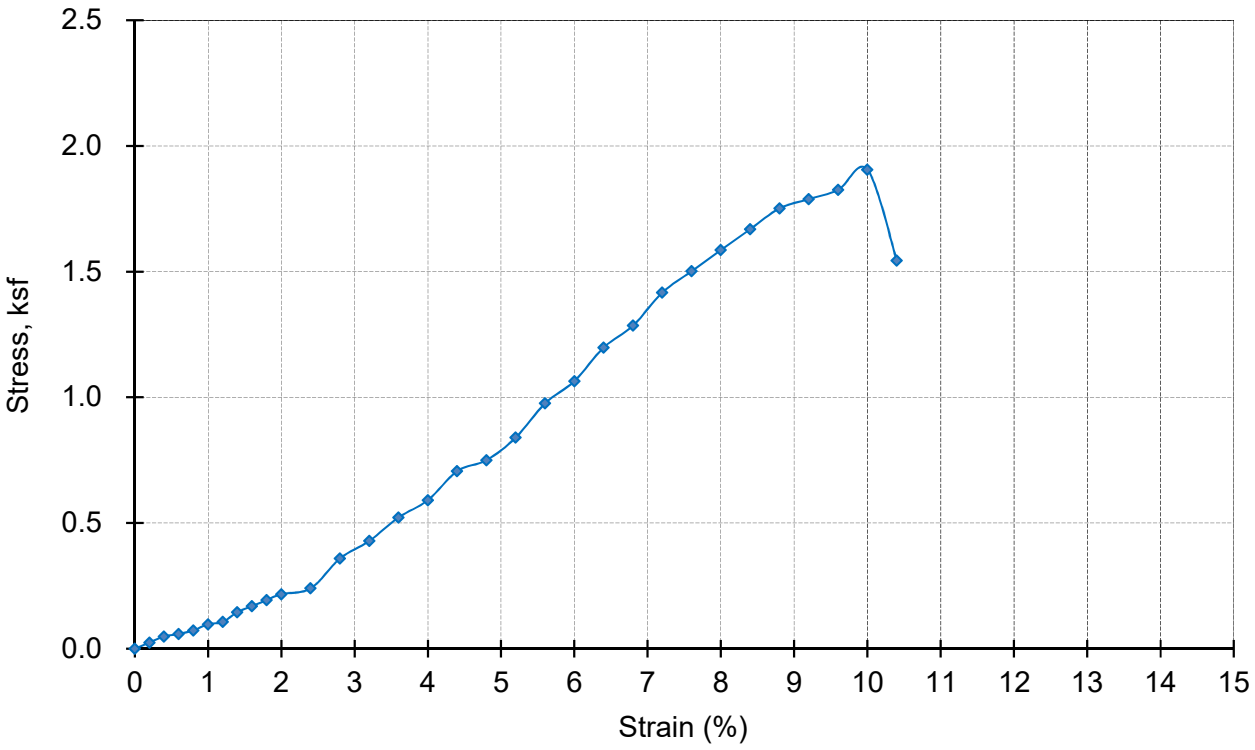
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4FA

UNCONFINED COMPRESSION TEST



Boring No.:	AS-84	**Unconfined Compressive Strength (ksf):**	1.91
Sample No. :	19	**Shear Strength (ksf)**	0.95
Depth (feet):	111	**Strain @ Failure (%):**	10.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	117
Test Method	ASTM D2166	**Water Content (%):**	17.0
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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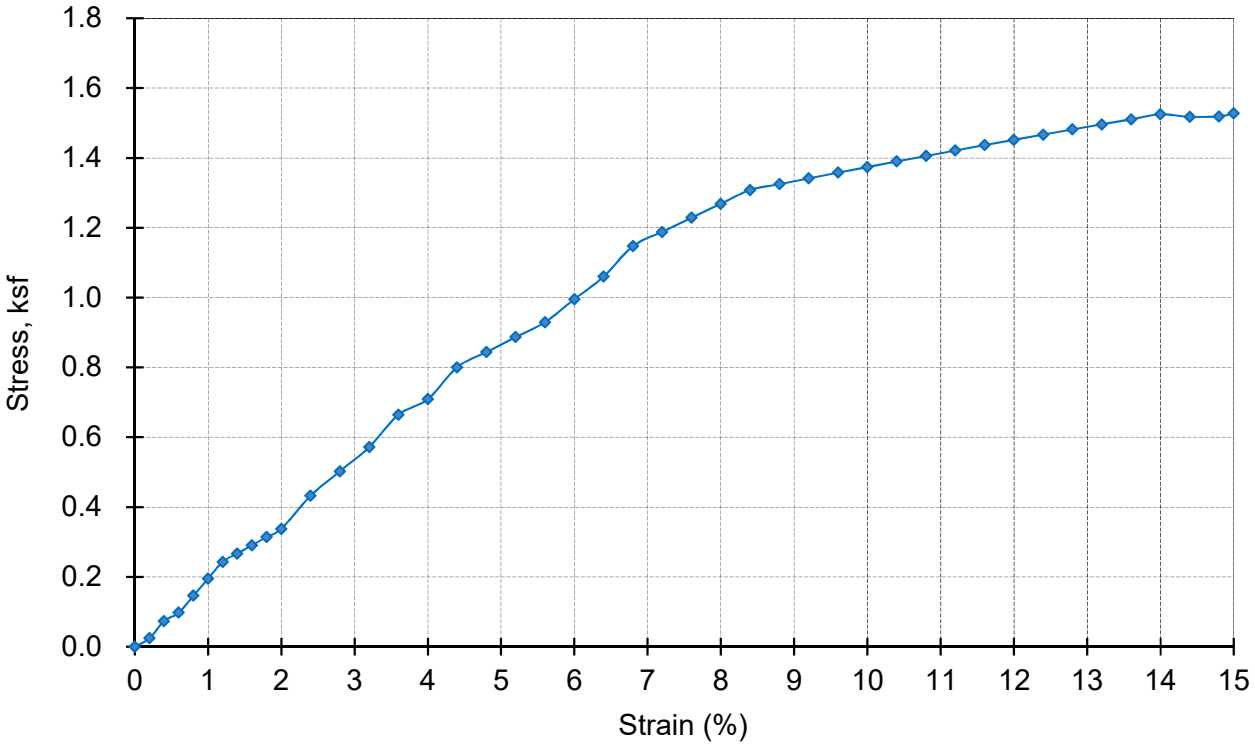
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4FB

UNCONFINED COMPRESSION TEST



Boring No.:	AS-86	**Unconfined Compressive Strength (ksf):**	1.53
Sample No. :	1	**Shear Strength (ksf)**	0.76
Depth (feet):	6	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	106
Test Method	ASTM D2166	**Water Content (%):**	19.2
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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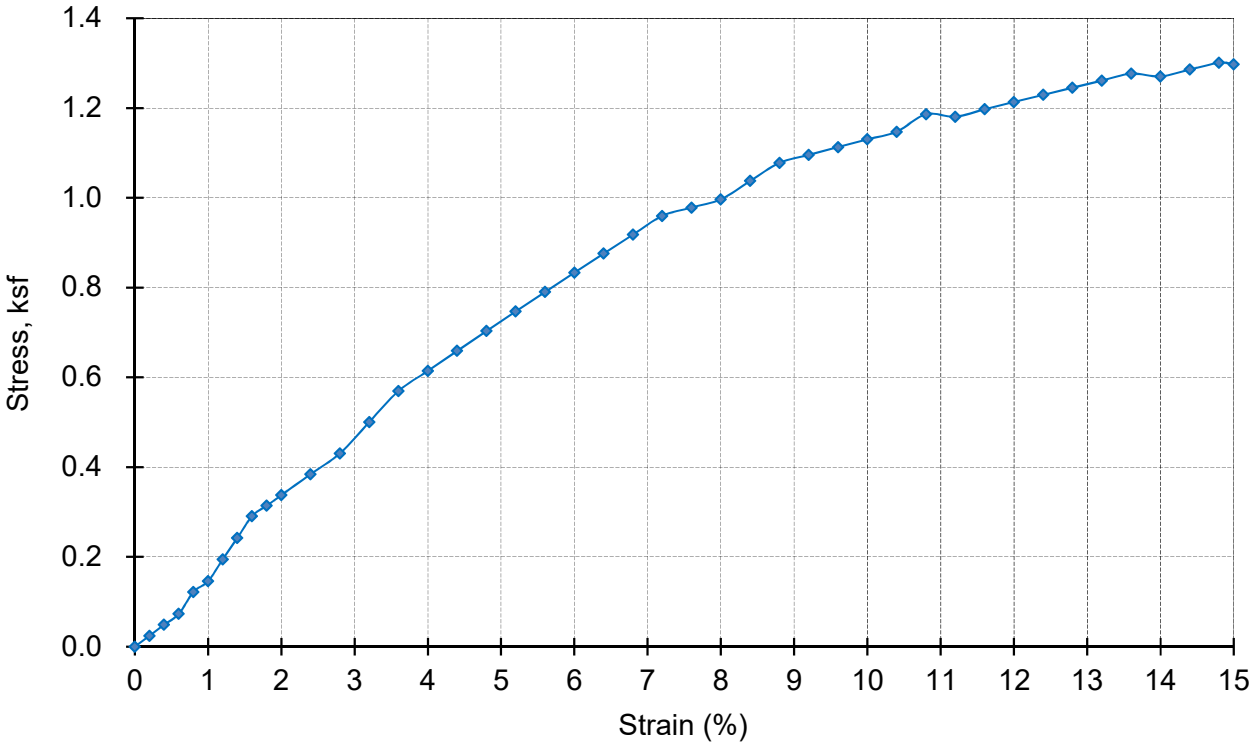
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4FC

UNCONFINED COMPRESSION TEST



Boring No.:	AS-86	**Unconfined Compressive Strength (ksf):**	1.30
Sample No. :	3	**Shear Strength (ksf)**	0.65
Depth (feet):	16	**Strain @ Failure (%):**	14.8
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	102
Test Method	ASTM D2166	**Water Content (%):**	22.7
Material Type:	CL		
Material Description:	Lean Clay with Sand		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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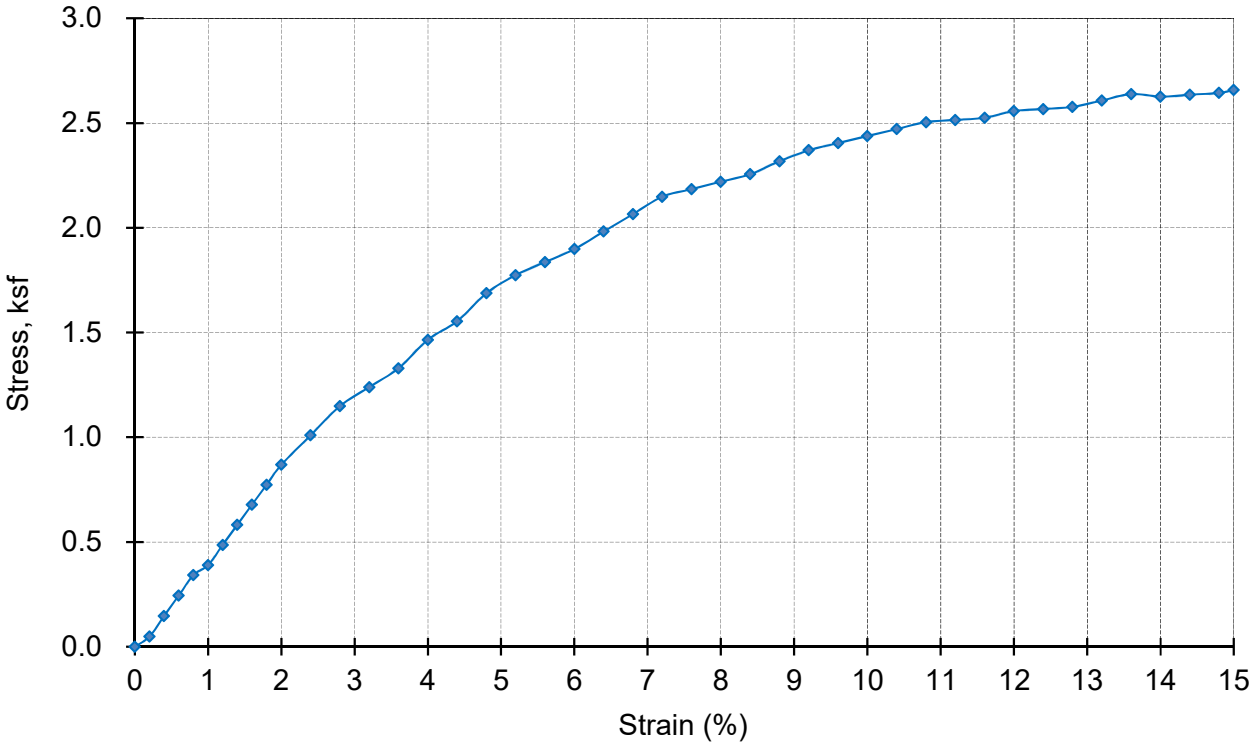
JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4FD

UNCONFINED COMPRESSION TEST



Boring No.:	AS-86	**Unconfined Compressive Strength (ksf):**	2.66
Sample No. :	7	**Shear Strength (ksf)**	1.33
Depth (feet):	36	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	95
Test Method	ASTM D2166	**Water Content (%):**	28.3
Material Type:	CL		
Material Description:	Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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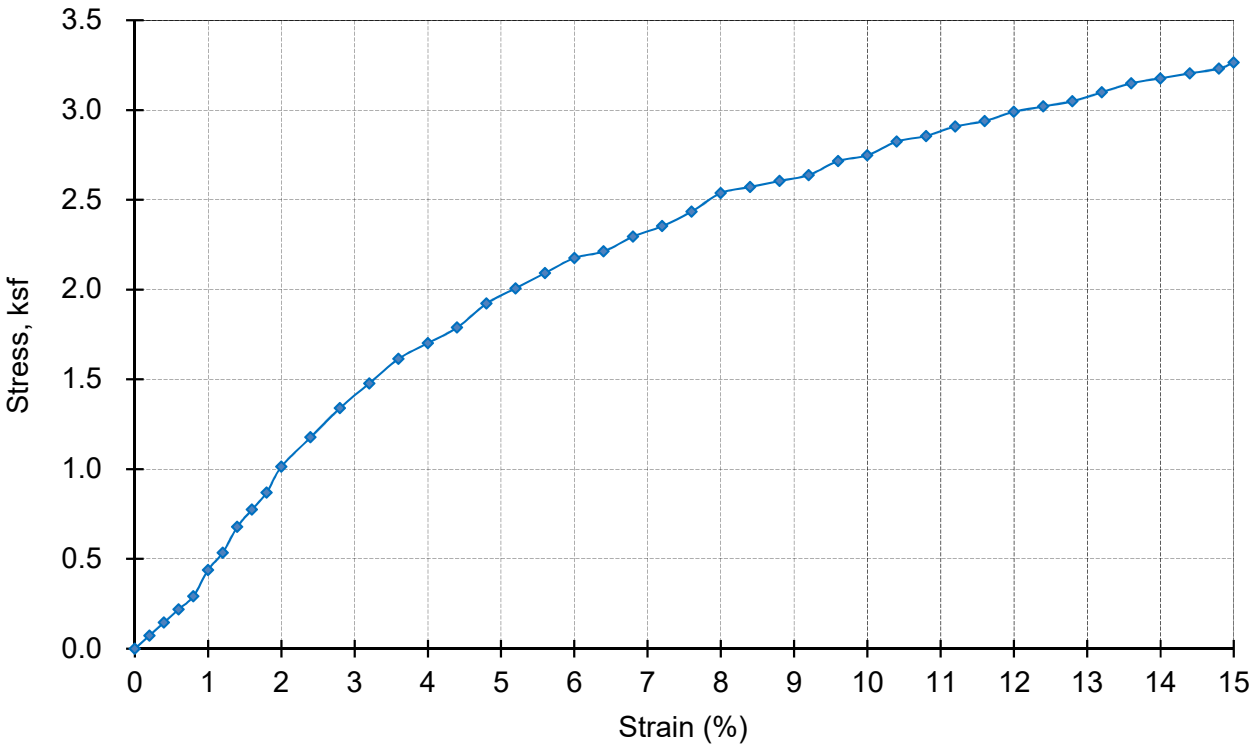
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4FE

UNCONFINED COMPRESSION TEST



Boring No.:	AS-86	**Unconfined Compressive Strength (ksf):**	3.27
Sample No. :	12	**Shear Strength (ksf)**	1.63
Depth (feet):	61	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	104
Test Method	ASTM D2166	**Water Content (%):**	22.2
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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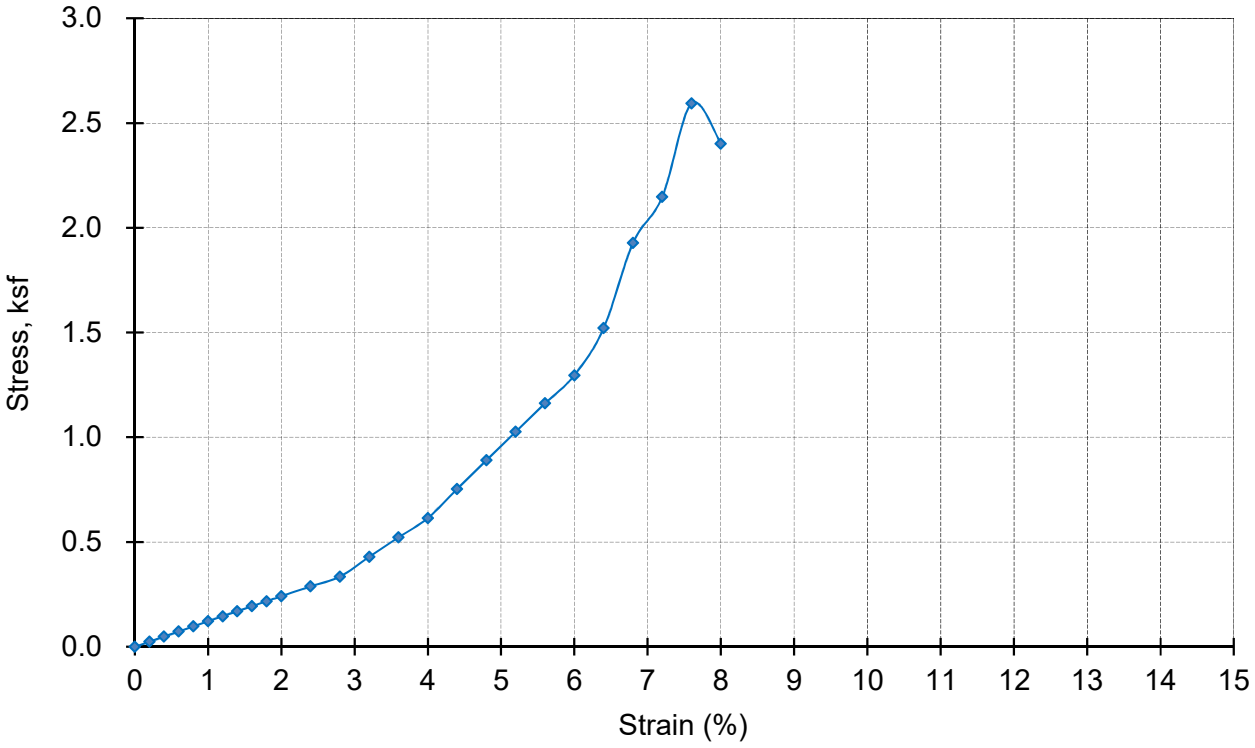
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4FF

UNCONFINED COMPRESSION TEST



Boring No.:	AS-86	**Unconfined Compressive Strength (ksf):**	2.59
Sample No. :	17	**Shear Strength (ksf)**	1.30
Depth (feet):	91	**Strain @ Failure (%):**	7.6
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	104
Test Method	ASTM D2166	**Water Content (%):**	22.1
Material Type:	ML		
Material Description:	Silt with Sand		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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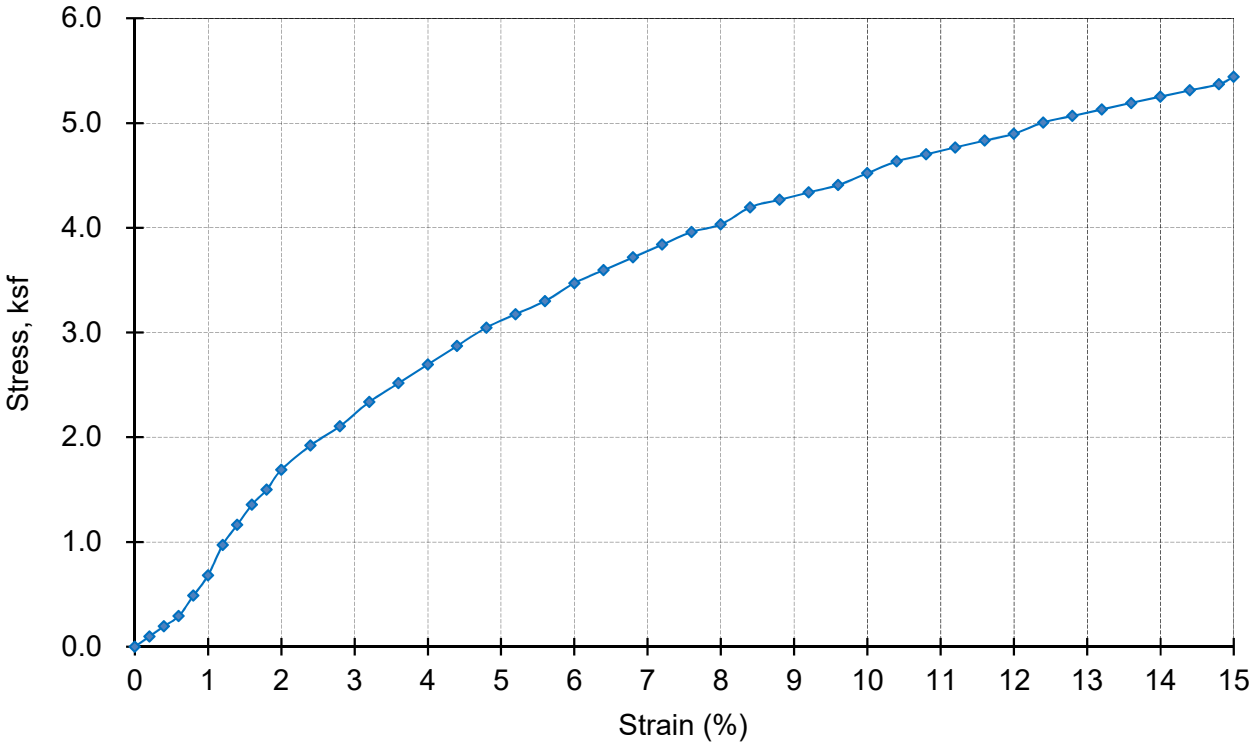
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4FG

UNCONFINED COMPRESSION TEST



Boring No.:	AS-86	**Unconfined Compressive Strength (ksf):**	5.44
Sample No. :	19	**Shear Strength (ksf)**	2.72
Depth (feet):	111	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	113
Test Method	ASTM D2166	**Water Content (%):**	17.4
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

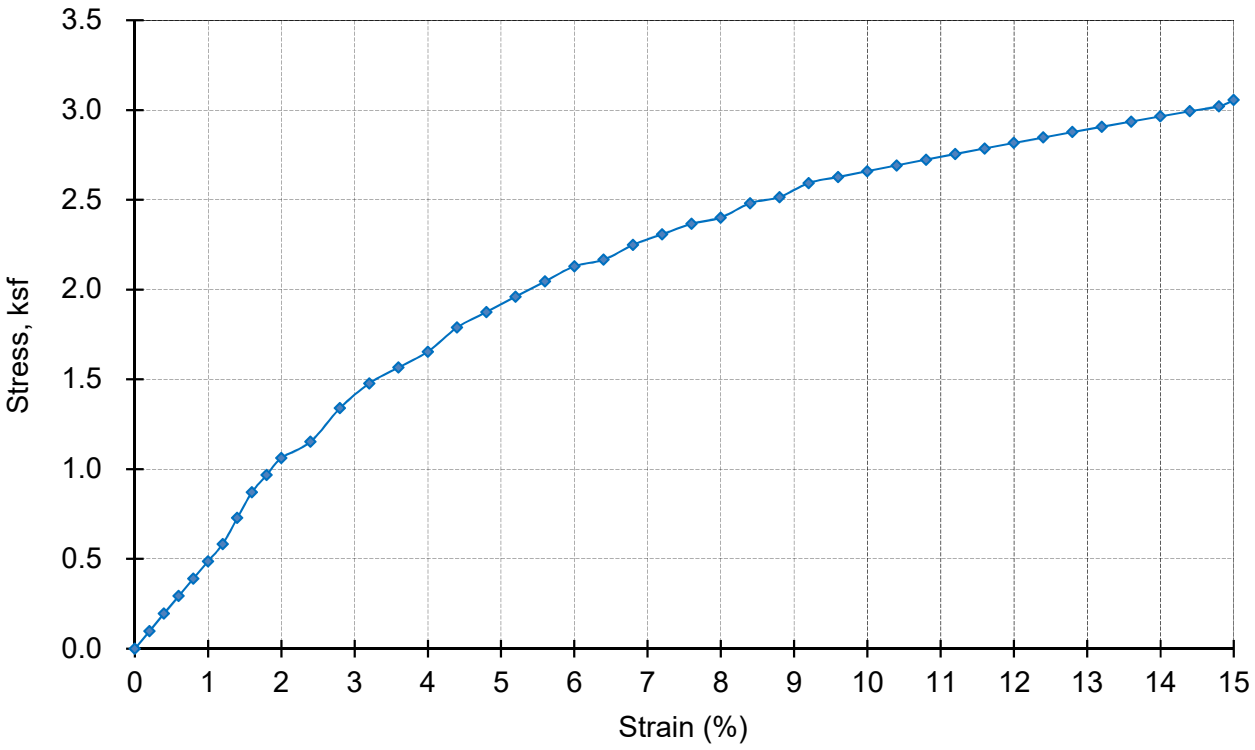
Remarks:

PARIKH
Practicing in the Geosciences

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4FH**

UNCONFINED COMPRESSION TEST



Boring No.:	AS-88	**Unconfined Compressive Strength (ksf):**	3.06
Sample No. :	4	**Shear Strength (ksf)**	1.53
Depth (feet):	21	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	95
Test Method	ASTM D2166	**Water Content (%):**	28.9
Material Type:	CL/CH		
Material Description:	Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

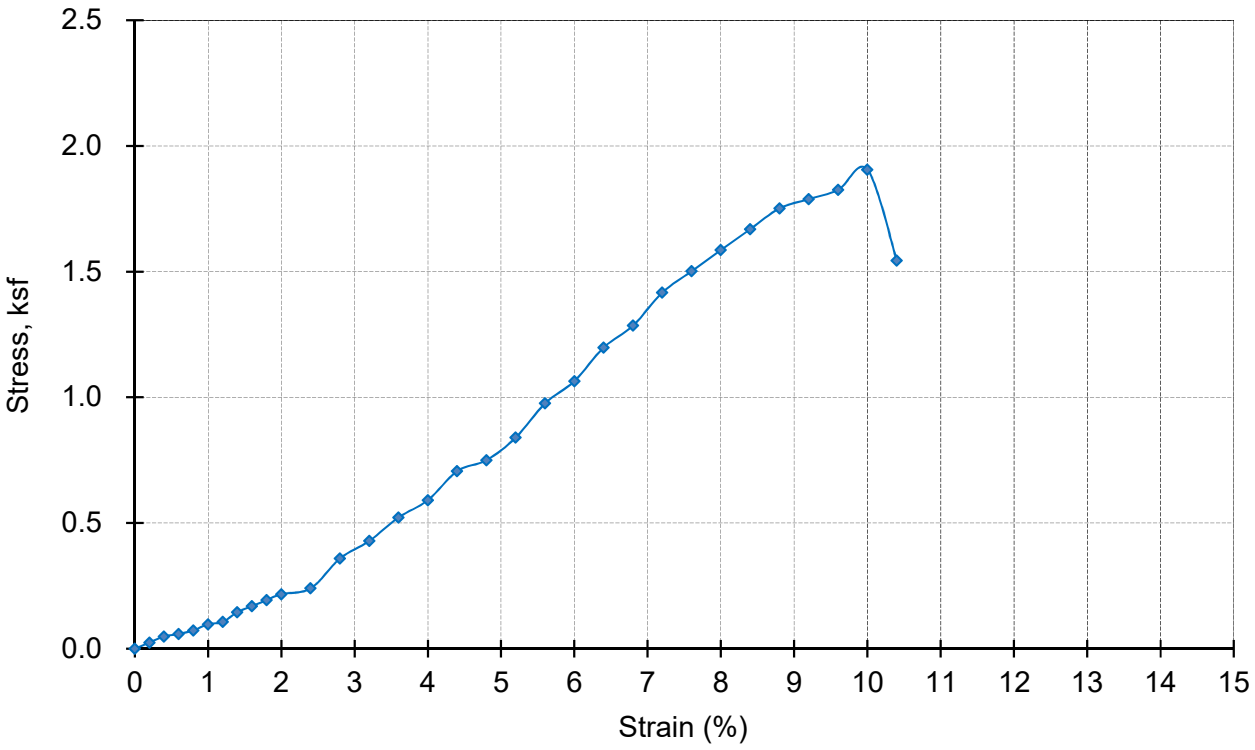
Remarks:

PARIKH
Practicing in the Geosciences

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4FI

UNCONFINED COMPRESSION TEST



Boring No.:	AS-88	**Unconfined Compressive Strength (ksf):**	1.91
Sample No. :	5	**Shear Strength (ksf)**	0.95
Depth (feet):	26	**Strain @ Failure (%):**	10.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	97
Test Method	ASTM D2166	**Water Content (%):**	26.3
Material Type:	ML		
Material Description:	Silt with Sand		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

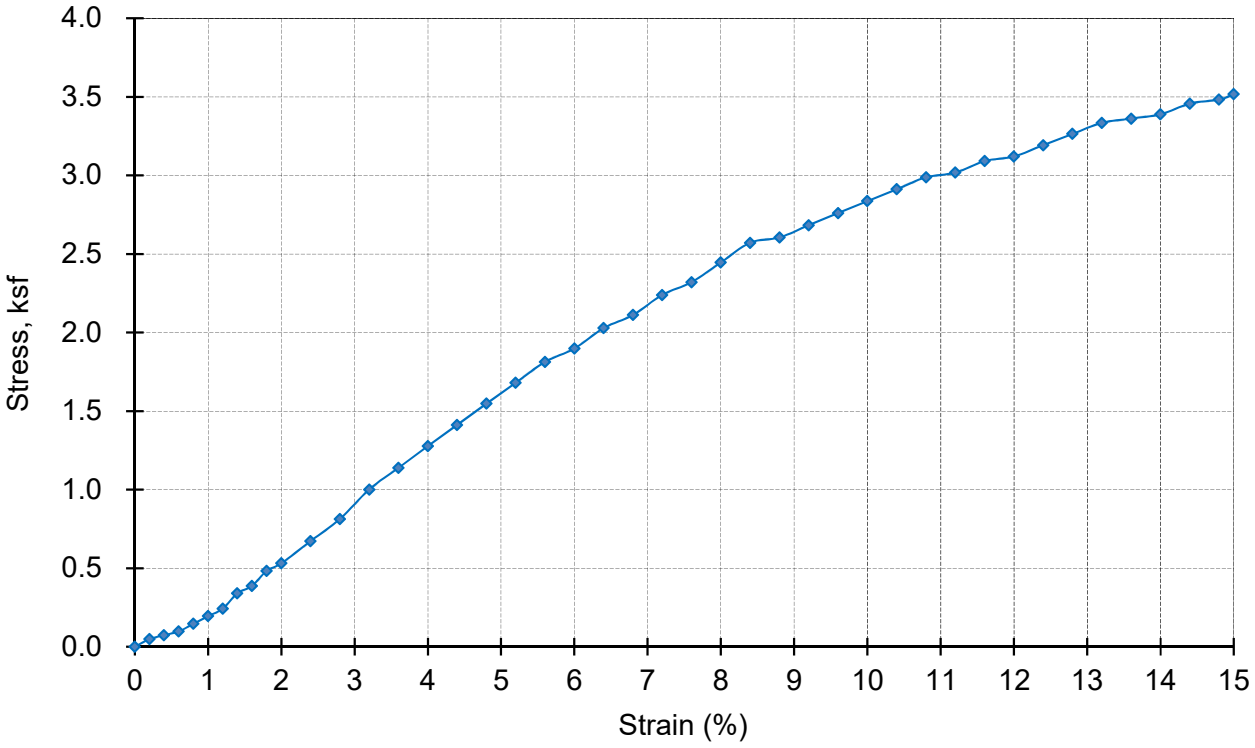
Remarks:

PARIKH
Practicing in the Geosciences

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4FJ**

UNCONFINED COMPRESSION TEST



Boring No.:	AS-88	**Unconfined Compressive Strength (ksf):**	3.52
Sample No. :	6	**Shear Strength (ksf)**	1.76
Depth (feet):	31	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	94
Test Method	ASTM D2166	**Water Content (%):**	29.0
Material Type:	CH		
Material Description:	Fat Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

PARIKH
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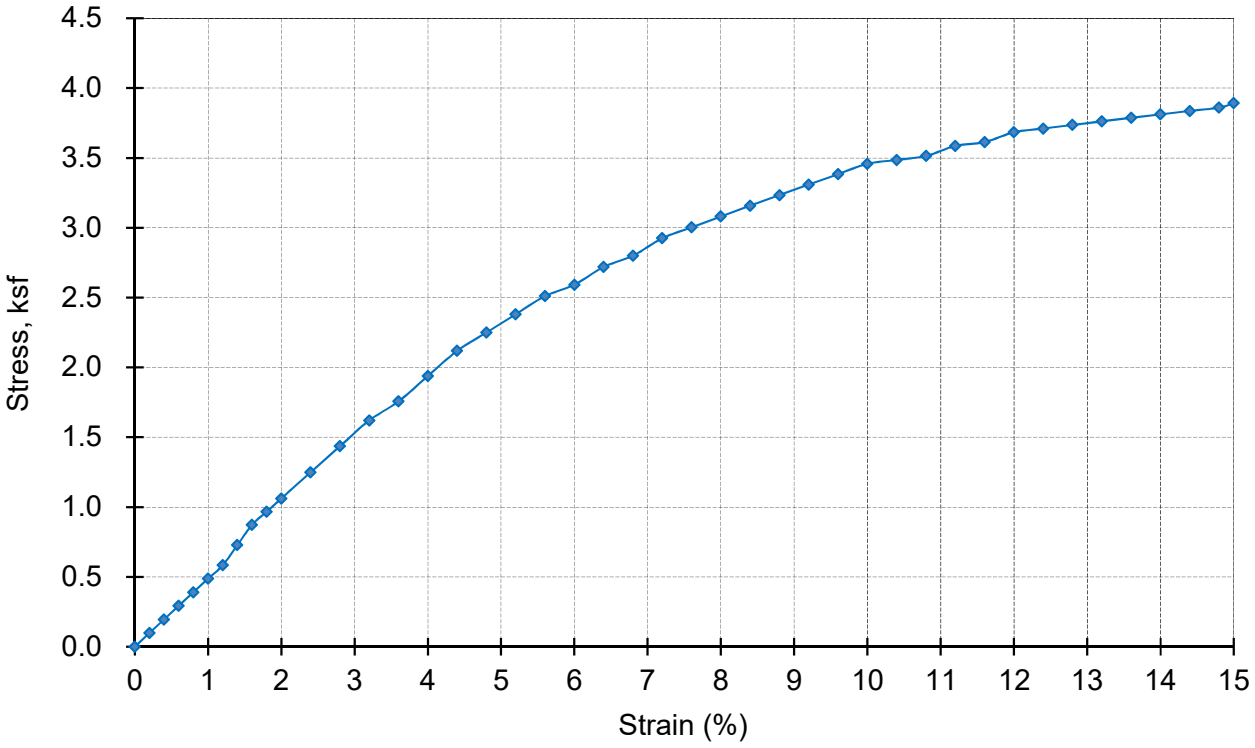
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4FK

UNCONFINED COMPRESSION TEST



Boring No.:	AS-88	**Unconfined Compressive Strength (ksf):**	3.89
Sample No. :	7	**Shear Strength (ksf)**	1.95
Depth (feet):	36	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	96
Test Method	ASTM D2166	**Water Content (%):**	27.2
Material Type:	CH		
Material Description:	Fat Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

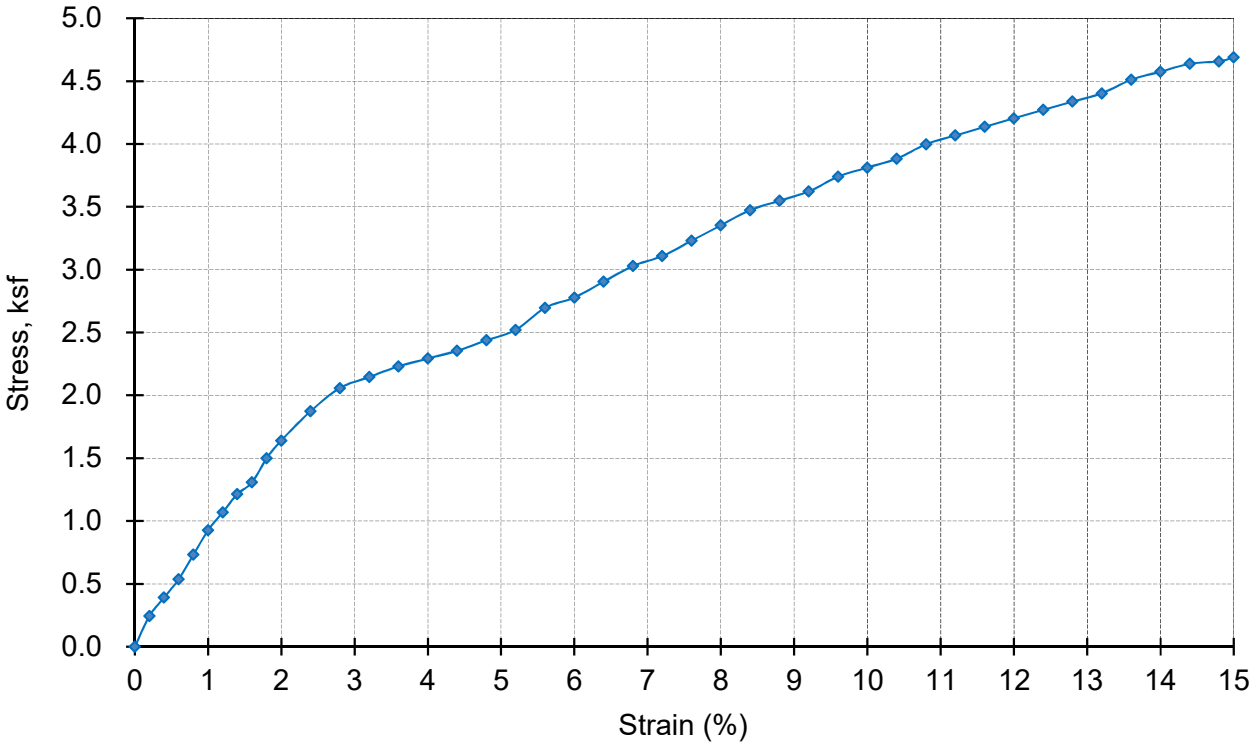
Remarks:

PARIKH
Practicing in the Geosciences

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4FL

UNCONFINED COMPRESSION TEST



Boring No.:	AS-88	**Unconfined Compressive Strength (ksf):**	4.69
Sample No. :	17	**Shear Strength (ksf)**	2.34
Depth (feet):	91	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	112
Test Method	ASTM D2166	**Water Content (%):**	17.8
Material Type:	CL		
Material Description:	Sandy Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

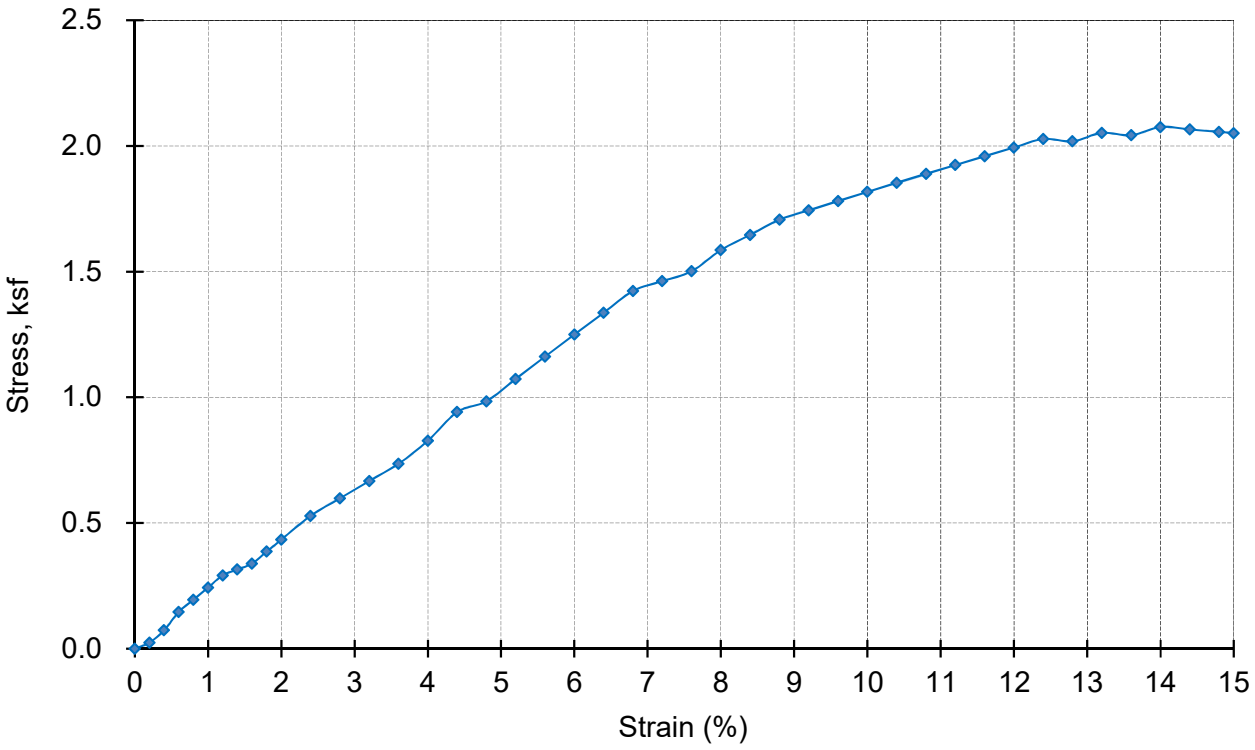
Remarks:

PARIKH
Practicing in the Geosciences

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4FM

UNCONFINED COMPRESSION TEST



Boring No.:	AS-88	**Unconfined Compressive Strength (ksf):**	2.08
Sample No. :	19	**Shear Strength (ksf)**	1.04
Depth (feet):	111	**Strain @ Failure (%):**	14.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	101
Test Method	ASTM D2166	**Water Content (%):**	21.7
Material Type:	CL		
Material Description:	Lean Clay		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

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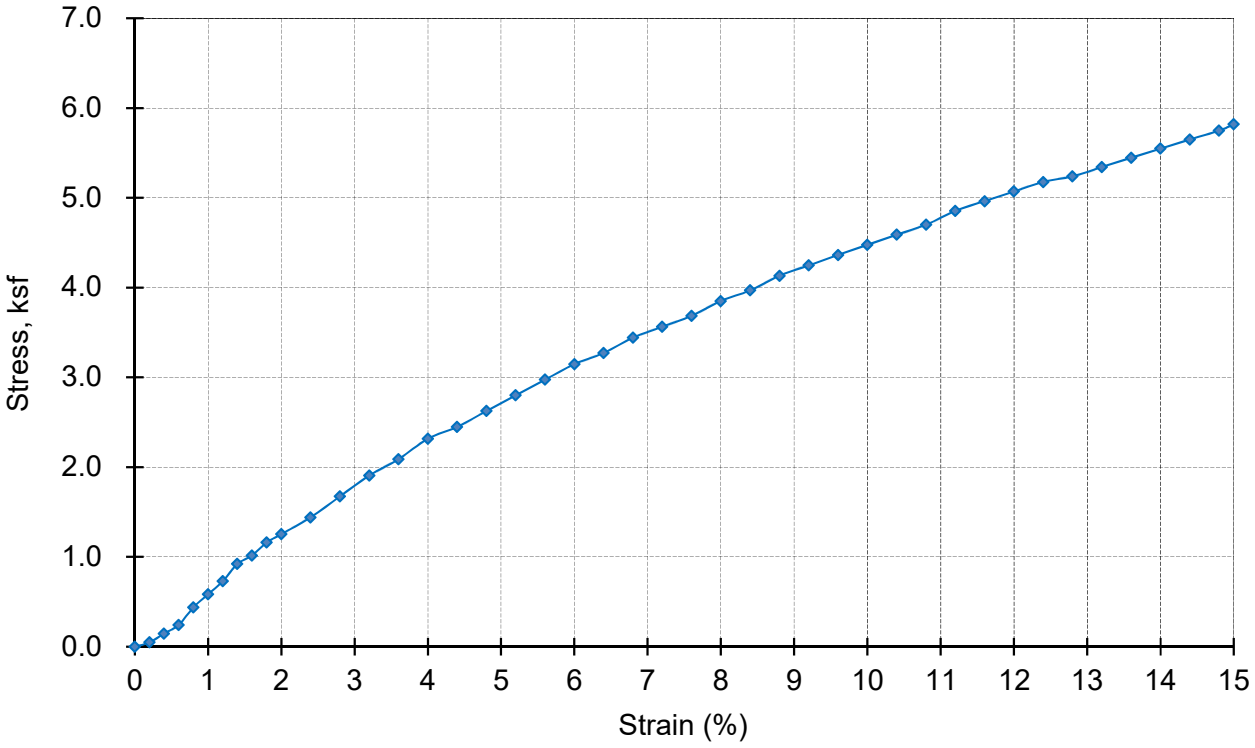
EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4FN

UNCONFINED COMPRESSION TEST



Boring No.:	AS-88	**Unconfined Compressive Strength (ksf):**	5.82
Sample No. :	20	**Shear Strength (ksf)**	2.91
Depth (feet):	121	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	113
Test Method	ASTM D2166	**Water Content (%):**	18.0
Material Type:	CL		
Material Description:	Lean Clay with Sand		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

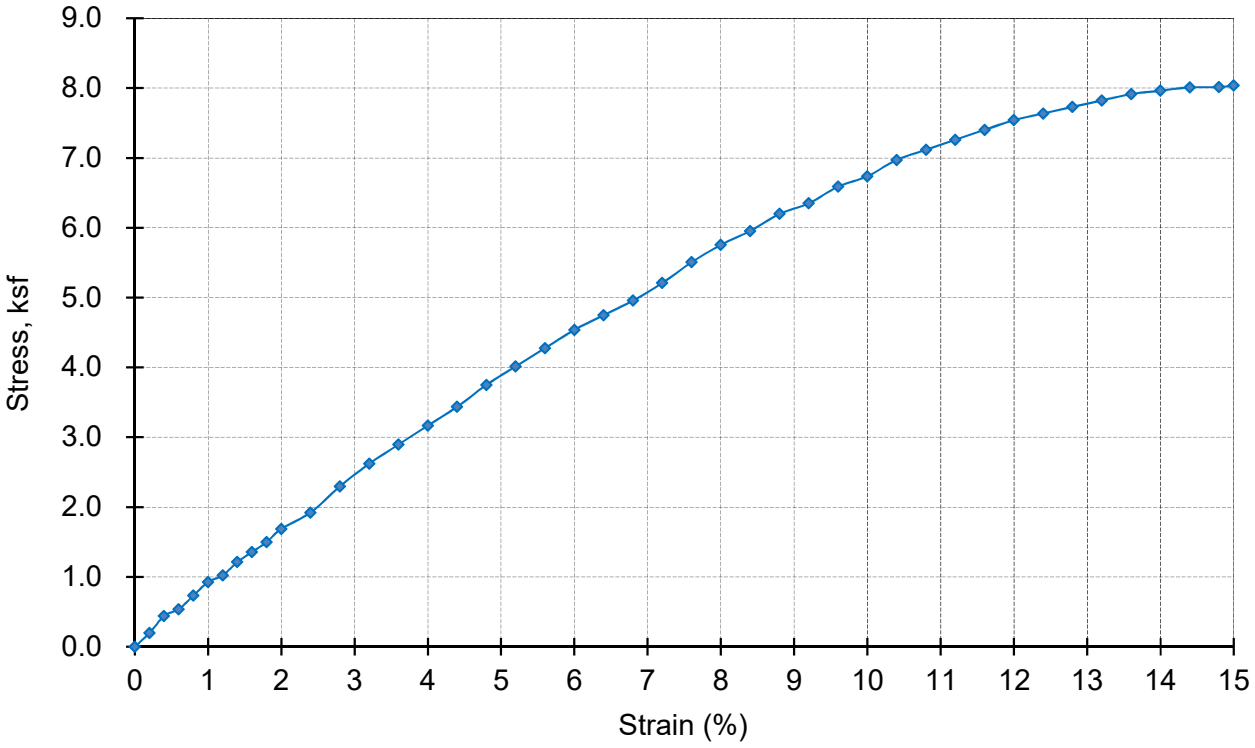
Remarks:

PARIKH
Practicing in the Geosciences

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.: IV-4FO**

UNCONFINED COMPRESSION TEST



Boring No.:	AS-88	**Unconfined Compressive Strength (ksf):**	8.04
Sample No. :	21	**Shear Strength (ksf)**	4.02
Depth (feet):	131	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	107
Test Method	ASTM D2166	**Water Content (%):**	20.7
Material Type:	CL		
Material Description:	Lean Clay with Sand		
Initial Height (inch):	5.00		
Initial Diameter (inch):	2.42		
Initial Area (ft^2):	0.032		
Strain Rate (inch/min):	0.1		

Remarks:

PARIKH
Practicing in the Geosciences

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

JOB NO.: 2017-125-GEO | **PLATE NO.:** IV-4FP

CORROSION TEST (SOIL SAMPLE)

Sunland Analytical
11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 05/11/2005
Date Submitted 05/04/2005

To: Prav Dayah
Parikh Consultants, Inc.
356 S. Milpitas Blvd.
Milpitas, Ca 95035

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 204125.10/CAP.EXP. Site ID : AS-1 #5 @ 26'.
Thank you for your business.

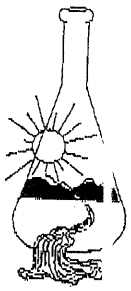
* For future reference to this analysis please use SUN # 44530-87754.

EVALUATION FOR SOIL CORROSION

Soil pH	7.10	
Minimum Resistivity	2.09 ohm-cm (x1000)	
Chloride	33.8 ppm	00.00338 %
Sulfate	30.1 ppm	00.00301 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5A



Sunland Analytical
11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 11/15/2006
Date Submitted 11/08/2006

To: Prav Dayah
Parikh Consultants, Inc.
356 S. Milpitas Blvd.
Milpitas, Ca 95035

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 204125.FD1 CAP EXPRE Site ID : AS-2#5@20'.
Thank you for your business.

* For future reference to this analysis please use SUN # 49312-98312.

EVALUATION FOR SOIL CORROSION

Soil pH	7.69	
Minimum Resistivity	1.10 ohm-cm (x1000)	
Chloride	44.9 ppm	00.00449 %
Sulfate	85.0 ppm	00.00850 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5B

Sunland Analytical
11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 05/18/2005
Date Submitted 05/13/2005

To: Prav Dayah
Parikh Consultants, Inc.
356 S. Milpitas Blvd.
Milpitas, Ca 95035

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 204125.10/CAP.EXPRS Site ID : AS-4 #3 @ 11'.
Thank you for your business.

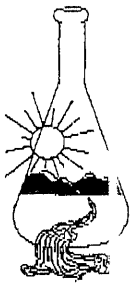
* For future reference to this analysis please use SUN # 44625-88004.

EVALUATION FOR SOIL CORROSION

Soil pH	7.95	
Minimum Resistivity	1.98 ohm-cm (x1000)	
Chloride	31.6 ppm	00.00316 %
Sulfate	38.8 ppm	00.00388 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5C



Sunland Analytical

11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 11/15/2006
Date Submitted 11/08/2006

To: Prav Dayah
Parikh Consultants, Inc.
356 S. Milpitas Blvd.
Milpitas, Ca 95035

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 204125.FD1 CAP EXPRE Site ID : AS-7#6@25'.
Thank you for your business.

* For future reference to this analysis please use SUN # 49312-98313.

EVALUATION FOR SOIL CORROSION

Soil pH	8.18		
Minimum Resistivity	0.56	ohm-cm (x1000)	
Chloride	39.7 ppm	00.00397	%
Sulfate	110.2 ppm	00.01102	%

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5D

Sunland Analytical
11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 05/11/2005
Date Submitted 05/04/2005

To: Prav Dayah
Parikh Consultants, Inc.
356 S. Milpitas Blvd.
Milpitas, Ca 95035

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 204125.10/CAP.EXP. Site ID : AS-11 #4 @ 16'.
Thank you for your business.

* For future reference to this analysis please use SUN # 44530-87753.

EVALUATION FOR SOIL CORROSION

Soil pH	7.85	
Minimum Resistivity	1.34 ohm-cm (x1000)	
Chloride	26.3 ppm	00.00263 %
Sulfate	37.8 ppm	00.00378 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5E

Sunland Analytical
11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 05/18/2005
Date Submitted 05/13/2005

To: Prav Dayah
Parikh Consultants, Inc.
356 S. Milpitas Blvd.
Milpitas, Ca 95035

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 204125.10/CAP.EXPRS Site ID : AS-15 #2 @ 6'.
Thank you for your business.

* For future reference to this analysis please use SUN # 44625-88003.

EVALUATION FOR SOIL CORROSION

Soil pH	7.52		
Minimum Resistivity	0.86	ohm-cm (x1000)	
Chloride	53.8 ppm	00.00538	%
Sulfate	6.2 ppm	00.00062	%

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5F

Sunland Analytical
11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 05/11/2005
Date Submitted 05/04/2005

To: Prav Dayah
Parikh Consultants, Inc.
356 S. Milpitas Blvd.
Milpitas, Ca 95035

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager RA

The reported analysis was requested for the following location:
Location : 204125.10/CAP.EXP. Site ID : AS-17 #3 @ 11'.
Thank you for your business.

* For future reference to this analysis please use SUN # 44530-87755.

EVALUATION FOR SOIL CORROSION

Soil pH	8.21	
Minimum Resistivity	1.85 ohm-cm (x1000)	
Chloride	44.9 ppm	00.00449 %
Sulfate	30.1 ppm	00.00301 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5G

Sunland Analytical
11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 05/25/2005
Date Submitted 05/18/2005

To: Prav Dayah
Parikh Consultants, Inc.
356 S. Milpitas Blvd.
Milpitas, Ca 95035

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager RH

The reported analysis was requested for the following location:
Location : 204125.10/CAPITOL EX Site ID : PS-21 #4 @ 14.5.
Thank you for your business.

* For future reference to this analysis please use SUN # 44671-88124.

EVALUATION FOR SOIL CORROSION

Soil pH	8.35	
Minimum Resistivity	0.13 ohm-cm (x1000)	
Chloride	1216.7 ppm	00.12167 %
Sulfate	1785.1 ppm	00.17851 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5H

Sunland Analytical
11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 05/25/2005
Date Submitted 05/18/2005

To: Prav Dayah
Parikh Consultants, Inc.
356 S. Milpitas Blvd.
Milpitas, Ca 95035

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 204125.10/CAPITOL EX Site ID : AS-24 #4 @ 16'.
Thank you for your business.

* For future reference to this analysis please use SUN # 44671-88122.

EVALUATION FOR SOIL CORROSION

Soil pH	7.63	
Minimum Resistivity	0.46 ohm-cm (x1000)	
Chloride	371.2 ppm	00.03712 %
Sulfate	19.4 ppm	00.00194 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5I

Sunland Analytical
11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 11/17/2006
Date Submitted 11/14/2006

To: Prav Dayah
Parikh Consultants, Inc.
356 S. Milpitas Blvd.
Milpitas, Ca 95035

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 204125.FD1/CAPITOL Site ID : AS25#5@20'.
Thank you for your business.

* For future reference to this analysis please use SUN # 49345-98395.

EVALUATION FOR SOIL CORROSION

Soil pH	8.51		
Minimum Resistivity	0.78	ohm-cm (x1000)	
Chloride	193.8 ppm	00.01938	%
Sulfate	148.4 ppm	00.01484	%

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5J

Sunland Analytical
11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 05/25/2005
Date Submitted 05/18/2005

To: Prav Dayah
Parikh Consultants, Inc.
356 S. Milpitas Blvd.
Milpitas, Ca 95035

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 204125.10/CAPITOL EX Site ID : AS-29 #4 @ 16'.
Thank you for your business.

* For future reference to this analysis please use SUN # 44671-88123.

EVALUATION FOR SOIL CORROSION

Soil pH	7.98	
Minimum Resistivity	1.02 ohm-cm (x1000)	
Chloride	97.4 ppm	00.00974 %
Sulfate	94.9 ppm	00.00949 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5K

Sunland Analytical
11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 05/25/2005
Date Submitted 05/18/2005

To: Prav Dayah
Parikh Consultants, Inc.
356 S. Milpitas Blvd.
Milpitas, Ca 95035

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 204125.10/CAPITOL EX Site ID : AS-39 #4 @ 11'.
Thank you for your business.

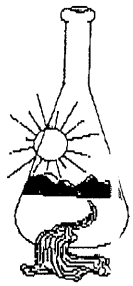
* For future reference to this analysis please use SUN # 44671-88126.

EVALUATION FOR SOIL CORROSION

Soil pH	7.75	
Minimum Resistivity	1.82 ohm-cm (x1000)	
Chloride	44.1 ppm	00.00441 %
Sulfate	37.5 ppm	00.00375 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5L



Sunland Analytical
11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 11/17/2006
Date Submitted 11/14/2006

To: Prav Dayah
Parikh Consultants, Inc.
356 S. Milpitas Blvd.
Milpitas, Ca 95035

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 204125.FD1/CAPITOL Site ID : AS40#6@25'.
Thank you for your business.

* For future reference to this analysis please use SUN # 49345-98394.

EVALUATION FOR SOIL CORROSION

Soil pH	8.21		
Minimum Resistivity	1.13 ohm-cm (x1000)		
Chloride	71.2 ppm	00.00712	%
Sulfate	66.5 ppm	00.00665	%

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5M

Sunland Analytical
11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 05/25/2005
Date Submitted 05/18/2005

To: Prav Dayah
Parikh Consultants, Inc.
356 S. Milpitas Blvd.
Milpitas, Ca 95035

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager RH

The reported analysis was requested for the following location:
Location : 204125.10/CAPITOL EX Site ID : AG-46 #4 @ 14.5.
Thank you for your business.

* For future reference to this analysis please use SUN # 44671-88125.

EVALUATION FOR SOIL CORROSION

Soil pH	7.58	
Minimum Resistivity	1.47 ohm-cm (x1000)	
Chloride	41.4 ppm	00.00414 %
Sulfate	30.9 ppm	00.00309 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5N

Sunland Analytical

11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 09/12/2018
Date Submitted 09/07/2018

To: Nasir Ahmad
Parikh Consultants, Inc.
2360 Qume Dr. Suite A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 2017-125-LAB Site ID : AS-68 2@11FT.
Thank you for your business.

* For future reference to this analysis please use SUN # 77972-163039.

EVALUATION FOR SOIL CORROSION

Soil pH	8.48		
Minimum Resistivity	0.75 ohm-cm (x1000)		
Chloride	38.3 ppm	00.00383	%
Sulfate	232.4 ppm	00.02324	%

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5O

Sunland Analytical

11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 09/12/2018
Date Submitted 09/07/2018

To: Nasir Ahmad
Parikh Consultants, Inc.
2360 Qume Dr. Suite A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 2017-125-LAB Site ID : AS-70 2@11FT.
Thank you for your business.

* For future reference to this analysis please use SUN # 77972-163041.

EVALUATION FOR SOIL CORROSION

Soil pH	8.07	
Minimum Resistivity	1.05 ohm-cm (x1000)	
Chloride	35.8 ppm	00.00358 %
Sulfate	102.5 ppm	00.01025 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5P

Sunland Analytical

11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 09/12/2018
Date Submitted 09/07/2018

To: Nasir Ahmad
Parikh Consultants, Inc.
2360 Qume Dr. Suite A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 2017-125-LAB Site ID : AS-72 2@11FT.
Thank you for your business.

* For future reference to this analysis please use SUN # 77972-163043.

EVALUATION FOR SOIL CORROSION

Soil pH	8.76	
Minimum Resistivity	1.23 ohm-cm (x1000)	
Chloride	23.3 ppm	00.00233 %
Sulfate	42.3 ppm	00.00423 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5Q

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 09/19/2018
Date Submitted 09/14/2018

To: Nasir Ahmad
Parikh Consultants, Inc.
2360 Qume Dr. Suite A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 2017-125-GEO Site ID : AS-74 4@21FT.
Thank you for your business.

* For future reference to this analysis please use SUN # 78040-163192.

EVALUATION FOR SOIL CORROSION

Soil pH	8.14	
Minimum Resistivity	1.10 ohm-cm (x1000)	
Chloride	31.5 ppm	00.00315 %
Sulfate	102.9 ppm	00.01029 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5R

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 09/05/2018
Date Submitted 08/29/2018

To: Nasir Ahmad
Parikh Consultants, Inc.
2360 Qume Dr. Suite A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 2017-125-GEO Site ID : AS-76 3@16FT.
Thank you for your business.

* For future reference to this analysis please use SUN # 77926-162926.

EVALUATION FOR SOIL CORROSION

Soil pH	8.15		
Minimum Resistivity	0.12 ohm-cm (x1000)		
Chloride	984.1 ppm	00.09841	%
Sulfate	2754.4 ppm	00.27544	%

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5S

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 09/19/2018
Date Submitted 09/14/2018

To: Nasir Ahmad
Parikh Consultants, Inc.
2360 Qume Dr. Suite A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 2017-125-GEO Site ID : AS-78 2@11FT.
Thank you for your business.

* For future reference to this analysis please use SUN # 78040-163193.

EVALUATION FOR SOIL CORROSION

Soil pH	7.91		
Minimum Resistivity	0.06 ohm-cm (x1000)		
Chloride	1380.8 ppm	00.13808	%
Sulfate	5698.6 ppm	00.56986	%

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5T

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 09/05/2018
Date Submitted 08/29/2018

To: Nasir Ahmad
Parikh Consultants, Inc.
2360 Qume Dr. Suite A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 2017-125-GEO Site ID : AS-80 2@11FT.
Thank you for your business.

* For future reference to this analysis please use SUN # 77926-162924.

EVALUATION FOR SOIL CORROSION

Soil pH	8.04	
Minimum Resistivity	0.06 ohm-cm (x1000)	
Chloride	2124.0 ppm	00.21240 %
Sulfate	7928.0 ppm	00.79280 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5U

Sunland Analytical

11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 08/29/2018
Date Submitted 08/22/2018

To: Nasir Ahmad
Parikh Consultants, Inc.
2360 Qume Dr. Suite A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 2017-125-GEO Site ID : AS-82 2@11FT.
Thank you for your business.

* For future reference to this analysis please use SUN # 77882-162822.

EVALUATION FOR SOIL CORROSION

Soil pH	8.38	
Minimum Resistivity	0.06 ohm-cm (x1000)	
Chloride	1784.0 ppm	00.17840 %
Sulfate	3580.4 ppm	00.35804 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5V

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 09/19/2018
Date Submitted 09/14/2018

To: Nasir Ahmad
Parikh Consultants, Inc.
2360 Qume Dr. Suite A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 2017-125-GEO Site ID : AS-84 1@6FT.
Thank you for your business.

* For future reference to this analysis please use SUN # 78040-163194.

EVALUATION FOR SOIL CORROSION

Soil pH	9.09	
Minimum Resistivity	0.27 ohm-cm (x1000)	
Chloride	238.7 ppm	00.02387 %
Sulfate	1058.6 ppm	00.10586 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5W

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 08/29/2018
Date Submitted 08/22/2018

To: Nasir Ahmad
Parikh Consultants, Inc.
2360 Qume Dr. Suite A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 2017-125-GEO Site ID : AS-86 2@11FT.
Thank you for your business.

* For future reference to this analysis please use SUN # 77882-162824.

EVALUATION FOR SOIL CORROSION

Soil pH	8.19	
Minimum Resistivity	0.48 ohm-cm (x1000)	
Chloride	116.8 ppm	00.01168 %
Sulfate	211.6 ppm	00.02116 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5X

Sunland Analytical

11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 08/24/2018
Date Submitted 08/21/2018

To: Nasir Ahmad
Parikh Consultants, Inc.
2360 Qume Dr. Suite A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 2017-125-GEO Site ID : AS-88 3@16FT.
Thank you for your business.

* For future reference to this analysis please use SUN # 77865-162772.

EVALUATION FOR SOIL CORROSION

Soil pH	8.42	
Minimum Resistivity	0.32 ohm-cm (x1000)	
Chloride	356.0 ppm	00.03560 %
Sulfate	377.4 ppm	00.03774 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5Y

CORROSION TEST (WATER SAMPLE)

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 09/12/2018
Date Submitted 09/07/2018

To: Nasir Ahmad
Parikh Consultants, Inc.
2360 Qume Dr. Suite A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 2017-125-LAB Site ID : AS-68 WATER.
Thank you for your business.

* For future reference to this analysis please use SUN # 77972-163040.

EVALUATION FOR WATER CORROSION

Soil pH	7.49		
Minimum Resistivity	0.32 ohm-cm (x1000)		
Chloride	164.0 ppm	0.01640	%
Sulfate	802.5ppm	0.08025	%

METHODS
pH and Min.Resistivity CA DOT Test #643 Mod.(Sm.Cell)
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5Z

Sunland Analytical

11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 09/12/2018
Date Submitted 09/07/2018

To: Nasir Ahmad
Parikh Consultants, Inc.
2360 Qume Dr. Suite A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 2017-125-LAB Site ID : AS-70 WATER.
Thank you for your business.

* For future reference to this analysis please use SUN # 77972-163042.

EVALUATION FOR WATER CORROSION

Soil pH	7.49	
Minimum Resistivity	0.35 ohm-cm (x1000)	
Chloride	143.2 ppm	0.01432 %
Sulfate	275.1ppm	0.02751 %

METHODS
pH and Min.Resistivity CA DOT Test #643 Mod.(Sm.Cell)
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5AA

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 09/12/2018
Date Submitted 09/07/2018

To: Nasir Ahmad
Parikh Consultants, Inc.
2360 Qume Dr. Suite A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 2017-125-LAB Site ID : AS-72 WATER.
Thank you for your business.

* For future reference to this analysis please use SUN # 77972-163044.

EVALUATION FOR WATER CORROSION

Soil pH	8.64		
Minimum Resistivity	0.48 ohm-cm (x1000)		
Chloride	129.0 ppm	0.01290	%
Sulfate	261.3ppm	0.02613	%

METHODS
pH and Min.Resistivity CA DOT Test #643 Mod.(Sm.Cell)
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5AB

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 09/05/2018
Date Submitted 08/29/2018

To: Nasir Ahmad
Parikh Consultants, Inc.
2360 Qume Dr. Suite A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 2017-125-GEO Site ID : AS-76 WATER.
Thank you for your business.

* For future reference to this analysis please use SUN # 77926-162927.

EVALUATION FOR WATER CORROSION

Soil pH	8.06		
Minimum Resistivity	0.11 ohm-cm (x1000)		
Chloride	2607.1 ppm	0.26071	%
Sulfate	6444.0ppm	0.64440	%

METHODS
pH and Min.Resistivity CA DOT Test #643 Mod.(Sm.Cell)
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5AC

Sunland Analytical

11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 09/05/2018
Date Submitted 08/29/2018

To: Nasir Ahmad
Parikh Consultants, Inc.
2360 Qume Dr. Suite A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 2017-125-GEO Site ID : AS-80 WATER.
Thank you for your business.

* For future reference to this analysis please use SUN # 77926-162925.

EVALUATION FOR WATER CORROSION

Soil pH	7.71		
Minimum Resistivity	0.10 ohm-cm (x1000)		
Chloride	2492.1 ppm	0.24921	%
Sulfate	6510.5ppm	0.65105	%

METHODS
pH and Min.Resistivity CA DOT Test #643 Mod.(Sm.Cell)
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5AD

Sunland Analytical

11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 08/29/2018
Date Submitted 08/22/2018

To: Nasir Ahmad
Parikh Consultants, Inc.
2360 Qume Dr. Suite A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 2017-125-GEO Site ID : AS-82 WATER.
Thank you for your business.

* For future reference to this analysis please use SUN # 77882-162823.

EVALUATION FOR WATER CORROSION

Soil pH	7.37	
Minimum Resistivity	0.06 ohm-cm (x1000)	
Chloride	9446.5 ppm	0.94465 %
Sulfate	1323.3ppm	0.13233 %

METHODS
pH and Min.Resistivity CA DOT Test #643 Mod.(Sm.Cell)
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5AE

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 08/29/2018
Date Submitted 08/22/2018

To: Nasir Ahmad
Parikh Consultants, Inc.
2360 Qume Dr. Suite A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 2017-125-GEO Site ID : AS-86 WATER.
Thank you for your business.

* For future reference to this analysis please use SUN # 77882-162825.

EVALUATION FOR WATER CORROSION

Soil pH	8.03		
Minimum Resistivity	0.75 ohm-cm (x1000)		
Chloride	273.8 ppm	0.02738	%
Sulfate	487.5ppm	0.04875	%

METHODS
pH and Min.Resistivity CA DOT Test #643 Mod.(Sm.Cell)
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5AF

Sunland Analytical

11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 08/24/2018
Date Submitted 08/21/2018

To: Nasir Ahmad
Parikh Consultants, Inc.
2360 Qume Dr. Suite A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 2017-125-GEO Site ID : AS-88 WATER.
Thank you for your business.

* For future reference to this analysis please use SUN # 77865-162773.

EVALUATION FOR WATER CORROSION

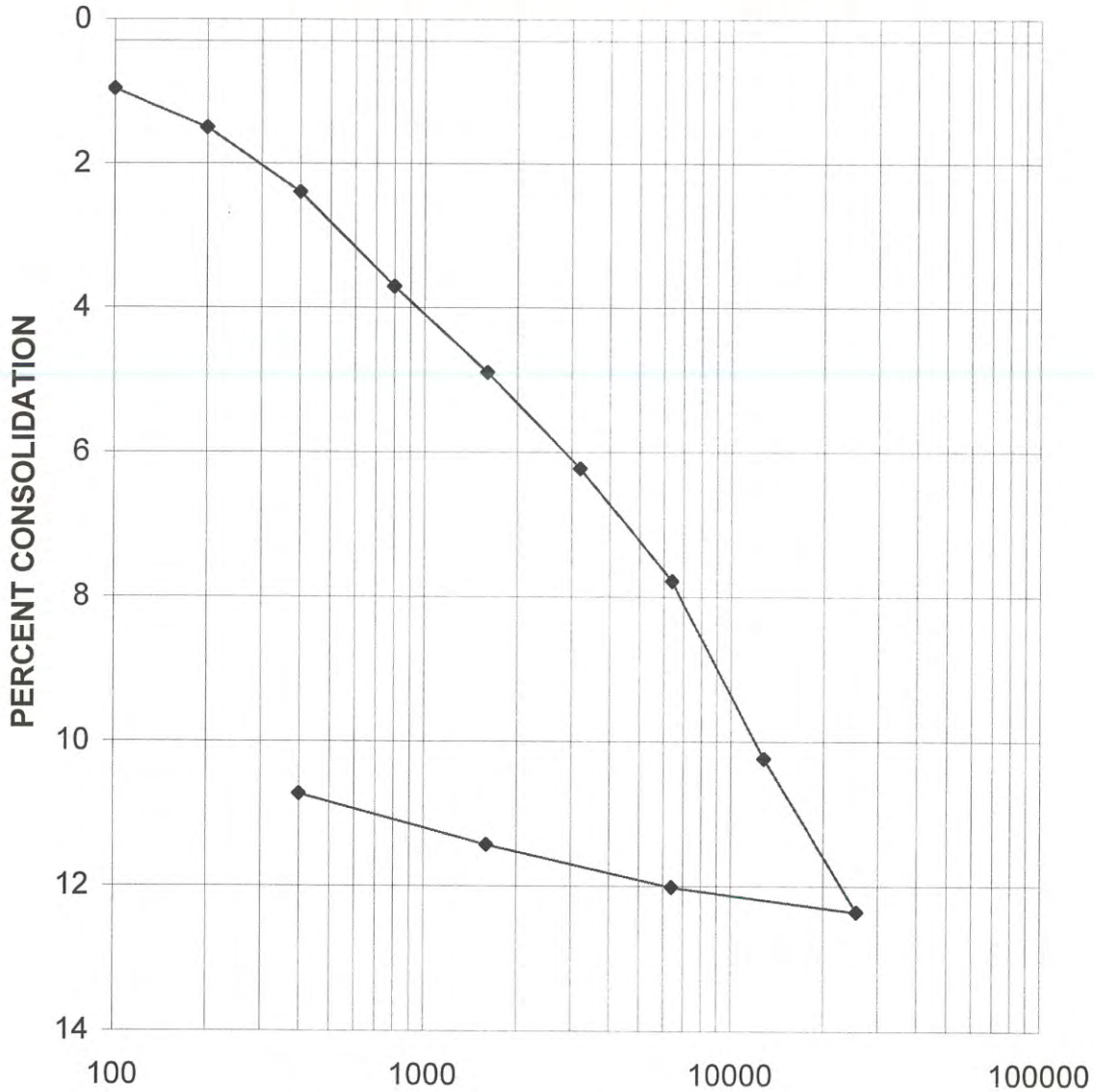
Soil pH	7.66		
Minimum Resistivity	0.09 ohm-cm (x1000)		
Chloride	665.2 ppm	0.06652	%
Sulfate	2388.7ppm	0.23887	%

METHODS
pH and Min.Resistivity CA DOT Test #643 Mod.(Sm.Cell)
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Plate No.: IV-5AG

CONSOLIDATION TEST

CONSOLIDATION TEST RESULTS



	MOISTURE CONTENT %	DRY DENSITY PCF	HEIGHT (INCHES)	DIAMETER (INCHES)
INITIAL	18.3	114.9	1.0000	2.416
FINAL	13.8	128.7	0.8927	2.416

BORING NO.	AS-1	SAMPLE NO.	3	ELEV. OR DEPTH	16'
DESCRIPTION	Sandy clay with some gravel, brown				

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS ENGINEERING

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT

DATE	JOB NO:
5/16/05	2017-125-GEO

Reported by: Prav Dayah

Plate No.: IV-6A

CONSOLIDATION TEST - TIME CURVE

JOB #: 204125.10

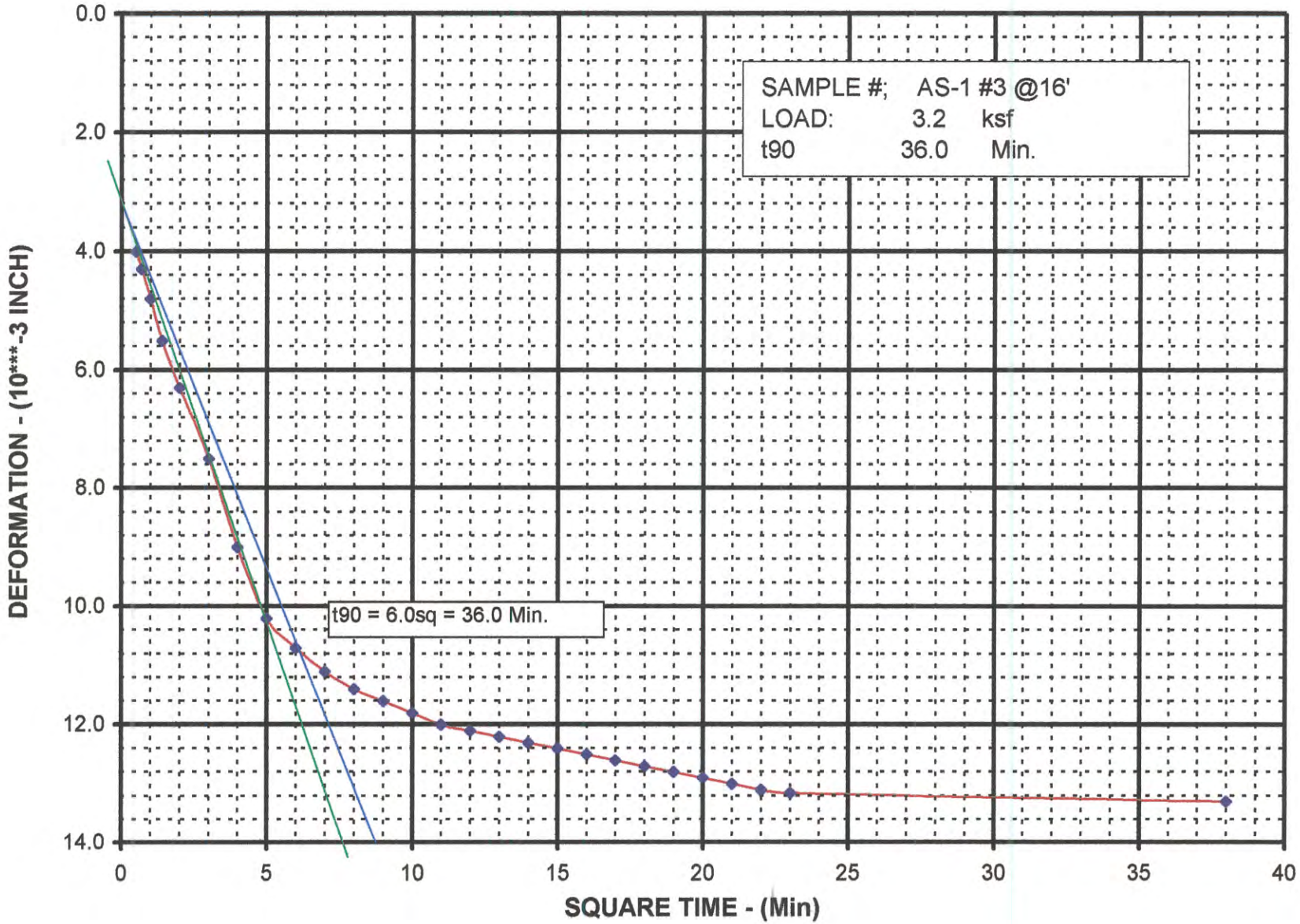


Plate No.: IV-6B

CONSOLIDATION TEST - TIME CURVE

JOB #: 204125.10

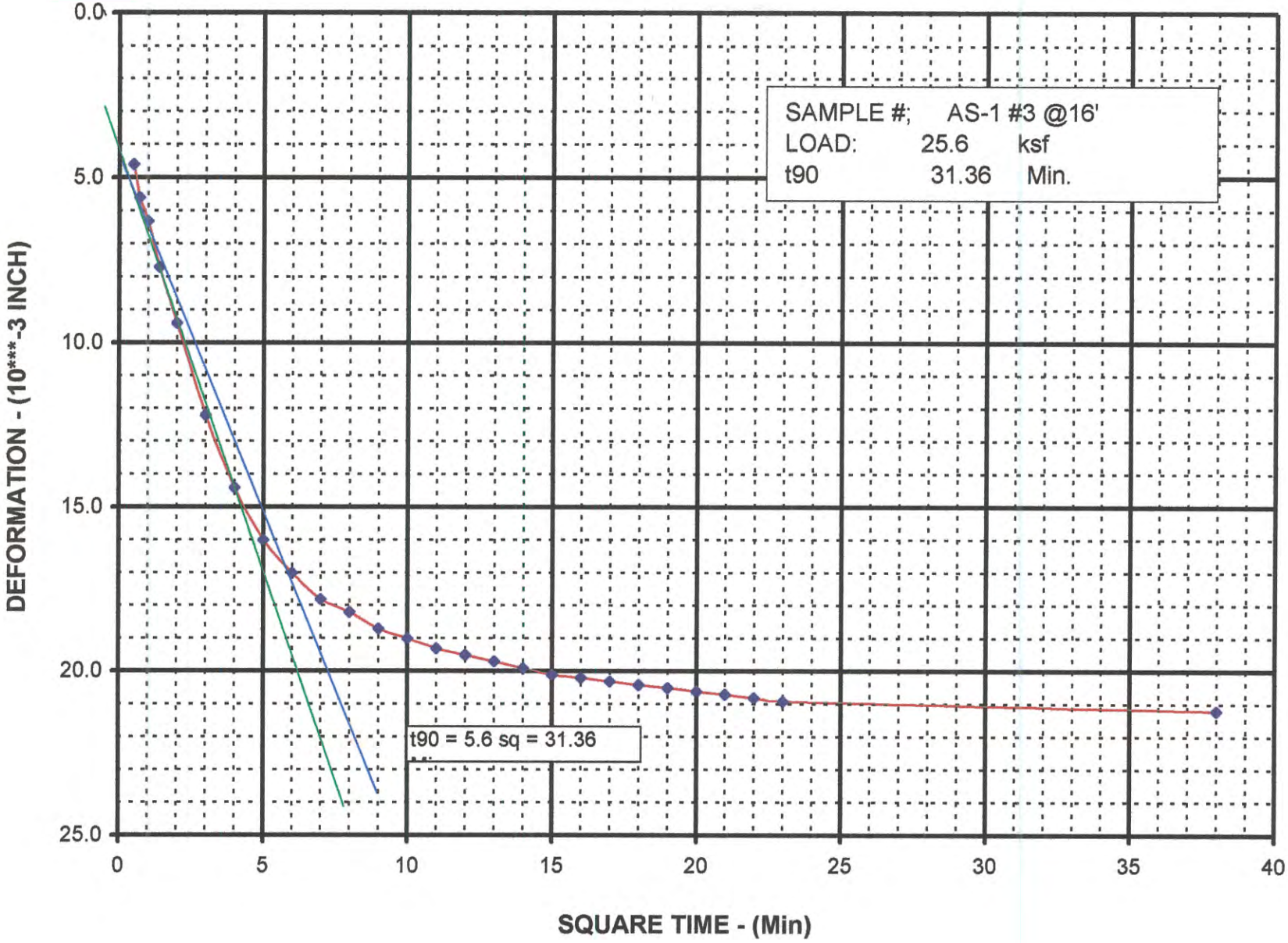
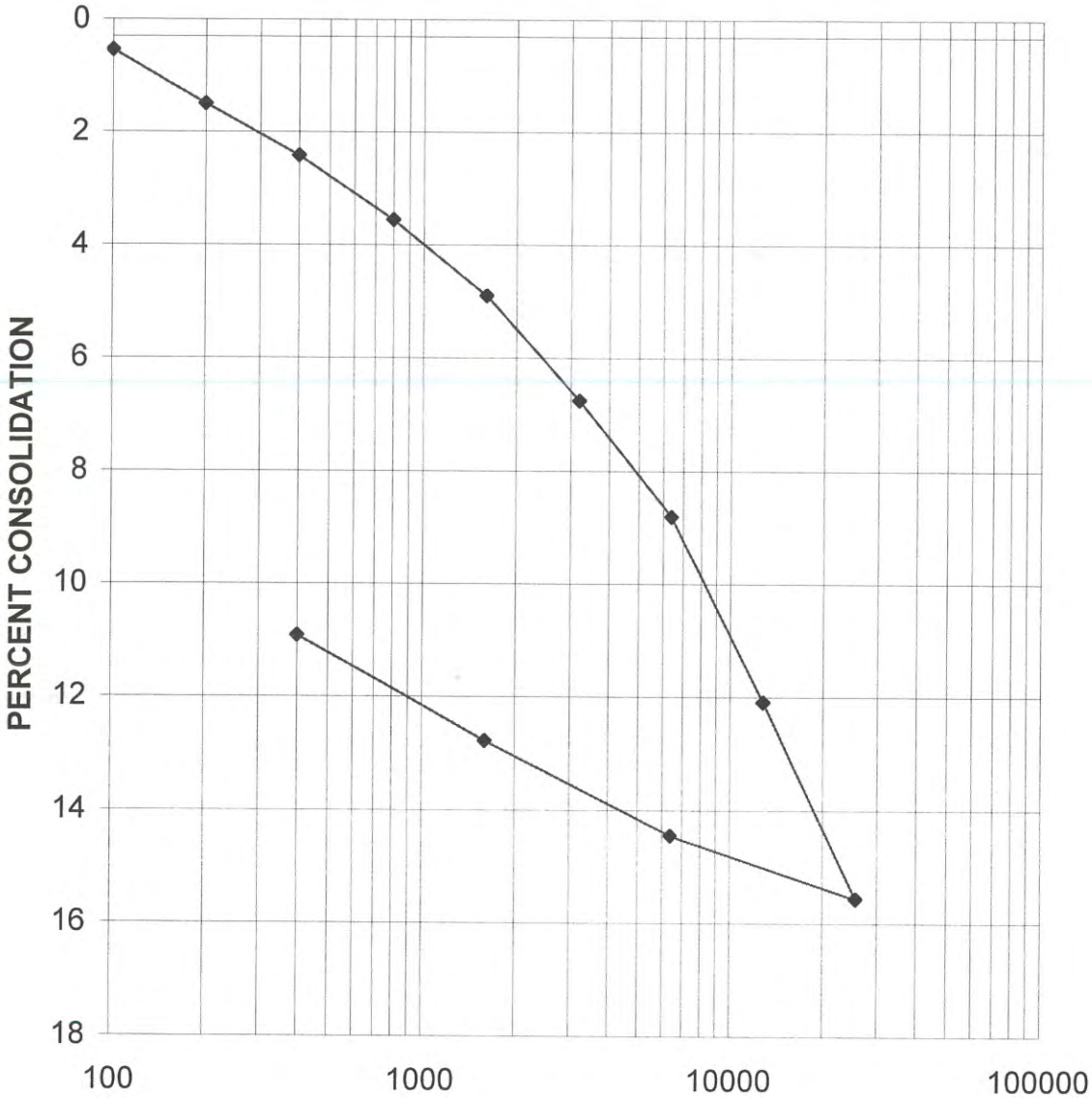


Plate No.: IV-6C

CONSOLIDATION TEST RESULTS



	MOISTURE CONTENT %	DRY DENSITY PCF	HEIGHT (INCHES)	DIAMETER (INCHES)
INITIAL	32.1	93.0	1.0000	2.416
FINAL	25.8	104.4	0.8908	2.416

BORING NO.	AS-15	SAMPLE NO.	4	ELEV. OR DEPTH	16'
DESCRIPTION	Lean clay, brown				

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS ENGINEERING

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT

DATE	JOB NO:
5/16/05	2017-125-GEO

Reported by: Prav Dayah

Plate No.: IV-6D

CONSOLIDATION TEST - TIME CURVE

JOB #: 204125.10

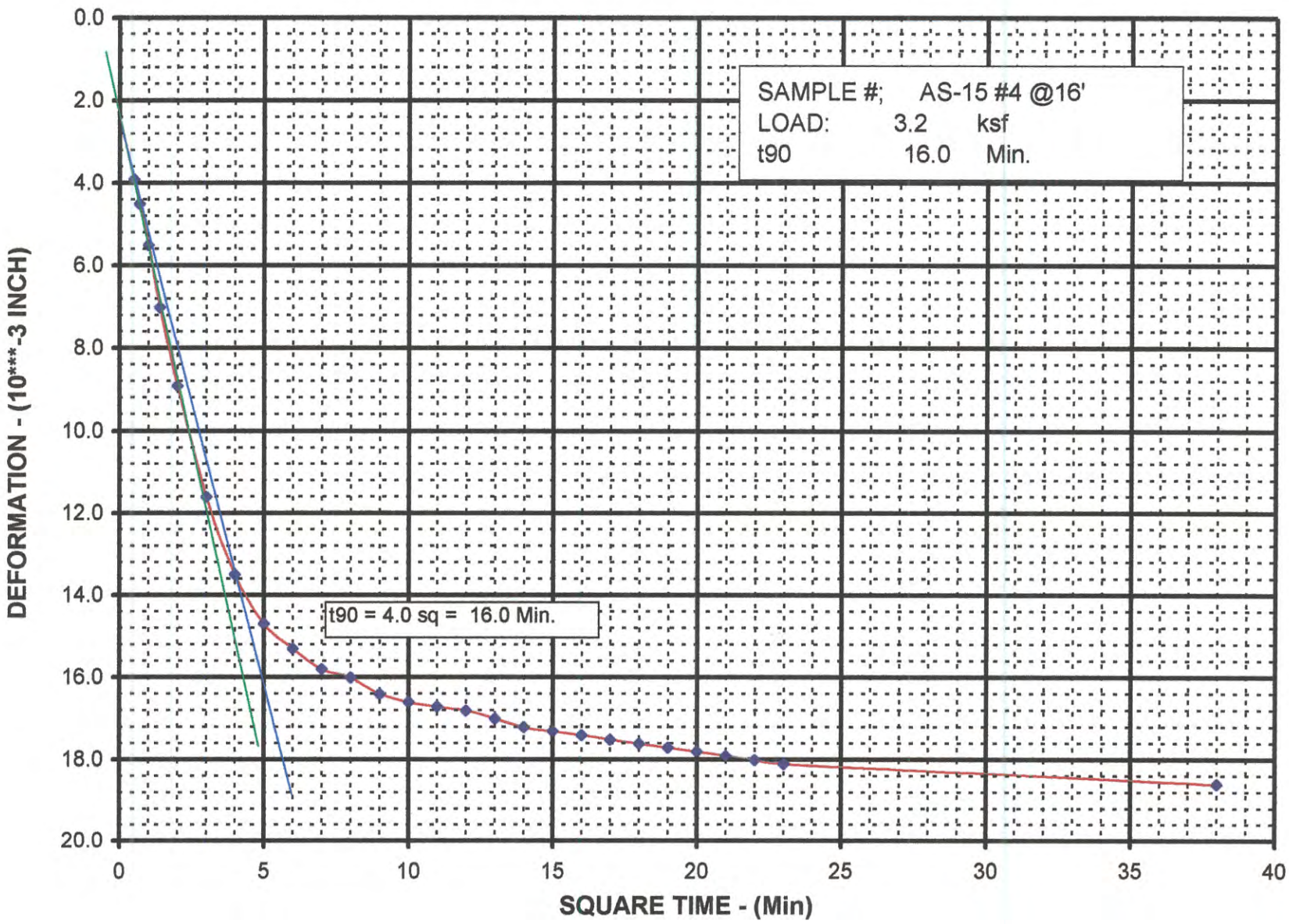


Plate No.: IV-6E

CONSOLIDATION TEST - TIME CURVE

JOB #: 204125.10

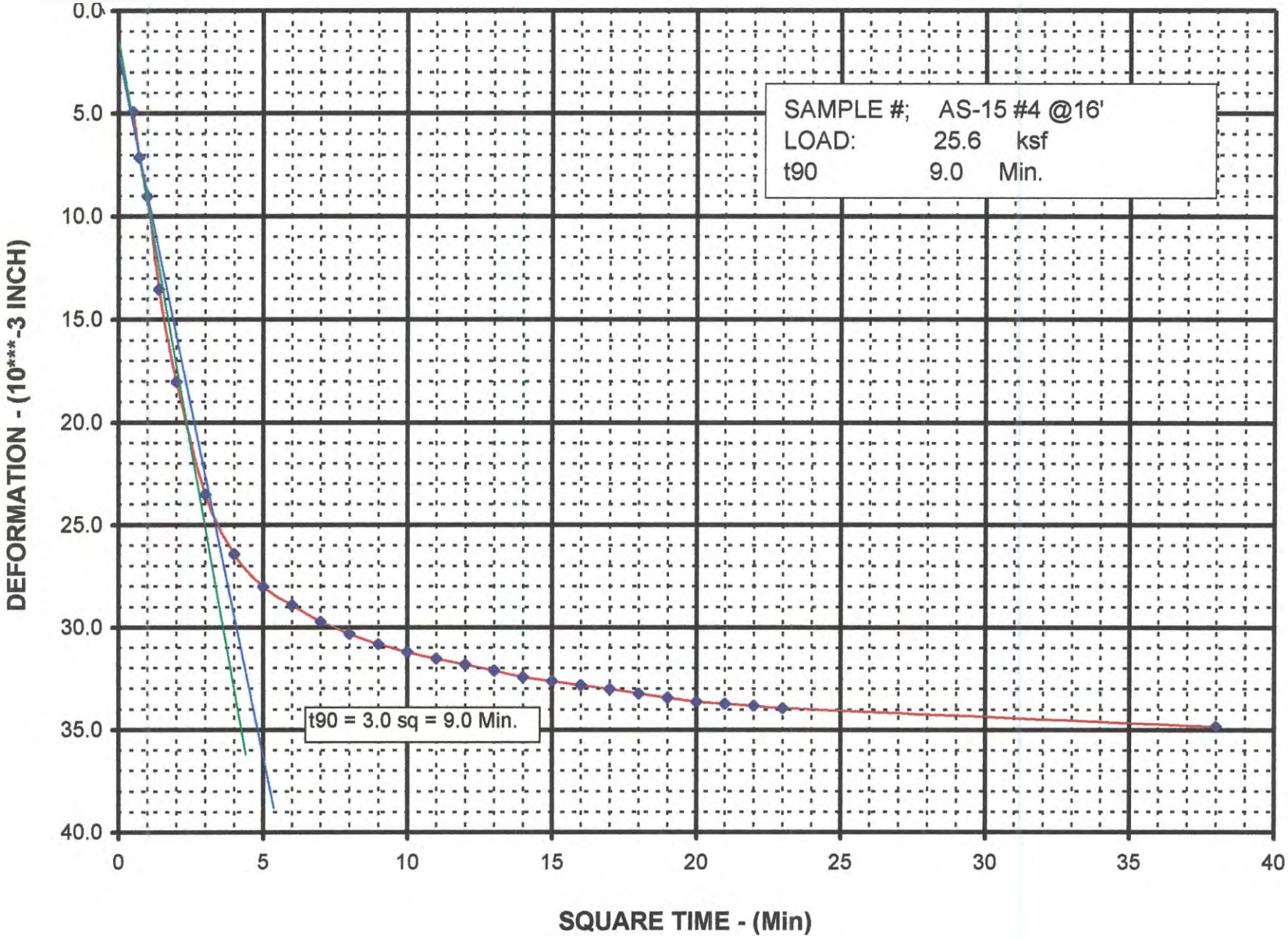
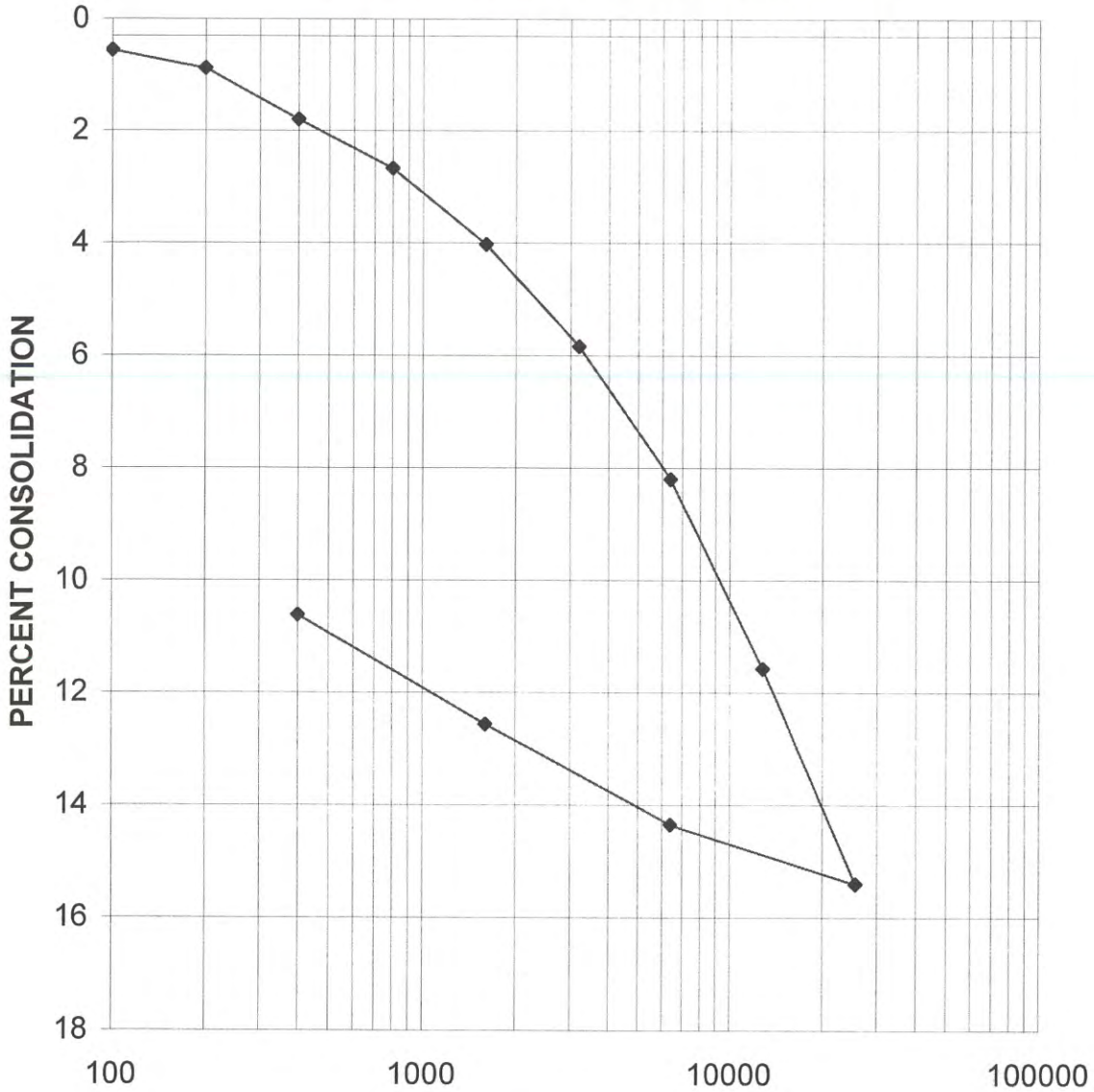


Plate No.: IV-6F

CONSOLIDATION TEST RESULTS



	MOISTURE CONTENT %	DRY DENSITY PCF	HEIGHT (INCHES)	DIAMETER (INCHES)
INITIAL	33.8	90.9	1.0000	2.416
FINAL	27.4	101.7	0.8938	2.416

BORING NO.	AS-17	SAMPLE NO.	4	ELEV. OR DEPTH	16'
DESCRIPTION	Lean clay, brown				

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS ENGINEERING

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT

DATE	JOB NO:
5/16/05	2017-125-GEO

Reported by: Prav Dayah

Plate No.: IV-6G

CONSOLIDATION TEST - TIME CURVE

JOB #: 204125.10

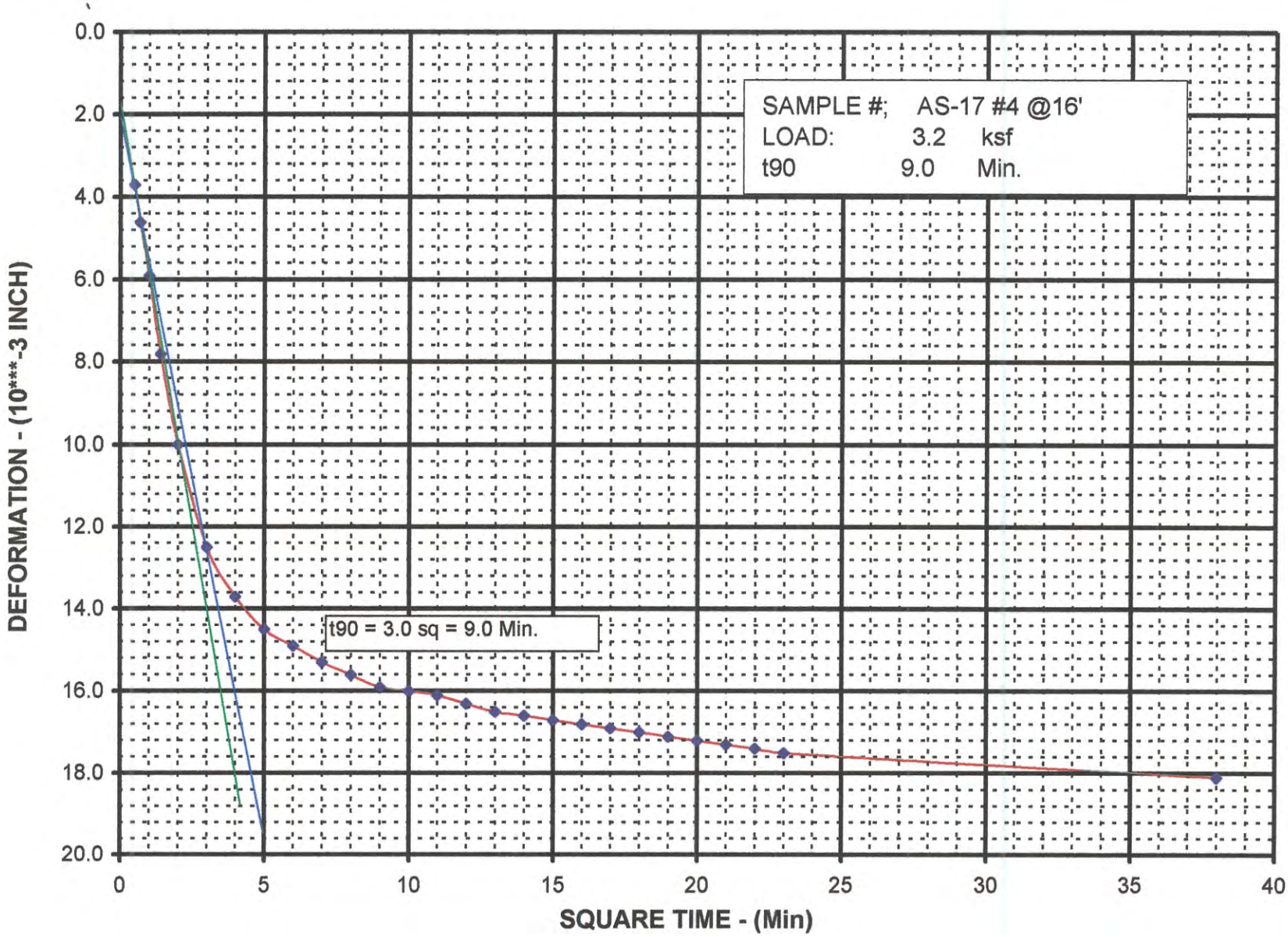


Plate No.: IV-6H

CONSOLIDATION TEST - TIME CURVE

JOB #: 204125.10

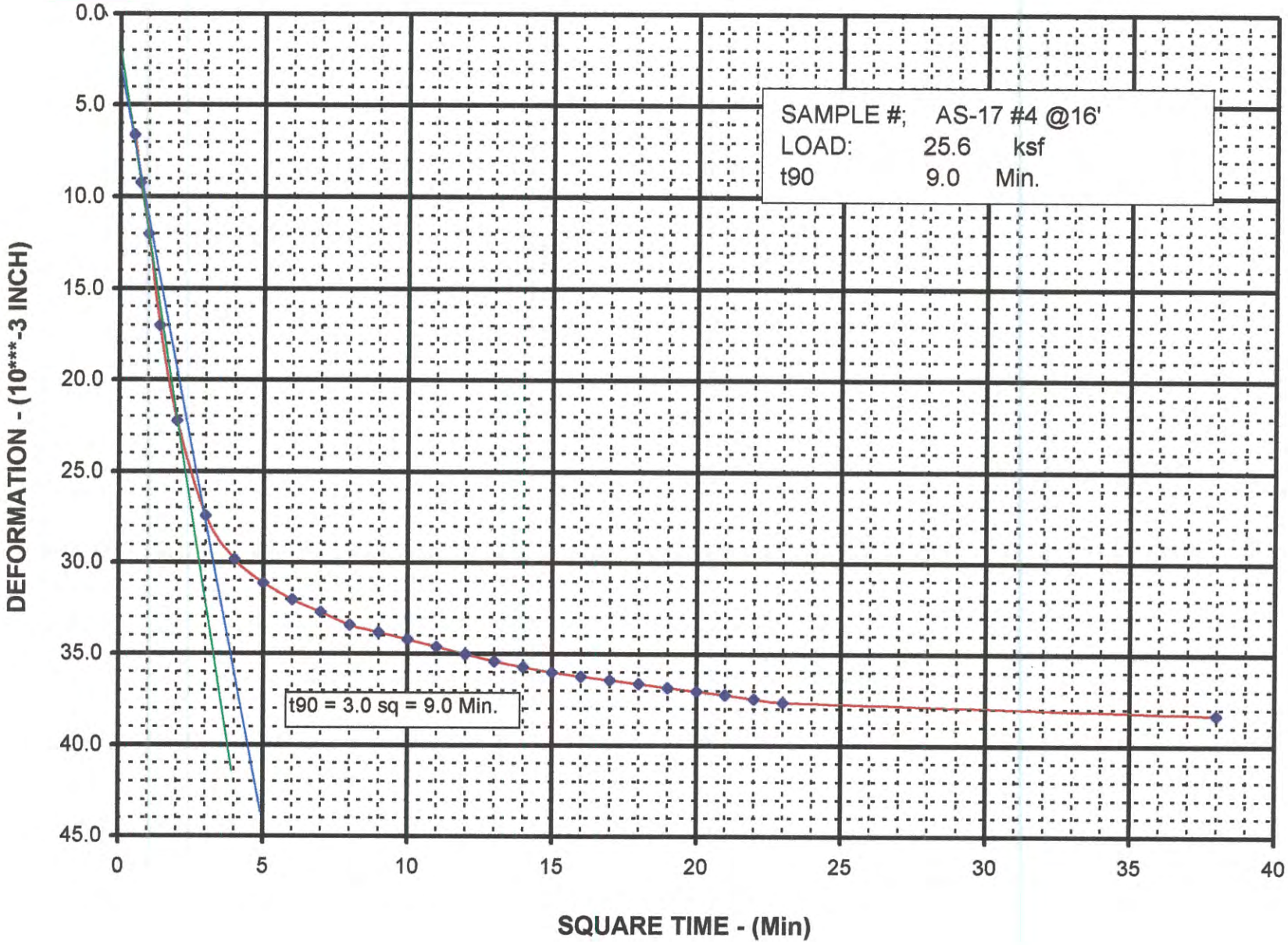
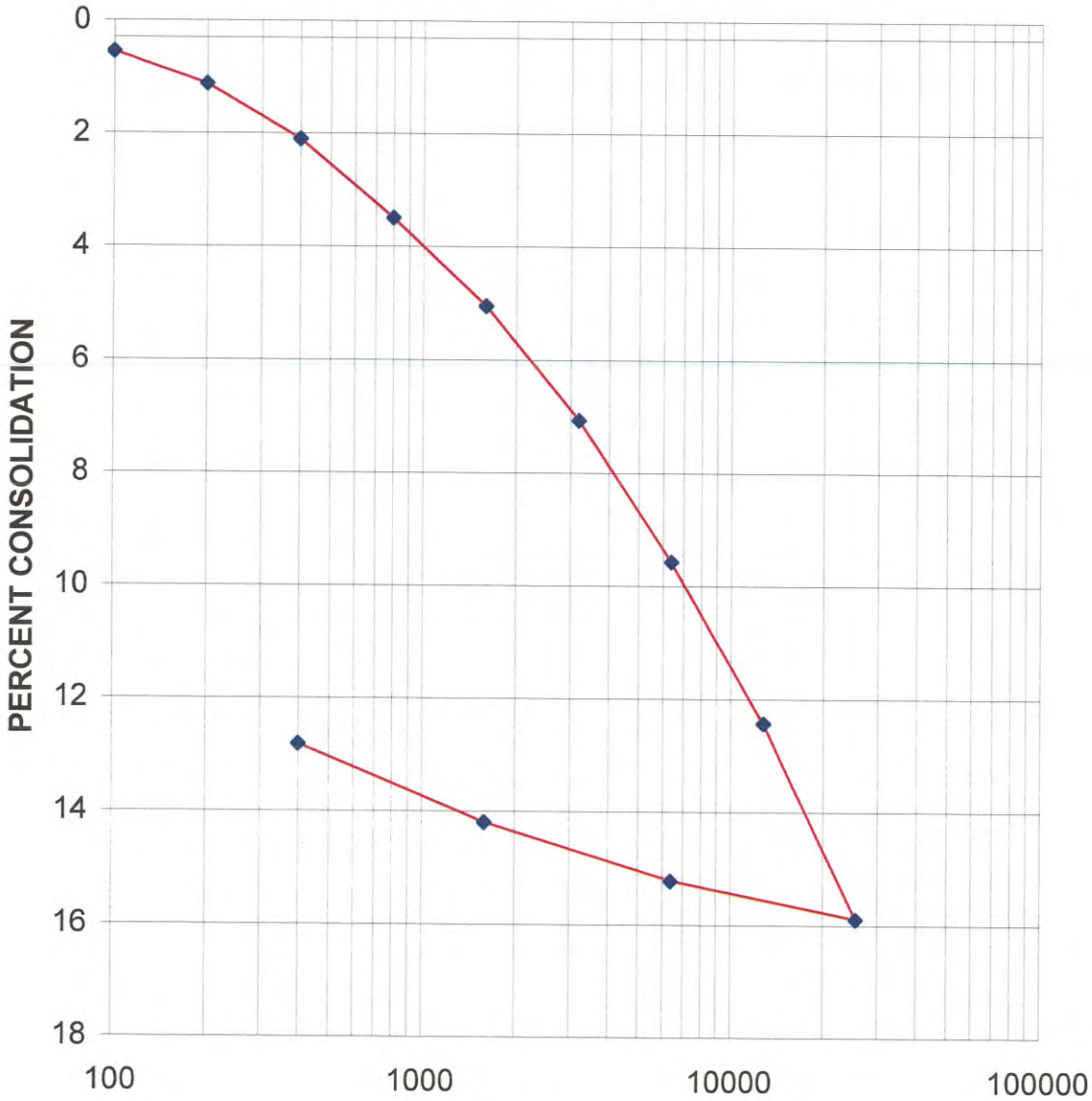


Plate No.: IV-6l

CONSOLIDATION TEST RESULTS



	MOISTURE CONTENT %	DRY DENSITY PCF	HEIGHT (INCHES)	DIAMETER (INCHES)
INITIAL	28.9	93.1	1.0000	2.416
FINAL	23.0	106.8	0.8719	2.416

BORING NO.	AS-3	SAMPLE NO.	3	ELEV. OR DEPTH	10'
DESCRIPTION	Lean clay, yellowish brown				

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS ENGINEERING

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT

DATE 11/13/06

JOB NO: 2017-125-GEO

Reported by: Prav Dayah

Plate No.: IV-6J

CONSOLIDATION TEST - TIME CURVE

JOB #: 204125.FD1

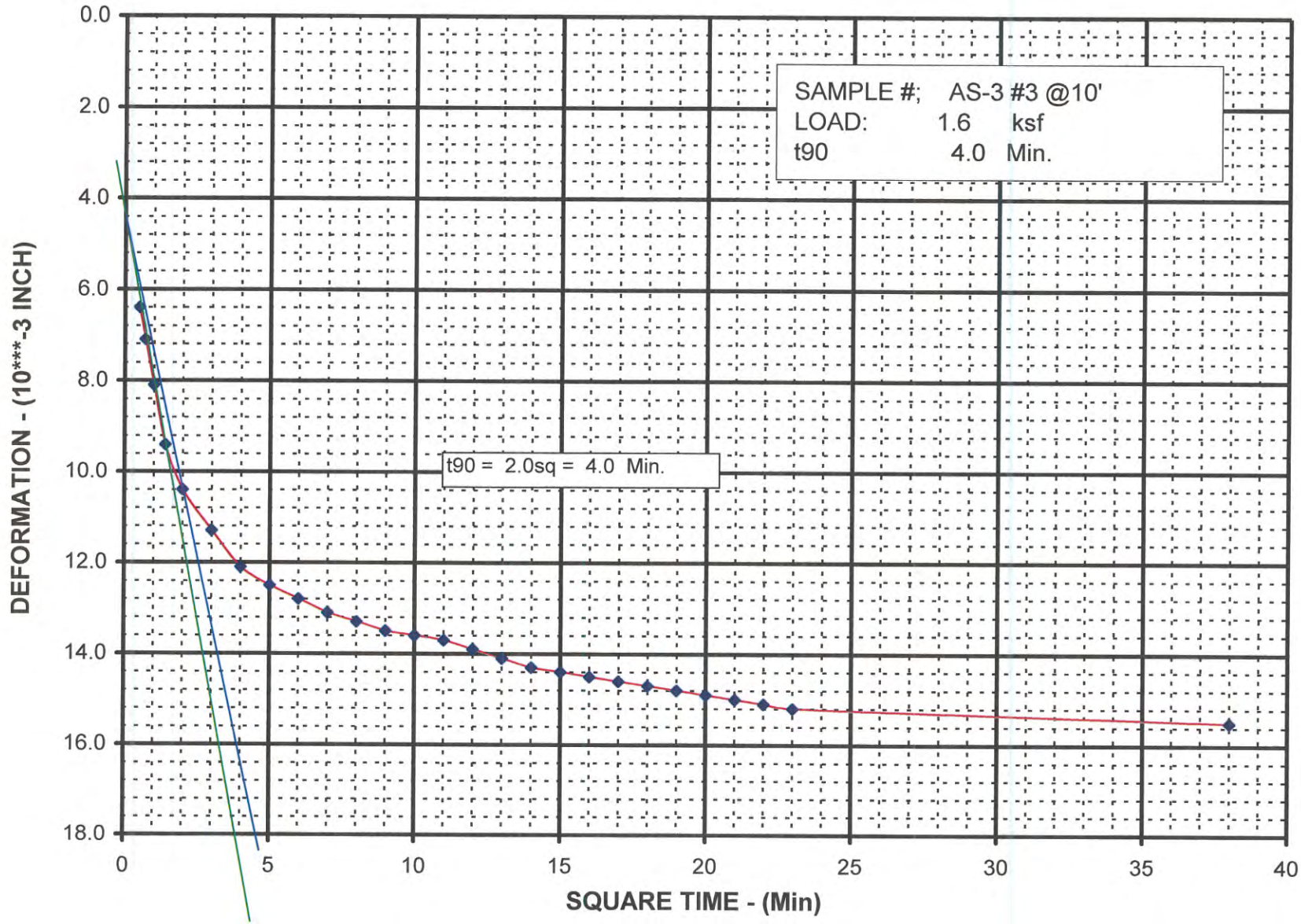


Plate No.: IV-6K

CONSOLIDATION TEST - TIME CURVE

JOB #: 204125.FD1

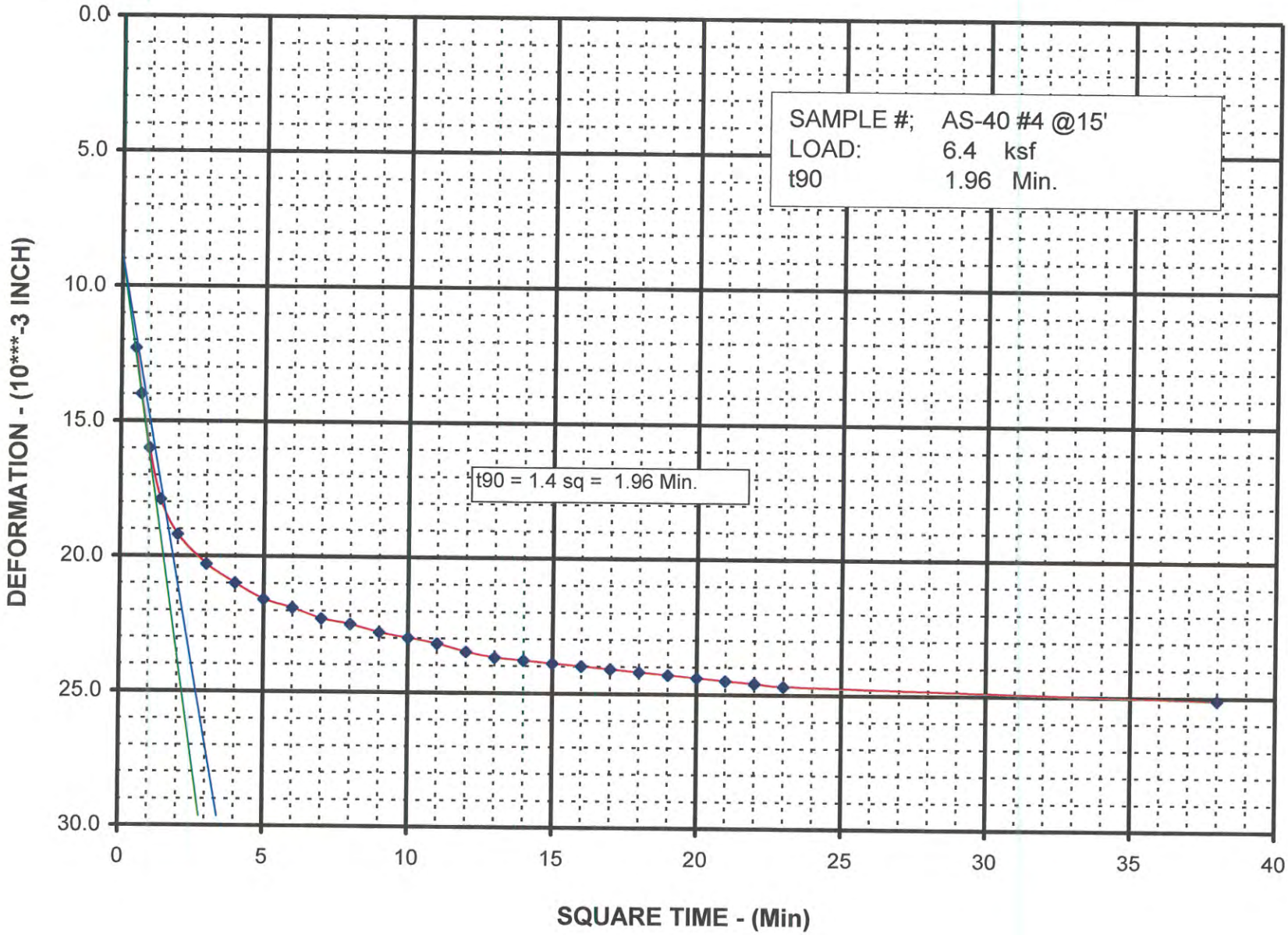
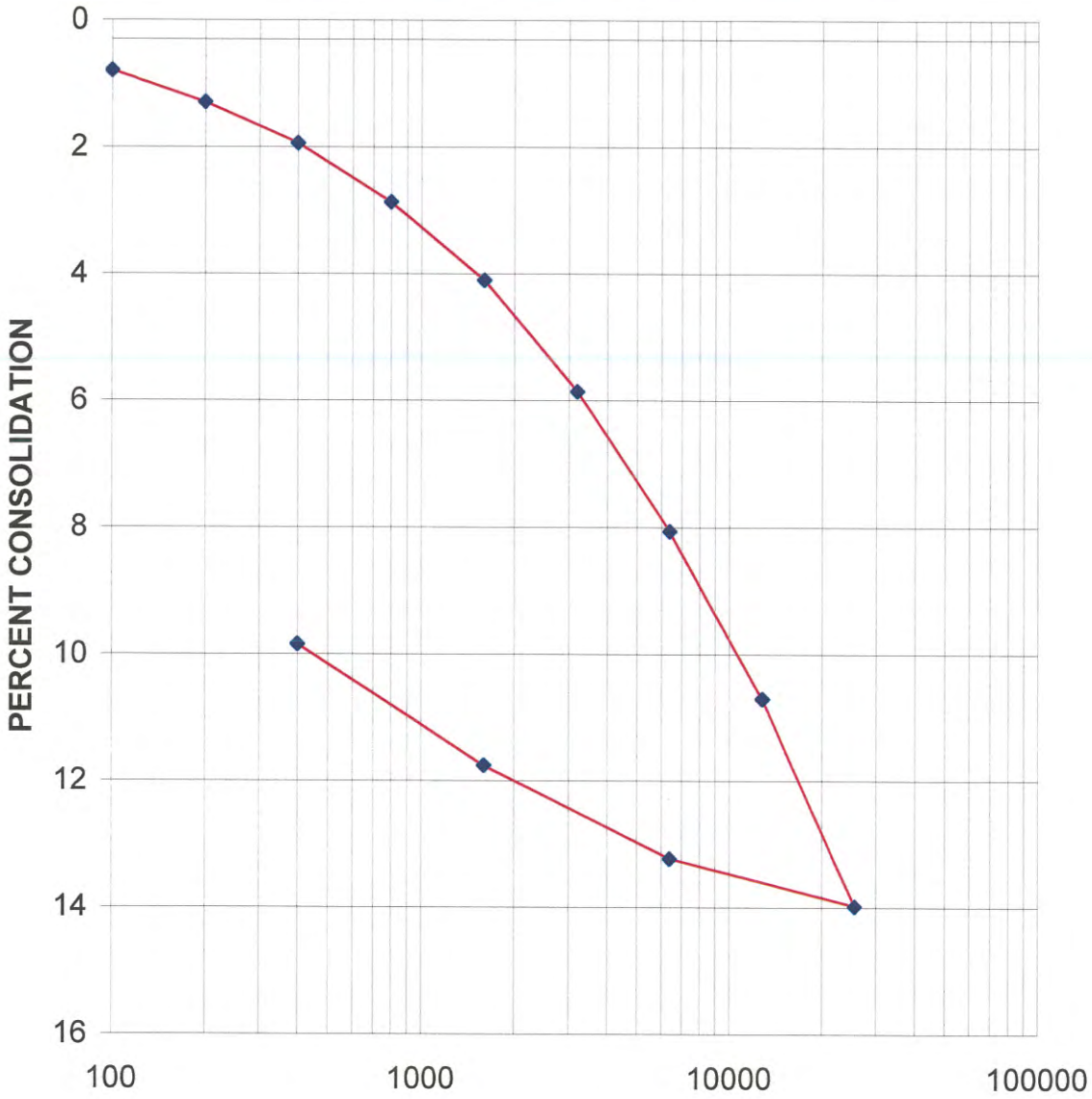


Plate No.: IV-6L

CONSOLIDATION TEST RESULTS



	MOISTURE CONTENT %	DRY DENSITY PCF	HEIGHT (INCHES)	DIAMETER (INCHES)
INITIAL	30.4	95.0	1.0000	2.416
FINAL	24.7	105.4	0.9016	2.416

BORING NO.	AS-40	SAMPLE NO.	4	ELEV. OR DEPTH	15'
DESCRIPTION	Lean clay, yellowish brown				

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS ENGINEERING

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT

DATE 11/08/06

JOB NO: 2017-125-GEO

Reported by: Prav Dayah

Plate No.: IV-6M

CONSOLIDATION TEST - TIME CURVE

JOB #: 204125.FD1

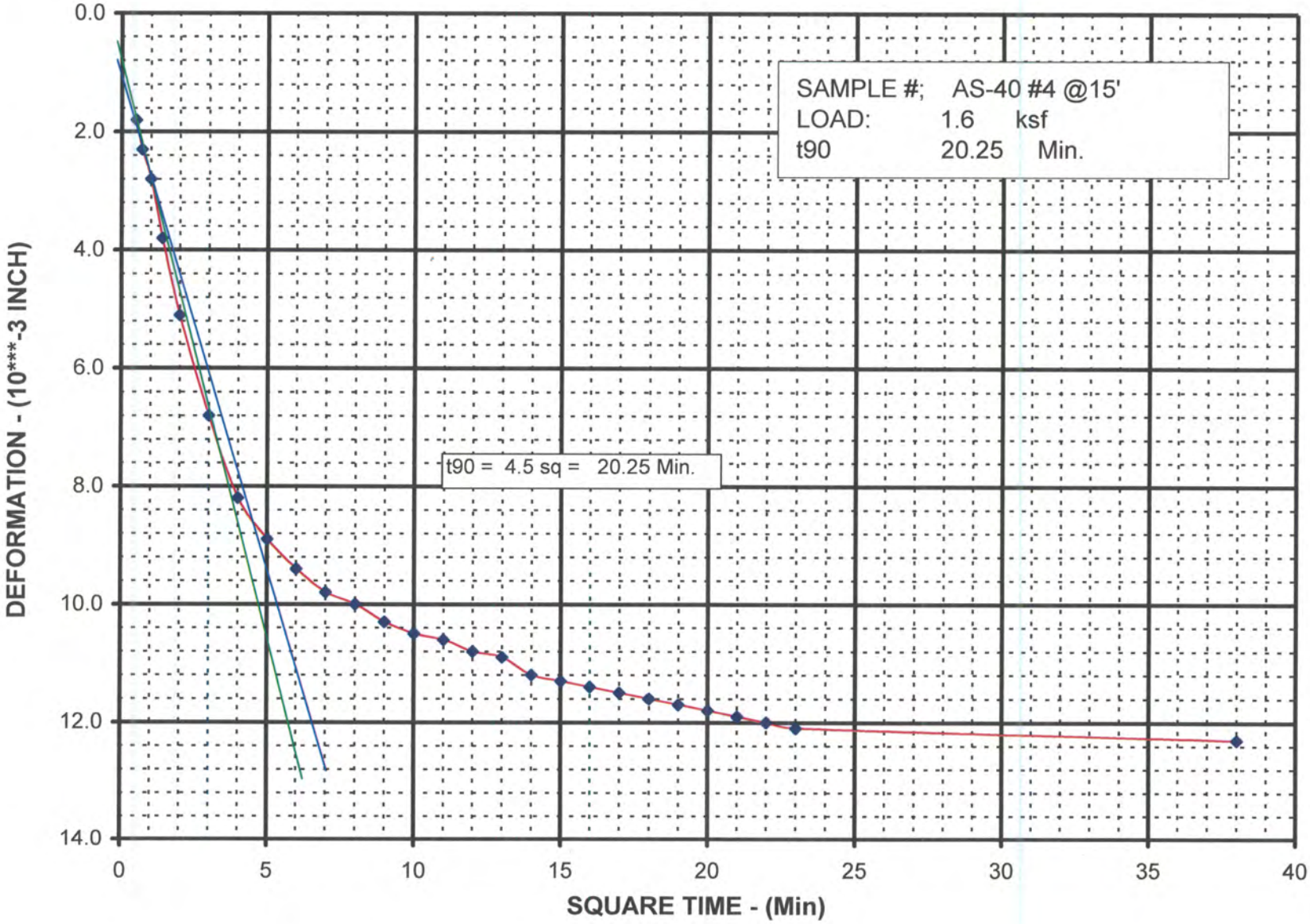


Plate No.: IV-6N

CONSOLIDATION TEST - TIME CURVE

JOB #: 204125.FD1

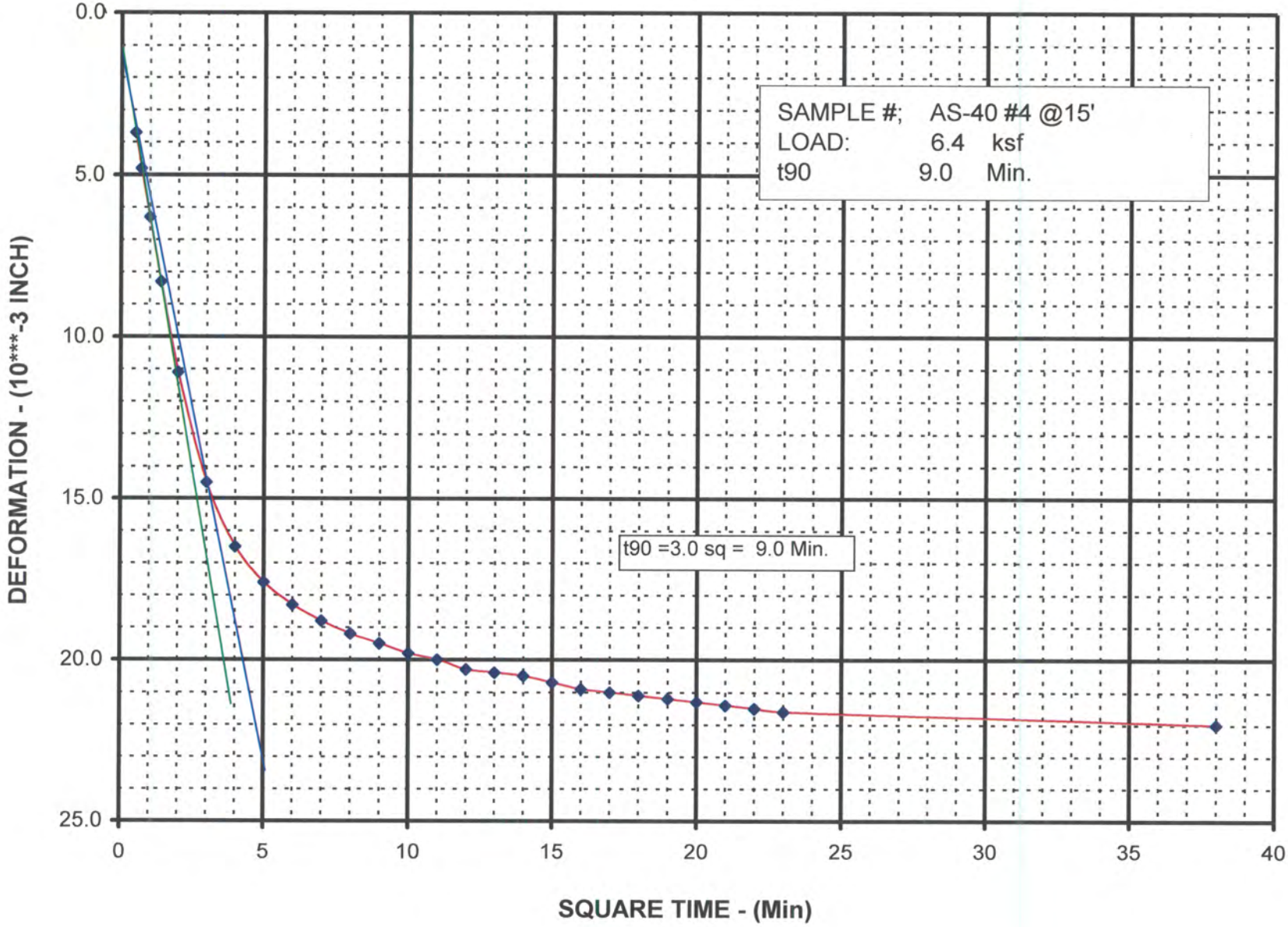


Plate No.: IV-6O

One Dimensional Consolidation Properties
(Oedometer)

Client	Santa Clara Valley Transportation Authority	**Lab Ref**	
Project	Eastridge to BART Regional Connector Project	**Job**	2017-125-GEO
Borehole	AS-68 ("SB" Station 1007+43)	**Sample**	4
Location	San Jose, California	**Depth**	21 feet

Test Details			
Standard	ASTM D2435-96 / AASHTO T216-94	**Particle Specific Gravity**	2.65
Sample Type	Core sample	**Lab. Temperature**	72.0 deg.F
Method of Testing (A/B)	A		
Sample Description	Lean Clay		
Variations from Procedure	None		

Specimen Details			
Specimen Reference	A	**Description**	
Depth within Sample	0.0000 in	**Orientation within Sample**	
Specimen Mass	0.1591 lb	**Condition**	Natural Moisture
Specimen Height	0.7500 in	**Preparation**	
Comments			

Apparatus			
Ring Number	1	**Ring Diameter**	2.0000 in
Ring Height	0.7500 in	**Ring Weight**	0.1367 lb
Lever Ratio	1.00 : 1	**Drainage**	Double-Sided

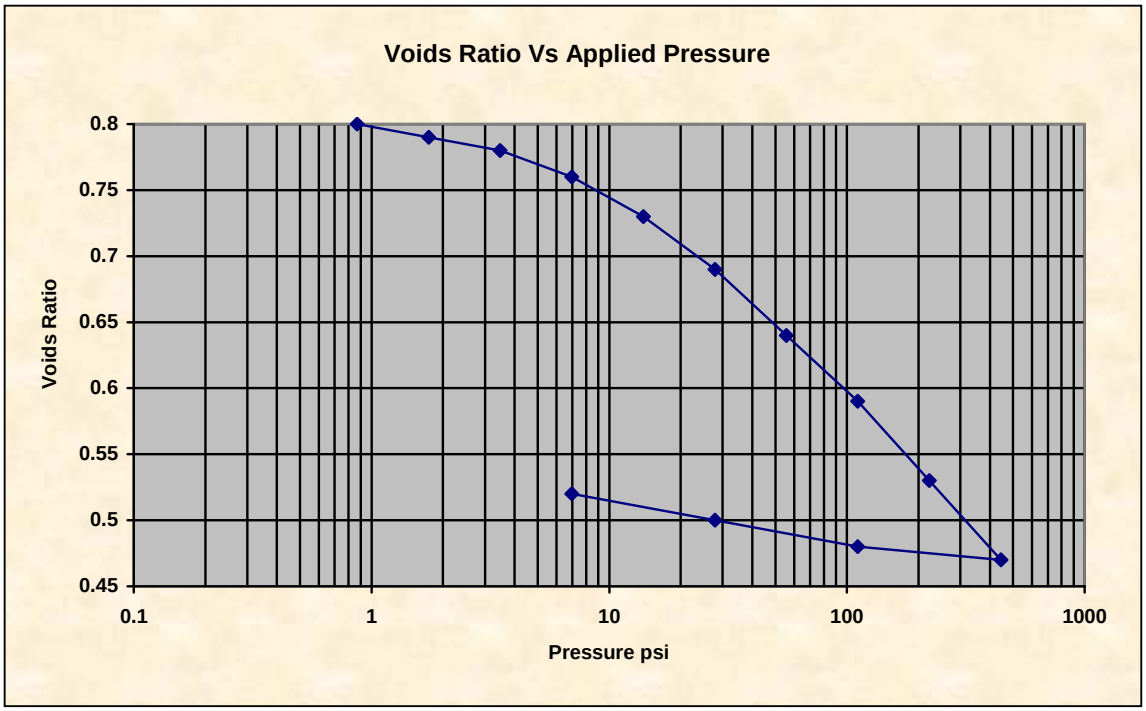


Plate No.: IV-6P

One Dimensional Consolidation Properties
(Oedometer)

Client	Santa Clara Valley Transportation Authority	**Lab Ref**	
Project	Eastridge to BART Regional Connector Project	**Job**	2017-125-GEO
Borehole	AS-68 ("SB" Station 1007+43)	**Sample**	4
Location	San Jose, California	**Depth**	21 feet

Initial Moisture Content*	27.0 % (trimmings: 27.0 %)	**Final Moisture Content**	19.2 %
Initial Bulk Density	116.68 lb/ft3	**Final Bulk Density**	129.78 lb/ft3
Initial Dry Density	91.89 lb/ft3	**Final Dry Density**	108.92 lb/ft3
Initial Void Ratio	0.8003	**Final Void Ratio**	0.52
Initial Degree of Saturation	89.42%	**Final Degree of Saturation**	97.94 %
Pre-consolidation Pressure	0.00 psi		

* Calculated from initial and dry weights of whole specimen

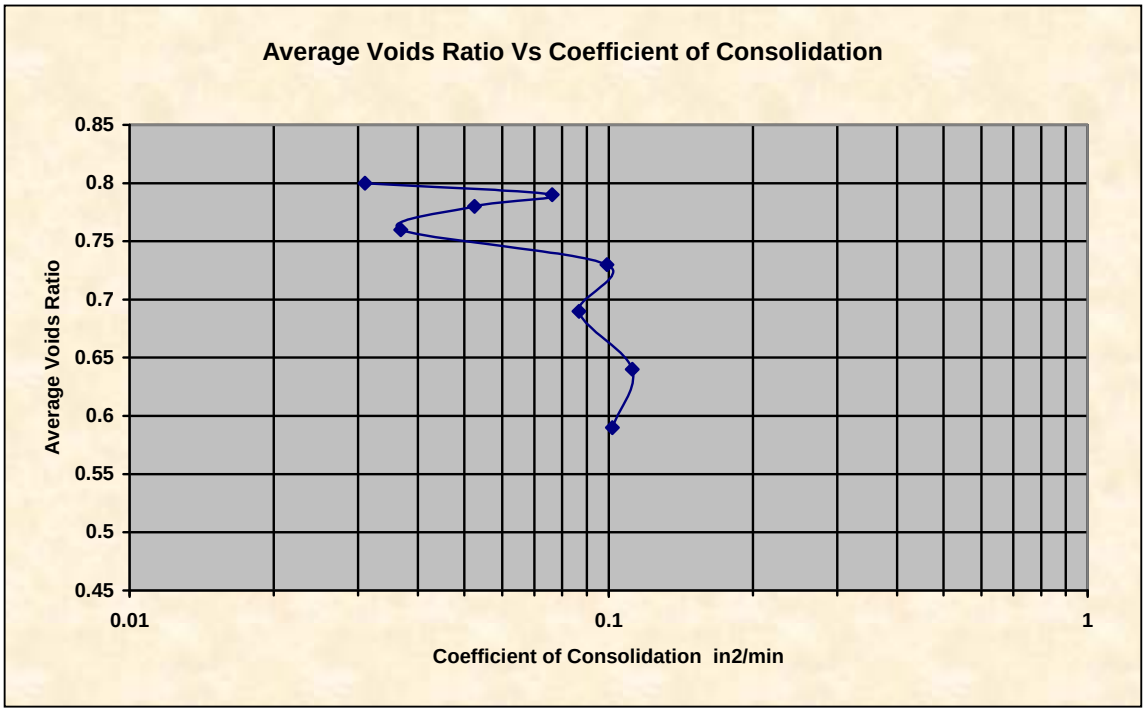
Pressure (Loading)	**Load Increment Duration**	**Deformation (Corrected)**	**d_{100} (Corrected)**	**Coefficient of Consolidation (c_v)**
0.00				
0.87 psi	151.000 min	0.00111	0.00111	---------
1.74 psi	240.000 min	0.00341	0.00341	---------
3.48 psi	762.000 min	0.01021	0.01021	0.03101 in2/min
6.96 psi	480.000 min	0.01921	0.01921	0.07625 in2/min
13.92 psi	4080.000 min	0.03391	0.03391	0.05246 in2/min
27.85 psi	1440.000 min	0.04851	0.04851	0.03681 in2/min
55.55 psi	1440.000 min	0.06781	0.06781	0.09920 in2/min
111.10 psi	1260.000 min	0.08951	0.08951	0.08677 in2/min
222.20 psi	3840.000 min	0.11501	0.11501	0.11207 in2/min
444.40 psi	1680.000 min	0.14031	0.14031	0.10187 in2/min
111.10 psi	1440.000 min	0.13531	0.13531	---------
27.85 psi	1080.000 min	0.12721	0.12721	---------
6.96 psi	1260.000 min	0.11721	0.11721	---------

Plate No.: IV-6Q

One Dimensional Consolidation Properties
(Oedometer)

Method of Time Fitting Used	Log Time

Client	Santa Clara Valley Transportation Authority	**Lab Ref**	
Project	Eastridge to BART Regional Connector Project	**Job**	2017-125-GEO
Borehole	AS-68 (“SB” Station 1007+43)	**Sample**	4
Location	San Jose, California	**Depth**	21 feet



Tested By and Date:	SM 2/15/19
Checked By and Date:	EO 2/28/19
Approved By and Date:	

Plate No:

One Dimensional Consolidation Properties
(Oedometer)

Client	Santa Clara Valley Transportation Authority	**Lab Ref**	
Project	Eastridge to BART Regional Connector Project	**Job**	2017-125-GEO
Borehole	AS-68 ("SB" Station 1007+43)	**Sample**	4
Location	San Jose, California	**Depth**	21 feet

Test Details			
Standard	ASTM D2435-96 / AASHTO T216-94	**Particle Specific Gravity**	2.65
Sample Type	Core sample	**Lab. Temperature**	72.0 deg.F
Method of Testing (A/B)	A		
Sample Description	Lean Clay		
Variations from Procedure	None		

Specimen Details			
Specimen Reference	A	**Description**	
Depth within Sample	0.0000 in	**Orientation within Sample**	
Specimen Mass	0.1591 lb	**Condition**	Natural Moisture
Specimen Height	0.7500 in	**Preparation**	
Comments			

Apparatus			
Ring Number	1	**Ring Diameter**	2.0000 in
Ring Height	0.7500 in	**Ring Weight**	0.1367 lb
Lever Ratio	1.00 : 1	**Drainage**	Double-Sided

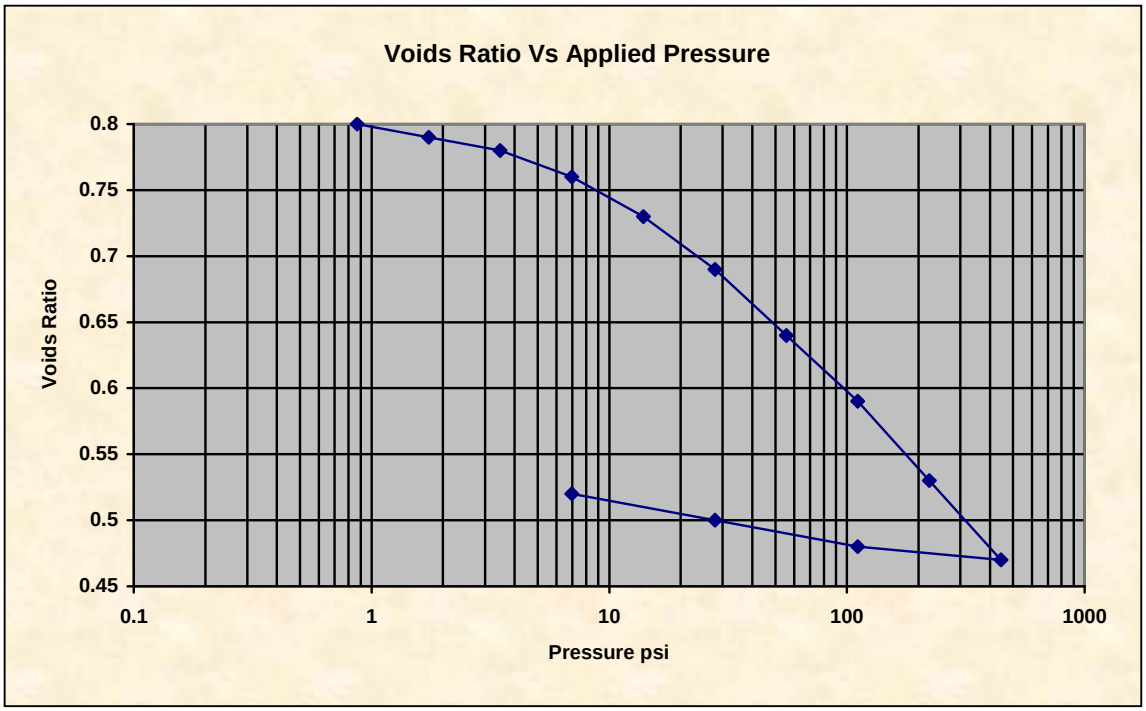


Plate No.: IV-6S

One Dimensional Consolidation Properties
(Oedometer)

Client	Santa Clara Valley Transportation Authority	**Lab Ref**	
Project	Eastridge to BART Regional Connector Project	**Job**	2017-125-GEO
Borehole	AS-68 ("SB" Station 1007+43)	**Sample**	4
Location	San Jose, California	**Depth**	21 feet

Initial Moisture Content*	27.0 % (trimmings: 27.0 %)	**Final Moisture Content**	19.2 %
Initial Bulk Density	116.68 lb/ft3	**Final Bulk Density**	129.78 lb/ft3
Initial Dry Density	91.89 lb/ft3	**Final Dry Density**	108.92 lb/ft3
Initial Void Ratio	0.8003	**Final Void Ratio**	0.52
Initial Degree of Saturation	89.42%	**Final Degree of Saturation**	97.94 %
Pre-consolidation Pressure	0.00 psi		

* Calculated from initial and dry weights of whole specimen

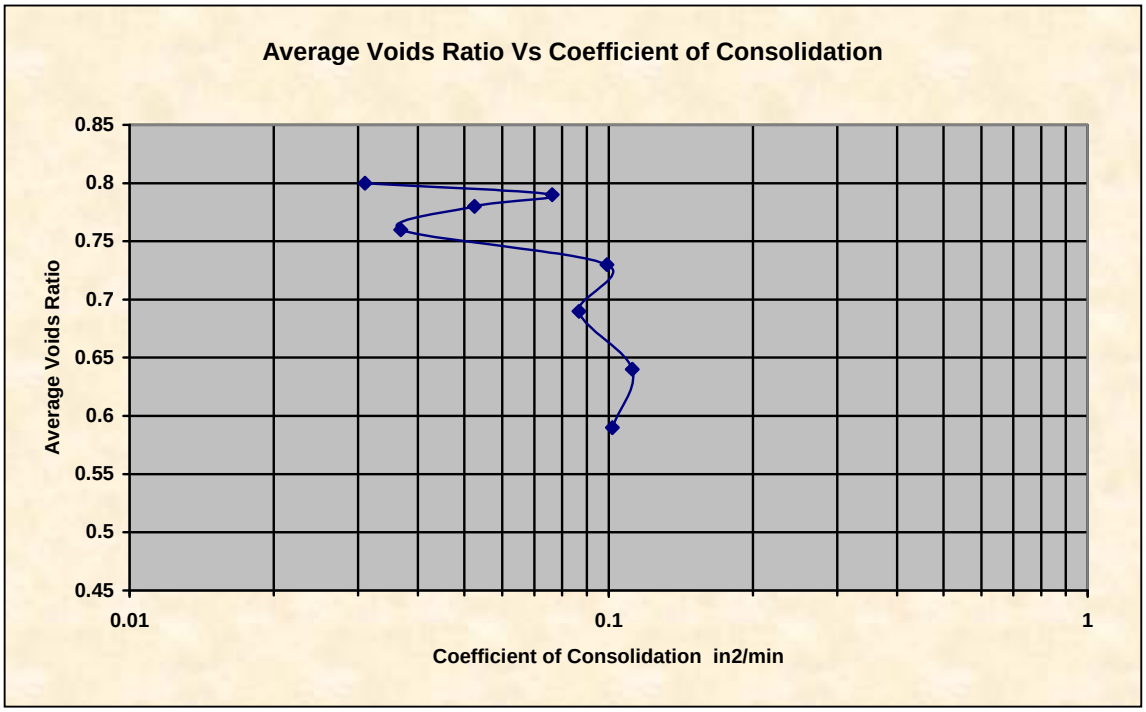
Pressure (Loading)	**Load Increment Duration**	**Deformation (Corrected)**	**d_{100} (Corrected)**	**Coefficient of Consolidation (c_v)**
0.00				
0.87 psi	151.000 min	0.00111	0.00111	---------
1.74 psi	240.000 min	0.00341	0.00341	---------
3.48 psi	762.000 min	0.01021	0.01021	0.03101 in2/min
6.96 psi	480.000 min	0.01921	0.01921	0.07625 in2/min
13.92 psi	4080.000 min	0.03391	0.03391	0.05246 in2/min
27.85 psi	1440.000 min	0.04851	0.04851	0.03681 in2/min
55.55 psi	1440.000 min	0.06781	0.06781	0.09920 in2/min
111.10 psi	1260.000 min	0.08951	0.08951	0.08677 in2/min
222.20 psi	3840.000 min	0.11501	0.11501	0.11207 in2/min
444.40 psi	1680.000 min	0.14031	0.14031	0.10187 in2/min
111.10 psi	1440.000 min	0.13531	0.13531	---------
27.85 psi	1080.000 min	0.12721	0.12721	---------
6.96 psi	1260.000 min	0.11721	0.11721	---------

Plate No.: IV-6T

One Dimensional Consolidation Properties
(Oedometer)

Method of Time Fitting Used	Log Time

Client	Santa Clara Valley Transportation Authority	**Lab Ref**	
Project	Eastridge to BART Regional Connector Project	**Job**	2017-125-GEO
Borehole	AS-68 (“SB” Station 1007+43)	**Sample**	4
Location	San Jose, California	**Depth**	21 feet



Tested By and Date:	SM 2/15/19
Checked By and Date:	EO 2/28/19
Approved By and Date:	

Plate No:

One Dimensional Consolidation Properties
(Oedometer)

Client	Santa Clara Valley Transportation Authority	**Lab Ref**	
Project	Eastridge to BART Regional Connector Project	**Job**	2017-125-GEO
Borehole	AS-86 ("SB" Station 1057+95)	**Sample**	5
Location	San Jose, California	**Depth**	26

Test Details			
Standard	ASTM D2435-96 / AASHTO T216-94	**Particle Specific Gravity**	2.65
Sample Type	Core sample	**Lab. Temperature**	72.0 deg.F
Method of Testing (A/B)	A		
Sample Description	Lean Clay		
Variations from Procedure	None		

Specimen Details			
Specimen Reference	A	**Description**	
Depth within Sample	0.0000 in	**Orientation within Sample**	
Specimen Mass	0.1570 lb	**Condition**	Natural Moisture
Specimen Height	0.7500 in	**Preparation**	
Comments			

Apparatus			
Ring Number	3	**Ring Diameter**	2.0000 in
Ring Height	0.7500 in	**Ring Weight**	0.1378 lb
Lever Ratio	1.00 : 1	**Drainage**	Double-Sided

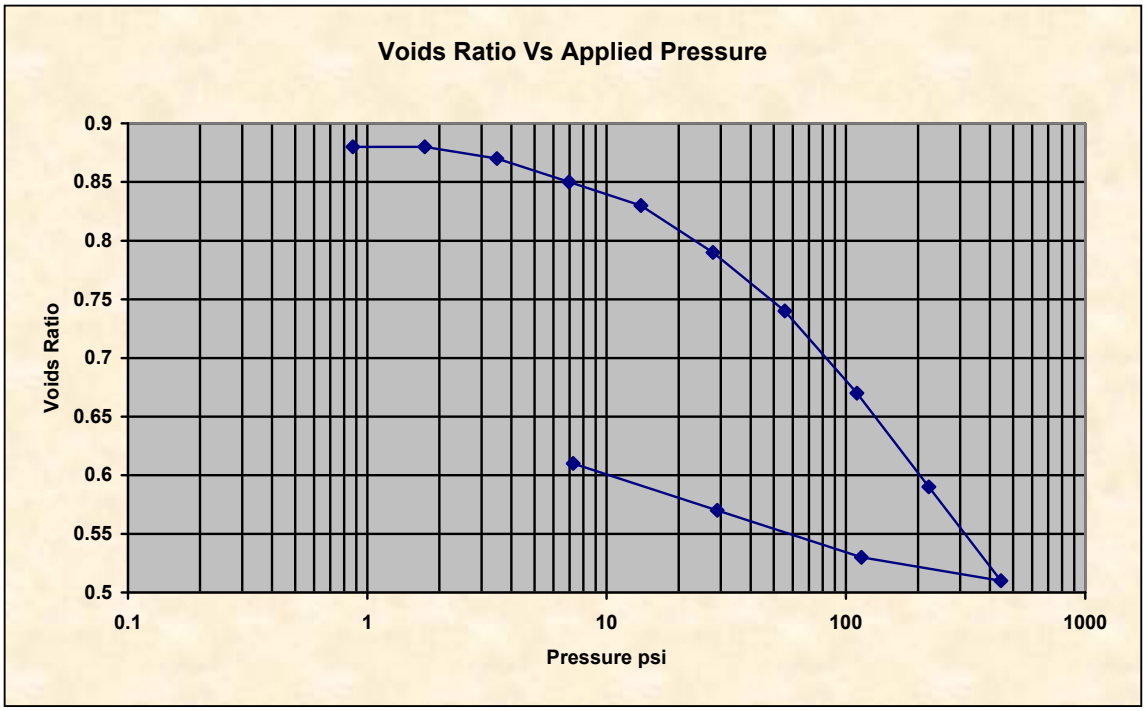


Plate No.: IV-6V

A-400

One Dimensional Consolidation Properties
(Oedometer)

Client	Santa Clara Valley Transportation Authority	**Lab Ref**	
Project	Eastridge to BART Regional Connector Project	**Job**	2017-125-GEO
Borehole	AS-86 ("SB" Station 1057+95)	**Sample**	5
Location	San Jose, California	**Depth**	26

Initial Moisture Content*	30.5 % (trimmings: 31.2 %)	**Final Moisture Content**	23.1 %
Initial Bulk Density	115.14 lb/ft3	**Final Bulk Density**	126.62 lb/ft3
Initial Dry Density	88.43 lb/ft3	**Final Dry Density**	102.85 lb/ft3
Initial Void Ratio	0.87	**Final Void Ratio**	0.61
Initial Degree of Saturation	92.47%	**Final Degree of Saturation**	100.79%
Pre-consolidation Pressure	0.00 psi		

* Calculated from initial and dry weights of whole specimen

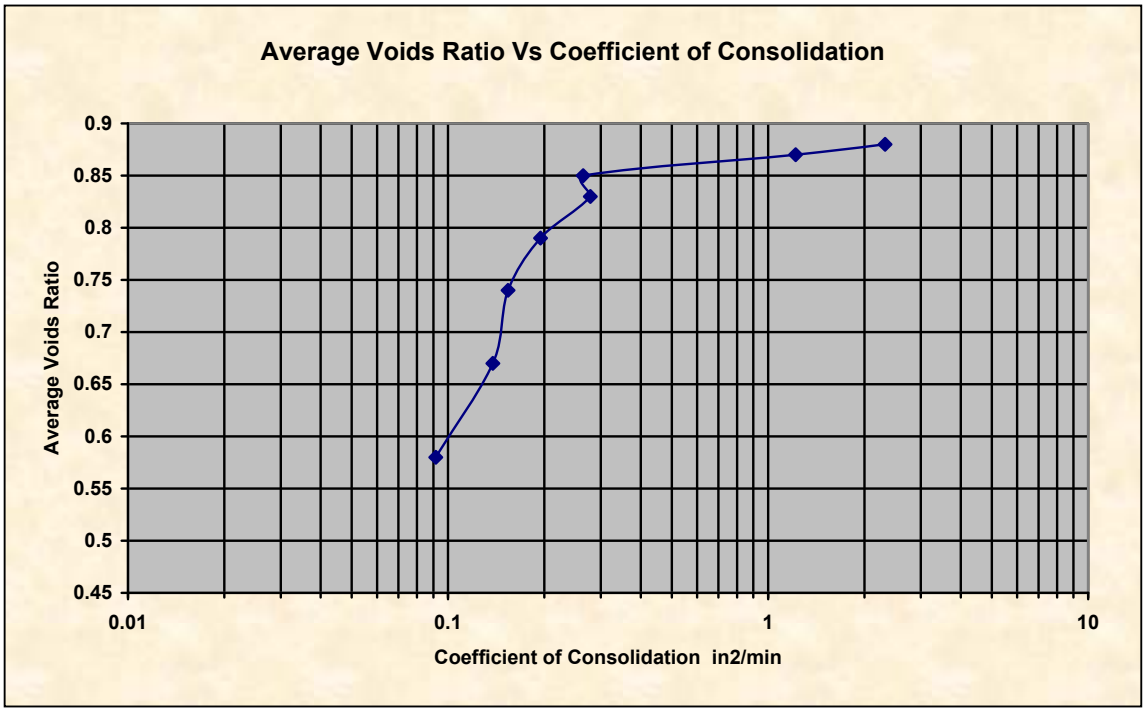
Pressure (Loading)	Load Increment Duration	Deformation (Corrected)	d_{100} (Corrected)	Coefficient of Consolidation (c_v)
0.00				
0.87 psi	190.000 min	0	0	---------
1.74 psi	762.000 min	0.0017	0.0017	---------
3.48 psi	480.000 min	0.005	0.005	2.31922 in2/min
6.96 psi	4080.000 min	0.011	0.011	1.21934 in2/min
13.92 psi	480.000 min	0.0192	0.0192	0.26427 in2/min
27.85 psi	960.000 min	0.0341	0.0341	0.27843 in2/min
55.55 psi	1440.000 min	0.0543	0.0543	0.19457 in2/min
111.10 psi	1260.000 min	0.083	0.083	0.15402 in2/min
222.20 psi	3840.000 min	0.1165	0.1165	0.13802 in2/min
444.40 psi	1680.000 min	0.1495	0.1495	0.09153 in2/min
116.03 psi	1440.000 min	0.1396	0.1396	---------
29.01 psi	1080.000 min	0.1243	0.1243	---------
7.25 psi	1260.000 min	0.1071	0.1071	---------

Plate No.: IV-6W

One Dimensional Consolidation Properties
(Oedometer)

Method of Time Fitting Used	Log Time

Client	Santa Clara Valley Transportation Authority	**Lab Ref**	
Project	Eastridge to BART Regional Connector Project	**Job**	2017-125-GEO
Borehole	AS-86 ("SB" Station 1057+95)	**Sample**	5
Location	San Jose, California	**Depth**	26



Tested By and Date:	SM 2/15/19
Checked By and Date:	EO 2/28/19
Approved By and Date:	

Plate No.: IV-6X

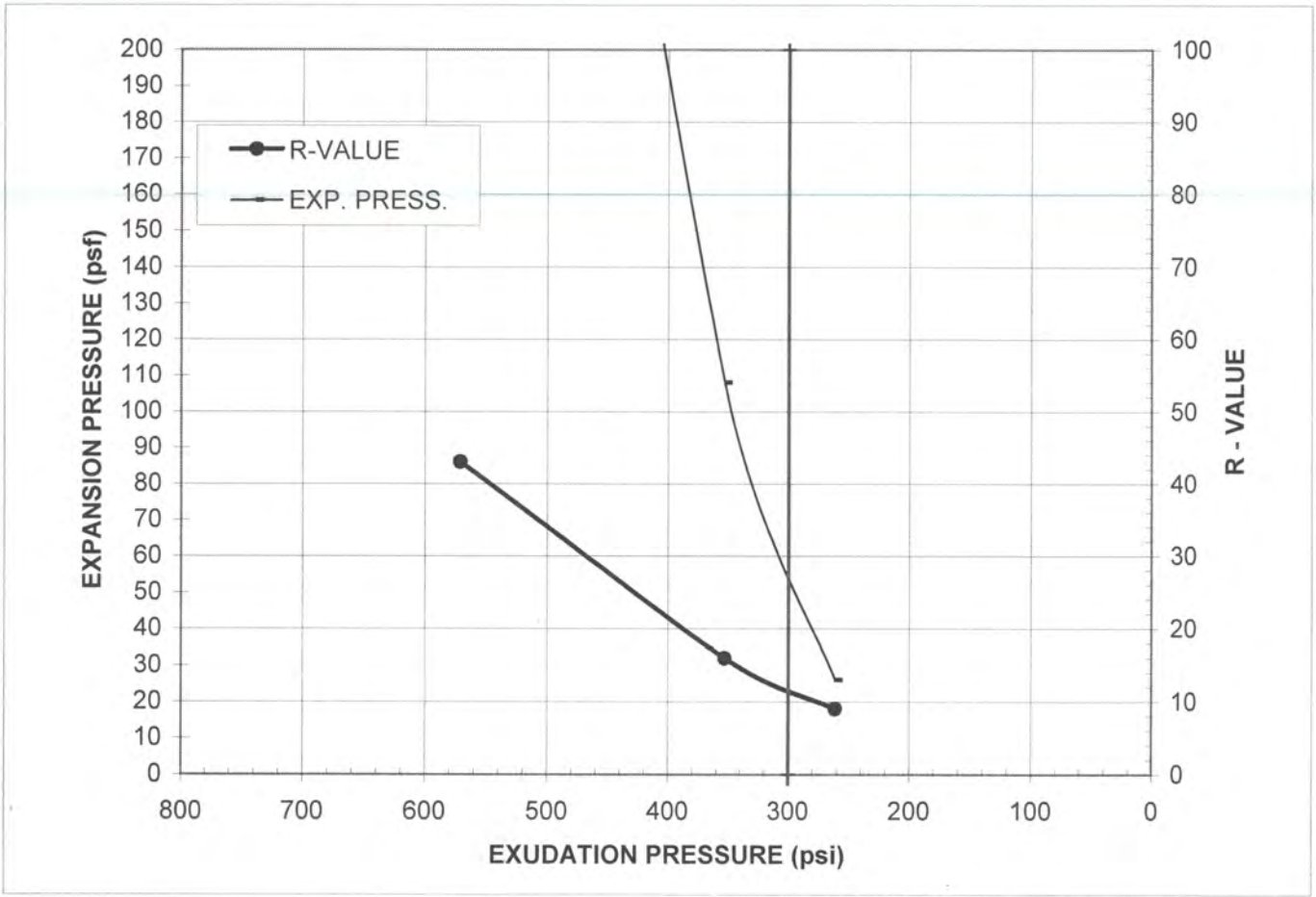
A-402

R-VALUE TEST

R-VALUE REPORT

Parikh Consultants, Inc. | ASTM D2844 or CTM 301 | (408) 945-1011

Project Name:	EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT	Date:	5/24/05
Client:	BKF ENGINEERS	Project #:	2017-125-GEO
Sample #:	AG-18 Depth: 2' - 3'	Lab #:	M531
Location / Source:	Native	Sample Date:	
Material :	Sandy clay, dark brown	Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	261	353	571
Expansion Pressure, psf	26	108	533
R-Value	9	16	43
Moisture Content at Test, %	17.6	15.7	14.1
Dry Density at Test, pcf	110.2	115.6	118.8

R-Value @ 300 psi Exudation Pressure = 12

Expansion Pressure @300 psi Exudation, psf = **55**

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

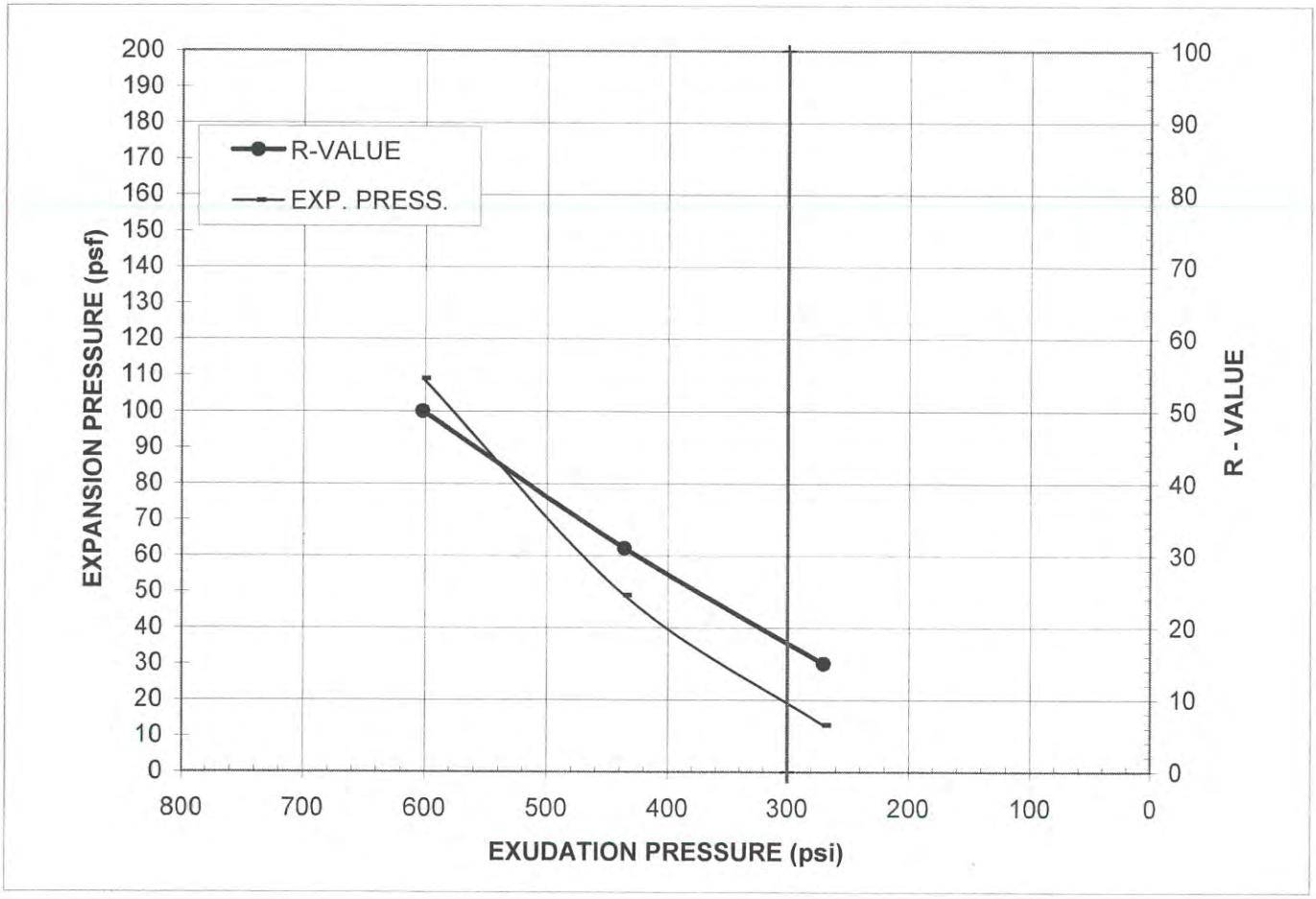
RVALUE with calcs pdp

Plate No.: IV-7A

R-VALUE REPORT

Parikh Consultants, Inc. | ASTM D2844 or CTM 301 | (408) 945-1011

Project Name:	EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT			Date:	5/24/05
Client:	BKF ENGINEERS			Project #:	2017-125-GEO
Sample #:	AG-19	Depth:	2' - 3'	Lab #:	M531
Location / Source:		Native		Sample Date:	
Material :	Sandy clay, brown			Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	270	436	602
Expansion Pressure, psf	13	49	109
R-Value	15	31	50
Moisture Content at Test, %	17.0	15.1	14.1
Dry Density at Test, pcf	111.1	115.9	113.9

R-Value @ 300 psi Exudation Pressure = **17**

Expansion Pressure @300 psi Exudation, psf = **19**

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

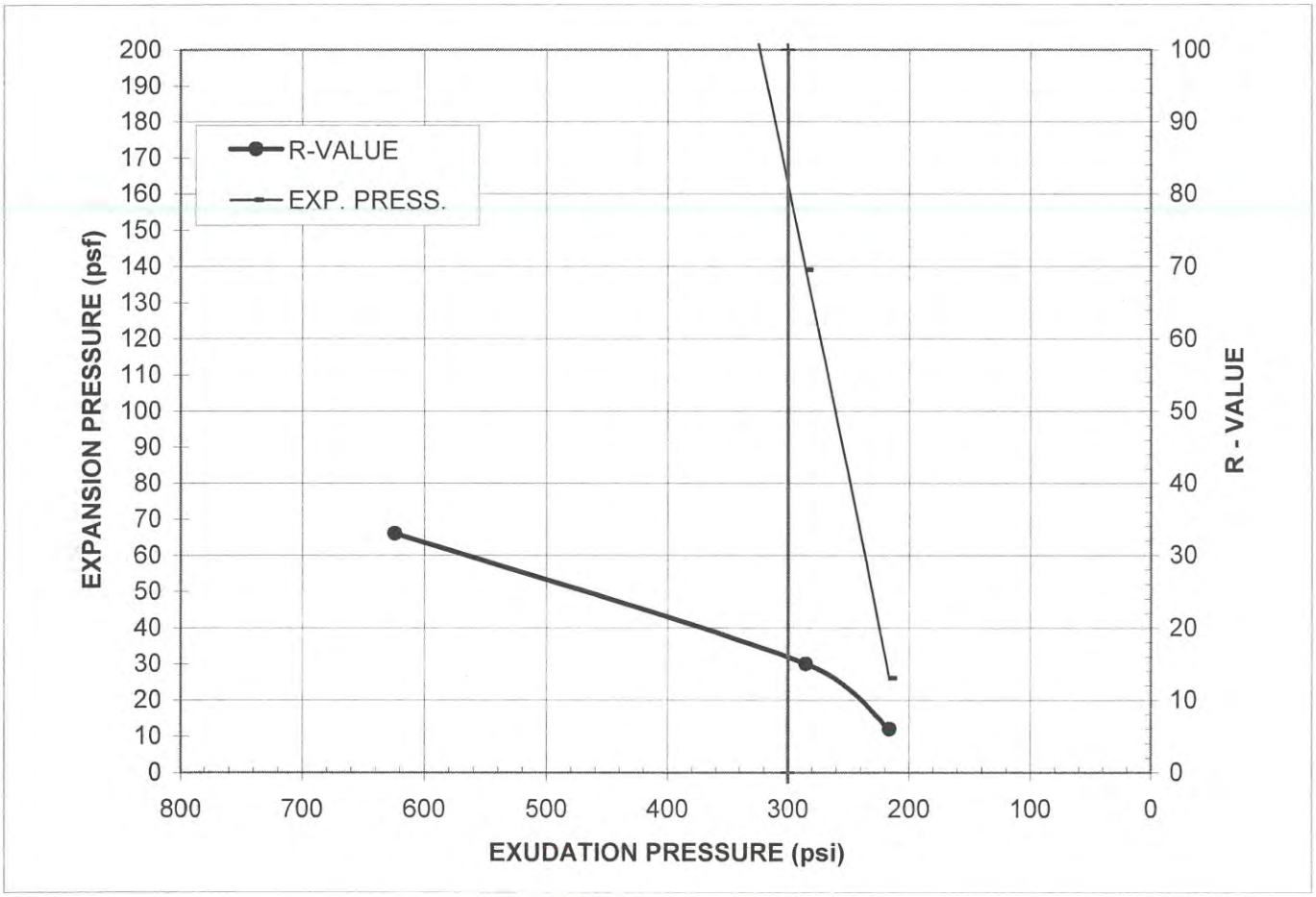
RVALUE with calcs pdp

Plate No.: IV-7B

R-VALUE REPORT

Parikh Consultants, Inc. | ASTM D2844 or CTM 301 | (408) 945-1011

Project Name:	EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT			Date:	5/24/05
Client:	BKF ENGINEERS			Project #:	2017-125-GEO
Sample #:	PS-21	Depth:	2' - 3'	Lab #:	M531
Location / Source:	Native			Sample Date:	
Material :	Sandy clay, dark brown			Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	216	285	624
Expansion Pressure, psf	26	139	676
R-Value	6	15	33
Moisture Content at Test, %	19.0	17.2	14.9
Dry Density at Test, pcf	105.6	112.0	117.0

R-Value @ 300 psi Exudation Pressure =	**16**	Expansion Pressure @300 psi Exudation, psf =	**165**
Minimum R-Value Requirement:			

Comments:

Report By: Prav Dayah

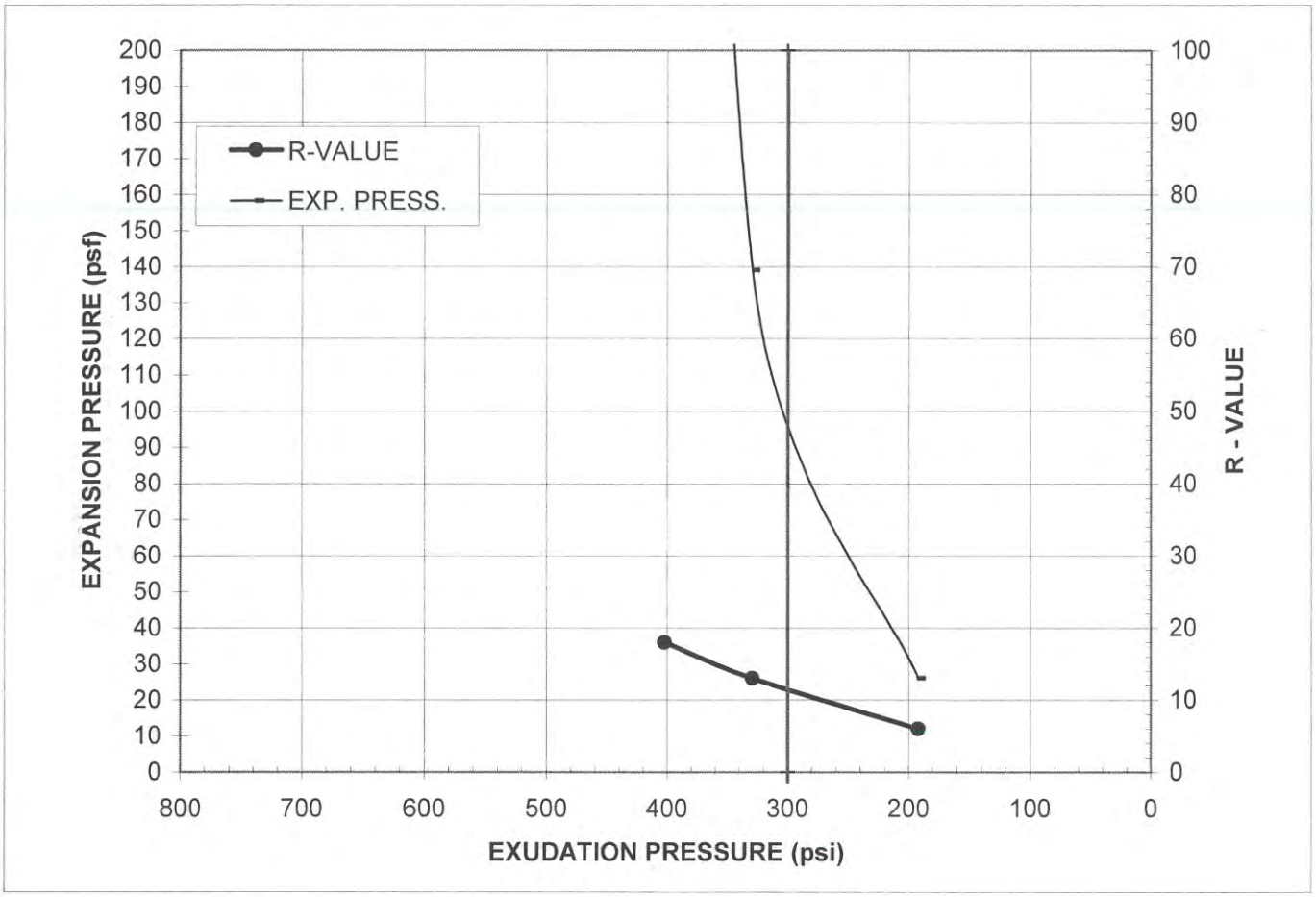
RVALUE with calcs pdp

Plate No.: IV-7C

R-VALUE REPORT

Parikh Consultants, Inc. | ASTM D2844 or CTM 301 | (408) 945-1011

Project Name:	EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT			Date:	5/24/05
Client:	BKF ENGINEERS			Project #:	2017-125-GEO
Sample #:	PS-23	Depth:	2' - 3'	Lab #:	M531
Location / Source:		Native		Sample Date:	
Material :	Sandy clay, brown			Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	192	329	402
Expansion Pressure, psf	26	139	676
R-Value	6	13	18
Moisture Content at Test, %	19.8	17.8	16.7
Dry Density at Test, pcf	106.4	110.3	112.9

R-Value @ 300 psi Exudation Pressure = 12

Expansion Pressure @300 psi Exudation, psf = **98**

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

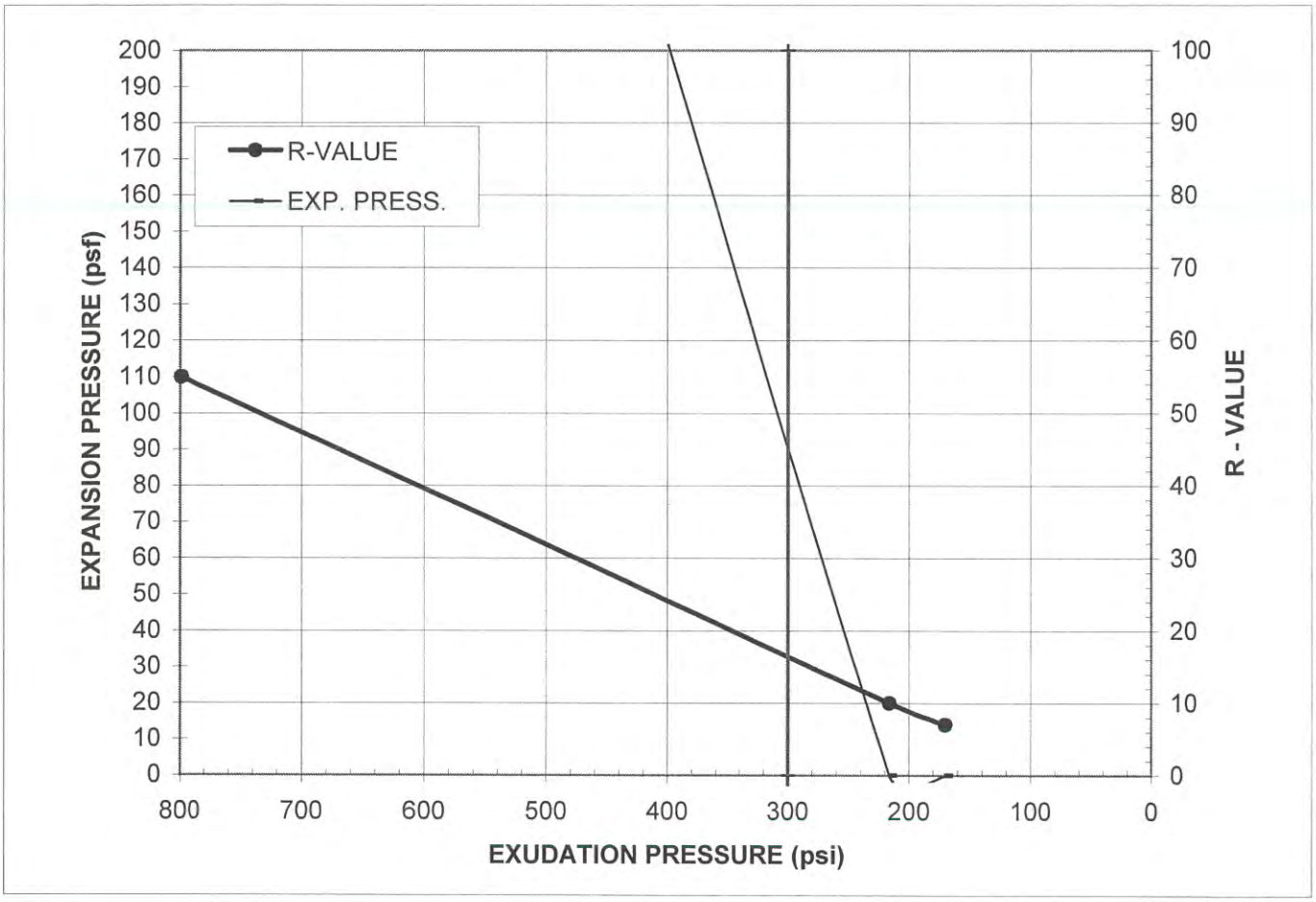
RVALUE with calcs pdp

Plate No.: IV-7D

R-VALUE REPORT

Parikh Consultants, Inc. | ASTM D2844 or CTM 301 | (408) 945-1011

Project Name:	EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT			Date:	9/14/05
Client:	BKF ENGINEERS			Project #:	204125.10
Sample #:	T-31	Depth:	1' -5'	Lab #:	M552
Location / Source:		Native / Eastridge Shopping Mall Parking Lot		Sample Date:	
Material :	Clay, brown			Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	170	216	799
Expansion Pressure, psf	0	0	653
R-Value	7	10	55
Moisture Content at Test, %	24.1	22.1	18.5
Dry Density at Test, pcf	103.2	107.4	115.8

R-Value @ 300 psi Exudation Pressure = 16

Expansion Pressure @300 psi Exudation, psf = **90**

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

RVALUE with calcs pdp

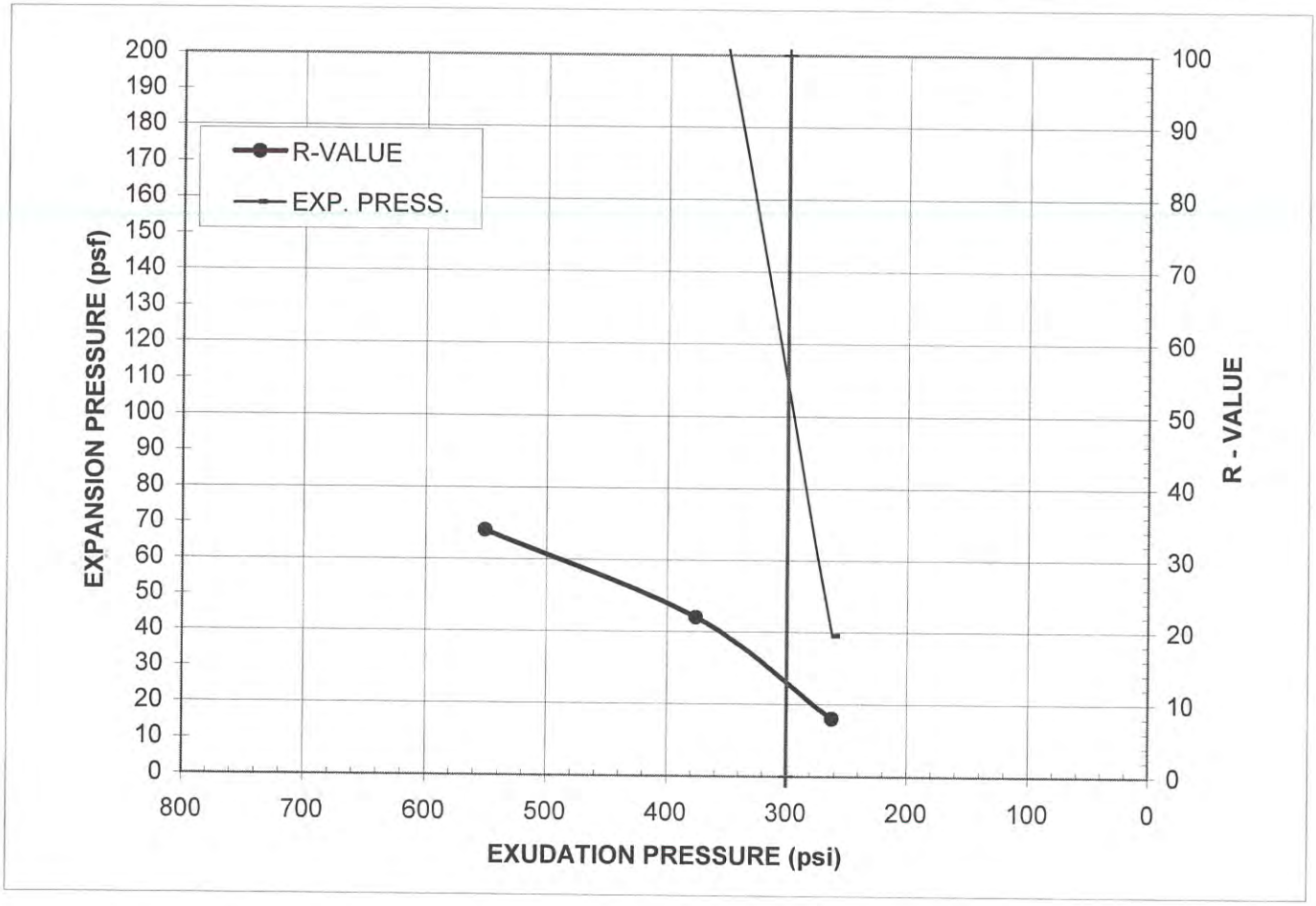
Plate No.: IV-7E

A-408

R-VALUE REPORT

Parikh Consultants, Inc. | ASTM D2844 or CTM 301 | (408) 945-1011

Project Name:	EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT			Date:	9/14/05
Client:	BKF ENGINEERS			Project #:	2017-125-GEO
Sample #:	T-32	Depth:	1' -5'	Lab #:	M552
Location / Source:		Native / Eastridge Shopping Mall Parking Lot		Sample Date:	
Material :	Clay, brown			Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	262	376	551
Expansion Pressure, psf	39	243	498
R-Value	8	22	34
Moisture Content at Test, %	18.7	16.3	14.9
Dry Density at Test, pcf	109.0	114.9	117.9

R-Value @ 300 psi Exudation Pressure = 14

Expansion Pressure @300 psi Exudation, psf = **110**

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

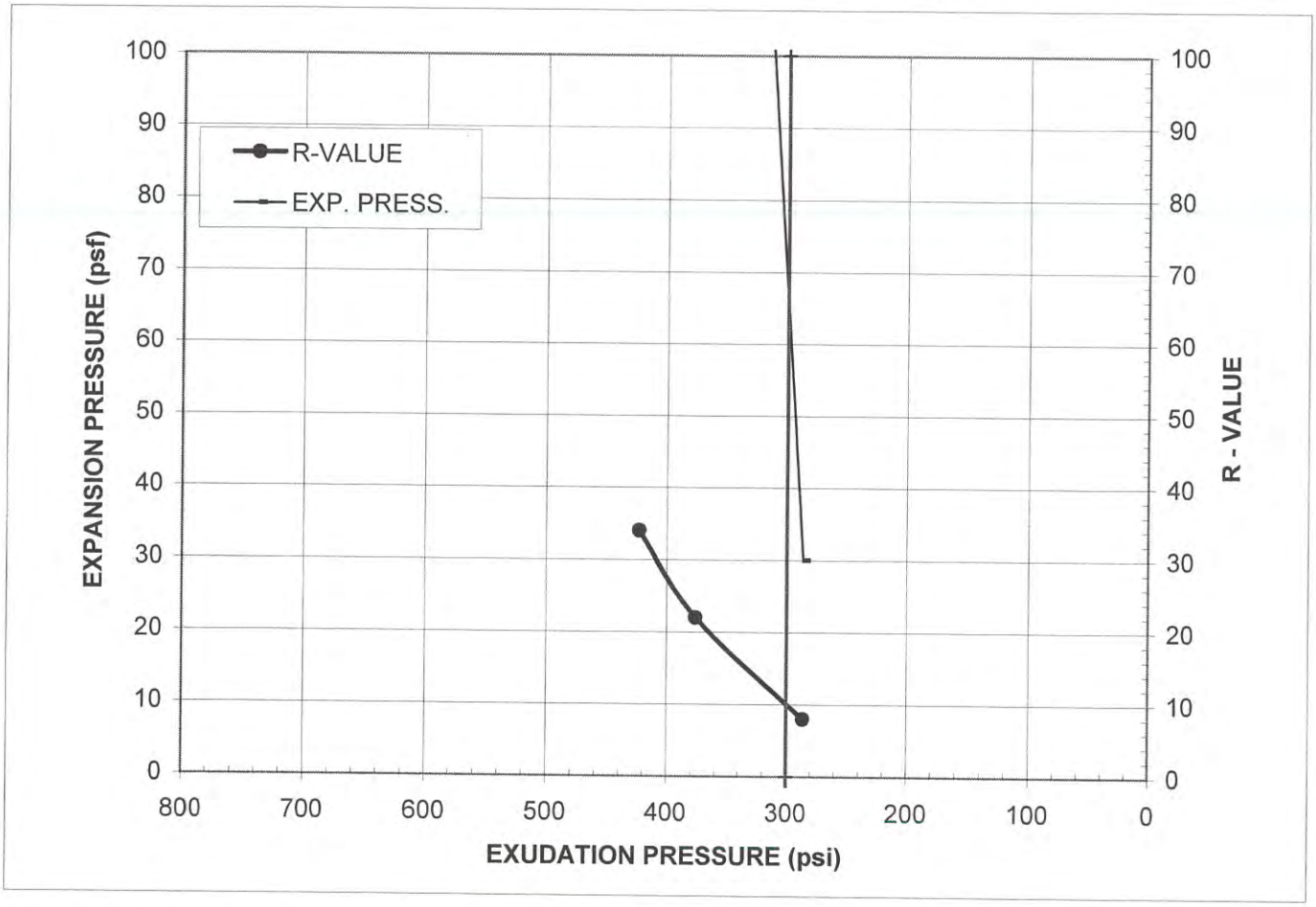
RVALUE with calcs pdp

Plate No.: IV-7F

R-VALUE REPORT

Parikh Consultants, Inc. | ASTM D2844 or CTM 301 | (408) 945-1011

Project Name:	EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT			Date:	9/14/05
Client:	BKF ENGINEERS			Project #:	2017-125-GEO
Sample #:	T-33	Depth:	1' -5'	Lab #:	M552
Location / Source:		Native / Eastridge Shopping Mall Parking Lot		Sample Date:	
Material :	Clay, brown			Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	286	376	423
Expansion Pressure, psf	30	264	324
R-Value	8	22	34
Moisture Content at Test, %	23.1	21.9	20.9
Dry Density at Test, pcf	102.0	104.0	106.4

R-Value @ 300 psi Exudation Pressure = **10**

Expansion Pressure @300 psi Exudation, psf = **70**

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

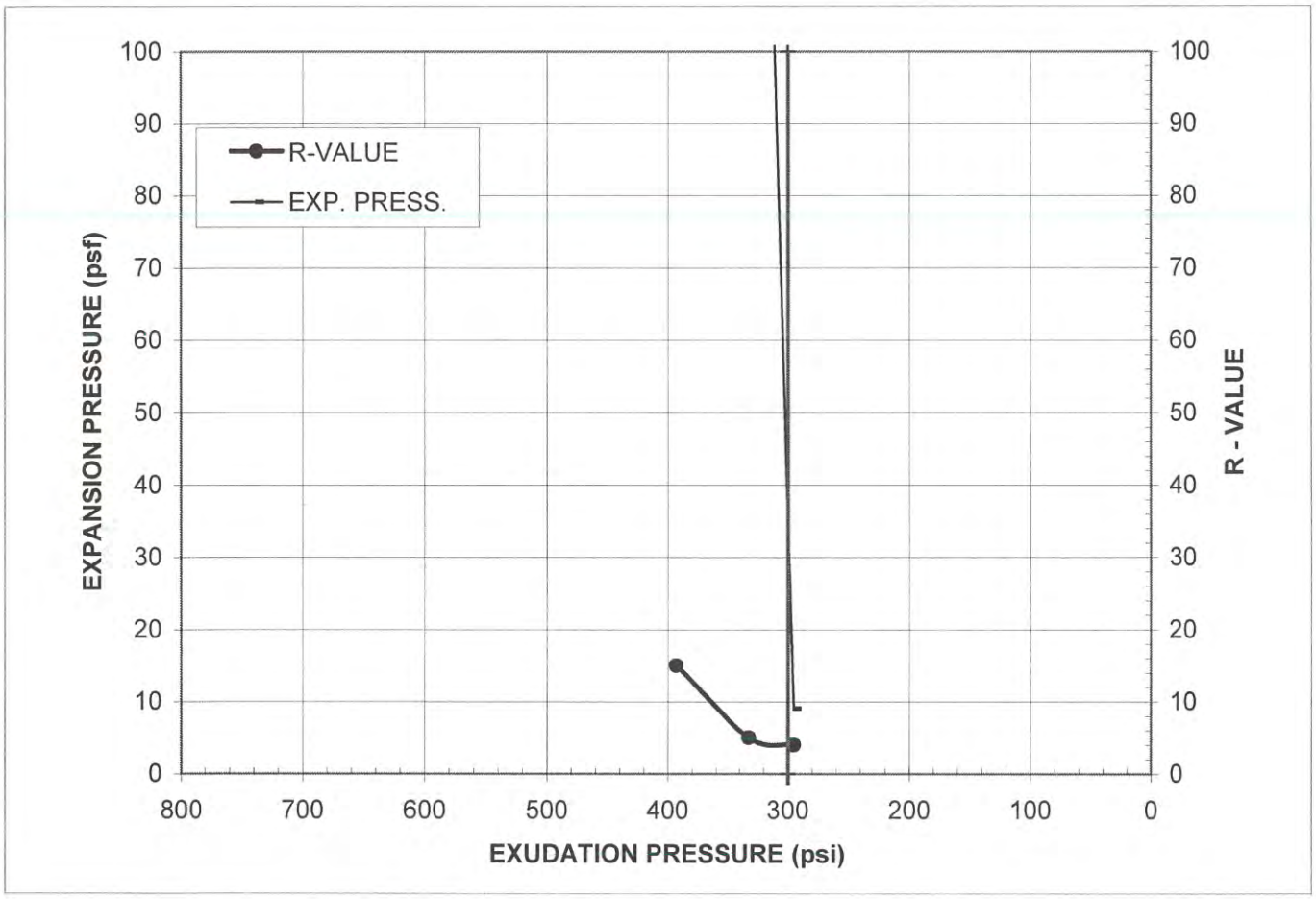
RVALUE with calcs pdp

Plate No.: IV-7G

R-VALUE REPORT

Parikh Consultants, Inc. | ASTM D2844 or CTM 301 | (408) 945-1011

Project Name:	EASTRIDGE TO BART REGIONAL CONNECTOR			Date:	9/14/05
Client:	BKF ENGINEERS			Project #:	2017-125-GEO
Sample #:	P-34	Depth:	1' -5'	Lab #:	M552
Location / Source:		Native / Eastridge Shopping Mall Parking Lot		Sample Date:	
Material :	Heavy clay, brown			Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	295	332	393
Expansion Pressure, psf	9	208	385
R-Value	4	5	15
Moisture Content at Test, %	21.2	19.5	17.5
Dry Density at Test, pcf	101.7	106.6	112.6

R-Value @ 300 psi Exudation Pressure = 5

Expansion Pressure @300 psi Exudation, psf = **40**

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

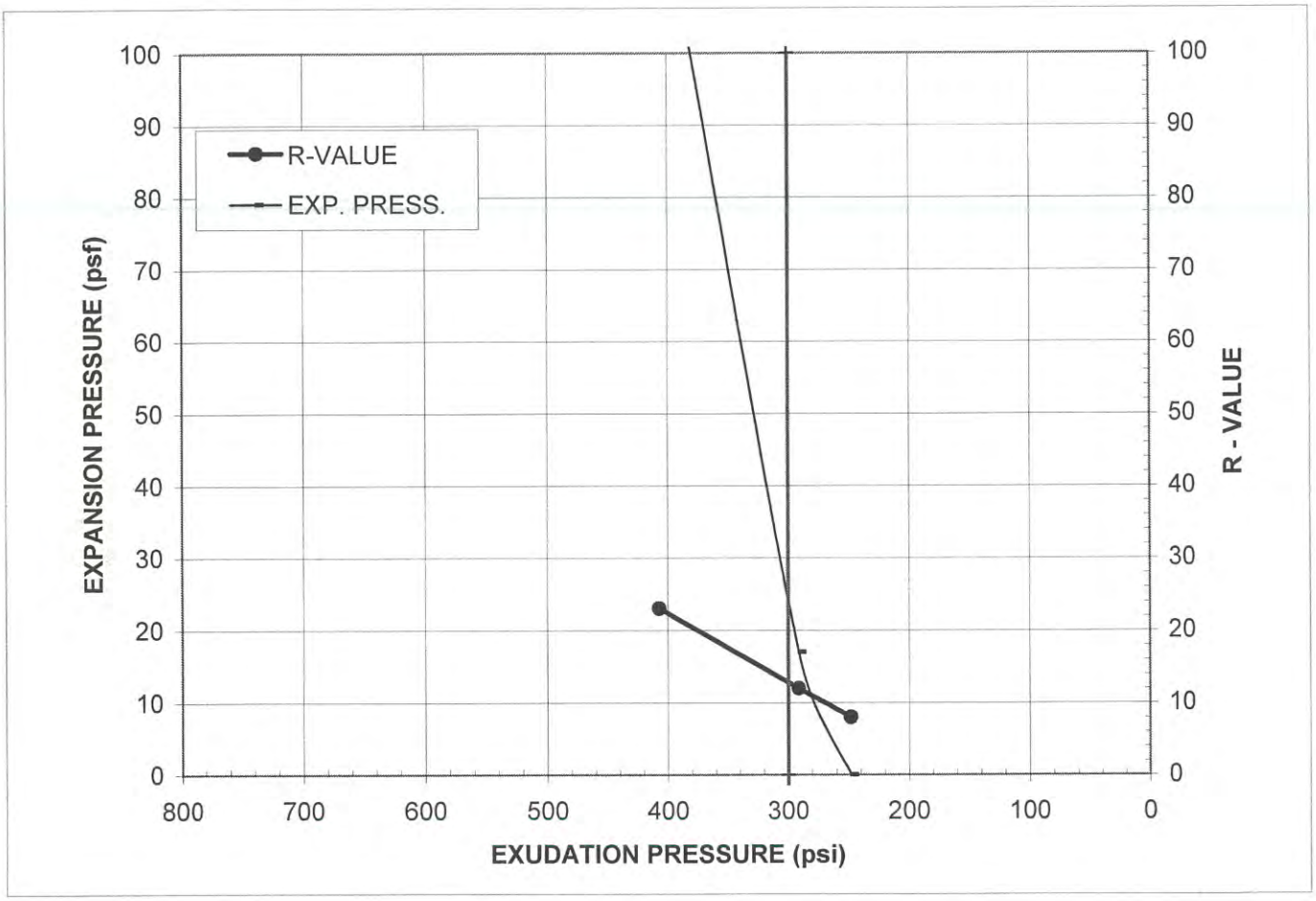
RVALUE with calcs pdp

Plate No.: IV-7H

R-VALUE REPORT

Parikh Consultants, Inc. | ASTM D2844 or CTM 301 | (408) 945-1011

Project Name:	EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT			Date:	9/14/05
Client:	BKF ENGINEERS			Project #:	2017-125-GEO
Sample #:	P-35	Depth:	1' -5'	Lab #:	M552
Location / Source:	Native / Eastridge Shopping Mall Parking Lot			Sample Date:	
Material :	Clay with some sand, brown			Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	248	291	407
Expansion Pressure, psf	0	17	126
R-Value	8	12	23
Moisture Content at Test, %	19.6	18.1	16.1
Dry Density at Test, pcf	107.4	110.9	114.9

R-Value @ 300 psi Exudation Pressure = **13**

Expansion Pressure @300 psi Exudation, psf = **24**

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

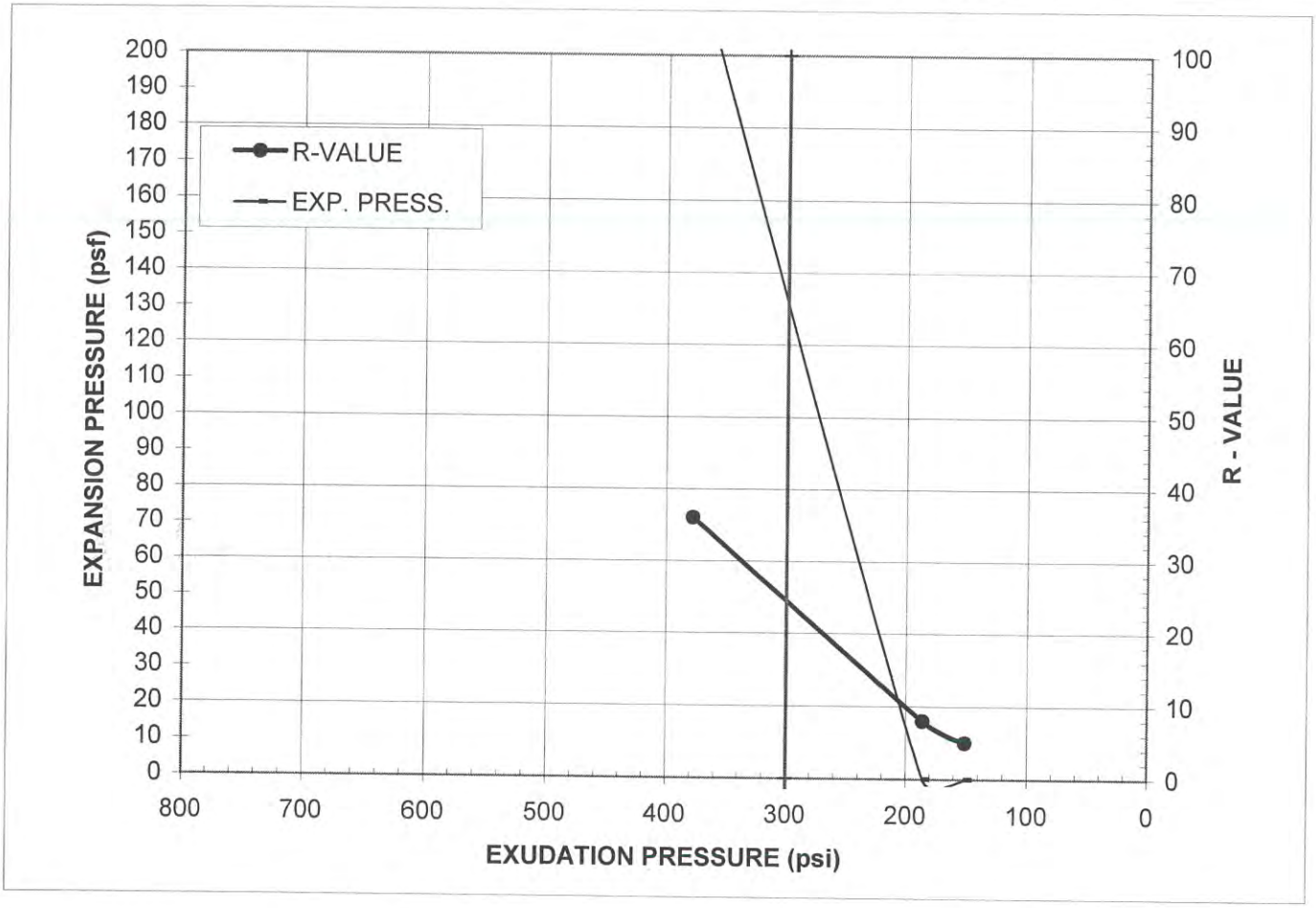
RVALUE with calcs pdp

Plate No.: IV-7I

R-VALUE REPORT

Parikh Consultants, Inc. **ASTM D2844 or CTM 301** (408) 945-1011

Project Name:	EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT			Date:	9/14/05
Client:	BKF ENGINEERS			Project #:	2017-125-GEO
Sample #:	R-36	Depth:	1' -5'	Lab #:	M552
Location / Source:		Native / Eastridge Shopping Mall Parking Lot		Sample Date:	
Material :	Sandy clay, brown			Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	151	186	378
Expansion Pressure, psf	0	0	225
R-Value	5	8	36
Moisture Content at Test, %	22.4	20.3	18.4
Dry Density at Test, pcf	102.4	105.9	111.1

R-Value @ 300 psi Exudation Pressure = 25

Expansion Pressure @300 psi Exudation, psf = **130**

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

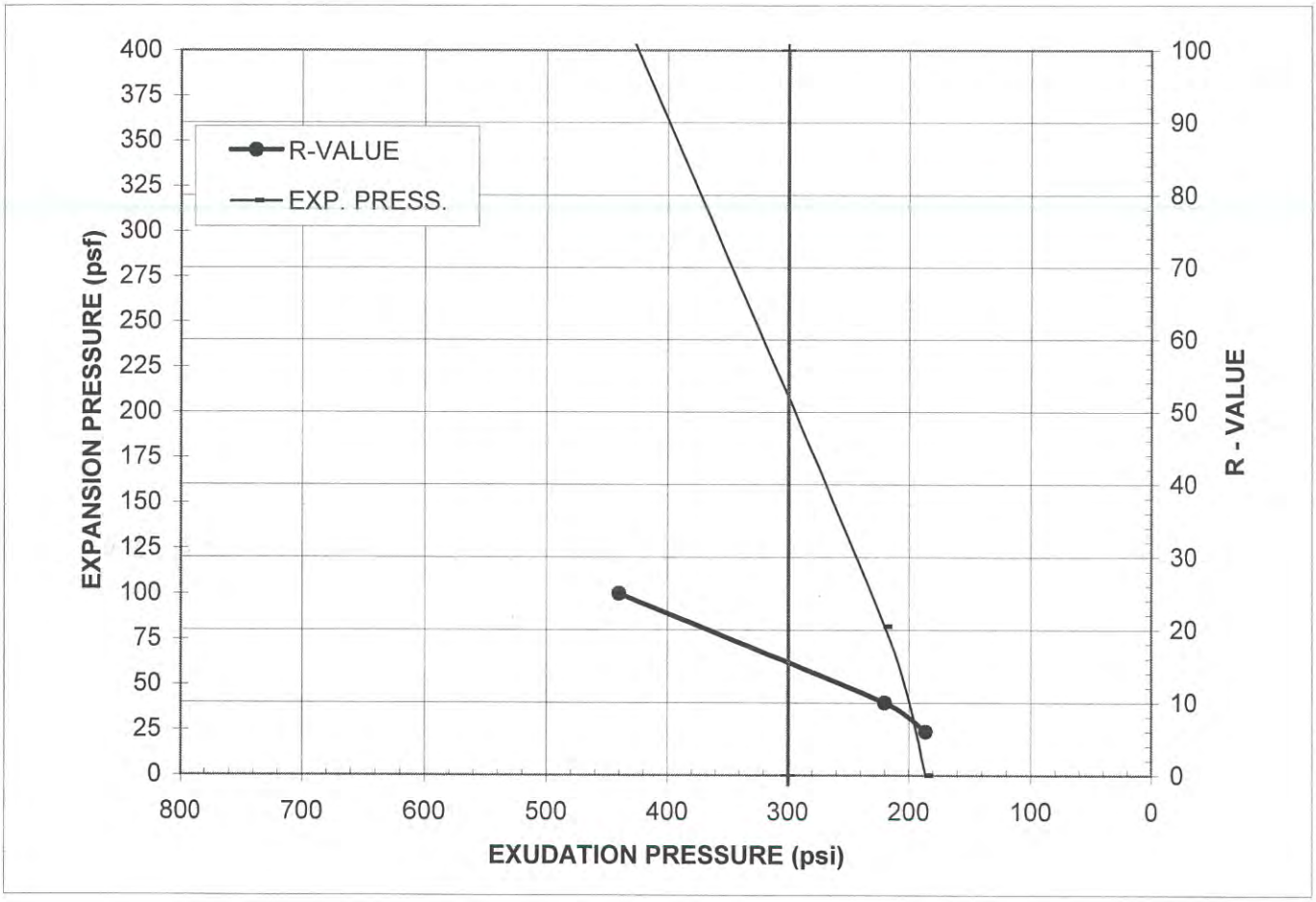
RVALUE with calcs pdp

Plate No.: IV-7J

R-VALUE REPORT

Parikh Consultants, Inc. **ASTM D2844 or CTM 301** (408) 945-1011

Project Name:	EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT			Date:	9/14/05
Client:	BKF ENGINEERS			Project #:	2017-125-GEO
Sample #:	R-37	Depth:	1' -5'	Lab #:	M552
Location / Source:		Native / Eastridge Shopping Mall Parking Lot		Sample Date:	
Material :	Clay with some gravel, brown			Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	186	220	440
Expansion Pressure, psf	0	82	424
R-Value	6	10	25
Moisture Content at Test, %	21.7	19.7	16.7
Dry Density at Test, pcf	102.7	107.0	112.9

R-Value @ 300 psi Exudation Pressure = 16

Expansion Pressure @300 psi Exudation, psf = **210**

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

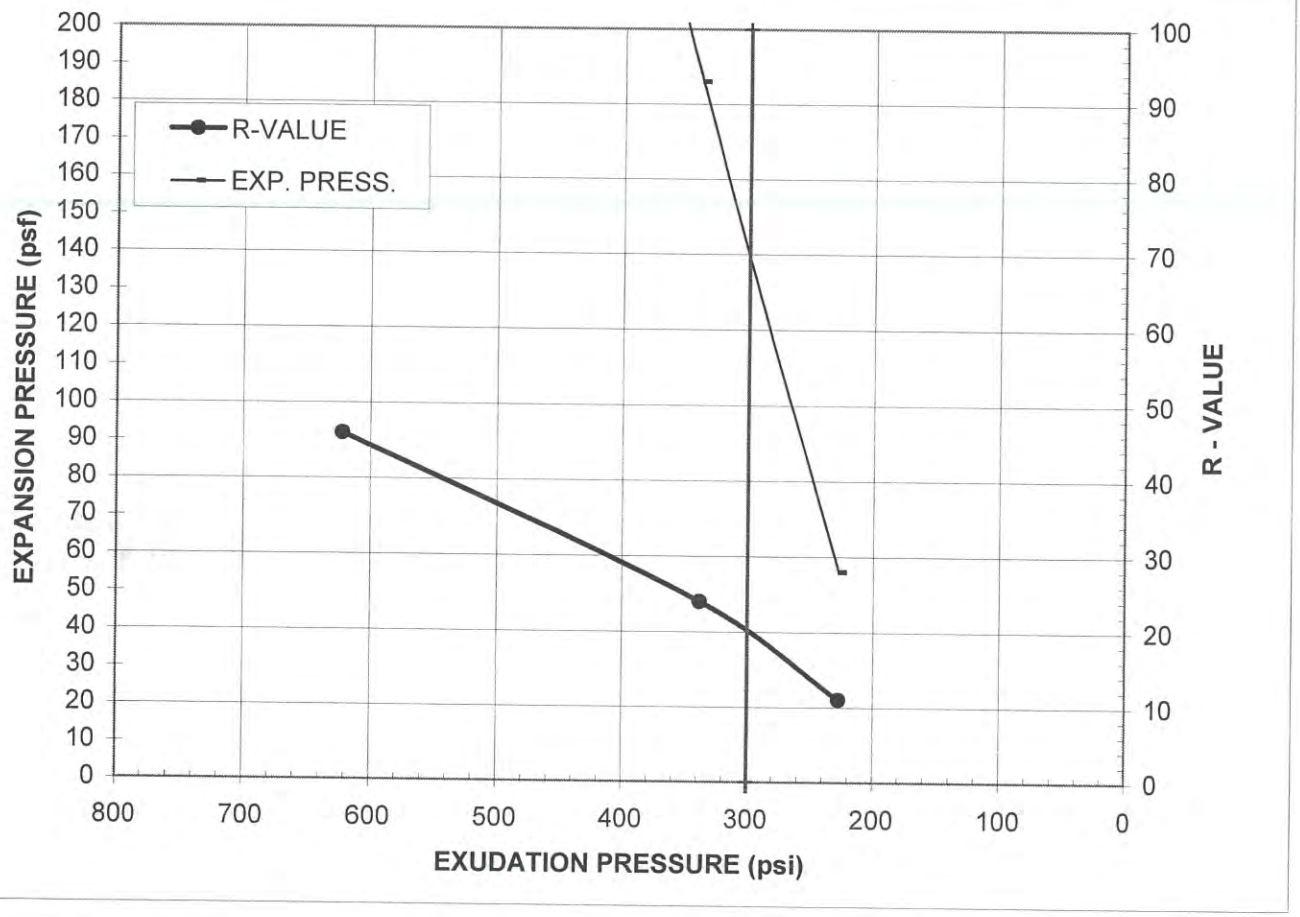
RVALUE with calcs pdp

Plate No.: IV-7K

R-VALUE REPORT

Parikh Consultants, Inc. | ASTM D2844 or CTM 301 | (408) 945-1011

Project Name:	EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT			Date:	9/14/05
Client:	BKF ENGINEERS			Project #:	2017-125-GEO
Sample #:	R-38	Depth:	1' -5'	Lab #:	M552
Location / Source:		Native / Eastridge Shopping Mall Parking Lot		Sample Date:	
Material :	Clay, brown			Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	227	338	622
Expansion Pressure, psf	56	186	550
R-Value	11	24	46
Moisture Content at Test, %	17.6	15.7	13.8
Dry Density at Test, pcf	109.2	113.8	119.0

R-Value @ 300 psi Exudation Pressure = 20

Expansion Pressure @300 psi Exudation, psf = **138**

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

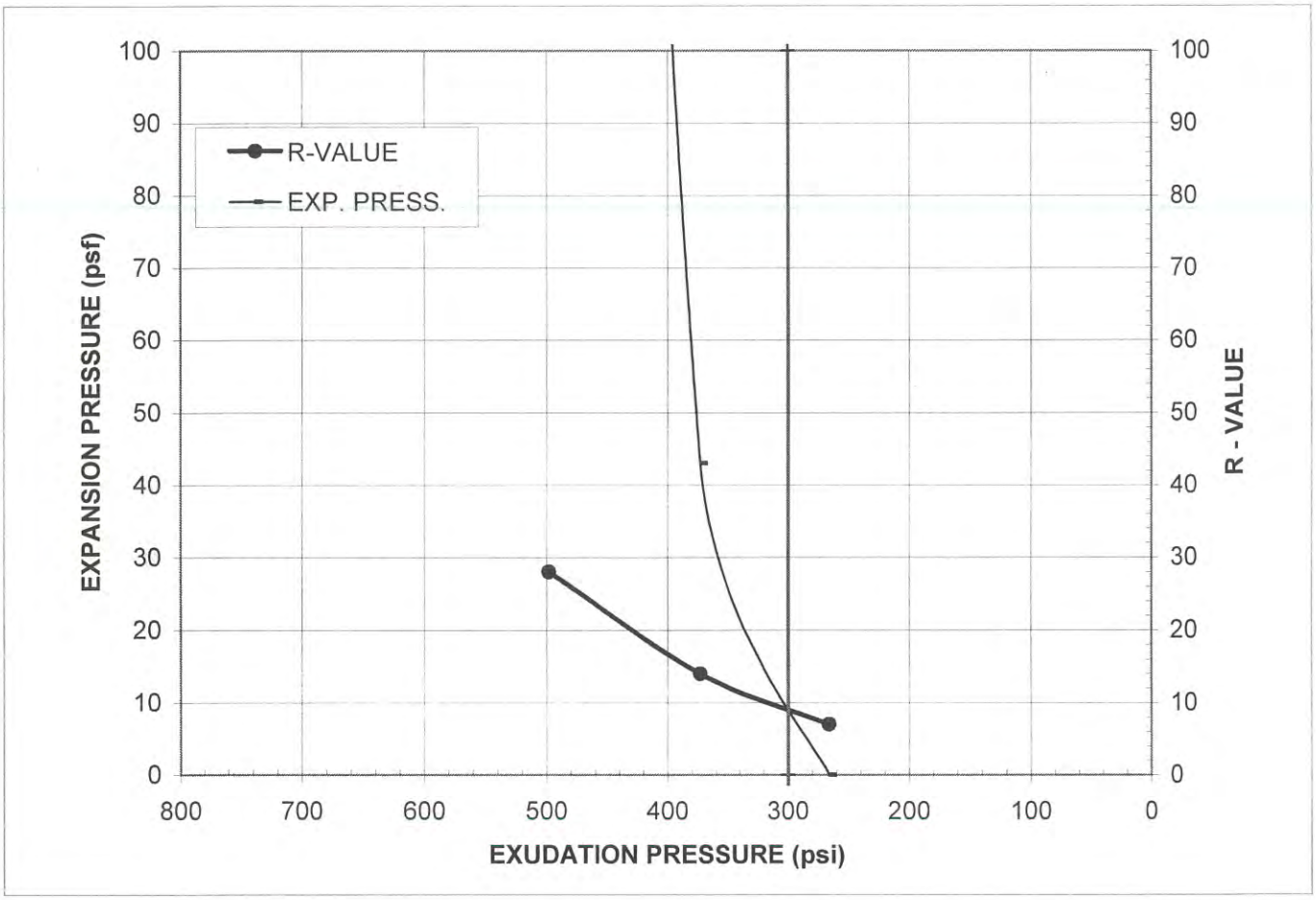
RVALUE with calcs pdp

Plate No.: IV-7L

R-VALUE REPORT

Parikh Consultants, Inc. | ASTM D2844 or CTM 301 | (408) 945-1011

Project Name:	EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT			Date:	5/17/05
Client:	BKF ENGINEERS			Project #:	2017-125-GEO
Sample #:	AG-46	Depth:	2' - 5'	Lab #:	M531
Location / Source:	Native			Sample Date:	
Material :	Clay, dark brown			Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	266	373	498
Expansion Pressure, psf	0	43	468
R-Value	7	14	28
Moisture Content at Test, %	25.6	22.7	20.7
Dry Density at Test, pcf	96.0	102.1	105.9

R-Value @ 300 psi Exudation Pressure = **9**

Expansion Pressure @300 psi Exudation, psf = **9**

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

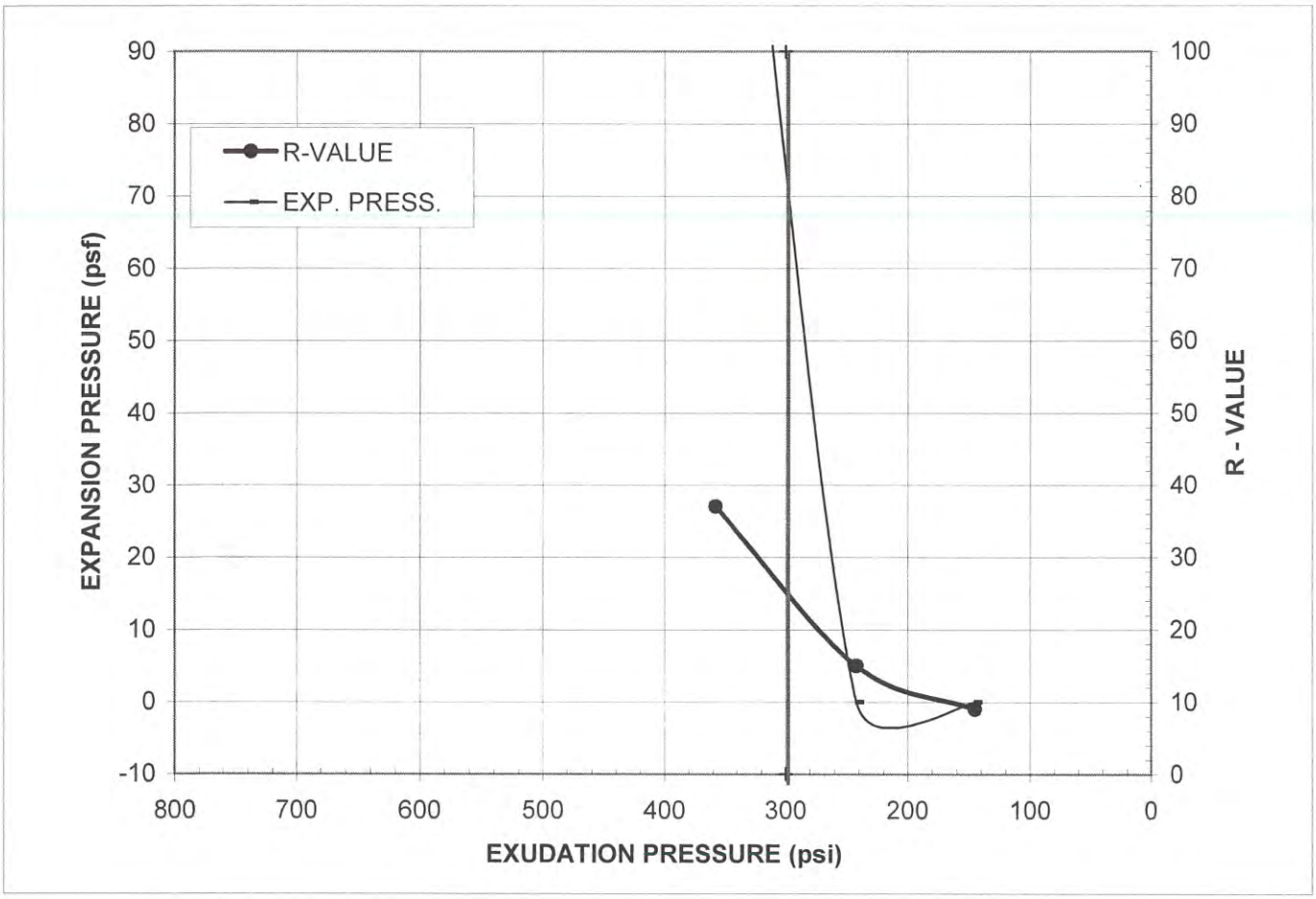
RVALUE with calcs pdp

Plate No.: IV-7M

R-VALUE REPORT

Parikh Consultants, Inc. | ASTM D2844 or CTM 301 | (408) 945-1011

Project Name:	EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT			Date:	5/17/05
Client:	BKF ENGINEERS			Project #:	2017-125-GEO
Sample #:	PS-47	Depth:	2' - 5'	Lab #:	M531
Location / Source:		Native		Sample Date:	
Material :	Clay with gravel, dark brown			Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	145	242	358
Expansion Pressure, psf	0	0	164
R-Value	9	15	37
Moisture Content at Test, %	24.5	20.5	17.5
Dry Density at Test, pcf	197.5	209.2	218.6

R-Value @ 300 psi Exudation Pressure = 25

Expansion Pressure @300 psi Exudation, psf = **70**

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

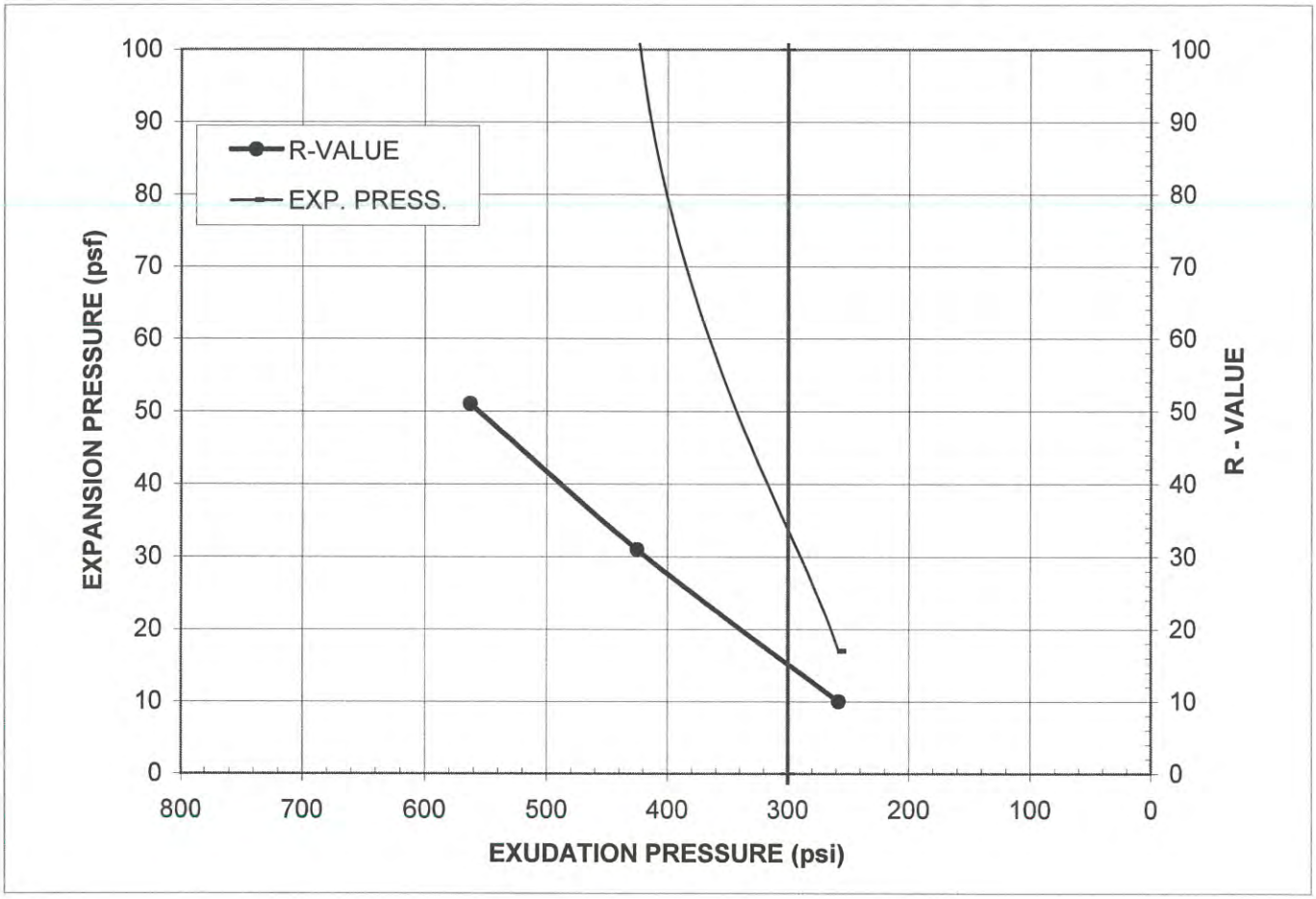
RVALUE with calcs pdp

Plate No.: IV-7N

R-VALUE REPORT

Parikh Consultants, Inc. | ASTM D2844 or CTM 301 | (408) 945-1011

Project Name:	EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT			Date:	9/28/06
Client:	BKF ENGINEERS			Project #:	2017-125-GEO
Sample #:	PA-60	Depth:	0' - 5'	Lab #:	M552
Location / Source:		Capital Expway Eastridge Shopping Mall		Sample Date:	
Material :	Clay, brown			Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	258	425	563
Expansion Pressure, psf	17	103	446
R-Value	10	31	51
Moisture Content at Test, %	17.0	15.0	13.1
Dry Density at Test, pcf	111.9	116.1	120.8

R-Value @ 300 psi Exudation Pressure = 15

Expansion Pressure @300 psi Exudation, psf = **34**

Minimum R-Value Requirement:

Comments:

Natural Moisture Content % 15.0 Lean Clay - CL

Report By: Prav Dayah

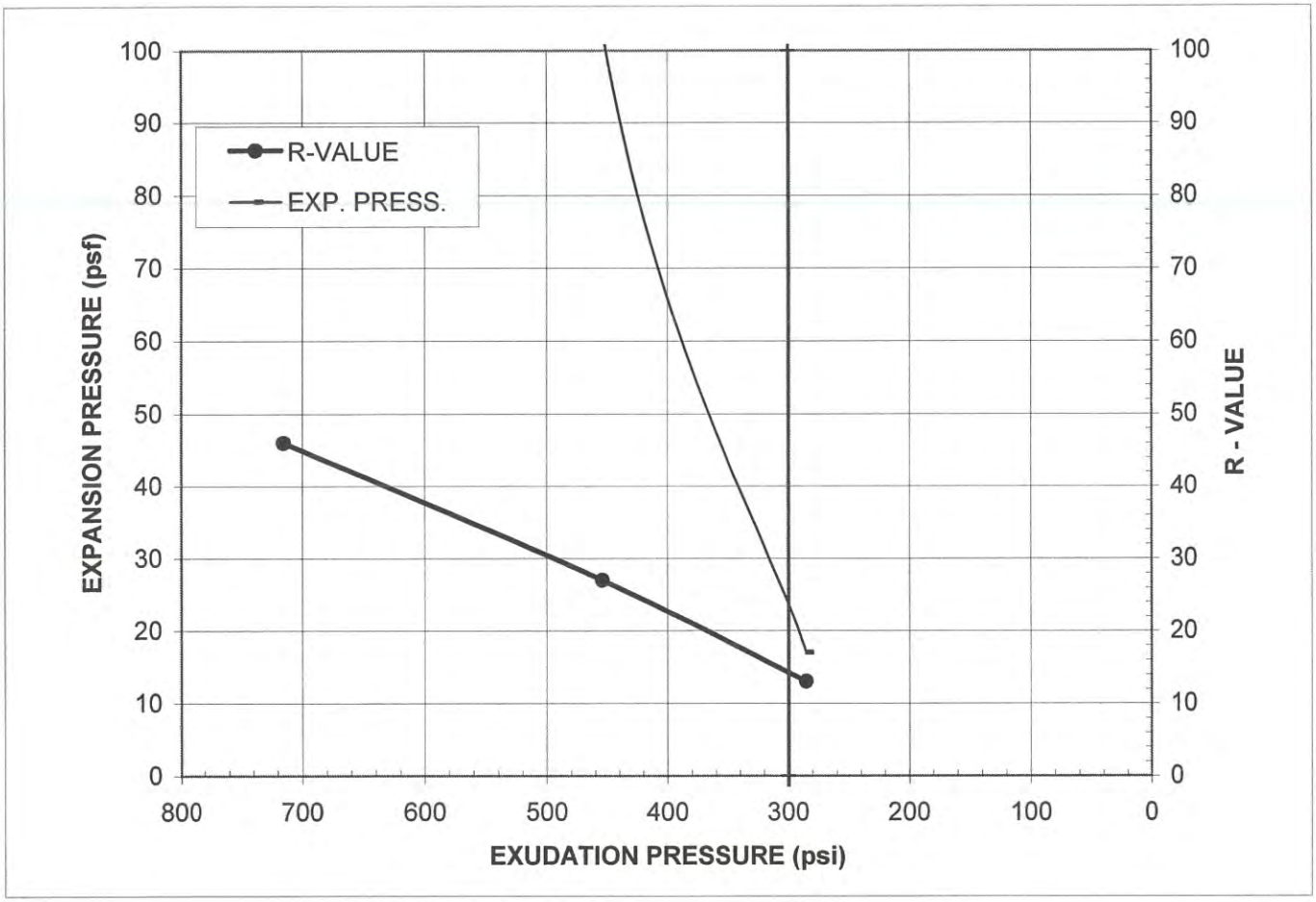
RVALUE with calcs pdp

Plate No.: IV-7O

R-VALUE REPORT

Parikh Consultants, Inc. | ASTM D2844 or CTM 301 | (408) 945-1011

Project Name:	EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT	Date:	9/28/06
Client:	BKF ENGINEERS	Project #:	2017-125-GEO
Sample #:	PA-61	Depth: 0' - 5'	Lab #: M552
Location / Source:	Capital Expway Eastridge Shopping Mall	Sample Date:	
Material :	Clay, brown	Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	285	454	715
Expansion Pressure, psf	17	103	446
R-Value	13	27	46
Moisture Content at Test, %	16.2	15.1	14.3
Dry Density at Test, pcf	113.5	116.9	118.7

R-Value @ 300 psi Exudation Pressure = 14

Expansion Pressure @300 psi Exudation, psf = **24**

Minimum R-Value Requirement:

Comments:

Natural Moisture Content % 16.2 Lean Clay - CL

Report By: Prav Dayah

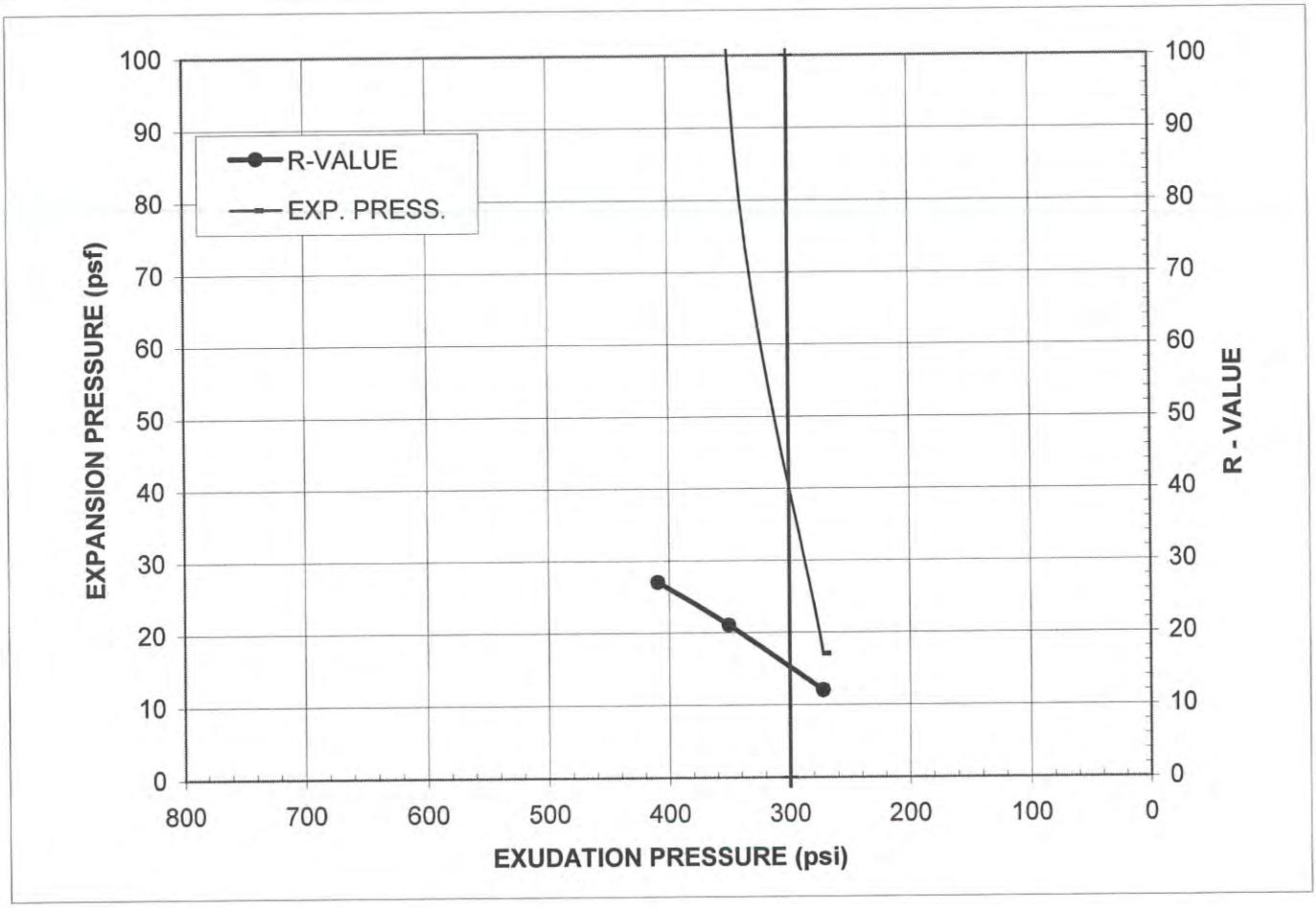
RVALUE with calcs pdp

Plate No.: IV-7P

R-VALUE REPORT

Parikh Consultants, Inc. | ASTM D2844 or CTM 301 | (408) 945-1011

Project Name:	EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT			Date:	9/28/06
Client:	BKF ENGINEERS			Project #:	2017-125-GEO
Sample #:	PA-62	Depth:	0' - 5'	Lab #:	M552
Location / Source:	Capital Expway Eastridge Shopping Mall			Sample Date:	
Material :	Clay, brown			Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	272	350	409
Expansion Pressure, psf	17	103	446
R-Value	12	21	27
Moisture Content at Test, %	18.8	17.6	16.3
Dry Density at Test, pcf	208.9	213.7	216.4

R-Value @ 300 psi Exudation Pressure = **15**

Expansion Pressure @300 psi Exudation, psf = **40**

Minimum R-Value Requirement:

Comments:

Natural Moisture Content % 18.8 Lean Clay - CL

Report By: Prav Dayah

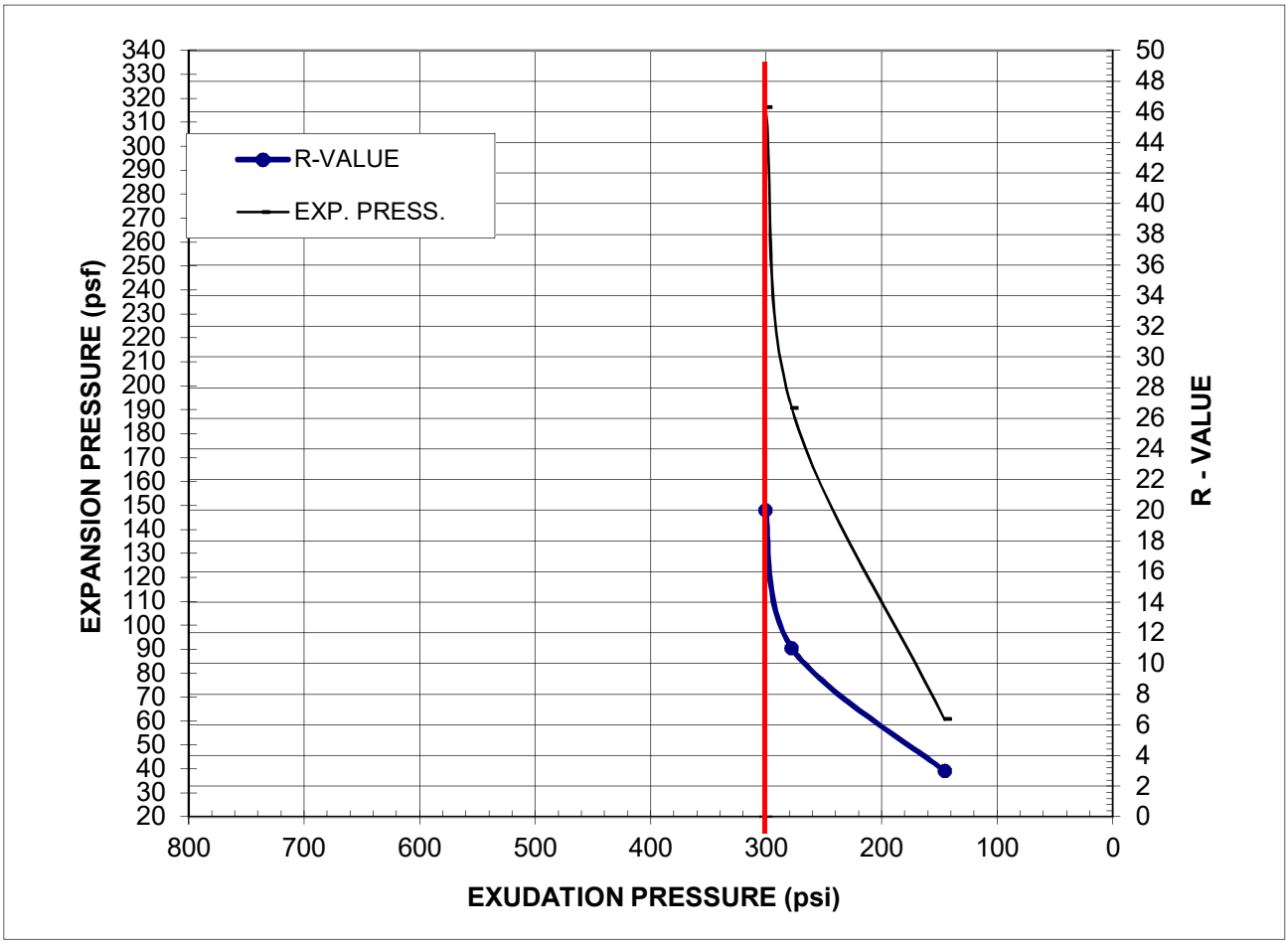
RVALUE with calcs pdp

Plate No.: IV-7Q

R-VALUE REPORT

Parikh Consultants, Inc. **ASTM D2844 or CTM 301** (408) 452-9000

Project Name:	Eastridge To BART Regional Connector Project	Date:	8/27/18
Client:	Santa Clara Valley Transportation Authority	Project #:	2017-125-GEO
Sample #:	AS - 72 Depth: 0-5	Lab #:	M996
	Onsite /Capitol Expressway, San Jose	Sample Date:	7/27/2018
Material :	Brown Silty Clay	Sampled By:	L S Bhangoo



Specimen No.	A	B	C
Exudation Pressure, psi	145.48	277.7	300.42
Expansion Pressure, psf	60.62	190.52	316.09
R-Value	3	11	20
Moisture Content at Test, %	16.3	14.4	12.9
Dry Density at Test, pcf	112.2	117.8	120.3

R-Value @ 300 psi Exudation Pressure = 20

Expansion Pressure @300 psi Exudation, psf = **315**

Minimum R-Value Requirement:

Comments:

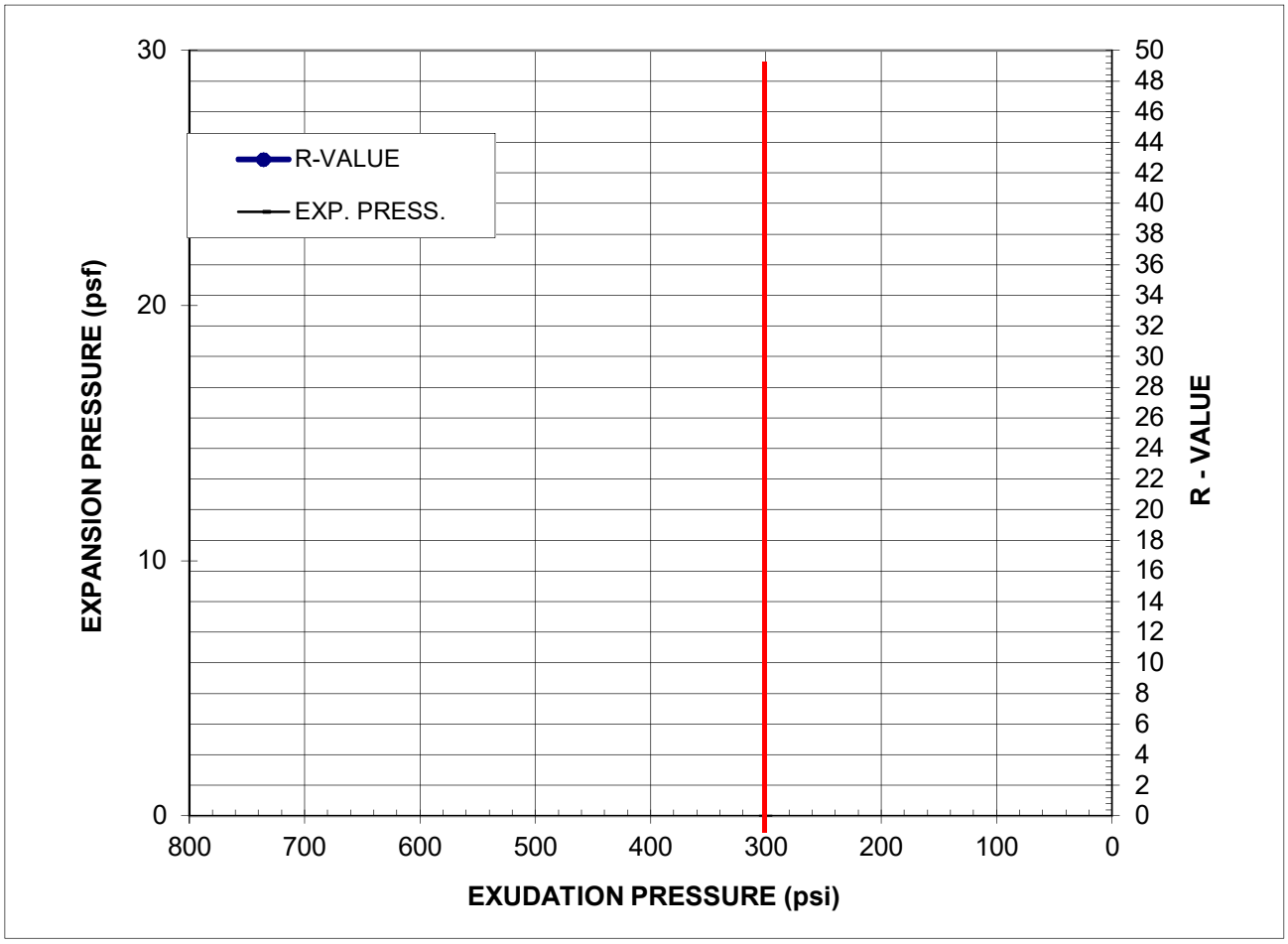
Reported By : Nasir Ahmad

Plate No: IV-7R

R-VALUE REPORT

Parikh Consultants, Inc. **ASTM D2844 or CTM 301** (408) 452-9000

Project Name:	Eastridge to BART Regional Connector Project	Date:	8/6/18
Client:	Santa Clara Transportion Authority	Project #:	2017-125-GEO
Sample #:	AS-74 Depth: 0-5	Lab #:	M996
	Onsite /Capitol Expressway, San Jose	Sample Date:	7/23/2018
Material :	Dark Brown Fat Clay	Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi			
Expansion Pressure, psf			
R-Value			
Moisture Content at Test, %			
Dry Density at Test, pcf			

R-Value @ 300 psi Exudation Pressure = **Less then 5** Expansion Pressure @300 psi Exudation, psf =

Minimum R-Value Requirement:

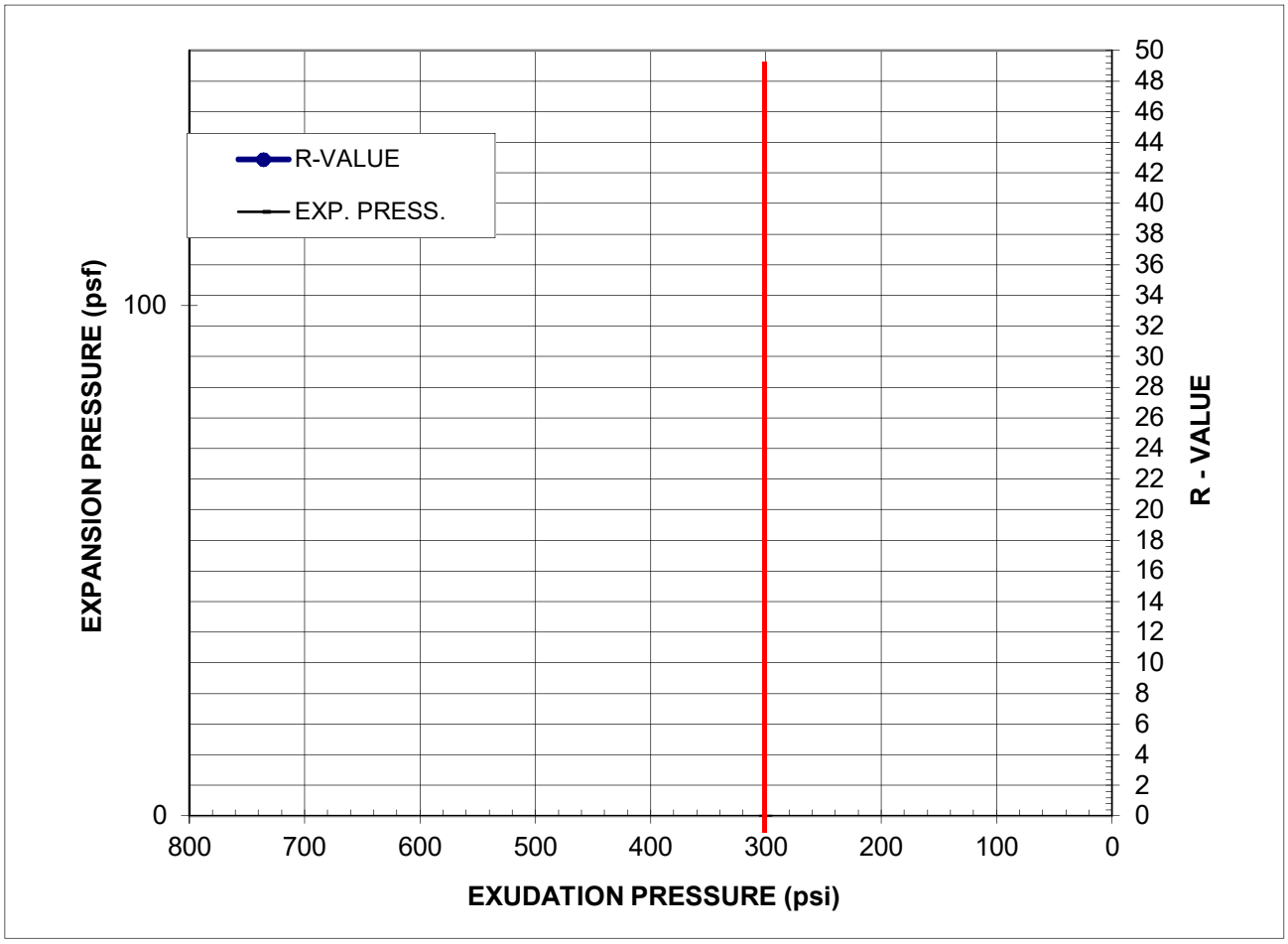
Comments:

Reported By : Nasir Ahmad **Plate No: IV-7S**

R-VALUE REPORT

Parikh Consultants, Inc. **ASTM D2844 or CTM 301** (408) 452-9000

Project Name:	Eastridge To BART Regional Connector Project	Date:	8/27/18
Client:	Santa Clara Valley Transportation Authority	Project #:	2017-125-GEO
Sample #:	AS - 76 Depth: 0-5	Lab #:	M996
	Onsite /Capitol Expressway, San Jose	Sample Date:	7/27/2018
Material :	Olive Brown Fat Clay	Sampled By:	L S Bhangoo



Specimen No.	A	B	C
Exudation Pressure, psi			
Expansion Pressure, psf			
R-Value	0	0	0
Moisture Content at Test, %	0.0	0.0	0.0
Dry Density at Test, pcf	#DIV/0!	#DIV/0!	#DIV/0!

R-Value @ 300 psi Exudation Pressure = **Less then 5** Expansion Pressure @300 psi Exudation, psf =

Minimum R-Value Requirement:

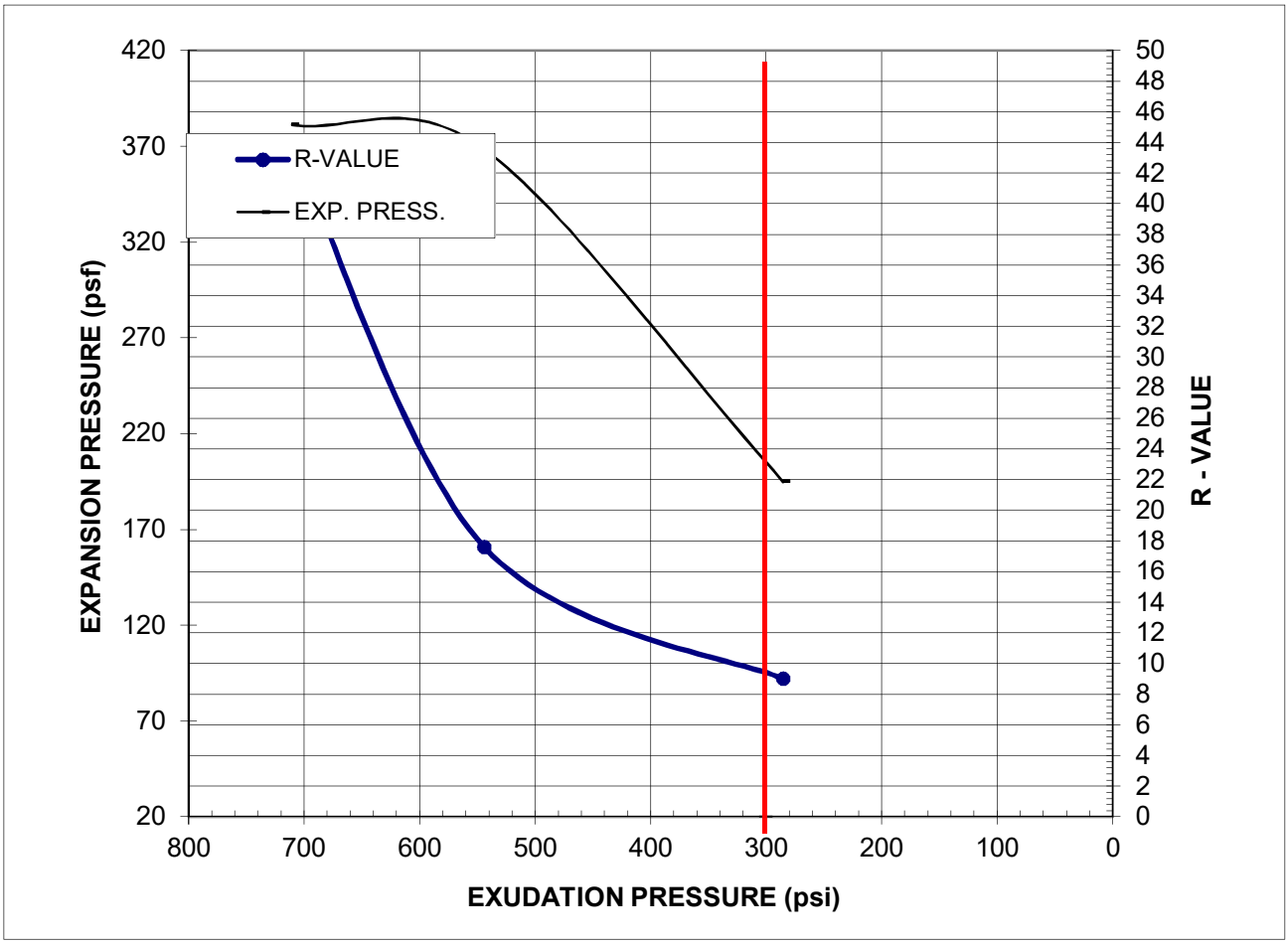
Comments:

Reported By : Nasir Ahmad **Plate No: IV-7T**

R-VALUE REPORT

Parikh Consultants, Inc. **ASTM D2844 or CTM 301** (408) 452-9000

Project Name:	Eastridge To BART Regional Connector Project	Date:	8/6/18
Client:	Santa Clara Valley Transportation Authority	Project #:	2017-125-GEO
Sample #:	AS - 78 Depth: 0-5	Lab #:	M996
	Onsite /Capitol Expressway, San Jose	Sample Date:	7/25/2018
Material :	Brown Silty Clay	Sampled By:	L S Bhangoo



Specimen No.	A	B	C
Exudation Pressure, psi	285.19	544.1	710
Expansion Pressure, psf	194.8	368.5	381.04
R-Value	9	17.6	44
Moisture Content at Test, %	10.4	8.6	6.7
Dry Density at Test, pcf	119.6	126.2	126.5

R-Value @ 300 psi Exudation Pressure = 9

Expansion Pressure @300 psi Exudation, psf = **210**

Minimum R-Value Requirement:

Comments:

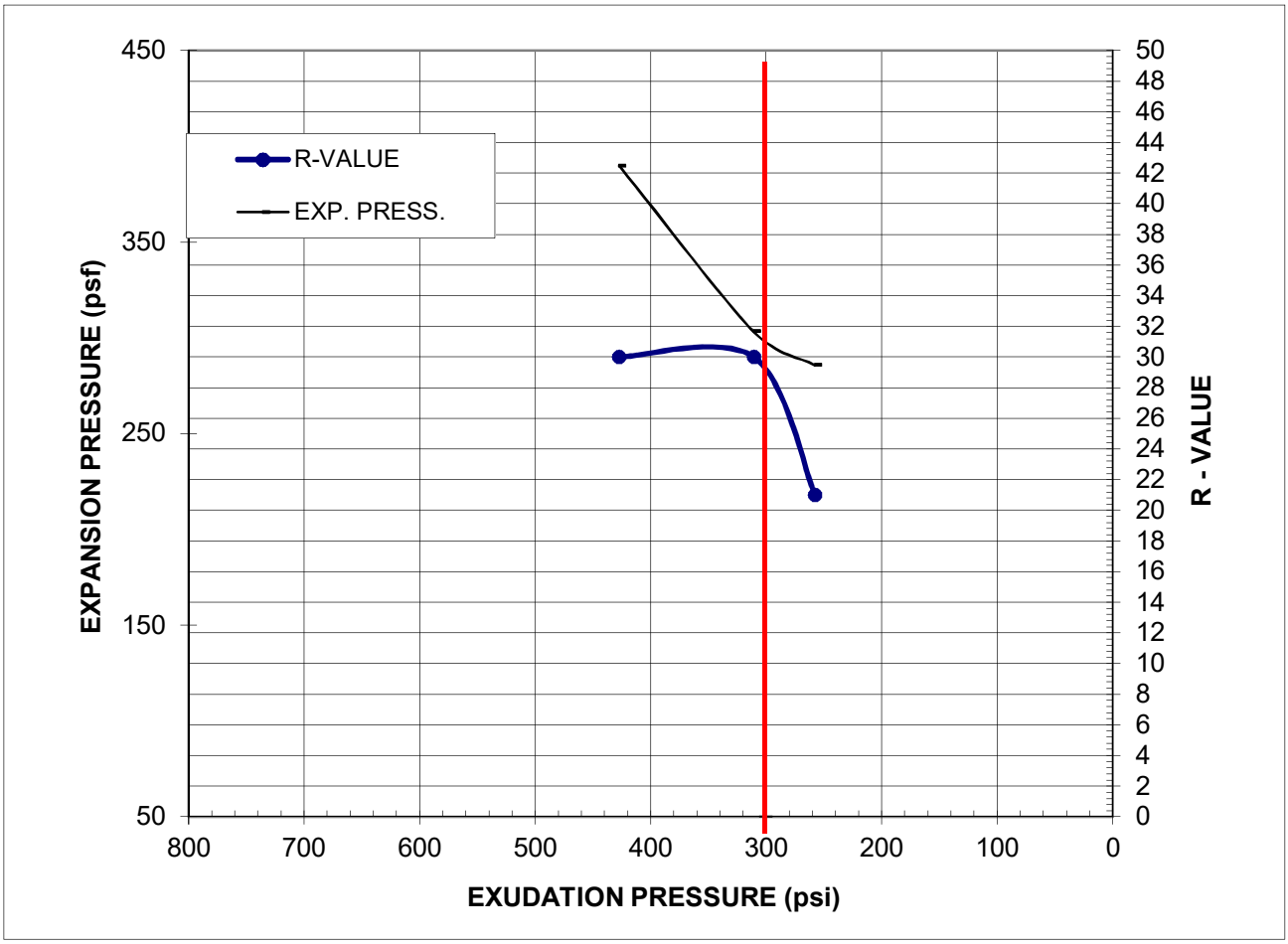
Reported By : Nasir Ahmad

Plate No: IV-7U

R-VALUE REPORT

Parikh Consultants, Inc. **ASTM D2844 or CTM 301** (408) 452-9000

Project Name:	Eastridge To BART Regional Connector Project	Date:	8/24/18
Client:	Santa Clara Valley Transportation Authority	Project #:	2017-125-GEO
Sample #:	AS - 80 Depth: 0-5	Lab #:	M996
	Onsite /Capitol Expressway, San Jose	Sample Date:	7/27/2018
Material :	Brown Lean Clay	Sampled By:	L S Bhangoo



Specimen No.	A	B	C
Exudation Pressure, psi	257.8	310.56	427
Expansion Pressure, psf	285.78	303.1	389.7
R-Value	21	30	30
Moisture Content at Test, %	16.2	15.7	15.2
Dry Density at Test, pcf	114.6	115.3	117.1

R-Value @ 300 psi Exudation Pressure = 29

Expansion Pressure @300 psi Exudation, psf = **275**

Minimum R-Value Requirement:

Comments:

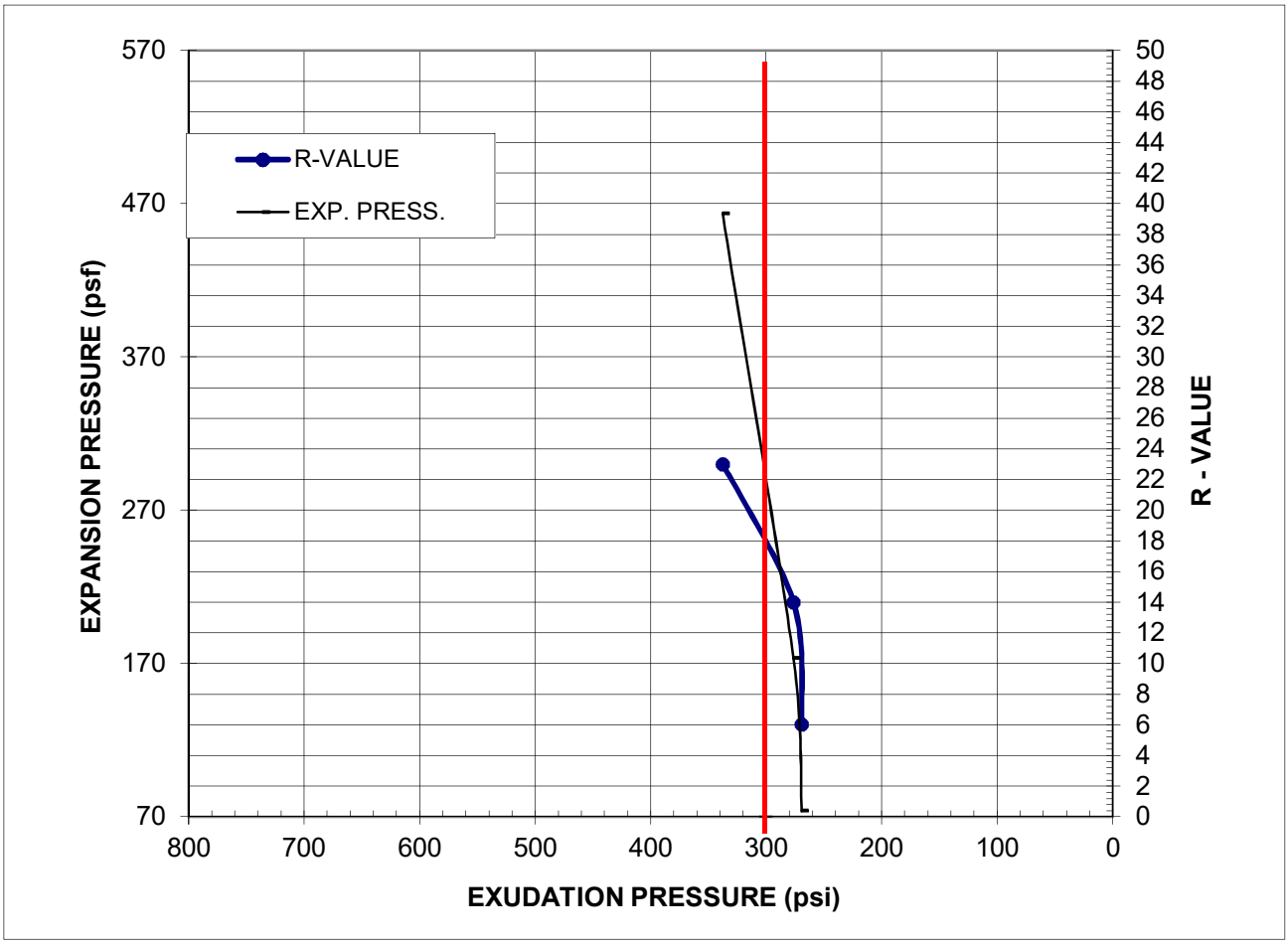
Reported By : Nasir Ahmad

Plate No: IV-7V

R-VALUE REPORT

Parikh Consultants, Inc. **ASTM D2844 or CTM 301** (408) 452-9000

Project Name:	Eastridge To BART Regional Connector Project	Date:	8/23/18
Client:	Santa Clara Valley Transportation Authority	Project #:	2017-125-GEO
Sample #:	AS - 82 Depth: 0-5	Lab #:	M996
	Onsite /Capitol Expressway, San Jose	Sample Date:	7/27/2018
Material :	Brown Silty Clay	Sampled By:	L S Bhangoo



Specimen No.	A	B	C
Exudation Pressure, psi	269.13	276.3	337.5
Expansion Pressure, psf	73.6	173.2	463.3
R-Value	6	14	23
Moisture Content at Test, %	21.1	20.1	17.5
Dry Density at Test, pcf	106.4	108.3	112.4

R-Value @ 300 psi Exudation Pressure = 18

Expansion Pressure @300 psi Exudation, psf = **290**

Minimum R-Value Requirement:

Comments:

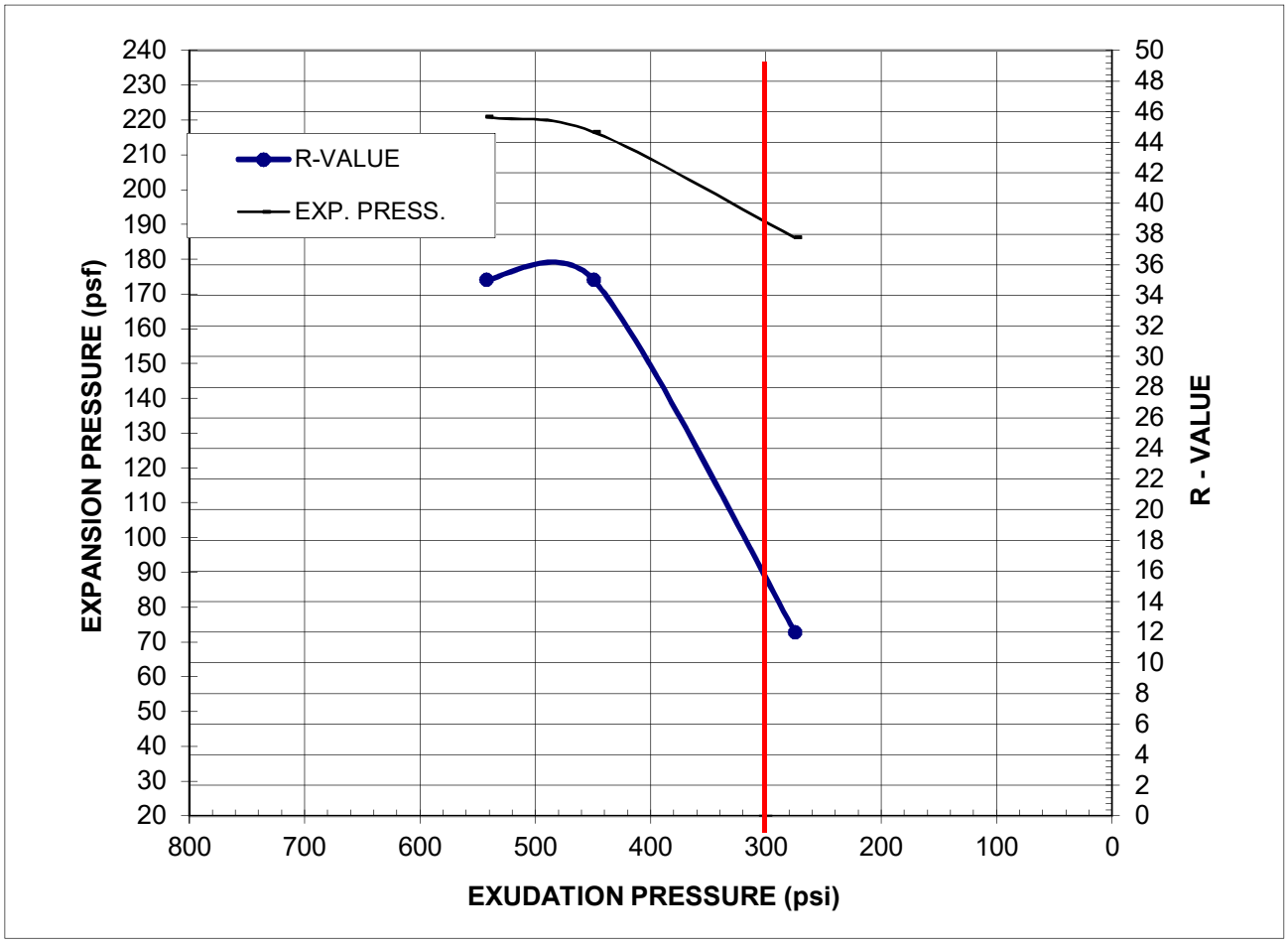
Reported By : Nasir Ahmad

Plate No: IV-7W

R-VALUE REPORT

Parikh Consultants, Inc. **ASTM D2844 or CTM 301** (408) 452-9000

Project Name:	Eastridge To BART Regional Connector Project	Date:	8/6/18
Client:	Santa Clara Valley Transportation Authority	Project #:	2017-125-GEO
Sample #:	AS - 84 Depth: 0-5	Lab #:	M996
	Onsite /Capitol Expressway, San Jose	Sample Date:	7/27/2018
Material :	Brown Silty Clay	Sampled By:	L S Bhangoo



Specimen No.	A	B	C
Exudation Pressure, psi	274.77	449.25	542.17
Expansion Pressure, psf	186.19	216.5	220.83
R-Value	12	35	35
Moisture Content at Test, %	11.4	9.5	7.6
Dry Density at Test, pcf	118.4	127.3	127.7

R-Value @ 300 psi Exudation Pressure = 16

Expansion Pressure @300 psi Exudation, psf = **190**

Minimum R-Value Requirement:

Comments:

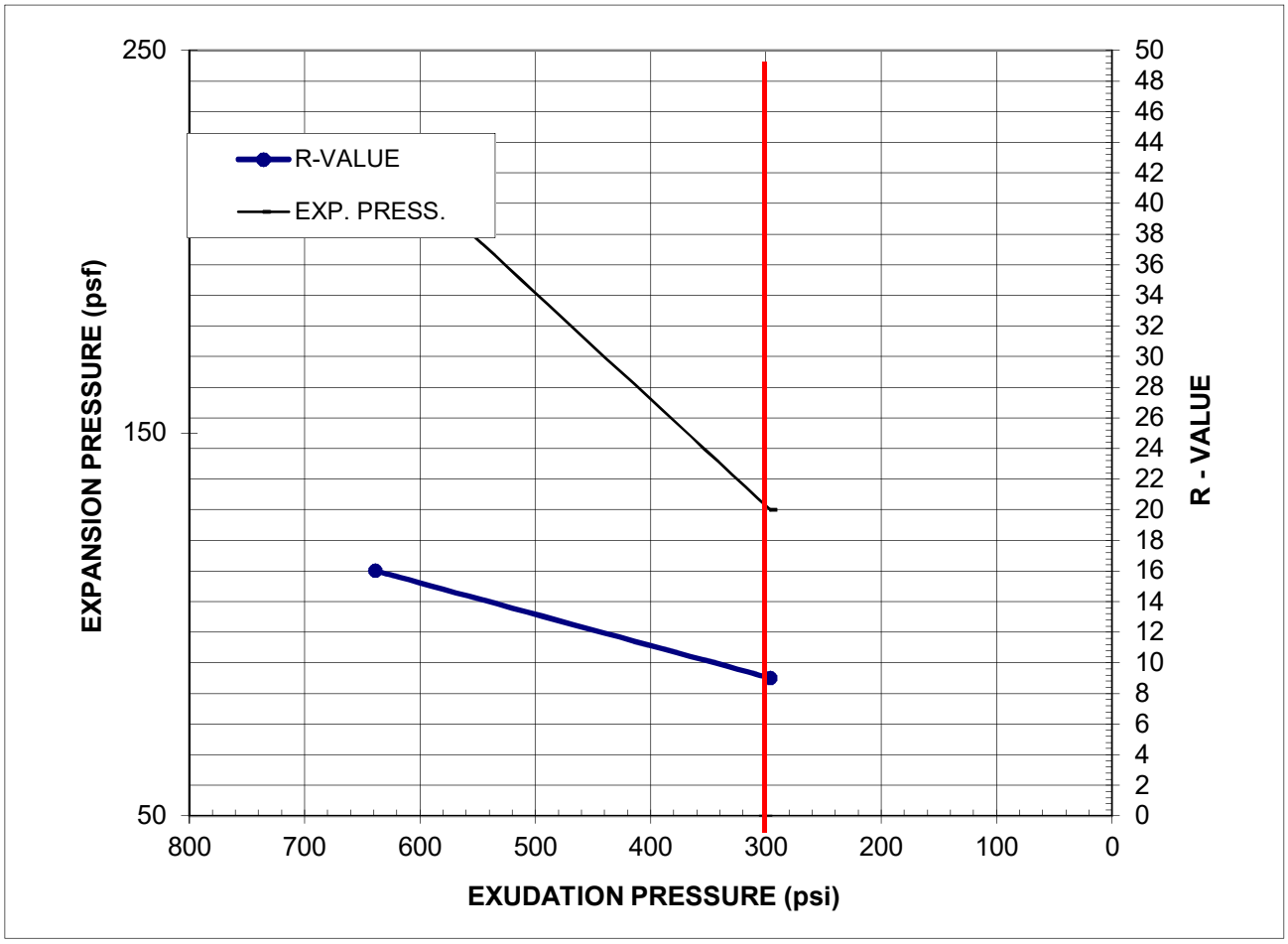
Reported By : Nasir Ahmad

Plate No: IV-7X

R-VALUE REPORT

Parikh Consultants, Inc. **ASTM D2844 or CTM 301** (408) 452-9000

Project Name:	Eastridge To BART Regional Connector Project	Date:	8/24/18
Client:	Santa Clara Valley Transportation Authority	Project #:	2017-125-GEO
Sample #:	AS - 86 Depth: 0-5	Lab #:	M996
	Onsite /Capitol Expressway, San Jose	Sample Date:	7/27/2018
Material :	Brown Lean Clay	Sampled By:	L S Bhangoo



Specimen No.	A	B	C
Exudation Pressure, psi	295.88	638.4	
Expansion Pressure, psf	129.9	225.16	
R-Value	9	16	
Moisture Content at Test, %	18.2	16.2	
Dry Density at Test, pcf	110.3	114.3	

R-Value @ 300 psi Exudation Pressure = 9

Expansion Pressure @300 psi Exudation, psf = **130**

Minimum R-Value Requirement:

Comments:

Exudation Pressuer test material was exuding out of mold , only two point

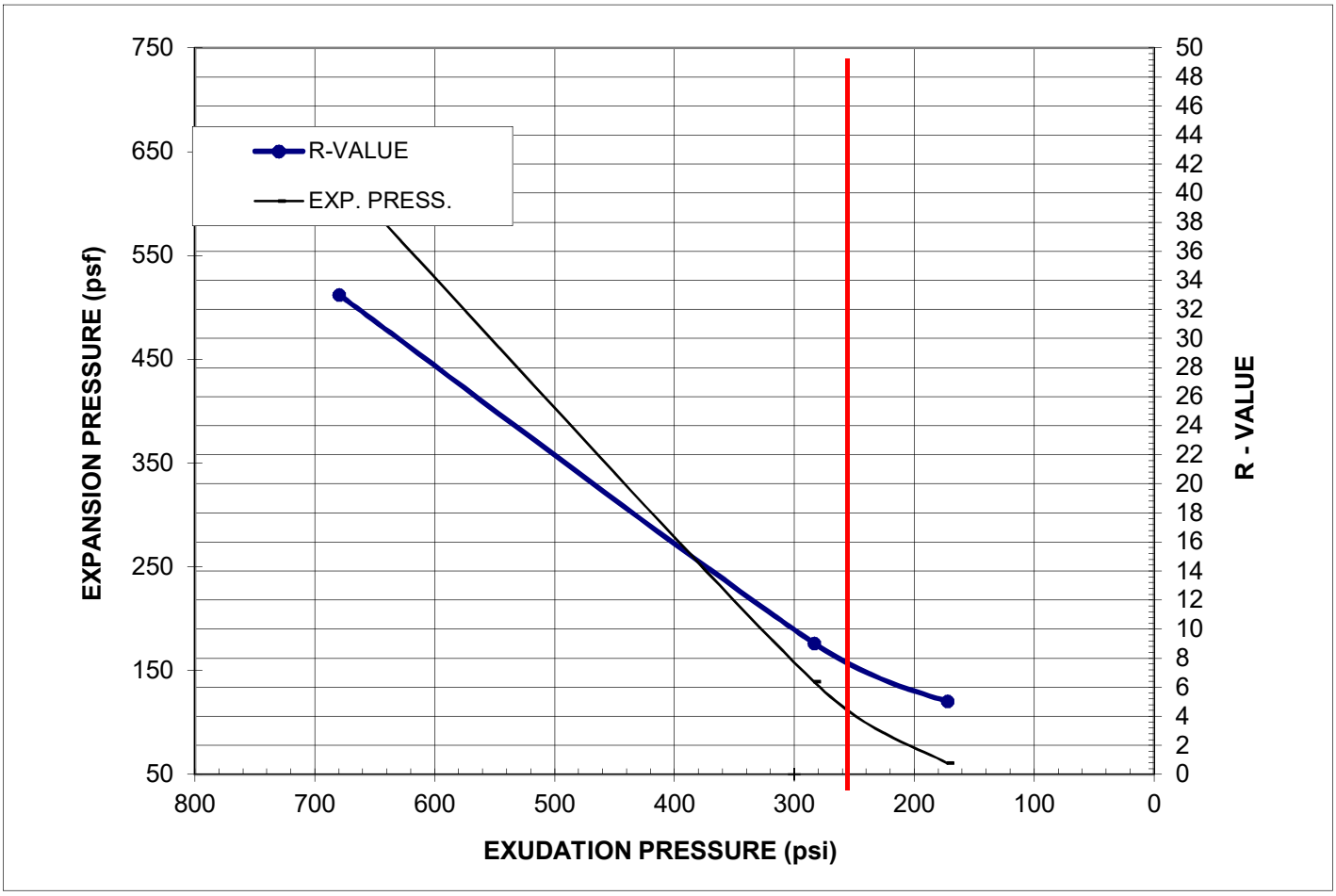
Reported By : Nasir Ahmad

Plate No: IV-7Y

R-VALUE REPORT

Parikh Consultants, Inc. **ASTM D2844 or CTM 301** (408) 452-9000

Project Name:	Eastridge To BART Regional Connector Project	Date:	8/23/18
Client:	Santa Clara Valley Transportation Authority	Project #:	2017-125-GEO
Sample #:	AS - 88 Depth: 0-5	Lab #:	M996
	Onsite /Capitol Expressway, San Jose	Sample Date:	7/27/2018
Material :	Brown Silty Clay	Sampled By:	L S Bhangoo



Specimen No.	A	B	C
Exudation Pressure, psi	172.3	283	679.5
Expansion Pressure, psf	60.62	138.56	627.8
R-Value	5	9	33
Moisture Content at Test, %	19.1	17.6	15.1
Dry Density at Test, pcf	10.9	111.6	118.3

R-Value @ 300 psi Exudation Pressure = 10

Expansion Pressure @300 psi Exudation, psf = **170**

Minimum R-Value Requirement:

Comments:

Reported By : Nasir Ahmad

Plate No: IV-7Z

R-value Test Report (Caltrans 301)

Job No.:	157-358	**Date:**	10/16/18	**Initial Moisture,**	12.6
Client:	Parikh Consultants	**Tested**	PJ	**R-value**	**24**
Project:	2017-125-GEO	**Reduced**	RU		
Sample	AS-68 @ 0-5'	**Checked**	DC	**Expansion Pressure**	**50** psf
Soil Type:	Grayish Brown Sandy CLAY				

Specimen Number	A	B	C	D
Exudation Pressure, psi	231	339	491	
Prepaired Weight, grams	1200	1200	1200	
Final Water Added, grams/cc	40	21	8	
Weight of Soil & Mold, grams	3206	3196	3167	
Weight of Mold, grams	2064	2106	2099	
Height After Compaction, in.	2.66	2.42	2.34	
Moisture Content, %	16.3	14.5	13.3	
Dry Density, pcf	111.9	119.2	122.1	
Expansion Pressure, psf	0	69	99	
Stabilometer @ 1000				
Stabilometer @ 2000	136	106	100	
Turns Displacement	3.66	3.00	2.84	
R-value	12	28	31	

Remarks:

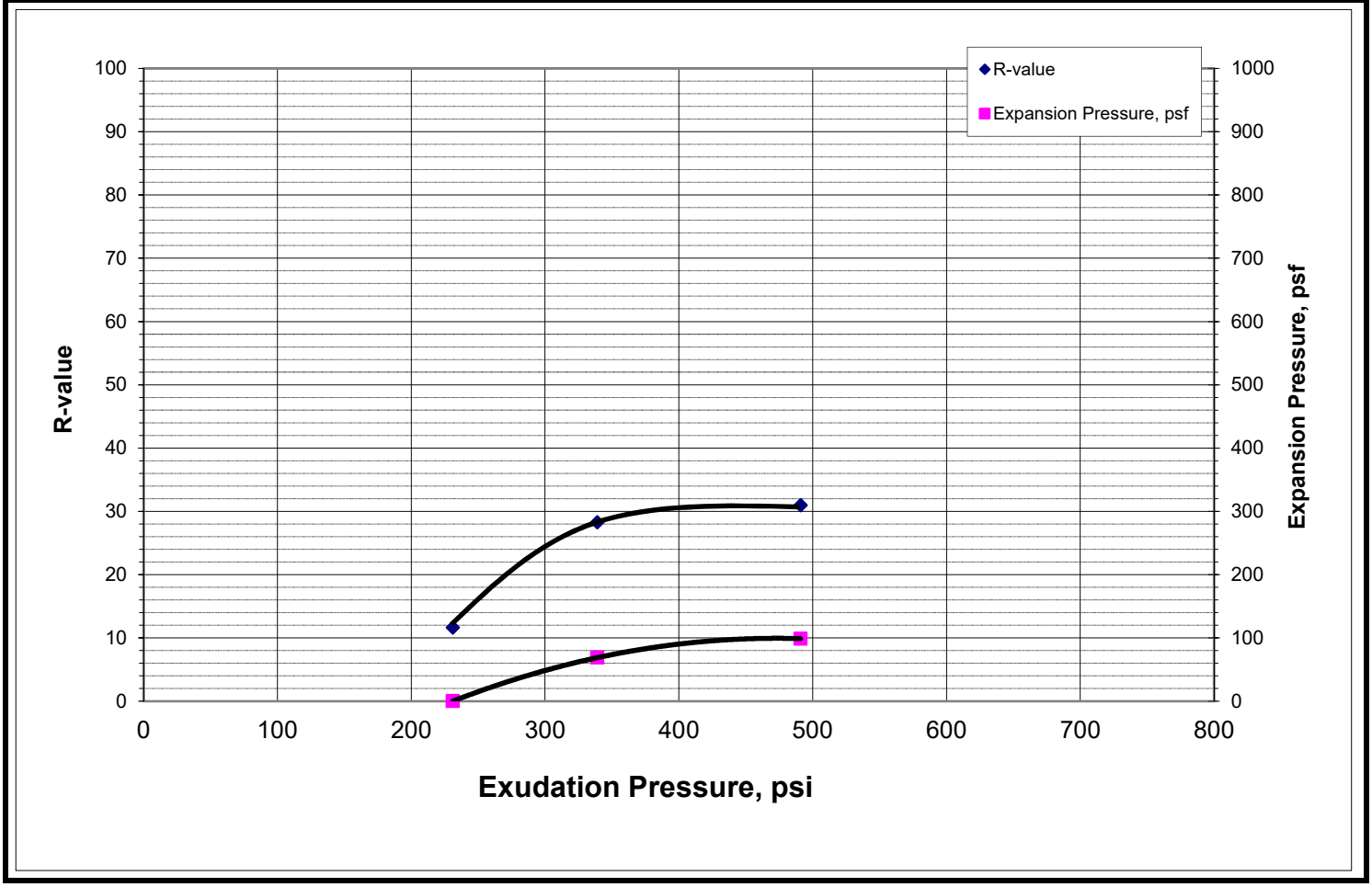


Plate No.: IV-7AA

R-value Test Report (Caltrans 301)

Job No.:	157-358	**Date:**	10/17/18	**Initial Moisture,**	10.2
Client:	Parikh Consultants	**Tested**	PJ	**R-value**	**16**
Project:	2017-125-GEO	**Reduced**	RU		
Sample	AS-70 @ 0-5'	**Checked**	DC	**Expansion Pressure**	**0** psf
Soil Type:	Grayish Brown Sandy CLAY/ Clayey SAND				

Specimen Number	A	B	C	D
Exudation Pressure, psi	473	270	160	
Prepaired Weight, grams	1200	1200	1200	
Final Water Added, grams/cc	14	35	54	
Weight of Soil & Mold, grams	3138	3199	3195	
Weight of Mold, grams	2064	2099	2098	
Height After Compaction, in.	2.42	2.50	2.55	
Moisture Content, %	11.5	13.5	15.2	
Dry Density, pcf	120.6	117.6	113.2	
Expansion Pressure, psf	13	0	0	
Stabilometer @ 1000				
Stabilometer @ 2000	90	133	142	
Turns Displacement	2.82	3.45	3.85	
R-value	39	13	8	

Remarks:

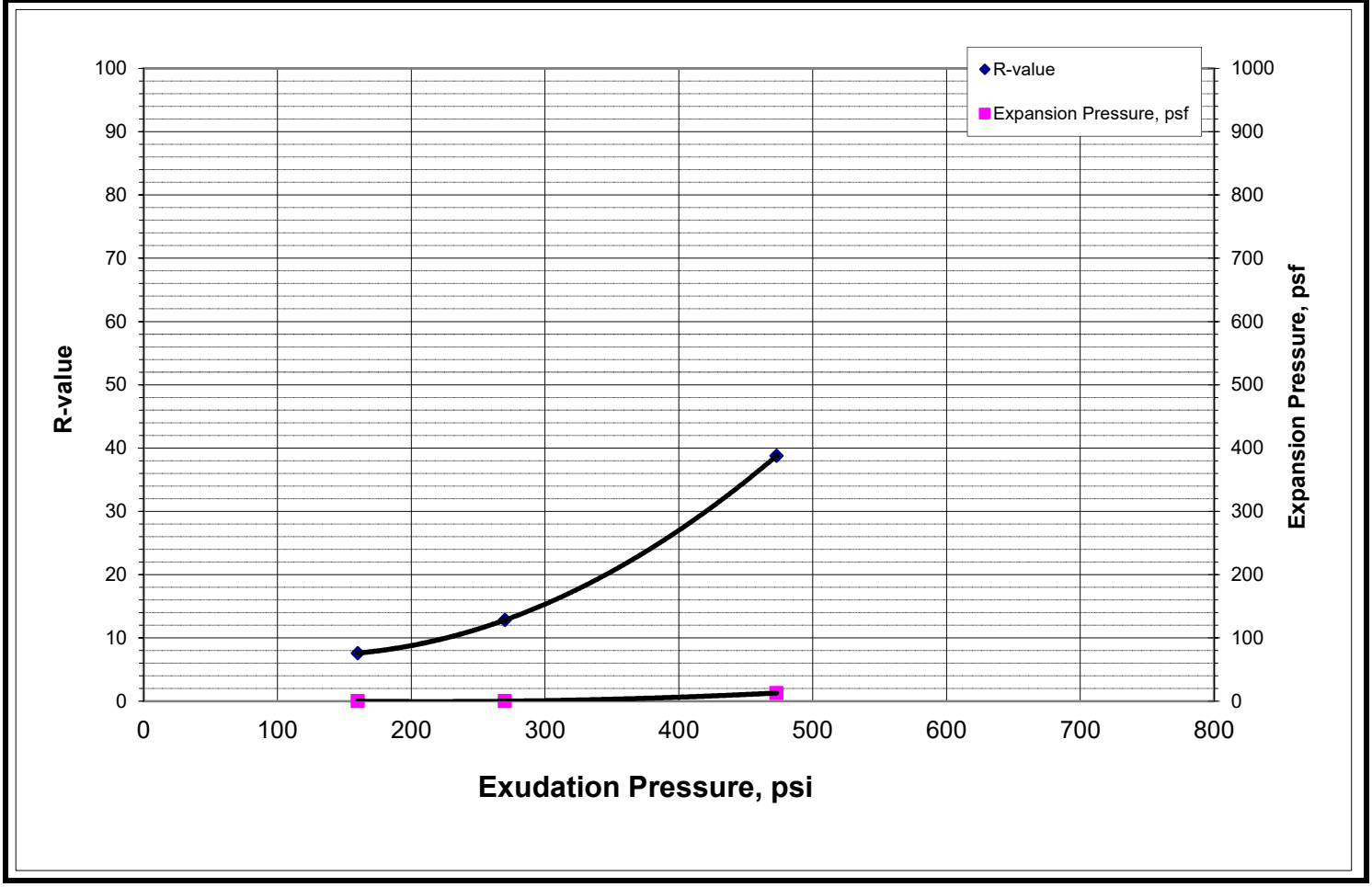


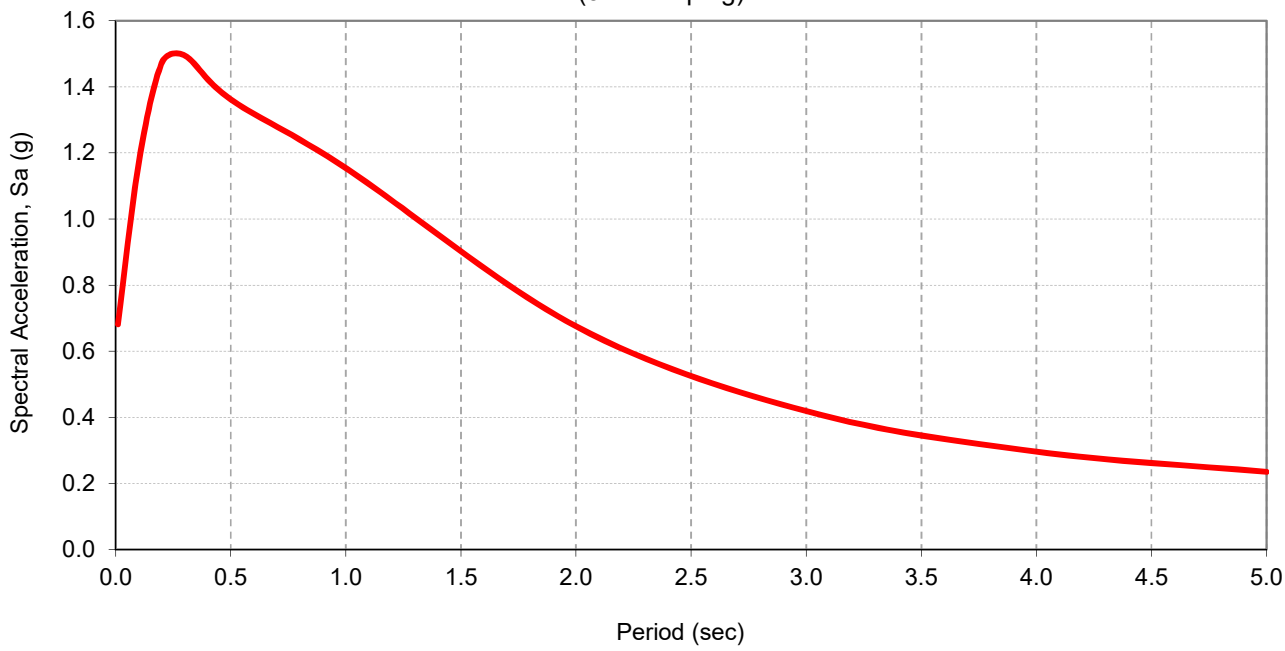
Plate No.: IV-7AB

APPENDIX V

ARS CURVE

RECOMMENDED ACCELERATION RESPONSE SPECTRUM

(5% Damping)



Site Information

Latitude:	37.3555
Longitude	-121.8326
V_{S30} (ft/s) =	720
$Z_{1.0}$ (m) =	N/A
$Z_{2.5}$ (km) =	N/A

Governing Curve:

Caltrans Online Probabilistic ARS

Recommended Response Spectrum				
Period (sec)	Caltrans Online Probabilistic Spectral Acceleration (g)	Adjusted for Near Fault Effect	Adjusted For Basin Effect	Final Adjusted Spectral Acceleration (g)
0.0	0.682	1	1	0.682
0.1	1.169	1	1	1.169
0.2	1.472	1	1	1.472
0.3	1.495	1	1	1.495
0.5	1.362	1	1	1.362
1.0	0.962	1.2	1	1.154
2.0	0.563	1.2	1	0.676
3.0	0.349	1.2	1	0.419
4.0	0.247	1.2	1	0.296
5.0	0.196	1.2	1	0.235

The curve has been modified to account for the proximity of the site to the fault. The spectral accelerations at periods of 1.0 sec. and greater have been increased by 20%. A linear interpolation is used between 0.5 and 1 sec.

Source:

1. Caltrans ARS Online tool (V.2, http://dap3.dot.ca.gov/ARS_Online/)

2. Caltrans Methodology for Developing Design Response Spectrum for Use in Seismic Design Recommendations, November 2012

PARIKH Practicing in the Geosciences

EAST RIDGE BART REGIONAL CONNECTOR PROJECT
SAN JOSE, CALIFORNIA

Project No.: 2017-125-GEO | **Plate No.:**

APPENDIX VI

LIQUEFACTION ANALYSES

LIQUEFACTION ANALYSES (BORINGS)

LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***Eastridge BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
BORING NO. ***AS-3***

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
Hayward Fault
a_{max} *(g)=* 0.6
FAULT M_w *=* 7.5

GW DEPTH (ft)= 16

BOREHOLE DIA (in)= 6
HAMMER ENERGY = 60%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 16 *(below OG)*

MSF = 1.00

SOIL STRATA							*LIQUEFACTION RESISTANCE* ($CRR_{7.5}$)											*CYCLIC STRESS RATIO (CSR)*				*F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	$SPT\text{-}N_{eq.}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	17.0	1	17	2	10	SPT	10.0	1.0	0.95	1.2	1.05	12.0	2062.6	1.0	11.8	55%											
17.0	21.0	2	21	1	10	SPT	10.0	1.0	0.95	1.2	1.05	12.0	2313.0	0.9	11.1	14%	13.8	0.1	2625.0	2313.0	1.0	0.4	1.0	1.0	(0.34)	1.85%	0.89
21.0	40.0	3	40	2	16	SPT	16.0	1.0	1.00	1.2	1.05	20.2	3502.4	0.8	15.2	55%											
40.0	44.0	4	44	1	12	SPT	12.0	1.0	1.00	1.2	1.05	15.1	3752.8	0.7	11.0	39%	18.2	0.2	5500.0	3752.8	0.8	0.5	0.8	1.0	(0.35)	1.50%	0.72
44.0	52.5	5	52.5	2	10	SPT	10.0	1.0	1.00	1.2	1.05	12.6	4284.9	0.7	8.6	55%											
52.5	65.0	6	65	1	38	SPT	38.0	1.0	1.00	1.2	1.05	47.9	5067.4	0.6	30.1	30%	39.4		8125.0	5067.4	0.6	0.4	0.7	1.0	NON-LIQ.		
65.0	101.5	7	101.5	2	23	SPT	23.0	1.0	1.00	1.2	1.05	29.0	7352.3	0.5	15.1	55%											

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\,(N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC $\leq$ 5% a = 0, b = 1.0
   for 5% < FC < 35% $a = \exp(1.76-(190/FC^2))$, $b = (0.99+(FC^{1.5}/1000))$
   for FC $\geq$ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

2/4/2020

LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***Eastridge BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
BORING NO. **AS-5**

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
Hayward Fault
a_{max} *(g)=* 0.6
FAULT M_w *=* 7.5

GW DEPTH (ft)= 13

BOREHOLE DIA (in)= 6
HAMMER ENERGY = 60%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 13 *(below OG)*

MSF = 1.00

SOIL STRATA							*LIQUEFACTION RESISTANCE* ($CRR_{7.5}$)											*CYCLIC STRESS RATIO (CSR)*				*F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	$SPT\text{-}N_{eq.}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	27.0	1	27	2	13	SPT	13.0	1.0	1.00	1.2	1.05	16.4	2501.4	0.9	14.6	55%											
27.0	32.0	2	32	1	23	SPT	23.0	1.0	1.00	1.2	1.05	29.0	2814.4	0.8	24.4	14%	27.7	0.4	4000.0	2814.4	0.9	0.5	0.9	1.0	NON-LIQ.		
32.0	52.0	3	52	2	16	SPT	16.0	1.0	1.00	1.2	1.05	20.2	4066.4	0.7	14.1	55%											
52.0	70.0	4	70	1	39	SPT	39.0	1.0	1.00	1.2	1.05	49.1	5193.2	0.6	30.5	30%	39.9		8750.0	5193.2	0.6	0.4	0.7	1.0	NON-LIQ.		
70.0	85.0	5	85	2	29	SPT	29.0	1.0	1.00	1.2	1.05	36.5	6132.2	0.6	20.9	20%											
85.0	94.0	6	94	1	34	SPT	34.0	1.0	1.00	1.2	1.05	42.8	6695.6	0.5	23.4	30%	31.7		11750.0	6695.6	0.5	0.3	0.6	1.0	NON-LIQ.		
94.0	100.5	7	100.5	2	40	SPT	40.0	1.0	1.00	1.2	1.05	50.4	7102.5	0.5	26.7	35%											

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\,(N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC $\leq$ 5% a = 0, b = 1.0
   for 5% < FC < 35% $a = \exp(1.76-(190/FC^2))$, $b = (0.99+(FC^{1.5}/1000))$
   for FC $\geq$ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

2/4/2020

LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***Eastridge BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
BORING NO. **AS-7**

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
Hayward Fault
a_{max} *(g)=* 0.6
FAULT M_w *=* 7.5

GW DEPTH (ft)= 11

BOREHOLE DIA (in)= 6
HAMMER ENERGY = 60%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 11 *(below OG)*

MSF = 1.00

SOIL STRATA							*LIQUEFACTION RESISTANCE* ($CRR_{7.5}$)											*CYCLIC STRESS RATIO (CSR)*				*F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	$SPT\text{-}N_{eq.}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	8.0	1	8	2	16	SPT	16.0	1.0	0.85	1.2	1.05	17.1	1000.0	1.4	24.2	55%											
8.0	18.0	2	18	2	8	SPT	8.0	1.0	0.95	1.2	1.05	9.6	1813.2	1.1	10.1	55%											
18.0	32.0	3	32	2	17	SPT	17.0	1.0	1.00	1.2	1.05	21.4	2689.6	0.9	18.5	55%											
32.0	40.0	4	40	2	10	SPT	10.0	1.0	1.00	1.2	1.05	12.6	3190.4	0.8	10.0	55%											
40.0	57.5	5	57.5	2	19	SPT	19.0	1.0	1.00	1.2	1.05	23.9	4285.9	0.7	16.4	55%											
57.5	62.5	6	62.5	1	17	SPT	17.0	1.0	1.00	1.2	1.05	21.4	4598.9	0.7	14.1	20%	18.9	0.2	7812.5	4598.9	0.6	0.4	0.8	1.0	(0.37)	1.46%	0.88
62.5	76.0	7	76	1	24	SPT	24.0	1.0	1.00	1.2	1.05	30.2	5444.0	0.6	18.3	29%	25.6	0.3	9500.0	5444.0	0.6	0.4	0.7	1.0	NON-LIQ.		
76.0	100.5	8	100.5	2	26	SPT	26.0	1.0	1.00	1.2	1.05	32.8	7002.2	0.5	17.5	55%											

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\,(N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC $\leq$ 5% a = 0, b = 1.0
   for 5% < FC < 35% $a = \exp(1.76-(190/FC^2))$, $b = (0.99+(FC^{1.5}/1000))$
   for FC $\geq$ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

2/4/2020

LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***East Ridge BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
BORING NO. ***AS-68***

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.682
FAULT M_w = 6.9

GW DEPTH (ft)= 10

BOREHOLE DIA (in)= 3.875
HAMMER ENERGY = 75%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 10 *(below OG)*

MSF = 1.24

SOIL STRATA							*LIQUEFACTION RESISTANCE ($CRR_{7.5}$)*												*CYCLIC STRESS RATIO (CSR)*				*F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	SPT-$N_{eq.}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	8.0	1	6	2	29	MC	18.9	1.3	0.80	1.0	1.00	18.9	690.0	1.7	32.0												
8.0	13.0	2	11	2	8	MC	5.2	1.3	0.85	1.0	1.00	5.5	1217.6	1.3	7.1												
13.0	18.0	3	16	2	13	MC	8.5	1.3	0.95	1.0	1.00	10.0	1505.6	1.2	11.6												
18.0	23.0	4	21	2	8	MC	5.2	1.3	0.95	1.0	1.00	6.2	1793.6	1.1	6.5												
23.0	29.5	5	26	2	23	MC	15.0	1.3	1.00	1.0	1.00	18.7	2081.6	1.0	18.3												
29.5	33.5	6	31	2	1	SPT	1.0	1.3	1.00	1.2	1.00	1.5	2369.6	0.9	1.4												
33.5	41.0	7	36	1	20	MC	13.0	1.3	1.00	1.0	1.00	16.3	2657.6	0.9	14.1	31%	21.2	0.2	4280.0	2657.6	0.9	0.6	0.9	1.0	(0.41)	1.34%	1.21
41.0	43.0	8	41	2	22	MC	14.3	1.3	1.00	1.0	1.00	17.9	2945.6	0.8	14.7												
43.0	51.0	9	46	1	13	MC	8.5	1.3	1.00	1.0	1.00	10.6	3233.6	0.8	8.3	42%	15.0	0.2	5480.00	3233.6	0.8	0.6	0.9	1.0	(0.29)	1.74%	1.67
51.0	53.0	10	51	2	11	SPT	11.0	1.3	1.00	1.2	1.00	16.5	3521.6	0.8	12.4												
53.0	58.0	11	56	2	16	MC	10.4	1.3	1.00	1.0	1.00	13.0	3809.6	0.7	9.4												
58.0	63.5	12	61	2	29	MC	18.9	1.3	1.00	1.0	1.00	23.6	4097.6	0.7	16.5												
63.5	69.0	13	66	2	21	MC	13.7	1.3	1.00	1.0	1.00	17.1	4385.6	0.7	11.5	86%											
69.0	72.0	14	71	2	31	MC	20.2	1.3	1.00	1.0	1.00	25.2	4673.6	0.7	16.5												
72.0	78.5	15	76	2	28	MC	18.2	1.3	1.00	1.0	1.00	22.8	4961.6	0.6	14.4												
78.5	86.0	16	81	2	26	MC	16.9	1.3	1.00	1.0	1.00	21.1	5249.6	0.6	13.0												
86.0	98.0	17	91	2	31	MC	20.2	1.3	1.00	1.0	1.00	25.2	5825.6	0.6	14.8												
98.0	103.5	18	101	2	47	MC	30.6	1.3	1.00	1.0	1.00	38.2	6401.6	0.6	21.3	72%											
103.5	116.0	19	111	2	35	MC	22.8	1.3	1.00	1.0	1.00	28.4	6977.6	0.5	15.2												
116.0	126.0	20	121	2	68	MC	44.2	1.3	1.00	1.0	1.00	55.3	7558.6	0.5	28.4												
126.0	136.0	21	131	2	55	MC	35.8	1.3	1.00	1.0	1.00	44.7	8149.6	0.5	22.1												
136.0	146.0	22	141	2	33	MC	21.5	1.3	1.00	1.0	1.00	26.8	8750.6	0.5	12.8												
146.0	151.5	23	151	2	48	MC	31.2	1.3	1.00	1.0	1.00	39.0	9361.6	0.5	18.0												

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\,(N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC ≤ 5% a = 0, b = 1.0
   for 5% < FC < 35% $a = \exp(1.76-(190/FC^2))$, $b = (0.99+(FC^{1.5}/1000))$
   for FC ≥ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

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LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***East Ridge BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
BORING NO. ***AS-70***

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.682
FAULT M_w = 6.9

GW DEPTH (ft)= 10

BOREHOLE DIA (in)= 3.875
HAMMER ENERGY = 75%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 10 *(below OG)*

MSF = 1.24

SOIL STRATA							*LIQUEFACTION RESISTANCE (CRR 7.5)*												*CYCLIC STRESS RATIO (CSR)*				*F.S.=(CRR 7.5/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	SPT-$N_{eq.}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	8.5	1	6	2	20	MC	13.0	1.3	0.80	1.0	1.00	13.0	690.0	1.7	22.1												
8.5	13.0	2	11	1	7	MC	4.6	1.3	0.85	1.0	1.00	4.8	1215.1	1.3	6.2		6.2	0.1	1277.5	1215.1	1.0	0.5	1.0	1.0	(0.22)	3.37%	1.82
13.0	18.0	3	16	2	4	MC	2.6	1.3	0.95	1.0	1.00	3.1	1503.1	1.2	3.6												
18.0	23.0	4	21	2	9	MC	5.9	1.3	0.95	1.0	1.00	6.9	1791.1	1.1	7.3												
23.0	28.0	5	26	2	7	SPT	7.0	1.3	1.00	1.2	1.00	10.5	2079.1	1.0	10.3												
28.0	33.0	6	31	2	19	MC	12.4	1.3	1.00	1.0	1.00	15.4	2367.1	0.9	14.2												
33.0	38.0	7	36	2	15	MC	9.8	1.3	1.00	1.0	1.00	12.2	2655.1	0.9	10.6												
38.0	43.0	8	41	2	13	SPT	13.0	1.3	1.00	1.2	1.00	19.5	2943.1	0.8	16.1												
43.0	50.0	9	46	2	48	MC	31.2	1.3	1.00	1.0	1.00	39.0	3231.1	0.8	30.7												
50.0	53.0	10	51	2	11	MC	7.2	1.3	1.00	1.0	1.00	8.9	3519.1	0.8	6.7												
53.0	58.5	11	56	2	16	MC	10.4	1.3	1.00	1.0	1.00	13.0	3807.1	0.7	9.4												
58.5	65.0	12	61	1	37	SPT	37.0	1.3	1.00	1.2	1.00	55.5	4095.1	0.7	38.8	32%	50.1		7277.50	4095.1	0.7	0.5	0.8	1.0	NON-LIQ.		
65.0	68.5	13	66	2	24	MC	15.6	1.3	1.00	1.0	1.00	19.5	4383.1	0.7	13.2												
68.5	73.0	14	71	1	26	MC	16.9	1.3	1.00	1.0	1.00	21.1	4671.1	0.7	13.8		13.8	0.1	8477.50	4671.1	0.6	0.5	0.8	1.0	(0.30)	1.85%	1.00
73.0	78.5	15	76	1	29	SPT	29.0	1.3	1.00	1.2	1.00	43.5	4959.1	0.6	27.6	45%	38.2		9077.50	4959.1	0.6	0.5	0.7	1.0	NON-LIQ.		
78.5	83.0	16	81	2	25	MC	16.3	1.3	1.00	1.0	1.00	20.3	5247.1	0.6	12.5												
83.0	94.5	17	91	2	31	MC	20.2	1.3	1.00	1.0	1.00	25.2	5823.1	0.6	14.8												
94.5	107.0	18	101	1	34	SPT	34.0	1.3	1.00	1.2	1.00	51.0	6399.1	0.6	28.5	12%	31.0		12077.50	6399.1	0.5	0.4	0.6	1.0	NON-LIQ.		
107.0	117.0	19	111	2	46	MC	29.9	1.3	1.00	1.0	1.00	37.4	6975.1	0.5	20.0												
117.0	126.0	20	121	2	36	MC	23.4	1.3	1.00	1.0	1.00	29.3	7555.1	0.5	15.0												
126.0	136.0	21	131	2	28	MC	18.2	1.3	1.00	1.0	1.00	22.8	8146.1	0.5	11.3												
136.0	147.0	22	141	2	19	SPT	19.0	1.3	1.00	1.2	1.00	28.5	8747.1	0.5	13.6												
147.0	151.5	23	151	1	78	MC	50.7	1.3	1.00	1.0	1.00	63.4	9357.1	0.5	29.3		29.3	0.4	18155.50	9357.1	0.4	0.4	0.5	1.0	NON-LIQ.		

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\,(N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC ≤ 5% a = 0, b = 1.0
   for 5% < FC < 35% a = exp(1.76-(190/FC^2)), b = (0.99+(FC$^{1.5}$/1000))
   for FC ≥ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

3/4/2019

LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***Eastridge BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
BORING NO. **AG-18**

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
Hayward Fault
a_{max} *(g)=* 0.6
FAULT M_w *=* 7.5

GW DEPTH (ft)= 8.5

BOREHOLE DIA (in)= 6
HAMMER ENERGY = 60%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 8.5 *(below OG)*

MSF = 1.00

SOIL STRATA							*LIQUEFACTION RESISTANCE* ($CRR_{7.5}$)											*CYCLIC STRESS RATIO (CSR)*				*F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	$SPT\text{-}N_{eq.}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,\ CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	7.5	1	7.5	2	27	SPT	27.0	1.0	0.80	1.2	1.05	27.2	937.5	1.5	39.8	55%											
7.5	12.0	2	12.0	1	14	SPT	14.0	1.0	0.85	1.2	1.05	15.0	1281.6	1.2	18.7	35%	27.5	0.4	1500.0	1281.6	1.0	0.4	1.0	1.0	NON-LIQ.		
12.0	17.0	3	17.0	2	11	SPT	11.0	1.0	0.95	1.2	1.05	13.2	1594.6	1.1	14.7	55%											
17.0	25.0	4	25.0	2	18	SPT	18.0	1.0	1.00	1.2	1.05	22.7	2095.4	1.0	22.2	55%											

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\ (N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC $\leq$ 5% a = 0, b = 1.0
   for 5% < FC < 35% $a = \exp(1.76-(190/FC^2))$, $b = (0.99+(FC^{1.5}/1000))$
   for FC $\geq$ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

2/4/2020

LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***Eastridge BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
BORING NO. **TE-54**

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
Hayward Fault
a_{max} *(g)=* 0.6
FAULT M_w *=* 7.5

GW DEPTH (ft)= 15

BOREHOLE DIA (in)= 6
HAMMER ENERGY = 60%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 15 *(below OG)*

MSF = 1.00

SOIL STRATA							*LIQUEFACTION RESISTANCE* ($CRR_{7.5}$)											*CYCLIC STRESS RATIO (CSR)*				*F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	$SPT\text{-}N_{eq.}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	4.5	1	4.5	2	36	SPT	36.0	1.0	0.75	1.2	1.05	34.0	562.5	1.7	57.8	55%											
4.5	13.0	2	13.0	2	18	SPT	18.0	1.0	0.85	1.2	1.05	19.3	1625.0	1.1	21.4	55%											
13.0	17.0	3	17.0	1	18	SPT	18.0	1.0	0.95	1.2	1.05	21.5	2000.2	1.0	21.5	11%	23.3	0.3	2125.0	2000.2	1.0	0.4	1.0	1.0	(0.66)	1.25%	0.60
17.0	20.0	4	20.0	2	13	SPT	13.0	1.0	0.95	1.2	1.05	15.6	2188.0	1.0	14.9	55%											

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\,(N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC $\leq$ 5% a = 0, b = 1.0
   for 5% < FC < 35% $a = \exp(1.76-(190/FC^2))$, $b = (0.99+(FC^{1.5}/1000))$
   for FC $\geq$ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

2/4/2020

LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***East Ridge BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
BORING NO. ***AS-72***

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.682
FAULT M_w = 6.9

GW DEPTH (ft)= 10

BOREHOLE DIA (in)= 3.875
HAMMER ENERGY = 75%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 10 *(below OG)*

MSF = 1.24

SOIL STRATA							*LIQUEFACTION RESISTANCE ($CRR_{7.5}$)*												*CYCLIC STRESS RATIO (CSR)*				*F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	$SPT\text{-}N_{eq.}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,\ CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	8.0	1	6	2	48	MC	31.2	1.3	0.80	1.0	1.00	31.2	690.0	1.7	53.0												
8.0	13.0	2	11	2	13	MC	8.5	1.3	0.85	1.0	1.00	9.0	1217.6	1.3	11.5												
13.0	16.5	3	16	1	6	MC	3.9	1.3	0.95	1.0	1.00	4.6	1505.6	1.2	5.3		5.3	0.1	1880.0	1505.6	1.0	0.5	1.0	1.0	(0.17)	3.77%	1.58
16.5	23.0	4	21	2	11	MC	7.2	1.3	0.95	1.0	1.00	8.5	1793.6	1.1	9.0												
23.0	28.5	5	26	2	15	MC	9.8	1.3	1.00	1.0	1.00	12.2	2081.6	1.0	11.9												
28.5	34.0	6	31	2	15	MC	9.8	1.3	1.00	1.0	1.00	12.2	2369.6	0.9	11.2												
34.0	37.5	7	36	2	6	SPT	6.0	1.3	1.00	1.2	1.00	9.0	2657.6	0.9	7.8												
37.5	43.5	8	41	1	40	SPT	40.0	1.3	1.00	1.2	1.00	60.0	2945.6	0.8	49.4	18%	55.7		4880.0	2945.6	0.8	0.6	0.9	1.0	NON-LIQ.		
43.5	48.0	9	46	2	23	MC	15.0	1.3	1.00	1.0	1.00	18.7	3233.6	0.8	14.7												
48.0	52.0	10	51	2	28	MC	18.2	1.3	1.00	1.0	1.00	22.8	3521.6	0.8	17.1												
52.0	58.5	11	56	1	38	MC	24.7	1.3	1.00	1.0	1.00	30.9	3809.6	0.7	22.4	17%	26.8	0.3	6680.00	3809.6	0.7	0.5	0.8	1.0	NON-LIQ.		
58.5	63.0	12	61	1	35	SPT	35.0	1.3	1.00	1.2	1.00	52.5	4097.6	0.7	36.7	27%	45.8		7280.00	4097.6	0.7	0.5	0.8	1.0	NON-LIQ.		
63.0	75.0	13	71	2	18	MC	11.7	1.3	1.00	1.0	1.00	14.6	4673.6	0.7	9.6												
75.0	83.0	14	81	1	42	MC	27.3	1.3	1.00	1.0	1.00	34.1	5249.6	0.6	21.1	16%	25.0	0.3	9680.00	5249.6	0.5	0.4	0.7	1.0	NON-LIQ.		
83.0	96.0	15	91	2	31	MC	20.2	1.3	1.00	1.0	1.00	25.2	5825.6	0.6	14.8												
96.0	106.0	16	101	2	41	MC	26.7	1.3	1.00	1.0	1.00	33.3	6401.6	0.6	18.6												
106.0	116.0	17	111	1	28	SPT	28.0	1.3	1.00	1.2	1.00	42.0	6977.6	0.5	22.5	67%	32.0		13280.00	6977.6	0.5	0.4	0.7	1.0	NON-LIQ.		
116.0	125.5	18	121	1	40	SPT	40.0	1.3	1.00	1.2	1.00	60.0	7553.6	0.5	30.9		30.9		14480.00	7553.6	0.5	0.4	0.6	1.0	NON-LIQ.		
125.5	136.0	19	131	2	44	MC	28.6	1.3	1.00	1.0	1.00	35.8	8129.6	0.5	17.7												
136.0	146.0	20	141	2	40	MC	26.0	1.3	1.00	1.0	1.00	32.5	8710.6	0.5	15.6	66%											
146.0	150.0	21	149.5	2	39	SPT	39.0	1.3	1.00	1.2	1.00	58.5	9212.2	0.5	27.3												

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\ (N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC ≤ 5% a = 0, b = 1.0
   for 5% < FC < 35% a = exp(1.76-(190/FC^2)), b = (0.99+($FC^{1.5}$/1000))
   for FC ≥ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

3/4/2019

LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***Eastridge BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
BORING NO. **AG-19**

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
Hayward Fault
a_{max} *(g)=* 0.6
FAULT M_w *=* 7.5

GW DEPTH (ft)= 13

BOREHOLE DIA (in)= 6
HAMMER ENERGY = 60%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 13 *(below OG)*

MSF = 1.00

SOIL STRATA							*LIQUEFACTION RESISTANCE* ($CRR_{7.5}$)											*CYCLIC STRESS RATIO (CSR)*				*F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	$SPT\text{-}N_{eq.}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,\ CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	12.0	1	12.0	2	19	SPT	19.0	1.0	0.85	1.2	1.05	20.3	1500.0	1.2	23.5	55%											
12.0	17.0	2	17.0	2	14	SPT	14.0	1.0	0.95	1.2	1.05	16.8	1875.4	1.0	17.3	55%											
17.0	22.0	3	22.0	1	18	SPT	18.0	1.0	0.95	1.2	1.05	21.5	2188.4	1.0	20.6	33%	29.2	0.4	2750.0	2188.4	1.0	0.5	1.0	1.0	NON-LIQ.		
22.0	25.0	4	25.0	2	25	SPT	25.0	1.0	1.00	1.2	1.05	31.5	2376.2	0.9	28.9	55%											

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\ (N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC $\leq$ 5% a = 0, b = 1.0
   for 5% < FC < 35% $a = \exp(1.76-(190/FC^2))$, $b = (0.99+(FC^{1.5}/1000))$
   for FC $\geq$ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

2/4/2020

LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***East Ridge BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
BORING NO. ***AS-74***

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.682
FAULT M_w *=* 6.9

GW DEPTH (ft)= 10

BOREHOLE DIA (in)= 3.875
HAMMER ENERGY = 75%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 10 *(below OG)*

MSF = 1.24

SOIL STRATA							*LIQUEFACTION RESISTANCE* ($CRR_{7.5}$)											*CYCLIC STRESS RATIO (CSR)*				*F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	SPT-$N_{eq.}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,\ CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	8.0	1	6	2	29	MC	18.9	1.3	0.80	1.0	1.00	18.9	690.0	1.7	32.0												
8.0	13.5	2	11	1	19	MC	12.4	1.3	0.85	1.0	1.00	13.1	1217.6	1.3	16.8	27%	23.6	0.3	1280.0	1217.6	1.0	0.5	1.0	1.0	(0.72)	1.24%	0.82
13.5	18.5	3	16	2	12	MC	7.8	1.3	0.95	1.0	1.00	9.3	1505.6	1.2	10.7												
18.5	23.5	4	21	3	10	MC	6.5	1.3	0.95	1.0	1.00	7.7	1793.6	1.1	8.2										#VALUE!	#VALUE!	#VALUE!
23.5	28.5	5	26	2	16	MC	10.4	1.3	1.00	1.0	1.00	13.0	2081.6	1.0	12.7												
28.5	33.5	6	31	2	26	MC	16.9	1.3	1.00	1.0	1.00	21.1	2369.6	0.9	19.4												
33.5	38.5	7	36	2	15	MC	9.8	1.3	1.00	1.0	1.00	12.2	2657.6	0.9	10.6												
38.5	43.5	8	41	2	22	MC	14.3	1.3	1.00	1.0	1.00	17.9	2945.6	0.8	14.7												
43.5	48.5	9	46	2	21	MC	13.7	1.3	1.00	1.0	1.00	17.1	3233.6	0.8	13.4												
48.5	53.5	10	51	2	34	MC	22.1	1.3	1.00	1.0	1.00	27.6	3521.6	0.8	20.8												
53.5	58.5	11	56	2	35	MC	22.8	1.3	1.00	1.0	1.00	28.4	3809.6	0.7	20.6												
58.5	63.5	12	61	2	23	MC	15.0	1.3	1.00	1.0	1.00	18.7	4097.6	0.7	13.1	56%											
63.5	71.0	13	66	2	52	MC	33.8	1.3	1.00	1.0	1.00	42.3	4385.6	0.7	28.5												
71.0	74.5	14	71	1	42	MC	27.3	1.3	1.00	1.0	1.00	34.1	4673.6	0.7	22.3	13%	25.0	0.3	8480.00	4673.6	0.6	0.5	0.7	1.0	NON-LIQ.		
74.5	78.5	15	76	2	30	MC	19.5	1.3	1.00	1.0	1.00	24.4	4961.6	0.6	15.5												
78.5	88.5	16	81	2	32	MC	20.8	1.3	1.00	1.0	1.00	26.0	5249.6	0.6	16.0												
88.5	96.0	17	91	2	37	MC	24.1	1.3	1.00	1.0	1.00	30.1	5825.6	0.6	17.6												
96.0	106.0	18	101	2	43	MC	28.0	1.3	1.00	1.0	1.00	34.9	6401.6	0.6	19.5												
106.0	116.0	19	111	2	36	MC	23.4	1.3	1.00	1.0	1.00	29.3	6977.6	0.5	15.7												
116.0	129.0	20	121	1	70	SPT	70.0	1.3	1.00	1.2	1.00	105.0	7558.6	0.5	54.0	12%	57.2		14485.00	7558.6	0.5	0.4	0.6	1.0	NON-LIQ.		
129.0	137.0	21	131	2	41	SPT	41.0	1.3	1.00	1.2	1.00	61.5	8146.6	0.5	30.5												
137.0	147.5	22	140.5	1	90	SPT	90.0	1.3	1.00	1.2	1.00	135.0	8716.3	0.5	64.7		64.7		16859.50	8716.3	0.4	0.4	0.6	1.0	NON-LIQ.		
147.5	151.5	23	151	2	78	MC	50.7	1.3	1.00	1.0	1.00	63.4	9356.1	0.5	29.3												

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\ (N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC $\leq$ 5% a = 0, b = 1.0
   for 5% < FC < 35% a = exp(1.76-(190/FC^2)), b = (0.99+($FC^{1.5}$/1000))
   for FC $\geq$ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

3/4/2019

LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***East Ridge BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
BORING NO. ***AS-76***

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.682
FAULT M_w = 6.9

GW DEPTH (ft)= 10

BOREHOLE DIA (in)= 3.875
HAMMER ENERGY = 72%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 10 *(below OG)*

MSF = 1.24

SOIL STRATA							*LIQUEFACTION RESISTANCE ($CRR_{7.5}$)*												*CYCLIC STRESS RATIO (CSR)*				*F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	SPT-$N_{eq.}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	8.5	1	6	2	9	MC	5.9	1.2	0.80	1.0	1.00	5.6	690.0	1.7	9.6												
8.5	13.0	2	11	1	7	MC	4.6	1.2	0.85	1.0	1.00	4.6	1215.1	1.3	6.0	50%	12.2	0.1	1277.5	1215.1	1.0	0.5	1.0	1.0	(0.36)	2.03%	1.10
13.0	18.5	3	16	1	8	MC	5.2	1.2	0.95	1.0	1.00	5.9	1503.1	1.2	6.8	47%	13.2	0.1	1877.5	1503.1	1.0	0.5	1.0	1.0	(0.33)	1.91%	1.26
18.5	23.5	4	21	1	4	SPT	4.0	1.2	0.95	1.2	1.00	5.5	1791.1	1.1	5.8	43%	11.9	0.1	2477.5	1791.1	1.0	0.6	1.0	1.0	(0.28)	2.06%	1.24
23.5	28.5	5	26	2	10	MC	6.5	1.2	1.00	1.0	1.00	7.8	2079.1	1.0	7.7												
28.5	33.5	6	31	2	13	MC	8.5	1.2	1.00	1.0	1.00	10.2	2367.1	0.9	9.3												
33.5	38.5	7	36	2	17	MC	11.1	1.2	1.00	1.0	1.00	13.3	2655.1	0.9	11.5												
38.5	43.5	8	41	2	9	MC	5.9	1.2	1.00	1.0	1.00	7.0	2943.1	0.8	5.8												
43.5	48.5	9	46	2	19	MC	12.4	1.2	1.00	1.0	1.00	14.8	3231.1	0.8	11.7												
48.5	53.5	10	51	2	20	MC	13.0	1.2	1.00	1.0	1.00	15.6	3519.1	0.8	11.8												
53.5	58.5	11	56	1	19	SPT	19.0	1.2	1.00	1.2	1.00	27.4	3807.1	0.7	19.9	35%	28.8	0.4	6677.50	3807.1	0.7	0.5	0.8	1.0	NON-LIQ.		
58.5	63.5	12	61	2	23	MC	15.0	1.2	1.00	1.0	1.00	18.0	4095.1	0.7	12.6												
63.5	68.5	13	66	2	36	MC	23.4	1.2	1.00	1.0	1.00	28.1	4383.1	0.7	19.0												
68.5	72.0	14	71	1	30	SPT	30.0	1.2	1.00	1.2	1.00	43.3	4671.1	0.7	28.3		28.3	0.4	8477.50	4671.1	0.6	0.5	0.7	1.0	NON-LIQ.		
72.0	78.0	15	76	2	29	MC	18.9	1.2	1.00	1.0	1.00	22.7	4959.1	0.6	14.4												
78.0	86.0	16	81	2	31	MC	20.2	1.2	1.00	1.0	1.00	24.2	5247.1	0.6	14.9												
86.0	97.0	17	91	2	22	SPT	22.0	1.2	1.00	1.2	1.00	31.7	5823.1	0.6	18.6	60%											
97.0	106.0	18	101	1	34	SPT	34.0	1.2	1.00	1.2	1.00	49.0	6399.1	0.6	27.4		27.4	0.4	12077.50	6399.1	0.5	0.4	0.6	1.0	NON-LIQ.		
106.0	119.0	19	111	2	33	MC	21.5	1.2	1.00	1.0	1.00	25.8	6975.1	0.5	13.8												
119.0	126.0	20	121	2	61	MC	39.7	1.2	1.00	1.0	1.00	47.6	7553.1	0.5	24.5	72%											
126.0	134.0	21	131	2	45	MC	29.3	1.2	1.00	1.0	1.00	35.1	8144.1	0.5	17.4												
134.0	145.0	22	141	1	48	SPT	48.0	1.2	1.00	1.2	1.00	69.2	8747.1	0.5	33.1		33.1		16921.50	8747.1	0.4	0.4	0.6	1.0	NON-LIQ.		
145.0	151.5	23	151	2	46	MC	29.9	1.2	1.00	1.0	1.00	35.9	9359.1	0.5	16.6	70%											

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\,(N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC ≤ 5% a = 0, b = 1.0
   for 5% < FC < 35% a = exp(1.76-(190/FC^2)), b = (0.99+($FC^{1.5}$/1000))
   for FC ≥ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

3/4/2019

LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***East Ridge BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
BORING NO. ***AS-78***

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.682
FAULT M_w = 6.9

GW DEPTH (ft)= 10

BOREHOLE DIA (in)= 3.875
HAMMER ENERGY = 75%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 10 *(below OG)*

MSF = 1.24

SOIL STRATA							LIQUEFACTION RESISTANCE ($CRR_{7.5}$)												CYCLIC STRESS RATIO (CSR)				F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka			POST-LIQ. SETTLEMENT	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	SPT-$N_{eq.}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	8.0	1	6	2	14	MC	9.1	1.3	0.80	1.0	1.00	9.1	690.0	1.7	15.5												
8.0	13.0	2	11	2	4	MC	2.6	1.3	0.85	1.0	1.00	2.8	1217.6	1.3	3.6												
13.0	18.5	3	16	1	20	MC	13.0	1.3	0.95	1.0	1.00	15.5	1505.6	1.2	17.9	1%	17.9	0.2	1880.0	1505.6	1.0	0.5	1.0	1.0	(0.44)	1.52%	1.01
18.5	23.0	4	21	2	11	MC	7.2	1.3	0.95	1.0	1.00	8.5	1793.6	1.1	9.0												
23.0	29.0	5	26	2	13	MC	8.5	1.3	1.00	1.0	1.00	10.6	2081.6	1.0	10.4												
29.0	34.0	6	31	2	19	MC	12.4	1.3	1.00	1.0	1.00	15.5	2369.6	0.9	14.2												
34.0	38.0	7	36	2	16	MC	10.4	1.3	1.00	1.0	1.00	13.1	2657.6	0.9	11.3												
38.0	43.5	8	41	2	13	MC	8.5	1.3	1.00	1.0	1.00	10.6	2945.6	0.8	8.7												
43.5	48.0	9	46	2	20	MC	13.0	1.3	1.00	1.0	1.00	16.3	3233.6	0.8	12.8												
48.0	54.0	10	51	2	11	SPT	11.0	1.3	1.00	1.2	1.00	16.6	3521.6	0.8	12.5												
54.0	56.5	11	56	1	23	SPT	23.0	1.3	1.00	1.2	1.00	34.6	3809.6	0.7	25.1		25.1	0.3	6680.00	3809.6	0.7	0.5	0.8	1.0	NON-LIQ.		
56.5	63.0	12	61	2	19	MC	12.4	1.3	1.00	1.0	1.00	15.5	4097.6	0.7	10.8												
63.0	68.5	13	66	2	29	MC	18.9	1.3	1.00	1.0	1.00	23.7	4385.6	0.7	16.0												
68.5	73.0	14	71	2	26	MC	16.9	1.3	1.00	1.0	1.00	21.2	4673.6	0.7	13.9												
73.0	78.0	15	76	2	56	MC	36.4	1.3	1.00	1.0	1.00	45.7	4961.6	0.6	29.0												
78.0	86.0	16	81	2	22	SPT	22.0	1.3	1.00	1.2	1.00	33.1	5249.6	0.6	20.5												
86.0	97.0	17	91	2	52	MC	33.8	1.3	1.00	1.0	1.00	42.4	5825.6	0.6	24.9												
97.0	102.0	18	101	1	44	MC	28.6	1.3	1.00	1.0	1.00	35.9	6401.6	0.6	20.1	20%	25.3	0.3	12080.00	6401.6	0.5	0.4	0.7	1.0	NON-LIQ.		
102.0	116.0	19	110.5	1	100	SPT	100.0	1.3	1.00	1.2	1.00	150.6	6948.8	0.5	80.8	9%	82.7		13220.00	6948.8	0.5	0.4	0.6	1.0	NON-LIQ.		
116.0	126.0	20	121	2	48	MC	31.2	1.3	1.00	1.0	1.00	39.2	7558.6	0.5	20.1												
126.0	139.5	21	131	2	69	MC	44.9	1.3	1.00	1.0	1.00	56.3	8149.6	0.5	27.9												
139.5	145	22	140.5	1	90	MC	58.5	1.3	1.00	1.0	1.00	73.4	8716.8	0.5	35.2		35.2		16860.00	8716.8	0.4	0.4	0.6	1.0	NON-LIQ.		
145	151.5	23	151	1	85	SPT	85.0	1.3	1.00	1.2	1.00	128.0	9359.1	0.5	59.2		59.2		18157.50	9359.1	0.4	0.4	0.5	1.0	NON-LIQ.		

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\,(N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC ≤ 5% a = 0, b = 1.0
   for 5% < FC < 35% a = exp(1.76-(190/FC^2)), b = (0.99+($FC^{1.5}$/1000))
   for FC ≥ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

3/4/2019

LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***East Ridge BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
BORING NO. ***AS-80***

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.682
FAULT M_w *=* 6.9

GW DEPTH (ft)= 9.5

BOREHOLE DIA (in)= 3.875
HAMMER ENERGY = 72%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 9.5 *(below OG)*

MSF = 1.24

SOIL STRATA							*LIQUEFACTION RESISTANCE* ($CRR_{7.5}$)											*CYCLIC STRESS RATIO (CSR)*				*F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	SPT-$N_{eq.}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	8.5	1	6	2	7	MC	4.6	1.2	0.80	1.0	1.00	4.4	690.0	1.7	7.4												
8.5	13.5	2	11	2	5	MC	3.3	1.2	0.85	1.0	1.00	3.3	1183.9	1.3	4.3												
13.5	18.5	3	16	1	15	MC	9.8	1.2	0.95	1.0	1.00	11.1	1471.9	1.2	13.0	44%	20.6	0.2	1877.5	1471.9	1.0	0.5	1.0	1.0	(0.50)	1.37%	0.82
18.5	23.5	4	21	1	6	MC	3.9	1.2	0.95	1.0	1.00	4.5	1759.9	1.1	4.7		4.7	0.1	2477.5	1759.9	1.0	0.6	1.0	1.0	(0.15)	4.12%	2.47
23.5	28.5	5	26	2	13	MC	8.5	1.2	1.00	1.0	1.00	10.2	2047.9	1.0	10.0												
28.5	33.5	6	31	2	16	MC	10.4	1.2	1.00	1.0	1.00	12.5	2335.9	0.9	11.6												
33.5	38.5	7	36	2	11	MC	7.2	1.2	1.00	1.0	1.00	8.6	2623.9	0.9	7.5												
38.5	43.5	8	41	2	11	MC	7.2	1.2	1.00	1.0	1.00	8.6	2911.9	0.8	7.1												
43.5	48.5	9	46	2	15	MC	9.8	1.2	1.00	1.0	1.00	11.7	3199.9	0.8	9.3												
48.5	53.5	10	51	2	24	MC	15.6	1.2	1.00	1.0	1.00	18.7	3487.9	0.8	14.2												
53.5	58.5	11	56	2	7	SPT	7.0	1.2	1.00	1.2	1.00	10.1	3775.9	0.7	7.3												
58.5	63.5	12	61	2	31	MC	20.2	1.2	1.00	1.0	1.00	24.2	4063.9	0.7	17.0												
63.5	68.5	13	66	2	28	MC	18.2	1.2	1.00	1.0	1.00	21.9	4351.9	0.7	14.8												
68.5	73.5	14	71	2	30	MC	19.5	1.2	1.00	1.0	1.00	23.4	4639.9	0.7	15.4												
73.5	78.0	15	76	1	52	SPT	52.0	1.2	1.00	1.2	1.00	75.0	4927.9	0.6	47.8		47.8		9077.50	4927.9	0.6	0.5	0.7	1.0	NON-LIQ.		
78.0	83.5	16	81	2	44	MC	28.6	1.2	1.00	1.0	1.00	34.4	5215.9	0.6	21.3												
83.5	88.5	17	86	2	26	MC	16.9	1.2	1.00	1.0	1.00	20.3	5503.9	0.6	12.2												
88.5	96.0	18	91	2	37	MC	24.1	1.2	1.00	1.0	1.00	28.9	5791.9	0.6	17.0												
96.0	106.0	19	101	2	37	MC	24.1	1.2	1.00	1.0	1.00	28.9	6367.9	0.6	16.2												
106.0	116.0	20	111	1	100	MC	65.0	1.2	1.00	1.0	1.00	78.1	6948.9	0.5	41.9	7%	42.2		13282.50	6948.9	0.5	0.4	0.6	1.0	NON-LIQ.		
116.0	126.0	21	121	2	46	MC	29.9	1.2	1.00	1.0	1.00	35.9	7539.9	0.5	18.5												
126.0	136	22	131	2	23	SPT	23.0	1.2	1.00	1.2	1.00	33.2	8140.9	0.5	16.4												
136	147	23	141	2	59	MC	38.4	1.2	1.00	1.0	1.00	46.1	8751.9	0.5	22.0												
147	150.25	24	150	1	100	SPT	100.0	1.2	1.00	1.2	1.00	144.2	9309.3	0.5	66.8		66.8		18076.50	9309.3	0.4	0.4	0.5	1.0	NON-LIQ.		

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\,(N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC ≤ 5% a = 0, b = 1.0
   for 5% < FC < 35% a = exp(1.76-(190/FC^2)), b = (0.99+($FC^{1.5}$/1000))
   for FC ≥ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

3/4/2019

LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***Eastridge BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
BORING NO. ***PS-59***

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
Hayward Fault
a_{max} *(g)=* 0.532
FAULT M_w *=* 7.5

GW DEPTH (ft)= 8

BOREHOLE DIA (in)= 6
HAMMER ENERGY = 60%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 8 *(below OG)*

MSF = 1.00

SOIL STRATA							*LIQUEFACTION RESISTANCE* ($CRR_{7.5}$)											*CYCLIC STRESS RATIO (CSR)*				*F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	$SPT\text{-}N_{eq.}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	4.5	1	4.5	1	9	SPT	9.0	1.0	0.75	1.2	1.05	8.5	562.5	1.7	14.5	30%	21.4		562.5	562.5	1.0	0.3	1.0	1.0			
4.5	11.5	2	11.5	2	10	SPT	10.0	1.0	0.85	1.2	1.05	10.7	1219.1	1.3	13.7	55%											
11.5	18.0	3	18.0	1	11	SPT	11.0	1.0	0.95	1.2	1.05	13.2	1626.0	1.1	14.6	47%	22.5	0.2	2250.0	1626.0	1.0	0.5	1.0	1.0	(0.54)	1.28%	1.00
18.0	20.0	4	20.0	2	17	SPT	17.0	1.0	0.95	1.2	1.05	20.3	1751.2	1.1	21.7	55%											

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\,(N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC $\leq$ 5% a = 0, b = 1.0
   for 5% < FC < 35% $a = \exp(1.76-(190/FC^2))$, $b = (0.99+(FC^{1.5}/1000))$
   for FC $\geq$ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

2/4/2020

LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***East Ridge BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
BORING NO. ***AS-82***

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.682
FAULT M_w = 6.9

GW DEPTH (ft)= 9.5

BOREHOLE DIA (in)= 3.875
HAMMER ENERGY = 75%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 9.5 *(below OG)*

MSF = 1.24

SOIL STRATA							*LIQUEFACTION RESISTANCE ($CRR_{7.5}$)*											*CYCLIC STRESS RATIO (CSR)*				*F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	SPT-$N_{eq.}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,\ CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	8.0	1	6	2	8	MC	5.2	1.3	0.80	1.0	1.00	5.2	690.0	1.7	8.9											
8.0	13.0	2	11	2	6	MC	3.9	1.3	0.85	1.0	1.00	4.2	1186.4	1.3	5.4											
13.0	18.0	3	16	2	5	MC	3.3	1.3	0.95	1.0	1.00	3.9	1474.4	1.2	4.5											
18.0	23.5	4	21	2	11	MC	7.2	1.3	0.95	1.0	1.00	8.5	1762.4	1.1	9.1											
23.5	28.5	5	26	2	11	MC	7.2	1.3	1.00	1.0	1.00	9.0	2050.4	1.0	8.9											
28.5	34.0	6	31	2	10	MC	6.5	1.3	1.00	1.0	1.00	8.2	2338.4	0.9	7.5											
34.0	38.0	7	36	2	15	MC	9.8	1.3	1.00	1.0	1.00	12.2	2626.4	0.9	10.7											
38.0	43.0	8	41	2	11	MC	7.2	1.3	1.00	1.0	1.00	9.0	2914.4	0.8	7.4											
43.0	48.0	9	46	2	8	MC	5.2	1.3	1.00	1.0	1.00	6.5	3202.4	0.8	5.2											
48.0	53.0	10	51	2	5	MC	3.3	1.3	1.00	1.0	1.00	4.1	3490.4	0.8	3.1											
53.0	58.0	11	56	2	25	MC	16.3	1.3	1.00	1.0	1.00	20.4	3778.4	0.7	14.8											
58.0	63.0	12	61	2	19	MC	12.4	1.3	1.00	1.0	1.00	15.5	4066.4	0.7	10.9											
63.0	68.0	13	66	2	20	MC	13.0	1.3	1.00	1.0	1.00	16.3	4354.4	0.7	11.1											
68.0	74.0	14	71	2	42	MC	27.3	1.3	1.00	1.0	1.00	34.3	4642.4	0.7	22.5											
74.0	76.3	15B	76	1	47	MC	30.6	1.3	1.00	1.0	1.00	38.3	4930.4	0.6	24.4	54%	34.3		9080.00	4930.4	0.6	0.5	0.7	1.0	NON-LIQ.		
76.3	79.0	15A	76.3	1	47	MC	30.6	1.3	1.00	1.0	1.00	38.3	4947.7	0.6	24.4	18%	29.3	0.4	9116.00	4947.7	0.6	0.5	0.7	1.0	NON-LIQ.		
79.0	83.0	16	81	2	32	MC	20.8	1.3	1.00	1.0	1.00	26.1	5218.4	0.6	16.2											
83.0	95.0	17	91	2	50	MC	32.5	1.3	1.00	1.0	1.00	40.8	5794.4	0.6	24.0											
95.0	106.0	18	101	2	50	MC	32.5	1.3	1.00	1.0	1.00	40.8	6370.4	0.6	22.9											
106.0	116.0	19	111	2	46	MC	29.9	1.3	1.00	1.0	1.00	37.5	6951.4	0.5	20.1											
116.0	126.0	20	121	1	49	MC	31.9	1.3	1.00	1.0	1.00	40.0	7542.4	0.5	20.6	75%	29.7	0.4	14500.00	7542.4	0.5	0.4	0.6	1.0	NON-LIQ.		
126.0	136	21	131	1	58	SPT	58.0	1.3	1.00	1.2	1.00	87.3	8143.4	0.5	43.3		43.3		15725.00	8143.4	0.5	0.4	0.6	1.0	NON-LIQ.		
136	148	22	141	1	88	SPT	88.0	1.3	1.00	1.2	1.00	132.5	8754.4	0.5	63.3		63.3		16960.00	8754.4	0.4	0.4	0.6	1.0	NON-LIQ.		
148	151.5	23	151	2	51	MC	33.2	1.3	1.00	1.0	1.00	41.6	9373.4	0.5	19.2											

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\ (N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC ≤ 5% a = 0, b = 1.0
   for 5% < FC < 35% a = exp(1.76-(190/FC^2)), b = (0.99+($FC^{1.5}$/1000))
   for FC ≥ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

3/4/2019

LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***East Ridge BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
BORING NO. ***AS-84***

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.682
FAULT M_w *=* 6.9

GW DEPTH (ft)= 9

BOREHOLE DIA (in)= 3.875
HAMMER ENERGY = 75%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 9 *(below OG)*

MSF = 1.24

SOIL STRATA							*LIQUEFACTION RESISTANCE* ($CRR_{7.5}$)											*CYCLIC STRESS RATIO (CSR)*				*F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	SPT-$N_{eq.}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,\ CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	8.5	1	6	2	7	MC	4.6	1.3	0.80	1.0	1.00	4.6	690.0	1.7	7.8												
8.5	13.0	2	11	2	9	MC	5.9	1.3	0.85	1.0	1.00	6.2	1152.7	1.3	8.2												
13.0	18.5	3	16	2	16	MC	10.4	1.3	0.95	1.0	1.00	12.4	1440.7	1.2	14.6	90%											
18.5	23.5	4	21	2	27	MC	17.6	1.3	0.95	1.0	1.00	20.9	1728.7	1.1	22.5	74%											
23.5	28.5	5	26	2	15	MC	9.8	1.3	1.00	1.0	1.00	12.2	2016.7	1.0	12.2												
28.5	33.5	6	31	2	22	MC	14.3	1.3	1.00	1.0	1.00	17.9	2304.7	0.9	16.7												
33.5	38.5	7	36	2	23	MC	15.0	1.3	1.00	1.0	1.00	18.8	2592.7	0.9	16.5												
38.5	43.5	8	41	2	19	MC	12.4	1.3	1.00	1.0	1.00	15.5	2880.7	0.8	12.9												
43.5	48.5	9	46	2	25	MC	16.3	1.3	1.00	1.0	1.00	20.4	3168.7	0.8	16.2												
48.5	53.5	10	51	2	23	MC	15.0	1.3	1.00	1.0	1.00	18.8	3456.7	0.8	14.3												
53.5	58.5	11	56	1	39	MC	25.4	1.3	1.00	1.0	1.00	31.8	3744.7	0.7	23.3	15%	26.9	0.3	6677.50	3744.7	0.7	0.5	0.8	1.0	NON-LIQ.		
58.5	63.5	12	61	2	21	MC	13.7	1.3	1.00	1.0	1.00	17.1	4032.7	0.7	12.1												
63.5	68.5	13	66	2	21	MC	13.7	1.3	1.00	1.0	1.00	17.1	4320.7	0.7	11.7												
68.5	72.0	14	71	2	26	MC	16.9	1.3	1.00	1.0	1.00	21.2	4608.7	0.7	14.0												
72.0	78.0	15	76	1	35	MC	22.8	1.3	1.00	1.0	1.00	28.6	4896.7	0.6	18.2	46%	26.9	0.3	9077.50	4896.7	0.6	0.5	0.7	1.0	NON-LIQ.		
78.0	86.0	16	81	2	42	MC	27.3	1.3	1.00	1.0	1.00	34.3	5184.7	0.6	21.3												
86.0	97.0	17	91	2	42	MC	27.3	1.3	1.00	1.0	1.00	34.3	5760.7	0.6	20.2	51%											
97.0	106.0	18	101	2	39	MC	25.4	1.3	1.00	1.0	1.00	31.8	6336.7	0.6	17.9												
106.0	119.0	19	111	2	61	MC	39.7	1.3	1.00	1.0	1.00	49.8	6912.7	0.5	26.8												
119.0	126.0	20	120.5	1	95	MC	61.8	1.3	1.00	1.0	1.00	77.5	7461.4	0.5	40.1	13%	43.3		14419.00	7461.4	0.5	0.4	0.6	1.0	NON-LIQ.		
126.0	134.0	21	131	1	55	SPT	55.0	1.3	1.00	1.2	1.00	82.8	8081.7	0.5	41.2		41.2		15694.50	8081.7	0.5	0.4	0.6	1.0	NON-LIQ.		
134.0	145	22	140	1	100	MC	65.0	1.3	1.00	1.0	1.00	81.6	8624.1	0.5	39.3	16%	44.1		16798.50	8624.1	0.4	0.4	0.6	1.0	NON-LIQ.		
145	151.5	23	151	1	88	MC	57.2	1.3	1.00	1.0	1.00	71.8	9296.7	0.5	33.3		33.3		18157.50	9296.7	0.4	0.4	0.5	1.0	NON-LIQ.		

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\ (N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC ≤ 5% a = 0, b = 1.0
   for 5% < FC < 35% a = exp(1.76-(190/FC^2)), b = (0.99+($FC^{1.5}$/1000))
   for FC ≥ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

3/4/2019

LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***Eastridge BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
BORING NO. **AS-23**

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
Hayward Fault
a_{max} *(g)=* 0.6
FAULT M_w *=* 7.5

GW DEPTH (ft)= 8

BOREHOLE DIA (in)= 6
HAMMER ENERGY = 60%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 8 *(below OG)*

MSF = 1.00

SOIL STRATA							*LIQUEFACTION RESISTANCE* ($CRR_{7.5}$)											*CYCLIC STRESS RATIO (CSR)*				*F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	$SPT\text{-}N_{eq.}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	4.0	1	4.0	2	25	SPT	25.0	1.0	0.75	1.2	1.05	23.6	500.0	1.7	40.2	55%											
4.0	7.5	2	7.5	2	9	SPT	9.0	1.0	0.80	1.2	1.05	9.1	937.5	1.5	13.3	55%											
7.5	12.5	3	12.5	1	11	SPT	11.0	1.0	0.85	1.2	1.05	11.8	1281.7	1.2	14.7	55%	22.7	0.3	1562.5	1281.7	1.0	0.5	1.0	1.0	(0.54)	1.27%	0.76
12.5	17.0	4	17.0	2	17	SPT	17.0	1.0	0.95	1.2	1.05	20.3	1563.4	1.1	23.0	33%											
17.0	25.0	5	25.0	2	17	SPT	17.0	1.0	1.00	1.2	1.05	21.4	2064.2	1.0	21.1	55%											

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\,(N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC $\leq$ 5% a = 0, b = 1.0
   for 5% < FC < 35% a = $\exp(1.76-(190/FC^2))$, b = $(0.99+(FC^{1.5}/1000))$
   for FC $\geq$ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

2/4/2020

LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***East Ridge BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
BORING NO. ***AS-86***

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.682
FAULT M_w *=* 6.9

GW DEPTH (ft)= 11

BOREHOLE DIA (in)= 3.875
HAMMER ENERGY = 75%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 11 *(below OG)*

MSF = 1.24

SOIL STRATA							*LIQUEFACTION RESISTANCE* ($CRR_{7.5}$)											*CYCLIC STRESS RATIO (CSR)*				*F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	SPT-$N_{eq.}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,\ CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	8.5	1	6	2	9	MC	5.9	1.3	0.80	1.0	1.00	5.9	690.0	1.7	10.0												
8.5	13.5	2	11	2	9	MC	5.9	1.3	0.85	1.0	1.00	6.2	1277.5	1.3	7.8												
13.5	18.5	3	16	2	5	MC	3.3	1.3	0.95	1.0	1.00	3.9	1565.5	1.1	4.4												
18.5	24.0	4	21	2	15	SPT	15.0	1.3	0.95	1.2	1.00	21.5	1853.5	1.0	22.3												
24.0	28.5	5	26	2	10	MC	6.5	1.3	1.00	1.0	1.00	8.2	2141.5	1.0	7.9												
28.5	33.5	6	31	2	15	MC	9.8	1.3	1.00	1.0	1.00	12.2	2429.5	0.9	11.1												
33.5	38.5	7	36	2	16	MC	10.4	1.3	1.00	1.0	1.00	13.1	2717.5	0.9	11.2												
38.5	43.5	8	41	2	17	MC	11.1	1.3	1.00	1.0	1.00	13.9	3005.5	0.8	11.3												
43.5	48.5	9	46	2	22	MC	14.3	1.3	1.00	1.0	1.00	17.9	3293.5	0.8	14.0												
48.5	53.5	10	51	1	18	MC	11.7	1.3	1.00	1.0	1.00	14.7	3581.5	0.7	11.0	52%	18.2	0.2	6077.50	3581.5	0.7	0.6	0.8	1.0	(0.36)	1.50%	0.90
53.5	56.5	11	56	1	11	SPT	11.0	1.3	1.00	1.2	1.00	16.6	3869.5	0.7	11.9		11.9	0.1	6677.50	3869.5	0.7	0.5	0.8	1.0	(0.25)	2.07%	0.74
56.5	63.0	12	61	2	33	MC	21.5	1.3	1.00	1.0	1.00	26.9	4157.5	0.7	18.7												
63.0	68.0	13	66	1	67	MC	43.6	1.3	1.00	1.0	1.00	54.7	4445.5	0.7	36.7	11%	38.7		7877.50	4445.5	0.6	0.5	0.7	1.0	NON-LIQ.		
68.0	73.5	14	71	2	15	SPT	15.0	1.3	1.00	1.2	1.00	22.6	4733.5	0.7	14.7												
73.5	78.0	15	76	1	66	MC	42.9	1.3	1.00	1.0	1.00	53.8	5021.5	0.6	34.0		34.0		9077.50	5021.5	0.6	0.5	0.7	1.0	NON-LIQ.		
78.0	85.0	16	81	2	47	MC	30.6	1.3	1.00	1.0	1.00	38.3	5309.5	0.6	23.5												
85.0	96.0	17	91	1	35	MC	22.8	1.3	1.00	1.0	1.00	28.6	5885.5	0.6	16.6	75%	25.0	0.3	10877.50	5885.5	0.5	0.4	0.7	1.0	NON-LIQ.		
96.0	104.0	18	101	1	41	MC	26.7	1.3	1.00	1.0	1.00	33.4	6461.5	0.6	18.6	48%	27.3	0.3	12077.50	6461.5	0.5	0.4	0.7	1.0	NON-LIQ.		
104.0	116.0	19	111	2	35	MC	22.8	1.3	1.00	1.0	1.00	28.6	7037.5	0.5	15.2												
116.0	128.0	20	121	2	45	MC	29.3	1.3	1.00	1.0	1.00	36.7	7618.5	0.5	18.8												
128.0	138.0	21	131	1	58	SPT	58.0	1.3	1.00	1.2	1.00	87.3	8207.5	0.5	43.1	22%	50.9		15695.50	8207.5	0.5	0.4	0.6	1.0	NON-LIQ.		
138.0	146	22	141	2	74	MC	48.1	1.3	1.00	1.0	1.00	60.4	8806.5	0.5	28.8												
146	151.5	23	151	2	73	MC	47.5	1.3	1.00	1.0	1.00	59.5	9417.5	0.5	27.4												

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\ (N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC ≤ 5% a = 0, b = 1.0
   for 5% < FC < 35% $a = \exp(1.76-(190/FC^2))$, $b = (0.99+(FC^{1.5}/1000))$
   for FC ≥ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

3/4/2019

LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***East Ridge BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
BORING NO. ***AS-88***

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.682
FAULT M_w = 6.9

GW DEPTH (ft)= 11.5

BOREHOLE DIA (in)= 3.875
HAMMER ENERGY = 75%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 11.5 *(below OG)*

MSF = 1.24

SOIL STRATA							*LIQUEFACTION RESISTANCE* ($CRR_{7.5}$)											*CYCLIC STRESS RATIO (CSR)*				*F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	SPT-$N_{eq.}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	6.5	1	6	2	8	MC	5.2	1.3	0.80	1.0	1.00	5.2	690.0	1.7	8.9												
6.5	13.5	2	11	2	12	MC	7.8	1.3	0.85	1.0	1.00	8.3	1287.5	1.2	10.4	71%											
13.5	18.5	3	16	1	7	MC	4.6	1.3	0.95	1.0	1.00	5.4	1606.7	1.1	6.1	47%	12.3	0.1	1887.5	1606.7	1.0	0.5	1.0	1.0	(0.33)	2.02%	1.21
18.5	23.5	4	21	2	15	MC	9.8	1.3	0.95	1.0	1.00	11.6	1894.7	1.0	11.9												
23.5	28.5	5	26	2	14	MC	9.1	1.3	1.00	1.0	1.00	11.4	2182.7	1.0	10.9												
28.5	33.5	6	31	2	15	MC	9.8	1.3	1.00	1.0	1.00	12.2	2470.7	0.9	11.0												
33.5	38.5	7	36	2	23	MC	15.0	1.3	1.00	1.0	1.00	18.8	2758.7	0.9	16.0												
38.5	43.5	8	41	2	27	MC	17.6	1.3	1.00	1.0	1.00	22.0	3046.7	0.8	17.8												
43.5	48.5	9	46	1	19	MC	12.4	1.3	1.00	1.0	1.00	15.5	3334.7	0.8	12.0	37%	19.4	0.2	5487.50	3334.7	0.8	0.6	0.9	1.0	(0.38)	1.43%	0.86
48.5	53.5	10	51	1	35	MC	22.8	1.3	1.00	1.0	1.00	28.6	3622.7	0.7	21.2	11%	23.0	0.3	6087.50	3622.7	0.7	0.6	0.8	1.0	(0.46)	1.26%	0.76
53.5	58.5	11	56	1	29	MC	18.9	1.3	1.00	1.0	1.00	23.7	3910.7	0.7	16.9	10%	18.2	0.2	6687.50	3910.7	0.7	0.5	0.8	1.0	(0.36)	1.50%	0.90
58.5	63.0	12	61	2	23	SPT	23.0	1.3	1.00	1.2	1.00	34.6	4198.7	0.7	23.9												
63.0	68.0	13	66	1	62	SPT	62.0	1.3	1.00	1.2	1.00	93.4	4486.7	0.7	62.3		62.3		7887.50	4486.7	0.6	0.5	0.7	1.0	NON-LIQ.		
68.0	73.0	14	71	2	16	SPT	16.0	1.3	1.00	1.2	1.00	24.1	4774.7	0.6	15.6												
73.0	78.0	15	76	2	24	SPT	24.0	1.3	1.00	1.2	1.00	36.1	5062.7	0.6	22.7												
78.0	85.0	16	81	1	100	MC	65.0	1.3	1.00	1.0	1.00	81.6	5350.7	0.6	49.9	22%	58.3		9687.50	5350.7	0.5	0.4	0.7	1.0	NON-LIQ.		
85.0	96.0	17	91	2	72	MC	46.8	1.3	1.00	1.0	1.00	58.7	5926.7	0.6	34.1												
96.0	106.0	18	101	2	75	MC	48.8	1.3	1.00	1.0	1.00	61.2	6502.7	0.6	33.9												
106.0	116.0	19	111	2	32	MC	20.8	1.3	1.00	1.0	1.00	26.1	7078.7	0.5	13.9												
116.0	126.0	20	121	2	50	MC	32.5	1.3	1.00	1.0	1.00	40.8	7659.7	0.5	20.8												
126.0	135.5	21	131	2	44	MC	28.6	1.3	1.00	1.0	1.00	35.9	8250.7	0.5	17.7												
135.5	142.5	22	141	1	83	MC	54.0	1.3	1.00	1.0	1.00	67.7	8852.2	0.5	32.2		32.2		16933.00	8852.2	0.4	0.4	0.6	1.0	NON-LIQ.		
142.5	151.5	23	151	1	88	MC	57.2	1.3	1.00	1.0	1.00	71.8	9466.7	0.5	33.0		33.0		18171.50	9466.7	0.4	0.4	0.5	1.0	NON-LIQ.		

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\,(N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC ≤ 5% a = 0, b = 1.0
   for 5% < FC < 35% a = exp(1.76-(190/FC^2)), b = (0.99+($FC^{1.5}$/1000))
   for FC ≥ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

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LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***Eastridge BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
BORING NO. **AE-58**

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
Hayward Fault
a_{max} *(g)=* 0.6
FAULT M_w *=* 7.5

GW DEPTH (ft)= 35

BOREHOLE DIA (in)= 6
HAMMER ENERGY = 60%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 35 *(below OG)*

MSF = 1.00

SOIL STRATA							*LIQUEFACTION RESISTANCE* ($CRR_{7.5}$)											*CYCLIC STRESS RATIO (CSR)*				*F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	$SPT\text{-}N_{eq.}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,\ CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	4.5	1	4.5	2	13	SPT	13.0	1.0	0.75	1.2	1.05	12.3	562.5	1.7	20.9	55%											
4.5	13.0	2	13.0	1	19	SPT	19.0	1.0	0.85	1.2	1.05	20.3	1625.0	1.1	22.6	30%	30.8		1625.0	1625.0	1.0	0.4	1.0	1.0			
13.0	21.5	3	21.5	1	44	SPT	44.0	1.0	0.95	1.2	1.05	52.7	2687.5	0.9	45.4	30%	57.2		2687.5	2687.5	1.0	0.4	0.9	1.0			
21.5	27.0	4	27.0	1	20	SPT	20.0	1.0	1.00	1.2	1.05	25.2	3375.0	0.8	19.4	43%	28.3		3375.0	3375.0	0.9	0.4	0.8	1.0			
27.0	34.9	5	34.9	2	22	SPT	22.0	1.0	1.00	1.2	1.05	27.7	4362.5	0.7	18.8	55%											

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\ (N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC $\leq$ 5% a = 0, b = 1.0
   for 5% < FC < 35% $a = \exp(1.76-(190/FC^2))$, $b = (0.99+(FC^{1.5}/1000))$
   for FC $\geq$ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

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LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***Eastridge BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
BORING NO. **AS-27**

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
Hayward Fault
a_{max} *(g)=* 0.6
FAULT M_w *=* 7.5

GW DEPTH (ft)= 12

BOREHOLE DIA (in)= 6
HAMMER ENERGY = 60%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 12 *(below OG)*

MSF = 1.00

SOIL STRATA							*LIQUEFACTION RESISTANCE* ($CRR_{7.5}$)											*CYCLIC STRESS RATIO (CSR)*				*F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	$SPT\text{-}N_{eq.}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,\ CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	8.0	1	8.0	2	12	SPT	12.0	1.0	0.85	1.2	1.05	12.9	1000.0	1.4	18.2	55%											
8.0	13.0	2	13.0	1	4	SPT	4.0	1.0	0.85	1.2	1.05	4.3	1562.6	1.1	4.8	31%	10.4	0.1	1625.0	1562.6	1.0	0.4	1.0	1.0	(0.30)	2.29%	1.37
13.0	18.0	3	18.0	2	18	SPT	18.0	1.0	0.95	1.2	1.05	21.5	1875.6	1.0	22.2	55%											
18.0	25.0	4	25.0	2	8	SPT	8.0	1.0	1.00	1.2	1.05	10.1	2313.8	0.9	9.4	55%											
25.0	48.5	5	48.5	2	16	SPT	16.0	1.0	1.00	1.2	1.05	20.2	3784.9	0.7	14.7	55%											
48.5	53.5	6	53.5	1	17	SPT	17.0	1.0	1.00	1.2	1.05	21.4	4097.9	0.7	15.0	30%	22.0	0.2	6687.5	4097.9	0.7	0.5	0.8	1.0	(0.42)	1.30%	0.78
53.5	58.5	7	58.5	1	32	SPT	32.0	1.0	1.00	1.2	1.05	40.3	4410.9	0.7	27.2	10%	28.6	0.4	7312.5	4410.9	0.7	0.4	0.7	1.0	NON-LIQ.		
58.5	100.5	8	100.5	2	30	SPT	30.0	1.0	1.00	1.2	1.05	37.8	7040.1	0.5	20.1	55%											
100.5	105.5	9	105.5	1	50	SPT	50.0	1.0	1.00	1.2	1.05	63.0	7353.1	0.5	32.9	20%	39.1		13187.50	7353.1	0.5	0.3	0.6	1.0	NON-LIQ.		
105.5	110.0	10	110.0	2	50	SPT	50.0	1.0	1.00	1.2	1.05	63.0	7634.8	0.5	32.2	55%											

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\ (N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC $\leq$ 5% a = 0, b = 1.0
   for 5% < FC < 35% $a = \exp(1.76-(190/FC^2))$, $b = (0.99+(FC^{1.5}/1000))$
   for FC $\geq$ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

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LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***Eastridge BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
BORING NO. **AS-40**

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
Hayward Fault
a_{max} *(g)=* 0.6
FAULT M_w *=* 7.5

GW DEPTH (ft)= 11.5

BOREHOLE DIA (in)= 6
HAMMER ENERGY = 60%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 11.5 *(below OG)*

MSF = 1.00

SOIL STRATA							*LIQUEFACTION RESISTANCE* ($CRR_{7.5}$)											*CYCLIC STRESS RATIO (CSR)*				*F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	$SPT\text{-}N_{eq.}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	12.5	1	12.5	2	12	SPT	12.0	1.0	0.85	1.2	1.05	12.9	1500.1	1.2	14.8	55%											
12.5	28.0	2	28.0	2	12	SPT	12.0	1.0	1.00	1.2	1.05	15.1	2470.4	0.9	13.6	14%											
28.0	37.5	3	37.5	2	16	SPT	16.0	1.0	1.00	1.2	1.05	20.2	3065.1	0.8	16.3	55%											
37.5	42.5	4	42.5	1	21	SPT	21.0	1.0	1.00	1.2	1.05	26.5	3378.1	0.8	20.4	39%	29.4	0.4	5312.5	3378.1	0.8	0.5	0.8	1.0	NON-LIQ.		
42.5	53.0	5	53.0	2	14	SPT	14.0	1.0	1.00	1.2	1.05	17.6	4035.4	0.7	12.4	55%											
53.0	58.0	6	58.0	1	35	SPT	35.0	1.0	1.00	1.2	1.05	44.1	4348.4	0.7	29.9	30%	39.2		7250.0	4348.4	0.7	0.4	0.7	1.0	NON-LIQ.		
58.0	80.0	7	80.0	2	25	SPT	25.0	1.0	1.00	1.2	1.05	31.5	5725.6	0.6	18.6	55%											
80.0	84.0	8	84.0	1	50	SPT	50.0	1.0	1.00	1.2	1.05	63.0	5976.0	0.6	36.4	30%	46.8		10500.0	5976.0	0.5	0.4	0.6	1.0	NON-LIQ.		
84.0	101.5	9	101.5	2	29	SPT	29.0	1.0	1.00	1.2	1.05	36.5	7071.5	0.5	19.4	55%											

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\,(N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC $\leq$ 5% a = 0, b = 1.0
   for 5% < FC < 35% a = $\exp(1.76-(190/FC^2))$, b = $(0.99+(FC^{1.5}/1000))$
   for FC $\geq$ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

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LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***East Ridge BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
BORING NO. ***P-35***

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.682
FAULT M_w = 6.9

GW DEPTH (ft)= 14

BOREHOLE DIA (in)= 8
HAMMER ENERGY = 70%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 14 *(below OG)*

MSF = 1.24

SOIL STRATA							*LIQUEFACTION RESISTANCE* ($CRR_{7.5}$)											*CYCLIC STRESS RATIO (CSR)*				*F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	$SPT\text{-}N_{eq.}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,\ CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	3.5	1	3	2	16	MC	10.4	1.2	0.75	1.0	1.15	10.5	345.0	1.7	17.8											
3.5	9.0	2	6	2	40	MC	26.0	1.2	0.80	1.0	1.15	27.9	702.5	1.7	47.1											
9.0	13.0	3	11	2	44	MC	28.6	1.2	0.85	1.0	1.15	32.6	1302.5	1.2	40.4											
13.0	16.5	4	16	2	23	MC	15.0	1.2	0.95	1.0	1.15	19.1	1777.7	1.1	20.2											

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\ (N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC ≤ 5% a = 0, b = 1.0
   for 5% < FC < 35% $a = \exp(1.76-(190/FC^2))$, $b = (0.99+(FC^{1.5}/1000))$
   for FC ≥ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

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LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***East Ridge BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
BORING NO. ***AS-39***

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.682
FAULT M_w = 6.9

GW DEPTH (ft)= 12

BOREHOLE DIA (in)= 5
HAMMER ENERGY = 70%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 12 *(below OG)*

MSF = 1.24

SOIL STRATA							*LIQUEFACTION RESISTANCE (CRR 7.5)*												*CYCLIC STRESS RATIO (CSR)*				*F.S.=(CRR 7.5/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	SPT-N_{eq}	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60, CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	4.0	1	3	2	13	MC	8.5	1.2	0.75	1.0	1.05	7.8	345.0	1.7	13.2												
4.0	8.0	2	6	2	29	MC	18.9	1.2	0.80	1.0	1.05	18.5	700.0	1.7	31.2												
8.0	13.0	3	11	2	20	MC	13.0	1.2	0.85	1.0	1.05	13.5	1300.0	1.2	16.8												
13.0	18.0	4	16	2	23	MC	15.0	1.2	0.95	1.0	1.05	17.4	1650.4	1.1	19.2												
18.0	23.0	5	21	2	26	MC	16.9	1.2	0.95	1.0	1.05	19.7	1938.4	1.0	20.0												
23.0	28.0	6	26	2	31	MC	20.2	1.2	1.00	1.0	1.05	24.7	2226.4	0.9	23.4												
28.0	36.0	7	31	2	32	MC	20.8	1.2	1.00	1.0	1.05	25.5	2514.4	0.9	22.7												
36.0	40.0	8	36	1	25	MC	16.3	1.2	1.00	1.0	1.05	19.9	2802.4	0.8	16.8	32%	25.0	0.3	4300.0	2802.4	0.9	0.6	0.9	1.0	NON-LIQ.		
40.0	41.5	9	41	1	80	MC	52.0	1.2	1.00	1.0	1.05	63.7	3090.4	0.8	51.2		51.2		4900.00	3090.4	0.8	0.6	0.8	1.0	NON-LIQ.		
41.5	48.0	10	46	2	26	MC	16.9	1.2	1.00	1.0	1.05	20.7	3378.4	0.8	15.9												
48.0	53.0	11	51	2	24	MC	15.6	1.2	1.00	1.0	1.05	19.1	3666.4	0.7	14.1												
53.0	58.0	12	56	2	31	MC	20.2	1.2	1.00	1.0	1.05	24.7	3954.4	0.7	17.6												
58.0	64.0	13	61	2	35	MC	22.8	1.2	1.00	1.0	1.05	27.9	4242.4	0.7	19.1												
64.0	77.0	14	71	1	57	SPT	57.0	1.2	1.00	1.2	1.05	83.8	4818.4	0.6	54.0	18%	60.8		8500.00	4818.4	0.6	0.5	0.7	1.0	NON-LIQ.		
77.0	89.0	15	81	2	25	SPT	25.0	1.2	1.00	1.2	1.05	36.8	5394.4	0.6	22.4												
89.0	93.0	16	91	1	85	MC	55.3	1.2	1.00	1.0	1.05	67.7	5970.4	0.6	39.2		39.2		10900.00	5970.4	0.5	0.4	0.6	1.0	NON-LIQ.		
93.0	105.0	17	101	2	100	MC	65.0	1.2	1.00	1.0	1.05	79.6	6546.4	0.6	44.0												
105.0	115.0	18	111	2	77	MC	50.1	1.2	1.00	1.0	1.05	61.3	7122.4	0.5	32.5												
115.0	121.5	19	121	2	85	MC	55.3	1.2	1.00	1.0	1.05	67.7	7698.4	0.5	34.5												

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\,(N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC ≤ 5% a = 0, b = 1.0
   for 5% < FC < 35% a = exp(1.76-(190/FC^2)), b = (0.99+(FC$^{1.5}$/1000))
   for FC ≥ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

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LIQUEFACTION ANALYSES (CPTS)

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge To BART Regional Connector Project*** *FAULT INFO*
PROJECT NO. ***2017-125-GEO*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-67*** *FAULT* M_w = 6.9 *MSF* = 1.24 a_{max} *(g)*= 0.682 V_{S30m}(m/s)= #REF! 236.1

			CPT RESULT INPUT								***CSR***				***CRR 7.5***				***F.S.=(CRR 7.5/CSR)*MSF*Kσ*Kα***				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
0.492			-9999	-9999	0.03		0.03		1.7	1.00	0.444							1.00			0.00	0.00
0.984			-9999	-9999	0.06		0.06		1.7	1.00	0.443							1.00			0.00	0.00
1.476			-9999	-9999	0.089		0.089		1.7	1.00	0.443							1.00			0.00	0.00
1.968			-9999	-9999	0.119		0.119		1.6679	1.00	0.442							1.00			0.00	0.00
2.461			-9999	-9999	0.149		0.149		1.6308	1.00	0.442							1.00			0.00	0.00
2.953			-9999	-9999	0.179		0.179		1.5954	1.00	0.441							1.00			0.00	0.00
3.445			-9999	-9999	0.208		0.208		1.5625	0.99	0.441							1.00			0.00	0.00
3.937			-9999	-9999	0.238		0.238		1.5299	0.99	0.440										0.00	0.00
4.429			-9999	-9999	0.268		0.268		1.4986	0.99	0.440										0.00	0.00
4.921			-9999	-9999	0.298		0.298		1.4686	0.99	0.439										0.00	0.00
5.413	3	Clay	22.187	0.923	0.327		0.327	2.53	1.4407	0.99	0.439	2.530	1.44	31.97	2.925	93.492	0.16				119.76	119.76
5.905	4	Silty Clay to Clay	24.912	0.984	0.357		0.357	2.49	1.413	0.99	0.438	2.490	1.41	35.20	2.718	95.687	0.16				124.95	124.95
6.398	4	Silty Clay to Clay	25.545	0.894	0.387		0.387	2.51	1.3863	0.99	0.438	2.510	1.39	35.41	2.820	99.845	0.17				126.77	126.77
6.89	3	Clay	18.677	0.638	0.417		0.417	2.58	1.3605	0.99	0.437	2.580	1.36	25.41	3.206	81.479	0.13				125.97	125.97
7.382	4	Silty Clay to Clay	23.563	0.637	0.446		0.446	2.51	1.3366	0.98	0.437	2.510	1.34	31.49	2.820	88.797	0.15	1.00	0		130.25	130.25
7.874	4	Silty Clay to Clay	21.526	0.656	0.476		0.476	2.55	1.3126	0.98	0.436	2.550	1.31	28.26	3.034	85.735	0.14	1.00	1		131.73	131.73
8.366	4	Silty Clay to Clay	15.959	0.401	0.506		0.506	2.58	1.2896	0.98	0.436	2.580	1.29	20.58	3.206	65.989	0.11	1.00	1		130.27	130.27
8.858	4	Silty Clay to Clay	17.315	0.272	0.536		0.536	2.41	1.2673	0.98	0.435	2.410	1.27	21.94	2.354	51.646	0.09	1.00	1		134.92	134.92
9.35	4	Silty Clay to Clay	19.655	0.274	0.565		0.565	2.41	1.2465	0.98	0.435	2.410	1.25	24.50	2.354	57.662	0.10	1.00	1		137.44	137.44
9.842	4	Silty Clay to Clay	15.759	0.28	0.595		0.595	2.56	1.2256	0.98	0.434	2.560	1.23	19.31	3.091	59.693	0.10	1.00	1		135.06	135.06
10.335	4	Silty Clay to Clay	18.526	0.269	0.625		0.625	2.57	1.2055	0.98	0.434	2.570	1.21	22.33	3.148	70.303	0.11	1.00	1		136.76	136.76
10.827	4	Silty Clay to Clay	15.549	0.237	0.655		0.655	2.56	1.186	0.98	0.433	2.560	1.19	18.44	3.091	56.993	0.10	1.00	1		138.64	138.64
11.319	4	Silty Clay to Clay	15.195	0.202	0.684	0.01	0.675	2.57	1.1733	0.98	0.439	2.570	1.17	17.83	3.148	56.124	0.10	1.00	1	(0.27)	138.73	60.90
11.811	4	Silty Clay to Clay	12.25	0.208	0.714	0.025	0.689	2.7	1.1646	0.98	0.448							1.00	1		147.91	147.91
12.303	4	Silty Clay to Clay	12.084	0.192	0.744	0.041	0.703	2.76	1.1561	0.97	0.457							1.00	1		139.01	139.01
12.795	3	Clay	9.672	0.199	0.774	0.056	0.718	2.84	1.147	0.97	0.465							1.00	1		128.74	128.74
13.287	4	Silty Clay to Clay	10.267	0.194	0.804	0.071	0.732	2.82	1.1387	0.97	0.473							1.00	1		130.04	130.04
13.779	4	Silty Clay to Clay	10.13	0.15	0.833	0.087	0.746	2.74	1.1305	0.97	0.481							1.00	1		137.12	137.12
14.272	4	Silty Clay to Clay	9.359	0.14	0.863	0.102	0.761	2.76	1.1219	0.97	0.488							1.00	1		132.55	132.55
14.764	4	Silty Clay to Clay	8.946	0.133	0.893	0.118	0.775	2.84	1.1139	0.97	0.495							1.00	1		121.69	121.69
15.256	4	Silty Clay to Clay	8.981	0.142	0.923	0.133	0.79	2.86	1.1055	0.97	0.501							1.00	1		121.84	121.84
15.748	3	Clay	9.111	0.161	0.952	0.148	0.804	2.9	1.0978	0.97	0.508							1.00	1		121.82	121.82
16.24	3	Clay	8.836	0.207	0.982	0.164	0.818	2.96	1.0902	0.97	0.514							1.00	1		120.03	120.03
16.732	3	Clay	8.341	0.208	1.012	0.179	0.833	3.02	1.0821	0.96	0.520							1.00	1		116.02	116.02
17.224	3	Clay	8.003	0.202	1.042	0.194	0.847	3.04	1.0747	0.96	0.526							1.00	1		114.39	114.39
17.716	3	Clay	9.056	0.243	1.071	0.21	0.862	3.05	1.0669	0.96	0.530							1.00	1		119.23	119.23
18.209	3	Clay	7.845	0.281	1.101	0.225	0.876	3.15	1.0597	0.96	0.536							1.00	1		112.58	112.58
18.701	3	Clay	6.978	0.228	1.131	0.24	0.89	3.21	1.0526	0.96	0.541							1.00	1		104.48	104.48
19.193	3	Clay	7.074	0.209	1.161	0.256	0.905	3.16	1.0451	0.96	0.545							1.00	1		107.50	107.50
19.685	3	Clay	8.258	0.21	1.19	0.271	0.919	3.09	1.0382	0.96	0.550							1.00	1		113.63	113.63
20.177	3	Clay	8.506	0.154	1.22	0.287	0.934	3	1.0309	0.96	0.554							1.00	1		119.41	119.41
20.669	4	Silty Clay to Clay	9.125	0.138	1.25	0.302	0.948	2.93	1.0242	0.96	0.558							1.00	1		124.38	124.38
21.161	4	Silty Clay to Clay	9.717	0.135	1.28	0.317	0.962	2.83	1.0176	0.95	0.563							1.00	1		138.08	138.08
21.653	5	Clayey Silt to Silty Clay	20.122	0.222	1.309	0.333	0.977	2.5	1.0106	0.95	0.566	2.500	1.01	20.33	2.768	56.295	0.10	1.00	1	(0.21)	162.41	60.90
22.146	5	Clayey Silt to Silty Clay	32.29	0.626	1.339	0.348	0.991	2.33	1.0041	0.95	0.570	2.330	1.00	32.42	2.049	66.426	0.11	1.00	1	(0.23)	172.73	91.33
22.638	5	Clayey Silt to Silty Clay	56.789	0.447	1.369	0.363	1.006	2.29	0.9973	0.95	0.573	2.290	1.00	56.63	1.917	108.571	0.20	1.00	1	(0.43)	173.56	91.33
23.13	4	Silty Clay to Clay	13.268	0.197	1.399	0.379	1.02	2.67	0.991	0.95	0.576							1.00	1		182.02	182.02
23.622	4	Silty Clay to Clay	12.95	0.189	1.428	0.394	1.034	2.81	0.9848	0.95	0.579							0.99	1		153.01	153.01
24.114	4	Silty Clay to Clay	14.232	0.221	1.458	0.409	1.049	2.77	0.9782	0.94	0.582							0.99	1		165.98	165.98
24.606	4	Silty Clay to Clay	18.581	0.411	1.488	0.425	1.063	2.79	0.9722	0.94	0.585							0.99	1		188.60	188.60
25.098	4	Silty Clay to Clay	20.508	0.679	1.518	0.44	1.078	2.83	0.9658	0.94	0.588							0.99	1		205.56	205.56
25.59	4	Silty Clay to Clay	22.792	0.807	1.547	0.456	1.092	2.83	0.9599	0.94	0.590							0.98	1		217.60	217.60
26.083	4	Silty Clay to Clay	23.068	0.884	1.577	0.471	1.106	2.84	0.954	0.94	0.593							0.98	1		220.08	220.08
26.575	4	Silty Clay to Clay	23.26	0.872	1.607	0.486	1.121	2.84	0.9479	0.94	0.595							0.98	1		221.26	221.26
27.067	4	Silty Clay to Clay	24.884	0.956	1.637	0.502	1.135	2.83	0.9422	0.93	0.597							0.97	1		227.52	227.52
27.559	4	Silty Clay to Clay	25.408	0.959	1.667	0.517	1.15	2.82	0.9362	0.93	0.599							0.97	1		233.21	233.21
28.051	4	Silty Clay to Clay	26.233	0.951	1.696	0.532	1.164	2.79	0.9306	0.93	0.601							0.97	1		240.18	240.18
28.543	4	Silty Clay to Clay	27.032	0.947	1.726	0.548	1.178	2.79	0.9251	0.93	0.602							0.97	1		241.22	241.22
29.035	4	Silty Clay to Clay	22.407	0.852	1.756	0.563	1.193	2.85	0.9193	0.93	0.604							0.97	1		216.21	216.21
29.527	4	Silty Clay to Clay	15.993	0.375	1.786	0.578	1.207	2.92	0.914	0.92	0.605							0.96	1		177.71	177.71
30.02	3	Clay	12.573	0.405	1.815	0.594	1.221	3.05	0.9087	0.92	0.607							0.96	1		153.74	153.74
30.512	3	Clay	13.323	0.319	1.845	0.609	1.236	3.04	0.9031	0.92	0.607							0.96	1		152.03	152.03
31.004	4	Silty Clay to Clay	13.158	0.315	1.875	0.625	1.25	2.87	0.898	0.92	0.609							0.96	1		180.18	180.18
31.496	4	Silty Clay to Clay	26.123	0.781	1.905	0.64	1.265	2.83	0.8925	0.91	0.609							0.95	1		223.70	223.70
31.988	3	Clay	21.251	0.938	1.934	0.655	1.279	2.97	0.8875	0.91	0.610							0.95	1		207.56	207.56
32.48	3	Clay	15.828	0.707	1.964	0.671	1.293	3.02	0.8825	0.91	0.611							0.95	1		187.59	187.59
32.972	4	Silty Clay to Clay	23.948	0.512	1.994	0.686	1.308	2.83	0.8772	0.90	0.611							0.95	1		210.41	210.41
33.464	4	Silty Clay to Clay	22.528	0.502	2.024	0.701	1.322	2.79	0.8723	0.90	0.611							0.95	1		218.78	218.78
33.957	4	Silty Clay to Clay	23.976	0.719	2.053	0.717	1.337	2.8	0.8672	0.90	0.611							0.94	1		230.77	230.77
34.449	4	Silty Clay to Clay	28.959	0.82	2.083	0.732	1.351	2.81	0.8624	0.89	0.611							0.94	1		239.92	239.92
34.941	4	Silty Clay to Clay	21.113	0.818	2.113	0.747	1.365	2.92	0.8577	0.89	0.611							0.94	1		215.46	215.46
35.433	4	Silty Clay to Clay	21.361	0.549	2.143	0.763	1.38	2.86	0.8527	0.89	0.611							0.94	1		212.29	212.29
35.925	4	Silty Clay to Clay	23.013	0.506	2.172	0.778	1.394	2.79	0.8481	0.88	0.611							0.94	1		220.51	220.51
36.417	4	Silty Clay to Clay	24.472	0.563	2.202	0.794	1.409	2.79	0.8432	0.88	0.610							0.93	1		226.91	226.91
36.909	4	Silty Clay to Clay	27.472	0.711	2.232	0.809	1.423	2.79	0.8387	0.88	0.610							0.93	1		240.18	240.18
37.401	4	Silty Clay to Clay	28.793	0.917	2.262	0.824	1.437	2.78	0.8343	0.87	0.609							0.93	1		260.22	260.22
37.894	4	Silty Clay to Clay	33.666	1.133	2.291	0.84	1.452	2.78	0.8296	0.87	0.608							0.93	1		271.21	271.21
38.386	4	Silty Clay to Clay	29	0.924	2.321	0.855	1.466	2.81	0.8252	0.86	0.607							0.93	1		256.44	256.44
38.878	4	Silty Clay to Clay	22.875	0.81	2.351	0.87	1.481	2.92	0.8206	0.86	0.606							0.92	1		220.28	220.28
39.37	3	Clay	15.966	0.477	2.381	0.886	1.495	3.07	0.8163	0.86	0.605							0.92	1		178.28	178.28
39.862	4	Silty Clay to Clay	17.604	0.517	2.411	0.901	1.509	2.99	0.8121	0.85	0.604							0.92	1		188.80	188.80
40.354	4	Silty Clay to Clay	25.435	0.374	2.44	0.917	1.524	2.89	0.8076	0.85	0.602							0.92	1		197.91	197.91
40.846	4	Silty Clay to Clay	16.633	0.236	2.47	0.932	1.538	2.88	0.8035	0.84	0.600							0.92	1		182.34	182.34
41.338	4	Silty Clay to Clay	21.609	0.243	2.5	0.947	1.553	2.77	0.7991	0.84	0.599							0.92	1		200.91	200.91
41.831	4	Silty Clay to Clay	20.509	0.38	2.53	0.963	1.567	2.84	0.7951	0.83	0.597							0.91	1		211.79	211.79
42.323	4	Silty Clay to Clay	33.968	0.98	2.559	0.978	1.581	2.8	0.7911	0.83	0.595							0.91	1		271.07	271.07
42.815	4	Silty Clay to Clay	39.804	1.639	2.589	0.993	1.596	2.78	0.7868	0.83	0.593							0.91	1		311.33	311.33
43.307	4	Silty Clay to Clay	43.383	1.672	2.619	1.009	1.61	2.8	0.7829	0.82	0.592							0.91	1		312.93	312.93
43.799	3	Clay	29.784	1.573	2.649	1.024	1.625	2.94	0.7788	0.82	0.589							0.91	1		264.40	264.40
44.291	4	Silty Clay to Clay	22.655	0.663	2.678	1.039	1.639	2.98	0.7749	0.81	0.587							0.91	1		219.42	219.42
44.783	4	Silty Clay to Clay	20.25	0.451	2.708	1.055	1.653	2.91	0.7711	0.81	0.585							0.90	1		209.61	209.61
45.275	4	Silty Clay to Clay	23.343	0.498	2.738	1.07	1.668	2.9	0.7671	0.80	0.583							0.90	1		216.73	216.73
45.768	4	Silty Clay to Clay	21.884	0.547	2.768	1.086	1.682	2.92	0.7634	0.80	0.581							0.90	1		217.21	217.21
46.26	4	Silty Clay to Clay	22.187	0.553	2.797	1.101	1.696	2.88	0.7597	0.79	0.578							0.90	1		224.88	224.88
46.752	4	Silty Clay to Clay	26.977	0.545	2.827	1.116	1.711	2.83	0.7558	0.79	0.576							0.90	1		233.94	233.94
47.244	4	Silty Clay to Clay	22.916	0.552	2.857	1.132	1.725	2.85	0.7521	0.78	0.573							0.90	1		236.72	236.72
47.736	5	Clayey Silt to Silty Clay	50.622	1.103	2.887	1.147	1.74	2.49	0.7483	0.78	0.571	2.490	0.75	37.88	2.718	102.974	0.18	0.90	1	(0.35)	210.64	83.24
48.228	6	Sandy Silt to Clayey Silt	93.744	1.189	2.916	1.162	1.754	2.06	0.7448	0.77	0.568	2.060	0.74	69.82	1.387	96.816	0.16	0.88	1	(0.31)	234.51	168.05
48.72	6	Sandy Silt to Clayey Silt	262.28	2.546	2.946	1.178	1.768	1.77	0.7412	0.77	0.566	1.770	0.74	194.41	1.085	211.004		0.82	1		258.92	258.92
49.212	6	Sandy Silt to Clayey Silt	345.74	3.523	2.976	1.193	1.783	1.57	0.7375	0.76	0.563	1.570	0.74	254.99	1.000	254.989		0.79	1		273.20	273.20
49.705	7	Silty Sand to Sandy Silt	483.9	2.229	3.006	1.208	1.797	1.36	0.7341	0.76	0.560	1.360	0.73	355.22	1.000	355.217		0.79	1		279.56	279.56
50.197	6	Sandy Silt to Clayey Silt	313.01	2.21	3.035	1.224	1.812	1.49	0.7304	0.75	0.557	1.490	0.73	228.63	1.000	228.628		0.79	1		272.66	272.66

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge To BART Regional Connector Project*** *FAULT INFO*
PROJECT NO. ***2017-125-GEO*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-67*** *FAULT* M_w = 6.9 *MSF* = 1.24 a_{max} *(g)*= 0.682 V_{S30m}(m/s)= #REF! 236.1

			CPT RESULT INPUT							***CSR***		***CRR 7.5***						***F.S.=(CRR 7.5/CSR)*MSF*K σ*K α***				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
50.689	6	Sandy Silt to Clayey Silt	299.88	2.317	3.065	1.239	1.826	1.57	0.727	0.75	0.555	1.570	0.73	218.02	1.000	218.024		0.79	1		268.54	268.54
51.181	6	Sandy Silt to Clayey Silt	329.97	1.889	3.095	1.255	1.84	1.45	0.7237	0.74	0.552	1.450	0.72	238.79	1.000	238.793		0.78	1		273.49	273.49
51.673	6	Sandy Silt to Clayey Silt	443.9	2.377	3.125	1.27	1.855	1.44	0.7201	0.74	0.549	1.440	0.72	319.67	1.000	319.669		0.78	1		282.05	282.05
52.165	6	Sandy Silt to Clayey Silt	495.9	6.565	3.154	1.285	1.869	1.5	0.7168	0.73	0.547	1.500	0.72	355.49	1.000	355.486		0.78	1		289.97	289.97
52.657	6	Sandy Silt to Clayey Silt	546.86	4.664	3.184	1.301	1.884	1.54	0.7134	0.73	0.544	1.540	0.71	390.10	1.000	390.105		0.78	1		287.65	287.65
53.149	6	Sandy Silt to Clayey Silt	147.33	4.751	3.214	1.316	1.898	2.08	0.7101	0.72	0.541	2.080	0.71	104.62	1.420	148.526	0.38	0.83	1	(0.73)	256.47	256.47
53.642	4	Silty Clay to Clay	72.589	2.824	3.244	1.331	1.912	2.62	0.7069	0.72	0.539							0.88	1		450.41	450.41
54.134	4	Silty Clay to Clay	44.979	1.038	3.274	1.347	1.927	2.71	0.7035	0.71	0.536							0.88	1		335.19	335.19
54.626	4	Silty Clay to Clay	28.188	0.553	3.303	1.362	1.941	2.82	0.7004	0.71	0.533							0.88	1		249.81	249.81
55.118	4	Silty Clay to Clay	22.572	0.372	3.333	1.377	1.956	2.89	0.6971	0.70	0.530							0.87	1		221.21	221.21
55.61	4	Silty Clay to Clay	20.559	0.417	3.363	1.393	1.97	2.98	0.694	0.70	0.528							0.87	1		207.61	207.61
56.102	5	Clayey Silt to Silty Clay	31.326	0.729	3.393	1.408	1.984	2.62	0.691	0.69	0.525							0.87	1		332.39	332.39
56.594	5	Clayey Silt to Silty Clay	118.84	1.91	3.422	1.424	1.999	2.38	0.6877	0.69	0.523	2.380	0.69	81.72	2.233	182.457		0.87	1		231.96	231.96
57.086	5	Clayey Silt to Silty Clay	41.655	1.204	3.452	1.439	2.013	2.65	0.6847	0.68	0.520							0.87	1		362.50	362.50
57.579	5	Clayey Silt to Silty Clay	35.345	0.634	3.482	1.454	2.028	2.74	0.6815	0.68	0.517							0.87	1		286.47	286.47
58.071	5	Clayey Silt to Silty Clay	35.895	0.556	3.512	1.47	2.042	2.74	0.6786	0.68	0.515							0.87	1		279.29	279.29
58.563	5	Clayey Silt to Silty Clay	29.344	0.518	3.541	1.485	2.056	2.8	0.6757	0.67	0.512							0.87	1		260.10	260.10
59.055	5	Clayey Silt to Silty Clay	29.179	0.521	3.571	1.5	2.071	2.83	0.6726	0.67	0.510							0.86	1		254.61	254.61
59.547	4	Silty Clay to Clay	30.72	0.617	3.601	1.516	2.085	2.84	0.6697	0.66	0.508							0.86	1		261.61	261.61
60.039	4	Silty Clay to Clay	32.021	0.734	3.631	1.531	2.1	2.86	0.6667	0.66	0.505							0.86	1		273.26	273.26
60.531	4	Silty Clay to Clay	35.538	1.086	3.66	1.546	2.114	2.88	0.6639	0.65	0.503							0.86	1		281.84	281.84
61.023	4	Silty Clay to Clay	34.726	0.914	3.69	1.562	2.128	2.87	0.6611	0.65	0.500							0.86	1		282.81	282.81
61.516	4	Silty Clay to Clay	35.827	0.902	3.72	1.577	2.143	2.84	0.6581	0.65	0.498							0.86	1		290.26	290.26
62.008	4	Silty Clay to Clay	38.593	1.16	3.75	1.593	2.157	2.84	0.6553	0.64	0.496							0.86	1		300.83	300.83
62.5	4	Silty Clay to Clay	39.195	1.139	3.779	1.608	2.172	2.83	0.6524	0.64	0.493							0.86	1		308.49	308.49
62.992	4	Silty Clay to Clay	36.033	1.046	3.809	1.623	2.186	2.87	0.6497	0.64	0.491							0.86	1		285.58	285.58
63.484	4	Silty Clay to Clay	28.601	0.65	3.839	1.639	2.2	2.95	0.6471	0.63	0.489							0.85	1		247.15	247.15
63.976	4	Silty Clay to Clay	23.921	0.594	3.869	1.654	2.215	3	0.6442	0.63	0.487							0.85	1		228.47	228.47
64.468	4	Silty Clay to Clay	23.718	0.472	3.898	1.669	2.229	2.99	0.6416	0.63	0.485							0.85	1		224.08	224.08
64.96	4	Silty Clay to Clay	26.013	0.526	3.928	1.685	2.243	2.95	0.639	0.62	0.483							0.85	1		246.29	246.29
65.453	4	Silty Clay to Clay	32.179	0.853	3.958	1.7	2.258	2.95	0.6362	0.62	0.481							0.85	1		255.85	255.85
65.945	4	Silty Clay to Clay	25.49	0.472	3.988	1.715	2.272	2.96	0.6336	0.62	0.479							0.85	1		233.55	233.55
66.437	4	Silty Clay to Clay	29.895	0.544	4.018	1.731	2.287	2.89	0.6309	0.61	0.477							0.85	1		255.02	255.02
66.929	5	Clayey Silt to Silty Clay	36.941	0.708	4.047	1.746	2.301	2.8	0.6284	0.61	0.475							0.85	1		289.71	289.71
67.421	5	Clayey Silt to Silty Clay	36.694	0.748	4.077	1.762	2.315	2.79	0.6259	0.61	0.474							0.85	1		301.04	301.04
67.913	4	Silty Clay to Clay	43.906	1.082	4.107	1.777	2.33	2.81	0.6232	0.60	0.472							0.84	1		319.55	319.55
68.405	4	Silty Clay to Clay	48.2	1.306	4.137	1.792	2.344	2.81	0.6208	0.60	0.470							0.84	1		329.66	329.66
68.897	4	Silty Clay to Clay	38.07	0.947	4.166	1.808	2.359	2.83	0.6182	0.60	0.468							0.84	1		308.79	308.79
69.39	4	Silty Clay to Clay	39.02	0.948	4.196	1.823	2.373	2.85	0.6157	0.60	0.467							0.84	1		308.43	308.43
69.882	4	Silty Clay to Clay	44.704	2.289	4.226	1.838	2.387	2.91	0.6133	0.59	0.465							0.84	1		342.21	342.21
70.374	4	Silty Clay to Clay	64.331	2.935	4.256	1.854	2.402	2.81	0.6108	0.59	0.463							0.84	1		412.08	412.08
70.866	4	Silty Clay to Clay	57.78	1.972	4.285	1.869	2.416	2.81	0.6084	0.59	0.462							0.84	1		387.56	387.56
71.358	4	Silty Clay to Clay	39.928	1.348	4.315	1.885	2.431	2.9	0.6059	0.58	0.460							0.84	1		314.63	314.63
71.85	4	Silty Clay to Clay	41.842	0.956	4.345	1.9	2.445	2.83	0.6036	0.58	0.459							0.84	1		312.60	312.60
72.342	4	Silty Clay to Clay	41.194	0.914	4.375	1.915	2.459	2.83	0.6013	0.58	0.457							0.84	1		318.67	318.67
72.834	5	Clayey Silt to Silty Clay	60.257	1.557	4.404	1.931	2.474	2.8	0.5988	0.58	0.456							0.83	1		339.54	339.54
73.327	5	Clayey Silt to Silty Clay	37.987	0.684	4.434	1.946	2.488	2.85	0.5965	0.58	0.454							0.83	1		288.70	288.70
73.819	5	Clayey Silt to Silty Clay	27.032	0.407	4.464	1.961	2.503	2.92	0.5941	0.57	0.453							0.83	1		245.02	245.02
74.311	5	Clayey Silt to Silty Clay	27.486	0.53	4.494	1.977	2.517	2.91	0.5919	0.57	0.452							0.83	1		253.02	253.02
74.803	5	Clayey Silt to Silty Clay	44.456	0.599	4.523	1.992	2.531	2.82	0.5897	0.57	0.450							0.83	1		288.91	288.91
75.295	5	Clayey Silt to Silty Clay	32.097	0.5	4.553	2.007	2.546	2.9	0.5873	0.57	0.449							0.83	1		263.27	263.27
75.787	4	Silty Clay to Clay	28.766	0.485	4.583	2.023	2.56	2.99	0.5851	0.56	0.448							0.83	1		238.12	238.12
76.279	4	Silty Clay to Clay	26.247	0.809	4.613	2.038	2.575	2.91	0.5828	0.56	0.447							0.83	1		291.00	291.00
76.771	5	Clayey Silt to Silty Clay	79.003	2.129	4.642	2.054	2.589	2.65	0.5806	0.56	0.445							0.83	1		447.56	447.56
77.264	5	Clayey Silt to Silty Clay	68.763	2.675	4.672	2.069	2.603	2.7	0.5785	0.56	0.444							0.83	1		463.31	463.31
77.756	5	Clayey Silt to Silty Clay	75.882	2.907	4.702	2.084	2.618	2.67	0.5762	0.56	0.443							0.82	1		486.46	486.46
78.248	5	Clayey Silt to Silty Clay	102.32	3.471	4.732	2.1	2.632	2.68	0.5741	0.55	0.442							0.82	1		487.54	487.54
78.74	4	Silty Clay to Clay	37.933	1.363	4.762	2.115	2.647	2.95	0.5719	0.55	0.441							0.82	1		327.11	327.11
79.232	5	Clayey Silt to Silty Clay	35.992	0.839	4.791	2.13	2.661	2.86	0.5698	0.55	0.440							0.82	1		305.26	305.26
79.724	4	Silty Clay to Clay	29.895	0.844	4.821	2.146	2.675	2.93	0.5677	0.55	0.439							0.82	1		280.08	280.08
80.216	4	Silty Clay to Clay	25.876	0.537	4.851	2.161	2.69	3.06	0.5656	0.55	0.438							0.82	1		235.63	235.63
80.708	4	Silty Clay to Clay	25.838	0.559	4.881	2.176	2.704	3.05	0.5635	0.55	0.437							0.82	1		235.72	235.72
81.201	4	Silty Clay to Clay	26.123	0.53	4.91	2.192	2.718	3.02	0.5615	0.54	0.436							0.82	1		240.58	240.58
81.693	5	Clayey Silt to Silty Clay	30.858	0.409	4.94	2.207	2.733	2.94	0.5594	0.54	0.435							0.82	1		251.77	251.77
82.185	5	Clayey Silt to Silty Clay	35.744	0.481	4.97	2.223	2.747	2.81	0.5574	0.54	0.434							0.82	1		330.74	330.74
82.677	5	Clayey Silt to Silty Clay	140.03	2.204	5	2.238	2.762	2.36	0.5553	0.54	0.433	2.360	0.56	77.76	2.156	167.673		0.82	1		262.54	262.54
83.169	5	Clayey Silt to Silty Clay	78.673	1.7	5.029	2.253	2.776	2.46	0.5533	0.54	0.432	2.460	0.55	43.53	2.574	112.061	0.21	0.82	1	(0.49)	257.15	91.33
83.661	4	Silty Clay to Clay	45.915	0.962	5.059	2.269	2.79	2.88	0.5514	0.54	0.431							0.81	1		326.55	326.55
84.153	4	Silty Clay to Clay	30.197	0.809	5.089	2.284	2.805	2.98	0.5493	0.53	0.430							0.81	1		277.53	277.53
84.645	4	Silty Clay to Clay	32.403	0.9	5.119	2.299	2.819	2.95	0.5474	0.53	0.429							0.81	1		275.89	275.89
85.138	5	Clayey Silt to Silty Clay	29.179	0.525	5.148	2.315	2.834	2.97	0.5454	0.53	0.428							0.81	1		256.77	256.77
85.63	4	Silty Clay to Clay	27.169	0.607	5.178	2.33	2.848	3.05	0.5435	0.53	0.428							0.81	1		245.84	245.84
86.122	4	Silty Clay to Clay	27.747	0.7	5.208	2.345	2.862	3.06	0.5416	0.53	0.427							0.81	1		251.36	251.36
86.614	4	Silty Clay to Clay	26.123	0.57	5.238	2.361	2.877	3.06	0.5396	0.53	0.426							0.81	1		243.61	243.61
87.106	4	Silty Clay to Clay	25.889	0.457	5.267	2.376	2.891	3.03	0.5378	0.53	0.425							0.81	1		241.10	241.10
87.598	5	Clayey Silt to Silty Clay	28.119	0.474	5.297	2.392	2.906	2.99	0.5358	0.53	0.424							0.81	1		250.65	250.65
88.09	4	Silty Clay to Clay	28.793	0.532	5.327	2.407	2.92	3.01	0.534	0.52	0.424							0.81	1		251.99	251.99
88.582	4	Silty Clay to Clay	29.206	0.58	5.357	2.422	2.934	3.01	0.5322	0.52	0.423							0.81	1		256.64	256.64
89.075	4	Silty Clay to Clay	30.72	0.671	5.386	2.438	2.949	3.02	0.5302	0.52	0.422							0.81	1		262.14	262.14
89.567	4	Silty Clay to Clay	32.344	0.838	5.416	2.453	2.963	2.95	0.5285	0.52	0.422							0.80	1		294.98	294.98
90.059	4	Silty Clay to Clay	45.502	1.124	5.446	2.468	2.978	2.89	0.5266	0.52	0.421							0.80	1		341.66	341.66
90.551	4	Silty Clay to Clay	44.752	1.512	5.476	2.484	2.992	2.97	0.5248	0.52	0.420							0.80	1		325.31	325.31
91.043	4	Silty Clay to Clay	36.515	0.924	5.505	2.499	3.006	3	0.5231	0.52	0.420							0.80	1		292.79	292.79
91.535	4	Silty Clay to Clay	36.529	0.928	5.535	2.514	3.021	2.98	0.5212	0.52	0.419							0.80	1		293.79	293.79
92.027	4	Silty Clay to Clay	37.877	0.963	5.565	2.53	3.035	2.96	0.5195	0.51	0.418							0.80	1		303.91	303.91
92.519	4	Silty Clay to Clay	40.933	1.318	5.595	2.545	3.05	3	0.5176	0.51	0.418							0.80	1		310.12	310.12
93.012	4	Silty Clay to Clay	36.446	1.28	5.625	2.561	3.064	3.06	0.5159	0.51	0.417							0.80	1		295.48	295.48
93.504	4	Silty Clay to Clay	33.638	1.087	5.654	2.576	3.078	3.09	0.5143	0.51	0.416							0.80	1		280.49	280.49
93.996	4	Silty Clay to Clay	32.472	1.019	5.684	2.591	3.093	3.09	0.5125	0.51	0.416							0.80	1		272.96	272.96
94.488	4	Silty Clay to Clay	32.978	0.883	5.714	2.607	3.107	3.06	0.5108	0.51	0.415							0.80	1		274.65	274.65
94.98	4	Silty Clay to Clay	32.778	0.797	5.744	2.622	3.122	3.03	0.509	0.51	0.414							0.80	1		274.79	274.79
95.472	5	Clayey Silt to Silty Clay	33.005	0.622	5.773	2.637	3.136	2.99	0.5074	0.51	0.414							0.80	1		275.03	275.03
95.964	5	Clayey Silt to Silty Clay	34.959	0.937	5.803	2.653	3.15	2.92	0.5057	0.51	0.413							0.79	1		316.83	316.83
96.456	5	Clayey Silt to Silty Clay	59.321	1.601	5.833	2.668	3.165	2.82	0.504	0.51	0.413							0.79	1		381.14	381.14
96.949	5	Clayey Silt to Silty Clay	50.444	1.574	5.863	2.684	3.179	2.86	0.5024	0.50	0.412							0.79	1		380.66	380.66
97.441	4	Silty Clay to Clay	58.192	2.269	5.892	2.699	3.193	2.84	0.5008	0.50	0.412							0.79	1		407.23	407.23
97.933	5	Clayey Silt to Silty Clay	65.893	2.225	5.922	2.714	3.208	2.8	0.4991	0.50	0.411							0.79	1		439.77	439.77
98.425	5	Clayey Silt to Silty Clay	77.406	2.72	5.952	2.73	3.222	2.8	0.4975	0.50	0.411							0.79	1		447.38	447.38
98.917	5	Clayey Silt to Silty Clay	60.505	1.834	5.982	2.745	3.237	2.84	0.4958	0.50	0.410							0.79	1		397.74	397.74
99.409	4	Silty Clay to Clay	37.63	1.175	6.011	2.76	3.251	2.95	0.4943	0.50	0.410							0.79	1		325.86	325.86
99.901	4	Silty Clay to Clay	34.822	0.855	6.041	2.776	3.265	3.01	0.4927	0.50	0.409							0.79	1		298.19	298.19
100.39	4	Silty Clay to Clay	44.484	1.283	6.071	2.791	3.28	2.96	0.4911	0.50	0.408							0.79	1		334.70	334.70
100.89	5	Clayey Silt to Silty Clay	56.651	1.783	6.101	2.806	3.294	2.84	0.4895	0.50	0.408							0.79	1		387.21	387.21
101.38	5	Clayey Silt to Silty Clay	49.356	1.151	6.13	2.822	3.309	2.85	0.4879	0.50	0.407							0.79	1		368.86	368.86
101.87	5	Clayey Silt to Silty Clay	45.585	1.098	6.16	2.837	3.323	2.89	0.4864	0.50	0.407							0.79	1		346.07	346.07
102.36	4	Silty Clay to Clay	60.615	1.895	6.19	2.853	3.337	2.87	0.4849	0.49	0.407							0.79	1		400.71	400.71

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME	***Eastridge To BART Regional Connector Project***		*FAULT INFO*			
PROJECT NO.	***2017-125-GEO***		*COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*			
CPT NO.	***CPT-AS-67***	*FAULT M_w =* 6.9	*MSF =* 1.24	*a_{max} (g)=* 0.682	V_{S30m}(m/s)= #REF!	236.1

			CPT RESULT INPUT							***CSR***				***$CRR_{7.5}$***				***F.S.=($CRR_{7.5}$/CSR)*MSF*K σ*K α***				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
102.85	4	Silty Clay to Clay	69.809	2.564	6.22	2.868	3.352	2.85	0.4833	0.49	0.406							0.79	1		439.14	439.14
103.35	5	Clayey Silt to Silty Clay	71.213	2.706	6.249	2.883	3.366	2.79	0.4818	0.49	0.406							0.78	1		467.64	467.64
103.84	4	Silty Clay to Clay	87.454	2.878	6.279	2.899	3.381	2.78	0.4802	0.49	0.405							0.78	1		510.42	510.42
104.33	9	Sand	115.81	4.802	6.309	2.914	3.395	2.78	0.4788	0.49	0.405							0.78	1		538.98	538.98
104.82	4	Silty Clay to Clay	85.851	3.339	6.339	2.929	3.409	2.76	0.4773	0.49	0.404							0.78	1		518.96	518.96
105.32	4	Silty Clay to Clay	92.822	3.641	6.369	2.945	3.424	2.78	0.4758	0.49	0.404							0.78	1		499.18	499.18
105.81	4	Silty Clay to Clay	68.322	2.612	6.398	2.96	3.438	2.85	0.4743	0.49	0.403							0.78	1		441.15	441.15
106.3	5	Clayey Silt to Silty Clay	58.826	1.863	6.428	2.975	3.453	2.88	0.4728	0.49	0.403							0.78	1		392.81	392.81
106.79	5	Clayey Silt to Silty Clay	41.456	0.883	6.458	2.991	3.467	2.95	0.4714	0.49	0.402							0.78	1		321.81	321.81
107.28	5	Clayey Silt to Silty Clay	31.684	0.535	6.488	3.006	3.481	3.01	0.47	0.49	0.402							0.78	1		274.66	274.66
107.78	5	Clayey Silt to Silty Clay	33.032	0.658	6.517	3.022	3.496	3.04	0.4685	0.49	0.401							0.78	1		280.98	280.98
108.27	5	Clayey Silt to Silty Clay	92.244	2.482	6.547	3.037	3.51	2.82	0.4671	0.48	0.401							0.78	1		415.21	415.21
108.76	5	Clayey Silt to Silty Clay	86.325	2.099	6.577	3.052	3.525	2.65	0.4656	0.48	0.401							0.78	1		553.02	553.02
109.25	5	Clayey Silt to Silty Clay	137.17	5.214	6.607	3.068	3.539	2.42	0.4642	0.48	0.400	2.420	0.46	63.68	2.396	152.564	0.41	0.78	1	(0.99)	295.86	133.52
109.74	5	Clayey Silt to Silty Clay	111.57	2.758	6.636	3.083	3.553	2.5	0.4629	0.48	0.400	2.500	0.46	51.64	2.768	142.965	0.35	0.78	1	(0.85)	287.14	107.96
110.24	4	Silty Clay to Clay	38.979	1.408	6.666	3.098	3.568	3.05	0.4614	0.48	0.399							0.78	1		338.99	338.99
110.73	5	Clayey Silt to Silty Clay	38.579	0.918	6.696	3.114	3.582	2.99	0.4601	0.48	0.399							0.77	1		313.60	313.60
111.22	5	Clayey Silt to Silty Clay	43.631	0.895	6.726	3.129	3.597	2.94	0.4586	0.48	0.398							0.77	1		324.42	324.42
111.71	5	Clayey Silt to Silty Clay	35.317	0.708	6.755	3.144	3.611	3.01	0.4573	0.48	0.398							0.77	1		295.49	295.49
112.2	5	Clayey Silt to Silty Clay	34.151	0.58	6.785	3.16	3.625	3.01	0.456	0.48	0.398							0.77	1		282.28	282.28
112.7	5	Clayey Silt to Silty Clay	34.904	0.617	6.815	3.175	3.64	3.01	0.4545	0.48	0.397							0.77	1		285.20	285.20
113.19	5	Clayey Silt to Silty Clay	36.116	0.876	6.845	3.191	3.654	3	0.4532	0.48	0.397							0.77	1		304.04	304.04
113.68	5	Clayey Silt to Silty Clay	39.832	0.72	6.874	3.206	3.668	2.95	0.4519	0.48	0.396							0.77	1		318.35	318.35
114.17	5	Clayey Silt to Silty Clay	42.722	0.748	6.904	3.221	3.683	2.94	0.4505	0.48	0.396							0.77	1		315.03	315.03
114.67	5	Clayey Silt to Silty Clay	39.474	0.725	6.934	3.237	3.697	2.98	0.4493	0.48	0.396							0.77	1		306.89	306.89
115.16	5	Clayey Silt to Silty Clay	38.339	0.865	6.964	3.252	3.712	3.02	0.4479	0.48	0.395							0.77	1		308.05	308.05
115.65	5	Clayey Silt to Silty Clay	44.484	1.077	6.993	3.267	3.726	2.99	0.4466	0.47	0.395							0.77	1		327.27	327.27
116.14	5	Clayey Silt to Silty Clay	45.503	1.035	7.023	3.283	3.74	2.96	0.4453	0.47	0.394							0.77	1		335.57	335.57
116.63	5	Clayey Silt to Silty Clay	41.236	1.058	7.053	3.298	3.755	3	0.444	0.47	0.394							0.77	1		322.76	322.76
117.13	5	Clayey Silt to Silty Clay	40.255	0.977	7.083	3.313	3.769	3	0.4427	0.47	0.394							0.77	1		319.81	319.81
117.62	5	Clayey Silt to Silty Clay	51.256	0.839	7.112	3.329	3.784	2.72	0.4414	0.47	0.393							0.77	1		411.81	411.81
118.11	5	Clayey Silt to Silty Clay	48.806	0.833	7.142	3.344	3.798	2.7	0.4402	0.47	0.393							0.77	1		404.69	404.69
118.6	5	Clayey Silt to Silty Clay	37.657	0.52	7.172	3.36	3.812	2.92	0.4389	0.47	0.393							0.77	1		306.80	306.80
119.09	5	Clayey Silt to Silty Clay	37.268	0.533	7.202	3.375	3.827	2.95	0.4376	0.47	0.392							0.76	1		299.36	299.36
119.59	5	Clayey Silt to Silty Clay	39.116	0.659	7.232	3.39	3.841	2.98	0.4364	0.47	0.392							0.76	1		305.50	305.50
120.08	5	Clayey Silt to Silty Clay	42.86	0.948	7.261	3.406	3.856	3	0.4351	0.47	0.391							0.76	1		319.25	319.25
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LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME	***Eastridge to BART Regional Connector Project***	*FAULT INFO*				
PROJECT NO.	***2017-125-GEO***	*COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*				
CPT NO.	***CPT-AS-69***	*FAULT* M_w = 6.9	*MSF* = 1.24	a_{max} *(g)*= 0.682	V_{S30m}(m/s)=	#REF! 222.2

			CPT RESULT INPUT							*CSR*		*CRR 7.5*							*F.S.=(CRR 7.5/CSR)*MSF*Kσ*Kα*				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
0.492			-9999	-9999	0.03		0.03		1.7	1.00	0.444							1.00			0.00	0.00
0.984			-9999	-9999	0.059		0.059		1.7	1.00	0.443							1.00			0.00	0.00
1.476			-9999	-9999	0.089		0.089		1.7	1.00	0.443							1.00			0.00	0.00
1.968			-9999	-9999	0.119		0.119		1.6679	1.00	0.442							1.00			0.00	0.00
2.461			-9999	-9999	0.149		0.149		1.6308	1.00	0.442							1.00			0.00	0.00
2.953			-9999	-9999	0.178		0.178		1.5965	1.00	0.441							1.00			0.00	0.00
3.445			-9999	-9999	0.208		0.208		1.5625	0.99	0.441							1.00			0.00	0.00
3.937			-9999	-9999	0.238		0.238		1.5299	0.99	0.440										0.00	0.00
4.429			-9999	-9999	0.268		0.268		1.4986	0.99	0.440										0.00	0.00
4.921			-9999	-9999	0.297		0.297		1.4696	0.99	0.439										0.00	0.00
5.413	4	Silty Clay to Clay	30.087	0.853	0.327		0.327	2.35	1.4407	0.99	0.439	2.350	1.44	43.35	2.120	91.881	0.15				123.16	123.16
5.906	4	Silty Clay to Clay	23.887	0.661	0.357		0.357	2.41	1.413	0.99	0.438	2.410	1.41	33.75	2.354	79.440	0.13				124.68	124.68
6.398	4	Silty Clay to Clay	30.748	0.965	0.387		0.387	2.44	1.3863	0.99	0.438	2.440	1.39	42.62	2.483	105.843	0.19				128.69	128.69
6.89	4	Silty Clay to Clay	21.856	0.728	0.416	0.007	0.409	2.5	1.3673	0.99	0.445	2.500	1.37	29.88	2.768	82.732	0.13			(0.00)	127.79	127.79
7.382	4	Silty Clay to Clay	19.283	0.365	0.446	0.023	0.423	2.46	1.3555	0.98	0.460	2.460	1.36	26.14	2.574	67.287	0.11	1.00	0	(0.00)	126.58	107.96
7.874	4	Silty Clay to Clay	17.837	0.395	0.476	0.038	0.438	2.52	1.3431	0.98	0.474	2.520	1.34	23.96	2.872	68.795	0.11	1.00	1	(0.29)	125.55	99.58
8.366	4	Silty Clay to Clay	16.151	0.396	0.506	0.054	0.452	2.54	1.3317	0.98	0.488	2.540	1.33	21.51	2.979	64.073	0.10	1.00	1	(0.27)	127.07	99.58
8.858	4	Silty Clay to Clay	27.114	0.553	0.535	0.069	0.467	2.36	1.3197	0.98	0.498	2.360	1.32	35.78	2.156	77.163	0.12	1.00	1	(0.30)	135.60	124.95
9.35	5	Clayey Silt to Silty Clay	33.225	0.667	0.565	0.084	0.481	2.27	1.3087	0.98	0.511	2.270	1.31	43.48	1.856	80.708	0.13	1.00	1	(0.31)	141.17	141.17
9.843	4	Silty Clay to Clay	33.308	0.902	0.595	0.1	0.495	2.37	1.2979	0.98	0.522	2.370	1.30	43.23	2.194	94.852	0.16	1.00	1	(0.38)	140.61	140.61
10.335	4	Silty Clay to Clay	19.819	0.492	0.625	0.115	0.51	2.57	1.2865	0.98	0.532	2.570	1.29	25.50	3.148	80.267	0.13	1.00	1	(0.30)	133.55	107.96
10.827	3	Clay	14.08	0.396	0.654	0.13	0.524	2.7	1.2761	0.98	0.541							1.00	1		162.22	162.22
11.319	4	Silty Clay to Clay	21.141	0.515	0.684	0.146	0.538	2.56	1.2658	0.98	0.550	2.560	1.27	26.76	3.091	82.706	0.13	1.00	1	(0.30)	134.02	91.33
11.811	4	Silty Clay to Clay	13.433	0.369	0.714	0.161	0.553	2.6	1.255	0.98	0.558							1.00	1		132.30	132.30
12.303	3	Clay	10.377	0.265	0.744	0.176	0.567	2.78	1.245	0.97	0.567							1.00	1		135.74	135.74
12.795	3	Clay	10.061	0.247	0.773	0.192	0.582	2.8	1.2346	0.97	0.573							1.00	1		131.48	131.48
13.287	3	Clay	10.398	0.249	0.803	0.207	0.596	2.78	1.2249	0.97	0.581							1.00	1		141.17	141.17
13.78	4	Silty Clay to Clay	19.434	0.52	0.833	0.223	0.61	2.59	1.2155	0.97	0.588	2.590	1.22	23.62	3.266	77.148	0.12	1.00	1	(0.26)	140.63	91.33
14.272	4	Silty Clay to Clay	18.085	0.282	0.863	0.238	0.625	2.57	1.2055	0.97	0.594	2.570	1.21	21.80	3.148	68.629	0.11	1.00	1	(0.23)	140.84	83.24
14.764	3	Clay	9.937	0.27	0.892	0.253	0.639	2.83	1.1963	0.97	0.600							1.00	1		135.26	135.26
15.256	3	Clay	9.875	0.29	0.922	0.269	0.654	2.9	1.1866	0.97	0.605							1.00	1		128.75	128.75
15.748	3	Clay	9.827	0.286	0.952	0.284	0.668	2.91	1.1777	0.97	0.611							1.00	1		128.61	128.61
16.24	3	Clay	8.203	0.29	0.982	0.299	0.682	3	1.169	0.97	0.616							1.00	1		117.41	117.41
16.732	3	Clay	6.579	0.187	1.011	0.315	0.697	3.09	1.1597	0.96	0.620							1.00	1		103.21	103.21
17.224	3	Clay	7.047	0.194	1.041	0.33	0.711	3.09	1.1512	0.96	0.625							1.00	1		104.55	104.55
17.717	3	Clay	7.37	0.218	1.071	0.345	0.725	3.09	1.1429	0.96	0.630							1.00	1		107.96	107.96
18.209	3	Clay	7.542	0.24	1.101	0.361	0.74	3.08	1.134	0.96	0.634							1.00	1		110.95	110.95
18.701	3	Clay	8.368	0.263	1.13	0.376	0.754	3.05	1.1259	0.96	0.638							1.00	1		117.64	117.64
19.193	3	Clay	9.992	0.278	1.16	0.392	0.769	2.99	1.1173	0.96	0.641							1.00	1		127.63	127.63
19.685	3	Clay	9.497	0.332	1.19	0.407	0.783	3.01	1.1094	0.96	0.645							1.00	1		126.94	126.94
20.177	3	Clay	8.974	0.223	1.22	0.422	0.797	3.01	1.1017	0.96	0.649							1.00	1		119.56	119.56
20.669	4	Silty Clay to Clay	8.451	0.104	1.249	0.438	0.812	2.92	1.0934	0.96	0.651							1.00	1		116.61	116.61
21.161	4	Silty Clay to Clay	8.478	0.104	1.279	0.453	0.826	2.87	1.0859	0.95	0.655							1.00	1		121.99	121.99
21.654	4	Silty Clay to Clay	13.406	0.592	1.309	0.468	0.841	2.69	1.0779	0.95	0.657							1.00	1		199.77	199.77
22.146	6	Sandy Silt to Clayey Silt	77.764	0.97	1.339	0.484	0.855	1.93	1.0706	0.95	0.660	1.930	1.07	83.25	1.218	101.438	0.18	1.00	1	(0.33)	186.06	186.06
22.638	6	Sandy Silt to Clayey Silt	117.27	0.912	1.368	0.499	0.869	1.87	1.0633	0.95	0.663	1.870	1.06	124.69	1.162	144.870	0.36	1.00	1	(0.68)	193.38	193.38
23.13	5	Clayey Silt to Silty Clay	73.36	2.101	1.398	0.515	0.884	2.23	1.0557	0.95	0.665	2.230	1.06	77.44	1.743	135.020	0.31	1.00	1	(0.58)	184.12	184.12
23.622	5	Clayey Silt to Silty Clay	44.897	0.789	1.428	0.53	0.898	2.34	1.0486	0.95	0.667	2.340	1.05	47.08	2.084	98.103	0.17	1.00	1	(0.31)	174.19	133.52
24.114	4	Silty Clay to Clay	21.326	0.285	1.458	0.545	0.912	2.55	1.0417	0.94	0.670	2.550	1.04	22.21	3.034	67.404	0.11	1.00	1	(0.20)	158.45	67.90
24.606	4	Silty Clay to Clay	20.012	0.301	1.487	0.561	0.927	2.59	1.0343	0.94	0.671	2.590	1.03	20.70	3.266	67.603	0.11	1.00	1	(0.20)	157.25	60.90
25.098	4	Silty Clay to Clay	19.616	0.375	1.517	0.576	0.941	2.66	1.0276	0.94	0.673							1.00	1		200.20	200.20
25.591	4	Silty Clay to Clay	21.967	0.427	1.547	0.591	0.956	2.68	1.0204	0.94	0.674							1.00	1		208.60	208.60
26.083	4	Silty Clay to Clay	21.574	0.675	1.577	0.607	0.97	2.75	1.0138	0.94	0.676							1.00	1		212.21	212.21
26.575	4	Silty Clay to Clay	21.774	0.702	1.606	0.622	0.984	2.78	1.0073	0.94	0.677							1.00	1		213.03	213.03
27.067	4	Silty Clay to Clay	22.848	0.752	1.636	0.637	0.999	2.77	1.0005	0.93	0.678							1.00	1		218.96	218.96
27.559	4	Silty Clay to Clay	23.233	0.675	1.666	0.653	1.013	2.78	0.9941	0.93	0.679							1.00	1		215.88	215.88
28.051	4	Silty Clay to Clay	20.522	0.722	1.696	0.668	1.028	2.81	0.9874	0.93	0.680							0.99	1		209.86	209.86
28.543	4	Silty Clay to Clay	26.371	0.684	1.725	0.684	1.042	2.73	0.9813	0.93	0.681							0.99	1		226.70	226.70
29.035	4	Silty Clay to Clay	21.389	0.784	1.755	0.699	1.056	2.83	0.9752	0.93	0.682							0.99	1		212.93	212.93
29.528	4	Silty Clay to Clay	19.696	0.836	1.785	0.714	1.071	2.83	0.9687	0.92	0.682							0.99	1		220.98	220.98
30.02	5	Clayey Silt to Silty Clay	68.57	1.36	1.815	0.73	1.085	2.39	0.9628	0.92	0.683	2.390	0.96	66.02	2.272	149.997	0.39	0.98	1	(0.70)	187.94	142.13
30.512	5	Clayey Silt to Silty Clay	61.358	2.384	1.844	0.745	1.099	2.46	0.9569	0.92	0.683	2.460	0.96	58.72	2.574	151.150	0.40	0.98	1	(0.71)	188.47	150.76
31.004	4	Silty Clay to Clay	25.573	0.863	1.874	0.76	1.114	2.77	0.9507	0.92	0.683							0.98	1		247.73	247.73
31.496	4	Silty Clay to Clay	25.16	0.838	1.904	0.776	1.128	2.83	0.945	0.91	0.683							0.98	1		227.74	227.74
31.988	3	Clay	21.003	0.909	1.934	0.791	1.143	2.9	0.939	0.91	0.682							0.97	1		211.88	211.88
32.48	4	Silty Clay to Clay	20.921	0.609	1.963	0.806	1.157	2.82	0.9334	0.91	0.682							0.97	1		212.82	212.82
32.972	4	Silty Clay to Clay	26.701	0.699	1.993	0.822	1.171	2.76	0.9279	0.90	0.682							0.97	1		238.81	238.81
33.465	4	Silty Clay to Clay	28.463	1.157	2.023	0.837	1.186	2.84	0.922	0.90	0.681							0.97	1		241.85	241.85
33.957	3	Clay	20.976	0.943	2.053	0.853	1.2	2.97	0.9167	0.90	0.681							0.96	1		207.84	207.84
34.449	3	Clay	18.017	0.799	2.082	0.868	1.215	3	0.911	0.89	0.679							0.96	1		192.90	192.90
34.941	4	Silty Clay to Clay	23.784	0.772	2.112	0.883	1.229	2.77	0.9057	0.89	0.679							0.96	1		242.64	242.64
35.433	4	Silty Clay to Clay	30.583	1.047	2.142	0.899	1.243	2.78	0.9005	0.89	0.678							0.96	1		246.47	246.47
35.925	4	Silty Clay to Clay	15.608	0.51	2.172	0.914	1.258	2.97	0.895	0.88	0.677							0.96	1		178.79	178.79
36.417	4	Silty Clay to Clay	13.516	0.127	2.201	0.929	1.272	2.84	0.89	0.88	0.675							0.95	1		163.06	163.06
36.909	4	Silty Clay to Clay	13.571	0.144	2.231	0.945	1.286	2.87	0.885	0.88	0.674							0.95	1		159.32	159.32
37.402	4	Silty Clay to Clay	14.259	0.311	2.261	0.96	1.301	2.96	0.8796	0.87	0.672							0.95	1		162.32	162.32
37.894	4	Silty Clay to Clay	14.204	0.341	2.291	0.975	1.315	3	0.8748	0.87	0.671							0.95	1		165.56	165.56
38.386	4	Silty Clay to Clay	19.104	0.817	2.32	0.991	1.33	2.86	0.8696	0.86	0.669							0.94	1		240.31	240.31
38.878	4	Silty Clay to Clay	65.928	2.3	2.35	1.006	1.344	2.53	0.8648	0.86	0.667	2.530	0.86	57.01	2.925	166.751		0.94	1		200.28	200.28
39.37	5	Clayey Silt to Silty Clay	76.608	2.32	2.38	1.022	1.358	2.48	0.86	0.86	0.665	2.480	0.86	65.89	2.669	175.874		0.94	1		201.37	201.37
39.862	5	Clayey Silt to Silty Clay	24.389	0.34	2.41	1.037	1.373	2.63	0.855	0.85	0.663							0.94	1		260.41	260.41
40.354	4	Silty Clay to Clay	24.059	0.406	2.439	1.052	1.387	2.73	0.8504	0.85	0.661							0.94	1		235.77	235.77
40.846	4	Silty Clay to Clay	29.619	1.108	2.469	1.068	1.402	2.81	0.8455	0.84	0.658							0.93	1		262.48	262.48
41.339	4	Silty Clay to Clay	34.739	1.262	2.499	1.083	1.416	2.77	0.841	0.84	0.656							0.93	1		284.44	284.44
41.831	4	Silty Clay to Clay	33.831	0.969	2.529	1.098	1.43	2.7	0.8365	0.83	0.654							0.93	1		285.03	285.03
42.323	4	Silty Clay to Clay	31.353	0.856	2.558	1.114	1.445	2.73	0.8318	0.83	0.651							0.93	1		271.93	271.93
42.815	4	Silty Clay to Clay	29.179	0.941	2.588	1.129	1.459	2.76	0.8274	0.83	0.649							0.93	1		260.80	260.80
43.307	4	Silty Clay to Clay	29.051	0.697	2.618	1.144	1.473	2.75	0.823	0.82	0.646							0.93	1		259.14	259.14
43.799	4	Silty Clay to Clay	34.987	1.148	2.648	1.16	1.488	2.69	0.8185	0.82	0.643							0.92	1		304.01	304.01
44.291	4	Silty Clay to Clay	38.18	1.342	2.677	1.175	1.502	2.68	0.8142	0.81	0.641							0.92	1		318.51	318.51
44.783	4	Silty Clay to Clay	34.822	1.002	2.707	1.191	1.517	2.74	0.8097	0.81	0.637							0.92	1		283.20	283.20
45.276	4	Silty Clay to Clay	24.362	0.816	2.737	1.206	1.531	2.87	0.8056	0.80	0.635							0.92	1		239.51	239.51
45.768	4	Silty Clay to Clay	22.947	0.581	2.767	1.221	1.545	2.89	0.8015	0.80	0.632							0.92	1		222.30	222.30
46.26	4	Silty Clay to Clay	23.398	0.621	2.796	1.237	1.56	2.86	0.7971	0.79	0.628							0.91	1		224.60	224.60
46.752	4	Silty Clay to Clay	20.838	0.46	2.826	1.252	1.574	2.88	0.7931	0.79	0.626							0.91	1		212.23	212.23
47.244	4	Silty Clay to Clay	20.7	0.455	2.856	1.267	1.589	2.91	0.7888	0.78	0.622							0.91	1		206.37	206.37
47.736	4	Silty Clay to Clay	19.434	0.389	2.886	1.283	1.603	2.95	0.7849	0.78	0.619							0.91	1		194.88	194.88
48.228	4	Silty Clay to Clay	15.924	0.361	2.915	1.298	1.617	2.96	0.781	0.77	0.616							0.91	1		188.23	188.23
48.72	4	Silty Clay to Clay	18.388	0.301	2.945	1.313	1.632	2.9	0.7768	0.77	0.613							0.91	1		194.49	194.49
49.213	4	Silty Clay to Clay	19.517	0.31	2.975	1.329	1.646	2.92	0.773	0.76	0.610							0.91	1		203.08	203.08
49.705	5	Clayey Silt to Silty Clay	43.796	1.136	3.005	1.344	1.66	2.7	0.7692	0.76	0.606							0.90	1		272.61	272.61
50.197	5	Clayey Silt to Silty Clay	31.126	0.315	3.034	1.36	1.675	2.55	0.7652	0.75	0.603	2.550	0.77	23.82	3.034	72.270	0.12	0.90	1	(0.21)	196.59	54.63

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project*** *FAULT INFO*
PROJECT NO. ***2017-125-GEO*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-69*** *FAULT* M_w = 6.9 *MSF* = 1.24 a_{max} *(g)*= 0.682 V_{S30m}(m/s)= #REF! 222.2

			CPT RESULT INPUT							***CSR***		***CRR*** $_{7.5}$						***F.S.=(CRR*** $_{7.5}$ ***/CSR)*MSF*K*** σ ****K*** α				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
50.689	5	Clayey Silt to Silty Clay	20.453	0.309	3.064	1.375	1.689	2.79	0.7615	0.75	0.600							0.90	1		213.74	213.74
51.181	4	Silty Clay to Clay	12.387	0.148	3.094	1.39	1.704	3.05	0.7576	0.74	0.596							0.90	1		159.15	159.15
51.673	4	Silty Clay to Clay	12.745	0.141	3.124	1.406	1.718	2.96	0.7539	0.74	0.593							0.90	1		166.29	166.29
52.165	5	Clayey Silt to Silty Clay	17.7	0.184	3.153	1.421	1.732	2.82	0.7503	0.73	0.590							0.90	1		196.36	196.36
52.657	5	Clayey Silt to Silty Clay	19.049	0.211	3.183	1.436	1.747	2.79	0.7465	0.73	0.586							0.89	1		204.56	204.56
53.15	4	Silty Clay to Clay	18.953	0.278	3.213	1.452	1.761	2.9	0.743	0.72	0.583							0.89	1		203.58	203.58
53.642	5	Clayey Silt to Silty Clay	44.319	1.035	3.243	1.467	1.776	2.63	0.7392	0.72	0.580							0.89	1		342.82	342.82
54.134	5	Clayey Silt to Silty Clay	87.647	2.569	3.272	1.482	1.79	2.4	0.7358	0.71	0.577	2.400	0.74	64.49	2.312	149.124	0.39	0.89	1	(0.74)	227.69	150.76
54.626	6	Sandy Silt to Clayey Silt	246.67	2.502	3.302	1.498	1.804	1.94	0.7324	0.71	0.574	1.940	0.73	180.65	1.229	222.019		0.84	1		251.35	251.35
55.118	6	Sandy Silt to Clayey Silt	226.6	4.852	3.332	1.513	1.819	1.89	0.7287	0.70	0.570	1.890	0.73	165.13	1.180	194.777		0.81	1		263.41	263.41
55.61	6	Sandy Silt to Clayey Silt	471.35	5.278	3.362	1.529	1.833	1.74	0.7254	0.70	0.567	1.740	0.73	341.90	1.065	364.053		0.78	1		273.64	273.64
56.102	6	Sandy Silt to Clayey Silt	214.49	2.022	3.391	1.544	1.847	1.84	0.722	0.69	0.564	1.840	0.72	154.87	1.137	176.090		0.82	1		258.24	258.24
56.594	5	Clayey Silt to Silty Clay	76.195	1.889	3.421	1.559	1.862	2.4	0.7185	0.69	0.561	2.400	0.72	54.74	2.312	126.591	0.27	0.88	1	(0.52)	226.56	124.95
57.087	4	Silty Clay to Clay	46.081	1.03	3.451	1.575	1.876	2.74	0.7152	0.68	0.558							0.88	1		308.36	308.36
57.579	4	Silty Clay to Clay	20.865	0.3	3.481	1.59	1.891	2.88	0.7117	0.68	0.555							0.88	1		226.73	226.73
58.071	4	Silty Clay to Clay	22.93	0.302	3.51	1.605	1.905	2.87	0.7085	0.68	0.552							0.88	1		216.78	216.78
58.563	4	Silty Clay to Clay	22.077	0.428	3.54	1.621	1.919	2.9	0.7054	0.67	0.549							0.88	1		216.93	216.93
59.055	4	Silty Clay to Clay	20.37	0.368	3.57	1.636	1.934	2.94	0.702	0.67	0.546							0.88	1		209.15	209.15
59.547	4	Silty Clay to Clay	20.257	0.373	3.6	1.651	1.948	2.9	0.6989	0.66	0.543							0.88	1		217.09	217.09
60.039	5	Clayey Silt to Silty Clay	36.887	0.507	3.629	1.667	1.963	2.73	0.6955	0.66	0.540							0.87	1		267.07	267.07
60.532	5	Clayey Silt to Silty Clay	39.102	0.712	3.659	1.682	1.977	2.68	0.6925	0.65	0.537							0.87	1		307.39	307.39
61.024	5	Clayey Silt to Silty Clay	37.795	1.03	3.689	1.698	1.991	2.73	0.6894	0.65	0.535							0.87	1		321.30	321.30
61.516	4	Silty Clay to Clay	27.527	0.946	3.719	1.713	2.006	2.85	0.6862	0.65	0.532							0.87	1		277.30	277.30
62.008	4	Silty Clay to Clay	24.114	0.494	3.748	1.728	2.02	2.9	0.6832	0.64	0.529							0.87	1		234.18	234.18
62.5	4	Silty Clay to Clay	21.278	0.485	3.778	1.744	2.034	2.99	0.6803	0.64	0.527							0.87	1		215.80	215.80
62.992	4	Silty Clay to Clay	19.248	0.37	3.808	1.759	2.049	3.02	0.6771	0.64	0.524							0.87	1		202.92	202.92
63.484	4	Silty Clay to Clay	19.902	0.345	3.838	1.774	2.063	2.97	0.6742	0.63	0.522							0.87	1		206.19	206.19
63.976	4	Silty Clay to Clay	21.719	0.369	3.867	1.79	2.078	2.94	0.6711	0.63	0.519							0.86	1		216.15	216.15
64.469	4	Silty Clay to Clay	22.214	0.441	3.897	1.805	2.092	2.95	0.6683	0.63	0.517							0.86	1		219.04	219.04
64.961	4	Silty Clay to Clay	20.37	0.389	3.927	1.82	2.106	2.97	0.6655	0.62	0.514							0.86	1		212.57	212.57
65.453	4	Silty Clay to Clay	21.058	0.396	3.957	1.836	2.121	2.97	0.6625	0.62	0.512							0.86	1		213.96	213.96
65.945	4	Silty Clay to Clay	27.114	0.556	3.986	1.851	2.135	2.94	0.6597	0.62	0.510							0.86	1		231.00	231.00
66.437	4	Silty Clay to Clay	21.636	0.448	4.016	1.867	2.15	2.95	0.6567	0.61	0.507							0.86	1		224.02	224.02
66.929	5	Clayey Silt to Silty Clay	23.247	0.325	4.046	1.882	2.164	2.89	0.654	0.61	0.505							0.86	1		226.33	226.33
67.421	4	Silty Clay to Clay	26.123	0.465	4.076	1.897	2.178	2.89	0.6513	0.61	0.503							0.86	1		237.20	237.20
67.913	4	Silty Clay to Clay	25.428	0.555	4.105	1.913	2.193	2.92	0.6484	0.60	0.501							0.85	1		241.33	241.33
68.406	4	Silty Clay to Clay	26.343	0.622	4.135	1.928	2.207	2.92	0.6457	0.60	0.499							0.85	1		247.39	247.39
68.898	4	Silty Clay to Clay	28.656	0.585	4.165	1.943	2.221	2.9	0.6431	0.60	0.497							0.85	1		252.96	252.96
69.39	4	Silty Clay to Clay	29.564	1	4.195	1.959	2.236	2.85	0.6403	0.60	0.495							0.85	1		301.47	301.47
69.882	4	Silty Clay to Clay	38.208	1.116	4.224	1.974	2.25	2.82	0.6377	0.59	0.493							0.85	1		324.87	324.87
70.374	4	Silty Clay to Clay	38.019	1.198	4.254	1.989	2.265	2.88	0.6349	0.59	0.491							0.85	1		304.82	304.82
70.866	4	Silty Clay to Clay	40.568	1.324	4.284	2.005	2.279	2.9	0.6324	0.59	0.489							0.85	1		317.36	317.36
71.358	4	Silty Clay to Clay	54.119	2.921	4.314	2.02	2.293	2.81	0.6298	0.58	0.488							0.85	1		403.26	403.26
71.85	4	Silty Clay to Clay	79.196	3.032	4.343	2.036	2.308	2.73	0.6271	0.58	0.486							0.85	1		449.59	449.59
72.343	4	Silty Clay to Clay	55.849	2.544	4.373	2.051	2.322	2.76	0.6246	0.58	0.484							0.84	1		426.50	426.50
72.835	4	Silty Clay to Clay	75.204	3.135	4.403	2.066	2.337	2.72	0.622	0.58	0.482							0.84	1		449.36	449.36
73.327	4	Silty Clay to Clay	55.523	2.064	4.433	2.082	2.351	2.83	0.6195	0.58	0.481							0.84	1		374.60	374.60
73.819	4	Silty Clay to Clay	36.99	1.075	4.462	2.097	2.365	2.9	0.6171	0.57	0.479							0.84	1		305.23	305.23
74.311	4	Silty Clay to Clay	34.574	0.965	4.492	2.112	2.38	2.93	0.6145	0.57	0.477							0.84	1		284.78	284.78
74.803	4	Silty Clay to Clay	29.867	0.915	4.522	2.128	2.394	2.99	0.6121	0.57	0.476							0.84	1		260.26	260.26
75.295	4	Silty Clay to Clay	24.719	0.504	4.552	2.143	2.408	2.99	0.6098	0.57	0.475							0.84	1		237.53	237.53
75.787	4	Silty Clay to Clay	25.408	0.521	4.581	2.158	2.423	2.99	0.6072	0.56	0.473							0.84	1		238.69	238.69
76.28	4	Silty Clay to Clay	26.646	0.679	4.611	2.174	2.437	3.01	0.6049	0.56	0.472							0.84	1		243.55	243.55
76.772	4	Silty Clay to Clay	25.8	0.596	4.641	2.189	2.452	3	0.6024	0.56	0.470							0.84	1		242.90	242.90
77.264	4	Silty Clay to Clay	25.82	0.532	4.671	2.205	2.466	2.96	0.6001	0.56	0.469							0.83	1		241.06	241.06
77.756	5	Clayey Silt to Silty Clay	25.05	0.349	4.7	2.22	2.48	2.91	0.5978	0.56	0.467							0.83	1		239.44	239.44
78.248	5	Clayey Silt to Silty Clay	25.353	0.368	4.73	2.235	2.495	2.89	0.5954	0.55	0.466							0.83	1		243.62	243.62
78.74	5	Clayey Silt to Silty Clay	26.233	0.385	4.76	2.251	2.509	2.87	0.5932	0.55	0.465							0.83	1		248.84	248.84
79.232	5	Clayey Silt to Silty Clay	27.114	0.426	4.79	2.266	2.524	2.87	0.5908	0.55	0.463							0.83	1		256.90	256.90
79.724	5	Clayey Silt to Silty Clay	43.796	0.519	4.819	2.281	2.538	2.74	0.5886	0.55	0.462							0.83	1		301.68	301.68
80.217	5	Clayey Silt to Silty Clay	41.095	0.529	4.849	2.297	2.552	2.71	0.5864	0.55	0.461							0.83	1		326.14	326.14
80.709	4	Silty Clay to Clay	35.262	0.929	4.879	2.312	2.567	2.9	0.584	0.55	0.460							0.83	1		287.75	287.75
81.201	4	Silty Clay to Clay	22.717	0.447	4.909	2.327	2.581	3.08	0.5819	0.54	0.459							0.83	1		227.55	227.55
81.693	4	Silty Clay to Clay	22.958	0.446	4.938	2.343	2.595	3.04	0.5797	0.54	0.458							0.83	1		226.86	226.86
82.185	4	Silty Clay to Clay	24.031	0.473	4.968	2.358	2.61	3.02	0.5774	0.54	0.456							0.83	1		234.28	234.28
82.677	4	Silty Clay to Clay	26.013	0.538	4.998	2.374	2.624	3.01	0.5753	0.54	0.455							0.82	1		241.02	241.02
83.169	4	Silty Clay to Clay	25.189	0.54	5.028	2.389	2.639	3.03	0.5731	0.54	0.454							0.82	1		241.33	241.33
83.661	4	Silty Clay to Clay	25.875	0.451	5.057	2.404	2.653	2.99	0.571	0.54	0.453							0.82	1		244.99	244.99
84.154	5	Clayey Silt to Silty Clay	28.325	0.489	5.087	2.42	2.667	2.89	0.5689	0.53	0.452							0.82	1		261.91	261.91
84.646	5	Clayey Silt to Silty Clay	27.665	0.454	5.117	2.435	2.682	2.89	0.5667	0.53	0.451							0.82	1		261.14	261.14
85.138	5	Clayey Silt to Silty Clay	26.034	0.42	5.147	2.45	2.696	2.95	0.5647	0.53	0.450							0.82	1		247.87	247.87
85.63	4	Silty Clay to Clay	26.977	0.524	5.176	2.466	2.711	2.99	0.5625	0.53	0.449							0.82	1		249.67	249.67
86.122	4	Silty Clay to Clay	30.803	0.591	5.206	2.481	2.725	2.98	0.5605	0.53	0.448							0.82	1		261.46	261.46
86.614	5	Clayey Silt to Silty Clay	32.647	0.729	5.236	2.496	2.739	2.88	0.5585	0.53	0.447							0.82	1		294.40	294.40
87.106	5	Clayey Silt to Silty Clay	33.225	0.777	5.266	2.512	2.754	2.89	0.5564	0.53	0.446							0.82	1		295.12	295.12
87.598	4	Silty Clay to Clay	30.335	0.72	5.295	2.527	2.768	2.98	0.5544	0.53	0.445							0.82	1		270.86	270.86
88.091	4	Silty Clay to Clay	32.289	0.671	5.325	2.543	2.782	2.96	0.5525	0.52	0.445							0.81	1		274.69	274.69
88.583	4	Silty Clay to Clay	30.858	0.72	5.355	2.558	2.797	2.99	0.5504	0.52	0.444							0.81	1		269.90	269.90
89.075	4	Silty Clay to Clay	28.931	0.931	5.385	2.573	2.811	3.06	0.5485	0.52	0.443							0.81	1		262.43	262.43
89.567	4	Silty Clay to Clay	28.05	0.765	5.414	2.589	2.826	3.06	0.5464	0.52	0.442							0.81	1		259.48	259.48
90.059	4	Silty Clay to Clay	30.748	0.819	5.444	2.604	2.84	2.96	0.5446	0.52	0.441							0.81	1		289.02	289.02
90.551	4	Silty Clay to Clay	38.538	1.086	5.474	2.619	2.854	2.92	0.5427	0.52	0.440							0.81	1		314.90	314.90
91.043	4	Silty Clay to Clay	39.135	1.124	5.504	2.635	2.869	2.93	0.5407	0.52	0.440							0.81	1		313.61	313.61
91.535	4	Silty Clay to Clay	40.345	1.112	5.533	2.65	2.883	2.9	0.5388	0.52	0.439							0.81	1		319.38	319.38
92.028	5	Clayey Silt to Silty Clay	40.795	1	5.563	2.665	2.898	2.87	0.5368	0.51	0.438							0.81	1		334.09	334.09
92.52	5	Clayey Silt to Silty Clay	60.257	1.299	5.593	2.681	2.912	2.77	0.535	0.51	0.437							0.81	1		434.21	434.21
93.012	5	Clayey Silt to Silty Clay	88.844	3.076	5.623	2.696	2.926	2.71	0.5332	0.51	0.436							0.81	1		502.61	502.61
93.504	5	Clayey Silt to Silty Clay	79.306	2.623	5.652	2.712	2.941	2.69	0.5313	0.51	0.436							0.81	1		484.48	484.48
93.996	5	Clayey Silt to Silty Clay	65.542	2.377	5.682	2.727	2.955	2.73	0.5295	0.51	0.435							0.81	1		472.81	472.81
94.488	9	Sand	102.9	3.934	5.712	2.742	2.97	2.7	0.5276	0.51	0.434							0.80	1		556.20	556.20
94.98	9	Sand	139.81	5.99	5.742	2.758	2.984	2.66	0.5258	0.51	0.434							0.80	1		632.61	632.61
95.472	9	Sand	112.13	5.787	5.771	2.773	2.998	2.69	0.5241	0.51	0.433							0.80	1		619.05	619.05
95.965	6	Sandy Silt to Clayey Silt	215.51	5.065	5.801	2.788	3.013	2.21	0.5222	0.51	0.432	2.210	0.52	112.54	1.692	190.372		0.77	1		293.01	293.01
96.457	6	Sandy Silt to Clayey Silt	356.18	2.988	5.831	2.804	3.027	1.74	0.5205	0.51	0.431	1.740	0.52	185.38	1.065	197.390		0.69	1		312.90	312.90
96.949	6	Sandy Silt to Clayey Silt	397.19	4.421	5.861	2.819	3.041	1.67	0.5187	0.50	0.431	1.670	0.52	206.04	1.017	209.621		0.66	1		320.22	320.22
97.441	7	Silty Sand to Sandy Silt	461.19	2.069	5.89	2.834	3.056	1.5	0.5169	0.50	0.430	1.500	0.52	238.40	1.000	238.398		0.64	1		323.63	323.63
97.933	6	Sandy Silt to Clayey Silt	382.11	2.44	5.92	2.85	3.07	1.58	0.5152	0.50	0.429	1.580	0.52	196.87	1.000	196.870		0.66	1		319.76	319.76
98.425	6	Sandy Silt to Clayey Silt	366.35	3.685	5.95	2.865	3.085	1.75	0.5134	0.50	0.429	1.750	0.51	188.09	1.072	201.558		0.67	1		317.00	317.00
98.917	6	Sandy Silt to Clayey Silt	395.13	3.691	5.98	2.881	3.099	1.69	0.5117	0.50	0.428	1.690	0.51	202.20	1.031	208.490		0.67	1		319.33	319.33
99.409	6	Sandy Silt to Clayey Silt	368.92	2.712	6.009	2.896	3.113	1.66	0.5101	0.50	0.428	1.660	0.51	188.18	1.010	190.139		0.67	1		318.42	318.42
99.902	6	Sandy Silt to Clayey Silt	361.52	3.929	6.039	2.911	3.128	1.78	0.5083	0.50	0.427	1.780	0.51	183.76	1.092	200.734		0.68	1		315.84	315.84
100.39	6	Sandy Silt to Clayey Silt	295.62	3.711	6.069	2.927	3.142	1.87	0.5067	0.50	0.426	1.870	0.51	149.78	1.162	174.022		0.70	1		311.38	311.38
100.89	6	Sandy Silt to Clayey Silt	295.84	3.228	6.099	2.942	3.157	1.89	0.5049	0.50	0.426	1.890	0.50	149.38	1.180	176.201		0.71	1		309.80	309.80
101.38	6	Sandy Silt to Clayey Silt	316.34	4.232	6.128	2.957	3.171	1.88	0.5033	0.50	0.425	1.880	0.50	159.22	1.171	186.380		0.70	1		313.24	313.24
101.87	6	Sandy Silt to Clayey Silt	397.96	3.427	6.158	2.973	3.185	1.66	0.5017	0.50	0.424	1.660	0.50	199.66	1.010	201.739		0.65	1		324.99	324.99
102.36	7	Silty Sand to Sandy Silt	563.9	3.037	6.188	2.988	3.2	1.44	0.5	0.49	0.424	1.440	0.50	281.95	1.000	281.948		0.63	1		335.07	335.07

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project*** *FAULT INFO*
PROJECT NO. ***2017-125-GEO*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-69*** *FAULT M_w =* 6.9 *MSF =* 1.24 *a_{max} (g)=* 0.682 V_{S30m}(m/s)= #REF! 222.2

		CPT RESULT INPUT							***CSR***				***$CRR_{7.5}$***				***F.S.=($CRR_{7.5}$/CSR)*MSF*Kσ*Kα***				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
102.85	7	Silty Sand to Sandy Silt	511.1	2.772	6.218	3.003	3.214	1.4	0.4984	0.49	0.423	1.400	0.50	254.74	1.000	254.738		0.63	1		334.71	334.71
103.35	7	Silty Sand to Sandy Silt	435.26	2.422	6.247	3.019	3.228	1.54	0.4968	0.49	0.423	1.540	0.50	216.25	1.000	216.254		0.64	1		327.15	327.15
103.84	6	Sandy Silt to Clayey Silt	316.04	4.326	6.277	3.034	3.243	1.83	0.4952	0.49	0.422	1.830	0.50	156.49	1.129	176.709		0.69	1		316.96	316.96
104.33	6	Sandy Silt to Clayey Silt	382.46	3.929	6.307	3.05	3.257	1.67	0.4936	0.49	0.422	1.670	0.49	188.79	1.017	192.066		0.65	1		326.30	326.30
104.82	7	Silty Sand to Sandy Silt	565.27	2.477	6.337	3.065	3.272	1.37	0.4919	0.49	0.421	1.370	0.49	278.09	1.000	278.086		0.62	1		339.17	339.17
105.32	7	Silty Sand to Sandy Silt	570.34	2.697	6.366	3.08	3.286	1.35	0.4904	0.49	0.420	1.350	0.49	279.70	1.000	279.702		0.62	1		341.08	341.08
105.81	7	Silty Sand to Sandy Silt	551.29	2.943	6.396	3.096	3.3	1.41	0.4889	0.49	0.420	1.410	0.49	269.52	1.000	269.519		0.62	1		339.93	339.93
106.3	7	Silty Sand to Sandy Silt	474.82	3.211	6.426	3.111	3.315	1.48	0.4873	0.49	0.419	1.480	0.49	231.36	1.000	231.362		0.62	1		334.42	334.42
106.79	6	Sandy Silt to Clayey Silt	322.98	2.45	6.456	3.126	3.329	1.81	0.4858	0.49	0.419	1.810	0.49	156.89	1.114	174.776		0.70	1		315.24	315.24
107.28	5	Clayey Silt to Silty Clay	117.73	2.954	6.485	3.142	3.344	2.49	0.4842	0.49	0.418	2.490	0.48	57.00	2.718	154.952	0.43	0.79	1	(0.99)	284.42	116.42
107.78	4	Silty Clay to Clay	62.459	2.791	6.515	3.157	3.358	2.83	0.4827	0.49	0.418							0.78	1		453.46	453.46
108.27	5	Clayey Silt to Silty Clay	44.099	0.865	6.545	3.173	3.372	2.92	0.4812	0.48	0.417							0.78	1		338.40	338.40
108.76	5	Clayey Silt to Silty Clay	48.503	1.446	6.575	3.188	3.387	2.71	0.4796	0.48	0.417							0.78	1		470.46	470.46
109.25	6	Sandy Silt to Clayey Silt	256.69	2.896	6.604	3.203	3.401	2.06	0.4782	0.48	0.416	2.060	0.48	122.74	1.387	170.205		0.75	1		304.81	304.81
109.74	6	Sandy Silt to Clayey Silt	302.17	2.793	6.634	3.219	3.415	1.86	0.4767	0.48	0.416	1.860	0.48	144.04	1.153	166.133		0.70	1		316.48	316.48
110.24	6	Sandy Silt to Clayey Silt	270.58	4.427	6.664	3.234	3.43	2	0.4752	0.48	0.415	2.000	0.48	128.57	1.300	167.140		0.72	1		313.98	313.98
110.73	6	Sandy Silt to Clayey Silt	268.72	3.224	6.694	3.249	3.444	2.03	0.4737	0.48	0.415	2.030	0.47	127.30	1.341	170.737		0.73	1		312.08	312.08
111.22	6	Sandy Silt to Clayey Silt	255.07	4.324	6.723	3.265	3.459	2.05	0.4722	0.48	0.414	2.050	0.47	120.44	1.371	165.135		0.73	1		311.86	311.86
111.71	6	Sandy Silt to Clayey Silt	266.85	3.75	6.753	3.28	3.473	2	0.4708	0.48	0.414	2.000	0.47	125.63	1.300	163.319		0.71	1		315.22	315.22
112.21	6	Sandy Silt to Clayey Silt	306.85	3.627	6.783	3.295	3.487	1.83	0.4694	0.48	0.413	1.830	0.47	144.03	1.129	162.634		0.68	1		323.61	323.61
112.7	7	Silty Sand to Sandy Silt	530.59	2.872	6.813	3.311	3.502	1.51	0.4679	0.48	0.413	1.510	0.47	248.25	1.000	248.254		0.61	1		340.00	340.00
113.19	7	Silty Sand to Sandy Silt	561.01	2.716	6.842	3.326	3.516	1.41	0.4665	0.48	0.412	1.410	0.47	261.71	1.000	261.707		0.60	1		345.23	345.23
113.68	7	Silty Sand to Sandy Silt	505.76	2.997	6.872	3.342	3.531	1.42	0.465	0.48	0.412	1.420	0.47	235.19	1.000	235.187		0.60	1		343.52	343.52

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME	***Eastridge to BART Regional Connector Project***	*FAULT INFO*			
PROJECT NO.	***2017-125-GEO***	*COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*			
CPT NO.	***CPT-AS-71***	*FAULT M_w =* 6.9	*MSF =* 1.24	*a_{max} (g)=* 0.682	V_{S30m}(m/s)= #REF! 239.5

			CPT RESULT INPUT							***CSR***		***$CRR_{7.5}$***						***F.S.=($CRR_{7.5}$/CSR)*MSF*K σ*K α***				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
0.492			-9999	-9999	0.03		0.03		1.7	1.00	0.444							1.00			0.00	0.00
0.984			-9999	-9999	0.059		0.059		1.7	1.00	0.443							1.00			0.00	0.00
1.476			-9999	-9999	0.089		0.089		1.7	1.00	0.443							1.00			0.00	0.00
1.968			-9999	-9999	0.119		0.119		1.6679	1.00	0.442							1.00			0.00	0.00
2.461			-9999	-9999	0.149		0.149		1.6308	1.00	0.442							1.00			0.00	0.00
2.953			-9999	-9999	0.178		0.178		1.5965	1.00	0.441							1.00			0.00	0.00
3.445			-9999	-9999	0.208		0.208		1.5625	0.99	0.441							1.00			0.00	0.00
3.937			-9999	-9999	0.238		0.238		1.5299	0.99	0.440										0.00	0.00
4.429			-9999	-9999	0.268		0.268		1.4986	0.99	0.440										0.00	0.00
4.921			-9999	-9999	0.297		0.297		1.4696	0.99	0.439										0.00	0.00
5.413	4	Silty Clay to Clay	28.959	1.042	0.327		0.327	2.33	1.4407	0.99	0.439	2.330	1.44	41.72	2.049	85.478	0.14				126.16	126.16
5.906	4	Silty Clay to Clay	16.984	0.528	0.357		0.357	2.52	1.413	0.99	0.438	2.520	1.41	24.00	2.872	68.913	0.11				119.84	119.84
6.398	4	Silty Clay to Clay	15.374	0.357	0.387		0.387	2.53	1.3863	0.99	0.438	2.530	1.39	21.31	2.925	62.334	0.10				119.73	119.73
6.89	4	Silty Clay to Clay	15.057	0.374	0.416		0.416	2.55	1.3614	0.99	0.437	2.550	1.36	20.50	3.034	62.197	0.10				121.51	121.51
7.382	4	Silty Clay to Clay	14.362	0.172	0.446		0.446	2.47	1.3366	0.98	0.437	2.470	1.34	19.20	2.621	50.318	0.09	1.00	0		123.58	123.58
7.874	4	Silty Clay to Clay	16.792	0.17	0.476	0.004	0.472	2.37	1.3158	0.98	0.440	2.370	1.32	22.09	2.194	48.477	0.09	1.00	1	(0.25)	127.63	75.40
8.366	4	Silty Clay to Clay	19.242	0.372	0.506	0.019	0.486	2.35	1.3049	0.98	0.454	2.350	1.30	25.11	2.120	53.221	0.09	1.00	1	(0.26)	135.15	107.96
8.858	5	Clayey Silt to Silty Clay	67.717	0.729	0.535	0.035	0.501	2.03	1.2934	0.98	0.465	2.030	1.29	87.58	1.341	117.466	0.23	1.00	1	(0.61)	152.69	152.69
9.35	5	Clayey Silt to Silty Clay	65.184	1.314	0.565	0.05	0.515	2.11	1.2828	0.98	0.477	2.110	1.28	83.62	1.473	123.183	0.25	1.00	1	(0.66)	154.49	154.49
9.843	4	Silty Clay to Clay	22.875	0.779	0.595	0.065	0.53	2.47	1.2717	0.98	0.487	2.470	1.27	29.09	2.621	76.253	0.12	1.00	1	(0.31)	141.70	141.70
10.335	4	Silty Clay to Clay	18.498	0.522	0.625	0.081	0.544	2.59	1.2615	0.98	0.498	2.590	1.26	23.33	3.266	76.212	0.12	1.00	1	(0.30)	134.63	91.33
10.827	4	Silty Clay to Clay	13.268	0.349	0.654	0.096	0.558	2.66	1.2514	0.98	0.508							1.00	1		161.15	161.15
11.319	4	Silty Clay to Clay	13.296	0.291	0.684	0.111	0.573	2.7	1.2408	0.98	0.517							1.00	1		151.30	151.30
11.811	3	Clay	10.791	0.301	0.714	0.127	0.587	2.76	1.2311	0.98	0.526							1.00	1		139.73	139.73
12.303	4	Silty Clay to Clay	10.484	0.218	0.744	0.142	0.602	2.76	1.2209	0.97	0.534							1.00	1		135.90	135.90
12.795	3	Clay	10.708	0.228	0.773	0.158	0.616	2.77	1.2115	0.97	0.541							1.00	1		138.01	138.01
13.287	4	Silty Clay to Clay	13.048	0.349	0.803	0.173	0.63	2.55	1.2022	0.97	0.549	2.550	1.20	15.69	3.034	47.595	0.09	1.00	1	(0.20)	138.93	75.40
13.78	5	Clayey Silt to Silty Clay	22.469	0.309	0.833	0.188	0.645	2.37	1.1924	0.97	0.556	2.370	1.19	26.79	2.194	58.784	0.10	1.00	1	(0.22)	145.96	83.24
14.272	5	Clayey Silt to Silty Clay	34.905	0.274	0.863	0.204	0.659	2.29	1.1834	0.97	0.563	2.290	1.18	41.31	1.917	79.189	0.13	1.00	1	(0.28)	148.83	91.33
14.764	4	Silty Clay to Clay	13.378	0.275	0.892	0.219	0.674	2.56	1.174	0.97	0.569	2.560	1.17	15.71	3.091	48.538	0.09	1.00	1	(0.20)	140.72	67.90
15.256	3	Clay	8.337	0.22	0.922	0.234	0.688	2.94	1.1653	0.97	0.575							1.00	1		118.60	118.60
15.748	3	Clay	8.836	0.244	0.952	0.25	0.702	2.97	1.1567	0.97	0.581							1.00	1		118.25	118.25
16.24	3	Clay	8.052	0.24	0.982	0.265	0.717	3	1.1476	0.97	0.586							1.00	1		115.46	115.46
16.732	3	Clay	8.065	0.194	1.011	0.28	0.731	2.98	1.1393	0.96	0.591							1.00	1		114.31	114.31
17.224	3	Clay	9.304	0.234	1.041	0.296	0.745	2.96	1.1311	0.96	0.597							1.00	1		122.57	122.57
17.717	3	Clay	9.965	0.3	1.071	0.311	0.76	2.95	1.1224	0.96	0.601							1.00	1		131.44	131.44
18.209	3	Clay	11.672	0.379	1.101	0.327	0.774	2.93	1.1145	0.96	0.606							1.00	1		142.06	142.06
18.701	3	Clay	12.442	0.403	1.13	0.342	0.789	2.9	1.1061	0.96	0.610							1.00	1		150.61	150.61
19.193	3	Clay	15.47	0.359	1.16	0.357	0.803	2.83	1.0984	0.96	0.614							1.00	1		160.10	160.10
19.685	4	Silty Clay to Clay	13.554	0.331	1.19	0.373	0.817	2.82	1.0907	0.96	0.618							1.00	1		158.35	158.35
20.177	3	Clay	10.791	0.339	1.22	0.388	0.832	2.91	1.0827	0.96	0.622							1.00	1		144.05	144.05
20.669	3	Clay	10.653	0.294	1.249	0.403	0.846	2.94	1.0753	0.96	0.625							1.00	1		139.80	139.80
21.161	3	Clay	15.58	0.447	1.279	0.419	0.861	2.91	1.0674	0.95	0.628							1.00	1		152.86	152.86
21.654	3	Clay	10.213	0.269	1.309	0.434	0.875	2.97	1.0602	0.95	0.632							1.00	1		138.38	138.38
22.146	4	Silty Clay to Clay	10.226	0.19	1.339	0.449	0.889	2.89	1.0531	0.95	0.635							1.00	1		133.34	133.34
22.638	4	Silty Clay to Clay	10.846	0.156	1.368	0.465	0.904	2.82	1.0456	0.95	0.637							1.00	1		140.73	140.73
23.13	4	Silty Clay to Clay	11.562	0.225	1.398	0.48	0.918	2.77	1.0387	0.95	0.640							1.00	1		162.78	162.78
23.622	4	Silty Clay to Clay	43.218	0.948	1.428	0.496	0.932	2.7	1.0319	0.95	0.643							1.00	1		235.42	235.42
24.114	3	Clay	17.535	0.762	1.458	0.511	0.947	2.89	1.0247	0.94	0.645							1.00	1		201.21	201.21
24.606	3	Clay	16.021	0.542	1.487	0.526	0.961	2.94	1.018	0.94	0.647							1.00	1		168.58	168.58
25.098	3	Clay	12.883	0.391	1.517	0.542	0.976	2.98	1.011	0.94	0.649							1.00	1		154.43	154.43
25.591	3	Clay	13.24	0.412	1.547	0.557	0.99	2.94	1.0046	0.94	0.651							1.00	1		166.44	166.44
26.083	3	Clay	21.774	0.859	1.577	0.572	1.004	2.86	0.9982	0.94	0.653							1.00	1		205.80	205.80
26.575	4	Silty Clay to Clay	24.967	0.929	1.606	0.588	1.019	2.79	0.9914	0.94	0.654							1.00	1		229.53	229.53
27.067	4	Silty Clay to Clay	26.123	0.918	1.636	0.603	1.033	2.76	0.9852	0.93	0.656							0.99	1		236.00	236.00
27.559	4	Silty Clay to Clay	25.621	0.877	1.666	0.618	1.048	2.76	0.9786	0.93	0.657							0.99	1		234.57	234.57
28.051	4	Silty Clay to Clay	25.27	0.87	1.696	0.634	1.062	2.77	0.9726	0.93	0.658							0.99	1		232.44	232.44
28.543	4	Silty Clay to Clay	25.297	0.846	1.725	0.649	1.076	2.76	0.9666	0.93	0.659							0.99	1		236.29	236.29
29.035	4	Silty Clay to Clay	27.775	0.975	1.755	0.665	1.091	2.75	0.9603	0.93	0.660							0.98	1		243.04	243.04
29.528	4	Silty Clay to Clay	26.509	0.844	1.785	0.68	1.105	2.78	0.9544	0.92	0.661							0.98	1		234.79	234.79
30.02	4	Silty Clay to Clay	22.49	0.703	1.815	0.695	1.119	2.82	0.9487	0.92	0.662							0.98	1		218.63	218.63
30.512	4	Silty Clay to Clay	22.517	0.682	1.844	0.711	1.134	2.81	0.9426	0.92	0.662							0.98	1		216.06	216.06
31.004	4	Silty Clay to Clay	19.985	0.701	1.874	0.726	1.148	2.91	0.937	0.92	0.662							0.97	1		196.80	196.80
31.496	3	Clay	12.855	0.444	1.904	0.741	1.163	3.05	0.931	0.91	0.662							0.97	1		158.40	158.40
31.988	3	Clay	12.377	0.3	1.934	0.757	1.177	3.03	0.9255	0.91	0.663							0.97	1		150.98	150.98
32.48	4	Silty Clay to Clay	15.498	0.466	1.963	0.772	1.191	2.85	0.9201	0.91	0.663							0.97	1		211.65	211.65
32.972	5	Clayey Silt to Silty Clay	44.539	1.635	1.993	0.787	1.206	2.25	0.9144	0.90	0.662	2.250	0.91	40.73	1.798	73.235	0.12	0.96	1	(0.21)	200.91	168.05
33.465	6	Sandy Silt to Clayey Silt	241.63	2.663	2.023	0.803	1.22	1.68	0.9091	0.90	0.662	1.680	0.91	219.67	1.024	224.997		0.93	1		230.48	230.48
33.957	6	Sandy Silt to Clayey Silt	285.93	1.442	2.053	0.818	1.235	1.45	0.9035	0.90	0.662	1.450	0.90	258.33	1.000	258.331		0.92	1		240.22	240.22
34.449	6	Sandy Silt to Clayey Silt	345.49	2.114	2.082	0.834	1.249	1.43	0.8983	0.89	0.661	1.430	0.90	310.37	1.000	310.366		0.91	1		246.77	246.77
34.941	6	Sandy Silt to Clayey Silt	474.82	4.875	2.112	0.849	1.263	1.39	0.8932	0.89	0.661	1.390	0.89	424.12	1.000	424.116		0.91	1		256.37	256.37
35.433	7	Silty Sand to Sandy Silt	511.26	2.867	2.142	0.864	1.278	1.25	0.8878	0.89	0.659	1.250	0.89	453.91	1.000	453.907		0.91	1		260.29	260.29
35.925	7	Silty Sand to Sandy Silt	474.43	1.745	2.172	0.88	1.292	1.23	0.8828	0.88	0.659	1.230	0.88	418.84	1.000	418.840		0.90	1		256.65	256.65
36.417	6	Sandy Silt to Clayey Silt	277.83	1.618	2.201	0.895	1.306	1.42	0.8779	0.88	0.658	1.420	0.88	243.91	1.000	243.908		0.90	1		243.97	243.97
36.909	6	Sandy Silt to Clayey Silt	114.4	1.054	2.231	0.91	1.321	1.84	0.8727	0.88	0.656	1.840	0.87	99.84	1.137	113.517	0.22	0.93	1	(0.38)	220.67	220.00
37.402	5	Clayey Silt to Silty Clay	34.602	0.743	2.261	0.926	1.335	2.52	0.8679	0.87	0.655	2.520	0.87	30.03	2.872	86.233	0.14	0.94	1	(0.25)	189.38	83.24
37.894	4	Silty Clay to Clay	28.215	0.52	2.291	0.941	1.35	2.66	0.8627	0.87	0.654							0.94	1		250.83	250.83
38.386	4	Silty Clay to Clay	27.995	0.598	2.32	0.956	1.364	2.69	0.858	0.86	0.652							0.94	1		250.67	250.67
38.878	4	Silty Clay to Clay	31.134	0.684	2.35	0.972	1.378	2.69	0.8534	0.86	0.651							0.94	1		262.85	262.85
39.37	4	Silty Clay to Clay	38.924	0.998	2.38	0.987	1.393	2.68	0.8484	0.86	0.649							0.94	1		281.15	281.15
39.862	4	Silty Clay to Clay	23.976	1.027	2.41	1.003	1.407	2.84	0.8439	0.85	0.647							0.93	1		239.79	239.79
40.354	4	Silty Clay to Clay	17.177	0.463	2.439	1.018	1.422	2.98	0.8391	0.85	0.645							0.93	1		187.96	187.96
40.846	4	Silty Clay to Clay	16.103	0.341	2.469	1.033	1.436	2.97	0.8346	0.84	0.643							0.93	1		175.74	175.74
41.339	4	Silty Clay to Clay	16.296	0.395	2.499	1.049	1.45	2.98	0.8302	0.84	0.641							0.93	1		175.58	175.58
41.831	4	Silty Clay to Clay	17.311	0.303	2.529	1.064	1.465	2.91	0.8255	0.83	0.639							0.93	1		182.84	182.84
42.323	4	Silty Clay to Clay	21.746	0.29	2.558	1.079	1.479	2.77	0.8212	0.83	0.636							0.92	1		205.85	205.85
42.815	4	Silty Clay to Clay	21.746	0.345	2.588	1.095	1.493	2.76	0.8169	0.83	0.634							0.92	1		213.29	213.29
43.307	4	Silty Clay to Clay	21.031	0.425	2.618	1.11	1.508	2.86	0.8124	0.82	0.631							0.92	1		203.73	203.73
43.799	4	Silty Clay to Clay	19.035	0.47	2.648	1.125	1.522	2.9	0.8082	0.82	0.629							0.92	1		197.27	197.27
44.291	4	Silty Clay to Clay	23.096	0.32	2.677	1.141	1.537	2.77	0.8038	0.81	0.626							0.92	1		214.14	214.14
44.783	4	Silty Clay to Clay	28.738	0.544	2.707	1.156	1.551	2.74	0.7997	0.81	0.623							0.92	1		249.27	249.27
45.276	4	Silty Clay to Clay	34.987	0.842	2.737	1.172	1.565	2.76	0.7957	0.80	0.621							0.91	1		269.56	269.56
45.768	4	Silty Clay to Clay	30.631	0.882	2.767	1.187	1.58	2.77	0.7914	0.80	0.618							0.91	1		262.46	262.46
46.26	4	Silty Clay to Clay	30.06	0.534	2.796	1.202	1.594	2.7	0.7874	0.79	0.615							0.91	1		261.59	261.59
46.752	5	Clayey Silt to Silty Clay	38.703	0.727	2.826	1.218	1.609	2.67	0.7832	0.79	0.612							0.91	1		283.29	283.29
47.244	5	Clayey Silt to Silty Clay	33.501	0.874	2.856	1.233	1.623	2.61	0.7793	0.78	0.609							0.91	1		321.40	321.40
47.736	5	Clayey Silt to Silty Clay	83.903	2.443	2.886	1.248	1.637	2.43	0.7755	0.78	0.606	2.430	0.78	65.06	2.439	158.693	0.45	0.91	1	(0.84)	220.21	150.76
48.228	6	Sandy Silt to Clayey Silt	178.71	3.673	2.915	1.264	1.652	2.06	0.7714	0.77	0.603	2.060	0.77	137.85	1.387	191.164		0.86	1		245.91	245.91
48.72	6	Sandy Silt to Clayey Silt	367.3	5.462	2.945	1.279	1.666	1.78	0.7676	0.77	0.600	1.780	0.77	281.94	1.092	307.980		0.82	1		264.20	264.20
49.213	6	Sandy Silt to Clayey Silt	359.23	5.665	2.975	1.294	1.68	1.78	0.7639	0.76	0.597	1.780	0.76	274.41	1.092	299.753		0.81	1		268.14	268.14
49.705	6	Sandy Silt to Clayey Silt	354.83	8.472	3.005	1.31	1.695	1.87	0.7599	0.76	0.594	1.870	0.76	269.64	1.162	313.281		0.81	1		266.63	266.63
50.197	6	Sandy Silt to Clayey Silt	318.85	4.731	3.034	1.325	1.709	1.78	0.7563	0.75	0.591	1.780	0.76	241.14	1.092	263.407		0.81	1		266.65	266.65

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project*** *FAULT INFO*
PROJECT NO. ***2017-125-GEO*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-71*** *FAULT* M_w = 6.9 *MSF* = 1.24 a_{max} *(g)*= 0.682 V_{S30m}(m/s)= #REF! 239.5

		CPT RESULT INPUT							***CSR***		***CRR*** $_{7.5}$						***F.S.=(CRR*** $_{7.5}$ ***/CSR)*MSF*K*** σ ****K*** α				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
50.689	6	Sandy Silt to Clayey Silt	366.94	4.08	3.064	1.341	1.724	1.69	0.7524	0.75	0.588	1.690	0.75	276.08	1.031	284.663		0.80	1		268.46	268.46
51.181	6	Sandy Silt to Clayey Silt	259.27	4.046	3.094	1.356	1.738	1.8	0.7488	0.74	0.585	1.800	0.75	194.14	1.107	214.847		0.81	1		262.45	262.45
51.673	6	Sandy Silt to Clayey Silt	315.88	4.252	3.124	1.371	1.752	1.76	0.7453	0.74	0.582	1.760	0.75	235.41	1.078	253.873		0.81	1		263.11	263.11
52.165	6	Sandy Silt to Clayey Silt	235.47	1.764	3.153	1.387	1.767	1.75	0.7415	0.73	0.578	1.750	0.74	174.60	1.072	187.098		0.83	1		255.40	255.40
52.657	5	Clayey Silt to Silty Clay	66.534	1.473	3.183	1.402	1.781	2.23	0.738	0.73	0.575	2.230	0.74	49.10	1.743	85.609	0.14	0.89	1	(0.27)	228.47	142.13
53.15	5	Clayey Silt to Silty Clay	37.079	0.671	3.213	1.417	1.796	2.64	0.7343	0.72	0.572							0.89	1		309.86	309.86
53.642	5	Clayey Silt to Silty Clay	39.116	0.895	3.243	1.433	1.81	2.71	0.7309	0.72	0.569							0.89	1		291.10	291.10
54.134	4	Silty Clay to Clay	33.459	0.903	3.272	1.448	1.824	2.76	0.7275	0.71	0.566							0.89	1		284.26	284.26
54.626	5	Clayey Silt to Silty Clay	37.465	0.755	3.302	1.463	1.839	2.74	0.7239	0.71	0.563							0.89	1		283.32	283.32
55.118	4	Silty Clay to Clay	26.729	0.525	3.332	1.479	1.853	2.81	0.7206	0.70	0.560							0.88	1		252.59	252.59
55.61	4	Silty Clay to Clay	28.092	0.601	3.362	1.494	1.867	2.8	0.7173	0.70	0.557							0.88	1		245.19	245.19
56.102	5	Clayey Silt to Silty Clay	26.092	0.374	3.391	1.51	1.882	2.77	0.7138	0.69	0.554							0.88	1		240.73	240.73
56.594	4	Silty Clay to Clay	27.764	0.391	3.421	1.525	1.896	2.87	0.7106	0.69	0.551							0.88	1		247.87	247.87
57.087	4	Silty Clay to Clay	42.887	1.095	3.451	1.54	1.911	2.86	0.7072	0.68	0.548							0.88	1		303.70	303.70
57.579	4	Silty Clay to Clay	78.893	2.594	3.481	1.556	1.925	2.75	0.704	0.68	0.545							0.88	1		362.77	362.77
58.071	4	Silty Clay to Clay	27.913	0.849	3.51	1.571	1.939	2.83	0.7009	0.68	0.542							0.88	1		284.62	284.62
58.563	4	Silty Clay to Clay	24.348	0.409	3.54	1.586	1.954	2.85	0.6975	0.67	0.539							0.87	1		235.30	235.30
59.055	4	Silty Clay to Clay	23.412	0.404	3.57	1.602	1.968	2.89	0.6944	0.67	0.536							0.87	1		224.81	224.81
59.547	4	Silty Clay to Clay	28.381	0.561	3.6	1.617	1.983	2.88	0.6912	0.66	0.534							0.87	1		242.17	242.17
60.039	4	Silty Clay to Clay	28.298	0.984	3.629	1.632	1.997	2.97	0.6881	0.66	0.531							0.87	1		244.99	244.99
60.532	4	Silty Clay to Clay	24.334	0.752	3.659	1.648	2.011	3.03	0.6851	0.65	0.528							0.87	1		226.34	226.34
61.024	4	Silty Clay to Clay	21.52	0.365	3.689	1.663	2.026	2.97	0.682	0.65	0.526							0.87	1		211.78	211.78
61.516	4	Silty Clay to Clay	22.435	0.35	3.719	1.679	2.04	2.9	0.679	0.65	0.523							0.87	1		219.05	219.05
62.008	5	Clayey Silt to Silty Clay	24.527	0.328	3.748	1.694	2.054	2.85	0.6761	0.64	0.520							0.87	1		227.83	227.83
62.5	5	Clayey Silt to Silty Clay	25.16	0.349	3.778	1.709	2.069	2.84	0.673	0.64	0.518							0.86	1		232.39	232.39
62.992	5	Clayey Silt to Silty Clay	28.601	0.408	3.808	1.725	2.083	2.84	0.6701	0.64	0.516							0.86	1		250.58	250.58
63.484	5	Clayey Silt to Silty Clay	75.728	1.884	3.838	1.74	2.098	2.63	0.6671	0.63	0.513							0.86	1		410.53	410.53
63.976	5	Clayey Silt to Silty Clay	81.839	2.382	3.867	1.755	2.112	2.53	0.6643	0.63	0.511	2.530	0.66	54.36	2.925	158.995	0.45	0.86	1	(0.95)	236.75	124.95
64.469	5	Clayey Silt to Silty Clay	97.983	2.239	3.897	1.771	2.126	2.43	0.6615	0.63	0.508	2.430	0.66	64.81	2.439	158.076	0.45	0.86	1	(0.94)	241.34	133.52
64.961	5	Clayey Silt to Silty Clay	96.951	3.49	3.927	1.786	2.141	2.46	0.6585	0.62	0.506	2.460	0.66	63.84	2.574	164.344		0.86	1		243.26	243.26
65.453	5	Clayey Silt to Silty Clay	48.173	2.066	3.957	1.801	2.155	2.67	0.6557	0.62	0.504							0.86	1		410.07	410.07
65.945	4	Silty Clay to Clay	28.326	0.529	3.986	1.817	2.17	2.88	0.6528	0.62	0.502							0.86	1		259.83	259.83
66.437	5	Clayey Silt to Silty Clay	27.885	0.5	4.016	1.832	2.184	2.86	0.6501	0.61	0.499							0.86	1		246.96	246.96
66.929	5	Clayey Silt to Silty Clay	28.226	0.365	4.046	1.848	2.198	2.82	0.6474	0.61	0.497							0.85	1		247.30	247.30
67.421	4	Silty Clay to Clay	26.289	0.447	4.076	1.863	2.213	2.89	0.6446	0.61	0.495							0.85	1		237.42	237.42
67.913	4	Silty Clay to Clay	23.894	0.475	4.105	1.878	2.227	2.96	0.642	0.60	0.493							0.85	1		228.78	228.78
68.406	4	Silty Clay to Clay	25.325	0.557	4.135	1.894	2.241	3	0.6393	0.60	0.491							0.85	1		231.46	231.46
68.898	5	Clayey Silt to Silty Clay	41.181	1.147	4.165	1.909	2.256	2.76	0.6366	0.60	0.489							0.85	1		317.06	317.06
69.39	5	Clayey Silt to Silty Clay	37.134	0.795	4.195	1.924	2.27	2.71	0.634	0.60	0.488							0.85	1		318.27	318.27
69.882	5	Clayey Silt to Silty Clay	26.123	0.301	4.224	1.94	2.285	2.83	0.6313	0.59	0.486							0.85	1		244.97	244.97
70.374	5	Clayey Silt to Silty Clay	28.959	0.236	4.254	1.955	2.299	2.74	0.6288	0.59	0.484							0.85	1		246.66	246.66
70.866	5	Clayey Silt to Silty Clay	27.582	0.215	4.284	1.97	2.313	2.74	0.6262	0.59	0.482							0.85	1		246.91	246.91
71.358	5	Clayey Silt to Silty Clay	31.574	0.41	4.314	1.986	2.328	2.8	0.6236	0.58	0.480							0.84	1		268.73	268.73
71.85	4	Silty Clay to Clay	37.74	0.889	4.343	2.001	2.342	2.87	0.6211	0.58	0.479							0.84	1		284.84	284.84
72.343	4	Silty Clay to Clay	27.115	0.708	4.373	2.017	2.357	2.96	0.6185	0.58	0.477							0.84	1		254.59	254.59
72.835	4	Silty Clay to Clay	27.335	0.52	4.403	2.032	2.371	2.93	0.6161	0.58	0.475							0.84	1		246.65	246.65
73.327	4	Silty Clay to Clay	28.105	0.591	4.433	2.047	2.385	2.9	0.6137	0.58	0.474							0.84	1		257.32	257.32
73.819	5	Clayey Silt to Silty Clay	30.259	0.449	4.462	2.063	2.4	2.85	0.6111	0.57	0.472							0.84	1		261.20	261.20
74.311	5	Clayey Silt to Silty Clay	29.283	0.48	4.492	2.078	2.414	2.89	0.6087	0.57	0.471							0.84	1		257.54	257.54
74.803	4	Silty Clay to Clay	35.813	0.764	4.522	2.093	2.428	2.91	0.6064	0.57	0.469							0.84	1		273.05	273.05
75.295	4	Silty Clay to Clay	37.41	0.687	4.552	2.109	2.443	2.88	0.6039	0.57	0.468							0.84	1		281.95	281.95
75.787	5	Clayey Silt to Silty Clay	33.755	0.711	4.581	2.124	2.457	2.86	0.6016	0.56	0.466							0.84	1		281.86	281.86
76.28	5	Clayey Silt to Silty Clay	35.4	0.699	4.611	2.139	2.472	2.83	0.5991	0.56	0.465							0.83	1		291.36	291.36
76.772	5	Clayey Silt to Silty Clay	38.676	0.658	4.641	2.155	2.486	2.8	0.5969	0.56	0.464							0.83	1		303.69	303.69
77.264	5	Clayey Silt to Silty Clay	42.64	1.114	4.671	2.17	2.5	2.75	0.5946	0.56	0.462							0.83	1		376.61	376.61
77.756	5	Clayey Silt to Silty Clay	133.48	2.528	4.7	2.186	2.515	2.41	0.5922	0.56	0.461	2.410	0.59	79.05	2.354	186.047		0.83	1		256.30	256.30
78.248	5	Clayey Silt to Silty Clay	81.013	2.642	4.73	2.201	2.529	2.54	0.59	0.55	0.460	2.540	0.59	47.80	2.979	142.381	0.35	0.83	1	(0.78)	252.83	116.42
78.74	4	Silty Clay to Clay	70.958	3.788	4.76	2.216	2.544	2.79	0.5876	0.55	0.458							0.83	1		454.88	454.88
79.232	5	Clayey Silt to Silty Clay	98.437	3.449	4.79	2.232	2.558	2.64	0.5854	0.55	0.457							0.83	1		528.77	528.77
79.724	4	Silty Clay to Clay	94.735	4.212	4.819	2.247	2.572	2.63	0.5832	0.55	0.456							0.83	1		549.44	549.44
80.217	4	Silty Clay to Clay	97.529	4.239	4.849	2.262	2.587	2.62	0.5809	0.55	0.455							0.83	1		565.51	565.51
80.709	5	Clayey Silt to Silty Clay	111.18	3.973	4.879	2.278	2.601	2.62	0.5788	0.55	0.454							0.83	1		550.86	550.86
81.201	4	Silty Clay to Clay	65.019	2.775	4.909	2.293	2.615	2.8	0.5767	0.54	0.453							0.83	1		429.61	429.61
81.693	4	Silty Clay to Clay	53.431	1.813	4.938	2.308	2.63	2.87	0.5744	0.54	0.452							0.82	1		363.53	363.53
82.185	4	Silty Clay to Clay	33.308	0.975	4.968	2.324	2.644	2.96	0.5723	0.54	0.451							0.82	1		288.74	288.74
82.677	4	Silty Clay to Clay	26.922	0.592	4.998	2.339	2.659	3.03	0.5701	0.54	0.449							0.82	1		246.81	246.81
83.169	4	Silty Clay to Clay	27.39	0.534	5.028	2.355	2.673	3	0.568	0.54	0.448							0.82	1		245.78	245.78
83.661	4	Silty Clay to Clay	28.849	0.642	5.057	2.37	2.687	2.97	0.566	0.54	0.447							0.82	1		256.99	256.99
84.154	5	Clayey Silt to Silty Clay	33.005	0.591	5.087	2.385	2.702	2.93	0.5638	0.53	0.446							0.82	1		269.03	269.03
84.646	5	Clayey Silt to Silty Clay	32.152	0.624	5.117	2.401	2.716	2.94	0.5618	0.53	0.445							0.82	1		264.62	264.62
85.138	4	Silty Clay to Clay	27.169	0.485	5.147	2.416	2.731	2.98	0.5597	0.53	0.444							0.82	1		247.62	247.62
85.63	5	Clayey Silt to Silty Clay	26.977	0.405	5.176	2.431	2.745	2.97	0.5577	0.53	0.444							0.82	1		242.58	242.58
86.122	5	Clayey Silt to Silty Clay	28.876	0.368	5.206	2.447	2.759	2.9	0.5557	0.53	0.443							0.82	1		256.72	256.72
86.614	5	Clayey Silt to Silty Clay	33.721	0.5	5.236	2.462	2.774	2.87	0.5536	0.53	0.442							0.82	1		274.27	274.27
87.106	5	Clayey Silt to Silty Clay	33.102	0.594	5.266	2.478	2.788	2.9	0.5517	0.53	0.441							0.81	1		275.43	275.43
87.598	4	Silty Clay to Clay	30.473	0.618	5.295	2.493	2.802	2.97	0.5497	0.53	0.440							0.81	1		266.43	266.43
88.091	4	Silty Clay to Clay	29.784	0.65	5.325	2.508	2.817	3.02	0.5477	0.52	0.439							0.81	1		257.10	257.10
88.583	4	Silty Clay to Clay	31.154	0.835	5.355	2.524	2.831	2.89	0.5458	0.52	0.438							0.81	1		319.96	319.96
89.075	5	Clayey Silt to Silty Clay	76.306	1.93	5.385	2.539	2.846	2.76	0.5437	0.52	0.437							0.81	1		394.93	394.93
89.567	4	Silty Clay to Clay	39.983	0.971	5.414	2.554	2.86	2.91	0.5419	0.52	0.437							0.81	1		322.04	322.04
90.059	4	Silty Clay to Clay	53.513	1.802	5.444	2.57	2.874	2.85	0.54	0.52	0.436							0.81	1		368.79	368.79
90.551	5	Clayey Silt to Silty Clay	86.133	1.532	5.474	2.585	2.889	2.69	0.538	0.52	0.435							0.81	1		423.62	423.62
91.043	5	Clayey Silt to Silty Clay	33.501	0.76	5.504	2.6	2.903	2.87	0.5362	0.52	0.434							0.81	1		315.41	315.41
91.535	5	Clayey Silt to Silty Clay	36.009	0.828	5.533	2.616	2.918	2.9	0.5342	0.52	0.433							0.81	1		305.28	305.28
92.028	5	Clayey Silt to Silty Clay	47.072	0.877	5.563	2.631	2.932	2.86	0.5324	0.51	0.433							0.81	1		319.44	319.44
92.52	4	Silty Clay to Clay	33.308	0.704	5.593	2.647	2.946	2.99	0.5306	0.51	0.432							0.81	1		274.14	274.14
93.012	4	Silty Clay to Clay	30.858	0.702	5.623	2.662	2.961	3.01	0.5287	0.51	0.431							0.80	1		265.56	265.56
93.504	5	Clayey Silt to Silty Clay	31.491	0.606	5.652	2.677	2.975	2.97	0.5269	0.51	0.431							0.80	1		270.00	270.00
93.996	5	Clayey Silt to Silty Clay	33.198	0.609	5.682	2.693	2.989	2.95	0.5252	0.51	0.430							0.80	1		277.71	277.71
94.488	4	Silty Clay to Clay	33.115	0.693	5.712	2.708	3.004	2.98	0.5233	0.51	0.429							0.80	1		276.94	276.94
94.98	4	Silty Clay to Clay	32.981	0.725	5.742	2.723	3.018	3.02	0.5216	0.51	0.429							0.80	1		276.07	276.07
95.472	5	Clayey Silt to Silty Clay	40.74	1.064	5.771	2.739	3.033	2.92	0.5197	0.51	0.428							0.80	1		315.37	315.37
95.965	5	Clayey Silt to Silty Clay	35.565	0.953	5.801	2.754	3.047	2.92	0.518	0.51	0.427							0.80	1		313.03	313.03
96.457	4	Silty Clay to Clay	34.106	0.858	5.831	2.769	3.061	3.02	0.5163	0.51	0.427							0.80	1		281.01	281.01
96.949	4	Silty Clay to Clay	33.425	0.696	5.861	2.785	3.076	3.01	0.5145	0.50	0.426							0.80	1		276.59	276.59
97.441	4	Silty Clay to Clay	33.191	0.688	5.89	2.8	3.09	3.01	0.5128	0.50	0.425							0.80	1		275.80	275.80
97.933	4	Silty Clay to Clay	39.336	0.94	5.92	2.816	3.105	2.99	0.511	0.50	0.425							0.80	1		298.80	298.80
98.425	4	Silty Clay to Clay	40.293	1.295	5.95	2.831	3.119	3	0.5094	0.50	0.424							0.80	1		313.91	313.91
98.917	4	Silty Clay to Clay	42.447	1.29	5.98	2.846	3.133	2.98	0.5077	0.50	0.424							0.80	1		323.82	323.82
99.409	5	Clayey Silt to Silty Clay	49.824	1.271	6.009	2.862	3.148	2.9	0.506	0.50	0.423							0.80	1		349.39	349.39
99.902	4	Silty Clay to Clay	58.936	1.538	6.039	2.877	3.162	2.94	0.5044	0.50	0.422							0.79	1		404.02	404.02
100.39	9	Sand	132.93	6.625	6.069	2.892	3.176	2.78	0.5027	0.50	0.422							0.79	1		585.51	585.51
100.89	9	Sand	115.39	5.892	6.099	2.908	3.191	2.73	0.501	0.50	0.421							0.79	1		598.15	598.15
101.38	4	Silty Clay to Clay	53.485	1.781	6.128	2.923	3.205	2.86	0.4994	0.50	0.421							0.79	1		413.54	413.54
101.87	4	Silty Clay to Clay	35.875	0.962	6.158	2.938	3.22	3	0.4977	0.50	0.420							0.79	1		298.33	298.33
102.36	4	Silty Clay to Clay	35.235	0.754	6.188	2.954	3.234	3.01	0.4962	0.49	0.419							0.79	1		285.87	285.87

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME	***Eastridge to BART Regional Connector Project***	*FAULT INFO*					
PROJECT NO.	***2017-125-GEO***	*COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*					
CPT NO.	***CPT-AS-71***	*FAULT M_w =*	6.9	*MSF =*	1.24	*a_{max} (g)=*	0.682

V_{S30m}(m/s)= #REF! 239.5

			CPT RESULT INPUT							***CSR***		***$CRR_{7.5}$***						***F.S.=($CRR_{7.5}$/CSR)*MSF*Kσ*Kα***				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
102.85	4	Silty Clay to Clay	35.4	0.942	6.218	2.969	3.248	3.05	0.4946	0.49	0.419							0.79	1		289.70	289.70
103.35	4	Silty Clay to Clay	37.024	1.21	6.247	2.985	3.263	3.08	0.4929	0.49	0.418							0.79	1		290.69	290.69
103.84	4	Silty Clay to Clay	34.003	0.882	6.277	3	3.277	3.07	0.4914	0.49	0.418							0.79	1		281.35	281.35
104.33	4	Silty Clay to Clay	33.886	0.828	6.307	3.015	3.292	3.05	0.4898	0.49	0.417							0.79	1		278.82	278.82
104.82	4	Silty Clay to Clay	32.93	0.717	6.337	3.031	3.306	3.04	0.4882	0.49	0.417							0.79	1		276.05	276.05
105.32	4	Silty Clay to Clay	35.565	0.967	6.366	3.046	3.32	3.06	0.4867	0.49	0.416							0.79	1		285.48	285.48
105.81	4	Silty Clay to Clay	37.079	1.189	6.396	3.061	3.335	3.07	0.4851	0.49	0.416							0.79	1		294.94	294.94
106.3	4	Silty Clay to Clay	36.997	1.032	6.426	3.077	3.349	3.06	0.4836	0.49	0.415							0.79	1		297.29	297.29
106.79	4	Silty Clay to Clay	47.017	1.014	6.456	3.092	3.363	2.98	0.4821	0.49	0.415							0.78	1		313.83	313.83
107.28	5	Clayey Silt to Silty Clay	42.117	0.878	6.485	3.107	3.378	2.95	0.4806	0.49	0.414							0.78	1		315.17	315.17
107.78	5	Clayey Silt to Silty Clay	41.676	1.043	6.515	3.123	3.392	2.97	0.4791	0.49	0.414							0.78	1		320.99	320.99
108.27	5	Clayey Silt to Silty Clay	44.567	1.22	6.545	3.138	3.407	2.92	0.4775	0.48	0.413							0.78	1		350.71	350.71
108.76	5	Clayey Silt to Silty Clay	65.515	1.807	6.575	3.154	3.421	2.81	0.4761	0.48	0.413							0.78	1		421.63	421.63
109.25	4	Silty Clay to Clay	75.425	2.705	6.604	3.169	3.435	2.78	0.4746	0.48	0.412							0.78	1		499.49	499.49
109.74	8	Sand to Silty Sand	173.89	7.342	6.634	3.184	3.45	2.63	0.4731	0.48	0.412							0.78	1		686.95	686.95
110.24	8	Sand to Silty Sand	158.61	6.493	6.664	3.2	3.464	2.57	0.4717	0.48	0.411	2.570	0.47	74.82	3.148	235.521		0.78	1		292.71	292.71
110.73	5	Clayey Silt to Silty Clay	97.171	3.925	6.694	3.215	3.479	2.73	0.4702	0.48	0.411							0.78	1		552.49	552.49
111.22	4	Silty Clay to Clay	48.173	1.462	6.723	3.23	3.493	2.98	0.4688	0.48	0.410							0.78	1		359.23	359.23
111.71	4	Silty Clay to Clay	44.126	1.315	6.753	3.246	3.507	3.01	0.4674	0.48	0.410							0.78	1		331.21	331.21
112.21	4	Silty Clay to Clay	46.989	1.424	6.783	3.261	3.522	2.98	0.4659	0.48	0.409							0.78	1		350.30	350.30
112.7	5	Clayey Silt to Silty Clay	67.387	2.656	6.813	3.276	3.536	2.74	0.4645	0.48	0.409							0.78	1		523.07	523.07
113.19	8	Sand to Silty Sand	141.35	5.359	6.842	3.292	3.55	2.68	0.4632	0.48	0.408							0.78	1		626.09	626.09
113.68	9	Sand	83.27	4.131	6.872	3.307	3.565	2.89	0.4617	0.48	0.408							0.78	1		501.00	501.00
114.17	9	Sand	79.857	4.243	6.902	3.323	3.579	2.88	0.4603	0.48	0.407							0.77	1		491.61	491.61
114.67	4	Silty Clay to Clay	54.394	2.4	6.932	3.338	3.594	2.94	0.4589	0.48	0.407							0.77	1		413.62	413.62
115.16	4	Silty Clay to Clay	43.19	1.352	6.961	3.353	3.608	3.06	0.4576	0.48	0.406							0.77	1		327.65	327.65
115.65	4	Silty Clay to Clay	59.018	1.592	6.991	3.369	3.622	2.94	0.4562	0.47	0.406							0.77	1		375.27	375.27
116.14	5	Clayey Silt to Silty Clay	63.615	1.769	7.021	3.384	3.637	2.91	0.4548	0.47	0.406							0.77	1		395.03	395.03
116.63	4	Silty Clay to Clay	51.273	1.689	7.051	3.399	3.651	2.97	0.4535	0.47	0.405							0.77	1		372.07	372.07
117.13	4	Silty Clay to Clay	71.131	3.013	7.08	3.415	3.666	2.91	0.4521	0.47	0.405							0.77	1		451.84	451.84
117.62	4	Silty Clay to Clay	87.619	3.692	7.11	3.43	3.68	2.86	0.4508	0.47	0.404							0.77	1		500.11	500.11
118.11	4	Silty Clay to Clay	75.686	3.141	7.14	3.445	3.694	2.89	0.4495	0.47	0.404							0.77	1		467.19	467.19
118.6	4	Silty Clay to Clay	82.417	3.332	7.17	3.461	3.709	2.88	0.4482	0.47	0.403							0.77	1		488.71	488.71
119.09	9	Sand	96.593	4.585	7.199	3.476	3.723	2.78	0.4469	0.47	0.403							0.77	1		572.05	572.05
119.59	9	Sand	119.58	5.43	7.229	3.492	3.737	2.75	0.4456	0.47	0.403							0.77	1		620.39	620.39

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project*** *FAULT INFO*
PROJECT NO. ***2017-125-GEO*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-73*** *FAULT* M_w = 6.9 *MSF* = 1.24 a_{max} *(g)*= 0.682 V_{S30m}(m/s)= #REF! 237.6

			CPT RESULT INPUT							***CSR***		***CRR*** $_{7.5}$						***F.S.=(CRR*** $_{7.5}$ ***/CSR)*MSF*K*** σ ****K*** α				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
0.492			-9999	-9999	0.03		0.03		1.7	1.00	0.444							1.00			0.00	0.00
0.984			-9999	-9999	0.059		0.059		1.7	1.00	0.443							1.00			0.00	0.00
1.476			-9999	-9999	0.089		0.089		1.7	1.00	0.443							1.00			0.00	0.00
1.968			-9999	-9999	0.119		0.119		1.6679	1.00	0.442							1.00			0.00	0.00
2.461			-9999	-9999	0.149		0.149		1.6308	1.00	0.442							1.00			0.00	0.00
2.953			-9999	-9999	0.178		0.178		1.5965	1.00	0.441							1.00			0.00	0.00
3.445			-9999	-9999	0.208		0.208		1.5625	0.99	0.441							1.00			0.00	0.00
3.937			-9999	-9999	0.238		0.238		1.5299	0.99	0.440										0.00	0.00
4.429			-9999	-9999	0.268		0.268		1.4986	0.99	0.440										0.00	0.00
4.921			-9999	-9999	0.297		0.297		1.4696	0.99	0.439										0.00	0.00
5.413	4	Silty Clay to Clay	28.959	0.787	0.327		0.327	2.3	1.4407	0.99	0.439	2.300	1.44	41.72	1.949	81.305	0.13				126.26	126.26
5.906	4	Silty Clay to Clay	44.952	1.216	0.357		0.357	2.25	1.413	0.99	0.438	2.250	1.41	63.52	1.798	114.218	0.22				133.29	133.29
6.398	4	Silty Clay to Clay	32.84	0.942	0.387		0.387	2.34	1.3863	0.99	0.438	2.340	1.39	45.52	2.084	94.863	0.16				133.07	133.07
6.89	4	Silty Clay to Clay	31.381	0.979	0.416		0.416	2.38	1.3614	0.99	0.437	2.380	1.36	42.72	2.233	95.380	0.16				134.33	134.33
7.382	4	Silty Clay to Clay	30.748	0.996	0.446		0.446	2.41	1.3366	0.98	0.437	2.410	1.34	41.10	2.354	96.728	0.16	1.00	0		135.74	135.74
7.874	4	Silty Clay to Clay	26.419	0.667	0.476		0.476	2.42	1.3126	0.98	0.436	2.420	1.31	34.68	2.396	83.086	0.13	1.00	1		136.58	136.58
8.366	4	Silty Clay to Clay	32.702	0.784	0.506	0.013	0.492	2.4	1.3002	0.98	0.448	2.400	1.30	42.52	2.312	98.323	0.17	1.00	1	(0.47)	139.89	139.89
8.858	4	Silty Clay to Clay	36.281	0.941	0.535	0.029	0.507	2.41	1.2888	0.98	0.459	2.410	1.29	46.76	2.354	110.055	0.20	1.00	1	(0.55)	142.04	142.04
9.35	4	Silty Clay to Clay	25.793	0.873	0.565	0.044	0.521	2.52	1.2783	0.98	0.471	2.520	1.28	32.97	2.872	94.683	0.16	1.00	1	(0.42)	138.77	133.52
9.843	4	Silty Clay to Clay	22.407	0.64	0.595	0.059	0.536	2.56	1.2673	0.98	0.482	2.560	1.27	28.40	3.091	87.759	0.14	1.00	1	(0.37)	137.56	116.42
10.335	4	Silty Clay to Clay	17.81	0.649	0.625	0.075	0.55	2.6	1.2571	0.98	0.493							1.00	1		136.23	136.23
10.827	4	Silty Clay to Clay	14.864	0.492	0.654	0.09	0.564	2.67	1.2472	0.98	0.502							1.00	1		177.75	177.75
11.319	4	Silty Clay to Clay	20.37	0.622	0.684	0.105	0.579	2.52	1.2366	0.98	0.511	2.520	1.24	25.19	2.872	72.338	0.12	1.00	1	(0.28)	141.79	107.96
11.811	5	Clayey Silt to Silty Clay	43.713	0.946	0.714	0.121	0.593	2.33	1.227	0.98	0.521	2.330	1.23	53.64	2.049	109.885	0.20	1.00	1	(0.48)	151.48	150.76
12.303	5	Clayey Silt to Silty Clay	48.943	0.797	0.744	0.136	0.608	2.31	1.2168	0.97	0.529	2.310	1.22	59.55	1.981	117.992	0.23	1.00	1	(0.55)	152.92	150.76
12.795	4	Silty Clay to Clay	29.949	0.612	0.773	0.152	0.622	2.39	1.2075	0.97	0.536	2.390	1.21	36.16	2.272	82.162	0.13	1.00	1	(0.30)	149.76	124.95
13.287	5	Clayey Silt to Silty Clay	32.048	0.664	0.803	0.167	0.636	2.34	1.1983	0.97	0.544	2.340	1.20	38.40	2.084	80.020	0.13	1.00	1	(0.29)	152.20	124.95
13.78	5	Clayey Silt to Silty Clay	28.078	0.601	0.833	0.182	0.651	2.35	1.1885	0.97	0.551	2.350	1.19	33.37	2.120	70.737	0.11	1.00	1	(0.25)	152.38	116.42
14.272	5	Clayey Silt to Silty Clay	36.914	0.565	0.863	0.198	0.665	2.39	1.1796	0.97	0.558	2.390	1.18	43.54	2.272	98.934	0.17	1.00	1	(0.38)	151.84	116.42
14.764	4	Silty Clay to Clay	19.159	0.422	0.892	0.213	0.679	2.58	1.1708	0.97	0.564	2.580	1.17	22.43	3.206	71.927	0.11	1.00	1	(0.25)	144.83	83.24
15.256	3	Clay	12.525	0.304	0.922	0.228	0.694	2.8	1.1616	0.97	0.570							1.00	1		148.79	148.79
15.748	3	Clay	11.644	0.323	0.952	0.244	0.708	2.86	1.153	0.97	0.576							1.00	1		142.93	142.93
16.24	3	Clay	11.892	0.382	0.982	0.259	0.723	2.9	1.144	0.97	0.582							1.00	1		141.45	141.45
16.732	3	Clay	10.075	0.296	1.011	0.274	0.737	2.94	1.1358	0.96	0.587							1.00	1		133.45	133.45
17.224	3	Clay	10.213	0.28	1.041	0.29	0.751	2.92	1.1276	0.96	0.592							1.00	1		133.11	133.11
17.717	3	Clay	10.846	0.285	1.071	0.305	0.766	2.9	1.119	0.96	0.597							1.00	1		137.07	137.07
18.209	3	Clay	11.837	0.311	1.101	0.321	0.78	2.86	1.1111	0.96	0.602							1.00	1		148.02	148.02
18.701	4	Silty Clay to Clay	14.947	0.45	1.13	0.336	0.795	2.73	1.1028	0.96	0.605							1.00	1		180.51	180.51
19.193	4	Silty Clay to Clay	22.682	0.372	1.16	0.351	0.809	2.53	1.0951	0.96	0.610	2.530	1.10	24.84	2.925	72.647	0.12	1.00	1	(0.23)	154.45	75.40
19.685	5	Clayey Silt to Silty Clay	40.795	0.478	1.19	0.367	0.823	2.41	1.0875	0.96	0.614	2.410	1.09	44.36	2.354	104.418	0.19	1.00	1	(0.37)	160.08	91.33
20.177	4	Silty Clay to Clay	18.223	0.432	1.22	0.382	0.838	2.63	1.0795	0.96	0.617							1.00	1		205.71	205.71
20.669	3	Clay	13.351	0.41	1.249	0.397	0.852	2.88	1.0721	0.96	0.621							1.00	1		160.01	160.01
21.161	3	Clay	12.855	0.419	1.279	0.413	0.866	2.95	1.0649	0.95	0.624							1.00	1		148.86	148.86
21.654	3	Clay	11.611	0.364	1.309	0.428	0.881	2.97	1.0572	0.95	0.627							1.00	1		144.65	144.65
22.146	3	Clay	13.103	0.366	1.339	0.444	0.895	2.91	1.0501	0.95	0.631							1.00	1		153.78	153.78
22.638	3	Clay	13.598	0.382	1.368	0.459	0.91	2.89	1.0427	0.95	0.633							1.00	1		159.27	159.27
23.13	4	Silty Clay to Clay	14.066	0.399	1.398	0.474	0.924	2.84	1.0358	0.95	0.636							1.00	1		169.97	169.97
23.622	4	Silty Clay to Clay	21.361	0.613	1.428	0.49	0.938	2.69	1.029	0.95	0.639							1.00	1		222.26	222.26
24.114	4	Silty Clay to Clay	21.086	0.739	1.458	0.505	0.953	2.74	1.0218	0.94	0.641							1.00	1		219.15	219.15
24.606	3	Clay	14.232	0.492	1.487	0.52	0.967	2.93	1.0152	0.94	0.643							1.00	1		168.14	168.14
25.098	3	Clay	14.266	0.466	1.517	0.536	0.982	2.95	1.0082	0.94	0.645							1.00	1		162.79	162.79
25.591	3	Clay	17.37	0.583	1.547	0.551	0.996	2.91	1.0018	0.94	0.647							1.00	1		175.33	175.33
26.083	3	Clay	17.672	0.59	1.577	0.566	1.01	2.93	0.9955	0.94	0.649							1.00	1		176.35	176.35
26.575	3	Clay	13.048	0.474	1.606	0.582	1.025	3.04	0.9888	0.94	0.650							1.00	1		155.94	155.94
27.067	3	Clay	12.119	0.47	1.636	0.597	1.039	3.09	0.9826	0.93	0.652							0.99	1		147.47	147.47
27.559	3	Clay	13.598	0.495	1.666	0.613	1.053	3.03	0.9765	0.93	0.654							0.99	1		160.81	160.81
28.051	3	Clay	18.581	0.761	1.696	0.628	1.068	2.93	0.97	0.93	0.655							0.99	1		192.83	192.83
28.543	3	Clay	22.022	0.941	1.725	0.643	1.082	2.89	0.9641	0.93	0.656							0.98	1		212.10	212.10
29.035	3	Clay	22.902	0.882	1.755	0.659	1.097	2.86	0.9578	0.93	0.656							0.98	1		216.67	216.67
29.528	4	Silty Clay to Clay	22.187	0.76	1.785	0.674	1.111	2.84	0.952	0.92	0.657							0.98	1		213.26	213.26
30.02	4	Silty Clay to Clay	20.635	0.603	1.815	0.689	1.125	2.83	0.9462	0.92	0.658							0.98	1		205.72	205.72
30.512	4	Silty Clay to Clay	20.755	0.632	1.844	0.705	1.14	2.84	0.9402	0.92	0.658							0.97	1		206.25	206.25
31.004	4	Silty Clay to Clay	21.058	0.65	1.874	0.72	1.154	2.85	0.9346	0.92	0.659							0.97	1		207.80	207.80
31.496	4	Silty Clay to Clay	21.333	0.664	1.904	0.735	1.169	2.84	0.9287	0.91	0.659							0.97	1		208.13	208.13
31.988	4	Silty Clay to Clay	20.893	0.605	1.934	0.751	1.183	2.9	0.9232	0.91	0.659							0.97	1		192.26	192.26
32.48	3	Clay	10.701	0.418	1.963	0.766	1.197	3.11	0.9178	0.91	0.659							0.96	1		152.51	152.51
32.972	3	Clay	17.287	0.472	1.993	0.782	1.212	3	0.9121	0.90	0.659							0.96	1		169.75	169.75
33.465	4	Silty Clay to Clay	18.14	0.568	2.023	0.797	1.226	2.93	0.9068	0.90	0.659							0.96	1		187.12	187.12
33.957	4	Silty Clay to Clay	16.241	0.439	2.053	0.812	1.24	2.94	0.9016	0.90	0.659							0.96	1		179.16	179.16
34.449	4	Silty Clay to Clay	14.837	0.374	2.082	0.828	1.255	2.97	0.8961	0.89	0.658							0.96	1		166.17	166.17
34.941	4	Silty Clay to Clay	13.662	0.253	2.112	0.843	1.269	2.95	0.891	0.89	0.657							0.95	1		162.82	162.82
35.433	4	Silty Clay to Clay	19.379	0.326	2.142	0.858	1.284	2.7	0.8857	0.89	0.656							0.95	1		214.61	214.61
35.925	5	Clayey Silt to Silty Clay	37.575	0.72	2.172	0.874	1.298	2.57	0.8807	0.88	0.656	2.570	0.88	33.09	3.148	104.174	0.19	0.95	1	(0.33)	185.38	83.24
36.417	4	Silty Clay to Clay	40.286	1.381	2.201	0.889	1.312	2.65	0.8758	0.88	0.655							0.95	1		313.87	313.87
36.909	4	Silty Clay to Clay	44.979	1.786	2.231	0.904	1.327	2.62	0.8706	0.88	0.653							0.94	1		354.60	354.60
37.402	4	Silty Clay to Clay	40.024	1.474	2.261	0.92	1.341	2.62	0.8658	0.87	0.652							0.94	1		338.67	338.67
37.894	4	Silty Clay to Clay	35.021	1.066	2.291	0.935	1.356	2.7	0.8607	0.87	0.651							0.94	1		286.62	286.62
38.386	4	Silty Clay to Clay	39.199	1.081	2.32	0.951	1.37	2.64	0.856	0.86	0.649							0.94	1		305.59	305.59
38.878	4	Silty Clay to Clay	34.161	0.9	2.35	0.966	1.384	2.68	0.8514	0.86	0.648							0.94	1		285.78	285.78
39.37	4	Silty Clay to Clay	27.727	0.926	2.38	0.981	1.399	2.74	0.8465	0.86	0.646							0.94	1		276.76	276.76
39.862	5	Clayey Silt to Silty Clay	112.78	2.102	2.41	0.997	1.413	2.3	0.8419	0.85	0.644	2.300	0.84	94.95	1.949	185.039		0.93	1		211.52	211.52
40.354	5	Clayey Silt to Silty Clay	109.67	1.754	2.439	1.012	1.427	2.23	0.8375	0.85	0.642	2.230	0.84	91.84	1.743	160.125		0.93	1		213.38	213.38
40.846	5	Clayey Silt to Silty Clay	25.352	0.44	2.469	1.027	1.442	2.52	0.8327	0.84	0.640	2.520	0.83	21.11	2.872	60.622	0.10	0.93	1	(0.18)	190.46	67.90
41.339	5	Clayey Silt to Silty Clay	21.609	0.225	2.499	1.043	1.456	2.66	0.8283	0.84	0.638							0.93	1		215.66	215.66
41.831	5	Clayey Silt to Silty Clay	23.866	0.305	2.529	1.058	1.471	2.68	0.8237	0.83	0.636							0.93	1		223.23	223.23
42.323	4	Silty Clay to Clay	26.509	0.453	2.558	1.073	1.485	2.73	0.8194	0.83	0.634							0.92	1		253.39	253.39
42.815	5	Clayey Silt to Silty Clay	107.71	2.142	2.588	1.089	1.499	2.12	0.8151	0.83	0.631	2.120	0.82	87.80	1.492	131.011	0.29	0.90	1	(0.51)	225.50	211.35
43.307	6	Sandy Silt to Clayey Silt	204.34	4.093	2.618	1.104	1.514	1.89	0.8106	0.82	0.629	1.890	0.81	165.64	1.180	195.380		0.86	1		245.55	245.55
43.799	6	Sandy Silt to Clayey Silt	294.79	2.47	2.648	1.12	1.528	1.67	0.8065	0.82	0.627	1.670	0.81	237.73	1.017	241.864		0.85	1		253.04	253.04
44.291	6	Sandy Silt to Clayey Silt	250.69	1.427	2.677	1.135	1.543	1.65	0.802	0.81	0.623	1.650	0.80	201.06	1.003	201.735		0.86	1		245.75	245.75
44.783	5	Clayey Silt to Silty Clay	56.321	1.186	2.707	1.15	1.557	2.27	0.798	0.81	0.621	2.270	0.80	44.94	1.856	83.417	0.13	0.92	1	(0.24)	213.83	124.95
45.276	4	Silty Clay to Clay	23.37	0.725	2.737	1.166	1.571	2.88	0.7939	0.80	0.619							0.91	1		236.27	236.27
45.768	4	Silty Clay to Clay	17.961	0.545	2.767	1.181	1.586	3.03	0.7897	0.80	0.616							0.91	1		194.14	194.14
46.26	4	Silty Clay to Clay	23.894	0.721	2.796	1.196	1.6	2.87	0.7857	0.79	0.613							0.91	1		247.43	247.43
46.752	5	Clayey Silt to Silty Clay	69.314	1.612	2.826	1.212	1.614	2.13	0.7818	0.79	0.610	2.130	0.78	54.19	1.512	81.922	0.13	0.89	1	(0.24)	231.47	211.35
47.244	6	Sandy Silt to Clayey Silt	251.13	3.826	2.856	1.227	1.629	1.96	0.7777	0.78	0.607	1.960	0.78	195.29	1.251	244.333		0.86	1		245.58	245.58
47.736	5	Clayey Silt to Silty Clay	47.98	1.163	2.886	1.242	1.643	2.43	0.7738	0.78	0.604	2.430	0.77	37.13	2.439	90.557	0.15	0.91	1	(0.28)	214.41	116.42
48.228	4	Silty Clay to Clay	24.339	0.407	2.915	1.258	1.658	2.84	0.7698	0.77	0.601							0.90	1		227.28	227.28
48.72	4	Silty Clay to Clay	24.94	0.416	2.945	1.273	1.672	2.82	0.766	0.77	0.598							0.90	1		228.65	228.65
49.213	4	Silty Clay to Clay	24.059	0.652	2.975	1.289	1.686	2.94	0.7623	0.76	0.595							0.90	1		226.56	226.56
49.705	4	Silty Clay to Clay	31.381	0.963	3.005	1.304	1.701	2.87	0.7584	0.76	0.592							0.90	1		248.36	248.36
50.197	4	Silty Clay to Clay	26.633	0.523	3.034	1.319	1.715	2.78	0.7547	0.75	0.589							0.90	1		250.54	250.54

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project*** *FAULT INFO*
PROJECT NO. ***2017-125-GEO*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-73*** *FAULT* M_w = 6.9 *MSF* = 1.24 a_{max} *(g)*= 0.682 V_{S30m}(m/s)= #REF! 237.6

			CPT RESULT INPUT								***CSR***		***CRR*** $_{7.5}$						***F.S.=(CRR*** $_{7.5}$ ***/CSR)*MSF*K*** σ ****K*** α				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
50.689	4	Silty Clay to Clay	26.873	0.588	3.064	1.335	1.73	2.83	0.7509	0.75	0.585							0.90	1		242.80	242.80
51.181	4	Silty Clay to Clay	27.417	0.66	3.094	1.35	1.744	2.83	0.7473	0.74	0.583							0.89	1		248.11	248.11
51.673	4	Silty Clay to Clay	31.821	0.725	3.124	1.365	1.758	2.8	0.7437	0.74	0.580							0.89	1		261.93	261.93
52.165	4	Silty Clay to Clay	28.986	0.785	3.153	1.381	1.773	2.85	0.74	0.73	0.576							0.89	1		256.35	256.35
52.657	4	Silty Clay to Clay	27.637	0.755	3.183	1.396	1.787	2.91	0.7365	0.73	0.573							0.89	1		242.46	242.46
53.15	4	Silty Clay to Clay	26.123	0.746	3.213	1.411	1.801	2.92	0.7331	0.72	0.570							0.89	1		241.63	241.63
53.642	4	Silty Clay to Clay	47.567	1.372	3.243	1.427	1.816	2.73	0.7294	0.72	0.567							0.89	1		307.69	307.69
54.134	5	Clayey Silt to Silty Clay	31.057	0.736	3.272	1.442	1.83	2.73	0.7261	0.71	0.564							0.89	1		288.85	288.85
54.626	4	Silty Clay to Clay	26.756	0.491	3.302	1.458	1.845	2.81	0.7225	0.71	0.561							0.88	1		243.96	243.96
55.118	4	Silty Clay to Clay	26.811	0.601	3.332	1.473	1.859	2.87	0.7192	0.70	0.558							0.88	1		241.78	241.78
55.61	4	Silty Clay to Clay	25.965	0.695	3.362	1.488	1.873	2.91	0.7159	0.70	0.555							0.88	1		237.09	237.09
56.102	4	Silty Clay to Clay	25.986	0.542	3.391	1.504	1.888	2.89	0.7124	0.69	0.552							0.88	1		235.74	235.74
56.594	4	Silty Clay to Clay	26.233	0.546	3.421	1.519	1.902	2.86	0.7092	0.69	0.549							0.88	1		242.30	242.30
57.087	4	Silty Clay to Clay	30.032	0.617	3.451	1.534	1.917	2.82	0.7058	0.68	0.546							0.88	1		259.60	259.60
57.579	4	Silty Clay to Clay	32.4	0.804	3.481	1.55	1.931	2.81	0.7027	0.68	0.543							0.88	1		277.75	277.75
58.071	4	Silty Clay to Clay	40.217	0.912	3.51	1.565	1.945	2.78	0.6995	0.68	0.540							0.88	1		298.04	298.04
58.563	4	Silty Clay to Clay	38.208	1.229	3.54	1.58	1.96	2.88	0.6962	0.67	0.537							0.87	1		307.26	307.26
59.055	6	Sandy Silt to Clayey Silt	181.82	2.756	3.57	1.596	1.974	2	0.6931	0.67	0.535	2.000	0.69	126.02	1.300	163.830		0.82	1		257.55	257.55
59.547	6	Sandy Silt to Clayey Silt	287.96	3.73	3.6	1.611	1.988	1.78	0.6901	0.66	0.532	1.780	0.69	198.72	1.092	217.070		0.78	1		271.71	271.71
60.039	6	Sandy Silt to Clayey Silt	168.91	2.033	3.629	1.627	2.003	2.03	0.6869	0.66	0.529	2.030	0.69	116.01	1.341	155.600	0.43	0.83	1	(0.84)	253.53	220.00
60.532	5	Clayey Silt to Silty Clay	55.357	2.427	3.659	1.642	2.017	2.56	0.6839	0.65	0.527	2.560	0.68	37.86	3.091	116.999	0.23	0.87	1	(0.47)	229.36	107.96
61.024	4	Silty Clay to Clay	43.768	1.082	3.689	1.657	2.032	2.79	0.6807	0.65	0.524							0.87	1		321.81	321.81
61.516	5	Clayey Silt to Silty Clay	28.585	0.506	3.719	1.673	2.046	2.82	0.6778	0.65	0.522							0.87	1		253.06	253.06
62.008	4	Silty Clay to Clay	27.803	0.559	3.748	1.688	2.06	2.91	0.6748	0.64	0.519							0.87	1		239.99	239.99
62.5	4	Silty Clay to Clay	20.948	0.538	3.778	1.703	2.075	3.02	0.6718	0.64	0.516							0.86	1		214.32	214.32
62.992	4	Silty Clay to Clay	20.384	0.331	3.808	1.719	2.089	3	0.6689	0.64	0.514							0.86	1		203.76	203.76
63.484	4	Silty Clay to Clay	20.811	0.281	3.838	1.734	2.104	2.93	0.6659	0.63	0.512							0.86	1		208.98	208.98
63.976	5	Clayey Silt to Silty Clay	24.664	0.299	3.867	1.749	2.118	2.86	0.6631	0.63	0.509							0.86	1		224.79	224.79
64.469	5	Clayey Silt to Silty Clay	24.871	0.363	3.897	1.765	2.132	2.88	0.6603	0.63	0.507							0.86	1		230.25	230.25
64.961	4	Silty Clay to Clay	25.683	0.435	3.927	1.78	2.147	2.86	0.6573	0.62	0.505							0.86	1		245.87	245.87
65.453	5	Clayey Silt to Silty Clay	32.4	0.614	3.957	1.796	2.161	2.81	0.6546	0.62	0.503							0.86	1		270.99	270.99
65.945	5	Clayey Silt to Silty Clay	34.024	0.597	3.986	1.811	2.175	2.77	0.6519	0.62	0.500							0.86	1		305.78	305.78
66.437	5	Clayey Silt to Silty Clay	116.58	2.308	4.016	1.826	2.19	2.47	0.649	0.61	0.498	2.470	0.65	75.66	2.621	198.316		0.85	1		241.97	241.97
66.929	5	Clayey Silt to Silty Clay	105.76	3.942	4.046	1.842	2.204	2.49	0.6463	0.61	0.496	2.490	0.65	68.35	2.718	185.808		0.85	1		245.75	245.75
67.421	4	Silty Clay to Clay	35.62	1.073	4.076	1.857	2.219	2.76	0.6435	0.61	0.494							0.85	1		353.77	353.77
67.913	4	Silty Clay to Clay	25.71	0.377	4.105	1.872	2.233	2.9	0.6408	0.60	0.492							0.85	1		235.70	235.70
68.406	5	Clayey Silt to Silty Clay	25.349	0.336	4.135	1.888	2.247	2.87	0.6382	0.60	0.490							0.85	1		233.00	233.00
68.898	5	Clayey Silt to Silty Clay	25.82	0.378	4.165	1.903	2.262	2.88	0.6355	0.60	0.488							0.85	1		234.15	234.15
69.39	5	Clayey Silt to Silty Clay	25.435	0.384	4.195	1.918	2.276	2.91	0.6329	0.60	0.486							0.85	1		232.43	232.43
69.882	4	Silty Clay to Clay	24.609	0.371	4.224	1.934	2.291	2.92	0.6302	0.59	0.484							0.85	1		228.59	228.59
70.374	4	Silty Clay to Clay	24.733	0.397	4.254	1.949	2.305	2.93	0.6277	0.59	0.483							0.85	1		231.54	231.54
70.866	4	Silty Clay to Clay	28.325	0.431	4.284	1.965	2.319	2.91	0.6252	0.59	0.481							0.85	1		242.82	242.82
71.358	4	Silty Clay to Clay	29.289	0.604	4.314	1.98	2.334	2.93	0.6225	0.58	0.479							0.84	1		250.98	250.98
71.85	4	Silty Clay to Clay	28.435	0.684	4.343	1.995	2.348	2.97	0.6201	0.58	0.477							0.84	1		250.99	250.99
72.343	4	Silty Clay to Clay	27.582	0.745	4.373	2.011	2.362	3	0.6176	0.58	0.476							0.84	1		245.09	245.09
72.835	4	Silty Clay to Clay	27.297	0.632	4.403	2.026	2.377	2.99	0.615	0.58	0.474							0.84	1		244.38	244.38
73.327	4	Silty Clay to Clay	29.702	0.666	4.433	2.041	2.391	2.96	0.6126	0.58	0.473							0.84	1		254.38	254.38
73.819	4	Silty Clay to Clay	29.289	0.621	4.462	2.057	2.406	2.94	0.6101	0.57	0.471							0.84	1		253.84	253.84
74.311	4	Silty Clay to Clay	27.403	0.536	4.492	2.072	2.42	2.95	0.6077	0.57	0.470							0.84	1		245.98	245.98
74.803	4	Silty Clay to Clay	28.518	0.593	4.522	2.087	2.434	2.95	0.6054	0.57	0.468							0.84	1		250.02	250.02
75.295	4	Silty Clay to Clay	28.972	0.542	4.552	2.103	2.449	2.92	0.6029	0.57	0.467							0.84	1		253.68	253.68
75.787	5	Clayey Silt to Silty Clay	29.681	0.474	4.581	2.118	2.463	2.88	0.6006	0.56	0.465							0.84	1		259.16	259.16
76.28	5	Clayey Silt to Silty Clay	34.547	0.669	4.611	2.134	2.478	2.86	0.5982	0.56	0.464							0.83	1		279.05	279.05
76.772	4	Silty Clay to Clay	35.4	0.772	4.641	2.149	2.492	2.88	0.5959	0.56	0.463							0.83	1		290.35	290.35
77.264	4	Silty Clay to Clay	40.41	1.271	4.671	2.164	2.506	2.94	0.5936	0.56	0.461							0.83	1		295.99	295.99
77.756	4	Silty Clay to Clay	31.078	1.001	4.7	2.18	2.521	3	0.5912	0.56	0.460							0.83	1		275.11	275.11
78.248	4	Silty Clay to Clay	31.023	0.868	4.73	2.195	2.535	2.97	0.589	0.55	0.459							0.83	1		272.51	272.51
78.74	4	Silty Clay to Clay	36.721	1.014	4.76	2.21	2.549	2.92	0.5868	0.55	0.458							0.83	1		290.33	290.33
79.232	5	Clayey Silt to Silty Clay	42.089	0.755	4.79	2.226	2.564	2.83	0.5845	0.55	0.456							0.83	1		308.57	308.57
79.724	5	Clayey Silt to Silty Clay	33.817	0.705	4.819	2.241	2.578	2.85	0.5823	0.55	0.455							0.83	1		294.55	294.55
80.217	4	Silty Clay to Clay	34.161	0.727	4.849	2.256	2.593	2.91	0.58	0.55	0.454							0.83	1		283.34	283.34
80.709	4	Silty Clay to Clay	38.4	1.285	4.879	2.272	2.607	2.93	0.5779	0.55	0.453							0.83	1		316.29	316.29
81.201	4	Silty Clay to Clay	47.595	1.914	4.909	2.287	2.621	2.93	0.5758	0.54	0.452							0.82	1		332.68	332.68
81.693	4	Silty Clay to Clay	37.685	1.04	4.938	2.303	2.636	2.96	0.5735	0.54	0.450							0.82	1		299.43	299.43
82.185	4	Silty Clay to Clay	34.932	0.895	4.968	2.318	2.65	2.97	0.5714	0.54	0.450							0.82	1		279.69	279.69
82.677	4	Silty Clay to Clay	30.906	0.787	4.998	2.333	2.665	3	0.5692	0.54	0.448							0.82	1		265.42	265.42
83.169	4	Silty Clay to Clay	31.876	0.814	5.028	2.349	2.679	3.01	0.5672	0.54	0.447							0.82	1		264.68	264.68
83.661	4	Silty Clay to Clay	30.142	0.745	5.057	2.364	2.693	3.02	0.5651	0.54	0.446							0.82	1		258.08	258.08
84.154	4	Silty Clay to Clay	28.769	0.645	5.087	2.379	2.708	3.01	0.5629	0.53	0.445							0.82	1		255.03	255.03
84.646	4	Silty Clay to Clay	30.39	0.638	5.117	2.395	2.722	2.97	0.5609	0.53	0.445							0.82	1		260.68	260.68
85.138	5	Clayey Silt to Silty Clay	32.62	0.591	5.147	2.41	2.736	2.93	0.5589	0.53	0.444							0.82	1		268.86	268.86
85.63	5	Clayey Silt to Silty Clay	33.404	0.574	5.176	2.425	2.751	2.9	0.5568	0.53	0.443							0.82	1		276.98	276.98
86.122	5	Clayey Silt to Silty Clay	34.767	0.724	5.206	2.441	2.765	2.9	0.5549	0.53	0.442							0.82	1		296.05	296.05
86.614	5	Clayey Silt to Silty Clay	45.585	1.067	5.236	2.456	2.78	2.87	0.5528	0.53	0.441							0.82	1		324.37	324.37
87.106	5	Clayey Silt to Silty Clay	40.874	1.006	5.266	2.472	2.794	2.88	0.5508	0.53	0.440							0.81	1		318.97	318.97
87.598	5	Clayey Silt to Silty Clay	41.676	1.087	5.295	2.487	2.808	2.85	0.5489	0.53	0.439							0.81	1		324.24	324.24
88.091	5	Clayey Silt to Silty Clay	45.613	0.842	5.325	2.502	2.823	2.79	0.5469	0.52	0.438							0.81	1		332.39	332.39
88.583	4	Silty Clay to Clay	45.035	1.504	5.355	2.518	2.837	2.81	0.545	0.52	0.437							0.81	1		402.66	402.66
89.075	4	Silty Clay to Clay	108.16	3.721	5.385	2.533	2.852	2.74	0.5429	0.52	0.437							0.81	1		496.71	496.71
89.567	4	Silty Clay to Clay	70.332	2.939	5.414	2.548	2.866	2.82	0.5411	0.52	0.436							0.81	1		450.94	450.94
90.059	4	Silty Clay to Clay	87.674	3.738	5.444	2.564	2.88	2.77	0.5392	0.52	0.435							0.81	1		490.81	490.81
90.551	4	Silty Clay to Clay	64.634	3.379	5.474	2.579	2.895	2.83	0.5372	0.52	0.434							0.81	1		469.88	469.88
91.043	9	Sand	97.116	3.99	5.504	2.594	2.909	2.73	0.5354	0.52	0.433							0.81	1		545.01	545.01
91.535	5	Clayey Silt to Silty Clay	181.6	4.616	5.533	2.61	2.923	2.44	0.5336	0.52	0.433	2.440	0.53	96.90	2.483	240.613		0.81	1		279.71	279.71
92.028	8	Sand to Silty Sand	142.07	4.732	5.563	2.625	2.938	2.51	0.5317	0.51	0.432	2.510	0.53	75.53	2.820	212.962		0.81	1		276.21	276.21
92.52	4	Silty Clay to Clay	84.949	3.532	5.593	2.641	2.952	2.81	0.5299	0.51	0.431							0.81	1		481.07	481.07
93.012	4	Silty Clay to Clay	42.282	1.191	5.623	2.656	2.967	2.92	0.528	0.51	0.430							0.80	1		342.79	342.79
93.504	5	Clayey Silt to Silty Clay	41.387	0.797	5.652	2.671	2.981	2.86	0.5262	0.51	0.430							0.80	1		318.86	318.86
93.996	5	Clayey Silt to Silty Clay	40.878	0.945	5.682	2.687	2.995	2.9	0.5244	0.51	0.429							0.80	1		312.38	312.38
94.488	4	Silty Clay to Clay	37.877	0.914	5.712	2.702	3.01	2.95	0.5226	0.51	0.428							0.80	1		300.35	300.35
94.98	5	Clayey Silt to Silty Clay	35.999	0.8	5.742	2.717	3.024	2.96	0.5208	0.51	0.428							0.80	1		293.24	293.24
95.472	5	Clayey Silt to Silty Clay	38.8	0.819	5.771	2.733	3.039	2.89	0.519	0.51	0.427							0.80	1		309.94	309.94
95.965	5	Clayey Silt to Silty Clay	37.85	0.808	5.801	2.748	3.053	2.9	0.5173	0.51	0.426							0.80	1		306.90	306.90
96.457	5	Clayey Silt to Silty Clay	34.381	0.708	5.831	2.763	3.067	2.96	0.5156	0.51	0.426							0.80	1		283.44	283.44
96.949	5	Clayey Silt to Silty Clay	34.189	0.65	5.861	2.779	3.082	2.97	0.5138	0.50	0.425							0.80	1		280.70	280.70
97.441	5	Clayey Silt to Silty Clay	38.951	1.048	5.89	2.794	3.096	2.91	0.5121	0.50	0.424							0.80	1		323.57	323.57
97.933	4	Silty Clay to Clay	38.345	1.276	5.92	2.81	3.11	2.93	0.5104	0.50	0.424							0.80	1		327.40	327.40
98.425	4	Silty Clay to Clay	36.351	0.999	5.95	2.825	3.125	3.02	0.5087	0.50	0.423							0.80	1		293.21	293.21
98.917	4	Silty Clay to Clay	37.547	1.016	5.98	2.84	3.139	3.01	0.507	0.50	0.423							0.80	1		296.08	296.08
99.409	4	Silty Clay to Clay	37.272	0.87	6.009	2.856	3.154	2.98	0.5053	0.50	0.422							0.79	1		295.95	295.95
99.902	5	Clayey Silt to Silty Clay	37.451	0.845	6.039	2.871	3.168	2.95	0.5037	0.50	0.421							0.79	1		299.20	299.20
100.39	5	Clayey Silt to Silty Clay	39.887	0.816	6.069	2.886	3.182	2.92	0.5021	0.50	0.421							0.79	1		312.32	312.32
100.89	5	Clayey Silt to Silty Clay	41.538	0.959	6.099	2.902	3.197	2.92	0.5003	0.50	0.420							0.79	1		317.60	317.60
101.38	4	Silty Clay to Clay	41.098	0.998	6.128	2.917	3.211	2.95	0.4988	0.50	0.420							0.79	1		315.11	315.11
101.87	4	Silty Clay to Clay	40.63	1.083	6.158	2.932	3.226	2.96	0.4971	0.50	0.419							0.79	1		314.69	314.69
102.36	5	Clayey Silt to Silty Clay	41.346	0.795	6.188	2.948	3.24	2.91	0.4955	0.49	0.419							0.79	1		316.39	316.39

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME	***Eastridge to BART Regional Connector Project***	*FAULT INFO*			
PROJECT NO.	***2017-125-GEO***	*COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*			
CPT NO.	***CPT-AS-73***	*FAULT M_w =* 6.9	*MSF =* 1.24	*a_{max} (g)=* 0.682	V_{S30m}(m/s)= #REF! 237.6

		CPT RESULT INPUT							***CSR***		***$CRR_{7.5}$***						***F.S.=($CRR_{7.5}$/CSR)*MSF*Kσ*Kα***				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
102.85	5	Clayey Silt to Silty Clay	41.126	0.763	6.218	2.963	3.254	2.9	0.4939	0.49	0.418							0.79	1		314.15	314.15
103.35	5	Clayey Silt to Silty Clay	37.547	0.807	6.247	2.979	3.269	2.94	0.4923	0.49	0.417							0.79	1		300.89	300.89
103.84	5	Clayey Silt to Silty Clay	36.836	0.693	6.277	2.994	3.283	2.95	0.4907	0.49	0.417							0.79	1		296.39	296.39
104.33	5	Clayey Silt to Silty Clay	40.382	0.762	6.307	3.009	3.297	2.93	0.4892	0.49	0.417							0.79	1		307.01	307.01
104.82	5	Clayey Silt to Silty Clay	40.506	0.853	6.337	3.025	3.312	2.93	0.4876	0.49	0.416							0.79	1		324.23	324.23
105.32	5	Clayey Silt to Silty Clay	50.705	0.986	6.366	3.04	3.326	2.88	0.4861	0.49	0.415							0.79	1		341.57	341.57
105.81	5	Clayey Silt to Silty Clay	38.786	0.804	6.396	3.055	3.341	2.92	0.4845	0.49	0.415							0.79	1		315.78	315.78
106.3	5	Clayey Silt to Silty Clay	39.116	0.798	6.426	3.071	3.355	2.95	0.483	0.49	0.414							0.78	1		307.12	307.12
106.79	5	Clayey Silt to Silty Clay	39.157	0.879	6.456	3.086	3.369	2.97	0.4815	0.49	0.414							0.78	1		308.31	308.31
107.28	5	Clayey Silt to Silty Clay	40.382	0.894	6.485	3.102	3.384	2.96	0.4799	0.49	0.413							0.78	1		313.88	313.88
107.78	5	Clayey Silt to Silty Clay	43.823	1.134	6.515	3.117	3.398	2.96	0.4785	0.49	0.413							0.78	1		326.91	326.91
108.27	4	Silty Clay to Clay	45.365	1.242	6.545	3.132	3.413	2.96	0.4769	0.48	0.412							0.78	1		334.69	334.69
108.76	5	Clayey Silt to Silty Clay	47.099	1.111	6.575	3.148	3.427	2.94	0.4755	0.48	0.412							0.78	1		336.51	336.51
109.25	5	Clayey Silt to Silty Clay	44.016	1.107	6.604	3.163	3.441	2.95	0.474	0.48	0.411							0.78	1		331.63	331.63
109.74	4	Silty Clay to Clay	43.548	1.184	6.634	3.178	3.456	2.97	0.4725	0.48	0.411							0.78	1		328.82	328.82
110.24	4	Silty Clay to Clay	43.359	1.189	6.664	3.194	3.47	2.97	0.4711	0.48	0.410							0.78	1		327.75	327.75
110.73	5	Clayey Silt to Silty Clay	43.493	0.997	6.694	3.209	3.484	2.96	0.4697	0.48	0.410							0.78	1		321.69	321.69
111.22	5	Clayey Silt to Silty Clay	37.161	0.933	6.723	3.224	3.499	3	0.4682	0.48	0.409							0.78	1		301.93	301.93
111.71	5	Clayey Silt to Silty Clay	36.088	0.771	6.753	3.24	3.513	3.02	0.4668	0.48	0.409							0.78	1		293.93	293.93
112.21	5	Clayey Silt to Silty Clay	37.299	0.8	6.783	3.255	3.528	2.99	0.4653	0.48	0.408							0.78	1		310.32	310.32
112.7	4	Silty Clay to Clay	45.723	1.267	6.813	3.271	3.542	2.97	0.4639	0.48	0.408							0.78	1		339.31	339.31
113.19	5	Clayey Silt to Silty Clay	50.21	1.441	6.842	3.286	3.556	2.93	0.4626	0.48	0.408							0.78	1		366.13	366.13
113.68	5	Clayey Silt to Silty Clay	60.202	1.77	6.872	3.301	3.571	2.86	0.4611	0.48	0.407							0.78	1		395.96	395.96
114.17	5	Clayey Silt to Silty Clay	59.633	1.527	6.902	3.317	3.585	2.84	0.4598	0.48	0.407							0.77	1		401.33	401.33
114.67	5	Clayey Silt to Silty Clay	64.606	1.697	6.932	3.332	3.6	2.83	0.4583	0.48	0.406							0.77	1		416.82	416.82
115.16	5	Clayey Silt to Silty Clay	81.536	2.285	6.961	3.347	3.614	2.77	0.457	0.48	0.406							0.77	1		481.84	481.84
115.65	9	Sand	102.32	3.832	6.991	3.363	3.628	2.81	0.4557	0.47	0.405							0.77	1		547.92	547.92
116.14	9	Sand	139.78	7.452	7.021	3.378	3.643	2.8	0.4543	0.47	0.405							0.77	1		632.58	632.58
116.63	9	Sand	132.02	6.327	7.051	3.393	3.657	2.73	0.453	0.47	0.404							0.77	1		667.86	667.86
117.13	8	Sand to Silty Sand	145.52	5.259	7.08	3.409	3.671	2.6	0.4517	0.47	0.404							0.77	1		296.51	296.51
117.62	8	Sand to Silty Sand	232.47	6.065	7.11	3.424	3.686	2.44	0.4503	0.47	0.404	2.440	0.45	104.67	2.483	259.915		0.77	1		307.00	307.00
118.11	8	Sand to Silty Sand	170.09	8.117	7.14	3.44	3.7	2.59	0.449	0.47	0.403	2.590	0.45	76.37	3.266	249.419		0.77	1		302.67	302.67
118.6	9	Sand	154.25	6.687	7.17	3.455	3.715	2.64	0.4476	0.47	0.403							0.77	1		741.80	741.80
119.09	9	Sand	194.89	8.47	7.199	3.47	3.729	2.6	0.4463	0.47	0.402							0.77	1		303.48	303.48
119.59	8	Sand to Silty Sand	186.19	7.484	7.229	3.486	3.743	2.58	0.4451	0.47	0.402	2.580	0.45	82.87	3.206	265.719		0.77	1		306.36	306.36
120.08	9	Sand	169.35	9.433	7.259	3.501	3.758	2.63	0.4437	0.47	0.401							0.77	1		806.84	806.84

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project*** *FAULT INFO*
PROJECT NO. ***2017-125-GEO*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-75*** *FAULT* M_w = 6.9 *MSF* = 1.24 a_{max} *(g)*= 0.682 V_{S30m}(m/s)= #REF! 230.6

			CPT RESULT INPUT							***CSR***				***CRR*** $_{7.5}$					***F.S.=(CRR*** $_{7.5}$ ***/CSR)*MSF*K*** σ ****K*** α				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
0.492			-9999	-9999	0.03		0.03		1.7	1.00	0.444							1.00			0.00	0.00
0.984			-9999	-9999	0.059		0.059		1.7	1.00	0.443							1.00			0.00	0.00
1.476			-9999	-9999	0.089		0.089		1.7	1.00	0.443							1.00			0.00	0.00
1.968			-9999	-9999	0.119		0.119		1.6679	1.00	0.442							1.00			0.00	0.00
2.461			-9999	-9999	0.149		0.149		1.6308	1.00	0.442							1.00			0.00	0.00
2.953			-9999	-9999	0.178		0.178		1.5965	1.00	0.441							1.00			0.00	0.00
3.445			-9999	-9999	0.208		0.208		1.5625	0.99	0.441							1.00			0.00	0.00
3.937			-9999	-9999	0.238		0.238		1.5299	0.99	0.440										0.00	0.00
4.429			-9999	-9999	0.268		0.268		1.4986	0.99	0.440										0.00	0.00
4.921			-9999	-9999	0.297		0.297		1.4696	0.99	0.439										0.00	0.00
5.413	3	Clay	14.975	0.505	0.327		0.327	2.55	1.4407	0.99	0.439	2.550	1.44	21.57	3.034	65.463	0.11				114.51	114.51
5.906	3	Clay	13.957	0.354	0.357		0.357	2.57	1.413	0.99	0.438	2.570	1.41	19.72	3.148	62.081	0.10				115.30	115.30
6.398	4	Silty Clay to Clay	12.539	0.296	0.387	0.004	0.382	2.58	1.3906	0.99	0.443	2.580	1.39	17.44	3.206	55.912	0.10			(0.00)	116.68	83.24
6.89	4	Silty Clay to Clay	12.635	0.296	0.416	0.02	0.397	2.6	1.3776	0.99	0.458										116.72	116.72
7.382	4	Silty Clay to Clay	10.295	0.188	0.446	0.035	0.411	2.62	1.3656	0.98	0.474							1.00	0		133.41	133.41
7.874	4	Silty Clay to Clay	9.834	0.176	0.476	0.05	0.426	2.61	1.353	0.98	0.487							1.00	1		133.06	133.06
8.366	4	Silty Clay to Clay	13.709	0.244	0.506	0.066	0.44	2.44	1.3415	0.98	0.501	2.440	1.34	18.39	2.483	45.665	0.09	1.00	1	(0.22)	124.59	83.24
8.858	4	Silty Clay to Clay	17.7	0.243	0.535	0.081	0.454	2.33	1.3301	0.98	0.513	2.330	1.33	23.54	2.049	48.233	0.09	1.00	1	(0.22)	130.33	99.58
9.35	5	Clayey Silt to Silty Clay	28.518	0.483	0.565	0.096	0.469	2.31	1.3182	0.98	0.524	2.310	1.32	37.59	1.981	74.477	0.12	1.00	1	(0.28)	136.40	124.95
9.843	4	Silty Clay to Clay	29.2	0.653	0.595	0.112	0.483	2.34	1.3072	0.98	0.535	2.340	1.31	38.17	2.084	79.537	0.13	1.00	1	(0.29)	139.35	139.35
10.335	4	Silty Clay to Clay	30.308	0.689	0.625	0.127	0.498	2.35	1.2956	0.98	0.544	2.350	1.30	39.27	2.120	83.235	0.13	1.00	1	(0.30)	140.43	140.43
10.827	4	Silty Clay to Clay	32.84	0.701	0.654	0.143	0.512	2.34	1.285	0.98	0.553	2.340	1.29	42.20	2.084	87.937	0.14	1.00	1	(0.32)	143.08	143.08
11.319	4	Silty Clay to Clay	39.226	0.754	0.684	0.158	0.526	2.35	1.2746	0.98	0.563	2.350	1.27	50.00	2.120	105.979	0.19	1.00	1	(0.42)	144.54	144.54
11.811	4	Silty Clay to Clay	32.675	0.629	0.714	0.173	0.541	2.4	1.2636	0.98	0.571	2.400	1.26	41.29	2.312	95.477	0.16	1.00	1	(0.35)	141.56	116.42
12.303	4	Silty Clay to Clay	16.902	0.372	0.744	0.189	0.555	2.54	1.2536	0.97	0.579	2.540	1.25	21.19	2.979	63.117	0.10	1.00	1	(0.22)	135.00	83.24
12.795	4	Silty Clay to Clay	15.829	0.322	0.773	0.204	0.569	2.6	1.2436	0.97	0.586							1.00	1		132.75	132.75
13.287	4	Silty Clay to Clay	12.353	0.166	0.803	0.219	0.584	2.61	1.2332	0.97	0.593							1.00	1		150.81	150.81
13.78	4	Silty Clay to Clay	10.736	0.136	0.833	0.235	0.598	2.69	1.2236	0.97	0.600							1.00	1		132.28	132.28
14.272	4	Silty Clay to Clay	8.451	0.128	0.863	0.25	0.613	2.78	1.2135	0.97	0.605							1.00	1		117.97	117.97
14.764	3	Clay	8.313	0.13	0.892	0.265	0.627	2.83	1.2042	0.97	0.611							1.00	1		115.29	115.29
15.256	3	Clay	8.313	0.144	0.922	0.281	0.641	2.85	1.195	0.97	0.617							1.00	1		114.66	114.66
15.748	3	Clay	7.846	0.13	0.952	0.296	0.656	2.86	1.1853	0.97	0.622							1.00	1		113.09	113.09
16.24	3	Clay	7.901	0.128	0.982	0.312	0.67	2.86	1.1765	0.97	0.628							1.00	1		114.23	114.23
16.732	4	Silty Clay to Clay	8.671	0.139	1.011	0.327	0.685	2.83	1.1671	0.96	0.631							1.00	1		120.61	120.61
17.224	4	Silty Clay to Clay	12.442	0.161	1.041	0.342	0.699	2.74	1.1585	0.96	0.636							1.00	1		143.09	143.09
17.717	4	Silty Clay to Clay	31.601	0.683	1.071	0.358	0.713	2.52	1.15	0.96	0.641	2.520	1.15	36.34	2.872	104.360	0.19	1.00	1	(0.36)	150.97	99.58
18.209	4	Silty Clay to Clay	23.233	0.422	1.101	0.373	0.728	2.52	1.1411	0.96	0.645	2.520	1.14	26.51	2.872	76.129	0.12	1.00	1	(0.23)	151.85	91.33
18.701	4	Silty Clay to Clay	16.214	0.344	1.13	0.388	0.742	2.65	1.1329	0.96	0.648							1.00	1		180.44	180.44
19.193	4	Silty Clay to Clay	13.929	0.311	1.16	0.404	0.756	2.73	1.1247	0.96	0.652							1.00	1		165.32	165.32
19.685	3	Clay	12.869	0.372	1.19	0.419	0.771	2.85	1.1162	0.96	0.655							1.00	1		153.05	153.05
20.177	3	Clay	12.388	0.37	1.22	0.434	0.785	2.93	1.1083	0.96	0.659							1.00	1		144.33	144.33
20.669	3	Clay	10.719	0.351	1.249	0.45	0.8	2.98	1.1	0.96	0.661							1.00	1		137.00	137.00
21.161	3	Clay	11.589	0.344	1.279	0.465	0.814	2.95	1.0924	0.95	0.664							1.00	1		141.22	141.22
21.654	3	Clay	11.644	0.333	1.309	0.481	0.828	2.93	1.0848	0.95	0.667							1.00	1		144.27	144.27
22.146	3	Clay	12.36	0.344	1.339	0.496	0.843	2.85	1.0768	0.95	0.670							1.00	1		159.49	159.49
22.638	4	Silty Clay to Clay	19.379	0.553	1.368	0.511	0.857	2.76	1.0695	0.95	0.672							1.00	1		190.72	190.72
23.13	4	Silty Clay to Clay	22.352	0.643	1.398	0.527	0.872	2.66	1.0618	0.95	0.674							1.00	1		223.55	223.55
23.622	4	Silty Clay to Clay	25.243	0.946	1.428	0.542	0.886	2.7	1.0547	0.95	0.676							1.00	1		220.95	220.95
24.114	3	Clay	14.837	0.409	1.458	0.557	0.9	2.86	1.0476	0.94	0.679							1.00	1		172.68	172.68
24.606	3	Clay	13.612	0.442	1.487	0.573	0.915	2.93	1.0402	0.94	0.680							1.00	1		159.62	159.62
25.098	3	Clay	14.431	0.469	1.517	0.588	0.929	2.93	1.0333	0.94	0.682							1.00	1		163.60	163.60
25.591	4	Silty Clay to Clay	18.168	0.501	1.547	0.603	0.943	2.83	1.0266	0.94	0.683							1.00	1		183.20	183.20
26.083	4	Silty Clay to Clay	15.057	0.45	1.577	0.619	0.958	2.86	1.0195	0.94	0.684							1.00	1		176.08	176.08
26.575	3	Clay	13.213	0.454	1.606	0.634	0.972	2.98	1.0129	0.94	0.686							1.00	1		157.97	157.97
27.067	3	Clay	12.415	0.459	1.636	0.65	0.987	3.04	1.0059	0.93	0.686							1.00	1		150.92	150.92
27.559	3	Clay	11.617	0.442	1.666	0.665	1.001	3.06	0.9995	0.93	0.688							1.00	1		145.64	145.64
28.051	3	Clay	12.002	0.361	1.696	0.68	1.015	2.98	0.9932	0.93	0.689							1.00	1		152.50	152.50
28.543	4	Silty Clay to Clay	14.92	0.363	1.725	0.696	1.03	2.9	0.9865	0.93	0.689							0.99	1		164.29	164.29
29.035	4	Silty Clay to Clay	14.505	0.38	1.755	0.711	1.044	2.92	0.9804	0.93	0.690							0.99	1		167.25	167.25
29.528	4	Silty Clay to Clay	17.397	0.544	1.785	0.726	1.059	2.89	0.9739	0.92	0.690							0.99	1		182.92	182.92
30.02	4	Silty Clay to Clay	19.737	0.608	1.815	0.742	1.073	2.84	0.9679	0.92	0.690							0.99	1		199.49	199.49
30.512	4	Silty Clay to Clay	22.022	0.629	1.844	0.757	1.087	2.8	0.962	0.92	0.690							0.98	1		209.17	209.17
31.004	4	Silty Clay to Clay	20.894	0.593	1.874	0.773	1.102	2.82	0.9557	0.92	0.690							0.98	1		205.95	205.95
31.496	4	Silty Clay to Clay	18.609	0.523	1.904	0.788	1.116	2.85	0.9499	0.91	0.690							0.98	1		195.35	195.35
31.988	4	Silty Clay to Clay	19.107	0.509	1.934	0.803	1.13	2.85	0.9442	0.91	0.690							0.98	1		194.51	194.51
32.48	4	Silty Clay to Clay	20.642	0.599	1.963	0.819	1.145	2.8	0.9382	0.91	0.689							0.97	1		209.58	209.58
32.972	4	Silty Clay to Clay	26.344	0.644	1.993	0.834	1.159	2.76	0.9326	0.90	0.689							0.97	1		225.12	225.12
33.465	4	Silty Clay to Clay	20.894	0.668	2.023	0.849	1.174	2.83	0.9267	0.90	0.688							0.97	1		212.48	212.48
33.957	3	Clay	19.132	0.617	2.053	0.865	1.188	2.94	0.9213	0.90	0.688							0.97	1		190.38	190.38
34.449	3	Clay	16.871	0.54	2.082	0.88	1.202	2.97	0.9159	0.89	0.687							0.96	1		182.15	182.15
34.941	4	Silty Clay to Clay	20.26	0.553	2.112	0.895	1.217	2.86	0.9102	0.89	0.685							0.96	1		201.89	201.89
35.433	4	Silty Clay to Clay	20.59	0.632	2.142	0.911	1.231	2.88	0.905	0.89	0.685							0.96	1		202.15	202.15
35.925	4	Silty Clay to Clay	17.273	0.494	2.172	0.926	1.246	2.91	0.8994	0.88	0.683							0.96	1		189.41	189.41
36.417	4	Silty Clay to Clay	20.398	0.243	2.201	0.942	1.26	2.83	0.8943	0.88	0.682							0.95	1		181.35	181.35
36.909	4	Silty Clay to Clay	11.465	0.151	2.231	0.957	1.274	2.92	0.8892	0.88	0.681							0.95	1		151.52	151.52
37.402	4	Silty Clay to Clay	11.039	0.175	2.261	0.972	1.289	3.01	0.8839	0.87	0.679							0.95	1		142.90	142.90
37.894	4	Silty Clay to Clay	11.617	0.268	2.291	0.988	1.303	3.06	0.8789	0.87	0.677							0.95	1		147.60	147.60
38.386	4	Silty Clay to Clay	14.259	0.319	2.32	1.003	1.317	3.01	0.8741	0.86	0.675							0.95	1		160.64	160.64
38.878	4	Silty Clay to Clay	15.305	0.346	2.35	1.018	1.332	2.95	0.8689	0.86	0.673							0.94	1		173.06	173.06
39.37	4	Silty Clay to Clay	16.682	0.409	2.38	1.034	1.346	2.92	0.8641	0.86	0.671							0.94	1		186.27	186.27
39.862	4	Silty Clay to Clay	23.068	0.46	2.41	1.049	1.361	2.78	0.859	0.85	0.669							0.94	1		218.21	218.21
40.354	4	Silty Clay to Clay	30.638	0.557	2.439	1.064	1.375	2.67	0.8544	0.85	0.667							0.94	1		249.02	249.02
40.846	4	Silty Clay to Clay	26.619	0.501	2.469	1.08	1.389	2.72	0.8497	0.84	0.665							0.94	1		237.53	237.53
41.339	4	Silty Clay to Clay	20.178	0.482	2.499	1.095	1.404	2.81	0.8449	0.84	0.662							0.93	1		216.12	216.12
41.831	4	Silty Clay to Clay	24.83	0.714	2.529	1.111	1.418	2.78	0.8403	0.83	0.660							0.93	1		239.34	239.34
42.323	4	Silty Clay to Clay	27.142	0.734	2.558	1.126	1.433	2.79	0.8355	0.83	0.657							0.93	1		262.36	262.36
42.815	5	Clayey Silt to Silty Clay	65.488	1.994	2.588	1.141	1.447	2.37	0.8311	0.83	0.654	2.370	0.83	54.43	2.194	119.420	0.24	0.93	1	(0.42)	209.12	142.13
43.307	6	Sandy Silt to Clayey Silt	164.48	1.16	2.618	1.157	1.461	2.02	0.8268	0.82	0.652	2.020	0.83	135.98	1.327	180.449		0.91	1		222.03	222.03
43.799	5	Clayey Silt to Silty Clay	28.491	0.797	2.648	1.172	1.476	2.42	0.8221	0.82	0.649	2.420	0.82	23.42	2.396	56.119	0.10	0.93	1	(0.17)	198.84	83.24
44.291	4	Silty Clay to Clay	15.415	0.248	2.677	1.187	1.49	2.91	0.8178	0.81	0.646							0.92	1		185.52	185.52
44.783	4	Silty Clay to Clay	16.847	0.261	2.707	1.203	1.504	2.94	0.8136	0.81	0.643							0.92	1		195.29	195.29
45.276	4	Silty Clay to Clay	57.229	1.541	2.737	1.218	1.519	2.67	0.8091	0.80	0.640							0.92	1		324.16	324.16
45.768	5	Clayey Silt to Silty Clay	52.797	1.235	2.767	1.233	1.533	2.6	0.805	0.80	0.637							0.92	1		200.88	200.88
46.26	4	Silty Clay to Clay	30.748	0.733	2.796	1.249	1.548	2.72	0.8006	0.79	0.633							0.92	1		271.42	271.42
46.752	4	Silty Clay to Clay	22.765	0.64	2.826	1.264	1.562	2.84	0.7965	0.79	0.630							0.91	1		230.65	230.65
47.244	4	Silty Clay to Clay	20.804	0.453	2.856	1.28	1.576	2.9	0.7925	0.78	0.627							0.91	1		209.85	209.85
47.736	4	Silty Clay to Clay	21.719	0.527	2.886	1.295	1.591	2.86	0.7882	0.78	0.624							0.91	1		226.14	226.14
48.228	4	Silty Clay to Clay	50.347	1.682	2.915	1.31	1.605	2.65	0.7843	0.77	0.621							0.91	1		346.55	346.55
48.72	4	Silty Clay to Clay	37.437	1.233	2.945	1.326	1.62	2.66	0.7801	0.77	0.617							0.91	1		339.03	339.03
49.213	4	Silty Clay to Clay	24.885	0.545	2.975	1.341	1.634	2.82	0.7763	0.76	0.614							0.91	1		237.76	237.76
49.705	4	Silty Clay to Clay	22.29	0.563	3.005	1.356	1.648	2.86	0.7725	0.76	0.611							0.90	1		235.98	235.98
50.197	4	Silty Clay to Clay	51.036	1.067	3.034	1.372	1.663	2.7	0.7684	0.75	0.607							0.90	1		303.48	303.48

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project*** *FAULT INFO*
PROJECT NO. ***2017-125-GEO*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-75*** *FAULT* M_w = 6.9 *MSF* = 1.24 a_{max} *(g)*= 0.682 V_{S30m}(m/s)= #REF! 230.6

			CPT RESULT INPUT							***CSR***		***CRR$_{7.5}$***						***F.S.=(CRR$_{7.5}$/CSR)*MSF*Kσ*Kα***				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
50.689	4	Silty Clay to Clay	32.565	0.899	3.064	1.387	1.677	2.77	0.7647	0.75	0.604							0.90	1		282.67	282.67
51.181	4	Silty Clay to Clay	26.564	0.832	3.094	1.402	1.691	2.88	0.761	0.74	0.601							0.90	1		246.12	246.12
51.673	4	Silty Clay to Clay	20.783	0.584	3.124	1.418	1.706	2.95	0.7571	0.74	0.597							0.90	1		217.68	217.68
52.165	4	Silty Clay to Clay	20.343	0.521	3.153	1.433	1.72	2.98	0.7534	0.73	0.594							0.90	1		206.37	206.37
52.657	4	Silty Clay to Clay	25.518	0.594	3.183	1.449	1.735	2.91	0.7496	0.73	0.590							0.90	1		231.86	231.86
53.15	4	Silty Clay to Clay	27.803	0.999	3.213	1.464	1.749	2.89	0.746	0.72	0.587							0.89	1		250.13	250.13
53.642	4	Silty Clay to Clay	24.857	0.689	3.243	1.479	1.763	2.94	0.7425	0.72	0.584							0.89	1		231.41	231.41
54.134	4	Silty Clay to Clay	18.65	0.595	3.272	1.495	1.778	3.05	0.7388	0.71	0.581							0.89	1		200.29	200.29
54.626	4	Silty Clay to Clay	18.526	0.377	3.302	1.51	1.792	2.99	0.7353	0.71	0.577							0.89	1		196.01	196.01
55.118	4	Silty Clay to Clay	19.076	0.365	3.332	1.525	1.807	2.94	0.7316	0.70	0.574							0.89	1		204.44	204.44
55.61	4	Silty Clay to Clay	22.462	0.509	3.362	1.541	1.821	2.9	0.7282	0.70	0.571							0.89	1		225.01	225.01
56.102	4	Silty Clay to Clay	29.317	0.465	3.391	1.556	1.835	2.79	0.7249	0.69	0.568							0.89	1		251.72	251.72
56.594	4	Silty Clay to Clay	29.289	0.571	3.421	1.571	1.85	2.8	0.7213	0.69	0.564							0.88	1		263.38	263.38
57.087	4	Silty Clay to Clay	31.464	1.102	3.451	1.587	1.864	2.89	0.718	0.68	0.561							0.88	1		268.88	268.88
57.579	4	Silty Clay to Clay	31.244	1.067	3.481	1.602	1.878	2.91	0.7147	0.68	0.559							0.88	1		267.93	267.93
58.071	4	Silty Clay to Clay	29.344	0.923	3.51	1.618	1.893	2.89	0.7113	0.68	0.555							0.88	1		262.19	262.19
58.563	4	Silty Clay to Clay	25.655	0.7	3.54	1.633	1.907	2.9	0.7081	0.67	0.552							0.88	1		246.77	246.77
59.055	4	Silty Clay to Clay	25.243	0.564	3.57	1.648	1.922	2.9	0.7047	0.67	0.549							0.88	1		237.30	237.30
59.547	4	Silty Clay to Clay	23.894	0.58	3.6	1.664	1.936	2.92	0.7015	0.66	0.546							0.88	1		236.89	236.89
60.039	5	Clayey Silt to Silty Clay	28.271	1.047	3.629	1.679	1.95	2.33	0.6984	0.66	0.544	2.330	0.70	19.74	2.049	40.452	0.08	0.87	1	(0.17)	227.00	99.58
60.532	6	Sandy Silt to Clayey Silt	170.26	1.692	3.659	1.694	1.965	2.12	0.6951	0.65	0.541	2.120	0.70	118.35	1.492	176.590		0.86	1		243.40	243.40
61.024	5	Clayey Silt to Silty Clay	51.036	1.772	3.689	1.71	1.979	2.63	0.692	0.65	0.538							0.87	1		393.93	393.93
61.516	4	Silty Clay to Clay	33.501	0.712	3.719	1.725	1.994	2.8	0.6888	0.65	0.535							0.87	1		288.75	288.75
62.008	4	Silty Clay to Clay	28.684	0.705	3.748	1.74	2.008	2.85	0.6858	0.64	0.532							0.87	1		262.02	262.02
62.5	4	Silty Clay to Clay	26.371	0.634	3.778	1.756	2.022	2.9	0.6828	0.64	0.530							0.87	1		247.78	247.78
62.992	4	Silty Clay to Clay	28.05	0.64	3.808	1.771	2.037	2.91	0.6796	0.64	0.527							0.87	1		248.45	248.45
63.484	4	Silty Clay to Clay	28.381	0.898	3.838	1.787	2.051	2.88	0.6767	0.63	0.525							0.87	1		267.06	267.06
63.976	4	Silty Clay to Clay	26.647	0.717	3.867	1.802	2.065	2.89	0.6738	0.63	0.522							0.86	1		261.21	261.21
64.469	4	Silty Clay to Clay	27.266	0.724	3.897	1.817	2.08	2.92	0.6707	0.63	0.520							0.86	1		253.84	253.84
64.961	4	Silty Clay to Clay	34.437	0.898	3.927	1.833	2.094	2.85	0.6679	0.62	0.517							0.86	1		292.79	292.79
65.453	5	Clayey Silt to Silty Clay	53.926	2.005	3.957	1.848	2.109	2.61	0.6649	0.62	0.515							0.86	1		433.51	433.51
65.945	5	Clayey Silt to Silty Clay	144.96	2.939	3.986	1.863	2.123	2.23	0.6621	0.62	0.513	2.230	0.66	95.97	1.743	167.321		0.84	1		252.32	252.32
66.437	5	Clayey Silt to Silty Clay	90.234	2.864	4.016	1.879	2.137	2.31	0.6593	0.61	0.510	2.310	0.66	59.49	1.981	117.862	0.23	0.85	1	(0.48)	248.86	168.05
66.929	5	Clayey Silt to Silty Clay	94.666	2.632	4.046	1.894	2.152	2.23	0.6563	0.61	0.508	2.230	0.66	62.13	1.743	108.324	0.20	0.84	1	(0.41)	252.29	176.71
67.421	5	Clayey Silt to Silty Clay	159.14	2.976	4.076	1.909	2.166	2.19	0.6536	0.61	0.506	2.190	0.65	104.01	1.643	170.849		0.83	1		256.19	256.19
67.913	5	Clayey Silt to Silty Clay	99.855	3.403	4.105	1.925	2.181	2.48	0.6507	0.60	0.504	2.480	0.65	64.98	2.669	173.441		0.86	1		245.46	245.46
68.406	5	Clayey Silt to Silty Clay	187.08	3.75	4.135	1.94	2.195	2.26	0.648	0.60	0.502	2.260	0.65	121.23	1.827	221.455		0.83	1		258.99	258.99
68.898	5	Clayey Silt to Silty Clay	114.51	4.947	4.165	1.956	2.209	2.44	0.6454	0.60	0.500	2.440	0.65	73.90	2.483	183.506		0.85	1		250.47	250.47
69.39	4	Silty Clay to Clay	29.262	0.956	4.195	1.971	2.224	2.9	0.6425	0.60	0.498							0.85	1		317.46	317.46
69.882	4	Silty Clay to Clay	27.892	0.605	4.224	1.986	2.238	2.95	0.6399	0.59	0.496							0.85	1		247.47	247.47
70.374	4	Silty Clay to Clay	30.473	0.625	4.254	2.002	2.252	2.92	0.6373	0.59	0.494							0.85	1		253.35	253.35
70.866	4	Silty Clay to Clay	25.511	0.532	4.284	2.017	2.267	2.93	0.6346	0.59	0.492							0.85	1		246.11	246.11
71.358	5	Clayey Silt to Silty Clay	30.803	0.524	4.314	2.032	2.281	2.84	0.632	0.58	0.490							0.85	1		266.06	266.06
71.85	5	Clayey Silt to Silty Clay	27.816	0.553	4.343	2.048	2.296	2.86	0.6293	0.58	0.488							0.85	1		265.37	265.37
72.343	5	Clayey Silt to Silty Clay	28.794	0.597	4.373	2.063	2.31	2.85	0.6268	0.58	0.487							0.85	1		273.76	273.76
72.835	5	Clayey Silt to Silty Clay	65.653	1.66	4.403	2.078	2.324	2.6	0.6243	0.58	0.485							0.84	1		234.39	234.39
73.327	5	Clayey Silt to Silty Clay	51.339	1.285	4.433	2.094	2.339	2.65	0.6216	0.58	0.483							0.84	1		398.38	398.38
73.819	4	Silty Clay to Clay	27.115	0.476	4.462	2.109	2.353	2.91	0.6192	0.57	0.482							0.84	1		255.08	255.08
74.311	4	Silty Clay to Clay	24.857	0.506	4.492	2.125	2.368	2.95	0.6166	0.57	0.480							0.84	1		238.08	238.08
74.803	4	Silty Clay to Clay	25.439	0.481	4.522	2.14	2.382	2.94	0.6142	0.57	0.478							0.84	1		243.04	243.04
75.295	4	Silty Clay to Clay	31.216	0.692	4.552	2.155	2.396	2.91	0.6118	0.57	0.477							0.84	1		264.18	264.18
75.787	4	Silty Clay to Clay	31.491	0.745	4.581	2.171	2.411	2.89	0.6092	0.56	0.475							0.84	1		276.17	276.17
76.28	4	Silty Clay to Clay	31.601	0.725	4.611	2.186	2.425	2.88	0.6069	0.56	0.474							0.84	1		278.88	278.88
76.772	4	Silty Clay to Clay	30.445	0.726	4.641	2.201	2.439	2.93	0.6046	0.56	0.473							0.84	1		265.42	265.42
77.264	4	Silty Clay to Clay	24.913	0.566	4.671	2.217	2.454	3	0.6021	0.56	0.471							0.84	1		239.06	239.06
77.756	4	Silty Clay to Clay	22.263	0.471	4.7	2.232	2.468	3.03	0.5998	0.56	0.470							0.83	1		227.21	227.21
78.248	4	Silty Clay to Clay	23.068	0.499	4.73	2.247	2.483	3.03	0.5973	0.55	0.468							0.83	1		231.37	231.37
78.74	4	Silty Clay to Clay	25.16	0.556	4.76	2.263	2.497	3.01	0.5951	0.55	0.467							0.83	1		239.33	239.33
79.232	4	Silty Clay to Clay	25.711	0.517	4.79	2.278	2.511	2.96	0.5928	0.55	0.466							0.83	1		247.75	247.75
79.724	5	Clayey Silt to Silty Clay	28.16	0.543	4.819	2.294	2.526	2.92	0.5904	0.55	0.464							0.83	1		258.14	258.14
80.217	5	Clayey Silt to Silty Clay	31.959	0.596	4.849	2.309	2.54	2.87	0.5882	0.55	0.463							0.83	1		280.54	280.54
80.709	5	Clayey Silt to Silty Clay	34.134	0.763	4.879	2.324	2.555	2.86	0.5859	0.55	0.462							0.83	1		290.66	290.66
81.201	4	Silty Clay to Clay	30.968	0.702	4.909	2.34	2.569	2.91	0.5837	0.54	0.461							0.83	1		276.27	276.27
81.693	4	Silty Clay to Clay	29.179	0.649	4.938	2.355	2.583	2.94	0.5815	0.54	0.460							0.83	1		265.85	265.85
82.185	4	Silty Clay to Clay	28.539	0.599	4.968	2.37	2.598	2.93	0.5793	0.54	0.459							0.83	1		263.46	263.46
82.677	5	Clayey Silt to Silty Clay	28.904	0.561	4.998	2.386	2.612	2.92	0.5771	0.54	0.457							0.83	1		264.08	264.08
83.169	5	Clayey Silt to Silty Clay	28.628	0.543	5.028	2.401	2.626	2.92	0.575	0.54	0.456							0.82	1		263.75	263.75
83.661	5	Clayey Silt to Silty Clay	30.225	0.592	5.057	2.416	2.641	2.9	0.5728	0.54	0.455							0.82	1		274.17	274.17
84.154	5	Clayey Silt to Silty Clay	32.593	0.699	5.087	2.432	2.655	2.89	0.5707	0.53	0.454							0.82	1		283.93	283.93
84.646	5	Clayey Silt to Silty Clay	31.718	0.695	5.117	2.447	2.67	2.9	0.5685	0.53	0.453							0.82	1		281.88	281.88
85.138	4	Silty Clay to Clay	32.207	1.052	5.147	2.463	2.684	2.85	0.5664	0.53	0.452							0.82	1		332.38	332.38
85.63	5	Clayey Silt to Silty Clay	55.963	1.921	5.176	2.478	2.698	2.78	0.5644	0.53	0.451							0.82	1		390.42	390.42
86.122	5	Clayey Silt to Silty Clay	66.795	1.703	5.206	2.493	2.713	2.59	0.5622	0.53	0.450	2.590	0.56	37.55	3.266	122.653	0.25	0.82	1	(0.57)	251.26	91.33
86.614	5	Clayey Silt to Silty Clay	129.87	2.523	5.236	2.509	2.727	2.46	0.5602	0.53	0.449	2.460	0.56	72.76	2.574	187.300		0.82	1		261.52	261.52
87.106	5	Clayey Silt to Silty Clay	71.984	2.172	5.266	2.524	2.742	2.75	0.5581	0.53	0.448							0.82	1		425.21	425.21
87.598	4	Silty Clay to Clay	26.729	0.871	5.295	2.539	2.756	3.1	0.5561	0.53	0.447							0.82	1		262.71	262.71
88.091	4	Silty Clay to Clay	26.922	0.568	5.325	2.555	2.77	3.02	0.5542	0.52	0.447							0.82	1		250.70	250.70
88.583	5	Clayey Silt to Silty Clay	29.427	0.573	5.355	2.57	2.785	2.96	0.5521	0.52	0.446							0.81	1		264.87	264.87
89.075	5	Clayey Silt to Silty Clay	35.207	0.724	5.385	2.585	2.799	2.91	0.5501	0.52	0.445							0.81	1		284.34	284.34
89.567	5	Clayey Silt to Silty Clay	30.638	0.62	5.414	2.601	2.813	2.94	0.5482	0.52	0.444							0.81	1		275.43	275.43
90.059	4	Silty Clay to Clay	28.794	0.804	5.444	2.616	2.828	3.04	0.5462	0.52	0.443							0.81	1		258.36	258.36
90.551	4	Silty Clay to Clay	27.441	0.672	5.474	2.632	2.842	3.05	0.5443	0.52	0.442							0.81	1		253.46	253.46
91.043	5	Clayey Silt to Silty Clay	29.895	0.593	5.504	2.647	2.857	2.97	0.5423	0.52	0.441							0.81	1		265.95	265.95
91.535	5	Clayey Silt to Silty Clay	32.785	0.778	5.533	2.662	2.871	2.93	0.5404	0.52	0.441							0.81	1		287.89	287.89
92.028	5	Clayey Silt to Silty Clay	35.786	0.702	5.563	2.678	2.885	2.89	0.5386	0.51	0.440							0.81	1		300.64	300.64
92.52	5	Clayey Silt to Silty Clay	36.639	0.748	5.593	2.693	2.9	2.87	0.5366	0.51	0.439							0.81	1		307.16	307.16
93.012	5	Clayey Silt to Silty Clay	44.402	0.724	5.623	2.708	2.914	2.82	0.5348	0.51	0.438							0.81	1		322.63	322.63
93.504	5	Clayey Silt to Silty Clay	39.165	0.79	5.652	2.724	2.929	2.83	0.5328	0.51	0.437							0.81	1		317.20	317.20
93.996	5	Clayey Silt to Silty Clay	38.765	0.792	5.682	2.739	2.943	2.87	0.531	0.51	0.437							0.81	1		315.85	315.85
94.488	5	Clayey Silt to Silty Clay	92.822	1.725	5.712	2.754	2.957	2.68	0.5292	0.51	0.436							0.81	1		441.60	441.60
94.98	4	Silty Clay to Clay	103.17	4.002	5.742	2.77	2.972	2.73	0.5273	0.51	0.435							0.80	1		507.86	507.86
95.472	4	Silty Clay to Clay	74.131	3.415	5.771	2.785	2.986	2.84	0.5256	0.51	0.435							0.80	1		468.52	468.52
95.965	4	Silty Clay to Clay	78.446	3.574	5.801	2.801	3	2.78	0.5238	0.51	0.434							0.80	1		503.55	503.55
96.457	9	Sand	133.45	5.737	5.831	2.816	3.015	2.68	0.5219	0.51	0.433							0.80	1		609.94	609.94
96.949	9	Sand	124.67	5.903	5.861	2.831	3.029	2.66	0.5202	0.50	0.433							0.80	1		642.80	642.80
97.441	9	Sand	113.83	5.609	5.89	2.847	3.044	2.7	0.5184	0.50	0.432							0.80	1		599.73	599.73
97.933	4	Silty Clay to Clay	72.122	3.005	5.92	2.862	3.058	2.82	0.5167	0.50	0.431							0.80	1		473.28	473.28
98.425	4	Silty Clay to Clay	59.239	2.055	5.95	2.877	3.072	2.86	0.515	0.50	0.431							0.80	1		403.63	403.63
98.917	4	Silty Clay to Clay	60.87	2.114	5.98	2.893	3.087	2.84	0.5132	0.50	0.430							0.80	1		409.60	409.60
99.409	4	Silty Clay to Clay	60.891	1.88	6.009	2.908	3.101	2.88	0.5115	0.50	0.429							0.80	1		380.52	380.52
99.902	4	Silty Clay to Clay	37.63	0.908	6.039	2.923	3.116	2.99	0.5097	0.50	0.428							0.80	1		306.40	306.40
100.39	5	Clayey Silt to Silty Clay	34.698	0.777	6.069	2.939	3.13	2.97	0.5081	0.50	0.428							0.80	1		292.71	292.71
100.89	5	Clayey Silt to Silty Clay	33.308	0.733	6.099	2.954	3.144	2.97	0.5064	0.50	0.427							0.80	1		287.50	287.50
101.38	5	Clayey Silt to Silty Clay	32.84	0.593	6.128	2.97	3.159	2.93	0.5047	0.50	0.427							0.79	1		287.67	287.67
101.87	5	Clayey Silt to Silty Clay	37.96	0.695	6.158	2.985	3.173	2.88	0.5031	0.50	0.426							0.79	1		302.64	302.64
102.36	5	Clayey Silt to Silty Clay	32.235	0.6	6.188	3	3.187	2.92	0.5015	0.49	0.426							0.79	1		292.28	292.28

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME	***Eastridge to BART Regional Connector Project***	*FAULT INFO*			
PROJECT NO.	***2017-125-GEO***	*COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*			
CPT NO.	***CPT-AS-75***	*FAULT M_w =* 6.9	*MSF =* 1.24	*a_{max} (g)=* 0.682	V_{S30m}(m/s)= #REF! 230.6

			CPT RESULT INPUT							***CSR***		***$CRR_{7.5}$***						***F.S.=($CRR_{7.5}$/CSR)*MSF*Kσ*Kα***				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
102.85	5	Clayey Silt to Silty Clay	32.978	0.699	6.218	3.016	3.202	2.96	0.4998	0.49	0.425							0.79	1		287.42	287.42
103.35	5	Clayey Silt to Silty Clay	33.501	0.668	6.247	3.031	3.216	2.95	0.4982	0.49	0.424							0.79	1		290.28	290.28
103.84	5	Clayey Silt to Silty Clay	33.501	0.635	6.277	3.046	3.231	2.95	0.4965	0.49	0.424							0.79	1		290.32	290.32
104.33	5	Clayey Silt to Silty Clay	35.51	0.778	6.307	3.062	3.245	2.94	0.4949	0.49	0.423							0.79	1		301.47	301.47
104.82	5	Clayey Silt to Silty Clay	36.584	0.692	6.337	3.077	3.259	2.94	0.4934	0.49	0.423							0.79	1		302.45	302.45
105.32	5	Clayey Silt to Silty Clay	34.306	0.664	6.366	3.092	3.274	2.94	0.4917	0.49	0.422							0.79	1		295.66	295.66
105.81	5	Clayey Silt to Silty Clay	36.832	0.765	6.396	3.108	3.288	2.95	0.4902	0.49	0.421							0.79	1		303.25	303.25
106.3	5	Clayey Silt to Silty Clay	37.162	0.854	6.426	3.123	3.303	2.94	0.4886	0.49	0.421							0.79	1		313.39	313.39
106.79	5	Clayey Silt to Silty Clay	43.355	1.072	6.456	3.139	3.317	2.92	0.487	0.49	0.420							0.79	1		335.85	335.85
107.28	5	Clayey Silt to Silty Clay	48.393	1.245	6.485	3.154	3.331	2.84	0.4855	0.49	0.420							0.79	1		372.00	372.00
107.78	5	Clayey Silt to Silty Clay	57.147	1.426	6.515	3.169	3.346	2.71	0.4839	0.49	0.419							0.79	1		460.11	460.11
108.27	8	Sand to Silty Sand	181.35	5.854	6.545	3.185	3.36	2.55	0.4825	0.48	0.419	2.550	0.48	87.49	3.034	265.475		0.78	1		288.02	288.02
108.76	8	Sand to Silty Sand	178.16	7.661	6.575	3.2	3.374	2.54	0.481	0.48	0.418	2.540	0.48	85.69	2.979	255.267		0.78	1		295.44	295.44
109.25	8	Sand to Silty Sand	136.26	4.107	6.604	3.215	3.389	2.62	0.4794	0.48	0.418							0.78	1		651.07	651.07
109.74	4	Silty Clay to Clay	51.283	1.916	6.634	3.231	3.403	2.92	0.4779	0.48	0.417							0.78	1		395.20	395.20
110.24	4	Silty Clay to Clay	37.41	1.043	6.664	3.246	3.418	3.06	0.4764	0.48	0.417							0.78	1		306.94	306.94
110.73	4	Silty Clay to Clay	39.364	1.047	6.694	3.262	3.432	2.99	0.475	0.48	0.416							0.78	1		318.46	318.46
111.22	5	Clayey Silt to Silty Clay	43.218	1.122	6.723	3.277	3.446	2.95	0.4735	0.48	0.416							0.78	1		334.02	334.02
111.71	5	Clayey Silt to Silty Clay	42.502	1.093	6.753	3.292	3.461	2.95	0.472	0.48	0.415							0.78	1		332.02	332.02
112.21	5	Clayey Silt to Silty Clay	37.575	1.007	6.783	3.308	3.475	2.99	0.4706	0.48	0.415							0.78	1		313.18	313.18
112.7	5	Clayey Silt to Silty Clay	39.151	0.887	6.813	3.323	3.49	2.94	0.4691	0.48	0.414							0.78	1		323.78	323.78
113.19	5	Clayey Silt to Silty Clay	59.184	1.178	6.842	3.338	3.504	2.84	0.4677	0.48	0.414							0.78	1		366.36	366.36
113.68	5	Clayey Silt to Silty Clay	46.053	0.946	6.872	3.354	3.518	2.88	0.4663	0.48	0.413							0.78	1		349.89	349.89
114.17	5	Clayey Silt to Silty Clay	41.855	0.911	6.902	3.369	3.533	2.92	0.4648	0.48	0.413							0.78	1		332.13	332.13
114.67	5	Clayey Silt to Silty Clay	45.558	1.159	6.932	3.384	3.547	2.95	0.4635	0.48	0.412							0.78	1		340.76	340.76
115.16	4	Silty Clay to Clay	43.466	1.39	6.961	3.4	3.561	3	0.4621	0.48	0.412							0.78	1		338.14	338.14
115.65	4	Silty Clay to Clay	41.098	1.159	6.991	3.415	3.576	3	0.4606	0.47	0.411							0.78	1		327.56	327.56
116.14	5	Clayey Silt to Silty Clay	41.429	1.024	7.021	3.431	3.59	2.96	0.4593	0.47	0.411							0.77	1		330.64	330.64
116.63	5	Clayey Silt to Silty Clay	44.98	1.185	7.051	3.446	3.605	2.95	0.4579	0.47	0.410							0.77	1		340.39	340.39
117.13	5	Clayey Silt to Silty Clay	44.154	1.191	7.08	3.461	3.619	2.98	0.4565	0.47	0.410							0.77	1		339.15	339.15
117.62	4	Silty Clay to Clay	43.191	1.261	7.11	3.477	3.633	3.01	0.4552	0.47	0.409							0.77	1		331.62	331.62
118.11	4	Silty Clay to Clay	37.795	1.194	7.14	3.492	3.648	3.05	0.4538	0.47	0.409							0.77	1		315.83	315.83
118.6	5	Clayey Silt to Silty Clay	38.676	0.94	7.17	3.507	3.662	3	0.4525	0.47	0.409							0.77	1		317.19	317.19
119.09	5	Clayey Silt to Silty Clay	42.282	1.131	7.199	3.523	3.677	2.98	0.4511	0.47	0.408							0.77	1		328.74	328.74
119.59	4	Silty Clay to Clay	42.392	1.233	7.229	3.538	3.691	3.01	0.4498	0.47	0.408							0.77	1		326.57	326.57
120.08	4	Silty Clay to Clay	37.878	0.955	7.259	3.553	3.705	3.02	0.4485	0.47	0.407							0.77	1		314.74	314.74

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge to Bart Regional Connector Project*** *FAULT INFO*
PROJECT NO. ***2017-125-GEO*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-77*** *FAULT M_w =* 6.9 *MSF =* 1.24 *a_{max} (g)=* 0.682 V_{S30m}(m/s)= #REF! 217.4

			CPT RESULT INPUT							***CSR***		***$CRR_{7.5}$***						***F.S.=($CRR_{7.5}$/CSR)*MSF*Kσ*Kα***				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
0.492			-9999	-9999	0.03		0.03		1.7	1.00	0.444							1.00			0.00	0.00
0.984			-9999	-9999	0.059		0.059		1.7	1.00	0.443							1.00			0.00	0.00
1.476			-9999	-9999	0.089		0.089		1.7	1.00	0.443							1.00			0.00	0.00
1.968			-9999	-9999	0.119		0.119		1.6679	1.00	0.442							1.00			0.00	0.00
2.461			-9999	-9999	0.149		0.149		1.6308	1.00	0.442							1.00			0.00	0.00
2.953			-9999	-9999	0.178		0.178		1.5965	1.00	0.441							1.00			0.00	0.00
3.445			-9999	-9999	0.208		0.208		1.5625	0.99	0.441							1.00			0.00	0.00
3.937			-9999	-9999	0.238		0.238		1.5299	0.99	0.440										0.00	0.00
4.429			-9999	-9999	0.268		0.268		1.4986	0.99	0.440										0.00	0.00
4.921			-9999	-9999	0.297		0.297		1.4696	0.99	0.439										0.00	0.00
5.413	3	Clay	5.981	0.134	0.327	0.002	0.325	2.77	1.4426	0.99	0.441										94.37	94.37
5.906	3	Clay	7.625	0.187	0.357	0.018	0.339	2.73	1.4295	0.99	0.461										109.87	109.87
6.398	3	Clay	9.497	0.257	0.387	0.033	0.354	2.68	1.4157	0.99	0.478										127.58	127.58
6.89	4	Silty Clay to Clay	10.639	0.26	0.416	0.048	0.368	2.57	1.4031	0.99	0.494	2.570	1.40	14.93	3.148	46.990	0.09			(0.00)	114.31	83.24
7.382	4	Silty Clay to Clay	14.535	0.199	0.446	0.064	0.382	2.45	1.3906	0.98	0.510	2.450	1.39	20.21	2.528	51.103	0.09	1.00	0	(0.00)	118.11	83.24
7.874	4	Silty Clay to Clay	14.039	0.253	0.476	0.079	0.397	2.47	1.3776	0.98	0.523	2.470	1.38	19.34	2.621	50.696	0.09	1.00	1	(0.22)	120.29	83.24
8.366	4	Silty Clay to Clay	19.434	0.491	0.506	0.094	0.411	2.5	1.3656	0.98	0.536	2.500	1.37	26.54	2.768	73.472	0.12	1.00	1	(0.27)	123.41	99.58
8.858	4	Silty Clay to Clay	14.425	0.347	0.535	0.11	0.426	2.59	1.353	0.98	0.546	2.590	1.35	19.52	3.266	63.744	0.10	1.00	1	(0.24)	121.41	83.24
9.35	3	Clay	11.448	0.244	0.565	0.125	0.44	2.66	1.3415	0.98	0.558							1.00	1		141.79	141.79
9.843	4	Silty Clay to Clay	11.727	0.355	0.595	0.141	0.454	2.53	1.3301	0.98	0.569	2.530	1.33	15.60	2.925	45.621	0.09	1.00	1	(0.19)	126.14	91.33
10.335	4	Silty Clay to Clay	19.076	0.308	0.625	0.156	0.469	2.46	1.3182	0.98	0.578	2.460	1.32	25.15	2.574	64.730	0.11	1.00	1	(0.23)	128.81	91.33
10.827	4	Silty Clay to Clay	11.038	0.207	0.654	0.171	0.483	2.66	1.3072	0.98	0.587							1.00	1		139.17	139.17
11.319	3	Clay	9.635	0.194	0.684	0.187	0.498	2.72	1.2956	0.98	0.594							1.00	1		128.98	128.98
11.811	3	Clay	9.359	0.217	0.714	0.202	0.512	2.77	1.285	0.98	0.603							1.00	1		125.20	125.20
12.303	3	Clay	9.273	0.191	0.744	0.217	0.526	2.78	1.2746	0.97	0.611							1.00	1		124.80	124.80
12.795	3	Clay	9.167	0.228	0.773	0.233	0.541	2.8	1.2636	0.97	0.616							1.00	1		122.64	122.64
13.287	3	Clay	8.812	0.196	0.803	0.248	0.555	2.81	1.2536	0.97	0.624							1.00	1		123.34	123.34
13.78	4	Silty Clay to Clay	13.131	0.311	0.833	0.263	0.569	2.67	1.2436	0.97	0.630							1.00	1		159.20	159.20
14.272	4	Silty Clay to Clay	21.058	0.502	0.863	0.279	0.584	2.57	1.2332	0.97	0.636	2.570	1.23	25.97	3.148	81.747	0.13	1.00	1	(0.25)	138.20	91.33
14.764	4	Silty Clay to Clay	21.857	0.622	0.892	0.294	0.598	2.56	1.2236	0.97	0.641	2.560	1.22	26.74	3.091	82.653	0.13	1.00	1	(0.26)	140.94	99.58
15.256	4	Silty Clay to Clay	25.408	0.545	0.922	0.31	0.613	2.51	1.2135	0.97	0.645	2.510	1.21	30.83	2.820	86.930	0.14	1.00	1	(0.27)	144.08	99.58
15.748	4	Silty Clay to Clay	27.059	0.838	0.952	0.325	0.627	2.41	1.2042	0.97	0.651	2.410	1.20	32.58	2.354	76.690	0.12	1.00	1	(0.23)	152.24	142.13
16.24	5	Clayey Silt to Silty Clay	56.376	1.669	0.982	0.34	0.641	2.31	1.195	0.97	0.656	2.310	1.20	67.37	1.981	133.475	0.30	1.00	1	(0.57)	161.88	161.88
16.732	5	Clayey Silt to Silty Clay	55.636	1.291	1.011	0.356	0.656	2.27	1.1853	0.96	0.659	2.270	1.19	65.95	1.856	122.405	0.25	1.00	1	(0.47)	163.80	163.80
17.224	5	Clayey Silt to Silty Clay	56.486	1.013	1.041	0.371	0.67	2.18	1.1765	0.96	0.664	2.180	1.18	66.45	1.619	107.600	0.20	1.00	1	(0.37)	165.00	165.00
17.717	5	Clayey Silt to Silty Clay	59.899	0.927	1.071	0.386	0.685	2.17	1.1671	0.96	0.667	2.170	1.17	69.91	1.596	111.601	0.21	1.00	1	(0.39)	165.57	165.57
18.209	5	Clayey Silt to Silty Clay	35.07	0.751	1.101	0.402	0.699	2.3	1.1585	0.96	0.671	2.300	1.16	40.63	1.949	79.175	0.13	1.00	1	(0.23)	160.37	142.13
18.701	4	Silty Clay to Clay	28.023	0.628	1.13	0.417	0.713	2.5	1.15	0.96	0.675	2.500	1.15	32.23	2.768	89.219	0.15	1.00	1	(0.27)	151.63	99.58
19.193	4	Silty Clay to Clay	13.908	0.293	1.16	0.432	0.728	2.77	1.1411	0.96	0.677							1.00	1		164.90	164.90
19.685	4	Silty Clay to Clay	14.975	0.317	1.19	0.448	0.742	2.78	1.1329	0.96	0.681							1.00	1		158.81	158.81
20.177	3	Clay	12.938	0.375	1.22	0.463	0.756	2.86	1.1247	0.96	0.684							1.00	1		152.59	152.59
20.669	3	Clay	12.594	0.365	1.249	0.479	0.771	2.87	1.1162	0.96	0.686							1.00	1		151.04	151.04
21.161	3	Clay	12.883	0.375	1.279	0.494	0.785	2.87	1.1083	0.95	0.689							1.00	1		152.87	152.87
21.654	3	Clay	13.076	0.386	1.309	0.509	0.8	2.86	1.1	0.95	0.691							1.00	1		157.03	157.03
22.146	3	Clay	15.168	0.475	1.339	0.525	0.814	2.85	1.0924	0.95	0.693							1.00	1		165.36	165.36
22.638	3	Clay	14.418	0.43	1.368	0.54	0.828	2.86	1.0848	0.95	0.695							1.00	1		165.62	165.62
23.13	3	Clay	15.801	0.497	1.398	0.555	0.843	2.86	1.0768	0.95	0.697							1.00	1		168.76	168.76
23.622	3	Clay	14.693	0.48	1.428	0.571	0.857	2.87	1.0695	0.95	0.699							1.00	1		167.89	167.89
24.114	4	Silty Clay to Clay	15.085	0.447	1.458	0.586	0.872	2.83	1.0618	0.94	0.700							1.00	1		175.72	175.72
24.606	4	Silty Clay to Clay	22.683	0.611	1.487	0.601	0.886	2.75	1.0547	0.94	0.702							1.00	1		192.22	192.22
25.098	4	Silty Clay to Clay	14.535	0.363	1.517	0.617	0.9	2.82	1.0476	0.94	0.703							1.00	1		170.14	170.14
25.591	3	Clay	13.444	0.389	1.547	0.632	0.915	2.91	1.0402	0.94	0.704							1.00	1		159.38	159.38
26.083	3	Clay	14.287	0.445	1.577	0.648	0.929	2.92	1.0333	0.94	0.706							1.00	1		162.05	162.05
26.575	3	Clay	14.81	0.448	1.606	0.663	0.943	2.92	1.0266	0.94	0.707							1.00	1		165.31	165.31
27.067	3	Clay	14.369	0.504	1.636	0.678	0.958	2.96	1.0195	0.93	0.707							1.00	1		164.35	164.35
27.559	3	Clay	13.874	0.53	1.666	0.694	0.972	3	1.0129	0.93	0.708							1.00	1		161.01	161.01
28.051	3	Clay	13.895	0.532	1.696	0.709	0.987	3	1.0059	0.93	0.708							1.00	1		161.56	161.56
28.543	3	Clay	14.645	0.511	1.725	0.724	1.001	2.99	0.9995	0.93	0.709							1.00	1		161.88	161.88
29.035	3	Clay	13.103	0.441	1.755	0.74	1.015	3.01	0.9932	0.93	0.709							1.00	1		156.40	156.40
29.528	3	Clay	13.736	0.498	1.785	0.755	1.03	3.03	0.9865	0.92	0.709							0.99	1		157.57	157.57
30.02	3	Clay	13.117	0.492	1.815	0.77	1.044	3.05	0.9804	0.92	0.709							0.99	1		155.62	155.62
30.512	3	Clay	13.073	0.396	1.844	0.786	1.059	3.01	0.9739	0.92	0.709							0.99	1		154.19	154.19
31.004	4	Silty Clay to Clay	14.067	0.413	1.874	0.801	1.073	2.82	0.9679	0.92	0.709							0.99	1		187.07	187.07
31.496	4	Silty Clay to Clay	19.682	0.617	1.904	0.817	1.087	2.75	0.962	0.91	0.709							0.98	1		206.24	206.24
31.988	4	Silty Clay to Clay	12.966	0.295	1.934	0.832	1.102	2.88	0.9557	0.91	0.708							0.98	1		169.59	169.59
32.48	4	Silty Clay to Clay	14.645	0.342	1.963	0.847	1.116	2.94	0.9499	0.91	0.707							0.98	1		165.03	165.03
32.972	4	Silty Clay to Clay	16.186	0.495	1.993	0.863	1.13	2.94	0.9442	0.90	0.707							0.98	1		176.02	176.02
33.465	3	Clay	17.232	0.54	2.023	0.878	1.145	2.94	0.9382	0.90	0.706							0.97	1		179.57	179.57
33.957	3	Clay	14.177	0.49	2.053	0.893	1.159	3.02	0.9326	0.90	0.705							0.97	1		166.55	166.55
34.449	3	Clay	14.067	0.452	2.082	0.909	1.174	3.02	0.9267	0.89	0.703							0.97	1		166.68	166.68
34.941	4	Silty Clay to Clay	20.783	0.591	2.112	0.924	1.188	2.86	0.9213	0.89	0.702							0.97	1		200.74	200.74
35.433	4	Silty Clay to Clay	23.068	0.629	2.142	0.94	1.202	2.82	0.9159	0.89	0.701							0.96	1		214.89	214.89
35.925	4	Silty Clay to Clay	19.627	0.616	2.172	0.955	1.217	2.9	0.9102	0.88	0.699							0.96	1		197.67	197.67
36.417	4	Silty Clay to Clay	16.847	0.472	2.201	0.97	1.231	2.94	0.905	0.88	0.698							0.96	1		182.00	182.00
36.909	4	Silty Clay to Clay	14.865	0.374	2.231	0.986	1.246	2.97	0.8994	0.88	0.696							0.96	1		168.93	168.93
37.402	4	Silty Clay to Clay	14.362	0.268	2.261	1.001	1.26	2.95	0.8943	0.87	0.694							0.95	1		164.48	164.48
37.894	4	Silty Clay to Clay	15.897	0.358	2.291	1.016	1.274	2.9	0.8892	0.87	0.693							0.95	1		202.21	202.21
38.386	3	Clay	34.987	1.553	2.32	1.032	1.289	2.9	0.8839	0.86	0.690							0.95	1		234.22	234.22
38.878	3	Clay	13.963	0.258	2.35	1.047	1.303	3.02	0.8789	0.86	0.688							0.95	1		174.57	174.57
39.37	4	Silty Clay to Clay	16.985	0.258	2.38	1.062	1.318	2.81	0.8737	0.86	0.686							0.95	1		197.42	197.42
39.862	5	Clayey Silt to Silty Clay	58.909	0.797	2.41	1.078	1.332	2.54	0.8689	0.85	0.684	2.540	0.87	51.18	2.979	152.478	0.41	0.94	1	(0.70)	187.45	75.40
40.354	5	Clayey Silt to Silty Clay	36.914	0.996	2.439	1.093	1.346	2.57	0.8641	0.85	0.681	2.570	0.86	31.90	3.148	100.412	0.17	0.94	1	(0.30)	189.25	83.24
40.846	5	Clayey Silt to Silty Clay	55.88	0.865	2.469	1.109	1.361	2.28	0.859	0.84	0.678	2.280	0.86	48.00	1.886	90.542	0.15	0.94	1	(0.26)	201.50	116.42
41.339	5	Clayey Silt to Silty Clay	56.596	1.131	2.499	1.124	1.375	2.35	0.8544	0.84	0.676	2.350	0.85	48.35	2.120	102.493	0.18	0.94	1	(0.31)	200.15	107.96
41.831	4	Silty Clay to Clay	28.314	0.796	2.529	1.139	1.389	2.67	0.8497	0.83	0.673							0.94	1		283.75	283.75
42.323	5	Clayey Silt to Silty Clay	38.043	0.848	2.558	1.155	1.404	2.62	0.8449	0.83	0.670							0.93	1		292.22	292.22
42.815	4	Silty Clay to Clay	30.748	0.523	2.588	1.17	1.418	2.69	0.8403	0.83	0.668							0.93	1		250.38	250.38
43.307	4	Silty Clay to Clay	20.288	0.493	2.618	1.185	1.433	2.86	0.8355	0.82	0.664							0.93	1		206.22	206.22
43.799	4	Silty Clay to Clay	16.372	0.388	2.648	1.201	1.447	2.98	0.8311	0.82	0.662							0.93	1		183.55	183.55
44.291	4	Silty Clay to Clay	26.123	0.451	2.677	1.216	1.461	2.89	0.8268	0.81	0.658							0.93	1		208.00	208.00
44.783	5	Clayey Silt to Silty Clay	31.932	0.636	2.707	1.231	1.476	2.59	0.8221	0.81	0.655	2.590	0.82	26.25	3.266	85.740	0.14	0.93	1	(0.24)	193.11	75.40
45.276	5	Clayey Silt to Silty Clay	68.488	1.087	2.737	1.247	1.49	2.44	0.8178	0.80	0.652	2.440	0.82	56.01	2.483	139.087	0.33	0.92	1	(0.58)	202.88	99.58
45.768	4	Silty Clay to Clay	32.345	0.832	2.767	1.262	1.505	2.66	0.8133	0.80	0.649							0.92	1		297.56	297.56
46.26	4	Silty Clay to Clay	37.802	0.824	2.796	1.278	1.519	2.64	0.8091	0.79	0.645							0.92	1		345.13	345.13
46.752	4	Silty Clay to Clay	47.842	2.912	2.826	1.293	1.533	2.75	0.805	0.79	0.642							0.92	1		342.22	342.22
47.244	4	Silty Clay to Clay	22.986	0.591	2.856	1.308	1.548	2.93	0.8006	0.78	0.639							0.92	1		230.52	230.52
47.736	4	Silty Clay to Clay	24.665	0.509	2.886	1.324	1.562	2.82	0.7965	0.78	0.635							0.91	1		227.04	227.04
48.228	4	Silty Clay to Clay	24.573	0.519	2.915	1.339	1.576	2.82	0.7925	0.77	0.632							0.91	1		229.28	229.28
48.72	4	Silty Clay to Clay	23.206	0.538	2.945	1.354	1.591	2.88	0.7882	0.77	0.628							0.91	1		219.10	219.10
49.213	4	Silty Clay to Clay	20.426	0.567	2.975	1.37	1.605	2.96	0.7843	0.76	0.625							0.91	1		206.00	206.00
49.705	4	Silty Clay to Clay	21.526	0.512	3.005	1.385	1.62	2.9	0.7801	0.76	0.621							0.91	1		217.06	217.06
50.197	4	Silty Clay to Clay	34.519	0.879	3.034	1.4	1.634	2.76	0.7763	0.75	0.618							0.91	1		272.49	272.49

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge to Bart Regional Connector Project*** *FAULT INFO*
PROJECT NO. ***2017-125-GEO*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-77*** *FAULT* M_w = 6.9 *MSF* = 1.24 a_{max} *(g)*= 0.682 V_{S30m}(m/s)= #REF! 217.4

		CPT RESULT INPUT							***CSR***		***$CRR_{7.5}$***						***$F.S.=(CRR_{7.5}/CSR)*MSF*K\sigma*K\alpha$***				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
50.689	5	Clayey Silt to Silty Clay	42.695	1.333	3.064	1.416	1.648	2.57	0.7725	0.75	0.615	2.570	0.77	32.98	3.148	103.822	0.18	0.90	1	(0.34)	210.65	107.96
51.181	6	Sandy Silt to Clayey Silt	244.06	5.629	3.094	1.431	1.663	2.04	0.7684	0.74	0.611	2.040	0.77	187.54	1.356	254.282		0.84	1		252.44	252.44
51.673	6	Sandy Silt to Clayey Silt	446.25	8.668	3.124	1.447	1.677	1.78	0.7647	0.74	0.608	1.780	0.76	341.24	1.092	372.748		0.81	1		274.46	274.46
52.165	6	Sandy Silt to Clayey Silt	553.19	5.042	3.153	1.462	1.692	1.54	0.7607	0.73	0.604	1.540	0.76	420.82	1.000	420.821		0.81	1		280.63	280.63
52.657	6	Sandy Silt to Clayey Silt	396.09	3.657	3.183	1.477	1.706	1.52	0.7571	0.73	0.600	1.520	0.76	299.86	1.000	299.862		0.81	1		272.36	272.36
53.15	6	Sandy Silt to Clayey Silt	193.68	1.813	3.213	1.493	1.72	1.83	0.7534	0.72	0.597	1.830	0.75	145.92	1.129	164.776		0.85	1		247.31	247.31
53.642	5	Clayey Silt to Silty Clay	44.897	1.013	3.243	1.508	1.735	2.51	0.7496	0.72	0.594	2.510	0.75	33.65	2.820	94.887	0.16	0.90	1	(0.30)	210.43	83.24
54.134	5	Clayey Silt to Silty Clay	34.905	0.513	3.272	1.523	1.749	2.63	0.746	0.71	0.590							0.89	1		283.45	283.45
54.626	4	Silty Clay to Clay	28.518	0.516	3.302	1.539	1.763	2.77	0.7425	0.71	0.587							0.89	1		252.20	252.20
55.118	4	Silty Clay to Clay	21.141	0.504	3.332	1.554	1.778	2.93	0.7388	0.70	0.583							0.89	1		216.66	216.66
55.61	4	Silty Clay to Clay	21.472	0.423	3.362	1.569	1.792	2.89	0.7353	0.70	0.580							0.89	1		218.86	218.86
56.102	4	Silty Clay to Clay	29.344	0.456	3.391	1.585	1.807	2.78	0.7316	0.69	0.577							0.89	1		252.43	252.43
56.594	5	Clayey Silt to Silty Clay	39.089	1.681	3.421	1.6	1.821	2.35	0.7282	0.69	0.573	2.350	0.73	28.47	2.120	60.338	0.10	0.89	1	(0.19)	228.87	142.13
57.087	6	Sandy Silt to Clayey Silt	276.24	5.169	3.451	1.616	1.835	1.94	0.7249	0.68	0.570	1.940	0.72	200.24	1.229	246.089		0.82	1		261.39	261.39
57.579	6	Sandy Silt to Clayey Silt	382.6	4.131	3.481	1.631	1.85	1.75	0.7213	0.68	0.567	1.750	0.72	275.97	1.072	295.734		0.78	1		272.41	272.41
58.071	6	Sandy Silt to Clayey Silt	262.42	4.346	3.51	1.646	1.864	1.91	0.718	0.68	0.564	1.910	0.72	188.42	1.198	225.804		0.81	1		263.96	263.96
58.563	5	Clayey Silt to Silty Clay	131.05	4.221	3.54	1.662	1.879	2.28	0.7145	0.67	0.561	2.280	0.71	93.64	1.886	176.622		0.85	1		246.29	246.29
59.055	5	Clayey Silt to Silty Clay	131.61	4.668	3.57	1.677	1.893	2.49	0.7113	0.67	0.558	2.490	0.71	93.61	2.718	254.470		0.88	1		235.32	235.32
59.547	4	Silty Clay to Clay	33.061	0.787	3.6	1.692	1.907	2.8	0.7081	0.66	0.555							0.88	1		324.16	324.16
60.039	4	Silty Clay to Clay	29.442	0.542	3.629	1.708	1.922	2.81	0.7047	0.66	0.552							0.88	1		255.96	255.96
60.532	4	Silty Clay to Clay	29.73	0.585	3.659	1.723	1.936	2.81	0.7015	0.65	0.549							0.88	1		256.22	256.22
61.024	4	Silty Clay to Clay	24.913	0.489	3.689	1.738	1.95	2.86	0.6984	0.65	0.546							0.87	1		241.89	241.89
61.516	4	Silty Clay to Clay	26.564	0.526	3.719	1.754	1.965	2.88	0.6951	0.65	0.543							0.87	1		240.78	240.78
62.008	4	Silty Clay to Clay	27.775	0.646	3.748	1.769	1.979	2.81	0.692	0.64	0.540							0.87	1		285.48	285.48
62.5	5	Clayey Silt to Silty Clay	73.223	1.735	3.778	1.785	1.994	2.57	0.6888	0.64	0.537	2.570	0.69	50.44	3.148	158.769	0.45	0.87	1	(0.91)	222.88	91.33
62.992	5	Clayey Silt to Silty Clay	58.767	1.632	3.808	1.8	2.008	2.51	0.6858	0.64	0.535	2.510	0.69	40.30	2.820	113.631	0.22	0.87	1	(0.44)	227.89	107.96
63.484	5	Clayey Silt to Silty Clay	147.96	3.446	3.838	1.815	2.022	2.3	0.6828	0.63	0.532	2.300	0.68	101.03	1.949	196.875		0.86	1		243.98	243.98
63.976	5	Clayey Silt to Silty Clay	112.94	2.813	3.867	1.831	2.037	2.3	0.6796	0.63	0.529	2.300	0.68	76.76	1.949	149.588	0.39	0.86	1	(0.78)	246.19	176.71
64.469	5	Clayey Silt to Silty Clay	168.5	3.915	3.897	1.846	2.051	2.29	0.6767	0.63	0.527	2.290	0.68	114.02	1.917	218.588		0.85	1		249.64	249.64
64.961	5	Clayey Silt to Silty Clay	82.389	2.615	3.927	1.861	2.066	2.48	0.6736	0.62	0.524	2.480	0.67	55.50	2.669	148.143	0.38	0.86	1	(0.78)	237.71	133.52
65.453	4	Silty Clay to Clay	40.933	0.94	3.957	1.877	2.08	2.81	0.6707	0.62	0.522							0.86	1		309.28	309.28
65.945	5	Clayey Silt to Silty Clay	29.95	0.509	3.986	1.892	2.094	2.78	0.6679	0.62	0.520							0.86	1		270.78	270.78
66.437	5	Clayey Silt to Silty Clay	30.927	0.49	4.016	1.907	2.109	2.75	0.6649	0.61	0.517							0.86	1		274.37	274.37
66.929	5	Clayey Silt to Silty Clay	37.96	0.556	4.046	1.923	2.123	2.66	0.6621	0.61	0.515							0.86	1		305.47	305.47
67.421	5	Clayey Silt to Silty Clay	40.685	1.13	4.076	1.938	2.137	2.74	0.6593	0.61	0.513							0.86	1		318.96	318.96
67.913	4	Silty Clay to Clay	34.271	1.04	4.105	1.954	2.152	2.85	0.6563	0.60	0.511							0.86	1		295.85	295.85
68.406	4	Silty Clay to Clay	32.317	0.8	4.135	1.969	2.166	2.85	0.6536	0.60	0.508							0.86	1		281.73	281.73
68.898	5	Clayey Silt to Silty Clay	31.161	0.672	4.165	1.984	2.181	2.83	0.6507	0.60	0.506							0.86	1		276.51	276.51
69.39	4	Silty Clay to Clay	31.189	0.686	4.195	2	2.195	2.84	0.648	0.60	0.504							0.85	1		275.40	275.40
69.882	4	Silty Clay to Clay	31.739	1.467	4.224	2.015	2.209	2.89	0.6454	0.59	0.502							0.85	1		299.42	299.42
70.374	4	Silty Clay to Clay	43.218	1.128	4.254	2.03	2.224	2.8	0.6425	0.59	0.500							0.85	1		333.33	333.33
70.866	5	Clayey Silt to Silty Clay	51.091	2.209	4.284	2.046	2.238	2.44	0.6399	0.59	0.498	2.440	0.64	32.69	2.483	81.182	0.13	0.85	1	(0.27)	245.28	133.52
71.358	6	Sandy Silt to Clayey Silt	185.37	4.817	4.314	2.061	2.253	1.81	0.6371	0.58	0.496	1.810	0.64	118.10	1.114	131.569	0.29	0.73	1	(0.53)	290.15	290.15
71.85	6	Sandy Silt to Clayey Silt	670.51	7.557	4.343	2.076	2.267	1.58	0.6346	0.58	0.495	1.580	0.63	425.47	1.000	425.474		0.72	1		308.85	308.85
72.343	6	Sandy Silt to Clayey Silt	216.42	4.506	4.373	2.092	2.281	1.98	0.632	0.58	0.493	1.980	0.63	136.78	1.275	174.355		0.76	1		280.73	280.73
72.835	4	Silty Clay to Clay	53.073	1.793	4.403	2.107	2.296	2.71	0.6293	0.58	0.491							0.85	1		427.13	427.13
73.327	5	Clayey Silt to Silty Clay	38.621	0.629	4.433	2.123	2.31	2.75	0.6268	0.58	0.489							0.85	1		305.23	305.23
73.819	5	Clayey Silt to Silty Clay	35.593	0.631	4.462	2.138	2.324	2.78	0.6243	0.57	0.488							0.84	1		291.59	291.59
74.311	5	Clayey Silt to Silty Clay	35.3	0.637	4.492	2.153	2.339	2.81	0.6216	0.57	0.486							0.84	1		288.60	288.60
74.803	5	Clayey Silt to Silty Clay	45.31	0.863	4.522	2.169	2.353	2.79	0.6192	0.57	0.484							0.84	1		319.69	319.69
75.295	4	Silty Clay to Clay	49.219	1.488	4.552	2.184	2.368	2.83	0.6166	0.57	0.483							0.84	1		328.96	328.96
75.787	4	Silty Clay to Clay	35.166	0.815	4.581	2.199	2.382	2.86	0.6142	0.56	0.481							0.84	1		295.91	295.91
76.28	5	Clayey Silt to Silty Clay	35.242	0.681	4.611	2.215	2.396	2.8	0.6118	0.56	0.480							0.84	1		298.61	298.61
76.772	5	Clayey Silt to Silty Clay	53.375	0.949	4.641	2.23	2.411	2.71	0.6092	0.56	0.478							0.84	1		343.65	343.65
77.264	5	Clayey Silt to Silty Clay	52.164	1.319	4.671	2.245	2.425	2.66	0.6069	0.56	0.477							0.84	1		404.93	404.93
77.756	5	Clayey Silt to Silty Clay	86.766	2.398	4.7	2.261	2.44	2.64	0.6044	0.56	0.475							0.84	1		440.39	440.39
78.248	5	Clayey Silt to Silty Clay	34.795	0.817	4.73	2.276	2.454	2.81	0.6021	0.55	0.474							0.84	1		329.31	329.31
78.74	5	Clayey Silt to Silty Clay	42.199	0.906	4.76	2.292	2.468	2.8	0.5998	0.55	0.473							0.83	1		320.29	320.29
79.232	5	Clayey Silt to Silty Clay	37.382	0.976	4.79	2.307	2.483	2.82	0.5973	0.55	0.471							0.83	1		310.60	310.60
79.724	4	Silty Clay to Clay	30.473	0.689	4.819	2.322	2.497	2.91	0.5951	0.55	0.470							0.83	1		272.42	272.42
80.217	4	Silty Clay to Clay	30.418	0.731	4.849	2.338	2.511	2.94	0.5928	0.55	0.469							0.83	1		268.72	268.72
80.709	5	Clayey Silt to Silty Clay	32.593	0.666	4.879	2.353	2.526	2.89	0.5904	0.55	0.467							0.83	1		278.69	278.69
81.201	5	Clayey Silt to Silty Clay	34.877	0.694	4.909	2.368	2.54	2.83	0.5882	0.54	0.466							0.83	1		297.67	297.67
81.693	5	Clayey Silt to Silty Clay	38.814	0.761	4.938	2.384	2.555	2.8	0.5859	0.54	0.465							0.83	1		307.94	307.94
82.185	5	Clayey Silt to Silty Clay	31.134	0.65	4.968	2.399	2.569	2.86	0.5837	0.54	0.464							0.83	1		284.99	284.99
82.677	5	Clayey Silt to Silty Clay	30.886	0.625	4.998	2.414	2.583	2.9	0.5815	0.54	0.463							0.83	1		274.38	274.38
83.169	5	Clayey Silt to Silty Clay	33.005	0.771	5.028	2.43	2.598	2.89	0.5793	0.54	0.461							0.83	1		289.22	289.22
83.661	5	Clayey Silt to Silty Clay	40.52	1.004	5.057	2.445	2.612	2.85	0.5771	0.54	0.460							0.83	1		324.34	324.34
84.154	5	Clayey Silt to Silty Clay	61.634	1.764	5.087	2.461	2.627	2.77	0.5749	0.53	0.459							0.82	1		373.59	373.59
84.646	5	Clayey Silt to Silty Clay	38.208	0.804	5.117	2.476	2.641	2.8	0.5728	0.53	0.458							0.82	1		334.96	334.96
85.138	5	Clayey Silt to Silty Clay	37.258	0.838	5.147	2.491	2.655	2.85	0.5707	0.53	0.457							0.82	1		307.91	307.91
85.63	5	Clayey Silt to Silty Clay	42.089	1.013	5.176	2.507	2.67	2.83	0.5685	0.53	0.456							0.82	1		326.57	326.57
86.122	5	Clayey Silt to Silty Clay	42.117	1.095	5.206	2.522	2.684	2.84	0.5664	0.53	0.455							0.82	1		330.35	330.35
86.614	4	Silty Clay to Clay	38.373	1.133	5.236	2.537	2.698	2.9	0.5644	0.53	0.454							0.82	1		312.99	312.99
87.106	4	Silty Clay to Clay	31.849	0.811	5.266	2.553	2.713	2.94	0.5622	0.53	0.453							0.82	1		286.38	286.38
87.598	5	Clayey Silt to Silty Clay	32.042	0.676	5.295	2.568	2.727	2.9	0.5602	0.53	0.452							0.82	1		285.10	285.10
88.091	5	Clayey Silt to Silty Clay	34.932	0.723	5.325	2.583	2.742	2.89	0.5581	0.52	0.451							0.82	1		292.53	292.53
88.583	5	Clayey Silt to Silty Clay	32.152	0.724	5.355	2.599	2.756	2.92	0.5561	0.52	0.450							0.82	1		281.02	281.02
89.075	5	Clayey Silt to Silty Clay	31.395	0.604	5.385	2.614	2.77	2.91	0.5542	0.52	0.449							0.82	1		277.77	277.77
89.567	5	Clayey Silt to Silty Clay	34.575	0.626	5.414	2.63	2.785	2.88	0.5521	0.52	0.448							0.81	1		288.89	288.89
90.059	5	Clayey Silt to Silty Clay	34.354	0.797	5.444	2.645	2.799	2.9	0.5501	0.52	0.448							0.81	1		295.28	295.28
90.551	5	Clayey Silt to Silty Clay	34.299	0.815	5.474	2.66	2.814	2.91	0.5481	0.52	0.447							0.81	1		295.58	295.58
91.043	5	Clayey Silt to Silty Clay	34.209	0.777	5.504	2.676	2.828	2.92	0.5462	0.52	0.446							0.81	1		292.71	292.71
91.535	4	Silty Clay to Clay	33.68	0.848	5.533	2.691	2.842	2.94	0.5443	0.52	0.445							0.81	1		291.18	291.18
92.028	4	Silty Clay to Clay	34.767	0.81	5.563	2.706	2.857	2.94	0.5423	0.51	0.444							0.81	1		290.14	290.14
92.52	4	Silty Clay to Clay	33.893	0.831	5.593	2.722	2.871	2.96	0.5404	0.51	0.443							0.81	1		290.04	290.04
93.012	4	Silty Clay to Clay	34.836	1.031	5.623	2.737	2.885	2.98	0.5386	0.51	0.443							0.81	1		295.60	295.60
93.504	4	Silty Clay to Clay	36.887	1.092	5.652	2.752	2.9	2.97	0.5366	0.51	0.442							0.81	1		300.84	300.84
93.996	4	Silty Clay to Clay	35.734	0.872	5.682	2.768	2.914	2.94	0.5348	0.51	0.441							0.81	1		300.44	300.44
94.488	5	Clayey Silt to Silty Clay	38.841	0.875	5.712	2.783	2.929	2.85	0.5328	0.51	0.440							0.81	1		323.99	323.99
94.98	4	Silty Clay to Clay	47.086	1.208	5.742	2.799	2.943	2.9	0.531	0.51	0.440							0.81	1		355.68	355.68
95.472	4	Silty Clay to Clay	61.937	2.154	5.771	2.814	2.957	2.92	0.5292	0.51	0.439							0.81	1		371.38	371.38
95.965	4	Silty Clay to Clay	47.677	1.342	5.801	2.829	2.972	2.88	0.5273	0.51	0.438							0.80	1		355.57	355.57
96.457	5	Clayey Silt to Silty Clay	51.503	1.562	5.831	2.845	2.986	2.85	0.5256	0.51	0.437							0.80	1		375.45	375.45
96.949	4	Silty Clay to Clay	57.532	2.415	5.861	2.86	3.001	2.81	0.5237	0.50	0.437							0.80	1		425.05	425.05
97.441	5	Clayey Silt to Silty Clay	70.69	2.419	5.89	2.875	3.015	2.77	0.5219	0.50	0.436							0.80	1		452.34	452.34
97.933	5	Clayey Silt to Silty Clay	69.644	2.47	5.92	2.891	3.029	2.74	0.5202	0.50	0.435							0.80	1		453.08	453.08
98.425	5	Clayey Silt to Silty Clay	52.495	1.84	5.95	2.906	3.044	2.77	0.5184	0.50	0.435							0.80	1		409.21	409.21
98.917	5	Clayey Silt to Silty Clay	48.923	1.335	5.98	2.921	3.058	2.86	0.5167	0.50	0.434							0.80	1		362.63	362.63
99.409	5	Clayey Silt to Silty Clay	56.816	1.407	6.009	2.937	3.072	2.81	0.515	0.50	0.433							0.80	1		386.04	386.04
99.902	4	Silty Clay to Clay	61.469	3.562	6.039	2.952	3.087	2.86	0.5132	0.50	0.433							0.80	1		443.01	443.01
100.39	4	Silty Clay to Clay	93.868	3.315	6.069	2.968	3.101	2.77	0.5115	0.50	0.432							0.80	1		492.93	492.93
100.89	5	Clayey Silt to Silty Clay	68.433	2.109	6.099	2.983	3.116	2.76	0.5097	0.50	0.431							0.80	1		449.56	449.56
101.38	5	Clayey Silt to Silty Clay	69.038	2.088	6.128	2.998	3.13	2.75	0.5081	0.50	0.431							0.80	1		444.53	444.53
101.87	5	Clayey Silt to Silty Clay	62.625	1.817	6.158	3.014	3.144	2.77	0.5064	0.50	0.430							0.80	1		424.25	424.25
102.36	5	Clayey Silt to Silty Clay	55.412	1.473	6.188	3.029	3.159	2.82	0.5047	0.49	0.429							0.79	1		388.03	388.03

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME	***Eastridge to Bart Regional Connector Project***	*FAULT INFO*			
PROJECT NO.	***2017-125-GEO***	*COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*			
CPT NO.	***CPT-AS-77***	*FAULT* M_w = 6.9	*MSF* = 1.24	a_{max} *(g)*= 0.682	V_{S30m}(m/s)= #REF! 217.4

		CPT RESULT INPUT							***CSR***		***CRR*** $_{7.5}$						***F.S.=(CRR*** $_{7.5}$ ***/CSR)*MSF*K*** σ ****K*** α				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
102.85	5	Clayey Silt to Silty Clay	54.993	1.526	6.218	3.044	3.173	2.84	0.5031	0.49	0.429							0.79	1		388.12	388.12
103.35	4	Silty Clay to Clay	83.848	3.866	6.247	3.06	3.188	2.75	0.5014	0.49	0.428							0.79	1		513.54	513.54
103.84	9	Sand	97.261	4.141	6.277	3.075	3.202	2.71	0.4998	0.49	0.428							0.79	1		570.50	570.50
104.33	9	Sand	110.08	5.692	6.307	3.09	3.216	2.68	0.4982	0.49	0.427							0.79	1		630.13	630.13
104.82	8	Sand to Silty Sand	181.32	6.881	6.337	3.106	3.231	2.51	0.4965	0.49	0.426	2.510	0.50	90.03	2.820	253.832		0.79	1		290.58	290.58
105.32	8	Sand to Silty Sand	178.04	6.436	6.366	3.121	3.245	2.49	0.4949	0.49	0.426	2.490	0.49	88.12	2.718	239.535		0.79	1		292.67	292.67
105.81	8	Sand to Silty Sand	190.9	8.373	6.396	3.137	3.259	2.5	0.4934	0.49	0.425	2.500	0.49	94.19	2.768	260.754		0.79	1		295.72	295.72
106.3	8	Sand to Silty Sand	196.82	8.004	6.426	3.152	3.274	2.51	0.4917	0.49	0.425	2.510	0.49	96.78	2.820	272.879		0.79	1		296.11	296.11
106.79	9	Sand	184.08	8.285	6.456	3.167	3.288	2.56	0.4902	0.49	0.424	2.560	0.49	90.24	3.091	278.880		0.79	1		294.82	294.82
107.28	9	Sand	185.59	8.964	6.485	3.183	3.303	2.57	0.4886	0.49	0.423	2.570	0.49	90.67	3.148	285.432		0.79	1		294.83	294.83
107.78	8	Sand to Silty Sand	174.11	6.635	6.515	3.198	3.317	2.55	0.487	0.49	0.423	2.550	0.49	84.80	3.034	257.303		0.79	1		293.20	293.20
108.27	8	Sand to Silty Sand	183.58	5.612	6.545	3.213	3.331	2.37	0.4855	0.48	0.422	2.370	0.49	89.14	2.194	195.568		0.77	1		299.50	299.50
108.76	6	Sandy Silt to Clayey Silt	298.51	3.844	6.575	3.229	3.346	1.92	0.4839	0.48	0.422	1.920	0.48	144.46	1.208	174.547		0.70	1		317.65	317.65
109.25	6	Sandy Silt to Clayey Silt	440.16	3.316	6.604	3.244	3.36	1.64	0.4825	0.48	0.421	1.640	0.48	212.36	1.000	212.358		0.64	1		331.02	331.02
109.74	7	Silty Sand to Sandy Silt	486.52	2.926	6.634	3.259	3.375	1.53	0.4809	0.48	0.421	1.530	0.48	233.95	1.000	233.954		0.61	1		335.51	335.51
110.24	7	Silty Sand to Sandy Silt	482	2.84	6.664	3.275	3.389	1.46	0.4794	0.48	0.420	1.460	0.48	231.08	1.000	231.075		0.61	1		336.61	336.61

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LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME	***Eastridge to Bart Regional Connector Project***	*FAULT INFO*			
PROJECT NO.	***2017-125-GEO***	*COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*			
CPT NO.	***CPT-AS-81***	*FAULT* M_w = 6.9	*MSF* = 1.24	a_{max} *(g)*= 0.682	V_{S30m}(m/s)= #REF! 220.6

			CPT RESULT INPUT							***CSR***		***CRR*** $_{7.5}$						***F.S.=(CRR*** $_{7.5}$***/CSR)*MSF*K σ*K α***				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
0.492			-9999	-9999	0.03		0.03		1.7	1.00	0.444							1.00			0.00	0.00
0.984			-9999	-9999	0.059		0.059		1.7	1.00	0.443							1.00			0.00	0.00
1.476			-9999	-9999	0.089		0.089		1.7	1.00	0.443							1.00			0.00	0.00
1.968			-9999	-9999	0.119		0.119		1.6679	1.00	0.442							1.00			0.00	0.00
2.461			-9999	-9999	0.149		0.149		1.6308	1.00	0.442							1.00			0.00	0.00
2.953			-9999	-9999	0.178		0.178		1.5965	1.00	0.441							1.00			0.00	0.00
3.445			-9999	-9999	0.208		0.208		1.5625	0.99	0.441							1.00			0.00	0.00
3.937			-9999	-9999	0.238		0.238		1.5299	0.99	0.440										0.00	0.00
4.429			-9999	-9999	0.268		0.268		1.4986	0.99	0.440										0.00	0.00
4.921			-9999	-9999	0.297		0.297		1.4696	0.99	0.439										0.00	0.00
5.413	4	Silty Clay to Clay	15.718	0.469	0.327	0.004	0.324	2.49	1.4436	0.99	0.443	2.490	1.44	22.69	2.718	61.680	0.10			(0.00)	115.02	115.02
5.906	3	Clay	10.158	0.305	0.357	0.019	0.338	2.58	1.4304	0.99	0.463	2.580	1.43	14.53	3.206	46.591	0.09			(0.00)	112.00	91.33
6.398	3	Clay	8.479	0.259	0.387	0.034	0.352	2.7	1.4175	0.99	0.481										124.46	124.46
6.89	4	Silty Clay to Clay	10.099	0.233	0.416	0.05	0.367	2.57	1.404	0.99	0.495	2.570	1.40	14.18	3.148	44.634	0.09			(0.00)	114.24	83.24
7.382	5	Clayey Silt to Silty Clay	37.079	0.451	0.446	0.065	0.381	2.21	1.3915	0.98	0.511	2.210	1.39	51.60	1.692	87.281	0.14	1.00	0	(0.00)	130.68	130.68
7.874	5	Clayey Silt to Silty Clay	43.796	0.889	0.476	0.08	0.396	2.21	1.3784	0.98	0.524	2.210	1.38	60.37	1.692	102.124	0.18	1.00	1	(0.42)	135.26	135.26
8.366	4	Silty Clay to Clay	18.333	0.461	0.506	0.096	0.41	2.41	1.3665	0.98	0.538	2.410	1.37	25.05	2.354	58.962	0.10	1.00	1	(0.23)	127.25	116.42
8.858	4	Silty Clay to Clay	13.991	0.321	0.535	0.111	0.424	2.55	1.3547	0.98	0.549	2.550	1.35	18.95	3.034	57.509	0.10	1.00	1	(0.22)	122.06	83.24
9.35	3	Clay	10.874	0.26	0.565	0.126	0.439	2.68	1.3423	0.98	0.559							1.00	1		139.30	139.30
9.843	3	Clay	9.717	0.211	0.595	0.142	0.453	2.72	1.3309	0.98	0.570							1.00	1		127.99	127.99
10.335	3	Clay	8.891	0.207	0.625	0.157	0.468	2.77	1.3189	0.98	0.579							1.00	1		120.83	120.83
10.827	3	Clay	8.797	0.238	0.654	0.173	0.482	2.81	1.308	0.98	0.588							1.00	1		119.93	119.93
11.319	3	Clay	9.139	0.243	0.684	0.188	0.496	2.81	1.2972	0.98	0.597							1.00	1		121.41	121.41
11.811	3	Clay	8.534	0.199	0.714	0.203	0.511	2.81	1.2858	0.98	0.604							1.00	1		119.33	119.33
12.303	3	Clay	8.644	0.199	0.744	0.219	0.525	2.82	1.2754	0.97	0.612							1.00	1		117.96	117.96
12.795	3	Clay	8.678	0.204	0.773	0.234	0.539	2.83	1.2651	0.97	0.619							1.00	1		119.59	119.59
13.287	4	Silty Clay to Clay	11.286	0.227	0.803	0.249	0.554	2.73	1.2543	0.97	0.625							1.00	1		138.38	138.38
13.78	4	Silty Clay to Clay	13.571	0.331	0.833	0.265	0.568	2.7	1.2443	0.97	0.631							1.00	1		155.81	155.81
14.272	4	Silty Clay to Clay	14.975	0.425	0.863	0.28	0.583	2.69	1.2339	0.97	0.637							1.00	1		171.56	171.56
14.764	4	Silty Clay to Clay	19.242	0.527	0.892	0.295	0.597	2.64	1.2243	0.97	0.642							1.00	1		191.67	191.67
15.256	4	Silty Clay to Clay	20.26	0.598	0.922	0.311	0.611	2.58	1.2148	0.97	0.648	2.580	1.21	24.61	3.206	78.917	0.13	1.00	1	(0.24)	142.58	99.58
15.748	4	Silty Clay to Clay	31.904	0.9	0.952	0.326	0.626	2.49	1.2048	0.97	0.652	2.490	1.20	38.44	2.718	104.491	0.19	1.00	1	(0.35)	148.10	124.95
16.24	4	Silty Clay to Clay	27.988	0.582	0.982	0.342	0.64	2.41	1.1957	0.97	0.657	2.410	1.20	33.46	2.354	78.762	0.13	1.00	1	(0.24)	150.32	116.42
16.732	4	Silty Clay to Clay	31.574	0.638	1.011	0.357	0.655	2.43	1.186	0.96	0.660	2.430	1.19	37.45	2.439	91.332	0.15	1.00	1	(0.28)	150.19	107.96
17.224	4	Silty Clay to Clay	24.472	0.501	1.041	0.372	0.669	2.59	1.1771	0.96	0.665	2.590	1.18	28.81	3.266	94.081	0.16	1.00	1	(0.29)	144.78	83.24
17.717	4	Silty Clay to Clay	17.136	0.39	1.071	0.388	0.683	2.64	1.1683	0.96	0.669							1.00	1		185.08	185.08
18.209	4	Silty Clay to Clay	18.492	0.414	1.101	0.403	0.698	2.55	1.1591	0.96	0.672	2.550	1.16	21.43	3.034	65.037	0.11	1.00	1	(0.19)	145.91	75.40
18.701	4	Silty Clay to Clay	21.168	0.389	1.13	0.418	0.712	2.58	1.1506	0.96	0.676	2.580	1.15	24.36	3.206	78.098	0.12	1.00	1	(0.23)	145.32	75.40
19.193	3	Clay	10.763	0.266	1.16	0.434	0.726	2.87	1.1423	0.96	0.679							1.00	1		140.49	140.49
19.685	3	Clay	10.295	0.283	1.19	0.449	0.741	2.92	1.1334	0.96	0.682							1.00	1		133.27	133.27
20.177	3	Clay	10.598	0.31	1.22	0.464	0.755	2.94	1.1253	0.96	0.685							1.00	1		134.14	134.14
20.669	3	Clay	10.309	0.314	1.249	0.48	0.77	2.96	1.1168	0.96	0.687							1.00	1		133.35	133.35
21.161	3	Clay	10.545	0.29	1.279	0.495	0.784	2.94	1.1089	0.95	0.690							1.00	1		135.66	135.66
21.654	3	Clay	11.452	0.302	1.309	0.511	0.798	2.88	1.1011	0.95	0.693							1.00	1		145.39	145.39
22.146	4	Silty Clay to Clay	14.204	0.352	1.339	0.526	0.813	2.84	1.0929	0.95	0.694							1.00	1		157.03	157.03
22.638	3	Clay	13.681	0.363	1.368	0.541	0.827	2.85	1.0853	0.95	0.696							1.00	1		159.62	159.62
23.13	3	Clay	15.057	0.454	1.398	0.557	0.842	2.88	1.0774	0.95	0.698							1.00	1		163.89	163.89
23.622	3	Clay	13.544	0.442	1.428	0.572	0.856	2.9	1.07	0.95	0.700							1.00	1		163.70	163.70
24.114	4	Silty Clay to Clay	17.453	0.52	1.458	0.587	0.87	2.65	1.0628	0.94	0.702							1.00	1		220.17	220.17
24.606	4	Silty Clay to Clay	40.245	0.958	1.487	0.603	0.885	2.54	1.0552	0.94	0.703	2.540	1.06	42.46	2.979	126.501	0.27	1.00	1	(0.47)	163.35	91.33
25.098	4	Silty Clay to Clay	14.039	0.334	1.517	0.618	0.899	2.77	1.0481	0.94	0.704							1.00	1		179.30	179.30
25.591	4	Silty Clay to Clay	14.535	0.38	1.547	0.633	0.913	2.88	1.0412	0.94	0.706							1.00	1		159.96	159.96
26.083	3	Clay	13.007	0.391	1.577	0.649	0.928	2.95	1.0338	0.94	0.707							1.00	1		154.57	154.57
26.575	3	Clay	13.158	0.492	1.606	0.664	0.942	2.99	1.0271	0.94	0.707							1.00	1		154.65	154.65
27.067	3	Clay	13.874	0.465	1.636	0.68	0.957	2.97	1.0199	0.93	0.708							1.00	1		159.45	159.45
27.559	3	Clay	14.166	0.477	1.666	0.695	0.971	2.96	1.0134	0.93	0.709							1.00	1		162.28	162.28
28.051	3	Clay	14.287	0.492	1.696	0.71	0.985	2.98	1.0069	0.93	0.710							1.00	1		162.69	162.69
28.543	3	Clay	14.142	0.527	1.725	0.726	1	3	1	0.93	0.709							1.00	1		162.39	162.39
29.035	3	Clay	14.314	0.536	1.755	0.741	1.014	3	0.9937	0.93	0.710							1.00	1		161.90	161.90
29.528	3	Clay	13.819	0.39	1.785	0.756	1.029	2.96	0.987	0.92	0.710							0.99	1		161.41	161.41
30.02	4	Silty Clay to Clay	15.25	0.402	1.815	0.772	1.043	2.86	0.9808	0.92	0.710							0.99	1		176.12	176.12
30.512	4	Silty Clay to Clay	15.801	0.422	1.844	0.787	1.057	2.9	0.9747	0.92	0.710							0.99	1		174.26	174.26
31.004	3	Clay	12.8	0.428	1.874	0.802	1.072	3.04	0.9683	0.92	0.709							0.99	1		153.20	153.20
31.496	3	Clay	12.608	0.454	1.904	0.818	1.086	3.08	0.9624	0.91	0.709							0.98	1		150.81	150.81
31.988	3	Clay	12.869	0.471	1.934	0.833	1.1	3.08	0.9565	0.91	0.709							0.98	1		153.73	153.73
32.48	3	Clay	13.406	0.445	1.963	0.849	1.115	3.06	0.9503	0.91	0.708							0.98	1		157.11	157.11
32.972	3	Clay	13.709	0.495	1.993	0.864	1.129	3.06	0.9446	0.90	0.707							0.98	1		157.42	157.42
33.465	3	Clay	12.553	0.399	2.023	0.879	1.144	3.07	0.9386	0.90	0.706							0.97	1		152.48	152.48
33.957	3	Clay	12.442	0.403	2.053	0.895	1.158	3.09	0.933	0.90	0.705							0.97	1		148.35	148.35
34.449	3	Clay	11.858	0.335	2.082	0.91	1.172	3.09	0.9275	0.89	0.704							0.97	1		146.51	146.51
34.941	3	Clay	12.388	0.342	2.112	0.925	1.187	3.02	0.9217	0.89	0.703							0.97	1		154.98	154.98
35.433	4	Silty Clay to Clay	16.627	0.416	2.142	0.941	1.201	2.94	0.9163	0.89	0.702							0.96	1		173.09	173.09
35.925	3	Clay	13.076	0.385	2.172	0.956	1.216	3.05	0.9106	0.88	0.700							0.96	1		154.65	154.65
36.417	3	Clay	9.421	0.242	2.201	0.971	1.23	3.2	0.9053	0.88	0.698							0.96	1		127.79	127.79
36.909	4	Silty Clay to Clay	19.132	0.208	2.231	0.987	1.244	2.85	0.9002	0.88	0.697							0.96	1		166.99	166.99
37.402	4	Silty Clay to Clay	13.268	0.214	2.261	1.002	1.259	2.84	0.8947	0.87	0.695							0.95	1		173.97	173.97
37.894	4	Silty Clay to Clay	16.214	0.351	2.291	1.018	1.273	2.89	0.8896	0.87	0.693							0.95	1		183.50	183.50
38.386	4	Silty Clay to Clay	21.719	0.685	2.32	1.033	1.287	2.87	0.8846	0.86	0.691							0.95	1		212.08	212.08
38.878	4	Silty Clay to Clay	23.343	0.828	2.35	1.048	1.302	2.9	0.8793	0.86	0.689							0.95	1		219.58	219.58
39.37	4	Silty Clay to Clay	18.911	0.647	2.38	1.064	1.316	2.95	0.8744	0.86	0.687							0.95	1		197.77	197.77
39.862	4	Silty Clay to Clay	16.812	0.305	2.41	1.079	1.331	2.89	0.8692	0.85	0.684							0.94	1		184.11	184.11
40.354	4	Silty Clay to Clay	19.654	0.361	2.439	1.094	1.345	2.87	0.8644	0.85	0.682							0.94	1		215.48	215.48
40.846	4	Silty Clay to Clay	31.271	1.272	2.469	1.11	1.359	2.92	0.8597	0.84	0.679							0.94	1		232.95	232.95
41.339	4	Silty Clay to Clay	17.15	0.38	2.499	1.125	1.374	2.98	0.8547	0.84	0.676							0.94	1		190.09	190.09
41.831	5	Clayey Silt to Silty Clay	17.287	0.391	2.529	1.14	1.388	2.61	0.8501	0.83	0.674							0.94	1		287.77	287.77
42.323	5	Clayey Silt to Silty Clay	128.66	2.361	2.558	1.156	1.403	2.21	0.8452	0.83	0.671	2.210	0.85	108.74	1.692	183.951		0.92	1		217.81	217.81
42.815	6	Sandy Silt to Clayey Silt	199.79	2.435	2.588	1.171	1.417	1.79	0.8407	0.83	0.668	1.790	0.84	167.96	1.099	184.660		0.89	1		238.96	238.96
43.307	6	Sandy Silt to Clayey Silt	205.13	1.553	2.618	1.187	1.431	1.68	0.8362	0.82	0.665	1.680	0.84	171.53	1.024	175.691		0.88	1		239.68	239.68
43.799	5	Clayey Silt to Silty Clay	68.763	1.833	2.648	1.202	1.446	2.27	0.8314	0.82	0.662	2.270	0.83	57.17	1.856	106.117	0.19	0.93	1	(0.33)	213.49	159.40
44.291	4	Silty Clay to Clay	43.535	1.495	2.677	1.217	1.46	2.61	0.8271	0.81	0.659							0.93	1		355.45	355.45
44.783	5	Clayey Silt to Silty Clay	61.634	1.476	2.707	1.233	1.474	2.49	0.8227	0.81	0.656	2.490	0.82	50.71	2.718	137.845	0.32	0.93	1	(0.56)	204.50	116.42
45.276	5	Clayey Silt to Silty Clay	58.881	1.44	2.737	1.248	1.489	2.36	0.8181	0.80	0.653	2.360	0.82	48.17	2.156	103.881	0.18	0.92	1	(0.32)	210.39	133.52
45.768	5	Clayey Silt to Silty Clay	57.862	1.559	2.767	1.263	1.503	2.4	0.8139	0.80	0.650	2.400	0.81	47.09	2.312	108.900	0.20	0.92	1	(0.35)	207.92	116.42
46.26	4	Silty Clay to Clay	31.629	0.592	2.796	1.279	1.518	2.67	0.8094	0.79	0.646							0.92	1		271.64	271.64
46.752	4	Silty Clay to Clay	25.601	0.479	2.826	1.294	1.532	2.74	0.8053	0.79	0.643							0.92	1		239.96	239.96
47.244	5	Clayey Silt to Silty Clay	30.383	0.747	2.856	1.309	1.546	2.47	0.8012	0.78	0.640	2.470	0.80	24.34	2.621	63.807	0.10	0.92	1	(0.18)	201.88	83.24
47.736	5	Clayey Silt to Silty Clay	82.582	1.716	2.886	1.325	1.561	2.42	0.7968	0.78	0.636	2.420	0.80	65.80	2.396	157.654	0.44	0.91	1	(0.79)	209.61	116.42
48.228	4	Silty Clay to Clay	35.675	0.956	2.915	1.34	1.575	2.8	0.7928	0.77	0.632							0.91	1		274.29	274.29
48.72	4	Silty Clay to Clay	19.71	0.574	2.945	1.356	1.59	2.95	0.7885	0.77	0.629							0.91	1		215.64	215.64
49.213	4	Silty Clay to Clay	21.141	0.459	2.975	1.371	1.604	2.95	0.7846	0.76	0.625							0.91	1		199.90	199.90
49.705	4	Silty Clay to Clay	18.168	0.318	3.005	1.386	1.618	2.92	0.7807	0.76	0.622							0.91	1		194.16	194.16
50.197	4	Silty Clay to Clay	17.865	0.323	3.034	1.402	1.633	2.97	0.7766	0.75	0.618							0.91	1		184.04	184.04

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge to Bart Regional Connector Project*** *FAULT INFO*
PROJECT NO. ***2017-125-GEO*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-81*** *FAULT* M_w = 6.9 *MSF* = 1.24 a_{max} *(g)*= 0.682 V_{S30m}(m/s)= #REF! 220.6

			CPT RESULT INPUT							***CSR***		***$CRR_{7.5}$***						***F.S.=($CRR_{7.5}$/CSR)*MSF*K σ*K α***				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
50.689	4	Silty Clay to Clay	15.897	0.357	3.064	1.417	1.647	3.04	0.7727	0.75	0.615							0.91	1		178.17	178.17
51.181	4	Silty Clay to Clay	18.031	0.375	3.094	1.432	1.661	2.99	0.769	0.74	0.612							0.90	1		189.41	189.41
51.673	4	Silty Clay to Clay	17.886	0.437	3.124	1.448	1.676	2.98	0.765	0.74	0.608							0.90	1		192.74	192.74
52.165	4	Silty Clay to Clay	19.875	0.306	3.153	1.463	1.69	2.94	0.7612	0.73	0.604							0.90	1		193.82	193.82
52.657	4	Silty Clay to Clay	17.205	0.379	3.183	1.479	1.705	3.01	0.7573	0.73	0.601							0.90	1		186.08	186.08
53.15	4	Silty Clay to Clay	15.481	0.34	3.213	1.494	1.719	3.04	0.7537	0.72	0.598							0.90	1		177.93	177.93
53.642	4	Silty Clay to Clay	15.773	0.246	3.243	1.509	1.733	2.97	0.7501	0.72	0.594							0.90	1		180.33	180.33
54.134	4	Silty Clay to Clay	17.728	0.267	3.272	1.525	1.748	2.94	0.7463	0.71	0.590							0.89	1		187.75	187.75
54.626	4	Silty Clay to Clay	16.482	0.284	3.302	1.54	1.762	2.98	0.7427	0.71	0.587							0.89	1		185.08	185.08
55.118	4	Silty Clay to Clay	16.461	0.328	3.332	1.555	1.777	3.02	0.739	0.70	0.584							0.89	1		182.00	182.00
55.61	4	Silty Clay to Clay	15.395	0.31	3.362	1.571	1.791	3.04	0.7355	0.70	0.581							0.89	1		178.06	178.06
56.102	4	Silty Clay to Clay	15.911	0.299	3.391	1.586	1.805	3.01	0.7321	0.69	0.577							0.89	1		185.63	185.63
56.594	4	Silty Clay to Clay	24.802	0.6	3.421	1.601	1.82	2.86	0.7285	0.69	0.574							0.89	1		231.07	231.07
57.087	4	Silty Clay to Clay	25.545	0.571	3.451	1.617	1.834	2.82	0.7251	0.68	0.571							0.89	1		252.32	252.32
57.579	4	Silty Clay to Clay	31.574	0.711	3.481	1.632	1.848	2.84	0.7218	0.68	0.568							0.88	1		251.79	251.79
58.071	4	Silty Clay to Clay	26.086	0.534	3.51	1.648	1.863	2.81	0.7183	0.68	0.564							0.88	1		251.07	251.07
58.563	5	Clayey Silt to Silty Clay	31.188	0.568	3.54	1.663	1.877	2.74	0.715	0.67	0.561							0.88	1		269.26	269.26
59.055	5	Clayey Silt to Silty Clay	31.665	0.644	3.57	1.678	1.892	2.76	0.7115	0.67	0.558							0.88	1		277.23	277.23
59.547	5	Clayey Silt to Silty Clay	33.803	0.722	3.6	1.694	1.906	2.74	0.7083	0.66	0.555							0.88	1		285.05	285.05
60.039	5	Clayey Silt to Silty Clay	32.262	0.632	3.629	1.709	1.92	2.76	0.7051	0.66	0.552							0.88	1		272.98	272.98
60.532	4	Silty Clay to Clay	22.93	0.513	3.659	1.724	1.935	2.91	0.7018	0.65	0.549							0.88	1		230.04	230.04
61.024	4	Silty Clay to Clay	19.56	0.334	3.689	1.74	1.949	2.96	0.6986	0.65	0.546							0.88	1		204.90	204.90
61.516	4	Silty Clay to Clay	20.838	0.339	3.719	1.755	1.964	2.89	0.6953	0.65	0.543							0.87	1		219.17	219.17
62.008	5	Clayey Silt to Silty Clay	26.289	0.471	3.748	1.77	1.978	2.82	0.6923	0.64	0.540							0.87	1		242.66	242.66
62.5	5	Clayey Silt to Silty Clay	30.225	0.752	3.778	1.786	1.992	2.68	0.6892	0.64	0.538							0.87	1		318.14	318.14
62.992	5	Clayey Silt to Silty Clay	47.017	1.197	3.808	1.801	2.007	2.66	0.686	0.64	0.535							0.87	1		342.01	342.01
63.484	4	Silty Clay to Clay	28.807	0.607	3.838	1.817	2.021	2.81	0.683	0.63	0.533							0.87	1		273.29	273.29
63.976	4	Silty Clay to Clay	43.686	1.035	3.867	1.832	2.035	2.81	0.6801	0.63	0.530							0.87	1		297.61	297.61
64.469	4	Silty Clay to Clay	30.693	0.912	3.897	1.847	2.05	2.92	0.6769	0.63	0.527							0.87	1		265.11	265.11
64.961	4	Silty Clay to Clay	24.754	0.44	3.927	1.863	2.064	2.9	0.674	0.62	0.525							0.87	1		234.27	234.27
65.453	4	Silty Clay to Clay	24.603	0.445	3.957	1.878	2.079	2.89	0.6709	0.62	0.522							0.86	1		235.63	235.63
65.945	4	Silty Clay to Clay	26.206	0.56	3.986	1.893	2.093	2.92	0.6681	0.62	0.520							0.86	1		238.24	238.24
66.437	4	Silty Clay to Clay	23.983	0.459	4.016	1.909	2.107	2.92	0.6653	0.61	0.518							0.86	1		234.28	234.28
66.929	4	Silty Clay to Clay	24.692	0.476	4.046	1.924	2.122	2.91	0.6623	0.61	0.515							0.86	1		238.47	238.47
67.421	4	Silty Clay to Clay	25.023	0.648	4.076	1.939	2.136	2.96	0.6595	0.61	0.513							0.86	1		238.12	238.12
67.913	4	Silty Clay to Clay	23.739	0.58	4.105	1.955	2.151	2.97	0.6565	0.60	0.511							0.86	1		233.93	233.93
68.406	4	Silty Clay to Clay	25.766	0.566	4.135	1.97	2.165	2.91	0.6538	0.60	0.509							0.86	1		249.04	249.04
68.898	5	Clayey Silt to Silty Clay	34.767	0.739	4.165	1.986	2.179	2.82	0.6511	0.60	0.507							0.86	1		274.65	274.65
69.39	5	Clayey Silt to Silty Clay	27.259	0.552	4.195	2.001	2.194	2.84	0.6482	0.60	0.505							0.85	1		262.82	262.82
69.882	4	Silty Clay to Clay	27.527	0.534	4.224	2.016	2.208	2.88	0.6455	0.59	0.503							0.85	1		252.65	252.65
70.374	4	Silty Clay to Clay	26.922	0.508	4.254	2.032	2.222	2.87	0.6429	0.59	0.501							0.85	1		250.55	250.55
70.866	5	Clayey Silt to Silty Clay	26.332	0.449	4.284	2.047	2.237	2.87	0.6401	0.59	0.499							0.85	1		247.72	247.72
71.358	5	Clayey Silt to Silty Clay	27.445	0.495	4.314	2.062	2.251	2.85	0.6375	0.58	0.497							0.85	1		256.72	256.72
71.85	5	Clayey Silt to Silty Clay	29.317	0.521	4.343	2.078	2.266	2.83	0.6347	0.58	0.495							0.85	1		266.45	266.45
72.343	4	Silty Clay to Clay	32.345	0.66	4.373	2.093	2.28	2.87	0.6322	0.58	0.493							0.85	1		266.45	266.45
72.835	4	Silty Clay to Clay	25.353	0.573	4.403	2.108	2.294	2.94	0.6297	0.58	0.491							0.85	1		246.50	246.50
73.327	4	Silty Clay to Clay	24.988	0.497	4.433	2.124	2.309	2.96	0.627	0.58	0.490							0.85	1		238.02	238.02
73.819	5	Clayey Silt to Silty Clay	33.797	0.889	4.462	2.139	2.323	2.81	0.6245	0.57	0.488							0.84	1		314.87	314.87
74.311	4	Silty Clay to Clay	68.708	2.748	4.492	2.155	2.338	2.76	0.6218	0.57	0.486							0.84	1		394.28	394.28
74.803	4	Silty Clay to Clay	51.758	2.237	4.522	2.17	2.352	2.83	0.6194	0.57	0.485							0.84	1		383.15	383.15
75.295	4	Silty Clay to Clay	92.134	3.225	4.552	2.185	2.366	2.76	0.6169	0.57	0.483							0.84	1		434.06	434.06
75.787	4	Silty Clay to Clay	45.723	2.057	4.581	2.201	2.381	2.87	0.6144	0.56	0.481							0.84	1		355.05	355.05
76.28	4	Silty Clay to Clay	25.876	0.442	4.611	2.216	2.395	2.91	0.612	0.56	0.480							0.84	1		260.16	260.16
76.772	4	Silty Clay to Clay	23.343	0.431	4.641	2.231	2.41	2.97	0.6094	0.56	0.478							0.84	1		231.48	231.48
77.264	4	Silty Clay to Clay	25.628	0.486	4.671	2.247	2.424	2.94	0.6071	0.56	0.477							0.84	1		247.53	247.53
77.756	4	Silty Clay to Clay	31.134	0.74	4.7	2.262	2.438	2.9	0.6047	0.56	0.476							0.84	1		274.14	274.14
78.248	5	Clayey Silt to Silty Clay	37.107	1.188	4.73	2.277	2.453	2.63	0.6022	0.55	0.474							0.84	1		449.30	449.30
78.74	5	Clayey Silt to Silty Clay	131.33	5.755	4.76	2.293	2.467	2.59	0.5999	0.55	0.473	2.590	0.60	78.79	3.266	257.340		0.83	1		252.30	252.30
79.232	4	Silty Clay to Clay	51.476	1.48	4.79	2.308	2.481	2.82	0.5977	0.55	0.472							0.83	1		382.79	382.79
79.724	4	Silty Clay to Clay	58.964	2.129	4.819	2.324	2.496	2.8	0.5952	0.55	0.470							0.83	1		387.01	387.01
80.217	4	Silty Clay to Clay	48.751	1.556	4.849	2.339	2.51	2.83	0.593	0.55	0.469							0.83	1		366.02	366.02
80.709	4	Silty Clay to Clay	40.41	1.24	4.879	2.354	2.525	2.88	0.5906	0.55	0.467							0.83	1		318.18	318.18
81.201	4	Silty Clay to Clay	33.253	1.035	4.909	2.37	2.539	2.96	0.5884	0.54	0.466							0.83	1		285.04	285.04
81.693	4	Silty Clay to Clay	31.767	0.787	4.938	2.385	2.553	2.97	0.5862	0.54	0.465							0.83	1		273.66	273.66
82.185	4	Silty Clay to Clay	33.638	0.898	4.968	2.4	2.568	2.92	0.5839	0.54	0.464							0.83	1		282.80	282.80
82.677	4	Silty Clay to Clay	28.463	0.624	4.998	2.416	2.582	2.94	0.5817	0.54	0.463							0.83	1		269.19	269.19
83.169	4	Silty Clay to Clay	27.562	0.604	5.028	2.431	2.597	2.98	0.5794	0.54	0.462							0.83	1		252.76	252.76
83.661	4	Silty Clay to Clay	30.032	0.679	5.057	2.446	2.611	2.96	0.5773	0.54	0.460							0.83	1		262.54	262.54
84.154	4	Silty Clay to Clay	30.748	0.688	5.087	2.462	2.625	2.93	0.5752	0.53	0.459							0.82	1		274.03	274.03
84.646	4	Silty Clay to Clay	34.987	0.83	5.117	2.477	2.64	2.93	0.5729	0.53	0.458							0.82	1		284.12	284.12
85.138	4	Silty Clay to Clay	32.372	0.737	5.147	2.493	2.654	2.94	0.5708	0.53	0.457							0.82	1		277.69	277.69
85.63	4	Silty Clay to Clay	31.195	0.712	5.176	2.508	2.668	2.95	0.5688	0.53	0.456							0.82	1		276.21	276.21
86.122	4	Silty Clay to Clay	36.859	1.132	5.206	2.523	2.683	2.97	0.5666	0.53	0.455							0.82	1		285.77	285.77
86.614	4	Silty Clay to Clay	31.743	0.884	5.236	2.539	2.697	2.98	0.5645	0.53	0.454							0.82	1		277.53	277.53
87.106	4	Silty Clay to Clay	32.647	0.725	5.266	2.554	2.712	2.93	0.5624	0.53	0.453							0.82	1		280.55	280.55
87.598	4	Silty Clay to Clay	32.179	0.857	5.295	2.569	2.726	2.96	0.5604	0.53	0.452							0.82	1		279.66	279.66
88.091	4	Silty Clay to Clay	31.127	0.772	5.325	2.585	2.74	2.97	0.5584	0.52	0.451							0.82	1		274.20	274.20
88.583	5	Clayey Silt to Silty Clay	32.042	0.72	5.355	2.6	2.755	2.93	0.5563	0.52	0.450							0.82	1		279.67	279.67
89.075	5	Clayey Silt to Silty Clay	33.666	0.707	5.385	2.615	2.769	2.9	0.5543	0.52	0.450							0.82	1		286.15	286.15
89.567	5	Clayey Silt to Silty Clay	30.61	0.588	5.414	2.631	2.784	2.91	0.5522	0.52	0.449							0.81	1		278.10	278.10
90.059	5	Clayey Silt to Silty Clay	31.849	0.632	5.444	2.646	2.798	2.94	0.5503	0.52	0.448							0.81	1		273.28	273.28
90.551	4	Silty Clay to Clay	30.156	0.67	5.474	2.662	2.812	2.96	0.5484	0.52	0.447							0.81	1		270.15	270.15
91.043	4	Silty Clay to Clay	28.821	0.608	5.504	2.677	2.827	2.98	0.5463	0.52	0.446							0.81	1		263.59	263.59
91.535	4	Silty Clay to Clay	28.257	0.684	5.533	2.692	2.841	2.99	0.5444	0.52	0.445							0.81	1		272.19	272.19
92.028	4	Silty Clay to Clay	39.309	1.054	5.563	2.708	2.855	2.86	0.5425	0.51	0.444							0.81	1		358.12	358.12
92.52	4	Silty Clay to Clay	72.149	2.592	5.593	2.723	2.87	2.82	0.5405	0.51	0.444							0.81	1		413.17	413.17
93.012	4	Silty Clay to Clay	35.07	1.104	5.623	2.738	2.884	2.98	0.5387	0.51	0.443							0.81	1		318.02	318.02
93.504	4	Silty Clay to Clay	32.014	0.944	5.652	2.754	2.899	3.06	0.5367	0.51	0.442							0.81	1		273.70	273.70
93.996	4	Silty Clay to Clay	30.597	0.912	5.682	2.769	2.913	3.08	0.5349	0.51	0.441							0.81	1		267.38	267.38
94.488	4	Silty Clay to Clay	30.825	0.879	5.712	2.784	2.927	3.05	0.5331	0.51	0.441							0.81	1		272.13	272.13
94.98	4	Silty Clay to Clay	35.786	0.982	5.742	2.8	2.942	2.99	0.5311	0.51	0.440							0.81	1		291.46	291.46
95.472	4	Silty Clay to Clay	35.896	0.963	5.771	2.815	2.956	2.95	0.5294	0.51	0.439							0.81	1		302.27	302.27
95.965	5	Clayey Silt to Silty Clay	42.86	1.084	5.801	2.831	2.971	2.9	0.5275	0.51	0.438							0.80	1		325.00	325.00
96.457	5	Clayey Silt to Silty Clay	49.109	1.043	5.831	2.846	2.985	2.82	0.5257	0.51	0.438							0.80	1		349.89	349.89
96.949	5	Clayey Silt to Silty Clay	42.605	0.862	5.861	2.861	2.999	2.82	0.5239	0.50	0.437							0.80	1		336.38	336.38
97.441	5	Clayey Silt to Silty Clay	41.236	0.996	5.89	2.877	3.014	2.89	0.5221	0.50	0.436							0.80	1		327.38	327.38
97.933	5	Clayey Silt to Silty Clay	45.2	1.32	5.92	2.892	3.028	2.88	0.5203	0.50	0.435							0.80	1		348.55	348.55
98.425	5	Clayey Silt to Silty Clay	50.258	1.381	5.95	2.907	3.042	2.86	0.5186	0.50	0.435							0.80	1		362.03	362.03
98.917	5	Clayey Silt to Silty Clay	53.238	1.595	5.98	2.923	3.057	2.85	0.5168	0.50	0.434							0.80	1		373.31	373.31
99.409	5	Clayey Silt to Silty Clay	50.767	1.467	6.009	2.938	3.071	2.87	0.5151	0.50	0.433							0.80	1		367.36	367.36
99.902	4	Silty Clay to Clay	47.423	1.417	6.039	2.953	3.086	2.88	0.5133	0.50	0.433							0.80	1		362.46	362.46
100.39	4	Silty Clay to Clay	74.792	2.419	6.069	2.969	3.1	2.82	0.5116	0.50	0.432							0.80	1		445.22	445.22
100.89	9	Sand	89.216	5.389	6.099	2.984	3.114	2.79	0.51	0.50	0.431							0.80	1		542.68	542.68
101.38	9	Sand	112.67	5.424	6.128	3	3.129	2.74	0.5082	0.50	0.431							0.80	1		588.80	588.80
101.87	9	Sand	108.5	5.446	6.158	3.015	3.143	2.76	0.5066	0.50	0.430							0.80	1		581.89	581.89
102.36	9	Sand	111.84	6.075	6.188	3.03	3.158	2.77	0.5048	0.49	0.429							0.79	1		596.27	596.27

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME	***Eastridge to Bart Regional Connector Project***									*FAULT INFO*													
PROJECT NO.	***2017-125-GEO***									*COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*													
CPT NO.	***CPT-AS-81***						*FAULT* M_w =		6.9	*MSF* =	1.24	a_{max} *(g)*=	0.682					V_{S30m}(m/s)=	#REF!	220.6			
		CPT RESULT INPUT								***CSR***		***$CRR_{7.5}$***						***F.S.=($CRR_{7.5}$/CSR)*MSF*Kσ*Kα***					
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)	
102.85	9	Sand	123.35	6.796	6.218	3.046	3.172	2.76	0.5032	0.49	0.429							0.79	1		612.77	612.77	
103.35	9	Sand	111.98	6.089	6.247	3.061	3.186	2.78	0.5016	0.49	0.428							0.79	1		590.80	590.80	
103.84	9	Sand	108.84	6.446	6.277	3.076	3.201	2.78	0.4999	0.49	0.428							0.79	1		599.10	599.10	
104.33	8	Sand to Silty Sand	188.95	7.355	6.307	3.092	3.215	2.51	0.4983	0.49	0.427	2.510	0.50	94.15	2.820	265.464		0.79	1		291.81	291.81	
104.82	8	Sand to Silty Sand	232.33	7.641	6.337	3.107	3.229	2.37	0.4967	0.49	0.427	2.370	0.50	115.40	2.194	253.203		0.76	1		301.75	301.75	
105.32	8	Sand to Silty Sand	231.75	9.143	6.366	3.122	3.244	2.42	0.495	0.49	0.426	2.420	0.50	114.73	2.396	274.874		0.79	1		301.45	301.45	
105.81	8	Sand to Silty Sand	193.46	7.388	6.396	3.138	3.258	2.51	0.4935	0.49	0.425	2.510	0.49	95.47	2.820	269.186		0.79	1		295.41	295.41	
106.3	9	Sand	149.12	8.862	6.426	3.153	3.273	2.67	0.4918	0.49	0.425							0.79	1		727.45	727.45	
106.79	8	Sand to Silty Sand	168.55	6.928	6.456	3.169	3.287	2.46	0.4903	0.49	0.424	2.460	0.49	82.64	2.574	212.739		0.79	1		296.96	296.96	
107.28	5	Clayey Silt to Silty Clay	249.62	5.658	6.485	3.184	3.301	2.26	0.4888	0.49	0.424	2.260	0.49	122.01	1.827	222.882		0.75	1		304.99	304.99	
107.78	8	Sand to Silty Sand	221.84	5.587	6.515	3.199	3.316	2.3	0.4872	0.49	0.423	2.300	0.49	108.07	1.949	210.600		0.76	1		302.83	302.83	
108.27	8	Sand to Silty Sand	236.38	6.362	6.545	3.215	3.33	2.32	0.4857	0.48	0.423	2.320	0.49	114.80	2.015	231.266		0.76	1		303.28	303.28	
108.76	8	Sand to Silty Sand	196.77	7.924	6.575	3.23	3.345	2.45	0.484	0.48	0.422	2.450	0.48	95.24	2.528	240.797		0.79	1		299.43	299.43	
109.25	8	Sand to Silty Sand	190.79	6.906	6.604	3.245	3.359	2.51	0.4826	0.48	0.421	2.510	0.48	92.07	2.820	259.590		0.78	1		297.15	297.15	
109.74	8	Sand to Silty Sand	172.99	8.111	6.634	3.261	3.373	2.51	0.4811	0.48	0.421	2.510	0.48	83.22	2.820	234.641		0.78	1		296.24	296.24	
110.24	5	Clayey Silt to Silty Clay	194.95	4.635	6.664	3.276	3.388	2.4	0.4795	0.48	0.420	2.400	0.48	93.48	2.312	216.160		0.78	1		297.88	297.88	
110.73	8	Sand to Silty Sand	181.64	5.423	6.694	3.291	3.402	2.4	0.4781	0.48	0.420	2.400	0.48	86.83	2.312	200.790		0.78	1		298.75	298.75	
111.22	6	Sandy Silt to Clayey Silt	233.24	5.83	6.723	3.307	3.416	2.27	0.4766	0.48	0.419	2.270	0.48	111.16	1.856	206.327		0.75	1		305.60	305.60	
111.71	6	Sandy Silt to Clayey Silt	259.78	5.125	6.753	3.322	3.431	2.22	0.4751	0.48	0.419	2.220	0.48	123.41	1.717	211.915		0.74	1		307.84	307.84	
112.21	5	Clayey Silt to Silty Clay	94.171	2.864	6.783	3.338	3.445	2.54	0.4736	0.48	0.418	2.540	0.47	44.60	2.979	132.868	0.30	0.78	1	(0.69)	284.04	107.96	
112.7	5	Clayey Silt to Silty Clay	50.215	1.168	6.813	3.353	3.46	2.91	0.4721	0.48	0.418							0.78	1		367.23	367.23	
113.19	5	Clayey Silt to Silty Clay	51.256	1.144	6.842	3.368	3.474	2.9	0.4707	0.48	0.417							0.78	1		352.38	352.38	
113.68	5	Clayey Silt to Silty Clay	42.12	1.027	6.872	3.384	3.488	2.95	0.4693	0.48	0.417							0.78	1		332.95	332.95	
114.17	5	Clayey Silt to Silty Clay	46.356	0.961	6.902	3.399	3.503	2.91	0.4678	0.48	0.416							0.78	1		335.79	335.79	
114.67	5	Clayey Silt to Silty Clay	41.057	0.904	6.932	3.414	3.517	2.93	0.4664	0.48	0.416							0.78	1		326.99	326.99	
115.16	5	Clayey Silt to Silty Clay	39.474	0.95	6.961	3.43	3.532	2.96	0.4649	0.48	0.415							0.78	1		322.42	322.42	
115.65	5	Clayey Silt to Silty Clay	41.016	0.986	6.991	3.445	3.546	2.98	0.4635	0.47	0.415							0.78	1		321.63	321.63	
116.14	5	Clayey Silt to Silty Clay	39.984	1.038	7.021	3.46	3.56	3	0.4622	0.47	0.414							0.78	1		319.97	319.97	
116.63	4	Silty Clay to Clay	39.667	1.039	7.051	3.476	3.575	3.02	0.4607	0.47	0.414							0.78	1		311.19	311.19	
117.13	4	Silty Clay to Clay	35.414	0.875	7.08	3.491	3.589	3.05	0.4594	0.47	0.413							0.77	1		298.36	298.36	
117.62	4	Silty Clay to Clay	36.556	0.914	7.11	3.507	3.603	3.03	0.458	0.47	0.413							0.77	1		302.45	302.45	
118.11	5	Clayey Silt to Silty Clay	36.969	0.857	7.14	3.522	3.618	3	0.4566	0.47	0.412							0.77	1		308.47	308.47	
118.6	5	Clayey Silt to Silty Clay	37.83	0.844	7.17	3.537	3.632	2.99	0.4553	0.47	0.412							0.77	1		311.65	311.65	
119.09	5	Clayey Silt to Silty Clay	38.29	0.908	7.199	3.553	3.647	3	0.4539	0.47	0.411							0.77	1		313.59	313.59	
119.59	5	Clayey Silt to Silty Clay	39.006	0.973	7.229	3.568	3.661	2.99	0.4526	0.47	0.411							0.77	1		324.10	324.10	
120.08	5	Clayey Silt to Silty Clay	42.943	1.125	7.259	3.583	3.675	2.97	0.4513	0.47	0.411							0.77	1		336.15	336.15	

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project*** *FAULT INFO*
PROJECT NO. ***2017-125-GEO*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-83*** *FAULT* M_w = 6.9 *MSF* = 1.24 a_{max} *(g)*= 0.682 V_{S30m}(m/s)= #REF! 230.6

			CPT RESULT INPUT							***CSR***		***CRR 7.5***						***F.S.=(CRR 7.5/CSR)*MSF*K σ*K α***				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
0.492			-9999	-9999	0.03		0.03		1.7	1.00	0.444							1.00			0.00	0.00
0.984			-9999	-9999	0.059		0.059		1.7	1.00	0.443							1.00			0.00	0.00
1.476			-9999	-9999	0.089		0.089		1.7	1.00	0.443							1.00			0.00	0.00
1.968			-9999	-9999	0.119		0.119		1.6679	1.00	0.442							1.00			0.00	0.00
2.461			-9999	-9999	0.149		0.149		1.6308	1.00	0.442							1.00			0.00	0.00
2.953			-9999	-9999	0.178		0.178		1.5965	1.00	0.441							1.00			0.00	0.00
3.445			-9999	-9999	0.208		0.208		1.5625	0.99	0.441							1.00			0.00	0.00
3.937			-9999	-9999	0.238		0.238		1.5299	0.99	0.440										0.00	0.00
4.429			-9999	-9999	0.268		0.268		1.4986	0.99	0.440										0.00	0.00
4.921			-9999	-9999	0.297		0.297		1.4696	0.99	0.439										0.00	0.00
5.413	3	Clay	9.772	0.286	0.327		0.327	2.68	1.4407	0.99	0.439										126.15	126.15
5.906	3	Clay	10.33	0.273	0.357		0.357	2.65	1.413	0.99	0.438										134.25	134.25
6.398	3	Clay	12.002	0.285	0.387		0.387	2.61	1.3863	0.99	0.438										147.05	147.05
6.89	4	Silty Clay to Clay	17.507	0.323	0.416		0.416	2.45	1.3614	0.99	0.437	2.450	1.36	23.83	2.528	60.257	0.10				123.63	123.63
7.382	4	Silty Clay to Clay	17.122	0.264	0.446	0.005	0.441	2.39	1.3406	0.98	0.442	2.390	1.34	22.95	2.272	52.153	0.09	1.00	0	(0.00)	127.03	91.33
7.874	4	Silty Clay to Clay	14.287	0.213	0.476	0.021	0.455	2.48	1.3293	0.98	0.456	2.480	1.33	18.99	2.669	50.696	0.09	1.00	1	(0.25)	124.64	75.40
8.366	4	Silty Clay to Clay	12.879	0.294	0.506	0.036	0.47	2.6	1.3174	0.98	0.469							1.00	1		123.54	123.54
8.858	4	Silty Clay to Clay	13.406	0.297	0.535	0.051	0.484	2.58	1.3064	0.98	0.481	2.580	1.31	17.51	3.206	56.157	0.10	1.00	1	(0.25)	125.72	75.40
9.35	4	Silty Clay to Clay	18.375	0.239	0.565	0.067	0.498	2.43	1.2956	0.98	0.493	2.430	1.30	23.81	2.439	58.067	0.10	1.00	1	(0.25)	130.45	83.24
9.843	4	Silty Clay to Clay	14.184	0.264	0.595	0.082	0.513	2.52	1.2843	0.98	0.504	2.520	1.28	18.22	2.872	52.311	0.09	1.00	1	(0.23)	129.84	75.40
10.335	4	Silty Clay to Clay	14.837	0.309	0.625	0.098	0.527	2.62	1.2739	0.98	0.514							1.00	1		159.35	159.35
10.827	4	Silty Clay to Clay	13.598	0.247	0.654	0.113	0.542	2.6	1.2629	0.98	0.523							1.00	1		129.11	129.11
11.319	4	Silty Clay to Clay	11.121	0.262	0.684	0.128	0.556	2.7	1.2528	0.98	0.532							1.00	1		145.30	145.30
11.811	3	Clay	10.853	0.294	0.714	0.144	0.57	2.79	1.2429	0.98	0.542							1.00	1		137.02	137.02
12.303	3	Clay	10.818	0.284	0.744	0.159	0.585	2.81	1.2325	0.97	0.549							1.00	1		135.70	135.70
12.795	3	Clay	10.24	0.269	0.773	0.174	0.599	2.84	1.2229	0.97	0.557							1.00	1		130.30	130.30
13.287	3	Clay	8.341	0.197	0.803	0.19	0.613	2.87	1.2135	0.97	0.565							1.00	1		119.96	119.96
13.78	3	Clay	8.451	0.191	0.833	0.205	0.628	2.88	1.2035	0.97	0.571							1.00	1		117.72	117.72
14.272	3	Clay	9.387	0.213	0.863	0.22	0.642	2.86	1.1944	0.97	0.578							1.00	1		124.76	124.76
14.764	3	Clay	11.341	0.32	0.892	0.236	0.657	2.84	1.1847	0.97	0.583							1.00	1		138.26	138.26
15.256	3	Clay	13.378	0.36	0.922	0.251	0.671	2.78	1.1758	0.97	0.590							1.00	1		156.33	156.33
15.748	4	Silty Clay to Clay	16.186	0.455	0.952	0.267	0.685	2.68	1.1671	0.97	0.596							1.00	1		182.17	182.17
16.24	4	Silty Clay to Clay	19.558	0.533	0.982	0.282	0.7	2.57	1.1579	0.97	0.601	2.570	1.16	22.65	3.148	71.289	0.11	1.00	1	(0.23)	147.70	91.33
16.732	4	Silty Clay to Clay	27.445	0.702	1.011	0.297	0.714	2.53	1.1494	0.96	0.606	2.530	1.15	31.55	2.925	92.265	0.15	1.00	1	(0.31)	151.19	99.58
17.224	4	Silty Clay to Clay	24.847	0.595	1.041	0.313	0.729	2.54	1.1405	0.96	0.610	2.540	1.14	28.34	2.979	84.417	0.14	1.00	1	(0.28)	151.92	99.58
17.717	4	Silty Clay to Clay	29.977	0.794	1.071	0.328	0.743	2.54	1.1323	0.96	0.615	2.540	1.13	33.94	2.979	101.112	0.18	1.00	1	(0.35)	153.95	99.58
18.209	4	Silty Clay to Clay	18.223	0.481	1.101	0.343	0.757	2.67	1.1242	0.96	0.620							1.00	1		200.43	200.43
18.701	4	Silty Clay to Clay	14.801	0.372	1.13	0.359	0.772	2.77	1.1156	0.96	0.623							1.00	1		167.44	167.44
19.193	4	Silty Clay to Clay	15.195	0.329	1.16	0.374	0.786	2.73	1.1078	0.96	0.627							1.00	1		168.13	168.13
19.685	4	Silty Clay to Clay	15.03	0.323	1.19	0.389	0.8	2.65	1.1	0.96	0.632							1.00	1		183.03	183.03
20.177	4	Silty Clay to Clay	27.775	0.658	1.22	0.405	0.815	2.56	1.0918	0.96	0.635	2.560	1.09	30.33	3.091	93.721	0.16	1.00	1	(0.31)	157.98	91.33
20.669	4	Silty Clay to Clay	36.171	1.185	1.249	0.42	0.829	2.56	1.0843	0.96	0.638	2.560	1.08	39.22	3.091	121.210	0.25	1.00	1	(0.48)	163.81	124.95
21.161	4	Silty Clay to Clay	35.978	1.375	1.279	0.436	0.844	2.55	1.0763	0.95	0.641	2.550	1.08	38.72	3.034	117.497	0.23	1.00	1	(0.45)	166.71	133.52
21.654	5	Clayey Silt to Silty Clay	52.549	1.151	1.309	0.451	0.858	2.37	1.069	0.95	0.644	2.370	1.07	56.17	2.194	123.250	0.25	1.00	1	(0.49)	173.22	150.76
22.146	4	Silty Clay to Clay	30.17	1.153	1.339	0.466	0.872	2.47	1.0618	0.95	0.647	2.470	1.06	32.03	2.621	83.971	0.14	1.00	1	(0.26)	168.54	124.95
22.638	4	Silty Clay to Clay	26.867	0.596	1.368	0.482	0.887	2.68	1.0541	0.95	0.649							1.00	1		222.87	222.87
23.13	3	Clay	16.296	0.539	1.398	0.497	0.901	2.84	1.0471	0.95	0.652							1.00	1		182.06	182.06
23.622	3	Clay	15.911	0.531	1.428	0.512	0.916	2.88	1.0397	0.95	0.654							1.00	1		175.13	175.13
24.114	3	Clay	16.152	0.555	1.458	0.528	0.93	2.84	1.0329	0.94	0.657							1.00	1		187.98	187.98
24.606	4	Silty Clay to Clay	44.842	1.101	1.487	0.543	0.944	2.54	1.0261	0.94	0.659	2.540	1.03	46.01	2.979	137.072	0.32	1.00	1	(0.60)	170.08	107.96
25.098	4	Silty Clay to Clay	32.73	1.159	1.517	0.558	0.959	2.58	1.019	0.94	0.660	2.580	1.02	33.35	3.206	106.940	0.19	1.00	1	(0.36)	170.19	107.96
25.591	4	Silty Clay to Clay	23.674	0.641	1.547	0.574	0.973	2.75	1.0124	0.94	0.662							1.00	1		214.15	214.15
26.083	4	Silty Clay to Clay	16.998	0.46	1.577	0.589	0.987	2.81	1.0059	0.94	0.664							1.00	1		186.28	186.28
26.575	4	Silty Clay to Clay	15.608	0.465	1.606	0.605	1.002	2.89	0.9991	0.94	0.665							1.00	1		174.07	174.07
27.067	3	Clay	15.185	0.475	1.636	0.62	1.016	2.93	0.9928	0.93	0.667							1.00	1		169.64	169.64
27.559	3	Clay	15.305	0.503	1.666	0.635	1.031	2.94	0.9861	0.93	0.668							0.99	1		170.80	170.80
28.051	3	Clay	15.305	0.515	1.696	0.651	1.045	2.96	0.98	0.93	0.669							0.99	1		170.01	170.01
28.543	3	Clay	15.216	0.517	1.725	0.666	1.059	2.97	0.9739	0.93	0.670							0.99	1		170.03	170.03
29.035	3	Clay	16.076	0.616	1.755	0.681	1.074	2.98	0.9675	0.93	0.670							0.99	1		174.45	174.45
29.528	3	Clay	16.819	0.642	1.785	0.697	1.088	2.96	0.9615	0.92	0.671							0.98	1		180.79	180.79
30.02	4	Silty Clay to Clay	19.544	0.562	1.815	0.712	1.103	2.85	0.9553	0.92	0.671							0.98	1		195.91	195.91
30.512	4	Silty Clay to Clay	17.205	0.503	1.844	0.727	1.117	2.87	0.9495	0.92	0.672							0.98	1		187.92	187.92
31.004	3	Clay	15.388	0.53	1.874	0.743	1.131	2.99	0.9438	0.92	0.672							0.98	1		171.04	171.04
31.496	3	Clay	14.617	0.551	1.904	0.758	1.146	3.03	0.9378	0.91	0.672							0.97	1		167.05	167.05
31.988	3	Clay	14.576	0.538	1.934	0.774	1.16	3.04	0.9322	0.91	0.672							0.97	1		167.08	167.08
32.48	3	Clay	18.994	0.514	1.963	0.789	1.174	2.96	0.9267	0.91	0.672							0.97	1		178.70	178.70
32.972	3	Clay	15.856	0.501	1.993	0.804	1.189	2.98	0.9209	0.90	0.672							0.97	1		173.79	173.79
33.465	3	Clay	14.672	0.451	2.023	0.82	1.203	3.01	0.9155	0.90	0.672							0.96	1		165.92	165.92
33.957	3	Clay	13.626	0.413	2.053	0.835	1.218	3.05	0.9098	0.90	0.671							0.96	1		158.83	158.83
34.449	3	Clay	13.144	0.416	2.082	0.85	1.232	3.08	0.9046	0.89	0.670							0.96	1		157.03	157.03
34.941	3	Clay	14.727	0.498	2.112	0.866	1.246	3.06	0.8994	0.89	0.670							0.96	1		165.07	165.07
35.433	3	Clay	15.58	0.55	2.142	0.881	1.261	3.05	0.8939	0.89	0.668							0.95	1		171.21	171.21
35.925	3	Clay	15.794	0.539	2.172	0.896	1.275	3.04	0.8889	0.88	0.668							0.95	1		173.96	173.96
36.417	3	Clay	16.159	0.544	2.201	0.912	1.29	3.02	0.8835	0.88	0.666							0.95	1		176.31	176.31
36.909	4	Silty Clay to Clay	19.324	0.553	2.231	0.927	1.304	2.92	0.8786	0.88	0.665							0.95	1		196.37	196.37
37.402	4	Silty Clay to Clay	22.297	0.57	2.261	0.943	1.318	2.83	0.8737	0.87	0.664							0.95	1		214.50	214.50
37.894	4	Silty Clay to Clay	21.939	0.622	2.291	0.958	1.333	2.88	0.8685	0.87	0.662							0.94	1		211.77	211.77
38.386	4	Silty Clay to Clay	21.148	0.692	2.32	0.973	1.347	2.92	0.8638	0.86	0.660							0.94	1		208.76	208.76
38.878	4	Silty Clay to Clay	21.856	0.666	2.35	0.989	1.361	2.91	0.859	0.86	0.659							0.94	1		209.96	209.96
39.37	4	Silty Clay to Clay	21.334	0.638	2.38	1.004	1.376	2.9	0.854	0.86	0.657							0.94	1		209.41	209.41
39.862	4	Silty Clay to Clay	20.095	0.573	2.41	1.019	1.39	2.91	0.8494	0.85	0.655							0.94	1		205.18	205.18
40.354	4	Silty Clay to Clay	20.728	0.566	2.439	1.035	1.405	2.91	0.8445	0.85	0.652							0.93	1		204.07	204.07
40.846	4	Silty Clay to Clay	20.343	0.51	2.469	1.05	1.419	2.9	0.84	0.84	0.651							0.93	1		203.80	203.80
41.339	4	Silty Clay to Clay	20.549	0.462	2.499	1.065	1.433	2.87	0.8355	0.84	0.649							0.93	1		206.48	206.48
41.831	4	Silty Clay to Clay	22.214	0.579	2.529	1.081	1.448	2.85	0.8308	0.83	0.646							0.93	1		220.32	220.32
42.323	4	Silty Clay to Clay	29.798	0.711	2.558	1.096	1.462	2.75	0.8264	0.83	0.644							0.93	1		255.96	255.96
42.815	4	Silty Clay to Clay	23.674	0.807	2.588	1.112	1.477	2.76	0.8218	0.83	0.641							0.92	1		256.09	256.09
43.307	4	Silty Clay to Clay	36.391	0.66	2.618	1.127	1.491	2.76	0.8175	0.82	0.639							0.92	1		249.95	249.95
43.799	4	Silty Clay to Clay	22.72	0.537	2.648	1.142	1.505	2.84	0.8133	0.82	0.636							0.92	1		226.69	226.69
44.291	4	Silty Clay to Clay	26.729	0.664	2.677	1.158	1.52	2.73	0.8088	0.81	0.633							0.92	1		265.90	265.90
44.783	4	Silty Clay to Clay	66.341	1.962	2.707	1.173	1.534	2.66	0.8047	0.81	0.630							0.92	1		338.37	338.37
45.276	4	Silty Clay to Clay	32.95	1.36	2.737	1.188	1.549	2.84	0.8003	0.80	0.627							0.92	1		274.75	274.75
45.768	4	Silty Clay to Clay	21.895	0.381	2.767	1.204	1.563	2.86	0.7962	0.80	0.625							0.91	1		219.07	219.07
46.26	4	Silty Clay to Clay	25.325	0.45	2.796	1.219	1.577	2.77	0.7922	0.79	0.622							0.91	1		231.07	231.07
46.752	4	Silty Clay to Clay	27.169	0.505	2.826	1.235	1.592	2.74	0.788	0.79	0.618							0.91	1		245.25	245.25
47.244	4	Silty Clay to Clay	28.381	0.719	2.856	1.25	1.606	2.77	0.784	0.78	0.616							0.91	1		254.46	254.46
47.736	4	Silty Clay to Clay	31.134	0.685	2.886	1.265	1.62	2.74	0.7801	0.78	0.613							0.91	1		265.61	265.61
48.228	4	Silty Clay to Clay	32.069	0.626	2.915	1.281	1.635	2.7	0.776	0.77	0.609							0.91	1		271.79	271.79
48.72	4	Silty Clay to Clay	31.216	0.871	2.945	1.296	1.649	2.8	0.7722	0.77	0.606							0.90	1		263.96	263.96
49.213	4	Silty Clay to Clay	27.527	0.92	2.975	1.311	1.664	2.89	0.7682	0.76	0.603							0.90	1		248.08	248.08
49.705	4	Silty Clay to Clay	27.94	1.094	3.005	1.327	1.678	2.67	0.7644	0.76	0.600							0.90	1		318.66	318.66
50.197	5	Clayey Silt to Silty Clay	56.445	1.776	3.034	1.342	1.692	2.58	0.7607	0.75	0.597	2.580	0.76	42.94	3.206	137.681	0.32	0.90	1	(0.60)	211.59	99.58

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project*** *FAULT INFO*
PROJECT NO. ***2017-125-GEO*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-83*** *FAULT* M_w = 6.9 *MSF* = 1.24 a_{max} *(g)*= 0.682 V_{S30m}(m/s)= #REF! 230.6

			CPT RESULT INPUT							***CSR***		***CRR*** $_{7.5}$						***F.S.=(CRR*** $_{7.5}$ ***/CSR)*MSF*K*** σ ****K*** α				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
50.689	4	Silty Clay to Clay	42.86	1.7	3.064	1.357	1.707	2.78	0.7568	0.75	0.593							0.90	1		325.25	325.25
51.181	4	Silty Clay to Clay	24.499	0.722	3.094	1.373	1.721	2.91	0.7532	0.74	0.590							0.90	1		252.50	252.50
51.673	4	Silty Clay to Clay	27.83	0.972	3.124	1.388	1.736	2.88	0.7493	0.74	0.587							0.90	1		255.91	255.91
52.165	4	Silty Clay to Clay	31.202	0.931	3.153	1.404	1.75	2.82	0.7458	0.73	0.584							0.89	1		274.69	274.69
52.657	4	Silty Clay to Clay	26.784	0.873	3.183	1.419	1.764	2.86	0.7422	0.73	0.581							0.89	1		248.77	248.77
53.15	4	Silty Clay to Clay	23.687	0.349	3.213	1.434	1.779	2.82	0.7385	0.72	0.577							0.89	1		231.73	231.73
53.642	4	Silty Clay to Clay	29.427	0.58	3.243	1.45	1.793	2.79	0.735	0.72	0.574							0.89	1		251.86	251.86
54.134	4	Silty Clay to Clay	33.005	0.889	3.272	1.465	1.807	2.79	0.7316	0.71	0.571							0.89	1		302.03	302.03
54.626	5	Clayey Silt to Silty Clay	82.719	2.415	3.302	1.48	1.822	2.52	0.728	0.71	0.568	2.520	0.73	60.22	2.872	172.926		0.89	1		222.12	222.12
55.118	5	Clayey Silt to Silty Clay	43.741	1.586	3.332	1.496	1.836	2.57	0.7246	0.70	0.565	2.570	0.72	31.70	3.148	99.779	0.17	0.89	1	(0.33)	218.15	99.58
55.61	4	Silty Clay to Clay	51.118	1.023	3.362	1.511	1.851	2.75	0.7211	0.70	0.562							0.88	1		306.81	306.81
56.102	4	Silty Clay to Clay	21.251	0.506	3.391	1.526	1.865	2.94	0.7178	0.69	0.559							0.88	1		226.72	226.72
56.594	4	Silty Clay to Clay	20.157	0.513	3.421	1.542	1.879	3.03	0.7145	0.69	0.556							0.88	1		203.39	203.39
57.087	4	Silty Clay to Clay	20.508	0.553	3.451	1.557	1.894	3.05	0.7111	0.68	0.553							0.88	1		204.36	204.36
57.579	4	Silty Clay to Clay	20.501	0.571	3.481	1.573	1.908	3.05	0.7079	0.68	0.550							0.88	1		205.28	205.28
58.071	4	Silty Clay to Clay	20.728	0.565	3.51	1.588	1.923	3.03	0.7045	0.68	0.547							0.88	1		208.19	208.19
58.563	4	Silty Clay to Clay	21.224	0.48	3.54	1.603	1.937	2.97	0.7013	0.67	0.544							0.88	1		213.02	213.02
59.055	4	Silty Clay to Clay	21.746	0.383	3.57	1.619	1.951	2.93	0.6982	0.67	0.541							0.87	1		210.85	210.85
59.547	4	Silty Clay to Clay	19.792	0.308	3.6	1.634	1.966	2.94	0.6949	0.66	0.538							0.87	1		204.48	204.48
60.039	4	Silty Clay to Clay	21.912	0.448	3.629	1.649	1.98	2.87	0.6918	0.66	0.535							0.87	1		264.97	264.97
60.532	5	Clayey Silt to Silty Clay	52.329	1.355	3.659	1.665	1.994	2.71	0.6888	0.65	0.533							0.87	1		339.07	339.07
61.024	5	Clayey Silt to Silty Clay	38.951	0.763	3.689	1.68	2.009	2.68	0.6856	0.65	0.530							0.87	1		314.89	314.89
61.516	5	Clayey Silt to Silty Clay	39.446	0.866	3.719	1.695	2.023	2.71	0.6826	0.65	0.527							0.87	1		337.82	337.82
62.008	4	Silty Clay to Clay	46.191	2.073	3.748	1.711	2.038	2.87	0.6794	0.64	0.525							0.87	1		325.12	325.12
62.5	3	Clay	20.067	0.768	3.778	1.726	2.052	3.12	0.6765	0.64	0.522							0.87	1		224.67	224.67
62.992	4	Silty Clay to Clay	20.563	0.728	3.808	1.742	2.066	3.01	0.6736	0.64	0.520							0.86	1		242.60	242.60
63.484	5	Clayey Silt to Silty Clay	109.53	2.49	3.838	1.757	2.081	2.43	0.6705	0.63	0.517	2.430	0.67	73.44	2.439	179.130		0.86	1		237.23	237.23
63.976	5	Clayey Silt to Silty Clay	171.5	1.956	3.867	1.772	2.095	2.25	0.6677	0.63	0.515	2.250	0.67	114.50	1.798	205.906		0.86	1		245.04	245.04
64.469	5	Clayey Silt to Silty Clay	26.536	0.949	3.897	1.788	2.11	2.74	0.6647	0.63	0.512							0.86	1		321.85	321.85
64.961	4	Silty Clay to Clay	27.279	0.672	3.927	1.803	2.124	2.88	0.6619	0.62	0.510							0.86	1		260.48	260.48
65.453	5	Clayey Silt to Silty Clay	30.61	0.906	3.957	1.818	2.138	2.8	0.6591	0.62	0.508							0.86	1		288.48	288.48
65.945	5	Clayey Silt to Silty Clay	25.6	0.555	3.986	1.834	2.153	2.84	0.6561	0.62	0.505							0.86	1		260.11	260.11
66.437	4	Silty Clay to Clay	22.626	0.423	4.016	1.849	2.167	2.96	0.6534	0.61	0.503							0.86	1		222.93	222.93
66.929	4	Silty Clay to Clay	24.307	0.494	4.046	1.864	2.181	2.92	0.6507	0.61	0.501							0.86	1		238.46	238.46
67.421	4	Silty Clay to Clay	32.647	0.693	4.076	1.88	2.196	2.85	0.6478	0.61	0.499							0.85	1		286.00	286.00
67.913	5	Clayey Silt to Silty Clay	88.61	2.225	4.105	1.895	2.21	2.6	0.6452	0.60	0.497							0.85	1		233.13	233.13
68.406	5	Clayey Silt to Silty Clay	60.45	1.962	4.135	1.911	2.225	2.67	0.6423	0.60	0.495							0.85	1		412.97	412.97
68.898	4	Silty Clay to Clay	35.971	1.089	4.165	1.926	2.239	2.9	0.6397	0.60	0.493							0.85	1		296.69	296.69
69.39	4	Silty Clay to Clay	33.28	1.055	4.195	1.941	2.253	2.98	0.6371	0.60	0.491							0.85	1		269.64	269.64
69.882	4	Silty Clay to Clay	26.371	0.894	4.224	1.957	2.268	3.05	0.6344	0.59	0.489							0.85	1		246.05	246.05
70.374	4	Silty Clay to Clay	26.784	0.788	4.254	1.972	2.282	2.99	0.6318	0.59	0.487							0.85	1		251.22	251.22
70.866	4	Silty Clay to Clay	38.868	1.262	4.284	1.987	2.297	2.89	0.6291	0.59	0.486							0.85	1		305.22	305.22
71.358	4	Silty Clay to Clay	39.75	1.306	4.314	2.003	2.311	2.91	0.6266	0.58	0.484							0.85	1		300.97	300.97
71.85	4	Silty Clay to Clay	26.674	0.742	4.343	2.018	2.325	3.01	0.6241	0.58	0.482							0.84	1		246.05	246.05
72.343	4	Silty Clay to Clay	26.34	0.661	4.373	2.033	2.34	3	0.6215	0.58	0.480							0.84	1		242.05	242.05
72.835	4	Silty Clay to Clay	26.674	0.628	4.403	2.049	2.354	2.98	0.619	0.58	0.479							0.84	1		244.90	244.90
73.327	4	Silty Clay to Clay	27.169	0.625	4.433	2.064	2.368	2.96	0.6166	0.58	0.477							0.84	1		250.21	250.21
73.819	4	Silty Clay to Clay	32.234	0.772	4.462	2.08	2.383	2.88	0.614	0.57	0.476							0.84	1		284.82	284.82
74.311	4	Silty Clay to Clay	43.989	1.585	4.492	2.095	2.397	2.85	0.6116	0.57	0.474							0.84	1		316.54	316.54
74.803	4	Silty Clay to Clay	28.511	0.631	4.522	2.11	2.412	2.91	0.6091	0.57	0.472							0.84	1		271.47	271.47
75.295	4	Silty Clay to Clay	26.839	0.612	4.552	2.126	2.426	2.98	0.6067	0.57	0.471							0.84	1		246.83	246.83
75.787	4	Silty Clay to Clay	27.858	0.718	4.581	2.141	2.44	2.97	0.6044	0.56	0.470							0.84	1		260.32	260.32
76.28	4	Silty Clay to Clay	42.199	1.019	4.611	2.156	2.455	2.84	0.6019	0.56	0.468							0.84	1		335.86	335.86
76.772	5	Clayey Silt to Silty Clay	91.611	3.082	4.641	2.172	2.469	2.42	0.5996	0.56	0.467	2.420	0.60	54.93	2.396	131.609	0.29	0.83	1	(0.65)	258.72	150.76
77.264	6	Sandy Silt to Clayey Silt	198.54	5.501	4.671	2.187	2.484	2.13	0.5972	0.56	0.465	2.130	0.60	118.56	1.512	179.239		0.78	1		281.25	281.25
77.756	6	Sandy Silt to Clayey Silt	425.02	3.09	4.7	2.202	2.498	1.7	0.5949	0.56	0.464	1.700	0.59	252.85	1.038	262.424		0.71	1		298.86	298.86
78.248	6	Sandy Silt to Clayey Silt	369	2.715	4.73	2.218	2.512	1.66	0.5927	0.55	0.463	1.660	0.59	218.70	1.010	220.974		0.71	1		296.62	296.62
78.74	5	Clayey Silt to Silty Clay	95.685	3.415	4.76	2.233	2.527	2.31	0.5903	0.55	0.462	2.310	0.59	56.48	1.981	111.904	0.21	0.83	1	(0.47)	263.99	159.40
79.232	4	Silty Clay to Clay	36.611	1.064	4.79	2.249	2.541	2.93	0.5881	0.55	0.460							0.83	1		316.20	316.20
79.724	5	Clayey Silt to Silty Clay	34.911	0.672	4.819	2.264	2.555	2.86	0.5859	0.55	0.459							0.83	1		288.26	288.26
80.217	5	Clayey Silt to Silty Clay	41.841	0.93	4.849	2.279	2.57	2.76	0.5836	0.55	0.458							0.83	1		327.29	327.29
80.709	5	Clayey Silt to Silty Clay	37.465	0.646	4.879	2.295	2.584	2.78	0.5814	0.55	0.457							0.83	1		312.67	312.67
81.201	4	Silty Clay to Clay	28.876	0.66	4.909	2.31	2.599	2.96	0.5791	0.54	0.456							0.83	1		256.71	256.71
81.693	4	Silty Clay to Clay	24.974	0.506	4.938	2.325	2.613	3	0.577	0.54	0.454							0.83	1		241.10	241.10
82.185	5	Clayey Silt to Silty Clay	27.775	0.41	4.968	2.341	2.627	2.94	0.5749	0.54	0.453							0.82	1		245.49	245.49
82.677	5	Clayey Silt to Silty Clay	28.959	0.476	4.998	2.356	2.642	2.93	0.5726	0.54	0.452							0.82	1		261.91	261.91
83.169	4	Silty Clay to Clay	47.43	1.015	5.028	2.371	2.656	2.87	0.5705	0.54	0.451							0.82	1		317.01	317.01
83.661	4	Silty Clay to Clay	41.236	1.297	5.057	2.387	2.671	2.9	0.5683	0.54	0.450							0.82	1		317.60	317.60
84.154	4	Silty Clay to Clay	36.611	0.984	5.087	2.402	2.685	2.96	0.5663	0.53	0.449							0.82	1		290.12	290.12
84.646	4	Silty Clay to Clay	32.84	0.991	5.117	2.418	2.699	3.01	0.5642	0.53	0.448							0.82	1		277.04	277.04
85.138	4	Silty Clay to Clay	32.448	0.902	5.147	2.433	2.714	2.98	0.5621	0.53	0.447							0.82	1		279.44	279.44
85.63	4	Silty Clay to Clay	34.189	0.88	5.176	2.448	2.728	2.95	0.5601	0.53	0.446							0.82	1		286.94	286.94
86.122	4	Silty Clay to Clay	34.12	0.997	5.206	2.464	2.742	2.98	0.5581	0.53	0.445							0.82	1		290.65	290.65
86.614	4	Silty Clay to Clay	37.602	1.521	5.236	2.479	2.757	3.01	0.556	0.53	0.444							0.82	1		300.77	300.77
87.106	4	Silty Clay to Clay	38.153	1.219	5.266	2.494	2.771	2.99	0.554	0.53	0.444							0.82	1		301.88	301.88
87.598	4	Silty Clay to Clay	36.749	1.09	5.295	2.51	2.786	2.97	0.5519	0.53	0.443							0.81	1		296.35	296.35
88.091	4	Silty Clay to Clay	33.776	0.964	5.325	2.525	2.8	2.98	0.55	0.52	0.442							0.81	1		288.43	288.43
88.583	4	Silty Clay to Clay	34.381	0.955	5.355	2.54	2.814	2.95	0.5481	0.52	0.441							0.81	1		295.77	295.77
89.075	5	Clayey Silt to Silty Clay	38.084	1.016	5.385	2.556	2.829	2.9	0.546	0.52	0.440							0.81	1		306.86	306.86
89.567	5	Clayey Silt to Silty Clay	36.295	0.823	5.414	2.571	2.843	2.9	0.5442	0.52	0.439							0.81	1		302.35	302.35
90.059	4	Silty Clay to Clay	36.749	1.164	5.444	2.587	2.858	2.93	0.5421	0.52	0.438							0.81	1		324.55	324.55
90.551	4	Silty Clay to Clay	50.155	1.994	5.474	2.602	2.872	2.91	0.5403	0.52	0.438							0.81	1		358.33	358.33
91.043	4	Silty Clay to Clay	47.017	1.37	5.504	2.617	2.886	2.89	0.5384	0.52	0.437							0.81	1		347.84	347.84
91.535	4	Silty Clay to Clay	42.75	1.298	5.533	2.633	2.901	2.9	0.5365	0.52	0.436							0.81	1		335.51	335.51
92.028	4	Silty Clay to Clay	46.053	1.585	5.563	2.648	2.915	2.88	0.5346	0.51	0.435							0.81	1		362.79	362.79
92.52	4	Silty Clay to Clay	56.624	2.365	5.593	2.663	2.929	2.85	0.5328	0.51	0.435							0.81	1		397.68	397.68
93.012	4	Silty Clay to Clay	51.283	1.772	5.623	2.679	2.944	2.85	0.5309	0.51	0.434							0.81	1		391.93	391.93
93.504	5	Clayey Silt to Silty Clay	67.607	2.091	5.652	2.694	2.958	2.78	0.5291	0.51	0.433							0.81	1		433.07	433.07
93.996	4	Silty Clay to Clay	87.096	3.909	5.682	2.709	2.973	2.72	0.5272	0.51	0.432							0.80	1		527.00	527.00
94.488	9	Sand	113.28	5.474	5.712	2.725	2.987	2.71	0.5254	0.51	0.432							0.80	1		586.00	586.00
94.98	9	Sand	103.64	5.373	5.742	2.74	3.001	2.75	0.5237	0.51	0.431							0.80	1		568.74	568.74
95.472	9	Sand	95.052	4.587	5.771	2.756	3.016	2.83	0.5218	0.51	0.430							0.80	1		490.12	490.12
95.965	4	Silty Clay to Clay	42.97	1.488	5.801	2.771	3.03	2.99	0.5201	0.51	0.430							0.80	1		340.99	340.99
96.457	4	Silty Clay to Clay	36.391	1.026	5.831	2.786	3.045	2.98	0.5183	0.51	0.429							0.80	1		295.22	295.22
96.949	5	Clayey Silt to Silty Clay	32.589	0.685	5.861	2.802	3.059	2.96	0.5166	0.50	0.428							0.80	1		283.98	283.98
97.441	5	Clayey Silt to Silty Clay	37.162	0.81	5.89	2.817	3.073	2.96	0.5149	0.50	0.428							0.80	1		291.52	291.52
97.933	4	Silty Clay to Clay	34.134	0.874	5.92	2.832	3.088	2.99	0.5131	0.50	0.427							0.80	1		289.46	289.46
98.425	4	Silty Clay to Clay	32.923	0.877	5.95	2.848	3.102	3.02	0.5114	0.50	0.426							0.80	1		284.18	284.18
98.917	4	Silty Clay to Clay	35.565	0.902	5.98	2.863	3.116	2.99	0.5097	0.50	0.426							0.80	1		296.66	296.66
99.409	4	Silty Clay to Clay	36.467	0.998	6.009	2.878	3.131	2.97	0.508	0.50	0.425							0.80	1		303.85	303.85
99.902	5	Clayey Silt to Silty Clay	37.602	1.079	6.039	2.894	3.145	2.9	0.5063	0.50	0.425							0.80	1		343.40	343.40
100.39	5	Clayey Silt to Silty Clay	86.573	2.896	6.069	2.909	3.16	2.72	0.5046	0.50	0.424							0.79	1		519.18	519.18
100.89	8	Sand to Silty Sand	150.71	5.221	6.099	2.925	3.174	2.6	0.503	0.50	0.423							0.79	1		281.92	281.92
101.38	9	Sand	168.83	8.216	6.128	2.94	3.188	2.71	0.5014	0.50	0.423							0.79	1		647.97	647.97
101.87	3	Clay	43.438	2.669	6.158	2.955	3.203	3.05	0.4997	0.50	0.422							0.79	1		389.92	389.92
102.36	4	Silty Clay to Clay	34.973	0.733	6.188	2.971	3.217	3.02	0.4981	0.49	0.422							0.79	1		285.73	285.73

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME	***Eastridge to BART Regional Connector Project***		*FAULT INFO*			
PROJECT NO.	***2017-125-GEO***		*COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*			
CPT NO.	***CPT-AS-83***	*FAULT M_w =* 6.9	*MSF =* 1.24	*a_{max} (g)=* 0.682	V_{S30m}(m/s)= #REF!	230.6

Depth (ft)		Soil Behavior Type	CPT RESULT INPUT qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	CSR γ_d	CSR	CRR 7.5 Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	F.S.=(CRR 7.5/CSR)*MSF*K σ*K α Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
102.85	5	Clayey Silt to Silty Clay	34.381	0.571	6.218	2.986	3.232	2.95	0.4964	0.49	0.421							0.79	1		283.25	283.25
103.35	5	Clayey Silt to Silty Clay	33.831	0.535	6.247	3.001	3.246	2.95	0.4948	0.49	0.420							0.79	1		278.89	278.89
103.84	5	Clayey Silt to Silty Clay	31.939	0.468	6.277	3.017	3.26	2.96	0.4933	0.49	0.420							0.79	1		272.50	272.50
104.33	5	Clayey Silt to Silty Clay	32.427	0.541	6.307	3.032	3.275	2.97	0.4916	0.49	0.419							0.79	1		278.69	278.69
104.82	4	Silty Clay to Clay	40.658	0.922	6.337	3.047	3.289	2.97	0.4901	0.49	0.419							0.79	1		317.99	317.99
105.32	4	Silty Clay to Clay	48.696	2.1	6.366	3.063	3.303	3.03	0.4886	0.49	0.418							0.79	1		337.47	337.47
105.81	4	Silty Clay to Clay	38.056	1.348	6.396	3.078	3.318	3.08	0.4869	0.49	0.418							0.79	1		310.98	310.98
106.3	4	Silty Clay to Clay	37.346	1.311	6.426	3.094	3.332	3.08	0.4854	0.49	0.417							0.79	1		304.34	304.34
106.79	4	Silty Clay to Clay	37.437	1.304	6.456	3.109	3.347	3.08	0.4838	0.49	0.417							0.79	1		304.43	304.43
107.28	4	Silty Clay to Clay	37.52	1.343	6.485	3.124	3.361	3.07	0.4824	0.49	0.416							0.78	1		305.52	305.52
107.78	4	Silty Clay to Clay	38.235	1.253	6.515	3.14	3.375	3.05	0.4809	0.49	0.416							0.78	1		311.69	311.69
108.27	4	Silty Clay to Clay	39.116	1.14	6.545	3.155	3.39	3	0.4793	0.48	0.415							0.78	1		317.12	317.12
108.76	5	Clayey Silt to Silty Clay	41.153	0.895	6.575	3.17	3.404	2.91	0.4778	0.48	0.415							0.78	1		330.99	330.99
109.25	5	Clayey Silt to Silty Clay	47.292	1.148	6.604	3.186	3.419	2.87	0.4763	0.48	0.414							0.78	1		353.87	353.87
109.74	5	Clayey Silt to Silty Clay	47.237	1.166	6.634	3.201	3.433	2.89	0.4749	0.48	0.414							0.78	1		356.57	356.57
110.24	5	Clayey Silt to Silty Clay	46.576	1.369	6.664	3.216	3.447	2.93	0.4734	0.48	0.413							0.78	1		350.87	350.87
110.73	4	Silty Clay to Clay	42.75	1.314	6.694	3.232	3.462	2.98	0.4719	0.48	0.413							0.78	1		335.29	335.29
111.22	4	Silty Clay to Clay	39.495	1.076	6.723	3.247	3.476	3	0.4705	0.48	0.412							0.78	1		320.92	320.92
111.71	4	Silty Clay to Clay	41.126	1.098	6.753	3.263	3.49	2.99	0.4691	0.48	0.412							0.78	1		325.93	325.93
112.21	4	Silty Clay to Clay	42.144	1.32	6.783	3.278	3.505	3	0.4676	0.48	0.411							0.78	1		329.77	329.77
112.7	4	Silty Clay to Clay	41.291	1.206	6.813	3.293	3.519	2.99	0.4662	0.48	0.411							0.78	1		326.36	326.36
113.19	4	Silty Clay to Clay	40.997	1.111	6.842	3.309	3.534	2.99	0.4647	0.48	0.410							0.78	1		326.45	326.45
113.68	5	Clayey Silt to Silty Clay	42.557	1.17	6.872	3.324	3.548	2.98	0.4634	0.48	0.410							0.78	1		330.91	330.91
114.17	5	Clayey Silt to Silty Clay	41.745	1.011	6.902	3.339	3.562	2.96	0.462	0.48	0.409							0.78	1		330.80	330.80
114.67	5	Clayey Silt to Silty Clay	44.016	1.058	6.932	3.355	3.577	2.92	0.4605	0.48	0.409							0.77	1		344.09	344.09
115.16	5	Clayey Silt to Silty Clay	51.036	1.314	6.961	3.37	3.591	2.9	0.4592	0.48	0.408							0.77	1		366.07	366.07
115.65	5	Clayey Silt to Silty Clay	45.805	1.388	6.991	3.385	3.606	2.95	0.4578	0.47	0.408							0.77	1		353.94	353.94
116.14	5	Clayey Silt to Silty Clay	41.814	1.134	7.021	3.401	3.62	2.98	0.4564	0.47	0.407							0.77	1		333.03	333.03
116.63	5	Clayey Silt to Silty Clay	41.071	0.991	7.051	3.416	3.634	3	0.4551	0.47	0.407							0.77	1		318.70	318.70
117.13	4	Silty Clay to Clay	34.437	0.892	7.08	3.432	3.649	3.06	0.4537	0.47	0.406							0.77	1		294.59	294.59
117.62	4	Silty Clay to Clay	32.042	0.783	7.11	3.447	3.663	3.08	0.4524	0.47	0.406							0.77	1		282.88	282.88
118.11	5	Clayey Silt to Silty Clay	34.574	0.745	7.14	3.462	3.677	3.05	0.4511	0.47	0.406							0.77	1		287.90	287.90
118.6	5	Clayey Silt to Silty Clay	33.776	0.619	7.17	3.478	3.692	2.98	0.4497	0.47	0.405							0.77	1		299.37	299.37
119.09	5	Clayey Silt to Silty Clay	42.309	0.803	7.199	3.493	3.706	2.91	0.4484	0.47	0.405							0.77	1		335.04	335.04
119.59	5	Clayey Silt to Silty Clay	52.302	1.519	7.229	3.508	3.721	2.81	0.4471	0.47	0.404							0.77	1		403.23	403.23
120.08	5	Clayey Silt to Silty Clay	60.945	1.633	7.259	3.524	3.735	2.78	0.4458	0.47	0.404							0.77	1		431.37	431.37
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LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME	***Eastridge to BART Regional Connector Project***	*FAULT INFO*					
PROJECT NO.	***2017-125-GEO***	*COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*					
CPT NO.	***CPT-AS-85***	*FAULT* M_w = 6.9	*MSF* = 1.24	a_{max} *(g)*= 0.682		V_{S30m}(m/s)= #REF!	231.3

			CPT RESULT INPUT							***CSR***		***CRR*** $_{7.5}$						***F.S.=(CRR*** $_{7.5}$***/CSR)*MSF*K*** σ****K*** α				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
0.492			-9999	-9999	0.03		0.03		1.7	1.00	0.444							1.00			0.00	0.00
0.984			-9999	-9999	0.059		0.059		1.7	1.00	0.443							1.00			0.00	0.00
1.476			-9999	-9999	0.089		0.089		1.7	1.00	0.443							1.00			0.00	0.00
1.968			-9999	-9999	0.119		0.119		1.6679	1.00	0.442							1.00			0.00	0.00
2.461			-9999	-9999	0.149		0.149		1.6308	1.00	0.442							1.00			0.00	0.00
2.953			-9999	-9999	0.178		0.178		1.5965	1.00	0.441							1.00			0.00	0.00
3.445			-9999	-9999	0.208		0.208		1.5625	0.99	0.441							1.00			0.00	0.00
3.937			-9999	-9999	0.238		0.238		1.5299	0.99	0.440										0.00	0.00
4.429			-9999	-9999	0.268		0.268		1.4986	0.99	0.440										0.00	0.00
4.921			-9999	-9999	0.297		0.297		1.4696	0.99	0.439										0.00	0.00
5.413	3	Clay	7.487	0.166	0.327	0.005	0.322	2.71	1.4455	0.99	0.445										109.00	109.00
5.906	3	Clay	7.384	0.141	0.357	0.02	0.337	2.67	1.4314	0.99	0.464										109.31	109.31
6.398	3	Clay	9.387	0.183	0.387	0.036	0.351	2.62	1.4184	0.99	0.482										122.94	122.94
6.89	4	Silty Clay to Clay	11.534	0.231	0.416	0.051	0.366	2.51	1.4049	0.99	0.497	2.510	1.40	16.20	2.820	45.686	0.09			(0.00)	115.91	83.24
7.382	4	Silty Clay to Clay	20.508	0.319	0.446	0.066	0.38	2.43	1.3924	0.98	0.512	2.430	1.39	28.56	2.439	69.647	0.11	1.00	0	(0.00)	120.03	91.33
7.874	4	Silty Clay to Clay	11.41	0.178	0.476	0.082	0.394	2.52	1.3802	0.98	0.527	2.520	1.38	15.75	2.872	45.222	0.09	1.00	1	(0.21)	116.78	75.40
8.366	5	Clayey Silt to Silty Clay	27.059	0.298	0.506	0.097	0.409	2.23	1.3673	0.98	0.539	2.230	1.37	37.00	1.743	64.505	0.10	1.00	1	(0.24)	129.32	116.42
8.858	4	Silty Clay to Clay	32.868	0.663	0.535	0.112	0.423	2.3	1.3555	0.98	0.550	2.300	1.36	44.55	1.949	86.822	0.14	1.00	1	(0.32)	133.92	133.92
9.35	3	Clay	16.599	0.492	0.565	0.128	0.438	2.6	1.3431	0.98	0.561							1.00	1		125.71	125.71
9.843	3	Clay	10.901	0.328	0.595	0.143	0.452	2.72	1.3317	0.98	0.572							1.00	1		140.96	140.96
10.335	3	Clay	10.956	0.332	0.625	0.158	0.466	2.7	1.3205	0.98	0.582							1.00	1		151.21	151.21
10.827	4	Silty Clay to Clay	31.877	0.787	0.654	0.174	0.481	2.45	1.3087	0.98	0.589	2.450	1.31	41.72	2.528	105.474	0.19	1.00	1	(0.40)	136.19	133.52
11.319	4	Silty Clay to Clay	30.425	0.788	0.684	0.189	0.495	2.39	1.2979	0.98	0.598	2.390	1.30	39.49	2.272	89.721	0.15	1.00	1	(0.30)	140.50	140.50
11.811	4	Silty Clay to Clay	30.83	0.602	0.714	0.205	0.509	2.4	1.2873	0.98	0.606	2.400	1.29	39.69	2.312	91.772	0.15	1.00	1	(0.31)	139.20	124.95
12.303	4	Silty Clay to Clay	15.278	0.452	0.744	0.22	0.524	2.59	1.2761	0.97	0.613	2.590	1.28	19.50	3.266	63.676	0.10	1.00	1	(0.21)	131.83	83.24
12.795	3	Clay	9.442	0.268	0.773	0.235	0.538	2.85	1.2658	0.97	0.620							1.00	1		126.98	126.98
13.287	3	Clay	8.479	0.224	0.803	0.251	0.553	2.9	1.255	0.97	0.626							1.00	1		114.31	114.31
13.78	3	Clay	7.15	0.167	0.833	0.266	0.567	2.92	1.245	0.97	0.632							1.00	1		107.32	107.32
14.272	3	Clay	8.369	0.215	0.863	0.281	0.581	2.91	1.2353	0.97	0.639							1.00	1		114.65	114.65
14.764	3	Clay	8.85	0.243	0.892	0.297	0.596	2.89	1.2249	0.97	0.643							1.00	1		123.21	123.21
15.256	3	Clay	13.626	0.345	0.922	0.312	0.61	2.77	1.2155	0.97	0.649							1.00	1		157.80	157.80
15.748	3	Clay	17.838	0.749	0.952	0.327	0.625	2.73	1.2055	0.97	0.653							1.00	1		184.69	184.69
16.24	3	Clay	17.439	0.59	0.982	0.343	0.639	2.73	1.1963	0.97	0.658							1.00	1		187.07	187.07
16.732	4	Silty Clay to Clay	25.738	0.841	1.011	0.358	0.653	2.65	1.1873	0.96	0.662							1.00	1		213.50	213.50
17.224	3	Clay	15.333	0.564	1.041	0.374	0.668	2.75	1.1777	0.96	0.666							1.00	1		183.32	183.32
17.717	3	Clay	11.121	0.363	1.071	0.389	0.682	2.92	1.169	0.96	0.670							1.00	1		138.96	138.96
18.209	3	Clay	10.407	0.309	1.101	0.404	0.696	2.92	1.1603	0.96	0.674							1.00	1		132.96	132.96
18.701	3	Clay	10.763	0.306	1.13	0.42	0.711	2.89	1.1512	0.96	0.676							1.00	1		139.45	139.45
19.193	3	Clay	12.112	0.348	1.16	0.435	0.725	2.86	1.1429	0.96	0.680							1.00	1		148.87	148.87
19.685	4	Silty Clay to Clay	17.507	0.491	1.19	0.45	0.74	2.75	1.134	0.96	0.683							1.00	1		184.45	184.45
20.177	4	Silty Clay to Clay	28.216	0.913	1.22	0.466	0.754	2.57	1.1259	0.96	0.686	2.570	1.13	31.77	3.148	100.005	0.17	1.00	1	(0.31)	156.65	116.42
20.669	4	Silty Clay to Clay	48.448	1.655	1.249	0.481	0.768	2.4	1.1179	0.96	0.689	2.400	1.12	54.16	2.312	125.237	0.26	1.00	1	(0.47)	168.60	168.60
21.161	6	Sandy Silt to Clayey Silt	108.54	1.826	1.279	0.496	0.783	1.96	1.1094	0.95	0.691	1.960	1.11	120.42	1.251	150.655	0.40	1.00	1	(0.71)	186.87	186.87
21.654	6	Sandy Silt to Clayey Silt	157.62	0.887	1.309	0.512	0.797	1.61	1.1017	0.95	0.693	1.610	1.10	173.64	1.000	173.644		1.00	1		196.50	196.50
22.146	6	Sandy Silt to Clayey Silt	149.83	0.626	1.339	0.527	0.812	1.52	1.0934	0.95	0.695	1.520	1.09	163.83	1.000	163.831		1.00	1		196.61	196.61
22.638	6	Sandy Silt to Clayey Silt	129.54	0.62	1.368	0.543	0.826	1.64	1.0859	0.95	0.697	1.640	1.09	140.67	1.000	140.669	0.34	1.00	1	(0.60)	192.86	192.86
23.13	5	Clayey Silt to Silty Clay	61.964	0.934	1.398	0.558	0.84	2.07	1.0784	0.95	0.699	2.070	1.08	66.82	1.403	93.749	0.16	1.00	1	(0.28)	179.10	168.05
23.622	4	Silty Clay to Clay	30.359	0.854	1.428	0.573	0.855	2.54	1.0706	0.95	0.701	2.540	1.07	32.50	2.979	96.820	0.16	1.00	1	(0.29)	163.07	107.96
24.114	4	Silty Clay to Clay	21.058	0.676	1.458	0.589	0.869	2.72	1.0633	0.94	0.703							1.00	1		208.21	208.21
24.606	3	Clay	13.313	0.398	1.487	0.604	0.883	2.9	1.0562	0.94	0.704							1.00	1		161.06	161.06
25.098	3	Clay	13.736	0.416	1.517	0.619	0.898	2.9	1.0486	0.94	0.705							1.00	1		160.91	160.91
25.591	4	Silty Clay to Clay	17.149	0.494	1.547	0.635	0.912	2.79	1.0417	0.94	0.707							1.00	1		184.49	184.49
26.083	5	Clayey Silt to Silty Clay	24.169	0.521	1.577	0.65	0.927	2.45	1.0343	0.94	0.707	2.450	1.03	25.00	2.528	63.202	0.10	1.00	1	(0.18)	166.46	91.33
26.575	5	Clayey Silt to Silty Clay	56.761	0.669	1.606	0.665	0.941	2.38	1.0276	0.94	0.708	2.380	1.03	58.33	2.233	130.216	0.29	1.00	1	(0.50)	173.54	116.42
27.067	4	Silty Clay to Clay	18.306	0.819	1.636	0.681	0.955	2.81	1.0209	0.93	0.709							1.00	1		210.28	210.28
27.559	3	Clay	14.096	0.535	1.666	0.696	0.97	3	1.0138	0.93	0.710							1.00	1		161.41	161.41
28.051	3	Clay	14.59	0.529	1.696	0.712	0.984	2.98	1.0073	0.93	0.710							1.00	1		164.39	164.39
28.543	3	Clay	15.044	0.516	1.725	0.727	0.999	2.96	1.0005	0.93	0.710							1.00	1		167.65	167.65
29.035	3	Clay	15.14	0.526	1.755	0.742	1.013	2.97	0.9941	0.93	0.711							1.00	1		168.72	168.72
29.528	3	Clay	15.47	0.564	1.785	0.758	1.027	2.99	0.9879	0.92	0.711							0.99	1		169.51	169.51
30.02	3	Clay	14.59	0.632	1.815	0.773	1.042	3.04	0.9813	0.92	0.711							0.99	1		165.66	165.66
30.512	3	Clay	14.342	0.688	1.844	0.788	1.056	3.07	0.9752	0.92	0.711							0.99	1		163.82	163.82
31.004	3	Clay	14.59	0.582	1.874	0.804	1.07	3.05	0.9692	0.92	0.711							0.99	1		163.16	163.16
31.496	3	Clay	13.375	0.526	1.904	0.819	1.085	3.07	0.9628	0.91	0.710							0.98	1		158.79	158.79
31.988	3	Clay	14.892	0.594	1.934	0.834	1.099	3.06	0.9569	0.91	0.710							0.98	1		165.19	165.19
32.48	3	Clay	16.544	0.788	1.963	0.85	1.114	2.97	0.9507	0.91	0.708							0.98	1		190.27	190.27
32.972	3	Clay	20.838	0.857	1.993	0.865	1.128	2.93	0.945	0.90	0.708							0.98	1		198.54	198.54
33.465	3	Clay	15.663	0.531	2.023	0.881	1.142	2.99	0.9394	0.90	0.707							0.97	1		175.53	175.53
33.957	3	Clay	17.397	0.532	2.053	0.896	1.157	2.96	0.9334	0.90	0.706							0.97	1		181.74	181.74
34.449	3	Clay	15.773	0.585	2.082	0.911	1.171	3.02	0.9279	0.89	0.705							0.97	1		174.94	174.94
34.941	3	Clay	14.672	0.552	2.112	0.927	1.186	3.06	0.922	0.89	0.703							0.97	1		169.12	169.12
35.433	3	Clay	18.664	0.781	2.142	0.942	1.2	3	0.9167	0.89	0.702							0.96	1		190.61	190.61
35.925	3	Clay	20.15	0.863	2.172	0.957	1.214	2.97	0.9114	0.88	0.701							0.96	1		202.72	202.72
36.417	3	Clay	20.921	0.809	2.201	0.973	1.229	2.95	0.9057	0.88	0.699							0.96	1		204.50	204.50
36.909	3	Clay	19.93	0.819	2.231	0.988	1.243	2.99	0.9005	0.88	0.697							0.96	1		199.77	199.77
37.402	3	Clay	18.994	0.801	2.261	1.003	1.257	3.01	0.8954	0.87	0.696							0.96	1		194.63	194.63
37.894	3	Clay	19.665	0.763	2.291	1.019	1.272	2.96	0.89	0.87	0.694							0.95	1		204.04	204.04
38.386	4	Silty Clay to Clay	29.867	0.779	2.32	1.034	1.286	2.79	0.885	0.86	0.692							0.95	1		241.32	241.32
38.878	4	Silty Clay to Clay	25.876	0.861	2.35	1.05	1.301	2.82	0.8796	0.86	0.689							0.95	1		239.37	239.37
39.37	3	Clay	22.682	0.853	2.38	1.065	1.315	2.95	0.8748	0.86	0.687							0.95	1		211.29	211.29
39.862	3	Clay	18.306	0.78	2.41	1.08	1.329	3.05	0.8699	0.85	0.685							0.94	1		191.97	191.97
40.354	3	Clay	18.127	0.813	2.439	1.096	1.344	3.07	0.8648	0.85	0.682							0.94	1		188.79	188.79
40.846	3	Clay	20.068	0.729	2.469	1.111	1.358	3.01	0.86	0.84	0.680							0.94	1		198.34	198.34
41.339	4	Silty Clay to Clay	20.783	0.772	2.499	1.126	1.373	2.96	0.855	0.84	0.677							0.94	1		205.48	205.48
41.831	4	Silty Clay to Clay	20.976	0.634	2.529	1.142	1.387	2.93	0.8504	0.83	0.674							0.94	1		208.41	208.41
42.323	4	Silty Clay to Clay	21.224	0.657	2.558	1.157	1.401	2.94	0.8458	0.83	0.672							0.93	1		203.94	203.94
42.815	3	Clay	16.599	0.479	2.588	1.172	1.416	3.05	0.841	0.83	0.668							0.93	1		177.04	177.04
43.307	3	Clay	12.786	0.35	2.618	1.188	1.43	3.14	0.8365	0.82	0.666							0.93	1		155.70	155.70
43.799	4	Silty Clay to Clay	16.544	0.371	2.648	1.203	1.444	3.08	0.8321	0.82	0.663							0.93	1		164.16	164.16
44.291	4	Silty Clay to Clay	13.048	0.334	2.677	1.219	1.459	3.11	0.8274	0.81	0.659							0.93	1		159.55	159.55
44.783	4	Silty Clay to Clay	14.727	0.323	2.707	1.234	1.473	2.92	0.823	0.81	0.656							0.93	1		187.79	187.79
45.276	4	Silty Clay to Clay	17.948	0.46	2.737	1.249	1.488	2.89	0.8185	0.80	0.653							0.92	1		199.62	199.62
45.768	4	Silty Clay to Clay	16.2	0.377	2.767	1.265	1.502	2.94	0.8142	0.80	0.650							0.92	1		189.17	189.17
46.26	4	Silty Clay to Clay	21.857	0.623	2.796	1.28	1.516	2.84	0.81	0.79	0.647							0.92	1		233.13	233.13
46.752	4	Silty Clay to Clay	26.013	0.81	2.826	1.295	1.531	2.85	0.8056	0.79	0.643							0.92	1		241.78	241.78
47.244	4	Silty Clay to Clay	21.809	0.421	2.856	1.311	1.545	2.86	0.8015	0.78	0.640							0.92	1		214.89	214.89
47.736	4	Silty Clay to Clay	21.664	0.37	2.886	1.326	1.56	2.81	0.7971	0.78	0.636							0.91	1		214.86	214.86
48.228	4	Silty Clay to Clay	24.141	0.518	2.915	1.341	1.574	2.84	0.7931	0.77	0.633							0.91	1		234.94	234.94
48.72	4	Silty Clay to Clay	35.675	1.486	2.945	1.357	1.588	2.96	0.7891	0.77	0.630							0.91	1		246.96	246.96
49.213	3	Clay	20.58	0.803	2.975	1.372	1.603	3.05	0.7849	0.76	0.626							0.91	1		218.21	218.21
49.705	4	Silty Clay to Clay	35.593	1.269	3.005	1.388	1.617	2.78	0.781	0.76	0.623							0.91	1		308.69	308.69
50.197	5	Clayey Silt to Silty Clay	87.619	1.743	3.034	1.403	1.631	2.51	0.7771	0.75	0.619	2.510	0.78	68.09	2.820	191.980		0.91	1		212.68	212.68

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project*** *FAULT INFO*
PROJECT NO. ***2017-125-GEO*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-85*** *FAULT* M_w = 6.9 *MSF* = 1.24 a_{max} *(g)*= 0.682 V_{S30m}(m/s)= #REF! 231.3

			CPT RESULT INPUT							***CSR***		***CRR*** $_{7.5}$						***F.S.=(CRR*** $_{7.5}$ ***/CSR)*MSF*K*** σ ****K*** α				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
50.689	4	Silty Clay to Clay	28.353	0.89	3.064	1.418	1.646	2.69	0.773	0.75	0.615							0.91	1		309.01	309.01
51.181	4	Silty Clay to Clay	27.032	0.842	3.094	1.434	1.66	2.91	0.7692	0.74	0.612							0.90	1		241.40	241.40
51.673	4	Silty Clay to Clay	60.973	0.984	3.124	1.449	1.675	2.73	0.7652	0.74	0.608							0.90	1		286.97	286.97
52.165	4	Silty Clay to Clay	23.151	0.229	3.153	1.464	1.689	2.8	0.7615	0.73	0.605							0.90	1		229.22	229.22
52.657	4	Silty Clay to Clay	18.925	0.237	3.183	1.48	1.703	2.88	0.7578	0.73	0.602							0.90	1		196.63	196.63
53.15	4	Silty Clay to Clay	18.664	0.365	3.213	1.495	1.718	2.97	0.7539	0.72	0.598							0.90	1		193.75	193.75
53.642	4	Silty Clay to Clay	19.045	0.451	3.243	1.51	1.732	2.99	0.7503	0.72	0.595							0.90	1		196.25	196.25
54.134	4	Silty Clay to Clay	22.6	0.498	3.272	1.526	1.747	2.93	0.7465	0.71	0.591							0.89	1		214.12	214.12
54.626	4	Silty Clay to Clay	26.041	0.527	3.302	1.541	1.761	2.84	0.743	0.71	0.588							0.89	1		239.60	239.60
55.118	4	Silty Clay to Clay	27.748	0.647	3.332	1.557	1.775	2.84	0.7395	0.70	0.584							0.89	1		250.72	250.72
55.61	4	Silty Clay to Clay	28.271	0.835	3.362	1.572	1.79	2.9	0.7358	0.70	0.581							0.89	1		247.08	247.08
56.102	4	Silty Clay to Clay	25.243	0.725	3.391	1.587	1.804	2.93	0.7324	0.69	0.578							0.89	1		238.15	238.15
56.594	4	Silty Clay to Clay	29.592	0.733	3.421	1.603	1.818	2.9	0.729	0.69	0.574							0.89	1		250.62	250.62
57.087	4	Silty Clay to Clay	25.986	0.861	3.451	1.618	1.833	2.93	0.7254	0.68	0.571							0.89	1		244.24	244.24
57.579	4	Silty Clay to Clay	24.988	0.628	3.481	1.633	1.847	2.91	0.722	0.68	0.568							0.88	1		233.29	233.29
58.071	4	Silty Clay to Clay	26.903	0.601	3.51	1.649	1.862	2.85	0.7185	0.68	0.564							0.88	1		250.26	250.26
58.563	4	Silty Clay to Clay	50.54	0.982	3.54	1.664	1.876	2.73	0.7152	0.67	0.561							0.88	1		306.21	306.21
59.055	4	Silty Clay to Clay	27.445	0.579	3.57	1.679	1.89	2.78	0.712	0.67	0.559							0.88	1		276.03	276.03
59.547	5	Clayey Silt to Silty Clay	30.686	0.405	3.6	1.695	1.905	2.68	0.7085	0.66	0.555							0.88	1		278.62	278.62
60.039	5	Clayey Silt to Silty Clay	68.488	1.3	3.629	1.71	1.919	2.57	0.7054	0.66	0.552	2.570	0.71	48.31	3.148	152.073	0.41	0.88	1	(0.80)	217.92	83.24
60.532	5	Clayey Silt to Silty Clay	44.512	1.515	3.659	1.726	1.934	2.62	0.702	0.65	0.549							0.88	1		383.52	383.52
61.024	5	Clayey Silt to Silty Clay	79.939	1.035	3.689	1.741	1.948	2.49	0.6989	0.65	0.547	2.490	0.70	55.87	2.718	151.865	0.41	0.88	1	(0.80)	221.66	91.33
61.516	5	Clayey Silt to Silty Clay	26.977	0.77	3.719	1.756	1.962	2.69	0.6958	0.65	0.544							0.87	1		304.10	304.10
62.008	4	Silty Clay to Clay	23.646	0.406	3.748	1.772	1.977	2.87	0.6925	0.64	0.541							0.87	1		229.05	229.05
62.5	4	Silty Clay to Clay	22.682	0.507	3.778	1.787	1.991	2.94	0.6894	0.64	0.538							0.87	1		222.49	222.49
62.992	4	Silty Clay to Clay	21.65	0.404	3.808	1.802	2.005	2.95	0.6864	0.64	0.536							0.87	1		216.55	216.55
63.484	4	Silty Clay to Clay	21.251	0.375	3.838	1.818	2.02	2.95	0.6832	0.63	0.533							0.87	1		213.47	213.47
63.976	4	Silty Clay to Clay	21.354	0.405	3.867	1.833	2.034	2.95	0.6803	0.63	0.530							0.87	1		218.21	218.21
64.469	4	Silty Clay to Clay	26.426	0.473	3.897	1.848	2.049	2.89	0.6771	0.63	0.528							0.87	1		237.17	237.17
64.961	4	Silty Clay to Clay	26.041	0.497	3.927	1.864	2.063	2.84	0.6742	0.62	0.525							0.87	1		263.17	263.17
65.453	4	Silty Clay to Clay	45.585	0.954	3.957	1.879	2.077	2.82	0.6713	0.62	0.523							0.86	1		282.24	282.24
65.945	4	Silty Clay to Clay	22.38	0.478	3.986	1.895	2.092	2.97	0.6683	0.62	0.520							0.86	1		226.34	226.34
66.437	4	Silty Clay to Clay	21.506	0.407	4.016	1.91	2.106	2.97	0.6655	0.61	0.518							0.86	1		215.64	215.64
66.929	4	Silty Clay to Clay	22.517	0.41	4.046	1.925	2.121	2.91	0.6625	0.61	0.516							0.86	1		235.14	235.14
67.421	5	Clayey Silt to Silty Clay	34.106	1.349	4.076	1.941	2.135	2.65	0.6597	0.61	0.513							0.86	1		384.48	384.48
67.913	5	Clayey Silt to Silty Clay	79.031	3.038	4.105	1.956	2.149	2.55	0.6569	0.60	0.511	2.550	0.66	51.92	3.034	157.526	0.44	0.86	1	(0.92)	237.24	116.42
68.406	4	Silty Clay to Clay	53.843	1.575	4.135	1.971	2.164	2.75	0.654	0.60	0.509							0.86	1		369.00	369.00
68.898	4	Silty Clay to Clay	23.323	0.316	4.165	1.987	2.178	2.94	0.6513	0.60	0.507							0.86	1		234.01	234.01
69.39	5	Clayey Silt to Silty Clay	23.536	0.33	4.195	2.002	2.192	2.87	0.6486	0.60	0.505							0.85	1		233.31	233.31
69.882	5	Clayey Silt to Silty Clay	30.693	0.505	4.224	2.017	2.207	2.87	0.6457	0.59	0.503							0.85	1		250.20	250.20
70.374	4	Silty Clay to Clay	26.013	0.564	4.254	2.033	2.221	2.95	0.6431	0.59	0.501							0.85	1		239.47	239.47
70.866	4	Silty Clay to Clay	24.004	0.474	4.284	2.048	2.236	2.96	0.6403	0.59	0.499							0.85	1		232.46	232.46
71.358	4	Silty Clay to Clay	25.655	0.475	4.314	2.064	2.25	2.93	0.6377	0.58	0.497							0.85	1		240.73	240.73
71.85	4	Silty Clay to Clay	28.408	0.652	4.343	2.079	2.264	2.93	0.6351	0.58	0.495							0.85	1		251.81	251.81
72.343	4	Silty Clay to Clay	24.582	0.712	4.373	2.094	2.279	3.01	0.6324	0.58	0.493							0.85	1		237.60	237.60
72.835	4	Silty Clay to Clay	23.288	0.497	4.403	2.11	2.293	3.01	0.6298	0.58	0.492							0.85	1		226.69	226.69
73.327	4	Silty Clay to Clay	25.958	0.558	4.433	2.125	2.308	2.95	0.6271	0.58	0.490							0.85	1		242.84	242.84
73.819	4	Silty Clay to Clay	28.983	0.731	4.462	2.14	2.322	2.94	0.6246	0.57	0.488							0.84	1		263.22	263.22
74.311	5	Clayey Silt to Silty Clay	30.528	1.189	4.492	2.156	2.336	2.7	0.6222	0.57	0.486							0.84	1		371.89	371.89
74.803	5	Clayey Silt to Silty Clay	147.85	2.056	4.522	2.171	2.351	2.39	0.6195	0.57	0.485	2.390	0.62	91.60	2.272	208.114		0.84	1		246.11	246.11
75.295	5	Clayey Silt to Silty Clay	34.024	0.947	4.552	2.187	2.365	2.73	0.6171	0.57	0.483							0.84	1		347.98	347.98
75.787	4	Silty Clay to Clay	29.372	0.602	4.581	2.202	2.379	2.92	0.6147	0.56	0.482							0.84	1		259.93	259.93
76.28	4	Silty Clay to Clay	28.195	0.655	4.611	2.217	2.394	2.96	0.6121	0.56	0.480							0.84	1		254.01	254.01
76.772	4	Silty Clay to Clay	30.198	0.741	4.641	2.233	2.408	2.95	0.6098	0.56	0.479							0.84	1		258.42	258.42
77.264	4	Silty Clay to Clay	29.423	0.663	4.671	2.248	2.423	2.94	0.6072	0.56	0.477							0.84	1		262.02	262.02
77.756	4	Silty Clay to Clay	33.831	0.721	4.7	2.263	2.437	2.92	0.6049	0.56	0.476							0.84	1		269.78	269.78
78.248	4	Silty Clay to Clay	31.601	0.717	4.73	2.279	2.451	2.93	0.6026	0.55	0.474							0.84	1		268.29	268.29
78.74	4	Silty Clay to Clay	29.234	0.709	4.76	2.294	2.466	2.95	0.6001	0.55	0.473							0.83	1		264.49	264.49
79.232	4	Silty Clay to Clay	29.95	0.873	4.79	2.309	2.48	3.01	0.5978	0.55	0.472							0.83	1		260.54	260.54
79.724	4	Silty Clay to Clay	27.032	0.897	4.819	2.325	2.495	3.06	0.5954	0.55	0.470							0.83	1		251.35	251.35
80.217	4	Silty Clay to Clay	27.417	0.74	4.849	2.34	2.509	3.03	0.5932	0.55	0.469							0.83	1		252.41	252.41
80.709	4	Silty Clay to Clay	29.124	0.708	4.879	2.356	2.523	3	0.5909	0.55	0.468							0.83	1		259.48	259.48
81.201	4	Silty Clay to Clay	29.95	1.094	4.909	2.371	2.538	2.93	0.5886	0.54	0.467							0.83	1		319.96	319.96
81.693	4	Silty Clay to Clay	132.6	4.468	4.938	2.386	2.552	2.77	0.5864	0.54	0.465							0.83	1		452.12	452.12
82.185	4	Silty Clay to Clay	59.953	2.382	4.968	2.402	2.566	2.84	0.5842	0.54	0.464							0.83	1		415.12	415.12
82.677	5	Clayey Silt to Silty Clay	133.7	4.517	4.998	2.417	2.581	2.48	0.5819	0.54	0.463	2.480	0.58	77.79	2.669	207.660		0.83	1		262.61	262.61
83.169	8	Sand to Silty Sand	114.43	5.232	5.028	2.432	2.595	2.53	0.5797	0.54	0.462	2.530	0.58	66.34	2.925	194.020		0.83	1		262.50	262.50
83.661	4	Silty Clay to Clay	57.133	1.506	5.057	2.448	2.61	2.76	0.5774	0.54	0.461							0.83	1		419.32	419.32
84.154	5	Clayey Silt to Silty Clay	59.239	1.602	5.087	2.463	2.624	2.71	0.5753	0.53	0.460							0.82	1		411.69	411.69
84.646	4	Silty Clay to Clay	91.17	3.223	5.117	2.478	2.638	2.66	0.5732	0.53	0.459							0.82	1		533.44	533.44
85.138	9	Sand	95.85	6.299	5.147	2.494	2.653	2.78	0.571	0.53	0.458							0.82	1		531.64	531.64
85.63	3	Clay	54.944	3.195	5.176	2.509	2.667	2.98	0.5689	0.53	0.456							0.82	1		385.33	385.33
86.122	4	Silty Clay to Clay	36.859	1.41	5.206	2.525	2.682	3.01	0.5667	0.53	0.455							0.82	1		309.68	309.68
86.614	4	Silty Clay to Clay	33.831	1.052	5.236	2.54	2.696	3.01	0.5647	0.53	0.454							0.82	1		281.42	281.42
87.106	4	Silty Clay to Clay	32.045	0.91	5.266	2.555	2.71	3.01	0.5627	0.53	0.454							0.82	1		275.40	275.40
87.598	4	Silty Clay to Clay	34.795	1.084	5.295	2.571	2.725	2.99	0.5605	0.53	0.452							0.82	1		289.72	289.72
88.091	4	Silty Clay to Clay	38.841	1.03	5.325	2.586	2.739	2.94	0.5585	0.52	0.452							0.82	1		305.24	305.24
88.583	4	Silty Clay to Clay	37.982	1.074	5.355	2.601	2.753	2.94	0.5565	0.52	0.451							0.82	1		305.28	305.28
89.075	4	Silty Clay to Clay	38.648	1.342	5.385	2.617	2.768	2.96	0.5544	0.52	0.450							0.82	1		309.20	309.20
89.567	4	Silty Clay to Clay	39.261	1.227	5.414	2.632	2.782	2.96	0.5525	0.52	0.449							0.81	1		312.41	312.41
90.059	4	Silty Clay to Clay	44.594	1.495	5.444	2.647	2.797	2.93	0.5504	0.52	0.448							0.81	1		333.47	333.47
90.551	4	Silty Clay to Clay	46.211	1.669	5.474	2.663	2.811	2.93	0.5485	0.52	0.447							0.81	1		348.07	348.07
91.043	4	Silty Clay to Clay	52.081	2.075	5.504	2.678	2.825	2.93	0.5466	0.52	0.446							0.81	1		358.78	358.78
91.535	4	Silty Clay to Clay	54.064	2.14	5.533	2.694	2.84	2.88	0.5446	0.52	0.445							0.81	1		383.88	383.88
92.028	4	Silty Clay to Clay	50.568	1.965	5.563	2.709	2.854	2.88	0.5427	0.51	0.445							0.81	1		379.20	379.20
92.52	4	Silty Clay to Clay	54.065	1.971	5.593	2.724	2.869	2.9	0.5407	0.51	0.444							0.81	1		395.25	395.25
93.012	9	Sand	103.56	4.604	5.623	2.74	2.883	2.78	0.5388	0.51	0.443							0.81	1		508.21	508.21
93.504	9	Sand	88.775	4.004	5.652	2.755	2.897	2.81	0.537	0.51	0.442							0.81	1		488.11	488.11
93.996	4	Silty Clay to Clay	41.621	2.052	5.682	2.77	2.912	3	0.535	0.51	0.441							0.81	1		355.73	355.73
94.488	4	Silty Clay to Clay	40.107	1.349	5.712	2.786	2.926	2.99	0.5332	0.51	0.441							0.81	1		311.52	311.52
94.98	4	Silty Clay to Clay	35.552	1.114	5.742	2.801	2.94	3	0.5314	0.51	0.440							0.81	1		299.20	299.20
95.472	4	Silty Clay to Clay	35.813	1.223	5.771	2.816	2.955	3.05	0.5295	0.51	0.439							0.81	1		290.20	290.20
95.965	4	Silty Clay to Clay	32.978	1.104	5.801	2.832	2.969	3.08	0.5277	0.51	0.438							0.80	1		282.40	282.40
96.457	4	Silty Clay to Clay	34.134	1.165	5.831	2.847	2.984	3.06	0.5258	0.51	0.438							0.80	1		286.79	286.79
96.949	4	Silty Clay to Clay	35.662	1.205	5.861	2.863	2.998	3.05	0.5241	0.50	0.437							0.80	1		294.92	294.92
97.441	4	Silty Clay to Clay	36.942	1.542	5.89	2.878	3.012	3.08	0.5223	0.50	0.436							0.80	1		297.61	297.61
97.933	4	Silty Clay to Clay	35.669	1.428	5.92	2.893	3.027	3.1	0.5205	0.50	0.436							0.80	1		294.59	294.59
98.425	4	Silty Clay to Clay	36.804	1.377	5.95	2.909	3.041	3.08	0.5187	0.50	0.435							0.80	1		294.93	294.93
98.917	4	Silty Clay to Clay	34.031	1.021	5.98	2.924	3.056	3.05	0.5169	0.50	0.434							0.80	1		288.78	288.78
99.409	4	Silty Clay to Clay	35.758	0.85	6.009	2.939	3.07	3	0.5152	0.50	0.434							0.80	1		289.18	289.18
99.902	4	Silty Clay to Clay	33.583	0.837	6.039	2.955	3.084	3.01	0.5135	0.50	0.433							0.80	1		286.12	286.12
100.39	4	Silty Clay to Clay	34.757	0.972	6.069	2.97	3.099	3.02	0.5117	0.50	0.432							0.80	1		291.53	291.53
100.89	4	Silty Clay to Clay	34.574	1.158	6.099	2.985	3.113	3.05	0.5101	0.50	0.432							0.80	1		292.93	292.93
101.38	4	Silty Clay to Clay	34.189	1.13	6.128	3.001	3.127	3.08	0.5084	0.50	0.431							0.80	1		286.92	286.92
101.87	4	Silty Clay to Clay	34.179	1.145	6.158	3.016	3.142	3.08	0.5067	0.50	0.430							0.80	1		287.59	287.59
102.36	4	Silty Clay to Clay	35.07	1.153	6.188	3.032	3.156	3.05	0.5051	0.49	0.430							0.79	1		291.77	291.77

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project*** *FAULT INFO*
PROJECT NO. ***2017-125-GEO*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-85*** *FAULT* M_w = 6.9 *MSF* = 1.24 a_{max} *(g)*= 0.682 V_{S30m}(m/s)= #REF! 231.3

		CPT RESULT INPUT								***CSR***			***CRR*** $_{7.5}$					***F.S.=(CRR*** $_{7.5}$ ***/CSR)*MSF*Kσ*Kα***				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
102.85	4	Silty Clay to Clay	36.309	0.867	6.218	3.047	3.171	3	0.5033	0.49	0.429							0.79	1		295.89	295.89
103.35	4	Silty Clay to Clay	35.896	0.861	6.247	3.062	3.185	2.98	0.5017	0.49	0.428							0.79	1		297.03	297.03
103.84	4	Silty Clay to Clay	36.467	0.929	6.277	3.078	3.199	2.95	0.5001	0.49	0.428							0.79	1		333.14	333.14
104.33	4	Silty Clay to Clay	88.996	3.525	6.307	3.093	3.214	2.82	0.4984	0.49	0.427							0.79	1		485.32	485.32
104.82	9	Sand	99.497	5.37	6.337	3.108	3.228	2.74	0.4968	0.49	0.427							0.79	1		563.23	563.23
105.32	4	Silty Clay to Clay	67.469	2.738	6.366	3.124	3.243	2.82	0.4952	0.49	0.426							0.79	1		451.67	451.67
105.81	4	Silty Clay to Clay	39.419	0.993	6.396	3.139	3.257	3	0.4936	0.49	0.426							0.79	1		317.90	317.90
106.3	4	Silty Clay to Clay	36.584	0.927	6.426	3.154	3.271	2.99	0.4921	0.49	0.425							0.79	1		303.57	303.57
106.79	4	Silty Clay to Clay	35.042	0.923	6.456	3.17	3.286	3.04	0.4904	0.49	0.424							0.79	1		292.56	292.56
107.28	4	Silty Clay to Clay	33.336	0.95	6.485	3.185	3.3	3.06	0.4889	0.49	0.424							0.79	1		284.76	284.76
107.78	4	Silty Clay to Clay	30.142	0.749	6.515	3.201	3.314	3.08	0.4874	0.49	0.423							0.79	1		273.07	273.07
108.27	4	Silty Clay to Clay	32.317	0.747	6.545	3.216	3.329	3.04	0.4858	0.48	0.423							0.79	1		281.71	281.71
108.76	4	Silty Clay to Clay	34.849	0.895	6.575	3.231	3.343	3.02	0.4843	0.48	0.422							0.79	1		294.60	294.60
109.25	5	Clayey Silt to Silty Clay	37.63	0.897	6.604	3.247	3.358	2.99	0.4827	0.48	0.422							0.78	1		304.26	304.26
109.74	5	Clayey Silt to Silty Clay	37.988	0.939	6.634	3.262	3.372	2.98	0.4812	0.48	0.421							0.78	1		309.74	309.74
110.24	5	Clayey Silt to Silty Clay	38.538	0.975	6.664	3.277	3.386	2.97	0.4797	0.48	0.421							0.78	1		314.43	314.43
110.73	5	Clayey Silt to Silty Clay	44.429	1.173	6.694	3.293	3.401	2.91	0.4782	0.48	0.420							0.78	1		354.97	354.97
111.22	5	Clayey Silt to Silty Clay	61.881	1.831	6.723	3.308	3.415	2.83	0.4767	0.48	0.419							0.78	1		419.52	419.52
111.71	4	Silty Clay to Clay	64.689	2.29	6.753	3.323	3.43	2.86	0.4752	0.48	0.419							0.78	1		418.48	418.48
112.21	4	Silty Clay to Clay	38.318	1.441	6.783	3.339	3.444	3.02	0.4737	0.48	0.418							0.78	1		338.03	338.03
112.7	4	Silty Clay to Clay	35.73	1.226	6.813	3.354	3.458	3.11	0.4723	0.48	0.418							0.78	1		298.33	298.33
113.19	4	Silty Clay to Clay	35.097	1.174	6.842	3.37	3.473	3.11	0.4708	0.48	0.417							0.78	1		292.00	292.00
113.68	4	Silty Clay to Clay	32.351	1.052	6.872	3.385	3.487	3.14	0.4694	0.48	0.417							0.78	1		281.84	281.84
114.17	4	Silty Clay to Clay	38.483	1.285	6.902	3.4	3.502	3.09	0.4679	0.48	0.416							0.78	1		310.74	310.74
114.67	4	Silty Clay to Clay	42.392	1.859	6.932	3.416	3.516	3.08	0.4665	0.48	0.416							0.78	1		332.02	332.02
115.16	4	Silty Clay to Clay	40.823	1.43	6.961	3.431	3.53	3.07	0.4651	0.48	0.415							0.78	1		322.63	322.63
115.65	4	Silty Clay to Clay	40.286	1.403	6.991	3.446	3.545	3.06	0.4636	0.47	0.415							0.78	1		324.86	324.86
116.14	4	Silty Clay to Clay	48.696	1.81	7.021	3.462	3.559	3.01	0.4623	0.47	0.414							0.78	1		355.42	355.42
116.63	4	Silty Clay to Clay	53.21	1.93	7.051	3.477	3.573	2.99	0.4609	0.47	0.414							0.78	1		371.48	371.48
117.13	4	Silty Clay to Clay	50.647	1.945	7.08	3.492	3.588	2.98	0.4595	0.47	0.413							0.77	1		375.60	375.60
117.62	4	Silty Clay to Clay	58.138	2.066	7.11	3.508	3.602	2.91	0.4581	0.47	0.413							0.77	1		409.20	409.20
118.11	5	Clayey Silt to Silty Clay	80.462	2.347	7.14	3.523	3.617	2.81	0.4567	0.47	0.412							0.77	1		458.90	458.90
118.6	5	Clayey Silt to Silty Clay	62.267	2.122	7.17	3.539	3.631	2.85	0.4554	0.47	0.412							0.77	1		429.80	429.80
119.09	5	Clayey Silt to Silty Clay	56.954	1.806	7.199	3.554	3.645	2.91	0.4541	0.47	0.412							0.77	1		393.08	393.08
119.59	4	Silty Clay to Clay	54.807	1.692	7.229	3.569	3.66	2.93	0.4527	0.47	0.411							0.77	1		388.10	388.10
120.08	4	Silty Clay to Clay	61.496	2.138	7.259	3.585	3.674	2.92	0.4514	0.47	0.411							0.77	1		402.30	402.30

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME	***Eastridge to BART Regional Conncetor Project***	*FAULT INFO*				
PROJECT NO.	***2017-125-GEO***	*COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*				
CPT NO.	***CPT-AS-87***	*FAULT* M_w = 6.9	*MSF* = 1.24	a_{max} *(g)*= 0.682	V_{S30m}(m/s)=	#REF! 238.5

			CPT RESULT INPUT							***CSR***		***CRR*** $_{7.5}$						***F.S.=(CRR*** $_{7.5}$ ***/CSR)*MSF*K*** σ ****K*** α				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
0.492			-9999	-9999	0.03		0.03		1.7	1.00	0.444							1.00			0.00	0.00
0.984			-9999	-9999	0.059		0.059		1.7	1.00	0.443							1.00			0.00	0.00
1.476			-9999	-9999	0.089		0.089		1.7	1.00	0.443							1.00			0.00	0.00
1.968			-9999	-9999	0.119		0.119		1.6679	1.00	0.442							1.00			0.00	0.00
2.461			-9999	-9999	0.149		0.149		1.6308	1.00	0.442							1.00			0.00	0.00
2.953			-9999	-9999	0.178		0.178		1.5965	1.00	0.441							1.00			0.00	0.00
3.445			-9999	-9999	0.208		0.208		1.5625	0.99	0.441							1.00			0.00	0.00
3.937			-9999	-9999	0.238		0.238		1.5299	0.99	0.440										0.00	0.00
4.429			-9999	-9999	0.268		0.268		1.4986	0.99	0.440										0.00	0.00
4.921			-9999	-9999	0.297		0.297		1.4696	0.99	0.439										0.00	0.00
5.413	3	Clay	10.543	0.346	0.327		0.327	2.66	1.4407	0.99	0.439										138.77	138.77
5.906	3	Clay	10.185	0.332	0.357		0.357	2.71	1.413	0.99	0.438										130.07	130.07
6.398	3	Clay	9.074	0.256	0.387		0.387	2.74	1.3863	0.99	0.438										122.60	122.60
6.89	3	Clay	8.857	0.168	0.416		0.416	2.69	1.3614	0.99	0.437										122.26	122.26
7.382	4	Silty Clay to Clay	12.194	0.182	0.446	0.014	0.432	2.59	1.348	0.98	0.451	2.590	1.35	16.44	3.266	53.687	0.09	1.00	0	(0.00)	118.63	67.90
7.874	4	Silty Clay to Clay	16.792	0.413	0.476	0.03	0.446	2.54	1.3366	0.98	0.465	2.540	1.34	22.44	2.979	66.859	0.11	1.00	1	(0.29)	126.34	99.58
8.366	4	Silty Clay to Clay	26.096	0.619	0.506	0.045	0.461	2.37	1.3245	0.98	0.478	2.370	1.32	34.56	2.194	75.836	0.12	1.00	1	(0.31)	135.86	133.52
8.858	4	Silty Clay to Clay	26.344	0.825	0.535	0.061	0.475	2.41	1.3134	0.98	0.490	2.410	1.31	34.60	2.354	81.439	0.13	1.00	1	(0.33)	138.09	138.09
9.35	4	Silty Clay to Clay	27.225	1.001	0.565	0.076	0.489	2.44	1.3025	0.98	0.502	2.440	1.30	35.46	2.483	88.057	0.14	1.00	1	(0.35)	140.59	140.59
9.843	4	Silty Clay to Clay	40.272	1.198	0.595	0.091	0.504	2.38	1.2911	0.98	0.513	2.380	1.29	51.99	2.233	116.082	0.23	1.00	1	(0.54)	145.00	145.00
10.335	4	Silty Clay to Clay	32.427	0.956	0.625	0.107	0.518	2.43	1.2806	0.98	0.523	2.430	1.28	41.52	2.439	101.280	0.18	1.00	1	(0.42)	142.37	142.37
10.827	4	Silty Clay to Clay	22.27	0.551	0.654	0.122	0.533	2.53	1.2695	0.98	0.532	2.530	1.27	28.27	2.925	82.687	0.13	1.00	1	(0.31)	136.23	99.58
11.319	3	Clay	11.926	0.375	0.684	0.137	0.547	2.74	1.2593	0.98	0.541							1.00	1		154.31	154.31
11.811	4	Silty Clay to Clay	15.14	0.535	0.714	0.153	0.561	2.66	1.2493	0.98	0.550							1.00	1		180.41	180.41
12.303	4	Silty Clay to Clay	19.999	0.537	0.744	0.168	0.576	2.54	1.2387	0.97	0.558	2.540	1.24	24.77	2.979	73.800	0.12	1.00	1	(0.26)	140.05	99.58
12.795	4	Silty Clay to Clay	35.868	0.837	0.773	0.183	0.59	2.48	1.2291	0.97	0.565	2.480	1.23	44.08	2.669	117.674	0.23	1.00	1	(0.51)	144.93	116.42
13.287	4	Silty Clay to Clay	20.645	0.557	0.803	0.199	0.604	2.56	1.2195	0.97	0.573	2.560	1.22	25.18	3.091	77.810	0.12	1.00	1	(0.27)	142.48	99.58
13.78	3	Clay	20.398	0.634	0.833	0.214	0.619	2.72	1.2095	0.97	0.579							1.00	1		180.34	180.34
14.272	3	Clay	8.231	0.27	0.863	0.23	0.633	2.96	1.2002	0.97	0.586							1.00	1		123.51	123.51
14.764	3	Clay	7.343	0.182	0.892	0.245	0.648	2.98	1.1905	0.97	0.591							1.00	1		106.34	106.34
15.256	3	Clay	7.79	0.195	0.922	0.26	0.662	2.97	1.1815	0.97	0.598							1.00	1		111.24	111.24
15.748	3	Clay	8.368	0.217	0.952	0.276	0.676	2.96	1.1727	0.97	0.604							1.00	1		116.40	116.40
16.24	3	Clay	9.8	0.255	0.982	0.291	0.691	2.96	1.1634	0.97	0.608							1.00	1		120.71	120.71
16.732	3	Clay	7.047	0.221	1.011	0.306	0.705	3.05	1.1549	0.96	0.613							1.00	1		110.27	110.27
17.224	3	Clay	7.219	0.185	1.041	0.322	0.72	3.05	1.1458	0.96	0.618							1.00	1		107.80	107.80
17.717	3	Clay	10.488	0.346	1.071	0.337	0.734	2.99	1.1375	0.96	0.623							1.00	1		127.59	127.59
18.209	3	Clay	10.295	0.368	1.101	0.352	0.748	2.98	1.1294	0.96	0.627							1.00	1		134.63	134.63
18.701	3	Clay	10.681	0.361	1.13	0.368	0.763	2.98	1.1207	0.96	0.630							1.00	1		133.84	133.84
19.193	3	Clay	9.827	0.287	1.16	0.383	0.777	2.97	1.1128	0.96	0.635							1.00	1		131.93	131.93
19.685	3	Clay	11.727	0.301	1.19	0.399	0.791	2.82	1.105	0.96	0.639							1.00	1		161.46	161.46
20.177	4	Silty Clay to Clay	30.142	0.755	1.22	0.414	0.806	2.59	1.0967	0.96	0.642	2.590	1.10	33.06	3.266	107.965	0.20	1.00	1	(0.38)	157.64	99.58
20.669	4	Silty Clay to Clay	31.643	1.284	1.249	0.429	0.82	2.59	1.0891	0.96	0.645	2.590	1.09	34.46	3.266	112.556	0.21	1.00	1	(0.41)	163.01	124.95
21.161	4	Silty Clay to Clay	37.162	1.465	1.279	0.445	0.835	2.56	1.0811	0.95	0.648	2.560	1.08	40.18	3.091	124.164	0.26	1.00	1	(0.49)	166.55	142.13
21.654	5	Clayey Silt to Silty Clay	61.303	1.901	1.309	0.46	0.849	2.36	1.0737	0.95	0.651	2.360	1.07	65.82	2.156	141.936	0.35	1.00	1	(0.66)	177.77	177.77
22.146	5	Clayey Silt to Silty Clay	131.5	1.844	1.339	0.475	0.863	2.13	1.0664	0.95	0.654	2.130	1.07	140.23	1.512	211.994		1.00	1		187.66	187.66
22.638	5	Clayey Silt to Silty Clay	43.713	1.562	1.368	0.491	0.878	2.37	1.0587	0.95	0.656	2.370	1.06	46.28	2.194	101.539	0.18	1.00	1	(0.33)	177.24	168.05
23.13	4	Silty Clay to Clay	37.437	1.404	1.398	0.506	0.892	2.57	1.0516	0.95	0.659	2.570	1.05	39.37	3.148	123.934	0.26	1.00	1	(0.48)	169.03	124.95
23.622	4	Silty Clay to Clay	27.004	0.772	1.428	0.521	0.907	2.59	1.0441	0.95	0.661	2.590	1.04	28.20	3.266	92.089	0.15	1.00	1	(0.29)	165.11	99.58
24.114	4	Silty Clay to Clay	28.262	0.784	1.458	0.537	0.921	2.52	1.0372	0.94	0.663	2.520	1.04	29.31	2.872	84.181	0.14	1.00	1	(0.25)	167.65	99.58
24.606	5	Clayey Silt to Silty Clay	50.182	1.142	1.487	0.552	0.935	2.43	1.0304	0.94	0.665	2.430	1.03	51.71	2.439	126.121	0.27	1.00	1	(0.50)	173.90	124.95
25.098	4	Silty Clay to Clay	22.628	0.898	1.517	0.568	0.95	2.66	1.0233	0.94	0.666							1.00	1		257.60	257.60
25.591	4	Silty Clay to Clay	29.179	0.612	1.547	0.583	0.964	2.68	1.0166	0.94	0.668							1.00	1		233.13	233.13
26.083	4	Silty Clay to Clay	17.301	0.422	1.577	0.598	0.978	2.79	1.0101	0.94	0.670							1.00	1		192.06	192.06
26.575	3	Clay	13.621	0.387	1.606	0.614	0.993	2.94	1.0032	0.94	0.671							1.00	1		158.00	158.00
27.067	3	Clay	15.305	0.401	1.636	0.629	1.007	2.92	0.9968	0.93	0.673							1.00	1		164.42	164.42
27.559	4	Silty Clay to Clay	14.975	0.449	1.666	0.644	1.022	2.84	0.9901	0.93	0.673							1.00	1		189.00	189.00
28.051	4	Silty Clay to Clay	15.223	0.563	1.696	0.66	1.036	2.86	0.9839	0.93	0.675							0.99	1		190.41	190.41
28.543	3	Clay	16.049	0.442	1.725	0.675	1.05	2.93	0.9778	0.93	0.676							0.99	1		171.28	171.28
29.035	3	Clay	15.34	0.461	1.755	0.69	1.065	2.94	0.9713	0.93	0.676							0.99	1		170.92	170.92
29.528	3	Clay	15.718	0.483	1.785	0.706	1.079	2.94	0.9653	0.92	0.677							0.98	1		173.20	173.20
30.02	3	Clay	16.076	0.563	1.815	0.721	1.094	2.93	0.959	0.92	0.677							0.98	1		180.92	180.92
30.512	3	Clay	15.635	0.6	1.844	0.737	1.108	2.97	0.9532	0.92	0.677							0.98	1		178.24	178.24
31.004	3	Clay	15.216	0.553	1.874	0.752	1.122	3.01	0.9475	0.92	0.678							0.98	1		170.51	170.51
31.496	3	Clay	16.049	0.587	1.904	0.767	1.137	3	0.9414	0.91	0.677							0.97	1		174.94	174.94
31.988	3	Clay	16.847	0.652	1.934	0.783	1.151	3	0.9358	0.91	0.678							0.97	1		180.76	180.76
32.48	3	Clay	18.168	0.727	1.963	0.798	1.165	2.99	0.9302	0.91	0.677							0.97	1		185.36	185.36
32.972	3	Clay	16.957	0.571	1.993	0.813	1.18	3	0.9244	0.90	0.677							0.97	1		178.95	178.95
33.465	3	Clay	14.837	0.572	2.023	0.829	1.194	3.05	0.919	0.90	0.677							0.97	1		169.01	169.01
33.957	3	Clay	14.982	0.605	2.053	0.844	1.209	3.05	0.9132	0.90	0.676							0.96	1		173.07	173.07
34.449	3	Clay	19.6	0.74	2.082	0.859	1.223	2.97	0.908	0.89	0.675							0.96	1		192.58	192.58
34.941	4	Silty Clay to Clay	22.462	0.648	2.112	0.875	1.237	2.91	0.9027	0.89	0.674							0.96	1		203.28	203.28
35.433	3	Clay	16.681	0.53	2.142	0.89	1.252	2.97	0.8972	0.89	0.673							0.96	1		187.23	187.23
35.925	3	Clay	16.159	0.523	2.172	0.906	1.266	3	0.8921	0.88	0.672							0.95	1		177.62	177.62
36.417	3	Clay	16.159	0.489	2.201	0.921	1.281	2.99	0.8867	0.88	0.671							0.95	1		178.36	178.36
36.909	4	Silty Clay to Clay	19.242	0.552	2.231	0.936	1.295	2.95	0.8818	0.88	0.669							0.95	1		193.69	193.69
37.402	3	Clay	22.407	0.795	2.261	0.952	1.309	2.94	0.8768	0.87	0.668							0.95	1		209.26	209.26
37.894	3	Clay	20.59	0.862	2.291	0.967	1.324	2.99	0.8716	0.87	0.666							0.95	1		204.72	204.72
38.386	3	Clay	18.664	0.811	2.32	0.982	1.338	3.03	0.8668	0.86	0.665							0.94	1		197.44	197.44
38.878	4	Silty Clay to Clay	21.746	0.813	2.35	0.998	1.352	2.88	0.8621	0.86	0.663							0.94	1		227.58	227.58
39.37	4	Silty Clay to Clay	28.546	0.946	2.38	1.013	1.367	2.81	0.857	0.86	0.661							0.94	1		245.68	245.68
39.862	4	Silty Clay to Clay	20.425	0.75	2.41	1.028	1.381	2.95	0.8524	0.85	0.659							0.94	1		210.74	210.74
40.354	4	Silty Clay to Clay	20.529	0.733	2.439	1.044	1.396	2.97	0.8475	0.85	0.657							0.94	1		205.93	205.93
40.846	3	Clay	18.168	0.73	2.469	1.059	1.41	2.99	0.8429	0.84	0.655							0.93	1		202.63	202.63
41.339	3	Clay	22.38	0.717	2.499	1.075	1.424	2.98	0.8384	0.84	0.653							0.93	1		210.03	210.03
41.831	3	Clay	22.944	1.004	2.529	1.09	1.439	3	0.8336	0.83	0.650							0.93	1		218.03	218.03
42.323	3	Clay	21.306	1.108	2.558	1.105	1.453	3.05	0.8292	0.83	0.648							0.93	1		209.99	209.99
42.815	3	Clay	19.617	0.797	2.588	1.121	1.468	3.05	0.8246	0.83	0.645							0.93	1		199.84	199.84
43.307	3	Clay	19.765	0.687	2.618	1.136	1.482	3.03	0.8203	0.82	0.642							0.92	1		198.89	198.89
43.799	5	Clayey Silt to Silty Clay	28.353	0.902	2.648	1.151	1.496	2.58	0.816	0.82	0.640	2.580	0.82	23.14	3.206	74.187	0.12	0.92	1	(0.21)	199.81	91.33
44.291	6	Sandy Silt to Clayey Silt	120.49	2.443	2.677	1.167	1.511	2.08	0.8115	0.81	0.637	2.080	0.81	97.78	1.420	138.808	0.33	0.89	1	(0.57)	231.52	231.52
44.783	6	Sandy Silt to Clayey Silt	246.37	5.123	2.707	1.182	1.525	1.84	0.8073	0.81	0.634	1.840	0.81	198.90	1.137	226.160		0.85	1		251.20	251.20
45.276	6	Sandy Silt to Clayey Silt	389.79	4.325	2.737	1.197	1.539	1.68	0.8032	0.80	0.631	1.680	0.80	313.08	1.024	320.677		0.84	1		261.20	261.20
45.768	6	Sandy Silt to Clayey Silt	331.46	4.804	2.767	1.213	1.554	1.72	0.7988	0.80	0.628	1.720	0.80	264.78	1.051	278.370		0.84	1		258.73	258.73
46.26	6	Sandy Silt to Clayey Silt	161.04	1.959	2.796	1.228	1.568	1.97	0.7948	0.79	0.625	1.970	0.79	127.99	1.263	161.616		0.88	1		238.25	238.25
46.752	4	Silty Clay to Clay	47.213	1.597	2.826	1.244	1.583	2.65	0.7905	0.79	0.622							0.91	1		374.06	374.06
47.244	5	Clayey Silt to Silty Clay	117.4	3.674	2.856	1.259	1.597	2.29	0.7866	0.78	0.619	2.290	0.79	92.34	1.917	177.030		0.89	1		231.53	231.53
47.736	6	Sandy Silt to Clayey Silt	296.88	6.189	2.886	1.274	1.611	1.84	0.7826	0.78	0.616	1.840	0.78	232.35	1.137	264.190		0.83	1		262.14	262.14
48.228	6	Sandy Silt to Clayey Silt	712.87	9.191	2.915	1.29	1.626	1.59	0.7785	0.77	0.613	1.590	0.78	554.96	1.000	554.961		0.82	1		284.00	284.00
48.72	6	Sandy Silt to Clayey Silt	675.19	7.676	2.945	1.305	1.64	1.58	0.7746	0.77	0.610	1.580	0.77	523.03	1.000	523.033		0.82	1		285.70	285.70
49.213	6	Sandy Silt to Clayey Silt	440.11	7.068	2.975	1.32	1.655	1.73	0.7706	0.76	0.606	1.730	0.77	339.14	1.058	358.826		0.82	1		271.90	271.90
49.705	6	Sandy Silt to Clayey Silt	235.85	4.575	3.005	1.336	1.669	2.01	0.7668	0.76	0.603	2.010	0.77	180.86	1.313	237.516		0.85	1		250.66	250.66
50.197	5	Clayey Silt to Silty Clay	73.002	3.246	3.034	1.351	1.683	2.48	0.7631	0.75	0.600	2.480	0.76	55.71	2.669	148.702	0.39	0.90	1	(0.72)	224.85	168.05

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge to BART Regional Conncetor Project*** *FAULT INFO*
PROJECT NO. ***2017-125-GEO*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-87*** *FAULT* M_w = 6.9 *MSF* = 1.24 a_{max} *(g)*= 0.682 V_{S30m}(m/s)= #REF! 238.5

		CPT RESULT INPUT							***CSR***		***$CRR_{7.5}$***						***F.S.=($CRR_{7.5}$/CSR)*MSF*Kσ*Kα***				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
50.689	4	Silty Clay to Clay	56.156	2.4	3.064	1.366	1.698	2.73	0.7591	0.75	0.597							0.90	1		376.31	376.31
51.181	4	Silty Clay to Clay	40.066	1.137	3.094	1.382	1.712	2.74	0.7555	0.74	0.593							0.90	1		320.68	320.68
51.673	4	Silty Clay to Clay	34.161	0.984	3.124	1.397	1.726	2.79	0.7519	0.74	0.590							0.90	1		286.21	286.21
52.165	4	Silty Clay to Clay	28.738	0.842	3.153	1.413	1.741	2.87	0.748	0.73	0.587							0.90	1		259.70	259.70
52.657	4	Silty Clay to Clay	32.986	0.764	3.183	1.428	1.755	2.77	0.7445	0.73	0.584							0.89	1		276.40	276.40
53.15	5	Clayey Silt to Silty Clay	32.234	0.692	3.213	1.443	1.77	2.72	0.7407	0.72	0.580							0.89	1		280.13	280.13
53.642	4	Silty Clay to Clay	28.298	0.739	3.243	1.459	1.784	2.82	0.7373	0.72	0.577							0.89	1		251.53	251.53
54.134	4	Silty Clay to Clay	20.48	0.322	3.272	1.474	1.798	2.84	0.7338	0.71	0.574							0.89	1		222.90	222.90
54.626	4	Silty Clay to Clay	21.062	0.302	3.302	1.489	1.813	2.87	0.7302	0.71	0.571							0.89	1		210.85	210.85
55.118	4	Silty Clay to Clay	24.004	0.524	3.332	1.505	1.827	2.83	0.7268	0.70	0.568							0.89	1		244.67	244.67
55.61	4	Silty Clay to Clay	39.653	1.064	3.362	1.52	1.842	2.73	0.7232	0.70	0.564							0.88	1		306.19	306.19
56.102	4	Silty Clay to Clay	32.317	1.018	3.391	1.535	1.856	2.77	0.7199	0.69	0.561							0.88	1		304.02	304.02
56.594	4	Silty Clay to Clay	42.419	1.288	3.421	1.551	1.87	2.67	0.7166	0.69	0.558							0.88	1		390.72	390.72
57.087	5	Clayey Silt to Silty Clay	95.327	4.481	3.451	1.566	1.885	2.43	0.7131	0.68	0.555	2.430	0.71	67.98	2.439	165.806		0.88	1		237.97	237.97
57.579	6	Sandy Silt to Clayey Silt	233.57	3.033	3.481	1.582	1.899	2.06	0.7099	0.68	0.552	2.060	0.71	165.81	1.387	229.936		0.83	1		254.96	254.96
58.071	5	Clayey Silt to Silty Clay	160.18	3.955	3.51	1.597	1.913	2.2	0.7067	0.68	0.549	2.200	0.71	113.20	1.667	188.682		0.84	1		250.67	250.67
58.563	5	Clayey Silt to Silty Clay	120.53	5.075	3.54	1.612	1.928	2.37	0.7033	0.67	0.546	2.370	0.70	84.77	2.194	185.990		0.86	1		244.65	244.65
59.055	5	Clayey Silt to Silty Clay	130.04	1.734	3.57	1.628	1.942	2.31	0.7002	0.67	0.544	2.310	0.70	91.05	1.981	180.396		0.87	1		237.94	237.94
59.547	5	Clayey Silt to Silty Clay	29.702	0.558	3.6	1.643	1.957	2.74	0.6969	0.66	0.541							0.87	1		290.70	290.70
60.039	5	Clayey Silt to Silty Clay	27.266	0.265	3.629	1.658	1.971	2.68	0.6938	0.66	0.538							0.87	1		247.62	247.62
60.532	5	Clayey Silt to Silty Clay	28.188	0.352	3.659	1.674	1.985	2.66	0.6907	0.65	0.535							0.87	1		271.98	271.98
61.024	5	Clayey Silt to Silty Clay	36.584	0.555	3.689	1.689	2	2.65	0.6875	0.65	0.532							0.87	1		298.48	298.48
61.516	4	Silty Clay to Clay	38.535	1.015	3.719	1.704	2.014	2.78	0.6845	0.65	0.530							0.87	1		335.96	335.96
62.008	4	Silty Clay to Clay	97.612	3.299	3.748	1.72	2.029	2.76	0.6813	0.64	0.527							0.87	1		407.56	407.56
62.5	4	Silty Clay to Clay	37.344	1.384	3.778	1.735	2.043	2.9	0.6784	0.64	0.524							0.87	1		322.64	322.64
62.992	4	Silty Clay to Clay	46.824	1.491	3.808	1.751	2.057	2.83	0.6755	0.64	0.522							0.87	1		325.88	325.88
63.484	4	Silty Clay to Clay	35.317	1.055	3.838	1.766	2.072	2.86	0.6724	0.63	0.519							0.86	1		304.03	304.03
63.976	4	Silty Clay to Clay	34.299	1.029	3.867	1.781	2.086	2.89	0.6695	0.63	0.517							0.86	1		289.85	289.85
64.469	5	Clayey Silt to Silty Clay	39.474	2.189	3.897	1.797	2.1	2.61	0.6667	0.63	0.515							0.86	1		460.07	460.07
64.961	5	Clayey Silt to Silty Clay	171.8	2.566	3.927	1.812	2.115	2.23	0.6637	0.62	0.512	2.230	0.66	114.01	1.743	198.779		0.84	1		253.17	253.17
65.453	5	Clayey Silt to Silty Clay	70.305	2.248	3.957	1.827	2.129	2.46	0.6609	0.62	0.510	2.460	0.66	46.46	2.574	119.605	0.24	0.86	1	(0.50)	237.77	124.95
65.945	4	Silty Clay to Clay	33.473	1.018	3.986	1.843	2.144	2.92	0.6579	0.62	0.508							0.86	1		288.30	288.30
66.437	4	Silty Clay to Clay	32.455	0.702	4.016	1.858	2.158	2.88	0.6552	0.61	0.505							0.86	1		265.27	265.27
66.929	4	Silty Clay to Clay	28.226	0.619	4.046	1.873	2.172	2.91	0.6524	0.61	0.503							0.86	1		255.73	255.73
67.421	4	Silty Clay to Clay	32.785	0.806	4.076	1.889	2.187	2.9	0.6495	0.61	0.501							0.86	1		263.59	263.59
67.913	4	Silty Clay to Clay	25.077	0.585	4.105	1.904	2.201	2.97	0.6469	0.60	0.499							0.85	1		236.20	236.20
68.406	4	Silty Clay to Clay	20.604	0.361	4.135	1.92	2.216	3.03	0.644	0.60	0.497							0.85	1		207.15	207.15
68.898	4	Silty Clay to Clay	19.627	0.311	4.165	1.935	2.23	3.01	0.6414	0.60	0.495							0.85	1		202.12	202.12
69.39	4	Silty Clay to Clay	20.646	0.307	4.195	1.95	2.244	2.98	0.6388	0.60	0.493							0.85	1		209.21	209.21
69.882	4	Silty Clay to Clay	22.517	0.369	4.224	1.966	2.259	2.99	0.636	0.59	0.491							0.85	1		216.82	216.82
70.374	4	Silty Clay to Clay	22.093	0.498	4.254	1.981	2.273	3.04	0.6335	0.59	0.489							0.85	1		218.72	218.72
70.866	4	Silty Clay to Clay	22.655	0.559	4.284	1.996	2.287	3.02	0.6309	0.59	0.488							0.85	1		228.27	228.27
71.358	5	Clayey Silt to Silty Clay	50.898	1.015	4.314	2.012	2.302	2.8	0.6282	0.58	0.486							0.85	1		303.04	303.04
71.85	4	Silty Clay to Clay	32.675	0.961	4.343	2.027	2.316	2.83	0.6257	0.58	0.484							0.85	1		304.37	304.37
72.343	4	Silty Clay to Clay	32.702	0.955	4.373	2.042	2.331	2.9	0.6231	0.58	0.482							0.84	1		282.75	282.75
72.835	4	Silty Clay to Clay	30.005	0.772	4.403	2.058	2.345	2.93	0.6206	0.58	0.481							0.84	1		266.81	266.81
73.327	4	Silty Clay to Clay	28.05	0.776	4.433	2.073	2.359	2.97	0.6182	0.58	0.479							0.84	1		255.78	255.78
73.819	4	Silty Clay to Clay	27.978	0.756	4.462	2.089	2.374	2.97	0.6156	0.57	0.477							0.84	1		258.56	258.56
74.311	4	Silty Clay to Clay	28.436	0.847	4.492	2.104	2.388	2.98	0.6132	0.57	0.476							0.84	1		261.14	261.14
74.803	4	Silty Clay to Clay	31.271	0.989	4.522	2.119	2.403	2.92	0.6106	0.57	0.474							0.84	1		288.73	288.73
75.295	4	Silty Clay to Clay	36.309	1.216	4.552	2.135	2.417	2.92	0.6082	0.57	0.473							0.84	1		291.76	291.76
75.787	4	Silty Clay to Clay	28.023	0.627	4.581	2.15	2.431	3	0.6059	0.56	0.471							0.84	1		248.90	248.90
76.28	4	Silty Clay to Clay	25.511	0.6	4.611	2.165	2.446	3.02	0.6034	0.56	0.470							0.84	1		239.08	239.08
76.772	4	Silty Clay to Clay	25.958	0.64	4.641	2.181	2.46	3.02	0.6011	0.56	0.469							0.84	1		242.30	242.30
77.264	4	Silty Clay to Clay	27.472	0.753	4.671	2.196	2.474	3.01	0.5988	0.56	0.467							0.83	1		249.87	249.87
77.756	4	Silty Clay to Clay	29.509	0.72	4.7	2.211	2.489	2.97	0.5964	0.56	0.466							0.83	1		257.36	257.36
78.248	4	Silty Clay to Clay	29.798	0.601	4.73	2.227	2.503	2.91	0.5941	0.55	0.465							0.83	1		266.77	266.77
78.74	4	Silty Clay to Clay	32.345	0.772	4.76	2.242	2.518	2.81	0.5917	0.55	0.463							0.83	1		348.45	348.45
79.232	5	Clayey Silt to Silty Clay	149.01	4.261	4.79	2.258	2.532	2.35	0.5895	0.55	0.462	2.350	0.59	87.84	2.120	186.185		0.83	1		264.60	264.60
79.724	5	Clayey Silt to Silty Clay	158.83	3.616	4.819	2.273	2.546	2.33	0.5873	0.55	0.461	2.330	0.59	93.28	2.049	191.109		0.82	1		268.01	268.01
80.217	4	Silty Clay to Clay	78.59	3.392	4.849	2.288	2.561	2.78	0.585	0.55	0.459							0.83	1		441.11	441.11
80.709	4	Silty Clay to Clay	28.436	0.895	4.879	2.304	2.575	3.06	0.5828	0.55	0.458							0.83	1		272.22	272.22
81.201	4	Silty Clay to Clay	28.002	0.632	4.909	2.319	2.59	3	0.5805	0.54	0.457							0.83	1		251.67	251.67
81.693	4	Silty Clay to Clay	43.851	1.399	4.938	2.334	2.604	2.85	0.5783	0.54	0.456							0.83	1		390.08	390.08
82.185	6	Sandy Silt to Clayey Silt	269.27	4.274	4.968	2.35	2.618	1.98	0.5762	0.54	0.455	1.980	0.58	155.16	1.275	197.787		0.74	1		293.99	293.99
82.677	6	Sandy Silt to Clayey Silt	698.34	6.736	4.998	2.365	2.633	1.63	0.574	0.54	0.454	1.630	0.57	400.82	1.000	400.821		0.68	1		324.10	324.10
83.169	8	Sand to Silty Sand	469.04	11.395	5.028	2.381	2.647	1.92	0.5719	0.54	0.453	1.920	0.57	268.23	1.208	324.096		0.68	1		312.50	312.50
83.661	9	Sand	100.48	5.96	5.057	2.396	2.661	2.55	0.5698	0.54	0.452	2.550	0.57	57.25	3.034	173.712		0.82	1		268.63	268.63
84.154	5	Clayey Silt to Silty Clay	65.074	1.334	5.087	2.411	2.676	2.69	0.5676	0.53	0.451							0.82	1		429.90	429.90
84.646	5	Clayey Silt to Silty Clay	53.926	1.248	5.117	2.427	2.69	2.67	0.5656	0.53	0.450							0.82	1		399.54	399.54
85.138	5	Clayey Silt to Silty Clay	65.914	1.796	5.147	2.442	2.705	2.66	0.5634	0.53	0.449							0.82	1		422.28	422.28
85.63	5	Clayey Silt to Silty Clay	61.193	1.36	5.176	2.457	2.719	2.65	0.5614	0.53	0.448							0.82	1		420.72	420.72
86.122	5	Clayey Silt to Silty Clay	59.074	1.267	5.206	2.473	2.733	2.7	0.5594	0.53	0.447							0.82	1		395.56	395.56
86.614	5	Clayey Silt to Silty Clay	59.954	1.546	5.236	2.488	2.748	2.72	0.5572	0.53	0.446							0.82	1		404.20	404.20
87.106	5	Clayey Silt to Silty Clay	65.666	1.652	5.266	2.503	2.762	2.73	0.5553	0.53	0.445							0.82	1		426.71	426.71
87.598	5	Clayey Silt to Silty Clay	134.97	4.651	5.295	2.519	2.777	2.37	0.5532	0.53	0.444	2.370	0.55	74.66	2.194	163.809		0.82	1		272.11	272.11
88.091	6	Sandy Silt to Clayey Silt	234.42	2.177	5.325	2.534	2.791	1.99	0.5512	0.52	0.443	1.990	0.55	129.22	1.287	166.330		0.76	1		288.13	288.13
88.583	6	Sandy Silt to Clayey Silt	171.11	1.947	5.355	2.55	2.805	2.16	0.5493	0.52	0.442	2.160	0.55	93.99	1.574	147.969	0.38	0.81	1	(0.86)	274.38	150.76
89.075	5	Clayey Silt to Silty Clay	42.419	1.313	5.385	2.565	2.82	2.81	0.5473	0.52	0.441							0.81	1		373.62	373.62
89.567	4	Silty Clay to Clay	38.896	1.142	5.414	2.58	2.834	2.96	0.5454	0.52	0.441							0.81	1		304.28	304.28
90.059	4	Silty Clay to Clay	36.446	0.838	5.444	2.596	2.848	2.95	0.5435	0.52	0.440							0.81	1		294.87	294.87
90.551	4	Silty Clay to Clay	35.221	0.747	5.474	2.611	2.863	2.94	0.5415	0.52	0.439							0.81	1		288.67	288.67
91.043	4	Silty Clay to Clay	41.676	0.954	5.504	2.626	2.877	2.92	0.5396	0.52	0.438							0.81	1		305.45	305.45
91.535	5	Clayey Silt to Silty Clay	41.766	1.037	5.533	2.642	2.892	2.89	0.5376	0.52	0.437							0.81	1		321.77	321.77
92.028	4	Silty Clay to Clay	43.879	1.184	5.563	2.657	2.906	2.9	0.5358	0.51	0.437							0.81	1		331.77	331.77
92.52	4	Silty Clay to Clay	46.989	1.28	5.593	2.672	2.92	2.91	0.534	0.51	0.436							0.81	1		334.01	334.01
93.012	5	Clayey Silt to Silty Clay	41.277	0.931	5.623	2.688	2.935	2.89	0.532	0.51	0.435							0.81	1		323.01	323.01
93.504	5	Clayey Silt to Silty Clay	42.365	0.942	5.652	2.703	2.949	2.87	0.5302	0.51	0.434							0.81	1		328.98	328.98
93.996	5	Clayey Silt to Silty Clay	50.017	1.338	5.682	2.719	2.964	2.83	0.5283	0.51	0.434							0.80	1		368.10	368.10
94.488	5	Clayey Silt to Silty Clay	67.442	1.941	5.712	2.734	2.978	2.79	0.5266	0.51	0.433							0.80	1		418.87	418.87
94.98	4	Silty Clay to Clay	69.011	2.828	5.742	2.749	2.992	2.78	0.5248	0.51	0.432							0.80	1		451.62	451.62
95.472	5	Clayey Silt to Silty Clay	76.092	2.285	5.771	2.765	3.007	2.74	0.5229	0.51	0.432							0.80	1		464.16	464.16
95.965	4	Silty Clay to Clay	75.205	2.799	5.801	2.78	3.021	2.76	0.5212	0.51	0.431							0.80	1		470.40	470.40
96.457	4	Silty Clay to Clay	86.243	3.172	5.831	2.795	3.035	2.75	0.5195	0.51	0.430							0.80	1		484.73	484.73
96.949	4	Silty Clay to Clay	65.35	2.452	5.861	2.811	3.05	2.81	0.5176	0.50	0.430							0.80	1		441.08	441.08
97.441	4	Silty Clay to Clay	67.249	2.368	5.89	2.826	3.064	2.82	0.5159	0.50	0.429							0.80	1		433.33	433.33
97.933	4	Silty Clay to Clay	53.431	2.765	5.92	2.841	3.079	2.9	0.5141	0.50	0.428							0.80	1		403.45	403.45
98.425	4	Silty Clay to Clay	41.346	1.579	5.95	2.857	3.093	2.99	0.5125	0.50	0.428							0.80	1		339.39	339.39
98.917	4	Silty Clay to Clay	39.316	1.342	5.98	2.872	3.107	3.01	0.5108	0.50	0.427							0.80	1		312.47	312.47
99.409	5	Clayey Silt to Silty Clay	43.163	1.015	6.009	2.888	3.122	2.92	0.509	0.50	0.426							0.80	1		327.22	327.22
99.902	4	Silty Clay to Clay	51.628	1.378	6.039	2.903	3.136	2.81	0.5074	0.50	0.426							0.80	1		433.39	433.39
100.39	9	Sand	137.42	6.896	6.069	2.918	3.151	2.73	0.5056	0.50	0.425							0.79	1		594.39	594.39
100.89	9	Sand	129.7	5.745	6.099	2.934	3.165	2.66	0.504	0.50	0.425							0.79	1		657.83	657.83
101.38	9	Sand	120.98	6.496	6.128	2.949	3.179	2.73	0.5024	0.50	0.424							0.79	1		608.40	608.40
101.87	3	Clay	57.972	3.524	6.158	2.964	3.194	3.04	0.5007	0.50	0.423							0.79	1		408.82	408.82
102.36	3	Clay	45.186	2.389	6.188	2.98	3.208	3.12	0.4991	0.49	0.423							0.79	1		340.84	340.84

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge to BART Regional Conncetor Project*** *FAULT INFO*
PROJECT NO. ***2017-125-GEO*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-87*** *FAULT* M_w = 6.9 *MSF* = 1.24 a_{max} *(g)*= 0.682 V_{S30m}(m/s)= #REF! 238.5

			CPT RESULT INPUT							***CSR***		***CRR*** $_{7.5}$						***F.S.=(CRR*** $_{7.5}$ ***/CSR)*MSF*Kσ*Kα***				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
102.85	4	Silty Clay to Clay	75.838	2.757	6.218	2.995	3.222	2.94	0.4975	0.49	0.422							0.79	1		401.10	401.10
103.35	4	Silty Clay to Clay	46.439	2.598	6.247	3.01	3.237	3.02	0.4958	0.49	0.422							0.79	1		364.01	364.01
103.84	4	Silty Clay to Clay	39.247	1.439	6.277	3.026	3.251	3.1	0.4943	0.49	0.421							0.79	1		311.56	311.56
104.33	4	Silty Clay to Clay	45.365	1.521	6.307	3.041	3.266	3.01	0.4926	0.49	0.420							0.79	1		337.98	337.98
104.82	4	Silty Clay to Clay	51.641	2.056	6.337	3.057	3.28	2.98	0.4911	0.49	0.420							0.79	1		366.84	366.84
105.32	4	Silty Clay to Clay	54.807	2.408	6.366	3.072	3.294	2.99	0.4895	0.49	0.419							0.79	1		374.86	374.86
105.81	4	Silty Clay to Clay	50.595	2.113	6.396	3.087	3.309	3.01	0.4879	0.49	0.419							0.79	1		358.10	358.10
106.3	4	Silty Clay to Clay	41.401	1.579	6.426	3.103	3.323	3.06	0.4864	0.49	0.418							0.79	1		324.25	324.25
106.79	4	Silty Clay to Clay	39.866	1.348	6.456	3.118	3.338	3.05	0.4848	0.49	0.418							0.79	1		313.31	313.31
107.28	4	Silty Clay to Clay	40.85	1.104	6.485	3.133	3.352	3.01	0.4833	0.49	0.417							0.79	1		313.06	313.06
107.78	4	Silty Clay to Clay	38.318	1.212	6.515	3.149	3.366	3.03	0.4818	0.49	0.417							0.78	1		307.49	307.49
108.27	4	Silty Clay to Clay	38.136	1.006	6.545	3.164	3.381	3.01	0.4802	0.48	0.416							0.78	1		308.10	308.10
108.76	4	Silty Clay to Clay	41.098	1.171	6.575	3.179	3.395	3.02	0.4788	0.48	0.416							0.78	1		312.79	312.79
109.25	4	Silty Clay to Clay	42.017	1.028	6.604	3.195	3.409	2.97	0.4773	0.48	0.415							0.78	1		326.66	326.66
109.74	5	Clayey Silt to Silty Clay	56.156	1.779	6.634	3.21	3.424	2.87	0.4758	0.48	0.415							0.78	1		372.98	372.98
110.24	5	Clayey Silt to Silty Clay	55.158	1.483	6.664	3.226	3.438	2.85	0.4743	0.48	0.414							0.78	1		394.17	394.17
110.73	4	Silty Clay to Clay	67.772	2.294	6.694	3.241	3.453	2.93	0.4728	0.48	0.414							0.78	1		400.91	400.91
111.22	4	Silty Clay to Clay	48.338	1.899	6.723	3.256	3.467	3.03	0.4714	0.48	0.413							0.78	1		360.47	360.47
111.71	4	Silty Clay to Clay	44.622	1.547	6.753	3.272	3.481	3.03	0.47	0.48	0.413							0.78	1		335.03	335.03
112.21	4	Silty Clay to Clay	40.906	1.214	6.783	3.287	3.496	3.02	0.4685	0.48	0.412							0.78	1		323.82	323.82
112.7	5	Clayey Silt to Silty Clay	38.717	0.978	6.813	3.302	3.51	2.98	0.4671	0.48	0.412							0.78	1		315.99	315.99
113.19	5	Clayey Silt to Silty Clay	37.492	0.857	6.842	3.318	3.525	2.99	0.4656	0.48	0.411							0.78	1		304.34	304.34
113.68	5	Clayey Silt to Silty Clay	34.849	0.693	6.872	3.333	3.539	3	0.4642	0.48	0.411							0.78	1		292.53	292.53
114.17	5	Clayey Silt to Silty Clay	34.113	0.671	6.902	3.348	3.553	3	0.4629	0.48	0.410							0.78	1		291.33	291.33
114.67	5	Clayey Silt to Silty Clay	39.997	0.787	6.932	3.364	3.568	2.96	0.4614	0.48	0.410							0.78	1		325.74	325.74
115.16	4	Silty Clay to Clay	45.943	2.522	6.961	3.379	3.582	2.9	0.4601	0.48	0.409							0.77	1		420.52	420.52
115.65	4	Silty Clay to Clay	90.785	3.646	6.991	3.395	3.596	2.87	0.4587	0.47	0.409							0.77	1		460.07	460.07
116.14	4	Silty Clay to Clay	40.713	1.118	7.021	3.41	3.611	3.04	0.4573	0.47	0.408							0.77	1		334.47	334.47
116.63	5	Clayey Silt to Silty Clay	36.955	0.799	7.051	3.425	3.625	3.03	0.456	0.47	0.408							0.77	1		300.52	300.52
117.13	4	Silty Clay to Clay	39.392	0.971	7.08	3.441	3.64	3.04	0.4545	0.47	0.407							0.77	1		302.84	302.84
117.62	4	Silty Clay to Clay	35.899	0.919	7.11	3.456	3.654	3.06	0.4532	0.47	0.407							0.77	1		298.70	298.70
118.11	5	Clayey Silt to Silty Clay	38.015	0.894	7.14	3.471	3.668	3.02	0.4519	0.47	0.407							0.77	1		308.89	308.89
118.6	5	Clayey Silt to Silty Clay	42.722	1.201	7.17	3.487	3.683	2.96	0.4505	0.47	0.406							0.77	1		342.23	342.23
119.09	5	Clayey Silt to Silty Clay	55.33	1.452	7.199	3.502	3.697	2.88	0.4493	0.47	0.406							0.77	1		385.12	385.12
119.59	5	Clayey Silt to Silty Clay	58.206	1.518	7.229	3.517	3.712	2.87	0.4479	0.47	0.405							0.77	1		397.84	397.84
120.08	5	Clayey Silt to Silty Clay	55.66	1.571	7.259	3.533	3.726	2.89	0.4466	0.47	0.405							0.77	1		392.47	392.47

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME	***Eastridge to BART Regional Connector Project***	*FAULT INFO*					
PROJECT NO.	***2017-125-GEO***	*COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*					
CPT NO.	***CPT-AS-89***	*FAULT* M_w =	6.9	*MSF* =	1.24	a_{max} *(g)*=	0.682	V_{S30m}(m/s)=	#REF!		230.2

			CPT RESULT INPUT							***CSR***		***CRR*** $_{7.5}$						***F.S.=(CRR*** $_{7.5}$***/CSR)*MSF*K*** σ****K*** α				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
0.492			-9999	-9999	0.03		0.03		1.7	1.00	0.444							1.00			0.00	0.00
0.984			-9999	-9999	0.059		0.059		1.7	1.00	0.443							1.00			0.00	0.00
1.476			-9999	-9999	0.089		0.089		1.7	1.00	0.443							1.00			0.00	0.00
1.968			-9999	-9999	0.119		0.119		1.6679	1.00	0.442							1.00			0.00	0.00
2.461			-9999	-9999	0.149		0.149		1.6308	1.00	0.442							1.00			0.00	0.00
2.953			-9999	-9999	0.178		0.178		1.5965	1.00	0.441							1.00			0.00	0.00
3.445			-9999	-9999	0.208		0.208		1.5625	0.99	0.441							1.00			0.00	0.00
3.937			-9999	-9999	0.238		0.238		1.5299	0.99	0.440										0.00	0.00
4.429			-9999	-9999	0.268		0.268		1.4986	0.99	0.440										0.00	0.00
4.921			-9999	-9999	0.297		0.297		1.4696	0.99	0.439										0.00	0.00
5.413	3	Clay	4.907	0.093	0.327		0.327	2.81	1.4407	0.99	0.439										84.94	84.94
5.906	3	Clay	6.194	0.103	0.357		0.357	2.75	1.413	0.99	0.438										95.95	95.95
6.398	3	Clay	6.551	0.151	0.387		0.387	2.78	1.3863	0.99	0.438										101.30	101.30
6.89	3	Clay	7.019	0.17	0.416		0.416	2.78	1.3614	0.99	0.437										108.44	108.44
7.382	3	Clay	7.46	0.215	0.446		0.446	2.81	1.3366	0.98	0.437							1.00	0		110.77	110.77
7.874	3	Clay	7.157	0.112	0.476	0.014	0.462	2.74	1.3237	0.98	0.449							1.00	1		107.31	107.31
8.366	4	Silty Clay to Clay	9.194	0.074	0.506	0.029	0.477	2.58	1.3119	0.98	0.462	2.580	1.31	12.06	3.206	38.674	0.08	1.00	1	(0.22)	117.77	49.42
8.858	4	Silty Clay to Clay	9.854	0.116	0.535	0.045	0.491	2.56	1.301	0.98	0.474	2.560	1.30	12.82	3.091	39.621	0.08	1.00	1	(0.22)	120.73	54.63
9.35	4	Silty Clay to Clay	10.859	0.114	0.565	0.06	0.505	2.55	1.2903	0.98	0.486	2.550	1.29	14.01	3.034	42.514	0.09	1.00	1	(0.22)	126.01	67.90
9.843	4	Silty Clay to Clay	21.746	0.562	0.595	0.075	0.52	2.46	1.2791	0.98	0.497	2.460	1.28	27.81	2.574	71.602	0.11	1.00	1	(0.28)	138.37	116.42
10.335	4	Silty Clay to Clay	34.987	1.124	0.625	0.091	0.534	2.43	1.2687	0.98	0.508	2.430	1.27	44.39	2.439	108.267	0.20	1.00	1	(0.48)	144.76	144.76
10.827	4	Silty Clay to Clay	22.985	0.754	0.654	0.106	0.548	2.53	1.2586	0.98	0.517	2.530	1.26	28.93	2.925	84.609	0.14	1.00	1	(0.33)	140.93	124.95
11.319	4	Silty Clay to Clay	21.223	0.562	0.684	0.121	0.563	2.57	1.2479	0.98	0.526	2.570	1.25	26.48	3.148	83.369	0.13	1.00	1	(0.32)	137.28	99.58
11.811	4	Silty Clay to Clay	14.837	0.308	0.714	0.137	0.577	2.58	1.238	0.98	0.535	2.580	1.24	18.37	3.206	58.899	0.10	1.00	1	(0.23)	134.49	75.40
12.303	4	Silty Clay to Clay	21.774	0.445	0.744	0.152	0.592	2.54	1.2277	0.97	0.543	2.540	1.23	26.73	2.979	79.632	0.13	1.00	1	(0.29)	137.70	83.24
12.795	4	Silty Clay to Clay	12.635	0.364	0.773	0.168	0.606	2.68	1.2182	0.97	0.550							1.00	1		162.77	162.77
13.287	3	Clay	9.507	0.243	0.803	0.183	0.62	2.86	1.2088	0.97	0.558							1.00	1		127.70	127.70
13.78	3	Clay	9.91	0.205	0.833	0.198	0.635	2.82	1.1989	0.97	0.565							1.00	1		128.37	128.37
14.272	3	Clay	9.962	0.201	0.863	0.214	0.649	2.85	1.1898	0.97	0.572							1.00	1		128.86	128.86
14.764	3	Clay	9.056	0.285	0.892	0.229	0.664	2.93	1.1803	0.97	0.577							1.00	1		123.44	123.44
15.256	3	Clay	8.588	0.244	0.922	0.244	0.678	2.96	1.1715	0.97	0.584							1.00	1		118.66	118.66
15.748	3	Clay	9.056	0.25	0.952	0.26	0.692	2.94	1.1628	0.97	0.590							1.00	1		122.74	122.74
16.24	3	Clay	9.297	0.228	0.982	0.275	0.707	2.93	1.1536	0.97	0.595							1.00	1		123.97	123.97
16.732	3	Clay	9.249	0.264	1.011	0.29	0.721	2.95	1.1452	0.96	0.600							1.00	1		123.84	123.84
17.224	3	Clay	9.504	0.273	1.041	0.306	0.735	2.97	1.137	0.96	0.605							1.00	1		125.60	125.60
17.717	3	Clay	10.02	0.279	1.071	0.321	0.75	2.97	1.1282	0.96	0.609							1.00	1		130.34	130.34
18.209	3	Clay	10.13	0.377	1.101	0.337	0.764	3.01	1.1202	0.96	0.614							1.00	1		130.25	130.25
18.701	3	Clay	9.683	0.332	1.13	0.352	0.779	3.01	1.1117	0.96	0.617							1.00	1		130.88	130.88
19.193	3	Clay	12.332	0.474	1.16	0.367	0.793	3	1.1039	0.96	0.622							1.00	1		139.53	139.53
19.685	3	Clay	10.268	0.384	1.19	0.383	0.807	3.05	1.0962	0.96	0.626							1.00	1		133.60	133.60
20.177	3	Clay	9.992	0.388	1.22	0.398	0.822	3.07	1.088	0.96	0.629							1.00	1		129.53	129.53
20.669	3	Clay	9.056	0.357	1.249	0.413	0.836	3.11	1.0806	0.96	0.633							1.00	1		124.33	124.33
21.161	3	Clay	9.022	0.339	1.279	0.429	0.851	3.12	1.0726	0.95	0.635							1.00	1		121.80	121.80
21.654	3	Clay	9.552	0.322	1.309	0.444	0.865	3.06	1.0654	0.95	0.639							1.00	1		126.15	126.15
22.146	3	Clay	10.488	0.256	1.339	0.459	0.879	2.94	1.0582	0.95	0.642							1.00	1		135.13	135.13
22.638	4	Silty Clay to Clay	11.768	0.231	1.368	0.475	0.894	2.85	1.0506	0.95	0.644							1.00	1		149.88	149.88
23.13	4	Silty Clay to Clay	18.305	0.424	1.398	0.49	0.908	2.78	1.0436	0.95	0.647							1.00	1		179.25	179.25
23.622	4	Silty Clay to Clay	20.48	0.768	1.428	0.506	0.922	2.62	1.0368	0.95	0.650							1.00	1		248.99	248.99
24.114	4	Silty Clay to Clay	39.969	1.446	1.458	0.521	0.937	2.54	1.0295	0.94	0.652	2.540	1.03	41.15	2.979	122.577	0.25	1.00	1	(0.48)	172.86	124.95
24.606	4	Silty Clay to Clay	45.915	1.658	1.487	0.536	0.951	2.61	1.0228	0.94	0.654							1.00	1		306.83	306.83
25.098	4	Silty Clay to Clay	28.752	1.091	1.517	0.552	0.966	2.7	1.0157	0.94	0.655							1.00	1		257.05	257.05
25.591	4	Silty Clay to Clay	25.466	0.672	1.547	0.567	0.98	2.68	1.0092	0.94	0.658							1.00	1		237.70	237.70
26.083	4	Silty Clay to Clay	33.06	0.743	1.577	0.582	0.994	2.66	1.0027	0.94	0.660							1.00	1		242.79	242.79
26.575	4	Silty Clay to Clay	19.434	0.708	1.606	0.598	1.009	2.82	0.9959	0.94	0.660							1.00	1		208.91	208.91
27.067	4	Silty Clay to Clay	21.141	0.744	1.636	0.613	1.023	2.81	0.9897	0.93	0.662							1.00	1		211.67	211.67
27.559	4	Silty Clay to Clay	20.453	0.625	1.666	0.628	1.038	2.82	0.983	0.93	0.663							0.99	1		201.97	201.97
28.051	3	Clay	14.927	0.438	1.696	0.644	1.052	2.94	0.9769	0.93	0.664							0.99	1		169.62	169.62
28.543	4	Silty Clay to Clay	15.14	0.454	1.725	0.659	1.066	2.86	0.9709	0.93	0.665							0.99	1		184.05	184.05
29.035	4	Silty Clay to Clay	21.389	0.693	1.755	0.675	1.081	2.76	0.9645	0.93	0.666							0.98	1		217.51	217.51
29.528	4	Silty Clay to Clay	25.806	0.585	1.785	0.69	1.095	2.79	0.9586	0.92	0.667							0.98	1		209.59	209.59
30.02	3	Clay	14.748	0.483	1.815	0.705	1.109	2.98	0.9528	0.92	0.668							0.98	1		168.17	168.17
30.512	3	Clay	14.81	0.463	1.844	0.721	1.124	2.99	0.9466	0.92	0.668							0.98	1		165.82	165.82
31.004	3	Clay	15.002	0.454	1.874	0.736	1.138	2.97	0.941	0.92	0.668							0.97	1		168.71	168.71
31.496	3	Clay	15.085	0.453	1.904	0.751	1.153	2.98	0.935	0.91	0.668							0.97	1		167.98	167.98
31.988	3	Clay	14.41	0.464	1.934	0.767	1.167	3.02	0.9294	0.91	0.668							0.97	1		164.17	164.17
32.48	3	Clay	14.892	0.492	1.963	0.782	1.181	3.01	0.924	0.91	0.668							0.97	1		171.10	171.10
32.972	3	Clay	17.342	0.644	1.993	0.797	1.196	2.98	0.9182	0.90	0.668							0.96	1		181.19	181.19
33.465	3	Clay	17.122	0.544	2.023	0.813	1.21	2.96	0.9129	0.90	0.668							0.96	1		182.47	182.47
33.957	4	Silty Clay to Clay	17.92	0.509	2.053	0.828	1.225	2.86	0.9072	0.90	0.667							0.96	1		192.89	192.89
34.449	4	Silty Clay to Clay	16.158	0.336	2.082	0.844	1.239	2.85	0.902	0.89	0.666							0.96	1		183.40	183.40
34.941	4	Silty Clay to Clay	14.011	0.365	2.112	0.859	1.253	3	0.8969	0.89	0.666							0.96	1		163.05	163.05
35.433	3	Clay	14.328	0.501	2.142	0.874	1.268	3.07	0.8914	0.89	0.665							0.95	1		164.21	164.21
35.925	4	Silty Clay to Clay	16.681	0.544	2.172	0.89	1.282	2.97	0.8864	0.88	0.664							0.95	1		186.75	186.75
36.417	4	Silty Clay to Clay	17.893	0.566	2.201	0.905	1.296	2.93	0.8814	0.88	0.663							0.95	1		194.91	194.91
36.909	3	Clay	16.826	0.561	2.231	0.92	1.311	3.01	0.8761	0.88	0.661							0.95	1		180.96	180.96
37.402	3	Clay	16.213	0.538	2.261	0.936	1.325	3.03	0.8713	0.87	0.660							0.95	1		177.82	177.82
37.894	3	Clay	17.177	0.626	2.291	0.951	1.34	3.03	0.8661	0.87	0.658							0.94	1		187.11	187.11
38.386	3	Clay	21.361	0.964	2.32	0.966	1.354	3.01	0.8614	0.86	0.657							0.94	1		209.20	209.20
38.878	3	Clay	22.407	1.113	2.35	0.982	1.368	3.02	0.8567	0.86	0.655							0.94	1		214.25	214.25
39.37	3	Clay	20.618	0.962	2.38	0.997	1.383	3.03	0.8517	0.86	0.653							0.94	1		206.91	206.91
39.862	3	Clay	22.104	0.882	2.41	1.013	1.397	2.96	0.8471	0.85	0.652							0.94	1		217.82	217.82
40.354	4	Silty Clay to Clay	27.527	0.984	2.439	1.028	1.412	2.91	0.8423	0.85	0.649							0.93	1		232.68	232.68
40.846	3	Clay	18.085	0.908	2.469	1.043	1.426	3.04	0.8378	0.84	0.647							0.93	1		201.87	201.87
41.339	3	Clay	18.12	0.659	2.499	1.059	1.44	3.05	0.8333	0.84	0.645							0.93	1		191.22	191.22
41.831	3	Clay	23.013	0.862	2.529	1.074	1.455	2.99	0.8286	0.83	0.643							0.93	1		212.13	212.13
42.323	3	Clay	23.233	1.011	2.558	1.089	1.469	3.02	0.8243	0.83	0.641							0.93	1		216.38	216.38
42.815	3	Clay	22.345	1.062	2.588	1.105	1.483	3.04	0.82	0.83	0.638							0.92	1		216.19	216.19
43.307	4	Silty Clay to Clay	26.068	0.943	2.618	1.12	1.498	2.94	0.8154	0.82	0.636							0.92	1		231.61	231.61
43.799	4	Silty Clay to Clay	26.564	0.883	2.648	1.135	1.512	2.88	0.8112	0.82	0.633							0.92	1		240.58	240.58
44.291	4	Silty Clay to Clay	27.362	0.714	2.677	1.151	1.527	2.83	0.8067	0.81	0.630							0.92	1		243.75	243.75
44.783	4	Silty Clay to Clay	29.674	0.771	2.707	1.166	1.541	2.78	0.8026	0.81	0.627							0.92	1		261.71	261.71
45.276	4	Silty Clay to Clay	35.427	1.232	2.737	1.182	1.555	2.83	0.7985	0.80	0.625							0.92	1		258.69	258.69
45.768	4	Silty Clay to Clay	15.057	0.218	2.767	1.197	1.57	2.98	0.7942	0.80	0.622							0.91	1		185.27	185.27
46.26	4	Silty Clay to Clay	13.344	0.184	2.796	1.212	1.584	2.99	0.7902	0.79	0.619							0.91	1		162.44	162.44
46.752	4	Silty Clay to Clay	17.37	0.332	2.826	1.228	1.599	2.95	0.786	0.79	0.616							0.91	1		195.04	195.04
47.244	4	Silty Clay to Clay	44.043	1.226	2.856	1.243	1.613	2.79	0.7821	0.78	0.613							0.91	1		286.91	286.91
47.736	4	Silty Clay to Clay	34.051	1.27	2.886	1.258	1.627	2.81	0.7782	0.78	0.610							0.91	1		293.11	293.11
48.228	4	Silty Clay to Clay	30.528	0.623	2.915	1.274	1.642	2.8	0.7741	0.77	0.607							0.91	1		253.33	253.33
48.72	4	Silty Clay to Clay	20.12	0.382	2.945	1.289	1.656	2.84	0.7703	0.77	0.604							0.90	1		217.12	217.12
49.213	4	Silty Clay to Clay	20.638	0.439	2.975	1.304	1.67	2.89	0.7666	0.76	0.601							0.90	1		212.20	212.20
49.705	4	Silty Clay to Clay	21.361	0.452	3.005	1.32	1.685	2.94	0.7626	0.76	0.597							0.90	1		205.50	205.50
50.197	4	Silty Clay to Clay	16.413	0.452	3.034	1.335	1.699	3.07	0.7589	0.75	0.594							0.90	1		183.71	183.71

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME	***Eastridge to BART Regional Connector Project***	*FAULT INFO*			
PROJECT NO.	***2017-125-GEO***	*COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*			
CPT NO.	***CPT-AS-89***	*FAULT* M_w = 6.9	*MSF* = 1.24	a_{max} *(g)*= 0.682	V_{S30m}(m/s)= #REF! 230.2

			CPT RESULT INPUT							*CSR*		*CRR 7.5*							*F.S.=(CRR 7.5/CSR)*MSF*K σ*K α*				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
50.689	4	Silty Clay to Clay	18.829	0.48	3.064	1.351	1.714	2.97	0.755	0.75	0.591							0.90	1		202.67	202.67
51.181	4	Silty Clay to Clay	27.004	0.821	3.094	1.366	1.728	2.82	0.7514	0.74	0.588							0.90	1		263.95	263.95
51.673	4	Silty Clay to Clay	36.914	1.915	3.124	1.381	1.742	2.68	0.7478	0.74	0.585							0.89	1		367.08	367.08
52.165	5	Clayey Silt to Silty Clay	130.78	2.767	3.153	1.397	1.757	2.32	0.744	0.73	0.581	2.320	0.74	97.30	2.015	196.021		0.89	1		229.05	229.05
52.657	5	Clayey Silt to Silty Clay	61.798	0.778	3.183	1.412	1.771	2.36	0.7405	0.73	0.578	2.360	0.74	45.76	2.156	98.679	0.17	0.89	1	(0.32)	218.57	107.96
53.15	5	Clayey Silt to Silty Clay	27.499	0.37	3.213	1.427	1.786	2.76	0.7368	0.72	0.575							0.89	1		245.13	245.13
53.642	4	Silty Clay to Clay	24.989	0.386	3.243	1.443	1.8	2.81	0.7333	0.72	0.572							0.89	1		231.31	231.31
54.134	4	Silty Clay to Clay	26.481	0.459	3.272	1.458	1.814	2.82	0.7299	0.71	0.569							0.89	1		237.25	237.25
54.626	4	Silty Clay to Clay	31.106	0.623	3.302	1.473	1.829	2.83	0.7263	0.71	0.566							0.89	1		255.37	255.37
55.118	4	Silty Clay to Clay	30.968	1.137	3.332	1.489	1.843	2.89	0.723	0.70	0.563							0.88	1		265.00	265.00
55.61	4	Silty Clay to Clay	30.252	0.79	3.362	1.504	1.857	2.92	0.7197	0.70	0.560							0.88	1		251.47	251.47
56.102	4	Silty Clay to Clay	25.132	0.78	3.391	1.52	1.872	3.01	0.7161	0.69	0.557							0.88	1		227.88	227.88
56.594	4	Silty Clay to Clay	20.315	0.733	3.421	1.535	1.886	3.1	0.7129	0.69	0.554							0.88	1		208.20	208.20
57.087	4	Silty Clay to Clay	19.821	0.552	3.451	1.55	1.901	3.05	0.7094	0.68	0.551							0.88	1		205.53	205.53
57.579	4	Silty Clay to Clay	23.233	0.494	3.481	1.566	1.915	2.95	0.7063	0.68	0.548							0.88	1		221.37	221.37
58.071	4	Silty Clay to Clay	25.958	0.615	3.51	1.581	1.929	2.93	0.7031	0.68	0.545							0.88	1		235.51	235.51
58.563	4	Silty Clay to Clay	27.445	0.841	3.54	1.596	1.944	2.93	0.6997	0.67	0.542							0.88	1		253.55	253.55
59.055	4	Silty Clay to Clay	30.335	1.131	3.57	1.612	1.958	2.9	0.6966	0.67	0.539							0.87	1		273.23	273.23
59.547	4	Silty Clay to Clay	39.804	1.292	3.6	1.627	1.973	2.88	0.6934	0.66	0.536							0.87	1		286.06	286.06
60.039	4	Silty Clay to Clay	27.761	0.701	3.629	1.642	1.987	2.91	0.6903	0.66	0.533							0.87	1		262.53	262.53
60.532	4	Silty Clay to Clay	37.629	1.057	3.659	1.658	2.001	2.69	0.6873	0.65	0.531							0.87	1		378.50	378.50
61.024	4	Silty Clay to Clay	95.024	4.549	3.689	1.673	2.016	2.6	0.6841	0.65	0.528							0.87	1		234.92	234.92
61.516	4	Silty Clay to Clay	49.329	2.047	3.719	1.689	2.03	2.78	0.6811	0.65	0.526							0.87	1		391.80	391.80
62.008	4	Silty Clay to Clay	32.289	1.104	3.748	1.704	2.044	2.96	0.6782	0.64	0.523							0.87	1		267.37	267.37
62.5	4	Silty Clay to Clay	25.614	0.686	3.778	1.719	2.059	2.97	0.6751	0.64	0.520							0.87	1		240.86	240.86
62.992	4	Silty Clay to Clay	21.278	0.49	3.808	1.735	2.073	2.98	0.6722	0.64	0.518							0.86	1		222.32	222.32
63.484	4	Silty Clay to Clay	23.37	0.615	3.838	1.75	2.088	2.95	0.6691	0.63	0.515							0.86	1		257.62	257.62
63.976	4	Silty Clay to Clay	60.89	1.694	3.867	1.765	2.102	2.76	0.6663	0.63	0.513							0.86	1		347.14	347.14
64.469	4	Silty Clay to Clay	38.882	1.3	3.897	1.781	2.116	2.81	0.6634	0.63	0.511							0.86	1		324.87	324.87
64.961	4	Silty Clay to Clay	40.437	1.44	3.927	1.796	2.131	2.88	0.6605	0.62	0.508							0.86	1		317.32	317.32
65.453	4	Silty Clay to Clay	46.741	2.143	3.957	1.811	2.145	2.84	0.6577	0.62	0.506							0.86	1		348.09	348.09
65.945	4	Silty Clay to Clay	36.721	1.317	3.986	1.827	2.16	2.88	0.6548	0.62	0.504							0.86	1		310.07	310.07
66.437	4	Silty Clay to Clay	27.207	0.834	4.016	1.842	2.174	3.01	0.652	0.61	0.502							0.86	1		248.87	248.87
66.929	4	Silty Clay to Clay	26.123	1.027	4.046	1.858	2.188	3.09	0.6494	0.61	0.500							0.86	1		238.34	238.34
67.421	4	Silty Clay to Clay	24.847	0.984	4.076	1.873	2.203	3.12	0.6465	0.61	0.498							0.85	1		235.60	235.60
67.913	4	Silty Clay to Clay	32.179	1.087	4.105	1.888	2.217	3.01	0.6438	0.60	0.496							0.85	1		261.84	261.84
68.406	5	Clayey Silt to Silty Clay	41.896	1.338	4.135	1.904	2.231	2.67	0.6412	0.60	0.494							0.85	1		384.54	384.54
68.898	5	Clayey Silt to Silty Clay	47.127	1.654	4.165	1.919	2.246	2.68	0.6384	0.60	0.492							0.85	1		385.99	385.99
69.39	4	Silty Clay to Clay	27.913	0.711	4.195	1.934	2.26	2.99	0.6358	0.60	0.490							0.85	1		254.28	254.28
69.882	4	Silty Clay to Clay	28.406	0.699	4.224	1.95	2.275	2.96	0.6331	0.59	0.488							0.85	1		251.80	251.80
70.374	4	Silty Clay to Clay	30.362	0.889	4.254	1.965	2.289	2.97	0.6306	0.59	0.486							0.85	1		258.98	258.98
70.866	4	Silty Clay to Clay	25.655	0.776	4.284	1.98	2.303	3.02	0.628	0.59	0.484							0.85	1		243.51	243.51
71.358	4	Silty Clay to Clay	24.912	0.595	4.314	1.996	2.318	3.01	0.6254	0.58	0.482							0.85	1		234.49	234.49
71.85	4	Silty Clay to Clay	26.756	0.731	4.343	2.011	2.332	2.94	0.6229	0.58	0.481							0.84	1		258.43	258.43
72.343	4	Silty Clay to Clay	37.354	0.832	4.373	2.027	2.347	2.85	0.6202	0.58	0.479							0.84	1		291.67	291.67
72.835	4	Silty Clay to Clay	34.244	1.081	4.403	2.042	2.361	2.9	0.6178	0.58	0.477							0.84	1		282.73	282.73
73.327	4	Silty Clay to Clay	29.681	0.588	4.433	2.057	2.375	2.92	0.6154	0.58	0.476							0.84	1		267.37	267.37
73.819	5	Clayey Silt to Silty Clay	34.794	0.902	4.462	2.073	2.39	2.73	0.6128	0.57	0.474							0.84	1		396.82	396.82
74.311	8	Sand to Silty Sand	128.97	5.943	4.492	2.088	2.404	2.53	0.6104	0.57	0.473	2.530	0.61	78.72	2.925	230.251		0.84	1		256.80	256.80
74.803	8	Sand to Silty Sand	172.49	5.101	4.522	2.103	2.418	2.39	0.6081	0.57	0.471	2.390	0.61	104.88	2.272	238.296		0.82	1		264.72	264.72
75.295	5	Clayey Silt to Silty Clay	69.451	2.919	4.552	2.119	2.433	2.59	0.6056	0.57	0.470	2.590	0.61	42.06	3.266	137.359	0.32	0.84	1	(0.71)	247.02	107.96
75.787	4	Silty Clay to Clay	31.718	0.896	4.581	2.134	2.447	3.02	0.6032	0.56	0.468							0.84	1		271.32	271.32
76.28	4	Silty Clay to Clay	31.415	0.736	4.611	2.149	2.462	2.95	0.6008	0.56	0.467							0.84	1		266.57	266.57
76.772	4	Silty Clay to Clay	32.124	0.845	4.641	2.165	2.476	2.95	0.5985	0.56	0.466							0.83	1		282.68	282.68
77.264	4	Silty Clay to Clay	47.292	1.878	4.671	2.18	2.49	2.95	0.5962	0.56	0.464							0.83	1		313.49	313.49
77.756	4	Silty Clay to Clay	30.72	1.029	4.7	2.196	2.505	3.01	0.5938	0.56	0.463							0.83	1		280.90	280.90
78.248	4	Silty Clay to Clay	30.569	0.835	4.73	2.211	2.519	2.98	0.5916	0.55	0.462							0.83	1		267.98	267.98
78.74	4	Silty Clay to Clay	35.042	0.969	4.76	2.226	2.534	2.98	0.5892	0.55	0.460							0.83	1		275.24	275.24
79.232	4	Silty Clay to Clay	29.468	0.968	4.79	2.242	2.548	3.04	0.587	0.55	0.459							0.83	1		263.72	263.72
79.724	4	Silty Clay to Clay	33.721	0.962	4.819	2.257	2.562	2.96	0.5848	0.55	0.458							0.83	1		290.56	290.56
80.217	4	Silty Clay to Clay	43.273	1.375	4.849	2.272	2.577	2.91	0.5825	0.55	0.457							0.83	1		319.89	319.89
80.709	4	Silty Clay to Clay	36.363	1.219	4.879	2.288	2.591	2.95	0.5803	0.55	0.456							0.83	1		302.10	302.10
81.201	4	Silty Clay to Clay	36.074	1.109	4.909	2.303	2.605	2.97	0.5782	0.54	0.455							0.83	1		291.69	291.69
81.693	4	Silty Clay to Clay	34.299	1.227	4.938	2.318	2.62	3.03	0.5759	0.54	0.453							0.82	1		285.16	285.16
82.185	4	Silty Clay to Clay	34.134	1.718	4.968	2.334	2.634	2.9	0.5738	0.54	0.452							0.82	1		372.92	372.92
82.677	8	Sand to Silty Sand	173.92	6.773	4.998	2.349	2.649	2.51	0.5716	0.54	0.451	2.510	0.57	99.41	2.820	280.279		0.82	1		269.11	269.11
83.169	9	Sand	147.44	7.377	5.028	2.365	2.663	2.51	0.5695	0.54	0.450	2.510	0.57	83.97	2.820	236.742		0.82	1		274.53	274.53
83.661	9	Sand	169.87	8.174	5.057	2.38	2.677	2.52	0.5674	0.54	0.449	2.520	0.57	96.39	2.872	276.803		0.82	1		275.63	275.63
84.154	8	Sand to Silty Sand	230.76	8.095	5.087	2.395	2.692	2.37	0.5653	0.53	0.448	2.370	0.57	130.44	2.194	286.192		0.82	1		283.33	283.33
84.646	8	Sand to Silty Sand	216.92	6.905	5.117	2.411	2.706	2.32	0.5632	0.53	0.447	2.320	0.56	122.17	2.015	246.129		0.78	1		285.10	285.10
85.138	8	Sand to Silty Sand	215.46	9.042	5.147	2.426	2.721	2.39	0.5611	0.53	0.446	2.390	0.56	120.89	2.272	274.661		0.82	1		286.72	286.72
85.63	8	Sand to Silty Sand	266.85	7.392	5.176	2.441	2.735	2.24	0.5591	0.53	0.445	2.240	0.56	149.19	1.770	264.141		0.75	1		293.86	293.86
86.122	6	Sandy Silt to Clayey Silt	292.44	6.614	5.206	2.457	2.749	2.06	0.5571	0.53	0.444	2.060	0.56	162.92	1.387	225.921		0.73	1		299.90	299.90
86.614	8	Sand to Silty Sand	348.94	7.297	5.236	2.472	2.764	2.12	0.555	0.53	0.443	2.120	0.55	193.66	1.492	288.967		0.73	1		299.97	299.97
87.106	8	Sand to Silty Sand	228.23	11.492	5.266	2.487	2.778	2.37	0.553	0.53	0.442	2.370	0.55	126.22	2.194	276.932		0.82	1		292.34	292.34
87.598	8	Sand to Silty Sand	279.21	9.647	5.295	2.503	2.792	2.33	0.5511	0.53	0.442	2.330	0.55	153.87	2.049	315.245		0.81	1		294.78	294.78
88.091	9	Sand	211.99	10.959	5.325	2.518	2.807	2.42	0.549	0.52	0.441	2.420	0.55	116.39	2.396	278.852		0.81	1		290.58	290.58
88.583	8	Sand to Silty Sand	201.11	7.504	5.355	2.534	2.821	2.3	0.5471	0.52	0.440	2.300	0.55	110.04	1.949	214.429		0.76	1		291.78	291.78
89.075	6	Sandy Silt to Clayey Silt	338.14	4.216	5.385	2.549	2.836	1.92	0.5451	0.52	0.439	1.920	0.55	184.32	1.208	222.710		0.72	1		302.99	302.99
89.567	8	Sand to Silty Sand	361.82	7.538	5.414	2.564	2.85	2.09	0.5432	0.52	0.438	2.090	0.54	196.54	1.437	282.417		0.72	1		303.13	303.13
90.059	8	Sand to Silty Sand	261.09	11.503	5.444	2.58	2.864	2.29	0.5413	0.52	0.437	2.290	0.54	141.34	1.917	270.954		0.74	1		300.17	300.17
90.551	8	Sand to Silty Sand	392.9	10.332	5.474	2.595	2.879	2.19	0.5393	0.52	0.437	2.190	0.54	211.91	1.643	348.085		0.72	1		307.28	307.28
91.043	8	Sand to Silty Sand	278.55	10.99	5.504	2.61	2.893	2.28	0.5375	0.52	0.436	2.280	0.54	149.72	1.886	282.398		0.73	1		303.03	303.03
91.535	8	Sand to Silty Sand	281.11	8.732	5.533	2.626	2.908	2.3	0.5355	0.52	0.435	2.300	0.54	150.54	1.949	293.372		0.75	1		299.76	299.76
92.028	8	Sand to Silty Sand	211.81	9.791	5.563	2.641	2.922	2.39	0.5337	0.51	0.434	2.390	0.53	113.05	2.272	256.844		0.81	1		294.13	294.13
92.52	9	Sand	208.35	9.607	5.593	2.657	2.936	2.48	0.5319	0.51	0.434	2.480	0.53	110.83	2.669	295.833		0.81	1		288.98	288.98
93.012	9	Sand	155.17	6.722	5.623	2.672	2.951	2.6	0.53	0.51	0.433							0.81	1		275.91	275.91
93.504	4	Silty Clay to Clay	45.007	1.403	5.652	2.687	2.965	2.88	0.5282	0.51	0.432							0.80	1		395.04	395.04
93.996	5	Clayey Silt to Silty Clay	41.786	0.964	5.682	2.703	2.979	2.89	0.5264	0.51	0.431							0.80	1		322.40	322.40
94.488	5	Clayey Silt to Silty Clay	43.686	1.162	5.712	2.718	2.994	2.9	0.5246	0.51	0.431							0.80	1		332.09	332.09
94.98	4	Silty Clay to Clay	45.117	1.399	5.742	2.733	3.008	2.91	0.5228	0.51	0.430							0.80	1		343.25	343.25
95.472	4	Silty Clay to Clay	52.302	1.906	5.771	2.749	3.023	2.89	0.521	0.51	0.429							0.80	1		387.50	387.50
95.965	4	Silty Clay to Clay	62.542	3.552	5.801	2.764	3.037	2.87	0.5192	0.51	0.429							0.80	1		443.86	443.86
96.457	4	Silty Clay to Clay	49.989	2.386	5.831	2.779	3.051	2.91	0.5175	0.51	0.428							0.80	1		397.28	397.28
96.949	4	Silty Clay to Clay	47.481	1.446	5.861	2.795	3.066	2.93	0.5157	0.50	0.427							0.80	1		344.72	344.72
97.441	4	Silty Clay to Clay	48.723	1.592	5.89	2.81	3.08	2.93	0.514	0.50	0.427							0.80	1		353.05	353.05
97.933	4	Silty Clay to Clay	54.339	1.838	5.92	2.826	3.095	2.91	0.5122	0.50	0.426							0.80	1		365.77	365.77
98.425	4	Silty Clay to Clay	53.127	1.783	5.95	2.841	3.109	2.92	0.5106	0.50	0.425							0.80	1		370.86	370.86
98.917	5	Clayey Silt to Silty Clay	84.619	2.269	5.98	2.856	3.123	2.81	0.5089	0.50	0.425							0.80	1		426.87	426.87
99.409	5	Clayey Silt to Silty Clay	62.514	2.097	6.009	2.872	3.138	2.82	0.5071	0.50	0.424							0.80	1		421.15	421.15
99.902	4	Silty Clay to Clay	58.66	2.011	6.039	2.887	3.152	2.86	0.5055	0.50	0.424							0.79	1		391.04	391.04
100.39	4	Silty Clay to Clay	39.419	1.155	6.069	2.902	3.166	2.95	0.5039	0.50	0.423							0.79	1		330.63	330.63
100.89	4	Silty Clay to Clay	38.035	1.055	6.099	2.918	3.181	3.01	0.5022	0.50	0.422							0.79	1		299.03	299.03
101.38	4	Silty Clay to Clay	36.742	0.831	6.128	2.933	3.195	2.99	0.5006	0.50	0.422							0.79	1		296.89	296.89
101.87	5	Clayey Silt to Silty Clay	38.951	0.858	6.158	2.948	3.21	2.95	0.4989	0.50	0.421							0.79	1		308.88	308.88
102.36	4	Silty Clay to Clay	41.952	1.03	6.188	2.964	3.224	2.95	0.4973	0.49	0.421							0.79	1		319.88	319.88

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME	***Eastridge to BART Regional Connector Project***	*FAULT INFO*			
PROJECT NO.	***2017-125-GEO***	*COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*			
CPT NO.	***CPT-AS-89***	*FAULT M_w =* 6.9	*MSF =* 1.24	*a_{max} (g)=* 0.682	V_{S30m}(m/s)= #REF! 230.2

			CPT RESULT INPUT							***CSR***		***CRR$_{7.5}$***						***F.S.=(CRR$_{7.5}$/CSR)*MSF*Kσ*Kα***				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
102.85	4	Silty Clay to Clay	38.731	1.181	6.218	2.979	3.238	3.01	0.4957	0.49	0.420							0.79	1		308.41	308.41
103.35	4	Silty Clay to Clay	39.226	1.067	6.247	2.995	3.253	3.01	0.494	0.49	0.419							0.79	1		306.19	306.19
103.84	4	Silty Clay to Clay	41.415	1.23	6.277	3.01	3.267	3.02	0.4925	0.49	0.419							0.79	1		333.77	333.77
104.33	9	Sand	94.391	4.616	6.307	3.025	3.282	2.79	0.4909	0.49	0.418							0.79	1		546.11	546.11
104.82	9	Sand	127.57	6.967	6.337	3.041	3.296	2.71	0.4893	0.49	0.418							0.79	1		663.74	663.74
105.32	9	Sand	129.76	7.622	6.366	3.056	3.31	2.73	0.4878	0.49	0.417							0.79	1		663.69	663.69
105.81	9	Sand	92.767	5.928	6.396	3.071	3.325	2.84	0.4862	0.49	0.417							0.79	1		548.34	548.34
106.3	4	Silty Clay to Clay	44.154	1.977	6.426	3.087	3.339	3.07	0.4847	0.49	0.416							0.79	1		350.84	350.84
106.79	4	Silty Clay to Clay	45.53	1.771	6.456	3.102	3.353	3.04	0.4832	0.49	0.416							0.79	1		339.10	339.10
107.28	4	Silty Clay to Clay	49.026	1.634	6.485	3.117	3.368	3	0.4816	0.49	0.415							0.78	1		348.73	348.73
107.78	4	Silty Clay to Clay	47.842	1.731	6.515	3.133	3.382	3.03	0.4801	0.49	0.415							0.78	1		339.75	339.75
108.27	4	Silty Clay to Clay	42.337	1.484	6.545	3.148	3.397	3.06	0.4786	0.48	0.414							0.78	1		324.76	324.76
108.76	4	Silty Clay to Clay	41.594	1.598	6.575	3.164	3.411	3.09	0.4771	0.48	0.414							0.78	1		314.55	314.55
109.25	4	Silty Clay to Clay	35.482	1.197	6.604	3.179	3.425	3.11	0.4757	0.48	0.413							0.78	1		295.87	295.87
109.74	4	Silty Clay to Clay	36.721	1.107	6.634	3.194	3.44	3.08	0.4741	0.48	0.413							0.78	1		297.86	297.86
110.24	4	Silty Clay to Clay	41.208	1.175	6.664	3.21	3.454	3.03	0.4727	0.48	0.412							0.78	1		314.56	314.56
110.73	4	Silty Clay to Clay	43.355	1.219	6.694	3.225	3.469	2.99	0.4712	0.48	0.412							0.78	1		333.40	333.40
111.22	4	Silty Clay to Clay	46.025	1.212	6.723	3.24	3.483	2.97	0.4698	0.48	0.411							0.78	1		340.96	340.96
111.71	5	Clayey Silt to Silty Clay	55.342	1.449	6.753	3.256	3.497	2.89	0.4684	0.48	0.411							0.78	1		385.17	385.17
112.21	4	Silty Clay to Clay	63.615	2.366	6.783	3.271	3.512	2.9	0.4669	0.48	0.410							0.78	1		418.04	418.04
112.7	4	Silty Clay to Clay	73.883	2.256	6.813	3.286	3.526	3	0.4655	0.48	0.410							0.78	1		371.54	371.54
113.19	4	Silty Clay to Clay	29.371	0.622	6.842	3.302	3.54	3.15	0.4641	0.48	0.409							0.78	1		271.24	271.24
113.68	4	Silty Clay to Clay	29.963	0.607	6.872	3.317	3.555	3.1	0.4627	0.48	0.409							0.78	1		268.59	268.59
114.17	4	Silty Clay to Clay	39.226	1.213	6.902	3.333	3.569	3.08	0.4613	0.48	0.409							0.78	1		305.41	305.41
114.67	4	Silty Clay to Clay	44.539	1.517	6.932	3.348	3.584	3.01	0.4599	0.48	0.408							0.77	1		348.27	348.27
115.16	5	Clayey Silt to Silty Clay	54.779	1.158	6.961	3.363	3.598	2.93	0.4585	0.48	0.408							0.77	1		359.21	359.21
115.65	5	Clayey Silt to Silty Clay	40.141	0.933	6.991	3.379	3.612	2.96	0.4572	0.47	0.407							0.77	1		324.32	324.32
116.14	5	Clayey Silt to Silty Clay	41.924	1.002	7.021	3.394	3.627	2.97	0.4558	0.47	0.407							0.77	1		326.85	326.85
116.63	5	Clayey Silt to Silty Clay	45.007	1.169	7.051	3.409	3.641	2.98	0.4545	0.47	0.406							0.77	1		335.49	335.49
117.13	4	Silty Clay to Clay	42.839	1.435	7.08	3.425	3.656	3.01	0.453	0.47	0.406							0.77	1		337.36	337.36
117.62	4	Silty Clay to Clay	49.164	1.549	7.11	3.44	3.67	2.99	0.4517	0.47	0.405							0.77	1		356.30	356.30
118.11	4	Silty Clay to Clay	48.379	1.734	7.14	3.455	3.684	2.98	0.4505	0.47	0.405							0.77	1		364.65	364.65
118.6	5	Clayey Silt to Silty Clay	49.37	1.538	7.17	3.471	3.699	2.95	0.4491	0.47	0.404							0.77	1		366.65	366.65
119.09	5	Clayey Silt to Silty Clay	58.936	1.334	7.199	3.486	3.713	2.88	0.4478	0.47	0.404							0.77	1		380.23	380.23
119.59	5	Clayey Silt to Silty Clay	47.732	1.061	7.229	3.502	3.727	2.89	0.4465	0.47	0.404							0.77	1		363.08	363.08
120.08	5	Clayey Silt to Silty Clay	39.529	0.789	7.259	3.517	3.742	2.93	0.4452	0.47	0.403							0.77	1		333.25	333.25

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project*** *FAULT INFO*
PROJECT NO. ***2017-125-GEO*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-91*** *FAULT* M_w = 6.9 *MSF* = 1.24 a_{max} *(g)*= 0.682 V_{S30m}(m/s)= #REF! 250.8

			CPT RESULT INPUT							***CSR***		***CRR 7.5***						***F.S.=(CRR 7.5/CSR)*MSF*K σ*K α***				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
0.492			-9999	-9999	0.03		0.03		1.7	1.00	0.444							1.00			0.00	0.00
0.984			-9999	-9999	0.06		0.06		1.7	1.00	0.443							1.00			0.00	0.00
1.476			-9999	-9999	0.089		0.089		1.7	1.00	0.443							1.00			0.00	0.00
1.968			-9999	-9999	0.119		0.119		1.6679	1.00	0.442							1.00			0.00	0.00
2.461			-9999	-9999	0.149		0.149		1.6308	1.00	0.442							1.00			0.00	0.00
2.953			-9999	-9999	0.179		0.179		1.5954	1.00	0.441							1.00			0.00	0.00
3.445			-9999	-9999	0.208		0.208		1.5625	0.99	0.441							1.00			0.00	0.00
3.937			-9999	-9999	0.238		0.238		1.5299	0.99	0.440										0.00	0.00
4.429			-9999	-9999	0.268		0.268		1.4986	0.99	0.440										0.00	0.00
4.921			-9999	-9999	0.298		0.298		1.4686	0.99	0.439										0.00	0.00
5.413	4	Silty Clay to Clay	27.39	0.636	0.327		0.327	2.33	1.4407	0.99	0.439	2.330	1.44	39.46	2.049	80.847	0.13				123.00	123.00
5.905	4	Silty Clay to Clay	26.179	0.695	0.357		0.357	2.38	1.413	0.99	0.438	2.380	1.41	36.99	2.233	82.584	0.13				124.55	124.55
6.398	4	Silty Clay to Clay	18.746	0.414	0.387		0.387	2.46	1.3863	0.99	0.438	2.460	1.39	25.99	2.574	66.897	0.11				123.83	123.83
6.89	4	Silty Clay to Clay	18.388	0.562	0.417		0.417	2.56	1.3605	0.99	0.437	2.560	1.36	25.02	3.091	77.319	0.12				124.51	124.51
7.382	4	Silty Clay to Clay	16.131	0.474	0.446		0.446	2.6	1.3366	0.98	0.437							1.00	0		125.65	125.65
7.874	4	Silty Clay to Clay	17.095	0.414	0.476		0.476	2.58	1.3126	0.98	0.436	2.580	1.31	22.44	3.206	71.952	0.11	1.00	1		127.66	127.66
8.366	3	Clay	15.962	0.488	0.506		0.506	2.65	1.2896	0.98	0.436							1.00	1		174.41	174.41
8.858	3	Clay	16.2	0.52	0.536		0.536	2.67	1.2673	0.98	0.435							1.00	1		176.11	176.11
9.35	3	Clay	16.186	0.535	0.565		0.565	2.69	1.2465	0.98	0.435							1.00	1		175.43	175.43
9.842	4	Silty Clay to Clay	15.202	0.397	0.595		0.595	2.68	1.2256	0.98	0.434							1.00	1		169.89	169.89
10.335	4	Silty Clay to Clay	13.516	0.384	0.625		0.625	2.72	1.2055	0.98	0.434							1.00	1		160.76	160.76
10.827	4	Silty Clay to Clay	15.384	0.373	0.655		0.655	2.63	1.186	0.98	0.433							1.00	1		178.84	178.84
11.319	4	Silty Clay to Clay	25.959	0.39	0.684		0.684	2.49	1.1677	0.98	0.433	2.490	1.17	30.31	2.718	82.403	0.13	1.00	1		146.50	146.50
11.811	4	Silty Clay to Clay	19.593	0.447	0.714		0.714	2.52	1.1494	0.98	0.432	2.520	1.15	22.52	2.872	64.671	0.11	1.00	1		148.73	148.73
12.303	5	Clayey Silt to Silty Clay	38.098	0.474	0.744		0.744	2.25	1.1317	0.97	0.432	2.250	1.13	43.12	1.798	77.532	0.12	1.00	1		160.50	160.50
12.795	5	Clayey Silt to Silty Clay	55.11	0.426	0.774		0.774	2.1	1.1145	0.97	0.431	2.100	1.11	61.42	1.455	89.350	0.15	1.00	1		168.29	168.29
13.287	5	Clayey Silt to Silty Clay	37.85	0.754	0.804	0.009	0.795	2.39	1.1028	0.97	0.436	2.390	1.10	41.74	2.272	94.833	0.16	1.00	1	(0.45)	162.33	116.42
13.779	3	Clay	13.736	0.561	0.833	0.024	0.809	2.82	1.0951	0.97	0.443							1.00	1		179.60	179.60
14.272	3	Clay	11.534	0.388	0.863	0.04	0.823	2.96	1.0875	0.97	0.451							1.00	1		141.07	141.07
14.764	3	Clay	10.591	0.332	0.893	0.055	0.838	2.98	1.0795	0.97	0.458							1.00	1		136.44	136.44
15.256	3	Clay	11.589	0.405	0.923	0.07	0.852	2.98	1.0721	0.97	0.465							1.00	1		141.26	141.26
15.748	3	Clay	12.745	0.474	0.952	0.086	0.867	2.95	1.0643	0.97	0.471							1.00	1		151.75	151.75
16.24	3	Clay	13.846	0.588	0.982	0.101	0.881	2.96	1.0572	0.97	0.477							1.00	1		159.05	159.05
16.732	3	Clay	13.984	0.644	1.012	0.117	0.895	2.97	1.0501	0.96	0.484							1.00	1		162.80	162.80
17.224	3	Clay	15.498	0.639	1.042	0.132	0.91	2.93	1.0427	0.96	0.489							1.00	1		172.52	172.52
17.716	3	Clay	17.232	0.737	1.071	0.147	0.924	2.92	1.0358	0.96	0.495							1.00	1		181.92	181.92
18.209	3	Clay	17.342	0.861	1.101	0.163	0.938	2.94	1.029	0.96	0.500							1.00	1		184.19	184.19
18.701	3	Clay	17.838	0.778	1.131	0.178	0.953	2.92	1.0218	0.96	0.505							1.00	1		186.16	186.16
19.193	3	Clay	18.278	0.712	1.161	0.193	0.967	2.9	1.0152	0.96	0.510							1.00	1		186.60	186.60
19.685	3	Clay	16.214	0.635	1.19	0.209	0.982	2.94	1.0082	0.96	0.514							1.00	1		176.76	176.76
20.177	3	Clay	16.021	0.631	1.22	0.224	0.996	2.95	1.0018	0.96	0.519							1.00	1		175.32	175.32
20.669	3	Clay	16.544	0.666	1.25	0.239	1.01	2.97	0.9955	0.96	0.524							1.00	1		173.99	173.99
21.161	3	Clay	13.131	0.58	1.28	0.255	1.025	3.04	0.9888	0.95	0.528							1.00	1		157.65	157.65
21.653	3	Clay	12.69	0.479	1.309	0.27	1.039	3.06	0.9826	0.95	0.532							0.99	1		150.98	150.98
22.146	3	Clay	13.626	0.544	1.339	0.286	1.054	3.04	0.976	0.95	0.536							0.99	1		158.56	158.56
22.638	3	Clay	10.874	0.506	1.369	0.301	1.068	3.09	0.97	0.95	0.540							0.99	1		148.02	148.02
23.13	3	Clay	10.743	0.371	1.399	0.316	1.082	3.12	0.9641	0.95	0.543							0.98	1		139.01	139.01
23.622	3	Clay	15.085	0.577	1.428	0.332	1.097	3.03	0.9578	0.95	0.546							0.98	1		166.15	166.15
24.114	3	Clay	18.031	0.867	1.458	0.347	1.111	2.99	0.952	0.94	0.550							0.98	1		188.06	188.06
24.606	3	Clay	19.544	0.946	1.488	0.362	1.126	2.98	0.9458	0.94	0.553							0.98	1		195.46	195.46
25.098	3	Clay	19.765	0.883	1.518	0.378	1.14	2.94	0.9402	0.94	0.556							0.97	1		202.42	202.42
25.59	3	Clay	20.825	0.867	1.547	0.393	1.154	2.91	0.9346	0.94	0.558							0.97	1		205.93	205.93
26.083	4	Silty Clay to Clay	20.976	0.764	1.577	0.408	1.169	2.87	0.9287	0.94	0.561							0.97	1		210.62	210.62
26.575	4	Silty Clay to Clay	24.609	0.824	1.607	0.424	1.183	2.81	0.9232	0.94	0.564							0.97	1		226.13	226.13
27.067	4	Silty Clay to Clay	24.83	0.839	1.637	0.439	1.198	2.81	0.9174	0.93	0.566							0.96	1		230.88	230.88
27.559	4	Silty Clay to Clay	22.875	0.762	1.667	0.455	1.212	2.84	0.9121	0.93	0.568							0.96	1		216.36	216.36
28.051	4	Silty Clay to Clay	19.885	0.509	1.696	0.47	1.226	2.85	0.9068	0.93	0.570							0.96	1		200.74	200.74
28.543	4	Silty Clay to Clay	21.554	0.704	1.726	0.485	1.241	2.79	0.9013	0.93	0.572							0.96	1		232.87	232.87
29.035	4	Silty Clay to Clay	39.062	1.682	1.756	0.501	1.255	2.81	0.8961	0.93	0.574							0.96	1		259.23	259.23
29.527	3	Clay	20.856	0.864	1.786	0.516	1.27	2.94	0.8907	0.92	0.575							0.95	1		223.38	223.38
30.02	5	Clayey Silt to Silty Clay	80.765	1.834	1.815	0.531	1.284	2.44	0.8857	0.92	0.577	2.440	0.89	71.53	2.483	177.621		0.95	1		200.92	200.92
30.512	5	Clayey Silt to Silty Clay	156.22	2.85	1.845	0.547	1.298	2.11	0.8807	0.92	0.578	2.110	0.88	137.58	1.473	202.681		0.93	1		220.58	220.58
31.004	6	Sandy Silt to Clayey Silt	137.55	2.216	1.875	0.562	1.313	2.03	0.8754	0.92	0.579	2.030	0.88	120.42	1.341	161.510		0.93	1		222.47	222.47
31.496	5	Clayey Silt to Silty Clay	130.15	2.377	1.905	0.577	1.327	2.09	0.8706	0.91	0.581	2.090	0.87	113.30	1.437	162.810		0.93	1		220.39	220.39
31.988	6	Sandy Silt to Clayey Silt	138.38	2.617	1.934	0.593	1.342	2	0.8655	0.91	0.581	2.000	0.87	119.76	1.300	155.691	0.43	0.92	1	(0.84)	226.50	226.50
32.48	5	Clayey Silt to Silty Clay	149.42	2.692	1.964	0.608	1.356	2.08	0.8607	0.91	0.582	2.080	0.86	128.61	1.420	182.577		0.92	1		223.83	223.83
32.972	4	Silty Clay to Clay	39.694	1.557	1.994	0.624	1.37	2.56	0.856	0.90	0.583	2.560	0.86	33.98	3.091	105.015	0.19	0.94	1	(0.37)	197.11	116.42
33.464	4	Silty Clay to Clay	20.838	0.311	2.024	0.639	1.385	2.78	0.8511	0.90	0.584							0.94	1		213.57	213.57
33.957	4	Silty Clay to Clay	20.012	0.351	2.053	0.654	1.399	2.8	0.8465	0.90	0.584							0.94	1		201.09	201.09
34.449	4	Silty Clay to Clay	19.978	0.387	2.083	0.67	1.413	2.83	0.8419	0.89	0.584							0.93	1		200.81	200.81
34.941	4	Silty Clay to Clay	20.04	0.4	2.113	0.685	1.428	2.83	0.8371	0.89	0.584							0.93	1		209.17	209.17
35.433	4	Silty Clay to Clay	32.758	0.785	2.143	0.7	1.442	2.72	0.8327	0.89	0.585							0.93	1		257.39	257.39
35.925	5	Clayey Silt to Silty Clay	39.529	0.682	2.172	0.716	1.457	2.57	0.828	0.88	0.584	2.570	0.83	32.73	3.148	103.033	0.18	0.93	1	(0.36)	192.47	75.40
36.417	5	Clayey Silt to Silty Clay	40.713	0.727	2.202	0.731	1.471	2.52	0.8237	0.88	0.584	2.520	0.82	33.53	2.872	96.296	0.16	0.93	1	(0.32)	195.62	83.24
36.909	5	Clayey Silt to Silty Clay	51.889	1.361	2.232	0.747	1.485	2.56	0.8194	0.88	0.584	2.560	0.82	42.52	3.091	131.398	0.29	0.92	1	(0.57)	202.29	107.96
37.401	5	Clayey Silt to Silty Clay	120.68	3.735	2.262	0.762	1.5	2.32	0.8148	0.87	0.583	2.320	0.81	98.33	2.015	198.096		0.91	1		224.77	224.77
37.894	5	Clayey Silt to Silty Clay	154.87	5.032	2.291	0.777	1.514	2.27	0.8106	0.87	0.583	2.270	0.81	125.54	1.856	233.009		0.90	1		230.07	230.07
38.386	5	Clayey Silt to Silty Clay	95.767	2.579	2.321	0.793	1.529	2.48	0.8062	0.86	0.582	2.480	0.81	77.20	2.669	206.082		0.92	1		213.90	213.90
38.878	4	Silty Clay to Clay	34.547	0.889	2.351	0.808	1.543	2.71	0.802	0.86	0.581							0.92	1		308.74	308.74
39.37	4	Silty Clay to Clay	34.299	1.168	2.381	0.823	1.557	2.76	0.798	0.86	0.581							0.92	1		286.13	286.13
39.862	4	Silty Clay to Clay	29.537	0.808	2.411	0.839	1.572	2.78	0.7937	0.85	0.579							0.91	1		271.21	271.21
40.354	4	Silty Clay to Clay	29.36	0.789	2.44	0.854	1.586	2.81	0.7897	0.85	0.578							0.91	1		256.65	256.65
40.846	4	Silty Clay to Clay	30.308	0.995	2.47	0.869	1.601	2.82	0.7854	0.84	0.577							0.91	1		263.71	263.71
41.338	4	Silty Clay to Clay	29.427	0.813	2.5	0.885	1.615	2.83	0.7815	0.84	0.576							0.91	1		251.35	251.35
41.831	4	Silty Clay to Clay	24.696	0.541	2.53	0.9	1.629	2.86	0.7777	0.83	0.574							0.91	1		229.34	229.34
42.323	4	Silty Clay to Clay	24.747	0.561	2.559	0.916	1.644	2.85	0.7736	0.83	0.573							0.91	1		229.09	229.09
42.815	4	Silty Clay to Clay	25.187	0.598	2.589	0.931	1.658	2.88	0.7698	0.83	0.571							0.90	1		228.22	228.22
43.307	4	Silty Clay to Clay	22.077	0.645	2.619	0.946	1.673	2.93	0.7658	0.82	0.569							0.90	1		219.44	219.44
43.799	4	Silty Clay to Clay	24.445	0.545	2.649	0.962	1.687	2.87	0.762	0.82	0.568							0.90	1		227.14	227.14
44.291	4	Silty Clay to Clay	23.963	0.388	2.678	0.977	1.701	2.79	0.7584	0.81	0.566							0.90	1		228.03	228.03
44.783	4	Silty Clay to Clay	23.927	0.393	2.708	0.992	1.716	2.82	0.7545	0.81	0.564							0.90	1		229.93	229.93
45.275	4	Silty Clay to Clay	33.556	1.152	2.738	1.008	1.73	2.86	0.7509	0.80	0.562							0.90	1		269.30	269.30
45.768	4	Silty Clay to Clay	70.195	1.845	2.768	1.023	1.745	2.73	0.747	0.80	0.560							0.89	1		345.53	345.53
46.26	4	Silty Clay to Clay	31.436	1.303	2.797	1.038	1.759	2.83	0.7435	0.79	0.558							0.89	1		303.39	303.39
46.752	4	Silty Clay to Clay	36.694	1.069	2.827	1.054	1.773	2.82	0.74	0.79	0.556							0.89	1		287.81	287.81
47.244	4	Silty Clay to Clay	41.842	1.854	2.857	1.069	1.788	2.83	0.7363	0.78	0.553							0.89	1		315.25	315.25
47.736	4	Silty Clay to Clay	25.16	1.311	2.887	1.085	1.802	2.92	0.7328	0.78	0.551							0.89	1		270.61	270.61
48.228	4	Silty Clay to Clay	25.786	0.581	2.916	1.1	1.817	2.82	0.7292	0.77	0.548							0.89	1		248.23	248.23
48.72	5	Clayey Silt to Silty Clay	40.162	0.815	2.946	1.115	1.831	2.71	0.7258	0.77	0.546							0.89	1		291.78	291.78
49.212	4	Silty Clay to Clay	40.369	0.954	2.976	1.131	1.845	2.71	0.7225	0.76	0.544							0.88	1		307.13	307.13
49.705	4	Silty Clay to Clay	29.317	0.877	3.006	1.146	1.86	2.82	0.719	0.76	0.541							0.88	1		275.83	275.83
50.197	4	Silty Clay to Clay	27.225	0.907	3.035	1.161	1.874	2.95	0.7157	0.75	0.539							0.88	1		250.36	250.36

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME	***Eastridge to BART Regional Connector Project***	*FAULT INFO*				
PROJECT NO.	***2017-125-GEO***	*COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*				
CPT NO.	***CPT-AS-91***	*FAULT* M_w = 6.9	*MSF* = 1.24	a_{max} *(g)*= 0.682	V_{S30m}(m/s)=	#REF! 250.8

			CPT RESULT INPUT							***CSR***		***CRR*** $_{7.5}$						***F.S.=(CRR*** $_{7.5}$ ***/CSR)*MSF*K σ*K α***				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
50.689	4	Silty Clay to Clay	48.861	1.361	3.065	1.177	1.888	2.8	0.7124	0.75	0.537							0.88	1		316.85	316.85
51.181	5	Clayey Silt to Silty Clay	54.807	1.788	3.095	1.192	1.903	2.59	0.709	0.74	0.534	2.590	0.71	38.86	3.266	126.911	0.27	0.88	1	(0.55)	221.13	99.58
51.673	5	Clayey Silt to Silty Clay	88.721	2.46	3.125	1.207	1.917	2.43	0.7058	0.74	0.532	2.430	0.71	62.62	2.439	152.731	0.41	0.88	1	(0.84)	231.86	142.13
52.165	5	Clayey Silt to Silty Clay	84.261	2.446	3.154	1.223	1.932	2.57	0.7024	0.73	0.529	2.570	0.70	59.19	3.148	186.319		0.88	1		225.96	225.96
52.657	4	Silty Clay to Clay	24.417	0.839	3.184	1.238	1.946	2.95	0.6993	0.73	0.527							0.88	1		258.70	258.70
53.149	4	Silty Clay to Clay	21.348	0.523	3.214	1.254	1.96	3.01	0.6962	0.72	0.524							0.87	1		212.10	212.10
53.642	4	Silty Clay to Clay	23.013	0.561	3.244	1.269	1.975	2.94	0.6929	0.72	0.522							0.87	1		227.12	227.12
54.134	4	Silty Clay to Clay	39.254	0.668	3.274	1.284	1.989	2.78	0.6899	0.71	0.519							0.87	1		276.95	276.95
54.626	4	Silty Clay to Clay	35.786	1.015	3.303	1.3	2.004	2.79	0.6866	0.71	0.516							0.87	1		289.05	289.05
55.118	5	Clayey Silt to Silty Clay	35.077	0.711	3.333	1.315	2.018	2.77	0.6837	0.70	0.514							0.87	1		285.11	285.11
55.61	4	Silty Clay to Clay	34.107	0.699	3.363	1.33	2.032	2.79	0.6807	0.70	0.512							0.87	1		279.17	279.17
56.102	4	Silty Clay to Clay	31.491	0.779	3.393	1.346	2.047	2.86	0.6775	0.69	0.509							0.87	1		264.93	264.93
56.594	4	Silty Clay to Clay	29.379	0.944	3.422	1.361	2.061	2.96	0.6746	0.69	0.507							0.87	1		261.37	261.37
57.086	4	Silty Clay to Clay	45.53	1.81	3.452	1.376	2.076	2.97	0.6716	0.68	0.504							0.86	1		282.06	282.06
57.579	4	Silty Clay to Clay	28.305	0.813	3.482	1.392	2.09	2.97	0.6687	0.68	0.502							0.86	1		255.24	255.24
58.071	4	Silty Clay to Clay	29.014	0.683	3.512	1.407	2.104	2.87	0.6659	0.68	0.500							0.86	1		251.03	251.03
58.563	5	Clayey Silt to Silty Clay	27.362	0.406	3.541	1.423	2.119	2.81	0.6629	0.67	0.497							0.86	1		249.34	249.34
59.055	4	Silty Clay to Clay	29.895	0.532	3.571	1.438	2.133	2.85	0.6601	0.67	0.495							0.86	1		253.43	253.43
59.547	4	Silty Clay to Clay	30.239	1.072	3.601	1.453	2.148	2.91	0.6571	0.66	0.493							0.86	1		273.17	273.17
60.039	4	Silty Clay to Clay	37.74	1.312	3.631	1.469	2.162	2.94	0.6544	0.66	0.491							0.86	1		287.38	287.38
60.531	4	Silty Clay to Clay	32.069	1.315	3.66	1.484	2.176	3.04	0.6517	0.65	0.488							0.86	1		255.82	255.82
61.023	4	Silty Clay to Clay	23.453	0.548	3.69	1.499	2.191	3.04	0.6488	0.65	0.486							0.85	1		223.14	223.14
61.516	4	Silty Clay to Clay	23.447	0.492	3.72	1.515	2.205	2.98	0.6461	0.65	0.484							0.85	1		223.89	223.89
62.008	4	Silty Clay to Clay	26.344	0.624	3.75	1.53	2.22	2.87	0.6433	0.64	0.482							0.85	1		248.13	248.13
62.5	5	Clayey Silt to Silty Clay	23.949	0.345	3.779	1.545	2.234	2.86	0.6407	0.64	0.480							0.85	1		235.62	235.62
62.992	4	Silty Clay to Clay	21.065	0.294	3.809	1.561	2.248	2.96	0.6381	0.64	0.478							0.85	1		208.51	208.51
63.484	4	Silty Clay to Clay	24.802	0.431	3.839	1.576	2.263	2.93	0.6353	0.63	0.476							0.85	1		230.11	230.11
63.976	4	Silty Clay to Clay	27.087	0.562	3.869	1.592	2.277	2.95	0.6327	0.63	0.474							0.85	1		240.37	240.37
64.468	4	Silty Clay to Clay	24.72	0.612	3.898	1.607	2.292	3.04	0.63	0.63	0.472							0.85	1		230.96	230.96
64.96	4	Silty Clay to Clay	43.989	1.774	3.928	1.622	2.306	2.93	0.6275	0.62	0.470							0.85	1		335.78	335.78
65.453	5	Clayey Silt to Silty Clay	120.35	3.823	3.958	1.638	2.32	2.45	0.625	0.62	0.468	2.450	0.63	75.22	2.528	190.168		0.85	1		253.53	253.53
65.945	5	Clayey Silt to Silty Clay	181.19	4.488	3.988	1.653	2.335	2.25	0.6223	0.62	0.466	2.250	0.62	112.76	1.798	202.771		0.81	1		267.47	267.47
66.437	5	Clayey Silt to Silty Clay	190.43	3.13	4.018	1.668	2.349	2.21	0.6199	0.61	0.465	2.210	0.62	118.05	1.692	199.693		0.81	1		267.76	267.76
66.929	5	Clayey Silt to Silty Clay	139.04	3.374	4.047	1.684	2.363	2.38	0.6175	0.61	0.463	2.380	0.62	85.85	2.233	191.670		0.83	1		258.13	258.13
67.421	4	Silty Clay to Clay	89.381	4.254	4.077	1.699	2.378	2.67	0.6149	0.61	0.461							0.84	1		513.99	513.99
67.913	4	Silty Clay to Clay	58.688	2.965	4.107	1.715	2.392	2.8	0.6125	0.60	0.460							0.84	1		409.88	409.88
68.405	4	Silty Clay to Clay	44.402	1.373	4.137	1.73	2.407	2.91	0.6099	0.60	0.458							0.84	1		330.32	330.32
68.897	4	Silty Clay to Clay	49.109	1.725	4.166	1.745	2.421	2.83	0.6076	0.60	0.456							0.84	1		359.17	359.17
69.39	4	Silty Clay to Clay	66.258	2.388	4.196	1.761	2.435	2.84	0.6052	0.60	0.455							0.84	1		374.47	374.47
69.882	4	Silty Clay to Clay	37.905	2.118	4.226	1.776	2.45	3	0.6027	0.59	0.453							0.84	1		316.43	316.43
70.374	4	Silty Clay to Clay	39.915	1.713	4.256	1.791	2.464	2.93	0.6004	0.59	0.452							0.83	1		331.73	331.73
70.866	5	Clayey Silt to Silty Clay	106.34	2.747	4.285	1.807	2.479	2.58	0.598	0.59	0.450	2.580	0.60	63.59	3.206	203.895		0.83	1		248.46	248.46
71.358	5	Clayey Silt to Silty Clay	145.18	4.343	4.315	1.822	2.493	2.44	0.5957	0.58	0.449	2.440	0.60	86.49	2.483	214.757		0.83	1		260.46	260.46
71.85	4	Silty Clay to Clay	53.981	3.071	4.345	1.837	2.507	2.72	0.5935	0.58	0.447							0.83	1		452.80	452.80
72.342	4	Silty Clay to Clay	25.518	0.531	4.375	1.853	2.522	3.1	0.5911	0.58	0.446							0.83	1		239.55	239.55
72.834	4	Silty Clay to Clay	27.51	0.715	4.404	1.868	2.536	2.99	0.5889	0.58	0.445							0.83	1		256.72	256.72
73.327	4	Silty Clay to Clay	34.051	1.215	4.434	1.884	2.551	2.97	0.5865	0.58	0.443							0.83	1		274.44	274.44
73.819	5	Clayey Silt to Silty Clay	25.408	0.357	4.464	1.899	2.565	2.91	0.5843	0.57	0.442							0.83	1		250.13	250.13
74.311	5	Clayey Silt to Silty Clay	34.299	0.33	4.494	1.914	2.579	2.82	0.5822	0.57	0.441							0.83	1		265.38	265.38
74.803	4	Silty Clay to Clay	44.126	0.793	4.523	1.93	2.594	2.88	0.5799	0.57	0.439							0.83	1		299.73	299.73
75.295	4	Silty Clay to Clay	38.208	0.992	4.553	1.945	2.608	2.91	0.5777	0.57	0.438							0.83	1		304.24	304.24
75.787	5	Clayey Silt to Silty Clay	49.026	1.263	4.583	1.96	2.623	2.77	0.5755	0.56	0.437							0.82	1		372.71	372.71
76.279	5	Clayey Silt to Silty Clay	65.102	2.658	4.613	1.976	2.637	2.62	0.5734	0.56	0.436							0.82	1		507.50	507.50
76.771	5	Clayey Silt to Silty Clay	130.53	3.788	4.642	1.991	2.651	2.54	0.5713	0.56	0.435	2.540	0.57	74.57	2.979	222.146		0.82	1		260.97	260.97
77.264	9	Sand	70.332	3.816	4.672	2.006	2.666	2.71	0.5691	0.56	0.434							0.82	1		519.46	519.46
77.756	5	Clayey Silt to Silty Clay	128.94	5.578	4.702	2.022	2.68	2.23	0.567	0.56	0.433	2.230	0.57	73.11	1.743	127.463	0.27	0.79	1	(0.61)	280.77	220.00
78.248	6	Sandy Silt to Clayey Silt	405.42	4.89	4.732	2.037	2.695	1.95	0.5648	0.55	0.432	1.950	0.56	228.99	1.240	283.920		0.72	1		298.63	298.63
78.74	8	Sand to Silty Sand	177.85	6.571	4.762	2.053	2.709	2.3	0.5628	0.55	0.431	2.300	0.56	100.10	1.949	195.062		0.78	1		283.18	283.18
79.232	4	Silty Clay to Clay	84.812	4.512	4.791	2.068	2.723	2.62	0.5608	0.55	0.430							0.82	1		576.36	576.36
79.724	4	Silty Clay to Clay	23.178	0.576	4.821	2.083	2.738	3.06	0.5587	0.55	0.429							0.82	1		273.06	273.06
80.216	4	Silty Clay to Clay	23.123	0.431	4.851	2.099	2.752	3.11	0.5567	0.55	0.428							0.82	1		227.19	227.19
80.708	5	Clayey Silt to Silty Clay	40.63	2.281	4.881	2.114	2.767	2.65	0.5546	0.55	0.427							0.82	1		509.40	509.40
81.201	8	Sand to Silty Sand	122.39	5.781	4.91	2.129	2.781	2.58	0.5526	0.54	0.426	2.580	0.55	67.63	3.206	216.864		0.82	1		265.76	265.76
81.693	4	Silty Clay to Clay	42.475	0.951	4.94	2.145	2.795	2.93	0.5507	0.54	0.425							0.81	1		340.81	340.81
82.185	5	Clayey Silt to Silty Clay	36.914	0.698	4.97	2.16	2.81	2.92	0.5486	0.54	0.424							0.81	1		280.91	280.91
82.677	5	Clayey Silt to Silty Clay	30.666	0.526	5	2.175	2.824	2.93	0.5467	0.54	0.423							0.81	1		265.19	265.19
83.169	5	Clayey Silt to Silty Clay	32.445	0.426	5.029	2.191	2.839	2.88	0.5447	0.54	0.422							0.81	1		271.92	271.92
83.661	5	Clayey Silt to Silty Clay	36.694	0.654	5.059	2.206	2.853	2.88	0.5428	0.54	0.422							0.81	1		292.02	292.02
84.153	5	Clayey Silt to Silty Clay	38.621	0.836	5.089	2.222	2.867	2.9	0.5409	0.53	0.421							0.81	1		300.67	300.67
84.645	5	Clayey Silt to Silty Clay	37.344	0.826	5.119	2.237	2.882	2.92	0.539	0.53	0.420							0.81	1		297.16	297.16
85.138	4	Silty Clay to Clay	39.254	1.043	5.148	2.252	2.896	2.93	0.5371	0.53	0.419							0.81	1		307.20	307.20
85.63	4	Silty Clay to Clay	40.273	1.142	5.178	2.268	2.91	2.95	0.5353	0.53	0.419							0.81	1		307.78	307.78
86.122	5	Clayey Silt to Silty Clay	37.052	0.602	5.208	2.283	2.925	2.94	0.5333	0.53	0.418							0.81	1		289.36	289.36
86.614	5	Clayey Silt to Silty Clay	32.482	0.577	5.238	2.298	2.939	2.94	0.5315	0.53	0.417							0.81	1		270.35	270.35
87.106	4	Silty Clay to Clay	28.133	0.502	5.267	2.314	2.954	3.01	0.5296	0.53	0.416							0.81	1		251.43	251.43
87.598	4	Silty Clay to Clay	26.42	0.629	5.297	2.329	2.968	3.1	0.5278	0.53	0.416							0.80	1		237.72	237.72
88.09	4	Silty Clay to Clay	25.711	0.584	5.327	2.344	2.982	3.13	0.5261	0.52	0.415							0.80	1		234.14	234.14
88.582	4	Silty Clay to Clay	25.652	0.569	5.357	2.36	2.997	3.12	0.5242	0.52	0.414							0.80	1		234.80	234.80
89.075	4	Silty Clay to Clay	26.096	0.556	5.386	2.375	3.011	3.1	0.5224	0.52	0.414							0.80	1		238.38	238.38
89.567	4	Silty Clay to Clay	27.252	0.632	5.416	2.391	3.026	3.09	0.5206	0.52	0.413							0.80	1		245.40	245.40
90.059	4	Silty Clay to Clay	28.463	0.786	5.446	2.406	3.04	3.1	0.5189	0.52	0.412							0.80	1		253.06	253.06
90.551	4	Silty Clay to Clay	29.922	0.733	5.476	2.421	3.054	3.08	0.5172	0.52	0.412							0.80	1		257.39	257.39
91.043	5	Clayey Silt to Silty Clay	32.593	0.638	5.505	2.437	3.069	2.97	0.5153	0.52	0.411							0.80	1		279.56	279.56
91.535	4	Silty Clay to Clay	42.172	0.819	5.535	2.452	3.083	2.91	0.5137	0.52	0.410							0.80	1		345.61	345.61
92.027	5	Clayey Silt to Silty Clay	94.006	3.86	5.565	2.467	3.098	2.65	0.5119	0.51	0.410							0.80	1		581.09	581.09
92.519	6	Sandy Silt to Clayey Silt	230.1	4.946	5.595	2.483	3.112	2.26	0.5102	0.51	0.409	2.260	0.51	117.40	1.827	214.462		0.77	1		292.49	292.49
93.012	5	Clayey Silt to Silty Clay	101.19	2.473	5.625	2.498	3.126	2.36	0.5086	0.51	0.409	2.360	0.51	51.46	2.156	110.970	0.21	0.80	1	(0.50)	276.72	116.42
93.504	5	Clayey Silt to Silty Clay	37.74	0.665	5.654	2.514	3.141	2.84	0.5068	0.51	0.408							0.80	1		335.15	335.15
93.996	5	Clayey Silt to Silty Clay	36.03	0.508	5.684	2.529	3.155	2.88	0.5052	0.51	0.408							0.79	1		291.14	291.14
94.488	5	Clayey Silt to Silty Clay	39.447	0.713	5.714	2.544	3.17	2.9	0.5034	0.51	0.407							0.79	1		301.38	301.38
94.98	5	Clayey Silt to Silty Clay	38.091	0.804	5.744	2.56	3.184	2.93	0.5018	0.51	0.406							0.79	1		302.74	302.74
95.472	5	Clayey Silt to Silty Clay	39.97	0.725	5.773	2.575	3.198	2.91	0.5002	0.51	0.406							0.79	1		304.47	304.47
95.964	5	Clayey Silt to Silty Clay	39.368	0.677	5.803	2.59	3.213	2.89	0.4985	0.51	0.405							0.79	1		306.14	306.14
96.456	5	Clayey Silt to Silty Clay	40.107	0.711	5.833	2.606	3.227	2.89	0.497	0.51	0.405							0.79	1		314.13	314.13
96.949	5	Clayey Silt to Silty Clay	38.621	0.932	5.863	2.621	3.242	2.96	0.4953	0.50	0.404							0.79	1		299.72	299.72
97.441	5	Clayey Silt to Silty Clay	31.746	0.543	5.892	2.636	3.256	3.01	0.4937	0.50	0.404							0.79	1		270.30	270.30
97.933	5	Clayey Silt to Silty Clay	32.593	0.603	5.922	2.652	3.27	2.94	0.4922	0.50	0.403							0.79	1		289.07	289.07
98.425	5	Clayey Silt to Silty Clay	40.107	0.722	5.952	2.667	3.285	2.91	0.4905	0.50	0.403							0.79	1		306.60	306.60
98.917	5	Clayey Silt to Silty Clay	37.042	0.692	5.982	2.683	3.299	2.96	0.489	0.50	0.402							0.79	1		295.28	295.28
99.409	4	Silty Clay to Clay	37.933	0.97	6.011	2.698	3.314	3.01	0.4874	0.50	0.402							0.79	1		307.55	307.55
99.901	4	Silty Clay to Clay	39.337	1.357	6.041	2.713	3.328	3.03	0.4859	0.50	0.401							0.79	1		313.89	313.89
100.39	4	Silty Clay to Clay	36.171	0.859	6.071	2.729	3.342	3.02	0.4844	0.50	0.401							0.79	1		294.79	294.79
100.89	4	Silty Clay to Clay	35.545	0.775	6.101	2.744	3.357	3.01	0.4828	0.50	0.400							0.78	1		288.03	288.03
101.38	4	Silty Clay to Clay	43.823	1.539	6.13	2.759	3.371	2.95	0.4813	0.50	0.400							0.78	1		379.21	379.21
101.87	9	Sand	97.859	4.945	6.16	2.775	3.385	2.85	0.4798	0.50	0.400							0.78	1		516.14	516.14
102.36	9	Sand	100.72	5.898	6.19	2.79	3.4	2.79	0.4783	0.49	0.399							0.78	1		584.50	584.50

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME	***Eastridge to BART Regional Connector Project***	*FAULT INFO*					
PROJECT NO.	***2017-125-GEO***	*COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*					
CPT NO.	***CPT-AS-91***	*FAULT M_w =*	6.9	*MSF =*	1.24	*a_{max} (g)=*	0.682

V_{S30m}(m/s)= #REF! 250.8

			CPT RESULT INPUT							***CSR***		***$CRR_{7.5}$***						***F.S.=($CRR_{7.5}$/CSR)*MSF*Kσ*Kα***				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
102.85	9	Sand	125.41	6.622	6.22	2.805	3.414	2.79	0.4768	0.49	0.399							0.78	1		610.54	610.54
103.35	9	Sand	105.04	6.839	6.249	2.821	3.429	2.82	0.4753	0.49	0.398							0.78	1		593.05	593.05
103.84	8	Sand to Silty Sand	161.2	6.033	6.279	2.836	3.443	2.56	0.4738	0.49	0.398	2.560	0.47	76.38	3.091	236.062		0.78	1		293.70	293.70
104.33	8	Sand to Silty Sand	203.14	8.955	6.309	2.852	3.457	2.48	0.4724	0.49	0.397	2.480	0.47	95.96	2.669	256.161		0.78	1		303.44	303.44
104.82	8	Sand to Silty Sand	249.04	7.354	6.339	2.867	3.472	2.37	0.4709	0.49	0.397	2.370	0.47	117.27	2.194	257.296		0.76	1		308.29	308.29
105.32	6	Sandy Silt to Clayey Silt	241.45	5.183	6.369	2.882	3.486	2.21	0.4695	0.49	0.397	2.210	0.47	113.36	1.692	191.758		0.74	1		310.13	310.13
105.81	6	Sandy Silt to Clayey Silt	247.61	4.384	6.398	2.898	3.501	2.14	0.468	0.49	0.396	2.140	0.47	115.88	1.532	177.519		0.74	1		311.86	311.86
106.3	6	Sandy Silt to Clayey Silt	278.74	4.305	6.428	2.913	3.515	2.08	0.4666	0.49	0.396	2.080	0.47	130.06	1.420	184.639		0.72	1		315.54	315.54
106.79	6	Sandy Silt to Clayey Silt	289.97	6.402	6.458	2.928	3.529	2.14	0.4652	0.49	0.395	2.140	0.47	134.90	1.532	206.660		0.72	1		316.74	316.74
107.28	6	Sandy Silt to Clayey Silt	256.29	5.288	6.488	2.944	3.544	2.18	0.4637	0.49	0.395	2.180	0.46	118.85	1.619	192.439		0.73	1		314.86	314.86
107.78	6	Sandy Silt to Clayey Silt	275.03	5.589	6.517	2.959	3.558	2.14	0.4624	0.49	0.394	2.140	0.46	127.17	1.532	194.813		0.72	1		317.60	317.60
108.27	6	Sandy Silt to Clayey Silt	335.34	4.859	6.547	2.974	3.573	2.03	0.4609	0.48	0.394	2.030	0.46	154.57	1.341	207.305		0.70	1		323.53	323.53
108.76	6	Sandy Silt to Clayey Silt	331.86	6.128	6.577	2.99	3.587	2.06	0.4596	0.48	0.394	2.060	0.46	152.51	1.387	211.494		0.69	1		326.09	326.09
109.25	6	Sandy Silt to Clayey Silt	355.43	7.266	6.607	3.005	3.601	2.09	0.4582	0.48	0.393	2.090	0.46	162.87	1.437	234.035		0.69	1		327.31	327.31
109.74	6	Sandy Silt to Clayey Silt	317.55	6.277	6.636	3.021	3.616	2.09	0.4568	0.48	0.393	2.090	0.46	145.06	1.437	208.443		0.70	1		324.49	324.49
110.24	6	Sandy Silt to Clayey Silt	295.79	5.34	6.666	3.036	3.63	2.09	0.4555	0.48	0.392	2.090	0.46	134.73	1.437	193.595		0.71	1		323.05	323.05
110.73	6	Sandy Silt to Clayey Silt	331.37	5.367	6.696	3.051	3.645	2.03	0.4541	0.48	0.392	2.030	0.45	150.47	1.341	201.810		0.70	1		325.22	325.22
111.22	6	Sandy Silt to Clayey Silt	313.54	4.24	6.726	3.067	3.659	2	0.4528	0.48	0.392	2.000	0.45	141.96	1.300	184.547		0.70	1		324.34	324.34
111.71	6	Sandy Silt to Clayey Silt	290.96	5.532	6.755	3.082	3.673	2.11	0.4515	0.48	0.391	2.110	0.45	131.36	1.473	193.515		0.71	1		322.77	322.77
112.2	8	Sand to Silty Sand	238.91	10.037	6.785	3.097	3.688	2.44	0.4501	0.48	0.391	2.440	0.45	107.53	2.483	267.008		0.77	1		312.82	312.82
112.7	9	Sand	130.73	7.737	6.815	3.113	3.702	2.79	0.4488	0.48	0.391							0.77	1		623.76	623.76
113.19	4	Silty Clay to Clay	58.523	1.669	6.845	3.128	3.717	2.93	0.4474	0.48	0.390							0.77	1		419.38	419.38
113.68	4	Silty Clay to Clay	55.504	2.185	6.874	3.143	3.731	2.9	0.4462	0.48	0.390							0.77	1		442.00	442.00
114.17	9	Sand	201.75	8.614	6.904	3.159	3.745	2.61	0.4449	0.48	0.389							0.77	1		786.98	786.98
114.67	8	Sand to Silty Sand	292.42	11.286	6.934	3.174	3.76	2.34	0.4435	0.48	0.389	2.340	0.44	129.70	2.084	270.271		0.72	1		324.13	324.13
115.16	6	Sandy Silt to Clayey Silt	396.39	5.404	6.964	3.19	3.774	1.96	0.4423	0.48	0.389	1.960	0.44	175.32	1.251	219.349		0.66	1		337.43	337.43

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge to BART Regional Conncetor Project*** *FAULT INFO*
PROJECT NO. ***2017-125-GEO*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-92*** *FAULT* M_w = 6.9 *MSF* = 1.24 a_{max} *(g)*= 0.682 V_{S30m}(m/s)= #REF! 228.5

			CPT RESULT INPUT							***CSR***		***CRR*** $_{7.5}$						***F.S.=(CRR*** $_{7.5}$***/CSR)*MSF*K*** σ****K*** α				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
0.492			-9999	-9999	0.03	0.015	0.014		1.7	1.00	0.950							1.00			0.00	0.00
0.984			-9999	-9999	0.059	0.031	0.029		1.7	1.00	0.902							1.00			0.00	0.00
1.476			-9999	-9999	0.089	0.046	0.043		1.7	1.00	0.916							1.00			0.00	0.00
1.968			-9999	-9999	0.119	0.061	0.058		1.7	1.00	0.907							1.00			0.00	0.00
2.461			-9999	-9999	0.149	0.077	0.072		1.7	1.00	0.914							1.00			0.00	0.00
2.953			-9999	-9999	0.178	0.092	0.086		1.7	1.00	0.913							1.00			0.00	0.00
3.445			-9999	-9999	0.208	0.108	0.101		1.691	0.99	0.907							1.00			0.00	0.00
3.937			-9999	-9999	0.238	0.123	0.115		1.673	0.99	0.911										0.00	0.00
4.429			-9999	-9999	0.268	0.138	0.129		1.6554	0.99	0.913										0.00	0.00
4.921			-9999	-9999	0.297	0.154	0.144		1.6369	0.99	0.906										0.00	0.00
5.413	4	Silty Clay to Clay	23.452	0.557	0.327	0.169	0.158	2.22	1.62	0.99	0.908	2.220	1.62	37.99	1.717	65.241	0.11			(0.00)	99.72	99.72
5.906	4	Silty Clay to Clay	21.425	0.554	0.357	0.184	0.173	2.27	1.6023	0.99	0.904	2.270	1.60	34.33	1.856	63.719	0.10			(0.00)	100.65	100.65
6.398	4	Silty Clay to Clay	19.282	0.515	0.387	0.2	0.187	2.33	1.5862	0.99	0.906	2.330	1.59	30.58	2.049	62.659	0.10			(0.00)	101.56	101.56
6.89	4	Silty Clay to Clay	19.556	0.605	0.416	0.215	0.201	2.39	1.5703	0.99	0.905	2.390	1.57	30.71	2.272	69.771	0.11			(0.00)	103.07	103.07
7.382	3	Clay	16.709	0.532	0.446	0.23	0.216	2.46	1.5537	0.98	0.901	2.460	1.55	25.96	2.574	66.829	0.11	1.00	0	(0.00)	103.29	103.29
7.874	3	Clay	12.74	0.404	0.476	0.246	0.23	2.51	1.5385	0.98	0.903	2.510	1.54	19.60	2.820	55.262	0.10	1.00	1	(0.13)	102.51	102.51
8.366	3	Clay	12.596	0.312	0.506	0.261	0.245	2.51	1.5225	0.98	0.900	2.510	1.52	19.18	2.820	54.071	0.09	1.00	1	(0.13)	103.10	103.10
8.858	4	Silty Clay to Clay	11.974	0.238	0.535	0.277	0.259	2.5	1.5079	0.98	0.899	2.500	1.51	18.06	2.768	49.985	0.09	1.00	1	(0.13)	104.10	99.58
9.35	4	Silty Clay to Clay	15.357	0.275	0.565	0.292	0.273	2.3	1.4936	0.98	0.900	2.300	1.49	22.94	1.949	44.697	0.09	1.00	1	(0.12)	111.68	111.68
9.843	5	Clayey Silt to Silty Clay	26.371	0.466	0.595	0.307	0.288	2.21	1.4785	0.98	0.897	2.210	1.48	38.99	1.692	65.955	0.11	1.00	1	(0.15)	118.83	118.83
10.335	5	Clayey Silt to Silty Clay	30.973	0.558	0.625	0.323	0.302	2.08	1.4647	0.98	0.898	2.080	1.46	45.37	1.420	64.405	0.10	1.00	1	(0.14)	124.46	124.46
10.827	5	Clayey Silt to Silty Clay	46.847	0.182	0.654	0.338	0.316	1.84	1.4512	0.98	0.897	1.840	1.45	67.98	1.137	77.300	0.12	1.00	1	(0.17)	128.82	128.82
11.319	5	Clayey Silt to Silty Clay	19.095	0.166	0.684	0.353	0.331	2.12	1.437	0.98	0.894	2.120	1.44	27.44	1.492	40.943	0.08	1.00	1	(0.12)	120.81	99.58
11.811	4	Silty Clay to Clay	12.459	0.184	0.714	0.369	0.345	2.47	1.4239	0.98	0.895	2.470	1.42	17.74	2.621	46.505	0.09	1.00	1	(0.12)	113.61	83.24
12.303	3	Clay	10.986	0.274	0.744	0.384	0.36	2.62	1.4103	0.97	0.893							1.00	1		140.51	140.51
12.795	3	Clay	7.535	0.196	0.773	0.399	0.374	2.8	1.3977	0.97	0.892							1.00	1		112.50	112.50
13.287	3	Clay	7.966	0.192	0.803	0.415	0.388	2.78	1.3854	0.97	0.892							1.00	1		113.13	113.13
13.78	3	Clay	9.404	0.221	0.833	0.43	0.403	2.75	1.3724	0.97	0.890							1.00	1		122.64	122.64
14.272	3	Clay	12.481	0.288	0.863	0.446	0.417	2.69	1.3605	0.97	0.890							1.00	1		140.80	140.80
14.764	3	Clay	12.941	0.377	0.892	0.461	0.432	2.69	1.348	0.97	0.887							1.00	1		148.35	148.35
15.256	3	Clay	12.086	0.349	0.922	0.476	0.446	2.71	1.3366	0.97	0.887							1.00	1		146.84	146.84
15.748	3	Clay	13.43	0.382	0.952	0.492	0.46	2.67	1.3253	0.97	0.887							1.00	1		162.43	162.43
16.24	3	Clay	17.542	0.623	0.982	0.507	0.475	2.65	1.3134	0.97	0.885							1.00	1		184.49	184.49
16.732	3	Clay	19.009	0.759	1.011	0.522	0.489	2.67	1.3025	0.96	0.884							1.00	1		194.82	194.82
17.224	3	Clay	20.188	0.83	1.041	0.538	0.503	2.67	1.2918	0.96	0.884							1.00	1		199.69	199.69
17.717	3	Clay	19.901	0.772	1.071	0.553	0.518	2.69	1.2806	0.96	0.882							1.00	1		197.00	197.00
18.209	3	Clay	16.737	0.686	1.101	0.568	0.532	2.75	1.2702	0.96	0.882							1.00	1		177.06	177.06
18.701	3	Clay	11.532	0.409	1.13	0.584	0.547	2.84	1.2593	0.96	0.879							1.00	1		145.80	145.80
19.193	3	Clay	10.094	0.309	1.16	0.599	0.561	2.9	1.2493	0.96	0.879							1.00	1		127.19	127.19
19.685	3	Clay	8.552	0.184	1.19	0.615	0.575	2.91	1.2394	0.96	0.879							1.00	1		119.56	119.56
20.177	4	Silty Clay to Clay	16.622	0.329	1.22	0.63	0.59	2.68	1.2291	0.96	0.877							1.00	1		174.65	174.65
20.669	4	Silty Clay to Clay	15.271	0.517	1.249	0.645	0.604	2.65	1.2195	0.96	0.876							1.00	1		192.01	192.01
21.161	3	Clay	11.877	0.354	1.279	0.661	0.619	2.8	1.2095	0.95	0.874							1.00	1		152.81	152.81
21.654	3	Clay	10.022	0.341	1.309	0.676	0.633	2.94	1.2002	0.95	0.873							1.00	1		131.53	131.53
22.146	3	Clay	11.906	0.341	1.339	0.691	0.647	2.86	1.1911	0.95	0.872							1.00	1		149.85	149.85
22.638	3	Clay	17.916	0.685	1.368	0.707	0.662	2.78	1.1815	0.95	0.870							1.00	1		183.96	183.96
23.13	3	Clay	19.182	0.781	1.398	0.722	0.676	2.76	1.1727	0.95	0.869							1.00	1		196.42	196.42
23.622	3	Clay	20.246	0.755	1.428	0.737	0.69	2.74	1.164	0.95	0.868							1.00	1		201.41	201.41
24.114	3	Clay	21.008	0.769	1.458	0.753	0.705	2.73	1.1549	0.94	0.866							1.00	1		206.35	206.35
24.606	4	Silty Clay to Clay	21.109	0.76	1.487	0.768	0.719	2.73	1.1464	0.94	0.865							1.00	1		207.65	207.65
25.098	4	Silty Clay to Clay	21.339	0.732	1.517	0.784	0.734	2.72	1.1375	0.94	0.863							1.00	1		208.31	208.31
25.591	4	Silty Clay to Clay	21.109	0.679	1.547	0.799	0.748	2.72	1.1294	0.94	0.862							1.00	1		207.32	207.32
26.083	4	Silty Clay to Clay	20.85	0.681	1.577	0.814	0.762	2.73	1.1213	0.94	0.860							1.00	1		204.77	204.77
26.575	4	Silty Clay to Clay	19.901	0.647	1.606	0.83	0.777	2.74	1.1128	0.94	0.858							1.00	1		199.97	199.97
27.067	4	Silty Clay to Clay	19.297	0.589	1.636	0.845	0.791	2.75	1.105	0.93	0.856							1.00	1		195.78	195.78
27.559	4	Silty Clay to Clay	19.41	0.586	1.666	0.86	0.806	2.76	1.0967	0.93	0.854							1.00	1		196.07	196.07
28.051	4	Silty Clay to Clay	19.872	0.566	1.696	0.876	0.82	2.74	1.0891	0.93	0.852							1.00	1		198.13	198.13
28.543	4	Silty Clay to Clay	19.153	0.502	1.725	0.891	0.834	2.75	1.0816	0.93	0.850							1.00	1		191.97	191.97
29.035	4	Silty Clay to Clay	17.409	0.464	1.755	0.906	0.849	2.78	1.0737	0.93	0.848							1.00	1		184.13	184.13
29.528	4	Silty Clay to Clay	16.824	0.385	1.785	0.922	0.863	2.76	1.0664	0.92	0.846							1.00	1		180.55	180.55
30.02	4	Silty Clay to Clay	15.501	0.226	1.815	0.937	0.877	2.72	1.0592	0.92	0.844							1.00	1		173.21	173.21
30.512	4	Silty Clay to Clay	15.098	0.249	1.844	0.953	0.892	2.75	1.0516	0.92	0.841							1.00	1		166.41	166.41
31.004	4	Silty Clay to Clay	13.829	0.242	1.874	0.968	0.906	2.79	1.0446	0.92	0.839							1.00	1		161.09	161.09
31.496	4	Silty Clay to Clay	14.465	0.25	1.904	0.983	0.921	2.77	1.0372	0.91	0.836							1.00	1		166.39	166.39
31.988	4	Silty Clay to Clay	21.109	0.315	1.934	0.999	0.935	2.61	1.0304	0.91	0.834							1.00	1		219.73	219.73
32.48	5	Clayey Silt to Silty Clay	56.366	1.246	1.963	1.014	0.949	2.41	1.0237	0.91	0.832	2.410	1.02	57.70	2.354	135.814	0.31	1.00	1	(0.47)	174.40	116.42
32.972	5	Clayey Silt to Silty Clay	43.378	0.948	1.993	1.029	0.964	2.32	1.0166	0.90	0.828	2.320	1.02	44.10	2.015	88.842	0.15	1.00	1	(0.22)	180.78	142.13
33.465	5	Clayey Silt to Silty Clay	88.719	1.945	2.023	1.045	0.978	2.3	1.0101	0.90	0.826	2.300	1.01	89.62	1.949	174.636		1.00	1		185.62	185.62
33.957	4	Silty Clay to Clay	40.819	1.265	2.053	1.06	0.993	2.5	1.0032	0.90	0.823	2.500	1.00	40.95	2.768	113.366	0.22	1.00	1	(0.32)	178.50	133.52
34.449	4	Silty Clay to Clay	50.327	2.178	2.082	1.075	1.007	2.5	0.9968	0.89	0.820	2.500	1.00	50.17	2.768	138.885	0.33	1.00	1	(0.50)	181.92	150.76
34.941	4	Silty Clay to Clay	50.499	1.121	2.112	1.091	1.021	2.49	0.9905	0.89	0.817	2.490	0.99	50.02	2.718	135.978	0.31	1.00	1	(0.47)	179.04	124.95
35.433	4	Silty Clay to Clay	22.582	0.558	2.142	1.106	1.036	2.72	0.9839	0.89	0.814							0.99	1		226.57	226.57
35.925	4	Silty Clay to Clay	24.099	0.562	2.172	1.122	1.05	2.71	0.9778	0.88	0.811							0.99	1		222.51	222.51
36.417	4	Silty Clay to Clay	24.063	0.493	2.201	1.137	1.064	2.66	0.9717	0.88	0.807							0.99	1		229.43	229.43
36.909	4	Silty Clay to Clay	30.283	0.511	2.231	1.152	1.079	2.59	0.9653	0.88	0.803	2.590	0.97	29.23	3.266	95.477	0.16	0.98	1	(0.24)	171.69	75.40
37.402	4	Silty Clay to Clay	32.353	0.819	2.261	1.168	1.093	2.6	0.9594	0.87	0.800							0.98	1		174.77	174.77
37.894	4	Silty Clay to Clay	34.366	0.814	2.291	1.183	1.108	2.61	0.9532	0.87	0.796							0.98	1		272.40	272.40
38.386	4	Silty Clay to Clay	29.333	0.745	2.32	1.198	1.122	2.67	0.9475	0.86	0.793							0.98	1		253.71	253.71
38.878	4	Silty Clay to Clay	24.789	0.68	2.35	1.214	1.136	2.74	0.9418	0.86	0.789							0.97	1		234.00	234.00
39.37	4	Silty Clay to Clay	24.624	0.674	2.38	1.229	1.151	2.75	0.9358	0.86	0.785							0.97	1		229.71	229.71
39.862	4	Silty Clay to Clay	26.86	0.637	2.41	1.244	1.165	2.69	0.9302	0.85	0.782							0.97	1		244.32	244.32
40.354	4	Silty Clay to Clay	30.398	0.719	2.439	1.26	1.18	2.62	0.9244	0.85	0.777							0.97	1		264.71	264.71
40.846	4	Silty Clay to Clay	31.893	0.72	2.469	1.275	1.194	2.63	0.919	0.84	0.773							0.97	1		269.55	269.55
41.339	4	Silty Clay to Clay	30.024	0.889	2.499	1.291	1.208	2.69	0.9136	0.84	0.769							0.96	1		262.83	262.83
41.831	4	Silty Clay to Clay	31.462	0.783	2.529	1.306	1.223	2.65	0.908	0.83	0.765							0.96	1		271.39	271.39
42.323	4	Silty Clay to Clay	37.846	0.894	2.558	1.321	1.237	2.6	0.9027	0.83	0.761							0.96	1		183.76	183.76
42.815	4	Silty Clay to Clay	36.695	1	2.588	1.337	1.251	2.64	0.8976	0.83	0.757							0.96	1		289.23	289.23
43.307	4	Silty Clay to Clay	31.674	0.821	2.618	1.352	1.266	2.68	0.8921	0.82	0.752							0.95	1		271.66	271.66
43.799	4	Silty Clay to Clay	25.307	0.599	2.648	1.367	1.28	2.7	0.8871	0.82	0.748							0.95	1		251.10	251.10
44.291	4	Silty Clay to Clay	31.605	0.562	2.677	1.383	1.295	2.63	0.8818	0.81	0.743							0.95	1		264.98	264.98
44.783	4	Silty Clay to Clay	35.373	0.812	2.707	1.398	1.309	2.63	0.8768	0.81	0.739							0.95	1		279.82	279.82
45.276	4	Silty Clay to Clay	24.099	0.689	2.737	1.414	1.323	2.82	0.872	0.80	0.734							0.95	1		229.26	229.26
45.768	4	Silty Clay to Clay	18.553	0.456	2.767	1.429	1.338	2.9	0.8668	0.80	0.730							0.94	1		200.08	200.08
46.26	4	Silty Clay to Clay	24.502	0.479	2.796	1.444	1.352	2.76	0.8621	0.79	0.725							0.94	1		221.96	221.96
46.752	4	Silty Clay to Clay	23.941	0.428	2.826	1.46	1.367	2.74	0.857	0.79	0.720							0.94	1		225.59	225.59
47.244	4	Silty Clay to Clay	22.978	0.474	2.856	1.475	1.381	2.8	0.8524	0.78	0.716							0.94	1		217.66	217.66
47.736	4	Silty Clay to Clay	20.275	0.558	2.886	1.49	1.395	2.92	0.8478	0.78	0.712							0.94	1		208.14	208.14
48.228	5	Clayey Silt to Silty Clay	56.193	1.253	2.915	1.506	1.41	2.49	0.8429	0.77	0.706	2.490	0.84	47.37	2.718	128.758	0.28	0.93	1	(0.46)	196.82	99.58
48.72	5	Clayey Silt to Silty Clay	28.269	0.464	2.945	1.521	1.424	2.44	0.8384	0.77	0.702	2.440	0.84	23.70	2.483	58.853	0.10	0.93	1	(0.16)	194.67	83.24
49.213	5	Clayey Silt to Silty Clay	22.04	0.227	2.975	1.536	1.438	2.66	0.834	0.76	0.698							0.93	1		217.91	217.91
49.705	4	Silty Clay to Clay	23.467	0.328	3.005	1.552	1.453	2.78	0.8292	0.76	0.693							0.93	1		215.87	215.87
50.197	4	Silty Clay to Clay	19.901	0.509	3.034	1.567	1.467	2.95	0.8249	0.75	0.688							0.93	1		204.11	204.11

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge to BART Regional Conncetor Project*** *FAULT INFO*
PROJECT NO. ***2017-125-GEO*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-92*** *FAULT* M_w = 6.9 *MSF* = 1.24 a_{max} *(g)*= 0.682 V_{S30m}(m/s)= #REF! 228.5

		CPT RESULT INPUT							*CSR*		*CRR 7.5*						*F.S.=(CRR 7.5/CSR)*MSF*Kσ*Kα*				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
50.689	4	Silty Clay to Clay	19.93	0.881	3.064	1.583	1.482	2.99	0.8203	0.75	0.683							0.92	1		212.89	212.89
51.181	4	Silty Clay to Clay	22.892	0.835	3.094	1.598	1.496	2.91	0.816	0.74	0.679							0.92	1		235.56	235.56
51.673	5	Clayey Silt to Silty Clay	55.043	1.592	3.124	1.613	1.51	2.59	0.8118	0.74	0.675	2.590	0.81	44.68	3.266	145.941	0.37	0.92	1	(0.62)	199.33	91.33
52.165	5	Clayey Silt to Silty Clay	33.273	1.017	3.153	1.629	1.525	2.58	0.8073	0.73	0.670	2.580	0.81	26.86	3.206	86.134	0.14	0.92	1	(0.24)	197.71	83.24
52.657	4	Silty Clay to Clay	25.911	0.532	3.183	1.644	1.539	2.78	0.8032	0.73	0.666							0.92	1		244.06	244.06
53.15	4	Silty Clay to Clay	25.998	0.605	3.213	1.659	1.554	2.85	0.7988	0.72	0.661							0.92	1		228.95	228.95
53.642	4	Silty Clay to Clay	20.72	0.506	3.243	1.675	1.568	2.93	0.7948	0.72	0.657							0.91	1		210.56	210.56
54.134	4	Silty Clay to Clay	20.936	0.473	3.272	1.69	1.582	2.92	0.7908	0.71	0.652							0.91	1		207.98	207.98
54.626	4	Silty Clay to Clay	22.546	0.527	3.302	1.705	1.597	2.87	0.7866	0.71	0.648							0.91	1		220.51	220.51
55.118	4	Silty Clay to Clay	26.975	0.495	3.332	1.721	1.611	2.8	0.7826	0.70	0.644							0.91	1		234.27	234.27
55.61	4	Silty Clay to Clay	24.897	0.505	3.362	1.736	1.625	2.8	0.7788	0.70	0.640							0.91	1		234.45	234.45
56.102	5	Clayey Silt to Silty Clay	26.688	0.37	3.391	1.752	1.64	2.77	0.7746	0.69	0.635							0.91	1		228.82	228.82
56.594	4	Silty Clay to Clay	20.879	0.296	3.421	1.767	1.654	2.82	0.7708	0.69	0.631							0.90	1		210.96	210.96
57.087	4	Silty Clay to Clay	21.684	0.346	3.451	1.782	1.669	2.85	0.7668	0.68	0.627							0.90	1		222.90	222.90
57.579	5	Clayey Silt to Silty Clay	46.186	1.402	3.481	1.798	1.683	2.61	0.7631	0.68	0.623							0.90	1		351.19	351.19
58.071	5	Clayey Silt to Silty Clay	34.194	1.066	3.51	1.813	1.697	2.66	0.7594	0.68	0.619							0.90	1		328.69	328.69
58.563	4	Silty Clay to Clay	17.571	0.359	3.54	1.828	1.712	3.04	0.7555	0.67	0.615							0.90	1		188.10	188.10
59.055	4	Silty Clay to Clay	15.156	0.299	3.57	1.844	1.726	3.12	0.7519	0.67	0.612							0.90	1		167.09	167.09
59.547	4	Silty Clay to Clay	13.811	0.299	3.6	1.859	1.741	3.15	0.748	0.66	0.608							0.90	1		163.80	163.80
60.039	4	Silty Clay to Clay	19.297	0.517	3.629	1.874	1.755	2.88	0.7445	0.66	0.604							0.89	1		233.10	233.10
60.532	4	Silty Clay to Clay	24.042	0.738	3.659	1.89	1.769	2.86	0.741	0.65	0.601							0.89	1		246.40	246.40
61.024	4	Silty Clay to Clay	18.204	0.351	3.689	1.905	1.784	3.03	0.7373	0.65	0.597							0.89	1		190.57	190.57
61.516	4	Silty Clay to Clay	18.52	0.289	3.719	1.921	1.798	2.98	0.7338	0.65	0.593							0.89	1		190.54	190.54
62.008	4	Silty Clay to Clay	18.664	0.297	3.748	1.936	1.812	2.94	0.7304	0.64	0.590							0.89	1		198.68	198.68
62.5	4	Silty Clay to Clay	21.037	0.313	3.778	1.951	1.827	2.89	0.7268	0.64	0.586							0.89	1		208.86	208.86
62.992	4	Silty Clay to Clay	21.425	0.34	3.808	1.967	1.841	2.89	0.7234	0.64	0.583							0.89	1		219.32	219.32
63.484	4	Silty Clay to Clay	36.12	1.038	3.838	1.982	1.856	2.78	0.7199	0.63	0.580							0.88	1		298.45	298.45
63.976	4	Silty Clay to Clay	38.306	1.385	3.867	1.997	1.87	2.77	0.7166	0.63	0.577							0.88	1		314.77	314.77
64.469	4	Silty Clay to Clay	30.081	0.722	3.897	2.013	1.884	2.87	0.7134	0.63	0.574							0.88	1		261.28	261.28
64.961	4	Silty Clay to Clay	26.918	0.855	3.927	2.028	1.899	2.94	0.7099	0.62	0.571							0.88	1		244.39	244.39
65.453	4	Silty Clay to Clay	22.633	0.61	3.957	2.043	1.913	2.97	0.7067	0.62	0.568							0.88	1		227.43	227.43
65.945	4	Silty Clay to Clay	22.834	0.543	3.986	2.059	1.928	2.97	0.7033	0.62	0.564							0.88	1		224.83	224.83
66.437	4	Silty Clay to Clay	30.57	0.78	4.016	2.074	1.942	2.9	0.7002	0.61	0.562							0.88	1		254.66	254.66
66.929	4	Silty Clay to Clay	31.921	0.87	4.046	2.09	1.956	2.87	0.6971	0.61	0.559							0.87	1		280.29	280.29
67.421	4	Silty Clay to Clay	46.617	1.61	4.076	2.105	1.971	2.81	0.6938	0.61	0.556							0.87	1		331.80	331.80
67.913	4	Silty Clay to Clay	56.021	1.845	4.105	2.12	1.985	2.74	0.6907	0.60	0.553							0.87	1		361.22	361.22
68.406	4	Silty Clay to Clay	34.309	0.948	4.135	2.136	1.999	2.83	0.6877	0.60	0.551							0.87	1		295.63	295.63
68.898	4	Silty Clay to Clay	23.948	0.616	4.165	2.151	2.014	2.98	0.6845	0.60	0.548							0.87	1		233.02	233.02
69.39	4	Silty Clay to Clay	23.646	0.642	4.195	2.166	2.028	3.01	0.6815	0.60	0.546							0.87	1		225.46	225.46
69.882	4	Silty Clay to Clay	25.077	0.59	4.224	2.182	2.043	2.98	0.6784	0.59	0.543							0.87	1		230.41	230.41
70.374	4	Silty Clay to Clay	23.898	0.497	4.254	2.197	2.057	2.95	0.6755	0.59	0.541							0.87	1		230.56	230.56
70.866	4	Silty Clay to Clay	23.589	0.5	4.284	2.212	2.071	2.95	0.6726	0.59	0.539							0.86	1		228.89	228.89
71.358	4	Silty Clay to Clay	31.893	0.622	4.314	2.228	2.086	2.86	0.6695	0.58	0.536							0.86	1		266.26	266.26
71.85	4	Silty Clay to Clay	37.961	1.201	4.343	2.243	2.1	2.8	0.6667	0.58	0.534							0.86	1		317.59	317.59
72.343	4	Silty Clay to Clay	36.351	1.302	4.373	2.259	2.115	2.84	0.6637	0.58	0.531							0.86	1		306.45	306.45
72.835	5	Clayey Silt to Silty Clay	37.12	0.788	4.403	2.274	2.129	2.8	0.6609	0.58	0.529							0.86	1		293.09	293.09
73.327	5	Clayey Silt to Silty Clay	36.588	0.818	4.433	2.289	2.143	2.76	0.6581	0.58	0.527							0.86	1		309.09	309.09
73.819	4	Silty Clay to Clay	39.83	0.944	4.462	2.305	2.158	2.8	0.6552	0.57	0.525							0.86	1		306.60	306.60
74.311	4	Silty Clay to Clay	37.073	1.221	4.492	2.32	2.172	2.9	0.6524	0.57	0.523							0.86	1		298.23	298.23
74.803	4	Silty Clay to Clay	46.013	1.501	4.522	2.335	2.186	2.84	0.6497	0.57	0.521							0.86	1		336.49	336.49
75.295	4	Silty Clay to Clay	58.466	1.874	4.552	2.351	2.201	2.76	0.6469	0.57	0.519							0.85	1		366.72	366.72
75.787	4	Silty Clay to Clay	47.314	1.267	4.581	2.366	2.215	2.76	0.6442	0.56	0.517							0.85	1		348.60	348.60
76.28	5	Clayey Silt to Silty Clay	49.55	1.437	4.611	2.381	2.23	2.73	0.6414	0.56	0.515							0.85	1		362.95	362.95
76.772	5	Clayey Silt to Silty Clay	56.193	1.541	4.641	2.397	2.244	2.62	0.6388	0.56	0.514							0.85	1		416.23	416.23
77.264	5	Clayey Silt to Silty Clay	111.35	3.046	4.671	2.412	2.258	2.28	0.6362	0.56	0.512	2.280	0.64	70.84	1.886	133.622	0.30	0.84	1	(0.61)	254.70	168.05
77.756	5	Clayey Silt to Silty Clay	168.84	5.068	4.7	2.428	2.273	2.26	0.6335	0.56	0.510	2.260	0.63	106.95	1.827	195.379		0.82	1		264.24	264.24
78.248	5	Clayey Silt to Silty Clay	147.07	4.672	4.73	2.443	2.287	2.38	0.6309	0.55	0.508	2.380	0.63	92.79	2.233	207.157		0.83	1		259.10	259.10
78.74	5	Clayey Silt to Silty Clay	101.09	2.754	4.76	2.458	2.302	2.5	0.6282	0.55	0.507	2.500	0.63	63.50	2.768	175.804		0.85	1		245.84	245.84
79.232	4	Silty Clay to Clay	39.111	1.041	4.79	2.474	2.316	2.85	0.6257	0.55	0.505							0.85	1		316.48	316.48
79.724	4	Silty Clay to Clay	32.094	0.904	4.819	2.489	2.33	2.9	0.6232	0.55	0.504							0.84	1		284.96	284.96
80.217	4	Silty Clay to Clay	44.403	1.487	4.849	2.504	2.345	2.87	0.6206	0.55	0.502							0.84	1		343.81	343.81
80.709	5	Clayey Silt to Silty Clay	114.52	4.059	4.879	2.52	2.359	2.51	0.6182	0.55	0.500	2.510	0.62	70.79	2.820	199.587		0.84	1		254.24	254.24
81.201	5	Clayey Silt to Silty Clay	230.61	5.624	4.909	2.535	2.373	2.37	0.6157	0.54	0.499	2.370	0.62	141.99	2.194	311.542		0.82	1		263.44	263.44
81.693	4	Silty Clay to Clay	38.536	1.759	4.938	2.55	2.388	2.79	0.6132	0.54	0.497							0.84	1		387.95	387.95
82.185	4	Silty Clay to Clay	28.212	0.601	4.968	2.566	2.402	2.95	0.6108	0.54	0.496							0.84	1		258.66	258.66
82.677	4	Silty Clay to Clay	27.205	0.552	4.998	2.581	2.417	2.97	0.6082	0.54	0.494							0.84	1		241.88	241.88
83.169	4	Silty Clay to Clay	24.559	0.453	5.028	2.597	2.431	3	0.6059	0.54	0.493							0.84	1		232.01	232.01
83.661	4	Silty Clay to Clay	24.574	0.459	5.057	2.612	2.445	3.01	0.6036	0.54	0.492							0.84	1		230.85	230.85
84.154	4	Silty Clay to Clay	30.283	0.636	5.087	2.627	2.46	2.97	0.6011	0.53	0.490							0.84	1		281.59	281.59
84.646	5	Clayey Silt to Silty Clay	107.3	3.721	5.117	2.643	2.474	2.38	0.5988	0.53	0.489	2.380	0.60	64.25	2.233	143.443	0.35	0.83	1	(0.75)	258.12	142.13
85.138	6	Sandy Silt to Clayey Silt	222.99	3.666	5.147	2.658	2.489	2.16	0.5964	0.53	0.488	2.160	0.60	132.98	1.574	209.352		0.79	1		274.78	274.78
85.63	5	Clayey Silt to Silty Clay	165.04	4.627	5.176	2.673	2.503	2.45	0.5941	0.53	0.486	2.450	0.59	98.05	2.528	247.902		0.83	1		260.95	260.95
86.122	4	Silty Clay to Clay	32.641	1.438	5.206	2.689	2.517	2.91	0.5919	0.53	0.485							0.83	1		339.42	339.42
86.614	5	Clayey Silt to Silty Clay	26.946	0.479	5.236	2.704	2.532	2.95	0.5895	0.53	0.484							0.83	1		246.68	246.68
87.106	5	Clayey Silt to Silty Clay	25.968	0.38	5.266	2.719	2.546	2.96	0.5873	0.53	0.483							0.83	1		240.01	240.01
87.598	5	Clayey Silt to Silty Clay	30.11	0.667	5.295	2.735	2.561	2.92	0.585	0.53	0.481							0.83	1		266.98	266.98
88.091	5	Clayey Silt to Silty Clay	35.085	0.659	5.325	2.75	2.575	2.86	0.5828	0.52	0.480							0.83	1		290.97	290.97
88.583	5	Clayey Silt to Silty Clay	40.175	0.672	5.355	2.766	2.589	2.85	0.5806	0.52	0.479							0.83	1		297.28	297.28
89.075	5	Clayey Silt to Silty Clay	42.67	0.956	5.385	2.781	2.604	2.69	0.5783	0.52	0.478							0.83	1		426.51	426.51
89.567	5	Clayey Silt to Silty Clay	206.86	6.05	5.414	2.796	2.618	2.35	0.5762	0.52	0.477	2.350	0.58	119.20	2.120	252.652		0.81	1		273.45	273.45
90.059	5	Clayey Silt to Silty Clay	141.72	3.245	5.444	2.812	2.632	2.4	0.5741	0.52	0.476	2.400	0.57	81.36	2.312	188.143		0.82	1		266.62	266.62
90.551	5	Clayey Silt to Silty Clay	44.23	0.774	5.474	2.827	2.647	2.76	0.5719	0.52	0.475							0.82	1		358.43	358.43
91.043	5	Clayey Silt to Silty Clay	38.651	0.517	5.504	2.842	2.661	2.76	0.5698	0.52	0.474							0.82	1		303.20	303.20
91.535	5	Clayey Silt to Silty Clay	36.034	0.512	5.533	2.858	2.676	2.8	0.5676	0.52	0.473							0.82	1		292.41	292.41
92.028	5	Clayey Silt to Silty Clay	36.322	0.541	5.563	2.873	2.69	2.81	0.5656	0.51	0.472							0.82	1		293.54	293.54
92.52	5	Clayey Silt to Silty Clay	31.375	0.493	5.593	2.888	2.704	2.86	0.5635	0.51	0.471							0.82	1		277.39	277.39
93.012	5	Clayey Silt to Silty Clay	30.398	0.463	5.623	2.904	2.719	2.9	0.5614	0.51	0.470							0.82	1		264.05	264.05
93.504	5	Clayey Silt to Silty Clay	31.116	0.446	5.652	2.919	2.733	2.89	0.5594	0.51	0.469							0.82	1		267.64	267.64
93.996	5	Clayey Silt to Silty Clay	31.864	0.563	5.682	2.935	2.748	2.92	0.5572	0.51	0.468							0.82	1		269.40	269.40
94.488	5	Clayey Silt to Silty Clay	31.271	0.579	5.712	2.95	2.762	2.95	0.5553	0.51	0.467							0.82	1		269.65	269.65
94.98	4	Silty Clay to Clay	33.446	0.822	5.742	2.965	2.776	2.98	0.5533	0.51	0.466							0.82	1		279.18	279.18
95.472	4	Silty Clay to Clay	36.178	1.011	5.771	2.981	2.791	2.93	0.5512	0.51	0.465							0.81	1		312.25	312.25
95.965	4	Silty Clay to Clay	51.103	1.464	5.801	2.996	2.805	2.86	0.5493	0.51	0.464							0.81	1		351.37	351.37
96.457	5	Clayey Silt to Silty Clay	45.179	1.146	5.831	3.011	2.819	2.87	0.5474	0.51	0.463							0.81	1		341.05	341.05
96.949	4	Silty Clay to Clay	43.907	1.178	5.861	3.027	2.834	2.9	0.5454	0.50	0.462							0.81	1		334.79	334.79
97.441	4	Silty Clay to Clay	49.55	2.054	5.89	3.042	2.848	2.9	0.5435	0.50	0.461							0.81	1		360.32	360.32
97.933	4	Silty Clay to Clay	52.743	1.505	5.92	3.057	2.863	2.84	0.5415	0.50	0.460							0.81	1		373.19	373.19
98.425	5	Clayey Silt to Silty Clay	49.493	1.344	5.95	3.073	2.877	2.85	0.5396	0.50	0.460							0.81	1		357.71	357.71
98.917	5	Clayey Silt to Silty Clay	47.969	1.517	5.98	3.088	2.891	2.85	0.5378	0.50	0.459							0.81	1		364.08	364.08
99.409	4	Silty Clay to Clay	54.41	1.616	6.009	3.104	2.906	2.83	0.5358	0.50	0.458							0.81	1		406.83	406.83
99.902	9	Sand	106.41	5.619	6.039	3.119	2.92	2.75	0.534	0.50	0.457							0.81	1		548.26	548.26
100.39	9	Sand	107.53	6.517	6.069	3.134	2.935	2.78	0.532	0.50	0.456							0.81	1		560.13	560.13
100.89	4	Silty Clay to Clay	63.757	2.835	6.099	3.15	2.949	2.93	0.5302	0.50	0.456							0.81	1		417.59	417.59
101.38	4	Silty Clay to Clay	38.191	1.247	6.128	3.165	2.963	2.99	0.5285	0.50	0.455							0.80	1		321.14	321.14
101.87	4	Silty Clay to Clay	35.387	0.818	6.158	3.18	2.978	2.98	0.5266	0.50	0.454							0.80	1		289.92	289.92
102.36	4	Silty Clay to Clay	31.979	0.728	6.188	3.196	2.992	3.01	0.5248	0.49	0.453							0.80	1		276.22	276.22

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge to BART Regional Conncetor Project*** *FAULT INFO*
PROJECT NO. ***2017-125-GEO*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-92*** *FAULT* M_w = 6.9 *MSF* = 1.24 a_{max} *(g)*= 0.682 V_{S30m}(m/s)= #REF! 228.5

		CPT RESULT INPUT							***CSR***		***CRR*** $_{7.5}$						***F.S.=(CRR*** $_{7.5}$ ***/CSR)*MSF*K*** σ ****K*** α				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
102.85	4	Silty Clay to Clay	34.007	0.678	6.218	3.211	3.006	2.98	0.5231	0.49	0.453							0.80	1		286.79	286.79
103.35	4	Silty Clay to Clay	45.524	1.274	6.247	3.226	3.021	2.93	0.5212	0.49	0.452							0.80	1		329.79	329.79
103.84	4	Silty Clay to Clay	49.838	1.882	6.277	3.242	3.035	2.92	0.5195	0.49	0.451							0.80	1		356.18	356.18
104.33	4	Silty Clay to Clay	38.831	1.017	6.307	3.257	3.05	2.94	0.5176	0.49	0.450							0.80	1		327.32	327.32
104.82	4	Silty Clay to Clay	37.76	1.173	6.337	3.273	3.064	3.05	0.5159	0.49	0.450							0.80	1		297.77	297.77
105.32	4	Silty Clay to Clay	39.255	1.114	6.366	3.288	3.078	3.05	0.5143	0.49	0.449							0.80	1		295.91	295.91
105.81	4	Silty Clay to Clay	34.812	0.985	6.396	3.303	3.093	2.96	0.5125	0.49	0.448							0.80	1		315.74	315.74
106.3	5	Clayey Silt to Silty Clay	79.545	1.582	6.426	3.319	3.107	2.6	0.5108	0.49	0.447							0.80	1		260.43	260.43
106.79	5	Clayey Silt to Silty Clay	56.309	1.534	6.456	3.334	3.122	2.6	0.509	0.49	0.447							0.80	1		259.07	259.07
107.28	5	Clayey Silt to Silty Clay	54.065	0.912	6.485	3.349	3.136	2.72	0.5074	0.49	0.446							0.80	1		378.06	378.06
107.78	5	Clayey Silt to Silty Clay	45.898	0.861	6.515	3.365	3.15	2.79	0.5057	0.49	0.445							0.79	1		355.97	355.97
108.27	5	Clayey Silt to Silty Clay	50.904	0.929	6.545	3.38	3.165	2.8	0.504	0.48	0.445							0.79	1		389.88	389.88
108.76	5	Clayey Silt to Silty Clay	89.754	2.781	6.575	3.395	3.179	2.81	0.5024	0.48	0.444							0.79	1		435.49	435.49
109.25	4	Silty Clay to Clay	37.242	0.862	6.604	3.411	3.193	3	0.5008	0.48	0.443							0.79	1		320.60	320.60
109.74	5	Clayey Silt to Silty Clay	34.697	0.753	6.634	3.426	3.208	3.01	0.4991	0.48	0.443							0.79	1		284.98	284.98
110.24	5	Clayey Silt to Silty Clay	33.439	0.76	6.664	3.442	3.222	3.01	0.4975	0.48	0.442							0.79	1		287.47	287.47
110.73	4	Silty Clay to Clay	32.986	0.805	6.694	3.457	3.237	3.02	0.4958	0.48	0.441							0.79	1		287.01	287.01
111.22	4	Silty Clay to Clay	33.561	0.783	6.723	3.472	3.251	3.01	0.4943	0.48	0.441							0.79	1		289.20	289.20
111.71	5	Clayey Silt to Silty Clay	35.085	0.843	6.753	3.488	3.265	3	0.4927	0.48	0.440							0.79	1		294.76	294.76
112.21	5	Clayey Silt to Silty Clay	37.989	0.879	6.783	3.503	3.28	2.97	0.4911	0.48	0.439							0.79	1		308.20	308.20
112.7	5	Clayey Silt to Silty Clay	38.507	0.947	6.813	3.518	3.294	2.96	0.4895	0.48	0.439							0.79	1		312.91	312.91
113.19	5	Clayey Silt to Silty Clay	38.004	0.897	6.842	3.534	3.309	2.96	0.4879	0.48	0.438							0.79	1		311.69	311.69
113.68	5	Clayey Silt to Silty Clay	42.418	0.923	6.872	3.549	3.323	2.92	0.4864	0.48	0.437							0.79	1		323.22	323.22
114.17	5	Clayey Silt to Silty Clay	40.608	0.858	6.902	3.564	3.337	2.91	0.4849	0.48	0.437							0.79	1		325.06	325.06
114.67	5	Clayey Silt to Silty Clay	42.62	0.877	6.932	3.58	3.352	2.91	0.4833	0.48	0.436							0.79	1		326.70	326.70
115.16	5	Clayey Silt to Silty Clay	40.031	0.895	6.961	3.595	3.366	2.94	0.4818	0.48	0.436							0.78	1		320.18	320.18
115.65	5	Clayey Silt to Silty Clay	36.753	0.857	6.991	3.611	3.38	2.98	0.4803	0.47	0.435							0.78	1		308.39	308.39
116.14	5	Clayey Silt to Silty Clay	36.293	0.841	7.021	3.626	3.395	3	0.4788	0.47	0.434							0.78	1		301.65	301.65
116.63	5	Clayey Silt to Silty Clay	36.142	0.892	7.051	3.641	3.409	2.99	0.4773	0.47	0.434							0.78	1		308.98	308.98
117.13	5	Clayey Silt to Silty Clay	52.196	1.508	7.08	3.657	3.424	2.93	0.4758	0.47	0.433							0.78	1		362.04	362.04
117.62	5	Clayey Silt to Silty Clay	53.731	1.522	7.11	3.672	3.438	2.89	0.4743	0.47	0.433							0.78	1		384.56	384.56
118.11	5	Clayey Silt to Silty Clay	48.803	1.294	7.14	3.687	3.452	2.89	0.4729	0.47	0.432							0.78	1		368.76	368.76
118.6	5	Clayey Silt to Silty Clay	44	1.125	7.17	3.703	3.467	2.93	0.4714	0.47	0.432							0.78	1		341.44	341.44
119.09	5	Clayey Silt to Silty Clay	38.824	1.01	7.199	3.718	3.481	3	0.47	0.47	0.431							0.78	1		316.51	316.51
119.59	4	Silty Clay to Clay	40.118	1.071	7.229	3.733	3.496	2.99	0.4685	0.47	0.430							0.78	1		324.63	324.63
120.08	5	Clayey Silt to Silty Clay	58.638	1.581	7.259	3.749	3.51	2.89	0.4671	0.47	0.430							0.78	1		375.81	375.81

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project*** *FAULT INFO*
PROJECT NO. ***2017-125-GEO*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-93*** *FAULT* M_w = 6.9 *MSF* = 1.24 a_{max} *(g)*= 0.682 V_{S30m}(m/s)= #REF! 219.3

		CPT RESULT INPUT							***CSR***		***CRR*** $_{7.5}$						***F.S.=(CRR*** $_{7.5}$ ***/CSR)*MSF*K*** σ ****K*** α				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
0.492			-9999	-9999	0.03		0.03		1.7	1.00	0.444							1.00			0.00	0.00
0.984			-9999	-9999	0.06		0.06		1.7	1.00	0.443							1.00			0.00	0.00
1.476			-9999	-9999	0.089		0.089		1.7	1.00	0.443							1.00			0.00	0.00
1.968			-9999	-9999	0.119		0.119		1.6679	1.00	0.442							1.00			0.00	0.00
2.461			-9999	-9999	0.149		0.149		1.6308	1.00	0.442							1.00			0.00	0.00
2.953			-9999	-9999	0.179		0.179		1.5954	1.00	0.441							1.00			0.00	0.00
3.445			-9999	-9999	0.208		0.208		1.5625	0.99	0.441							1.00			0.00	0.00
3.937			-9999	-9999	0.238		0.238		1.5299	0.99	0.440										0.00	0.00
4.429			-9999	-9999	0.268		0.268		1.4986	0.99	0.440										0.00	0.00
4.921			-9999	-9999	0.298		0.298		1.4686	0.99	0.439										0.00	0.00
5.413	4	Silty Clay to Clay	24.885	0.634	0.327		0.327	2.41	1.4407	0.99	0.439	2.410	1.44	35.85	2.354	84.385	0.14				120.38	120.38
5.905	4	Silty Clay to Clay	19.035	0.486	0.357		0.357	2.43	1.413	0.99	0.438	2.430	1.41	26.90	2.439	65.600	0.11				121.98	121.98
6.398	4	Silty Clay to Clay	27.885	0.607	0.387		0.387	2.38	1.3863	0.99	0.438	2.380	1.39	38.66	2.233	86.303	0.14				128.84	128.84
6.89	4	Silty Clay to Clay	33.005	1.025	0.417		0.417	2.38	1.3605	0.99	0.437	2.380	1.36	44.90	2.233	100.253	0.17				135.35	135.35
7.382	4	Silty Clay to Clay	37.079	1.337	0.446		0.446	2.44	1.3366	0.98	0.437	2.440	1.34	49.56	2.483	123.061	0.25	1.00	0		138.43	138.43
7.874	4	Silty Clay to Clay	28.436	0.991	0.476		0.476	2.49	1.3126	0.98	0.436	2.490	1.31	37.33	2.718	101.468	0.18	1.00	1		137.70	137.70
8.366	4	Silty Clay to Clay	22.985	0.513	0.506		0.506	2.46	1.2896	0.98	0.436	2.460	1.29	29.64	2.574	76.303	0.12	1.00	1		136.42	136.42
8.858	4	Silty Clay to Clay	22.104	0.509	0.536		0.536	2.48	1.2673	0.98	0.435	2.480	1.27	28.01	2.669	74.774	0.12	1.00	1		137.56	137.56
9.35	4	Silty Clay to Clay	16.792	0.336	0.565		0.565	2.54	1.2465	0.98	0.435	2.540	1.25	20.93	2.979	62.351	0.10	1.00	1		136.23	136.23
9.842	4	Silty Clay to Clay	19.462	0.357	0.595		0.595	2.63	1.2256	0.98	0.434							1.00	1		177.02	177.02
10.335	4	Silty Clay to Clay	14.727	0.483	0.625	0.01	0.615	2.71	1.2121	0.98	0.441							1.00	1		167.30	167.30
10.827	4	Silty Clay to Clay	15.773	0.396	0.655	0.026	0.629	2.54	1.2028	0.98	0.451	2.540	1.20	18.97	2.979	56.518	0.10	1.00	1	(0.27)	141.26	83.24
11.319	5	Clayey Silt to Silty Clay	35.4	0.472	0.684	0.041	0.643	2.31	1.1937	0.98	0.460	2.310	1.19	42.26	1.981	83.722	0.13	1.00	1	(0.36)	150.75	107.96
11.811	4	Silty Clay to Clay	24.224	0.436	0.714	0.057	0.658	2.44	1.1841	0.98	0.469	2.440	1.18	28.68	2.483	71.224	0.11	1.00	1	(0.30)	145.78	83.24
12.303	3	Clay	9.552	0.189	0.744	0.072	0.672	2.83	1.1752	0.97	0.478							1.00	1		127.79	127.79
12.795	3	Clay	6.813	0.189	0.774	0.087	0.686	3.03	1.1665	0.97	0.487							1.00	1		103.81	103.81
13.287	3	Clay	5.588	0.197	0.804	0.103	0.701	3.18	1.1573	0.97	0.494							1.00	1		90.24	90.24
13.779	3	Clay	4.391	0.078	0.833	0.118	0.715	3.21	1.1488	0.97	0.502							1.00	1		79.79	79.79
14.272	3	Clay	4.735	0.074	0.863	0.133	0.73	3.15	1.1399	0.97	0.508							1.00	1		80.94	80.94
14.764	3	Clay	4.735	0.075	0.893	0.149	0.744	3.15	1.1317	0.97	0.516							1.00	1		81.93	81.93
15.256	3	Clay	4.928	0.077	0.923	0.164	0.758	3.13	1.1236	0.97	0.523							1.00	1		83.72	83.72
15.748	3	Clay	6.359	0.103	0.952	0.179	0.773	3.08	1.1151	0.97	0.528							1.00	1		94.29	94.29
16.24	3	Clay	7.019	0.185	0.982	0.195	0.787	3.1	1.1072	0.97	0.534							1.00	1		104.85	104.85
16.732	3	Clay	7.625	0.276	1.012	0.21	0.802	3.15	1.0989	0.96	0.540							1.00	1		108.51	108.51
17.224	3	Clay	7.037	0.288	1.042	0.226	0.816	3.2	1.0913	0.96	0.545							1.00	1		105.87	105.87
17.716	3	Clay	7.763	0.305	1.071	0.241	0.83	3.23	1.0837	0.96	0.551							1.00	1		106.00	106.00
18.209	3	Clay	6.634	0.332	1.101	0.256	0.845	3.29	1.0758	0.96	0.555							1.00	1		102.16	102.16
18.701	3	Clay	6.717	0.298	1.131	0.272	0.859	3.27	1.0685	0.96	0.560							1.00	1		103.25	103.25
19.193	3	Clay	8.726	0.304	1.161	0.287	0.874	3.14	1.0608	0.96	0.565							1.00	1		118.35	118.35
19.685	3	Clay	11.341	0.502	1.19	0.302	0.888	3.06	1.0536	0.96	0.569							1.00	1		135.97	135.97
20.177	3	Clay	9.552	0.354	1.22	0.318	0.902	3.12	1.0466	0.96	0.573							1.00	1		124.06	124.06
20.669	3	Clay	6.689	0.106	1.25	0.333	0.917	3.14	1.0392	0.96	0.577							1.00	1		105.12	105.12
21.161	3	Clay	9.111	0.172	1.28	0.348	0.931	3.04	1.0324	0.95	0.581							1.00	1		121.01	121.01
21.653	3	Clay	9.552	0.328	1.309	0.364	0.946	3.09	1.0252	0.95	0.584							1.00	1		125.70	125.70
22.146	3	Clay	8.458	0.271	1.339	0.379	0.96	3.15	1.0185	0.95	0.588							1.00	1		118.06	118.06
22.638	3	Clay	9.304	0.314	1.369	0.395	0.974	3.09	1.012	0.95	0.592							1.00	1		130.75	130.75
23.13	3	Clay	16.186	0.57	1.399	0.41	0.989	2.92	1.005	0.95	0.594							1.00	1		171.92	171.92
23.622	3	Clay	19.93	0.685	1.428	0.425	1.003	2.85	0.9986	0.95	0.597							1.00	1		198.40	198.40
24.114	4	Silty Clay to Clay	20.508	0.745	1.458	0.441	1.018	2.83	0.9919	0.94	0.600							1.00	1		208.60	208.60
24.606	4	Silty Clay to Clay	24.444	0.737	1.488	0.456	1.032	2.76	0.9857	0.94	0.603							0.99	1		224.33	224.33
25.098	4	Silty Clay to Clay	24.664	0.736	1.518	0.471	1.046	2.74	0.9795	0.94	0.606							0.99	1		227.28	227.28
25.59	4	Silty Clay to Clay	22.875	0.715	1.547	0.487	1.061	2.77	0.973	0.94	0.607							0.99	1		218.82	218.82
26.083	4	Silty Clay to Clay	21.375	0.637	1.577	0.502	1.075	2.79	0.967	0.94	0.610							0.99	1		210.98	210.98
26.575	4	Silty Clay to Clay	22.077	0.679	1.607	0.518	1.09	2.81	0.9607	0.94	0.612							0.98	1		210.40	210.40
27.067	4	Silty Clay to Clay	20.508	0.646	1.637	0.533	1.104	2.84	0.9549	0.93	0.614							0.98	1		205.57	205.57
27.559	4	Silty Clay to Clay	20.398	0.622	1.667	0.548	1.118	2.84	0.9491	0.93	0.616							0.98	1		202.07	202.07
28.051	4	Silty Clay to Clay	19.957	0.556	1.696	0.564	1.133	2.84	0.943	0.93	0.617							0.98	1		199.75	199.75
28.543	4	Silty Clay to Clay	16.571	0.48	1.726	0.579	1.147	2.87	0.9374	0.93	0.619							0.97	1		185.61	185.61
29.035	4	Silty Clay to Clay	14.947	0.341	1.756	0.594	1.161	2.95	0.9318	0.93	0.620							0.97	1		164.04	164.04
29.527	4	Silty Clay to Clay	12.219	0.357	1.786	0.61	1.176	2.99	0.9259	0.92	0.621							0.97	1		152.44	152.44
30.02	4	Silty Clay to Clay	16.076	0.235	1.815	0.625	1.19	2.79	0.9205	0.92	0.622							0.97	1		177.81	177.81
30.512	4	Silty Clay to Clay	19.131	0.392	1.845	0.64	1.205	2.86	0.9148	0.92	0.623							0.96	1		180.72	180.72
31.004	3	Clay	10.02	0.343	1.875	0.656	1.219	3.15	0.9095	0.92	0.624							0.96	1		136.75	136.75
31.496	3	Clay	8.382	0.112	1.905	0.671	1.233	3.14	0.9042	0.91	0.625							0.96	1		118.18	118.18
31.988	4	Silty Clay to Clay	8.27	0.101	1.934	0.687	1.248	3.03	0.8987	0.91	0.625							0.96	1		125.45	125.45
32.48	4	Silty Clay to Clay	15.223	0.299	1.964	0.702	1.262	3.06	0.8936	0.91	0.626							0.95	1		137.22	137.22
32.972	3	Clay	5.643	0.123	1.994	0.717	1.277	3.38	0.8882	0.90	0.626							0.95	1		103.48	103.48
33.464	4	Silty Clay to Clay	12.002	0.304	2.024	0.733	1.291	3.02	0.8832	0.90	0.626							0.95	1		144.38	144.38
33.957	4	Silty Clay to Clay	11.479	0.154	2.053	0.748	1.305	2.83	0.8782	0.90	0.626							0.95	1		174.56	174.56
34.449	4	Silty Clay to Clay	26.151	0.492	2.083	0.763	1.32	2.67	0.873	0.89	0.626							0.95	1		241.40	241.40
34.941	5	Clayey Silt to Silty Clay	27.472	0.476	2.113	0.779	1.334	2.62	0.8682	0.89	0.626							0.94	1		265.09	265.09
35.433	4	Silty Clay to Clay	27.527	0.567	2.143	0.794	1.349	2.76	0.8631	0.89	0.625							0.94	1		239.84	239.84
35.925	4	Silty Clay to Clay	27.445	0.933	2.172	0.809	1.363	2.84	0.8584	0.88	0.624							0.94	1		238.64	238.64
36.417	4	Silty Clay to Clay	26.784	0.851	2.202	0.825	1.377	2.73	0.8537	0.88	0.624							0.94	1		250.62	250.62
36.909	4	Silty Clay to Clay	28.646	0.565	2.232	0.84	1.392	2.66	0.8488	0.88	0.623							0.94	1		258.09	258.09
37.401	4	Silty Clay to Clay	30.335	0.763	2.262	0.856	1.406	2.71	0.8442	0.87	0.622							0.93	1		260.18	260.18
37.894	4	Silty Clay to Clay	30.418	0.879	2.291	0.871	1.421	2.76	0.8394	0.87	0.621							0.93	1		253.32	253.32
38.386	4	Silty Clay to Clay	20.205	0.41	2.321	0.886	1.435	2.81	0.8349	0.86	0.620							0.93	1		217.21	217.21
38.878	4	Silty Clay to Clay	22.104	0.391	2.351	0.902	1.449	2.74	0.8305	0.86	0.619							0.93	1		224.67	224.67
39.37	4	Silty Clay to Clay	30.115	0.64	2.381	0.917	1.464	2.71	0.8258	0.86	0.618							0.93	1		261.53	261.53
39.862	4	Silty Clay to Clay	37.602	0.921	2.411	0.932	1.478	2.7	0.8215	0.85	0.616							0.92	1		284.32	284.32
40.354	4	Silty Clay to Clay	34.344	0.909	2.44	0.948	1.493	2.71	0.8169	0.85	0.614							0.92	1		284.15	284.15
40.846	4	Silty Clay to Clay	36.116	0.994	2.47	0.963	1.507	2.67	0.8127	0.84	0.613							0.92	1		296.05	296.05
41.338	4	Silty Clay to Clay	37.726	0.921	2.5	0.978	1.521	2.65	0.8085	0.84	0.611							0.92	1		303.73	303.73
41.831	4	Silty Clay to Clay	36.446	1.09	2.53	0.994	1.536	2.7	0.8041	0.83	0.609							0.92	1		292.96	292.96
42.323	4	Silty Clay to Clay	31.629	0.789	2.559	1.009	1.55	2.72	0.8	0.83	0.607							0.92	1		274.42	274.42
42.815	4	Silty Clay to Clay	31.436	0.803	2.589	1.025	1.565	2.7	0.7957	0.83	0.605							0.91	1		283.43	283.43
43.307	4	Silty Clay to Clay	39.116	1.236	2.619	1.04	1.579	2.68	0.7917	0.82	0.603							0.91	1		313.53	313.53
43.799	4	Silty Clay to Clay	42.254	1.706	2.649	1.055	1.593	2.74	0.7877	0.82	0.601							0.91	1		320.55	320.55
44.291	4	Silty Clay to Clay	39.516	1.279	2.678	1.071	1.608	2.76	0.7835	0.81	0.599							0.91	1		304.13	304.13
44.783	4	Silty Clay to Clay	36.253	1.078	2.708	1.086	1.622	2.75	0.7796	0.81	0.596							0.91	1		296.84	296.84
45.275	4	Silty Clay to Clay	36.804	1.24	2.738	1.101	1.636	2.79	0.7757	0.80	0.594							0.91	1		284.73	284.73
45.768	4	Silty Clay to Clay	19.544	0.608	2.768	1.117	1.651	3.01	0.7717	0.80	0.592							0.90	1		206.94	206.94
46.26	3	Clay	10.433	0.335	2.797	1.132	1.665	3.26	0.7679	0.79	0.589							0.90	1		144.51	144.51
46.752	4	Silty Clay to Clay	11.259	0.205	2.827	1.147	1.68	3.21	0.7639	0.79	0.586							0.90	1		140.71	140.71
47.244	4	Silty Clay to Clay	12.828	0.312	2.857	1.163	1.694	3.17	0.7602	0.78	0.584							0.90	1		149.90	149.90
47.736	4	Silty Clay to Clay	13.791	0.278	2.887	1.178	1.708	3.05	0.7565	0.78	0.581							0.90	1		169.22	169.22
48.228	4	Silty Clay to Clay	22.27	0.475	2.916	1.194	1.723	2.92	0.7527	0.77	0.578							0.90	1		207.91	207.91
48.72	4	Silty Clay to Clay	26.647	0.933	2.946	1.209	1.737	2.81	0.7491	0.77	0.576							0.90	1		272.81	272.81
49.212	5	Clayey Silt to Silty Clay	57.147	1.248	2.976	1.224	1.752	2.61	0.7453	0.76	0.573							0.89	1		365.61	365.61
49.705	5	Clayey Silt to Silty Clay	73.47	1.685	3.006	1.24	1.766	2.38	0.7417	0.76	0.570	2.380	0.74	54.50	2.233	121.666	0.25	0.89	1	(0.48)	222.15	124.95
50.197	5	Clayey Silt to Silty Clay	54.449	0.876	3.035	1.255	1.78	2.4	0.7383	0.75	0.567	2.400	0.74	40.20	2.312	92.951	0.15	0.89	1	(0.30)	216.77	99.58

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project*** *FAULT INFO*
PROJECT NO. ***2017-125-GEO*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-93*** *FAULT* M_w = 6.9 *MSF* = 1.24 a_{max} *(g)*= 0.682 V_{S30m}(m/s)= #REF! 219.3

		CPT RESULT INPUT							***CSR***		***$CRR_{7.5}$***						***F.S.=($CRR_{7.5}$/CSR)*MSF*Kσ*Kα***				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
50.689	4	Silty Clay to Clay	26.165	0.527	3.065	1.27	1.795	2.82	0.7346	0.75	0.564							0.89	1		248.47	248.47
51.181	4	Silty Clay to Clay	25.903	0.571	3.095	1.286	1.809	2.88	0.7311	0.74	0.562							0.89	1		232.88	232.88
51.673	4	Silty Clay to Clay	24.155	0.569	3.125	1.301	1.824	2.91	0.7275	0.74	0.559							0.89	1		226.98	226.98
52.165	4	Silty Clay to Clay	23.426	0.556	3.154	1.316	1.838	2.94	0.7242	0.73	0.556							0.89	1		220.69	220.69
52.657	4	Silty Clay to Clay	19.187	0.469	3.184	1.332	1.852	3.05	0.7208	0.73	0.553							0.88	1		193.84	193.84
53.149	4	Silty Clay to Clay	14.624	0.334	3.214	1.347	1.867	3.15	0.7173	0.72	0.550							0.88	1		168.12	168.12
53.642	4	Silty Clay to Clay	15.057	0.393	3.244	1.363	1.881	3.14	0.7141	0.72	0.548							0.88	1		174.63	174.63
54.134	4	Silty Clay to Clay	17.673	0.41	3.274	1.378	1.896	3.08	0.7106	0.71	0.545							0.88	1		183.29	183.29
54.626	4	Silty Clay to Clay	16.621	0.302	3.303	1.393	1.91	3.04	0.7074	0.71	0.542							0.88	1		183.41	183.41
55.118	4	Silty Clay to Clay	18.526	0.36	3.333	1.409	1.924	3.01	0.7042	0.70	0.539							0.88	1		194.19	194.19
55.61	4	Silty Clay to Clay	20.26	0.407	3.363	1.424	1.939	2.95	0.7009	0.70	0.536							0.88	1		209.69	209.69
56.102	5	Clayey Silt to Silty Clay	34.079	0.926	3.393	1.439	1.953	2.7	0.6977	0.69	0.534							0.87	1		339.47	339.47
56.594	5	Clayey Silt to Silty Clay	135.96	3.375	3.422	1.455	1.968	2.28	0.6944	0.69	0.531	2.280	0.69	94.41	1.886	178.082		0.86	1		241.11	241.11
57.086	5	Clayey Silt to Silty Clay	78.976	1.337	3.452	1.47	1.982	2.34	0.6914	0.68	0.528	2.340	0.69	54.60	2.084	113.780	0.22	0.87	1	(0.44)	233.43	124.95
57.579	5	Clayey Silt to Silty Clay	39.632	1.002	3.482	1.486	1.996	2.72	0.6884	0.68	0.526							0.87	1		332.45	332.45
58.071	5	Clayey Silt to Silty Clay	71.351	2.001	3.512	1.501	2.011	2.63	0.6851	0.68	0.523							0.87	1		412.26	412.26
58.563	4	Silty Clay to Clay	63.533	2.11	3.541	1.516	2.025	2.7	0.6822	0.67	0.520							0.87	1		395.05	395.05
59.055	4	Silty Clay to Clay	41.387	1.079	3.571	1.532	2.04	2.76	0.679	0.67	0.518							0.87	1		328.12	328.12
59.547	5	Clayey Silt to Silty Clay	40.038	1.086	3.601	1.547	2.054	2.72	0.6761	0.66	0.515							0.87	1		329.52	329.52
60.039	4	Silty Clay to Clay	41.649	1.376	3.631	1.562	2.068	2.79	0.6732	0.66	0.513							0.86	1		330.39	330.39
60.531	4	Silty Clay to Clay	35.125	1.528	3.66	1.578	2.083	2.96	0.6701	0.65	0.510							0.86	1		281.79	281.79
61.023	4	Silty Clay to Clay	26.316	0.776	3.69	1.593	2.097	3	0.6673	0.65	0.508							0.86	1		245.85	245.85
61.516	4	Silty Clay to Clay	30.06	0.924	3.72	1.608	2.111	2.89	0.6645	0.65	0.506							0.86	1		265.07	265.07
62.008	4	Silty Clay to Clay	23.508	0.579	3.75	1.624	2.126	2.9	0.6615	0.64	0.503							0.86	1		245.44	245.44
62.5	4	Silty Clay to Clay	19.902	0.445	3.779	1.639	2.14	3.08	0.6587	0.64	0.501							0.86	1		199.97	199.97
62.992	4	Silty Clay to Clay	15.918	0.388	3.809	1.655	2.155	3.18	0.6557	0.64	0.498							0.86	1		180.21	180.21
63.484	4	Silty Clay to Clay	16.764	0.326	3.839	1.67	2.169	3.14	0.653	0.63	0.496							0.86	1		181.51	181.51
63.976	4	Silty Clay to Clay	17.975	0.331	3.869	1.685	2.183	3.06	0.6503	0.63	0.494							0.86	1		190.65	190.65
64.468	4	Silty Clay to Clay	19.021	0.218	3.898	1.701	2.198	2.98	0.6474	0.63	0.492							0.85	1		196.40	196.40
64.96	4	Silty Clay to Clay	19.09	0.23	3.928	1.716	2.212	2.96	0.6448	0.62	0.490							0.85	1		201.43	201.43
65.453	4	Silty Clay to Clay	21.636	0.385	3.958	1.731	2.227	2.98	0.642	0.62	0.488							0.85	1		208.23	208.23
65.945	4	Silty Clay to Clay	19.269	0.307	3.988	1.747	2.241	3.01	0.6393	0.62	0.486							0.85	1		203.06	203.06
66.437	4	Silty Clay to Clay	20.15	0.344	4.018	1.762	2.255	3.01	0.6368	0.61	0.484							0.85	1		211.84	211.84
66.929	4	Silty Clay to Clay	24.169	0.595	4.047	1.777	2.27	3	0.634	0.61	0.482							0.85	1		228.58	228.58
67.421	4	Silty Clay to Clay	23.24	0.558	4.077	1.793	2.284	3.01	0.6315	0.61	0.480							0.85	1		227.67	227.67
67.913	4	Silty Clay to Clay	24.444	0.72	4.107	1.808	2.299	3.06	0.6288	0.60	0.478							0.85	1		232.71	232.71
68.405	4	Silty Clay to Clay	27.665	0.944	4.137	1.824	2.313	3.09	0.6262	0.60	0.476							0.85	1		241.06	241.06
68.897	4	Silty Clay to Clay	19.655	0.657	4.166	1.839	2.327	3.14	0.6238	0.60	0.475							0.84	1		215.47	215.47
69.39	4	Silty Clay to Clay	19.716	0.399	4.196	1.854	2.342	3.07	0.6211	0.60	0.473							0.84	1		204.71	204.71
69.882	4	Silty Clay to Clay	21.003	0.403	4.226	1.87	2.356	3.04	0.6187	0.59	0.471							0.84	1		212.55	212.55
70.374	4	Silty Clay to Clay	23.288	0.442	4.256	1.885	2.371	3.01	0.6161	0.59	0.469							0.84	1		217.44	217.44
70.866	4	Silty Clay to Clay	19.985	0.285	4.285	1.9	2.385	2.99	0.6137	0.59	0.468							0.84	1		211.44	211.44
71.358	5	Clayey Silt to Silty Clay	20.398	0.289	4.315	1.916	2.399	2.97	0.6113	0.58	0.466							0.84	1		213.00	213.00
71.85	4	Silty Clay to Clay	22.187	0.349	4.345	1.931	2.414	2.99	0.6087	0.58	0.465							0.84	1		221.29	221.29
72.342	4	Silty Clay to Clay	24.719	0.452	4.375	1.946	2.428	2.99	0.6064	0.58	0.463							0.84	1		230.93	230.93
72.834	4	Silty Clay to Clay	25.022	0.652	4.404	1.962	2.443	3.02	0.6039	0.58	0.462							0.84	1		241.37	241.37
73.327	4	Silty Clay to Clay	27.665	1.031	4.434	1.977	2.457	3.09	0.6016	0.58	0.460							0.84	1		246.09	246.09
73.819	4	Silty Clay to Clay	24.871	0.775	4.464	1.993	2.471	3.08	0.5993	0.57	0.459							0.83	1		237.45	237.45
74.311	5	Clayey Silt to Silty Clay	25.187	0.433	4.494	2.008	2.486	2.93	0.5969	0.57	0.457							0.83	1		246.66	246.66
74.803	5	Clayey Silt to Silty Clay	32.62	0.431	4.523	2.023	2.5	2.8	0.5946	0.57	0.456							0.83	1		270.98	270.98
75.295	5	Clayey Silt to Silty Clay	31.749	0.419	4.553	2.039	2.515	2.79	0.5922	0.57	0.455							0.83	1		279.43	279.43
75.787	5	Clayey Silt to Silty Clay	34.134	0.732	4.583	2.054	2.529	2.83	0.59	0.56	0.453							0.83	1		289.11	289.11
76.279	5	Clayey Silt to Silty Clay	34.051	0.719	4.613	2.069	2.543	2.85	0.5878	0.56	0.452							0.83	1		291.82	291.82
76.771	5	Clayey Silt to Silty Clay	35.235	0.867	4.642	2.085	2.558	2.85	0.5854	0.56	0.451							0.83	1		300.24	300.24
77.264	5	Clayey Silt to Silty Clay	39.584	0.888	4.672	2.1	2.572	2.82	0.5832	0.56	0.450							0.83	1		308.12	308.12
77.756	5	Clayey Silt to Silty Clay	32.317	0.579	4.702	2.115	2.586	2.85	0.5811	0.56	0.448							0.83	1		281.63	281.63
78.248	5	Clayey Silt to Silty Clay	28.023	0.433	4.732	2.131	2.601	2.88	0.5788	0.55	0.447							0.83	1		261.13	261.13
78.74	5	Clayey Silt to Silty Clay	29.922	0.463	4.762	2.146	2.615	2.83	0.5767	0.55	0.446							0.83	1		274.38	274.38
79.232	5	Clayey Silt to Silty Clay	31.354	0.554	4.791	2.162	2.63	2.84	0.5744	0.55	0.445							0.82	1		282.08	282.08
79.724	5	Clayey Silt to Silty Clay	32.675	0.936	4.821	2.177	2.644	2.82	0.5723	0.55	0.444							0.82	1		323.56	323.56
80.216	5	Clayey Silt to Silty Clay	125.14	2.005	4.851	2.192	2.658	2.54	0.5702	0.55	0.443	2.540	0.57	71.36	2.979	212.578		0.82	1		247.13	247.13
80.708	5	Clayey Silt to Silty Clay	35.731	0.926	4.881	2.208	2.673	2.78	0.568	0.55	0.442							0.82	1		334.23	334.23
81.201	4	Silty Clay to Clay	26.096	0.557	4.91	2.223	2.687	3.05	0.566	0.54	0.441							0.82	1		235.49	235.49
81.693	4	Silty Clay to Clay	21	0.288	4.94	2.238	2.702	3.06	0.5638	0.54	0.440							0.82	1		213.56	213.56
82.185	5	Clayey Silt to Silty Clay	24.747	0.291	4.97	2.254	2.716	2.93	0.5618	0.54	0.439							0.82	1		234.63	234.63
82.677	5	Clayey Silt to Silty Clay	28.105	0.393	5	2.269	2.73	2.87	0.5598	0.54	0.438							0.82	1		255.21	255.21
83.169	5	Clayey Silt to Silty Clay	28.16	0.419	5.029	2.285	2.745	2.85	0.5577	0.54	0.437							0.82	1		262.76	262.76
83.661	5	Clayey Silt to Silty Clay	36.061	0.594	5.059	2.3	2.759	2.8	0.5557	0.54	0.436							0.82	1		296.08	296.08
84.153	5	Clayey Silt to Silty Clay	54.587	1.051	5.089	2.315	2.774	2.8	0.5536	0.53	0.435							0.82	1		326.82	326.82
84.645	4	Silty Clay to Clay	27.637	0.724	5.119	2.331	2.788	2.98	0.5517	0.53	0.434							0.81	1		272.30	272.30
85.138	4	Silty Clay to Clay	25.676	0.517	5.148	2.346	2.802	3.03	0.5497	0.53	0.433							0.81	1		245.45	245.45
85.63	4	Silty Clay to Clay	30.583	0.537	5.178	2.361	2.817	2.99	0.5477	0.53	0.432							0.81	1		255.00	255.00
86.122	5	Clayey Silt to Silty Clay	35.73	0.62	5.208	2.377	2.831	2.87	0.5458	0.53	0.432							0.81	1		304.70	304.70
86.614	5	Clayey Silt to Silty Clay	49.521	1.118	5.238	2.392	2.846	2.7	0.5437	0.53	0.431							0.81	1		386.93	386.93
87.106	5	Clayey Silt to Silty Clay	58.138	1.25	5.267	2.407	2.86	2.77	0.5419	0.53	0.430							0.81	1		363.67	363.67
87.598	4	Silty Clay to Clay	23.288	0.568	5.297	2.423	2.874	3.11	0.54	0.53	0.429							0.81	1		245.73	245.73
88.09	4	Silty Clay to Clay	24.307	0.536	5.327	2.438	2.889	3.08	0.538	0.52	0.428							0.81	1		236.32	236.32
88.582	4	Silty Clay to Clay	24.775	0.535	5.357	2.454	2.903	3.08	0.5362	0.52	0.428							0.81	1		238.09	238.09
89.075	4	Silty Clay to Clay	24.417	0.582	5.386	2.469	2.918	3.12	0.5342	0.52	0.427							0.81	1		238.28	238.28
89.567	4	Silty Clay to Clay	35.194	0.871	5.416	2.484	2.932	2.96	0.5324	0.52	0.426							0.81	1		282.15	282.15
90.059	5	Clayey Silt to Silty Clay	23.536	0.569	5.446	2.5	2.946	2.98	0.5306	0.52	0.425							0.81	1		263.28	263.28
90.551	4	Silty Clay to Clay	23.804	0.447	5.476	2.515	2.961	3.09	0.5287	0.52	0.425							0.80	1		231.07	231.07
91.043	4	Silty Clay to Clay	27.83	0.513	5.505	2.53	2.975	3.03	0.5269	0.52	0.424							0.80	1		248.23	248.23
91.535	4	Silty Clay to Clay	29.234	0.76	5.535	2.546	2.99	3.07	0.5251	0.52	0.423							0.80	1		260.84	260.84
92.027	4	Silty Clay to Clay	30.06	1.142	5.565	2.561	3.004	3.14	0.5233	0.51	0.423							0.80	1		261.99	261.99
92.519	4	Silty Clay to Clay	27.527	0.764	5.595	2.576	3.018	3.14	0.5216	0.51	0.422							0.80	1		253.95	253.95
93.012	4	Silty Clay to Clay	27.61	0.844	5.625	2.592	3.033	3.15	0.5197	0.51	0.421							0.80	1		247.98	247.98
93.504	4	Silty Clay to Clay	25.989	0.828	5.654	2.607	3.047	3.18	0.518	0.51	0.421							0.80	1		242.75	242.75
93.996	4	Silty Clay to Clay	25.594	0.767	5.684	2.623	3.062	3.18	0.5162	0.51	0.420							0.80	1		240.19	240.19
94.488	4	Silty Clay to Clay	25.648	0.776	5.714	2.638	3.076	3.17	0.5145	0.51	0.419							0.80	1		242.78	242.78
94.98	4	Silty Clay to Clay	31.987	0.863	5.744	2.653	3.09	3.13	0.5128	0.51	0.419							0.80	1		257.87	257.87
95.472	4	Silty Clay to Clay	22.71	0.619	5.773	2.669	3.105	3.2	0.511	0.51	0.418							0.80	1		229.99	229.99
95.964	4	Silty Clay to Clay	20.645	0.379	5.803	2.684	3.119	3.21	0.5094	0.51	0.418							0.80	1		216.21	216.21
96.456	4	Silty Clay to Clay	37.988	0.873	5.833	2.699	3.133	3.02	0.5077	0.51	0.417							0.80	1		282.50	282.50
96.949	5	Clayey Silt to Silty Clay	41.346	1.318	5.863	2.715	3.148	2.87	0.506	0.50	0.416							0.80	1		362.02	362.02
97.441	4	Silty Clay to Clay	70.387	3.22	5.892	2.73	3.162	2.79	0.5044	0.50	0.416							0.79	1		457.59	457.59
97.933	4	Silty Clay to Clay	80.049	3.106	5.922	2.745	3.177	2.8	0.5026	0.50	0.415							0.79	1		462.78	462.78
98.425	4	Silty Clay to Clay	62.267	1.695	5.952	2.761	3.191	2.89	0.501	0.50	0.415							0.79	1		384.56	384.56
98.917	4	Silty Clay to Clay	41.291	1.4	5.982	2.776	3.205	2.99	0.4994	0.50	0.414							0.79	1		333.88	333.88
99.409	5	Clayey Silt to Silty Clay	52.282	1.508	6.011	2.792	3.22	2.88	0.4977	0.50	0.413							0.79	1		368.60	368.60
99.901	4	Silty Clay to Clay	56.211	2.106	6.041	2.807	3.234	2.88	0.4962	0.50	0.413							0.79	1		401.99	401.99
100.39	4	Silty Clay to Clay	61.551	1.963	6.071	2.822	3.249	2.85	0.4945	0.50	0.412							0.79	1		417.53	417.53
100.89	5	Clayey Silt to Silty Clay	79.912	1.668	6.101	2.838	3.263	2.64	0.4929	0.50	0.412							0.79	1		485.26	485.26
101.38	5	Clayey Silt to Silty Clay	99.043	2.988	6.13	2.853	3.277	2.62	0.4914	0.50	0.411							0.79	1		557.91	557.91
101.87	8	Sand to Silty Sand	101.63	4.015	6.16	2.868	3.292	2.69	0.4898	0.50	0.411							0.79	1		581.83	581.83
102.36	9	Sand	107.36	4.803	6.19	2.884	3.306	2.72	0.4882	0.49	0.410							0.79	1		592.41	592.41

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project*** *FAULT INFO*
PROJECT NO. ***2017-125-GEO*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-93*** *FAULT* M_w = 6.9 *MSF* = 1.24 a_{max} *(g)*= 0.682 V_{S30m}(m/s)= #REF! 219.3

		CPT RESULT INPUT							***CSR***		***CRR*** $_{7.5}$						***F.S.=(CRR*** $_{7.5}$ ***/CSR)*MSF*K*** σ ****K*** α				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
102.85	8	Sand to Silty Sand	133.01	5.341	6.22	2.899	3.321	2.65	0.4866	0.49	0.410							0.79	1		650.31	650.31
103.35	9	Sand	80.545	4.986	6.249	2.914	3.335	2.78	0.4851	0.49	0.409							0.79	1		543.04	543.04
103.84	4	Silty Clay to Clay	56.579	1.999	6.279	2.93	3.349	2.94	0.4836	0.49	0.409							0.79	1		394.03	394.03
104.33	4	Silty Clay to Clay	60.092	2.213	6.309	2.945	3.364	2.84	0.482	0.49	0.408							0.78	1		432.78	432.78
104.82	5	Clayey Silt to Silty Clay	85.197	2.337	6.339	2.961	3.378	2.77	0.4806	0.49	0.408							0.78	1		458.24	458.24
105.32	5	Clayey Silt to Silty Clay	57.157	1.383	6.369	2.976	3.393	2.79	0.479	0.49	0.407							0.78	1		410.15	410.15
105.81	5	Clayey Silt to Silty Clay	58.991	1.895	6.398	2.991	3.407	2.86	0.4775	0.49	0.407							0.78	1		384.74	384.74
106.3	4	Silty Clay to Clay	38.483	0.933	6.428	3.007	3.421	2.98	0.4761	0.49	0.406							0.78	1		316.71	316.71
106.79	5	Clayey Silt to Silty Clay	36.296	0.651	6.458	3.022	3.436	2.97	0.4745	0.49	0.406							0.78	1		292.17	292.17
107.28	5	Clayey Silt to Silty Clay	35.992	0.681	6.488	3.037	3.45	2.99	0.4731	0.49	0.406							0.78	1		291.54	291.54
107.78	5	Clayey Silt to Silty Clay	35.732	0.675	6.517	3.053	3.465	3	0.4716	0.49	0.405							0.78	1		290.15	290.15
108.27	5	Clayey Silt to Silty Clay	36.336	0.684	6.547	3.068	3.479	2.99	0.4702	0.48	0.405							0.78	1		290.24	290.24
108.76	5	Clayey Silt to Silty Clay	36.088	0.715	6.577	3.083	3.493	3.01	0.4688	0.48	0.404							0.78	1		294.94	294.94
109.25	4	Silty Clay to Clay	38.407	1.13	6.607	3.099	3.508	3.04	0.4673	0.48	0.404							0.78	1		302.90	302.90
109.74	4	Silty Clay to Clay	38.081	0.986	6.636	3.114	3.522	3.04	0.4659	0.48	0.403							0.78	1		303.50	303.50
110.24	5	Clayey Silt to Silty Clay	39.474	0.832	6.666	3.13	3.537	2.98	0.4644	0.48	0.403							0.78	1		308.84	308.84
110.73	5	Clayey Silt to Silty Clay	38.951	0.781	6.696	3.145	3.551	2.97	0.4631	0.48	0.402							0.78	1		309.39	309.39
111.22	4	Silty Clay to Clay	36.253	0.868	6.726	3.16	3.565	3.03	0.4617	0.48	0.402							0.78	1		298.46	298.46
111.71	4	Silty Clay to Clay	32.84	0.885	6.755	3.176	3.58	3.11	0.4603	0.48	0.401							0.77	1		279.43	279.43
112.2	4	Silty Clay to Clay	29.619	0.739	6.785	3.191	3.594	3.14	0.4589	0.48	0.401							0.77	1		265.30	265.30
112.7	4	Silty Clay to Clay	30.087	0.705	6.815	3.206	3.608	3.13	0.4576	0.48	0.401							0.77	1		265.49	265.49
113.19	4	Silty Clay to Clay	29.929	0.681	6.845	3.222	3.623	3.1	0.4561	0.48	0.400							0.77	1		269.71	269.71
113.68	4	Silty Clay to Clay	33.391	0.688	6.874	3.237	3.637	3.06	0.4548	0.48	0.400							0.77	1		284.06	284.06
114.17	5	Clayey Silt to Silty Clay	37.134	0.9	6.904	3.253	3.652	3.03	0.4534	0.48	0.399							0.77	1		303.16	303.16
114.67	5	Clayey Silt to Silty Clay	40.024	0.925	6.934	3.268	3.666	3	0.4521	0.48	0.399							0.77	1		310.67	310.67
115.16	4	Silty Clay to Clay	33.583	0.807	6.964	3.283	3.68	3.06	0.4508	0.48	0.399							0.77	1		290.86	290.86
115.65	4	Silty Clay to Clay	32.028	0.814	6.993	3.299	3.695	3.12	0.4494	0.47	0.398							0.77	1		278.54	278.54
116.14	4	Silty Clay to Clay	32.303	0.921	7.023	3.314	3.709	3.14	0.4482	0.47	0.398							0.77	1		278.11	278.11
116.63	4	Silty Clay to Clay	31.546	0.95	7.053	3.329	3.724	3.17	0.4468	0.47	0.397							0.77	1		276.06	276.06
117.13	4	Silty Clay to Clay	31.326	0.982	7.083	3.345	3.738	3.18	0.4455	0.47	0.397							0.77	1		273.04	273.04
117.62	4	Silty Clay to Clay	30.5	0.716	7.112	3.36	3.752	3.15	0.4443	0.47	0.397							0.77	1		270.14	270.14
118.11	4	Silty Clay to Clay	30.858	0.751	7.142	3.375	3.767	3.13	0.4429	0.47	0.396							0.77	1		273.85	273.85
118.6	4	Silty Clay to Clay	32.675	0.88	7.172	3.391	3.781	3.15	0.4417	0.47	0.396							0.77	1		276.45	276.45
119.09	4	Silty Clay to Clay	30.555	0.865	7.202	3.406	3.796	3.18	0.4404	0.47	0.395							0.77	1		271.66	271.66
119.59	4	Silty Clay to Clay	30.748	0.936	7.232	3.422	3.81	3.21	0.4391	0.47	0.395							0.77	1		270.60	270.60
120.08	4	Silty Clay to Clay	27.279	0.983	7.261	3.437	3.824	3.28	0.4379	0.47	0.395							0.76	1		257.87	257.87

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project*** *FAULT INFO*
PROJECT NO. ***2017-125-GEO*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-94*** *FAULT* M_w = 6.9 *MSF* = 1.24 a_{max} *(g)*= 0.682 V_{S30m}(m/s)= #REF! 186.7

			CPT RESULT INPUT							***CSR***		***CRR*** $_{7.5}$						***F.S.=(CRR*** $_{7.5}$***/CSR)*MSF*K*** σ****K*** α				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
0.492			-9999	-9999	0.03	0.015	0.014		1.7	1.00	0.950							1.00			0.00	0.00
0.984			-9999	-9999	0.059	0.031	0.029		1.7	1.00	0.902							1.00			0.00	0.00
1.476			-9999	-9999	0.089	0.046	0.043		1.7	1.00	0.916							1.00			0.00	0.00
1.968			-9999	-9999	0.119	0.061	0.058		1.7	1.00	0.907							1.00			0.00	0.00
2.461			-9999	-9999	0.149	0.077	0.072		1.7	1.00	0.914							1.00			0.00	0.00
2.953			-9999	-9999	0.178	0.092	0.086		1.7	1.00	0.913							1.00			0.00	0.00
3.445			-9999	-9999	0.208	0.108	0.101		1.691	0.99	0.907							1.00			0.00	0.00
3.937			-9999	-9999	0.238	0.123	0.115		1.673	0.99	0.911										0.00	0.00
4.429			-9999	-9999	0.268	0.138	0.129		1.6554	0.99	0.913										0.00	0.00
4.921			-9999	-9999	0.297	0.154	0.144		1.6369	0.99	0.906										0.00	0.00
5.413	3	Clay	5.498	0.126	0.327	0.169	0.158	2.62	1.62	0.99	0.908										92.05	92.05
5.906	3	Clay	5.356	0.122	0.357	0.184	0.173	2.65	1.6023	0.99	0.904										87.99	87.99
6.398	3	Clay	5.753	0.105	0.387	0.2	0.187	2.63	1.5862	0.99	0.906										93.21	93.21
6.89	3	Clay	6.001	0.111	0.416	0.215	0.201	2.62	1.5703	0.99	0.905										95.19	95.19
7.382	3	Clay	5.65	0.128	0.446	0.23	0.216	2.69	1.5537	0.98	0.901							1.00	0		92.20	92.20
7.874	3	Clay	7.597	0.159	0.476	0.246	0.23	2.6	1.5385	0.98	0.903							1.00	1		94.83	94.83
8.366	3	Clay	8.093	0.161	0.506	0.261	0.245	2.58	1.5225	0.98	0.900	2.580	1.52	12.32	3.206	39.508	0.08	1.00	1	(0.11)	97.70	75.40
8.858	3	Clay	7.57	0.214	0.535	0.277	0.259	2.68	1.5079	0.98	0.899							1.00	1		109.53	109.53
9.35	3	Clay	7.226	0.182	0.565	0.292	0.273	2.69	1.4936	0.98	0.900							1.00	1		107.81	107.81
9.843	3	Clay	7.322	0.155	0.595	0.307	0.288	2.68	1.4785	0.98	0.897							1.00	1		107.05	107.05
10.335	3	Clay	8.974	0.196	0.625	0.323	0.302	2.64	1.4647	0.98	0.898							1.00	1		121.10	121.10
10.827	3	Clay	10.295	0.246	0.654	0.338	0.316	2.6	1.4512	0.98	0.897							1.00	1		108.47	108.47
11.319	4	Silty Clay to Clay	15.69	0.356	0.684	0.353	0.331	2.46	1.437	0.98	0.894	2.460	1.44	22.55	2.574	58.040	0.10	1.00	1	(0.14)	117.41	117.41
11.811	4	Silty Clay to Clay	34.106	0.797	0.714	0.369	0.345	2.31	1.4239	0.98	0.895	2.310	1.42	48.57	1.981	96.219	0.16	1.00	1	(0.23)	126.88	126.88
12.303	4	Silty Clay to Clay	22.049	0.781	0.744	0.384	0.36	2.36	1.4103	0.97	0.893	2.360	1.41	31.09	2.156	67.053	0.11	1.00	1	(0.15)	127.42	127.42
12.795	4	Silty Clay to Clay	39.859	0.694	0.773	0.399	0.374	2.27	1.3977	0.97	0.892	2.270	1.40	55.71	1.856	103.405	0.18	1.00	1	(0.25)	130.37	130.37
13.287	4	Silty Clay to Clay	17.562	0.476	0.803	0.415	0.388	2.38	1.3854	0.97	0.892	2.380	1.39	24.33	2.233	54.319	0.09	1.00	1	(0.13)	126.32	124.95
13.78	4	Silty Clay to Clay	16.688	0.485	0.833	0.43	0.403	2.52	1.3724	0.97	0.890	2.520	1.37	22.90	2.872	65.769	0.11	1.00	1	(0.15)	124.57	116.42
14.272	4	Silty Clay to Clay	26.398	0.923	0.863	0.446	0.417	2.45	1.3605	0.97	0.890	2.450	1.36	35.92	2.528	90.803	0.15	1.00	1	(0.21)	132.04	132.04
14.764	5	Clayey Silt to Silty Clay	45.53	0.842	0.892	0.461	0.432	2.23	1.348	0.97	0.887	2.230	1.35	61.38	1.743	107.007	0.19	1.00	1	(0.27)	141.28	141.28
15.256	5	Clayey Silt to Silty Clay	60.284	1.02	0.922	0.476	0.446	2.08	1.3366	0.97	0.887	2.080	1.34	80.57	1.420	114.387	0.22	1.00	1	(0.31)	147.74	147.74
15.748	5	Clayey Silt to Silty Clay	61.633	1.003	0.952	0.492	0.46	2.11	1.3253	0.97	0.887	2.110	1.33	81.68	1.473	120.331	0.24	1.00	1	(0.34)	148.84	148.84
16.24	4	Silty Clay to Clay	38.786	1.012	0.982	0.507	0.475	2.3	1.3134	0.97	0.885	2.300	1.31	50.94	1.949	99.274	0.17	1.00	1	(0.24)	142.73	142.73
16.732	4	Silty Clay to Clay	23.426	0.449	1.011	0.522	0.489	2.51	1.3025	0.96	0.884	2.510	1.30	30.51	2.820	86.033	0.14	1.00	1	(0.19)	133.00	107.96
17.224	3	Clay	10.928	0.285	1.041	0.538	0.503	2.73	1.2918	0.96	0.884							1.00	1		145.23	145.23
17.717	3	Clay	10.295	0.364	1.071	0.553	0.518	2.88	1.2806	0.96	0.882							1.00	1		131.11	131.11
18.209	3	Clay	9.937	0.393	1.101	0.568	0.532	2.9	1.2702	0.96	0.882							1.00	1		132.47	132.47
18.701	3	Clay	13.653	0.531	1.13	0.584	0.547	2.84	1.2593	0.96	0.879							1.00	1		152.23	152.23
19.193	3	Clay	15.181	0.596	1.16	0.599	0.561	2.8	1.2493	0.96	0.879							1.00	1		169.12	169.12
19.685	3	Clay	17.232	0.807	1.19	0.615	0.575	2.8	1.2394	0.96	0.879							1.00	1		179.34	179.34
20.177	3	Clay	14.314	0.87	1.22	0.63	0.59	2.87	1.2291	0.96	0.877							1.00	1		171.16	171.16
20.669	3	Clay	14.348	0.733	1.249	0.645	0.604	2.87	1.2195	0.96	0.876							1.00	1		168.83	168.83
21.161	3	Clay	17.535	0.818	1.279	0.661	0.619	2.84	1.2095	0.95	0.874							1.00	1		179.75	179.75
21.654	3	Clay	16.516	0.845	1.309	0.676	0.633	2.88	1.2002	0.95	0.873							1.00	1		175.09	175.09
22.146	3	Clay	15.442	0.783	1.339	0.691	0.647	2.92	1.1911	0.95	0.872							1.00	1		165.55	165.55
22.638	3	Clay	12.745	0.663	1.368	0.707	0.662	2.97	1.1815	0.95	0.870							1.00	1		151.88	151.88
23.13	3	Clay	11.42	0.501	1.398	0.722	0.676	2.99	1.1727	0.95	0.869							1.00	1		142.29	142.29
23.622	3	Clay	12.47	0.514	1.428	0.737	0.69	2.96	1.164	0.95	0.868							1.00	1		147.62	147.62
24.114	3	Clay	14.231	0.52	1.458	0.753	0.705	2.83	1.1549	0.94	0.866							1.00	1		174.54	174.54
24.606	4	Silty Clay to Clay	36.776	0.925	1.487	0.768	0.719	2.6	1.1464	0.94	0.865							1.00	1		153.07	153.07
25.098	4	Silty Clay to Clay	21.911	0.892	1.517	0.784	0.734	2.69	1.1375	0.94	0.863							1.00	1		227.98	227.98
25.591	3	Clay	15.828	0.582	1.547	0.799	0.748	2.82	1.1294	0.94	0.862							1.00	1		181.41	181.41
26.083	4	Silty Clay to Clay	16.681	0.535	1.577	0.814	0.762	2.78	1.1213	0.94	0.860							1.00	1		184.31	184.31
26.575	4	Silty Clay to Clay	25.435	0.699	1.606	0.83	0.777	2.53	1.1128	0.94	0.858	2.530	1.11	28.30	2.925	82.783	0.13	1.00	1	(0.19)	157.65	107.96
27.067	5	Clayey Silt to Silty Clay	52.604	1.006	1.636	0.845	0.791	2.38	1.105	0.93	0.856	2.380	1.10	58.13	2.233	129.771	0.28	1.00	1	(0.41)	166.24	133.52
27.559	4	Silty Clay to Clay	35.524	1.119	1.666	0.86	0.806	2.47	1.0967	0.93	0.854	2.470	1.10	38.96	2.621	102.125	0.18	1.00	1	(0.26)	163.41	116.42
28.051	4	Silty Clay to Clay	29.096	0.616	1.696	0.876	0.82	2.56	1.0891	0.93	0.852	2.560	1.09	31.69	3.091	97.936	0.17	1.00	1	(0.24)	158.33	91.33
28.543	4	Silty Clay to Clay	21.117	0.633	1.725	0.891	0.834	2.72	1.0816	0.93	0.850							1.00	1		208.03	208.03
29.035	4	Silty Clay to Clay	20.122	0.497	1.755	0.906	0.849	2.73	1.0737	0.93	0.848							1.00	1		199.34	199.34
29.528	4	Silty Clay to Clay	16.406	0.437	1.785	0.922	0.863	2.8	1.0664	0.92	0.846							1.00	1		179.39	179.39
30.02	3	Clay	16.379	0.494	1.815	0.937	0.877	2.85	1.0592	0.92	0.844							1.00	1		178.13	178.13
30.512	3	Clay	17.48	0.584	1.844	0.953	0.892	2.86	1.0516	0.92	0.841							1.00	1		181.30	181.30
31.004	3	Clay	16.681	0.519	1.874	0.968	0.906	2.86	1.0446	0.92	0.839							1.00	1		179.67	179.67
31.496	3	Clay	16.709	0.574	1.904	0.983	0.921	2.87	1.0372	0.91	0.836							1.00	1		180.60	180.60
31.988	4	Silty Clay to Clay	17.507	0.488	1.934	0.999	0.935	2.83	1.0304	0.91	0.834							1.00	1		184.21	184.21
32.48	4	Silty Clay to Clay	18.085	0.522	1.963	1.014	0.949	2.84	1.0237	0.91	0.832							1.00	1		187.32	187.32
32.972	3	Clay	16.991	0.652	1.993	1.029	0.964	2.9	1.0166	0.90	0.828							1.00	1		184.19	184.19
33.465	3	Clay	17.043	0.626	2.023	1.045	0.978	2.93	1.0101	0.90	0.826							1.00	1		181.91	181.91
33.957	3	Clay	17.92	0.681	2.053	1.06	0.993	2.93	1.0032	0.90	0.823							1.00	1		183.67	183.67
34.449	3	Clay	16.681	0.539	2.082	1.075	1.007	2.92	0.9968	0.89	0.820							1.00	1		180.35	180.35
34.941	4	Silty Clay to Clay	16.626	0.533	2.112	1.091	1.021	2.88	0.9905	0.89	0.817							1.00	1		185.16	185.16
35.433	4	Silty Clay to Clay	17.535	0.507	2.142	1.106	1.036	2.85	0.9839	0.89	0.814							0.99	1		190.36	190.36
35.925	4	Silty Clay to Clay	19.241	0.495	2.172	1.122	1.05	2.84	0.9778	0.88	0.811							0.99	1		192.47	192.47
36.417	3	Clay	15.36	0.519	2.201	1.137	1.064	2.94	0.9717	0.88	0.807							0.99	1		178.35	178.35
36.909	3	Clay	14.6	0.684	2.231	1.152	1.079	3.09	0.9653	0.88	0.803							0.98	1		165.13	165.13
37.402	3	Clay	14.785	0.748	2.261	1.168	1.093	3.11	0.9594	0.87	0.800							0.98	1		168.77	168.77
37.894	3	Clay	17.232	0.768	2.291	1.183	1.108	3.06	0.9532	0.87	0.796							0.98	1		178.66	178.66
38.386	3	Clay	17.067	0.874	2.32	1.198	1.122	3.07	0.9475	0.86	0.793							0.98	1		183.56	183.56
38.878	3	Clay	18.801	1.006	2.35	1.214	1.136	3.06	0.9418	0.86	0.789							0.97	1		193.18	193.18
39.37	3	Clay	20.893	1.177	2.38	1.229	1.151	3.04	0.9358	0.86	0.785							0.97	1		202.59	202.59
39.862	3	Clay	20.769	1.13	2.41	1.244	1.165	3.02	0.9302	0.85	0.782							0.97	1		208.71	208.71
40.354	3	Clay	24.526	1.162	2.439	1.26	1.18	2.96	0.9244	0.85	0.777							0.97	1		220.56	220.56
40.846	3	Clay	23.756	1.209	2.469	1.275	1.194	2.97	0.919	0.84	0.773							0.97	1		222.31	222.31
41.339	3	Clay	21.967	1.224	2.499	1.291	1.208	3.04	0.9136	0.84	0.769							0.96	1		208.96	208.96
41.831	3	Clay	16.764	1.006	2.529	1.306	1.223	3.14	0.908	0.83	0.765							0.96	1		183.77	183.77
42.323	3	Clay	14.053	0.86	2.558	1.321	1.237	3.22	0.9027	0.83	0.761							0.96	1		166.75	166.75
42.815	3	Clay	20.095	0.886	2.588	1.337	1.251	3.06	0.8976	0.83	0.757							0.96	1		195.26	195.26
43.307	3	Clay	24.141	1.003	2.618	1.352	1.266	2.92	0.8921	0.82	0.752							0.95	1		227.13	227.13
43.799	4	Silty Clay to Clay	27.197	1.047	2.648	1.367	1.28	2.86	0.8871	0.82	0.748							0.95	1		248.52	248.52
44.291	5	Clayey Silt to Silty Clay	63.313	1.731	2.677	1.383	1.295	2.24	0.8818	0.81	0.743	2.240	0.88	55.83	1.770	98.841	0.17	0.94	1	(0.27)	207.38	176.71
44.783	6	Sandy Silt to Clayey Silt	155.75	1.733	2.707	1.398	1.309	1.94	0.8768	0.81	0.739	1.940	0.88	136.57	1.229	167.840		0.93	1		220.93	220.93
45.276	5	Clayey Silt to Silty Clay	45.447	1.074	2.737	1.414	1.323	2.3	0.872	0.80	0.734	2.300	0.87	39.63	1.949	77.226	0.12	0.95	1	(0.20)	201.76	133.52
45.768	4	Silty Clay to Clay	24.692	0.95	2.767	1.429	1.338	2.9	0.8668	0.80	0.730							0.94	1		231.55	231.55
46.26	3	Clay	18.636	0.787	2.796	1.444	1.352	3.07	0.8621	0.79	0.725							0.94	1		194.44	194.44
46.752	3	Clay	26.631	1.057	2.826	1.46	1.367	2.9	0.857	0.79	0.720							0.94	1		255.79	255.79
47.244	5	Clayey Silt to Silty Clay	58.192	2.202	2.856	1.475	1.381	2.36	0.8524	0.78	0.716	2.360	0.85	49.60	2.156	106.962	0.19	0.94	1	(0.31)	208.96	159.40
47.736	5	Clayey Silt to Silty Clay	124.86	1.358	2.886	1.49	1.395	2.11	0.8478	0.78	0.712	2.110	0.85	105.86	1.473	155.945	0.43	0.92	1	(0.69)	217.43	185.37
48.228	5	Clayey Silt to Silty Clay	39.804	1.671	2.915	1.506	1.41	2.5	0.8429	0.77	0.706	2.500	0.84	33.55	2.768	92.885	0.15	0.93	1	(0.25)	202.89	124.95
48.72	5	Clayey Silt to Silty Clay	89.188	2.823	2.945	1.521	1.424	2.42	0.8384	0.77	0.702	2.420	0.84	74.78	2.396	179.154		0.93	1		213.67	213.67
49.213	5	Clayey Silt to Silty Clay	169.07	3.907	2.975	1.536	1.438	2.15	0.834	0.76	0.698	2.150	0.83	141.00	1.553	218.944		0.90	1		229.31	229.31
49.705	5	Clayey Silt to Silty Clay	149.89	3.451	3.005	1.552	1.453	2.12	0.8292	0.76	0.693	2.120	0.83	124.29	1.492	185.465		0.90	1		227.94	227.94
50.197	5	Clayey Silt to Silty Clay	46.934	1.066	3.034	1.567	1.467	2.44	0.8249	0.75	0.688	2.440	0.82	38.72	2.483	96.136	0.16	0.93	1	(0.27)	206.10	124.95

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project*** *FAULT INFO*
PROJECT NO. ***2017-125-GEO*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-94*** *FAULT* M_w = 6.9 *MSF* = 1.24 a_{max} *(g)*= 0.682 V_{S30m}(m/s)= #REF! 186.7

		CPT RESULT INPUT							***CSR***		***CRR*** $_{7.5}$						***F.S.=(CRR*** $_{7.5}$ ***/CSR)*MSF*K*** σ ****K*** α				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
50.689	3	Clay	26.942	1.553	3.064	1.583	1.482	3.04	0.8203	0.75	0.683							0.92	1		251.31	251.31
51.181	5	Clayey Silt to Silty Clay	165.38	3.754	3.094	1.598	1.496	2.14	0.816	0.74	0.679	2.140	0.82	134.96	1.532	206.749		0.90	1		229.60	229.60
51.673	6	Sandy Silt to Clayey Silt	237.23	1.636	3.124	1.613	1.51	1.76	0.8118	0.74	0.675	1.760	0.81	192.59	1.078	207.691		0.87	1		242.09	242.09
52.165	6	Sandy Silt to Clayey Silt	66.175	1.036	3.153	1.629	1.525	2.13	0.8073	0.73	0.670	2.130	0.81	53.43	1.512	80.766	0.13	0.92	1	(0.22)	217.82	150.76
52.657	4	Silty Clay to Clay	23.728	0.631	3.183	1.644	1.539	2.84	0.8032	0.73	0.666							0.92	1		244.09	244.09
53.15	4	Silty Clay to Clay	24.341	0.652	3.213	1.659	1.554	2.95	0.7988	0.72	0.661							0.92	1		235.27	235.27
53.642	4	Silty Clay to Clay	58.77	2.464	3.243	1.675	1.568	2.62	0.7948	0.72	0.657							0.91	1		401.60	401.60
54.134	4	Silty Clay to Clay	91.528	3.16	3.272	1.69	1.582	2.53	0.7908	0.71	0.652	2.530	0.79	72.38	2.925	211.695		0.91	1		215.23	215.23
54.626	3	Clay	26.123	1.71	3.302	1.705	1.597	2.96	0.7866	0.71	0.648							0.91	1		278.08	278.08
55.118	3	Clay	26.502	1.531	3.332	1.721	1.611	3.08	0.7826	0.70	0.644							0.91	1		237.72	237.72
55.61	3	Clay	24.251	1.315	3.362	1.736	1.625	3.09	0.7788	0.70	0.640							0.91	1		228.38	228.38
56.102	3	Clay	17.535	1.084	3.391	1.752	1.64	3.27	0.7746	0.69	0.635							0.91	1		190.38	190.38
56.594	3	Clay	18.114	1.124	3.421	1.767	1.654	3.26	0.7708	0.69	0.631							0.90	1		191.87	191.87
57.087	3	Clay	23.618	1.204	3.451	1.782	1.669	3.13	0.7668	0.68	0.627							0.90	1		218.44	218.44
57.579	3	Clay	27.334	1.256	3.481	1.798	1.683	3.04	0.7631	0.68	0.623							0.90	1		240.97	240.97
58.071	3	Clay	29.509	1.609	3.51	1.813	1.697	3.01	0.7594	0.68	0.619							0.90	1		263.41	263.41
58.563	3	Clay	40.658	2.209	3.54	1.828	1.712	2.98	0.7555	0.67	0.615							0.90	1		295.41	295.41
59.055	3	Clay	38.843	2.21	3.57	1.844	1.726	2.96	0.7519	0.67	0.612							0.90	1		304.94	304.94
59.547	3	Clay	46.232	2.547	3.6	1.859	1.741	2.93	0.748	0.66	0.608							0.90	1		349.68	349.68
60.039	6	Sandy Silt to Clayey Silt	172.32	4.868	3.629	1.874	1.755	1.96	0.7445	0.66	0.604	1.960	0.74	128.29	1.251	160.508		0.81	1		262.75	262.75
60.532	6	Sandy Silt to Clayey Silt	363.08	7.106	3.659	1.89	1.769	1.75	0.741	0.65	0.601	1.750	0.74	269.04	1.072	288.304		0.80	1		278.27	278.27

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project*** *FAULT INFO*
PROJECT NO. ***2017-125-GEO*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-94A*** *FAULT M_w =* 6.9 *MSF =* 1.24 *a_{max} (g)=* 0.682 V_{S30m}(m/s)= #REF! 217.9

		CPT RESULT INPUT							CSR				CRR$_{7.5}$				F.S.=(CRR$_{7.5}$/CSR)*MSF*Kσ*Kα				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	CRR$_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
0.492			-9999	-9999	0.03	0.015	0.014		1.7	1.00	0.950							1.00			0.00	0.00
0.984			-9999	-9999	0.059	0.031	0.029		1.7	1.00	0.902							1.00			0.00	0.00
1.476			-9999	-9999	0.089	0.046	0.043		1.7	1.00	0.916							1.00			0.00	0.00
1.968			-9999	-9999	0.119	0.061	0.058		1.7	1.00	0.907							1.00			0.00	0.00
2.461			-9999	-9999	0.149	0.077	0.072		1.7	1.00	0.914							1.00			0.00	0.00
2.953			-9999	-9999	0.178	0.092	0.086		1.7	1.00	0.913							1.00			0.00	0.00
3.445			-9999	-9999	0.208	0.108	0.101		1.691	0.99	0.907							1.00			0.00	0.00
3.937			-9999	-9999	0.238	0.123	0.115		1.673	0.99	0.911										0.00	0.00
4.429			-9999	-9999	0.268	0.138	0.129		1.6554	0.99	0.913										0.00	0.00
4.921			-9999	-9999	0.297	0.154	0.144		1.6369	0.99	0.906										0.00	0.00
5.413	3	Clay	4.748	0.08	0.327	0.169	0.158	2.49	1.62	0.99	0.908	2.490	1.62	7.69	2.718	20.910	0.07			(0.00)	83.25	67.90
5.906	3	Clay	5.359	0.079	0.357	0.184	0.173	2.49	1.6023	0.99	0.904	2.490	1.60	8.59	2.718	23.342	0.07			(0.00)	85.93	67.90
6.398	4	Silty Clay to Clay	8.414	0.097	0.387	0.2	0.187	2.45	1.5862	0.99	0.906	2.450	1.59	13.35	2.528	33.741	0.08			(0.00)	89.88	75.40
6.89	3	Clay	6.297	0.074	0.416	0.215	0.201	2.53	1.5703	0.99	0.905	2.530	1.57	9.89	2.925	28.921	0.07			(0.00)	89.39	67.90
7.382	4	Silty Clay to Clay	6.157	0.074	0.446	0.23	0.216	2.47	1.5537	0.98	0.901	2.470	1.55	9.57	2.621	25.075	0.07	1.00	0	(0.00)	92.47	60.90
7.874	4	Silty Clay to Clay	9.414	0.077	0.476	0.246	0.23	2.42	1.5385	0.98	0.903	2.420	1.54	14.48	2.396	34.699	0.08	1.00	1	(0.11)	95.87	67.90
8.366	3	Clay	6.97	0.103	0.506	0.261	0.245	2.55	1.5225	0.98	0.900	2.550	1.52	10.61	3.034	32.199	0.08	1.00	1	(0.11)	96.02	60.90
8.858	3	Clay	7.692	0.1	0.535	0.277	0.259	2.56	1.5079	0.98	0.899	2.560	1.51	11.60	3.091	35.846	0.08	1.00	1	(0.11)	97.82	60.90
9.35	4	Silty Clay to Clay	6.526	0.084	0.565	0.292	0.273	2.57	1.4936	0.98	0.900	2.570	1.49	9.75	3.148	30.683	0.08	1.00	1	(0.10)	98.70	60.90
9.843	4	Silty Clay to Clay	7.942	0.1	0.595	0.307	0.288	2.58	1.4785	0.98	0.897	2.580	1.48	11.74	3.206	37.651	0.08	1.00	1	(0.11)	101.15	60.90
10.335	3	Clay	8.886	0.163	0.625	0.323	0.302	2.59	1.4647	0.98	0.898	2.590	1.46	13.02	3.266	42.509	0.09	1.00	1	(0.12)	104.24	67.90
10.827	4	Silty Clay to Clay	18.41	0.298	0.654	0.338	0.316	2.25	1.4512	0.98	0.897	2.250	1.45	26.72	1.798	48.043	0.09	1.00	1	(0.12)	118.65	116.42
11.319	5	Clayey Silt to Silty Clay	36.015	0.292	0.684	0.353	0.331	2.12	1.437	0.98	0.894	2.120	1.44	51.75	1.492	77.223	0.12	1.00	1	(0.17)	124.94	124.94
11.811	4	Silty Clay to Clay	16.314	0.254	0.714	0.369	0.345	2.35	1.4239	0.98	0.895	2.350	1.42	23.23	2.120	49.240	0.09	1.00	1	(0.13)	118.71	99.58
12.303	4	Silty Clay to Clay	17.494	0.564	0.744	0.384	0.36	2.42	1.4103	0.97	0.893	2.420	1.41	24.67	2.396	59.108	0.10	1.00	1	(0.14)	122.19	122.19
12.795	4	Silty Clay to Clay	21.993	0.552	0.773	0.399	0.374	2.44	1.3977	0.97	0.892	2.440	1.40	30.74	2.483	76.331	0.12	1.00	1	(0.17)	123.92	123.92
13.287	4	Silty Clay to Clay	16.106	0.378	0.803	0.415	0.388	2.53	1.3854	0.97	0.892	2.530	1.39	22.31	2.925	65.261	0.11	1.00	1	(0.15)	120.88	99.58
13.78	4	Silty Clay to Clay	16.814	0.473	0.833	0.43	0.403	2.54	1.3724	0.97	0.890	2.540	1.37	23.08	2.979	68.743	0.11	1.00	1	(0.15)	123.20	107.96
14.272	4	Silty Clay to Clay	18.41	0.568	0.863	0.446	0.417	2.5	1.3605	0.97	0.890	2.500	1.36	25.05	2.768	69.343	0.11	1.00	1	(0.15)	127.82	124.95
14.764	5	Clayey Silt to Silty Clay	51.76	0.857	0.892	0.461	0.432	2.17	1.348	0.97	0.887	2.170	1.35	69.77	1.596	111.387	0.21	1.00	1	(0.29)	141.20	141.20
15.256	5	Clayey Silt to Silty Clay	57.189	0.892	0.922	0.476	0.446	2.08	1.3366	0.97	0.887	2.080	1.34	76.44	1.420	108.514	0.20	1.00	1	(0.28)	147.68	147.68
15.748	5	Clayey Silt to Silty Clay	60.09	1.09	0.952	0.492	0.46	2.1	1.3253	0.97	0.887	2.100	1.33	79.64	1.455	115.853	0.22	1.00	1	(0.31)	149.64	149.64
16.24	5	Clayey Silt to Silty Clay	61.312	1.019	0.982	0.507	0.475	2.11	1.3134	0.97	0.885	2.110	1.31	80.53	1.473	118.633	0.24	1.00	1	(0.33)	150.07	150.07
16.732	5	Clayey Silt to Silty Clay	44.762	0.704	1.011	0.522	0.489	2.26	1.3025	0.96	0.884	2.260	1.30	58.30	1.827	106.510	0.19	1.00	1	(0.27)	143.49	143.49
17.224	4	Silty Clay to Clay	13.412	0.381	1.041	0.538	0.503	2.59	1.2918	0.96	0.884	2.590	1.29	17.33	3.266	56.588	0.10	1.00	1	(0.14)	129.81	83.24
17.717	3	Clay	12.69	0.324	1.071	0.553	0.518	2.72	1.2806	0.96	0.882							1.00	1		151.27	151.27
18.209	3	Clay	12.773	0.389	1.101	0.568	0.532	2.72	1.2702	0.96	0.882							1.00	1		156.92	156.92
18.701	3	Clay	14.773	0.456	1.13	0.584	0.547	2.73	1.2593	0.96	0.879							1.00	1		162.61	162.61
19.193	3	Clay	13.546	0.458	1.16	0.599	0.561	2.79	1.2493	0.96	0.879							1.00	1		158.15	158.15
19.685	3	Clay	15.661	0.552	1.19	0.615	0.575	2.77	1.2394	0.96	0.879							1.00	1		171.74	171.74
20.177	3	Clay	17.3	0.731	1.22	0.63	0.59	2.77	1.2291	0.96	0.877							1.00	1		182.36	182.36
20.669	3	Clay	17.328	0.639	1.249	0.645	0.604	2.77	1.2195	0.96	0.876							1.00	1		181.40	181.40
21.161	3	Clay	17.272	0.642	1.279	0.661	0.619	2.78	1.2095	0.95	0.874							1.00	1		179.00	179.00
21.654	3	Clay	15.606	0.651	1.309	0.676	0.633	2.85	1.2002	0.95	0.873							1.00	1		167.78	167.78
22.146	3	Clay	11.663	0.501	1.339	0.691	0.647	2.94	1.1911	0.95	0.872							1.00	1		146.66	146.66
22.638	3	Clay	10.639	0.405	1.368	0.707	0.662	2.97	1.1815	0.95	0.870							1.00	1		135.88	135.88
23.13	3	Clay	11.329	0.425	1.398	0.722	0.676	2.95	1.1727	0.95	0.869							1.00	1		139.90	139.90
23.622	3	Clay	12.496	0.429	1.428	0.737	0.69	2.91	1.164	0.95	0.868							1.00	1		148.77	148.77
24.114	3	Clay	14.162	0.476	1.458	0.753	0.705	2.85	1.1549	0.94	0.866							1.00	1		166.84	166.84
24.606	4	Silty Clay to Clay	27.741	0.693	1.487	0.768	0.719	2.69	1.1464	0.94	0.865							1.00	1		208.21	208.21
25.098	4	Silty Clay to Clay	16.967	0.589	1.517	0.784	0.734	2.74	1.1375	0.94	0.863							1.00	1		191.83	191.83
25.591	4	Silty Clay to Clay	15.529	0.448	1.547	0.799	0.748	2.79	1.1294	0.94	0.862							1.00	1		173.51	173.51
26.083	4	Silty Clay to Clay	16.883	0.463	1.577	0.814	0.762	2.67	1.1213	0.94	0.860							1.00	1		206.06	206.06
26.575	4	Silty Clay to Clay	37.071	0.961	1.606	0.83	0.777	2.44	1.1128	0.94	0.858	2.440	1.11	41.25	2.483	102.436	0.18	1.00	1	(0.26)	162.26	124.95
27.067	5	Clayey Silt to Silty Clay	47.762	0.928	1.636	0.845	0.791	2.35	1.105	0.93	0.856	2.350	1.10	52.78	2.120	111.866	0.21	1.00	1	(0.30)	167.17	142.13
27.559	5	Clayey Silt to Silty Clay	36.821	0.73	1.666	0.86	0.806	2.39	1.0967	0.93	0.854	2.390	1.10	40.38	2.272	91.749	0.15	1.00	1	(0.22)	163.94	116.42
28.051	4	Silty Clay to Clay	23.069	0.578	1.696	0.876	0.82	2.54	1.0891	0.93	0.852	2.540	1.09	25.12	2.979	74.846	0.12	1.00	1	(0.17)	157.82	91.33
28.543	4	Silty Clay to Clay	24.908	0.605	1.725	0.891	0.834	2.67	1.0816	0.93	0.850							1.00	1		211.25	211.25
29.035	4	Silty Clay to Clay	16.425	0.372	1.755	0.906	0.849	2.75	1.0737	0.93	0.848							1.00	1		182.90	182.90
29.528	4	Silty Clay to Clay	16.106	0.375	1.785	0.922	0.863	2.8	1.0664	0.92	0.846							1.00	1		174.53	174.53
30.02	4	Silty Clay to Clay	15.967	0.434	1.815	0.937	0.877	2.83	1.0592	0.92	0.844							1.00	1		174.01	174.01
30.512	4	Silty Clay to Clay	15.838	0.409	1.844	0.953	0.892	2.83	1.0516	0.92	0.841							1.00	1		173.70	173.70
31.004	4	Silty Clay to Clay	16.092	0.429	1.874	0.968	0.906	2.85	1.0446	0.92	0.839							1.00	1		174.73	174.73
31.496	4	Silty Clay to Clay	16.189	0.462	1.904	0.983	0.921	2.85	1.0372	0.91	0.836							1.00	1		176.83	176.83
31.988	4	Silty Clay to Clay	16.904	0.432	1.934	0.999	0.935	2.81	1.0304	0.91	0.834							1.00	1		180.08	180.08
32.48	4	Silty Clay to Clay	17.744	0.378	1.963	1.014	0.949	2.8	1.0237	0.91	0.832							1.00	1		179.31	179.31
32.972	4	Silty Clay to Clay	15.891	0.444	1.993	1.029	0.964	2.87	1.0166	0.90	0.828							1.00	1		174.33	174.33
33.465	3	Clay	16.467	0.523	2.023	1.045	0.978	2.9	1.0101	0.90	0.826							1.00	1		176.80	176.80
33.957	4	Silty Clay to Clay	17.633	0.499	2.053	1.06	0.993	2.87	1.0032	0.90	0.823							1.00	1		181.54	181.54
34.449	4	Silty Clay to Clay	16.64	0.432	2.082	1.075	1.007	2.85	0.9968	0.89	0.820							1.00	1		180.45	180.45
34.941	4	Silty Clay to Clay	17.383	0.48	2.112	1.091	1.021	2.85	0.9905	0.89	0.817							1.00	1		183.92	183.92
35.433	4	Silty Clay to Clay	17.952	0.424	2.142	1.106	1.036	2.79	0.9839	0.89	0.814							0.99	1		192.29	192.29
35.925	4	Silty Clay to Clay	21.965	0.451	2.172	1.122	1.05	2.8	0.9778	0.88	0.811							0.99	1		192.95	192.95
36.417	3	Clay	14.565	0.457	2.201	1.137	1.064	2.98	0.9717	0.88	0.807							0.99	1		168.94	168.94
36.909	3	Clay	14.488	0.57	2.231	1.152	1.079	3.06	0.9653	0.88	0.803							0.98	1		164.11	164.11
37.402	3	Clay	15.189	0.553	2.261	1.168	1.093	3.02	0.9594	0.87	0.800							0.98	1		170.24	170.24
37.894	3	Clay	15.779	0.548	2.291	1.183	1.108	3	0.9532	0.87	0.796							0.98	1		174.51	174.51
38.386	3	Clay	17.8	0.707	2.32	1.198	1.122	2.99	0.9475	0.86	0.793							0.98	1		185.63	185.63
38.878	3	Clay	19.382	0.858	2.35	1.214	1.136	2.98	0.9418	0.86	0.789							0.97	1		197.73	197.73
39.37	3	Clay	20.243	0.968	2.38	1.229	1.151	3.01	0.9358	0.86	0.785							0.97	1		198.35	198.35
39.862	3	Clay	18.299	0.899	2.41	1.244	1.165	3.05	0.9302	0.85	0.782							0.97	1		189.34	189.34
40.354	3	Clay	17.786	0.781	2.439	1.26	1.18	3.02	0.9244	0.85	0.777							0.97	1		190.90	190.90
40.846	3	Clay	21.52	0.771	2.469	1.275	1.194	2.94	0.919	0.84	0.773							0.97	1		203.99	203.99
41.339	3	Clay	17.466	0.591	2.499	1.291	1.208	2.99	0.9136	0.84	0.769							0.96	1		185.59	185.59
41.831	4	Silty Clay to Clay	15.224	0.407	2.529	1.306	1.223	3.01	0.908	0.83	0.765							0.96	1		169.18	169.18
42.323	4	Silty Clay to Clay	16.133	0.471	2.558	1.321	1.237	2.98	0.9027	0.83	0.761							0.96	1		177.80	177.80
42.815	4	Silty Clay to Clay	19.494	0.545	2.588	1.337	1.251	2.87	0.8976	0.83	0.757							0.96	1		204.14	204.14
43.307	4	Silty Clay to Clay	27.435	0.617	2.618	1.352	1.266	2.73	0.8921	0.82	0.752							0.95	1		240.12	240.12
43.799	4	Silty Clay to Clay	30.268	0.876	2.648	1.367	1.28	2.64	0.8871	0.82	0.748							0.95	1		287.63	287.63
44.291	5	Clayey Silt to Silty Clay	86.804	1.716	2.677	1.383	1.295	2.43	0.8818	0.81	0.743	2.430	0.88	76.54	2.439	186.684		0.95	1		197.15	197.15
44.783	5	Clayey Silt to Silty Clay	54.009	1.187	2.707	1.398	1.309	2.57	0.8768	0.81	0.739	2.570	0.88	47.36	3.148	149.079	0.39	0.95	1	(0.62)	190.12	91.33
45.276	4	Silty Clay to Clay	17.147	0.533	2.737	1.414	1.323	2.94	0.872	0.80	0.734							0.95	1		198.57	198.57
45.768	4	Silty Clay to Clay	17.272	0.504	2.767	1.429	1.338	2.87	0.8668	0.80	0.730							0.94	1		203.88	203.88
46.26	4	Silty Clay to Clay	20.049	0.384	2.796	1.444	1.352	2.83	0.8621	0.79	0.725							0.94	1		204.79	204.79
46.752	4	Silty Clay to Clay	18.751	0.397	2.826	1.46	1.367	2.99	0.857	0.79	0.720							0.94	1		199.08	199.08
47.244	5	Clayey Silt to Silty Clay	72.086	1.841	2.856	1.475	1.381	2.32	0.8524	0.78	0.716	2.320	0.85	61.44	2.015	123.785	0.26	0.94	1	(0.42)	206.21	142.13
47.736	5	Clayey Silt to Silty Clay	85.082	1.396	2.886	1.49	1.395	2.24	0.8478	0.78	0.712	2.240	0.85	72.13	1.770	127.707	0.27	0.93	1	(0.44)	209.69	150.76
48.228	4	Silty Clay to Clay	40.979	1.347	2.915	1.506	1.41	2.6	0.8429	0.77	0.706							0.93	1		196.84	196.84
48.72	5	Clayey Silt to Silty Clay	132.37	2.88	2.945	1.521	1.424	2.25	0.8384	0.77	0.702	2.250	0.84	110.98	1.798	199.573		0.92	1		219.79	219.79
49.213	5	Clayey Silt to Silty Clay	182.94	3.17	2.975	1.536	1.438	2.09	0.834	0.76	0.698	2.090	0.83	152.56	1.437	219.221		0.90	1		230.65	230.65
49.705	5	Clayey Silt to Silty Clay	105.71	2.569	3.005	1.552	1.453	2.28	0.8292	0.76	0.693	2.280	0.83	87.66	1.886	165.348		0.92	1		218.62	218.62
50.197	4	Silty Clay to Clay	37.32	1.332	3.034	1.567	1.467	2.75	0.8249	0.75	0.688							0.93	1		322.74	322.74

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME	***Eastridge to BART Regional Connector Project***	*FAULT INFO*				
PROJECT NO.	***2017-125-GEO***	*COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*				
CPT NO.	***CPT-AS-94A***	*FAULT* M_w = 6.9	*MSF* = 1.24	a_{max} *(g)*= 0.682	V_{S30m}(m/s)=	#REF! 217.9

		CPT RESULT INPUT							***CSR***		***$CRR_{7.5}$***						***$F.S.=(CRR_{7.5}/CSR)*MSF*K\sigma*K\alpha$***				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
50.689	5	Clayey Silt to Silty Clay	49.15	2.585	3.064	1.583	1.482	2.5	0.8203	0.75	0.683	2.500	0.82	40.32	2.768	111.615	0.21	0.92	1	(0.35)	211.64	150.76
51.181	6	Sandy Silt to Clayey Silt	237.09	2.073	3.094	1.598	1.496	1.89	0.816	0.74	0.679	1.890	0.82	193.47	1.180	228.208		0.88	1		238.90	238.90
51.673	6	Sandy Silt to Clayey Silt	126.01	1.627	3.124	1.613	1.51	1.95	0.8118	0.74	0.675	1.950	0.81	102.30	1.240	126.835	0.27	0.90	1	(0.44)	229.51	211.35
52.165	4	Silty Clay to Clay	24.797	0.768	3.153	1.629	1.525	2.75	0.8073	0.73	0.670							0.92	1		278.09	278.09
52.657	4	Silty Clay to Clay	23.702	0.651	3.183	1.644	1.539	2.92	0.8032	0.73	0.666							0.92	1		223.13	223.13
53.15	4	Silty Clay to Clay	25.63	0.983	3.213	1.659	1.554	2.75	0.7988	0.72	0.661							0.92	1		300.38	300.38
53.642	5	Clayey Silt to Silty Clay	106.69	2.028	3.243	1.675	1.568	2.46	0.7948	0.72	0.657	2.460	0.79	84.79	2.574	218.282		0.91	1		211.64	211.64
54.134	4	Silty Clay to Clay	26.269	0.901	3.272	1.69	1.582	2.72	0.7908	0.71	0.652							0.91	1		301.26	301.26
54.626	4	Silty Clay to Clay	26.297	0.927	3.302	1.705	1.597	2.89	0.7866	0.71	0.648							0.91	1		253.45	253.45
55.118	4	Silty Clay to Clay	34.738	1.02	3.332	1.721	1.611	2.87	0.7826	0.70	0.644							0.91	1		262.53	262.53
55.61	4	Silty Clay to Clay	22.27	0.884	3.362	1.736	1.625	3.02	0.7788	0.70	0.640							0.91	1		222.11	222.11
56.102	3	Clay	21.979	0.85	3.391	1.752	1.64	3.06	0.7746	0.69	0.635							0.91	1		214.34	214.34
56.594	3	Clay	24.325	1.051	3.421	1.767	1.654	3.04	0.7708	0.69	0.631							0.90	1		223.92	223.92
57.087	3	Clay	24.992	0.971	3.451	1.782	1.669	3.01	0.7668	0.68	0.627							0.90	1		232.91	232.91
57.579	3	Clay	31.434	1.21	3.481	1.798	1.683	3	0.7631	0.68	0.623							0.90	1		246.71	246.71
58.071	3	Clay	24.631	1.377	3.51	1.813	1.697	3.07	0.7594	0.68	0.619							0.90	1		232.55	232.55
58.563	4	Silty Clay to Clay	23.797	0.812	3.54	1.828	1.712	3	0.7555	0.67	0.615							0.90	1		231.31	231.31
59.055	4	Silty Clay to Clay	26.185	0.828	3.57	1.844	1.726	2.95	0.7519	0.67	0.612							0.90	1		237.83	237.83
59.547	4	Silty Clay to Clay	29.283	1.092	3.6	1.859	1.741	2.92	0.748	0.66	0.608							0.90	1		277.88	277.88
60.039	5	Clayey Silt to Silty Clay	99.077	3.857	3.629	1.874	1.755	2.42	0.7445	0.66	0.604	2.420	0.74	73.76	2.396	176.726		0.89	1		233.34	233.34
60.532	6	Sandy Silt to Clayey Silt	327.47	5.954	3.659	1.89	1.769	1.95	0.741	0.65	0.601	1.950	0.74	242.65	1.240	300.856		0.81	1		262.48	262.48
61.024	6	Sandy Silt to Clayey Silt	376.34	2.796	3.689	1.905	1.784	1.77	0.7373	0.65	0.597	1.770	0.74	277.46	1.085	301.146		0.81	1		263.97	263.97
61.516	5	Clayey Silt to Silty Clay	67.31	2.555	3.719	1.921	1.798	2.31	0.7338	0.65	0.593	2.310	0.73	49.39	1.981	97.860	0.17	0.88	1	(0.31)	232.63	168.05
62.008	4	Silty Clay to Clay	29.462	1.435	3.748	1.936	1.812	2.93	0.7304	0.64	0.590							0.89	1		283.50	283.50
62.5	4	Silty Clay to Clay	25.686	0.858	3.778	1.951	1.827	2.99	0.7268	0.64	0.586							0.89	1		235.83	235.83
62.992	4	Silty Clay to Clay	26.449	0.711	3.808	1.967	1.841	2.93	0.7234	0.64	0.583							0.89	1		239.76	239.76
63.484	4	Silty Clay to Clay	28.657	0.712	3.838	1.982	1.856	2.9	0.7199	0.63	0.580							0.88	1		247.91	247.91
63.976	4	Silty Clay to Clay	25.186	0.627	3.867	1.997	1.87	2.93	0.7166	0.63	0.577							0.88	1		233.49	233.49
64.469	4	Silty Clay to Clay	22.808	0.438	3.897	2.013	1.884	2.95	0.7134	0.63	0.574							0.88	1		219.76	219.76
64.961	4	Silty Clay to Clay	26.352	0.706	3.927	2.028	1.899	2.9	0.7099	0.62	0.571							0.88	1		262.47	262.47
65.453	4	Silty Clay to Clay	49.15	1.523	3.957	2.043	1.913	2.76	0.7067	0.62	0.568							0.88	1		346.72	346.72
65.945	4	Silty Clay to Clay	59.549	2.318	3.986	2.059	1.928	2.65	0.7033	0.62	0.564							0.88	1		409.34	409.34
66.437	5	Clayey Silt to Silty Clay	67.866	2.512	4.016	2.074	1.942	2.51	0.7002	0.61	0.562	2.510	0.70	47.52	2.820	133.981	0.30	0.88	1	(0.59)	228.82	124.95
66.929	5	Clayey Silt to Silty Clay	90.275	1.833	4.046	2.09	1.956	2.49	0.6971	0.61	0.559	2.490	0.70	62.93	2.718	171.066		0.87	1		227.13	227.13
67.421	4	Silty Clay to Clay	41.652	0.925	4.076	2.105	1.971	2.83	0.6938	0.61	0.556							0.87	1		292.07	292.07
67.913	4	Silty Clay to Clay	21.416	0.61	4.105	2.12	1.985	3.05	0.6907	0.60	0.553							0.87	1		216.76	216.76
68.406	4	Silty Clay to Clay	22.048	0.652	4.135	2.136	1.999	3.09	0.6877	0.60	0.551							0.87	1		213.53	213.53
68.898	4	Silty Clay to Clay	23.353	0.729	4.165	2.151	2.014	3.04	0.6845	0.60	0.548							0.87	1		228.84	228.84
69.39	4	Silty Clay to Clay	36.71	0.938	4.195	2.166	2.028	2.87	0.6815	0.60	0.546							0.87	1		273.51	273.51
69.882	4	Silty Clay to Clay	29.073	0.933	4.224	2.182	2.043	2.97	0.6784	0.59	0.543							0.87	1		258.85	258.85
70.374	4	Silty Clay to Clay	26.019	0.862	4.254	2.197	2.057	3.11	0.6755	0.59	0.541							0.87	1		228.42	228.42
70.866	4	Silty Clay to Clay	24.277	0.901	4.284	2.212	2.071	3.11	0.6726	0.59	0.539							0.86	1		228.43	228.43
71.358	4	Silty Clay to Clay	22.326	0.824	4.314	2.228	2.086	3.11	0.6695	0.58	0.536							0.86	1		224.73	224.73
71.85	4	Silty Clay to Clay	25.741	0.682	4.343	2.243	2.1	2.99	0.6667	0.58	0.534							0.86	1		244.01	244.01
72.343	4	Silty Clay to Clay	55.203	2.06	4.373	2.259	2.115	2.82	0.6637	0.58	0.531							0.86	1		360.22	360.22
72.835	4	Silty Clay to Clay	64.894	3.193	4.403	2.274	2.129	2.82	0.6609	0.58	0.529							0.86	1		398.39	398.39
73.327	4	Silty Clay to Clay	42.319	2.015	4.433	2.289	2.143	2.97	0.6581	0.58	0.527							0.86	1		317.76	317.76
73.819	4	Silty Clay to Clay	32.44	1.184	4.462	2.305	2.158	3.01	0.6552	0.57	0.525							0.86	1		275.15	275.15
74.311	4	Silty Clay to Clay	35.988	1.311	4.492	2.32	2.172	2.95	0.6524	0.57	0.523							0.86	1		296.30	296.30
74.803	4	Silty Clay to Clay	46.206	1.558	4.522	2.335	2.186	2.89	0.6497	0.57	0.521							0.86	1		323.34	323.34
75.295	4	Silty Clay to Clay	40.486	1.531	4.552	2.351	2.201	2.92	0.6469	0.57	0.519							0.85	1		304.97	304.97
75.787	4	Silty Clay to Clay	28.768	0.938	4.581	2.366	2.215	3	0.6442	0.56	0.517							0.85	1		260.29	260.29
76.28	4	Silty Clay to Clay	24.887	0.667	4.611	2.381	2.23	3.04	0.6414	0.56	0.515							0.85	1		234.84	234.84
76.772	4	Silty Clay to Clay	24.214	0.581	4.641	2.397	2.244	3.01	0.6388	0.56	0.514							0.85	1		232.09	232.09
77.264	4	Silty Clay to Clay	24.144	0.548	4.671	2.412	2.258	3	0.6362	0.56	0.512							0.85	1		232.33	232.33
77.756	4	Silty Clay to Clay	25.825	0.643	4.7	2.428	2.273	3.02	0.6335	0.56	0.510							0.85	1		239.17	239.17
78.248	4	Silty Clay to Clay	25.241	0.917	4.73	2.443	2.287	2.99	0.6309	0.55	0.508							0.85	1		256.82	256.82
78.74	4	Silty Clay to Clay	33.627	0.763	4.76	2.458	2.302	2.9	0.6282	0.55	0.507							0.85	1		273.15	273.15
79.232	4	Silty Clay to Clay	28.088	0.684	4.79	2.474	2.316	2.94	0.6257	0.55	0.505							0.85	1		259.07	259.07
79.724	4	Silty Clay to Clay	28.712	0.748	4.819	2.489	2.33	2.97	0.6232	0.55	0.504							0.84	1		261.21	261.21
80.217	4	Silty Clay to Clay	32.906	1.326	4.849	2.504	2.345	2.97	0.6206	0.55	0.502							0.84	1		297.29	297.29
80.709	5	Clayey Silt to Silty Clay	75.238	2.631	4.879	2.52	2.359	2.55	0.6182	0.55	0.500	2.550	0.62	46.51	3.034	141.117	0.34	0.84	1	(0.71)	247.59	124.95
81.201	8	Sand to Silty Sand	222.95	5.91	4.909	2.535	2.373	2.23	0.6157	0.54	0.499	2.230	0.62	137.28	1.743	239.338		0.79	1		274.18	274.18
81.693	6	Sandy Silt to Clayey Silt	289.71	6.187	4.938	2.55	2.388	2.01	0.6132	0.54	0.497	2.010	0.61	177.63	1.313	233.284		0.75	1		287.86	287.86
82.185	6	Sandy Silt to Clayey Silt	345.69	4.348	4.968	2.566	2.402	1.8	0.6108	0.54	0.496	1.800	0.61	211.14	1.107	233.655		0.73	1		293.01	293.01
82.677	6	Sandy Silt to Clayey Silt	300.65	3.189	4.998	2.581	2.417	1.77	0.6082	0.54	0.494	1.770	0.61	182.87	1.085	198.472		0.74	1		289.22	289.22
83.169	6	Sandy Silt to Clayey Silt	242.36	2.877	5.028	2.597	2.431	1.87	0.6059	0.54	0.493	1.870	0.61	146.85	1.162	170.610		0.76	1		282.78	282.78
83.661	6	Sandy Silt to Clayey Silt	191.41	3.346	5.057	2.612	2.445	2.16	0.6036	0.54	0.492	2.160	0.60	115.53	1.574	181.868		0.81	1		268.36	268.36
84.154	5	Clayey Silt to Silty Clay	45.54	0.85	5.087	2.627	2.46	2.67	0.6011	0.53	0.490							0.84	1		404.09	404.09
84.646	5	Clayey Silt to Silty Clay	40.502	0.702	5.117	2.643	2.474	2.78	0.5988	0.53	0.489							0.83	1		311.67	311.67
85.138	5	Clayey Silt to Silty Clay	42.68	0.57	5.147	2.658	2.489	2.77	0.5964	0.53	0.488							0.83	1		296.94	296.94
85.63	5	Clayey Silt to Silty Clay	22.465	0.341	5.176	2.673	2.503	2.98	0.5941	0.53	0.486							0.83	1		226.55	226.55
86.122	4	Silty Clay to Clay	24.436	0.43	5.206	2.689	2.517	3.06	0.5919	0.53	0.485							0.83	1		236.01	236.01
86.614	5	Clayey Silt to Silty Clay	59.813	2.557	5.236	2.704	2.532	2.71	0.5895	0.53	0.484							0.83	1		449.81	449.81
87.106	5	Clayey Silt to Silty Clay	92.468	4.055	5.266	2.719	2.546	2.65	0.5873	0.53	0.483							0.83	1		511.61	511.61
87.598	4	Silty Clay to Clay	41.291	1.401	5.295	2.735	2.561	2.95	0.585	0.53	0.481							0.83	1		327.63	327.63
88.091	4	Silty Clay to Clay	30.573	0.929	5.325	2.75	2.575	3.03	0.5828	0.52	0.480							0.83	1		268.53	268.53
88.583	4	Silty Clay to Clay	29.962	0.746	5.355	2.766	2.589	3.03	0.5806	0.52	0.479							0.83	1		257.39	257.39
89.075	4	Silty Clay to Clay	29.959	0.864	5.385	2.781	2.604	3.05	0.5783	0.52	0.478							0.83	1		262.36	262.36
89.567	4	Silty Clay to Clay	38.737	1.189	5.414	2.796	2.618	3.01	0.5762	0.52	0.477							0.82	1		284.85	284.85
90.059	4	Silty Clay to Clay	35.238	1.155	5.444	2.812	2.632	3	0.5741	0.52	0.476							0.82	1		289.73	289.73
90.551	4	Silty Clay to Clay	37.209	1.28	5.474	2.827	2.647	2.96	0.5719	0.52	0.475							0.82	1		307.07	307.07
91.043	4	Silty Clay to Clay	39.32	1.199	5.504	2.842	2.661	2.94	0.5698	0.52	0.474							0.82	1		306.22	306.22
91.535	4	Silty Clay to Clay	34.662	0.893	5.533	2.858	2.676	2.96	0.5676	0.52	0.473							0.82	1		287.56	287.56
92.028	4	Silty Clay to Clay	43.319	1.382	5.563	2.873	2.69	2.96	0.5656	0.51	0.472							0.82	1		326.68	326.68
92.52	4	Silty Clay to Clay	51.482	2.7	5.593	2.888	2.704	2.97	0.5635	0.51	0.471							0.82	1		376.03	376.03
93.012	9	Sand	102.16	4.599	5.623	2.904	2.719	2.77	0.5614	0.51	0.470							0.82	1		519.36	519.36
93.504	9	Sand	80.5	4.297	5.652	2.919	2.733	2.79	0.5594	0.51	0.469							0.82	1		501.58	501.58
93.996	4	Silty Clay to Clay	53.239	2.723	5.682	2.935	2.748	2.99	0.5572	0.51	0.468							0.82	1		383.52	383.52
94.488	9	Sand	94.135	5.289	5.712	2.95	2.762	2.7	0.5553	0.51	0.467							0.82	1		587.26	587.26
94.98	8	Sand to Silty Sand	227.95	7.36	5.742	2.965	2.776	2.35	0.5533	0.51	0.466	2.350	0.55	126.13	2.120	267.349		0.77	1		287.45	287.45
95.472	8	Sand to Silty Sand	275.27	9.207	5.771	2.981	2.791	2.3	0.5512	0.51	0.465	2.300	0.55	151.74	1.949	295.698		0.75	1		295.45	295.45
95.965	8	Sand to Silty Sand	325.14	11.941	5.801	2.996	2.805	2.29	0.5493	0.51	0.464	2.290	0.55	178.60	1.917	342.390		0.74	1		300.99	300.99
96.457	8	Sand to Silty Sand	298.18	10.336	5.831	3.011	2.819	2.24	0.5474	0.51	0.463	2.240	0.55	163.22	1.770	288.981		0.74	1		300.48	300.48
96.949	8	Sand to Silty Sand	221.42	6.189	5.861	3.027	2.834	2.24	0.5454	0.50	0.462	2.240	0.55	120.76	1.770	213.798		0.77	1		290.71	290.71
97.441	6	Sandy Silt to Clayey Silt	186.05	3.36	5.89	3.042	2.848	2.2	0.5435	0.50	0.461	2.200	0.54	101.11	1.667	168.531		0.78	1		284.02	284.02
97.933	5	Clayey Silt to Silty Clay	172.89	4.01	5.92	3.057	2.863	2.37	0.5415	0.50	0.460	2.370	0.54	93.61	2.194	205.390		0.81	1		275.78	275.78
98.425	5	Clayey Silt to Silty Clay	55.203	1.741	5.95	3.073	2.877	2.76	0.5396	0.50	0.460							0.81	1		437.96	437.96
98.917	5	Clayey Silt to Silty Clay	49.261	1.189	5.98	3.088	2.891	2.83	0.5378	0.50	0.459							0.81	1		352.09	352.09
99.409	5	Clayey Silt to Silty Clay	47.428	1.311	6.009	3.104	2.906	2.88	0.5358	0.50	0.458							0.81	1		345.79	345.79
99.902	5	Clayey Silt to Silty Clay	51.705	1.457	6.039	3.119	2.92	2.84	0.534	0.50	0.457							0.81	1		378.03	378.03
100.39	5	Clayey Silt to Silty Clay	59.868	1.914	6.069	3.134	2.935	2.82	0.532	0.50	0.456							0.81	1		397.48	397.48
100.89	5	Clayey Silt to Silty Clay	53.065	1.393	6.099	3.15	2.949	2.83	0.5302	0.50	0.456							0.81	1		367.10	367.10
101.38	5	Clayey Silt to Silty Clay	44.346	1.054	6.128	3.165	2.963	2.86	0.5285	0.50	0.455							0.80	1		338.72	338.72
101.87	5	Clayey Silt to Silty Clay	41.902	0.868	6.158	3.18	2.978	2.89	0.5266	0.50	0.454							0.80	1		315.31	315.31
102.36	5	Clayey Silt to Silty Clay	37.737	0.671	6.188	3.196	2.992	2.89	0.5248	0.49	0.453							0.80	1		301.49	301.49

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME	***Eastridge to BART Regional Connector Project***	*FAULT INFO*			
PROJECT NO.	***2017-125-GEO***	*COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*			
CPT NO.	***CPT-AS-94A***	*FAULT M_w =* 6.9	*MSF =* 1.24	*a_{max} (g)=* 0.682	V_{S30m}(m/s)= #REF! 217.9

			CPT RESULT INPUT							***CSR***		***$CRR_{7.5}$***						***F.S.=($CRR_{7.5}$/CSR)*MSF*Kσ*Kα***				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
102.85	5	Clayey Silt to Silty Clay	41.458	0.818	6.218	3.211	3.006	2.87	0.5231	0.49	0.453							0.80	1		323.81	323.81
103.35	5	Clayey Silt to Silty Clay	55.925	1.331	6.247	3.226	3.021	2.8	0.5212	0.49	0.452							0.80	1		379.32	379.32
103.84	5	Clayey Silt to Silty Clay	67.81	2.093	6.277	3.242	3.035	2.76	0.5195	0.49	0.451							0.80	1		435.79	435.79
104.33	4	Silty Clay to Clay	74.308	2.656	6.307	3.257	3.05	2.79	0.5176	0.49	0.450							0.80	1		469.74	469.74
104.82	9	Sand	116.04	5.985	6.337	3.273	3.064	2.66	0.5159	0.49	0.450							0.80	1		616.12	616.12
105.32	8	Sand to Silty Sand	173.66	5.013	6.366	3.288	3.078	2.46	0.5143	0.49	0.449	2.460	0.51	89.31	2.574	229.902		0.80	1		285.50	285.50
105.81	8	Sand to Silty Sand	161.28	5.486	6.396	3.303	3.093	2.51	0.5125	0.49	0.448	2.510	0.51	82.65	2.820	233.030		0.80	1		283.34	283.34
106.3	9	Sand	101.41	4.734	6.426	3.319	3.107	2.71	0.5108	0.49	0.447							0.80	1		574.47	574.47
106.79	4	Silty Clay to Clay	57.626	2.969	6.456	3.334	3.122	2.9	0.509	0.49	0.447							0.80	1		443.23	443.23
107.28	5	Clayey Silt to Silty Clay	117.71	4.626	6.485	3.349	3.136	2.64	0.5074	0.49	0.446							0.80	1		598.08	598.08
107.78	5	Clayey Silt to Silty Clay	86.498	2.569	6.515	3.365	3.15	2.61	0.5057	0.49	0.445							0.79	1		556.15	556.15
108.27	4	Silty Clay to Clay	44.263	1.158	6.545	3.38	3.165	2.93	0.504	0.48	0.445							0.79	1		346.86	346.86
108.76	4	Silty Clay to Clay	35.183	1.148	6.575	3.395	3.179	3.04	0.5024	0.48	0.444							0.79	1		300.07	300.07
109.25	4	Silty Clay to Clay	34.686	1.104	6.604	3.411	3.193	3.1	0.5008	0.48	0.443							0.79	1		283.78	283.78
109.74	4	Silty Clay to Clay	34.46	1.079	6.634	3.426	3.208	3.11	0.4991	0.48	0.443							0.79	1		283.55	283.55
110.24	4	Silty Clay to Clay	36.432	1.13	6.664	3.442	3.222	3.08	0.4975	0.48	0.442							0.79	1		286.74	286.74
110.73	5	Clayey Silt to Silty Clay	38.07	0.766	6.694	3.457	3.237	2.98	0.4958	0.48	0.441							0.79	1		295.77	295.77
111.22	5	Clayey Silt to Silty Clay	38.563	0.763	6.723	3.472	3.251	2.95	0.4943	0.48	0.441							0.79	1		303.76	303.76
111.71	5	Clayey Silt to Silty Clay	43.791	1.067	6.753	3.488	3.265	2.94	0.4927	0.48	0.440							0.79	1		326.18	326.18
112.21	4	Silty Clay to Clay	46.623	1.318	6.783	3.503	3.28	2.97	0.4911	0.48	0.439							0.79	1		338.00	338.00
112.7	4	Silty Clay to Clay	44.263	1.491	6.813	3.518	3.294	3.01	0.4895	0.48	0.439							0.79	1		330.32	330.32
113.19	4	Silty Clay to Clay	41.042	1.182	6.842	3.534	3.309	3.01	0.4879	0.48	0.438							0.79	1		317.59	317.59
113.68	4	Silty Clay to Clay	36.571	0.901	6.872	3.549	3.323	3.03	0.4864	0.48	0.437							0.79	1		297.23	297.23
114.17	4	Silty Clay to Clay	36.09	0.835	6.902	3.564	3.337	3.04	0.4849	0.48	0.437							0.79	1		289.74	289.74
114.67	4	Silty Clay to Clay	33.266	0.916	6.932	3.58	3.352	3.08	0.4833	0.48	0.436							0.79	1		281.74	281.74
115.16	4	Silty Clay to Clay	34.599	1.031	6.961	3.595	3.366	3.07	0.4818	0.48	0.436							0.78	1		289.14	289.14
115.65	4	Silty Clay to Clay	37.932	0.936	6.991	3.611	3.38	3.05	0.4803	0.47	0.435							0.78	1		302.15	302.15
116.14	4	Silty Clay to Clay	43.846	1.283	7.021	3.626	3.395	3.04	0.4788	0.47	0.434							0.78	1		311.52	311.52
116.63	4	Silty Clay to Clay	38.154	0.977	7.051	3.641	3.409	3.03	0.4773	0.47	0.434							0.78	1		305.53	305.53
117.13	4	Silty Clay to Clay	38.143	0.966	7.08	3.657	3.424	3.04	0.4758	0.47	0.433							0.78	1		301.35	301.35
117.62	4	Silty Clay to Clay	40.514	1.227	7.11	3.672	3.438	3.05	0.4743	0.47	0.433							0.78	1		311.58	311.58
118.11	4	Silty Clay to Clay	43.208	1.407	7.14	3.687	3.452	3.04	0.4729	0.47	0.432							0.78	1		327.58	327.58
118.6	4	Silty Clay to Clay	49.205	1.697	7.17	3.703	3.467	3	0.4714	0.47	0.432							0.78	1		353.09	353.09
119.09	4	Silty Clay to Clay	56.064	2.059	7.199	3.718	3.481	2.95	0.47	0.47	0.431							0.78	1		386.74	386.74
119.59	4	Silty Clay to Clay	59.341	1.924	7.229	3.733	3.496	2.95	0.4685	0.47	0.430							0.78	1		380.67	380.67
120.08	4	Silty Clay to Clay	47.4	1.335	7.259	3.749	3.51	3	0.4671	0.47	0.430							0.78	1		344.82	344.82

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project*** *FAULT INFO*
PROJECT NO. ***2017-125-Geo*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-95*** *FAULT* M_w = 6.9 *MSF* = 1.24 a_{max} *(g)*= 0.682 V_{S30m}(m/s)= #REF! 167.4

		CPT RESULT INPUT							***CSR***								***CRR*** $_{7.5}$		***F.S.=(CRR*** $_{7.5}$ ***/CSR)*MSF*K*** σ ****K*** α	V_s	$V_{s,liq}$
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	(m/s)	(m/s)
0.492			-9999	-9999	0.03	0.015	0.014		1.7	1.00	0.950							1.00			0.00	0.00
0.984			-9999	-9999	0.059	0.031	0.029		1.7	1.00	0.902							1.00			0.00	0.00
1.476			-9999	-9999	0.089	0.046	0.043		1.7	1.00	0.916							1.00			0.00	0.00
1.968			-9999	-9999	0.119	0.061	0.058		1.7	1.00	0.907							1.00			0.00	0.00
2.461			-9999	-9999	0.149	0.077	0.072		1.7	1.00	0.914							1.00			0.00	0.00
2.953			-9999	-9999	0.178	0.092	0.086		1.7	1.00	0.913							1.00			0.00	0.00
3.445			-9999	-9999	0.208	0.108	0.101		1.691	0.99	0.907							1.00			0.00	0.00
3.937			-9999	-9999	0.238	0.123	0.115		1.673	0.99	0.911										0.00	0.00
4.429			-9999	-9999	0.268	0.138	0.129		1.6554	0.99	0.913										0.00	0.00
4.921			-9999	-9999	0.297	0.154	0.144		1.6369	0.99	0.906										0.00	0.00
5.413	4	Silty Clay to Clay	15.467	0.168	0.327	0.169	0.158	2.21	1.62	0.99	0.908	2.210	1.62	25.06	1.692	42.387	0.09			(0.00)	93.53	93.53
5.906	4	Silty Clay to Clay	14.023	0.163	0.357	0.184	0.173	2.23	1.6023	0.99	0.904	2.230	1.60	22.47	1.743	39.175	0.08			(0.00)	94.66	94.66
6.398	4	Silty Clay to Clay	7.914	0.134	0.387	0.2	0.187	2.43	1.5862	0.99	0.906	2.430	1.59	12.55	2.439	30.617	0.08			(0.00)	91.85	91.33
6.89	3	Clay	8.913	0.161	0.416	0.215	0.201	2.49	1.5703	0.99	0.905	2.490	1.57	14.00	2.718	38.047	0.08			(0.00)	93.12	83.24
7.382	4	Silty Clay to Clay	9.483	0.165	0.446	0.23	0.216	2.44	1.5537	0.98	0.901	2.440	1.55	14.73	2.483	36.585	0.08	1.00	0	(0.00)	96.82	91.33
7.874	4	Silty Clay to Clay	10.58	0.142	0.476	0.246	0.23	2.45	1.5385	0.98	0.903	2.450	1.54	16.28	2.528	41.152	0.08	1.00	1	(0.12)	98.20	83.24
8.366	3	Clay	8.358	0.155	0.506	0.261	0.245	2.54	1.5225	0.98	0.900	2.540	1.52	12.72	2.979	37.907	0.08	1.00	1	(0.11)	98.51	75.40
8.858	4	Silty Clay to Clay	10.524	0.241	0.535	0.277	0.259	2.52	1.5079	0.98	0.899	2.520	1.51	15.87	2.872	45.570	0.09	1.00	1	(0.12)	101.83	83.24
9.35	4	Silty Clay to Clay	7.47	0.099	0.565	0.292	0.273	2.54	1.4936	0.98	0.900	2.540	1.49	11.16	2.979	33.236	0.08	1.00	1	(0.11)	100.62	67.90
9.843	3	Clay	6.72	0.091	0.595	0.307	0.288	2.61	1.4785	0.98	0.897							1.00	1		101.84	101.84
10.335	3	Clay	6.637	0.091	0.625	0.323	0.302	2.63	1.4647	0.98	0.898							1.00	1		101.73	101.73
10.827	4	Silty Clay to Clay	7.831	0.097	0.654	0.338	0.316	2.58	1.4512	0.98	0.897	2.580	1.45	11.36	3.206	36.439	0.08	1.00	1	(0.11)	104.31	60.90
11.319	4	Silty Clay to Clay	12.995	0.193	0.684	0.353	0.331	2.5	1.437	0.98	0.894	2.500	1.44	18.67	2.768	51.696	0.09	1.00	1	(0.13)	110.29	75.40
11.811	5	Clayey Silt to Silty Clay	14.773	0.257	0.714	0.369	0.345	2.25	1.4239	0.98	0.895	2.250	1.42	21.04	1.798	37.828	0.08	1.00	1	(0.11)	122.64	122.64
12.303	5	Clayey Silt to Silty Clay	39.125	0.662	0.744	0.384	0.36	2.11	1.4103	0.97	0.893	2.110	1.41	55.18	1.473	81.284	0.13	1.00	1	(0.18)	133.72	133.72
12.795	5	Clayey Silt to Silty Clay	42.597	0.845	0.773	0.399	0.374	2.19	1.3977	0.97	0.892	2.190	1.40	59.54	1.643	97.799	0.17	1.00	1	(0.23)	133.86	133.86
13.287	5	Clayey Silt to Silty Clay	31.781	0.59	0.803	0.415	0.388	2.16	1.3854	0.97	0.892	2.160	1.39	44.03	1.574	69.313	0.11	1.00	1	(0.15)	134.51	134.51
13.78	5	Clayey Silt to Silty Clay	56.592	0.473	0.833	0.43	0.403	2	1.3724	0.97	0.890	2.000	1.37	77.67	1.300	100.969	0.18	1.00	1	(0.24)	139.73	139.73
14.272	5	Clayey Silt to Silty Clay	32.378	0.493	0.863	0.446	0.417	2.21	1.3605	0.97	0.890	2.210	1.36	44.05	1.692	74.519	0.12	1.00	1	(0.16)	136.43	136.43
14.764	5	Clayey Silt to Silty Clay	42.93	1.11	0.892	0.461	0.432	2.14	1.348	0.97	0.887	2.140	1.35	57.87	1.532	88.657	0.14	1.00	1	(0.20)	144.20	144.20
15.256	5	Clayey Silt to Silty Clay	69.06	1.018	0.922	0.476	0.446	2.05	1.3366	0.97	0.887	2.050	1.34	92.30	1.371	126.553	0.27	1.00	1	(0.37)	149.42	149.42
15.748	4	Silty Clay to Clay	33.155	0.956	0.952	0.492	0.46	2.35	1.3253	0.97	0.887	2.350	1.33	43.94	2.120	93.138	0.16	1.00	1	(0.22)	138.95	138.95
16.24	3	Clay	11.163	0.311	0.982	0.507	0.475	2.68	1.3134	0.97	0.885							1.00	1		157.89	157.89
16.732	3	Clay	9.997	0.226	1.011	0.522	0.489	2.74	1.3025	0.96	0.884							1.00	1		132.13	132.13
17.224	3	Clay	9.774	0.225	1.041	0.538	0.503	2.79	1.2918	0.96	0.884							1.00	1		126.19	126.19
17.717	3	Clay	8.935	0.195	1.071	0.553	0.518	2.81	1.2806	0.96	0.882							1.00	1		121.90	121.90
18.209	3	Clay	9.108	0.203	1.101	0.568	0.532	2.82	1.2702	0.96	0.882							1.00	1		122.44	122.44
18.701	3	Clay	9.719	0.213	1.13	0.584	0.547	2.81	1.2593	0.96	0.879							1.00	1		126.47	126.47
19.193	3	Clay	11.774	0.251	1.16	0.599	0.561	2.74	1.2493	0.96	0.879							1.00	1		148.49	148.49
19.685	4	Silty Clay to Clay	18.133	0.659	1.19	0.615	0.575	2.66	1.2394	0.96	0.879							1.00	1		190.63	190.63
20.177	4	Silty Clay to Clay	24.769	0.857	1.22	0.63	0.59	2.57	1.2291	0.96	0.877	2.570	1.23	30.44	3.148	95.831	0.16	1.00	1	(0.23)	144.54	124.95
20.669	4	Silty Clay to Clay	43.513	1.141	1.249	0.645	0.604	2.5	1.2195	0.96	0.876	2.500	1.22	53.06	2.768	146.906	0.37	1.00	1	(0.53)	149.49	149.49
21.161	3	Clay	20.576	0.837	1.279	0.661	0.619	2.68	1.2095	0.95	0.874							1.00	1		216.09	216.09
21.654	3	Clay	16.466	0.766	1.309	0.676	0.633	2.81	1.2002	0.95	0.873							1.00	1		181.86	181.86
22.146	3	Clay	18.299	0.638	1.339	0.691	0.647	2.77	1.1911	0.95	0.872							1.00	1		185.29	185.29
22.638	3	Clay	17.744	0.758	1.368	0.707	0.662	2.81	1.1815	0.95	0.870							1.00	1		181.90	181.90
23.13	3	Clay	16.078	0.665	1.398	0.722	0.676	2.85	1.1727	0.95	0.869							1.00	1		174.85	174.85
23.622	3	Clay	16.272	0.699	1.428	0.737	0.69	2.86	1.164	0.95	0.868							1.00	1		175.57	175.57
24.114	3	Clay	14.773	0.732	1.458	0.753	0.705	2.93	1.1549	0.94	0.866							1.00	1		163.87	163.87
24.606	3	Clay	11.774	0.547	1.487	0.768	0.719	3.01	1.1464	0.94	0.865							1.00	1		146.93	146.93
25.098	3	Clay	12.024	0.45	1.517	0.784	0.734	2.98	1.1375	0.94	0.863							1.00	1		144.92	144.92
25.591	3	Clay	12.121	0.392	1.547	0.799	0.748	2.93	1.1294	0.94	0.862							1.00	1		147.36	147.36
26.083	3	Clay	12.801	0.399	1.577	0.814	0.762	2.9	1.1213	0.94	0.860							1.00	1		152.24	152.24
26.575	4	Silty Clay to Clay	14.884	0.396	1.606	0.83	0.777	2.69	1.1128	0.94	0.858							1.00	1		190.49	190.49
27.067	4	Silty Clay to Clay	25.88	0.552	1.636	0.845	0.791	2.57	1.105	0.93	0.856	2.570	1.10	28.60	3.148	90.021	0.15	1.00	1	(0.21)	154.05	83.24
27.559	4	Silty Clay to Clay	16.8	0.466	1.666	0.86	0.806	2.74	1.0967	0.93	0.854							1.00	1		188.22	188.22
28.051	4	Silty Clay to Clay	14.051	0.366	1.696	0.876	0.82	2.86	1.0891	0.93	0.852							1.00	1		159.30	159.30
28.543	3	Clay	11.691	0.308	1.725	0.891	0.834	2.93	1.0816	0.93	0.850							1.00	1		145.10	145.10
29.035	3	Clay	11.767	0.304	1.755	0.906	0.849	2.9	1.0737	0.93	0.848							1.00	1		149.65	149.65
29.528	4	Silty Clay to Clay	17.577	0.478	1.785	0.922	0.863	2.67	1.0664	0.92	0.846							1.00	1		202.22	202.22
30.02	5	Clayey Silt to Silty Clay	38.82	0.533	1.815	0.937	0.877	2.47	1.0592	0.92	0.844	2.470	1.06	41.12	2.621	107.785	0.20	1.00	1	(0.29)	162.93	91.33
30.512	4	Silty Clay to Clay	17.716	0.488	1.844	0.953	0.892	2.7	1.0516	0.92	0.841							1.00	1		205.27	205.27
31.004	3	Clay	14.655	0.447	1.874	0.968	0.906	2.92	1.0446	0.92	0.839							1.00	1		165.02	165.02
31.496	3	Clay	14.259	0.417	1.904	0.983	0.921	2.92	1.0372	0.91	0.836							1.00	1		163.25	163.25
31.988	3	Clay	14.273	0.421	1.934	0.999	0.935	2.93	1.0304	0.91	0.834							1.00	1		163.26	163.26
32.48	3	Clay	14.939	0.461	1.963	1.014	0.949	2.93	1.0237	0.91	0.832							1.00	1		165.26	165.26
32.972	3	Clay	14.394	0.41	1.993	1.029	0.964	2.92	1.0166	0.90	0.828							1.00	1		164.82	164.82
33.465	3	Clay	14.44	0.403	2.023	1.045	0.978	2.94	1.0101	0.90	0.826							1.00	1		162.75	162.75
33.957	3	Clay	13.343	0.426	2.053	1.06	0.993	2.99	1.0032	0.90	0.823							1.00	1		158.20	158.20
34.449	3	Clay	14.523	0.472	2.082	1.075	1.007	2.99	0.9968	0.89	0.820							1.00	1		162.78	162.78
34.941	3	Clay	15.217	0.581	2.112	1.091	1.021	3.02	0.9905	0.89	0.817							1.00	1		165.75	165.75
35.433	3	Clay	12.44	0.553	2.142	1.106	1.036	3.09	0.9839	0.89	0.814							0.99	1		154.14	154.14
35.925	3	Clay	12.169	0.4	2.172	1.122	1.05	3.07	0.9778	0.88	0.811							0.99	1		150.80	150.80
36.417	3	Clay	15.522	0.487	2.201	1.137	1.064	3	0.9717	0.88	0.807							0.99	1		166.35	166.35
36.909	3	Clay	16.522	0.596	2.231	1.152	1.079	2.98	0.9653	0.88	0.803							0.98	1		179.54	179.54
37.402	3	Clay	17.994	0.677	2.261	1.168	1.093	2.99	0.9594	0.87	0.800							0.98	1		183.00	183.00
37.894	3	Clay	14.992	0.84	2.291	1.183	1.108	3.09	0.9532	0.87	0.796							0.98	1		172.86	172.86
38.386	3	Clay	16.772	0.631	2.32	1.198	1.122	3.03	0.9475	0.86	0.793							0.98	1		177.59	177.59
38.878	3	Clay	16.383	0.488	2.35	1.214	1.136	3	0.9418	0.86	0.789							0.97	1		173.79	173.79
39.37	4	Silty Clay to Clay	14.349	0.299	2.38	1.229	1.151	2.95	0.9358	0.86	0.785							0.97	1		166.95	166.95
39.862	4	Silty Clay to Clay	16.855	0.297	2.41	1.244	1.165	2.86	0.9302	0.85	0.782							0.97	1		176.72	176.72
40.354	4	Silty Clay to Clay	16.105	0.398	2.439	1.26	1.18	2.89	0.9244	0.85	0.777							0.97	1		175.07	175.07
40.846	4	Silty Clay to Clay	14.731	0.282	2.469	1.275	1.194	2.9	0.919	0.84	0.773							0.97	1		167.55	167.55
41.339	4	Silty Clay to Clay	14.411	0.234	2.499	1.291	1.208	2.89	0.9136	0.84	0.769							0.96	1		165.46	165.46
41.831	4	Silty Clay to Clay	17.855	0.272	2.529	1.306	1.223	2.83	0.908	0.83	0.765							0.96	1		178.74	178.74
42.323	4	Silty Clay to Clay	17.411	0.308	2.558	1.321	1.237	2.85	0.9027	0.83	0.761							0.96	1		190.67	190.67
42.815	4	Silty Clay to Clay	24.38	1.051	2.588	1.337	1.251	2.64	0.8976	0.83	0.757							0.96	1		282.21	282.21
43.307	5	Clayey Silt to Silty Clay	53.537	1.436	2.618	1.352	1.266	2.55	0.8921	0.82	0.752	2.550	0.89	47.76	3.034	144.921	0.36	0.95	1	(0.57)	189.80	107.96
43.799	4	Silty Clay to Clay	21.104	0.577	2.648	1.367	1.28	2.84	0.8871	0.82	0.748							0.95	1		225.31	225.31
44.291	4	Silty Clay to Clay	16.328	0.407	2.677	1.383	1.295	2.98	0.8818	0.81	0.743							0.95	1		175.90	175.90
44.783	4	Silty Clay to Clay	14.828	0.357	2.707	1.398	1.309	3.02	0.8768	0.81	0.739							0.95	1		167.32	167.32
45.276	4	Silty Clay to Clay	14.967	0.361	2.737	1.414	1.323	2.97	0.872	0.80	0.734							0.95	1		171.80	171.80
45.768	4	Silty Clay to Clay	14.613	0.268	2.767	1.429	1.338	2.94	0.8668	0.80	0.730							0.94	1		168.78	168.78
46.26	4	Silty Clay to Clay	13.694	0.226	2.796	1.444	1.352	2.98	0.8621	0.79	0.725							0.94	1		158.80	158.80
46.752	4	Silty Clay to Clay	14.162	0.399	2.826	1.46	1.367	2.93	0.857	0.79	0.720							0.94	1		182.44	182.44
47.244	4	Silty Clay to Clay	29.587	0.833	2.856	1.475	1.381	2.68	0.8524	0.78	0.716							0.94	1		286.35	286.35
47.736	5	Clayey Silt to Silty Clay	54.953	1.32	2.886	1.49	1.395	2.54	0.8478	0.78	0.712	2.540	0.85	46.59	2.979	138.785	0.33	0.94	1	(0.53)	197.63	107.96
48.228	4	Silty Clay to Clay	42.68	0.996	2.915	1.506	1.41	2.64	0.8429	0.77	0.706							0.93	1		309.12	309.12
48.72	4	Silty Clay to Clay	27.862	0.922	2.945	1.521	1.424	2.83	0.8384	0.77	0.702							0.93	1		253.13	253.13
49.213	4	Silty Clay to Clay	32.044	0.947	2.975	1.536	1.438	2.79	0.834	0.76	0.698							0.93	1		259.67	259.67
49.705	4	Silty Clay to Clay	23.297	0.676	3.005	1.552	1.453	2.83	0.8292	0.76	0.693							0.93	1		241.06	241.06
50.197	4	Silty Clay to Clay	27.102	0.797	3.034	1.567	1.467	2.83	0.8249	0.75	0.688							0.93	1		242.69	242.69

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME	***Eastridge to BART Regional Connector Project***		*FAULT INFO*				
PROJECT NO.	***2017-125-Geo***		*COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*				
CPT NO.	***CPT-AS-95***	*FAULT M_w =*	6.9	*MSF =* 1.24	*a_{max} (g)=* 0.682	V_{S30m}(m/s)= #REF!	167.4

		CPT RESULT INPUT							***CSR***		***$CRR_{7.5}$***					***F.S.=($CRR_{7.5}$/CSR)*MSF*Kσ*Kα***					
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
50.689	4	Silty Clay to Clay	30.323	1.129	3.064	1.583	1.482	2.79	0.8203	0.75	0.683							0.92	1		285.15	285.15
51.181	4	Silty Clay to Clay	80.222	2.551	3.094	1.598	1.496	2.55	0.816	0.74	0.679	2.550	0.82	65.46	3.034	198.630		0.92	1		208.01	208.01
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LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project*** *FAULT INFO*
PROJECT NO. ***2017-125-GEO*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-95A*** *FAULT* M_w = 6.9 *MSF* = 1.24 a_{max} *(g)*= 0.682 V_{S30m}(m/s)= #REF! 224.4

			CPT RESULT INPUT							***CSR***		***CRR*** $_{7.5}$						***F.S.=(CRR*** $_{7.5}$ ***/CSR)*MSF*K*** σ ****K*** α				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
0.492			-9999	-9999	0.03	0.015	0.014		1.7	1.00	0.950							1.00			0.00	0.00
0.984			-9999	-9999	0.059	0.031	0.029		1.7	1.00	0.902							1.00			0.00	0.00
1.476			-9999	-9999	0.089	0.046	0.043		1.7	1.00	0.916							1.00			0.00	0.00
1.968			-9999	-9999	0.119	0.061	0.058		1.7	1.00	0.907							1.00			0.00	0.00
2.461			-9999	-9999	0.149	0.077	0.072		1.7	1.00	0.914							1.00			0.00	0.00
2.953			-9999	-9999	0.178	0.092	0.086		1.7	1.00	0.913							1.00			0.00	0.00
3.445			-9999	-9999	0.208	0.108	0.101		1.691	0.99	0.907							1.00			0.00	0.00
3.937			-9999	-9999	0.238	0.123	0.115		1.673	0.99	0.911										0.00	0.00
4.429			-9999	-9999	0.268	0.138	0.129		1.6554	0.99	0.913										0.00	0.00
4.921			-9999	-9999	0.297	0.154	0.144		1.6369	0.99	0.906										0.00	0.00
5.413	4	Silty Clay to Clay	25.681	0.403	0.327	0.169	0.158	2.12	1.62	0.99	0.908	2.120	1.62	41.60	1.492	62.080	0.10			(0.00)	99.78	99.78
5.906	5	Clayey Silt to Silty Clay	26.659	0.277	0.357	0.184	0.173	2.04	1.6023	0.99	0.904	2.040	1.60	42.72	1.356	57.919	0.10			(0.00)	103.09	103.09
6.398	4	Silty Clay to Clay	21.367	0.278	0.387	0.2	0.187	2.17	1.5862	0.99	0.906	2.170	1.59	33.89	1.596	54.104	0.09			(0.00)	102.41	102.41
6.89	4	Silty Clay to Clay	13.603	0.348	0.416	0.215	0.201	2.42	1.5703	0.99	0.905	2.420	1.57	21.36	2.396	51.178	0.09			(0.00)	98.66	98.66
7.382	3	Clay	9.62	0.256	0.446	0.23	0.216	2.55	1.5537	0.98	0.901	2.550	1.55	14.95	3.034	45.351	0.09	1.00	0	(0.00)	97.00	97.00
7.874	4	Silty Clay to Clay	13.775	0.325	0.476	0.246	0.23	2.32	1.5385	0.98	0.903	2.320	1.54	21.19	2.015	42.693	0.09	1.00	1	(0.12)	105.89	105.89
8.366	5	Clayey Silt to Silty Clay	33.82	0.403	0.506	0.261	0.245	2.07	1.5225	0.98	0.900	2.070	1.52	51.49	1.403	72.237	0.12	1.00	1	(0.16)	115.55	115.55
8.858	5	Clayey Silt to Silty Clay	21.396	0.335	0.535	0.277	0.259	2.19	1.5079	0.98	0.899	2.190	1.51	32.26	1.643	52.995	0.09	1.00	1	(0.13)	112.54	112.54
9.35	3	Clay	7.477	0.151	0.565	0.292	0.273	2.56	1.4936	0.98	0.900	2.560	1.49	11.17	3.091	34.513	0.08	1.00	1	(0.11)	102.01	75.40
9.843	3	Clay	6.01	0.163	0.595	0.307	0.288	2.76	1.4785	0.98	0.897							1.00	1		99.79	99.79
10.335	3	Clay	5.946	0.188	0.625	0.323	0.302	2.84	1.4647	0.98	0.898							1.00	1		95.63	95.63
10.827	3	Clay	6.586	0.18	0.654	0.338	0.316	2.78	1.4512	0.98	0.897							1.00	1		102.86	102.86
11.319	3	Clay	8.167	0.194	0.684	0.353	0.331	2.67	1.437	0.98	0.894							1.00	1		124.30	124.30
11.811	4	Silty Clay to Clay	19.441	0.382	0.714	0.369	0.345	2.41	1.4239	0.98	0.895	2.410	1.42	27.68	2.354	65.156	0.11	1.00	1	(0.15)	119.61	116.42
12.303	5	Clayey Silt to Silty Clay	41.814	0.743	0.744	0.384	0.36	2.19	1.4103	0.97	0.893	2.190	1.41	58.97	1.643	96.863	0.16	1.00	1	(0.23)	132.55	132.55
12.795	5	Clayey Silt to Silty Clay	50.377	1.07	0.773	0.399	0.374	2.09	1.3977	0.97	0.892	2.090	1.40	70.41	1.437	101.177	0.18	1.00	1	(0.24)	138.61	138.61
13.287	6	Sandy Silt to Clayey Silt	76.497	0.451	0.803	0.415	0.388	1.87	1.3854	0.97	0.892	1.870	1.39	105.98	1.162	123.129	0.25	1.00	1	(0.35)	144.25	144.25
13.78	5	Clayey Silt to Silty Clay	61.111	0.688	0.833	0.43	0.403	1.94	1.3724	0.97	0.890	1.940	1.37	83.87	1.229	103.076	0.18	1.00	1	(0.25)	145.18	145.18
14.272	5	Clayey Silt to Silty Clay	47.278	1.045	0.863	0.446	0.417	2.16	1.3605	0.97	0.890	2.160	1.36	64.32	1.574	101.262	0.18	1.00	1	(0.25)	142.46	142.46
14.764	5	Clayey Silt to Silty Clay	49.637	1.245	0.892	0.461	0.432	2.2	1.348	0.97	0.887	2.200	1.35	66.91	1.667	111.528	0.21	1.00	1	(0.29)	144.27	144.27
15.256	5	Clayey Silt to Silty Clay	60.881	1.333	0.922	0.476	0.446	2.18	1.3366	0.97	0.887	2.180	1.34	81.37	1.619	131.755	0.29	1.00	1	(0.41)	146.43	146.43
15.748	4	Silty Clay to Clay	31.03	0.878	0.952	0.492	0.46	2.37	1.3253	0.97	0.887	2.370	1.33	41.12	2.194	90.228	0.15	1.00	1	(0.21)	138.99	138.99
16.24	3	Clay	12.366	0.375	0.982	0.507	0.475	2.66	1.3134	0.97	0.885							1.00	1		172.74	172.74
16.732	3	Clay	11.388	0.28	1.011	0.522	0.489	2.78	1.3025	0.96	0.884							1.00	1		134.83	134.83
17.224	3	Clay	9.116	0.315	1.041	0.538	0.503	2.89	1.2918	0.96	0.884							1.00	1		123.05	123.05
17.717	3	Clay	8.631	0.319	1.071	0.553	0.518	2.95	1.2806	0.96	0.882							1.00	1		118.24	118.24
18.209	3	Clay	8.656	0.293	1.101	0.568	0.532	2.95	1.2702	0.96	0.882							1.00	1		118.52	118.52
18.701	3	Clay	8.857	0.348	1.13	0.584	0.547	2.96	1.2593	0.96	0.879							1.00	1		120.50	120.50
19.193	3	Clay	9.634	0.346	1.16	0.599	0.561	2.89	1.2493	0.96	0.879							1.00	1		135.40	135.40
19.685	3	Clay	16.105	0.599	1.19	0.615	0.575	2.78	1.2394	0.96	0.879							1.00	1		170.90	170.90
20.177	3	Clay	18.463	0.783	1.22	0.63	0.59	2.7	1.2291	0.96	0.877							1.00	1		198.70	198.70
20.669	4	Silty Clay to Clay	21.051	0.562	1.249	0.645	0.604	2.64	1.2195	0.96	0.876							1.00	1		201.66	201.66
21.161	3	Clay	13.631	0.495	1.279	0.661	0.619	2.78	1.2095	0.95	0.874							1.00	1		168.64	168.64
21.654	3	Clay	14.01	0.545	1.309	0.676	0.633	2.86	1.2002	0.95	0.873							1.00	1		161.39	161.39
22.146	3	Clay	16.622	0.659	1.339	0.691	0.647	2.82	1.1911	0.95	0.872							1.00	1		176.72	176.72
22.638	3	Clay	18.29	0.877	1.368	0.707	0.662	2.81	1.1815	0.95	0.870							1.00	1		193.68	193.68
23.13	3	Clay	19.584	1.136	1.398	0.722	0.676	2.85	1.1727	0.95	0.869							1.00	1		195.12	195.12
23.622	3	Clay	15.932	0.867	1.428	0.737	0.69	2.95	1.164	0.95	0.868							1.00	1		172.39	172.39
24.114	3	Clay	12.567	0.673	1.458	0.753	0.705	3.03	1.1549	0.94	0.866							1.00	1		150.94	150.94
24.606	3	Clay	11.762	0.656	1.487	0.768	0.719	3.08	1.1464	0.94	0.865							1.00	1		142.93	142.93
25.098	3	Clay	11.532	0.658	1.517	0.784	0.734	3.09	1.1375	0.94	0.863							1.00	1		141.79	141.79
25.591	3	Clay	11.539	0.549	1.547	0.799	0.748	3.06	1.1294	0.94	0.862							1.00	1		142.05	142.05
26.083	3	Clay	11.791	0.524	1.577	0.814	0.762	3.03	1.1213	0.94	0.860							1.00	1		143.75	143.75
26.575	3	Clay	12.05	0.486	1.606	0.83	0.777	2.98	1.1128	0.94	0.858							1.00	1		149.47	149.47
27.067	4	Silty Clay to Clay	21.109	0.698	1.636	0.845	0.791	2.72	1.105	0.93	0.856							1.00	1		211.47	211.47
27.559	4	Silty Clay to Clay	23.61	0.858	1.666	0.86	0.806	2.71	1.0967	0.93	0.854							1.00	1		220.32	220.32
28.051	3	Clay	14.005	0.472	1.696	0.876	0.82	2.91	1.0891	0.93	0.852							1.00	1		164.42	164.42
28.543	3	Clay	13.682	0.503	1.725	0.891	0.834	2.95	1.0816	0.93	0.850							1.00	1		159.17	159.17
29.035	3	Clay	14.81	0.527	1.755	0.906	0.849	2.87	1.0737	0.93	0.848							1.00	1		175.83	175.83
29.528	4	Silty Clay to Clay	26.342	0.759	1.785	0.922	0.863	2.66	1.0664	0.92	0.846							1.00	1		231.77	231.77
30.02	4	Silty Clay to Clay	35.459	1.03	1.815	0.937	0.877	2.54	1.0592	0.92	0.844	2.540	1.06	37.56	2.979	111.887	0.21	1.00	1	(0.31)	166.37	107.96
30.512	4	Silty Clay to Clay	32.468	0.73	1.844	0.953	0.892	2.59	1.0516	0.92	0.841	2.590	1.05	34.14	3.266	111.516	0.21	1.00	1	(0.31)	164.12	99.58
31.004	3	Clay	14.753	0.617	1.874	0.968	0.906	2.9	1.0446	0.92	0.839							1.00	1		182.05	182.05
31.496	3	Clay	14.839	0.618	1.904	0.983	0.921	3.01	1.0372	0.91	0.836							1.00	1		163.92	163.92
31.988	3	Clay	13.488	0.517	1.934	0.999	0.935	3.02	1.0304	0.91	0.834							1.00	1		157.31	157.31
32.48	3	Clay	13.114	0.486	1.963	1.014	0.949	3.02	1.0237	0.91	0.832							1.00	1		155.84	155.84
32.972	3	Clay	14.552	0.56	1.993	1.029	0.964	3	1.0166	0.90	0.828							1.00	1		162.56	162.56
33.465	3	Clay	15.242	0.604	2.023	1.045	0.978	3.02	1.0101	0.90	0.826							1.00	1		166.76	166.76
33.957	3	Clay	13.833	0.717	2.053	1.06	0.993	3.09	1.0032	0.90	0.823							1.00	1		162.76	162.76
34.449	3	Clay	14.264	0.679	2.082	1.075	1.007	3.09	0.9968	0.89	0.820							1.00	1		162.48	162.48
34.941	3	Clay	14.609	0.704	2.112	1.091	1.021	3.09	0.9905	0.89	0.817							1.00	1		163.93	163.93
35.433	3	Clay	13.545	0.675	2.142	1.106	1.036	3.13	0.9839	0.89	0.814							0.99	1		158.53	158.53
35.925	3	Clay	13.416	0.701	2.172	1.122	1.05	3.15	0.9778	0.88	0.811							0.99	1		158.02	158.02
36.417	3	Clay	16.881	0.786	2.201	1.137	1.064	3.07	0.9717	0.88	0.807							0.99	1		175.13	175.13
36.909	3	Clay	17.959	0.943	2.231	1.152	1.079	3.05	0.9653	0.88	0.803							0.98	1		187.67	187.67
37.402	3	Clay	19.268	1.07	2.261	1.168	1.093	3.05	0.9594	0.87	0.800							0.98	1		192.74	192.74
37.894	3	Clay	18.948	1.054	2.291	1.183	1.108	3.06	0.9532	0.87	0.796							0.98	1		194.43	194.43
38.386	3	Clay	19.153	1.181	2.32	1.198	1.122	3.08	0.9475	0.86	0.793							0.98	1		193.90	193.90
38.878	3	Clay	17.859	0.942	2.35	1.214	1.136	3.06	0.9418	0.86	0.789							0.97	1		185.66	185.66
39.37	3	Clay	16.761	0.556	2.38	1.229	1.151	3.01	0.9358	0.86	0.785							0.97	1		180.35	180.35
39.862	3	Clay	16.68	0.837	2.41	1.244	1.165	3.11	0.9302	0.85	0.782							0.97	1		173.27	173.27
40.354	3	Clay	13.987	0.665	2.439	1.26	1.18	3.15	0.9244	0.85	0.777							0.97	1		164.30	164.30
40.846	3	Clay	17.341	0.618	2.469	1.275	1.194	3.06	0.919	0.84	0.773							0.97	1		174.82	174.82
41.339	3	Clay	15.759	0.694	2.499	1.291	1.208	3.06	0.9136	0.84	0.769							0.96	1		177.67	177.67
41.831	4	Silty Clay to Clay	19.095	0.594	2.529	1.306	1.223	2.96	0.908	0.83	0.765							0.96	1		190.07	190.07
42.323	4	Silty Clay to Clay	18.499	0.659	2.558	1.321	1.237	2.92	0.9027	0.83	0.761							0.96	1		195.28	195.28
42.815	4	Silty Clay to Clay	19.944	0.444	2.588	1.337	1.251	2.86	0.8976	0.83	0.757							0.96	1		202.91	202.91
43.307	4	Silty Clay to Clay	32.756	0.847	2.618	1.352	1.266	2.7	0.8921	0.82	0.752							0.95	1		266.33	266.33
43.799	4	Silty Clay to Clay	34.913	1.206	2.648	1.367	1.28	2.71	0.8871	0.82	0.748							0.95	1		275.65	275.65
44.291	4	Silty Clay to Clay	17.025	0.508	2.677	1.383	1.295	2.97	0.8818	0.81	0.743							0.95	1		194.06	194.06
44.783	3	Clay	13.056	0.534	2.707	1.398	1.309	3.2	0.8768	0.81	0.739							0.95	1		155.18	155.18
45.276	3	Clay	13.009	0.522	2.737	1.414	1.323	3.19	0.872	0.80	0.734							0.95	1		158.22	158.22
45.768	3	Clay	15.472	0.531	2.767	1.429	1.338	3.12	0.8668	0.80	0.730							0.94	1		166.88	166.88
46.26	3	Clay	14.537	0.461	2.796	1.444	1.352	3.11	0.8621	0.79	0.725							0.94	1		166.16	166.16
46.752	4	Silty Clay to Clay	19.987	0.52	2.826	1.46	1.367	2.96	0.857	0.79	0.720							0.94	1		196.17	196.17
47.244	4	Silty Clay to Clay	29.017	1.014	2.856	1.475	1.381	2.68	0.8524	0.78	0.716							0.94	1		292.60	292.60
47.736	5	Clayey Silt to Silty Clay	106.15	1.482	2.886	1.49	1.395	2.36	0.8478	0.78	0.712	2.360	0.85	89.99	2.156	194.054		0.94	1		205.27	205.27
48.228	5	Clayey Silt to Silty Clay	47.02	1.48	2.915	1.506	1.41	2.57	0.8429	0.77	0.706	2.570	0.84	39.63	3.148	124.765	0.26	0.93	1	(0.43)	197.91	107.96
48.72	4	Silty Clay to Clay	22.892	1.127	2.945	1.521	1.424	2.88	0.8384	0.77	0.702							0.93	1		254.20	254.20
49.213	4	Silty Clay to Clay	22.176	0.838	2.975	1.536	1.438	2.98	0.834	0.76	0.698							0.93	1		214.67	214.67
49.705	4	Silty Clay to Clay	21.224	0.698	3.005	1.552	1.453	2.96	0.8292	0.76	0.693							0.93	1		209.71	209.71
50.197	4	Silty Clay to Clay	22.597	0.695	3.034	1.567	1.467	2.91	0.8249	0.75	0.688							0.93	1		222.40	222.40

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME	***Eastridge to BART Regional Connector Project***	*FAULT INFO*			
PROJECT NO.	***2017-125-GEO***	*COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*			
CPT NO.	***CPT-AS-95A***	*FAULT M_w =* 6.9	*MSF =* 1.24	*a_{max} (g)=* 0.682	V_{S30m}(m/s)= #REF! 224.4

			CPT RESULT INPUT							CSR		CRR 7.5							F.S.=(CRR 7.5/CSR)*MSF*Kσ*Kα				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
50.689	4	Silty Clay to Clay	26.645	1.038	3.064	1.583	1.482	2.76	0.8203	0.75	0.683							0.92	1		294.72	294.72
51.181	5	Clayey Silt to Silty Clay	85.527	2.813	3.094	1.598	1.496	2.32	0.816	0.74	0.679	2.320	0.82	69.79	2.015	140.601	0.34	0.91	1	(0.56)	220.42	194.03
51.673	6	Sandy Silt to Clayey Silt	206.02	1.942	3.124	1.613	1.51	1.87	0.8118	0.74	0.675	1.870	0.81	167.25	1.162	194.319		0.88	1		240.16	240.16
52.165	6	Sandy Silt to Clayey Silt	235.39	1.454	3.153	1.629	1.525	1.63	0.8073	0.73	0.670	1.630	0.81	190.04	1.000	190.036		0.87	1		243.91	243.91
52.657	6	Sandy Silt to Clayey Silt	81.414	0.872	3.183	1.644	1.539	1.97	0.8032	0.73	0.666	1.970	0.80	65.39	1.263	82.573	0.13	0.90	1	(0.22)	223.45	159.40
53.15	4	Silty Clay to Clay	26.199	0.888	3.213	1.659	1.554	2.93	0.7988	0.72	0.661							0.92	1		231.65	231.65
53.642	3	Clay	17.859	0.642	3.243	1.675	1.568	3.14	0.7948	0.72	0.657							0.91	1		185.02	185.02
54.134	3	Clay	16.813	0.636	3.272	1.69	1.582	3.15	0.7908	0.71	0.652							0.91	1		181.21	181.21
54.626	4	Silty Clay to Clay	21.137	0.722	3.302	1.705	1.597	2.94	0.7866	0.71	0.648							0.91	1		221.64	221.64
55.118	4	Silty Clay to Clay	22.403	0.632	3.332	1.721	1.611	2.89	0.7826	0.70	0.644							0.91	1		231.75	231.75
55.61	4	Silty Clay to Clay	27.004	0.567	3.362	1.736	1.625	2.95	0.7788	0.70	0.640							0.91	1		210.51	210.51
56.102	4	Silty Clay to Clay	17.284	0.415	3.391	1.752	1.64	3.02	0.7746	0.69	0.635							0.91	1		194.12	194.12
56.594	4	Silty Clay to Clay	23.912	0.526	3.421	1.767	1.654	2.88	0.7708	0.69	0.631							0.90	1		224.91	224.91
57.087	5	Clayey Silt to Silty Clay	29.089	0.555	3.451	1.782	1.669	2.73	0.7668	0.68	0.627							0.90	1		258.83	258.83
57.579	5	Clayey Silt to Silty Clay	31.837	0.587	3.481	1.798	1.683	2.71	0.7631	0.68	0.623							0.90	1		271.00	271.00
58.071	4	Silty Clay to Clay	32.058	0.678	3.51	1.813	1.697	2.74	0.7594	0.68	0.619							0.90	1		272.04	272.04
58.563	4	Silty Clay to Clay	37.414	0.764	3.54	1.828	1.712	2.73	0.7555	0.67	0.615							0.90	1		285.56	285.56
59.055	4	Silty Clay to Clay	52.8	1.686	3.57	1.844	1.726	2.6	0.7519	0.67	0.612							0.90	1		215.52	215.52
59.547	5	Clayey Silt to Silty Clay	216.81	4.917	3.6	1.859	1.741	2.11	0.748	0.66	0.608	2.110	0.75	162.18	1.473	238.921		0.85	1		248.26	248.26
60.039	6	Sandy Silt to Clayey Silt	244.8	4.953	3.629	1.874	1.755	1.96	0.7445	0.66	0.604	1.960	0.74	182.25	1.251	228.015		0.82	1		258.81	258.81
60.532	6	Sandy Silt to Clayey Silt	305.15	3.674	3.659	1.89	1.769	1.8	0.741	0.65	0.601	1.800	0.74	226.12	1.107	250.233		0.81	1		262.05	262.05
61.024	6	Sandy Silt to Clayey Silt	245.37	1.68	3.689	1.905	1.784	1.75	0.7373	0.65	0.597	1.750	0.74	180.90	1.072	193.851		0.83	1		254.12	254.12
61.516	5	Clayey Silt to Silty Clay	43.684	1.182	3.719	1.921	1.798	2.39	0.7338	0.65	0.593	2.390	0.73	32.06	2.272	72.833	0.12	0.89	1	(0.21)	220.48	107.96
62.008	4	Silty Clay to Clay	28.844	0.894	3.748	1.936	1.812	2.89	0.7304	0.64	0.590							0.89	1		262.47	262.47
62.5	4	Silty Clay to Clay	39.801	1.067	3.778	1.951	1.827	2.88	0.7268	0.64	0.586							0.89	1		268.50	268.50
62.992	4	Silty Clay to Clay	21.18	0.613	3.808	1.967	1.841	3.02	0.7234	0.64	0.583							0.89	1		220.39	220.39
63.484	4	Silty Clay to Clay	22.23	0.634	3.838	1.982	1.856	2.99	0.7199	0.63	0.580							0.88	1		223.98	223.98
63.976	4	Silty Clay to Clay	26.141	0.813	3.867	1.997	1.87	2.95	0.7166	0.63	0.577							0.88	1		242.80	242.80
64.469	4	Silty Clay to Clay	31.088	0.848	3.897	2.013	1.884	2.95	0.7134	0.63	0.574							0.88	1		245.89	245.89
64.961	4	Silty Clay to Clay	23.064	0.685	3.927	2.028	1.899	3.04	0.7099	0.62	0.571							0.88	1		219.13	219.13
65.453	4	Silty Clay to Clay	19.412	0.558	3.957	2.043	1.913	3.11	0.7067	0.62	0.568							0.88	1		200.50	200.50
65.945	4	Silty Clay to Clay	19.412	0.743	3.986	2.059	1.928	2.9	0.7033	0.62	0.564							0.88	1		242.26	242.26
66.437	5	Clayey Silt to Silty Clay	33.532	0.432	4.016	2.074	1.942	2.7	0.7002	0.61	0.562							0.88	1		274.07	274.07
66.929	5	Clayey Silt to Silty Clay	27.507	0.399	4.046	2.09	1.956	2.77	0.6971	0.61	0.559							0.87	1		250.07	250.07
67.421	5	Clayey Silt to Silty Clay	26.055	0.401	4.076	2.105	1.971	2.79	0.6938	0.61	0.556							0.87	1		247.98	247.98
67.913	4	Silty Clay to Clay	26.817	0.591	4.105	2.12	1.985	2.84	0.6907	0.60	0.553							0.87	1		251.55	251.55
68.406	4	Silty Clay to Clay	33.13	0.655	4.135	2.136	1.999	2.81	0.6877	0.60	0.551							0.87	1		272.53	272.53
68.898	4	Silty Clay to Clay	35.142	0.868	4.165	2.151	2.014	2.8	0.6845	0.60	0.548							0.87	1		286.04	286.04
69.39	4	Silty Clay to Clay	34.941	0.757	4.195	2.166	2.028	2.85	0.6815	0.60	0.546							0.87	1		273.13	273.13
69.882	4	Silty Clay to Clay	25.278	0.775	4.224	2.182	2.043	3	0.6784	0.59	0.543							0.87	1		237.07	237.07
70.374	4	Silty Clay to Clay	22.662	0.628	4.254	2.197	2.057	3.04	0.6755	0.59	0.541							0.87	1		224.48	224.48
70.866	4	Silty Clay to Clay	22.575	0.585	4.284	2.212	2.071	3.01	0.6726	0.59	0.539							0.86	1		224.37	224.37
71.358	4	Silty Clay to Clay	24.711	0.561	4.314	2.228	2.086	2.95	0.6695	0.58	0.536							0.86	1		235.45	235.45
71.85	4	Silty Clay to Clay	30.484	0.526	4.343	2.243	2.1	2.86	0.6667	0.58	0.534							0.86	1		254.20	254.20
72.343	4	Silty Clay to Clay	23.179	0.539	4.373	2.259	2.115	2.94	0.6637	0.58	0.531							0.86	1		239.34	239.34
72.835	4	Silty Clay to Clay	28.916	0.737	4.403	2.274	2.129	2.85	0.6609	0.58	0.529							0.86	1		286.14	286.14
73.327	5	Clayey Silt to Silty Clay	122.02	1.719	4.433	2.289	2.143	2.46	0.6581	0.58	0.527	2.460	0.66	80.30	2.574	206.717		0.86	1		232.34	232.34
73.819	5	Clayey Silt to Silty Clay	38.795	0.886	4.462	2.305	2.158	2.63	0.6552	0.57	0.525							0.86	1		353.18	353.18
74.311	4	Silty Clay to Clay	30.606	0.65	4.492	2.32	2.172	2.86	0.6524	0.57	0.523							0.86	1		269.45	269.45
74.803	4	Silty Clay to Clay	31.792	0.832	4.522	2.335	2.186	2.88	0.6497	0.57	0.521							0.86	1		275.68	275.68
75.295	4	Silty Clay to Clay	37.558	1.065	4.552	2.351	2.201	2.82	0.6469	0.57	0.519							0.85	1		326.06	326.06
75.787	5	Clayey Silt to Silty Clay	85.211	3.083	4.581	2.366	2.215	2.6	0.6442	0.56	0.517							0.85	1		238.72	238.72
76.28	5	Clayey Silt to Silty Clay	123.92	3.089	4.611	2.381	2.23	2.48	0.6414	0.56	0.515	2.480	0.64	79.48	2.669	212.164		0.85	1		246.34	246.34
76.772	4	Silty Clay to Clay	38.795	1.823	4.641	2.397	2.244	2.78	0.6388	0.56	0.514							0.85	1		371.66	371.66
77.264	4	Silty Clay to Clay	27.101	0.859	4.671	2.412	2.258	3.07	0.6362	0.56	0.512							0.85	1		243.32	243.32
77.756	4	Silty Clay to Clay	37.874	1.26	4.7	2.428	2.273	3.02	0.6335	0.56	0.510							0.85	1		285.75	285.75
78.248	4	Silty Clay to Clay	63.786	2.067	4.73	2.443	2.287	2.85	0.6309	0.55	0.508							0.85	1		345.09	345.09
78.74	5	Clayey Silt to Silty Clay	35.66	0.871	4.76	2.458	2.302	2.76	0.6282	0.55	0.507							0.85	1		324.76	324.76
79.232	4	Silty Clay to Clay	37.041	0.98	4.79	2.474	2.316	2.87	0.6257	0.55	0.505							0.85	1		292.65	292.65
79.724	4	Silty Clay to Clay	25.02	0.556	4.819	2.489	2.33	3.04	0.6232	0.55	0.504							0.84	1		235.53	235.53
80.217	4	Silty Clay to Clay	24.344	0.582	4.849	2.504	2.345	3.05	0.6206	0.55	0.502							0.84	1		229.06	229.06
80.709	4	Silty Clay to Clay	26.86	0.696	4.879	2.52	2.359	3.03	0.6182	0.55	0.500							0.84	1		240.33	240.33
81.201	4	Silty Clay to Clay	27.924	0.631	4.909	2.535	2.373	2.99	0.6157	0.54	0.499							0.84	1		246.70	246.70
81.693	4	Silty Clay to Clay	27.32	0.618	4.938	2.55	2.388	2.99	0.6132	0.54	0.497							0.84	1		242.86	242.86
82.185	4	Silty Clay to Clay	23.236	0.455	4.968	2.566	2.402	3.03	0.6108	0.54	0.496							0.84	1		227.01	227.01
82.677	4	Silty Clay to Clay	26.934	0.64	4.998	2.581	2.417	2.99	0.6082	0.54	0.494							0.84	1		265.79	265.79
83.169	4	Silty Clay to Clay	48.716	1.689	5.028	2.597	2.431	2.89	0.6059	0.54	0.493							0.84	1		343.15	343.15
83.661	5	Clayey Silt to Silty Clay	111.78	2.697	5.057	2.612	2.445	2.59	0.6036	0.54	0.492	2.590	0.60	67.47	3.266	220.354		0.84	1		246.80	246.80
84.154	5	Clayey Silt to Silty Clay	94.787	3.237	5.087	2.627	2.46	2.58	0.6011	0.53	0.490	2.580	0.60	56.98	3.206	182.690		0.84	1		247.72	247.72
84.646	4	Silty Clay to Clay	32.871	1.215	5.117	2.643	2.474	2.88	0.5988	0.53	0.489							0.83	1		332.36	332.36
85.138	4	Silty Clay to Clay	31.663	1.161	5.147	2.658	2.489	3.06	0.5964	0.53	0.488							0.83	1		270.22	270.22
85.63	4	Silty Clay to Clay	33.388	1.253	5.176	2.673	2.503	3.07	0.5941	0.53	0.486							0.83	1		277.79	277.79
86.122	3	Clay	33.733	1.752	5.206	2.689	2.517	3.11	0.5919	0.53	0.485							0.83	1		279.71	279.71
86.614	4	Silty Clay to Clay	31.921	1.492	5.236	2.704	2.532	3.12	0.5895	0.53	0.484							0.83	1		272.52	272.52
87.106	4	Silty Clay to Clay	30.512	1.204	5.266	2.719	2.546	3.09	0.5873	0.53	0.483							0.83	1		267.15	267.15
87.598	4	Silty Clay to Clay	31.663	1.139	5.295	2.735	2.561	3.06	0.585	0.53	0.481							0.83	1		273.71	273.71
88.091	4	Silty Clay to Clay	34.654	1.466	5.325	2.75	2.575	3.06	0.5828	0.52	0.480							0.83	1		281.14	281.14
88.583	4	Silty Clay to Clay	29.707	0.909	5.355	2.766	2.589	3.05	0.5806	0.52	0.479							0.83	1		263.06	263.06
89.075	4	Silty Clay to Clay	28.111	0.699	5.385	2.781	2.604	3.02	0.5783	0.52	0.478							0.83	1		258.79	258.79
89.567	4	Silty Clay to Clay	37.731	1.052	5.414	2.796	2.618	2.92	0.5762	0.52	0.477							0.82	1		311.07	311.07
90.059	5	Clayey Silt to Silty Clay	72.327	2.063	5.444	2.812	2.632	2.77	0.5741	0.52	0.476							0.82	1		407.86	407.86
90.551	5	Clayey Silt to Silty Clay	80.724	2.088	5.474	2.827	2.647	2.73	0.5719	0.52	0.475							0.82	1		429.56	429.56
91.043	4	Silty Clay to Clay	63.376	2.185	5.504	2.842	2.661	2.74	0.5698	0.52	0.474							0.82	1		446.05	446.05
91.535	6	Sandy Silt to Clayey Silt	255.83	4.381	5.533	2.858	2.676	2.2	0.5676	0.52	0.473	2.200	0.57	145.21	1.667	242.031		0.78	1		282.40	282.40
92.028	8	Sand to Silty Sand	269.29	7.54	5.563	2.873	2.69	2.14	0.5656	0.51	0.472	2.140	0.57	152.30	1.532	233.316		0.75	1		294.49	294.49
92.52	8	Sand to Silty Sand	284.33	9.076	5.593	2.888	2.704	2.22	0.5635	0.51	0.471	2.220	0.56	160.23	1.717	275.140		0.75	1		293.89	293.89
93.012	8	Sand to Silty Sand	268.89	7.343	5.623	2.904	2.719	2.18	0.5614	0.51	0.470	2.180	0.56	150.95	1.619	244.406		0.75	1		294.13	294.13
93.504	6	Sandy Silt to Clayey Silt	297.56	5.325	5.652	2.919	2.733	2.01	0.5594	0.51	0.469	2.010	0.56	166.45	1.313	218.591		0.73	1		297.61	297.61
93.996	6	Sandy Silt to Clayey Silt	302.68	4.065	5.682	2.935	2.748	1.89	0.5572	0.51	0.468	1.890	0.56	168.67	1.180	198.954		0.72	1		299.14	299.14
94.488	6	Sandy Silt to Clayey Silt	262.02	3.169	5.712	2.95	2.762	1.89	0.5553	0.51	0.467	1.890	0.56	145.49	1.180	171.617		0.73	1		295.76	295.76
94.98	6	Sandy Silt to Clayey Silt	252.47	3.353	5.742	2.965	2.776	1.98	0.5533	0.51	0.466	1.980	0.55	139.70	1.275	178.075		0.75	1		291.16	291.16
95.472	5	Clayey Silt to Silty Clay	107.35	2.901	5.771	2.981	2.791	2.36	0.5512	0.51	0.465	2.360	0.55	59.18	2.156	127.611	0.27	0.81	1	(0.59)	269.25	133.52
95.965	4	Silty Clay to Clay	51.502	1.571	5.801	2.996	2.805	2.84	0.5493	0.51	0.464							0.81	1		378.42	378.42
96.457	4	Silty Clay to Clay	59.616	2.13	5.831	3.011	2.819	2.87	0.5474	0.51	0.463							0.81	1		376.85	376.85
96.949	4	Silty Clay to Clay	48.256	1.615	5.861	3.027	2.834	2.91	0.5454	0.50	0.462							0.81	1		354.99	354.99
97.441	5	Clayey Silt to Silty Clay	47.325	1.424	5.89	3.042	2.848	2.87	0.5435	0.50	0.461							0.81	1		344.52	344.52
97.933	5	Clayey Silt to Silty Clay	47.652	1.014	5.92	3.057	2.863	2.83	0.5415	0.50	0.460							0.81	1		338.13	338.13
98.425	5	Clayey Silt to Silty Clay	44.043	1.026	5.95	3.073	2.877	2.87	0.5396	0.50	0.460							0.81	1		328.88	328.88
98.917	5	Clayey Silt to Silty Clay	45.754	1.104	5.98	3.088	2.891	2.88	0.5378	0.50	0.459							0.81	1		331.71	331.71
99.409	4	Silty Clay to Clay	43.871	1.177	6.009	3.104	2.906	2.91	0.5358	0.50	0.458							0.81	1		328.76	328.76
99.902	4	Silty Clay to Clay	43.339	1.157	6.039	3.119	2.92	2.92	0.534	0.50	0.457							0.81	1		322.74	322.74
100.39	5	Clayey Silt to Silty Clay	41.958	0.935	6.069	3.134	2.935	2.92	0.532	0.50	0.456							0.81	1		313.15	313.15
100.89	5	Clayey Silt to Silty Clay	36.523	0.736	6.099	3.15	2.949	2.93	0.5302	0.50	0.456							0.81	1		294.27	294.27
101.38	5	Clayey Silt to Silty Clay	34.068	0.644	6.128	3.165	2.963	2.96	0.5285	0.50	0.455							0.80	1		280.46	280.46
101.87	5	Clayey Silt to Silty Clay	34.309	0.662	6.158	3.18	2.978	2.93	0.5266	0.50	0.454							0.80	1		286.95	286.95
102.36	5	Clayey Silt to Silty Clay	41.699	0.78	6.188	3.196	2.992	2.9	0.5248	0.49	0.453							0.80	1		322.92	322.92

LIQUEFACTION POTENTIAL ANALYSIS (per Youd et al., 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project*** *FAULT INFO*
PROJECT NO. ***2017-125-GEO*** *COAST RANGE - SIERRAN BLOCK BOUNDARY ZONE (CSB)*
CPT NO. ***CPT-AS-95A*** *FAULT* M_w = 6.9 *MSF* = 1.24 a_{max} *(g)*= 0.682 V_{S30m}(m/s)= #REF! 224.4

		CPT RESULT INPUT							***CSR***					***CRR*** $_{7.5}$			***F.S.=(CRR*** $_{7.5}$ ***/CSR)*MSF*K*** σ ****K*** α				
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	V_s (m/s)	$V_{s,liq}$ (m/s)
102.85	4	Silty Clay to Clay	71.464	2.389	6.218	3.211	3.006	2.87	0.5231	0.49	0.453							0.80	1		390.08	390.08
103.35	4	Silty Clay to Clay	52.225	2.08	6.247	3.226	3.021	2.93	0.5212	0.49	0.452							0.80	1		375.10	375.10
103.84	4	Silty Clay to Clay	49.611	1.978	6.277	3.242	3.035	2.98	0.5195	0.49	0.451							0.80	1		354.58	354.58
104.33	4	Silty Clay to Clay	54.382	1.901	6.307	3.257	3.05	2.93	0.5176	0.49	0.450							0.80	1		368.10	368.10
104.82	4	Silty Clay to Clay	55.37	1.86	6.337	3.273	3.064	2.87	0.5159	0.49	0.450							0.80	1		394.21	394.21
105.32	4	Silty Clay to Clay	80.408	2.58	6.366	3.288	3.078	2.82	0.5143	0.49	0.449							0.80	1		423.13	423.13
105.81	5	Clayey Silt to Silty Clay	54.4	1.541	6.396	3.303	3.093	2.83	0.5125	0.49	0.448							0.80	1		388.26	388.26
106.3	5	Clayey Silt to Silty Clay	55.963	1.296	6.426	3.319	3.107	2.85	0.5108	0.49	0.447							0.80	1		362.98	362.98
106.79	4	Silty Clay to Clay	42.763	1.166	6.456	3.334	3.122	2.97	0.509	0.49	0.447							0.80	1		326.74	326.74
107.28	4	Silty Clay to Clay	46.013	1.503	6.485	3.349	3.136	2.98	0.5074	0.49	0.446							0.80	1		342.56	342.56
107.78	4	Silty Clay to Clay	45.582	1.993	6.515	3.365	3.15	3.01	0.5057	0.49	0.445							0.79	1		344.92	344.92
108.27	4	Silty Clay to Clay	43.684	1.773	6.545	3.38	3.165	3.05	0.504	0.48	0.445							0.79	1		328.79	328.79
108.76	4	Silty Clay to Clay	42.088	1.633	6.575	3.395	3.179	3.05	0.5024	0.48	0.444							0.79	1		321.33	321.33
109.25	4	Silty Clay to Clay	42.706	1.206	6.604	3.411	3.193	3	0.5008	0.48	0.443							0.79	1		322.38	322.38
109.74	4	Silty Clay to Clay	45.179	1.195	6.634	3.426	3.208	2.94	0.4991	0.48	0.443							0.79	1		331.57	331.57
110.24	5	Clayey Silt to Silty Clay	45.351	1.017	6.664	3.442	3.222	2.88	0.4975	0.48	0.442							0.79	1		341.63	341.63
110.73	5	Clayey Silt to Silty Clay	48.285	0.685	6.694	3.457	3.237	2.8	0.4958	0.48	0.441							0.79	1		344.46	344.46
111.22	5	Clayey Silt to Silty Clay	47.733	0.769	6.723	3.472	3.251	2.8	0.4943	0.48	0.441							0.79	1		351.46	351.46
111.71	5	Clayey Silt to Silty Clay	58.494	1.597	6.753	3.488	3.265	2.76	0.4927	0.48	0.440							0.79	1		411.61	411.61
112.21	5	Clayey Silt to Silty Clay	59.501	1.37	6.783	3.503	3.28	2.8	0.4911	0.48	0.439							0.79	1		394.98	394.98
112.7	4	Silty Clay to Clay	39.316	0.891	6.813	3.518	3.294	2.98	0.4895	0.48	0.439							0.79	1		314.56	314.56
113.19	4	Silty Clay to Clay	41.584	1.383	6.842	3.534	3.309	3.03	0.4879	0.48	0.438							0.79	1		315.11	315.11
113.68	4	Silty Clay to Clay	43.08	1.444	6.872	3.549	3.323	3.03	0.4864	0.48	0.437							0.79	1		326.36	326.36
114.17	4	Silty Clay to Clay	51.19	2.162	6.902	3.564	3.337	3.04	0.4849	0.48	0.437							0.79	1		359.23	359.23
114.67	4	Silty Clay to Clay	54.842	3.187	6.932	3.58	3.352	3.07	0.4833	0.48	0.436							0.79	1		374.99	374.99
115.16	4	Silty Clay to Clay	51.118	2.749	6.961	3.595	3.366	3.08	0.4818	0.48	0.436							0.78	1		364.43	364.43
115.65	4	Silty Clay to Clay	52.254	2.494	6.991	3.611	3.38	3.07	0.4803	0.47	0.435							0.78	1		359.85	359.85
116.14	4	Silty Clay to Clay	45.668	2.094	7.021	3.626	3.395	3.09	0.4788	0.47	0.434							0.78	1		339.85	339.85
116.63	4	Silty Clay to Clay	42.663	1.603	7.051	3.641	3.409	3.08	0.4773	0.47	0.434							0.78	1		324.10	324.10
117.13	4	Silty Clay to Clay	42.433	1.44	7.08	3.657	3.424	3.06	0.4758	0.47	0.433							0.78	1		324.06	324.06
117.62	4	Silty Clay to Clay	44.719	1.403	7.11	3.672	3.438	3.03	0.4743	0.47	0.433							0.78	1		329.66	329.66
118.11	4	Silty Clay to Clay	47.767	1.863	7.14	3.687	3.452	3.04	0.4729	0.47	0.432							0.78	1		351.74	351.74
118.6	4	Silty Clay to Clay	54.396	2.652	7.17	3.703	3.467	3.03	0.4714	0.47	0.432							0.78	1		378.39	378.39
119.09	4	Silty Clay to Clay	53.979	2.441	7.199	3.718	3.481	3.05	0.47	0.47	0.431							0.78	1		369.26	369.26
119.59	4	Silty Clay to Clay	46.876	2.077	7.229	3.733	3.496	3.1	0.4685	0.47	0.430							0.78	1		343.86	343.86
120.08	4	Silty Clay to Clay	43.454	1.775	7.259	3.749	3.51	3.11	0.4671	0.47	0.430							0.78	1		330.58	330.58

LIQUEFACTION POTENTIAL ANALYSIS (per Youd & Idriss, 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
CPT NO. ***CPT-AS-06***

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.6 (Design Basis EQ)
FAULT M_w = 7.5
MSF = 1.00

			CPT RESULT INPUT							*CSR*		*$CRR_{7.5}$*						*$F.S.=(CRR_{7.5}/CSR)*MSF*K\sigma*K\alpha$*		
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.
0.492					0.03		0.03	-9999	2	1.00	0.390							1.00	1	
1.476					0.089		0.089	-9999	2	1.00	0.389							1.00	1	
2.461					0.148		0.148	-9999	2	1.00	0.389							1.00	1	
3.445					0.207		0.207	-9999	2	0.99	0.388							1.00	1	
4.429					0.266		0.266	-9999	1.94	0.99	0.387							1.00	1	
5.413	3	Clay	7.38	0.29	0.325		0.325	2.81	1.75	0.99	0.386							1.00	1	
6.398	5	Clayey Silt to Silty Clay	16.24	0.41	0.384		0.384	2.55	1.61	0.99	0.385	2.550	1.61	26.15	3.034	79.334	0.13	1.00	1	
7.382	5	Clayey Silt to Silty Clay	14.21	0.37	0.443		0.443	2.64	1.5	0.98	0.384							1.00	1	
8.366	4	Silty Clay to Clay	9.87	0.32	0.502		0.502	2.81	1.41	0.98	0.383							1.00	1	
9.35	5	Clayey Silt to Silty Clay	14.17	0.33	0.561	0.011	0.55	2.63	1.35	0.98	0.390							1.00	1	
10.335	3	Clay	5.11	0.28	0.62	0.042	0.578	3.26	1.31	0.98	0.409							1.00	1	
11.319	2	Organic	3.11	0.22	0.679	0.072	0.607	3.56	1.28	0.98	0.426							1.00	1	
12.303	3	Clay	3.65	0.16	0.738	0.103	0.635	3.39	1.25	0.97	0.442							1.00	1	
13.287	4	Silty Clay to Clay	11.78	0.36	0.797	0.134	0.663	2.84	1.23	0.97	0.456							1.00	1	
14.271	6	Sandy Silt to Clayey Silt	30.12	0.64	0.856	0.165	0.692	2.47	1.2	0.97	0.468	2.470	1.20	36.14	2.621	94.745	0.16	1.00	1	0.34
15.256	5	Clayey Silt to Silty Clay	12.94	0.32	0.915	0.195	0.72	2.78	1.18	0.97	0.480							1.00	1	
16.24	3	Clay	6.77	0.31	0.974	0.226	0.748	3.22	1.16	0.97	0.490							1.00	1	
17.224	3	Clay	11.58	0.52	1.033	0.257	0.777	3.01	1.13	0.96	0.500							1.00	1	
18.208	3	Clay	14.54	0.66	1.093	0.288	0.805	2.94	1.11	0.96	0.509							1.00	1	
19.193	3	Clay	14.2	0.7	1.152	0.318	0.833	2.98	1.1	0.96	0.517							1.00	1	
20.177	3	Clay	9.12	0.49	1.211	0.349	0.862	3.2	1.08	0.96	0.524							1.00	1	
21.161	3	Clay	6.92	0.36	1.27	0.38	0.89	3.33	1.06	0.95	0.531							1.00	1	
22.145	3	Clay	4.55	0.15	1.329	0.41	0.918	3.41	1.04	0.95	0.537							1.00	1	
23.13	4	Silty Clay to Clay	13.15	0.48	1.388	0.441	0.947	2.98	1.03	0.95	0.542							1.00	1	
24.114	4	Silty Clay to Clay	15.28	0.51	1.447	0.472	0.975	2.92	1.01	0.94	0.547							1.00	1	
25.098	4	Silty Clay to Clay	18.52	0.7	1.506	0.503	1.003	2.88	1	0.94	0.551							1.00	1	
26.082	4	Silty Clay to Clay	20.95	0.8	1.565	0.533	1.032	2.84	0.98	0.94	0.555							0.99	1	
27.067	4	Silty Clay to Clay	22.71	0.92	1.624	0.564	1.06	2.85	0.97	0.93	0.558							0.98	1	
28.051	3	Clay	20.55	0.94	1.683	0.595	1.088	2.93	0.96	0.93	0.561							0.98	1	
29.035	3	Clay	24	1.25	1.742	0.626	1.117	2.92	0.95	0.93	0.563							0.97	1	
30.019	3	Clay	9	0.55	1.801	0.656	1.145	3.38	0.93	0.92	0.565							0.96	1	
31.004	5	Clayey Silt to Silty Clay	14.82	0.34	1.86	0.687	1.173	2.88	0.92	0.92	0.566							0.95	1	
31.988	5	Clayey Silt to Silty Clay	20.2	0.54	1.919	0.718	1.202	2.8	0.91	0.91	0.566							0.95	1	
32.972	5	Clayey Silt to Silty Clay	31.87	1.13	1.978	0.748	1.23	2.73	0.9	0.90	0.567							0.94	1	
33.956	4	Silty Clay to Clay	25.29	1.05	2.037	0.779	1.258	2.87	0.89	0.90	0.567							0.93	1	
34.941	3	Clay	16.29	0.72	2.096	0.81	1.287	3.07	0.88	0.89	0.566							0.93	1	
35.925	4	Silty Clay to Clay	11.39	0.42	2.156	0.841	1.315	3.18	0.87	0.88	0.565							0.92	1	
36.909	3	Clay	12.03	0.53	2.215	0.871	1.343	3.23	0.86	0.88	0.564							0.92	1	
37.893	3	Clay	13.09	0.58	2.274	0.902	1.372	3.2	0.85	0.87	0.562							0.91	1	
38.877	5	Clayey Silt to Silty Clay	16.71	0.55	2.333	0.933	1.4	3.01	0.85	0.86	0.559							0.90	1	
39.862	5	Clayey Silt to Silty Clay	16.61	0.57	2.392	0.964	1.428	3.04	0.84	0.85	0.557							0.90	1	
40.846	4	Silty Clay to Clay	14.61	0.52	2.451	0.994	1.456	3.12	0.83	0.84	0.554							0.89	1	
41.83	5	Clayey Silt to Silty Clay	11.04	0.29	2.51	1.025	1.485	3.18	0.82	0.83	0.550							0.89	1	
42.814	4	Silty Clay to Clay	9.8	0.33	2.569	1.056	1.513	3.3	0.81	0.83	0.546							0.88	1	
43.799	5	Clayey Silt to Silty Clay	9.96	0.26	2.628	1.087	1.541	3.24	0.81	0.82	0.542							0.88	1	
44.783	5	Clayey Silt to Silty Clay	34.06	1.35	2.687	1.117	1.57	2.84	0.8	0.81	0.538							0.87	1	
45.767	6	Sandy Silt to Clayey Silt	84.11	2.5	2.746	1.148	1.598	2.38	0.79	0.80	0.533	2.380	0.79	66.45	2.233	148.348	0.38	0.88	1	0.72
46.751	6	Sandy Silt to Clayey Silt	19.28	0.45	2.805	1.179	1.626	2.93	0.78	0.79	0.529							0.91	1	
47.736	5	Clayey Silt to Silty Clay	19.94	0.54	2.864	1.209	1.655	2.96	0.78	0.78	0.524							0.86	1	
48.72	6	Sandy Silt to Clayey Silt	30.13	0.86	2.923	1.24	1.683	2.82	0.77	0.77	0.519							0.90	1	
49.704	5	Clayey Silt to Silty Clay	29.65	1.05	2.982	1.271	1.711	2.9	0.76	0.76	0.514							0.85	1	
50.688	6	Sandy Silt to Clayey Silt	19.94	0.43	3.041	1.302	1.74	2.94	0.76	0.75	0.508							0.90	1	
51.673	6	Sandy Silt to Clayey Silt	26.28	0.54	3.1	1.332	1.768	2.82	0.75	0.74	0.503							0.89	1	
52.657	5	Clayey Silt to Silty Clay	35.58	1.12	3.159	1.363	1.796	2.82	0.75	0.73	0.498							0.84	1	
53.641	5	Clayey Silt to Silty Clay	24.55	0.76	3.219	1.394	1.825	2.96	0.74	0.72	0.493							0.83	1	
54.625	5	Clayey Silt to Silty Clay	20.07	0.65	3.278	1.425	1.853	3.06	0.73	0.71	0.488							0.83	1	
55.61	6	Sandy Silt to Clayey Silt	19.51	0.48	3.337	1.455	1.881	3	0.73	0.70	0.483							0.88	1	
56.594	7	Silty Sand to Sandy Silt	89.75	1.62	3.396	1.486	1.91	2.23	0.72	0.69	0.477	2.230	0.72	64.62	1.743	112.663	0.21	0.84	1	0.45
57.578	10	Gravelly Sand to Sand	374.94	2.14	3.455	1.517	1.938	1.44	0.72	0.68	0.473	1.440	0.72	269.96	1.000	269.957		0.77	1	
58.562	10	Gravelly Sand to Sand	482.04	1.16	3.514	1.547	1.966	1.12	0.71	0.67	0.468	1.120	0.71	342.25	1.000	342.248		0.76	1	
59.547	9	Sand	392.01	3.69	3.573	1.578	1.995	1.58	0.71	0.66	0.463	1.580	0.71	278.33	1.000	278.327		0.76	1	
60.531	11	Sitff Fine-Grained	105.67	4.76	3.632	1.609	2.023	2.48	0.7	0.65	0.459	2.480	0.70	73.97	2.669	197.449		0.81	1	
61.515	6	Sandy Silt to Clayey Silt	56.88	1.71	3.691	1.64	2.051	2.68	0.7	0.65	0.454							0.87	1	
62.499	6	Sandy Silt to Clayey Silt	35.78	0.88	3.75	1.67	2.08	2.81	0.69	0.64	0.450							0.86	1	
63.483	6	Sandy Silt to Clayey Silt	26.29	0.59	3.809	1.701	2.108	2.92	0.69	0.63	0.446							0.86	1	
64.468	8	Sand to Silty Sand	121.73	1.29	3.868	1.732	2.136	2	0.68	0.63	0.442	2.000	0.68	82.78	1.300	107.609	0.20	0.79	1	0.44
65.452	8	Sand to Silty Sand	131.17	2.26	3.927	1.763	2.165	2.12	0.68	0.62	0.438	2.120	0.68	89.20	1.492	133.094	0.30	0.78	1	0.68
66.436	6	Sandy Silt to Clayey Silt	23.16	0.54	3.986	1.793	2.193	3.03	0.68	0.61	0.434							0.85	1	
67.42	6	Sandy Silt to Clayey Silt	29.17	0.56	4.045	1.824	2.221	2.87	0.67	0.61	0.431							0.85	1	
68.405	6	Sandy Silt to Clayey Silt	43.43	1.16	4.104	1.855	2.25	2.78	0.67	0.60	0.427							0.85	1	
69.389	6	Sandy Silt to Clayey Silt	58.7	1.93	4.163	1.886	2.278	2.74	0.66	0.60	0.424							0.85	1	
70.373	5	Clayey Silt to Silty Clay	52.52	1.82	4.222	1.916	2.306	2.8	0.66	0.59	0.421							0.78	1	
71.357	6	Sandy Silt to Clayey Silt	61.76	1.96	4.282	1.947	2.335	2.71	0.65	0.58	0.418							0.84	1	
72.342	6	Sandy Silt to Clayey Silt	58.76	1.9	4.341	1.978	2.363	2.74	0.65	0.58	0.415							0.84	1	
73.326	6	Sandy Silt to Clayey Silt	23.52	0.55	4.4	2.008	2.391	3.04	0.65	0.58	0.413							0.84	1	
74.31	6	Sandy Silt to Clayey Silt	23.86	0.59	4.459	2.039	2.42	3.04	0.64	0.57	0.410							0.84	1	
75.294	5	Clayey Silt to Silty Clay	45.96	1.83	4.518	2.07	2.448	2.9	0.64	0.57	0.408							0.76	1	
76.279	9	Sand	221.56	2.11	4.577	2.101	2.476	1.8	0.64	0.56	0.405	1.800	0.64	141.80	1.107	156.923	0.44	0.71	1	1.08
77.263	7	Silty Sand to Sandy Silt	83.25	1.99	4.636	2.131	2.505	2.39	0.63	0.56	0.403	2.390	0.63	52.45	2.272	119.162	0.24	0.80	1	0.59
78.247	5	Clayey Silt to Silty Clay	45.49	1.63	4.695	2.162	2.533	2.9	0.63	0.55	0.401							0.76	1	
79.231	6	Sandy Silt to Clayey Silt	22.74	0.51	4.754	2.193	2.561	3.06	0.62	0.55	0.399							0.83	1	
80.216	6	Sandy Silt to Clayey Silt	25.99	0.53	4.813	2.224	2.589	2.97	0.62	0.55	0.397							0.83	1	
81.2	6	Sandy Silt to Clayey Silt	34.26	0.76	4.872	2.254	2.618	2.87	0.62	0.54	0.395							0.82	1	
82.184	6	Sandy Silt to Clayey Silt	26.12	0.54	4.931	2.285	2.646	2.99	0.61	0.54	0.393							0.82	1	
83.168	6	Sandy Silt to Clayey Silt	20.55	0.35	4.99	2.316	2.674	3.06	0.61	0.54	0.391							0.82	1	
84.153	6	Sandy Silt to Clayey Silt	21.74	0.48	5.049	2.346	2.703	3.09	0.61	0.53	0.390							0.82	1	
85.137	6	Sandy Silt to Clayey Silt	33.48	0.73	5.108	2.377	2.731	2.92	0.61	0.53	0.388							0.82	1	
86.121	6	Sandy Silt to Clayey Silt	24.96	0.55	5.167	2.408	2.759	3.05	0.6	0.53	0.387							0.82	1	
87.105	6	Sandy Silt to Clayey Silt	52.1	1.29	5.226	2.439	2.788	2.77	0.6	0.53	0.385							0.81	1	
88.089	5	Clayey Silt to Silty Clay	29.09	0.93	5.285	2.469	2.816	3.1	0.6	0.52	0.384							0.73	1	
89.074	6	Sandy Silt to Clayey Silt	24.45	0.63	5.345	2.5	2.844	3.11	0.59	0.52	0.382							0.81	1	
90.058	6	Sandy Silt to Clayey Silt	29.22	0.8	5.404	2.531	2.873	3.05	0.59	0.52	0.381							0.81	1	
91.042	6	Sandy Silt to Clayey Silt	29.06	0.75	5.463	2.562	2.901	3.04	0.59	0.52	0.380							0.81	1	
92.026	5	Clayey Silt to Silty Clay	31.27	0.97	5.522	2.592	2.929	3.07	0.58	0.51	0.378							0.72	1	
93.011	6	Sandy Silt to Clayey Silt	30.33	0.77	5.581	2.623	2.958	3.03	0.58	0.51	0.377							0.81	1	
93.995	6	Sandy Silt to Clayey Silt	29.86	0.78	5.64	2.654	2.986	3.04	0.58	0.51	0.376							0.80	1	
94.979	6	Sandy Silt to Clayey Silt	33.49	0.88	5.699	2.685	3.014	2.99	0.58	0.51	0.375							0.80	1	
95.963	6	Sandy Silt to Clayey Silt	28.49	0.75	5.758	2.715	3.043	3.09	0.57	0.51	0.374							0.80	1	
96.948	6	Sandy Silt to Clayey Silt	24.1	0.51	5.817	2.746	3.071	3.11	0.57	0.50	0.373							0.80	1	
97.932	6	Sandy Silt to Clayey Silt	23.87	0.54	5.876	2.777	3.099	3.14	0.57	0.50	0.371							0.80	1	
98.916	6	Sandy Silt to Clayey Silt	25.02	0.56	5.935	2.807	3.128	3.11	0.57	0.50	0.370							0.80	1	
99.9	6	Sandy Silt to Clayey Silt	25.73	0.63	5.994	2.838	3.156	3.13	0.56	0.50	0.369							0.79	1	
100.885	6	Sandy Silt to Clayey Silt	23.76	0.4	6.053	2.869	3.184	3.08	0.56	0.50	0.368							0.79	1	
101.869	7	Silty Sand to Sandy Silt	31.4	0.51	6.112	2.9	3.213	2.94	0.56	0.50	0.367							0.79	1	

LIQUEFACTION POTENTIAL ANALYSIS (per Youd & Idriss, 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
CPT NO. ***CPT-AS-06***

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.6 (Design Basis EQ)
FAULT M_w = 7.5
MSF = 1.00

			CPT RESULT INPUT							*CSR*		*$CRR_{7.5}$*						*$F.S.=(CRR_{7.5}/CSR)*MSF*K\sigma*K\alpha$*		
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.
102.853	7	Silty Sand to Sandy Silt	49.5	1	6.171	2.93	3.241	2.8	0.56	0.49	0.367							0.79	1	
103.837	6	Sandy Silt to Clayey Silt	49.9	1.24	6.23	2.961	3.269	2.86	0.55	0.49	0.366							0.79	1	
104.822	5	Clayey Silt to Silty Clay	35.58	1.31	6.289	2.992	3.298	3.11	0.55	0.49	0.365							0.70	1	
105.806	6	Sandy Silt to Clayey Silt	31.45	0.93	6.348	3.023	3.326	3.1	0.55	0.49	0.364							0.79	1	
106.79	6	Sandy Silt to Clayey Silt	50.69	1.38	6.408	3.053	3.354	2.87	0.55	0.49	0.363							0.79	1	
107.774	5	Clayey Silt to Silty Clay	64.78	2.6	6.467	3.084	3.383	2.89	0.54	0.49	0.362							0.69	1	
108.759	6	Sandy Silt to Clayey Silt	57.72	2.04	6.526	3.115	3.411	2.9	0.54	0.48	0.361							0.78	1	
109.743	5	Clayey Silt to Silty Clay	36.39	1.18	6.585	3.145	3.439	3.09	0.54	0.48	0.361							0.69	1	
110.727	6	Sandy Silt to Clayey Silt	33.87	0.84	6.644	3.176	3.468	3.04	0.54	0.48	0.360							0.78	1	
111.711	6	Sandy Silt to Clayey Silt	33.22	0.77	6.703	3.207	3.496	3.04	0.53	0.48	0.359							0.78	1	
112.695	6	Sandy Silt to Clayey Silt	37.24	0.91	6.762	3.238	3.524	3	0.53	0.48	0.358							0.78	1	
113.68	6	Sandy Silt to Clayey Silt	47.38	1.6	6.821	3.268	3.553	2.99	0.53	0.48	0.357							0.78	1	
114.664	5	Clayey Silt to Silty Clay	96.81	3.9	6.88	3.299	3.581	2.78	0.53	0.48	0.357							0.68	1	
115.648	6	Sandy Silt to Clayey Silt	110.19	3.73	6.939	3.33	3.609	2.68	0.53	0.47	0.356							0.72	1	
116.632	5	Clayey Silt to Silty Clay	40.37	1.59	6.998	3.361	3.638	3.12	0.52	0.47	0.355							0.68	1	
117.617	6	Sandy Silt to Clayey Silt	44.04	1.39	7.057	3.391	3.666	3.01	0.52	0.47	0.354							0.77	1	
118.601	6	Sandy Silt to Clayey Silt	56.6	1.63	7.116	3.422	3.694	2.88	0.52	0.47	0.354							0.77	1	
119.585	6	Sandy Silt to Clayey Silt	41.85	1.16	7.175	3.453	3.722	3.02	0.52	0.47	0.353							0.77	1	

LIQUEFACTION POTENTIAL ANALYSIS (per Youd & Idriss, 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
CPT NO. ***CPT-AS-08***

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.6 (Design Basis EQ)

FAULT M_w = 7.5
MSF = 1.00

			CPT RESULT INPUT							*CSR*		*CRR 7.5*						*F.S.=(CRR 7.5/CSR)*MSF*Kσ*Kα*		
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.
0.492					0.03		0.03	-9999	2	1.00	0.390							1.00	1	
1.476					0.089		0.089	-9999	2	1.00	0.389							1.00	1	
2.461					0.148		0.148	-9999	2	1.00	0.389							1.00	1	
3.445					0.207		0.207	-9999	2	0.99	0.388							1.00	1	
4.429					0.266		0.266	-9999	1.94	0.99	0.387							1.00	1	
5.413	4	Silty Clay to Clay	38.82	1.75	0.325		0.325	-9999	1.75	0.99	0.386							1.00	1	
6.398	3	Clay	22.87	1.07	0.384		0.384	2.62	1.61	0.99	0.385							1.00	1	
7.382	4	Silty Clay to Clay	14.3	0.5	0.443	0.012	0.431	2.65	1.52	0.98	0.395							1.00	1	
8.366	4	Silty Clay to Clay	9.77	0.29	0.502	0.043	0.459	2.75	1.48	0.98	0.419							1.00	1	
9.35	5	Clayey Silt to Silty Clay	10.87	0.28	0.561	0.073	0.488	2.69	1.43	0.98	0.440							1.00	1	
10.335	3	Clay	9.39	0.37	0.62	0.104	0.516	2.89	1.39	0.98	0.458							1.00	1	
11.319	4	Silty Clay to Clay	6.84	0.21	0.679	0.135	0.544	2.97	1.36	0.98	0.475							1.00	1	
12.303	5	Clayey Silt to Silty Clay	7.19	0.11	0.738	0.166	0.573	2.79	1.32	0.97	0.489							1.00	1	
13.287	5	Clayey Silt to Silty Clay	11.68	0.17	0.797	0.196	0.601	2.62	1.29	0.97	0.503							1.00	1	
14.271	4	Silty Clay to Clay	8.05	0.19	0.856	0.227	0.629	2.9	1.26	0.97	0.515							1.00	1	
15.256	3	Clay	8.63	0.32	0.915	0.258	0.658	3.01	1.23	0.97	0.525							1.00	1	
16.24	3	Clay	11.05	0.43	0.974	0.288	0.686	2.94	1.21	0.97	0.535							1.00	1	
17.224	3	Clay	10.12	0.41	1.033	0.319	0.714	3.01	1.18	0.96	0.544							1.00	1	
18.208	3	Clay	13.12	0.55	1.093	0.35	0.743	2.93	1.16	0.96	0.552							1.00	1	
19.193	3	Clay	12.47	0.55	1.152	0.381	0.771	2.98	1.14	0.96	0.559							1.00	1	
20.177	3	Clay	12.37	0.56	1.211	0.411	0.799	3.01	1.12	0.96	0.565							1.00	1	
21.161	3	Clay	11.61	0.5	1.27	0.442	0.828	3.03	1.1	0.95	0.571							1.00	1	
22.145	3	Clay	8.22	0.28	1.329	0.473	0.856	3.13	1.08	0.95	0.576							1.00	1	
23.13	6	Sandy Silt to Clayey Silt	30.16	0.76	1.388	0.504	0.884	2.56	1.06	0.95	0.581	2.560	1.06	31.97	3.091	98.804	0.17	1.00	1	0.29
24.114	3	Clay	14.07	0.61	1.447	0.534	0.913	3.01	1.05	0.94	0.584							1.00	1	
25.098	5	Clayey Silt to Silty Clay	16.39	0.55	1.506	0.565	0.941	2.88	1.03	0.94	0.588							1.00	1	
26.082	5	Clayey Silt to Silty Clay	18.34	0.49	1.565	0.596	0.969	2.78	1.02	0.94	0.591							1.00	1	
27.067	5	Clayey Silt to Silty Clay	17.08	0.42	1.624	0.627	0.997	2.79	1	0.93	0.593							1.00	1	
28.051	6	Sandy Silt to Clayey Silt	22.07	0.52	1.683	0.657	1.026	2.69	0.99	0.93	0.595							0.99	1	
29.035	6	Sandy Silt to Clayey Silt	94.94	2.71	1.742	0.688	1.054	2.26	0.97	0.93	0.596	2.260	0.97	92.09	1.827	168.232		0.98	1	
30.019	6	Sandy Silt to Clayey Silt	82.73	2.32	1.801	0.719	1.082	2.3	0.96	0.92	0.598	2.300	0.96	79.42	1.949	154.770	0.42	0.98	1	0.71
31.004	6	Sandy Silt to Clayey Silt	60.37	1.61	1.86	0.749	1.111	2.39	0.95	0.92	0.598	2.390	0.95	57.35	2.272	130.304	0.29	0.97	1	0.48
31.988	6	Sandy Silt to Clayey Silt	25.87	0.64	1.919	0.78	1.139	2.7	0.94	0.91	0.598							0.97	1	
32.972	5	Clayey Silt to Silty Clay	20.12	0.48	1.978	0.811	1.167	2.79	0.93	0.90	0.598							0.95	1	
33.956	5	Clayey Silt to Silty Clay	20.5	0.55	2.037	0.842	1.196	2.82	0.91	0.90	0.596							0.95	1	
34.941	5	Clayey Silt to Silty Clay	22.28	0.6	2.096	0.872	1.224	2.79	0.9	0.89	0.595							0.94	1	
35.925	5	Clayey Silt to Silty Clay	16.08	0.51	2.156	0.903	1.252	2.99	0.89	0.88	0.594							0.93	1	
36.909	5	Clayey Silt to Silty Clay	21.79	0.67	2.215	0.934	1.281	2.87	0.88	0.88	0.591							0.93	1	
37.893	5	Clayey Silt to Silty Clay	44.06	1.69	2.274	0.965	1.309	2.67	0.87	0.87	0.589							0.92	1	
38.877	7	Silty Sand to Sandy Silt	94.7	2.23	2.333	0.995	1.337	2.24	0.86	0.86	0.586	2.240	0.86	81.44	1.770	144.192	0.36	0.92	1	0.61
39.862	7	Silty Sand to Sandy Silt	55.31	1.09	2.392	1.026	1.366	2.37	0.86	0.85	0.582	2.370	0.86	47.57	2.194	104.363	0.19	0.93	1	0.32
40.846	5	Clayey Silt to Silty Clay	19.04	0.53	2.451	1.057	1.394	2.94	0.85	0.84	0.578							0.91	1	
41.83	6	Sandy Silt to Clayey Silt	24.96	0.57	2.51	1.087	1.422	2.77	0.84	0.83	0.574							0.93	1	
42.814	5	Clayey Silt to Silty Clay	18.85	0.66	2.569	1.118	1.451	3.02	0.83	0.83	0.570							0.89	1	
43.799	5	Clayey Silt to Silty Clay	13.1	0.34	2.628	1.149	1.479	3.11	0.82	0.82	0.565							0.89	1	
44.783	5	Clayey Silt to Silty Clay	17	0.37	2.687	1.18	1.507	2.94	0.81	0.81	0.560							0.88	1	
45.767	6	Sandy Silt to Clayey Silt	22.88	0.5	2.746	1.21	1.536	2.81	0.81	0.80	0.555							0.92	1	
46.751	6	Sandy Silt to Clayey Silt	28.43	0.57	2.805	1.241	1.564	2.72	0.8	0.79	0.550							0.91	1	
47.736	5	Clayey Silt to Silty Clay	27.74	0.8	2.864	1.272	1.592	2.83	0.79	0.78	0.544							0.87	1	
48.72	5	Clayey Silt to Silty Clay	18.97	0.5	2.923	1.303	1.621	2.97	0.79	0.77	0.539							0.87	1	
49.704	6	Sandy Silt to Clayey Silt	22.23	0.46	2.982	1.333	1.649	2.86	0.78	0.76	0.533							0.90	1	
50.688	6	Sandy Silt to Clayey Silt	18.91	0.43	3.041	1.364	1.677	2.96	0.77	0.75	0.527							0.90	1	
51.673	6	Sandy Silt to Clayey Silt	26.39	0.64	3.1	1.395	1.706	2.83	0.77	0.74	0.521							0.90	1	
52.657	6	Sandy Silt to Clayey Silt	27.6	0.66	3.159	1.426	1.734	2.82	0.76	0.73	0.516							0.90	1	
53.641	6	Sandy Silt to Clayey Silt	25.24	0.6	3.219	1.456	1.762	2.87	0.75	0.72	0.510							0.89	1	
54.625	7	Silty Sand to Sandy Silt	140.97	2.76	3.278	1.487	1.791	2.11	0.75	0.71	0.505	2.110	0.75	105.73	1.473	155.754	0.43	0.82	1	0.85
55.61	9	Sand	332.83	4.73	3.337	1.518	1.819	1.75	0.74	0.70	0.499	1.750	0.74	246.29	1.072	263.928		0.79	1	
56.594	9	Sand	326	3.71	3.396	1.548	1.847	1.69	0.74	0.69	0.494	1.690	0.74	241.24	1.031	248.739		0.78	1	
57.578	9	Sand	252.96	2.47	3.455	1.579	1.876	1.72	0.73	0.68	0.488	1.720	0.73	184.66	1.051	194.139		0.78	1	
58.562	10	Gravelly Sand to Sand	334.36	2.17	3.514	1.61	1.904	1.51	0.72	0.67	0.483	1.510	0.72	240.74	1.000	240.739		0.77	1	
59.547	10	Gravelly Sand to Sand	468.55	3.97	3.573	1.641	1.932	1.49	0.72	0.66	0.478	1.490	0.72	337.36	1.000	337.356		0.77	1	
60.531	9	Sand	327.15	4.29	3.632	1.671	1.961	1.74	0.71	0.65	0.473	1.740	0.71	232.28	1.065	247.330		0.76	1	
61.515	6	Sandy Silt to Clayey Silt	46.42	1.34	3.691	1.702	1.989	2.74	0.71	0.65	0.468							0.87	1	
62.499	6	Sandy Silt to Clayey Silt	36.99	0.85	3.75	1.733	2.017	2.78	0.7	0.64	0.464							0.87	1	
63.483	6	Sandy Silt to Clayey Silt	26.14	0.36	3.809	1.764	2.046	2.81	0.7	0.63	0.459							0.87	1	
64.468	6	Sandy Silt to Clayey Silt	26.79	0.39	3.868	1.794	2.074	2.82	0.69	0.63	0.455							0.86	1	
65.452	6	Sandy Silt to Clayey Silt	24.96	0.37	3.927	1.825	2.102	2.86	0.69	0.62	0.451							0.86	1	
66.436	6	Sandy Silt to Clayey Silt	38.51	0.84	3.986	1.856	2.13	2.76	0.69	0.61	0.447							0.86	1	
67.42	6	Sandy Silt to Clayey Silt	53.13	1.67	4.045	1.887	2.159	2.74	0.68	0.61	0.443							0.86	1	
68.405	6	Sandy Silt to Clayey Silt	64.2	1.97	4.104	1.917	2.187	2.67	0.68	0.60	0.440							0.85	1	
69.389	6	Sandy Silt to Clayey Silt	66.76	2.07	4.163	1.948	2.215	2.66	0.67	0.60	0.436							0.84	1	
70.373	6	Sandy Silt to Clayey Silt	36.52	0.89	4.222	1.979	2.244	2.84	0.67	0.59	0.433							0.85	1	
71.357	6	Sandy Silt to Clayey Silt	26.38	0.54	4.282	2.009	2.272	2.95	0.66	0.58	0.430							0.85	1	
72.342	6	Sandy Silt to Clayey Silt	28.96	0.6	4.341	2.04	2.3	2.91	0.66	0.58	0.427							0.85	1	
73.326	6	Sandy Silt to Clayey Silt	29.42	0.61	4.4	2.071	2.329	2.9	0.66	0.58	0.424							0.84	1	
74.31	6	Sandy Silt to Clayey Silt	83.22	3.04	4.459	2.102	2.357	2.65	0.65	0.57	0.421							0.81	1	
75.294	5	Clayey Silt to Silty Clay	69.68	2.64	4.518	2.132	2.385	2.73	0.65	0.57	0.418							0.77	1	
76.279	6	Sandy Silt to Clayey Silt	41.53	1.02	4.577	2.163	2.414	2.82	0.64	0.56	0.416							0.84	1	
77.263	6	Sandy Silt to Clayey Silt	33.72	0.65	4.636	2.194	2.442	2.86	0.64	0.56	0.413							0.84	1	
78.247	6	Sandy Silt to Clayey Silt	65.91	1.84	4.695	2.225	2.47	2.68	0.64	0.55	0.411							0.83	1	
79.231	6	Sandy Silt to Clayey Silt	37.46	0.84	4.754	2.255	2.499	2.85	0.63	0.55	0.409							0.83	1	
80.216	6	Sandy Silt to Clayey Silt	32.71	0.86	4.813	2.286	2.527	2.96	0.63	0.55	0.407							0.83	1	
81.2	6	Sandy Silt to Clayey Silt	35.79	0.83	4.872	2.317	2.555	2.89	0.63	0.54	0.405							0.83	1	
82.184	6	Sandy Silt to Clayey Silt	34.43	0.79	4.931	2.347	2.584	2.91	0.62	0.54	0.403							0.83	1	
83.168	7	Silty Sand to Sandy Silt	37.86	0.65	4.99	2.378	2.612	2.8	0.62	0.54	0.401							0.83	1	
84.153	6	Sandy Silt to Clayey Silt	26.8	0.42	5.049	2.409	2.64	2.93	0.62	0.53	0.399							0.82	1	
85.137	6	Sandy Silt to Clayey Silt	37.15	0.94	5.108	2.44	2.669	2.91	0.61	0.53	0.397							0.82	1	
86.121	6	Sandy Silt to Clayey Silt	34.76	0.74	5.167	2.47	2.697	2.91	0.61	0.53	0.395							0.82	1	
87.105	7	Silty Sand to Sandy Silt	34.04	0.51	5.226	2.501	2.725	2.84	0.61	0.53	0.394							0.82	1	
88.089	7	Silty Sand to Sandy Silt	40.37	0.52	5.285	2.532	2.754	2.73	0.6	0.52	0.392							0.82	1	
89.074	6	Sandy Silt to Clayey Silt	28.69	0.44	5.345	2.563	2.782	2.92	0.6	0.52	0.391							0.81	1	
90.058	6	Sandy Silt to Clayey Silt	28.51	0.53	5.404	2.593	2.81	2.97	0.6	0.52	0.389							0.81	1	
91.042	6	Sandy Silt to Clayey Silt	36.49	0.72	5.463	2.624	2.839	2.88	0.59	0.52	0.388							0.81	1	
92.026	6	Sandy Silt to Clayey Silt	36.04	0.7	5.522	2.655	2.867	2.89	0.59	0.51	0.387							0.81	1	
93.011	6	Sandy Silt to Clayey Silt	53.78	1.77	5.581	2.686	2.895	2.86	0.59	0.51	0.385							0.81	1	
93.995	7	Silty Sand to Sandy Silt	192.68	5.62	5.64	2.716	2.924	2.22	0.58	0.51	0.384	2.220	0.58	111.75	1.717	191.902		0.69	1	
94.979	9	Sand	341.24	4.31	5.699	2.747	2.952	1.78	0.58	0.51	0.383	1.780	0.58	197.92	1.092	216.196		0.65	1	
95.963	11	Sitff Fine-Grained	172.69	7.33	5.758	2.778	2.98	2.38	0.58	0.51	0.381	2.380	0.58	100.16	2.233	223.616		0.69	1	
96.948	6	Sandy Silt to Clayey Silt	80.28	2.67	5.817	2.808	3.009	2.72	0.58	0.50	0.380							0.78	1	
97.932	6	Sandy Silt to Clayey Silt	96.02	3.57	5.876	2.839	3.037	2.7	0.57	0.50	0.379							0.76	1	
98.916	6	Sandy Silt to Clayey Silt	41.76	0.78	5.935	2.87	3.065	2.85	0.57	0.50	0.378							0.80	1	
99.9	6	Sandy Silt to Clayey Silt	47.84	1.05	5.994	2.901	3.094	2.84	0.57	0.50	0.377							0.80	1	
100.885	6	Sandy Silt to Clayey Silt	41.36	0.9	6.053	2.931	3.122	2.9	0.57	0.50	0.376							0.80	1	
101.869	6	Sandy Silt to Clayey Silt	42.47	1.2	6.112	2.962	3.15	2.95	0.56	0.50	0.375							0.79	1	

LIQUEFACTION POTENTIAL ANALYSIS (per Youd & Idriss, 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
CPT NO. ***CPT-AS-08***

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.6 (Design Basis EQ)

FAULT M_w = 7.5
MSF = 1.00

			CPT RESULT INPUT							*CSR*		*$CRR_{7.5}$*						*$F.S.=(CRR_{7.5}/CSR)*MSF*K\sigma*K\alpha$*		
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.
102.853	6	Sandy Silt to Clayey Silt	41.6	0.96	6.171	2.993	3.179	2.91	0.56	0.49	0.374							0.79	1	
103.837	6	Sandy Silt to Clayey Silt	60.61	1.56	6.23	3.024	3.207	2.78	0.56	0.49	0.373							0.79	1	
104.822	11	Sitff Fine-Grained	113.1	4.9	6.289	3.054	3.235	2.7	0.56	0.49	0.372							0.73	1	
105.806	5	Clayey Silt to Silty Clay	67.73	2.55	6.348	3.085	3.263	2.86	0.55	0.49	0.371							0.70	1	
106.79	5	Clayey Silt to Silty Clay	76.28	2.97	6.408	3.116	3.292	2.82	0.55	0.49	0.370							0.70	1	
107.774	6	Sandy Silt to Clayey Silt	80.03	2.78	6.467	3.146	3.32	2.78	0.55	0.49	0.369							0.77	1	
108.759	6	Sandy Silt to Clayey Silt	38.72	0.89	6.526	3.177	3.348	2.97	0.55	0.48	0.368							0.79	1	
109.743	6	Sandy Silt to Clayey Silt	43.1	0.92	6.585	3.208	3.377	2.9	0.54	0.48	0.367							0.78	1	
110.727	7	Silty Sand to Sandy Silt	133.09	3.78	6.644	3.239	3.405	2.34	0.54	0.48	0.366	2.340	0.54	71.87	2.084	149.757	0.39	0.70	1	1.07
111.711	9	Sand	326.87	4.23	6.703	3.269	3.433	1.82	0.54	0.48	0.365	1.820	0.54	176.51	1.122	197.958		0.61	1	
112.695	6	Sandy Silt to Clayey Silt	76.91	1.93	6.762	3.3	3.462	2.73	0.54	0.48	0.365							0.77	1	
113.68	7	Silty Sand to Sandy Silt	39.51	0.68	6.821	3.331	3.49	2.93	0.54	0.48	0.364							0.78	1	
114.664	6	Sandy Silt to Clayey Silt	40.87	1.01	6.88	3.362	3.518	2.99	0.53	0.48	0.363							0.78	1	
115.648	6	Sandy Silt to Clayey Silt	98.08	3.66	6.939	3.392	3.547	2.75	0.53	0.47	0.362							0.74	1	
116.632	9	Sand	335.25	2.99	6.998	3.423	3.575	1.7	0.53	0.47	0.361	1.700	0.53	177.68	1.038	184.409		0.60	1	
117.617	6	Sandy Silt to Clayey Silt	92.15	3.41	7.057	3.454	3.603	2.78	0.53	0.47	0.361							0.74	1	
118.601	6	Sandy Silt to Clayey Silt	51.37	1.45	7.116	3.485	3.632	2.93	0.52	0.47	0.360							0.77	1	
119.585	6	Sandy Silt to Clayey Silt	46.99	1.3	7.175	3.515	3.66	2.97	0.52	0.47	0.359							0.77	1	

LIQUEFACTION POTENTIAL ANALYSIS (per Youd & Idriss, 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
CPT NO. ***CPT-AS-09***

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.6 (Design Basis EQ)
FAULT M_w = 7.5
MSF = 1.00

Depth (ft)		Soil Behavior Type	CPT RESULT INPUT qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	CSR γ_d	CSR	CRR$_{7.5}$ Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	CRR$_{7.5}$	F.S.=(CRR$_{7.5}$/CSR)*MSF*Kσ*Kα Kσ	Kα	F.S.
0.246	7	Silty Sand to Sandy Silt	27	0.17	0.015		0.015	-9999	2	1.00	0.390							1.00	1	
0.738	6	Sandy Silt to Clayey Silt	24.81	0.27	0.044		0.044	1.89	2	1.00	0.390	1.890	1.70	42.18	1.180	49.751	0.09	1.00	1	
1.23	7	Silty Sand to Sandy Silt	41.35	0.53	0.074		0.074	1.86	2	1.00	0.390	1.860	1.70	70.30	1.153	81.074	0.13	1.00	1	
1.722	6	Sandy Silt to Clayey Silt	16.5	0.1	0.103		0.103	2.04	2	1.00	0.389	2.040	1.70	28.05	1.356	38.033	0.08	1.00	1	
2.215	5	Clayey Silt to Silty Clay	12.92	0.3	0.133		0.133	2.5	2	1.00	0.389	2.500	1.70	21.96	2.768	60.806	0.10	1.00	1	
2.707	7	Silty Sand to Sandy Silt	30.24	0.34	0.162		0.162	2.05	2	1.00	0.388	2.050	1.70	51.41	1.371	70.483	0.11	1.00	1	
3.199	7	Silty Sand to Sandy Silt	23.15	0.18	0.192		0.192	2.08	2	0.99	0.388	2.080	1.70	39.36	1.420	55.870	0.10	1.00	1	
3.691	7	Silty Sand to Sandy Silt	19.8	0.12	0.221		0.221	2.12	2	0.99	0.387	2.120	1.70	33.66	1.492	50.226	0.09	1.00	1	
4.183	6	Sandy Silt to Clayey Silt	20.23	0.17	0.251		0.251	2.2	2	0.99	0.387	2.200	1.70	34.39	1.667	57.322	0.10	1.00	1	
4.675	6	Sandy Silt to Clayey Silt	23.61	0.38	0.281		0.281	2.32	1.89	0.99	0.386	2.320	1.70	40.14	2.015	80.859	0.13	1.00	1	
5.167	5	Clayey Silt to Silty Clay	22.19	0.71	0.31		0.31	2.55	1.8	0.99	0.386	2.550	1.70	37.72	3.034	114.460	0.22	1.00	1	
5.659	5	Clayey Silt to Silty Clay	24.11	0.64	0.34		0.34	2.49	1.72	0.99	0.386	2.490	1.70	40.99	2.718	111.418	0.21	1.00	1	
6.152	5	Clayey Silt to Silty Clay	22.91	0.78	0.369		0.369	2.59	1.65	0.99	0.385	2.590	1.65	37.80	3.266	123.461	0.26	1.00	1	
6.644	5	Clayey Silt to Silty Clay	17.97	0.53	0.399		0.399	2.56	1.58	0.99	0.385	2.560	1.58	28.39	3.091	87.749	0.14	1.00	1	
7.136	5	Clayey Silt to Silty Clay	15.44	0.37	0.428		0.428	2.57	1.53	0.99	0.384	2.570	1.53	23.62	3.148	74.365	0.12	1.00	1	
7.628	5	Clayey Silt to Silty Clay	13.27	0.23	0.458		0.458	2.56	1.48	0.98	0.384	2.560	1.48	19.64	3.091	60.697	0.10	1.00	1	
8.12	5	Clayey Silt to Silty Clay	17.5	0.38	0.487		0.487	2.54	1.43	0.98	0.383	2.540	1.43	25.03	2.979	74.549	0.12	1.00	1	
8.612	5	Clayey Silt to Silty Clay	18.12	0.55	0.517		0.517	2.64	1.39	0.98	0.383							1.00	1	
9.104	5	Clayey Silt to Silty Clay	12.35	0.32	0.546		0.546	2.7	1.35	0.98	0.383							1.00	1	
9.596	5	Clayey Silt to Silty Clay	11.01	0.27	0.576		0.576	2.75	1.32	0.98	0.382							1.00	1	
10.088	5	Clayey Silt to Silty Clay	9.44	0.22	0.605		0.605	2.82	1.29	0.98	0.382							1.00	1	
10.581	5	Clayey Silt to Silty Clay	10.2	0.19	0.635		0.635	2.75	1.26	0.98	0.381							1.00	1	
11.073	5	Clayey Silt to Silty Clay	12.69	0.27	0.664		0.664	2.71	1.23	0.98	0.381							1.00	1	
11.565	6	Sandy Silt to Clayey Silt	13.93	0.15	0.694		0.694	2.6	1.2	0.98	0.381							1.00	1	
12.057	5	Clayey Silt to Silty Clay	9.65	0.09	0.723		0.723	2.68	1.18	0.97	0.380							1.00	1	
12.549	7	Silty Sand to Sandy Silt	25.55	0.21	0.753		0.753	2.32	1.15	0.97	0.380	2.320	1.15	29.38	2.015	59.193	0.10	1.00	1	
13.041	6	Sandy Silt to Clayey Silt	22.4	0.28	0.782		0.782	2.47	1.13	0.97	0.379	2.470	1.13	25.31	2.621	66.351	0.11	1.00	1	
13.533	4	Silty Clay to Clay	9.86	0.26	0.812	0.001	0.811	2.96	1.11	0.97	0.379							1.00	1	
14.025	3	Clay	7.28	0.22	0.842	0.016	0.825	3.13	1.1	0.97	0.386							1.00	1	
14.518	3	Clay	6.26	0.21	0.871	0.032	0.839	3.23	1.09	0.97	0.393							1.00	1	
15.01	4	Silty Clay to Clay	8.03	0.24	0.901	0.047	0.853	3.1	1.08	0.97	0.399							1.00	1	
15.502	4	Silty Clay to Clay	10.95	0.32	0.93	0.063	0.868	2.97	1.07	0.97	0.404							1.00	1	
15.994	4	Silty Clay to Clay	12.03	0.4	0.96	0.078	0.882	2.97	1.07	0.97	0.410							1.00	1	
16.486	3	Clay	9.63	0.37	0.989	0.093	0.896	3.11	1.06	0.97	0.416							1.00	1	
16.978	3	Clay	9.01	0.33	1.019	0.109	0.91	3.13	1.05	0.96	0.421							1.00	1	
17.47	5	Clayey Silt to Silty Clay	14.99	0.45	1.048	0.124	0.924	2.88	1.04	0.96	0.426							1.00	1	
17.962	3	Clay	15.67	0.75	1.078	0.139	0.938	2.99	1.03	0.96	0.431							1.00	1	
18.454	3	Clay	14.35	0.59	1.107	0.155	0.953	2.99	1.02	0.96	0.435							1.00	1	
18.947	3	Clay	12.44	0.56	1.137	0.17	0.967	3.08	1.02	0.96	0.440							1.00	1	
19.439	3	Clay	11.99	0.55	1.166	0.185	0.981	3.11	1.01	0.96	0.444							1.00	1	
19.931	3	Clay	10.67	0.49	1.196	0.201	0.995	3.16	1	0.96	0.449							1.00	1	
20.423	3	Clay	10.16	0.41	1.225	0.216	1.009	3.16	1	0.96	0.453							1.00	1	
20.915	3	Clay	9.26	0.33	1.255	0.232	1.023	3.18	0.99	0.95	0.457							0.99	1	
21.407	3	Clay	8.09	0.27	1.284	0.247	1.038	3.23	0.98	0.95	0.460							0.99	1	
21.899	5	Clayey Silt to Silty Clay	10.88	0.21	1.314	0.262	1.052	2.96	0.98	0.95	0.464							0.98	1	
22.391	5	Clayey Silt to Silty Clay	10.01	0.23	1.344	0.278	1.066	3.05	0.97	0.95	0.467							0.98	1	
22.884	4	Silty Clay to Clay	5.92	0.14	1.373	0.293	1.08	3.33	0.96	0.95	0.470							0.98	1	
23.376	4	Silty Clay to Clay	5.37	0.1	1.403	0.308	1.094	3.35	0.96	0.95	0.474							0.97	1	
23.868	4	Silty Clay to Clay	11.76	0.33	1.432	0.324	1.108	3.05	0.95	0.95	0.477							0.97	1	
24.36	5	Clayey Silt to Silty Clay	18.33	0.58	1.462	0.339	1.123	2.89	0.94	0.94	0.479							0.97	1	
24.852	4	Silty Clay to Clay	19.14	0.69	1.491	0.354	1.137	2.92	0.94	0.94	0.482							0.96	1	
25.344	4	Silty Clay to Clay	19.19	0.73	1.521	0.37	1.151	2.93	0.93	0.94	0.485							0.96	1	
25.836	4	Silty Clay to Clay	18.83	0.7	1.55	0.385	1.165	2.94	0.93	0.94	0.487							0.96	1	
26.328	4	Silty Clay to Clay	20.44	0.74	1.58	0.401	1.179	2.9	0.92	0.94	0.490							0.95	1	
26.821	5	Clayey Silt to Silty Clay	22.93	0.77	1.609	0.416	1.193	2.84	0.92	0.93	0.492							0.95	1	
27.313	5	Clayey Silt to Silty Clay	25.1	0.71	1.639	0.431	1.208	2.77	0.91	0.93	0.494							0.94	1	
27.805	5	Clayey Silt to Silty Clay	24.1	0.68	1.668	0.447	1.222	2.79	0.9	0.93	0.496							0.94	1	
28.297	5	Clayey Silt to Silty Clay	17.25	0.53	1.698	0.462	1.236	2.95	0.9	0.93	0.498							0.94	1	
28.789	5	Clayey Silt to Silty Clay	18.33	0.47	1.727	0.477	1.25	2.89	0.89	0.93	0.499							0.94	1	
29.281	5	Clayey Silt to Silty Clay	25.25	0.69	1.757	0.493	1.264	2.78	0.89	0.92	0.501							0.93	1	
29.773	6	Sandy Silt to Clayey Silt	33.03	0.8	1.786	0.508	1.278	2.65	0.88	0.92	0.502							0.95	1	
30.265	6	Sandy Silt to Clayey Silt	35.73	1.01	1.816	0.523	1.293	2.66	0.88	0.92	0.504							0.95	1	
30.758	4	Silty Clay to Clay	25.04	0.99	1.845	0.539	1.307	2.89	0.87	0.92	0.505							0.92	1	
31.25	5	Clayey Silt to Silty Clay	37.89	1.36	1.875	0.554	1.321	2.72	0.87	0.91	0.506							0.92	1	
31.742	6	Sandy Silt to Clayey Silt	70.48	1.8	1.905	0.57	1.335	2.36	0.87	0.91	0.507	2.360	0.87	61.32	2.156	132.226	0.29	0.93	1	0.58
32.234	8	Sand to Silty Sand	126.42	2.03	1.934	0.585	1.349	2.03	0.86	0.91	0.508	2.030	0.86	108.72	1.341	145.818	0.37	0.90	1	0.73
32.726	8	Sand to Silty Sand	76.19	0.93	1.964	0.6	1.363	2.12	0.86	0.91	0.509	2.120	0.86	65.52	1.492	97.771	0.17	0.92	1	0.33
33.218	5	Clayey Silt to Silty Clay	29.81	0.89	1.993	0.616	1.377	2.77	0.85	0.90	0.509							0.91	1	
33.71	6	Sandy Silt to Clayey Silt	21.97	0.49	2.023	0.631	1.392	2.82	0.85	0.90	0.510							0.94	1	
34.202	5	Clayey Silt to Silty Clay	17.16	0.34	2.052	0.646	1.406	2.91	0.84	0.90	0.510							0.90	1	
34.694	5	Clayey Silt to Silty Clay	23.83	0.61	2.082	0.662	1.42	2.84	0.84	0.89	0.510							0.90	1	
35.187	5	Clayey Silt to Silty Clay	26.53	0.74	2.111	0.677	1.434	2.81	0.84	0.89	0.511							0.90	1	
35.679	5	Clayey Silt to Silty Clay	21.89	0.53	2.141	0.692	1.448	2.86	0.83	0.89	0.511							0.89	1	
36.171	5	Clayey Silt to Silty Clay	37.05	1.13	2.17	0.708	1.462	2.72	0.83	0.88	0.511							0.89	1	
36.663	6	Sandy Silt to Clayey Silt	107.79	3.02	2.2	0.723	1.477	2.27	0.82	0.88	0.510	2.270	0.82	88.39	1.856	164.055		0.88	1	
37.155	8	Sand to Silty Sand	161.02	2.9	2.229	0.739	1.491	2.01	0.82	0.87	0.510	2.010	0.82	132.04	1.313	173.401		0.86	1	
37.647	6	Sandy Silt to Clayey Silt	59.5	1.46	2.259	0.754	1.505	2.42	0.82	0.87	0.510	2.420	0.82	48.79	2.396	116.894	0.23	0.91	1	0.45
38.139	6	Sandy Silt to Clayey Silt	41.84	0.96	2.288	0.769	1.519	2.61	0.81	0.87	0.509							0.92	1	
38.631	6	Sandy Silt to Clayey Silt	29.94	0.62	2.318	0.785	1.533	2.72	0.81	0.86	0.509							0.92	1	
39.124	6	Sandy Silt to Clayey Silt	30.66	0.73	2.347	0.8	1.547	2.75	0.8	0.86	0.508							0.92	1	
39.616	6	Sandy Silt to Clayey Silt	29.22	0.71	2.377	0.815	1.562	2.78	0.8	0.85	0.507							0.91	1	
40.108	6	Sandy Silt to Clayey Silt	29.32	0.57	2.407	0.831	1.576	2.72	0.8	0.85	0.506							0.91	1	
40.6	5	Clayey Silt to Silty Clay	32.05	0.96	2.436	0.846	1.59	2.8	0.79	0.85	0.505							0.87	1	
41.092	5	Clayey Silt to Silty Clay	35.96	1.1	2.466	0.862	1.604	2.77	0.79	0.84	0.504							0.87	1	
41.584	6	Sandy Silt to Clayey Silt	34.71	0.96	2.495	0.877	1.618	2.76	0.79	0.84	0.503							0.91	1	
42.076	6	Sandy Silt to Clayey Silt	28.83	0.7	2.525	0.892	1.632	2.8	0.78	0.83	0.502							0.91	1	
42.568	5	Clayey Silt to Silty Clay	22.12	0.58	2.554	0.908	1.647	2.94	0.78	0.83	0.500							0.86	1	
43.061	5	Clayey Silt to Silty Clay	16.23	0.48	2.584	0.923	1.661	3.12	0.78	0.82	0.499							0.86	1	
43.553	6	Sandy Silt to Clayey Silt	15.91	0.23	2.613	0.938	1.675	2.96	0.77	0.82	0.498							0.90	1	
44.045	6	Sandy Silt to Clayey Silt	15.16	0.09	2.643	0.954	1.689	2.83	0.77	0.81	0.496							0.90	1	
44.537	6	Sandy Silt to Clayey Silt	20.32	0.17	2.672	0.969	1.703	2.74	0.77	0.81	0.495							0.90	1	
45.029	6	Sandy Silt to Clayey Silt	30.2	0.54	2.702	0.984	1.717	2.73	0.76	0.80	0.493							0.90	1	
45.521	5	Clayey Silt to Silty Clay	71.57	2.74	2.731	1	1.732	2.61	0.76	0.80	0.491							0.85	1	
46.013	3	Clay	38.78	2.38	2.761	1.015	1.746	2.97	0.76	0.79	0.489							0.85	1	
46.505	5	Clayey Silt to Silty Clay	29.51	0.84	2.79	1.031	1.76	2.86	0.75	0.79	0.487							0.84	1	
46.997	6	Sandy Silt to Clayey Silt	31.94	0.85	2.82	1.046	1.774	2.82	0.75	0.78	0.486							0.89	1	
47.49	5	Clayey Silt to Silty Clay	36.33	1.1	2.849	1.061	1.788	2.8	0.75	0.78	0.484							0.84	1	
47.982	5	Clayey Silt to Silty Clay	32.52	0.96	2.879	1.077	1.802	2.84	0.74	0.77	0.482							0.84	1	
48.474	6	Sandy Silt to Clayey Silt	40.35	0.99	2.908	1.092	1.817	2.71	0.74	0.77	0.480							0.89	1	
48.966	6	Sandy Silt to Clayey Silt	40.29	1.16	2.938	1.107	1.831	2.76	0.74	0.76	0.478							0.89	1	
49.458	6	Sandy Silt to Clayey Silt	32.79	0.86	2.968	1.123	1.845	2.82	0.74	0.76	0.476							0.88	1	
49.95	6	Sandy Silt to Clayey Silt	36.46	0.86	2.997	1.138	1.859	2.75	0.73	0.75	0.474							0.88	1	
50.442	5	Clayey Silt to Silty Clay	32.77	0.94	3.027	1.153	1.873	2.85	0.73	0.75	0.472							0.83	1	
50.934	6	Sandy Silt to Clayey Silt	57.19	1.64	3.056	1.169	1.887	2.64	0.73	0.74	0.469							0.88	1	

LIQUEFACTION POTENTIAL ANALYSIS (per Youd & Idriss, 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
CPT NO. ***CPT-AS-09***

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.6 (Design Basis EQ)
FAULT M_w = 7.5
MSF = 1.00

			CPT RESULT INPUT							*CSR*		*$CRR_{7.5}$*						*$F.S.=(CRR_{7.5}/CSR)*MSF*K\sigma*K\alpha$*		
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.
51.427	6	Sandy Silt to Clayey Silt	51.55	1.54	3.086	1.184	1.901	2.69	0.73	0.74	0.467							0.88	1	
51.919	6	Sandy Silt to Clayey Silt	33.49	0.71	3.115	1.2	1.916	2.77	0.72	0.73	0.465							0.88	1	
52.411	6	Sandy Silt to Clayey Silt	25.6	0.43	3.145	1.215	1.93	2.84	0.72	0.73	0.463							0.88	1	
52.903	6	Sandy Silt to Clayey Silt	27.72	0.6	3.174	1.23	1.944	2.87	0.72	0.72	0.461							0.88	1	
53.395	6	Sandy Silt to Clayey Silt	64.65	1.67	3.204	1.246	1.958	2.46	0.71	0.72	0.459	2.460	0.71	45.90	2.574	118.163	0.23	0.86	1	0.51
53.887	8	Sand to Silty Sand	158.57	2.53	3.233	1.261	1.972	2.02	0.71	0.71	0.456	2.020	0.71	112.58	1.327	149.401	0.39	0.79	1	0.85
54.379	6	Sandy Silt to Clayey Silt	63.95	1.45	3.263	1.276	1.986	2.42	0.71	0.71	0.454	2.420	0.71	45.40	2.396	108.783	0.20	0.86	1	0.44
54.871	5	Clayey Silt to Silty Clay	25.7	0.75	3.292	1.292	2.001	2.99	0.71	0.70	0.452							0.81	1	
55.364	6	Sandy Silt to Clayey Silt	25.81	0.57	3.322	1.307	2.015	2.92	0.7	0.70	0.450							0.87	1	
55.856	6	Sandy Silt to Clayey Silt	29.47	0.74	3.351	1.322	2.029	2.89	0.7	0.70	0.448							0.87	1	
56.348	6	Sandy Silt to Clayey Silt	21.51	0.41	3.381	1.338	2.043	2.98	0.7	0.69	0.446							0.87	1	
56.84	6	Sandy Silt to Clayey Silt	19.14	0.36	3.41	1.353	2.057	3.03	0.7	0.69	0.444							0.87	1	
57.332	6	Sandy Silt to Clayey Silt	35.14	0.78	3.44	1.369	2.071	2.8	0.69	0.68	0.442							0.86	1	
57.824	6	Sandy Silt to Clayey Silt	58.45	1.48	3.47	1.384	2.086	2.63	0.69	0.68	0.440							0.86	1	
58.316	6	Sandy Silt to Clayey Silt	37.26	1.11	3.499	1.399	2.1	2.85	0.69	0.67	0.438							0.86	1	
58.808	6	Sandy Silt to Clayey Silt	52.68	1.22	3.529	1.415	2.114	2.65	0.69	0.67	0.436							0.86	1	
59.3	6	Sandy Silt to Clayey Silt	33.47	0.8	3.558	1.43	2.128	2.85	0.69	0.67	0.434							0.86	1	
59.793	6	Sandy Silt to Clayey Silt	33.37	0.81	3.588	1.445	2.142	2.86	0.68	0.66	0.432							0.86	1	
60.285	6	Sandy Silt to Clayey Silt	35.37	0.79	3.617	1.461	2.156	2.81	0.68	0.66	0.430							0.86	2	
60.777	6	Sandy Silt to Clayey Silt	32.99	0.74	3.647	1.476	2.171	2.85	0.68	0.65	0.428							0.86	3	
61.269	6	Sandy Silt to Clayey Silt	29.2	0.79	3.676	1.491	2.185	2.95	0.68	0.65	0.426							0.86	4	
61.761	6	Sandy Silt to Clayey Silt	24.1	0.5	3.706	1.507	2.199	2.98	0.67	0.65	0.424							0.85	5	
62.253	6	Sandy Silt to Clayey Silt	23.77	0.44	3.735	1.522	2.213	2.96	0.67	0.64	0.422							0.85	6	
62.745	6	Sandy Silt to Clayey Silt	22.02	0.4	3.765	1.538	2.227	3	0.67	0.64	0.421							0.85	7	
63.237	6	Sandy Silt to Clayey Silt	21.53	0.42	3.794	1.553	2.241	3.03	0.67	0.63	0.419							0.85	8	
63.73	6	Sandy Silt to Clayey Silt	27.36	0.54	3.824	1.568	2.256	2.92	0.67	0.63	0.417							0.85	9	
64.222	6	Sandy Silt to Clayey Silt	28.49	0.58	3.853	1.584	2.27	2.91	0.66	0.63	0.415							0.85	10	
64.714	6	Sandy Silt to Clayey Silt	25.17	0.45	3.883	1.599	2.284	2.94	0.66	0.62	0.414							0.85	11	
65.206	6	Sandy Silt to Clayey Silt	33.36	0.69	3.912	1.614	2.298	2.85	0.66	0.62	0.412							0.85	12	
65.698	6	Sandy Silt to Clayey Silt	39.16	0.75	3.942	1.63	2.312	2.76	0.66	0.62	0.411							0.85	13	
66.19	6	Sandy Silt to Clayey Silt	32.41	0.54	3.971	1.645	2.326	2.82	0.66	0.61	0.409							0.84	14	
66.682	6	Sandy Silt to Clayey Silt	34.9	0.71	4.001	1.661	2.341	2.83	0.65	0.61	0.407							0.84	15	
67.174	6	Sandy Silt to Clayey Silt	32.69	0.76	4.031	1.676	2.355	2.9	0.65	0.61	0.406							0.84	16	
67.666	6	Sandy Silt to Clayey Silt	34.03	0.75	4.06	1.691	2.369	2.87	0.65	0.61	0.404							0.84	17	
68.159	6	Sandy Silt to Clayey Silt	39.84	1.13	4.09	1.707	2.383	2.87	0.65	0.60	0.403							0.84	18	
68.651	6	Sandy Silt to Clayey Silt	53.49	1.62	4.119	1.722	2.397	2.77	0.65	0.60	0.402							0.84	19	
69.143	7	Silty Sand to Sandy Silt	124.57	3.34	4.149	1.737	2.411	2.29	0.64	0.60	0.400	2.290	0.64	79.72	1.917	152.836	0.41	0.77	20	1.03
69.635	8	Sand to Silty Sand	161.66	2.47	4.178	1.753	2.425	2.04	0.64	0.59	0.399	2.040	0.64	103.46	1.356	140.283	0.34	0.74	21	0.84
70.127	7	Silty Sand to Sandy Silt	125.16	3.3	4.208	1.768	2.44	2.29	0.64	0.59	0.398	2.290	0.64	80.10	1.917	153.560	0.42	0.76	22	1.05
70.619	4	Silty Clay to Clay	38.11	1.58	4.237	1.783	2.454	3	0.64	0.59	0.396							0.76	23	
71.111	6	Sandy Silt to Clayey Silt	34.94	0.83	4.267	1.799	2.468	2.9	0.64	0.59	0.395							0.83	24	
71.603	6	Sandy Silt to Clayey Silt	25	0.42	4.296	1.814	2.482	2.98	0.63	0.58	0.394							0.83	25	
72.096	6	Sandy Silt to Clayey Silt	25.02	0.5	4.326	1.83	2.496	3.02	0.63	0.58	0.393							0.83	26	
72.588	6	Sandy Silt to Clayey Silt	27.15	0.49	4.355	1.845	2.51	2.95	0.63	0.58	0.392							0.83	27	
73.08	7	Silty Sand to Sandy Silt	55.73	1.04	4.385	1.86	2.525	2.65	0.63	0.58	0.390							0.83	28	
73.572	7	Silty Sand to Sandy Silt	175.74	4.36	4.414	1.876	2.539	2.17	0.63	0.57	0.389	2.170	0.63	110.72	1.596	176.745		0.72	29	
74.064	7	Silty Sand to Sandy Silt	242.94	5.4	4.444	1.891	2.553	2.04	0.63	0.57	0.388	2.040	0.63	153.05	1.356	207.521		0.69	30	
74.556	9	Sand	293.86	2.93	4.473	1.906	2.567	1.73	0.62	0.57	0.387	1.730	0.62	182.19	1.058	192.771		0.69	31	
75.048	9	Sand	319.09	2.84	4.503	1.922	2.581	1.67	0.62	0.57	0.386	1.670	0.62	197.84	1.017	201.273		0.68	32	
75.54	8	Sand to Silty Sand	295.6	5.07	4.533	1.937	2.595	1.9	0.62	0.57	0.385	1.900	0.62	183.27	1.189	217.882		0.68	33	
76.033	9	Sand	340.85	3.84	4.562	1.952	2.61	1.72	0.62	0.56	0.384	1.720	0.62	211.33	1.051	222.174		0.68	34	
76.525	6	Sandy Silt to Clayey Silt	105.64	3.92	4.592	1.968	2.624	2.61	0.62	0.56	0.383							0.77	35	
77.017	6	Sandy Silt to Clayey Silt	45.1	1.25	4.621	1.983	2.638	2.85	0.62	0.56	0.382							0.82	36	
77.509	6	Sandy Silt to Clayey Silt	40.31	0.85	4.651	1.999	2.652	2.84	0.61	0.56	0.381							0.82	37	
78.001	7	Silty Sand to Sandy Silt	56.83	1.14	4.68	2.014	2.666	2.68	0.61	0.56	0.380							0.82	38	
78.493	6	Sandy Silt to Clayey Silt	59.77	1.59	4.71	2.029	2.68	2.74	0.61	0.55	0.379							0.82	39	
78.985	6	Sandy Silt to Clayey Silt	65.76	1.95	4.739	2.045	2.695	2.73	0.61	0.55	0.378							0.82	40	
79.477	5	Clayey Silt to Silty Clay	49.53	1.66	4.769	2.06	2.709	2.88	0.61	0.55	0.378							0.74	41	
79.97	6	Sandy Silt to Clayey Silt	65.33	1.77	4.798	2.075	2.723	2.71	0.61	0.55	0.377							0.82	42	
80.462	6	Sandy Silt to Clayey Silt	40.35	1.15	4.828	2.091	2.737	2.92	0.6	0.55	0.376							0.82	43	
80.954	5	Clayey Silt to Silty Clay	28.19	0.93	4.857	2.106	2.751	3.13	0.6	0.54	0.375							0.74	44	
81.446	6	Sandy Silt to Clayey Silt	30.71	0.63	4.887	2.121	2.765	2.98	0.6	0.54	0.374							0.82	45	
81.938	6	Sandy Silt to Clayey Silt	26.68	0.35	4.916	2.137	2.78	2.95	0.6	0.54	0.374							0.82	46	
82.43	6	Sandy Silt to Clayey Silt	26.19	0.31	4.946	2.152	2.794	2.94	0.6	0.54	0.373							0.81	47	
82.922	6	Sandy Silt to Clayey Silt	31.26	0.52	4.975	2.168	2.808	2.93	0.6	0.54	0.372							0.81	48	
83.414	6	Sandy Silt to Clayey Silt	41.97	0.76	5.005	2.183	2.822	2.81	0.6	0.54	0.371							0.81	49	
83.906	6	Sandy Silt to Clayey Silt	40.78	0.81	5.035	2.198	2.836	2.85	0.59	0.54	0.371							0.81	50	
84.399	6	Sandy Silt to Clayey Silt	39.54	1.1	5.064	2.214	2.85	2.95	0.59	0.53	0.370							0.81	51	
84.891	6	Sandy Silt to Clayey Silt	44.31	1.23	5.094	2.229	2.865	2.9	0.59	0.53	0.369							0.81	52	
85.383	6	Sandy Silt to Clayey Silt	33.67	0.8	5.123	2.244	2.879	2.98	0.59	0.53	0.369							0.81	53	
85.875	6	Sandy Silt to Clayey Silt	46.17	0.92	5.153	2.26	2.893	2.8	0.59	0.53	0.368							0.81	54	
86.367	6	Sandy Silt to Clayey Silt	34.81	0.64	5.182	2.275	2.907	2.91	0.59	0.53	0.367							0.81	55	
86.859	6	Sandy Silt to Clayey Silt	33.58	0.79	5.212	2.29	2.921	2.99	0.59	0.53	0.367							0.81	56	
87.351	6	Sandy Silt to Clayey Silt	31.58	0.87	5.241	2.306	2.935	3.06	0.58	0.53	0.366							0.81	57	
87.843	6	Sandy Silt to Clayey Silt	28.85	0.74	5.271	2.321	2.95	3.09	0.58	0.52	0.366							0.81	58	
88.336	6	Sandy Silt to Clayey Silt	28.98	0.59	5.3	2.337	2.964	3.04	0.58	0.52	0.365							0.80	59	
88.828	6	Sandy Silt to Clayey Silt	30.66	0.71	5.33	2.352	2.978	3.04	0.58	0.52	0.364							0.80	60	
89.32	6	Sandy Silt to Clayey Silt	29.19	0.63	5.359	2.367	2.992	3.05	0.58	0.52	0.364							0.80	61	
89.812	6	Sandy Silt to Clayey Silt	30.47	0.67	5.389	2.383	3.006	3.04	0.58	0.52	0.363							0.80	62	
90.304	6	Sandy Silt to Clayey Silt	30.02	0.54	5.418	2.398	3.02	3	0.58	0.52	0.363							0.80	63	
90.796	7	Silty Sand to Sandy Silt	29.15	0.36	5.448	2.413	3.034	2.94	0.57	0.52	0.362							0.80	64	
91.288	6	Sandy Silt to Clayey Silt	37.82	0.9	5.477	2.429	3.049	2.96	0.57	0.52	0.362							0.80	65	
91.78	7	Silty Sand to Sandy Silt	45.87	0.82	5.507	2.444	3.063	2.8	0.57	0.52	0.361							0.80	66	
92.273	6	Sandy Silt to Clayey Silt	30.01	0.43	5.536	2.46	3.077	2.96	0.57	0.51	0.361							0.80	67	
92.765	7	Silty Sand to Sandy Silt	30.96	0.43	5.566	2.475	3.091	2.94	0.57	0.51	0.360							0.80	68	
93.257	7	Silty Sand to Sandy Silt	30.07	0.36	5.596	2.49	3.105	2.92	0.57	0.51	0.360							0.80	69	
93.749	6	Sandy Silt to Clayey Silt	29.83	0.41	5.625	2.506	3.119	2.95	0.57	0.51	0.359							0.80	70	
94.241	6	Sandy Silt to Clayey Silt	34.43	0.63	5.655	2.521	3.134	2.95	0.56	0.51	0.359							0.80	71	
94.733	6	Sandy Silt to Clayey Silt	36.67	0.92	5.684	2.536	3.148	2.98	0.56	0.51	0.358							0.80	72	
95.225	6	Sandy Silt to Clayey Silt	35.24	0.78	5.714	2.552	3.162	2.97	0.56	0.51	0.358							0.79	73	
95.717	6	Sandy Silt to Clayey Silt	37.1	0.71	5.743	2.567	3.176	2.92	0.56	0.51	0.357							0.79	74	
96.209	6	Sandy Silt to Clayey Silt	35.43	0.71	5.773	2.582	3.19	2.95	0.56	0.51	0.357							0.79	75	
96.702	6	Sandy Silt to Clayey Silt	37.73	0.9	5.802	2.598	3.204	2.96	0.56	0.50	0.356							0.79	76	
97.194	6	Sandy Silt to Clayey Silt	38.12	0.83	5.832	2.613	3.219	2.93	0.56	0.50	0.356							0.79	77	
97.686	6	Sandy Silt to Clayey Silt	35.63	0.9	5.861	2.629	3.233	3	0.56	0.50	0.356							0.79	78	
98.178	6	Sandy Silt to Clayey Silt	33.51	0.99	5.891	2.644	3.247	3.06	0.56	0.50	0.355							0.79	79	
98.67	6	Sandy Silt to Clayey Silt	32.5	0.93	5.92	2.659	3.261	3.1	0.55	0.50	0.355							0.79	80	
99.162	6	Sandy Silt to Clayey Silt	34.96	0.75	5.95	2.675	3.275	3	0.55	0.50	0.354							0.79	81	
99.654	6	Sandy Silt to Clayey Silt	41.99	0.8	5.979	2.69	3.289	2.88	0.55	0.50	0.354							0.79	82	

LIQUEFACTION POTENTIAL ANALYSIS (per Youd & Idriss, 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
CPT NO. ***CPT-AS-12***

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.6 (Design Basis EQ)

FAULT M_w = 7.5
MSF = 1.00

			CPT RESULT INPUT							*CSR*		*CRR 7.5*						*F.S.=(CRR 7.5/CSR)*MSF*Kσ*Kα*		
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.
0.246	7	Silty Sand to Sandy Silt	21.16	0.12	0.015		0.015	-9999	2	1.00	0.390							1.00	1	
0.738	6	Sandy Silt to Clayey Silt	20.34	0.44	0.044		0.044	-9999	2	1.00	0.390							1.00	1	
1.23	5	Clayey Silt to Silty Clay	20.36	0.51	0.074		0.074	-9999	2	1.00	0.390							1.00	1	
1.722	5	Clayey Silt to Silty Clay	13.67	0.28	0.103		0.103	2.41	2	1.00	0.389	2.410	1.70	23.24	2.354	54.696	0.10	1.00	1	
2.215	5	Clayey Silt to Silty Clay	14.29	0.28	0.133		0.133	2.42	2	1.00	0.389	2.420	1.70	24.29	2.396	58.203	0.10	1.00	1	
2.707	7	Silty Sand to Sandy Silt	35.22	0.25	0.162		0.162	1.87	2	1.00	0.388	1.870	1.70	59.87	1.162	69.564	0.11	1.00	1	
3.199	7	Silty Sand to Sandy Silt	35.75	0.3	0.192		0.192	1.94	2	0.99	0.388	1.940	1.70	60.78	1.229	74.692	0.12	1.00	1	
3.691	7	Silty Sand to Sandy Silt	35.41	0.39	0.221		0.221	2.04	2	0.99	0.387	2.040	1.70	60.20	1.356	81.620	0.13	1.00	1	
4.183	5	Clayey Silt to Silty Clay	14.65	0.28	0.251		0.251	2.52	2	0.99	0.387	2.520	1.70	24.91	2.872	71.518	0.11	1.00	1	
4.675	4	Silty Clay to Clay	7.65	0.21	0.281		0.281	2.65	1.89	0.99	0.386							1.00	1	
5.167	6	Sandy Silt to Clayey Silt	13.27	0.13	0.31		0.31	2.42	1.8	0.99	0.386	2.420	1.70	22.56	2.396	54.048	0.09	1.00	1	
5.659	6	Sandy Silt to Clayey Silt	13.78	0.2	0.34		0.34	2.52	1.72	0.99	0.386	2.520	1.70	23.43	2.872	67.271	0.11	1.00	1	
6.152	6	Sandy Silt to Clayey Silt	13.94	0.19	0.369		0.369	2.52	1.65	0.99	0.385	2.520	1.65	23.00	2.872	66.050	0.11	1.00	1	
6.644	6	Sandy Silt to Clayey Silt	13.84	0.14	0.399		0.399	2.48	1.58	0.99	0.385	2.480	1.58	21.87	2.669	58.371	0.10	1.00	1	
7.136	6	Sandy Silt to Clayey Silt	11.5	0.14	0.428		0.428	2.59	1.53	0.99	0.384	2.590	1.53	17.60	3.266	57.466	0.10	1.00	1	
7.628	5	Clayey Silt to Silty Clay	9.84	0.1	0.458		0.458	2.56	1.48	0.98	0.384	2.560	1.48	14.56	3.091	45.008	0.09	1.00	1	
8.12	5	Clayey Silt to Silty Clay	9.94	0.17	0.487	0.01	0.477	2.63	1.45	0.98	0.391							1.00	1	
8.612	6	Sandy Silt to Clayey Silt	16.5	0.23	0.517	0.025	0.491	2.52	1.43	0.98	0.403	2.520	1.43	23.60	2.872	67.756	0.11	1.00	1	0.27
9.104	7	Silty Sand to Sandy Silt	26.72	0.2	0.546	0.041	0.506	2.2	1.41	0.98	0.413	2.200	1.41	37.68	1.667	62.796	0.10	1.00	1	0.25
9.596	5	Clayey Silt to Silty Clay	11.95	0.18	0.576	0.056	0.52	2.61	1.39	0.98	0.423							1.00	1	
10.088	5	Clayey Silt to Silty Clay	8.05	0.15	0.605	0.071	0.534	2.79	1.37	0.98	0.433							1.00	1	
10.581	4	Silty Clay to Clay	6.75	0.15	0.635	0.087	0.548	2.92	1.35	0.98	0.442							1.00	1	
11.073	4	Silty Clay to Clay	6.43	0.13	0.664	0.102	0.562	2.93	1.33	0.98	0.450							1.00	1	
11.565	4	Silty Clay to Clay	6.83	0.15	0.694	0.118	0.576	2.93	1.32	0.98	0.459							1.00	1	
12.057	4	Silty Clay to Clay	7.03	0.16	0.723	0.133	0.591	2.95	1.3	0.97	0.465							1.00	1	
12.549	4	Silty Clay to Clay	6.84	0.19	0.753	0.148	0.605	3.01	1.29	0.97	0.473							1.00	1	
13.041	3	Clay	7.03	0.23	0.782	0.164	0.619	3.05	1.27	0.97	0.479							1.00	1	
13.533	3	Clay	7.73	0.27	0.812	0.179	0.633	3.04	1.26	0.97	0.486							1.00	1	
14.025	3	Clay	8.22	0.29	0.842	0.194	0.647	3.03	1.24	0.97	0.493							1.00	1	
14.518	3	Clay	8.39	0.28	0.871	0.21	0.661	3.01	1.23	0.97	0.498							1.00	1	
15.01	3	Clay	8.05	0.3	0.901	0.225	0.675	3.07	1.22	0.97	0.504							1.00	1	
15.502	3	Clay	6.8	0.23	0.93	0.24	0.69	3.13	1.2	0.97	0.509							1.00	1	
15.994	3	Clay	7.94	0.27	0.96	0.256	0.704	3.07	1.19	0.97	0.514							1.00	1	
16.486	3	Clay	7.75	0.24	0.989	0.271	0.718	3.07	1.18	0.97	0.519							1.00	1	
16.978	3	Clay	7.09	0.23	1.019	0.287	0.732	3.13	1.17	0.96	0.523							1.00	1	
17.47	4	Silty Clay to Clay	5.28	0.11	1.048	0.302	0.746	3.18	1.16	0.96	0.528							1.00	1	
17.962	4	Silty Clay to Clay	7.41	0.15	1.078	0.317	0.76	3.02	1.15	0.96	0.532							1.00	1	
18.454	5	Clayey Silt to Silty Clay	11.58	0.23	1.107	0.333	0.775	2.82	1.14	0.96	0.535							1.00	1	
18.947	6	Sandy Silt to Clayey Silt	19.65	0.3	1.137	0.348	0.789	2.57	1.13	0.96	0.539	2.570	1.13	22.20	3.148	69.899	0.11	1.00	1	0.21
19.439	5	Clayey Silt to Silty Clay	11.86	0.27	1.166	0.363	0.803	2.85	1.12	0.96	0.543							1.00	1	
19.931	3	Clay	6.39	0.24	1.196	0.379	0.817	3.27	1.11	0.96	0.546							1.00	1	
20.423	4	Silty Clay to Clay	12.29	0.38	1.225	0.394	0.831	2.93	1.1	0.96	0.549							1.00	1	
20.915	5	Clayey Silt to Silty Clay	18.01	0.6	1.255	0.409	0.845	2.81	1.09	0.95	0.553							1.00	1	
21.407	5	Clayey Silt to Silty Clay	19.66	0.68	1.284	0.425	0.86	2.79	1.08	0.95	0.555							1.00	1	
21.899	5	Clayey Silt to Silty Clay	21.87	0.77	1.314	0.44	0.874	2.76	1.07	0.95	0.558							1.00	1	
22.391	5	Clayey Silt to Silty Clay	22.17	0.71	1.344	0.456	0.888	2.74	1.06	0.95	0.561							1.00	1	
22.884	5	Clayey Silt to Silty Clay	23.23	0.68	1.373	0.471	0.902	2.7	1.05	0.95	0.563							1.00	1	
23.376	5	Clayey Silt to Silty Clay	23.57	0.73	1.403	0.486	0.916	2.72	1.04	0.95	0.566							1.00	1	
23.868	5	Clayey Silt to Silty Clay	23.74	0.76	1.432	0.502	0.93	2.73	1.04	0.95	0.568							1.00	1	
24.36	5	Clayey Silt to Silty Clay	24.72	0.79	1.462	0.517	0.945	2.72	1.03	0.94	0.570							1.00	1	
24.852	5	Clayey Silt to Silty Clay	18.85	0.58	1.491	0.532	0.959	2.82	1.02	0.94	0.571							1.00	1	
25.344	4	Silty Clay to Clay	11.48	0.38	1.521	0.548	0.973	3.05	1.01	0.94	0.573							1.00	1	
25.836	3	Clay	7.69	0.26	1.55	0.563	0.987	3.26	1.01	0.94	0.575							1.00	1	
26.328	3	Clay	5.75	0.19	1.58	0.579	1.001	3.42	1	0.94	0.577							1.00	1	
26.821	6	Sandy Silt to Clayey Silt	18.97	0.31	1.609	0.594	1.015	2.68	0.99	0.93	0.578							1.00	1	
27.313	5	Clayey Silt to Silty Clay	16.4	0.39	1.639	0.609	1.03	2.84	0.99	0.93	0.579							0.99	1	
27.805	5	Clayey Silt to Silty Clay	13.44	0.31	1.668	0.625	1.044	2.93	0.98	0.93	0.580							0.99	1	
28.297	5	Clayey Silt to Silty Clay	14.53	0.37	1.698	0.64	1.058	2.92	0.97	0.93	0.581							0.98	1	
28.789	6	Sandy Silt to Clayey Silt	18.74	0.38	1.727	0.655	1.072	2.76	0.97	0.93	0.582							0.99	1	
29.281	6	Sandy Silt to Clayey Silt	20.45	0.45	1.757	0.671	1.086	2.75	0.96	0.92	0.583							0.98	1	
29.773	6	Sandy Silt to Clayey Silt	16.67	0.31	1.786	0.686	1.1	2.8	0.95	0.92	0.584							0.98	1	
30.265	6	Sandy Silt to Clayey Silt	20.34	0.41	1.816	0.701	1.115	2.74	0.95	0.92	0.584							0.98	1	
30.758	7	Silty Sand to Sandy Silt	30.56	0.37	1.845	0.717	1.129	2.42	0.94	0.92	0.584	2.420	0.94	28.73	2.396	68.825	0.11	0.98	1	0.19
31.25	6	Sandy Silt to Clayey Silt	26.98	0.38	1.875	0.732	1.143	2.51	0.94	0.91	0.585	2.510	0.94	25.36	2.820	71.506	0.11	0.97	1	0.19
31.742	5	Clayey Silt to Silty Clay	24.25	0.67	1.905	0.748	1.157	2.77	0.93	0.91	0.585							0.96	1	
32.234	4	Silty Clay to Clay	20.19	0.79	1.934	0.763	1.171	2.94	0.92	0.91	0.585							0.95	1	
32.726	5	Clayey Silt to Silty Clay	15.93	0.49	1.964	0.778	1.185	2.98	0.92	0.91	0.585							0.95	1	
33.218	5	Clayey Silt to Silty Clay	17.87	0.42	1.993	0.794	1.2	2.87	0.91	0.90	0.585							0.95	1	
33.71	6	Sandy Silt to Clayey Silt	17.91	0.31	2.023	0.809	1.214	2.8	0.91	0.90	0.584							0.96	1	
34.202	6	Sandy Silt to Clayey Silt	24.59	0.4	2.052	0.824	1.228	2.65	0.9	0.90	0.584							0.96	1	
34.694	6	Sandy Silt to Clayey Silt	26.32	0.56	2.082	0.84	1.242	2.69	0.9	0.89	0.584							0.96	1	
35.187	5	Clayey Silt to Silty Clay	23.98	0.68	2.111	0.855	1.256	2.81	0.89	0.89	0.583							0.93	1	
35.679	4	Silty Clay to Clay	16.31	0.6	2.141	0.87	1.27	3.05	0.89	0.89	0.582							0.93	1	
36.171	6	Sandy Silt to Clayey Silt	19.55	0.3	2.17	0.886	1.284	2.75	0.88	0.88	0.581							0.95	1	
36.663	6	Sandy Silt to Clayey Silt	27.34	0.64	2.2	0.901	1.299	2.72	0.88	0.88	0.580							0.95	1	
37.155	5	Clayey Silt to Silty Clay	23.47	0.72	2.229	0.917	1.313	2.86	0.87	0.87	0.579							0.92	1	
37.647	5	Clayey Silt to Silty Clay	20.8	0.56	2.259	0.932	1.327	2.88	0.87	0.87	0.578							0.92	1	
38.139	6	Sandy Silt to Clayey Silt	29.66	0.7	2.288	0.947	1.341	2.7	0.86	0.87	0.577							0.94	1	
38.631	6	Sandy Silt to Clayey Silt	27.74	0.7	2.318	0.963	1.355	2.75	0.86	0.86	0.576							0.94	1	
39.124	5	Clayey Silt to Silty Clay	19.8	0.58	2.347	0.978	1.369	2.93	0.85	0.86	0.574							0.91	1	
39.616	5	Clayey Silt to Silty Clay	20.1	0.45	2.377	0.993	1.384	2.87	0.85	0.85	0.572							0.91	1	
40.108	6	Sandy Silt to Clayey Silt	24.38	0.42	2.407	1.009	1.398	2.72	0.85	0.85	0.571							0.94	1	
40.6	6	Sandy Silt to Clayey Silt	28.22	0.51	2.436	1.024	1.412	2.68	0.84	0.85	0.569							0.93	1	
41.092	6	Sandy Silt to Clayey Silt	35.14	0.83	2.466	1.039	1.426	2.66	0.84	0.84	0.567							0.93	1	
41.584	5	Clayey Silt to Silty Clay	33.03	1.03	2.495	1.055	1.44	2.76	0.83	0.84	0.565							0.90	1	
42.076	4	Silty Clay to Clay	21.78	0.81	2.525	1.07	1.454	2.98	0.83	0.83	0.564							0.89	1	
42.568	5	Clayey Silt to Silty Clay	19.16	0.45	2.554	1.086	1.469	2.92	0.83	0.83	0.561							0.89	1	
43.061	6	Sandy Silt to Clayey Silt	22.25	0.43	2.584	1.101	1.483	2.81	0.82	0.82	0.559							0.92	1	
43.553	7	Silty Sand to Sandy Silt	36.39	0.56	2.613	1.116	1.497	2.47	0.82	0.82	0.557	2.470	0.82	29.84	2.621	78.219	0.12	0.92	1	0.22
44.045	6	Sandy Silt to Clayey Silt	28.92	0.62	2.643	1.132	1.511	2.74	0.81	0.81	0.555							0.92	1	
44.537	5	Clayey Silt to Silty Clay	21.16	0.53	2.672	1.147	1.525	2.91	0.81	0.81	0.552							0.88	1	
45.029	6	Sandy Silt to Clayey Silt	25.49	0.58	2.702	1.162	1.539	2.81	0.81	0.80	0.550							0.92	1	
45.521	6	Sandy Silt to Clayey Silt	32.3	0.84	2.731	1.178	1.554	2.75	0.8	0.80	0.547							0.92	1	
46.013	5	Clayey Silt to Silty Clay	33.11	0.99	2.761	1.193	1.568	2.78	0.8	0.79	0.545							0.87	1	
46.505	6	Sandy Silt to Clayey Silt	31.09	0.74	2.79	1.208	1.582	2.75	0.8	0.79	0.542							0.91	1	
46.997	6	Sandy Silt to Clayey Silt	29.17	0.79	2.82	1.224	1.596	2.81	0.79	0.78	0.540							0.91	1	
47.49	5	Clayey Silt to Silty Clay	28.9	0.91	2.849	1.239	1.61	2.86	0.79	0.78	0.537							0.87	1	
47.982	5	Clayey Silt to Silty Clay	26.28	0.84	2.879	1.255	1.624	2.91	0.78	0.77	0.535							0.86	1	
48.474	4	Silty Clay to Clay	18.06	0.64	2.908	1.27	1.639	3.1	0.78	0.77	0.532							0.86	1	
48.966	5	Clayey Silt to Silty Clay	19.87	0.46	2.938	1.285	1.653	2.96	0.78	0.76	0.529							0.86	1	
49.458	6	Sandy Silt to Clayey Silt	18.85	0.38	2.968	1.301	1.667	2.96	0.77	0.76	0.527							0.90	1	
49.95	6	Sandy Silt to Clayey Silt	18.37	0.28	2.997	1.316	1.681	2.91	0.77	0.75	0.524							0.90	1	
50.442	6	Sandy Silt to Clayey Silt	24.87	0.36	3.027	1.331	1.695	2.76	0.77	0.75	0.521							0.90	1	
50.934	6	Sandy Silt to Clayey Silt	23.46	0.51	3.056	1.347	1.709	2.89	0.76	0.74	0.518							0.90	1	

LIQUEFACTION POTENTIAL ANALYSIS (per Youd & Idriss, 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
CPT NO. ***CPT-AS-12***

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.6 (Design Basis EQ)

FAULT M_w = 7.5
MSF = 1.00

			CPT RESULT INPUT							*CSR*		*CRR 7.5*						*F.S.=(CRR 7.5/CSR)*MSF*Kσ*Kα*		
Depth		Soil Behavior Type	qc	fs	σ_v	u	σ_v'	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.
(ft)			(tsf)	(tsf)	(tsf)	(tsf)	(tsf)													
51.427	6	Sandy Silt to Clayey Silt	23.7	0.5	3.086	1.362	1.724	2.88	0.76	0.74	0.515							0.90	1	
51.919	6	Sandy Silt to Clayey Silt	29.24	0.59	3.115	1.378	1.738	2.78	0.76	0.73	0.513							0.90	1	
52.411	6	Sandy Silt to Clayey Silt	37.05	0.83	3.145	1.393	1.752	2.71	0.76	0.73	0.510							0.89	1	
52.903	6	Sandy Silt to Clayey Silt	36.3	0.95	3.174	1.408	1.766	2.76	0.75	0.72	0.507							0.89	1	
53.395	6	Sandy Silt to Clayey Silt	35.03	0.83	3.204	1.424	1.78	2.75	0.75	0.72	0.505							0.89	1	
53.887	6	Sandy Silt to Clayey Silt	32.69	0.8	3.233	1.439	1.794	2.79	0.75	0.71	0.502							0.89	1	
54.379	6	Sandy Silt to Clayey Silt	30.6	0.68	3.263	1.454	1.808	2.8	0.74	0.71	0.499							0.89	1	
54.871	6	Sandy Silt to Clayey Silt	30.89	0.64	3.292	1.47	1.823	2.78	0.74	0.70	0.496							0.89	1	
55.364	6	Sandy Silt to Clayey Silt	32.11	0.65	3.322	1.485	1.837	2.77	0.74	0.70	0.494							0.89	1	
55.856	6	Sandy Silt to Clayey Silt	31.9	0.73	3.351	1.5	1.851	2.8	0.74	0.70	0.491							0.88	1	
56.348	6	Sandy Silt to Clayey Silt	32.96	0.84	3.381	1.516	1.865	2.82	0.73	0.69	0.488							0.88	1	
56.84	5	Clayey Silt to Silty Clay	31.11	0.94	3.41	1.531	1.879	2.89	0.73	0.69	0.486							0.83	1	
57.332	5	Clayey Silt to Silty Clay	26.85	0.76	3.44	1.547	1.893	2.94	0.73	0.68	0.483							0.83	1	
57.824	5	Clayey Silt to Silty Clay	23.89	0.64	3.47	1.562	1.908	2.98	0.72	0.68	0.481							0.82	1	
58.316	5	Clayey Silt to Silty Clay	18.84	0.55	3.499	1.577	1.922	3.12	0.72	0.67	0.478							0.82	1	
58.808	5	Clayey Silt to Silty Clay	17.74	0.39	3.529	1.593	1.936	3.08	0.72	0.67	0.476							0.82	1	
59.3	6	Sandy Silt to Clayey Silt	17.89	0.27	3.558	1.608	1.95	3	0.72	0.67	0.473							0.87	1	
59.793	6	Sandy Silt to Clayey Silt	25.94	0.4	3.588	1.623	1.964	2.82	0.71	0.66	0.471							0.87	1	
60.285	6	Sandy Silt to Clayey Silt	23.47	0.42	3.617	1.639	1.978	2.91	0.71	0.66	0.468							0.87	2	
60.777	6	Sandy Silt to Clayey Silt	22.51	0.37	3.647	1.654	1.993	2.91	0.71	0.65	0.466							0.87	3	
61.269	6	Sandy Silt to Clayey Silt	27.26	0.59	3.676	1.669	2.007	2.89	0.71	0.65	0.464							0.87	4	
61.761	6	Sandy Silt to Clayey Silt	33.36	0.92	3.706	1.685	2.021	2.86	0.7	0.65	0.462							0.87	5	
62.253	6	Sandy Silt to Clayey Silt	29.26	0.65	3.735	1.7	2.035	2.87	0.7	0.64	0.459							0.87	6	
62.745	6	Sandy Silt to Clayey Silt	24.93	0.52	3.765	1.716	2.049	2.93	0.7	0.64	0.457							0.87	7	
63.237	6	Sandy Silt to Clayey Silt	22.64	0.56	3.794	1.731	2.063	3.02	0.7	0.63	0.455							0.87	8	
63.73	5	Clayey Silt to Silty Clay	21.29	0.73	3.824	1.746	2.078	3.13	0.69	0.63	0.453							0.80	9	
64.222	5	Clayey Silt to Silty Clay	18.54	0.45	3.853	1.762	2.092	3.12	0.69	0.63	0.451							0.80	10	
64.714	6	Sandy Silt to Clayey Silt	19.01	0.28	3.883	1.777	2.106	2.99	0.69	0.62	0.449							0.86	11	
65.206	6	Sandy Silt to Clayey Silt	18.93	0.24	3.912	1.792	2.12	2.96	0.69	0.62	0.447							0.86	12	
65.698	6	Sandy Silt to Clayey Silt	21.04	0.27	3.942	1.808	2.134	2.92	0.68	0.62	0.445							0.86	13	
66.19	6	Sandy Silt to Clayey Silt	23.44	0.3	3.971	1.823	2.148	2.87	0.68	0.61	0.443							0.86	14	
66.682	6	Sandy Silt to Clayey Silt	20.27	0.23	4.001	1.838	2.163	2.91	0.68	0.61	0.441							0.86	15	
67.174	6	Sandy Silt to Clayey Silt	19.14	0.21	4.031	1.854	2.177	2.94	0.68	0.61	0.439							0.86	16	
67.666	6	Sandy Silt to Clayey Silt	20.74	0.25	4.06	1.869	2.191	2.92	0.68	0.61	0.437							0.85	17	
68.159	6	Sandy Silt to Clayey Silt	22.44	0.45	4.09	1.885	2.205	2.99	0.67	0.60	0.436							0.85	18	
68.651	6	Sandy Silt to Clayey Silt	24.74	0.65	4.119	1.9	2.219	3.02	0.67	0.60	0.434							0.85	19	
69.143	6	Sandy Silt to Clayey Silt	23.93	0.54	4.149	1.915	2.233	2.99	0.67	0.60	0.432							0.85	20	
69.635	6	Sandy Silt to Clayey Silt	25.1	0.51	4.178	1.931	2.248	2.95	0.67	0.59	0.430							0.85	21	
70.127	6	Sandy Silt to Clayey Silt	28.9	0.43	4.208	1.946	2.262	2.82	0.67	0.59	0.429							0.85	22	
70.619	6	Sandy Silt to Clayey Silt	28.96	0.64	4.237	1.961	2.276	2.91	0.66	0.59	0.427							0.85	23	
71.111	6	Sandy Silt to Clayey Silt	28.02	0.55	4.267	1.977	2.29	2.9	0.66	0.59	0.426							0.85	24	
71.603	6	Sandy Silt to Clayey Silt	30.22	0.73	4.296	1.992	2.304	2.91	0.66	0.58	0.424							0.85	25	
72.096	6	Sandy Silt to Clayey Silt	34.16	0.81	4.326	2.007	2.318	2.86	0.66	0.58	0.423							0.85	26	
72.588	6	Sandy Silt to Clayey Silt	35.41	0.98	4.355	2.023	2.333	2.89	0.65	0.58	0.421							0.84	27	
73.08	6	Sandy Silt to Clayey Silt	33.15	0.88	4.385	2.038	2.347	2.91	0.65	0.58	0.420							0.84	28	
73.572	6	Sandy Silt to Clayey Silt	33.22	0.75	4.414	2.054	2.361	2.87	0.65	0.57	0.419							0.84	29	
74.064	6	Sandy Silt to Clayey Silt	36.73	0.86	4.444	2.069	2.375	2.83	0.65	0.57	0.417							0.84	30	
74.556	6	Sandy Silt to Clayey Silt	44.02	0.92	4.473	2.084	2.389	2.74	0.65	0.57	0.416							0.84	31	
75.048	6	Sandy Silt to Clayey Silt	31.75	0.75	4.503	2.1	2.403	2.9	0.65	0.57	0.415							0.84	32	
75.54	6	Sandy Silt to Clayey Silt	29.69	0.71	4.533	2.115	2.417	2.94	0.64	0.57	0.414							0.84	33	
76.033	6	Sandy Silt to Clayey Silt	31.11	0.74	4.562	2.13	2.432	2.92	0.64	0.56	0.412							0.84	34	
76.525	6	Sandy Silt to Clayey Silt	37.97	0.89	4.592	2.146	2.446	2.83	0.64	0.56	0.411							0.84	35	
77.017	6	Sandy Silt to Clayey Silt	51.74	1.58	4.621	2.161	2.46	2.79	0.64	0.56	0.410							0.84	36	
77.509	7	Silty Sand to Sandy Silt	55.36	1.04	4.651	2.177	2.474	2.64	0.64	0.56	0.409							0.83	37	
78.001	6	Sandy Silt to Clayey Silt	30.03	0.66	4.68	2.192	2.488	2.92	0.63	0.56	0.408							0.83	38	
78.493	6	Sandy Silt to Clayey Silt	28.92	0.56	4.71	2.207	2.502	2.91	0.63	0.55	0.406							0.83	39	
78.985	6	Sandy Silt to Clayey Silt	28.64	0.6	4.739	2.223	2.517	2.93	0.63	0.55	0.405							0.83	40	
79.477	6	Sandy Silt to Clayey Silt	29.71	0.76	4.769	2.238	2.531	2.97	0.63	0.55	0.404							0.83	41	
79.97	6	Sandy Silt to Clayey Silt	27.05	0.74	4.798	2.253	2.545	3.04	0.63	0.55	0.403							0.83	42	
80.462	6	Sandy Silt to Clayey Silt	28.17	0.77	4.828	2.269	2.559	3.02	0.63	0.55	0.402							0.83	43	
80.954	6	Sandy Silt to Clayey Silt	36.67	0.76	4.857	2.284	2.573	2.85	0.62	0.54	0.401							0.83	44	
81.446	6	Sandy Silt to Clayey Silt	31.24	0.84	4.887	2.299	2.587	2.98	0.62	0.54	0.400							0.83	45	
81.938	6	Sandy Silt to Clayey Silt	30	0.8	4.916	2.315	2.602	3	0.62	0.54	0.399							0.83	46	
82.43	6	Sandy Silt to Clayey Silt	28.28	0.75	4.946	2.33	2.616	3.03	0.62	0.54	0.398							0.83	47	
82.922	6	Sandy Silt to Clayey Silt	27.26	0.66	4.975	2.346	2.63	3.02	0.62	0.54	0.397							0.82	48	
83.414	6	Sandy Silt to Clayey Silt	28.81	0.56	5.005	2.361	2.644	2.94	0.62	0.54	0.396							0.82	49	
83.906	6	Sandy Silt to Clayey Silt	26.83	0.56	5.035	2.376	2.658	3	0.61	0.54	0.396							0.82	50	
84.399	6	Sandy Silt to Clayey Silt	28.45	0.51	5.064	2.392	2.672	2.93	0.61	0.53	0.395							0.82	51	
84.891	6	Sandy Silt to Clayey Silt	30.2	0.58	5.094	2.407	2.687	2.92	0.61	0.53	0.394							0.82	52	
85.383	6	Sandy Silt to Clayey Silt	35.24	0.7	5.123	2.422	2.701	2.86	0.61	0.53	0.393							0.82	53	
85.875	6	Sandy Silt to Clayey Silt	34.05	0.96	5.153	2.438	2.715	2.97	0.61	0.53	0.392							0.82	54	
86.367	5	Clayey Silt to Silty Clay	34.35	1.09	5.182	2.453	2.729	3.01	0.61	0.53	0.391							0.74	55	
86.859	6	Sandy Silt to Clayey Silt	35.33	0.98	5.212	2.468	2.743	2.96	0.6	0.53	0.391							0.82	56	
87.351	5	Clayey Silt to Silty Clay	35.26	1.16	5.241	2.484	2.757	3.01	0.6	0.53	0.390							0.74	57	
87.843	6	Sandy Silt to Clayey Silt	33.49	0.9	5.271	2.499	2.772	2.99	0.6	0.52	0.389							0.82	58	
88.336	6	Sandy Silt to Clayey Silt	32.37	0.83	5.3	2.515	2.786	2.99	0.6	0.52	0.388							0.81	59	
88.828	6	Sandy Silt to Clayey Silt	32.3	0.93	5.33	2.53	2.8	3.02	0.6	0.52	0.388							0.81	60	
89.32	5	Clayey Silt to Silty Clay	31.22	0.99	5.359	2.545	2.814	3.07	0.6	0.52	0.387							0.73	61	
89.812	6	Sandy Silt to Clayey Silt	29.47	0.79	5.389	2.561	2.828	3.05	0.59	0.52	0.386							0.81	62	
90.304	6	Sandy Silt to Clayey Silt	30.6	0.84	5.418	2.576	2.842	3.04	0.59	0.52	0.386							0.81	63	
90.796	6	Sandy Silt to Clayey Silt	31.07	0.75	5.448	2.591	2.857	3	0.59	0.52	0.385							0.81	64	
91.288	6	Sandy Silt to Clayey Silt	35.41	0.6	5.477	2.607	2.871	2.87	0.59	0.52	0.384							0.81	65	
91.78	7	Silty Sand to Sandy Silt	37.16	0.61	5.507	2.622	2.885	2.84	0.59	0.52	0.383							0.81	66	
92.273	6	Sandy Silt to Clayey Silt	39.67	0.79	5.536	2.637	2.899	2.85	0.59	0.51	0.383							0.81	67	
92.765	7	Silty Sand to Sandy Silt	35.33	0.49	5.566	2.653	2.913	2.83	0.59	0.51	0.382							0.81	68	
93.257	6	Sandy Silt to Clayey Silt	43.06	0.83	5.596	2.668	2.927	2.82	0.58	0.51	0.382							0.81	69	
93.749	6	Sandy Silt to Clayey Silt	31.92	0.73	5.625	2.684	2.941	3	0.58	0.51	0.381							0.81	70	
94.241	7	Silty Sand to Sandy Silt	31.64	0.47	5.655	2.699	2.956	2.89	0.58	0.51	0.380							0.81	71	
94.733	7	Silty Sand to Sandy Silt	54.6	0.93	5.684	2.714	2.97	2.69	0.58	0.51	0.380							0.80	72	
95.225	6	Sandy Silt to Clayey Silt	49.4	1.31	5.714	2.73	2.984	2.86	0.58	0.51	0.379							0.80	73	
95.717	7	Silty Sand to Sandy Silt	55.94	0.99	5.743	2.745	2.998	2.71	0.58	0.51	0.379							0.80	74	
96.209	7	Silty Sand to Sandy Silt	50.83	0.98	5.773	2.76	3.012	2.77	0.58	0.51	0.378							0.80	75	
96.702	7	Silty Sand to Sandy Silt	46.93	0.9	5.802	2.776	3.026	2.81	0.57	0.50	0.377							0.80	76	
97.194	6	Sandy Silt to Clayey Silt	48.44	1.27	5.832	2.791	3.041	2.87	0.57	0.50	0.377							0.80	77	
97.686	6	Sandy Silt to Clayey Silt	45.27	1.12	5.861	2.806	3.055	2.89	0.57	0.50	0.376							0.80	78	
98.178	6	Sandy Silt to Clayey Silt	59.94	1.56	5.891	2.822	3.069	2.78	0.57	0.50	0.376							0.80	79	
98.67	6	Sandy Silt to Clayey Silt	63.03	1.91	5.92	2.837	3.083	2.81	0.57	0.50	0.375							0.80	80	
99.162	6	Sandy Silt to Clayey Silt	54.06	1.47	5.95	2.853	3.097	2.84	0.57	0.50	0.375							0.80	81	
99.654	6	Sandy Silt to Clayey Silt	71.27	2.13	5.979	2.868	3.111	2.75	0.57	0.50	0.374							0.79	82	

LIQUEFACTION POTENTIAL ANALYSIS (per Youd & Idriss, 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
CPT NO. ***CPT-AS-13***

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.6 (Design Basis EQ)

FAULT M_w = 7.5
MSF = 1.00

			CPT RESULT INPUT							*CSR*		*CRR 7.5*						*F.S.=(CRR 7.5/CSR)*MSF*Kσ*Kα*		
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.
0.492					0.03		0.03	-9999	2	1.00	0.390							1.00	1	
1.476					0.089		0.089	-9999	2	1.00	0.389							1.00	1	
2.461					0.148		0.148	-9999	2	1.00	0.389							1.00	1	
3.445					0.207		0.207	-9999	2	0.99	0.388							1.00	1	
4.429	3	Clay	2.19	0.07	0.266		0.266	3.17	1.94	0.99	0.387							1.00	1	
5.413	3	Clay	5.93	0.27	0.325	0.013	0.312	2.92	1.79	0.99	0.402							1.00	1	
6.398	3	Clay	3.22	0.08	0.384	0.044	0.34	3.04	1.71	0.99	0.435							1.00	1	
7.382	1	Sensitive Fines	5.28	0.06	0.443	0.074	0.369	2.69	1.65	0.98	0.461							1.00	1	
8.366	5	Clayey Silt to Silty Clay	12.45	0.2	0.502	0.105	0.397	2.52	1.59	0.98	0.485	2.520	1.59	19.80	2.872	56.845	0.10	1.00	1	0.20
9.35	6	Sandy Silt to Clayey Silt	12.49	0.17	0.561	0.136	0.425	2.58	1.53	0.98	0.505	2.580	1.53	19.11	3.206	61.274	0.10	1.00	1	0.20
10.335	5	Clayey Silt to Silty Clay	12.29	0.19	0.62	0.167	0.454	2.54	1.49	0.98	0.521	2.540	1.49	18.31	2.979	54.551	0.10	1.00	1	0.18
11.319	5	Clayey Silt to Silty Clay	7.8	0.14	0.679	0.197	0.482	2.73	1.44	0.98	0.536							1.00	1	
12.303	5	Clayey Silt to Silty Clay	7.93	0.12	0.738	0.228	0.51	2.71	1.4	0.97	0.550							1.00	1	
13.287	5	Clayey Silt to Silty Clay	9.45	0.22	0.797	0.259	0.539	2.77	1.36	0.97	0.561							1.00	1	
14.271	4	Silty Clay to Clay	9.28	0.26	0.856	0.289	0.567	2.85	1.33	0.97	0.571							1.00	1	
15.256	4	Silty Clay to Clay	11.73	0.38	0.915	0.32	0.595	2.82	1.3	0.97	0.581							1.00	1	
16.24	3	Clay	10.38	0.38	0.974	0.351	0.623	2.92	1.27	0.97	0.589							1.00	1	
17.224	3	Clay	9.99	0.4	1.033	0.382	0.652	2.99	1.24	0.96	0.595							1.00	1	
18.208	4	Silty Clay to Clay	16.06	0.56	1.093	0.412	0.68	2.78	1.21	0.96	0.603							1.00	1	
19.193	3	Clay	11.73	0.45	1.152	0.443	0.708	2.95	1.19	0.96	0.609							1.00	1	
20.177	5	Clayey Silt to Silty Clay	12.17	0.34	1.211	0.474	0.737	2.86	1.17	0.96	0.613							1.00	1	
21.161	4	Silty Clay to Clay	10.24	0.29	1.27	0.505	0.765	2.95	1.14	0.95	0.618							1.00	1	
22.145	5	Clayey Silt to Silty Clay	18.11	0.6	1.329	0.535	0.793	2.77	1.12	0.95	0.622							1.00	1	
23.13	5	Clayey Silt to Silty Clay	22.01	0.72	1.388	0.566	0.822	2.71	1.1	0.95	0.624							1.00	1	
24.114	5	Clayey Silt to Silty Clay	22.08	0.7	1.447	0.597	0.85	2.71	1.08	0.94	0.627							1.00	1	
25.098	5	Clayey Silt to Silty Clay	23.25	0.67	1.506	0.628	0.878	2.67	1.07	0.94	0.630							1.00	1	
26.082	5	Clayey Silt to Silty Clay	18.2	0.54	1.565	0.658	0.907	2.79	1.05	0.94	0.631							1.00	1	
27.067	5	Clayey Silt to Silty Clay	14.99	0.28	1.624	0.689	0.935	2.77	1.03	0.93	0.633							1.00	1	
28.051	5	Clayey Silt to Silty Clay	10.92	0.19	1.683	0.72	0.963	2.89	1.02	0.93	0.634							1.00	1	
29.035	5	Clayey Silt to Silty Clay	9.11	0.11	1.742	0.75	0.992	2.9	1	0.93	0.634							1.00	1	
30.019	5	Clayey Silt to Silty Clay	21.19	0.6	1.801	0.781	1.02	2.76	0.99	0.92	0.634							0.99	1	
31.004	5	Clayey Silt to Silty Clay	20.25	0.61	1.86	0.812	1.048	2.81	0.98	0.92	0.634							0.99	1	
31.988	6	Sandy Silt to Clayey Silt	27.45	0.64	1.919	0.843	1.077	2.63	0.96	0.91	0.632							0.99	1	
32.972	5	Clayey Silt to Silty Clay	16.4	0.45	1.978	0.873	1.105	2.9	0.95	0.90	0.631							0.97	1	
33.956	6	Sandy Silt to Clayey Silt	27.09	0.57	2.037	0.904	1.133	2.64	0.94	0.90	0.629							0.98	1	
34.941	7	Silty Sand to Sandy Silt	32.47	0.37	2.096	0.935	1.162	2.39	0.93	0.89	0.627	2.390	0.93	30.20	2.272	68.608	0.11	0.97	1	0.18
35.925	6	Sandy Silt to Clayey Silt	32.25	0.65	2.156	0.966	1.19	2.53	0.92	0.88	0.625	2.530	0.92	29.67	2.925	86.778	0.14	0.97	1	0.23
36.909	6	Sandy Silt to Clayey Silt	54.14	1.28	2.215	0.996	1.218	2.4	0.91	0.88	0.622	2.400	0.91	49.27	2.312	113.925	0.22	0.96	1	0.35
37.893	6	Sandy Silt to Clayey Silt	34.88	1.06	2.274	1.027	1.247	2.66	0.9	0.87	0.618							0.96	1	
38.877	6	Sandy Silt to Clayey Silt	38.19	1.09	2.333	1.058	1.275	2.62	0.89	0.86	0.614							0.95	1	
39.862	6	Sandy Silt to Clayey Silt	40.01	1.26	2.392	1.088	1.303	2.64	0.88	0.85	0.610							0.95	1	
40.846	5	Clayey Silt to Silty Clay	34.65	1.29	2.451	1.119	1.332	2.76	0.87	0.84	0.605							0.92	1	
41.83	6	Sandy Silt to Clayey Silt	28.38	0.77	2.51	1.15	1.36	2.75	0.86	0.83	0.601							0.94	1	
42.814	6	Sandy Silt to Clayey Silt	51.23	1.62	2.569	1.181	1.388	2.53	0.85	0.83	0.596	2.530	0.85	43.55	2.925	127.361	0.27	0.93	1	0.46
43.799	6	Sandy Silt to Clayey Silt	31.37	0.88	2.628	1.211	1.417	2.73	0.84	0.82	0.590							0.93	1	
44.783	5	Clayey Silt to Silty Clay	23.16	0.68	2.687	1.242	1.445	2.88	0.83	0.81	0.584							0.90	1	
45.767	6	Sandy Silt to Clayey Silt	27.99	0.77	2.746	1.273	1.473	2.79	0.82	0.80	0.579							0.93	1	
46.751	6	Sandy Silt to Clayey Silt	46.15	1.06	2.805	1.304	1.502	2.49	0.82	0.79	0.572	2.490	0.82	37.84	2.718	102.872	0.18	0.92	1	0.32
47.736	6	Sandy Silt to Clayey Silt	24.98	0.46	2.864	1.334	1.53	2.75	0.81	0.78	0.566							0.92	1	
48.72	6	Sandy Silt to Clayey Silt	23.89	0.49	2.923	1.365	1.558	2.79	0.8	0.77	0.560							0.92	1	
49.704	6	Sandy Silt to Clayey Silt	26.62	0.67	2.982	1.396	1.587	2.81	0.79	0.76	0.554							0.91	1	
50.688	5	Clayey Silt to Silty Clay	21.15	0.65	3.041	1.427	1.615	2.97	0.79	0.75	0.548							0.87	1	
51.673	5	Clayey Silt to Silty Clay	25.51	0.95	3.1	1.457	1.643	2.96	0.78	0.74	0.541							0.86	1	
52.657	6	Sandy Silt to Clayey Silt	27.54	0.66	3.159	1.488	1.672	2.82	0.77	0.73	0.535							0.90	1	
53.641	5	Clayey Silt to Silty Clay	24.88	0.8	3.219	1.519	1.7	2.95	0.77	0.72	0.529							0.85	1	
54.625	6	Sandy Silt to Clayey Silt	36.85	1.12	3.278	1.549	1.728	2.77	0.76	0.71	0.523							0.90	1	
55.61	8	Sand to Silty Sand	133.11	2.3	3.337	1.58	1.756	2.08	0.75	0.70	0.517	2.080	0.75	99.83	1.420	141.727	0.34	0.83	1	0.67
56.594	5	Clayey Silt to Silty Clay	38.45	1.27	3.396	1.611	1.785	2.8	0.75	0.69	0.511							0.84	1	
57.578	6	Sandy Silt to Clayey Silt	25.19	0.65	3.455	1.642	1.813	2.91	0.74	0.68	0.505							0.89	1	
58.562	5	Clayey Silt to Silty Clay	29.62	0.9	3.514	1.672	1.841	2.9	0.74	0.67	0.500							0.83	1	
59.547	5	Clayey Silt to Silty Clay	29.11	0.87	3.573	1.703	1.87	2.91	0.73	0.66	0.494							0.83	1	
60.531	6	Sandy Silt to Clayey Silt	77.43	2.42	3.632	1.734	1.898	2.45	0.73	0.65	0.489	2.450	0.73	56.52	2.528	142.905	0.35	0.85	1	0.72
61.515	5	Clayey Silt to Silty Clay	74.83	3.11	3.691	1.765	1.926	2.66	0.72	0.65	0.484							0.82	1	
62.499	6	Sandy Silt to Clayey Silt	20.31	0.44	3.75	1.795	1.955	3.02	0.72	0.64	0.479							0.87	1	
63.483	5	Clayey Silt to Silty Clay	21.45	0.66	3.809	1.826	1.983	3.08	0.71	0.63	0.474							0.81	1	
64.468	5	Clayey Silt to Silty Clay	21.37	0.53	3.868	1.857	2.011	3.02	0.71	0.63	0.469							0.81	1	
65.452	6	Sandy Silt to Clayey Silt	21.38	0.47	3.927	1.887	2.04	3	0.7	0.62	0.465							0.87	1	
66.436	6	Sandy Silt to Clayey Silt	19.79	0.41	3.986	1.918	2.068	3.03	0.7	0.61	0.461							0.86	1	
67.42	6	Sandy Silt to Clayey Silt	19.17	0.37	4.045	1.949	2.096	3.03	0.69	0.61	0.457							0.86	1	
68.405	6	Sandy Silt to Clayey Silt	20.72	0.37	4.104	1.98	2.125	2.97	0.69	0.60	0.453							0.86	1	
69.389	6	Sandy Silt to Clayey Silt	22.7	0.55	4.163	2.01	2.153	3.01	0.68	0.60	0.449							0.86	1	
70.373	5	Clayey Silt to Silty Clay	46.18	1.63	4.222	2.041	2.181	2.82	0.68	0.59	0.445							0.79	1	
71.357	6	Sandy Silt to Clayey Silt	74.02	2.55	4.282	2.072	2.21	2.65	0.67	0.58	0.442							0.83	1	
72.342	6	Sandy Silt to Clayey Silt	82.61	2.79	4.341	2.103	2.238	2.62	0.67	0.58	0.439							0.82	1	
73.326	7	Silty Sand to Sandy Silt	222.06	5.5	4.4	2.133	2.266	2.08	0.66	0.58	0.436	2.080	0.66	146.56	1.420	208.063		0.73	1	
74.31	9	Sand	305.89	4.5	4.459	2.164	2.295	1.82	0.66	0.57	0.432	1.820	0.66	201.89	1.122	226.419		0.72	1	
75.294	7	Silty Sand to Sandy Silt	145.44	3.56	4.518	2.195	2.323	2.21	0.66	0.57	0.430	2.210	0.66	95.99	1.692	162.379		0.76	1	
76.279	7	Silty Sand to Sandy Silt	32.56	0.21	4.577	2.226	2.351	2.61	0.65	0.56	0.427							0.84	1	
77.263	7	Silty Sand to Sandy Silt	25.02	0.26	4.636	2.256	2.38	2.8	0.65	0.56	0.424							0.84	1	
78.247	7	Silty Sand to Sandy Silt	86.77	1.51	4.695	2.287	2.408	2.27	0.64	0.55	0.422	2.270	0.64	55.53	1.856	103.074	0.18	0.80	1	0.43
79.231	9	Sand	238.76	3.33	4.754	2.318	2.436	1.89	0.64	0.55	0.419	1.890	0.64	152.81	1.180	180.246		0.70	1	
80.216	8	Sand to Silty Sand	220.88	3.02	4.813	2.348	2.465	1.91	0.64	0.55	0.417	1.910	0.64	141.36	1.198	169.410		0.71	1	
81.2	7	Silty Sand to Sandy Silt	80.73	1.58	4.872	2.379	2.493	2.35	0.63	0.54	0.415	2.350	0.63	50.86	2.120	107.805	0.20	0.81	1	0.47
82.184	7	Silty Sand to Sandy Silt	23.29	0.15	4.931	2.41	2.521	2.84	0.63	0.54	0.413							0.83	1	
83.168	7	Silty Sand to Sandy Silt	31.34	0.37	4.99	2.441	2.55	2.79	0.63	0.54	0.410							0.83	1	
84.153	6	Sandy Silt to Clayey Silt	45.84	0.97	5.049	2.471	2.578	2.76	0.62	0.53	0.409							0.83	1	
85.137	7	Silty Sand to Sandy Silt	71.26	1.51	5.108	2.502	2.606	2.42	0.62	0.53	0.407	2.420	0.62	44.18	2.396	105.852	0.19	0.81	1	0.47
86.121	6	Sandy Silt to Clayey Silt	35.76	0.73	5.167	2.533	2.635	2.87	0.62	0.53	0.405							0.82	1	
87.105	7	Silty Sand to Sandy Silt	148.65	4.15	5.226	2.564	2.663	2.27	0.61	0.53	0.403	2.270	0.61	90.68	1.856	168.303		0.73	1	
88.089	9	Sand	208.95	2.69	5.285	2.594	2.691	1.92	0.61	0.52	0.401	1.920	0.61	127.46	1.208	154.006	0.42	0.69	1	1.05
89.074	6	Sandy Silt to Clayey Silt	37.03	0.9	5.345	2.625	2.72	2.92	0.61	0.52	0.400							0.82	1	
90.058	6	Sandy Silt to Clayey Silt	43.12	0.93	5.404	2.656	2.748	2.82	0.6	0.52	0.398							0.82	1	
91.042	6	Sandy Silt to Clayey Silt	44.95	1.04	5.463	2.686	2.776	2.82	0.6	0.52	0.397							0.82	1	
92.026	7	Silty Sand to Sandy Silt	45.2	0.89	5.522	2.717	2.804	2.78	0.6	0.51	0.395							0.81	1	
93.011	6	Sandy Silt to Clayey Silt	54.1	1.32	5.581	2.748	2.833	2.76	0.59	0.51	0.394							0.81	1	
93.995	6	Sandy Silt to Clayey Silt	47.87	1.1	5.64	2.779	2.861	2.81	0.59	0.51	0.392							0.81	1	
94.979	6	Sandy Silt to Clayey Silt	29.31	0.56	5.699	2.809	2.889	2.98	0.59	0.51	0.391							0.81	1	
95.963	7	Silty Sand to Sandy Silt	40.23	0.75	5.758	2.84	2.918	2.83	0.59	0.51	0.390							0.81	1	
96.948	6	Sandy Silt to Clayey Silt	49	1.19	5.817	2.871	2.946	2.82	0.58	0.50	0.388							0.81	1	
97.932	6	Sandy Silt to Clayey Silt	42.15	0.93	5.876	2.902	2.974	2.86	0.58	0.50	0.387							0.80	1	
98.916	6	Sandy Silt to Clayey Silt	51.91	1.2	5.935	2.932	3.003	2.79	0.58	0.50	0.386							0.80	1	
99.9	6	Sandy Silt to Clayey Silt	45.47	1.01	5.994	2.963	3.031	2.83	0.57	0.50	0.385							0.80	1	
100.885	6	Sandy Silt to Clayey Silt	119.65	4.01	6.053	2.994	3.059	2.41	0.57	0.50	0.384	2.410	0.57	68.20	2.354	160.520		0.73	1	
101.869	5	Clayey Silt to Silty Clay	75.64	3.2	6.112	3.025	3.088	2.83	0.57	0.50	0.382							0.71	1	

LIQUEFACTION POTENTIAL ANALYSIS (per Youd & Idriss, 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
CPT NO. ***CPT-AS-13***

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.6 (Design Basis EQ)

FAULT M_w = 7.5
MSF = 1.00

			CPT RESULT INPUT							*CSR*		*$CRR_{7.5}$*						*$F.S.=(CRR_{7.5}/CSR)*MSF*K\sigma*K\alpha$*		
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.
102.853	6	Sandy Silt to Clayey Silt	59.27	1.77	6.171	3.055	3.116	2.82	0.57	0.49	0.381							0.80	1	
103.837	5	Clayey Silt to Silty Clay	82.54	3.46	6.23	3.086	3.144	2.8	0.56	0.49	0.380							0.71	1	
104.822	6	Sandy Silt to Clayey Silt	52.76	1.28	6.289	3.117	3.173	2.82	0.56	0.49	0.379							0.79	1	
105.806	7	Silty Sand to Sandy Silt	45.36	0.91	6.348	3.147	3.201	2.83	0.56	0.49	0.378							0.79	1	
106.79	7	Silty Sand to Sandy Silt	85	1.73	6.408	3.178	3.229	2.38	0.56	0.49	0.377	2.380	0.56	47.60	2.233	106.271	0.19	0.77	1	0.51
107.774	7	Silty Sand to Sandy Silt	39.27	0.53	6.467	3.209	3.258	2.82	0.55	0.49	0.376							0.79	1	
108.759	7	Silty Sand to Sandy Silt	36.61	0.51	6.526	3.24	3.286	2.85	0.55	0.48	0.375							0.79	1	
109.743	6	Sandy Silt to Clayey Silt	44.53	1.03	6.585	3.27	3.314	2.89	0.55	0.48	0.374							0.79	1	
110.727	6	Sandy Silt to Clayey Silt	68.56	2.33	6.644	3.301	3.343	2.83	0.55	0.48	0.373							0.79	1	
111.711	6	Sandy Silt to Clayey Silt	37.61	0.86	6.703	3.332	3.371	2.97	0.54	0.48	0.372							0.78	1	
112.695	6	Sandy Silt to Clayey Silt	37.76	0.95	6.762	3.363	3.399	3	0.54	0.48	0.371							0.78	1	
113.68	6	Sandy Silt to Clayey Silt	35.65	0.86	6.821	3.393	3.428	3.02	0.54	0.48	0.370							0.78	1	
114.664	6	Sandy Silt to Clayey Silt	35.46	0.76	6.88	3.424	3.456	3	0.54	0.48	0.369							0.78	1	
115.648	6	Sandy Silt to Clayey Silt	34.17	0.72	6.939	3.455	3.484	3.02	0.54	0.47	0.369							0.78	1	
116.632	6	Sandy Silt to Clayey Silt	41.62	0.88	6.998	3.485	3.513	2.93	0.53	0.47	0.368							0.78	1	
117.617	6	Sandy Silt to Clayey Silt	40.23	0.93	7.057	3.516	3.541	2.97	0.53	0.47	0.367							0.78	1	
118.601	6	Sandy Silt to Clayey Silt	37.85	0.81	7.116	3.547	3.569	2.98	0.53	0.47	0.366							0.78	1	
119.585	6	Sandy Silt to Clayey Silt	41.8	0.99	7.175	3.578	3.598	2.97	0.53	0.47	0.365							0.77	1	

LIQUEFACTION POTENTIAL ANALYSIS (per Youd & Idriss, 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
CPT NO. ***CPT-AS-14***

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.6 (Design Basis EQ)
FAULT M_w = 7.5
MSF = 1.00

			CPT RESULT INPUT							*CSR*		*CRR 7.5*						*F.S.=(CRR 7.5/CSR)*MSF*Kσ*Kα*			
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	N_{60}
0.246	7	Silty Sand to Sandy Silt	30.92	0.23	0.015		0.015	-9999	2	1.00	0.390							1.00	1		
0.738	7	Silty Sand to Sandy Silt	28.7	0.17	0.044		0.044	1.67	2	1.00	0.390	1.670	1.70	48.79	1.017	49.638	0.09	1.00	1		
1.23	7	Silty Sand to Sandy Silt	25.43	0.19	0.074		0.074	1.87	2	1.00	0.390	1.870	1.70	43.23	1.162	50.227	0.09	1.00	1		
1.722	7	Silty Sand to Sandy Silt	26.79	0.22	0.103		0.103	1.93	2	1.00	0.389	1.930	1.70	45.54	1.218	55.492	0.10	1.00	1		
2.215	7	Silty Sand to Sandy Silt	26.96	0.18	0.133		0.133	1.92	2	1.00	0.389	1.920	1.70	45.83	1.208	55.378	0.10	1.00	1		
2.707	7	Silty Sand to Sandy Silt	28.45	0.32	0.162		0.162	2.07	2	1.00	0.388	2.070	1.70	48.37	1.403	67.852	0.11	1.00	1		
3.199	6	Sandy Silt to Clayey Silt	24.26	0.29	0.192		0.192	2.17	2	0.99	0.388	2.170	1.70	41.24	1.596	65.838	0.11	1.00	1		
3.691	6	Sandy Silt to Clayey Silt	16.12	0.28	0.221		0.221	2.43	2	0.99	0.387	2.430	1.70	27.40	2.439	66.839	0.11	1.00	1		
4.183	5	Clayey Silt to Silty Clay	13.58	0.28	0.251		0.251	2.56	2	0.99	0.387	2.560	1.70	23.09	3.091	71.349	0.11	1.00	1		
4.675	5	Clayey Silt to Silty Clay	9.75	0.21	0.281		0.281	2.6	1.89	0.99	0.386							1.00	1		
5.167	5	Clayey Silt to Silty Clay	17.53	0.41	0.31		0.31	2.55	1.8	0.99	0.386	2.550	1.70	29.80	3.034	90.423	0.15	1.00	1		
5.659	5	Clayey Silt to Silty Clay	28.66	0.96	0.34		0.34	2.5	1.72	0.99	0.386	2.500	1.70	48.72	2.768	134.884	0.31	1.00	1		
6.152	5	Clayey Silt to Silty Clay	32.69	1.06	0.369		0.369	2.47	1.65	0.99	0.385	2.470	1.65	53.94	2.621	141.390	0.34	1.00	1		
6.644	5	Clayey Silt to Silty Clay	23.61	0.82	0.399		0.399	2.53	1.58	0.99	0.385	2.530	1.58	37.30	2.925	109.105	0.20	1.00	1		
7.136	5	Clayey Silt to Silty Clay	18.14	0.6	0.428		0.428	2.61	1.53	0.99	0.384							1.00	1		
7.628	5	Clayey Silt to Silty Clay	18.89	0.54	0.458		0.458	2.58	1.48	0.98	0.384	2.580	1.48	27.96	3.206	89.643	0.15	1.00	1		
8.12	5	Clayey Silt to Silty Clay	19.46	0.47	0.487		0.487	2.6	1.43	0.98	0.383							1.00	1		
8.612	5	Clayey Silt to Silty Clay	18.62	0.4	0.517	0.01	0.507	2.59	1.4	0.98	0.391	2.590	1.40	26.07	3.266	85.139	0.14	1.00	1	0.35	9.9
9.104	6	Sandy Silt to Clayey Silt	17.65	0.28	0.546	0.025	0.521	2.54	1.39	0.98	0.401	2.540	1.39	24.53	2.979	73.085	0.12	1.00	1	0.29	9.2
9.596	6	Sandy Silt to Clayey Silt	17.93	0.34	0.576	0.04	0.535	2.58	1.37	0.98	0.411	2.580	1.37	24.56	3.206	78.764	0.13	1.00	1	0.30	8.1
10.088	6	Sandy Silt to Clayey Silt	23	0.42	0.605	0.056	0.549	2.48	1.35	0.98	0.421	2.480	1.35	31.05	2.669	82.883	0.13	1.00	1	0.32	8.6
10.581	6	Sandy Silt to Clayey Silt	28.45	0.59	0.635	0.071	0.564	2.45	1.33	0.98	0.429	2.450	1.33	37.84	2.528	95.664	0.16	1.00	1	0.38	8.6
11.073	5	Clayey Silt to Silty Clay	16.03	0.37	0.664	0.087	0.578	2.6	1.32	0.98	0.438							1.00	1		
11.565	6	Sandy Silt to Clayey Silt	19.57	0.29	0.694	0.102	0.592	2.51	1.3	0.98	0.446	2.510	1.30	25.44	2.820	71.731	0.11	1.00	1	0.26	9.3
12.057	6	Sandy Silt to Clayey Silt	17.63	0.18	0.723	0.117	0.606	2.46	1.28	0.97	0.454	2.460	1.28	22.57	2.574	58.092	0.10	1.00	1	0.22	6.2
12.549	6	Sandy Silt to Clayey Silt	13.65	0.13	0.753	0.133	0.62	2.55	1.27	0.97	0.461	2.550	1.27	17.34	3.034	52.600	0.09	1.00	1	0.20	6.5
13.041	5	Clayey Silt to Silty Clay	10.41	0.13	0.782	0.148	0.634	2.66	1.26	0.97	0.468							1.00	1		
13.533	5	Clayey Silt to Silty Clay	9.65	0.14	0.812	0.163	0.649	2.74	1.24	0.97	0.474							1.00	1		
14.025	5	Clayey Silt to Silty Clay	10.03	0.13	0.842	0.179	0.663	2.71	1.23	0.97	0.481							1.00	1		
14.518	5	Clayey Silt to Silty Clay	11.18	0.19	0.871	0.194	0.677	2.73	1.22	0.97	0.487							1.00	1		
15.01	5	Clayey Silt to Silty Clay	10.65	0.22	0.901	0.209	0.691	2.81	1.2	0.97	0.493							1.00	1		
15.502	5	Clayey Silt to Silty Clay	9.99	0.23	0.93	0.225	0.705	2.88	1.19	0.97	0.498							1.00	1		
15.994	4	Silty Clay to Clay	7.98	0.24	0.96	0.24	0.719	3.05	1.18	0.97	0.503							1.00	1		
16.486	5	Clayey Silt to Silty Clay	12.78	0.32	0.989	0.256	0.734	2.81	1.17	0.97	0.507							1.00	1		
16.978	5	Clayey Silt to Silty Clay	16.93	0.49	1.019	0.271	0.748	2.75	1.16	0.96	0.512							1.00	1		
17.47	4	Silty Clay to Clay	14.46	0.51	1.048	0.286	0.762	2.87	1.15	0.96	0.517							1.00	1		
17.962	4	Silty Clay to Clay	13.18	0.41	1.078	0.302	0.776	2.88	1.14	0.96	0.521							1.00	1		
18.454	5	Clayey Silt to Silty Clay	12.52	0.32	1.107	0.317	0.79	2.86	1.13	0.96	0.525							1.00	1		
18.947	5	Clayey Silt to Silty Clay	13.16	0.31	1.137	0.332	0.804	2.82	1.12	0.96	0.529							1.00	1		
19.439	5	Clayey Silt to Silty Clay	13.14	0.38	1.166	0.348	0.819	2.88	1.11	0.96	0.532							1.00	1		
19.931	5	Clayey Silt to Silty Clay	13.69	0.42	1.196	0.363	0.833	2.89	1.1	0.96	0.536							1.00	1		
20.423	5	Clayey Silt to Silty Clay	9.28	0.15	1.225	0.379	0.847	2.92	1.09	0.96	0.539							1.00	1		
20.915	6	Sandy Silt to Clayey Silt	12.73	0.08	1.255	0.394	0.861	2.58	1.08	0.95	0.543	2.580	1.08	13.75	3.206	44.084	0.09	1.00	1	0.16	5.2
21.407	6	Sandy Silt to Clayey Silt	27.38	0.58	1.284	0.409	0.875	2.56	1.07	0.95	0.545	2.560	1.07	29.30	3.091	90.543	0.15	1.00	1	0.27	4.9
21.899	6	Sandy Silt to Clayey Silt	34.82	0.61	1.314	0.425	0.889	2.42	1.06	0.95	0.549	2.420	1.06	36.91	2.396	88.429	0.14	1.00	1	0.26	4.6
22.391	5	Clayey Silt to Silty Clay	14.35	0.4	1.344	0.44	0.904	2.88	1.05	0.95	0.551							1.00	1		
22.884	4	Silty Clay to Clay	10.8	0.32	1.373	0.455	0.918	3.02	1.04	0.95	0.553							1.00	1		
23.376	5	Clayey Silt to Silty Clay	15.91	0.49	1.403	0.471	0.932	2.88	1.04	0.95	0.556							1.00	1		
23.868	4	Silty Clay to Clay	21.27	0.78	1.432	0.486	0.946	2.82	1.03	0.95	0.558							1.00	1		
24.36	5	Clayey Silt to Silty Clay	23.59	0.84	1.462	0.501	0.96	2.77	1.02	0.94	0.561							1.00	1		
24.852	5	Clayey Silt to Silty Clay	24.81	0.87	1.491	0.517	0.974	2.76	1.01	0.94	0.563							1.00	1		
25.344	5	Clayey Silt to Silty Clay	24.36	0.81	1.521	0.532	0.989	2.75	1.01	0.94	0.564							1.00	1		
25.836	5	Clayey Silt to Silty Clay	23.59	0.78	1.55	0.548	1.003	2.77	1	0.94	0.566							1.00	1		
26.328	5	Clayey Silt to Silty Clay	22.74	0.72	1.58	0.563	1.017	2.78	0.99	0.94	0.568							0.99	1		
26.821	5	Clayey Silt to Silty Clay	23.1	0.75	1.609	0.578	1.031	2.78	0.98	0.93	0.569							0.99	1		
27.313	5	Clayey Silt to Silty Clay	24.19	0.72	1.639	0.594	1.045	2.75	0.98	0.93	0.571							0.99	1		
27.805	5	Clayey Silt to Silty Clay	25.06	0.66	1.668	0.609	1.059	2.71	0.97	0.93	0.572							0.98	1		
28.297	5	Clayey Silt to Silty Clay	22.25	0.66	1.698	0.624	1.073	2.79	0.97	0.93	0.573							0.98	1		
28.789	6	Sandy Silt to Clayey Silt	27.77	0.43	1.727	0.64	1.088	2.51	0.96	0.93	0.574	2.510	0.96	26.66	2.820	75.166	0.12	0.98	1	0.21	4.4
29.281	5	Clayey Silt to Silty Clay	22.15	0.62	1.757	0.655	1.102	2.79	0.95	0.92	0.575							0.97	1		
29.773	6	Sandy Silt to Clayey Silt	17.21	0.29	1.786	0.67	1.116	2.77	0.95	0.92	0.575							0.98	1		
30.265	6	Sandy Silt to Clayey Silt	19.21	0.28	1.816	0.686	1.13	2.7	0.94	0.92	0.576							0.98	1		
30.758	6	Sandy Silt to Clayey Silt	20.38	0.43	1.845	0.701	1.144	2.77	0.93	0.92	0.577							0.97	1		
31.25	5	Clayey Silt to Silty Clay	17.61	0.4	1.875	0.717	1.158	2.85	0.93	0.91	0.577							0.96	1		
31.742	5	Clayey Silt to Silty Clay	16.16	0.36	1.905	0.732	1.173	2.89	0.92	0.91	0.577							0.95	1		
32.234	6	Sandy Silt to Clayey Silt	23.96	0.39	1.934	0.747	1.187	2.65	0.92	0.91	0.577							0.97	1		
32.726	6	Sandy Silt to Clayey Silt	21.83	0.25	1.964	0.763	1.201	2.62	0.91	0.91	0.577							0.96	1		
33.218	6	Sandy Silt to Clayey Silt	18.99	0.27	1.993	0.778	1.215	2.73	0.91	0.90	0.577							0.96	1		
33.71	6	Sandy Silt to Clayey Silt	20.1	0.3	2.023	0.793	1.229	2.72	0.9	0.90	0.577							0.96	1		
34.202	6	Sandy Silt to Clayey Silt	27.62	0.6	2.052	0.809	1.243	2.68	0.9	0.90	0.577							0.96	1		
34.694	6	Sandy Silt to Clayey Silt	27.62	0.54	2.082	0.824	1.258	2.66	0.89	0.89	0.576							0.96	1		
35.187	6	Sandy Silt to Clayey Silt	23.68	0.55	2.111	0.839	1.272	2.77	0.89	0.89	0.576							0.95	1		
35.679	6	Sandy Silt to Clayey Silt	22.34	0.52	2.141	0.855	1.286	2.8	0.88	0.89	0.575							0.95	1		
36.171	5	Clayey Silt to Silty Clay	21.98	0.62	2.17	0.87	1.3	2.86	0.88	0.88	0.574							0.92	1		
36.663	5	Clayey Silt to Silty Clay	24.15	0.67	2.2	0.886	1.314	2.82	0.87	0.88	0.574							0.92	1		
37.155	6	Sandy Silt to Clayey Silt	25.49	0.6	2.229	0.901	1.328	2.76	0.87	0.87	0.573							0.94	1		
37.647	6	Sandy Silt to Clayey Silt	28.28	0.59	2.259	0.916	1.343	2.7	0.86	0.87	0.571							0.94	1		
38.139	6	Sandy Silt to Clayey Silt	29.24	0.74	2.288	0.932	1.357	2.73	0.86	0.87	0.570							0.94	1		
38.631	5	Clayey Silt to Silty Clay	29.02	0.82	2.318	0.947	1.371	2.77	0.85	0.86	0.569							0.91	1		
39.124	5	Clayey Silt to Silty Clay	27.85	0.9	2.347	0.962	1.385	2.83	0.85	0.86	0.567							0.91	1		
39.616	5	Clayey Silt to Silty Clay	23.83	0.71	2.377	0.978	1.399	2.87	0.85	0.85	0.566							0.90	1		
40.108	5	Clayey Silt to Silty Clay	19.42	0.51	2.407	0.993	1.413	2.93	0.84	0.85	0.565							0.90	1		
40.6	6	Sandy Silt to Clayey Silt	25.32	0.59	2.436	1.008	1.428	2.79	0.84	0.85	0.563							0.93	1		
41.092	6	Sandy Silt to Clayey Silt	26	0.59	2.466	1.024	1.442	2.78	0.83	0.84	0.561							0.93	1		
41.584	6	Sandy Silt to Clayey Silt	19.23	0.32	2.495	1.039	1.456	2.84	0.83	0.84	0.559							0.93	1		
42.076	6	Sandy Silt to Clayey Silt	19.23	0.24	2.525	1.055	1.47	2.78	0.82	0.83	0.557							0.93	1		
42.568	6	Sandy Silt to Clayey Silt	19.78	0.36	2.554	1.07	1.484	2.86	0.82	0.83	0.555							0.92	1		
43.061	6	Sandy Silt to Clayey Silt	18.74	0.36	2.584	1.085	1.498	2.9	0.82	0.82	0.553							0.92	1		
43.553	5	Clayey Silt to Silty Clay	30.92	0.95	2.613	1.101	1.513	2.81	0.81	0.82	0.551							0.88	1		
44.045	7	Silty Sand to Sandy Silt	87.43	1.81	2.643	1.116	1.527	2.25	0.81	0.81	0.549	2.250	0.81	70.82	1.798	127.349	0.27	0.89	1	0.50	8.5
44.537	9	Sand	124.4	1.11	2.672	1.131	1.541	1.89	0.81	0.81	0.547	1.890	0.81	100.76	1.180	118.858	0.24	0.87	1	0.43	10.5
45.029	9	Sand	139.39	0.61	2.702	1.147	1.555	1.68	0.8	0.80	0.544	1.680	0.80	111.51	1.024	114.217	0.22	0.86	1	0.40	11.5
45.521	9	Sand	173.46	0.7	2.731	1.162	1.569	1.58	0.8	0.80	0.542	1.580	0.80	138.77	1.000	138.768	0.33	0.84	1	0.61	9.7
46.013	9	Sand	196.63	1.13	2.761	1.178	1.583	1.62	0.79	0.79	0.540	1.620	0.79	155.34	1.000	155.338	0.43	0.83	1	0.79	10.8
46.505	9	Sand	236.89	1.13	2.79	1.193	1.598	1.51	0.79	0.79	0.537	1.510	0.79	187.14	1.000	187.143		0.83	1		
46.997	9	Sand	267.92	1.61	2.82	1.208	1.612	1.53	0.79	0.78	0.534	1.530	0.79	211.66	1.000	211.657		0.83	1		
47.49	9	Sand	216.01	1.93	2.849	1.224	1.626	1.72	0.78	0.78	0.532	1.720	0.78	168.49	1.051	177.136		0.82	1		
47.982	9	Sand	169.88	1.97	2.879	1.239	1.64	1.87	0.78	0.77	0.529	1.870	0.78	132.51	1.162	153.951	0.42	0.83	1	0.79	11.4
48.474	7	Silty Sand to Sandy Silt	83.43	1.71	2.908	1.254	1.654	2.28	0.78	0.77	0.527	2.280	0.78	65.08	1.886	122.743	0.25	0.87	1	0.48	9.3
48.966	6	Sandy Silt to Clayey Silt	45.65	1.44	2.938	1.27	1.668	2.71	0.77	0.76	0.524							0.90	1		
49.458	6	Sandy Silt to Clayey Silt	23.87	0.43	2.968	1.285	1.682	2.83	0.77	0.76	0.522							0.90	1		
49.95	6	Sandy Silt to Clayey Silt	30.66	0.62	2.997	1.3	1.697	2.75	0.77	0.75	0.519							0.90	1		
50.442	6	Sandy Silt to Clayey Silt	29.71	0.54	3.027	1.316	1.711	2.74	0.76	0.75	0.516							0.90	1		
50.934	6	Sandy Silt to Clayey Silt	23.93	0.5	3.056	1.331	1.725	2.88	0.76	0.74	0.514							0.90	1		
51.427	5	Clayey Silt to Silty Clay	19.44	0.48	3.086	1.347	1.739	3.02	0.76	0.74	0.511							0.85	1		
51.919	5	Clayey Silt to Silty Clay	19.25	0.42	3.115	1.362	1.753	3	0.76	0.73	0.508							0.85	1		
52.411	5	Clayey Silt to Silty Clay	18.61	0.41	3.145	1.377	1.767	3.02	0.75	0.73	0.506							0.84	1		

LIQUEFACTION POTENTIAL ANALYSIS (per Youd & Idriss, 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
CPT NO. ***CPT-AS-14***

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.6 (Design Basis EQ)
FAULT M_w = 7.5
MSF = 1.00

Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	N_{60}
52.903	6	Sandy Silt to Clayey Silt	20	0.36	3.174	1.393	1.782	2.94	0.75	0.72	0.503							0.89	1		
53.395	6	Sandy Silt to Clayey Silt	20.27	0.32	3.204	1.408	1.796	2.91	0.75	0.72	0.500							0.89	1		
53.887	6	Sandy Silt to Clayey Silt	19.84	0.42	3.233	1.423	1.81	2.99	0.74	0.71	0.497							0.89	1		
54.379	6	Sandy Silt to Clayey Silt	29.19	0.59	3.263	1.439	1.824	2.8	0.74	0.71	0.495							0.89	1		
54.871	6	Sandy Silt to Clayey Silt	23.11	0.5	3.292	1.454	1.838	2.93	0.74	0.70	0.492							0.89	1		
55.364	6	Sandy Silt to Clayey Silt	27.13	0.46	3.322	1.469	1.852	2.81	0.73	0.70	0.490							0.88	1		
55.856	5	Clayey Silt to Silty Clay	31.37	0.95	3.351	1.485	1.867	2.89	0.73	0.70	0.487							0.83	1		
56.348	5	Clayey Silt to Silty Clay	22.08	0.52	3.381	1.5	1.881	2.98	0.73	0.69	0.484							0.83	1		
56.84	6	Sandy Silt to Clayey Silt	22.94	0.29	3.41	1.516	1.895	2.83	0.73	0.69	0.482							0.88	1		
57.332	6	Sandy Silt to Clayey Silt	22.53	0.25	3.44	1.531	1.909	2.82	0.72	0.68	0.479							0.88	1		
57.824	6	Sandy Silt to Clayey Silt	23.89	0.29	3.47	1.546	1.923	2.81	0.72	0.68	0.477							0.88	1		
58.316	6	Sandy Silt to Clayey Silt	27.81	0.35	3.499	1.562	1.937	2.74	0.72	0.67	0.474							0.88	1		
58.808	6	Sandy Silt to Clayey Silt	24.55	0.38	3.529	1.577	1.952	2.86	0.72	0.67	0.472							0.87	1		
59.3	6	Sandy Silt to Clayey Silt	41.12	0.91	3.558	1.592	1.966	2.71	0.71	0.67	0.469							0.87	1		
59.793	6	Sandy Silt to Clayey Silt	43.24	1.23	3.588	1.608	1.98	2.76	0.71	0.66	0.467							0.87	1		
60.285	6	Sandy Silt to Clayey Silt	43.37	1.27	3.617	1.623	1.994	2.77	0.71	0.66	0.465							0.87	2		
60.777	6	Sandy Silt to Clayey Silt	45.19	1.44	3.647	1.638	2.008	2.78	0.71	0.65	0.463							0.87	3		
61.269	6	Sandy Silt to Clayey Silt	45.48	1.46	3.676	1.654	2.022	2.79	0.7	0.65	0.460							0.87	4		
61.761	5	Clayey Silt to Silty Clay	47.02	1.78	3.706	1.669	2.037	2.82	0.7	0.65	0.458							0.81	5		
62.253	5	Clayey Silt to Silty Clay	32.49	1.07	3.735	1.685	2.051	2.93	0.7	0.64	0.456							0.81	6		
62.745	5	Clayey Silt to Silty Clay	24.45	0.67	3.765	1.7	2.065	3.02	0.7	0.64	0.454							0.80	7		
63.237	6	Sandy Silt to Clayey Silt	18.59	0.37	3.794	1.715	2.079	3.08	0.69	0.63	0.451							0.86	8		
63.73	6	Sandy Silt to Clayey Silt	21.72	0.41	3.824	1.731	2.093	2.99	0.69	0.63	0.450							0.86	9		
64.222	5	Clayey Silt to Silty Clay	21.74	0.51	3.853	1.746	2.107	3.05	0.69	0.63	0.447							0.80	10		
64.714	6	Sandy Silt to Clayey Silt	22.08	0.38	3.883	1.761	2.122	2.97	0.69	0.62	0.445							0.86	11		
65.206	6	Sandy Silt to Clayey Silt	23.91	0.34	3.912	1.777	2.136	2.89	0.68	0.62	0.443							0.86	12		
65.698	6	Sandy Silt to Clayey Silt	23.95	0.32	3.942	1.792	2.15	2.88	0.68	0.62	0.442							0.86	13		
66.19	6	Sandy Silt to Clayey Silt	32.62	0.65	3.971	1.807	2.164	2.83	0.68	0.61	0.440							0.86	14		
66.682	6	Sandy Silt to Clayey Silt	30.77	0.49	4.001	1.823	2.178	2.81	0.68	0.61	0.438							0.86	15		
67.174	6	Sandy Silt to Clayey Silt	27.89	0.45	4.031	1.838	2.192	2.86	0.68	0.61	0.436							0.85	16		
67.666	6	Sandy Silt to Clayey Silt	28.36	0.55	4.06	1.854	2.206	2.9	0.67	0.61	0.434							0.85	17		
68.159	6	Sandy Silt to Clayey Silt	31.28	0.76	4.09	1.869	2.221	2.91	0.67	0.60	0.433							0.85	18		
68.651	6	Sandy Silt to Clayey Silt	52.02	1.61	4.119	1.884	2.235	2.76	0.67	0.60	0.431							0.85	19		
69.143	6	Sandy Silt to Clayey Silt	64.78	1.92	4.149	1.9	2.249	2.67	0.67	0.60	0.429							0.84	20		
69.635	5	Clayey Silt to Silty Clay	59.49	2.13	4.178	1.915	2.263	2.76	0.66	0.59	0.428							0.78	21		
70.127	6	Sandy Silt to Clayey Silt	60.65	1.8	4.208	1.93	2.277	2.7	0.66	0.59	0.426							0.85	22		
70.619	5	Clayey Silt to Silty Clay	32.94	0.97	4.237	1.946	2.291	2.95	0.66	0.59	0.425							0.78	23		
71.111	6	Sandy Silt to Clayey Silt	25.81	0.56	4.267	1.961	2.306	2.99	0.66	0.59	0.423							0.85	24		
71.603	6	Sandy Silt to Clayey Silt	34.24	0.81	4.296	1.977	2.32	2.88	0.66	0.58	0.421							0.85	25		
72.096	7	Silty Sand to Sandy Silt	47.45	0.91	4.326	1.992	2.334	2.69	0.65	0.58	0.420							0.84	26		
72.588	6	Sandy Silt to Clayey Silt	31.47	0.88	4.355	2.007	2.348	2.97	0.65	0.58	0.419							0.84	27		
73.08	6	Sandy Silt to Clayey Silt	33.26	0.72	4.385	2.023	2.362	2.88	0.65	0.58	0.417							0.84	28		
73.572	6	Sandy Silt to Clayey Silt	34.58	0.85	4.414	2.038	2.376	2.9	0.65	0.57	0.416							0.84	29		
74.064	6	Sandy Silt to Clayey Silt	40.59	0.94	4.444	2.053	2.391	2.81	0.65	0.57	0.414							0.84	30		
74.556	6	Sandy Silt to Clayey Silt	30.88	0.62	4.473	2.069	2.405	2.91	0.64	0.57	0.413							0.84	31		
75.048	6	Sandy Silt to Clayey Silt	35.5	0.78	4.503	2.084	2.419	2.87	0.64	0.57	0.412							0.84	32		
75.54	6	Sandy Silt to Clayey Silt	33.34	0.93	4.533	2.099	2.433	2.96	0.64	0.57	0.411							0.84	33		
76.033	6	Sandy Silt to Clayey Silt	43.7	1.16	4.562	2.115	2.447	2.83	0.64	0.56	0.410							0.84	34		
76.525	6	Sandy Silt to Clayey Silt	114.92	4.04	4.592	2.13	2.461	2.41	0.64	0.56	0.408	2.410	0.64	73.55	2.354	173.108		0.77	35		
77.017	7	Silty Sand to Sandy Silt	183.56	5.43	4.621	2.146	2.476	2.21	0.64	0.56	0.407	2.210	0.64	117.48	1.692	198.729		0.72	36		
77.509	9	Sand	235.98	1.52	4.651	2.161	2.49	1.67	0.63	0.56	0.406	1.670	0.63	148.67	1.017	151.250	0.40	0.70	37	0.99	24.8
78.001	9	Sand	159.02	1.62	4.68	2.176	2.504	1.93	0.63	0.56	0.405	1.930	0.63	100.18	1.218	122.069	0.25	0.74	38	0.62	28.4
78.493	5	Clayey Silt to Silty Clay	38.1	1.31	4.71	2.192	2.518	2.97	0.63	0.55	0.404							0.76	39		
78.985	6	Sandy Silt to Clayey Silt	29.68	0.77	4.739	2.207	2.532	3.01	0.63	0.55	0.403							0.83	40		
79.477	6	Sandy Silt to Clayey Silt	31.49	0.82	4.769	2.222	2.546	2.98	0.63	0.55	0.402							0.83	41		
79.97	6	Sandy Silt to Clayey Silt	31.71	0.81	4.798	2.238	2.561	2.98	0.62	0.55	0.401							0.83	42		
80.462	6	Sandy Silt to Clayey Silt	30.94	0.7	4.828	2.253	2.575	2.96	0.62	0.55	0.400							0.83	43		
80.954	6	Sandy Silt to Clayey Silt	31	0.6	4.857	2.268	2.589	2.93	0.62	0.54	0.399							0.83	44		
81.446	6	Sandy Silt to Clayey Silt	29.07	0.5	4.887	2.284	2.603	2.93	0.62	0.54	0.398							0.83	45		
81.938	7	Silty Sand to Sandy Silt	44.95	0.65	4.916	2.299	2.617	2.69	0.62	0.54	0.397							0.82	46		
82.43	6	Sandy Silt to Clayey Silt	66.52	1.58	4.946	2.315	2.631	2.65	0.62	0.54	0.396							0.82	47		
82.922	7	Silty Sand to Sandy Silt	150.4	3.53	4.975	2.33	2.646	2.21	0.61	0.54	0.395	2.210	0.61	91.74	1.692	155.196	0.43	0.73	48	1.08	11.8
83.414	8	Sand to Silty Sand	141.77	2.2	5.005	2.345	2.66	2.1	0.61	0.54	0.394	2.100	0.61	86.48	1.455	125.807	0.27	0.74	49	0.67	13.6
83.906	6	Sandy Silt to Clayey Silt	42.42	0.97	5.035	2.361	2.674	2.84	0.61	0.54	0.393							0.82	50		
84.399	7	Silty Sand to Sandy Silt	43.74	0.47	5.064	2.376	2.688	2.66	0.61	0.53	0.392							0.82	51		
84.891	6	Sandy Silt to Clayey Silt	33.8	0.83	5.094	2.391	2.702	2.95	0.61	0.53	0.392							0.82	52		
85.383	6	Sandy Silt to Clayey Silt	29.51	0.82	5.123	2.407	2.716	3.04	0.61	0.53	0.391							0.82	53		
85.875	6	Sandy Silt to Clayey Silt	26.45	0.63	5.153	2.422	2.73	3.06	0.61	0.53	0.390							0.82	54		
86.367	6	Sandy Silt to Clayey Silt	27.91	0.61	5.182	2.437	2.745	3.01	0.6	0.53	0.389							0.82	55		
86.859	6	Sandy Silt to Clayey Silt	29.3	0.63	5.212	2.453	2.759	2.99	0.6	0.53	0.388							0.82	56		
87.351	6	Sandy Silt to Clayey Silt	29.9	0.71	5.241	2.468	2.773	3	0.6	0.53	0.388							0.82	57		
87.843	6	Sandy Silt to Clayey Silt	31.35	0.66	5.271	2.484	2.787	2.95	0.6	0.52	0.387							0.81	58		
88.336	6	Sandy Silt to Clayey Silt	33.15	0.67	5.3	2.499	2.801	2.91	0.6	0.52	0.386							0.81	59		
88.828	6	Sandy Silt to Clayey Silt	42.5	0.95	5.33	2.514	2.815	2.84	0.6	0.52	0.386							0.81	60		
89.32	6	Sandy Silt to Clayey Silt	34.26	0.74	5.359	2.53	2.83	2.92	0.59	0.52	0.385							0.81	61		
89.812	5	Clayey Silt to Silty Clay	38.95	1.53	5.389	2.545	2.844	3.03	0.59	0.52	0.384							0.73	62		
90.304	5	Clayey Silt to Silty Clay	34.39	1.14	5.418	2.56	2.858	3.03	0.59	0.52	0.383							0.73	63		
90.796	5	Clayey Silt to Silty Clay	37.18	1.42	5.448	2.576	2.872	3.05	0.59	0.52	0.383							0.73	64		
91.288	5	Clayey Silt to Silty Clay	35.48	1.37	5.477	2.591	2.886	3.07	0.59	0.52	0.382							0.73	65		
91.78	5	Clayey Silt to Silty Clay	33.17	1.3	5.507	2.606	2.9	3.11	0.59	0.52	0.381							0.73	66		
92.273	5	Clayey Silt to Silty Clay	31.6	1.21	5.536	2.622	2.915	3.13	0.59	0.51	0.381							0.73	67		
92.765	5	Clayey Silt to Silty Clay	30.79	0.94	5.566	2.637	2.929	3.08	0.58	0.51	0.380							0.72	68		
93.257	6	Sandy Silt to Clayey Silt	30.3	0.84	5.596	2.653	2.943	3.06	0.58	0.51	0.380							0.81	69		
93.749	7	Silty Sand to Sandy Silt	49.27	0.91	5.625	2.668	2.957	2.76	0.58	0.51	0.379							0.81	70		
94.241	6	Sandy Silt to Clayey Silt	37.31	0.8	5.655	2.683	2.971	2.91	0.58	0.51	0.378							0.80	71		
94.733	7	Silty Sand to Sandy Silt	49.51	0.85	5.684	2.699	2.985	2.74	0.58	0.51	0.378							0.80	72		
95.225	6	Sandy Silt to Clayey Silt	43.97	1.07	5.714	2.714	3	2.87	0.58	0.51	0.377							0.80	73		
95.717	7	Silty Sand to Sandy Silt	67.54	1.52	5.743	2.729	3.014	2.68	0.58	0.51	0.377							0.80	74		
96.209	6	Sandy Silt to Clayey Silt	61.96	1.65	5.773	2.745	3.028	2.76	0.57	0.51	0.376							0.80	75		
96.702	6	Sandy Silt to Clayey Silt	69.48	2.02	5.802	2.76	3.042	2.74	0.57	0.50	0.375							0.80	76		
97.194	5	Clayey Silt to Silty Clay	46.7	1.87	5.832	2.776	3.056	3	0.57	0.50	0.375							0.72	77		
97.686	6	Sandy Silt to Clayey Silt	36.33	0.98	5.861	2.791	3.07	2.99	0.57	0.50	0.374							0.80	78		
98.178	6	Sandy Silt to Clayey Silt	77.06	2.08	5.891	2.806	3.085	2.69	0.57	0.50	0.374							0.78	79		
98.67	4	Silty Clay to Clay	43.36	1.94	5.92	2.822	3.099	3.07	0.57	0.50	0.373							0.71	80		
99.162	6	Sandy Silt to Clayey Silt	35.52	0.97	5.95	2.837	3.113	3.04	0.57	0.50	0.373							0.80	81		
99.654	6	Sandy Silt to Clayey Silt	43.42	1.21	5.979	2.852	3.127	2.95	0.57	0.50	0.372							0.80	82		

LIQUEFACTION POTENTIAL ANALYSIS (per Youd & Idriss, 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
CPT NO. ***CPT-AS-22***

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.6 (Design Basis EQ)

FAULT M_w = 7.5
MSF = 1.00

			CPT RESULT INPUT							*CSR*		*CRR 7.5*						*F.S.=(CRR 7.5/CSR)*MSF*Kσ*Kα*		
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.
0.246	8	Sand to Silty Sand	61.43	0.13	0.015		0.015	-9999	2	1.00	0.390							1.00	1	
0.738	8	Sand to Silty Sand	54.85	0.19	0.044		0.044	-9999	2	1.00	0.390							1.00	1	
1.23	7	Silty Sand to Sandy Silt	34.58	0.13	0.074		0.074	1.59	2	1.00	0.390	1.590	1.70	58.79	1.000	58.786	0.10	1.00	1	
1.722	7	Silty Sand to Sandy Silt	36.69	0.19	0.103		0.103	1.71	2	1.00	0.389	1.710	1.70	62.37	1.045	65.155	0.11	1.00	1	
2.215	7	Silty Sand to Sandy Silt	30.04	0.11	0.133		0.133	1.76	2	1.00	0.389	1.760	1.70	51.07	1.078	55.074	0.10	1.00	1	
2.707	7	Silty Sand to Sandy Silt	26.29	0.07	0.162		0.162	1.78	2	1.00	0.388	1.780	1.70	44.69	1.092	48.820	0.09	1.00	1	
3.199	7	Silty Sand to Sandy Silt	28.08	0.15	0.192		0.192	1.92	2	0.99	0.388	1.920	1.70	47.74	1.208	57.678	0.10	1.00	1	
3.691	6	Sandy Silt to Clayey Silt	15.74	0.1	0.221		0.221	2.2	2	0.99	0.387	2.200	1.70	26.76	1.667	44.599	0.09	1.00	1	
4.183	5	Clayey Silt to Silty Clay	9.77	0.09	0.251		0.251	2.49	2	0.99	0.387	2.490	1.70	16.61	2.718	45.150	0.09	1.00	1	
4.675	5	Clayey Silt to Silty Clay	9.01	0.21	0.281		0.281	2.64	1.89	0.99	0.386							1.00	1	
5.167	4	Silty Clay to Clay	8.52	0.24	0.31		0.31	2.66	1.8	0.99	0.386							1.00	1	
5.659	4	Silty Clay to Clay	5.41	0.12	0.34		0.34	2.78	1.72	0.99	0.386							1.00	1	
6.152	1	Sensitive Fines	3.98	0.06	0.369		0.369	2.86	1.65	0.99	0.385							1.00	1	
6.644	1	Sensitive Fines	2.92	0.04	0.399		0.399	2.99	1.58	0.99	0.385							1.00	1	
7.136	1	Sensitive Fines	3.6	0.04	0.428		0.428	2.92	1.53	0.99	0.384							1.00	1	
7.628	1	Sensitive Fines	3.62	0.04	0.458		0.458	2.93	1.48	0.98	0.384							1.00	1	
8.12	1	Sensitive Fines	5.2	0.09	0.487		0.487	2.89	1.43	0.98	0.383							1.00	1	
8.612	4	Silty Clay to Clay	6.37	0.13	0.517		0.517	2.88	1.39	0.98	0.383							1.00	1	
9.104	3	Clay	4.49	0.14	0.546		0.546	3.14	1.35	0.98	0.383							1.00	1	
9.596	3	Clay	3.36	0.1	0.576		0.576	3.29	1.32	0.98	0.382							1.00	1	
10.088	3	Clay	4.28	0.1	0.605		0.605	3.14	1.29	0.98	0.382							1.00	1	
10.581	4	Silty Clay to Clay	5.24	0.12	0.635		0.635	3.07	1.26	0.98	0.381							1.00	1	
11.073	4	Silty Clay to Clay	4.72	0.1	0.664		0.664	3.11	1.23	0.98	0.381							1.00	1	
11.565	4	Silty Clay to Clay	5.56	0.1	0.694		0.694	3.02	1.2	0.98	0.381							1.00	1	
12.057	6	Sandy Silt to Clayey Silt	20.19	0.36	0.723		0.723	2.57	1.18	0.97	0.380	2.570	1.18	23.82	3.148	74.998	0.12	1.00	1	
12.549	6	Sandy Silt to Clayey Silt	38.94	0.9	0.753		0.753	2.42	1.15	0.97	0.380	2.420	1.15	44.78	2.396	107.289	0.19	1.00	1	
13.041	3	Clay	15.24	0.71	0.782		0.782	2.92	1.13	0.97	0.379							1.00	1	
13.533	4	Silty Clay to Clay	11.99	0.41	0.812		0.812	2.94	1.11	0.97	0.379							1.00	1	
14.025	4	Silty Clay to Clay	9.56	0.3	0.842		0.842	3.03	1.09	0.97	0.379							1.00	1	
14.518	4	Silty Clay to Clay	9.88	0.3	0.871		0.871	3.02	1.07	0.97	0.378							1.00	1	
15.01	4	Silty Clay to Clay	8.03	0.18	0.901		0.901	3.06	1.05	0.97	0.378							1.00	1	
15.502	4	Silty Clay to Clay	8.05	0.21	0.93	0.009	0.921	3.1	1.04	0.97	0.381							1.00	1	
15.994	3	Clay	7.96	0.27	0.96	0.025	0.935	3.17	1.03	0.97	0.387							1.00	1	
16.486	3	Clay	9.16	0.34	0.989	0.04	0.949	3.14	1.03	0.97	0.392							1.00	1	
16.978	3	Clay	8.88	0.33	1.019	0.056	0.963	3.16	1.02	0.96	0.398							1.00	1	
17.47	4	Silty Clay to Clay	11.26	0.34	1.048	0.071	0.977	3.01	1.01	0.96	0.403							1.00	1	
17.962	3	Clay	9.88	0.37	1.078	0.086	0.992	3.13	1	0.96	0.408							1.00	1	
18.454	4	Silty Clay to Clay	8.84	0.28	1.107	0.102	1.006	3.14	1	0.96	0.412							1.00	1	
18.947	3	Clay	10.11	0.43	1.137	0.117	1.02	3.17	0.99	0.96	0.417							0.99	1	
19.439	3	Clay	9.39	0.43	1.166	0.132	1.034	3.23	0.98	0.96	0.421							0.99	1	
19.931	3	Clay	9.27	0.36	1.196	0.148	1.048	3.2	0.98	0.96	0.426							0.99	1	
20.423	3	Clay	10.28	0.38	1.225	0.163	1.062	3.15	0.97	0.96	0.430							0.98	1	
20.915	3	Clay	10.2	0.4	1.255	0.178	1.076	3.17	0.96	0.95	0.434							0.98	1	
21.407	3	Clay	7.98	0.33	1.284	0.194	1.091	3.3	0.96	0.95	0.437							0.97	1	
21.899	4	Silty Clay to Clay	8.28	0.26	1.314	0.209	1.105	3.22	0.95	0.95	0.441							0.97	1	
22.391	4	Silty Clay to Clay	8.67	0.28	1.344	0.225	1.119	3.22	0.95	0.95	0.445							0.97	1	
22.884	3	Clay	8.9	0.35	1.373	0.24	1.133	3.26	0.94	0.95	0.448							0.96	1	
23.376	4	Silty Clay to Clay	10.69	0.35	1.403	0.255	1.147	3.14	0.93	0.95	0.452							0.96	1	
23.868	4	Silty Clay to Clay	12.1	0.4	1.432	0.271	1.161	3.09	0.93	0.95	0.455							0.96	1	
24.36	4	Silty Clay to Clay	11.93	0.37	1.462	0.286	1.176	3.09	0.92	0.94	0.458							0.95	1	
24.852	5	Clayey Silt to Silty Clay	11.35	0.27	1.491	0.301	1.19	3.05	0.92	0.94	0.460							0.95	1	
25.344	5	Clayey Silt to Silty Clay	12.33	0.26	1.521	0.317	1.204	2.98	0.91	0.94	0.463							0.95	1	
25.836	5	Clayey Silt to Silty Clay	16.71	0.39	1.55	0.332	1.218	2.88	0.91	0.94	0.466							0.94	1	
26.328	6	Sandy Silt to Clayey Silt	23.68	0.42	1.58	0.347	1.232	2.68	0.9	0.94	0.469							0.96	1	
26.821	6	Sandy Silt to Clayey Silt	34.47	0.86	1.609	0.363	1.246	2.62	0.9	0.93	0.471							0.96	1	
27.313	5	Clayey Silt to Silty Clay	22.53	0.6	1.639	0.378	1.261	2.81	0.89	0.93	0.473							0.93	1	
27.805	5	Clayey Silt to Silty Clay	15.46	0.4	1.668	0.394	1.275	2.96	0.89	0.93	0.475							0.93	1	
28.297	5	Clayey Silt to Silty Clay	15.69	0.33	1.698	0.409	1.289	2.91	0.88	0.93	0.477							0.93	1	
28.789	5	Clayey Silt to Silty Clay	20.98	0.49	1.727	0.424	1.303	2.82	0.88	0.93	0.479							0.92	1	
29.281	5	Clayey Silt to Silty Clay	21.25	0.58	1.757	0.44	1.317	2.86	0.87	0.92	0.481							0.92	1	
29.773	5	Clayey Silt to Silty Clay	15.69	0.42	1.786	0.455	1.331	2.98	0.87	0.92	0.482							0.92	1	
30.265	5	Clayey Silt to Silty Clay	19.04	0.59	1.816	0.47	1.346	2.95	0.86	0.92	0.484							0.91	1	
30.758	5	Clayey Silt to Silty Clay	19.65	0.63	1.845	0.486	1.36	2.94	0.86	0.92	0.485							0.91	1	
31.25	5	Clayey Silt to Silty Clay	16.21	0.53	1.875	0.501	1.374	3.04	0.85	0.91	0.486							0.91	1	
31.742	5	Clayey Silt to Silty Clay	16.46	0.46	1.905	0.516	1.388	3	0.85	0.91	0.488							0.91	1	
32.234	5	Clayey Silt to Silty Clay	18.35	0.59	1.934	0.532	1.402	2.99	0.84	0.91	0.489							0.90	1	
32.726	5	Clayey Silt to Silty Clay	17.55	0.49	1.964	0.547	1.416	2.98	0.84	0.91	0.490							0.90	1	
33.218	5	Clayey Silt to Silty Clay	16.31	0.48	1.993	0.563	1.431	3.03	0.84	0.90	0.490							0.90	1	
33.71	4	Silty Clay to Clay	14.89	0.54	2.023	0.578	1.445	3.13	0.83	0.90	0.491							0.90	1	
34.202	4	Silty Clay to Clay	15.75	0.55	2.052	0.593	1.459	3.1	0.83	0.90	0.491							0.89	1	
34.694	4	Silty Clay to Clay	17.01	0.59	2.082	0.609	1.473	3.06	0.82	0.89	0.492							0.89	1	
35.187	5	Clayey Silt to Silty Clay	16.63	0.44	2.111	0.624	1.487	3.01	0.82	0.89	0.492							0.89	1	
35.679	5	Clayey Silt to Silty Clay	20.61	0.51	2.141	0.639	1.501	2.9	0.82	0.89	0.493							0.89	1	
36.171	5	Clayey Silt to Silty Clay	15.95	0.44	2.17	0.655	1.516	3.05	0.81	0.88	0.492							0.88	1	
36.663	4	Silty Clay to Clay	13.86	0.52	2.2	0.67	1.53	3.2	0.81	0.88	0.493							0.88	1	
37.155	4	Silty Clay to Clay	15.31	0.59	2.229	0.686	1.544	3.16	0.8	0.87	0.492							0.88	1	
37.647	5	Clayey Silt to Silty Clay	18.95	0.61	2.259	0.701	1.558	3.02	0.8	0.87	0.492							0.88	1	
38.139	5	Clayey Silt to Silty Clay	13.91	0.42	2.288	0.716	1.572	3.15	0.8	0.87	0.492							0.87	1	
38.631	5	Clayey Silt to Silty Clay	16.38	0.45	2.318	0.732	1.586	3.06	0.79	0.86	0.492							0.87	1	
39.124	5	Clayey Silt to Silty Clay	19.29	0.67	2.347	0.747	1.601	3.05	0.79	0.86	0.491							0.87	1	
39.616	4	Silty Clay to Clay	19.65	0.73	2.377	0.762	1.615	3.06	0.79	0.85	0.490							0.87	1	
40.108	4	Silty Clay to Clay	16.04	0.63	2.407	0.778	1.629	3.17	0.78	0.85	0.490							0.86	1	
40.6	4	Silty Clay to Clay	16.33	0.61	2.436	0.793	1.643	3.16	0.78	0.85	0.489							0.86	1	
41.092	4	Silty Clay to Clay	19.1	0.67	2.466	0.808	1.657	3.07	0.78	0.84	0.488							0.86	1	
41.584	5	Clayey Silt to Silty Clay	23.51	0.71	2.495	0.824	1.671	2.95	0.77	0.84	0.487							0.86	1	
42.076	4	Silty Clay to Clay	24.34	0.91	2.525	0.839	1.685	2.99	0.77	0.83	0.486							0.86	1	
42.568	5	Clayey Silt to Silty Clay	25.64	0.7	2.554	0.855	1.7	2.89	0.77	0.83	0.485							0.85	1	
43.061	4	Silty Clay to Clay	25	0.98	2.584	0.87	1.714	3	0.76	0.82	0.484							0.85	1	
43.553	4	Silty Clay to Clay	24.98	1.02	2.613	0.885	1.728	3.02	0.76	0.82	0.482							0.85	1	
44.045	4	Silty Clay to Clay	18.12	0.71	2.643	0.901	1.742	3.15	0.76	0.81	0.481							0.85	1	
44.537	5	Clayey Silt to Silty Clay	20.99	0.56	2.672	0.916	1.756	2.99	0.75	0.81	0.480							0.84	1	
45.029	5	Clayey Silt to Silty Clay	18.61	0.59	2.702	0.931	1.77	3.09	0.75	0.80	0.478							0.84	1	
45.521	5	Clayey Silt to Silty Clay	21.95	0.56	2.731	0.947	1.785	2.97	0.75	0.80	0.476							0.84	1	
46.013	6	Sandy Silt to Clayey Silt	19.65	0.33	2.761	0.962	1.799	2.93	0.75	0.79	0.475							0.89	1	
46.505	6	Sandy Silt to Clayey Silt	19.46	0.22	2.79	0.977	1.813	2.84	0.74	0.79	0.473							0.89	1	
46.997	6	Sandy Silt to Clayey Silt	17.69	0.14	2.82	0.993	1.827	2.82	0.74	0.78	0.472							0.89	1	
47.49	6	Sandy Silt to Clayey Silt	22.53	0.24	2.849	1.008	1.841	2.77	0.74	0.78	0.470							0.89	1	
47.982	6	Sandy Silt to Clayey Silt	29	0.38	2.879	1.024	1.855	2.71	0.73	0.77	0.468							0.88	1	
48.474	7	Silty Sand to Sandy Silt	82.11	1.47	2.908	1.039	1.87	2.26	0.73	0.77	0.466	2.260	0.73	59.94	1.827	109.498	0.20	0.85	1	0.43
48.966	5	Clayey Silt to Silty Clay	58.71	2.21	2.938	1.054	1.884	2.7	0.73	0.76	0.464							0.83	1	
49.458	5	Clayey Silt to Silty Clay	29.62	1.08	2.968	1.07	1.898	2.96	0.73	0.76	0.462							0.83	1	
49.95	7	Silty Sand to Sandy Silt	123.87	2.77	2.997	1.085	1.912	2.2	0.72	0.75	0.460	2.200	0.72	89.19	1.667	148.653	0.39	0.81	1	0.84
50.442	8	Sand to Silty Sand	127.25	1.79	3.027	1.1	1.926	2.05	0.72	0.75	0.459	2.050	0.72	91.62	1.371	125.616	0.26	0.81	1	0.58
50.934	3	Clay	29.36	1.42	3.056	1.116	1.94	3.05	0.72	0.74	0.457							0.82	1	

LIQUEFACTION POTENTIAL ANALYSIS (per Youd & Idriss, 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
CPT NO. ***CPT-AS-22***

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.6 (Design Basis EQ)

FAULT M_w = 7.5
MSF = 1.00

			CPT RESULT INPUT							*CSR*		*CRR 7.5*						*F.S.=(CRR 7.5/CSR)*MSF*Kσ*Kα*		
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.
51.427	4	Silty Clay to Clay	18.31	0.63	3.086	1.131	1.955	3.17	0.72	0.74	0.454							0.82	1	
51.919	5	Clayey Silt to Silty Clay	18.48	0.47	3.115	1.146	1.969	3.1	0.71	0.73	0.452							0.82	1	
52.411	6	Sandy Silt to Clayey Silt	57.28	1.76	3.145	1.162	1.983	2.67	0.71	0.73	0.451							0.87	1	
52.903	5	Clayey Silt to Silty Clay	51.4	2.23	3.174	1.177	1.997	2.81	0.71	0.72	0.449							0.81	1	
53.395	4	Silty Clay to Clay	30.53	1.3	3.204	1.193	2.011	3.01	0.71	0.72	0.447							0.81	1	
53.887	5	Clayey Silt to Silty Clay	18.27	0.54	3.233	1.208	2.025	3.15	0.7	0.71	0.445							0.81	1	
54.379	5	Clayey Silt to Silty Clay	21.06	0.58	3.263	1.223	2.04	3.07	0.7	0.71	0.442							0.81	1	
54.871	6	Sandy Silt to Clayey Silt	22.33	0.46	3.292	1.239	2.054	2.98	0.7	0.70	0.440							0.87	1	
55.364	5	Clayey Silt to Silty Clay	23.78	0.6	3.322	1.254	2.068	3	0.7	0.70	0.438							0.80	1	
55.856	5	Clayey Silt to Silty Clay	30.55	0.86	3.351	1.269	2.082	2.92	0.69	0.70	0.436							0.80	1	
56.348	5	Clayey Silt to Silty Clay	23.42	0.58	3.381	1.285	2.096	3.01	0.69	0.69	0.435							0.80	1	
56.84	5	Clayey Silt to Silty Clay	19.78	0.52	3.41	1.3	2.11	3.11	0.69	0.69	0.433							0.80	1	
57.332	5	Clayey Silt to Silty Clay	22.19	0.75	3.44	1.315	2.125	3.12	0.69	0.68	0.431							0.80	1	
57.824	5	Clayey Silt to Silty Clay	22.68	0.64	3.47	1.331	2.139	3.07	0.68	0.68	0.429							0.80	1	
58.316	6	Sandy Silt to Clayey Silt	30.54	0.83	3.499	1.346	2.153	2.92	0.68	0.67	0.427							0.86	1	
58.808	6	Sandy Silt to Clayey Silt	70.44	2.2	3.529	1.362	2.167	2.64	0.68	0.67	0.425							0.84	1	
59.3	3	Clay	40.2	2.1	3.558	1.377	2.181	2.99	0.68	0.67	0.423							0.79	1	
59.793	6	Sandy Silt to Clayey Silt	56.19	1.58	3.588	1.392	2.195	2.7	0.67	0.66	0.421							0.85	1	
60.285	5	Clayey Silt to Silty Clay	54.45	2.29	3.617	1.408	2.209	2.82	0.67	0.66	0.419							0.79	2	
60.777	8	Sand to Silty Sand	169.2	3.35	3.647	1.423	2.224	2.09	0.67	0.65	0.418	2.090	0.67	113.36	1.437	162.895		0.76	3	
61.269	8	Sand to Silty Sand	135.56	1.98	3.676	1.438	2.238	2.07	0.67	0.65	0.416	2.070	0.67	90.83	1.403	127.421	0.27	0.77	4	0.66
61.761	5	Clayey Silt to Silty Clay	47.27	1.86	3.706	1.454	2.252	2.86	0.67	0.65	0.414							0.78	5	
62.253	6	Sandy Silt to Clayey Silt	56.13	1.62	3.735	1.469	2.266	2.71	0.66	0.64	0.412							0.85	6	
62.745	8	Sand to Silty Sand	185.36	2.57	3.765	1.485	2.28	1.95	0.66	0.64	0.411	1.950	0.66	122.34	1.240	151.682	0.40	0.74	7	0.98
63.237	10	Gravelly Sand to Sand	357.9	2.23	3.794	1.5	2.294	1.5	0.66	0.63	0.409	1.500	0.66	236.21	1.000	236.214		0.72	8	
63.73	10	Gravelly Sand to Sand	418.32	2.95	3.824	1.515	2.309	1.49	0.66	0.63	0.407	1.490	0.66	276.09	1.000	276.091		0.72	9	
64.222	9	Sand	333.4	3.37	3.853	1.531	2.323	1.68	0.66	0.63	0.406	1.680	0.66	220.04	1.024	225.383		0.71	10	
64.714	7	Silty Sand to Sandy Silt	85.07	2.03	3.883	1.546	2.337	2.37	0.65	0.62	0.404	2.370	0.65	55.30	2.194	121.321	0.25	0.81	11	0.61
65.206	6	Sandy Silt to Clayey Silt	57.9	1.37	3.912	1.561	2.351	2.66	0.65	0.62	0.403							0.84	12	
65.698	6	Sandy Silt to Clayey Silt	55.05	1.34	3.942	1.577	2.365	2.69	0.65	0.62	0.401							0.84	13	
66.19	6	Sandy Silt to Clayey Silt	48.27	1.16	3.971	1.592	2.379	2.75	0.65	0.61	0.400							0.84	14	
66.682	7	Silty Sand to Sandy Silt	123.78	3.02	4.001	1.607	2.394	2.26	0.65	0.61	0.398	2.260	0.65	80.46	1.827	146.978	0.38	0.77	15	0.94
67.174	7	Silty Sand to Sandy Silt	201.1	4.65	4.031	1.623	2.408	2.1	0.64	0.61	0.397	2.100	0.64	128.70	1.455	187.233		0.72	16	
67.666	6	Sandy Silt to Clayey Silt	62.43	2.08	4.06	1.638	2.422	2.74	0.64	0.61	0.396							0.84	17	
68.159	6	Sandy Silt to Clayey Silt	35.88	1.03	4.09	1.654	2.436	2.92	0.64	0.60	0.394							0.84	18	
68.651	6	Sandy Silt to Clayey Silt	40.33	1.22	4.119	1.669	2.45	2.89	0.64	0.60	0.393							0.84	19	
69.143	6	Sandy Silt to Clayey Silt	38.16	0.93	4.149	1.684	2.464	2.86	0.64	0.60	0.392							0.83	20	
69.635	5	Clayey Silt to Silty Clay	40.74	1.31	4.178	1.7	2.479	2.91	0.64	0.59	0.390							0.76	21	
70.127	5	Clayey Silt to Silty Clay	34.94	1.09	4.208	1.715	2.493	2.97	0.63	0.59	0.389							0.76	22	
70.619	5	Clayey Silt to Silty Clay	29.47	1.14	4.237	1.73	2.507	3.1	0.63	0.59	0.388							0.76	23	
71.111	6	Sandy Silt to Clayey Silt	27.87	0.59	4.267	1.746	2.521	2.98	0.63	0.59	0.387							0.83	24	
71.603	6	Sandy Silt to Clayey Silt	35.9	0.64	4.296	1.761	2.535	2.82	0.63	0.58	0.386							0.83	25	
72.096	6	Sandy Silt to Clayey Silt	35.56	0.78	4.326	1.776	2.549	2.88	0.63	0.58	0.385							0.83	26	
72.588	6	Sandy Silt to Clayey Silt	30.28	0.75	4.355	1.792	2.564	2.98	0.62	0.58	0.383							0.83	27	
73.08	6	Sandy Silt to Clayey Silt	28.34	0.59	4.385	1.807	2.578	2.98	0.62	0.58	0.382							0.83	28	
73.572	6	Sandy Silt to Clayey Silt	29.38	0.58	4.414	1.823	2.592	2.95	0.62	0.57	0.381							0.83	29	
74.064	6	Sandy Silt to Clayey Silt	30.77	0.72	4.444	1.838	2.606	2.97	0.62	0.57	0.380							0.83	30	
74.556	6	Sandy Silt to Clayey Silt	33.49	0.8	4.473	1.853	2.62	2.94	0.62	0.57	0.379							0.82	31	
75.048	6	Sandy Silt to Clayey Silt	30.56	0.65	4.503	1.869	2.634	2.96	0.62	0.57	0.378							0.82	32	
75.54	6	Sandy Silt to Clayey Silt	32.28	0.54	4.533	1.884	2.649	2.88	0.61	0.57	0.377							0.82	33	
76.033	6	Sandy Silt to Clayey Silt	32.98	0.74	4.562	1.899	2.663	2.94	0.61	0.56	0.376							0.82	34	
76.525	6	Sandy Silt to Clayey Silt	34.56	0.74	4.592	1.915	2.677	2.91	0.61	0.56	0.375							0.82	35	
77.017	6	Sandy Silt to Clayey Silt	39.33	1.14	4.621	1.93	2.691	2.93	0.61	0.56	0.375							0.82	36	
77.509	6	Sandy Silt to Clayey Silt	58.71	1.6	4.651	1.945	2.705	2.75	0.61	0.56	0.374							0.82	37	
78.001	5	Clayey Silt to Silty Clay	39.37	1.3	4.68	1.961	2.719	2.97	0.61	0.56	0.373							0.74	38	
78.493	5	Clayey Silt to Silty Clay	37.33	1.29	4.71	1.976	2.734	3	0.6	0.55	0.372							0.74	39	
78.985	6	Sandy Silt to Clayey Silt	30	0.71	4.739	1.992	2.748	3	0.6	0.55	0.371							0.82	40	
79.477	6	Sandy Silt to Clayey Silt	29.13	0.76	4.769	2.007	2.762	3.04	0.6	0.55	0.370							0.82	41	
79.97	6	Sandy Silt to Clayey Silt	33.32	0.7	4.798	2.022	2.776	2.93	0.6	0.55	0.370							0.82	42	
80.462	5	Clayey Silt to Silty Clay	29.15	0.96	4.828	2.038	2.79	3.11	0.6	0.55	0.369							0.74	43	
80.954	6	Sandy Silt to Clayey Silt	24.78	0.48	4.857	2.053	2.804	3.07	0.6	0.54	0.368							0.81	44	
81.446	6	Sandy Silt to Clayey Silt	34.54	0.7	4.887	2.068	2.818	2.92	0.6	0.54	0.367							0.81	45	
81.938	6	Sandy Silt to Clayey Silt	47.85	1.22	4.916	2.084	2.833	2.83	0.59	0.54	0.367							0.81	46	
82.43	6	Sandy Silt to Clayey Silt	53.79	1.44	4.946	2.099	2.847	2.8	0.59	0.54	0.366							0.81	47	
82.922	6	Sandy Silt to Clayey Silt	50.64	1.12	4.975	2.114	2.861	2.77	0.59	0.54	0.365							0.81	48	
83.414	8	Sand to Silty Sand	193.52	2.79	5.005	2.13	2.875	1.99	0.59	0.54	0.365	1.990	0.59	114.18	1.287	146.963	0.38	0.69	49	1.03
83.906	10	Gravelly Sand to Sand	404.99	2.22	5.035	2.145	2.889	1.46	0.59	0.54	0.364	1.460	0.59	238.94	1.000	238.944		0.65	50	
84.399	10	Gravelly Sand to Sand	467.27	3.36	5.064	2.161	2.903	1.5	0.59	0.53	0.363	1.500	0.59	275.69	1.000	275.689		0.65	51	
84.891	10	Gravelly Sand to Sand	419.06	2.98	5.094	2.176	2.918	1.53	0.59	0.53	0.363	1.530	0.59	247.25	1.000	247.245		0.65	52	
85.383	10	Gravelly Sand to Sand	382.82	1.71	5.123	2.191	2.932	1.43	0.58	0.53	0.362	1.430	0.58	222.04	1.000	222.036		0.65	53	
85.875	10	Gravelly Sand to Sand	336.57	2.37	5.153	2.207	2.946	1.6	0.58	0.53	0.361	1.600	0.58	195.21	1.000	195.211		0.65	54	
86.367	9	Sand	302.71	2.69	5.182	2.222	2.96	1.71	0.58	0.53	0.361	1.710	0.58	175.57	1.045	183.402		0.65	55	
86.859	9	Sand	295.86	2.67	5.212	2.237	2.974	1.72	0.58	0.53	0.360	1.720	0.58	171.60	1.051	180.407		0.65	56	
87.351	6	Sandy Silt to Clayey Silt	84.71	2.68	5.241	2.253	2.988	2.69	0.58	0.53	0.360							0.78	57	
87.843	6	Sandy Silt to Clayey Silt	38.01	0.76	5.271	2.268	3.003	2.9	0.58	0.52	0.359							0.80	58	
88.336	7	Silty Sand to Sandy Silt	101.93	2.41	5.3	2.284	3.017	2.35	0.58	0.52	0.359	2.350	0.58	59.12	2.120	125.312	0.26	0.75	59	0.73
88.828	7	Silty Sand to Sandy Silt	120.09	2.27	5.33	2.299	3.031	2.23	0.57	0.52	0.358	2.230	0.57	68.45	1.743	119.342	0.24	0.73	60	0.66
89.32	6	Sandy Silt to Clayey Silt	46.97	1.18	5.359	2.314	3.045	2.87	0.57	0.52	0.358							0.80	61	
89.812	6	Sandy Silt to Clayey Silt	42.01	1.01	5.389	2.33	3.059	2.9	0.57	0.52	0.357							0.80	62	
90.304	6	Sandy Silt to Clayey Silt	42.14	1.2	5.418	2.345	3.073	2.95	0.57	0.52	0.357							0.80	63	
90.796	6	Sandy Silt to Clayey Silt	42.69	0.96	5.448	2.36	3.088	2.88	0.57	0.52	0.356							0.80	64	
91.288	6	Sandy Silt to Clayey Silt	36.22	0.73	5.477	2.376	3.102	2.93	0.57	0.52	0.355							0.80	65	
91.78	6	Sandy Silt to Clayey Silt	35.6	0.95	5.507	2.391	3.116	3	0.57	0.52	0.355							0.80	66	
92.273	6	Sandy Silt to Clayey Silt	37.41	1.09	5.536	2.406	3.13	3.01	0.57	0.51	0.355							0.80	67	
92.765	6	Sandy Silt to Clayey Silt	37.07	0.79	5.566	2.422	3.144	2.93	0.56	0.51	0.354							0.80	68	
93.257	6	Sandy Silt to Clayey Silt	37.56	0.74	5.596	2.437	3.158	2.92	0.56	0.51	0.354							0.79	69	
93.749	7	Silty Sand to Sandy Silt	35.28	0.52	5.625	2.453	3.173	2.88	0.56	0.51	0.353							0.79	70	
94.241	6	Sandy Silt to Clayey Silt	31.75	0.68	5.655	2.468	3.187	3.02	0.56	0.51	0.353							0.79	71	
94.733	6	Sandy Silt to Clayey Silt	37.45	0.84	5.684	2.483	3.201	2.96	0.56	0.51	0.352							0.79	72	
95.225	6	Sandy Silt to Clayey Silt	30.24	0.53	5.714	2.499	3.215	2.99	0.56	0.51	0.352							0.79	73	
95.717	7	Silty Sand to Sandy Silt	34.96	0.52	5.743	2.514	3.229	2.88	0.56	0.51	0.351							0.79	74	
96.209	7	Silty Sand to Sandy Silt	39.5	0.53	5.773	2.529	3.243	2.8	0.56	0.51	0.351							0.79	75	
96.702	7	Silty Sand to Sandy Silt	40.95	0.74	5.802	2.545	3.258	2.85	0.55	0.50	0.351							0.79	76	
97.194	7	Silty Sand to Sandy Silt	41.4	0.81	5.832	2.56	3.272	2.86	0.55	0.50	0.350							0.79	77	
97.686	6	Sandy Silt to Clayey Silt	51.77	1.16	5.861	2.575	3.286	2.81	0.55	0.50	0.350							0.79	78	
98.178	6	Sandy Silt to Clayey Silt	74.49	2.4	5.891	2.591	3.3	2.77	0.55	0.50	0.349							0.78	79	
98.67	6	Sandy Silt to Clayey Silt	118.14	3.72	5.92	2.606	3.314	2.6	0.55	0.50	0.349							0.72	80	
99.162	6	Sandy Silt to Clayey Silt	68.12	2.07	5.95	2.622	3.328	2.8	0.55	0.50	0.349							0.79	81	
99.654	6	Sandy Silt to Clayey Silt	48.76	1.26	5.979	2.637	3.342	2.89	0.55	0.50	0.348							0.79	82	

LIQUEFACTION POTENTIAL ANALYSIS (per Youd & Idriss, 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
CPT NO. ***CPT-AS-26***

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.6 (Design Basis EQ)

FAULT M_w = 7.5
MSF = 1.00

			CPT RESULT INPUT							*CSR*		*CRR 7.5*						*F.S.=(CRR 7.5/CSR)*MSF*Kσ*Kα*		
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.
0.492					0.03		0.03	-9999	2	1.00	0.390							1.00	1	
1.476					0.089		0.089	-9999	2	1.00	0.389							1.00	1	
2.461					0.148		0.148	-9999	2	1.00	0.389							1.00	1	
3.445					0.207		0.207	-9999	2	0.99	0.388							1.00	1	
4.429					0.266		0.266	-9999	1.94	0.99	0.387							1.00	1	
5.413	5	Clayey Silt to Silty Clay	13.37	0.34	0.325		0.325	2.57	1.75	0.99	0.386	2.570	1.70	22.73	3.148	71.550	0.11	1.00	1	
6.398	5	Clayey Silt to Silty Clay	8.44	0.15	0.384		0.384	2.61	1.61	0.99	0.385							1.00	1	
7.382	1	Sensitive Fines	7.53	0.05	0.443		0.443	2.55	1.5	0.98	0.384	2.550	1.50	11.30	3.034	34.272	0.08	1.00	1	
8.366	1	Sensitive Fines	7.01	0.08	0.502	0.011	0.491	2.65	1.43	0.98	0.392							1.00	1	
9.35	1	Sensitive Fines	5.98	0.05	0.561	0.042	0.519	2.71	1.39	0.98	0.413							1.00	1	
10.335	1	Sensitive Fines	7.16	0.05	0.62	0.073	0.547	2.62	1.35	0.98	0.433							1.00	1	
11.319	1	Sensitive Fines	7.09	0.07	0.679	0.104	0.576	2.69	1.32	0.98	0.449							1.00	1	
12.303	5	Clayey Silt to Silty Clay	8.3	0.08	0.738	0.134	0.604	2.66	1.29	0.97	0.464							1.00	1	
13.287	6	Sandy Silt to Clayey Silt	39.75	1.03	0.797	0.165	0.632	2.42	1.26	0.97	0.478	2.420	1.26	50.09	2.396	119.997	0.24	1.00	1	0.50
14.271	6	Sandy Silt to Clayey Silt	40.63	0.86	0.856	0.196	0.66	2.36	1.23	0.97	0.491	2.360	1.23	49.97	2.156	107.766	0.20	1.00	1	0.40
15.256	5	Clayey Silt to Silty Clay	15.43	0.3	0.915	0.227	0.689	2.63	1.21	0.97	0.501							1.00	1	
16.24	5	Clayey Silt to Silty Clay	15.74	0.39	0.974	0.257	0.717	2.71	1.18	0.97	0.512							1.00	1	
17.224	5	Clayey Silt to Silty Clay	10.56	0.2	1.033	0.288	0.745	2.8	1.16	0.96	0.521							1.00	1	
18.208	5	Clayey Silt to Silty Clay	8.78	0.17	1.093	0.319	0.774	2.9	1.14	0.96	0.529							1.00	1	
19.193	5	Clayey Silt to Silty Clay	13.32	0.24	1.152	0.349	0.802	2.73	1.12	0.96	0.537							1.00	1	
20.177	4	Silty Clay to Clay	9.3	0.27	1.211	0.38	0.83	3.02	1.1	0.96	0.544							1.00	1	
21.161	5	Clayey Silt to Silty Clay	11.29	0.3	1.27	0.411	0.859	2.93	1.08	0.95	0.550							1.00	1	
22.145	4	Silty Clay to Clay	15.85	0.59	1.329	0.442	0.887	2.89	1.06	0.95	0.556							1.00	1	
23.13	4	Silty Clay to Clay	18.83	0.79	1.388	0.472	0.915	2.88	1.05	0.95	0.561							1.00	1	
24.114	4	Silty Clay to Clay	17.24	0.7	1.447	0.503	0.944	2.91	1.03	0.94	0.565							1.00	1	
25.098	4	Silty Clay to Clay	14.15	0.54	1.506	0.534	0.972	2.99	1.01	0.94	0.569							1.00	1	
26.082	5	Clayey Silt to Silty Clay	17.57	0.5	1.565	0.565	1	2.82	1	0.94	0.572							1.00	1	
27.067	6	Sandy Silt to Clayey Silt	27.01	0.7	1.624	0.595	1.029	2.65	0.99	0.93	0.575							0.99	1	
28.051	5	Clayey Silt to Silty Clay	14.05	0.39	1.683	0.626	1.057	2.93	0.97	0.93	0.577							0.98	1	
29.035	6	Sandy Silt to Clayey Silt	19.82	0.41	1.742	0.657	1.085	2.73	0.96	0.93	0.579							0.98	1	
30.019	5	Clayey Silt to Silty Clay	22.18	0.63	1.801	0.688	1.114	2.78	0.95	0.92	0.580							0.97	1	
31.004	5	Clayey Silt to Silty Clay	17.59	0.52	1.86	0.718	1.142	2.89	0.94	0.92	0.581							0.96	1	
31.988	5	Clayey Silt to Silty Clay	16.62	0.46	1.919	0.749	1.17	2.9	0.92	0.91	0.582							0.95	1	
32.972	5	Clayey Silt to Silty Clay	16.09	0.43	1.978	0.78	1.199	2.91	0.91	0.90	0.582							0.95	1	
33.956	5	Clayey Silt to Silty Clay	16.09	0.42	2.037	0.81	1.227	2.92	0.9	0.90	0.581							0.94	1	
34.941	5	Clayey Silt to Silty Clay	16.01	0.42	2.096	0.841	1.255	2.93	0.89	0.89	0.580							0.93	1	
35.925	5	Clayey Silt to Silty Clay	15.84	0.45	2.156	0.872	1.284	2.97	0.88	0.88	0.579							0.93	1	
36.909	5	Clayey Silt to Silty Clay	16.48	0.45	2.215	0.903	1.312	2.95	0.87	0.88	0.577							0.92	1	
37.893	6	Sandy Silt to Clayey Silt	18.97	0.42	2.274	0.933	1.34	2.85	0.86	0.87	0.575							0.94	1	
38.877	4	Silty Clay to Clay	14.48	0.5	2.333	0.964	1.369	3.09	0.85	0.86	0.572							0.91	1	
39.862	5	Clayey Silt to Silty Clay	15.32	0.48	2.392	0.995	1.397	3.05	0.85	0.85	0.569							0.90	1	
40.846	4	Silty Clay to Clay	17.76	0.63	2.451	1.026	1.425	3.04	0.84	0.84	0.566							0.90	1	
41.83	4	Silty Clay to Clay	20.26	0.74	2.51	1.056	1.454	3	0.83	0.83	0.562							0.89	1	
42.814	4	Silty Clay to Clay	20.98	0.85	2.569	1.087	1.482	3.02	0.82	0.83	0.558							0.89	1	
43.799	4	Silty Clay to Clay	20.19	0.76	2.628	1.118	1.51	3.03	0.81	0.82	0.554							0.88	1	
44.783	5	Clayey Silt to Silty Clay	21.28	0.52	2.687	1.148	1.539	2.89	0.81	0.81	0.549							0.88	1	
45.767	5	Clayey Silt to Silty Clay	19.19	0.46	2.746	1.179	1.567	2.94	0.8	0.80	0.544							0.87	1	
46.751	6	Sandy Silt to Clayey Silt	17.56	0.28	2.805	1.21	1.595	2.88	0.79	0.79	0.539							0.91	1	
47.736	6	Sandy Silt to Clayey Silt	17.17	0.3	2.864	1.241	1.624	2.92	0.78	0.78	0.534							0.91	1	
48.72	6	Sandy Silt to Clayey Silt	23.96	0.54	2.923	1.271	1.652	2.84	0.78	0.77	0.528							0.90	1	
49.704	6	Sandy Silt to Clayey Silt	22.97	0.49	2.982	1.302	1.68	2.85	0.77	0.76	0.523							0.90	1	
50.688	7	Silty Sand to Sandy Silt	159.66	3.15	3.041	1.333	1.709	2.06	0.77	0.75	0.518	2.060	0.77	122.94	1.387	170.482		0.82	1	
51.673	7	Silty Sand to Sandy Silt	80.35	1.4	3.1	1.364	1.737	2.25	0.76	0.74	0.512	2.250	0.76	61.07	1.798	109.812	0.20	0.87	1	0.40
52.657	5	Clayey Silt to Silty Clay	21.61	0.64	3.159	1.394	1.765	3	0.75	0.73	0.507							0.84	1	
53.641	6	Sandy Silt to Clayey Silt	34.72	0.92	3.219	1.425	1.793	2.78	0.75	0.72	0.502							0.89	1	
54.625	5	Clayey Silt to Silty Clay	22.27	0.76	3.278	1.456	1.822	3.03	0.74	0.71	0.496							0.84	1	
55.61	4	Silty Clay to Clay	28.95	1.22	3.337	1.487	1.85	2.99	0.74	0.70	0.491							0.83	1	
56.594	7	Silty Sand to Sandy Silt	90	2.18	3.396	1.517	1.878	2.32	0.73	0.69	0.486	2.320	0.73	65.70	2.015	132.357	0.30	0.84	1	0.61
57.578	7	Silty Sand to Sandy Silt	136.6	3.4	3.455	1.548	1.907	2.2	0.72	0.68	0.480	2.200	0.72	98.35	1.667	163.930		0.81	1	
58.562	6	Sandy Silt to Clayey Silt	61.64	1.7	3.514	1.579	1.935	2.61	0.72	0.67	0.475							0.87	1	
59.547	5	Clayey Silt to Silty Clay	15	0.4	3.573	1.609	1.963	3.22	0.71	0.66	0.471							0.82	1	
60.531	6	Sandy Silt to Clayey Silt	27.25	0.62	3.632	1.64	1.992	2.89	0.71	0.65	0.466							0.87	1	
61.515	5	Clayey Silt to Silty Clay	36.93	1.18	3.691	1.671	2.02	2.86	0.7	0.65	0.461							0.81	1	
62.499	6	Sandy Silt to Clayey Silt	83.7	2.3	3.75	1.702	2.048	2.39	0.7	0.64	0.457	2.390	0.70	58.59	2.272	133.118	0.30	0.83	1	0.66
63.483	8	Sand to Silty Sand	220.63	3.94	3.809	1.732	2.077	1.97	0.69	0.63	0.452	1.970	0.69	152.23	1.263	192.230		0.75	1	
64.468	10	Gravelly Sand to Sand	353.77	2.83	3.868	1.763	2.105	1.57	0.69	0.63	0.448	1.570	0.69	244.10	1.000	244.101		0.74	1	
65.452	10	Gravelly Sand to Sand	450.01	2.99	3.927	1.794	2.133	1.44	0.68	0.62	0.445	1.440	0.68	306.01	1.000	306.007		0.74	1	
66.436	9	Sand	292.43	2.47	3.986	1.825	2.162	1.65	0.68	0.61	0.441	1.650	0.68	198.85	1.003	199.516		0.73	1	
67.42	6	Sandy Silt to Clayey Silt	61.57	1.55	4.045	1.855	2.19	2.63	0.68	0.61	0.437							0.85	1	
68.405	6	Sandy Silt to Clayey Silt	40.64	0.86	4.104	1.886	2.218	2.76	0.67	0.60	0.434							0.85	1	
69.389	6	Sandy Silt to Clayey Silt	32.79	0.78	4.163	1.917	2.247	2.88	0.67	0.60	0.430							0.85	1	
70.373	6	Sandy Silt to Clayey Silt	24.4	0.45	4.222	1.947	2.275	2.96	0.66	0.59	0.427							0.85	1	
71.357	6	Sandy Silt to Clayey Silt	25.45	0.32	4.282	1.978	2.303	2.86	0.66	0.58	0.424							0.85	1	
72.342	6	Sandy Silt to Clayey Silt	61.09	1.8	4.341	2.009	2.332	2.7	0.65	0.58	0.421							0.84	1	
73.326	6	Sandy Silt to Clayey Silt	46.55	1.04	4.4	2.04	2.36	2.74	0.65	0.58	0.418							0.84	1	
74.31	6	Sandy Silt to Clayey Silt	35.9	0.67	4.459	2.07	2.388	2.79	0.65	0.57	0.416							0.84	1	
75.294	6	Sandy Silt to Clayey Silt	45.31	1.3	4.518	2.101	2.417	2.81	0.64	0.57	0.413							0.84	1	
76.279	11	Sitff Fine-Grained	135.17	5.63	4.577	2.132	2.445	2.41	0.64	0.56	0.411	2.410	0.64	86.51	2.354	203.611		0.76	1	
77.263	12	Sand to Clayey Sand	266.59	7.75	4.636	2.163	2.473	2.1	0.64	0.56	0.408	2.100	0.64	170.62	1.455	248.207		0.70	1	
78.247	8	Sand to Silty Sand	247.83	5.05	4.695	2.193	2.502	2	0.63	0.55	0.406	2.000	0.63	156.13	1.300	202.973		0.69	1	
79.231	6	Sandy Silt to Clayey Silt	52.43	1.58	4.754	2.224	2.53	2.79	0.63	0.55	0.404							0.83	1	
80.216	12	Sand to Clayey Sand	147.49	5.83	4.813	2.255	2.558	2.37	0.63	0.55	0.402	2.370	0.63	92.92	2.194	203.868		0.74	1	
81.2	6	Sandy Silt to Clayey Silt	99.93	2.86	4.872	2.286	2.587	2.39	0.62	0.54	0.400	2.390	0.62	61.96	2.272	140.767	0.34	0.78	1	0.85
82.184	8	Sand to Silty Sand	325.26	5.13	4.931	2.316	2.615	1.85	0.62	0.54	0.398	1.850	0.62	201.66	1.145	230.918		0.68	1	
83.168	9	Sand	360.38	4.54	4.99	2.347	2.643	1.74	0.62	0.54	0.396	1.740	0.62	223.44	1.065	237.916		0.68	1	
84.153	9	Sand	388.98	5.37	5.049	2.378	2.672	1.75	0.61	0.53	0.394	1.750	0.61	237.28	1.072	254.266		0.67	1	
85.137	9	Sand	247.13	3.13	5.108	2.408	2.7	1.86	0.61	0.53	0.393	1.860	0.61	150.75	1.153	173.866		0.68	1	
86.121	7	Silty Sand to Sandy Silt	42.29	0.81	5.167	2.439	2.728	2.79	0.61	0.53	0.391							0.82	1	
87.105	7	Silty Sand to Sandy Silt	34.4	0.5	5.226	2.47	2.757	2.82	0.6	0.53	0.389							0.82	1	
88.089	6	Sandy Silt to Clayey Silt	46.08	0.97	5.285	2.501	2.785	2.77	0.6	0.52	0.388							0.81	1	
89.074	5	Clayey Silt to Silty Clay	84.24	3.22	5.345	2.531	2.813	2.73	0.6	0.52	0.386							0.73	1	
90.058	6	Sandy Silt to Clayey Silt	37.57	0.72	5.404	2.562	2.842	2.87	0.59	0.52	0.385							0.81	1	
91.042	5	Clayey Silt to Silty Clay	61.88	2.4	5.463	2.593	2.87	2.85	0.59	0.52	0.384							0.73	1	
92.026	6	Sandy Silt to Clayey Silt	46.85	1.07	5.522	2.624	2.898	2.82	0.59	0.51	0.382							0.81	1	
93.011	7	Silty Sand to Sandy Silt	40.43	0.73	5.581	2.654	2.926	2.82	0.58	0.51	0.381							0.81	1	
93.995	6	Sandy Silt to Clayey Silt	41.24	1.03	5.64	2.685	2.955	2.89	0.58	0.51	0.380							0.81	1	
94.979	5	Clayey Silt to Silty Clay	68.16	3	5.699	2.716	2.983	2.86	0.58	0.51	0.379							0.72	1	
95.963	6	Sandy Silt to Clayey Silt	54.36	1.6	5.758	2.746	3.011	2.83	0.58	0.51	0.378							0.80	1	
96.948	5	Clayey Silt to Silty Clay	101.48	4.22	5.817	2.777	3.04	2.71	0.57	0.50	0.376							0.72	1	
97.932	11	Sitff Fine-Grained	69.8	3.88	5.876	2.808	3.068	2.94	0.57	0.50	0.375							0.80	1	
98.916	6	Sandy Silt to Clayey Silt	42.35	0.88	5.935	2.839	3.096	2.87	0.57	0.50	0.374							0.80	1	
99.9	6	Sandy Silt to Clayey Silt	38.42	0.74	5.994	2.869	3.125	2.89	0.57	0.50	0.373							0.80	1	
100.885	6	Sandy Silt to Clayey Silt	33.07	0.63	6.053	2.9	3.153	2.96	0.56	0.50	0.372							0.79	1	
101.869	6	Sandy Silt to Clayey Silt	51.47	1.3	6.112	2.931	3.181	2.83	0.56	0.50	0.371							0.79	1	

LIQUEFACTION POTENTIAL ANALYSIS (per Youd & Idriss, 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
CPT NO. ***CPT-AS-26***

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.6 (Design Basis EQ)

FAULT M_w = 7.5
MSF = 1.00

			CPT RESULT INPUT							*CSR*		$CRR_{7.5}$						$F.S.=(CRR_{7.5}/CSR)*MSF*K\sigma*K\alpha$		
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.
102.853	7	Silty Sand to Sandy Silt	42.97	0.67	6.171	2.962	3.21	2.8	0.56	0.49	0.370							0.79	1	
103.837	7	Silty Sand to Sandy Silt	36.41	0.49	6.23	2.992	3.238	2.84	0.56	0.49	0.369							0.79	1	
104.822	6	Sandy Silt to Clayey Silt	47.84	1.32	6.289	3.023	3.266	2.89	0.55	0.49	0.368							0.79	1	
105.806	6	Sandy Silt to Clayey Silt	104.92	3.09	6.348	3.054	3.295	2.63	0.55	0.49	0.367							0.74	1	
106.79	6	Sandy Silt to Clayey Silt	92.23	3.38	6.408	3.085	3.323	2.74	0.55	0.49	0.366							0.75	1	
107.774	6	Sandy Silt to Clayey Silt	36.74	1	6.467	3.115	3.351	3.04	0.55	0.49	0.366							0.79	1	
108.759	6	Sandy Silt to Clayey Silt	40.16	0.97	6.526	3.146	3.38	2.96	0.54	0.48	0.365							0.78	1	
109.743	6	Sandy Silt to Clayey Silt	34.79	0.66	6.585	3.177	3.408	2.97	0.54	0.48	0.364							0.78	1	
110.727	6	Sandy Silt to Clayey Silt	36.58	0.76	6.644	3.207	3.436	2.97	0.54	0.48	0.363							0.78	1	
111.711	6	Sandy Silt to Clayey Silt	39.37	1.25	6.703	3.238	3.465	3.05	0.54	0.48	0.362							0.78	1	
112.695	6	Sandy Silt to Clayey Silt	41.03	1.02	6.762	3.269	3.493	2.97	0.54	0.48	0.361							0.78	1	
113.68	5	Clayey Silt to Silty Clay	51.86	1.82	6.821	3.3	3.521	2.96	0.53	0.48	0.361							0.69	1	
114.664	5	Clayey Silt to Silty Clay	84.43	3.72	6.88	3.33	3.55	2.85	0.53	0.48	0.360							0.68	1	
115.648	7	Silty Sand to Sandy Silt	161.4	3.91	6.939	3.361	3.578	2.24	0.53	0.47	0.359	2.240	0.53	85.54	1.770	151.451	0.40	0.67	1	1.12
116.632	5	Clayey Silt to Silty Clay	49.17	1.73	6.998	3.392	3.606	3	0.53	0.47	0.358							0.68	1	
117.617	7	Silty Sand to Sandy Silt	42.54	0.62	7.057	3.423	3.635	2.84	0.52	0.47	0.357							0.77	1	
118.601	6	Sandy Silt to Clayey Silt	43.11	0.95	7.116	3.453	3.663	2.93	0.52	0.47	0.357							0.77	1	
119.585	6	Sandy Silt to Clayey Silt	55.9	1.67	7.175	3.484	3.691	2.91	0.52	0.47	0.356							0.77	1	

LIQUEFACTION POTENTIAL ANALYSIS (per Youd & Idriss, 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
CPT NO. ***CPT-AS-28***

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.6 (Design Basis EQ)
FAULT M_w = 7.5
MSF = 1.00

			CPT RESULT INPUT							*CSR*		*$CRR_{7.5}$*						*$F.S.=(CRR_{7.5}/CSR)*MSF*K\sigma*K\alpha$*			
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	N_{60}
0.246	7	Silty Sand to Sandy Silt	27.31	0.09	0.015		0.015	-9999	2	1.00	0.390							1.00	1		
0.738	8	Sand to Silty Sand	40.05	0.08	0.044		0.044	1.3	2	1.00	0.390	1.300	1.70	68.09	1.000	68.085	0.11	1.00	1		
1.23	7	Silty Sand to Sandy Silt	22.68	0.06	0.074		0.074	1.7	2	1.00	0.390	1.700	1.70	38.56	1.038	40.016	0.08	1.00	1		
1.722	7	Silty Sand to Sandy Silt	22.81	0.06	0.103		0.103	1.75	2	1.00	0.389	1.750	1.70	38.78	1.072	41.553	0.08	1.00	1		
2.215	6	Sandy Silt to Clayey Silt	15.48	0.02	0.133		0.133	1.88	2	1.00	0.389	1.880	1.70	26.32	1.171	30.805	0.08	1.00	1		
2.707	6	Sandy Silt to Clayey Silt	15.44	0.05	0.162		0.162	2.03	2	1.00	0.388	2.030	1.70	26.25	1.341	35.204	0.08	1.00	1		
3.199	7	Silty Sand to Sandy Silt	17.46	0.02	0.192		0.192	1.9	2	0.99	0.388	1.900	1.70	29.68	1.189	35.287	0.08	1.00	1		
3.691	6	Sandy Silt to Clayey Silt	11.78	0.02	0.221		0.221	2.15	2	0.99	0.387	2.150	1.70	20.03	1.553	31.096	0.08	1.00	1		
4.183	6	Sandy Silt to Clayey Silt	15.88	0.1	0.251		0.251	2.24	2	0.99	0.387	2.240	1.70	27.00	1.770	47.796	0.09	1.00	1		
4.675	5	Clayey Silt to Silty Clay	9.77	0.15	0.281		0.281	2.5	1.89	0.99	0.386	2.500	1.70	16.61	2.768	45.981	0.09	1.00	1		
5.167	6	Sandy Silt to Clayey Silt	17.89	0.09	0.31		0.31	2.19	1.8	0.99	0.386	2.190	1.70	30.41	1.643	49.957	0.09	1.00	1		
5.659	6	Sandy Silt to Clayey Silt	17.16	0.18	0.34		0.34	2.37	1.72	0.99	0.386	2.370	1.70	29.17	2.194	64.005	0.10	1.00	1		
6.152	6	Sandy Silt to Clayey Silt	21.91	0.26	0.369		0.369	2.32	1.65	0.99	0.385	2.320	1.65	36.15	2.015	72.830	0.12	1.00	1		
6.644	6	Sandy Silt to Clayey Silt	14.12	0.17	0.399		0.399	2.51	1.58	0.99	0.385	2.510	1.58	22.31	2.820	62.902	0.10	1.00	1		
7.136	5	Clayey Silt to Silty Clay	12.18	0.21	0.428		0.428	2.58	1.53	0.99	0.384	2.580	1.53	18.64	3.206	59.753	0.10	1.00	1		
7.628	5	Clayey Silt to Silty Clay	14.99	0.37	0.458		0.458	2.61	1.48	0.98	0.384							1.00	1		
8.12	4	Silty Clay to Clay	13.57	0.46	0.487	0.001	0.487	2.7	1.43	0.98	0.383							1.00	1		
8.612	4	Silty Clay to Clay	8.9	0.22	0.517	0.016	0.501	2.78	1.41	0.98	0.395							1.00	1		
9.104	5	Clayey Silt to Silty Clay	9.07	0.18	0.546	0.031	0.515	2.73	1.39	0.98	0.406							1.00	1		
9.596	5	Clayey Silt to Silty Clay	9.5	0.22	0.576	0.047	0.529	2.76	1.37	0.98	0.416							1.00	1		
10.088	5	Clayey Silt to Silty Clay	9.96	0.22	0.605	0.062	0.543	2.74	1.36	0.98	0.425							1.00	1		
10.581	5	Clayey Silt to Silty Clay	13.46	0.29	0.635	0.077	0.557	2.64	1.34	0.98	0.435							1.00	1		
11.073	7	Silty Sand to Sandy Silt	63.69	0.86	0.664	0.093	0.572	2.06	1.32	0.98	0.442	2.060	1.32	84.07	1.387	116.583	0.23	1.00	1	0.51	20.3
11.565	7	Silty Sand to Sandy Silt	61.48	1.23	0.694	0.108	0.586	2.19	1.31	0.98	0.451	2.190	1.31	80.54	1.643	132.295	0.30	1.00	1	0.66	19.6
12.057	6	Sandy Silt to Clayey Silt	40.97	0.89	0.723	0.124	0.6	2.35	1.29	0.97	0.458	2.350	1.29	52.85	2.120	112.026	0.21	1.00	1	0.46	15.7
12.549	6	Sandy Silt to Clayey Silt	41.29	1.19	0.753	0.139	0.614	2.44	1.28	0.97	0.466	2.440	1.28	52.85	2.483	131.237	0.29	1.00	1	0.62	15.8
13.041	7	Silty Sand to Sandy Silt	65.63	0.81	0.782	0.154	0.628	2.04	1.26	0.97	0.472	2.040	1.26	82.69	1.356	112.123	0.21	1.00	1	0.45	20.9
13.533	7	Silty Sand to Sandy Silt	50.85	0.96	0.812	0.17	0.642	2.25	1.25	0.97	0.479	2.250	1.25	63.56	1.798	114.302	0.22	1.00	1	0.46	16.2
14.025	6	Sandy Silt to Clayey Silt	25.79	0.54	0.842	0.185	0.657	2.52	1.23	0.97	0.485	2.520	1.23	31.72	2.872	91.093	0.15	1.00	1	0.31	9.9
14.518	5	Clayey Silt to Silty Clay	16.31	0.48	0.871	0.2	0.671	2.72	1.22	0.97	0.491							1.00	1		
15.01	5	Clayey Silt to Silty Clay	14.01	0.42	0.901	0.216	0.685	2.79	1.21	0.97	0.497							1.00	1		
15.502	5	Clayey Silt to Silty Clay	13.03	0.35	0.93	0.231	0.699	2.8	1.2	0.97	0.502							1.00	1		
15.994	4	Silty Clay to Clay	11.86	0.35	0.96	0.246	0.713	2.86	1.18	0.97	0.507							1.00	1		
16.486	4	Silty Clay to Clay	11.45	0.37	0.989	0.262	0.727	2.91	1.17	0.97	0.512							1.00	1		
16.978	4	Silty Clay to Clay	12.44	0.47	1.019	0.277	0.742	2.93	1.16	0.96	0.516							1.00	1		
17.47	4	Silty Clay to Clay	11.24	0.41	1.048	0.293	0.756	2.96	1.15	0.96	0.521							1.00	1		
17.962	4	Silty Clay to Clay	11.01	0.35	1.078	0.308	0.77	2.95	1.14	0.96	0.525							1.00	1		
18.454	4	Silty Clay to Clay	10.35	0.32	1.107	0.323	0.784	2.97	1.13	0.96	0.529							1.00	1		
18.947	5	Clayey Silt to Silty Clay	13.27	0.39	1.137	0.339	0.798	2.86	1.12	0.96	0.533							1.00	1		
19.439	4	Silty Clay to Clay	14.22	0.46	1.166	0.354	0.812	2.87	1.11	0.96	0.537							1.00	1		
19.931	3	Clay	12.41	0.5	1.196	0.369	0.826	2.99	1.1	0.96	0.540							1.00	1		
20.423	4	Silty Clay to Clay	13.31	0.48	1.225	0.385	0.841	2.94	1.09	0.96	0.543							1.00	1		
20.915	3	Clay	11.93	0.46	1.255	0.4	0.855	3.01	1.08	0.95	0.546							1.00	1		
21.407	4	Silty Clay to Clay	12.67	0.48	1.284	0.415	0.869	2.98	1.07	0.95	0.549							1.00	1		
21.899	5	Clayey Silt to Silty Clay	14.01	0.44	1.314	0.431	0.883	2.9	1.06	0.95	0.552							1.00	1		
22.391	4	Silty Clay to Clay	13.59	0.49	1.344	0.446	0.897	2.96	1.06	0.95	0.555							1.00	1		
22.884	3	Clay	12.23	0.47	1.373	0.462	0.911	3.03	1.05	0.95	0.558							1.00	1		
23.376	4	Silty Clay to Clay	13.46	0.5	1.403	0.477	0.926	2.98	1.04	0.95	0.560							1.00	1		
23.868	4	Silty Clay to Clay	14.78	0.52	1.432	0.492	0.94	2.94	1.03	0.95	0.562							1.00	1		
24.36	5	Clayey Silt to Silty Clay	14.63	0.4	1.462	0.508	0.954	2.88	1.02	0.94	0.564							1.00	1		
24.852	5	Clayey Silt to Silty Clay	17.84	0.46	1.491	0.523	0.968	2.79	1.02	0.94	0.566							1.00	1		
25.344	5	Clayey Silt to Silty Clay	15.91	0.41	1.521	0.538	0.982	2.85	1.01	0.94	0.568							1.00	1		
25.836	5	Clayey Silt to Silty Clay	16.48	0.53	1.55	0.554	0.996	2.89	1	0.94	0.570							1.00	1		
26.328	4	Silty Clay to Clay	15.46	0.51	1.58	0.569	1.011	2.93	0.99	0.94	0.571							1.00	1		
26.821	5	Clayey Silt to Silty Clay	14.57	0.46	1.609	0.585	1.025	2.95	0.99	0.93	0.572							0.99	1		
27.313	5	Clayey Silt to Silty Clay	23.21	0.59	1.639	0.6	1.039	2.71	0.98	0.93	0.574							0.99	1		
27.805	6	Sandy Silt to Clayey Silt	54.64	1.45	1.668	0.615	1.053	2.41	0.97	0.93	0.575	2.410	0.97	53.00	2.354	124.745	0.26	0.99	1	0.45	21
28.297	4	Silty Clay to Clay	24.74	1.02	1.698	0.631	1.067	2.83	0.97	0.93	0.576							0.98	1		
28.789	5	Clayey Silt to Silty Clay	20.46	0.59	1.727	0.646	1.081	2.82	0.96	0.93	0.577							0.98	1		
29.281	4	Silty Clay to Clay	16.06	0.54	1.757	0.661	1.096	2.96	0.96	0.92	0.578							0.97	1		
29.773	4	Silty Clay to Clay	16.93	0.59	1.786	0.677	1.11	2.95	0.95	0.92	0.578							0.97	1		
30.265	5	Clayey Silt to Silty Clay	17.59	0.57	1.816	0.692	1.124	2.92	0.94	0.92	0.579							0.97	1		
30.758	5	Clayey Silt to Silty Clay	21.08	0.55	1.845	0.707	1.138	2.8	0.94	0.92	0.580							0.96	1		
31.25	5	Clayey Silt to Silty Clay	16.91	0.48	1.875	0.723	1.152	2.91	0.93	0.91	0.580							0.96	1		
31.742	5	Clayey Silt to Silty Clay	17.18	0.5	1.905	0.738	1.166	2.92	0.93	0.91	0.581							0.95	1		
32.234	5	Clayey Silt to Silty Clay	16.8	0.48	1.934	0.754	1.181	2.93	0.92	0.91	0.580							0.95	1		
32.726	5	Clayey Silt to Silty Clay	16.4	0.48	1.964	0.769	1.195	2.95	0.91	0.91	0.580							0.95	1		
33.218	5	Clayey Silt to Silty Clay	16.63	0.54	1.993	0.784	1.209	2.98	0.91	0.90	0.580							0.94	1		
33.71	5	Clayey Silt to Silty Clay	16.97	0.51	2.023	0.8	1.223	2.95	0.9	0.90	0.580							0.94	1		
34.202	5	Clayey Silt to Silty Clay	17.1	0.56	2.052	0.815	1.237	2.98	0.9	0.90	0.580							0.94	1		
34.694	4	Silty Clay to Clay	17.78	0.62	2.082	0.83	1.251	2.98	0.89	0.89	0.579							0.94	1		
35.187	5	Clayey Silt to Silty Clay	18.37	0.52	2.111	0.846	1.266	2.92	0.89	0.89	0.578							0.93	1		
35.679	5	Clayey Silt to Silty Clay	19.19	0.51	2.141	0.861	1.28	2.89	0.88	0.89	0.578							0.93	1		
36.171	5	Clayey Silt to Silty Clay	17.18	0.56	2.17	0.876	1.294	2.99	0.88	0.88	0.577							0.93	1		
36.663	4	Silty Clay to Clay	15.29	0.54	2.2	0.892	1.308	3.07	0.87	0.88	0.576							0.92	1		
37.155	4	Silty Clay to Clay	15.44	0.54	2.229	0.907	1.322	3.07	0.87	0.87	0.575							0.92	1		
37.647	5	Clayey Silt to Silty Clay	16.29	0.53	2.259	0.923	1.336	3.03	0.87	0.87	0.574							0.92	1		
38.139	5	Clayey Silt to Silty Clay	15.85	0.46	2.288	0.938	1.35	3.02	0.86	0.87	0.573							0.91	1		
38.631	5	Clayey Silt to Silty Clay	17.38	0.55	2.318	0.953	1.365	3.01	0.86	0.86	0.571							0.91	1		
39.124	4	Silty Clay to Clay	18.74	0.69	2.347	0.969	1.379	3.02	0.85	0.86	0.570							0.91	1		
39.616	4	Silty Clay to Clay	22	0.84	2.377	0.984	1.393	2.97	0.85	0.85	0.569							0.91	1		
40.108	5	Clayey Silt to Silty Clay	23.55	0.87	2.407	0.999	1.407	2.93	0.84	0.85	0.567							0.90	1		
40.6	4	Silty Clay to Clay	20.27	0.79	2.436	1.015	1.421	3.02	0.84	0.85	0.565							0.90	1		
41.092	5	Clayey Silt to Silty Clay	21.02	0.6	2.466	1.03	1.435	2.93	0.83	0.84	0.564							0.90	1		
41.584	5	Clayey Silt to Silty Clay	17.95	0.51	2.495	1.045	1.45	3	0.83	0.84	0.561							0.89	1		
42.076	6	Sandy Silt to Clayey Silt	19.57	0.39	2.525	1.061	1.464	2.88	0.83	0.83	0.560							0.93	1		
42.568	6	Sandy Silt to Clayey Silt	16.65	0.3	2.554	1.076	1.478	2.93	0.82	0.83	0.558							0.92	1		
43.061	6	Sandy Silt to Clayey Silt	14.39	0.19	2.584	1.092	1.492	2.94	0.82	0.82	0.556							0.92	1		
43.553	6	Sandy Silt to Clayey Silt	16.02	0.15	2.613	1.107	1.506	2.82	0.81	0.82	0.553							0.92	1		
44.045	6	Sandy Silt to Clayey Silt	18.31	0.2	2.643	1.122	1.52	2.79	0.81	0.81	0.551							0.92	1		
44.537	6	Sandy Silt to Clayey Silt	15.67	0.23	2.672	1.138	1.535	2.93	0.81	0.81	0.549							0.92	1		
45.029	6	Sandy Silt to Clayey Silt	26.4	0.33	2.702	1.153	1.549	2.66	0.8	0.80	0.547							0.92	1		
45.521	6	Sandy Silt to Clayey Silt	30.7	0.51	2.731	1.168	1.563	2.67	0.8	0.80	0.544							0.91	1		
46.013	7	Silty Sand to Sandy Silt	70.12	1.1	2.761	1.184	1.577	2.25	0.8	0.79	0.542	2.250	0.80	56.10	1.798	100.875	0.18	0.89	1	0.32	22.4
46.505	6	Sandy Silt to Clayey Silt	59.18	1.8	2.79	1.199	1.591	2.5	0.79	0.79	0.539	2.500	0.79	46.75	2.768	129.431	0.28	0.90	1	0.52	22.6
46.997	8	Sand to Silty Sand	168.65	3.3	2.82	1.214	1.605	2.04	0.79	0.78	0.537	2.040	0.79	133.23	1.356	180.649		0.84	1		
47.49	6	Sandy Silt to Clayey Silt	171.16	5.38	2.849	1.23	1.62	2.19	0.79	0.78	0.534	2.190	0.79	135.22	1.643	222.110		0.83	1		
47.982	7	Silty Sand to Sandy Silt	114.18	2.44	2.879	1.245	1.634	2.18	0.78	0.77	0.531	2.180	0.78	89.06	1.619	144.203	0.36	0.86	1	0.68	36.4
48.474	5	Clayey Silt to Silty Clay	27.73	0.92	2.908	1.261	1.648	2.91	0.78	0.77	0.529							0.86	1		
48.966	5	Clayey Silt to Silty Clay	19.84	0.6	2.938	1.276	1.662	3.04	0.78	0.76	0.526							0.86	1		
49.458	5	Clayey Silt to Silty Clay	21.46	0.6	2.968	1.291	1.676	2.98	0.77	0.76	0.524							0.86	1		
49.95	5	Clayey Silt to Silty Clay	26.55	0.7	2.997	1.307	1.69	2.88	0.77	0.75	0.521							0.85	1		
50.442	6	Sandy Silt to Clayey Silt	25.11	0.52	3.027	1.322	1.705	2.85	0.77	0.75	0.518							0.90	1		
50.934	5	Clayey Silt to Silty Clay	23.91	0.72	3.056	1.337	1.719	2.97	0.76	0.74	0.515							0.85	1		
51.427	6	Sandy Silt to Clayey Silt	30.7	0.79	3.086	1.353	1.733	2.82	0.76	0.74	0.513							0.90	1		
51.919	5	Clayey Silt to Silty Clay	23.25	0.72	3.115	1.368	1.747	2.99	0.76	0.73	0.510							0.85	1		
52.411	5	Clayey Silt to Silty Clay	25.89	0.92	3.145	1.384	1.761	2.99	0.75	0.73	0.507							0.84	1		

LIQUEFACTION POTENTIAL ANALYSIS (per Youd & Idriss, 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
CPT NO. ***CPT-AS-28***

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.6 (Design Basis EQ)
FAULT M_w = 7.5
MSF = 1.00

			CPT RESULT INPUT							*CSR*		*$CRR_{7.5}$*						*$F.S.=(CRR_{7.5}/CSR)*MSF*K\sigma*K\alpha$*			
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.	N_{60}
52.903	5	Clayey Silt to Silty Clay	25.49	0.77	3.174	1.399	1.775	2.95	0.75	0.72	0.505							0.84	1		
53.395	6	Sandy Silt to Clayey Silt	60.71	1.68	3.204	1.414	1.79	2.48	0.75	0.72	0.502	2.480	0.75	45.53	2.669	121.542	0.25	0.88	1	0.49	23.2
53.887	5	Clayey Silt to Silty Clay	63.05	2.52	3.233	1.43	1.804	2.68	0.74	0.71	0.499							0.84	1		
54.379	5	Clayey Silt to Silty Clay	57.35	2.3	3.263	1.445	1.818	2.72	0.74	0.71	0.496							0.84	1		
54.871	5	Clayey Silt to Silty Clay	29.04	0.84	3.292	1.46	1.832	2.9	0.74	0.70	0.494							0.83	1		
55.364	5	Clayey Silt to Silty Clay	24.87	0.68	3.322	1.476	1.846	2.96	0.74	0.70	0.491							0.83	1		
55.856	5	Clayey Silt to Silty Clay	25.3	0.74	3.351	1.491	1.86	2.97	0.73	0.70	0.489							0.83	1		
56.348	5	Clayey Silt to Silty Clay	24.81	0.8	3.381	1.506	1.875	3.01	0.73	0.69	0.486							0.83	1		
56.84	4	Silty Clay to Clay	19.36	0.71	3.41	1.522	1.889	3.16	0.73	0.69	0.483							0.83	1		
57.332	6	Sandy Silt to Clayey Silt	27.34	0.67	3.44	1.537	1.903	2.9	0.73	0.68	0.481							0.88	1		
57.824	6	Sandy Silt to Clayey Silt	32.56	0.77	3.47	1.553	1.917	2.82	0.72	0.68	0.478							0.88	1		
58.316	5	Clayey Silt to Silty Clay	36.71	1.31	3.499	1.568	1.931	2.88	0.72	0.67	0.476							0.82	1		
58.808	5	Clayey Silt to Silty Clay	29.11	1	3.529	1.583	1.945	2.97	0.72	0.67	0.473							0.82	1		
59.3	6	Sandy Silt to Clayey Silt	45.16	1.03	3.558	1.599	1.959	2.68	0.71	0.67	0.471							0.87	1		
59.793	6	Sandy Silt to Clayey Silt	67.87	1.89	3.588	1.614	1.974	2.47	0.71	0.66	0.469	2.470	0.71	48.19	2.621	126.315	0.27	0.86	1	0.57	26
60.285	5	Clayey Silt to Silty Clay	96.74	3.71	3.617	1.629	1.988	2.45	0.71	0.66	0.466	2.450	0.71	68.69	2.528	173.652		0.81	2		
60.777	4	Silty Clay to Clay	57.52	2.75	3.647	1.645	2.002	2.81	0.71	0.65	0.464							0.81	3		
61.269	5	Clayey Silt to Silty Clay	100.51	4.06	3.676	1.66	2.016	2.46	0.7	0.65	0.462	2.460	0.70	70.36	2.574	181.118		0.81	4		
61.761	6	Sandy Silt to Clayey Silt	124.97	4.05	3.706	1.675	2.03	2.32	0.7	0.65	0.459	2.320	0.70	87.48	2.015	176.233		0.80	5		
62.253	4	Silty Clay to Clay	49.96	2.22	3.735	1.691	2.044	2.85	0.7	0.64	0.457							0.81	6		
62.745	11	Sitff Fine-Grained	99.59	4.5	3.765	1.706	2.059	2.61	0.7	0.64	0.455							0.82	7		
63.237	11	Sitff Fine-Grained	103.55	4.73	3.794	1.722	2.073	2.61	0.69	0.63	0.453							0.81	8		
63.73	3	Clay	46.14	2.35	3.824	1.737	2.087	2.92	0.69	0.63	0.451							0.80	9		
64.222	6	Sandy Silt to Clayey Silt	51.53	1.53	3.853	1.752	2.101	2.73	0.69	0.63	0.449							0.86	10		
64.714	6	Sandy Silt to Clayey Silt	30.24	0.7	3.883	1.768	2.115	2.89	0.69	0.62	0.447							0.86	11		
65.206	6	Sandy Silt to Clayey Silt	25.34	0.38	3.912	1.783	2.129	2.88	0.69	0.62	0.445							0.86	12		
65.698	5	Clayey Silt to Silty Clay	33.73	1.05	3.942	1.798	2.144	2.92	0.68	0.62	0.443							0.80	13		
66.19	6	Sandy Silt to Clayey Silt	44.95	1.35	3.971	1.814	2.158	2.8	0.68	0.61	0.441							0.86	14		
66.682	5	Clayey Silt to Silty Clay	27.21	0.74	4.001	1.829	2.172	2.99	0.68	0.61	0.439							0.79	15		
67.174	5	Clayey Silt to Silty Clay	28.41	0.94	4.031	1.844	2.186	3.03	0.68	0.61	0.437							0.79	16		
67.666	6	Sandy Silt to Clayey Silt	113.48	3.25	4.06	1.86	2.2	2.33	0.67	0.61	0.436	2.330	0.67	76.03	2.049	155.769	0.43	0.79	17	0.99	43.4
68.159	9	Sand	340.34	3.9	4.09	1.875	2.214	1.7	0.67	0.60	0.434	1.700	0.67	228.03	1.038	236.660		0.73	18		
68.651	9	Sand	314.53	4.5	4.119	1.891	2.229	1.8	0.67	0.60	0.432	1.800	0.67	210.74	1.107	233.212		0.73	19		
69.143	9	Sand	380.69	3.86	4.149	1.906	2.243	1.63	0.67	0.60	0.430	1.630	0.67	255.06	1.000	255.062		0.72	20		
69.635	9	Sand	324.39	3.31	4.178	1.921	2.257	1.68	0.67	0.59	0.429	1.680	0.67	217.34	1.024	222.614		0.72	21		
70.127	9	Sand	293.56	2.99	4.208	1.937	2.271	1.72	0.66	0.59	0.427	1.720	0.66	193.75	1.051	203.694		0.72	22		
70.619	8	Sand to Silty Sand	239.96	4.49	4.237	1.952	2.285	1.97	0.66	0.59	0.426	1.970	0.66	158.37	1.263	199.982		0.72	23		
71.111	7	Silty Sand to Sandy Silt	204.45	6.17	4.267	1.967	2.299	2.18	0.66	0.59	0.424	2.180	0.66	134.94	1.619	218.485		0.73	24		
71.603	12	Sand to Clayey Sand	227.27	7.14	4.296	1.983	2.314	2.16	0.66	0.58	0.423	2.160	0.66	150.00	1.574	236.136		0.72	25		
72.096	11	Sitff Fine-Grained	142.5	6.89	4.326	1.998	2.328	2.44	0.66	0.58	0.421	2.440	0.66	94.05	2.483	233.539		0.76	26		
72.588	5	Clayey Silt to Silty Clay	84.36	3.55	4.355	2.013	2.342	2.69	0.65	0.58	0.420							0.77	27		
73.08	5	Clayey Silt to Silty Clay	38.62	1.38	4.385	2.029	2.356	2.94	0.65	0.58	0.418							0.77	28		
73.572	6	Sandy Silt to Clayey Silt	39.73	0.92	4.414	2.044	2.37	2.82	0.65	0.57	0.417							0.84	29		
74.064	6	Sandy Silt to Clayey Silt	43.16	1.13	4.444	2.06	2.384	2.82	0.65	0.57	0.416							0.84	30		
74.556	6	Sandy Silt to Clayey Silt	44.25	0.95	4.473	2.075	2.399	2.76	0.65	0.57	0.414							0.84	31		
75.048	6	Sandy Silt to Clayey Silt	52.25	1.35	4.503	2.09	2.413	2.74	0.64	0.57	0.413							0.84	32		
75.54	11	Sitff Fine-Grained	84.21	4	4.533	2.106	2.427	2.74	0.64	0.57	0.412							0.80	33		
76.033	4	Silty Clay to Clay	38.69	1.68	4.562	2.121	2.441	3.01	0.64	0.56	0.411							0.77	34		
76.525	6	Sandy Silt to Clayey Silt	31.07	0.62	4.592	2.136	2.455	2.91	0.64	0.56	0.409							0.84	35		
77.017	6	Sandy Silt to Clayey Silt	29.66	0.48	4.621	2.152	2.469	2.89	0.64	0.56	0.408							0.83	36		
77.509	6	Sandy Silt to Clayey Silt	56.45	1.8	4.651	2.167	2.483	2.78	0.63	0.56	0.407							0.83	37		
78.001	6	Sandy Silt to Clayey Silt	82.13	2.94	4.68	2.183	2.498	2.67	0.63	0.56	0.406							0.80	38		
78.493	12	Sand to Clayey Sand	126.34	4.89	4.71	2.198	2.512	2.41	0.63	0.55	0.405	2.410	0.63	79.59	2.354	187.337		0.76	39		
78.985	8	Sand to Silty Sand	295.75	5.71	4.739	2.213	2.526	1.94	0.63	0.55	0.404	1.940	0.63	186.32	1.229	228.988		0.69	40		
79.477	8	Sand to Silty Sand	353.37	6.13	4.769	2.229	2.54	1.85	0.63	0.55	0.403	1.850	0.63	222.62	1.145	254.922		0.69	41		
79.97	9	Sand	285.34	3.97	4.798	2.244	2.554	1.84	0.63	0.55	0.402	1.840	0.63	179.76	1.137	204.398		0.69	42		
80.462	9	Sand	243.26	3.23	4.828	2.259	2.568	1.87	0.62	0.55	0.401	1.870	0.62	150.82	1.162	175.230		0.69	43		
80.954	8	Sand to Silty Sand	125.23	1.73	4.857	2.275	2.583	2.1	0.62	0.54	0.400	2.100	0.62	77.64	1.455	112.951	0.21	0.75	44	0.54	30
81.446	6	Sandy Silt to Clayey Silt	28.51	0.68	4.887	2.29	2.597	3.02	0.62	0.54	0.399							0.83	45		
81.938	7	Silty Sand to Sandy Silt	33.56	0.38	4.916	2.305	2.611	2.76	0.62	0.54	0.398							0.83	46		
82.43	7	Silty Sand to Sandy Silt	31.24	0.42	4.946	2.321	2.625	2.83	0.62	0.54	0.397							0.82	47		
82.922	6	Sandy Silt to Clayey Silt	32.79	0.58	4.975	2.336	2.639	2.86	0.62	0.54	0.396							0.82	48		
83.414	6	Sandy Silt to Clayey Silt	37.35	0.86	5.005	2.352	2.653	2.87	0.61	0.54	0.395							0.82	49		
83.906	7	Silty Sand to Sandy Silt	58.75	1.28	5.035	2.367	2.668	2.69	0.61	0.54	0.394							0.82	50		
84.399	6	Sandy Silt to Clayey Silt	56.15	1.31	5.064	2.382	2.682	2.73	0.61	0.53	0.393							0.82	51		
84.891	6	Sandy Silt to Clayey Silt	38.5	0.72	5.094	2.398	2.696	2.83	0.61	0.53	0.393							0.82	52		
85.383	6	Sandy Silt to Clayey Silt	35.97	0.65	5.123	2.413	2.71	2.85	0.61	0.53	0.392							0.82	53		
85.875	6	Sandy Silt to Clayey Silt	31.41	0.55	5.153	2.428	2.724	2.9	0.61	0.53	0.391							0.82	54		
86.367	6	Sandy Silt to Clayey Silt	29.77	0.47	5.182	2.444	2.738	2.9	0.6	0.53	0.390							0.82	55		
86.859	6	Sandy Silt to Clayey Silt	46.14	0.97	5.212	2.459	2.753	2.78	0.6	0.53	0.389							0.82	56		
87.351	6	Sandy Silt to Clayey Silt	51.7	1.25	5.241	2.474	2.767	2.77	0.6	0.53	0.389							0.82	57		
87.843	6	Sandy Silt to Clayey Silt	46.27	1.24	5.271	2.49	2.781	2.84	0.6	0.52	0.388							0.82	58		
88.336	6	Sandy Silt to Clayey Silt	46.81	1.09	5.3	2.505	2.795	2.8	0.6	0.52	0.387							0.81	59		
88.828	6	Sandy Silt to Clayey Silt	42.8	1.35	5.33	2.521	2.809	2.92	0.6	0.52	0.386							0.81	60		
89.32	4	Silty Clay to Clay	47.31	2.18	5.359	2.536	2.823	2.99	0.6	0.52	0.386							0.73	61		
89.812	3	Clay	45.08	2.47	5.389	2.551	2.838	3.06	0.59	0.52	0.385							0.73	62		
90.304	4	Silty Clay to Clay	37.95	1.85	5.418	2.567	2.852	3.1	0.59	0.52	0.384							0.73	63		
90.796	5	Clayey Silt to Silty Clay	35.41	1.12	5.448	2.582	2.866	3.01	0.59	0.52	0.384							0.73	64		
91.288	6	Sandy Silt to Clayey Silt	36.16	1.03	5.477	2.597	2.88	2.97	0.59	0.52	0.383							0.81	65		
91.78	6	Sandy Silt to Clayey Silt	36.37	1.03	5.507	2.613	2.894	2.97	0.59	0.52	0.382							0.81	66		
92.273	6	Sandy Silt to Clayey Silt	38.92	1.02	5.536	2.628	2.908	2.94	0.59	0.51	0.382							0.81	67		
92.765	6	Sandy Silt to Clayey Silt	65.74	1.99	5.566	2.643	2.923	2.76	0.59	0.51	0.381							0.81	68		
93.257	5	Clayey Silt to Silty Clay	65.52	2.96	5.596	2.659	2.937	2.88	0.58	0.51	0.380							0.72	69		
93.749	6	Sandy Silt to Clayey Silt	38.99	1.03	5.625	2.674	2.951	2.95	0.58	0.51	0.380							0.81	70		
94.241	6	Sandy Silt to Clayey Silt	109.52	3.17	5.655	2.69	2.965	2.39	0.58	0.51	0.379	2.390	0.58	63.52	2.272	144.322	0.36	0.75	71	0.95	
94.733	7	Silty Sand to Sandy Silt	214.15	5.46	5.684	2.705	2.979	2.15	0.58	0.51	0.379	2.150	0.58	124.21	1.553	192.867		0.67	72		
95.225	12	Sand to Clayey Sand	158.15	6.24	5.714	2.72	2.993	2.38	0.58	0.51	0.378	2.380	0.58	91.73	2.233	204.788		0.70	73		
95.717	11	Sitff Fine-Grained	73.7	3.44	5.743	2.736	3.008	2.86	0.58	0.51	0.377							0.79	74		
96.209	5	Clayey Silt to Silty Clay	41.01	1.33	5.773	2.751	3.022	3	0.58	0.51	0.377							0.72	75		
96.702	6	Sandy Silt to Clayey Silt	46.12	1.37	5.802	2.766	3.036	2.93	0.57	0.50	0.376							0.80	76		
97.194	6	Sandy Silt to Clayey Silt	59.66	1.33	5.832	2.782	3.05	2.75	0.57	0.50	0.376							0.80	77		
97.686	6	Sandy Silt to Clayey Silt	62.9	1.85	5.861	2.797	3.064	2.8	0.57	0.50	0.375							0.80	78		
98.178	6	Sandy Silt to Clayey Silt	54.47	1.47	5.891	2.812	3.078	2.83	0.57	0.50	0.375							0.80	79		
98.67	6	Sandy Silt to Clayey Silt	47.45	1.35	5.92	2.828	3.092	2.9	0.57	0.50	0.374							0.80	80		
99.162	6	Sandy Silt to Clayey Silt	42.36	1.03	5.95	2.843	3.107	2.91	0.57	0.50	0.373							0.80	81		
99.654	6	Sandy Silt to Clayey Silt	32.9	0.6	5.979	2.859	3.121	2.96	0.57	0.50	0.373							0.80	82		

LIQUEFACTION POTENTIAL ANALYSIS (per Youd & Idriss, 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
CPT NO. ***CPT-AS-30***

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.6 (Design Basis EQ)

FAULT M_w = 7.5
MSF = 1.00

			CPT RESULT INPUT							*CSR*		*CRR 7.5*						*F.S.=(CRR 7.5/CSR)*MSF*Kσ*Kα*		
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.
0.246	6	Sandy Silt to Clayey Silt	18.16	0.18	0.015		0.015	-9999	2	1.00	0.390							1.00	1	
0.738	6	Sandy Silt to Clayey Silt	14.59	0.21	0.044		0.044	2.14	2	1.00	0.390	2.140	1.70	24.80	1.532	37.997	0.08	1.00	1	
1.23	6	Sandy Silt to Clayey Silt	16.25	0.16	0.074		0.074	2.1	2	1.00	0.390	2.100	1.70	27.63	1.455	40.188	0.08	1.00	1	
1.722	1	Sensitive Fines	7.82	0.05	0.103		0.103	2.35	2	1.00	0.389	2.350	1.70	13.29	2.120	28.179	0.07	1.00	1	
2.215	1	Sensitive Fines	5.11	0.04	0.133		0.133	2.59	2	1.00	0.389	2.590	1.70	8.69	3.266	28.372	0.07	1.00	1	
2.707	1	Sensitive Fines	4.51	0.06	0.162		0.162	2.61	2	1.00	0.388							1.00	1	
3.199	6	Sandy Silt to Clayey Silt	15.99	0.2	0.192		0.192	2.33	2	0.99	0.388	2.330	1.70	27.18	2.049	55.691	0.10	1.00	1	
3.691	5	Clayey Silt to Silty Clay	8.26	0.09	0.221		0.221	2.56	2	0.99	0.387	2.560	1.70	14.04	3.091	43.398	0.09	1.00	1	
4.183	1	Sensitive Fines	8.8	0.07	0.251		0.251	2.5	2	0.99	0.387	2.500	1.70	14.96	2.768	41.416	0.08	1.00	1	
4.675	5	Clayey Silt to Silty Clay	10.41	0.23	0.281		0.281	2.58	1.89	0.99	0.386	2.580	1.70	17.70	3.206	56.745	0.10	1.00	1	
5.167	5	Clayey Silt to Silty Clay	9.01	0.18	0.31		0.31	2.64	1.8	0.99	0.386							1.00	1	
5.659	5	Clayey Silt to Silty Clay	8.6	0.09	0.34		0.34	2.53	1.72	0.99	0.386	2.530	1.70	14.62	2.925	42.760	0.09	1.00	1	
6.152	1	Sensitive Fines	4.62	0.04	0.369		0.369	2.69	1.65	0.99	0.385							1.00	1	
6.644	1	Sensitive Fines	4.38	0.03	0.399		0.399	2.68	1.58	0.99	0.385							1.00	1	
7.136	1	Sensitive Fines	5.36	0.04	0.428		0.428	2.66	1.53	0.99	0.384							1.00	1	
7.628	5	Clayey Silt to Silty Clay	8.84	0.1	0.458		0.458	2.62	1.48	0.98	0.384							1.00	1	
8.12	1	Sensitive Fines	5.71	0.07	0.487		0.487	2.78	1.43	0.98	0.383							1.00	1	
8.612	1	Sensitive Fines	5.2	0.07	0.517		0.517	2.88	1.39	0.98	0.383							1.00	1	
9.104	1	Sensitive Fines	5.15	0.08	0.546		0.546	2.95	1.35	0.98	0.383							1.00	1	
9.596	1	Sensitive Fines	4.09	0.03	0.576		0.576	2.94	1.32	0.98	0.382							1.00	1	
10.088	1	Sensitive Fines	6.15	0.06	0.605		0.605	2.82	1.29	0.98	0.382							1.00	1	
10.581	5	Clayey Silt to Silty Clay	9.2	0.08	0.635		0.635	2.63	1.26	0.98	0.381							1.00	1	
11.073	6	Sandy Silt to Clayey Silt	20.31	0.29	0.664		0.664	2.5	1.23	0.98	0.381	2.500	1.23	24.98	2.768	69.159	0.11	1.00	1	
11.565	6	Sandy Silt to Clayey Silt	33.22	0.72	0.694		0.694	2.45	1.2	0.98	0.381	2.450	1.20	39.86	2.528	100.785	0.18	1.00	1	
12.057	6	Sandy Silt to Clayey Silt	42.97	1.1	0.723		0.723	2.41	1.18	0.97	0.380	2.410	1.18	50.70	2.354	119.341	0.24	1.00	1	
12.549	7	Silty Sand to Sandy Silt	61.71	0.97	0.753		0.753	2.16	1.15	0.97	0.380	2.160	1.15	70.97	1.574	111.720	0.21	1.00	1	
13.041	7	Silty Sand to Sandy Silt	62.01	1.17	0.782	0.004	0.778	2.22	1.13	0.97	0.381	2.220	1.13	70.07	1.717	120.325	0.24	1.00	1	0.63
13.533	5	Clayey Silt to Silty Clay	21.25	0.51	0.812	0.02	0.792	2.62	1.12	0.97	0.389							1.00	1	
14.025	6	Sandy Silt to Clayey Silt	29.56	0.67	0.842	0.035	0.806	2.53	1.11	0.97	0.395	2.530	1.11	32.81	2.925	95.966	0.16	1.00	1	0.41
14.518	6	Sandy Silt to Clayey Silt	25.47	0.44	0.871	0.051	0.821	2.51	1.1	0.97	0.401	2.510	1.10	28.02	2.820	78.994	0.13	1.00	1	0.31
15.01	4	Silty Clay to Clay	10.18	0.28	0.901	0.066	0.835	2.97	1.09	0.97	0.408							1.00	1	
15.502	5	Clayey Silt to Silty Clay	9.73	0.21	0.93	0.081	0.849	2.94	1.09	0.97	0.413							1.00	1	
15.994	4	Silty Clay to Clay	7.88	0.19	0.96	0.097	0.863	3.07	1.08	0.97	0.419							1.00	1	
16.486	4	Silty Clay to Clay	7.37	0.2	0.989	0.112	0.877	3.13	1.07	0.97	0.425							1.00	1	
16.978	4	Silty Clay to Clay	7.9	0.23	1.019	0.127	0.891	3.13	1.06	0.96	0.430							1.00	1	
17.47	3	Clay	7.9	0.25	1.048	0.143	0.906	3.16	1.05	0.96	0.434							1.00	1	
17.962	4	Silty Clay to Clay	8.88	0.23	1.078	0.158	0.92	3.06	1.04	0.96	0.440							1.00	1	
18.454	4	Silty Clay to Clay	13.24	0.4	1.107	0.173	0.934	2.94	1.03	0.96	0.444							1.00	1	
18.947	4	Silty Clay to Clay	17.25	0.64	1.137	0.189	0.948	2.89	1.03	0.96	0.449							1.00	1	
19.439	5	Clayey Silt to Silty Clay	16.65	0.5	1.166	0.204	0.962	2.86	1.02	0.96	0.453							1.00	1	
19.931	5	Clayey Silt to Silty Clay	13.59	0.37	1.196	0.22	0.976	2.92	1.01	0.96	0.457							1.00	1	
20.423	4	Silty Clay to Clay	13.35	0.47	1.225	0.235	0.991	3	1	0.96	0.461							1.00	1	
20.915	3	Clay	16.02	0.78	1.255	0.25	1.005	3.02	1	0.95	0.465							1.00	1	
21.407	3	Clay	14.76	0.63	1.284	0.266	1.019	3.02	0.99	0.95	0.468							0.99	1	
21.899	4	Silty Clay to Clay	16.93	0.62	1.314	0.281	1.033	2.93	0.98	0.95	0.472							0.99	1	
22.391	3	Clay	15.41	0.67	1.344	0.296	1.047	3.02	0.98	0.95	0.476							0.99	1	
22.884	3	Clay	11.82	0.57	1.373	0.312	1.061	3.16	0.97	0.95	0.479							0.98	1	
23.376	3	Clay	9.26	0.41	1.403	0.327	1.075	3.26	0.96	0.95	0.482							0.98	1	
23.868	3	Clay	9.86	0.36	1.432	0.342	1.09	3.19	0.96	0.95	0.485							0.97	1	
24.36	4	Silty Clay to Clay	11.24	0.39	1.462	0.358	1.104	3.12	0.95	0.94	0.488							0.97	1	
24.852	4	Silty Clay to Clay	12.05	0.44	1.491	0.373	1.118	3.11	0.95	0.94	0.490							0.97	1	
25.344	4	Silty Clay to Clay	14.16	0.46	1.521	0.389	1.132	3.02	0.94	0.94	0.493							0.96	1	
25.836	5	Clayey Silt to Silty Clay	32.22	0.92	1.55	0.404	1.146	2.66	0.93	0.94	0.495							0.96	1	
26.328	5	Clayey Silt to Silty Clay	26.13	0.8	1.58	0.419	1.16	2.76	0.93	0.94	0.498							0.96	1	
26.821	5	Clayey Silt to Silty Clay	16.59	0.43	1.609	0.435	1.175	2.9	0.92	0.93	0.499							0.95	1	
27.313	5	Clayey Silt to Silty Clay	14.11	0.35	1.639	0.45	1.189	2.97	0.92	0.93	0.502							0.95	1	
27.805	5	Clayey Silt to Silty Clay	14.22	0.41	1.668	0.465	1.203	3.01	0.91	0.93	0.503							0.95	1	
28.297	4	Silty Clay to Clay	14.61	0.46	1.698	0.481	1.217	3.03	0.91	0.93	0.505							0.94	1	
28.789	5	Clayey Silt to Silty Clay	13.82	0.32	1.727	0.496	1.231	2.98	0.9	0.93	0.507							0.94	1	
29.281	6	Sandy Silt to Clayey Silt	30.28	0.56	1.757	0.511	1.245	2.55	0.9	0.92	0.509	2.550	0.90	27.25	3.034	82.689	0.13	0.96	1	0.26
29.773	6	Sandy Silt to Clayey Silt	23.61	0.53	1.786	0.527	1.26	2.75	0.89	0.92	0.510							0.95	1	
30.265	5	Clayey Silt to Silty Clay	16.33	0.46	1.816	0.542	1.274	2.97	0.89	0.92	0.511							0.93	1	
30.758	4	Silty Clay to Clay	15.95	0.55	1.845	0.558	1.288	3.04	0.88	0.92	0.512							0.93	1	
31.25	5	Clayey Silt to Silty Clay	16.06	0.48	1.875	0.573	1.302	3	0.88	0.91	0.513							0.92	1	
31.742	5	Clayey Silt to Silty Clay	15.07	0.43	1.905	0.588	1.316	3.02	0.87	0.91	0.514							0.92	1	
32.234	5	Clayey Silt to Silty Clay	14.99	0.31	1.934	0.604	1.33	2.95	0.87	0.91	0.515							0.92	1	
32.726	4	Silty Clay to Clay	14.31	0.5	1.964	0.619	1.345	3.11	0.86	0.91	0.516							0.91	1	
33.218	4	Silty Clay to Clay	13.52	0.46	1.993	0.634	1.359	3.13	0.86	0.90	0.516							0.91	1	
33.71	4	Silty Clay to Clay	14.59	0.47	2.023	0.65	1.373	3.09	0.85	0.90	0.517							0.91	1	
34.202	4	Silty Clay to Clay	14.48	0.55	2.052	0.665	1.387	3.14	0.85	0.90	0.517							0.91	1	
34.694	4	Silty Clay to Clay	13.71	0.49	2.082	0.68	1.401	3.15	0.84	0.89	0.517							0.90	1	
35.187	5	Clayey Silt to Silty Clay	15.08	0.45	2.111	0.696	1.415	3.07	0.84	0.89	0.517							0.90	1	
35.679	4	Silty Clay to Clay	17.86	0.62	2.141	0.711	1.43	3.03	0.84	0.89	0.517							0.90	1	
36.171	4	Silty Clay to Clay	17.82	0.65	2.17	0.727	1.444	3.05	0.83	0.88	0.517							0.90	1	
36.663	4	Silty Clay to Clay	17.97	0.65	2.2	0.742	1.458	3.05	0.83	0.88	0.517							0.89	1	
37.155	4	Silty Clay to Clay	18.7	0.71	2.229	0.757	1.472	3.05	0.82	0.87	0.517							0.89	1	
37.647	4	Silty Clay to Clay	18.74	0.74	2.259	0.773	1.486	3.07	0.82	0.87	0.516							0.89	1	
38.139	5	Clayey Silt to Silty Clay	18.08	0.38	2.288	0.788	1.5	2.93	0.82	0.87	0.516							0.89	1	
38.631	6	Sandy Silt to Clayey Silt	26.36	0.41	2.318	0.803	1.515	2.7	0.81	0.86	0.515							0.92	1	
39.124	6	Sandy Silt to Clayey Silt	25.79	0.44	2.347	0.819	1.529	2.73	0.81	0.86	0.514							0.92	1	
39.616	6	Sandy Silt to Clayey Silt	16.27	0.19	2.377	0.834	1.543	2.85	0.81	0.85	0.513							0.92	1	
40.108	6	Sandy Silt to Clayey Silt	11.75	0.12	2.407	0.85	1.557	3	0.8	0.85	0.513							0.92	1	
40.6	5	Clayey Silt to Silty Clay	15.03	0.29	2.436	0.865	1.571	3	0.8	0.85	0.511							0.87	1	
41.092	5	Clayey Silt to Silty Clay	14.2	0.34	2.466	0.88	1.585	3.09	0.79	0.84	0.510							0.87	1	
41.584	5	Clayey Silt to Silty Clay	11.78	0.24	2.495	0.896	1.6	3.15	0.79	0.84	0.509							0.87	1	
42.076	5	Clayey Silt to Silty Clay	14.1	0.25	2.525	0.911	1.614	3.02	0.79	0.83	0.508							0.87	1	
42.568	6	Sandy Silt to Clayey Silt	30.19	0.82	2.554	0.926	1.628	2.8	0.78	0.83	0.506							0.91	1	
43.061	6	Sandy Silt to Clayey Silt	27.36	0.71	2.584	0.942	1.642	2.84	0.78	0.82	0.505							0.91	1	
43.553	6	Sandy Silt to Clayey Silt	44.25	0.98	2.613	0.957	1.656	2.61	0.78	0.82	0.503							0.90	1	
44.045	5	Clayey Silt to Silty Clay	17.38	0.39	2.643	0.972	1.67	3.01	0.77	0.81	0.502							0.86	1	
44.537	5	Clayey Silt to Silty Clay	16.76	0.38	2.672	0.988	1.684	3.04	0.77	0.81	0.500							0.86	1	
45.029	5	Clayey Silt to Silty Clay	15.78	0.33	2.702	1.003	1.699	3.06	0.77	0.80	0.498							0.85	1	
45.521	6	Sandy Silt to Clayey Silt	21.7	0.32	2.731	1.019	1.713	2.82	0.76	0.80	0.496							0.90	1	
46.013	6	Sandy Silt to Clayey Silt	19.91	0.41	2.761	1.034	1.727	2.95	0.76	0.79	0.495							0.90	1	
46.505	6	Sandy Silt to Clayey Silt	29.34	0.76	2.79	1.049	1.741	2.83	0.76	0.79	0.493							0.90	1	
46.997	6	Sandy Silt to Clayey Silt	57.2	1.63	2.82	1.065	1.755	2.61	0.75	0.78	0.491							0.89	1	
47.49	6	Sandy Silt to Clayey Silt	43.27	1.34	2.849	1.08	1.769	2.74	0.75	0.78	0.489							0.89	1	
47.982	5	Clayey Silt to Silty Clay	33.98	1.04	2.879	1.095	1.784	2.83	0.75	0.77	0.487							0.84	1	
48.474	4	Silty Clay to Clay	36.46	1.5	2.908	1.111	1.798	2.89	0.75	0.77	0.485							0.84	1	
48.966	5	Clayey Silt to Silty Clay	34.5	1.27	2.938	1.126	1.812	2.88	0.74	0.76	0.483							0.84	1	
49.458	6	Sandy Silt to Clayey Silt	50.12	1.35	2.968	1.141	1.826	2.66	0.74	0.76	0.481							0.89	1	
49.95	5	Clayey Silt to Silty Clay	33.77	1.02	2.997	1.157	1.84	2.84	0.74	0.75	0.478							0.83	1	
50.442	5	Clayey Silt to Silty Clay	51.08	1.88	3.027	1.172	1.854	2.74	0.73	0.75	0.476							0.83	1	
50.934	8	Sand to Silty Sand	120.82	1.49	3.056	1.188	1.869	2.02	0.73	0.74	0.474	2.020	0.73	88.20	1.327	117.041	0.23	0.82	1	0.48

LIQUEFACTION POTENTIAL ANALYSIS (per Youd & Idriss, 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
CPT NO. ***CPT-AS-30***

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.6 (Design Basis EQ)

FAULT M_w = 7.5
MSF = 1.00

			CPT RESULT INPUT							*CSR*		*CRR 7.5*						*F.S.=(CRR 7.5/CSR)*MSF*Kσ*Kα*		
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.
51.427	7	Silty Sand to Sandy Silt	108.66	1.97	3.086	1.203	1.883	2.17	0.73	0.74	0.472	2.170	0.73	79.32	1.596	126.628	0.27	0.83	1	0.57
51.919	6	Sandy Silt to Clayey Silt	78.85	2.49	3.115	1.218	1.897	2.45	0.73	0.73	0.470	2.450	0.73	57.56	2.528	145.525	0.37	0.85	1	0.78
52.411	5	Clayey Silt to Silty Clay	30.89	1.21	3.145	1.234	1.911	2.97	0.72	0.73	0.468							0.82	1	
52.903	5	Clayey Silt to Silty Clay	22.46	0.54	3.174	1.249	1.925	2.99	0.72	0.72	0.465							0.82	1	
53.395	6	Sandy Silt to Clayey Silt	23.38	0.38	3.204	1.264	1.939	2.88	0.72	0.72	0.463							0.88	1	
53.887	6	Sandy Silt to Clayey Silt	25.53	0.38	3.233	1.28	1.954	2.82	0.72	0.71	0.461							0.87	1	
54.379	6	Sandy Silt to Clayey Silt	23.55	0.41	3.263	1.295	1.968	2.9	0.71	0.71	0.459							0.87	1	
54.871	7	Silty Sand to Sandy Silt	29.62	0.34	3.292	1.31	1.982	2.7	0.71	0.70	0.456							0.87	1	
55.364	6	Sandy Silt to Clayey Silt	33.37	0.54	3.322	1.326	1.996	2.73	0.71	0.70	0.454							0.87	1	
55.856	6	Sandy Silt to Clayey Silt	36.63	0.61	3.351	1.341	2.01	2.7	0.71	0.70	0.452							0.87	1	
56.348	7	Silty Sand to Sandy Silt	41.99	0.75	3.381	1.357	2.024	2.66	0.7	0.69	0.450							0.87	1	
56.84	8	Sand to Silty Sand	112.96	1.71	3.41	1.372	2.039	2.12	0.7	0.69	0.448	2.120	0.70	79.07	1.492	117.988	0.23	0.81	1	0.52
57.332	5	Clayey Silt to Silty Clay	63.93	2.51	3.44	1.387	2.053	2.72	0.7	0.68	0.446							0.81	1	
57.824	7	Silty Sand to Sandy Silt	178.15	4.53	3.47	1.403	2.067	2.14	0.7	0.68	0.444	2.140	0.70	124.71	1.532	191.043		0.77	1	
58.316	6	Sandy Silt to Clayey Silt	87.26	2.8	3.499	1.418	2.081	2.43	0.69	0.67	0.442	2.430	0.69	60.21	2.439	146.852	0.37	0.83	1	0.85
58.808	5	Clayey Silt to Silty Clay	39.76	1.58	3.529	1.433	2.095	2.91	0.69	0.67	0.440							0.80	1	
59.3	6	Sandy Silt to Clayey Silt	74.33	2.65	3.558	1.449	2.109	2.65	0.69	0.67	0.438							0.84	1	
59.793	5	Clayey Silt to Silty Clay	58.99	2.21	3.588	1.464	2.124	2.75	0.69	0.66	0.435							0.80	1	
60.285	6	Sandy Silt to Clayey Silt	68.03	1.64	3.617	1.479	2.138	2.44	0.68	0.66	0.433	2.440	0.68	46.26	2.483	114.871	0.22	0.84	2	0.51
60.777	5	Clayey Silt to Silty Clay	29.02	1	3.647	1.495	2.152	3.01	0.68	0.65	0.432							0.79	3	
61.269	6	Sandy Silt to Clayey Silt	41.42	1.1	3.676	1.51	2.166	2.79	0.68	0.65	0.430							0.86	4	
61.761	6	Sandy Silt to Clayey Silt	35.41	0.87	3.706	1.526	2.18	2.84	0.68	0.65	0.428							0.86	5	
62.253	6	Sandy Silt to Clayey Silt	27.07	0.48	3.735	1.541	2.194	2.88	0.68	0.64	0.426							0.85	6	
62.745	6	Sandy Silt to Clayey Silt	26.64	0.43	3.765	1.556	2.208	2.87	0.67	0.64	0.424							0.85	7	
63.237	6	Sandy Silt to Clayey Silt	41.95	0.86	3.794	1.572	2.223	2.73	0.67	0.63	0.422							0.85	8	
63.73	6	Sandy Silt to Clayey Silt	32.58	0.84	3.824	1.587	2.237	2.9	0.67	0.63	0.421							0.85	9	
64.222	6	Sandy Silt to Clayey Silt	24.64	0.52	3.853	1.602	2.251	2.98	0.67	0.63	0.419							0.85	10	
64.714	6	Sandy Silt to Clayey Silt	20.4	0.32	3.883	1.618	2.265	3.01	0.66	0.62	0.417							0.85	11	
65.206	6	Sandy Silt to Clayey Silt	18.1	0.28	3.912	1.633	2.279	3.07	0.66	0.62	0.416							0.85	12	
65.698	7	Silty Sand to Sandy Silt	25.94	0.3	3.942	1.649	2.293	2.83	0.66	0.62	0.414							0.85	13	
66.19	6	Sandy Silt to Clayey Silt	22.98	0.29	3.971	1.664	2.308	2.91	0.66	0.61	0.412							0.85	14	
66.682	6	Sandy Silt to Clayey Silt	22.34	0.28	4.001	1.679	2.322	2.92	0.66	0.61	0.411							0.84	15	
67.174	6	Sandy Silt to Clayey Silt	20.97	0.32	4.031	1.695	2.336	2.99	0.65	0.61	0.409							0.84	16	
67.666	6	Sandy Silt to Clayey Silt	21.74	0.37	4.06	1.71	2.35	3	0.65	0.61	0.408							0.84	17	
68.159	6	Sandy Silt to Clayey Silt	25.59	0.44	4.09	1.725	2.364	2.92	0.65	0.60	0.406							0.84	18	
68.651	6	Sandy Silt to Clayey Silt	27.26	0.58	4.119	1.741	2.378	2.94	0.65	0.60	0.405							0.84	19	
69.143	6	Sandy Silt to Clayey Silt	25.6	0.53	4.149	1.756	2.393	2.96	0.65	0.60	0.403							0.84	20	
69.635	6	Sandy Silt to Clayey Silt	29.94	0.71	4.178	1.771	2.407	2.92	0.64	0.59	0.402							0.84	21	
70.127	6	Sandy Silt to Clayey Silt	27.96	0.74	4.208	1.787	2.421	2.99	0.64	0.59	0.401							0.84	22	
70.619	5	Clayey Silt to Silty Clay	26.94	0.76	4.237	1.802	2.435	3.02	0.64	0.59	0.399							0.77	23	
71.111	6	Sandy Silt to Clayey Silt	33.62	0.57	4.267	1.818	2.449	2.82	0.64	0.59	0.398							0.84	24	
71.603	5	Clayey Silt to Silty Clay	38.65	1.42	4.296	1.833	2.463	2.95	0.64	0.58	0.397							0.76	25	
72.096	7	Silty Sand to Sandy Silt	163.66	3.91	4.326	1.848	2.478	2.18	0.64	0.58	0.396	2.180	0.64	104.74	1.619	169.595		0.74	26	
72.588	7	Silty Sand to Sandy Silt	161.07	3.57	4.355	1.864	2.492	2.16	0.63	0.58	0.394	2.160	0.63	101.47	1.574	159.747	0.46	0.74	27	1.16
73.08	5	Clayey Silt to Silty Clay	35.54	1.37	4.385	1.879	2.506	3.02	0.63	0.58	0.393							0.76	28	
73.572	6	Sandy Silt to Clayey Silt	26.21	0.34	4.414	1.894	2.52	2.91	0.63	0.57	0.392							0.83	29	
74.064	6	Sandy Silt to Clayey Silt	28.45	0.54	4.444	1.91	2.534	2.95	0.63	0.57	0.391							0.83	30	
74.556	6	Sandy Silt to Clayey Silt	38.11	0.95	4.473	1.925	2.548	2.89	0.63	0.57	0.390							0.83	31	
75.048	6	Sandy Silt to Clayey Silt	44.54	1.15	4.503	1.94	2.563	2.83	0.62	0.57	0.389							0.83	32	
75.54	6	Sandy Silt to Clayey Silt	67.86	1.76	4.533	1.956	2.577	2.66	0.62	0.57	0.388							0.82	33	
76.033	6	Sandy Silt to Clayey Silt	65.5	2.11	4.562	1.971	2.591	2.74	0.62	0.56	0.387							0.82	34	
76.525	6	Sandy Silt to Clayey Silt	95.52	3.1	4.592	1.987	2.605	2.61	0.62	0.56	0.386							0.78	35	
77.017	6	Sandy Silt to Clayey Silt	30.64	0.8	4.621	2.002	2.619	3.01	0.62	0.56	0.385							0.82	36	
77.509	6	Sandy Silt to Clayey Silt	27.13	0.63	4.651	2.017	2.633	3.04	0.62	0.56	0.384							0.82	37	
78.001	6	Sandy Silt to Clayey Silt	33.45	0.87	4.68	2.033	2.648	2.97	0.61	0.56	0.383							0.82	38	
78.493	5	Clayey Silt to Silty Clay	31.64	0.94	4.71	2.048	2.662	3.03	0.61	0.55	0.382							0.75	39	
78.985	6	Sandy Silt to Clayey Silt	43.76	1.05	4.739	2.063	2.676	2.84	0.61	0.55	0.381							0.82	40	
79.477	6	Sandy Silt to Clayey Silt	29.09	0.75	4.769	2.079	2.69	3.04	0.61	0.55	0.380							0.82	41	
79.97	6	Sandy Silt to Clayey Silt	23.15	0.23	4.798	2.094	2.704	2.96	0.61	0.55	0.379							0.82	42	
80.462	7	Silty Sand to Sandy Silt	28.3	0.35	4.828	2.109	2.718	2.89	0.61	0.55	0.379							0.82	43	
80.954	6	Sandy Silt to Clayey Silt	40.5	0.73	4.857	2.125	2.732	2.81	0.61	0.54	0.378							0.82	44	
81.446	6	Sandy Silt to Clayey Silt	41.97	1.2	4.887	2.14	2.747	2.91	0.6	0.54	0.377							0.82	45	
81.938	6	Sandy Silt to Clayey Silt	31.66	0.84	4.916	2.156	2.761	3.02	0.6	0.54	0.376							0.82	46	
82.43	6	Sandy Silt to Clayey Silt	68.67	2.35	4.946	2.171	2.775	2.76	0.6	0.54	0.375							0.81	47	
82.922	6	Sandy Silt to Clayey Silt	90.54	3.38	4.975	2.186	2.789	2.69	0.6	0.54	0.375							0.78	48	
83.414	7	Silty Sand to Sandy Silt	192.16	6.06	5.005	2.202	2.803	2.24	0.6	0.54	0.374	2.240	0.60	115.30	1.770	204.130		0.70	49	
83.906	11	Sitff Fine-Grained	99.68	4.68	5.035	2.217	2.817	2.73	0.6	0.54	0.373							0.77	50	
84.399	6	Sandy Silt to Clayey Silt	40.52	1.25	5.064	2.232	2.832	2.96	0.59	0.53	0.372							0.81	51	
84.891	5	Clayey Silt to Silty Clay	39.52	1.39	5.094	2.248	2.846	3.01	0.59	0.53	0.372							0.73	52	
85.383	4	Silty Clay to Clay	40.4	1.77	5.123	2.263	2.86	3.06	0.59	0.53	0.371							0.73	53	
85.875	5	Clayey Silt to Silty Clay	36.13	1.42	5.153	2.278	2.874	3.08	0.59	0.53	0.371							0.73	54	
86.367	5	Clayey Silt to Silty Clay	34.56	1.16	5.182	2.294	2.888	3.06	0.59	0.53	0.370							0.73	55	
86.859	6	Sandy Silt to Clayey Silt	34.28	0.96	5.212	2.309	2.902	3.02	0.59	0.53	0.369							0.81	56	
87.351	6	Sandy Silt to Clayey Silt	31.69	0.7	5.241	2.325	2.917	3	0.59	0.53	0.369							0.81	57	
87.843	5	Clayey Silt to Silty Clay	50.66	1.87	5.271	2.34	2.931	2.93	0.58	0.52	0.368							0.72	58	
88.336	6	Sandy Silt to Clayey Silt	64.63	2.1	5.3	2.355	2.945	2.8	0.58	0.52	0.367							0.81	59	
88.828	5	Clayey Silt to Silty Clay	62.69	2.4	5.33	2.371	2.959	2.86	0.58	0.52	0.367							0.72	60	
89.32	5	Clayey Silt to Silty Clay	93.9	3.77	5.359	2.386	2.973	2.72	0.58	0.52	0.366							0.72	61	
89.812	7	Silty Sand to Sandy Silt	163.43	4.49	5.389	2.401	2.987	2.25	0.58	0.52	0.366	2.250	0.58	94.79	1.798	170.455		0.70	62	
90.304	7	Silty Sand to Sandy Silt	158.66	4.84	5.418	2.417	3.002	2.29	0.58	0.52	0.365	2.290	0.58	92.02	1.917	176.412		0.70	63	
90.796	8	Sand to Silty Sand	166.16	2.55	5.448	2.432	3.016	2.06	0.58	0.52	0.364	2.060	0.58	96.37	1.387	133.643	0.30	0.70	64	0.83
91.288	9	Sand	234.21	2.13	5.477	2.448	3.03	1.8	0.57	0.52	0.364	1.800	0.57	133.50	1.107	147.739	0.38	0.66	65	1.04
91.78	8	Sand to Silty Sand	210.53	3.84	5.507	2.463	3.044	2.05	0.57	0.52	0.363	2.050	0.57	120.00	1.371	164.529		0.67	66	
92.273	8	Sand to Silty Sand	240.6	4.64	5.536	2.478	3.058	2.02	0.57	0.51	0.363	2.020	0.57	137.14	1.327	181.989		0.65	67	
92.765	12	Sand to Clayey Sand	176.63	6.38	5.566	2.494	3.072	2.32	0.57	0.51	0.362	2.320	0.57	100.68	2.015	202.825		0.69	68	
93.257	5	Clayey Silt to Silty Clay	72.57	3.31	5.596	2.509	3.087	2.87	0.57	0.51	0.362							0.71	69	
93.749	4	Silty Clay to Clay	52.17	2.5	5.625	2.524	3.101	3.01	0.57	0.51	0.361							0.71	70	
94.241	6	Sandy Silt to Clayey Silt	48.08	1.4	5.655	2.54	3.115	2.91	0.57	0.51	0.361							0.80	71	
94.733	6	Sandy Silt to Clayey Silt	47.66	1.3	5.684	2.555	3.129	2.9	0.57	0.51	0.360							0.80	72	
95.225	6	Sandy Silt to Clayey Silt	50.83	1.22	5.714	2.57	3.143	2.84	0.56	0.51	0.360							0.80	73	
95.717	6	Sandy Silt to Clayey Silt	43.93	1.24	5.743	2.586	3.157	2.95	0.56	0.51	0.359							0.79	74	
96.209	5	Clayey Silt to Silty Clay	62.63	2.57	5.773	2.601	3.172	2.9	0.56	0.51	0.359							0.71	75	
96.702	6	Sandy Silt to Clayey Silt	166.37	5.25	5.802	2.617	3.186	2.3	0.56	0.50	0.358	2.300	0.56	93.17	1.949	181.558		0.69	76	
97.194	12	Sand to Clayey Sand	164.07	5.74	5.832	2.632	3.2	2.34	0.56	0.50	0.358	2.340	0.56	91.88	2.084	191.455		0.69	77	
97.686	5	Clayey Silt to Silty Clay	84.65	3.54	5.861	2.647	3.214	2.8	0.56	0.50	0.358							0.70	78	
98.178	5	Clayey Silt to Silty Clay	53.94	2.13	5.891	2.663	3.228	2.96	0.56	0.50	0.357							0.70	79	
98.67	6	Sandy Silt to Clayey Silt	41.97	1.21	5.92	2.678	3.242	2.99	0.56	0.50	0.357							0.79	80	
99.162	6	Sandy Silt to Clayey Silt	45.97	1.38	5.95	2.693	3.257	2.96	0.55	0.50	0.356							0.79	81	
99.654	5	Clayey Silt to Silty Clay	43.82	1.57	5.979	2.709	3.271	3.03	0.55	0.50	0.356							0.70	82	

LIQUEFACTION POTENTIAL ANALYSIS (per Youd & Idriss, 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
CPT NO. ***CPT-AS-42***

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.6 (Design Basis EQ)

FAULT M_w = 7.5
MSF = 1.00

			CPT RESULT INPUT							*CSR*		*CRR 7.5*						*F.S.=(CRR 7.5/CSR)*MSF*Kσ*Kα*		
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.
0.492					0.03		0.03	-9999	2	1.00	0.390							1.00	1	
1.476					0.089		0.089	-9999	2	1.00	0.389							1.00	1	
2.461					0.148		0.148	-9999	2	1.00	0.389							1.00	1	
3.445					0.207		0.207	-9999	2	0.99	0.388							1.00	1	
4.429					0.266		0.266	-9999	1.94	0.99	0.387							1.00	1	
5.413	3	Clay	17.9	1.07	0.325		0.325	2.65	1.75	0.99	0.386							1.00	1	
6.398	3	Clay	18.64	1.31	0.384		0.384	2.74	1.61	0.99	0.385							1.00	1	
7.382	3	Clay	19.24	1.11	0.443		0.443	2.71	1.5	0.98	0.384							1.00	1	
8.366	4	Silty Clay to Clay	35.59	1.58	0.502		0.502	2.58	1.41	0.98	0.383	2.580	1.41	50.18	3.206	160.906		1.00	1	
9.35	4	Silty Clay to Clay	31.72	1.4	0.561		0.561	2.59	1.34	0.98	0.382	2.590	1.34	42.50	3.266	138.822	0.33	1.00	1	
10.335	3	Clay	18.45	0.94	0.62		0.62	2.8	1.27	0.98	0.382							1.00	1	
11.319	3	Clay	11.59	0.54	0.679		0.679	2.97	1.21	0.98	0.381							1.00	1	
12.303	3	Clay	11.3	0.48	0.738		0.738	2.98	1.16	0.97	0.380							1.00	1	
13.287	3	Clay	12.69	0.61	0.797	0.009	0.788	2.99	1.13	0.97	0.383							1.00	1	
14.271	3	Clay	10.04	0.38	0.856	0.04	0.817	3.03	1.11	0.97	0.396							1.00	1	
15.256	3	Clay	11.13	0.49	0.915	0.07	0.845	3.04	1.09	0.97	0.409							1.00	1	
16.24	3	Clay	10.84	0.46	0.974	0.101	0.873	3.06	1.07	0.97	0.420							1.00	1	
17.224	3	Clay	12.18	0.62	1.033	0.132	0.902	3.08	1.05	0.96	0.430							1.00	1	
18.208	3	Clay	12.05	0.61	1.093	0.163	0.93	3.1	1.04	0.96	0.441							1.00	1	
19.193	3	Clay	9.17	0.44	1.152	0.193	0.958	3.21	1.02	0.96	0.450							1.00	1	
20.177	4	Silty Clay to Clay	17.59	0.62	1.211	0.224	0.987	2.87	1.01	0.96	0.458							1.00	1	
21.161	5	Clayey Silt to Silty Clay	33.75	1.07	1.27	0.255	1.015	2.62	0.99	0.95	0.465							1.00	1	
22.145	4	Silty Clay to Clay	18.21	0.76	1.329	0.286	1.043	2.92	0.98	0.95	0.473							0.99	1	
23.13	5	Clayey Silt to Silty Clay	12.85	0.34	1.388	0.316	1.072	2.95	0.97	0.95	0.479							0.98	1	
24.114	3	Clay	17.07	0.76	1.447	0.347	1.1	2.99	0.95	0.94	0.485							0.97	1	
25.098	4	Silty Clay to Clay	20.41	0.81	1.506	0.378	1.128	2.9	0.94	0.94	0.490							0.96	1	
26.082	4	Silty Clay to Clay	27.28	1.22	1.565	0.408	1.157	2.84	0.93	0.94	0.495							0.96	1	
27.067	3	Clay	29.59	1.45	1.624	0.439	1.185	2.85	0.92	0.93	0.499							0.95	1	
28.051	4	Silty Clay to Clay	31.36	1.29	1.683	0.47	1.213	2.79	0.91	0.93	0.503							0.94	1	
29.035	5	Clayey Silt to Silty Clay	29.71	1.07	1.742	0.501	1.241	2.77	0.9	0.93	0.507							0.94	1	
30.019	7	Silty Sand to Sandy Silt	99.95	2.09	1.801	0.531	1.27	2.18	0.89	0.92	0.509	2.180	0.89	88.96	1.619	144.034	0.36	0.93	1	0.70
31.004	8	Sand to Silty Sand	154.55	2.56	1.86	0.562	1.298	1.97	0.88	0.92	0.512	1.970	0.88	136.00	1.263	171.735		0.91	1	
31.988	5	Clayey Silt to Silty Clay	55.65	1.98	1.919	0.593	1.326	2.53	0.87	0.91	0.514	2.530	0.87	48.42	2.925	141.604	0.34	0.92	1	0.67
32.972	5	Clayey Silt to Silty Clay	29.81	0.89	1.978	0.624	1.355	2.75	0.86	0.90	0.515							0.91	1	
33.956	6	Sandy Silt to Clayey Silt	24.85	0.65	2.037	0.654	1.383	2.79	0.85	0.90	0.516							0.94	1	
34.941	6	Sandy Silt to Clayey Silt	38.03	1.17	2.096	0.685	1.411	2.68	0.84	0.89	0.516							0.93	1	
35.925	5	Clayey Silt to Silty Clay	96.77	3.86	2.156	0.716	1.44	2.41	0.83	0.88	0.516	2.410	0.83	80.32	2.354	189.043		0.90	1	
36.909	11	Sitff Fine-Grained	68.83	3.27	2.215	0.747	1.468	2.63	0.83	0.88	0.516							0.91	1	
37.893	7	Silty Sand to Sandy Silt	174.6	3.53	2.274	0.777	1.496	2.02	0.82	0.87	0.515	2.020	0.82	143.17	1.327	189.991		0.86	1	
38.877	7	Silty Sand to Sandy Silt	155.56	4.48	2.333	0.808	1.525	2.18	0.81	0.86	0.514	2.180	0.81	126.00	1.619	204.021		0.86	1	
39.862	6	Sandy Silt to Clayey Silt	80.93	2.54	2.392	0.839	1.553	2.4	0.8	0.85	0.512	2.400	0.80	64.74	2.312	149.712	0.39	0.89	1	0.77
40.846	5	Clayey Silt to Silty Clay	54.75	2.01	2.451	0.869	1.581	2.66	0.8	0.84	0.510							0.87	1	
41.83	12	Sand to Clayey Sand	132.51	5.03	2.51	0.9	1.61	2.32	0.79	0.83	0.507	2.320	0.79	104.68	2.015	210.891		0.85	1	
42.814	7	Silty Sand to Sandy Silt	141.78	2.9	2.569	0.931	1.638	2.1	0.78	0.83	0.505	2.100	0.78	110.59	1.455	160.879		0.84	1	
43.799	6	Sandy Silt to Clayey Silt	46.06	1.35	2.628	0.962	1.666	2.67	0.77	0.82	0.502							0.90	1	
44.783	5	Clayey Silt to Silty Clay	18.35	0.5	2.687	0.992	1.695	3.02	0.77	0.81	0.498							0.85	1	
45.767	6	Sandy Silt to Clayey Silt	23.07	0.56	2.746	1.023	1.723	2.88	0.76	0.80	0.495							0.90	1	
46.751	6	Sandy Silt to Clayey Silt	25.65	0.52	2.805	1.054	1.751	2.81	0.76	0.79	0.491							0.89	1	
47.736	6	Sandy Silt to Clayey Silt	29.4	0.62	2.864	1.085	1.78	2.77	0.75	0.78	0.487							0.89	1	
48.72	6	Sandy Silt to Clayey Silt	41.35	1.26	2.923	1.115	1.808	2.75	0.74	0.77	0.483							0.89	1	
49.704	5	Clayey Silt to Silty Clay	30.22	1.11	2.982	1.146	1.836	2.93	0.74	0.76	0.479							0.83	1	
50.688	6	Sandy Silt to Clayey Silt	19.41	0.43	3.041	1.177	1.865	2.97	0.73	0.75	0.474							0.88	1	
51.673	5	Clayey Silt to Silty Clay	47.88	1.69	3.1	1.207	1.893	2.75	0.73	0.74	0.470							0.83	1	
52.657	5	Clayey Silt to Silty Clay	27.72	1.05	3.159	1.238	1.921	2.99	0.72	0.73	0.466							0.82	1	
53.641	5	Clayey Silt to Silty Clay	23.41	0.65	3.219	1.269	1.95	2.97	0.72	0.72	0.461							0.82	1	
54.625	5	Clayey Silt to Silty Clay	26.3	0.89	3.278	1.3	1.978	2.98	0.71	0.71	0.457							0.81	1	
55.61	5	Clayey Silt to Silty Clay	26.64	0.74	3.337	1.33	2.006	2.94	0.71	0.70	0.453							0.81	1	
56.594	6	Sandy Silt to Clayey Silt	20.95	0.43	3.396	1.361	2.035	2.96	0.7	0.69	0.448							0.87	1	
57.578	6	Sandy Silt to Clayey Silt	26.12	0.52	3.455	1.392	2.063	2.87	0.7	0.68	0.444							0.87	1	
58.562	6	Sandy Silt to Clayey Silt	24.65	0.55	3.514	1.423	2.091	2.93	0.69	0.67	0.440							0.86	1	

LIQUEFACTION POTENTIAL ANALYSIS (per Youd & Idriss, 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
CPT NO. ***CPT-AS-42A***

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.6 (Design Basis EQ)

FAULT M_w = 7.5
MSF = 1.00

			CPT RESULT INPUT							*CSR*		*CRR 7.5*						*F.S.=(CRR 7.5/CSR)*MSF*Kσ*Kα*		
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.
0.492					0.03		0.03	-9999	2	1.00	0.390							1.00	1	
1.476					0.089		0.089	-9999	2	1.00	0.389							1.00	1	
2.461					0.148		0.148	-9999	2	1.00	0.389							1.00	1	
3.445					0.207		0.207	-9999	2	0.99	0.388							1.00	1	
4.429					0.266		0.266	-9999	1.94	0.99	0.387							1.00	1	
5.413	3	Clay	24.13	1.7	0.325		0.325	-9999	1.75	0.99	0.386							1.00	1	
6.398	3	Clay	23.02	1.56	0.384		0.384	-9999	1.61	0.99	0.385							1.00	1	
7.382	3	Clay	22.91	1.24	0.443		0.443	2.64	1.5	0.98	0.384							1.00	1	
8.366	4	Silty Clay to Clay	36.95	1.54	0.502		0.502	2.55	1.41	0.98	0.383	2.550	1.41	52.10	3.034	158.082	0.45	1.00	1	
9.35	4	Silty Clay to Clay	38.34	1.75	0.561		0.561	2.59	1.34	0.98	0.382	2.590	1.34	51.38	3.266	167.795		1.00	1	
10.335	4	Silty Clay to Clay	20.43	0.81	0.62		0.62	2.69	1.27	0.98	0.382							1.00	1	
11.319	3	Clay	14.52	0.63	0.679		0.679	2.86	1.21	0.98	0.381							1.00	1	
12.303	4	Silty Clay to Clay	11.1	0.41	0.738		0.738	2.94	1.16	0.97	0.380							1.00	1	
13.287	3	Clay	12.12	0.58	0.797	0.009	0.788	3.01	1.13	0.97	0.383							1.00	1	
14.271	3	Clay	11.58	0.5	0.856	0.04	0.817	3.01	1.11	0.97	0.396							1.00	1	
15.256	4	Silty Clay to Clay	8.31	0.25	0.915	0.07	0.845	3.06	1.09	0.97	0.409							1.00	1	
16.24	4	Silty Clay to Clay	8.13	0.22	0.974	0.101	0.873	3.05	1.07	0.97	0.420							1.00	1	
17.224	3	Clay	12.58	0.54	1.033	0.132	0.902	3.02	1.05	0.96	0.430							1.00	1	
18.208	3	Clay	11.59	0.47	1.093	0.163	0.93	3.06	1.04	0.96	0.441							1.00	1	
19.193	3	Clay	10.97	0.43	1.152	0.193	0.958	3.08	1.02	0.96	0.450							1.00	1	
20.177	5	Clayey Silt to Silty Clay	12.24	0.34	1.211	0.224	0.987	2.94	1.01	0.96	0.458							1.00	1	
21.161	6	Sandy Silt to Clayey Silt	25.83	0.66	1.27	0.255	1.015	2.65	0.99	0.95	0.465							1.00	1	
22.145	4	Silty Clay to Clay	18.18	0.66	1.329	0.286	1.043	2.89	0.98	0.95	0.473							0.99	1	
23.13	5	Clayey Silt to Silty Clay	20.48	0.5	1.388	0.316	1.072	2.74	0.97	0.95	0.479							0.98	1	
24.114	4	Silty Clay to Clay	22.95	0.99	1.447	0.347	1.1	2.87	0.95	0.94	0.485							0.97	1	
25.098	4	Silty Clay to Clay	19.45	0.84	1.506	0.378	1.128	2.95	0.94	0.94	0.490							0.96	1	
26.082	3	Clay	26.5	1.34	1.565	0.408	1.157	2.89	0.93	0.94	0.495							0.96	1	
27.067	3	Clay	30.25	1.56	1.624	0.439	1.185	2.86	0.92	0.93	0.499							0.95	1	
28.051	4	Silty Clay to Clay	33.07	1.43	1.683	0.47	1.213	2.78	0.91	0.93	0.503							0.94	1	
29.035	5	Clayey Silt to Silty Clay	31.43	1.15	1.742	0.501	1.241	2.76	0.9	0.93	0.507							0.94	1	
30.019	6	Sandy Silt to Clayey Silt	85.7	2.59	1.801	0.531	1.27	2.34	0.89	0.92	0.509	2.340	0.89	76.27	2.084	158.935	0.45	0.93	1	0.89
31.004	8	Sand to Silty Sand	200.79	3.46	1.86	0.562	1.298	1.91	0.88	0.92	0.512	1.910	0.88	176.70	1.198	211.753		0.90	1	
31.988	8	Sand to Silty Sand	193.53	3	1.919	0.593	1.326	1.89	0.87	0.91	0.514	1.890	0.87	168.37	1.180	198.606		0.89	1	
32.972	5	Clayey Silt to Silty Clay	37.42	1.41	1.978	0.624	1.355	2.74	0.86	0.90	0.515							0.91	1	
33.956	5	Clayey Silt to Silty Clay	23.87	0.86	2.037	0.654	1.383	2.91	0.85	0.90	0.516							0.91	1	
34.941	5	Clayey Silt to Silty Clay	23.42	0.69	2.096	0.685	1.411	2.87	0.84	0.89	0.516							0.90	1	
35.925	6	Sandy Silt to Clayey Silt	78.73	2.11	2.156	0.716	1.44	2.35	0.83	0.88	0.516	2.350	0.83	65.35	2.120	138.510	0.33	0.91	1	0.63
36.909	5	Clayey Silt to Silty Clay	62.43	2.74	2.215	0.747	1.468	2.64	0.83	0.88	0.516							0.89	1	
37.893	9	Sand	223.49	2.58	2.274	0.777	1.496	1.77	0.82	0.87	0.515	1.770	0.82	183.26	1.085	198.903		0.85	1	
38.877	9	Sand	156.69	1.49	2.333	0.808	1.525	1.83	0.81	0.86	0.514	1.830	0.81	126.92	1.129	143.314	0.35	0.86	1	0.69
39.862	9	Sand	161.93	1.01	2.392	0.839	1.553	1.7	0.8	0.85	0.512	1.700	0.80	129.54	1.038	134.448	0.31	0.85	1	0.60
40.846	4	Silty Clay to Clay	23.12	1.01	2.451	0.869	1.581	3.03	0.8	0.84	0.510							0.87	1	
41.83	6	Sandy Silt to Clayey Silt	55.65	1.31	2.51	0.9	1.61	2.44	0.79	0.83	0.507	2.440	0.79	43.96	2.483	109.167	0.20	0.90	1	0.40
42.814	6	Sandy Silt to Clayey Silt	90.91	3.19	2.569	0.931	1.638	2.41	0.78	0.83	0.505	2.410	0.78	70.91	2.354	166.897		0.87	1	
43.799	3	Clay	18.88	0.83	2.628	0.962	1.666	3.14	0.77	0.82	0.502							0.86	1	
44.783	5	Clayey Silt to Silty Clay	21.7	0.58	2.687	0.992	1.695	2.95	0.77	0.81	0.498							0.85	1	
45.767	5	Clayey Silt to Silty Clay	41.46	1.56	2.746	1.023	1.723	2.79	0.76	0.80	0.495							0.85	1	
46.751	6	Sandy Silt to Clayey Silt	32.1	0.83	2.805	1.054	1.751	2.79	0.76	0.79	0.491							0.89	1	
47.736	6	Sandy Silt to Clayey Silt	45.53	1.37	2.864	1.085	1.78	2.7	0.75	0.78	0.487							0.89	1	
48.72	7	Silty Sand to Sandy Silt	145.67	4.14	2.923	1.115	1.808	2.22	0.74	0.77	0.483	2.220	0.74	107.80	1.717	185.105		0.82	1	
49.704	4	Silty Clay to Clay	60.58	2.92	2.982	1.146	1.836	2.76	0.74	0.76	0.479							0.83	1	
50.688	5	Clayey Silt to Silty Clay	19.7	0.46	3.041	1.177	1.865	3.01	0.73	0.75	0.474							0.83	1	
51.673	5	Clayey Silt to Silty Clay	34.97	1.27	3.1	1.207	1.893	2.88	0.73	0.74	0.470							0.83	1	
52.657	5	Clayey Silt to Silty Clay	49.07	2.11	3.159	1.238	1.921	2.81	0.72	0.73	0.466							0.82	1	
53.641	5	Clayey Silt to Silty Clay	23.36	0.83	3.219	1.269	1.95	3.03	0.72	0.72	0.461							0.82	1	
54.625	6	Sandy Silt to Clayey Silt	26.08	0.65	3.278	1.3	1.978	2.9	0.71	0.71	0.457							0.87	1	
55.61	6	Sandy Silt to Clayey Silt	25.88	0.62	3.337	1.33	2.006	2.9	0.71	0.70	0.453							0.87	1	
56.594	6	Sandy Silt to Clayey Silt	36.97	1.03	3.396	1.361	2.035	2.81	0.7	0.69	0.448							0.87	1	
57.578	6	Sandy Silt to Clayey Silt	29.5	0.77	3.455	1.392	2.063	2.89	0.7	0.68	0.444							0.87	1	
58.562	6	Sandy Silt to Clayey Silt	23.95	0.51	3.514	1.423	2.091	2.93	0.69	0.67	0.440							0.86	1	
59.547	6	Sandy Silt to Clayey Silt	24.46	0.42	3.573	1.453	2.12	2.87	0.69	0.66	0.436							0.86	1	
60.531	6	Sandy Silt to Clayey Silt	24.39	0.53	3.632	1.484	2.148	2.93	0.68	0.65	0.432							0.86	1	
61.515	5	Clayey Silt to Silty Clay	25.16	0.71	3.691	1.515	2.176	2.99	0.68	0.65	0.428							0.79	1	
62.499	5	Clayey Silt to Silty Clay	29.28	1.18	3.75	1.546	2.205	3.04	0.67	0.64	0.424							0.79	1	
63.483	4	Silty Clay to Clay	29.07	1.39	3.809	1.576	2.233	3.1	0.67	0.63	0.421							0.79	1	
64.468	4	Silty Clay to Clay	35.07	1.57	3.868	1.607	2.261	3	0.67	0.63	0.417							0.78	1	
65.452	5	Clayey Silt to Silty Clay	42.28	1.74	3.927	1.638	2.29	2.92	0.66	0.62	0.414							0.78	1	
66.436	12	Sand to Clayey Sand	149.15	5.94	3.986	1.668	2.318	2.36	0.66	0.61	0.411	2.360	0.66	98.44	2.156	212.274		0.76	1	
67.42	12	Sand to Clayey Sand	217.56	8.44	4.045	1.699	2.346	2.25	0.65	0.61	0.408	2.250	0.65	141.41	1.798	254.298		0.72	1	
68.405	11	Sitff Fine-Grained	77.12	5.44	4.104	1.73	2.374	2.88	0.65	0.60	0.405							0.82	1	
69.389	6	Sandy Silt to Clayey Silt	30.3	0.82	4.163	1.761	2.403	2.96	0.65	0.60	0.402							0.84	1	
70.373	6	Sandy Silt to Clayey Silt	32.83	0.81	4.222	1.791	2.431	2.9	0.64	0.59	0.400							0.84	1	
71.357	6	Sandy Silt to Clayey Silt	35.71	0.82	4.282	1.822	2.459	2.85	0.64	0.58	0.397							0.84	1	
72.342	6	Sandy Silt to Clayey Silt	30.36	0.63	4.341	1.853	2.488	2.89	0.63	0.58	0.395							0.83	1	
73.326	6	Sandy Silt to Clayey Silt	32.51	0.68	4.4	1.884	2.516	2.87	0.63	0.58	0.392							0.83	1	
74.31	6	Sandy Silt to Clayey Silt	34.29	0.84	4.459	1.914	2.544	2.89	0.63	0.57	0.390							0.83	1	
75.294	6	Sandy Silt to Clayey Silt	54.2	1.28	4.518	1.945	2.573	2.71	0.62	0.57	0.388							0.83	1	
76.279	6	Sandy Silt to Clayey Silt	41.29	1.04	4.577	1.976	2.601	2.84	0.62	0.56	0.386							0.83	1	
77.263	6	Sandy Silt to Clayey Silt	38.99	1.06	4.636	2.006	2.629	2.88	0.62	0.56	0.384							0.82	1	
78.247	11	Sitff Fine-Grained	83.97	4.6	4.695	2.037	2.658	2.81	0.61	0.55	0.382							0.79	1	
79.231	11	Sitff Fine-Grained	202.02	8.7	4.754	2.068	2.686	2.32	0.61	0.55	0.380	2.320	0.61	123.23	2.015	248.260		0.70	1	
80.216	11	Sitff Fine-Grained	151.12	8.91	4.813	2.099	2.714	2.65	0.61	0.55	0.379							0.73	1	
81.2	12	Sand to Clayey Sand	180.14	6.52	4.872	2.129	2.743	2.3	0.6	0.54	0.377	2.300	0.60	108.08	1.949	210.627		0.71	1	
82.184	11	Sitff Fine-Grained	64.38	4	4.931	2.16	2.771	2.96	0.6	0.54	0.375							0.82	1	
83.168	6	Sandy Silt to Clayey Silt	38.14	1.16	4.99	2.191	2.799	2.97	0.6	0.54	0.374							0.81	1	
84.153	11	Sitff Fine-Grained	118.04	5.37	5.049	2.222	2.828	2.66	0.59	0.53	0.372							0.74	1	
85.137	11	Sitff Fine-Grained	185.35	7.94	5.108	2.252	2.856	2.35	0.59	0.53	0.371	2.350	0.59	109.36	2.120	231.797		0.69	1	
86.121	6	Sandy Silt to Clayey Silt	169.58	5.84	5.167	2.283	2.884	2.31	0.59	0.53	0.370	2.310	0.59	100.05	1.981	198.227		0.70	1	
87.105	5	Clayey Silt to Silty Clay	63.25	2.73	5.226	2.314	2.913	2.87	0.59	0.53	0.368							0.73	1	
88.089	6	Sandy Silt to Clayey Silt	45.54	1.29	5.285	2.345	2.941	2.88	0.58	0.52	0.367							0.81	1	
89.074	5	Clayey Silt to Silty Clay	44.44	1.59	5.345	2.375	2.969	2.96	0.58	0.52	0.366							0.72	1	
90.058	11	Sitff Fine-Grained	121.32	5.8	5.404	2.406	2.998	2.69	0.58	0.52	0.365							0.73	1	
91.042	5	Clayey Silt to Silty Clay	39.41	1.71	5.463	2.437	3.026	3.07	0.57	0.52	0.364							0.72	1	
92.026	6	Sandy Silt to Clayey Silt	36.88	1.12	5.522	2.467	3.054	3	0.57	0.51	0.363							0.80	1	
93.011	6	Sandy Silt to Clayey Silt	44.91	1.27	5.581	2.498	3.083	2.9	0.57	0.51	0.362							0.80	1	
93.995	6	Sandy Silt to Clayey Silt	43.64	1.17	5.64	2.529	3.111	2.9	0.57	0.51	0.361							0.80	1	
94.979	6	Sandy Silt to Clayey Silt	49.94	1.38	5.699	2.56	3.139	2.85	0.56	0.51	0.360							0.80	1	
95.963	6	Sandy Silt to Clayey Silt	76.8	2.79	5.758	2.59	3.168	2.77	0.56	0.51	0.359							0.78	1	
96.948	8	Sand to Silty Sand	227.39	4.31	5.817	2.621	3.196	2.04	0.56	0.50	0.358	2.040	0.56	127.34	1.356	172.656		0.65	1	
97.932	8	Sand to Silty Sand	371.51	6.75	5.876	2.652	3.224	1.89	0.56	0.50	0.357	1.890	0.56	208.05	1.180	245.404		0.63	1	
98.916	7	Silty Sand to Sandy Silt	271.44	7.14	5.935	2.683	3.253	2.1	0.55	0.50	0.356	2.100	0.55	149.29	1.455	217.184		0.63	1	
99.9	11	Sitff Fine-Grained	111.9	4.61	5.994	2.713	3.281	2.69	0.55	0.50	0.355							0.73	1	
100.885	6	Sandy Silt to Clayey Silt	63.04	2.05	6.053	2.744	3.309	2.83	0.55	0.50	0.355							0.79	1	
101.869	6	Sandy Silt to Clayey Silt	54.71	1.56	6.112	2.775	3.338	2.86	0.55	0.50	0.354							0.79	1	

LIQUEFACTION POTENTIAL ANALYSIS (per Youd & Idriss, 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
CPT NO. ***CPT-AS-42A***

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.6 (Design Basis EQ)

FAULT M_w = 7.5
MSF = 1.00

			CPT RESULT INPUT							*CSR*		*$CRR_{7.5}$*						*$F.S.=(CRR_{7.5}/CSR)*MSF*K\sigma*K\alpha$*		
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.
102.853	6	Sandy Silt to Clayey Silt	37.39	0.79	6.171	2.805	3.366	2.95	0.55	0.49	0.353							0.78	1	
103.837	6	Sandy Silt to Clayey Silt	33.54	0.65	6.23	2.836	3.394	2.98	0.54	0.49	0.352							0.78	1	
104.822	6	Sandy Silt to Clayey Silt	65.33	1.77	6.289	2.867	3.423	2.77	0.54	0.49	0.351							0.78	1	
105.806	6	Sandy Silt to Clayey Silt	56.66	1.58	6.348	2.898	3.451	2.85	0.54	0.49	0.351							0.78	1	
106.79	6	Sandy Silt to Clayey Silt	51.88	1.16	6.408	2.928	3.479	2.83	0.54	0.49	0.350							0.78	1	
107.774	5	Clayey Silt to Silty Clay	55.77	2.19	6.467	2.959	3.507	2.96	0.53	0.49	0.349							0.69	1	
108.759	6	Sandy Silt to Clayey Silt	41.14	1.09	6.526	2.99	3.536	2.98	0.53	0.48	0.349							0.78	1	
109.743	6	Sandy Silt to Clayey Silt	31.29	0.65	6.585	3.021	3.564	3.05	0.53	0.48	0.348							0.78	1	
110.727	6	Sandy Silt to Clayey Silt	46.29	1.28	6.644	3.051	3.592	2.94	0.53	0.48	0.347							0.77	1	
111.711	5	Clayey Silt to Silty Clay	58.09	2.23	6.703	3.082	3.621	2.95	0.53	0.48	0.347							0.68	1	
112.695	6	Sandy Silt to Clayey Silt	45.13	1.41	6.762	3.113	3.649	3.01	0.52	0.48	0.346							0.77	1	
113.68	6	Sandy Silt to Clayey Silt	40.49	0.99	6.821	3.144	3.677	2.99	0.52	0.48	0.345							0.77	1	
114.664	6	Sandy Silt to Clayey Silt	48.9	1.31	6.88	3.174	3.706	2.93	0.52	0.48	0.345							0.77	1	
115.648	11	Sitff Fine-Grained	105.95	4.92	6.939	3.205	3.734	2.8	0.52	0.47	0.344							0.72	1	
116.632	5	Clayey Silt to Silty Clay	52.04	2.27	6.998	3.236	3.762	3.05	0.52	0.47	0.343							0.67	1	
117.617	6	Sandy Silt to Clayey Silt	46.19	1.4	7.057	3.266	3.791	2.99	0.51	0.47	0.343							0.77	1	
118.601	6	Sandy Silt to Clayey Silt	36.41	0.86	7.116	3.297	3.819	3.04	0.51	0.47	0.342							0.76	1	
119.585	6	Sandy Silt to Clayey Silt	38.64	0.87	7.175	3.328	3.847	3	0.51	0.47	0.341							0.76	1	

LIQUEFACTION POTENTIAL ANALYSIS (per Youd & Idriss, 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
CPT NO. ***CPT-AS-44***

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.6 (Design Basis EQ)

FAULT M_w = 7.5
MSF = 1.00

		CPT RESULT INPUT							*CSR*		*CRR 7.5*						*F.S.=(CRR 7.5/CSR)*MSF*Kσ*Kα*		
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.
0.492					0.03		0.03	-9999	2	1.00	0.390							1.00	1	
1.476					0.089		0.089	-9999	2	1.00	0.389							1.00	1	
2.461					0.148		0.148	-9999	2	1.00	0.389							1.00	1	
3.445					0.207		0.207	-9999	2	0.99	0.388							1.00	1	
4.429					0.266		0.266	-9999	1.94	0.99	0.387							1.00	1	
5.413	5	Clayey Silt to Silty Clay	27.12	1.02	0.325		0.325	2.55	1.75	0.99	0.386	2.550	1.70	46.10	3.034	139.890	0.33	1.00	1	
6.398	3	Clay	23.85	1.17	0.384		0.384	2.62	1.61	0.99	0.385							1.00	1	
7.382	3	Clay	19.75	1.16	0.443		0.443	2.71	1.5	0.98	0.384							1.00	1	
8.366	3	Clay	19.89	0.9	0.502		0.502	2.66	1.41	0.98	0.383							1.00	1	
9.35	4	Silty Clay to Clay	26.81	1.15	0.561		0.561	2.63	1.34	0.98	0.382							1.00	1	
10.335	3	Clay	30.02	1.57	0.62		0.62	2.65	1.27	0.98	0.382							1.00	1	
11.319	3	Clay	15.59	0.64	0.679		0.679	2.82	1.21	0.98	0.381							1.00	1	
12.303	5	Clayey Silt to Silty Clay	9.41	0.2	0.738		0.738	2.87	1.16	0.97	0.380							1.00	1	
13.287	4	Silty Clay to Clay	7.98	0.22	0.797	0.025	0.773	3.01	1.14	0.97	0.391							1.00	1	
14.271	4	Silty Clay to Clay	8.42	0.25	0.856	0.055	0.801	3.03	1.12	0.97	0.404							1.00	1	
15.256	3	Clay	12.44	0.56	0.915	0.086	0.829	3	1.1	0.97	0.417							1.00	1	
16.24	3	Clay	9.9	0.37	0.974	0.117	0.858	3.06	1.08	0.97	0.428							1.00	1	
17.224	3	Clay	12.47	0.52	1.033	0.148	0.886	3.01	1.06	0.96	0.438							1.00	1	
18.208	3	Clay	12.55	0.61	1.093	0.178	0.914	3.07	1.05	0.96	0.448							1.00	1	
19.193	5	Clayey Silt to Silty Clay	26.55	0.89	1.152	0.209	0.943	2.7	1.03	0.96	0.457							1.00	1	
20.177	5	Clayey Silt to Silty Clay	36.13	1.41	1.211	0.24	0.971	2.64	1.01	0.96	0.465							1.00	1	
21.161	8	Sand to Silty Sand	179.53	2.48	1.27	0.27	0.999	1.83	1	0.95	0.473	1.830	1.00	179.53	1.129	202.722		1.00	1	
22.145	8	Sand to Silty Sand	194.73	3.51	1.329	0.301	1.028	1.9	0.99	0.95	0.479	1.900	0.99	192.78	1.189	229.188		0.99	1	
23.13	9	Sand	187.76	1.22	1.388	0.332	1.056	1.6	0.97	0.95	0.486	1.600	0.97	182.13	1.000	182.127		0.98	1	
24.114	6	Sandy Silt to Clayey Silt	23.57	0.49	1.447	0.363	1.084	2.67	0.96	0.94	0.492							0.98	1	
25.098	4	Silty Clay to Clay	25.76	1.12	1.506	0.393	1.113	2.85	0.95	0.94	0.497							0.97	1	
26.082	3	Clay	31.85	1.76	1.565	0.424	1.141	2.85	0.94	0.94	0.502							0.96	1	
27.067	3	Clay	35.21	1.99	1.624	0.455	1.169	2.83	0.92	0.93	0.506							0.95	1	
28.051	3	Clay	33.7	1.7	1.683	0.486	1.198	2.82	0.91	0.93	0.509							0.95	1	
29.035	5	Clayey Silt to Silty Clay	31.73	1.27	1.742	0.516	1.226	2.78	0.9	0.93	0.513							0.94	1	
30.019	5	Clayey Silt to Silty Clay	54.49	2.38	1.801	0.547	1.254	2.63	0.89	0.92	0.516							0.93	1	
31.004	7	Silty Sand to Sandy Silt	178.11	4.35	1.86	0.578	1.283	2.06	0.88	0.92	0.518	2.060	0.88	156.74	1.387	217.351		0.91	1	
31.988	8	Sand to Silty Sand	224.12	3.26	1.919	0.608	1.311	1.83	0.87	0.91	0.519	1.830	0.87	194.98	1.129	220.173		0.90	1	
32.972	9	Sand	197.02	2.51	1.978	0.639	1.339	1.82	0.86	0.90	0.521	1.820	0.86	169.44	1.122	190.026		0.89	1	
33.956	8	Sand to Silty Sand	225.56	3.51	2.037	0.67	1.367	1.85	0.86	0.90	0.522	1.850	0.86	193.98	1.145	222.125		0.88	1	
34.941	8	Sand to Silty Sand	193.31	2.97	2.096	0.701	1.396	1.9	0.85	0.89	0.522	1.900	0.85	164.31	1.189	195.343		0.88	1	
35.925	7	Silty Sand to Sandy Silt	159.45	3.55	2.156	0.731	1.424	2.08	0.84	0.88	0.522	2.080	0.84	133.94	1.420	190.145		0.88	1	
36.909	5	Clayey Silt to Silty Clay	76.92	2.97	2.215	0.762	1.452	2.47	0.83	0.88	0.522	2.470	0.83	63.84	2.621	167.354		0.89	1	
37.893	5	Clayey Silt to Silty Clay	26.66	0.81	2.274	0.793	1.481	2.85	0.82	0.87	0.520							0.89	1	
38.877	6	Sandy Silt to Clayey Silt	40.48	1.16	2.333	0.824	1.509	2.68	0.81	0.86	0.519							0.92	1	
39.862	5	Clayey Silt to Silty Clay	44.22	1.51	2.392	0.854	1.537	2.7	0.81	0.85	0.517							0.88	1	
40.846	6	Sandy Silt to Clayey Silt	58.27	1.28	2.451	0.885	1.566	2.4	0.8	0.84	0.515	2.400	0.80	46.62	2.312	107.793	0.20	0.90	1	0.38
41.83	7	Silty Sand to Sandy Silt	101.23	2.43	2.51	0.916	1.594	2.25	0.79	0.83	0.512	2.250	0.79	79.97	1.798	143.809	0.36	0.87	1	0.70
42.814	5	Clayey Silt to Silty Clay	24.39	0.72	2.569	0.947	1.622	2.92	0.79	0.83	0.510							0.86	1	
43.799	6	Sandy Silt to Clayey Silt	27.04	0.7	2.628	0.977	1.651	2.85	0.78	0.82	0.506							0.90	1	
44.783	5	Clayey Silt to Silty Clay	36.67	1.31	2.687	1.008	1.679	2.82	0.77	0.81	0.503							0.86	1	
45.767	4	Silty Clay to Clay	53.19	2.39	2.746	1.039	1.707	2.75	0.77	0.80	0.499							0.85	1	
46.751	9	Sand	303.72	3.48	2.805	1.069	1.736	1.7	0.76	0.79	0.495	1.700	0.76	230.83	1.038	239.566		0.80	1	
47.736	9	Sand	362.62	4.16	2.864	1.1	1.764	1.65	0.75	0.78	0.491	1.650	0.75	271.97	1.003	272.872		0.80	1	
48.72	9	Sand	415.84	3.82	2.923	1.131	1.792	1.54	0.75	0.77	0.487	1.540	0.75	311.88	1.000	311.880		0.79	1	
49.704	9	Sand	410.46	4.15	2.982	1.162	1.821	1.58	0.74	0.76	0.483	1.580	0.74	303.74	1.000	303.740		0.79	1	
50.688	9	Sand	284.75	2.63	3.041	1.192	1.849	1.66	0.74	0.75	0.478	1.660	0.74	210.72	1.010	212.908		0.78	1	
51.673	10	Gravelly Sand to Sand	339.78	2.52	3.1	1.223	1.877	1.54	0.73	0.74	0.474	1.540	0.73	248.04	1.000	248.039		0.78	1	
52.657	8	Sand to Silty Sand	186.63	3.06	3.159	1.254	1.906	1.97	0.72	0.73	0.469	1.970	0.72	134.37	1.263	169.676		0.78	1	
53.641	6	Sandy Silt to Clayey Silt	72.22	2.59	3.219	1.285	1.934	2.63	0.72	0.72	0.465							0.85	1	
54.625	11	Sitff Fine-Grained	79.8	3.86	3.278	1.315	1.962	2.69	0.71	0.71	0.461							0.84	1	
55.61	5	Clayey Silt to Silty Clay	47.22	1.76	3.337	1.346	1.991	2.8	0.71	0.70	0.456							0.81	1	
56.594	6	Sandy Silt to Clayey Silt	38.18	1.05	3.396	1.377	2.019	2.81	0.7	0.69	0.452							0.87	1	
57.578	12	Sand to Clayey Sand	176.05	6.12	3.455	1.407	2.047	2.25	0.7	0.68	0.447	2.250	0.70	123.24	1.798	221.608		0.77	1	
58.562	11	Sitff Fine-Grained	129.33	6.47	3.514	1.438	2.076	2.46	0.69	0.67	0.443	2.460	0.69	89.24	2.574	229.722		0.79	1	
59.547	7	Silty Sand to Sandy Silt	45.02	0.8	3.573	1.469	2.104	2.65	0.69	0.66	0.439							0.86	1	
60.531	6	Sandy Silt to Clayey Silt	56.35	1.57	3.632	1.5	2.132	2.68	0.68	0.65	0.435							0.86	1	
61.515	4	Silty Clay to Clay	57.18	2.84	3.691	1.53	2.161	2.84	0.68	0.65	0.431							0.79	1	
62.499	5	Clayey Silt to Silty Clay	60.5	2.55	3.75	1.561	2.189	2.78	0.68	0.64	0.427							0.79	1	
63.483	5	Clayey Silt to Silty Clay	98.62	3.85	3.809	1.592	2.217	2.47	0.67	0.63	0.424	2.470	0.67	66.08	2.621	173.204		0.79	1	
64.468	11	Sitff Fine-Grained	74.63	3.64	3.868	1.623	2.246	2.76	0.67	0.63	0.420							0.83	1	
65.452	11	Sitff Fine-Grained	64.63	3.26	3.927	1.653	2.274	2.82	0.66	0.62	0.417							0.84	1	
66.436	7	Silty Sand to Sandy Silt	108.38	2.82	3.986	1.684	2.302	2.31	0.66	0.61	0.414	2.310	0.66	71.53	1.981	141.720	0.34	0.79	1	0.83
67.42	8	Sand to Silty Sand	429.26	8.11	4.045	1.715	2.331	1.82	0.66	0.61	0.411	1.820	0.66	283.31	1.122	317.738		0.71	1	
68.405	12	Sand to Clayey Sand	187.12	7.11	4.104	1.746	2.359	2.28	0.65	0.60	0.408	2.280	0.65	121.63	1.886	229.411		0.73	1	
69.389	7	Silty Sand to Sandy Silt	246.2	5.57	4.163	1.776	2.387	2.03	0.65	0.60	0.405	2.030	0.65	160.03	1.341	214.634		0.71	1	
70.373	6	Sandy Silt to Clayey Silt	83.61	2.48	4.222	1.807	2.416	2.45	0.64	0.59	0.402	2.450	0.64	53.51	2.528	135.286	0.31	0.81	1	0.77
71.357	6	Sandy Silt to Clayey Silt	93.45	3.25	4.282	1.838	2.444	2.61	0.64	0.58	0.400							0.79	1	
72.342	6	Sandy Silt to Clayey Silt	64.5	2.14	4.341	1.868	2.472	2.73	0.64	0.58	0.397							0.83	1	
73.326	6	Sandy Silt to Clayey Silt	27.47	0.46	4.4	1.899	2.5	2.92	0.63	0.58	0.395							0.83	1	
74.31	6	Sandy Silt to Clayey Silt	34.66	0.69	4.459	1.93	2.529	2.85	0.63	0.57	0.392							0.83	1	
75.294	6	Sandy Silt to Clayey Silt	30.45	0.48	4.518	1.961	2.557	2.85	0.63	0.57	0.390							0.83	1	
76.279	7	Silty Sand to Sandy Silt	38.64	0.54	4.577	1.991	2.585	2.71	0.62	0.56	0.388							0.83	1	
77.263	6	Sandy Silt to Clayey Silt	42.43	0.88	4.636	2.022	2.614	2.77	0.62	0.56	0.386							0.83	1	
78.247	6	Sandy Silt to Clayey Silt	40.35	1.21	4.695	2.053	2.642	2.89	0.62	0.55	0.384							0.82	1	
79.231	6	Sandy Silt to Clayey Silt	35.8	1.01	4.754	2.084	2.67	2.93	0.61	0.55	0.383							0.82	1	
80.216	6	Sandy Silt to Clayey Silt	40.21	1.06	4.813	2.114	2.699	2.87	0.61	0.55	0.381							0.82	1	
81.2	6	Sandy Silt to Clayey Silt	48.42	1.4	4.872	2.145	2.727	2.83	0.61	0.54	0.379							0.82	1	
82.184	5	Clayey Silt to Silty Clay	75.74	2.85	4.931	2.176	2.755	2.74	0.6	0.54	0.378							0.74	1	
83.168	12	Sand to Clayey Sand	187.77	7.28	4.99	2.206	2.784	2.31	0.6	0.54	0.376	2.310	0.60	112.66	1.981	223.210		0.70	1	
84.153	7	Silty Sand to Sandy Silt	212.56	5.31	5.049	2.237	2.812	2.13	0.6	0.53	0.375	2.130	0.60	127.54	1.512	192.803		0.68	1	
85.137	7	Silty Sand to Sandy Silt	211.1	5.16	5.108	2.268	2.84	2.13	0.59	0.53	0.373	2.130	0.59	124.55	1.512	188.287		0.68	1	
86.121	7	Silty Sand to Sandy Silt	196.16	5.26	5.167	2.299	2.869	2.18	0.59	0.53	0.372	2.180	0.59	115.73	1.619	187.393		0.69	1	
87.105	8	Sand to Silty Sand	294.79	5.51	5.226	2.329	2.897	1.95	0.59	0.53	0.370	1.950	0.59	173.93	1.240	215.645		0.65	1	
88.089	8	Sand to Silty Sand	357.47	8.62	5.285	2.36	2.925	1.98	0.58	0.52	0.369	1.980	0.58	207.33	1.275	264.294		0.65	1	
89.074	7	Silty Sand to Sandy Silt	287.03	7.37	5.345	2.391	2.954	2.06	0.58	0.52	0.368	2.060	0.58	166.48	1.387	230.859		0.65	1	
90.058	7	Silty Sand to Sandy Silt	226.38	5.68	5.404	2.422	2.982	2.12	0.58	0.52	0.367	2.120	0.58	131.30	1.492	195.921		0.67	1	
91.042	7	Silty Sand to Sandy Silt	84.21	2.03	5.463	2.452	3.01	2.62	0.58	0.52	0.366							0.78	1	
92.026	6	Sandy Silt to Clayey Silt	63.94	1.84	5.522	2.483	3.039	2.78	0.57	0.51	0.365							0.80	1	
93.011	6	Sandy Silt to Clayey Silt	44.25	0.99	5.581	2.514	3.067	2.86	0.57	0.51	0.364							0.80	1	
93.995	6	Sandy Silt to Clayey Silt	87.71	2.81	5.64	2.545	3.095	2.68	0.57	0.51	0.363							0.77	1	
94.979	7	Silty Sand to Sandy Silt	132.46	3.85	5.699	2.575	3.124	2.34	0.57	0.51	0.362	2.340	0.57	75.50	2.084	157.329	0.44	0.72	1	1.22
95.963	6	Sandy Silt to Clayey Silt	52.73	1.31	5.758	2.606	3.152	2.82	0.56	0.51	0.361							0.79	1	
96.948	11	Sitff Fine-Grained	93.73	4.05	5.817	2.637	3.18	2.76	0.56	0.50	0.360							0.76	1	
97.932	6	Sandy Silt to Clayey Silt	47.44	1.1	5.876	2.667	3.209	2.85	0.56	0.50	0.359							0.79	1	
98.916	6	Sandy Silt to Clayey Silt	76.49	2.47	5.935	2.698	3.237	2.75	0.56	0.50	0.358							0.78	1	
99.9	6	Sandy Silt to Clayey Silt	63.26	1.96	5.994	2.729	3.265	2.82	0.55	0.50	0.357							0.79	1	
100.885	6	Sandy Silt to Clayey Silt	47.72	1.29	6.053	2.76	3.294	2.9	0.55	0.50	0.356							0.79	1	
101.869	6	Sandy Silt to Clayey Silt	48.42	1.21	6.112	2.79	3.322	2.87	0.55	0.50	0.355							0.79	1	

LIQUEFACTION POTENTIAL ANALYSIS (per Youd & Idriss, 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
CPT NO. ***CPT-AS-44***

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.6 (Design Basis EQ)

FAULT M_w = 7.5
MSF = 1.00

			CPT RESULT INPUT							*CSR*		*$CRR_{7.5}$*						*$F.S.=(CRR_{7.5}/CSR)*MSF*K\sigma*K\alpha$*		
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.
102.853	6	Sandy Silt to Clayey Silt	53.46	1.42	6.171	2.821	3.35	2.85	0.55	0.49	0.355							0.79	1	
103.837	11	Sitff Fine-Grained	133.64	5.52	6.23	2.852	3.379	2.65	0.54	0.49	0.354							0.70	1	
104.822	5	Clayey Silt to Silty Clay	56.96	2.23	6.289	2.883	3.407	2.94	0.54	0.49	0.353							0.69	1	
105.806	5	Clayey Silt to Silty Clay	63.21	2.35	6.348	2.913	3.435	2.88	0.54	0.49	0.352							0.69	1	
106.79	6	Sandy Silt to Clayey Silt	51.57	1.53	6.408	2.944	3.464	2.9	0.54	0.49	0.352							0.78	1	
107.774	5	Clayey Silt to Silty Clay	79.03	3.05	6.467	2.975	3.492	2.81	0.54	0.49	0.351							0.69	1	
108.759	4	Silty Clay to Clay	55.56	2.61	6.526	3.005	3.52	3.02	0.53	0.48	0.350							0.69	1	
109.743	6	Sandy Silt to Clayey Silt	41.64	0.94	6.585	3.036	3.549	2.94	0.53	0.48	0.349							0.78	1	
110.727	6	Sandy Silt to Clayey Silt	52.25	1.36	6.644	3.067	3.577	2.88	0.53	0.48	0.349							0.77	1	
111.711	6	Sandy Silt to Clayey Silt	48.33	1.43	6.703	3.098	3.605	2.94	0.53	0.48	0.348							0.77	1	
112.695	6	Sandy Silt to Clayey Silt	49.22	1.12	6.762	3.128	3.633	2.87	0.52	0.48	0.347							0.77	1	
113.68	7	Silty Sand to Sandy Silt	50.68	0.98	6.821	3.159	3.662	2.83	0.52	0.48	0.347							0.77	1	
114.664	7	Silty Sand to Sandy Silt	39.16	0.75	6.88	3.19	3.69	2.94	0.52	0.48	0.346							0.77	1	
115.648	6	Sandy Silt to Clayey Silt	41.4	0.89	6.939	3.221	3.718	2.94	0.52	0.47	0.345							0.77	1	
116.632	6	Sandy Silt to Clayey Silt	42.41	0.97	6.998	3.251	3.747	2.95	0.52	0.47	0.345							0.77	1	
117.617	6	Sandy Silt to Clayey Silt	52.36	1.23	7.057	3.282	3.775	2.87	0.51	0.47	0.344							0.77	1	
118.601	6	Sandy Silt to Clayey Silt	59.73	2.13	7.116	3.313	3.803	2.93	0.51	0.47	0.343							0.77	1	
119.585	5	Clayey Silt to Silty Clay	52.52	2	7.175	3.344	3.832	3.02	0.51	0.47	0.343							0.67	1	

LIQUEFACTION POTENTIAL ANALYSIS (per Youd & Idriss, 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
CPT NO. ***CPT-AS-48***

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.6 (Design Basis EQ)

FAULT M_w = 7.5
MSF = 1.00

			CPT RESULT INPUT							*CSR*		*$CRR_{7.5}$*						*$F.S.=(CRR_{7.5}/CSR)*MSF*K\sigma*K\alpha$*		
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.
0.492					0.03		0.03	-9999	2	1.00	0.390							1.00	1	
1.476					0.089		0.089	-9999	2	1.00	0.389							1.00	1	
2.461					0.148		0.148	-9999	2	1.00	0.389							1.00	1	
3.445					0.207		0.207	-9999	2	0.99	0.388							1.00	1	
4.429					0.266		0.266	-9999	1.94	0.99	0.387							1.00	1	
5.413	5	Clayey Silt to Silty Clay	17.3	0.36	0.325		0.325	2.52	1.75	0.99	0.386	2.520	1.70	29.41	2.872	84.454	0.14	1.00	1	
6.398	6	Sandy Silt to Clayey Silt	25.88	0.55	0.384		0.384	2.42	1.61	0.99	0.385	2.420	1.61	41.67	2.396	99.828	0.17	1.00	1	
7.382	5	Clayey Silt to Silty Clay	22.16	0.59	0.443		0.443	2.56	1.5	0.98	0.384	2.560	1.50	33.24	3.091	102.730	0.18	1.00	1	
8.366	6	Sandy Silt to Clayey Silt	35.04	0.58	0.502		0.502	2.3	1.41	0.98	0.383	2.300	1.41	49.41	1.949	96.280	0.16	1.00	1	
9.35	7	Silty Sand to Sandy Silt	39.05	0.45	0.561		0.561	2.18	1.34	0.98	0.382	2.180	1.34	52.33	1.619	84.726	0.14	1.00	1	
10.335	5	Clayey Silt to Silty Clay	15.41	0.3	0.62	0.01	0.61	2.62	1.28	0.98	0.388							1.00	1	
11.319	6	Sandy Silt to Clayey Silt	10.67	0.11	0.679	0.041	0.638	2.61	1.25	0.98	0.405							1.00	1	
12.303	6	Sandy Silt to Clayey Silt	9.94	0.05	0.738	0.072	0.666	2.56	1.23	0.97	0.421	2.560	1.23	12.23	3.091	37.786	0.08	1.00	1	0.19
13.287	5	Clayey Silt to Silty Clay	8.08	0.08	0.797	0.103	0.695	2.74	1.2	0.97	0.435							1.00	1	
14.271	5	Clayey Silt to Silty Clay	9.82	0.15	0.856	0.133	0.723	2.77	1.18	0.97	0.448							1.00	1	
15.256	6	Sandy Silt to Clayey Silt	31.85	0.65	0.915	0.164	0.751	2.46	1.15	0.97	0.460	2.460	1.15	36.63	2.574	94.289	0.16	1.00	1	0.34
16.24	6	Sandy Silt to Clayey Silt	25.23	0.49	0.974	0.195	0.78	2.53	1.13	0.97	0.470	2.530	1.13	28.51	2.925	83.385	0.13	1.00	1	0.28
17.224	7	Silty Sand to Sandy Silt	36.21	0.47	1.033	0.226	0.808	2.31	1.11	0.96	0.480	2.310	1.11	40.19	1.981	79.632	0.13	1.00	1	0.26
18.208	5	Clayey Silt to Silty Clay	12.06	0.24	1.093	0.256	0.836	2.82	1.09	0.96	0.490							1.00	1	
19.193	5	Clayey Silt to Silty Clay	10.09	0.13	1.152	0.287	0.865	2.8	1.08	0.96	0.498							1.00	1	
20.177	5	Clayey Silt to Silty Clay	10.34	0.15	1.211	0.318	0.893	2.83	1.06	0.96	0.506							1.00	1	
21.161	5	Clayey Silt to Silty Clay	11.37	0.16	1.27	0.348	0.921	2.8	1.04	0.95	0.513							1.00	1	
22.145	5	Clayey Silt to Silty Clay	10.28	0.23	1.329	0.379	0.95	2.97	1.03	0.95	0.519							1.00	1	
23.13	4	Silty Clay to Clay	14.15	0.46	1.388	0.41	0.978	2.94	1.01	0.95	0.525							1.00	1	
24.114	4	Silty Clay to Clay	12.14	0.42	1.447	0.441	1.006	3.04	1	0.94	0.530							1.00	1	
25.098	5	Clayey Silt to Silty Clay	14.21	0.38	1.506	0.471	1.035	2.92	0.98	0.94	0.534							0.99	1	
26.082	4	Silty Clay to Clay	15.34	0.53	1.565	0.502	1.063	2.96	0.97	0.94	0.538							0.98	1	
27.067	4	Silty Clay to Clay	12.68	0.41	1.624	0.533	1.091	3.04	0.96	0.93	0.542							0.97	1	
28.051	5	Clayey Silt to Silty Clay	13.93	0.38	1.683	0.564	1.119	2.96	0.95	0.93	0.545							0.97	1	
29.035	6	Sandy Silt to Clayey Silt	24.5	0.46	1.742	0.594	1.148	2.65	0.93	0.93	0.548							0.97	1	
30.019	5	Clayey Silt to Silty Clay	16.33	0.39	1.801	0.625	1.176	2.89	0.92	0.92	0.550							0.95	1	
31.004	5	Clayey Silt to Silty Clay	22.19	0.55	1.86	0.656	1.204	2.77	0.91	0.92	0.551							0.95	1	
31.988	6	Sandy Silt to Clayey Silt	31.35	0.88	1.919	0.687	1.233	2.69	0.9	0.91	0.552							0.96	1	
32.972	5	Clayey Silt to Silty Clay	15.17	0.37	1.978	0.717	1.261	2.95	0.89	0.90	0.553							0.93	1	
33.956	5	Clayey Silt to Silty Clay	16.01	0.43	2.037	0.748	1.289	2.96	0.88	0.90	0.553							0.93	1	
34.941	5	Clayey Silt to Silty Clay	15.16	0.31	2.096	0.779	1.318	2.92	0.87	0.89	0.553							0.92	1	
35.925	5	Clayey Silt to Silty Clay	15.25	0.37	2.156	0.809	1.346	2.97	0.86	0.88	0.552							0.91	1	
36.909	5	Clayey Silt to Silty Clay	15.22	0.4	2.215	0.84	1.374	3	0.85	0.88	0.551							0.91	1	
37.893	5	Clayey Silt to Silty Clay	16.29	0.42	2.274	0.871	1.403	2.98	0.84	0.87	0.549							0.90	1	
38.877	5	Clayey Silt to Silty Clay	15.98	0.32	2.333	0.902	1.431	2.93	0.84	0.86	0.547							0.90	1	
39.862	5	Clayey Silt to Silty Clay	14.77	0.4	2.392	0.932	1.459	3.05	0.83	0.85	0.545							0.89	1	
40.846	5	Clayey Silt to Silty Clay	15.16	0.37	2.451	0.963	1.488	3.02	0.82	0.84	0.542							0.89	1	
41.83	5	Clayey Silt to Silty Clay	16.56	0.48	2.51	0.994	1.516	3.04	0.81	0.83	0.539							0.88	1	
42.814	5	Clayey Silt to Silty Clay	19.33	0.61	2.569	1.025	1.544	3.01	0.8	0.83	0.535							0.88	1	
43.799	4	Silty Clay to Clay	18.96	0.72	2.628	1.055	1.573	3.07	0.8	0.82	0.531							0.87	1	
44.783	5	Clayey Silt to Silty Clay	17.97	0.42	2.687	1.086	1.601	2.98	0.79	0.81	0.527							0.87	1	
45.767	5	Clayey Silt to Silty Clay	19.79	0.47	2.746	1.117	1.629	2.94	0.78	0.80	0.523							0.86	1	
46.751	6	Sandy Silt to Clayey Silt	16.32	0.26	2.805	1.147	1.658	2.93	0.78	0.79	0.519							0.90	1	
47.736	6	Sandy Silt to Clayey Silt	17.78	0.24	2.864	1.178	1.686	2.86	0.77	0.78	0.514							0.90	1	
48.72	6	Sandy Silt to Clayey Silt	25.53	0.63	2.923	1.209	1.714	2.85	0.76	0.77	0.509							0.90	1	
49.704	5	Clayey Silt to Silty Clay	27.49	0.79	2.982	1.24	1.743	2.88	0.76	0.76	0.504							0.85	1	
50.688	5	Clayey Silt to Silty Clay	40.46	1.38	3.041	1.27	1.771	2.78	0.75	0.75	0.499							0.84	1	
51.673	4	Silty Clay to Clay	17.19	0.67	3.1	1.301	1.799	3.19	0.75	0.74	0.494							0.84	1	
52.657	6	Sandy Silt to Clayey Silt	41.46	0.92	3.159	1.332	1.828	2.67	0.74	0.73	0.489							0.89	1	
53.641	7	Silty Sand to Sandy Silt	100.31	2.09	3.219	1.363	1.856	2.24	0.73	0.72	0.485	2.240	0.73	73.23	1.770	129.646	0.28	0.84	1	0.58
54.625	9	Sand	141.84	1.46	3.278	1.393	1.884	1.92	0.73	0.71	0.480	1.920	0.73	103.54	1.208	125.109	0.26	0.81	1	0.55
55.61	6	Sandy Silt to Clayey Silt	55.13	1.55	3.337	1.424	1.913	2.65	0.72	0.70	0.475							0.88	1	
56.594	6	Sandy Silt to Clayey Silt	117.91	3.81	3.396	1.455	1.941	2.33	0.72	0.69	0.470	2.330	0.72	84.90	2.049	173.928		0.81	1	
57.578	6	Sandy Silt to Clayey Silt	66.16	1.61	3.455	1.486	1.969	2.43	0.71	0.68	0.465	2.430	0.71	46.97	2.439	114.570	0.22	0.86	1	0.47
58.562	5	Clayey Silt to Silty Clay	24.96	0.7	3.514	1.516	1.998	2.98	0.71	0.67	0.460							0.81	1	
59.547	5	Clayey Silt to Silty Clay	24.84	0.67	3.573	1.547	2.026	2.97	0.7	0.66	0.456							0.81	1	
60.531	6	Sandy Silt to Clayey Silt	24.18	0.61	3.632	1.578	2.054	2.97	0.7	0.65	0.452							0.87	1	
61.515	6	Sandy Silt to Clayey Silt	26.68	0.53	3.691	1.608	2.083	2.88	0.69	0.65	0.447							0.86	1	
62.499	5	Clayey Silt to Silty Clay	48.56	1.82	3.75	1.639	2.111	2.81	0.69	0.64	0.443							0.80	1	
63.483	11	Sitff Fine-Grained	115.22	5.15	3.809	1.67	2.139	2.46	0.68	0.63	0.439	2.460	0.68	78.35	2.574	201.693		0.80	1	
64.468	8	Sand to Silty Sand	234.13	4.97	3.868	1.701	2.168	2.01	0.68	0.63	0.435	2.010	0.68	159.21	1.313	209.085		0.73	1	
65.452	6	Sandy Silt to Clayey Silt	101.54	2.94	3.927	1.731	2.196	2.36	0.67	0.62	0.432	2.360	0.67	68.03	2.156	146.704	0.37	0.80	1	0.87
66.436	7	Silty Sand to Sandy Silt	163.83	3.34	3.986	1.762	2.224	2.11	0.67	0.61	0.428	2.110	0.67	109.77	1.473	161.704		0.76	1	
67.42	8	Sand to Silty Sand	194.09	3.58	4.045	1.793	2.252	2.03	0.67	0.61	0.425	2.030	0.67	130.04	1.341	174.411		0.74	1	
68.405	5	Clayey Silt to Silty Clay	45.71	1.57	4.104	1.824	2.281	2.85	0.66	0.60	0.422							0.78	1	
69.389	6	Sandy Silt to Clayey Silt	48.54	1.25	4.163	1.854	2.309	2.75	0.66	0.60	0.419							0.85	1	
70.373	6	Sandy Silt to Clayey Silt	33.14	0.81	4.222	1.885	2.337	2.9	0.65	0.59	0.416							0.84	1	
71.357	6	Sandy Silt to Clayey Silt	28.07	0.57	4.282	1.916	2.366	2.93	0.65	0.58	0.413							0.84	1	
72.342	6	Sandy Silt to Clayey Silt	29.04	0.6	4.341	1.946	2.394	2.92	0.65	0.58	0.410							0.84	1	
73.326	6	Sandy Silt to Clayey Silt	27.5	0.49	4.4	1.977	2.422	2.91	0.64	0.58	0.408							0.84	1	
74.31	6	Sandy Silt to Clayey Silt	32.93	0.63	4.459	2.008	2.451	2.84	0.64	0.57	0.405							0.84	1	
75.294	6	Sandy Silt to Clayey Silt	51.93	1.54	4.518	2.039	2.479	2.78	0.64	0.57	0.403							0.83	1	
76.279	5	Clayey Silt to Silty Clay	36.19	1.18	4.577	2.069	2.507	2.97	0.63	0.56	0.400							0.76	1	
77.263	6	Sandy Silt to Clayey Silt	81.49	2.37	4.636	2.1	2.536	2.62	0.63	0.56	0.398							0.80	1	
78.247	6	Sandy Silt to Clayey Silt	86.3	2.59	4.695	2.131	2.564	2.61	0.62	0.55	0.396							0.79	1	
79.231	8	Sand to Silty Sand	216.55	4.26	4.754	2.162	2.592	2.04	0.62	0.55	0.394	2.040	0.62	134.26	1.356	182.042		0.70	1	
80.216	6	Sandy Silt to Clayey Silt	44.69	1.21	4.813	2.192	2.621	2.85	0.62	0.55	0.392							0.82	1	
81.2	6	Sandy Silt to Clayey Silt	32.75	0.59	4.872	2.223	2.649	2.88	0.61	0.54	0.390							0.82	1	
82.184	7	Silty Sand to Sandy Silt	73.5	1.55	4.931	2.254	2.677	2.4	0.61	0.54	0.389	2.400	0.61	44.84	2.312	103.675	0.18	0.81	1	0.47
83.168	6	Sandy Silt to Clayey Silt	77.35	2.03	4.99	2.285	2.706	2.64	0.61	0.54	0.387							0.80	1	
84.153	6	Sandy Silt to Clayey Silt	25.83	0.55	5.049	2.315	2.734	3.04	0.6	0.53	0.385							0.82	1	
85.137	6	Sandy Silt to Clayey Silt	28.75	0.54	5.108	2.346	2.762	2.97	0.6	0.53	0.384							0.82	1	
86.121	6	Sandy Silt to Clayey Silt	28.49	0.47	5.167	2.377	2.791	2.93	0.6	0.53	0.382							0.81	1	
87.105	6	Sandy Silt to Clayey Silt	40.37	0.8	5.226	2.407	2.819	2.83	0.6	0.53	0.381							0.81	1	
88.089	6	Sandy Silt to Clayey Silt	26.92	0.39	5.285	2.438	2.847	2.94	0.59	0.52	0.379							0.81	1	
89.074	6	Sandy Silt to Clayey Silt	29.49	0.48	5.345	2.469	2.876	2.94	0.59	0.52	0.378							0.81	1	
90.058	6	Sandy Silt to Clayey Silt	26.38	0.42	5.404	2.5	2.904	2.99	0.59	0.52	0.377							0.81	1	
91.042	6	Sandy Silt to Clayey Silt	37.81	0.85	5.463	2.53	2.932	2.9	0.58	0.52	0.376							0.81	1	
92.026	6	Sandy Silt to Clayey Silt	35.6	0.96	5.522	2.561	2.961	2.98	0.58	0.51	0.374							0.80	1	
93.011	5	Clayey Silt to Silty Clay	41.14	1.64	5.581	2.592	2.989	3.03	0.58	0.51	0.373							0.72	1	
93.995	5	Clayey Silt to Silty Clay	34.56	1.38	5.64	2.623	3.017	3.11	0.58	0.51	0.372							0.72	1	
94.979	6	Sandy Silt to Clayey Silt	31.4	0.87	5.699	2.653	3.046	3.05	0.57	0.51	0.371							0.80	1	
95.963	6	Sandy Silt to Clayey Silt	65.06	2.22	5.758	2.684	3.074	2.81	0.57	0.51	0.370							0.80	1	
96.948	6	Sandy Silt to Clayey Silt	115.05	4.29	5.817	2.715	3.102	2.64	0.57	0.50	0.369							0.73	1	
97.932	5	Clayey Silt to Silty Clay	59.29	2.15	5.876	2.745	3.131	2.88	0.57	0.50	0.368							0.71	1	
98.916	5	Clayey Silt to Silty Clay	60.37	2.26	5.935	2.776	3.159	2.88	0.56	0.50	0.367							0.71	1	
99.9	6	Sandy Silt to Clayey Silt	41.06	1.06	5.994	2.807	3.187	2.94	0.56	0.50	0.366							0.79	1	
100.885	6	Sandy Silt to Clayey Silt	44.66	1.03	6.053	2.838	3.216	2.87	0.56	0.50	0.365							0.79	1	
101.869	6	Sandy Silt to Clayey Silt	44.4	1.03	6.112	2.868	3.244	2.88	0.56	0.50	0.364							0.79	1	

LIQUEFACTION POTENTIAL ANALYSIS (per Youd & Idriss, 2001)

PROJECT NAME ***Eastridge to BART Regional Connector Project***
PROJECT NO. ***2017-125-GEO***
CPT NO. ***CPT-AS-48***

FAULT INFO
HAYWARD FAULT
a_{max} *(g)=* 0.6 (Design Basis EQ)

FAULT M_w = 7.5
MSF = 1.00

			CPT RESULT INPUT							*CSR*		*$CRR_{7.5}$*						*$F.S.=(CRR_{7.5}/CSR)*MSF*K\sigma*K\alpha$*		
Depth (ft)		Soil Behavior Type	qc (tsf)	fs (tsf)	σ_v (tsf)	u (tsf)	σ_v' (tsf)	Ic*	C_N*	γ_d	CSR	Ic	C_Q	q_{c1N}	K_C	$(q_{c1N})_{cs}$	$CRR_{7.5}$	Kσ	Kα	F.S.
102.853	6	Sandy Silt to Clayey Silt	65.76	1.83	6.171	2.899	3.272	2.78	0.55	0.49	0.363							0.79	1	
103.837	11	Sitff Fine-Grained	111.95	4.55	6.23	2.93	3.301	2.7	0.55	0.49	0.362							0.73	1	
104.822	7	Silty Sand to Sandy Silt	159.53	4.26	6.289	2.961	3.329	2.27	0.55	0.49	0.361	2.270	0.55	87.74	1.856	162.856		0.69	1	
105.806	7	Silty Sand to Sandy Silt	173.07	5.09	6.348	2.991	3.357	2.27	0.55	0.49	0.360	2.270	0.55	95.19	1.856	176.678		0.67	1	
106.79	6	Sandy Silt to Clayey Silt	162.23	5.45	6.408	3.022	3.385	2.34	0.54	0.49	0.360	2.340	0.54	87.60	2.084	182.547		0.68	1	
107.774	8	Sand to Silty Sand	190.58	3.61	6.467	3.053	3.414	2.11	0.54	0.49	0.359	2.110	0.54	102.91	1.473	151.608	0.40	0.66	1	1.13
108.759	8	Sand to Silty Sand	170.97	2.4	6.526	3.084	3.442	2.05	0.54	0.48	0.358	2.050	0.54	92.32	1.371	126.581	0.27	0.67	1	0.75
109.743	7	Silty Sand to Sandy Silt	49.29	0.85	6.585	3.114	3.47	2.82	0.54	0.48	0.357							0.78	1	
110.727	7	Silty Sand to Sandy Silt	48.97	0.95	6.644	3.145	3.499	2.84	0.53	0.48	0.356							0.78	1	
111.711	6	Sandy Silt to Clayey Silt	57.75	1.42	6.703	3.176	3.527	2.83	0.53	0.48	0.356							0.78	1	
112.695	6	Sandy Silt to Clayey Silt	57.41	1.93	6.762	3.206	3.555	2.91	0.53	0.48	0.355							0.78	1	
113.68	11	Sitff Fine-Grained	89.13	4.45	6.821	3.237	3.584	2.87	0.53	0.48	0.354							0.75	1	
114.664	6	Sandy Silt to Clayey Silt	49.94	1.25	6.88	3.268	3.612	2.91	0.53	0.48	0.353							0.77	1	
115.648	7	Silty Sand to Sandy Silt	56.24	1.17	6.939	3.299	3.64	2.81	0.52	0.47	0.353							0.77	1	
116.632	7	Silty Sand to Sandy Silt	60.17	1.17	6.998	3.329	3.669	2.77	0.52	0.47	0.352							0.77	1	
117.617	6	Sandy Silt to Clayey Silt	61.97	1.5	7.057	3.36	3.697	2.81	0.52	0.47	0.351							0.77	1	
118.601	7	Silty Sand to Sandy Silt	66.71	1.49	7.116	3.391	3.725	2.77	0.52	0.47	0.351							0.77	1	
119.585	6	Sandy Silt to Clayey Silt	51.88	1.2	7.175	3.422	3.754	2.89	0.52	0.47	0.350							0.77	1	

CALCULATIONS OF SHEAR WAVE VELOCITY

East Ridge Bart Regional Connector Project

Average Shear Wave Velocity Calculation (V_{s30})

Based on: **AS-67**

Top Layer (ft)	Bottom Layer (ft)	Vs (ft/s)	Thickness, T (ft)	T/V_s	Vs_{30} (m/s)
0	9.5	350	9.5	0.0271	
9.5	19.5	502.9	10	0.0199	
19.5	29.5	676.8	10	0.0148	
29.5	39.5	854.2	10	0.0117	
39.5	49.5	930.2	10	0.0108	
49.5	59.5	858.5	10	0.0116	
59.5	69.4	841	9.9	0.0118	
69.4	79.4	1036.7	10	0.0096	
79.4	89.4	897.3	10	0.0111	
89.4	99.6	1022	10.2	0.0100	
99.6	109.4	1192.9	9.8	0.0082	
109.4	119.7	1148.2	10.3	0.0090	
				0.1385	219.20

East Ridge Bart Regional Connector Project

Average Shear Wave Velocity Calculation (V_{s30})

Based on: **AS-71**

Top Layer (ft)	Bottom Layer (ft)	Vs (ft/s)	Thickness, T	T/V_s	Vs_{30} (m/s)
0	9.3	350	9.3	0.0266	
9.3	14.4	511	5.1	0.0100	
14.4	19.5	513.7	5.1	0.0099	
19.5	24.4	667.6	4.9	0.0073	
24.4	29.5	659.2	5.1	0.0077	
29.5	39.4	854.8	9.9	0.0116	
39.4	49.4	904.9	10	0.0111	
49.4	59.5	813.3	10.1	0.0124	
59.5	69.5	926.2	10	0.0108	
69.5	79.6	1015.6	10.1	0.0099	
79.6	89.4	907	9.8	0.0108	
89.4	99.6	982.5	10.2	0.0104	
99.6	109.4	1112	9.8	0.0088	
109.4	119.6	933	10.2	0.0109	
				0.1385	219.06

East Ridge Bart Regional Connector Project

Average Shear Wave Velocity Calculation (V_{s30})

Based on: AS-75

Top Layer (ft)	Bottom Layer (ft)	Vs (ft/s)	Thickness, T	T/V_s	Vs_{30} (m/s)
0	9.3	350	9.3	0.0266	
9.3	14.4	544.2	5.1	0.0094	
14.4	19.4	464.2	5	0.0108	
19.4	24.4	645.9	5	0.0077	
24.4	29.5	573.5	5.1	0.0089	
29.5	34.4	664.1	4.9	0.0074	
34.4	39.5	643	5.1	0.0079	
39.5	44.5	833.4	5	0.0060	
44.5	49.4	927.9	4.9	0.0053	
49.4	54.5	861.5	5.1	0.0059	
54.5	59.5	861.5	5	0.0058	
59.5	64.5	902.7	5	0.0055	
64.5	69.5	941.4	5	0.0053	
69.5	74.5	1312	5	0.0038	
74.5	79.6	736.8	5.1	0.0069	
79.6	84.5	1046.9	4.9	0.0047	
84.5	89.6	1225.1	5.1	0.0042	
89.6	94.5	1025.1	4.9	0.0048	
94.5	99.6	1048.4	5.1	0.0049	
99.6	104.7	1303.7	5.1	0.0039	
104.7	109.4	1093.5	4.7	0.0043	
109.4	114.5	1027.2	5.1	0.0050	
114.5	119.7	1029.2	5.2	0.0051	
				0.1417	214.12

East Ridge Bart Regional Connector Project

Average Shear Wave Velocity Calculation (V_{s30})

Based on: **AS-77**

Top Layer (ft)	Bottom Layer (ft)	Vs (ft/s)	Thickness, T	T/V_s	Vs_{30} (m/s)
0	9.3	350	9.3	0.0266	
9.3	14.4	421.2	5.1	0.0121	
14.4	19.4	553.3	5	0.0090	
19.4	24.4	572.9	5	0.0087	
24.4	29.4	555	5	0.0090	
29.4	34.4	736	5	0.0068	
34.4	39.5	574	5.1	0.0089	
39.5	44.5	833.4	5	0.0060	
44.5	49.4	1185.1	4.9	0.0041	
49.4	54.5	861.5	5.1	0.0059	
54.5	59.4	1035.6	4.9	0.0047	
59.4	64.6	971.7	5.2	0.0054	
64.6	69.4	1463.3	4.8	0.0033	
69.4	74.5	1059.1	5.1	0.0048	
74.5	79.4	723.5	4.9	0.0068	
79.4	84.6	1437.9	5.2	0.0036	
84.6	89.6	1185.6	5	0.0042	
89.6	94.6	574.5	5	0.0087	
94.6	99.4	960.9	4.8	0.0050	
99.4	104.5	1155.6	5.1	0.0044	
104.5	109.4	964.8	4.9	0.0051	
				0.1437	210.81

East Ridge Bart Regional Connector Project

Average Shear Wave Velocity Calculation (V_{s30})

Based on: **AS-83**

Top Layer (ft)	Bottom Layer (ft)	Vs (ft/s)	Thickness, T	T/V_s	Vs_{30} (m/s)
0	9.5	350	9.5	0.0271	
9.5	14.4	518.3	4.9	0.0095	
14.4	19.5	591.8	5.1	0.0086	
19.5	24.4	625.1	4.9	0.0078	
24.4	29.5	590.2	5.1	0.0086	
29.5	34.4	574.8	4.9	0.0085	
34.4	39.5	647.1	5.1	0.0079	
39.5	44.5	919.1	5	0.0054	
44.5	49.5	996.5	5	0.0050	
49.5	54.5	964.5	5	0.0052	
54.5	59.4	768.6	4.9	0.0064	
59.4	64.5	854.4	5.1	0.0060	
64.5	69.4	911.1	4.9	0.0054	
69.4	74.5	794.4	5.1	0.0064	
74.5	79.6	1155.5	5.1	0.0044	
79.6	84.5	974.3	4.9	0.0050	
84.5	89.6	996.9	5.1	0.0051	
89.6	94.5	1058.2	4.9	0.0046	
94.5	99.4	1144.3	4.9	0.0043	
99.4	104.5	1027.2	5.1	0.0050	
104.5	109.4	878.7	4.9	0.0056	
109.4	114.5	1093.5	5.1	0.0047	
114.5	119.7	1071.2	5.2	0.0049	
				0.1414	214.26

East Ridge Bart Regional Connector Project

Average Shear Wave Velocity Calculation (V_{s30})

Based on: **AS-87**

Top Layer (ft)	Bottom Layer (ft)	Vs (ft/s)	Thickness, T	T/V_s	Vs_{30} (m/s)
0	9.3	350	9.3	0.0266	
9.3	14.4	486.3	5.1	0.0105	
14.4	19.5	602.4	5.1	0.0085	
19.5	24.4	625.1	4.9	0.0078	
24.4	29.5	607.8	5.1	0.0084	
29.5	34.4	585.1	4.9	0.0084	
34.4	39.5	672.9	5.1	0.0076	
39.5	44.5	870.3	5	0.0057	
44.5	49.4	1612.5	4.9	0.0030	
49.4	54.5	861.5	5.1	0.0059	
54.5	59.4	910.9	4.9	0.0054	
59.4	64.5	941.4	5.1	0.0054	
64.5	69.5	861.6	5	0.0058	
69.5	74.5	902.7	5	0.0055	
74.5	79.4	911.1	4.9	0.0054	
79.4	84.5	1142.5	5.1	0.0045	
84.5	89.4	1200.1	4.9	0.0041	
89.4	94.5	932.9	5.1	0.0055	
94.5	99.4	1261.7	4.9	0.0039	
99.4	104.5	1027.2	5.1	0.0050	
104.5	109.4	1118.3	4.9	0.0044	
109.4	114.5	1142.6	5.1	0.0045	
114.5	119.7	1179.5	5.2	0.0044	
				0.1378	219.75

East Ridge Bart Regional Connector Project

Average Shear Wave Velocity Calculation (V_{s30})

Based on: **AS-91**

Top Layer (ft)	Bottom Layer (ft)	Vs (ft/s)	Thickness, T	T/V_s	Vs_{30} (m/s)
0	9.3	350	9.3	0.0266	
9.3	14.4	633.2	5.1	0.0081	
14.4	19.5	591.8	5.1	0.0086	
19.5	24.4	621.1	4.9	0.0079	
24.4	29.5	793	5.1	0.0064	
29.5	34.4	1003	4.9	0.0049	
34.4	39.9	886.5	5.5	0.0062	
39.9	44.5	857.9	4.6	0.0054	
44.5	49.5	1058.8	5	0.0047	
49.5	54.5	833.7	5	0.0060	
54.5	59.4	902.6	4.9	0.0054	
59.4	64.5	861.6	5.1	0.0059	
64.5	69.4	964.6	4.9	0.0051	
69.4	74.5	861.7	5.1	0.0059	
74.5	79.4	994	4.9	0.0049	
79.4	84.5	941.5	5.1	0.0054	
84.5	89.4	911.2	4.9	0.0054	
89.4	94.6	1019.1	5.2	0.0051	
94.6	99.4	1034	4.8	0.0046	
99.4	109.6	1287.2	10.2	0.0079	
109.6	115.2	1429.9	5.6	0.0039	
				0.1326	228.50

East Ridge Bart Regional Connector Project

Average Shear Wave Velocity Calculation (V_{s30})

Based on: **AS-92**

Top Layer (ft)	Bottom Layer (ft)	Vs (ft/s)	Thickness, T	T/V_s	Vs_{30} (m/s)
0	9.5	350	9.5	0.0271	
9.5	14.4	521.1	4.9	0.0094	
14.4	19.5	640.5	5.1	0.0080	
19.5	24.4	594.8	4.9	0.0082	
24.4	29.5	642.5	5.1	0.0079	
29.5	34.4	877.6	4.9	0.0056	
34.4	39.4	964	5	0.0052	
39.4	44.5	932.3	5.1	0.0055	
44.5	49.4	878.2	4.9	0.0056	
49.4	54.5	833.2	5.1	0.0061	
54.5	59.5	907.7	5	0.0055	
59.5	64.5	833.8	5	0.0060	
64.5	69.4	870.7	4.9	0.0056	
69.4	74.5	907.8	5.1	0.0056	
74.5	79.4	1261.6	4.9	0.0039	
79.4	84.5	932.9	5.1	0.0055	
84.5	89.6	1155.5	5.1	0.0044	
89.6	94.6	1093.4	5	0.0046	
94.6	99.4	1068.9	4.8	0.0045	
99.4	104.5	1105.3	5.1	0.0046	
104.5	109.4	1004.2	4.9	0.0049	
109.4	114.5	1142.6	5.1	0.0045	
114.5	119.7	1060.4	5.2	0.0049	
				0.1342	225.68

East Ridge Bart Regional Connector Project

Average Shear Wave Velocity Calculation (V_{s30})

Based on: AS-93

Top Layer (ft)	Bottom Layer (ft)	Vs (ft/s)	Thickness, T	T/V_s	Vs_{30} (m/s)
0	9.5	350	9.5	0.0271	
9.5	19.5	538.3	10	0.0186	
19.5	29.4	670.2	9.9	0.0148	
29.4	39.4	812.6	10	0.0123	
39.4	49.5	936.7	10.1	0.0108	
49.5	59.4	768.6	9.9	0.0129	
59.4	69.5	847.3	10.1	0.0119	
69.5	79.4	911.1	9.9	0.0109	
79.4	89.6	937.2	10.2	0.0109	
89.6	99.6	948.3	10	0.0105	
99.6	109.6	1212.8	10	0.0082	
109.6	119.7	1011.9	10.1	0.0100	
				0.1407	215.73

East Ridge Bart Regional Connector Project

Average Shear Wave Velocity Calculation (V_{s30})

Based on: **AS-94**

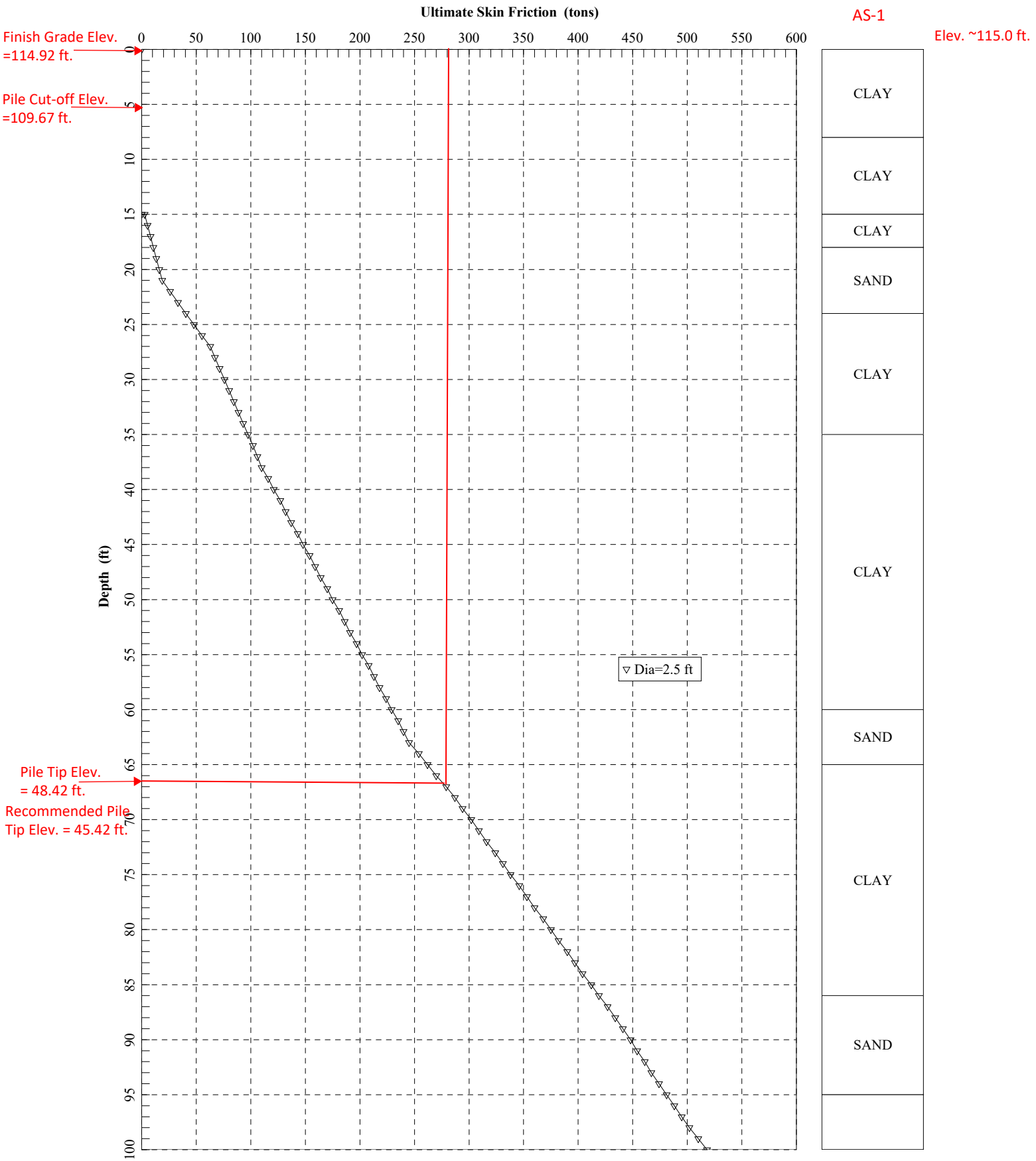
Top Layer (ft)	Bottom Layer (ft)	Vs (ft/s)	Thickness, T	T/V_s	Vs_{30} (m/s)
0	9.5	350	9.5	0.0271	
9.5	14.4	510.2	4.9	0.0096	
14.4	19.5	571.8	5.1	0.0089	
19.5	24.4	645.6	4.9	0.0076	
24.4	29.5	646.6	5.1	0.0079	
29.5	34.4	610.5	4.9	0.0080	
34.4	39.5	612.1	5.1	0.0083	
39.5	44.5	780.5	5	0.0064	
44.5	49.5	1058.8	5	0.0047	
49.5	54.5	819.8	5	0.0061	
54.5	59.5	950.1	5	0.0053	
59.5	64.5	820	5	0.0061	
64.5	69.5	820	5	0.0061	
69.5	74.5	1014.4	5	0.0049	
74.5	79.6	1081.7	5.1	0.0047	
79.6	84.5	1214.9	4.9	0.0040	
84.5	89.4	1046.9	4.9	0.0047	
89.4	94.5	1027.2	5.1	0.0050	
94.5	99.4	1312.1	4.9	0.0037	
99.4	104.7	1093.5	5.3	0.0048	
104.7	109.4	1235.5	4.7	0.0038	
109.4	114.5	997	5.1	0.0051	
114.5	119.7	1153.6	5.2	0.0045	
				0.1392	217.51

PILE CAPACITY ANALYSES

VERTICAL PILE CAPACITY ANALYSES (SHAFT ANALYSES RESULTS)
AERIAL GUIDEWAY – ABUTMENT 1 THROUGH BENT 6R

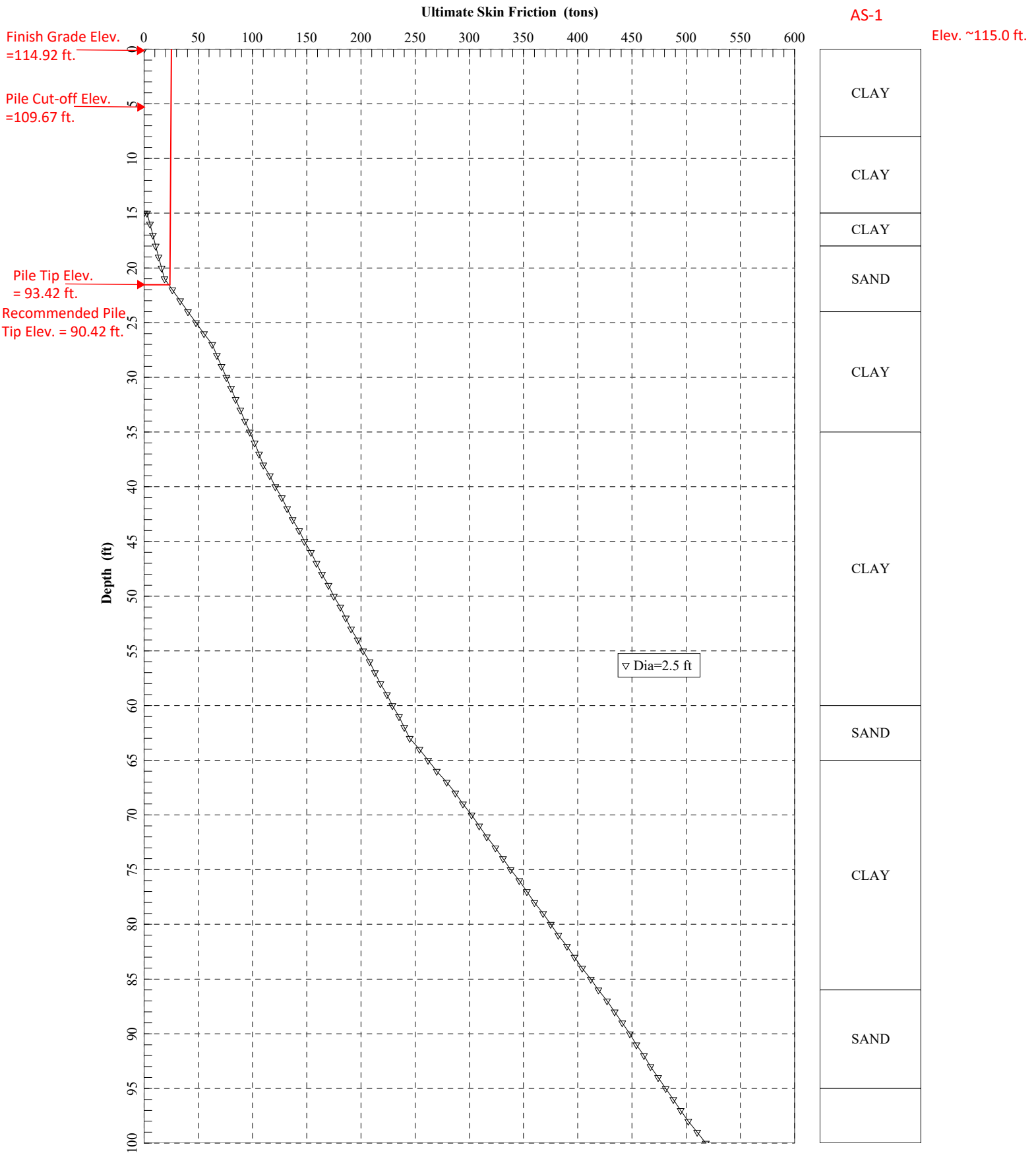
AERIAL GUIDEWAY - ABUTMENT 1 (30-INCH DIAMETER CIDH CONCRETE PILE)

Vertical Load Demand = 390 kips (Strength Limit Compression)/0.7 = 560 kips



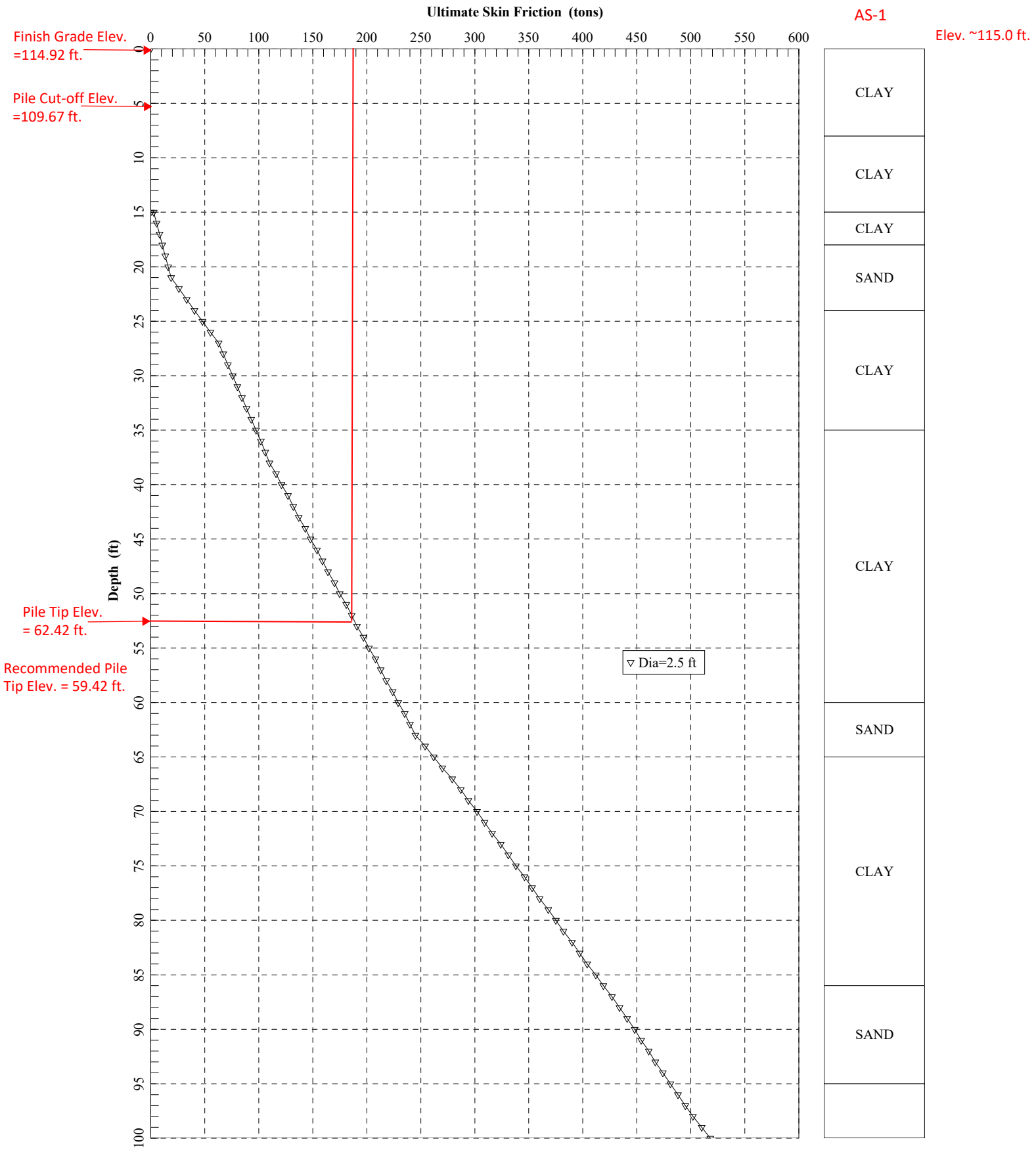
Eastridge to BART Regional Connector Project Abutment 1 - 30-Inch CIDH Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 30 kips (Strength Limit Tension)/0.7 = 50 kips



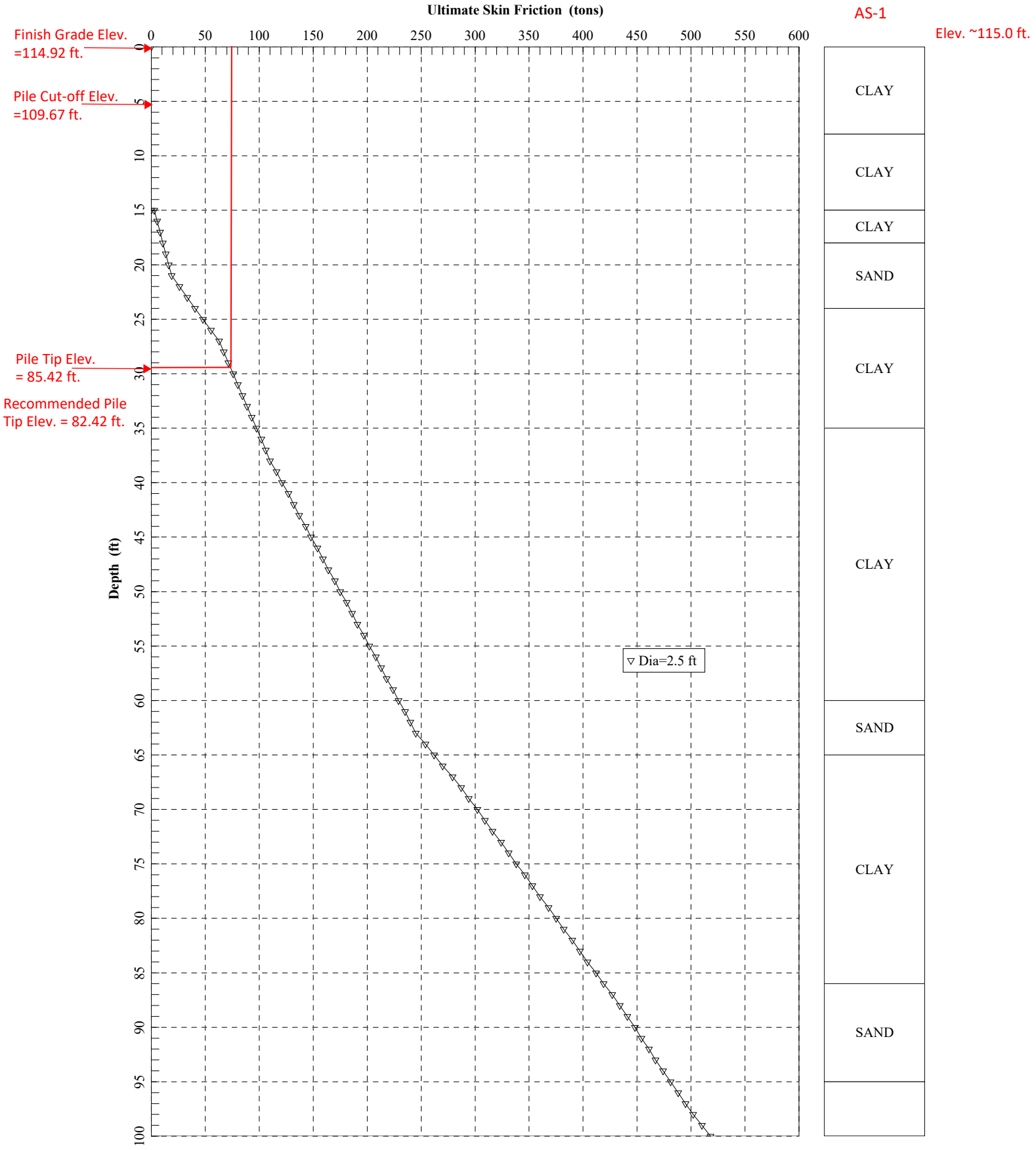
Eastridge to BART Regional Connector Project Abutment 1 - 30-Inch CIDH Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 380 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project Abutment 1 - 30-Inch CIDH Concrete Pile Extreme Event Limit State (Compression)

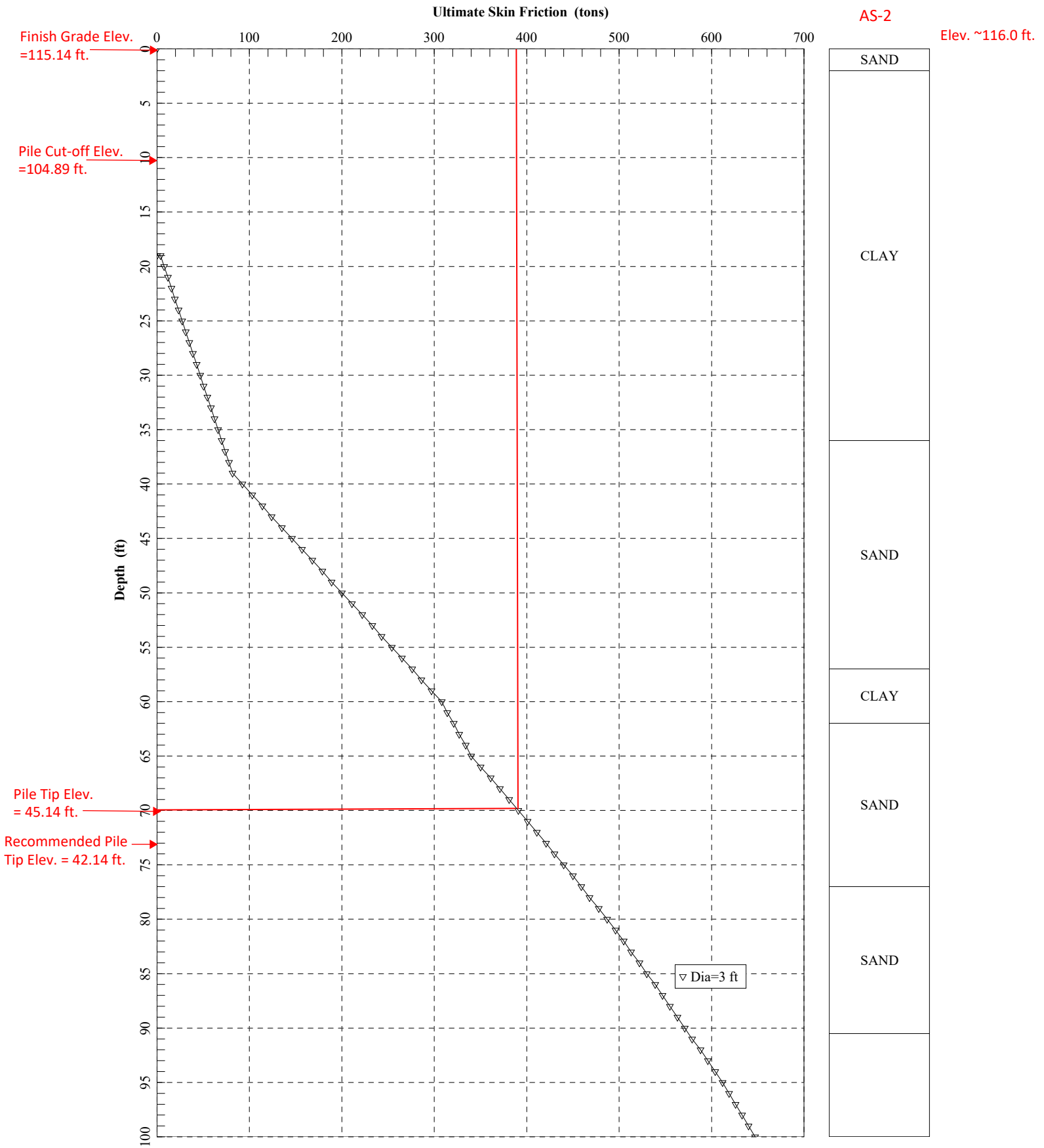
Vertical Load Demand = 150 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Abutment 1 - 30-Inch CIDH Concrete Pile Extreme Event Limit State (Tension)

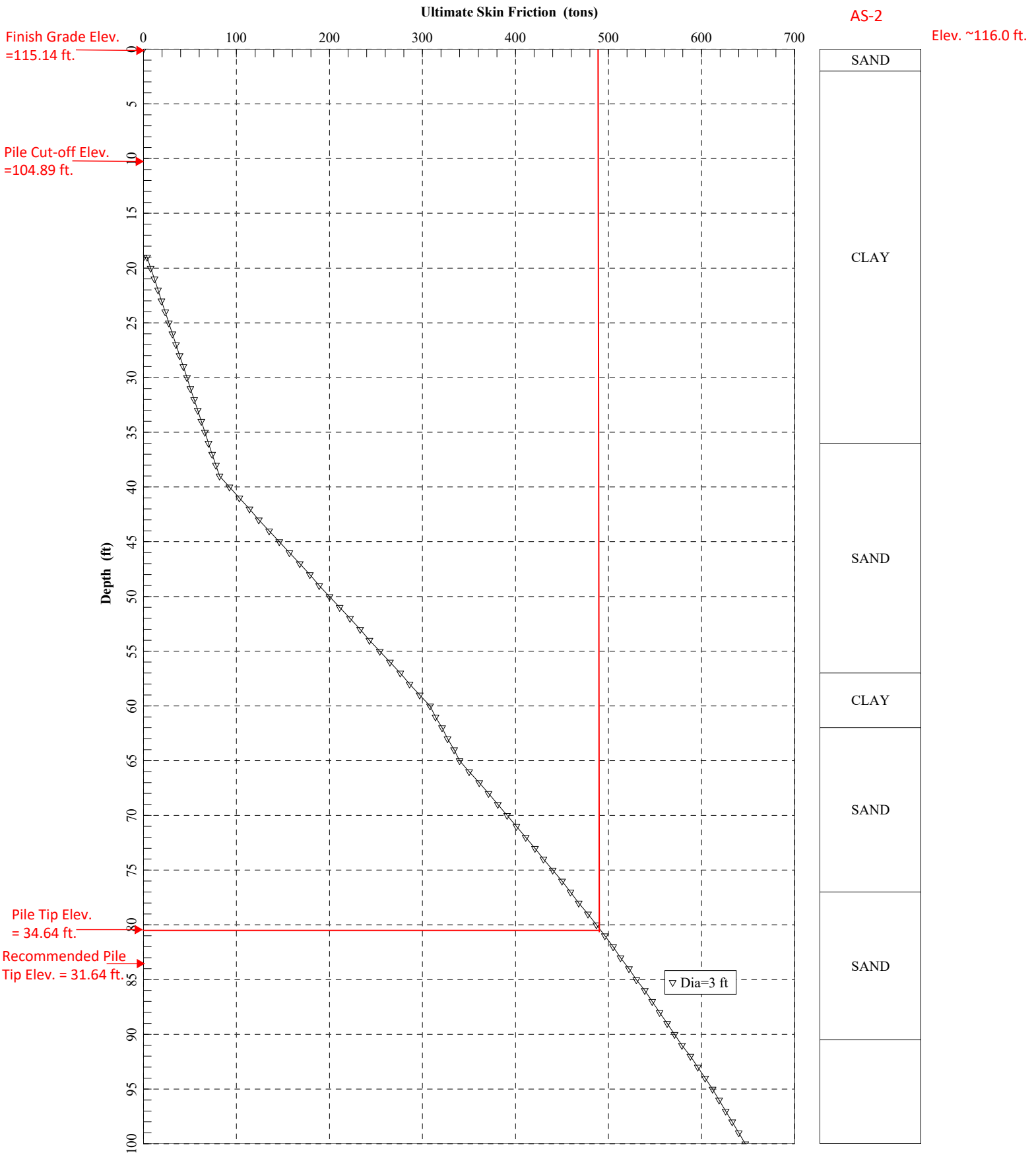
AERIAL GUIDEWAY – BENT 2 (36-INCH DIAMETER CIDH CONCRETE PILE)

Vertical Load Demand = 540 kips (Strength Limit Compression)/0.7 = 780 kips



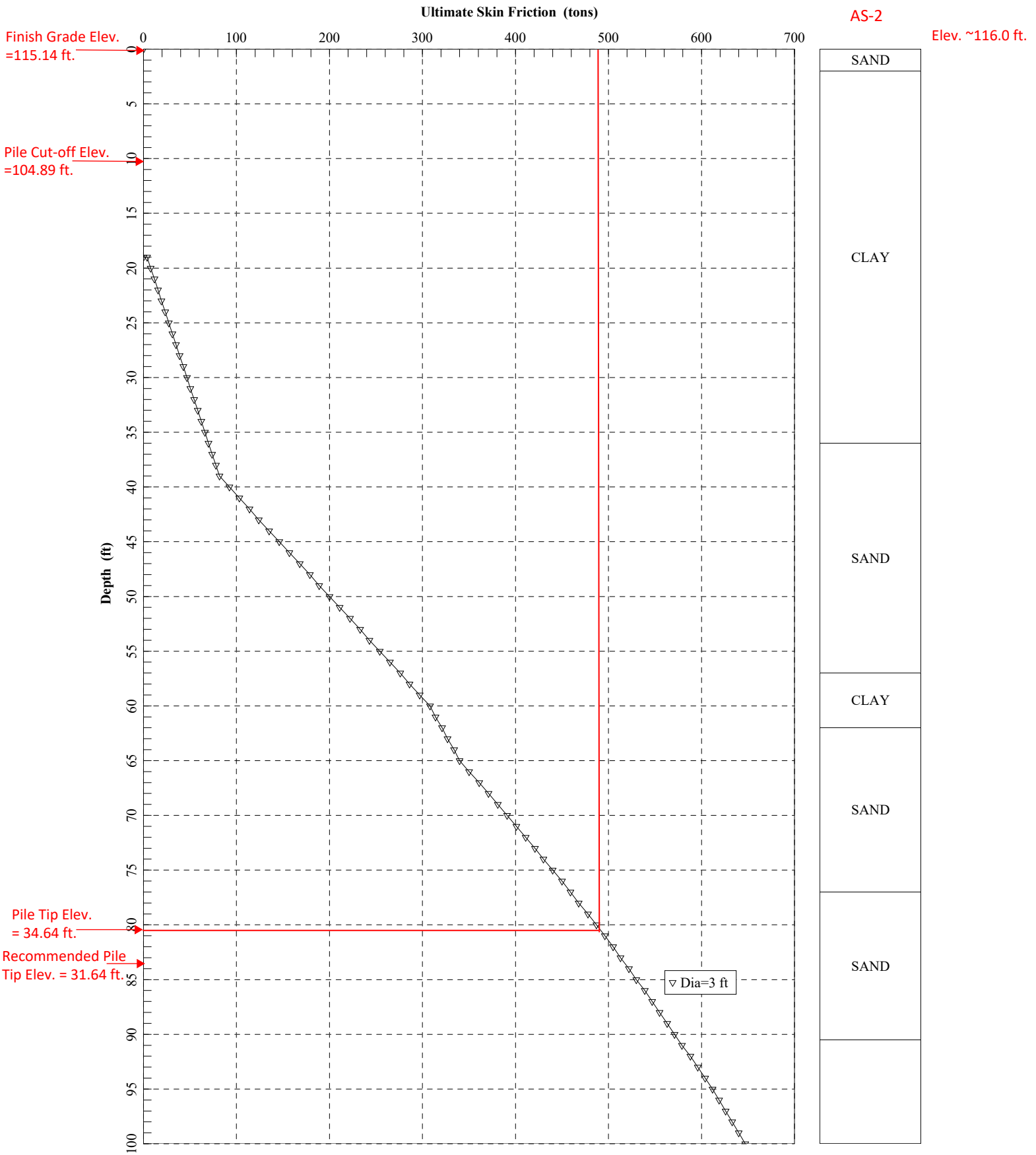
Eastridge to BART Regional Connector Project Bent 2 - 36-Inch CIDH Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 980 kips (Extreme Event Limit Compression)



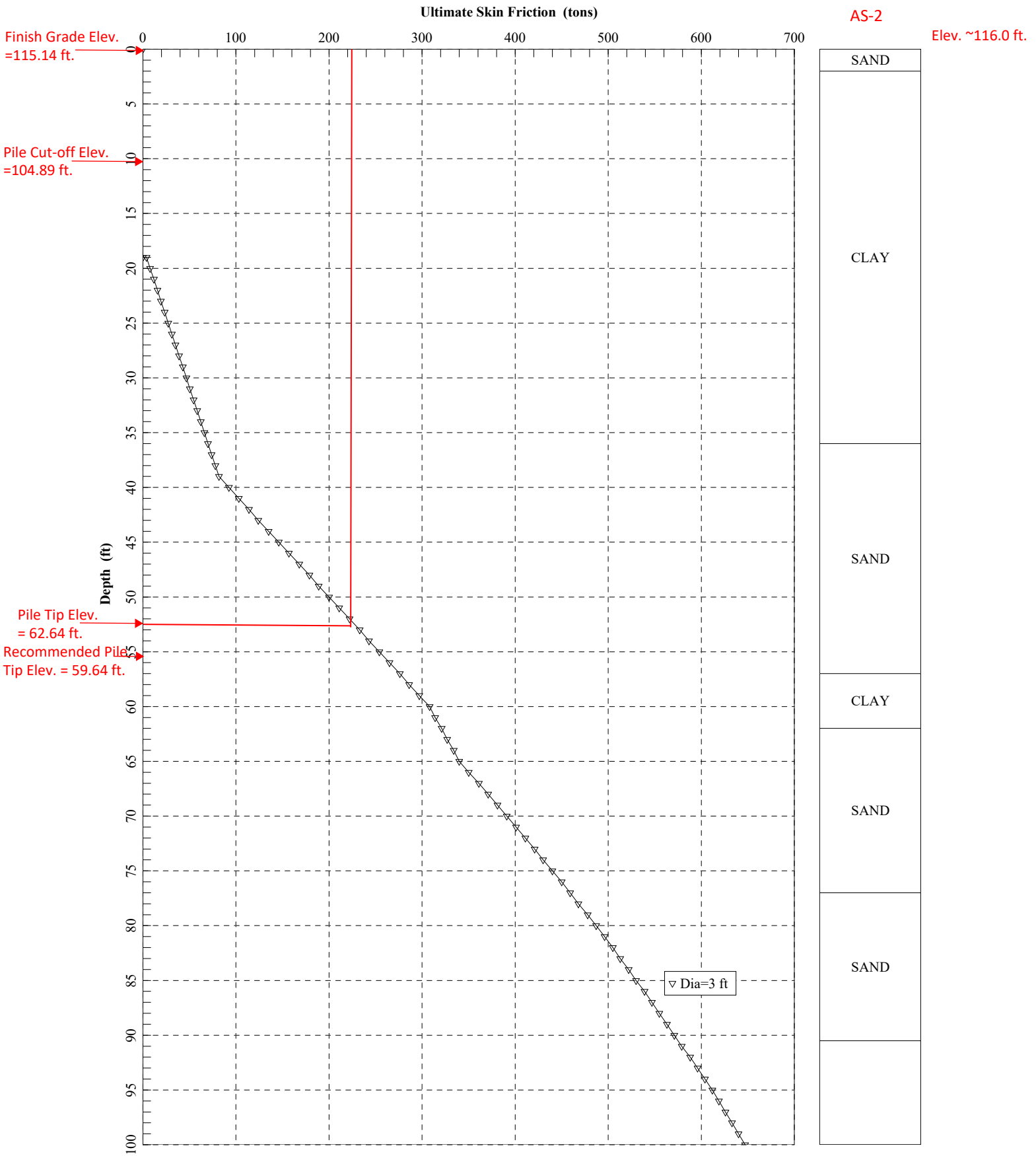
Eastridge to BART Regional Connector Project Bent 2 - 36-Inch CIDH Concrete Pile Extreme Event Limit State (Compression)

Vertical Load Demand = 980 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project Bent 2 - 36-Inch CIDH Concrete Pile Extreme Event Limit State (Compression)

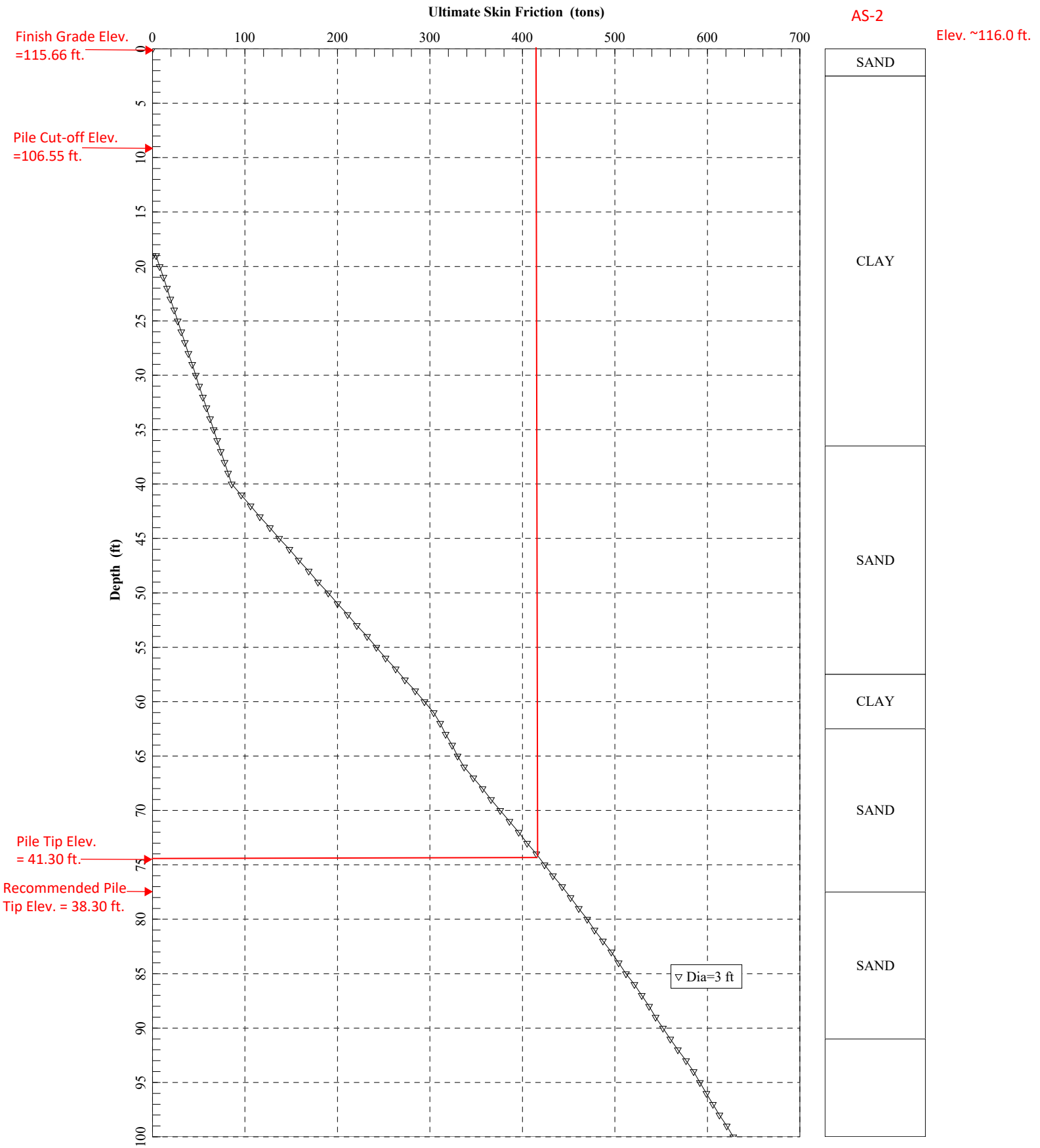
Vertical Load Demand = 450 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 2 - 36-Inch CIDH Concrete Pile Extreme Event Limit State (Tension)

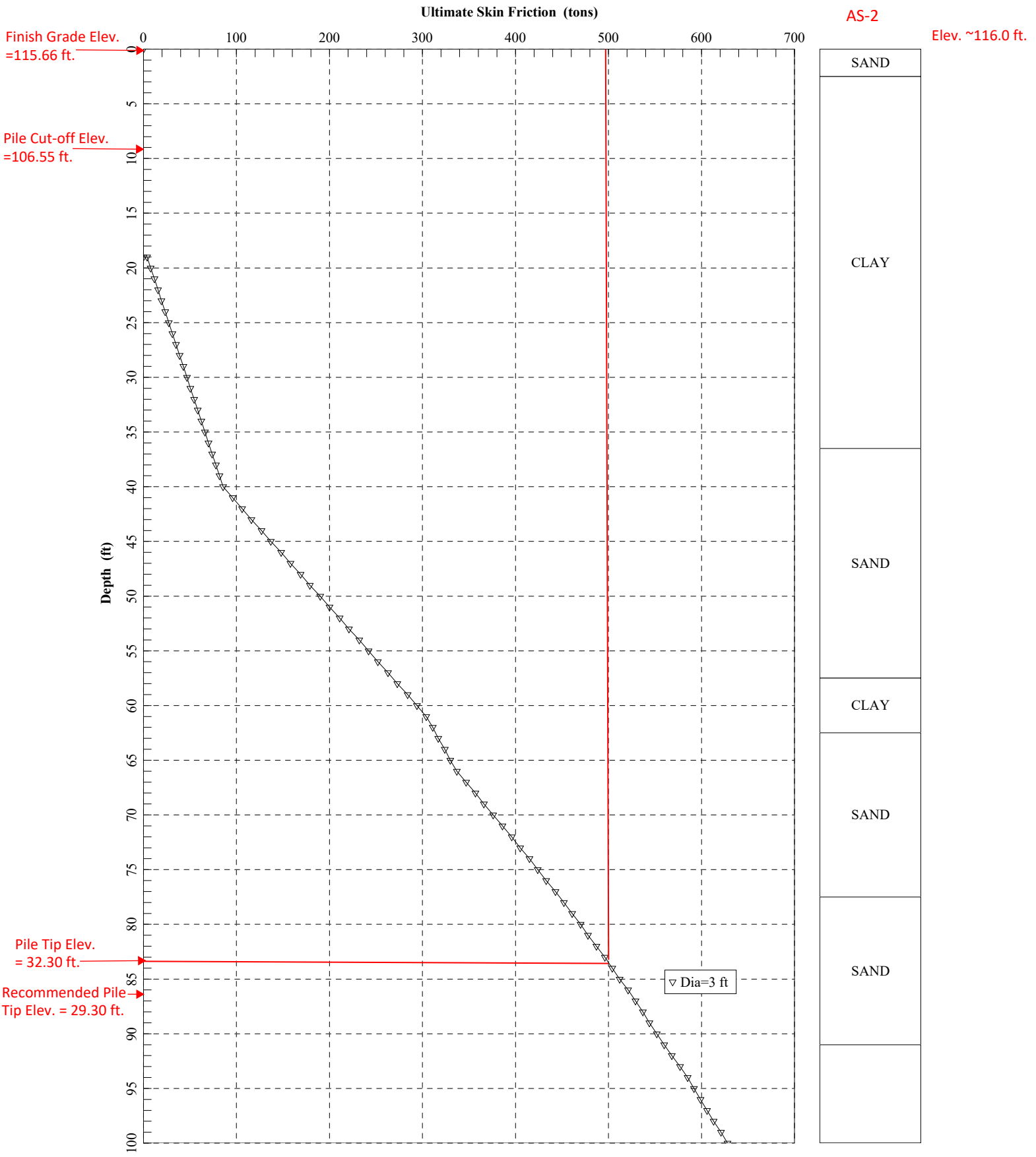
AERIAL GUIDEWAY – BENT 3 (36-INCH DIAMETER CIDH CONCRETE PILE)

Vertical Load Demand = 580 kips (Strength Limit Compression)/0.7 = 830 kips



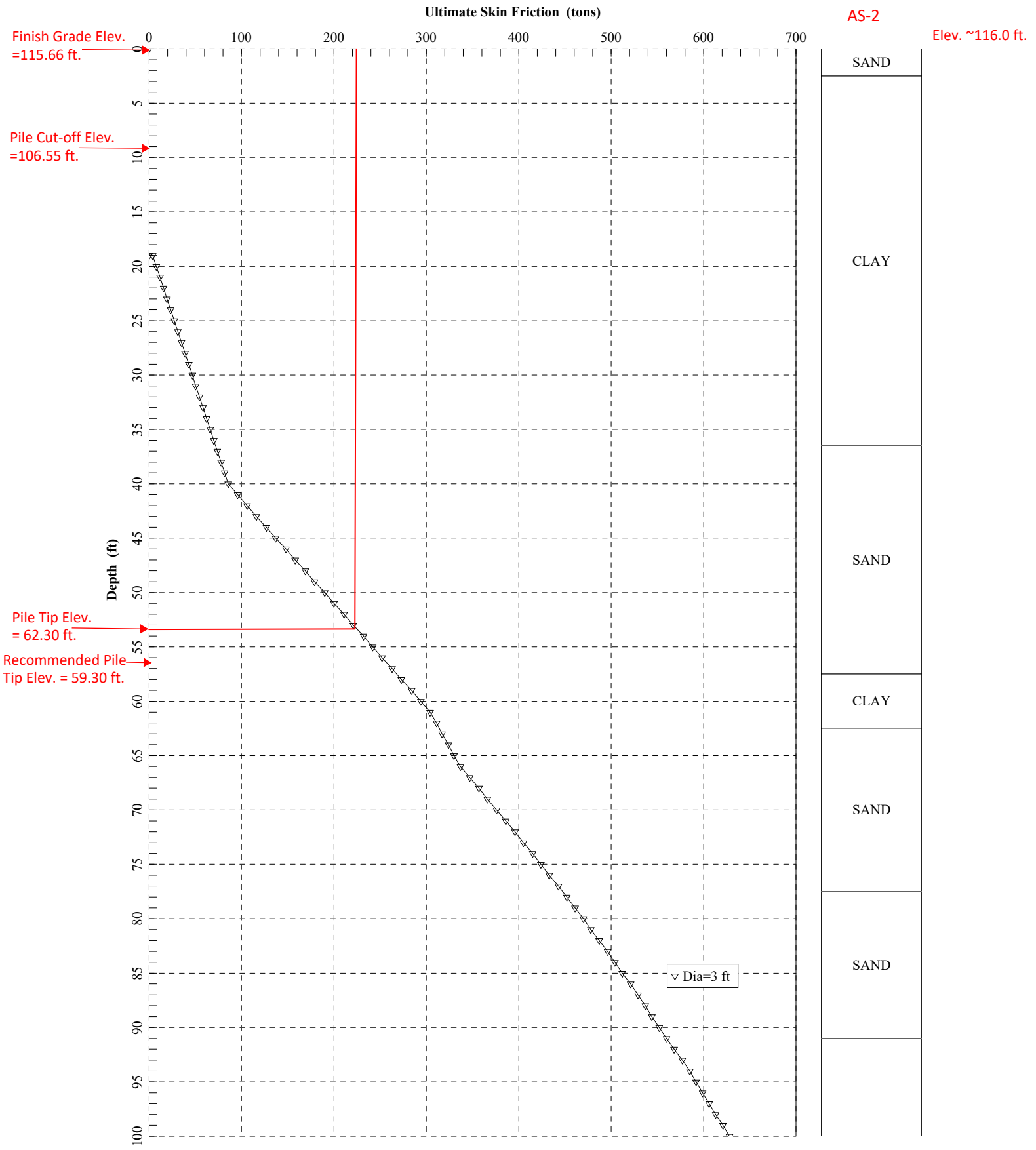
Eastridge to BART Regional Connector Project Bent 3 - 36-Inch CIDH Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 1000 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project Bent 3 - 36-Inch CIDH Concrete Pile Extreme Event Limit State (Compression)

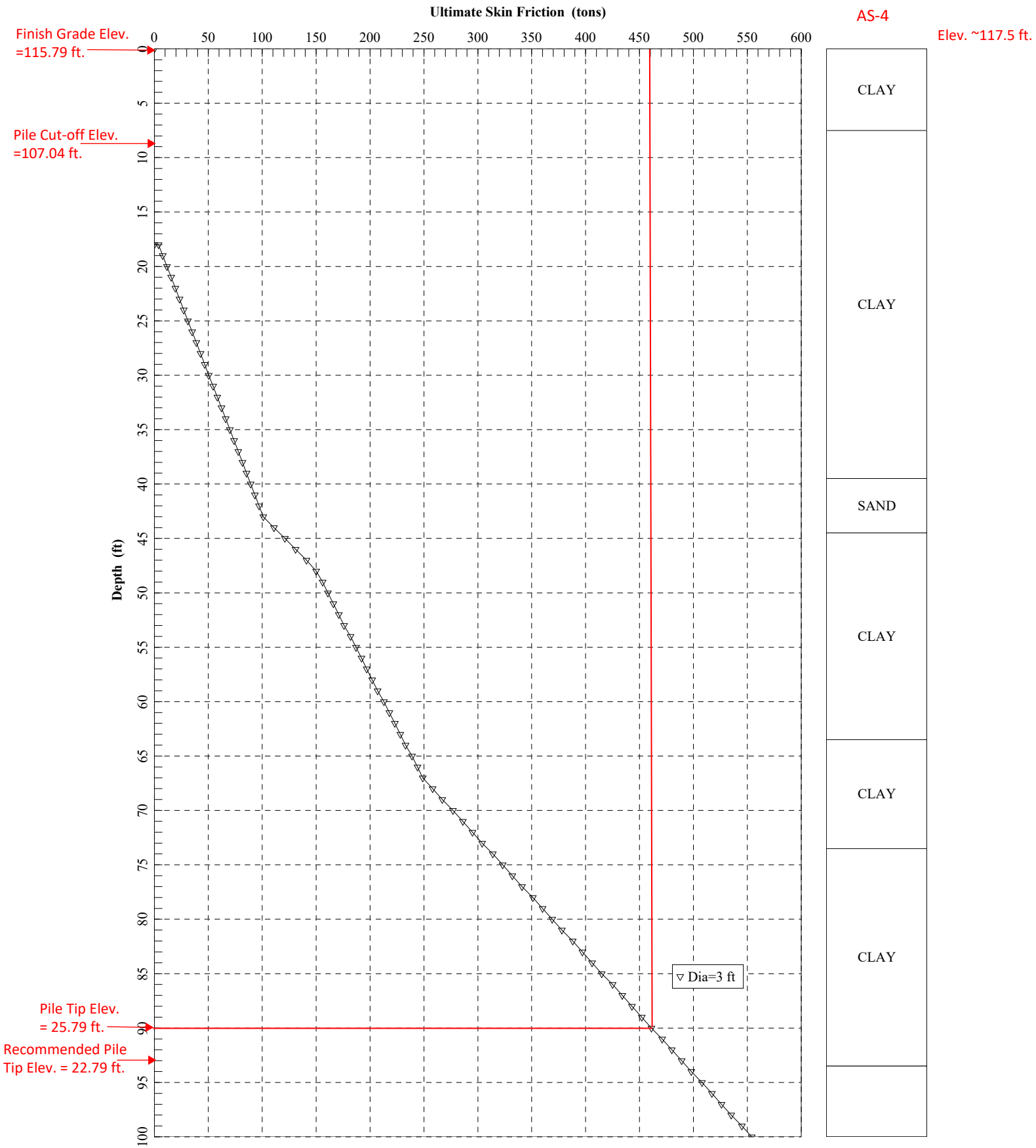
Vertical Load Demand = 450 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 3 - 36-Inch CIDH Concrete Pile Extreme Event Limit State (Tension)

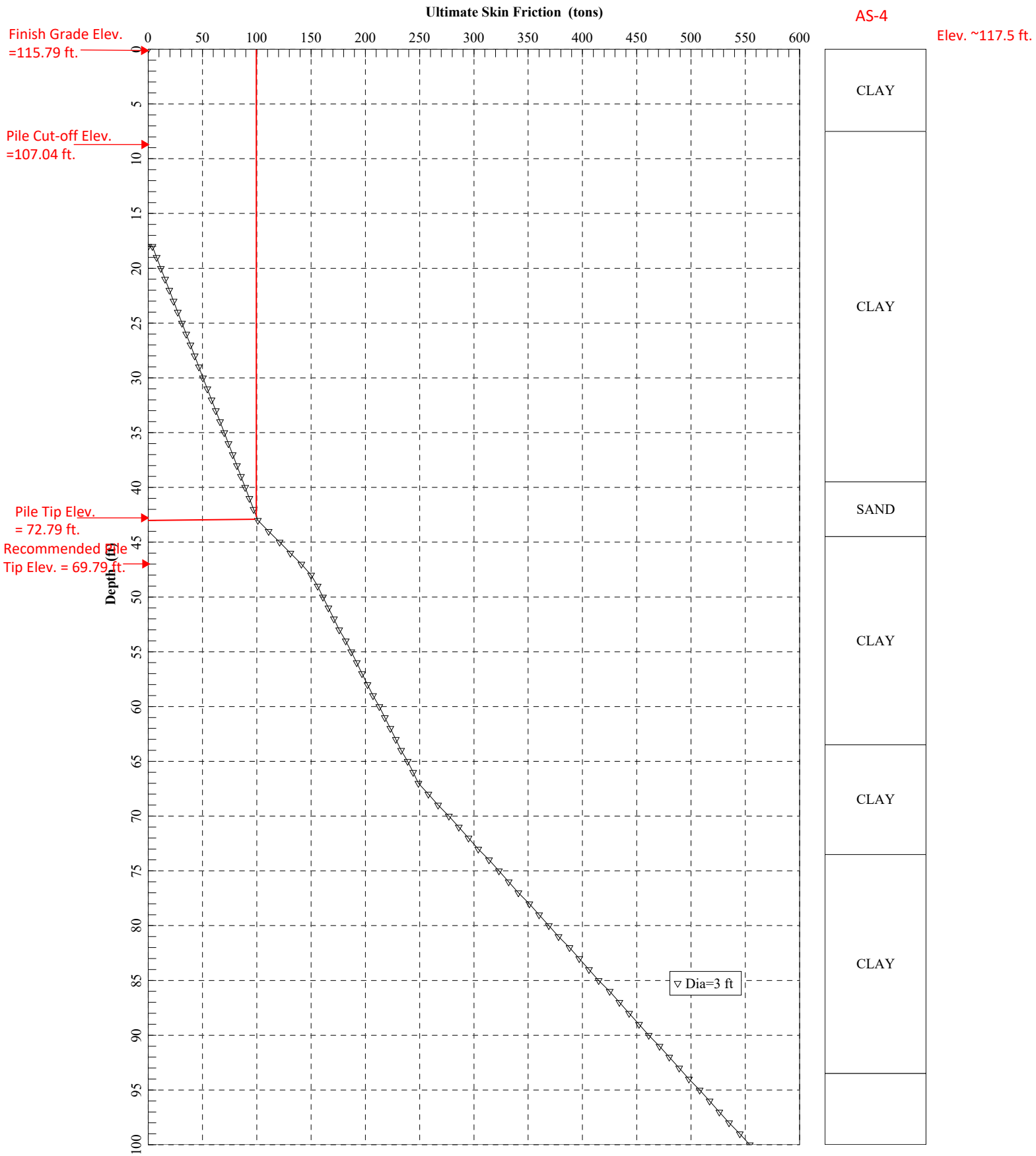
AERIAL GUIDEWAY – BENT 4 (36-INCH DIAMETER CIDH CONCRETE PILE)

Vertical Load Demand = 640 kips (Strength Limit Compression)/0.7 = 920 kips



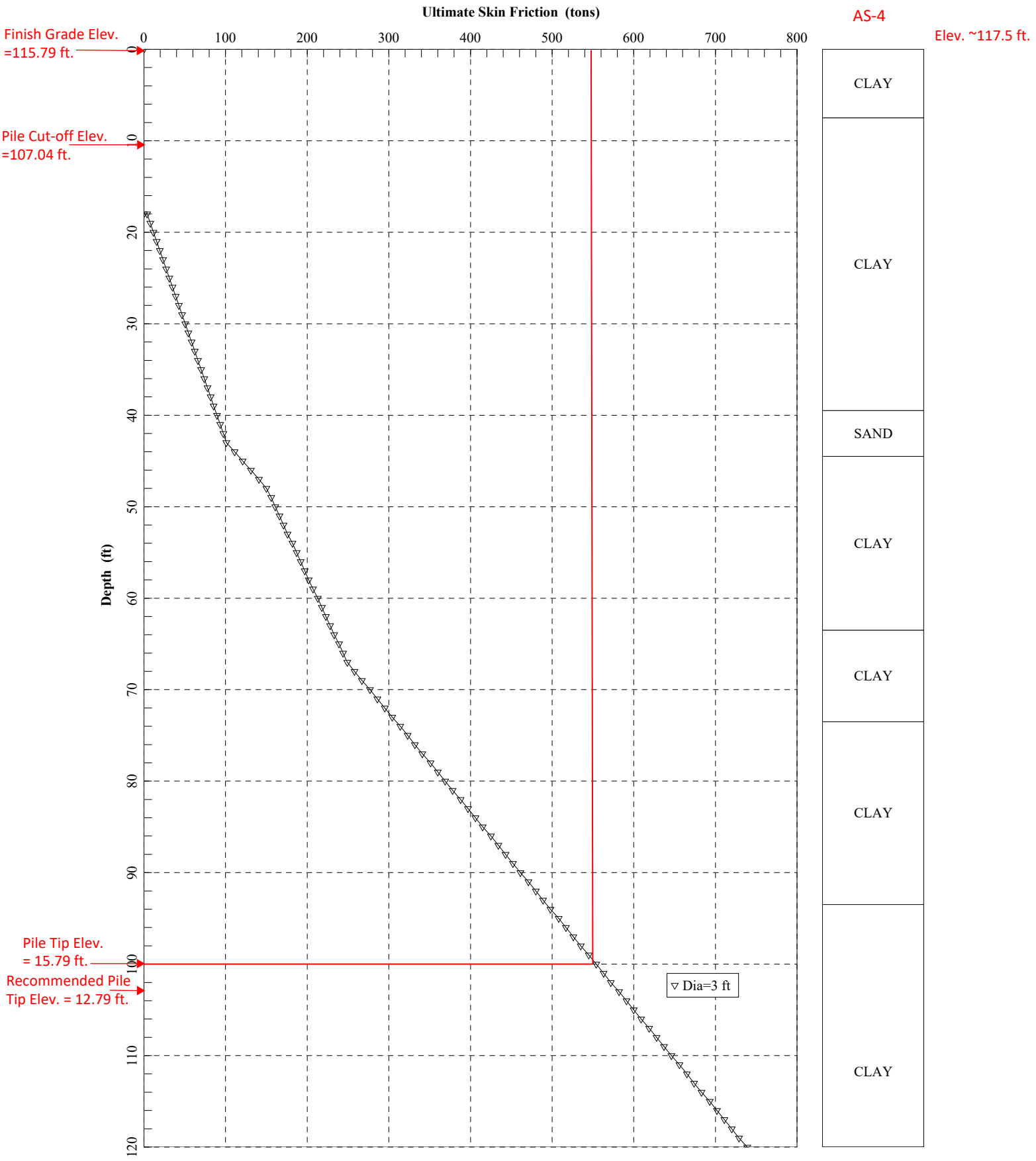
Eastridge to BART Regional Connector Project Bent 4 - 36-Inch CIDH Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 70 kips (Strength Limit Tension)/0.7 = 100 kips



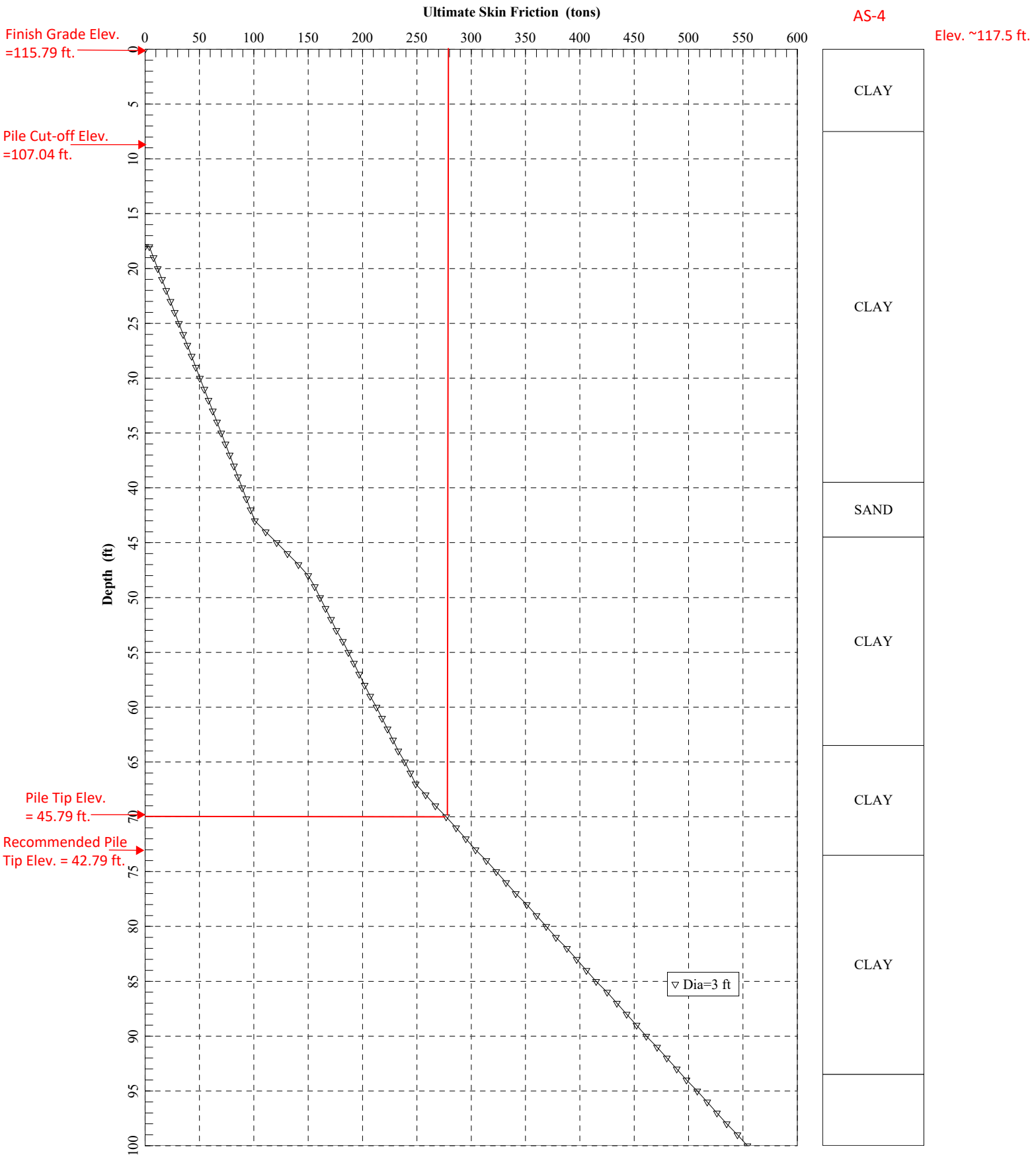
Eastridge to BART Regional Connector Project Bent 4 - 36-Inch CIDH Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 1090 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project Bent 4 - 36-Inch CIDH Concrete Pile Extreme Event Limit State (Compresion)

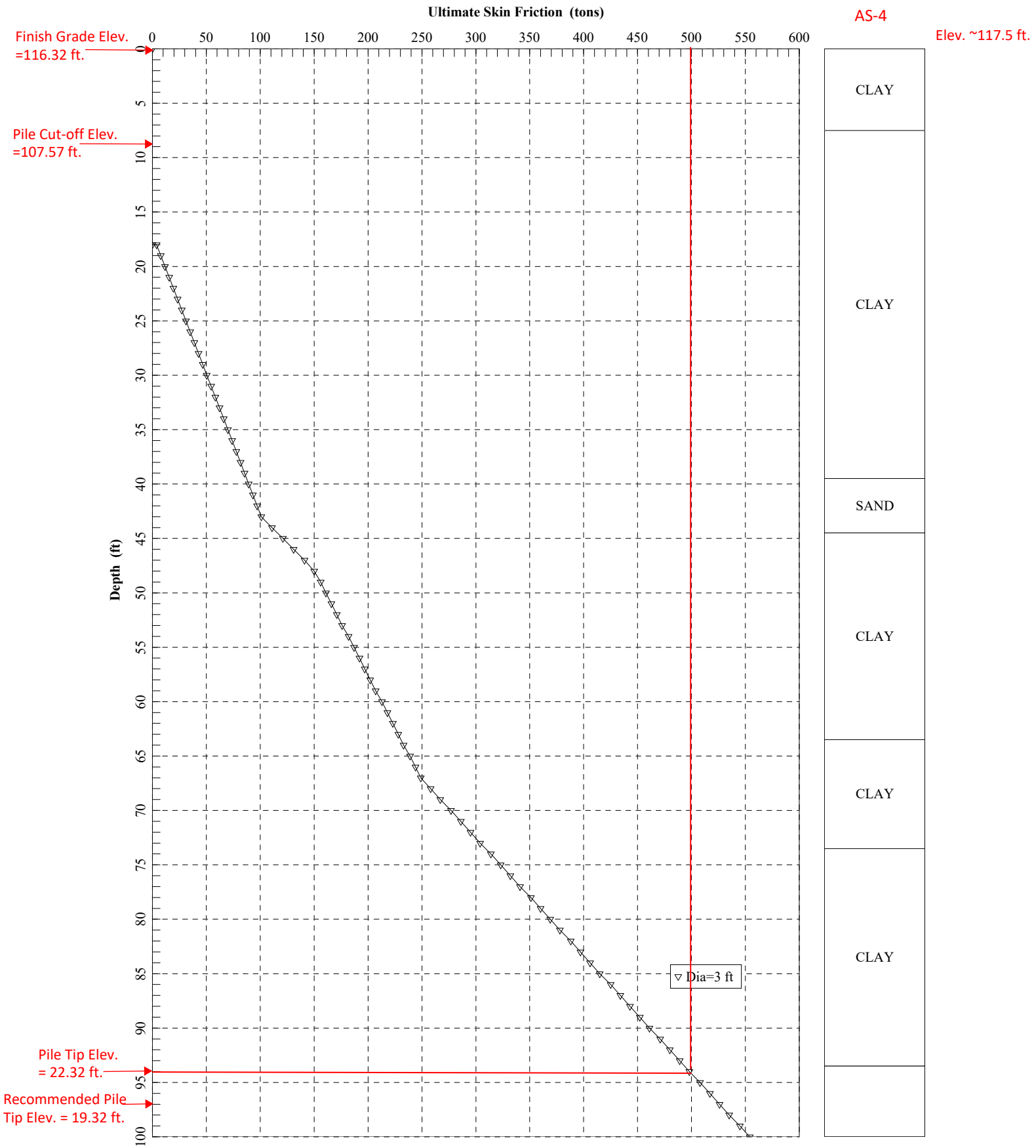
Vertical Load Demand = 560 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 4 - 36-Inch CIDH Concrete Pile Extreme Event Limit State (Tension)

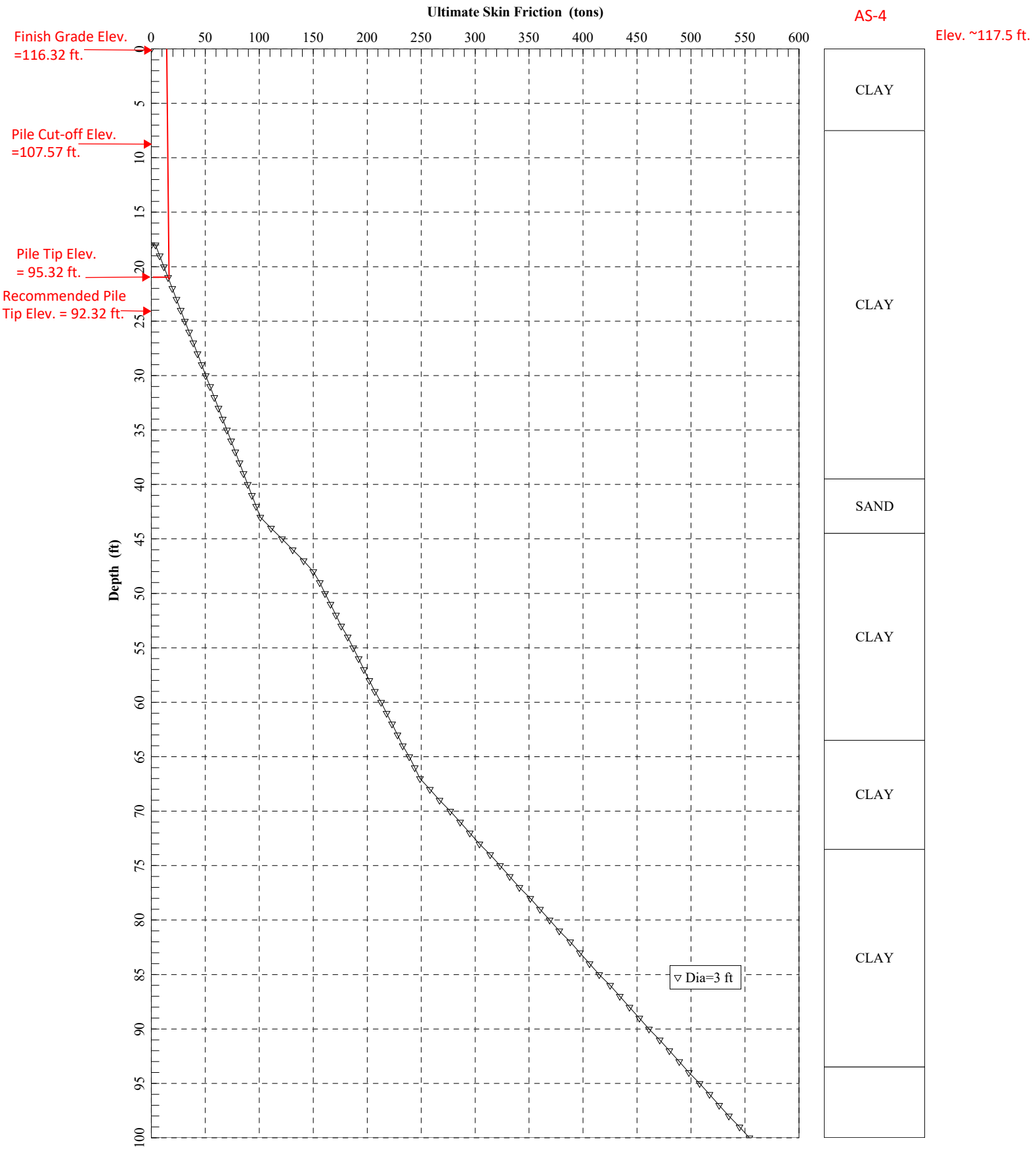
AERIAL GUIDEWAY – BENT 5 (36-INCH DIAMETER CIDH CONCRETE PILE)

Vertical Load Demand = 700 kips (Strength Limit Compression)/0.7 = 1000 kips



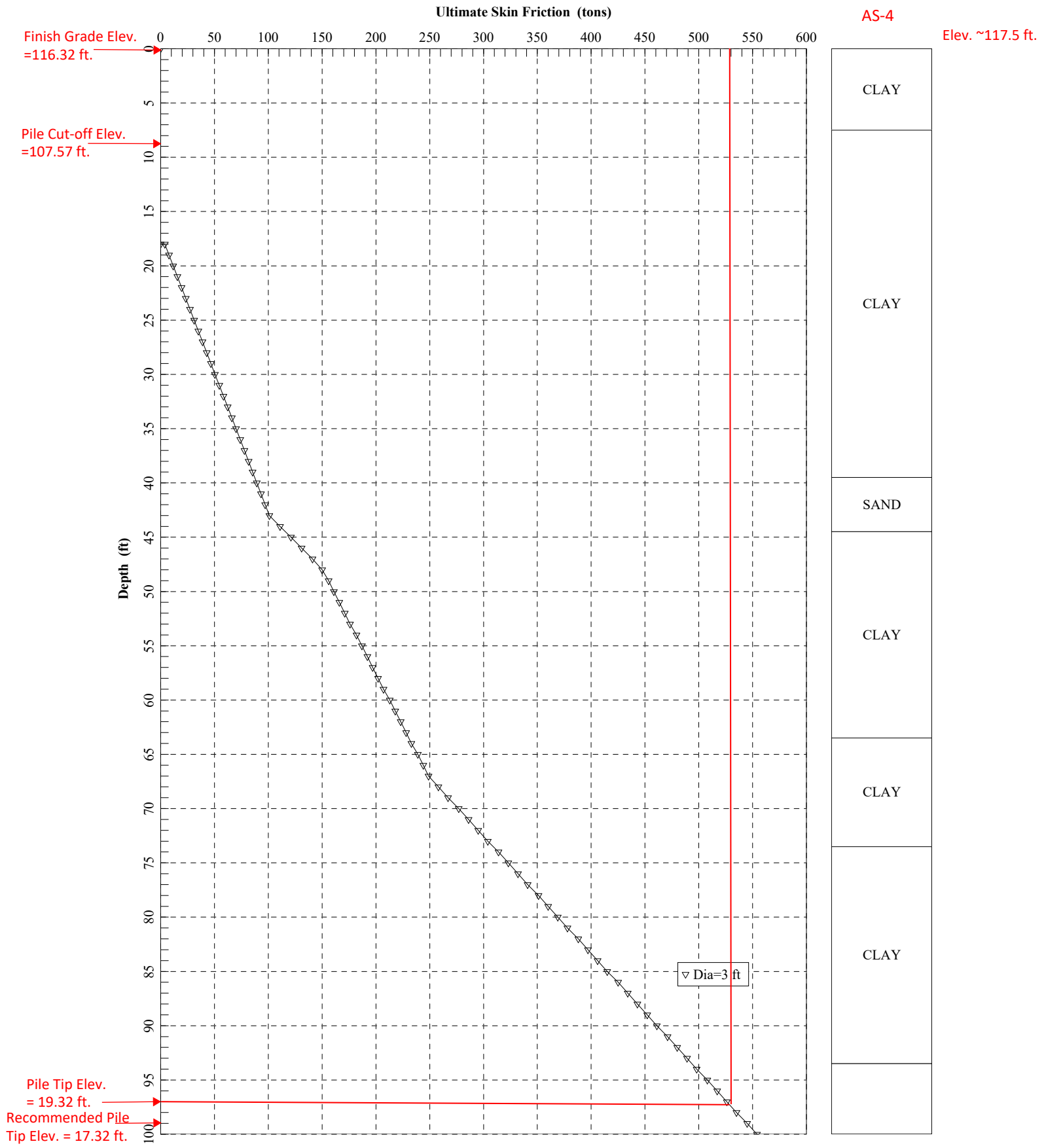
Eastridge to BART Regional Connector Project Bent 5 - 36-Inch CIDH Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 20 kips (Strength Limit Tension)/0.7 = 30 kips



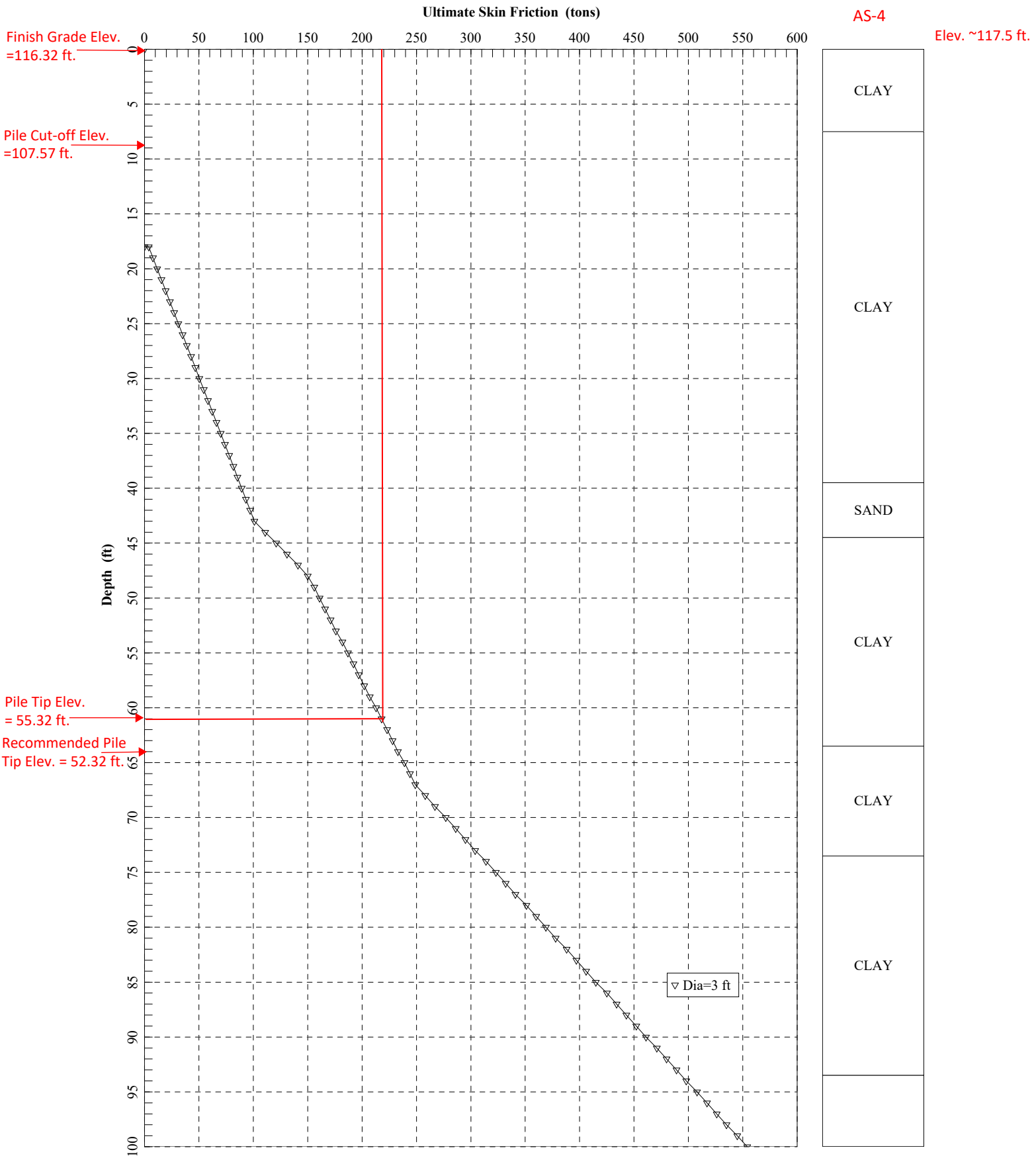
Eastridge to BART Regional Connector Project Bent 5 - 36-Inch CIDH Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 1060 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project Bent 5 - 36-Inch CIDH Concrete Pile Extreme Event Limit State (Compression)

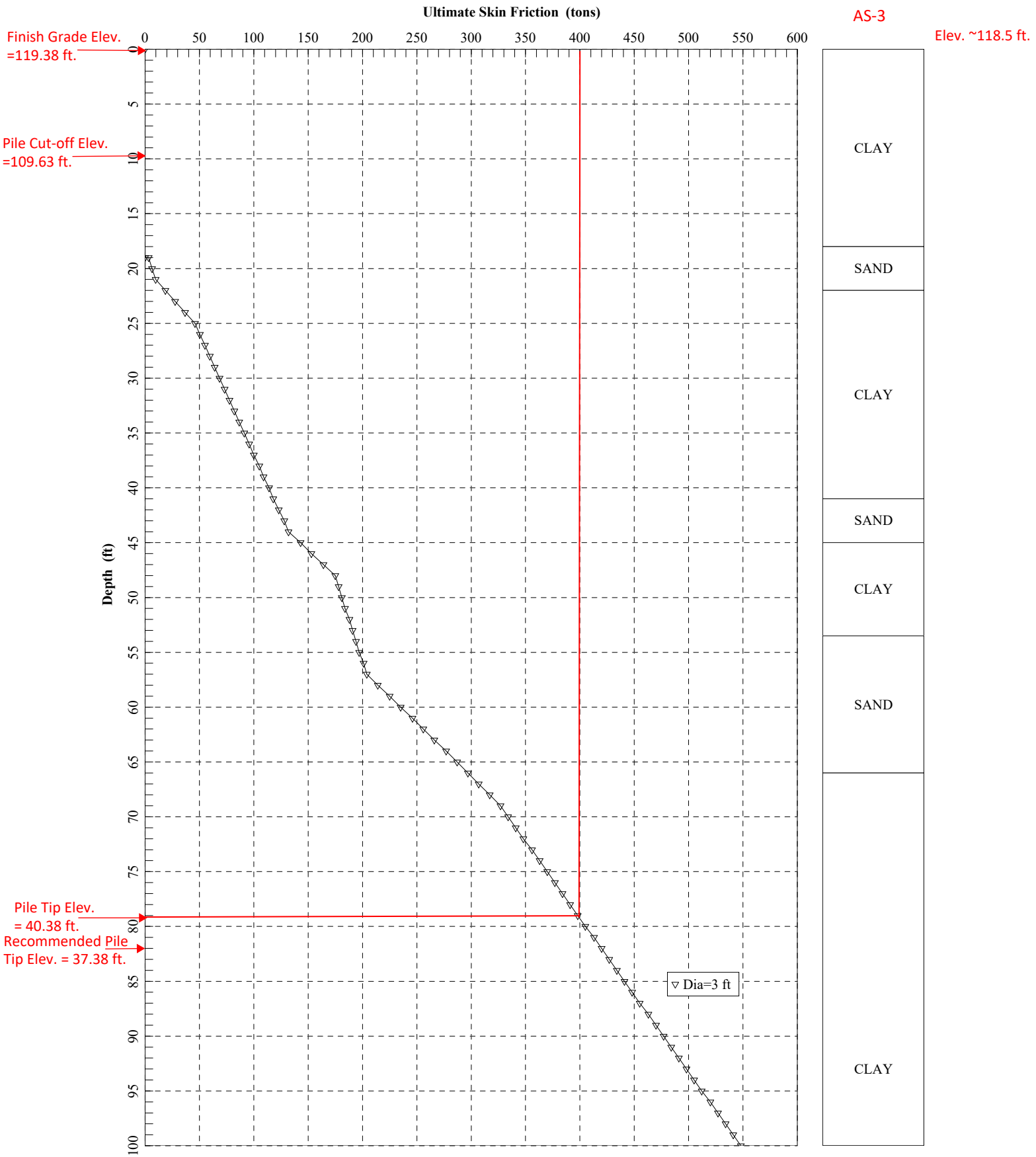
Vertical Load Demand = 440 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project Bent 5 - 36-Inch CIDH Concrete Pile Extreme Event Limit State (Tension)

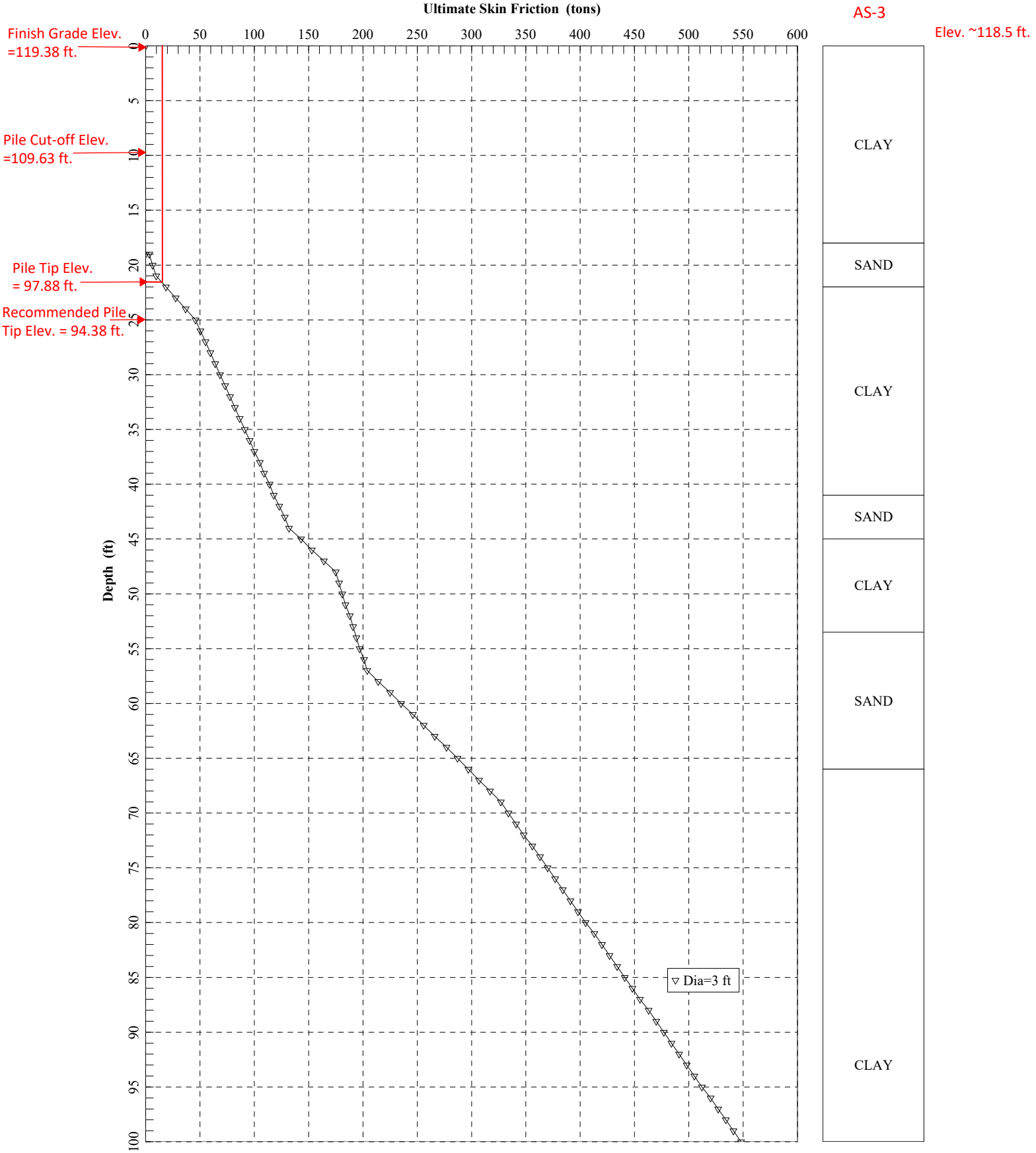
AERIAL GUIDEWAY – BENT 6R (36-INCH DIAMETER CIDH CONCRETE PILE)

Vertical Load Demand = 560 kips (Strength Limit Compression)/0.7 = 800 kips



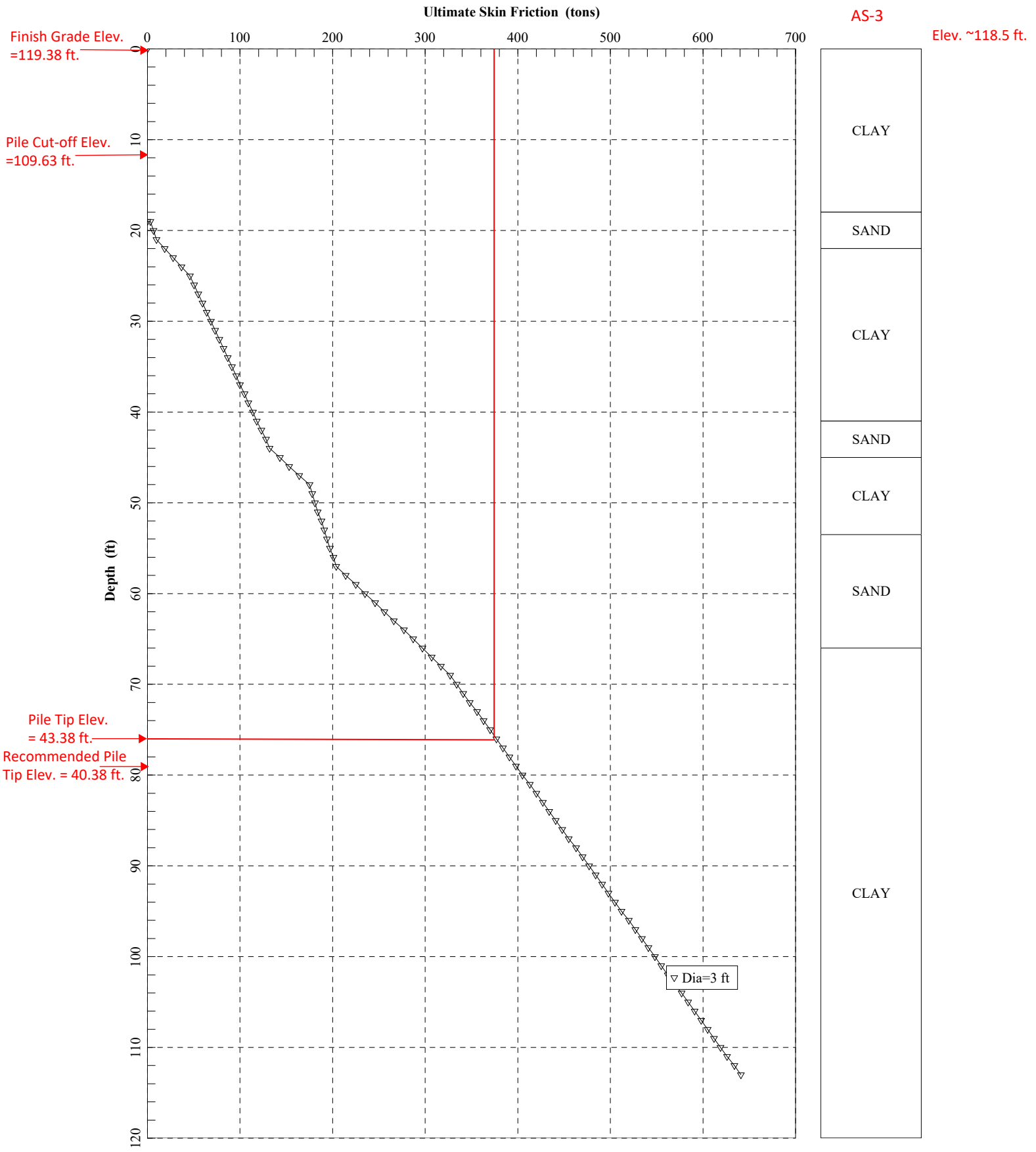
Eastridge to BART Regional Connector Project Bent 6 - 36-Inch CIDH Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 20 kips (Strength Limit Tension)/0.7 = 30 kips



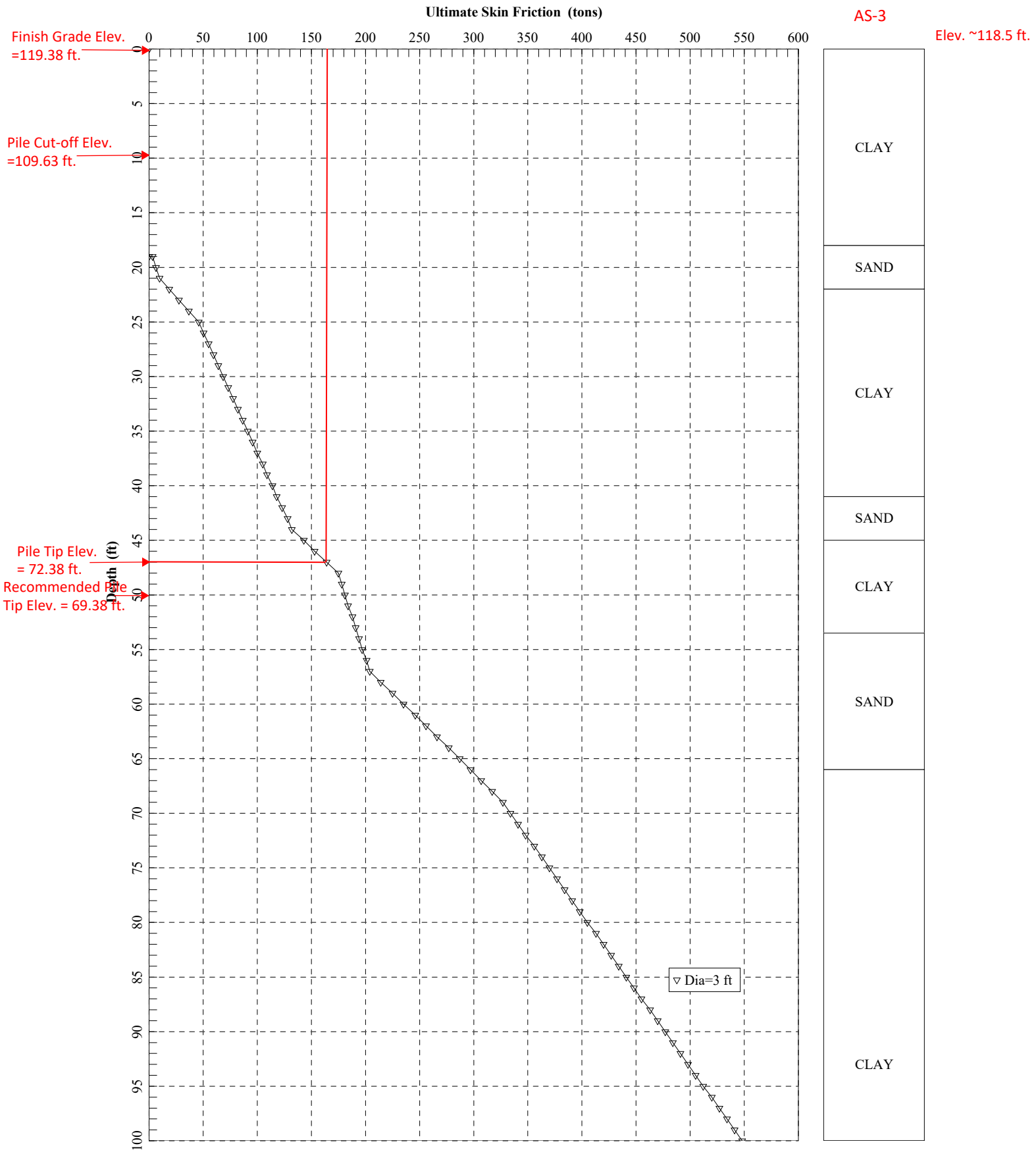
Eastridge to BART Regional Connector Project Bent 6 - 36-Inch CIDH Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 750 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project Bent 6 - 36-Inch CIDH Concrete Pile Extreme Event Limit State (Compression)

Vertical Load Demand = 330 kips (Extreme Event Limit Tension)

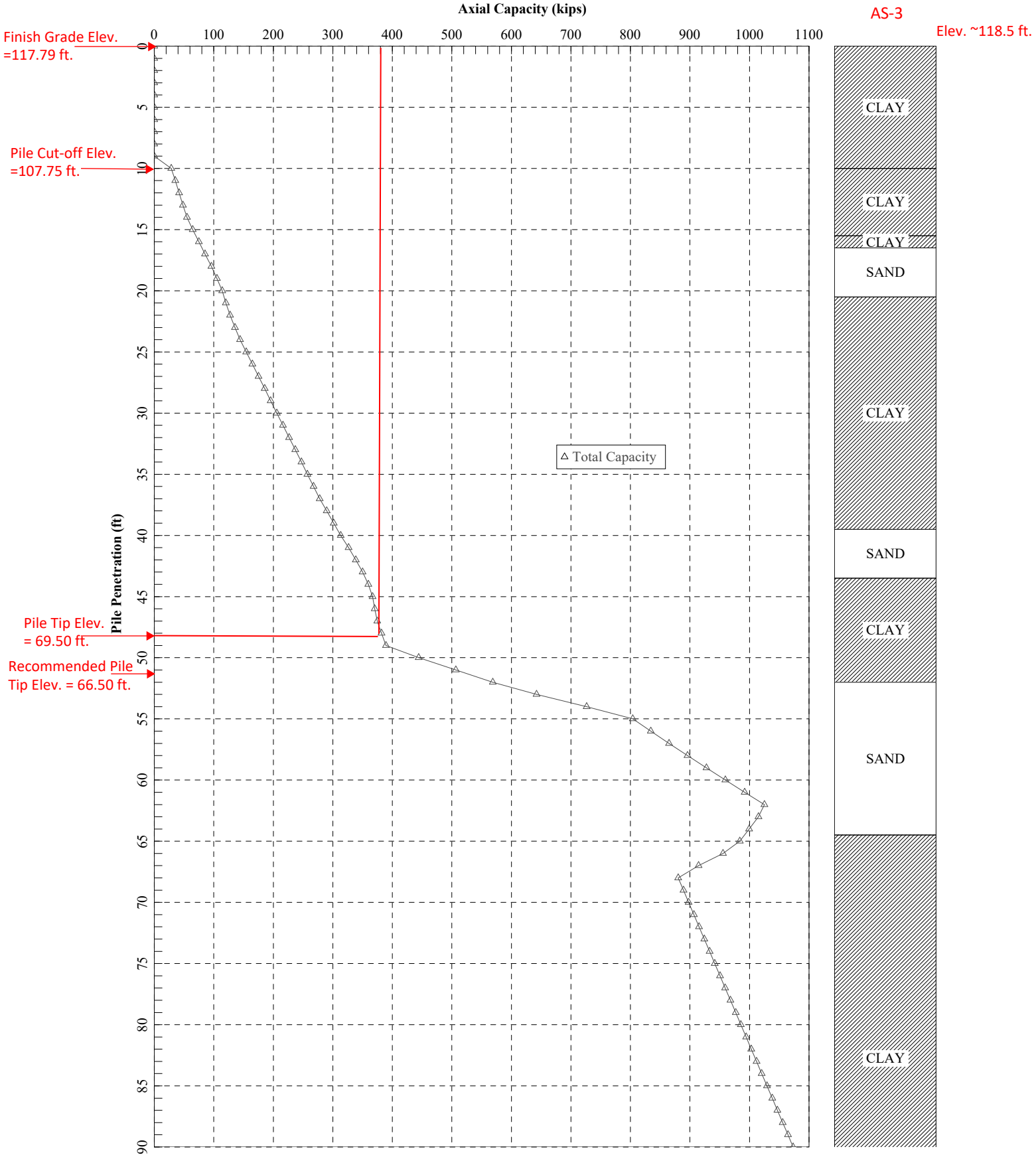


Eastridge to BART Regional Connector Project Bent 6 - 36-Inch CIDH Concrete Pile Extreme Event Limit State (Tension)

VERTICAL PILE CAPACITY ANALYSES (A-PILE ANALYSES RESULTS)
AERIAL GUIDEWAY – BENT 6L THROUGH ABUTMENT 76

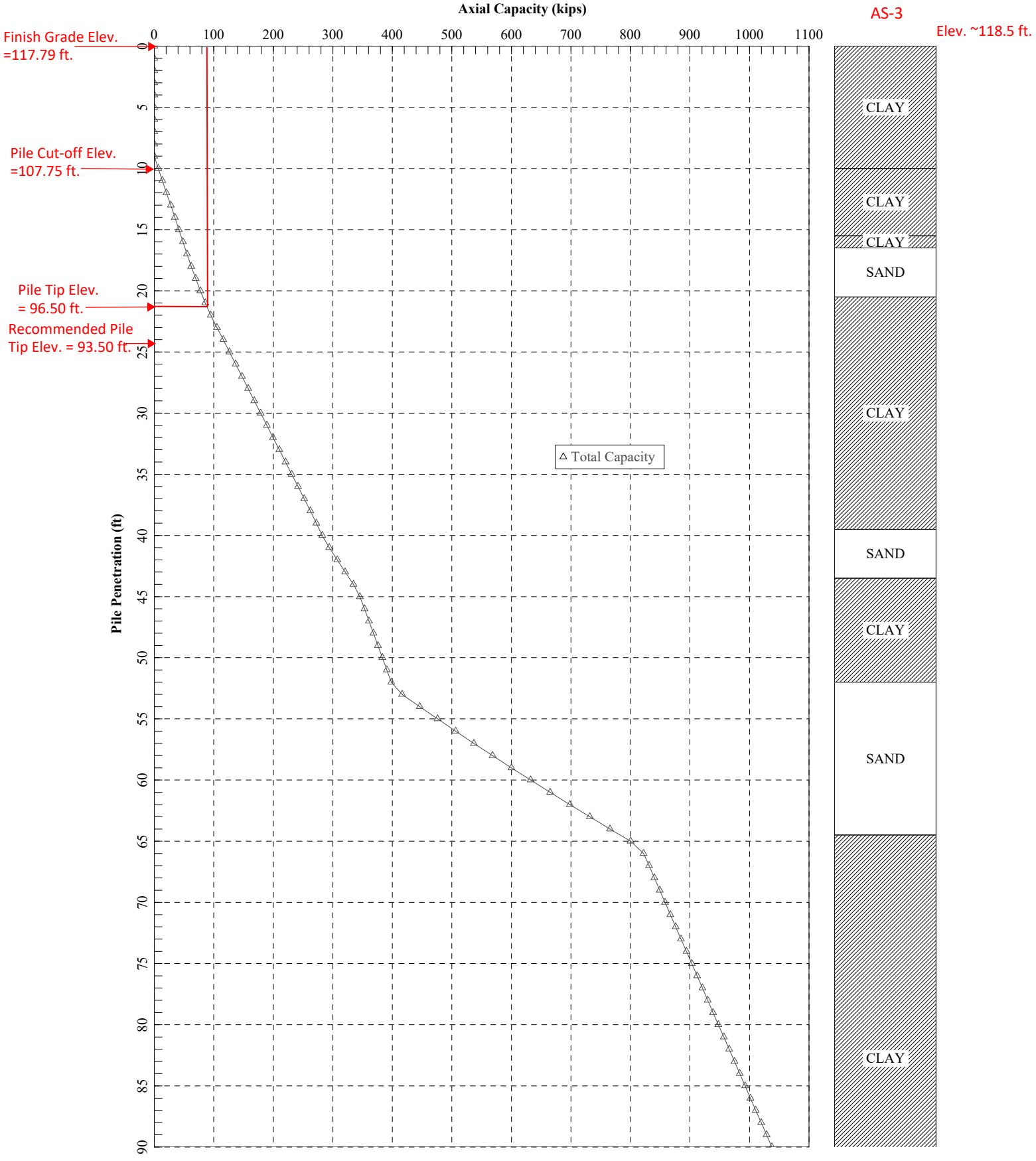
AERIAL GUIDEWAY – BENT 6L (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 260 kips (Strength Limit Compression)/0.7 = 380 kips



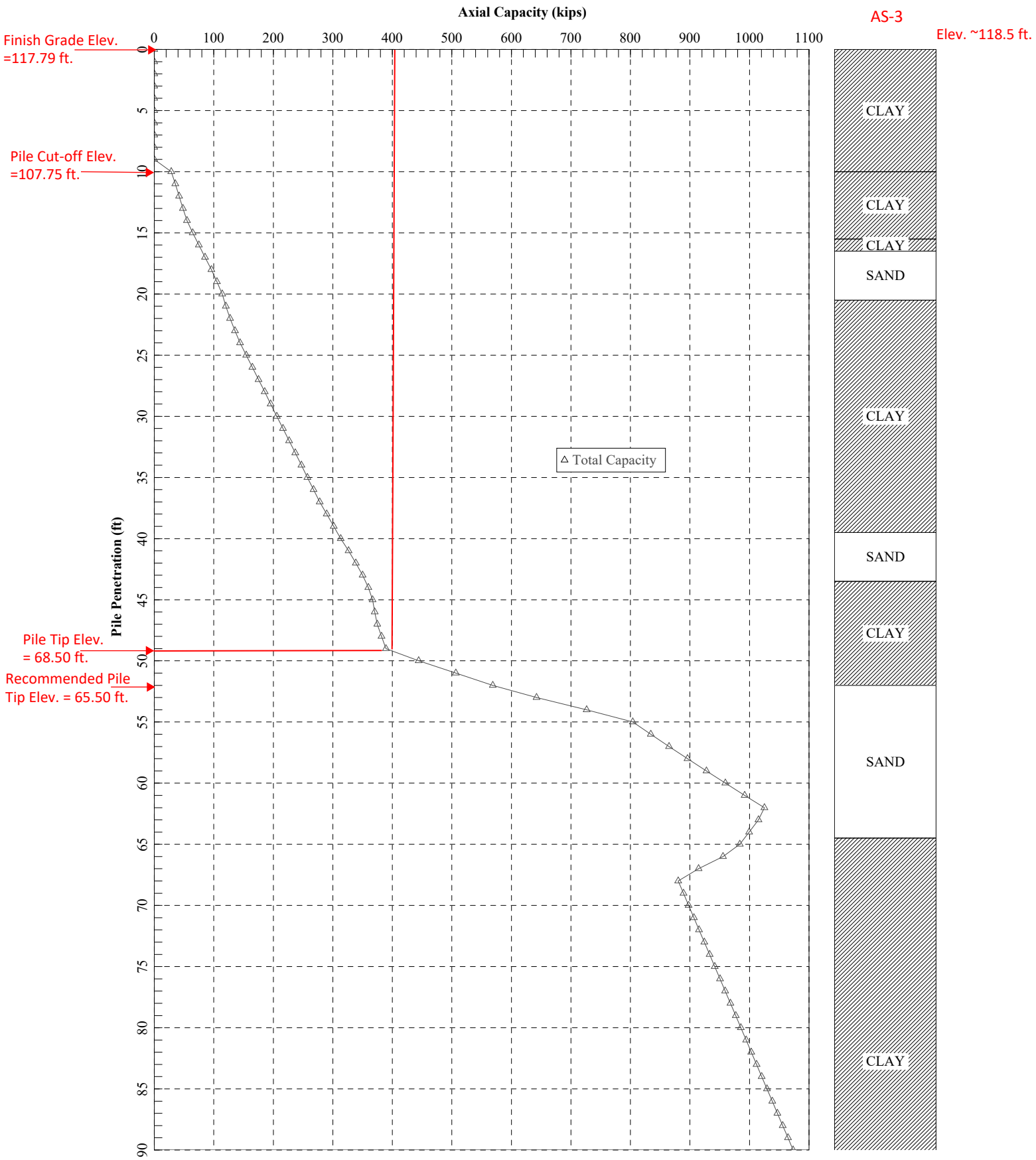
Eastridge to BART Regional Connector Project Bent 6 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 60 kips (Strength Limit Tension)/0.7 = 90 kips



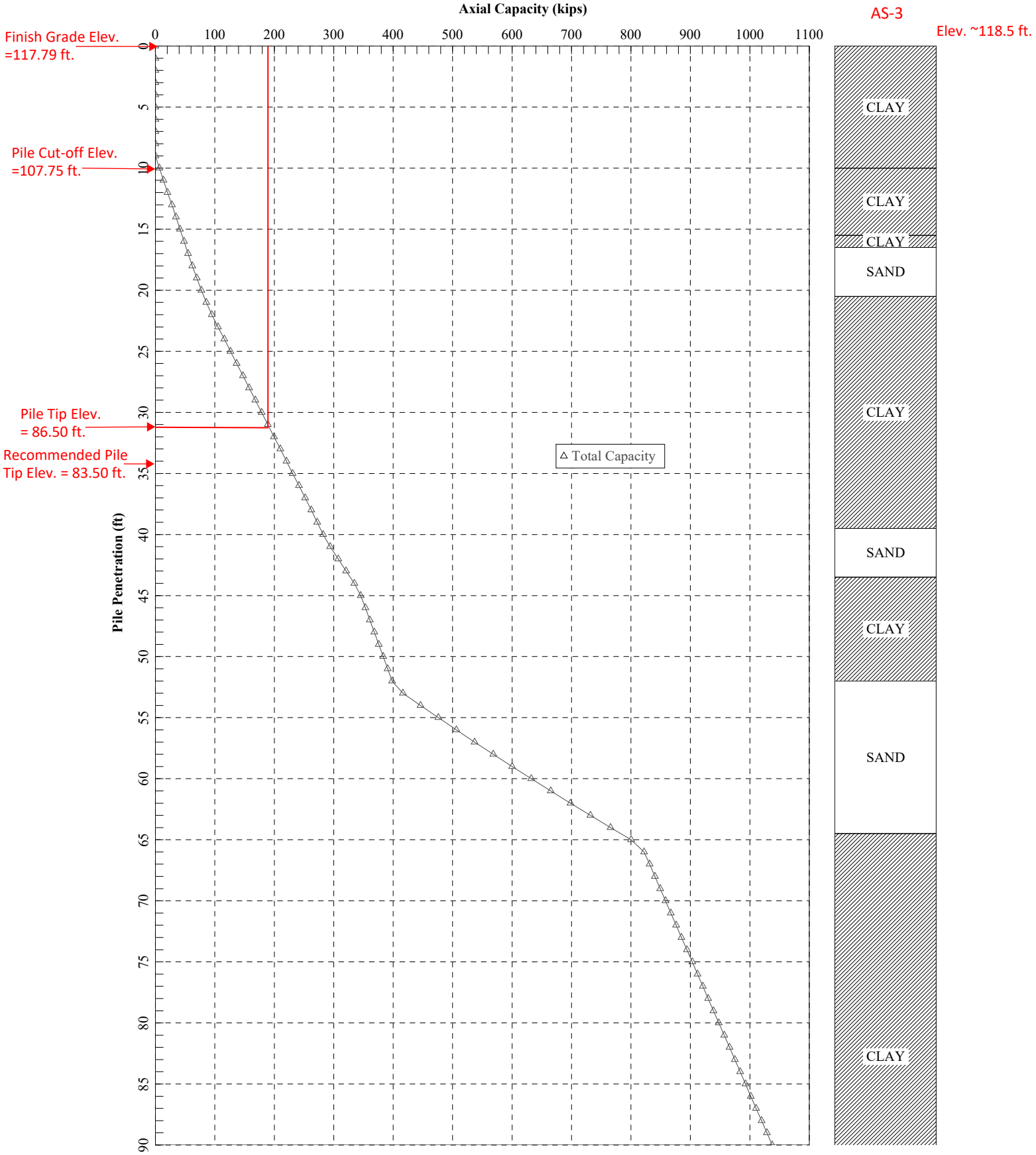
Eastridge to BART Regional Connector Project Bent 6 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 400 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project Bent 6 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

Vertical Load Demand = 190 kips (Extreme Event Limit Tension)



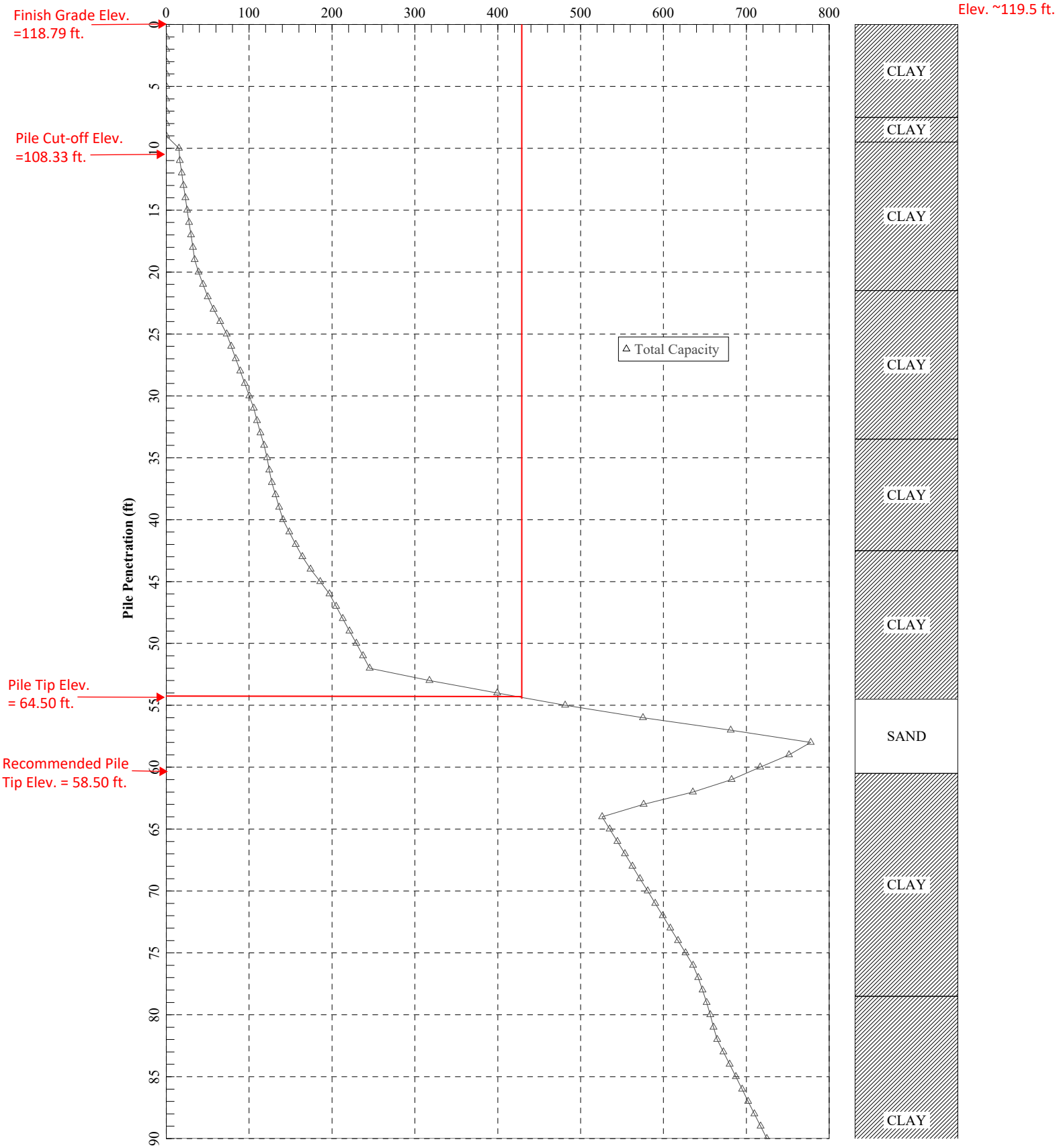
Eastridge to BART Regional Connector Project Bent 6 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

AERIAL GUIDEWAY – BENT 7 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 300 kips (Strength Limit Compression)/0.7 = 430 kips

CPT-AS-6

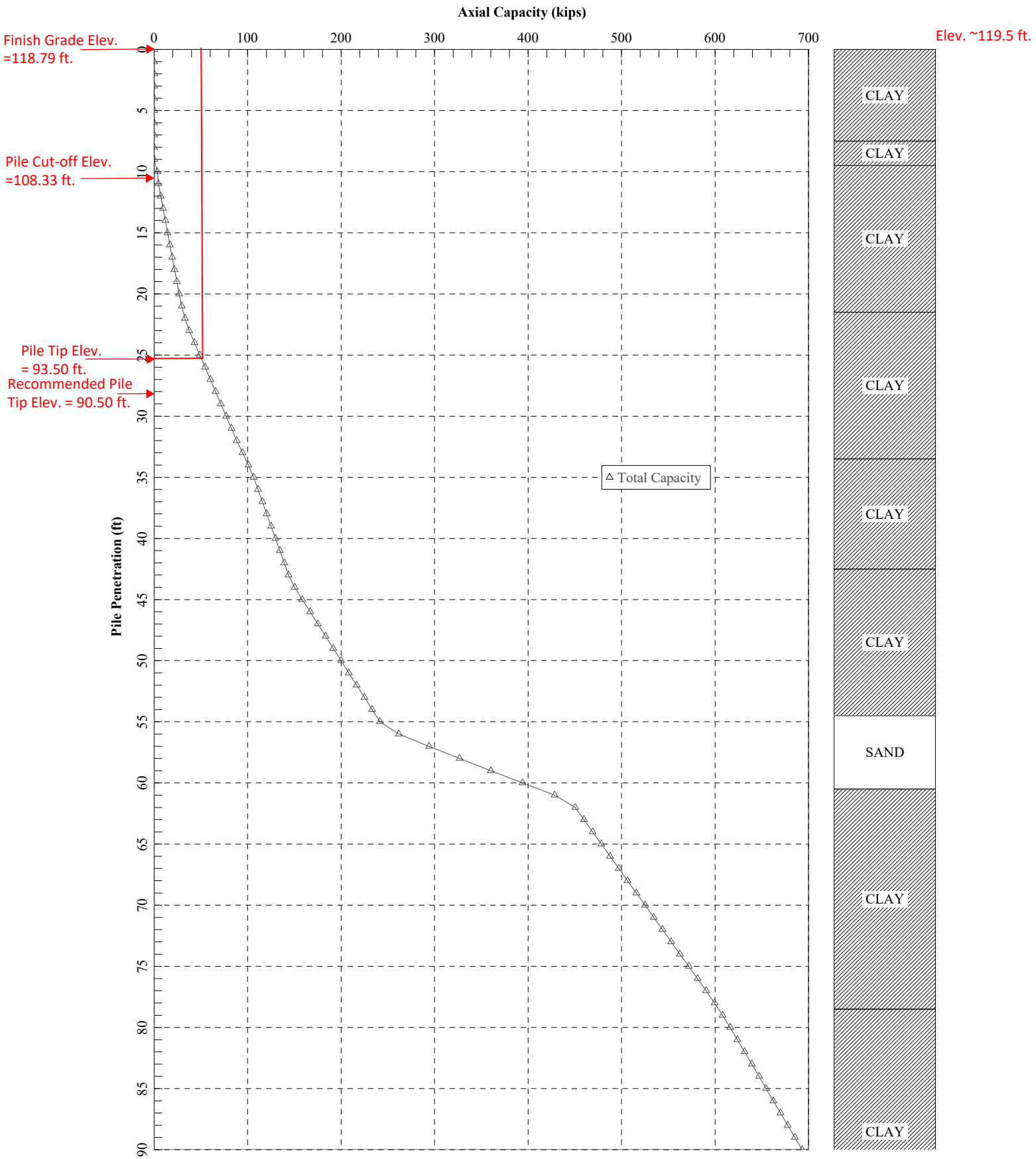
Elev. ~119.5 ft.



Eastridge to BART Regional Connector Project Bent 7 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

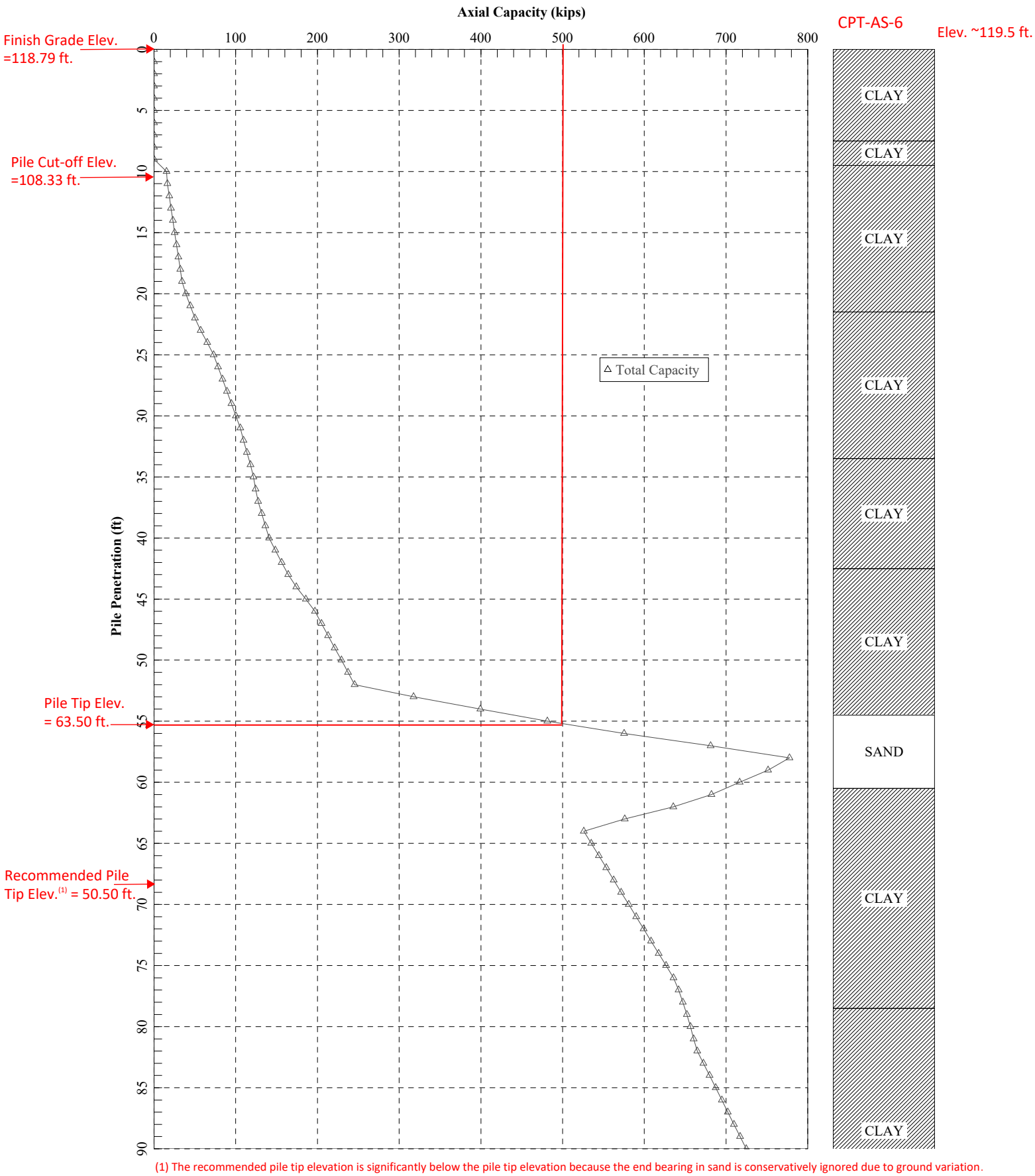
Vertical Load Demand = 30 kips (Strength Limit Tension)/0.7 = 50 kips

CPT-AS-6



Eastridge to BART Regional Connector Project Bent 7 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 500 kips (Extreme Event Limit Compression)



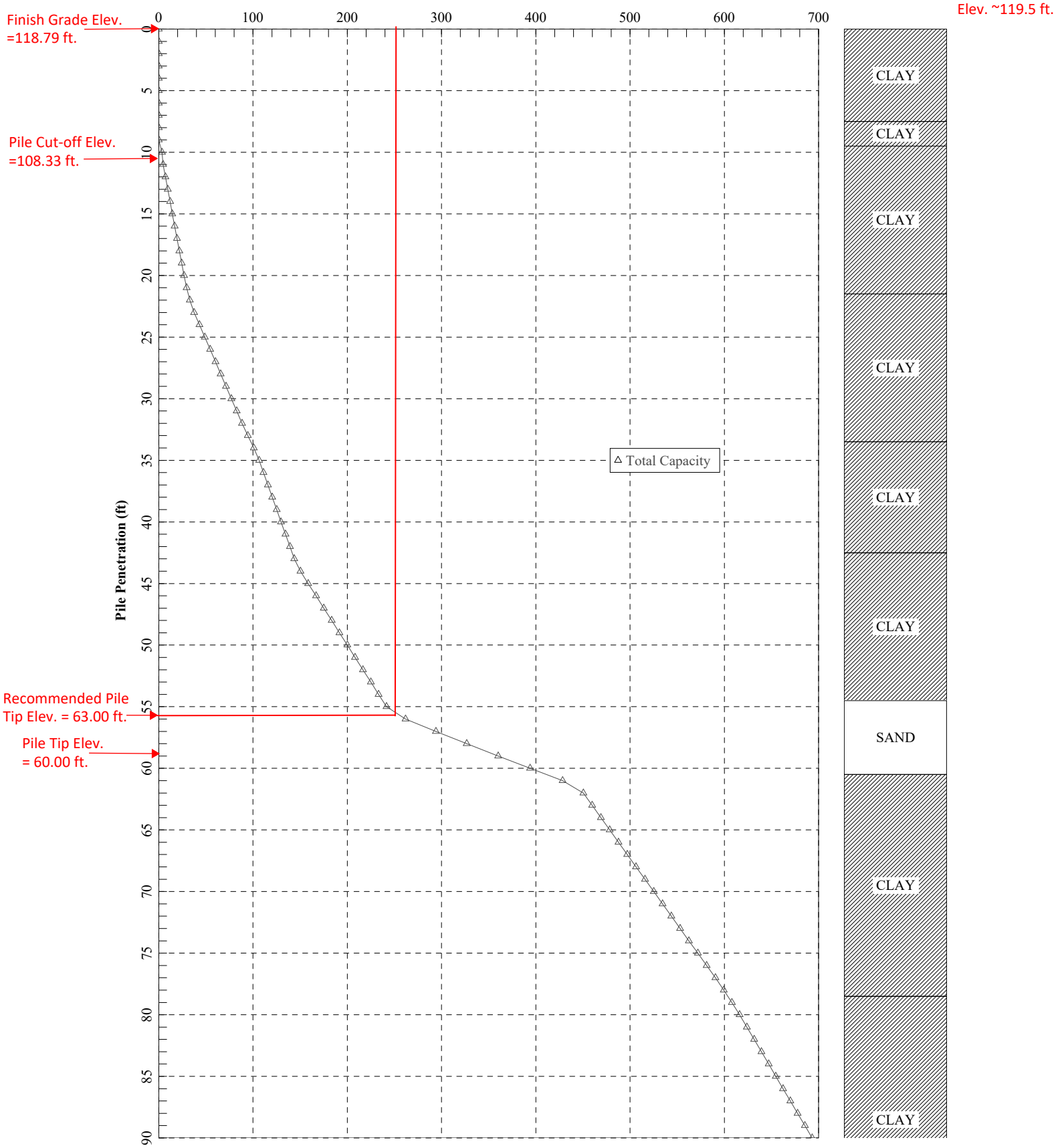
(1) The recommended pile tip elevation is significantly below the pile tip elevation because the end bearing in sand is conservatively ignored due to ground variation.

Eastridge to BART Regional Connector Project Bent 7 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

Vertical Load Demand = 250 kips (Extreme Event Limit Tension)

CPT-AS-6

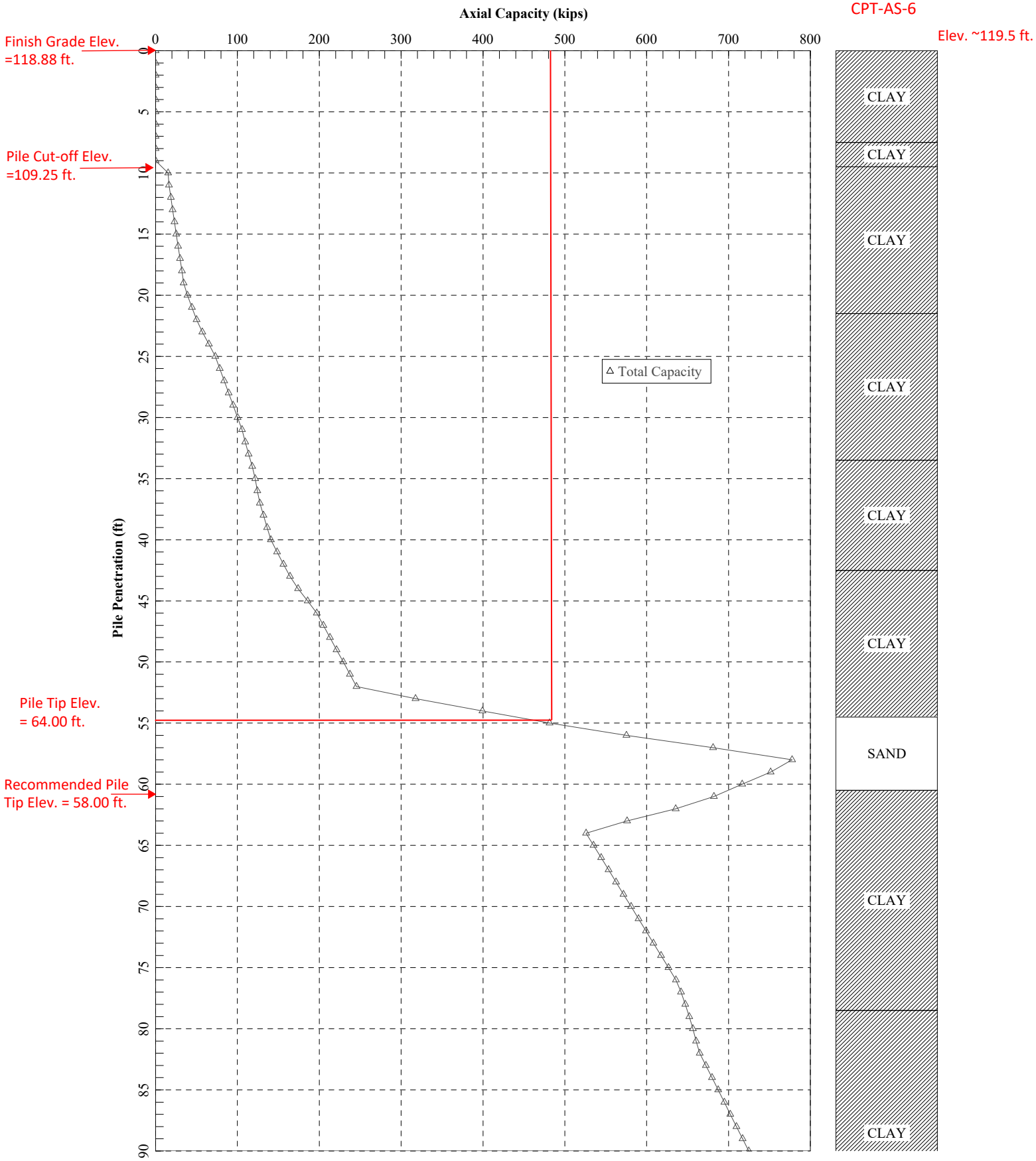
Elev. ~119.5 ft.



Eastridge to BART Regional Connector Project Bent 7 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

AERIAL GUIDEWAY – BENT 8 (18-INCH SQUARE PRECAST CONCRETE PILE)

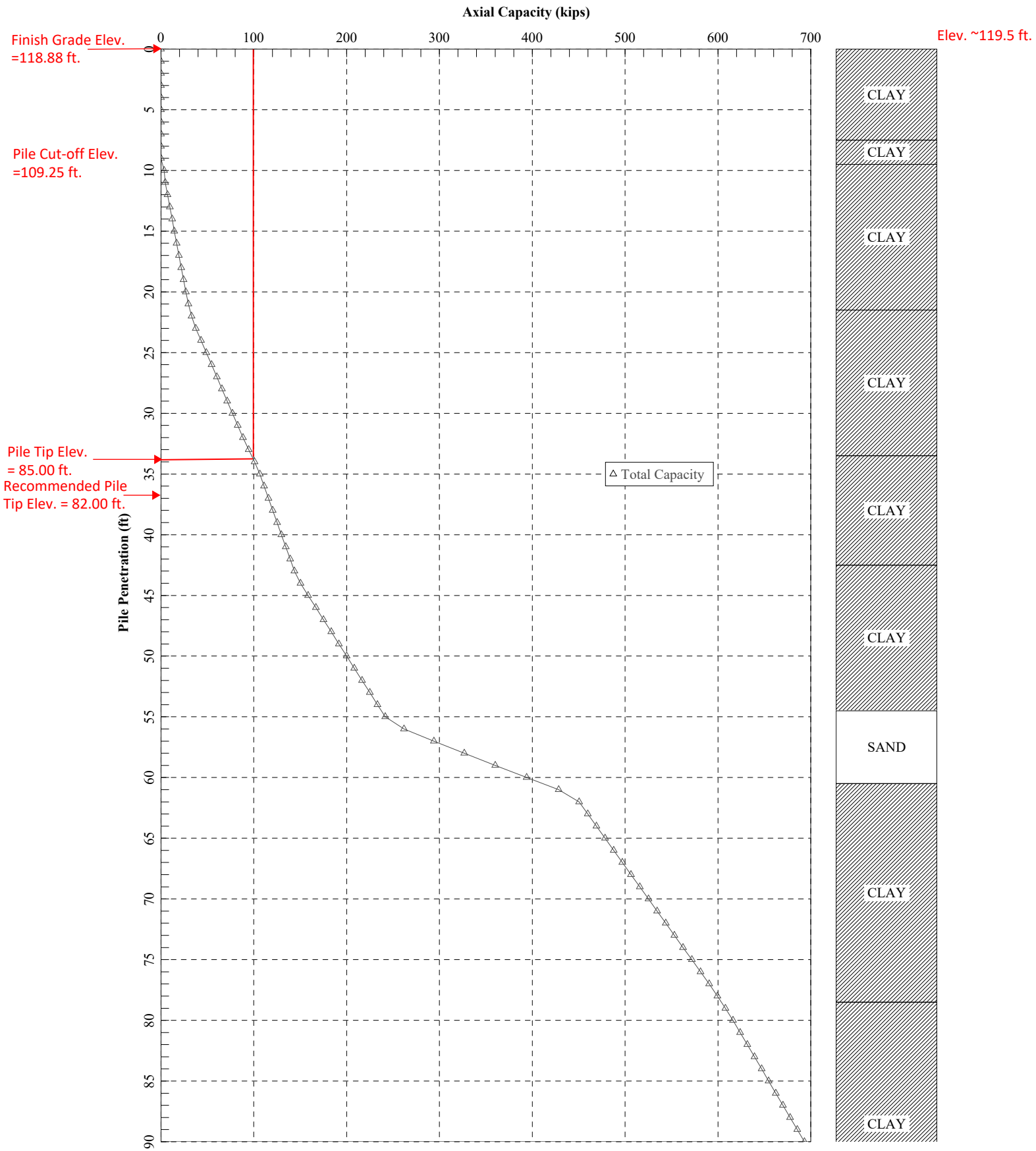
Vertical Load Demand = 330 kips (Strength Limit Compression)/0.7 = 480 kips



Eastridge to BART Regional Connector Project Bent 8 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

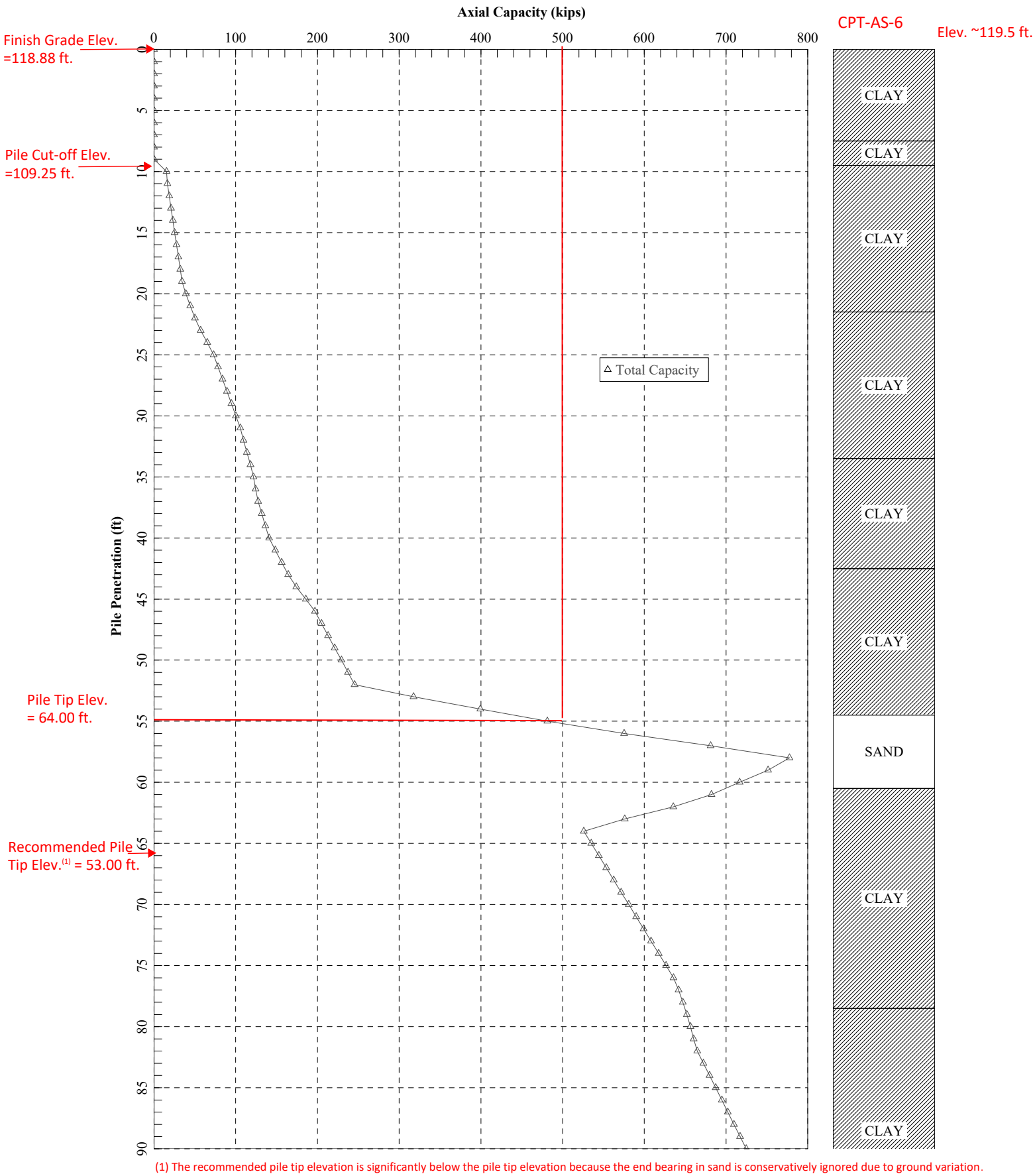
Vertical Load Demand = 70 kips (Strength Limit Tension)/0.7 = 100 kips

CPT-AS-6



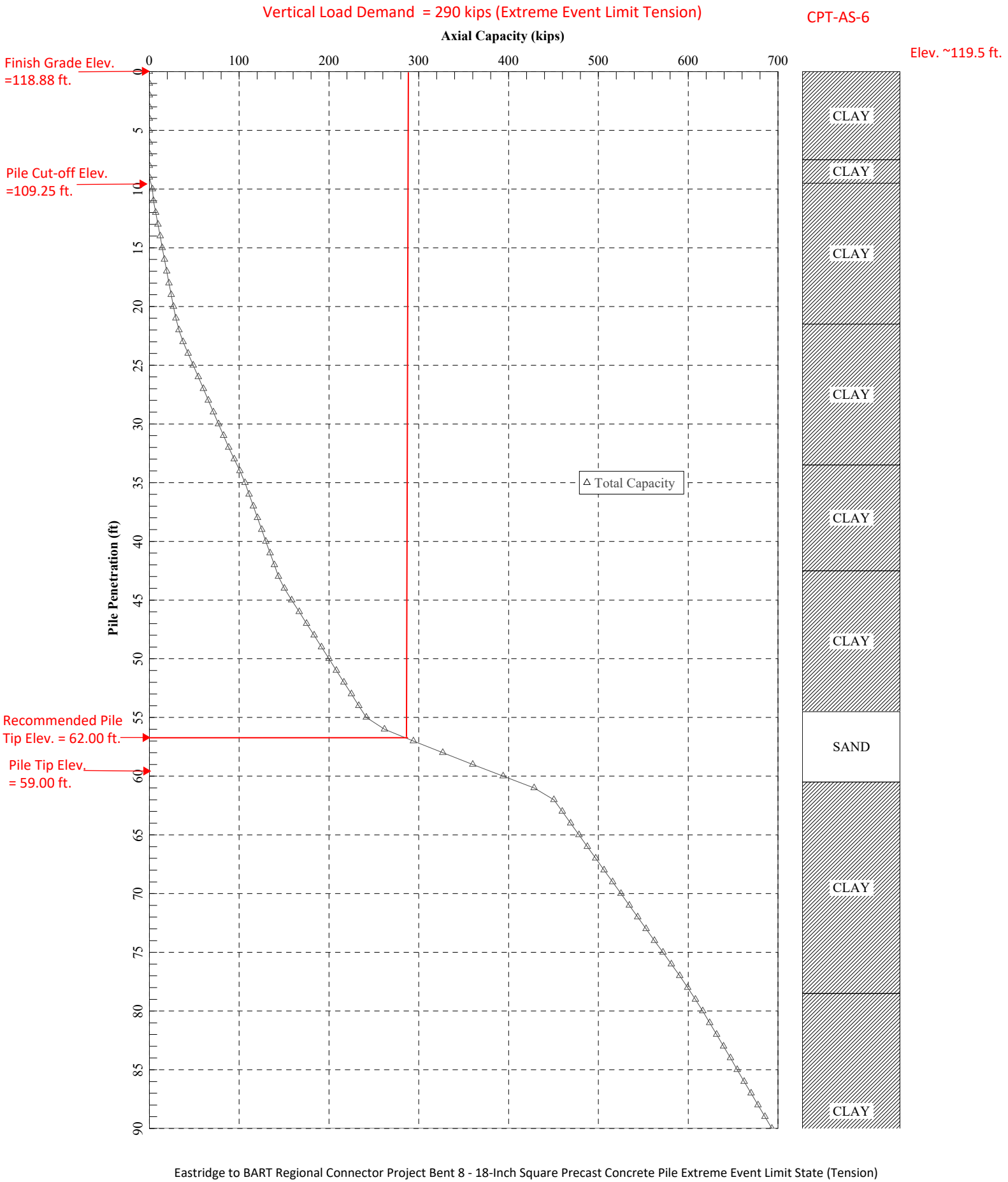
Eastridge to BART Regional Connector Project Bent 8 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 500 kips (Extreme Event Limit Compression)



(1) The recommended pile tip elevation is significantly below the pile tip elevation because the end bearing in sand is conservatively ignored due to ground variation.

Eastridge to BART Regional Connector Project Bent 8 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)



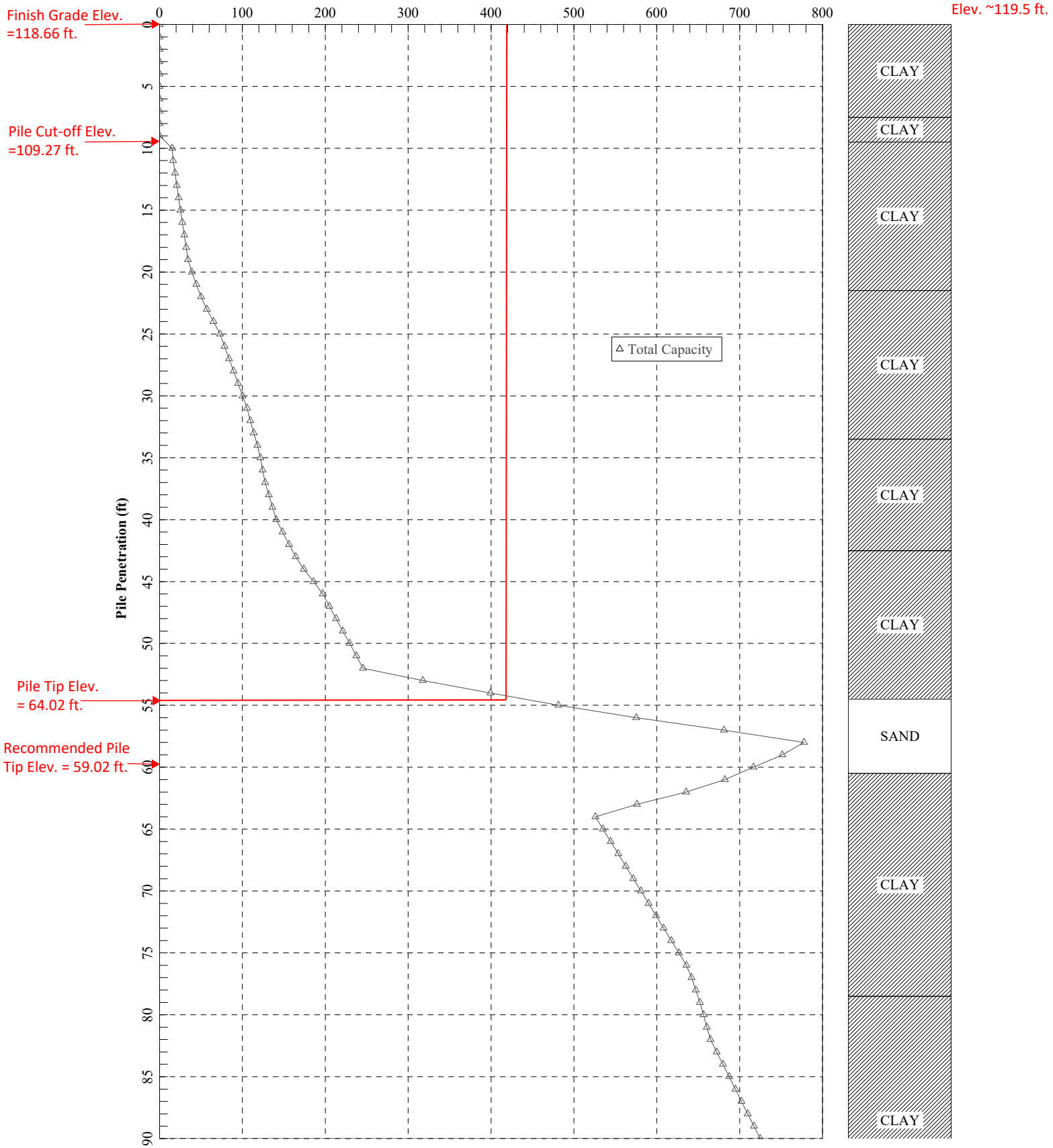
Eastridge to BART Regional Connector Project Bent 8 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

AERIAL GUIDEWAY – BENT 9 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 290 kips (Strength Limit Compression)/0.7 = 420 kips

CPT-AS-6

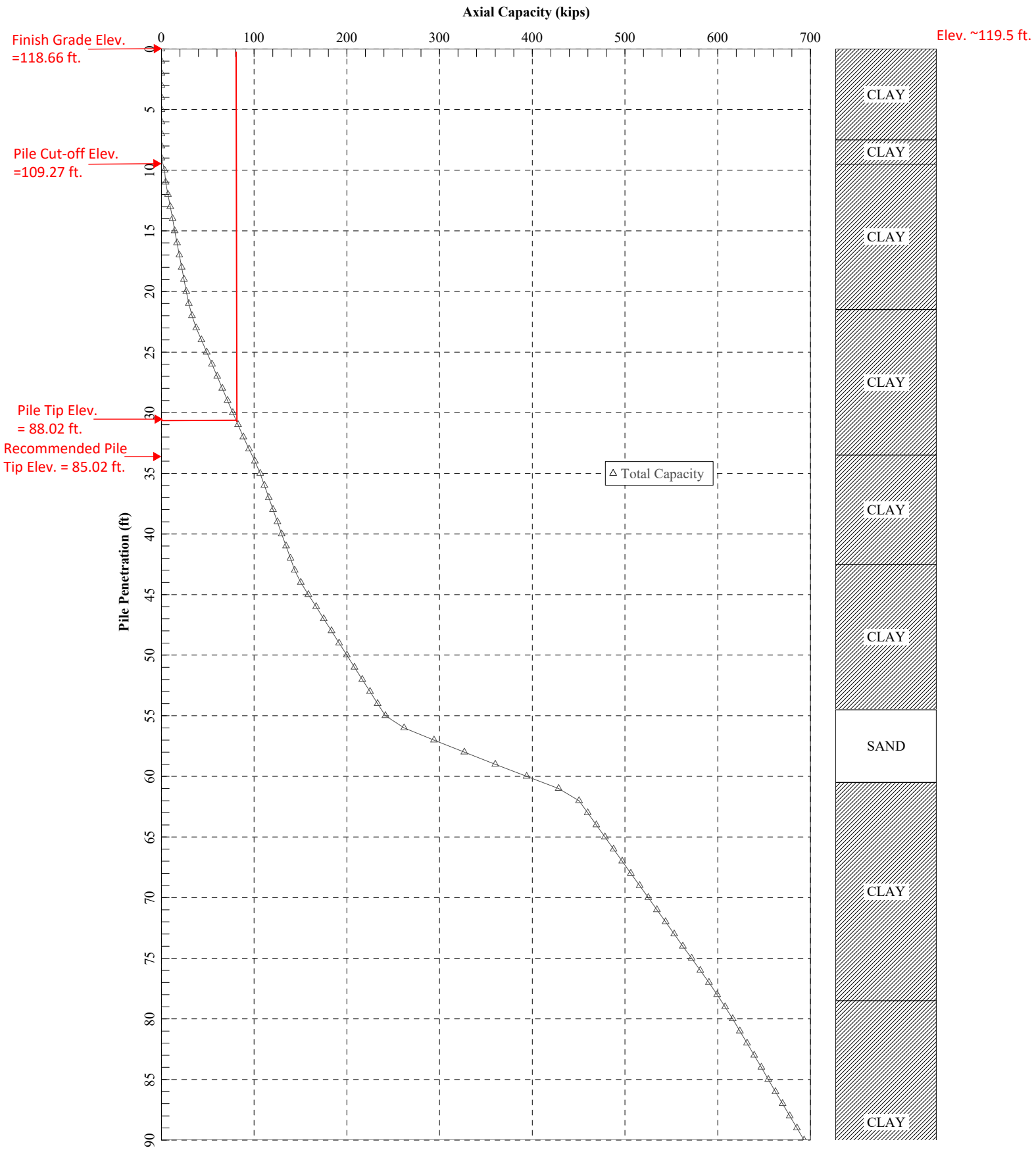
Elev. ~119.5 ft.



Eastridge to BART Regional Connector Project Bent 9 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

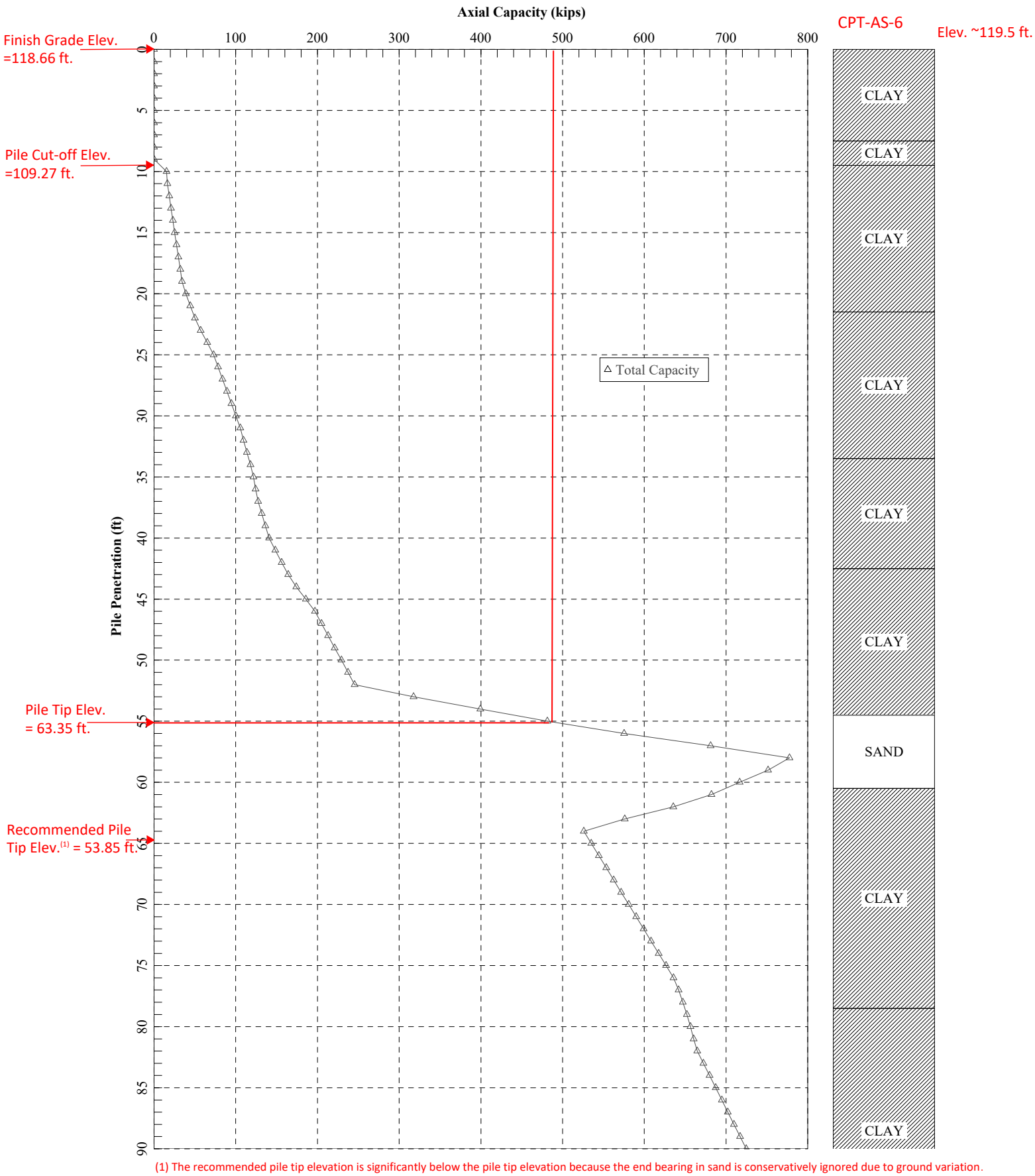
Vertical Load Demand = 50 kips (Strength Limit Tension)/0.7 = 80 kips

CPT-AS-6



Eastridge to BART Regional Connector Project Bent 9 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 490 kips (Extreme Event Limit Compression)



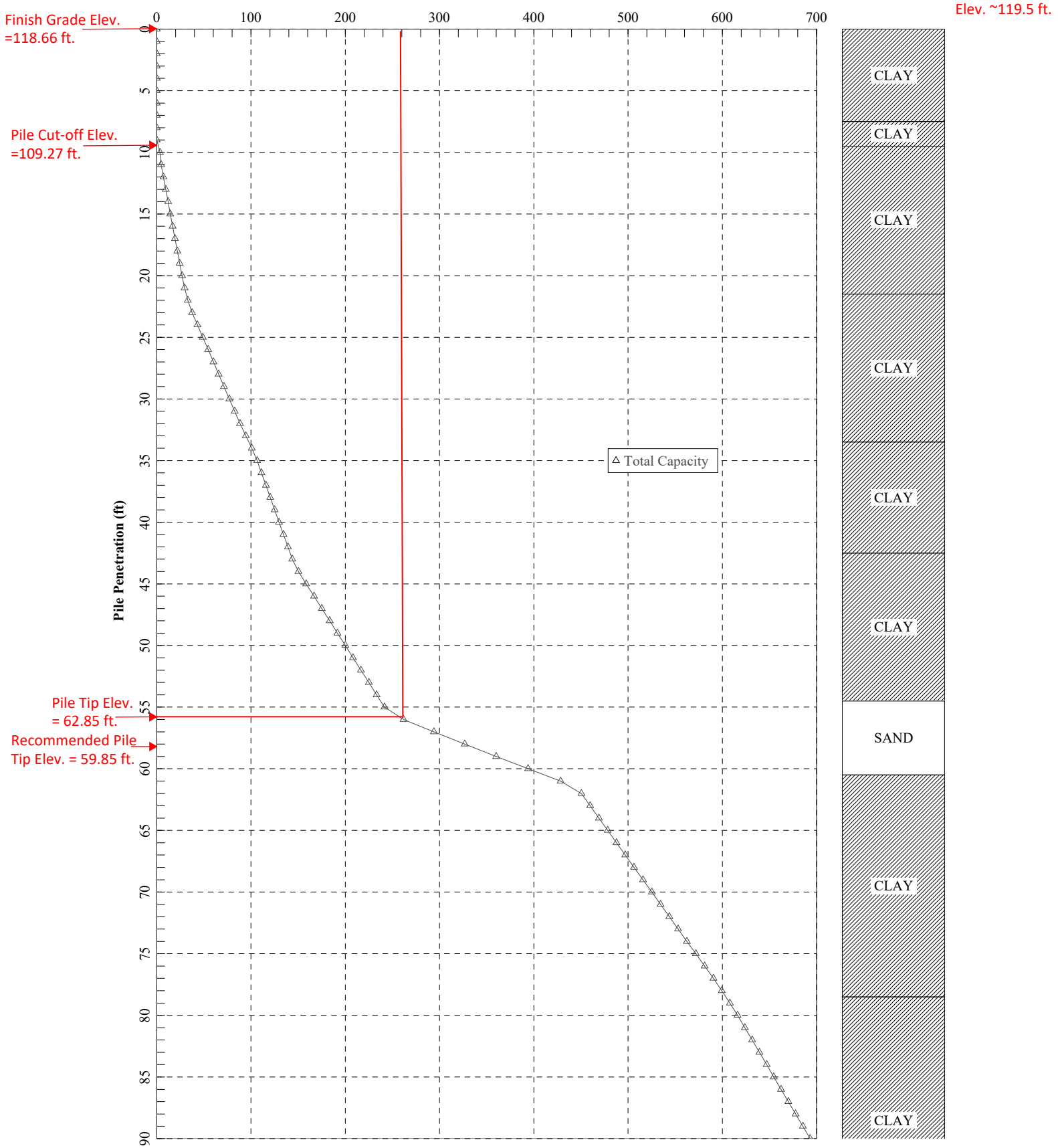
(1) The recommended pile tip elevation is significantly below the pile tip elevation because the end bearing in sand is conservatively ignored due to ground variation.

Eastridge to BART Regional Connector Project Bent 9 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

Vertical Load Demand = 260 kips (Extreme Event Limit Tension)

CPT-AS-6

Elev. ~119.5 ft.



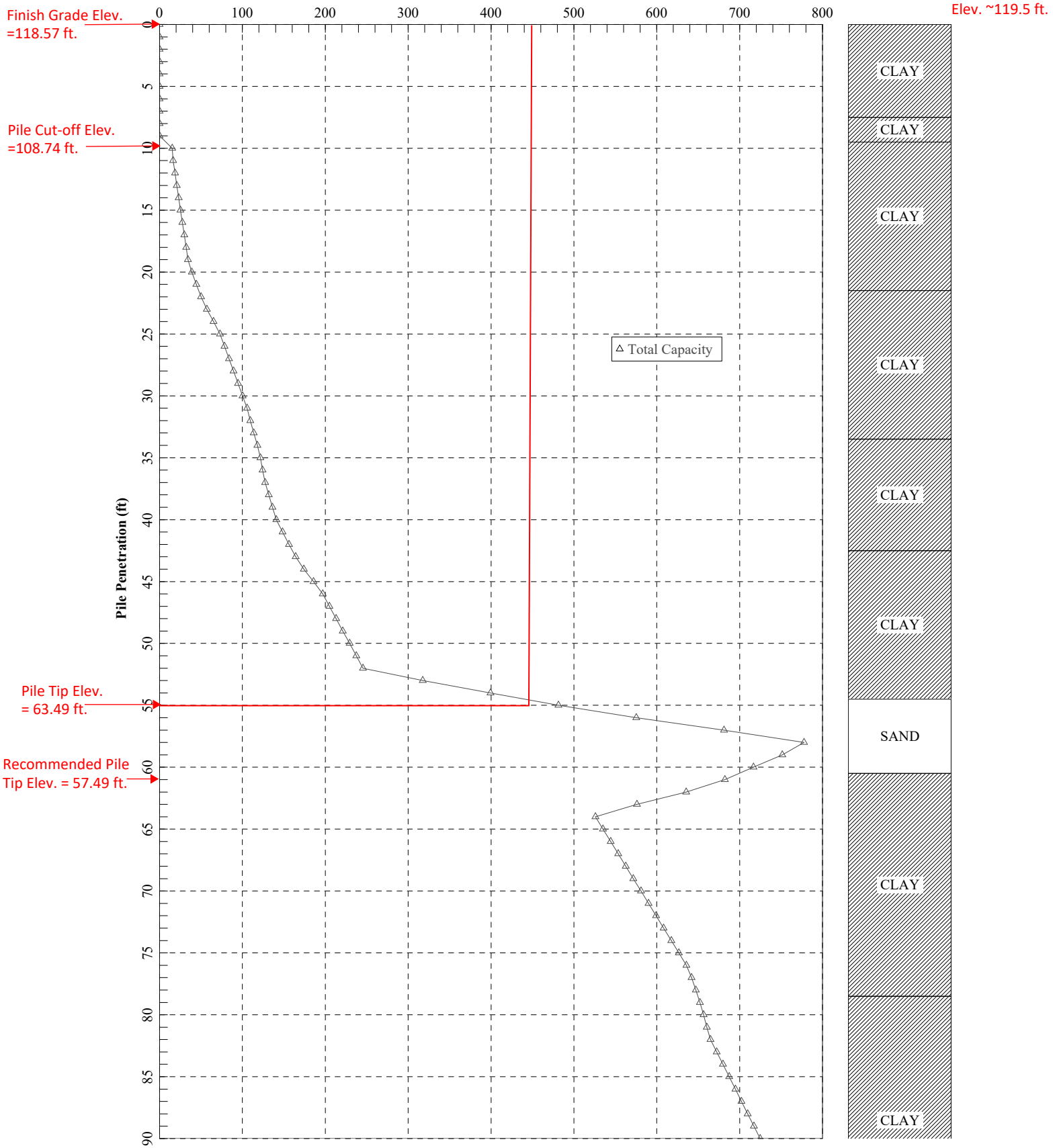
Eastridge to BART Regional Connector Project Bent 9 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

AERIAL GUIDEWAY – BENT 10 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 310 kips (Strength Limit Compression)/0.7 = 450 kips

CPT-AS-6

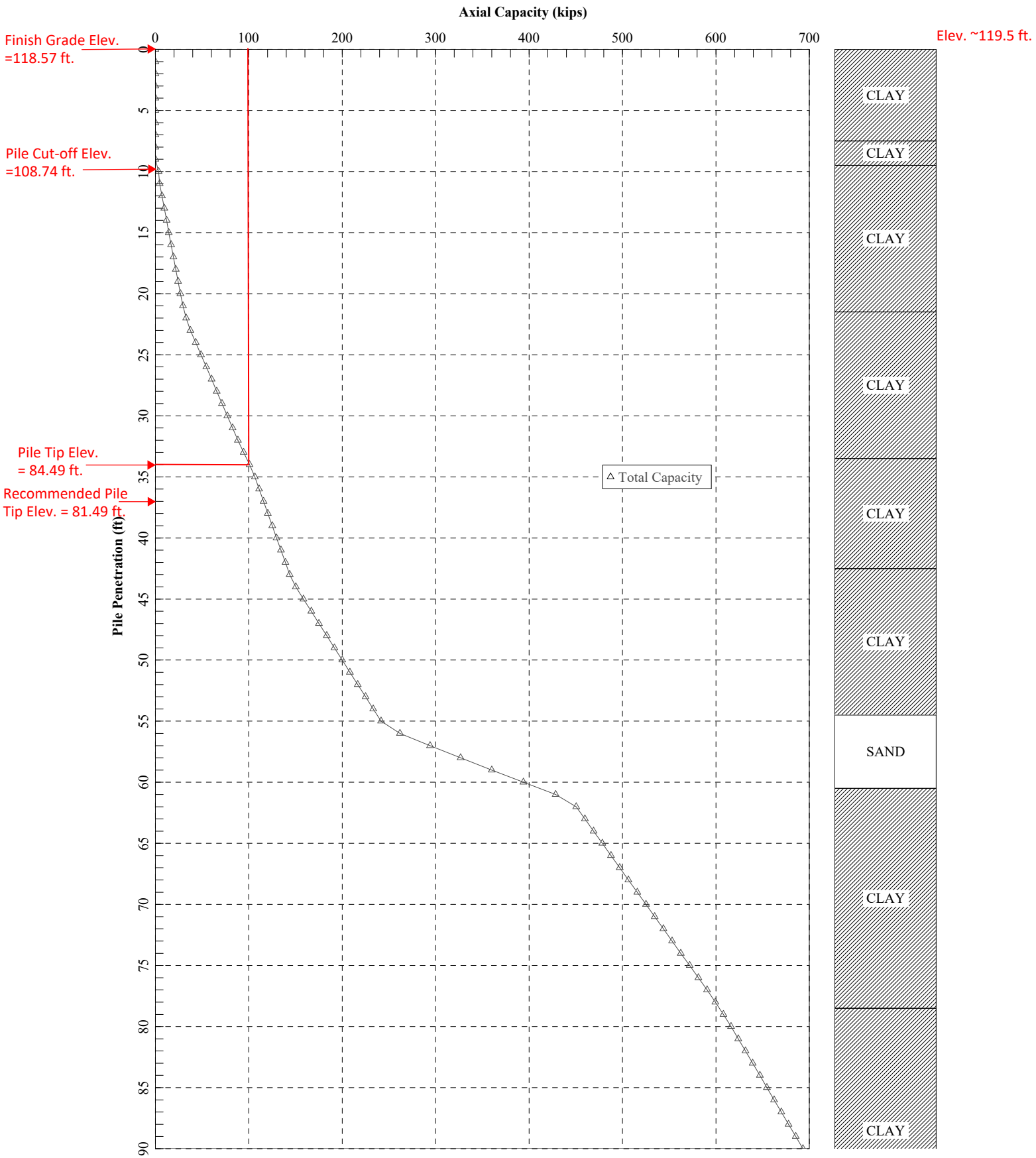
Elev. ~119.5 ft.



Eastridge to BART Regional Connector Project Bent 10 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

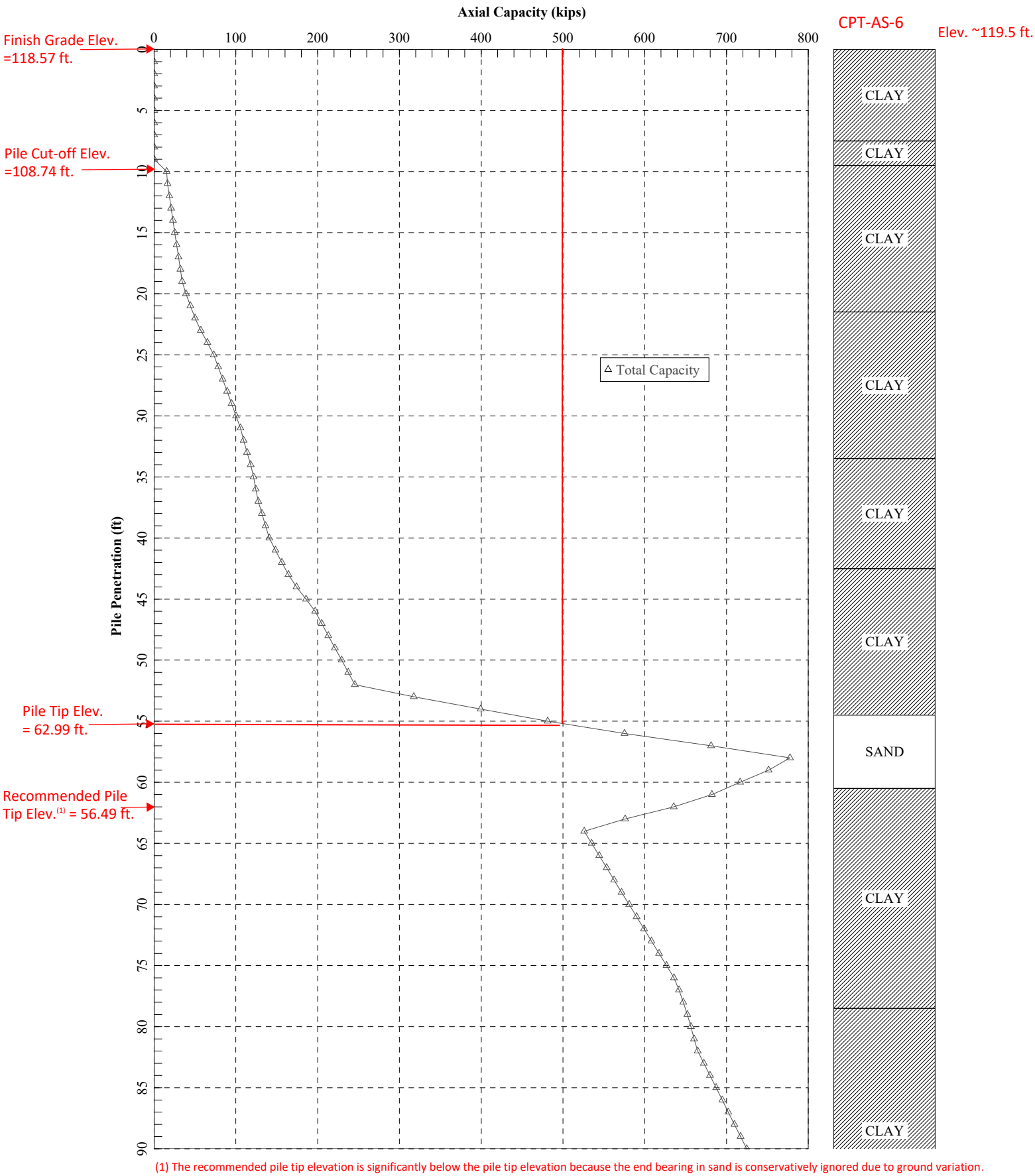
Vertical Load Demand = 70 kips (Strength Limit Tension)/0.7 = 100 kips

CPT-AS-6



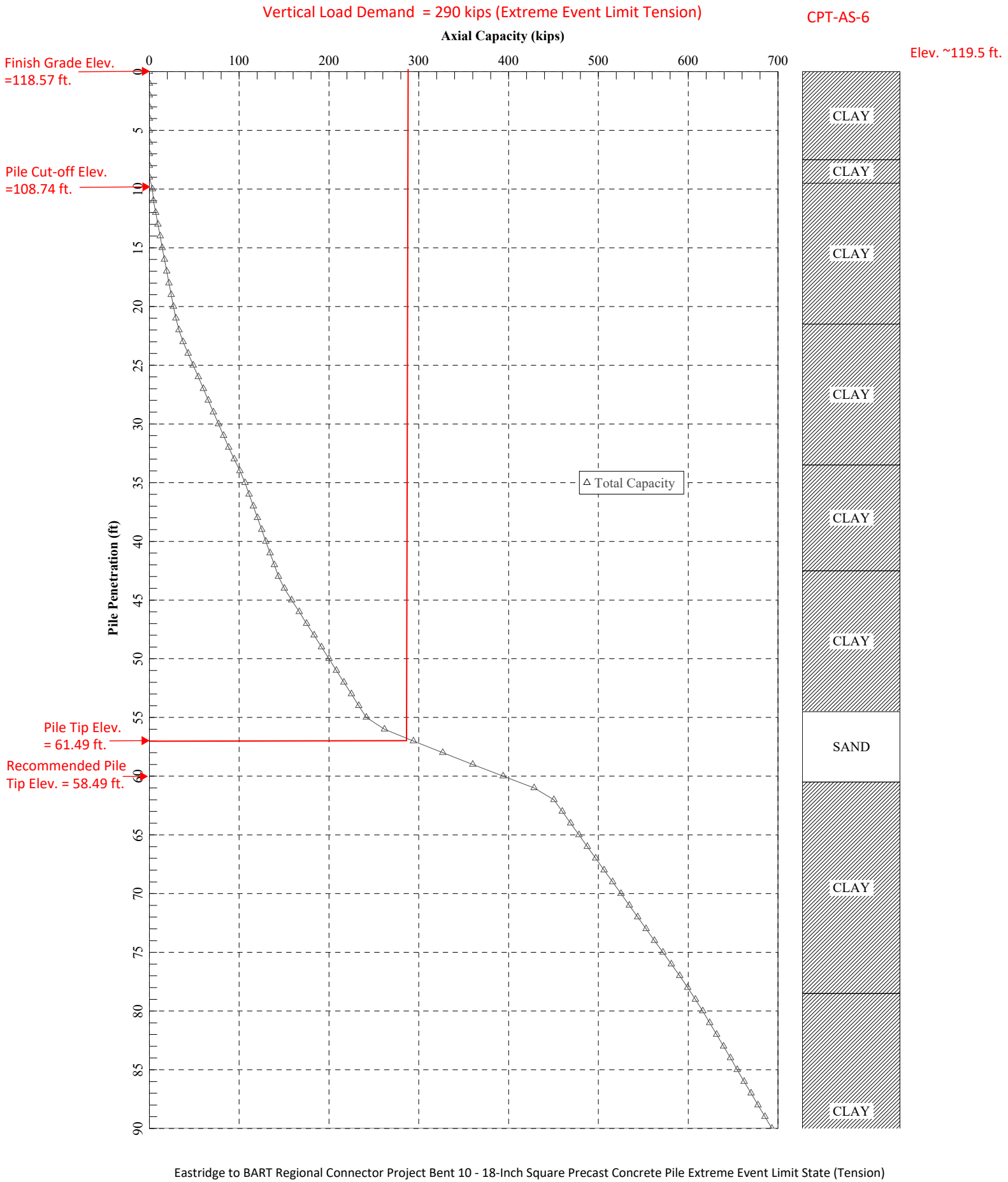
Eastridge to BART Regional Connector Project Bent 10 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 490 kips (Extreme Event Limit Compression)



(1) The recommended pile tip elevation is significantly below the pile tip elevation because the end bearing in sand is conservatively ignored due to ground variation.

Eastridge to BART Regional Connector Project Bent 10 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

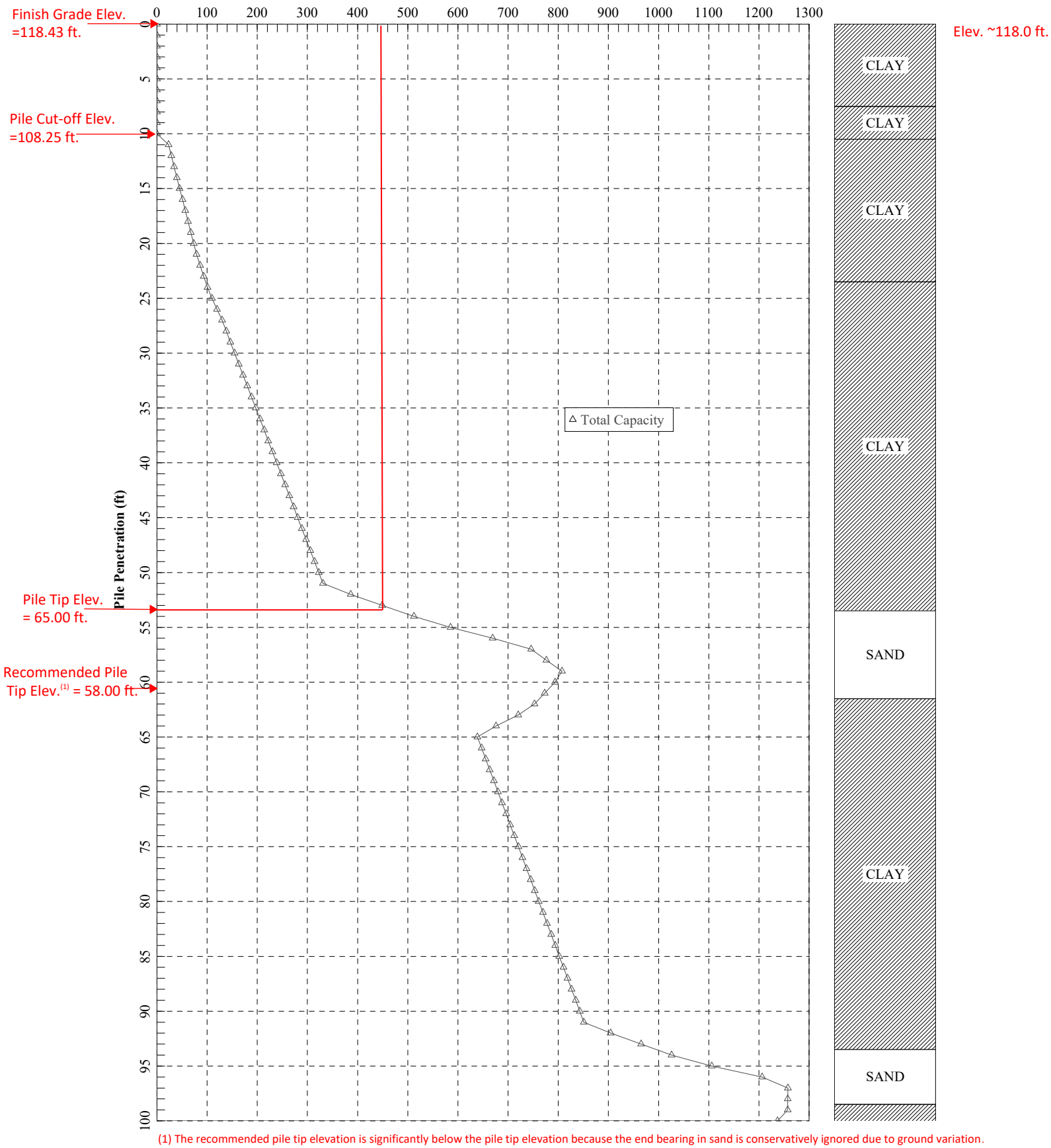


Eastridge to BART Regional Connector Project Bent 10 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

AERIAL GUIDEWAY – BENT 11 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 310 kips (Strength Limit Compression)/0.7 = 450 kips

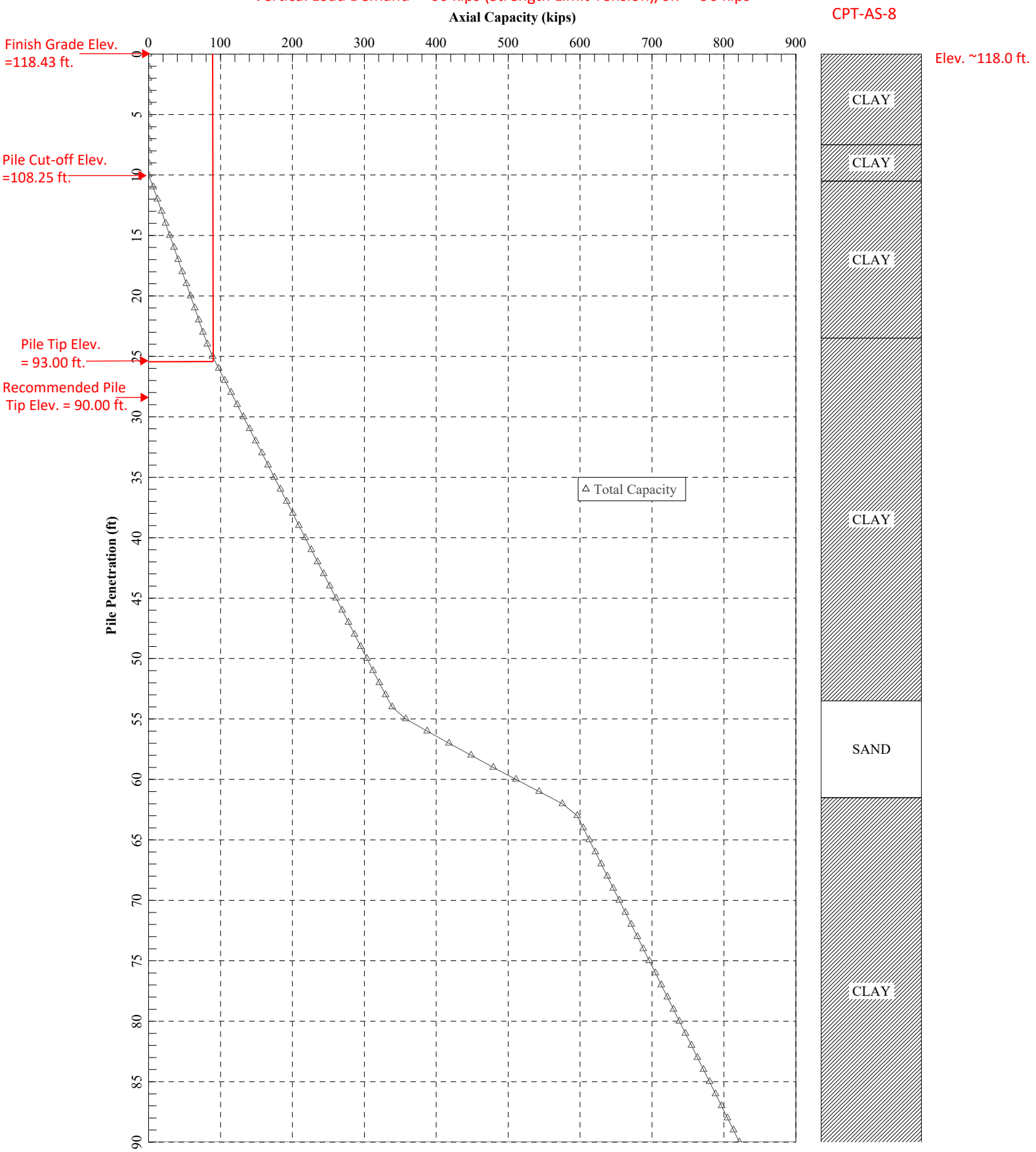
CPT-AS-8



(1) The recommended pile tip elevation is significantly below the pile tip elevation because the end bearing in sand is conservatively ignored due to ground variation.

Eastridge to BART Regional Connector Project Bent 11 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

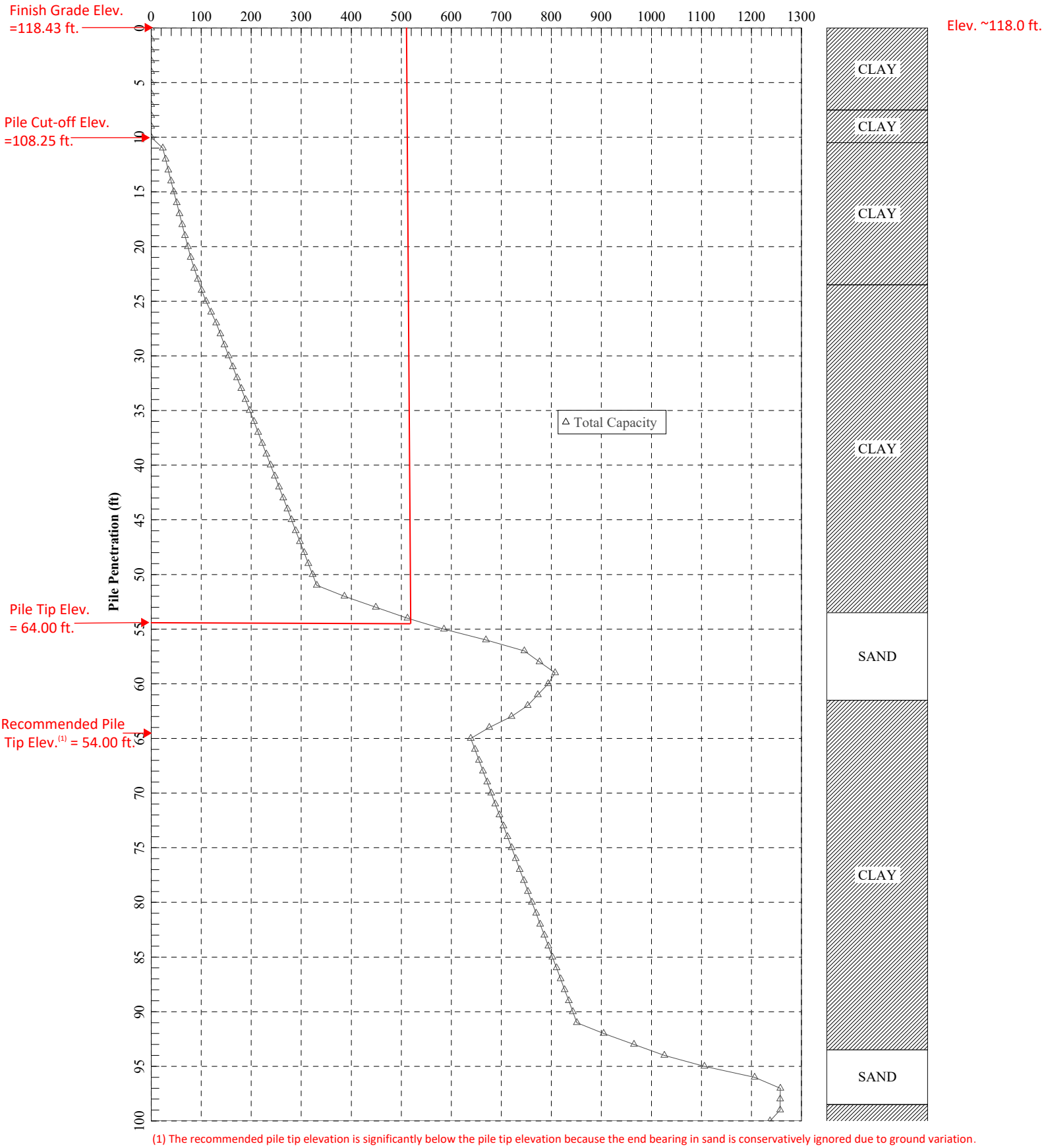
Vertical Load Demand = 60 kips (Strength Limit Tension)/0.7 = 90 kips



Eastridge to BART Regional Connector Project Bent 11 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 510 kips (Extreme Event Limit Compression)

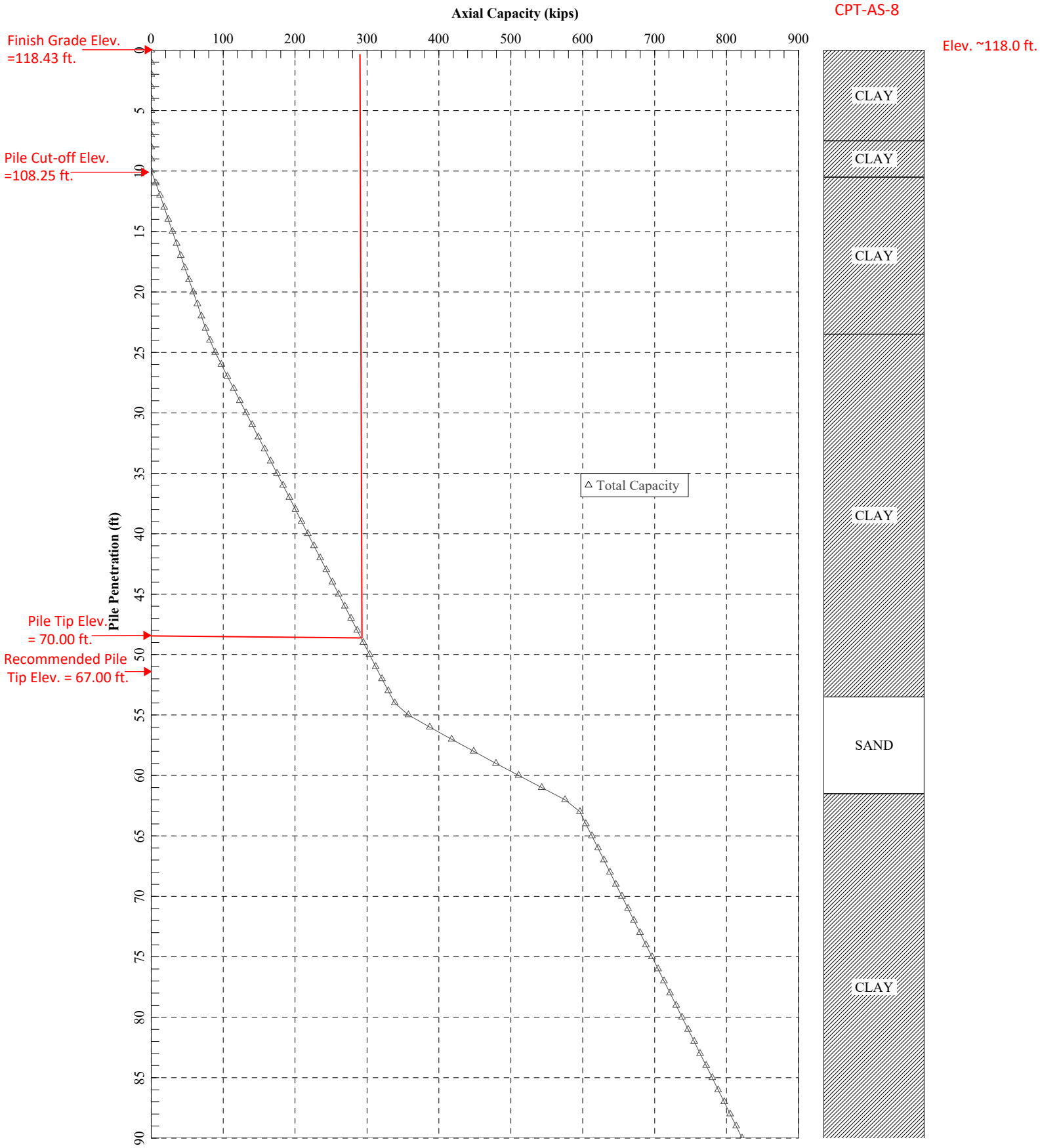
CPT-AS-8



(1) The recommended pile tip elevation is significantly below the pile tip elevation because the end bearing in sand is conservatively ignored due to ground variation.

Eastridge to BART Regional Connector Project Bent 11 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

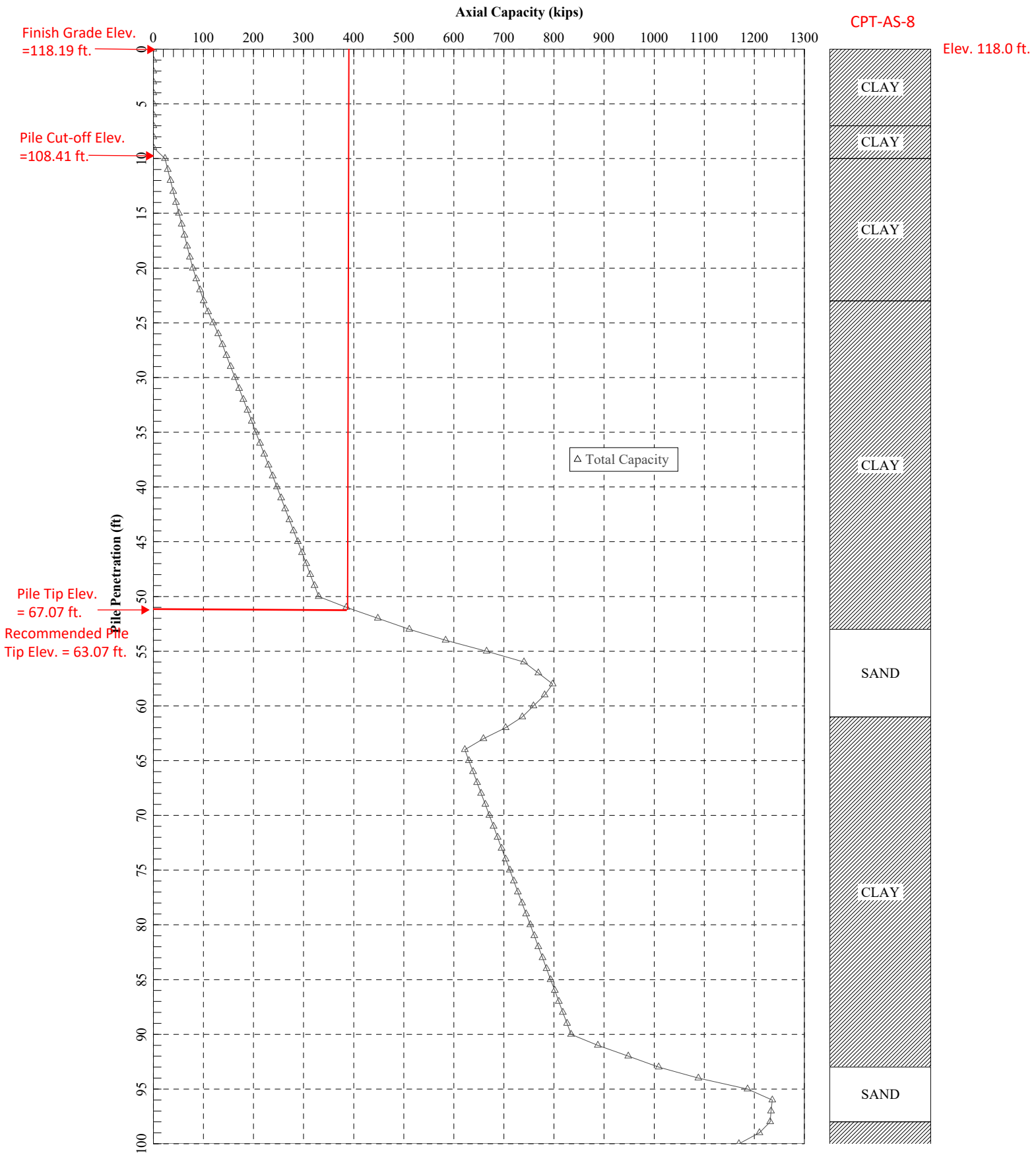
Vertical Load Demand = 290 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 11 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

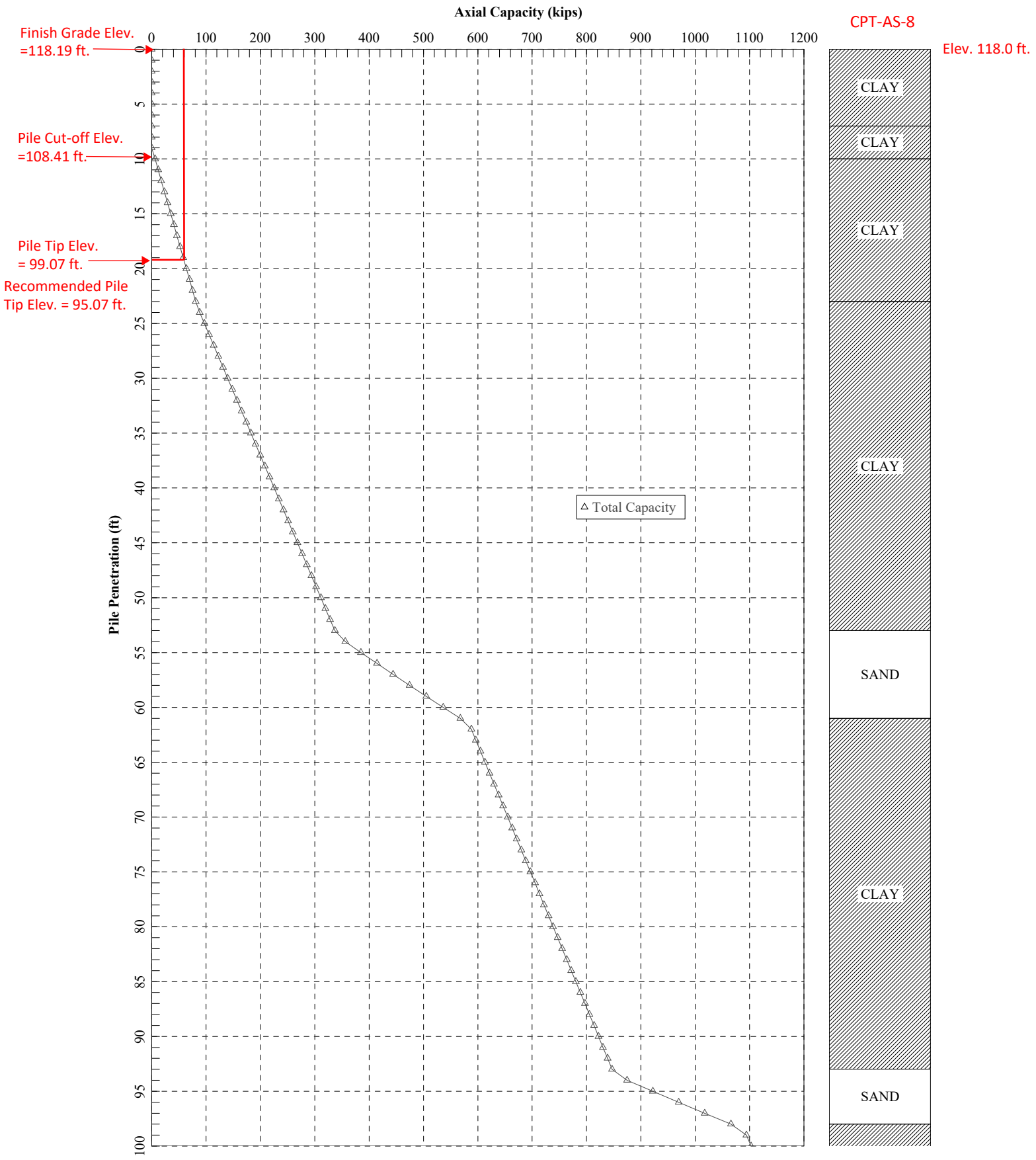
AERIAL GUIDEWAY – BENT 12 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 270 kips (Strength Limit Compression)/0.7 = 390 kips



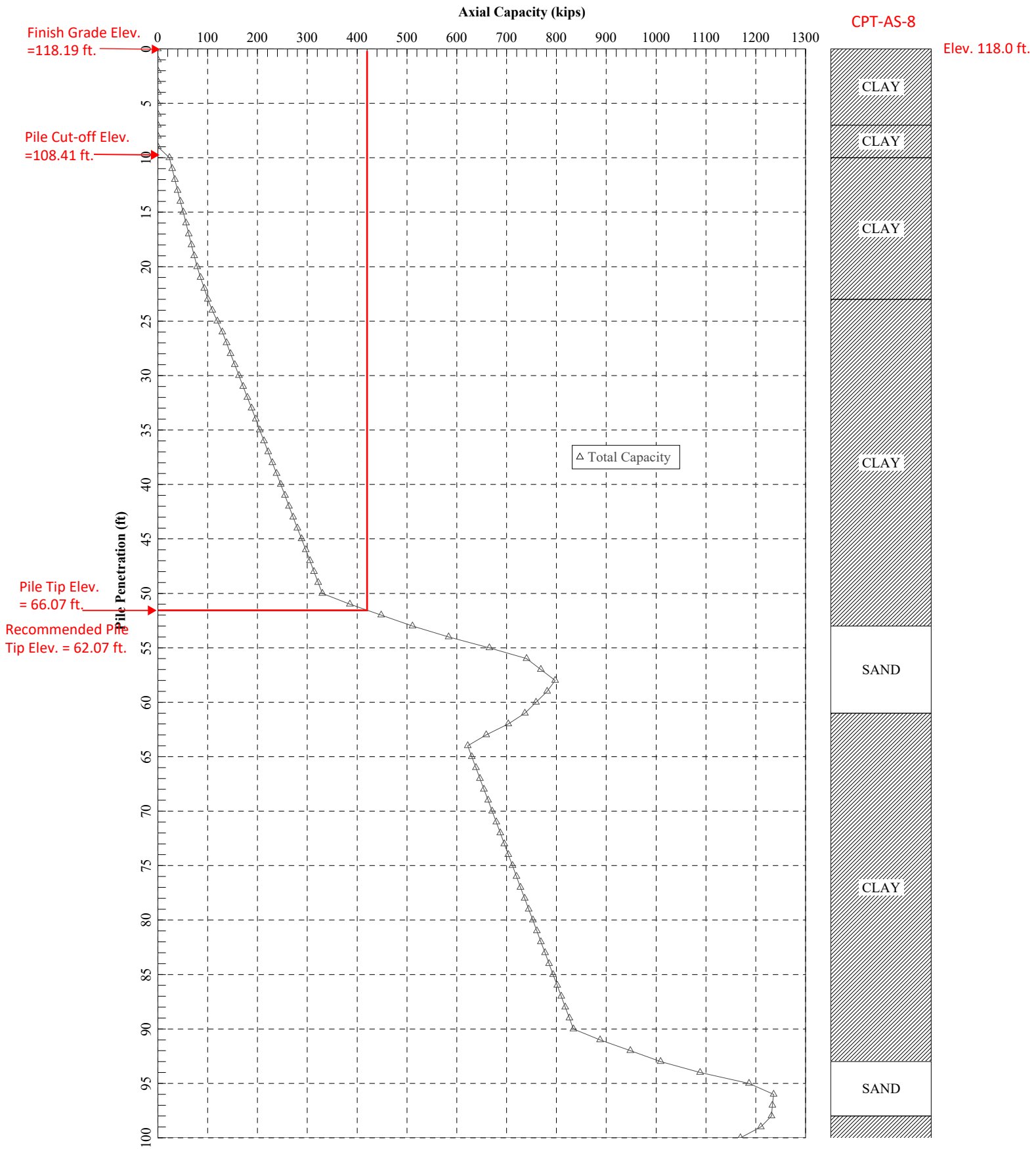
Eastridge to BART Regional Connector Project Bent 12 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 40 kips (Strength Limit Tension)/0.7 = 60 kips



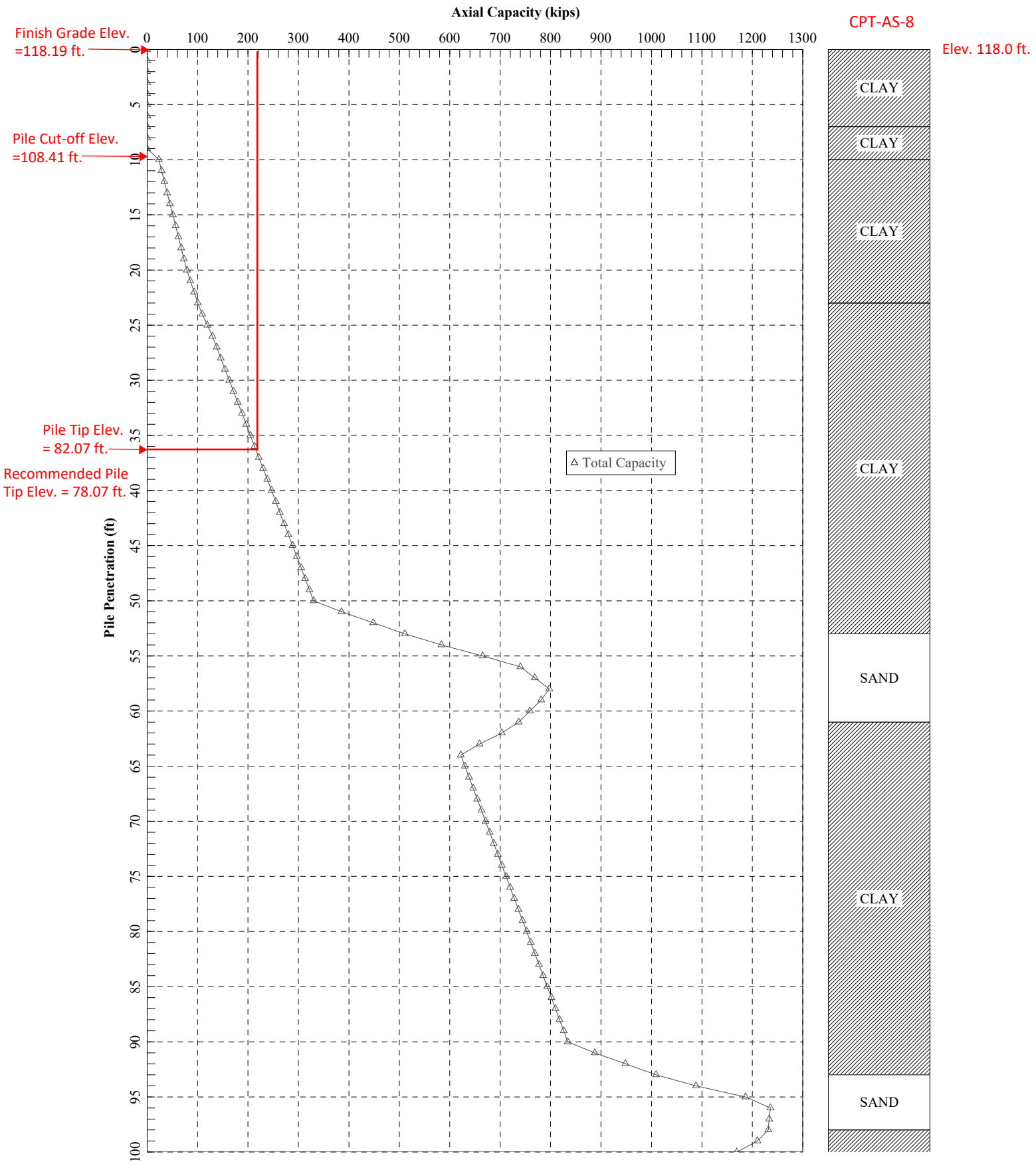
Eastridge to BART Regional Connector Project Bent 12 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 420 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project Bent 12 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

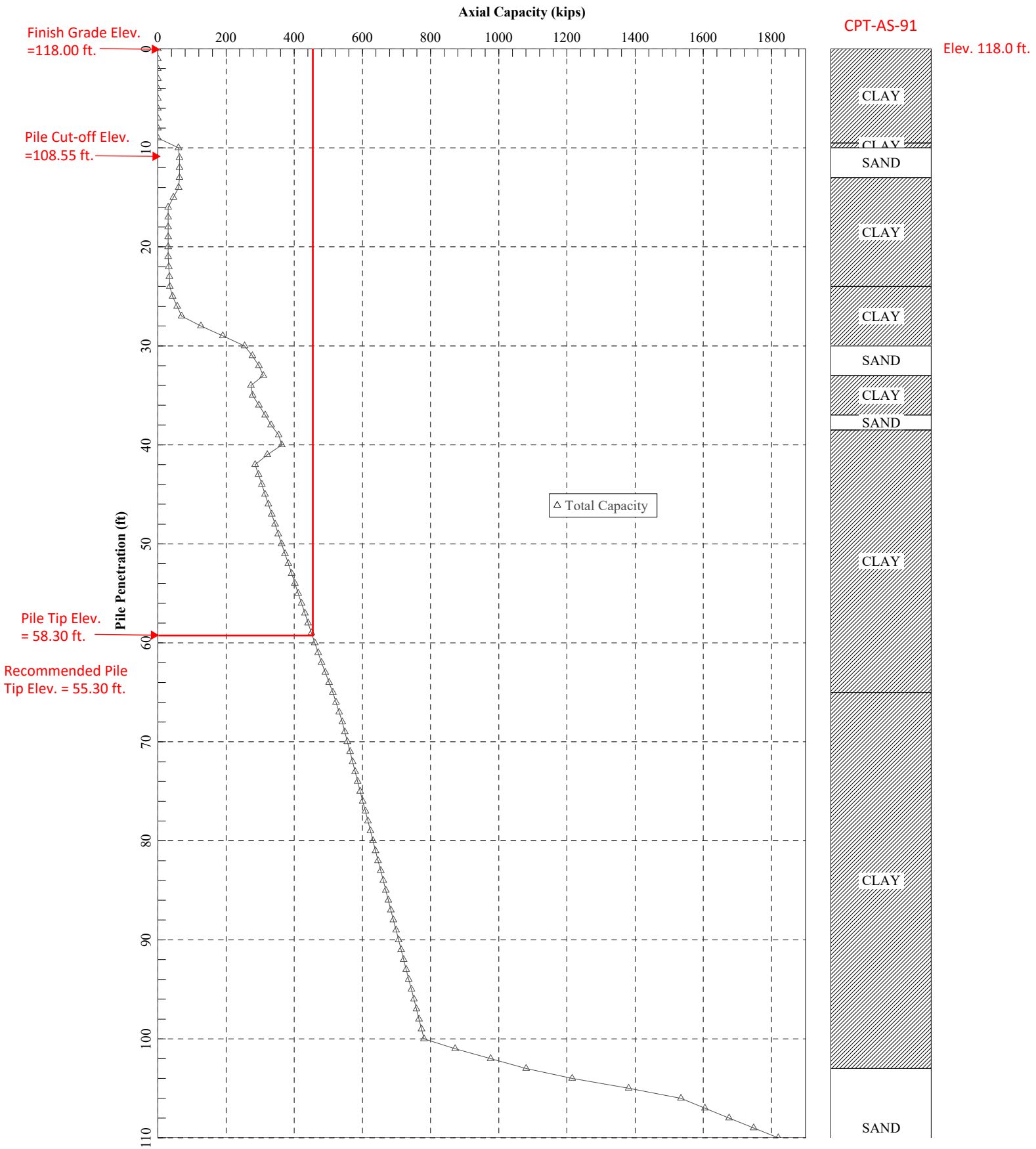
Vertical Load Demand = 220 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 12 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

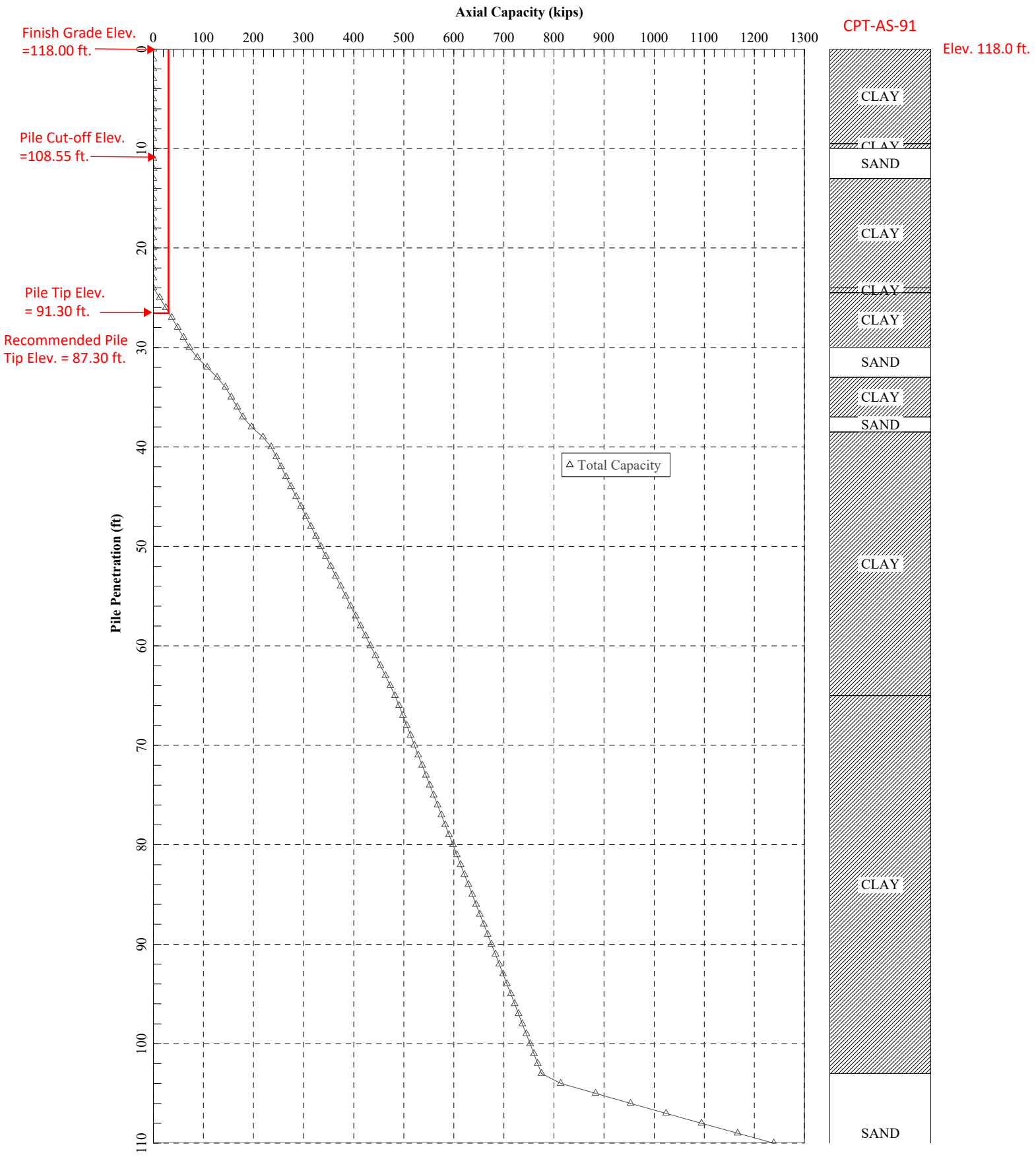
AERIAL GUIDEWAY – BENT 13 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 310 kips (Strength Limit Compression)/0.7 = 450 kips



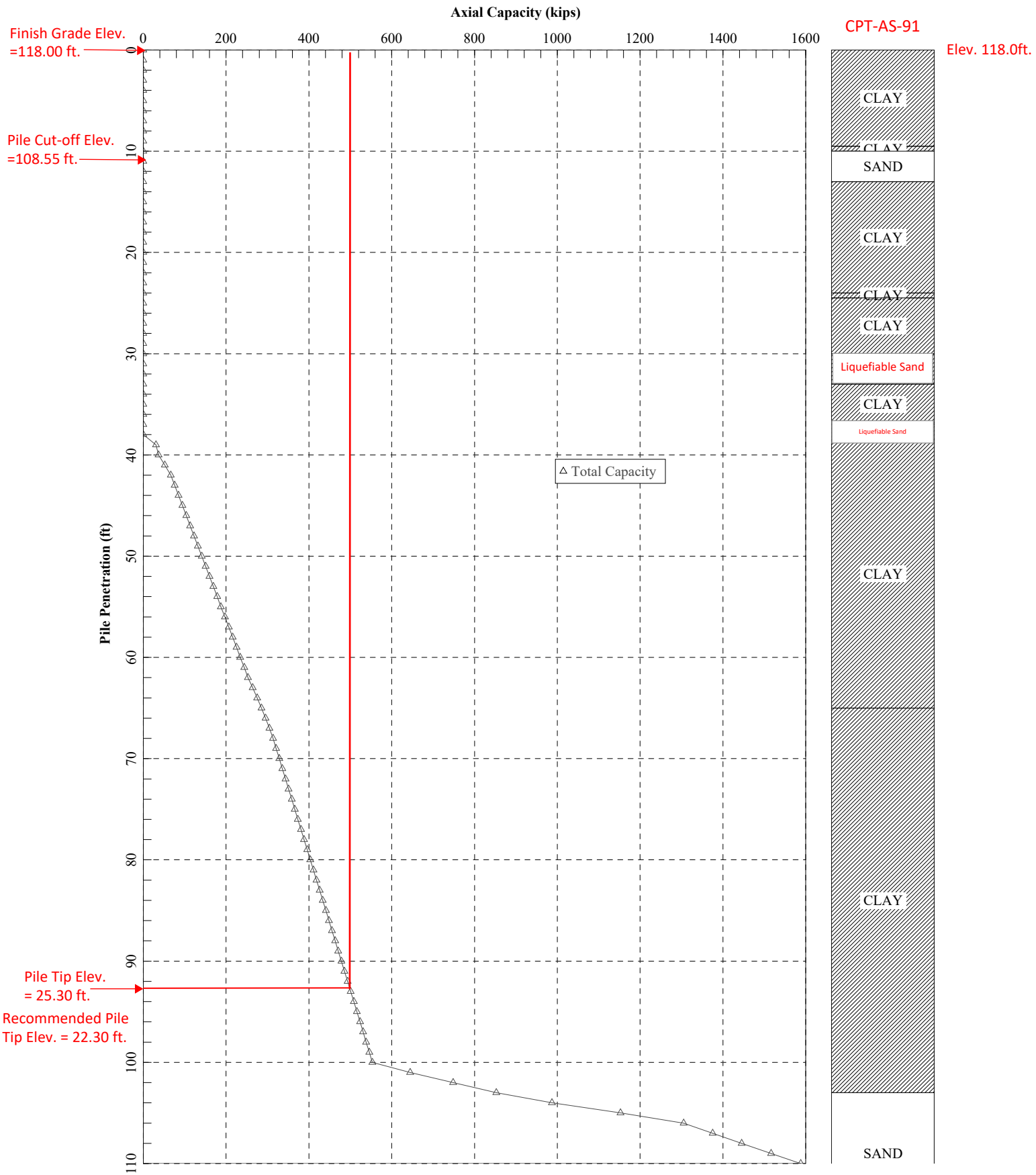
Eastridge to BART Regional Connector Project Bent 13 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 20 kips (Strength Limit Tension)/0.7 = 30 kips

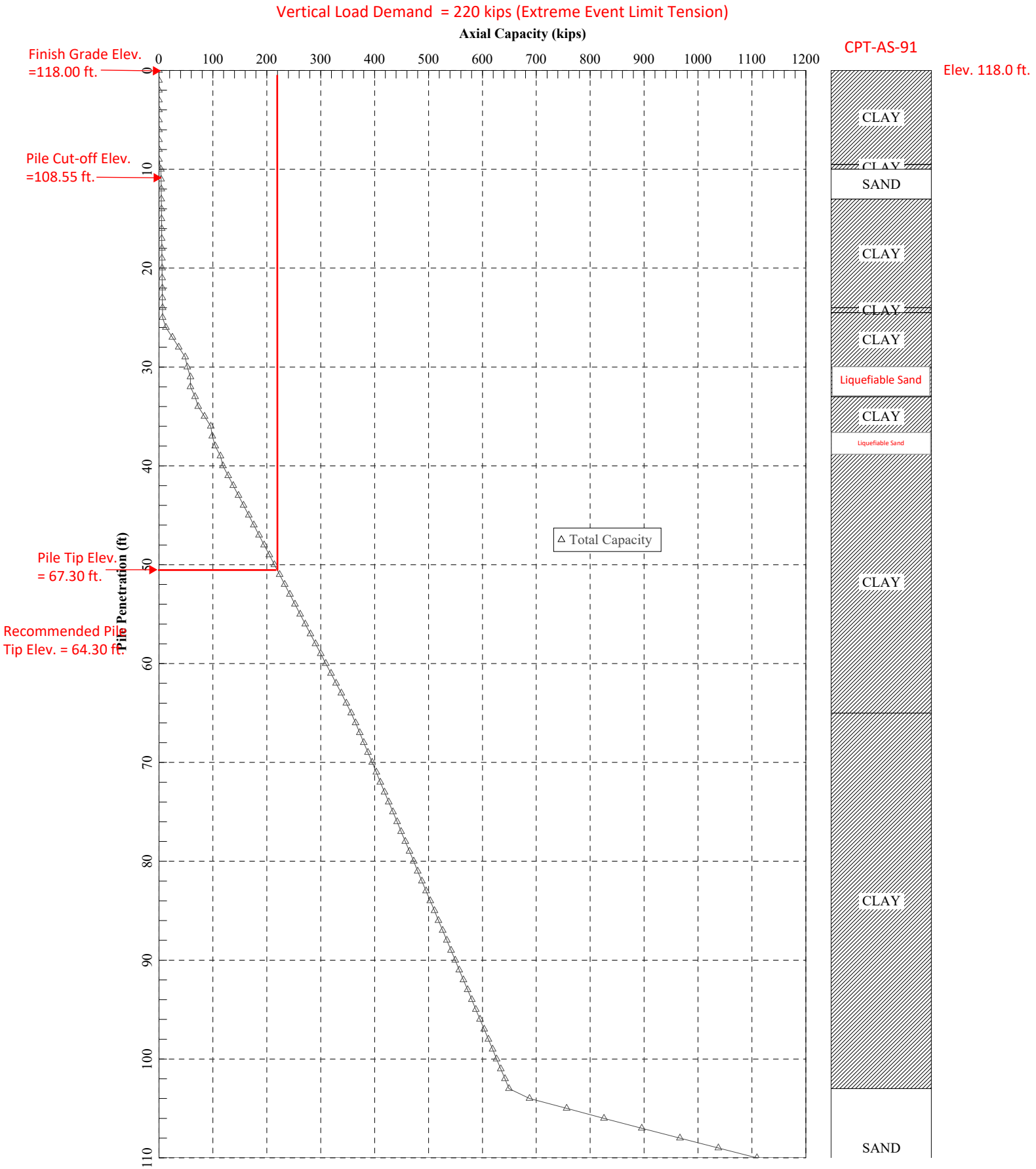


Eastridge to BART Regional Connector Project Bent 13 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 29 kips (Downdrag) + 470 kips (Extreme Event Limit Compression) = 500 kips



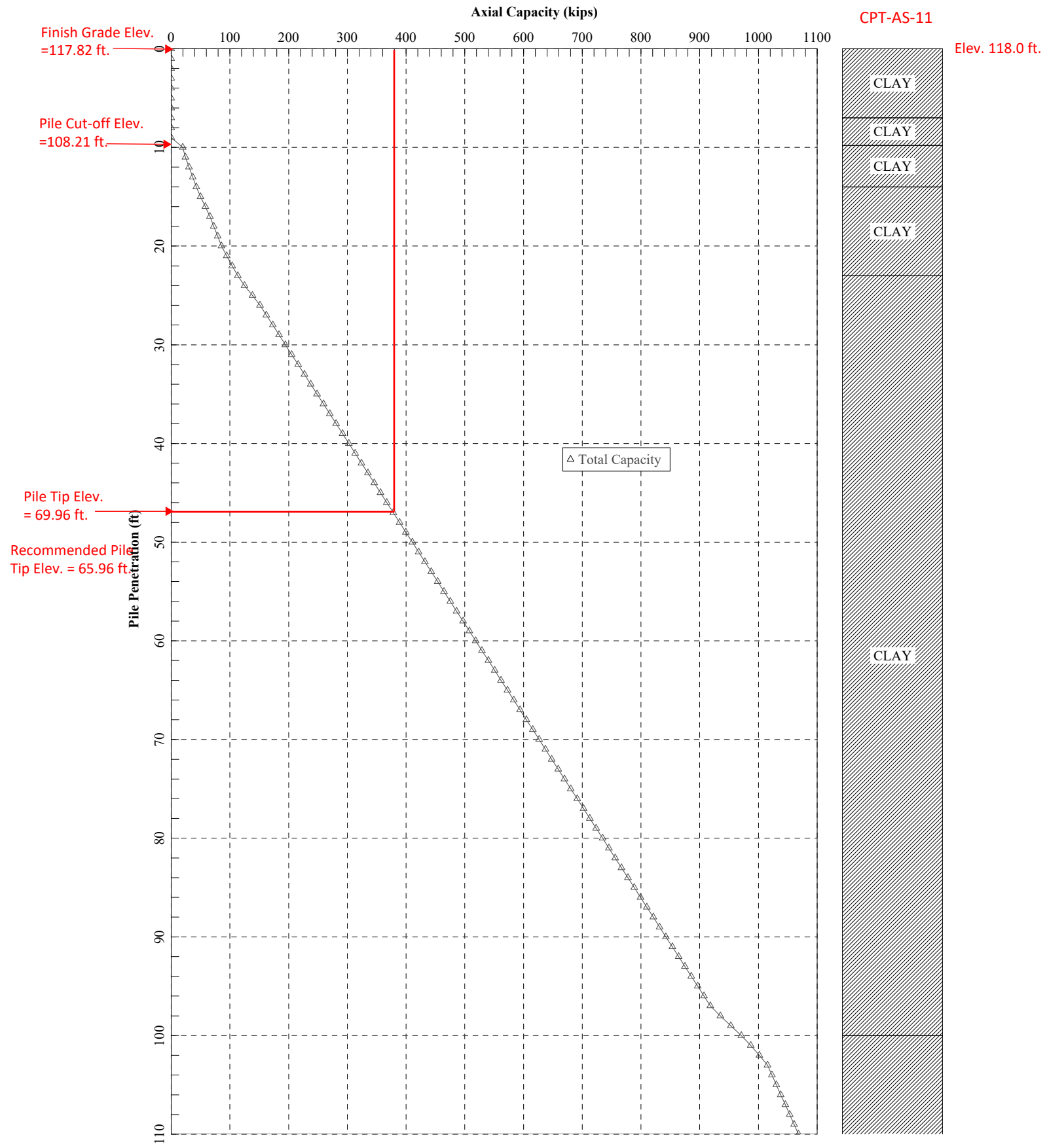
Eastridge to BART Regional Connector Project Bent 13 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)



Eastridge to BART Regional Connector Project Bent 13 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

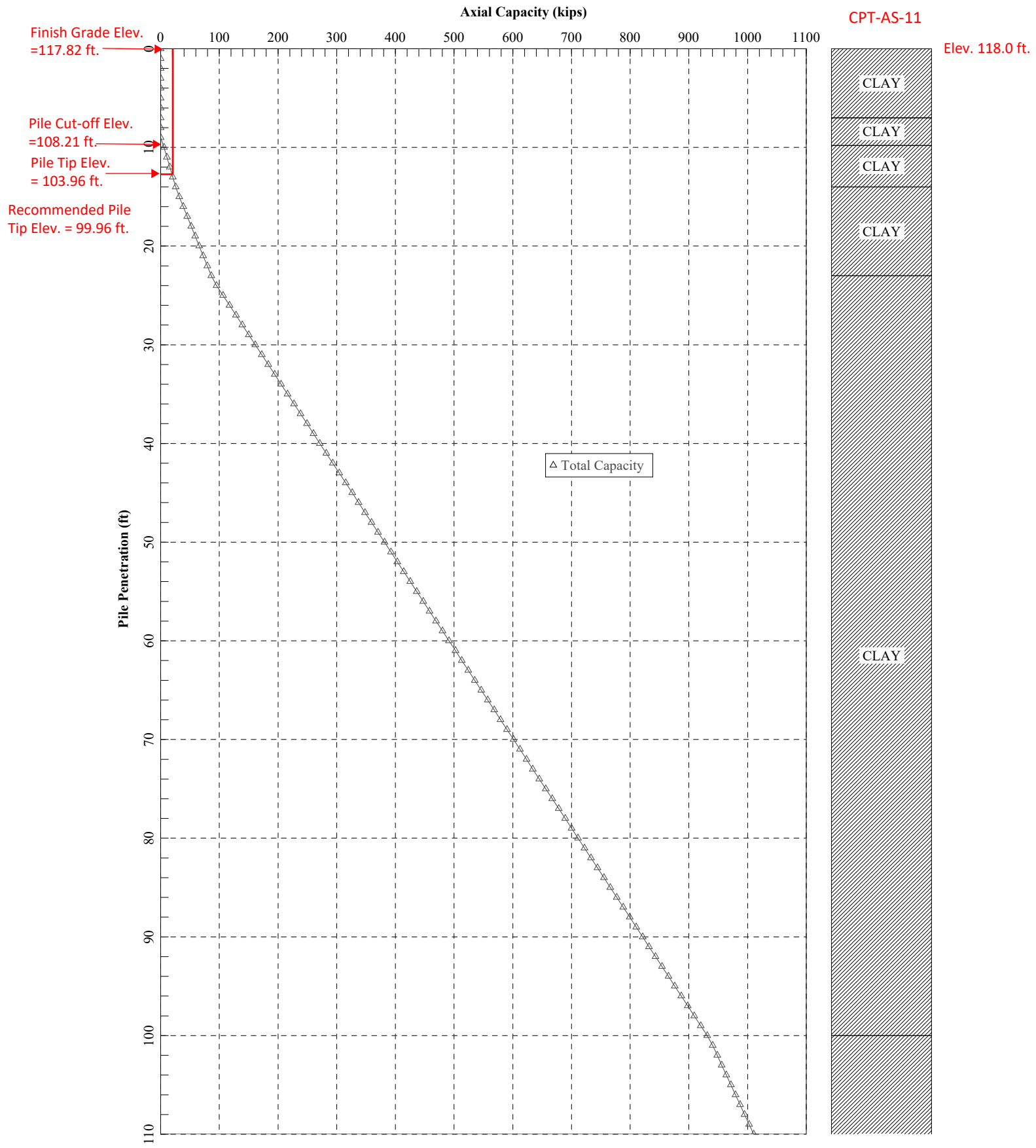
AERIAL GUIDEWAY – BENT 14 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 260 kips (Strength Limit Compression)/0.7 = 380 kips

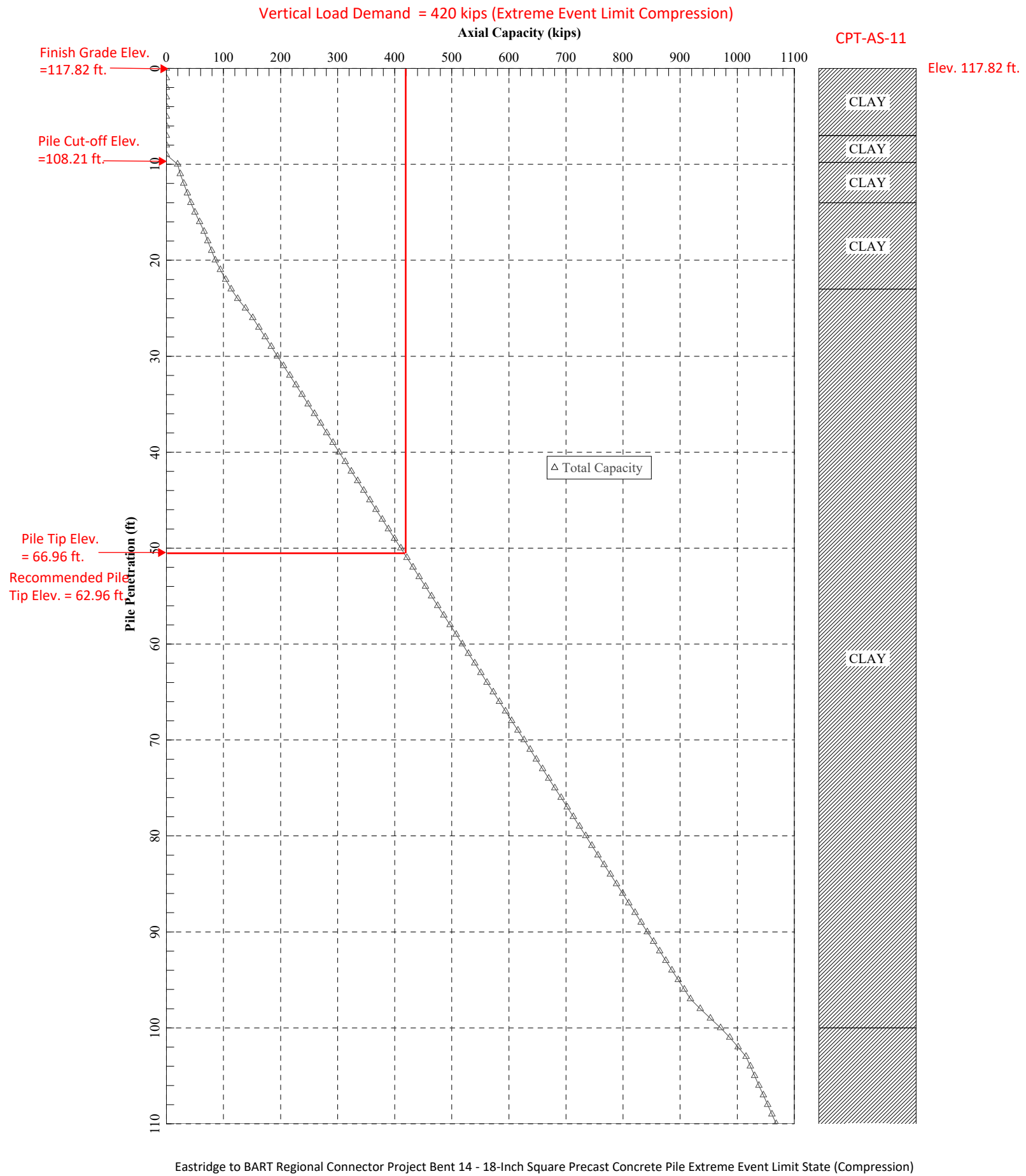


Eastridge to BART Regional Connector Project Bent 14 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

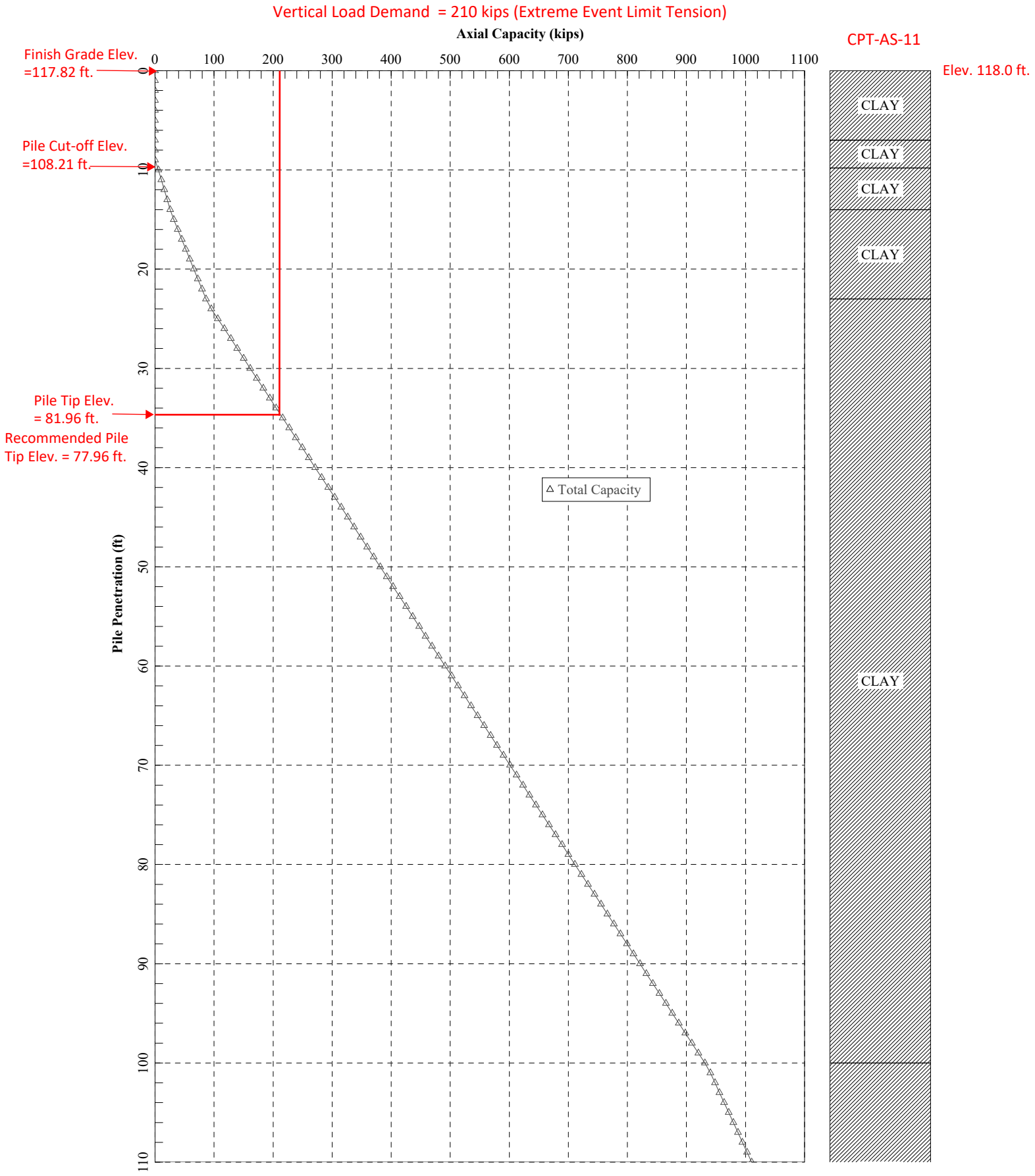
Vertical Load Demand = 10 kips (Strength Limit Tension)/0.7 = 20 kips



Eastridge to BART Regional Connector Project Bent 14 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)



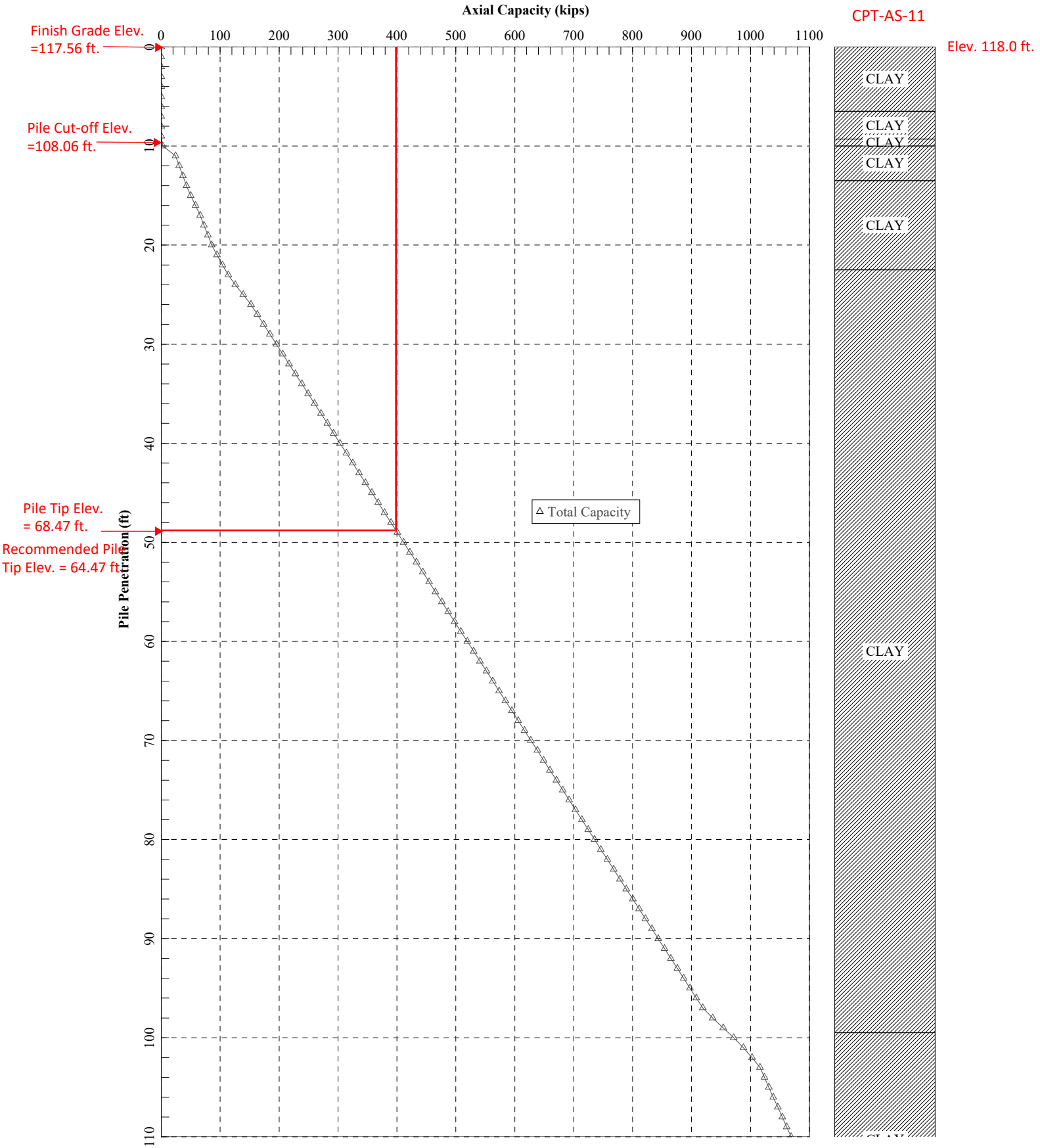
Eastridge to BART Regional Connector Project Bent 14 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)



Eastridge to BART Regional Connector Project Bent 14 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

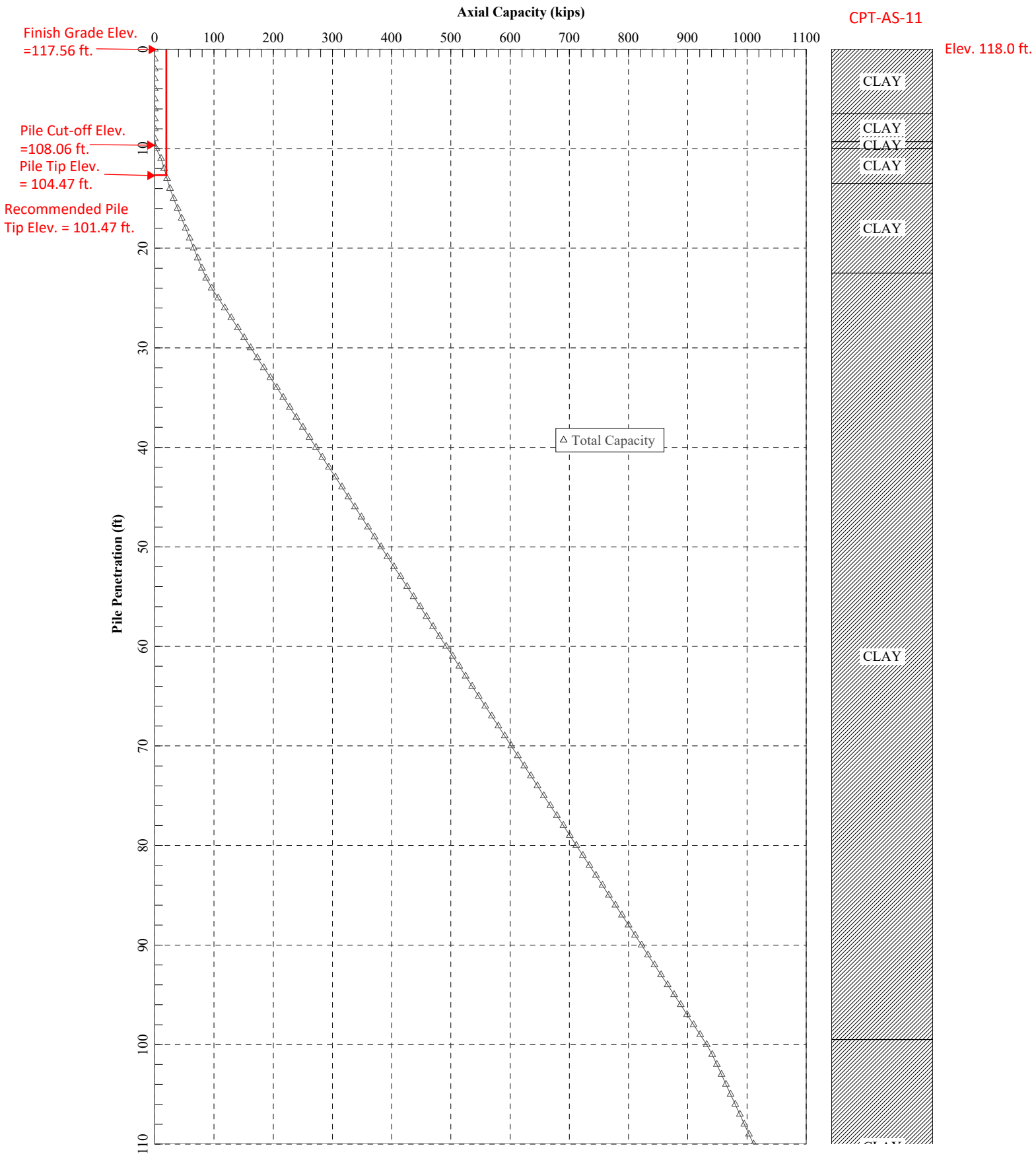
AERIAL GUIDEWAY – BENT 15 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 280 kips (Strength Limit Compression)/0.7 = 400 kips

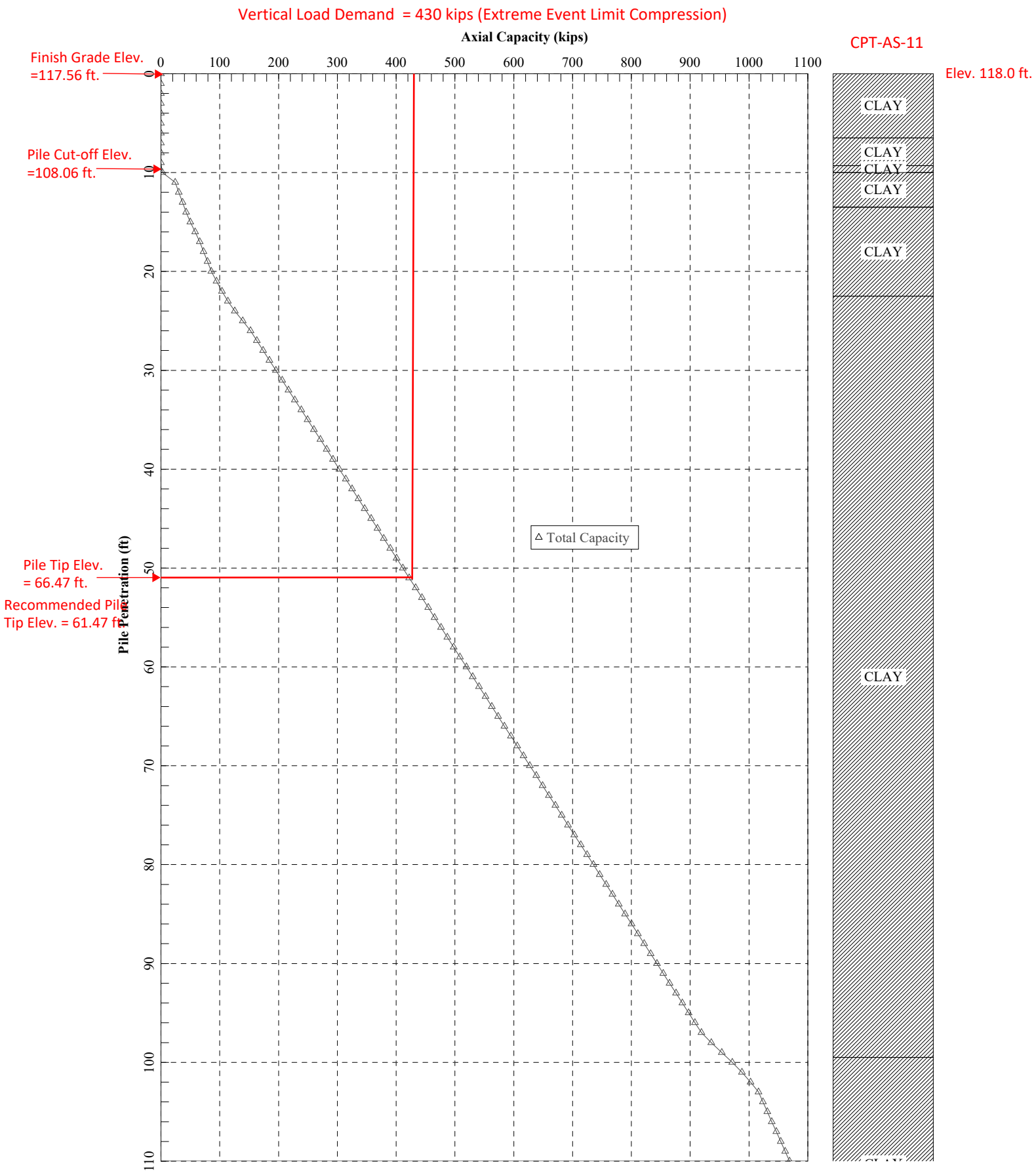


Eastridge to BART Regional Connector Project Bent 15 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

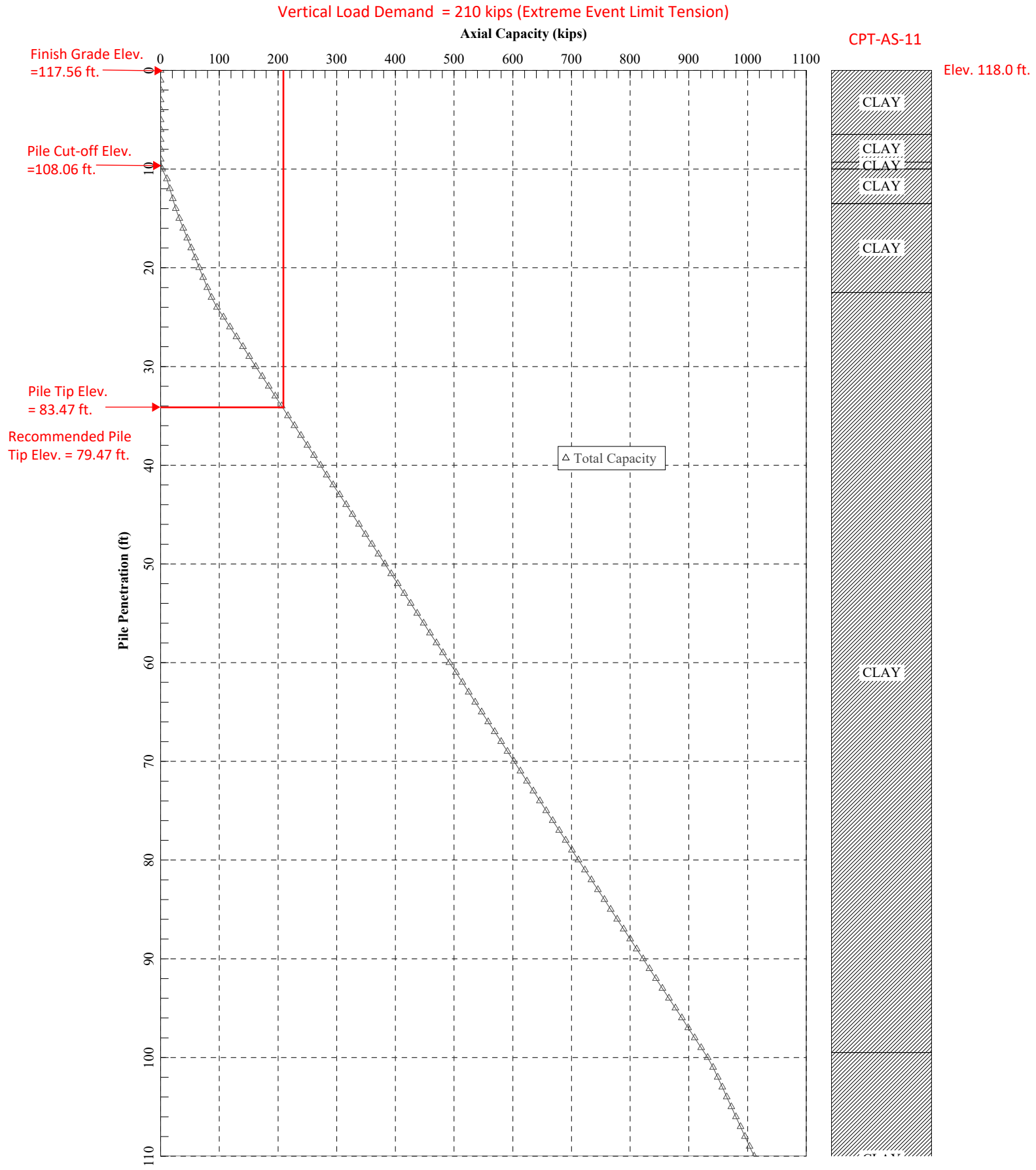
Vertical Load Demand = 10 kips (Strength Limit Tension)/0.7 = 20 kips



Eastridge to BART Regional Connector Project Bent 15 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)



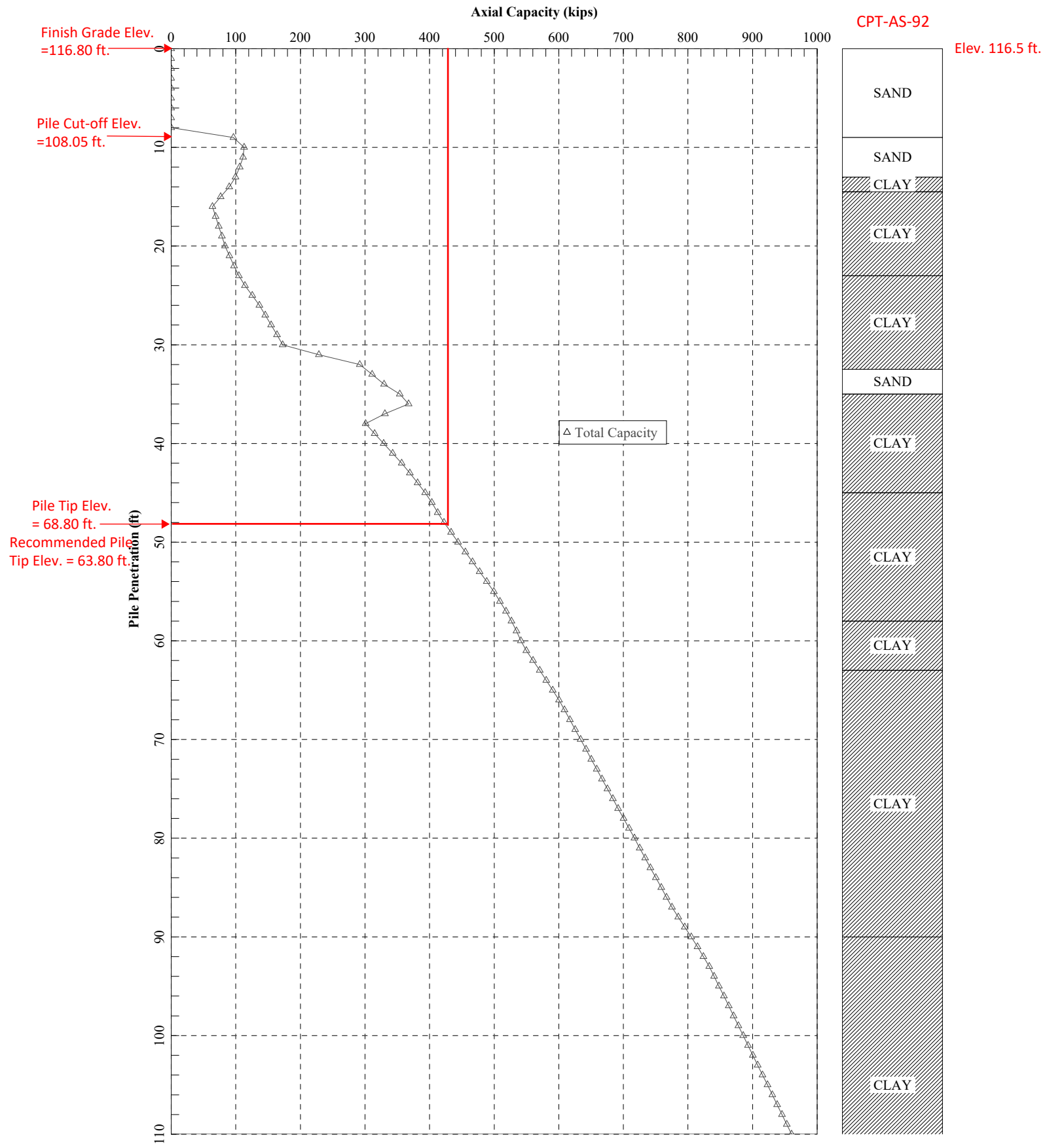
Eastridge to BART Regional Connector Project Bent 15 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)



Eastridge to BART Regional Connector Project Bent 15 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

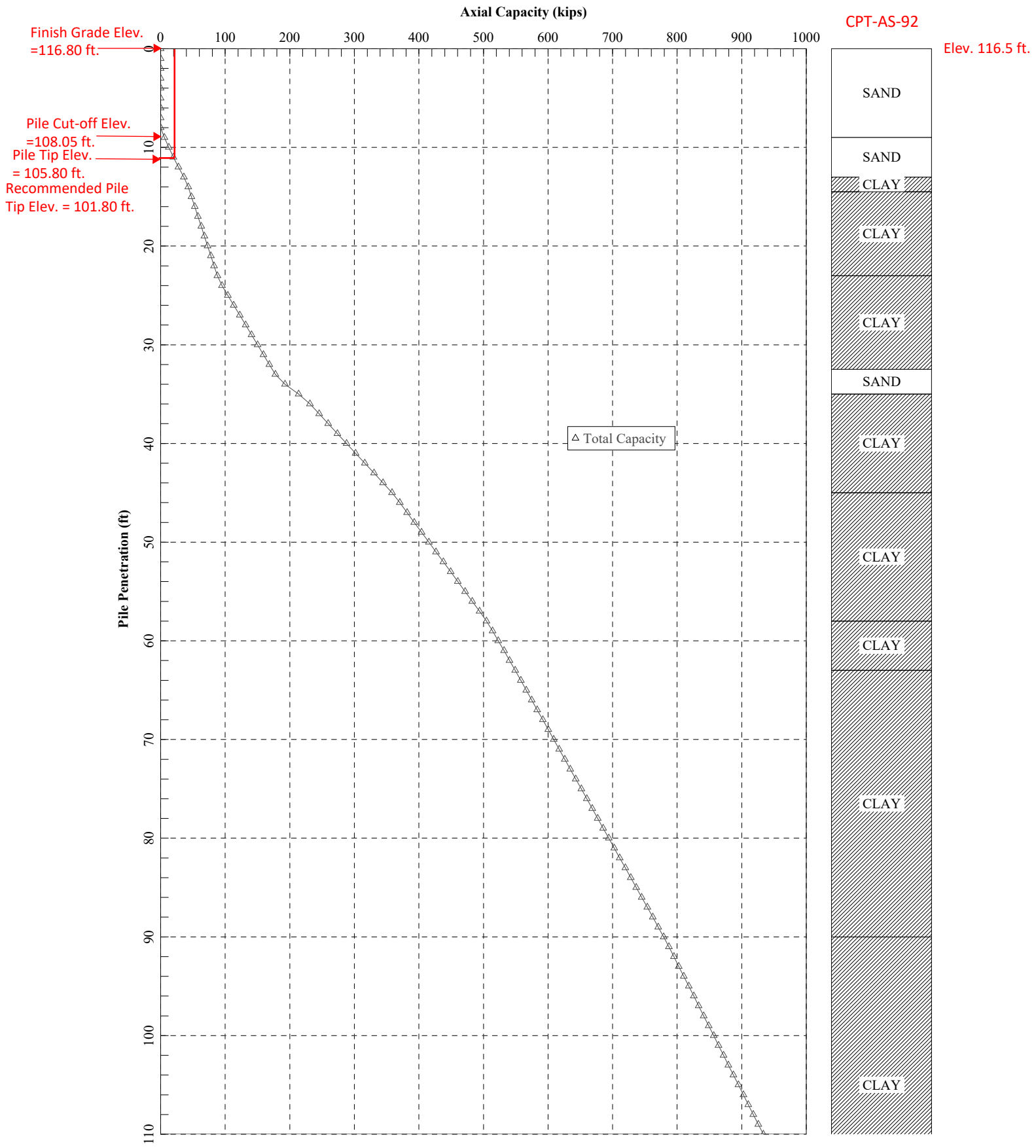
AERIAL GUIDEWAY – BENT 16 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 300 kips (Strength Limit Compression)/0.7 = 430 kips



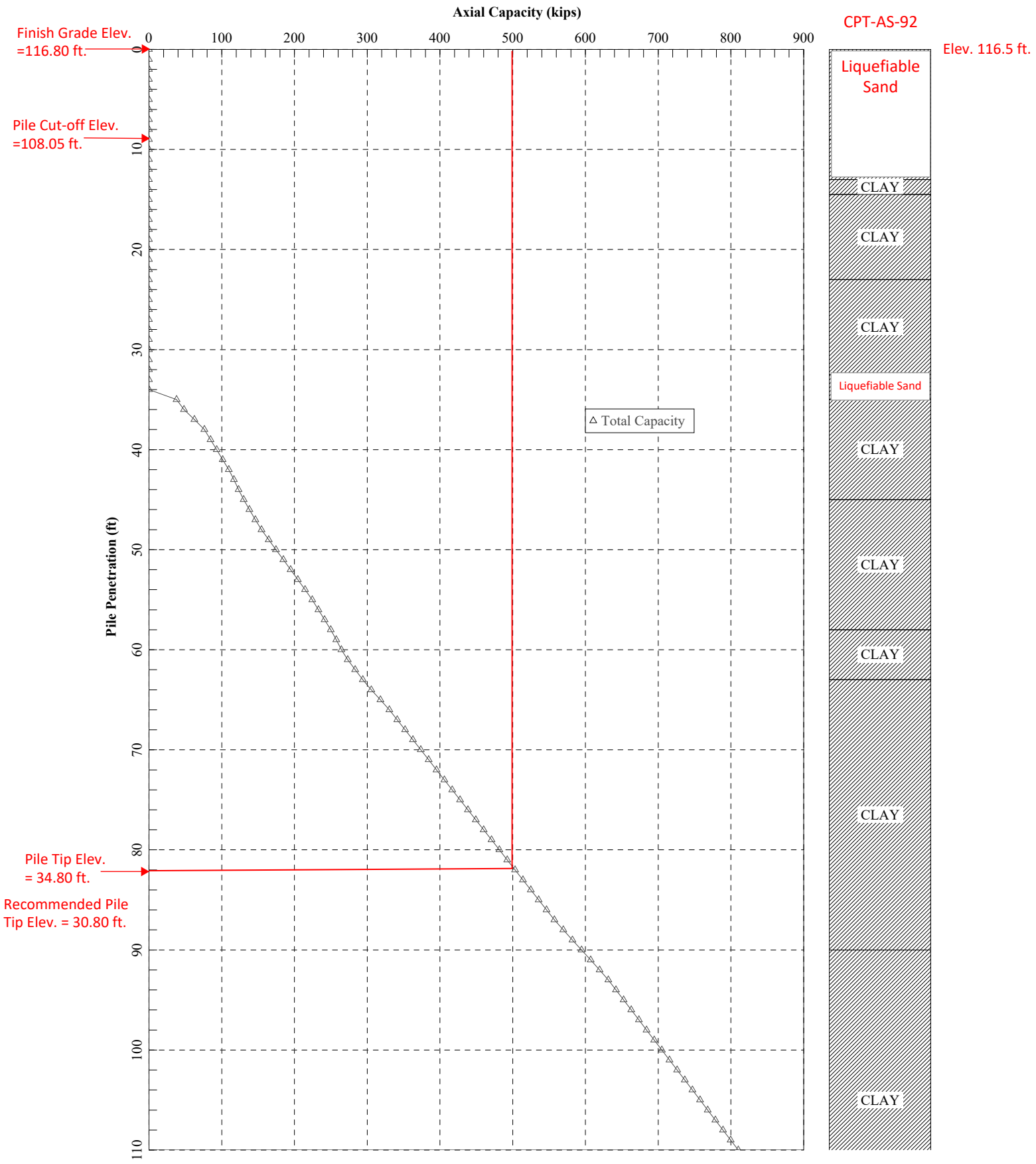
Eastridge to BART Regional Connector Project Bent 16 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 10 kips (Strength Limit Tension)/0.7 = 20 kips

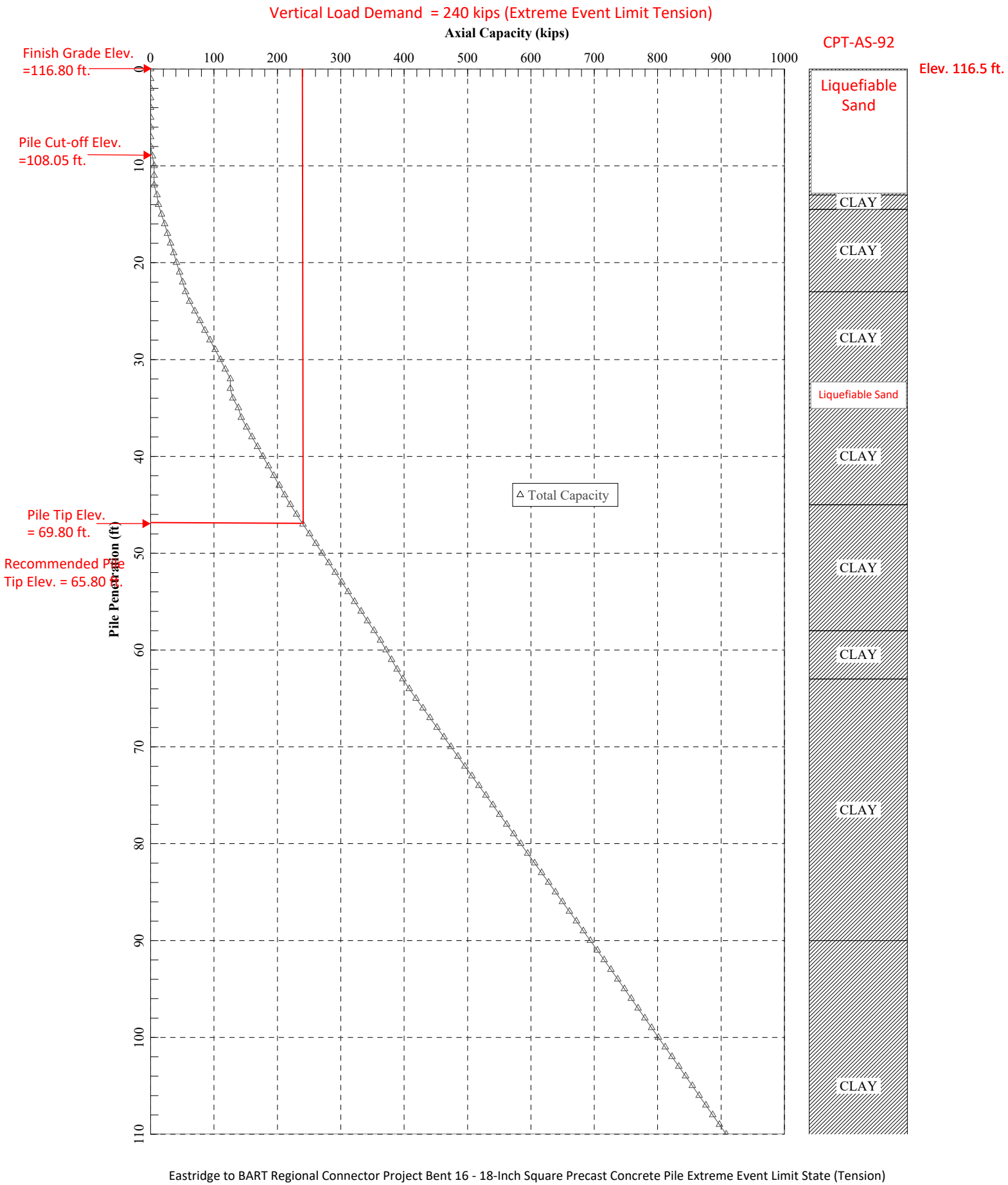


Eastridge to BART Regional Connector Project Bent 16 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 18 kips (Downdrag) + 480 kips (Extreme Event Limit Compression) = 500 kips



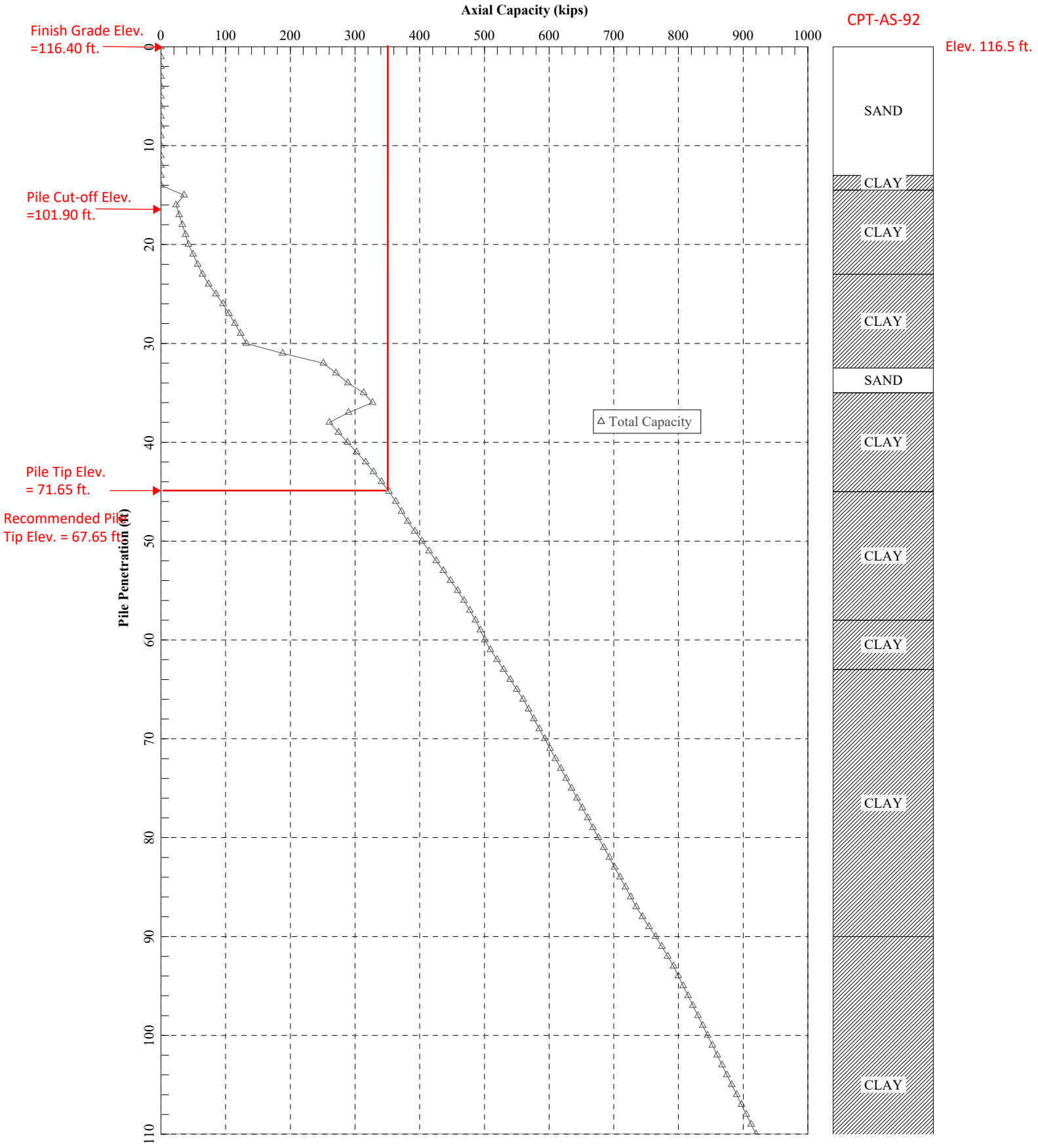
Eastridge to BART Regional Connector Project Bent 16 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)



Eastridge to BART Regional Connector Project Bent 16 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

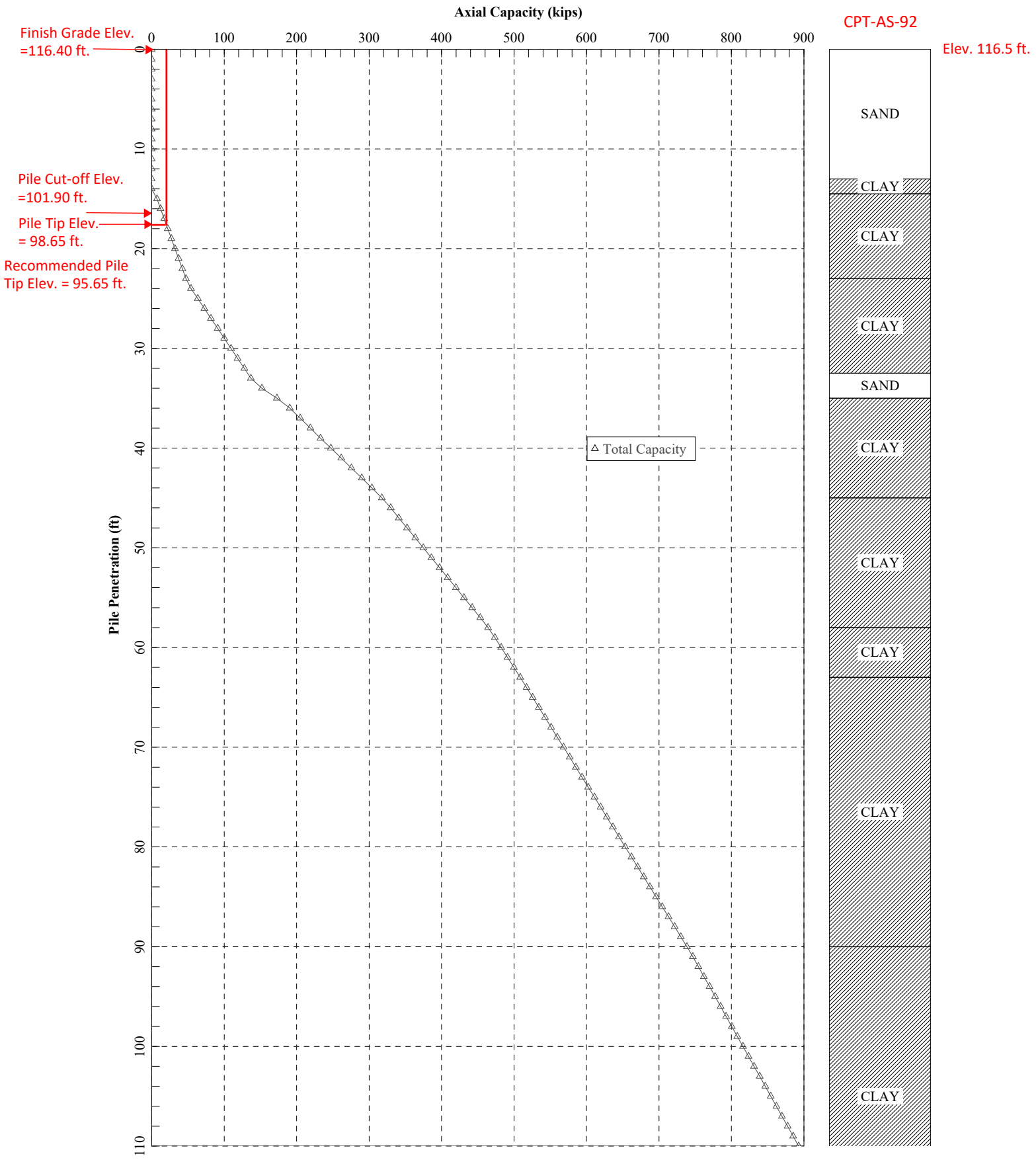
AERIAL GUIDEWAY – BENT 17 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 240 kips (Strength Limit Compression)/0.7 = 350 kips



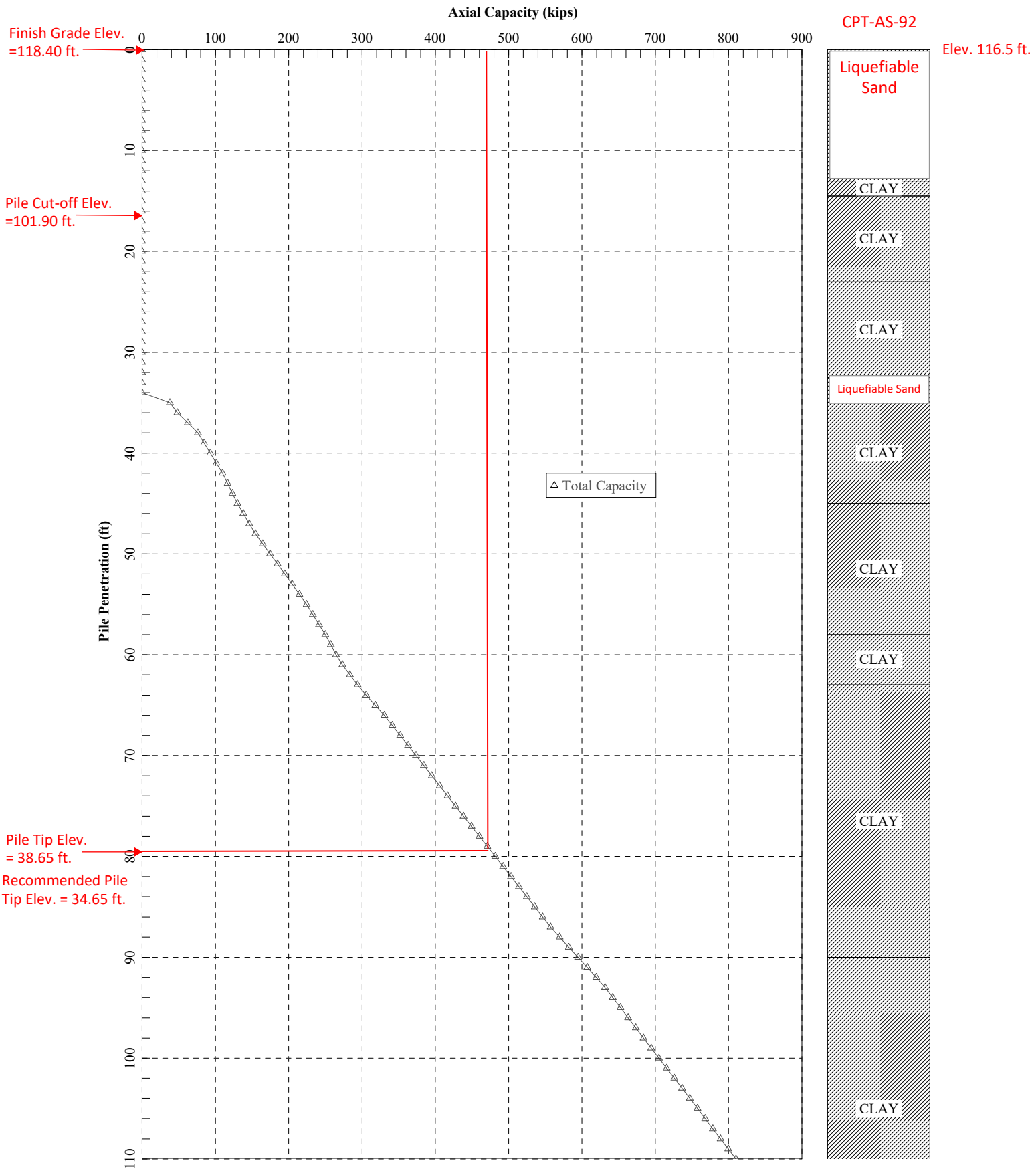
Eastridge to BART Regional Connector Project Bent 17 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 10 kips (Strength Limit Tension)/0.7 = 20 kips

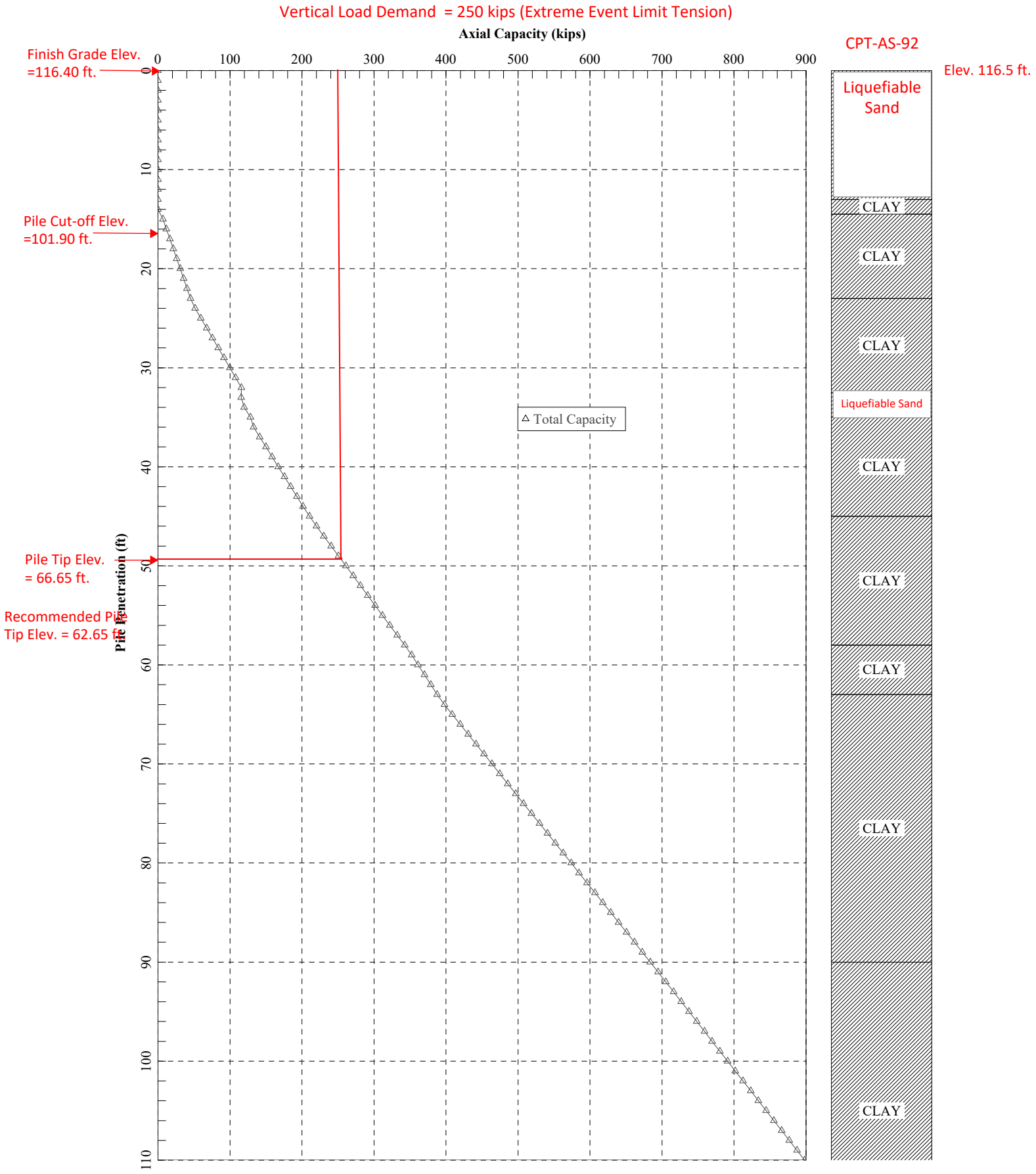


Eastridge to BART Regional Connector Project Bent 17 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 16 kips (Downdrag) + 450 kips (Extreme Event Limit Compression) = 470 kips



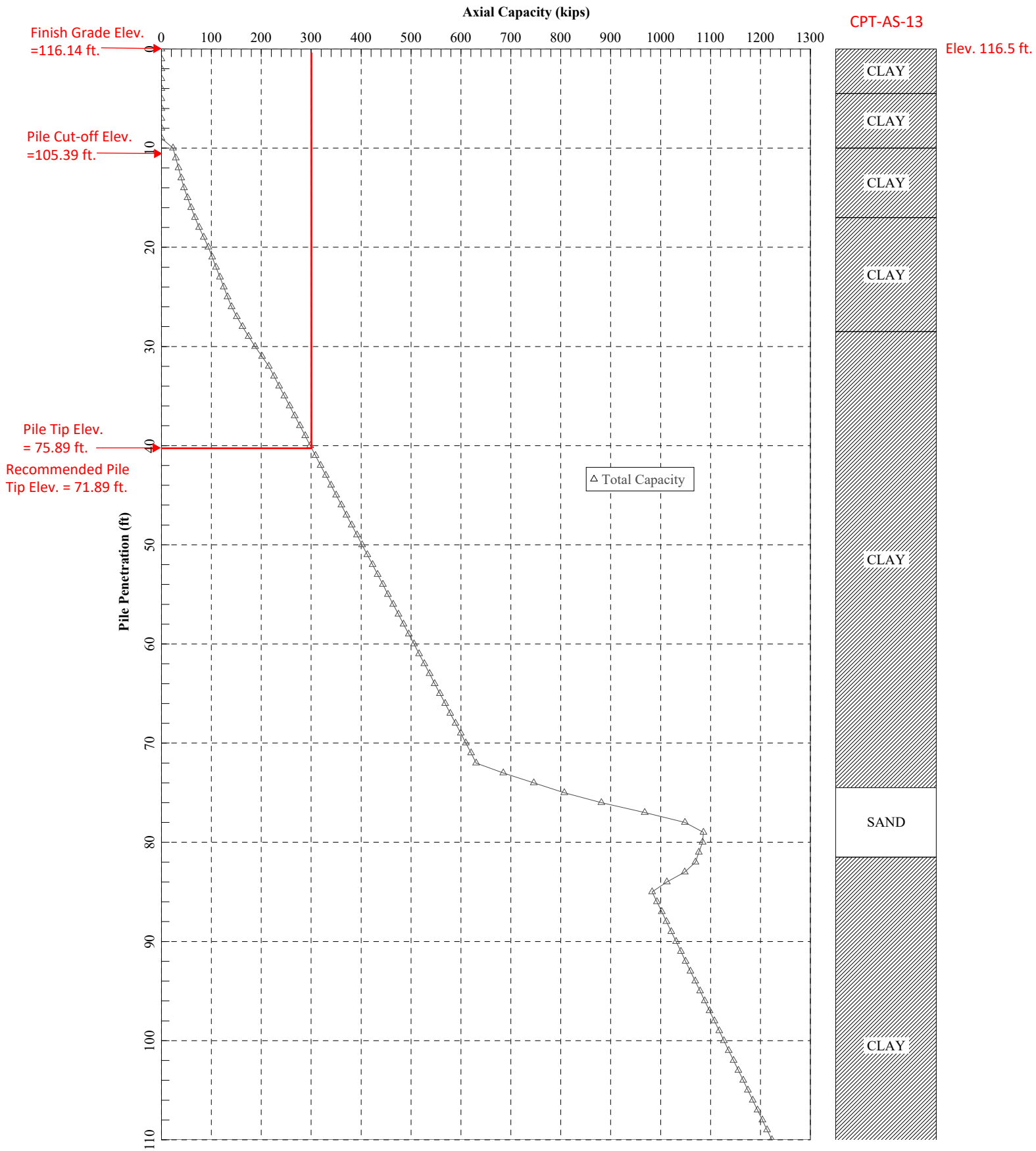
Eastridge to BART Regional Connector Project Bent 17 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)



Eastridge to BART Regional Connector Project Bent 17 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

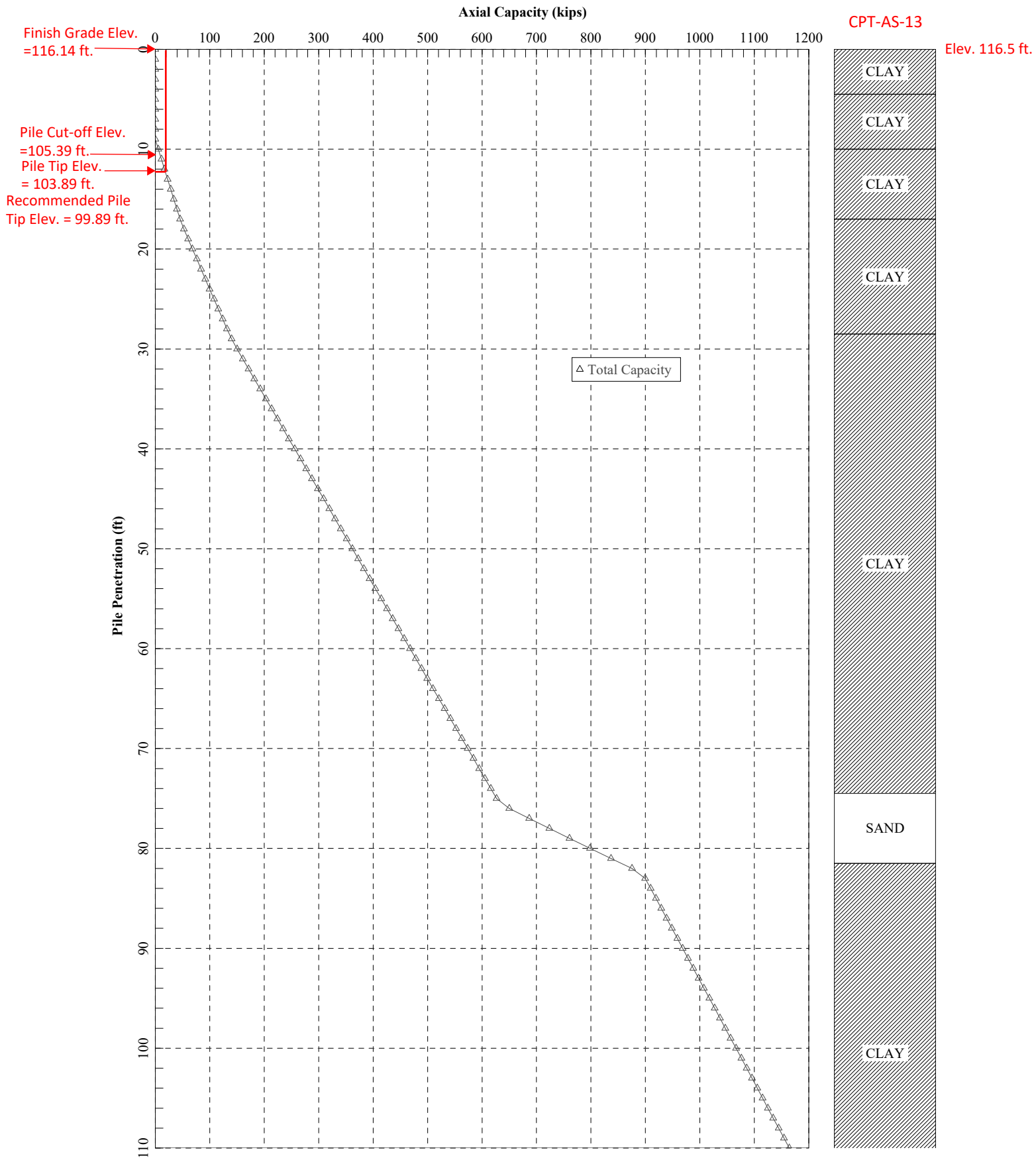
AERIAL GUIDEWAY – BENT 18 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 210 kips (Strength Limit Compression)/0.7 = 300 kips

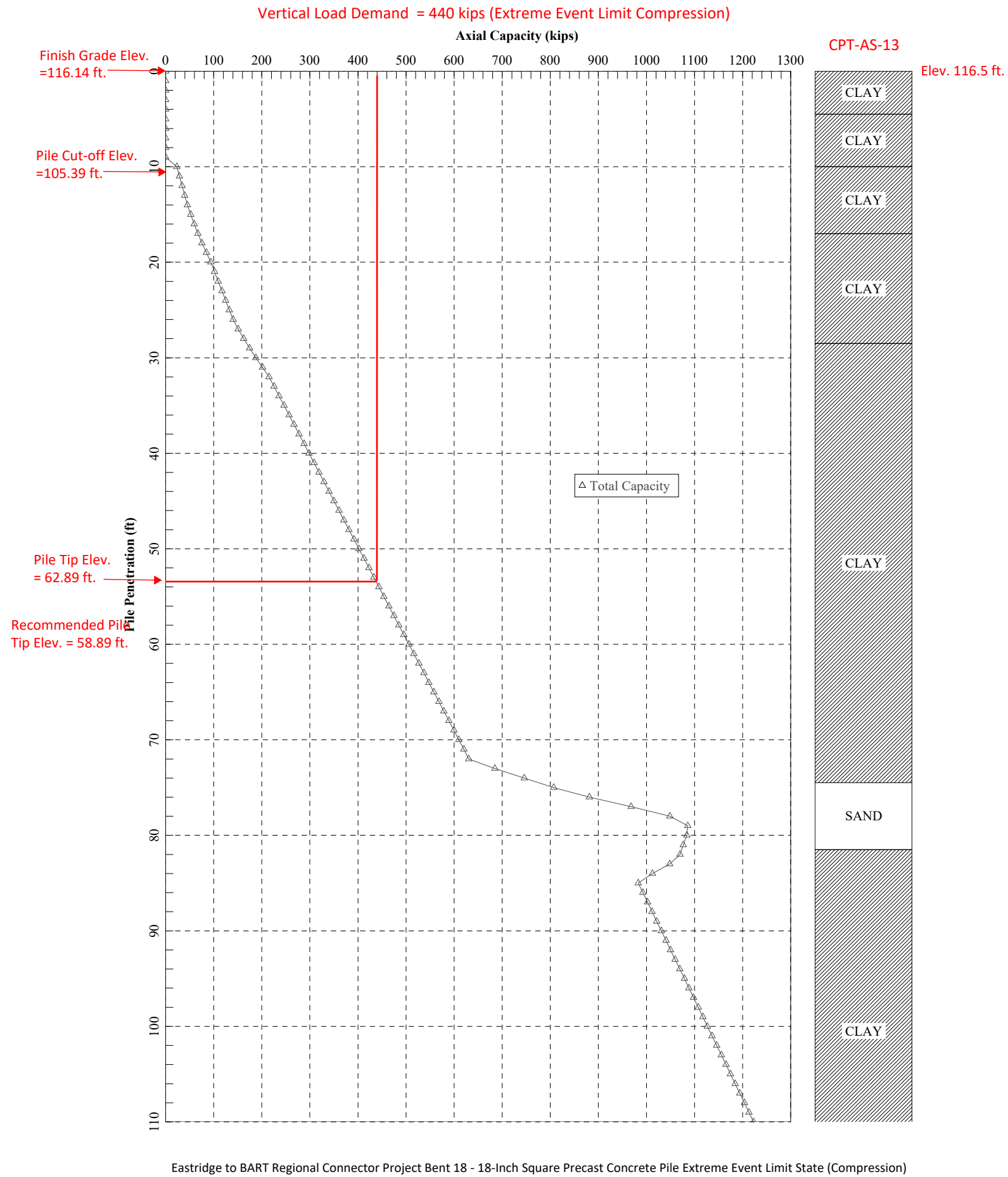


Eastridge to BART Regional Connector Project Bent 18 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

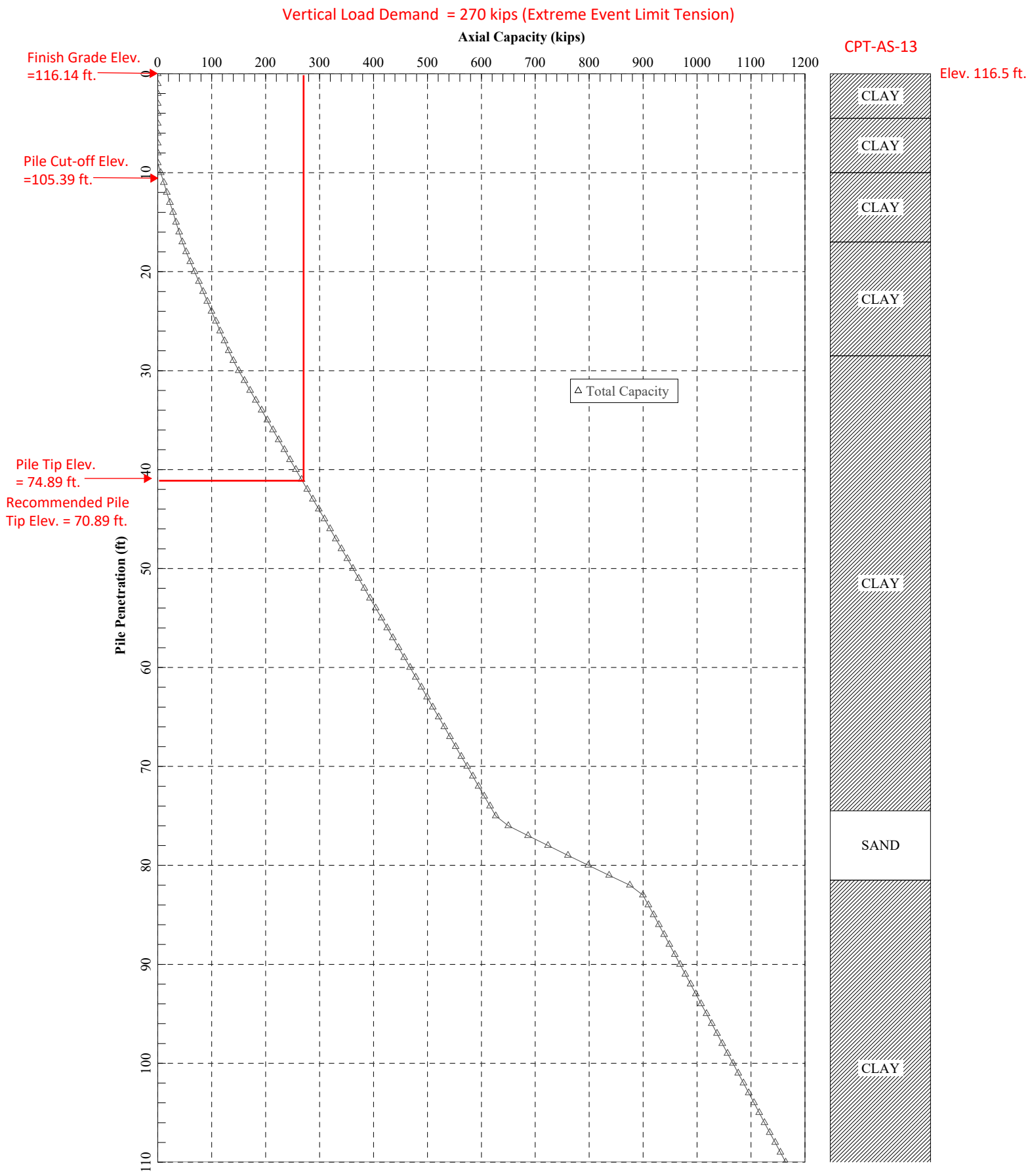
Vertical Load Demand = 10 kips (Strength Limit Tension)/0.7 = 20 kips



Eastridge to BART Regional Connector Project Bent 18 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)



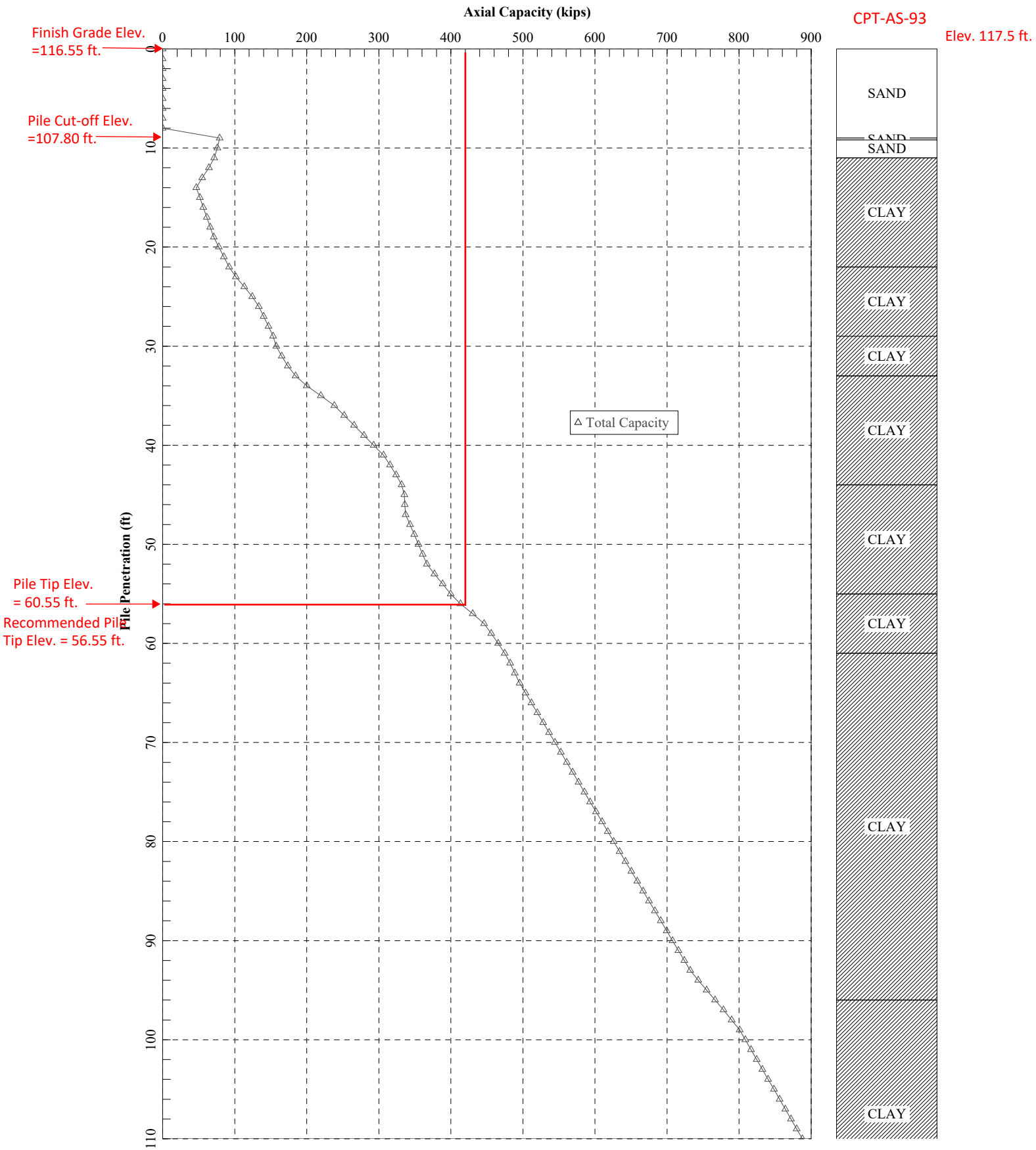
Eastridge to BART Regional Connector Project Bent 18 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)



Eastridge to BART Regional Connector Project Bent 18 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

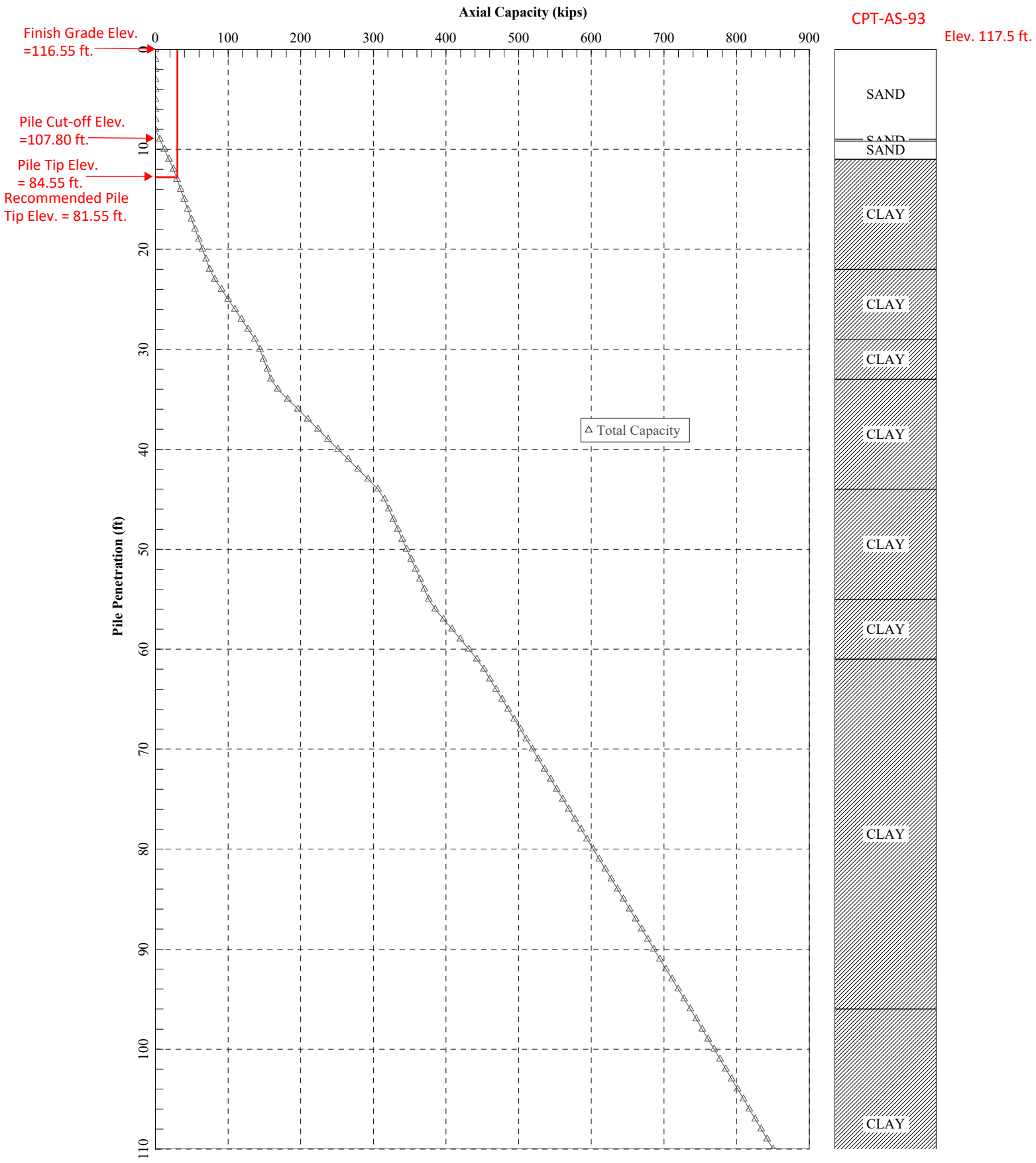
AERIAL GUIDEWAY – BENT 19 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 290 kips (Strength Limit Compression)/0.7 = 420 kips



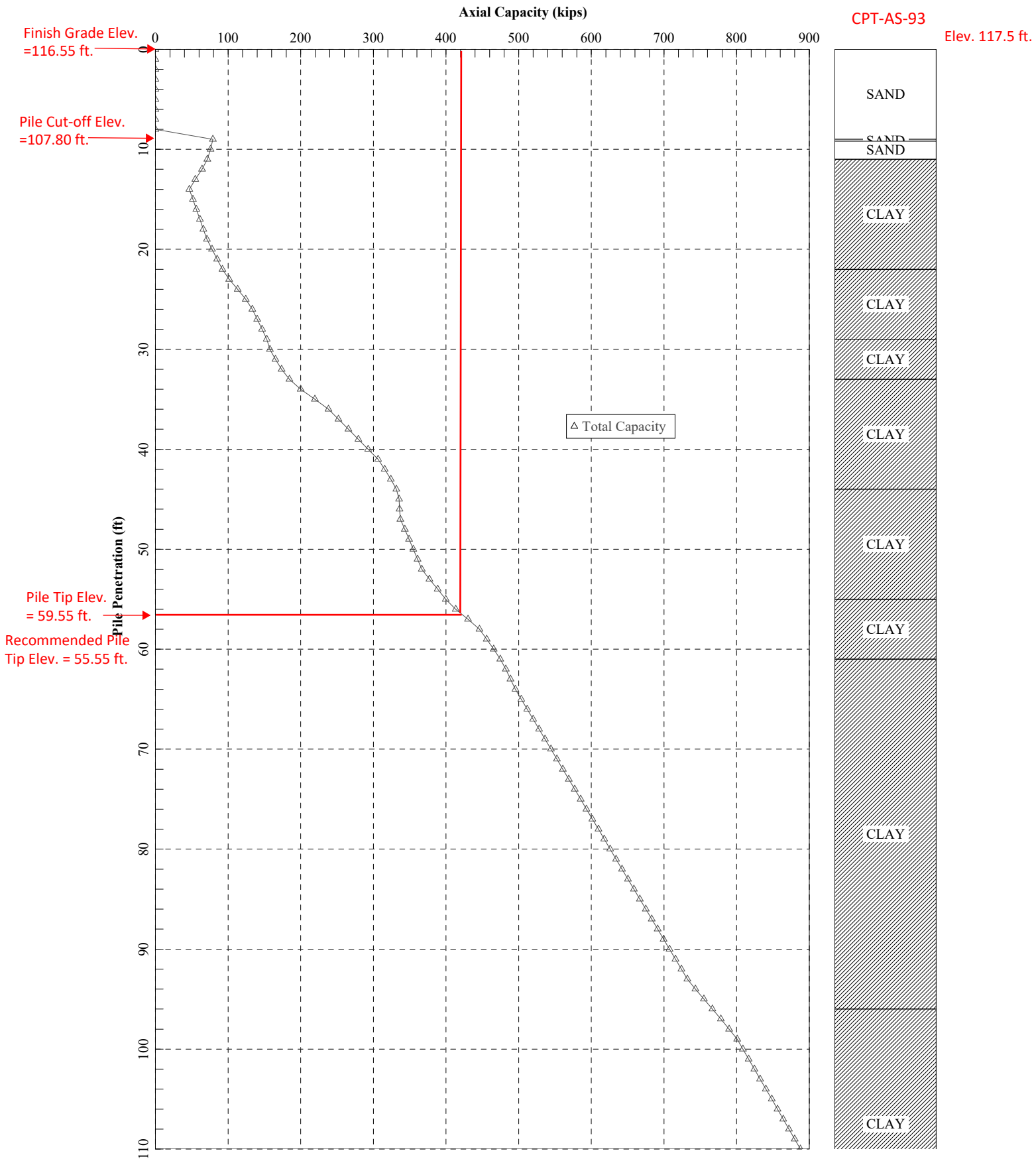
Eastridge to BART Regional Connector Project Bent 19 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 20 kips (Strength Limit Tension)/0.7 = 30 kips



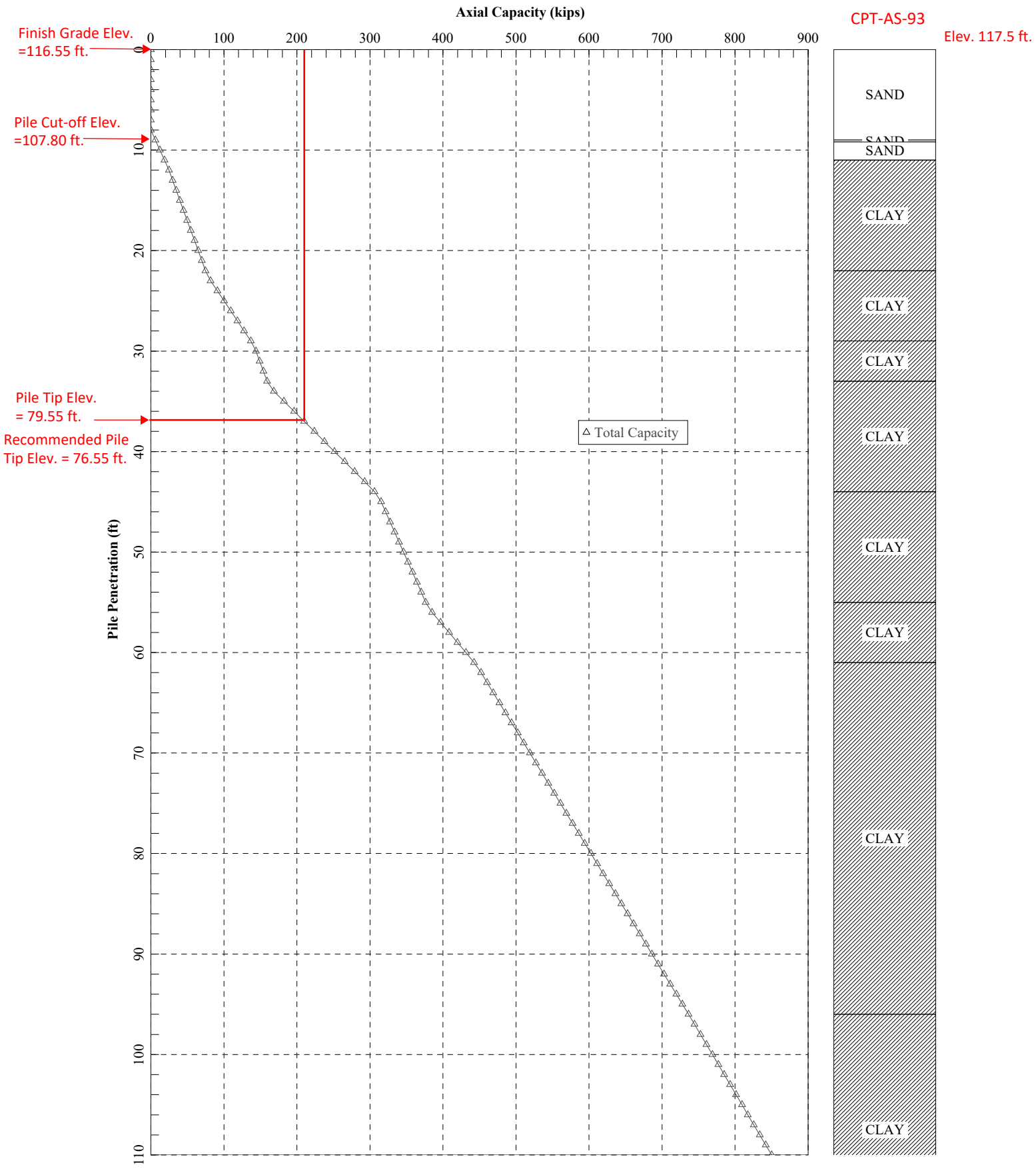
Eastridge to BART Regional Connector Project Bent 19 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 420 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project Bent 19 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

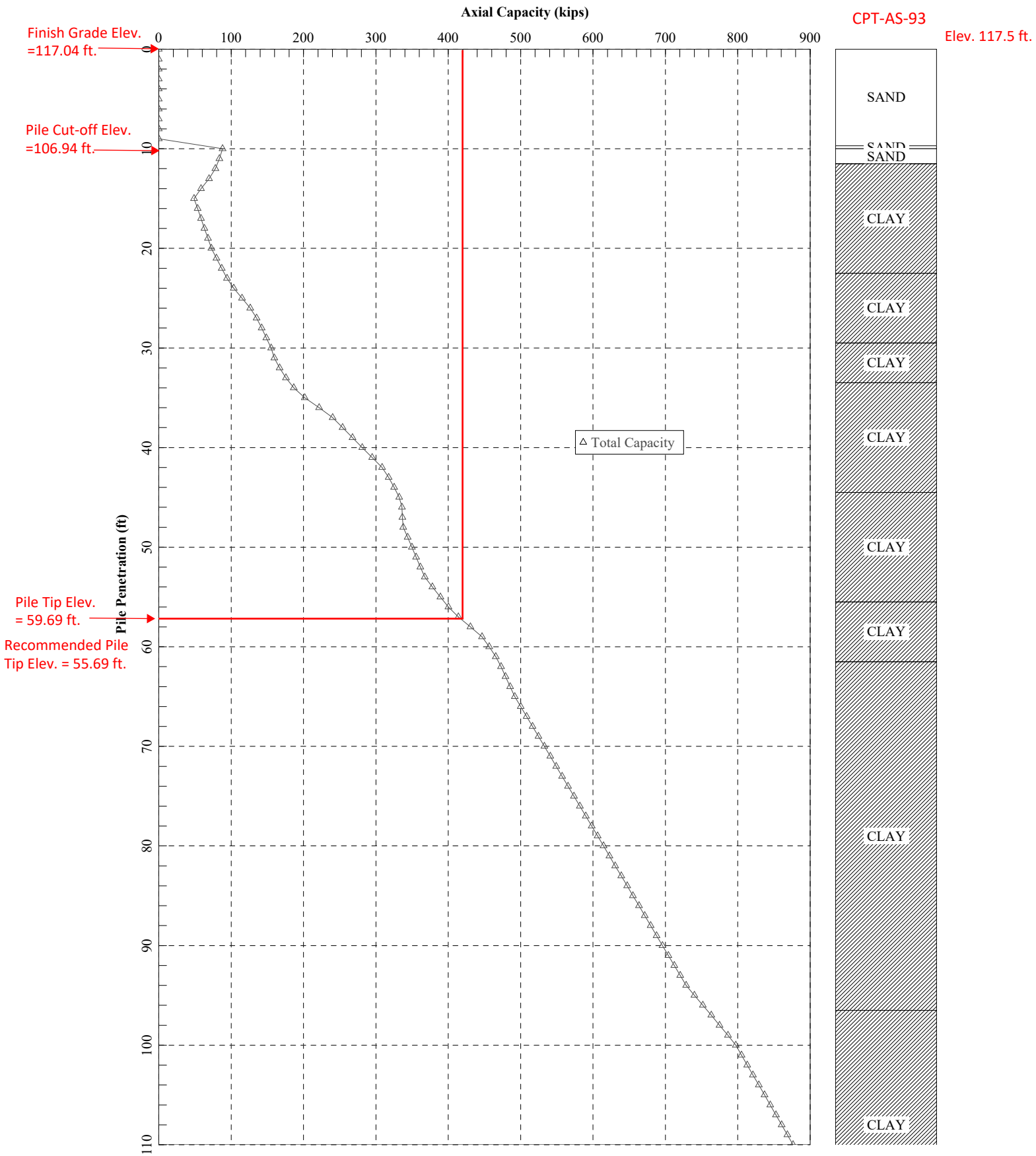
Vertical Load Demand = 210 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 19 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

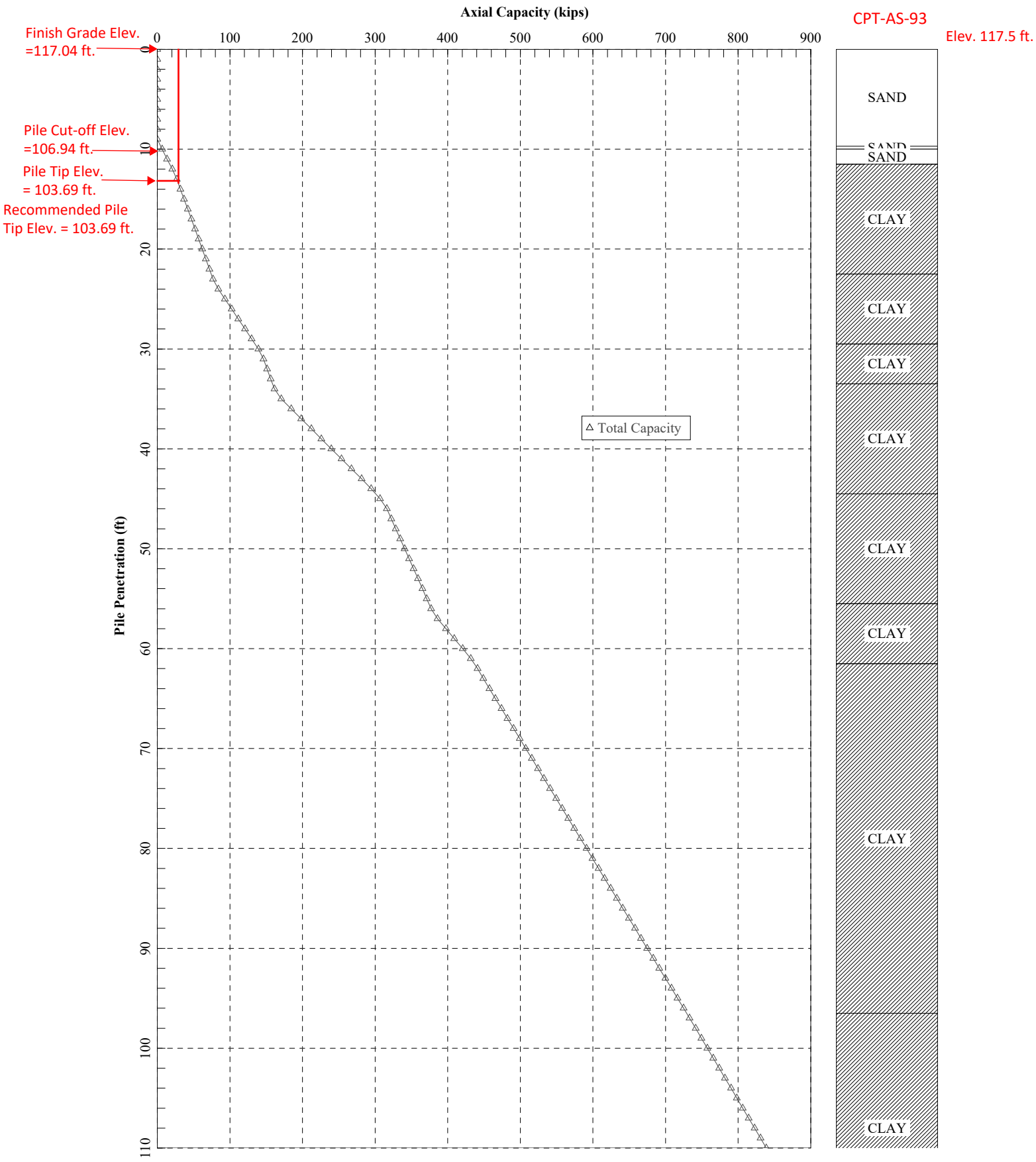
AERIAL GUIDEWAY – BENT 20 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 290 kips (Strength Limit Compression)/0.7 = 420 kips



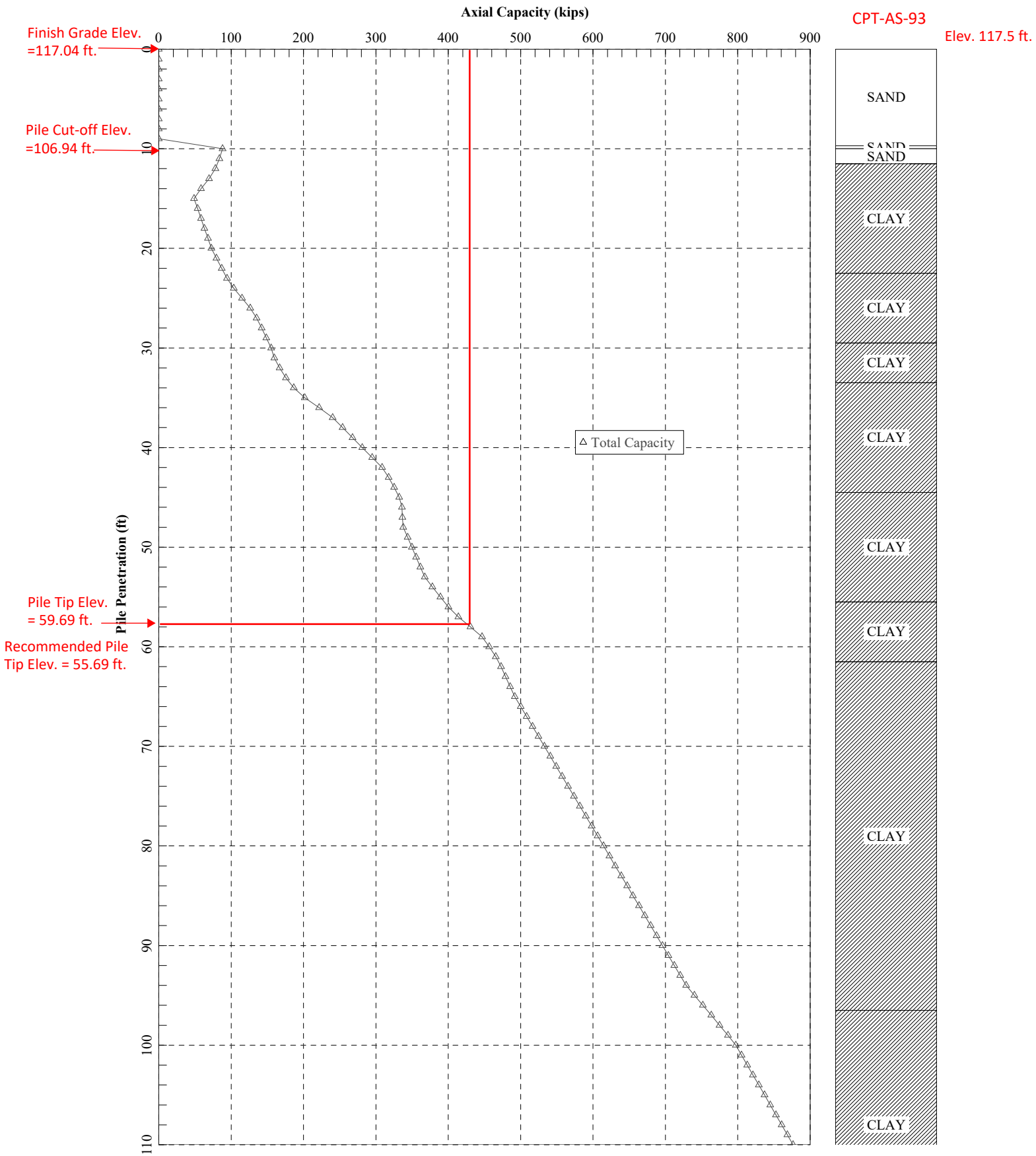
Eastridge to BART Regional Connector Project Bent 20 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 20 kips (Strength Limit Tension)/0.7 = 30 kips



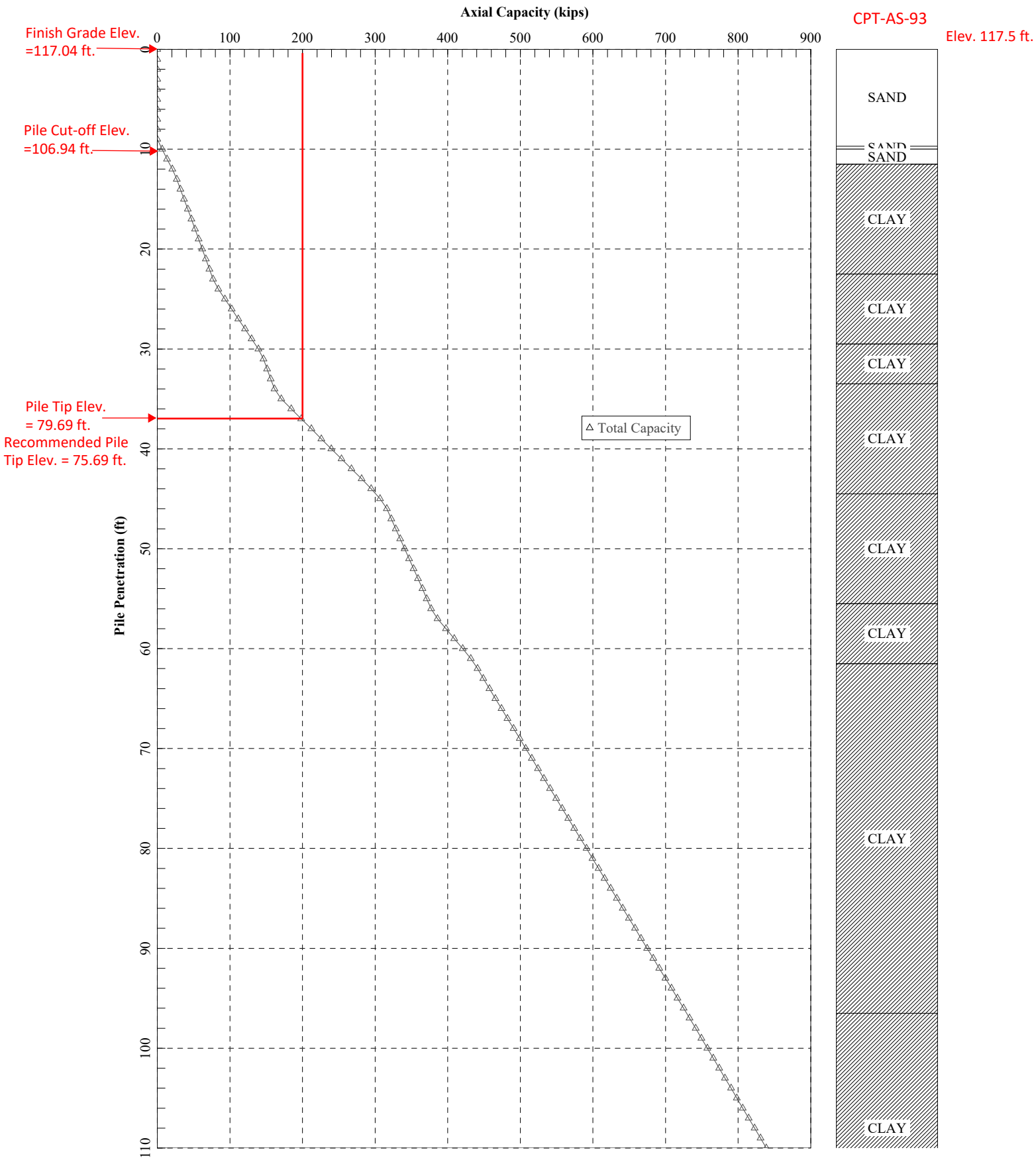
Eastridge to BART Regional Connector Project Bent 20 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 430 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project Bent 20 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

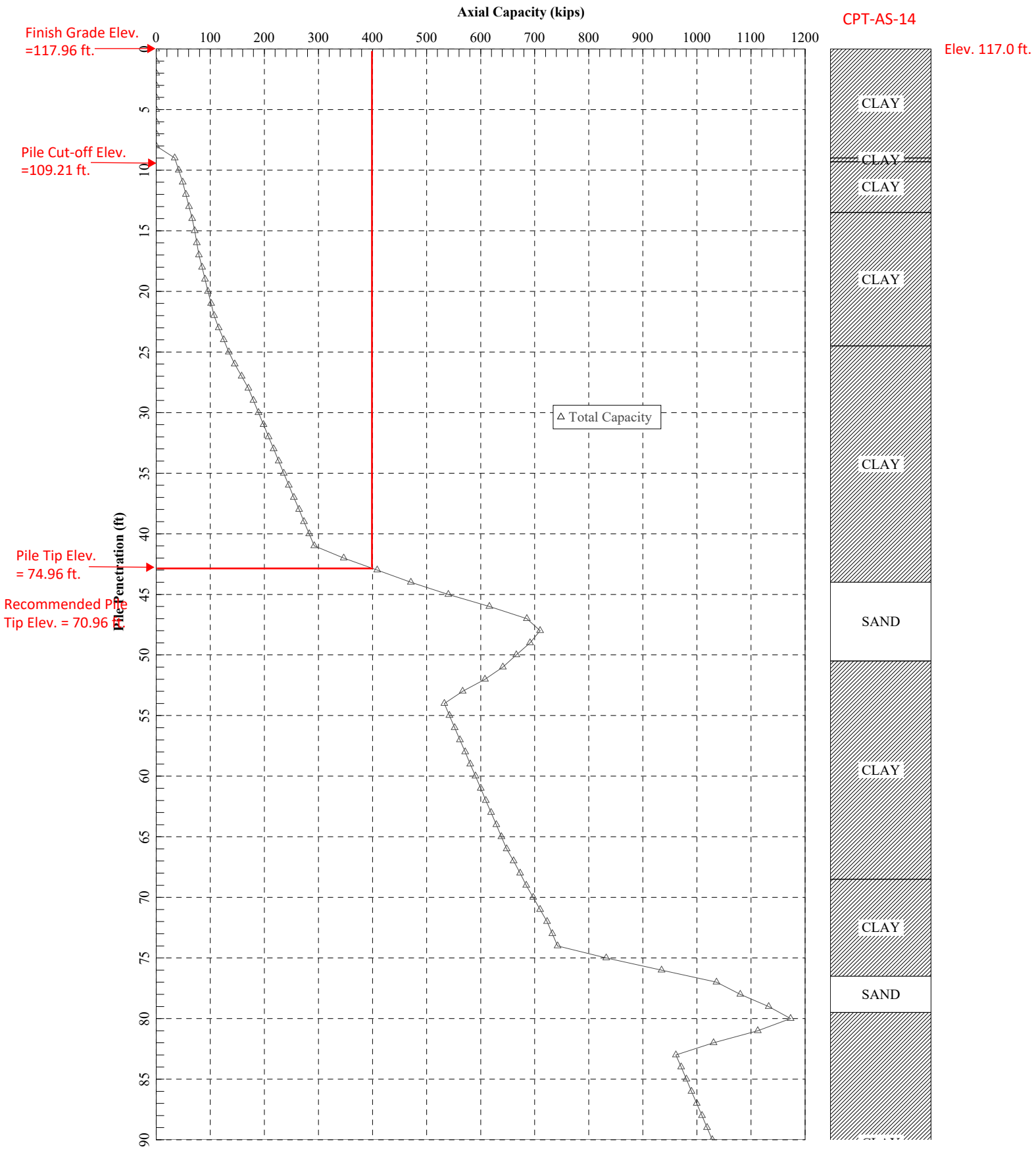
Vertical Load Demand = 200 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 20 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

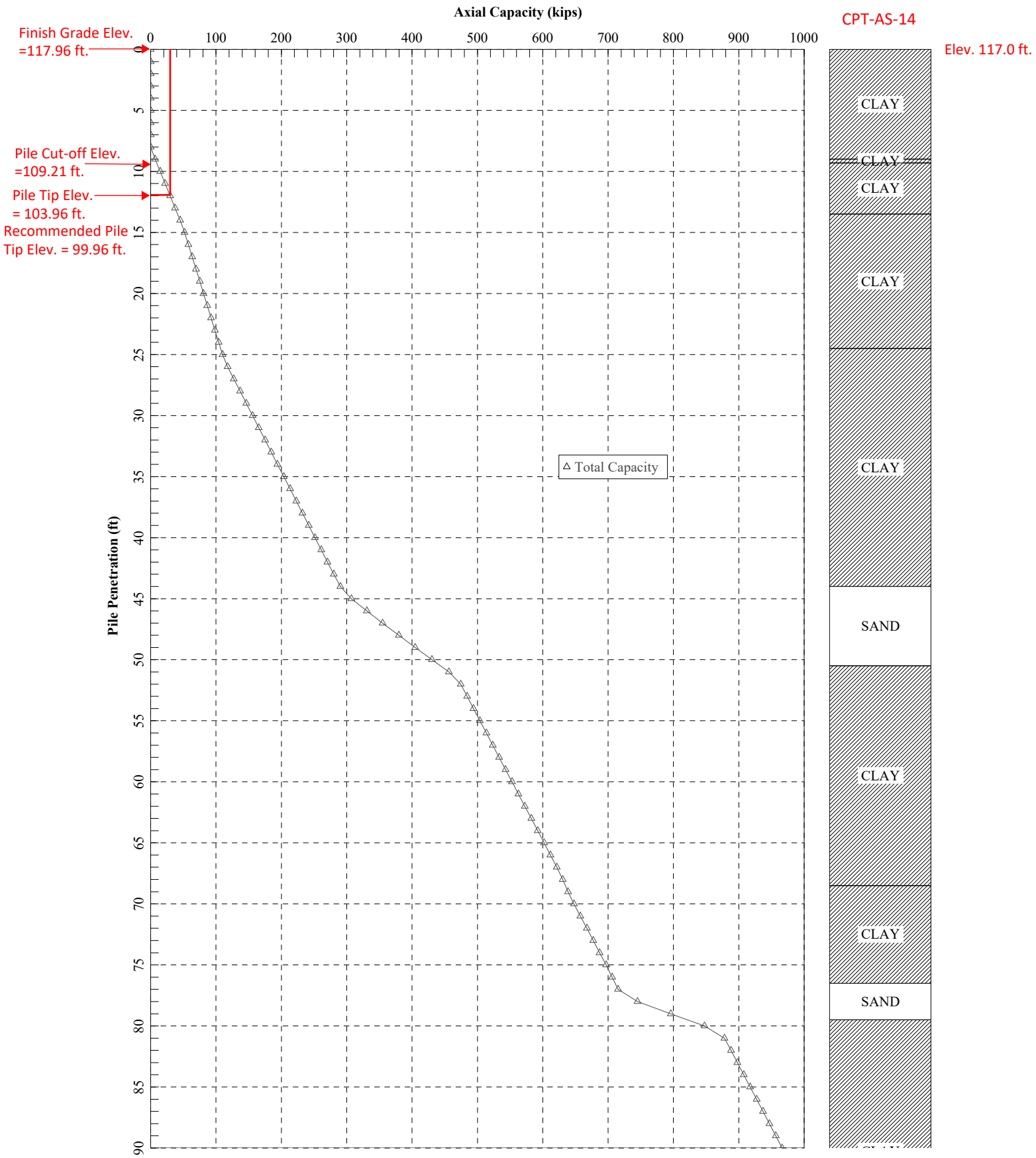
AERIAL GUIDEWAY – BENT 21 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 280 kips (Strength Limit Compression)/0.7 = 400 kips



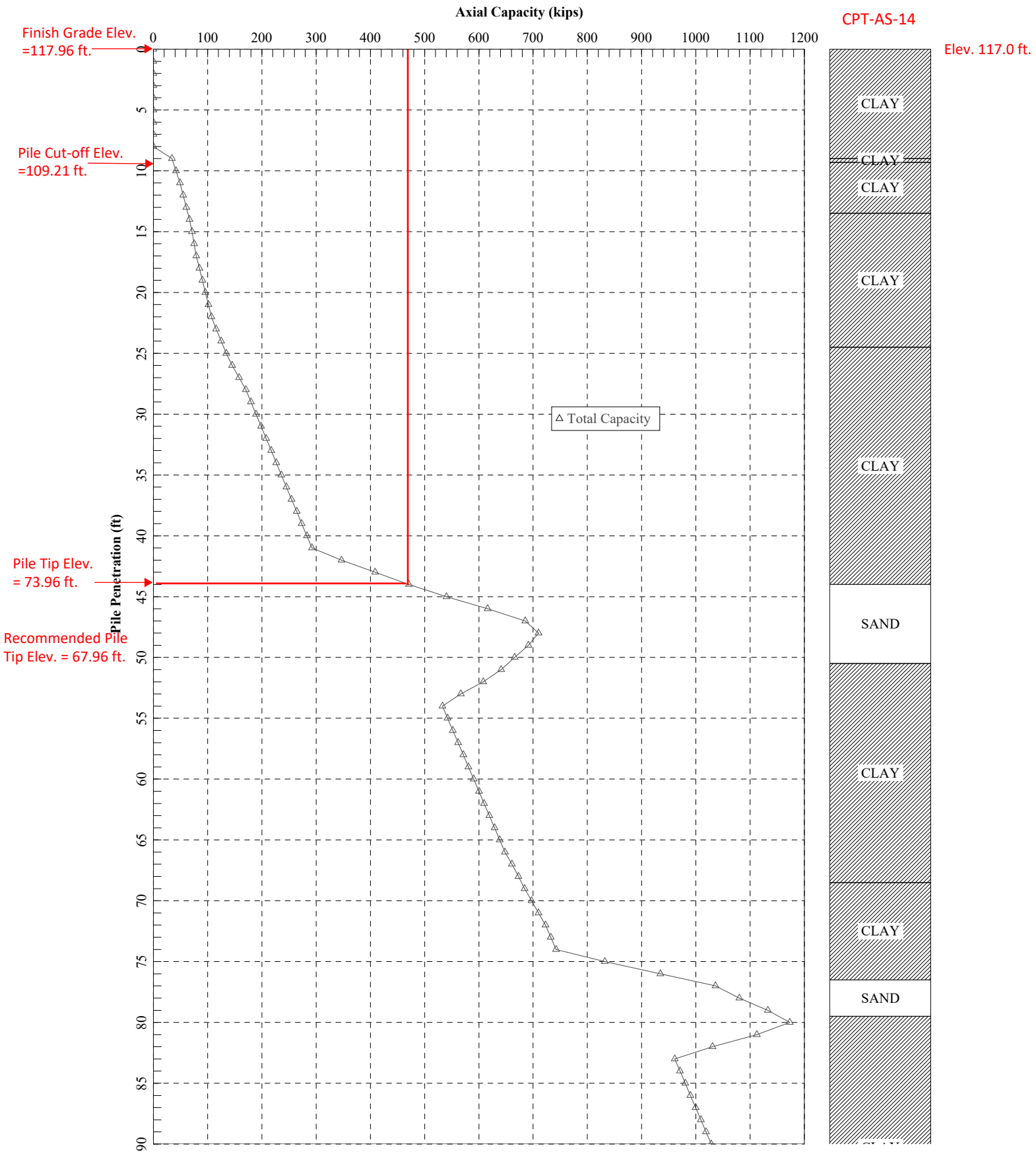
Eastridge to BART Regional Connector Project Bent 21 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 20 kips (Strength Limit Tension)/0.7 = 30 kips



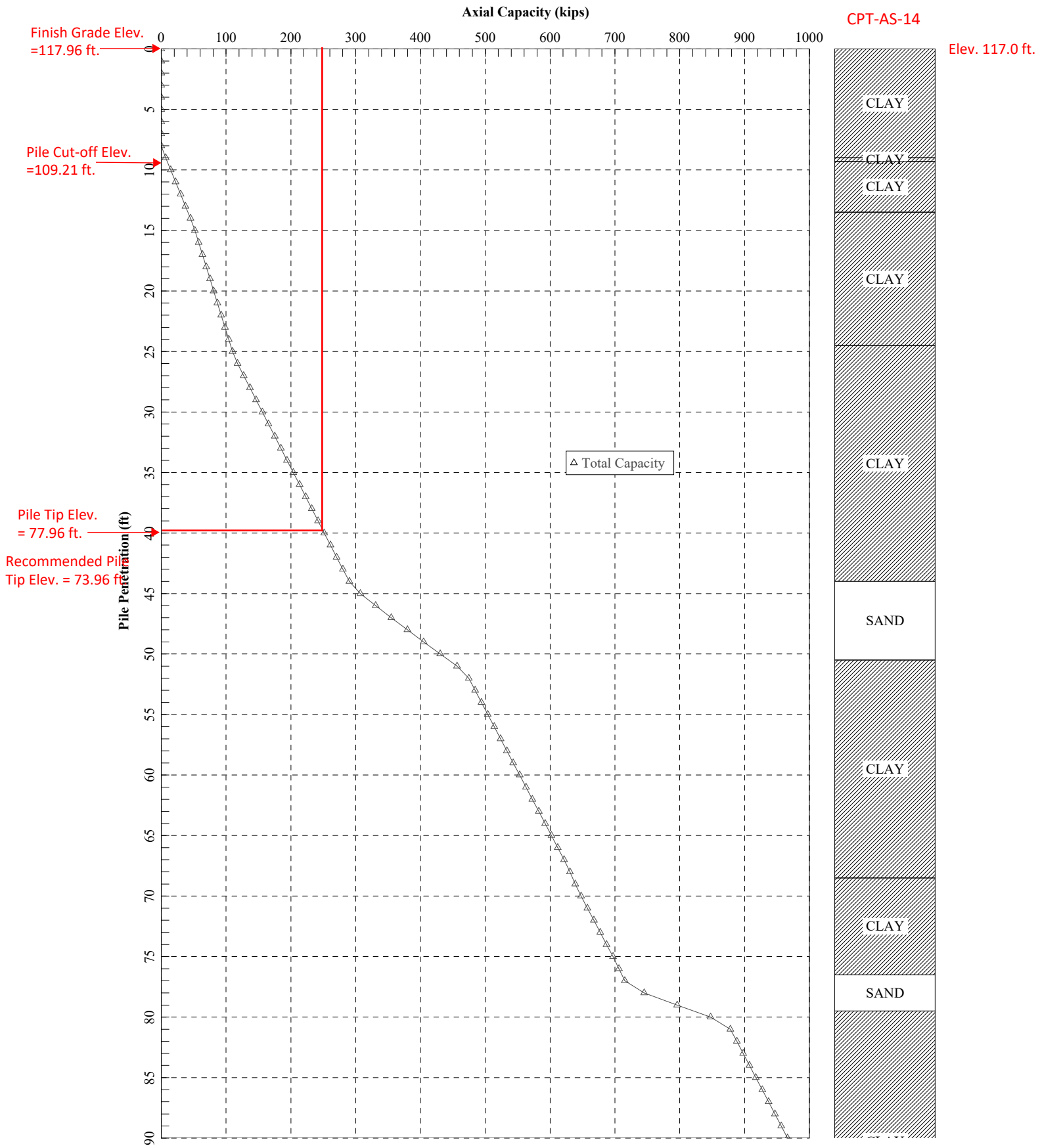
Eastridge to BART Regional Connector Project Bent 21 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 470 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project Bent 21 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

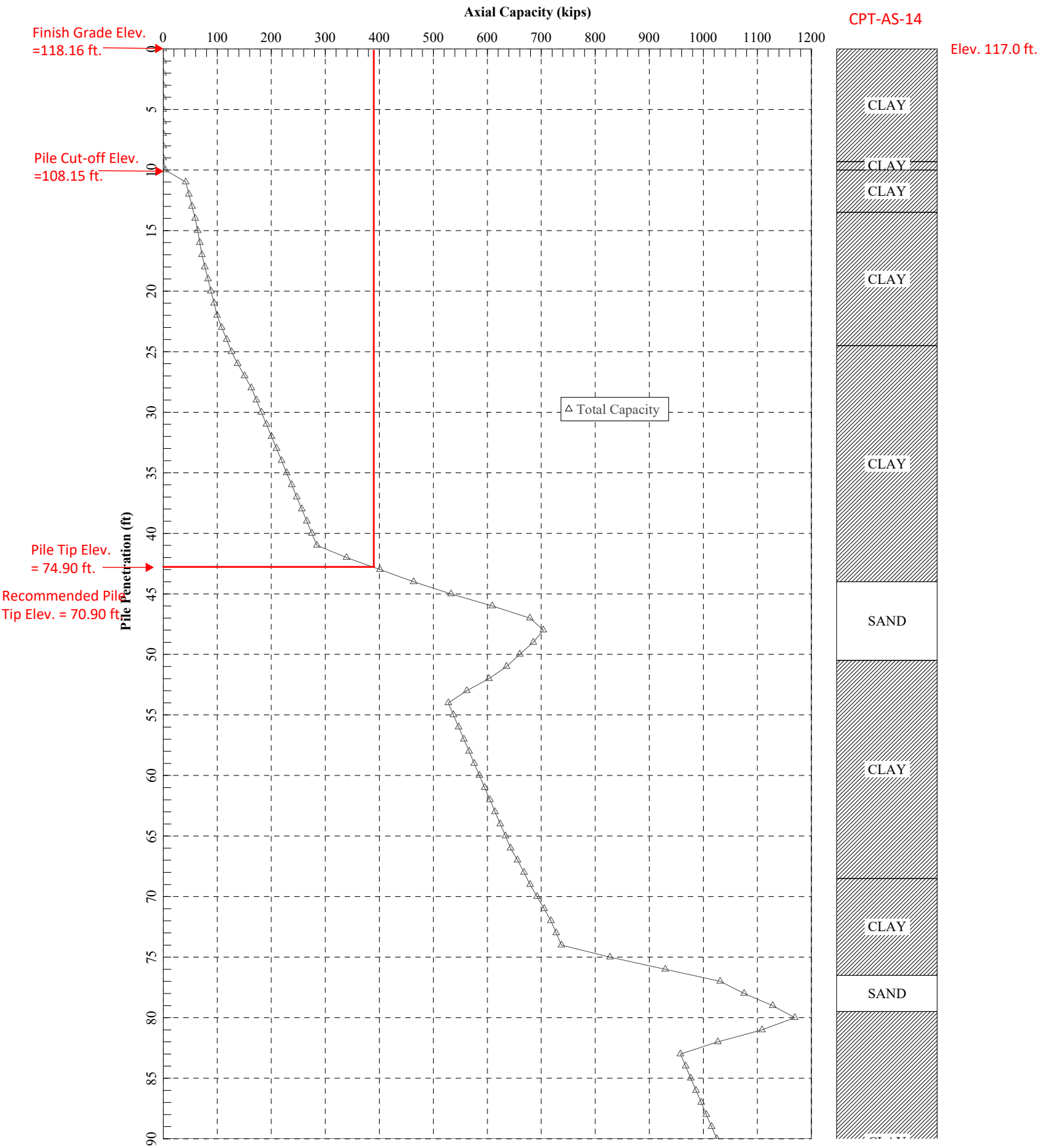
Vertical Load Demand = 250 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 21 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

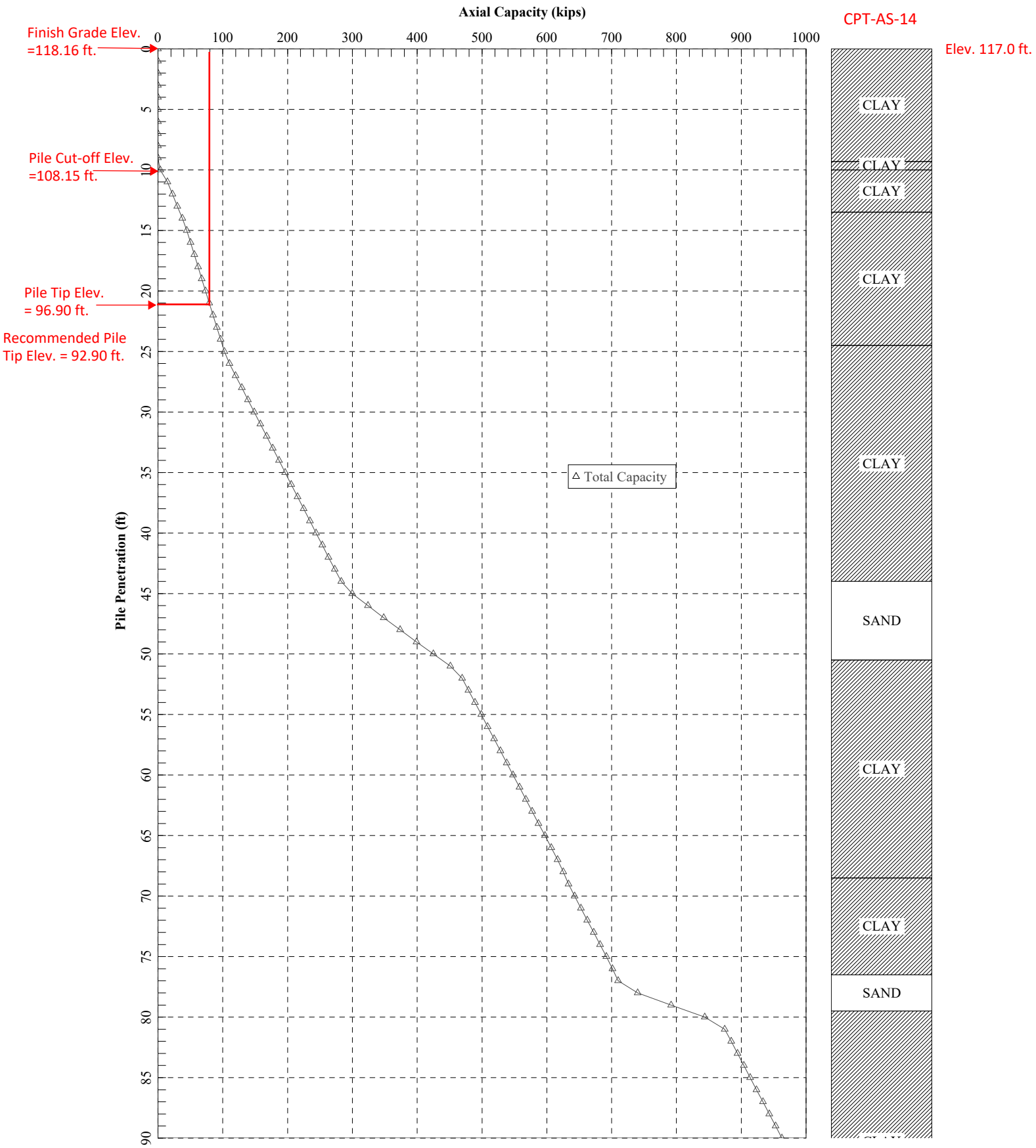
AERIAL GUIDEWAY – BENT 22 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 270 kips (Strength Limit Compression)/0.7 = 390 kips



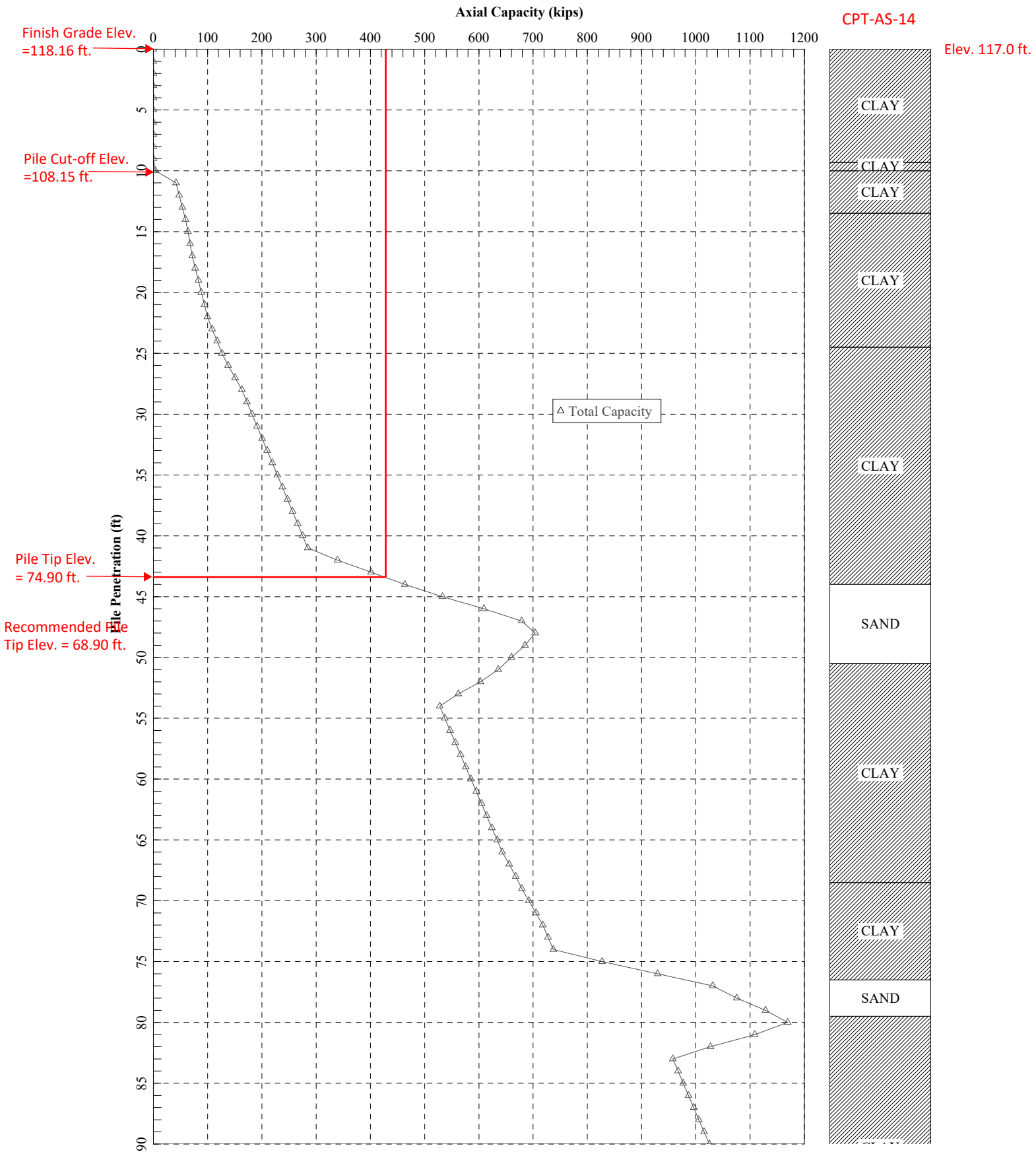
Eastridge to BART Regional Connector Project Bent 22 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 50 kips (Strength Limit Tension)/0.7 = 80 kips



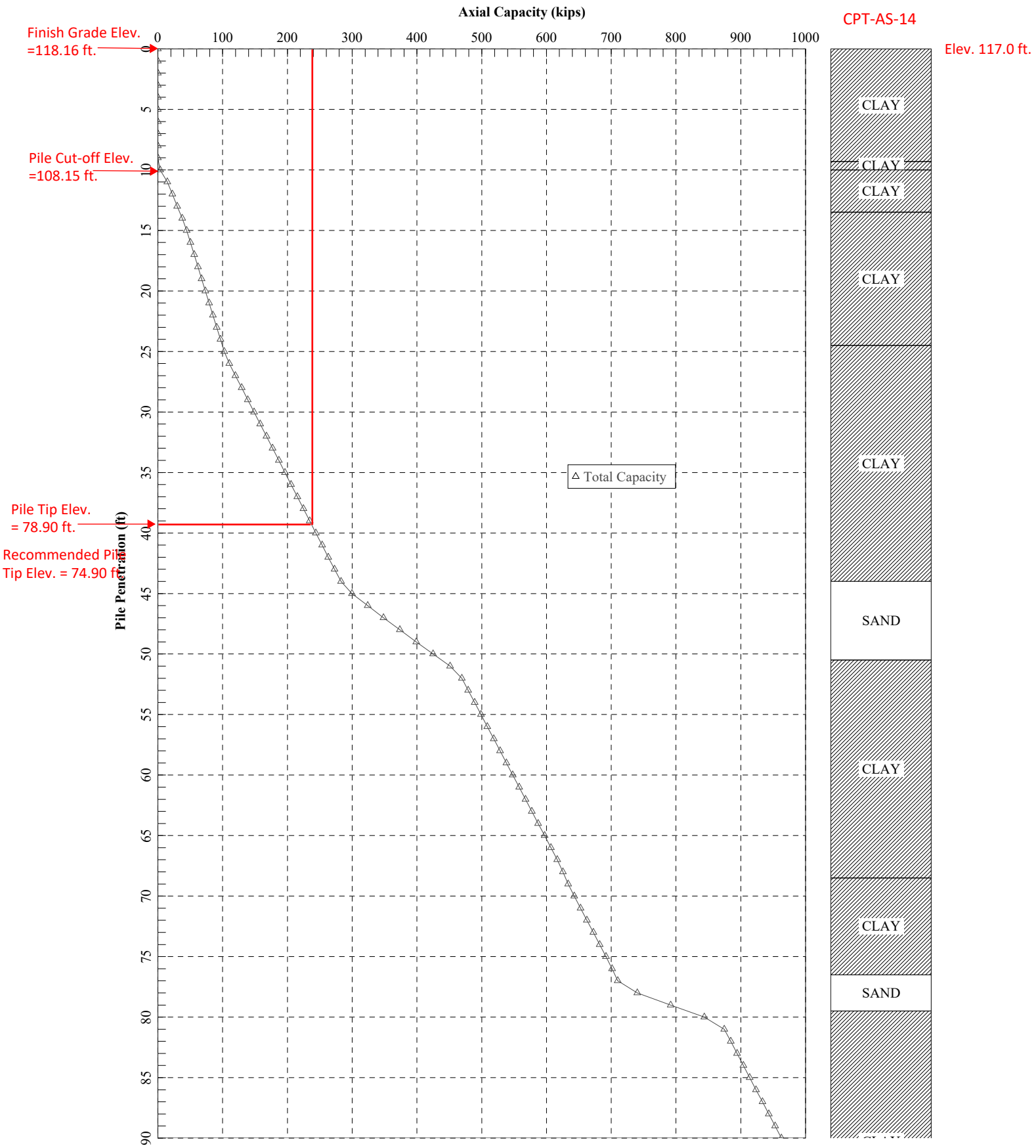
Eastridge to BART Regional Connector Project Bent 22 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 430 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project Bent 22 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

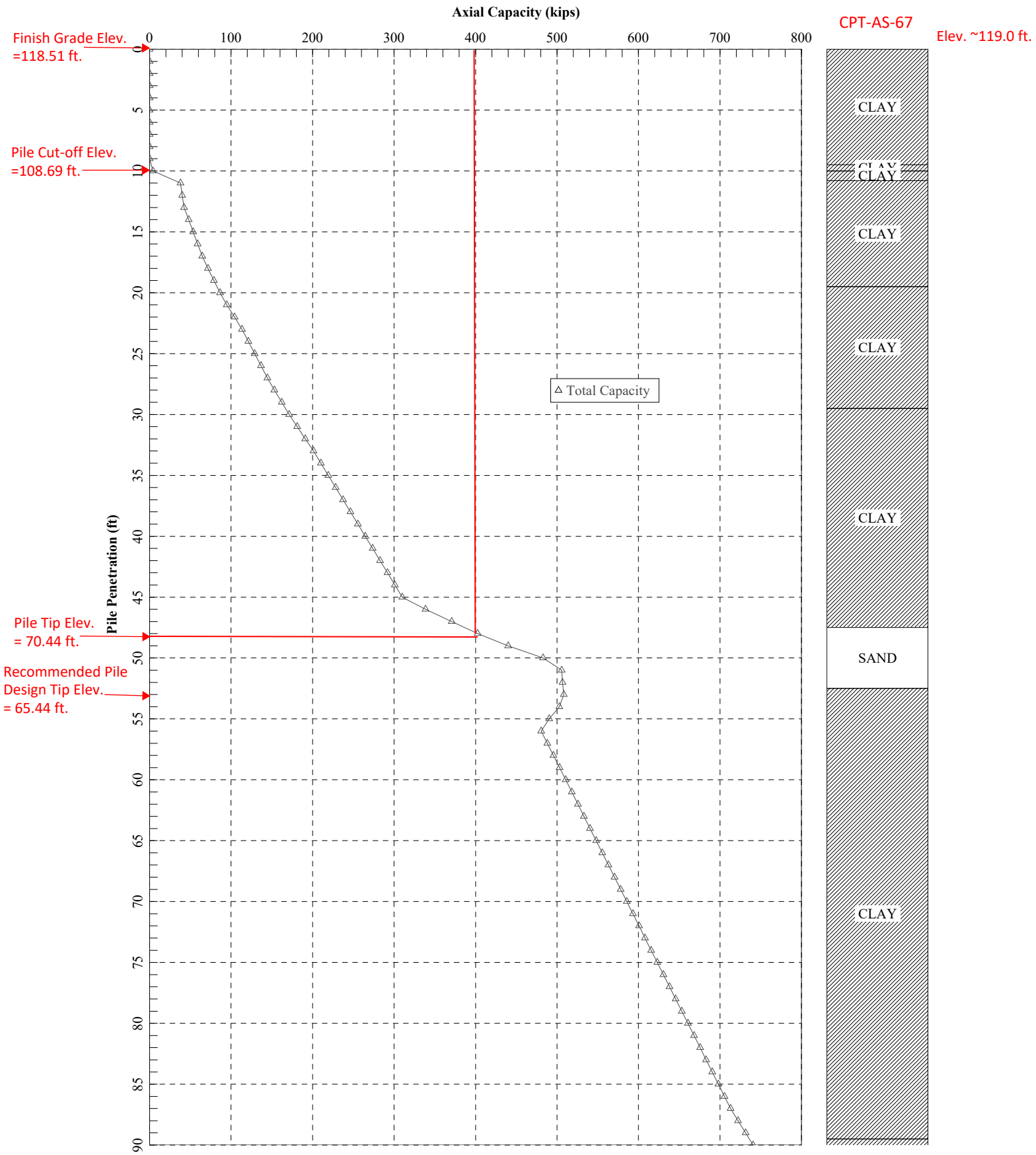
Vertical Load Demand = 240 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 22 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

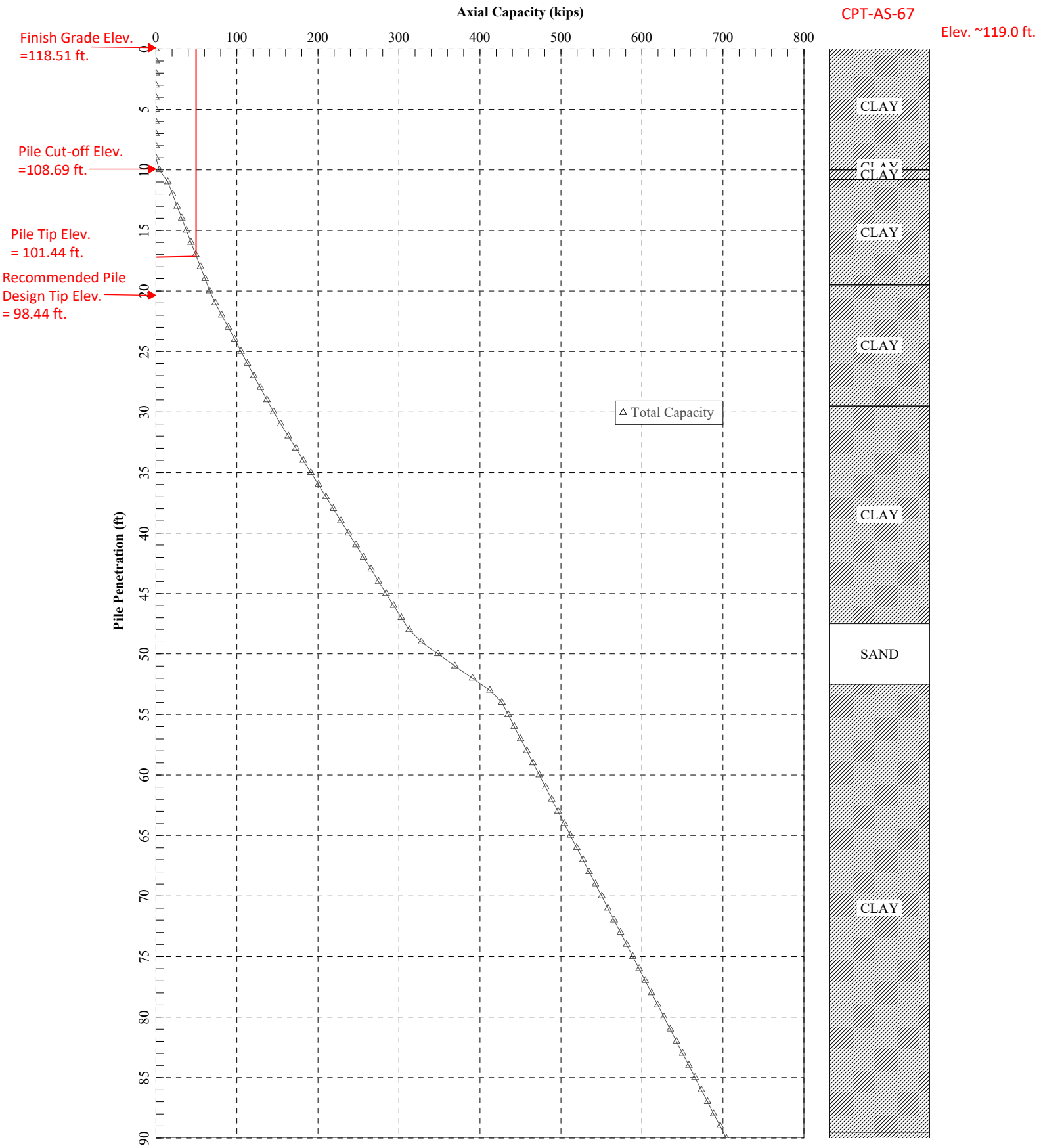
AERIAL GUIDEWAY – BENT 23 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 280 kips (Strength Limit Compression)/0.7 = 400 kips



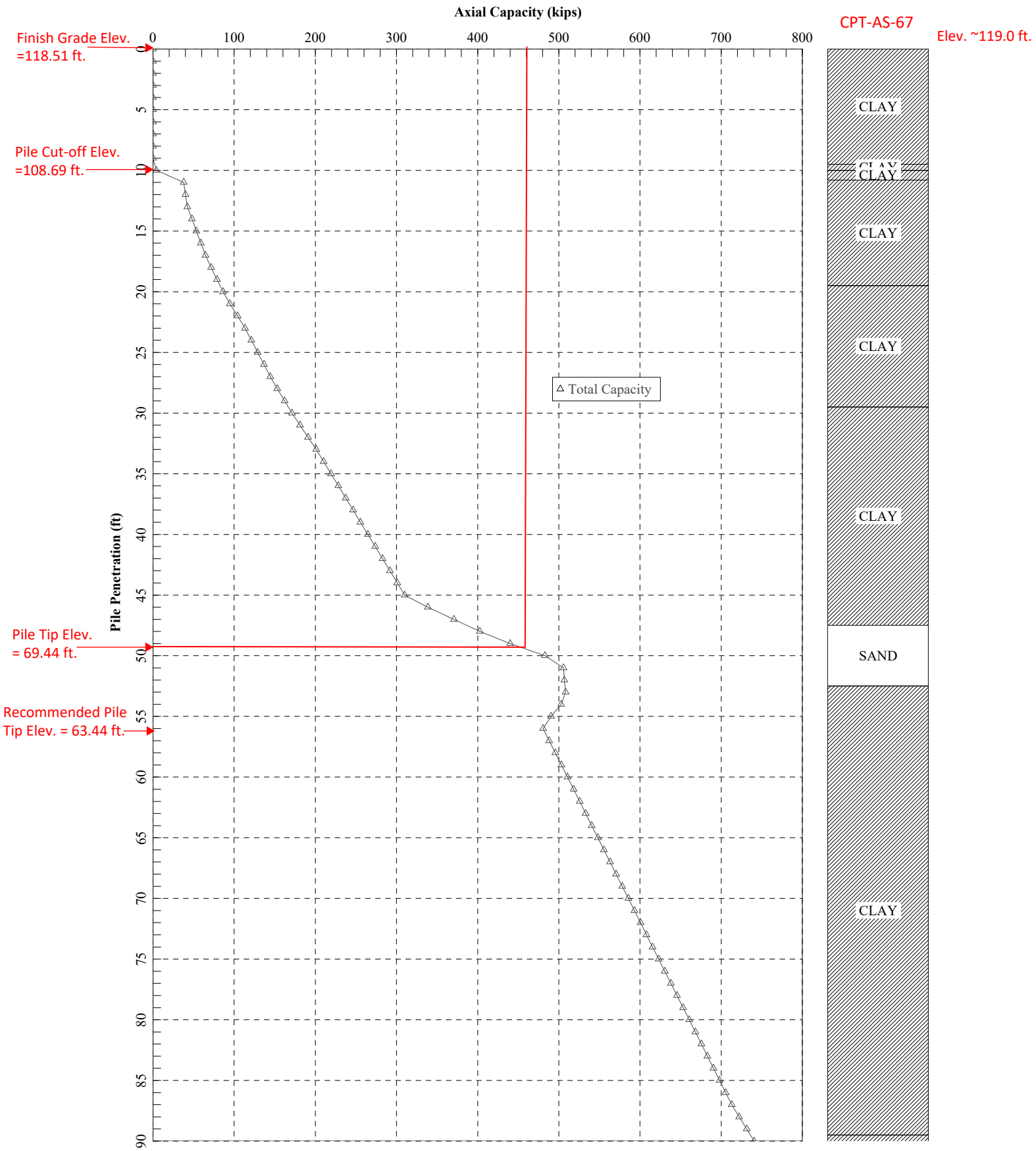
Eastridge to BART Regional Connector Project Bent 23 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 30 kips (Strength Limit Tension)/0.7 = 50 kips



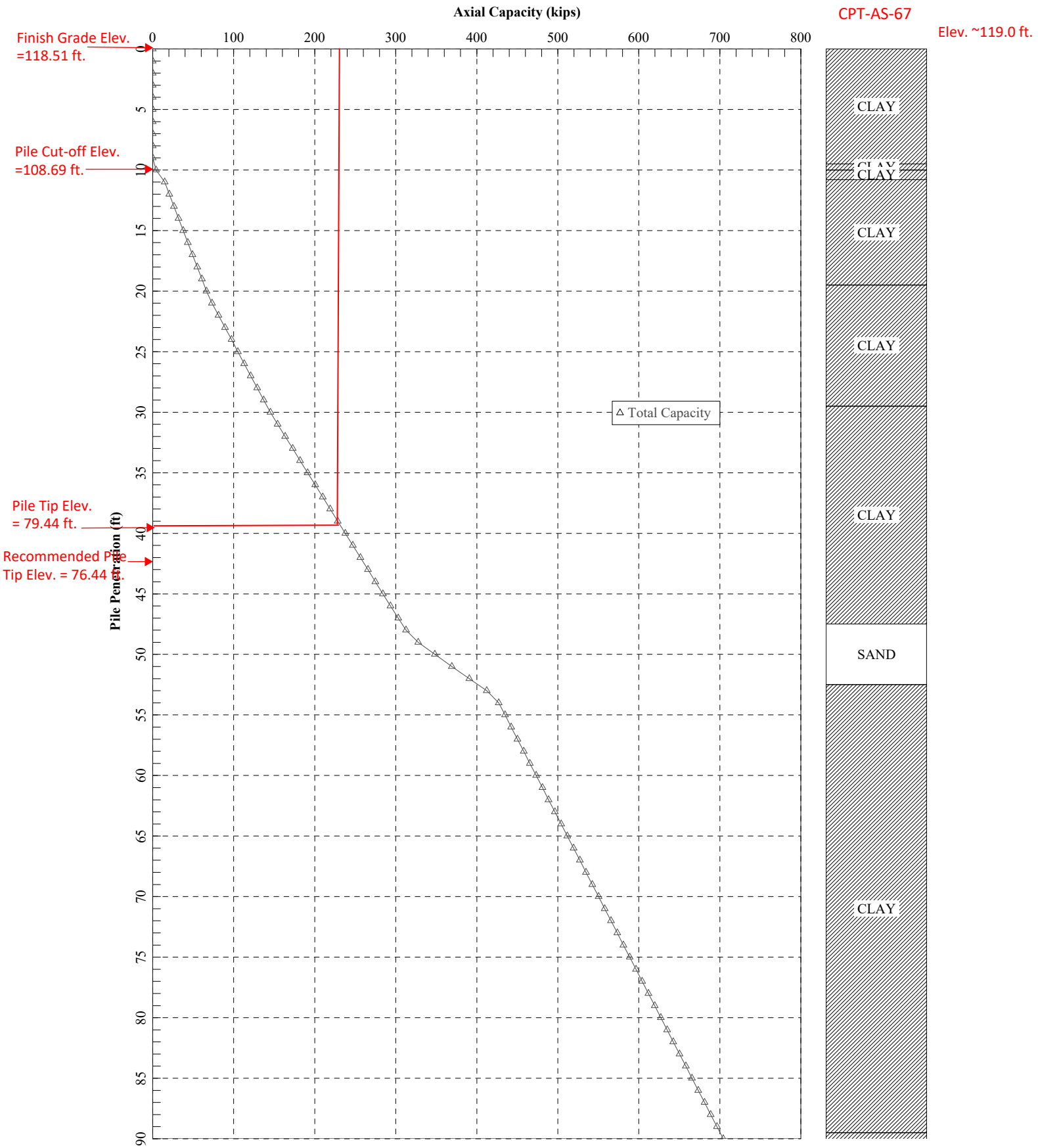
Eastridge to BART Regional Connector Project Bent 23 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 460 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project Bent 23 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

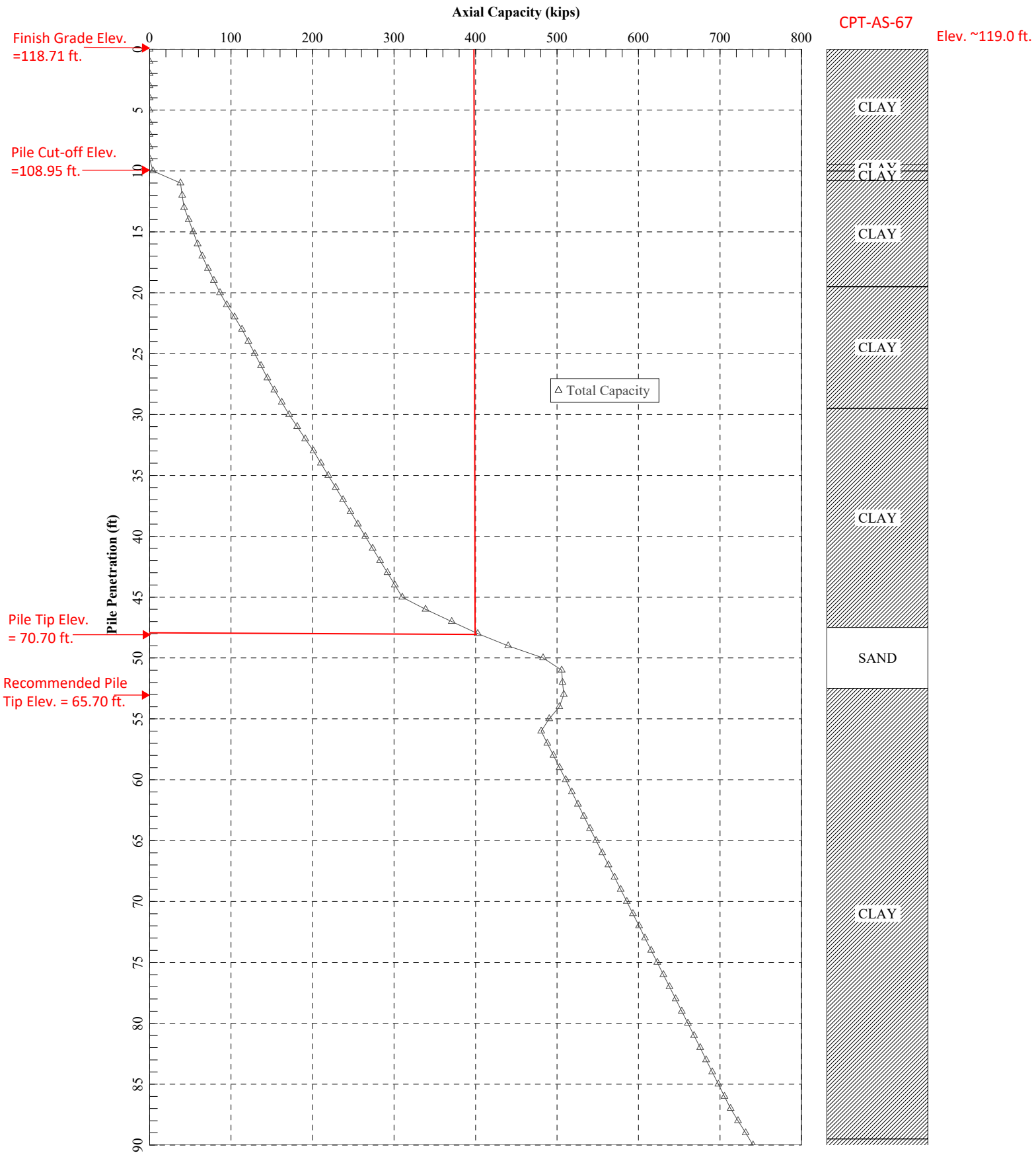
Vertical Load Demand = 230 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 23 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

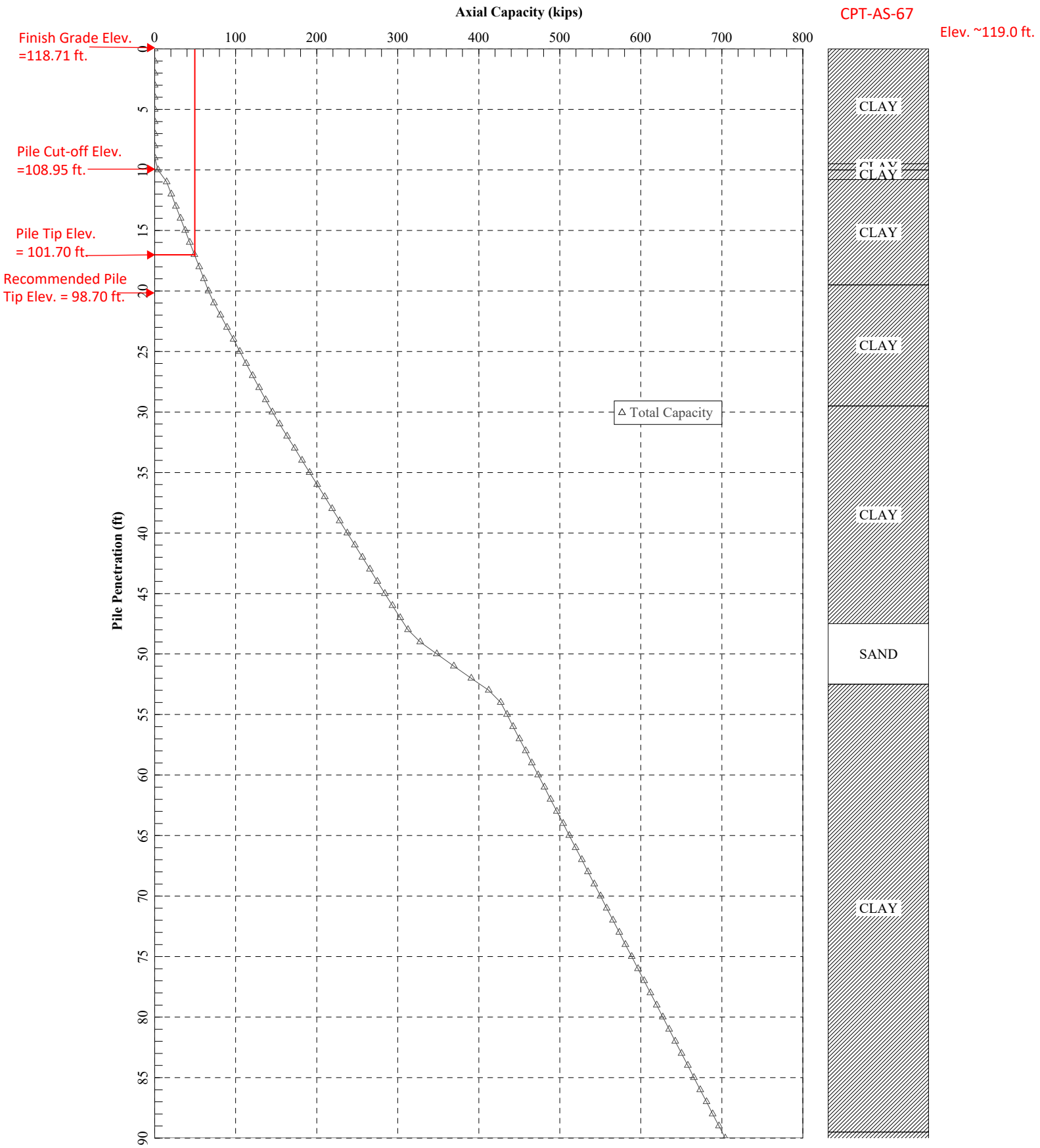
AERIAL GUIDEWAY – BENT 24 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 280 kips (Strength Limit Compression)/0.7 = 400 kips



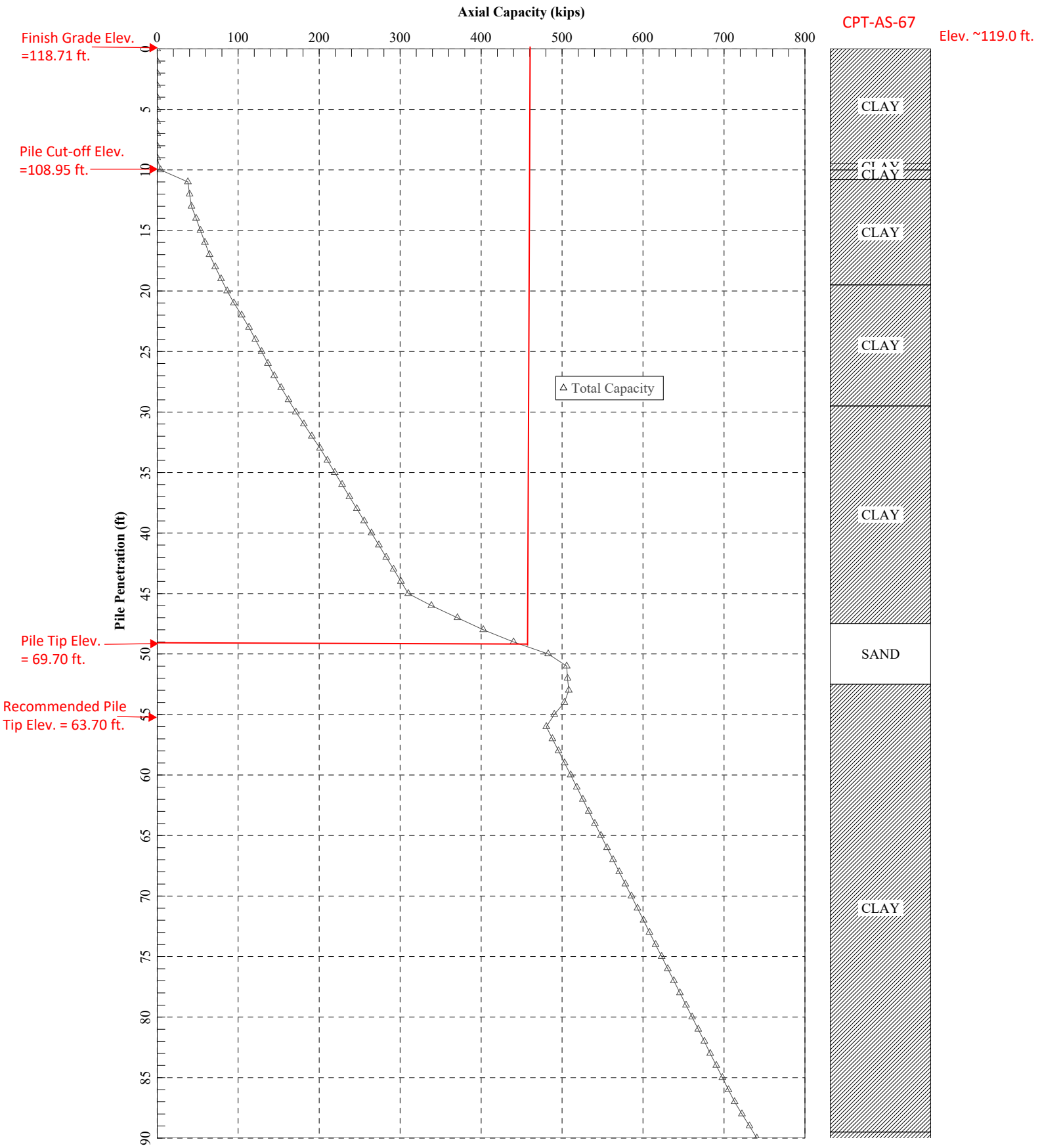
Eastridge to BART Regional Connector Project Bent 24 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 30 kips (Strength Limit Tension)/0.7 = 50 kips



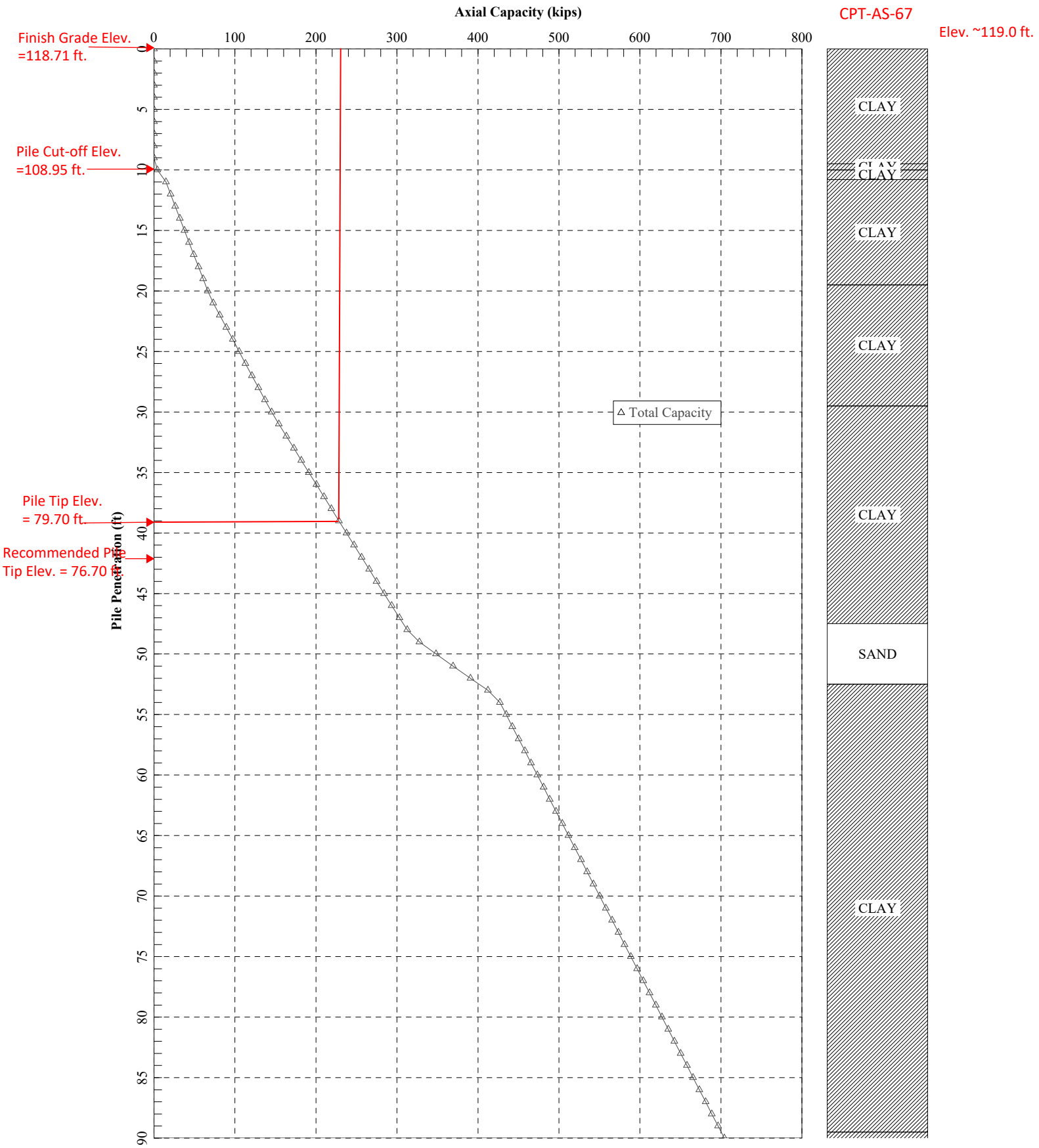
Eastridge to BART Regional Connector Project Bent 24 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 460 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project Bent 24 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

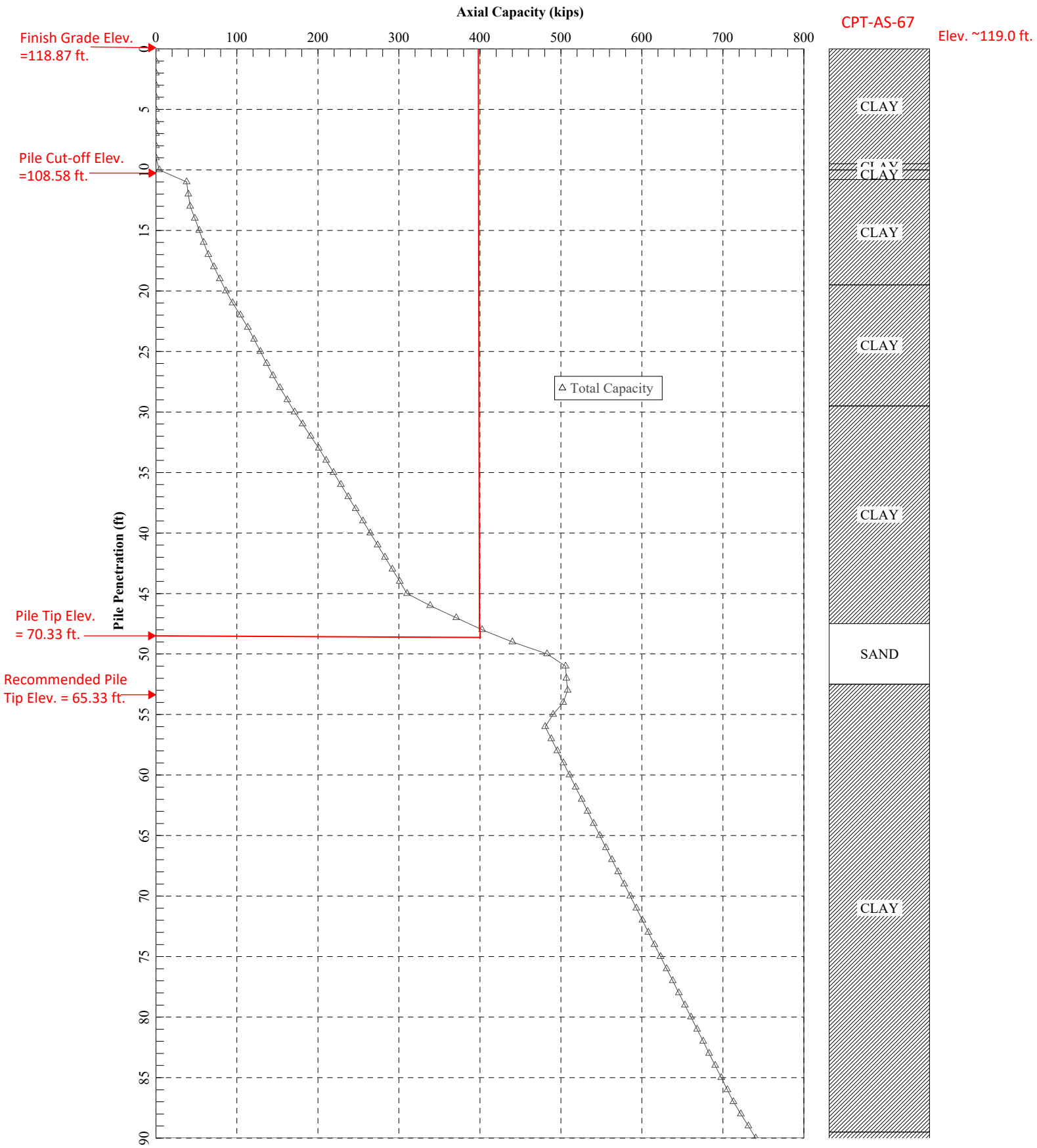
Vertical Load Demand = 230 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 24 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

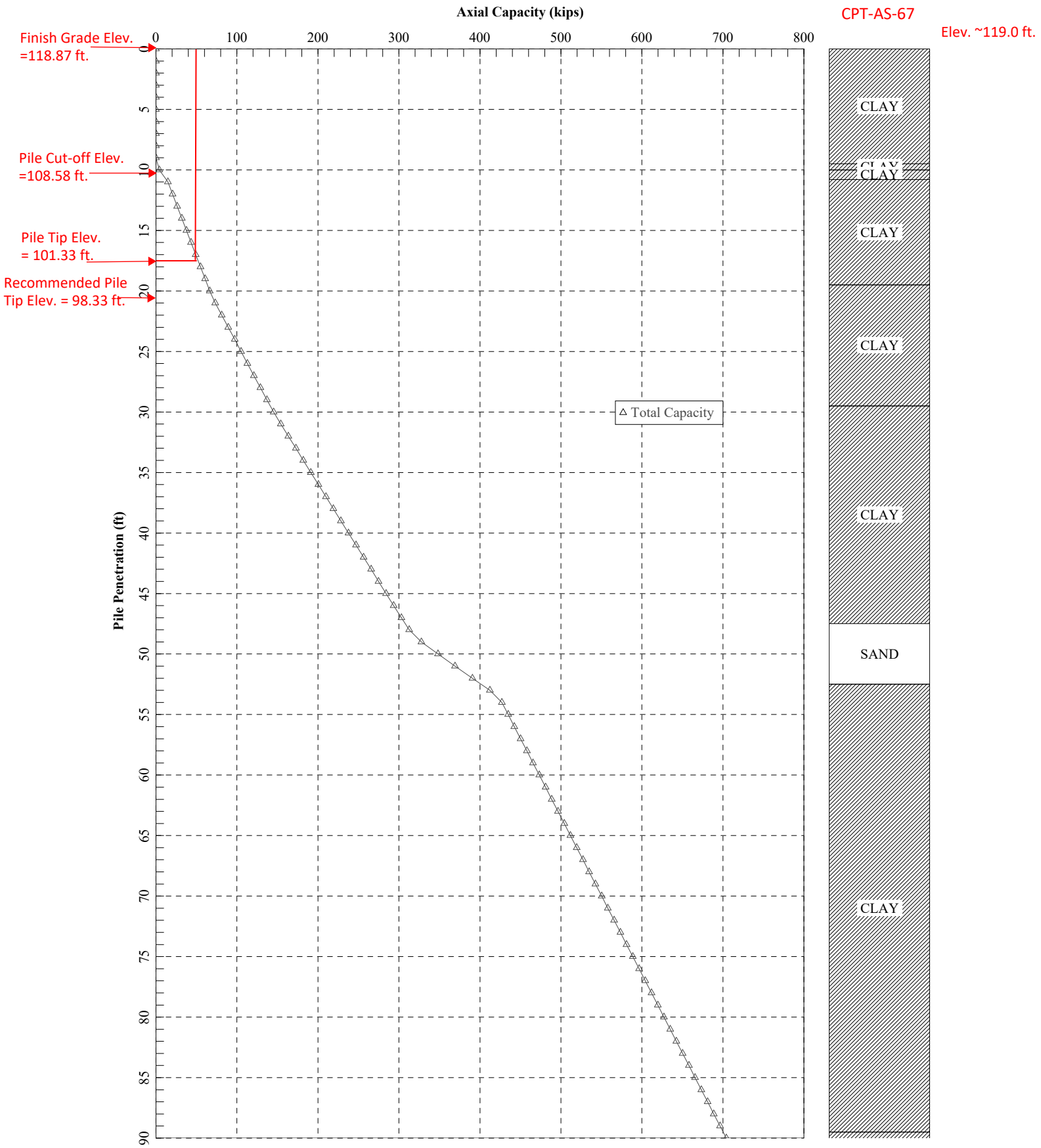
AERIAL GUIDEWAY – BENT 25 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 280 kips (Strength Limit Compression)/0.7 = 400 kips



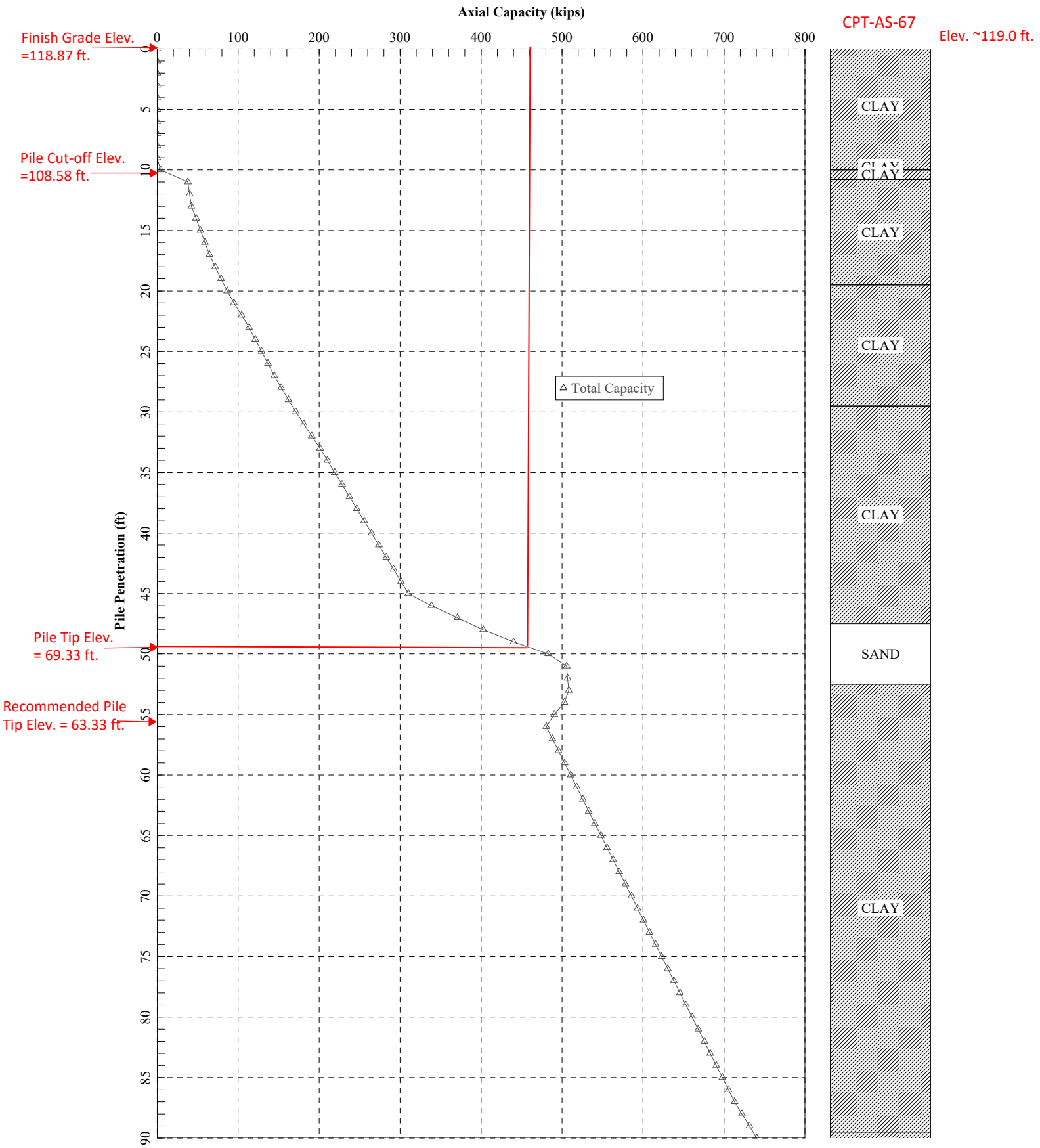
Eastridge to BART Regional Connector Project Bent 25 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 30 kips (Strength Limit Tension)/0.7 = 50 kips



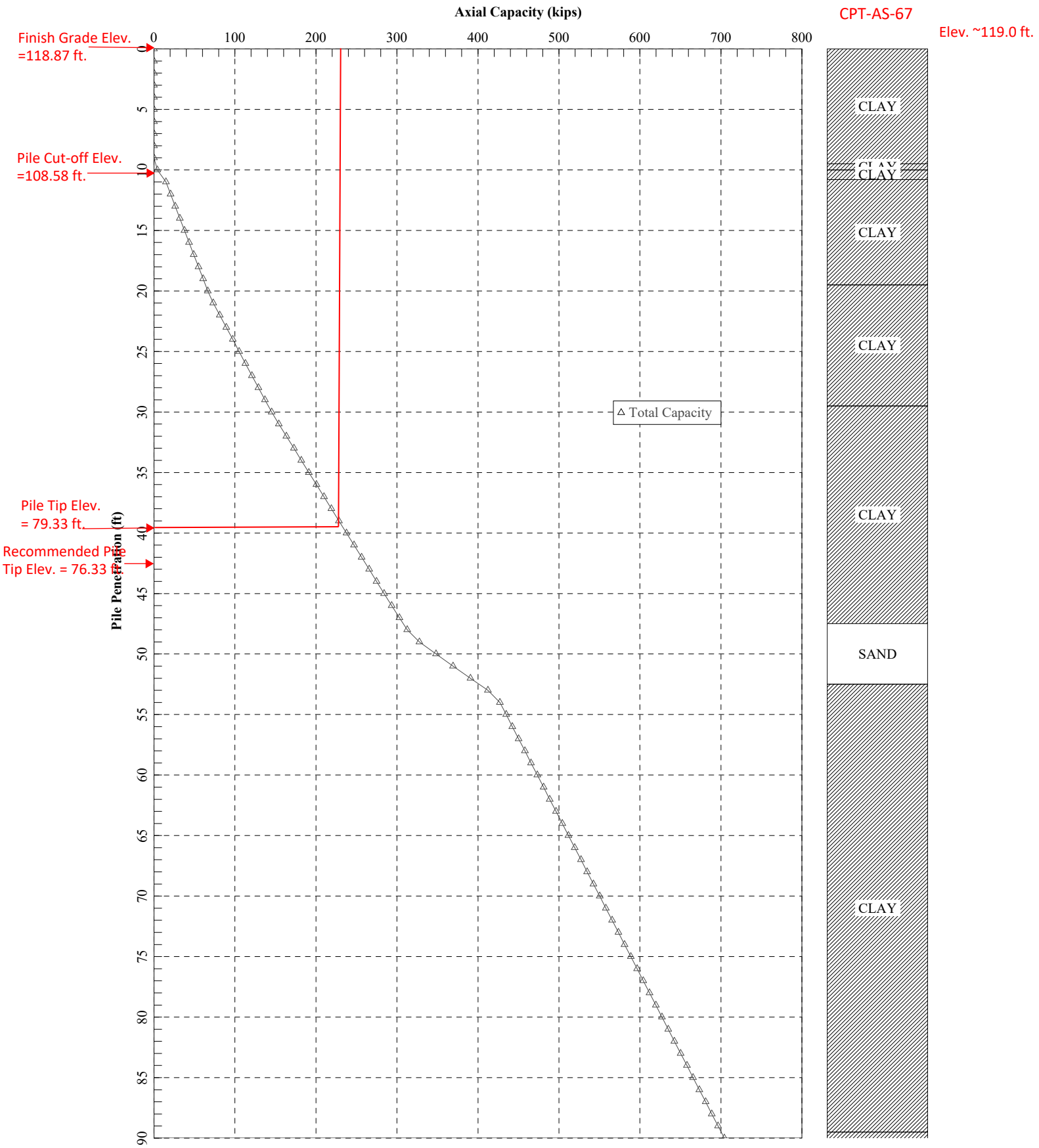
Eastridge to BART Regional Connector Project Bent 25 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 460 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project Bent 25 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

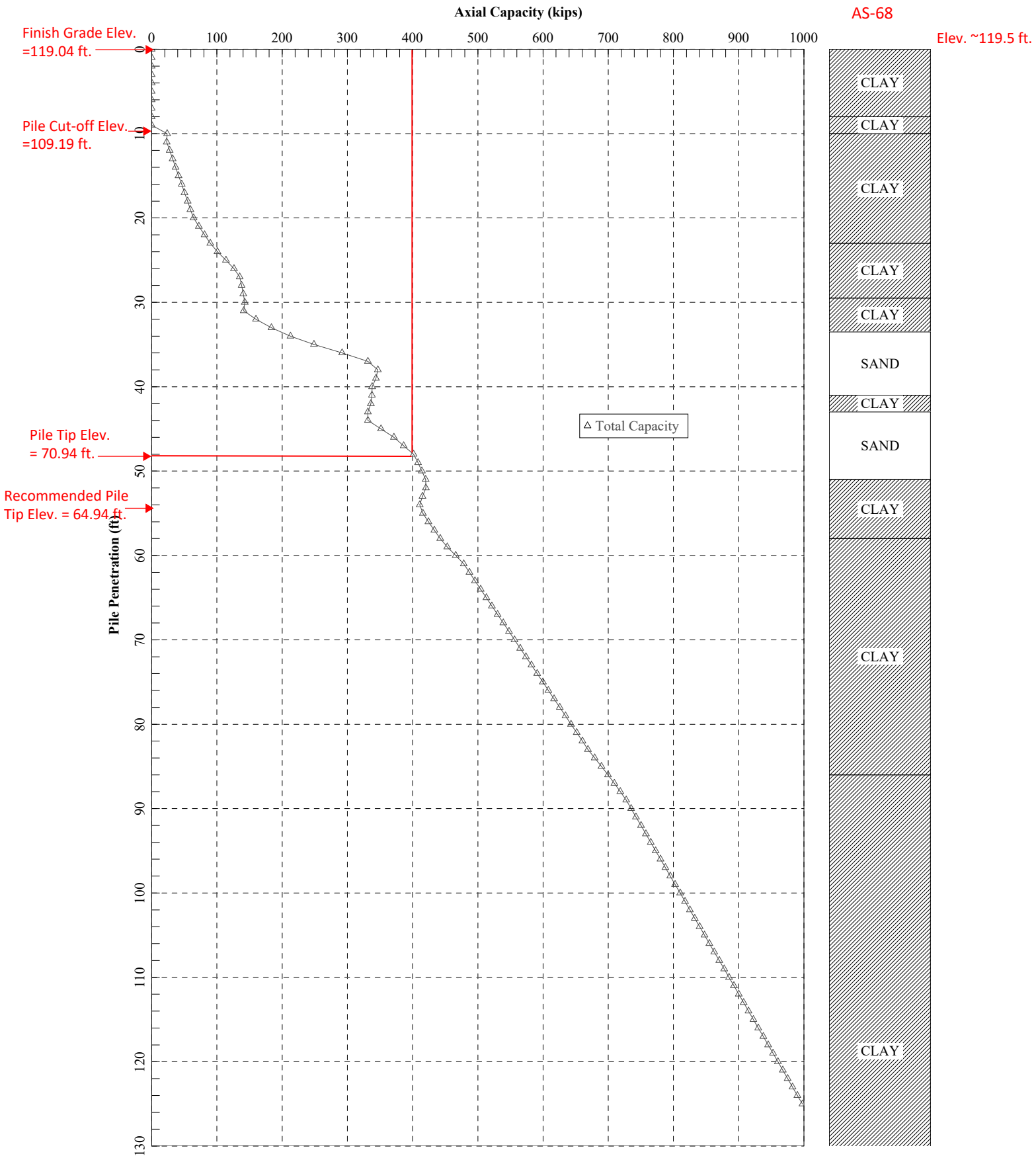
Vertical Load Demand = 230 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 25 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

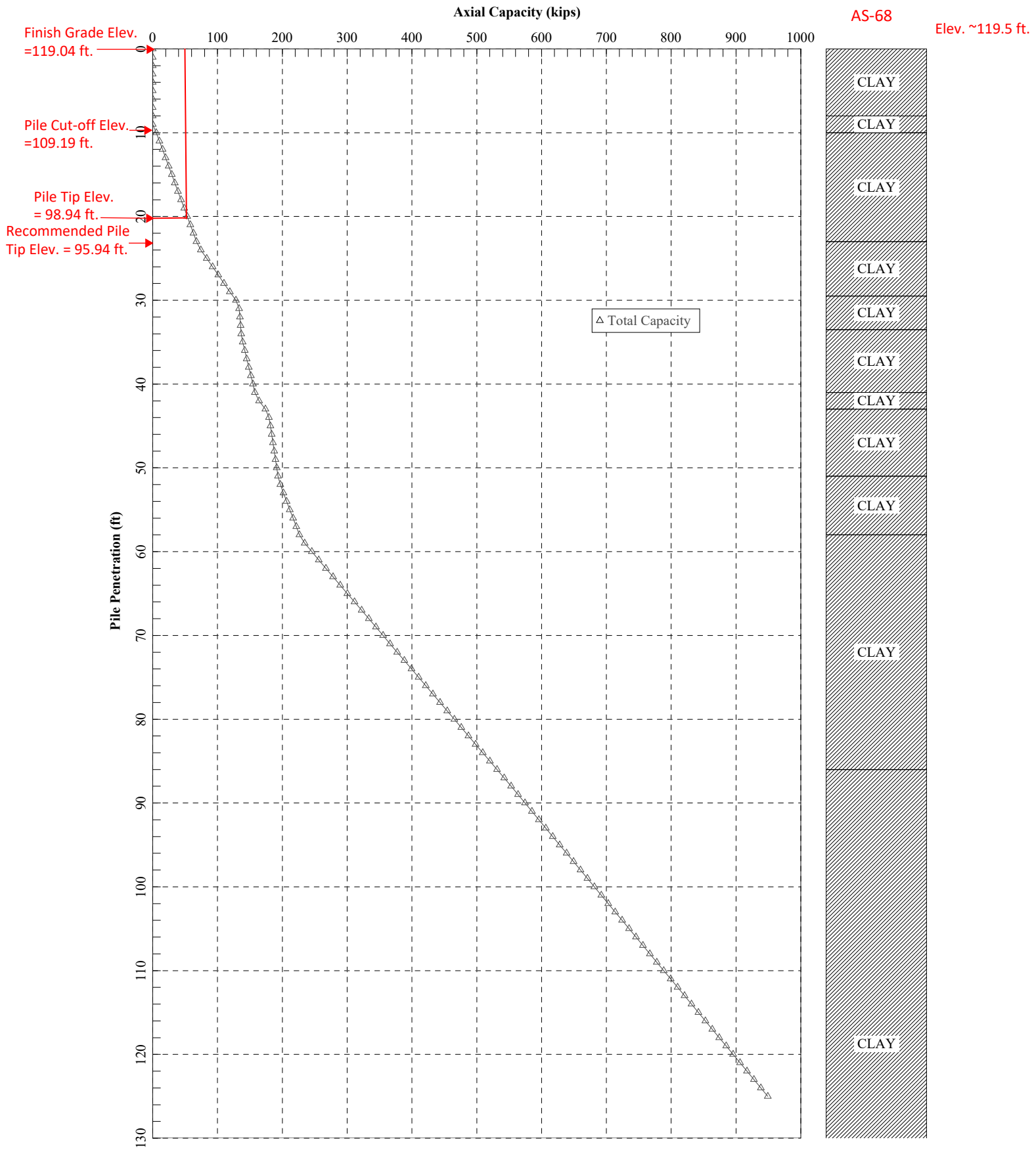
AERIAL GUIDEWAY – BENT 26 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 280 kips (Strength Limit Compression)/0.7 = 400 kips



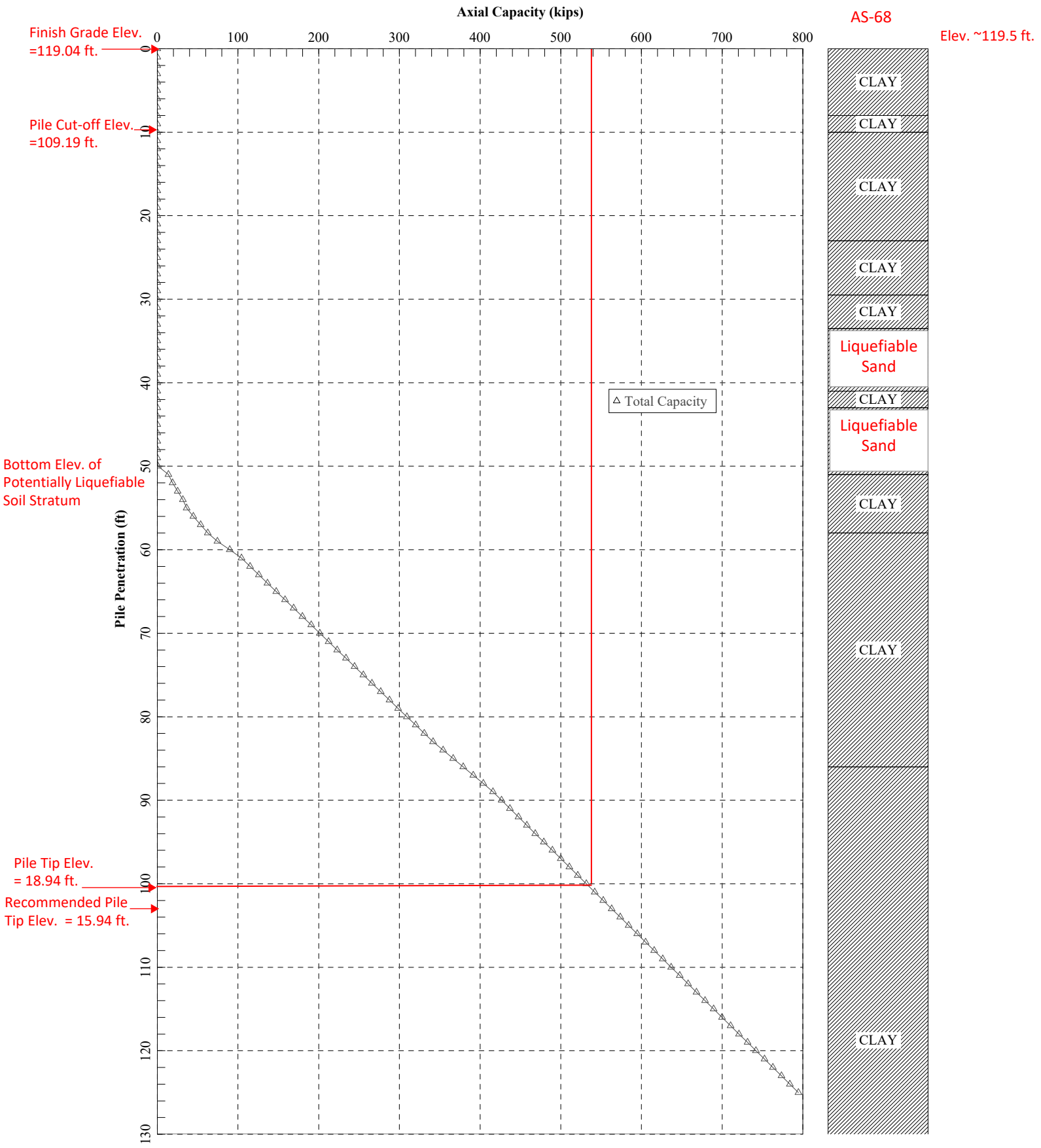
Eastridge to BART Regional Connector Project Bent 26 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 30 kips (Strength Limit Tension)/0.7 = 50 kips

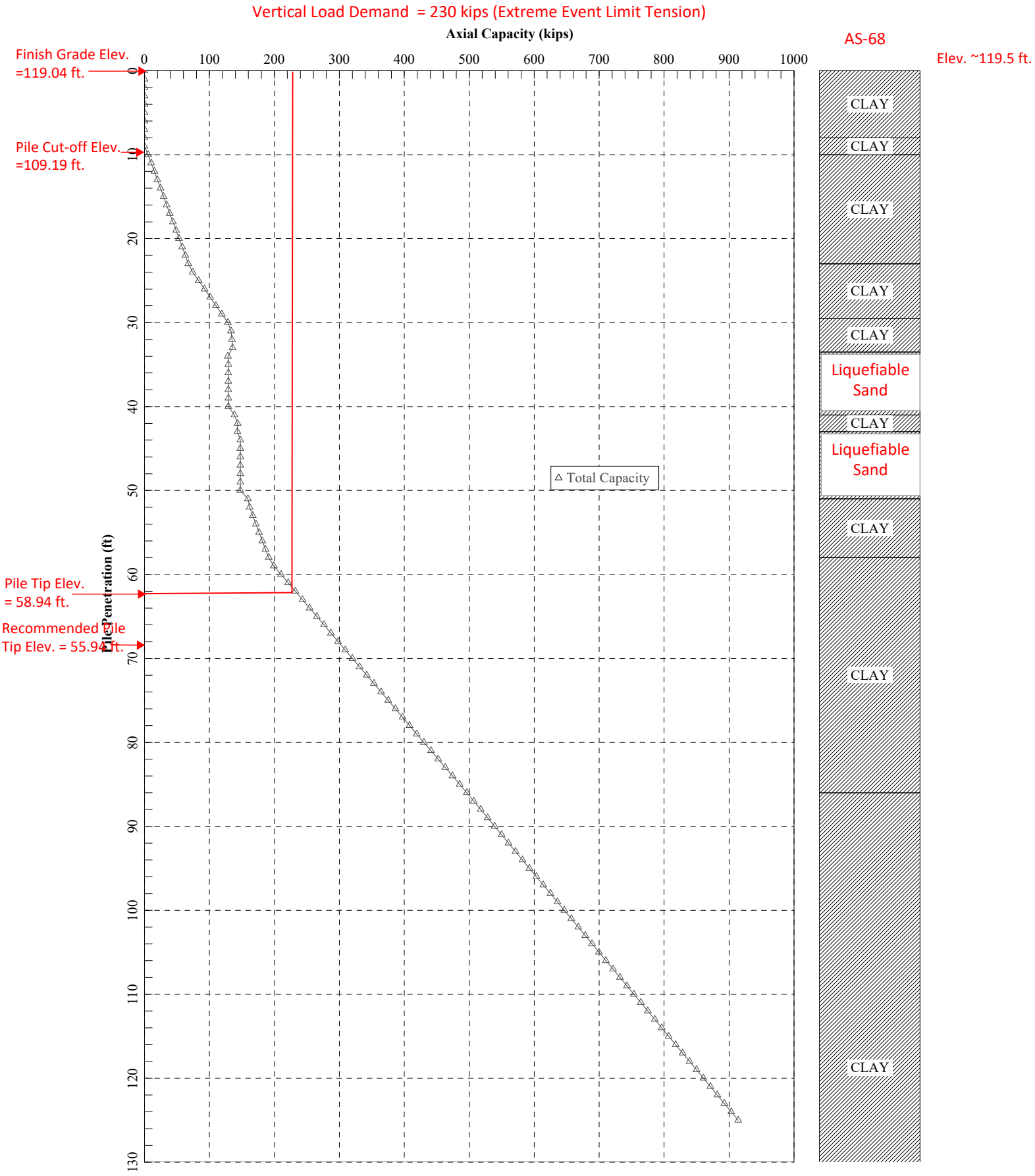


Eastridge to BART Regional Connector Project Bent 26 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 75 kips (Downdrag) + 460 kips (Extreme Event Limit Compression) = 540 kips



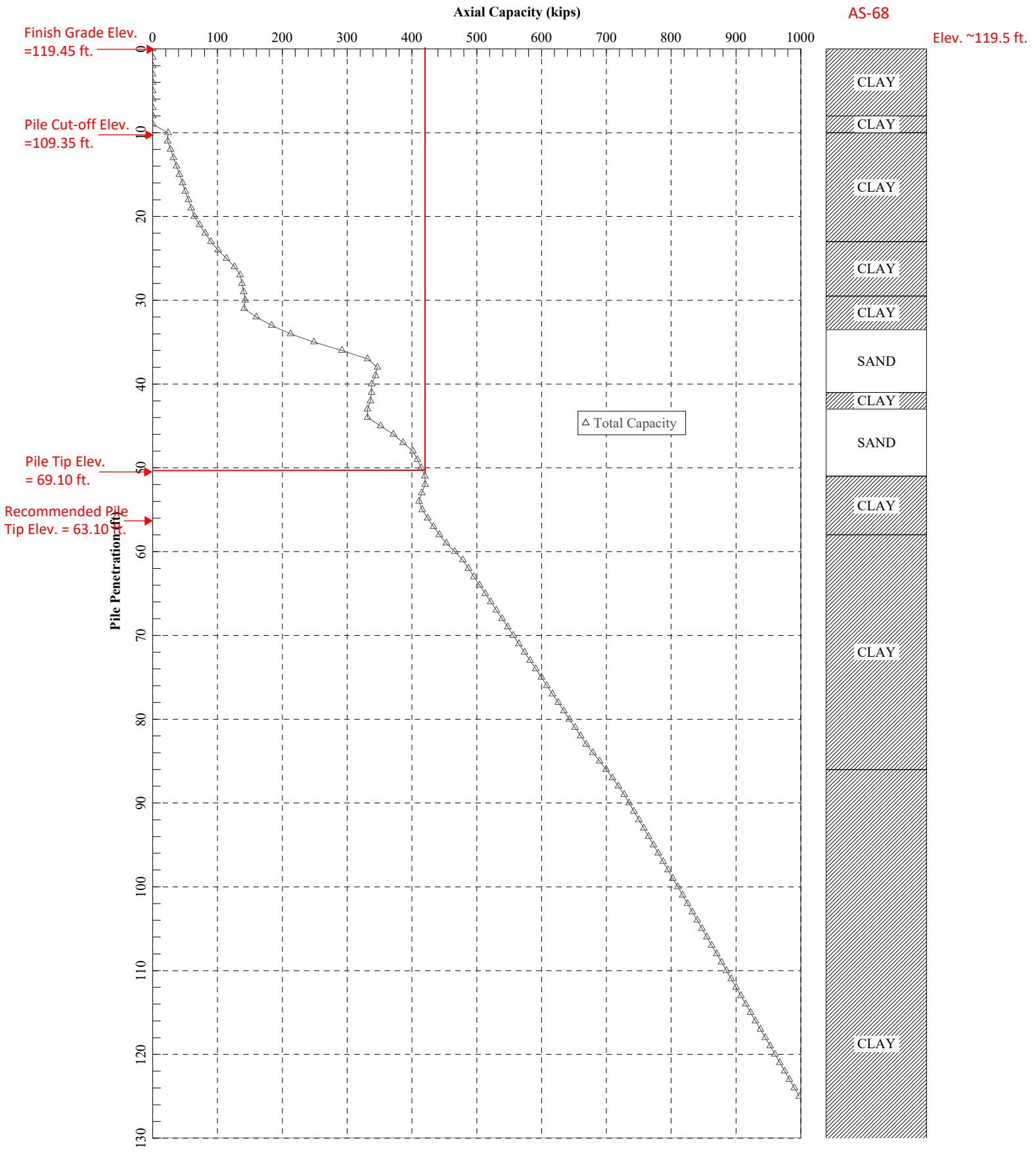
Eastridge to BART Regional Connector Project Bent 26 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)



Eastridge to BART Regional Connector Project Bent 26 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

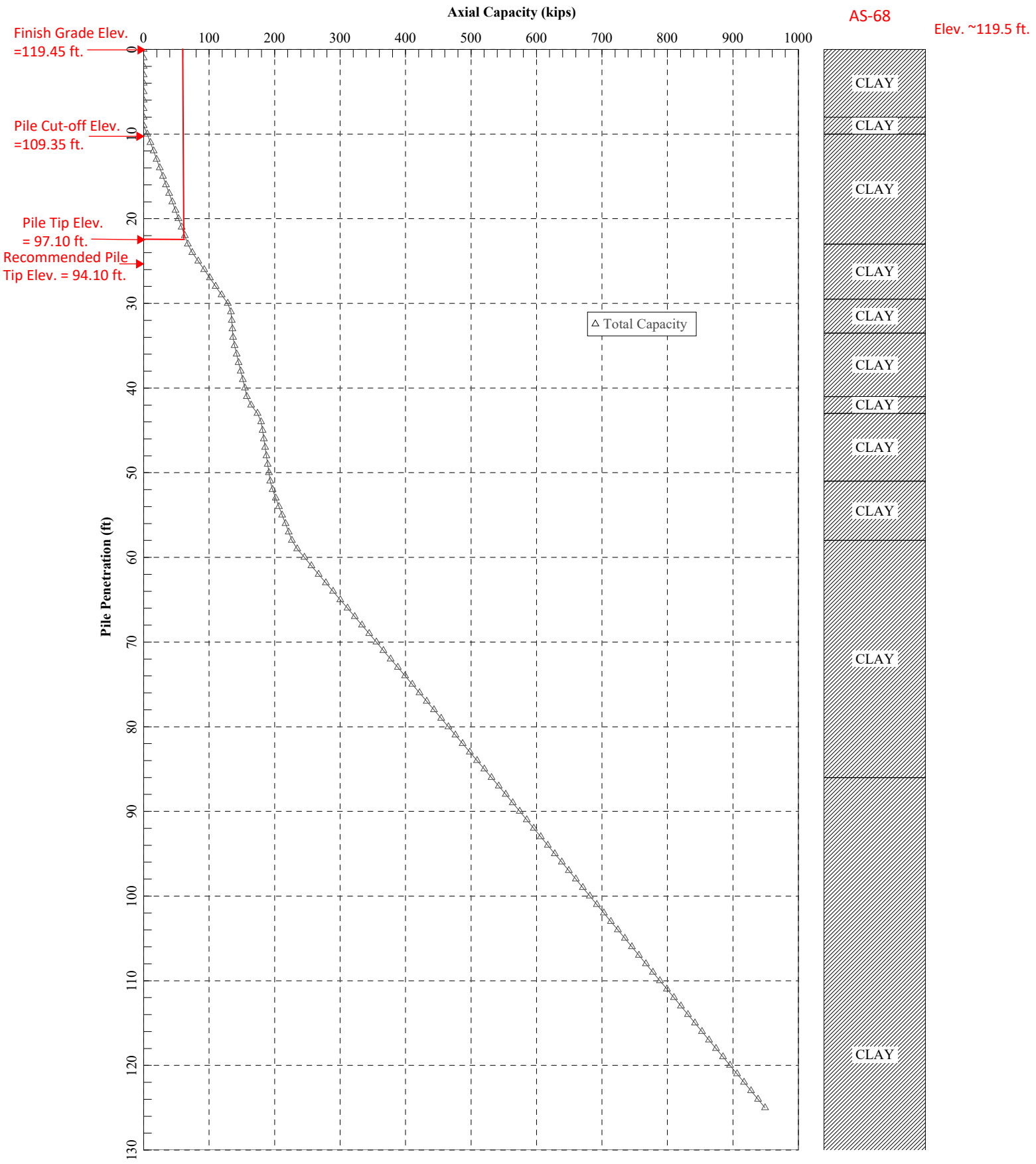
AERIAL GUIDEWAY – BENT 27 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 290 kips (Strength Limit Compression)/0.7 = 420 kips



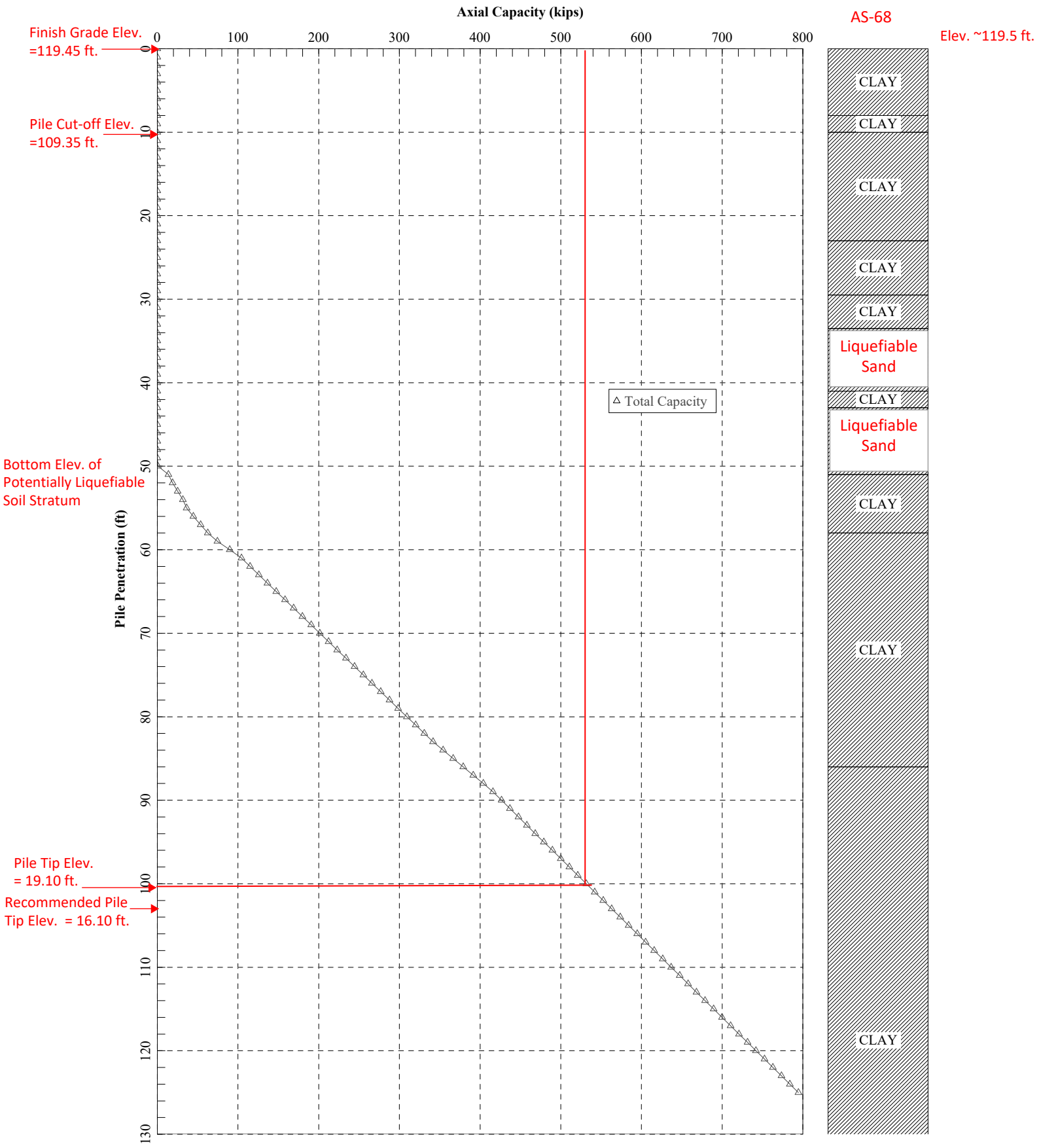
Eastridge to BART Regional Connector Project Bent 27 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 40 kips (Strength Limit Tension)/0.7 = 60 kips

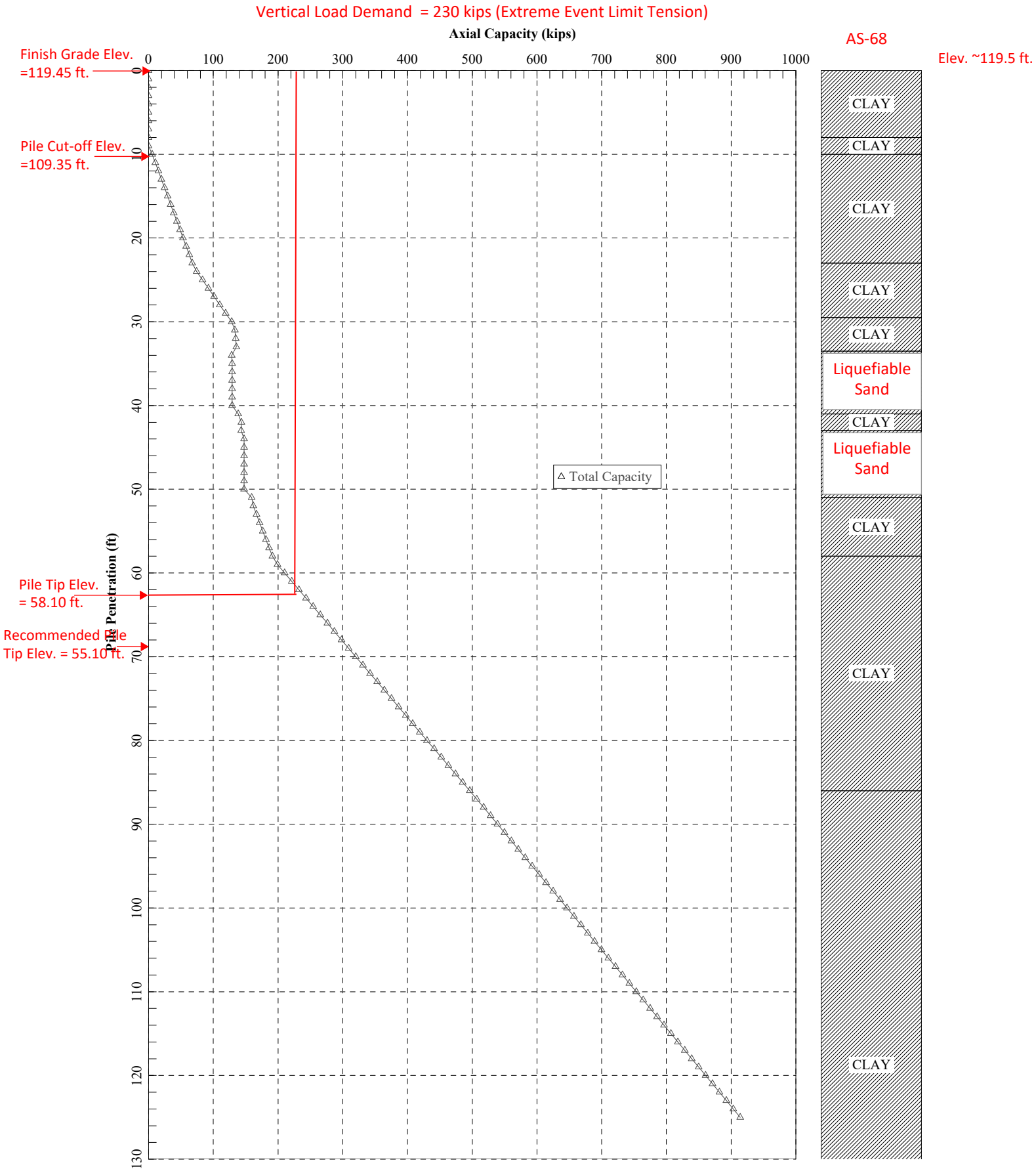


Eastridge to BART Regional Connector Project Bent 27 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 75 kips (Downdrag) + 450 kips (Extreme Event Limit Compression) = 530 kips



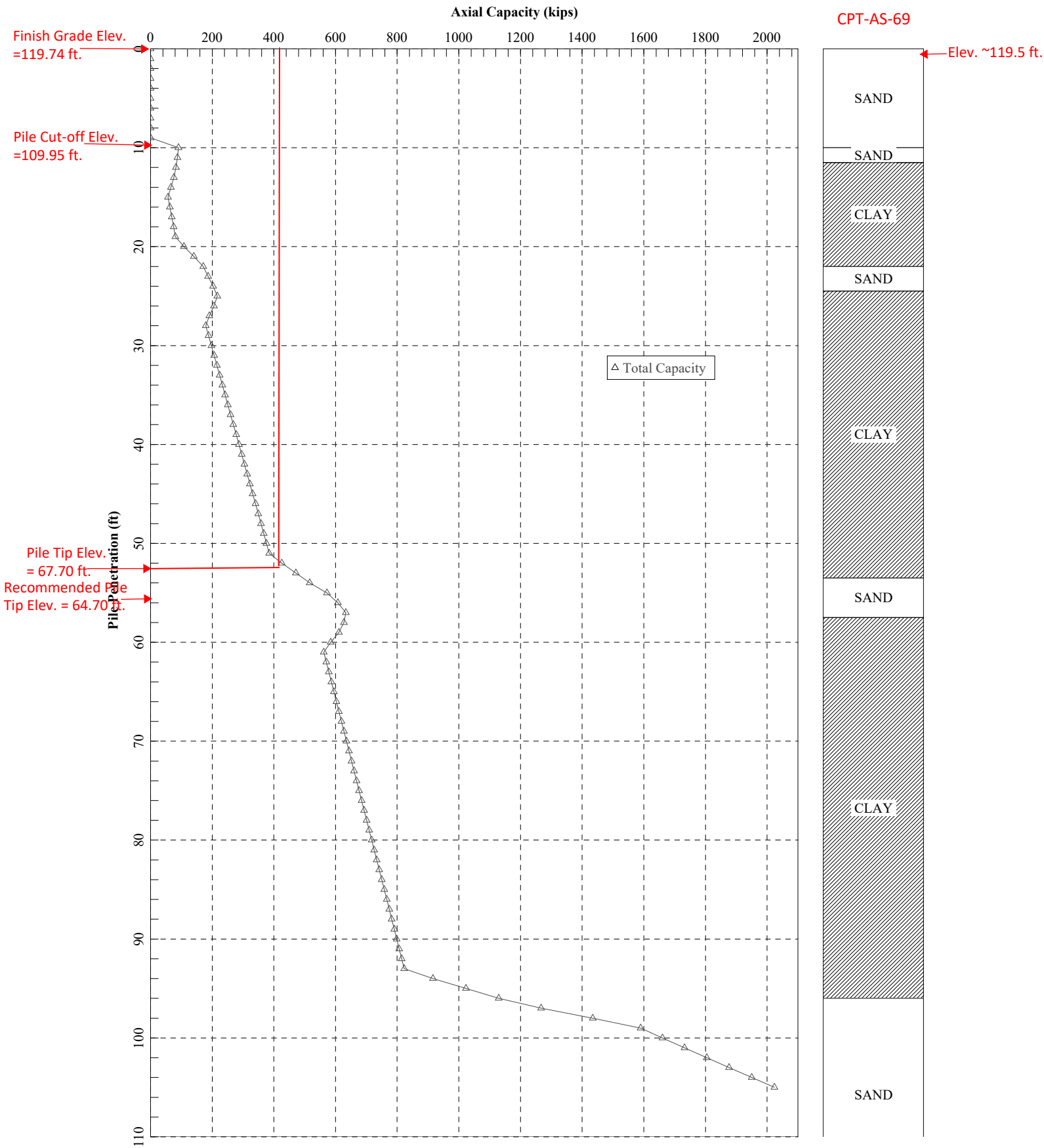
Eastridge to BART Regional Connector Project Bent 27 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)



Eastridge to BART Regional Connector Project Bent 27 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

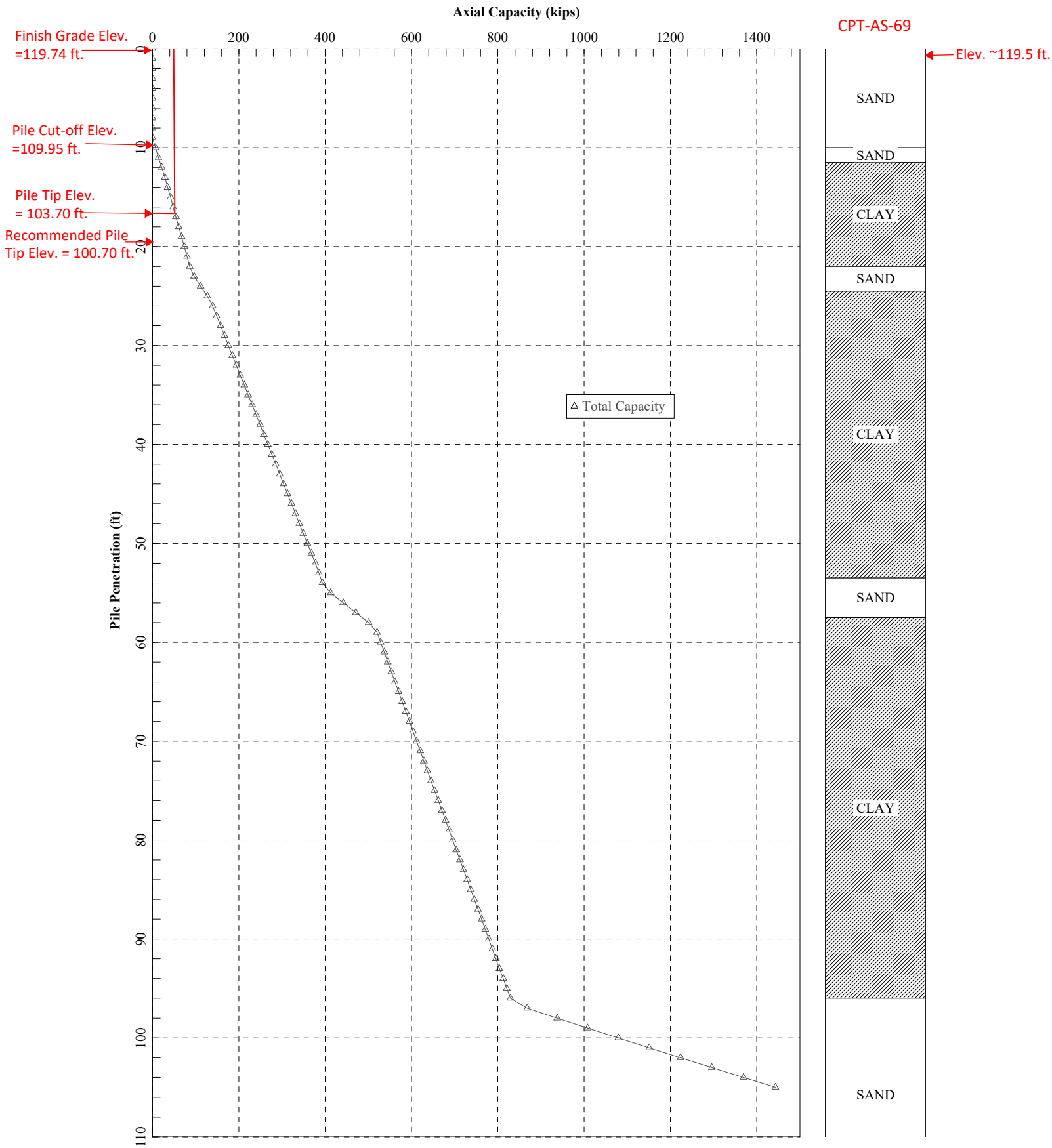
AERIAL GUIDEWAY – BENT 28 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 290 kips (Strength Limit Compression)/0.7 = 420 kips



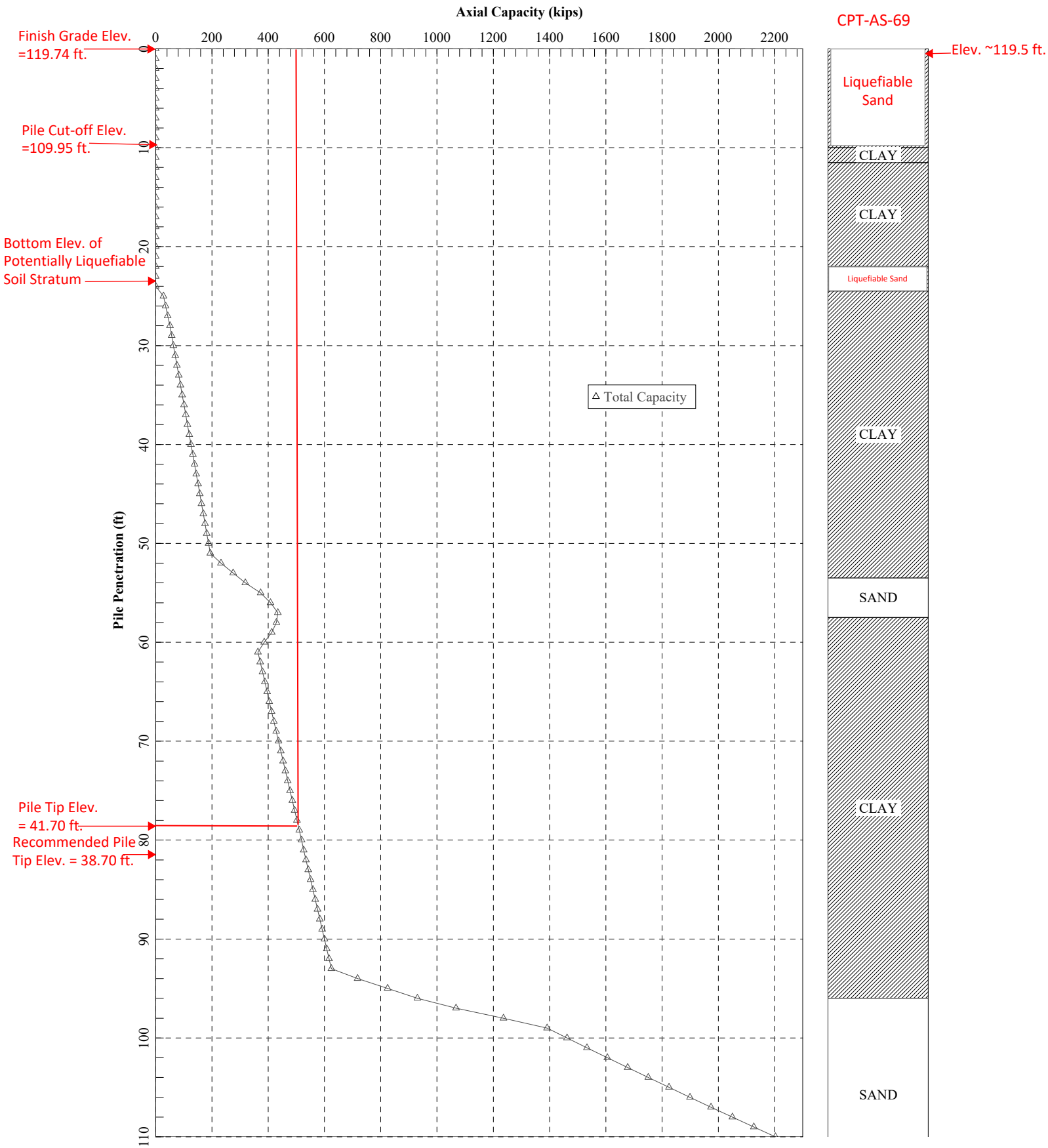
Eastridge to BART Regional Connector Project Bent 28 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 30 kips (Strength Limit Tension)/0.7 = 50 kips



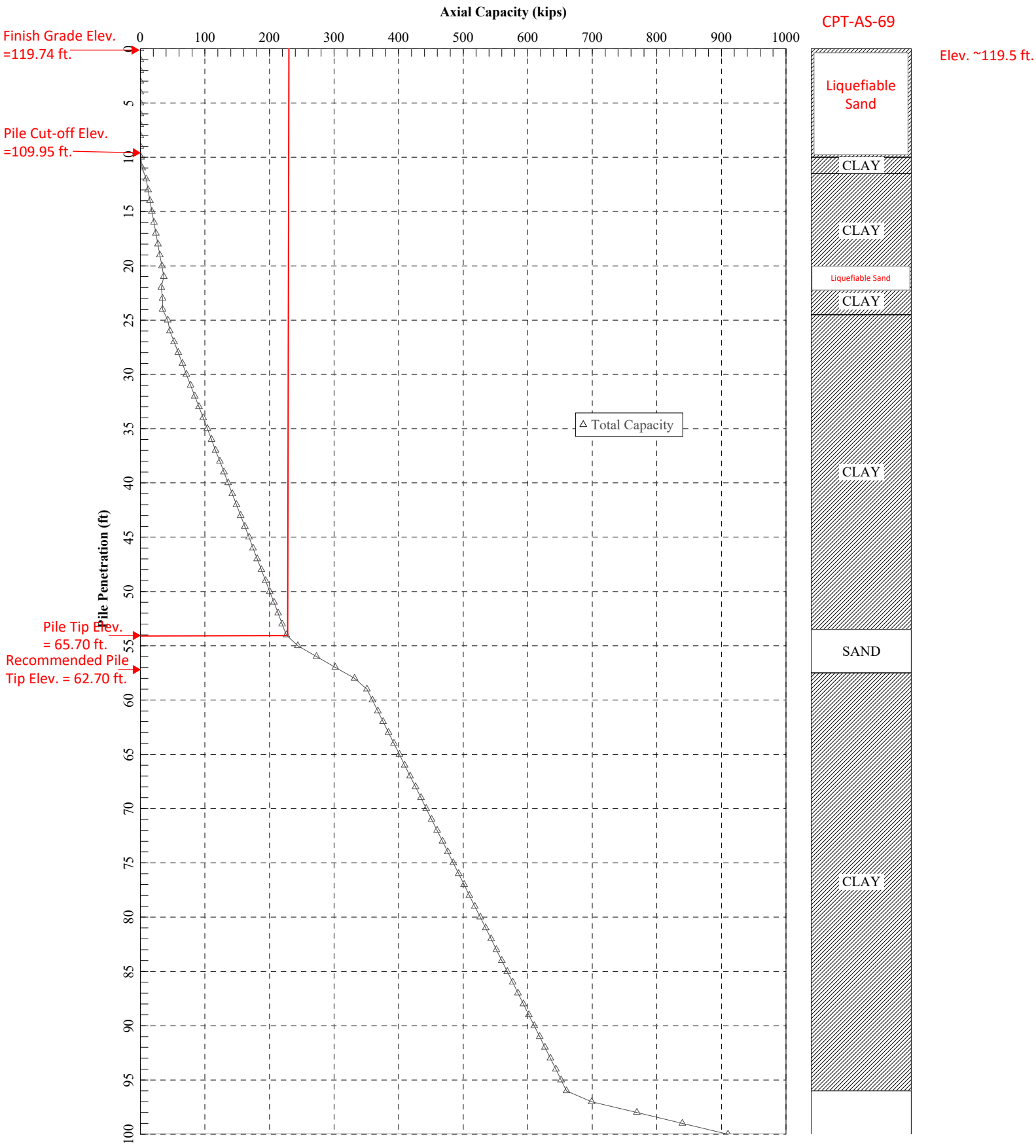
Eastridge to BART Regional Connector Project Bent 28 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 31 kips (Downdrag) + 450 kips (Extreme Event Limit Compression) = 490 kips



Eastridge to BART Regional Connector Project Bent 28 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

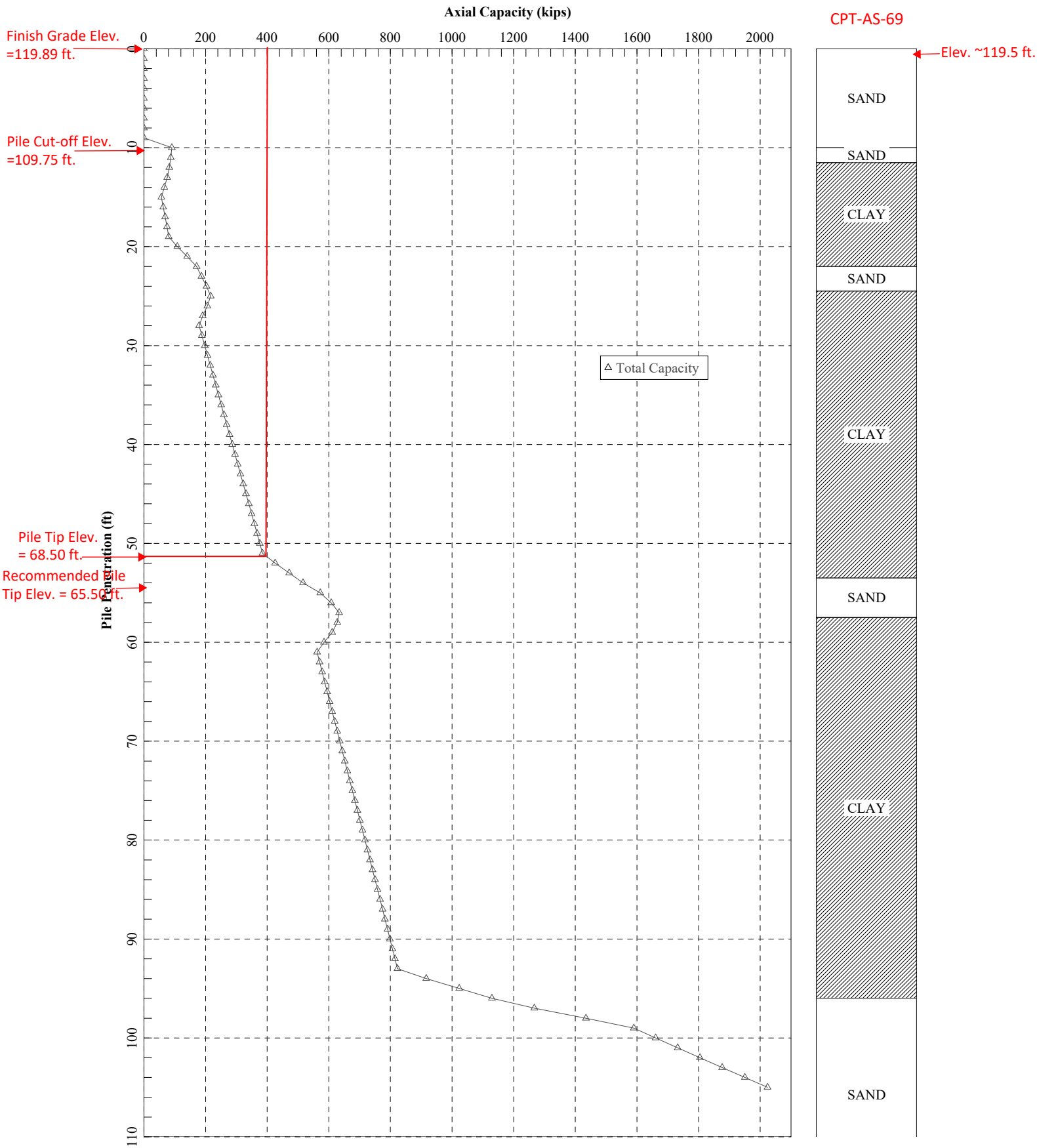
Vertical Load Demand = 230 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 28 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

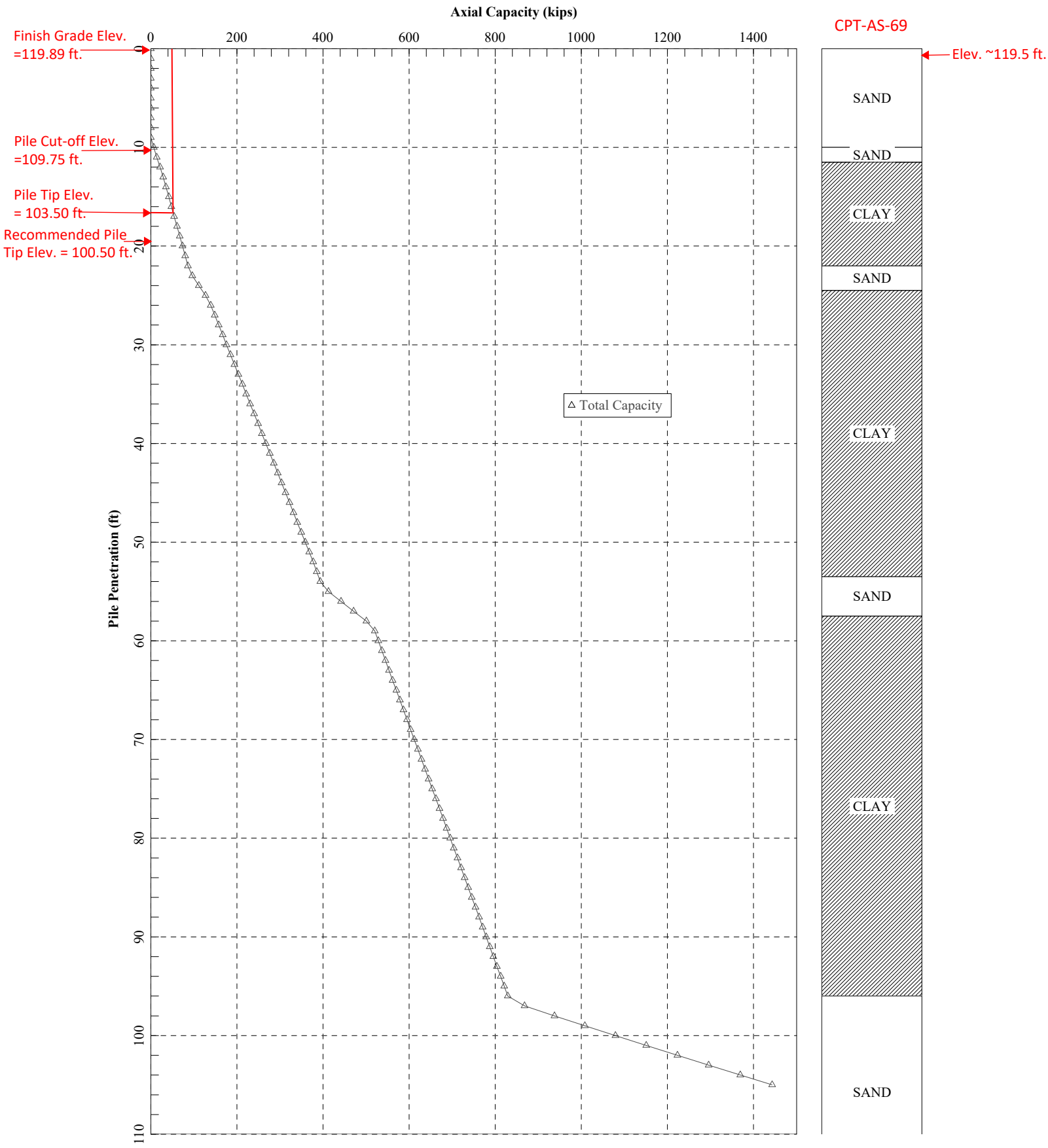
AERIAL GUIDEWAY – BENT 29 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 280 kips (Strength Limit Compression)/0.7 = 400 kips



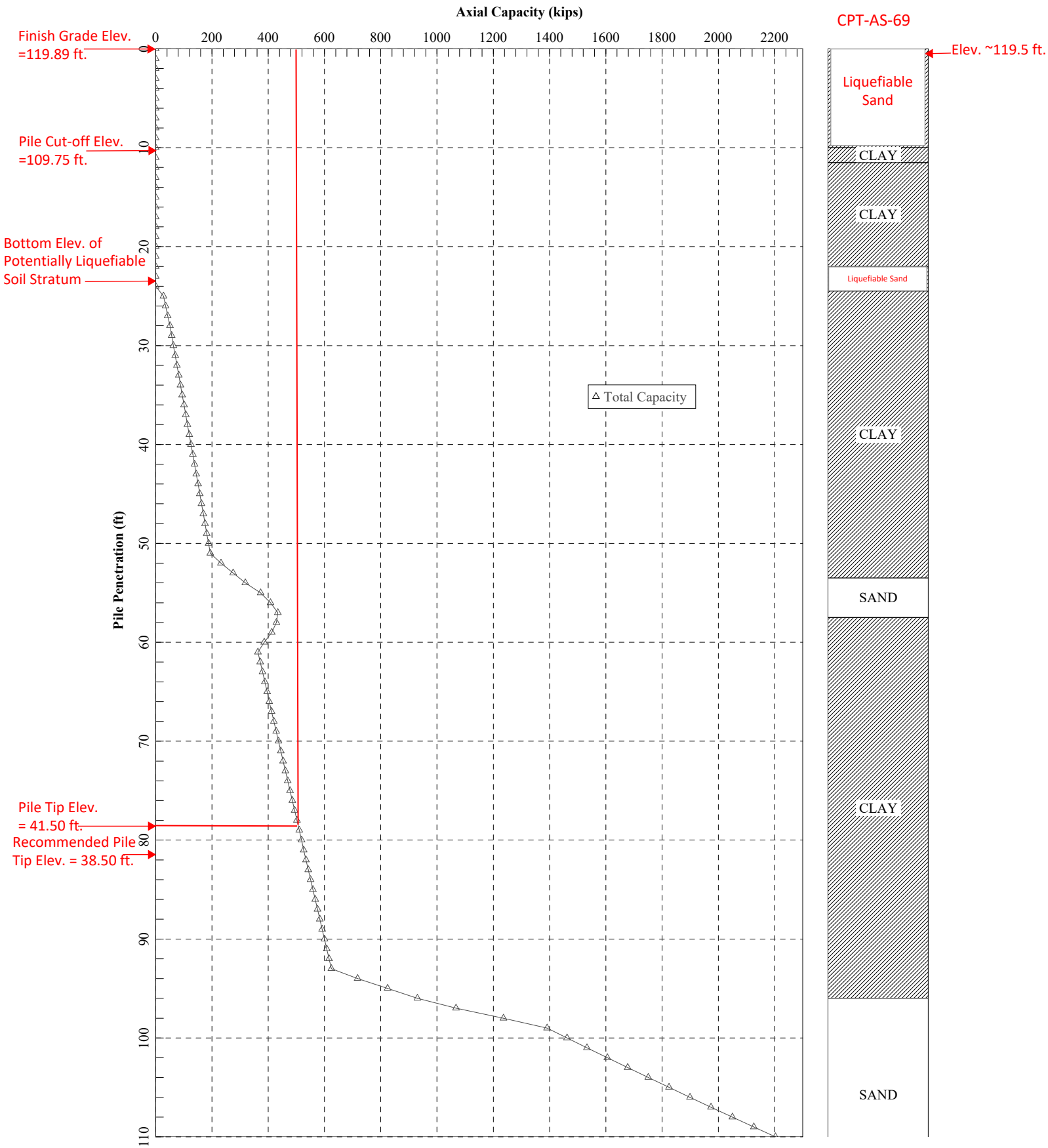
Eastridge to BART Regional Connector Project Bent 29 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 30 kips (Strength Limit Tension)/0.7 = 50 kips



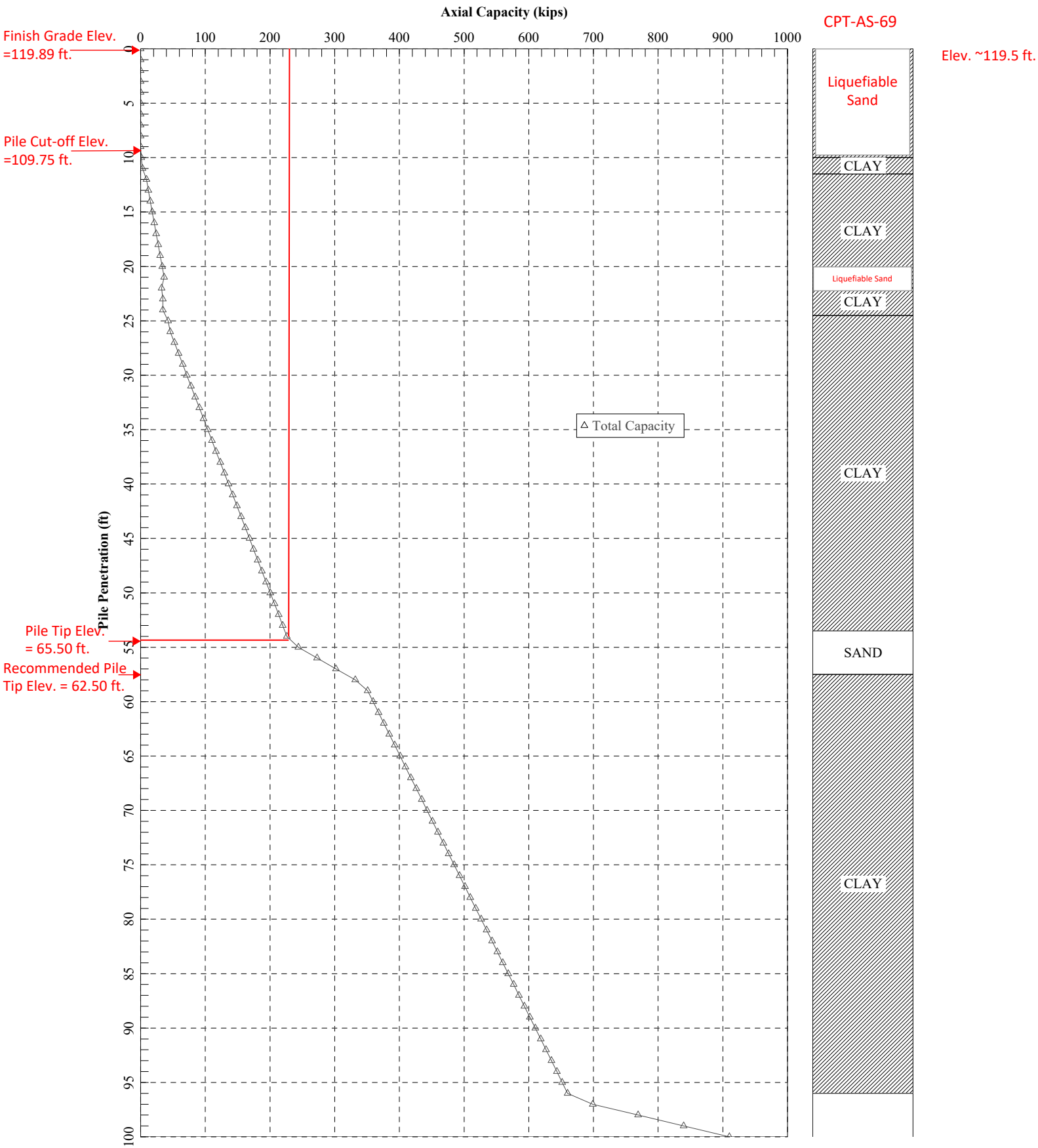
Eastridge to BART Regional Connector Project Bent 29 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 31 kips (Downdrag) + 460 kips (Extreme Event Limit Compression) = 500 kips



Eastridge to BART Regional Connector Project Bent 29 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

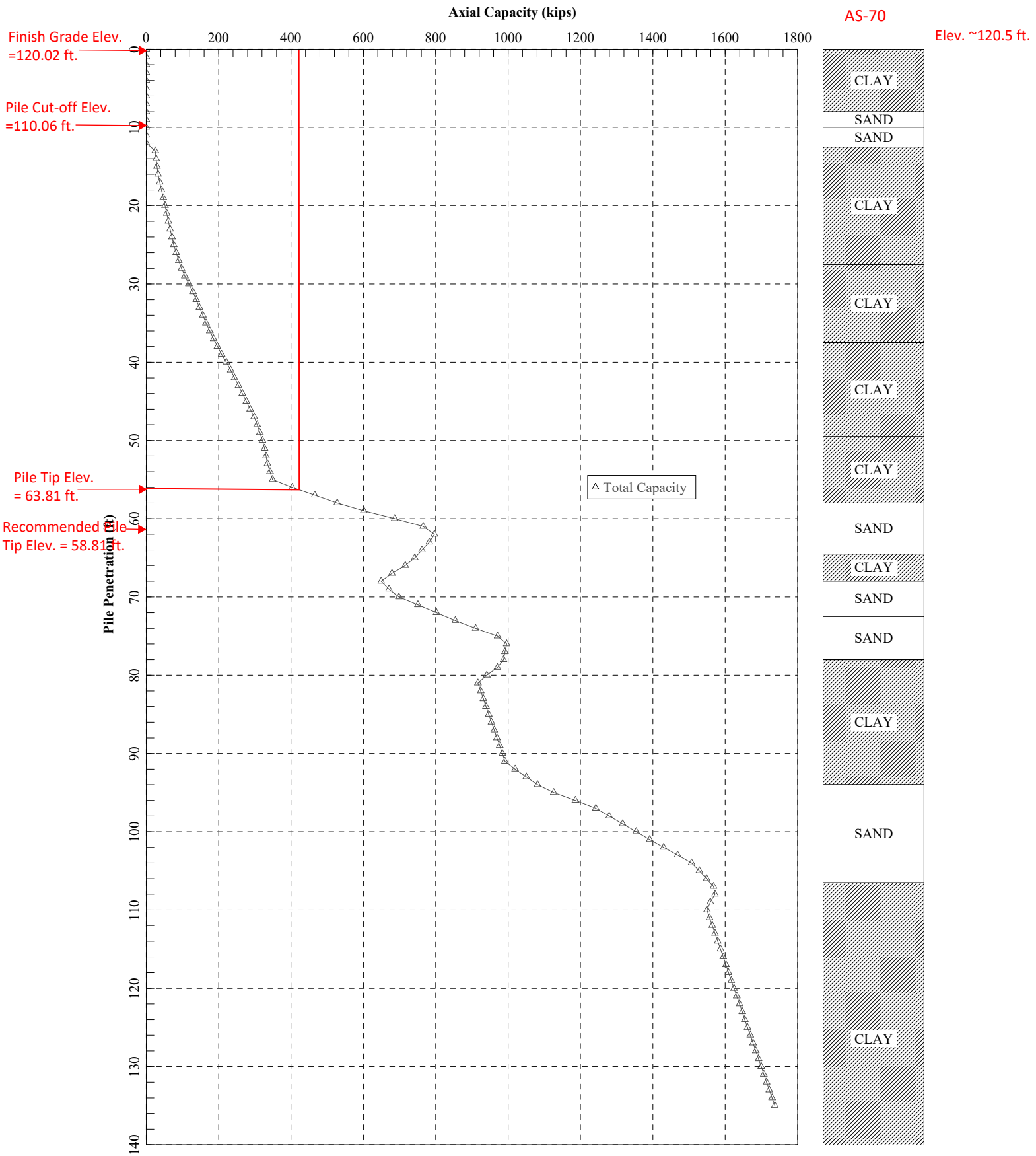
Vertical Load Demand = 230 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 29 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

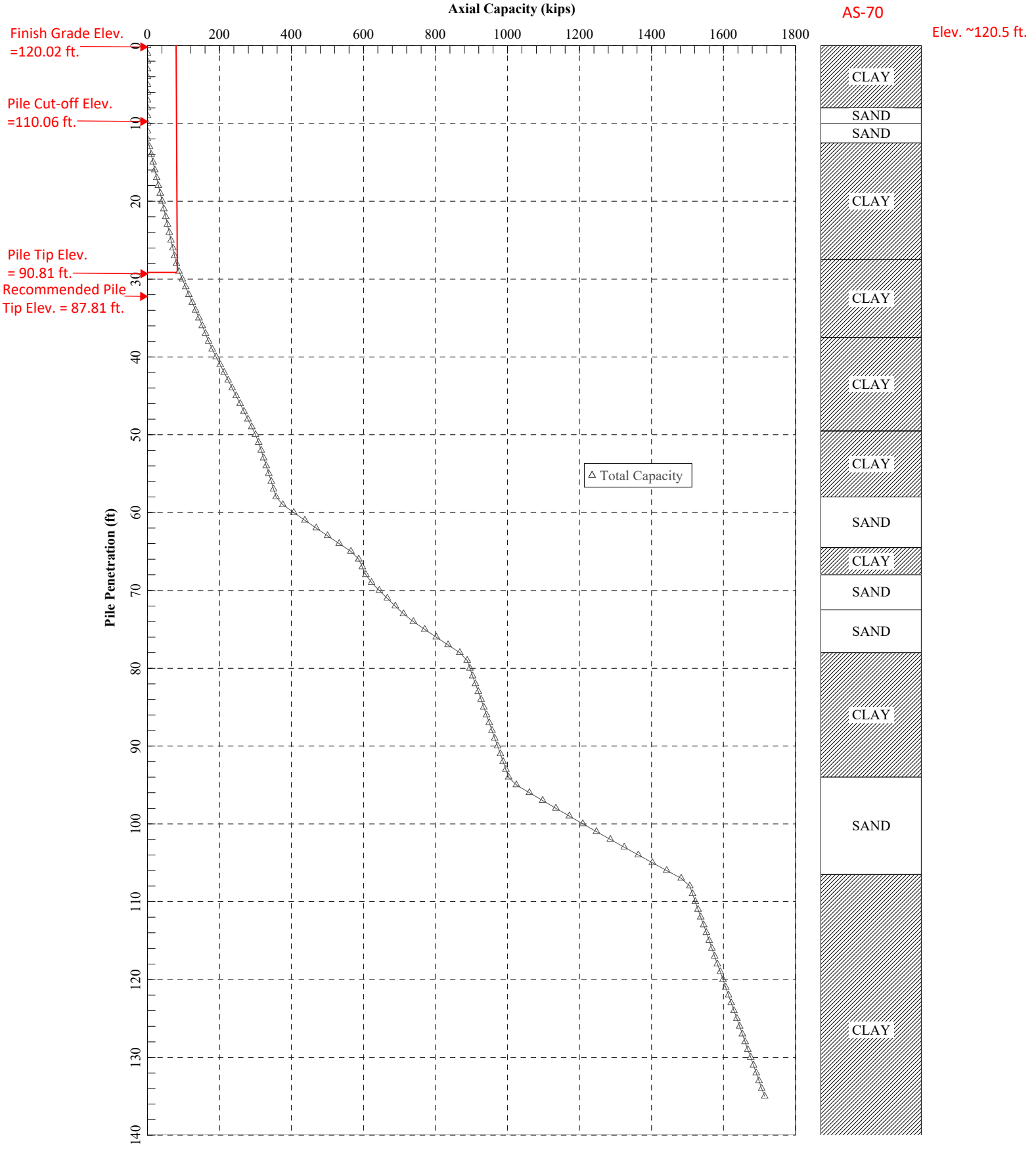
AERIAL GUIDEWAY – BENT 30 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 290 kips (Strength Limit Compression)/0.7 = 420 kips



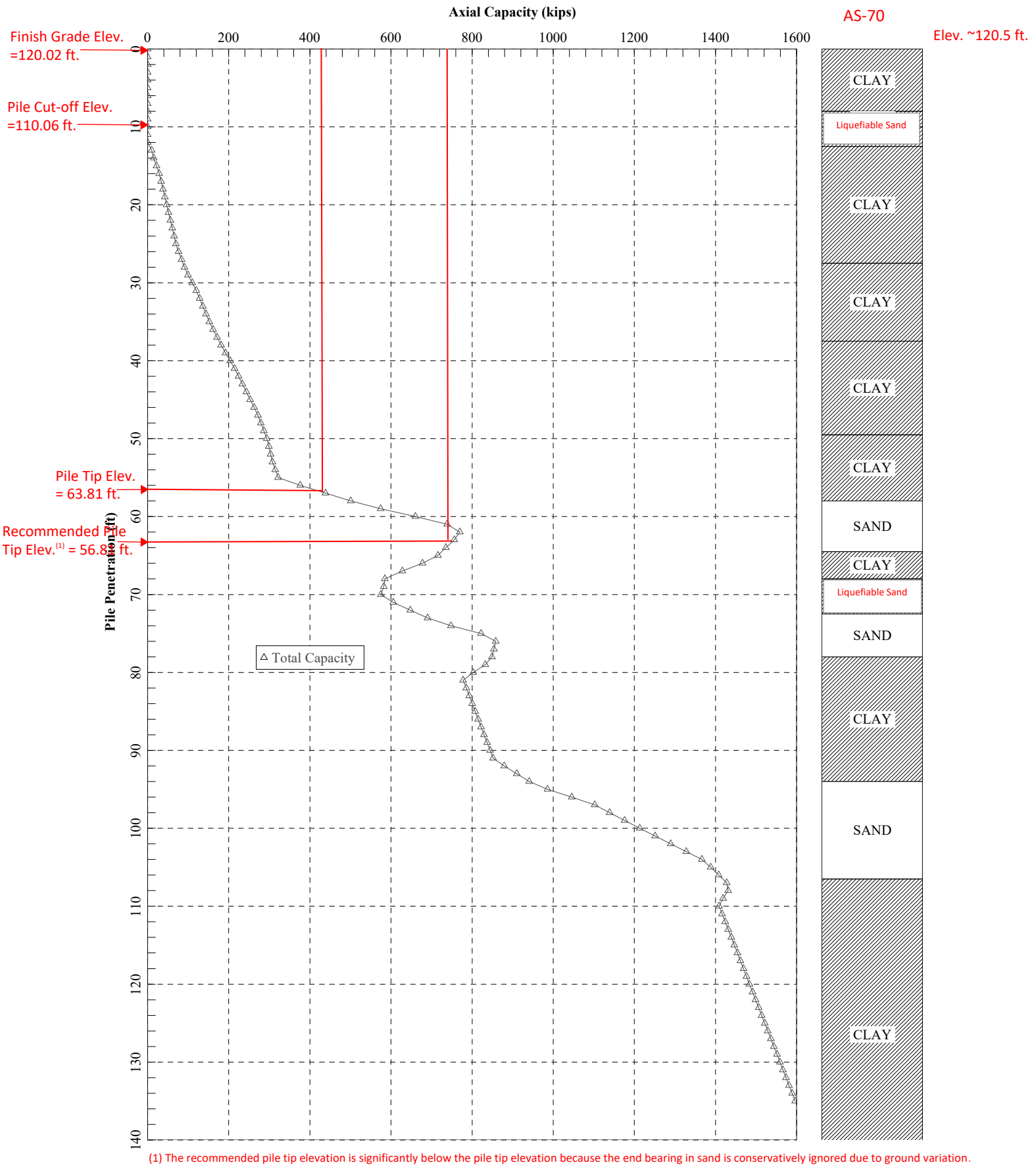
Eastridge to BART Regional Connector Project Bent 30 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 50 kips (Strength Limit Tension)/0.7 = 80 kips



Eastridge to BART Regional Connector Project Bent 30 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

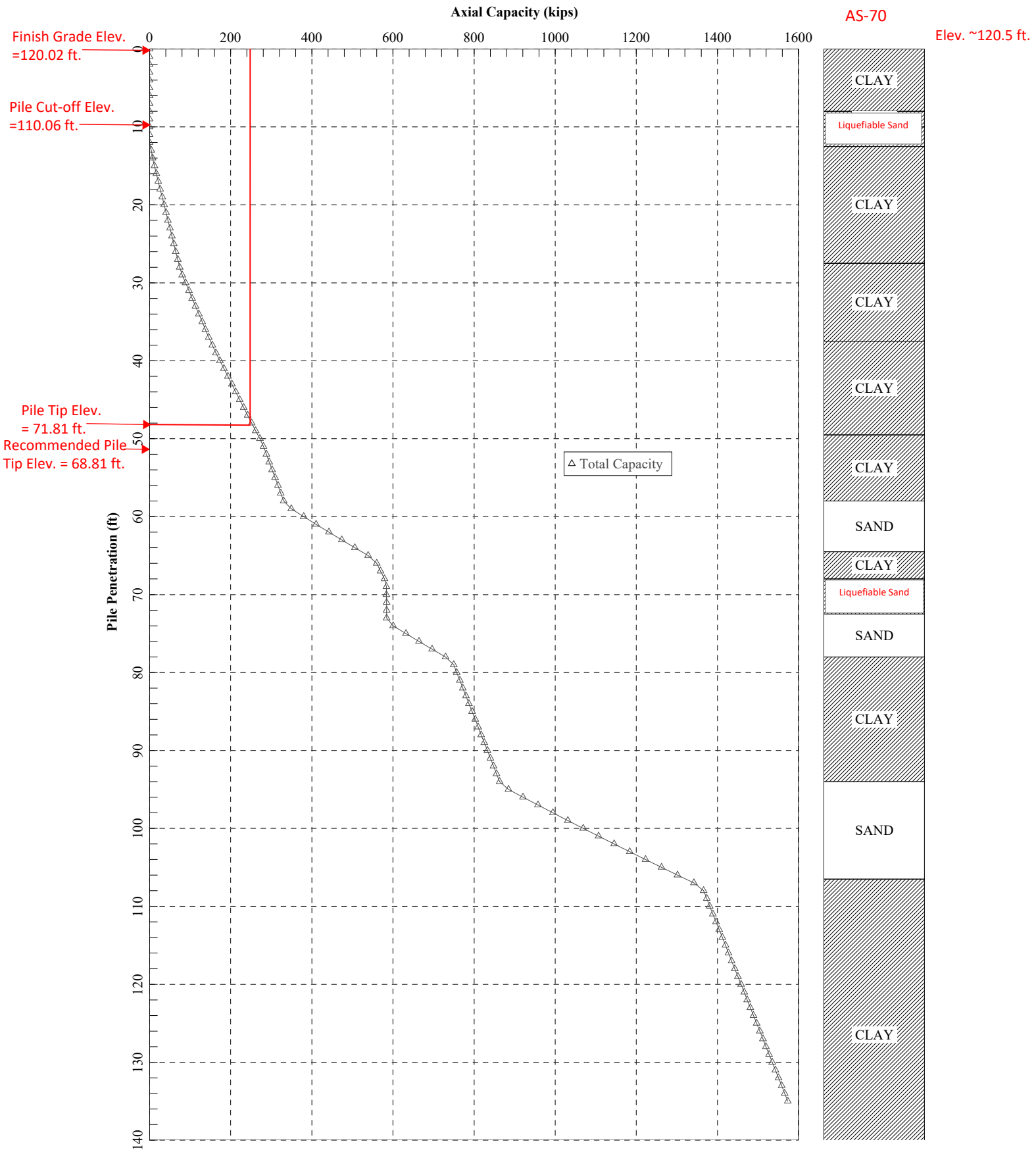
Vertical Load Demand = 460 kips (Extreme Event Limit Compression)



(1) The recommended pile tip elevation is significantly below the pile tip elevation because the end bearing in sand is conservatively ignored due to ground variation.

Eastridge to BART Regional Connector Project Bent 30 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

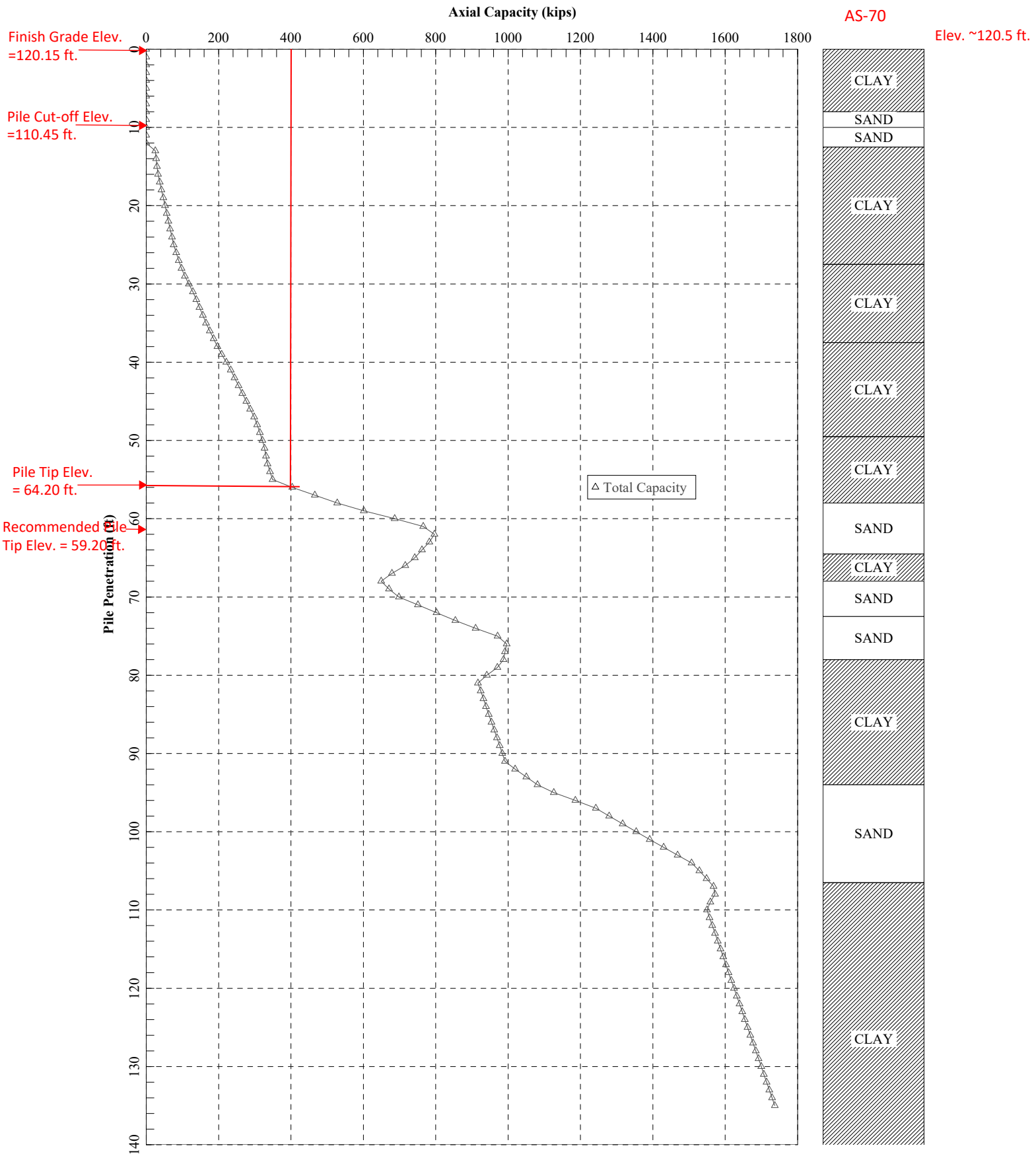
Vertical Load Demand = 250 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 30 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

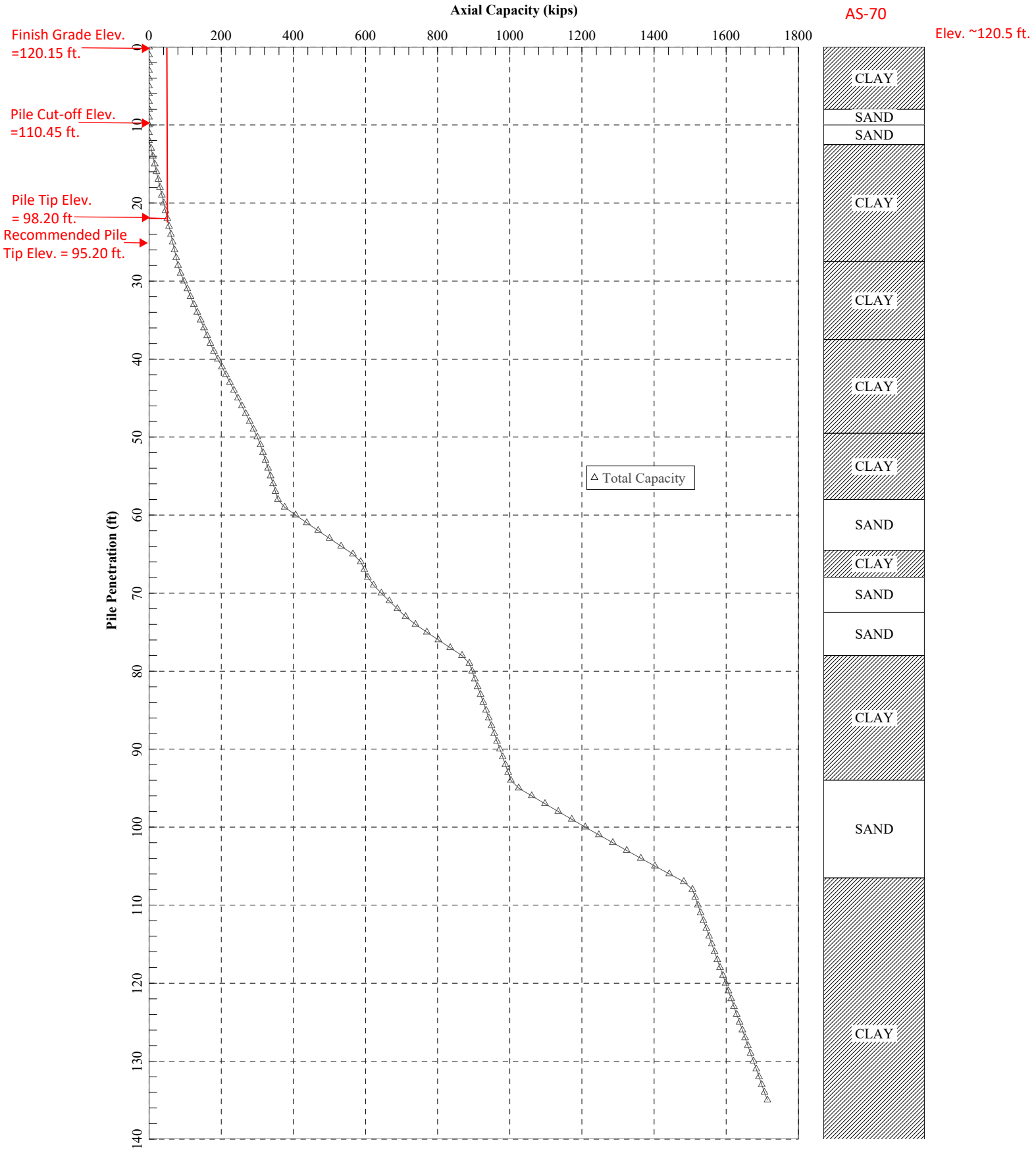
AERIAL GUIDEWAY – BENT 31 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 280 kips (Strength Limit Compression)/0.7 = 400 kips



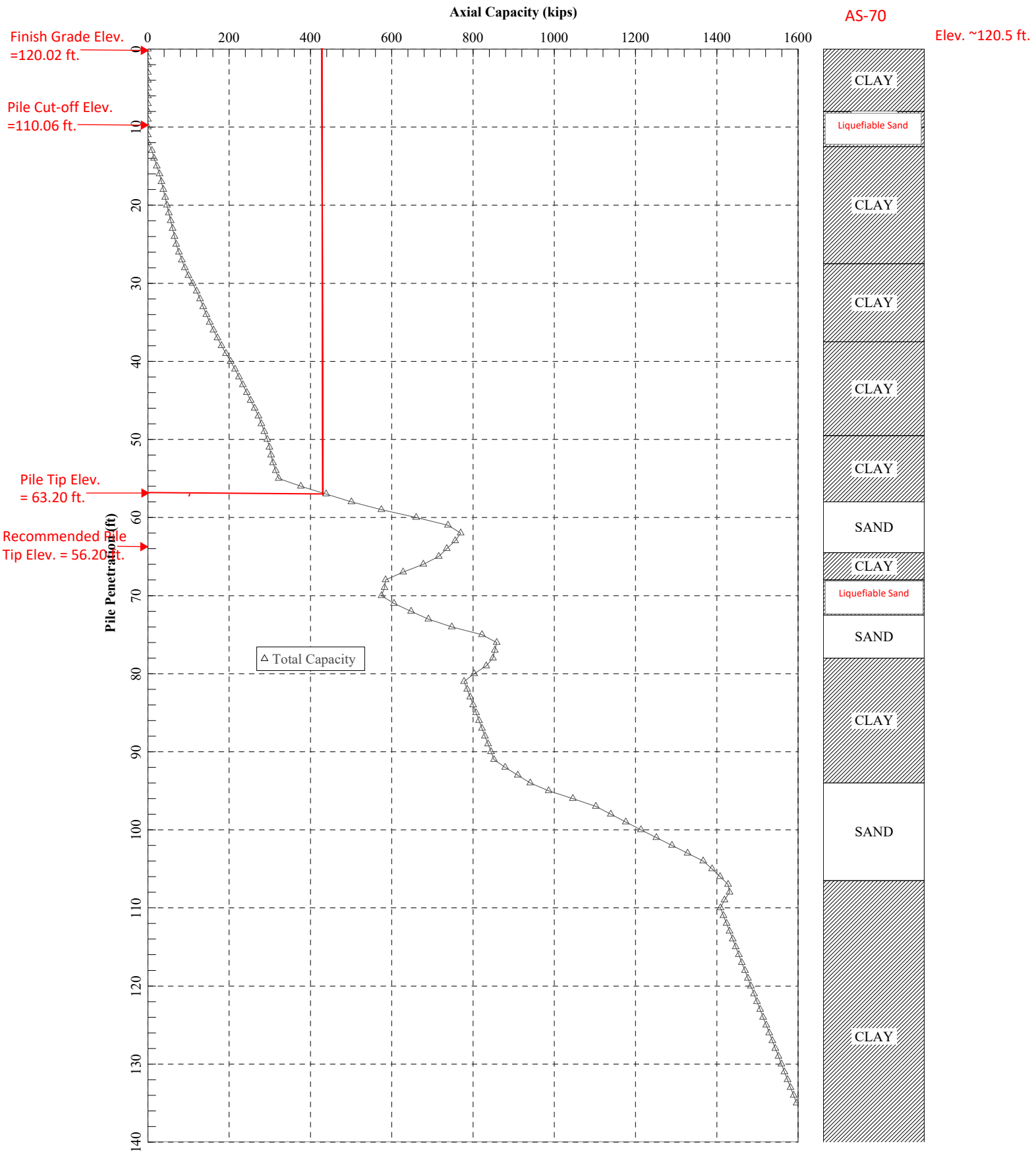
Eastridge to BART Regional Connector Project Bent 31 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 30 kips (Strength Limit Tension)/0.7 = 50 kips



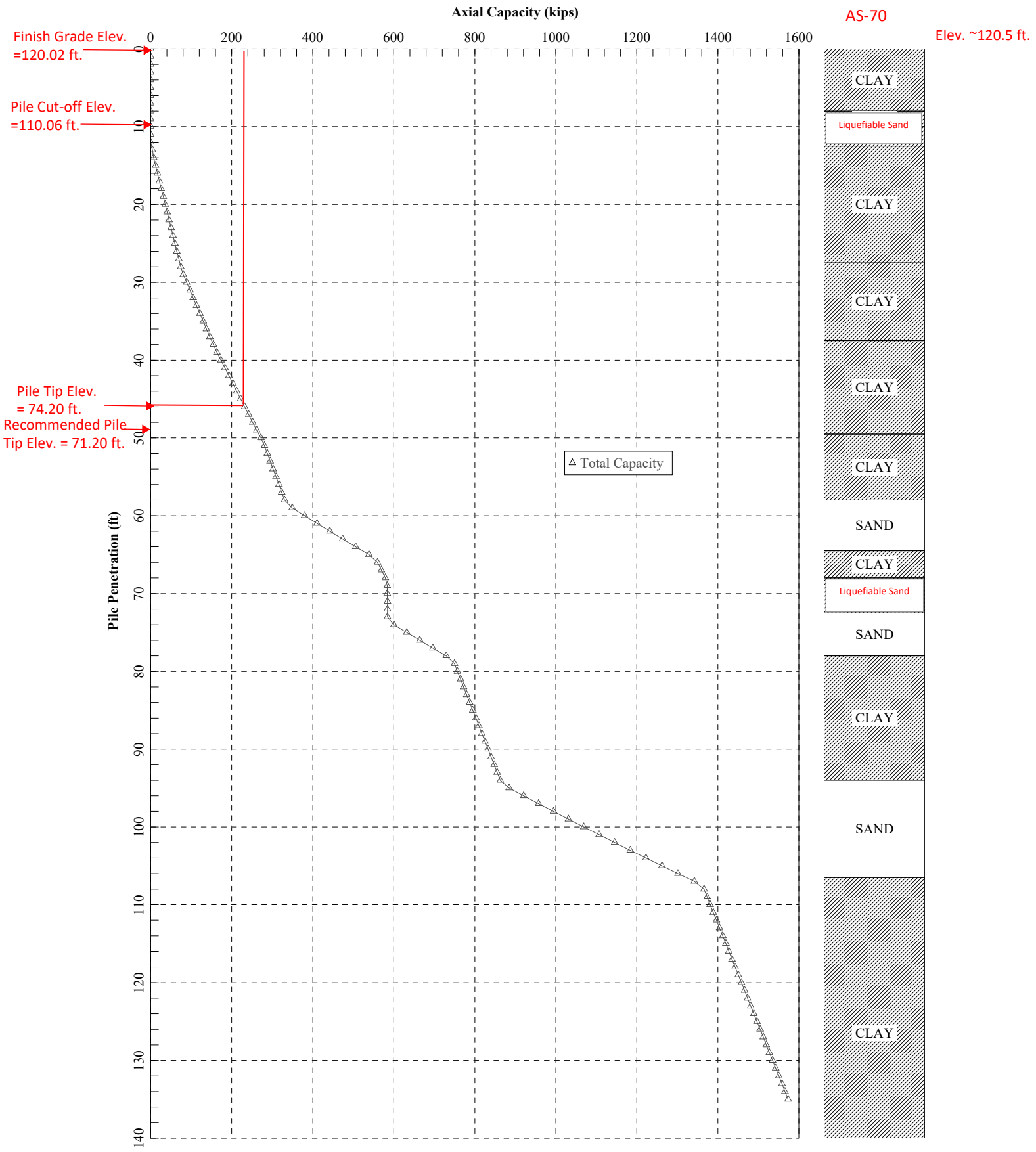
Eastridge to BART Regional Connector Project Bent 31 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 460 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project Bent 31 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

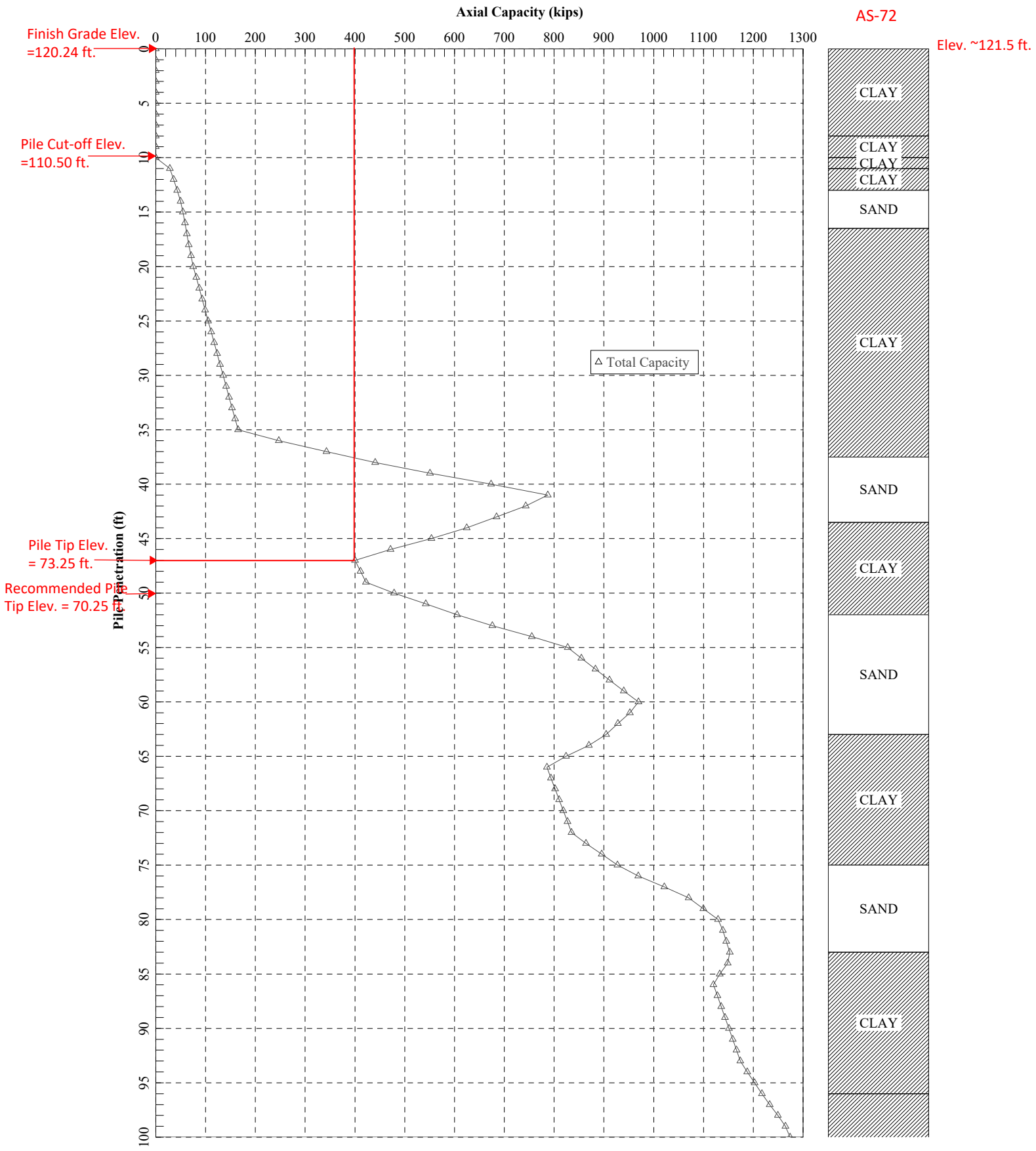
Vertical Load Demand = 230 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 31 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

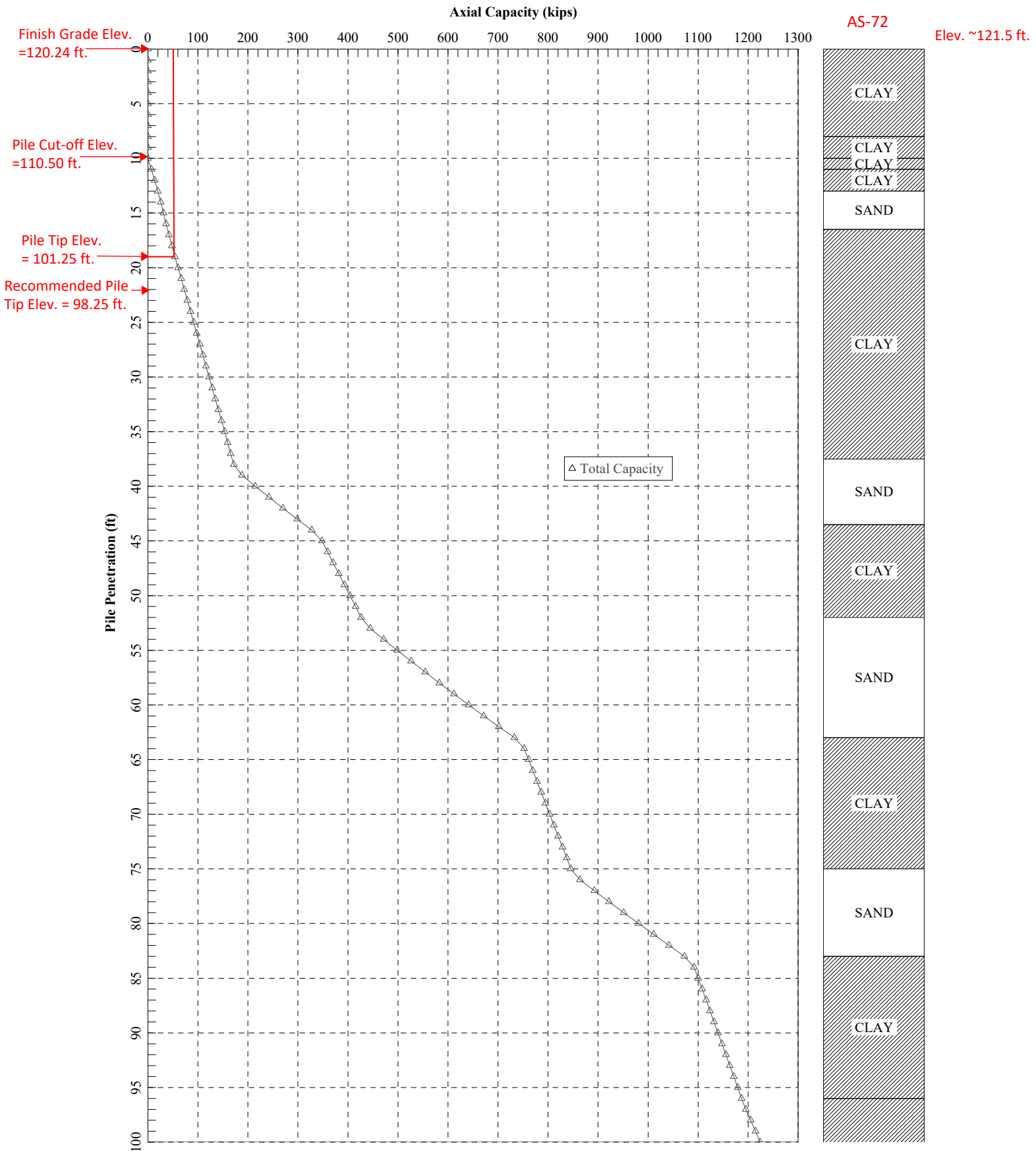
AERIAL GUIDEWAY – BENT 32 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 280 kips (Strength Limit Compression)/0.7 = 400 kips



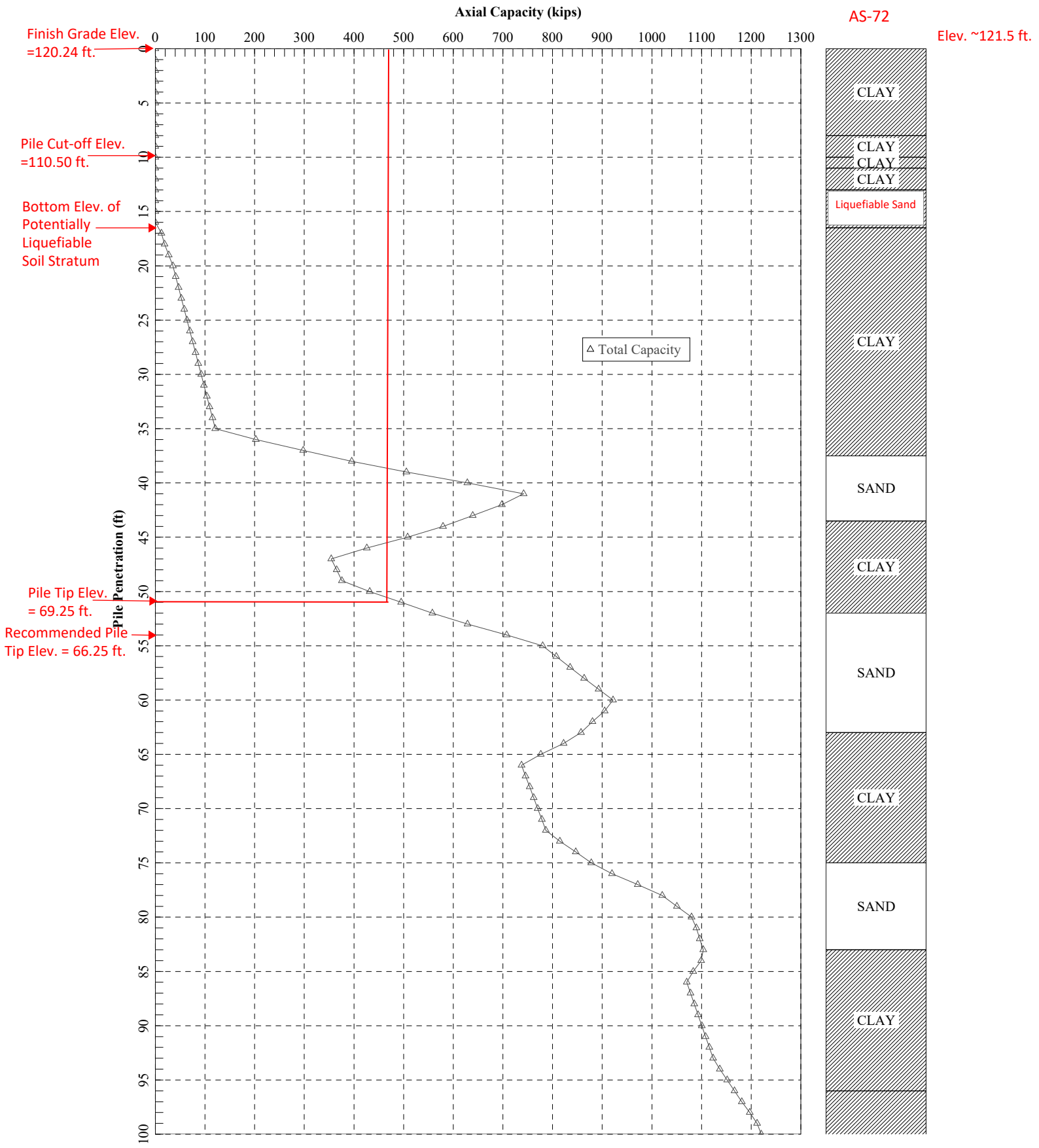
Eastridge to BART Regional Connector Project Bent 32 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 30 kips (Strength Limit Tension)/0.7 = 50 kips



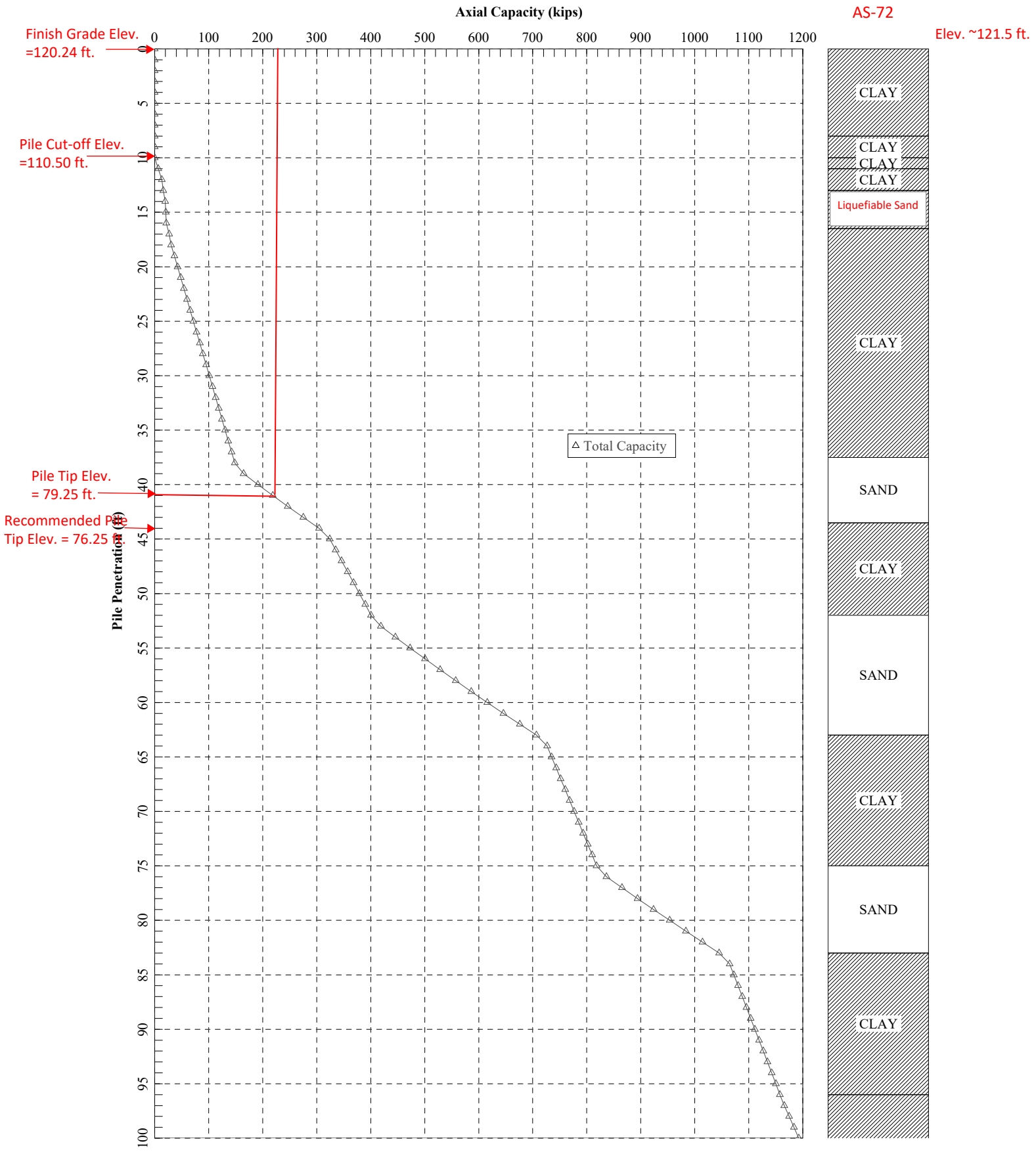
Eastridge to BART Regional Connector Project Bent 32 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 3 kips (Downdrag) + 460 kips (Extreme Event Limit Compression) = 470 kips



Eastridge to BART Regional Connector Project Bent 32 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

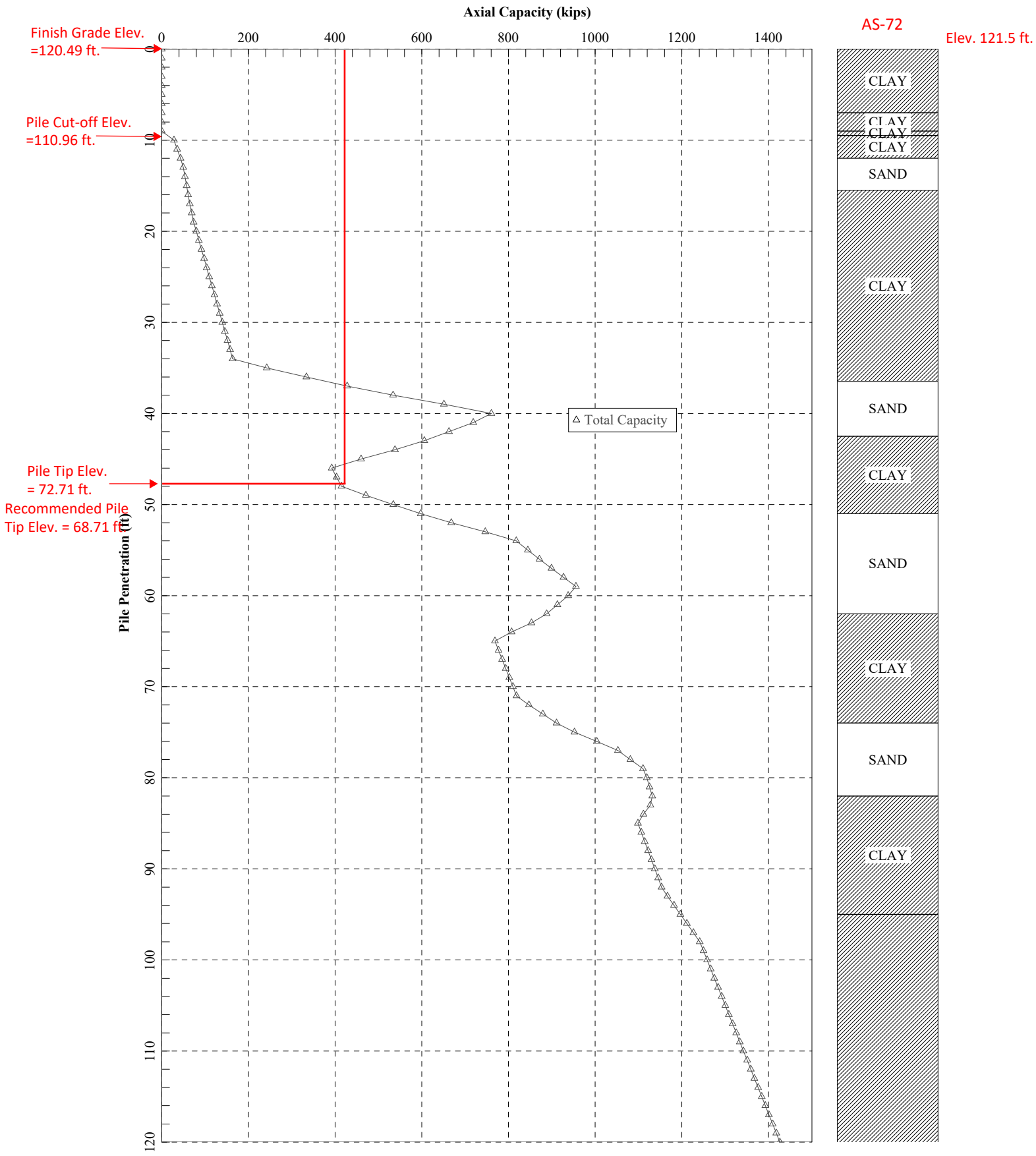
Vertical Load Demand = 230 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 32 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

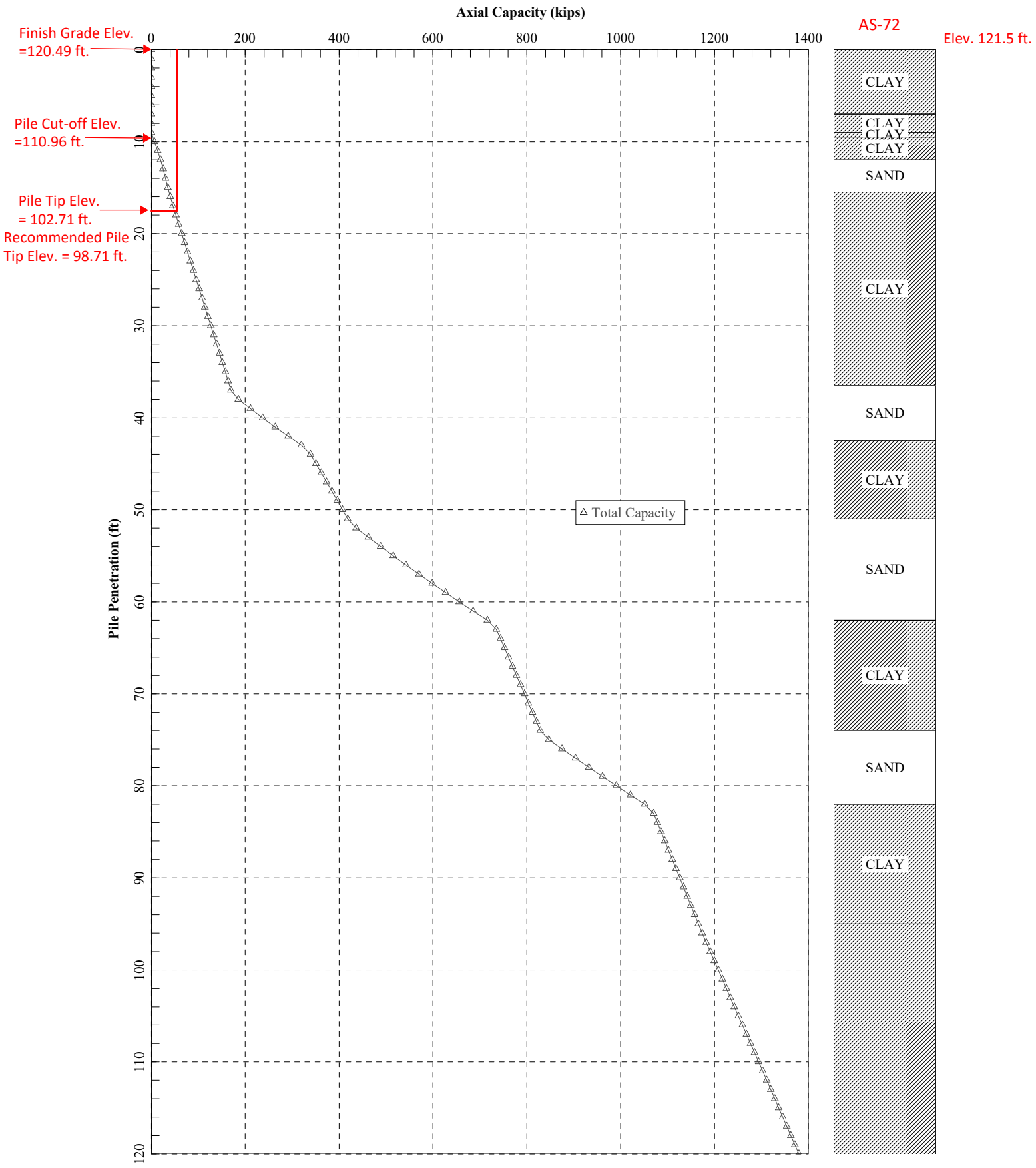
AERIAL GUIDEWAY – BENT 33 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 300 kips (Strength Limit Compression)/0.7 = 430 kips



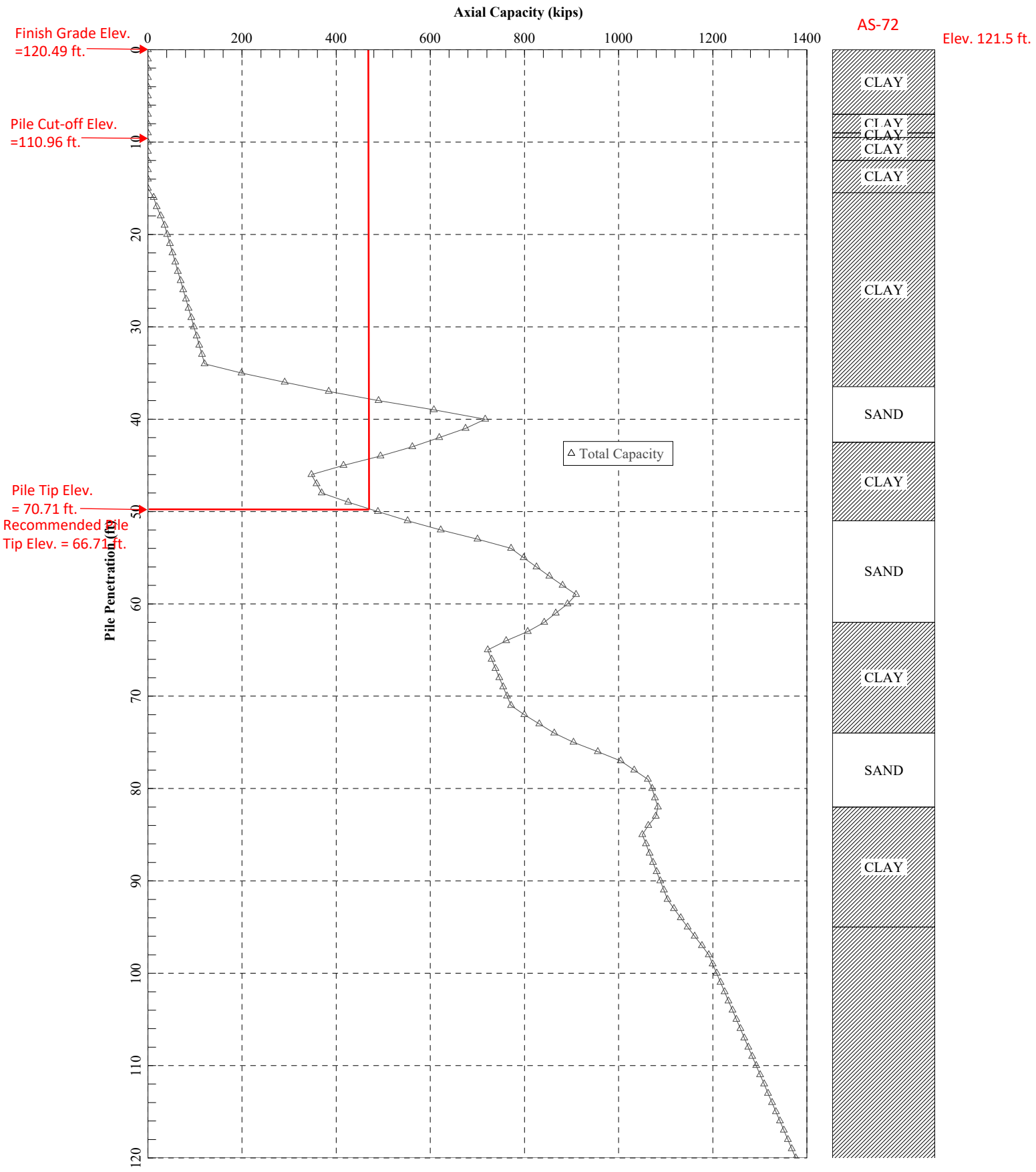
Eastridge to BART Regional Connector Project Bent 33 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 40 kips (Strength Limit Tension)/0.7 = 60 kips

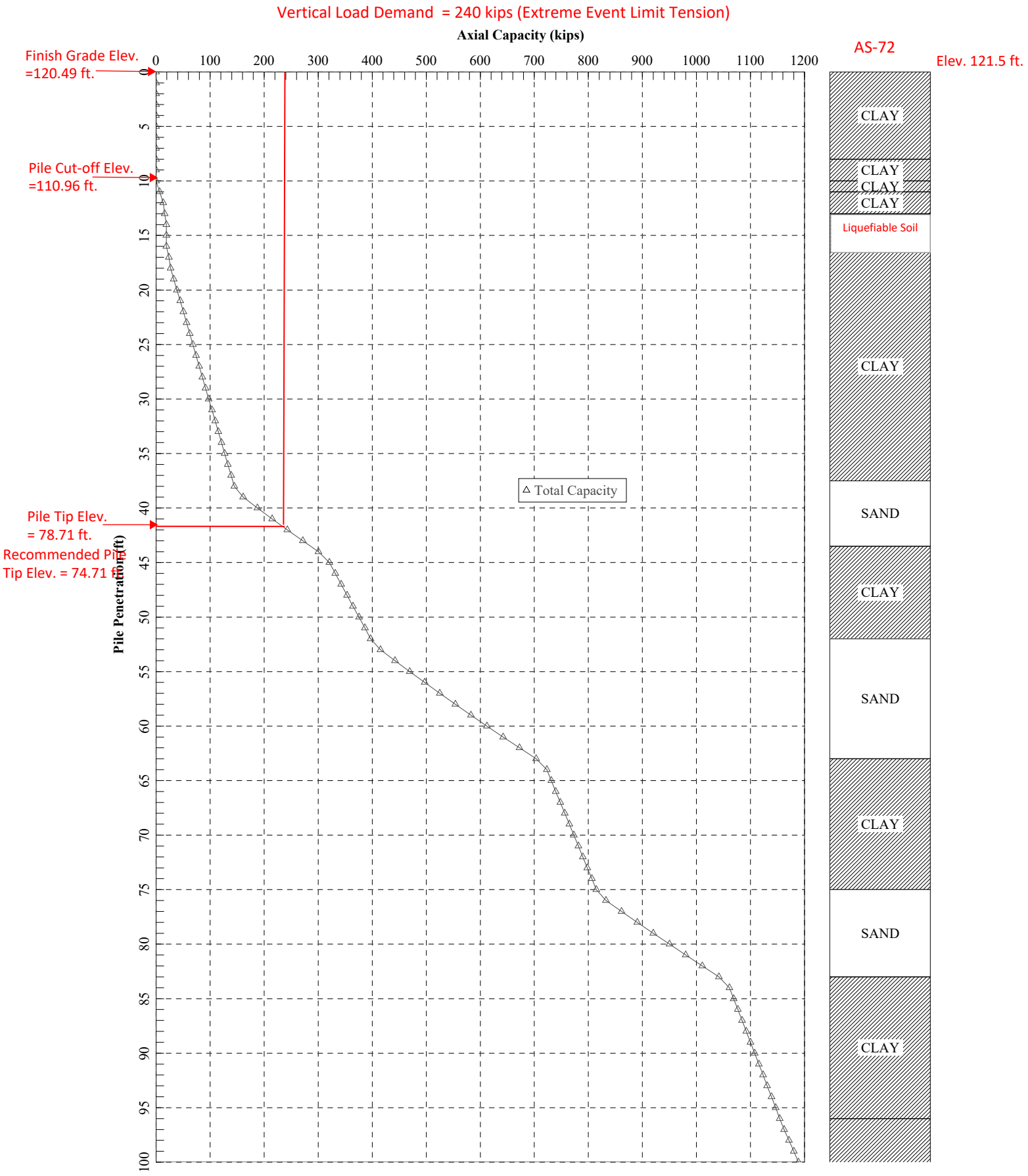


Eastridge to BART Regional Connector Project Bent 33 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 5.4 kips (Downdrag) + 460 kips (Extreme Event Limit Compression) = 470 kips



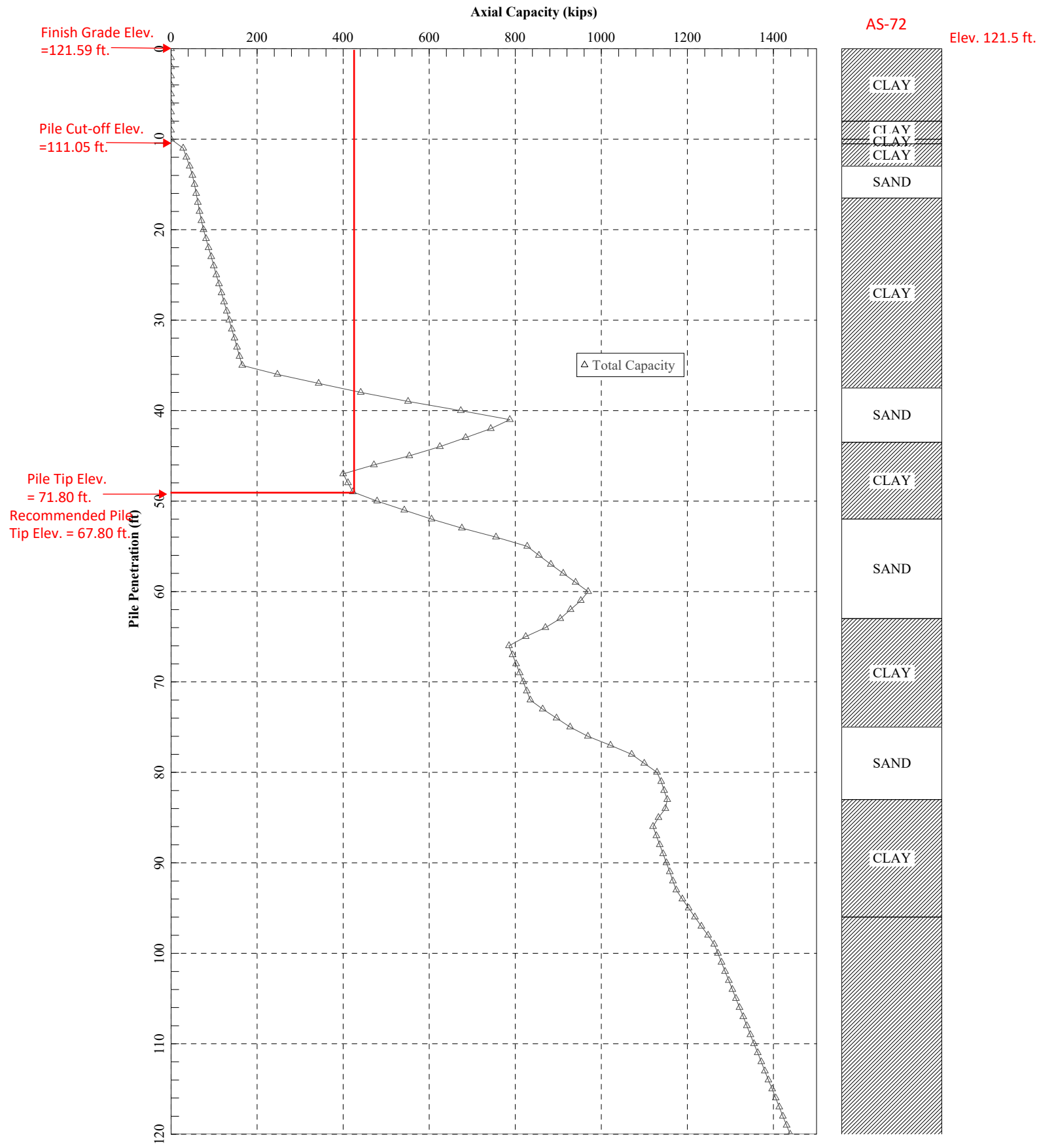
Eastridge to BART Regional Connector Project Bent 33 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)



Eastridge to BART Regional Connector Project Bent 33 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

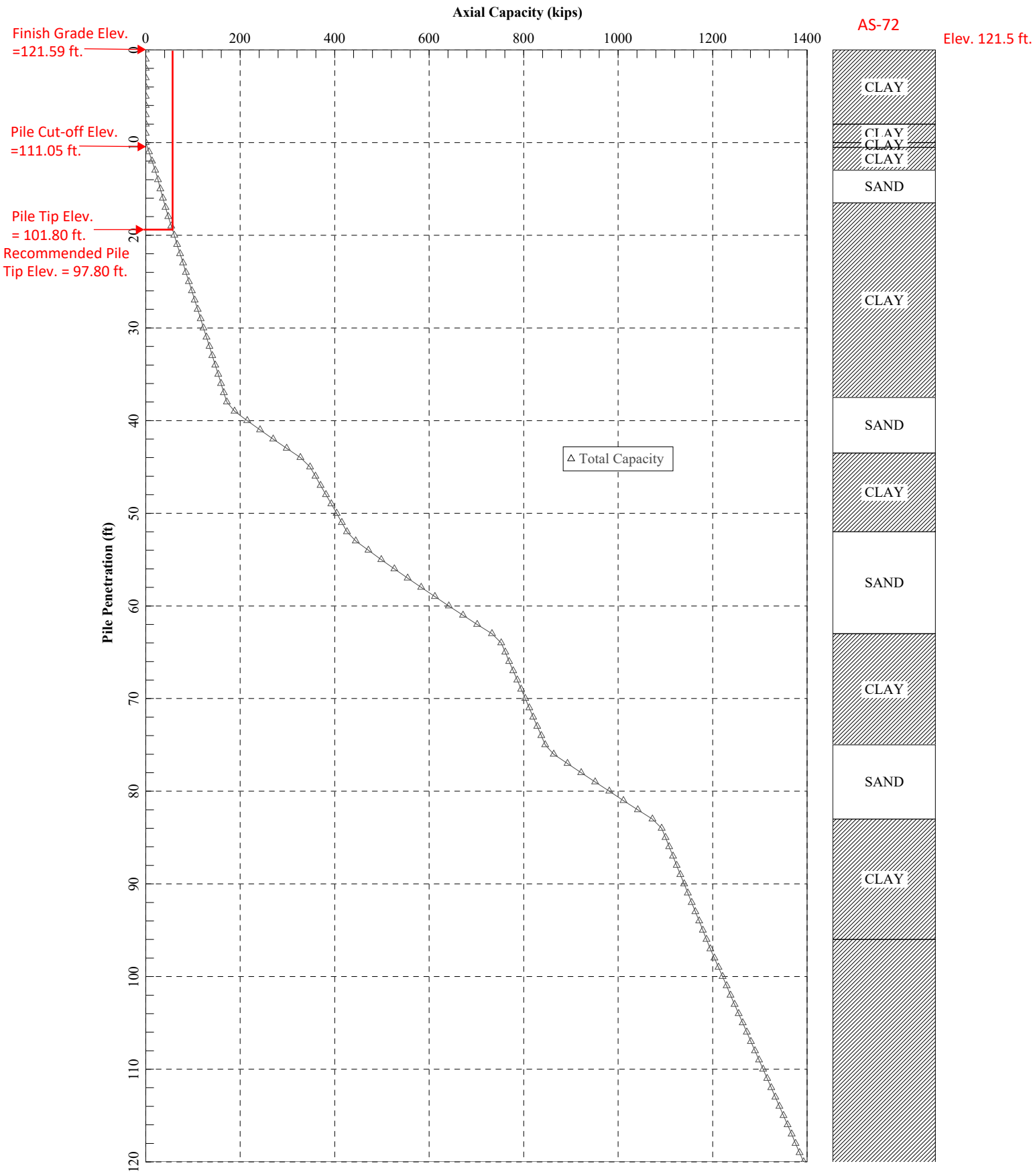
AERIAL GUIDEWAY – BENT 34 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 300 kips (Strength Limit Compression)/0.7 = 430 kips



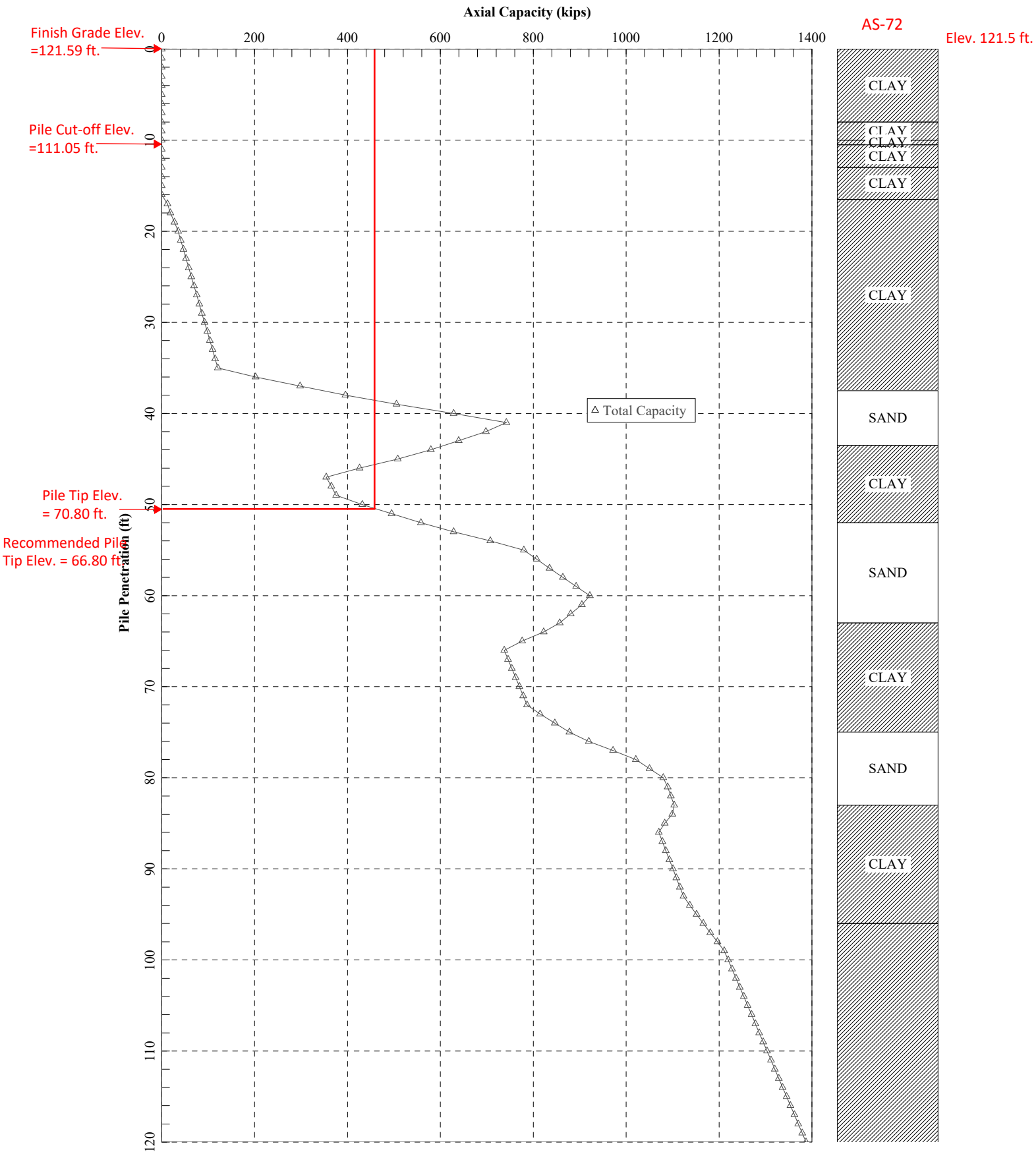
Eastridge to BART Regional Connector Project Bent 34 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 40 kips (Strength Limit Tension)/0.7 = 60 kips



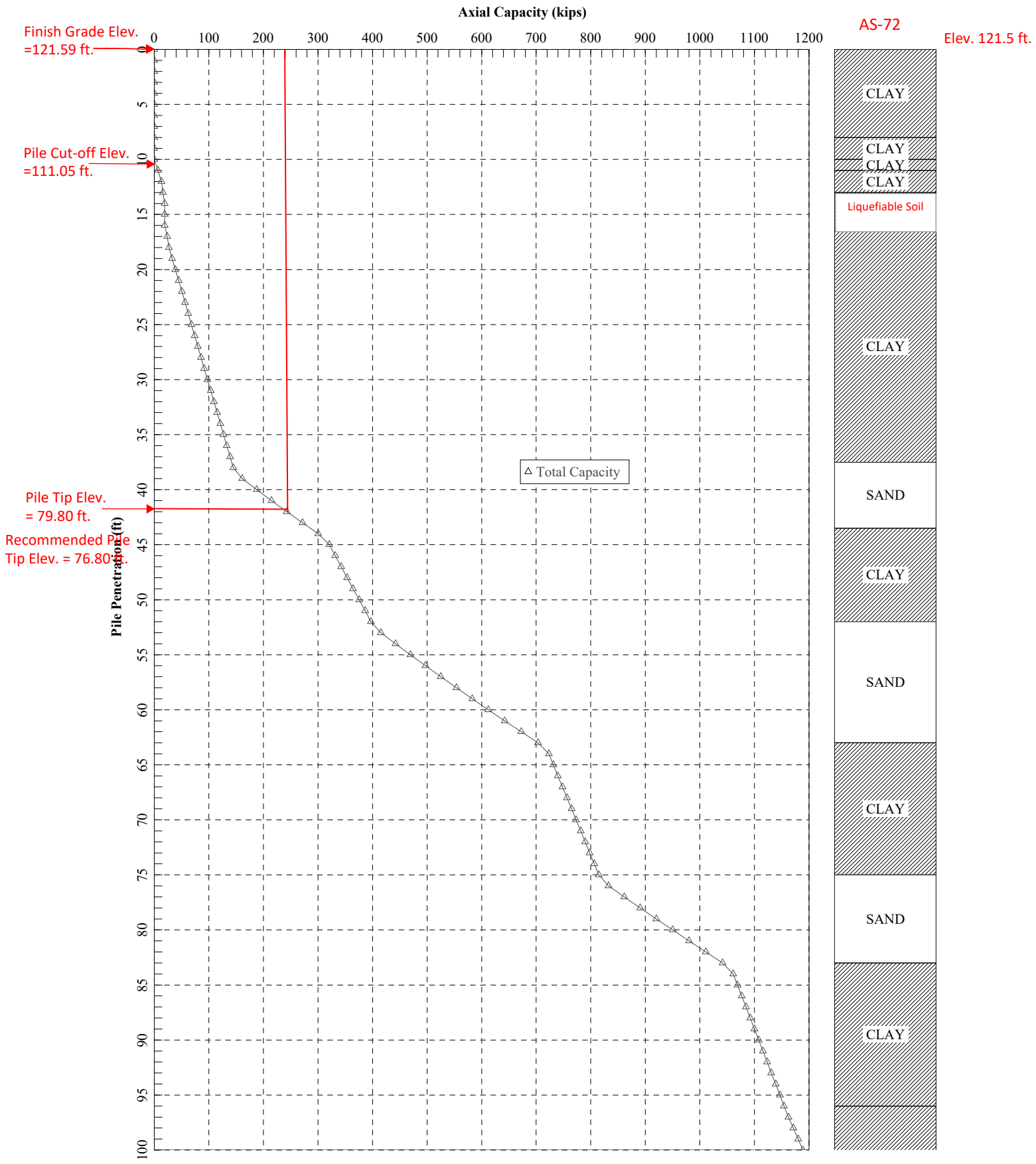
Eastridge to BART Regional Connector Project Bent 34 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 5.4 kips (Downdrag) + 450 kips (Extreme Event Limit Compression) = 460 kips



Eastridge to BART Regional Connector Project Bent 34 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

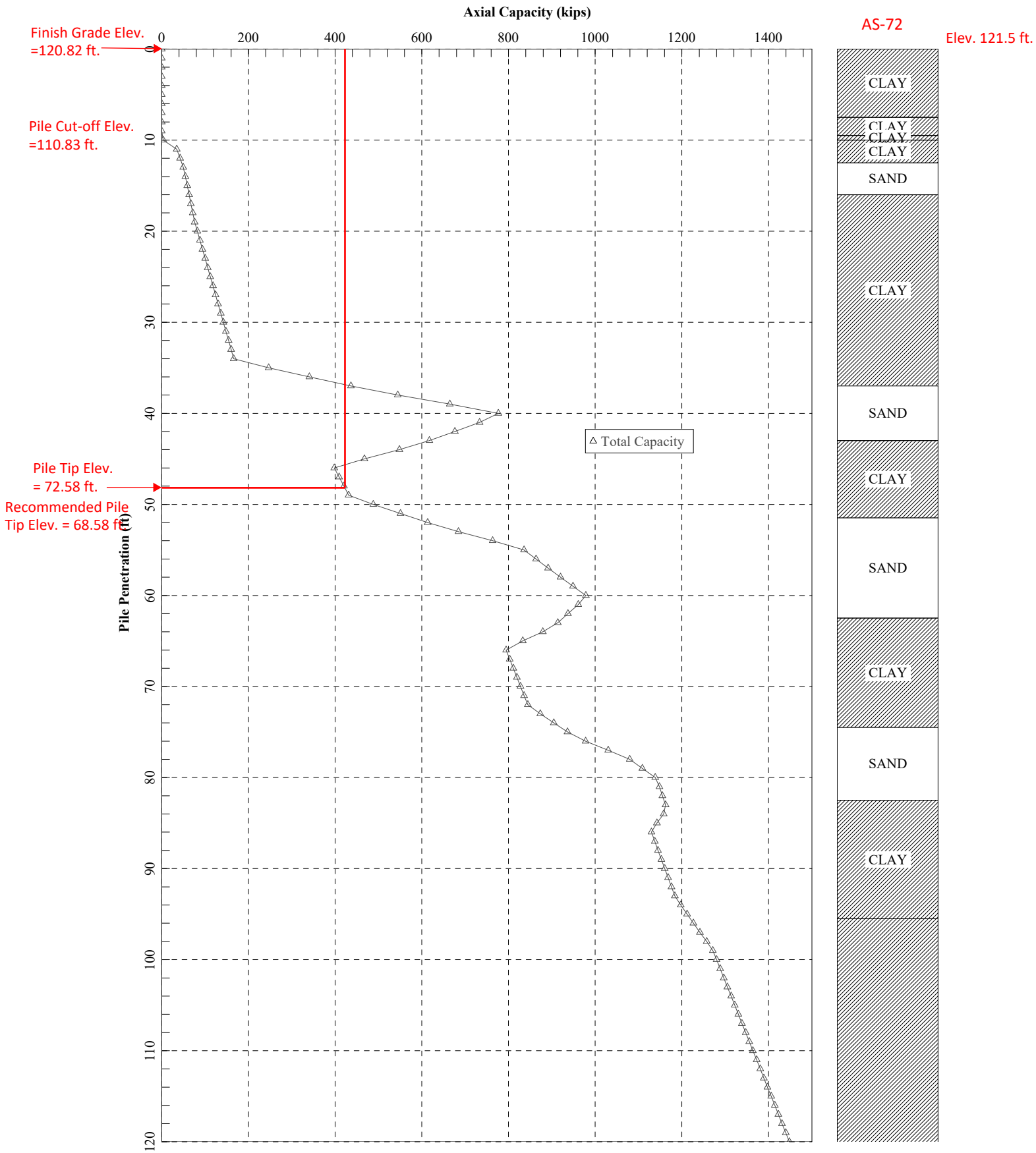
Vertical Load Demand = 240 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 34 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

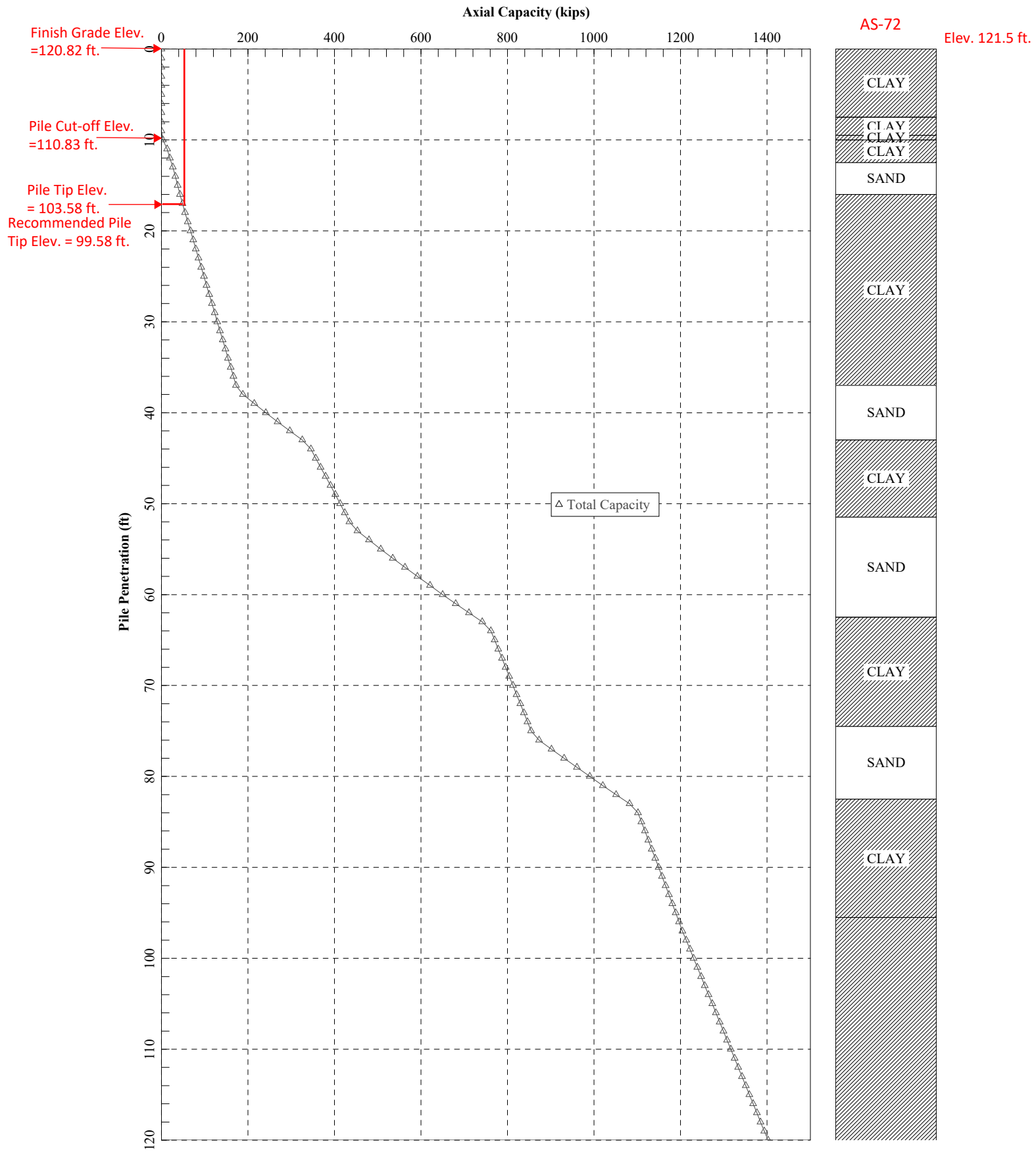
AERIAL GUIDEWAY – BENT 35 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 290 kips (Strength Limit Compression)/0.7 = 420 kips



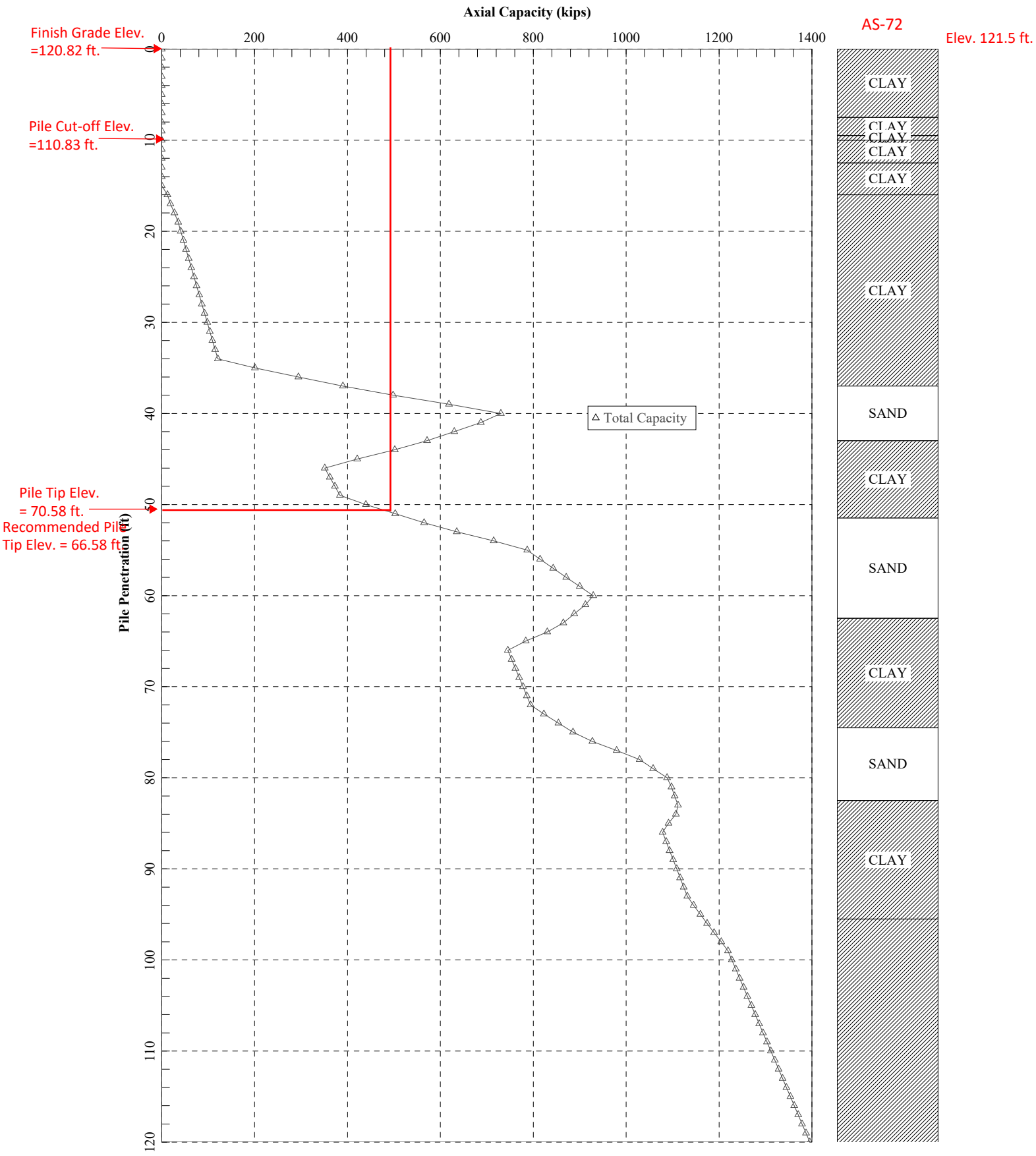
Eastridge to BART Regional Connector Project Bent 35 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 30 kips (Strength Limit Tension)/0.7 = 50 kips



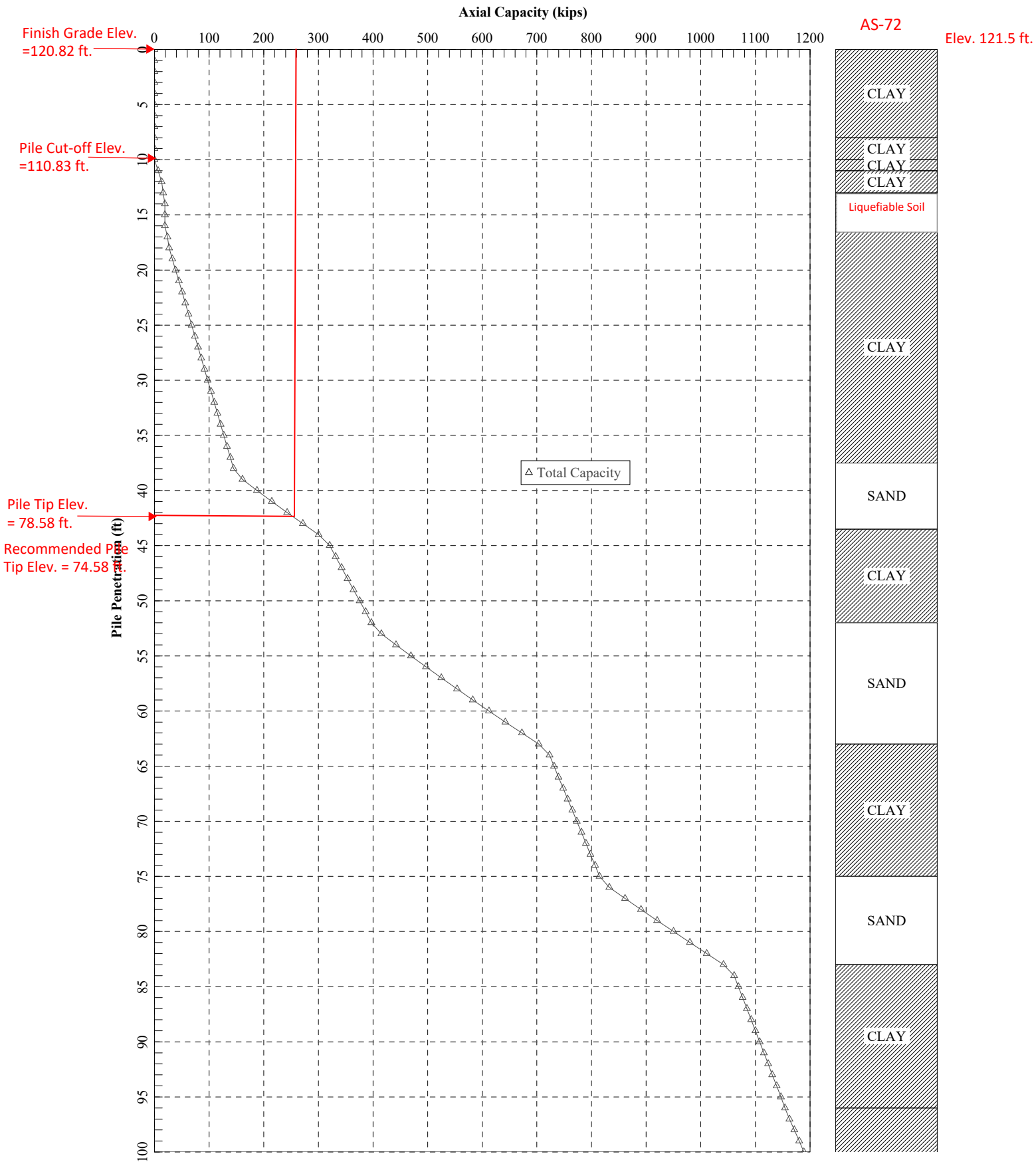
Eastridge to BART Regional Connector Project Bent 35 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 5.4 kips (Downdrag) + 480 kips (Extreme Event Limit Compression) = 490 kips



Eastridge to BART Regional Connector Project Bent 35 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

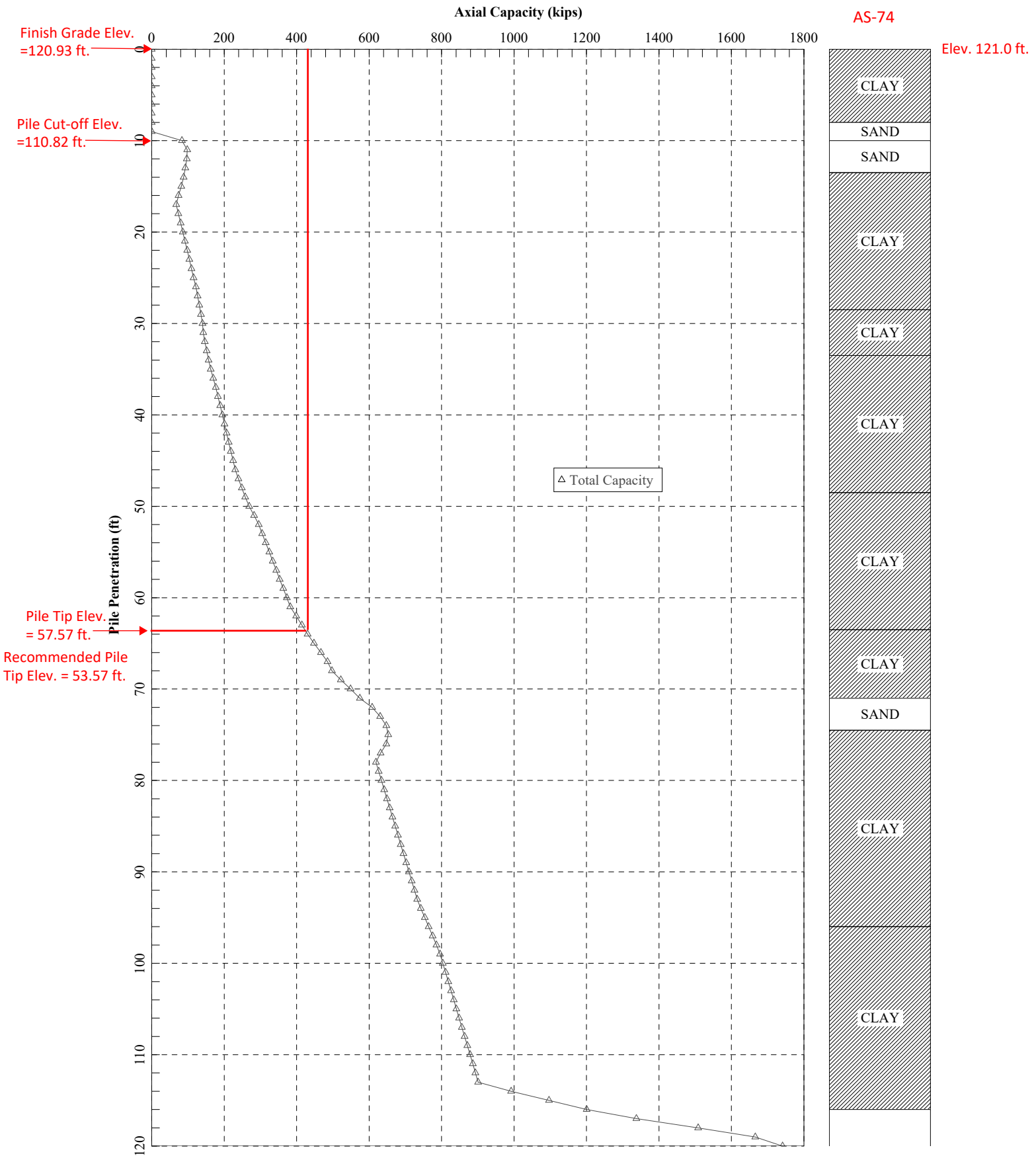
Vertical Load Demand = 260 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 35 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

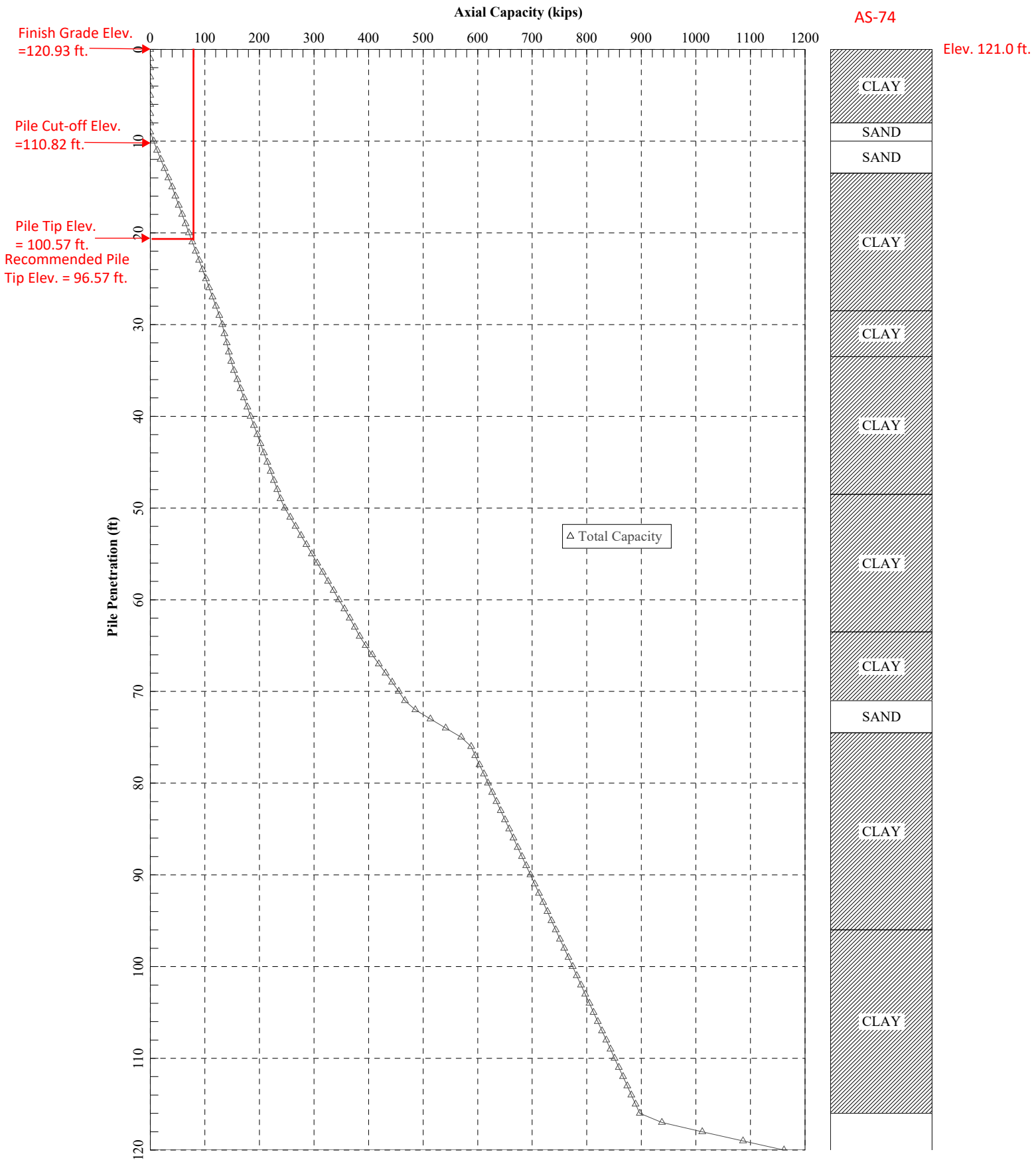
AERIAL GUIDEWAY – BENT 36 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 300 kips (Strength Limit Compression)/0.7 = 430 kips



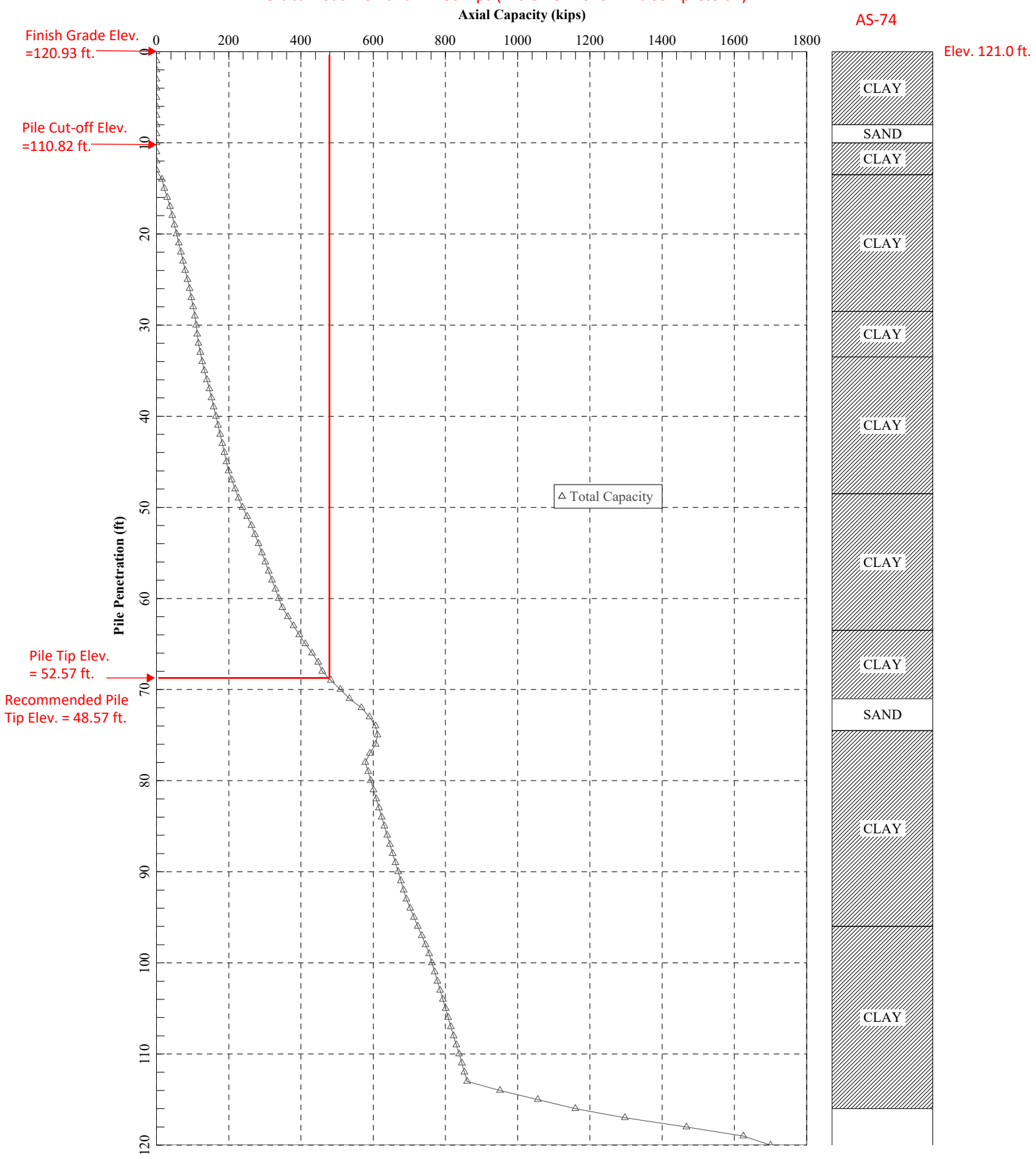
Eastridge to BART Regional Connector Project Bent 36 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 50 kips (Strength Limit Tension)/0.7 = 80 kips

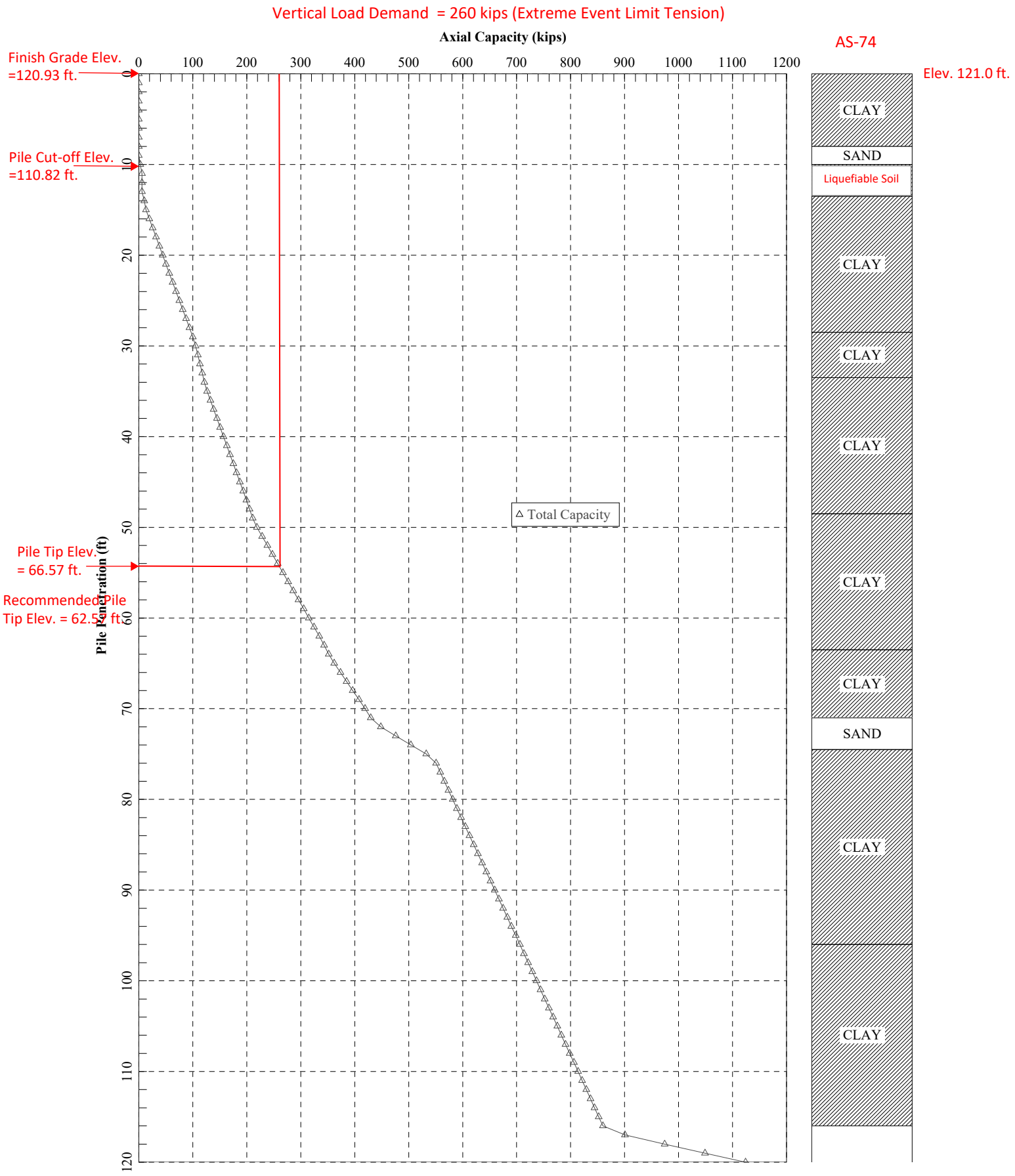


Eastridge to BART Regional Connector Project Bent 36 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 480 kips (Extreme Event Limit Compression)



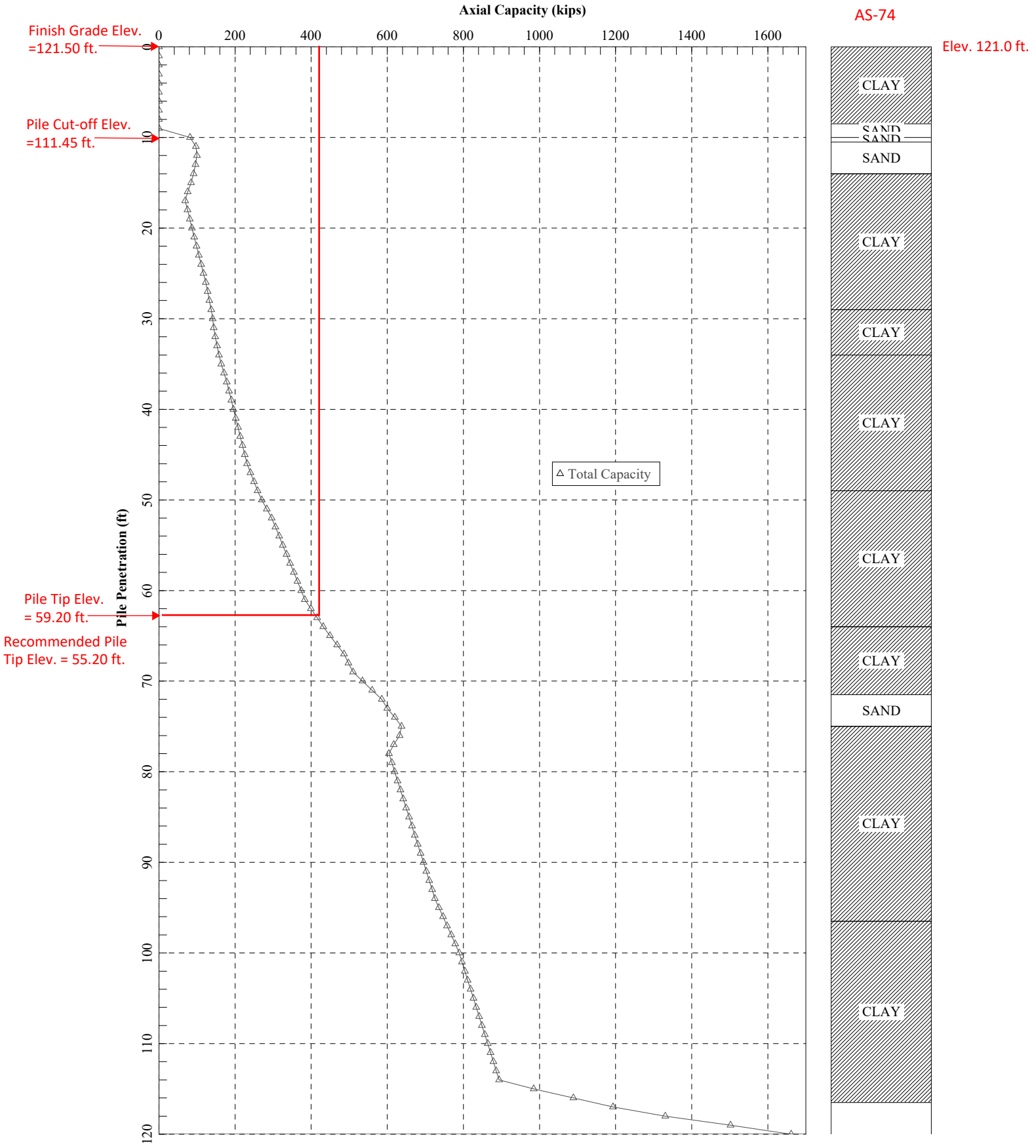
Eastridge to BART Regional Connector Project Bent 36 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)



Eastridge to BART Regional Connector Project Bent 36 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

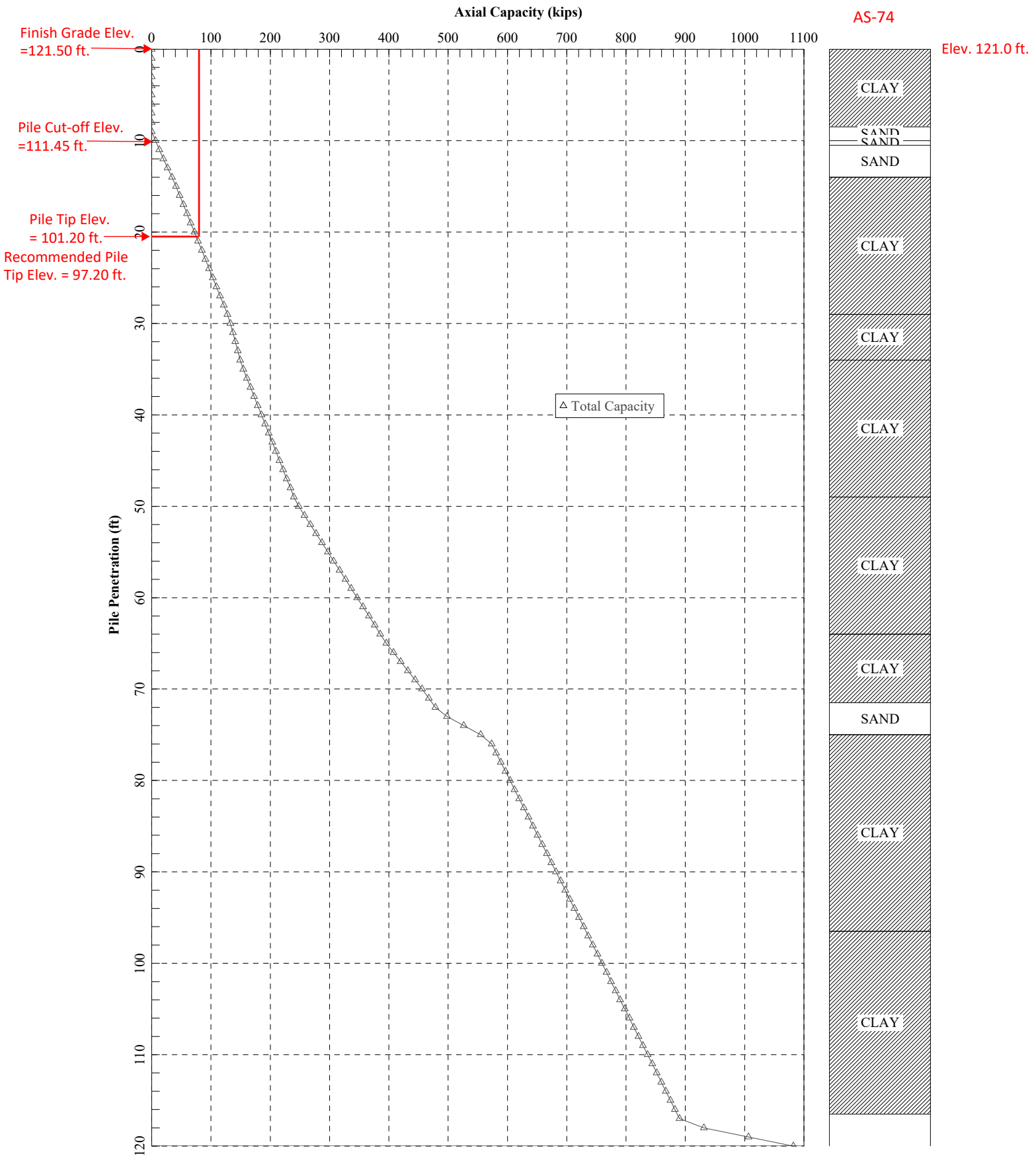
AERIAL GUIDEWAY – BENT 37 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 300 kips (Strength Limit Compression)/0.7 = 430 kips



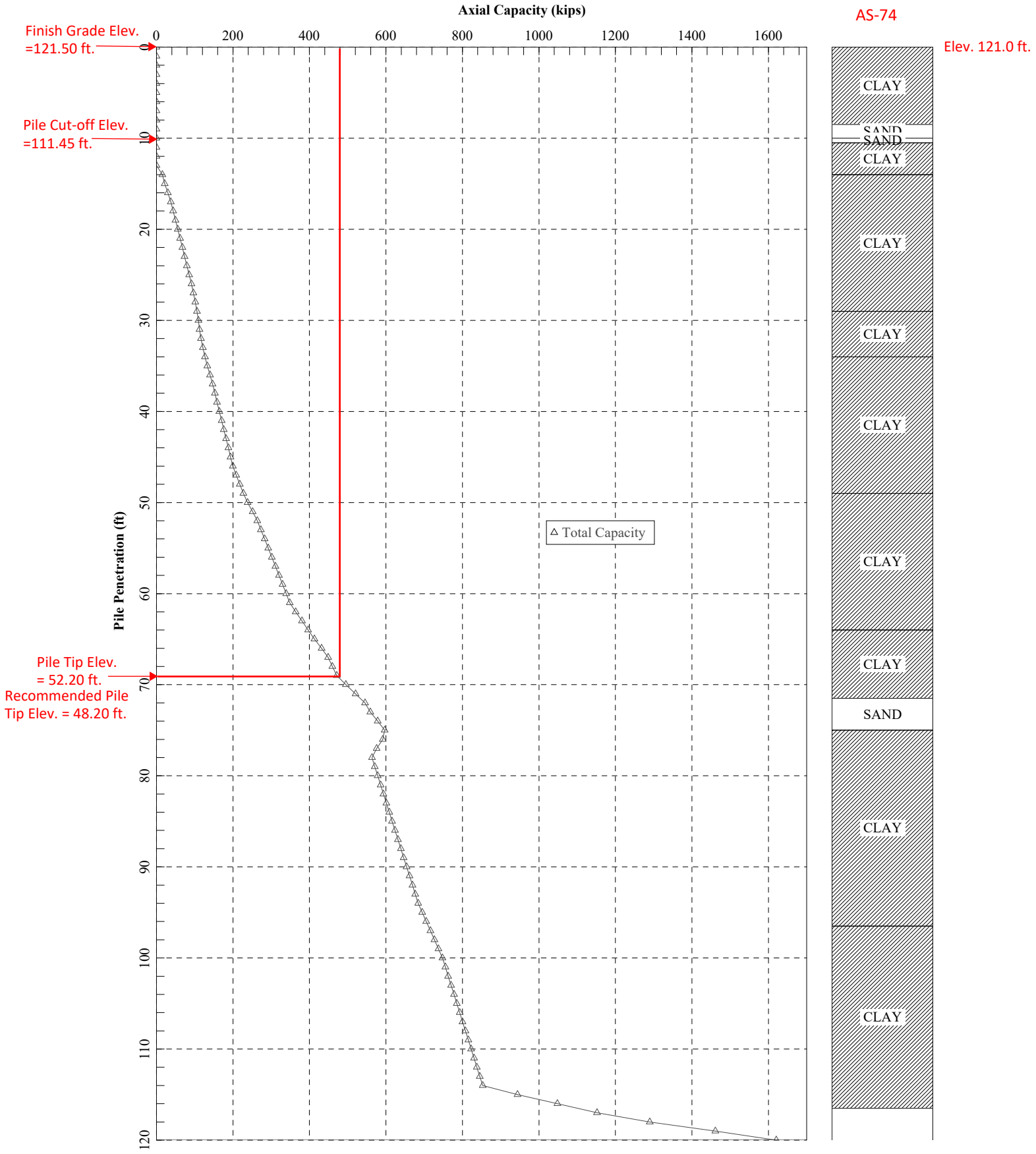
Eastridge to BART Regional Connector Project Bent 37 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 50 kips (Strength Limit Tension)/0.7 = 80 kips

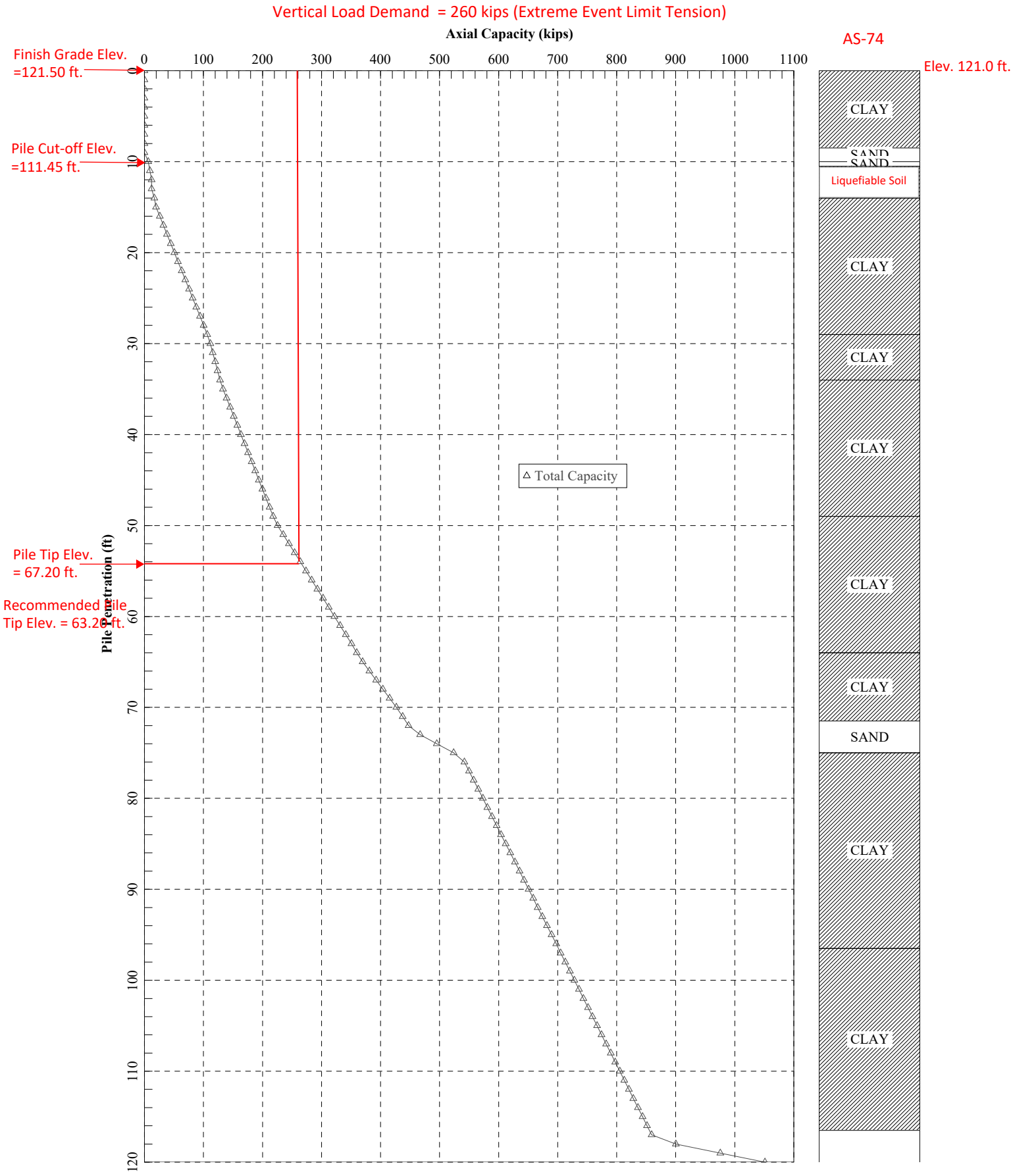


Eastridge to BART Regional Connector Project Bent 37 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 480 kips (Extreme Event Limit Compression)



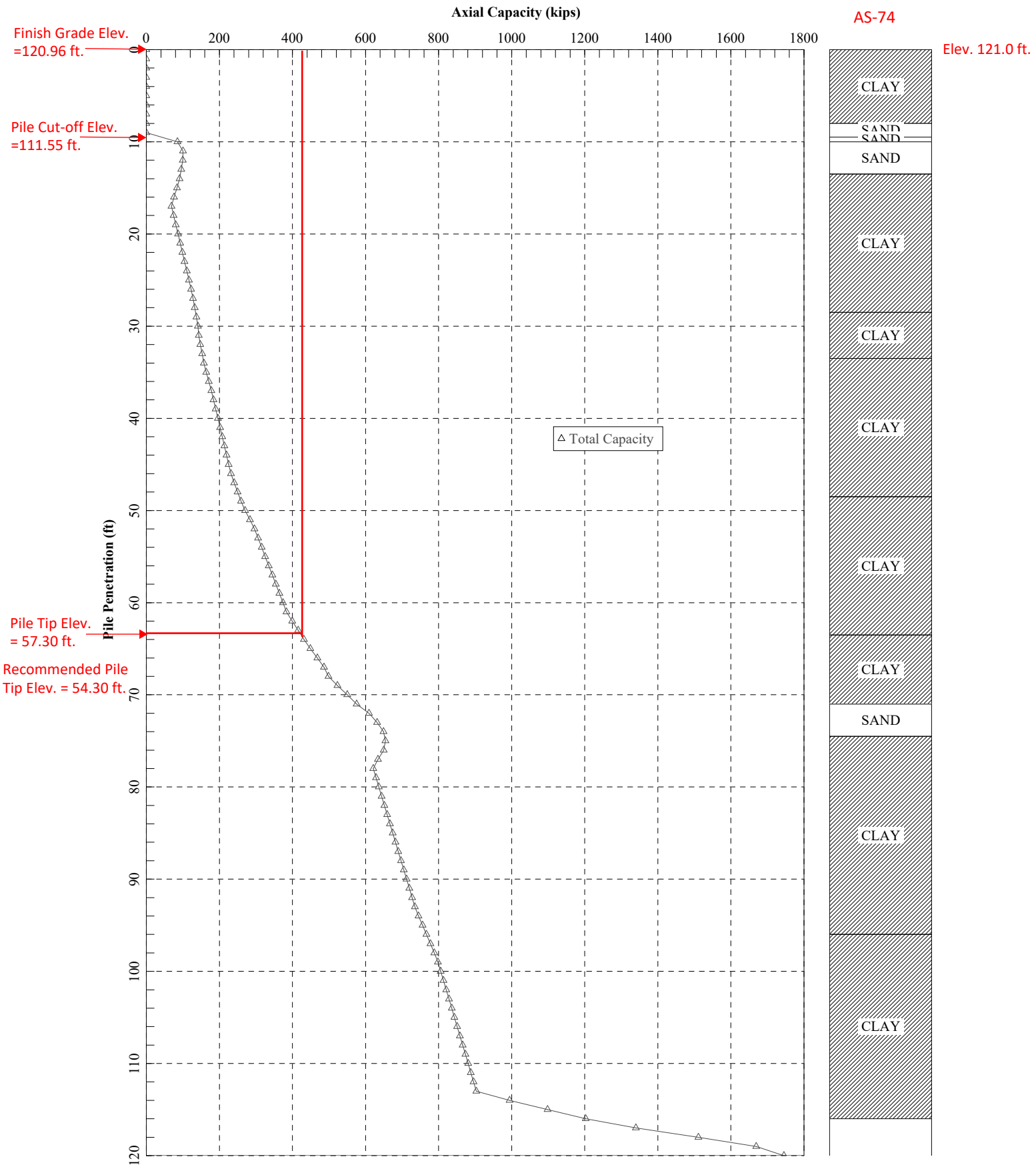
Eastridge to BART Regional Connector Project Bent 37 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)



Eastridge to BART Regional Connector Project Bent 37 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

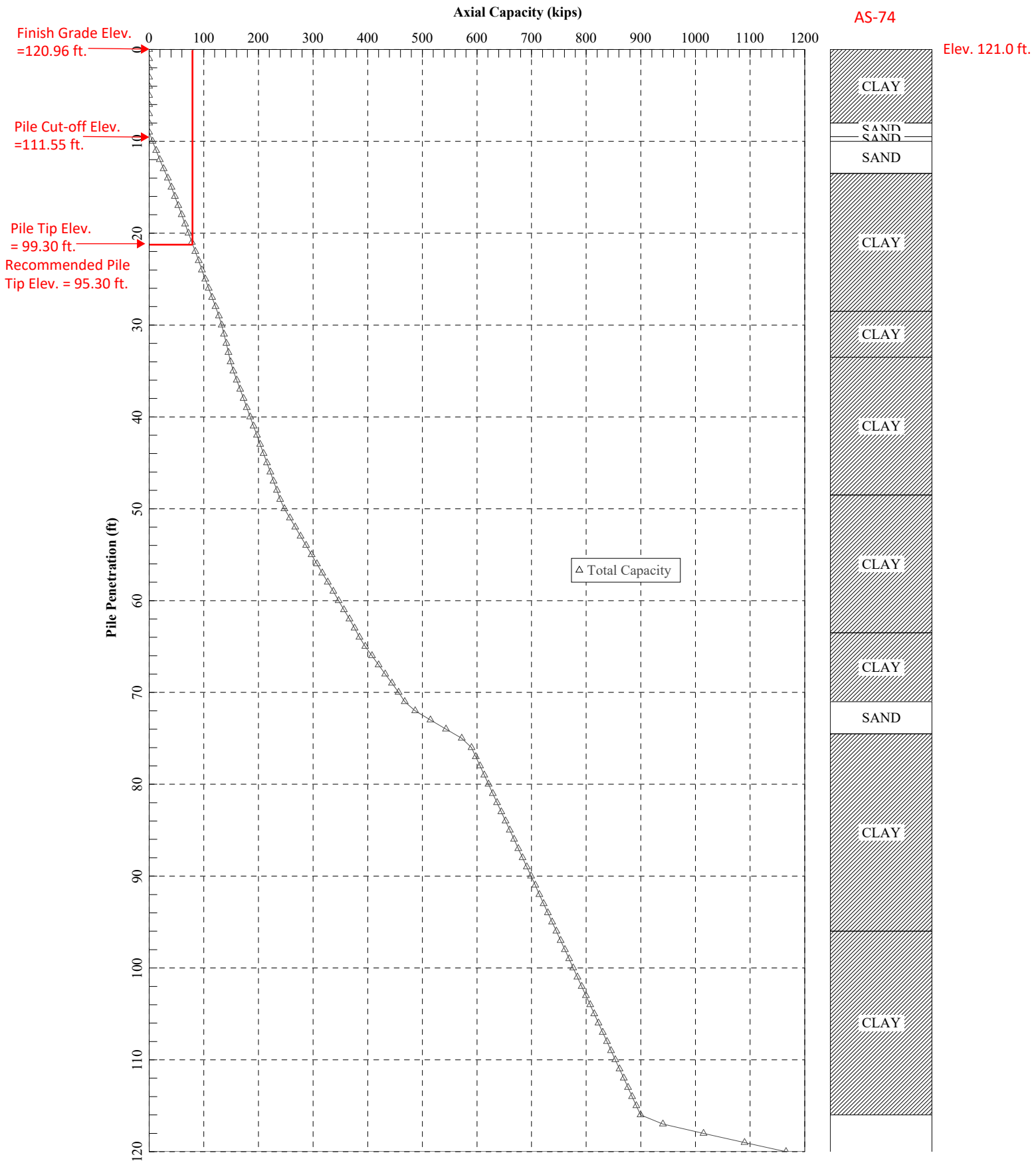
AERIAL GUIDEWAY – BENT 38 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 300 kips (Strength Limit Compression)/0.7 = 430 kips



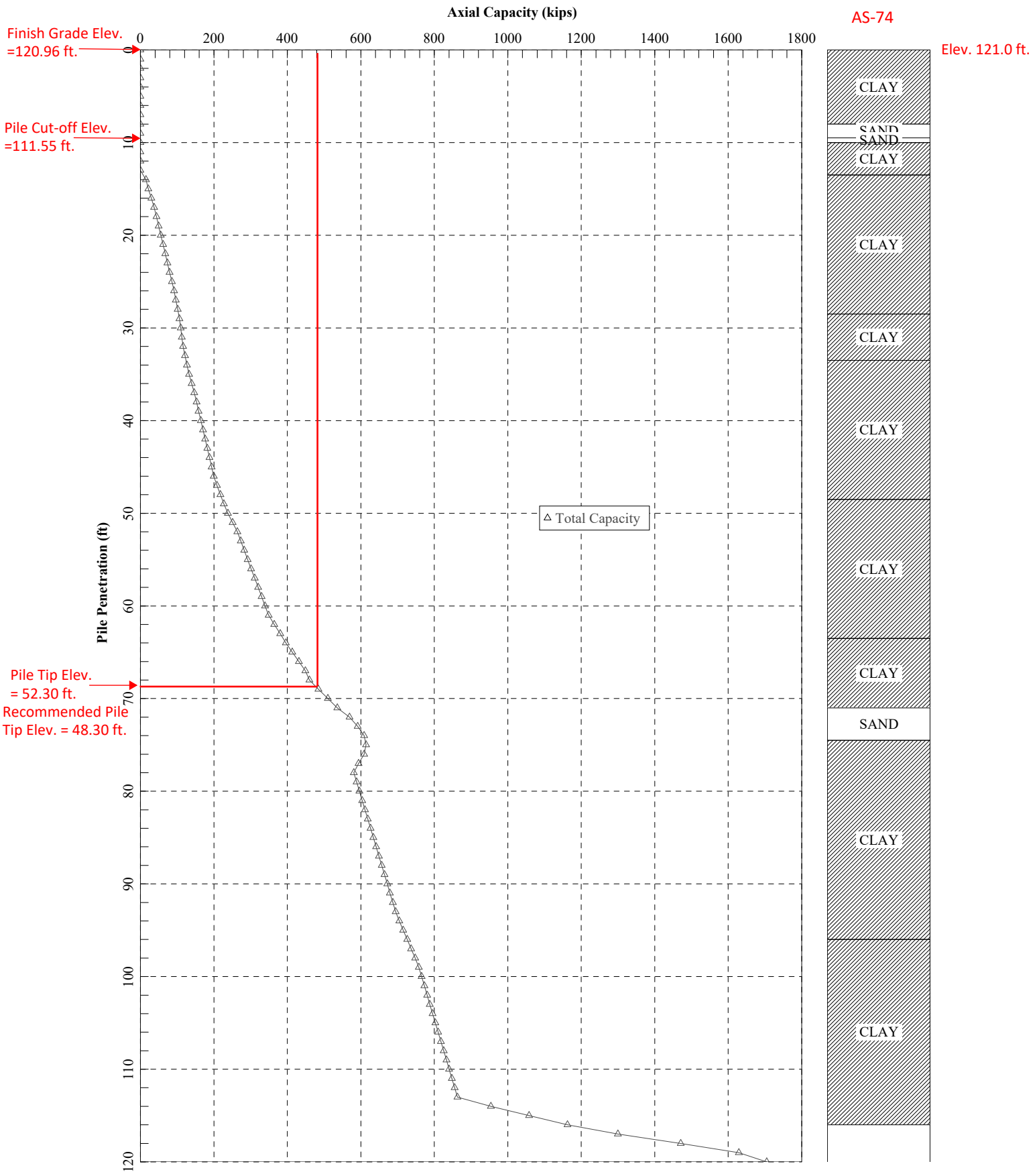
Eastridge to BART Regional Connector Project Bent 38 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 50 kips (Strength Limit Tension)/0.7 = 80 kips

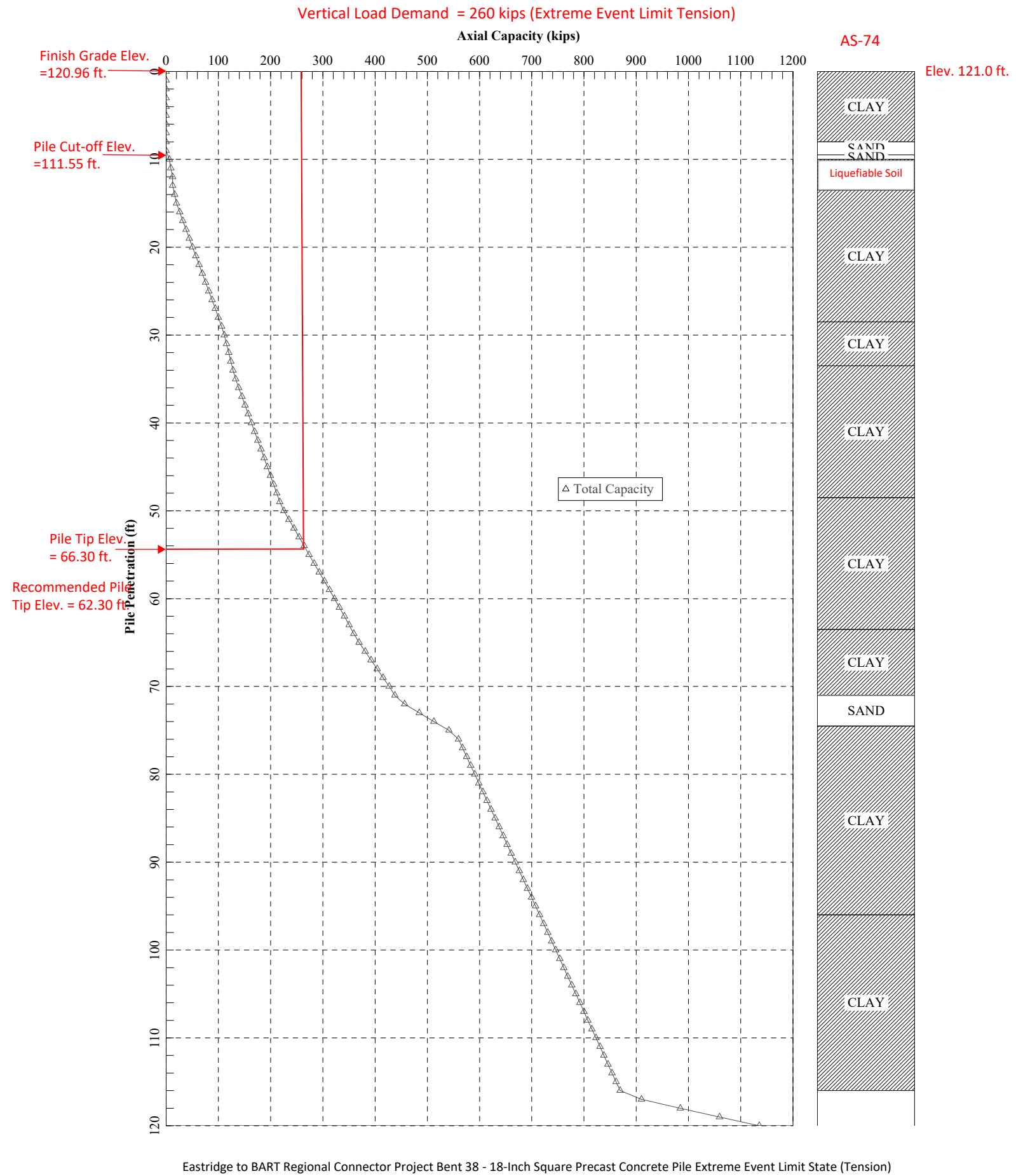


Eastridge to BART Regional Connector Project Bent 38 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 480 kips (Extreme Event Limit Compression)



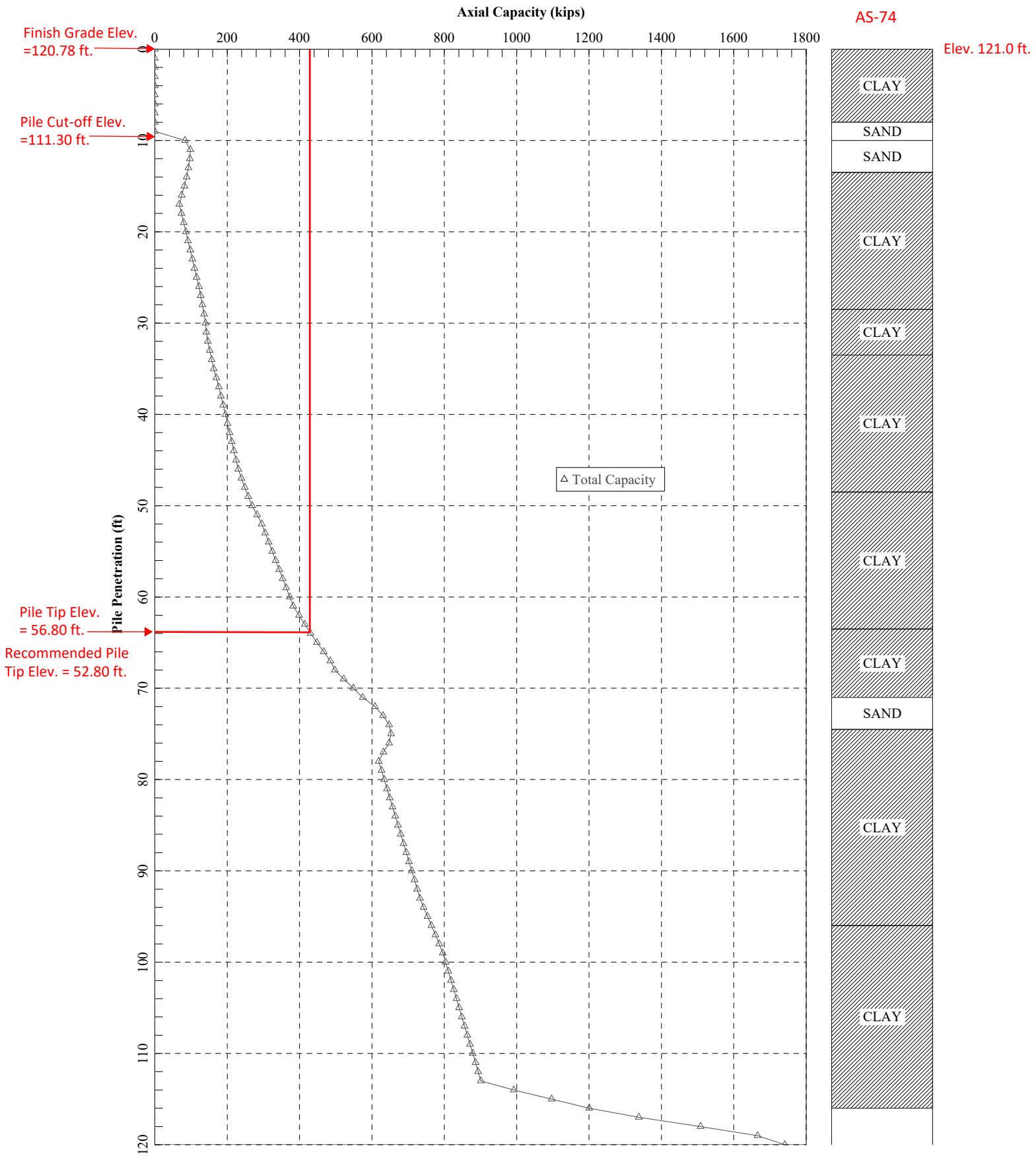
Eastridge to BART Regional Connector Project Bent 38 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)



Eastridge to BART Regional Connector Project Bent 38 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

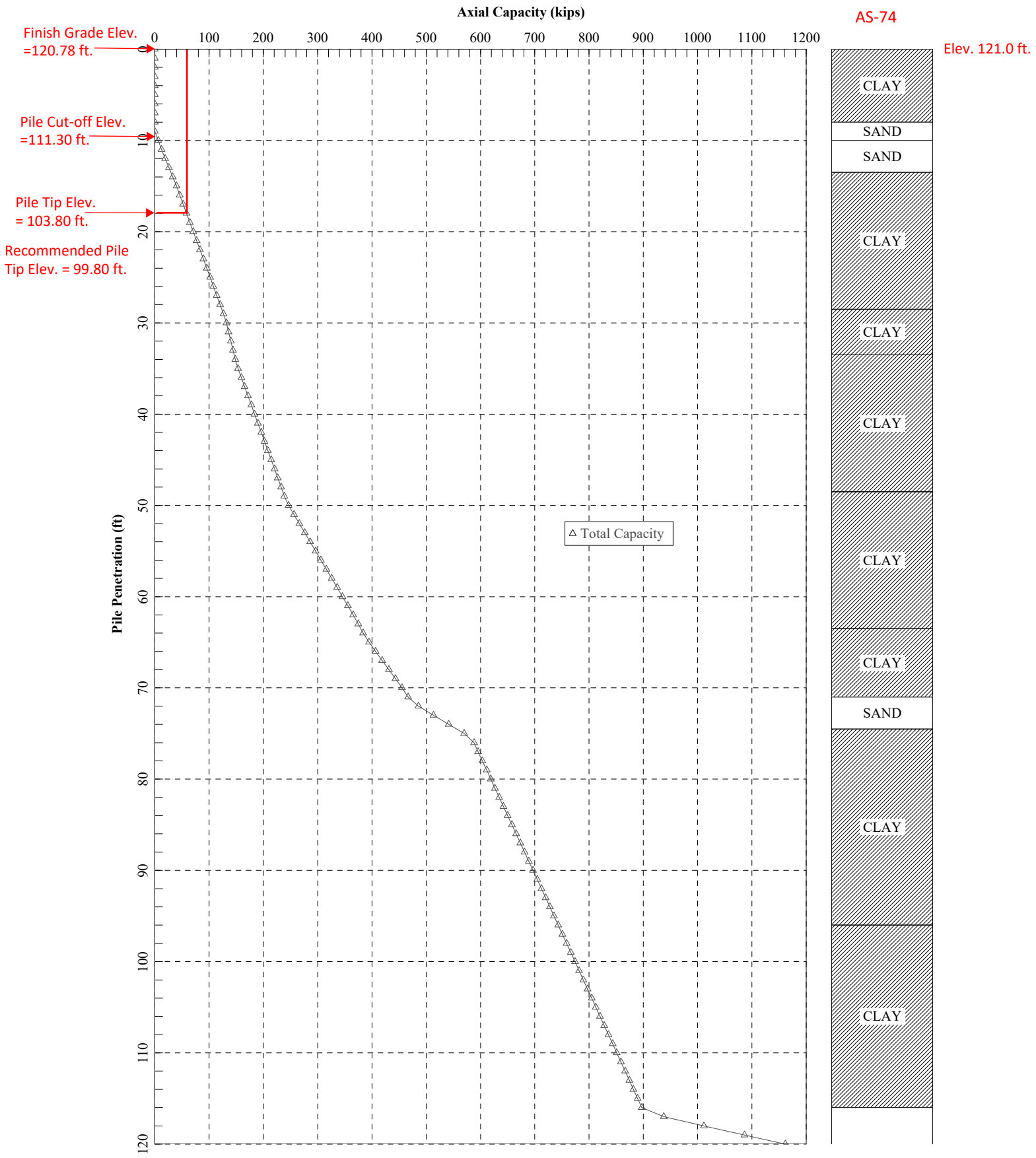
AERIAL GUIDEWAY – BENT 39 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 300 kips (Strength Limit Compression)/0.7 = 430 kips



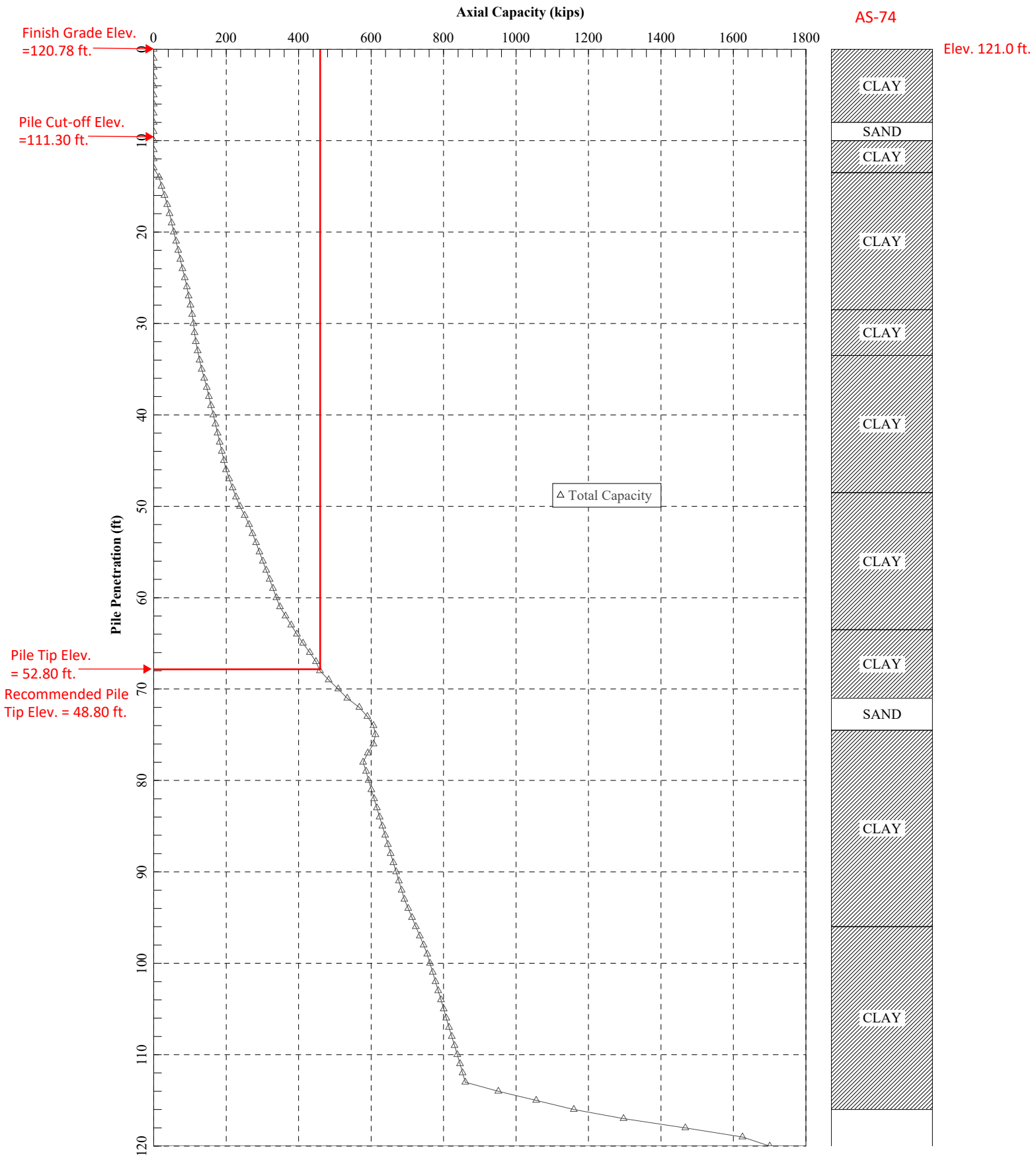
Eastridge to BART Regional Connector Project Bent 39 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 40 kips (Strength Limit Tension)/0.7 = 60 kips



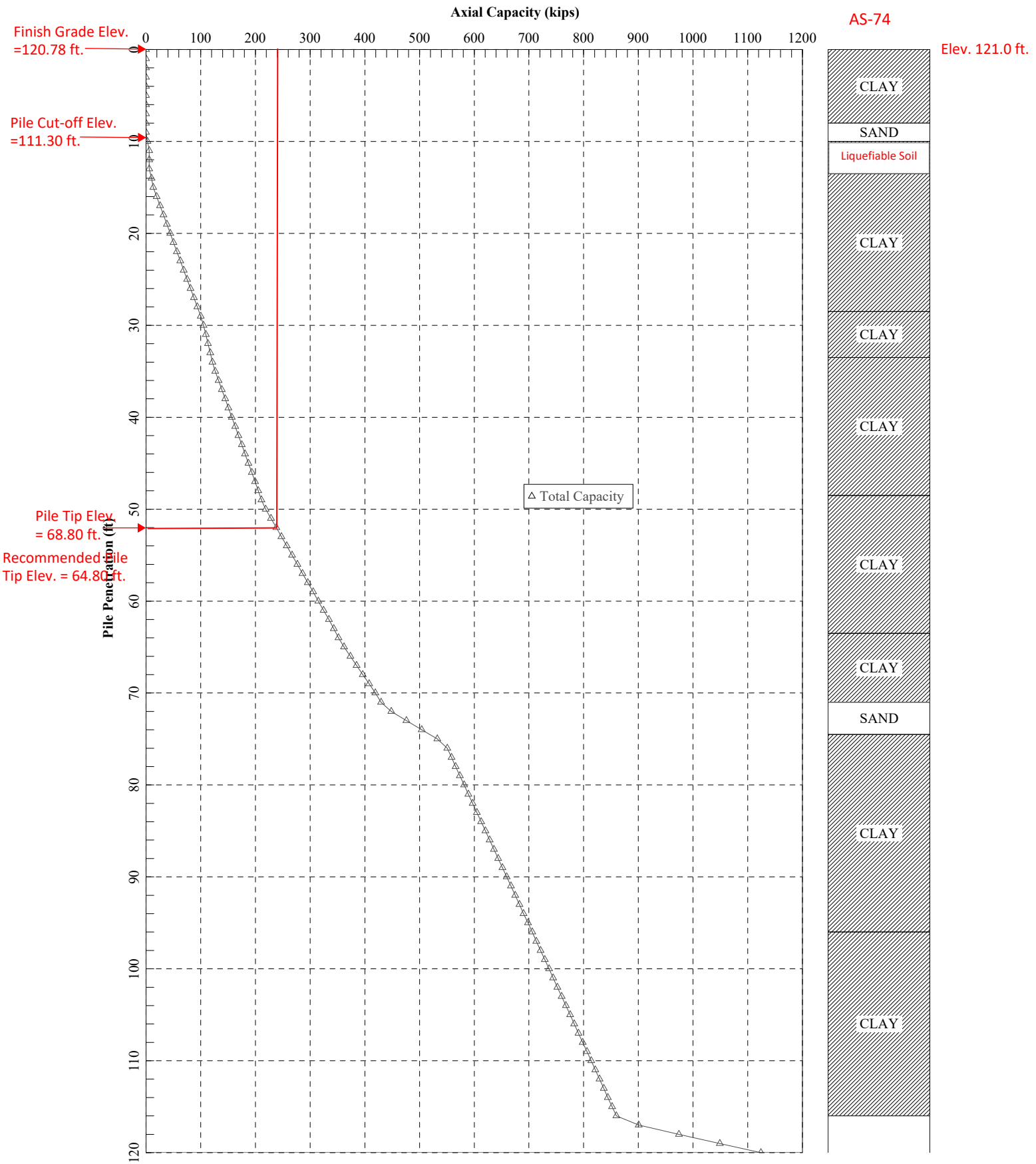
Eastridge to BART Regional Connector Project Bent 39 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 460 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project Bent 39 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

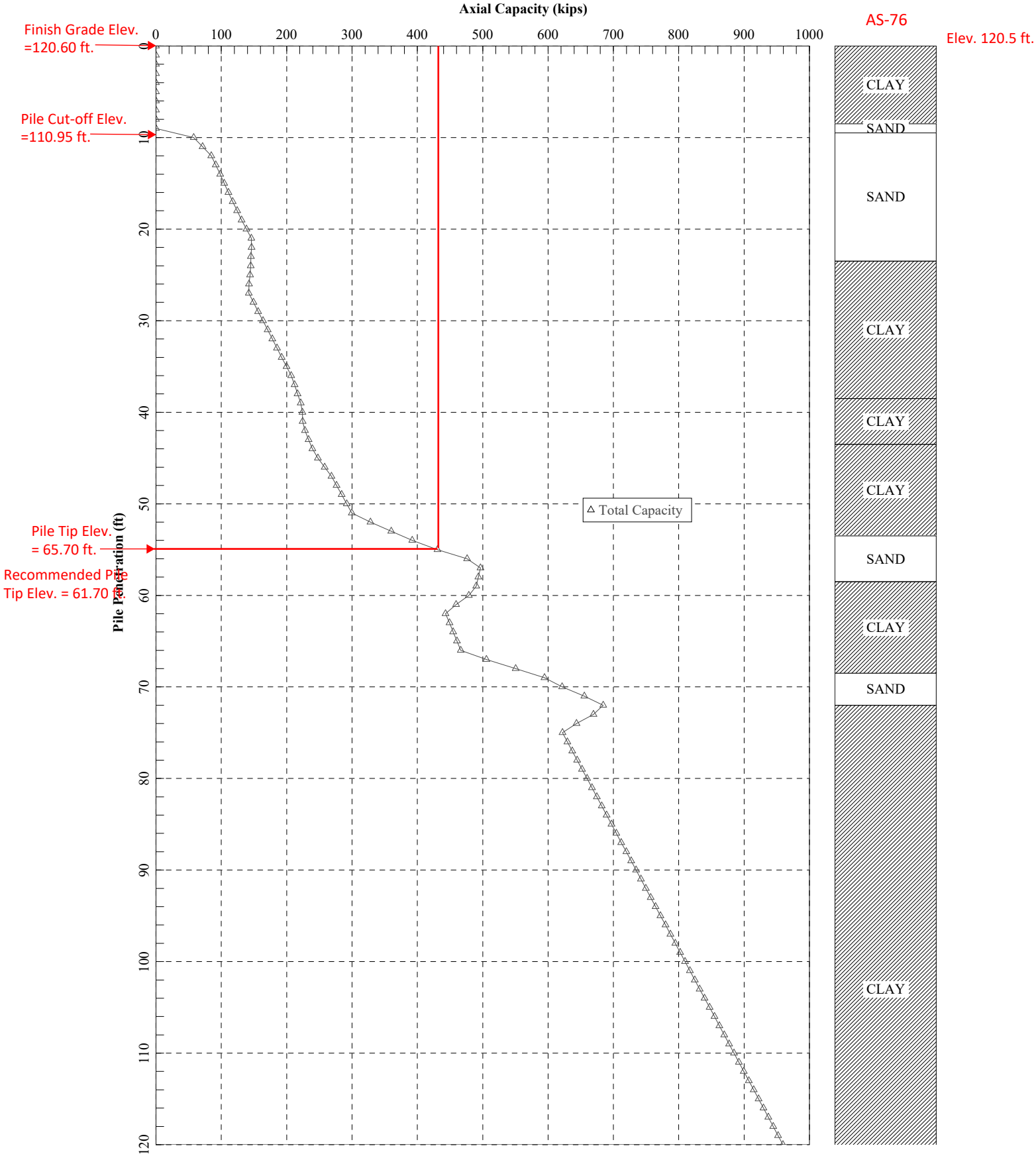
Vertical Load Demand = 240 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 39 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

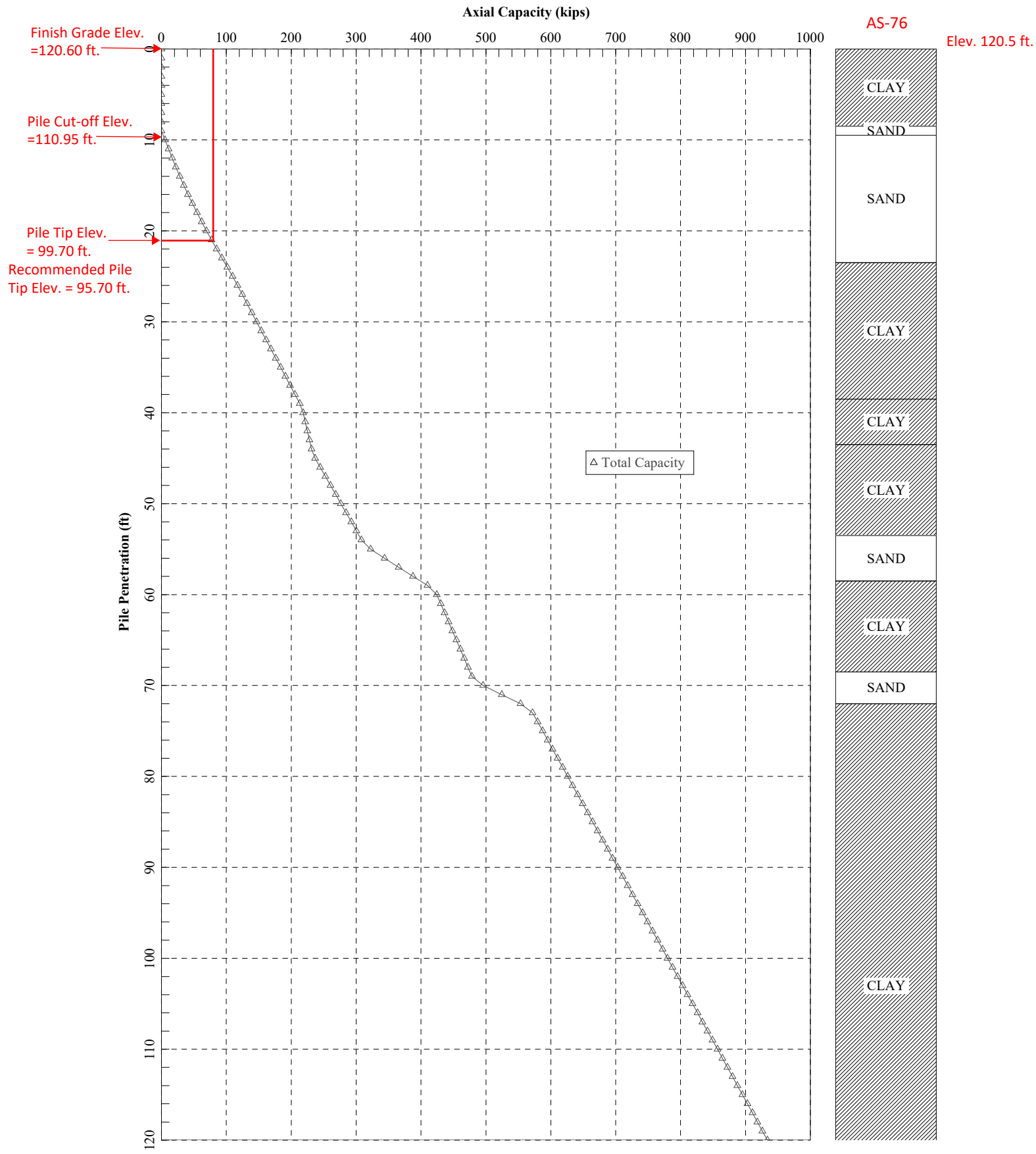
AERIAL GUIDEWAY – BENT 40 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 300 kips (Strength Limit Compression)/0.7 = 430 kips



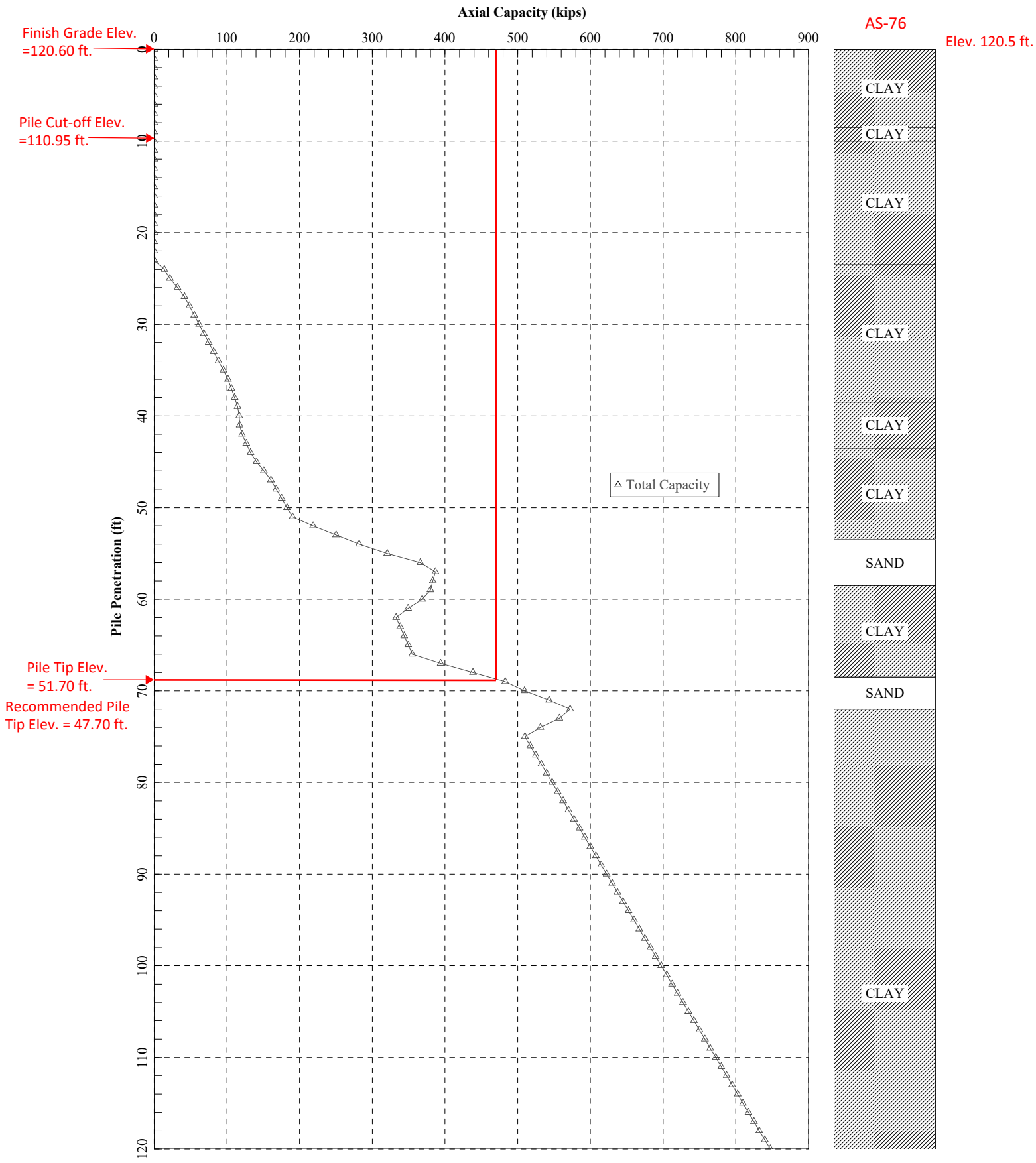
Eastridge to BART Regional Connector Project Bent 40 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 50 kips (Strength Limit Tension)/0.7 = 80 kips

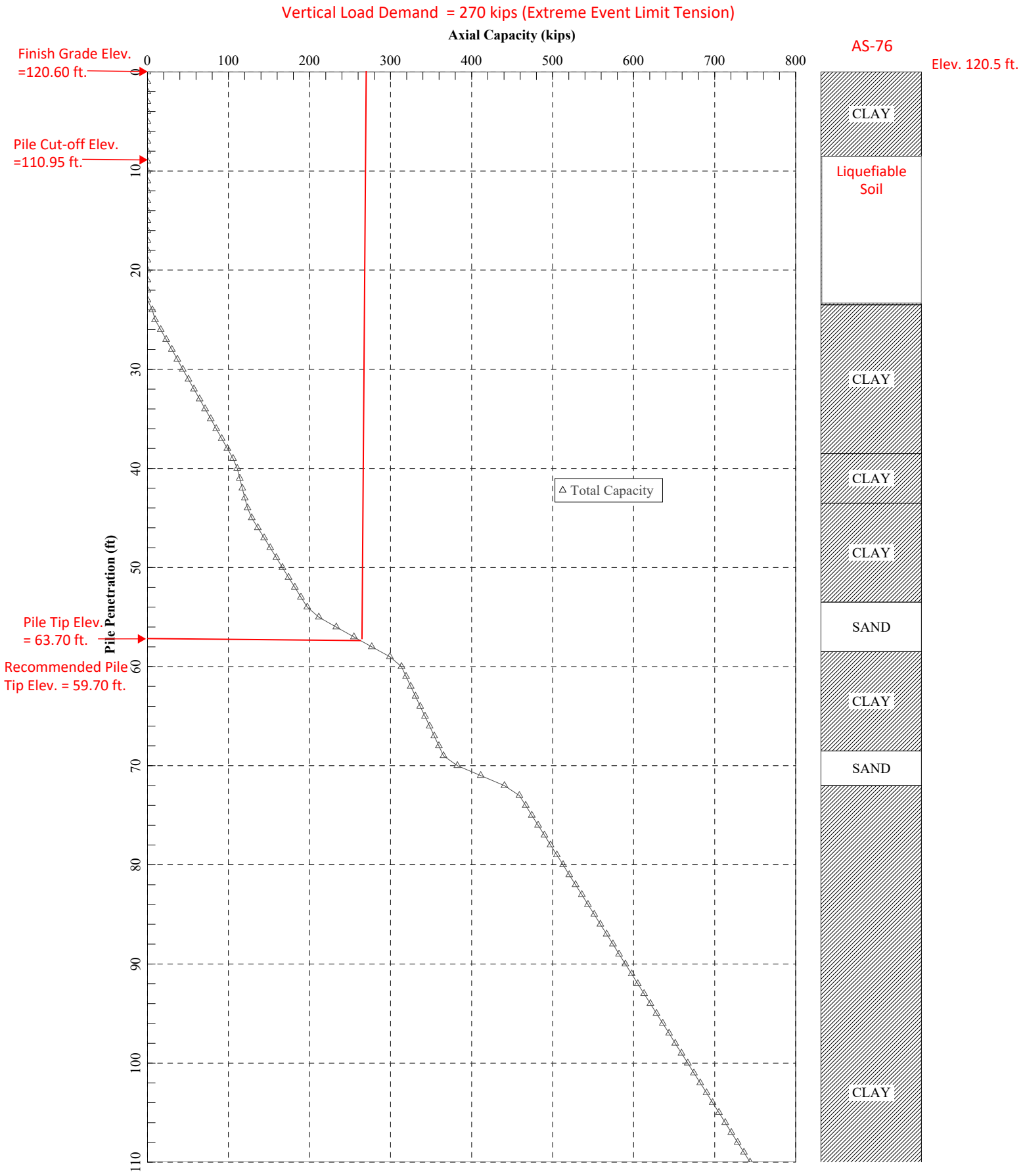


Eastridge to BART Regional Connector Project Bent 40 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 470 kips (Extreme Event Limit Compression)



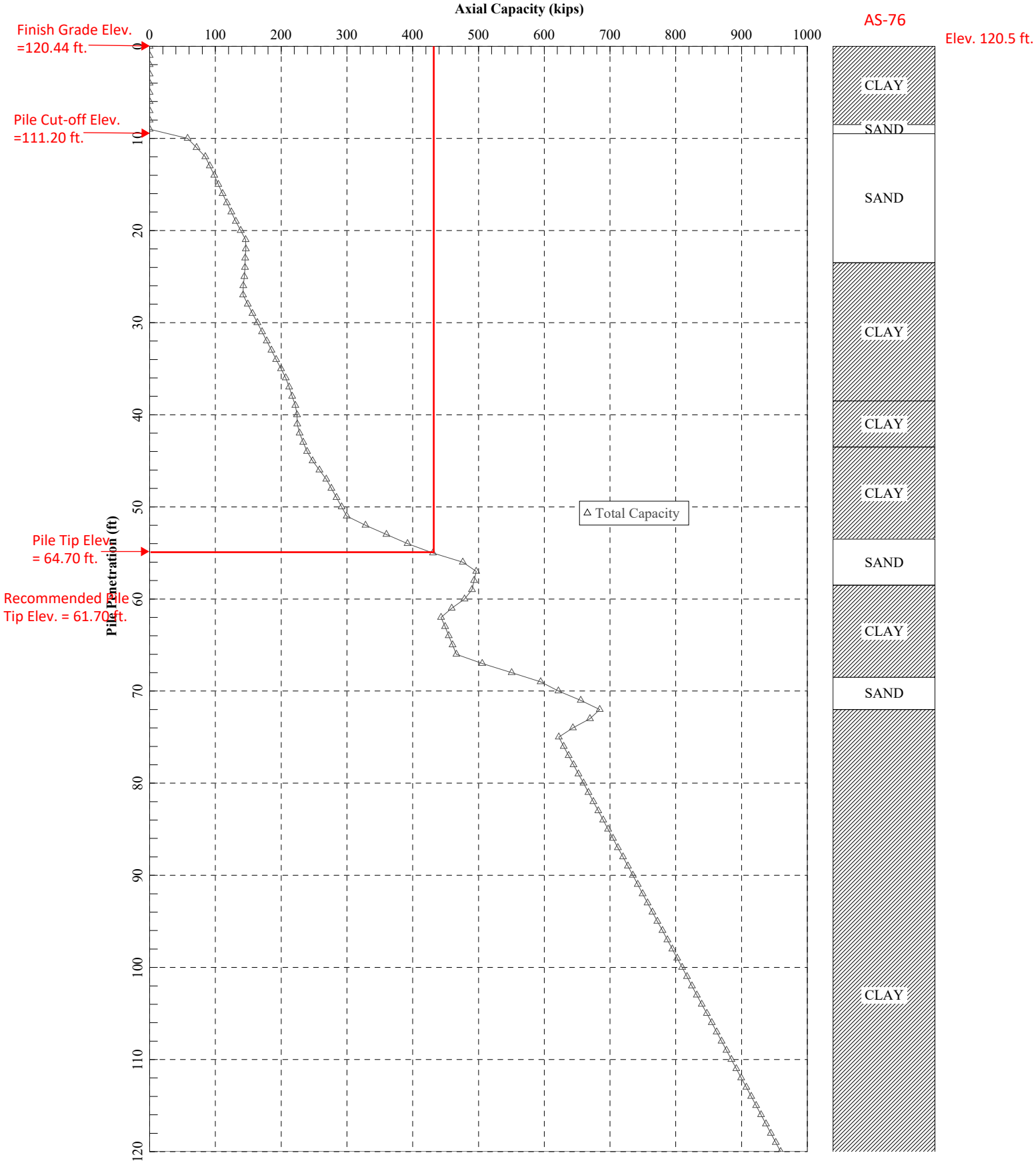
Eastridge to BART Regional Connector Project Bent 40 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)



Eastridge to BART Regional Connector Project Bent 40 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

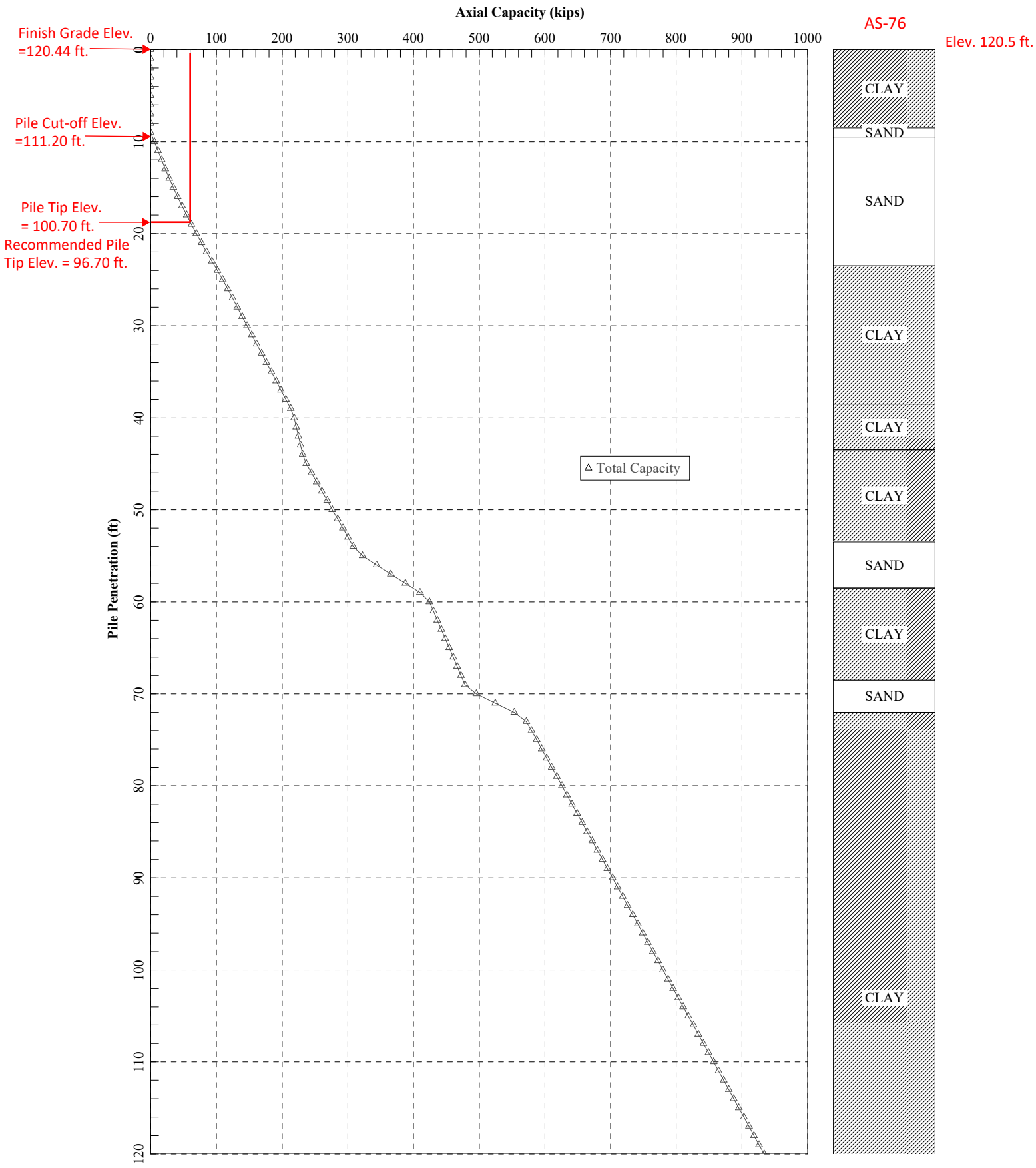
AERIAL GUIDEWAY – BENT 41 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 300 kips (Strength Limit Compression)/0.7 = 430 kips



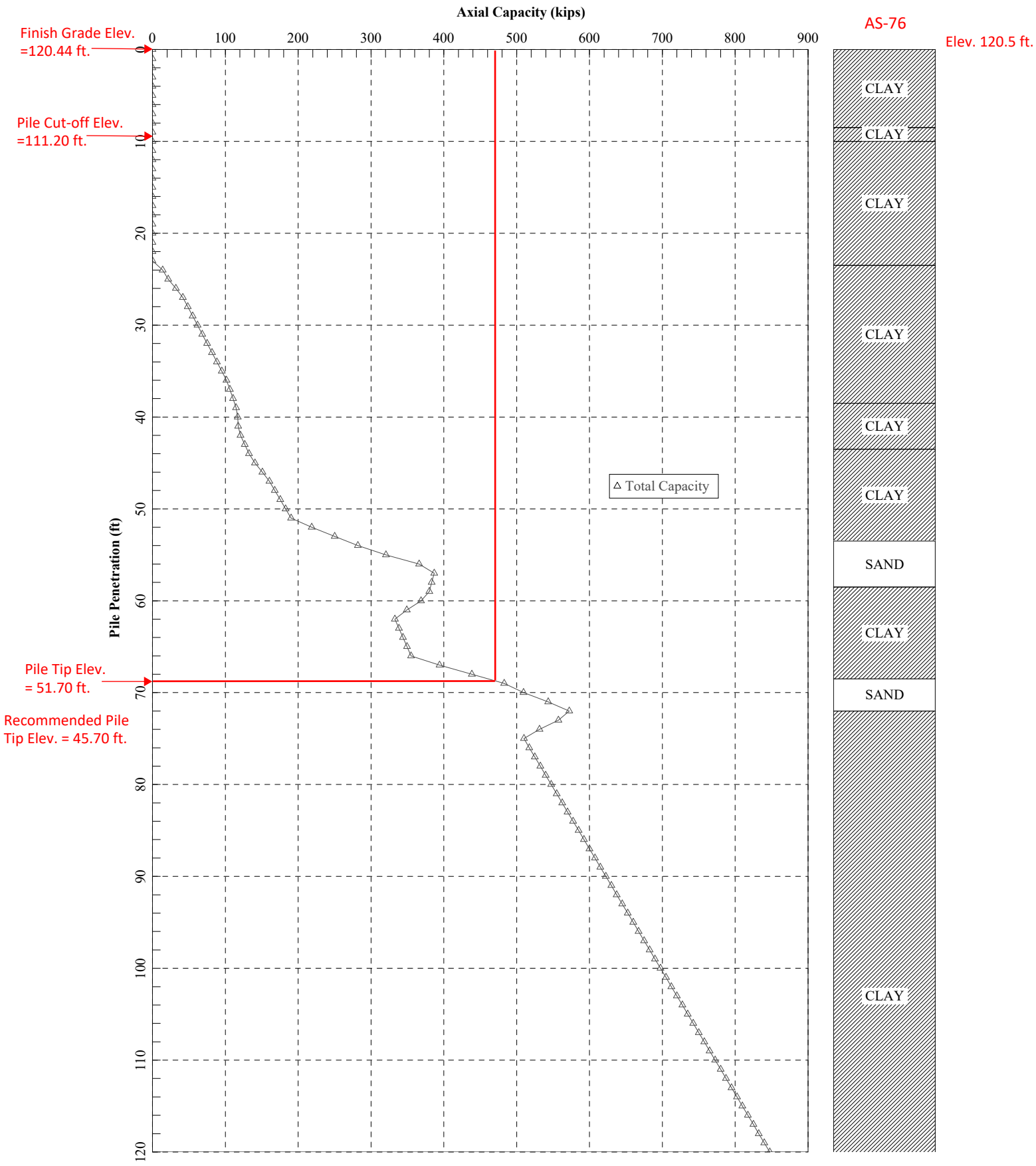
Eastridge to BART Regional Connector Project Bent 41 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 40 kips (Strength Limit Tension)/0.7 = 60 kips



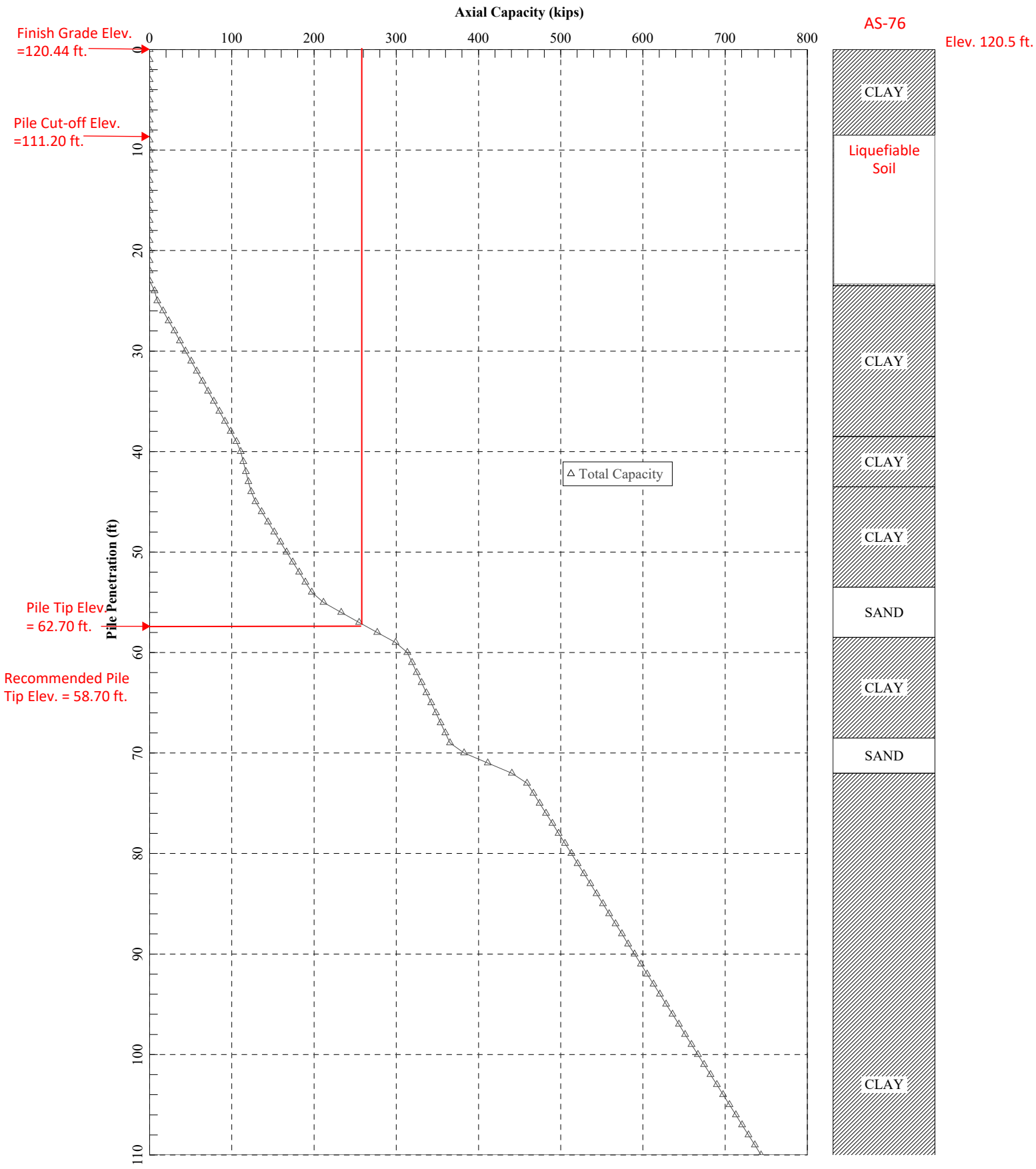
Eastridge to BART Regional Connector Project Bent 41 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 470 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project Bent 41 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

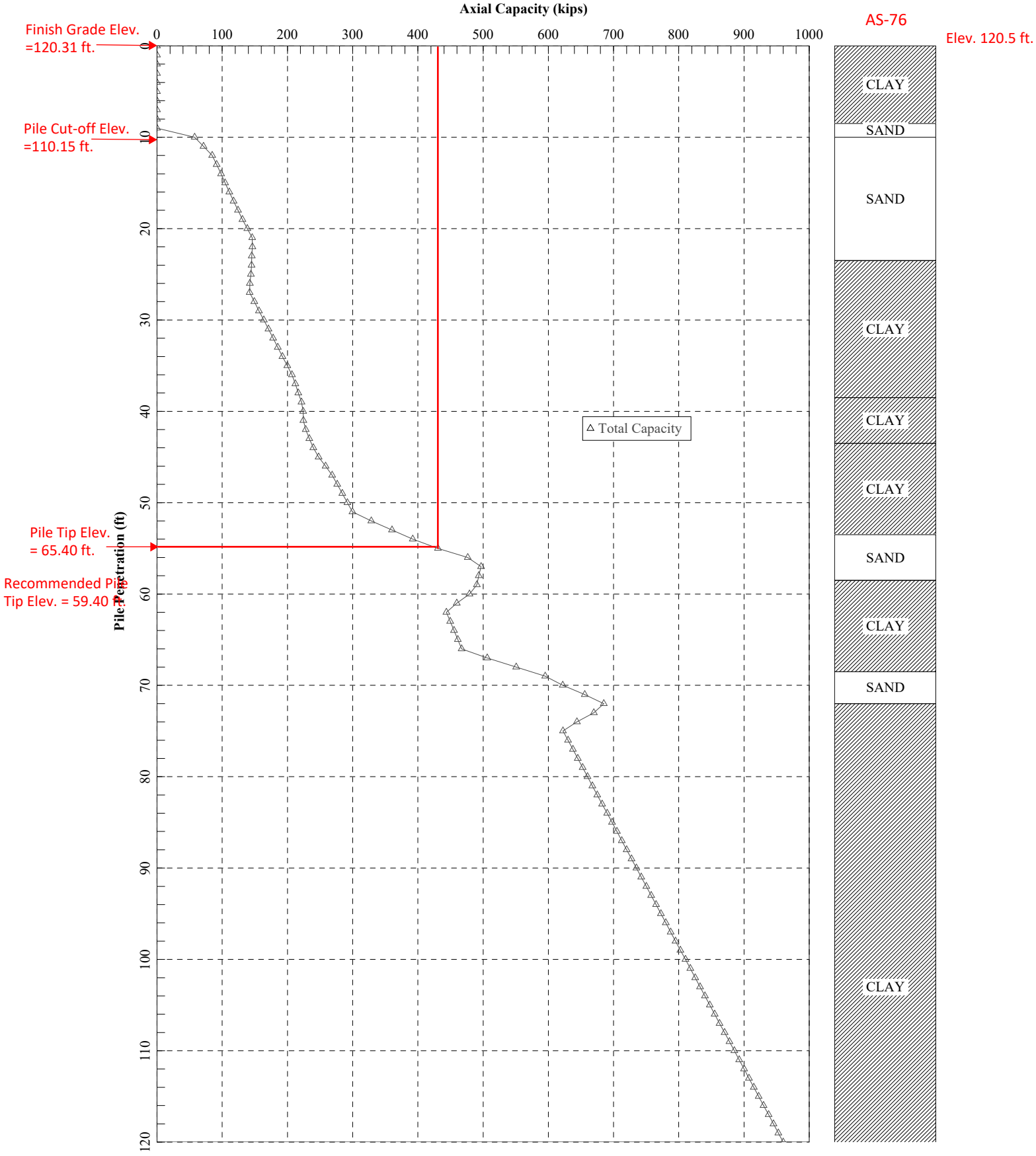
Vertical Load Demand = 260 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 41 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

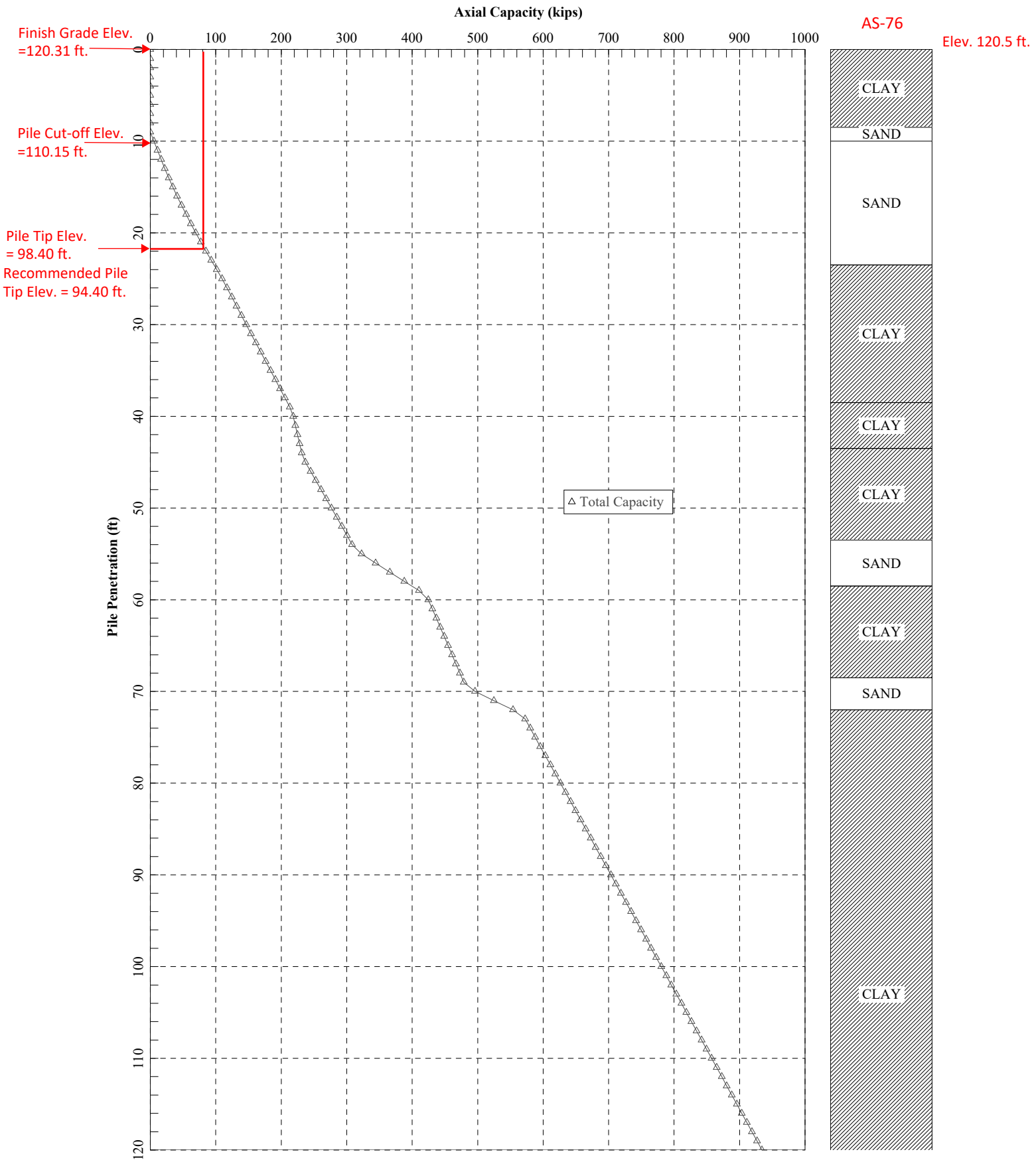
AERIAL GUIDEWAY – BENT 42 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 300 kips (Strength Limit Compression)/0.7 = 430 kips



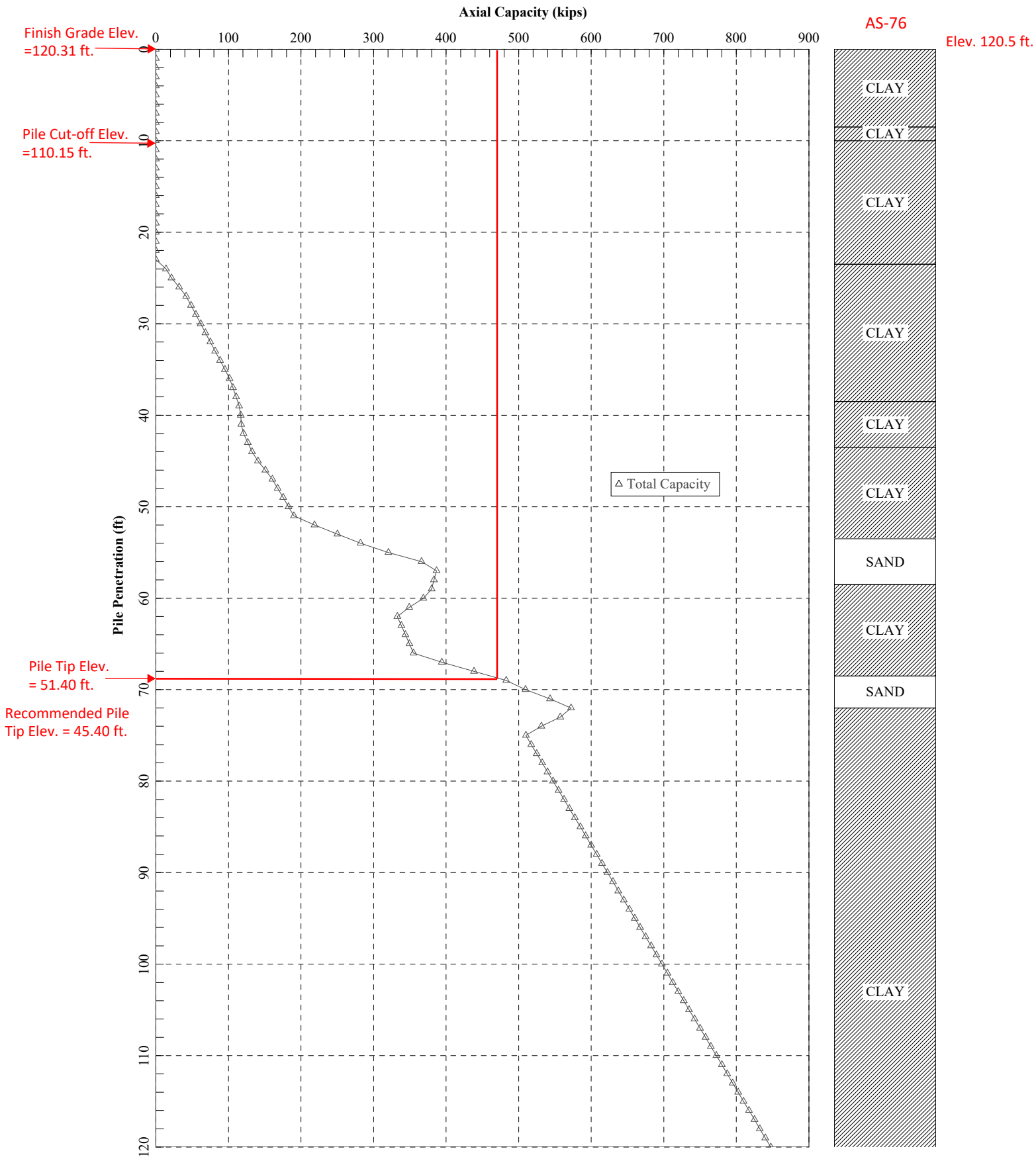
Eastridge to BART Regional Connector Project Bent 42 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 50 kips (Strength Limit Tension)/0.7 = 80 kips



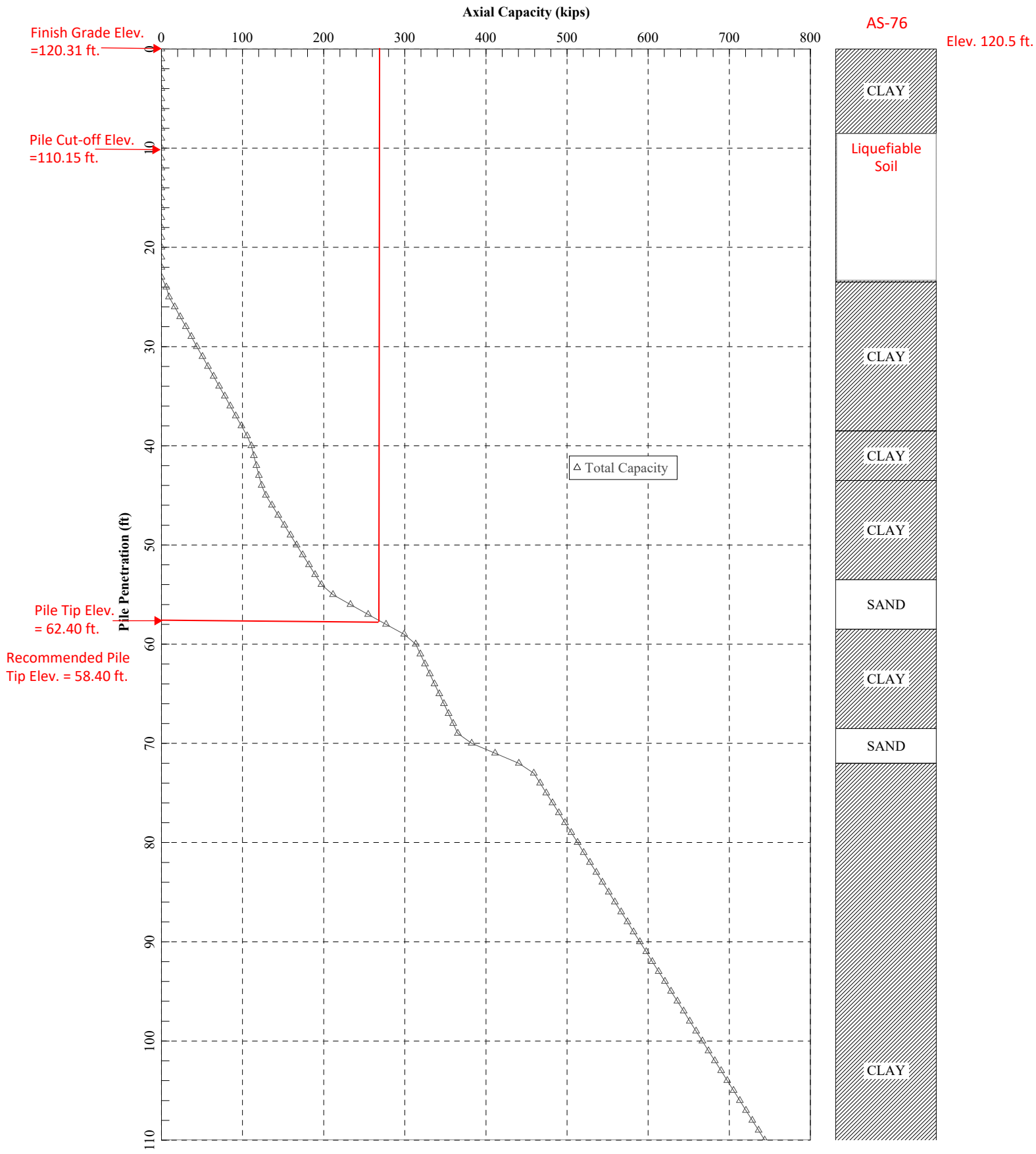
Eastridge to BART Regional Connector Project Bent 42 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 470 kips (Extreme Event Limit Compression)



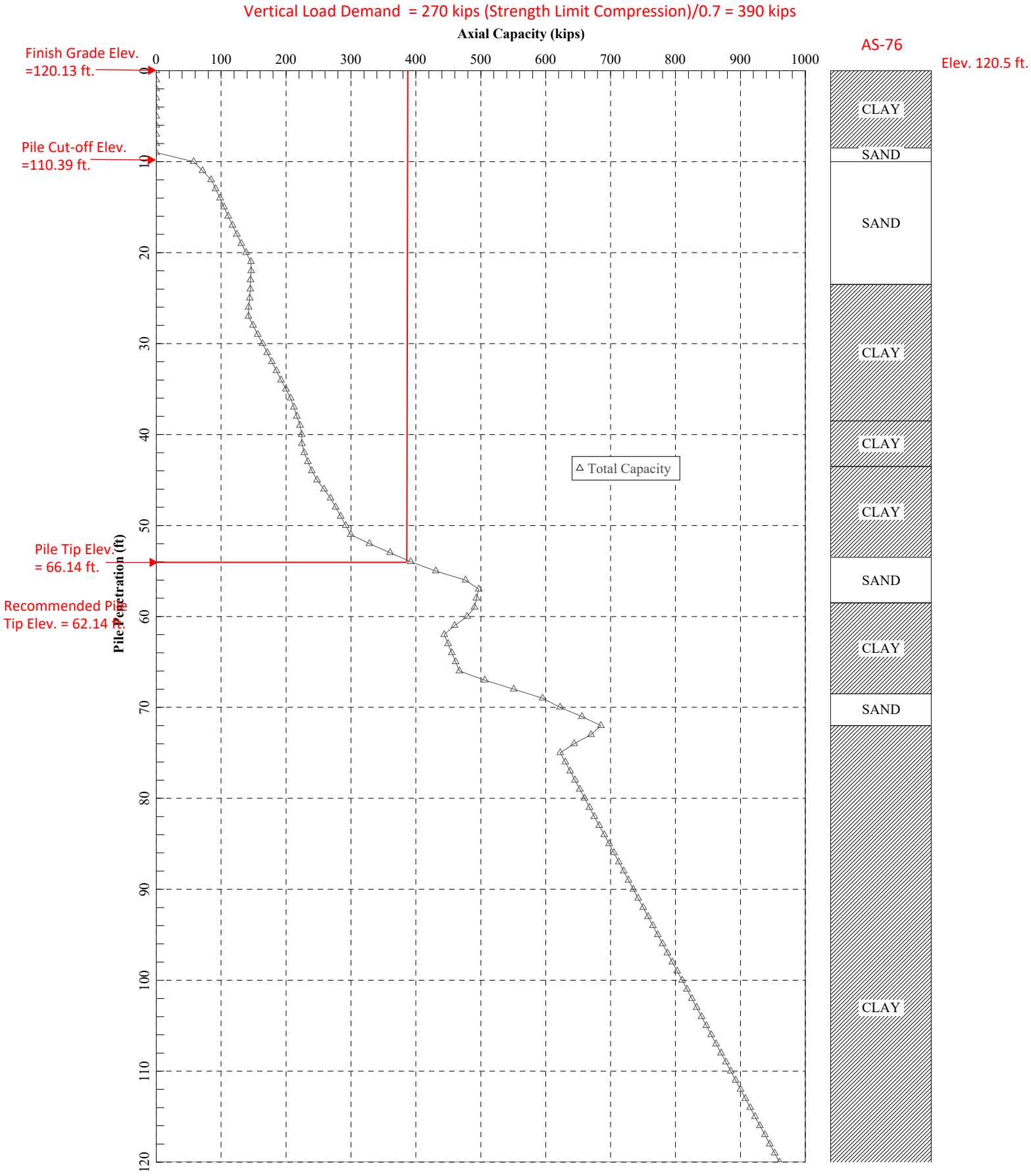
Eastridge to BART Regional Connector Project Bent 42 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

Vertical Load Demand = 270 kips (Extreme Event Limit Tension)



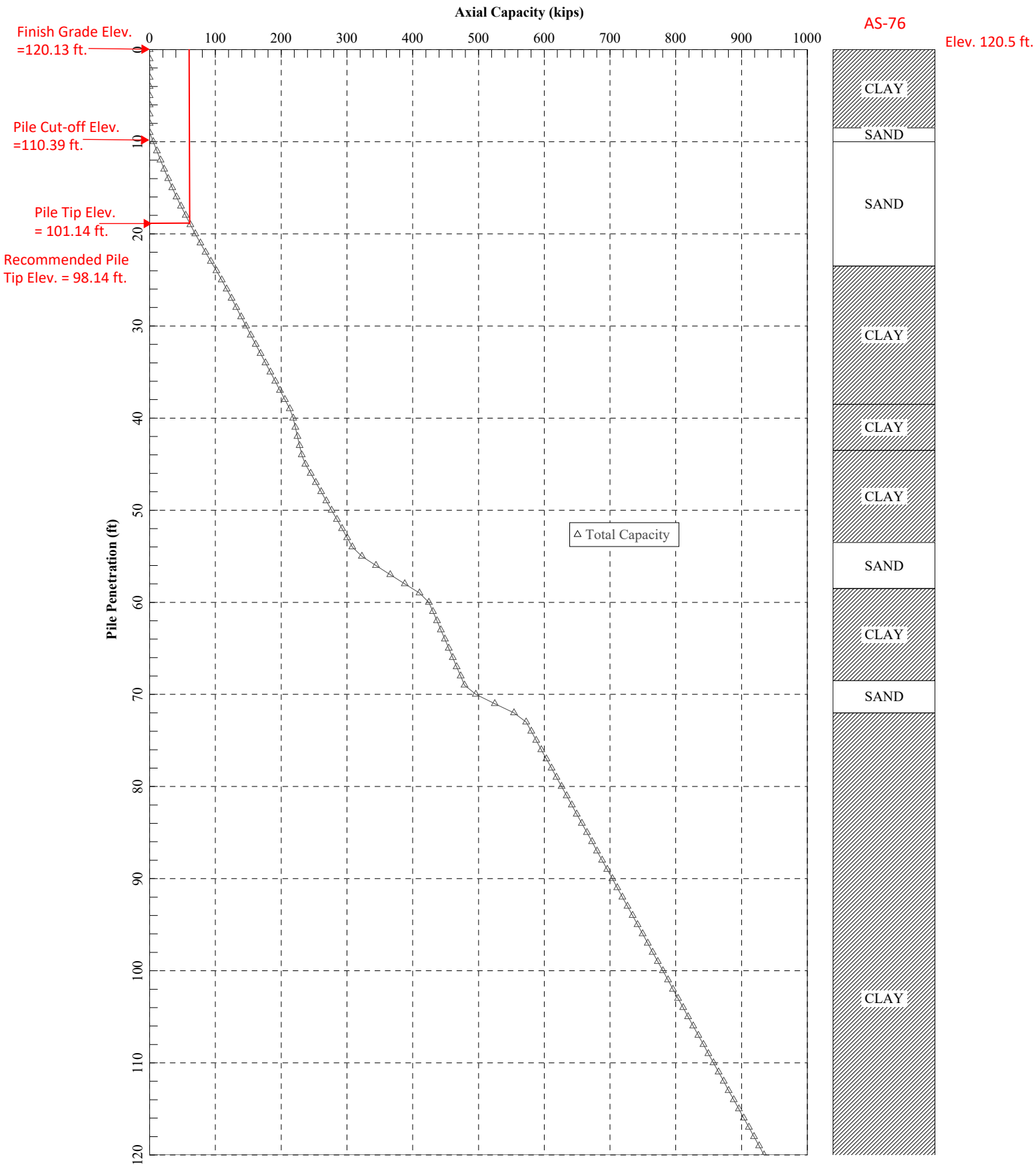
Eastridge to BART Regional Connector Project Bent 42 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

AERIAL GUIDEWAY – BENT 43 (18-INCH SQUARE PRECAST CONCRETE PILE)



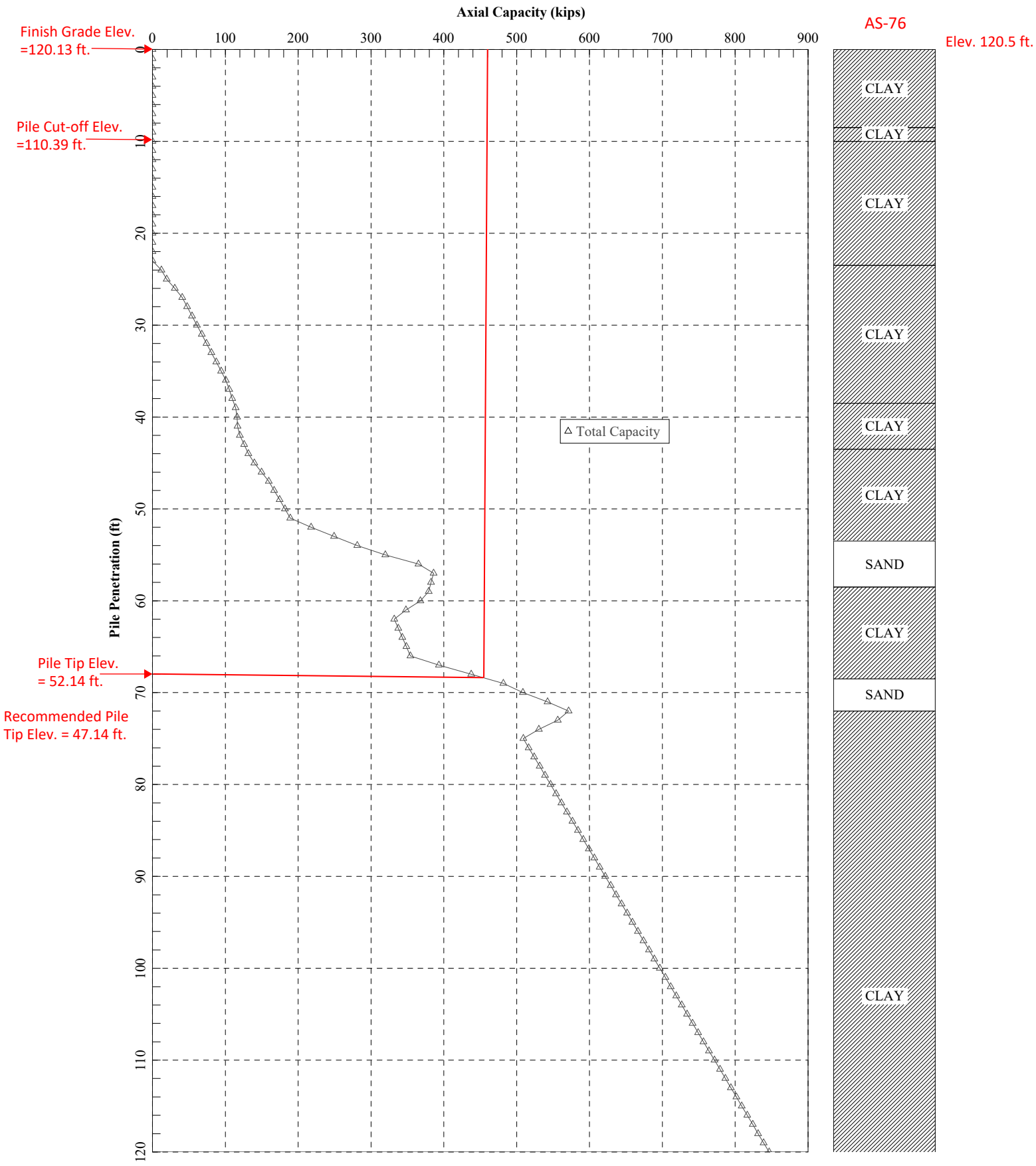
Eastridge to BART Regional Connector Project Bent 43 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 40 kips (Strength Limit Tension)/0.7 = 60 kips

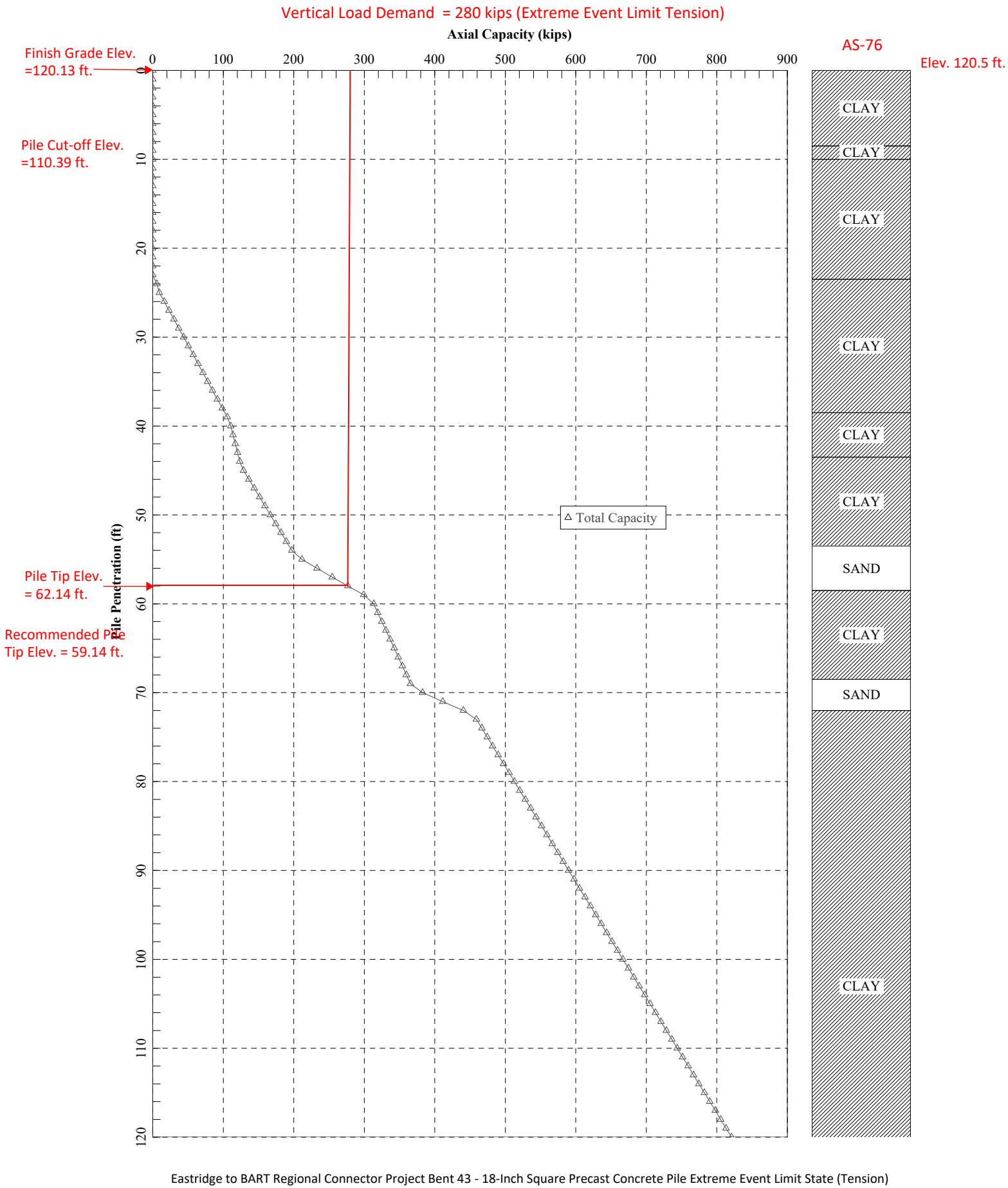


Eastridge to BART Regional Connector Project Bent 43 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 460 kips (Extreme Event Limit Compression)



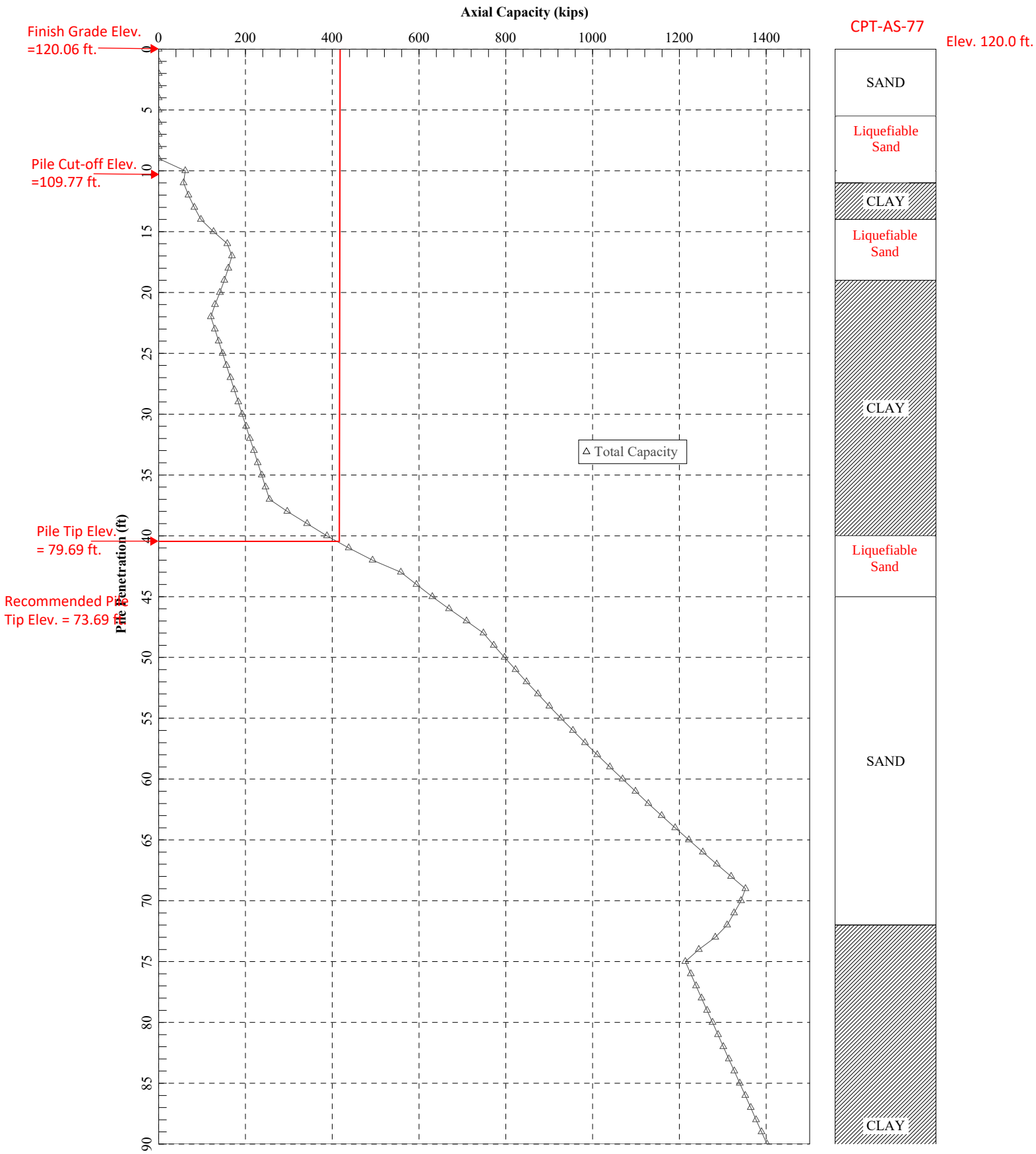
Eastridge to BART Regional Connector Project Bent 43 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)



Eastridge to BART Regional Connector Project Bent 43 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

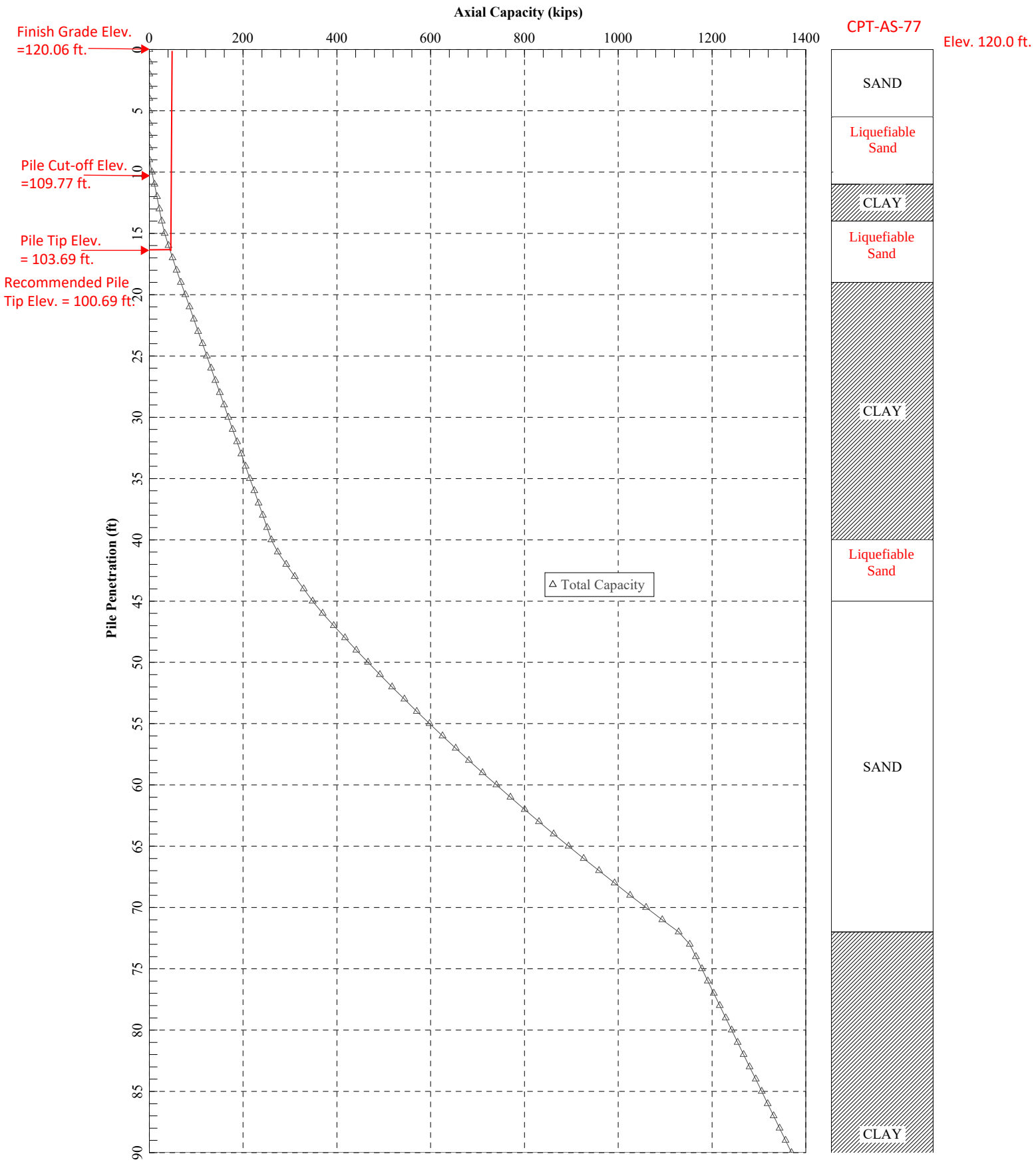
AERIAL GUIDEWAY – BENT 44 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 290 kips (Strength Limit Compression)/0.7 = 420 kips



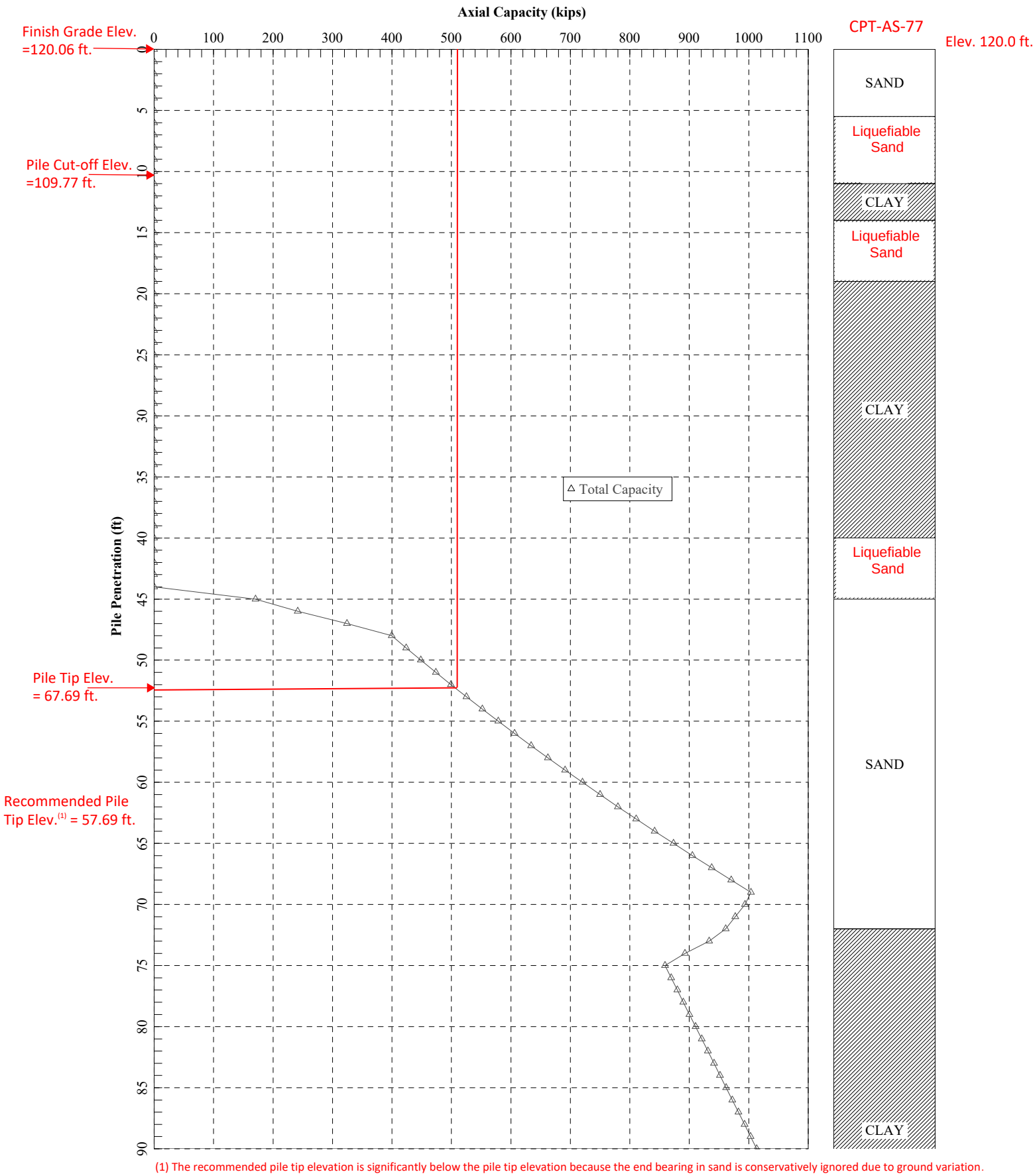
Eastridge to BART Regional Connector Project Bent 44 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 30 kips (Strength Limit Tension)/0.7 = 50 kips



Eastridge to BART Regional Connector Project Bent 44 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

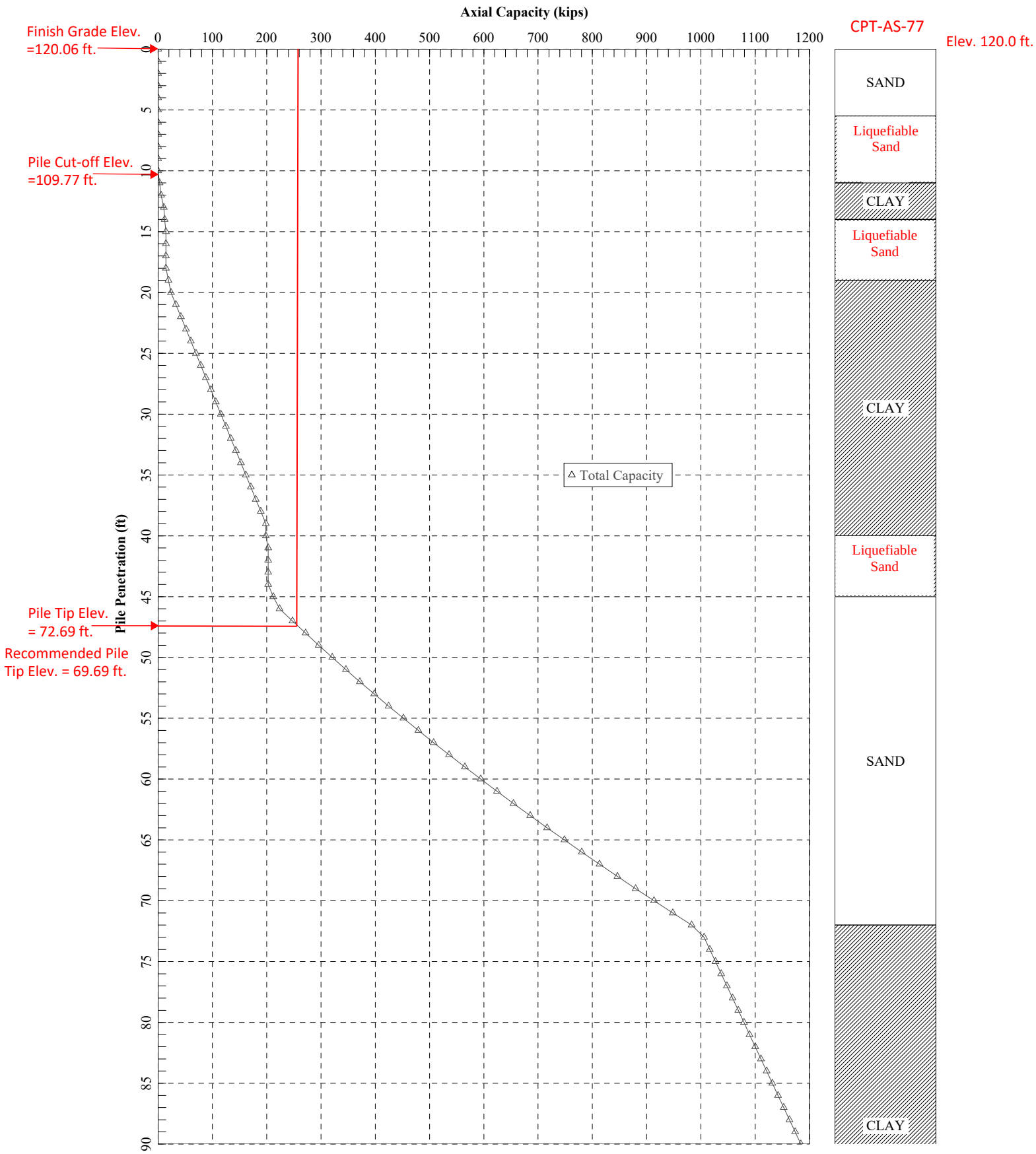
Vertical Load Demand = 25 kips (Downdrag) + 480 kips (Extreme Event Limit Compression) = 510 kips



(1) The recommended pile tip elevation is significantly below the pile tip elevation because the end bearing in sand is conservatively ignored due to ground variation.

Eastridge to BART Regional Connector Project Bent 44 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

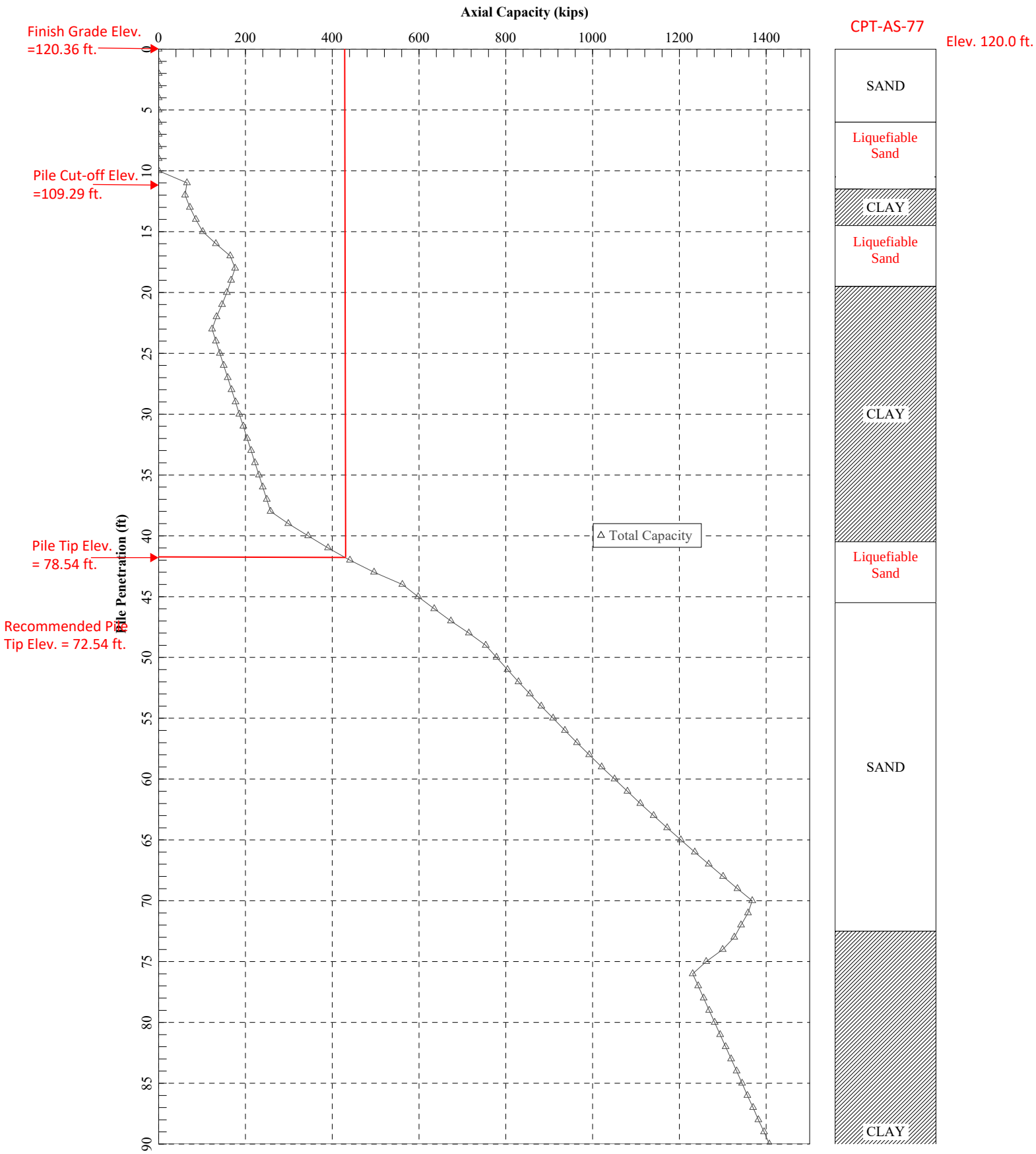
Vertical Load Demand = 260 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 44 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

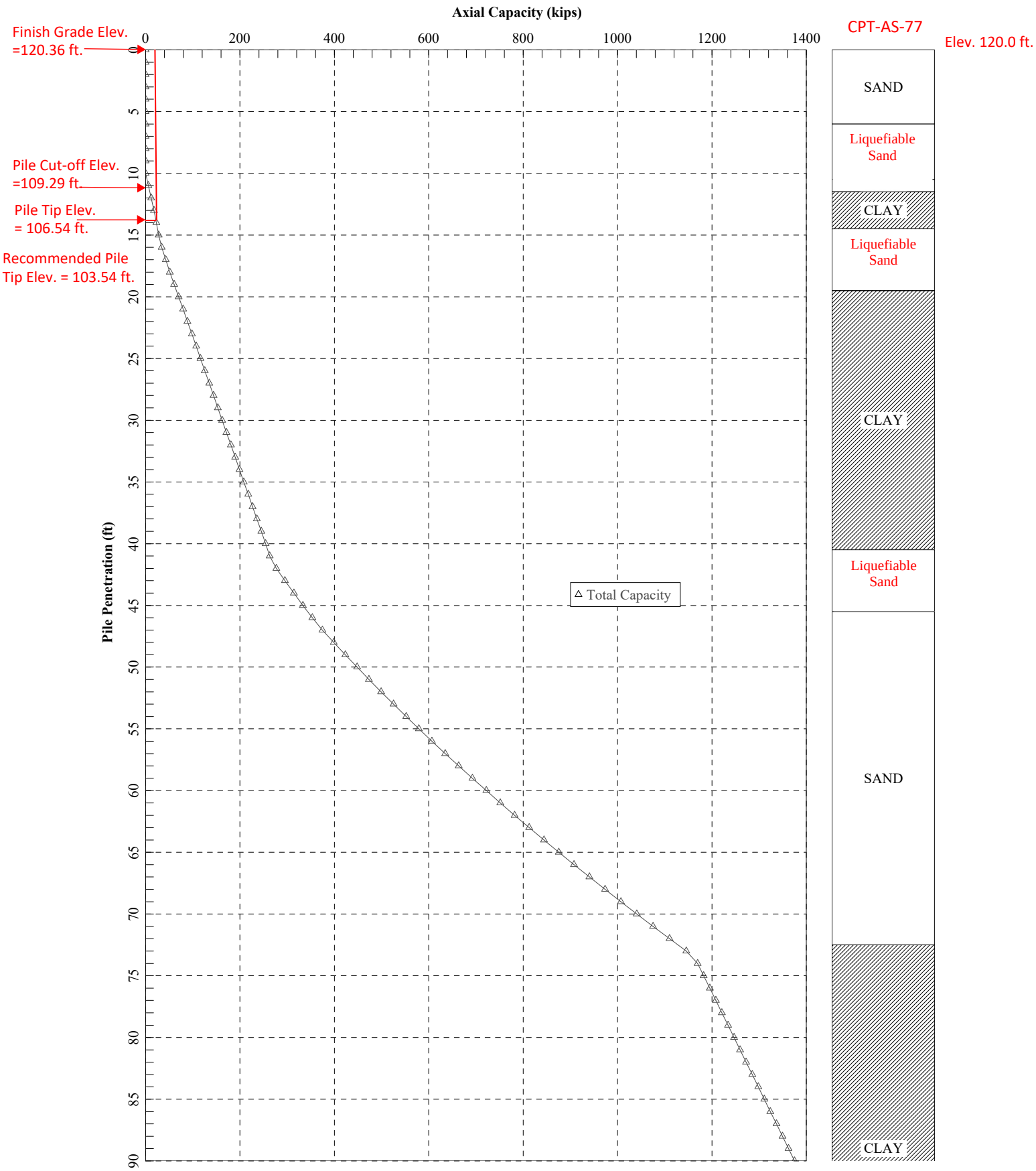
AERIAL GUIDEWAY – BENT 45 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 300 kips (Strength Limit Compression)/0.7 = 430 kips



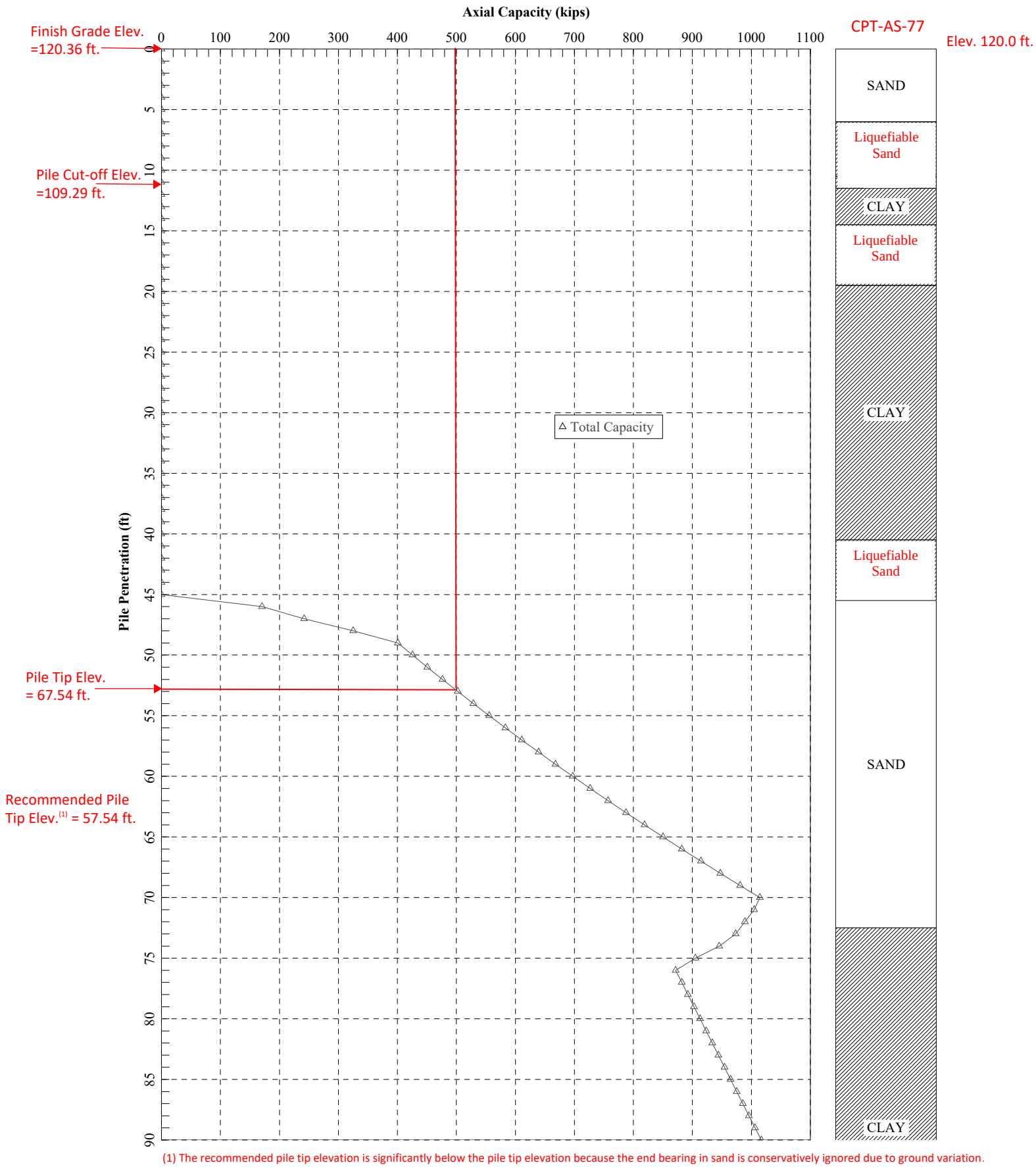
Eastridge to BART Regional Connector Project Bent 45 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 10 kips (Strength Limit Tension)/0.7 = 20 kips



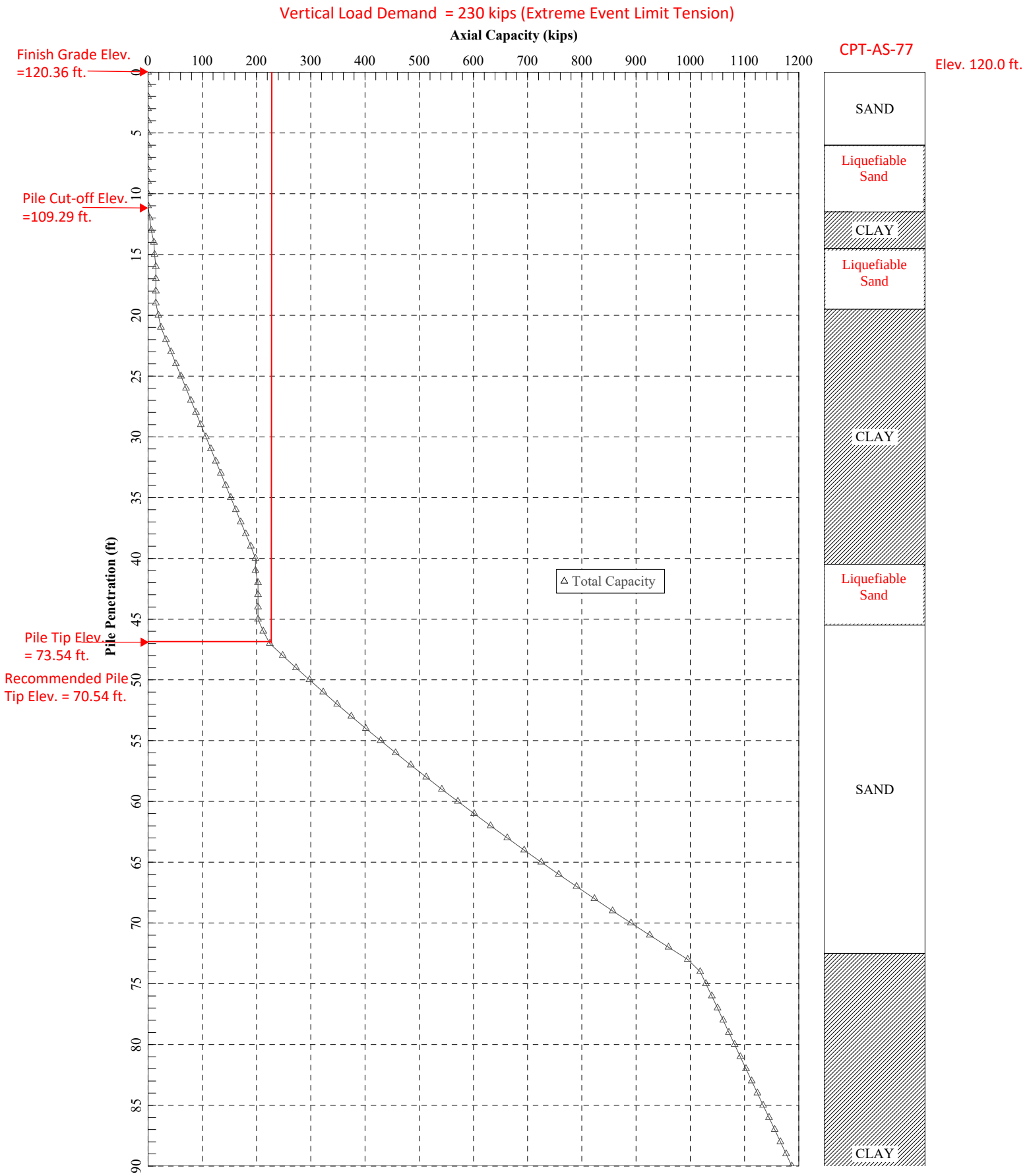
Eastridge to BART Regional Connector Project Bent 45 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 25 kips (Downdrag) + 470 kips (Extreme Event Limit Compression) = 500 kips



(1) The recommended pile tip elevation is significantly below the pile tip elevation because the end bearing in sand is conservatively ignored due to ground variation.

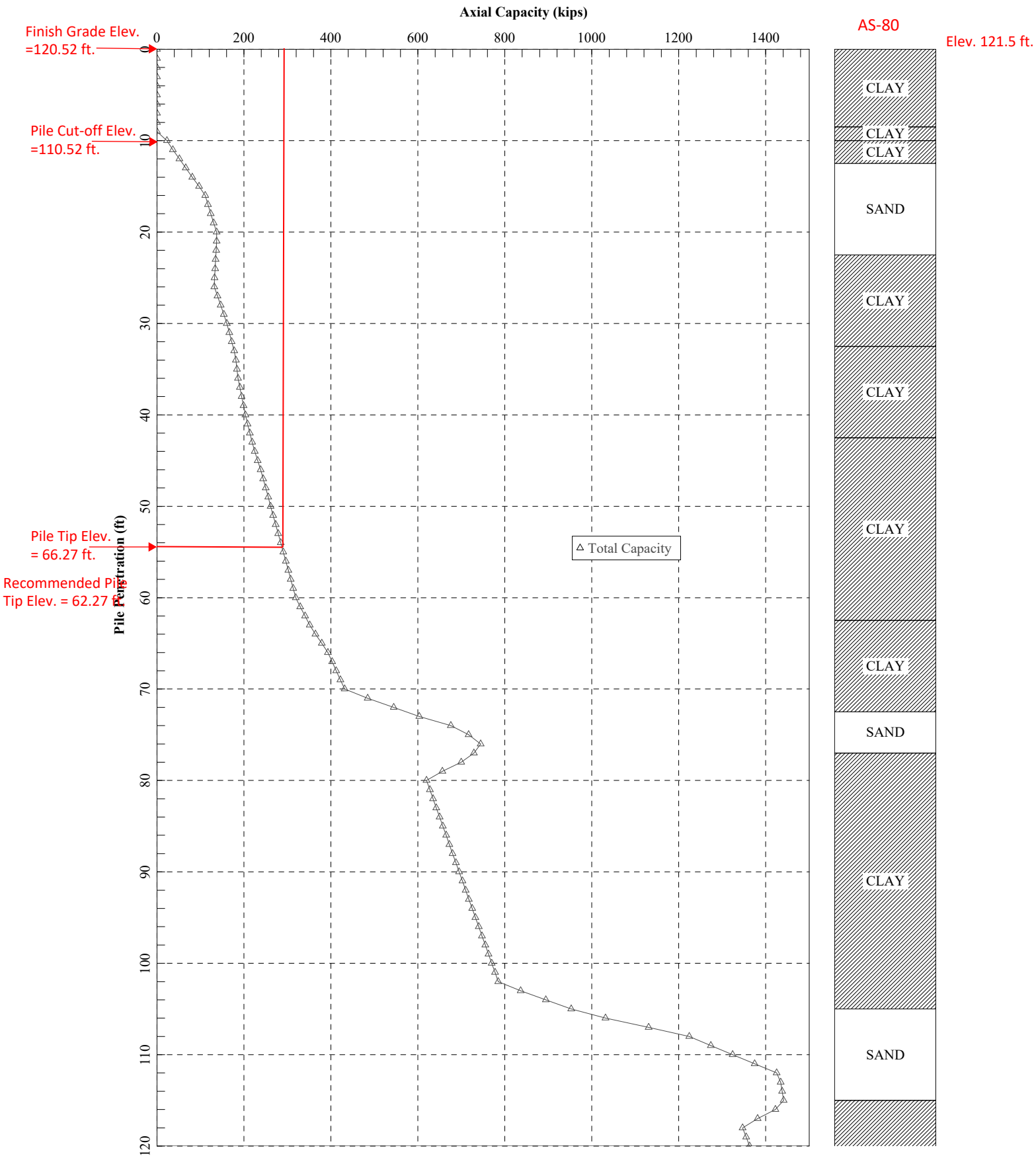
Eastridge to BART Regional Connector Project Bent 45 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)



Eastridge to BART Regional Connector Project Bent 45 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

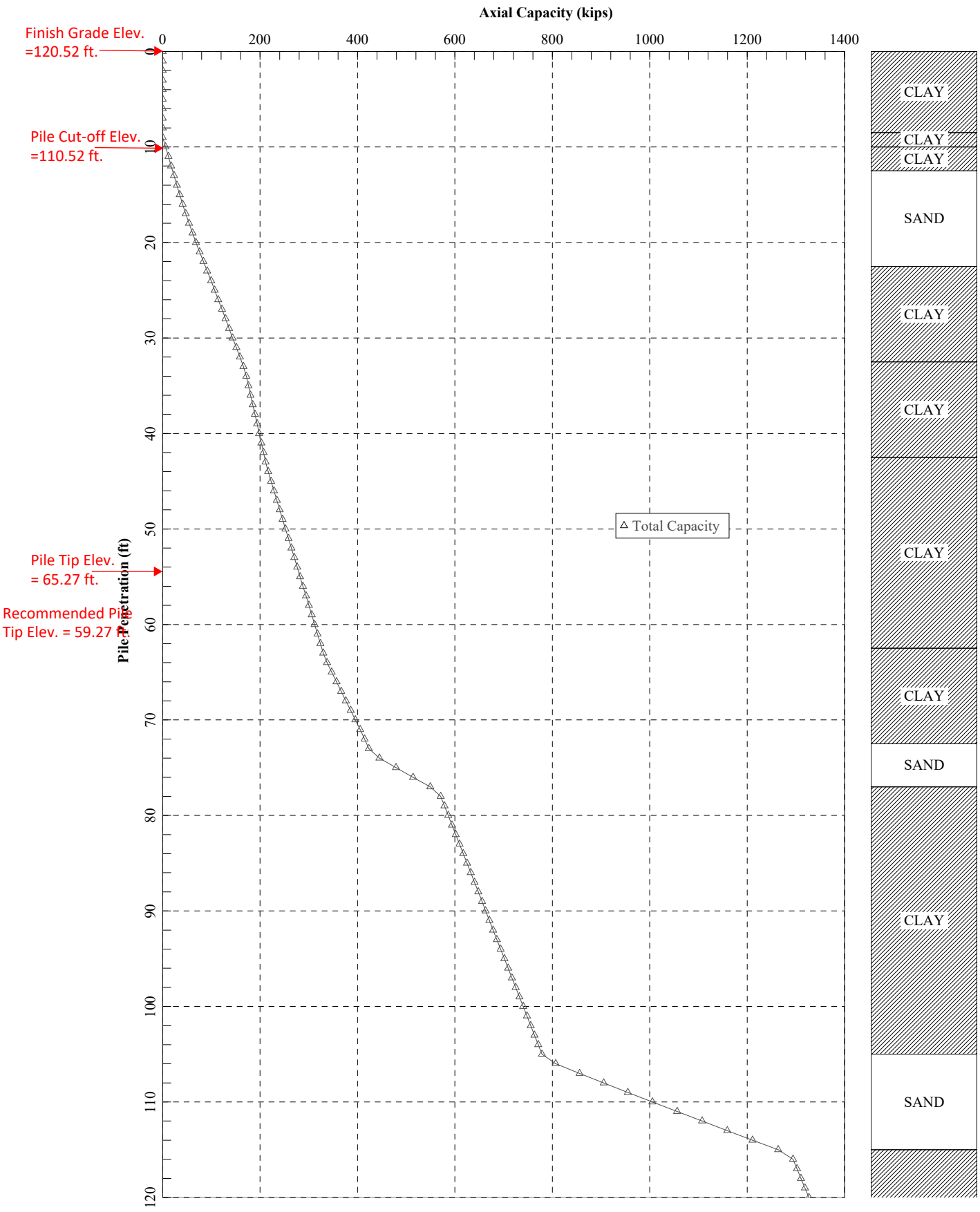
AERIAL GUIDEWAY – BENT 46 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 200 kips (Strength Limit Compression)/0.7 = 290 kips

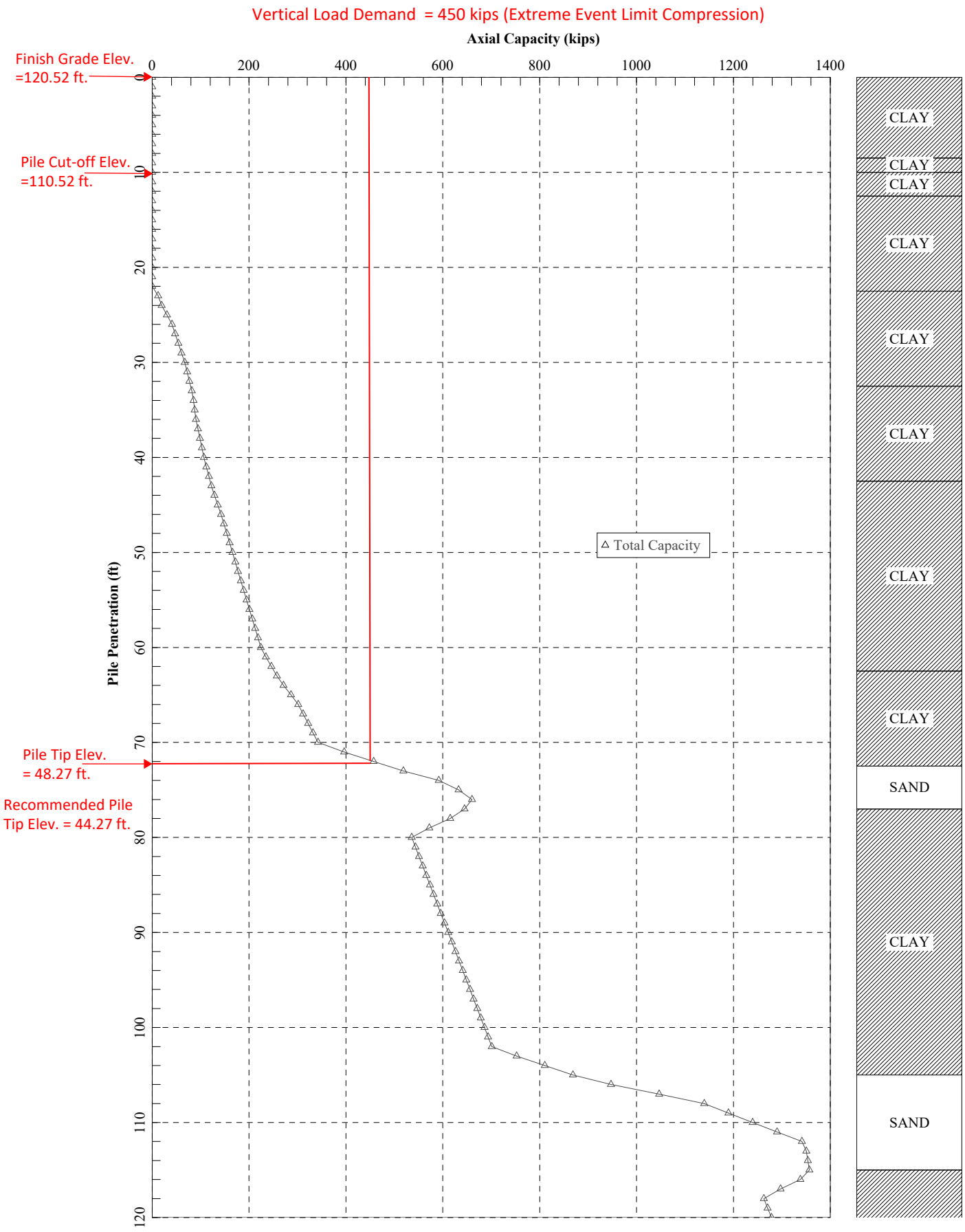


Eastridge to BART Regional Connector Project Bent 46 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

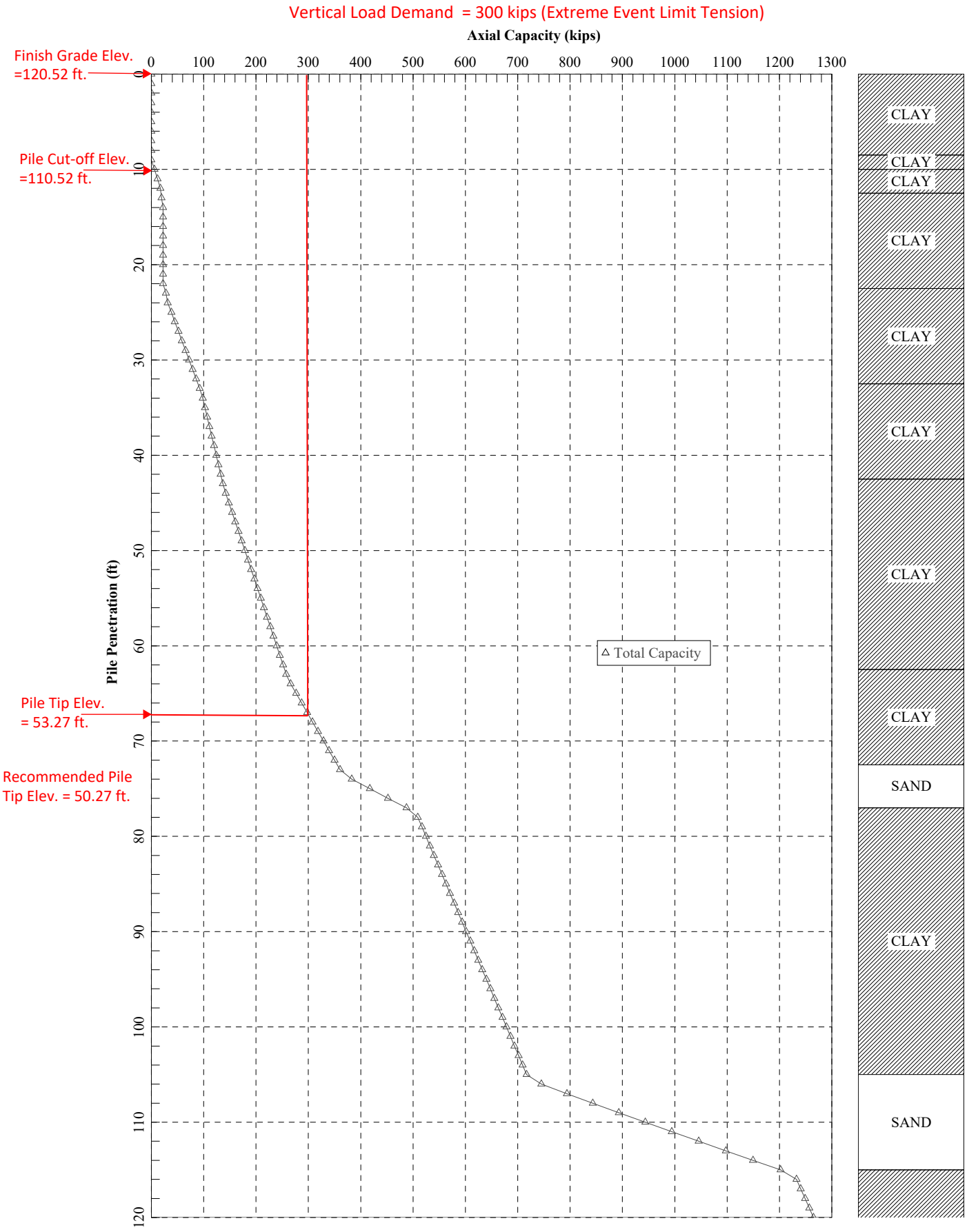
Vertical Load Demand = 0 kips (Strength Limit Tension)/0.7 = 0 kips



Eastridge to BART Regional Connector Project Bent 46 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)



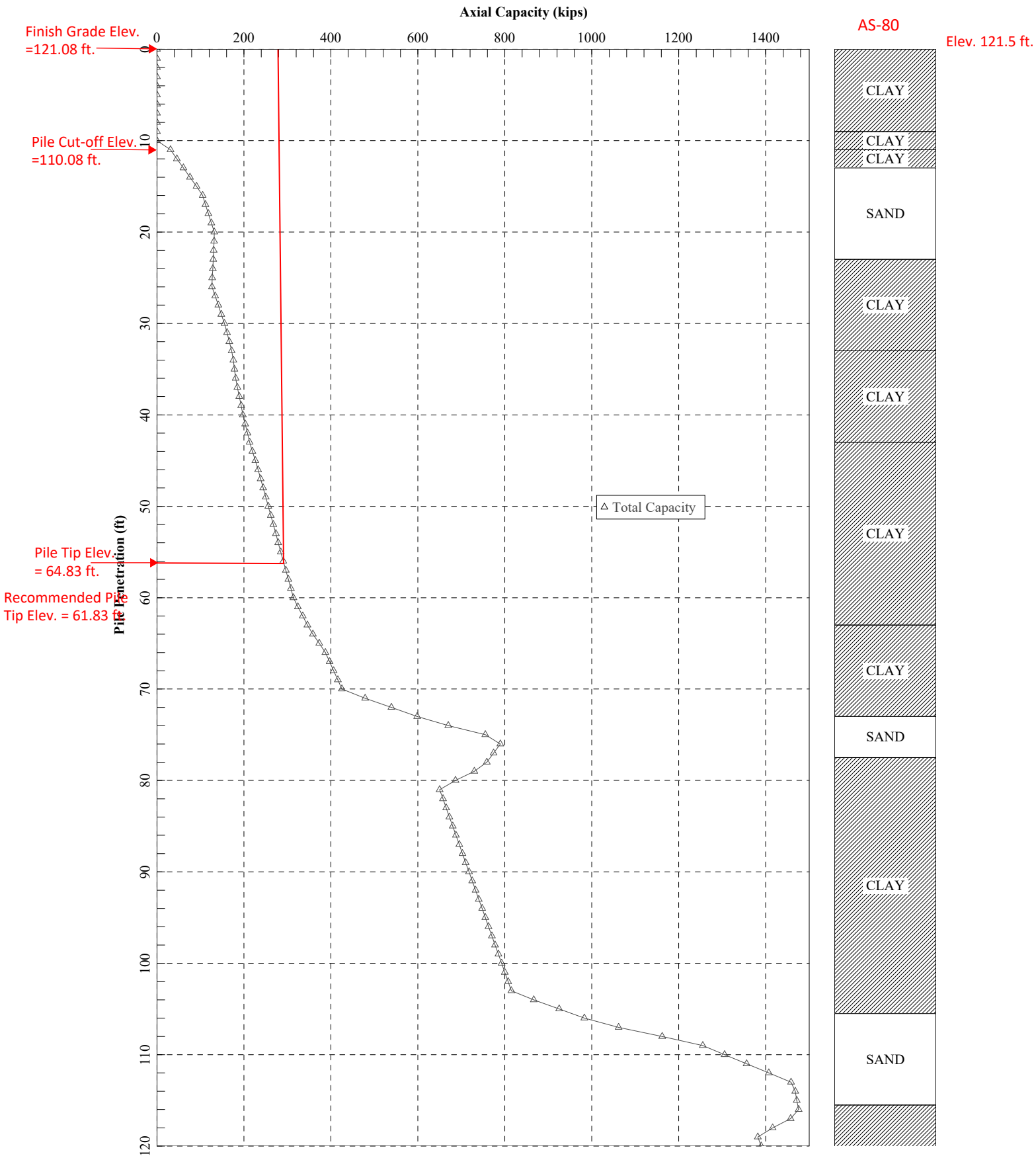
Eastridge to BART Regional Connector Project Bent 46 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)



Eastridge to BART Regional Connector Project Bent 46 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

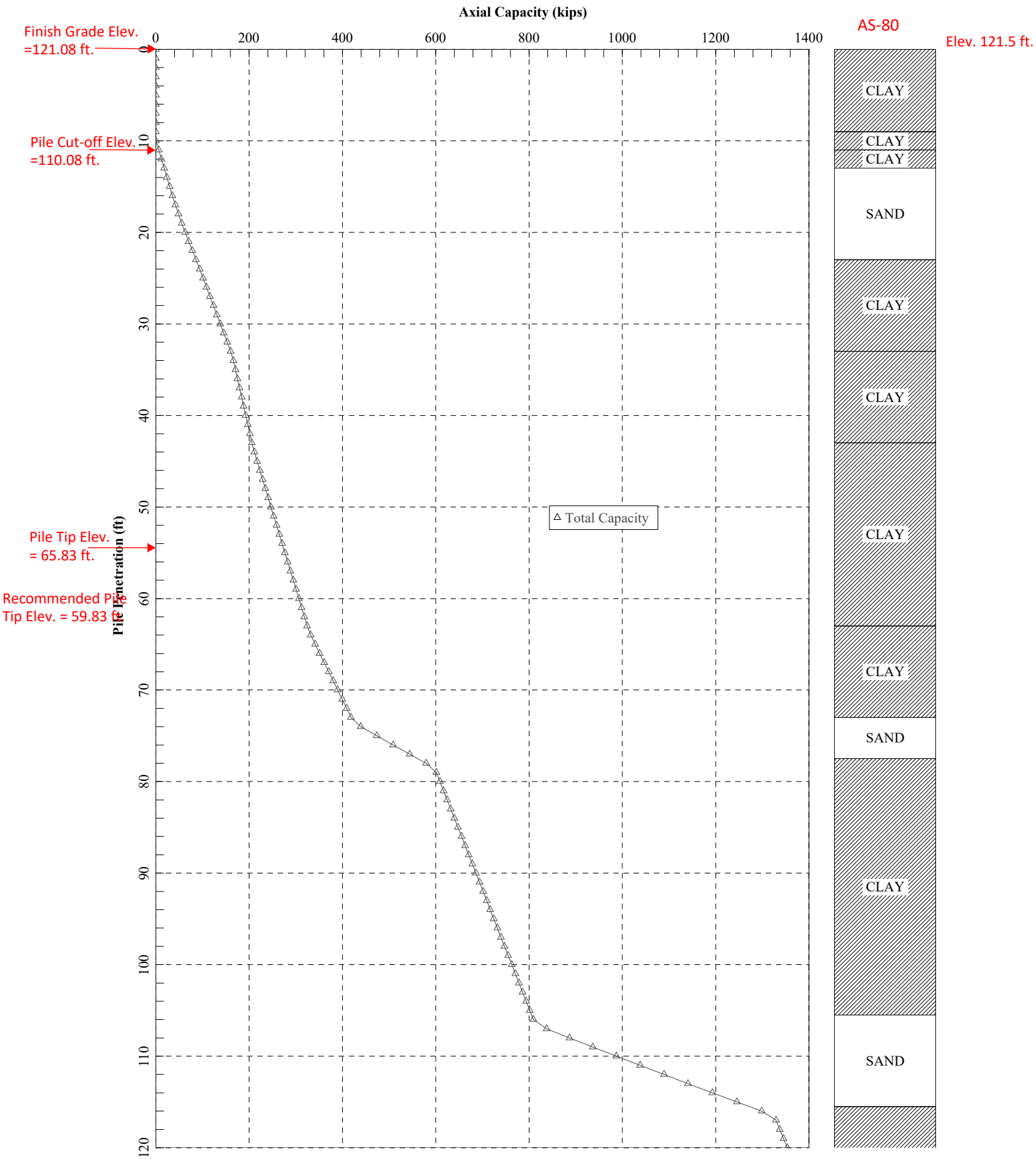
AERIAL GUIDEWAY – BENT 47 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 190 kips (Strength Limit Compression)/0.7 = 280 kips



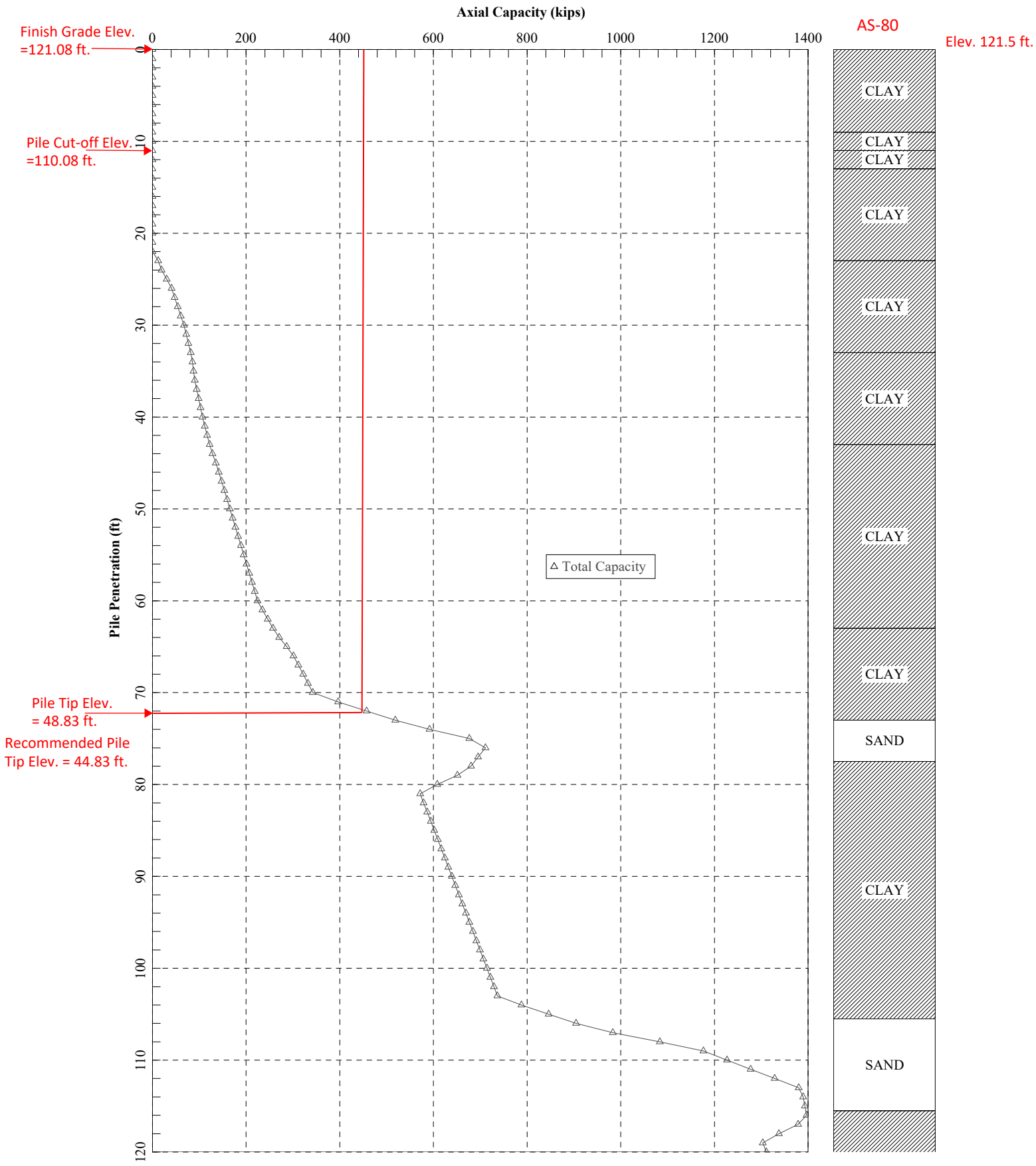
Eastridge to BART Regional Connector Project Bent 47 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 0 kips (Strength Limit Tension)/0.7 = 0 kips



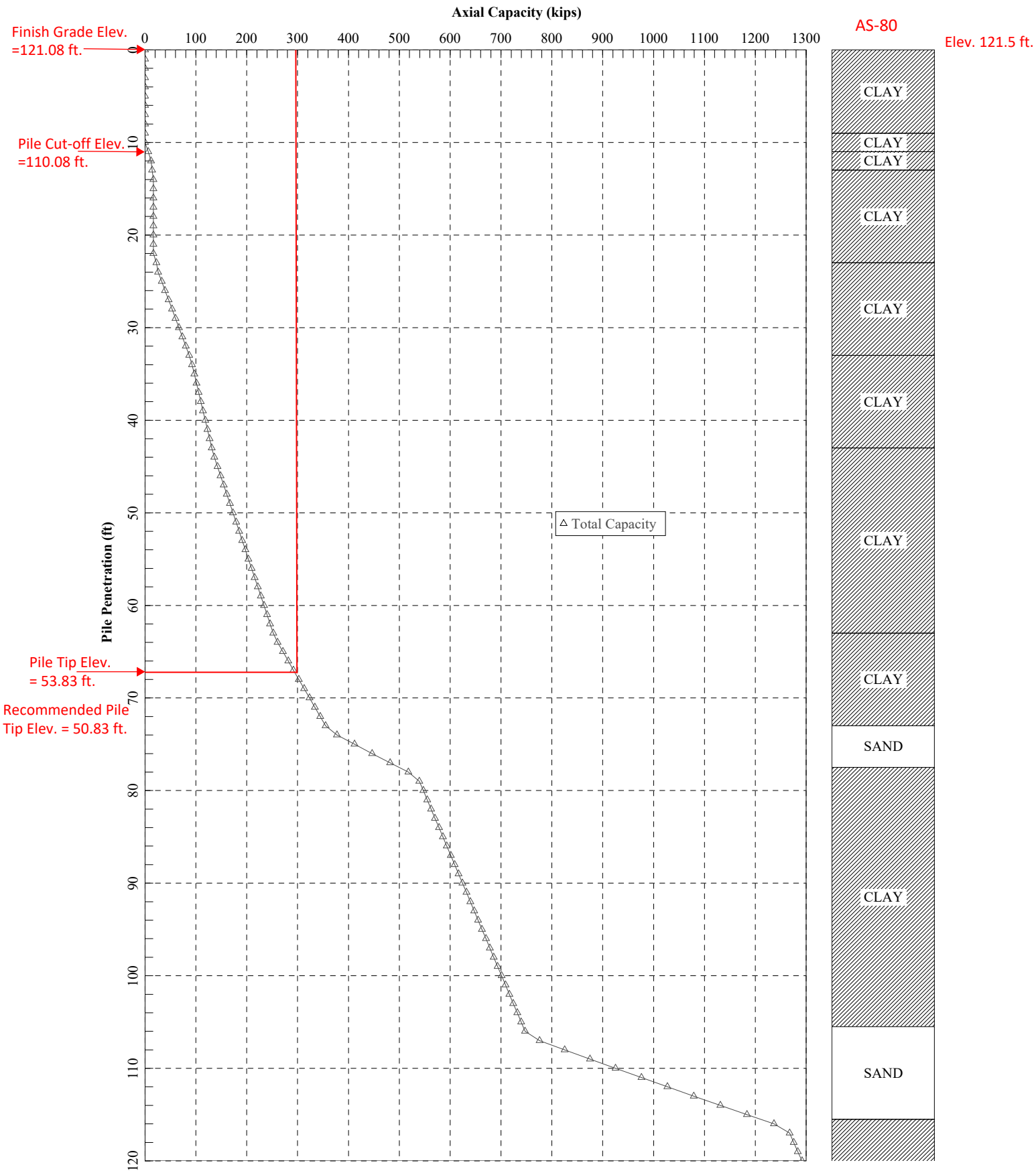
Eastridge to BART Regional Connector Project Bent 47 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 450 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project Bent 47 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

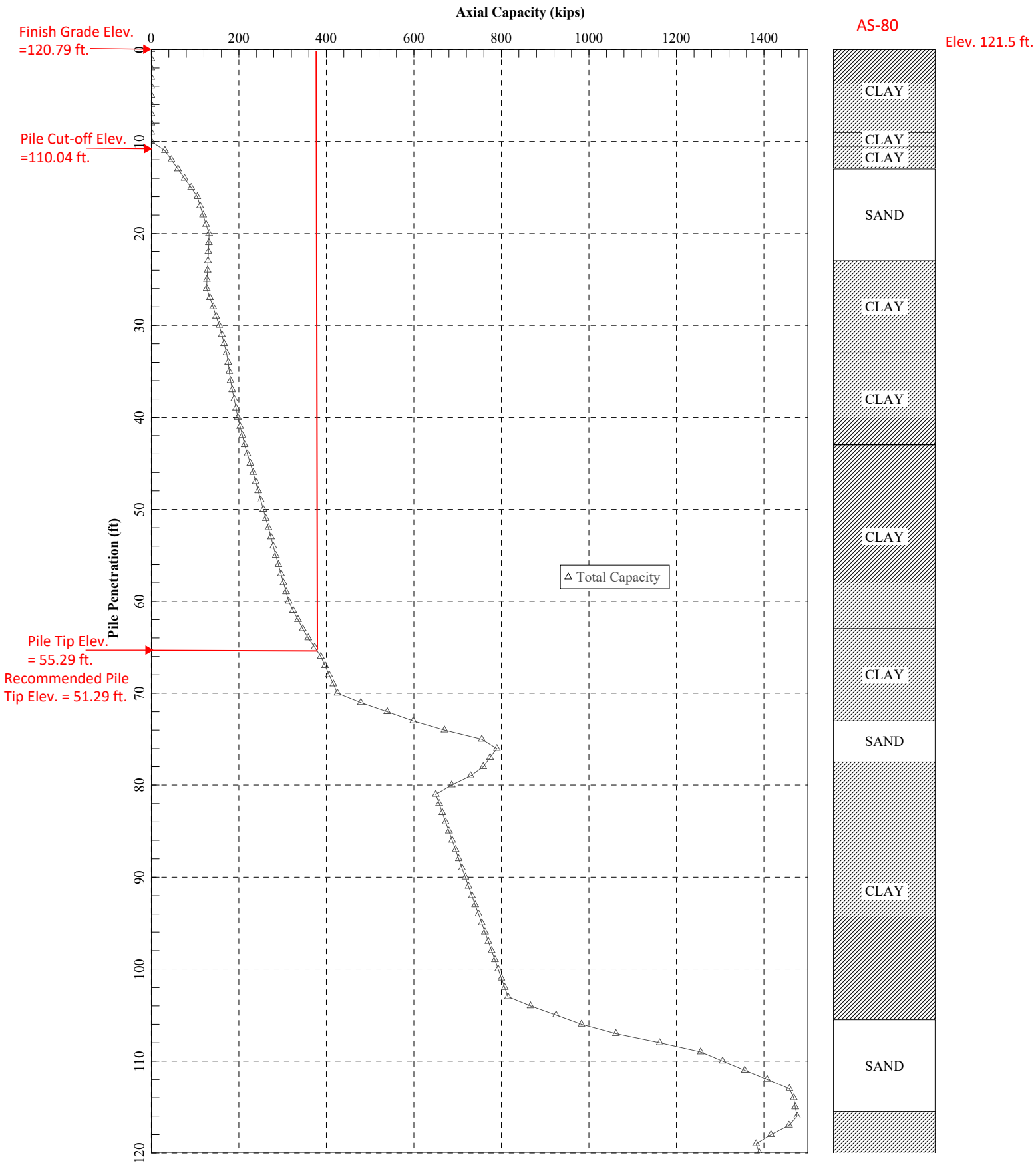
Vertical Load Demand = 300 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 47 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

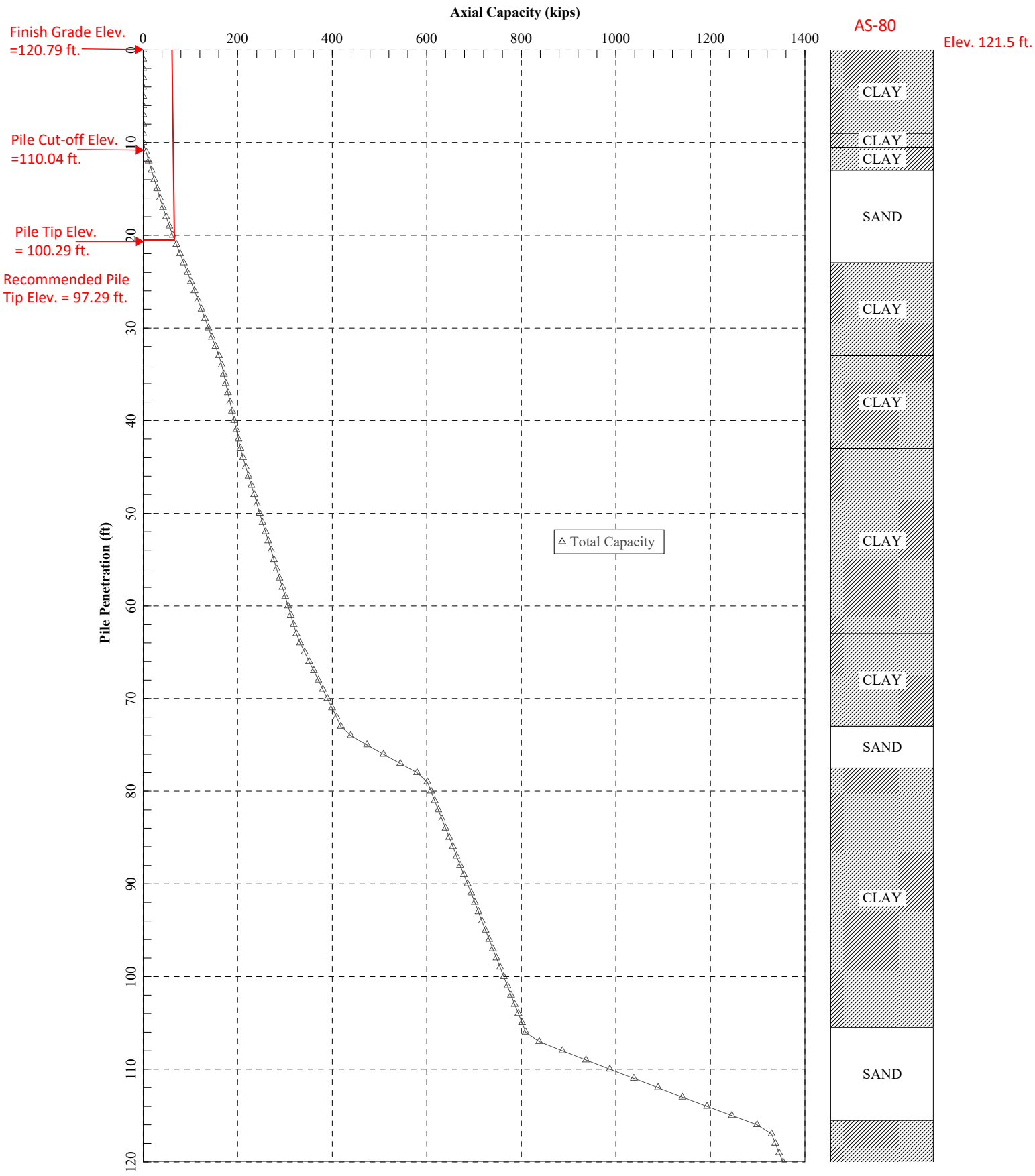
AERIAL GUIDEWAY – BENT 48 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 260 kips (Strength Limit Compression)/0.7 = 380 kips



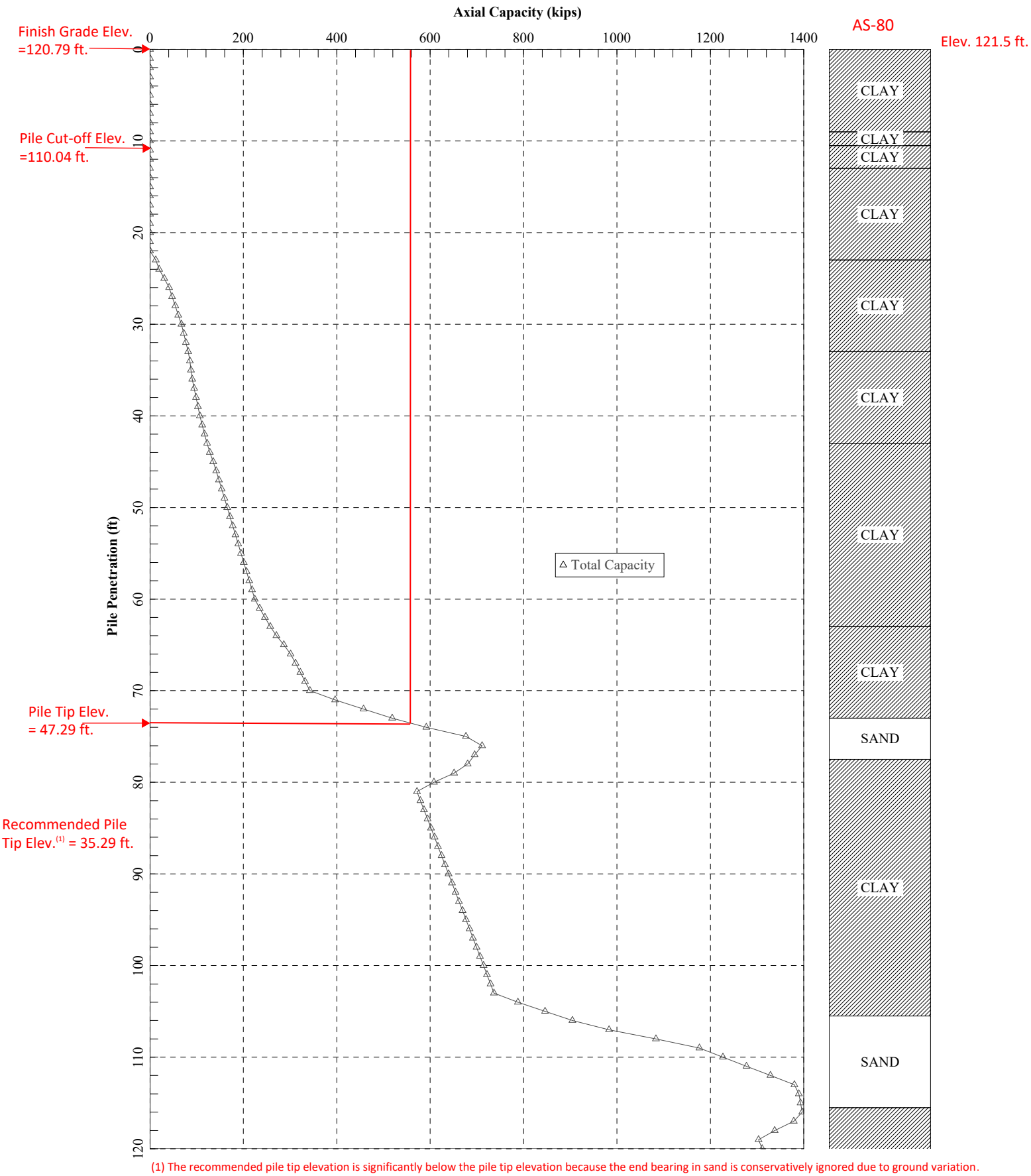
Eastridge to BART Regional Connector Project Bent 48 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 40 kips (Strength Limit Tension)/0.7 = 60 kips



Eastridge to BART Regional Connector Project Bent 48 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

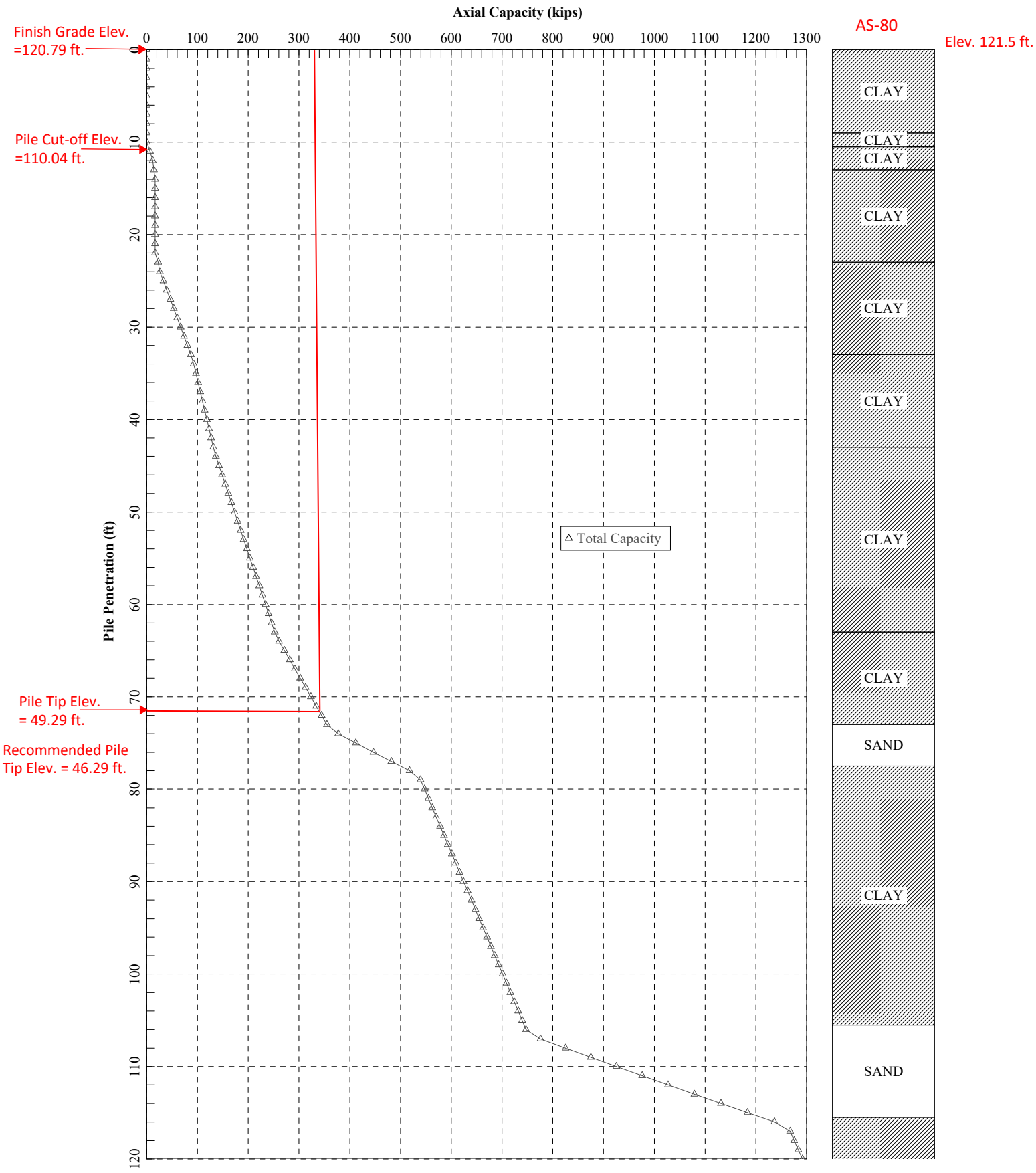
Vertical Load Demand = 560 kips (Extreme Event Limit Compression)



(1) The recommended pile tip elevation is significantly below the pile tip elevation because the end bearing in sand is conservatively ignored due to ground variation.

Eastridge to BART Regional Connector Project Bent 48 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

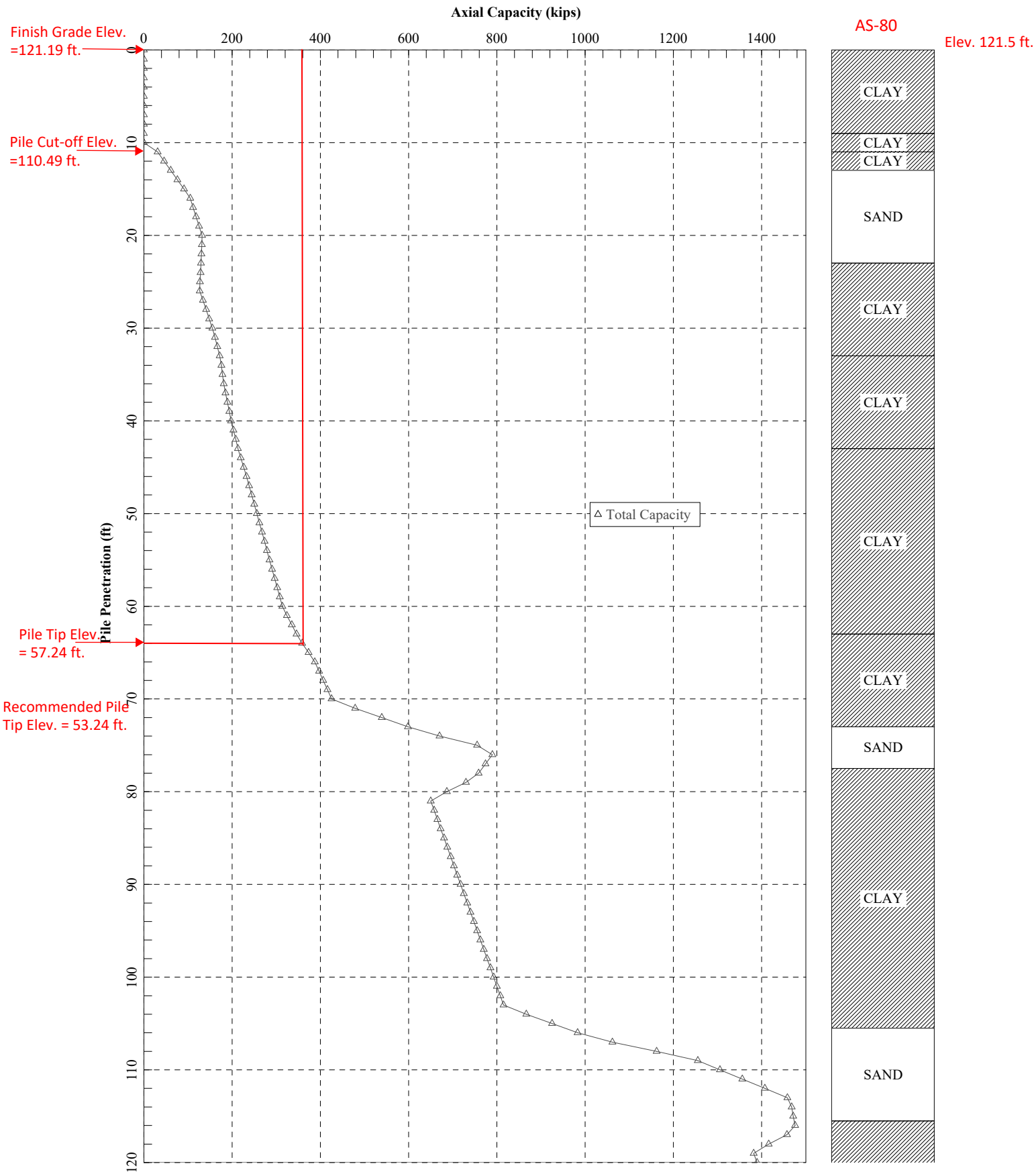
Vertical Load Demand = 360 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 48 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

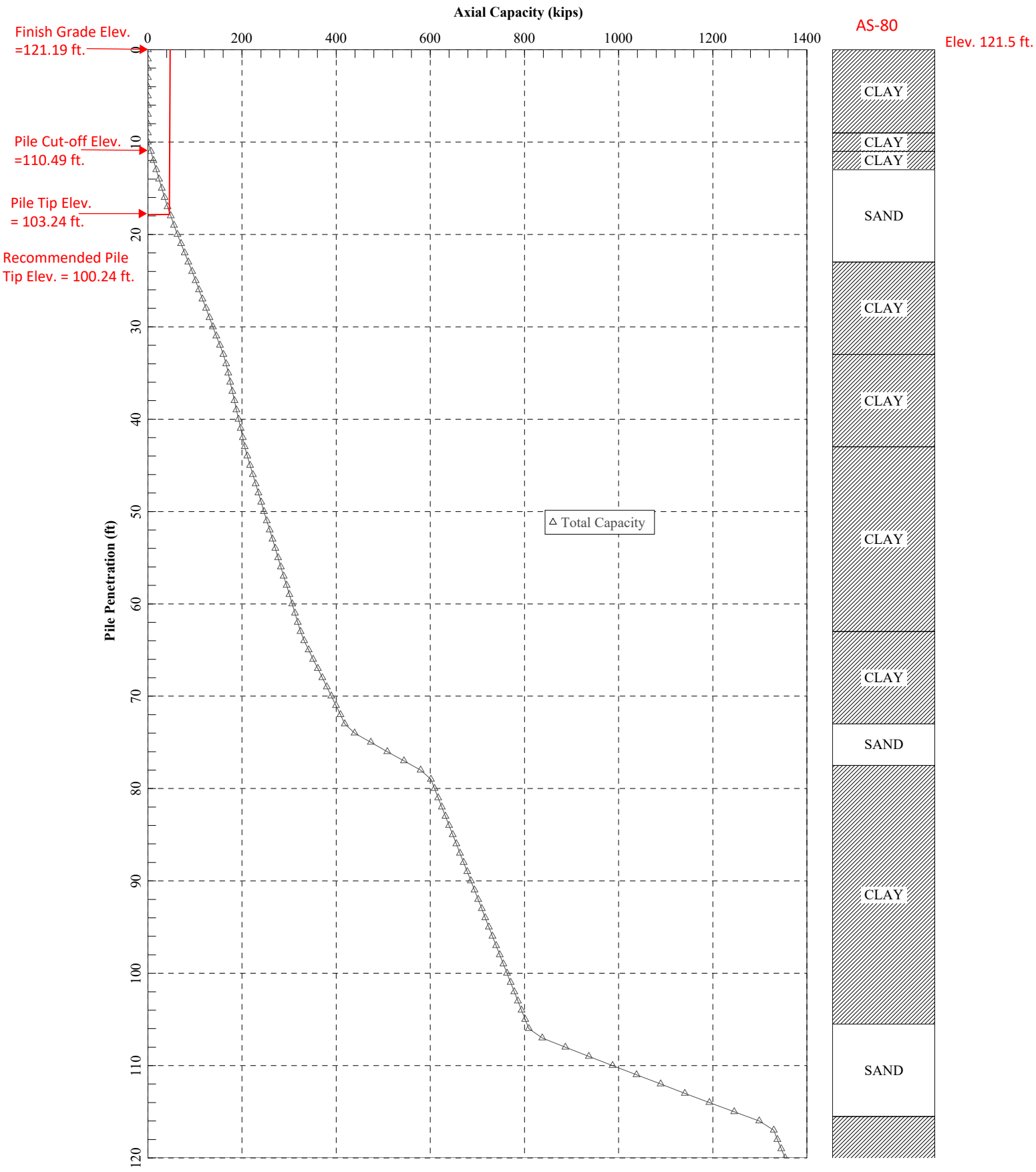
AERIAL GUIDEWAY – BENT 49 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 250 kips (Strength Limit Compression)/0.7 = 360 kips



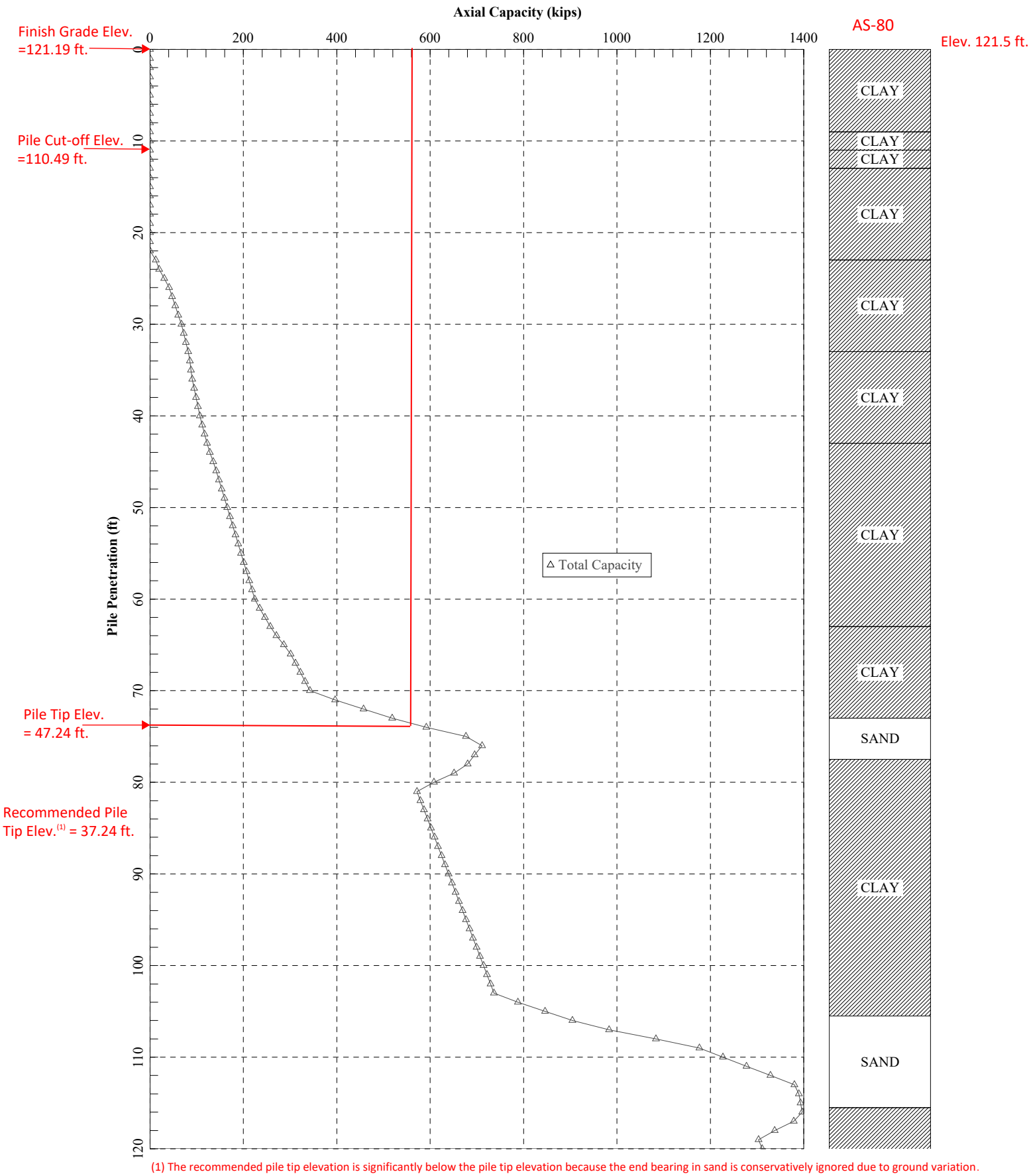
Eastridge to BART Regional Connector Project Bent 49 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 30 kips (Strength Limit Tension)/0.7 = 50 kips



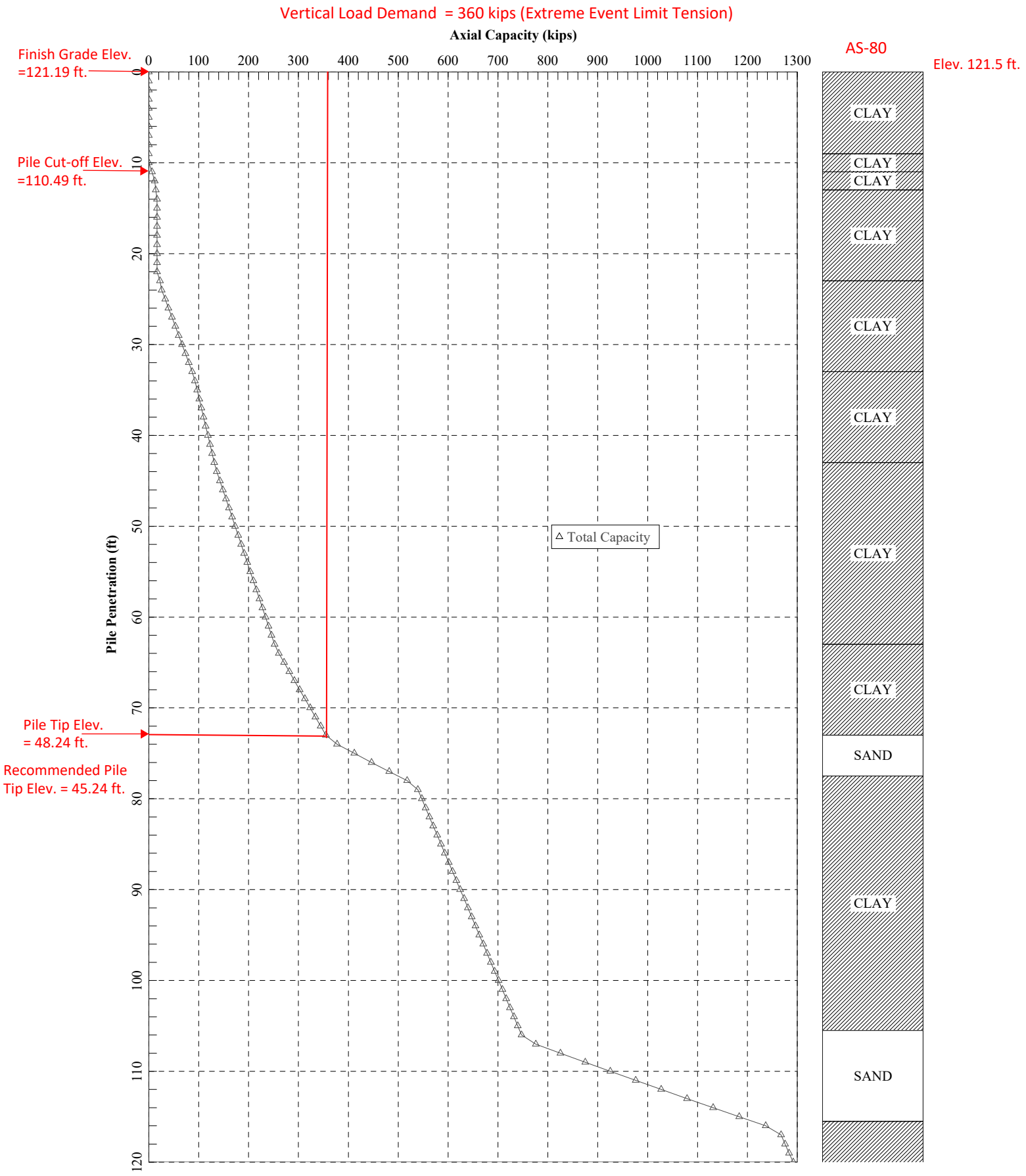
Eastridge to BART Regional Connector Project Bent 49 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 560 kips (Extreme Event Limit Compression)



(1) The recommended pile tip elevation is significantly below the pile tip elevation because the end bearing in sand is conservatively ignored due to ground variation.

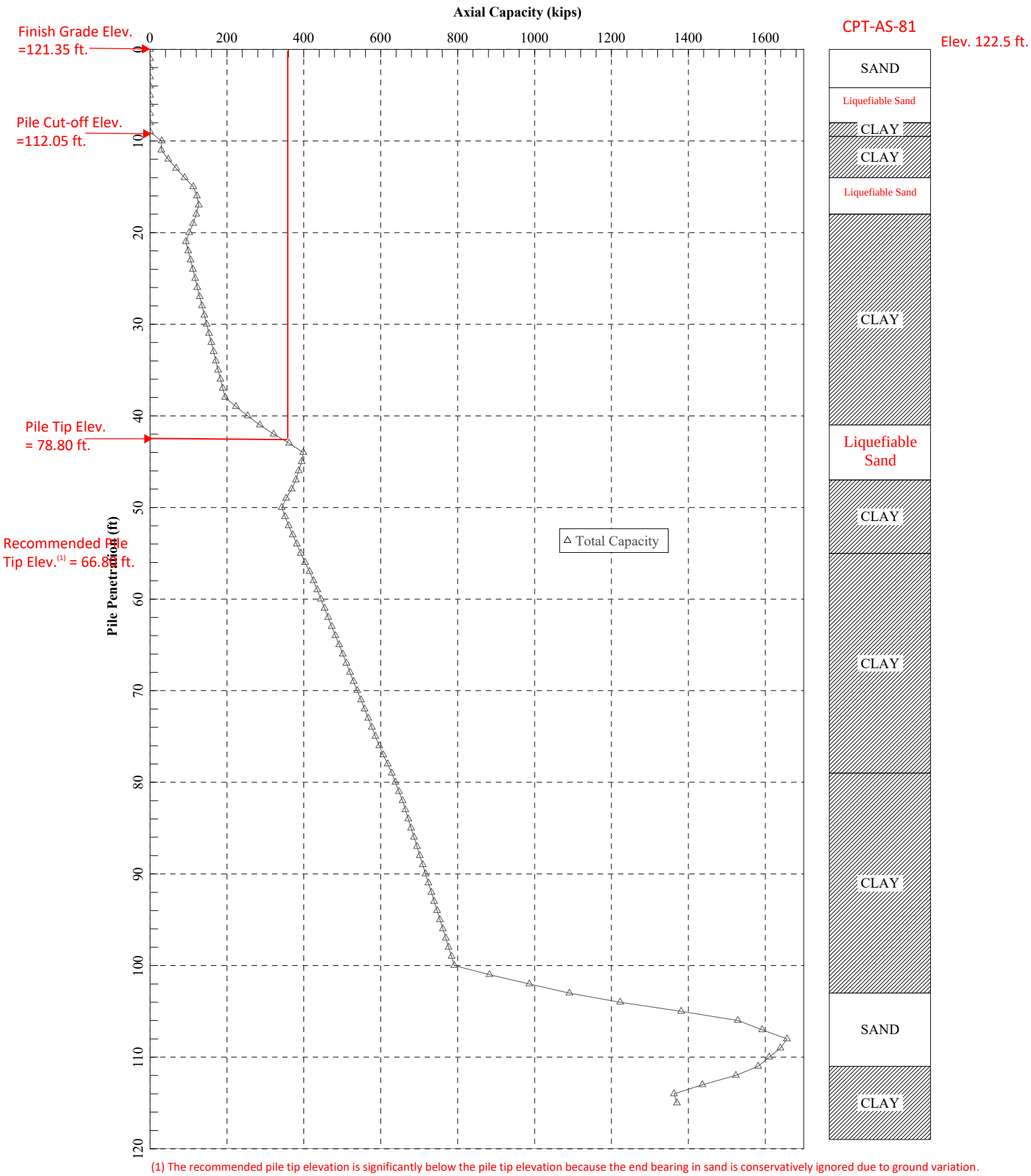
Eastridge to BART Regional Connector Project Bent 49 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)



Eastridge to BART Regional Connector Project Bent 49 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

AERIAL GUIDEWAY – BENT 50 (18-INCH SQUARE PRECAST CONCRETE PILE)

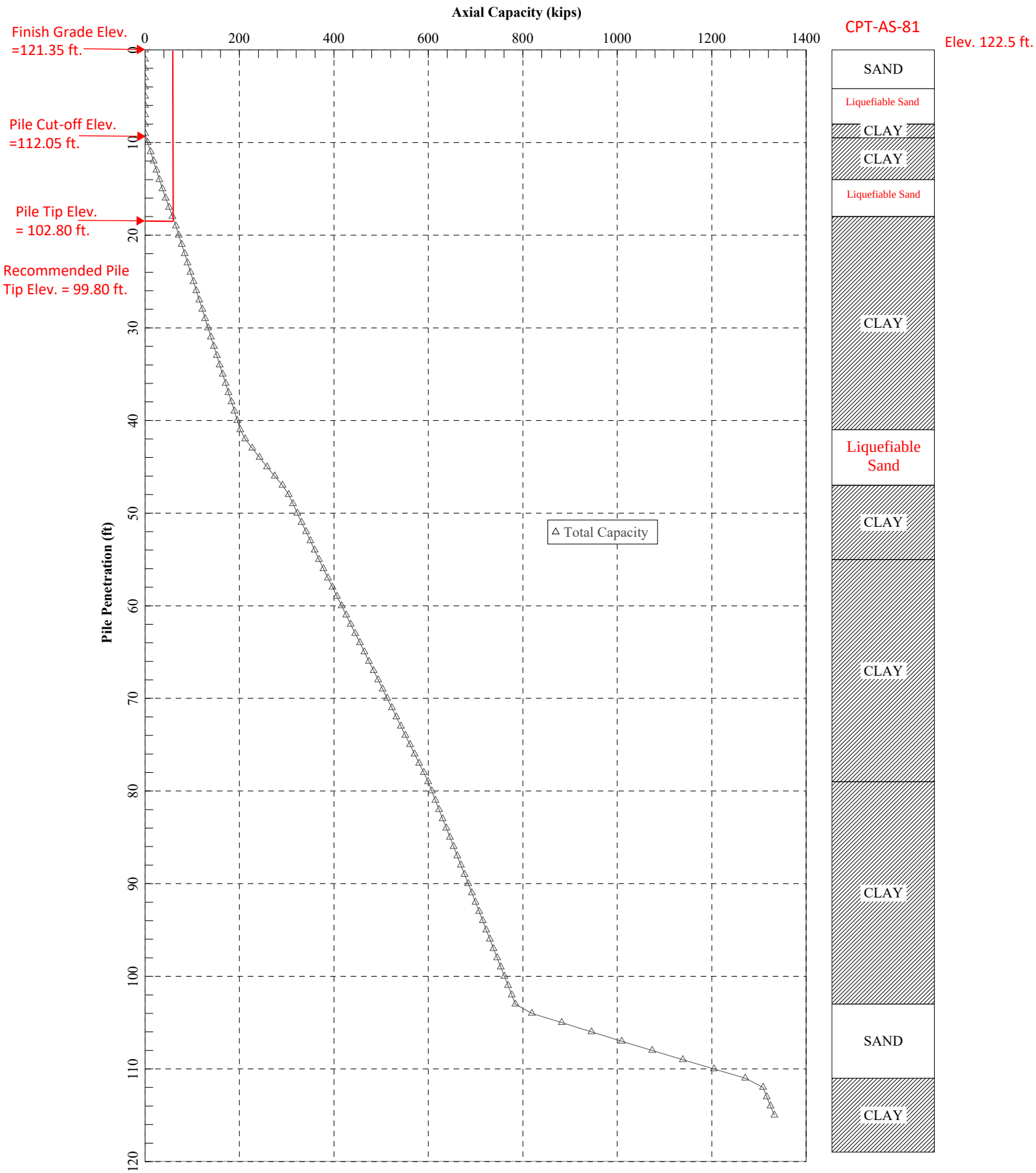
Vertical Load Demand = 250 kips (Strength Limit Compression)/0.7 = 360 kips



(1) The recommended pile tip elevation is significantly below the pile tip elevation because the end bearing in sand is conservatively ignored due to ground variation.

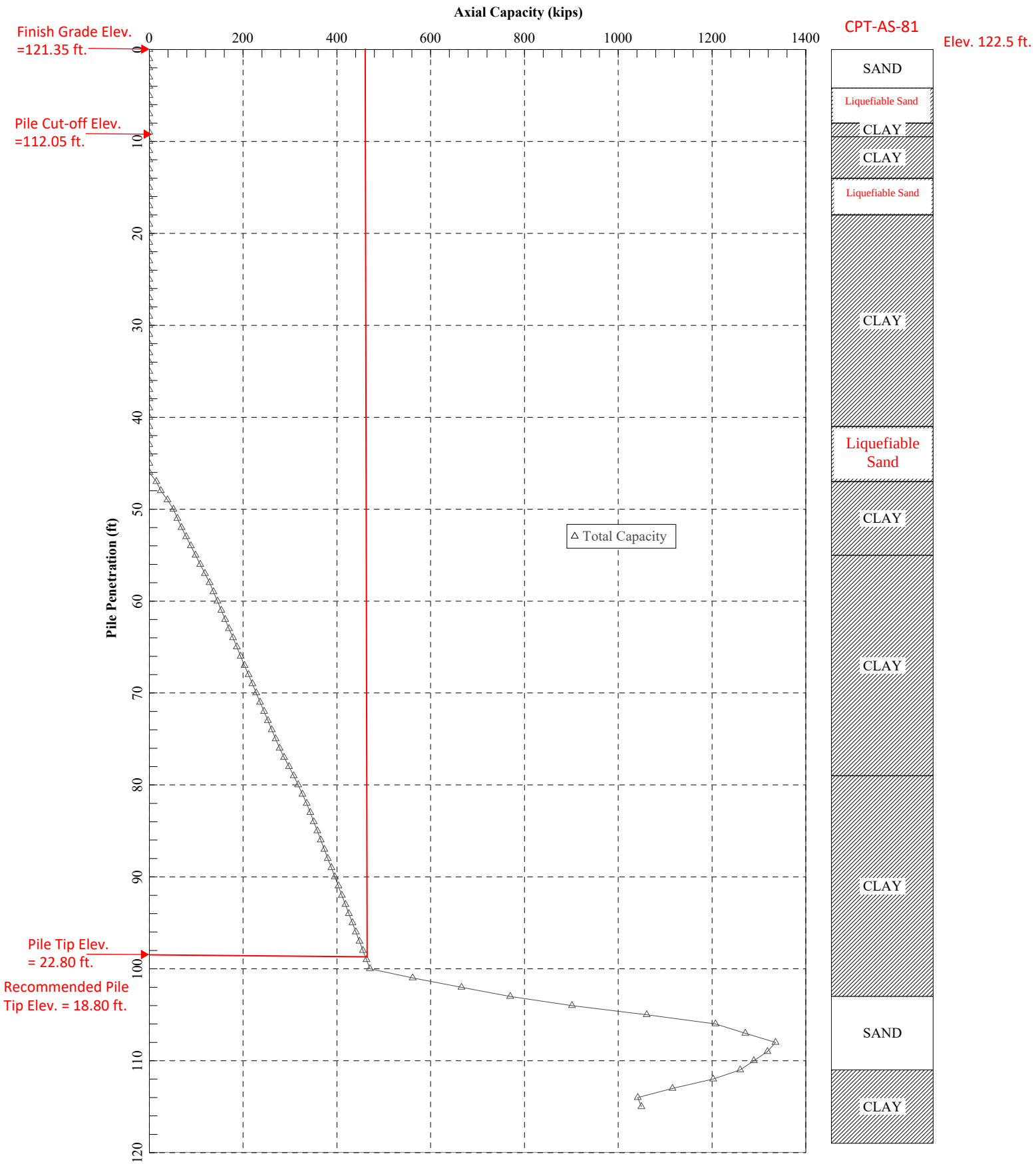
Eastridge to BART Regional Connector Project Bent 50 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 40 kips (Strength Limit Tension)/0.7 = 60 kips

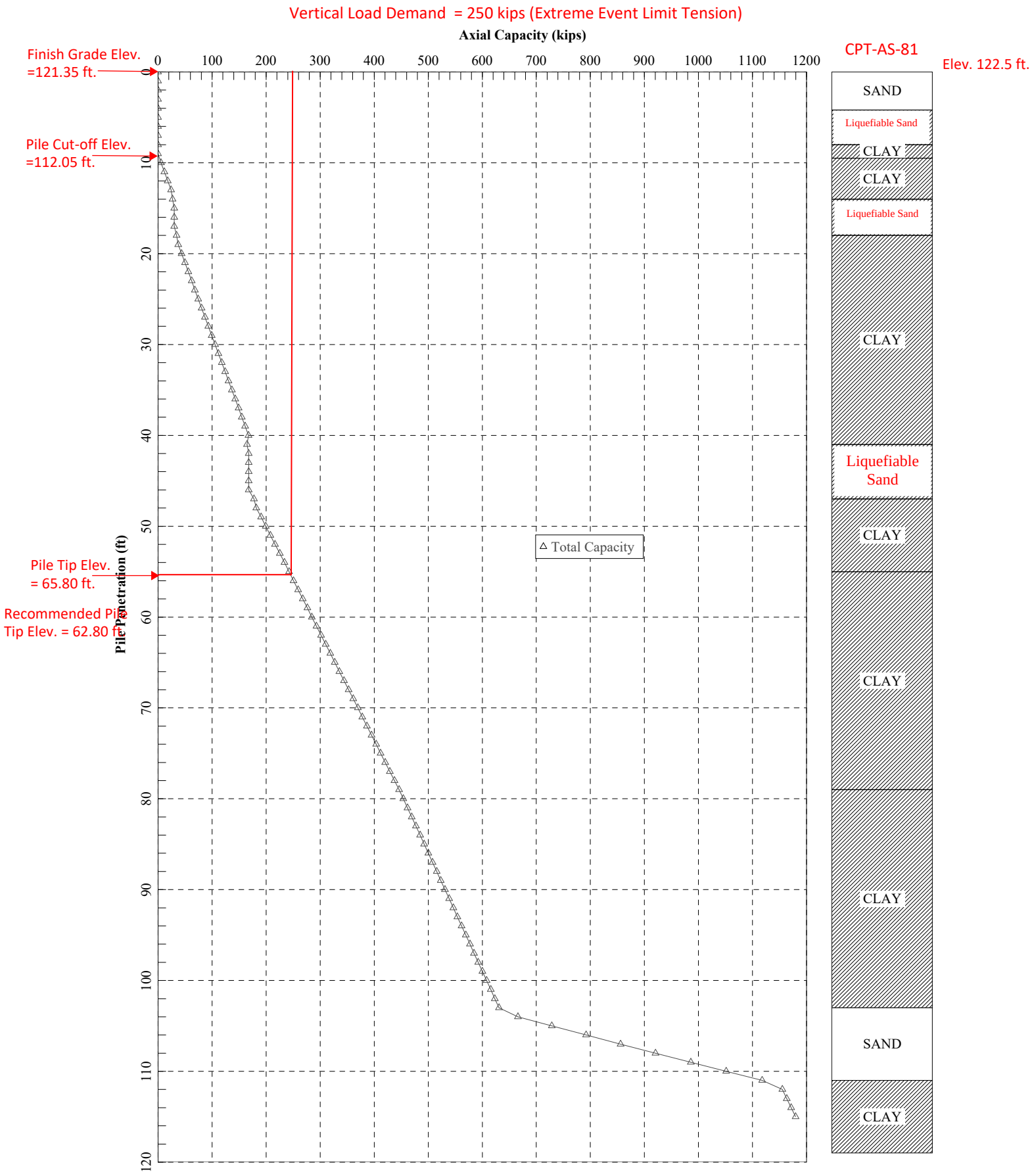


Eastridge to BART Regional Connector Project Bent 50 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 24 kips (Downdrag) + 430 kips (Extreme Event Limit Compression) = 460 kips



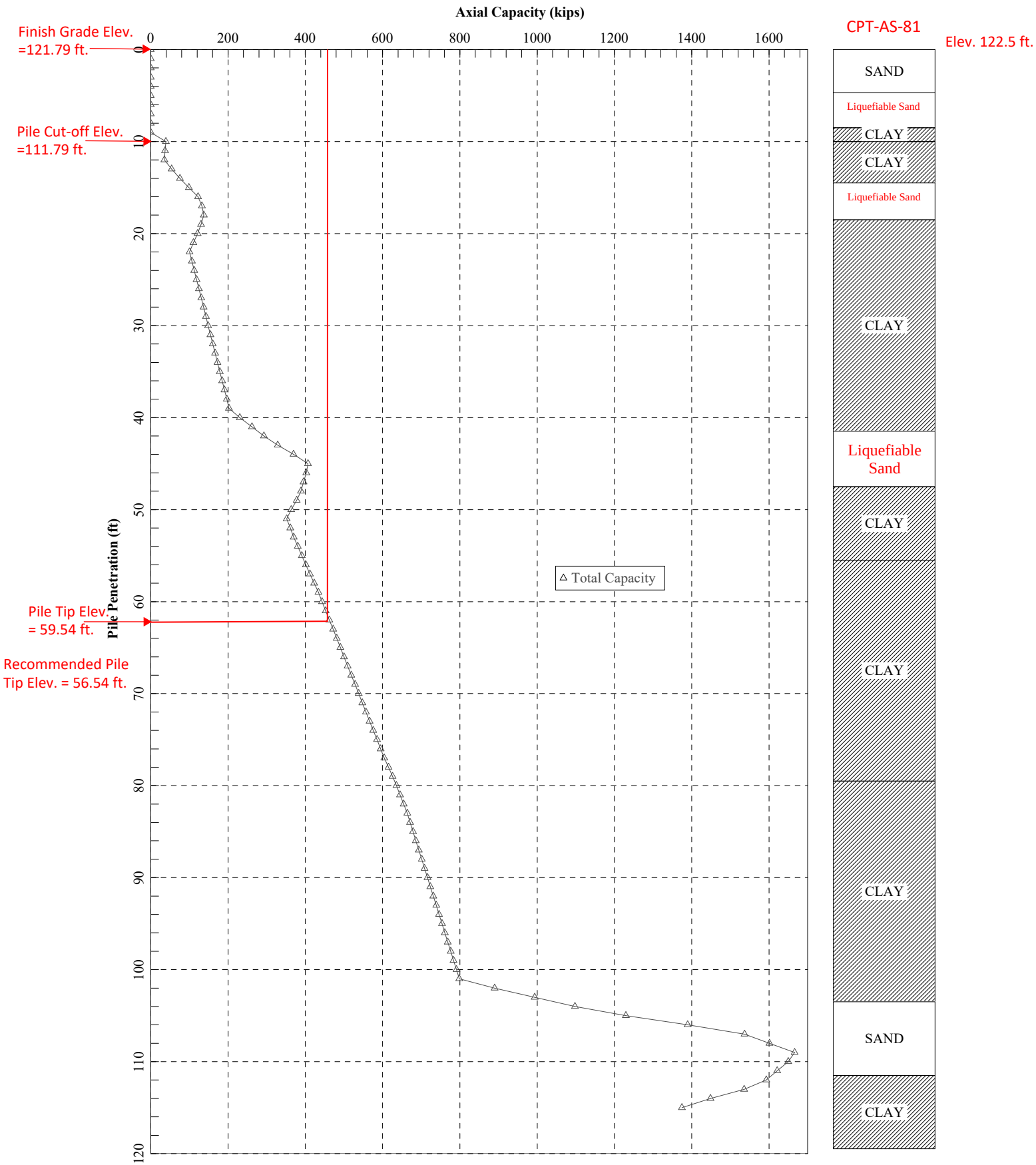
Eastridge to BART Regional Connector Project Bent 50 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)



Eastridge to BART Regional Connector Project Bent 50 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

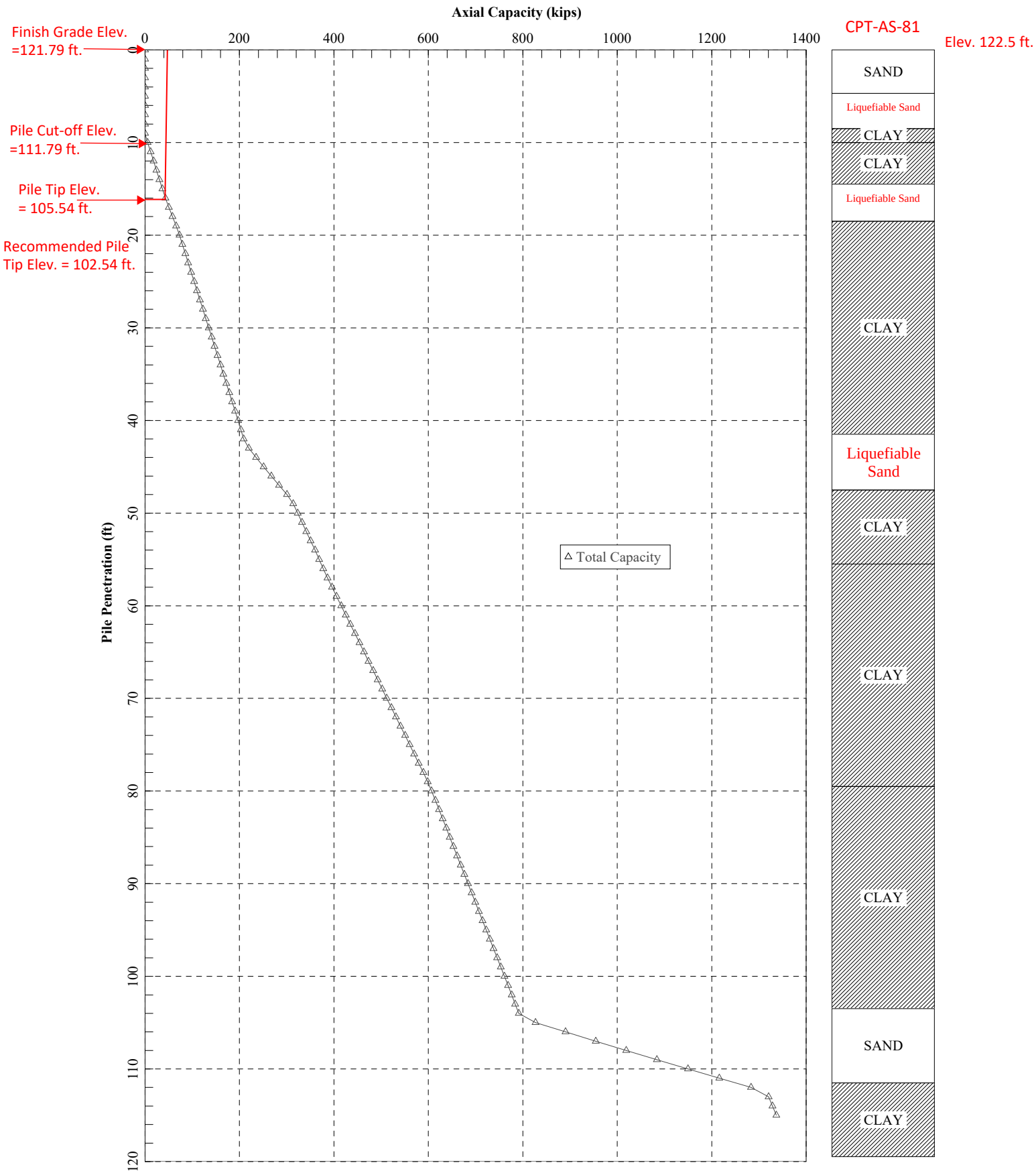
AERIAL GUIDEWAY – BENT 51 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 320 kips (Strength Limit Compression)/0.7 = 460 kips



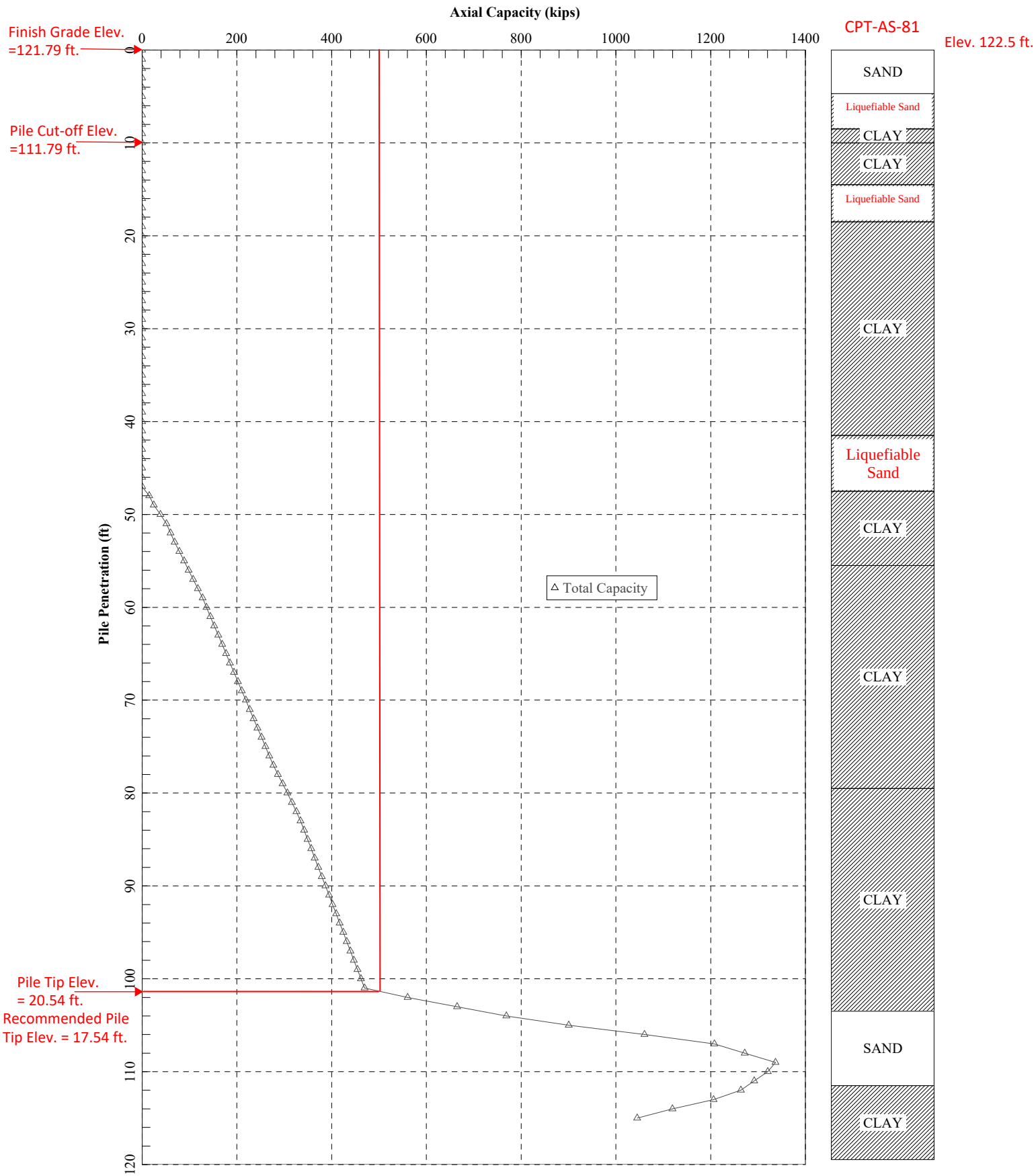
Eastridge to BART Regional Connector Project Bent 51 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 30 kips (Strength Limit Tension)/0.7 = 50 kips

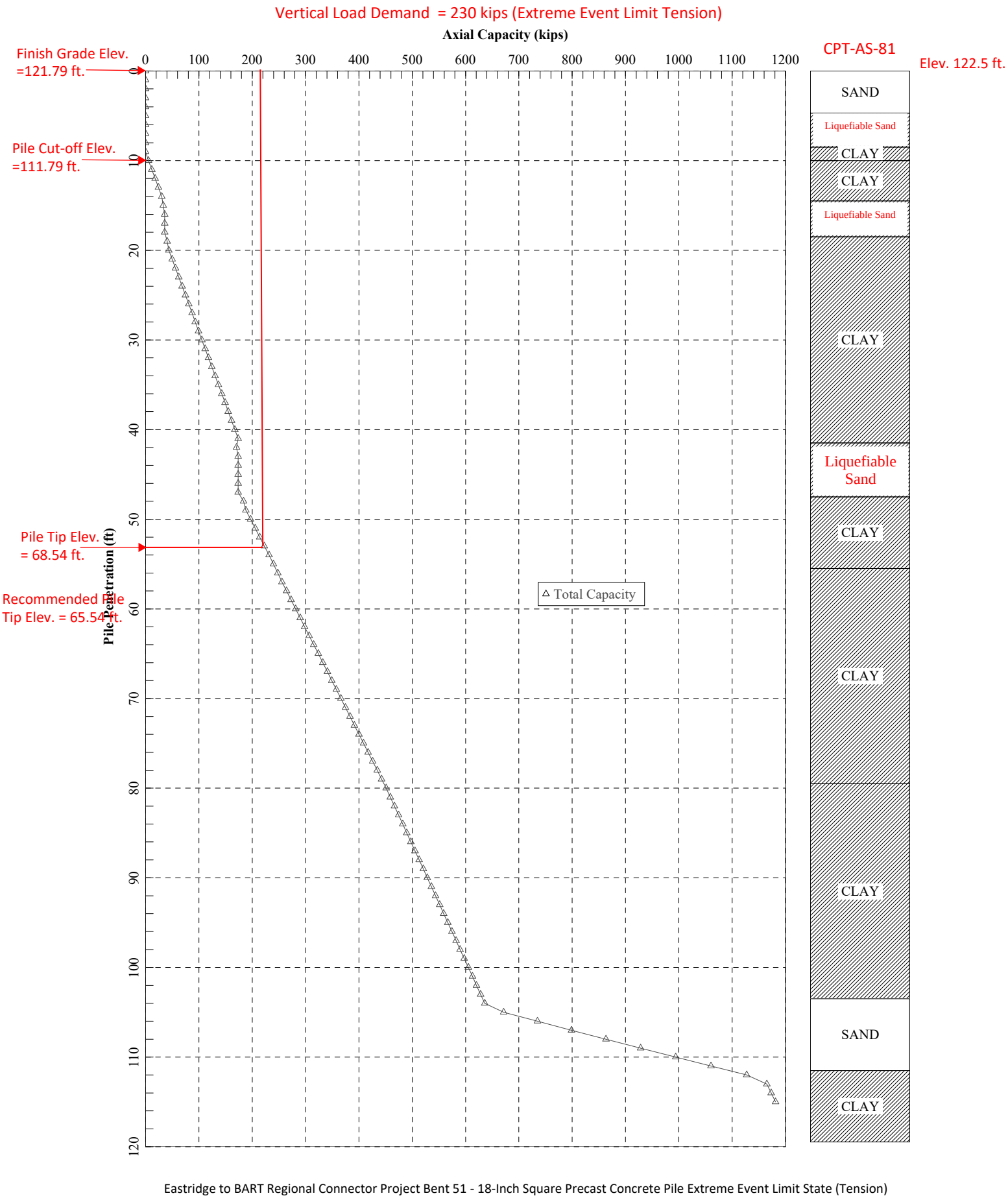


Eastridge to BART Regional Connector Project Bent 51 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 25 kips (Downdrag) + 470 kips (Extreme Event Limit Compression) = 500 kips



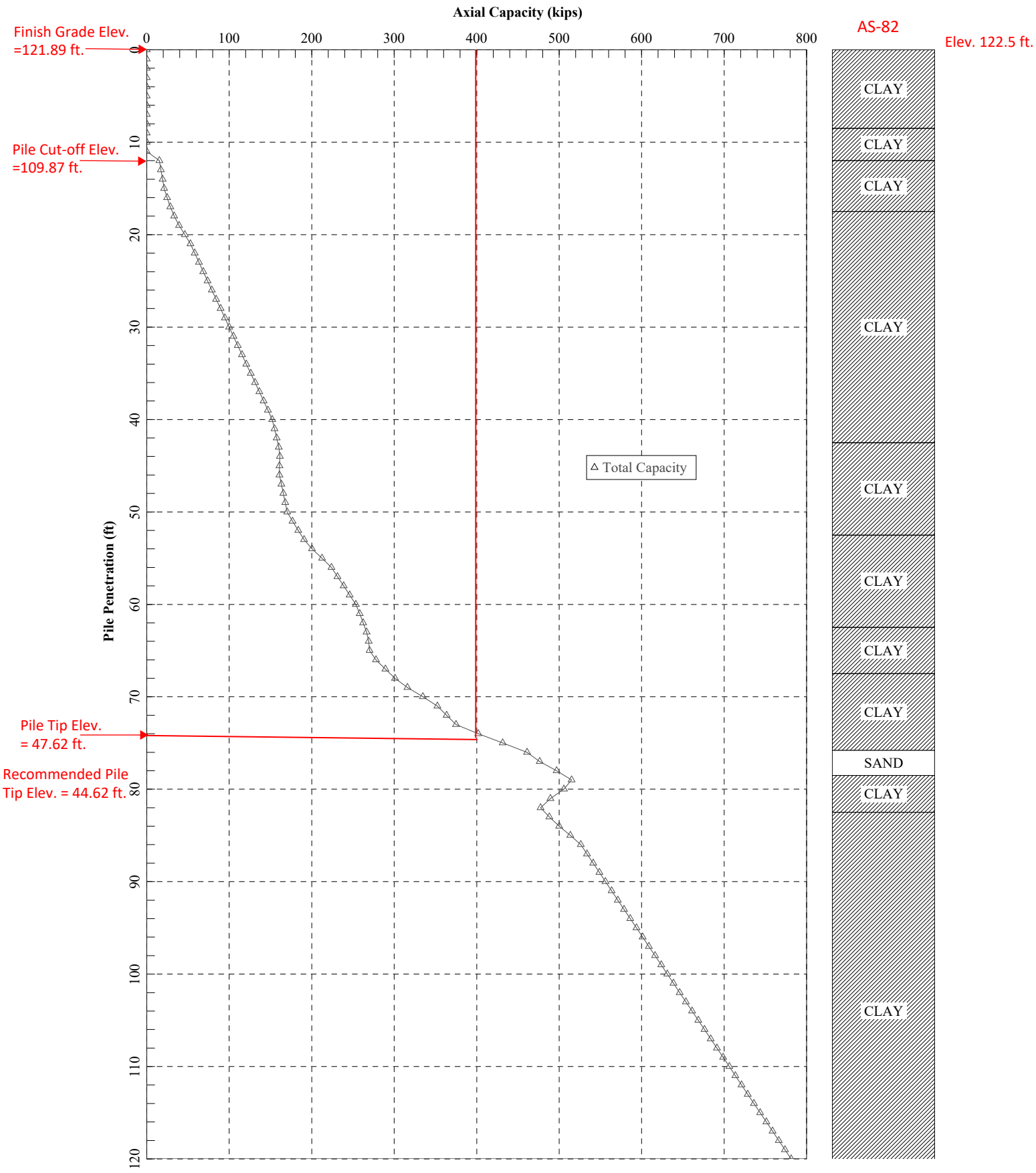
Eastridge to BART Regional Connector Project Bent 51 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)



Eastridge to BART Regional Connector Project Bent 51 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

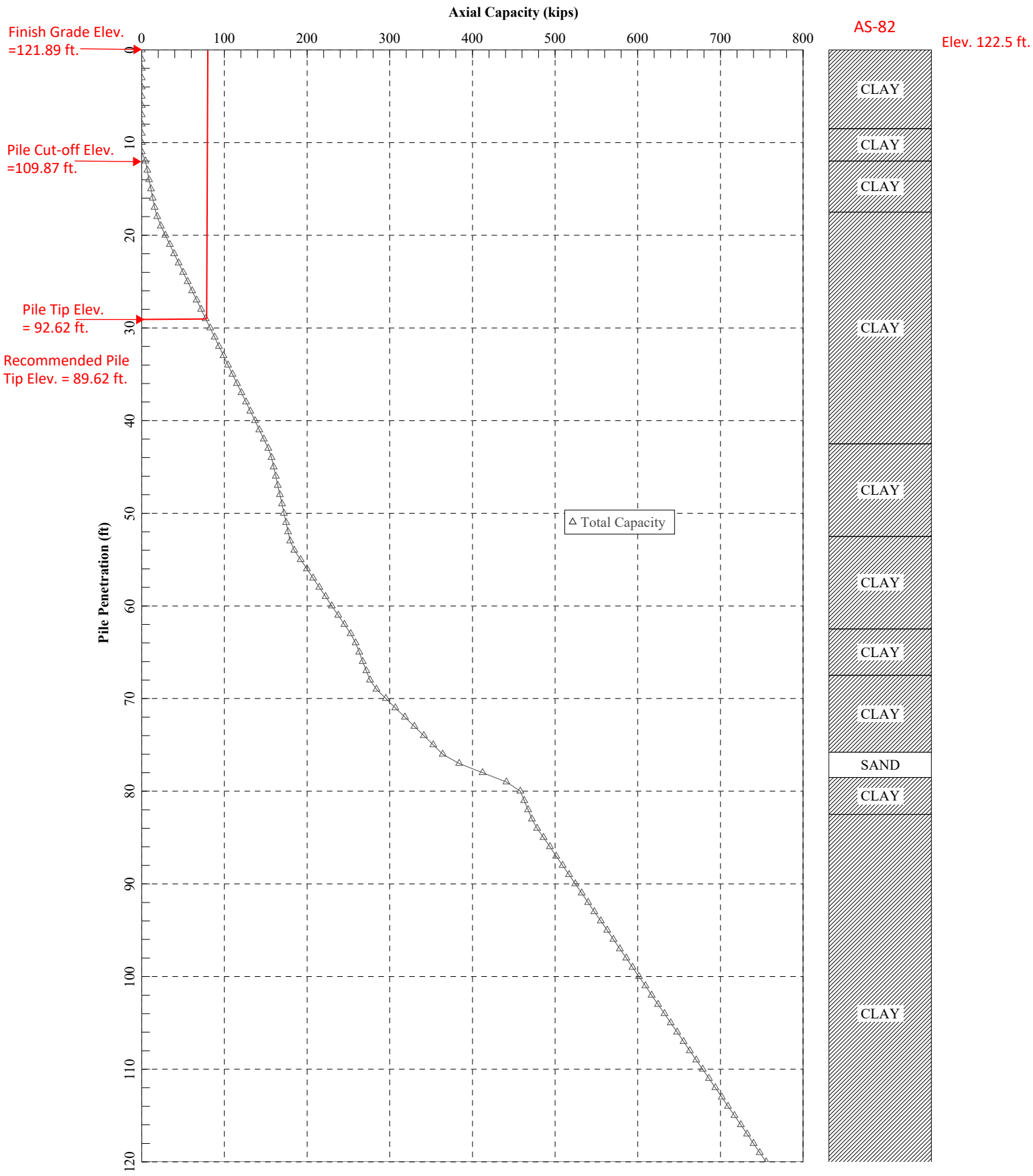
AERIAL GUIDEWAY – BENT 52 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 280 kips (Strength Limit Compression)/0.7 = 400 kips



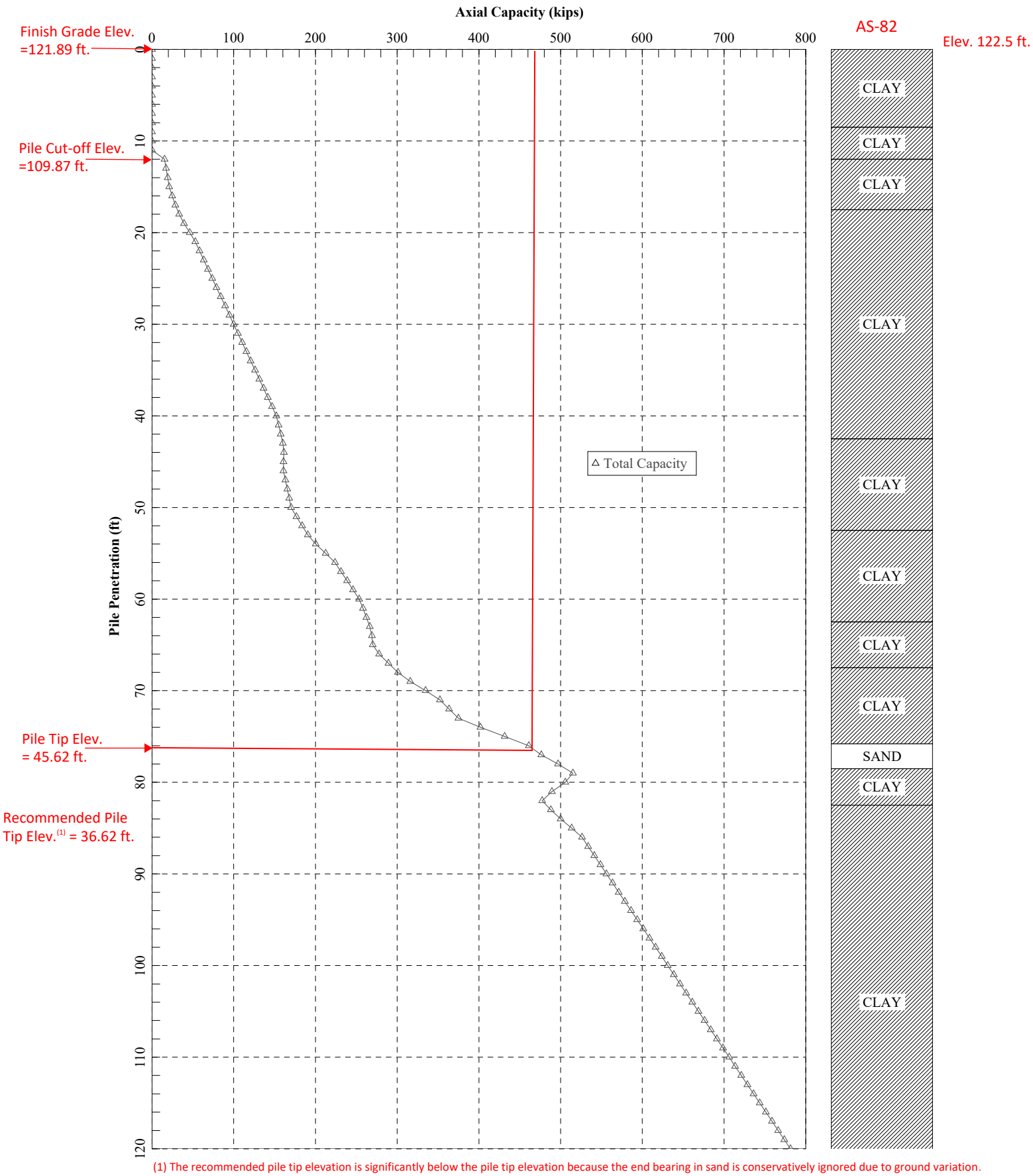
Eastridge to BART Regional Connector Project Bent 52 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 50 kips (Strength Limit Tension)/0.7 = 80 kips



Eastridge to BART Regional Connector Project Bent 52 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

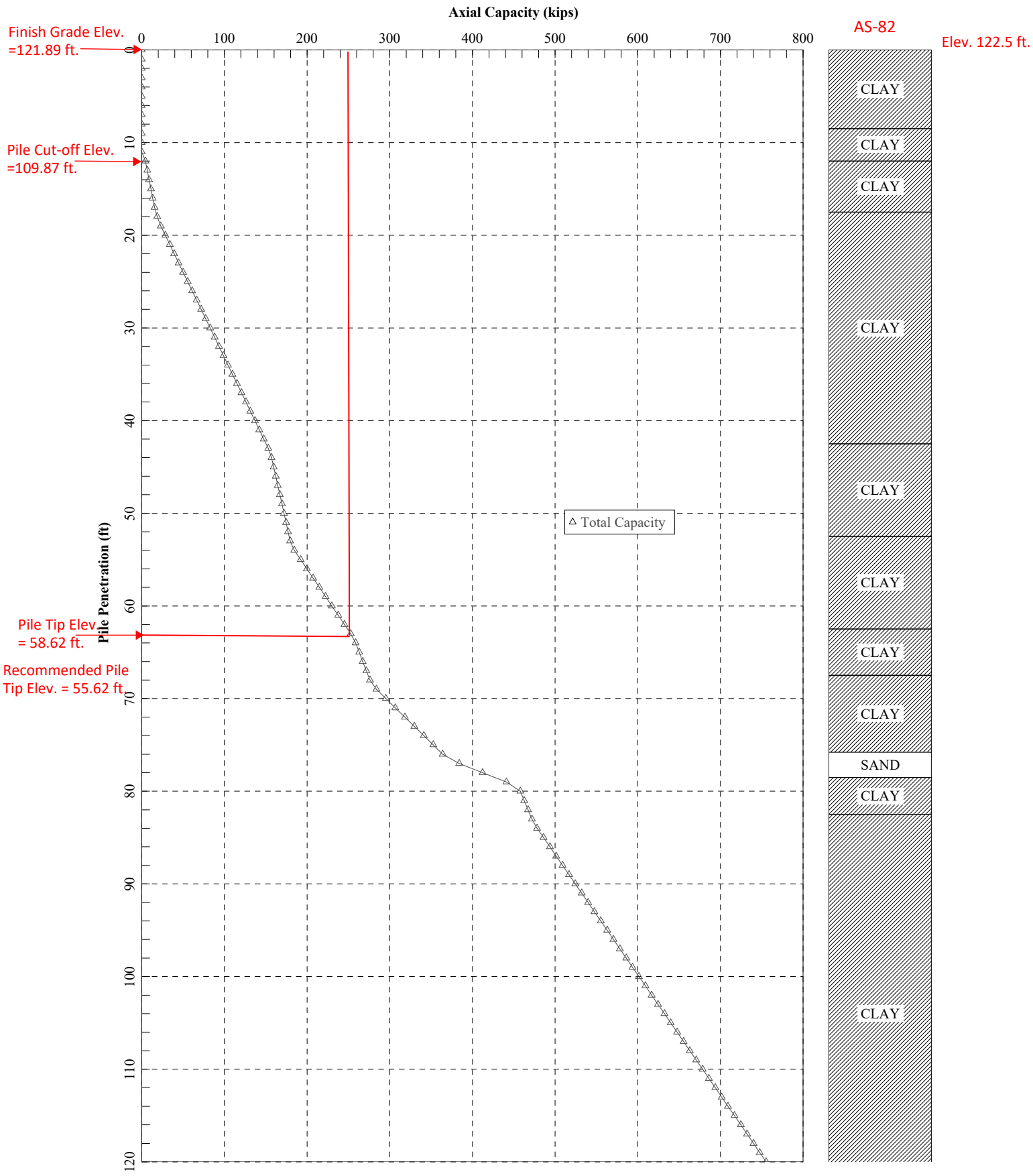
Vertical Load Demand = 470 kips (Extreme Event Limit Compression)



(1) The recommended pile tip elevation is significantly below the pile tip elevation because the end bearing in sand is conservatively ignored due to ground variation.

Eastridge to BART Regional Connector Project Bent 52 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

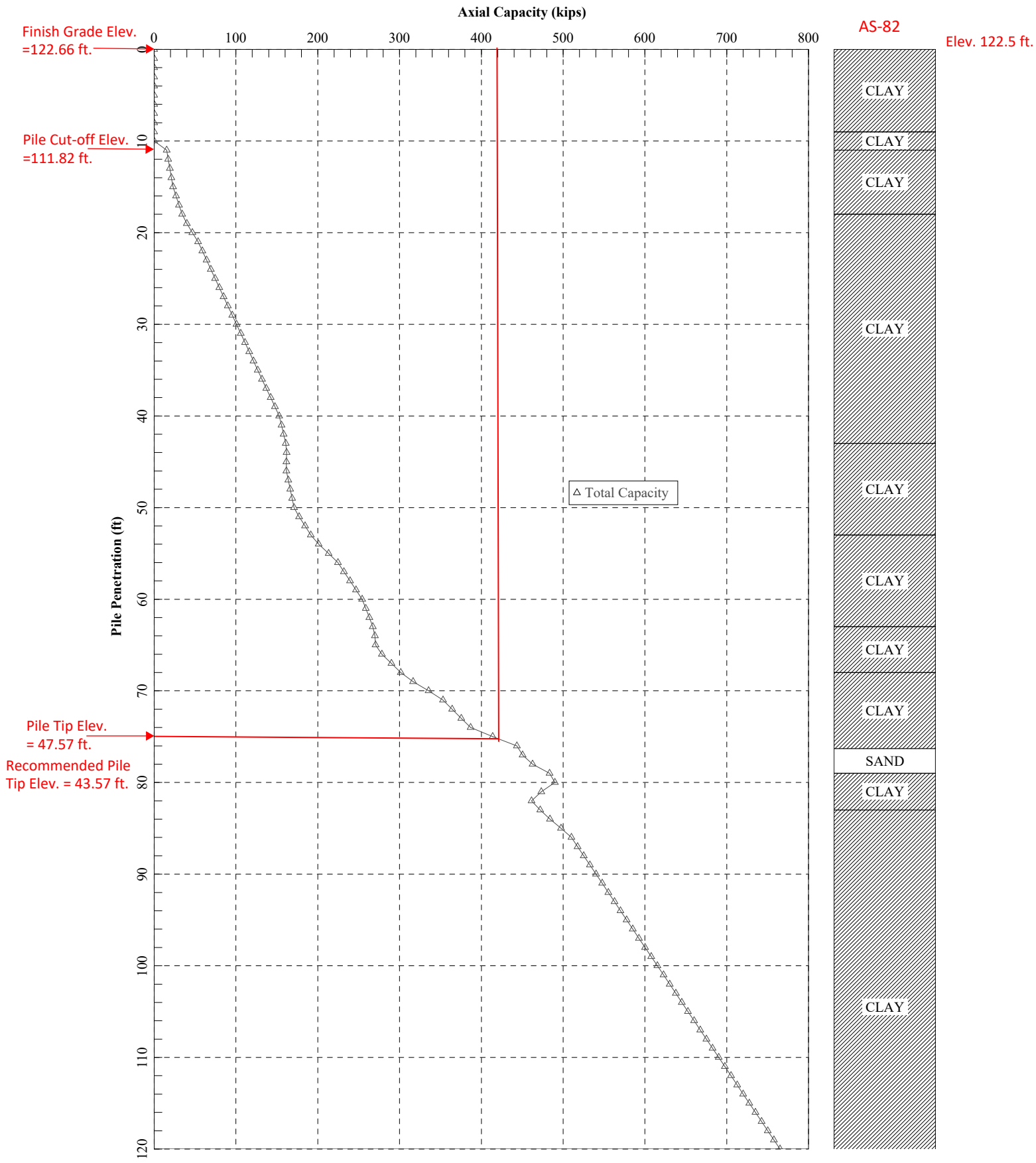
Vertical Load Demand = 250 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 52 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

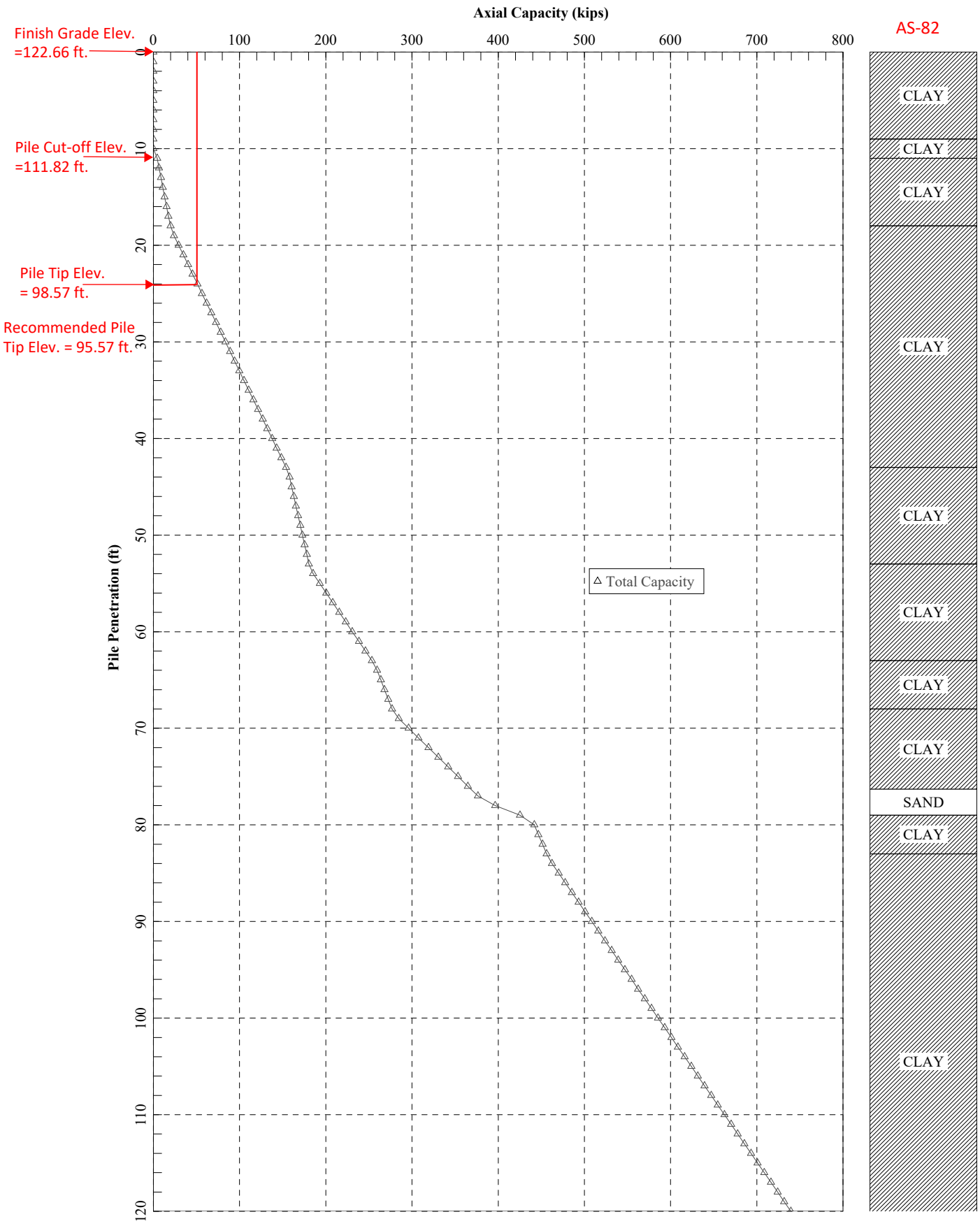
AERIAL GUIDEWAY – BENT 53 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 290 kips (Strength Limit Compression)/0.7 = 420 kips



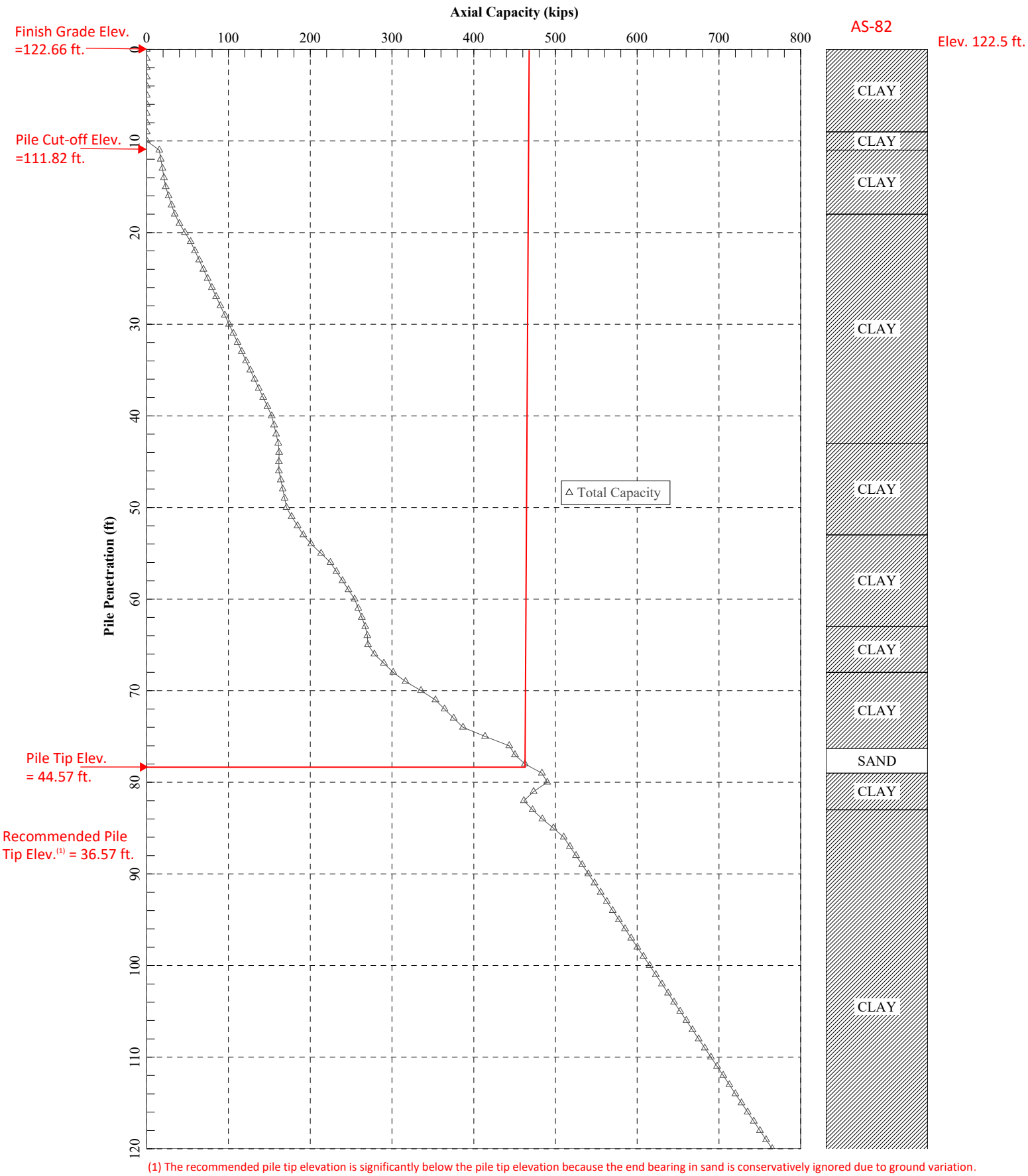
Eastridge to BART Regional Connector Project Bent 53 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 30 kips (Strength Limit Tension)/0.7 = 50 kips



Eastridge to BART Regional Connector Project Bent 53 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

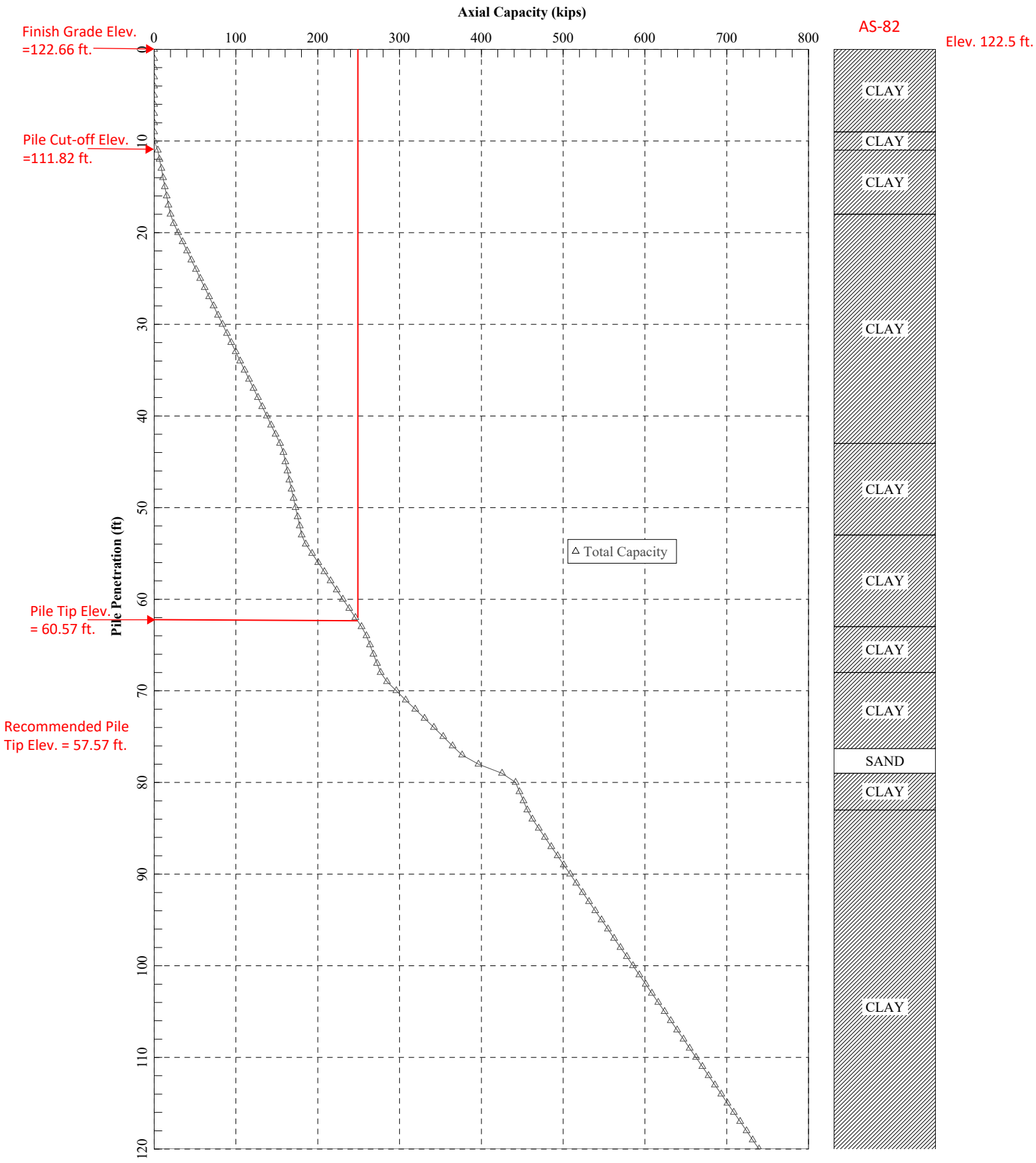
Vertical Load Demand = 470 kips (Extreme Event Limit Compression)



(1) The recommended pile tip elevation is significantly below the pile tip elevation because the end bearing in sand is conservatively ignored due to ground variation.

Eastridge to BART Regional Connector Project Bent 53 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

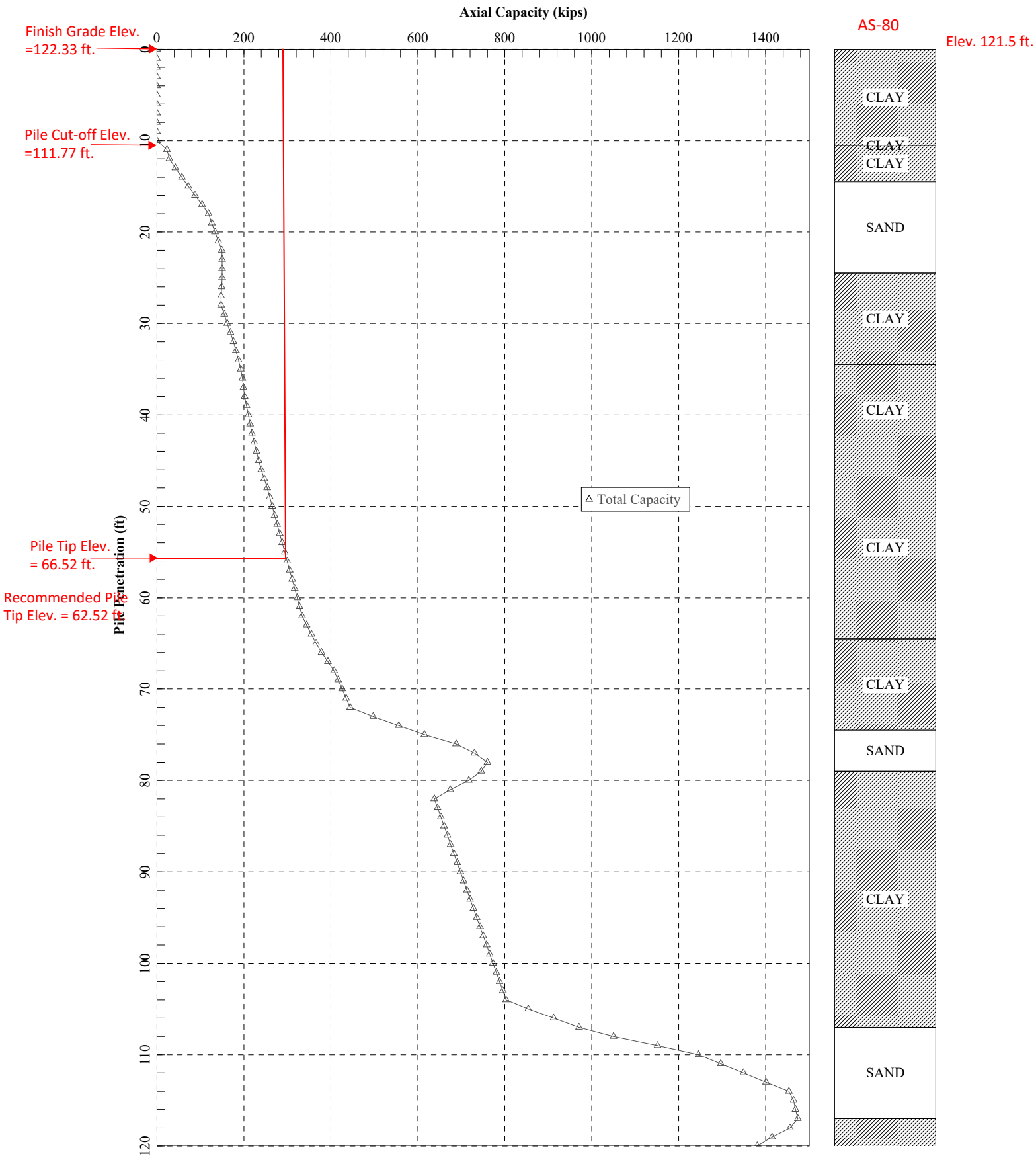
Vertical Load Demand = 250 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 53 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

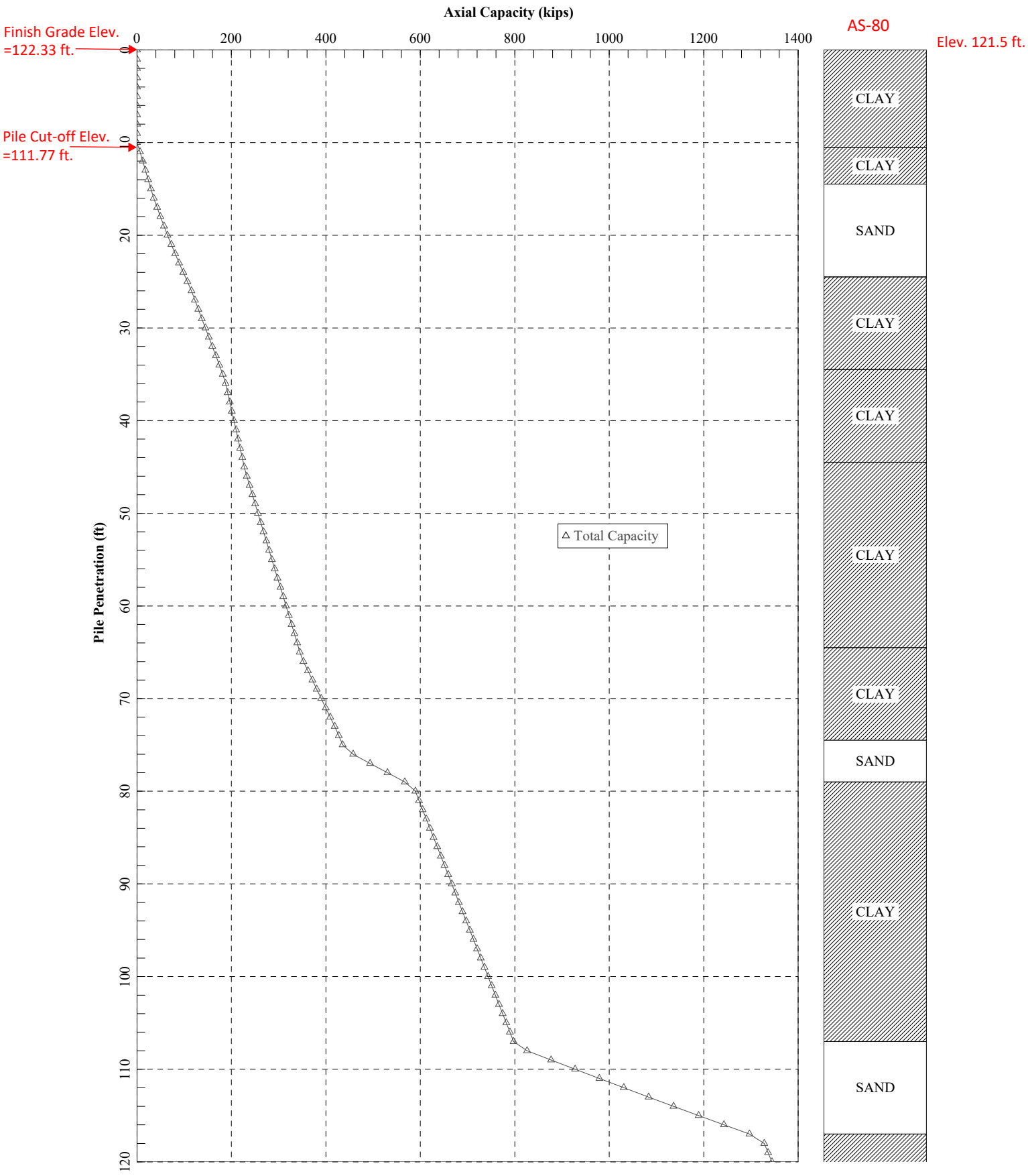
AERIAL GUIDEWAY – BENT 54 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 200 kips (Strength Limit Compression)/0.7 = 290 kips



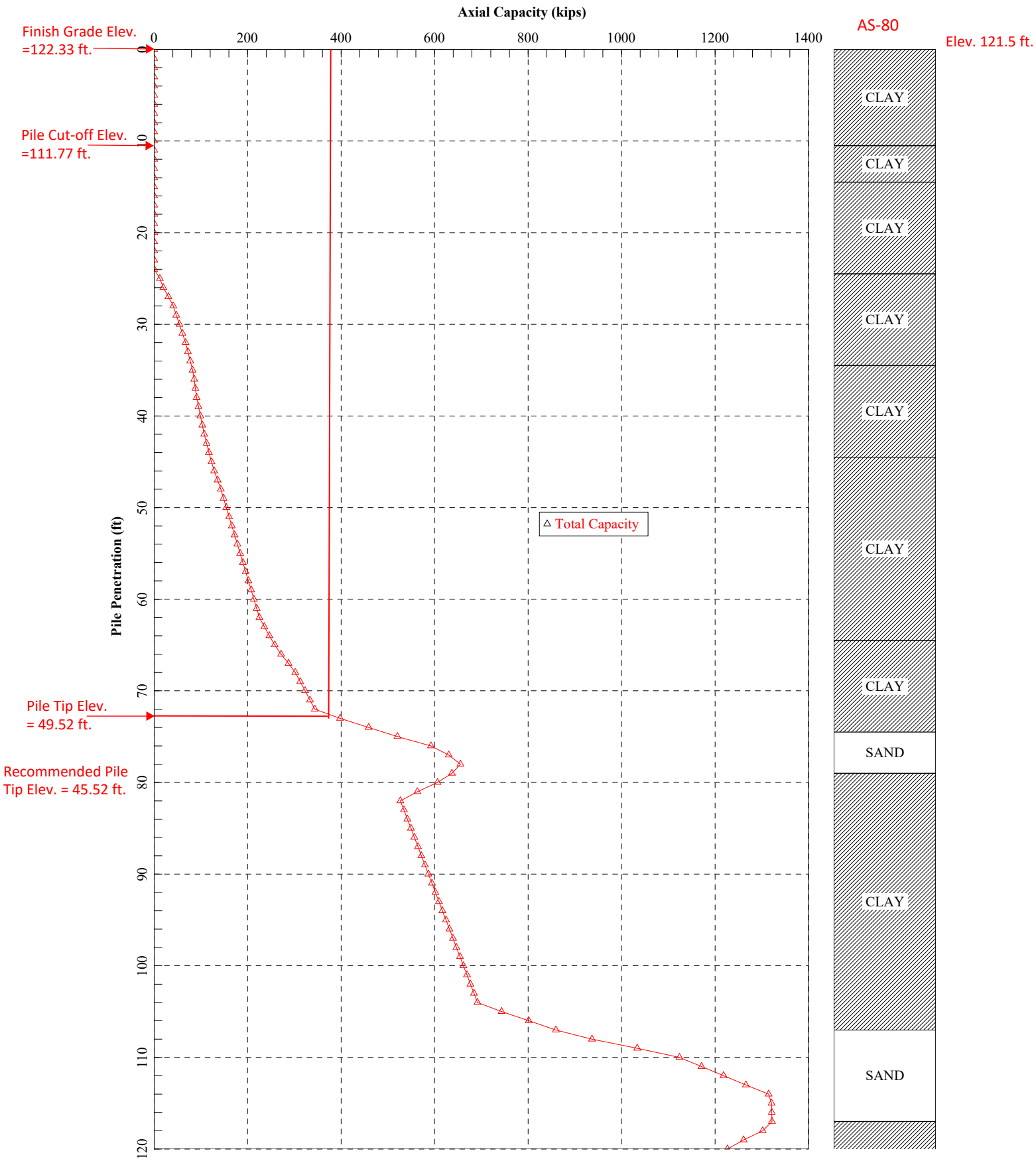
Eastridge to BART Regional Connector Project Bent 54 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 0 kips (Strength Limit Tension)/0.7 = 0 kips

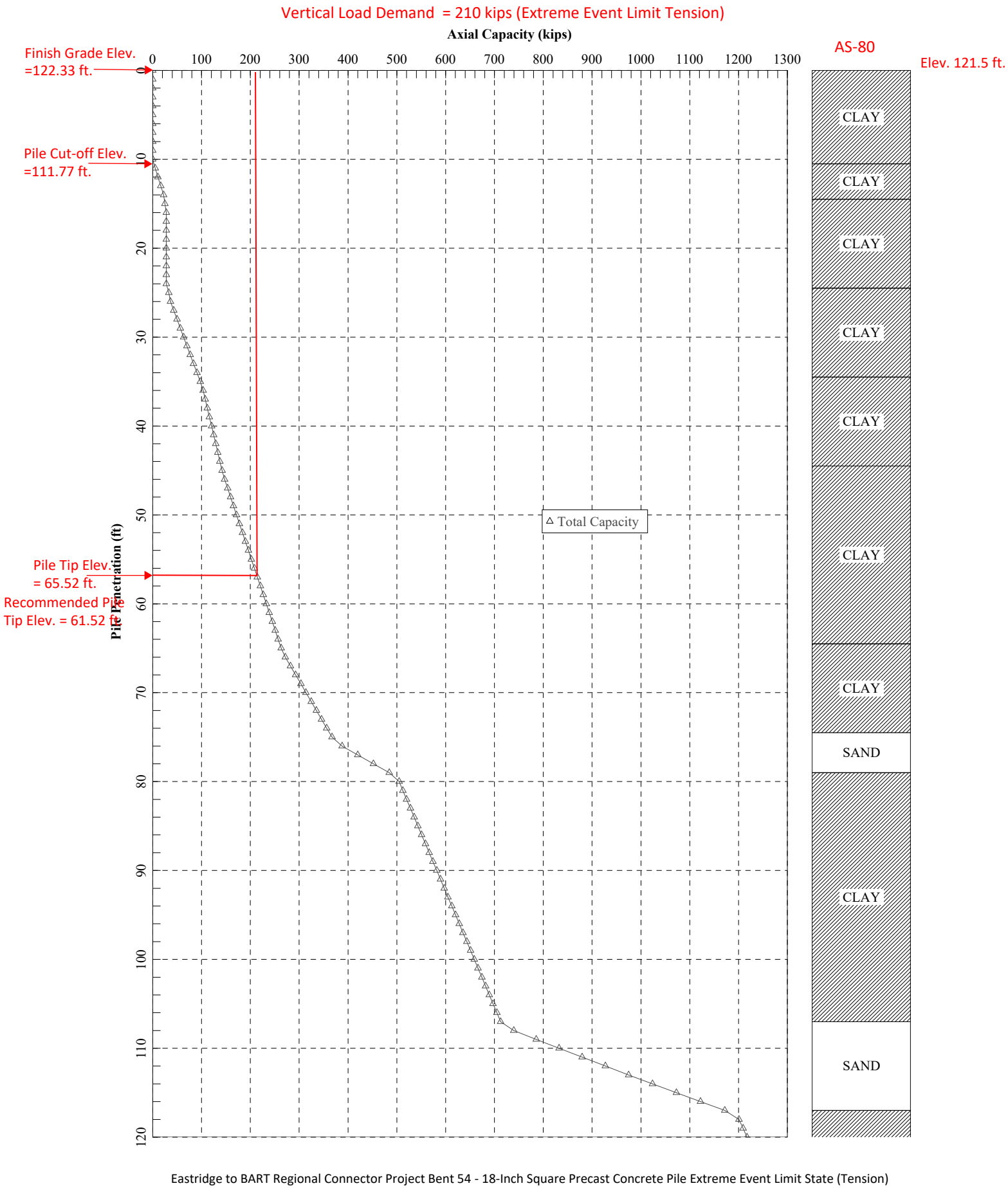


Eastridge to BART Regional Connector Project Bent 54 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 380 kips (Extreme Event Limit Compression)



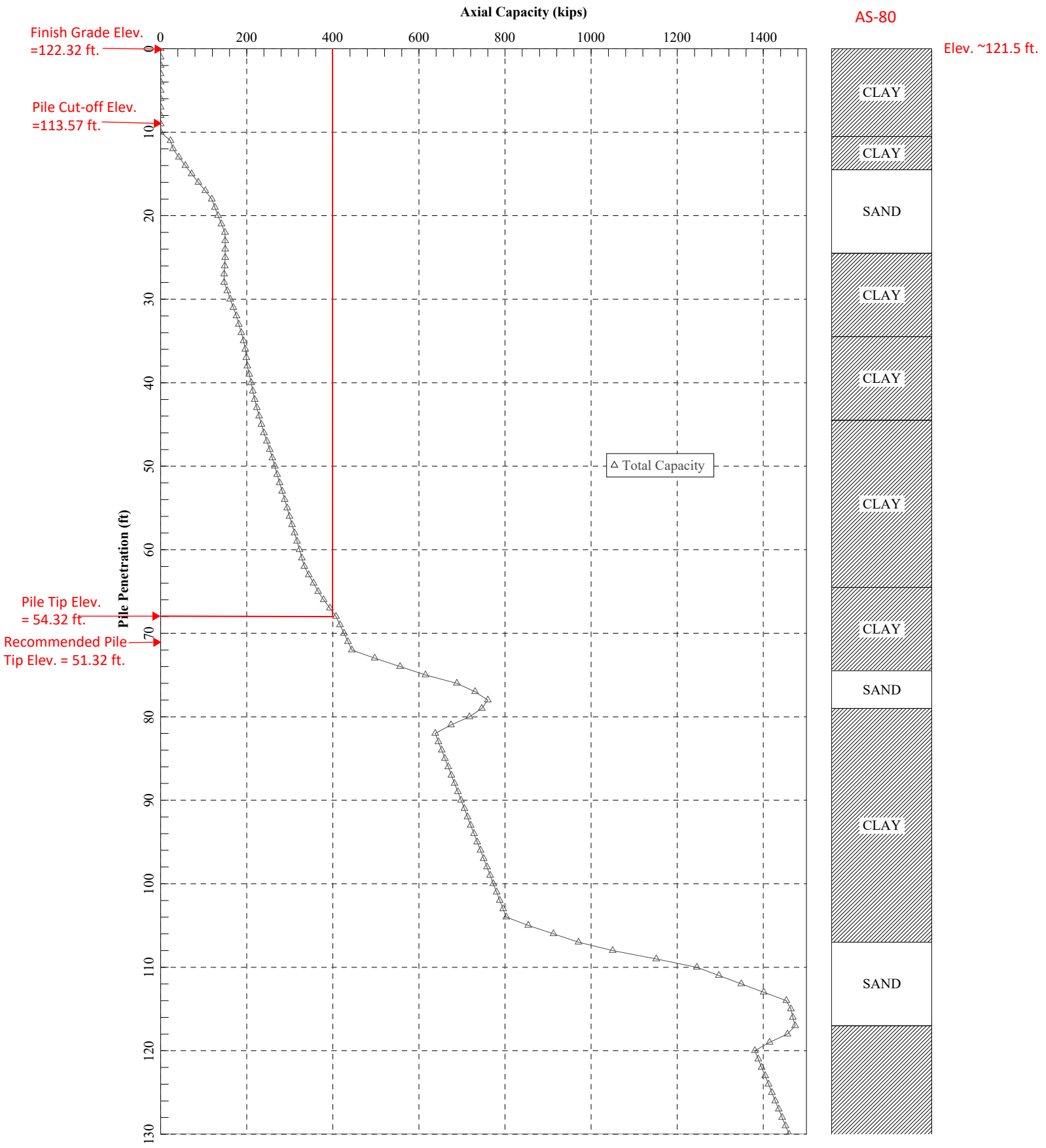
Eastridge to BART Regional Connector Project Bent 54 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)



Eastridge to BART Regional Connector Project Bent 54 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

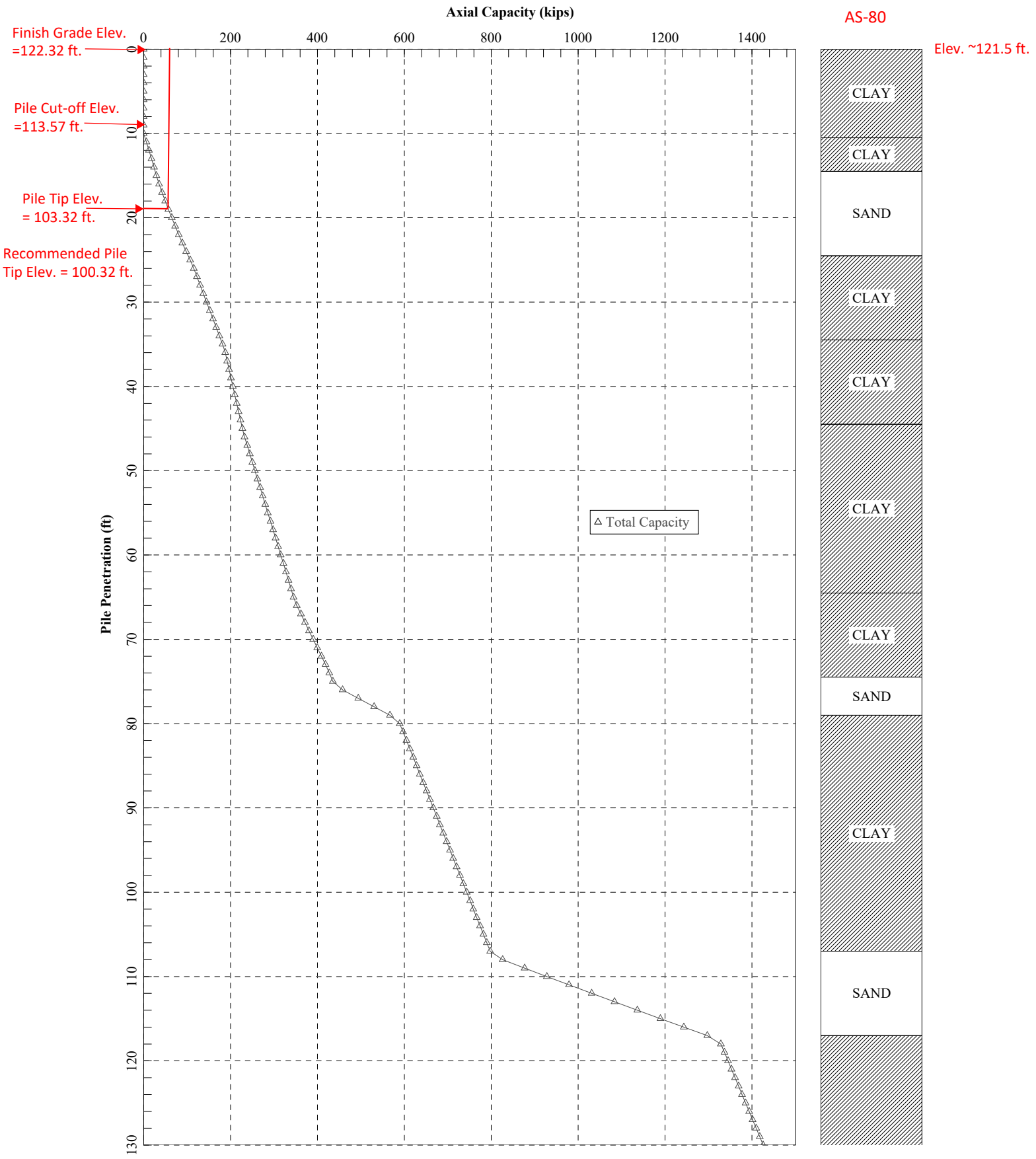
AERIAL GUIDEWAY – BENT 55 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 280 kips (Strength Limit Compression)/0.7 = 400 kips



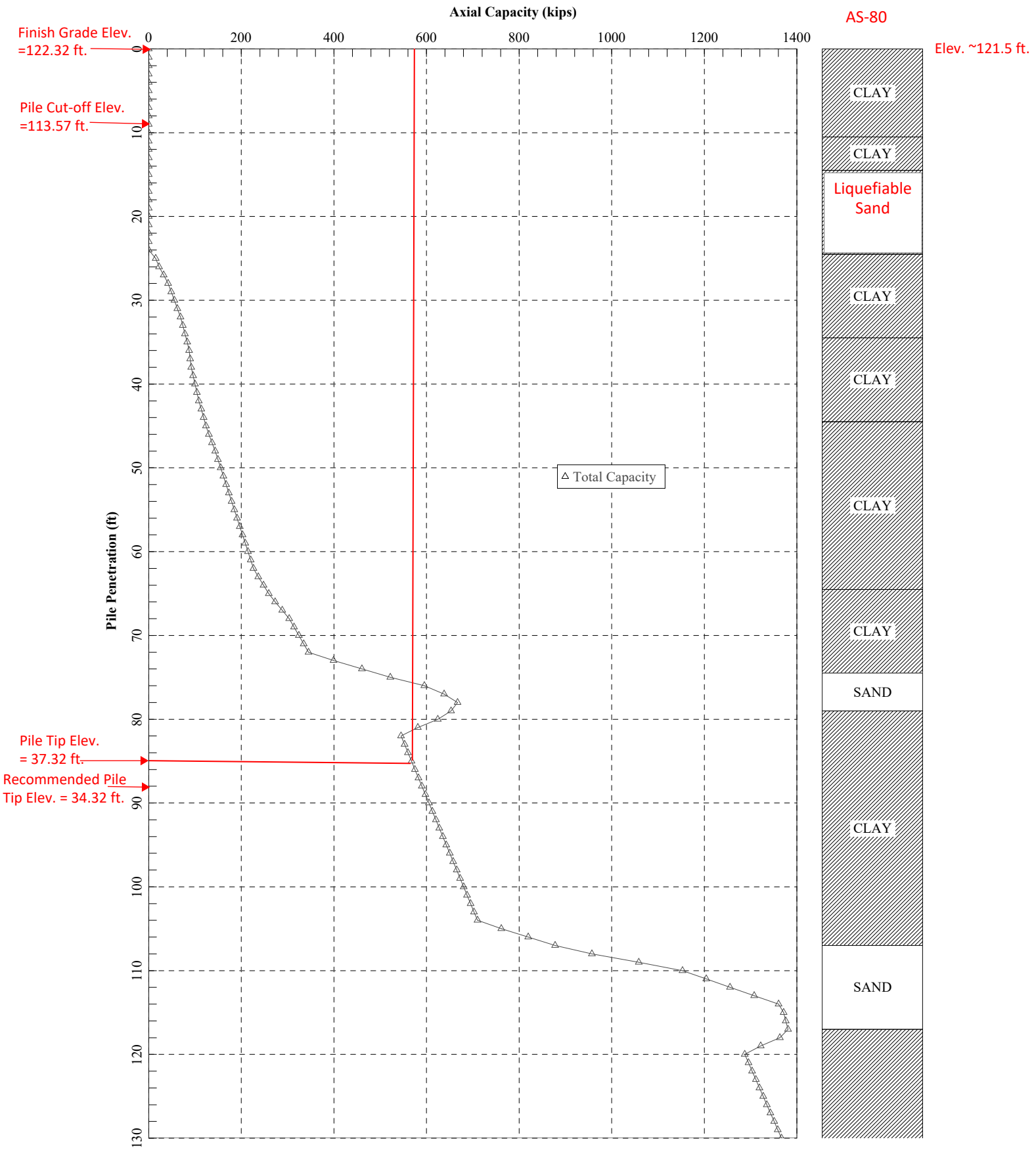
Eastridge to BART Regional Connector Project Bent 55 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 40 kips (Strength Limit Tension)/0.7 = 60 kips

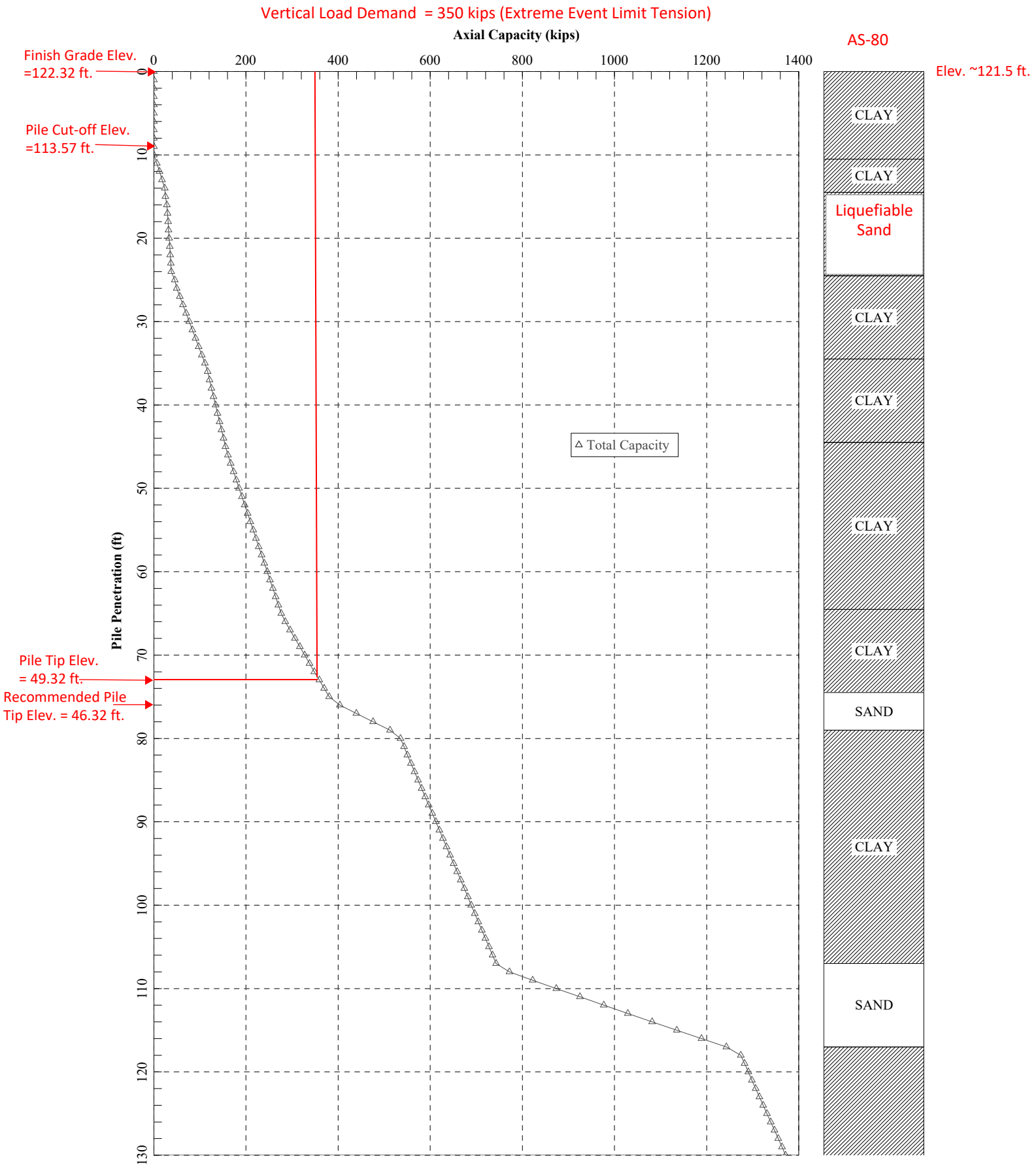


Eastridge to BART Regional Connector Project Bent 55 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 7.8 kips (Downdrag) + 560 kips (Extreme Event Limit Compression) = 570 kips



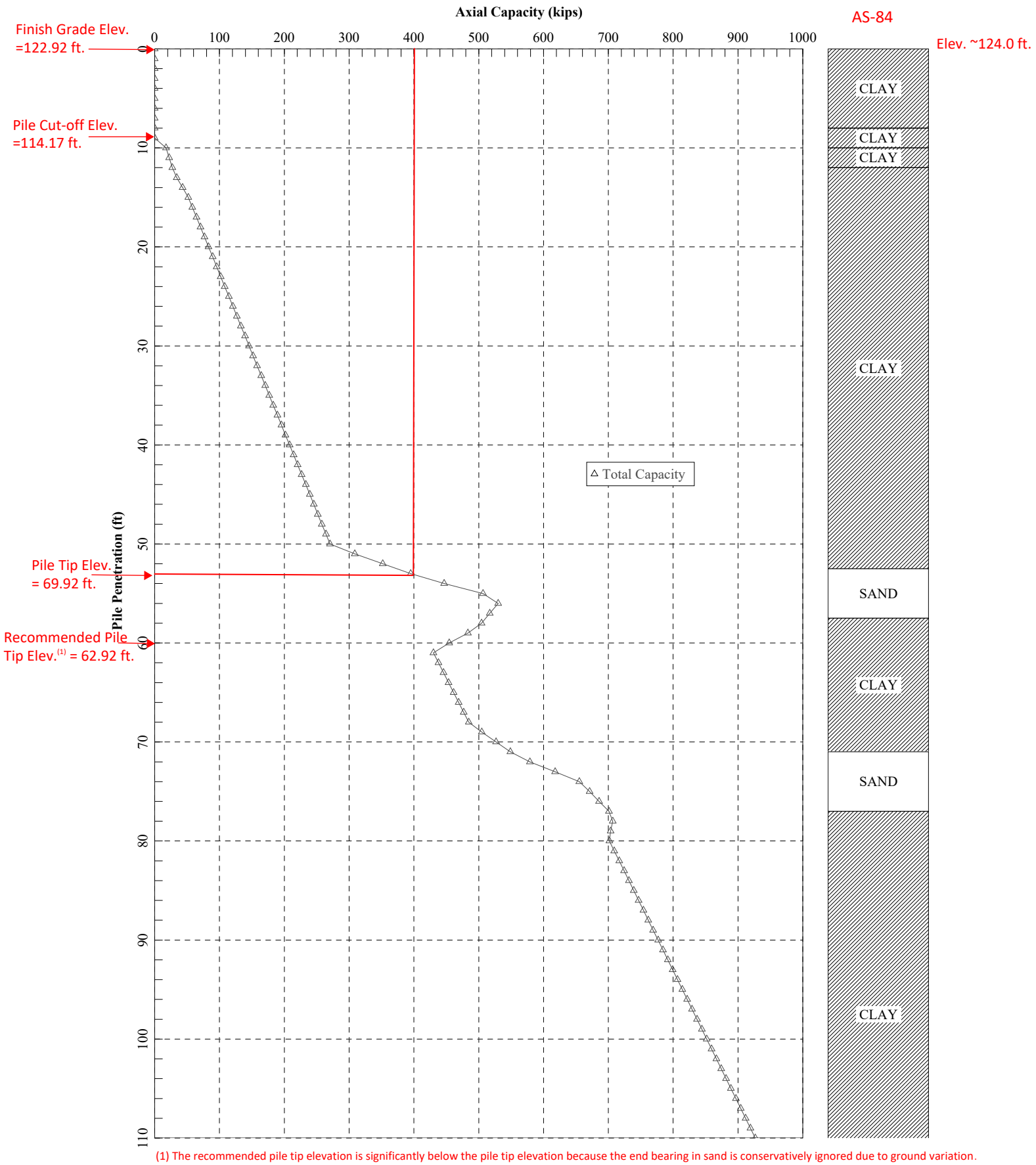
Eastridge to BART Regional Connector Project Bent 55 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)



Eastridge to BART Regional Connector Project Bent 55 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

AERIAL GUIDEWAY – BENT 56 (18-INCH SQUARE PRECAST CONCRETE PILE)

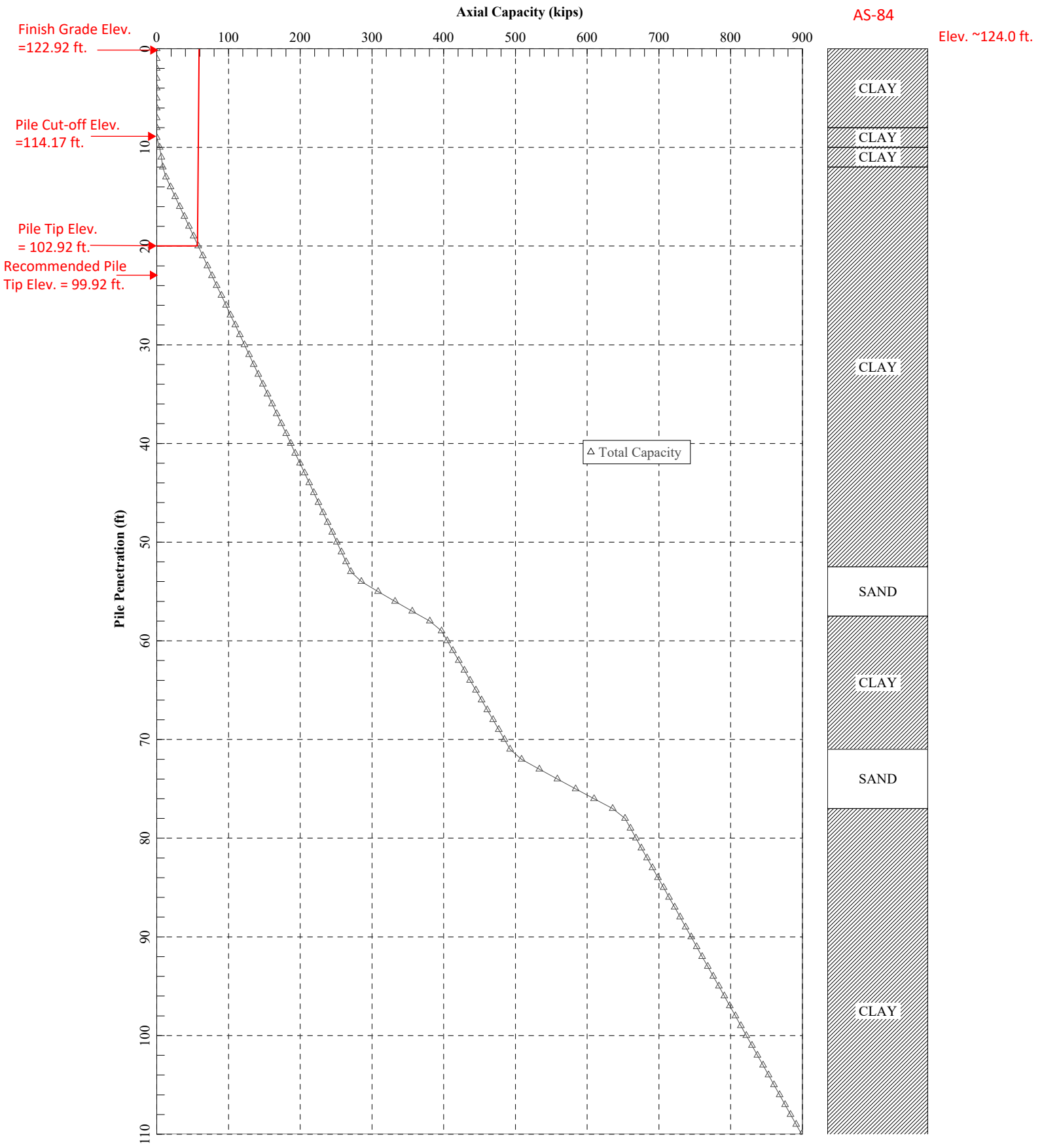
Vertical Load Demand = 280 kips (Strength Limit Compression)/0.7 = 400 kips



(1) The recommended pile tip elevation is significantly below the pile tip elevation because the end bearing in sand is conservatively ignored due to ground variation.

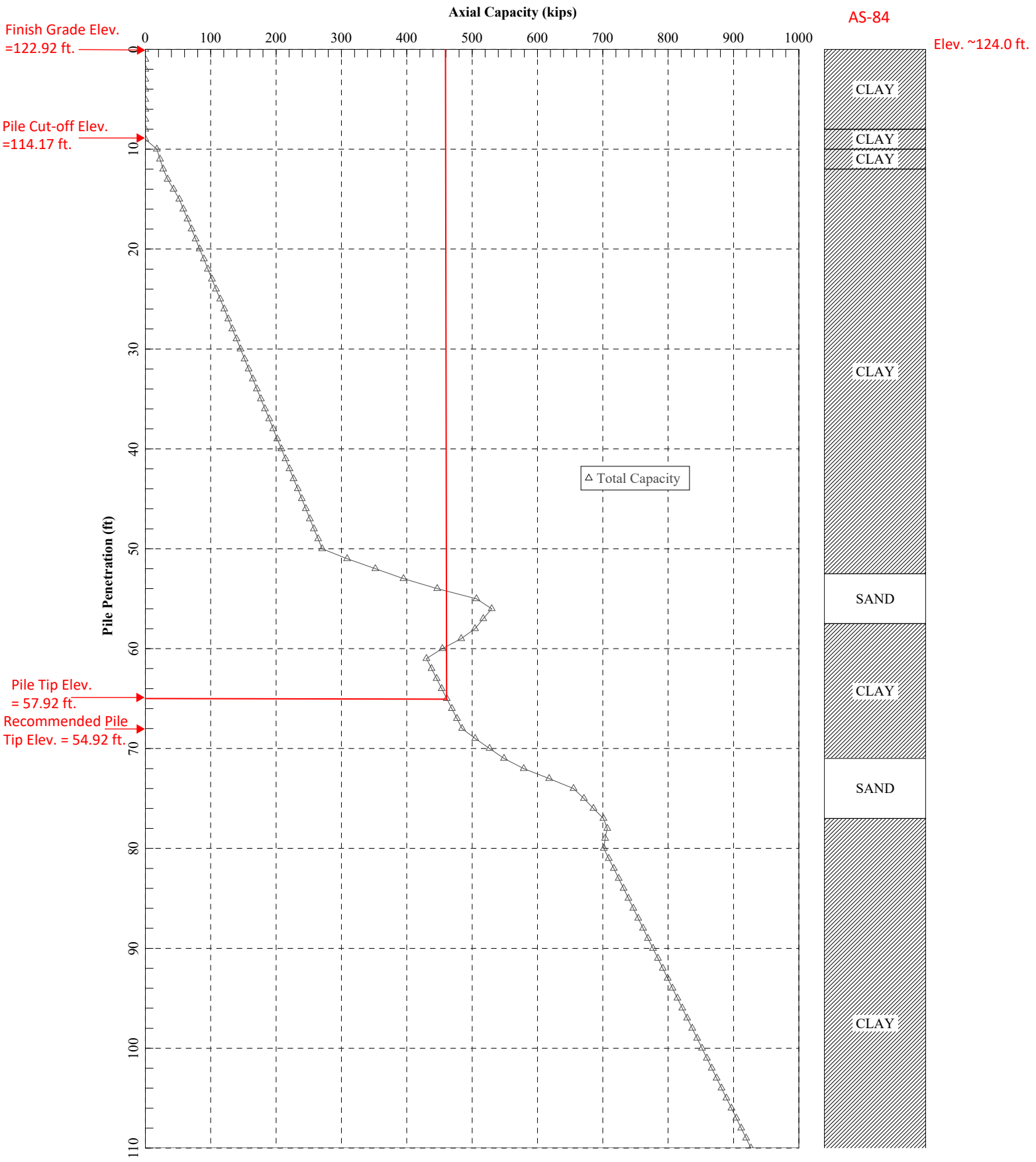
Eastridge to BART Regional Connector Project Bent 56 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 40 kips (Strength Limit Tension)/0.7 = 60 kips



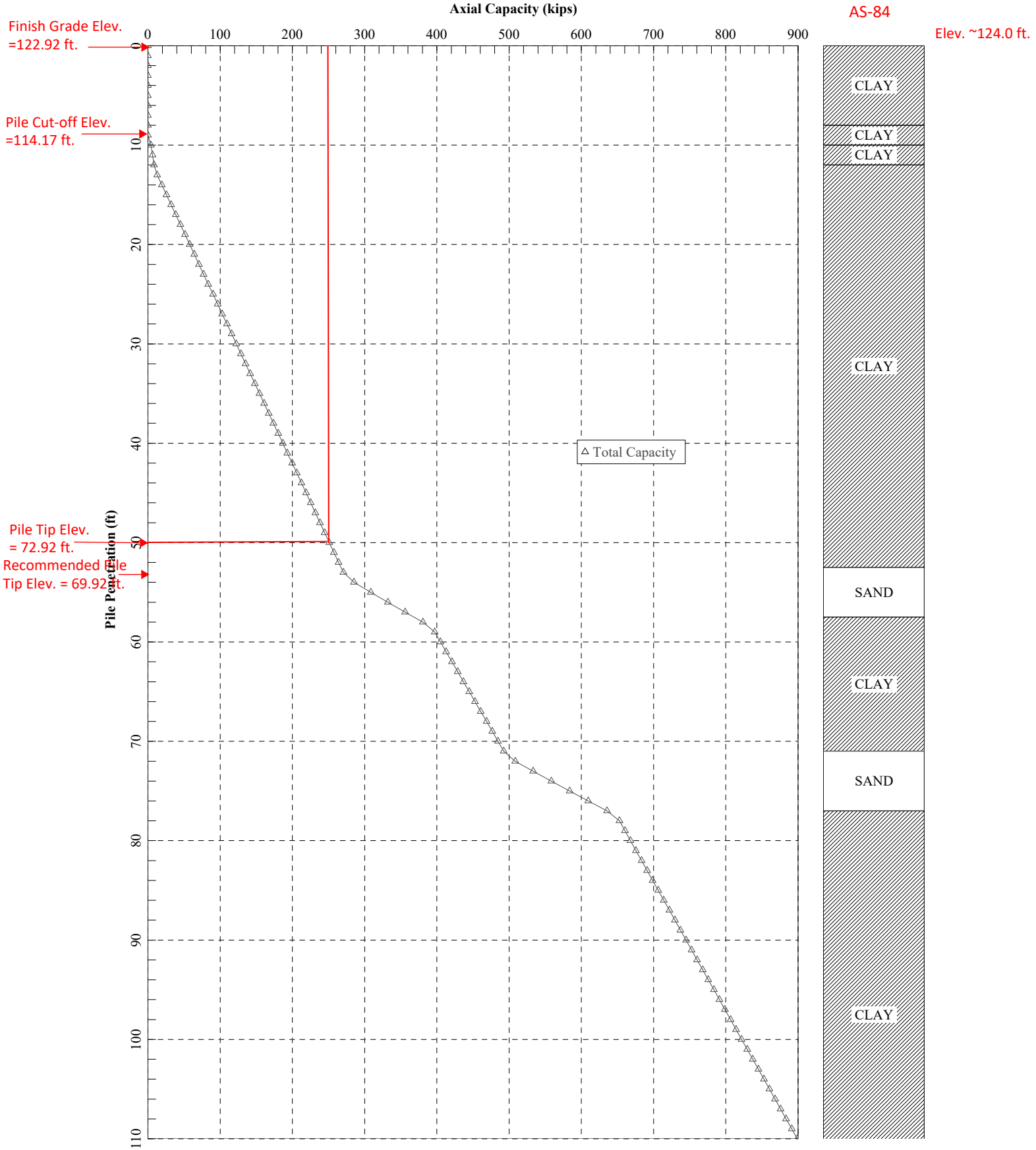
Eastridge to BART Regional Connector Project Bent 56 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 460 kips (Extreme Event Limit Compression)



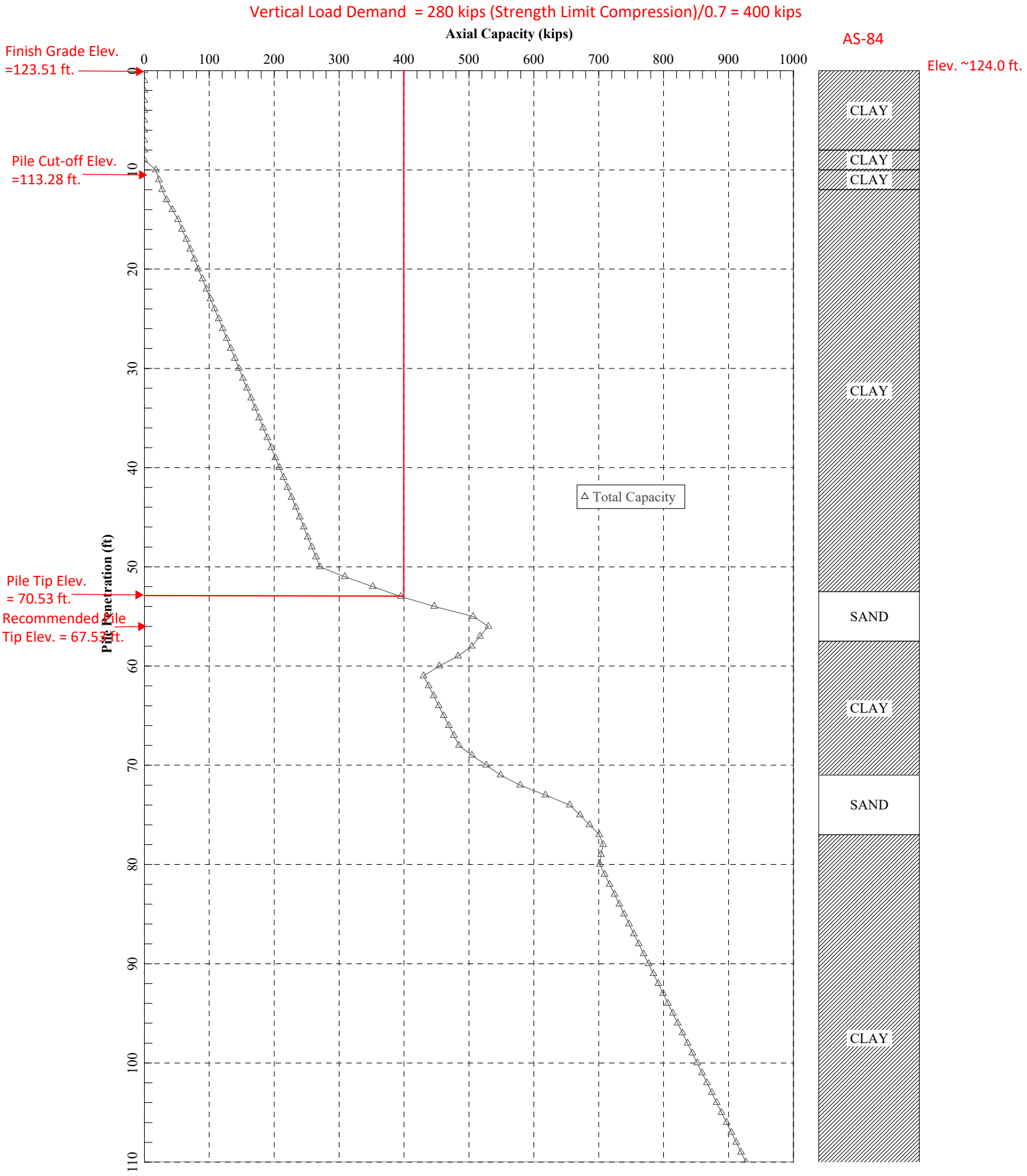
Eastridge to BART Regional Connector Project Bent 56 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

Vertical Load Demand = 250 kips (Extreme Event Limit Tension)



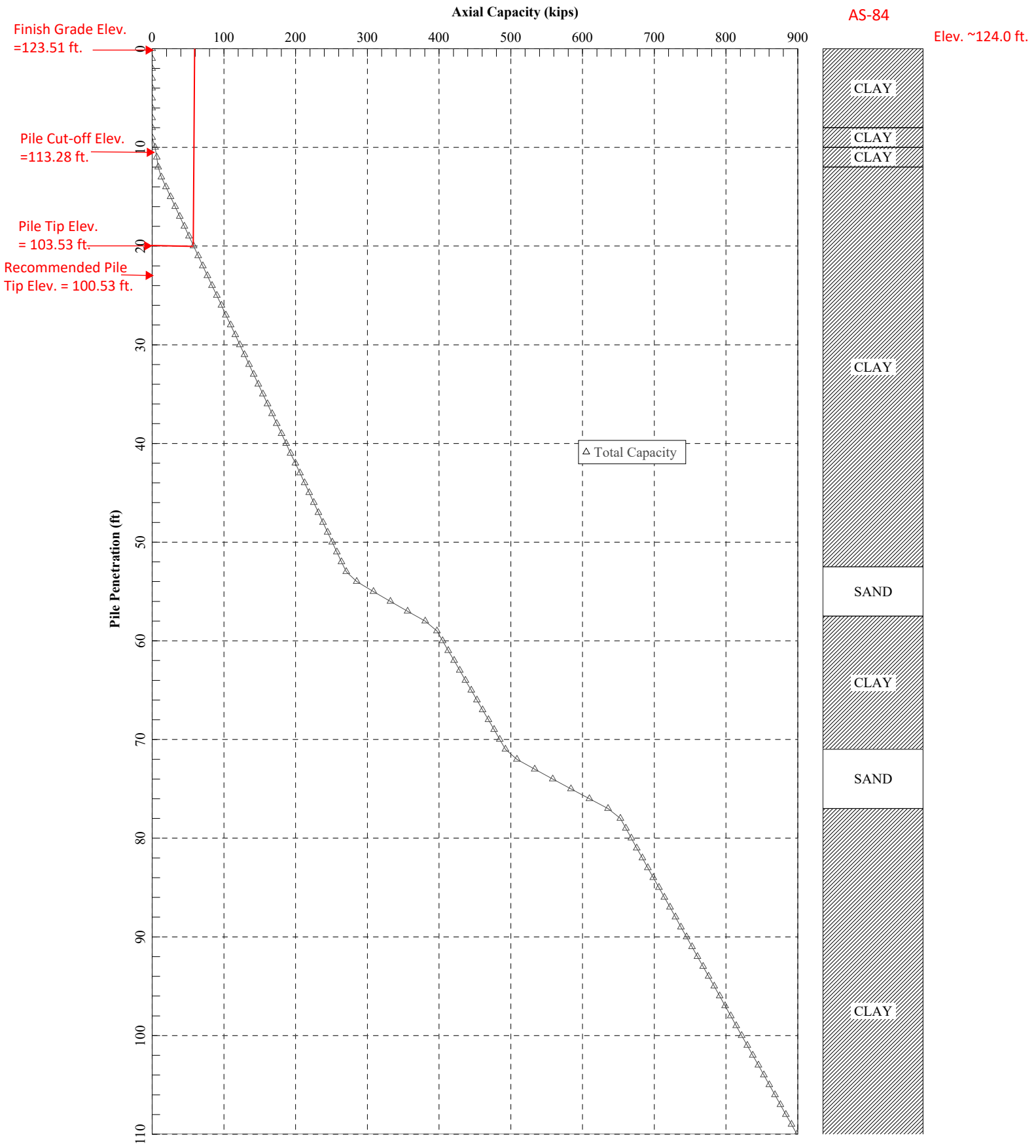
Eastridge to BART Regional Connector Project Bent 56 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

AERIAL GUIDEWAY – BENT 57 (18-INCH SQUARE PRECAST CONCRETE PILE)



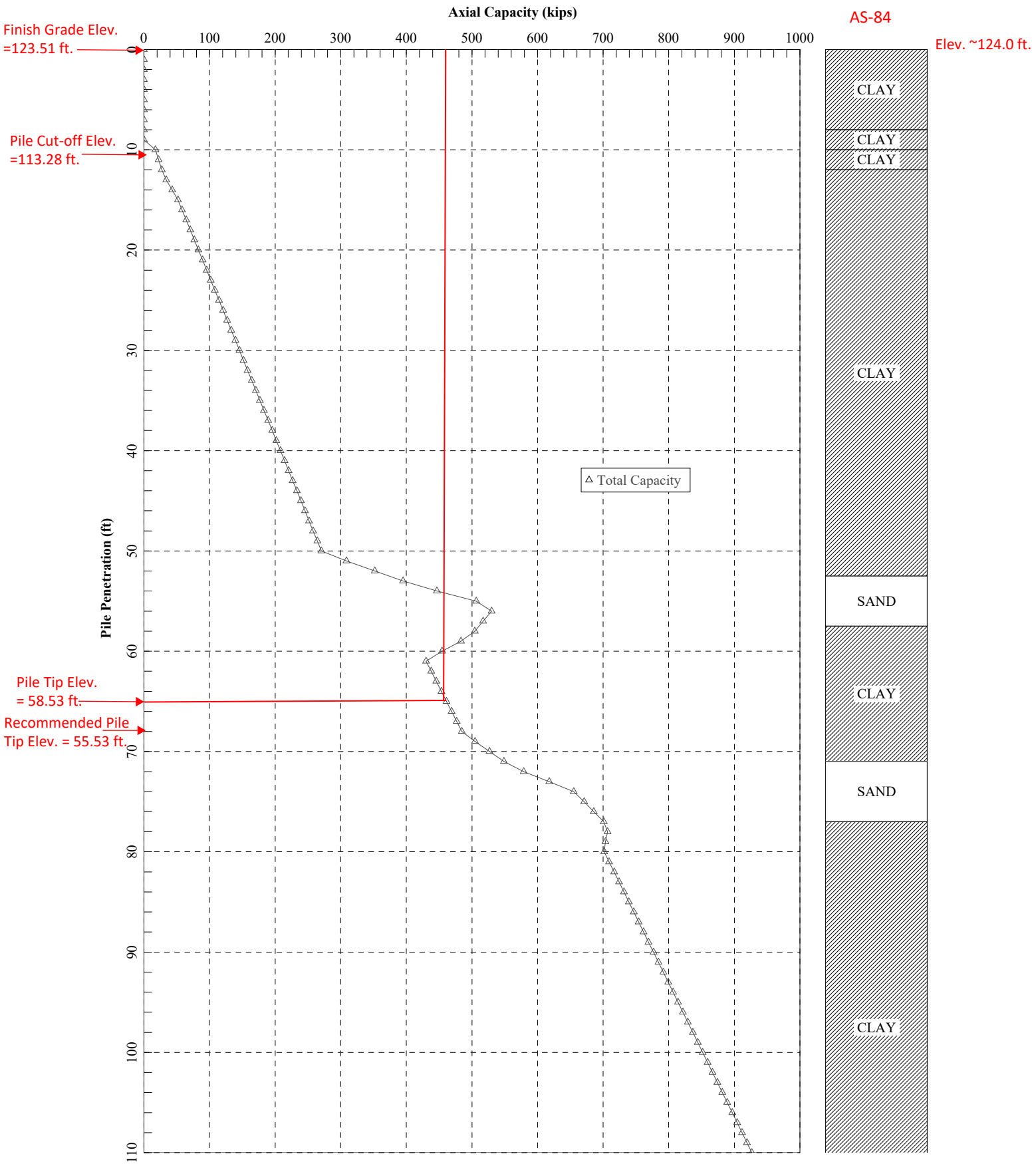
Eastridge to BART Regional Connector Project Bent 57 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 40 kips (Strength Limit Tension)/0.7 = 60 kips

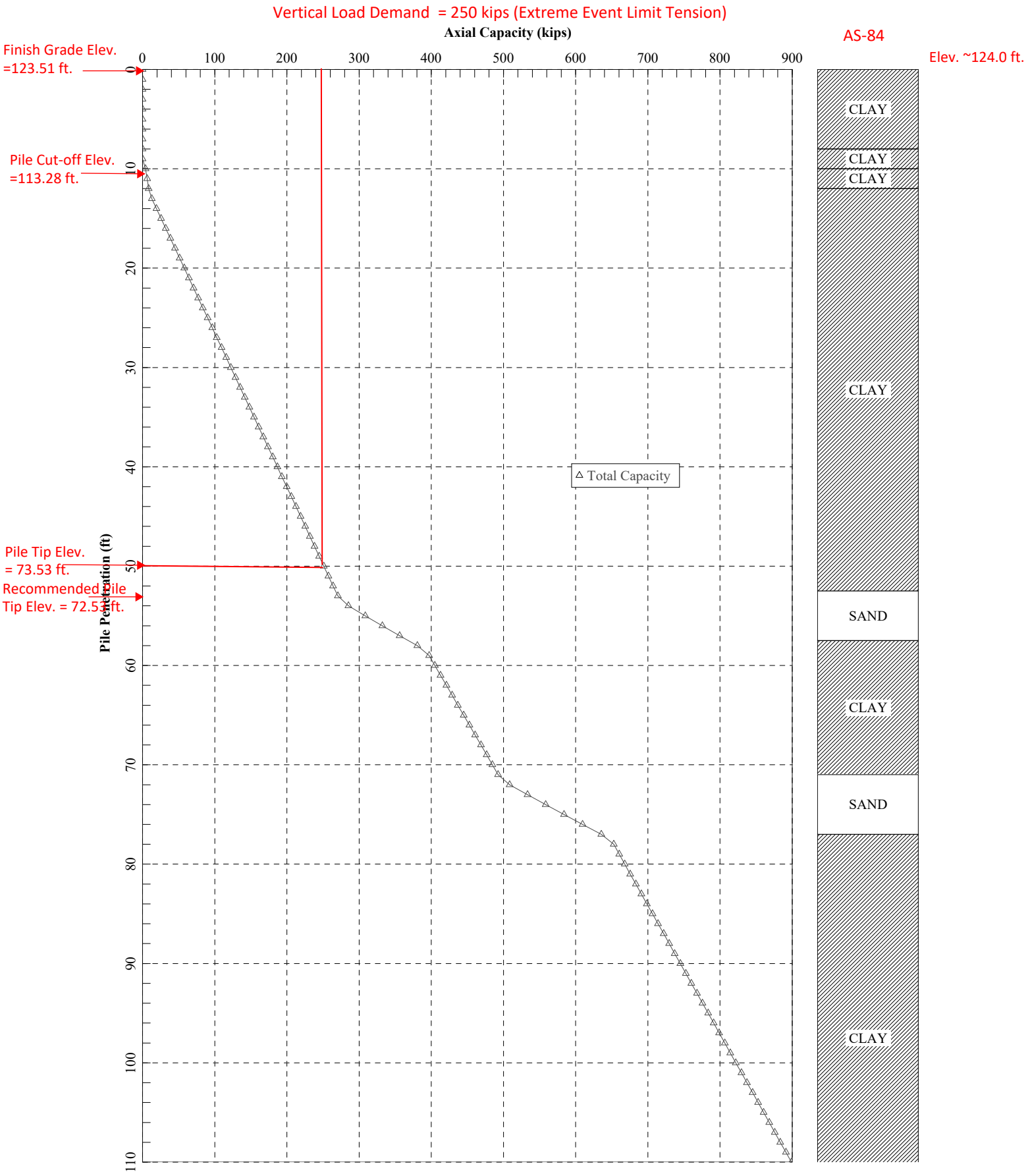


Eastridge to BART Regional Connector Project Bent 57 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 460 kips (Extreme Event Limit Compression)



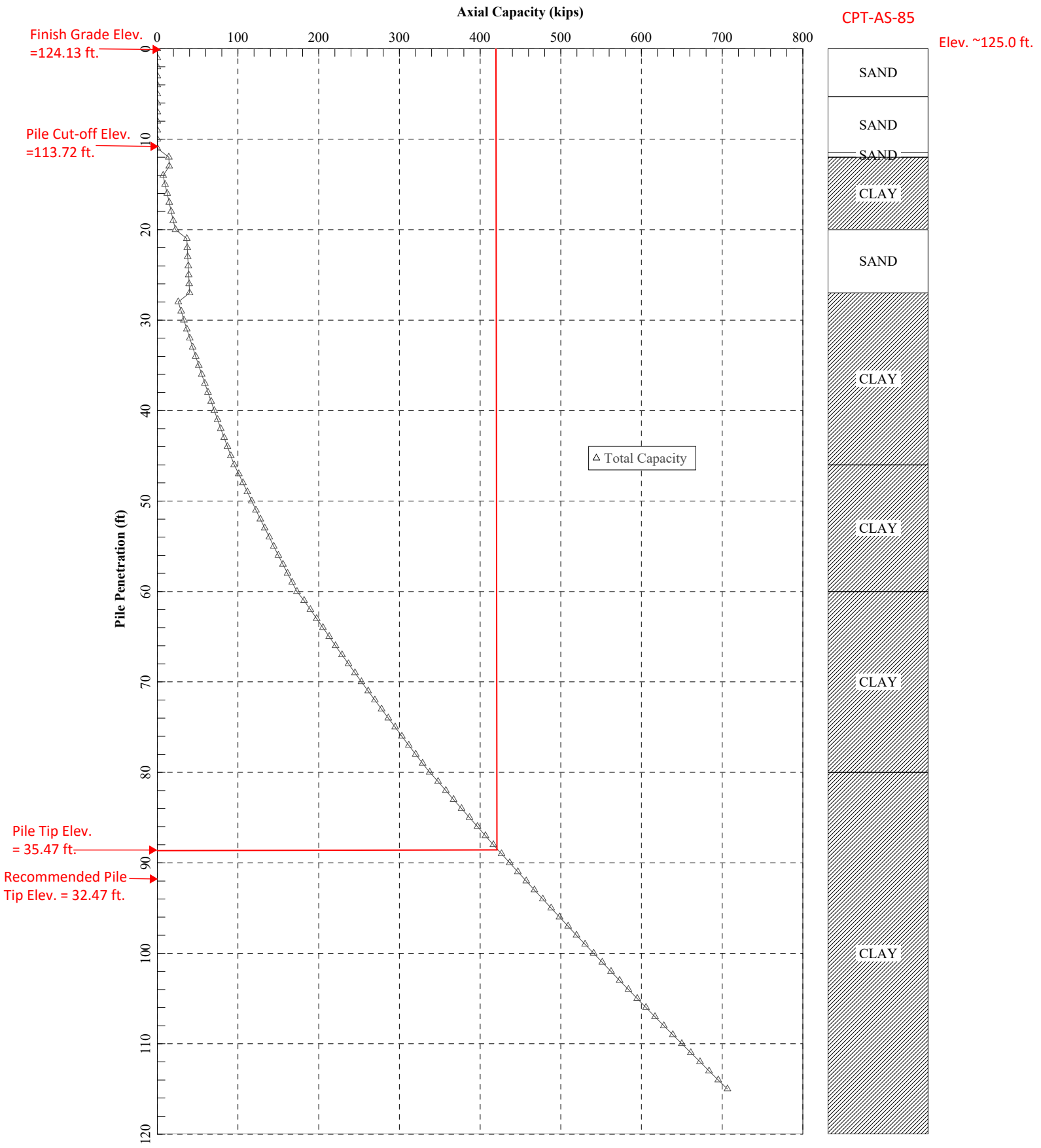
Eastridge to BART Regional Connector Project Bent 57 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)



Eastridge to BART Regional Connector Project Bent 57 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

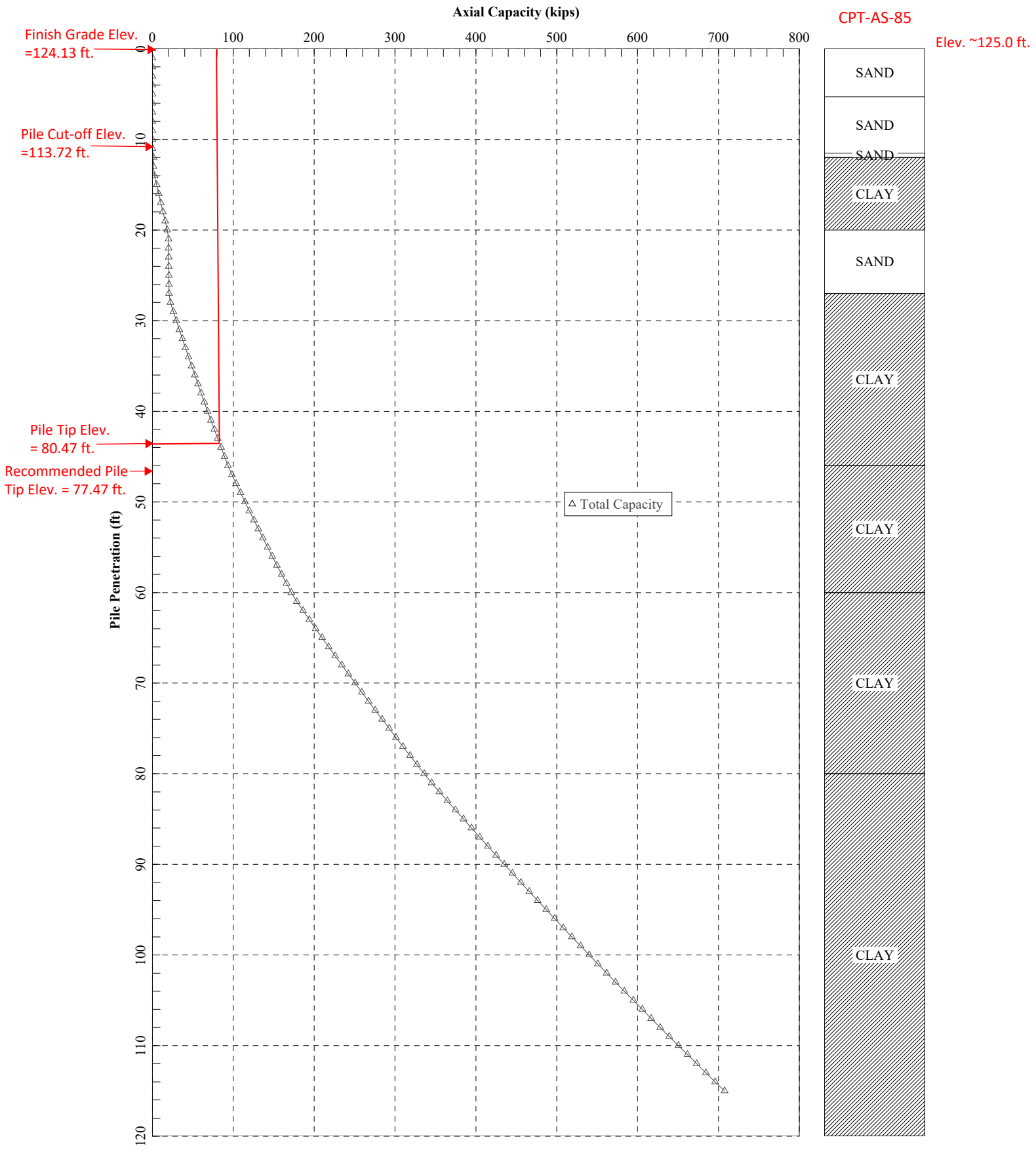
AERIAL GUIDEWAY – BENT 58 (18-INCH DIAMETER PIPE PILE)

Vertical Load Demand = 290 kips (Strength Limit Compression)/0.7 = 420 kips



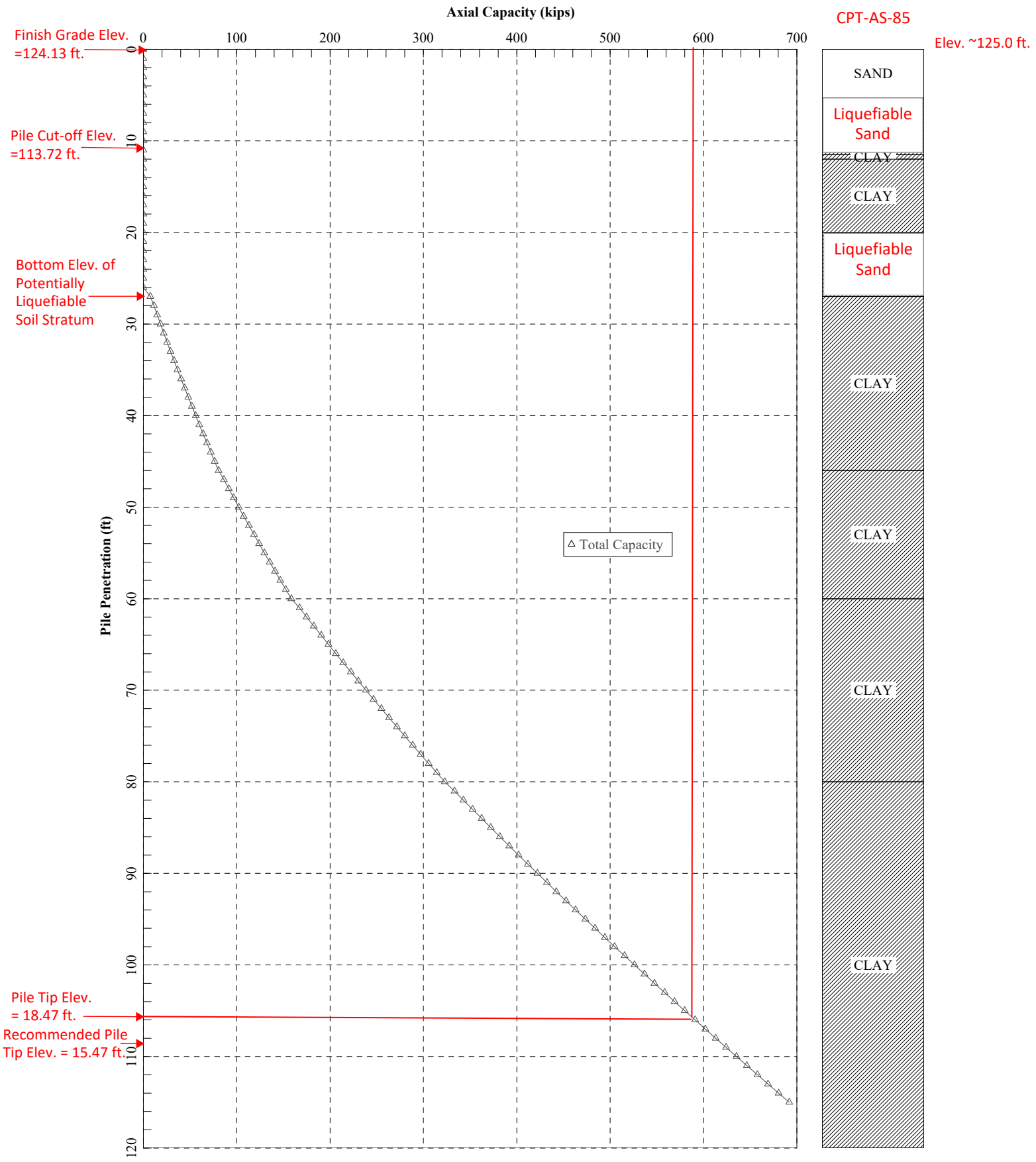
Eastridge to BART Regional Connector Project Bent 58 - 18-Inch Circular Steel Pipe Pile Strength Limit State (Compression)

Vertical Load Demand = 50 kips (Strength Limit Tension)/0.7 = 80 kips

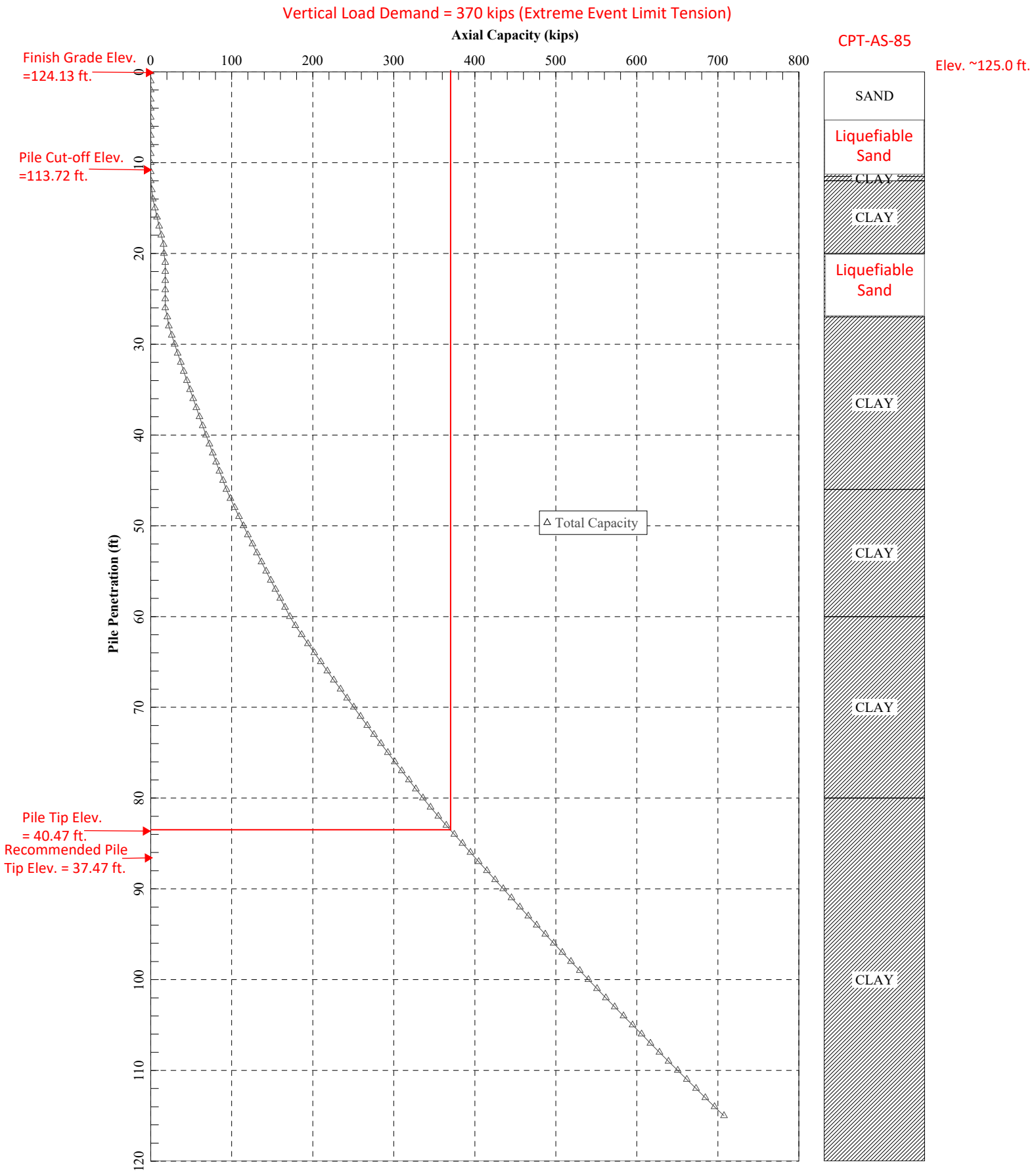


Eastridge to BART Regional Connector Project Bent 58 - 18-Inch Circular Steel Pipe Pile Strength Limit State (Tension)

Vertical Load Demand = 16 kips (Downdrag) + 570 kips (Extreme Event Limit Compression) = 590 kips



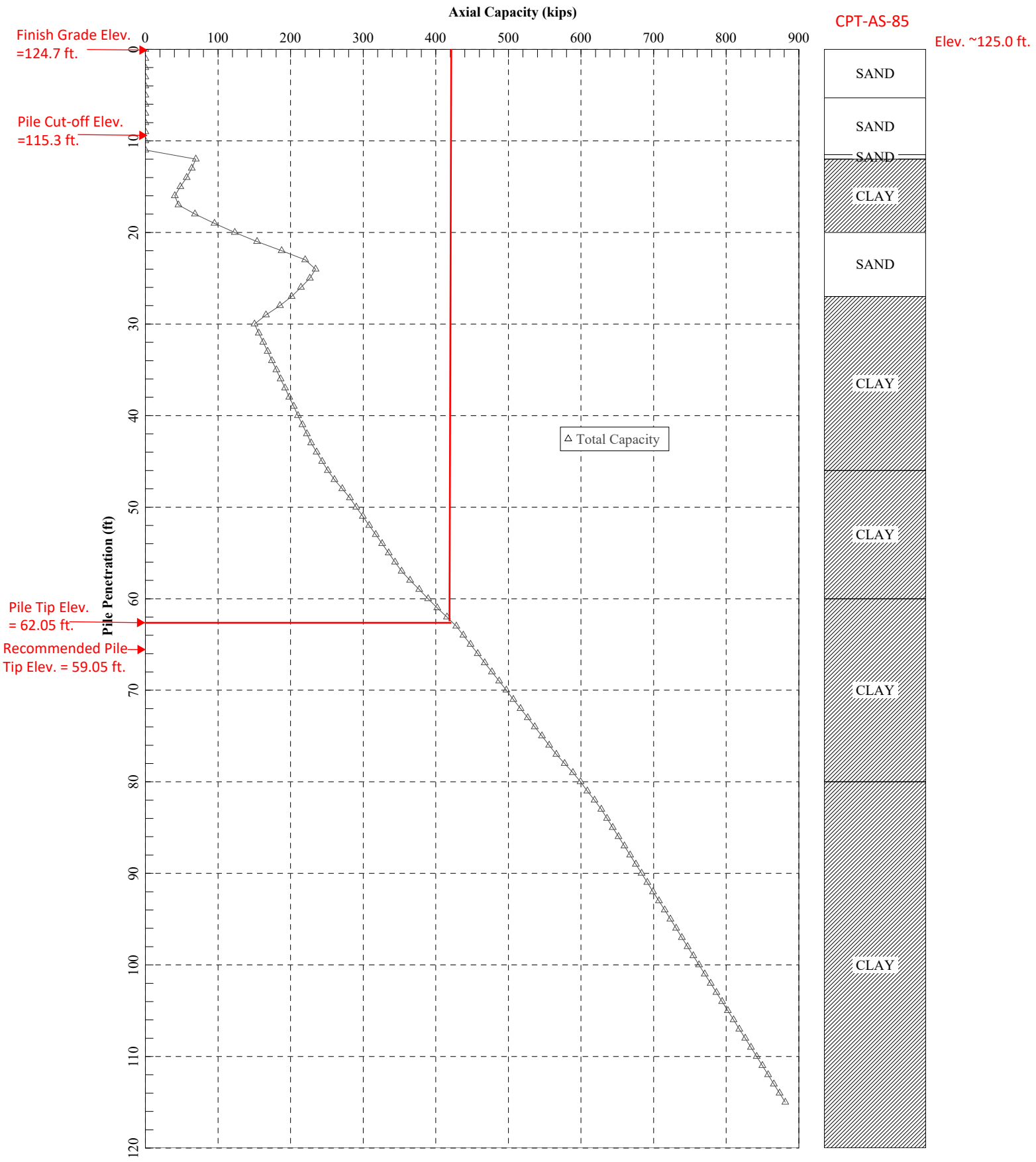
Eastridge to BART Regional Connector Project Bent 58 - 18-Inch Circular Steel Pipe Pile Extreme Event Limit State (Compression)



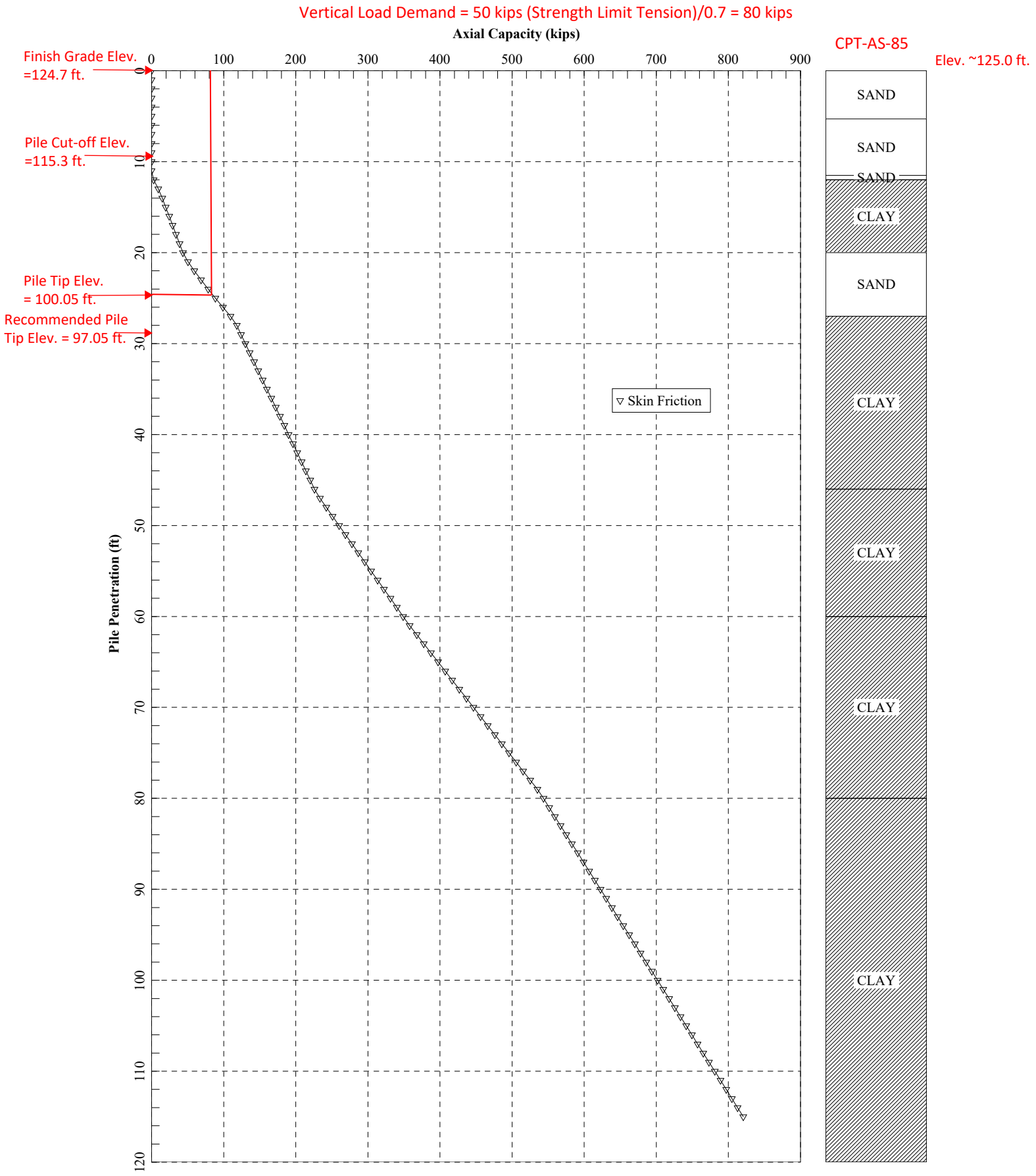
Eastridge to BART Regional Connector Project Bent 58 - 18-Inch Circular Steel Pipe Pile Extreme Event Limit State (Tension)

AERIAL GUIDEWAY – BENT 59 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 290 kips (Strength Limit Compression)/0.7 = 420 kips

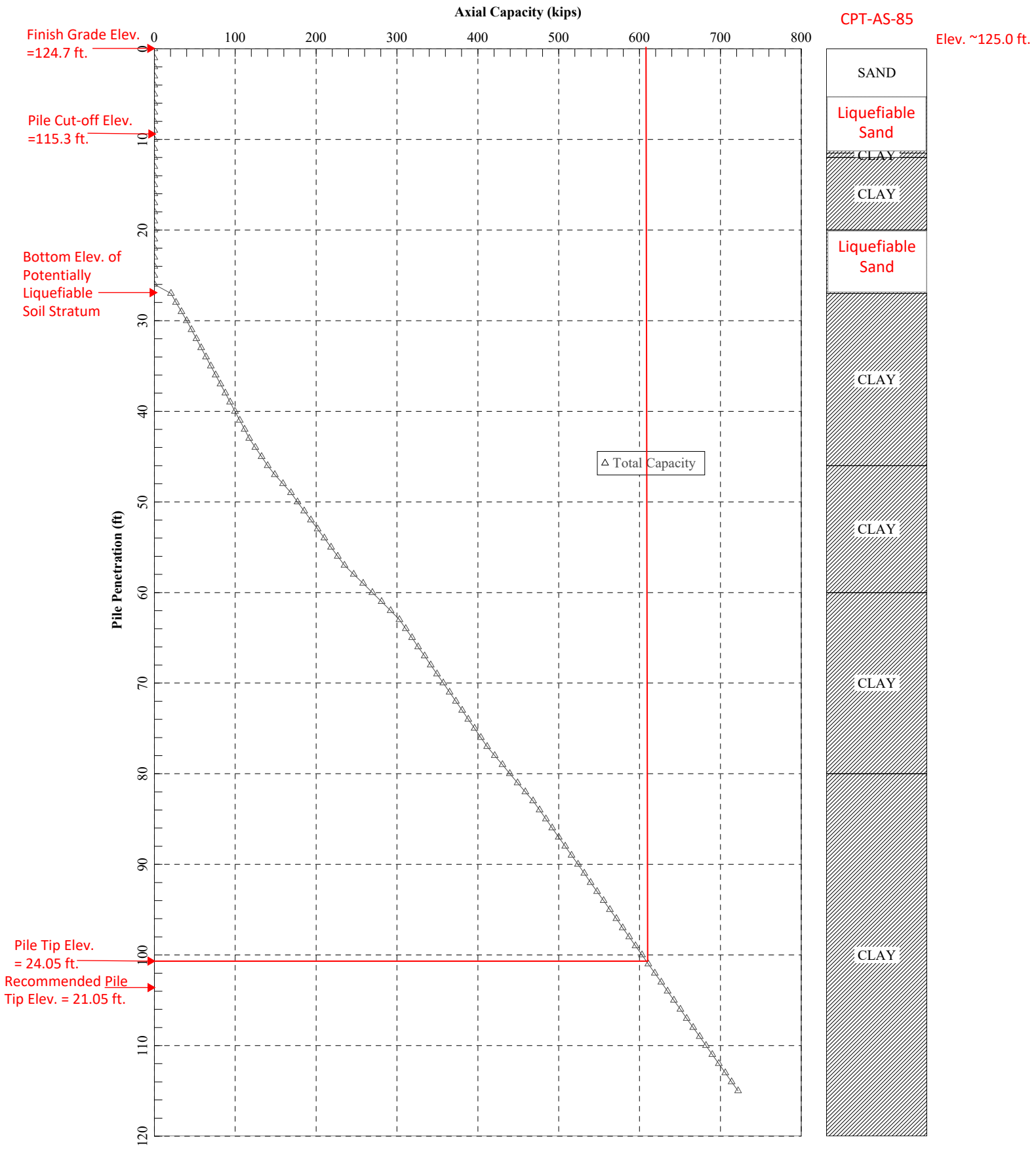


Eastridge to BART Regional Connector Project Bent 59 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

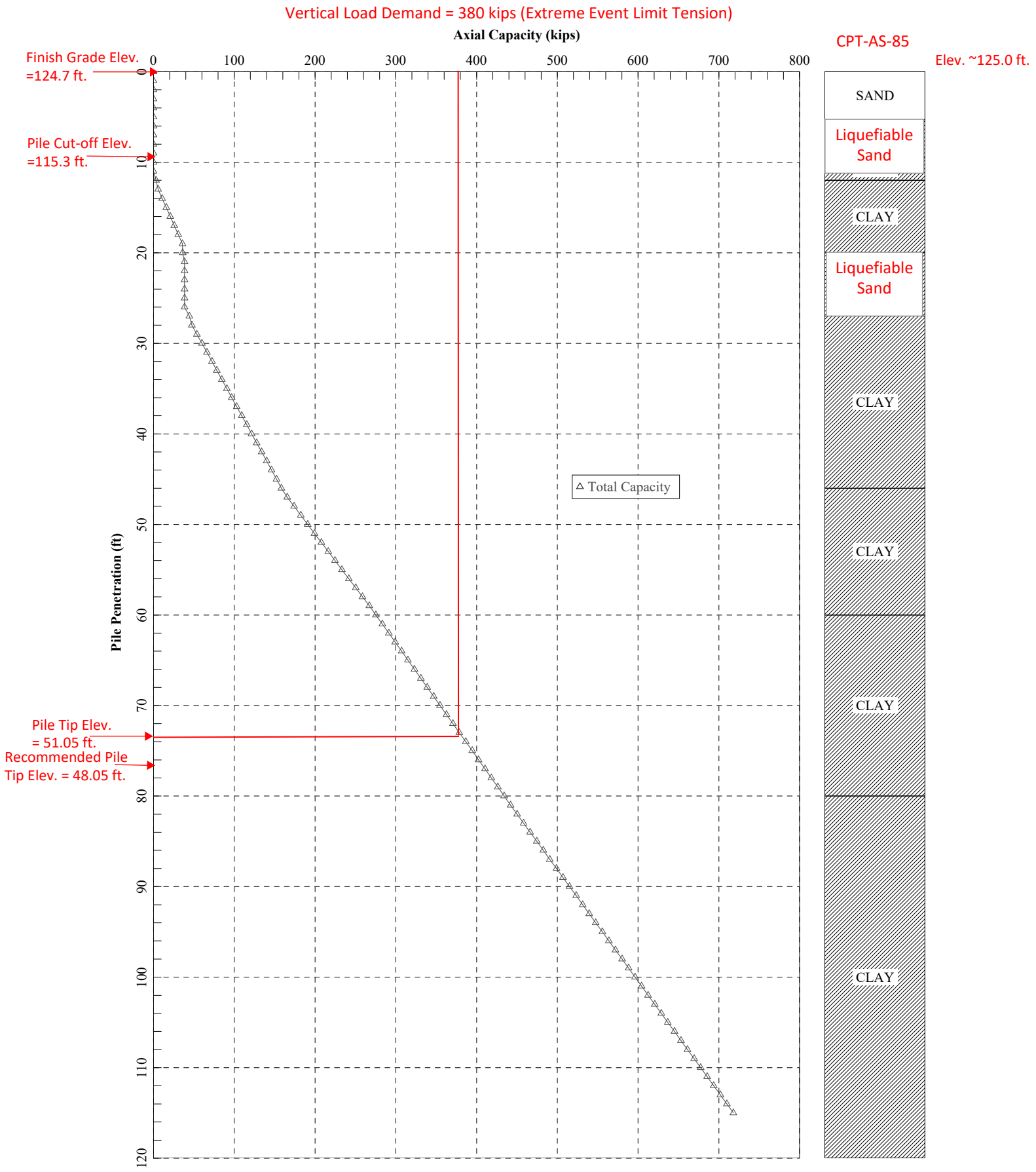


Eastridge to BART Regional Connector Project Bent 59 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 16 kips (Downdrag) + 590 kips (Extreme Event Limit Compression) = 610 kips



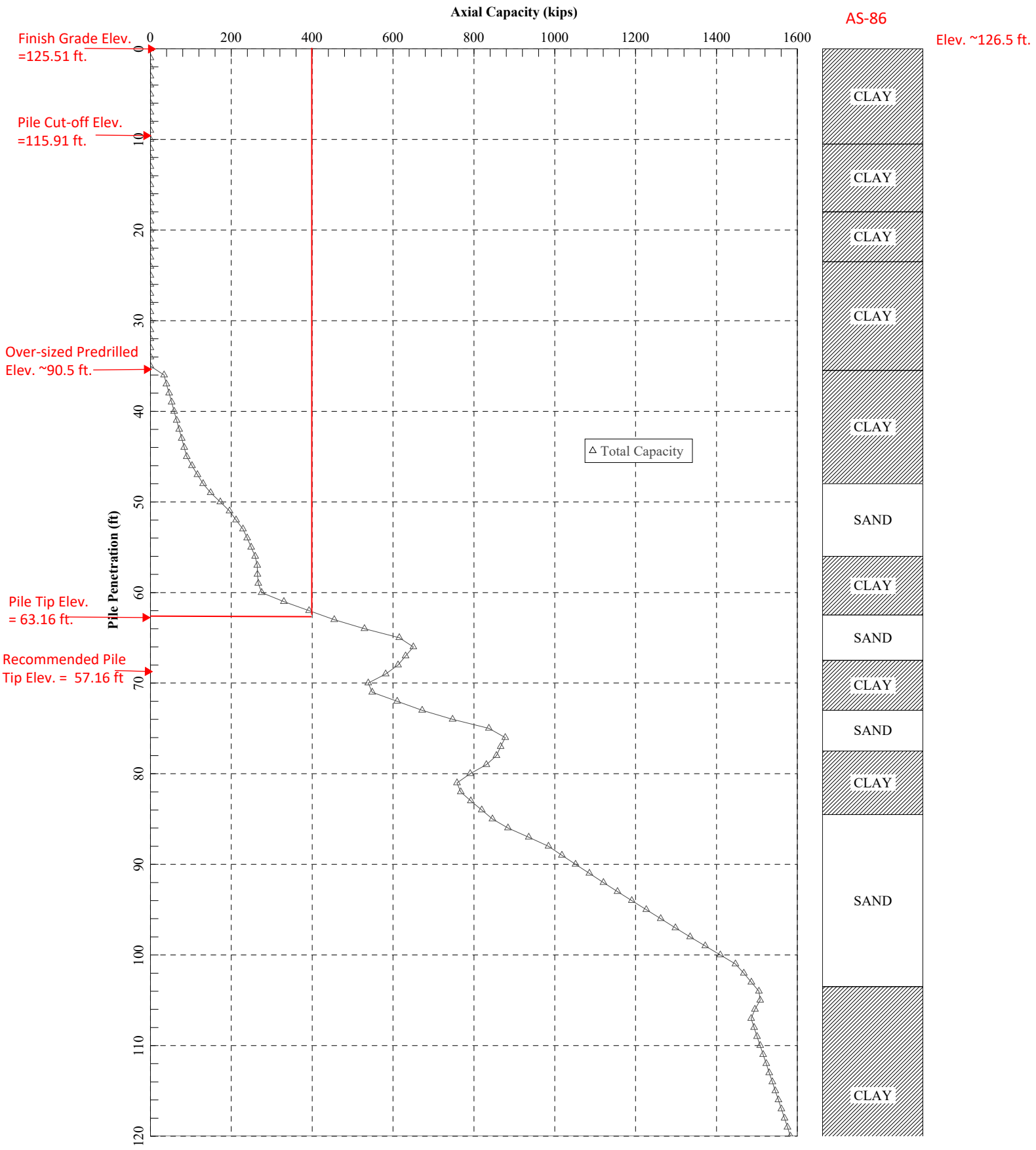
Eastridge to BART Regional Connector Project Bent 59 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)



Eastridge to BART Regional Connector Project Bent 59 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

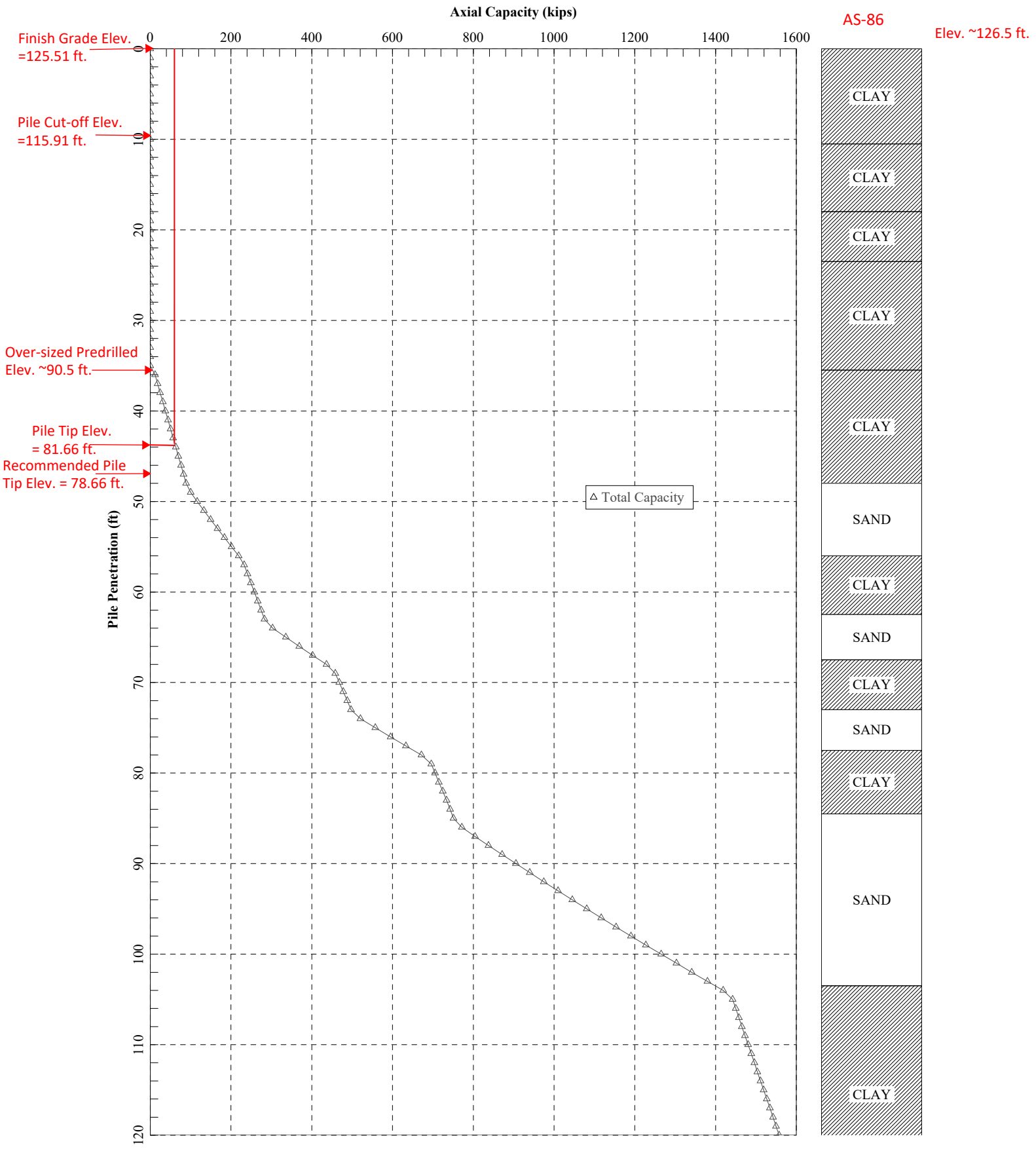
AERIAL GUIDEWAY – BENT 60 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 280 kips (Strength Limit Compression)/0.7 = 400 kips



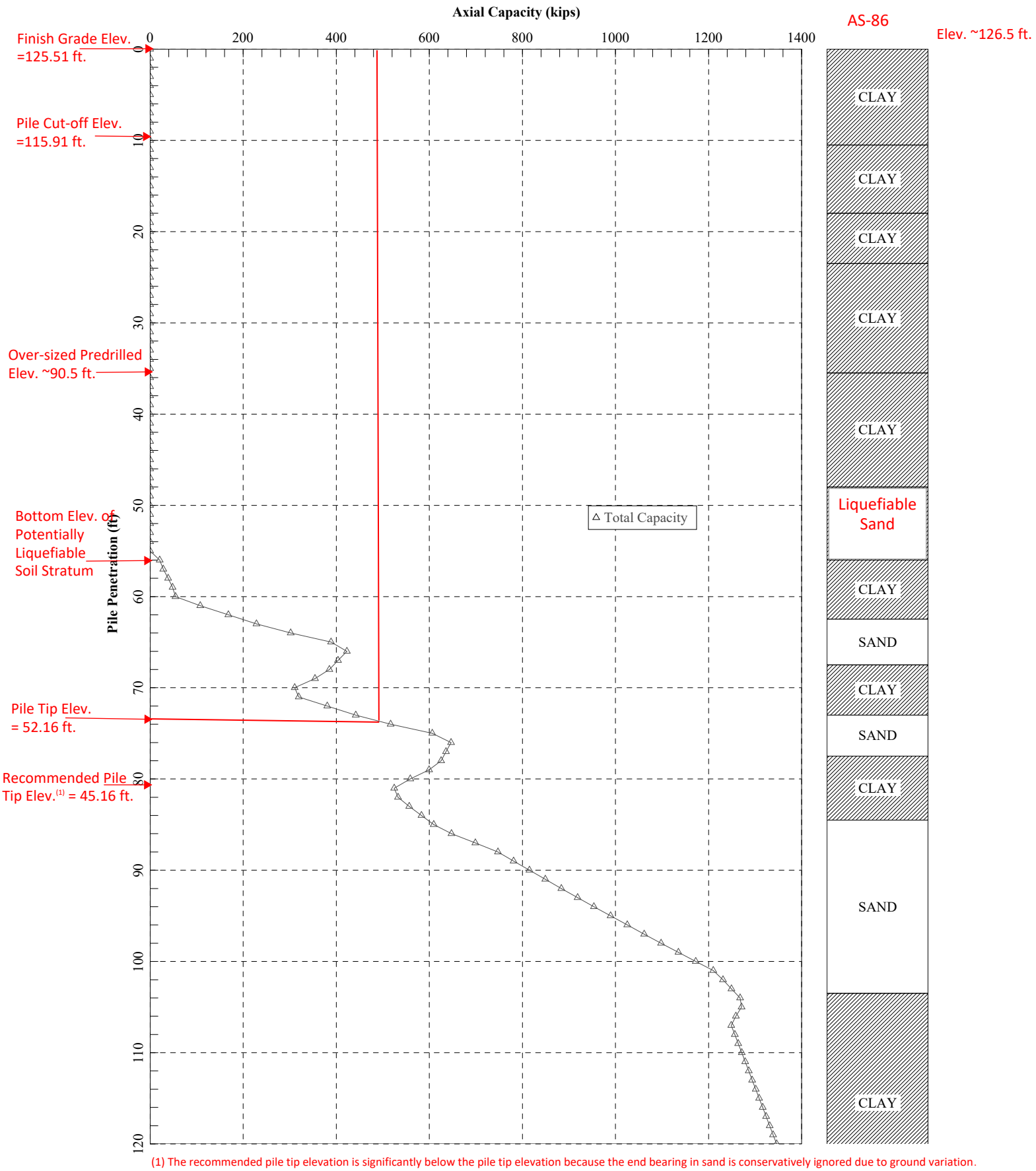
Eastridge to BART Regional Connector Project Bent 60 - 18-Inch Square Precast Concrete Pile (25' Predrilled) Strength Limit State (Compression)

Vertical Load Demand = 40 kips (Strength Limit Tension)/0.7 = 60 kips



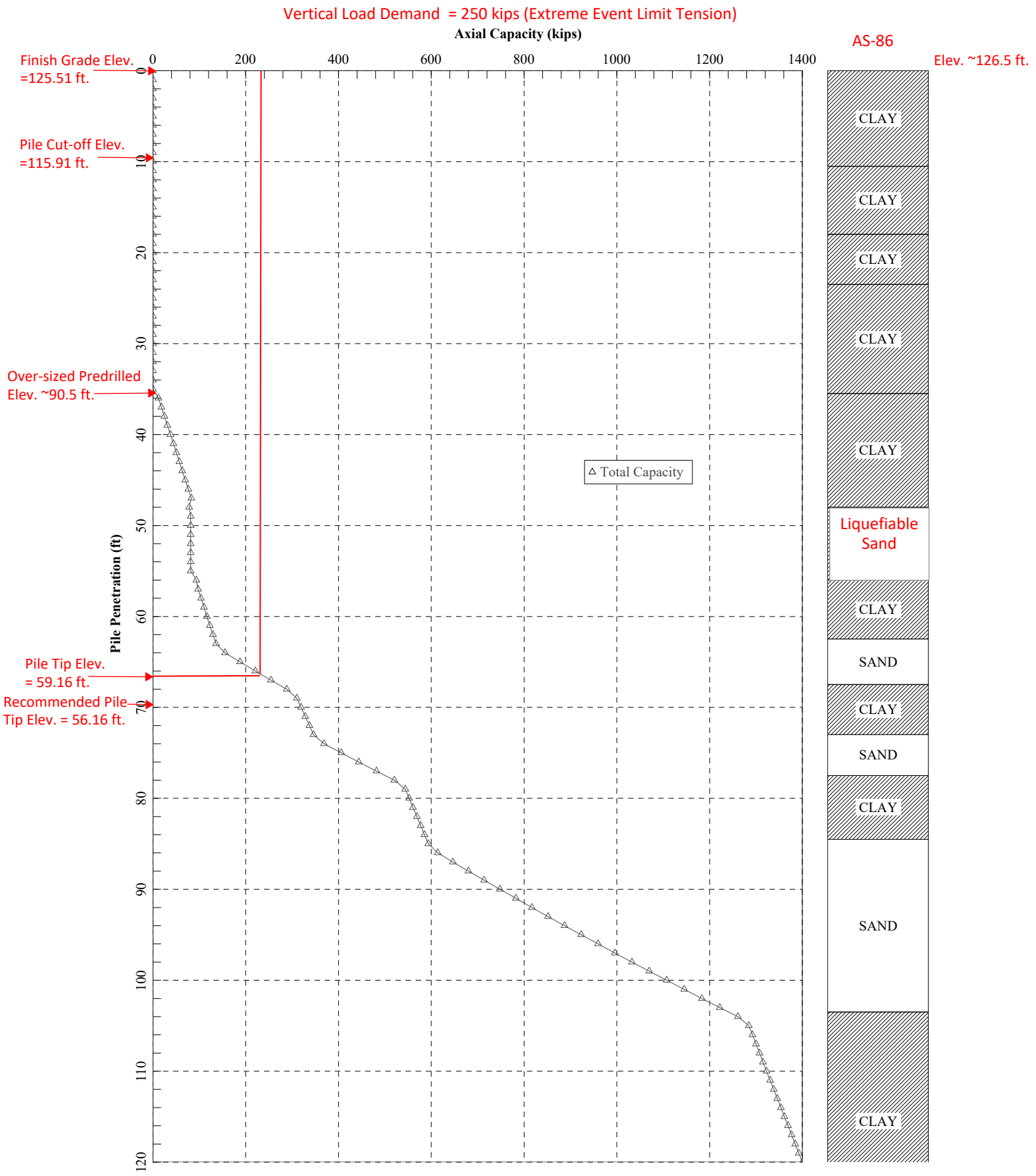
Eastridge to BART Regional Connector Project Bent 60 - 18-Inch Square Precast Concrete Pile (25' Predrilled) Strength Limit State (Tension)

Vertical Load Demand = 22 kips (Downdrag) + 460 kips (Extreme Event Limit Compression) = 490 kips



(1) The recommended pile tip elevation is significantly below the pile tip elevation because the end bearing in sand is conservatively ignored due to ground variation.

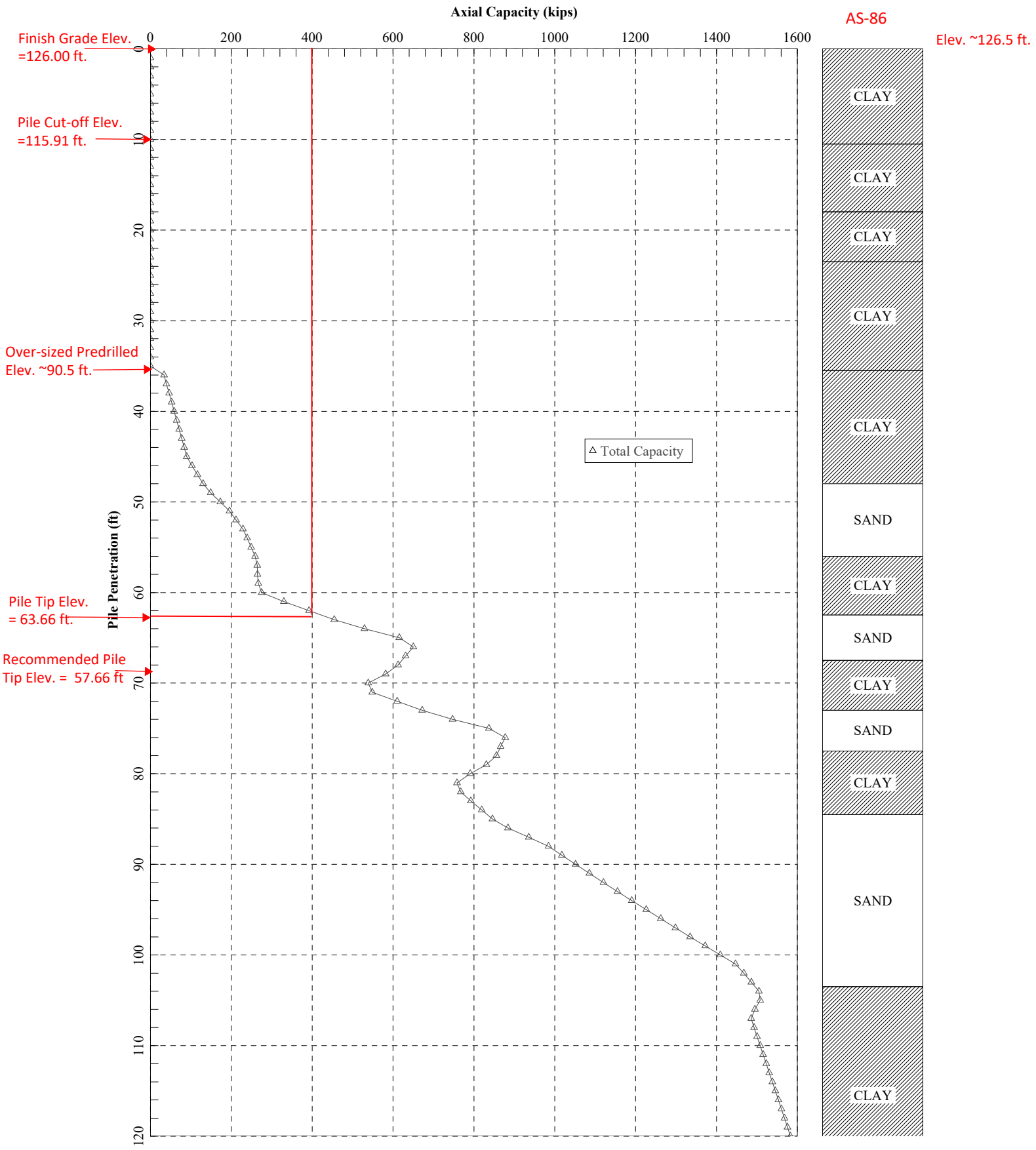
Eastridge to BART Regional Connector Project Bent 60 - 18-Inch Square Precast Concrete Pile (25' Predrilled) Extreme Event Limit State (Compresssion)



Eastridge to BART Regional Connector Project Bent 60 - 18-Inch Square Precast Concrete Pile (25' Predrilled) Extreme Event Limit State (Tension)

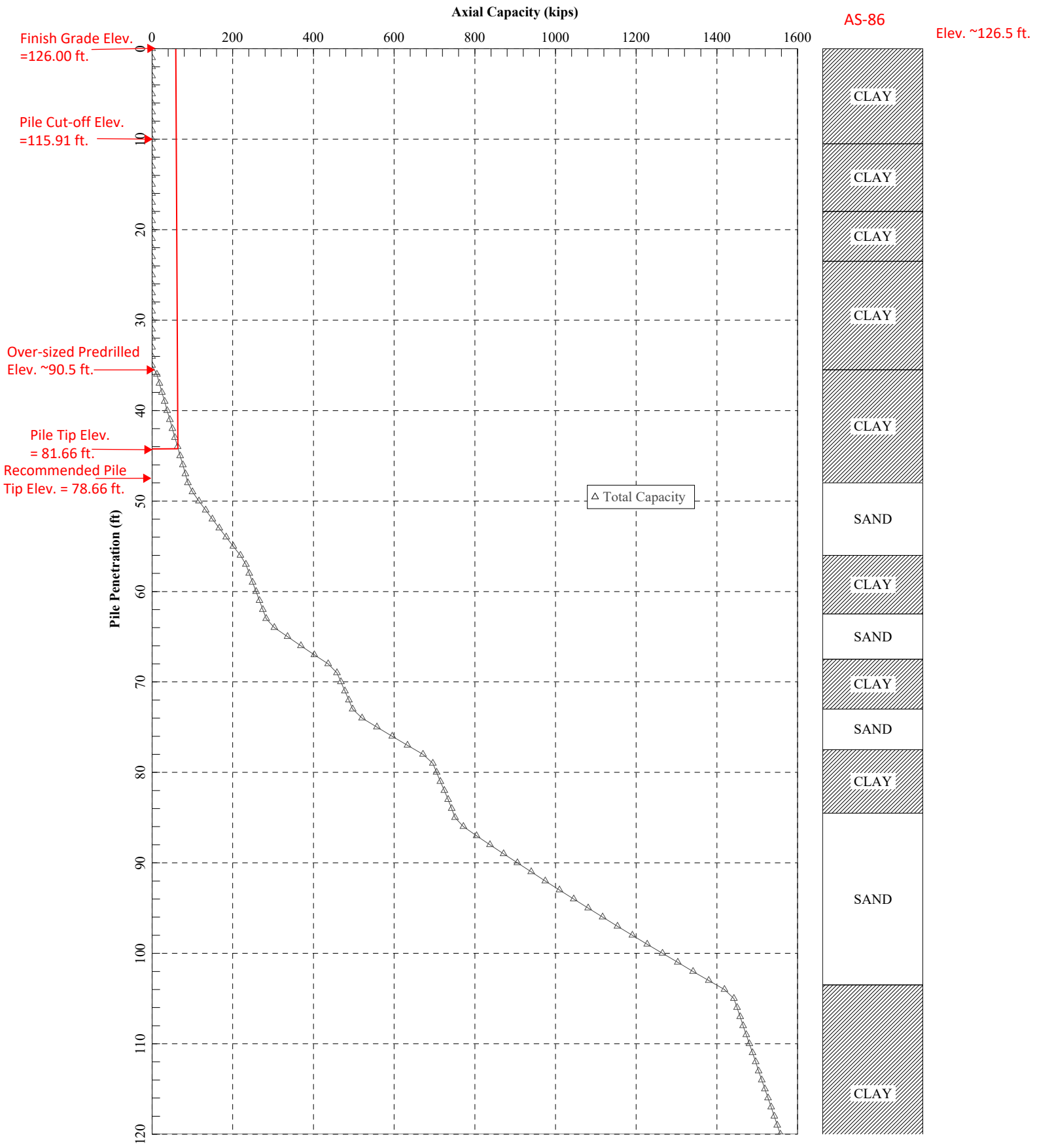
AERIAL GUIDEWAY – BENT 61 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 280 kips (Strength Limit Compression)/0.7 = 400 kips



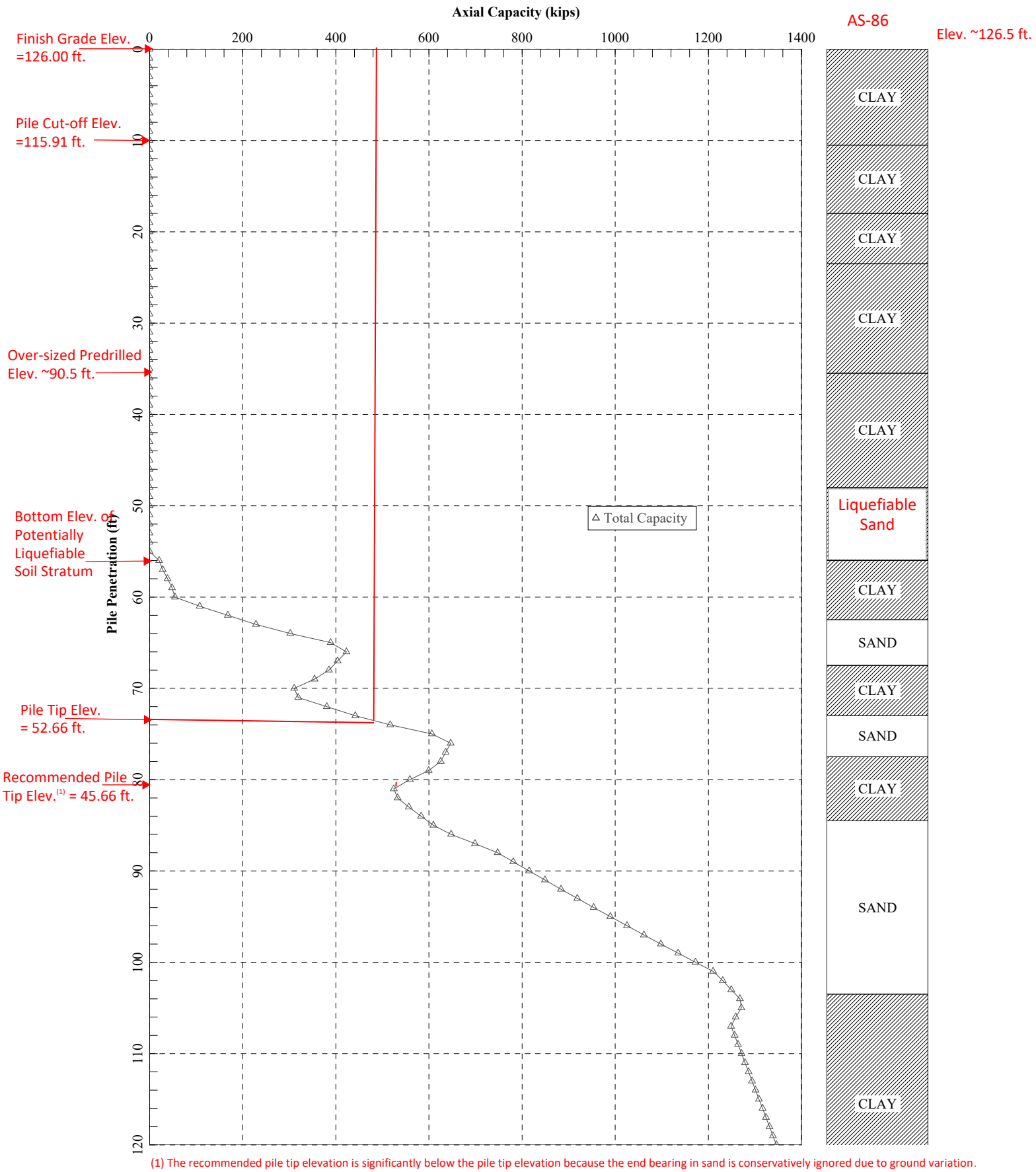
Eastridge to BART Regional Connector Project Bent 61 - 18-Inch Square Precast Concrete Pile (25' Predrilled) Strength Limit State (Compression)

Vertical Load Demand = 40 kips (Strength Limit Tension)/0.7 = 60 kips



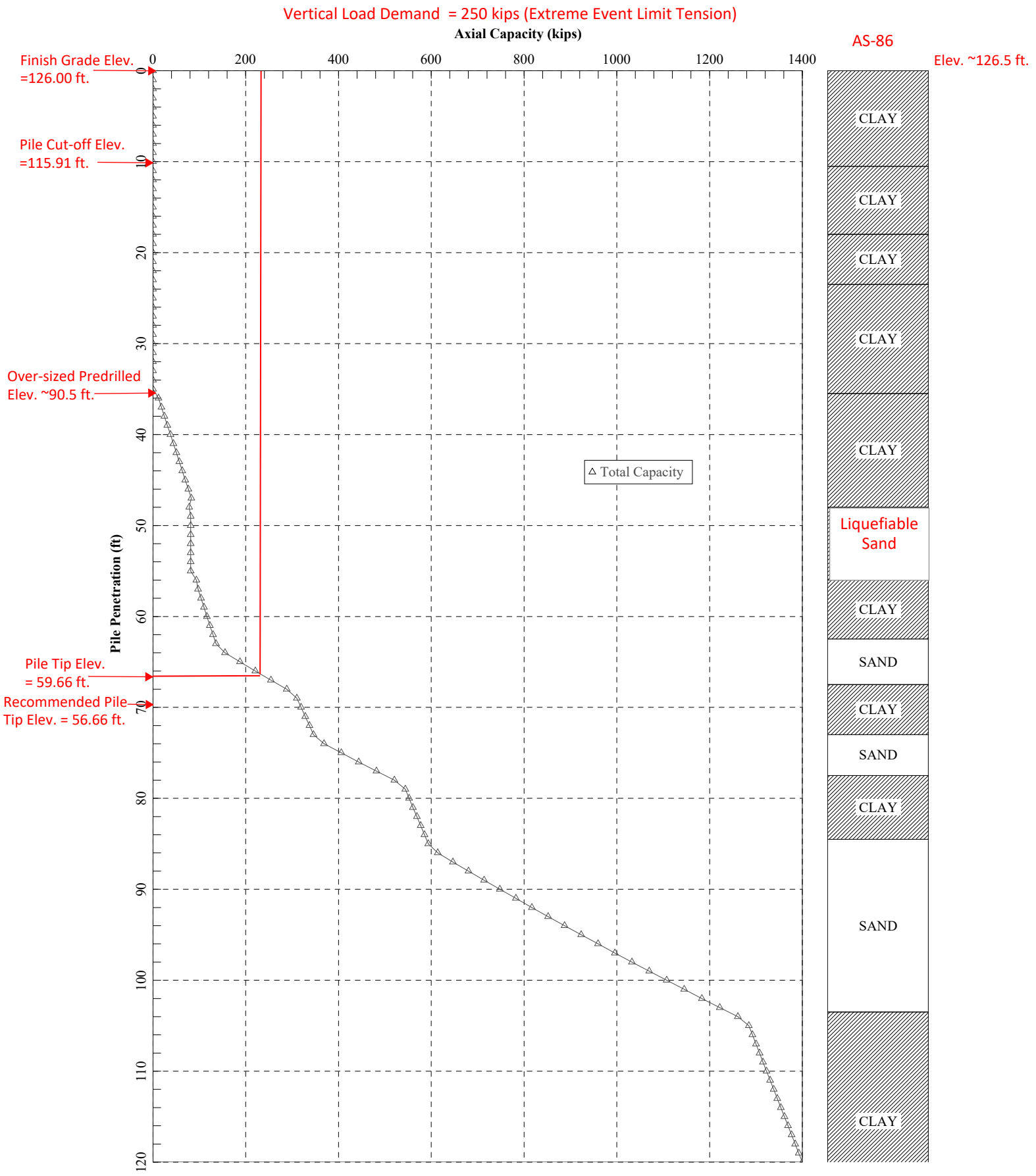
Eastridge to BART Regional Connector Project Bent 61 - 18-Inch Square Precast Concrete Pile (25' Predrilled) Strength Limit State (Tension)

Vertical Load Demand = 22 kips (Downdrag) + 460 kips (Extreme Event Limit Compression) = 490 kips



(1) The recommended pile tip elevation is significantly below the pile tip elevation because the end bearing in sand is conservatively ignored due to ground variation.

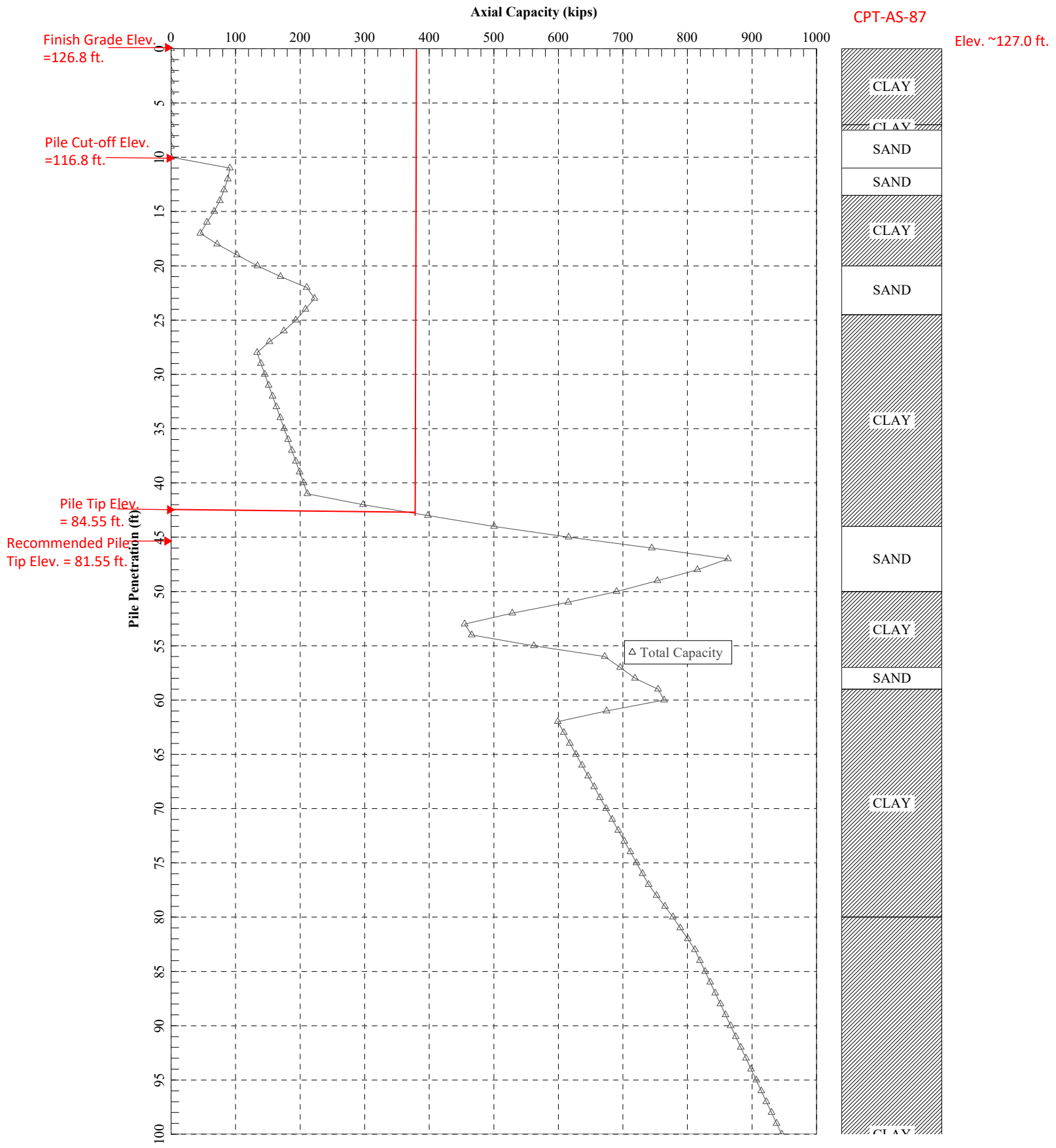
Eastridge to BART Regional Connector Project Bent 61 - 18-Inch Square Precast Concrete Pile (25' Predrilled) Extreme Event Limit State (Compresssion)



Eastridge to BART Regional Connector Project Bent 61 - 18-Inch Square Precast Concrete Pile (25' Predrilled) Extreme Event Limit State (Tension)

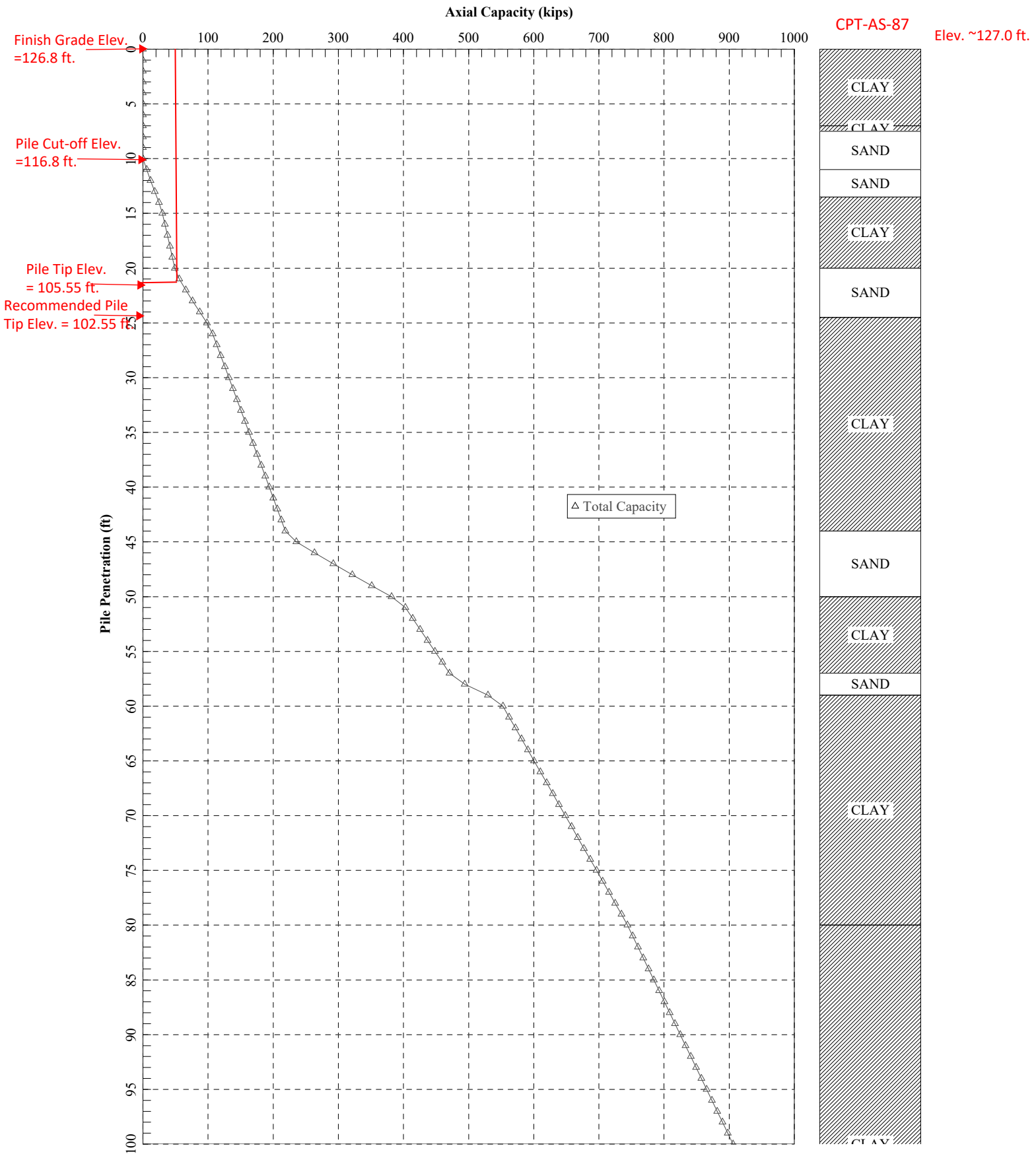
AERIAL GUIDEWAY – BENT 62 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 260 kips (Strength Limit Compression)/0.7 = 380 kips



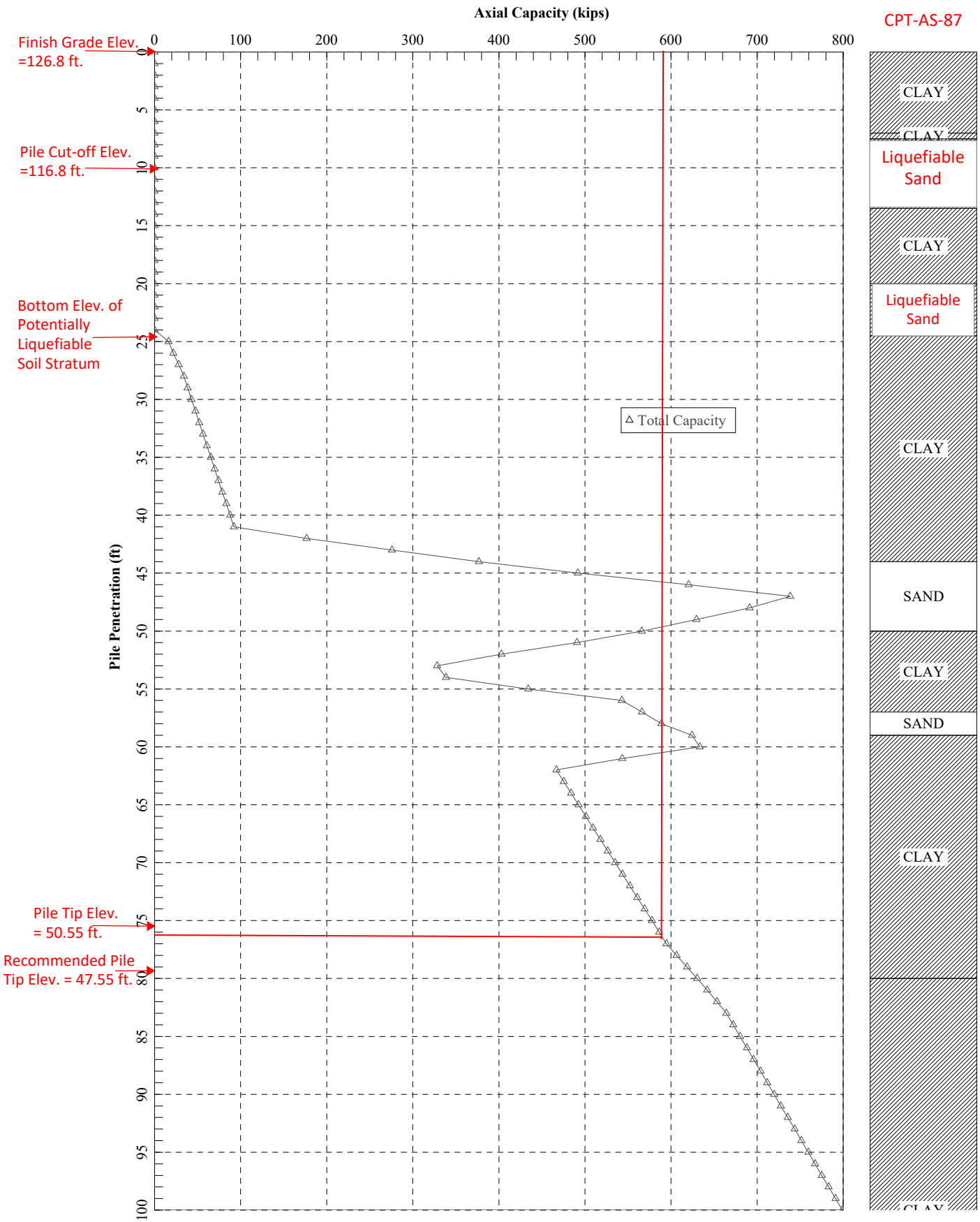
Eastridge to BART Regional Connector Project Bent 62 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 30 kips (Strength Limit Tension)/0.7 = 50 kips



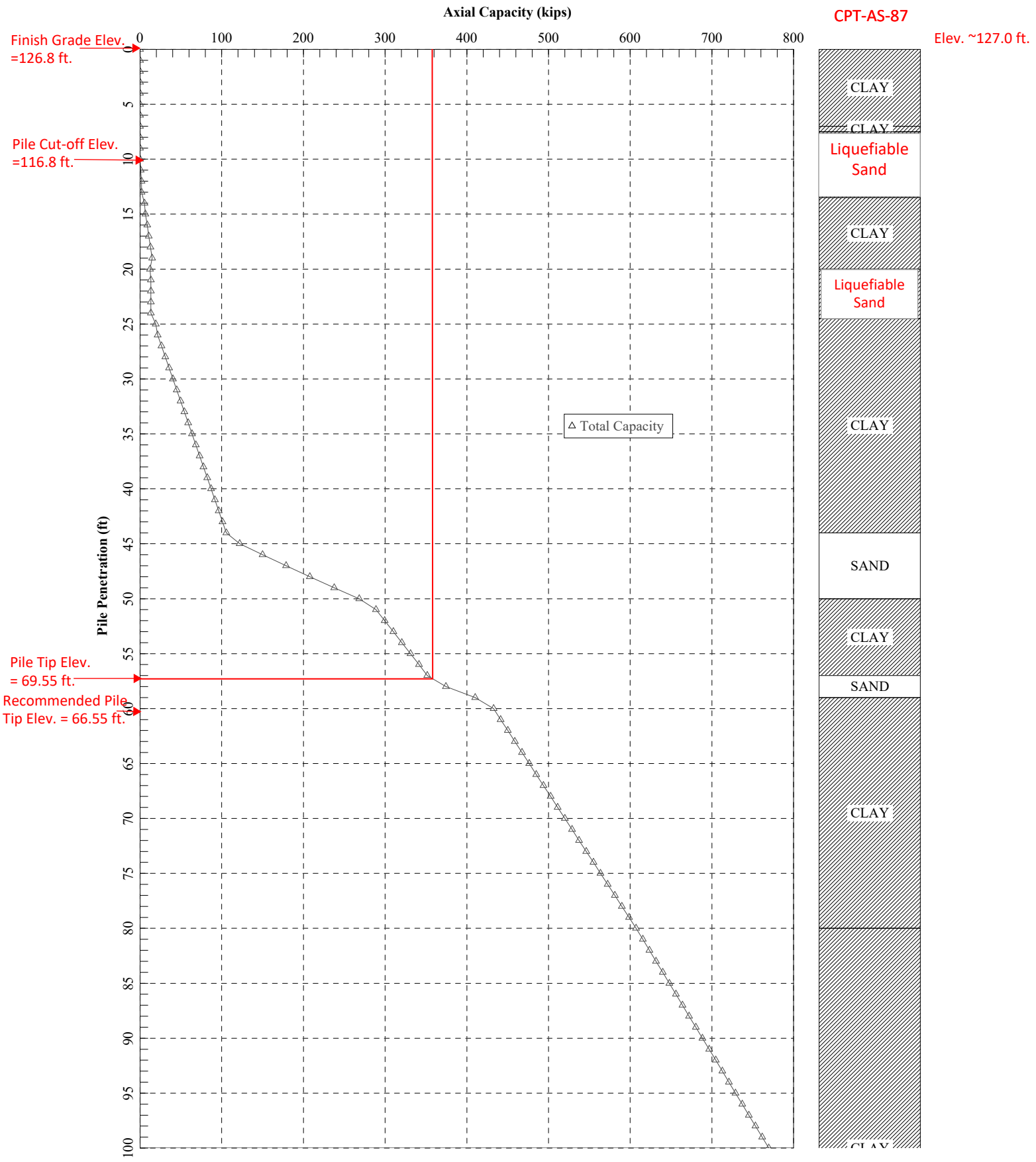
Eastridge to BART Regional Connector Project Bent 62 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 15 kips (Downdrag) + 570 kips (Extreme Event Limit Compression) = 590 kips



Eastridge to BART Regional Connector Project Bent 62 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

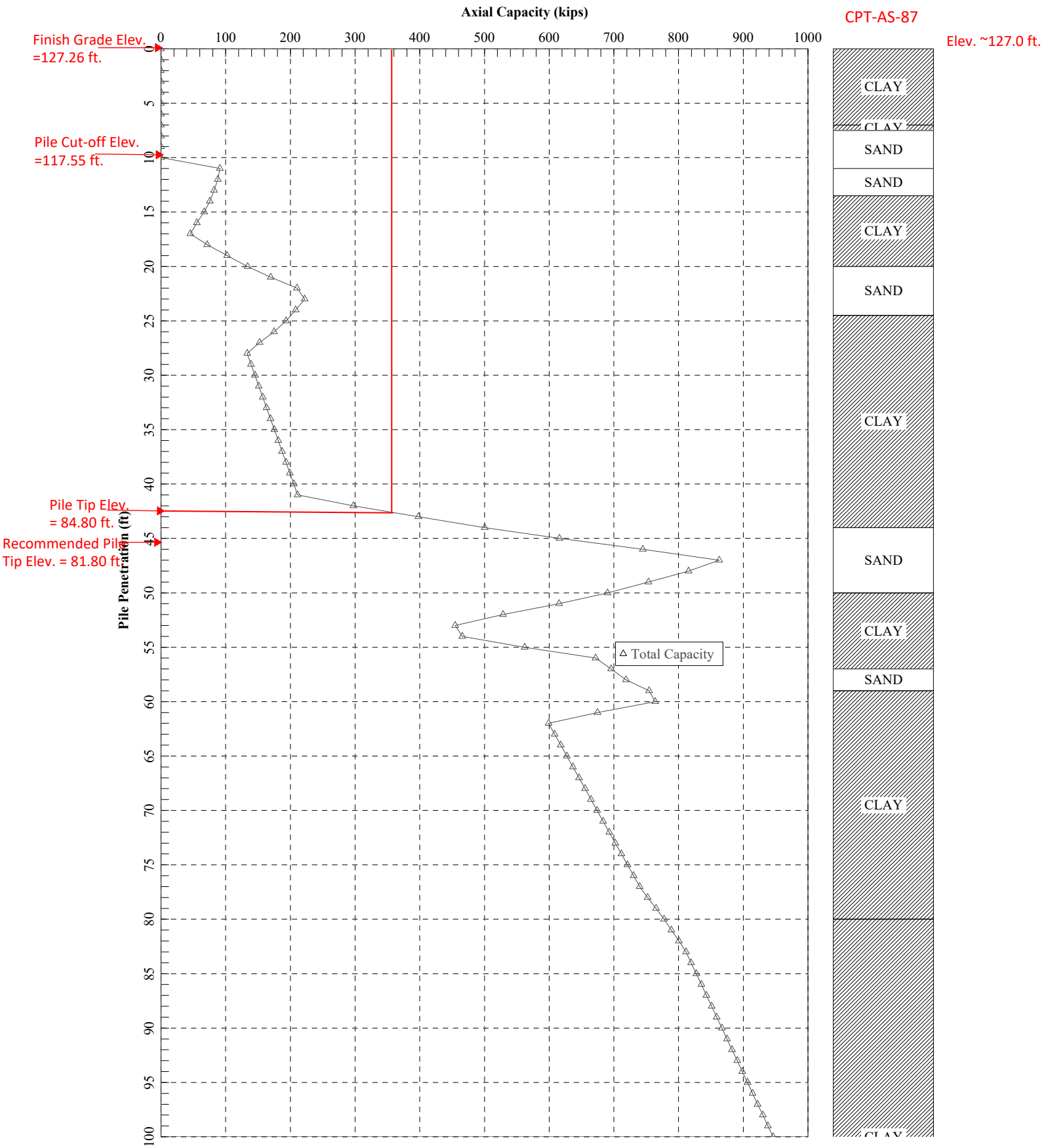
Vertical Load Demand = 360 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 62 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

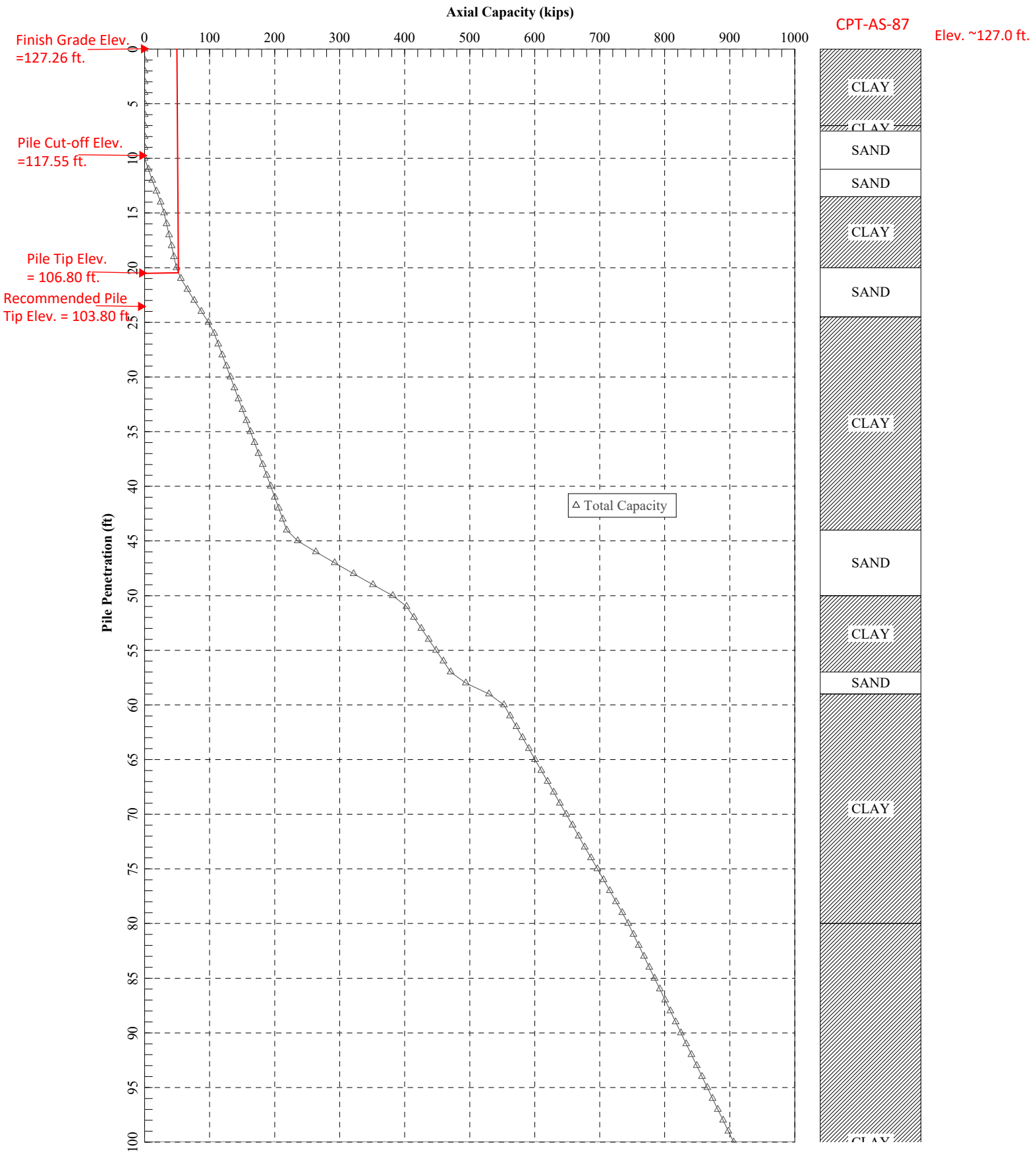
AERIAL GUIDEWAY – BENT 63 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 250 kips (Strength Limit Compression)/0.7 = 360 kips



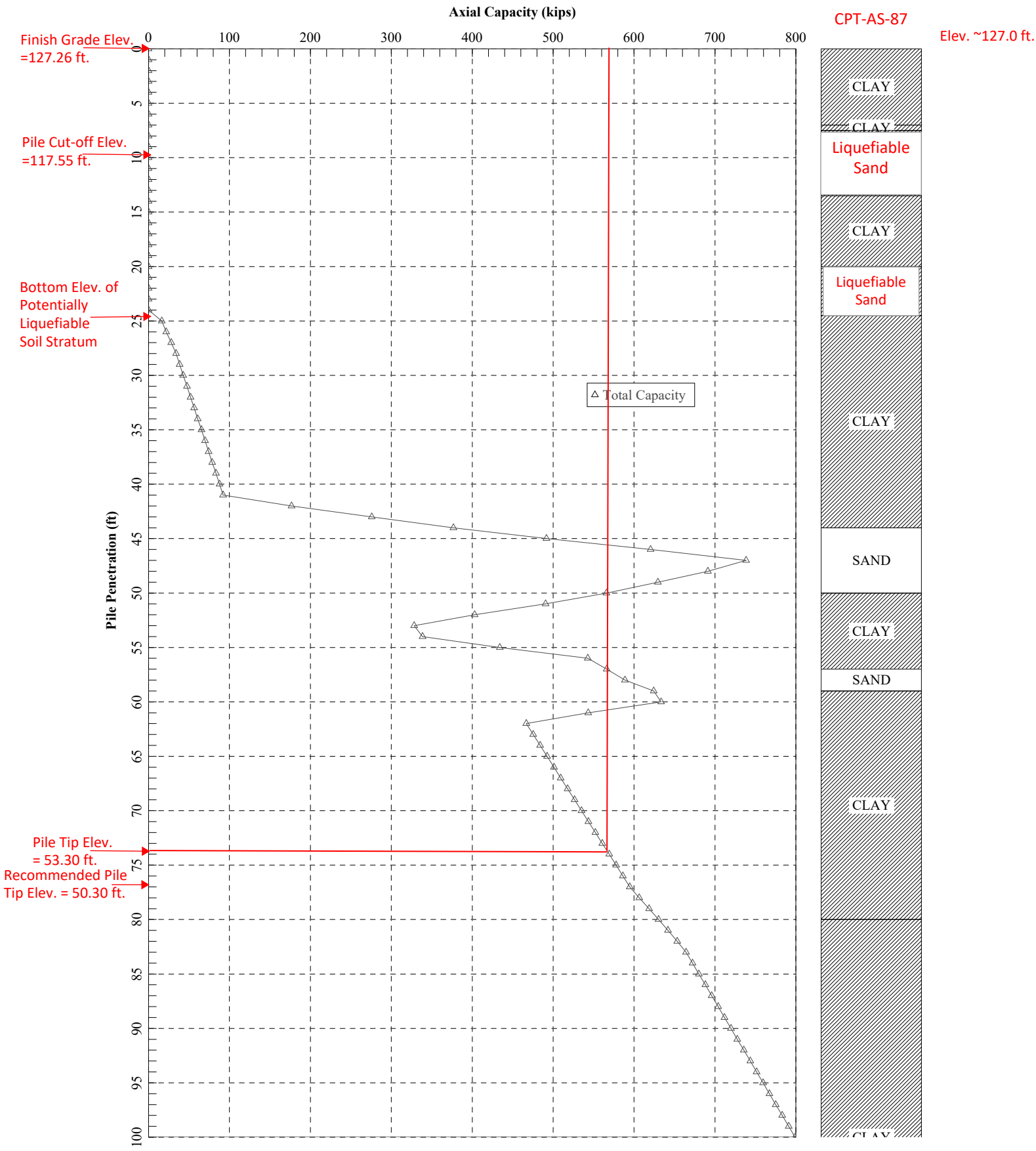
Eastridge to BART Regional Connector Project Bent 63 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 30 kips (Strength Limit Tension)/0.7 = 50 kips



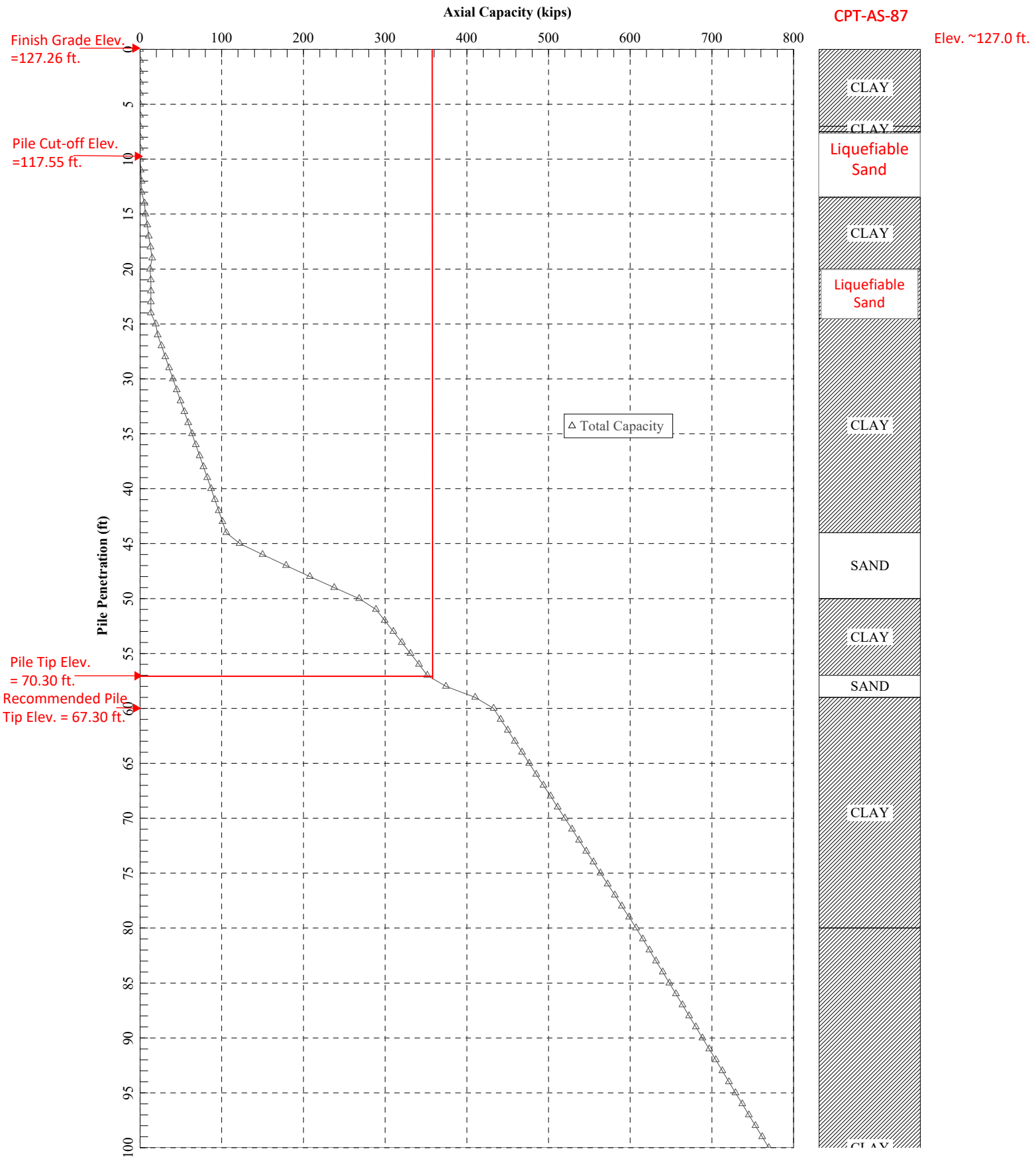
Eastridge to BART Regional Connector Project Bent 63 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 15 kips (Downdrag) + 550 kips (Extreme Event Limit Compression) = 570 kips



Eastridge to BART Regional Connector Project Bent 63 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

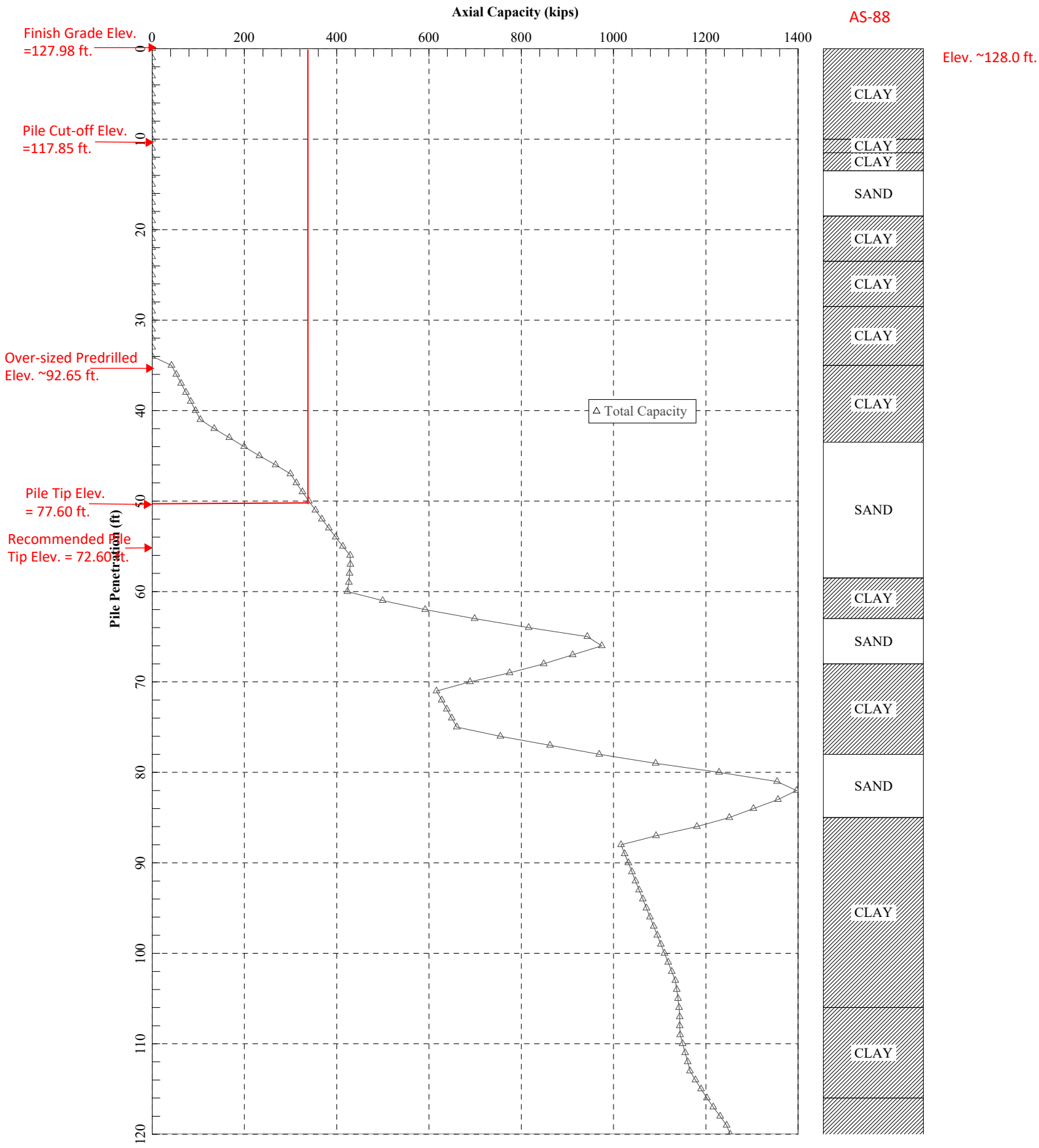
Vertical Load Demand = 360 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 63 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

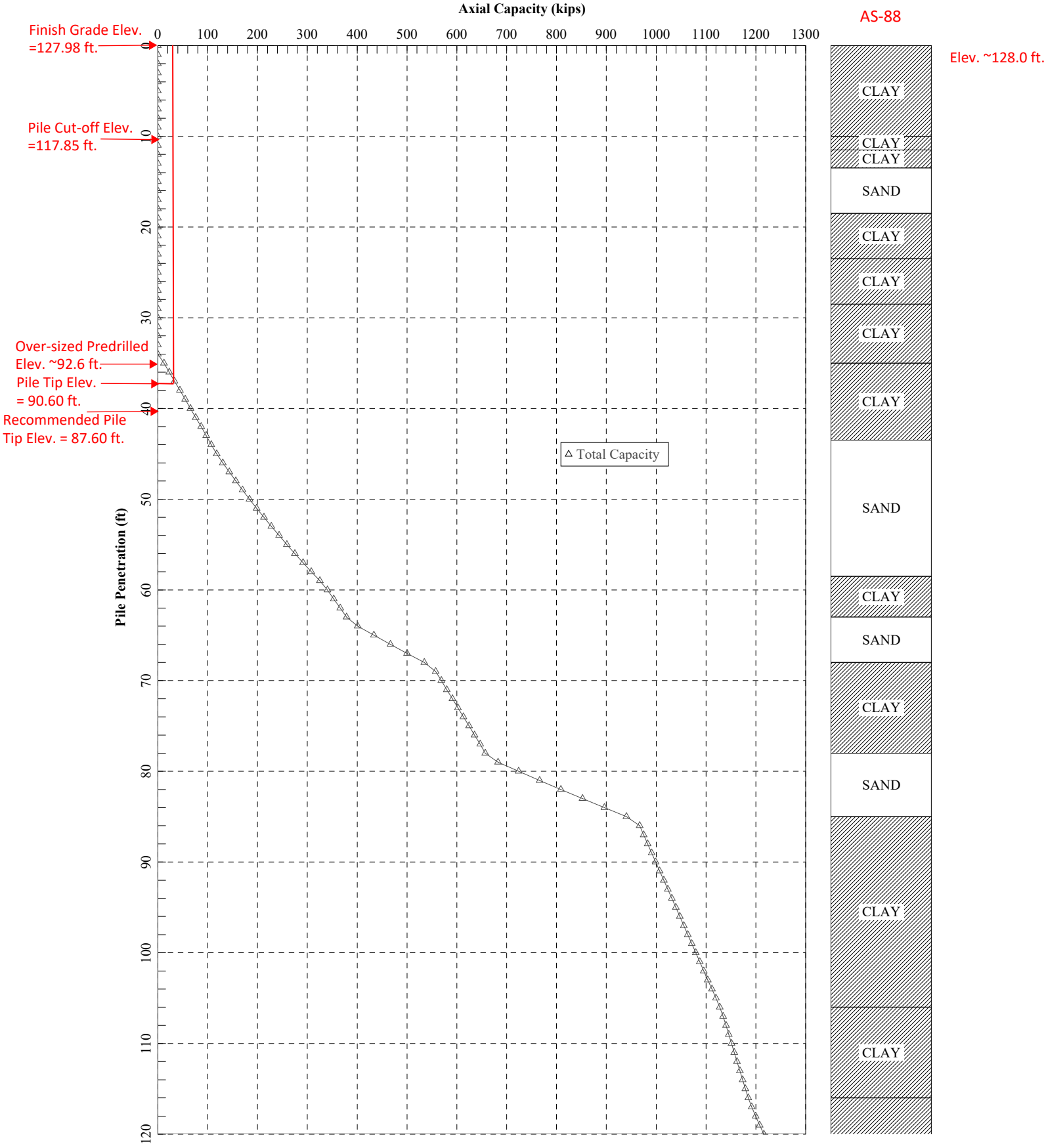
AERIAL GUIDEWAY – BENT 64 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 250 kips (Strength Limit Compression)/0.7 = 360 kips



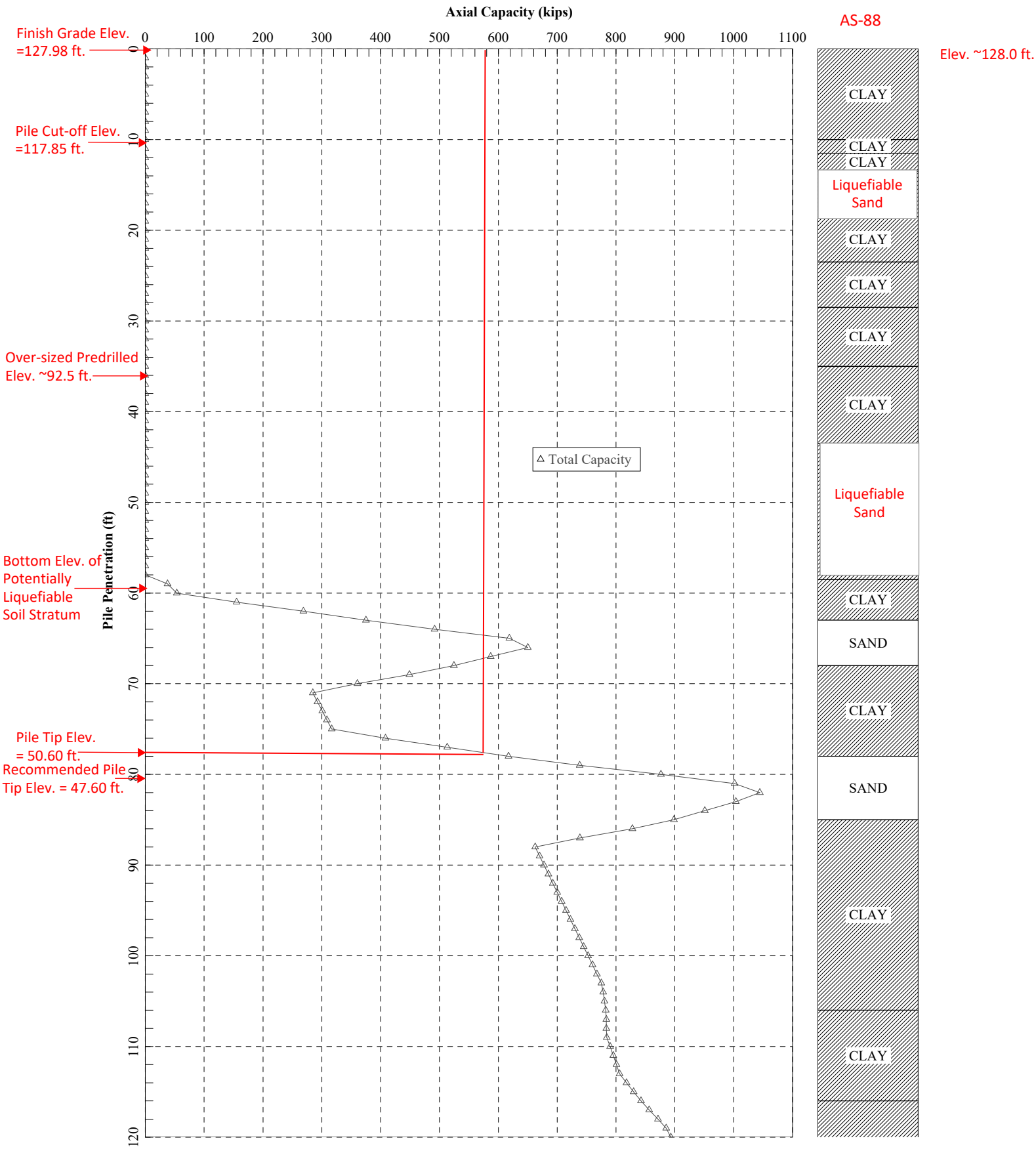
Eastridge to BART Regional Connector Project Bent 64 - 18-Inch Square Precast Concrete Pile (25' Predrilled) Strength Limit State (Compression)

Vertical Load Demand = 20 kips (Strength Limit Tension)/0.7 = 30 kips

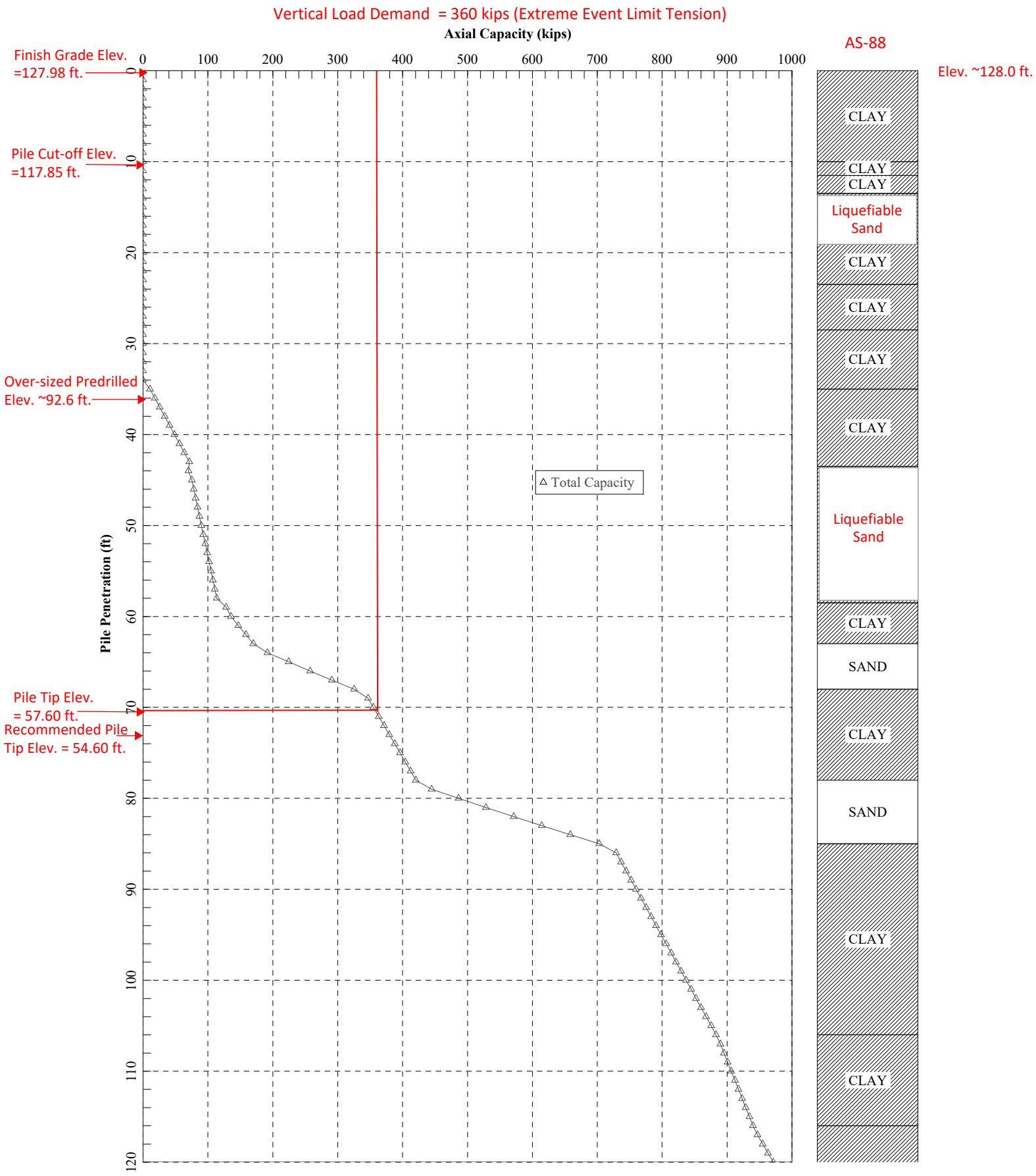


Eastridge to BART Regional Connector Project Bent 64 - 18-Inch Square Precast Concrete Pile (25' Predrilled) Strength Limit State (Tension)

Vertical Load Demand = 15 kips (Downdrag) + 560 kips (Extreme Event Limit Compression) = 580 kips



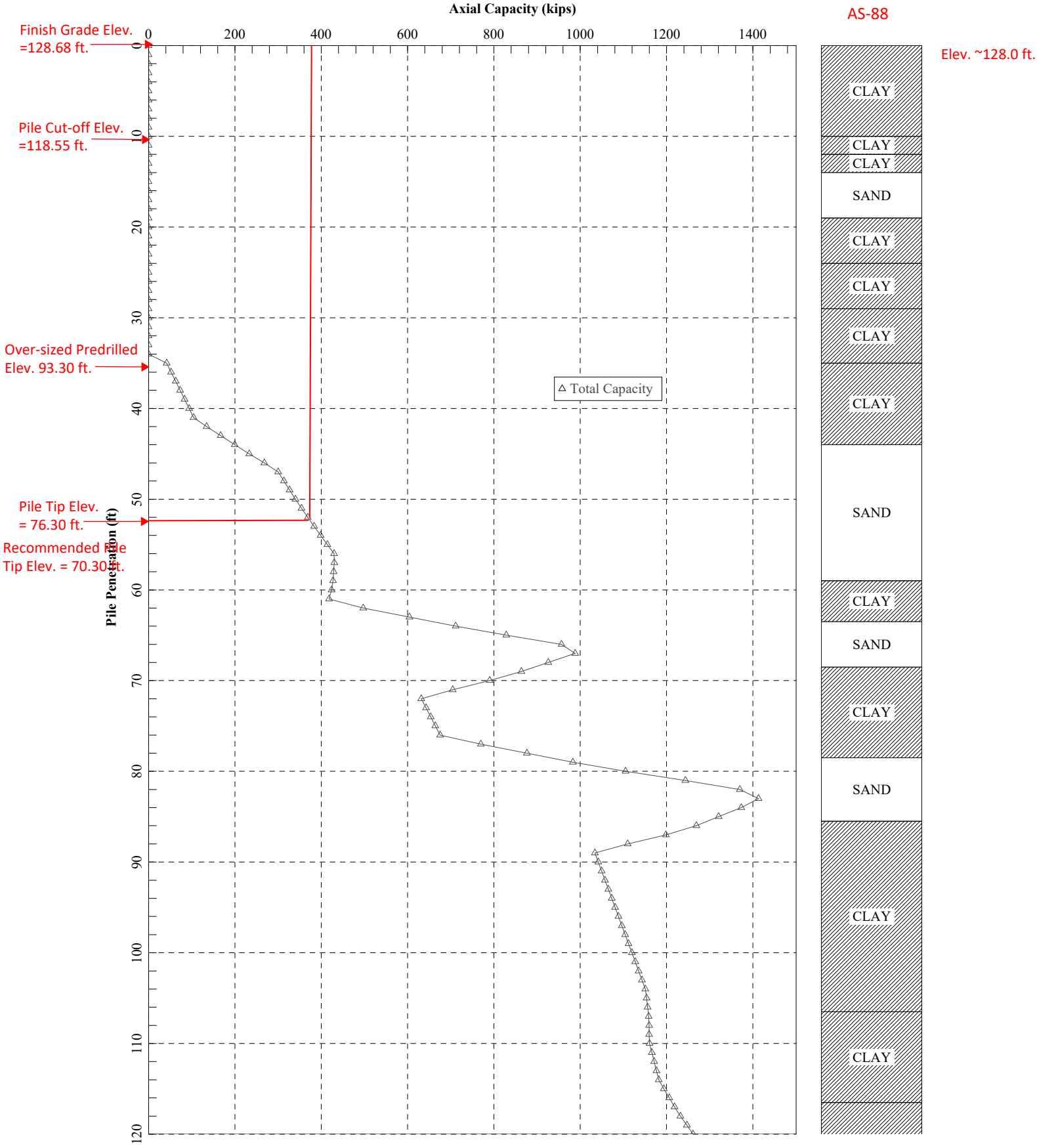
Eastridge to BART Regional Connector Project Bent 64 - 18-Inch Square Precast Concrete Pile (25' Predrilled) Extreme Event Limit State (Compression)



Eastridge to BART Regional Connector Project Bent 64 - 18-Inch Square Precast Concrete Pile (25' Predrilled) Extreme Event Limit State (Tension)

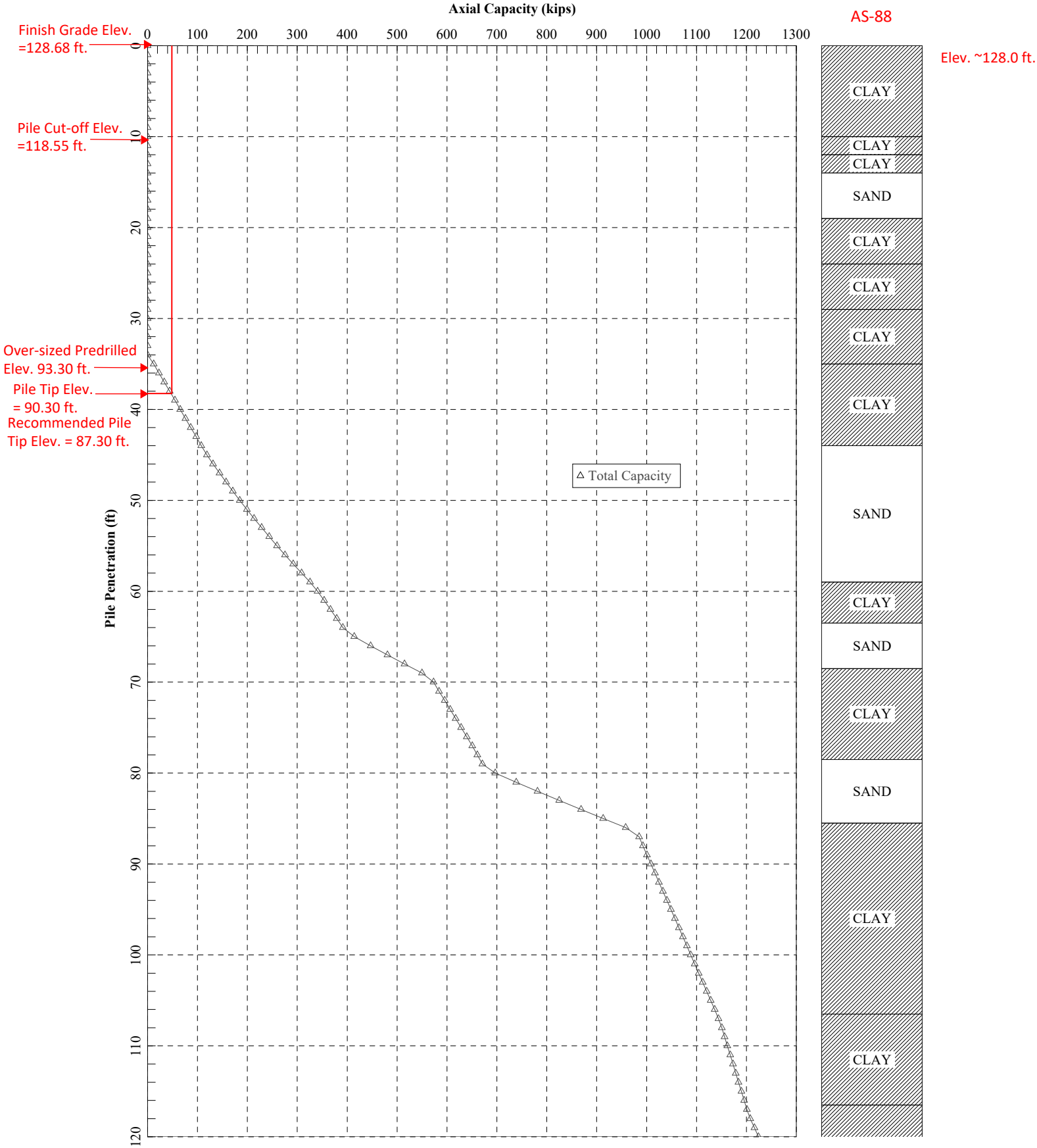
AERIAL GUIDEWAY – BENT 65 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 260 kips (Strength Limit Compression)/0.7 = 380 kips



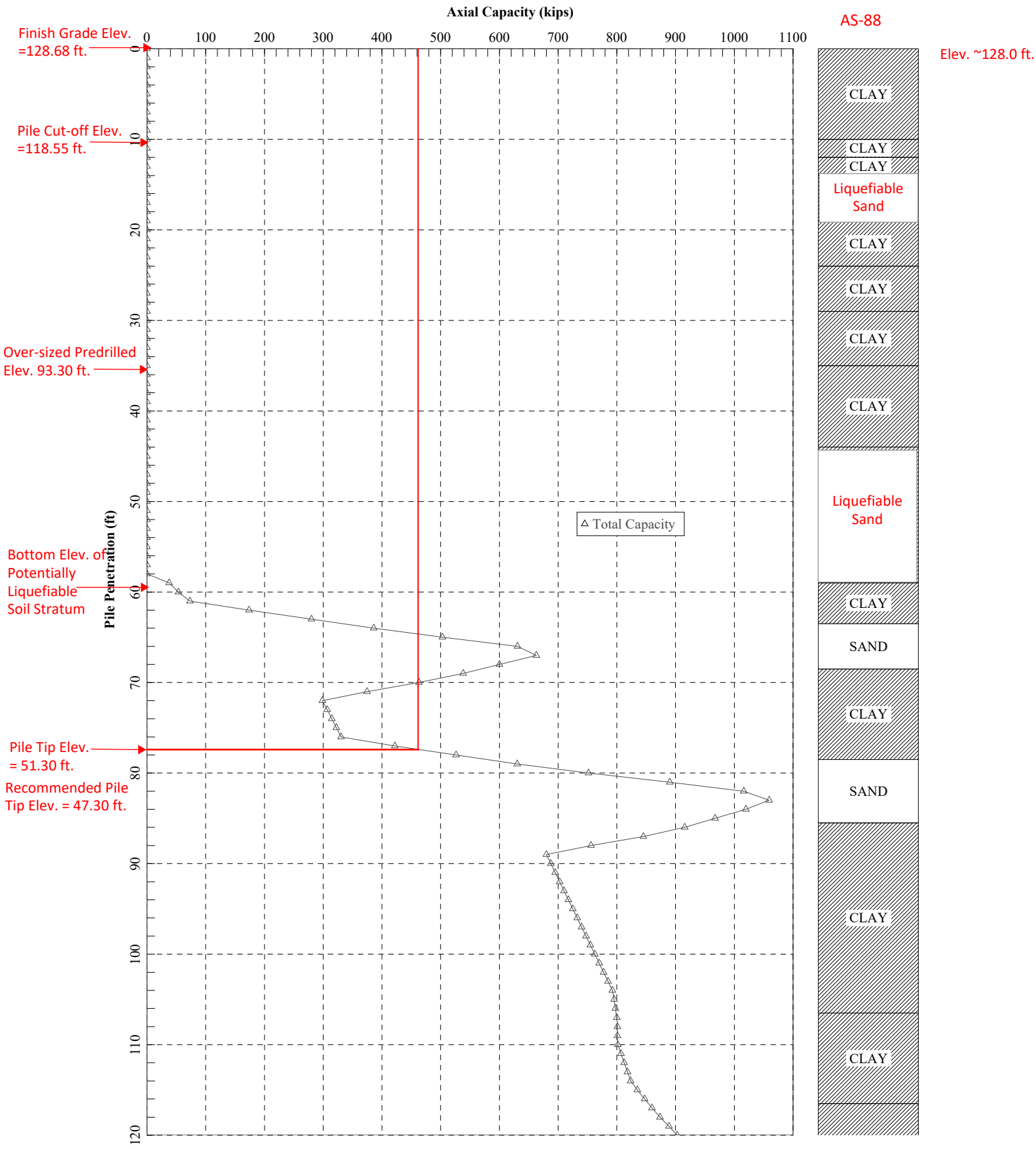
Eastridge to BART Regional Connector Project Bent 65 - 18-Inch Square Precast Concrete Pile (25' Predrilled) Strength Limit State (Compression)

Vertical Load Demand = 30 kips (Strength Limit Tension)/0.7 = 50 kips

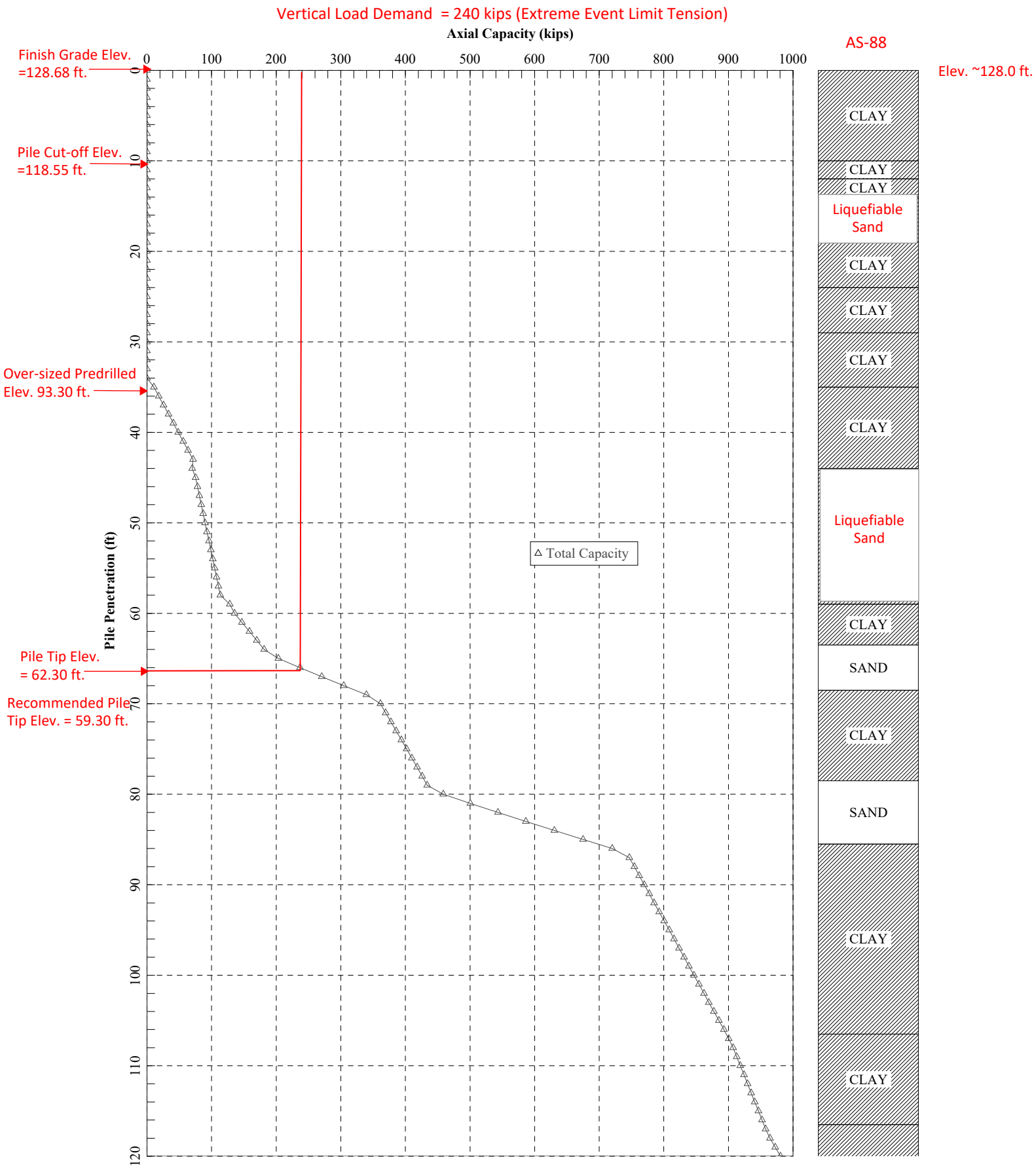


Eastridge to BART Regional Connector Project Bent 65 - 18-Inch Square Precast Concrete Pile (25' Predrilled) Strength Limit State (Tension)

Vertical Load Demand = 15 kips (Downdrag) + 440 kips (Extreme Event Limit Compression) = 460 kips



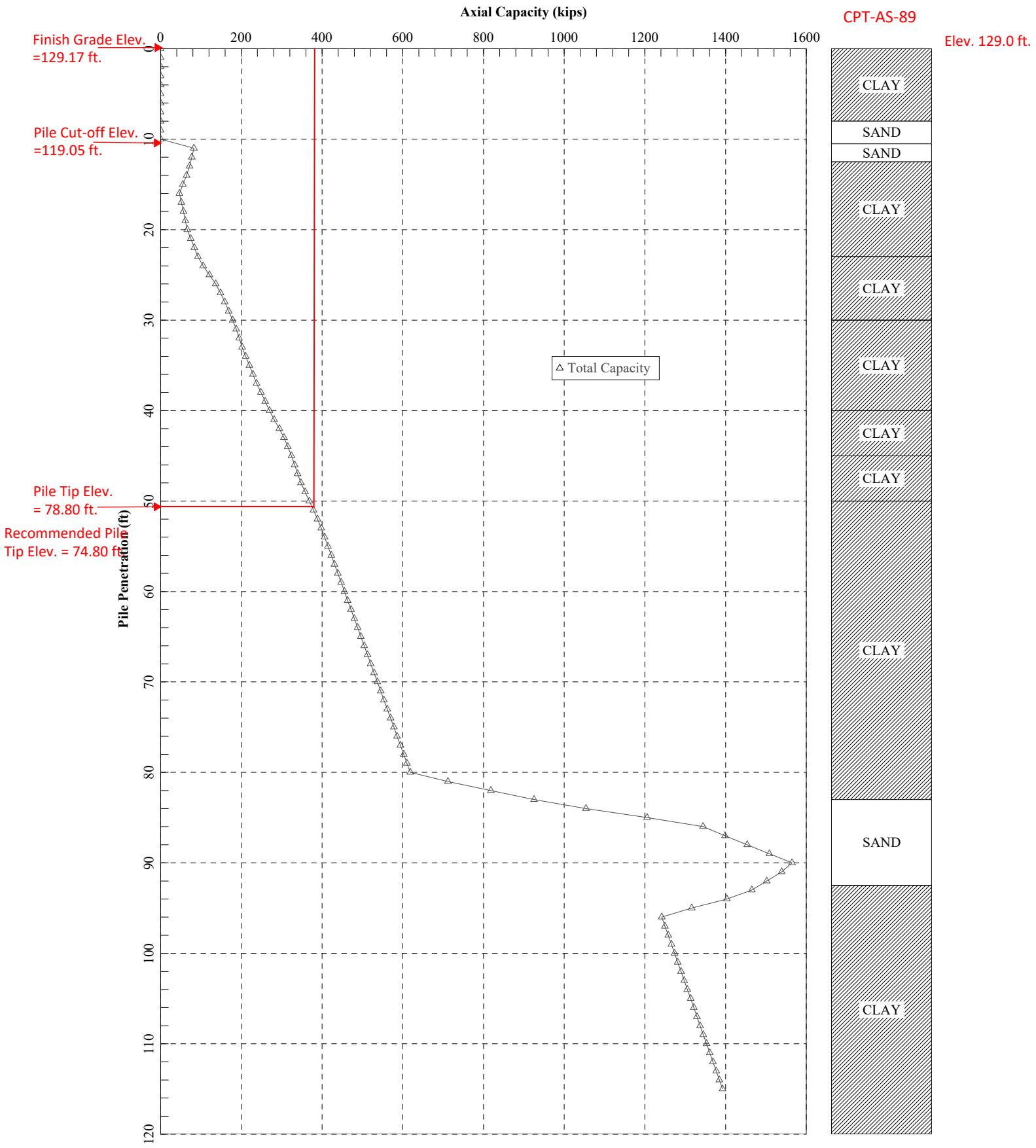
Eastridge to BART Regional Connector Project Bent 65 - 18-Inch Square Precast Concrete Pile (25' Predrilled) Extreme Event Limit State (Compression)



Eastridge to BART Regional Connector Project Bent 65 - 18-Inch Square Precast Concrete Pile (25' Predrilled) Extreme Event Limit State (Tension)

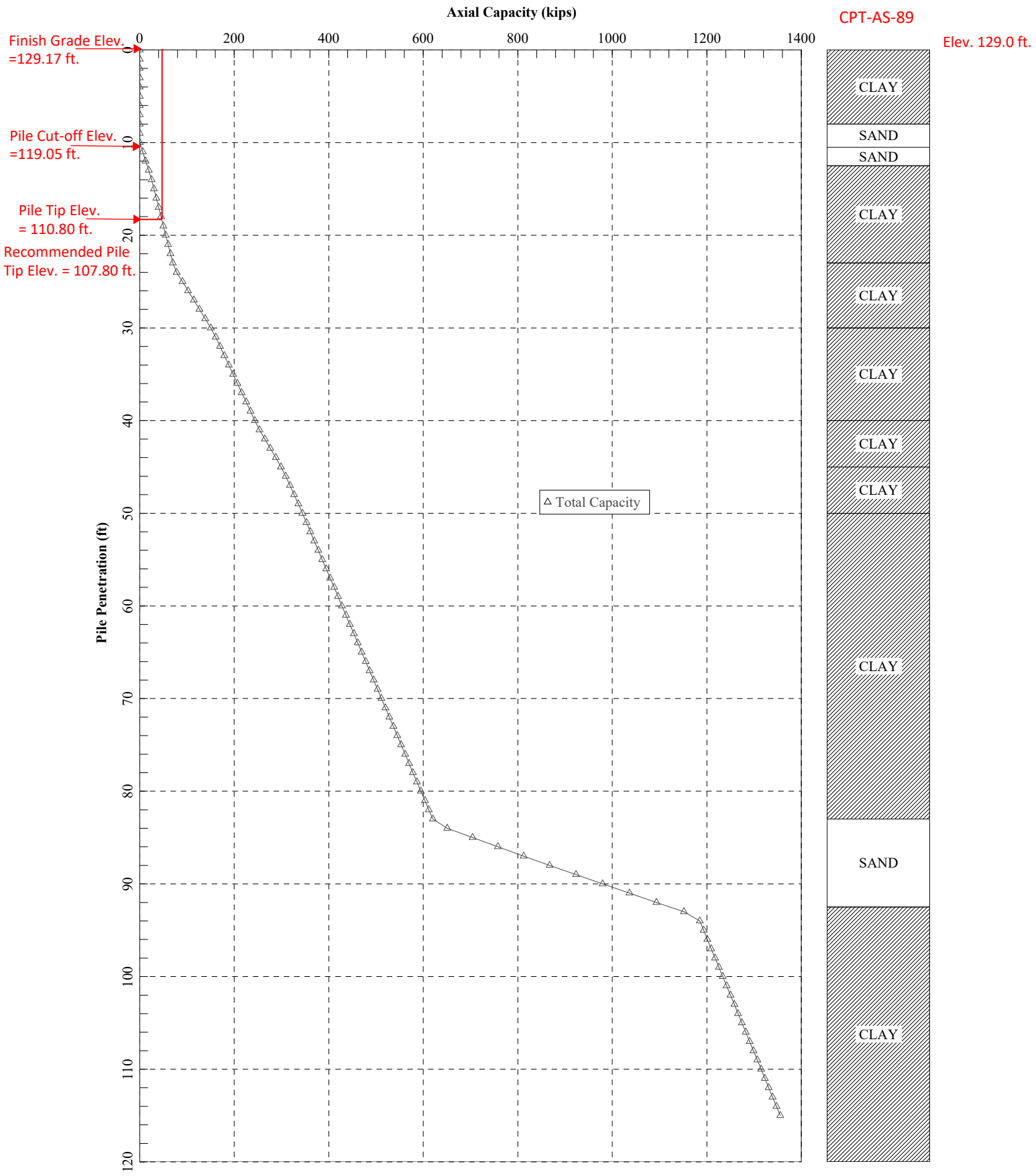
AERIAL GUIDEWAY – BENT 66 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 260 kips (Strength Limit Compression)/0.7 = 380 kips

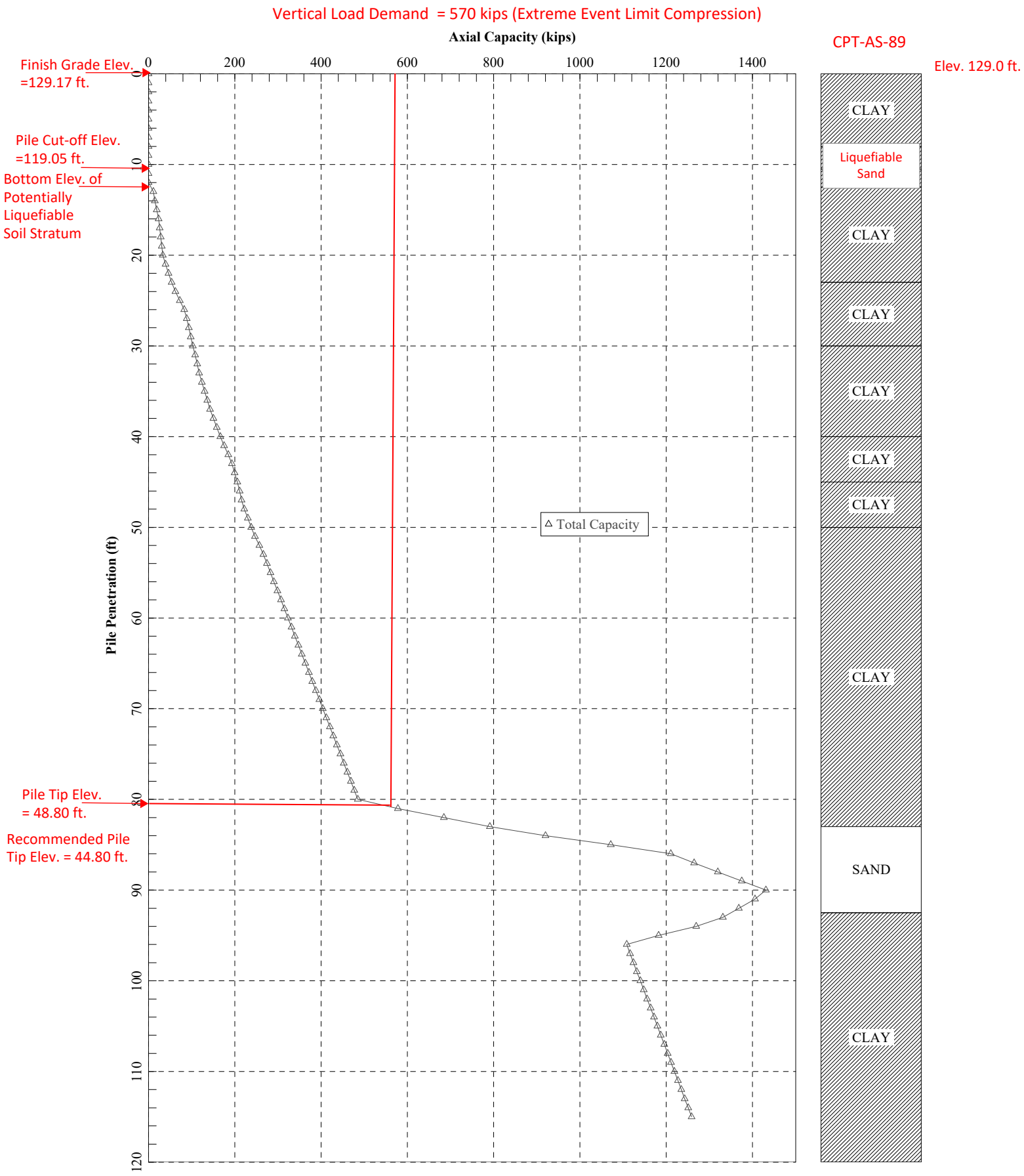


Eastridge to BART Regional Connector Project Bent 66 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 30 kips (Strength Limit Tension)/0.7 = 50 kips

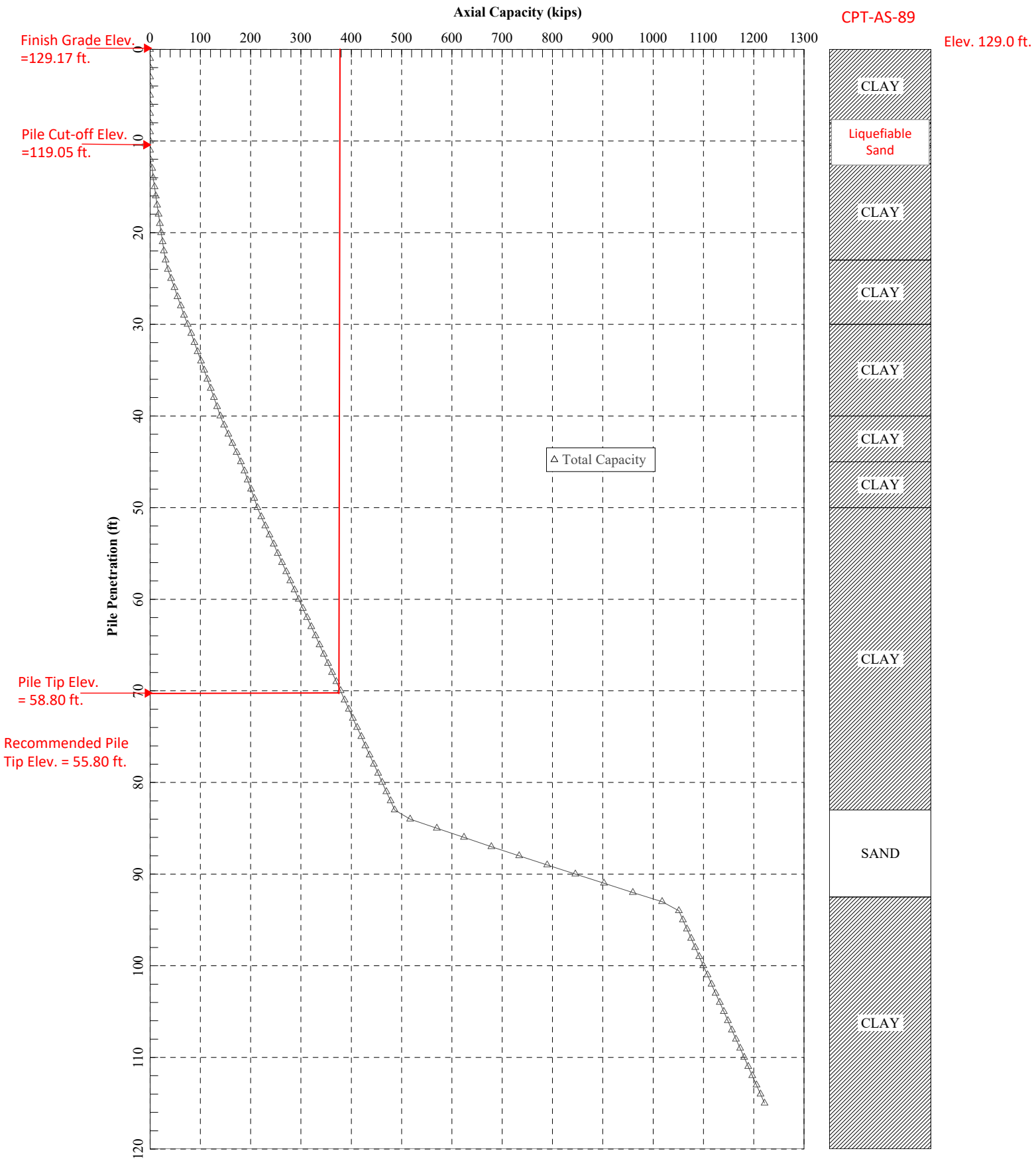


Eastridge to BART Regional Connector Project Bent 66 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)



Eastridge to BART Regional Connector Project Bent 66 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

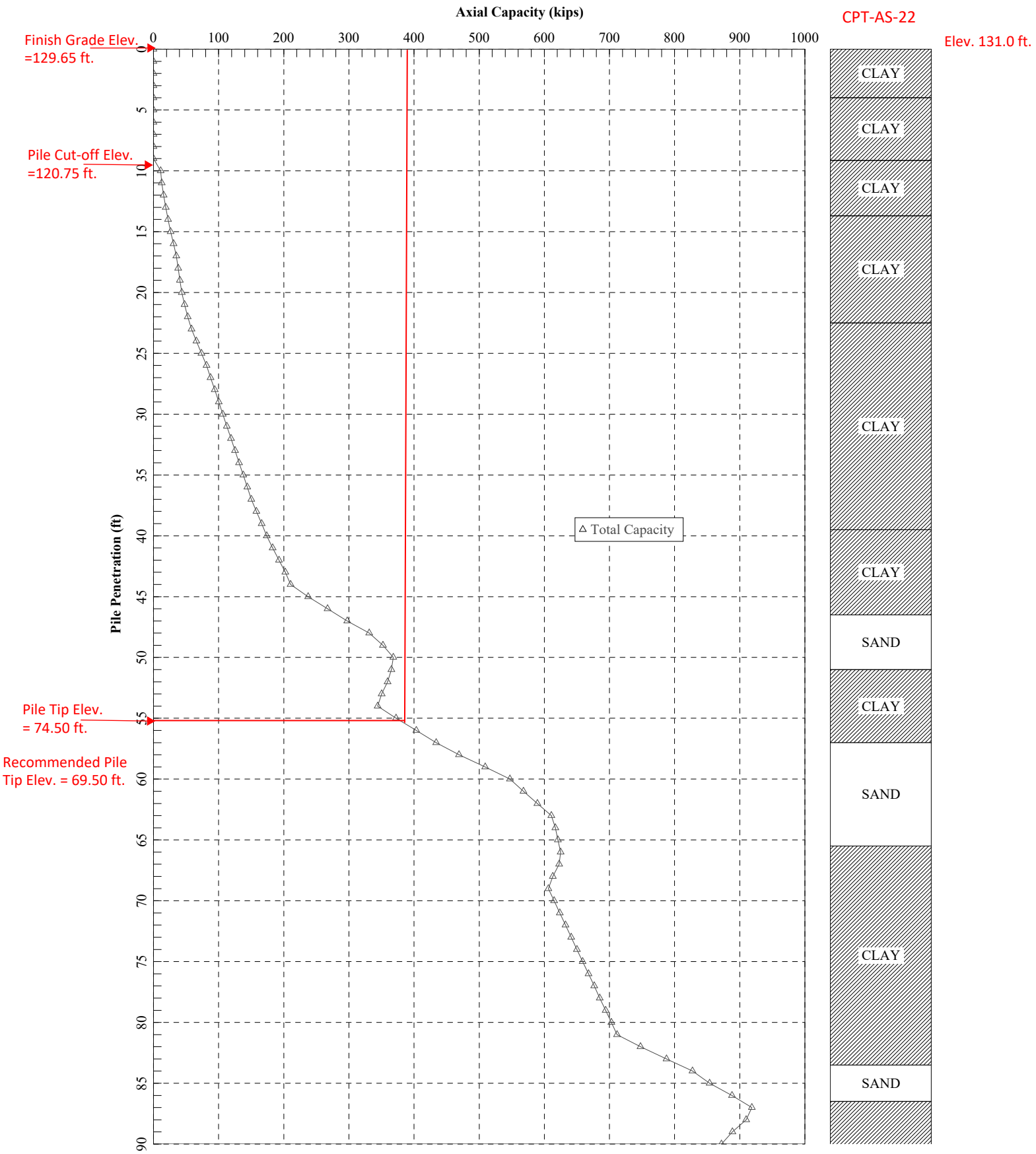
Vertical Load Demand = 380 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 66 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

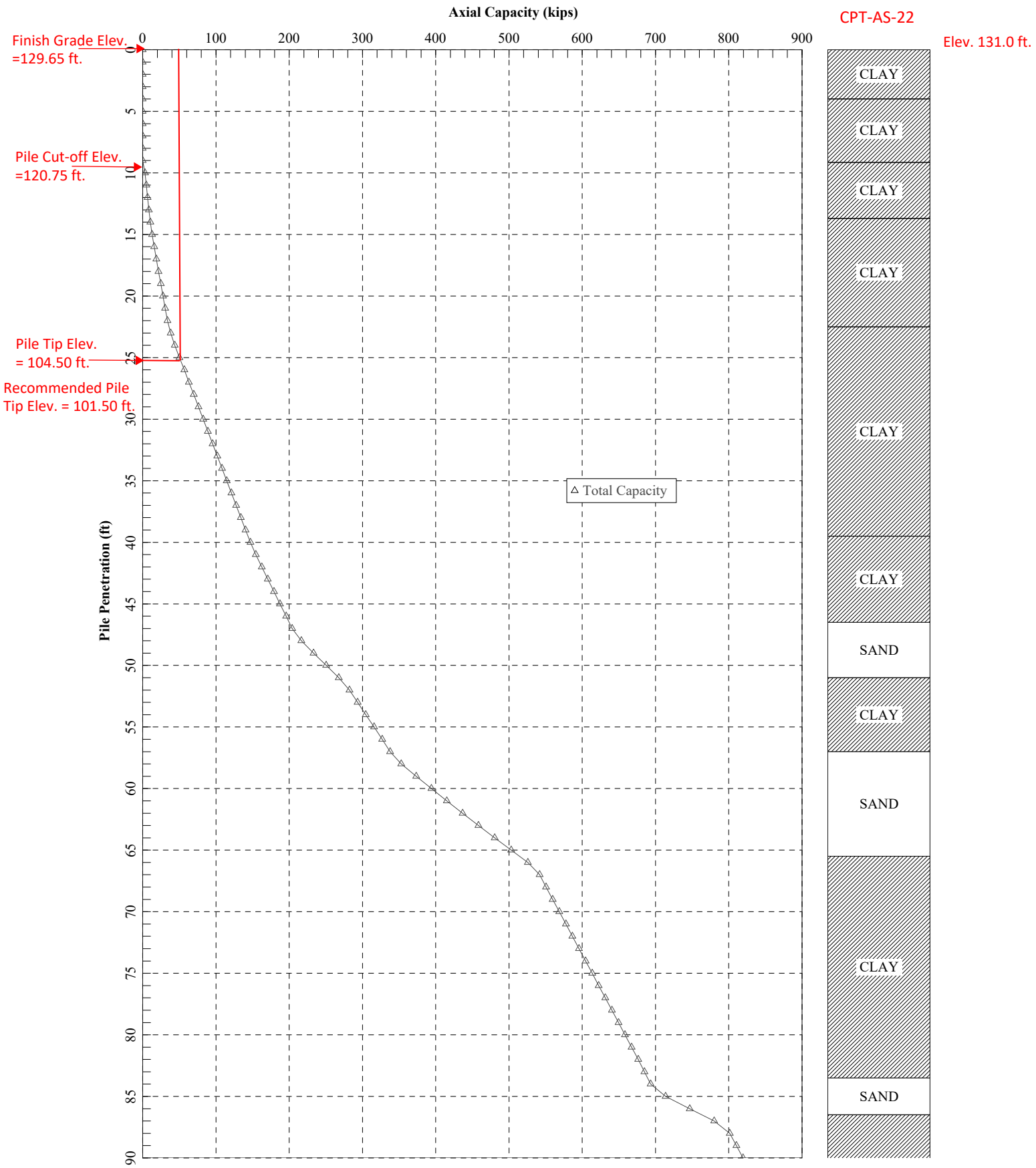
AERIAL GUIDEWAY – BENT 67 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 270 kips (Strength Limit Compression)/0.7 = 390 kips



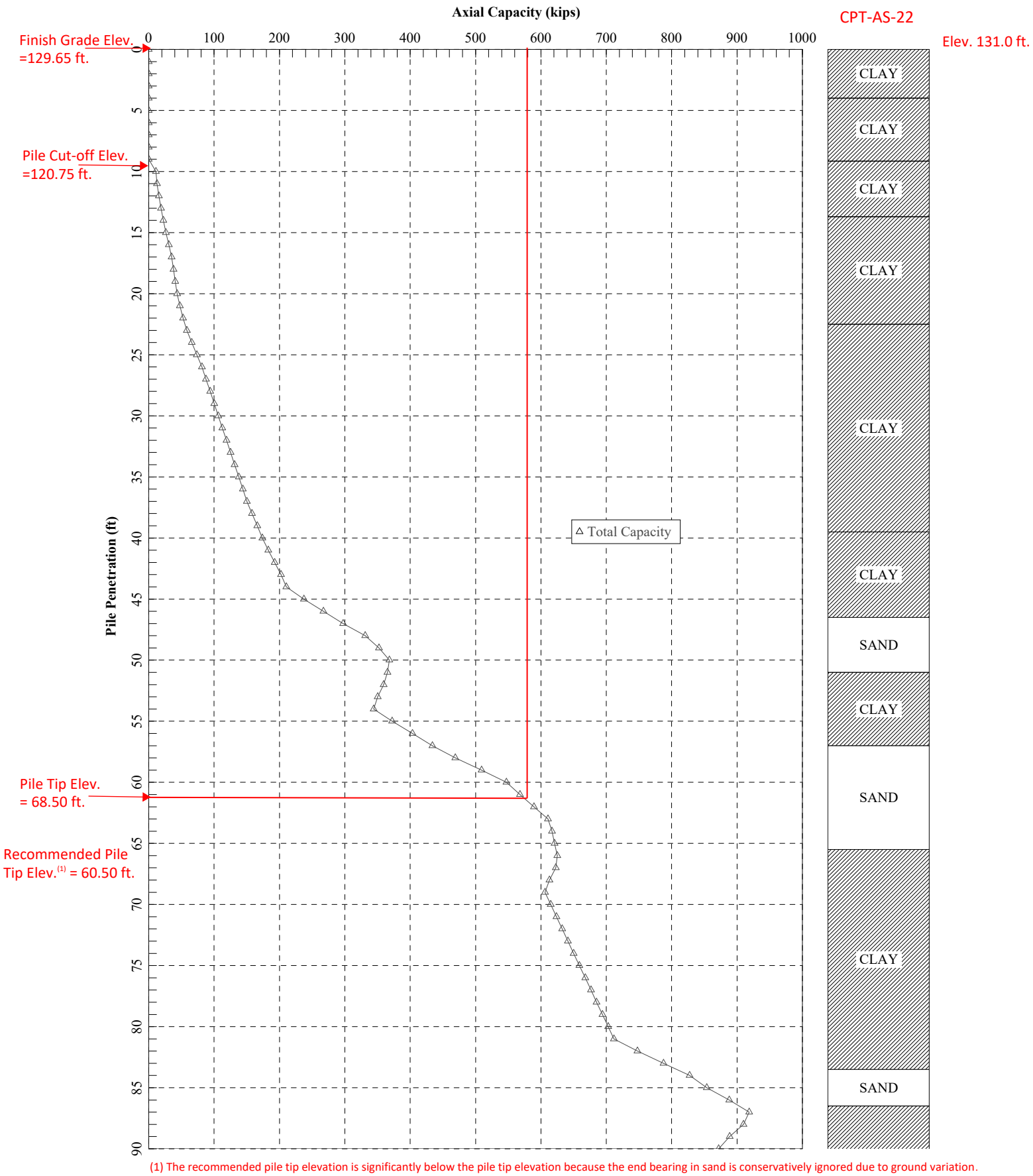
Eastridge to BART Regional Connector Project Bent 67 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 30 kips (Strength Limit Tension)/0.7 = 50 kips



Eastridge to BART Regional Connector Project Bent 67 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

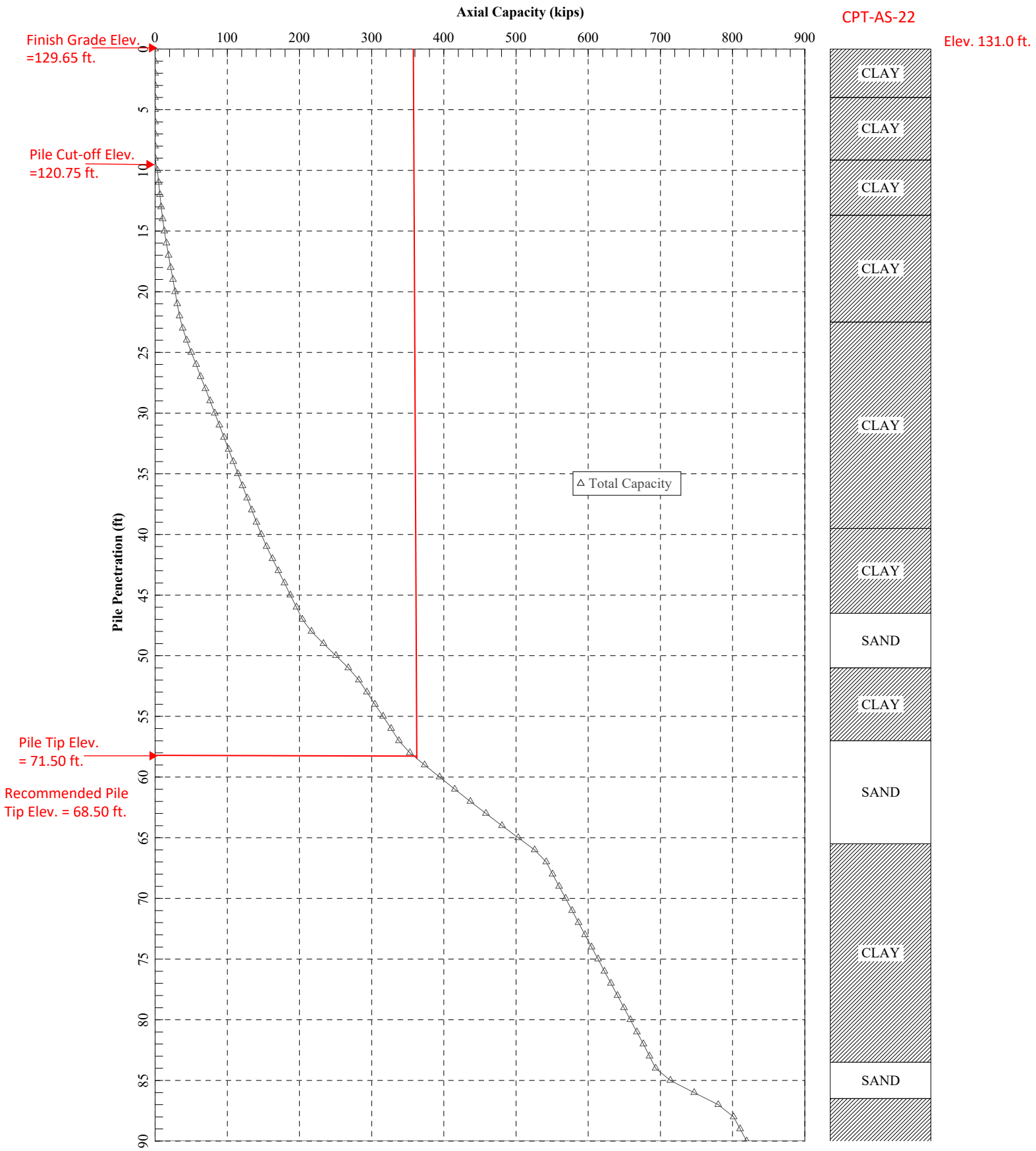
Vertical Load Demand = 580 kips (Extreme Event Limit Compression)



(1) The recommended pile tip elevation is significantly below the pile tip elevation because the end bearing in sand is conservatively ignored due to ground variation.

Eastridge to BART Regional Connector Project Bent 67 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

Vertical Load Demand = 360 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 67 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

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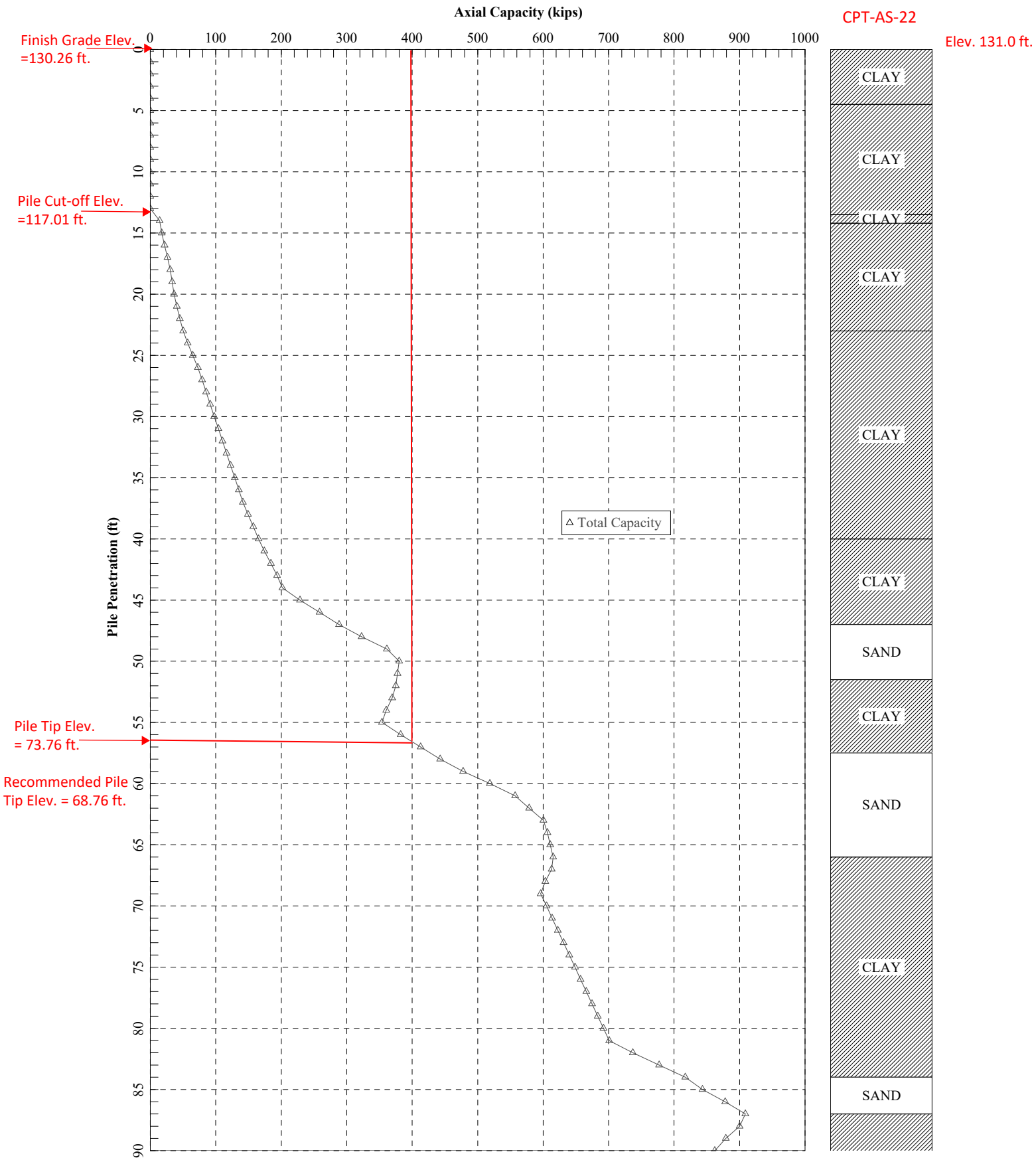
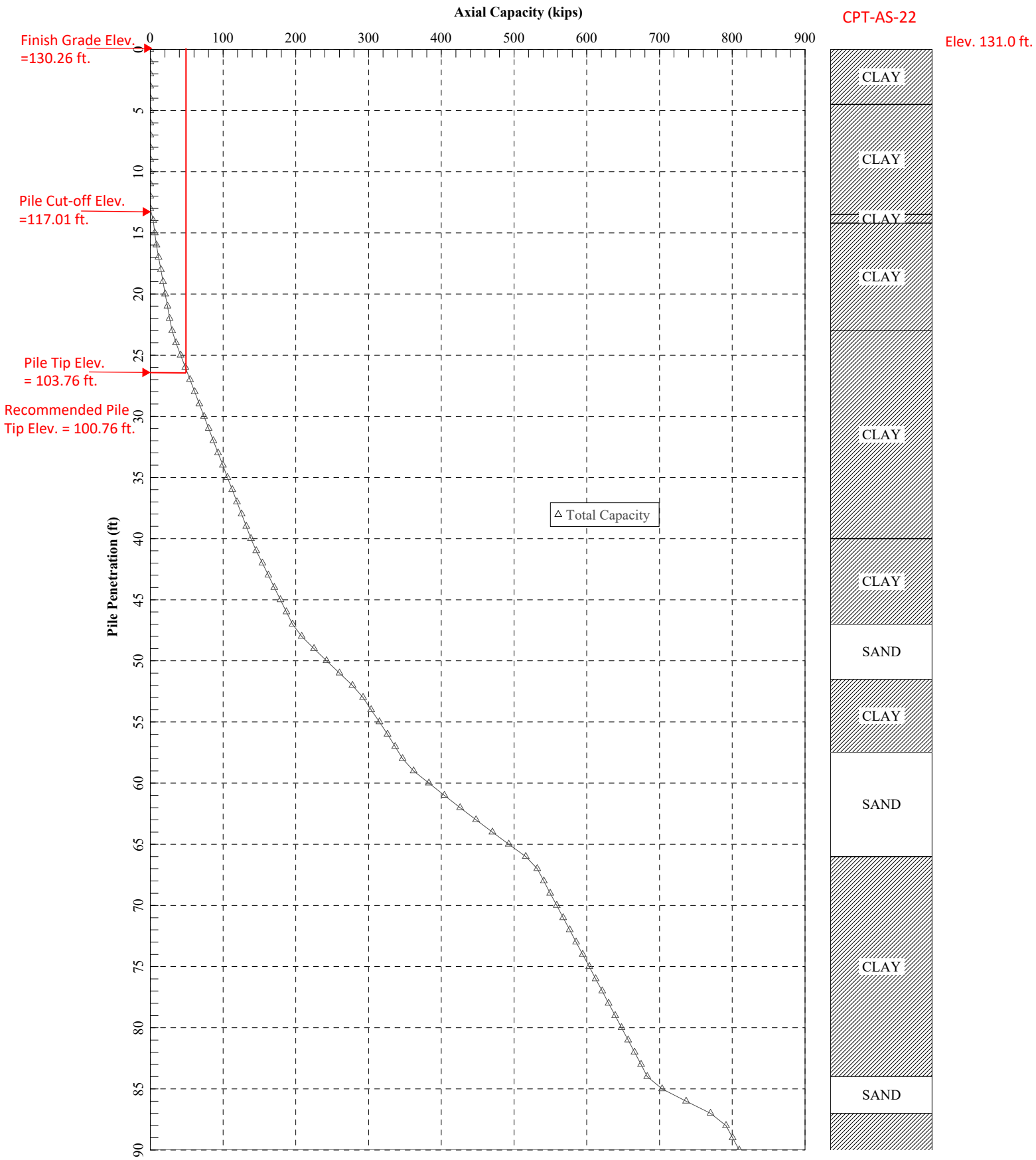
AERIAL GUIDEWAY – BENT 68 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 280 kips (Strength Limit Compression)/0.7 = 400 kips



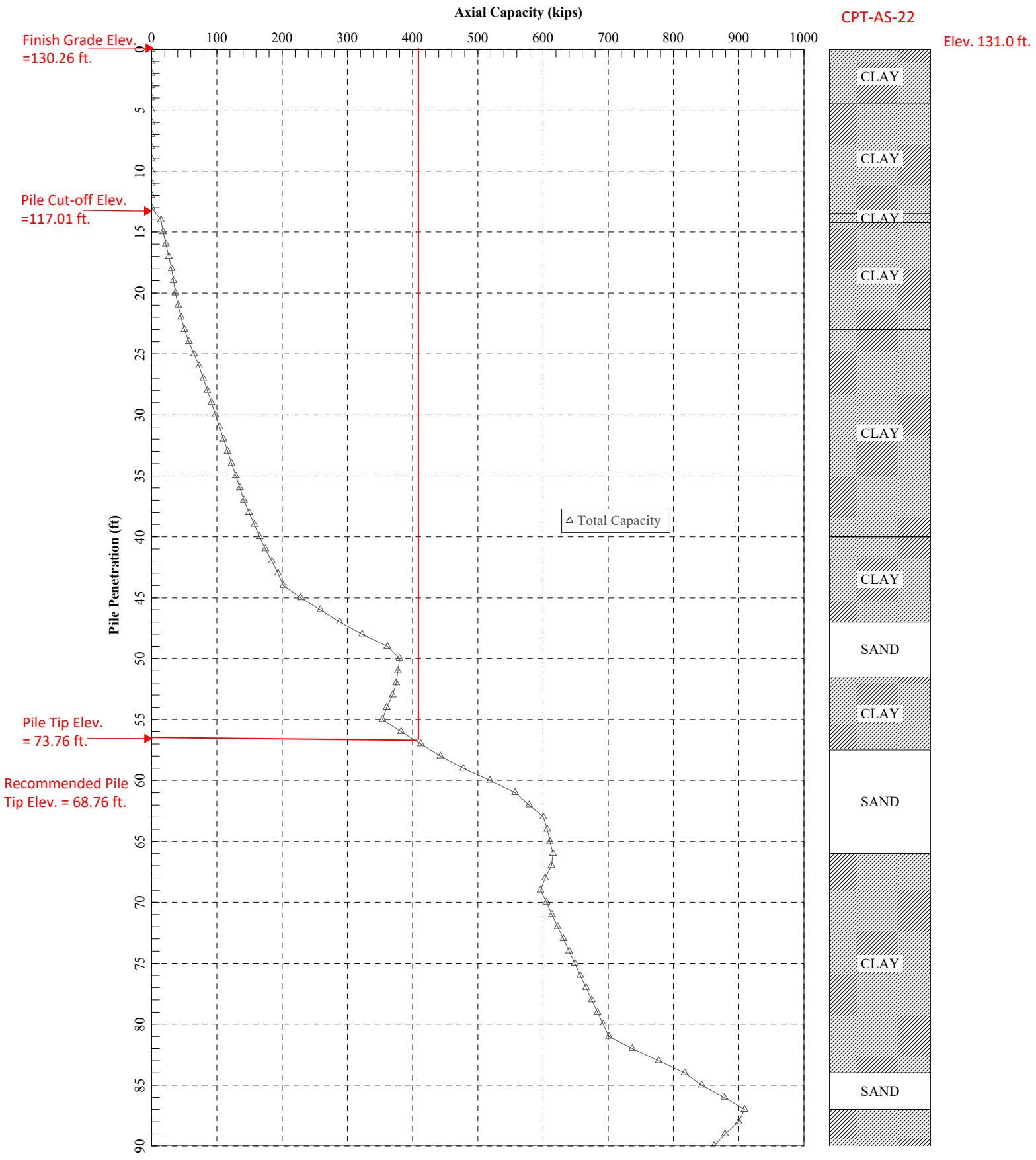
Eastridge to BART Regional Connector Project Bent 68-LT - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 30 kips (Strength Limit Tension)/0.7 = 50 kips



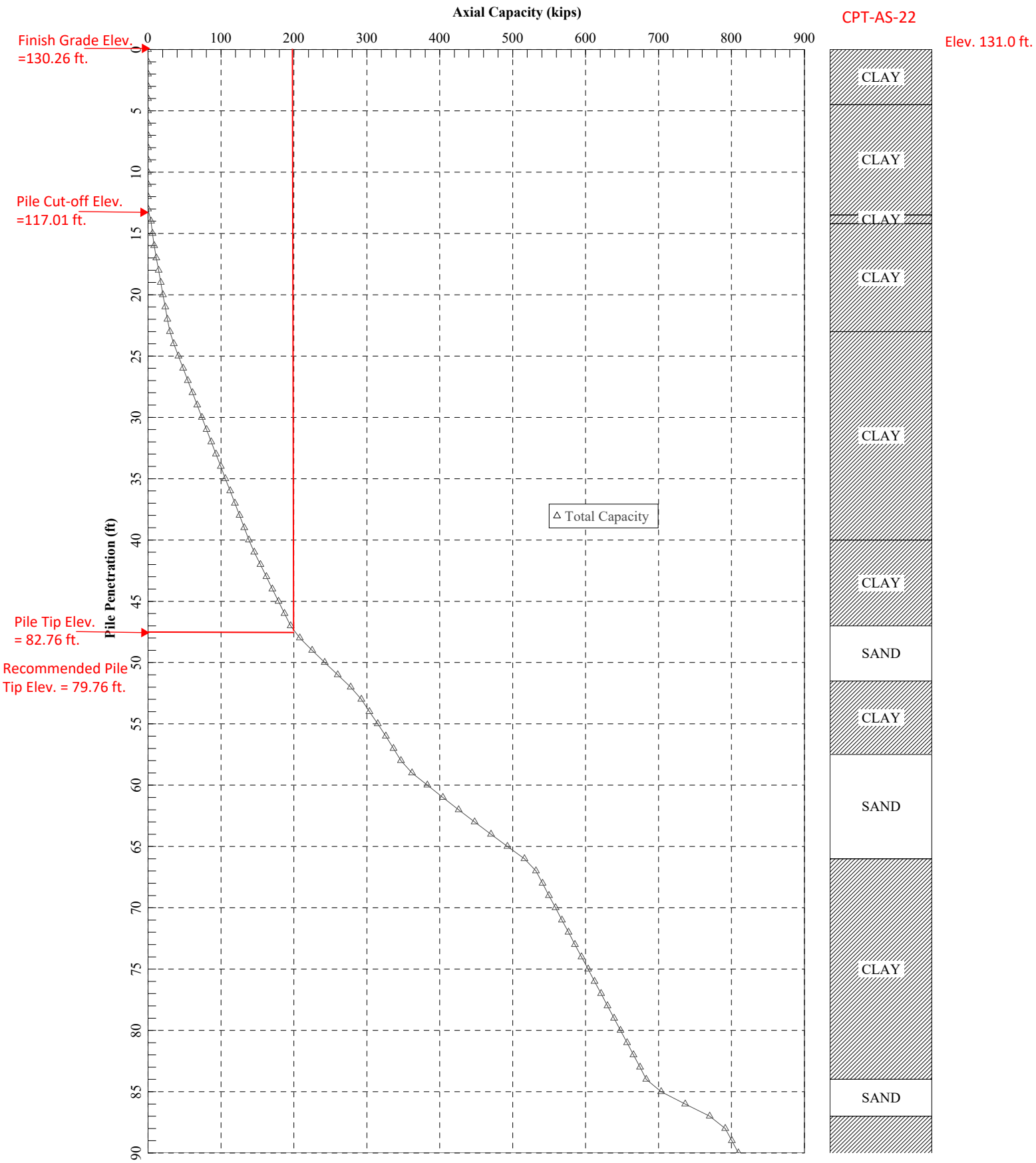
Eastridge to BART Regional Connector Project Bent 68-LT - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 410 kips (Extreme Event Limit Compression)



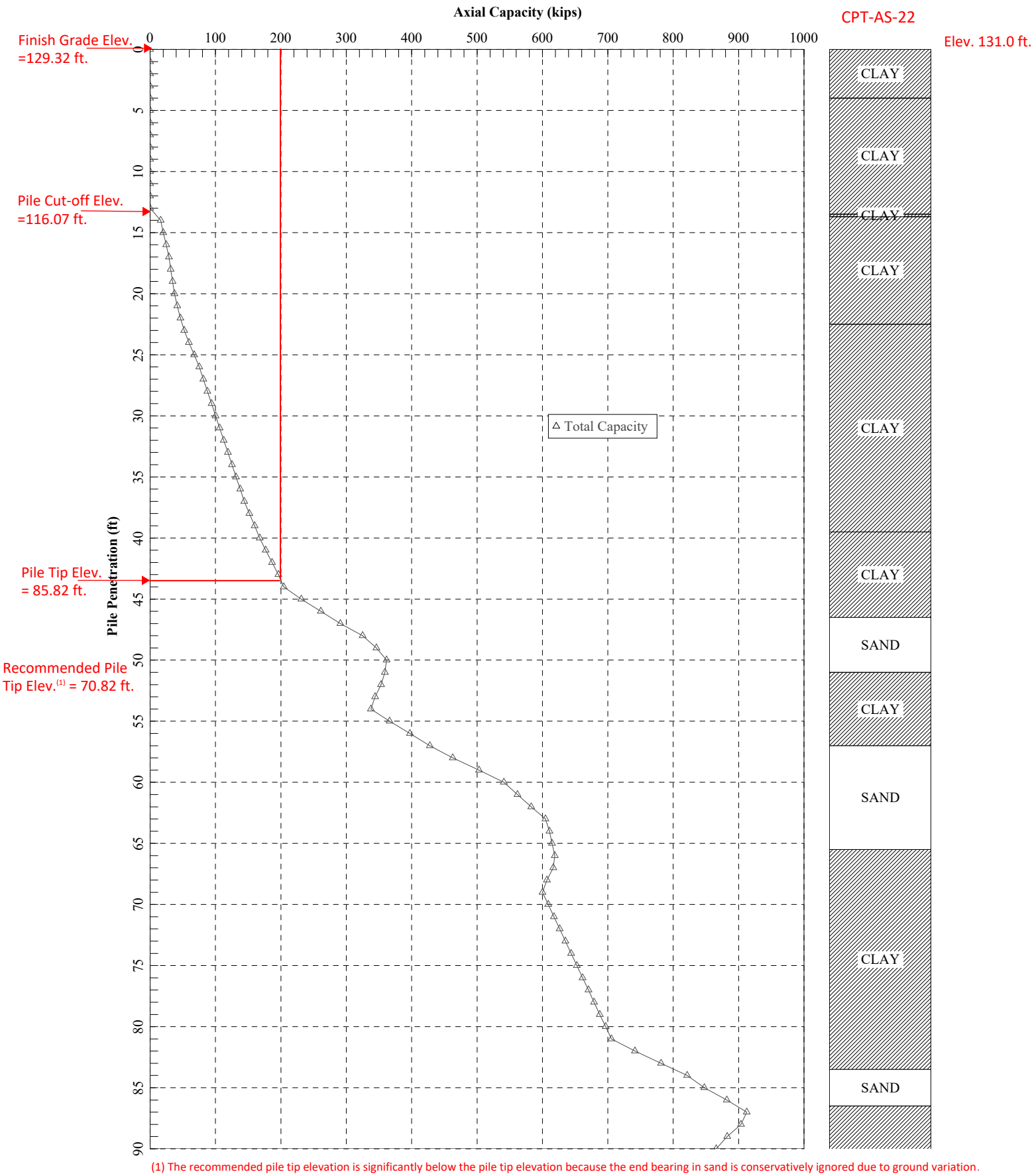
Eastridge to BART Regional Connector Project Bent 68-LT-18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

Vertical Load Demand = 200 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 68-LT - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

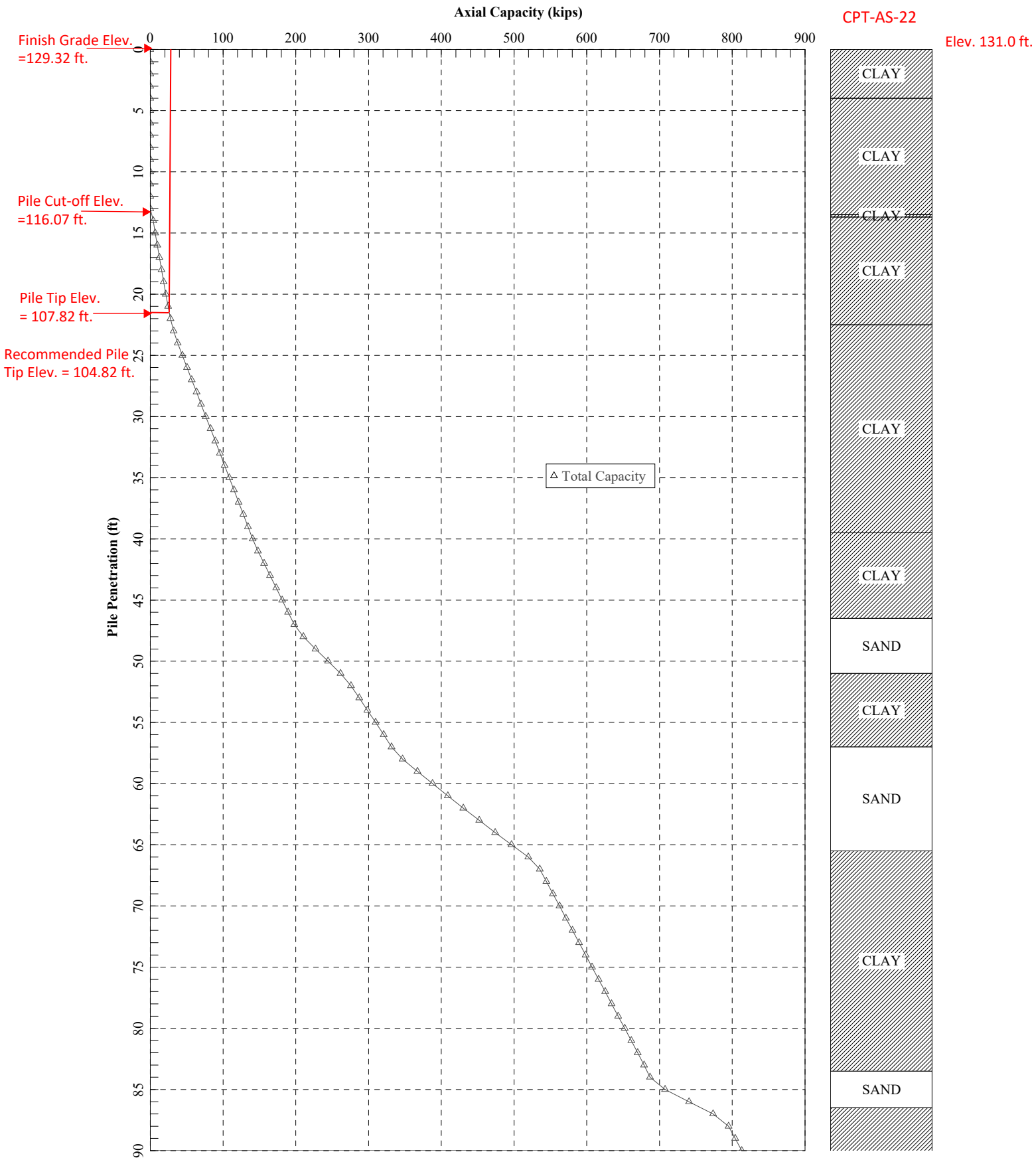
Vertical Load Demand = 200 kips (Strength Limit Compression)/0.7 = 290 kips



(1) The recommended pile tip elevation is significantly below the pile tip elevation because the end bearing in sand is conservatively ignored due to ground variation.

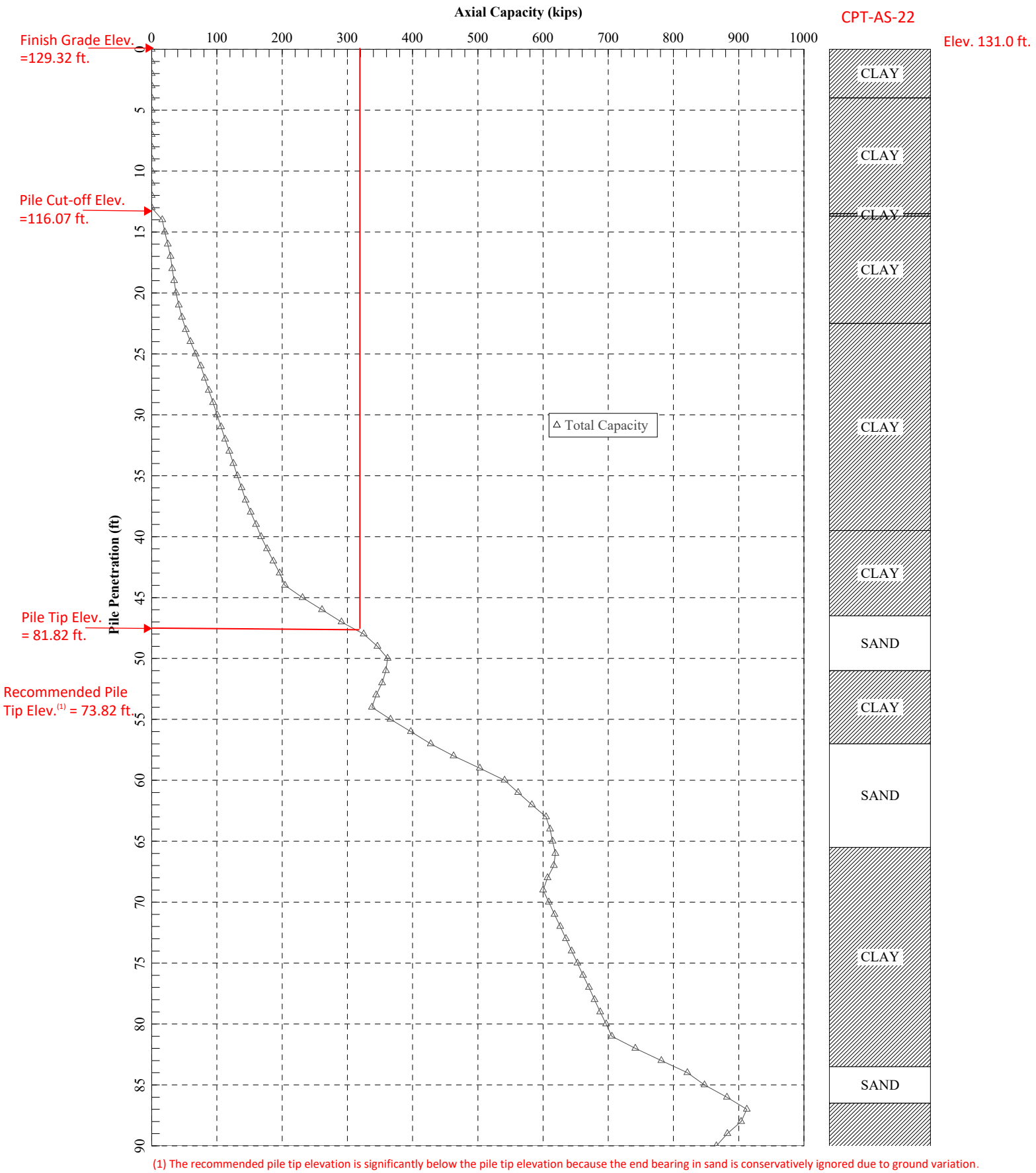
Eastridge to BART Regional Connector Project Bent 68-RT - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 20 kips (Strength Limit Tension)/0.7 = 30 kips



Eastridge to BART Regional Connector Project Bent 68-RT - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

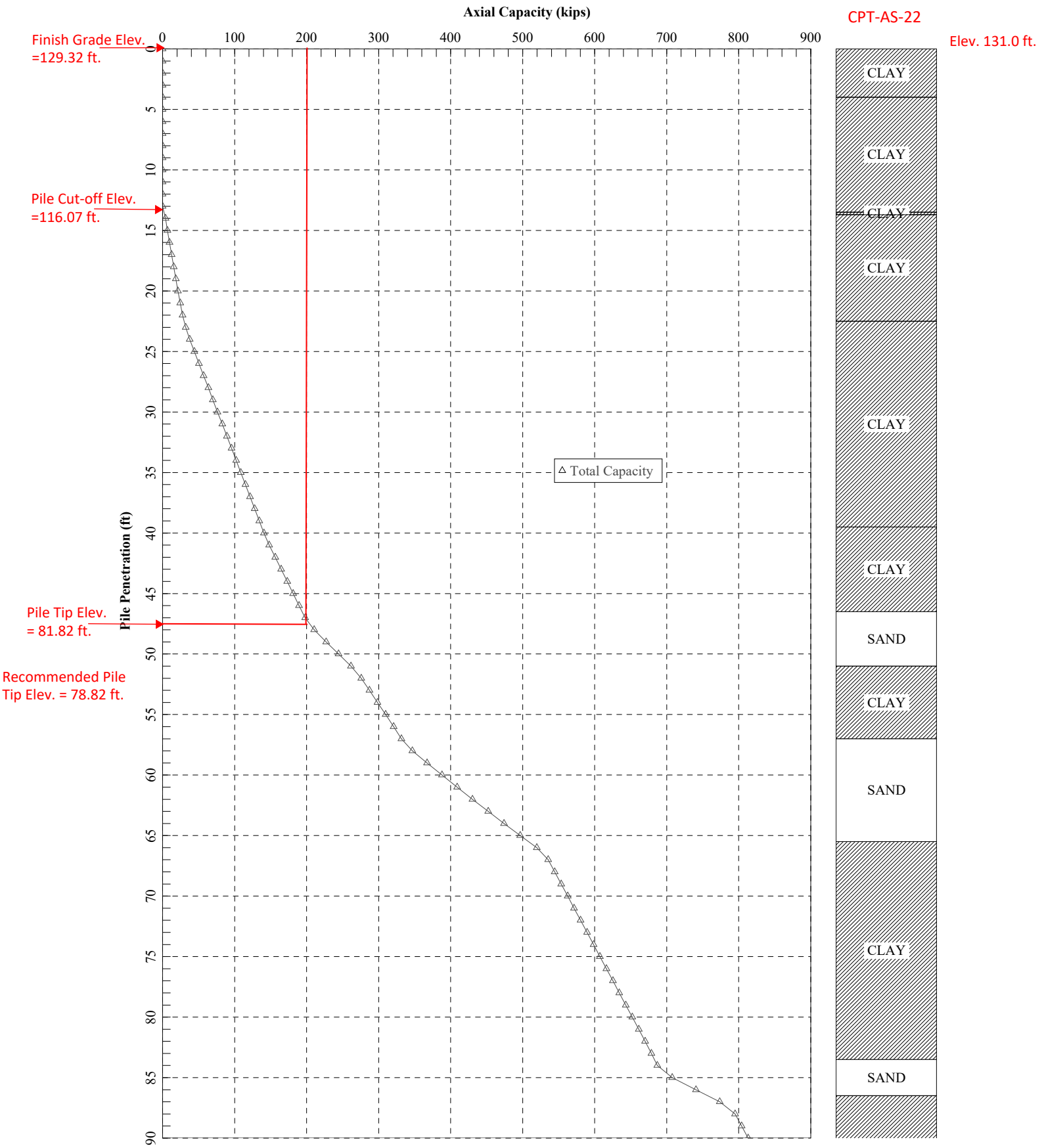
Vertical Load Demand = 320 kips (Extreme Event Limit Compression)



(1) The recommended pile tip elevation is significantly below the pile tip elevation because the end bearing in sand is conservatively ignored due to ground variation.

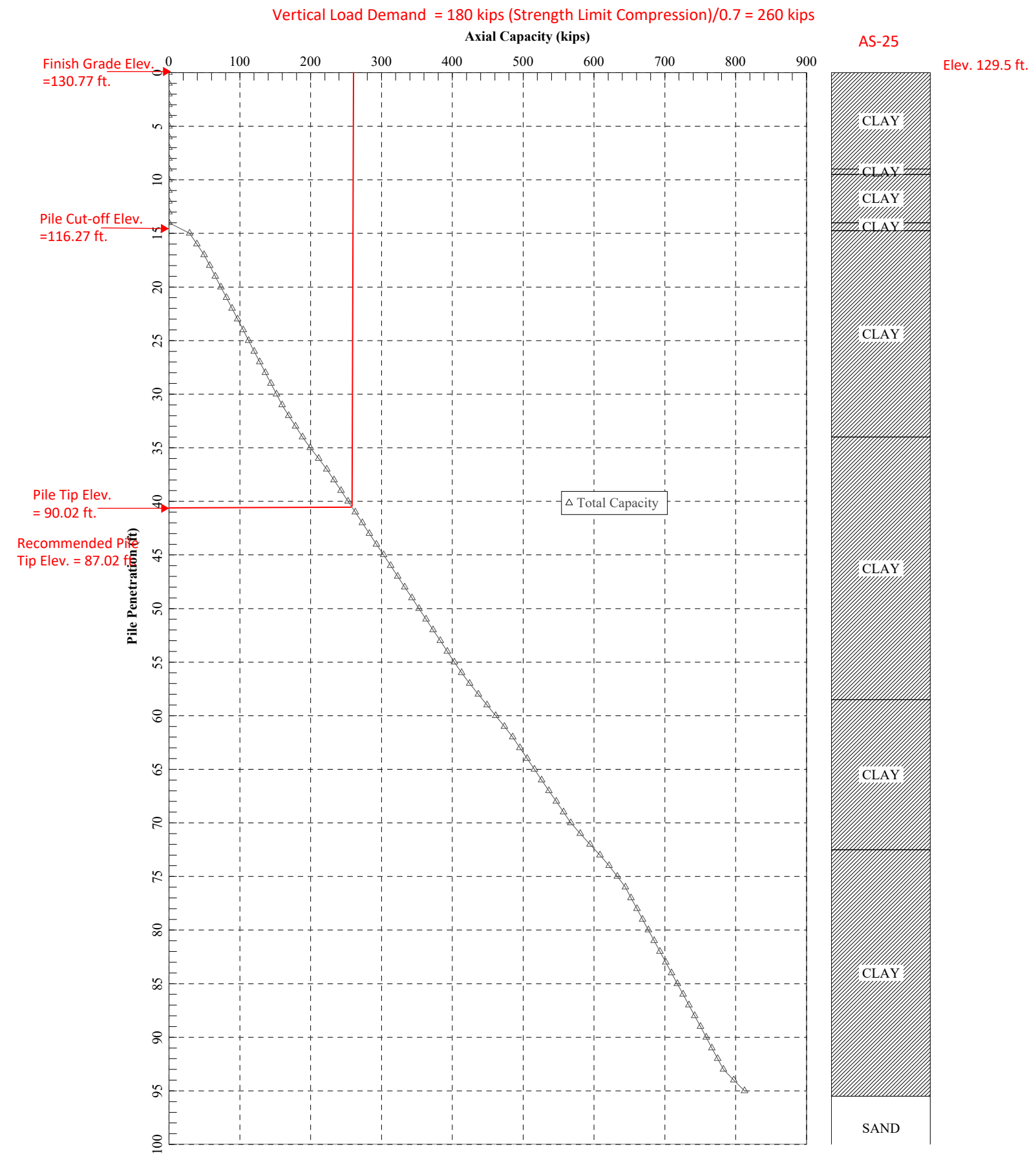
Eastridge to BART Regional Connector Project Bent 68-RT-18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

Vertical Load Demand = 200 kips (Extreme Event Limit Tension)



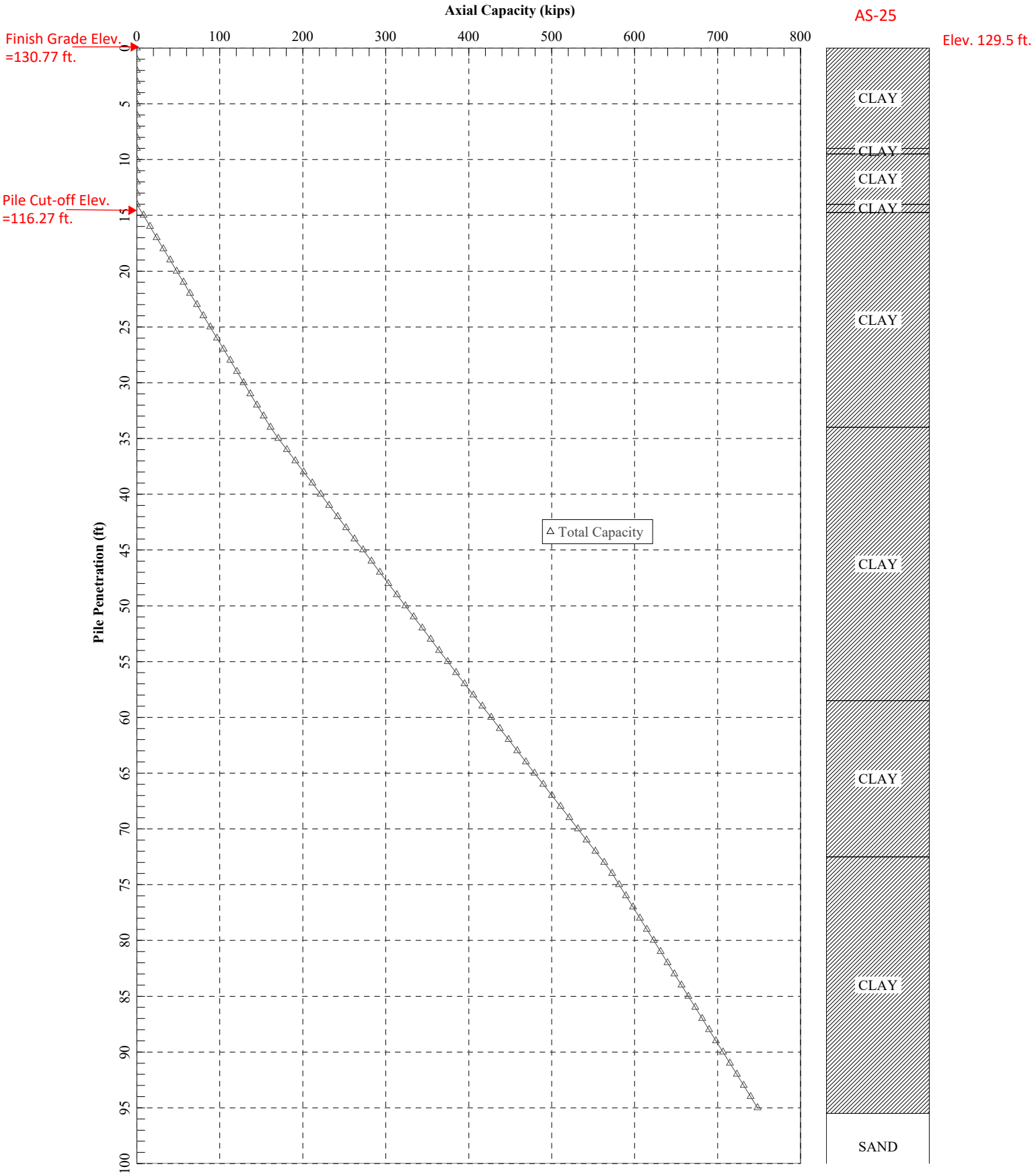
Eastridge to BART Regional Connector Project Bent 68-RT - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

AERIAL GUIDEWAY – BENT 69 (18-INCH SQUARE PRECAST CONCRETE PILE)

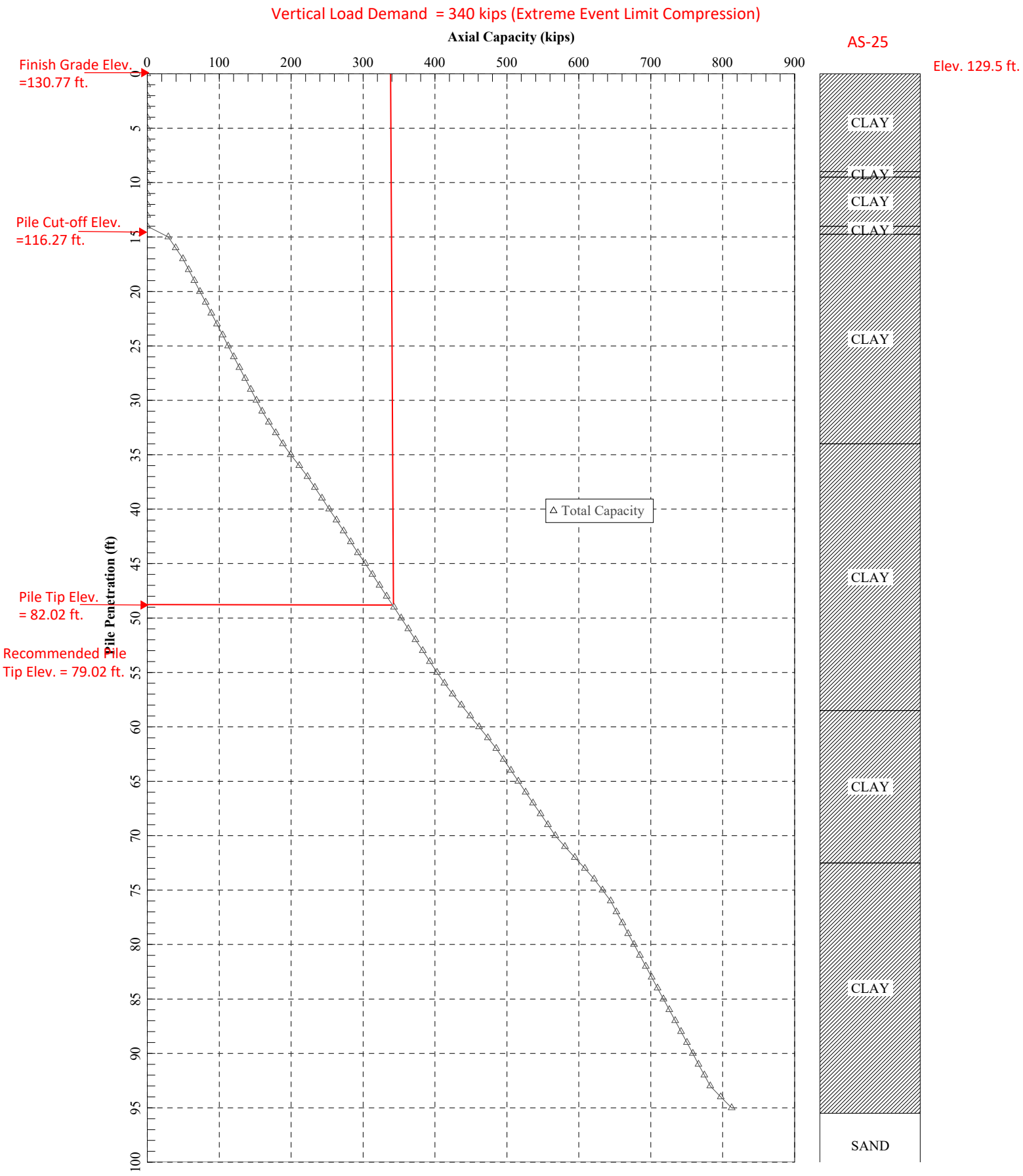


Eastridge to BART Regional Connector Project Bent 69-LT - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 0 kip (Strength Limit Tension)/0.7 = 0 kip

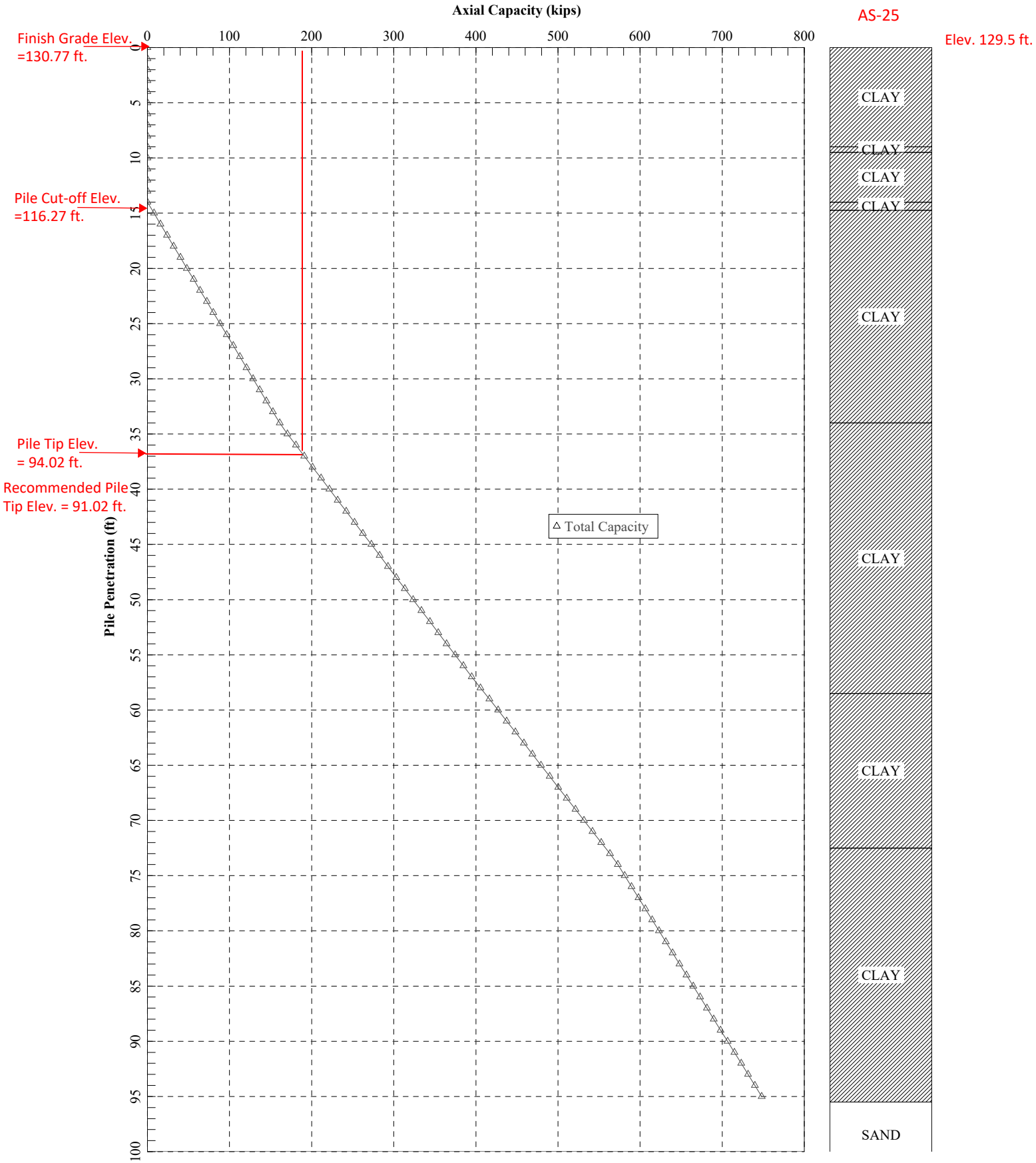


Eastridge to BART Regional Connector Project Bent 69-LT - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)



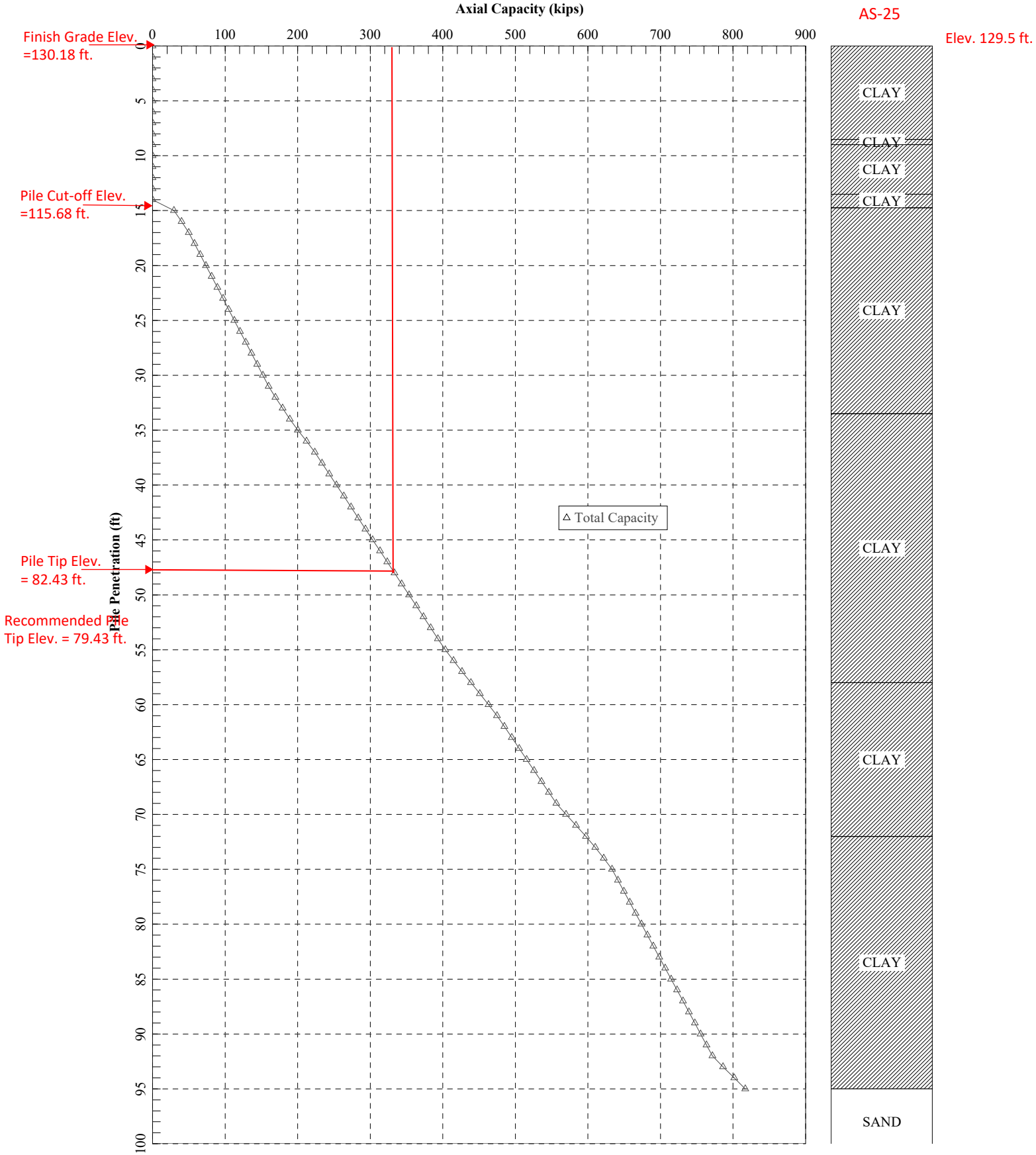
Eastridge to BART Regional Connector Project Bent 69-LT-18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

Vertical Load Demand = 190 kips (Extreme Event Limit Tension)



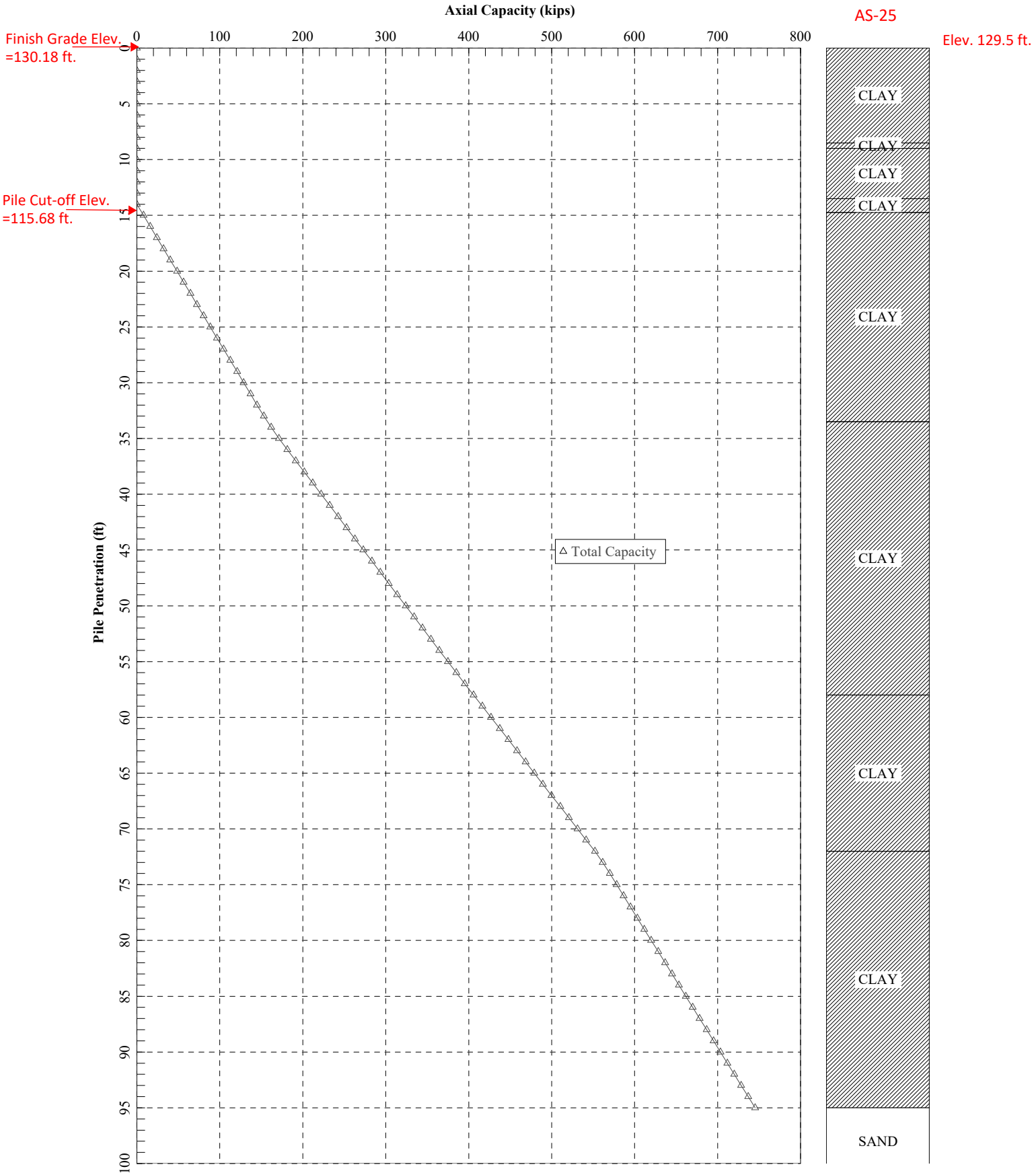
Eastridge to BART Regional Connector Project Bent 69-LT - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

Vertical Load Demand = 230 kips (Strength Limit Compression)/0.7 = 330 kips



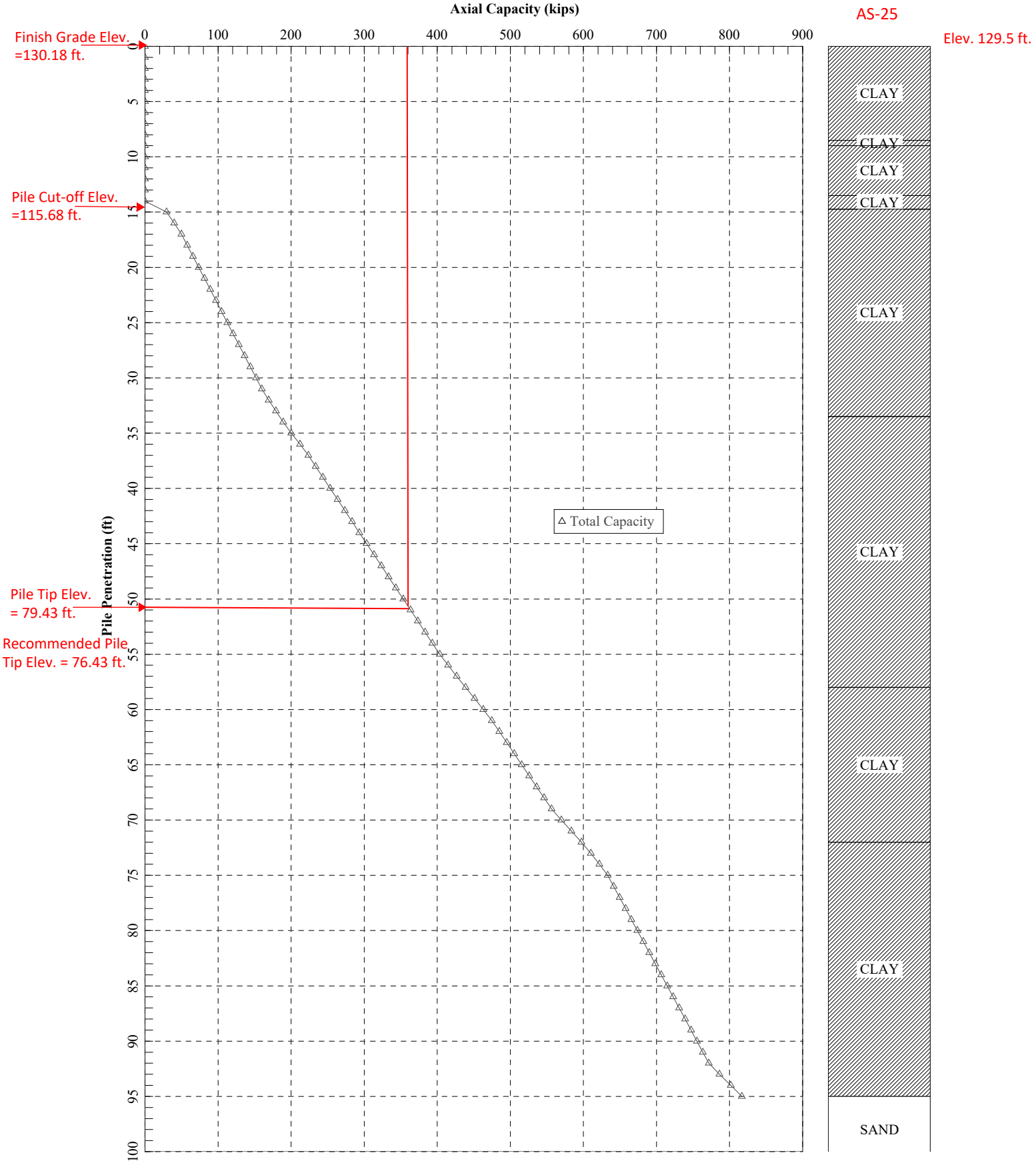
Eastridge to BART Regional Connector Project Bent 69-RT - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 0 kip (Strength Limit Tension)/0.7 = 0 kip



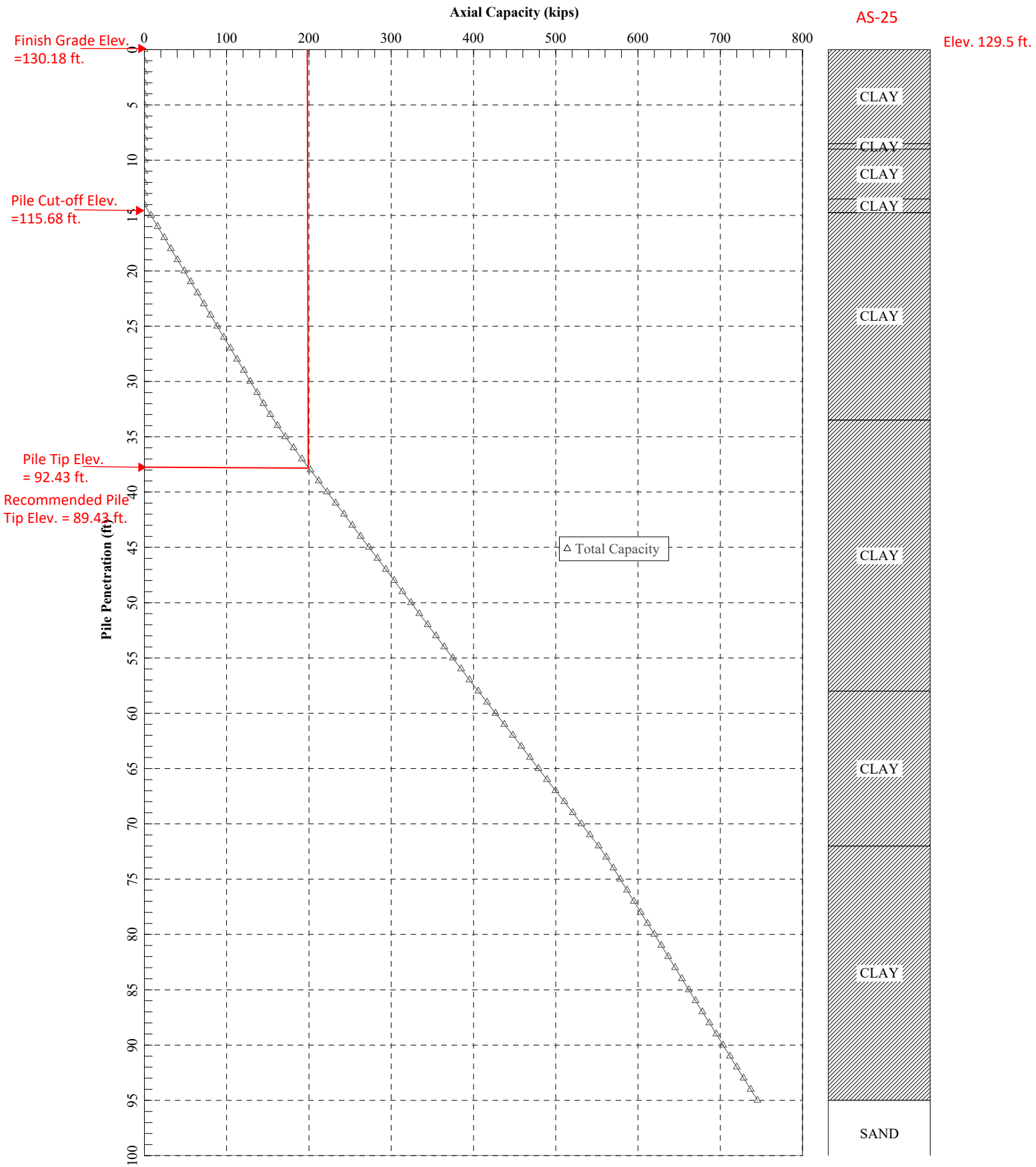
Eastridge to BART Regional Connector Project Bent 69-RT - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 360 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project Bent 69-RT-18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

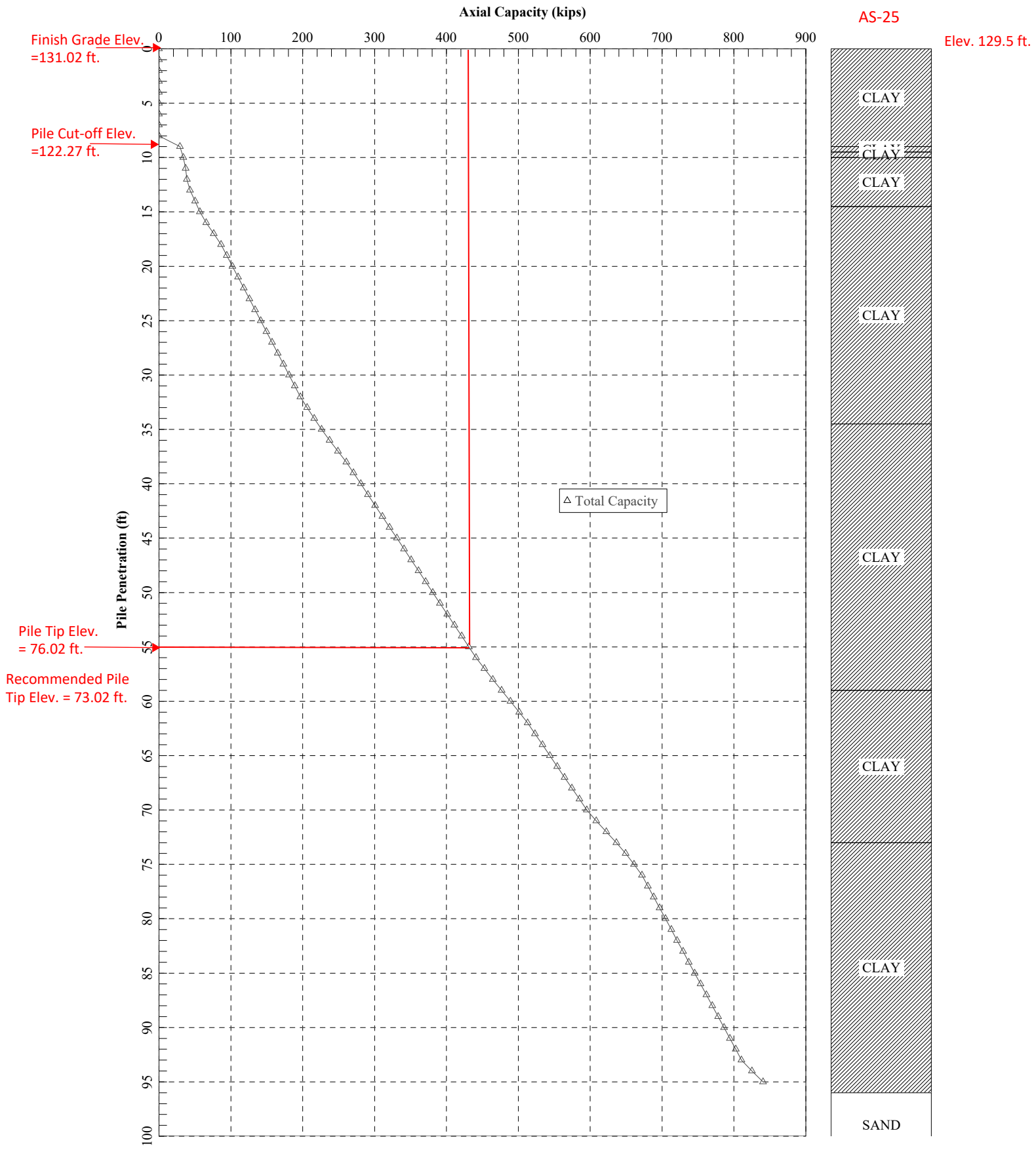
Vertical Load Demand = 200 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 69-RT - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

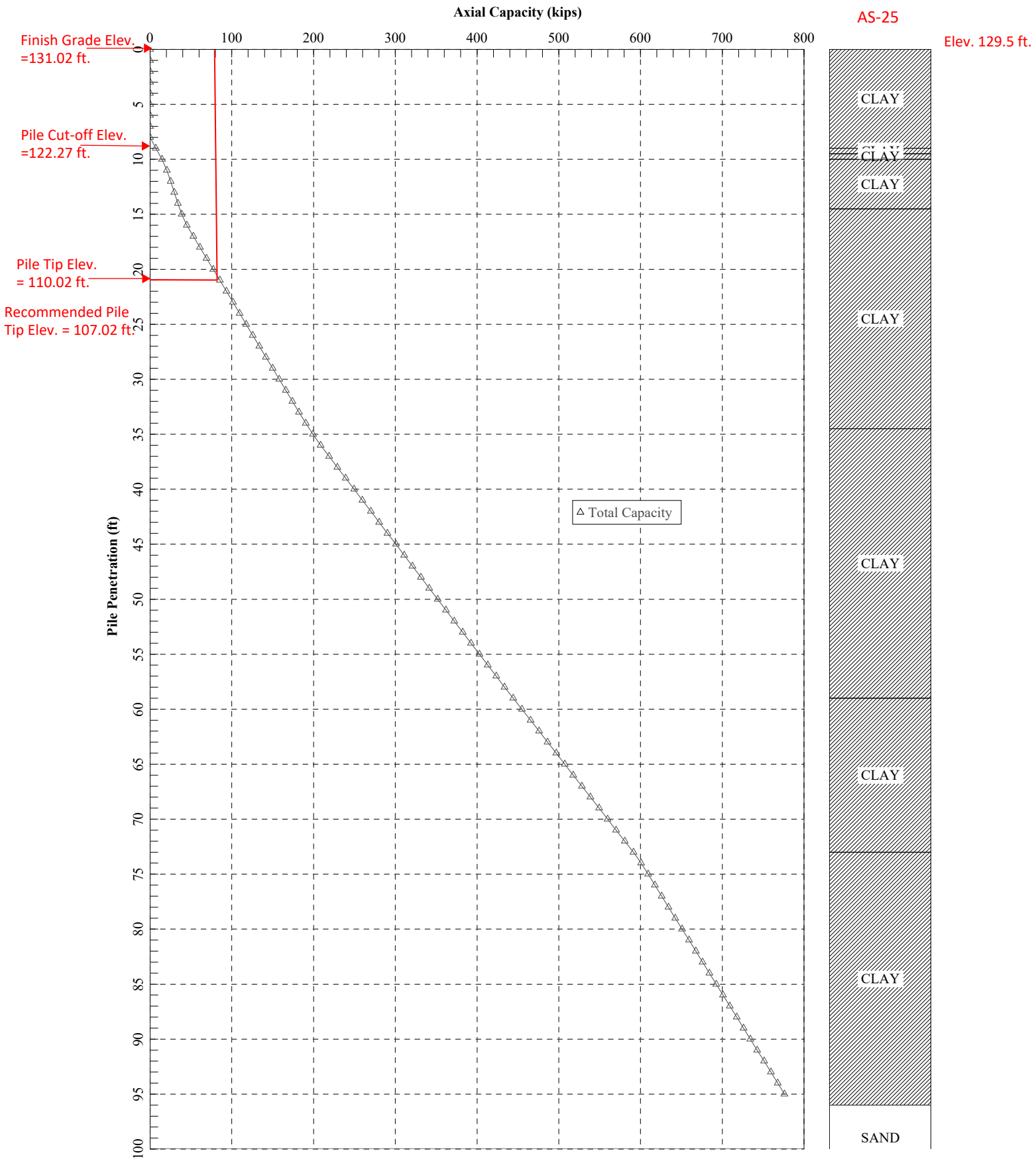
AERIAL GUIDEWAY – BENT 70 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 300 kips (Strength Limit Compression)/0.7 = 430 kips



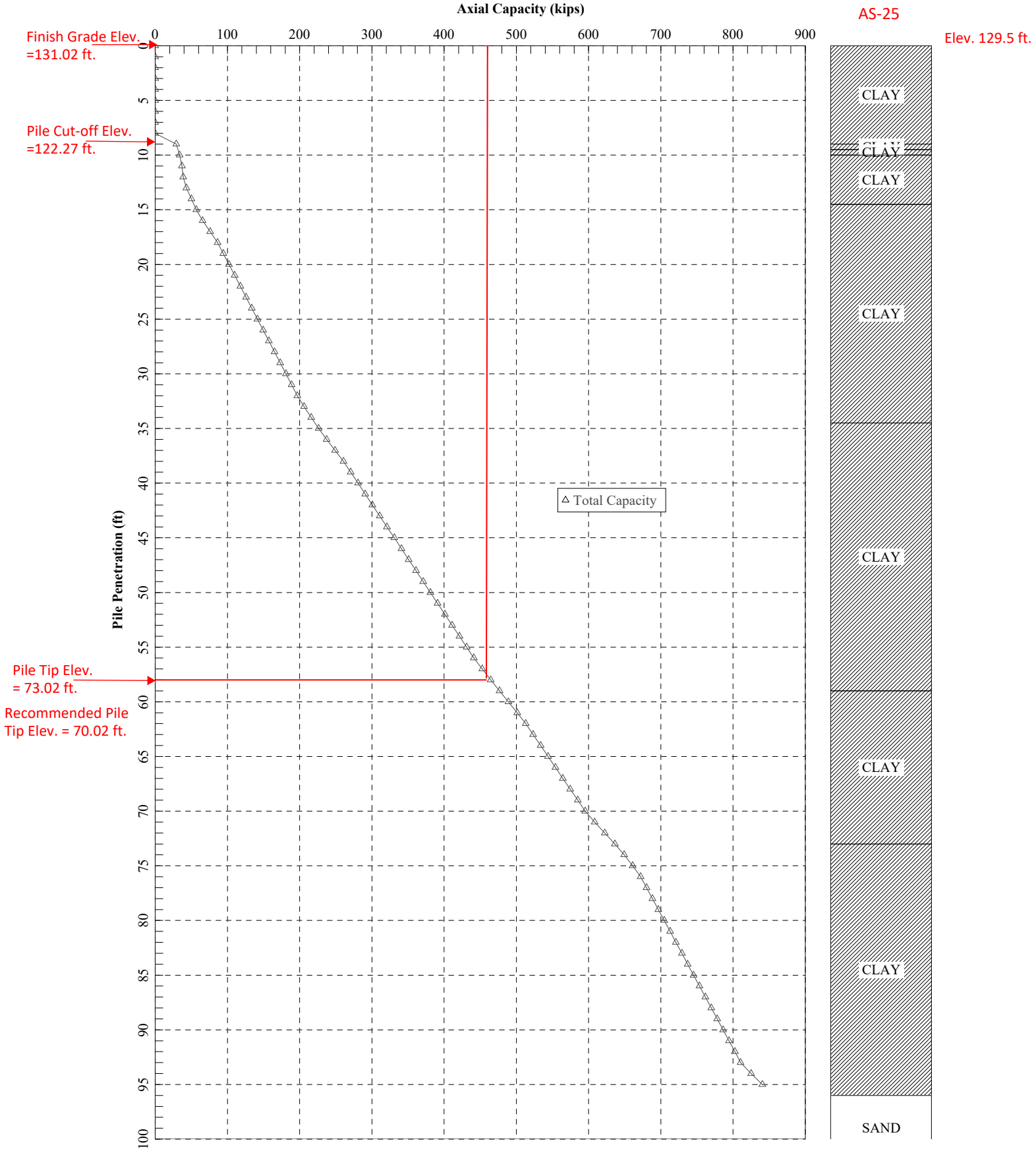
Eastridge to BART Regional Connector Project Bent 70 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 50 kips (Strength Limit Tension)/0.7 = 80 kips



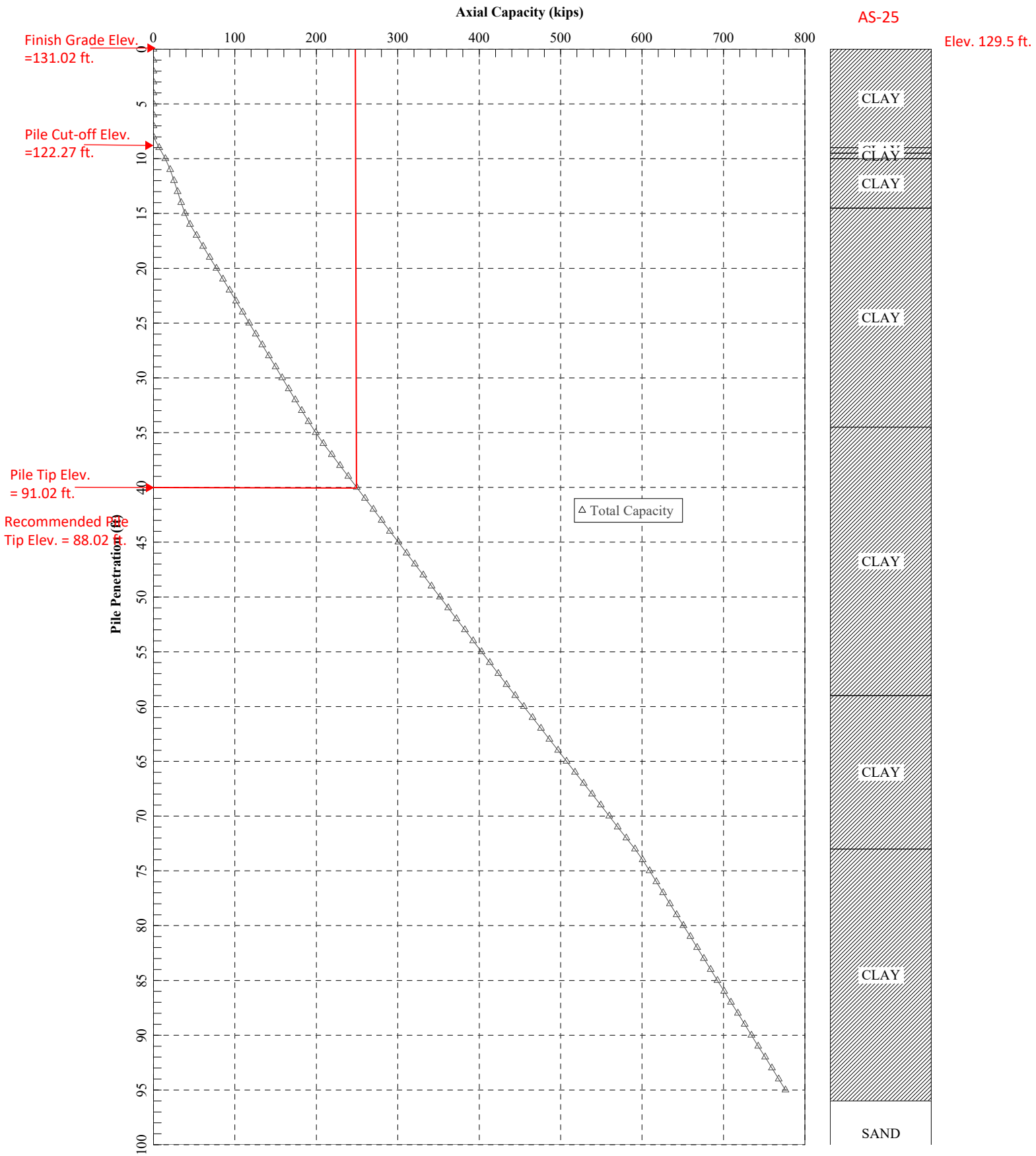
Eastridge to BART Regional Connector Project Bent 70 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 460 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project Bent 70-18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

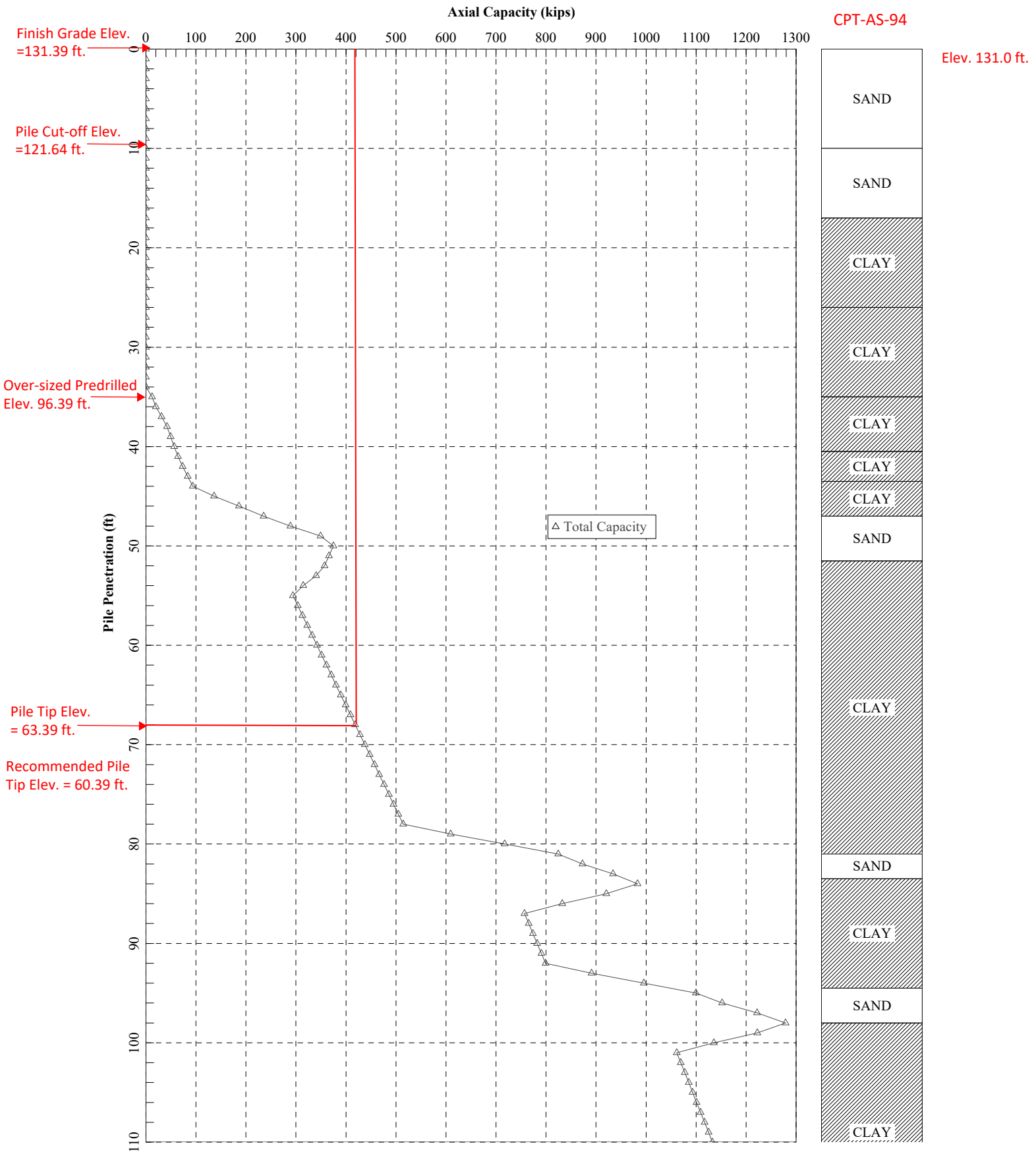
Vertical Load Demand = 250 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 70 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

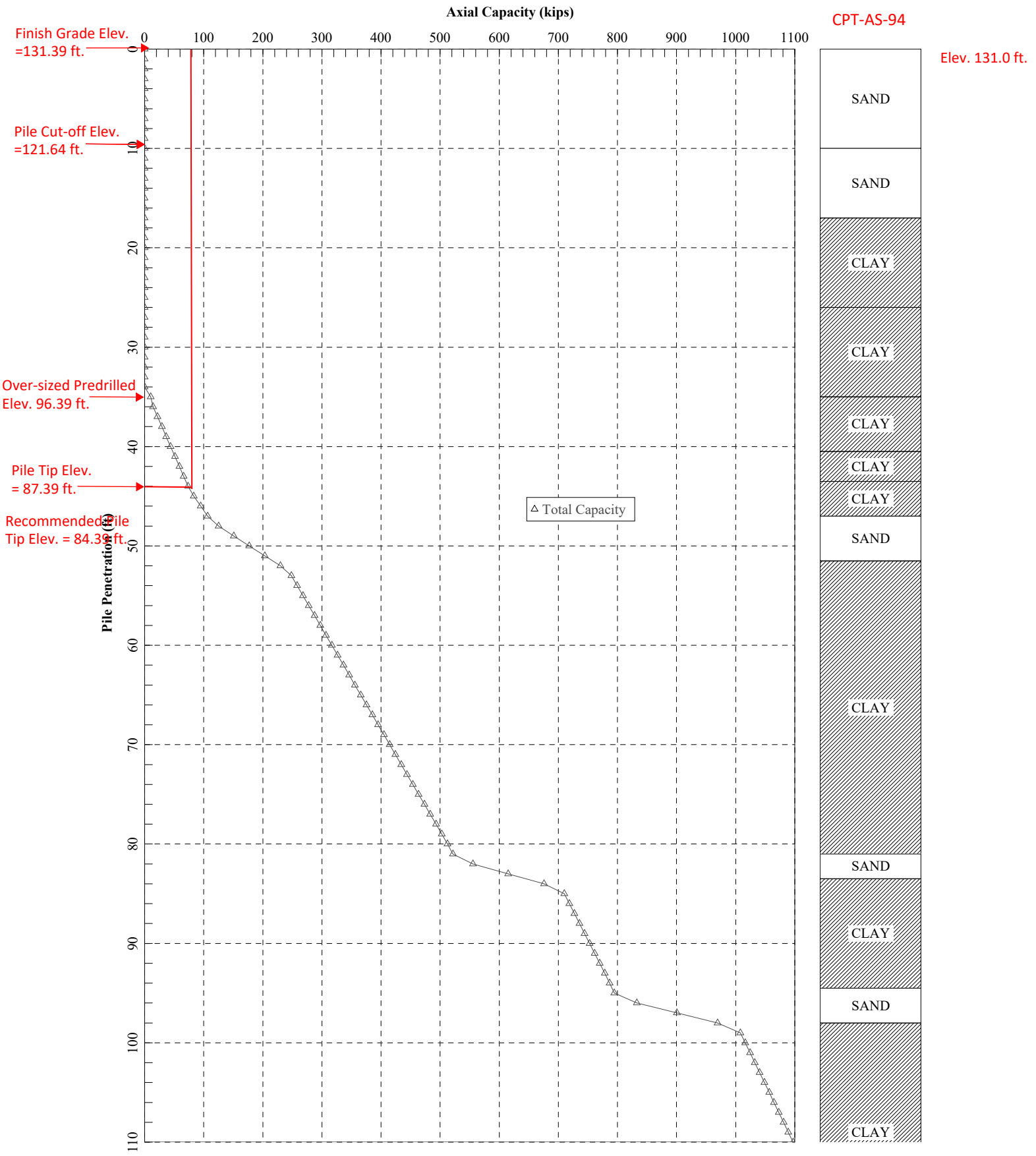
AERIAL GUIDEWAY – BENT 71 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 290 kips (Strength Limit Compression)/0.7 = 420 kips



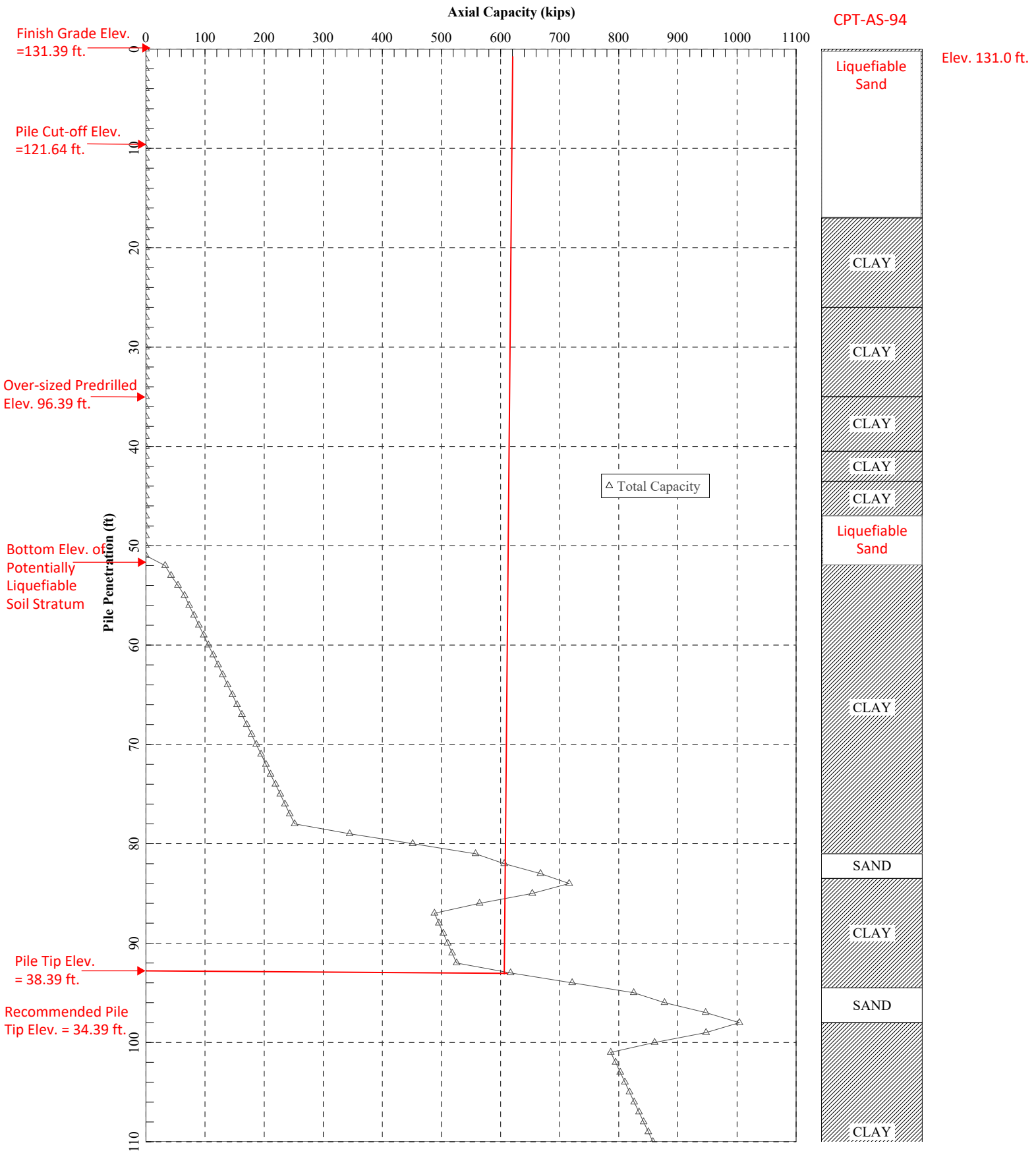
Eastridge to BART Regional Connector Project Bent 71 - 18-Inch Square Precast Concrete Pile (25' Predrilled) Strength Limit State (Compression)

Vertical Load Demand = 50 kips (Strength Limit Tension)/0.7 = 80 kips

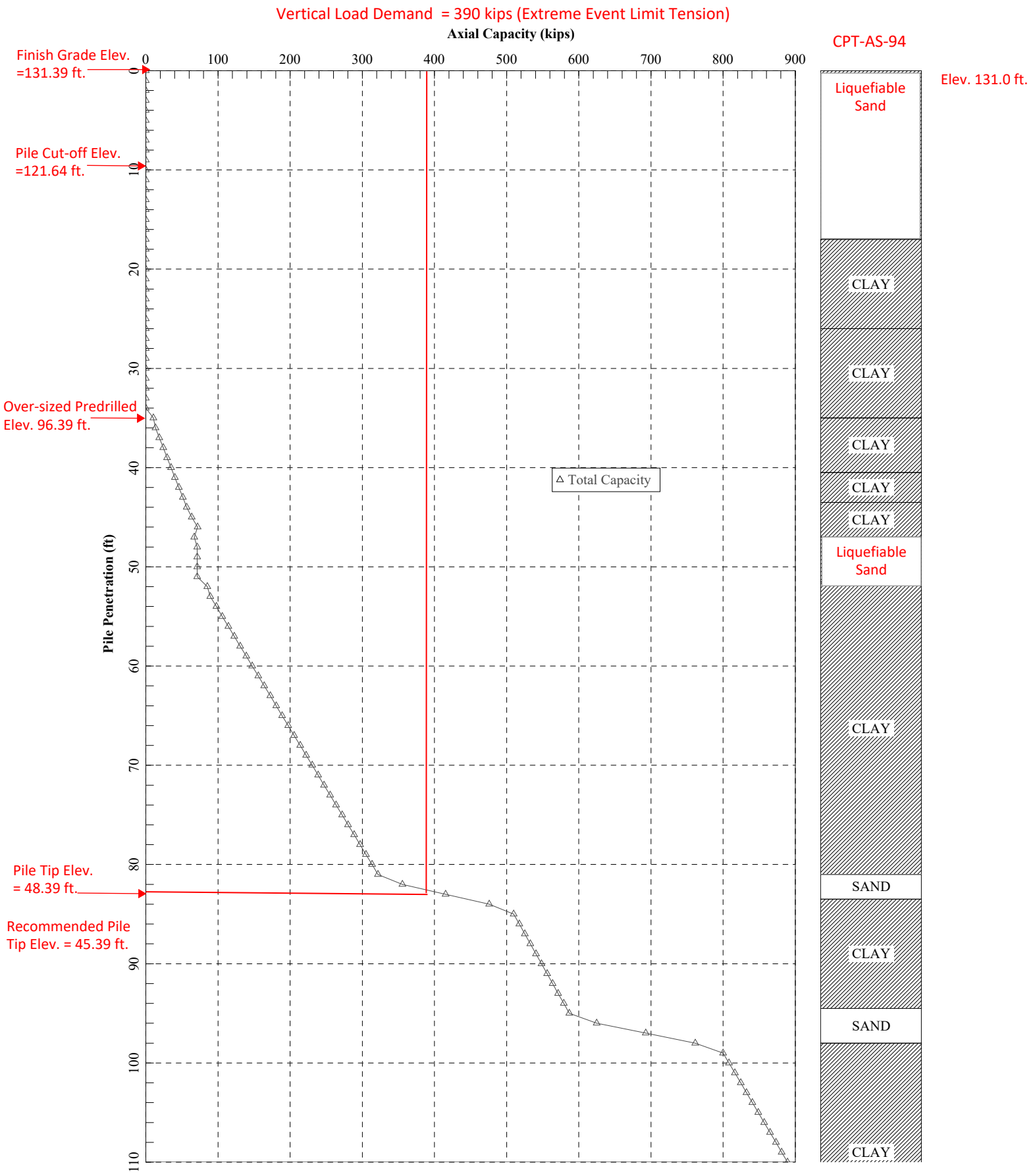


Eastridge to BART Regional Connector Project Bent 71 - 18-Inch Square Precast Concrete Pile (25' Predrilled) Strength Limit State (Tension)

Vertical Load Demand = 32 kips (Downdrag) + 580 kips (Extreme Event Limit Compression) = 620 kips



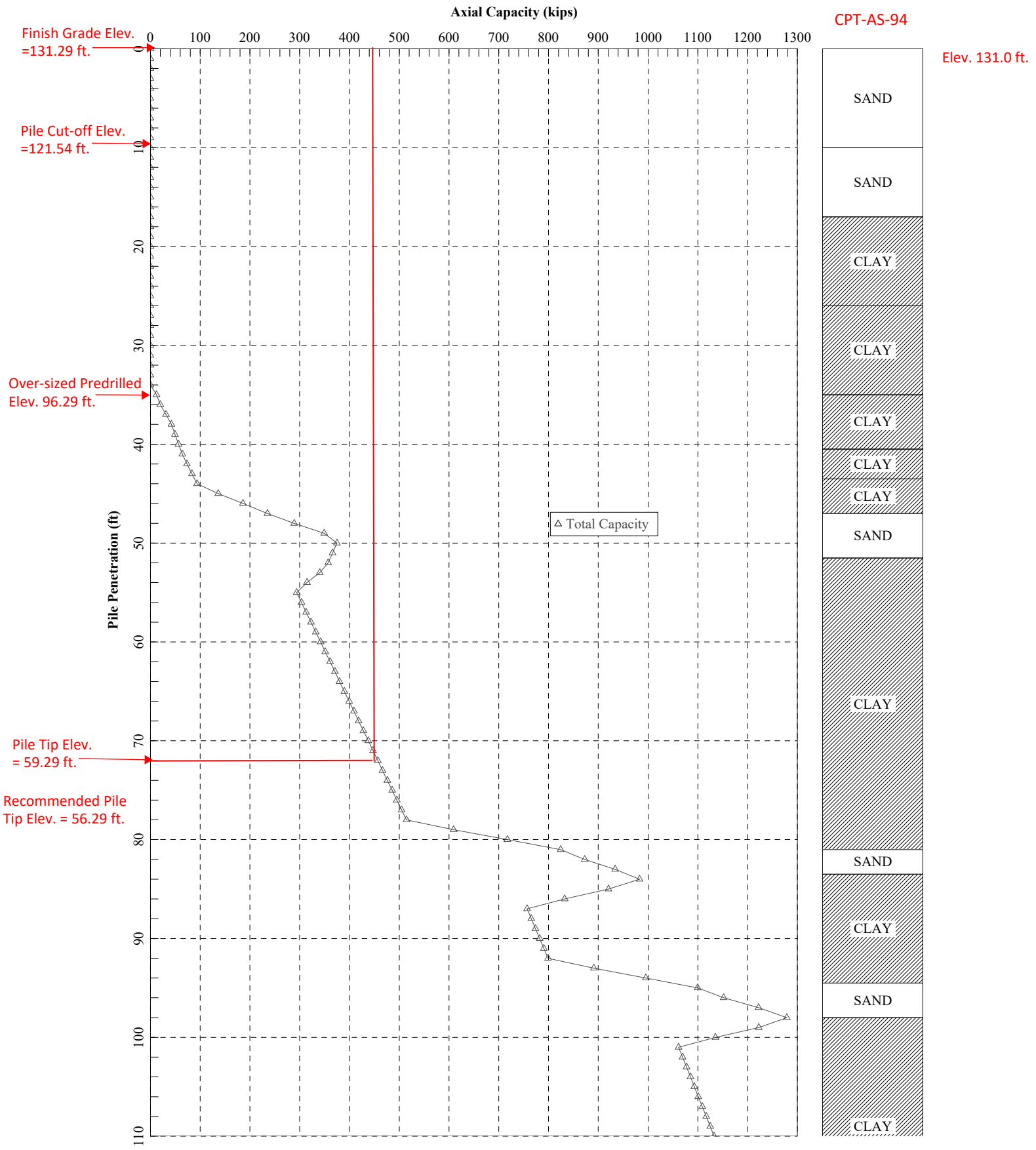
Eastridge to BART Regional Connector Project Bent 71 - 18-Inch Square Precast Concrete Pile (25' Predrilled) Extreme Event Limit State (Compression)



Eastridge to BART Regional Connector Project Bent 71 - 18-Inch Square Precast Concrete Pile (25' Predrilled) Extreme Event Limit State (Tension)

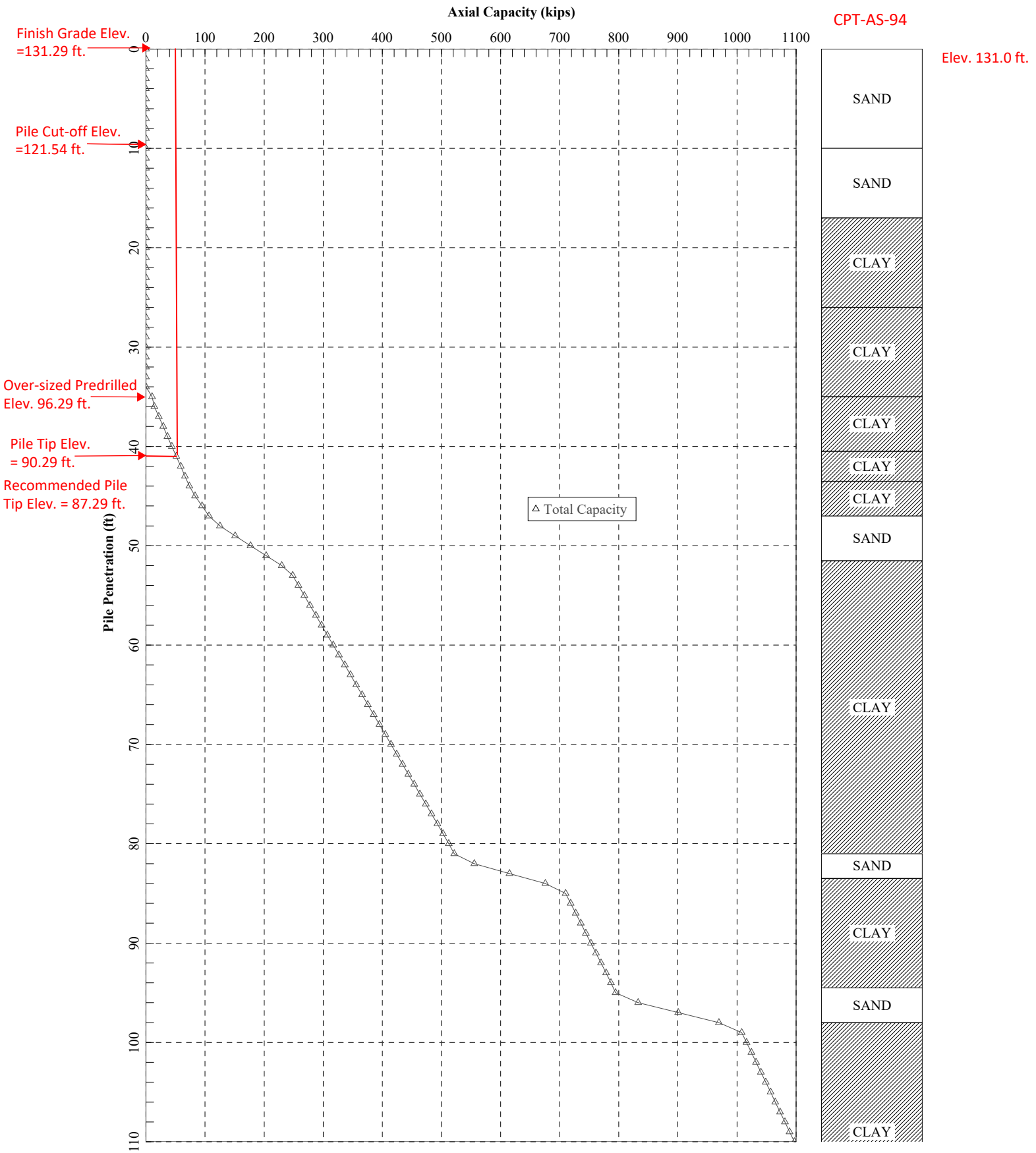
AERIAL GUIDEWAY – BENT 72 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 310 kips (Strength Limit Compression)/0.7 = 450 kips



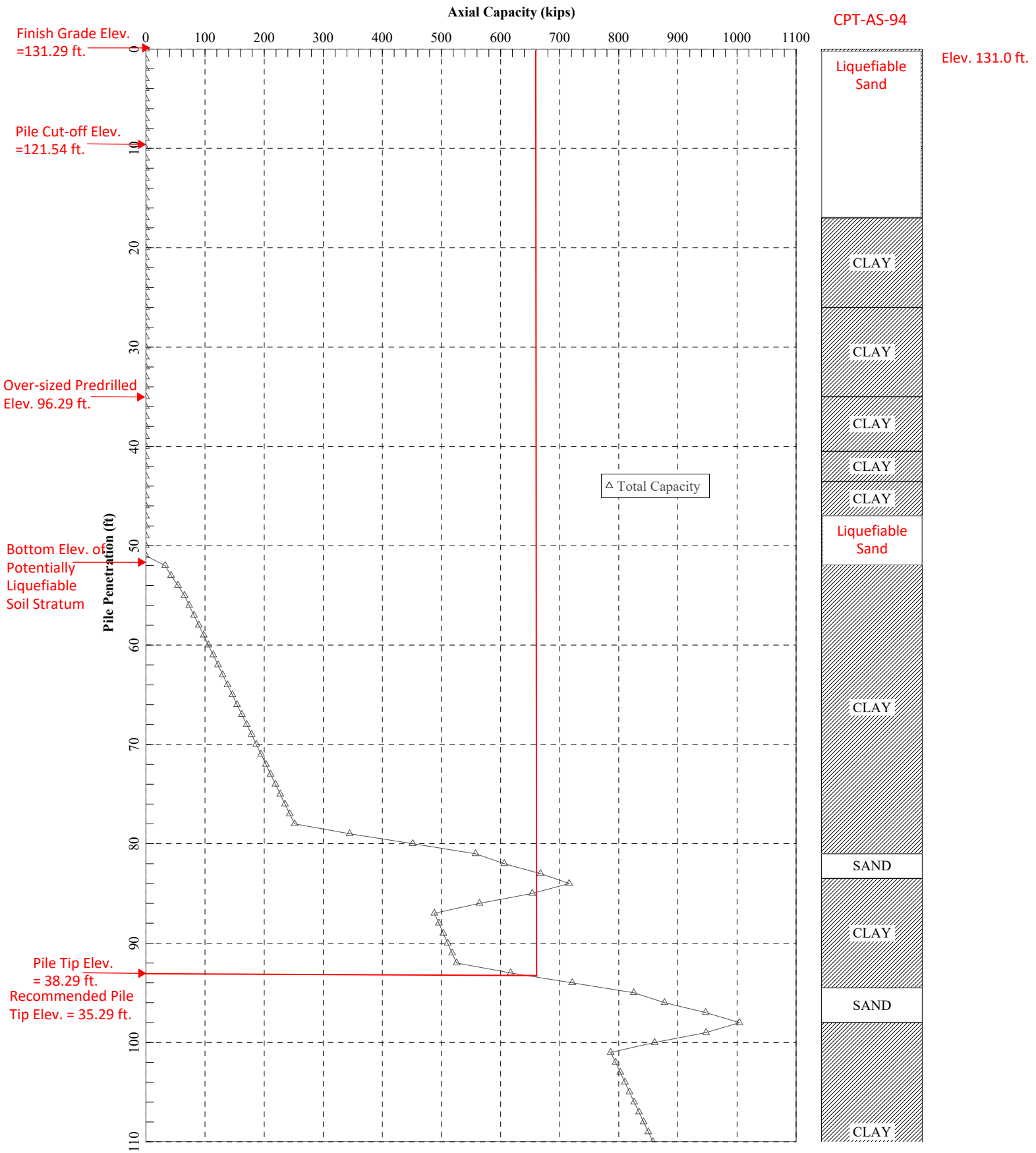
Eastridge to BART Regional Connector Project Bent 72 - 18-Inch Square Precast Concrete Pile (25' Predrilled) Strength Limit State (Compression)

Vertical Load Demand = 30 kips (Strength Limit Tension)/0.7 = 50 kips

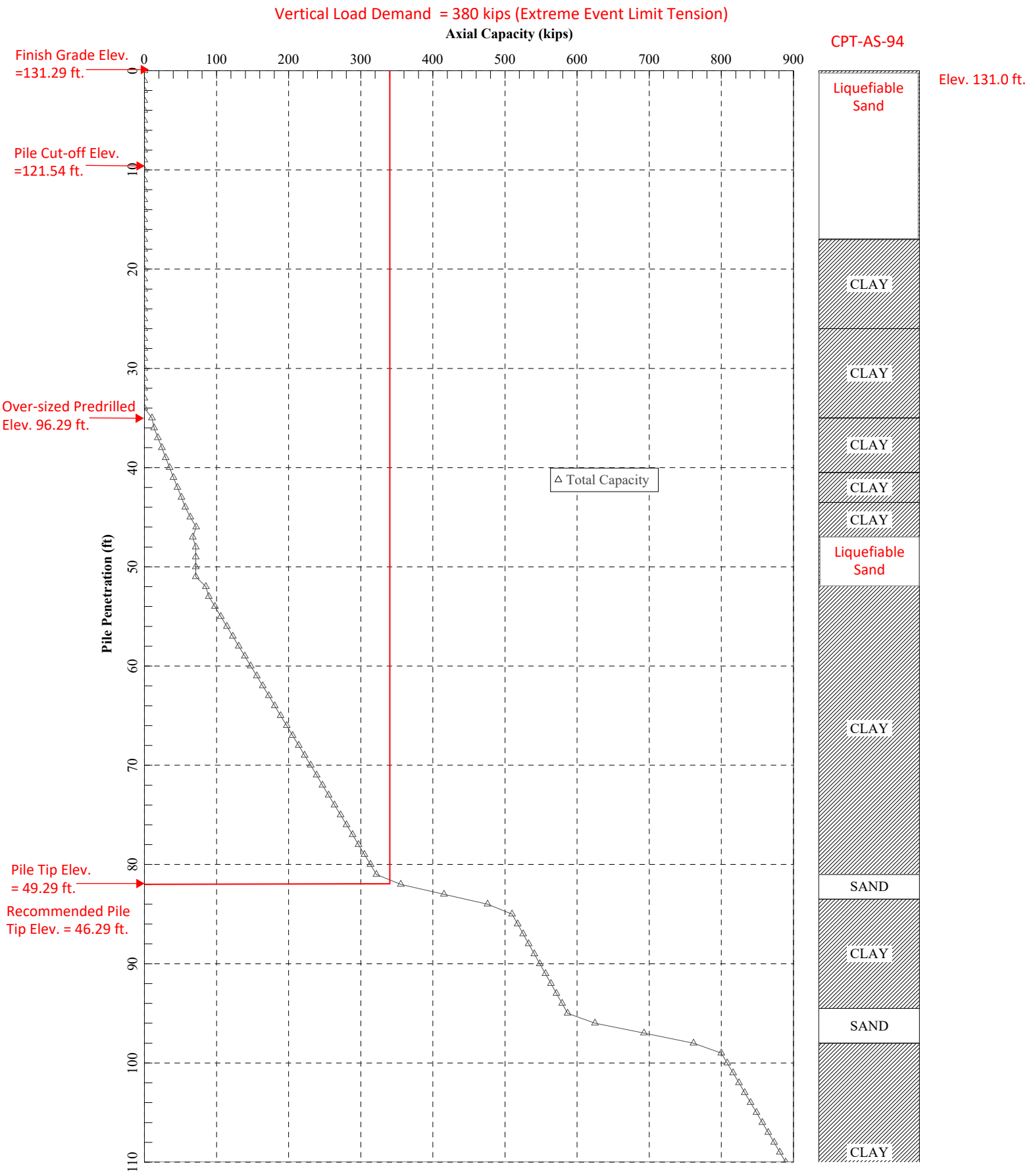


Eastridge to BART Regional Connector Project Bent 72 - 18-Inch Square Precast Concrete Pile (25' Predrilled) Strength Limit State (Tension)

Vertical Load Demand = 32 kips (Downdrag) + 620 kips (Extreme Event Limit Compression) = 660 kips



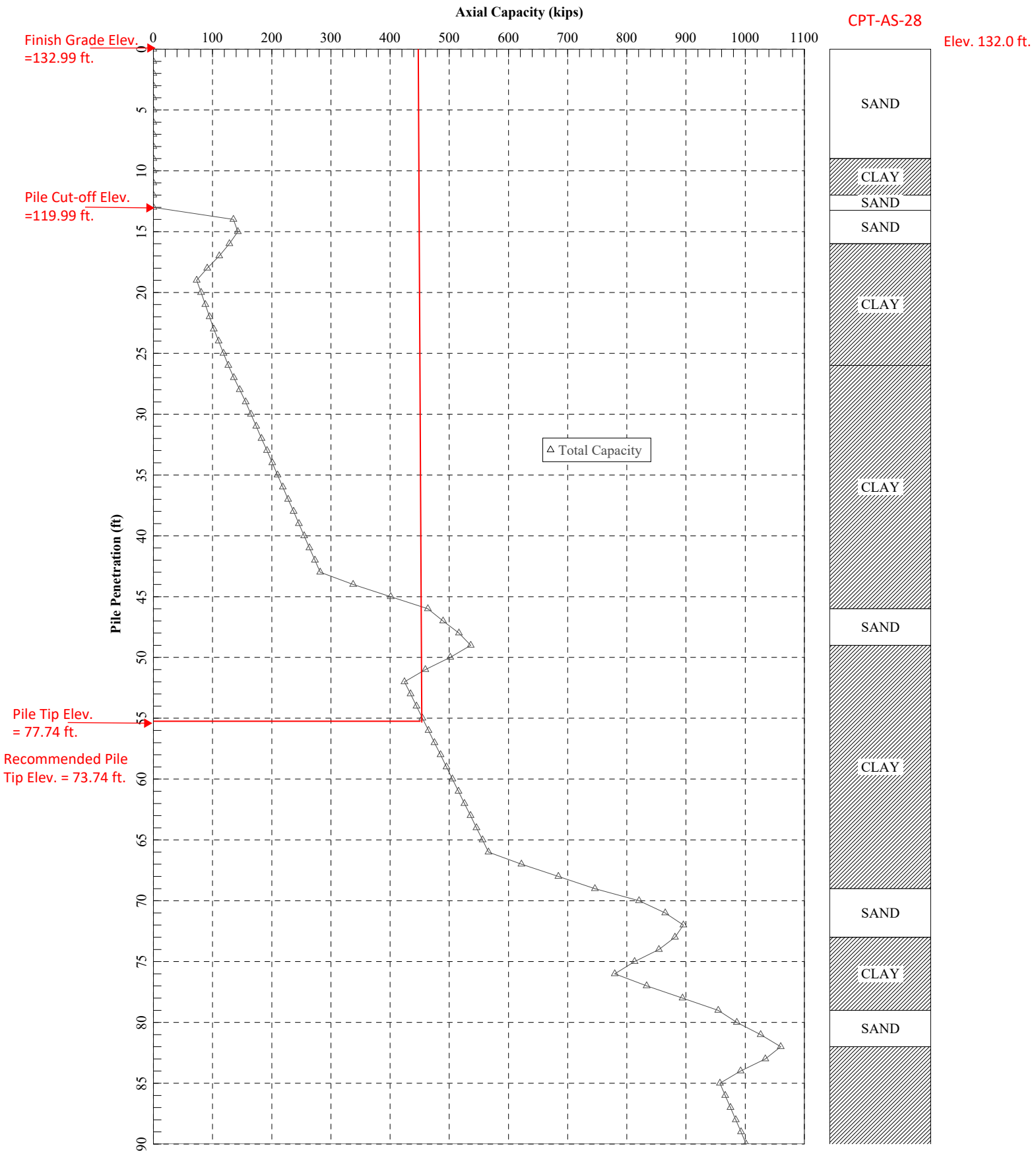
Eastridge to BART Regional Connector Project Bent 72 - 18-Inch Square Precast Concrete Pile (25' Predrilled) Extreme Event Limit State (Compression)



Eastridge to BART Regional Connector Project Bent 72 - 18-Inch Square Precast Concrete Pile (25' Predrilled) Extreme Event Limit State (Tension)

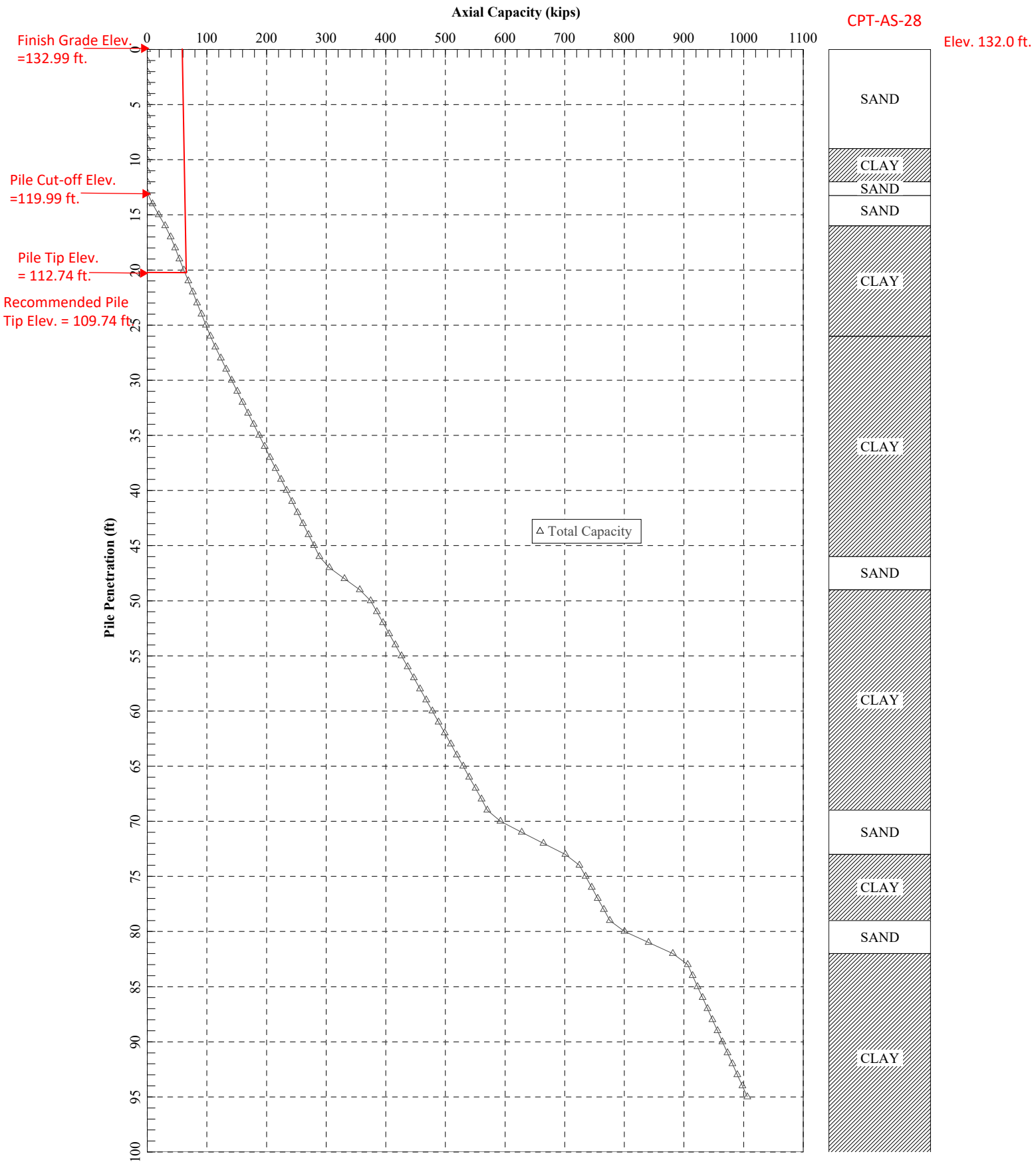
AERIAL GUIDEWAY – BENT 73 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 310 kips (Strength Limit Compression)/0.7 = 450 kips



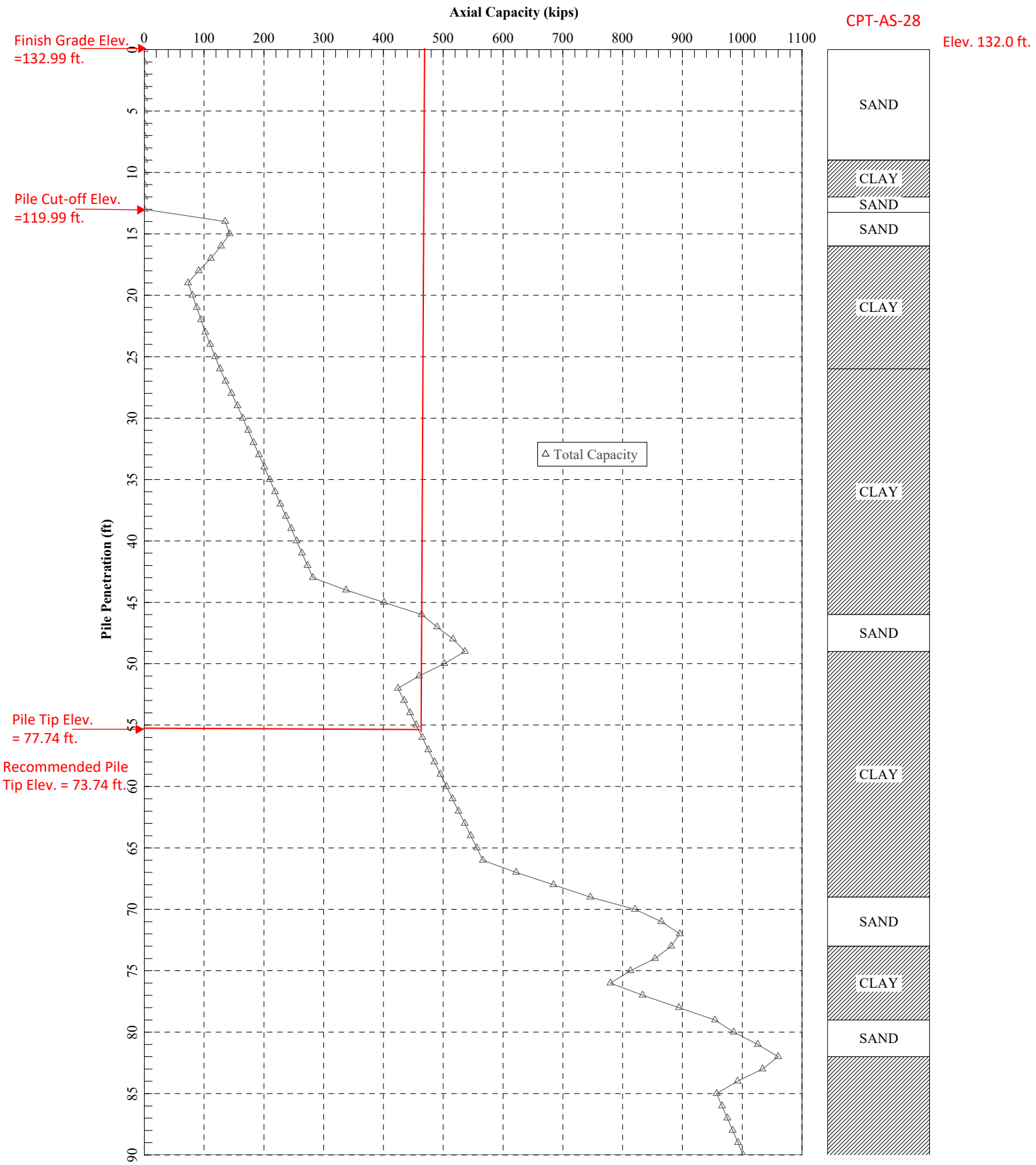
Eastridge to BART Regional Connector Project Bent 73 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 40 kips (Strength Limit Tension)/0.7 = 60 kips



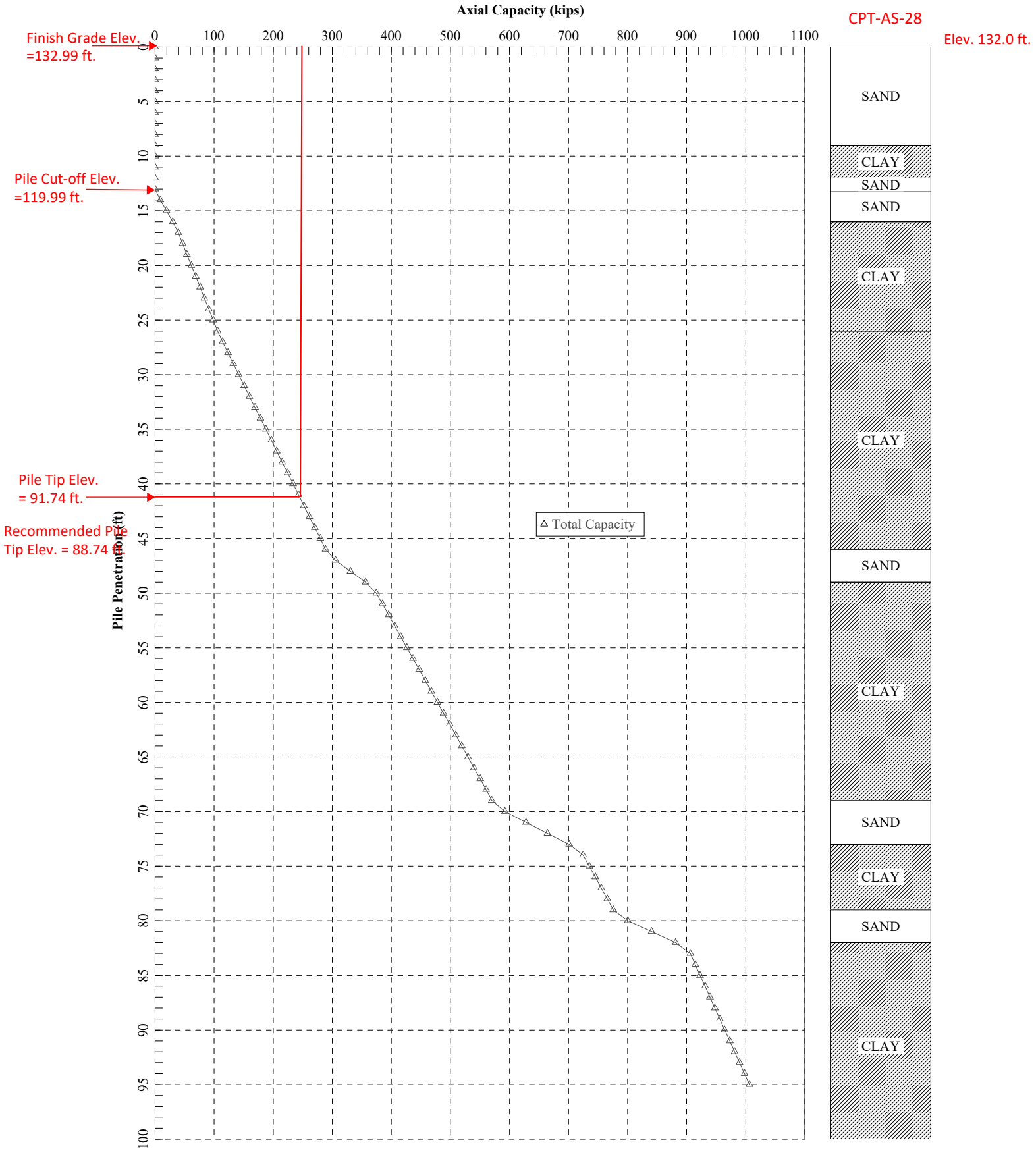
Eastridge to BART Regional Connector Project Bent 73 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 470 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project Bent 73-18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

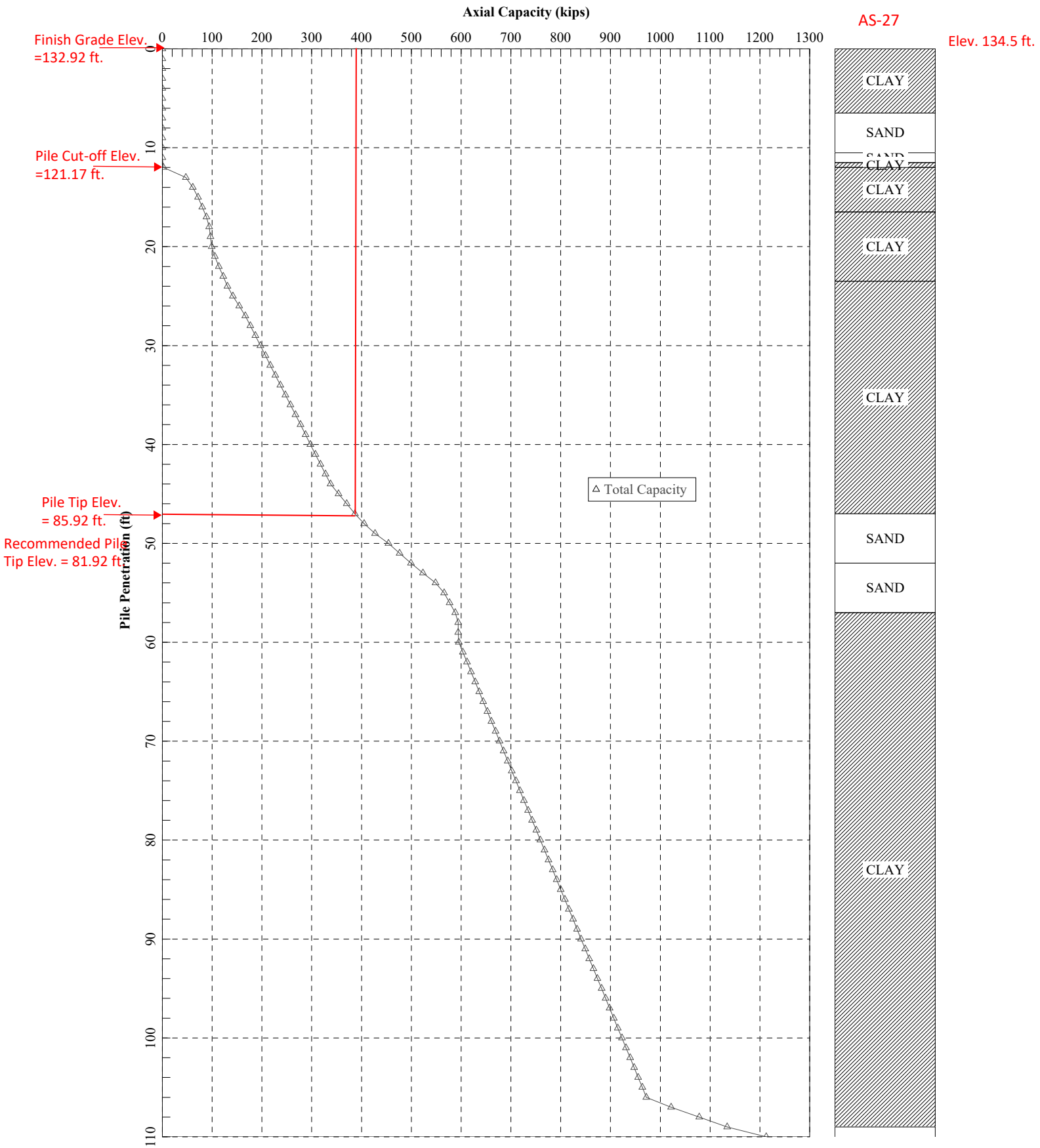
Vertical Load Demand = 250 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Bent 73 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

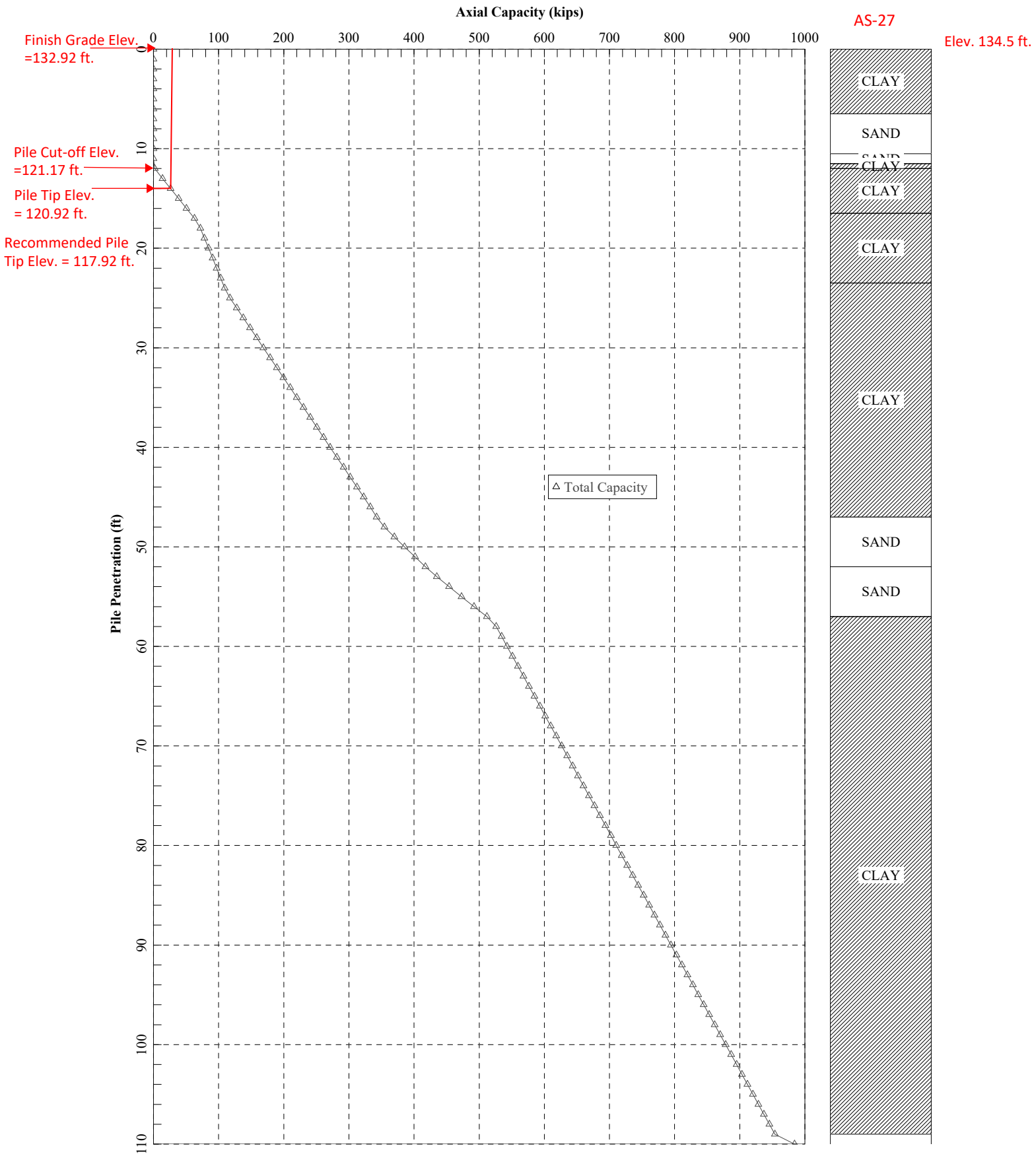
AERIAL GUIDEWAY – BENT 74 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 270 kips (Strength Limit Compression)/0.7 = 390 kips

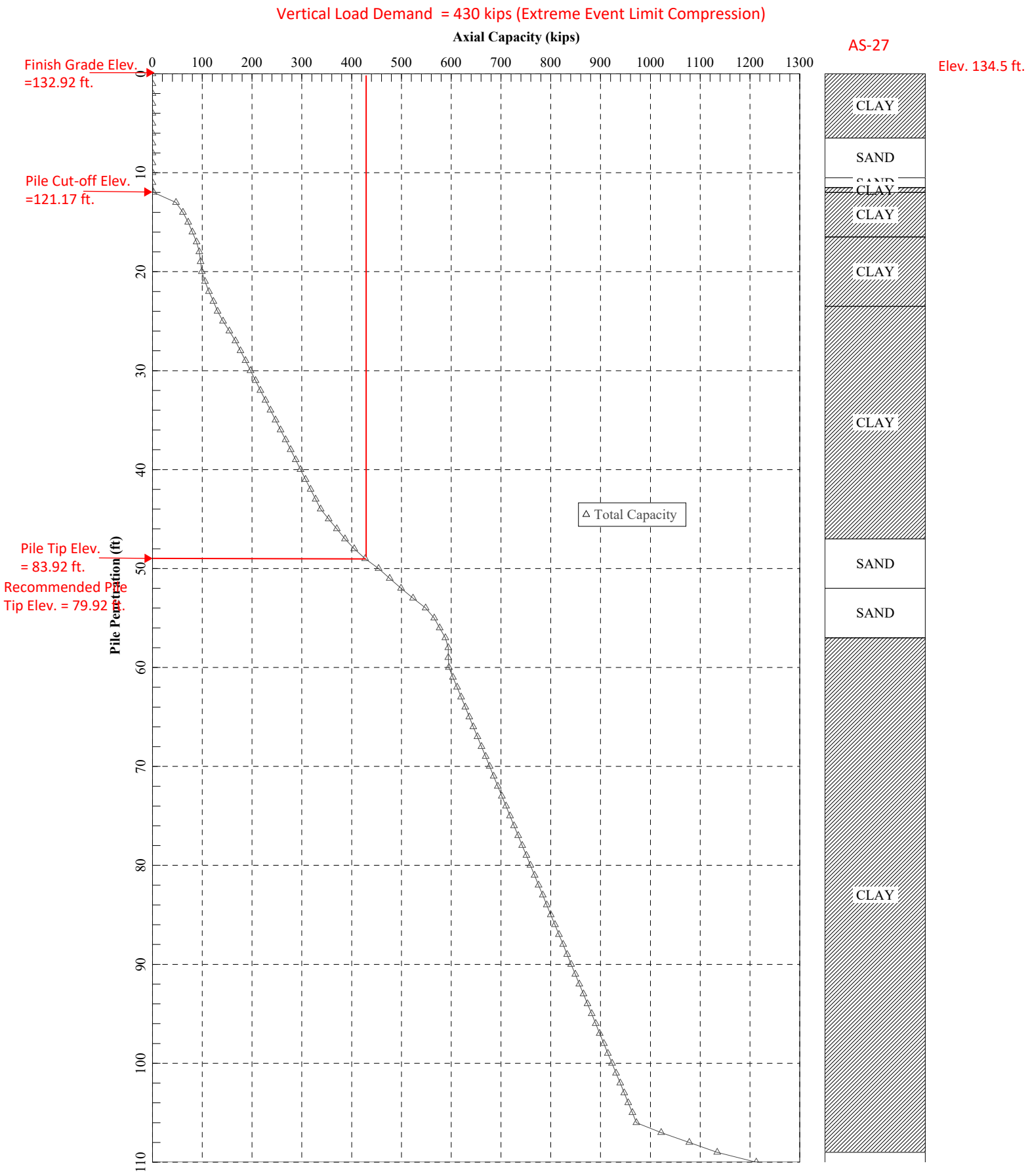


Eastridge to BART Regional Connector Project Bent 74 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

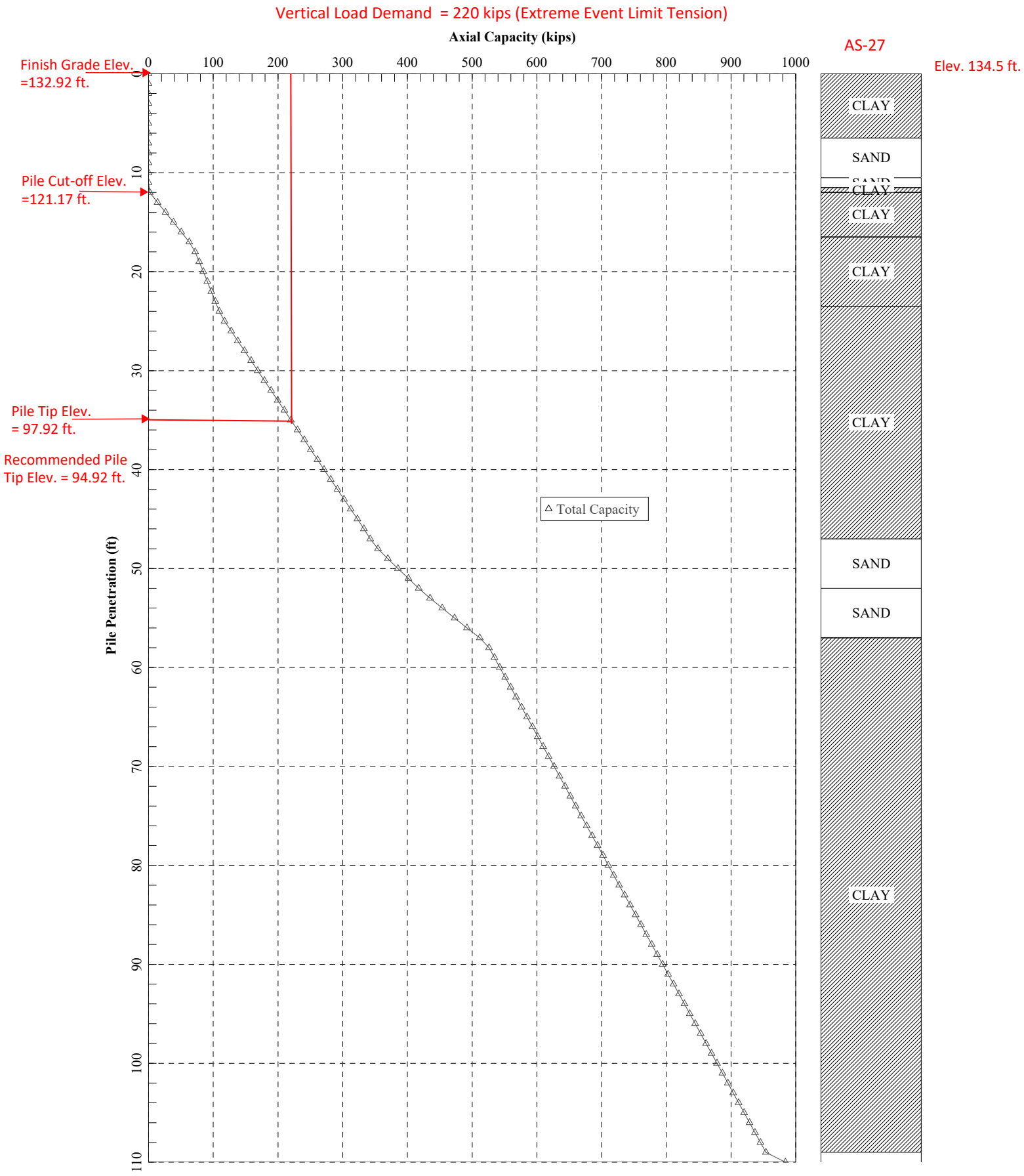
Vertical Load Demand = 20 kips (Strength Limit Tension)/0.7 = 30 kips



Eastridge to BART Regional Connector Project Bent 74 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)



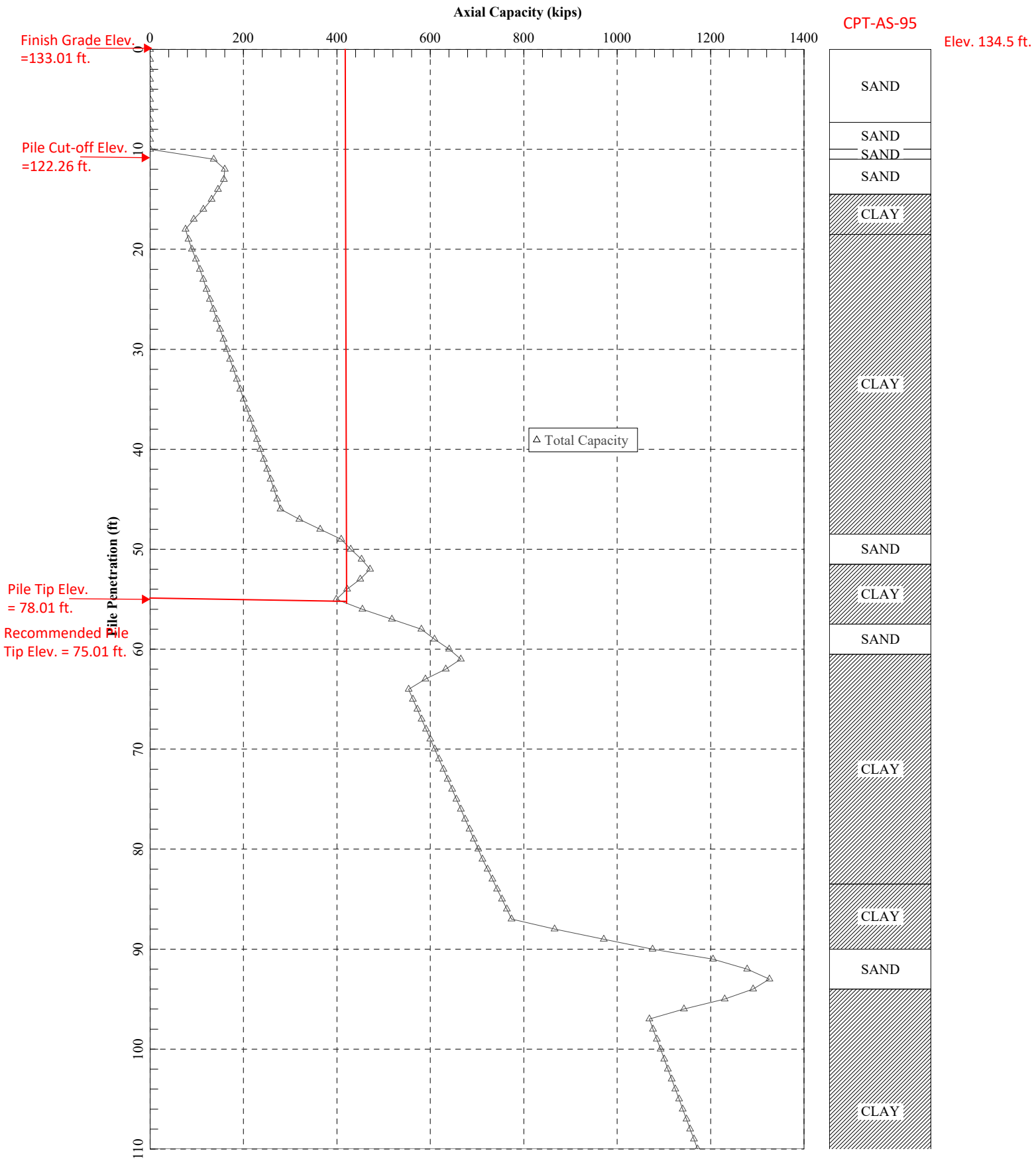
Eastridge to BART Regional Connector Project Bent 74-18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)



Eastridge to BART Regional Connector Project Bent 74 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

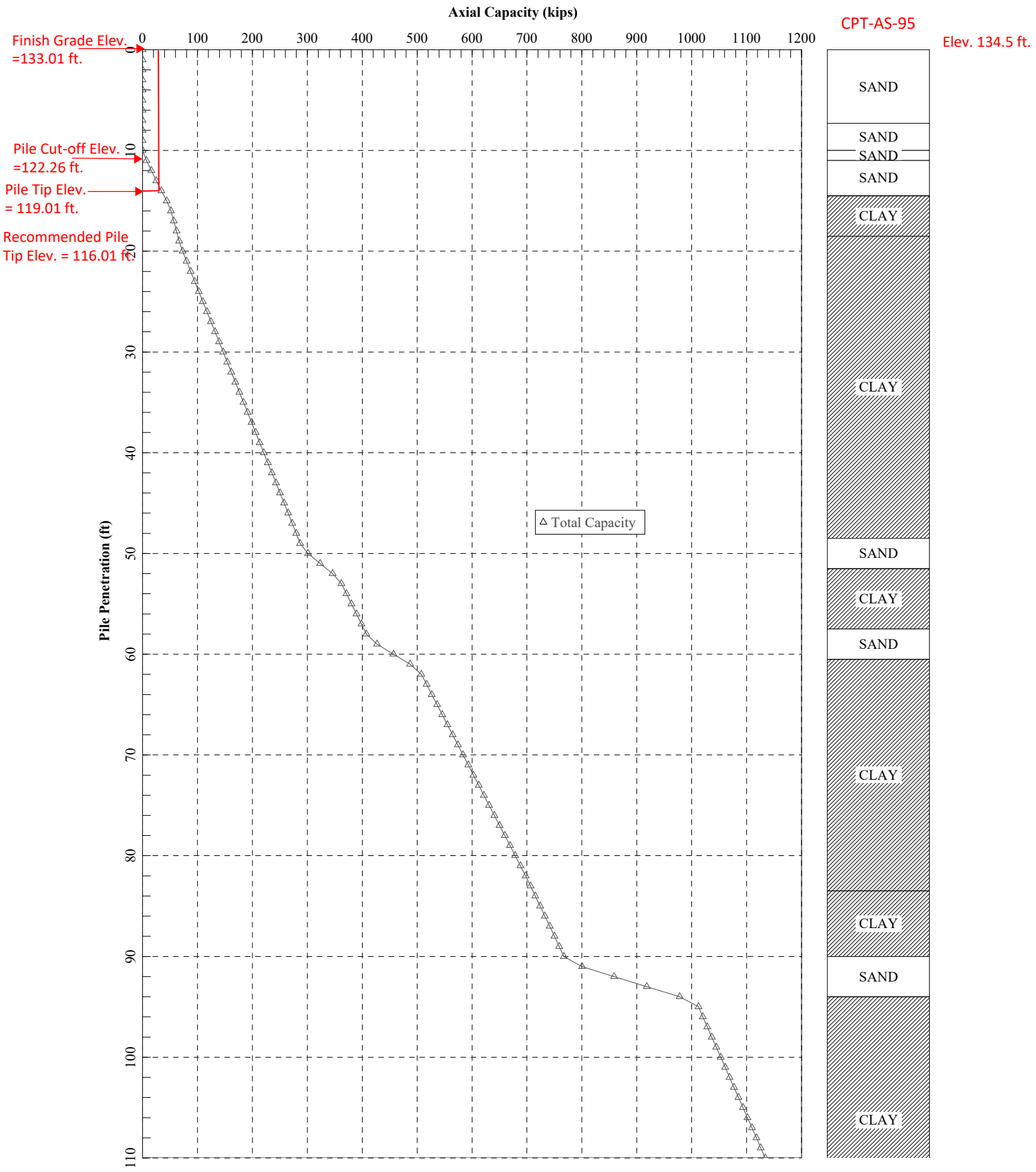
AERIAL GUIDEWAY – BENT 75 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 290 kips (Strength Limit Compression)/0.7 = 420 kips

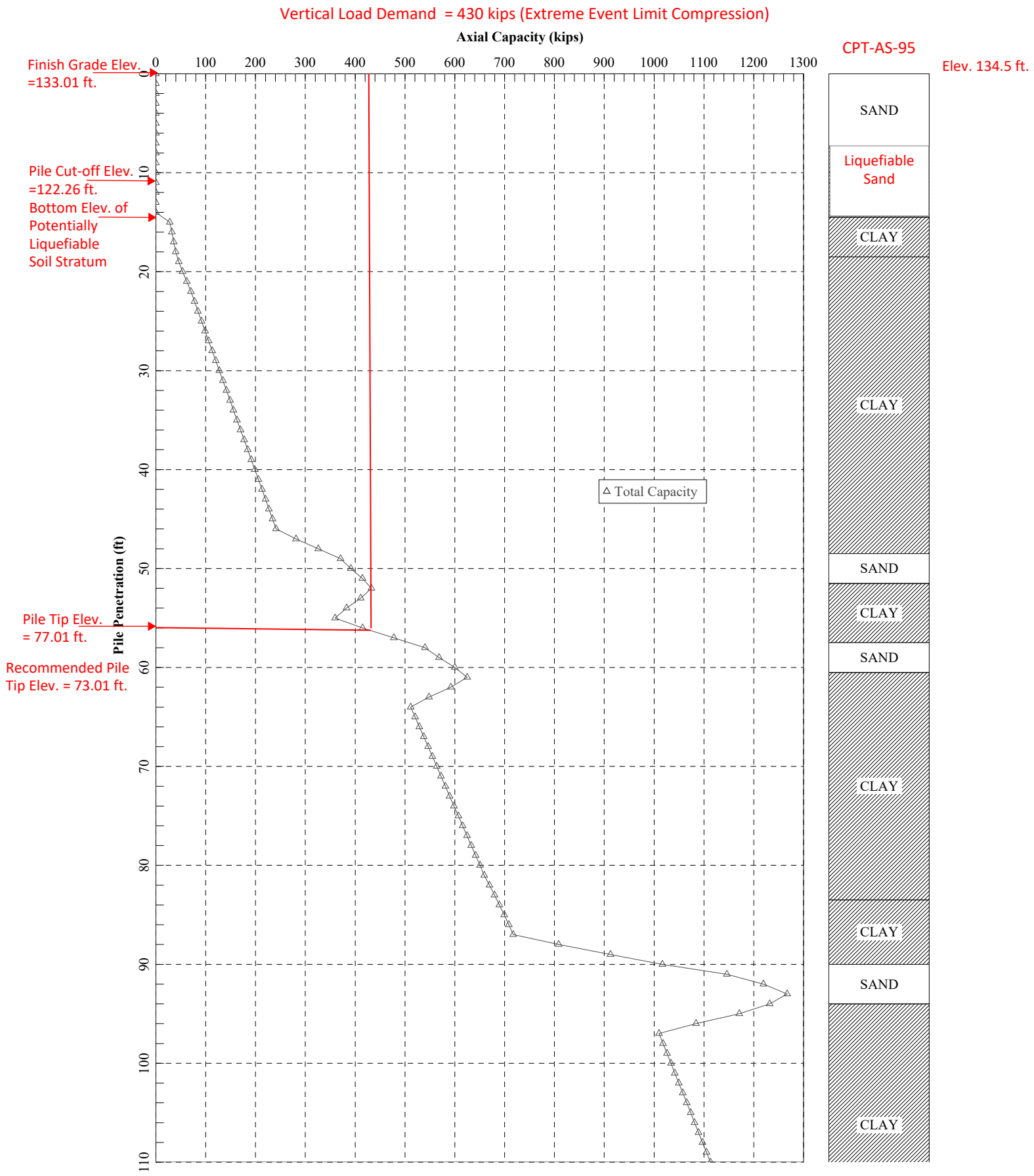


Eastridge to BART Regional Connector Project Bent 75 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

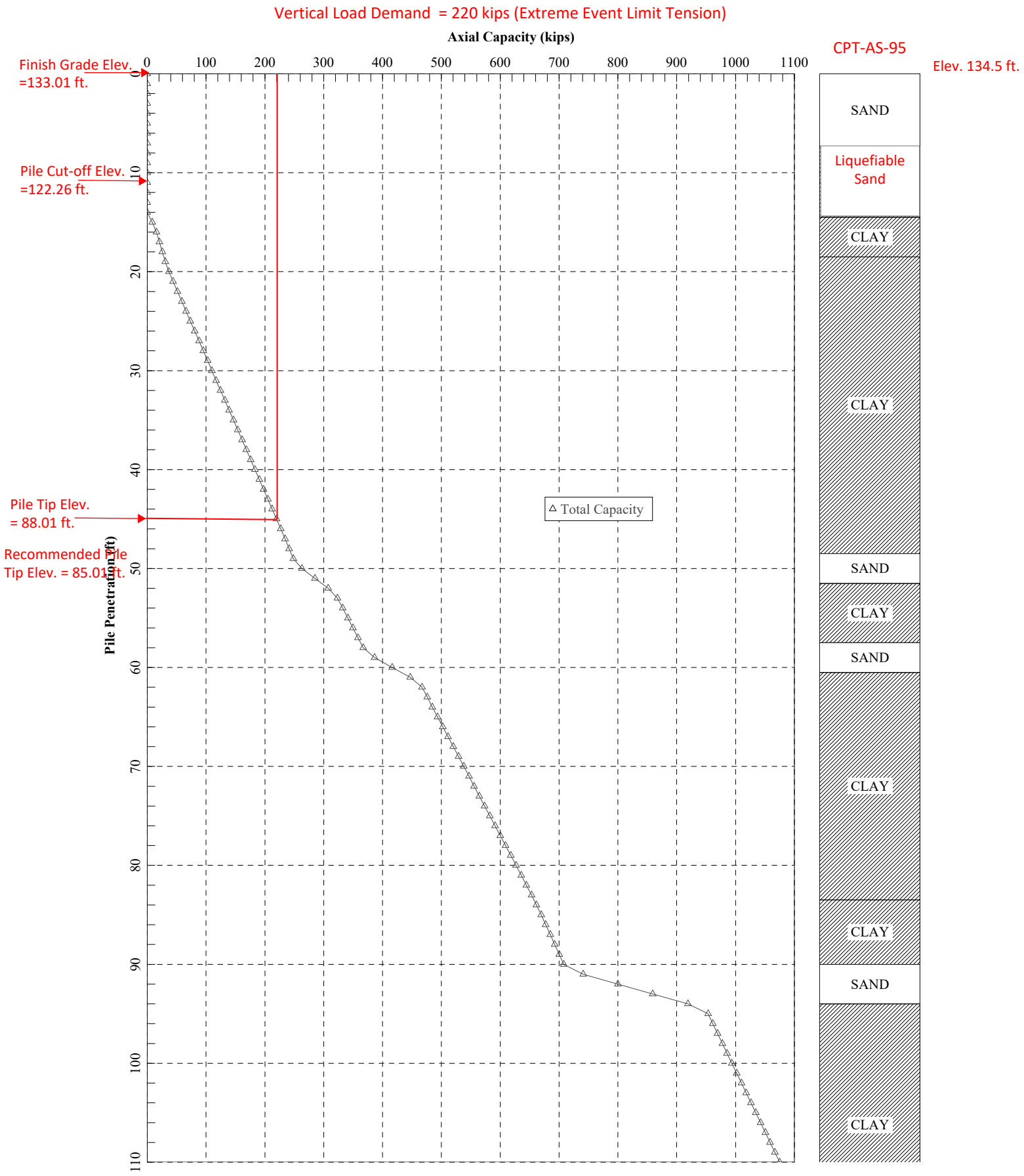
Vertical Load Demand = 20 kips (Strength Limit Tension)/0.7 = 30 kips



Eastridge to BART Regional Connector Project Bent 75 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)



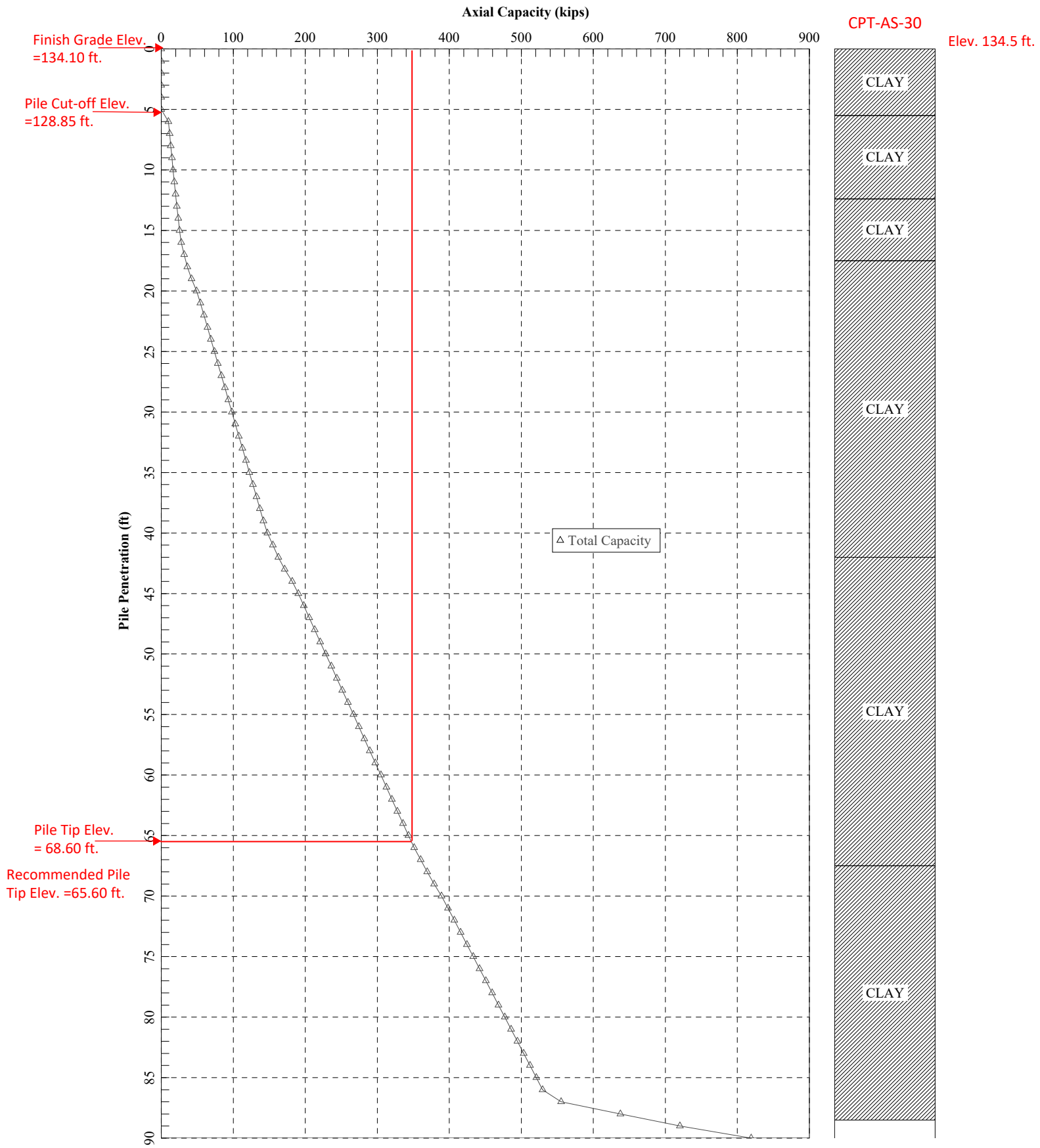
Eastridge to BART Regional Connector Project Bent 75-18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)



Eastridge to BART Regional Connector Project Bent 75 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

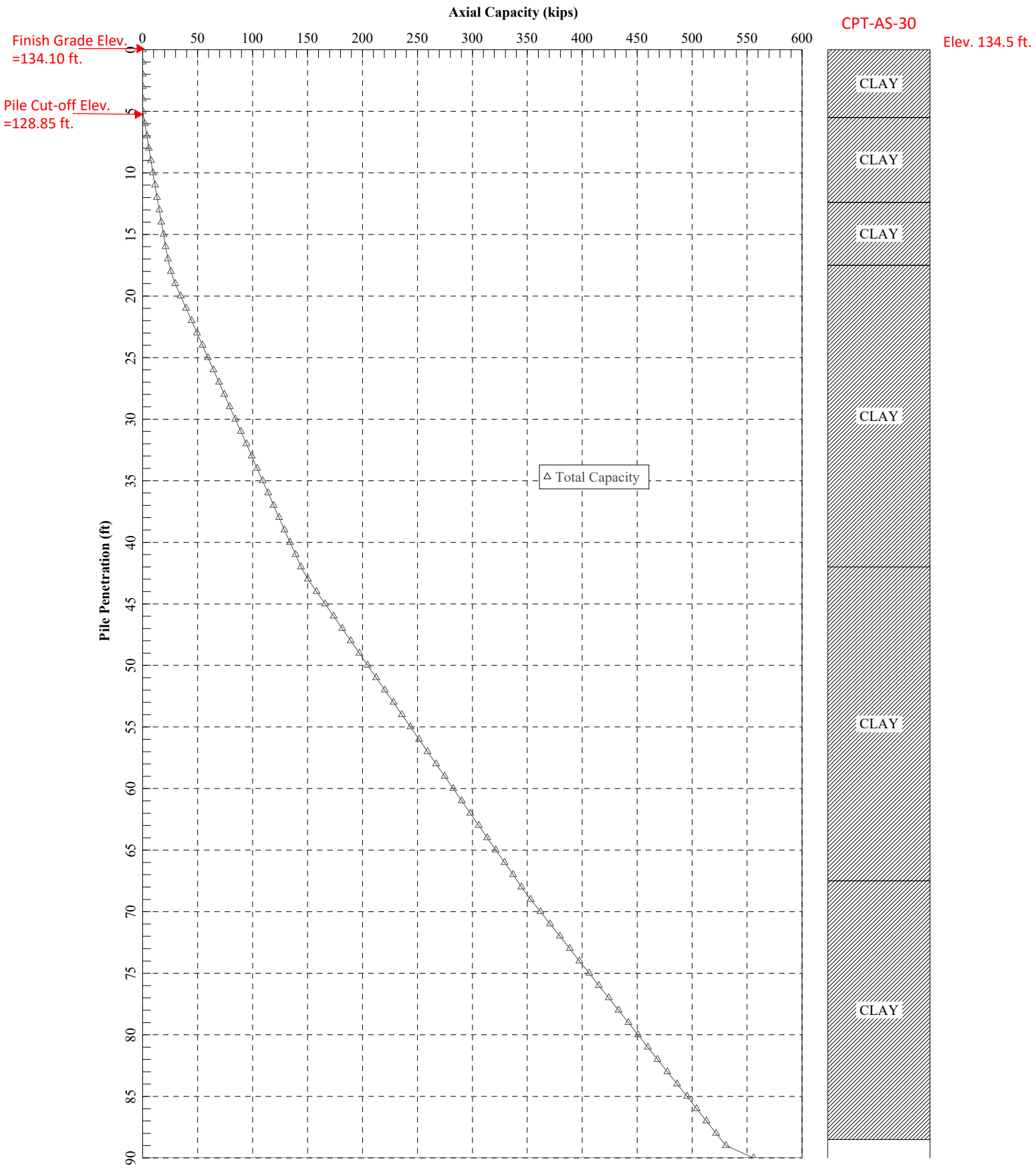
AERIAL GUIDEWAY – ABUTMENT 76 (14-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 240 kips (Strength Limit Compression)/0.7 = 350 kips



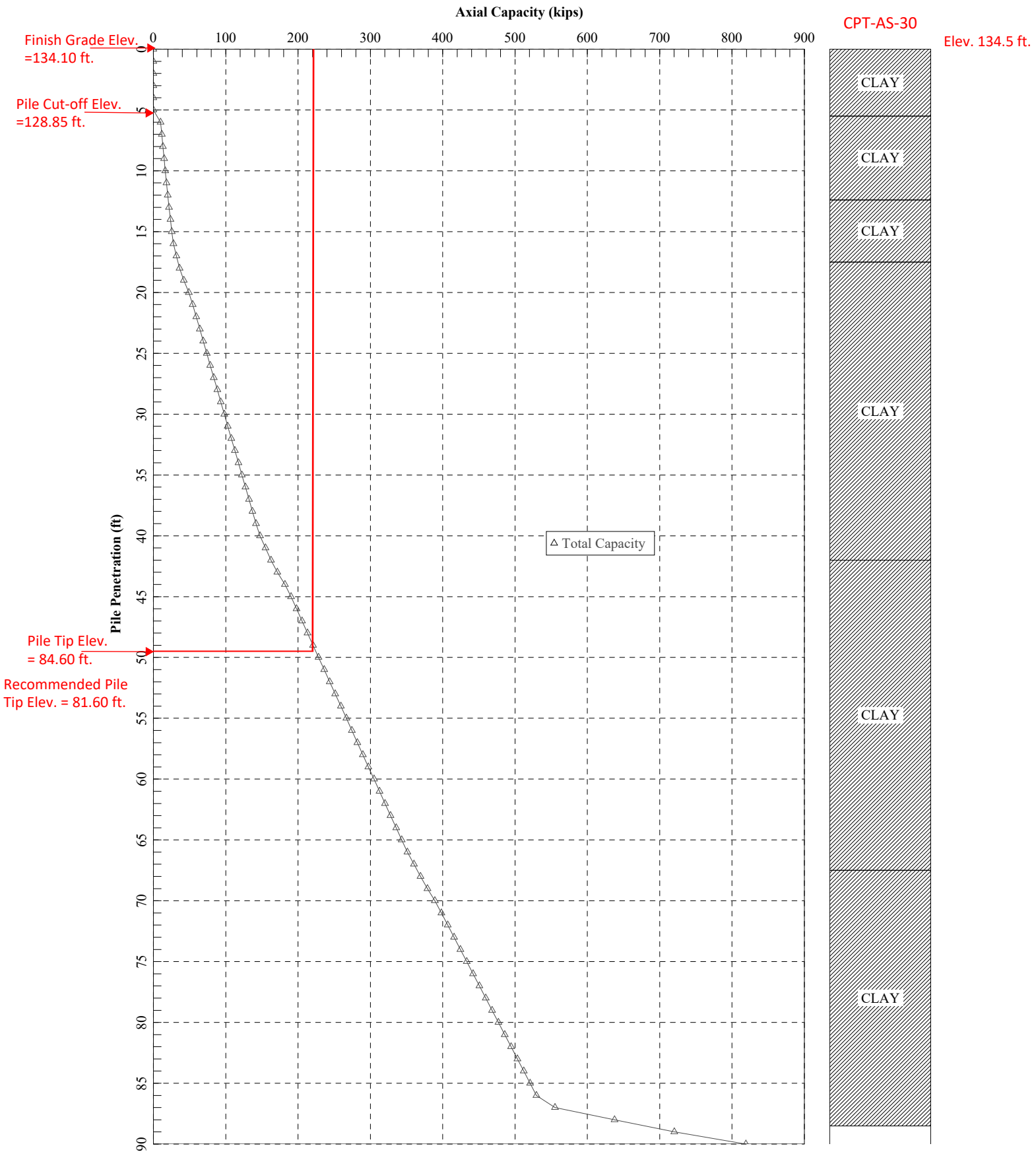
Eastridge to BART Regional Connector Project Abut 76 - 14-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 0 kips (Strength Limit Tension)/0.7 = 0 kips



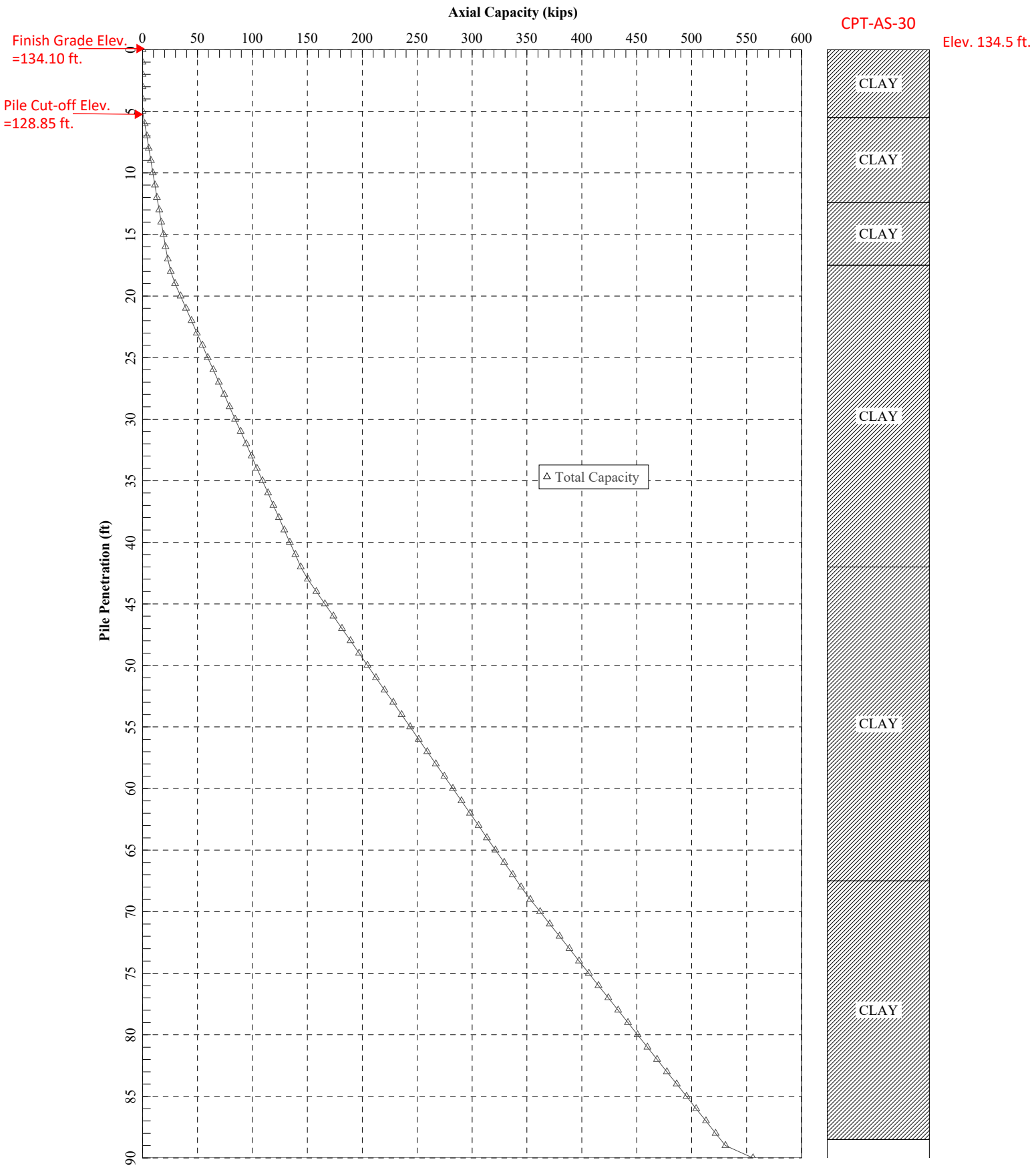
Eastridge to BART Regional Connector Project Abut 76 - 14-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 220 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project Abut 76-14-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

Vertical Load Demand = 0 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Abut 76 - 14-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

AERIAL GUIDEWAY – PILE GROUP SETTLEMENT (ABUTMENT 1 THROUGH ABUTMENT 76)

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Abutment 1_Model 1***
REFERENCE BORIN	***AS-1 (Elev. 115 ft)***
Hammer Energy =	60%
GW Level (ft)=	15

Finish Grade Elev. (ft) =	114.92
Pile Cut-off Elev. (ft) =	109.67
Footing Depth (ft) =	5.25
Pile Length (ft)=	17
Width of Pile Group, B (ft)=	15
Length of Pile Group, L (ft)=	32.25
Permanent Load Pressure (kip)=	1670
Pile Tip Ele (ft)=	92.67

Eq. Footing Depth (ft	16.6
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	8.5	3	26	MC	17	125.0	125.0	20.0%	1063							739375								
8.5	13.5	3	17	MC	11	125.0	125.0	20.0%	625				1100	4400		483438								
13.5	18	3	16	MC	10	125.0	83.4	20.0%	375	2018	2022.7	1300		5200	2.6	455000				0.076				0.076
18	24	1	29	SPT	29	125.0	62.6	20.0%	376	2251	1572.7								72				0.230	0.230
24	28	2	29	MC	19	125.0	62.6	20.0%	250	2564	1172.8	2356	1500	6000	2.3		0.0250	0.1252			0.197			0.197
28	32	3	25	MC	16	125.0	62.6	20.0%	250	2814	954.5	2031		8125	2.9	710938				0.064				0.064
32	38	2	30	MC	20	125.0	62.6	20.0%	376	3127	758.5	2438	1000	4000	1.3		0.0250	0.1252			0.170			0.170
38	43	3	70	SPT	70	125.0	62.6	20.0%	313	3471	605.8	8750		35000	10.1	3062500				0.012				0.012
43	48	3	38	MC	25	125.0	62.6	20.0%	313	3784	504.0	3088		12350	3.3	1080625				0.028				0.028
48	53	3	31	MC	20	125.0	62.6	20.0%	313	4097	425.9	2519		10075	2.5	881563				0.029				0.029
53	59	3	23	SPT	23	125.0	62.6	20.0%	376	4442	359.4	2875		11500	2.6	1006250				0.026				0.026
59	64	1	70	MC	46	125.0	62.6	20.0%	313	4786	307.4								76				0.021	0.021
64	76	1	34	MC	22	125.0	62.6	20.0%	751	5318	246.8								48				0.059	0.059
76	85	2	38	MC	25	125.0	62.6	20.0%	563	5975	193.9	3088	2000	8000	1.3		0.0250	0.1252			0.037			0.037
85	94	1	70	MC	46	125.0	62.6	20.0%	563	6539	161.0								68				0.017	0.017
94	103	3	74	MC	48	125.0	62.6	20.0%	563	7102	135.9	6013		24050	3.4	2104375				0.007				0.007
103	113	3	70	MC	46	125.0	62.6	20.0%	626	7697	115.2	5688		22750	3.0	1990625				0.007				0.007

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 2 & 3_Model 1***
REFERENCE BORIN	***AS-2 (Elev. 116 ft)***
Hammer Energy =	60%
GW Level (ft)=	17

Finish Grade Elev. (ft) =	115
Pile Cut-off Elev. (ft) =	105.5
Footing Depth (ft) =	9.5
Pile Length (ft)=	51
Width of Pile Group, B (ft)=	23.5
Length of Pile Group, L (ft)=	23.5
Permanent Load Pressure (kip)=	2350
Pile Tip Ele (ft)=	54.50

Eq. Footing Depth (ft	43.5
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	2	1	33	MC	21	125.0	125.0	20.0%	250															
2	6	3	28	MC	18	125.0	125.0	20.0%	500							796250								
6	11	3	17	MC	11	125.0	125.0	20.0%	625							483438								
11	17	3	21	MC	14	125.0	125.0	20.0%	750							597188								
17	21.5	2	12	MC	8	125.0	62.6	20.0%	282				900	3600										
21.5	24.5	2	12	MC	8	125.0	62.6	20.0%	188				900	3600										
24.5	30.5	2	18	MC	12	125.0	62.6	20.0%	376															
30.5	35.5	2	15	SPT	15	125.0	62.6	20.0%	313															
35.5	41.5	1	41	MC	27	125.0	62.6	20.0%	376															
41.5	45	2	7	SPT	7	125.0	62.6	20.0%	219	3831	1381.1	875		3831	1.0		0.0250	0.1252				0.301		0.301
45	51.5	1	68	MC	44	125.0	62.6	20.0%	407	4081	1147.7								79				0.107	0.107
51.5	56	1	32	MC	21	125.0	62.6	20.0%	282	4426	912.4								49				0.090	0.090
56	61	3	37	MC	24	125.0	62.6	20.0%	313	4723	762.9	3006		12025	2.5	1052188				0.044				0.044
61	75	1	53	MC	34	125.0	62.6	20.0%	876	5318	556.2								61				0.119	0.119
75	80	2	23	SPT	23	125.0	62.6	20.0%	313	5912	423.4	2875		11500	1.9		0.0250	0.1252			0.045			0.045
80	89.5	1	90	MC	59	125.0	62.6	20.0%	595	6366	351.6								82				0.032	0.032
89.5	99.5	2	38	MC	25	125.0	62.6	20.0%	626	6977	280.7	3088	1440	5760	0.8		0.0200	0.1000				0.206		0.206

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 4 & 5_Model 1***
REFERENCE BORIN	***AS-4 (Elev. 117.5 ft)***
Hammer Energy =	60%
GW Level (ft)=	13.5

Finish Grade Elev. (ft) =	116
Pile Cut-off Elev. (ft) =	107.5
Footing Depth (ft) =	8.5
Pile Length (ft)=	28
Width of Pile Group, B (ft)=	23.5
Length of Pile Group, L (ft)=	23.5
Permanent Load Pressure (kip)=	2580
Pile Tip Ele (ft)=	79.50

Eq. Footing Depth (ft	27.2
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG From	To	Soil Type	BLOW COUNT	SAMPLER TYPE	AVG SPT-N_{60}	γ_T (pcf)	γ' (pcf)	ω	σ_v' (psf)	σ_v' (psf)	$\Delta\sigma_v'$ (psf)	Su (psf)	Lab Su (psf)	Pp (psf)	OCR	E (psf)	Cr/1+e_0	Cc/1+e_0	C' (Hough Method)	Settlements (in) Elastic	OC	NC	SAND	Sum
0	3.5	3	33	MC	21	125.0	125.0	5.3%	438							938438								
3.5	7.5	3	27	MC	18	125.0	125.0	15.4%	500				3460	13840		767813								
7.5	12.5	3	14	MC	9	125.0	125.0	25.7%	625							398125								
12.5	17	3	21	MC	14	125.0	76.5	30.1%	344							597188								
17	20	3	27	MC	18	125.0	62.6	26.0%	188							767813								
20	26.5	2	15	MC	10	125.0	62.6	25.4%	407				560	2240										
26.5	31.5	3	26	MC	17	125.0	62.6	26.7%	313	2679	2106.1	2113		8450	3.2	739375				0.148				0.148
31.5	38.5	3	16	SPT	16	125.0	62.6	21.3%	438	3033	1560.1	2000		8000	2.6	700000				0.187				0.187
38.5	44	1	36	MC	23	125.0	62.6	21.0%	344	3425	1172.1								56				0.152	0.152
44	47.5	3	24	SPT	24	125.0	62.6	17.0%	219	3706	975.9	3000		12000	3.2	1050000				0.039				0.039
47.5	51.5	3	37	MC	24	125.0	62.6	16.1%	250	3941	847.7	3006		12025	3.1	1052188				0.039				0.039
51.5	56.5	2	23	MC	15	125.0	62.6	19.8%	313	4223	724.7	1869		7475	1.8		0.0266	0.1329			0.110			0.110
56.5	63.5	2	20	SPT	20	125.0	62.6	24.2%	438	4598	598.3	2500		10000	2.2		0.0266	0.1329			0.119			0.119
63.5	73.5	3	59	MC	38	125.0	62.6	23.1%	626	5131	469.0	4794		19175	3.7	1677813				0.034				0.034
73.5	88.5	2	49	MC	32	125.0	62.6	22.5%	939	5913	343.5	3981	1650	6600	1.1		0.0262	0.1312			0.116			0.116
88.5	97.5	2	42	MC	27	125.0	62.6	22.4%	563	6664	265.0	3413		13650	2.0		0.0200	0.1000			0.037			0.037
97.5	104.5	3	61	MC	40	125.0	62.6	17.0%	438	7165	226.8	4956		19825	2.8	1734688				0.011				0.011

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 20% was estimated based on available test data.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.

	Elastic	OC	NC	SAND	Sum
Estimated Settlement (in)=	*0.5*	*0.4*	*0.0*	*0.2*	*0.99*

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***	*Finish Grade Elev. (ft) =*	119.38	Eq. Footing Depth (ft	47.8
PROJECT NO.	***2017-125-GEO***	*Pile Cut-off Elev. (ft) =*	109.63	Settlement Limit (in)	1.0
STRUCTURE	***Bent 6-Lt (East)_Model 1***	*Footing Depth (ft) =*	9.75		
REFERENCE BORIN	***AS-3 (Elev. 118.5 ft)***	*Pile Length (ft)=*	57		
Hammer Energy =	60%	*Width of Pile Group, B (ft)=*	23.5		
GW Level (ft)=	16.5	*Length of Pile Group, L (ft)=*	23.5		
		Permanent Load Pressure (kip)=	2020		
		Pile Tip Ele (ft)=	52.63	*Cr/Cc=*	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	4.5	3	16	MC	10	125.0	125.0	16.0%	563							455000								
4.5	8.5	2	9	MC	6	125.0	125.0	20.0%	500				460	1840										
8.5	12.5	2	6	MC	4	125.0	125.0	29.0%	500															
12.5	17.5	2	10	MC	7	125.0	112.5	29.0%	563				800	3200										
17.5	21.5	1	14	MC	9	125.0	62.6	21.0%	250															
21.5	27.5	3	32	MC	21	125.0	62.6	21.0%	376							910000								
27.5	32.5	3	23	MC	15	125.0	62.6	20.0%	313							654063								
32.5	39.5	2	11	MC	7	125.0	62.6	22.0%	438				500	2000										
39.5	44	1	18	MC	12	125.0	62.6	15.0%	282															
44	48.5	2	14	MC	9	125.0	62.6	24.0%	282	4042	1098.9	1138	1060	4240	1.0		0.0265	0.1327			0.005	0.100		0.105
48.5	52	2	10	MC	7	125.0	62.6	23.0%	219	4175	997.5	813	900	3600	0.9		0.0230	0.1151				0.450		0.450
52	57.5	1	49	MC	32	125.0	62.6	16.0%	344	4457	824.4								61				0.079	0.079
57.5	64.5	1	70	MC	46	125.0	62.6	16.0%	438	4848	649.9								76				0.061	0.061
64.5	74.5	2	39	MC	25	125.0	62.6	23.0%	626	5380	489.3	3169		12675	2.4		0.0275	0.1376			0.125			0.125
74.5	84.5	2	20	MC	13	125.0	62.6	27.0%	626	6006	366.4	1625		6500	1.1		0.0275	0.1376			0.085			0.085
84.5	94.5	2	38	MC	25	125.0	62.6	25.0%	626	6632	284.6	3088	3200	12800	1.9		0.0200	0.1000			0.044			0.044
94.5	101	2	51	MC	33	125.0	62.6	18.0%	407	7149	236.1	4144		16575	2.3		0.0200	0.1000			0.022			0.022
																				0.0	*0.3*	*0.5*	*0.1*	*0.97*

Estimated Settlement (in)=

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 20% was estimated based on available test data.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***	*Finish Grade Elev. (ft) =*	117.79	Eq. Footing Depth (ft	48.7
PROJECT NO.	***2017-125-GEO***	*Pile Cut-off Elev. (ft) =*	107.75	Settlement Limit (in)	1.0
STRUCTURE	***Bent 6-Rt (West)_Model 1***	*Footing Depth (ft) =*	10.04		
REFERENCE BORIN	***AS-3 (Elev. 118.5 ft)***	*Pile Length (ft)=*	58		
Hammer Energy =	60%	*Width of Pile Group, B (ft)=*	22		
GW Level (ft)=	15.5	*Length of Pile Group, L (ft)=*	22		
		Permanent Load Pressure (kip)=	2410		
		Pile Tip Ele (ft)=	49.75	*Cr/Cc=*	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	3.5	3	16	MC	10	125.0	125.0	16.0%	438							455000								
3.5	7.5	2	9	MC	6	125.0	125.0	20.0%	500				460	1840										
7.5	11.5	2	6	MC	4	125.0	125.0	29.0%	500															
11.5	16.5	2	10	MC	7	125.0	112.5	29.0%	563				800	3200										
16.5	20.5	1	14	MC	9	125.0	62.6	21.0%	250															
20.5	26.5	3	32	MC	21	125.0	62.6	21.0%	376							910000								
26.5	31.5	3	23	MC	15	125.0	62.6	20.0%	313							654063								
31.5	38.5	2	11	MC	7	125.0	62.6	22.0%	438				500	2000										
38.5	43	1	18	MC	12	125.0	62.6	15.0%	282															
43	47.5	2	14	MC	9	125.0	62.6	24.0%	282				1060	4240										
47.5	51	2	10	MC	7	125.0	62.6	23.0%	219	4088	1335.5	813	900	3600	0.9		0.0230	0.1151				0.389		0.389
51	56.5	1	49	MC	32	125.0	62.6	16.0%	344	4332	1120.5								62				0.106	0.106
56.5	63.5	1	70	MC	46	125.0	62.6	16.0%	438	4723	870.2								76				0.081	0.081
63.5	73.5	2	39	MC	25	125.0	62.6	23.0%	626	5255	645.0	3169		12675	2.4		0.0275	0.1376			0.166			0.166
73.5	83.5	2	20	MC	13	125.0	62.6	27.0%	626	5881	476.4	1625		6500	1.1		0.0275	0.1376			0.112			0.112
83.5	93.5	2	38	MC	25	125.0	62.6	25.0%	626	6507	366.2	3088	3200	12800	2.0		0.0200	0.1000			0.057			0.057
93.5	100	2	51	MC	33	125.0	62.6	18.0%	407	7024	301.7	4144		16575	2.4		0.0200	0.1000			0.028			0.028
																				0.0	*0.4*	*0.4*	*0.2*	*0.94*

Estimated Settlement (in)=

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 20% was estimated based on available test data.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 7, 8, 9 & 10_Model 1***
REFERENCE BORIN	***CPT-AS-6 (Elev. 119.5 ft)***
Hammer Energy =	60%
GW Level (ft)=	8

Finish Grade Elev. (ft) =	118.5
Pile Cut-off Elev. (ft) =	109
Footing Depth (ft) =	9.5
Pile Length (ft)=	50
Width of Pile Group, B (ft)=	22
Length of Pile Group, L (ft)=	22
Permanent Load Pressure (kip)=	2680
Pile Tip Ele (ft)=	59.00

Eq. Footing Depth (ft	42.8
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	10	3	6	SPT	6	125.0	112.5	20.0%	1125							262500								
10	22	2	6	SPT	6	125.0	62.6	20.0%	751															
22	34	3	12	SPT	12	125.0	62.6	20.0%	751							525000								
34	43	2	8	SPT	8	125.0	62.6	20.0%	563	3186	1784.8	1000		4000	1.3		0.0250	0.1252			0.005	0.024		0.029
43	55	2	16	SPT	16	125.0	62.6	20.0%	751	3567	1333.3	2000		8000	2.2		0.0250	0.1252			0.497			0.497
55	61	1	9	SPT	9	125.0	62.6	20.0%	376	4130	924.8								37				0.173	0.173
61	70	3	28	SPT	28	125.0	62.6	20.0%	563	4600	712.4	3500		14000	3.0	1225000				0.063				0.063
70	79	3	28	SPT	28	125.0	62.6	20.0%	563	5163	541.8	3500		14000	2.7	1225000				0.048				0.048
79	99	2	20	SPT	20	125.0	62.6	20.0%	1252	6071	372.4	2500		10000	1.6		0.0200	0.1000			0.124			0.124
99	119	3	32	SPT	32	125.0	62.6	20.0%	1252	7323	243.9	4000		16000	2.2	1400000				0.042				0.042

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 11_Model 1***
REFERENCE BORIN	***CPT-AS-8 (Elev. 118.0 ft)***
Hammer Energy =	60%
GW Level (ft)=	20

Finish Grade Elev. (ft) =	118.43
Pile Cut-off Elev. (ft) =	108.25
Footing Depth (ft) =	10.18
Pile Length (ft)=	50.0
Width of Pile Group, B (ft)=	22
Length of Pile Group, L (ft)=	22
Permanent Load Pressure (kip)=	2570
Pile Tip Ele (ft)=	58.25

Eq. Footing Depth (ft	43.5
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	6.5	3	8	SPT	8	125.0	125.0	20.0%	813							350000								
6.5	14.5	3	8	SPT	8	125.0	125.0	20.0%	1000							350000								
14.5	22	2	8	SPT	8	125.0	108.4	20.0%	813															
22	32	2	12	SPT	12	125.0	62.6	20.0%	626															
32	42	2	12	SPT	12	125.0	62.6	20.0%	626															
42	52	2	12	SPT	12	125.0	62.6	20.0%	626	4238	1395.8	1500		6000	1.4		0.0250	0.1252			0.315			0.315
52	60	1	7	SPT	7	125.0	62.6	20.0%	501	4754	982.2								33				0.234	0.234
60	70	2	16	SPT	16	125.0	62.6	20.0%	626	5317	710.3	2000		8000	1.5		0.0250	0.1252			0.164			0.164
70	80	2	16	SPT	16	125.0	62.6	20.0%	626	5943	522.2	2000		8000	1.3		0.0250	0.1252			0.110			0.110
80	92	2	16	SPT	16	125.0	62.6	20.0%	751	6632	390.2	2000		8000	1.2		0.0200	0.1000			0.072			0.072
92	97	1	9	SPT	9	125.0	62.6	20.0%	313	7164	319.7								34				0.033	0.033
97	108	2	24	SPT	24	125.0	62.6	20.0%	689	7665	269.5	3000		12000	1.6		0.0200	0.1000			0.040			0.040
108	119	2	24	SPT	24	125.0	62.6	20.0%	689	8353	217.7	3000		12000	1.4		0.0200	0.1000			0.029			0.029

Estimated Settlement (in)= *0.0* *0.7* *0.0* *0.3* *1.00*

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 20% was estimated based on available test data.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 12_Model 2***
REFERENCE BORIN	***CPT-AS-8 (Elev. 118.0 ft)***
Hammer Energy =	60%
GW Level (ft)=	7.5

Finish Grade Elev. (ft) =	118.19
Pile Cut-off Elev. (ft) =	108.41
Footing Depth (ft) =	9.78
Pile Length (ft)=	58
Width of Pile Group, B (ft)=	23.5
Length of Pile Group, L (ft)=	28
Permanent Load Pressure (kip)=	2930
Pile Tip Ele (ft)=	50.41

Eq. Footing Depth (ft	48.4
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG From	To	Soil Type	BLOW COUNT	SAMPLER TYPE	AVG SPT-N_{60}	γ_T (pcf)	γ' (pcf)	ω	σ_v' (psf)	σ_v' (psf)	$\Delta\sigma_v'$ (psf)	Su (psf)	Lab Su (psf)	Pp (psf)	OCR	E (psf)	Cr/1+e_0	Cc/1+e_0	C' (Hough Method)	Settlements (in) Elastic	OC	NC	SAND	Sum
0	8	3	8	SPT	8	125.0	121.1	20.0%	969							350000								
8	16	3	8	SPT	8	125.0	62.6	20.0%	501							350000								
16	23.5	2	8	SPT	8	125.0	62.6	20.0%	470															
23.5	33.5	2	12	SPT	12	125.0	62.6	20.0%	626															
33.5	43.5	2	12	SPT	12	125.0	62.6	20.0%	626															
43.5	53.5	2	12	SPT	12	125.0	62.6	20.0%	626	3659	1295.5	1500		6000	1.6		0.0250	0.1252			0.200			0.200
53.5	61.5	1	7	SPT	7	125.0	62.6	20.0%	501	4068	1001.5								34				0.271	0.271
61.5	71.5	2	16	SPT	16	125.0	62.6	20.0%	626	4631	736.0	2000		8000	1.7		0.0250	0.1252			0.192			0.192
71.5	81.5	2	16	SPT	16	125.0	62.6	20.0%	626	5257	548.3	2000		8000	1.5		0.0250	0.1252			0.129			0.129
81.5	93.5	2	16	SPT	16	125.0	62.6	20.0%	751	5946	414.2	2000		8000	1.3		0.0200	0.1000			0.084			0.084
93.5	98.5	1	9	SPT	9	125.0	62.6	20.0%	313	6478	341.6								35				0.039	0.039
98.5	109.5	2	24	SPT	24	125.0	62.6	20.0%	689	6978	289.4	3000		12000	1.7		0.0200	0.1000			0.047			0.047
109.5	120.5	2	24	SPT	24	125.0	62.6	20.0%	689	7667	235.2	3000		12000	1.6		0.0200	0.1000			0.035			0.035

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 13_Model 2***
REFERENCE BORIN	***CPT-AS-91 (Elev. 118.0 ft)***
Hammer Energy =	60%
GW Level (ft)=	13

Finish Grade Elev. (ft) =	118
Pile Cut-off Elev. (ft) =	108.55
Footing Depth (ft) =	9.45
Pile Length (ft)=	58
Width of Pile Group, B (ft)=	25.5
Length of Pile Group, L (ft)=	25.5
Permanent Load Pressure (kip)=	3150
Pile Tip Ele (ft)=	50.55

Eq. Footing Depth (ft	48.1
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	10	3	12	SPT	12	125.0	125.0	20.0%	1250							525000								
10	13	1	3	SPT	3	125.0	125.0	20.0%	375															
13	18	3	12	SPT	12	125.0	62.6	20.0%	313							525000								
18	24	3	12	SPT	12	125.0	62.6	20.0%	376							525000								
24	30	3	16	SPT	16	125.0	62.6	20.0%	376							700000								
30	33	1	6	SPT	6	125.0	62.6	20.0%	188															
33	37	3	16	SPT	16	125.0	62.6	20.0%	250							700000								
37	38.5	1	8	SPT	8	125.0	62.6	20.0%	94															
38.5	48.5	2	16	SPT	16	125.0	62.6	20.0%	626	3835	1553.8	2000		8000	2.1		0.0250	0.1252			0.017			0.017
48.5	58.5	2	16	SPT	16	125.0	62.6	20.0%	626	4160	1249.2	2000		8000	1.9		0.0250	0.1252			0.343			0.343
58.5	65	2	16	SPT	16	125.0	62.6	20.0%	407	4677	921.5	2000		8000	1.7		0.0250	0.1252			0.153			0.153
65	75	2	20	SPT	20	125.0	62.6	20.0%	626	5193	707.7	2500		10000	1.9		0.0250	0.1252			0.167			0.167
75	85	2	20	SPT	20	125.0	62.6	20.0%	626	5819	535.2	2500		10000	1.7		0.0250	0.1252			0.115			0.115
85	95	2	20	SPT	20	125.0	62.6	20.0%	626	6445	418.9	2500		10000	1.6		0.0250	0.1252			0.082			0.082
95	103	2	20	SPT	20	125.0	62.6	20.0%	501	7009	343.8	2500		10000	1.4		0.0250	0.1252			0.050			0.050
103	109	1	13	SPT	13	125.0	62.6	20.0%	376	7447	298.6								37				0.033	0.033
109	115	1	14	SPT	14	125.0	62.6	20.0%	376	7822	266.5								38				0.028	0.028

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 14 & 15_Model 2***
REFERENCE BORIN	***CPT-AS-11 (Elev. 118.0 ft)***
Hammer Energy =	60%
GW Level (ft)=	9.8

Finish Grade Elev. (ft) =	118
Pile Cut-off Elev. (ft) =	108
Footing Depth (ft) =	10
Pile Length (ft)=	61
Width of Pile Group, B (ft)=	23.5
Length of Pile Group, L (ft)=	28
Permanent Load Pressure (kip)=	3260
Pile Tip Ele (ft)=	47.00

Eq. Footing Depth (ft	50.7
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	7	3	12	SPT	12	125.0	125.0	20.0%	875							525000								
7	14	3	7	SPT	7	125.0	87.6	20.0%	613							297500								
14	23	3	10	SPT	10	125.0	62.6	20.0%	563							437500								
23	33	3	16	SPT	16	125.0	62.6	20.0%	626							700000								
33	43	3	16	SPT	16	125.0	62.6	20.0%	626							700000								
43	53	2	16	SPT	16	125.0	62.6	20.0%	626	3856	1463.5	2000		8000	2.1		0.0250	0.1252			0.098			0.098
53	63	2	16	SPT	16	125.0	62.6	20.0%	626	4242	1144.6	2000		8000	1.9		0.0250	0.1252			0.312			0.312
63	73	2	16	SPT	16	125.0	62.6	20.0%	626	4868	811.6	2000		8000	1.6		0.0250	0.1252			0.201			0.201
73	83	2	16	SPT	16	125.0	62.6	20.0%	626	5494	605.4	2000		8000	1.5		0.0250	0.1252			0.136			0.136
83	93	2	16	SPT	16	125.0	62.6	20.0%	626	6120	468.8	2000		8000	1.3		0.0250	0.1252			0.096			0.096
93	100	2	16	SPT	16	125.0	62.6	20.0%	438	6652	386.1	2000		8000	1.2		0.0250	0.1252			0.052			0.052
100	107	2	32	SPT	32	125.0	62.6	20.0%	438	7091	333.4	4000		16000	2.3		0.0250	0.1252			0.042			0.042
107	114	2	32	SPT	32	125.0	62.6	20.0%	438	7529	290.7	4000		16000	2.1		0.0250	0.1252			0.035			0.035
114	121.5	2	32	SPT	32	125.0	62.6	20.0%	470	7983	254.7	4000		16000	2.0		0.0200	0.1000			0.025			0.025

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 16_Model 2***
REFERENCE BORIN	***CPT-AS-92 (Elev. 116.5 ft)***
Hammer Energy =	60%
GW Level (ft)=	13

Finish Grade Elev. (ft) =	116.8
Pile Cut-off Elev. (ft) =	108.05
Footing Depth (ft) =	8.75
Pile Length (ft)=	67
Width of Pile Group, B (ft)=	28
Length of Pile Group, L (ft)=	30.5
Permanent Load Pressure (kip)=	4260
Pile Tip Ele (ft)=	41.05

Eq. Footing Depth (ft	53.4
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	7	1	3	SPT	3	125.0	125.0	20.0%	875															
7	13	1	3	SPT	3	125.0	125.0	20.0%	750															
13	23	2	6	SPT	6	125.0	62.6	20.0%	626															
23	32.5	2	12	SPT	12	125.0	62.6	20.0%	595															
32.5	35	1	6	SPT	6	125.0	62.6	20.0%	157															
35	45	3	20	SPT	20	125.0	62.6	20.0%	626							875000								
45	52	2	16	SPT	16	125.0	62.6	20.0%	438															
52	58	2	16	SPT	16	125.0	62.6	20.0%	376	4299	1468.5	2000		8000	1.9		0.0250	0.1252			0.176			0.176
58	63	2	12	SPT	12	125.0	62.6	20.0%	313	4599	1238.3	1500		6000	1.3		0.0250	0.1252			0.156			0.156
63	73	2	16	SPT	16	125.0	62.6	20.0%	626	5068	973.4	2000		8000	1.6		0.0250	0.1252			0.229			0.229
73	83	2	16	SPT	16	125.0	62.6	20.0%	626	5694	734.5	2000		8000	1.4		0.0250	0.1252			0.158			0.158
83	90	2	16	SPT	16	125.0	62.6	20.0%	438	6226	594.4	2000		8000	1.3		0.0250	0.1252			0.083			0.083
90	100	2	20	SPT	20	125.0	62.6	20.0%	626	6758	490.9	2500		10000	1.5		0.0250	0.1252			0.091			0.091
100	110	2	20	SPT	20	125.0	62.6	20.0%	626	7384	400.3	2500		10000	1.4		0.0200	0.1000			0.055			0.055
110	120	2	20	SPT	20	125.0	62.6	20.0%	626	8010	332.7	2500		10000	1.2		0.0200	0.1000			0.042			0.042

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 17_Model 2***
REFERENCE BORIN	***CPT-AS-92 (Elev. 116.5 ft)***
Hammer Energy =	60%
GW Level (ft)=	13

Finish Grade Elev. (ft) =	116.4
Pile Cut-off Elev. (ft) =	101.9
Footing Depth (ft) =	14.5
Pile Length (ft)=	85
Width of Pile Group, B (ft)=	37
Length of Pile Group, L (ft)=	37
Permanent Load Pressure (kip)=	6550
Pile Tip Ele (ft)=	16.90

Eq. Footing Depth (ft	71.2
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	7	1	3	SPT	3	125.0	125.0	20.0%	875															
7	13	1	3	SPT	3	125.0	125.0	20.0%	750															
13	23	2	6	SPT	6	125.0	62.6	20.0%	626															
23	32.5	2	12	SPT	12	125.0	62.6	20.0%	595															
32.5	35	1	6	SPT	6	125.0	62.6	20.0%	157															
35	45	3	20	SPT	20	125.0	62.6	20.0%	626							875000								
45	52	2	16	SPT	16	125.0	62.6	20.0%	438															
52	58	2	16	SPT	16	125.0	62.6	20.0%	376															
58	63	2	12	SPT	12	125.0	62.6	20.0%	313															
63	73	2	16	SPT	16	125.0	62.6	20.0%	626	5324	1492.3	2000		8000	1.5		0.0250	0.1252			0.059			0.059
73	83	2	16	SPT	16	125.0	62.6	20.0%	626	5694	1257.7	2000		8000	1.4		0.0250	0.1252			0.260			0.260
83	90	2	16	SPT	16	125.0	62.6	20.0%	438	6226	1006.6	2000		8000	1.3		0.0250	0.1252			0.137			0.137
90	100	2	20	SPT	20	125.0	62.6	20.0%	626	6758	823.8	2500		10000	1.5		0.0250	0.1252			0.150			0.150
100	110	2	20	SPT	20	125.0	62.6	20.0%	626	7384	666.1	2500		10000	1.4		0.0200	0.1000			0.090			0.090
110	120	2	20	SPT	20	125.0	62.6	20.0%	626	8010	549.6	2500		10000	1.2		0.0200	0.1000			0.069			0.069

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 18_Model 2***
REFERENCE BORIN	***CPT-AS-13 (Elev. 116.5 ft)***
Hammer Energy =	60%
GW Level (ft)=	5

Finish Grade Elev. (ft) =	116.14
Pile Cut-off Elev. (ft) =	106.14
Footing Depth (ft) =	10
Pile Length (ft)=	75
Width of Pile Group, B (ft)=	37
Length of Pile Group, L (ft)=	37
Permanent Load Pressure (kip)=	5560
Pile Tip Ele (ft)=	31.14

Eq. Footing Depth (ft	60.0
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	5	3	8	SPT	8	125.0	125.0	20.0%	625							350000								
5	11.5	3	8	SPT	8	125.0	62.6	20.0%	407							350000								
11.5	17.5	3	8	SPT	8	125.0	62.6	20.0%	376							350000								
17.5	23.5	3	12	SPT	12	125.0	62.6	20.0%	376							525000								
23.5	29	3	12	SPT	12	125.0	62.6	20.0%	344							525000								
29	39	3	20	SPT	20	125.0	62.6	20.0%	626							875000								
39	49	3	20	SPT	20	125.0	62.6	20.0%	626							875000								
49	59	3	20	SPT	20	125.0	62.6	20.0%	626							875000								
59	69	2	20	SPT	20	125.0	62.6	20.0%	626	4350	1257.3	2500		10000	2.3		0.0250	0.1252			0.298			0.298
69	75	2	20	SPT	20	125.0	62.6	20.0%	376	4819	1015.3	2500		10000	2.1		0.0250	0.1252			0.150			0.150
75	82	1	9	SPT	9	125.0	62.6	20.0%	438	5226	858.0								35				0.156	0.156
82	92	3	32	SPT	32	125.0	62.6	20.0%	626	5758	701.9	4000		16000	2.8	1400000				0.060				0.060
92	102	3	32	SPT	32	125.0	62.6	20.0%	626	6384	567.3	4000		16000	2.5	1400000				0.049				0.049
102	112	2	32	SPT	32	125.0	62.6	20.0%	626	7010	468.0	4000		16000	2.3		0.0200	0.1000			0.067			0.067
112	120	2	32	SPT	32	125.0	62.6	20.0%	501	7574	399.3	4000		16000	2.1		0.0200	0.1000			0.043			0.043

Estimated Settlement (in)= *0.1* *0.6* *0.0* *0.2* *0.82*

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 20% was estimated based on available test data.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 19 & 20_Model 2***
REFERENCE BORIN	***CPT-AS-93 (Elev. 117.5 ft)***
Hammer Energy =	60%
GW Level (ft)=	9.5

Finish Grade Elev. (ft) =	116.8
Pile Cut-off Elev. (ft) =	107.3
Footing Depth (ft) =	9.5
Pile Length (ft)=	68
Width of Pile Group, B (ft)=	23.5
Length of Pile Group, L (ft)=	28
Permanent Load Pressure (kip)=	3290
Pile Tip Ele (ft)=	39.30

Eq. Footing Depth (ft	54.8
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	9.5	1	3	SPT	3	125.0	125.0	20.0%	1188															
9.5	11.3	1	3	SPT	3	125.0	62.6	20.0%	113															
11.3	17.3	2	6	SPT	6	125.0	62.6	20.0%	376															
17.3	22.3	2	6	SPT	6	125.0	62.6	20.0%	313															
22.3	29.3	3	12	SPT	12	125.0	62.6	20.0%	438							525000								
29.3	33.3	2	6	SPT	6	125.0	62.6	20.0%	250															
33.3	39.3	3	20	SPT	20	125.0	62.6	20.0%	376							875000								
39.3	44.3	3	20	SPT	20	125.0	62.6	20.0%	313							875000								
44.3	49.3	2	8	SPT	8	125.0	62.6	20.0%	313															
49.3	55.3	2	8	SPT	8	125.0	62.6	20.0%	376	4040	1393.0	1000		4040	1.0		0.0250	0.1252				0.090		0.090
55.3	61.3	2	20	SPT	20	125.0	62.6	20.0%	376	4242	1224.5	2500		10000	2.4		0.0250	0.1252			0.198			0.198
61.3	71.3	2	16	SPT	16	125.0	62.6	20.0%	626	4743	918.8	2000		8000	1.7		0.0250	0.1252			0.231			0.231
71.3	81.3	2	16	SPT	16	125.0	62.6	20.0%	626	5369	674.4	2000		8000	1.5		0.0250	0.1252			0.154			0.154
81.3	91.3	2	16	SPT	16	125.0	62.6	20.0%	626	5995	516.0	2000		8000	1.3		0.0250	0.1252			0.108			0.108
91.3	96.3	2	16	SPT	16	125.0	62.6	20.0%	313	6465	431.1	2000		8000	1.2		0.0250	0.1252			0.042			0.042
96.3	106.3	2	24	SPT	24	125.0	62.6	20.0%	626	6934	365.6	3000		12000	1.7		0.0250	0.1252			0.067			0.067
106.3	114.3	2	24	SPT	24	125.0	62.6	20.0%	501	7498	305.0	3000		12000	1.6		0.0250	0.1252			0.042			0.042
114.3	119.3	2	24	SPT	24	125.0	62.6	20.0%	313	7904	270.1	3000		12000	1.5		0.0200	0.1000			0.018			0.018

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***	*Finish Grade Elev. (ft) =*	117.96	Eq. Footing Depth (ft	34.1
PROJECT NO.	***2017-125-GEO***	*Pile Cut-off Elev. (ft) =*	109.21	Settlement Limit (in)	1.0
STRUCTURE	***Bent 21_Model 2***	*Footing Depth (ft) =*	8.75		
REFERENCE BORIN	***CPT-AS-14 (Elev. 117.0 ft)***	*Pile Length (ft)=*	38		
Hammer Energy =	60%	*Width of Pile Group, B (ft)=*	23.5		
GW Level (ft)=	9.3	*Length of Pile Group, L (ft)=*	30.5		
		Permanent Load Pressure (kip)=	3310		
		Pile Tip Ele (ft)=	71.21	*Cr/Cc=*	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	$SPT\text{-}N_{60}$	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	9.3	3	12	SPT	12	125.0	125.0	20.0%	1163							525000								
9.3	13.5	3	12	SPT	12	125.0	62.6	20.0%	263							525000								
13.5	19.5	3	8	SPT	8	125.0	62.6	20.0%	376							350000								
19.5	24.5	2	8	SPT	8	125.0	62.6	20.0%	313															
24.5	34.5	3	16	SPT	16	125.0	62.6	20.0%	626	2727	2097.9	2000		8000	2.9	700000				0.015				0.015
34.5	44	3	16	SPT	16	125.0	62.6	20.0%	595	3037	1656.8	2000		8000	2.6	700000				0.270				0.270
44	50.5	1	6	SPT	6	125.0	62.6	20.0%	407	3538	1191.0								34				0.290	0.290
50.5	60.5	3	20	SPT	20	125.0	62.6	20.0%	626	4055	890.0	2500		10000	2.5	875000				0.122				0.122
60.5	68.5	2	20	SPT	20	125.0	62.6	20.0%	501	4618	675.6	2500		10000	2.2		0.0250	0.1252			0.143			0.143
68.5	76.5	3	28	SPT	28	125.0	62.6	20.0%	501	5119	544.0	3500		14000	2.7	1225000				0.043				0.043
76.5	79.5	1	11	SPT	11	125.0	62.6	20.0%	188	5463	474.6								37				0.035	0.035
79.5	89.5	3	32	SPT	32	125.0	62.6	20.0%	626	5870	408.5	4000		16000	2.7	1400000				0.035				0.035
89.5	96.5	3	32	SPT	32	125.0	62.6	20.0%	438	6402	341.0	4000		16000	2.5	1400000				0.020				0.020
96.5	101	2	32	SPT	32	125.0	62.6	20.0%	282	6762	304.4	4000		16000	2.4		0.0200	0.1000			0.021			0.021

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 22_Model 2***
REFERENCE BORIN	***CPT-AS-14 (Elev. 117.0 ft)***
Hammer Energy =	60%
GW Level (ft)=	9.3

Finish Grade Elev. (ft) =	118.16
Pile Cut-off Elev. (ft) =	108.15
Footing Depth (ft) =	10.01
Pile Length (ft)=	30
Width of Pile Group, B (ft)=	23.5
Length of Pile Group, L (ft)=	28
Permanent Load Pressure (kip)=	2830
Pile Tip Ele (ft)=	78.15

Eq. Footing Depth (ft	30.0
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG From	To	Soil Type	BLOW COUNT	SAMPLER TYPE	AVG SPT-N_{60}	γ_T (pcf)	γ' (pcf)	ω	σ_v' (psf)	σ_v' (psf)	$\Delta\sigma_v'$ (psf)	Su (psf)	Lab Su (psf)	Pp (psf)	OCR	E (psf)	Cr/1+e_0	Cc/1+e_0	C' (Hough Method)	Settlements (in) Elastic	OC	NC	SAND	Sum
0	9.3	3	12	SPT	12	125.0	125.0	20.0%	1163							525000								
9.3	13.5	3	12	SPT	12	125.0	62.6	20.0%	263							525000								
13.5	19.5	3	8	SPT	8	125.0	62.6	20.0%	376							350000								
19.5	24.5	2	8	SPT	8	125.0	62.6	20.0%	313															
24.5	34.5	3	16	SPT	16	125.0	62.6	20.0%	626	2599	1967.2	2000		8000	3.1	700000				0.151				0.151
34.5	44	3	16	SPT	16	125.0	62.6	20.0%	595	3037	1401.7	2000		8000	2.6	700000				0.228				0.228
44	50.5	1	6	SPT	6	125.0	62.6	20.0%	407	3538	1009.7								34				0.251	0.251
50.5	60.5	3	20	SPT	20	125.0	62.6	20.0%	626	4055	755.6	2500		10000	2.5	875000				0.104				0.104
60.5	68.5	2	20	SPT	20	125.0	62.6	20.0%	501	4618	574.2	2500		10000	2.2		0.0250	0.1252			0.122			0.122
68.5	76.5	3	28	SPT	28	125.0	62.6	20.0%	501	5119	462.7	3500		14000	2.7	1225000				0.036				0.036
76.5	79.5	1	11	SPT	11	125.0	62.6	20.0%	188	5463	403.9								37				0.030	0.030
79.5	89.5	3	32	SPT	32	125.0	62.6	20.0%	626	5870	347.7	4000		16000	2.7	1400000				0.030				0.030
89.5	96.5	3	32	SPT	32	125.0	62.6	20.0%	438	6402	290.4	4000		16000	2.5	1400000				0.017				0.017
96.5	101	2	32	SPT	32	125.0	62.6	20.0%	282	6762	259.3	4000		16000	2.4		0.0200	0.1000			0.018			0.018
																			Estimated Settlement (in)=	*0.6*	*0.1*	*0.0*	*0.3*	*0.99*

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 20% was estimated based on available test data.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 23, 24 & 25_Model 3***
REFERENCE BORIN	***CPT-AS-67 (Elev. 119.0 ft)***
Hammer Energy =	60%
GW Level (ft)=	11

Finish Grade Elev. (ft) =	118.5
Pile Cut-off Elev. (ft) =	108.5
Footing Depth (ft) =	10
Pile Length (ft)=	59
Width of Pile Group, B (ft)=	22
Length of Pile Group, L (ft)=	22
Permanent Load Pressure (kip)=	2800
Pile Tip Ele (ft)=	49.50

Eq. Footing Depth (ft	49.3
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	9.5	3	16	SPT	16	125.0	125.0	20.0%	1188							700000								
9.5	19.5	3	8	SPT	8	125.0	72.0	20.0%	720							350000								
19.5	29.5	3	12	SPT	12	125.0	62.6	20.0%	626							525000								
29.5	38.5	3	14	SPT	14	125.0	62.6	20.0%	563							630000								
38.5	47.5	2	14	SPT	14	125.0	62.6	20.0%	563															
47.5	52.5	1	6	SPT	6	125.0	62.6	20.0%	313	3874	1496.9								34				0.161	0.161
52.5	62.5	2	20	SPT	20	125.0	62.6	20.0%	626	4286	1127.5	2500		10000	2.3		0.0250	0.1252			0.305			0.305
62.5	72.5	2	20	SPT	20	125.0	62.6	20.0%	626	4912	782.1	2500		10000	2.0		0.0250	0.1252			0.193			0.193
72.5	82.5	2	20	SPT	20	125.0	62.6	20.0%	626	5538	574.2	2500		10000	1.8		0.0250	0.1252			0.129			0.129
82.5	89.5	2	20	SPT	20	125.0	62.6	20.0%	438	6070	456.3	2500		10000	1.6		0.0200	0.1000			0.053			0.053
89.5	99.5	2	24	SPT	24	125.0	62.6	20.0%	626	6602	371.4	3000		12000	1.8		0.0250	0.1252			0.071			0.071
99.5	109.5	2	24	SPT	24	125.0	62.6	20.0%	626	7228	298.6	3000		12000	1.7		0.0200	0.1000			0.042			0.042
109.5	119.5	3	24	SPT	24	125.0	62.6	20.0%	626	7854	245.3	3000		12000	1.5	1050000				0.028				0.028

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***	*Finish Grade Elev. (ft) =*	119	Eq. Footing Depth (ft	57.3
PROJECT NO.	***2017-125-GEO***	*Pile Cut-off Elev. (ft) =*	109	Settlement Limit (in)	1.0
STRUCTURE	***Bent 26 & 27_Model 3***	*Footing Depth (ft) =*	10		
REFERENCE BORIN	***AS-68 (Elev. 119.5 ft)***	*Pile Length (ft)=*	71		
Hammer Energy =	72%	*Width of Pile Group, B (ft)=*	22		
GW Level (ft)=	9.5	*Length of Pile Group, L (ft)=*	22		
		Permanent Load Pressure (kip)=	2800		
		Pile Tip Ele (ft)=	38.00	*Cr/Cc=*	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	7.5	3	29	MC	23	125.0	125.0	22.9%	938				2910	11640		990999								
7.5	12.5	3	8	MC	6	125.0	87.6	29.1%	438							273379								
12.5	17.5	2	13	MC	10	125.0	62.6	29.0%	313				880	3520										
17.5	22.5	2	8	MC	6	125.0	62.6	27.0%	313															
22.5	29	3	23	MC	18	125.0	62.6	24.7%	407				2450	9800		785965								
29	33	2	1	SPT	1	125.0	62.6	25.1%	250															
33	40.5	1	20	MC	16	125.0	62.6	18.4%	470															
40.5	42.5	3	22	MC	17	125.0	62.6	20.0%	125							751793								
42.5	50.5	1	13	MC	10	125.0	62.6	21.6%	501															
50.5	52.5	2	11	SPT	13	125.0	62.6	19.2%	125															
52.5	57.5	2	16	MC	12	125.0	62.6	22.1%	313	4187	1337.8	1562	810	3240	0.8		0.0279	0.1396				0.034		0.034
57.5	63	2	29	MC	23	125.0	62.6	26.5%	344	4364	1186.3	2831		11326	2.6		0.0262	0.1309			0.180			0.180
63	68.5	2	21	MC	16	125.0	62.6	25.8%	344	4709	957.3	2050		8201	1.7		0.0262	0.1309			0.139			0.139
68.5	71.5	2	31	MC	24	125.0	62.6	22.3%	188	4975	822.9	3027		12107	2.4		0.0259	0.1294			0.062			0.062
71.5	78	2	28	MC	22	125.0	62.6	21.8%	407	5272	703.6	2734	2430	9720	1.8		0.0259	0.1294			0.110			0.110
78	85.5	2	26	MC	20	125.0	62.6	21.7%	470	5710	570.1	2539	1840	7360	1.3		0.0312	0.1561			0.116			0.116
85.5	97.5	2	31	MC	24	125.0	62.6	26.0%	751	6321	439.3	3027	2560	10240	1.6		0.0312	0.1561			0.131			0.131
97.5	103	3	47	MC	37	125.0	62.6	32.5%	344	6868	356.8	4589		18355	2.7	1606103				0.015				0.015
103	115.5	2	35	MC	27	125.0	62.6	30.1%	783	7432	294.0	3417	2740	10960	1.5		0.0246	0.1231			0.062			0.062
115.5	125.5	3	68	MC	53	125.0	62.6	19.2%	626	8136	236.4	6639		26557	3.3	2323723				0.012				0.012
125.5	135.5	3	55	MC	43	125.0	62.6	24.7%	626	8762	198.3	5370		21480	2.5	1879482				0.013				0.013
135.5	145.5	2	33	MC	26	125.0	62.6	25.5%	626	9388	168.7	3222	2000	8000	0.9		0.0200	0.1000				0.093		0.093
145.5	151	2	48	MC	37	125.0	62.6	19.5%	344	9873	150.1	4687		18746	1.9		0.0200	0.1000			0.009			0.009
																				Estimated Settlement (in)=	*0.0*	*0.8*	*0.1*	*0.0*	*0.98*

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 20% was estimated based on available test data.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***	*Finish Grade Elev. (ft) =*	119.5	Eq. Footing Depth (ft	44.0
PROJECT NO.	***2017-125-GEO***	*Pile Cut-off Elev. (ft) =*	109.5	Settlement Limit (in)	1.0
STRUCTURE	***Bent 28 & 29_Model 3***	*Footing Depth (ft) =*	10		
REFERENCE BORIN	***CPT-AS-69 (Elev. 119.5 ft)***	*Pile Length (ft)=*	51		
Hammer Energy =	60%	*Width of Pile Group, B (ft)=*	22		
GW Level (ft)=	21.5	*Length of Pile Group, L (ft)=*	22		
		Permanent Load Pressure (kip)=	2800		
		Pile Tip Ele (ft)=	58.50	*Cr/Cc=*	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	11	1	3	SPT	3	125.0	125.0	20.0%	1375															
11	21.5	2	8	SPT	8	125.0	125.0	20.0%	1313															
21.5	24	1	6	SPT	6	125.0	62.6	20.0%	157															
24	34	2	12	SPT	12	125.0	62.6	20.0%	626															
34	44	2	12	SPT	12	125.0	62.6	20.0%	626	4096	1840.9	1500		6000	1.5		0.0250	0.1252						0.000
44	53	2	12	SPT	12	125.0	62.6	20.0%	563	4378	1479.7	1500		6000	1.4		0.0250	0.1252			0.342			0.342
53	57	1	7	SPT	7	125.0	62.6	20.0%	250	4785	1120.0								34				0.129	0.129
57	67	2	16	SPT	16	125.0	62.6	20.0%	626	5223	861.8	2000		8000	1.5		0.0250	0.1252			0.199			0.199
67	77	2	16	SPT	16	125.0	62.6	20.0%	626	5849	623.7	2000		8000	1.4		0.0200	0.1000			0.106			0.106
77	87	2	16	SPT	16	125.0	62.6	20.0%	626	6475	472.3	2000		8000	1.2		0.0200	0.1000			0.073			0.073
87	95.5	2	16	SPT	16	125.0	62.6	20.0%	532	7054	376.4	2000		8000	1.1		0.0200	0.1000			0.046			0.046
95.5	115	1	14	SPT	14	125.0	62.6	20.0%	1221	7930	278.6								38				0.093	0.093
																				0.0	*0.8*	*0.0*	*0.2*	*0.99*

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 20% was estimated based on available test data.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.

Estimated Settlement (in)=

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 30 & 31_Model 3***
REFERENCE BORIN	***AS-70 (Elev. 120.5 ft)***
Hammer Energy =	72%
GW Level (ft)=	9.5

Finish Grade Elev. (ft) =	120
Pile Cut-off Elev. (ft) =	110.5
Footing Depth (ft) =	9.5
Pile Length (ft)=	64
Width of Pile Group, B (ft)=	22
Length of Pile Group, L (ft)=	22
Permanent Load Pressure (kip)=	2800
Pile Tip Ele (ft)=	46.50

Eq. Footing Depth (ft	52.2
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG From	To	Soil Type	BLOW COUNT	SAMPLER TYPE	AVG SPT-N_{60}	γ_T (pcf)	γ' (pcf)	ω	σ_v' (psf)	σ_v' (psf)	$\Delta\sigma_v'$ (psf)	Su (psf)	Lab Su (psf)	Pp (psf)	OCR	E (psf)	Cr/1+e_0	Cc/1+e_0	C' (Hough Method)	Settlements (in) Elastic	OC	NC	SAND	Sum
0	8	3	20	MC	16	125.0	125.0	21.8%	1000				3140	12560		683448								
8	12.5	1	7	MC	5	125.0	83.4	26.4%	375															
12.5	17.5	2	4	MC	3	125.0	62.6	30.6%	313				840	3360										
17.5	22.5	2	9	MC	7	125.0	62.6	30.0%	313															
22.5	27.5	2	7	SPT	8	125.0	62.6	29.5%	313															
27.5	32.5	3	19	MC	15	125.0	62.6	22.8%	313				1730	6920		649276								
32.5	37.5	2	15	MC	12	125.0	62.6	19.7%	313															
37.5	42.5	3	13	SPT	16	125.0	62.6	22.0%	313							683448								
42.5	49.5	3	48	MC	37	125.0	62.6	17.9%	438				2680	10720		1640275								
49.5	52.5	2	11	MC	9	125.0	62.6	21.7%	188	3869	1479.7	1074		4296	1.1		0.0254	0.1269			0.005	0.048		0.053
52.5	58	2	16	MC	12	125.0	62.6	17.9%	344	4051	1299.6	1562	1310	5240	1.3		0.0271	0.1354			0.200	0.081		0.281
58	64.5	1	37	SPT	44	125.0	62.6	14.3%	407	4427	1019.1								77				0.091	0.091
64.5	68	2	24	MC	19	125.0	62.6	24.1%	219	4740	849.3	2343		9373	2.0		0.0254	0.1269			0.076			0.076
68	72.5	1	26	MC	20	125.0	62.6	20.7%	282	4990	742.3								47				0.069	0.069
72.5	78	1	29	SPT	35	125.0	62.6	23.6%	344	5303	634.8								62				0.053	0.053
78	82.5	2	25	MC	20	125.0	62.6	20.9%	282	5616	549.0	2441	1560	6240	1.1		0.0211	0.1053			0.046			0.046
82.5	94	2	31	MC	24	125.0	62.6	23.5%	720	6117	444.0	3027		12107	2.0		0.0211	0.1053			0.088			0.088
94	106.5	1	34	SPT	41	125.0	62.6	12.1%	783	6868	335.0								63				0.049	0.049
106.5	116.5	2	46	MC	36	125.0	62.6	23.6%	626	7573	265.6	4491	2950	11800	1.6		0.0257	0.1287			0.046			0.046
116.5	125.5	2	36	MC	28	125.0	62.6	21.4%	563	8167	222.6	3515		14060	1.7		0.0282	0.1411			0.036			0.036
125.5	135.5	2	28	MC	22	125.0	62.6	21.8%	626	8762	189.2	2734	3120	12480	1.4		0.0282	0.1411			0.031			0.031
135.5	146.5	2	19	SPT	23	125.0	62.6	26.4%	689	9419	160.3	2854		11416	1.2		0.0200	0.1000			0.019			0.019
146.5	151	1	78	MC	61	125.0	62.6	17.7%	282	9905	143.0								72				0.005	0.005

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 32_Model 3***
REFERENCE BORIN	***AS-72 (Elev. 121.5 ft)***
Hammer Energy =	72%
GW Level (ft)=	8.5

Finish Grade Elev. (ft) =	120.24
Pile Cut-off Elev. (ft) =	110.5
Footing Depth (ft) =	9.74
Pile Length (ft)=	44
Width of Pile Group, B (ft)=	22
Length of Pile Group, L (ft)=	22
Permanent Load Pressure (kip)=	2800
Pile Tip Ele (ft)=	66.50

Eq. Footing Depth (ft	39.1
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	6.5	3	48	MC	37	125.0	125.0	18.2%	813				3510	14040		1640275								
6.5	11.5	3	13	MC	10	125.0	87.6	22.2%	438							444241								
11.5	15	1	6	MC	5	125.0	62.6	31.3%	219															
15	21.5	3	11	MC	9	125.0	62.6	36.2%	407							375896								
21.5	27	3	15	MC	12	125.0	62.6	25.6%	344				1530	6120		512586								
27	32.5	2	15	MC	12	125.0	62.6	23.7%	344															
32.5	36	2	6	SPT	7	125.0	62.6	21.8%	219															
36	42	1	40	SPT	48	125.0	62.6	11.3%	376	3068	1925.9								94				0.079	0.079
42	46.5	3	23	MC	18	125.0	62.6	15.6%	282	3300	1599.2	2246		8982	2.7	785965				0.110				0.110
46.5	50.5	3	28	MC	22	125.0	62.6	18.3%	250	3567	1317.9	2734	2230	8920	2.5	956827				0.066				0.066
50.5	57	1	38	MC	30	125.0	62.6	13.1%	407	3895	1062.2								61				0.133	0.133
57	61.5	1	35	SPT	42	125.0	62.6	18.2%	282	4239	866.6								75				0.058	0.058
61.5	73.5	2	18	MC	14	125.0	62.6	18.9%	751	4756	660.8	1757	1600	6400	1.3		0.0259	0.1294			0.211			0.211
73.5	81.5	1	42	MC	33	125.0	62.6	18.3%	501	5382	496.5								59				0.062	0.062
81.5	94.5	2	31	MC	24	125.0	62.6	21.7%	814	6039	382.2	3027	1610	6440	1.1		0.0265	0.1324			0.110			0.110
94.5	104.5	2	41	MC	32	125.0	62.6	20.5%	626	6759	297.0	4003		16012	2.4		0.0250	0.1252			0.056			0.056
104.5	114.5	2	28	SPT	34	125.0	62.6	22.9%	626	7385	244.1	4206		16823	2.3		0.0244	0.1222			0.041			0.041
114.5	124	3	40	SPT	48	125.0	62.6	20.0%	595	7995	205.1	6008		24033	3.0	2102917				0.011				0.011
124	134.5	2	44	MC	34	125.0	62.6	18.8%	657	8621	174.0	4296	3750	15000	1.7		0.0285	0.1423			0.031			0.031
134.5	144.5	2	40	MC	31	125.0	62.6	21.2%	626	9263	149.0	3905		15622	1.7		0.0200	0.1000			0.017			0.017
144.5	148.5	2	39	SPT	47	125.0	62.6	26.9%	250	9701	134.9	5858		23433	2.4		0.0200	0.1000			0.006			0.006

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***	*Finish Grade Elev. (ft) =*	121	Eq. Footing Depth (ft	47.3
PROJECT NO.	***2017-125-GEO***	*Pile Cut-off Elev. (ft) =*	111	Settlement Limit (in)	1.0
STRUCTURE	***Bent 33, 34 & 35_Model 4***	*Footing Depth (ft) =*	10		
REFERENCE BORIN	***AS-72 (Elev. 121.5 ft)***	*Pile Length (ft)=*	56		
Hammer Energy =	72%	*Width of Pile Group, B (ft)=*	22		
GW Level (ft)=	9.5	*Length of Pile Group, L (ft)=*	22		
		Permanent Load Pressure (kip)=	2840		
		Pile Tip Ele (ft)=	55.00	*Cr/Cc=*	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	Cr/1+e_0	Cc/1+e_0	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	7.5	3	48	MC	37	125.0	125.0	18.2%	938				3510	14040		1640275								
7.5	12.5	3	13	MC	10	125.0	87.6	22.2%	438							444241								
12.5	16	1	6	MC	5	125.0	62.6	31.3%	219															
16	22.5	3	11	MC	9	125.0	62.6	36.2%	407							375896								
22.5	28	3	15	MC	12	125.0	62.6	25.6%	344				1530	6120		512586								
28	33.5	2	15	MC	12	125.0	62.6	23.7%	344															
33.5	37	2	6	SPT	7	125.0	62.6	21.8%	219															
37	43	1	40	SPT	48	125.0	62.6	11.3%	376															
43	47.5	3	23	MC	18	125.0	62.6	15.6%	282	3561	1710.3	2246		8982	2.5	785965				0.004				0.004
47.5	51.5	3	28	MC	22	125.0	62.6	18.3%	250	3692	1547.9	2734	2230	8920	2.4	956827				0.078				0.078
51.5	58	1	38	MC	30	125.0	62.6	13.1%	407	4020	1228.4								61				0.149	0.149
58	62.5	1	35	SPT	42	125.0	62.6	18.2%	282	4364	989.1								74				0.065	0.065
62.5	74.5	2	18	MC	14	125.0	62.6	18.9%	751	4881	742.8	1757	1600	6400	1.3		0.0259	0.1294			0.229			0.229
74.5	82.5	1	42	MC	33	125.0	62.6	18.3%	501	5507	550.4								59				0.068	0.068
82.5	95.5	2	31	MC	24	125.0	62.6	21.7%	814	6164	419.0	3027	1610	6440	1.0		0.0265	0.1324			0.079	0.197		0.276
95.5	105.5	2	41	MC	32	125.0	62.6	20.5%	626	6884	322.6	4003		16012	2.3		0.0250	0.1252			0.060			0.060
105.5	115.5	2	28	SPT	34	125.0	62.6	22.9%	626	7510	263.4	4206		16823	2.2		0.0244	0.1222			0.044			0.044
115.5	125	3	40	SPT	48	125.0	62.6	20.0%	595	8120	220.1	6008		24033	3.0	2102917				0.012				0.012
125	135.5	2	44	MC	34	125.0	62.6	18.8%	657	8746	186.0	4296	3750	15000	1.7		0.0285	0.1423			0.033			0.033
135.5	145.5	2	40	MC	31	125.0	62.6	21.2%	626	9388	158.6	3905		15622	1.7		0.0200	0.1000			0.017			0.017
145.5	149.5	2	39	SPT	47	125.0	62.6	26.9%	250	9826	143.2	5858		23433	2.4		0.0200	0.1000			0.006			0.006

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***	*Finish Grade Elev. (ft) =*	121	Eq. Footing Depth (ft	45.3
PROJECT NO.	***2017-125-GEO***	*Pile Cut-off Elev. (ft) =*	111	Settlement Limit (in)	1.0
STRUCTURE	***Bent 36, 37, 38 & 39_Model 4***	*Footing Depth (ft) =*	10		
REFERENCE BORIN	***AS-74 (Elev. 121.0 ft)***	*Pile Length (ft)=*	53		
Hammer Energy =	75%	*Width of Pile Group, B (ft)=*	22		
GW Level (ft)=	10	*Length of Pile Group, L (ft)=*	22		
		Permanent Load Pressure (kip)=	2840		
		Pile Tip Ele (ft)=	58.00	*Cr/Cc=*	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	Cr/1+e_0	Cc/1+e_0	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	8	3	29	MC	24	125.0	125.0	24.1%	1000				3060	12240		1034983								
8	13.5	1	19	MC	15	125.0	85.3	27.7%	469															
13.5	18.5	3	12	MC	10	125.0	62.6	26.8%	313				1060	4240		428269								
18.5	23.5	2	10	MC	8	125.0	62.6	39.4%	313															
23.5	28.5	3	16	MC	13	125.0	62.6	36.5%	313				1530	6120		571025								
28.5	33.5	2	26	MC	21	125.0	62.6	24.9%	313				670	2680										
33.5	38.5	2	15	MC	12	125.0	62.6	23.0%	313															
38.5	43.5	2	22	MC	18	125.0	62.6	23.8%	313				1140	4560										
43.5	48.5	2	21	MC	17	125.0	62.6	21.1%	313	3561	1669.1	2141		8565	2.4		0.0233	0.1167			0.148			0.148
48.5	53.5	2	34	MC	28	125.0	62.6	23.7%	313	3817	1381.9	3467	1930	7720	2.0		0.0250	0.1249			0.201			0.201
53.5	58.5	3	35	MC	29	125.0	62.6	20.3%	313	4130	1121.0	3569		14276	3.5	1249117				0.054				0.054
58.5	63.5	2	23	MC	19	125.0	62.6	18.1%	313	4443	927.6	2345		9381	2.1		0.0250	0.1249			0.123			0.123
63.5	71	3	52	MC	42	125.0	62.6	16.6%	470	4834	748.8	5302		21210	4.4	1855831				0.036				0.036
71	74.5	1	42	MC	34	125.0	62.6	19.9%	219	5178	631.1								61				0.034	0.034
74.5	78.5	2	30	MC	24	125.0	62.6	22.9%	250	5413	566.0	3059	2010	8040	1.5		0.0247	0.1235			0.051			0.051
78.5	88.5	2	32	MC	26	125.0	62.6	19.3%	626	5851	468.8	3263		13052	2.2		0.0254	0.1270			0.102			0.102
88.5	96	2	37	MC	30	125.0	62.6	25.0%	470	6399	378.8	3773	1670	6680	1.0		0.0254	0.1270			0.043	0.072		0.115
96	106	2	43	MC	35	125.0	62.6	20.7%	626	6947	312.5	4385	2450	9800	1.4		0.0235	0.1173			0.054			0.054
106	116	2	36	MC	29	125.0	62.6	22.6%	626	7573	256.0	3671	3900	15600	2.1		0.0235	0.1173			0.041			0.041
116	129	1	70	SPT	88	125.0	62.6	16.9%	814	8293	208.1								103				0.016	0.016
129	137	3	41	SPT	51	125.0	62.6	22.8%	501	8950	175.2	6432		25728	2.9	2251156				0.007				0.007
137	147.5	1	90	SPT	113	125.0	62.6	16.3%	657	9529	152.2								121				0.007	0.007
147.5	151.5	3	78	MC	64	125.0	62.6	27.5%	250	9983	137.3	7954		31814	3.2	2783747				0.002				0.002
																			Estimated Settlement (in)=	*0.1*	*0.8*	*0.1*	*0.1*	*0.99*

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 20% was estimated based on available test data.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME ***Eastridge BART Regional Connector***
PROJECT NO. ***2017-125-GEO***
STRUCTURE ***Bent 40, 41 & 42_Model 4***
REFERENCE BORIN ***AS-76 (Elev. 120.5 ft)***
Hammer Energy = 72%
GW Level (ft)= 9.5

Finish Grade Elev. (ft) = 120.5
Pile Cut-off Elev. (ft) = 110.15
Footing Depth (ft) = 10.35
Pile Length (ft)= 74
Width of Pile Group, B (ft)= 26
Length of Pile Group, L (ft)= 26.5
Permanent Load Pressure (kip)= 2800
Pile Tip Ele (ft)= 36.15

Eq. Footing Depth (ft 59.7
Settlement Limit (in) 1.0

Cr/Cc= 20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	Cr/1+e_0	Cc/1+e_0	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	8.5	3	9	MC	7	125.0	125.0	24.0%	1063				1630	6520		307552								
8.5	13	1	7	MC	5	125.0	76.5	23.5%	344															
13	18.5	1	8	MC	6	125.0	62.6	19.8%	344															
18.5	23.5	1	4	SPT	5	125.0	62.6	17.5%	313															
23.5	28.5	2	10	MC	8	125.0	62.6	27.9%	313				1190	4760										
28.5	33.5	2	13	MC	10	125.0	62.6	24.5%	313															
33.5	38.5	2	17	MC	13	125.0	62.6	24.0%	313															
38.5	43.5	2	9	MC	7	125.0	62.6	22.5%	313				510	2040										
43.5	48.5	2	19	MC	15	125.0	62.6	22.7%	313				1300	5200										
48.5	53.5	2	20	MC	16	125.0	62.6	21.2%	313															
53.5	58.5	1	19	SPT	23	125.0	62.6	17.9%	313															
58.5	63.5	2	23	MC	18	125.0	62.6	22.1%	313	4448	1003.4	2246	910	3640	0.8		0.0232	0.1162				0.470		0.470
63.5	68.5	3	36	MC	28	125.0	62.6	19.8%	313	4724	854.8	3515		14060	3.0	1230206				0.042				0.042
68.5	72	1	30	SPT	36	125.0	62.6	16.4%	219	4990	740.7								64				0.039	0.039
72	78	2	29	MC	23	125.0	62.6	19.1%	376	5288	638.3	2831	2370	9480	1.8		0.0266	0.1329			0.095			0.095
78	86	2	31	MC	24	125.0	62.6	23.1%	501	5726	522.1	3027		12107	2.1		0.0269	0.1344			0.098			0.098
86	97	2	22	SPT	26	125.0	62.6	24.2%	689	6321	409.1	3305		13218	2.1		0.0269	0.1344			0.097			0.097
97	106	3	34	SPT	41	125.0	62.6	23.7%	563	6947	325.6	5107		20428	2.9	1787479				0.020				0.020
106	119	2	33	MC	26	125.0	62.6	20.0%	814	7635	260.2	3222		12888	1.7		0.0238	0.1192			0.054			0.054
119	126	2	61	MC	48	125.0	62.6	17.6%	438	8261	216.5	5956	2240	8960	1.1		0.0266	0.1332			0.025			0.025
126	134	2	45	MC	35	125.0	62.6	20.7%	501	8731	190.5	4394		17574	2.0		0.0266	0.1332			0.024			0.024
134	145	1	48	SPT	58	125.0	62.6	23.2%	689	9326	163.8								71				0.014	0.014
145	151.5	2	46	MC	36	125.0	62.6	18.2%	407	9873	143.9	4491		17965	1.8		0.0200	0.1000			0.010			0.010

Estimated Settlement (in)= *0.1* *0.4* *0.5* *0.1* *0.99*

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 20% was estimated based on available test data.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***	*Finish Grade Elev. (ft) =*	120.13
PROJECT NO.	***2017-125-GEO***	*Pile Cut-off Elev. (ft) =*	110.39
STRUCTURE	***Bent 43_Model 5***	*Footing Depth (ft) =*	9.74
REFERENCE BORIN	***AS-76 (Elev. 120.5 ft)***	*Pile Length (ft)=*	75
Hammer Energy =	72%	*Width of Pile Group, B (ft)=*	28
GW Level (ft)=	9.5	*Length of Pile Group, L (ft)=*	28
		Permanent Load Pressure (kip)=	3020
		Pile Tip Ele (ft)=	35.39

Eq. Footing Depth (ft	59.7
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG													Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	γ_T (pcf)	γ' (pcf)	ω	σ_v' (psf)	σ_v' (psf)	$\Delta\sigma_v'$ (psf)	Su (psf)	Lab Su (psf)	Pp (psf)	OCR	E (psf)	Cr/1+e_0	Cc/1+e_0	C' (Hough Method)	Elastic	OC	NC	SAND	Sum
0	8.5	3	9	MC	7	125.0	125.0	24.0%	1063				1630	6520		307552								
8.5	13	1	7	MC	5	125.0	76.5	23.5%	344															
13	18.5	1	8	MC	6	125.0	62.6	19.8%	344															
18.5	23.5	1	4	SPT	5	125.0	62.6	17.5%	313															
23.5	28.5	2	10	MC	8	125.0	62.6	27.9%	313				1190	4760										
28.5	33.5	2	13	MC	10	125.0	62.6	24.5%	313															
33.5	38.5	2	17	MC	13	125.0	62.6	24.0%	313															
38.5	43.5	2	9	MC	7	125.0	62.6	22.5%	313				510	2040										
43.5	48.5	2	19	MC	15	125.0	62.6	22.7%	313				1300	5200										
48.5	53.5	2	20	MC	16	125.0	62.6	21.2%	313															
53.5	58.5	1	19	SPT	23	125.0	62.6	17.9%	313															
58.5	63.5	2	23	MC	18	125.0	62.6	22.1%	313	4450	1002.7	2246	910	3640	0.8		0.0232	0.1162				0.462		0.462
63.5	68.5	3	36	MC	28	125.0	62.6	19.8%	313	4724	860.0	3515		14060	3.0	1230206				0.042				0.042
68.5	72	1	30	SPT	36	125.0	62.6	16.4%	219	4990	748.7								64				0.040	0.040
72	78	2	29	MC	23	125.0	62.6	19.1%	376	5288	648.1	2831	2370	9480	1.8		0.0266	0.1329			0.096			0.096
78	86	2	31	MC	24	125.0	62.6	23.1%	501	5726	533.2	3027		12107	2.1		0.0269	0.1344			0.100			0.100
86	97	2	22	SPT	26	125.0	62.6	24.2%	689	6321	420.4	3305		13218	2.1		0.0269	0.1344			0.099			0.099
97	106	3	34	SPT	41	125.0	62.6	23.7%	563	6947	336.3	5107		20428	2.9	1787479				0.020				0.020
106	119	2	33	MC	26	125.0	62.6	20.0%	814	7635	270.0	3222		12888	1.7		0.0238	0.1192			0.056			0.056
119	126	2	61	MC	48	125.0	62.6	17.6%	438	8261	225.4	5956	2240	8960	1.1		0.0266	0.1332			0.026			0.026
126	134	2	45	MC	35	125.0	62.6	20.7%	501	8731	198.8	4394		17574	2.0		0.0266	0.1332			0.025			0.025
134	145	1	48	SPT	58	125.0	62.6	23.2%	689	9326	171.3								71				0.015	0.015
145	151.5	2	46	MC	36	125.0	62.6	18.2%	407	9873	150.8	4491		17965	1.8		0.0200	0.1000			0.010			0.010

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 44_Model 5***
REFERENCE BORIN	***CPT-AS-77 (Elev. 120.0 ft)***
Hammer Energy =	60%
GW Level (ft)=	5.5

Finish Grade Elev. (ft) =	120.06
Pile Cut-off Elev. (ft) =	109.94
Footing Depth (ft) =	10.12
Pile Length (ft)=	62
Width of Pile Group, B (ft)=	22
Length of Pile Group, L (ft)=	22
Permanent Load Pressure (kip)=	2700
Pile Tip Ele (ft)=	47.94

Eq. Footing Depth (ft	51.5
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	5.5	1	3	SPT	3	125.0	125.0	20.0%	688															
5.5	11	1	3	SPT	3	125.0	62.6	20.0%	344															
11	14	2	6	SPT	6	125.0	62.6	20.0%	188															
14	19	1	5	SPT	5	125.0	62.6	20.0%	313															
19	26	2	12	SPT	12	125.0	62.6	20.0%	438															
26	33	2	12	SPT	12	125.0	62.6	20.0%	438															
33	40	2	12	SPT	12	125.0	62.6	20.0%	438															
40	45	1	7	SPT	7	125.0	62.6	20.0%	313															
45	55	1	8	SPT	8	125.0	62.6	20.0%	626	3675	1367.1								36				0.162	0.162
55	65	1	8	SPT	8	125.0	62.6	20.0%	626	4099	1029.4								36				0.329	0.329
65	72	1	9	SPT	9	125.0	62.6	20.0%	438	4631	757.2								36				0.153	0.153
72	80	2	20	SPT	20	125.0	62.6	20.0%	501	5101	597.7	2500		10000	2.0		0.0250	0.1252			0.116			0.116
80	88	2	20	SPT	20	125.0	62.6	20.0%	501	5602	477.3	2500		10000	1.8		0.0250	0.1252			0.085			0.085
88	96	2	20	SPT	20	125.0	62.6	20.0%	501	6102	389.9	2500		10000	1.6		0.0250	0.1252			0.065			0.065
96	105	2	20	SPT	20	125.0	62.6	20.0%	563	6635	321.0	2500		10000	1.5		0.0250	0.1252			0.055			0.055
105	110	1	13	SPT	13	125.0	62.6	20.0%	313	7073	277.1								38				0.027	0.027
																				0.0	*0.3*	*0.0*	*0.7*	*0.99*

Estimated Settlement (in)=

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 20% was estimated based on available test data.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 45_Model 5***
REFERENCE BORIN	***CPT-AS-77 (Elev. 120.0 ft)***
Hammer Energy =	60%
GW Level (ft)=	6

Finish Grade Elev. (ft) =	120.36
Pile Cut-off Elev. (ft) =	109.79
Footing Depth (ft) =	10.57
Pile Length (ft)=	59
Width of Pile Group, B (ft)=	27
Length of Pile Group, L (ft)=	27
Permanent Load Pressure (kip)=	3010
Pile Tip Ele (ft)=	50.79

Eq. Footing Depth (ft	49.9
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	6	1	3	SPT	3	125.0	125.0	20.0%	750															
6	11.5	1	3	SPT	3	125.0	62.6	20.0%	344															
11.5	14.5	2	6	SPT	6	125.0	62.6	20.0%	188															
14.5	19.5	1	5	SPT	5	125.0	62.6	20.0%	313															
19.5	26.5	2	12	SPT	12	125.0	62.6	20.0%	438															
26.5	33.5	2	12	SPT	12	125.0	62.6	20.0%	438															
33.5	40.5	2	12	SPT	12	125.0	62.6	20.0%	438															
40.5	45.5	1	7	SPT	7	125.0	62.6	20.0%	313															
45.5	55.5	1	8	SPT	8	125.0	62.6	20.0%	626	3674	1230.2								36				0.234	0.234
55.5	65.5	1	8	SPT	8	125.0	62.6	20.0%	626	4162	917.9								35				0.293	0.293
65.5	72.5	1	9	SPT	9	125.0	62.6	20.0%	438	4694	696.0								36				0.140	0.140
72.5	80.5	2	20	SPT	20	125.0	62.6	20.0%	501	5163	560.8	2500		10000	1.9		0.0250	0.1252			0.108			0.108
80.5	88.5	2	20	SPT	20	125.0	62.6	20.0%	501	5664	455.8	2500		10000	1.8		0.0250	0.1252			0.081			0.081
88.5	96.5	2	20	SPT	20	125.0	62.6	20.0%	501	6165	377.8	2500		10000	1.6		0.0250	0.1252			0.062			0.062
96.5	105.5	2	20	SPT	20	125.0	62.6	20.0%	563	6697	314.9	2500		10000	1.5		0.0250	0.1252			0.054			0.054
105.5	110.5	1	13	SPT	13	125.0	62.6	20.0%	313	7135	274.3								38				0.026	0.026

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 46_Model 5***
REFERENCE BORIN	***AS-80 (Elev. 121.5 ft)***
Hammer Energy =	72%
GW Level (ft)=	8.5

Finish Grade Elev. (ft) =	120.52
Pile Cut-off Elev. (ft) =	110.52
Footing Depth (ft) =	10
Pile Length (ft)=	69
Width of Pile Group, B (ft)=	32.5
Length of Pile Group, L (ft)=	32.5
Permanent Load Pressure (kip)=	3750
Pile Tip Ele (ft)=	41.52

Eq. Footing Depth (ft	56.0
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	8	3	7	MC	5	125.0	125.0	23.0%	1000				1250	5000		239207								
8	13	2	5	MC	4	125.0	68.8	32.5%	344				840	3360										
13	18	1	15	MC	12	125.0	62.6	18.3%	313															
18	23	2	6	MC	5	125.0	62.6	25.0%	313															
23	28	2	13	MC	10	125.0	62.6	23.3%	313															
28	33	3	16	MC	12	125.0	62.6	26.3%	313				1910	7640		546758								
33	38	2	11	MC	9	125.0	62.6	29.1%	313				720	2880										
38	43	2	11	MC	9	125.0	62.6	25.7%	313															
43	48	2	15	MC	12	125.0	62.6	12.8%	313				1050	4200										
48	53	2	24	MC	19	125.0	62.6	24.7%	313				1420	5680										
53	58	2	7	SPT	8	125.0	62.6	22.0%	313	4099	1174.7	1051		4206	1.0		0.0256	0.1282			0.007	0.302		0.309
58	63	2	31	MC	24	125.0	62.6	18.4%	313	4318	1041.7	3027	1670	6680	1.5		0.0231	0.1156			0.130			0.130
63	68	2	28	MC	22	125.0	62.6	21.2%	313	4631	887.6	2734		10935	2.4		0.0231	0.1156			0.106			0.106
68	73	2	30	MC	23	125.0	62.6	16.2%	313	4944	765.3	2929		11716	2.4		0.0234	0.1172			0.088			0.088
73	77.5	1	52	SPT	62	125.0	62.6	17.7%	282	5241	671.1								93				0.030	0.030
77.5	83	3	44	MC	34	125.0	62.6	16.8%	344	5554	589.6	4296		17184	3.1	1503585				0.026				0.026
83	88	2	26	MC	20	125.0	62.6	24.0%	313	5883	519.0	2539	2230	8920	1.5		0.0254	0.1269			0.056			0.056
88	95.5	2	37	MC	29	125.0	62.6	20.7%	470	6274	450.4	3613		14450	2.3		0.0248	0.1239			0.067			0.067
95.5	105.5	2	37	MC	29	125.0	62.6	20.1%	626	6822	375.0	3613		14450	2.1		0.0248	0.1239			0.069			0.069
105.5	115.5	1	100	MC	78	125.0	62.6	19.5%	626	7448	309.9								97				0.022	0.022
115.5	125.5	2	46	MC	36	125.0	62.6	18.5%	626	8074	260.4	4491		17965	2.2		0.0255	0.1274			0.042			0.042
125.5	135.5	2	23	SPT	28	125.0	62.6	20.9%	626	8700	221.9	3455		13819	1.6		0.0200	0.1000			0.026			0.026
135.5	146.5	3	59	MC	46	125.0	62.6	17.4%	689	9357	190.0	5760		23042	2.5	2016171				0.012				0.012
																				Estimated Settlement (in)=	*0.0*	*0.6*	*0.3*	*0.1*	*0.98*

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 20% was estimated based on available test data.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***	*Finish Grade Elev. (ft) =*	121.08	Eq. Footing Depth (ft	57.0
PROJECT NO.	***2017-125-GEO***	*Pile Cut-off Elev. (ft) =*	110.08	Settlement Limit (in)	1.0
STRUCTURE	***Bent 47_Model 5***	*Footing Depth (ft) =*	11		
REFERENCE BORIN	***AS-80 (Elev. 121.5 ft)***	*Pile Length (ft)=*	69		
Hammer Energy =	72%	*Width of Pile Group, B (ft)=*	32.5		
GW Level (ft)=	9	*Length of Pile Group, L (ft)=*	32.5		
		Permanent Load Pressure (kip)=	3870		
		Pile Tip Ele (ft)=	41.08	*Cr/Cc=*	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	8.5	3	7	MC	5	125.0	125.0	23.0%	1063				1250	5000		239207								
8.5	13.5	2	5	MC	4	125.0	68.8	32.5%	344				840	3360										
13.5	18.5	1	15	MC	12	125.0	62.6	18.3%	313															
18.5	23.5	2	6	MC	5	125.0	62.6	25.0%	313															
23.5	28.5	2	13	MC	10	125.0	62.6	23.3%	313															
28.5	33.5	3	16	MC	12	125.0	62.6	26.3%	313				1910	7640		546758								
33.5	38.5	2	11	MC	9	125.0	62.6	29.1%	313				720	2880										
38.5	43.5	2	11	MC	9	125.0	62.6	25.7%	313															
43.5	48.5	2	15	MC	12	125.0	62.6	12.8%	313				1050	4200										
48.5	53.5	2	24	MC	19	125.0	62.6	24.7%	313				1420	5680										
53.5	58.5	2	7	SPT	8	125.0	62.6	22.0%	313	4177	1223.1	1051		4206	1.0		0.0256	0.1282			0.001	0.250		0.252
58.5	63.5	2	31	MC	24	125.0	62.6	18.4%	313	4380	1093.1	3027	1670	6680	1.5		0.0231	0.1156			0.134			0.134
63.5	68.5	2	28	MC	22	125.0	62.6	21.2%	313	4693	930.2	2734		10935	2.3		0.0231	0.1156			0.109			0.109
68.5	73.5	2	30	MC	23	125.0	62.6	16.2%	313	5006	801.2	2929		11716	2.3		0.0234	0.1172			0.091			0.091
73.5	78	1	52	SPT	62	125.0	62.6	17.7%	282	5304	702.0								93				0.031	0.031
78	83.5	3	44	MC	34	125.0	62.6	16.8%	344	5617	616.2	4296		17184	3.1	1503585				0.027				0.027
83.5	88.5	2	26	MC	20	125.0	62.6	24.0%	313	5945	542.0	2539	2230	8920	1.5		0.0254	0.1269			0.058			0.058
88.5	96	2	37	MC	29	125.0	62.6	20.7%	470	6336	469.9	3613		14450	2.3		0.0248	0.1239			0.069			0.069
96	106	2	37	MC	29	125.0	62.6	20.1%	626	6884	390.9	3613		14450	2.1		0.0248	0.1239			0.071			0.071
106	116	1	100	MC	78	125.0	62.6	19.5%	626	7510	322.8								97				0.023	0.023
116	126	2	46	MC	36	125.0	62.6	18.5%	626	8136	271.0	4491		17965	2.2		0.0255	0.1274			0.044			0.044
126	136	2	23	SPT	28	125.0	62.6	20.9%	626	8762	230.8	3455		13819	1.6		0.0200	0.1000			0.027			0.027
136	147	2	59	MC	46	125.0	62.6	17.4%	689	9420	197.4	5760		23042	2.4		0.0200	0.1000			0.024			0.024
																				Estimated Settlement (in)=	*0.0*	*0.6*	*0.3*	*0.1*	*0.96*

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 20% was estimated based on available test data.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 48_Model 5***
REFERENCE BORIN	***AS-80 (Elev. 121.5 ft)***
Hammer Energy =	72%
GW Level (ft)=	9

Finish Grade Elev. (ft) =	120.79
Pile Cut-off Elev. (ft) =	110.54
Footing Depth (ft) =	10.25
Pile Length (ft)=	69
Width of Pile Group, B (ft)=	22
Length of Pile Group, L (ft)=	26.5
Permanent Load Pressure (kip)=	2750
Pile Tip Ele (ft)=	41.54

Eq. Footing Depth (ft	56.3
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG													Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	γ_T (pcf)	γ' (pcf)	ω	σ_v' (psf)	σ_v' (psf)	$\Delta\sigma_v'$ (psf)	Su (psf)	Lab Su (psf)	Pp (psf)	OCR	E (psf)	Cr/1+e_0	Cc/1+e_0	C' (Hough Method)	Elastic	OC	NC	SAND	Sum
0	8.5	3	7	MC	5	125.0	125.0	23.0%	1063				1250	5000		239207								
8.5	13.5	2	5	MC	4	125.0	68.8	32.5%	344				840	3360										
13.5	18.5	1	15	MC	12	125.0	62.6	18.3%	313															
18.5	23.5	2	6	MC	5	125.0	62.6	25.0%	313															
23.5	28.5	2	13	MC	10	125.0	62.6	23.3%	313															
28.5	33.5	3	16	MC	12	125.0	62.6	26.3%	313				1910	7640		546758								
33.5	38.5	2	11	MC	9	125.0	62.6	29.1%	313				720	2880										
38.5	43.5	2	11	MC	9	125.0	62.6	25.7%	313															
43.5	48.5	2	15	MC	12	125.0	62.6	12.8%	313				1050	4200										
48.5	53.5	2	24	MC	19	125.0	62.6	24.7%	313				1420	5680										
53.5	58.5	2	7	SPT	8	125.0	62.6	22.0%	313	4153	1177.7	1051		4206	1.0		0.0256	0.1282			0.004	0.356		0.360
58.5	63.5	2	31	MC	24	125.0	62.6	18.4%	313	4380	1018.9	3027	1670	6680	1.5		0.0231	0.1156			0.126			0.126
63.5	68.5	2	28	MC	22	125.0	62.6	21.2%	313	4693	847.7	2734		10935	2.3		0.0231	0.1156			0.100			0.100
68.5	73.5	2	30	MC	23	125.0	62.6	16.2%	313	5006	716.3	2929		11716	2.3		0.0234	0.1172			0.082			0.082
73.5	78	1	52	SPT	62	125.0	62.6	17.7%	282	5304	617.9								93				0.028	0.028
78	83.5	3	44	MC	34	125.0	62.6	16.8%	344	5617	534.7	4296		17184	3.1	1503585				0.023				0.023
83.5	88.5	2	26	MC	20	125.0	62.6	24.0%	313	5945	464.2	2539	2230	8920	1.5		0.0254	0.1269			0.050			0.050
88.5	96	2	37	MC	29	125.0	62.6	20.7%	470	6336	397.1	3613		14450	2.3		0.0248	0.1239			0.059			0.059
96	106	2	37	MC	29	125.0	62.6	20.1%	626	6884	325.1	3613		14450	2.1		0.0248	0.1239			0.060			0.060
106	116	1	100	MC	78	125.0	62.6	19.5%	626	7510	264.5								97				0.019	0.019
116	126	2	46	MC	36	125.0	62.6	18.5%	626	8136	219.3	4491		17965	2.2		0.0255	0.1274			0.035			0.035
126	136	2	23	SPT	28	125.0	62.6	20.9%	626	8762	184.8	3455		13819	1.6		0.0200	0.1000			0.022			0.022
136	147	2	59	MC	46	125.0	62.6	17.4%	689	9420	156.7	5760		23042	2.4		0.0200	0.1000			0.019			0.019
																			Estimated Settlement (in)=	*0.0*	*0.6*	*0.4*	*0.0*	*0.98*

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 20% was estimated based on available test data.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***	*Finish Grade Elev. (ft) =*	121.19	Eq. Footing Depth (ft	56.7
PROJECT NO.	***2017-125-GEO***	*Pile Cut-off Elev. (ft) =*	110.49	Settlement Limit (in)	1.0
STRUCTURE	***Bent 49_Model 5***	*Footing Depth (ft) =*	10.7		
REFERENCE BORIN	***AS-80 (Elev. 121.5 ft)***	*Pile Length (ft)=*	69		
Hammer Energy =	72%	*Width of Pile Group, B (ft)=*	22		
GW Level (ft)=	9	*Length of Pile Group, L (ft)=*	26.5		
		Permanent Load Pressure (kip)=	2900		
		Pile Tip Ele (ft)=	41.49	*Cr/Cc=*	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	8.5	3	7	MC	5	125.0	125.0	23.0%	1063				1250	5000		239207								
8.5	13.5	2	5	MC	4	125.0	68.8	32.5%	344				840	3360										
13.5	18.5	1	15	MC	12	125.0	62.6	18.3%	313															
18.5	23.5	2	6	MC	5	125.0	62.6	25.0%	313															
23.5	28.5	2	13	MC	10	125.0	62.6	23.3%	313															
28.5	33.5	3	16	MC	12	125.0	62.6	26.3%	313				1910	7640		546758								
33.5	38.5	2	11	MC	9	125.0	62.6	29.1%	313				720	2880										
38.5	43.5	2	11	MC	9	125.0	62.6	25.7%	313															
43.5	48.5	2	15	MC	12	125.0	62.6	12.8%	313				1050	4200										
48.5	53.5	2	24	MC	19	125.0	62.6	24.7%	313				1420	5680										
53.5	58.5	2	7	SPT	8	125.0	62.6	22.0%	313	4167	1253.6	1051		4206	1.0		0.0256	0.1282			0.002	0.305		0.307
58.5	63.5	2	31	MC	24	125.0	62.6	18.4%	313	4380	1093.4	3027	1670	6680	1.5		0.0231	0.1156			0.134			0.134
63.5	68.5	2	28	MC	22	125.0	62.6	21.2%	313	4693	908.3	2734		10935	2.3		0.0231	0.1156			0.107			0.107
68.5	73.5	2	30	MC	23	125.0	62.6	16.2%	313	5006	766.5	2929		11716	2.3		0.0234	0.1172			0.087			0.087
73.5	78	1	52	SPT	62	125.0	62.6	17.7%	282	5304	660.5								93				0.030	0.030
78	83.5	3	44	MC	34	125.0	62.6	16.8%	344	5617	571.0	4296		17184	3.1	1503585				0.025				0.025
83.5	88.5	2	26	MC	20	125.0	62.6	24.0%	313	5945	495.3	2539	2230	8920	1.5		0.0254	0.1269			0.053			0.053
88.5	96	2	37	MC	29	125.0	62.6	20.7%	470	6336	423.3	3613		14450	2.3		0.0248	0.1239			0.063			0.063
96	106	2	37	MC	29	125.0	62.6	20.1%	626	6884	346.2	3613		14450	2.1		0.0248	0.1239			0.063			0.063
106	116	1	100	MC	78	125.0	62.6	19.5%	626	7510	281.4								97				0.020	0.020
116	126	2	46	MC	36	125.0	62.6	18.5%	626	8136	233.2	4491		17965	2.2		0.0255	0.1274			0.038			0.038
126	136	2	23	SPT	28	125.0	62.6	20.9%	626	8762	196.4	3455		13819	1.6		0.0200	0.1000			0.023			0.023
136	147	2	59	MC	46	125.0	62.6	17.4%	689	9420	166.4	5760		23042	2.4		0.0200	0.1000			0.020			0.020

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 50_Model 5***
REFERENCE BORIN	***CPT-AS-81 (Elev. 122.5 ft)***
Hammer Energy =	60%
GW Level (ft)=	4.2

Finish Grade Elev. (ft) =	121.35
Pile Cut-off Elev. (ft) =	112.05
Footing Depth (ft) =	9.3
Pile Length (ft)=	57
Width of Pile Group, B (ft)=	22
Length of Pile Group, L (ft)=	26.5
Permanent Load Pressure (kip)=	2600
Pile Tip Ele (ft)=	55.05

Eq. Footing Depth (ft	47.3
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	4.2	1	3	SPT	3	125.0	125.0	20.0%	525															
4.2	8	1	3	SPT	3	125.0	62.6	20.0%	238															
8	14	2	8	SPT	8	125.0	62.6	20.0%	376															
14	18	1	4	SPT	4	125.0	62.6	20.0%	250															
18	26	2	8	SPT	8	125.0	62.6	20.0%	501															
26	34	2	8	SPT	8	125.0	62.6	20.0%	501															
34	41	2	8	SPT	8	125.0	62.6	20.0%	438															
41	47	1	6	SPT	6	125.0	62.6	20.0%	376															
47	55	2	12	SPT	12	125.0	62.6	20.0%	501	3464	1174.7	1500		6000	1.7		0.0250	0.1252			0.293			0.293
55	63	2	16	SPT	16	125.0	62.6	20.0%	501	3955	862.5	2000		8000	2.0		0.0250	0.1252			0.206			0.206
63	71	2	16	SPT	16	125.0	62.6	20.0%	501	4456	657.0	2000		8000	1.8		0.0250	0.1252			0.144			0.144
71	79	2	16	SPT	16	125.0	62.6	20.0%	501	4957	517.0	2000		8000	1.6		0.0250	0.1252			0.104			0.104
79	87	2	20	SPT	20	125.0	62.6	20.0%	501	5458	417.5	2500		10000	1.8		0.0250	0.1252			0.077			0.077
87	95	2	20	SPT	20	125.0	62.6	20.0%	501	5959	344.1	2500		10000	1.7		0.0250	0.1252			0.059			0.059
95	103	2	20	SPT	20	125.0	62.6	20.0%	501	6459	288.6	2500		10000	1.5		0.0250	0.1252			0.046			0.046
103	111	1	13	SPT	13	125.0	62.6	20.0%	501	6960	245.4								38				0.038	0.038
111	119	2	24	SPT	24	125.0	62.6	20.0%	501	7461	211.3	3000		12000	1.6		0.0200	0.1000			0.023			0.023

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 51_Model 5***
REFERENCE BORIN	***CPT-AS-81 (Elev. 122.5 ft)***
Hammer Energy =	60%
GW Level (ft)=	4.2

Finish Grade Elev. (ft) =	121.79
Pile Cut-off Elev. (ft) =	111.79
Footing Depth (ft) =	10
Pile Length (ft)=	58
Width of Pile Group, B (ft)=	27
Length of Pile Group, L (ft)=	27
Permanent Load Pressure (kip)=	2960
Pile Tip Ele (ft)=	53.79

Eq. Footing Depth (ft	48.7
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	4.2	1	3	SPT	3	125.0	125.0	20.0%	525															
4.2	8	1	3	SPT	3	125.0	62.6	20.0%	238															
8	14	2	8	SPT	8	125.0	62.6	20.0%	376															
14	18	1	4	SPT	4	125.0	62.6	20.0%	250															
18	26	2	8	SPT	8	125.0	62.6	20.0%	501															
26	34	2	8	SPT	8	125.0	62.6	20.0%	501															
34	41	2	8	SPT	8	125.0	62.6	20.0%	438															
41	47	1	6	SPT	6	125.0	62.6	20.0%	376															
47	55	2	12	SPT	12	125.0	62.6	20.0%	501	3507	1208.0	1500		6000	1.7		0.0250	0.1252			0.245			0.245
55	63	2	16	SPT	16	125.0	62.6	20.0%	501	3955	921.8	2000		8000	2.0		0.0250	0.1252			0.219			0.219
63	71	2	16	SPT	16	125.0	62.6	20.0%	501	4456	707.8	2000		8000	1.8		0.0250	0.1252			0.154			0.154
71	79	2	16	SPT	16	125.0	62.6	20.0%	501	4957	560.6	2000		8000	1.6		0.0250	0.1252			0.112			0.112
79	87	2	20	SPT	20	125.0	62.6	20.0%	501	5458	454.9	2500		10000	1.8		0.0250	0.1252			0.084			0.084
87	95	2	20	SPT	20	125.0	62.6	20.0%	501	5959	376.5	2500		10000	1.7		0.0250	0.1252			0.064			0.064
95	103	2	20	SPT	20	125.0	62.6	20.0%	501	6459	316.8	2500		10000	1.5		0.0250	0.1252			0.050			0.050
103	111	1	13	SPT	13	125.0	62.6	20.0%	501	6960	270.2								38				0.042	0.042
111	119	2	24	SPT	24	125.0	62.6	20.0%	501	7461	233.2	3000		12000	1.6		0.0200	0.1000			0.026			0.026

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 20% was estimated based on available test data.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.

Estimated Settlement (in)=	*0.0*	*1.0*	*0.0*	*0.0*	*0.99*

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 52_Model 5***
REFERENCE BORIN	***AS-82 (Elev. 122.5 ft)***
Hammer Energy =	75%
GW Level (ft)=	8.5

Finish Grade Elev. (ft) =	121.89
Pile Cut-off Elev. (ft) =	109.87
Footing Depth (ft) =	12.02
Pile Length (ft)=	80
Width of Pile Group, B (ft)=	28
Length of Pile Group, L (ft)=	28
Permanent Load Pressure (kip)=	3290
Pile Tip Ele (ft)=	29.87

Eq. Footing Depth (ft	65.4
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	7.5	2	8	MC	7	125.0	125.0	23.2%	938				750	3000										
7.5	12.5	2	6	MC	5	125.0	75.1	30.2%	375															
12.5	17.5	2	5	MC	4	125.0	62.6	24.5%	313				750	3000										
17.5	23	2	11	MC	9	125.0	62.6	24.3%	344															
23	28	2	11	MC	9	125.0	62.6	30.7%	313				1300	5200										
28	33.5	2	10	MC	8	125.0	62.6	26.5%	344															
33.5	37.5	2	15	MC	12	125.0	62.6	30.4%	250				1530	6120										
37.5	42.5	2	11	MC	9	125.0	62.6	22.1%	313															
42.5	47.5	2	8	MC	7	125.0	62.6	27.0%	313				640	2560										
47.5	52.5	2	5	MC	4	125.0	62.6	27.7%	313				390	1560										
52.5	57.5	2	25	MC	20	125.0	62.6	23.8%	313															
57.5	62.5	2	19	MC	15	125.0	62.6	19.6%	313															
62.5	67.5	2	20	MC	16	125.0	62.6	24.3%	313	4689	1058.9	2039	980	3920	0.8		0.0249	0.1247				0.284		0.284
67.5	73.5	3	42	MC	34	125.0	62.6	19.8%	376	4944	919.6	4283		17131	3.5	1498941				0.044				0.044
73.5	75.8	3	47	MC	38	125.0	62.6	19.3%	144	5203	804.1	4793		19170	3.7	1677386				0.013				0.013
75.8	78.5	1	47	MC	38	125.0	62.6	12.3%	169	5360	744.8								65				0.028	0.028
78.5	82.5	2	32	MC	26	125.0	62.6	22.2%	250	5570	675.0	3263	880	3520	0.6		0.0254	0.1269				0.303		0.303
82.5	94.5	2	50	MC	41	125.0	62.6	20.7%	751	6071	543.4	5098	2970	11880	2.0		0.0282	0.1409			0.151			0.151
94.5	105.5	2	50	MC	41	125.0	62.6	25.1%	689	6790	412.4	5098	2400	9600	1.4		0.0282	0.1409			0.095			0.095
105.5	115.5	3	46	MC	38	125.0	62.6	26.3%	626	7448	330.2	4691		18762	2.5	1641697				0.024				0.024
115.5	125.5	3	49	MC	40	125.0	62.6	20.4%	626	8074	272.8	4996		19986	2.5	1748764				0.019				0.019
125.5	135.5	1	58	SPT	73	125.0	62.6	19.9%	626	8700	229.2								86				0.016	0.016
135.5	147.5	1	88	SPT	110	125.0	62.6	13.0%	751	9388	192.3								119				0.011	0.011

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***	*Finish Grade Elev. (ft) =*	122.66	Eq. Footing Depth (ft	65.5
PROJECT NO.	***2017-125-GEO***	*Pile Cut-off Elev. (ft) =*	111.82	Settlement Limit (in)	1.0
STRUCTURE	***Bent 53_Model 5***	*Footing Depth (ft) =*	10.84		
REFERENCE BORIN	***AS-82 (Elev. 122.5 ft)***	*Pile Length (ft)=*	82		
Hammer Energy =	75%	*Width of Pile Group, B (ft)=*	22		
GW Level (ft)=	9	*Length of Pile Group, L (ft)=*	22		
		Permanent Load Pressure (kip)=	2660		
		Pile Tip Ele (ft)=	29.82	*Cr/Cc=*	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	8	2	8	MC	7	125.0	125.0	23.2%	1000				750	3000										
8	13	2	6	MC	5	125.0	75.1	30.2%	375															
13	18	2	5	MC	4	125.0	62.6	24.5%	313				750	3000										
18	23.5	2	11	MC	9	125.0	62.6	24.3%	344															
23.5	28.5	2	11	MC	9	125.0	62.6	30.7%	313				1300	5200										
28.5	34	2	10	MC	8	125.0	62.6	26.5%	344															
34	38	2	15	MC	12	125.0	62.6	30.4%	250				1530	6120										
38	43	2	11	MC	9	125.0	62.6	22.1%	313															
43	48	2	8	MC	7	125.0	62.6	27.0%	313				640	2560										
48	53	2	5	MC	4	125.0	62.6	27.7%	313				390	1560										
53	58	2	25	MC	20	125.0	62.6	23.8%	313															
58	63	2	19	MC	15	125.0	62.6	19.6%	313															
63	68	2	20	MC	16	125.0	62.6	24.3%	313	4740	1039.7	2039	980	3920	0.8		0.0249	0.1247				0.321		0.321
68	74	3	42	MC	34	125.0	62.6	19.8%	376	5006	884.9	4283		17131	3.4	1498941				0.043				0.043
74	76.3	3	47	MC	38	125.0	62.6	19.3%	144	5266	764.8	4793		19170	3.6	1677386				0.013				0.013
76.3	79	1	47	MC	38	125.0	62.6	12.3%	169	5422	703.8								65				0.026	0.026
79	83	2	32	MC	26	125.0	62.6	22.2%	250	5632	633.0	3263	880	3520	0.6		0.0254	0.1269				0.282		0.282
83	95	2	50	MC	41	125.0	62.6	20.7%	751	6133	501.5	5098	2970	11880	1.9		0.0282	0.1409			0.138			0.138
95	106	2	50	MC	41	125.0	62.6	25.1%	689	6853	374.1	5098	2400	9600	1.4		0.0282	0.1409			0.086			0.086
106	116	3	46	MC	38	125.0	62.6	26.3%	626	7510	295.8	4691		18762	2.5	1641697				0.022				0.022
116	126	3	49	MC	40	125.0	62.6	20.4%	626	8136	242.1	4996		19986	2.5	1748764				0.017				0.017
126	136	1	58	SPT	73	125.0	62.6	19.9%	626	8762	201.7								86				0.014	0.014
136	148	1	88	SPT	110	125.0	62.6	13.0%	751	9451	168.0								119				0.009	0.009

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 54_Model 5***
REFERENCE BORIN	***AS-80 (Elev. 121.5 ft)***
Hammer Energy =	72%
GW Level (ft)=	10.5

Finish Grade Elev. (ft) =	122.33
Pile Cut-off Elev. (ft) =	111.77
Footing Depth (ft) =	10.56
Pile Length (ft)=	71
Width of Pile Group, B (ft)=	32.5
Length of Pile Group, L (ft)=	32.5
Permanent Load Pressure (kip)=	3620
Pile Tip Ele (ft)=	40.77

Eq. Footing Depth (ft	57.9
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	10	3	7	MC	5	125.0	125.0	23.0%	1250				1250	5000		239207								
10	15	2	5	MC	4	125.0	68.8	32.5%	344				840	3360										
15	20	1	15	MC	12	125.0	62.6	18.3%	313															
20	25	2	6	MC	5	125.0	62.6	25.0%	313															
25	30	2	13	MC	10	125.0	62.6	23.3%	313															
30	35	3	16	MC	12	125.0	62.6	26.3%	313				1910	7640		546758								
35	40	2	11	MC	9	125.0	62.6	29.1%	313				720	2880										
40	45	2	11	MC	9	125.0	62.6	25.7%	313															
45	50	2	15	MC	12	125.0	62.6	12.8%	313				1050	4200										
50	55	2	24	MC	19	125.0	62.6	24.7%	313				1420	5680										
55	60	2	7	SPT	8	125.0	62.6	22.0%	313	4345	1105.6	1051		4345	1.0		0.0256	0.1282				0.319		0.319
60	65	2	31	MC	24	125.0	62.6	18.4%	313	4568	980.1	3027	1670	6680	1.5		0.0231	0.1156			0.117			0.117
65	70	2	28	MC	22	125.0	62.6	21.2%	313	4881	836.8	2734		10935	2.2		0.0231	0.1156			0.095			0.095
70	75	2	30	MC	23	125.0	62.6	16.2%	313	5194	722.7	2929		11716	2.3		0.0234	0.1172			0.080			0.080
75	79.5	1	52	SPT	62	125.0	62.6	17.7%	282	5491	634.7								92				0.028	0.028
79.5	85	3	44	MC	34	125.0	62.6	16.8%	344	5804	558.3	4296		17184	3.0	1503585				0.025				0.025
85	90	2	26	MC	20	125.0	62.6	24.0%	313	6133	492.0	2539	2230	8920	1.5		0.0254	0.1269			0.051			0.051
90	97.5	2	37	MC	29	125.0	62.6	20.7%	470	6524	427.5	3613		14450	2.2		0.0248	0.1239			0.061			0.061
97.5	107.5	2	37	MC	29	125.0	62.6	20.1%	626	7072	356.5	3613		14450	2.0		0.0248	0.1239			0.064			0.064
107.5	117.5	1	100	MC	78	125.0	62.6	19.5%	626	7698	295.0								96				0.020	0.020
117.5	127.5	2	46	MC	36	125.0	62.6	18.5%	626	8324	248.2	4491		17965	2.2		0.0255	0.1274			0.039			0.039
127.5	137.5	2	23	SPT	28	125.0	62.6	20.9%	626	8950	211.7	3455		13819	1.5		0.0200	0.1000			0.024			0.024
137.5	148.5	2	59	MC	46	125.0	62.6	17.4%	689	9607	181.4	5760		23042	2.4		0.0200	0.1000			0.021			0.021
																				Estimated Settlement (in)=	*0.0*	*0.6*	*0.3*	*0.0*	*0.94*

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 20% was estimated based on available test data.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 55_Model 6***
REFERENCE BORIN	***AS-80 (Elev. 121.5 ft)***
Hammer Energy =	72%
GW Level (ft)=	10.5

Finish Grade Elev. (ft) =	122.32
Pile Cut-off Elev. (ft) =	113.57
Footing Depth (ft) =	8.75
Pile Length (ft)=	73
Width of Pile Group, B (ft)=	22
Length of Pile Group, L (ft)=	22
Permanent Load Pressure (kip)=	2580
Pile Tip Ele (ft)=	40.57

Eq. Footing Depth (ft	57.4
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	10	3	7	MC	5	125.0	125.0	23.0%	1250				1250	5000		239207								
10	15	2	5	MC	4	125.0	68.8	32.5%	344				840	3360										
15	20	1	15	MC	12	125.0	62.6	18.3%	313															
20	25	2	6	MC	5	125.0	62.6	25.0%	313															
25	30	2	13	MC	10	125.0	62.6	23.3%	313															
30	35	3	16	MC	12	125.0	62.6	26.3%	313				1910	7640		546758								
35	40	2	11	MC	9	125.0	62.6	29.1%	313				720	2880										
40	45	2	11	MC	9	125.0	62.6	25.7%	313															
45	50	2	15	MC	12	125.0	62.6	12.8%	313				1050	4200										
50	55	2	24	MC	19	125.0	62.6	24.7%	313				1420	5680										
55	60	2	7	SPT	8	125.0	62.6	22.0%	313	4330	1137.5	1051		4330	1.0		0.0256	0.1282				0.402		0.402
60	65	2	31	MC	24	125.0	62.6	18.4%	313	4568	975.9	3027	1670	6680	1.5		0.0231	0.1156			0.117			0.117
65	70	2	28	MC	22	125.0	62.6	21.2%	313	4881	810.6	2734		10935	2.2		0.0231	0.1156			0.093			0.093
70	75	2	30	MC	23	125.0	62.6	16.2%	313	5194	684.0	2929		11716	2.3		0.0234	0.1172			0.076			0.076
75	79.5	1	52	SPT	62	125.0	62.6	17.7%	282	5491	589.3								92				0.026	0.026
79.5	85	3	44	MC	34	125.0	62.6	16.8%	344	5804	509.4	4296		17184	3.0	1503585				0.022				0.022
85	90	2	26	MC	20	125.0	62.6	24.0%	313	6133	441.8	2539	2230	8920	1.5		0.0254	0.1269			0.046			0.046
90	97.5	2	37	MC	29	125.0	62.6	20.7%	470	6524	377.5	3613		14450	2.2		0.0248	0.1239			0.054			0.054
97.5	107.5	2	37	MC	29	125.0	62.6	20.1%	626	7072	308.7	3613		14450	2.0		0.0248	0.1239			0.055			0.055
107.5	117.5	1	100	MC	78	125.0	62.6	19.5%	626	7698	250.8								96				0.017	0.017
117.5	127.5	2	46	MC	36	125.0	62.6	18.5%	626	8324	207.8	4491		17965	2.2		0.0255	0.1274			0.033			0.033
127.5	137.5	2	23	SPT	28	125.0	62.6	20.9%	626	8950	175.0	3455		13819	1.5		0.0200	0.1000			0.020			0.020
137.5	148.5	2	59	MC	46	125.0	62.6	17.4%	689	9607	148.3	5760		23042	2.4		0.0200	0.1000			0.018			0.018

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***	*Finish Grade Elev. (ft) =*	123	Eq. Footing Depth (ft	50.2
PROJECT NO.	***2017-125-GEO***	*Pile Cut-off Elev. (ft) =*	113.5	Settlement Limit (in)	1.0
STRUCTURE	***Bent 56 & 57_Model 6***	*Footing Depth (ft) =*	9.5		
REFERENCE BORIN	***AS-84 (Elev. 124 ft)***	*Pile Length (ft)=*	61		
Hammer Energy =	75%	*Width of Pile Group, B (ft)=*	22		
GW Level (ft)=	8	*Length of Pile Group, L (ft)=*	22		
		Permanent Load Pressure (kip)=	2580		
		Pile Tip Ele (ft)=	52.50	*Cr/Cc=*	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	7.5	3	7	MC	6	125.0	125.0	12.9%	938							249823								
7.5	12	3	9	MC	7	125.0	69.5	29.4%	313							321202								
12	17.5	3	16	MC	13	125.0	62.6	22.2%	344							571025								
17.5	22.5	3	27	MC	22	125.0	62.6	19.8%	313							963605								
22.5	27.5	3	15	MC	12	125.0	62.6	26.3%	313				1300	5200		535336								
27.5	32.5	3	22	MC	18	125.0	62.6	24.6%	313				1600	6400		785159								
32.5	37.5	3	23	MC	19	125.0	62.6	29.1%	313							820848								
37.5	42.5	2	19	MC	15	125.0	62.6	22.5%	313				1400	5600										
42.5	47.5	3	25	MC	20	125.0	62.6	23.0%	313							892227								
47.5	52.5	2	23	MC	19	125.0	62.6	19.9%	313	3713	1363.5	2345	1800	7200	1.9		0.0301	0.1503			0.114			0.114
52.5	57.5	1	39	MC	32	125.0	62.6	14.0%	313	3942	1159.7								64				0.105	0.105
57.5	62.5	2	21	MC	17	125.0	62.6	21.6%	313	4255	948.1	2141		8565	2.0		0.0301	0.1503			0.158			0.158
62.5	67.5	2	21	MC	17	125.0	62.6	21.3%	313	4568	789.5	2141	1300	5200	1.1		0.0301	0.1503			0.101	0.117		0.218
67.5	71	2	26	MC	21	125.0	62.6	30.1%	219	4834	684.0	2651		10605	2.2		0.0266	0.1332			0.064			0.064
71	77	1	35	MC	29	125.0	62.6	19.2%	376	5132	589.3								55				0.061	0.061
77	85	2	42	MC	34	125.0	62.6	23.2%	501	5570	481.9	4283	2500	10000	1.8		0.0297	0.1483			0.103			0.103
85	96	3	42	MC	34	125.0	62.6	17.2%	689	6165	377.5	4283		17131	2.8	1498941				0.033				0.033
96	105	2	39	MC	32	125.0	62.6	29.3%	563	6791	300.5	3977	2770	11080	1.6		0.0241	0.1203			0.049			0.049
105	118	2	61	MC	50	125.0	62.6	16.6%	814	7479	240.1	6220	2700	10800	1.4		0.0241	0.1203			0.052			0.052
118	125	1	95	MC	77	125.0	62.6	18.1%	438	8105	199.7								93				0.010	0.010
125	133	1	55	SPT	69	125.0	62.6	22.1%	501	8575	175.7								83				0.010	0.010
133	144	1	100	MC	82	125.0	62.6	10.8%	689	9169	151.1								93				0.010	0.010
144	150.5	1	88	MC	72	125.0	62.6	22.3%	407	9717	132.7								82				0.006	0.006

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 20% was estimated based on available test data.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.

Estimated Settlement (in)=	*0.0*	*0.6*	*0.1*	*0.2*	*0.99*

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 58_Model 6***
REFERENCE BORIN	***CPT-AS-85 (Elev. 125.0 ft)***
Hammer Energy =	60%
GW Level (ft)=	4.5

Finish Grade Elev. (ft) =	124.13
Pile Cut-off Elev. (ft) =	113.72
Footing Depth (ft) =	10.41
Pile Length (ft)=	53
Width of Pile Group, B (ft)=	23.5
Length of Pile Group, L (ft)=	28
Permanent Load Pressure (kip)=	2600
Pile Tip Ele (ft)=	60.72

Eq. Footing Depth (ft	45.7
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	4.8	1	3	SPT	3	125.0	121.1	20.0%	581															
4.8	11.5	1	3	SPT	3	125.0	62.6	20.0%	419															
11.5	19.5	3	6	SPT	6	125.0	62.6	20.0%	501							280000								
19.5	26.5	1	4	SPT	4	125.0	62.6	20.0%	438															
26.5	36.5	2	8	SPT	8	125.0	62.6	20.0%	626															
36.5	45.5	2	8	SPT	8	125.0	62.6	20.0%	563															
45.5	52.5	2	12	SPT	12	125.0	62.6	20.0%	438	3356	1190.1	1500		6000	1.8		0.0250	0.1252			0.268			0.268
52.5	59.5	2	12	SPT	12	125.0	62.6	20.0%	438	3786	904.1	1500		6000	1.6		0.0250	0.1252			0.196			0.196
59.5	69.5	2	20	SPT	20	125.0	62.6	20.0%	626	4319	673.5	2500		10000	2.3		0.0250	0.1252			0.189			0.189
69.5	79.5	2	20	SPT	20	125.0	62.6	20.0%	626	4945	499.6	2500		10000	2.0		0.0250	0.1252			0.126			0.126
79.5	89.5	2	24	SPT	24	125.0	62.6	20.0%	626	5571	385.3	3000		12000	2.2		0.0250	0.1252			0.087			0.087
89.5	99.5	2	24	SPT	24	125.0	62.6	20.0%	626	6197	306.2	3000		12000	1.9		0.0250	0.1252			0.063			0.063
99.5	109.5	2	24	SPT	24	125.0	62.6	20.0%	626	6823	249.2	3000		12000	1.8		0.0200	0.1000			0.037			0.037
109.5	119.5	2	24	SPT	24	125.0	62.6	20.0%	626	7449	206.7	3000		12000	1.6		0.0200	0.1000			0.029			0.029

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 20% was estimated based on available test data.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.

	Elastic	OC	NC	SAND	Sum
Estimated Settlement (in)=	*0.0*	*1.0*	*0.0*	*0.0*	*0.99*

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 58 & 59_Model 6***
REFERENCE BORIN	***CPT-AS-85 (Elev. 125.0 ft)***
Hammer Energy =	60%
GW Level (ft)=	4.5

Finish Grade Elev. (ft) =	124.72
Pile Cut-off Elev. (ft) =	115.28
Footing Depth (ft) =	9.44
Pile Length (ft)=	59
Width of Pile Group, B (ft)=	22
Length of Pile Group, L (ft)=	22
Permanent Load Pressure (kip)=	2600
Pile Tip Ele (ft)=	56.28

Eq. Footing Depth (ft	48.8
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	4.8	1	3	SPT	3	125.0	121.1	20.0%	581															
4.8	11.5	1	3	SPT	3	125.0	62.6	20.0%	419															
11.5	19.5	3	6	SPT	6	125.0	62.6	20.0%	501							280000								
19.5	26.5	1	4	SPT	4	125.0	62.6	20.0%	438															
26.5	36.5	2	8	SPT	8	125.0	62.6	20.0%	626															
36.5	45.5	2	8	SPT	8	125.0	62.6	20.0%	563															
45.5	52.5	2	12	SPT	12	125.0	62.6	20.0%	438	3451	1372.1	1500		6000	1.7		0.0250	0.1252			0.163			0.163
52.5	59.5	2	12	SPT	12	125.0	62.6	20.0%	438	3786	1087.6	1500		6000	1.6		0.0250	0.1252			0.231			0.231
59.5	69.5	2	20	SPT	20	125.0	62.6	20.0%	626	4319	789.3	2500		10000	2.3		0.0250	0.1252			0.219			0.219
69.5	79.5	2	20	SPT	20	125.0	62.6	20.0%	626	4945	572.5	2500		10000	2.0		0.0250	0.1252			0.143			0.143
79.5	89.5	2	24	SPT	24	125.0	62.6	20.0%	626	5571	434.1	3000		12000	2.2		0.0250	0.1252			0.098			0.098
89.5	99.5	2	24	SPT	24	125.0	62.6	20.0%	626	6197	340.4	3000		12000	1.9		0.0250	0.1252			0.070			0.070
99.5	109.5	2	24	SPT	24	125.0	62.6	20.0%	626	6823	274.1	3000		12000	1.8		0.0200	0.1000			0.041			0.041
109.5	119.5	2	24	SPT	24	125.0	62.6	20.0%	626	7449	225.4	3000		12000	1.6		0.0200	0.1000			0.031			0.031
																			Estimated Settlement (in)=	*0.0*	*1.0*	*0.0*	*0.0*	*1.00*

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 20% was estimated based on available test data.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***	*Finish Grade Elev. (ft) =*	125.5	Eq. Footing Depth (ft	56.2
PROJECT NO.	***2017-125-GEO***	*Pile Cut-off Elev. (ft) =*	116	Settlement Limit (in)	1.0
STRUCTURE	***Bent 60 & 61_Model 6***	*Footing Depth (ft) =*	9.5		
REFERENCE BORIN	***AS-86 (Elev. 126.5 ft)***	*Pile Length (ft)=*	70		
Hammer Energy =	75%	*Width of Pile Group, B (ft)=*	22		
GW Level (ft)=	10	*Length of Pile Group, L (ft)=*	22		
		Permanent Load Pressure (kip)=	2580		
		Pile Tip Ele (ft)=	46.00	*Cr/Cc=*	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	7.5	3	9	MC	7	125.0	125.0	19.2%	938				760	3040		321202								
7.5	12.5	3	9	MC	7	125.0	93.8	25.7%	469							321202								
12.5	17.5	2	5	MC	4	125.0	62.6	22.7%	313				650	2600										
17.5	23	3	15	SPT	19	125.0	62.6	20.0%	344							823594								
23	27.5	2	10	MC	8	125.0	62.6	28.1%	282															
27.5	32.5	2	15	MC	12	125.0	62.6	29.3%	313															
32.5	37.5	2	16	MC	13	125.0	62.6	28.3%	313				1330	5320										
37.5	42.5	2	17	MC	14	125.0	62.6	26.0%	313															
42.5	47.5	3	22	MC	18	125.0	62.6	20.4%	313							785159								
47.5	52.5	2	18	MC	15	125.0	62.6	23.4%	313															
52.5	55.5	1	11	SPT	14	125.0	62.6	20.3%	188															
55.5	62	2	33	MC	27	125.0	62.6	22.2%	407	4323	1108.2	3365	1630	6520	1.5		0.0275	0.1376			0.191			0.191
62	67	1	67	MC	55	125.0	62.6	15.6%	313	4662	895.8								88				0.052	0.052
67	72.5	2	15	SPT	19	125.0	62.6	25.0%	344	4990	743.3	2353		9413	1.9		0.0243	0.1217			0.097			0.097
72.5	77	1	66	MC	54	125.0	62.6	17.3%	282	5303	631.5								83				0.032	0.032
77	84	3	47	MC	38	125.0	62.6	18.6%	438	5663	531.6	4793		19170	3.4	1677386				0.027				0.027
84	95	2	35	MC	29	125.0	62.6	22.1%	689	6227	416.9	3569	1300	5200	0.8		0.0244	0.1221				0.454		0.454
95	103	1	41	MC	33	125.0	62.6	18.8%	501	6821	331.9								56				0.035	0.035
103	115	2	35	MC	29	125.0	62.6	17.4%	751	7447	267.7	3569	2720	10880	1.5		0.0238	0.1189			0.053			0.053
115	127	2	45	MC	37	125.0	62.6	17.5%	751	8199	212.6	4589		18354	2.2		0.0200	0.1000			0.032			0.032
127	137	1	58	SPT	73	125.0	62.6	19.2%	626	8887	175.7								86				0.012	0.012
137	145	3	74	MC	60	125.0	62.6	6.6%	501	9451	152.3	7546		30183	3.2	2640991				0.006				0.006
145	150.5	3	73	MC	60	125.0	62.6	20.5%	344	9873	137.6	7444		29775	3.0	2605302				0.003				0.003

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 62 & 63_Model 6***
REFERENCE BORIN	***CPT-AS-87 (Elev. 127.0 ft)***
Hammer Energy =	60%
GW Level (ft)=	7

Finish Grade Elev. (ft) =	127
Pile Cut-off Elev. (ft) =	117
Footing Depth (ft) =	10
Pile Length (ft)=	58
Width of Pile Group, B (ft)=	22
Length of Pile Group, L (ft)=	22
Permanent Load Pressure (kip)=	2630
Pile Tip Ele (ft)=	59.00

Eq. Footing Depth (ft	48.7
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	7.5	3	6	SPT	6	125.0	120.8	20.0%	906							280000								
7.5	13.5	1	3	SPT	3	125.0	62.6	20.0%	376															
13.5	20	2	5	SPT	5	125.0	62.6	20.0%	407															
20	24.5	1	5	SPT	5	125.0	62.6	20.0%	282															
24.5	34.5	2	8	SPT	8	125.0	62.6	20.0%	626															
34.5	44	2	8	SPT	8	125.0	62.6	20.0%	595															
44	50	1	9	SPT	9	125.0	62.6	20.0%	376	3525	1490.9								37				0.066	0.066
50	57	2	16	SPT	16	125.0	62.6	20.0%	438	3786	1234.0	2000		8000	2.1		0.0250	0.1252			0.258			0.258
57	59	1	10	SPT	10	125.0	62.6	20.0%	125	4068	1024.5								38				0.062	0.062
59	69	2	16	SPT	16	125.0	62.6	20.0%	626	4443	819.0	2000		8000	1.8		0.0250	0.1252			0.221			0.221
69	80	2	16	SPT	16	125.0	62.6	20.0%	689	5101	583.0	2000		8000	1.6		0.0250	0.1252			0.155			0.155
80	90	2	24	SPT	24	125.0	62.6	20.0%	626	5758	436.0	3000		12000	2.1		0.0250	0.1252			0.095			0.095
90	100	2	24	SPT	24	125.0	62.6	20.0%	626	6384	342.2	3000		12000	1.9		0.0250	0.1252			0.068			0.068
100	110	2	24	SPT	24	125.0	62.6	20.0%	626	7010	275.7	3000		12000	1.7		0.0200	0.1000			0.040			0.040
110	120	2	24	SPT	24	125.0	62.6	20.0%	626	7636	226.9	3000		12000	1.6		0.0200	0.1000			0.031			0.031

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 64_Model 6***
REFERENCE BORIN	***AS-88 (Elev. 128.0 ft)***
Hammer Energy =	75%
GW Level (ft)=	11.5

Finish Grade Elev. (ft) =	127.98
Pile Cut-off Elev. (ft) =	117.85
Footing Depth (ft) =	10.13
Pile Length (ft)=	38
Width of Pile Group, B (ft)=	22
Length of Pile Group, L (ft)=	22
Permanent Load Pressure (kip)=	2500
Pile Tip Ele (ft)=	79.85

Eq. Footing Depth (ft	35.5
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	6.5	3	8	MC	7	125.0	125.0	16.2%	813							285513								
6.5	13.5	3	12	MC	10	125.0	107.2	21.6%	750							428269								
13.5	18.5	1	7	MC	6	125.0	62.6	22.6%	313															
18.5	23.5	3	15	MC	12	125.0	62.6	28.9%	313				1500	6000		535336								
23.5	28.5	2	14	MC	11	125.0	62.6	26.3%	313				950	3800										
28.5	33.5	3	15	MC	12	125.0	62.6	29.4%	313				1800	7200		535336								
33.5	38.5	3	23	MC	19	125.0	62.6	27.2%	313	3033	1909.3	2345	1950	7800	2.6	820848				0.085				0.085
38.5	43.5	3	27	MC	22	125.0	62.6	26.4%	313	3284	1546.7	2753		11013	3.4	963605				0.096				0.096
43.5	48.5	1	19	MC	15	125.0	62.6	15.0%	313	3597	1223.5								45				0.169	0.169
48.5	53.5	1	35	MC	29	125.0	62.6	13.8%	313	3910	991.9								60				0.098	0.098
53.5	58.5	1	29	MC	24	125.0	62.6	19.4%	313	4223	820.4								53				0.088	0.088
58.5	63	3	23	SPT	29	125.0	62.6	20.7%	282	4521	695.5	3608		14433	3.2	1262844				0.030				0.030
63	68	1	62	SPT	78	125.0	62.6	10.5%	313	4818	597.2								117				0.026	0.026
68	73	2	16	SPT	20	125.0	62.6	23.4%	313	5131	514.6	2510		10040	2.0		0.0218	0.1091			0.054			0.054
73	78	3	24	SPT	30	125.0	62.6	21.3%	313	5444	448.0	3765		15060	2.8	1317750				0.020				0.020
78	85	1	100	MC	82	125.0	62.6	13.6%	438	5820	383.8								112				0.021	0.021
85	96	2	72	MC	59	125.0	62.6	17.8%	689	6383	310.7	7342	2300	9200	1.4		0.0252	0.1259			0.069			0.069
96	106	3	75	MC	61	125.0	62.6	20.3%	626	7040	249.0	7648		30591	4.3	2676680				0.011				0.011
106	116	2	32	MC	26	125.0	62.6	21.7%	626	7666	205.8	3263	1000	4000	0.5		0.0242	0.1212				0.167		0.167
116	126	2	50	MC	41	125.0	62.6	18.4%	626	8292	173.0	5098	2900	11600	1.4		0.0261	0.1304			0.028			0.028
126	135.5	2	44	MC	36	125.0	62.6	20.7%	595	8903	148.0	4487	4000	16000	1.8		0.0261	0.1304			0.021			0.021
135.5	142.5	1	83	MC	68	125.0	62.6	22.1%	438	9419	130.9								79				0.006	0.006
142.5	151.5	1	88	MC	72	125.0	62.6	15.9%	563	9920	117.0								81				0.007	0.007

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 20% was estimated based on available test data.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.

Estimated Settlement (in)=	*0.2*	*0.2*	*0.2*	*0.4*	*1.00*

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 65_Model 7***
REFERENCE BORIN	***AS-88 (Elev. 128.0 ft)***
Hammer Energy =	75%
GW Level (ft)=	12

Finish Grade Elev. (ft) =	128.68
Pile Cut-off Elev. (ft) =	118.55
Footing Depth (ft) =	10.13
Pile Length (ft)=	39
Width of Pile Group, B (ft)=	22
Length of Pile Group, L (ft)=	22
Permanent Load Pressure (kip)=	2530
Pile Tip Ele (ft)=	79.55

Eq. Footing Depth (ft	36.1
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	7	3	8	MC	7	125.0	125.0	16.2%	875							285513								
7	14	3	12	MC	10	125.0	107.2	21.6%	750							428269								
14	19	1	7	MC	6	125.0	62.6	22.6%	313															
19	24	3	15	MC	12	125.0	62.6	28.9%	313				1500	6000		535336								
24	29	2	14	MC	11	125.0	62.6	26.3%	313				950	3800										
29	34	3	15	MC	12	125.0	62.6	29.4%	313				1800	7200		535336								
34	39	3	23	MC	19	125.0	62.6	27.2%	313	3100	1905.8	2345	1950	7800	2.5	820848				0.080				0.080
39	44	3	27	MC	22	125.0	62.6	26.4%	313	3347	1552.4	2753		11013	3.3	963605				0.097				0.097
44	49	1	19	MC	15	125.0	62.6	15.0%	313	3660	1229.1								45				0.168	0.168
49	54	1	35	MC	29	125.0	62.6	13.8%	313	3973	997.2								60				0.098	0.098
54	59	1	29	MC	24	125.0	62.6	19.4%	313	4286	825.2								53				0.087	0.087
59	63.5	3	23	SPT	29	125.0	62.6	20.7%	282	4583	700.0	3608		14433	3.1	1262844				0.030				0.030
63.5	68.5	1	62	SPT	78	125.0	62.6	10.5%	313	4880	601.2								117				0.026	0.026
68.5	73.5	2	16	SPT	20	125.0	62.6	23.4%	313	5193	518.2	2510		10040	1.9		0.0218	0.1091			0.054			0.054
73.5	78.5	3	24	SPT	30	125.0	62.6	21.3%	313	5506	451.3	3765		15060	2.7	1317750				0.021				0.021
78.5	85.5	1	100	MC	82	125.0	62.6	13.6%	438	5882	386.9								112				0.021	0.021
85.5	96.5	2	72	MC	59	125.0	62.6	17.8%	689	6445	313.2	7342	2300	9200	1.4		0.0252	0.1259			0.069			0.069
96.5	106.5	3	75	MC	61	125.0	62.6	20.3%	626	7103	251.1	7648		30591	4.3	2676680				0.011				0.011
106.5	116.5	2	32	MC	26	125.0	62.6	21.7%	626	7729	207.7	3263	1000	4000	0.5		0.0242	0.1212				0.167		0.167
116.5	126.5	2	50	MC	41	125.0	62.6	18.4%	626	8355	174.6	5098	2900	11600	1.4		0.0261	0.1304			0.028			0.028
126.5	136	2	44	MC	36	125.0	62.6	20.7%	595	8965	149.4	4487	4000	16000	1.8		0.0261	0.1304			0.021			0.021
136	143	1	83	MC	68	125.0	62.6	22.1%	438	9482	132.1								79				0.006	0.006
143	152	1	88	MC	72	125.0	62.6	15.9%	563	9982	118.1								81				0.007	0.007

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 66_Model 7***
REFERENCE BORIN	***CPT-AS-89 (Elev. 129.0 ft)***
Hammer Energy =	60%
GW Level (ft)=	7

Finish Grade Elev. (ft) =	129.17
Pile Cut-off Elev. (ft) =	119.05
Footing Depth (ft) =	10.12
Pile Length (ft)=	57
Width of Pile Group, B (ft)=	22
Length of Pile Group, L (ft)=	22
Permanent Load Pressure (kip)=	2530
Pile Tip Ele (ft)=	62.05

Eq. Footing Depth (ft	48.1
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	8	3	4	SPT	4	125.0	117.2	20.0%	938							175000								
8	12.5	1	3	SPT	3	125.0	62.6	20.0%	282															
12.5	23	2	6	SPT	6	125.0	62.6	20.0%	657															
23	30	3	16	SPT	16	125.0	62.6	20.0%	438							700000								
30	40	2	12	SPT	12	125.0	62.6	20.0%	626															
40	45	3	16	SPT	16	125.0	62.6	20.0%	313							700000								
45	50	2	12	SPT	12	125.0	62.6	20.0%	313	3508	1438.3	1500		6000	1.7		0.0250	0.1252			0.084			0.084
50	58	2	16	SPT	16	125.0	62.6	20.0%	501	3817	1151.2	2000		8000	2.1		0.0250	0.1252			0.275			0.275
58	66	2	16	SPT	16	125.0	62.6	20.0%	501	4318	840.0	2000		8000	1.9		0.0250	0.1252			0.186			0.186
66	74	2	16	SPT	16	125.0	62.6	20.0%	501	4819	639.9	2000		8000	1.7		0.0250	0.1252			0.130			0.130
74	83	2	16	SPT	16	125.0	62.6	20.0%	563	5351	496.6	2000		8000	1.5		0.0250	0.1252			0.104			0.104
83	92.5	1	12	SPT	12	125.0	62.6	20.0%	595	5930	389.2								38				0.083	0.083
92.5	102.5	2	24	SPT	24	125.0	62.6	20.0%	626	6540	309.7	3000		12000	1.8		0.0250	0.1252			0.060			0.060
102.5	112.5	2	24	SPT	24	125.0	62.6	20.0%	626	7166	251.1	3000		12000	1.7		0.0200	0.1000			0.036			0.036
112.5	120	2	24	SPT	24	125.0	62.6	20.0%	470	7714	212.4	3000		12000	1.6		0.0200	0.1000			0.021			0.021

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 67_Model 7***
REFERENCE BORIN	***CPT-AS-22 (Elev. 131.0 ft)***
Hammer Energy =	60%
GW Level (ft)=	13.7

Finish Grade Elev. (ft) =	129.65
Pile Cut-off Elev. (ft) =	120.75
Footing Depth (ft) =	8.9
Pile Length (ft)=	48
Width of Pile Group, B (ft)=	25.5
Length of Pile Group, L (ft)=	25.5
Permanent Load Pressure (kip)=	2560
Pile Tip Ele (ft)=	72.75

Eq. Footing Depth (ft	40.9
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG From	To	Soil Type	BLOW COUNT	SAMPLER TYPE	AVG SPT-N_{60}	γ_T (pcf)	γ' (pcf)	ω	σ_v' (psf)	σ_v' (psf)	$\Delta\sigma_v'$ (psf)	Su (psf)	Lab Su (psf)	Pp (psf)	OCR	E (psf)	Cr/1+e_0	Cc/1+e_0	C' (Hough Method)	Settlements (in) Elastic	OC	NC	SAND	Sum
0	4	3	4	SPT	4	125.0	125.0	20.0%	500							175000								
4	13.7	2	4	SPT	4	125.0	125.0	20.0%	1213															
13.7	22.5	2	8	SPT	8	125.0	62.6	20.0%	551															
22.5	30.5	2	12	SPT	12	125.0	62.6	20.0%	501															
30.5	39.5	2	12	SPT	12	125.0	62.6	20.0%	563															
39.5	46.5	2	16	SPT	16	125.0	62.6	20.0%	438	3591	1304.5	2000		8000	2.2		0.0250	0.1252			0.226			0.226
46.5	51	1	6	SPT	6	125.0	62.6	20.0%	282	3907	1051.2								34				0.167	0.167
51	57	2	20	SPT	20	125.0	62.6	20.0%	376	4235	858.7	2500		10000	2.4		0.0250	0.1252			0.145			0.145
57	65.5	1	7	SPT	7	125.0	62.6	20.0%	532	4689	669.2								34				0.174	0.174
65.5	74.5	2	24	SPT	24	125.0	62.6	20.0%	563	5237	513.6	3000		12000	2.3		0.0250	0.1252			0.110			0.110
74.5	83.5	2	24	SPT	24	125.0	62.6	20.0%	563	5800	404.0	3000		12000	2.1		0.0250	0.1252			0.079			0.079
83.5	86.5	1	9	SPT	9	125.0	62.6	20.0%	188	6176	349.4								35				0.025	0.025
86.5	93.5	2	28	SPT	28	125.0	62.6	20.0%	438	6489	311.9	3500		14000	2.2		0.0250	0.1252			0.043			0.043
93.5	98.5	2	28	SPT	28	125.0	62.6	20.0%	313	6864	274.3	3500		14000	2.0		0.0200	0.1000			0.020			0.020

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 68-LT_Model 7***
REFERENCE BORIN	***CPT-AS-22 (Elev. 131.0 ft)***
Hammer Energy =	60%
GW Level (ft)=	14.2

Finish Grade Elev. (ft) =	130.26
Pile Cut-off Elev. (ft) =	117.01
Footing Depth (ft) =	13.25
Pile Length (ft)=	52
Width of Pile Group, B (ft)=	22
Length of Pile Group, L (ft)=	22
Permanent Load Pressure (kip)=	2680
Pile Tip Ele (ft)=	65.01

Eq. Footing Depth (ft	47.9
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	4.5	3	4	SPT	4	125.0	125.0	20.0%	563							175000								
4.5	14.2	2	4	SPT	4	125.0	125.0	20.0%	1213															
14.2	23	2	8	SPT	8	125.0	62.6	20.0%	551															
23	31	2	12	SPT	12	125.0	62.6	20.0%	501															
31	40	2	12	SPT	12	125.0	62.6	20.0%	563															
40	47	2	16	SPT	16	125.0	62.6	20.0%	438															
47	51.5	1	6	SPT	6	125.0	62.6	20.0%	282	3998	1584.6								33				0.186	0.186
51.5	57.5	2	20	SPT	20	125.0	62.6	20.0%	376	4298	1271.1	2500		10000	2.3		0.0250	0.1252			0.203			0.203
57.5	66	1	7	SPT	7	125.0	62.6	20.0%	532	4752	948.1								34				0.238	0.238
66	75	2	24	SPT	24	125.0	62.6	20.0%	563	5299	699.1	3000		12000	2.3		0.0250	0.1252			0.145			0.145
75	84	2	24	SPT	24	125.0	62.6	20.0%	563	5863	532.9	3000		12000	2.0		0.0250	0.1252			0.102			0.102
84	87	1	9	SPT	9	125.0	62.6	20.0%	188	6238	453.0								35				0.032	0.032
87	94	2	28	SPT	28	125.0	62.6	20.0%	438	6551	399.4	3500		14000	2.1		0.0250	0.1252			0.054			0.054
94	99	2	28	SPT	28	125.0	62.6	20.0%	313	6927	346.7	3500		14000	2.0		0.0200	0.1000			0.025			0.025

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 20% was estimated based on available test data.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.

Estimated Settlement (in)=	*0.0*	*0.5*	*0.0*	*0.5*	*0.99*

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 68-RT_Model 7***
REFERENCE BORIN	***CPT-AS-22 (Elev. 131.0 ft)***
Hammer Energy =	60%
GW Level (ft)=	13.2

Finish Grade Elev. (ft) =	129.32
Pile Cut-off Elev. (ft) =	116.07
Footing Depth (ft) =	13.25
Pile Length (ft)=	39
Width of Pile Group, B (ft)=	22
Length of Pile Group, L (ft)=	22
Permanent Load Pressure (kip)=	1960
Pile Tip Ele (ft)=	77.07

Eq. Footing Depth (ft	39.3
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG From	To	Soil Type	BLOW COUNT	SAMPLER TYPE	AVG SPT-N_{60}	γ_T (pcf)	γ' (pcf)	ω	σ_v' (psf)	σ_v' (psf)	$\Delta\sigma_v'$ (psf)	Su (psf)	Lab Su (psf)	Pp (psf)	OCR	E (psf)	Cr/1+e_0	Cc/1+e_0	C' (Hough Method)	Settlements (in) Elastic	OC	NC	SAND	Sum
0	3.5	3	4	SPT	4	125.0	125.0	20.0%	438							175000								
3.5	13.2	2	4	SPT	4	125.0	125.0	20.0%	1213															
13.2	22	2	8	SPT	8	125.0	62.6	20.0%	551															
22	30	2	12	SPT	12	125.0	62.6	20.0%	501															
30	39	2	12	SPT	12	125.0	62.6	20.0%	563															
39	46	2	16	SPT	16	125.0	62.6	20.0%	438	3492	1330.9	2000		8000	2.3		0.0250	0.1252			0.284			0.284
46	50.5	1	6	SPT	6	125.0	62.6	20.0%	282	3844	1012.4								34				0.163	0.163
50.5	56.5	2	20	SPT	20	125.0	62.6	20.0%	376	4173	808.1	2500		10000	2.4		0.0250	0.1252			0.139			0.139
56.5	65	1	7	SPT	7	125.0	62.6	20.0%	532	4627	614.0								34				0.162	0.162
65	74	2	24	SPT	24	125.0	62.6	20.0%	563	5174	460.4	3000		12000	2.3		0.0250	0.1252			0.100			0.100
74	83	2	24	SPT	24	125.0	62.6	20.0%	563	5738	355.5	3000		12000	2.1		0.0250	0.1252			0.071			0.071
83	86	1	9	SPT	9	125.0	62.6	20.0%	188	6113	304.3								35				0.022	0.022
86	93	2	28	SPT	28	125.0	62.6	20.0%	438	6426	269.7	3500		14000	2.2		0.0250	0.1252			0.038			0.038
93	98	2	28	SPT	28	125.0	62.6	20.0%	313	6802	235.4	3500		14000	2.1		0.0200	0.1000			0.018			0.018

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 20% was estimated based on available test data.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.

	Elastic	OC	NC	SAND	Sum
Estimated Settlement (in)=	*0.0*	*0.6*	*0.0*	*0.3*	*1.00*

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 69-LT_Model 7***
REFERENCE BORIN	***AS-25 (Elev. 129.5 ft)***
Hammer Energy =	70%
GW Level (ft)=	9.5

Finish Grade Elev. (ft) =	130.77
Pile Cut-off Elev. (ft) =	116.27
Footing Depth (ft) =	14.5
Pile Length (ft)=	11
Width of Pile Group, B (ft)=	22
Length of Pile Group, L (ft)=	22
Permanent Load Pressure (kip)=	2100
Pile Tip Ele (ft)=	105.27

Eq. Footing Depth (ft	21.8
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	4.5	3	27	MC	20	125.0	125.0	15.0%	563							895781								
4.5	9	3	11	MC	8	125.0	125.0	25.0%	563							364948								
9	14.5	2	6	MC	5	125.0	68.3	24.0%	376															
14.5	19	3	11	MC	8	125.0	62.6	27.0%	282							364948								
19	23	3	14	MC	11	125.0	62.6	26.0%	250	1996	3047.6	1327		5308	2.7	464479				0.092				0.092
23	28	3	15	MC	11	125.0	62.6	30.0%	313	2189	2440.6	1422		5688	2.6	497656				0.294				0.294
28	34	3	20	MC	15	125.0	62.6	26.0%	376	2533	1730.7	1896		7583	3.0	663542				0.188				0.188
34	38	3	24	MC	18	125.0	62.6	30.0%	250	2846	1323.5	2275		9100	3.2	796250				0.080				0.080
38	44	3	32	MC	24	125.0	62.6	27.0%	376	3159	1044.8	3033		12133	3.8	1061667				0.071				0.071
44	49	3	28	MC	21	125.0	62.6	22.0%	313	3504	828.9	2654		10617	3.0	928958				0.054				0.054
49	54	3	28	MC	21	125.0	62.6	22.0%	313	3817	685.9	2654		10617	2.8	928958				0.044				0.044
54	57.5	2	24	MC	18	125.0	62.6	22.0%	219	4083	591.5	2275		9100	2.2		0.0200	0.1000			0.049			0.049
57.5	65	3	33	MC	25	125.0	62.6	18.0%	470	4427	495.8	3128		12513	2.8	1094844				0.041				0.041
65	71.5	3	63	MC	48	125.0	62.6	9.0%	407	4865	404.2	5972		23888	4.9	2090156				0.015				0.015
71.5	84	3	56	MC	42	125.0	62.6	19.0%	783	5460	315.5	5308		21233	3.9	1857917				0.025				0.025
84	93	3	43	MC	33	125.0	62.6	21.0%	563	6133	246.3	4076		16304	2.7	1426615				0.019				0.019
93	101.5	1	64	MC	49	125.0	62.6	17.0%	532	6681	205.5								71				0.019	0.019

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***	*Finish Grade Elev. (ft) =*	130.18	Eq. Footing Depth (ft	25.8
PROJECT NO.	***2017-125-GEO***	*Pile Cut-off Elev. (ft) =*	115.68	Settlement Limit (in)	1.0
STRUCTURE	***Bent 69-RT_Model 7***	*Footing Depth (ft) =*	14.5		
REFERENCE BORIN	***AS-25 (Elev. 129.5 ft)***	*Pile Length (ft)=*	17		
Hammer Energy =	70%	*Width of Pile Group, B (ft)=*	22		
GW Level (ft)=	9	*Length of Pile Group, L (ft)=*	22		
		Permanent Load Pressure (kip)=	2620		
		Pile Tip Ele (ft)=	98.68	*Cr/Cc=*	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	4	3	27	MC	20	125.0	125.0	15.0%	500							895781								
4	8.5	3	11	MC	8	125.0	125.0	25.0%	563							364948								
8.5	14	2	6	MC	5	125.0	68.3	24.0%	376															
14	18.5	3	11	MC	8	125.0	62.6	27.0%	282							364948								
18.5	22.5	3	14	MC	11	125.0	62.6	26.0%	250							464479								
22.5	27.5	3	15	MC	11	125.0	62.6	30.0%	313	2231	3225.6	1422		5688	2.5	497656				0.130				0.130
27.5	33.5	3	20	MC	15	125.0	62.6	26.0%	376	2471	2506.1	1896		7583	3.1	663542				0.272				0.272
33.5	37.5	3	24	MC	18	125.0	62.6	30.0%	250	2784	1879.8	2275		9100	3.3	796250				0.113				0.113
37.5	43.5	3	32	MC	24	125.0	62.6	27.0%	376	3097	1462.0	3033		12133	3.9	1061667				0.099				0.099
43.5	48.5	3	28	MC	21	125.0	62.6	22.0%	313	3441	1145.1	2654		10617	3.1	928958				0.074				0.074
48.5	53.5	3	28	MC	21	125.0	62.6	22.0%	313	3754	938.6	2654		10617	2.8	928958				0.061				0.061
53.5	57	2	24	MC	18	125.0	62.6	22.0%	219	4020	804.0	2275		9100	2.3		0.0200	0.1000			0.067			0.067
57	64.5	3	33	MC	25	125.0	62.6	18.0%	470	4365	668.9	3128		12513	2.9	1094844				0.055				0.055
64.5	71	3	63	MC	48	125.0	62.6	9.0%	407	4803	541.1	5972		23888	5.0	2090156				0.020				0.020
71	83.5	3	56	MC	42	125.0	62.6	19.0%	783	5397	418.9	5308		21233	3.9	1857917				0.034				0.034
83.5	92.5	3	43	MC	33	125.0	62.6	21.0%	563	6070	324.7	4076		16304	2.7	1426615				0.025				0.025
92.5	101	1	64	MC	49	125.0	62.6	17.0%	532	6618	269.6								71				0.025	0.025

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 70_Model 7***
REFERENCE BORIN	***AS-25 (Elev. 129.5 ft)***
Hammer Energy =	70%
GW Level (ft)=	10

Finish Grade Elev. (ft) =	131.02
Pile Cut-off Elev. (ft) =	122.27
Footing Depth (ft) =	8.75
Pile Length (ft)=	22
Width of Pile Group, B (ft)=	22
Length of Pile Group, L (ft)=	22
Permanent Load Pressure (kip)=	2610
Pile Tip Ele (ft)=	100.27

Eq. Footing Depth (ft	23.4
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	5	3	27	MC	20	125.0	125.0	15.0%	625							895781								
5	9.5	3	11	MC	8	125.0	125.0	25.0%	563							364948								
9.5	15	2	6	MC	5	125.0	68.3	24.0%	376															
15	19.5	3	11	MC	8	125.0	62.6	27.0%	282							364948								
19.5	23.5	3	14	MC	11	125.0	62.6	26.0%	250	2092	3024.7	1327		5308	2.5	464479				0.007				0.007
23.5	28.5	3	15	MC	11	125.0	62.6	30.0%	313	2252	2562.2	1422		5688	2.5	497656				0.309				0.309
28.5	34.5	3	20	MC	15	125.0	62.6	26.0%	376	2596	1864.3	1896		7583	2.9	663542				0.202				0.202
34.5	38.5	3	24	MC	18	125.0	62.6	30.0%	250	2909	1450.7	2275		9100	3.1	796250				0.087				0.087
38.5	44.5	3	32	MC	24	125.0	62.6	27.0%	376	3222	1160.9	3033		12133	3.8	1061667				0.079				0.079
44.5	49.5	3	28	MC	21	125.0	62.6	22.0%	313	3566	932.1	2654		10617	3.0	928958				0.060				0.060
49.5	54.5	3	28	MC	21	125.0	62.6	22.0%	313	3879	778.1	2654		10617	2.7	928958				0.050				0.050
54.5	58	2	24	MC	18	125.0	62.6	22.0%	219	4145	675.3	2275		9100	2.2		0.0200	0.1000			0.055			0.055
58	65.5	3	33	MC	25	125.0	62.6	18.0%	470	4490	570.0	3128		12513	2.8	1094844				0.047				0.047
65.5	72	3	63	MC	48	125.0	62.6	9.0%	407	4928	468.2	5972		23888	4.8	2090156				0.017				0.017
72	84.5	3	56	MC	42	125.0	62.6	19.0%	783	5522	368.4	5308		21233	3.8	1857917				0.030				0.030
84.5	93.5	3	43	MC	33	125.0	62.6	21.0%	563	6195	289.7	4076		16304	2.6	1426615				0.022				0.022
93.5	102	1	64	MC	49	125.0	62.6	17.0%	532	6743	242.9								71				0.022	0.022

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 71 & 72_Model 7***
REFERENCE BORIN	***CPT-AS-94 (Elev. 131.0 ft)***
Hammer Energy =	60%
GW Level (ft)=	15

Finish Grade Elev. (ft) =	131
Pile Cut-off Elev. (ft) =	121.5
Footing Depth (ft) =	9.5
Pile Length (ft)=	61
Width of Pile Group, B (ft)=	22
Length of Pile Group, L (ft)=	22
Permanent Load Pressure (kip)=	3040
Pile Tip Ele (ft)=	60.50

Eq. Footing Depth (ft	50.2
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	10	1	2	SPT	2	125.0	125.0	20.0%	1250															
10	17	1	4	SPT	4	125.0	107.2	20.0%	750															
17	26	2	6	SPT	6	125.0	62.6	20.0%	563															
26	33	2	10	SPT	10	125.0	62.6	20.0%	438															
33	40.5	2	10	SPT	10	125.0	62.6	20.0%	470															
40.5	43.5	2	10	SPT	10	125.0	62.6	20.0%	188															
43.5	47	2	16	SPT	16	125.0	62.6	20.0%	219															
47	51.5	1	7	SPT	7	125.0	62.6	20.0%	282	4118	1644.1								34				0.068	0.068
51.5	61	2	16	SPT	16	125.0	62.6	20.0%	595	4457	1296.8	2000		8000	1.8		0.0250	0.1252			0.317			0.317
61	71	2	16	SPT	16	125.0	62.6	20.0%	626	5068	898.5	2000		8000	1.6		0.0250	0.1252			0.213			0.213
71	81	2	16	SPT	16	125.0	62.6	20.0%	626	5694	654.2	2000		8000	1.4		0.0250	0.1252			0.142			0.142
81	83.5	1	12	SPT	12	125.0	62.6	20.0%	157	6085	549.0								38				0.030	0.030
83.5	88.5	2	20	SPT	20	125.0	62.6	20.0%	313	6320	497.5	2500		10000	1.6		0.0250	0.1252			0.049			0.049
88.5	94.5	2	20	SPT	20	125.0	62.6	20.0%	376	6664	434.3	2500		10000	1.5		0.0250	0.1252			0.049			0.049
94.5	98	1	13	SPT	13	125.0	62.6	20.0%	219	6961	388.9								38				0.026	0.026
98	105	2	24	SPT	24	125.0	62.6	20.0%	438	7290	346.5	3000		12000	1.6		0.0250	0.1252			0.042			0.042
105	112	2	24	SPT	24	125.0	62.6	20.0%	438	7728	300.0	3000		12000	1.6		0.0250	0.1252			0.035			0.035
112	120	2	24	SPT	24	125.0	62.6	20.0%	501	8198	259.8	3000		12000	1.5		0.0200	0.1000			0.026			0.026

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 73_Model 7***
REFERENCE BORIN	***CPT-AS-28 (Elev. 131.0 ft)***
Hammer Energy =	60%
GW Level (ft)=	10

Finish Grade Elev. (ft) =	132.99
Pile Cut-off Elev. (ft) =	119.99
Footing Depth (ft) =	13
Pile Length (ft)=	55
Width of Pile Group, B (ft)=	22
Length of Pile Group, L (ft)=	26.5
Permanent Load Pressure (kip)=	3410
Pile Tip Ele (ft)=	64.99

Eq. Footing Depth (ft	49.7
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	Cr/1+e_0	Cc/1+e_0	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	10	1	4	SPT	4	125.0	125.0	20.0%	1250															
10	13	3	8	SPT	8	125.0	62.6	20.0%	188							350000								
13	17	1	5	SPT	5	125.0	62.6	20.0%	250															
17	27	2	10	SPT	10	125.0	62.6	20.0%	626															
27	37	2	12	SPT	12	125.0	62.6	20.0%	626															
37	47	2	12	SPT	12	125.0	62.6	20.0%	626															
47	50	1	8	SPT	8	125.0	62.6	20.0%	188	3744	1871.1								36				0.020	0.020
50	60	2	16	SPT	16	125.0	62.6	20.0%	626	4067	1488.5	2000		8000	2.0		0.0250	0.1252			0.407			0.407
60	70	2	16	SPT	16	125.0	62.6	20.0%	626	4693	1018.1	2000		8000	1.7		0.0250	0.1252			0.256			0.256
70	74	1	9	SPT	9	125.0	62.6	20.0%	250	5131	810.1								36				0.086	0.086
74	80	2	20	SPT	20	125.0	62.6	20.0%	376	5444	698.3	2500		10000	1.8		0.0250	0.1252			0.094			0.094
80	83	1	10	SPT	10	125.0	62.6	20.0%	188	5726	616.3								36				0.044	0.044
83	92	2	20	SPT	20	125.0	62.6	20.0%	563	6102	527.7	2500		10000	1.6		0.0200	0.1000			0.078			0.078

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 74_Model 7***
REFERENCE BORIN	***AS-27 (Elev. 134.5 ft)***
Hammer Energy =	60%
GW Level (ft)=	10.5

Finish Grade Elev. (ft) =	132.92
Pile Cut-off Elev. (ft) =	121.17
Footing Depth (ft) =	11.75
Pile Length (ft)=	55
Width of Pile Group, B (ft)=	23.5
Length of Pile Group, L (ft)=	32.5
Permanent Load Pressure (kip)=	3710
Pile Tip Ele (ft)=	66.17

Eq. Footing Depth (ft	48.4
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	Cr/1+e_0	Cc/1+e_0	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	6.5	3	10	SPT	10	125.0	125.0	20.0%	813							437500								
6.5	11.5	1	1	SPT	1	125.0	112.5	20.0%	563															
11.5	16.5	3	16	SPT	16	125.0	62.6	20.0%	313							700000								
16.5	23.5	2	8	SPT	8	125.0	62.6	20.0%	438															
23.5	31.5	3	14	SPT	14	125.0	62.6	20.0%	501							612500								
31.5	39.5	2	14	SPT	14	125.0	62.6	20.0%	501															
39.5	47	2	14	SPT	14	125.0	62.6	20.0%	470															
47	52	1	4	SPT	4	125.0	62.6	20.0%	313	3798	1616.0								31				0.211	0.211
52	57	1	6	SPT	6	125.0	62.6	20.0%	313	4067	1360.3								33				0.229	0.229
57	67	3	26	SPT	26	125.0	62.6	20.0%	626	4536	1039.3	3250		13000	2.9	1137500				0.110				0.110
67	77	3	26	SPT	26	125.0	62.6	20.0%	626	5162	762.1	3250		13000	2.5	1137500				0.080				0.080
77	87	2	26	SPT	26	125.0	62.6	20.0%	626	5788	582.7	3250		13000	2.2		0.0250	0.1252			0.125			0.125
87	94	2	26	SPT	26	125.0	62.6	20.0%	438	6321	475.8	3250		13000	2.1		0.0250	0.1252			0.066			0.066
94	101	2	26	SPT	26	125.0	62.6	20.0%	438	6759	408.4	3250		13000	1.9		0.0250	0.1252			0.054			0.054
101	109	2	26	SPT	26	125.0	62.6	20.0%	501	7228	350.9	3250		13000	1.8		0.0250	0.1252			0.049			0.049
109	114	1	11	SPT	11	125.0	62.6	20.0%	313	7635	310.4								36				0.029	0.029
114	118.5	2	32	SPT	32	125.0	62.6	20.0%	282	7932	285.1	4000		16000	2.0		0.0200	0.1000			0.017			0.017

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 75_Model 7***
REFERENCE BORIN	***CPT-AS-95 (Elev. 134.5 ft)***
Hammer Energy =	60%
GW Level (ft)=	7.3

Finish Grade Elev. (ft) =	133.01
Pile Cut-off Elev. (ft) =	122.26
Footing Depth (ft) =	10.75
Pile Length (ft)=	66
Width of Pile Group, B (ft)=	22
Length of Pile Group, L (ft)=	26.5
Permanent Load Pressure (kip)=	3330
Pile Tip Ele (ft)=	56.26

Eq. Footing Depth (ft	54.8
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	4.5	1	3	SPT	3	125.0	125.0	20.0%	563															
4.5	10	1	3	SPT	3	125.0	94.4	20.0%	519															
10	14.5	1	4	SPT	4	125.0	62.6	20.0%	282															
14.5	18.5	2	6	SPT	6	125.0	62.6	20.0%	250															
18.5	28.5	3	10	SPT	10	125.0	62.6	20.0%	626							420000								
28.5	38.5	2	10	SPT	10	125.0	62.6	20.0%	626															
38.5	48.5	2	10	SPT	10	125.0	62.6	20.0%	626															
48.5	51.5	1	7	SPT	7	125.0	62.6	20.0%	188															
51.5	57.5	2	12	SPT	12	125.0	62.6	20.0%	376	3969	1471.4	1500		6000	1.5		0.0250	0.1252			0.113			0.113
57.5	60.5	1	8	SPT	8	125.0	62.6	20.0%	188	4149	1308.4								35				0.121	0.121
60.5	68.5	2	16	SPT	16	125.0	62.6	20.0%	501	4493	1063.6	2000		8000	1.8		0.0250	0.1252			0.222			0.222
68.5	76.5	2	16	SPT	16	125.0	62.6	20.0%	501	4994	814.0	2000		8000	1.6		0.0250	0.1252			0.158			0.158
76.5	83.5	2	16	SPT	16	125.0	62.6	20.0%	438	5464	652.0	2000		8000	1.5		0.0250	0.1252			0.103			0.103
83.5	90	2	20	SPT	20	125.0	62.6	20.0%	407	5886	544.3	2500		10000	1.7		0.0250	0.1252			0.075			0.075
90	94	1	12	SPT	12	125.0	62.6	20.0%	250	6215	478.0								37				0.041	0.041
94	102	2	24	SPT	24	125.0	62.6	20.0%	501	6590	416.0	3000		12000	1.8		0.0250	0.1252			0.064			0.064
102	110	2	24	SPT	24	125.0	62.6	20.0%	501	7091	350.5	3000		12000	1.7		0.0250	0.1252			0.050			0.050
110	118.5	2	24	SPT	24	125.0	62.6	20.0%	532	7608	297.9	3000		12000	1.6		0.0200	0.1000			0.034			0.034
																				0.0	*0.8*	*0.0*	*0.2*	*0.98*

Estimated Settlement (in)=

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 20% was estimated based on available test data.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Abutment 76_Model 7***
REFERENCE BORIN	***CPT-AS-30 (Elev. 134.5 ft)***
Hammer Energy =	60%
GW Level (ft)=	12.5

Finish Grade Elev. (ft) =	134.1
Pile Cut-off Elev. (ft) =	128.85
Footing Depth (ft) =	5.25
Pile Length (ft)=	36
Width of Pile Group, B (ft)=	14
Length of Pile Group, L (ft)=	38
Permanent Load Pressure (kip)=	1970
Pile Tip Ele (ft)=	92.85

Eq. Footing Depth (ft	29.3
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

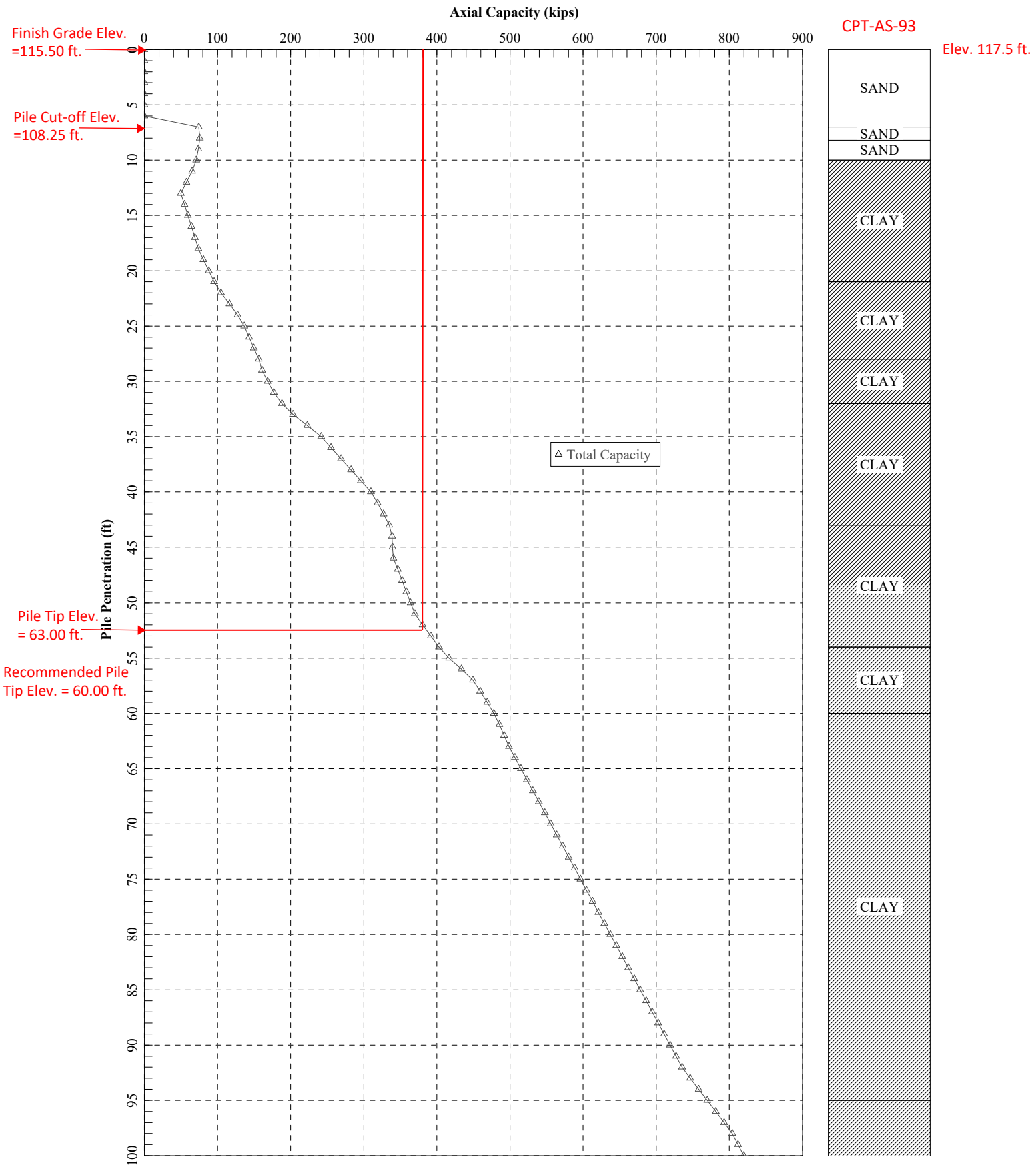
GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	5.5	3	6	SPT	6	125.0	125.0	20.0%	688							262500								
5.5	12.4	3	6	SPT	6	125.0	125.0	20.0%	863							262500								
12.4	17.5	2	6	SPT	6	125.0	63.8	20.0%	326															
17.5	25.5	3	12	SPT	12	125.0	62.6	20.0%	501							525000								
25.5	33.5	2	12	SPT	12	125.0	62.6	20.0%	501	2744	1343.8	1500		6000	2.2		0.0250	0.1252			0.221			0.221
33.5	42	2	12	SPT	12	125.0	62.6	20.0%	532	3143	976.1	1500		6000	1.9		0.0250	0.1252			0.300			0.300
42	50.5	3	20	SPT	20	125.0	62.6	20.0%	532	3675	683.8	2500		10000	2.7	875000				0.080				0.080
50.5	59	2	20	SPT	20	125.0	62.6	20.0%	532	4207	506.7	2500		10000	2.4		0.0250	0.1252			0.126			0.126
59	67.5	2	20	SPT	20	125.0	62.6	20.0%	532	4739	390.9	2500		10000	2.1		0.0250	0.1252			0.088			0.088
67.5	74.5	2	24	SPT	24	125.0	62.6	20.0%	438	5225	316.9	3000		12000	2.3		0.0250	0.1252			0.054			0.054
74.5	81.5	2	24	SPT	24	125.0	62.6	20.0%	438	5663	266.9	3000		12000	2.1		0.0250	0.1252			0.042			0.042
81.5	88.5	2	24	SPT	24	125.0	62.6	20.0%	438	6101	227.9	3000		12000	2.0		0.0250	0.1252			0.033			0.033
88.5	93	1	13	SPT	13	125.0	62.6	20.0%	282	6461	201.9								38				0.019	0.019
93	99.5	2	32	SPT	32	125.0	62.6	20.0%	407	6805	181.0	4000		16000	2.4		0.0200	0.1000			0.018			0.018

VERTICAL PILE CAPACITY ANALYSES (A-PILE ANALYSES RESULTS)
STORY ROAD PEDESTRIAN OVERCROSSING – BENT 1 THROUGH BENT 4

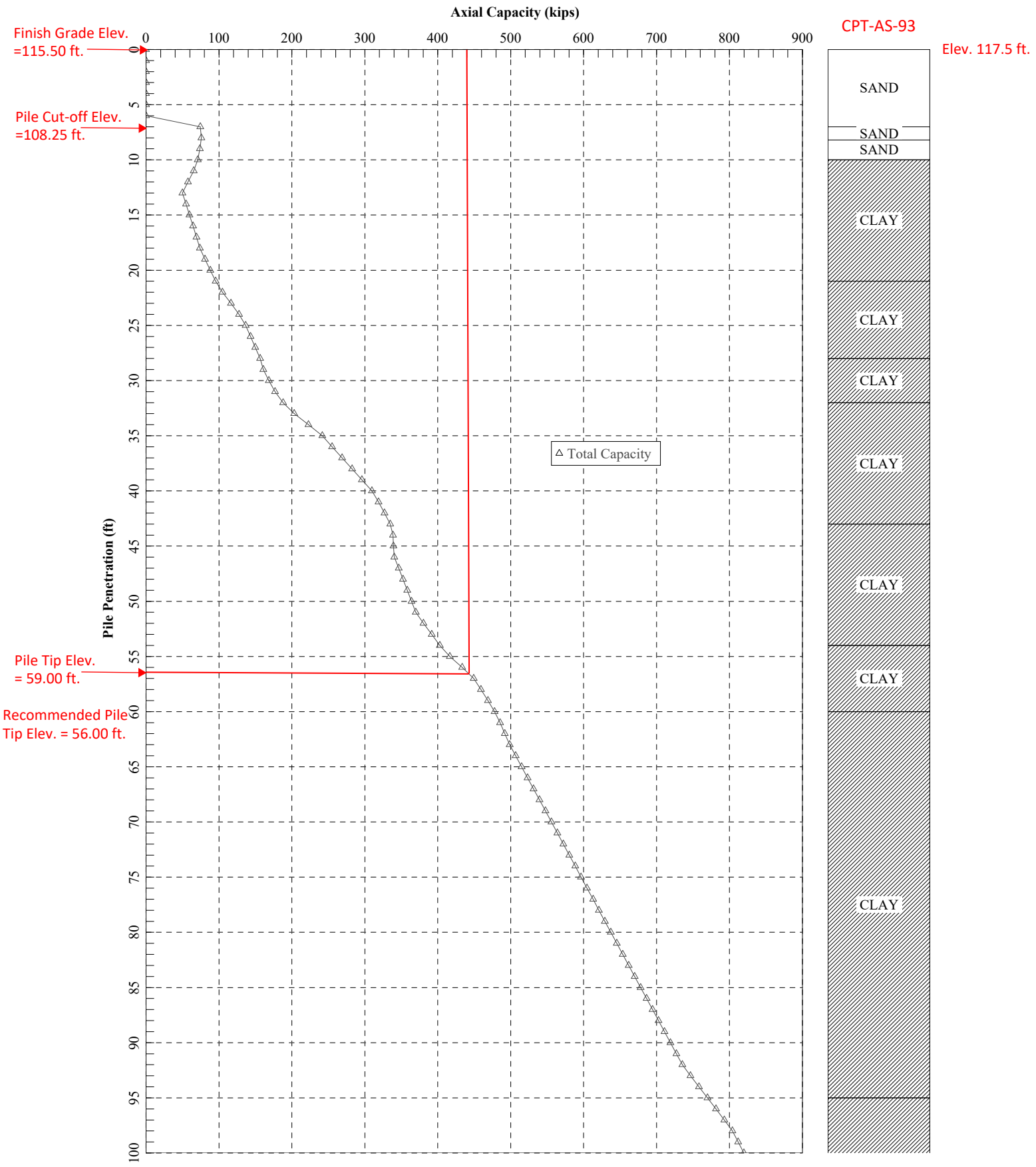
STORY ROAD PEDESTRIAN OVERCROSSING - BENT 1 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 260 kips (Strength Limit Compression)/0.7 = 380 kips



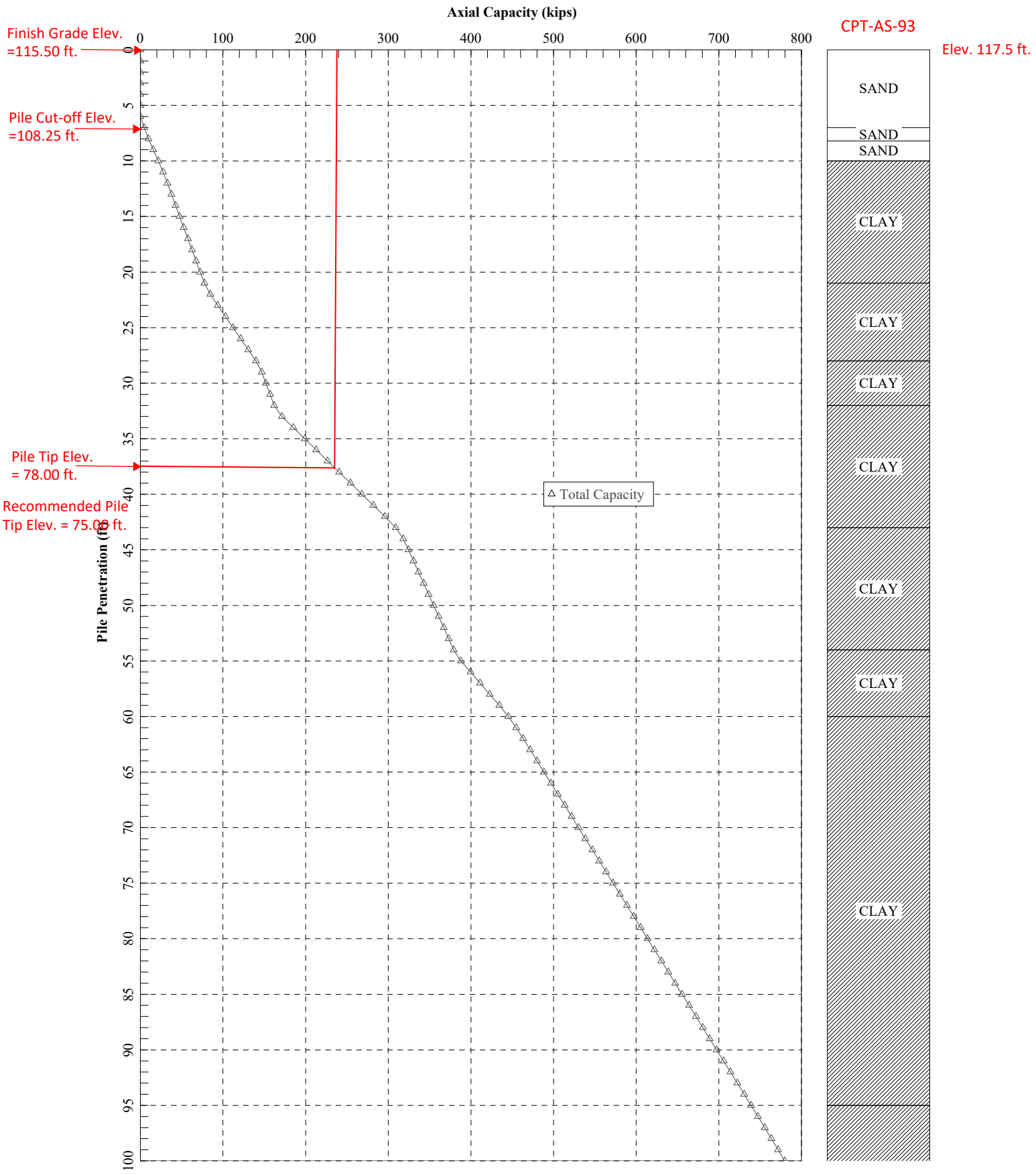
Eastridge to BART Regional Connector Project Story Road POC Bent 1 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 440 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project Story Road POC Bent 1 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

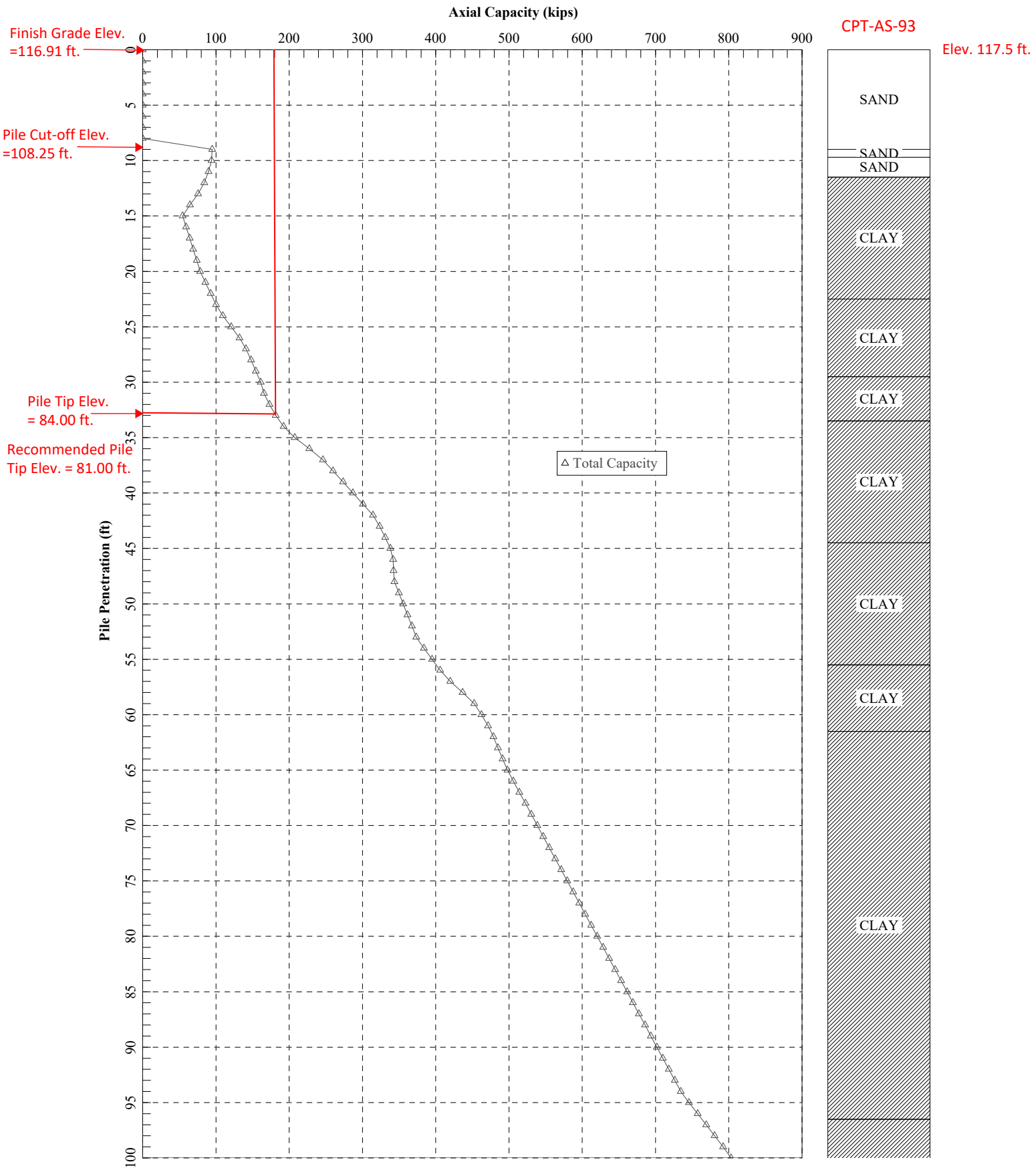
Vertical Load Demand = 240 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Story Road POC Bent 1 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

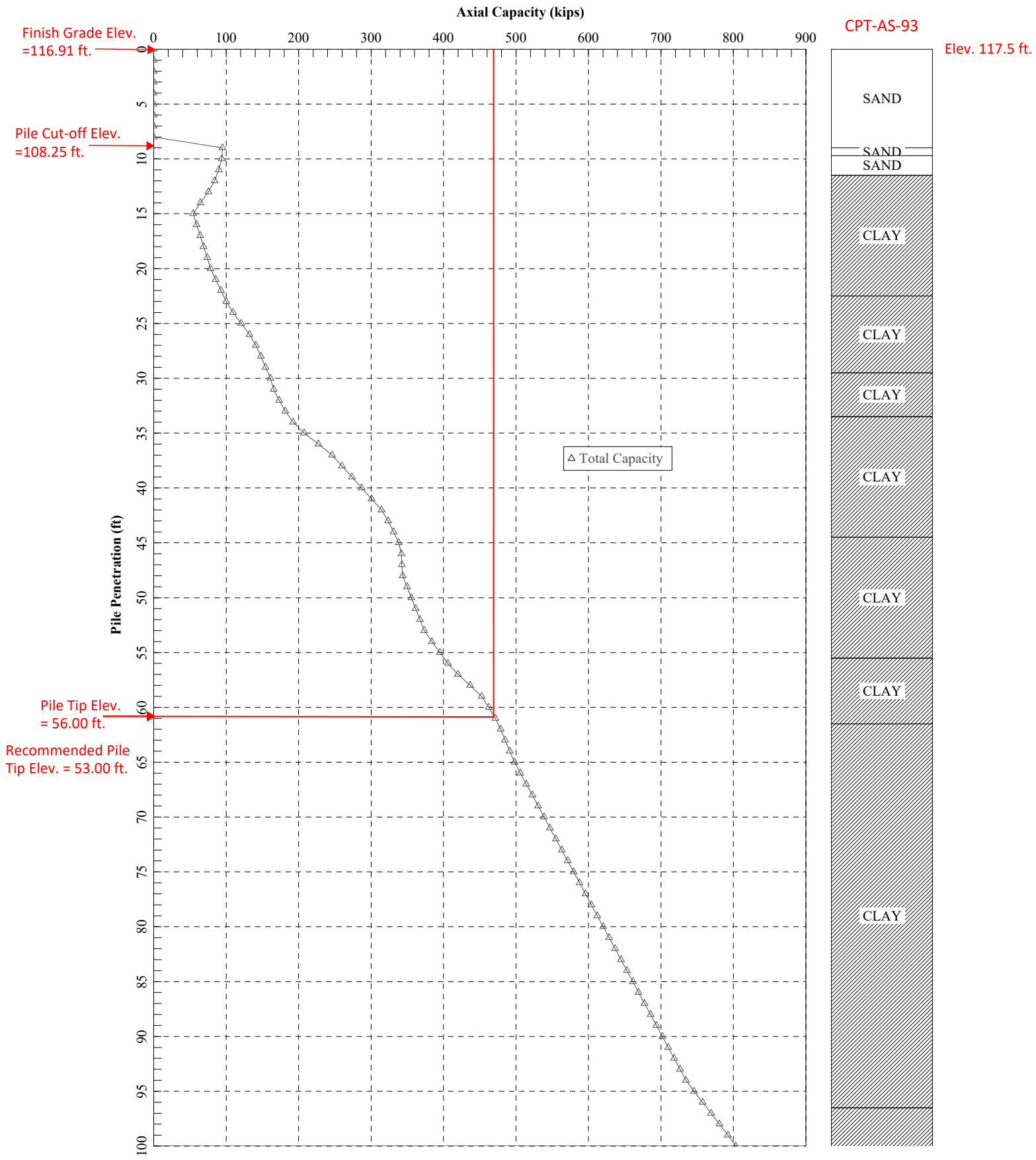
STORY ROAD PEDESTRIAN OVERCROSSING - BENT 2 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 120 kips (Strength Limit Compression)/0.7 = 180 kips



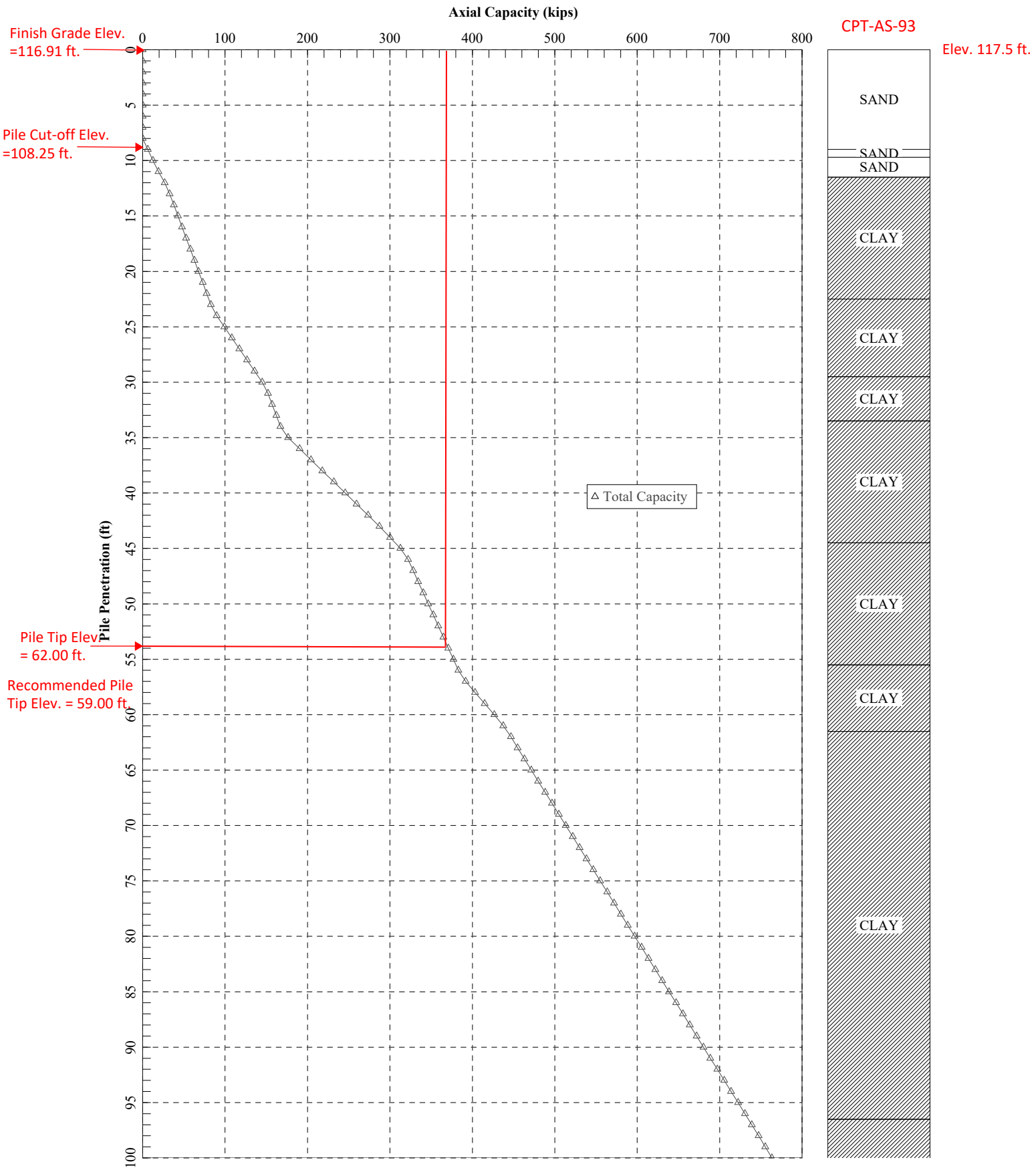
Eastridge to BART Regional Connector Project Story Road POC Bent 2 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 470 kips (Extreme Event Limit Compression)



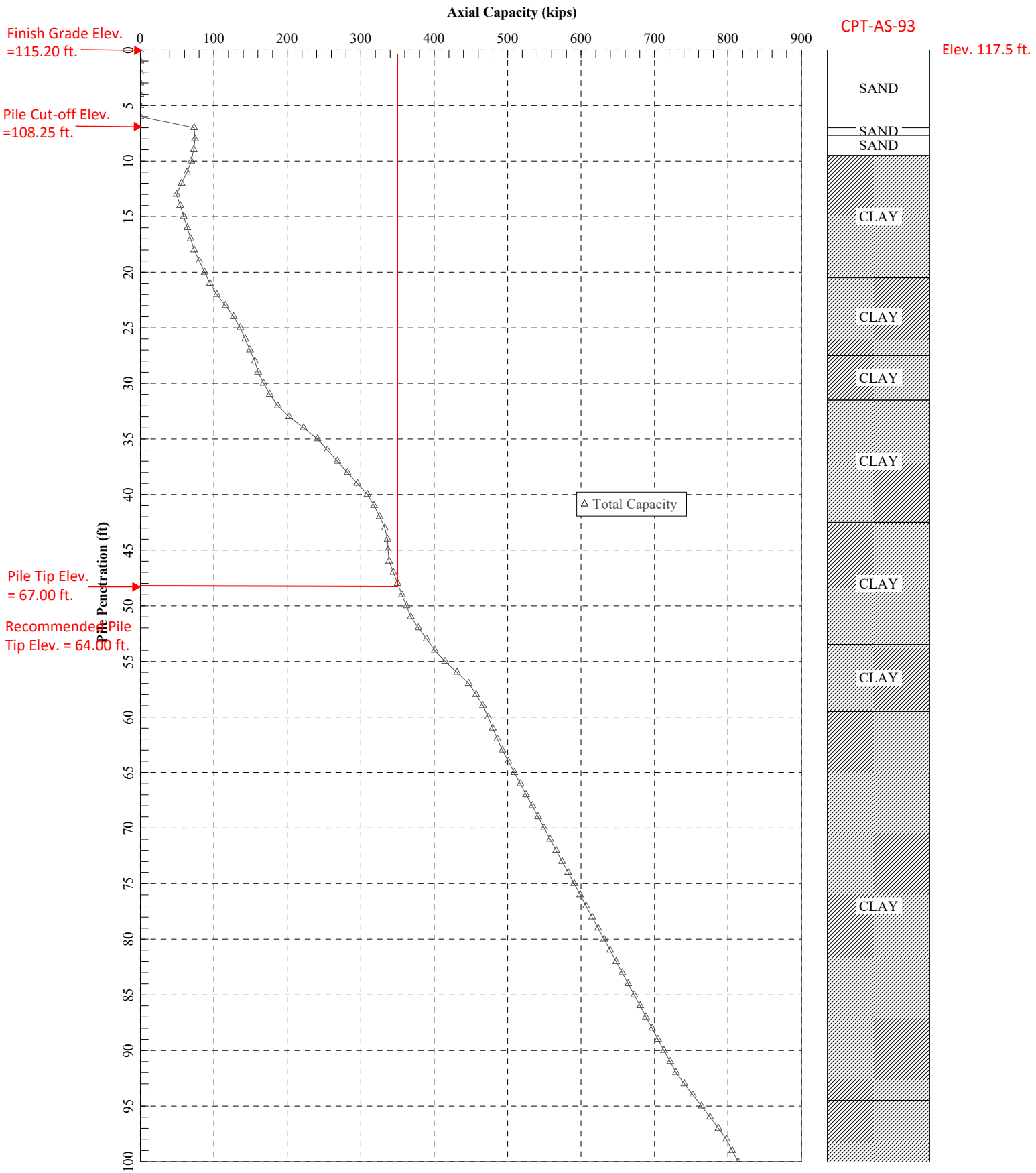
Eastridge to BART Regional Connector Project Story Road POC Bent 2 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

Vertical Load Demand = 370 kips (Extreme Event Limit Tension)



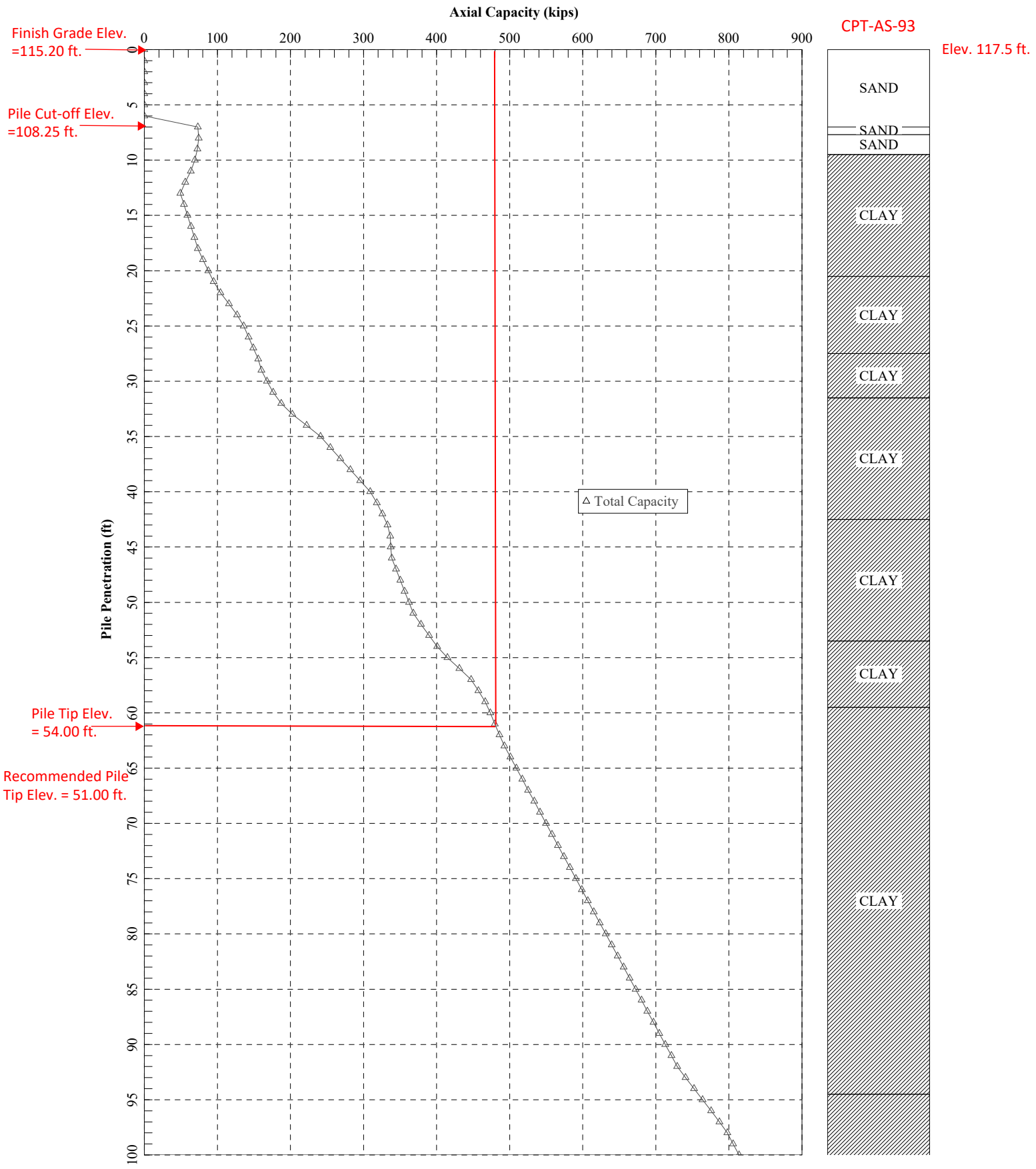
STORY ROAD PEDESTRIAN OVERCROSSING - BENT 3 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 240 kips (Strength Limit Compression)/0.7 = 350 kips



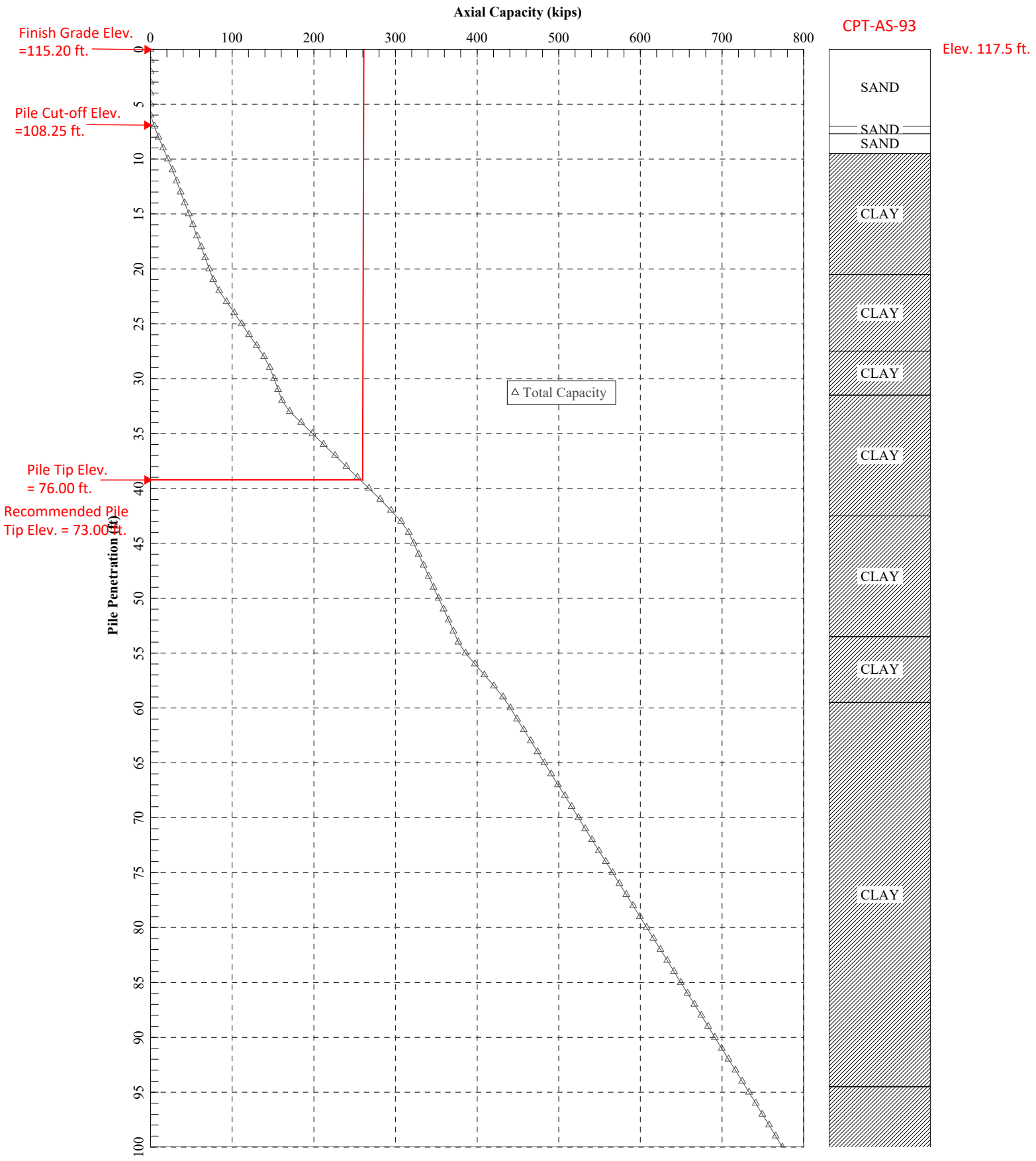
Eastridge to BART Regional Connector Project Story Road POC Bent 3 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 480 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project Story Road POC Bent 3 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

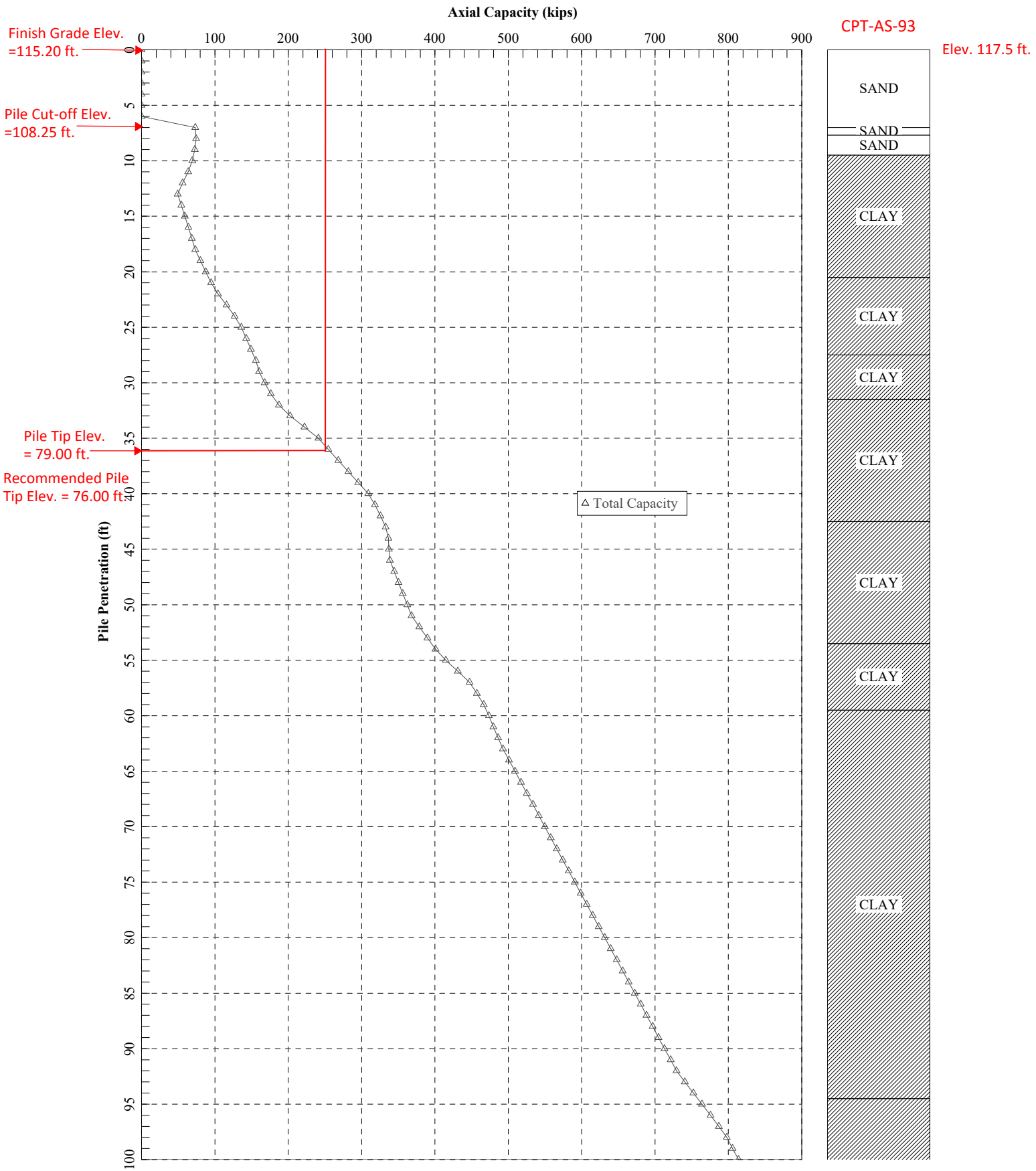
Vertical Load Demand = 260 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Story Road POC Bent 3 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

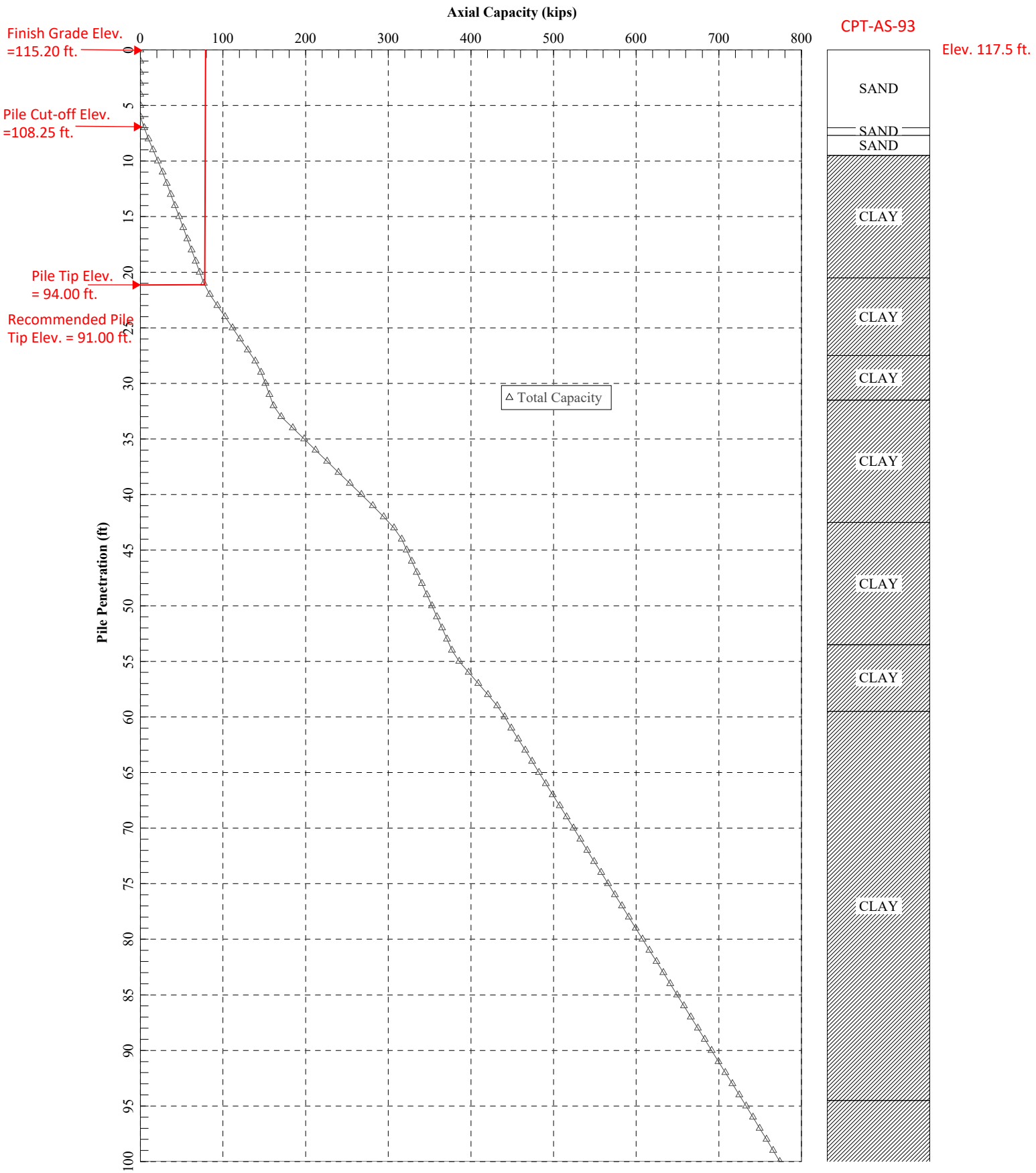
STORY ROAD PEDESTRIAN OVERCROSSING - BENT 4 (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 170 kips (Strength Limit Compression)/0.7 = 250 kips



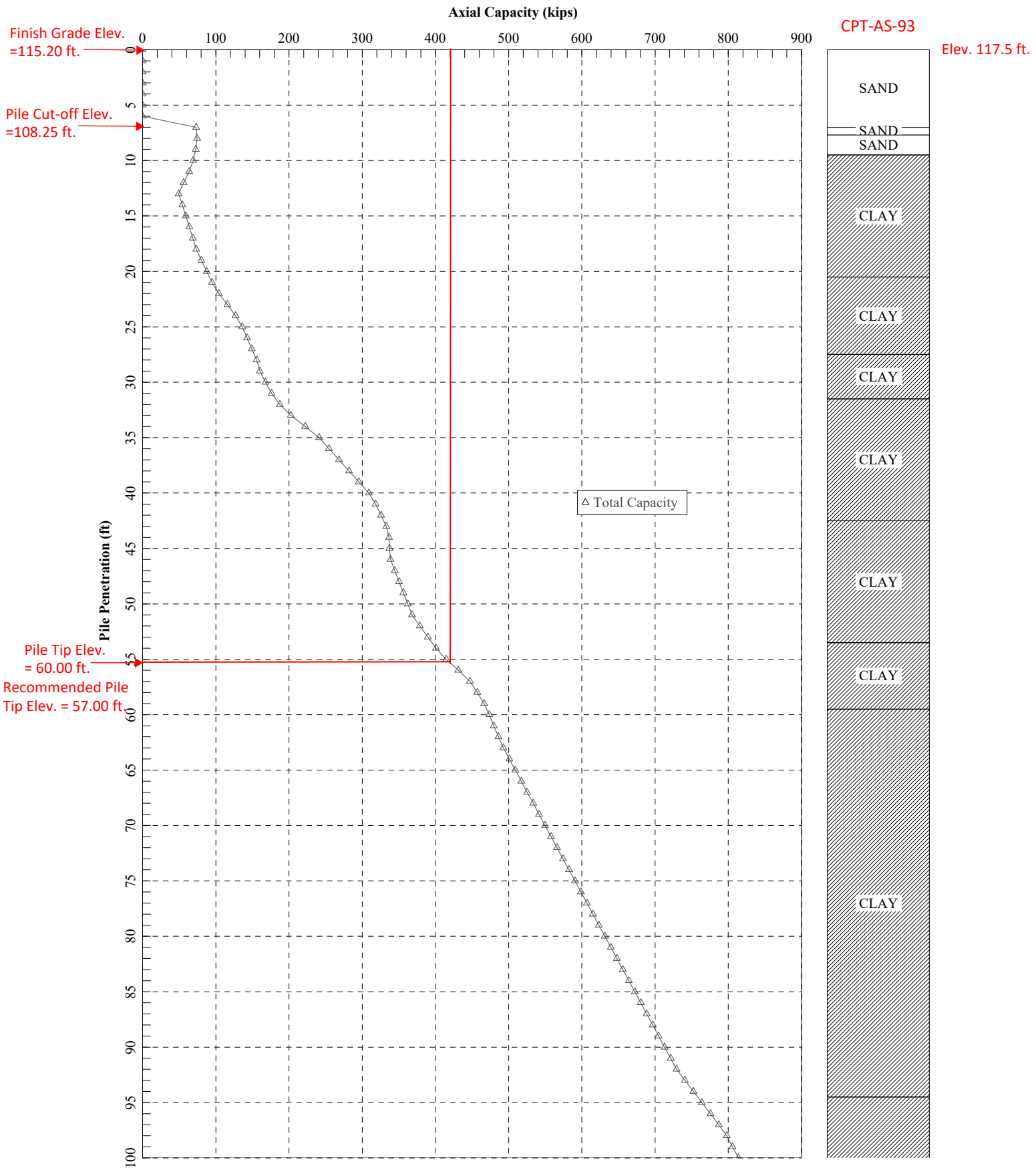
Eastridge to BART Regional Connector Project Story Road POC Bent 4 - 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 50 kips (Strength Limit Tension)/0.7 = 80 kips



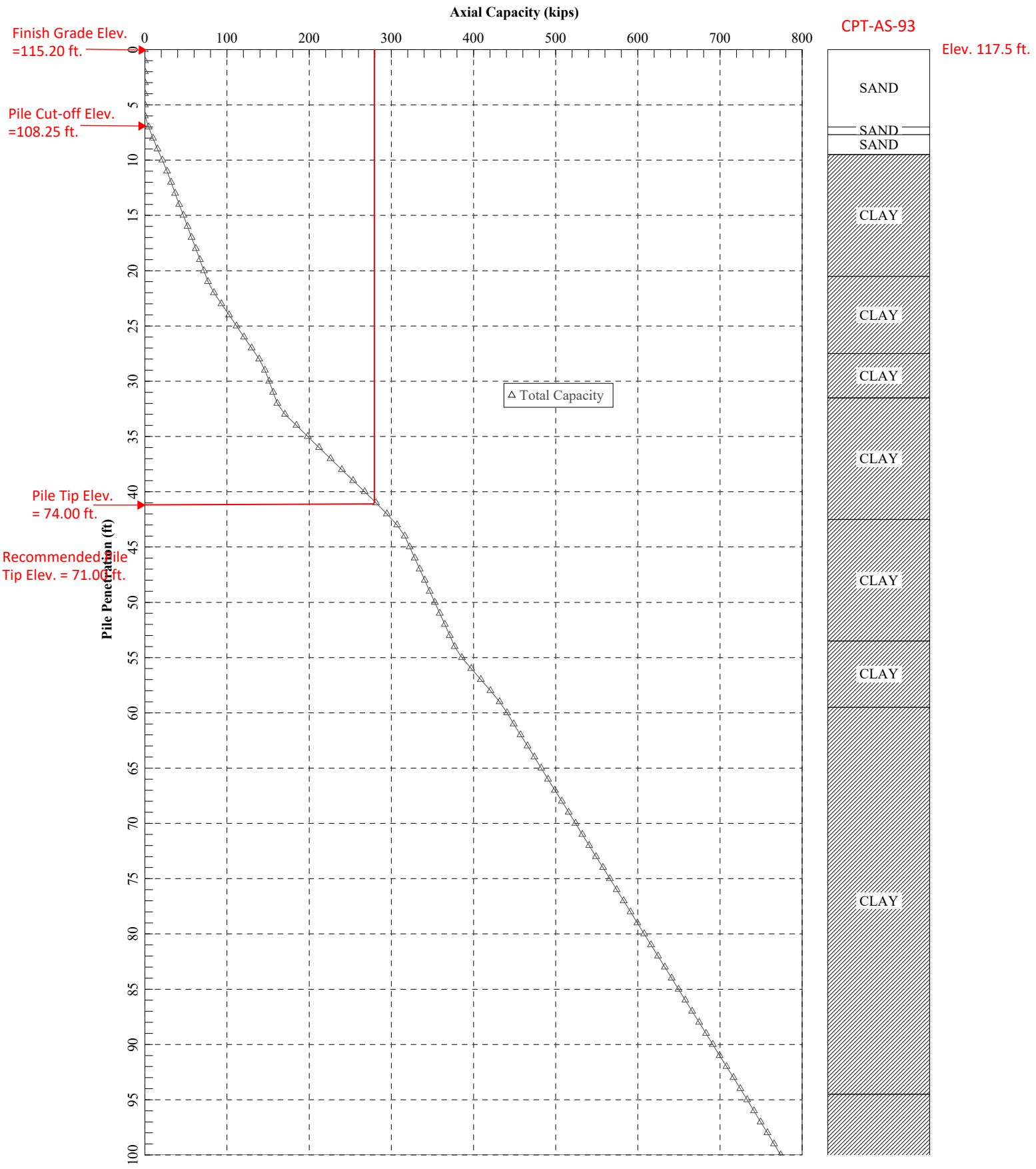
Eastridge to BART Regional Connector Project Story Road POC Bent 4 - 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 420 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project Story Road POC Bent 4 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

Vertical Load Demand = 280 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Story Road POC Bent 4 - 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

STORY ROAD PEDESTRIAN OVERCROSSING – PILE GROUP SETTLEMENT (BENT 1 THROUGH BENT 4)

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 1, 3 & 4_Story Road POC***
REFERENCE BORIN	***CPT-AS-93 (Elev. 117.5 ft)***
Hammer Energy =	60%
GW Level (ft)=	8

Finish Grade Elev. (ft) =	115.3
Pile Cut-off Elev. (ft) =	108.25
Footing Depth (ft) =	7.05
Pile Length (ft)=	9
Width of Pile Group, B (ft)=	12
Length of Pile Group, L (ft)=	12
Permanent Load Pressure (kip)=	430
Pile Tip Ele (ft)=	99.25

Eq. Footing Depth (ft	13.1
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	8	1	3	SPT	3	125.0	125.0	20.0%	1000															
8	9.8	1	3	SPT	3	125.0	62.6	20.0%	113															
9.8	15.8	2	6	SPT	6	125.0	62.6	20.0%	376	1402	1603.6	800		3200	2.3		0.0250	0.1252			0.274			0.274
15.8	20.8	2	6	SPT	6	125.0	62.6	20.0%	313	1645	1048.6	800		3200	1.9		0.0250	0.1252			0.322			0.322
20.8	27.8	3	12	SPT	12	125.0	62.6	20.0%	438	2020	624.0	1500		6000	3.0	525000				0.100				0.100
27.8	31.8	2	6	SPT	6	125.0	62.6	20.0%	250	2365	426.6	800		3200	1.4		0.0250	0.1252			0.087			0.087
31.8	37.8	3	20	SPT	20	125.0	62.6	20.0%	376	2678	318.4	2500		10000	3.7	875000				0.026				0.026
37.8	42.8	3	20	SPT	20	125.0	62.6	20.0%	313	3022	240.9	2500		10000	3.3	875000				0.017				0.017
42.8	47.8	2	8	SPT	8	125.0	62.6	20.0%	313	3335	192.6	1000		4000	1.2		0.0250	0.1252			0.037			0.037
47.8	53.8	2	8	SPT	8	125.0	62.6	20.0%	376	3679	154.5	1000		4000	1.1		0.0250	0.1252			0.032			0.032
53.8	59.8	3	20	SPT	20	125.0	62.6	20.0%	376	4055	124.6	2500		10000	2.5	875000				0.010				0.010
59.8	69.8	2	16	SPT	16	125.0	62.6	20.0%	626	4556	96.5	2000		8000	1.8		0.0250	0.1252			0.027			0.027
69.8	79.8	2	16	SPT	16	125.0	62.6	20.0%	626	5182	73.0	2000		8000	1.5		0.0250	0.1252			0.018			0.018
79.8	89.8	2	16	SPT	16	125.0	62.6	20.0%	626	5808	57.1	2000		8000	1.4		0.0250	0.1252			0.013			0.013
89.8	94.8	2	16	SPT	16	125.0	62.6	20.0%	313	6277	48.4	2000		8000	1.3		0.0250	0.1252			0.005			0.005
94.8	104.8	2	24	SPT	24	125.0	62.6	20.0%	626	6747	41.5	3000		12000	1.8		0.0250	0.1252			0.008			0.008
104.8	112.8	2	24	SPT	24	125.0	62.6	20.0%	501	7310	35.1	3000		12000	1.6		0.0250	0.1252			0.005			0.005
112.8	117.8	2	24	SPT	24	125.0	62.6	20.0%	313	7717	31.3	3000		12000	1.6		0.0200	0.1000			0.002			0.002

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Bent 2_Story Road POC***
REFERENCE BORIN	***CPT-AS-93 (Elev. 117.5 ft)***
Hammer Energy =	60%
GW Level (ft)=	9.6

Finish Grade Elev. (ft) =	116.91
Pile Cut-off Elev. (ft) =	108.25
Footing Depth (ft) =	8.66
Pile Length (ft)=	15
Width of Pile Group, B (ft)=	17.5
Length of Pile Group, L (ft)=	17.5
Permanent Load Pressure (kip)=	800
Pile Tip Ele (ft)=	93.25

Eq. Footing Depth (ft	18.7
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

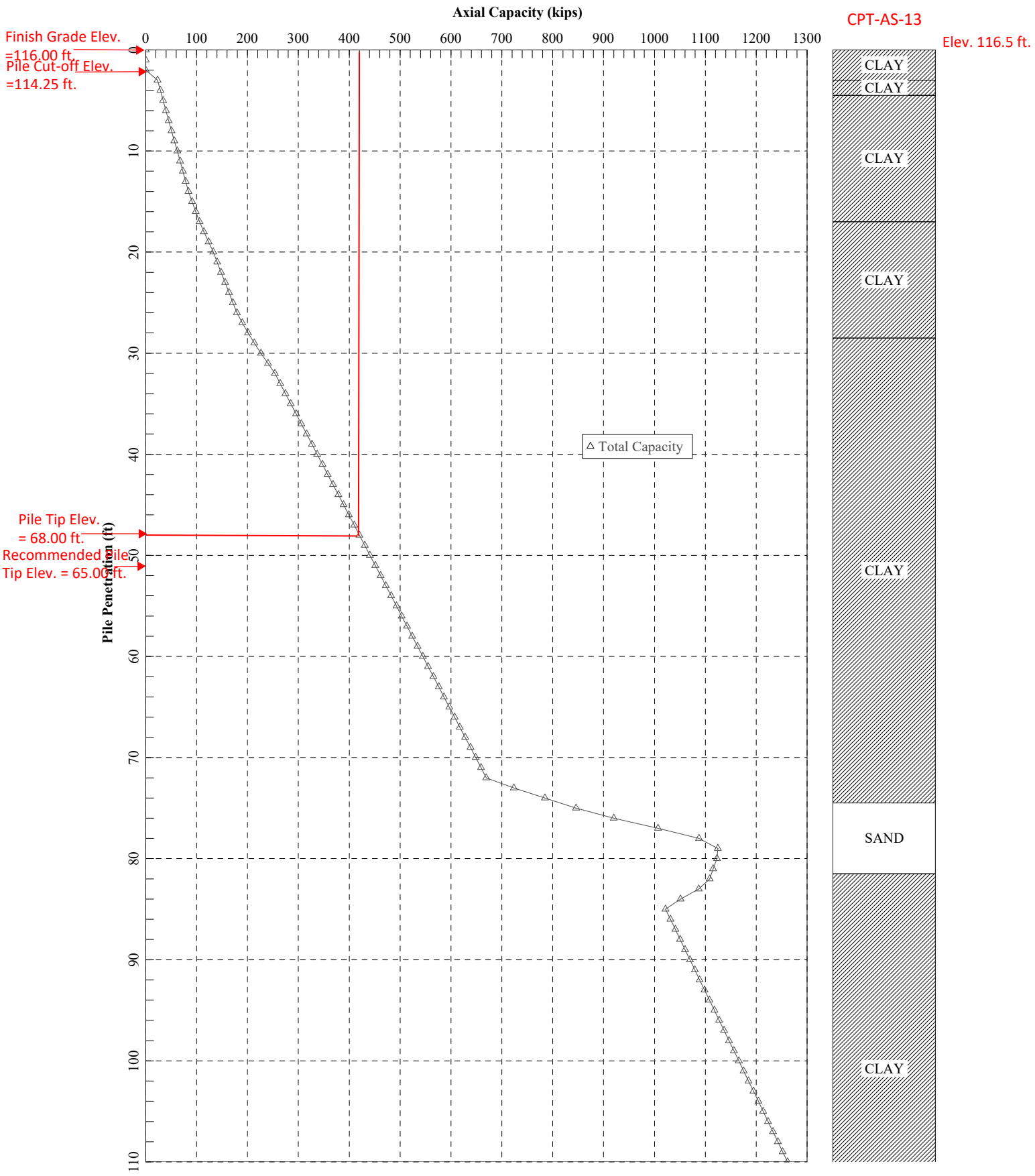
GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	9.6	1	3	SPT	3	125.0	125.0	20.0%	1200															
9.6	11.4	1	3	SPT	3	125.0	62.6	20.0%	113															
11.4	17.4	2	6	SPT	6	125.0	62.6	20.0%	376															
17.4	22.4	2	6	SPT	6	125.0	62.6	20.0%	313	1884	1347.0	800		3200	1.7		0.0250	0.1252			0.258	0.024		0.282
22.4	29.4	3	12	SPT	12	125.0	62.6	20.0%	438	2220	904.5	1500		6000	2.7	525000				0.145				0.145
29.4	33.4	2	6	SPT	6	125.0	62.6	20.0%	250	2565	644.2	800		3200	1.2		0.0250	0.1252			0.115	0.007		0.123
33.4	39.4	3	20	SPT	20	125.0	62.6	20.0%	376	2878	494.1	2500		10000	3.5	875000				0.041				0.041
39.4	44.4	3	20	SPT	20	125.0	62.6	20.0%	313	3222	382.4	2500		10000	3.1	875000				0.026				0.026
44.4	49.4	2	8	SPT	8	125.0	62.6	20.0%	313	3535	310.7	1000		4000	1.1		0.0250	0.1252			0.055			0.055
49.4	55.4	2	8	SPT	8	125.0	62.6	20.0%	376	3879	252.9	1000		4000	1.0		0.0250	0.1252			0.024	0.127		0.151
55.4	61.4	2	20	SPT	20	125.0	62.6	20.0%	376	4255	206.5	2500		10000	2.4		0.0250	0.1252			0.037			0.037
61.4	71.4	2	16	SPT	16	125.0	62.6	20.0%	626	4756	162.2	2000		8000	1.7		0.0250	0.1252			0.044			0.044
71.4	81.4	2	16	SPT	16	125.0	62.6	20.0%	626	5382	124.3	2000		8000	1.5		0.0250	0.1252			0.030			0.030
81.4	91.4	2	16	SPT	16	125.0	62.6	20.0%	626	6008	98.2	2000		8000	1.3		0.0250	0.1252			0.021			0.021
91.4	96.4	2	16	SPT	16	125.0	62.6	20.0%	313	6477	83.7	2000		8000	1.2		0.0250	0.1252			0.008			0.008
96.4	106.4	2	24	SPT	24	125.0	62.6	20.0%	626	6947	72.2	3000		12000	1.7		0.0250	0.1252			0.013			0.013
106.4	114.4	2	24	SPT	24	125.0	62.6	20.0%	501	7510	61.3	3000		12000	1.6		0.0250	0.1252			0.008			0.008
114.4	119.4	2	24	SPT	24	125.0	62.6	20.0%	313	7917	54.9	3000		12000	1.5		0.0200	0.1000			0.004			0.004

VERTICAL PILE CAPACITY ANALYSES (A-PILE ANALYSES RESULTS)
ACCESS AND ELEVATOR ACCESS

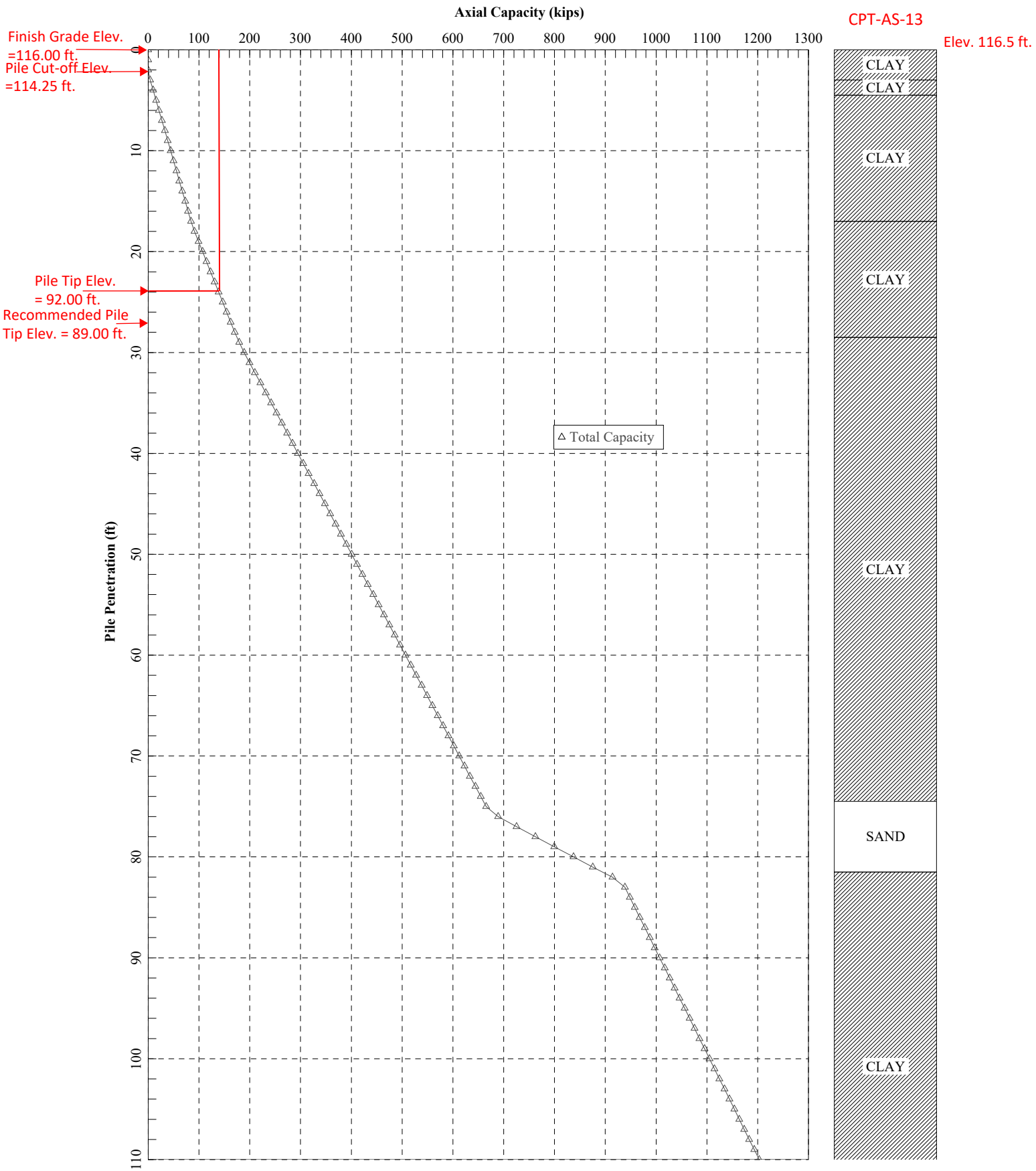
SOUTH ACCESS (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 292 kips (Strength Limit Compression)/0.7 = 420 kips



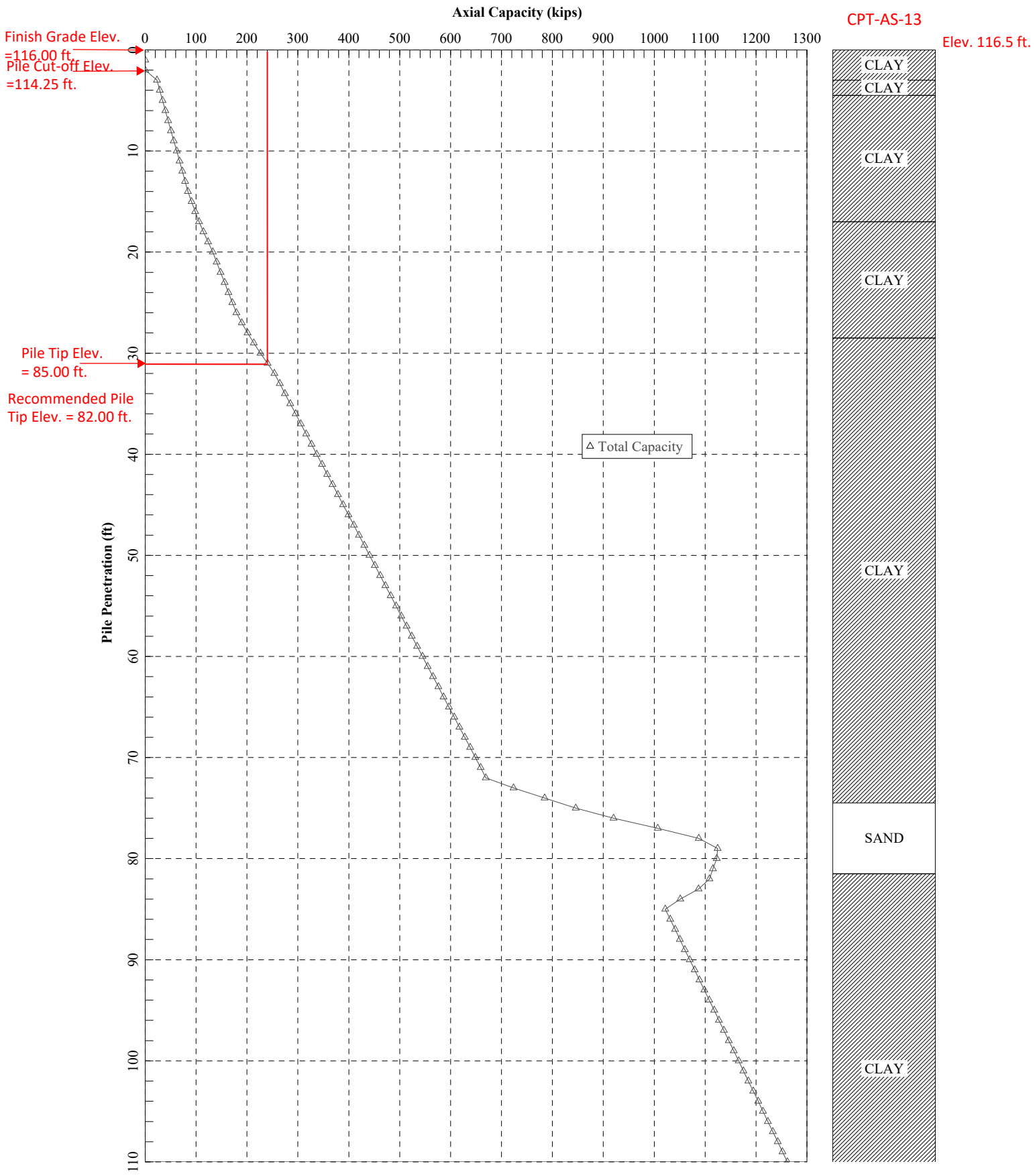
Eastridge to BART Regional Connector Project South Access 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 97 kips (Strength Limit Tension)/0.7 = 140 kips



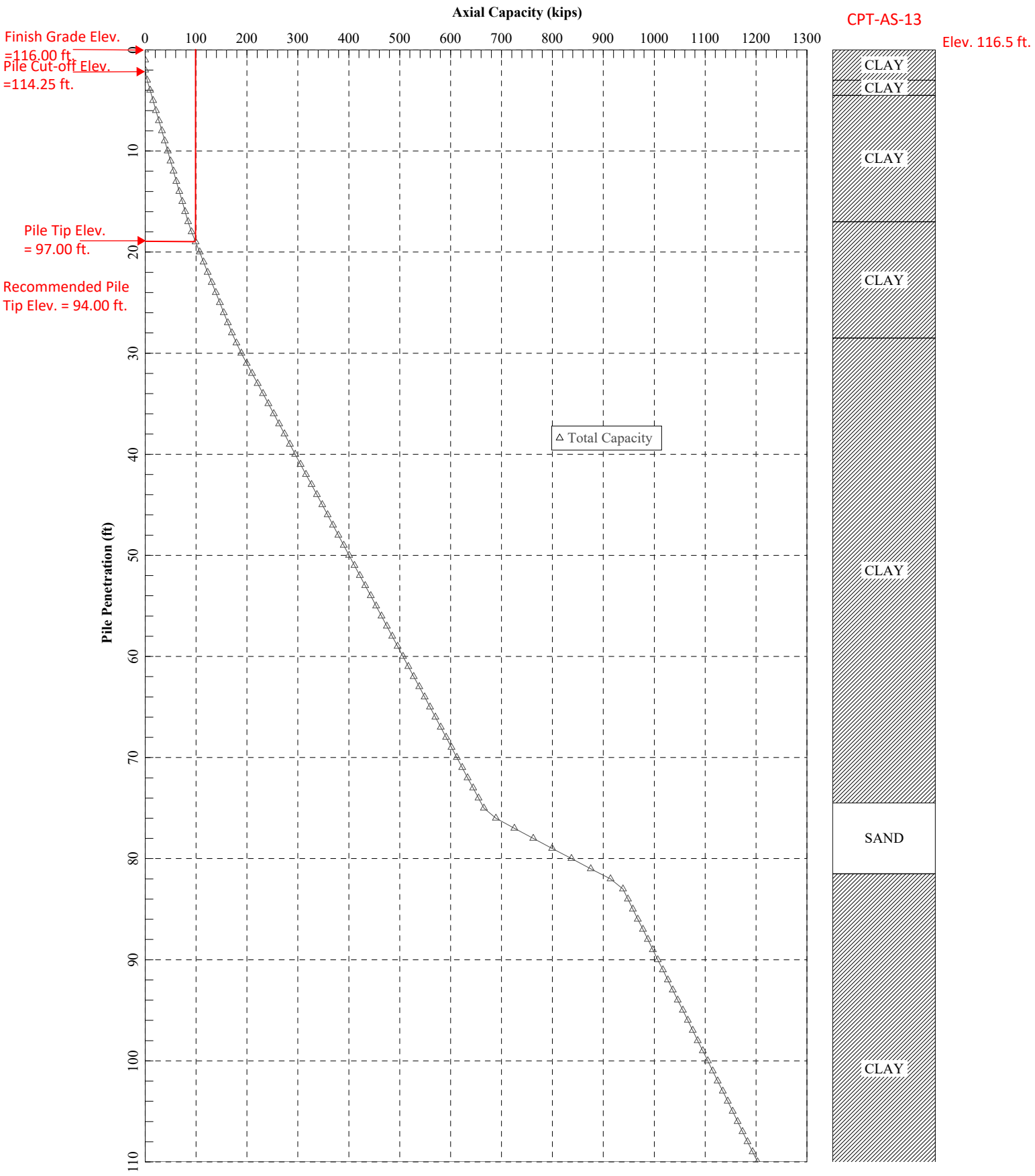
Eastridge to BART Regional Connector Project South Access 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 240 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project South Access 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

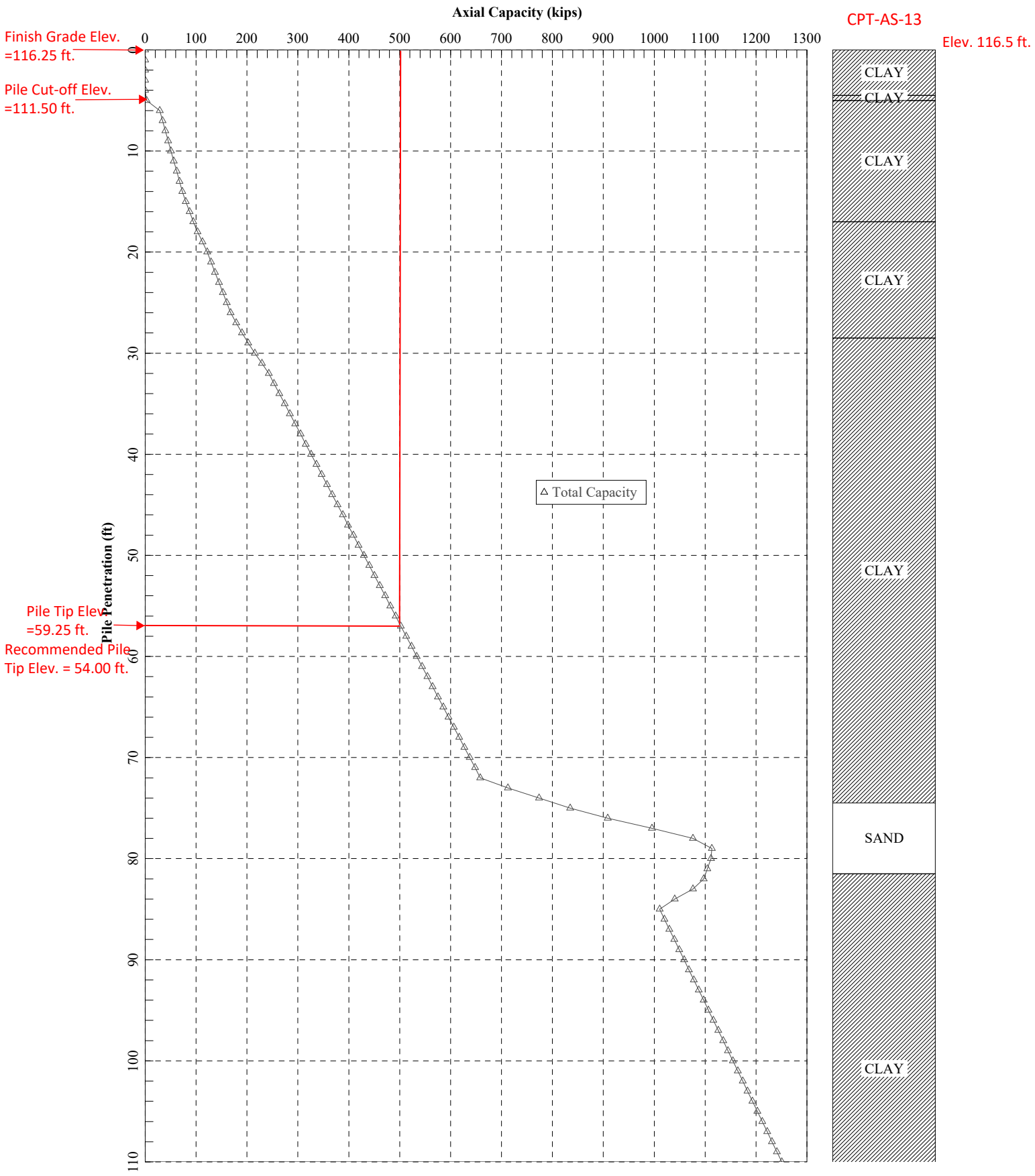
Vertical Load Demand = 100 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project South Access 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

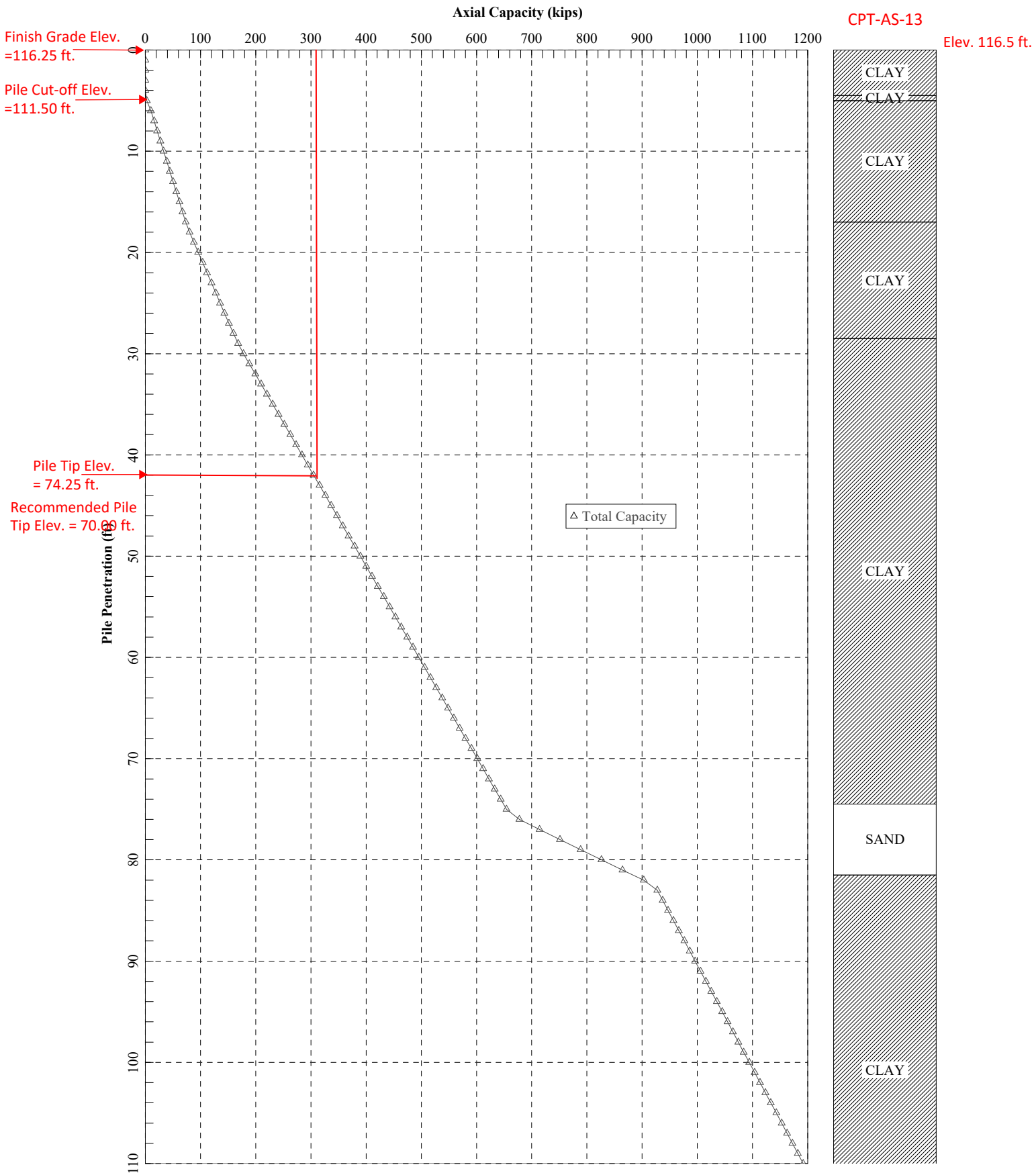
NORTH ACCESS (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 346 kips (Strength Limit Compression)/0.7 = 500 kips



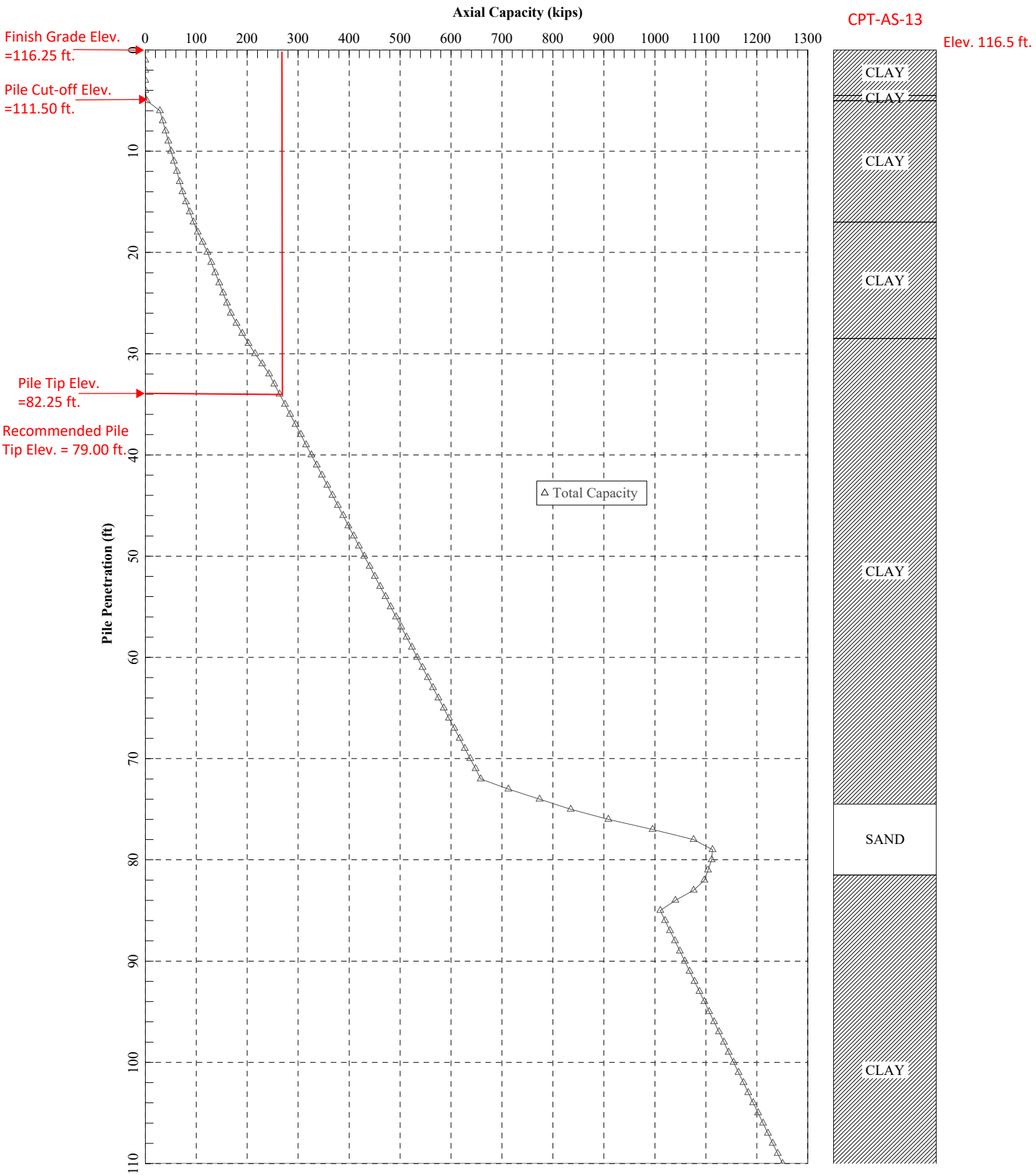
Eastridge to BART Regional Connector Project North Access 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 212 kips (Strength Limit Tension)/0.7 = 310 kips



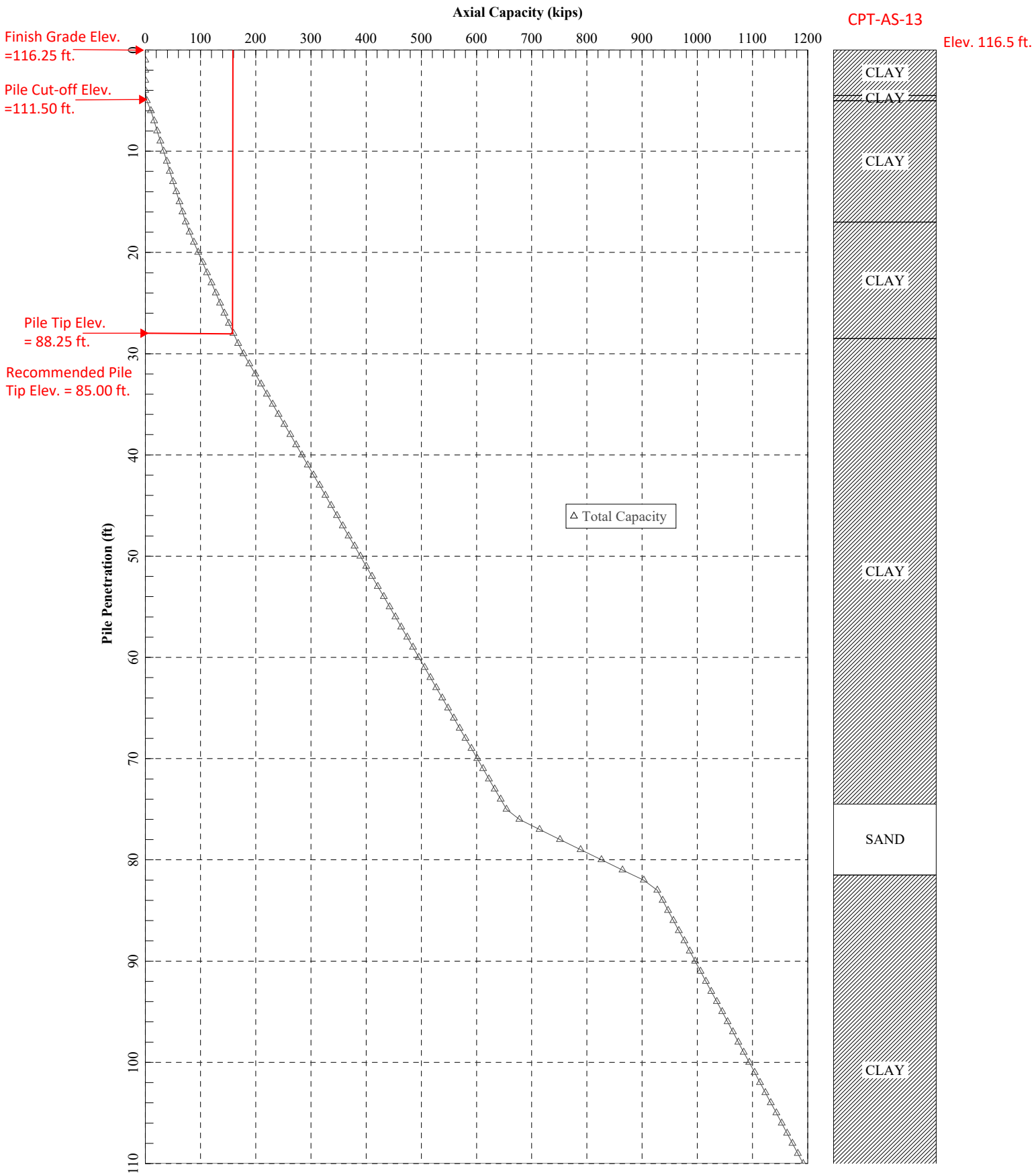
Eastridge to BART Regional Connector Project North Access 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 270 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project North Access 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

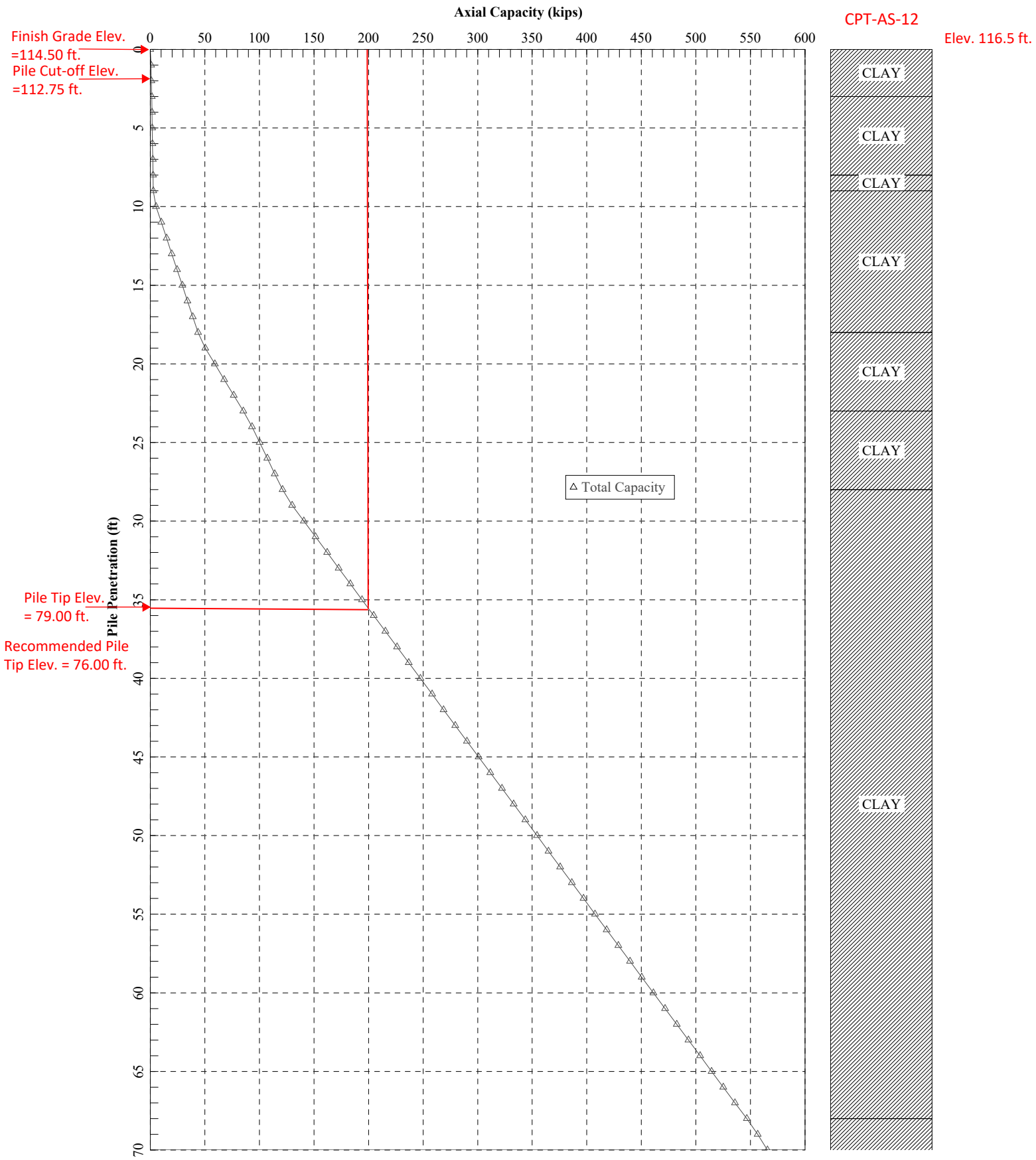
Vertical Load Demand = 160 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project North Access 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

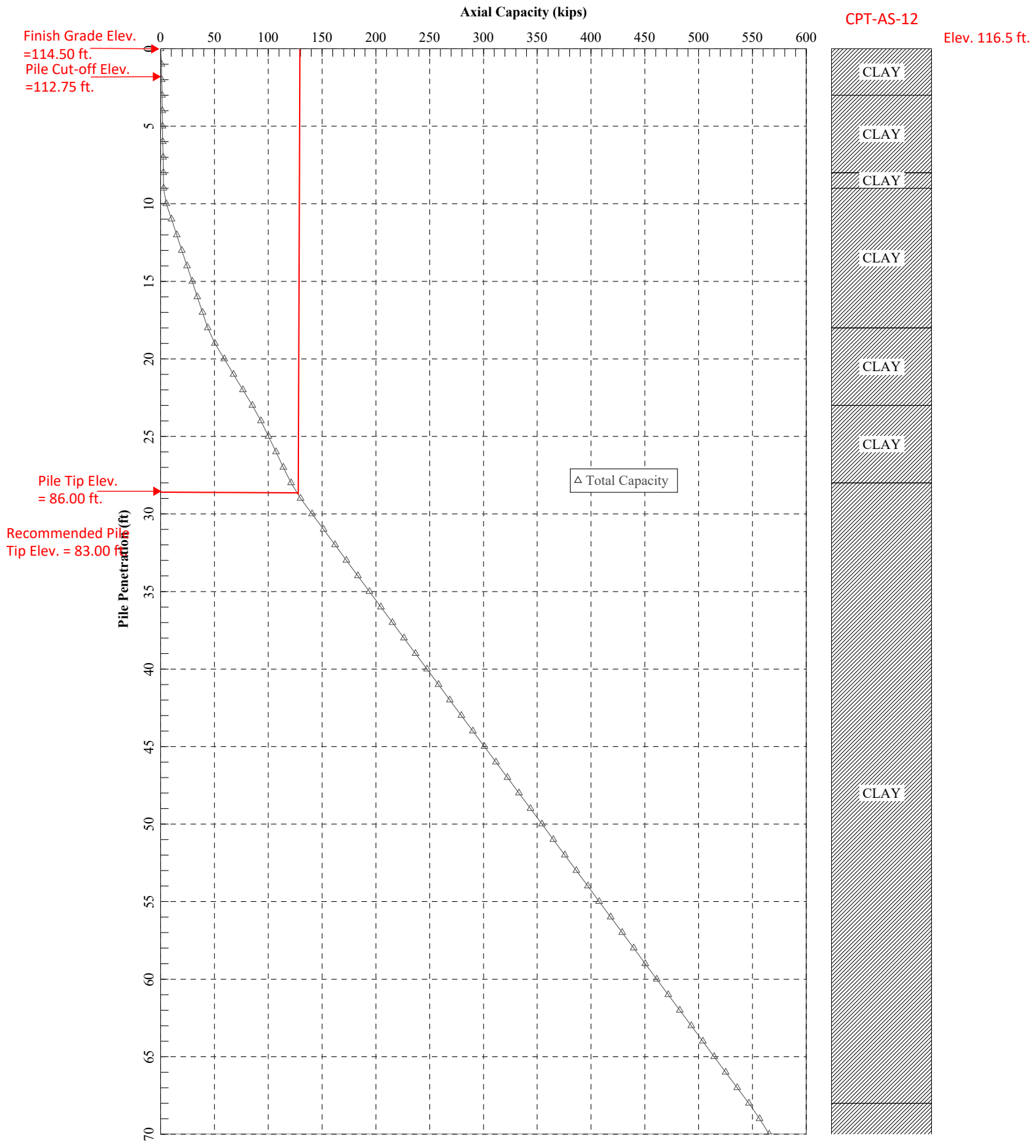
EAST ACCESS (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 140 kips (Strength Limit Compression)/0.7 = 200 kips



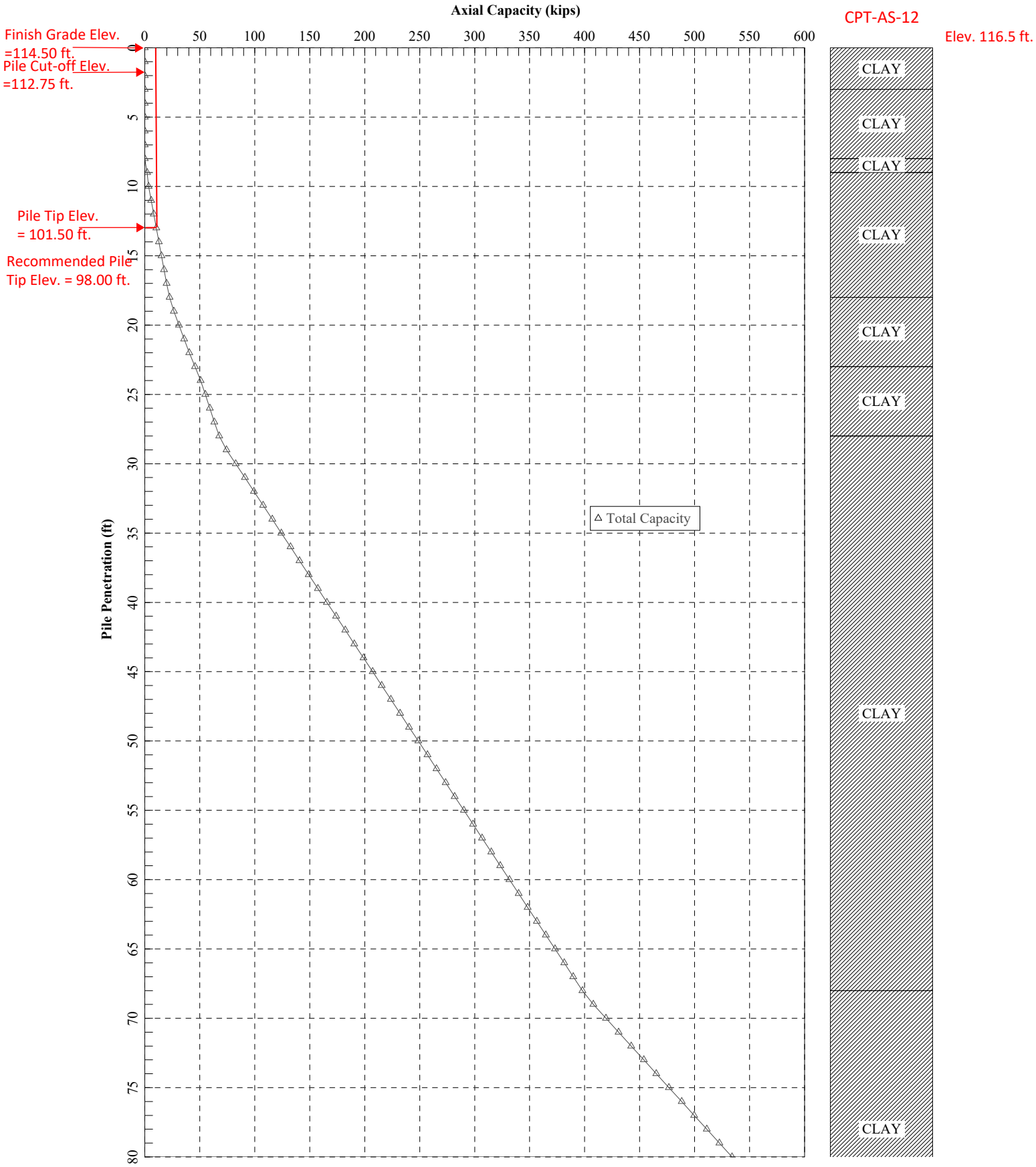
Eastridge to BART Regional Connector Project East Access 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 130 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project East Access 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

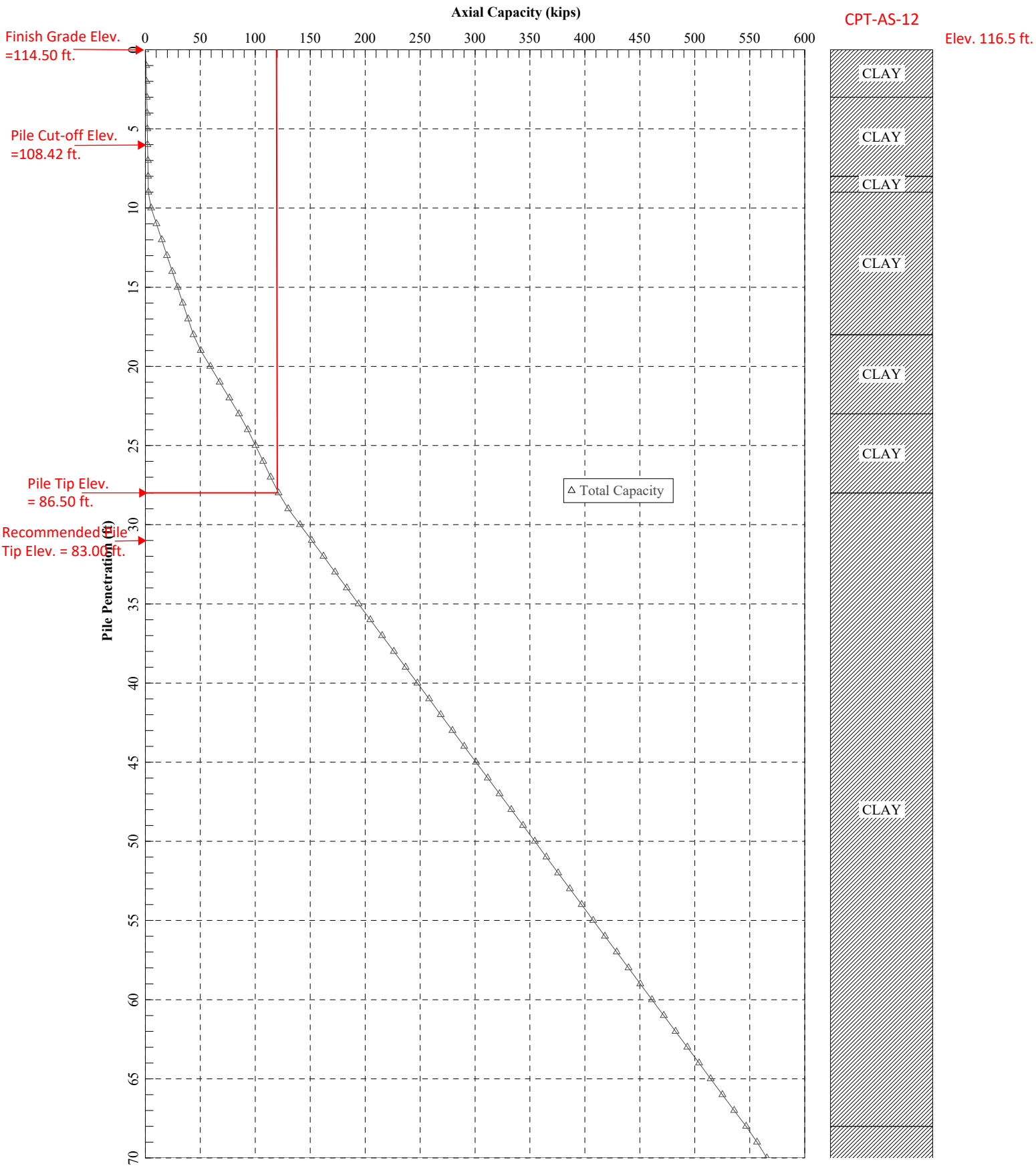
Vertical Load Demand = 10 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project East Access 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

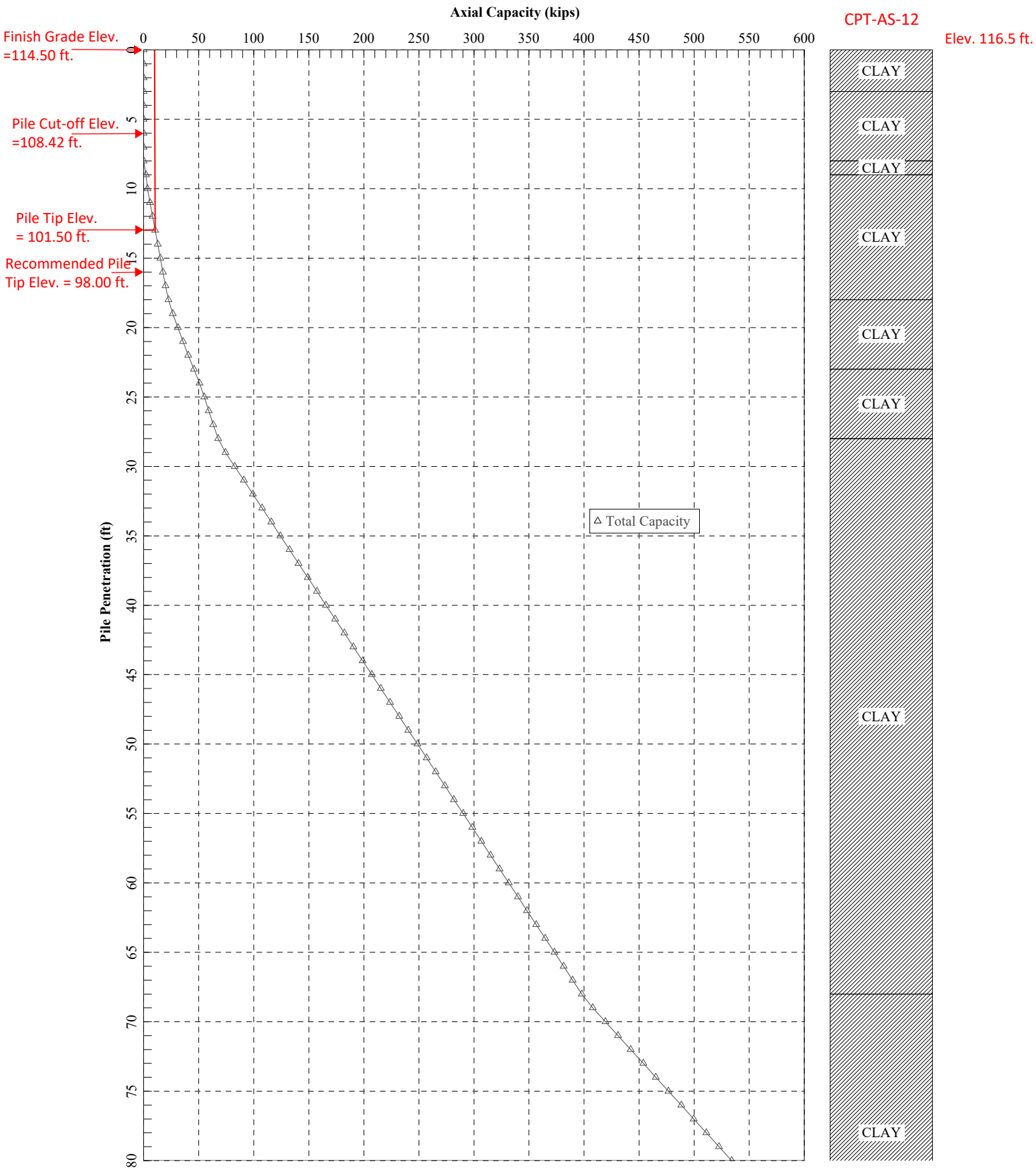
ELEVATOR EAST ACCESS (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 79 kips (Strength Limit Compression)/0.7 = 120 kips



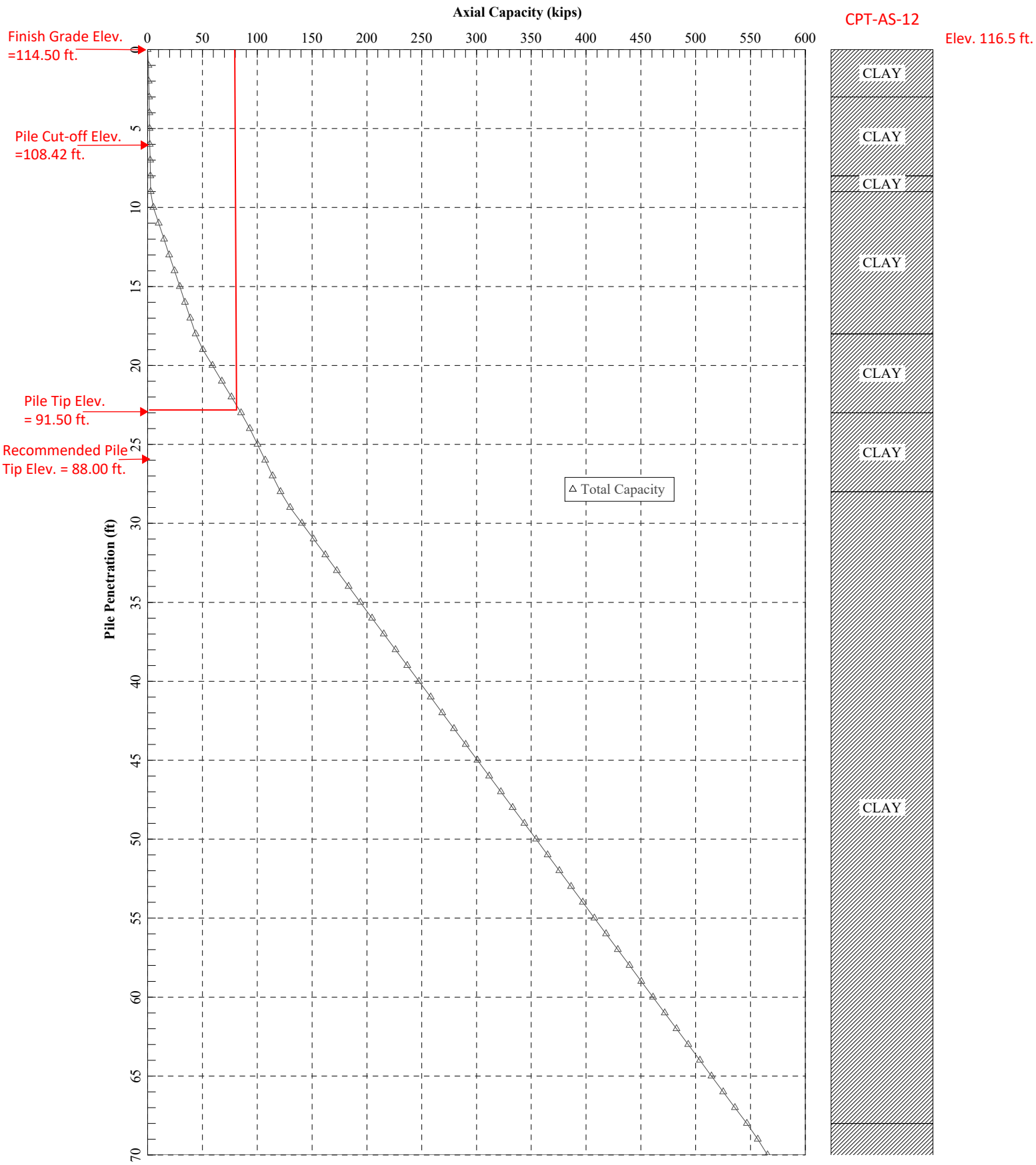
Eastridge to BART Regional Connector Project Elevator East Access 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 4 kips (Strength Limit Tension)/0.7 = 10 kips



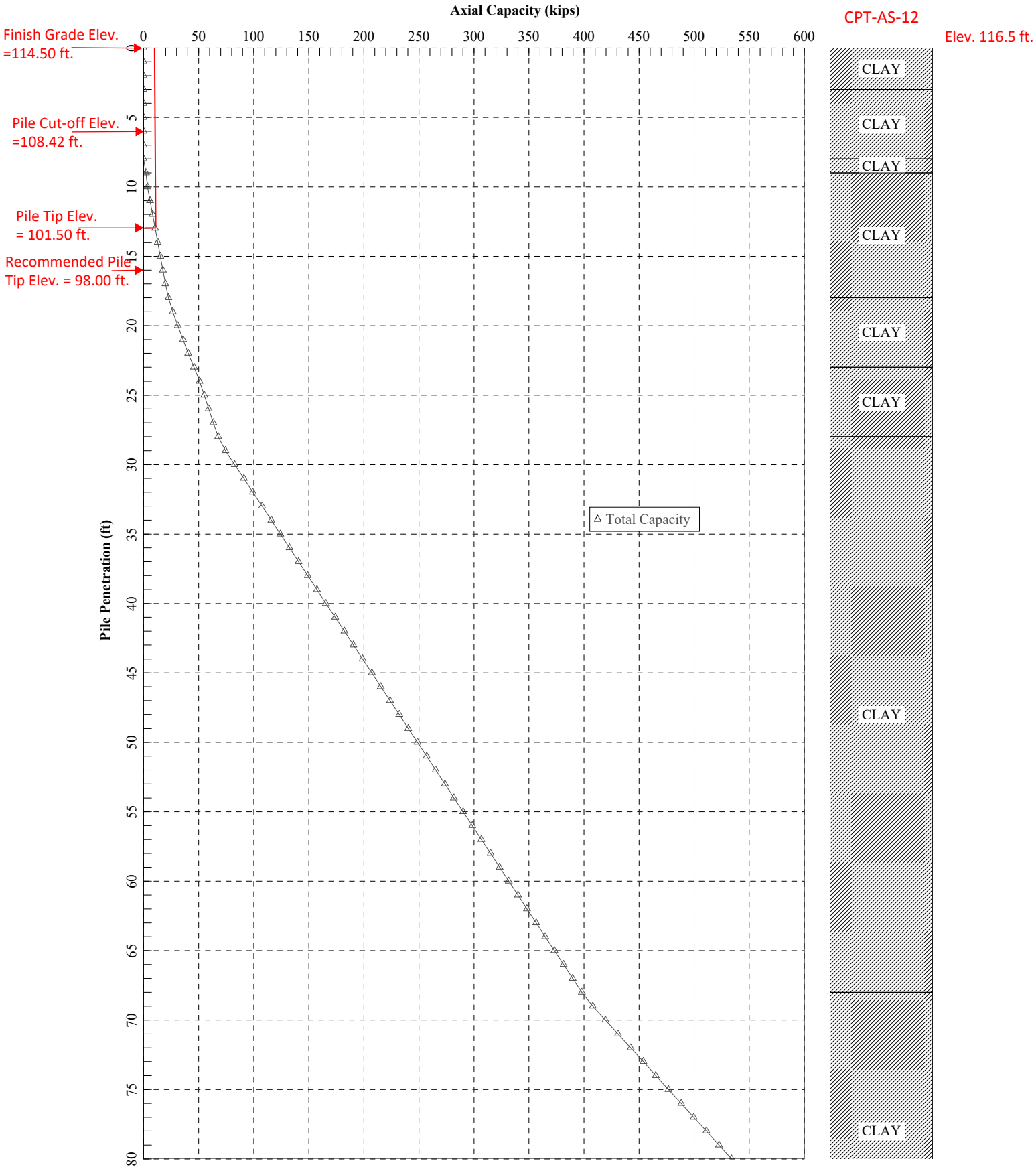
Eastridge to BART Regional Connector Project Elevator East Access 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 80 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project Elevator East Access 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

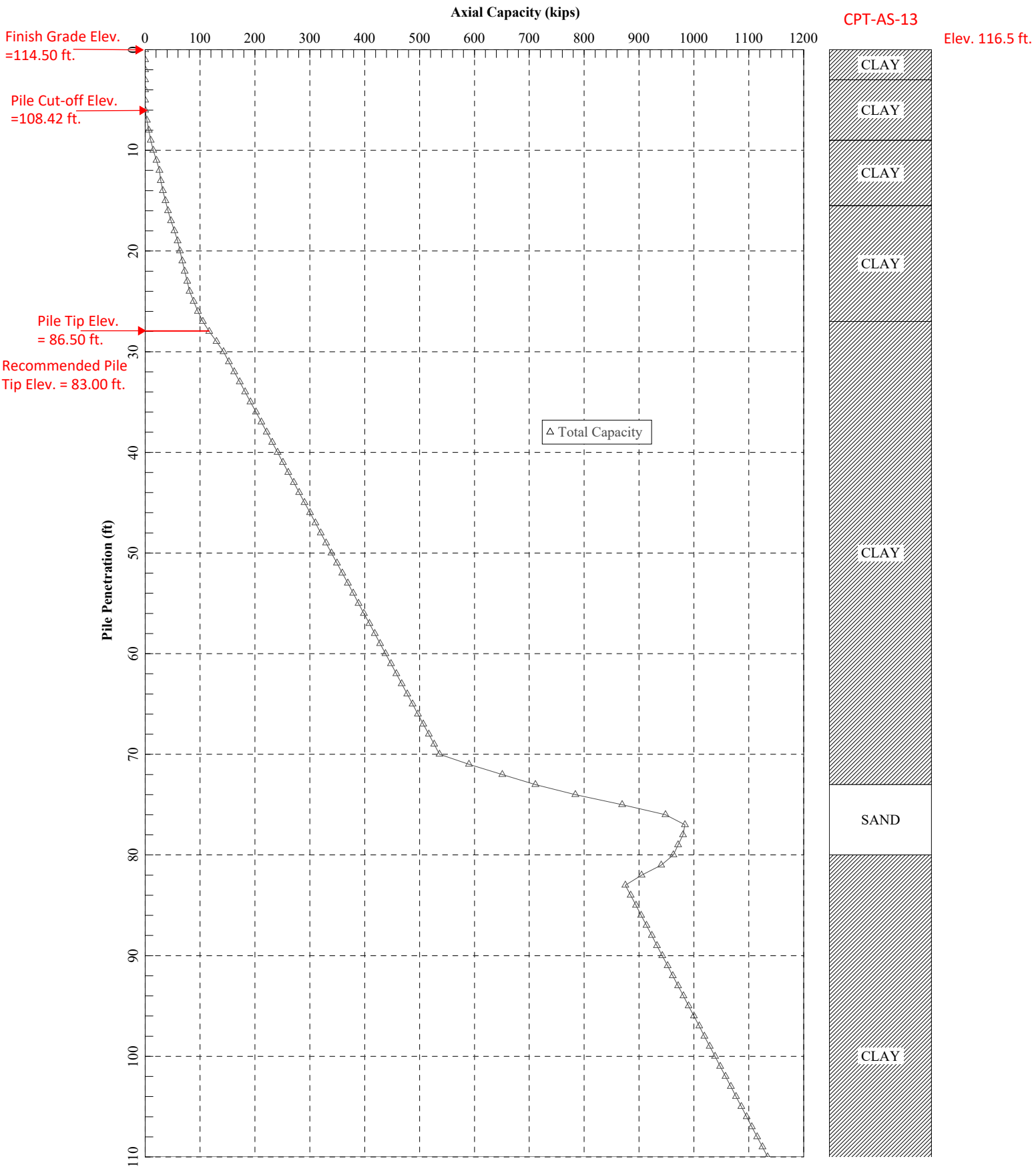
Vertical Load Demand = 10 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Elevator East Access 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

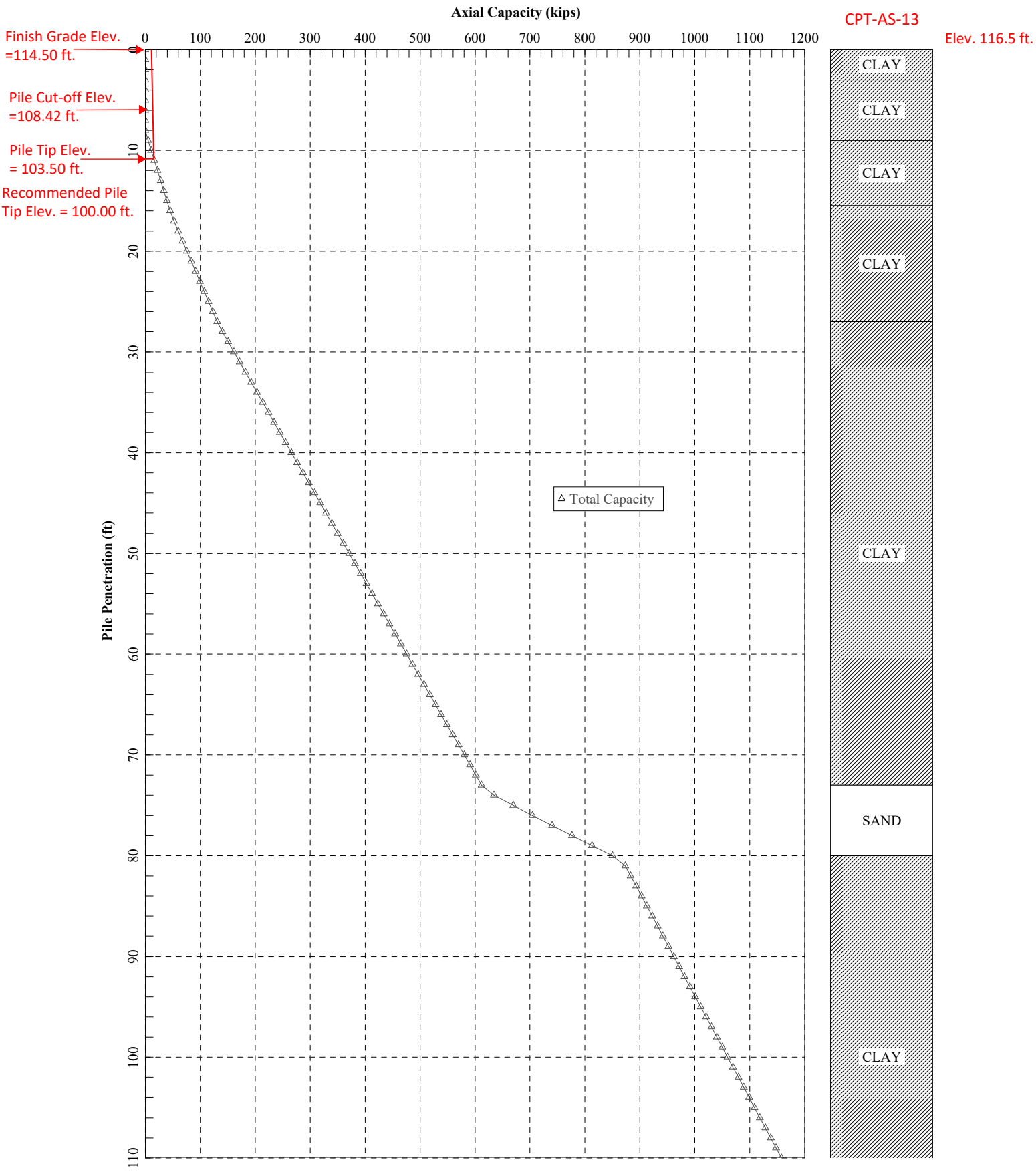
ELEVATOR WEST ACCESS (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 79 kips (Strength Limit Compression)/0.7 = 120 kips

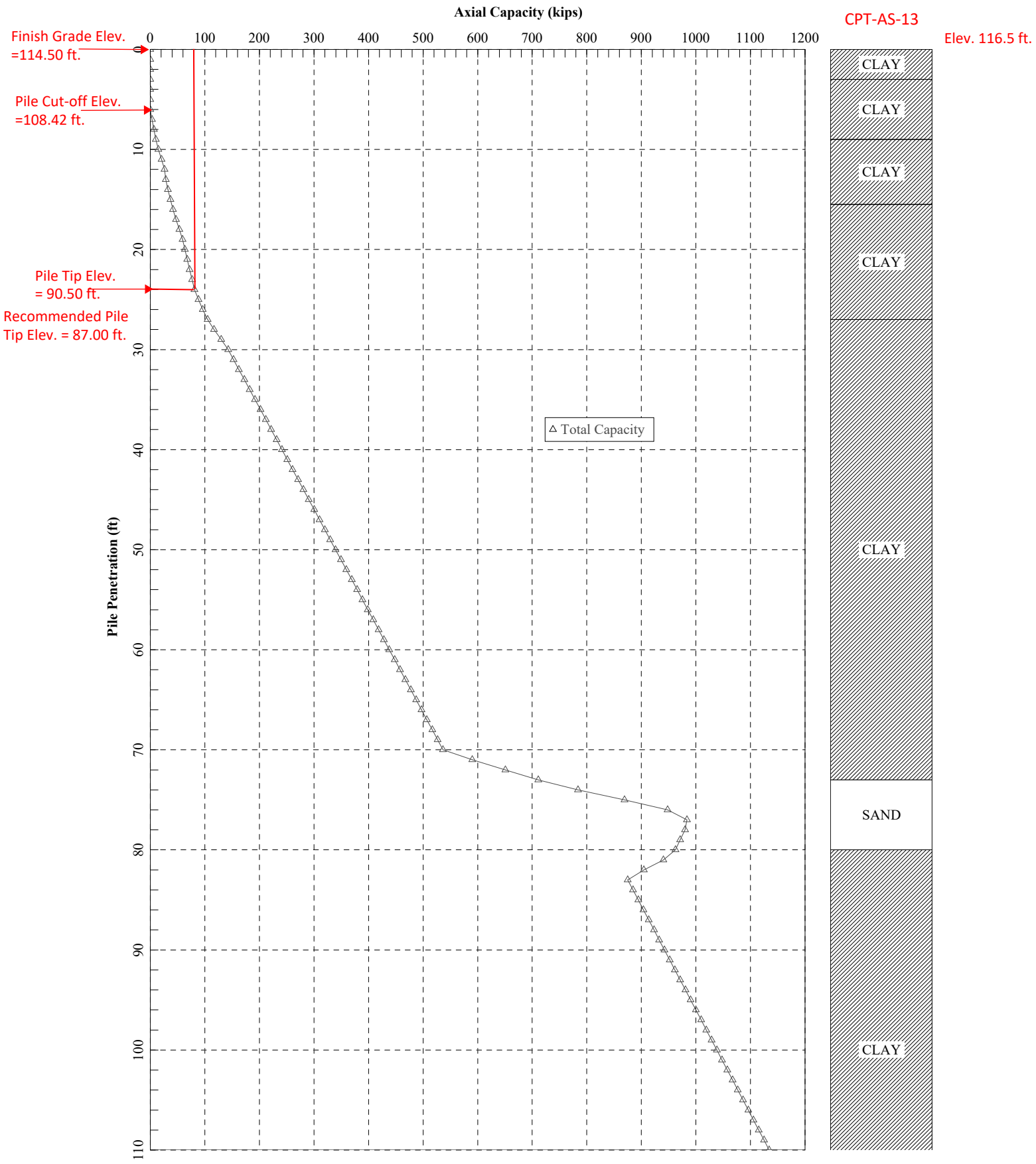


Eastridge to BART Regional Connector Project Elevator West Access 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 4 kips (Strength Limit Tension)/0.7 = 10 kips

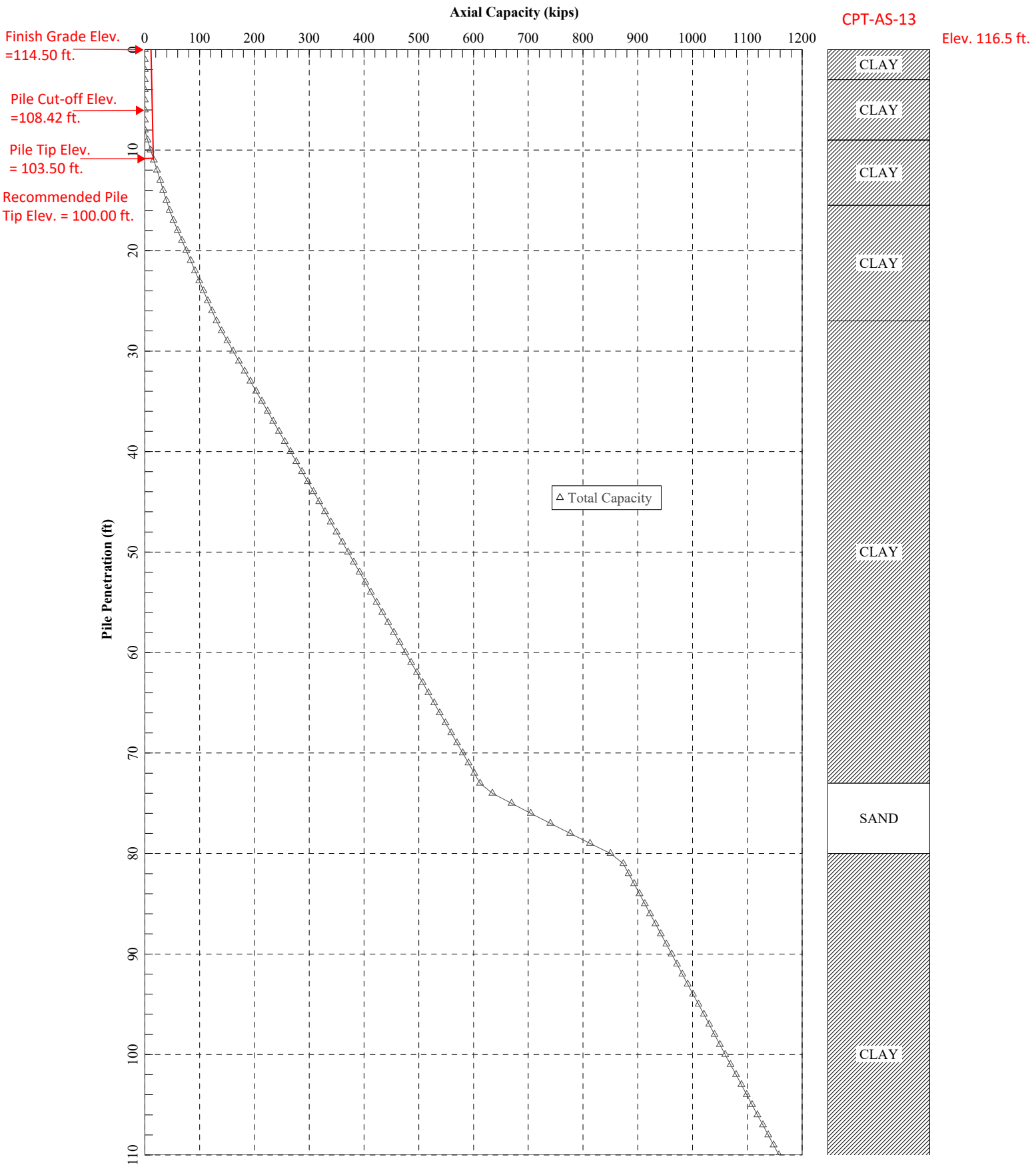


Eastridge to BART Regional Connector Project Elevator West Access 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)



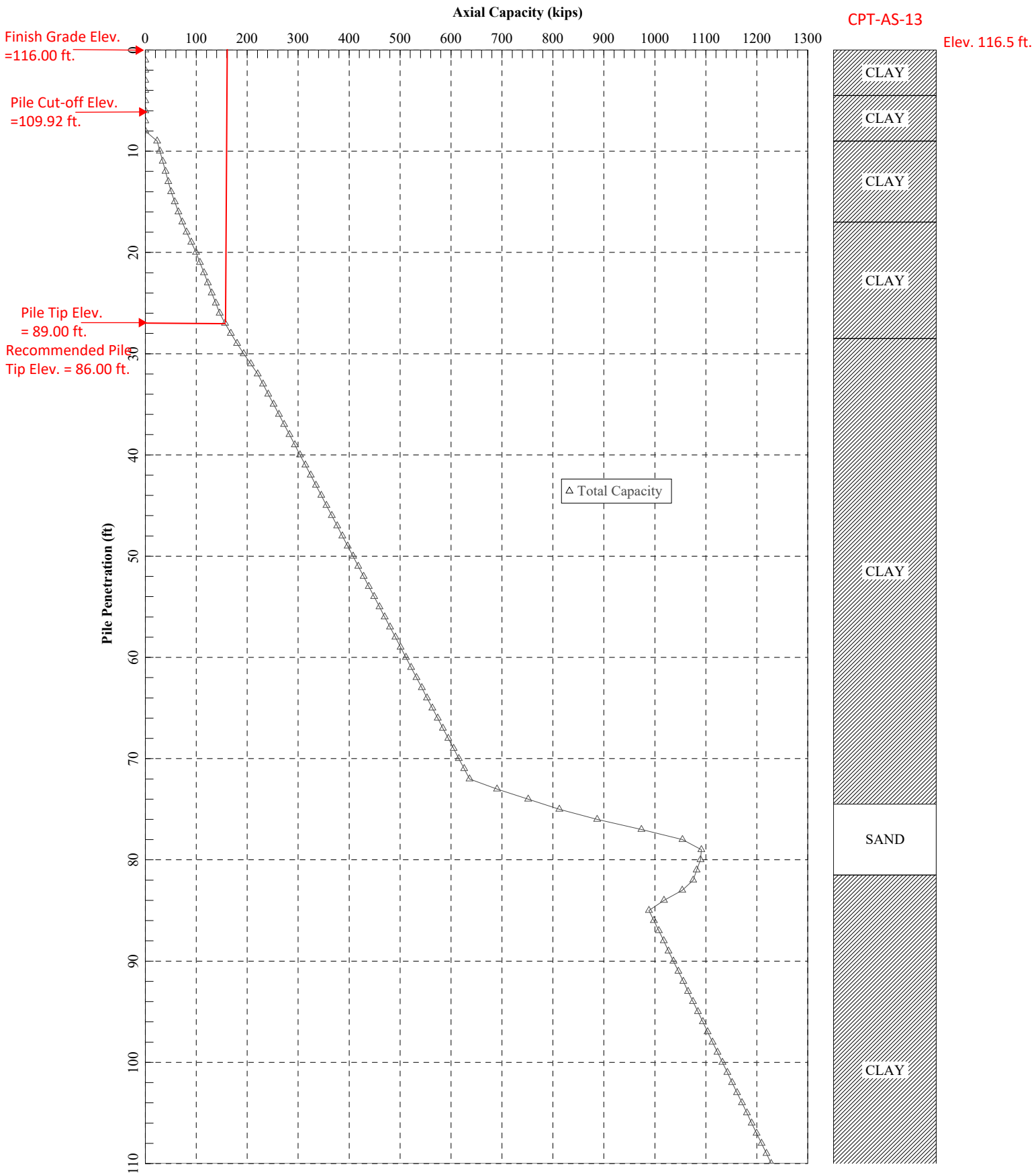
Eastridge to BART Regional Connector Project Elevator West Access 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

Vertical Load Demand = 10 kips (Extreme Event Limit Tension)



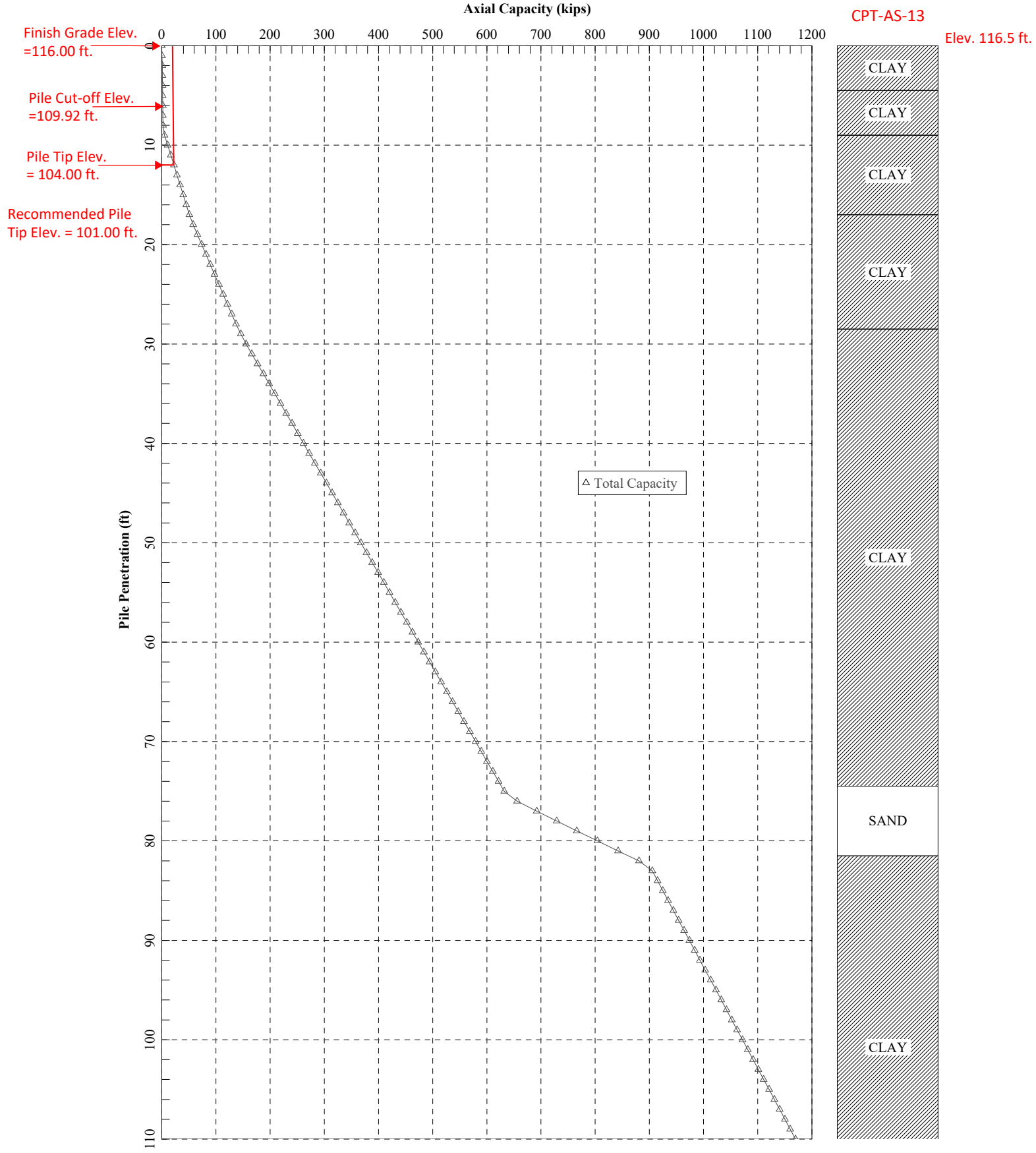
ELEVATOR SOUTH ACCESS (18-INCH SQUARE PRECAST CONCRETE PILE)

Vertical Load Demand = 106 kips (Strength Limit Compression)/0.7 = 160 kips



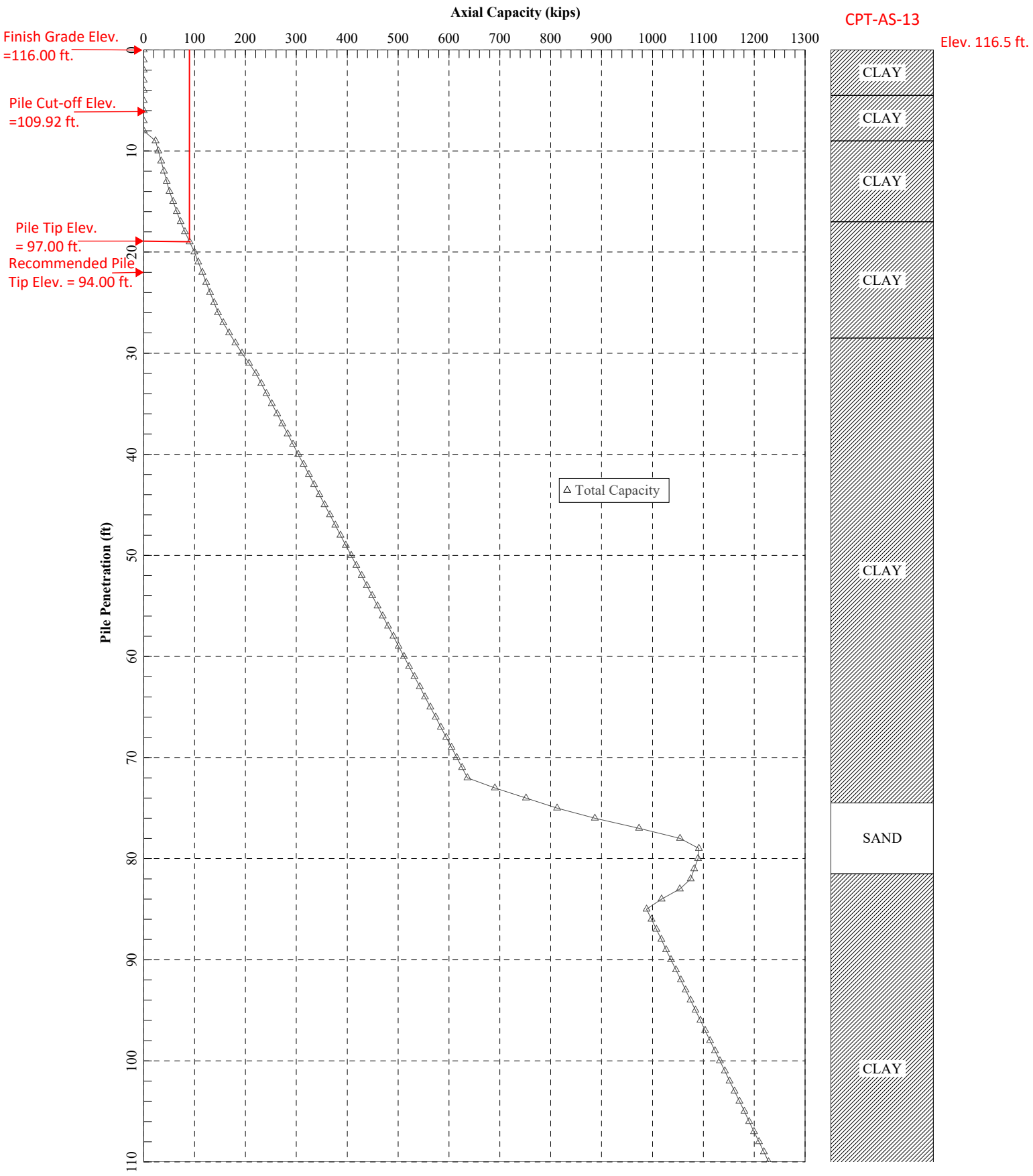
Eastridge to BART Regional Connector Project Elevator South Access 18-Inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 9 kips (Strength Limit Tension)/0.7 = 20 kips



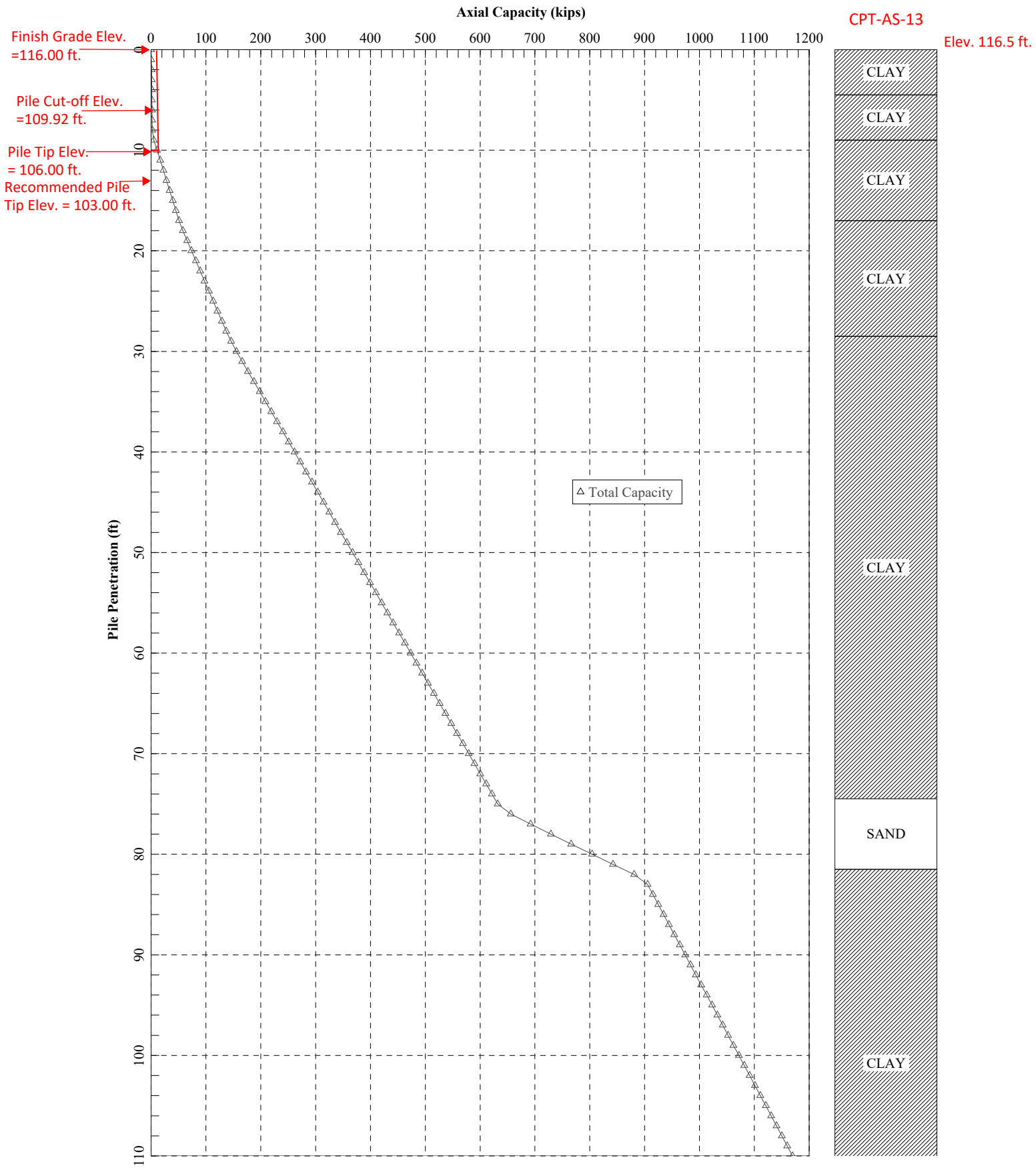
Eastridge to BART Regional Connector Project Elevator South Access 18-Inch Square Precast Concrete Pile Strength Limit State (Tension)

Vertical Load Demand = 90 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project Elevator South Access 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

Vertical Load Demand = 10 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Elevator South Access 18-Inch Square Precast Concrete Pile Extreme Event Limit State (Tension)

ACCESS AND ELEVATOR ACCESS – PILE GROUP SETTLEMENT

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***South Access***
REFERENCE BORIN	***CPT-AS-13 (Elev. 116.5 ft)***
Hammer Energy =	60%
GW Level (ft)=	4.5

Finish Grade Elev. (ft) =	116
Pile Cut-off Elev. (ft) =	114.25
Footing Depth (ft) =	1.75
Pile Length (ft)=	13
Width of Pile Group, B (ft)=	15
Length of Pile Group, L (ft)=	62.5
Permanent Load Pressure (kip)=	901
Pile Tip Ele (ft)=	101.25

Eq. Footing Depth (ft	10.4
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)
0	4.5	2	8	SPT	8	125.0	125.0	20.0%	563										
4.5	17	2	12	SPT	12	125.0	62.6	20.0%	783	1139	567.9	1500		6000	5.3		0.0250	0.1252	
17	28.5	2	7	SPT	7	125.0	62.6	20.0%	720	1705	359.4	875		3500	2.1		0.0250	0.1252	
28.5	38.5	2	15	SPT	15	125.0	62.6	20.0%	626	2378	236.2	1875		7500	3.2		0.0250	0.1252	
38.5	48.5	2	14	SPT	14	125.0	62.6	20.0%	626	3004	172.0	1750		7000	2.3		0.0250	0.1252	
48.5	58.5	2	15	SPT	15	125.0	62.6	20.0%	626	3630	131.3	1875		7500	2.1		0.0250	0.1252	
58.5	68.5	2	23	SPT	23	125.0	62.6	20.0%	626	4256	103.8	2875		11500	2.7		0.0250	0.1252	
68.5	74.5	2	27	SPT	27	125.0	62.6	20.0%	376	4757	87.6	3375		13500	2.8		0.0250	0.1252	
74.5	81.5	1	19	SPT	19	125.0	62.6	20.0%	438	5164	77.1								45
81.5	91.5	2	35	SPT	35	125.0	62.6	20.0%	626	5696	66.1	4375		17500	3.1		0.0200	0.1000	
91.5	101.5	2	29	SPT	29	125.0	62.6	20.0%	626	6322	55.9	3625		14500	2.3		0.0250	0.1252	
101.5	111.5	2	23	SPT	23	125.0	62.6	20.0%	626	6948	47.9	2875		11500	1.7		0.0200	0.1000	
111.5	119.5	2	62	SPT	62	125.0	62.6	20.0%	501	7511	42.1	7750		31000	4.1		0.0200	0.1000	

Settlements (in)

Elastic	OC	NC	SAND	Sum
	0.347			0.347
	0.287			0.287
	0.124			0.124
	0.073			0.073
	0.046			0.046
	0.031			0.031
	0.014			0.014
			0.012	0.012
	0.012			0.012
	0.011			0.011
	0.007			0.007
	0.005			0.005

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 20% was estimated based on available test data.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.

Estimated Settlement (in)=	*0.0*	*1.0*	*0.0*	*0.0*	*0.97*

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***North Access***
REFERENCE BORIN	***CPT-AS-13 (Elev. 116.5 ft)***
Hammer Energy =	60%
GW Level (ft)=	4.8

Finish Grade Elev. (ft) =	116.25
Pile Cut-off Elev. (ft) =	111.5
Footing Depth (ft) =	4.75
Pile Length (ft)=	26
Width of Pile Group, B (ft)=	21.5
Length of Pile Group, L (ft)=	35.5
Permanent Load Pressure (kip)=	1270
Pile Tip Ele (ft)=	85.50

Eq. Footing Depth (ft	22.1
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)
0.0	4.8	2	8	SPT	8	125.0	125.0	20.0%	594										
4.8	17.3	2	12	SPT	12	125.0	62.6	20.0%	783										
17.3	28.8	2	7	SPT	7	125.0	62.6	20.0%	720	1887	798.1	875		3500	1.9		0.0250	0.1252	
28.8	38.8	2	15	SPT	15	125.0	62.6	20.0%	626	2409	543.7	1875		7500	3.1		0.0250	0.1252	
38.8	48.8	2	14	SPT	14	125.0	62.6	20.0%	626	3035	372.2	1750		7000	2.3		0.0250	0.1252	
48.8	58.8	2	15	SPT	15	125.0	62.6	20.0%	626	3661	270.8	1875		7500	2.0		0.0250	0.1252	
58.8	68.8	2	23	SPT	23	125.0	62.6	20.0%	626	4287	206.0	2875		11500	2.7		0.0250	0.1252	
68.8	74.8	2	27	SPT	27	125.0	62.6	20.0%	376	4788	169.5	3375		13500	2.8		0.0250	0.1252	
74.8	81.8	1	19	SPT	19	125.0	62.6	20.0%	438	5195	146.6								45
81.8	91.8	2	35	SPT	35	125.0	62.6	20.0%	626	5727	123.0	4375		17500	3.1		0.0200	0.1000	
91.8	101.8	2	29	SPT	29	125.0	62.6	20.0%	626	6353	101.9	3625		14500	2.3		0.0250	0.1252	
101.8	111.8	2	23	SPT	23	125.0	62.6	20.0%	626	6979	85.8	2875		11500	1.6		0.0200	0.1000	
111.8	119.8	2	62	SPT	62	125.0	62.6	20.0%	501	7542	74.4	7750		31000	4.1		0.0200	0.1000	

Settlements (in)

Elastic	OC	NC	SAND	Sum
	0.307			0.307
	0.266			0.266
	0.151			0.151
	0.093			0.093
	0.061			0.061
	0.027			0.027
			0.022	0.022
	0.022			0.022
	0.021			0.021
	0.013			0.013
	0.008			0.008
0.0	*1.0*	*0.0*	*0.0*	*0.99*

Estimated Settlement (in)=

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 20% was estimated based on available test data.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***East Access***
REFERENCE BORIN	***CPT-AS-12 (Elev. 116.5 ft)***
Hammer Energy =	60%
GW Level (ft)=	3.0

Finish Grade Elev. (ft) =	114.5
Pile Cut-off Elev. (ft) =	112.75
Footing Depth (ft) =	1.75
Pile Length (ft)=	8
Width of Pile Group, B (ft)=	22
Length of Pile Group, L (ft)=	30.375
Permanent Load Pressure (kip)=	532
Pile Tip Ele (ft)=	104.75

Eq. Footing Depth (ft	7.1
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG From	To	Soil Type	BLOW COUNT	SAMPLER TYPE	AVG SPT-N_{60}	γ_T (pcf)	γ' (pcf)	ω	σ_v' (psf)	σ_v' (psf)	$\Delta\sigma_v'$ (psf)	Su (psf)	Lab Su (psf)	Pp (psf)	OCR	E (psf)	Cr/1+e_0	Cc/1+e_0	C' (Hough Method)
0.0	3.0	2	12	SPT	12	125.0	125.0	20.0%	375										
3.0	8.0	2	12	SPT	12	125.0	62.6	20.0%	313	659	632.1	1500		6000	9.1		0.0250	0.1252	
8.0	18.0	2	6	SPT	6	125.0	62.6	20.0%	626	1001	446.5	800		3200	3.2		0.0250	0.1252	
18.0	23.0	2	16	SPT	16	125.0	62.6	20.0%	313	1471	300.7	2000		8000	5.4		0.0250	0.1252	
23.0	28.0	2	10	SPT	10	125.0	62.6	20.0%	313	1784	240.0	1250		5000	2.8		0.0250	0.1252	
28.0	38.0	2	16	SPT	16	125.0	62.6	20.0%	626	2253	178.4	2000		8000	3.6		0.0250	0.1252	
38.0	48.0	2	16	SPT	16	125.0	62.6	20.0%	626	2879	127.3	2000		8000	2.8		0.0250	0.1252	
48.0	58.0	2	16	SPT	16	125.0	62.6	20.0%	626	3505	95.5	2000		8000	2.3		0.0250	0.1252	
58.0	68.0	2	16	SPT	16	125.0	62.6	20.0%	626	4131	74.2	2000		8000	1.9		0.0200	0.1000	
68.0	78.0	2	24	SPT	24	125.0	62.6	20.0%	626	4757	59.3	3000		12000	2.5		0.0200	0.1000	
78.0	88.0	2	24	SPT	24	125.0	62.6	20.0%	626	5383	48.5	3000		12000	2.2		0.0200	0.1000	

Settlements (in)				
Elastic	OC	NC	SAND	Sum
	0.080			0.080
	0.481			0.481
	0.121			0.121
	0.082			0.082
	0.099			0.099
	0.056			0.056
	0.035			0.035
	0.019			0.019
	0.013			0.013
	0.009			0.009
0.0	*1.0*	*0.0*	*0.0*	*1.00*

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 20% was estimated based on available test data.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.

Estimated Settlement (in)=

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***	*Finish Grade Elev. (ft) =*	114.5	Eq. Footing Depth (ft	12.7
PROJECT NO.	***2017-125-GEO***	*Pile Cut-off Elev. (ft) =*	108.42	Settlement Limit (in)	1.0
STRUCTURE	***Elevator East Access***	*Footing Depth (ft) =*	6.08		
REFERENCE BORIN	***CPT-AS-12 (Elev. 116.5 ft)***	*Pile Length (ft)=*	10		
Hammer Energy =	60%	*Width of Pile Group, B (ft)=*	9.7		
GW Level (ft)=	3.0	*Length of Pile Group, L (ft)=*	11.2		
		Permanent Load Pressure (kip)=	249		
		Pile Tip Ele (ft)=	98.42	*Cr/Cc=*	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0.0	3.0	2	12	SPT	12	125.0	125.0	20.0%	375															
3.0	8.0	2	12	SPT	12	125.0	62.6	20.0%	313															
8.0	18.0	2	6	SPT	6	125.0	62.6	20.0%	626	1150	926.6	800		3200	2.8		0.0250	0.1252			0.405			0.405
18.0	23.0	2	16	SPT	16	125.0	62.6	20.0%	313	1471	537.5	2000		8000	5.4		0.0250	0.1252			0.203			0.203
23.0	28.0	2	10	SPT	10	125.0	62.6	20.0%	313	1784	353.9	1250		5000	2.8		0.0250	0.1252			0.118			0.118
28.0	38.0	2	16	SPT	16	125.0	62.6	20.0%	626	2253	215.0	2000		8000	3.6		0.0250	0.1252			0.119			0.119
38.0	48.0	2	16	SPT	16	125.0	62.6	20.0%	626	2879	128.4	2000		8000	2.8		0.0250	0.1252			0.057			0.057
48.0	58.0	2	16	SPT	16	125.0	62.6	20.0%	626	3505	85.3	2000		8000	2.3		0.0250	0.1252			0.031			0.031
58.0	68.0	2	16	SPT	16	125.0	62.6	20.0%	626	4131	60.7	2000		8000	1.9		0.0200	0.1000			0.015			0.015
68.0	78.0	2	24	SPT	24	125.0	62.6	20.0%	626	4757	45.4	3000		12000	2.5		0.0200	0.1000			0.010			0.010
78.0	88.0	2	24	SPT	24	125.0	62.6	20.0%	626	5383	35.3	3000		12000	2.2		0.0200	0.1000			0.007			0.007

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Elevator West Access***
REFERENCE BORIN	***CPT-AS-13 (Elev. 116.5 ft)***
Hammer Energy =	60%
GW Level (ft)=	3.0

Finish Grade Elev. (ft) =	114.5
Pile Cut-off Elev. (ft) =	108.42
Footing Depth (ft) =	6.08
Pile Length (ft)=	10
Width of Pile Group, B (ft)=	9.7
Length of Pile Group, L (ft)=	11.2
Permanent Load Pressure (kip)=	249
Pile Tip Ele (ft)=	98.42

Eq. Footing Depth (ft	12.7
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0.0	3.0	2	8	SPT	8	125.0	125.0	20.0%	375															
3.0	15.5	2	12	SPT	12	125.0	62.6	20.0%	783	1071	1086.1	1500		6000	5.6		0.0250	0.1252			0.251			0.251
15.5	27.0	2	7	SPT	7	125.0	62.6	20.0%	720	1517	501.9	875		3500	2.3		0.0250	0.1252			0.429			0.429
27.0	37.0	2	15	SPT	15	125.0	62.6	20.0%	626	2190	228.3	1875		7500	3.4		0.0250	0.1252			0.129			0.129
37.0	47.0	2	14	SPT	14	125.0	62.6	20.0%	626	2816	134.5	1750		7000	2.5		0.0250	0.1252			0.061			0.061
47.0	57.0	2	15	SPT	15	125.0	62.6	20.0%	626	3442	88.5	1875		7500	2.2		0.0250	0.1252			0.033			0.033
57.0	67.0	2	23	SPT	23	125.0	62.6	20.0%	626	4068	62.7	2875		11500	2.8		0.0250	0.1252			0.020			0.020
67.0	73.0	2	27	SPT	27	125.0	62.6	20.0%	376	4569	49.3	3375		13500	3.0		0.0250	0.1252			0.008			0.008
73.0	80.0	1	19	SPT	19	125.0	62.6	20.0%	438	4976	41.4								46				0.007	0.007
80.0	90.0	2	35	SPT	35	125.0	62.6	20.0%	626	5508	33.6	4375		17500	3.2		0.0200	0.1000			0.006			0.006
90.0	100.0	2	29	SPT	29	125.0	62.6	20.0%	626	6134	27.0	3625		14500	2.4		0.0250	0.1252			0.006			0.006
100.0	110.0	2	23	SPT	23	125.0	62.6	20.0%	626	6760	22.1	2875		11500	1.7		0.0200	0.1000			0.003			0.003
110.0	118.0	2	62	SPT	62	125.0	62.6	20.0%	501	7324	18.8	7750		31000	4.2		0.0200	0.1000			0.002			0.002

Estimated Settlement (in)= *0.0* *0.9* *0.0* *0.0* *0.96*

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 20% was estimated based on available test data.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***Elevator South Access***
REFERENCE BORIN	***CPT-AS-13 (Elev. 116.5 ft)***
Hammer Energy =	60%
GW Level (ft)=	4.5

Finish Grade Elev. (ft) =	116
Pile Cut-off Elev. (ft) =	109.92
Footing Depth (ft) =	6.08
Pile Length (ft)=	14
Width of Pile Group, B (ft)=	9.7
Length of Pile Group, L (ft)=	11.2
Permanent Load Pressure (kip)=	330
Pile Tip Ele (ft)=	95.92

Eq. Footing Depth (ft	15.4
Settlement Limit (in)	1.0
Cr/Cc=	20.0%

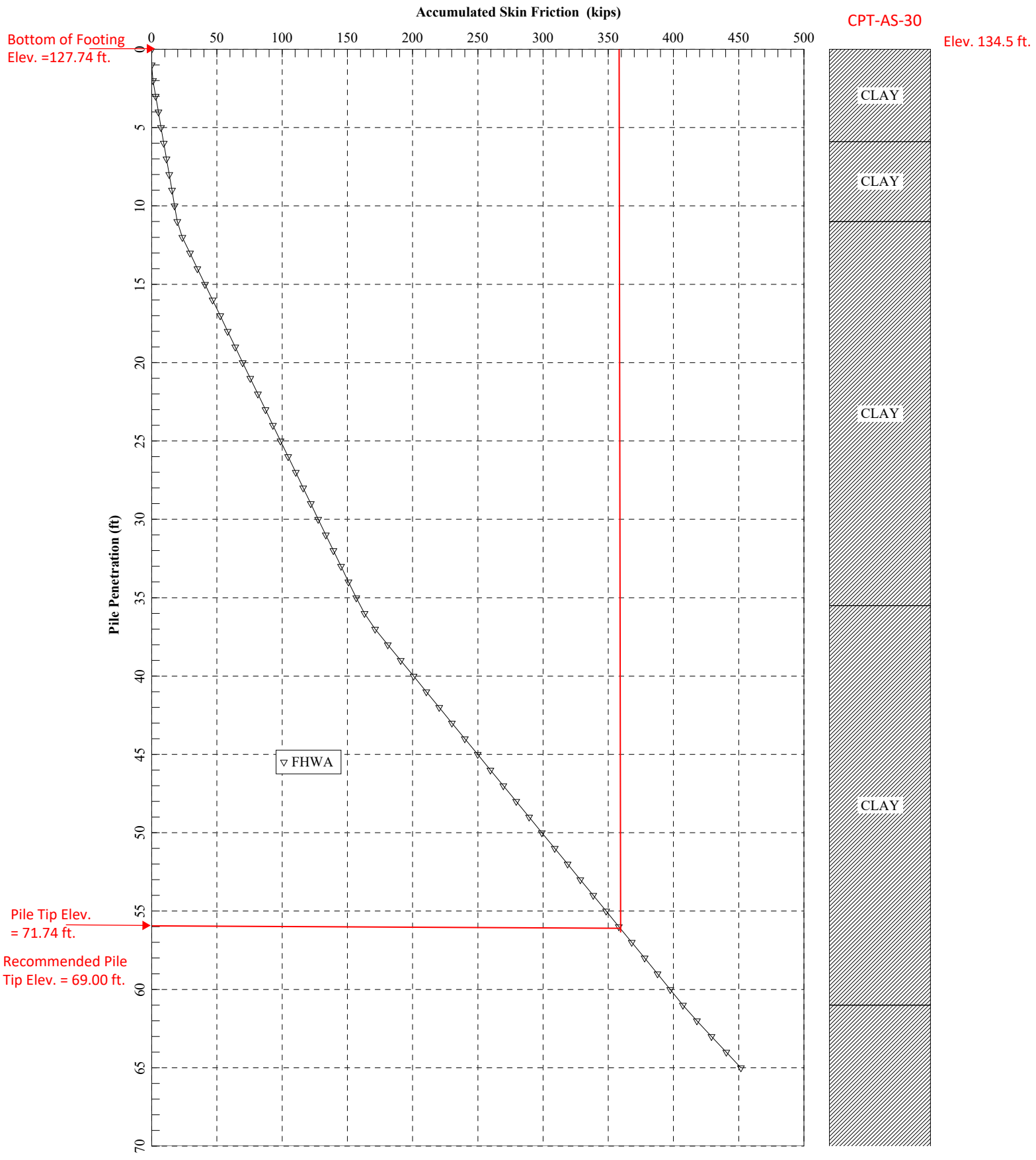
GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	$SPT\text{-}N_{60}$	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	4.5	2	8	SPT	8	125.0	125.0	20.0%	563															
4.5	17	2	12	SPT	12	125.0	62.6	20.0%	783	1295	1306.6	1500		6000	4.6		0.0250	0.1252			0.144			0.144
17	28.5	2	7	SPT	7	125.0	62.6	20.0%	720	1705	655.3	875		3500	2.1		0.0250	0.1252			0.488			0.488
28.5	38.5	2	15	SPT	15	125.0	62.6	20.0%	626	2378	299.5	1875		7500	3.2		0.0250	0.1252			0.155			0.155
38.5	48.5	2	14	SPT	14	125.0	62.6	20.0%	626	3004	176.9	1750		7000	2.3		0.0250	0.1252			0.075			0.075
48.5	58.5	2	15	SPT	15	125.0	62.6	20.0%	626	3630	116.6	1875		7500	2.1		0.0250	0.1252			0.041			0.041
58.5	68.5	2	23	SPT	23	125.0	62.6	20.0%	626	4256	82.6	2875		11500	2.7		0.0250	0.1252			0.025			0.025
68.5	74.5	2	27	SPT	27	125.0	62.6	20.0%	376	4757	65.1	3375		13500	2.8		0.0250	0.1252			0.011			0.011
74.5	81.5	1	19	SPT	19	125.0	62.6	20.0%	438	5164	54.7								45				0.008	0.008
81.5	91.5	2	35	SPT	35	125.0	62.6	20.0%	626	5696	44.4	4375		17500	3.1		0.0200	0.1000			0.008			0.008
91.5	101.5	2	29	SPT	29	125.0	62.6	20.0%	626	6322	35.7	3625		14500	2.3		0.0250	0.1252			0.007			0.007
101.5	111.5	2	23	SPT	23	125.0	62.6	20.0%	626	6948	29.3	2875		11500	1.7		0.0200	0.1000			0.004			0.004
111.5	119.5	2	62	SPT	62	125.0	62.6	20.0%	501	7511	24.9	7750		31000	4.1		0.0200	0.1000			0.003			0.003

SOUTH APPROACH CIP WALL ON PILE
(SOUTHBOUND AND NORTHBOUND)
(SB STATION 1080+05.87 – SB STATION 1080+88.00)
(18-INCH SQUARE PRECAST CONCRETE PILE)

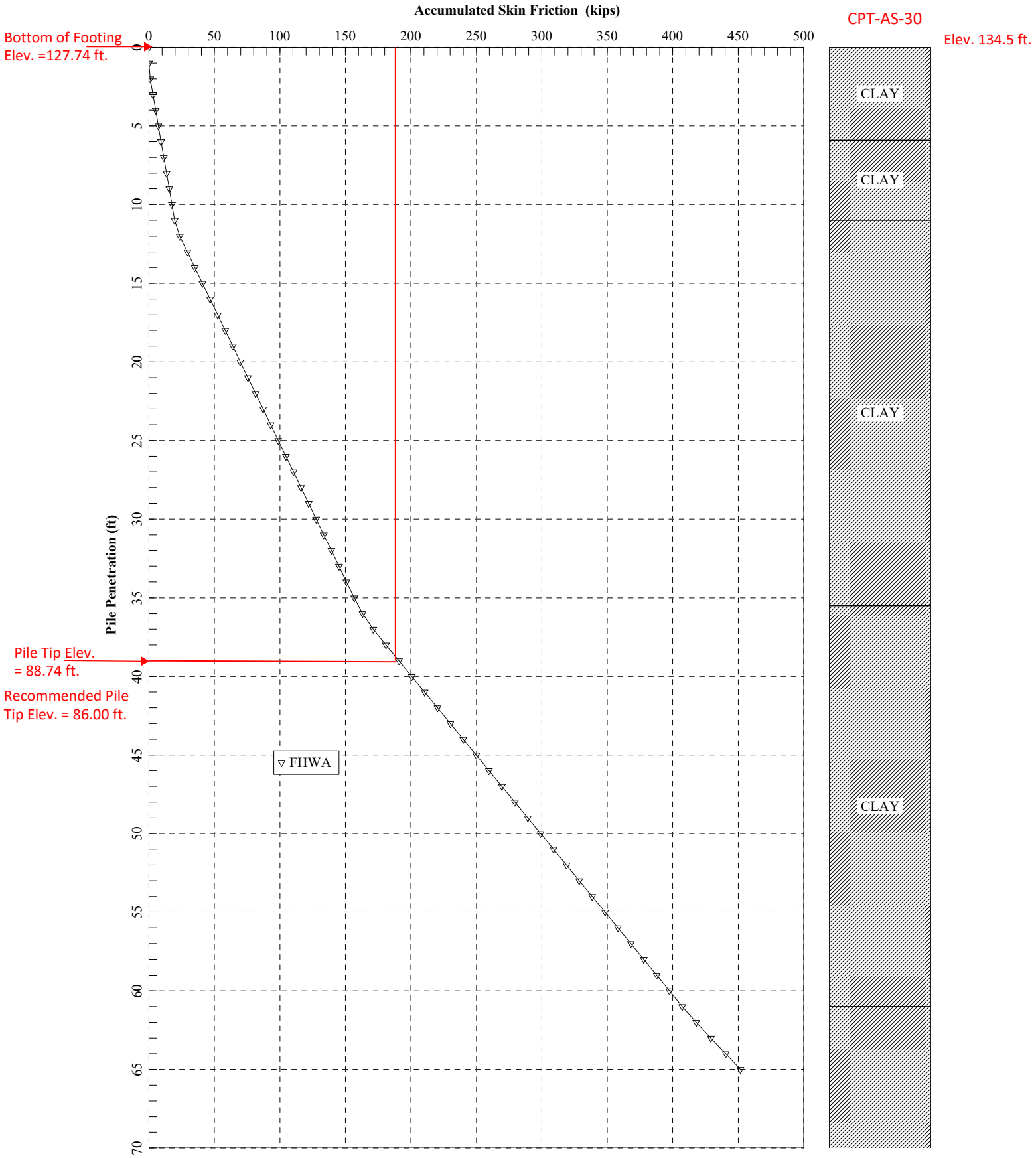
FRONT PILE - 18-INCH SQUARE PRECAST CONCRETE PILE

Vertical Load Demand = 251 kips (Strength Limit Compression)/0.7 = 360 kips



Eastridge to BART Regional Connector Project CIP Wall (Sta. 1080+05.87 to 1080+88.00) Front Pile - 18-inch Square Precast Concrete Pile Strength Limit State (Compression)

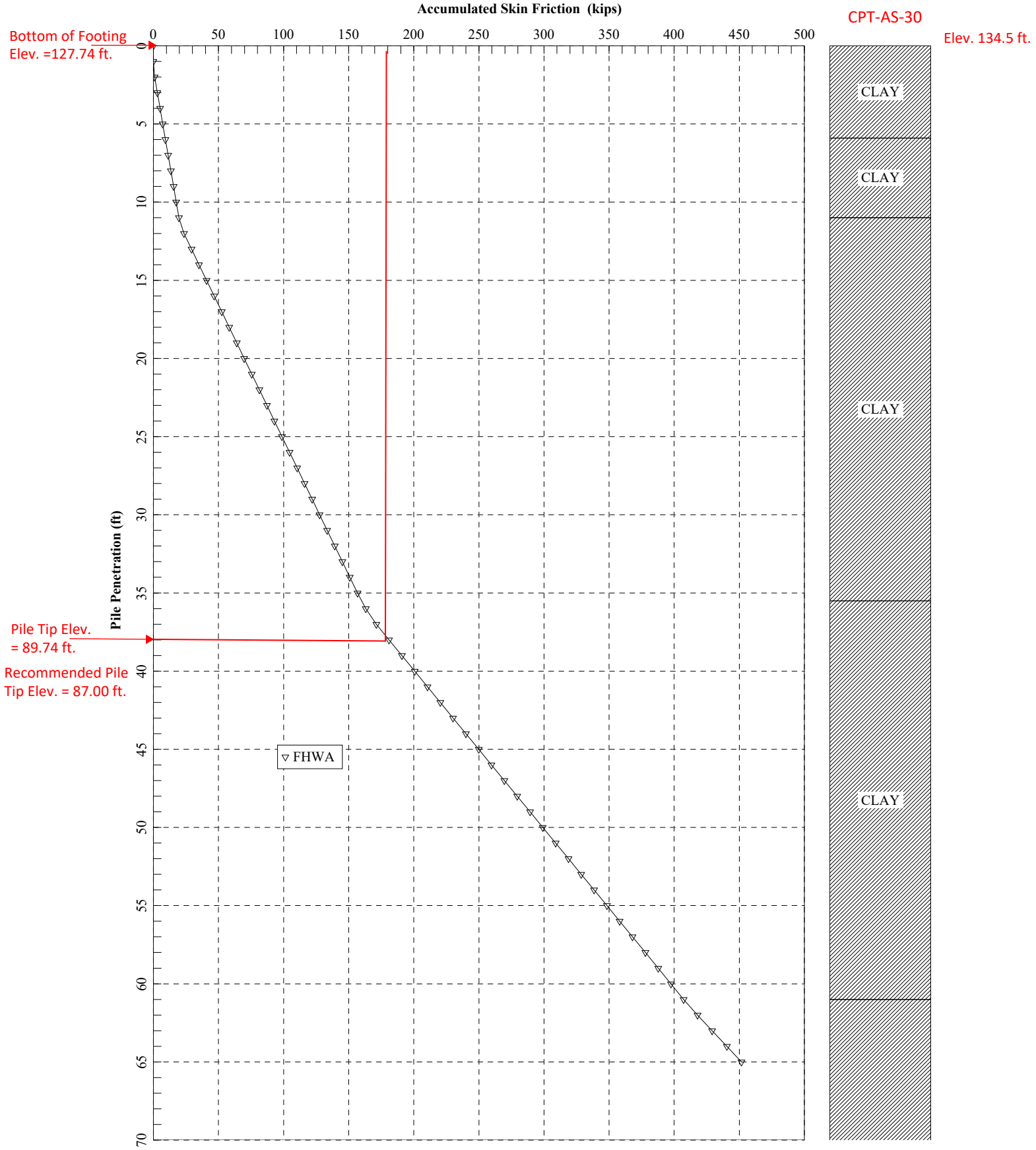
Vertical Load Demand = 190 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project CIP Wall (Sta. 1080+05.87 to 1080+88.00) Front Pile - 18-inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

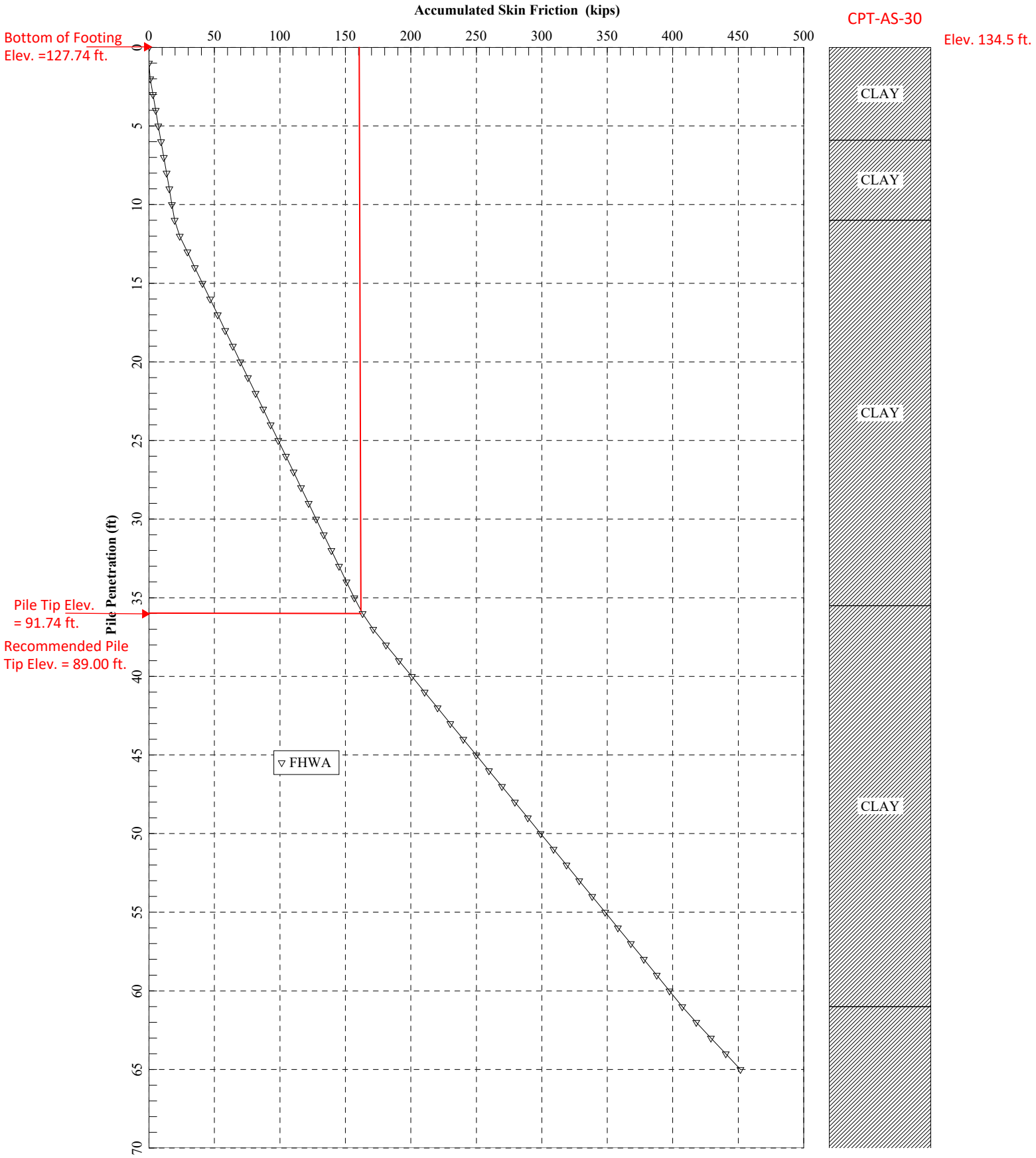
BACK PILE - 18-INCH SQUARE PRECAST CONCRETE PILE

Vertical Load Demand = 121 kips (Strength Limit Compression)/0.7 = 180 kips



Eastridge to BART Regional Connector Project CIP Wall (Sta. 1080+05.87 to 1080+88.00) Back Pile - 18-inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 160 kips (Extreme Event Limit Compression)

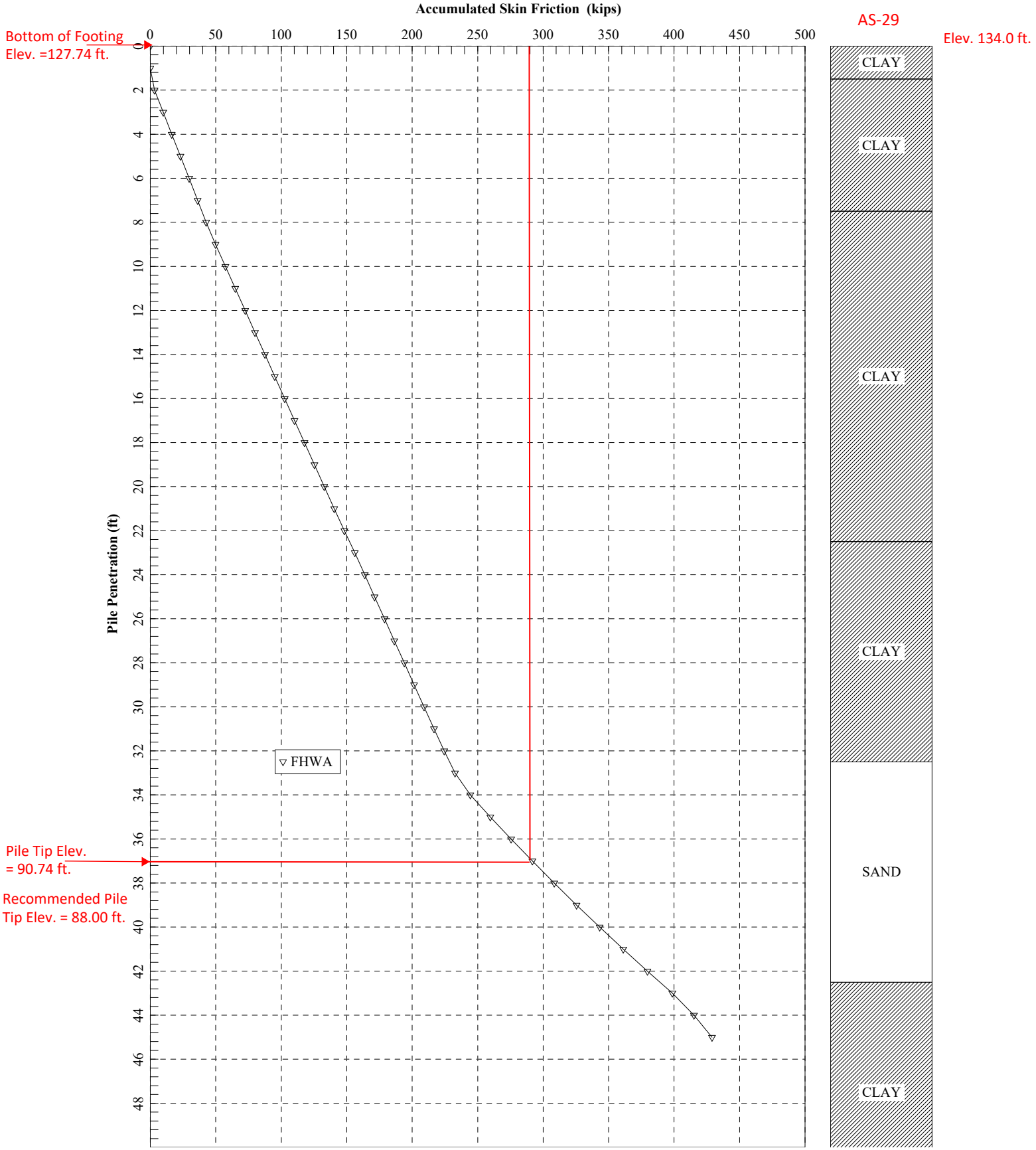


Eastridge to BART Regional Connector Project CIP Wall (Sta. 1080+05.87 to 1080+88.00) Back Pile - 18-inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

SOUTH APPROACH CIP WALL ON PILE
(SOUTHBOUND AND NORTHBOUND)
(SB STATION 1080+88.00 – SB STATION 1081+96.37)
(18-INCH SQUARE PRECAST CONCRETE PILE)

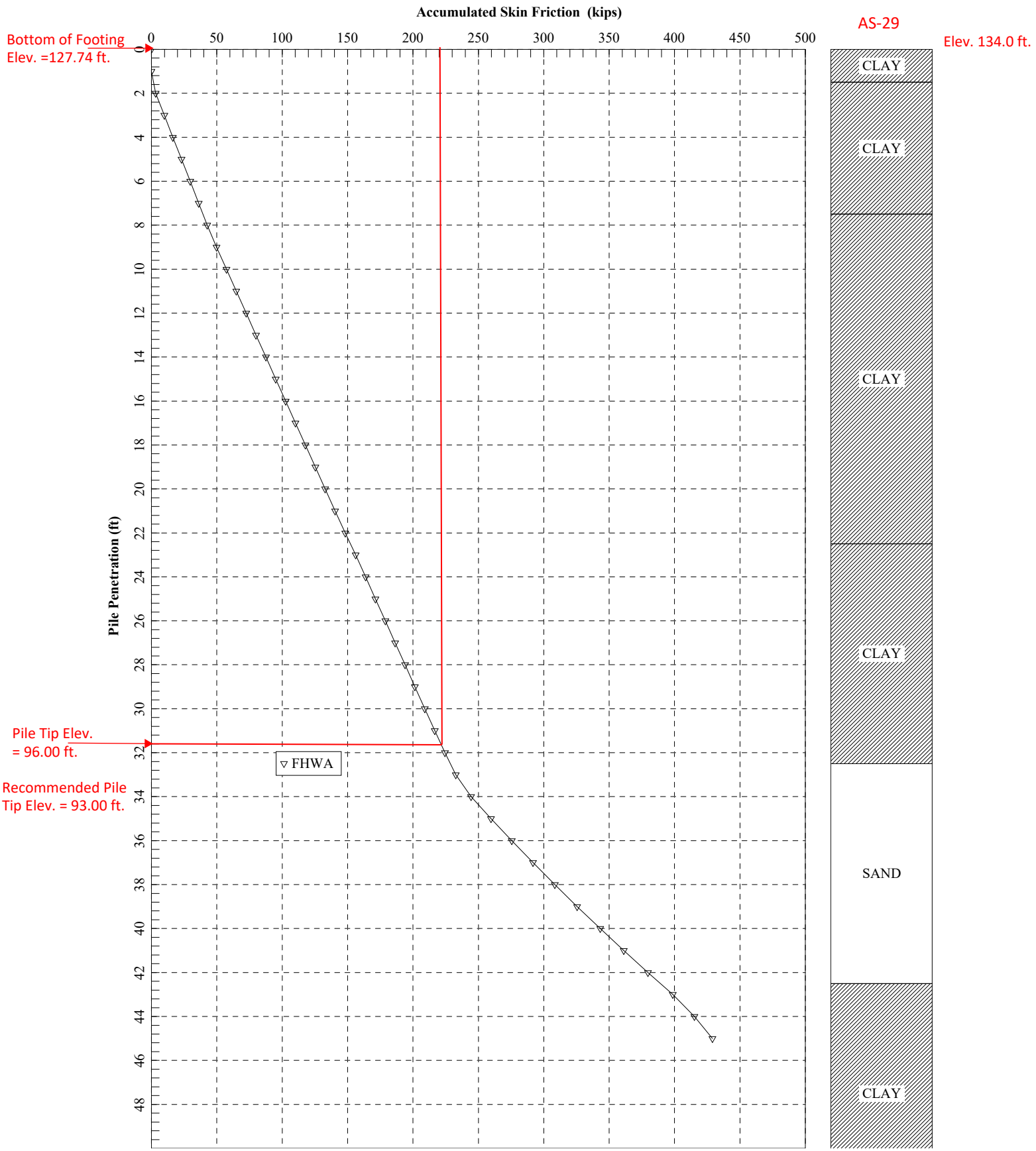
FRONT PILE - 18-INCH SQUARE PRECAST CONCRETE PILE

Vertical Load Demand = 198 kips (Strength Limit Compression)/0.7 = 290 kips



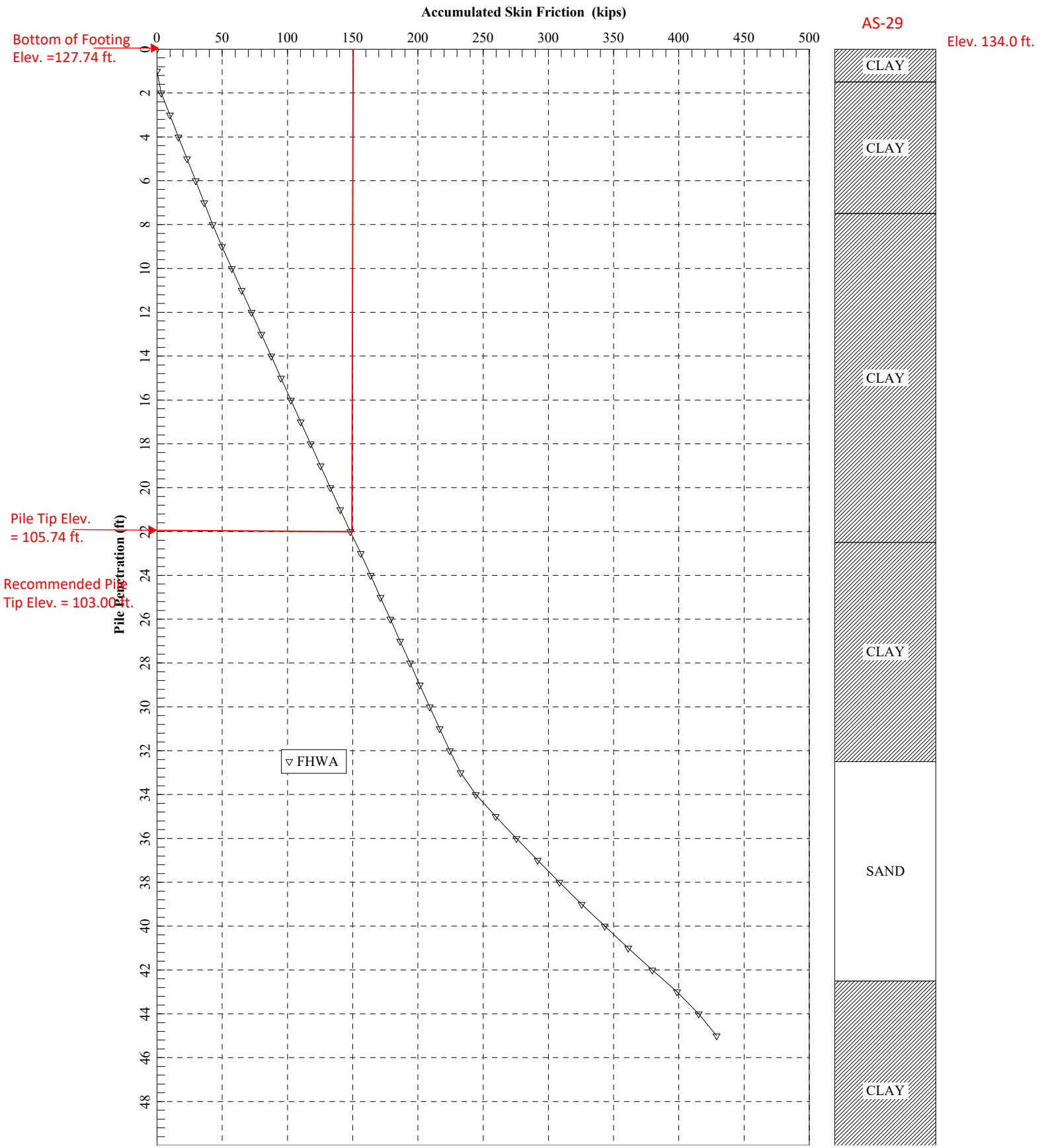
Eastridge to BART Regional Connector Project CIP Wall (Sta. 1080+88.00 to 1081+60.00) Front Pile - 18-inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 153 kips (Strength Limit Compression)/0.7 = 220 kips



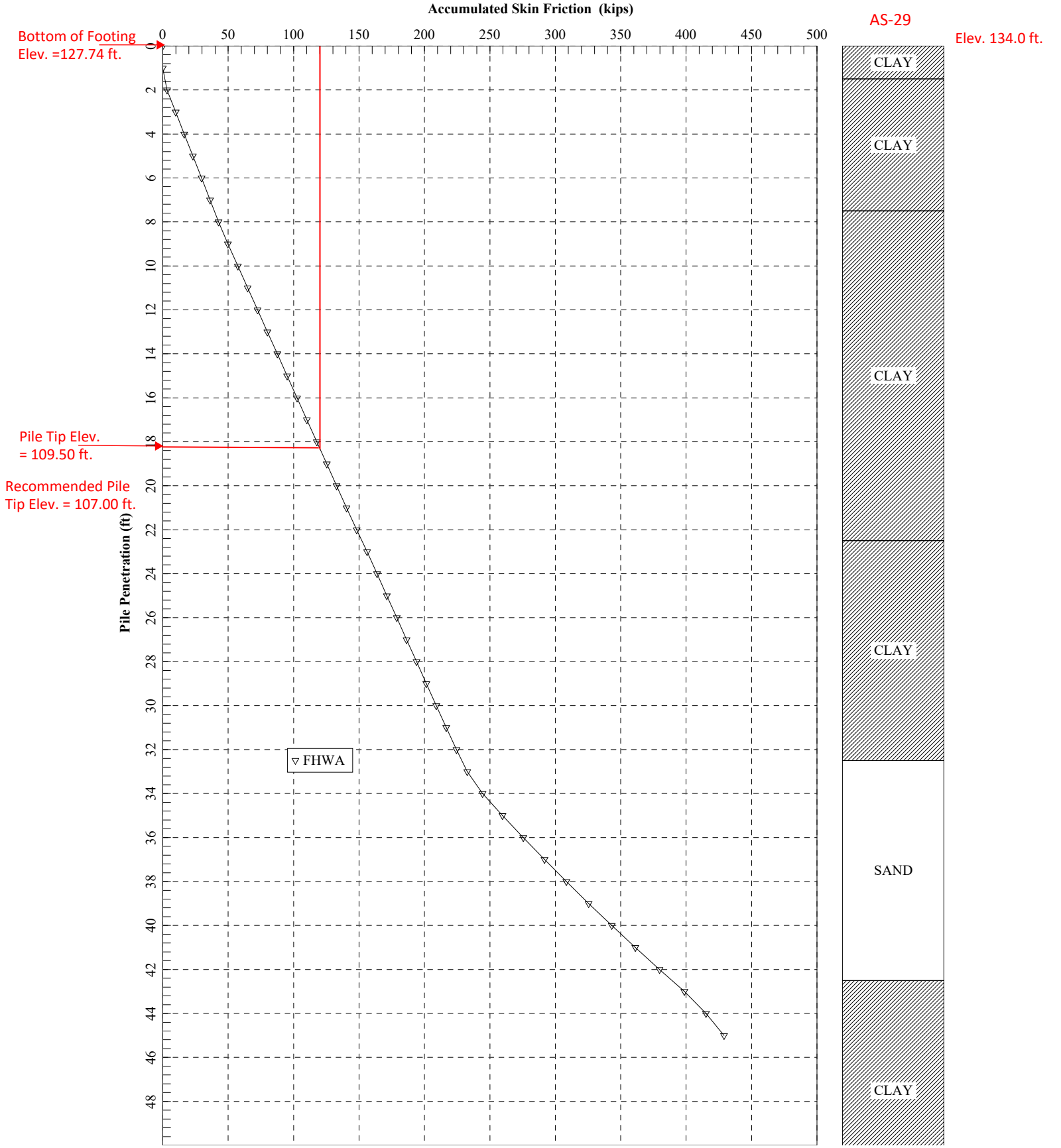
Eastridge to BART Regional Connector Project CIP Wall (Sta. 1081+60.00 to 1081+96.37) Front Pile - 18-inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 150 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project CIP Wall (Sta. 1080+88.00 to 1081+60.00) Front Pile - 18-inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

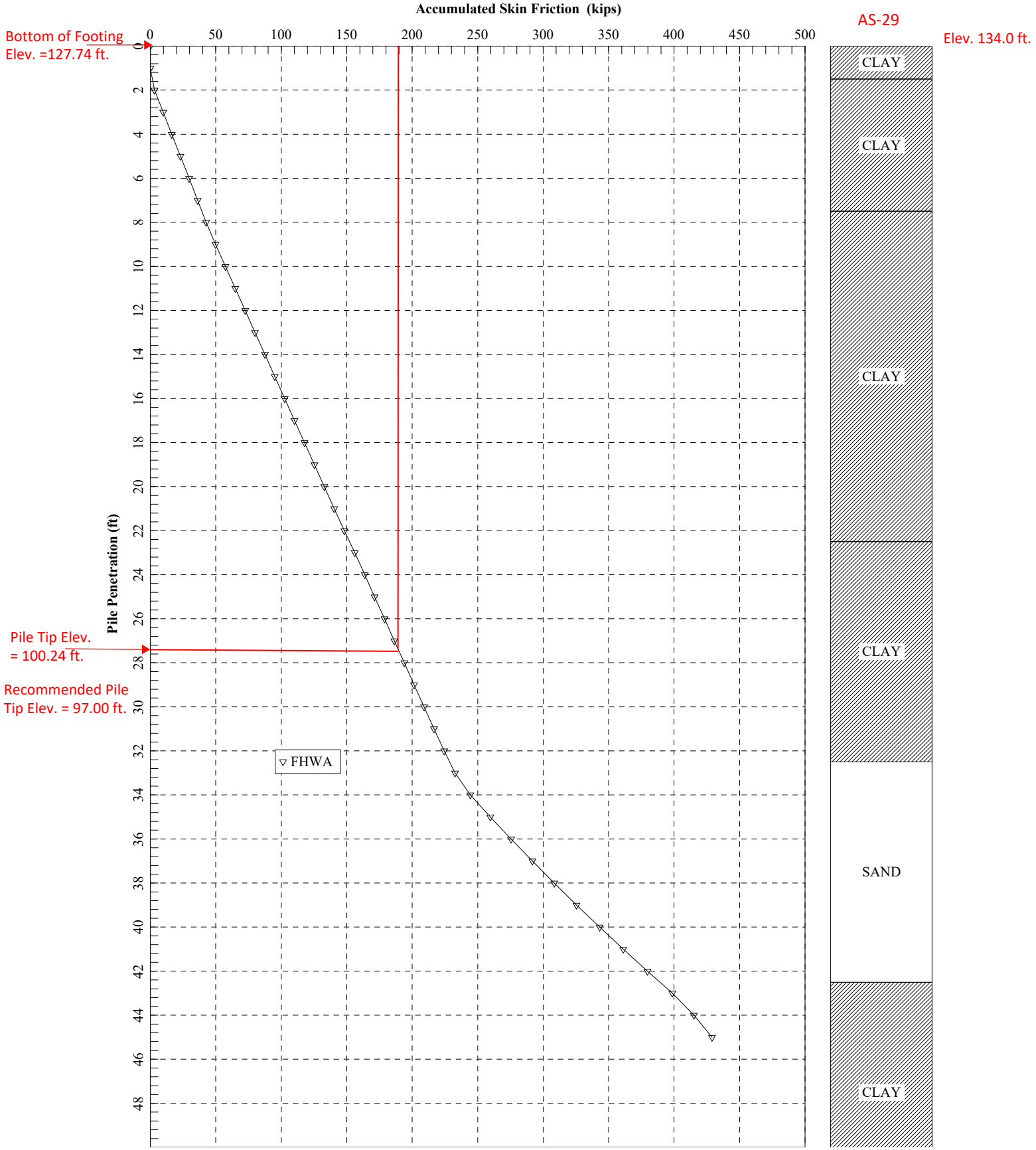
Vertical Load Demand = 120 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project CIP Wall (Sta. 1081+60.00 to 1081+96.37) Front Pile - 18-inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

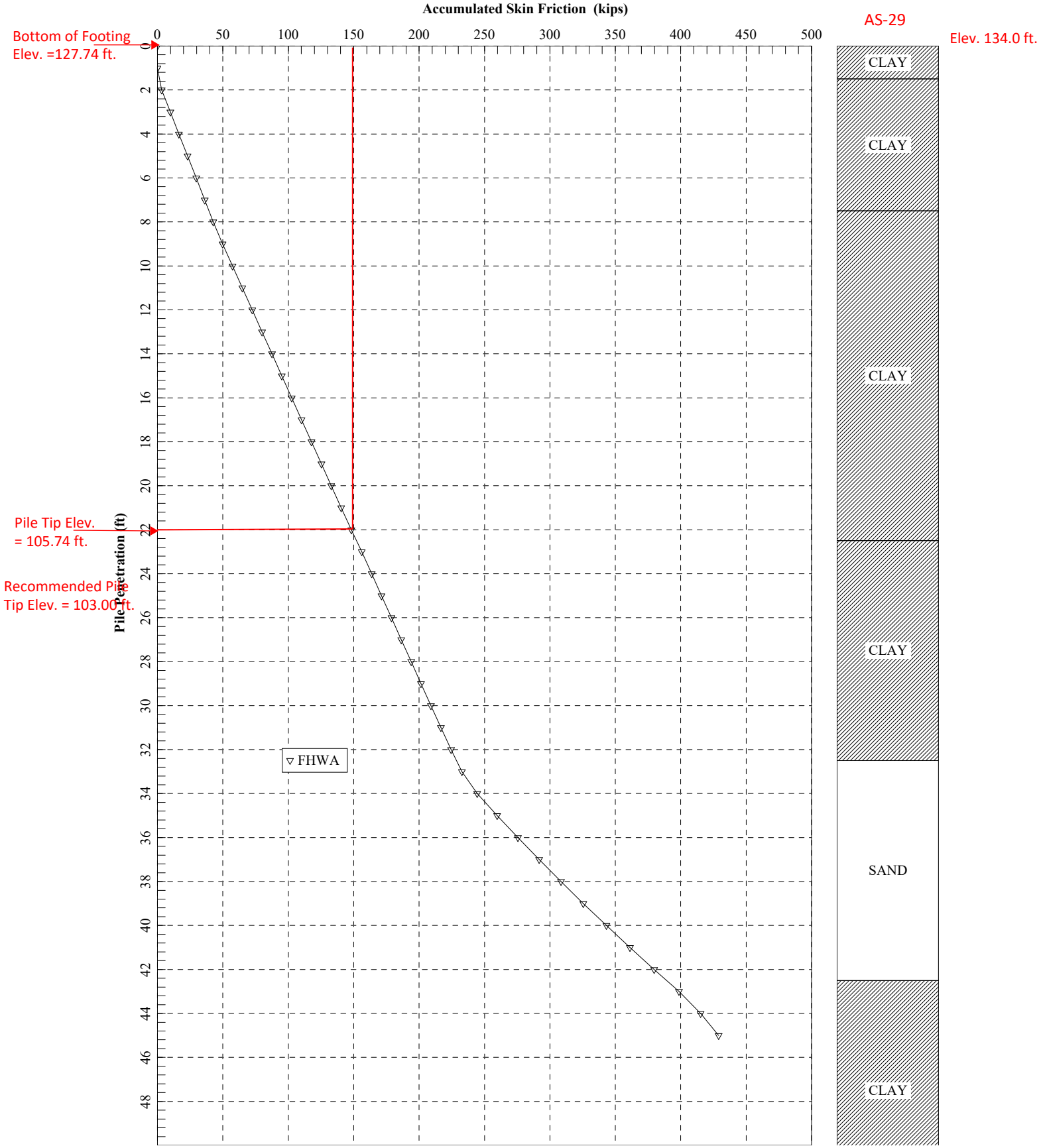
BACK PILE - 18-INCH SQUARE PRECAST CONCRETE PILE

Vertical Load Demand = 133 kips (Strength Limit Compression)/0.7 = 190 kips



Eastridge to BART Regional Connector Project CIP Wall (Sta. 1080+88.00 to 1081+96.37) Back Pile - 18-inch Square Precast Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 150 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project CIP Wall (Sta. 1080+88.00 to 1081+96.37) Back Pile - 18-inch Square Precast Concrete Pile Extreme Event Limit State (Compression)

SOUTH APPROACH CIP WALL ON PILE
(SOUTHBOUND AND NORTHBOUND)
PILE GROUP SETTLEMENT

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***	*Finish Grade Elev. (ft) =*	132.74	Eq. Footing Depth (ft	27.7
PROJECT NO.	***2017-125-GEO***	*Pile Cut-off Elev. (ft) =*	129.74	Settlement Limit (in)	1.0
STRUCTURE	***CIP South Approach RW Sta 1080+5.87 to 1080+87.50 (H=20 ft)***	*Footing Depth (ft) =*	3		
REFERENCE BORIN	***CPT-AS-30 (Elev. 134.5)***	*Pile Length (ft)=*	37		
Hammer Energy =	60%	*Width of Pile Group, B (ft)=*	12		
GW Level (ft)=	4.5	*Length of Pile Group, L (ft)=*	82		
		Permanent Load Pressure (kip)=	2966		
		Pile Tip Ele (ft)=	92.74	*Cr/Cc=*	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	5.5	3	6	SPT	6	125.0	113.7	20.0%	625							262500								
5.5	12.4	3	6	SPT	6	125.0	62.6	20.0%	432							262500								
12.4	17.5	2	6	SPT	6	125.0	62.6	20.0%	319															
17.5	25.5	3	12	SPT	12	125.0	62.6	20.0%	501							525000								
25.5	33.5	2	12	SPT	12	125.0	62.6	20.0%	501	2195	1119.2	1500		6000	2.7		0.0250	0.1252			0.314			0.314
33.5	42	2	12	SPT	12	125.0	62.6	20.0%	532	2644	825.3	1500		6000	2.3		0.0250	0.1252			0.301			0.301
42	50.5	3	20	SPT	20	125.0	62.6	20.0%	532	3176	612.1	2500		10000	3.1	875000				0.071				0.071
50.5	59	3	20	SPT	20	125.0	62.6	20.0%	532	3708	475.1	2500		10000	2.7	875000				0.055				0.055
59	67.5	2	20	SPT	20	125.0	62.6	20.0%	532	4240	381.0	2500		10000	2.4		0.0250	0.1252			0.095			0.095
67.5	74.5	3	24	SPT	24	125.0	62.6	20.0%	438	4725	318.4	3000		12000	2.5	1050000				0.025				0.025
74.5	81.5	2	24	SPT	24	125.0	62.6	20.0%	438	5164	274.6	3000		12000	2.3		0.0250	0.1252			0.047			0.047
81.5	88.5	2	24	SPT	24	125.0	62.6	20.0%	438	5602	239.5	3000		12000	2.1		0.0200	0.1000			0.031			0.031
88.5	93	1	13	SPT	13	125.0	62.6	20.0%	282	5962	215.5								39				0.022	0.022
93	99.5	3	32	SPT	32	126.0	63.6	20.0%	413	6309	195.9	4000		16000	2.5	1400000				0.011				0.011

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***	*Finish Grade Elev. (ft) =*	132.24	Eq. Footing Depth (ft	9.8
PROJECT NO.	***2017-125-GEO***	*Pile Cut-off Elev. (ft) =*	129.74	Settlement Limit (in)	1.0
STRUCTURE	***CIP South Approach RW Sta 1080+87+50 to 1081+60.25 (H=17 ft)***	*Footing Depth (ft) =*	2.5		
REFERENCE BORIN	***AS-29 (Elev. 134.0)***	*Pile Length (ft)=*	11		
Hammer Energy =	60%	*Width of Pile Group, B (ft)=*	12		
GW Level (ft)=	8	*Length of Pile Group, L (ft)=*	73		
		Permanent Load Pressure (kip)=	2402		
		Pile Tip Ele (ft)=	118.74	*Cr/Cc=*	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	5.5	3	24	SPT	24	125.0	125.0	20.0%	688							1050000								
5.5	8	3	10	SPT	10	125.0	125.0	20.0%	313							437500								
8	14	3	10	SPT	10	125.0	62.6	20.0%	376	1245	1718.4	1250		5000	4.0	437500				0.196				0.196
14	29	3	12	SPT	12	125.0	62.6	20.0%	939	1845	994.8	1500		6000	3.3	525000				0.341				0.341
29	39	3	20	SPT	20	125.0	62.6	20.0%	626	2628	598.0	2500		10000	3.8	875000				0.082				0.082
39	49	1	8	SPT	8	125.0	62.6	20.0%	626	3254	434.9								36				0.179	0.179
49	59	3	22	SPT	22	125.0	62.6	20.0%	626	3880	332.2	2750		11000	2.8	962500				0.041				0.041
59	62	1	9	SPT	9	125.0	62.6	20.0%	188	4287	284.4								36				0.028	0.028
62	72	3	28	SPT	28	125.0	62.6	20.0%	626	4693	246.4	3500		14000	3.0	1225000				0.024				0.024
72	82	3	28	SPT	28	125.0	62.6	20.0%	626	5319	201.6	3500		14000	2.6	1225000				0.020				0.020
82	92	2	28	SPT	28	125.0	62.6	20.0%	626	5945	168.2	3500		14000	2.4		0.0250	0.1252			0.036			0.036
92	102	2	28	SPT	28	125.0	62.6	20.0%	626	6571	142.6	3500		14000	2.1		0.0200	0.1000			0.022			0.022
102	112	2	28	SPT	28	125.0	62.6	20.0%	626	7197	122.5	3500		14000	1.9		0.0200	0.1000			0.018			0.018
112	120	2	28	SPT	28	126.0	63.6	20.0%	509	7765	107.8	3500		14000	1.8		0.0200	0.1000			0.012			0.012

PILE GROUP SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***CIP South Approach RW Sta 1081+60.25 to 1081+96.37 (H=14 ft)***
REFERENCE BORIN	***AS-29 (Elev. 134.0)***
Hammer Energy =	60%
GW Level (ft)=	8

Finish Grade Elev. (ft) =	131.74
Pile Cut-off Elev. (ft) =	129.74
Footing Depth (ft) =	2
Pile Length (ft)=	9
Width of Pile Group, B (ft)=	12
Length of Pile Group, L (ft)=	36
Permanent Load Pressure (kip)=	893
Pile Tip Ele (ft)=	120.74

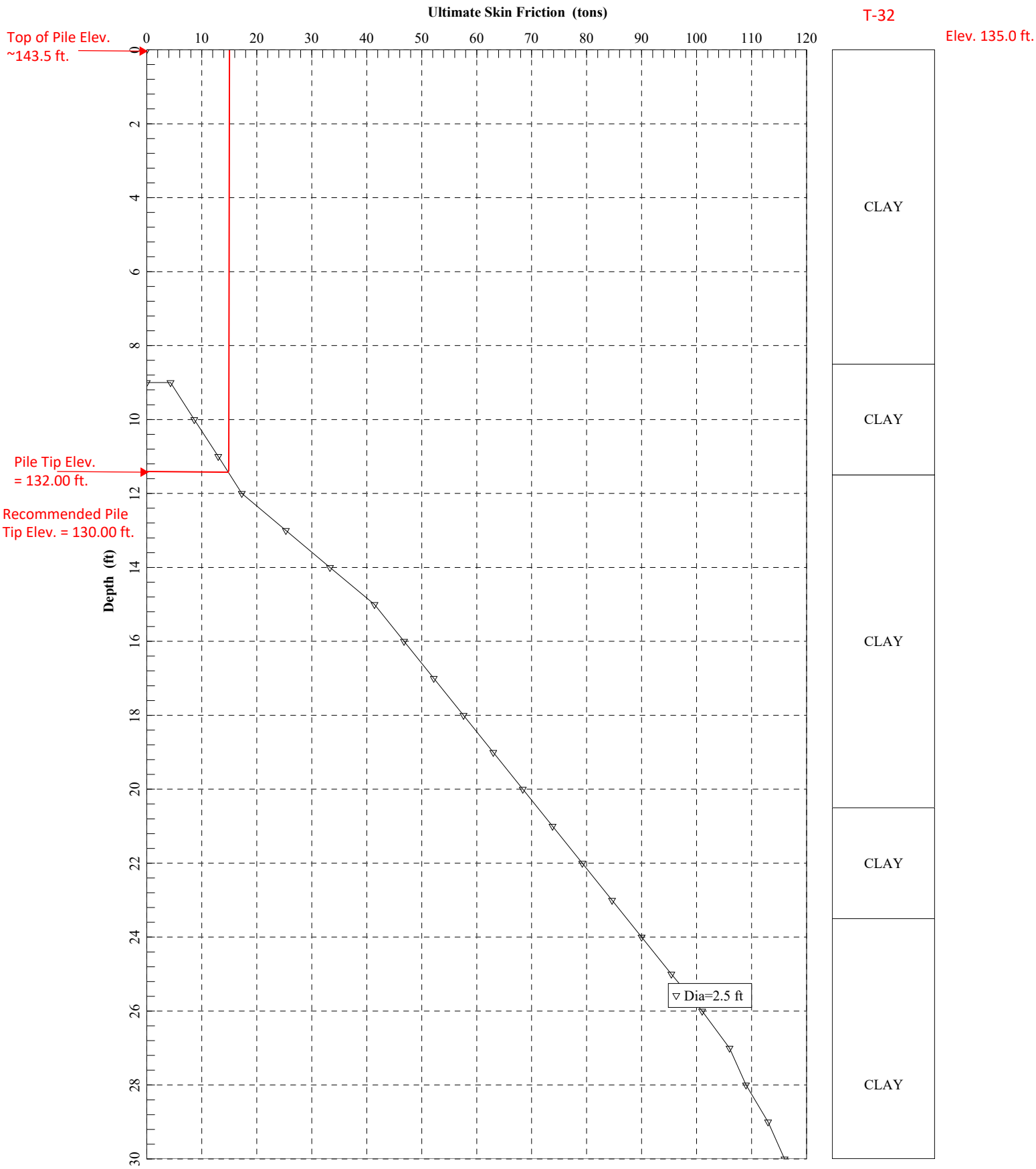
Eq. Footing Depth (ft	8.0
Settlement Limit (in)	0.7
Cr/Cc=	20.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	5.5	3	24	SPT	24	125.0	125.0	20.0%	688							1050000								
5.5	8	3	10	SPT	10	125.0	125.0	20.0%	313	1000	1526.5	1250		5000	5.0	437500				0.000				0.000
8	14	3	10	SPT	10	125.0	62.6	20.0%	376	1188	1181.2	1250		5000	4.2	437500				0.194				0.194
14	29	3	12	SPT	12	125.0	62.6	20.0%	939	1845	596.8	1500		6000	3.3	525000				0.205				0.205
29	39	3	20	SPT	20	125.0	62.6	20.0%	626	2628	335.1	2500		10000	3.8	875000				0.046				0.046
39	49	1	8	SPT	8	125.0	62.6	20.0%	626	3254	233.5								36				0.099	0.099
49	59	3	22	SPT	22	125.0	62.6	20.0%	626	3880	172.2	2750		11000	2.8	962500				0.021				0.021
59	62	1	9	SPT	9	125.0	62.6	20.0%	188	4287	144.6								36				0.014	0.014
62	72	3	28	SPT	28	125.0	62.6	20.0%	626	4693	123.1	3500		14000	3.0	1225000				0.012				0.012
72	82	3	28	SPT	28	125.0	62.6	20.0%	626	5319	98.4	3500		14000	2.6	1225000				0.010				0.010
82	92	2	28	SPT	28	125.0	62.6	20.0%	626	5945	80.5	3500		14000	2.4		0.0250	0.1252			0.018			0.018
92	102	2	28	SPT	28	125.0	62.6	20.0%	626	6571	67.1	3500		14000	2.1		0.0200	0.1000			0.011			0.011
102	112	2	28	SPT	28	125.0	62.6	20.0%	626	7197	56.8	3500		14000	1.9		0.0200	0.1000			0.008			0.008
112	120	2	28	SPT	28	126.0	63.6	20.0%	509	7765	49.4	3500		14000	1.8		0.0200	0.1000			0.005			0.005

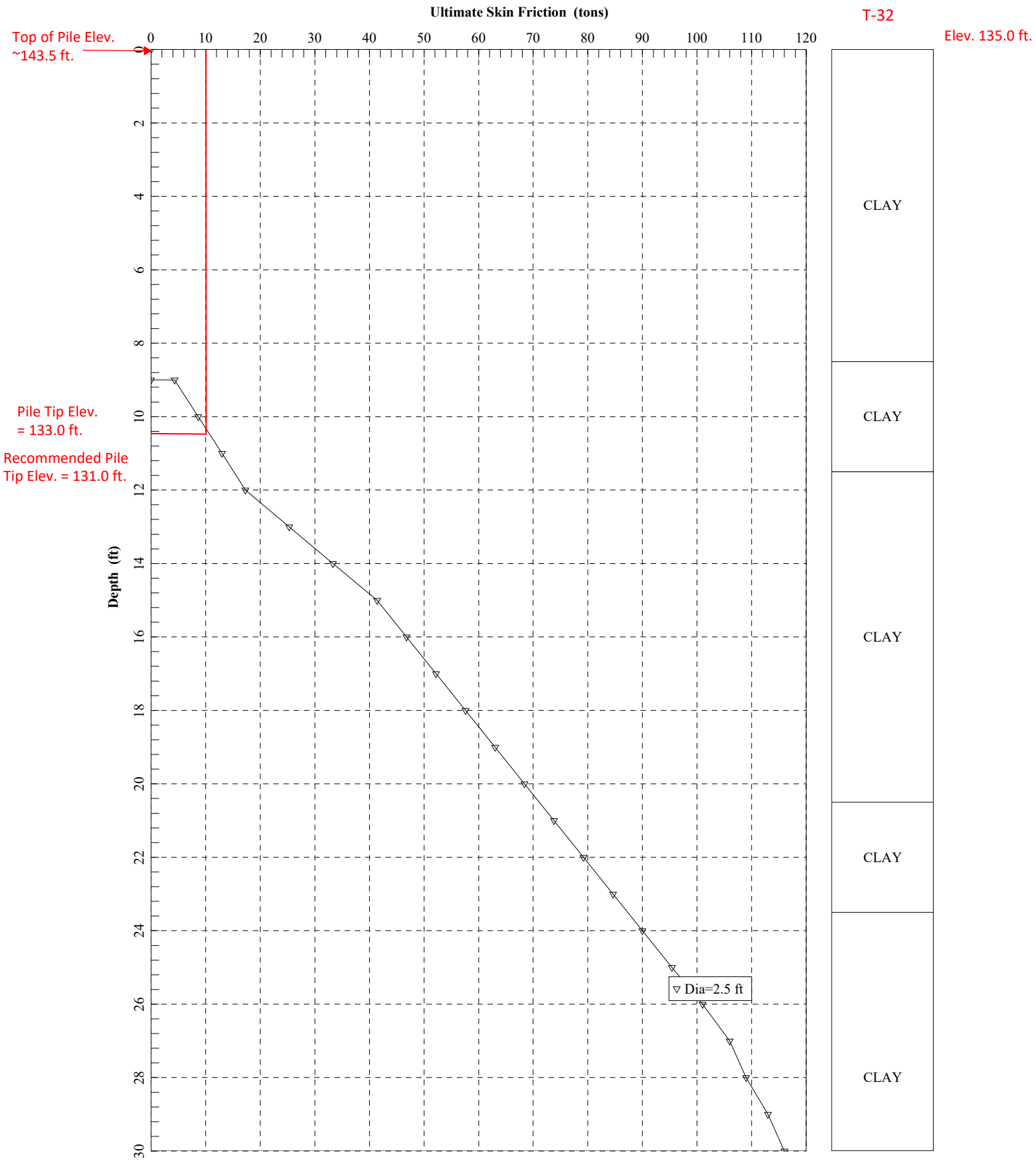
VERTICAL PILE CAPACITY ANALYSES (SHAFT ANALYSES RESULTS) EASTRIDGE STATION SHELTER (30-INCH DIAMETER CIDH CONCRETE PILE)

Vertical Load Demand = 20 kips (Strength Limit Tension)/0.7 = 30 kips



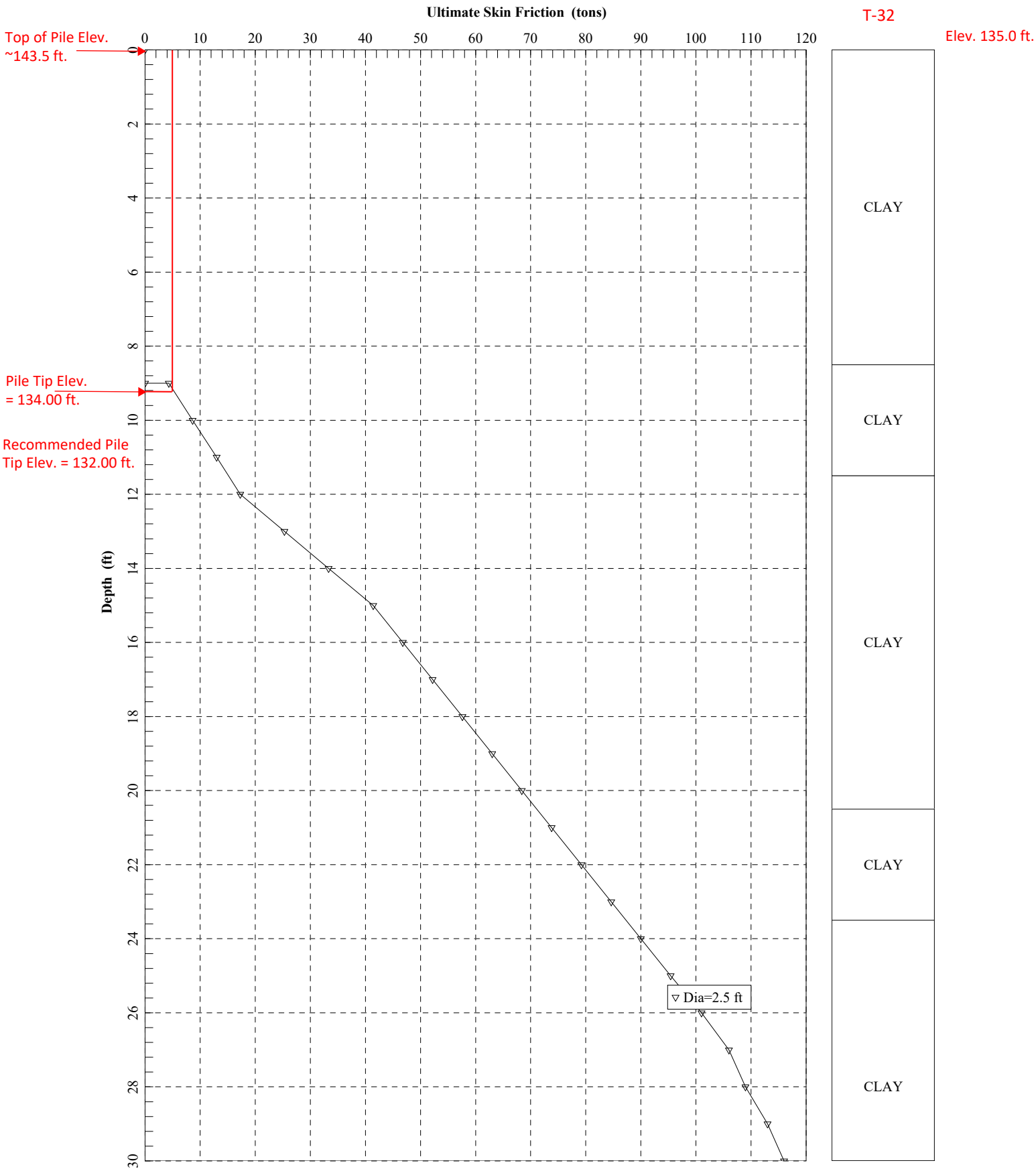
Eastridge to BART Regional Connector Project Eastridge Station Shelter - 30-Inch CIDH Concrete Pile Strength Limit State (Compression)

Vertical Load Demand = 20 kips (Extreme Event Limit Compression)



Eastridge to BART Regional Connector Project Eastridge Station Shelter - 30-Inch CIDH Concrete Pile Extreme Event Limit State (Compression)

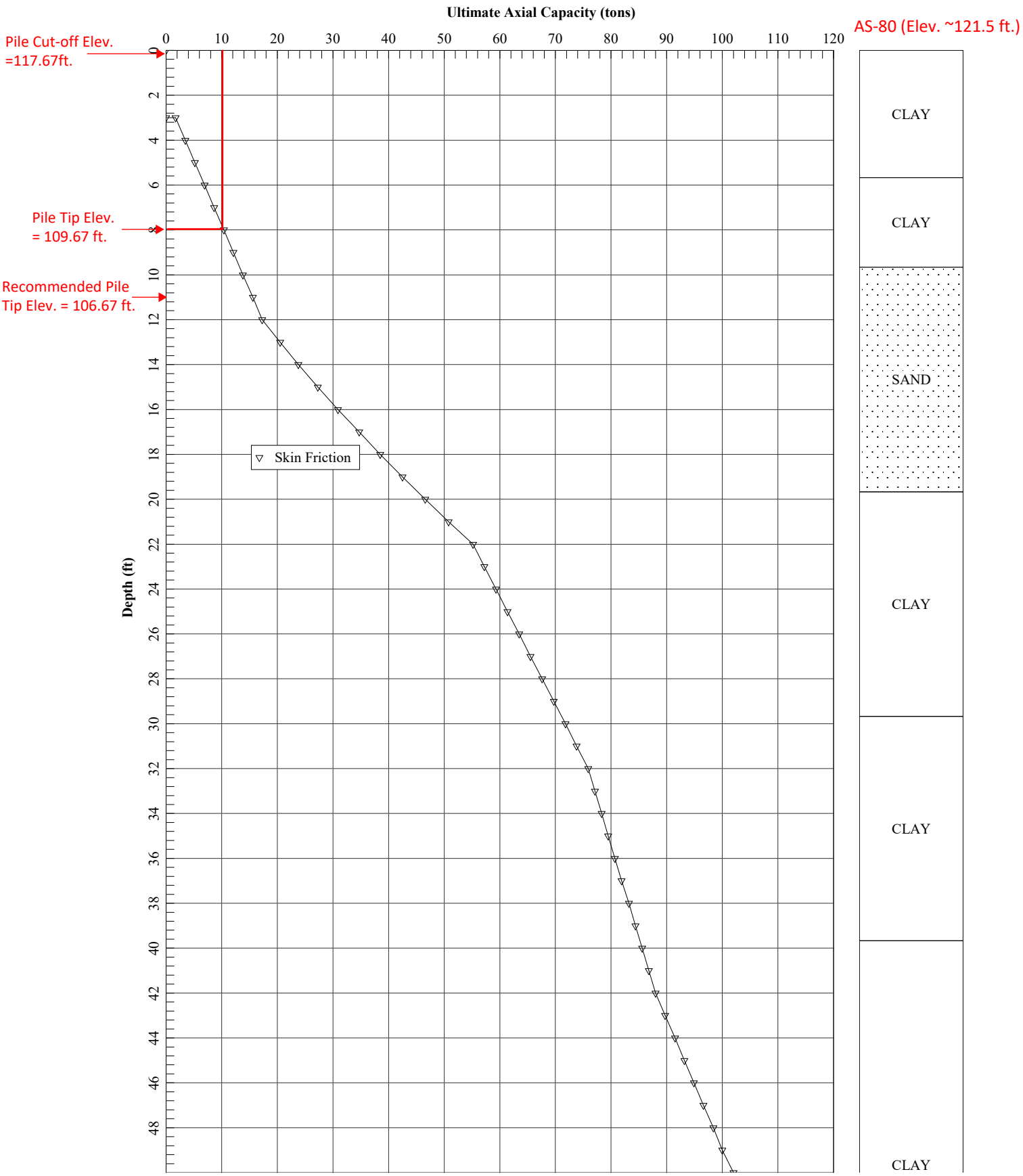
Vertical Load Demand = 10 kips (Extreme Event Limit Tension)



Eastridge to BART Regional Connector Project Eastridge Station Shelter - 30-Inch CIDH Concrete Pile Extreme Event Limit State (Tension)

VERTICAL PILE CAPACITY ANALYSES (SHAFT ANALYSES RESULTS)
TPSS #33 (24-INCH DIAMETER CIDH CONCRETE PILE)

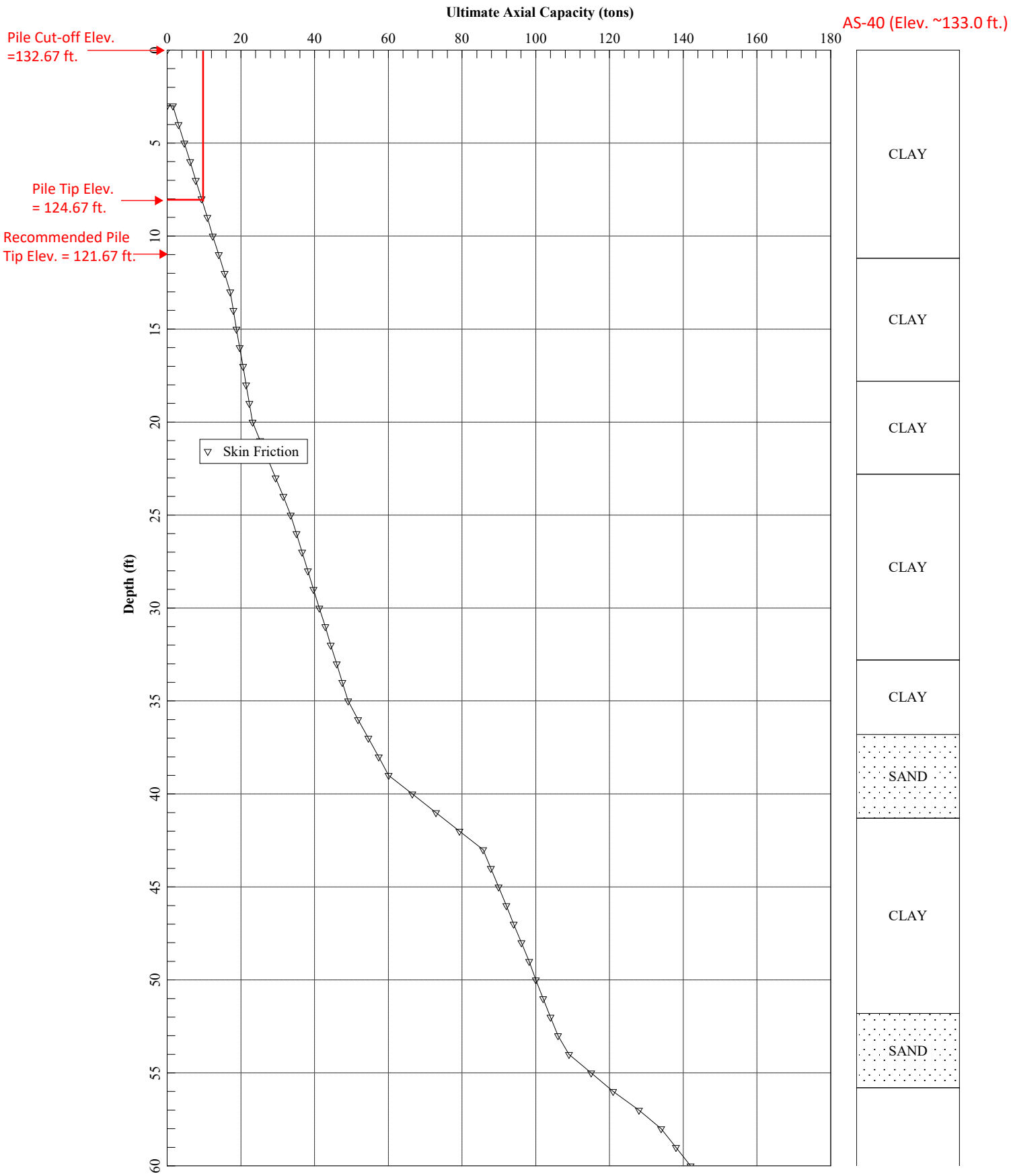
Vertical Load Demand = 13.75 kips (Strength Limit Compression)/0.7 = 20 kips



Eastridge to BART Regional Connector Project TPSS #33 - 24 Inch CIDH Concrete Pile Strength Limit State (Compression)

VERTICAL PILE CAPACITY ANALYSES (SHAFT ANALYSES RESULTS)
TPSS #34 (24-INCH DIAMETER CIDH CONCRETE PILE)

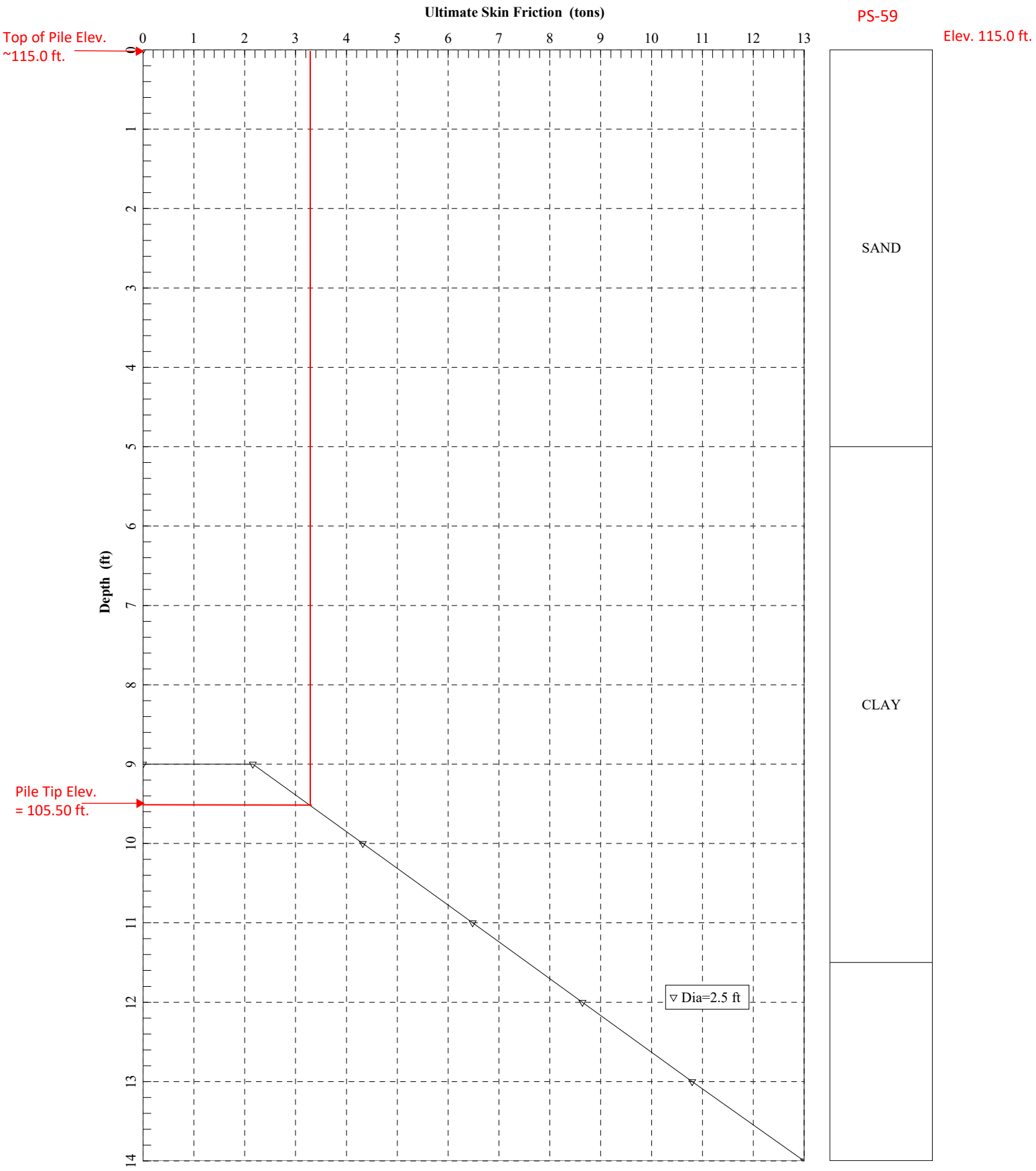
Vertical Load Demand = 13.75 kips (Strength Limit Compression)/0.7 = 20 kips



Eastridge to BART Regional Connector Project TPSS #34 - 24 Inch CIDH Concrete Pile Strength Limit State (Compression)

VERTICAL PILE CAPACITY ANALYSES (SHAFT ANALYSES RESULTS) RELOCATED OCALA BUS CANOPY COLUMNS(24-INCH DIAMETER CIDH CONCRETE PILE)

Vertical Load Demand = 6.5 kips (Compression)



Eastridge to BART Regional Connector Project Relocated Ocala Bus Canopy - 30-Inch CIDH Concrete Pile (Compression)

GEOTECHNICAL LPILE PARAMETERS
AERIAL GUIDEWAY

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: AS-1 **Date:** 9/22/2018
Station: "SB" Track Line 971+30 **By:** JZ/EO

Approx. Ground Surface Elevation: 115.0
Structure ID: Abutment 1

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 8	115 to 107	Clay	Stiff Clay w/o Free Water (Reese)	1750	-	125
8 to 15	107 to 100	Clay	Stiff Clay w/o Free Water (Reese)	1250	-	120
15 to 18	100 to 97	Clay	Stiff Clay w/o Free Water (Reese)	1250	-	62.5
18 to 24	97 to 91	Sand	Sand (Reese)	-	35	62.5
24 to 35	91 to 80	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
35 to 60	80 to 55	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
60 to 65	55 to 50	Sand	Sand (Reese)	-	36	67.5
65 to 86	50 to 29	Clay	Stiff Clay w/o Free Water (Reese)	3500	-	67.5
86 to 95	29 to 20	Sand	Sand (Reese)	-	36	67.5
95 to 121.5	20 to -6.5	Clay	Stiff Clay w/o Free Water (Reese)	4000	-	67.5

Default values can be used for e_{50} and K.
Groundwater is considered at depth of 15.0 feet below existing ground at Elevation +100.0 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: AS-2 **Date:** 9/22/2018
Station: "SB" Track Line 973+90 **By:** JZ/EO

Approx. Ground Surface Elevation: 116.0
Structure ID: Bent 2 & Bent 3

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 3	116 to 113	Sand	Sand (Reese)	-	35	115
3 to 18	113 to 98	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	120
18 to 37	98 to 79	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	62.5
37 to 58	79 to 58	Sand	Sand (Reese)	-	33	67.5
58 to 63	58 to 53	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	72.5
63 to 78	53 to 38	Sand	Sand (Reese)	-	33	72.5
78 to 91.5	38 to 24.5	Sand	Sand (Reese)	-	36	72.5
91.5 to 100	24.5 to 16	Clay	Stiff Clay w/o Free Water (Reese)	2750	-	67.5

Default values can be used for e_{50} and K.
Groundwater is considered at depth of 18.0 feet below existing ground at Elevation +98.0 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: AS-4 **Date:** 9/22/2018
Station: "SB" Track Line 976+10 **By:** JZ/EO

Approx. Ground Surface Elevation: 117.5
Structure ID: Bent 4 & Bent 5

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 5	117.5 to 112.5	Clay	Stiff Clay w/o Free Water (Reese)	2250	-	125
5 to 9	112.5 to 108.5	Clay	Stiff Clay w/o Free Water (Reese)	2250	-	125
9 to 15	108.5 to 102.5	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	120
15 to 41	102.5 to 76.5	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	62.5
41 to 46	76.5 to 71.5	Sand	Sand (Reese)	-	33	62.5
46 to 65	71.5 to 52.5	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
65 to 75	52.5 to 42.5	Clay	Stiff Clay w/o Free Water (Reese)	3750	-	67.5
75 to 95	42.5 to 22.5	Clay	Stiff Clay w/o Free Water (Reese)	2750	-	67.5
95 to 123.5	22.5 to -6	Clay	Stiff Clay w/o Free Water (Reese)	3750	-	67.5

Default values can be used for e_{50} and K.
Groundwater is considered at depth of 15.0 feet below existing ground at Elevation +102.5 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: AS-3 **Date:** 9/22/2018
Station: "SB" Track Line 978+70 **By:** JZ/EO

Approx. Ground Surface Elevation: 118.5
Structure ID: Bent 6

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 16	118.5 to 102.5	Clay	Stiff Clay w/o Free Water (Reese)	1250	-	115
16 to 17	102.5 to 101.5	Clay	Stiff Clay w/o Free Water (Reese)	1250	-	57.5
17 to 21	101.5 to 97.5	Sand	Sand (Reese)	-	31	62.5
21 to 40	97.5 to 78.5	Clay	Stiff Clay w/o Free Water (Reese)	1750	-	67.5
40 to 44	78.5 to 74.5	Sand	Sand (Reese)	-	31	67.5
44 to 52.5	74.5 to 66	Clay	Stiff Clay w/o Free Water (Reese)	1250	-	67.5
52.5 to 65	66 to 53.5	Sand	Sand (Reese)	-	36	67.5
65 to 101.5	53.5 to 17	Clay	Stiff Clay w/o Free Water (Reese)	2750	-	67.5

Default values can be used for e_{50} and K.

Groundwater is considered at depth of 16.0 feet below existing ground at Elevation +102.5 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: CPT-AS-6 **Date:** 1/15/2019
Station: "SB" Track Line 980+55 **By:** JZ/EO

Approx. Ground Surface Elevation: 119.5
Structure ID: Bent 7, Bent 8, Bent 9 & Bent 10

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 9	119.5 to 110.5	Clay	Soft Clay (Matlock)	750	-	110
9 to 23	110.5 to 96.5	Clay	Soft Clay (Matlock)	750	-	57.5
23 to 35	96.5 to 84.5	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
35 to 44	84.5 to 75.5	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	67.5
44 to 56	75.5 to 63.5	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
56 to 62	63.5 to 57.5	Sand	Sand (Reese)	-	37	67.5
62 to 80	57.5 to 39.5	Clay	Stiff Clay w/o Free Water (Reese)	3500	-	67.5
80 to 100	39.5 to 19.5	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
100 to 120	19.5 to -0.5	Clay	Stiff Clay w/o Free Water (Reese)	4000	-	67.5

Default values can be used for e_{50} and K.
Groundwater is considered at depth of 9.0 feet below existing ground at Elevation +110.5 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: CPT-AS-8 **Date:** 12/14/2018
Station: "SB" Track Line 985+95 **By:** JZ/EO

Approx. Ground Surface Elevation: 118.0
Structure ID: Bent 11 & Bent 12

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 7	118 to 111	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	125
7 to 23	111 to 95	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	67.5
23 to 53	95 to 65	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
53 to 61	65 to 57	Sand	Sand (Reese)	-	36	67.5
61 to 93	57 to 25	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
93 to 98	25 to 20	Sand	Sand (Reese)	-	36	67.5
98 to 120	20 to -2	Clay	Stiff Clay w/o Free Water (Reese)	3000	-	67.5

Default values can be used for e_{50} and K.
Groundwater is considered at depth of 7.0 feet below existing ground at Elevation +111.0 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: CPT-AS-91 **Date:** 11/1/2018
Station: "SB" Line 988+75 **By:** JZ

Approx. Ground Surface Elevation: 118.0
Structure ID: Bent 13

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 10	118 to 108	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	125
10 to 13	108 to 105	Sand	Sand (Reese)	-	34	125
13 to 24	105 to 94	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
24 to 30	94 to 88	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
30 to 33	88 to 85	Liquefiable Sand	Case I) Sand (Reese)	-	36	67.5
			Case II) Soft Clay (Matlock)	Sr=400	-	67.5
33 to 37	85 to 81	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
37 to 38.5	81 to 79.5	Liquefiable Sand	Case I) Sand (Reese)	-	36	67.5
			Case II) Soft Clay (Matlock)	Sr=400	-	67.5
38.5 to 65	79.5 to 53	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
65 to 103	53 to 15	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
103 to 115	15 to 3	Sand	Sand (Reese)	-	38	67.5

Default values can be used for e_{50} and K except for the liquefied soils (Case II) where e_{50} of 0.05 should be used.
Groundwater is considered at depth of 13.0 feet below existing ground at Elevation +105.0 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: CPT-AS-11 **Date:** 9/22/2018
Station: "SB" Track Line 990+65 **By:** JZ/EO

Approx. Ground Surface Elevation: 118.0
Structure ID: Bent 14 & Bent 15

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 7	118 to 111	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	125
7 to 9.8	111 to 108.2	Clay	Soft Clay (Matlock)	850	-	115
9.8 to 14	108.2 to 104	Clay	Soft Clay (Matlock)	850	-	57.5
14 to 23	104 to 95	Clay	Stiff Clay w/o Free Water (Reese)	1250	-	62.5
23 to 100	95 to 18	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
100 to 121.5	18 to -3.5	Clay	Stiff Clay w/o Free Water (Reese)	4000	-	67.5

Default values can be used for e_{50} and K.
Groundwater is considered at depth of 9.8 feet below existing ground at Elevation +108.2 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: CPT-AS-92 **Date:** 11/1/2018
Station: "SB" Line 993+33 **By:** JZ

Approx. Ground Surface Elevation: 116.5
Structure ID: Bent 16 & Bent 17

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 13	116.5 to 103.5	Liquefiable Sand	Case I) Sand (Reese)	-	34	125
			Case II) Soft Clay (Matlock)	Sr=1000	-	125
13 to 23	103.5 to 93.5	Clay	Soft Clay (Matlock)	800	-	67.5
23 to 32.5	93.5 to 84	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
32.5 to 35	84 to 81.5	Liquefiable Sand	Case I) Sand (Reese)	-	36	67.5
			Case II) Soft Clay (Matlock)	Sr=800	-	67.5
35 to 45	81.5 to 71.5	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
45 to 58	71.5 to 58.5	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
58 to 63	58.5 to 53.5	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
63 to 90	53.5 to 26.5	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
90 to 120	26.5 to -3.5	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5

Default values can be used for e_{50} and K except for the liquefied soils (Case II) where e_{50} of 0.05 should be used.
Groundwater is considered at depth of 13.0 feet below existing ground at Elevation +103.5 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: CPT-AS-13 **Date:** 9/22/2018
Station: "SB" Track Line 996+05 **By:** JZ/EO

Approx. Ground Surface Elevation: 116.5
Structure ID: Bent 18

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 5	116.5 to 111.5	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	120
5 to 17.5	111.5 to 99	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	62.5
17.5 to 29	99 to 87.5	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
29 to 75	87.5 to 41.5	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
75 to 82	41.5 to 34.5	Sand	Sand (Reese)	-	36	67.5
82 to 120	34.5 to -3.5	Clay	Stiff Clay w/o Free Water (Reese)	4000	-	67.5

Default values can be used for e_{50} and K.
Groundwater is considered at depth of 5.0 feet below existing ground at Elevation +111.5 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: CPT-AS-93
Station: "SB" Line 998+30

Date: 11/1/2018
By: JZ/EO

Approx. Ground Surface Elevation: 117.5
Structure ID: Bent 19 & Bent 20

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 10.2	117.5 to 107.3	Sand	Sand (Reese)	-	34	125
10.2 to 12	107.3 to 105.5	Sand	Sand (Reese)	-	34	67.5
12 to 23	105.5 to 94.5	Clay	Soft Clay (Matlock)	800	-	57.5
23 to 30	94.5 to 87.5	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
30 to 34	87.5 to 83.5	Clay	Soft Clay (Matlock)	800	-	57.5
34 to 45	83.5 to 72.5	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
45 to 56	72.5 to 61.5	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	57.5
56 to 62	61.5 to 55.5	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
62 to 97	55.5 to 20.5	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
97 to 120	20.5 to -2.5	Clay	Stiff Clay w/o Free Water (Reese)	3000	-	67.5

Default values can be used for e_{50} and K.

Groundwater is considered at depth of 10.2 feet below existing ground at Elevation +107.3 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: CPT-AS-14 **Date:** 9/22/2018
Station: "SB" Track Line 1000+85 **By:** JZ/EO

Approx. Ground Surface Elevation: 117.0
Structure ID: Bent 21 & Bent 22

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 8.3	117 to 108.7	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	120
8.3 to 12.5	108.7 to 104.5	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
12.5 to 23.5	104.5 to 93.5	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	62.5
23.5 to 43	93.5 to 74	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
43 to 49.5	74 to 67.5	Sand	Sand (Reese)	-	36	67.5
49.5 to 67.5	67.5 to 49.5	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
67.5 to 75.5	49.5 to 41.5	Clay	Stiff Clay w/o Free Water (Reese)	3500	-	67.5
75.5 to 78.5	41.5 to 38.5	Sand	Sand (Reese)	-	38	67.5
78.5 to 100	38.5 to 17	Clay	Stiff Clay w/o Free Water (Reese)	4000	-	67.5

Default values can be used for e_{50} and K.
Groundwater is considered at depth of 8.3 feet below existing ground at Elevation +108.7 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: CPT-AS-67 **Date:** 11/1/2018
Station: "SB" Line 1004+66 **By:** JZ

Approx. Ground Surface Elevation: 119.0
Structure ID: Bent 23, Bent 24 & Bent 25

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 10	119 to 109	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	125
10 to 11.3	109 to 107.7	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	120
11.3 to 20	107.7 to 99	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	62.5
20 to 30	99 to 89	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
30 to 48	89 to 71	Clay	Stiff Clay w/o Free Water (Reese)	1800	-	67.5
48 to 53	71 to 66	Sand	Sand (Reese)	-	34	67.5
53 to 90	66 to 29	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
90 to 120	29 to -1	Clay	Stiff Clay w/o Free Water (Reese)	3000	-	67.5

Default values can be used for e_{50} and K.

Groundwater is considered at depth of 11.3 feet below existing ground at Elevation +107.7 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: AS-68 **Date:** 11/1/2018
Station: "SB" Line 1007+43 **By:** JZ

Approx. Ground Surface Elevation: 119.5
Structure ID: Bent 26 & Bent 27

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 8	119.5 to 111.5	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	125
8 to 10	111.5 to 109.5	Clay	Soft Clay (Matlock)	800	-	115
10 to 23	109.5 to 96.5	Clay	Soft Clay (Matlock)	800	-	57.5
23 to 29.5	96.5 to 90	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
29.5 to 33.5	90 to 86	Clay	Soft Clay (Matlock)	150	-	67.5
33.5 to 41	86 to 78.5	Liquefiable Sand	Case I) Sand (Reese)	-	34	67.5
			Case II) Soft Clay (Matlock)	Sr=500	-	67.5
41 to 43	78.5 to 76.5	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
43 to 51	76.5 to 68.5	Liquefiable Sand	Case I) Sand (Reese)	-	32	67.5
			Case II) Soft Clay (Matlock)	Sr=300	-	67.5
51 to 58	68.5 to 61.5	Clay	Soft Clay (Matlock)	800	-	57.5
58 to 86	61.5 to 33.5	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
86 to 151.5	33.5 to -32	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5

Default values can be used for e_{50} and K except for the liquefied soils (Case II) where e_{50} of 0.05 should be used.
Groundwater is considered at depth of 10.0 feet below existing ground at Elevation +109.5 feet.

LPILE PARAMETERS

Boring ID: CPT-AS-69 **Date:** 11/1/2018
Station: "SB" Line 1010+41 **By:** JZ

Approx. Ground Surface Elevation: 119.5
Structure ID: Bent 28 & Bent 29

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 11	119.5 to 108.5	Liquefiable Sand	Case I) Sand (Reese)	-	34	125
			Case II) Soft Clay (Matlock)	Sr=700	-	125
11 to 21.5	108.5 to 98	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	125
21.5 to 24	98 to 95.5	Liquefiable Sand	Case I) Sand (Reese)	-	34	67.5
			Case II) Stiff Clay w/o Free Water (Reese)	Sr=1000	-	67.5
24 to 53	95.5 to 66.5	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
53 to 57	66.5 to 62.5	Sand	Sand (Reese)	-	35	67.5
57 to 95.5	62.5 to 24	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
95.5 to 115	24 to 4.5	Sand	Sand (Reese)	-	38	67.5

Default values can be used for e_{50} and K except for the liquefied soils (Case II) where e_{50} of 0.05 should be used.
Groundwater is considered at depth of 21.5 feet below existing ground at Elevation +98.0 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: AS-70 **Date:** 11/1/2018
Station: "SB" Line 1013+26 **By:** JZ

Approx. Ground Surface Elevation: 120.5
Structure ID: Bent 30 & Bent 31

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 8.5	120.5 to 112	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	125
8.5 to 13	112 to 107.5	Liquefiable Sand	Case I) Sand (Reese)	-	30	67.5
			Case II) Soft Clay (Matlock)	Sr=150	-	67.5
13 to 28	107.5 to 92.5	Clay	Soft Clay (Matlock)	800	-	67.5
28 to 38	92.5 to 82.5	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
38 to 50	82.5 to 70.5	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
50 to 58.5	70.5 to 62	Clay	Stiff Clay w/o Free Water (Reese)	1200	-	67.5
58.5 to 65	62 to 55.5	Sand	Sand (Reese)	-	36	67.5
65 to 68.5	55.5 to 52	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
68.5 to 73	52 to 47.5	Liquefiable Sand	Case I) Sand (Reese)	-	32	67.5
			Case II) Soft Clay (Matlock)	Sr=600	-	67.5
73 to 78.5	47.5 to 42	Sand	Sand (Reese)	-	35	67.5
78.5 to 94.5	42 to 26	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
94.5 to 107	26 to 13.5	Sand	Sand (Reese)	-	34	67.5
107 to 147	13.5 to -26.5	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
147 to 151.5	-26.5 to -31	Sand	Sand (Reese)	-	34	67.5

Default values can be used for e_{50} and K except for the liquefied soils (Case II) where e_{50} of 0.05 should be used.
Groundwater is considered at depth of 10.0 feet below existing ground at Elevation +110.5 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: AS-72 **Date:** 11/1/2018
Station: "SB" Line 1018+91 **By:** JZ

Approx. Ground Surface Elevation: 121.5
Structure ID: Bent 32, Bent 33, Bent 34 & Bent 35

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 8	121.5 to 113.5	Clay	Stiff Clay w/o Free Water (Reese)	3000	-	125
8 to 10	113.5 to 111.5	Clay	Stiff Clay w/o Free Water (Reese)	1200	-	125
10 to 13	111.5 to 108.5	Clay	Stiff Clay w/o Free Water (Reese)	1200	-	67.5
13 to 16.5	108.5 to 105	Liquefiable Sand	Case I) Sand (Reese)	-	30	57.5
			Case II) Soft Clay (Matlock)	Sr=150	-	57.5
16.5 to 37.5	105 to 84	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	57.5
37.5 to 43.5	84 to 78	Sand	Sand (Reese)	-	38	67.5
43.5 to 52	78 to 69.5	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
52 to 63	69.5 to 58.5	Sand	Sand (Reese)	-	36	67.5
63 to 75	58.5 to 46.5	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
75 to 83	46.5 to 38.5	Sand	Sand (Reese)	-	34	67.5
83 to 96	38.5 to 25.5	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
96 to 150	25.5 to -28.5	Clay	Stiff Clay w/o Free Water (Reese)	3500	-	67.5

Default values can be used for e_{50} and K except for the liquefied soils (Case II) where e_{50} of 0.05 should be used.
Groundwater is considered at depth of 10.0 feet below existing ground at Elevation +111.5 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: AS-74 **Date:** 11/1/2018
Station: "SB" Line 1024+91 **By:** JZ

Approx. Ground Surface Elevation: 121.0
Structure ID: Bent 36, Bent 37, Bent 38 & Bent 39

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 8	121 to 113	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	125
8 to 10	113 to 111	Sand	Sand (Reese)	-	33	67.5
10 to 13.5	111 to 107.5	Liquefiable Sand	Case I) Sand (Reese)	-	33	67.5
			Case II) Soft Clay (Matlock)	Sr=400	-	67.5
13.5 to 28.5	107.5 to 92.5	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	57.5
28.5 to 33.5	92.5 to 87.5	Clay	Soft Clay (Matlock)	650	-	57.5
33.5 to 48.5	87.5 to 72.5	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	67.5
48.5 to 63.5	72.5 to 57.5	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
63.5 to 71	57.5 to 50	Clay	Stiff Clay w/o Free Water (Reese)	4000	-	67.5
71 to 74.5	50 to 46.5	Sand	Sand (Reese)	-	34	67.5
74.5 to 96	46.5 to 25	Clay	Stiff Clay w/o Free Water (Reese)	1600	-	67.5
96 to 116	25 to 5	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
116 to 129	5 to -8	Sand	Sand (Reese)	-	38	72.5
129 to 137	-8 to -16	Clay	Stiff Clay w/o Free Water (Reese)	5000	-	67.5
137 to 147.5	-16 to -26.5	Sand	Sand (Reese)	-	38	72.5
147.5 to 151.5	-26.5 to -30.5	Clay	Stiff Clay w/o Free Water (Reese)	5000	-	67.5

Default values can be used for e_{50} and K except for the liquefied soils (Case II) where e_{50} of 0.05 should be used.
Groundwater is considered at depth of 10.0 feet below existing ground at Elevation +111.0 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: AS-76 **Date:** 11/1/2018
Station: "SB" Line 1030+84 **By:** JZ

Approx. Ground Surface Elevation: 120.5
Structure ID: Bent 40, Bent 41, Bent 42 & Bent 43

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 8.5	120.5 to 112	Clay	Stiff Clay w/o Free Water (Reese)	1200	-	125
8.5 to 23.5	112 to 97	Liquefiable Sand	Case I) Sand (Reese)	-	32	57.5
			Case II) Soft Clay (Matlock)	Sr=150	-	57.5
23.5 to 38.5	97 to 82	Clay	Stiff Clay w/o Free Water (Reese)	1200	-	67.5
38.5 to 43.5	82 to 77	Clay	Soft Clay (Matlock)	500	-	57.5
43.5 to 53.5	77 to 67	Clay	Stiff Clay w/o Free Water (Reese)	1300	-	67.5
53.5 to 58.5	67 to 62	Sand	Sand (Reese)	-	34	67.5
58.5 to 68.5	62 to 52	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	57.5
68.5 to 72	52 to 48.5	Sand	Sand (Reese)	-	35	67.5
72 to 134	48.5 to -13.5	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
134 to 145	-13.5 to -24.5	Sand	Sand (Reese)	-	34	67.5
145 to 151.5	-24.5 to -31	Clay	Stiff Clay w/o Free Water (Reese)	3000	-	67.5

Default values can be used for e_{50} and K except for the liquefied soils (Case II) where e_{50} of 0.05 should be used.
Groundwater is considered at depth of 9.5 feet below existing ground at Elevation +111.0 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: CPT-AS-77 **Date:** 11/1/2018
Station: "SB" Line 1033+65 **By:** JZ

Approx. Ground Surface Elevation: 120.0
Structure ID: Bent 44 & Bent 45

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 5.5	120 to 114.5	Sand	Sand (Reese)	-	34	125
5.5 to 11	114.5 to 109	Liquefiable Sand	Case I) Sand (Reese)	-	34	67.5
			Case II) Soft Clay (Matlock)	Sr=300	-	67.5
11 to 14	109 to 106	Clay	Soft Clay (Matlock)	800	-	57.5
14 to 19	106 to 101	Liquefiable Sand	Case I) Sand (Reese)	-	35	67.5
			Case II) Soft Clay (Matlock)	Sr=600	-	67.5
19 to 40	101 to 80	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
40 to 45	80 to 75	Liquefiable Sand	Case I) Sand (Reese)	-	35	67.5
			Case II) Soft Clay (Matlock)	Sr=400	-	67.5
45 to 72	75 to 48	Sand	Sand (Reese)	-	36	67.5
72 to 105	48 to 15	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
105 to 110	15 to 10	Sand	Sand (Reese)	-	38	67.5

Default values can be used for e_{50} and K except for the liquefied soils (Case II) where e_{50} of 0.05 should be used.
Groundwater is considered at depth of 5.5 feet below existing ground at Elevation +114.5 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: AS-80 **Date:** 11/1/2018
Station: "SB" Line 1040+60 **By:** JZ

Approx. Ground Surface Elevation: 121.5
Structure ID: Bents 46, 47, 48, 49, 54 & 55

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 9.5	121.5 to 112	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	115
9.5 to 13.5	112 to 108	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	57.5
13.5 to 23.5	108 to 98	Liquefiable Sand	Case I) Sand (Reese)	-	32	62.5
			Case II) Soft Clay (Matlock)	Sr=200	-	62.5
23.5 to 33.5	98 to 88	Clay	Stiff Clay w/o Free Water (Reese)	1200	-	67.5
33.5 to 43.5	88 to 78	Clay	Soft Clay (Matlock)	700	-	57.5
43.5 to 63.5	78 to 58	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	57.5
63.5 to 73.5	58 to 48	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
73.5 to 78	48 to 43.5	Sand	Sand (Reese)	-	36	67.5
78 to 106	43.5 to 15.5	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
106 to 116	15.5 to 5.5	Sand	Sand (Reese)	-	36	67.5
116 to 147	5.5 to -25.5	Clay	Stiff Clay w/o Free Water (Reese)	3000	-	67.5
147 to 150.3	-25.5 to -28.8	Sand	Sand (Reese)	-	38	67.5

Default values can be used for e_{50} and K except for the liquefied soils (Case II) where e_{50} of 0.05 should be used.
Groundwater is considered at depth of 9.5 feet below existing ground at Elevation +112.0 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: CPT-AS-81 **Date:** 11/1/2018
Station: "SB" Line 1042+72 **By:** JZ

Approx. Ground Surface Elevation: 122.5
Structure ID: Bent 50 & Bent 51

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 5.2	122.5 to 117.3	Sand	Sand (Reese)	-	34	125
5.2 to 9	117.3 to 113.5	Liquefiable Sand	Case I) Sand (Reese)	-	34	67.5
			Case II) Soft Clay (Matlock)	Sr=600	-	67.5
9 to 15	113.5 to 107.5	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	57.5
15 to 19	107.5 to 103.5	Liquefiable Sand	Case I) Sand (Reese)	-	34	67.5
			Case II) Soft Clay (Matlock)	Sr=400	-	67.5
19 to 42	103.5 to 80.5	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	57.5
42 to 48	80.5 to 74.5	Liquefiable Sand	Case I) Sand (Reese)	-	34	67.5
			Case II) Soft Clay (Matlock)	Sr=600	-	67.5
48 to 56	74.5 to 66.5	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
56 to 80	66.5 to 42.5	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
80 to 104	42.5 to 18.5	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
104 to 112	18.5 to 10.5	Sand	Sand (Reese)	-	38	67.5
112 to 120	10.5 to 2.5	Clay	Stiff Clay w/o Free Water (Reese)	3000	-	67.5

Default values can be used for e_{50} and K except for the liquefied soils (Case II) where e_{50} of 0.05 should be used.
Groundwater is considered at depth of 5.2 feet below existing ground at Elevation +117.3 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: AS-82 **Date:** 11/1/2018
Station: "SB" Line 1045+56 **By:** JZ

Approx. Ground Surface Elevation: 122.5
Structure ID: Bent 52 & Bent 53

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 9	122.5 to 113.5	Clay	Soft Clay (Matlock)	700	-	115
9 to 18	113.5 to 104.5	Clay	Soft Clay (Matlock)	700	-	57.5
18 to 43	104.5 to 79.5	Clay	Stiff Clay w/o Free Water (Reese)	1200	-	67.5
43 to 53	79.5 to 69.5	Clay	Soft Clay (Matlock)	450	-	57.5
53 to 63	69.5 to 59.5	Clay	Stiff Clay w/o Free Water (Reese)	1800	-	67.5
63 to 68	59.5 to 54.5	Clay	Soft Clay (Matlock)	900	-	57.5
68 to 76.3	54.5 to 46.2	Clay	Stiff Clay w/o Free Water (Reese)	3000	-	67.5
76.3 to 79	46.2 to 43.5	Sand	Sand (Reese)	-	34	67.5
79 to 83	43.5 to 39.5	Clay	Soft Clay (Matlock)	800	-	57.5
83 to 126	39.5 to -3.5	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
126 to 148	-3.5 to -25.5	Sand	Sand (Reese)	-	38	67.5
148 to 151.5	-25.5 to -29	Clay	Stiff Clay w/o Free Water (Reese)	4000	-	67.5

Default values can be used for e_{50} and K.

Groundwater is considered at depth of 9.0 feet below existing ground at Elevation +113.5 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: AS-84 **Date:** 11/1/2018
Station: "SB" Line 1051+55 **By:** JZ

Approx. Ground Surface Elevation: 124.0
Structure ID: Bent 56 & Bent 57

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 9	124 to 115	Clay	Soft Clay (Matlock)	700	-	115
9 to 13	115 to 111	Clay	Soft Clay (Matlock)	700	-	57.5
13 to 53.5	111 to 70.5	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
53.5 to 58.5	70.5 to 65.5	Sand	Sand (Reese)	-	35	67.5
58.5 to 72	65.5 to 52	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
72 to 78	52 to 46	Sand	Sand (Reese)	-	33	67.5
78 to 119	46 to 5	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
119 to 151.5	5 to -27.5	Sand	Sand (Reese)	-	36	67.5

Default values can be used for e_{50} and K.

Groundwater is considered at depth of 9.0 feet below existing ground at Elevation +115.0 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: CPT-AS-85 **Date:** 11/1/2018
Station: "SB" Line 1054+55 **By:** JZ

Approx. Ground Surface Elevation: 125.0
Structure ID: Bent 58 & Bent 59

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 5.3	125 to 119.7	Sand	Sand (Reese)	-	34	125
5.3 to 12	119.7 to 113	Liquefiable Sand	Case I) Sand (Reese)	-	34	67.5
			Case II) Soft Clay (Matlock)	Sr=450	-	67.5
12 to 20	113 to 105	Clay	Soft Clay (Matlock)	800	-	57.5
20 to 27	105 to 98	Liquefiable Sand	Case I) Sand (Reese)	-	34	67.5
			Case II) Soft Clay (Matlock)	Sr=800	-	67.5
27 to 46	98 to 79	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	57.5
46 to 60	79 to 65	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
60 to 80	65 to 45	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
80 to 120	45 to 5	Clay	Stiff Clay w/o Free Water (Reese)	3000	-	67.5

Default values can be used for e_{50} and K except for the liquefied soils (Case II) where e_{50} of 0.05 should be used.
Groundwater is considered at depth of 5 feet below existing ground at Elevation +120.0 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: AS-86 **Date:** 11/1/2018
Station: "SB" Line 1057+95 **By:** JZ

Approx. Ground Surface Elevation: 126.5
Structure ID: Bent 60 & Bent 61

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 11	126.5 to 115.5	Clay	Soft Clay (Matlock)	700	-	115
11 to 18.5	115.5 to 108	Clay	Soft Clay (Matlock)	700	-	57.5
18.5 to 24	108 to 102.5	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
24 to 48.5	102.5 to 78	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
48.5 to 56.5	78 to 70	Liquefiable Sand	Case I) Sand (Reese)	-	32	67.5
			Case II) Soft Clay (Matlock)	Sr=400	-	67.5
56.5 to 63	70 to 63.5	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
63 to 68	63.5 to 58.5	Sand	Sand (Reese)	-	36	67.5
68 to 73.5	58.5 to 53	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
73.5 to 78	53 to 48.5	Sand	Sand (Reese)	-	36	67.5
78 to 85	48.5 to 41.5	Clay	Stiff Clay w/o Free Water (Reese)	3000	-	67.5
85 to 104	41.5 to 22.5	Sand	Sand (Reese)	-	34	67.5
104 to 128	22.5 to -1.5	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
128 to 138	-1.5 to -11.5	Sand	Sand (Reese)	-	36	67.5
138 to 151.5	-11.5 to -25	Clay	Stiff Clay w/o Free Water (Reese)	5000	-	67.5

Default values can be used for e_{50} and K except for the liquefied soils (Case II) where e_{50} of 0.05 should be used.
Groundwater is considered at depth of 11.0 feet below existing ground at Elevation +115.5 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: CPT-AS-87 **Date:** 11/1/2018
Station: "SB" Line 1060+45 **By:** JZ

Approx. Ground Surface Elevation: 127.0
Structure ID: Bent 62 & Bent 63

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 7.5	127 to 119.5	Clay	Soft Clay (Matlock)	800	-	115
7.5 to 13.5	119.5 to 113.5	Liquefiable Sand	Case I) Sand (Reese)	-	34	67.5
			Case II) Soft Clay (Matlock)	Sr=600	-	67.5
13.5 to 20	113.5 to 107	Clay	Soft Clay (Matlock)	600	-	57.5
20 to 24.5	107 to 102.5	Liquefiable Sand	Case I) Sand (Reese)	-	35	67.5
			Case II) Soft Clay (Matlock)	Sr=500	-	67.5
24.5 to 44	102.5 to 83	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	57.5
44 to 50	83 to 77	Sand	Sand (Reese)	-	38	67.5
50 to 57	77 to 70	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
57 to 59	70 to 68	Sand	Sand (Reese)	-	38	67.5
59 to 80	68 to 47	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
80 to 120	47 to 7	Clay	Stiff Clay w/o Free Water (Reese)	3000	-	67.5

Default values can be used for e_{50} and K except for the liquefied soils (Case II) where e_{50} of 0.05 should be used.
Groundwater is considered at depth of 7.0 feet below existing ground at Elevation +120.0 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: AS-88 **Date:** 11/1/2018
Station: "SB" Line 1063+05 **By:** JZ

Approx. Ground Surface Elevation: 128.0
Structure ID: Bent 64 & Bent 65

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 11.5	128 to 116.5	Clay	Soft Clay (Matlock)	800	-	115
11.5 to 13.5	116.5 to 114.5	Clay	Soft Clay (Matlock)	800	-	57.5
13.5 to 18.5	114.5 to 109.5	Liquefiable Sand	Case I) Sand (Reese)	-	32	67.5
			Case II) Soft Clay (Matlock)	Sr=150	-	67.5
18.5 to 23.5	109.5 to 104.5	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
23.5 to 28.5	104.5 to 99.5	Clay	Soft Clay (Matlock)	900	-	57.5
28.5 to 43.5	99.5 to 84.5	Clay	Stiff Clay w/o Free Water (Reese)	1800	-	67.5
43.5 to 58.5	84.5 to 69.5	Liquefiable Sand	Case I) Sand (Reese)	-	34	67.5
			Case II) Soft Clay (Matlock)	Sr=600	-	67.5
58.5 to 63	69.5 to 65	Clay	Stiff Clay w/o Free Water (Reese)	3000	-	67.5
63 to 68	65 to 60	Sand	Sand (Reese)	-	38	67.5
68 to 78	60 to 50	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
78 to 85	50 to 43	Sand	Sand (Reese)	-	38	67.5
85 to 106	43 to 22	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
106 to 116	22 to 12	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	57.5
116 to 135.5	12 to -7.5	Clay	Stiff Clay w/o Free Water (Reese)	3000	-	67.5
135.5 to 151.5	-7.5 to -23.5	Sand	Sand (Reese)	-	36	67.5

Default values can be used for e_{50} and K except for the liquefied soils (Case II) where e_{50} of 0.05 should be used.
Groundwater is considered at depth of 11.5 feet below existing ground at Elevation +116.5 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: CPT-AS-89 **Date:** 11/1/2018
Station: "SB" Line 1065+10 **By:** JZ

Approx. Ground Surface Elevation: 129.0
Structure ID: Bent 66

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 8	129 to 121	Clay	Soft Clay (Matlock)	500	-	115
8 to 12.5	121 to 116.5	Liquefiable Sand	Case I) Sand (Reese)	-	34	67.5
			Case II) Soft Clay (Matlock)	Sr=250	-	67.5
12.5 to 23	116.5 to 106	Clay	Soft Clay (Matlock)	800	-	57.5
23 to 30	106 to 99	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
30 to 40	99 to 89	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
40 to 45	89 to 84	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
45 to 50	84 to 79	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
50 to 83	79 to 46	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
83 to 92.5	46 to 36.5	Sand	Sand (Reese)	-	38	67.5
92.5 to 120	36.5 to 9	Clay	Stiff Clay w/o Free Water (Reese)	3000	-	67.5

Default values can be used for e_{50} and K except for the liquefied soils (Case II) where e_{50} of 0.05 should be used.
Groundwater is considered at depth of 7 feet below existing ground at Elevation +122.0 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: CPT-AS-22 **Date:** 9/22/2018
Station: "SB" Track Line 1067+90 **By:** JZ/EO

Approx. Ground Surface Elevation: 131.0
Structure ID: Bent 67 & Bent 68

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 5.5	131 to 125.5	Clay	Soft Clay (Matlock)	500	-	105
5.5 to 15.2	125.5 to 115.8	Clay	Soft Clay (Matlock)	500	-	52.5
15.2 to 24	115.8 to 107	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	57.5
24 to 41	107 to 90	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
41 to 48	90 to 83	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
48 to 52.5	83 to 78.5	Sand	Sand (Reese)	-	34	62.5
52.5 to 58.5	78.5 to 72.5	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	72.5
58.5 to 67	72.5 to 64	Sand	Sand (Reese)	-	34	67.5
67 to 85	64 to 46	Clay	Stiff Clay w/o Free Water (Reese)	3000	-	67.5
85 to 88	46 to 43	Sand	Sand (Reese)	-	35	67.5
88 to 100	43 to 31	Clay	Stiff Clay w/o Free Water (Reese)	3500	-	67.5

Default values can be used for e_{50} and K.

Groundwater is considered at depth of 15.2 feet below existing ground at Elevation +115.8 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: AS-25 **Date:** 9/22/2018
Station: "SB" Track Line 1069+45 **By:** JZ/EO

Approx. Ground Surface Elevation: 129.5
Structure ID: Bent 69 & Bent 70

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 8	129.5 to 121.5	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	125
8 to 8.5	121.5 to 121	Clay	Soft Clay (Matlock)	750	-	115
8.5 to 13	121 to 116.5	Clay	Soft Clay (Matlock)	750	-	62.5
13 to 33	116.5 to 96.5	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	62.5
33 to 57.5	96.5 to 72	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	62.5
57.5 to 71.5	72 to 58	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
71.5 to 94.5	58 to 35	Clay	Stiff Clay w/o Free Water (Reese)	3500	-	67.5
94.5 to 100.5	35 to 29	Sand	Sand (Reese)	-	33	67.5

Default values can be used for e_{50} and K.
Groundwater is considered at depth of 8.5 feet below existing ground at Elevation +121.0 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: CPT-AS-94 **Date:** 11/1/2018
Station: "SB" Line 1073+02 **By:** JZ

Approx. Ground Surface Elevation: 131.0
Structure ID: Bent 71 & Bent 72

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 10	131 to 121	Liquefiable Sand	Case I) Sand (Reese)	-	32	125
			Case II) Soft Clay (Matlock)	Sr=150	-	125
10 to 17	121 to 114	Liquefiable Sand	Case I) Sand (Reese)	-	34	125
			Case II) Soft Clay (Matlock)	Sr=600	-	125
17 to 26	114 to 105	Clay	Soft Clay (Matlock)	800	-	115
26 to 40.5	105 to 90.5	Clay	Stiff Clay w/o Free Water (Reese)	1200	-	125
40.5 to 43.5	90.5 to 87.5	Clay	Stiff Clay w/o Free Water (Reese)	1200	-	67.5
43.5 to 47	87.5 to 84	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
47 to 51.5	84 to 79.5	Liquefiable Sand	Case I) Sand (Reese)	-	35	67.5
			Case II) Stiff Clay w/o Free Water (Reese)	Sr=1000	-	67.5
51.5 to 81	79.5 to 50	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
81 to 83.5	50 to 47.5	Sand	Sand (Reese)	-	38	67.5
83.5 to 94.5	47.5 to 36.5	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
94.5 to 98	36.5 to 33	Sand	Sand (Reese)	-	38	67.5
98 to 120	33 to 11	Clay	Stiff Clay w/o Free Water (Reese)	3000	-	67.5

Default values can be used for e_{50} and K except for the liquefied soils (Case II) where e_{50} of 0.05 should be used.
Groundwater is considered at depth of 40.5 feet below existing ground at Elevation +90.5 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: CPT-AS-28 **Date:** 12/14/2018
Station: "SB" Track Line 1075+10 **By:** JZ/EO

Approx. Ground Surface Elevation: 131.0
Structure ID: Bent 73

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 8	131 to 123	Sand	Sand (Reese)	-	36	125
8 to 11	123 to 120	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	67.5
11 to 15	120 to 116	Sand	Sand (Reese)	-	36	67.5
15 to 25	116 to 106	Clay	Stiff Clay w/o Free Water (Reese)	1200	-	67.5
25 to 45	106 to 86	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
45 to 48	86 to 83	Sand	Sand (Reese)	-	36	67.5
48 to 68	83 to 63	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
68 to 72	63 to 59	Sand	Sand (Reese)	-	36	67.5
72 to 78	59 to 53	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
78 to 81	53 to 50	Sand	Sand (Reese)	-	36	67.5
81 to 90	50 to 41	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5

Default values can be used for e_{50} and K.
Groundwater is considered at depth of 8 feet below existing ground at Elevation +123.0 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: AS-27 **Date:** 9/22/2018
Station: "SB" Track Line 1076+40 **By:** JZ/EO

Approx. Ground Surface Elevation: 134.5
Structure ID: Bent 74

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 8	134.5 to 126.5	Clay	Stiff Clay w/o Free Water (Reese)	1250	-	120
8 to 12	126.5 to 122.5	Sand	Sand (Reese)	-	29	115
12 to 13	122.5 to 121.5	Sand	Sand (Reese)	-	29	57.5
13 to 18	121.5 to 116.5	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	62.5
18 to 25	116.5 to 109.5	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	57.5
25 to 48.5	109.5 to 86	Clay	Stiff Clay w/o Free Water (Reese)	1750	-	62.5
48.5 to 53.5	86 to 81	Sand	Sand (Reese)	-	32	67.5
53.5 to 58.5	81 to 76	Sand	Sand (Reese)	-	33	67.5
58.5 to 110.5	76 to 24	Clay	Stiff Clay w/o Free Water (Reese)	3250	-	67.5
110.5 to 115.5	24 to 19	Sand	Sand (Reese)	-	36	67.5
115.5 to 120	19 to 14.5	Clay	Stiff Clay w/o Free Water (Reese)	4000	-	67.5

Default values can be used for e_{50} and K.
Groundwater is considered at depth of 12 feet below existing ground at Elevation +122.5 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: CPT-AS-95 **Date:** 11/1/2018
Station: "SB" Line 1078+67 **By:** JZ

Approx. Ground Surface Elevation: 134.5
Structure ID: Bent 75

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 8.8	134.5 to 125.7	Sand	Sand (Reese)	-	34	125
8.8 to 11.5	125.7 to 123	Liquefiable Sand	Case I) Sand (Reese)	-	34	67.5
			Case II) Soft Clay (Matlock)	Sr=700	-	67.5
11.5 to 16	123 to 118.5	Liquefiable Sand	Case I) Sand (Reese)	-	36	67.5
			Case II) Stiff Clay w/o Free Water (Reese)	Sr=1500	-	67.5
16 to 20	118.5 to 114.5	Clay	Soft Clay (Matlock)	800	-	57.5
20 to 50	114.5 to 84.5	Clay	Stiff Clay w/o Free Water (Reese)	1200	-	67.5
50 to 53	84.5 to 81.5	Sand	Sand (Reese)	-	35	67.5
53 to 59	81.5 to 75.5	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
59 to 62	75.5 to 72.5	Sand	Sand (Reese)	-	36	67.5
62 to 85	72.5 to 49.5	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
85 to 91.5	49.5 to 43	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
91.5 to 95.5	43 to 39	Sand	Sand (Reese)	-	38	67.5
95.5 to 120	39 to 14.5	Clay	Stiff Clay w/o Free Water (Reese)	3000	-	67.5

Default values can be used for e_{50} and K except for the liquefied soils (Case II) where e_{50} of 0.05 should be used.
Groundwater is considered at depth of 8.8 feet below existing ground at Elevation +125.7 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: CPT-AS-30 **Date:** 9/22/2018
Station: "SB" Track Line 1080+45 **By:** JZ/EO

Approx. Ground Surface Elevation: 134.5
Structure ID: Abutment 76

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 12.9	134.5 to 121.6	Clay	Soft Clay (Matlock)	750	-	105
12.9 to 18	121.6 to 116.5	Clay	Soft Clay (Matlock)	750	-	52.5
18 to 42.5	116.5 to 92	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
42.5 to 68	92 to 66.5	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
68 to 89	66.5 to 45.5	Clay	Stiff Clay w/o Free Water (Reese)	3000	-	67.5
89 to 93.5	45.5 to 41	Sand	Sand (Reese)	-	38	67.5
93.5 to 100	41 to 34.5	Clay	Stiff Clay w/o Free Water (Reese)	4000	-	67.5

Default values can be used for e_{50} and K.
Groundwater is considered at depth of 12.9 feet below existing ground at Elevation +121.6 feet.

GEOTECHNICAL LPILE PARAMETERS
STORY ROAD PEDESTRIAN OVERCROSSING

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: CPT-AS-93 **Date:** 11/1/2018
Station: "SB" Line 998+30 **By:** JZ/EO

Approx. Ground Surface Elevation: 117.5
Structure ID: Story Road Pedestrian Overcrossing (Bent 1 through Bent 4)

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 10.2	117.5 to 107.3	Sand	Sand (Reese)	-	34	125
10.2 to 12	107.3 to 105.5	Sand	Sand (Reese)	-	34	67.5
12 to 23	105.5 to 94.5	Clay	Soft Clay (Matlock)	800	-	57.5
23 to 30	94.5 to 87.5	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
30 to 34	87.5 to 83.5	Clay	Soft Clay (Matlock)	800	-	57.5
34 to 45	83.5 to 72.5	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
45 to 56	72.5 to 61.5	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	57.5
56 to 62	61.5 to 55.5	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
62 to 97	55.5 to 20.5	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
97 to 120	20.5 to -2.5	Clay	Stiff Clay w/o Free Water (Reese)	3000	-	67.5

Default values can be used for e_{50} and K.
Groundwater is considered at depth of 10.2 feet below existing ground at Elevation +107.3 feet.

GEOTECHNICAL LPILE PARAMETERS
ACCESS AND ELEVATOR ACCESS

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
ACCESS STRUCTURE AND ELEVATOR - LPILE PARAMETERS

Boring ID: CPT-AS-12 **Date:** 7/22/2018
Station: SB Track Line 997+20 **By:** JZ

Approx. Ground Surface Elevation: 116.5
Structure ID: East Access and Elevator East Access

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 5	116.5 to 111.5	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	120
5 to 10	111.5 to 106.5	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	62.5
10 to 20	106.5 to 96.5	Clay	Soft Clay (Matlock)	800	-	62.5
20 to 25	96.5 to 91.5	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
25 to 30	91.5 to 86.5	Clay	Stiff Clay w/o Free Water (Reese)	1250	-	67.5
30 to 70	86.5 to 46.5	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
70 to 90	46.5 to 26.5	Clay	Stiff Clay w/o Free Water (Reese)	3000	-	67.5

Default values can be used for e_{50} and K.
Groundwater is considered at depth of 5.0 feet below existing ground at Elevation +111.5 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
ACCESS STRUCTURE AND ELEVATOR - LPILE PARAMETERS

Boring ID: CPT-AS-13 **Date:** 9/22/2018
Station: "SB" Track Line 996+05 **By:** JZ/EO

Approx. Ground Surface Elevation: 116.5
Structure ID: South Access, North Access, Elevator West Access and Elevator South Access

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 5	116.5 to 111.5	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	120
5 to 17.5	111.5 to 99	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	62.5
17.5 to 29	99 to 87.5	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
29 to 75	87.5 to 41.5	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
75 to 82	41.5 to 34.5	Sand	Sand (Reese)	-	36	67.5
82 to 120	34.5 to -3.5	Clay	Stiff Clay w/o Free Water (Reese)	4000	-	67.5

Default values can be used for e_{50} and K.
Groundwater is considered at depth of 5.0 feet below existing ground at Elevation +111.5 feet.

GEOTECHNICAL LPILE PARAMETERS
EASTRIDGE STATION SHELTER

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: T-32 **Date:** 2/27/2020
Station: "SB" Track Line 1086+90 **By:** JZ

Approx. Ground Surface Elevation: 135.0
Structure ID: Eastridge Station Shelter

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 3	135 to 132	Clay	Stiff Clay w/o Free Water (Reese)	4000	-	125
3 to 12	132 to 123	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	125
12 to 15	123 to 120	Silt	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
15 to 24	120 to 111	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
24 to 27.5	111 to 107.5	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5

Default values can be used for e_{50} and K.
Groundwater is considered at depth of 12.0 feet below existing ground at Elevation +123.0 feet.

GEOTECHNICAL LPILE PARAMETERS
TES POLES

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: AS-1 **Date:** 9/22/2018
Station: "SB" Track Line 971+30 **By:** JZ/EO

Approx. Ground Surface Elevation: 115.0
Structure ID: TES Pole (Station 966+00 to 971+50)

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 8	115 to 107	Clay	Stiff Clay w/o Free Water (Reese)	1750	-	125
8 to 15	107 to 100	Clay	Stiff Clay w/o Free Water (Reese)	1250	-	120
15 to 18	100 to 97	Clay	Stiff Clay w/o Free Water (Reese)	1250	-	62.5
18 to 24	97 to 91	Sand	Sand (Reese)	-	35	62.5
24 to 35	91 to 80	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	67.5
35 to 60	80 to 55	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
60 to 65	55 to 50	Sand	Sand (Reese)	-	36	67.5
65 to 86	50 to 29	Clay	Stiff Clay w/o Free Water (Reese)	3500	-	67.5
86 to 95	29 to 20	Sand	Sand (Reese)	-	36	67.5
95 to 121.5	20 to -6.5	Clay	Stiff Clay w/o Free Water (Reese)	4000	-	67.5

Default values can be used for e_{50} and K except for the liquefied soils (Case II) where e_{50} of 0.05 should be used.
Groundwater is considered at depth of 15.0 feet below existing ground at Elevation +100.0 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: CPT-AS-30 **Date:** 9/22/2018
Station: "SB" Track Line 1080+45 **By:** JZ/EO

Approx. Ground Surface Elevation: 134.5
Structure ID: TES Pole (Station 1080+00 to Station 1080+95)

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 12.9	134.5 to 121.6	Clay	Mod. Stiff Clay w/o Free Water (Reese)	750	-	105
12.9 to 18	121.6 to 116.5	Clay	Mod. Stiff Clay w/o Free Water (Reese)	750	-	52.5
18 to 42.5	116.5 to 92	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	67.5
42.5 to 68	92 to 66.5	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
68 to 89	66.5 to 45.5	Clay	Stiff Clay w/o Free Water (Reese)	3000	-	67.5
89 to 93.5	45.5 to 41	Sand	Sand (Reese)	-	38	67.5
93.5 to 100	41 to 34.5	Clay	Stiff Clay w/o Free Water (Reese)	4000	-	67.5

Default values can be used for e_{50} and K except for the liquefied soils (Case II) where e_{50} of 0.05 should be used.
Groundwater is considered at depth of 12.9 feet below existing ground at Elevation +121.6 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: AS-29 **Date:** 9/22/2018
Station: "SB" Track Line 1081+45 **By:** JZ/EO

Approx. Ground Surface Elevation: 134.0
Structure ID: TES Pole (Station 1080+95 to Station 1082+15)

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 5.5	134 to 128.5	Clay	Stiff Clay w/o Free Water (Reese)	3000	-	125
5.5 to 8	128.5 to 126	Clay	Stiff Clay w/o Free Water (Reese)	1250	-	115
8 to 14	126 to 120	Clay	Stiff Clay w/o Free Water (Reese)	1250	-	62.5
14 to 29	120 to 105	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	62.5
29 to 39	105 to 95	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	62.5
39 to 49	95 to 85	Sand	Sand (Reese)	-	36	67.5
49 to 59	85 to 75	Clay	Stiff Clay w/o Free Water (Reese)	2750	-	67.5
59 to 62	75 to 72	Sand	Sand (Reese)	-	36	72.5
62 to 120	72 to 14	Clay	Stiff Clay w/o Free Water (Reese)	3500	-	67.5

Default values can be used for e_{50} and K except for the liquefied soils (Case II) where e_{50} of 0.05 should be used.
Groundwater is considered at depth of 8 feet below existing ground at Elevation +126.0 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: AS-40 **Date:** 9/22/2018
Station: "SB" Track Line 1082+85 **By:** JZ/EO

Approx. Ground Surface Elevation: 133.0
Structure ID TES Pole (Station 1082+15 to Station 1088+80)

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 11.5	133 to 121.5	Clay	Stiff Clay w/o Free Water (Reese)	1250	-	125
11.5 to 12.5	121.5 to 120.5	Clay	Stiff Clay w/o Free Water (Reese)	1250	-	67.5
12.5 to 28	120.5 to 105	Clay	Stiff Clay w/o Free Water (Reese)	1250	-	57.5
28 to 37.5	105 to 95.5	Clay	Stiff Clay w/o Free Water (Reese)	1750	-	62.5
37.5 to 42.5	95.5 to 90.5	Sand	Sand (Reese)	-	33	62.5
42.5 to 53	90.5 to 80	Clay	Stiff Clay w/o Free Water (Reese)	1500	-	62.5
53 to 58	80 to 75	Sand	Sand (Reese)	-	35	72.5
58 to 80	75 to 53	Clay	Stiff Clay w/o Free Water (Reese)	2750	-	72.5
80 to 84	53 to 49	Sand	Sand (Reese)	-	37	72.5
84 to 101.5	49 to 31.5	Clay	Stiff Clay w/o Free Water (Reese)	3250	-	67.5

Default values can be used for e_{50} and K except for the liquefied soils (Case II) where e_{50} of 0.05 should be used.
Groundwater is considered at depth of 11.5 feet below existing ground at Elevation +121.5 feet.

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: AS-39 **Date:** 10/31/2018
Station: "SB" Track Line 1094+75 **By:** JZ/EO

Approx. Ground Surface Elevation: 139.0
Structure ID TES Pole (Station 1088+80 to Station 1095+50)

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 4	139 to 135	Clay	Stiff Clay w/o Free Water (Reese)	1200	-	125
4 to 8	135 to 131	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	125
8 to 12	131 to 127	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	125
12 to 18	127 to 121	Clay	Stiff Clay w/o Free Water (Reese)	2000	-	62.5
18 to 28	121 to 111	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	62.5
28 to 36	111 to 103	Clay	Stiff Clay w/o Free Water (Reese)	3000	-	62.5
36 to 41.5	103 to 97.5	Sand	Sand (Reese)	-	36	62.5
41.5 to 64	97.5 to 75	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	62.5
64 to 77	75 to 62	Sand	Sand (Reese)	-	38	62.5
77 to 89	62 to 50	Clay	Stiff Clay w/o Free Water (Reese)	3000	-	62.5
89 to 93	50 to 46	Sand	Sand (Reese)	-	36	62.5
93 to 121.5	46 to 17.5	Clay	Stiff Clay w/o Free Water (Reese)	5000	-	62.5

Default values can be used for e_{50} and K except for the liquefied soils (Case II) where e_{50} of 0.05 should be used.
Groundwater is considered at depth of 17.0 feet below existing ground at Elevation +122.0 feet.

GEOTECHNICAL LPILE PARAMETERS
TPSS # 33 AND TPSS #34

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: AS-80
Station: "SB" Line 1040+60
Approx. Ground Surface Elevation: 121.5
Structure ID: TPSS #33

Date: 11/1/2018
By: JZ

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 9.5	121.5 to 112	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	115
9.5 to 13.5	112 to 108	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	57.5
13.5 to 23.5	108 to 98	Liquefiable Sand	Case I) Sand (Reese)	-	32	62.5
			Case II) Soft Clay (Matlock)	Sr=200	-	62.5
23.5 to 33.5	98 to 88	Clay	Stiff Clay w/o Free Water (Reese)	1200	-	67.5
33.5 to 43.5	88 to 78	Clay	Soft Clay (Matlock)	700	-	57.5
43.5 to 63.5	78 to 58	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	57.5
63.5 to 73.5	58 to 48	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
73.5 to 78	48 to 43.5	Sand	Sand (Reese)	-	36	67.5
78 to 106	43.5 to 15.5	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	67.5
106 to 116	15.5 to 5.5	Sand	Sand (Reese)	-	36	67.5
116 to 147	5.5 to -25.5	Clay	Stiff Clay w/o Free Water (Reese)	3000	-	67.5
147 to 150.3	-25.5 to -28.8	Sand	Sand (Reese)	-	38	67.5

Default values can be used for e_{50} and K except for the liquefied soils (Case II) where e_{50} of 0.05 should be used.
Groundwater is considered at depth of 9.5 feet below existing ground at Elevation +112.0 feet.

Eastridge to BART Regional Connector
LPILE PARAMETERS

Boring ID: AS-40
Station: TBD
Approx. Ground Surface Elevation: 133.0
Structure ID: TPSS #34

Date 5/18/2020
By: KA

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 11.5	133 to 121.5	Clay	Stiff Clay w/o Free Water (Reese)	900	-	125
11.5 to 18	121.5 to 115	Clay	Stiff Clay w/o Free Water (Reese)	500	-	65
18 to 23	115 to 110	Clay	Stiff Clay w/o Free Water (Reese)	1200	-	65
23 to 33	110 to 100	Clay	Stiff Clay w/o Free Water (Reese)	900	-	65
33 to 37	100 to 96	Clay	Stiff Clay w/o Free Water (Reese)	1600	-	65
37 to 41.5	96 to 91.5	Sand	Sand (Reese)	-	34	65
41.5 to 52	91.5 to 81	Clay	Stiff Clay w/o Free Water (Reese)	1200	-	65
52 to 56	81 to 77	Sand	Sand (Reese)	-	36	65
56 to 78.5	77 to 54.5	Clay	Stiff Clay w/o Free Water (Reese)	2200	-	65
78.5 to 83	54.5 to 50	Sand	Sand (Reese)	-	38	65
83 to 101.5	50 to 31.5	Clay	Stiff Clay w/o Free Water (Reese)	2500	-	65

Notes:
1) Groundwater was estimated at Elevation +121.5 ft.
2) Soil unit weights of 125 pcf and 65 pcf can be used above and below groundwater level, respectively.

GEOTECHNICAL LPILE PARAMETERS
RELOCATED OCALA BUS CANOPY COLUMN

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT
LPILE PARAMETERS

Boring ID: PS-59 **Date:** 2/11/2020
Station: "SB" Track Line 1040+50 **By:** KA

Approx. Ground Surface Elevation: 115.0
Structure ID: Ocala Relocated Bus Canopy

Depth (ft)	Elevation (ft)	Generalized Soil Profile	LPILE Soil Type	c (psf)	Phi (degrees)	Effective Unit Weight γ' (pcf)
0 to 5	115 to 110	Sand	Sand (Reese)	-	30	125
5 to 8	110 to 107	Sand	Stiff Clay w/o Free Water (Reese)	1000	-	125
8 to 11.5	107 to 103.5	Clay	Stiff Clay w/o Free Water (Reese)	1000	-	57.5
11.5 to 17	103.5 to 98	Liquefiable Sand	Case I) Sand (Reese)	-	30	67.5
			Case II) Soft Clay (Matlock)	Sr=420	-	67.5
17 to 20	98 to 95	Clay	Stiff Clay w/o Free Water (Reese)	1750	-	57.5

Default values can be used for e_{50} and K.
Groundwater is considered at depth of 8.0 feet below existing ground at Elevation +107.0 feet.

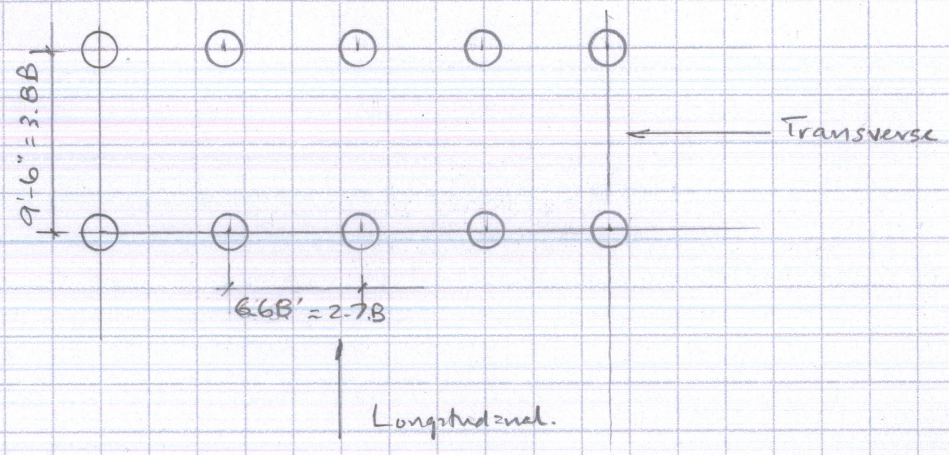
P-MULTIPLIER FOR AERIAL GUIDEWAY

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-175-GEO
PROJECT NAME EBRC
CALCULATED BY A Lam DATE 3/2020
CHECKED BY _____ DATE _____
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT P-Multiplier

Abutment 1 - 30" CIDH Concrete Pile



Longitudinal Direction

Row 1 3.8B P-Multiplier $P_M = 0.75 + \frac{3.8-3.0}{5.0-3.0} \times (1.0-0.75) = 0.85$

Row 2 3.8B P-Multiplier $P_M = 0.55 + \frac{3.8-3.0}{5.0-3.0} \times (0.85-0.55) = 0.67$

Average value between 2 rows $P_{M\,avg} = \frac{0.85+0.67}{2} = \underline{\underline{0.76}}$

Transverse Direction

Row 1 2.7B P-Multiplier $P_M = 0.60 + \frac{2.7-2.0}{3.0-2.0} \times (0.75-0.60) = 0.71$

Row 2 2.7B P-Multiplier $P_M = 0.35 + \frac{2.7-2.0}{3.0-2.0} \times (0.55-0.35) = 0.49$

Row 3 2.7B P-Multiplier $P_M = 0.25 + \frac{2.7-2.0}{3.0-2.0} \times (0.40-0.25) = 0.36$

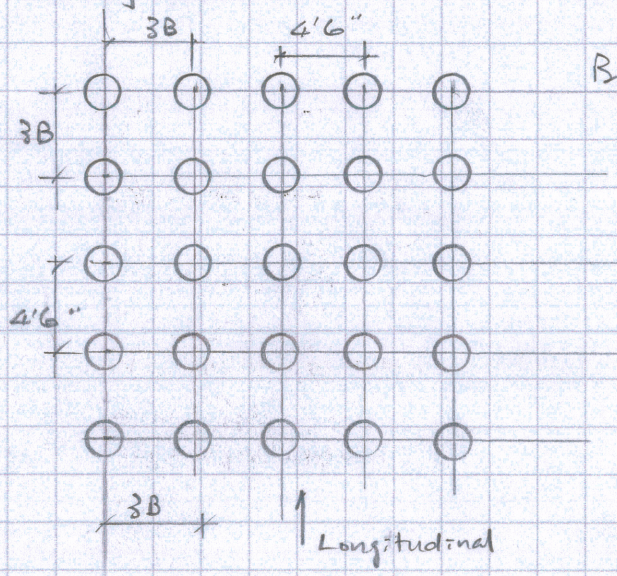
Average among 5 rows $P_{M\,avg} = \frac{0.71+0.49+0.36\times 3}{5} = \underline{\underline{0.46}}$

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-GEO
PROJECT NAME EBRC
CALCULATED BY A Lam DATE 4/2019
CHECKED BY E Ortoke DATE 4/2019
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT P-Multipler

Footing Detail SC 332A



18" square precast concrete pile

Bents 2-5, 8-11, 23-42, 50-51, 55-70, 72.
Bent 6 Rt.

Longitudinal and Transverse Direction (Reference AASHTO Bridge Design Specifications Sixth Edition Section 10.7.2.4)

Row 1 3.0B P-Multiplier $P_M = 0.75$

Row 2 2.0B P-Multiplier $P_M = 0.55$

Row 3, Row 4, and Row 5 P-Multiplier = 0.40

Average value among Trans $P_{M\,avg} = \frac{0.75 + 0.55 + 0.40 + 0.40 + 0.40}{5}$

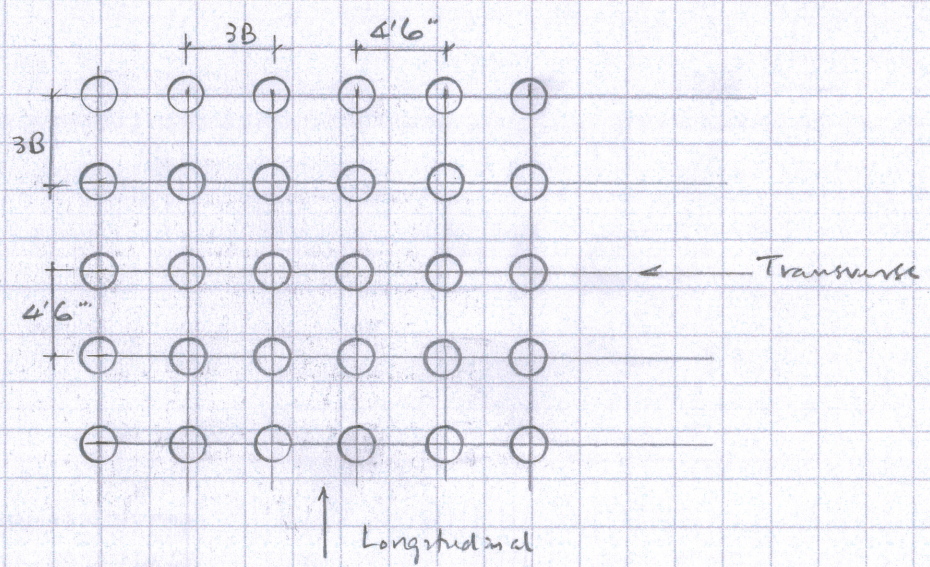
$= 0.50$

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-GEO
PROJECT NAME EBRC
CALCULATED BY A Lam DATE 4/2019
CHECKED BY EOrtakci DATE 4/2019
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT P-Multiplier

Footing Detail sc332B 18" square precast concrete pile - Bents 52, 72, 73



Longitudinal Direction

Row 1 3.0B P-Multiplier $P_M = 0.75$

Row 2 3.0B P-Multiplier $P_M = 0.55$

Row 3, Row 4, Row 5, P-Multiplier $P_M = 0.40$

Average value among 5 rows $P_{M\,avg} = \frac{0.75 + 0.55 + 0.40 + 0.40 + 0.40}{5}$

$= 0.50$

Transverse Direction

Row 1 3.0B P-Multiplier $P_M = 0.75$

Row 2 3.0B P-Multiplier $P_M = 0.55$

Row 3, Row 4, Row 5 and Row 6 P-Multiplier $P_M = 0.40$

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-GE0
PROJECT NAME EBRC
CALCULATED BY A Lam DATE 4/2019
CHECKED BY Ortaki DATE 4/2019
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT P-Multiplier

Footing Detail for 332B

Average value among 6 rows $P_{M\,avg} = \frac{0.77 + 0.55 + 0.40 + 0.40 + 0.40 + 0.40}{6}$

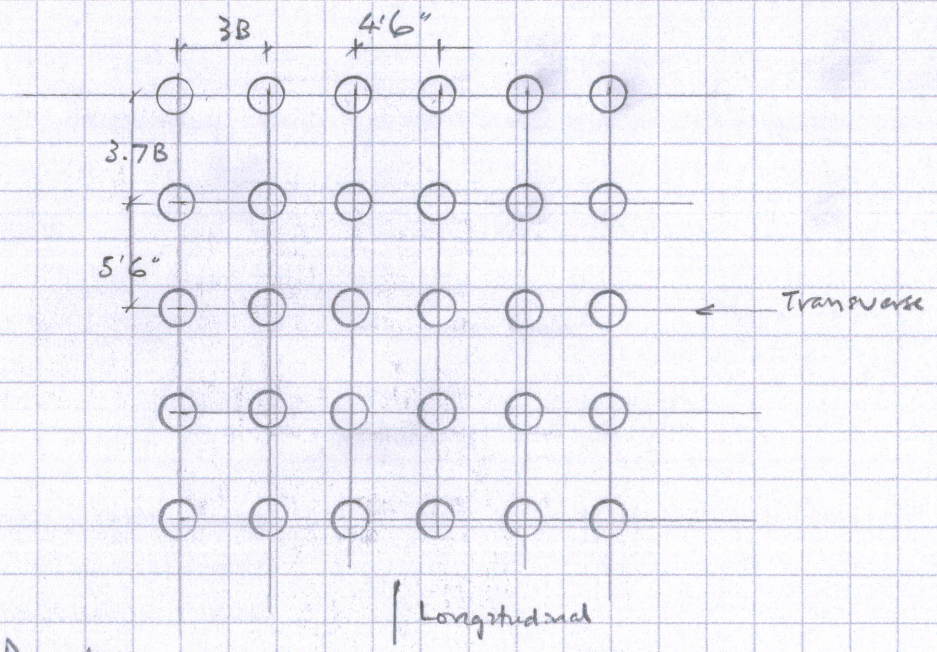
$= 0.48$

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-GEO
PROJECT NAME EBRC
CALCULATED BY A Lam DATE 4/2019
CHECKED BY E Ortakci DATE 4/2019
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT P-Multiplier

Footing Detail sc 333A 18" Square precast concrete pile Bents 44



Longitudinal Direction

Row 1 3.7B P-Multiplier $P_M = 0.75 + \frac{3.7-3.0}{5.0-3.0} \times (1-0.75) = 0.84$

Row 2 3.7B P-Multiplier $P_M = 0.55 + \frac{3.7-3.0}{5.0-3.0} \times (0.85-0.55) = 0.66$

Row 3, Row 4, Row 5 P-Multiplier $P_M = 0.40 + \frac{3.7-3.0}{5.0-3.0} \times (0.7-0.40) = 0.51$

Average value among 5 rows $P_{M\,avg} = \frac{0.84+0.66+0.51+0.51+0.51}{5}$

$= \underline{\underline{0.61}}$

Transverse Direction

Row 1 3.0B P-Multiplier $P_M = 0.75$

Row 2 3.0B P-Multiplier $P_M = 0.55$

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-6E0
PROJECT NAME EBRC
CALCULATED BY A Lam DATE 4/2019
CHECKED BY E Ortakci DATE 4/2019
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT P-Multiplier

Footing Detail Sc 333A

Row 3, Row 4, Row 5, and Row 6 P-Multiplier $P_M = 0.40$

Average value among 6 rows = $\frac{0.75 + 0.75 + 0.40 + 0.40 + 0.40 + 0.40}{6.0}$

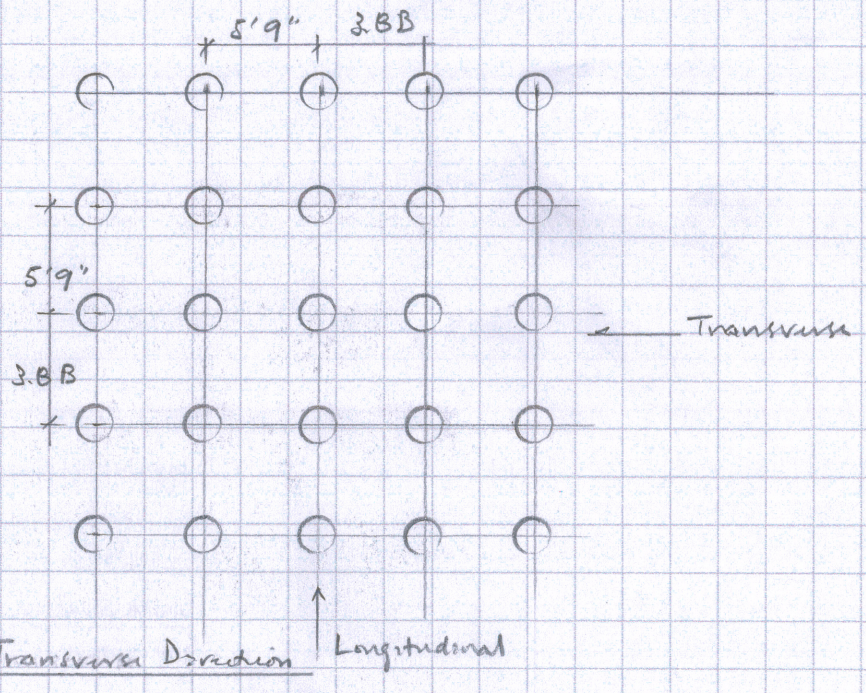
$= 0.48$

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-6E0
PROJECT NAME EBRC
CALCULATED BY A Lam DATE 4/2019
CHECKED BY E Ortakci DATE 4/2019
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT P-Multiplier

Footing Detail 333B 18" square precast concrete pile Bent 45



Longitudinal and Transverse Direction

Row 1 3.8B P-Multiplier $P_M = 0.75 + \frac{3.8 - 3.0}{5.0 - 3.0} \times (1 - 0.75) = 0.85$

Row 2 3.8B P-Multiplier $P_M = 0.55 + \frac{3.8 - 3.0}{5.0 - 3.0} \times (0.85 - 0.55) = 0.67$

Row 3, Row 4, Row 5. 3.8B P-Multiplier $P_M = 0.40 + \frac{3.8 - 3.0}{5.0 - 3.0} \times (0.70 - 0.40)$

$= 0.52$

Average Value among 5 rows $P_{M\,avg} = \frac{0.85 + 0.67 + 0.52 + 0.52 + 0.52}{5}$

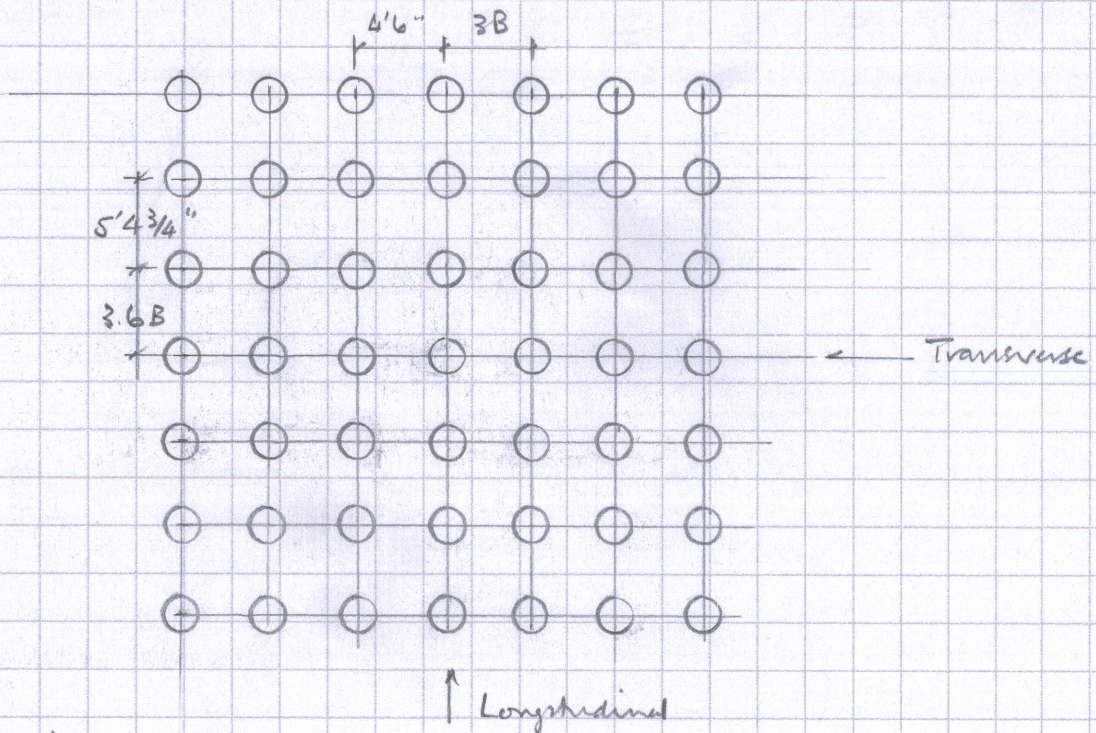
$= \underline{0.62}$

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-127 GEO
PROJECT NAME EBRC
CALCULATED BY A Lam DATE 4/2019
CHECKED BY EU/Yakel DATE 4/2019
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT P-Multiplier

Footing Detail sc333c 18" square precast concrete pile Bent 46



Longitudinal Direction

Row 1 3.6B P-Multiplier $P_M = 0.75 + \frac{3.6-3.0}{5.0-3.0} \times (1-0.75) = 0.83$

Row 2 3.6B P-Multiplier $P_M = 0.55 + \frac{3.6-3.0}{5.0-3.0} \times (0.85-0.55) = 0.64$

Row 3, Row 4, Row 5, Row 6, Row 7, $P_M = 0.40 + \frac{3.6-3.0}{5.0-3.0} \times (0.70-0.40) = 0.49$

Average value among 7 rows $P_{M\,avg} = \frac{0.83+0.64+0.49+0.49+0.49+0.49+0.49}{7}$

$= 0.56$

Transverse Direction

Average value among 7 rows $P_{M\,avg} = \frac{0.75+0.55+0.40+0.40+0.40+0.40+0.40}{7}$

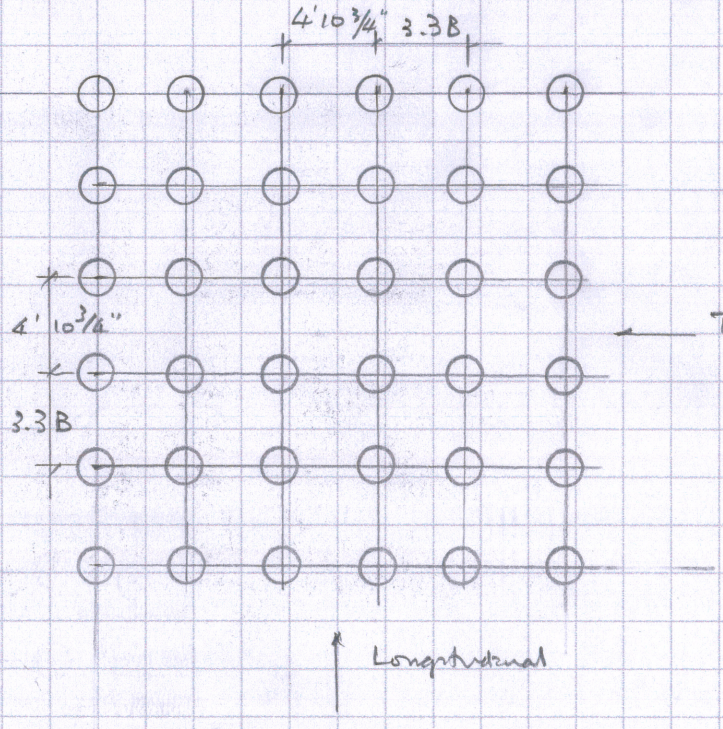
$= 0.47$

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-GEO
PROJECT NAME EBRC
CALCULATED BY A-Lam DATE 4/2019
CHECKED BY Eortekci DATE 4/2019
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT P-Multiplier

Footing Detail SC333D 18" square precast concrete pile Bent 47



Longitudinal and Transverse Direction

Row 1 3.3B P-Multiplier $P_M = 0.75 + \frac{3.3-3.0}{5.0-3.0} \times (1.0-0.75) = 0.79$

Row 2 3.3B P-Multiplier $P_M = 0.55 + \frac{3.3-3.0}{5.0-3.0} \times (0.85-0.55) = 0.60$

Row 3, Row 4, Row 5, Row 6 3.3B P-Multiplier $P_M = 0.40 + \frac{3.3-3.0}{5.0-3.0} \times (0.70-0.40)$

$= 0.45$

Average value among 6 rows $P_{Mavg} = \frac{0.79+0.60+0.45+0.45+0.45+0.45}{6}$

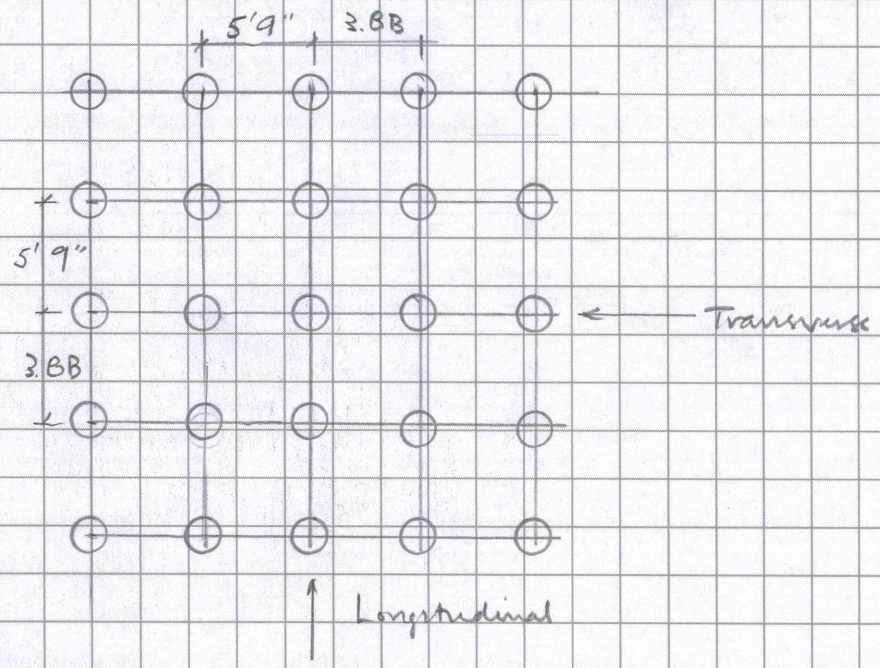
$= 0.53$

PARIKH
Practicing in the Geosciences

PROJECT NO. 2019-125-GEO
PROJECT NAME EBRC
CALCULATED BY A Leon DATE 4/2019
CHECKED BY EOrtakci DATE 4/2019
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT P-Multiplier

Footing Detail SC334A "B" square precast concrete pile Bent 4B



Longitudinal and Transverse Direction

Row 1 3.BB P-Multiplier $P_M = 0.75 + \frac{3.B - 3.0}{5.0 - 3.0} \times (1.0 - 0.75) = 0.85$

Row 2 3.BB P-Multiplier $P_M = 0.55 + \frac{3.B - 3.0}{5.0 - 3.0} \times (0.85 - 0.55) = 0.67$

Row 3, Row 4 and Row 5, 3.BB P-Multiplier $P_M = 0.40 + \frac{3.B - 3.0}{5.0 - 3.0} \times (0.70 - 0.40)$

$= 0.52$

Average value among 5 rows $P_{M\,avg} = \frac{0.85 + 0.67 + 0.52 + 0.52 + 0.52}{5}$

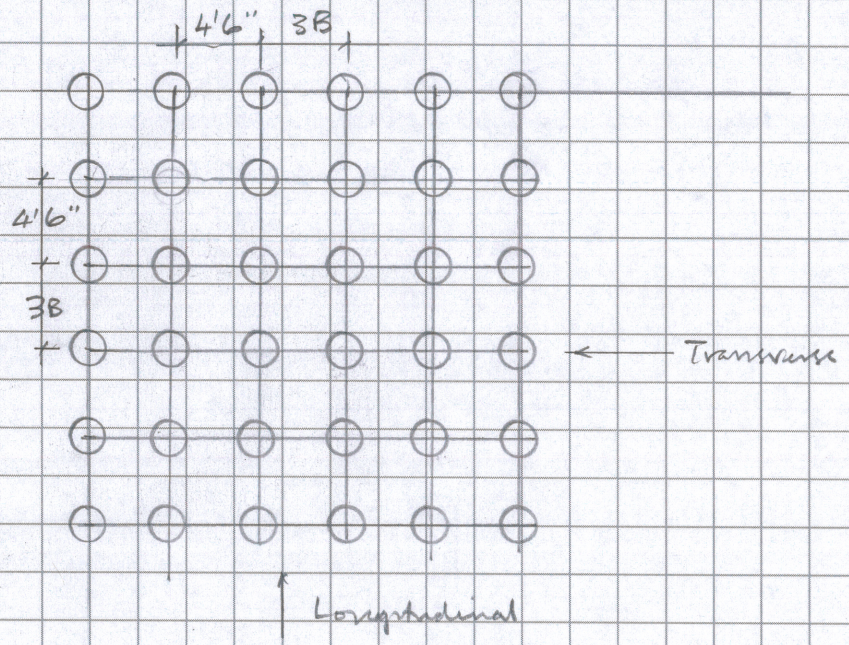
$= \underline{\underline{0.62}}$

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-GEO
PROJECT NAME EBRC
CALCULATED BY A Lam DATE 4/2019
CHECKED BY E Ortoker DATE 4/2019
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT P-Multiplier

Footing Detail SC334B 18" Square precast concrete pile Reacts 49, 53



Longitudinal and Transverse Direction

Row 1 3.0B P-Multiplier $P_M = 0.75$

Row 2 3.0B P-Multiplier $P_M = 0.55$

Row 3, Row 4, Row 5 and Row 6, 3.0B P-Multiplier $P_M = 0.40$

Average value among 6 rows $P_{Mavg} = \frac{0.75 + 0.55 + 0.40 + 0.40 + 0.40 + 0.40}{6}$

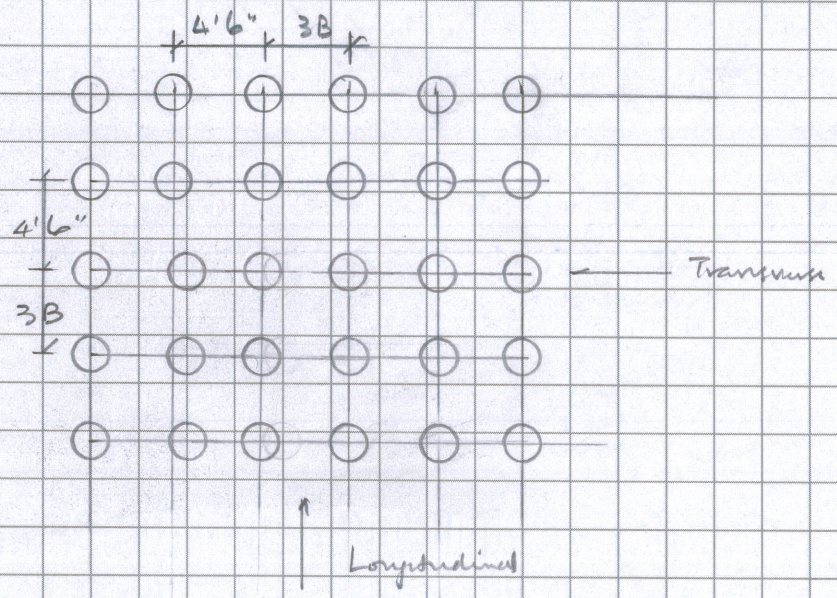
$= 0.48$

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-GEO
PROJECT NAME EBRC
CALCULATED BY A Law DATE 4/2019
CHECKED BY E Ortakci DATE 4/2019
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT P-Multiplier

Footing Detail sk334C 18" Square precast concrete pile Bent 54



Longitudinal Direction

Average value among 5 rows $P_{M\,avg} = \frac{0.75 + 0.55 + 0.40 + 0.40 + 0.40}{5}$

$= 0.50$

Transverse Direction

Average value among 6 rows $P_{M\,avg} = \frac{0.75 + 0.55 + 0.4 + 0.4 + 0.4 + 0.4}{6}$

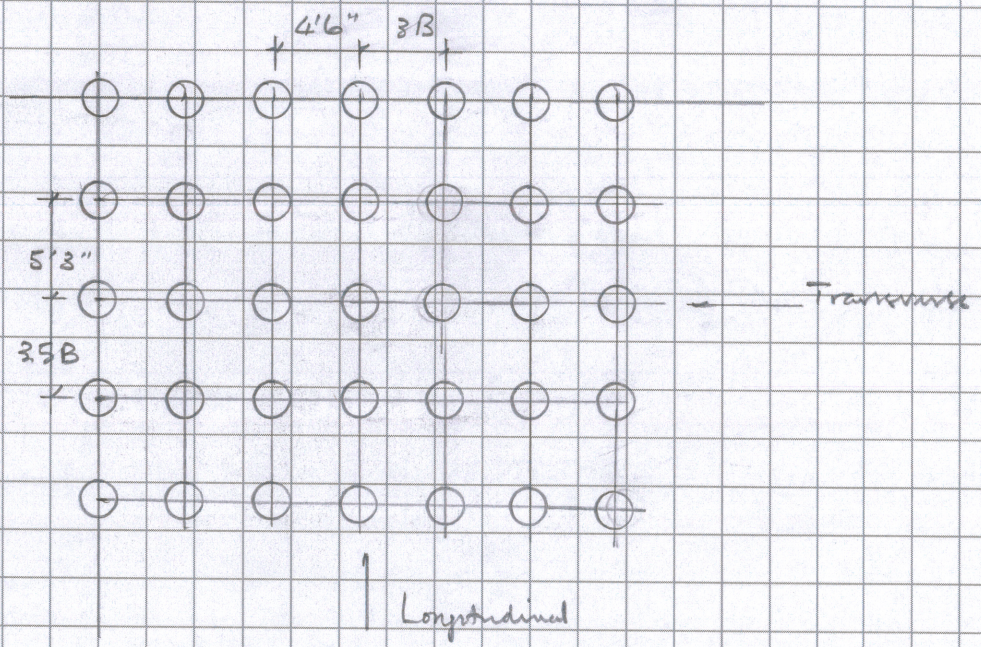
$= 0.48$

PARIKH
Practicing in the Geosciences

PROJECT NO. 2019-125-650
PROJECT NAME EBRC
CALCULATED BY Alam DATE 4/2019
CHECKED BY E Oritake DATE 4/2019
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT P-Multiplier

Footing Detail Sc 3334D 18" square precast concrete pile Bent 74



Longitudinal Direction

Row 1 3.5B P-Multiplier $P_{M1} = 0.75 + \frac{3.5-3.0}{5.0-3.0} \times (1.00 - 0.75) = 0.81$

Row 2 3.5B P-Multiplier $P_{M2} = 0.55 + \frac{3.5-3.0}{5.0-3.0} \times (0.85 - 0.55) = 0.63$

Row 3, Row 4 and Row 5, 3.5B, P-Multiplier $P_{M3} = 0.40 + \frac{3.5-3.0}{5.0-3.0} \times (0.70 - 0.40)$

$= 0.48$

Average value among 5 rows $P_{M\,avg} = \frac{0.81 + 0.63 + 0.48 + 0.48 + 0.48}{5}$

$= \underline{0.58}$

Transverse Direction

Average value among 7 rows $P_{M\,avg} = \frac{0.75 + 0.55 + 0.40 + 0.40 + 0.40 + 0.40 + 0.40}{7}$

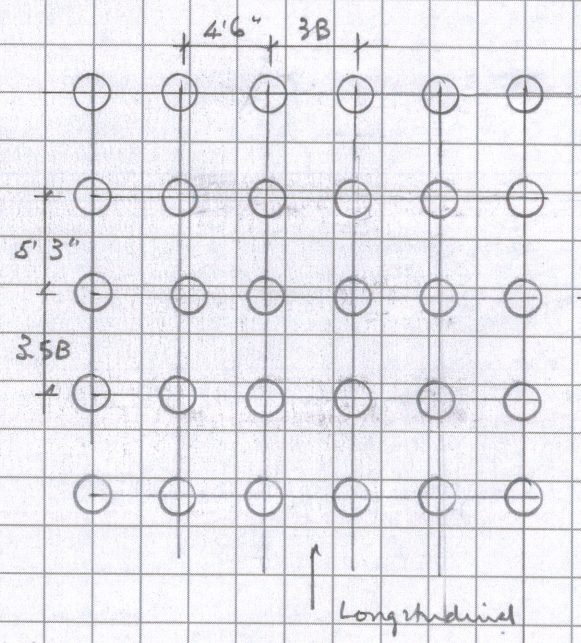
$= \underline{0.47}$

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-6E0
PROJECT NAME EBRC
CALCULATED BY A Lam DATE 4/2019
CHECKED BY E Ortakci DATE 4/2019
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT P-Multiplier

Footing Detail SC334E 18" square precast concrete pile Bent 75



Longitudinal Direction

Similar to Footing Detail SC334D

Average value among 5 rows $P_{m\,avg} = \frac{0.81+0.63+0.48+0.48+0.48}{5}$

$= 0.58$

Transverse Direction

Average value among 6 rows $P_{m\,avg} = \frac{0.75+0.55+0.40+0.40+0.40+0.40}{6}$

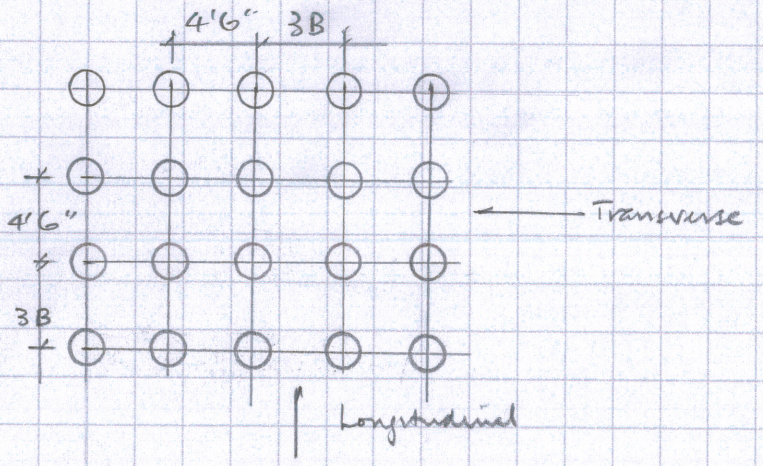
$= 0.48$

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-GEO
PROJECT NAME EBRC
CALCULATED BY A Lam DATE 4/2019
CHECKED BY E Ortaku DATE 4/2019
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT P-Multiplier

Footing Detail #c334F 18" square precast concrete pile Bent 6 LT



Longitudinal Direction

3.0B Average value among the 4 rows $P_{M\,avg} = \frac{0.75 + 0.55 + 0.40 + 0.40}{4}$

$= 0.53$

Transverse Direction

3.0B Average value among the 5 rows $P_{M\,avg} = \frac{0.75 + 0.55 + 0.40 + 0.40 + 0.40}{5}$

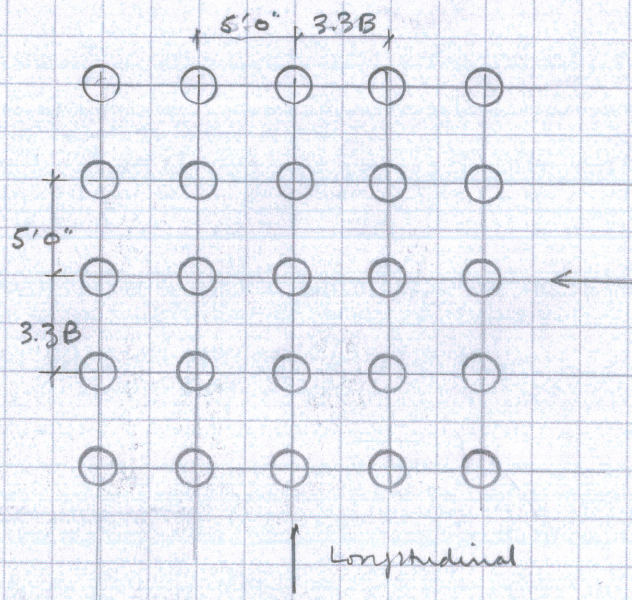
$= 0.50$

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-GE0
PROJECT NAME EBRC
CALCULATED BY A Lam DATE 4/2019
CHECKED BY E Ortakci DATE 4/2019
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT P-Multiplier

Footing Detail SC335A 18" square precast concrete pile Bent 7



Longitudinal and Transverse Direction

Row 1 3.3B P-Multiplier $P_M = 0.75 + \frac{3.3 - 3.0}{5.0 - 3.0} \times (1.0 - 0.75) = 0.79$

Row 2 3.3B P-Multiplier $P_M = 0.55 + \frac{3.3 - 3.0}{5.0 - 3.0} \times (0.85 - 0.55) = 0.60$

Row 3, Row 4, Row 5, P-Multiplier $P_M = 0.40 + \frac{3.3 - 3.0}{5.0 - 3.0} \times (0.70 - 0.40)$

$= 0.45$

Average value among 5 rows $P_{M\,avg} = \frac{0.79 + 0.60 + 0.45 + 0.45 + 0.45}{5}$

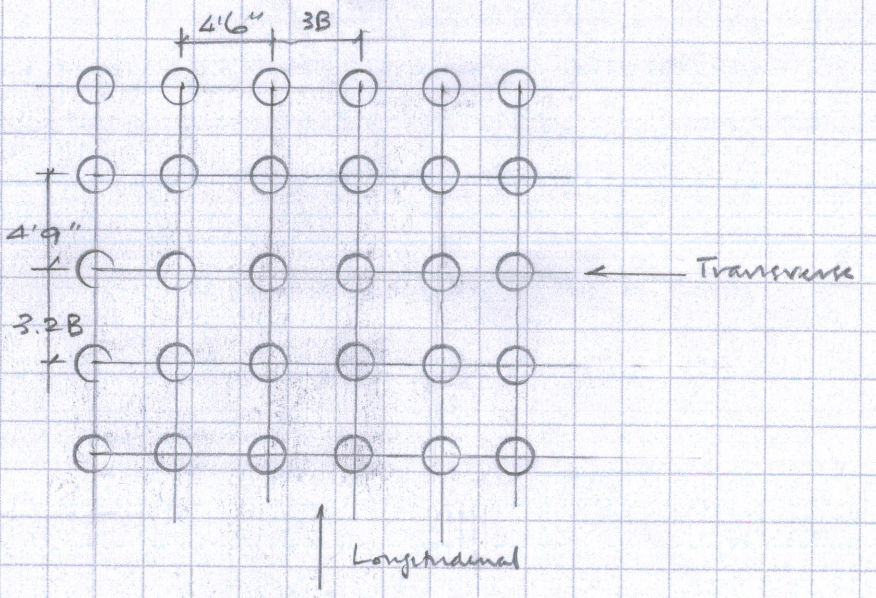
$= 0.55$

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-GEO
PROJECT NAME EBRC
CALCULATED BY A Law DATE 4/2019
CHECKED BY E Oltoke DATE 4/2019
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT P-Multiplier

Footing Detail Sc335B 18" square precast concrete pile Bents 12 & 13



Longitudinal Direction

Row 1 3.2B P-Multiplier $P_M = 0.75 + \frac{3.2-3.0}{5.0-3.0} \times (1.0-0.75) = 0.78$

Row 2 3.2B P-Multiplier $P_M = 0.55 + \frac{3.2-3.0}{5.0-3.0} \times (0.85-0.55) = 0.58$

Row 3, Row 4, Row 5, 3.2B P-Multiplier $P_M = 0.40 + \frac{3.2-3.0}{5.0-3.0} \times (0.70-0.40) = 0.43$

Average value among 5 rows $P_{M\,avg} = \frac{0.78+0.58+0.43+0.43+0.43}{5}$

$= \underline{\underline{0.53}}$

Transverse Direction

2.0B Average value among 6 rows $P_{M\,avg} = \frac{0.75+0.55+0.40+0.40+0.40+0.40}{6}$

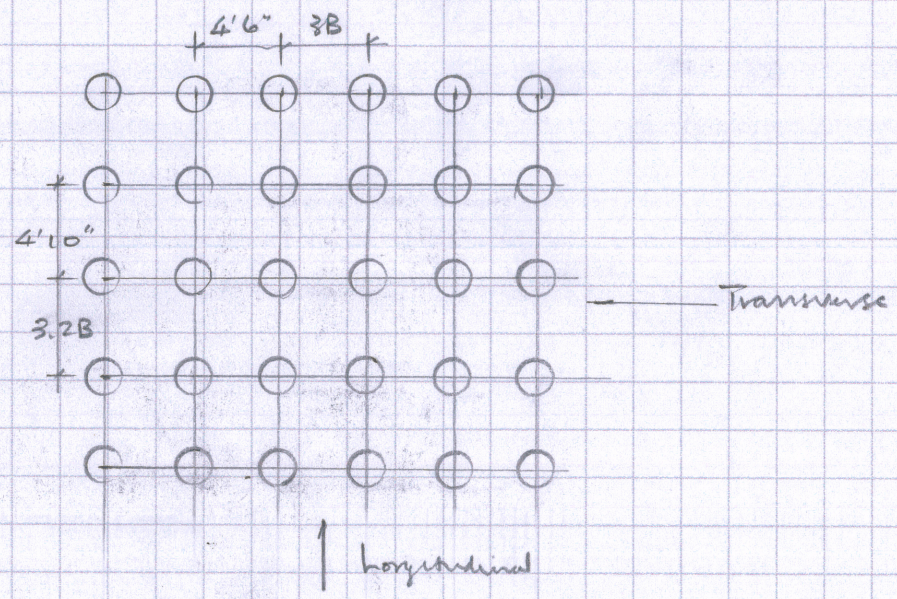
$= \underline{\underline{0.48}}$

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-620
PROJECT NAME EBRC
CALCULATED BY A Lam DATE 4/2019
CHECKED BY E Otake DATE 4/2019
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT P-Multiplier

Footing Detail SC335C 18" square precast concrete pile Bents 14, 15, 19, 20



With reference to Footing Detail SC335B

Longitudinal Direction

3.2B Average value among 5 rows $P_{m\,avg} = \frac{0.78 + 0.58 + 0.43 + 0.43 + 0.43}{5}$

$= 0.53$

Transverse Direction

3.0B Average value among 6 rows $P_{m\,avg} = \frac{0.75 + 0.55 + 0.40 + 0.40 + 0.40 + 0.40}{6}$

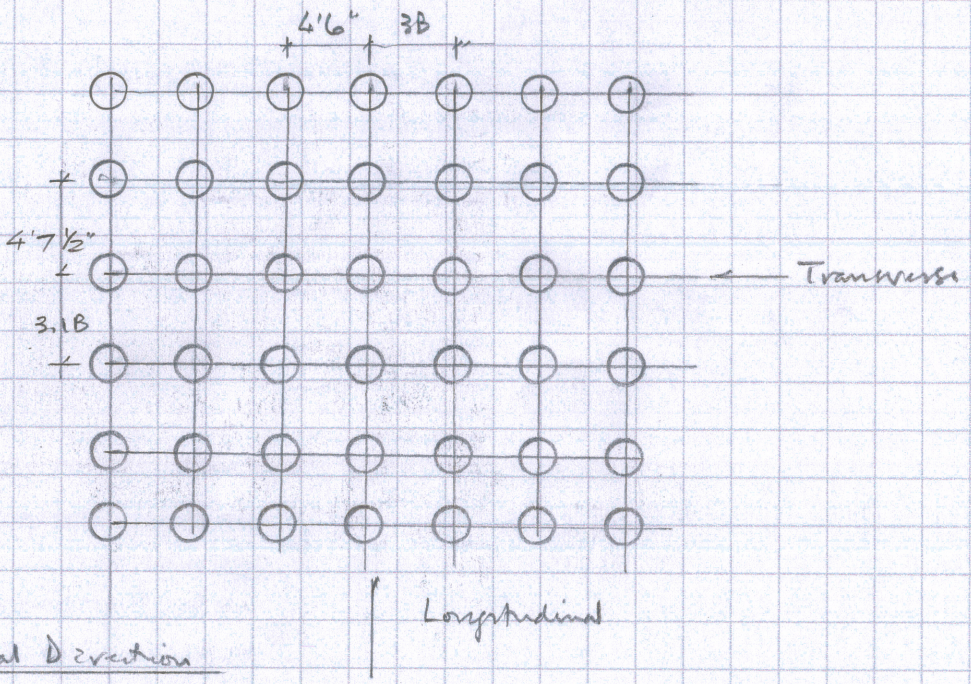
$= 0.48$

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-GEO
PROJECT NAME EBRC
CALCULATED BY A Lam DATE 4/2019
CHECKED BY E O'Takei DATE 4/2019
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT P-Multipliers

Footing Detail SC335D 18" square precast concrete pile Bent 16



Longitudinal Direction

Row 1 3.1B P-Multiplier $P_M = 0.75 + \frac{3.1-3.0}{5.0-3.0} \times (1.0-0.75) = 0.76$

Row 2 3.1B P-Multiplier $P_M = 0.55 + \frac{3.1-3.0}{5.0-3.0} \times (0.85-0.55) = 0.57$

Row 3, Row 4, Row 5, Row 6, 3.1B, P-Multiplier $P_M = 0.40 + \frac{3.1-3.0}{5.0-3.0} \times (0.70-0.40) = 0.42$

Average value among 6 rows $P_{M\,avg} = \frac{0.76+0.57+0.42+0.42+0.42+0.42}{6}$

$= \underline{0.50}$

Transverse Direction

3.0B Average value among 7 rows $P_{M\,avg} = \frac{0.75+0.55+0.40+0.40+0.40+0.40+0.40}{7}$

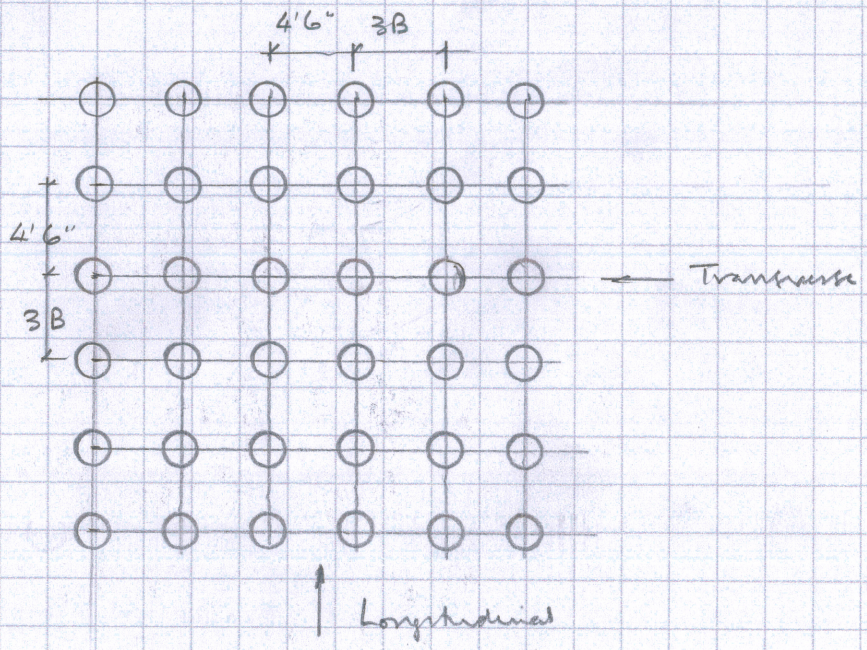
$= \underline{0.47}$

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-GEO
PROJECT NAME EBRS
CALCULATED BY Alam DATE 4/2019
CHECKED BY E Ortakci DATE 4/2019
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT P-Multiplier

Footing Detail 335E 18" square precast concrete pile Bent 21



Longitudinal and Transverse Direction

Row 1 3.0B P-Multiplier $P_{M1} = 0.75$

Row 2 3.0B P-Multiplier $P_{M1} = 0.55$

Row 3, Row 4, Row 5, Row 6 3.0B P-Multiplier $P_{M1} = 0.40$

Average value among 6 rows $P_{M\,avg} = \frac{0.75 + 0.55 + 0.40 + 0.40 + 0.40 + 0.40}{6}$

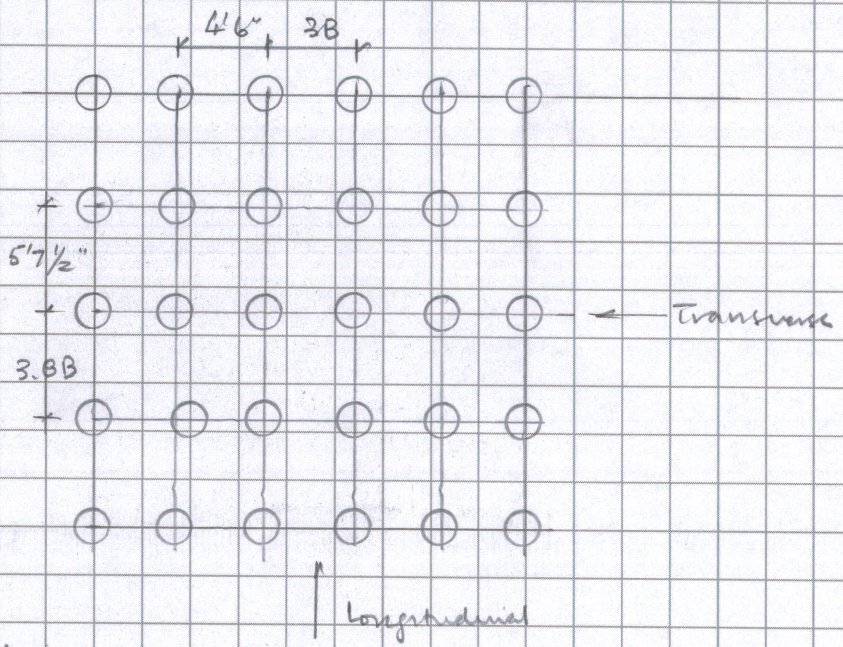
$= 0.48$

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-G60
PROJECT NAME EBRC
CALCULATED BY A Lam DATE 4/2019
CHECKED BY E Ortalan DATE 4/2019
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT P-Multiplier

Footing Detail SC 385F 18" square precast concrete pile Bent 27



Longitudinal Direction

Row 1 3.8B P-Multiplier $P_M = 0.75 + \frac{3.8-3.0}{5.0-3.0} \times (1.0-0.75) = 0.85$

Row 2 3.8B P-Multiplier $P_M = 0.55 + \frac{3.8-3.0}{5.0-3.0} \times (0.85-0.55) = 0.67$

Row 3, Row 4, Row 5, 3.8B P-Multiplier $P_M = 0.40 + \frac{3.8-3.0}{5.0-3.0} \times (0.7-0.4) = 0.52$

Average value among 5 rows $P_{M\,avg} = \frac{0.85+0.67+0.52+0.52+0.52}{5} = 0.62$

Transverse Direction

3.0B Average value among 6 rows $P_{M\,avg} = \frac{0.75+0.55+0.40+0.40+0.40+0.40}{6}$

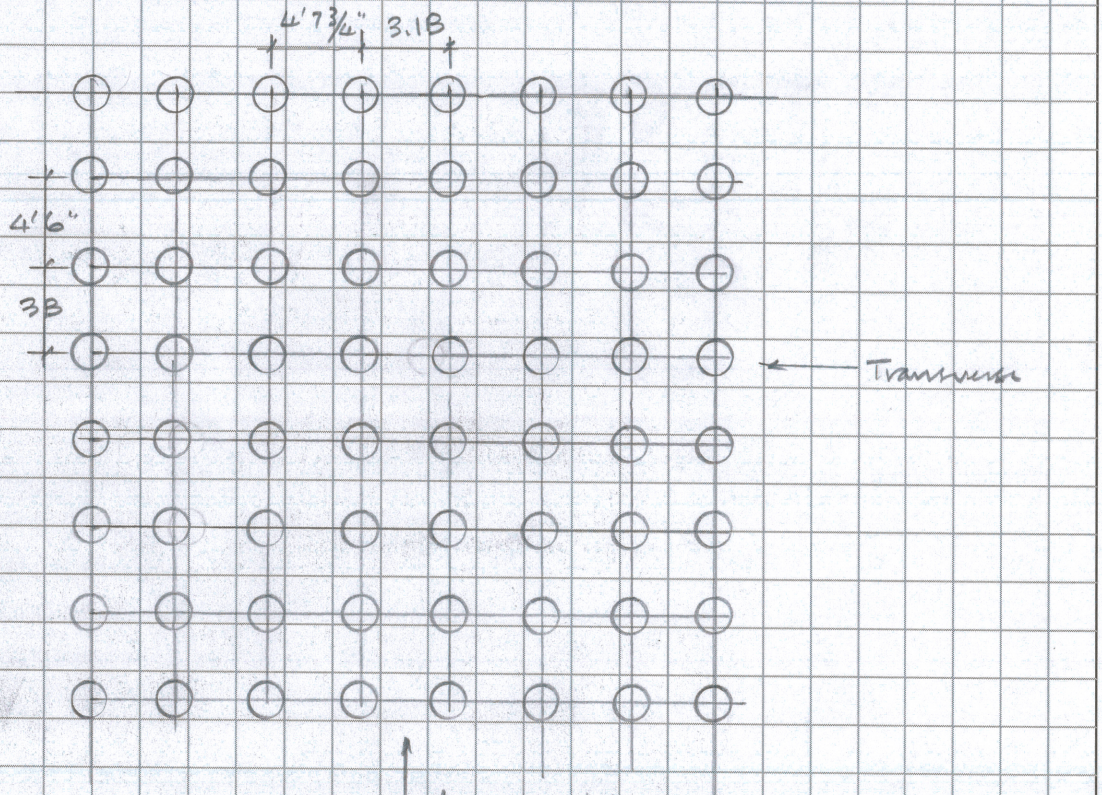
$= 0.48$

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-660
PROJECT NAME EBRC
CALCULATED BY Alam DATE 4/2019
CHECKED BY E Ostaki DATE 4/2019
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT P-Multiplier

Footing Detail for 36A 18" Square precast concrete pile Bent 17



Longitudinal Direction

3.0B Average among 8 rows $P_{M\,avg} = \frac{0.75 + 0.55 + 0.40 + 0.40 + 0.40 + 0.40 + 0.40 + 0.40}{8}$

$= \underline{\underline{0.46}}$

Transverse Direction

Row 1 3.1B P-Multiplier $P_M = 0.75 + \frac{3.1 - 3.0}{5.0 - 3.0} \times (1.0 - 0.75) = 0.76$

Row 2 3.1B P-Multiplier $P_M = 0.55 + \frac{3.1 - 3.0}{5.0 - 3.0} \times (0.85 - 0.55) = 0.57$

Row 3, Row 4, Row 5, Row 6, Row 7, Row 8 3.1B P-Multiplier $P_M = 0.40 + \frac{3.1 - 3.0}{5.0 - 3.0} \times (0.70 - 0.40) = 0.42$

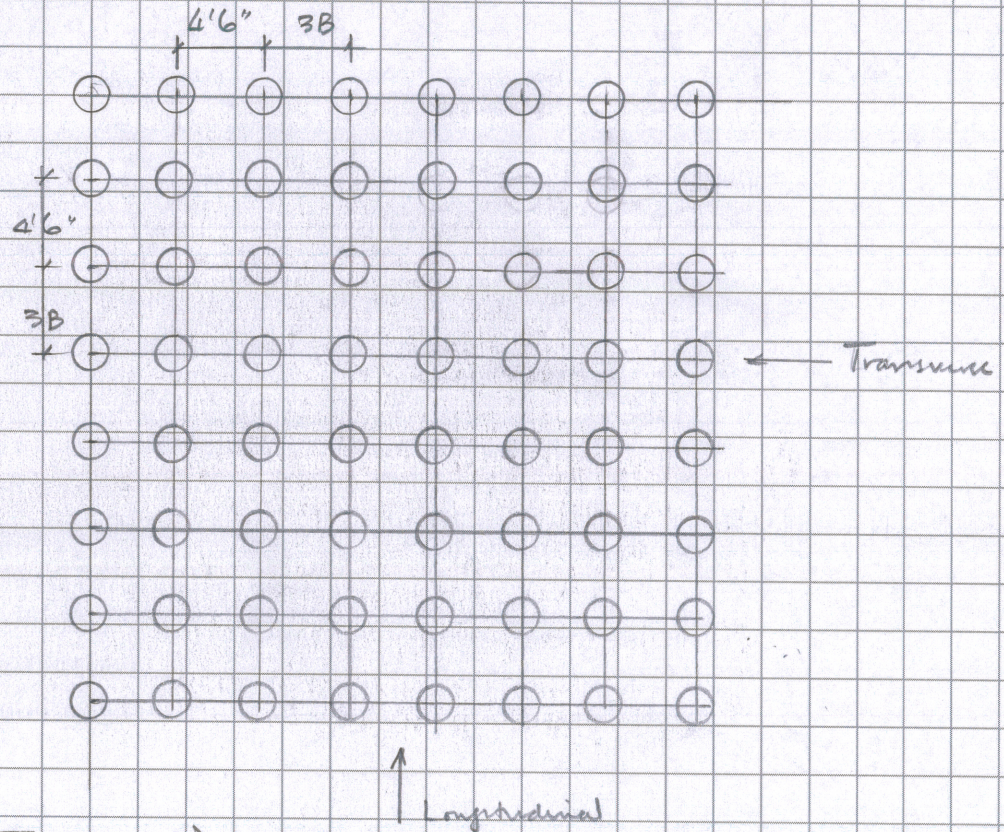
Average value among 8 row $P_{M\,avg} = \frac{0.76 + 0.57 + 0.42 + 0.42 + 0.42 + 0.42 + 0.42 + 0.42}{8} = \underline{\underline{0.48}}$

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-650
PROJECT NAME EBRC
CALCULATED BY A Lam DATE 4/2019
CHECKED BY E Ortakci DATE 4/2019
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT P-Multiplier

Footing Detail SC336B 18' square precast concrete pile Bent 1B



Longitudinal and Transverse Direction

Row 1 3.0B P-Multiplier $P_{M1} = 0.75$

Row 2 3.0B P-Multiplier $P_{M1} = 0.55$

Row 3, Row 4, Row 5, Row 6, Row 7, Row 8 3.0B P-Multiplier $P_{M1} = 0.40$

Average value among 8 rows $P_{M\,avg} = \frac{0.75 + 0.55 + 0.40 + 0.40 + 0.40 + 0.40 + 0.40 + 0.40}{8}$

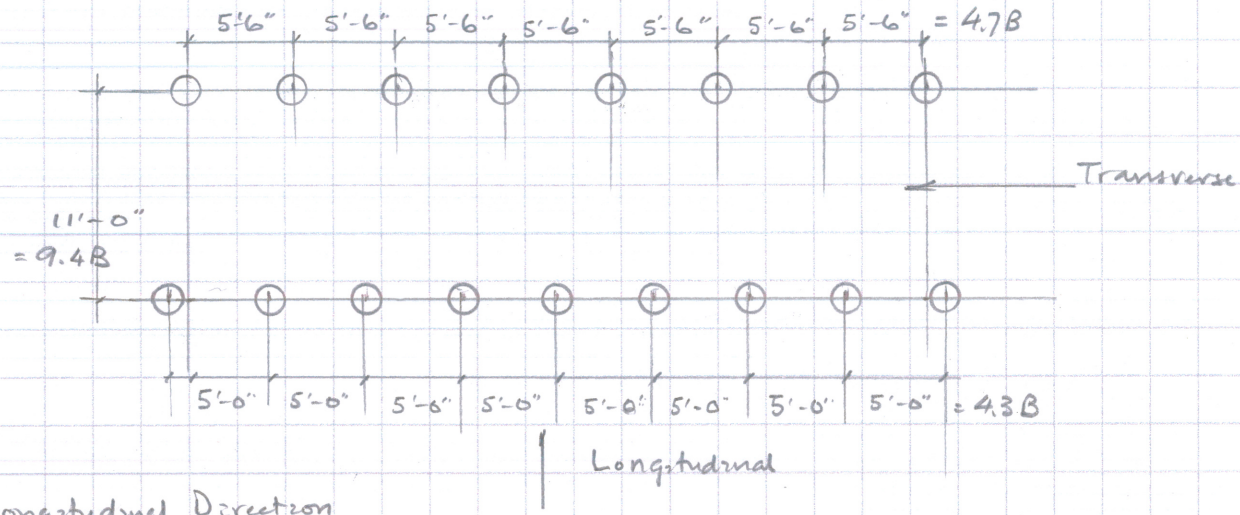
$= 0.46$

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-GEO
PROJECT NAME EBRE
CALCULATED BY Alam DATE 2/2020
CHECKED BY _____ DATE _____
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT P-Multiplier

Abutment 76 - 14" square precast concrete pile



Longitudinal Direction

Row 1 9.4B P-Multiplier Row 1 = 1.0

Row 2 9.4B P-Multiplier Row 2 = 1.0

Average value among 2 rows $P_{M\,avg} = \frac{1.0+1.0}{2} = 1.0$

Transverse Direction

Average pile spacing = $\frac{7\times 4.7 + 8\times 4.3}{15} = \frac{32.9+34.4}{15}$

$= 4.5B$

Row 1 4.5B P-Multiplier $P_M = 0.75 + \frac{4.5-3.0}{5.0-3.0}\times(1.0-0.71) = 0.94$

Row 2 4.5B P-Multiplier $P_M = 0.55 + \frac{4.5-3.0}{5.0-3.0}\times(0.85-0.55) = 0.78$

Row 3 4.5B P-Multiplier $P_M = 0.40 + \frac{4.5-3.0}{5.0-3.0}\times(0.70-0.40) = 0.63$

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-GEO
PROJECT NAME EBRC
CALCULATED BY Alam DATE 2/2020
CHECKED BY _____ DATE _____
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT P-Multiplier

Abutment 76 - 14" Square precast concrete pile

Assume 9 rows of pile

Average value among 9 rows $P_{mavg} = \frac{0.94 + 0.78 + 0.63 \times 7}{9}$

$= 0.68$

10.7.2.4—Horizontal Pile Foundation Movement

C10.7.2.4

Revise Table as follows:

Table 10.7.2.4-1 Pile P-Multipliers, P_m for Multiple Row Shading ~~(average from Hannigan et al., 2005).~~

Pile *CTC* spacing (in the Direction of Loading)	P-Multipliers, P_m		
	Row 1	Row 2	Row 3
2.0*B*	0.60	0.35	0.25
3.0*B*	0.75 ~~0.8~~	0.55 ~~0.4~~	0.40 ~~0.3~~
5.0*B*	1.0	0.85	0.70
7.0*B*	1.0	1.0	0.90

Revise the 7th Paragraph as follows:

Loading direction and spacing shall be taken as defined in Figure 10.7.2.4-1. A P-multiplier of 1.0 shall be used for pile *CTC* spacing of 8*B* or greater. If the loading direction for a single row of piles is perpendicular to the row (bottom detail in the Figure), a P-multiplier ~~group reduction factor~~ of less than 1.0 shall only be used if the pile spacing is ~~5~~4*B* or less~~, i.e., a *Pm* of 0.8 for a spacing of 3*B*, as shown in Figure 10.7.2.4-1~~. A P-multiplier of 0.80, 0.90 and 1.0 shall be used for pile spacing of 2.5*B*, 3*B* and 4*B*, respectively.

Revise the 6th Paragraph as follows:

The multipliers on the pile rows are a topic of current research and may change in the future. Values from recent research have been ~~tabulated by~~ compiled from Reese and Van Impe (2000), Caltrans (2003), Hannigan et al. (2006), and Rollins et al. (2006).

BEARING CAPACITY ANALYSES (STRENGTH AND EXTREME EVENT LIMIT CASE) FOR CIP WALL

Meyerhof Bearing Capacity Calculation

Project No:	2017-125-GEO	**Date:**	3/23/2020
Project Name:	Eastridge to BART Regional Connector Project	**By:**	EO
Structure	North Approach CIP Wall (NB & SB 968+54.75-968+94.20) (Boring AS-1)		

Input Parameters

Unit weight, γ (pcf)	120
Cohesion, c (psf)	1100
Friction Angle, ϕ (deg)	0
Width, B (feet)	10.5
Length, L (feet)	39.45
Depth, D (feet)	2.5
Load Inclination, θ (deg)	0
Water Depth, Dw (feet)	9.5
Factor of Safety, FS	3

Calculated Parameters	
Kp	1.00
sc	1.05
sq	1.00
sγ	1.00
dc	1.05
dq	1.00
dγ	1.00
ic	1.00
iq	1.00
iγ	0.00
Nq	1.00
Nc	5.14
Nγ	0.00
Overburden above footing, $\sigma_{zD'}$ (psf)	300.00
Eff. UW below footing, γ' (pcf)	232.32

Bearing Capacity	
(Under Vertical Load)	
q_{ult} (ksf)	6.539
q_{all} (ksf)	2.180

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-GEO
PROJECT NAME EBRC
CALCULATED BY A'Lam DATE 3/2020
CHECKED BY _____ DATE _____
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT Bearing Capacity Analysis

North Approach.

CIP Wall (Station 968+54.75 - 968+94.20) (Based on Boring AS-1)

Gross Nominal Bearing Resistance (Q_u) = 6500

AASHTO LRFD Section 11 Table 11.5.7-1 Q_b (Strength) = 0.55

AASHTO LRFD Section 11.5.8 Q_b (Extreme) = 0.80

Q_R (Factored Nominal Bearing Resistance - Strength) = $Q_b \times Q_u$

= 0.55 x 6500

= 3575 psf Say 3500 psf

Q_R (Factored Nominal Bearing Resistance - Extreme) = $Q_b \times Q_u$

= 0.80 x 6500 psf

= 5,200 psf Say

Meyerhof Bearing Capacity Calculation

Project No:	2017-125-GEO	**Date:**	3/23/2020
Project Name:	Eastridge to BART Regional Connector Project	**By:**	EO
Structure	North Approach CIP Wall (NB & SB 968+94.20-969+59.13) (Boring AS-1)		

Input Parameters

Unit weight, γ (pcf)	120
Cohesion, c (psf)	1100
Friction Angle, ϕ (deg)	0
Width, B (feet)	15
Length, L (feet)	64.93
Depth, D (feet)	2.5
Load Inclination, θ (deg)	0
Water Depth, Dw (feet)	9.5
Factor of Safety, FS	3

Calculated Parameters

Kp	1.00
sc	1.05
sq	1.00
sγ	1.00
dc	1.03
dq	1.00
dγ	1.00
ic	1.00
iq	1.00
iγ	0.00
Nq	1.00
Nc	5.14
Nγ	0.00
Overburden above footing, $\sigma_{zD'}$ (psf)	300.00
Eff. UW below footing, γ' (pcf)	232.32

Bearing Capacity

(Under Vertical Load)	
q_{ult} (ksf)	6.412
q_{all} (ksf)	2.137

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-GEO
PROJECT NAME EBRC
CALCULATED BY A. Lam DATE 3/2020
CHECKED BY _____ DATE _____
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT Bearing Capacity Analyses

North Approach

CIP Wall (Station 968+94.20 - 969+59.13) (Based on Boring AS-1)

Gross Nominal Bearing Resistance (Q_n) = 6400 psf

AASHTO LRFD Section 11 Table 11.5.7-1 Q_b (Strength) = 0.55

AASHTO LRFD Section 11.5.8 Q_b (Extreme) = 0.80

Q_R (Factored Nominal Bearing Resistance - Strength) = $Q_b \times Q_n$

$= 0.55 \times 6400$ psf

$= 3520$ psf say 3500 psf

Q_R (Factored Nominal Bearing Resistance - Extreme) = $Q_b \times Q_n$

$= 0.80 \times 6400$ psf

$= 5120$ psf say 5100 psf

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-660
PROJECT NAME EBRL
CALCULATED BY Alam DATE 3/2020
CHECKED BY _____ DATE _____
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT Bearing Capacity Analyses

South Approach

CIP Wall (Station 1081+96.37-1082+24.00) (Based on Boring AS-40) (1082+85)

DM7 Figure 5

$c_1 = 1000$ psf $c_2 = 500$ psf $c_2/c_1 = 500/1000 = 0.5$

$T = 11.5'$ $B = 15.0'$ $T/B = 0.77$ $N_c = 3.8$

$D/B = 7.5/15.0 = 0.17$ $N_{cD}/N_c = 1.05$ $N_{cD} = 4.73$

$Q_{ult} = c_1 N_{cD} + \gamma D$

$= 1000 \times 3.8 + 120 \times 2.5$

$= 4100$ psf

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-GEO
PROJECT NAME EBRC
CALCULATED BY A Lam DATE 3/2020
CHECKED BY _____ DATE _____
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT Bearing Capacity Analyses

Smith Approach CIP Wall (Station 1081+96.37 - 1082+24.00) (Based on Boring 45-40)

Gross Nominal Bearing Resistance (Q_u) = 4100 psf

LRFD Section 11 Table 11.5.7-1 Q_b (Strength) = 0.55

LRFD Section 11.5.8 Q_b (Extreme) = 0.80

Q_R (Factored Nominal Bearing Resistance: Strength) = $Q_b \times Q_u$

$Q_b = 0.55$

$Q_R = 0.55 \times 4100$ psf

$= 2255$ psf Say 2300 psf

Q_R (Factored Nominal Bearing Resistance - Extreme) = $Q_b \times Q_u$

$Q_b = 0.80$

$Q_R = 0.80 \times 4100$ psf

$= 3280$ psf Say 3300 psf

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-GEO
PROJECT NAME EBRC
CALCULATED BY A Lam DATE 3/2020
CHECKED BY _____ DATE _____
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT Bearing Capacity Analyses

South Approach

CIP Wall (Station 10B2+24.00 - 10B4+00.00) (Based on Boring AS-40) ("SB" Track 10B2+85)

DM 7 Figure 5

$c_1 = 1000$ psf $c_2 = 500$ psf $c_2/c_1 = 500/1000 = 0.5$

$T = 11.5'$ $B = 10.5'$ $T/B = 1.10$ $N_c = 4.3$

$D/B = 2.5/10.5 = 0.24$ $N_{c0}/N_c = 1.07$ $N_{c0} = 5.56$

$Q_{ult} = c_1 N_{c0} + \gamma D$

$= 1000 \times 4.3 + 120 \times 2.5$

$= \underline{4600 \text{ psf}}$

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-660
PROJECT NAME EBRC
CALCULATED BY A Lam DATE 3/2020
CHECKED BY _____ DATE _____
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT Bearing Capacity Analyses

South Approach CIP Wall (Station 1082+24.00 - 1084+00.00) (Based on Boring AS-405)

Gross Nominal Bearing Resistance (Q_u) = 4600 psf

LRFD Section 11 Table 11.5.7-1 Q_b (Strength) = 0.55

LRFD Section 11.5.8 Q_b (Extreme) = 0.80

Q_R (Factored Nominal Bearing Resistance - Strength) = $Q_b \times Q_u$

$Q_b = 0.55$

$Q_R = 0.55 \times 4600$ psf

= 2530 psf Say 2500 psf

Q_R (Factored Nominal Bearing Resistance - Extreme) = $Q_b \times Q_u$

$Q_b = 0.80$

$Q_R = 0.80 \times 4600$ psf

= 3680 psf Say 3700 psf

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125.6Eq
PROJECT NAME EBRC
CALCULATED BY A Leum DATE 3/2020
CHECKED BY _____ DATE _____
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT Bearing Capacity Analyses

South Approach

CIP Wall (Station 1084+00.00 - 1088+23.33) (Based on Boring T-32) ("SB" Track 1086+90)

DM7 Figure 5

$c_1 = 3000$ psf $c_2 = 1500$ psf $c_2/c_1 = 0.5$

$T = 12'$ $B = 7.5'$ $T/B = 1.6$ $N_c = 4.8$

$D/B = 2.5/7.5 = 0.33$ $N_{cD}/N_c = 1.10$ $N_{cD} = 6.08$

$Q_{ult} = c_1 N_{cD} + \gamma D$

$= 3000 \times 4.8 + 120 \times 2.5$

$= \underline{14,700 \text{ psf}}$

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-GE
PROJECT NAME EBRL
CALCULATED BY A Lam DATE 3/2020
CHECKED BY _____ DATE _____
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT Bearing Capacity Analyses

South Approach CIP Wall (Station 1084+00.00-1088+23.33) (Based on Boring T-32)

Gross Nominal Bearing Resistance (R_n) = 14700 psf

LRFD Section 11 Table 11.5.7-1 Q_b (Strength) = 0.55

LRFD Section 11.5.8 Q_b (Extreme) = 0.80

Q_R (Factored Nominal Bearing Resistance - Strength) = $Q_b \times Q_n$

$Q_b = 0.55$

$Q_R = 0.55 \times 14700$ psf

= 8,085 psf say 8,000 psf

Q_R (Factored Nominal Bearing Resistance - Extreme) = $Q_b \times Q_n$

$Q_b = 0.80$

$Q_n = 0.80 \times 14700$ psf

= 11,760 psf say 11,700 psf

Meyerhof Bearing Capacity Calculation

Project No:	2017-125-GEO	**Date:**	3/23/2020
Project Name:	Eastridge to BART Regional Connector Project	**By:**	EO
Structure	South Approach CIP Wall (1088+23.33-1089+90.92) (Boring PS-63)		

Input Parameters

Unit weight, γ (pcf)	125
Cohesion, c (psf)	1250
Friction Angle, ϕ (deg)	0
Width, B (feet)	5
Length, L (feet)	167.59
Depth, D (feet)	2.5
Load Inclination, θ (deg)	0
Water Depth, Dw (feet)	10
Factor of Safety, FS	3

Calculated Parameters

Kp	1.00
sc	1.01
sq	1.00
sγ	1.00
dc	1.10
dq	1.00
dγ	1.00
ic	1.00
iq	1.00
iγ	0.00
Nq	1.00
Nc	5.14
Nγ	0.00
Overburden above footing, $\sigma_{zD'}$ (psf)	312.50
Eff. UW below footing, γ' (pcf)	125.00

Bearing Capacity

(Under Vertical Load)

q_{ult} (ksf)	7.422
q_{all} (ksf)	2.474

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-GGo
PROJECT NAME EBRC
CALCULATED BY A Lam DATE 3/2020
CHECKED BY _____ DATE _____
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT Bearing Capacity Analyses

South Approach CIP Wall (Station 108B+23.33 - 108B+90.92) (Based on Boring PS-63)

Gross Nominal Bearing Resistance (Q_u) = 7400 psf

LRFD Section 11 Table 11.5.7-1 Q_b (Strength) = 0.55

LRFD Section 11.5.8 Q_b (Extreme) = 0.80

Q_R (Factored Nominal Bearing Resistance - Strength) = $Q_b \times Q_u$

$Q_b = 0.55$

$Q_u = 0.55 \times 7400$ psf

= 4,070 psf Say 4,000 psf

Q_R (Factored Nominal Bearing Resistance - Extreme) = $Q_b \times Q_u$

$Q_b = 0.80$

$Q_u = 0.80 \times 7400$ psf

= 5,920 psf Say 5,900 psf

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-660
PROJECT NAME EBRC
CALCULATED BY A Lam DATE 3/2020
CHECKED BY _____ DATE _____
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT Bearing Capacity Analyses

South Approach LTP Wall (Stations 1089+90.92 - 1090+21.92) (Based on Boring T-33) ("SB" Track 1090+00)

DM7 Figure 5

$c_1 = 2500$ psf $c_2 = 2250$ psf $c_2/c_1 = 0.9$

T = B' B = 4.5' T/B = 1.8 $N_c = 5.53$

D/B = 2.5/4.5 = 0.56 $N_{cD}/N_c = 1.16$ $N_{cD} = 6.41$
Use 5.53 instead

$Q_{ult} = c_1 N_{cD} + \gamma D$

$= 2500 \times 5.53 + 120 \times 2.5$

$= 14,125$ psf

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-GE
PROJECT NAME EBRC
CALCULATED BY A Lam DATE 3/2020
CHECKED BY _____ DATE _____
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT Bearing Capacity Analyses

Smith Approach (CSP Wall (Station 1089+90.92 - 1090+21.19) (Based on Boring T-33)

Gross Nominal Bearing Resistance Q_u = 14,125 psf

LRFD Section 11. Table 11.5.7-1 Q_b (Strength) = 0.55

LRFD Section 11.5.8 Q_b (Extreme) = 0.80

Q_R (Factored Nominal Bearing Resistance - Strength) = $Q_b \times Q_u$

Q_b = 0.55

Q_R = 0.55 x 14,125 psf

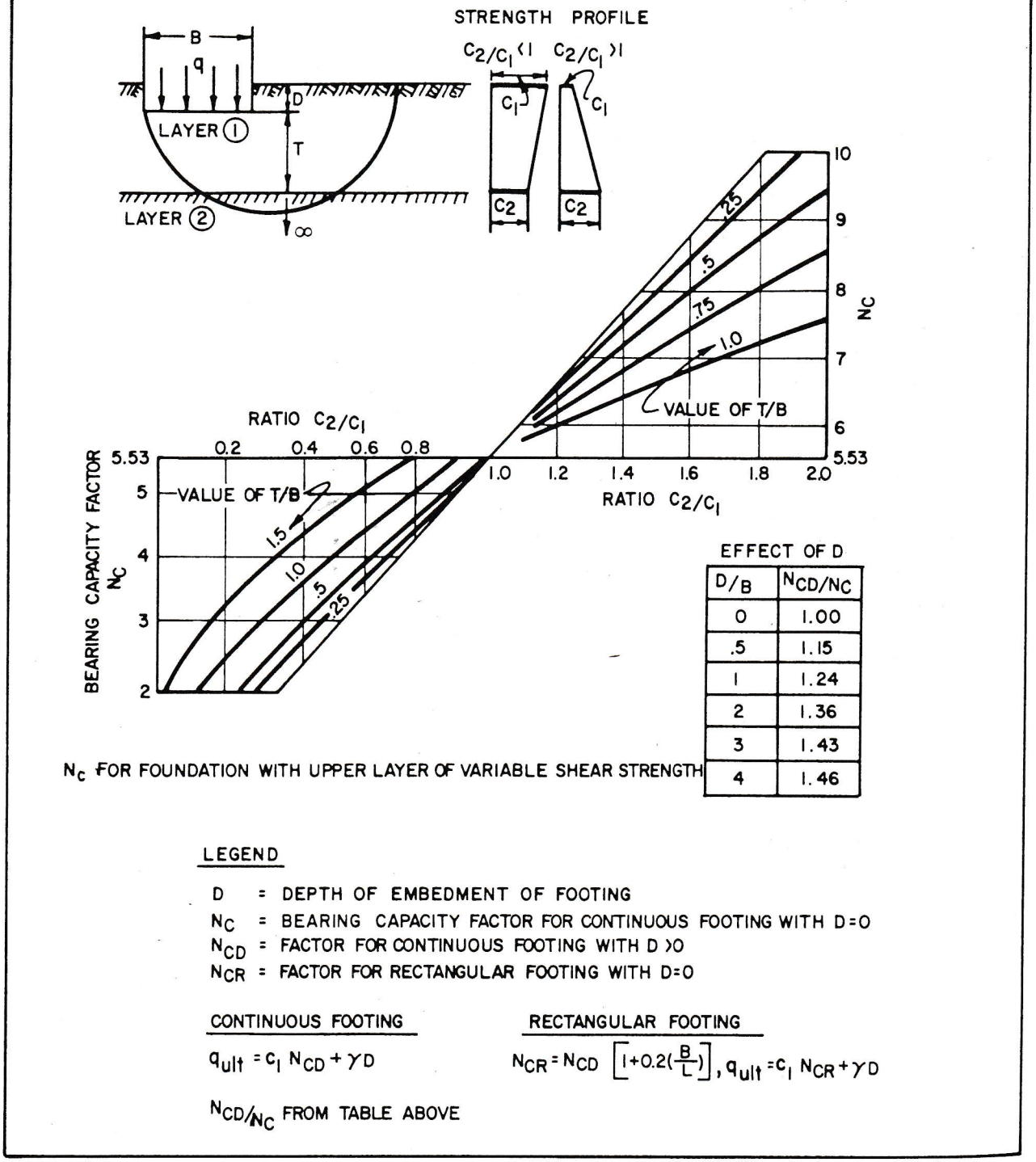
= 7,769 psf say 7,700 psf

Q_R (Factored Nominal Bearing Resistance - Extreme) = $Q_b \times Q_u$

Q_b = 0.80

Q_R = 0.80 x 14,125

= 11,300 psf



D/B	N_{CD}/N_C
0	1.00
.5	1.15
1	1.24
2	1.36
3	1.43
4	1.46

LEGEND

D = DEPTH OF EMBEDMENT OF FOOTING
N_C = BEARING CAPACITY FACTOR FOR CONTINUOUS FOOTING WITH D=0
N_{CD} = FACTOR FOR CONTINUOUS FOOTING WITH D >0
N_{CR} = FACTOR FOR RECTANGULAR FOOTING WITH D=0

CONTINUOUS FOOTING

$q_{ult} = c_1 N_{CD} + \gamma D$

N_{CD}/N_C FROM TABLE ABOVE

RECTANGULAR FOOTING

$N_{CR} = N_{CD}\left[1+0.2\left(\frac{B}{L}\right)\right]$, $q_{ult} = c_1 N_{CR} + \gamma D$

FIGURE 5 (continued)
Ultimate Bearing Capacity of Two Layer Cohesive Soil ($\emptyset$=0)

BEARING CAPACITY ANALYSES (SETTLEMENT CONTROLLED)
CIP WALL

SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge to BART Regional Connector***	*Footing Depth (ft) =*	2.5
PROJECT NO.	***2017-125-GEO***	*Fill Height (ft)=*	-
STRUCTURE	***CIP WALL [Sta 968+54.75 - 968+94.20 (NB & SB)***	*Base Width, B (ft)=*	10.5
REFERENCE BORI	***AS-1***	*Side Slope (XH:1V)=*	-
Hammer Energy =	60%	*Effective Width, B' (ft)=*	7.6
GW Level (ft)=	15	*Length, L (ft)=*	-
		Plane Strain? (Y/N)	Y
		Contact Pressure (psf)=	2100

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Cr/Cc= 25.0%

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	Cr/1+e_0	Cc/1+e_0	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	2.5	3	26	MC	17	125.0	125.0	27.0%	313	156		2113				739375								
2.5	8	3	26	MC	17	125.0	125.0	27.0%	688	656	1542.0	2113		8450	12.9	739375				0.138				0.138
8	13	3	17	MC	11	125.0	125.0	23.0%	625	1313	1023.1	1381	1100	4400	3.4	483438				0.127				0.127
13	18	3	16	MC	10	125.0	62.6	18.0%	313	1782	774.8	1300		5200	2.9	455000				0.102				0.102
18	24	1	29	SPT	29	125.0	62.6	14.0%	376	2126	611.5								98				0.081	0.081
24	30	2	29	MC	19	125.0	62.6	18.6%	376	2501	497.2	2356	1500	6000	2.4		0.0360	0.1441			0.204			0.204
30	35	3	25	MC	16	125.0	62.6	27.6%	313	2846	424.5	2031		8125	2.9	710938				0.036				0.036
35	39	2	30	MC	20	125.0	62.6	27.6%	250	3127	379.1	2438	940	3760	1.2		0.0356	0.1426			0.085			0.085
39	45	3	50	SPT	50	125.0	62.6	27.0%	376	3440	338.9	6250		25000	7.3	2187500				0.011				0.011
45	49	3	38	MC	25	125.0	62.6	27.0%	250	3753	306.3	3088		12350	3.3	1080625				0.014				0.014
49	55	3	31	MC	20	125.0	62.6	17.6%	376	4066	279.5	2519		10075	2.5	881563				0.023				0.023
55	58	3	23	SPT	23	125.0	62.6	21.4%	188	4348	259.1	2875		11500	2.6	1006250				0.009				0.009
58	65	1	50	MC	33	125.0	62.6	18.4%	438	4661	239.6								80				0.023	0.023
65	77	1	34	MC	22	125.0	62.6	25.6%	751	5256	209.7								63				0.039	0.039
77	84	2	38	MC	25	125.0	62.6	34.9%	438	5851	186.4	3088	2020	8080	1.4		0.0258	0.1031			0.029			0.029
84	93	1	50	SPT	50	125.0	62.6	11.2%	563	6351	170.5								97				0.013	0.013
93	102	3	74	MC	48	125.0	62.6	9.1%	563	6915	155.6	6013		24050	3.5	2104375				0.008				0.008
102	112	2	50	MC	33	125.0	62.6	12.2%	626	7509	142.4	4063		16250	2.2		0.0305	0.1219			0.030			0.030
112	124	3	70	MC	46	126.0	63.6	18.7%	763	8204	129.7	5688		22750	2.8	1990625				0.009				0.009
																			Estimated Settlement (in)=	*0.5*	*0.3*	*0.0*	*0.2*	*1.0*

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 25% was estimated based on the previous project experience.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.

SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge to BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***CIP WALL [Sta 96+94.20 - 969+59.13 (NB & SB)]***
REFERENCE BORII	***AS-1***
Hammer Energy =	60%
GW Level (ft)=	15

Footing Depth (ft) =	2.5
Fill Height (ft)=	-
Base Width, B (ft)=	15
Side Slope (XH:1V)=	-
Effective Width, B' (ft)=	11.4
Length, L (ft)=	-
Plane Strain? (Y/N)	Y
Contact Pressure (psf)=	1600

Cr/Cc= 25.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	2.5	3	26	MC	17	125.0	125.0	27.0%	313	156		2113				739375								
2.5	8	3	26	MC	17	125.0	125.0	27.0%	688	656	1289.0	2113		8450	12.9	739375				0.115				0.115
8	13	3	17	MC	11	125.0	125.0	23.0%	625	1313	940.2	1381	1100	4400	3.4	483438				0.117				0.117
13	18	3	16	MC	10	125.0	62.6	18.0%	313	1782	747.5	1300		5200	2.9	455000				0.099				0.099
18	24	1	29	SPT	29	125.0	62.6	14.0%	376	2126	610.0								98				0.081	0.081
24	30	2	29	MC	19	125.0	62.6	18.6%	376	2501	508.1	2356	1500	6000	2.4		0.0360	0.1441			0.208			0.208
30	35	3	25	MC	16	125.0	62.6	27.6%	313	2846	440.6	2031		8125	2.9	710938				0.037				0.037
35	39	2	30	MC	20	125.0	62.6	27.6%	250	3127	397.4	2438	940	3760	1.2		0.0356	0.1426			0.089			0.089
39	45	3	50	SPT	50	125.0	62.6	27.0%	376	3440	358.3	6250		25000	7.3	2187500				0.012				0.012
45	49	3	38	MC	25	125.0	62.6	27.0%	250	3753	326.3	3088		12350	3.3	1080625				0.014				0.014
49	55	3	31	MC	20	125.0	62.6	17.6%	376	4066	299.5	2519		10075	2.5	881563				0.024				0.024
55	58	3	23	SPT	23	125.0	62.6	21.4%	188	4348	278.9	2875		11500	2.6	1006250				0.010				0.010
58	65	1	50	MC	33	125.0	62.6	18.4%	438	4661	259.1								80				0.025	0.025
65	77	1	34	MC	22	125.0	62.6	25.6%	751	5256	228.3								63				0.042	0.042
77	84	2	38	MC	25	125.0	62.6	34.9%	438	5851	204.0	3088	2020	8080	1.4		0.0258	0.1031			0.032			0.032
84	93	1	50	SPT	50	125.0	62.6	11.2%	563	6351	187.3								97				0.014	0.014
93	102	3	74	MC	48	125.0	62.6	9.1%	563	6915	171.4	6013		24050	3.5	2104375				0.009				0.009
102	112	2	50	MC	33	125.0	62.6	12.2%	626	7509	157.4	4063		16250	2.2		0.0305	0.1219			0.033			0.033
112	124	3	70	MC	46	125.0	62.6	18.7%	751	8198	143.7	5688		22750	2.8	1990625				0.010				0.010

SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge to BART Regional Connector***	*Footing Depth (ft) =*	2.5
PROJECT NO.	***2017-125-GEO***	*Fill Height (ft)=*	-
STRUCTURE	***CIP WALL (Sta 1081+96.37 - 1082+29.00 (South***	*Base Width, B (ft)=*	15
REFERENCE BORI	***AS-40***	*Side Slope (XH:1V)=*	-
Hammer Energy =	60%	*Effective Width, B' (ft)=*	11.4
GW Level (ft)=	11.5	*Length, L (ft)=*	-
		Plane Strain? (Y/N)	Y
		Contact Pressure (psf)=	600

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Cr/Cc= 25.0%

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	Cr/1+e_0	Cc/1+e_0	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	2.5	3	18	MC	12	125.0	125.0	22.0%	313	156		1463				511875								
2.5	3.5	3	18	MC	12	125.0	125.0	22.0%	125	375	574.8	1463		5850	15.6	511875				0.013				0.013
3.5	6	1	15	MC	10	125.0	125.0	17.0%	313	594	501.1								38				0.211	0.211
6	12	1	12	MC	8	125.0	62.6	20.0%	376	938	382.1								32				0.339	0.339
12	17	2	8	MC	5	125.0	62.6	30.0%	313	1282	292.3	650		2600	2.0		0.0307	0.1227			0.164			0.164
17	22	3	21	MC	14	125.0	62.6	19.0%	313	1595	240.8	1706		6825	4.3	597188				0.024				0.024
22	29.5	2	13	MC	8	125.0	62.6	28.0%	470	1986	197.4	1056		4225	2.1		0.0350	0.1401			0.130			0.130
29.5	32.5	3	18	MC	12	125.0	62.6	26.0%	188	2315	171.4	1463	1910	7640	3.3	511875				0.012				0.012
32.5	40	3	29	MC	19	125.0	62.6	26.0%	470	2644	151.5	2356		9425	3.6	824688				0.017				0.017
40	44.5	1	42	MC	27	125.0	62.6	11.0%	282	3019	133.7								83				0.012	0.012
44.5	49.5	2	18	MC	12	125.0	62.6	24.0%	313	3317	122.4	1463		5850	1.8		0.0356	0.1426			0.034			0.034
49.5	55	2	20	MC	13	125.0	62.6	27.0%	344	3645	111.9	1625	1300	5200	1.4		0.0294	0.1177			0.025			0.025
55	59	1	69	MC	45	125.0	62.6	17.0%	250	3943	103.8								108				0.005	0.005
59	69	3	49	MC	32	125.0	62.6	13.0%	626	4381	93.8	3981		15925	3.6	1393438				0.008				0.008
69	81.5	2	37	MC	24	125.0	62.6	18.0%	783	5085	81.3	3006		12025	2.4		0.0275	0.1101			0.028			0.028
81.5	85.5	1	106	MC	69	125.0	62.6	14.0%	250	5602	74.0								137				0.002	0.002
85.5	95	3	47	MC	31	125.0	62.6	21.0%	595	6024	69.0	3819		15275	2.5	1336563				0.006				0.006
95	101.5	2	41	MC	27	125.0	62.6	25.0%	407	6525	63.8	3331		13325	2.0		0.0250	0.1000			0.008			0.008

SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge to BART Regional Connector***	*Footing Depth (ft) =*	2.5
PROJECT NO.	***2017-125-GEO***	*Fill Height (ft)=*	-
STRUCTURE	***CIP WALL (Sta 1082+29.00 - 1084+00.00 (South***	*Base Width, B (ft)=*	10.5
REFERENCE BORI	***AS-40***	*Side Slope (XH:1V)=*	-
Hammer Energy =	60%	*Effective Width, B' (ft)=*	7.6
GW Level (ft)=	11.5	*Length, L (ft)=*	-
		Plane Strain? (Y/N)	Y
		Contact Pressure (psf)=	700

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Cr/Cc= 25.0%

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	Cr/1+e_0	Cc/1+e_0	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	2.5	3	18	MC	12	125.0	125.0	22.0%	313	156		1463				511875								
2.5	3.5	3	18	MC	12	125.0	125.0	22.0%	125	375	656.8	1463		5850	15.6	511875				0.015				0.015
3.5	6	1	15	MC	10	125.0	125.0	17.0%	313	594	540.1								38				0.223	0.223
6	12	1	12	MC	8	125.0	62.6	20.0%	376	938	377.3								32				0.336	0.336
12	17	2	8	MC	5	125.0	62.6	30.0%	313	1282	271.4	650		2600	2.0		0.0307	0.1227			0.153			0.153
17	22	3	21	MC	14	125.0	62.6	19.0%	313	1595	216.3	1706		6825	4.3	597188				0.022				0.022
22	29.5	2	13	MC	8	125.0	62.6	28.0%	470	1986	172.4	1056		4225	2.1		0.0350	0.1401			0.114			0.114
29.5	32.5	3	18	MC	12	125.0	62.6	26.0%	188	2315	147.4	1463	1910	7640	3.3	511875				0.010				0.010
32.5	40	3	29	MC	19	125.0	62.6	26.0%	470	2644	128.7	2356		9425	3.6	824688				0.014				0.014
40	44.5	1	42	MC	27	125.0	62.6	11.0%	282	3019	112.4								83				0.010	0.010
44.5	49.5	2	18	MC	12	125.0	62.6	24.0%	313	3317	102.1	1463		5850	1.8		0.0356	0.1426			0.028			0.028
49.5	55	2	20	MC	13	125.0	62.6	27.0%	344	3645	92.8	1625	1300	5200	1.4		0.0294	0.1177			0.021			0.021
55	59	1	69	MC	45	125.0	62.6	17.0%	250	3943	85.7								108				0.004	0.004
59	69	3	49	MC	32	125.0	62.6	13.0%	626	4381	77.0	3981		15925	3.6	1393438				0.007				0.007
69	81.5	2	37	MC	24	125.0	62.6	18.0%	783	5085	66.2	3006		12025	2.4		0.0275	0.1101			0.023			0.023
81.5	85.5	1	106	MC	69	125.0	62.6	14.0%	250	5602	60.0								137				0.002	0.002
85.5	95	3	47	MC	31	125.0	62.6	21.0%	595	6024	55.8	3819		15275	2.5	1336563				0.005				0.005
95	101.5	2	41	MC	27	125.0	62.6	25.0%	407	6525	51.5	3331		13325	2.0		0.0250	0.1000			0.007			0.007
																			Estimated Settlement (in)=	*0.1*	*0.3*	*0.0*	*0.6*	*1.0*

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 25% was estimated based on the previous project experience.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.

SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge to BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***CIP WALL (Sta 1084+00.00 - 1088+23.33 (South***
REFERENCE BORI	***T-32***
Hammer Energy =	60%
GW Level (ft)=	12

Footing Depth (ft) =	2.5
Fill Height (ft)=	-
Base Width, B (ft)=	7.5
Side Slope (XH:1V)=	-
Effective Width, B' (ft)=	6.6
Length, L (ft)=	-
Plane Strain? (Y/N)	Y
Contact Pressure (psf)=	3000

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Cr/Cc= 25.0%

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	Cr/1+e_0	Cc/1+e_0	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	2.5	3	58	MC	38	125.0	125.0	14.0%	313	156		4713				1649375								
2.5	3	3	58	MC	38	125.0	125.0	14.0%	63	344	2890.5	4713		18850	54.8	1649375				0.011				0.011
3	8	3	38	MC	25	125.0	125.0	15.0%	625	688	2062.5	3088		12350	18.0	1080625				0.115				0.115
8	14.5	1	39	MC	25	125.0	62.6	22.0%	407	1203	1289.9								59				0.420	0.420
14.5	19.5	3	22	MC	14	125.0	62.6	30.0%	313	1563	938.4	1788		7150	4.6	625625				0.090				0.090
19.5	25	3	26	MC	17	125.0	62.6	33.0%	344	1892	751.4	2113		8450	4.5	739375				0.067				0.067
25	27.5	3	37	MC	24	125.0	62.6	32.0%	157	2142	652.4	3006		12025	5.6	1052188				0.019				0.019
27.5	100	3	37	MC	24	125.0	62.6	32.0%	4539	4490	291.8	3006		12025	2.7	1052188				0.241				0.241

SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge to BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***CIP WALL (Sta 1088+23.33 - 1089+90.92 (South***
REFERENCE BORI	***PS-63***
Hammer Energy =	60%
GW Level (ft)=	9.5

Footing Depth (ft) =	2.5
Fill Height (ft)=	-
Base Width, B (ft)=	5
Side Slope (XH:1V)=	-
Effective Width, B' (ft)=	3.4
Length, L (ft)=	-
Plane Strain? (Y/N)	Y
Contact Pressure (psf)=	4000

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Cr/Cc= 25.0%

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	Cr/1+e_0	Cc/1+e_0	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	2.5	3	25	MC	16	125.0	125.0	19.0%	313	156		2031				710938								
2.5	4	3	25	MC	16	125.0	125.0	19.0%	188	406	3277.1	2031		8125	20.0	710938				0.083				0.083
4	8	3	17	MC	11	125.0	125.0	17.0%	500	750	1971.0	1381		5525	7.4	483438				0.196				0.196
8	12	3	10	MC	7	125.0	62.6	36.0%	250	1125	1247.7	813		3250	2.9	284375				0.211				0.211
12	17	3	18	MC	12	125.0	62.6	29.0%	313	1407	883.1	1463		5850	4.2	511875				0.104				0.104
17	23.5	3	16	MC	10	125.0	62.6	28.0%	407	1767	643.0	1300		5200	2.9	455000				0.110				0.110
23.5	28.5	1	29	MC	19	125.0	62.6	29.0%	313	2127	505.6								40				0.139	0.139
28.5	32.5	3	44	MC	29	125.0	62.6	19.0%	250	2409	433.1	3575		14300	5.9	1251250				0.017				0.017
32.5	37.5	3	43	MC	28	125.0	62.6	19.0%	313	2690	378.8	3494		13975	5.2	1222813				0.019				0.019
37.5	100	3	43	MC	28	125.0	62.6	19.0%	3913	4803	195.3	3494		13975	2.9	1222813				0.120				0.120

Estimated Settlement (in)= *0.9* *0.0* *0.0* *0.1* *1.0*

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 25% was estimated based on the previous project experience.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.
6. Red text is data that was extrapolated.

SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge to BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***CIP WALL (Sta 1089+90.92 - 1090+21.19 (South***
REFERENCE BORI	***T-33***
Hammer Energy =	60%
GW Level (ft)=	11

Footing Depth (ft) =	2.5
Fill Height (ft)=	-
Base Width, B (ft)=	4.5
Side Slope (XH:1V)=	-
Effective Width, B' (ft)=	1.6
Length, L (ft)=	-
Plane Strain? (Y/N)	Y
Contact Pressure (psf)=	10300

Cr/Cc= 25.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG													Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	γ_T (pcf)	γ' (pcf)	ω	σ_v' (psf)	σ_v' (psf)	$\Delta\sigma_v'$ (psf)	Su (psf)	Lab Su (psf)	Pp (psf)	OCR	E (psf)	Cr/1+e_0	Cc/1+e_0	C' (Hough Method)	Elastic	OC	NC	SAND	Sum
0	2.5	3	53	MC	34	125.0	125.0	23.0%	313	156		4306				1507188								
2.5	4	3	53	MC	34	125.0	125.0	23.0%	188	406	7012.8	4306		17225	42.4	1507188				0.084				0.084
4	8	3	36	MC	23	125.0	125.0	18.0%	500	750	3231.4	2925		11700	15.6	1023750				0.152				0.152
8	10.5	1	31	MC	20	125.0	125.0	23.0%	313	1156	1973.7								50				0.257	0.257
10.5	18	3	26	MC	17	125.0	62.6	33.0%	470	1547	1234.5	2113		8450	5.5	739375				0.150				0.150
18	24	3	32	MC	21	125.0	62.6	29.0%	376	1970	819.9	2600		10400	5.3	910000				0.065				0.065
24	28	3	37	MC	24	125.0	62.6	29.0%	250	2283	656.6	3006		12025	5.3	1052188				0.030				0.030
28	100	3	37	MC	24	125.0	62.6	29.0%	4507	4662	261.2	3006		12025	2.6	1052188				0.214				0.214

BEARING CAPACITY ANALYSES (STRENGTH AND EXTREME EVENT LIMIT CASE) FOR MSE WALL

Meyerhof Bearing Capacity Calculation

Project No:	2017-125-GEO	**Date:**	3/12/2020
Project Name:	Eastridge to BART Regional Connector Project	**By:**	AL
Structure	North Approach MSE Wall (NB & SB 969+57.48 - 972+02.48) (Boring AS-1)		

Input Parameters

Unit weight, γ (pcf)	120
Cohesion, c (psf)	1100
Friction Angle, ϕ (deg)	0
Width, B (feet)	18.5
Length, L (feet)	246
Depth, D (feet)	2.5
Load Inclination, θ (deg)	0
Water Depth, Dw (feet)	9.5
Factor of Safety, FS	3

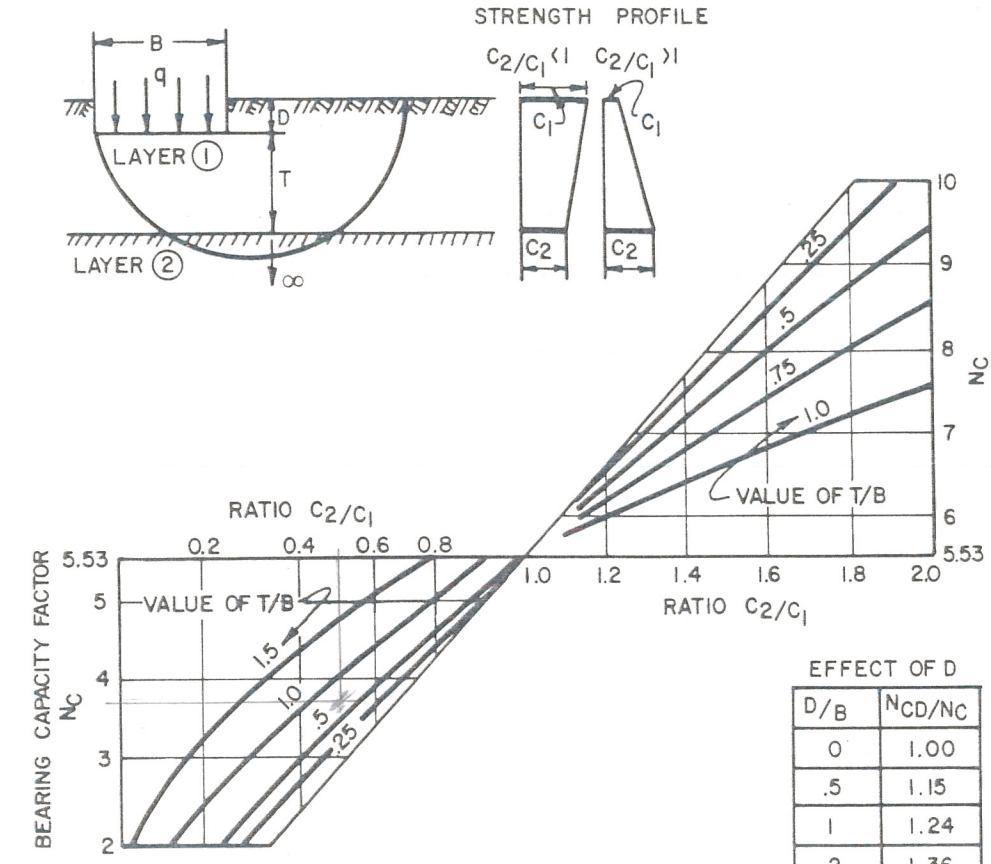
Calculated Parameters

Kp	1.00
sc	1.02
sq	1.00
sγ	1.00
dc	1.03
dq	1.00
dγ	1.00
ic	1.00
iq	1.00
iγ	0.00
Nq	1.00
Nc	5.14
Nγ	0.00
Overburden above footing, $\sigma_{zD'}$ (psf)	300.00
Eff. UW below footing, γ' (pcf)	232.32

Bearing Capacity

(Under Vertical Load)

q_{ult} (ksf)	6.194
q_{all} (ksf)	2.065
$q_{strength}$ (ksf)	4.03
$q_{extreme}$ (ksf)	5.57



EFFECT OF D

D/B	N_{CD}/N_C
0	1.00
.5	1.15
1	1.24
2	1.36
3	1.43
4	1.46

N_C FOR FOUNDATION WITH UPPER LAYER OF VARIABLE SHEAR STRENGTH

LEGEND

D = DEPTH OF EMBEDMENT OF FOOTING
N_C = BEARING CAPACITY FACTOR FOR CONTINUOUS FOOTING WITH D=0
N_{CD} = FACTOR FOR CONTINUOUS FOOTING WITH D >0
N_{CR} = FACTOR FOR RECTANGULAR FOOTING WITH D=0

CONTINUOUS FOOTING

$q_{ult} = c_1 N_{CD} + \gamma D$

N_{CD}/N_C FROM TABLE ABOVE

RECTANGULAR FOOTING

$N_{CR} = N_{CD}\left[1+0.2\left(\frac{B}{L}\right)\right]$, $q_{ult} = c_1 N_{CR} + \gamma D$

FIGURE 5 (continued)
Ultimate Bearing Capacity of Two Layer Cohesive Soil (Ø=0)

BEARING CAPACITY ANALYSES (SETTLEMENT CONTROLLED)
MSE WALL

SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge to BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***MSE WALL [Sta 969+57.48 - 972+02.48 (NB & SE***
REFERENCE BORII	***AS-1***
Hammer Energy =	60%
GW Level (ft)=	15

Footing Depth (ft) =	2.5	
Fill Height (ft)=	30	(effective)
Base Width, B (ft)=	32	
Side Slope (XH:1V)=	-	
Effective Width, B' (ft)=	18.5	
Length, L (ft)=	-	
Plane Strain? (Y/N)	Y	
Contact Pressure (psf)=	3900	

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Cr/Cc= 25.0%

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	Cr/1+e_0	Cc/1+e_0	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	8	3	26	MC	17	125.0	125.0	27.0%	1000	500	3607.5	2113		8450	16.9	739375				0.468				0.468
8	13	3	17	MC	11	125.0	125.0	23.0%	625	1313	2722.6	1381	1100	4400	3.4	483438				0.338				0.338
13	18	3	16	MC	10	125.0	62.6	18.0%	313	1782	2290.5	1300		5200	2.9	455000				0.302				0.302
18	24	1	29	SPT	29	125.0	62.6	14.0%	376	2126	1950.0								98				0.208	0.208
24	30	2	29	MC	19	125.0	62.6	18.6%	376	2501	1677.9	2356	1500	6000	2.4		0.0360	0.1441			0.578			0.578
30	35	3	25	MC	16	125.0	62.6	27.6%	313	2846	1487.6	2031		8125	2.9	710938				0.126				0.126
35	39	2	30	MC	20	125.0	62.6	27.6%	250	3127	1361.3	2438	940	3760	1.2		0.0356	0.1426			0.137	0.527		0.663
39	45	3	50	SPT	50	125.0	62.6	27.0%	376	3440	1244.0	6250		25000	7.3	2187500				0.041				0.041
45	49	3	38	MC	25	125.0	62.6	27.0%	250	3753	1145.2	3088		12350	3.3	1080625				0.051				0.051
49	55	3	31	MC	20	125.0	62.6	17.6%	376	4066	1061.0	2519		10075	2.5	881563				0.087				0.087
55	58	3	23	SPT	23	125.0	62.6	21.4%	188	4348	995.2	2875		11500	2.6	1006250				0.036				0.036
58	65	1	50	MC	33	125.0	62.6	18.4%	438	4661	931.0								80				0.083	0.083
65	77	1	34	MC	22	125.0	62.6	25.6%	751	5256	829.3								63				0.146	0.146
77	84	2	38	MC	25	125.0	62.6	34.9%	438	5851	747.7	3088	2020	8080	1.4		0.0258	0.1031			0.113			0.113
84	93	1	50	SPT	50	125.0	62.6	11.2%	563	6351	690.4								97				0.050	0.050
93	102	3	74	MC	48	125.0	62.6	9.1%	563	6915	635.7	6013		24050	3.5	2104375				0.033				0.033
102	112	2	50	MC	33	125.0	62.6	12.2%	626	7509	586.6	4063		16250	2.2		0.0305	0.1219			0.119			0.119
112	124	3	70	MC	46	125.0	62.6	18.7%	751	8198	538.4	5688		22750	2.8	1990625				0.039				0.039

BEARING CAPACITY ANALYSES FOR RELOCATED OCALA BUS CANOPY GLASS SCREEN WALL

Meyerhof Bearing Capacity Calculation

Project No:	2017-125-GEO	**Date:**	1/29/2020
Project Name:	Eastridge to BART Regional Connector Project	**By:**	AL
Structure	Ocala Bus Canopy (Boring PS-59)		

Input Parameters

Unit weight, γ (pcf)	120
Cohesion, c (psf)	900
Friction Angle, ϕ (deg)	0
Width, B (feet)	3
Length, L (feet)	20
Depth, D (feet)	4.5
Load Inclination, θ (deg)	0
Water Depth, Dw (feet)	8
Factor of Safety, FS	3

Calculated Parameters

Kp	1.00
sc	1.03
sq	1.00
sγ	1.00
dc	1.30
dq	1.00
dγ	1.00
ic	1.00
iq	1.00
iγ	0.00
Nq	1.00
Nc	5.14
Nγ	0.00
Overburden above footing, $\sigma_{zD'}$ (psf)	540.00
Eff. UW below footing, γ' (pcf)	120.00

Bearing Capacity

(Under Vertical Load)

q_{ult} (ksf)	6.734
q_{all} (ksf)	2.245
$q_{strength}$ (ksf)	4.38
$q_{extreme}$ (ksf)	6.06

LATERAL EARTH PRESSURES

LATERAL EARTH PRESSURES DUE TO SURCHARGE FOR CIP WALL

PARIKH
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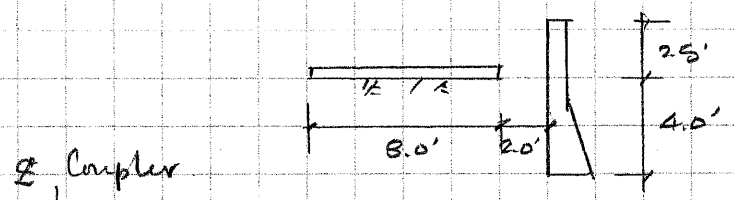
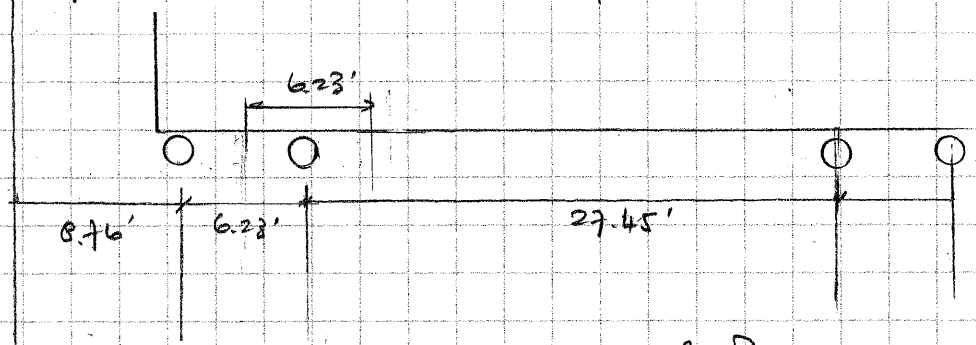
PROJECT NO. 2017-125-GEO
PROJECT NAME Fastrack to BART Regional Connector
CALCULATED BY A Lam DATE 12/13/2018
CHECKED BY E. Ortakci DATE 12/13/2018
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT Surcharge Lateral Load

1) 8'-0" Long Rail



℄ Coupler



Vertical Stress (uniform) = $\frac{2 \times P}{8 \times 6.23}$ $P = 12$ kips

$= \frac{2 \times 12 \text{ kips}}{49.84 \text{ ft}^2} = 0.482 \text{ ksf}$

2) 8'-6" Long Rail

Vertical Stress (uniform) = $\frac{2 \times 12 \text{ kips}}{8.5 \times 6.23}$

$= \frac{24 \text{ kips}}{52.96 \text{ ft}^2} = 0.453 \text{ ksf}$

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT - CIP WALL July 09, 2019

Lateral Load on CIP Walll due to Train Surcharge (Elastic Solution)

Per AASHTO Section 3.11.6.2:

3.11.6.2 Point, Line and Strip Loads (ES)—Walls Restrained from Movement

The horizontal pressure, Δ_{ph} in ksf, on a wall resulting from a uniformly loaded strip parallel to the wall may be taken as:

$$\Delta_{ph} = \frac{2p}{\pi}[\delta - \sin\delta\cos(\delta + 2\alpha)] \qquad (3.11.6.2\text{-}1)$$

where:

p = uniform load intensity on strip parallel to wall (ksf)

α = angle specified in Figure 1 (rad.)

δ = angle specified in Figure 1 (rad.)

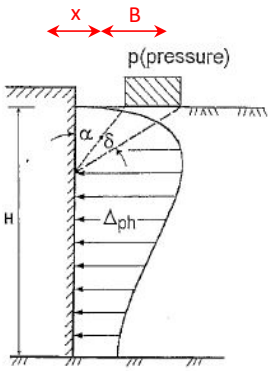


Figure 3.11.6.2-1 Horizontal Pressure on Wall Caused by a Uniformly Loaded Strip.

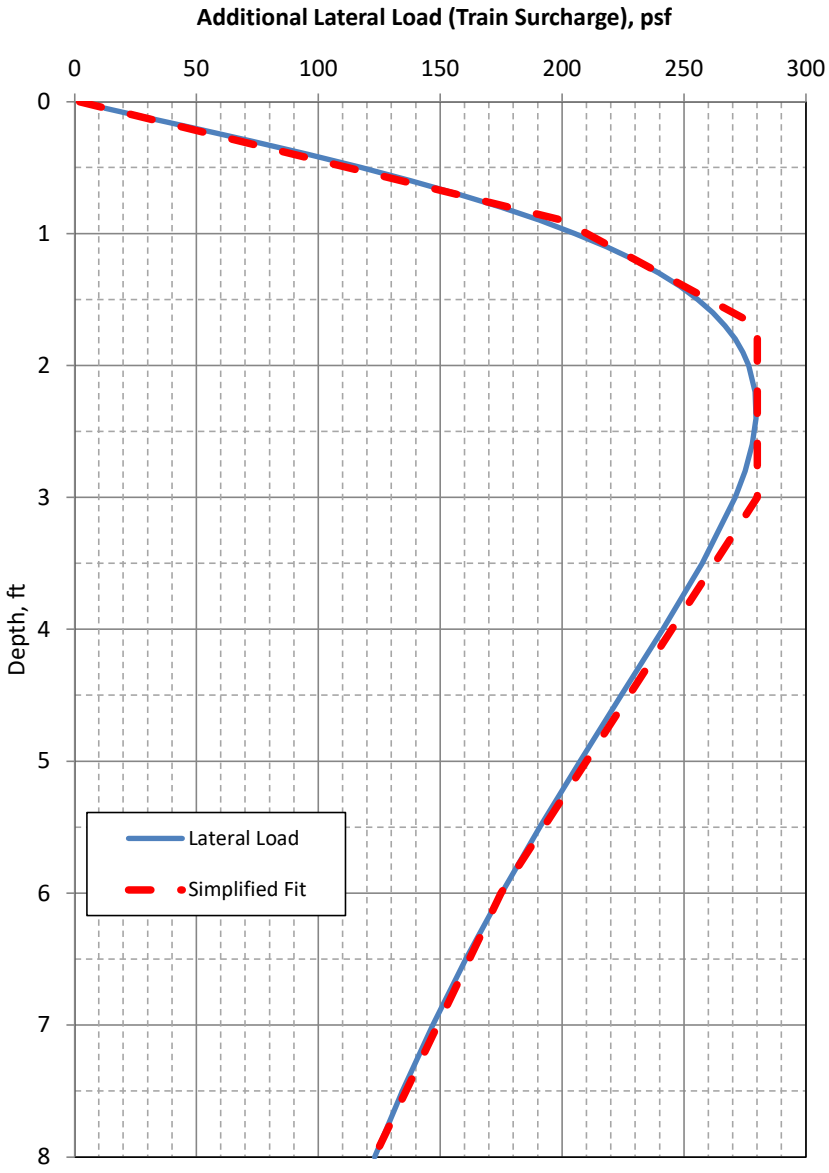
SIMPLIFIED FIT

Depth, z	Additional Lateral Load
ft	psf
0	**2**
0.9	**200**
1.7	**280**
3	**280**
6	**175**
8	**123**

Design Height up to 8 ft

x =	2	ft	(Closest horizontal distance of surcharge to wall, per information provided by Sierra Engineering Group
p =	485	psf	(Estimated train surcharge per Parikh's e-mail to Sierra Engineering Group dated February 5, 2019
B =	8	ft	(Width of train surcharge, per information provided by Structural Designer

Depth, z	α	δ	Additional Lateral Load
ft	rad	rad	psf
0.05	1.546	0.020	12
0.1	1.521	0.040	25
0.2	1.471	0.080	49
0.3	1.422	0.119	73
0.4	1.373	0.157	96
0.5	1.326	0.195	117
0.6	1.279	0.232	138
0.7	1.234	0.267	157
0.8	1.190	0.301	175
0.9	1.148	0.333	191
1.0	1.107	0.364	205
1.1	1.068	0.393	218
1.2	1.030	0.421	230
1.3	0.994	0.447	240
1.4	0.960	0.472	248
1.5	0.927	0.495	256
1.6	0.896	0.516	262
1.7	0.866	0.536	267
1.8	0.838	0.555	271
1.9	0.811	0.572	274
2.0	0.785	0.588	277
2.2	0.738	0.616	279
2.4	0.695	0.641	280
2.6	0.656	0.661	278
2.8	0.620	0.678	275
3.0	0.588	0.691	271
3.5	0.519	0.715	257
4.0	0.464	0.727	241
4.5	0.418	0.730	224
5.0	0.381	0.727	207
5.5	0.349	0.719	191
6.0	0.322	0.709	175
6.5	0.298	0.696	161
7.0	0.278	0.682	147
7.5	0.261	0.667	135
8.0	0.245	0.651	123



Total Force P = 1.61 Kips/ft of wall

Point of Action = 3.8 ft below top of wall

EASTRIDGE TO BART REGIONAL CONNECTOR PROJECT

Lateral Load on CIP Wall due to Train Surcharge (Elastic Solution)

Per AASHTO Section 3.11.6.2:

3.11.6.2 Point, Line and Strip Loads (*ES*)—Walls Restrained from Movement

The horizontal pressure, Δ_{ph} in ksf, on a wall resulting from a uniformly loaded strip parallel to the wall may be taken as:

$$\Delta_{ph} = \frac{2p}{\pi}[\delta - \sin\delta\cos(\delta + 2\alpha)] \qquad (3.11.6.2\text{-}1)$$

where:

p = uniform load intensity on strip parallel to wall (ksf)

α = angle specified in Figure 1 (rad.)

δ = angle specified in Figure 1 (rad.)

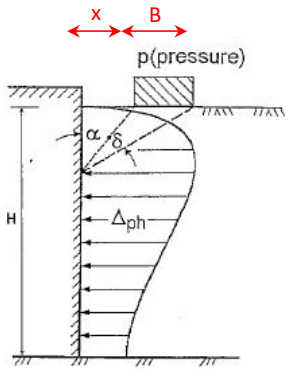


Figure 3.11.6.2-1 Horizontal Pressure on Wall Caused by a Uniformly Loaded Strip.

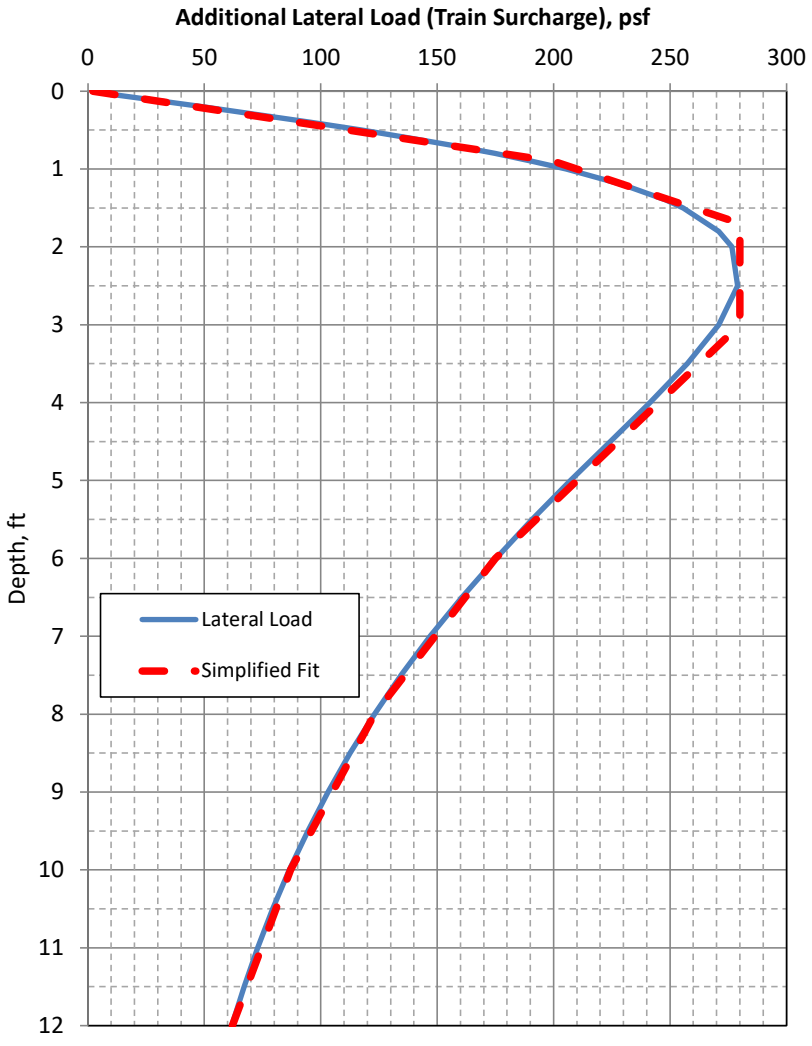
SIMPLIFIED FIT

Depth, z	Additional Lateral Load
ft	psf
0	**2**
0.9	**200**
1.7	**280**
3	**280**
6	**175**
8	**123**
10	**87**
12	**62**

Design Height up to 12 ft

x =	2	ft	(Closest horizontal distance of surcharge to wall, per information provided by Sierra Engineering Group
p =	485	psf	(Estimated train surcharge per Parikh's e-mail to Sierra Engineering Group dated February 5, 2019
B =	8	ft	(Width of train surcharge, per information provided by Structural Designer

Depth, z	α	δ	Additional Lateral Load
ft	rad	rad	psf
0.05	1.546	0.020	12
0.1	1.521	0.040	25
0.2	1.471	0.080	49
0.3	1.422	0.119	73
0.4	1.373	0.157	96
0.5	1.326	0.195	117
0.6	1.279	0.232	138
0.7	1.234	0.267	157
0.8	1.190	0.301	175
0.9	1.148	0.333	191
1.0	1.107	0.364	205
1.2	1.030	0.421	230
1.4	0.960	0.472	248
1.5	0.927	0.495	256
1.8	0.838	0.555	271
2.0	0.785	0.588	277
2.5	0.675	0.651	279
3.0	0.588	0.691	271
3.5	0.519	0.715	257
4.0	0.464	0.727	241
4.5	0.418	0.730	224
5.0	0.381	0.727	207
5.5	0.349	0.719	191
6.0	0.322	0.709	175
6.5	0.298	0.696	161
7.0	0.278	0.682	147
7.5	0.261	0.667	135
8.0	0.245	0.651	123
8.5	0.231	0.635	113
9.0	0.219	0.619	103
9.5	0.207	0.604	94
10.0	0.197	0.588	87
10.5	0.188	0.573	79
11.0	0.180	0.558	73
11.5	0.172	0.544	67
12.0	0.165	0.530	62



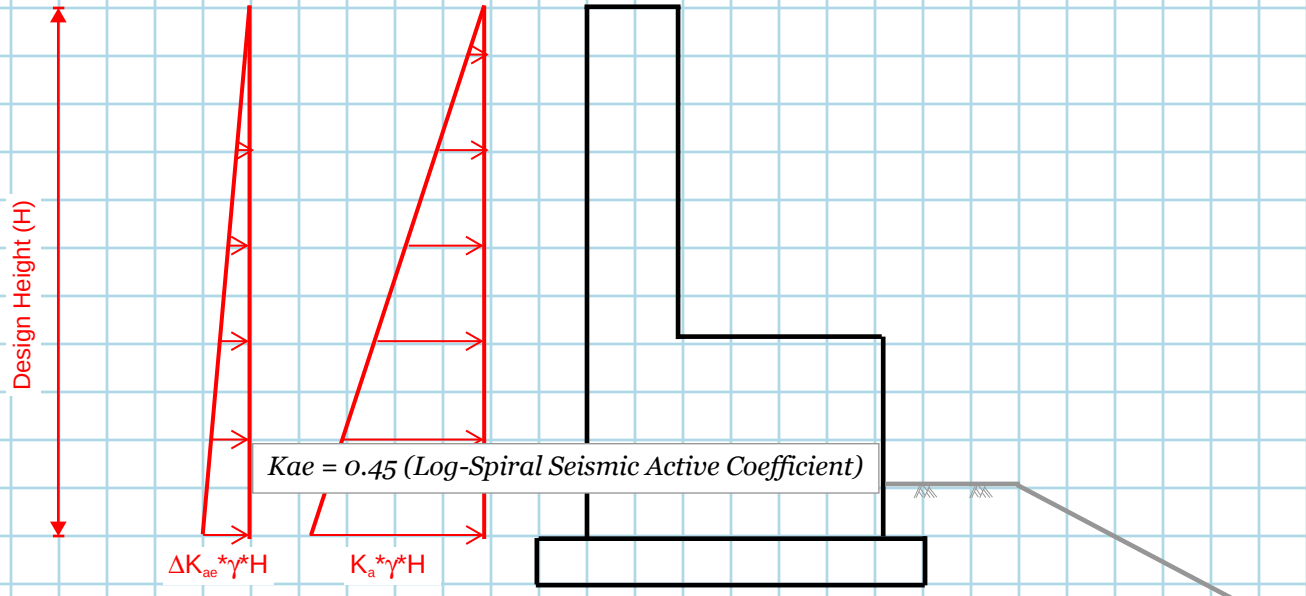
Total Force P = 1.96 Kips/ft of wall

Point of Action = 4.9 ft below top of wall

EARTH RETAINING SYSTEM SEISMIC EARTH PRESSURE

By: AL
Date: 5/17/2020

EBRC Earth Retaining System Seismic Earth Pressure



Illustrative purposes only / Not to Scale

The abutment foundations are on "Not Competent Soil" and per AASHTO LRFD C11.6.5, they are not exempt from Extreme Event (Seismic) design.

Recommended values for lateral soil pressures/coefficients for un-restrained earth retaining systems are shown below:
γ = 120 pcf
K_a = 0.30 (In-Situ Lateral Coefficient)
K_{ae} = 0.45 (Seismic Active Coefficient per AASHTO)(Phi = 32.5-degree and c' = 150 psf)
ΔK_{ae} = 0.15 (Incremental Seismic Active Coefficient)
Based on the above, Incremental Seismic Force can be calculated as $0.5*H*(\Delta K_{ae}*\gamma*H) = 9.00*H^2$ lb/ft

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LATERAL EARTH PRESSURES FOR MSE WALL

Rankine Active Lateral Pressure Coefficient (K_a)

Project Name/Number: Eastridge to BART Regional Connector **By:** EO
Structure Name/Number: MSE Wall **Date:** 3/5/2019

Parameters	Angle in degrees	Angle in radians	
ϕ	34	0.593	(Friction Angle of Soil)
β	0	0.000	(Backfill angle with horizontal)

K_a	0.28

Recommend 0.3

$$K_a = \frac{\cos\beta - \left(\cos^2\beta - \cos^2\phi\right)^{1/2}}{\cos\beta + \left(\cos^2\beta - \cos^2\phi\right)^{1/2}}$$

M-O Seismic Active Lateral Pressure Coefficient (K_{AE})

Project Name/Number: Eastridge to BART Regional Connector **By:** EO

Structure Name/Number: MSE Wall **Date:** 3/5/2019

Parameters	Angle in degrees	Angle in Radians	
ϕ	34	0.593	(Friction Angle of Soil)
i	0	0.000	(Backfill angle with horizontal)
β	0	0.000	(Wall backface angle **with vertical**)
δ	22.78	0.398	(Friction Angle between Soil and the backface of the wall)

kh (no unit)	0.23	
kv (no unit)	0	
θ_{MO} (rad)		0.226

K_{ae}	0.43

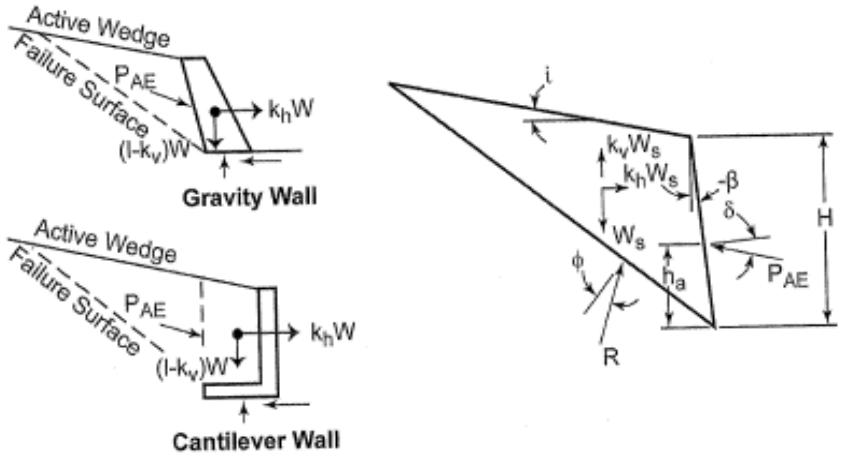


Figure A11.3.1-1—Mononobe-Okabe Method Force Diagrams

$$K_{AE} = \frac{\cos^2(\phi - \theta_{MO} - \beta)}{\cos\theta_{MO}\cos^2\beta\cos(\delta+\beta+\theta_{MO})} \times \left[1 + \sqrt{\frac{\sin(\phi+\delta)\sin(\phi-\theta_{MO}-i)}{\cos(\delta+\beta+\theta_{MO})\cos(i-\beta)}}\right]^{-2} \qquad \text{(A11.3.1-1)}$$

where:

K_{AE} = seismic active earth pressure coefficient (dim)
γ = unit weight of soil (kcf)
H = height of wall (ft)
h = height of wall at back of wall heel considering height of sloping surcharge, if present (ft)
ϕ_f = friction angle of soil (degrees)
θ_{MO} = arc tan $[k_h/(1 - k_v)]$ (degrees)
δ = wall backfill interface friction angle (degrees)
k_h = horizontal seismic acceleration coefficient (dim.)
k_v = vertical seismic acceleration coefficient (dim.)
i = backfill slope angle (degrees)
β = slope of wall to the vertical, negative as shown (degrees)

SETTLEMENT ANALYSES FOR MSE WALL

SETTLEMENT ANALYSIS

PROJECT NAME	***Eastridge to BART Regional Connector***
PROJECT NO.	***2017-125-GEO***
STRUCTURE	***MSE WALL [Sta 969+57.48 - 972+02.48 (NB & SE***
REFERENCE BORI	***AS-1***
Hammer Energy =	60%
GW Level (ft)=	15

Footing Depth (ft) =	2.5
Fill Height (ft)=	22
Base Width, B (ft)=	32
Side Slope (XH:1V)=	-
Effective Width, B' (ft)=	32
Length, L (ft)=	-
Plane Strain? (Y/N)	Y
Contact Pressure (psf)=	2860

Cr/Cc= 25.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	8	3	26	MC	17	125.0	125.0	27.0%	1000	500	2731.9	2113		8450	16.9	739375				0.355				0.355
8	13	3	17	MC	11	125.0	125.0	23.0%	625	1313	2288.0	1381	1100	4400	3.4	483438				0.284				0.284
13	18	3	16	MC	10	125.0	62.6	18.0%	313	1782	2033.8	1300		5200	2.9	455000				0.268				0.268
18	24	1	29	SPT	29	125.0	62.6	14.0%	376	2126	1812.3								98				0.197	0.197
24	30	2	29	MC	19	125.0	62.6	18.6%	376	2501	1619.8	2356	1500	6000	2.4		0.0360	0.1441			0.562			0.562
30	35	3	25	MC	16	125.0	62.6	27.6%	313	2846	1476.1	2031		8125	2.9	710938				0.125				0.125
35	39	2	30	MC	20	125.0	62.6	27.6%	250	3127	1376.2	2438	940	3760	1.2		0.0356	0.1426			0.137	0.536		0.673
39	45	3	50	SPT	50	125.0	62.6	27.0%	376	3440	1280.0	6250		25000	7.3	2187500				0.042				0.042
45	49	3	38	MC	25	125.0	62.6	27.0%	250	3753	1196.3	3088		12350	3.3	1080625				0.053				0.053
49	55	3	31	MC	20	125.0	62.6	17.6%	376	4066	1122.9	2519		10075	2.5	881563				0.092				0.092
55	58	3	23	SPT	23	125.0	62.6	21.4%	188	4348	1064.2	2875		11500	2.6	1006250				0.038				0.038
58	65	1	50	MC	33	125.0	62.6	18.4%	438	4661	1005.7								80				0.089	0.089
65	77	1	34	MC	22	125.0	62.6	25.6%	751	5256	910.6								63				0.159	0.159
77	84	2	38	MC	25	125.0	62.6	34.9%	438	5851	832.0	3088	2020	8080	1.4		0.0258	0.1031			0.125			0.125
84	93	1	50	SPT	50	125.0	62.6	11.2%	563	6351	775.6								97				0.055	0.055
93	102	3	74	MC	48	125.0	62.6	9.1%	563	6915	720.6	6013		24050	3.5	2104375				0.037				0.037
102	112	2	50	MC	33	125.0	62.6	12.2%	626	7509	670.5	4063		16250	2.2		0.0305	0.1219			0.136			0.136
112	124	3	70	MC	46	125.0	62.6	18.7%	751	8198	620.5	5688		22750	2.8	1990625				0.045				0.045

PARIKH
Practicing in the Geosciences

PROJECT NO. 2017-125-GEO
PROJECT NAME Eastridge to BART Reg. Con.
CALCULATED BY EO DATE 3/6/19
CHECKED BY AL DATE 3/12/19
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT Consolidation Time for MSE Wall

AS-1 Sample #3 Consol Test:

t_{90} = 31.36 min Hdr = 1/2 = 0.5"
Load = 25.6 ksf Normally-consolidated
T_{90} = 0.848 (for 90% consolidation time factor)

$$c_v = \frac{T_{90} \times Hdr^2}{t_{90}} = \frac{0.848 \times (0.5)^2}{31.36} = 0.067\ ft^2/day$$

* Settlement time for the layer between 35 to 39 ft (AS-1)

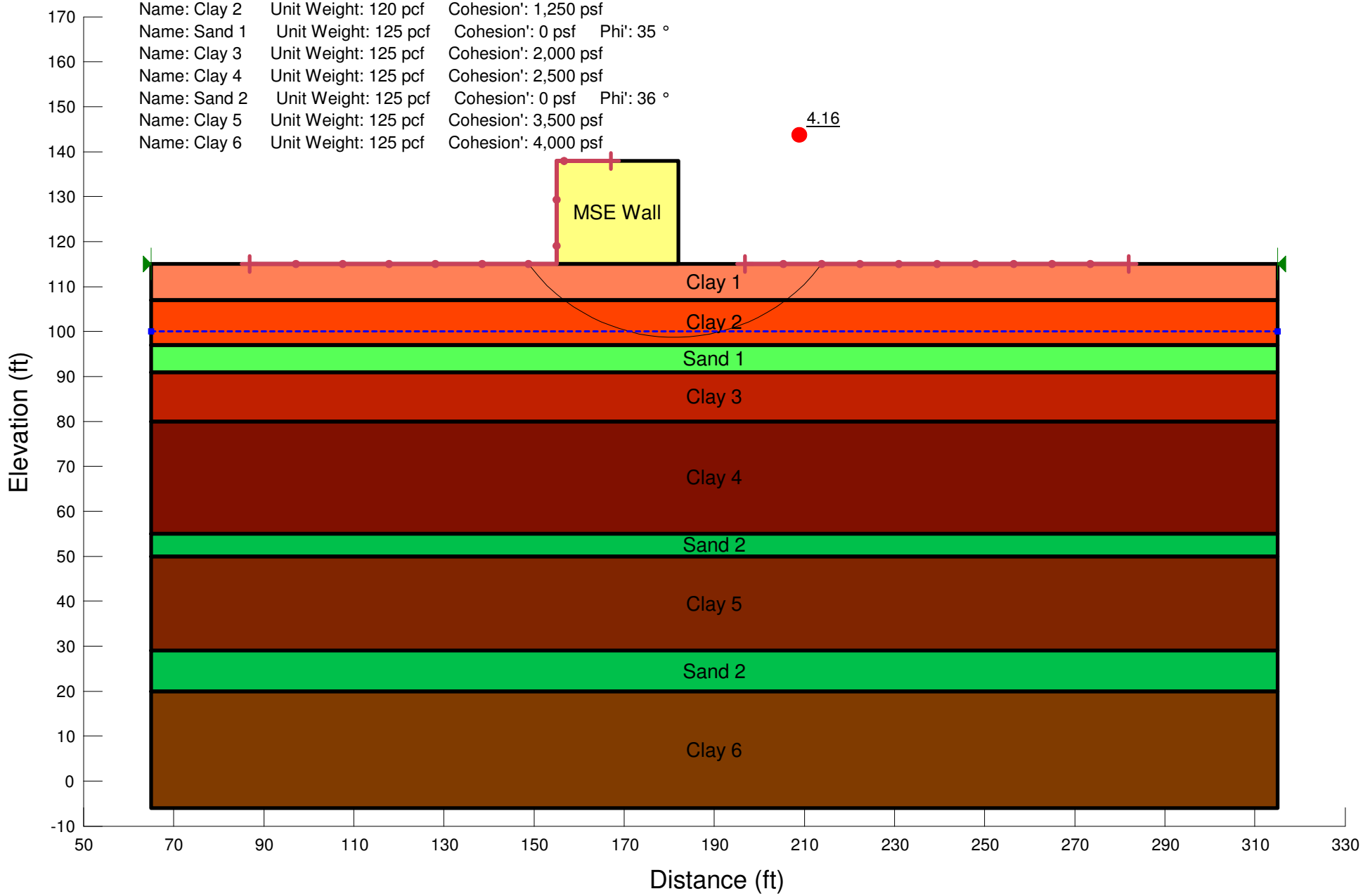
$$t_{90} = \frac{0.848 \times (4/12)^2}{0.067} \cong 51\ days$$

say 60 days

GLOBAL STABILITY ANALYSES

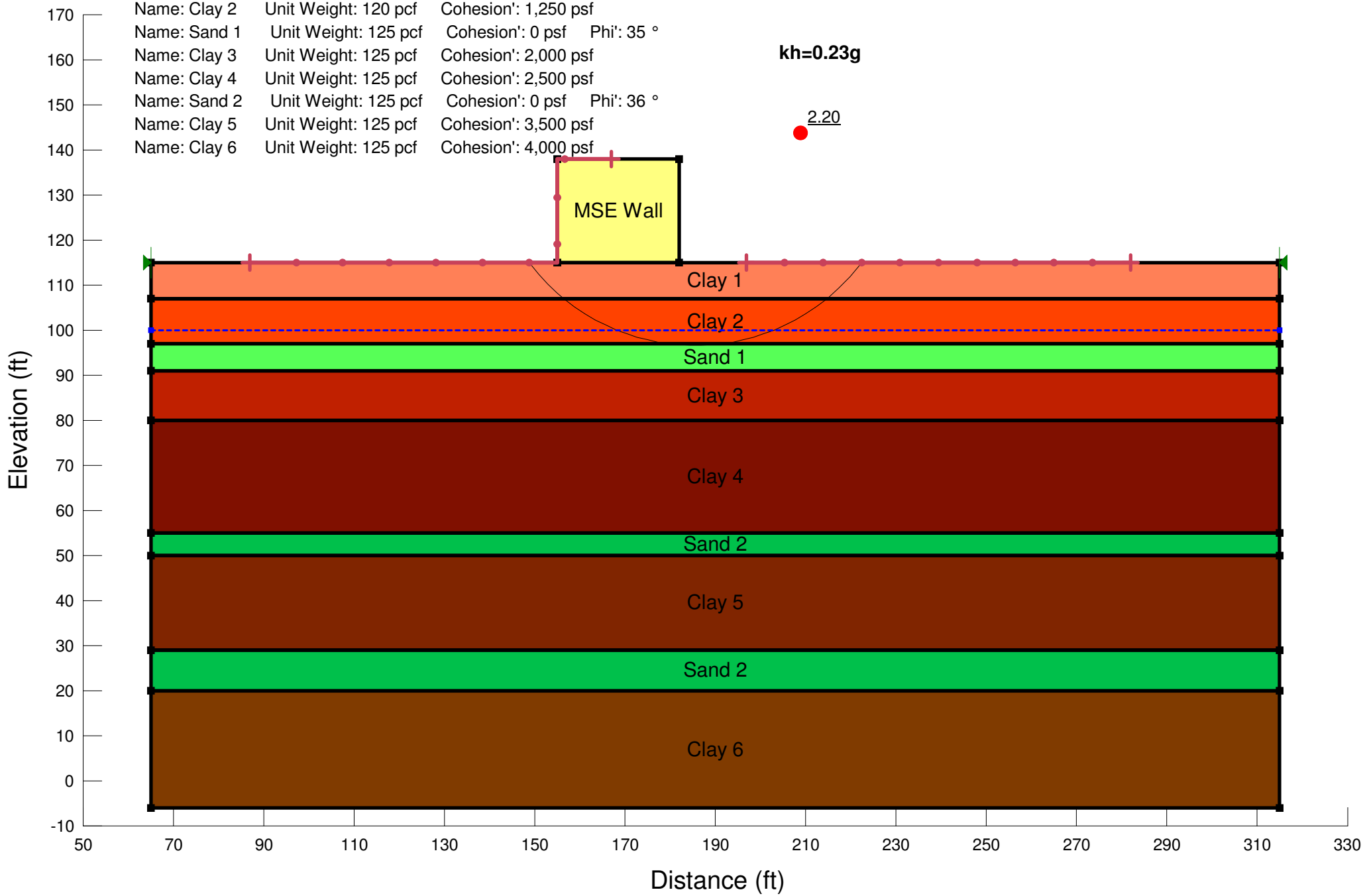
Eastridge to BART Regional Connector Project
North Approach MSE Wall (RW No. 2)_Static Case

Name: MSE Wall Unit Weight: 130 pcf
Name: Clay 1 Unit Weight: 125 pcf Cohesion': 1,750 psf
Name: Clay 2 Unit Weight: 120 pcf Cohesion': 1,250 psf
Name: Sand 1 Unit Weight: 125 pcf Cohesion': 0 psf Phi': 35 °
Name: Clay 3 Unit Weight: 125 pcf Cohesion': 2,000 psf
Name: Clay 4 Unit Weight: 125 pcf Cohesion': 2,500 psf
Name: Sand 2 Unit Weight: 125 pcf Cohesion': 0 psf Phi': 36 °
Name: Clay 5 Unit Weight: 125 pcf Cohesion': 3,500 psf
Name: Clay 6 Unit Weight: 125 pcf Cohesion': 4,000 psf

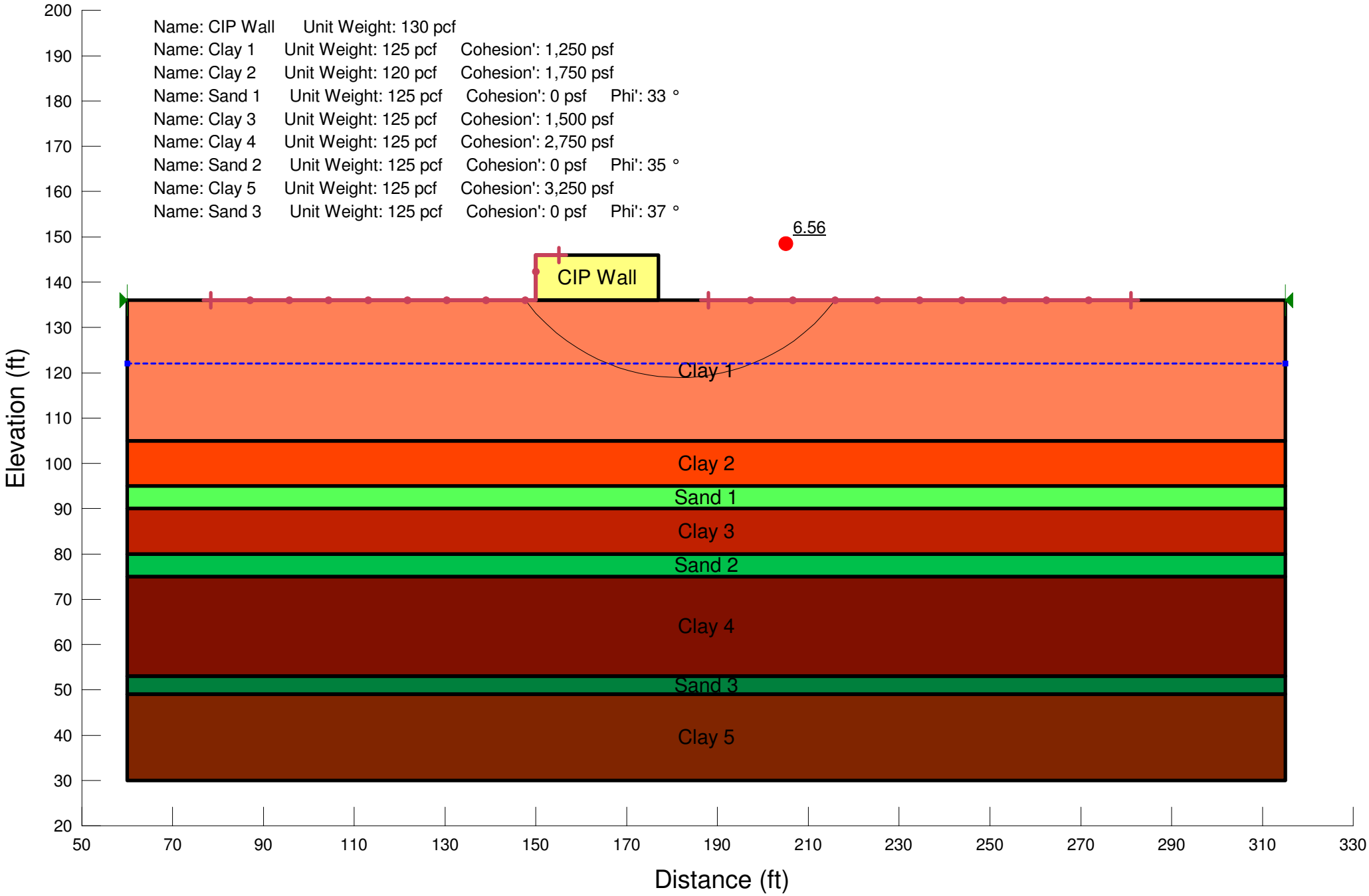


Eastridge to BART Regional Connector Project
North Approach MSE Wall (RW No. 2)_Pseudo-Static Case

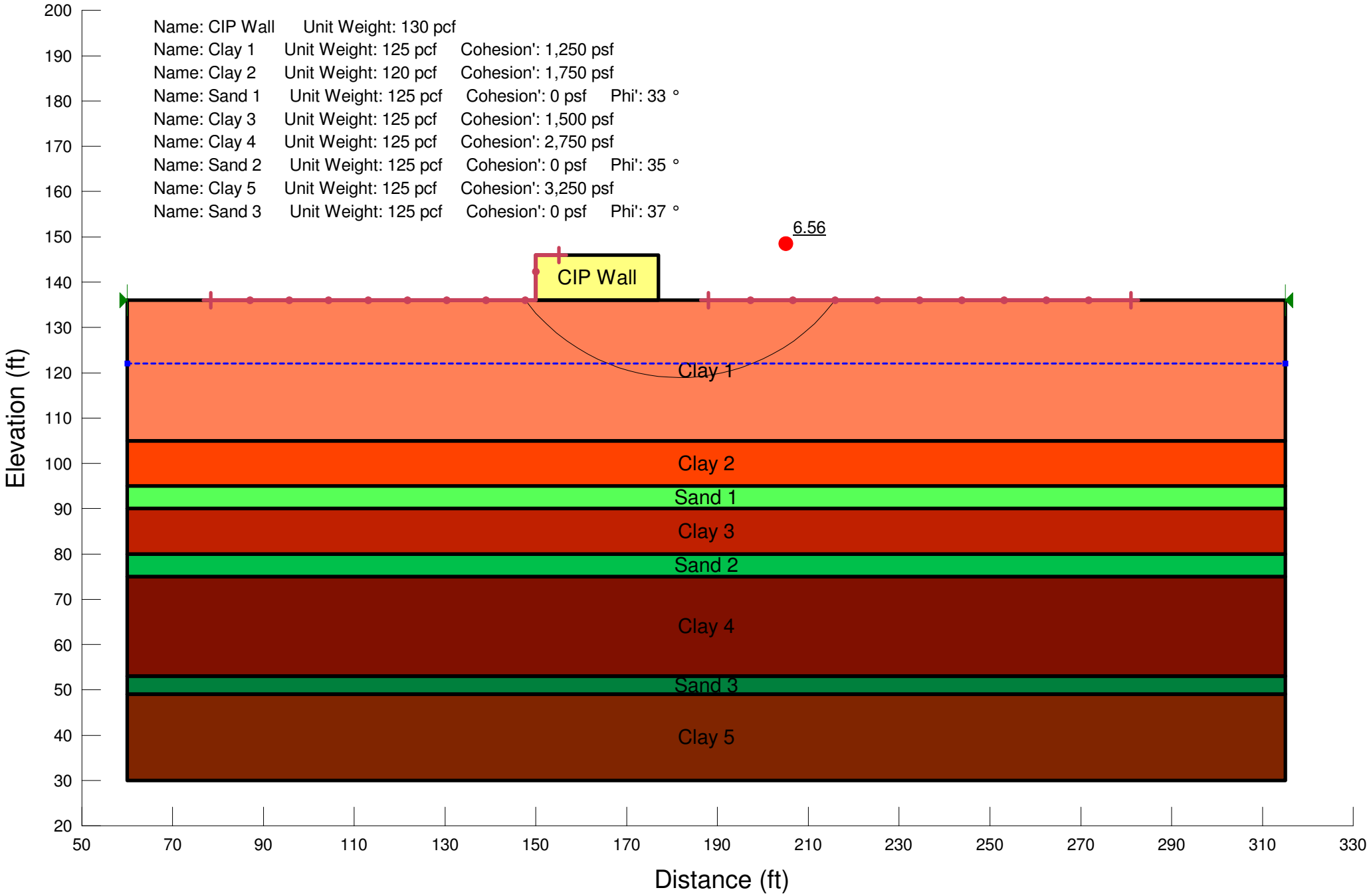
Name: MSE Wall Unit Weight: 130 pcf
Name: Clay 1 Unit Weight: 125 pcf Cohesion': 1,750 psf
Name: Clay 2 Unit Weight: 120 pcf Cohesion': 1,250 psf
Name: Sand 1 Unit Weight: 125 pcf Cohesion': 0 psf Phi': 35 °
Name: Clay 3 Unit Weight: 125 pcf Cohesion': 2,000 psf
Name: Clay 4 Unit Weight: 125 pcf Cohesion': 2,500 psf
Name: Sand 2 Unit Weight: 125 pcf Cohesion': 0 psf Phi': 36 °
Name: Clay 5 Unit Weight: 125 pcf Cohesion': 3,500 psf
Name: Clay 6 Unit Weight: 125 pcf Cohesion': 4,000 psf



Eastridge to BART Regional Connector Project
South Approach CIP Wall (RW No. 5)_Static Case



Eastridge to BART Regional Connector Project
South Approach CIP Wall (RW No. 5)_Static Case



STRUCTURAL PAVEMENT DESIGN

PAVEMENT DESIGN

PER HIGHWAY DESIGN MANUAL, CHAP. 600

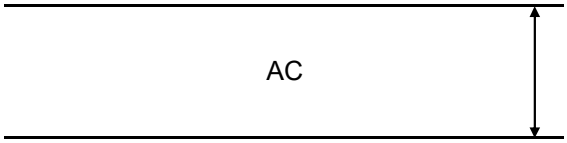
PROJECT NAME: *Eastridge to BART Regional Connector Project*
PROJECT NO.: *2017-125-GEO*

Design Case: Full depth AC

Design TI= ***10.5*** ***Capitol Expressway ("SB" Sta. 1024+70-Sta. 1037+15)***
R_{BS}= ***5***

$GE_{AC} = 0.0032*TI*(100-R_{BS}) =$		3.19	
=>	GE'_{AC}=	3.29	(add 0.1 ft safety factor)
=>	AC Thickness=	1.37	
=>	AC Thickness=	**1.40**	ft (round up to the nearest 0.05 ft)

Design Section:



1.40 ft

Base Soil

PAVEMENT DESIGN

PER HIGHWAY DESIGN MANUAL, CHAP. 600

PROJECT NAME: *Eastridge to BART Regional Connector Project*
PROJECT NO.: *2017-125-GEO*

Design Case: AC over AB

Design TI= ***10.5*** ***Capitol Expressway ("SB" Sta. 1024+70-Sta. 1037+15)***
R_{BS}= ***5***
R_{AB}= 78

$GE_{AC+AB} = 0.0032*TI*(100-R_{BS}) =$ 3.19

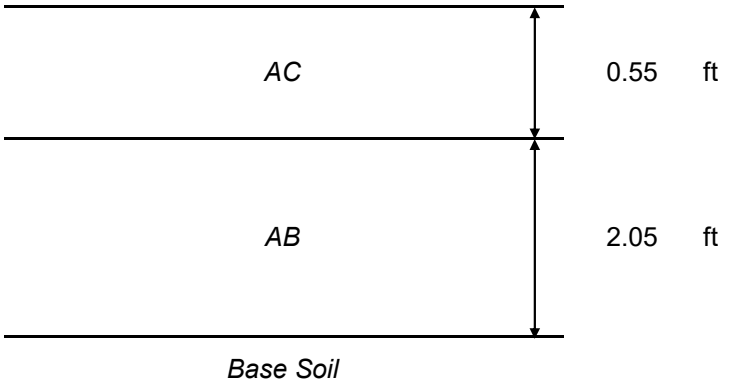
$GE_{AC} = 0.0032*TI*(100-R_{AB}) =$ 0.74
=> GE'_{AC} = 0.94 (add 0.2 ft safety factor)
AC Thickness = 0.54 ft

=> AC Thickness = **0.55** ft (round up to the nearest 0.05 ft)
$G_{f, AC}$ = 1.77
GE_{AC} = 0.97

$GE_{AB} = GE_{AC+AB} - GE_{AC} =$ 2.22
AB thickness= 2.02 ft

=> AB Thickness= **2.05** ft (round up to the nearest 0.05 ft)
GE_{AB}= 2.26 $G_{f, AB}$=1.1

Design Section:



PAVEMENT DESIGN

PER HIGHWAY DESIGN MANUAL, CHAP. 600

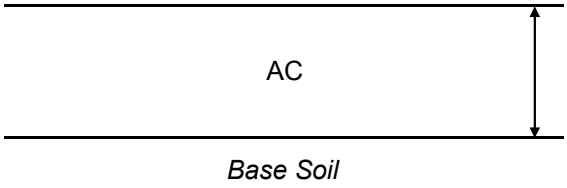
PROJECT NAME: *Eastridge to BART Regional Connector Project*
PROJECT NO.: *2017-125-GEO*

Design Case: Full depth AC

Design TI= ***9.5*** ***Capitol Avenue&City Street("SB" Sta. 1024+70 - Sta. 1037+15)***
R_{BS}= ***5***

$GE_{AC} = 0.0032*TI*(100-R_{BS}) =$		2.89	
=>	GE'_{AC}=	2.99	(add 0.1 ft safety factor)
=>	AC Thickness=	1.23	
=>	AC Thickness=	**1.25**	ft (round up to the nearest 0.05 ft)

Design Section:



PAVEMENT DESIGN

PER HIGHWAY DESIGN MANUAL, CHAP. 600

PROJECT NAME: *Eastridge to BART Regional Connector Project*
PROJECT NO.: *2017-125-GEO*

Design Case: AC over AB

Design TI= ***9.5*** ***Capitol Avenue&City Street("SB" Sta. 1024+70 - Sta. 1037+15)***
R_{BS}= ***5***
R_{AB}= 78

$GE_{AC+AB} = 0.0032*TI*(100-R_{BS}) =$ 2.89

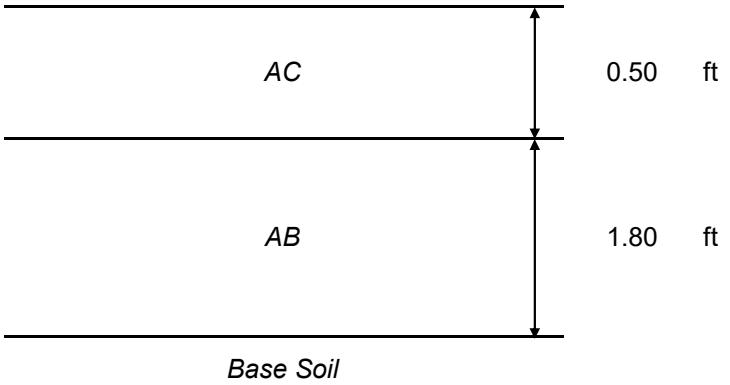
$GE_{AC} = 0.0032*TI*(100-R_{AB}) =$ 0.67
=> GE'_{AC} = 0.87 (add 0.2 ft safety factor)
AC Thickness = 0.47 ft

=> AC Thickness = **0.50** ft (round up to the nearest 0.05 ft)
$G_{f, AC}$ = 1.84
GE_{AC} = 0.92

$GE_{AB} = GE_{AC+AB} - GE_{AC} =$ 1.97
AB thickness= 1.79 ft

=> AB Thickness= **1.80** ft (round up to the nearest 0.05 ft)
GE_{AB}= 1.98 $G_{f, AB}$=1.1

Design Section:



PAVEMENT DESIGN

PER HIGHWAY DESIGN MANUAL, CHAP. 600

PROJECT NAME: *Eastridge to BART Regional Connector Project*
PROJECT NO.: *2017-125-GEO*

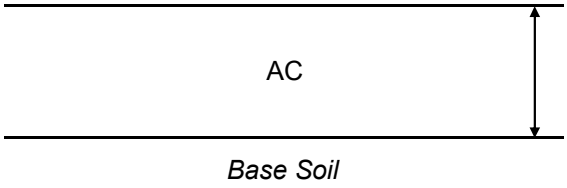
Design Case: Full depth AC

Design TI= ***7.0*** ***Park-and-Ride Lot***
R_{BS}= ***10***

$GE_{AC} = 0.0032*TI*(100-R_{BS}) =$ 2.02
=> GE'_{AC}= 2.12 (add 0.1 ft safety factor)
=> AC Thickness= 0.85

=> AC Thickness= **0.85** ft (round up to the nearest 0.05 ft)

Design Section:



PAVEMENT DESIGN

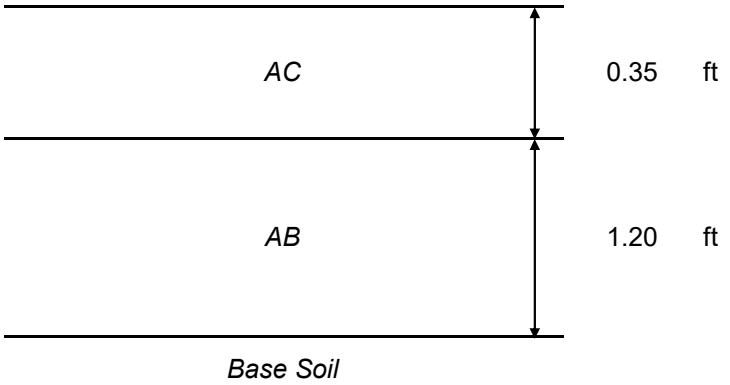
PER HIGHWAY DESIGN MANUAL, CHAP. 600

PROJECT NAME: *Eastridge to BART Regional Connector Project*
PROJECT NO.: *2017-125-GEO*

Design Case: AC over AB

Design TI=	***7.0***	***Park-and-Ride Lot***	
R_{BS}=	***10***		
R_{AB}=	78		
$GE_{AC+AB} = 0.0032*TI*(100-R_{BS}) =$		2.02	
$GE_{AC} = 0.0032*TI*(100-R_{AB}) =$		0.49	
=>	GE'_{AC} =	0.69	(add 0.2 ft safety factor)
	AC Thickness =	0.32	ft
=>	AC Thickness =	**0.35**	ft (round up to the nearest 0.05 ft)
	$G_{f, AC}$ =	2.14	
	GE_{AC} =	0.75	
$GE_{AB} = GE_{AC+AB} - GE_{AC} =$		1.27	
	AB thickness=	1.15	ft
=>	AB Thickness=	**1.20**	ft (round up to the nearest 0.05 ft)
	GE_{AB}=	1.32	$G_{f, AB}$=1.1

Design Section:



PAVEMENT DESIGN

PER HIGHWAY DESIGN MANUAL, CHAP. 600

PROJECT NAME: *Eastridge to BART Regional Connector Project*
PROJECT NO.: *2017-125-GEO*

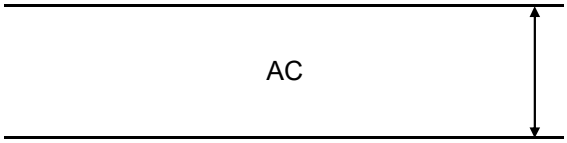
Design Case: Full depth AC

Design TI= ***8.0*** ***Park-and-Ride Lot***
R_{BS}= ***10***

$GE_{AC} = 0.0032*TI*(100-R_{BS}) =$ 2.30
=> GE'_{AC}= 2.40 (add 0.1 ft safety factor)
=> AC Thickness= 0.98

=> AC Thickness= **1.00** ft (round up to the nearest 0.05 ft)

Design Section:



1.00 ft

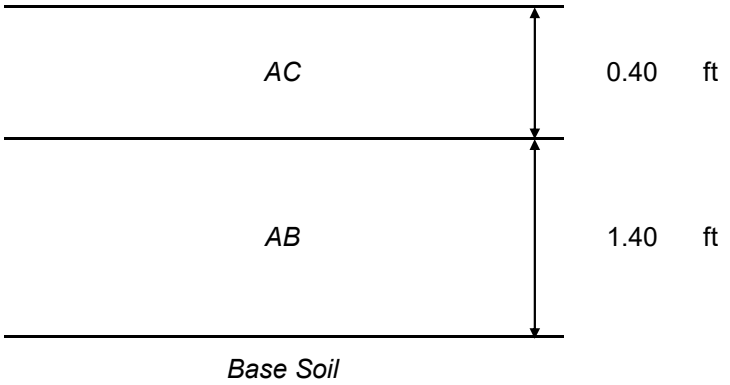
Base Soil

PAVEMENT DESIGN

PER HIGHWAY DESIGN MANUAL, CHAP. 600

PROJECT NAME: *Eastridge to BART Regional Connector Project*
PROJECT NO.: *2017-125-GEO*

Design Case: AC over AB

Design TI=	***8.0***	***Park-and-Ride Lot***	
R_{BS}=	***10***		
R_{AB}=	78		
$GE_{AC+AB} = 0.0032*TI*(100-R_{BS}) =$		2.30	
$GE_{AC} = 0.0032*TI*(100-R_{AB}) =$		0.56	
=>	GE'_{AC} =	0.76	(add 0.2 ft safety factor)
	AC Thickness =	0.38	ft
=>	AC Thickness =	**0.40**	ft (round up to the nearest 0.05 ft)
	$G_{f, AC}$ =	2.00	
	GE_{AC} =	0.80	
$GE_{AB} = GE_{AC+AB} - GE_{AC} =$		1.50	
	AB thickness=	1.37	ft
=>	AB Thickness=	**1.40**	ft (round up to the nearest 0.05 ft)
	GE_{AB}=	1.54	$G_{f, AB}$=1.1

Design Section: