Alabama State Port Authority

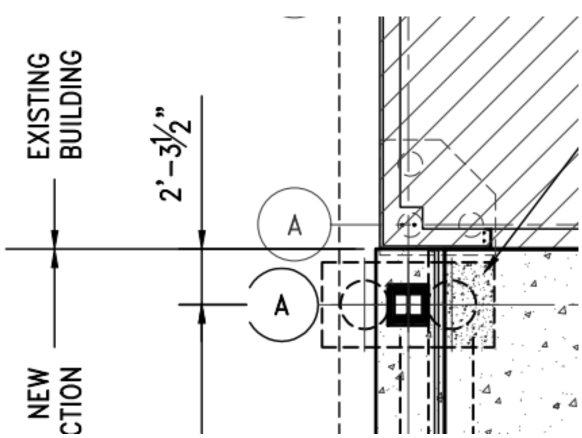
Addendum to R&P or Specification Booklet

Project Name Pit and Roof Extension TASD Diesel Shop

Project No. 11407 **Task No.** 02 **Addendum No.** 2

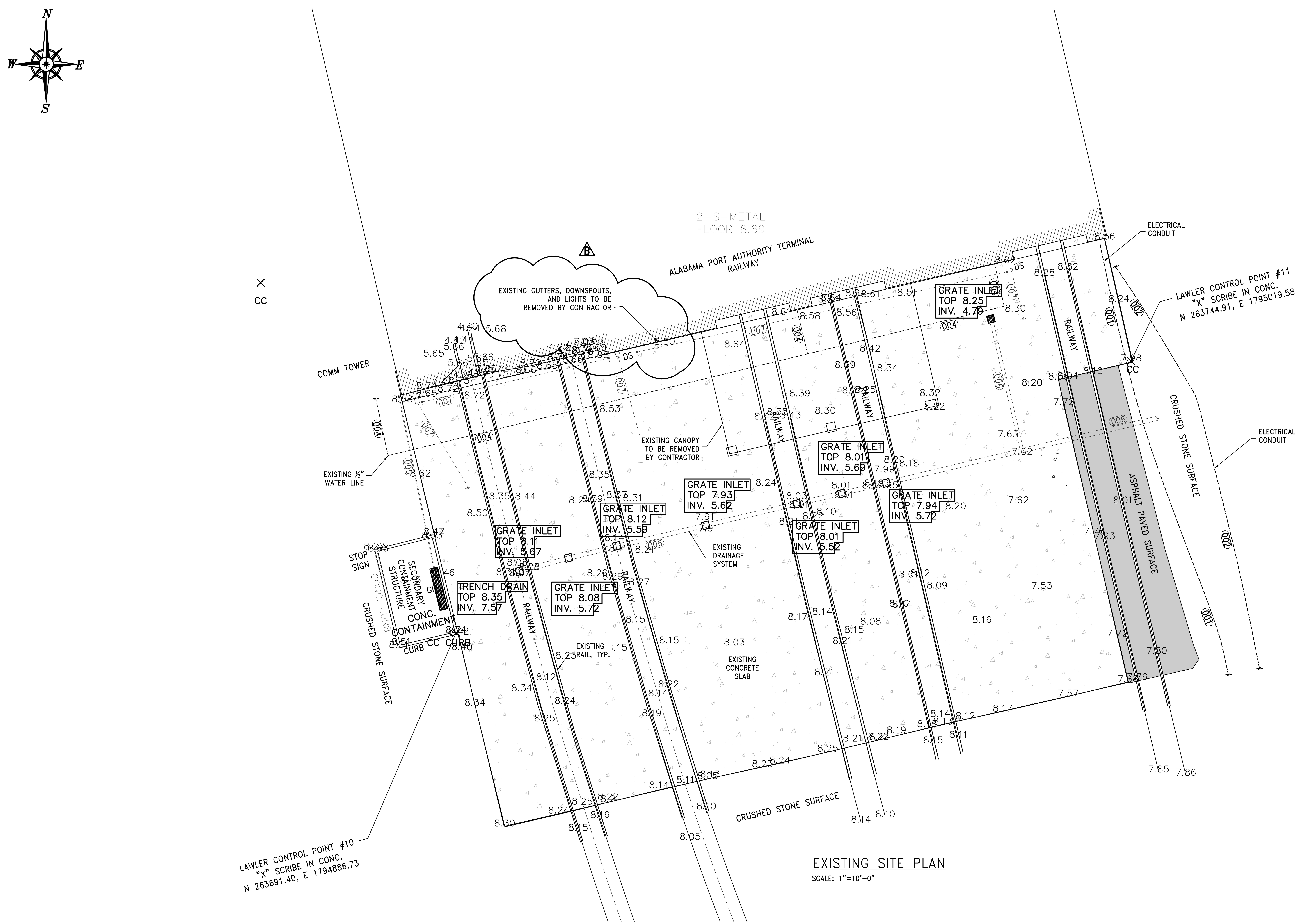
To: Prospective Bidders **Date:** 05/02/2025

The following items are clarifications to questions received. These items are hereby included in the bid documents by this addendum.

Item	Description
1.	Question: Is there a geotechnical report? If so, could you please send it over so we can review the soil conditions on the site? Answer: Yes, the Geotech report will be provided to all prospective bidders.
2.	Question: Is there a confirmed working grade? Answer: See revised 4503-C1.
3.	Question: What is Top of Cap elevation for all the isolated one and two pile caps? Answer: Top of Cap elevation for A1, A2 and A3 is 5.6. Top of Cap elevation for all remaining caps is 8.6.
4.	Question: To your knowledge, are there any horizontal or vertical proximity issues that would affect a drilling rig? We typically need at least 5’ of clearance horizontally and no restrictions vertically. Answer: See clip below. Column line A is 2’-3-1/2” from the centerline of the pile to the edge of the existing building. 

5.	Question: Can you confirm that there are no 16" piles on the project? The pile details show both 14" and 24" piles, but there is one callout for 16" in drawing 4503-F4 detail 5A. Answer: There are no 16" piles on the project. Only 14" and 24". See revised 4503-F4.
6.	Question: Can you confirm that the bid lengths are as noted: 55' pay pile for 14". 65' pay pile for 24". There is a conflicting note on drawing 4503-F2 showing a 55' 24" pile. Answer: The 14" piles are 55' long and the 24" piles are 65' long. See revised 4503-F2.
7.	Question: Could you please provide a list of approved rail road contractors in the area? Answer: Contractor must be qualified to perform the work.
8.	Question: During the prebid meeting, it was said that rail work would be assisted by ASPA. Please clarity what scope of work the contractor is to include. Answer: All removal, storage, handling, and installation of rail shall be performed by the contractor. All rail activities shall be coordinated with ASPA/TRR personnel.
9.	Question: The schedule of prices lists out the installation of the jib crane. I have not seen any details or specifications of the jib crane. Please provide info in order to price the installation. Answer: Details for the jib crane foundation/anchor bolts can be found on 4503-F7. The contractor is only responsible for the jib crane foundation and setting the anchor bolts. The jib crane will be installed at a later date by owner.
10.	Question: Could you please provide a Geotech report? Answer: Yes, the Geotech report will be provided to all prospective bidders.
11.	Question: The Enlarged Foundation Plan of the pit area as shown on drawing 4503 – F3 seems to show (8) pilings having a larger diameter than 14" as scaled on Detail G/F4. These piling scale 16" diameter, however there is no detail for a 16" diameter auger cast pile. Detail 5A/F4 calls for a 16" diameter pile at the location shown on detail F/F3 as a 14" Diameter pile. Section E/F3 identifies (4) piles as 14" diameter at the location shown on detail A/F4 as 24" diameter piles. Please clarify. Answer: There are no 16" augercast piles. The larger piles called out as 14" on 4503 – F3 should be 24" diameter -See addendum 1, revised 4503-F3. On Section E, the piles supporting a cap with a 4'-0" pedestal are 24" diameter. See revised 4503-F4.

12.	Question: Would an NZ 26 sheetpile be acceptable for the jack pit? Answer: Yes, this is an acceptable alternative to the AZ26-700 sheetpiles.
13.	Question: What is the water table elevation at the location of the Jack Pump Pit? Answer: See Geotech report.
14.	Question: Division 13, Section 8.0, paragraph 8.1 refers to a standing seam roof system, and paragraph 8.3 requires the panels to be screwed to secondary fasteners with stainless steel screws. This could imply a PBR roof panel. Are the metal building roof panels to be standing seam or PBR screw-down? Answer: Roof must match existing building roof ribs.



EXISTING SITE PLAN

SCALE: 1"=10'-0"

NOTE:

SEE E.F. THOMPSON GEOTECHNOLOGIES, INC. DRAWING #24-046A FOR UTILITY DETAILS. CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL UTILITY LOCATIONS.

REV.	DESCRIPTION	DATE	BY	CHK'D
C	ADDENDUM 2 – REVISED SPOT ELEVATIONS	05/01/25	VTH	WBS
B	ADDENDUM 1	04/22/25	VTH	WBS
A	ISSUED FOR BID	04/04/25	VTH	WBS

11880 Cranston Drive, Ste. 101
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(901) 290-5444

CMG ENGINEERS, INC.

457 St. Michael Street
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(251) 433-1611

PROJECT

TRR RAIL PIT EXPANSION

MOBILE ALABAMA

TITLE

EXISTING SITE PLAN

DATE 04/02/25 22x34 REV. C

DRAWING NUMBER 4503–C1

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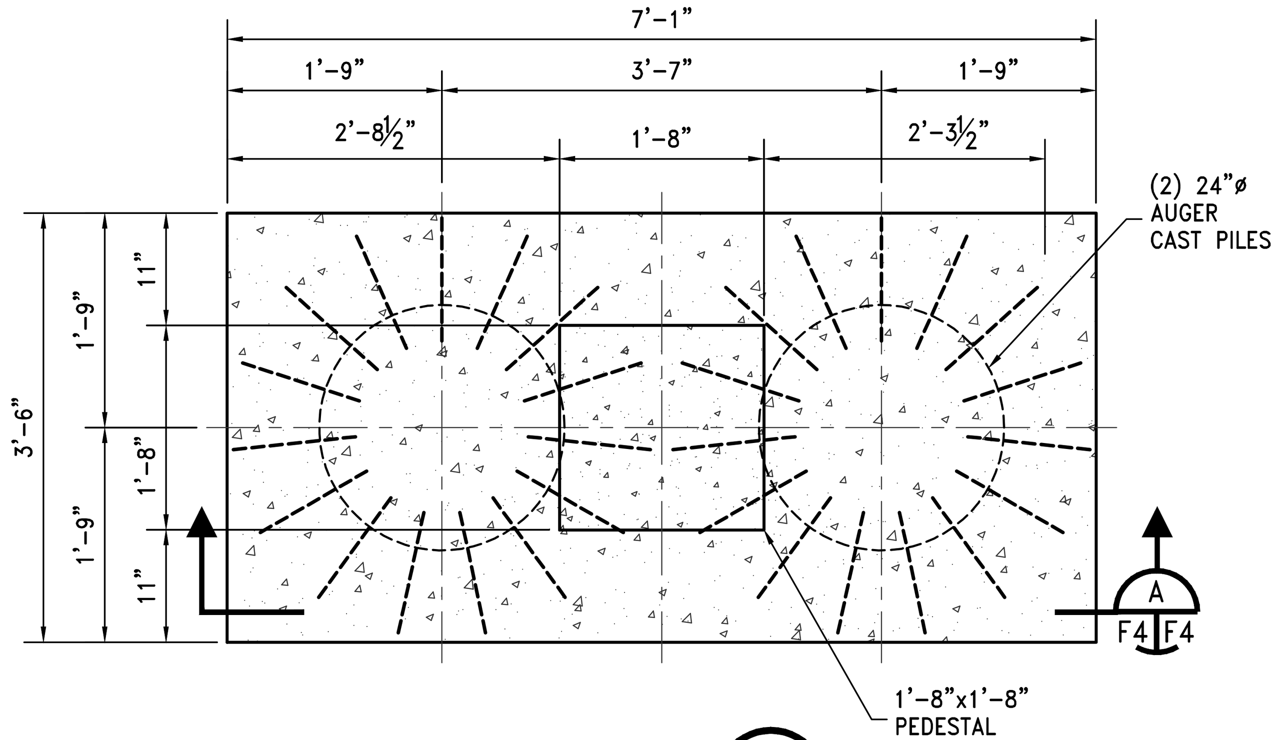
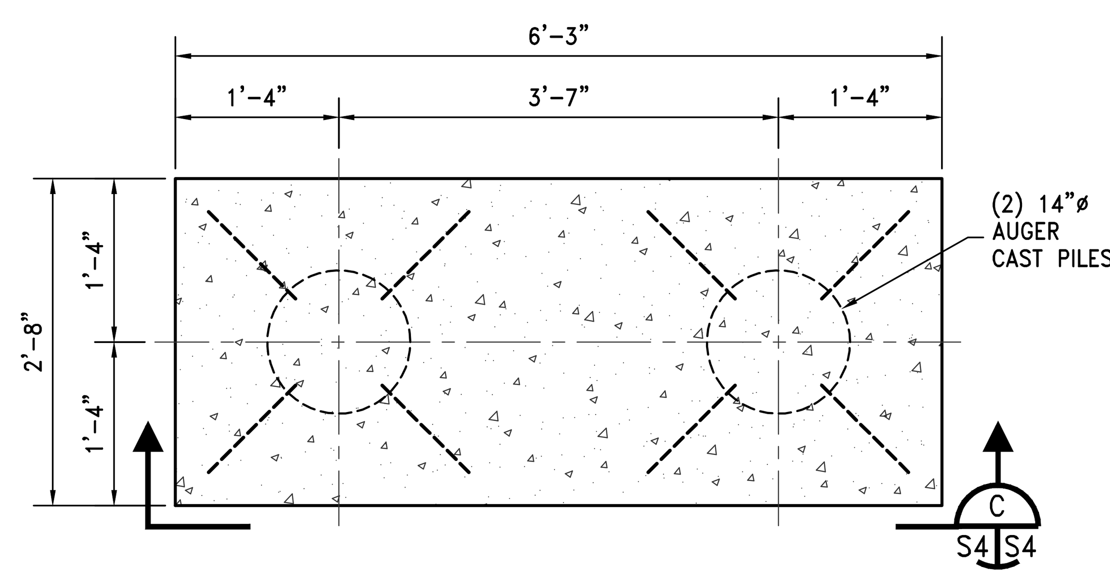
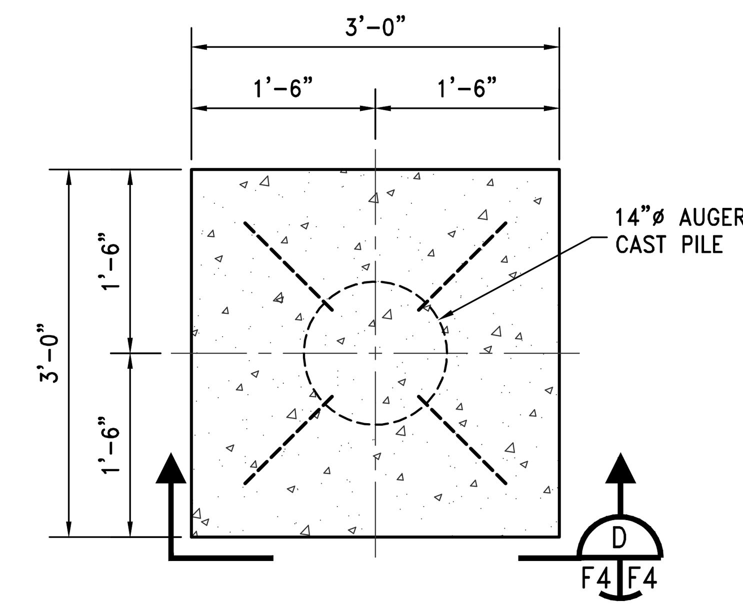


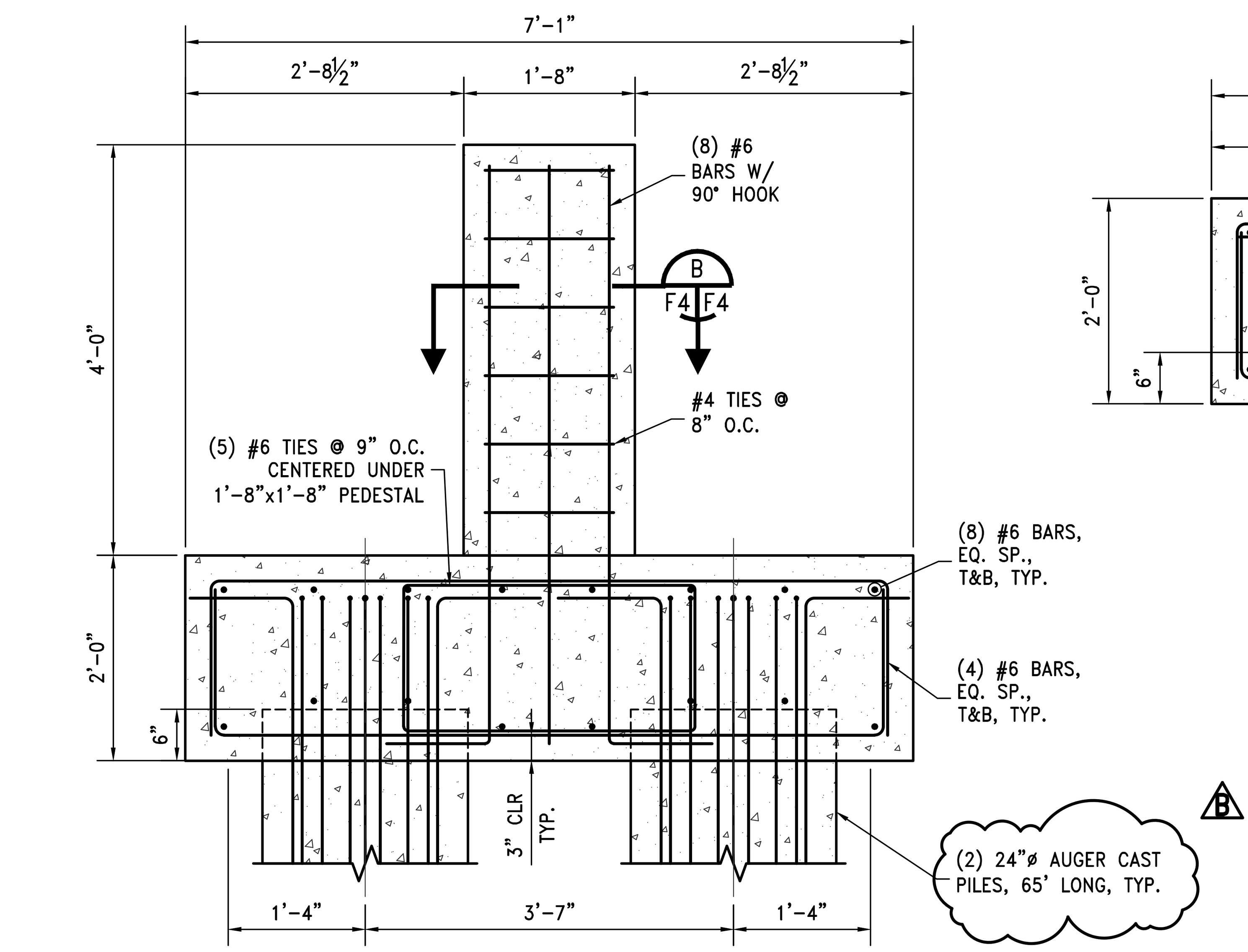
DETAIL 1
3/4""=1'-0" F2 F4



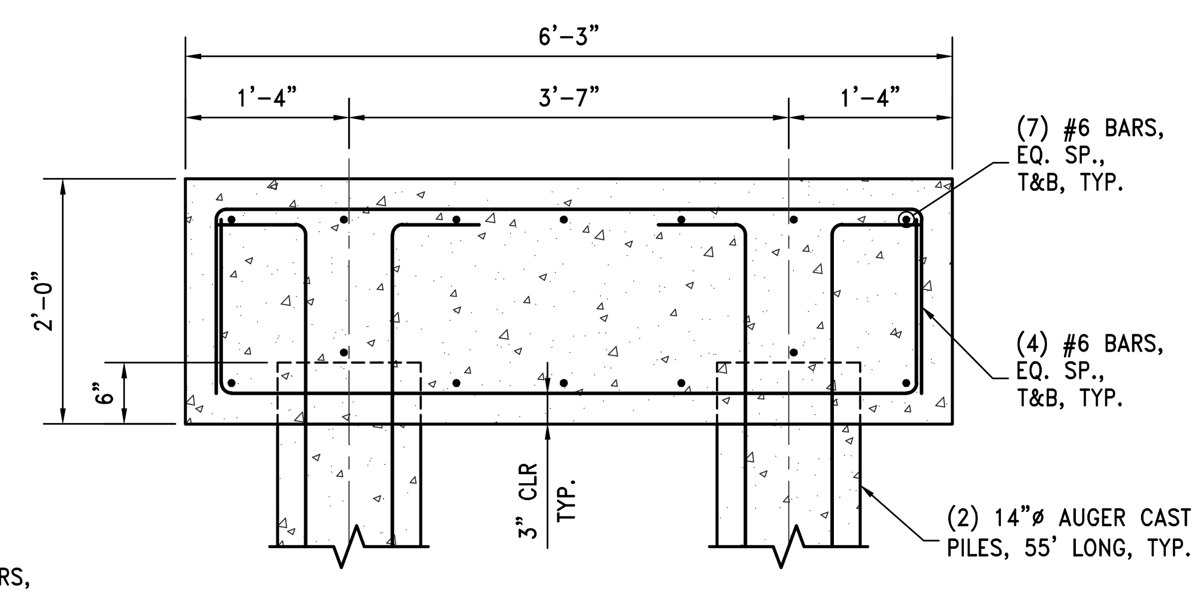
DETAIL 2
3/4""=1'-0" F2 F4



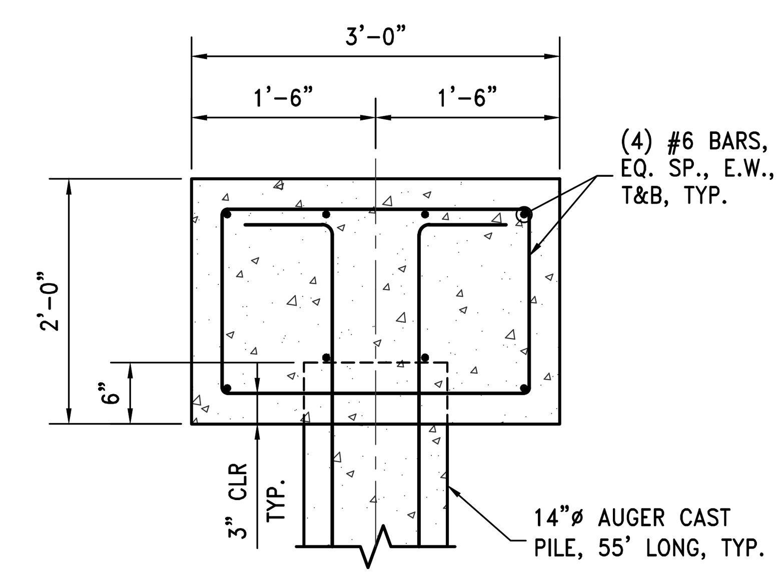
DETAIL 3
3/4""=1'-0" F2 F4



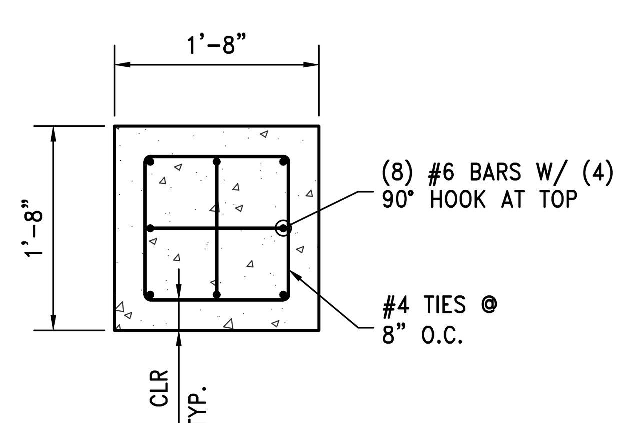
SECTION A
3/4"=1'-0" F4 F4



SECTION C
3/4"=1'-0" F4 F4

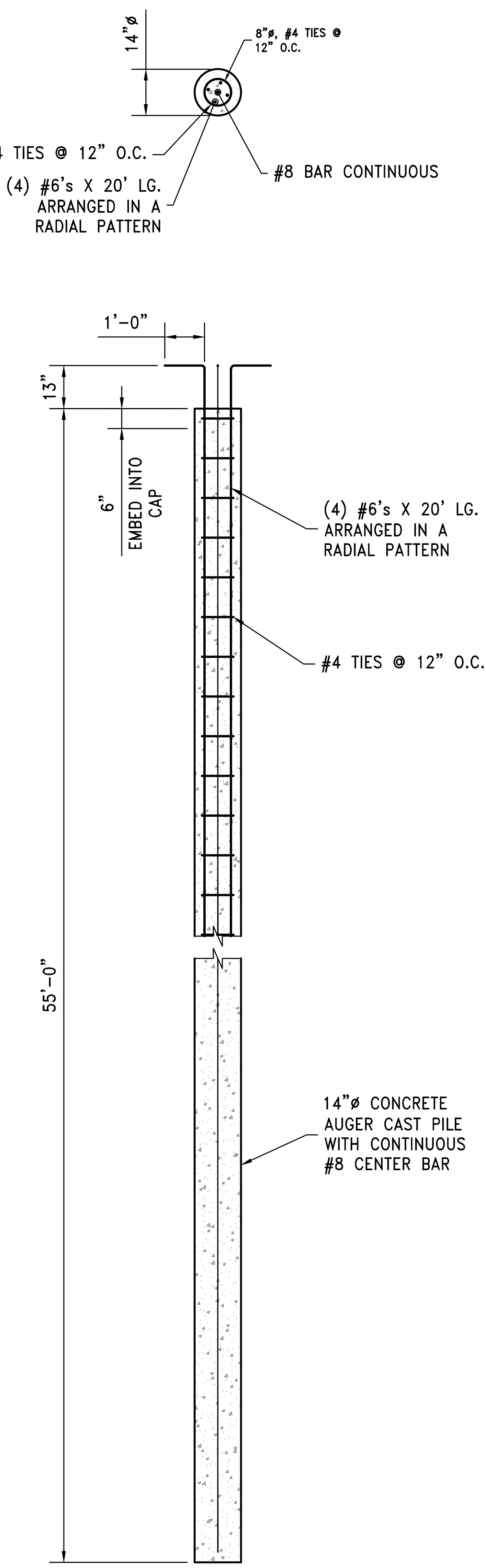


SECTION D
3/4"=1'-0" F4 F4

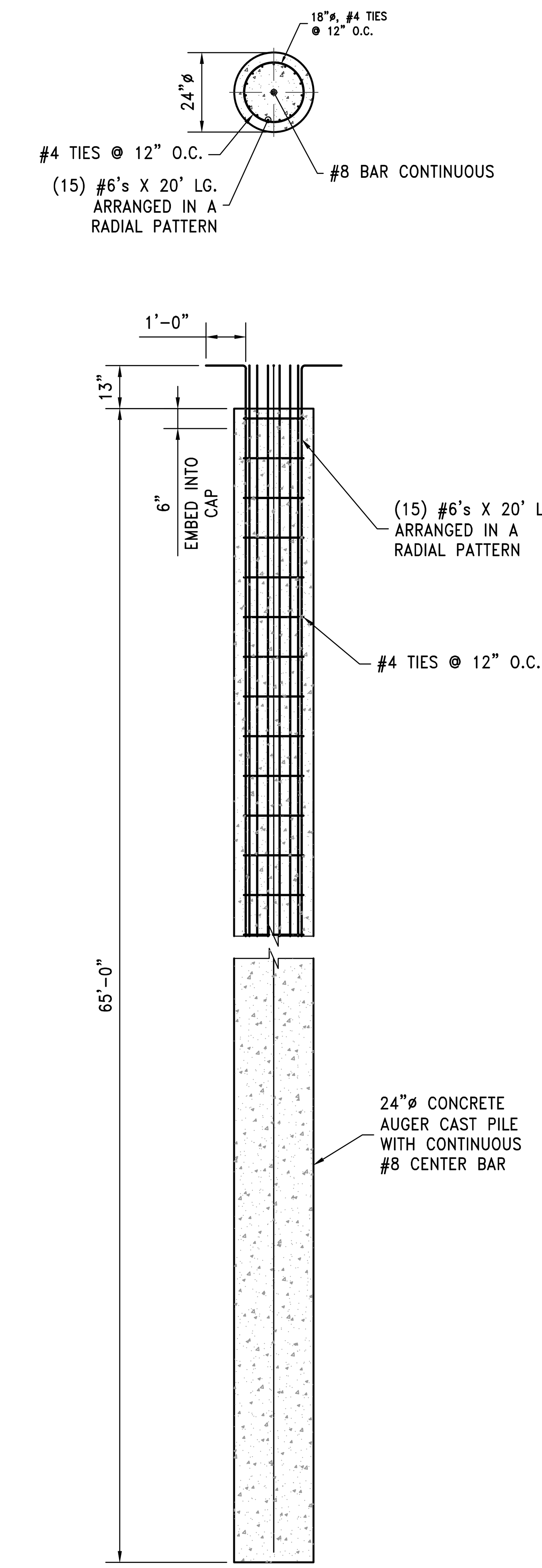


SECTION B
3/4"=1'-0" F4 F4

* PEDESTAL, FOUNDATION, REINFORCEMENT AND PILE SIZES MAY BE REVISED BASED ON PRE-ENGINEERED METAL BUILDING (PROVIDED BY CONTRACTOR) REACTIONS AND DETAILS.



14" AUGER CAST PILE DETAIL
N.T.S.



24" AUGER CAST PILE DETAIL
N.T.S.

REV.	DESCRIPTION	DATE	BY	CHK'D
B	ADDENDUM 2	05/01/25	VTH	WBS
A	ISSUED FOR BID	04/04/25	VTH	WBS

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PROJECT
TRR RAIL PIT EXPANSION
MOBILE
ALABAMA

TITLE
FOUNDATION DETAILS AND SECTIONS

DATE 04/02/25
22x34 REV. B
DRAWING NUMBER 4503-F2

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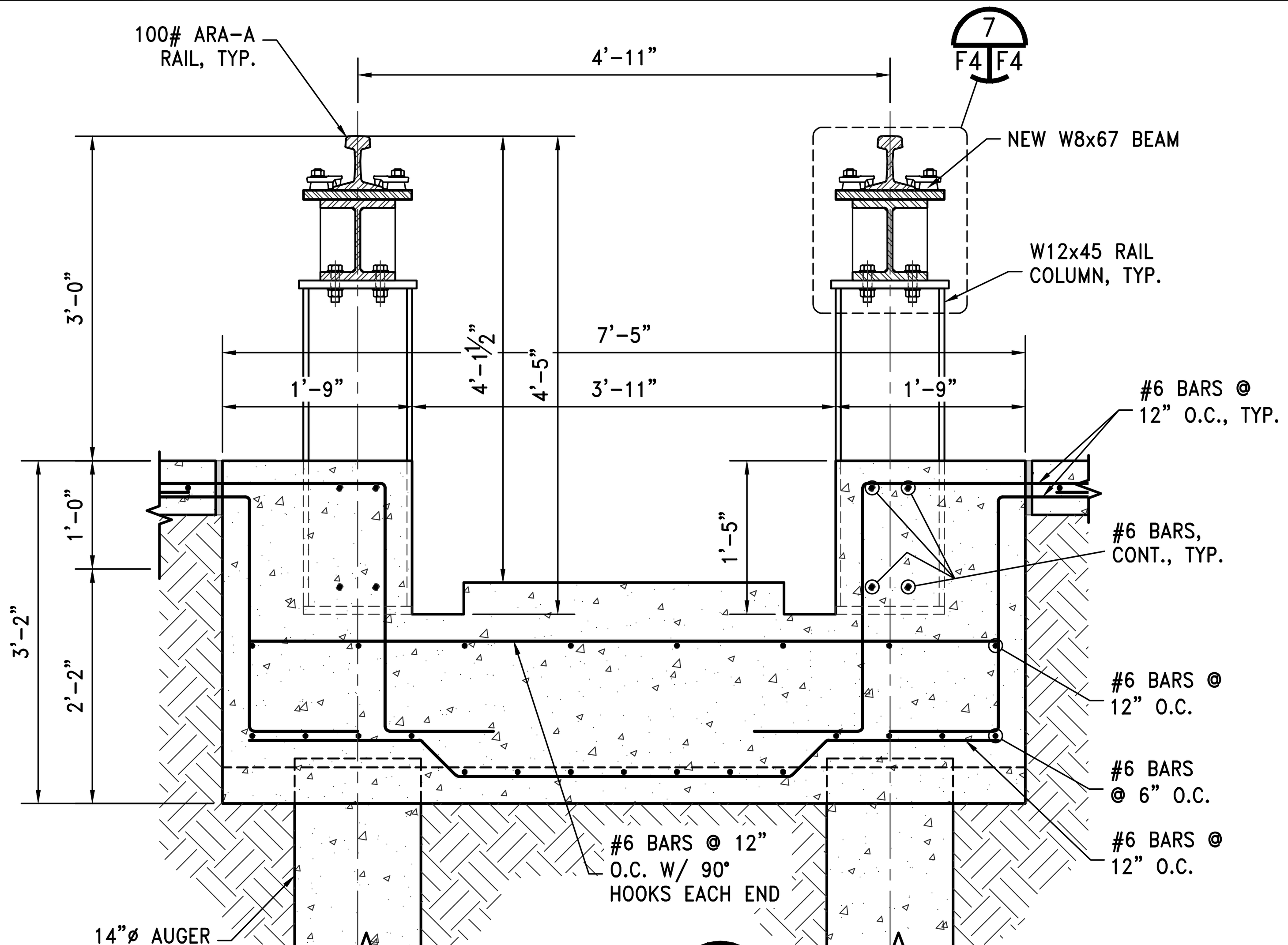

DETAIL 4
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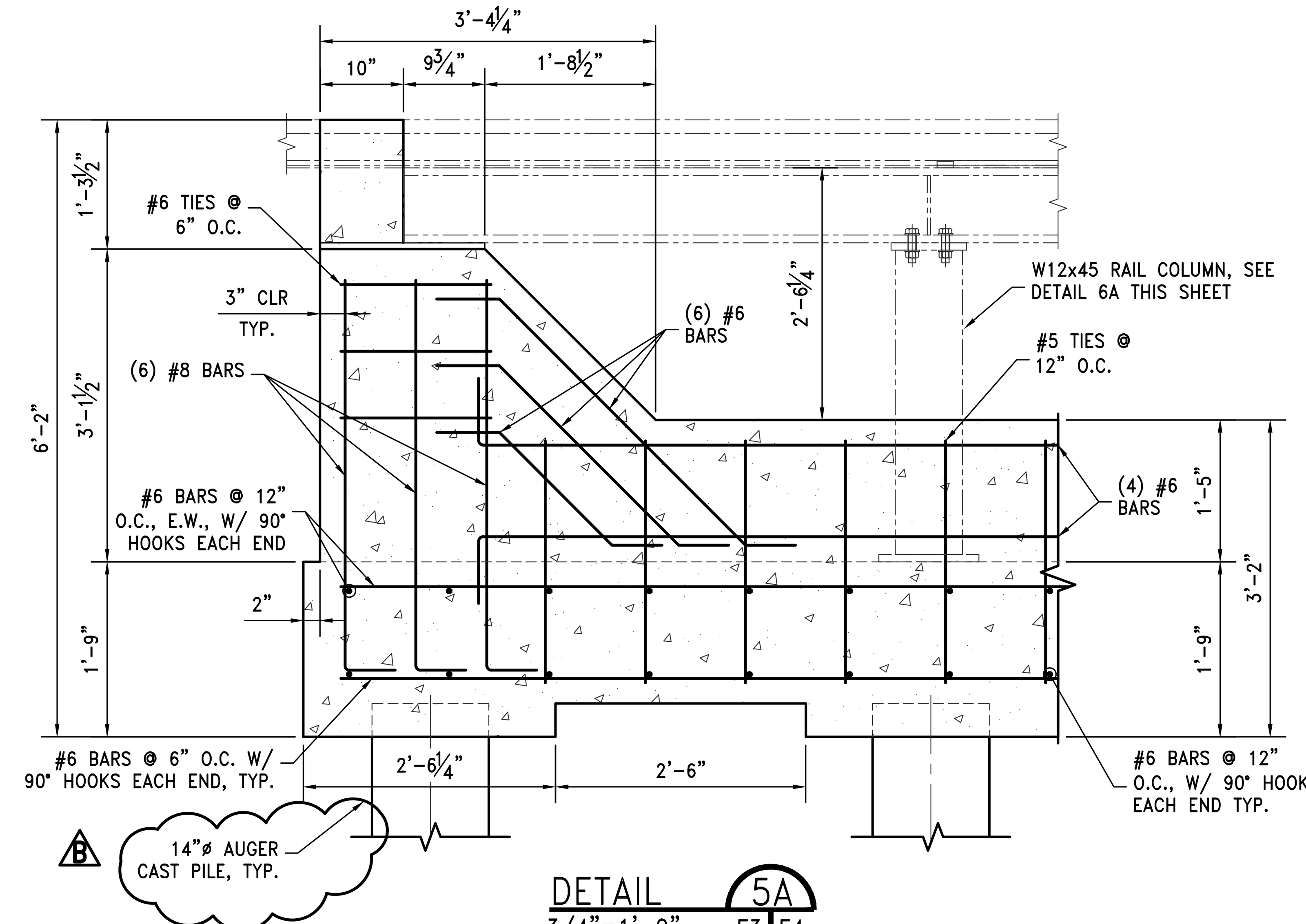
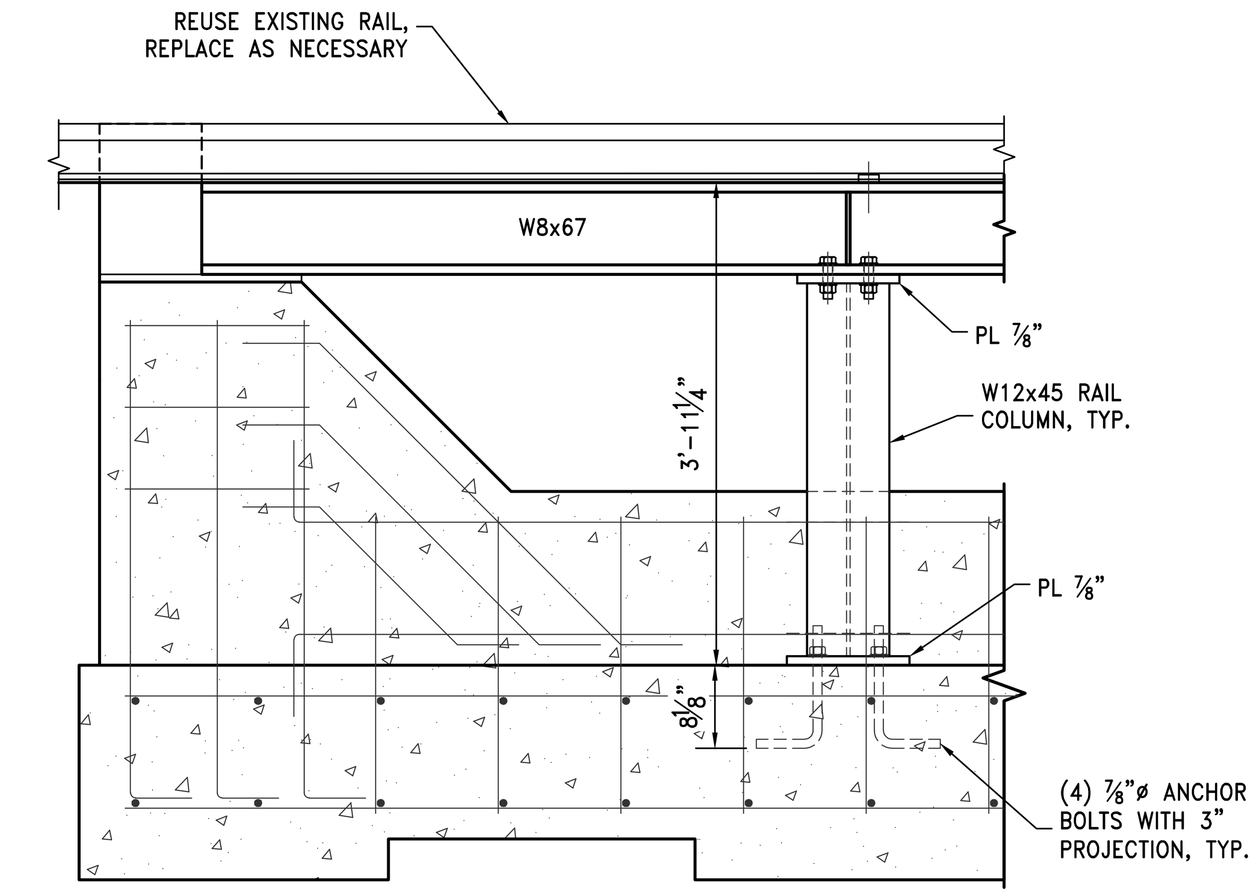


DETAIL 5A
3/4"=1'-0" F3 F4



DETAIL 6A
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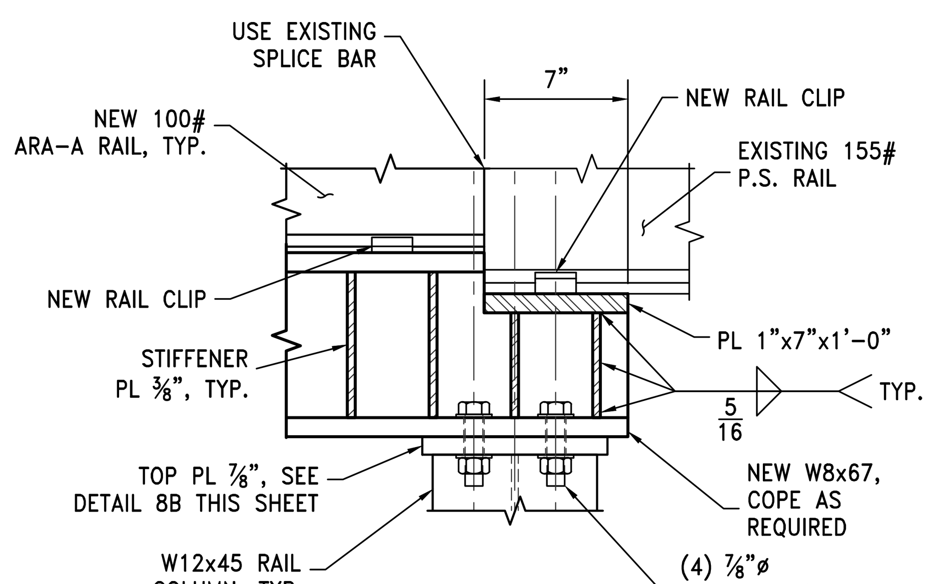
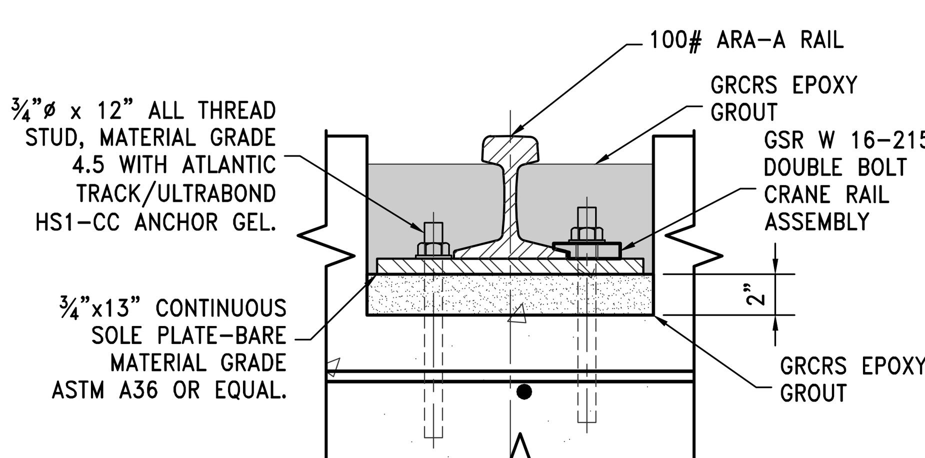
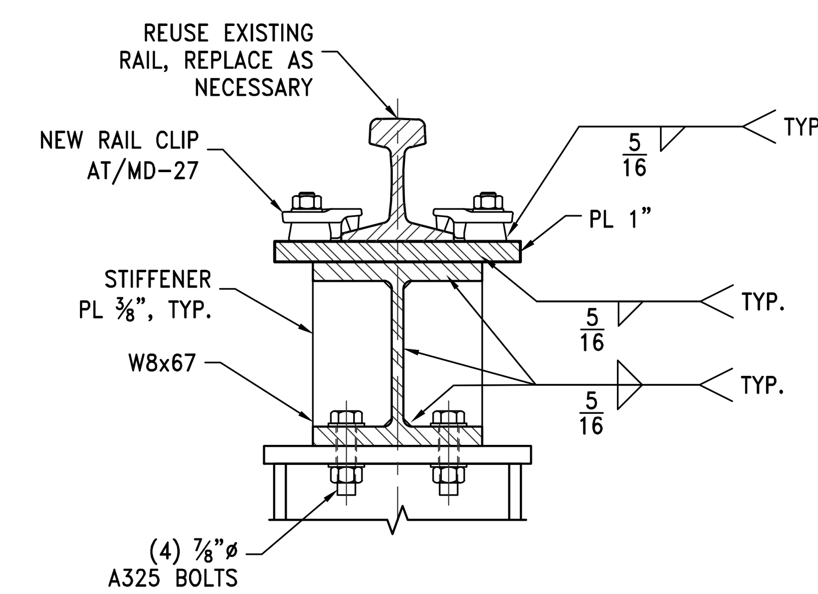


DETAIL 5B
1 1/2"=1'-0" F3 F4



DETAIL 6B
3/4"=1'-0" F4 F4



DETAIL 7
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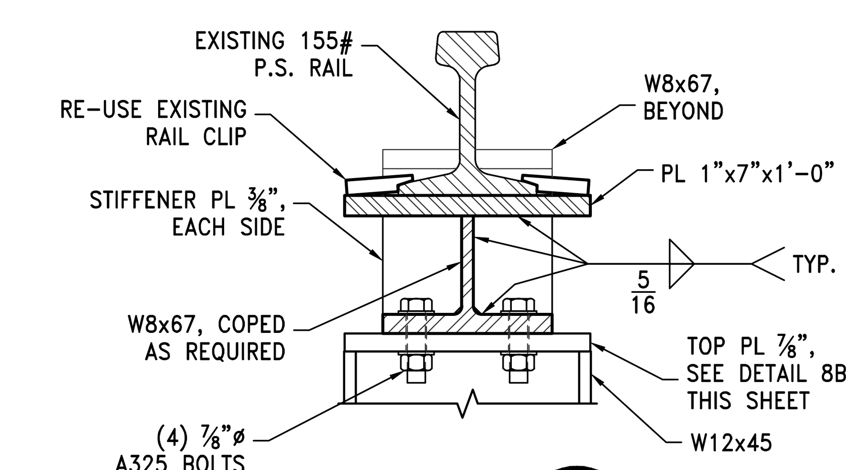

DETAIL 8A
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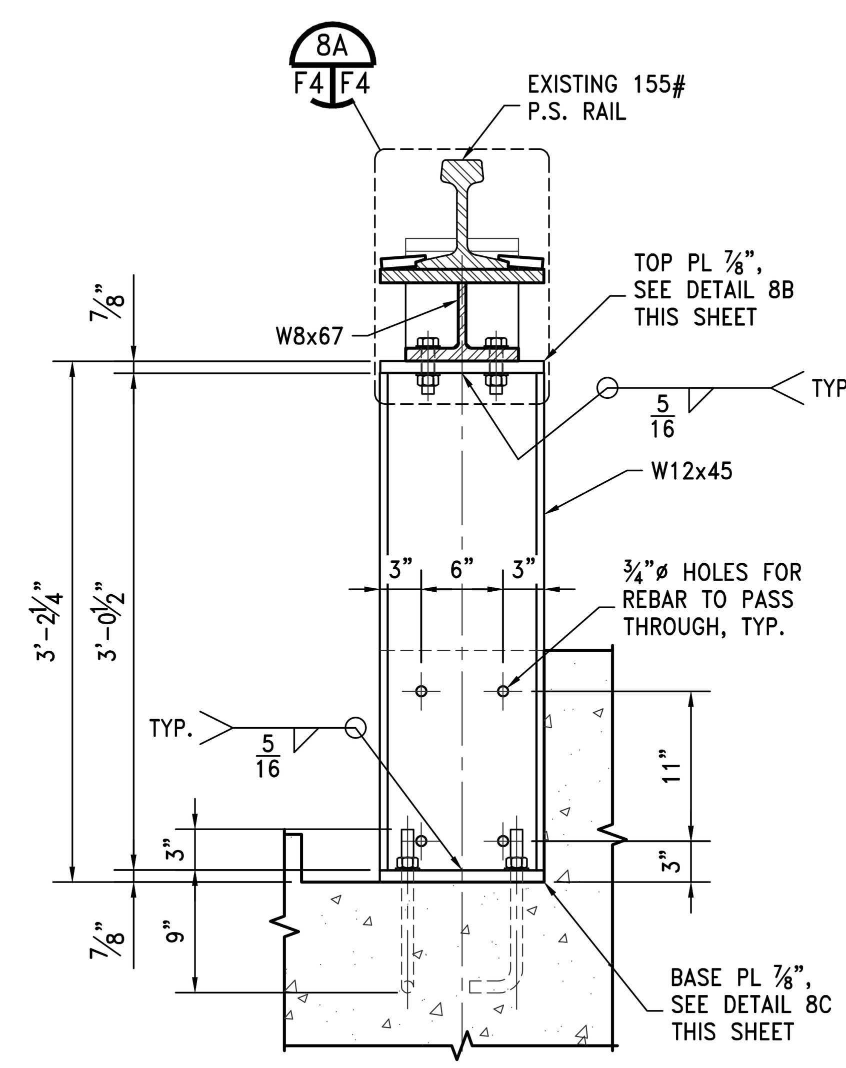
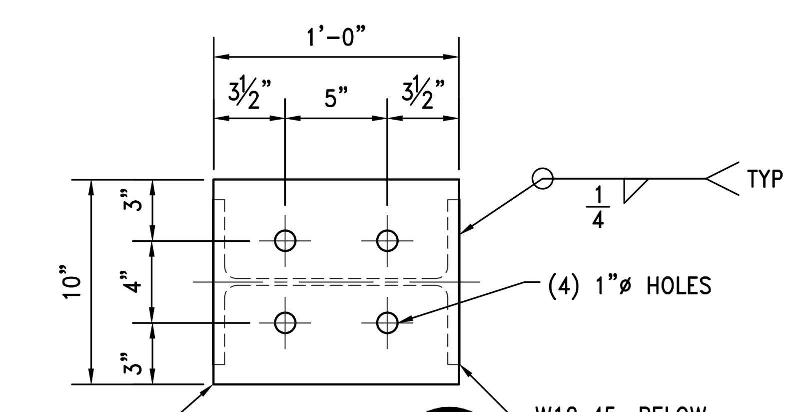


SECTION J
1"=1'-0" F3 F4



DETAIL 8B
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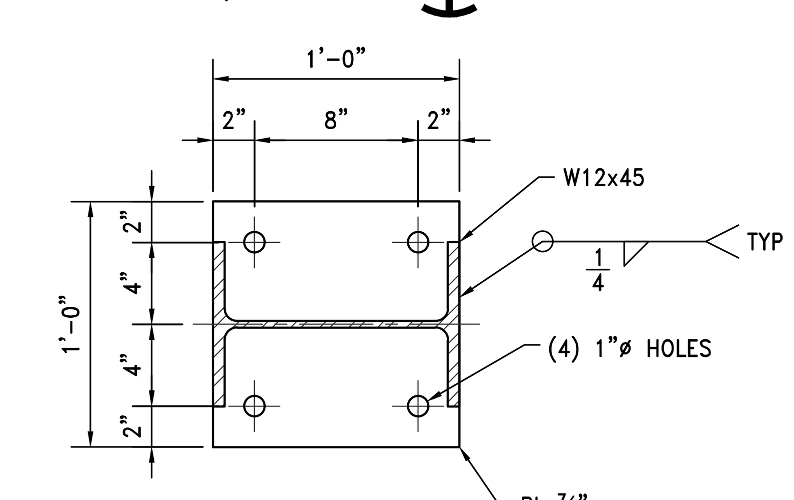

DETAIL 8C
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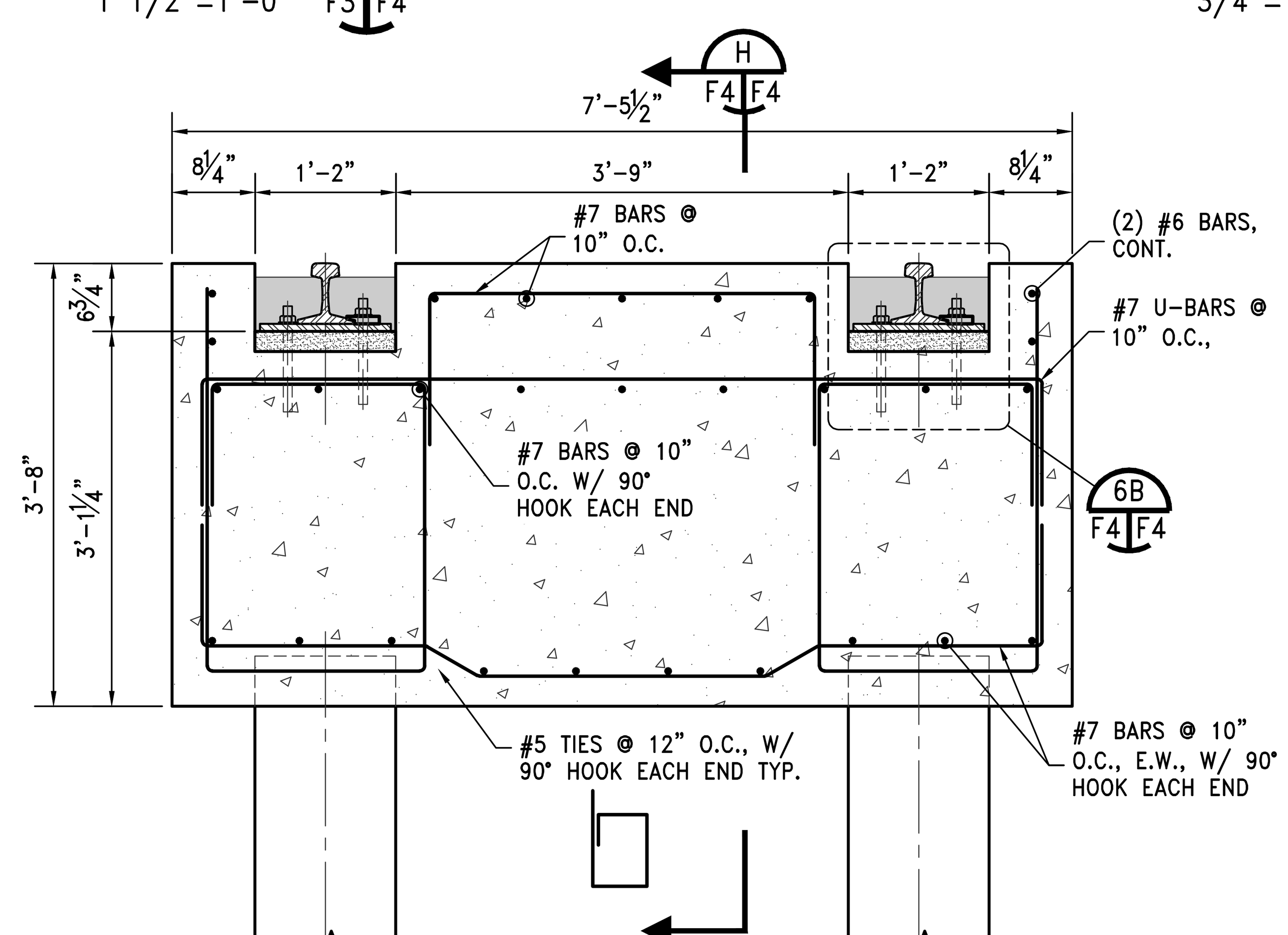
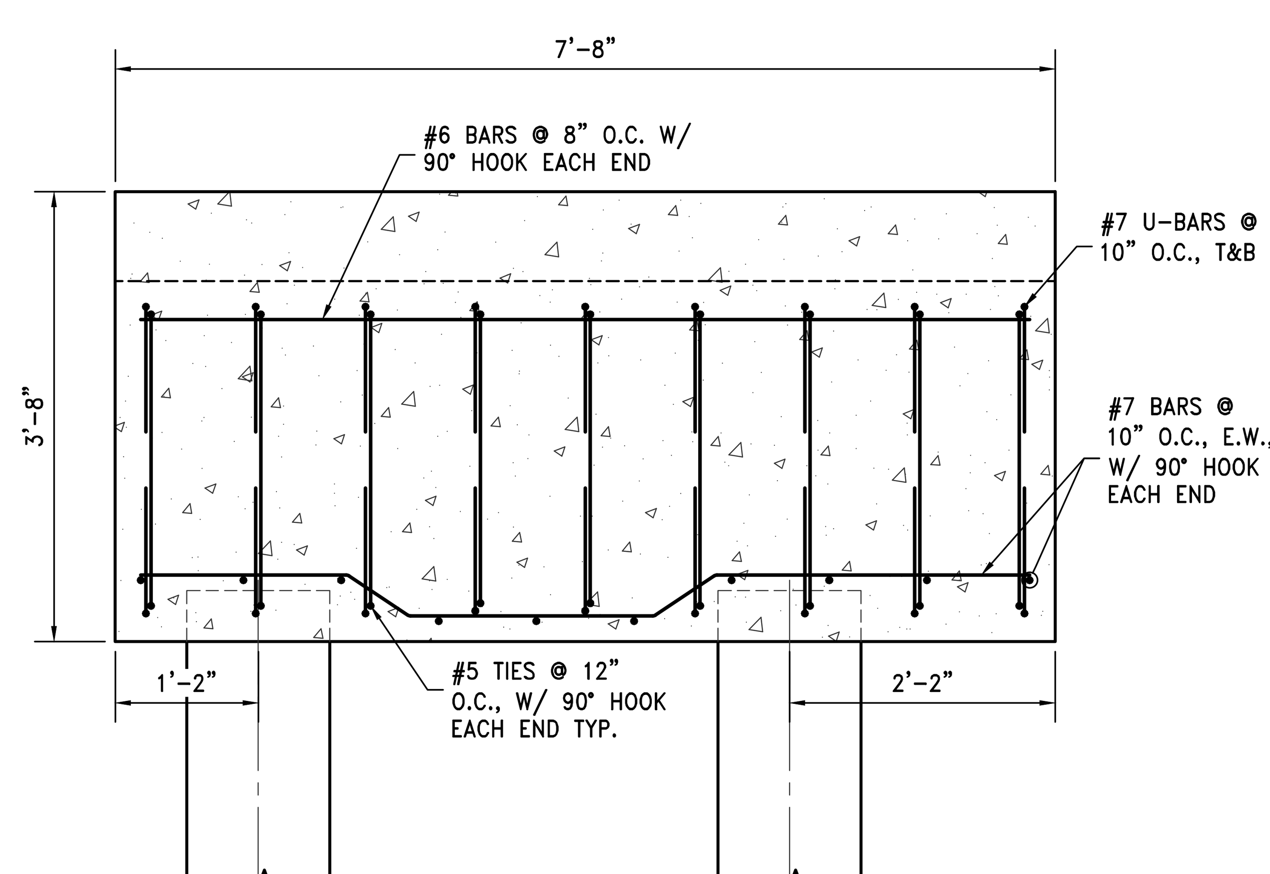


SECTION G
3/4"=1'-0" F3 F4



SECTION H
3/4"=1'-0" F4 F4

REV.	DESCRIPTION	DATE	BY	CHK'D
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A	ISSUED FOR BID	04/04/25	VTH	WBS

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TITLE
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DATE 04/02/25
22x34 REV. B
DRAWING NUMBER 4503-F4

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Alabama Port Authority Terminal Railway Rail Pit and Canopy Expansion

126 Industrial Canal Road

Mobile, AL

Report of Subsurface Investigation and

Geotechnical Engineering Evaluation

Prepared for:

COWLES, MURPHY, GLOVER & ASSOCIATES

SESI Project No: M24-264

July 16, 2024

SOUTHERN EARTH SCIENCES
Geotechnical | Environmental | Materials Testing

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July 16, 2024

COWLES, MURPHY, GLOVER & ASSOCIATES
457 St. Michael Street
Mobile, AL 36602

ATTENTION: Mr. Bruce Smith

REFERENCE: Report of Subsurface Investigation and Geotechnical Engineering Evaluation
Alabama Port Authority Terminal Railway – Rail Pit and Canopy Expansion
126 Industrial Canal Road
Mobile, AL
SESI Project No: M24-264

Dear Mr. Smith,

Southern Earth Sciences, Inc. (SESI) has completed the authorized scope of subsurface investigation and geotechnical engineering evaluation for the referenced project. This report presents our understanding of the available project information and outlines our soil related recommendations and comments regarding construction and foundation support for the proposed rail pit and canopy expansion.

We appreciate this opportunity to be of service and look forward to our continued involvement throughout pile testing and construction phases of the project. Please do not hesitate to contact us if you have any questions.

Sincerely,

SOUTHERN EARTH SCIENCES, INC.

Curran Nicholas

Curran Nicholas, E.I.	Matt Coaker, P.E.
Project Manager	Vice President
	Registered, Alabama 30835

CN/mc

Attachments

1.0 PROJECT INFORMATION

Based on our understanding of the provided information, the project will consist of the expansion of two (2) existing pile supported rail pits. The project will also include the expansion of the canopy structure, approximately 12,000 ft^2 in plan area. The expansion will be constructed on the south side of the existing building located at 126 Industrial Canal Road in Mobile, Alabama. The project site is currently a concrete slab/apron area with numerous railway spurs. Based on the provided drawings from 1968, we understand the existing rail pits are supported by augercast piling of unknown length. The bottom of the existing rail pits are approximately 6.17 feet below the top of the rail. Based on our correspondence with Cowles, Murphy, Glover & Associates (CGL), we understand that tapered timber piles for the canopy and augercast piling for the rail pits are the preferred foundation support systems. We assume that final site grade will match existing site grade. According to Kyle Peterman, P.E. with CGL, the maximum column load of the canopy structure is on the order of 50 kips and the maximum load for the rail pits is on the order of 25 tons. No detailed grading or topographic information was available for the structure at the writing of this report.

2.0 FIELD INVESTIGATION

Three (3) Cone Penetrometer Test (CPT) soundings and two (2) concrete cores were performed within the proposed rail pit and canopy expansion area. The test locations were located in the field by SES personnel using the provided site plan, reference to site features and a handheld GPS with an accuracy of ±30 feet. A Test Location Plan depicting the approximate test locations is attached in **Appendix 1**.

The existing concrete was cored at 2 locations using a diamond core barrel and electric core drill. Concrete core thickness ranged from approximately 5.5-inch to 6.5-inches. Core photos are attached in **Appendix 2.**

CPT soundings were performed in general accordance with ASTM Specification D-5778 using a truck mounted 20-ton Hogentogler Electronic CPT rig. CPT soundings were advanced to a depth of approximately 80 feet below the existing ground surface. Soil classifications were interpreted from methods recommended by Robertson and Campanella. Correlations between Cone Resistance values and Standard Penetration Testing "N" values were performed according to the methods developed by Robertson, Campanella and Wightman. The soil types and stratigraphy shown on the CPT Log sheets are based upon material parameters measured and evaluated as the cone is advanced. CPT Log sheets graphically showing the cone tip resistance, friction, equivalent N60-value and interpreted soil behavior type at each sounding location are attached in **Appendix 2**.

3.0 GENERALIZED SUBSURFACE CONDITIONS

The subsurface descriptions below are generalized to highlight the major subsurface stratigraphy encountered across the site. The CPT Sounding logs attached in **Appendix 2** present specific information at individual sounding location including soil description, stratification, ground water level, and soil strength. This information is representative of conditions encountered at the test locations. Variations may occur and should be expected between test locations. The stratification represents the approximate boundary between subsurface materials as the actual transition may be gradual.

Beneath an upper layer of concrete or gravel, soils at this site generally consist of medium dense to dense sands to depths of approximately 3 to 4 feet underlain by soft to medium stiff silts and clays to depths ranging from approximately 10 to 12 feet below existing ground surface. Below approximately 10 to 12 feet, loose to medium dense silty sands and stiff sandy silts were encountered to approximately 30 feet beneath the existing ground surface underlain by very soft to medium stiff silts and clays to approximately 40 feet below existing ground surface. Medium dense to dense sands were encountered below this level to termination of the investigation at approximately 80 feet below existing ground surface. Test location B-3 encountered medium stiff silt from approximately 70 to 75 feet below existing ground surface. Detailed descriptions of soils are shown on the CPT Sounding logs included in **Appendix 2**. Reference to depth has been made with respect to the existing ground surface at the time of our field investigation.

4.0 GROUNDWATER

Direct groundwater measurements were not possible at the other CPT locations at the time of our investigation due to the CPT sounding holes collapsing upon rod removal. The CPT sounding holes collapsed at depths ranging from approximately 5.5 to 8.5 feet below the existing ground surface. The CPT sounding holes caved in upon removal of the CPT rods with no free water being observed at the cave-in depth. A hole collapse often occurs at or slightly above the groundwater or saturated soil level but can also occur due to the presence of loose soils without the presence of groundwater. The collapsed depths at the CPT sounding locations are likely the result of groundwater present within the upper reaches of much of this site. Depth to sounding collapse at each test location at the time of our investigation are shown on the appropriate CPT sounding sheet attached in **Appendix 2**.

Estimation of static groundwater levels using measured porewater pressure from CPT data indicates that a hydrostatic water level exists at depths of approximately 5 to 8 feet below ground surface, which corresponds closely to the depths of sounding collapse.

Groundwater depths or elevations should be verified at the time of construction for cases where groundwater variations are potentially significant for construction. Fluctuation in the groundwater table will occur due to variances in rainfall, elevation, drainage, types of soil encountered and other factors not evident at the time measurements were made. Reference to depth has been made with respect to the existing ground surface encountered at the time of our field investigation.

5.0 FOUNDATION CONSIDERATIONS AND RECOMMENDATIONS

Our evaluation of foundation conditions has been based on the project previously described in this report and subsurface data obtained during the investigation. In evaluating the CPT soundings, we have used empirical correlations previously established between standard penetration resistances, soil index properties and foundation stability and the characteristics for soils similar to those encountered at the referenced site. Soil parameters used in the evaluation were derived from the CPT sounding data using the interpretation software RAPID CPT® by Dataforensics.

5.1 Pile Supported Foundation – Estimated Pile Capacities

We understand that the proposed rail pits and canopy structures are planned to be designed for pile supported foundations. To assist in project planning and foundation design, we have developed the following tables presenting recommended pile penetration depths and allowable compression and tension pile capacities from static analysis. The allowable pile capacities are based on a Factor of Safety (FOS) of 2.0 for compression and 2.5 for tension, respectively.

Tapered timber piles with a penetration depth of 20 or 25 feet below ground surface have been designed to derive their capacity as a result of a combination od side resistance in the sandy and clayey soils present above approximately 15 feet and end bearing in the loose to medium dense sands beginning below approximately 15 feet to approximately 30 feet below ground surface. Auger-cast piles with a penetration depth of 50 and 60 feet below ground surface have been designed to derive their capacity as a result of a combination of side resistance in the sandy and clayey soils present above approximately 40 feet and end bearing in the medium dense to dense sands beginning below approximately 40 feet. Pile penetration depth is referenced to the existing ground surface encountered at time of our field investigation. The final recommended tip elevation will be developed based on results of the test pile program.

TABLE 1
ALLOWABLE PILE CAPACITIES
TAPERED TIMBER PILE

Pile Penetration Below Existing Grade* (ft)	Pile Diameter (inches)	Allowable Compression Capacity (tons)	Allowable Tension Capacity (tons)
20	8	3.0	2.5
	10	4.0	3.0
	12	5.0	3.5
25	8	5.0	3.0
	10	6.0	3.5
	12	7.0	4.0
45	8	13	8.5
	10	18	11
	12	24	14

***Referenced to existing ground surface at the time of field investigation**

TABLE 2
ALLOWABLE PILE CAPACITIES
AUGER-CAST PILING (ACP)

Pile Penetration Below Existing Grade* (ft)	Pile Diameter (inches)	Allowable Compression Capacity (tons)	Allowable Tension Capacity (tons)
50	14	35	15
	16	40	17
	18	45	20
60	14	40	20
	16	50	23
	18	60	26

***Referenced to existing ground surface at the time of field investigation**

We will be pleased to evaluate additional pile types/sections at your request. The pile length, sizes and capacities presented are based on soil-pile interaction and do not consider the structural aspects of the pile. *Pile penetration depths are measured from the existing ground surface and should be adjusted* *accordingly to ensure that the correct penetration depth is achieved*. Fill heights exceeding about 2.5 feet above original site elevations would result in reduced pile capacity as a result of down drag forces on the piles caused by fill induced settlement. We should be notified if more than 2.5 feet of fill will be placed above the original ground surface.

6.0 AUGER-CAST PILE INSTALLATION CONSIDERATIONS AND LOAD TEST PROGRAM

The equipment, experience and installation technique on the part of the contractor are crucial to successful Auger-cast pile performance. Careful monitoring and recording of the pile installation should be performed by an experienced technician to help identify possible installation problems. Piles should not be installed within 3 pile diameters of newly placed piling until the grout has cured for at least 24 hours or within 6 pile diameters until the grout has cured for at least 12 hours.

6.1 Auger-Cast Pile Load Test Recommendations

We suggest installing one (1) test pile within the proposed expansion area for Static Load Testing for each pile size/loading configuration. The static compressive load test should be conducted as described in ASTM Specification D1143 to at least 3 times the design load or to failure.

If design tension loads exceed 60 percent of the recommended allowable tension capacity, plans should be made to install an additional tension test pile for Static Tension Load testing at each planned compression test pile location. Tension testing of a tested compression pile is not recommended. Static tension load testing should be conducted as described in ASTM Specification D3689 to at least 2 times the design load. Piling reinforcement for the tension test pile should be cast to allow for connection to a full-length center bar during testing. Since the purpose of the tension load test is to assess the geotechnical capacity of the soil-pile interaction (not the structural capacity of the pile), the tension test pile reinforcement should be over-designed to minimize elongation of the pile during the test. Elongation of the test pile and center bar during tension testing often causes structural failure of the pile grout near the bottom of the reinforcement cage, resulting in excessive deflection during the test that is not representative of the geotechnical performance of the pile in tension. **The test pile reinforcement, connection systems and reaction frame should be designed for the loadings specific to this project by a licensed professional structural engineer.**

Alternately, in lieu of a separate static tension load test, tension capacity could be assessed by instrumenting the compression test pile with vibrating wire strain gauges that would be used to measure and record the capacity distribution along the length of the pile. The strain gauge data would be supplemented by monitoring deflection of at least two reaction piles during the compression load test. SES will be available to discuss with the design team as the design progresses.

If pile response to lateral loading is a controlling aspect of the foundation design and lateral load testing is determined to be necessary by the project Structural Engineer, static lateral load testing may be performed on either the compression or the tension pile to at least twice the design load in accordance with ASTM D3966.

The test pile(s) should be located within the building/structure footprint to obtain representative data, but should be positioned within the structure such that it is not incorporated into the foundation system and does not interfere with construction of foundations, utilities, infrastructure, etc. Upon completion of the test pile program, the test piles should be cut off at a level such that it will not affect future construction.

All test sections, equipment and installation procedures should be the same as those to be used during production pile installation. Pile load test results would be used to verify the placement procedures and that the pile section produces the desired design capacity. Since adjustments of the pile lengths or installation procedures may be made based on the test pile installation and load test results, we recommend the test pile program and production pile installation be performed under the direct supervision of the SES project geotechnical engineer of record. SES should be consulted to collaborate with the design team to establish detailed Pile Load Test Program recommendations once site, civil, and structural plans have been developed.

6.2 Thermal Integrity Profiling (TIP)

We recommend that installation of all Auger-Cast test piles **(and 2 % of all production auger cast piling on this project)** be monitored using Thermal Integrity Profiling (TIP) technology in general accordance with ASTM D7949 - *Standard Test Methods for Thermal Integrity Profiling of Concrete Deep Foundations*. The TIP system, manufactured by Pile Dynamics, Inc. (PDI) in association with Foundation and Geotechnical Engineering, LLC (FGE), uses instrumented Thermal Wire® cables and Thermal Acquisition Ports (TAPs) to measure concrete temperatures during curing. The Thermal Wire® cables have temperature sensors spaced every 12-inches along the ordered cable length and are cast into the concrete along the pile/shaft length. The battery powered Thermal Acquisition Ports automatically measure temperature at each sensor at specified time intervals (typically every 15 minutes) allowing the concrete curing process to be monitored. During the curing process, heat generated during cement hydration is recorded and used to create a profile of temperature versus depth.

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Analysis of the temperature measurements can then be used to evaluate concrete quality and cover at each cross section along the pile/shaft length. After the peak temperature is achieved (approximately 10 hours after placement of the concrete), the TAP box(es) are disconnected from the Thermal Wires® and connected to the TIP Processing Unit. Data is downloaded and saved to the unit's hard drive for further review, data adjustment, analysis and output. Graphical results of the collected thermal data are presented as an estimate of the vertical pile profile relative to the theoretical pile diameter. The profile will indicate changes in pile diameter or material quality within the grout column.

7.0 DRIVEN PILE INSTALLATION CONSIDERATIONS AND LOAD TEST PROGRAM

In evaluating driven piles for this project, it should be considered that dense sand strata will be encountered prior to design tip elevation; therefore, considerations should be taken to account for difficult driving/drilling that may occur at varying elevations across the site. Deep deposits of medium dense to dense sands encountered at this site above the recommended pile tip elevations will result in installation difficulty, likely requiring jetting to facilitate pile penetration to design tip elevation or pile cut-off if refusal is encountered and design pile capacity is confirmed above design tip elevation.

Hard driving may be encountered in the medium dense sands encountered between approximately 10 to 30 and below approximately 40 feet below ground surface. Consideration should be given to the means and methods that will be required to advance piling to the recommended tip elevation. Medium dense to dense sands were encountered above the intended bearing stratum. Jetting or vibrating through these intermediate sands will help facilitate pile penetration while reducing driving effort and associated vibrations. Piles may be jetted/vibrated to within 5 feet of the recommended penetration depth. Jetting should not be performed within about 5 feet of design pile tip elevation. Piles should be driven a minimum of 5 feet to final tip elevation.

Closely spaced piles will become increasingly more difficult to install to the desired tip elevation if a proper installation pattern is not established. It may be necessary to start installation towards the center of the pile cap and work outwards. We recommend a minimum pile spacing of three (3) pile diameters, center to center. Closer spacing will result in a reduction in capacity due to group effect.

7.1 Preliminary Drivability Evaluation

Once the pile diameter has been selected or narrowed to a couple of options, we recommend that a preliminary Drivability Analysis be conducted to develop a general idea of minimum pile hammer energy requirements for installation of driven piles on this project. The analysis should be performed using the GRL Wave Equation Analysis Program (WEAP). GRLWEAP is a computer program which simulates motions and forces in a foundation pile when driven by either an impact hammer or vibratory hammer. The program computes the blow count (number of blow/unit length of permanent set) of a pile under one or more assumed ultimate resistance values and other dynamic soil resistance parameters, given a hammer and associated driving system.

Additionally, GRLWEAP computes the internal axial stress in a pile, both tension and compression averaged over the cross-section for a certain pile penetration and associated ultimate capacity values, the energy transferred by the hammer to pile and the velocity and displacements along the pile for certain pile penetration and associated capacity values. A final drivability analysis would be necessary after contract award to evaluate the contractor's proposed hammer configuration.

7.2 Test Pile Recommendations

We recommend a test pile program which includes installing one (1) test pile using a Pile Driving Analyzer (PDA). PDA results, in conjunction with driving resistances, can be calibrated with the driving hammer to formulate installation criteria and estimate the installed capacity of individual piles, allowing full utilization of the achieved capacity. The test pile should be installed using the same equipment configuration to be used for production pile installation in accordance with the installation procedures described above.

A tentative driving resistance should be computed using a dynamic formula such as the Wave Equation. In computing the required driving resistance, we recommend an ultimate capacity of at least two times the design capacity be used in the dynamic formula.

PDA results would be used to verify the placement procedures and that the pile section produces the desired design capacity. The test pile section, equipment, and installation procedures should be the same as those planned for use in the foundation. Since adjustments of the pile lengths or installation procedures may be made based on the test pile installation and PDA test results, we recommend the test pile program and production pile installation be performed under the direct supervision of the project geotechnical engineer of record.

7.3 Vibration Monitoring During Pile Driving

Infrastructure, underground utilities, and nearby structures can be damaged by vibrations and subsidence caused by vibrations during pile driving. Care should be taken by the contractor to ensure that vibrations do not impact the adjacent structure. Monitoring ground vibrations during installation of the foundation system using a seismograph should be considered. A pre-construction survey of the existing residence is also recommended. We will be available upon request to assist with monitoring vibrations and assessing pile installation technique alterations if needed to help reduce vibrations.

8.0 LATERAL PILE CAPACITY EVALUATION

Information necessary for lateral evaluation of pile foundations (i.e., pile size, lateral loading, moment, pile cap configuration, etc.) had not been developed at the writing of this report. We will be available to perform the additional analyses as the design progresses, or as required.

9.0 INDIVIDUAL PILE SETTLEMENT AND GROUP EFFICIENCY

We recommend installing piles at a minimum center to center spacing of 3 pile diameters. A reduction in capacity due to group effects for properly spaced piles at the recommended pile penetration depths will not be required.

Detailed structural loading information was not available at this time. Estimated settlement of individual piles properly installed to the recommended depth are expected to be less than 0.5 inch at service load. Piles installed in groups (up to 8 piles per pile group) at the recommended minimum center-to-center spacing of 3 pile diameters at the recommended pile penetration depths are not expected to undergo additional settlement at service load due to group effects. SES should be consulted to review plans and design details and to evaluate larger pile groups once pile type, pile loading, and pile cap configurations have been established.

10.0 GENERAL COMMENTS AND LIMITATIONS

While the CPT soundings are representative of subsurface conditions at the respective locations and for its respective vertical reach, local variations characteristic of the subsurface materials of the region are anticipated and may be encountered. The delineation between soil types shown on the log is approximate and the description represents our interpretation of subsurface conditions at the designated test location and on the particular date explored.

This report has been prepared in order to aid in the evaluation of this project and to assist the engineers in the project planning and structural design. At the time of writing, changes were still being considered to foundations, site grading, and other aspects of the project that could have a significant impact on the applicability or relevance of the recommendations provided in this report. SESI should be consulted as the design process continues to ensure that the recommendations provided in this report are still applicable, and that they are being properly interpreted.

This report is intended for use with regard to the specific project discussed herein as we understand it at this time, and any substantial changes in the project, loads, locations, or assumed grades should be brought to our attention so that we may determine how such changes may affect our conclusions and recommendations. We would appreciate the opportunity to review the plans and specifications for construction to ensure that our conclusions and recommendations are interpreted correctly.

Professional judgments on design alternatives and criteria are presented in this report. These are based partly on our evaluations of technical information gathered, partly on our understanding of the characteristics of the project being planned, and partly on our general experience with subsurface conditions in the area. We do not guarantee performance of the project in any respect, only that our engineering work and judgments rendered meet the standard of care of our profession.

The Geotechnical Engineer of Record should be retained by the Owner in the construction phase of the project so they can observe subsurface conditions revealed during construction, confirm that design assumptions are still applicable or provide revised recommendations based on conditions encountered during construction, and to help ensure that our recommendations are properly interpreted. We recommend that Southern Earth Sciences, Inc. be retained to perform observation and field-testing services during the site preparation and foundation construction.

APPENDIX 1

Test Location Plan

NOT TO SCALE

CPT SOUNDING

TRR Rail Pit Extension
Mobile, AL

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TEST LOCATION PLAN
SESI JOB #: M24-264

APPENDIX 2

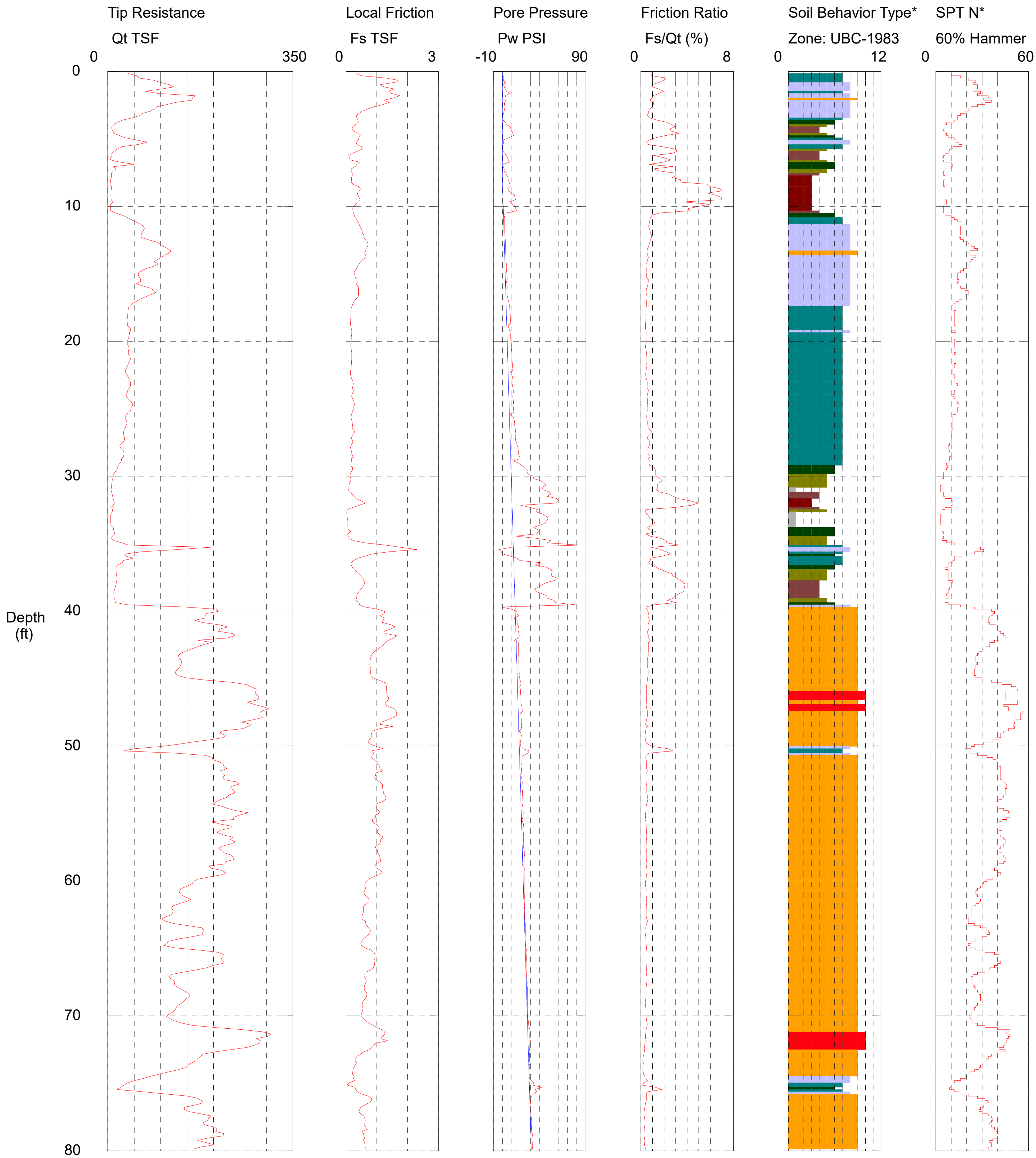
CPT Sounding Logs

Concrete Core Photos

Southern Earth Sciences

Operator: Brandon Green
Sounding: B-1
Cone Used: DDG1526
GPS Data: N30.72400 W88.05250

CPT Date/Time: 6/14/2024 11:13:40 AM
Location: TRR RAIL PIT AND BUILDING
Job Number: M24-264
Groundwater: Collapsed Dry At 8.6-ft.



Maximum Depth = 80.22 feet

Depth Increment = 0.164 feet

1	sensitive fine grained
2	organic material
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	gravelly sand to sand
11	very stiff fine grained (*)
12	sand to clayey sand (*)

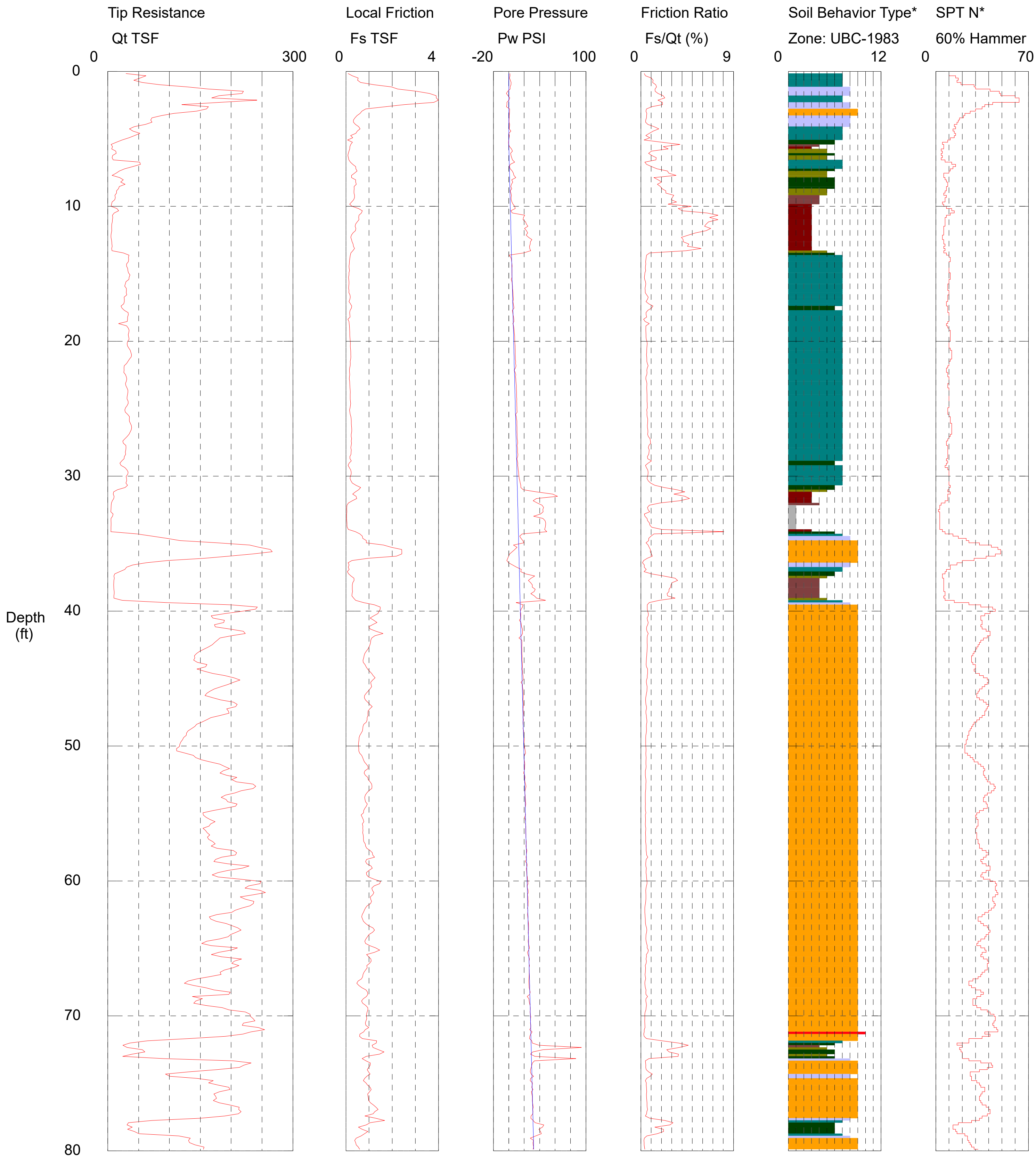
5.5" Concrete

*Soil behavior type and SPT based on data from UBC-1983

Southern Earth Sciences

Operator: Brandon Green
Sounding: B-2
Cone Used: DDG1526
GPS Data: N30.72388 W88.05233

CPT Date/Time: 6/14/2024 10:20:27 AM
Location: TRR RAIL PIT AND BUILDING
Job Number: M24-264
Groundwater: Collapsed Dry At 5.5-ft.



Maximum Depth = 80.22 feet
Depth Increment = 0.164 feet

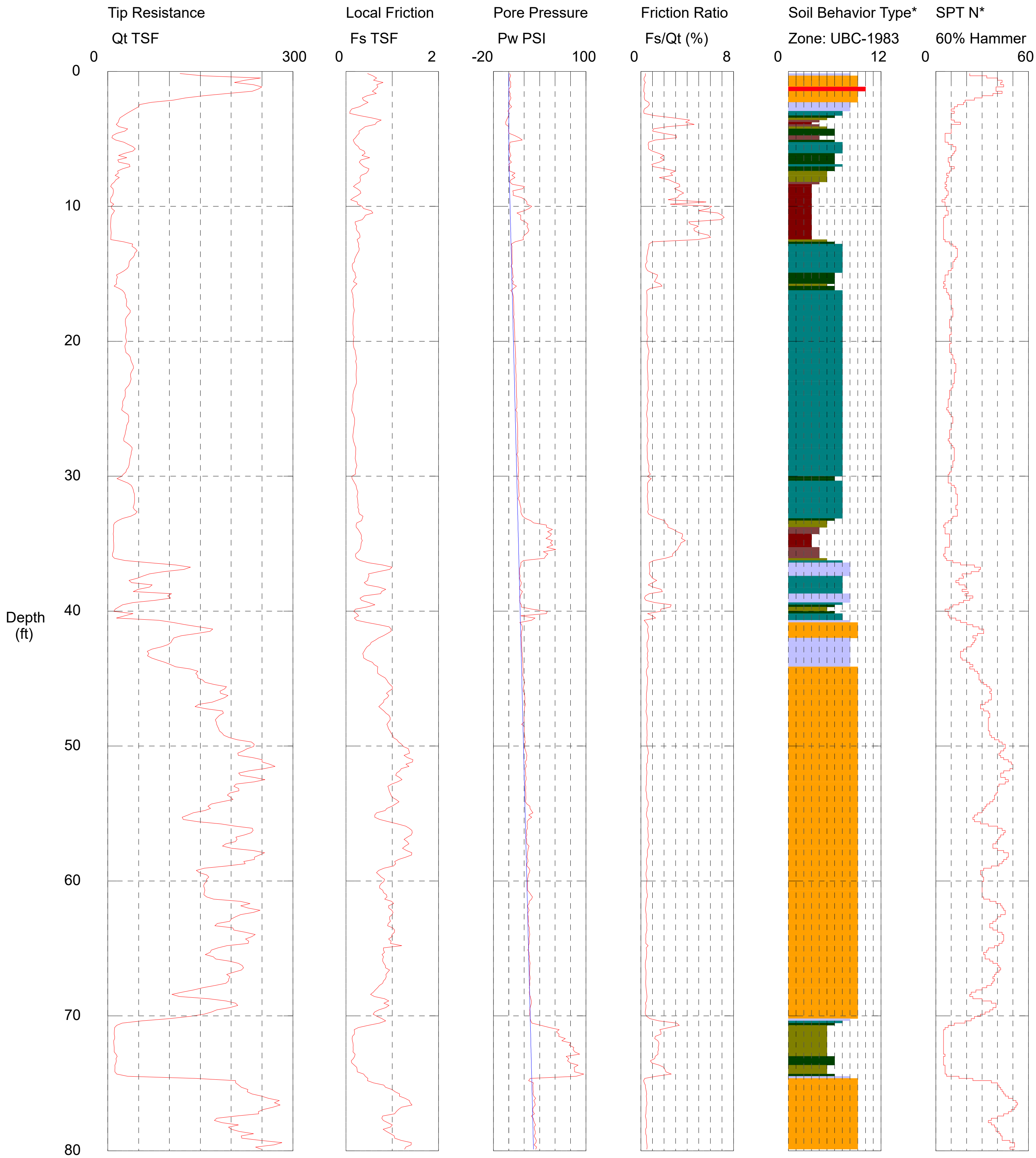
1 sensitive fine grained
2 organic material
3 clay
6" Concrete
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Southern Earth Sciences

Operator: Brandon Green
Sounding: B-3
Cone Used: DDG1526
GPS Data: N30.72407 W88.05209

CPT Date/Time: 6/14/2024 9:20:26 AM
Location: TRR RAIL PIT AND BUILDING
Job Number: M24-264
Groundwater: Collapsed Dry At 6.2-ft.



Maximum Depth = 80.22 feet

Depth Increment = 0.164 feet

1	sensitive fine grained
2	organic material
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	gravelly sand to sand
11	very stiff fine grained (*)
12	sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

B-1

TRR Rail Pit Extension	SOUTHERN EARTH SCIENCES Geotechnical | Environmental | Materials Testing	Concrete Core Photographs SESI Project No: M24-264

B-2

TRR Rail Pit Extension	SOUTHERN EARTH SCIENCES Geotechnical | Environmental | Materials Testing	Concrete Core Photographs SESI Project No: M24-264