COLLETON COUNTY
SOUTH CAROLINA

Purchasing Department
109 Benson Street
Walterboro, SC 29488
843.782.0504

BID: CPST-17
EMERGENCY OPERATIONS CENTER

Due: Thursday, October 22, 2026, at 11:00 am

ADDENDUM 1
Date: October 14, 2026

RESPONSE TO BIDDERS' QUESTIONS

GENERAL

1. QUESTION: On page 21 of the ITB, under Article 5, Section 5.01B, as well as on the bid form, there is an allowance of $100,000.00 called out for unfounded issues. However on page 14 of the Project Manual, section 3.3A, an allowance of $150,000.00 is specified for Owner's General Contingency Allowance. Please clarify the governing allowance amount, usage procedures, approved markups, and reconciliation requirements; specifically confirm that any unused allowance will be credited back to the County.
   ANSWER: The $100,000.00 contingency will govern, and all unused funds will be returned to the county.

2. QUESTION: Do you have a Bidders / Plan Holders list for this project? If so could you please forward it to DFH?
   ANSWER: A separate Bidders/Plan Holders list will not be distributed. Bid information is publicly available through the project's public bidding site.

3. REFERENCE: Section 01 40 00 – Quality Requirements / General Conditions Article 13
   QUESTION: Section 01 40 00 indicates that the Owner will engage a qualified testing agency for testing and inspections specifically identified as the Owner's responsibility, including required special inspections. The General Conditions, however, state that the Contractor shall employ and pay for an independent testing laboratory to perform inspections, tests, or approvals required by the Contract Documents.
   Please clarify responsibility for contracting and payment of third-party testing and special inspections for the project, including but not limited to soils/density testing, concrete testing, structural inspections, and other code-required special inspections. Please identify which testing costs are to be included in the Contractor's Base Bid and which will be provided directly by the Owner.
   ANSWER: Geotech report is provided with this addendum. Third-party testing is to be included in the GC's bid. No preferred testing agency.

4. REFERENCE: Contract Article 23/ Section 01 77 00 – Closeout Procedures
   QUESTION: Please confirm the required general warranty period for the Project and whether all subcontractors and suppliers should carry a two-year warranty unless a longer manufacturer or specification warranty is required.
   ANSWER: Per Contract Article 23, the general Project warranty period is 730 days from Substantial Completion. Repairs or replacements are warranted for 365 days from completion, and longer specified or manufacturer warranties shall govern where applicable.

5. REFERENCE: Contract Article 4 / Section 01 77 00 – Closeout Procedures

   QUESTION: The Contract establishes a 300-calendar-day Contract Time commencing upon issuance of the Notice to Proceed (NTP). Please confirm whether the 300-calendar-day duration is measured to Substantial Completion or Final

Completion, and whether the $500/day liquidated damages are assessed based on Substantial Completion or Final Completion.
Please also clarify applicable rain/weather day allowances and confirm whether Substantial Completion is achieved upon overall building occupancy/issuance of the Certificate of Occupancy. If Final Completion is required within the 300 calendar days, please confirm that punch list completion, closeout documentation, final inspections, and other requirements for final acceptance must be completed within this duration.

ANSWER: Per Contract Article 4.03, the 300-calendar-day Contract Time runs from NTP through Final Completion/readiness for final payment, including punch list completion, closeout documentation, and final inspections. Liquidated damages of $500 per day apply thereafter. Substantial Completion does not satisfy the Contract Time and shall be established in accordance with the Contract Documents. Weather-related extensions shall be administered per Section 01 26 00, Paragraph 1.5.B.

6. REFERENCE: Section 01 50 00 – Temporary Facilities and Controls
QUESTION: Section 01 50 00 permits the temporary use of permanent services during construction and requires responsibility for the operation, maintenance, and protection of permanent services used prior to Owner acceptance.
The documents reviewed do not clearly identify responsibility for utility consumption charges during construction.
Please confirm whether the Contractor is responsible for electrical and water utility consumption charges during construction, including charges incurred after permanent utility services have been established but prior to Owner acceptance.
ANSWER: The Contractor shall be responsible for electrical and water utility consumption charges incurred during construction, including use of permanent utility services, until Substantial Completion. Upon Substantial Completion, the County shall assume responsibility for utility consumption charges.

7. QUESTION: Please identify responsibility for tap fees, impact fees, water meter fees, building permit fees, utility tap/impact/SCDOT fees, and confirm which costs must be included in the Contractor's Base Bid

   Please also identify the applicable water and sewer utility provider(s), provide the current fees or applicable fee schedule. Confirm whether Colleton County waives municipal building permit fees, and provide a sales tax exemption certificate if applicable.

   ANSWER: Per the Contract Documents, the Contractor shall include in the Base Bid all applicable taxes, permits, governmental charges, inspection fees, and other fees required to complete the Work. Owner confirmed project is within city limits and no fees of any sort are waived.

8. QUESTION: Is the General Contractor and all subcontractors required to purchase Colleton County Building permits for the work?
ANSWER: The General Contractor shall obtain and pay for all required construction permits and licenses. Trade-specific permits or licenses shall be

obtained as required by the applicable authority having jurisdiction. No permit fees are waived, and all associated costs shall be included in the Base Bid.

9. QUESTION: Confirm required disposal facility parameters for demolition debris and whether waste manifest documentation is required by the County.
   ANSWER: Per Section 017419, demolition and construction debris shall be legally disposed of in accordance with the Contract Documents and requirements of authorities having jurisdiction. No waste manifest is required by the Contract Documents for nonhazardous debris; comply with all applicable regulatory documentation requirements.

10. QUESTION: Confirm the 300-calendar-day duration commences upon Notice to Proceed (NTP), clarify rain/weather day allowances, and define if substantial completion applies to overall building occupancy.
    ANSWER: The Contract Time is 300 calendar days commencing upon issuance of the NTP and extending through Final Completion. Weather-related extensions shall be administered per Section 012600, Paragraph 1.5.B. Substantial Completion occurs when the Work is sufficiently complete for the Owner's intended use and is established by the Certificate of Substantial Completion.

11. QUESTION: Is the radio tower, foundation design, grounding, and cabling procurement in this general contract, or performed separately by owner/vendor?
    ANSWER: The existing tower located in Ashton, SC, shall be relocated as part of the project. The General Contractor shall be responsible for contracting, coordinating, and executing all associated work, including coordination with Kevin Carter of Mobile Communications. Mobile Communications typically provides turnkey monopole services, including foundation design, furnishing, and installation. The General Contractor shall coordinate and verify all requirements associated with the relocation and installation.

12. QUESTION: Will the County issue an Owner-Furnished Contractor-Installed (OFCI) and Owner-Furnished Owner-Installed (OFOI) matrix clarifying who buys, installs, and wires critical equipment such as the generator, UPS, radio/dispatch consoles, IT racks, access control, cameras, furniture, and appliances
    ANSWER: No matrix will be issued at this time. The General Contractor shall be responsible for the generator, UPS, access control, security equipment, and cameras. The Owner shall furnish radio/dispatch consoles, IT racks, furniture, and kitchen appliances. The existing projection screen shall be Owner-furnished and Contractor-installed. Installation and connection responsibilities for other Owner-furnished equipment shall be coordinated with the Owner.

13. QUESTION: Can the County confirm that the $500/day liquidated damages are assessed to Substantial Completion or Final Completion? The bid documents appear to reference Final Completion; is this accomplished upon receipt of the CO? Please also confirm that full 5% retainage release is allowed at Substantial Completion.
    ANSWER: Per Contract Article 4.03, liquidated damages of $500 per day apply after Final Completion is due until the Work is completed and ready for final payment. Substantial Completion does not satisfy the Contract Time and shall be

established in accordance with the Contract Documents, not solely by issuance of the Certificate of Occupancy. At Substantial Completion, payments may increase to 95%, less applicable deductions and amounts for incomplete or corrective Work. Remaining retainage shall be released upon Final Completion and acceptance.

QUESTION: What are the permitted standard work hours, weekend allowances, and any night work mandates driven by adjacent operational county facilities?

ANSWER: Construction work may be performed 24 hours a day, 7 days a week, including weekends and holidays, as needed to complete the Work within the established Contract Time. No Owner-imposed work hour restrictions apply.

14. QUESTION: What is the exact division of work between the General Contractor and County IT or vendors for structured cabling, access control, CCTV, DAS, and dispatch consoles?
ANSWER: PRTC shall perform the applicable communications and AV work as a subcontractor to the General Contractor, in accordance with the Contract Documents. Access control, security equipment, and cameras shall be provided by the General Contractor. Radio/dispatch consoles and IT racks shall be Owner-furnished.

15. QUESTION: What are the commissioning authority requirements, witness testing protocols, and required training hours for emergency power, HVAC, and security systems?
ANSWER: Commissioning, testing, witnessing, and training shall be provided in accordance with the applicable specification sections. The General Contractor shall be responsible for final HVAC testing and County personnel training.

16. QUESTION: Can the County confirm that low-bid evaluation is strictly based on the Base Bid plus the $100,000 allowance, with zero alternate pricing required?
ANSWER: The $100,000 Owner's General Contingency Allowance shall be included in the Base Bid. No alternate pricing is required. The contract will be awarded based on the lowest responsive, responsible Base Bid, inclusive of the $100,000 allowance, in accordance with the Contract Documents.

17. QUESTION: Is electronic or scanned submission of bid bonds via email fully acceptable for bid responsiveness?
ANSWER: Electronic or scanned submission of a properly executed Bid Bond with the emailed Bid is acceptable. The Bid Bond shall comply with Article 7 and utilize the County's Bid Bond form included in the Contract Documents.

18. QUESTION: Will the Notice to Proceed (NTP) be managed or delayed to accommodate the 90-day bid validity and lead times for critical equipment such as the generator, switchgear, and shelter openings?
ANSWER: The Notice to Proceed will be issued by the Owner following execution of the Contract. The Contract Time shall commence upon issuance of the NTP, and the Contractor shall account for all procurement and lead times for critical equipment and materials within the established Contract Time. The 90-day bid validity period does not extend the Contract Time.

19. QUESTION: Can the County confirm that Davis-Bacon and federal prevailing wage rates do not apply to this project under Homeland Security EOC Grant 2024-EO-05003?
ANSWER: The County confirms that Davis-Bacon Act and federal prevailing wage requirements do not apply to this project under Homeland Security EOC Grant No. 2024-EO-05003. Contractors shall comply with all other applicable federal, state, and local labor requirements.

20. QUESTION: Will time extensions and costs resulting from potential FEMA Environmental & Historic Preservation (EHP) stop-work orders be handled via Change Order?
ANSWER: Any impacts to the Contract Time or Contract Sum resulting from a FEMA Environmental and Historic Preservation (EHP) stop-work directive will be evaluated in accordance with the Contract Documents. The Contractor shall promptly document and submit any resulting schedule and cost impacts. Approved adjustments to the Contract Time and/or Contract Sum will be incorporated by Change Order in accordance with Section 012600 – Contract Modification Procedures.

21. QUESTION: Who are the preferred or required local inspection agencies, special inspection agents, and is the County Construction Coordinator already under contract?
ANSWER: The County has no preferred testing or special inspection agencies. All required inspections and special inspections shall be performed in accordance with the Contract Documents and requirements of the authorities having jurisdiction. Third-party testing and special inspection costs shall be included in the Contractor's Base Bid. Construction Administration services will be provided by Johnson, Laschober & Associates, P.C. (JLA).

22. QUESTION: The Project Manual references project phasing but no phasing plan has been provided. Please confirm all work is to be executed in a single phase, or provide a phasing plan.
ANSWER: Per Section 011000 – Summary, the Work shall be executed as a single phase. References to phased construction are not applicable to this Project. Contractor shall coordinate sequencing as necessary to maintain required access and ongoing operations.

23. QUESTION: Are there designated/approved locations for temporary utilities?
ANSWER: Per Section 015000 – Temporary Facilities and Controls, temporary utility locations and connections shall be coordinated with the Owner prior to installation. Contractor shall provide required temporary utilities and comply with applicable permitting and inspection requirements.

CIVIL

1. QUESTION: Please provide the complete geotechnical investigation/report referenced in the construction documents, including all borings, laboratory data, recommendations, and any subsequent geotechnical addenda or correspondence.

Confirm that bidders are to rely on this report for earthwork, foundation, pavement, and sub-surface condition pricing.
ANSWER: Geotechnical report attached with Addendum 1 below.

2. QUESTION: Please identify the civil sheet and detail that delineate Heavy Duty Asphalt paving versus the typical/light-duty asphalt paving.
ANSWER: Heavy duty asphalt is not required. The detail has been removed.

3. REFERENCE: C-301
QUESTION: Is the fire line 100% DIP? What size casing is required? Is the 2" service tap a 4x2 service saddle or 4x2 tapping
saddle & valve? What material is the 2" water service line? What size line is the new fire hydrant tied into? What fittings are
needed to tie into the existing hydrant leg for the 4" fire line? What size gate valve is needed at sta.0+04.61?
ANSWER:

   - Yes, Fire is 100% DIP see sheet C-301.
   - Steel casing is minimum 10” see Jack and Bore detail 9/C-603.
   - It is just a Service tapping saddle. There is a separate Gate valve see sheet C-301.
   - PVC schedule 80 see sheet C-301
   - 6” line to be field verified. Notify JLA if line is not 6”
   - Tapping sleeves see detail on sheet C-603
   - 4” gate valve See sheet C-301.

4. REFERENCE: C301
QUESTION: How long is the bore supposed to be?
ANSWER: 60 LF see sheet C-301.

5. REFERENCE: CD001
QUESTION: Shows a line to be demolished with the #9 circled, indicating it is a water line. However, the drawing shows it as an OHP line. Can you clarify?
ANSWER: Numbers have been adjusted to 10 to show electrical line to be removed.

6. REFERENCE: CD001
QUESTION: Will an arborist need to be on retainer for the trees left onsite?
ANSWER: No, an arborist will not be required to be on retainer.

7. REFERENCE: Division 31 / Geotechnical requirements
QUESTION: This question may be answered by Geotech report…, otherwise: The scope and allocation of risk for unsuitable soils and groundwater conditions require clarification. Geotechnical report attached with Addendum 1 below.

8. Please provide direction for handling unsuitable soils and groundwater, including remediation and dewatering requirements. Confirm the governing Division 31 provisions and responsibility for associated work and additional costs.
ANSWER: Geotechnical report attached with Addendum 1 below.

9. QUESTION: Emergency overflow: Provide the emergency overflow section, width, lining, riprap or turf reinforcement, discharge point, and erosion-protection requirements.
   ANSWER: See emergency overflow detail 4/C-602

10. QUESTION: Storm tie-ins: Provide details for lowering or modifying existing storm piping and structures, including pipe material, couplings, temporary bypass, restoration, and pre/post-construction inspection requirements.
    ANSWER: Note has been added to C-201.

11. QUESTION: Groundwater and dewatering: Confirm the design groundwater elevation and required dewatering basis for utility, pond, footing, and deep-foundation work, including discharge and permitting requirements.
    ANSWER: Geotechnical report attached with Addendum 1 below.

12. REFERNCE: C101/C601
    QUESTION: In the plans on page C-101 it calls for concrete pavement and it says to see Detail 1/C-601, but that is an asphalt detail. I didn't see a detail for concrete pavement. Should we assume the typical 6-inch, 4,000 PSI spec
    ANSWER: See concrete sidewalk detail 11/C-601.

13. QUESTION: Provide details for the generator pad.
    ANSWER: See blow-up on C-101 and Generator pad detail on 3/C-603.

14. The fleet maintenance fence and gate, is that existing?
    ANSWER: Yes, that is an existing gate and fence.

15. REFERENCE: C-301/ C-602
    QUESTION: C-301 requires directional boring, while Detail 10/C-602 shows saw cutting and replacing concrete. Please confirm the required installation method and whether the 58 LF of steel casing applies to the bored crossing.
    ANSWER: Directional boring will be required see sheet C-301 and detail on sheet C-603. Steel casing is now 60 LF.

16. REFERENCE: C-602
    QUESTION: C-301 shows a 4-inch sanitary sewer, while the standard detail on C-602 calls for a minimum 6-inch service. Which size should we carry?
    ANSWER: 4" sanitary sewer line. Detail on C-602 has been removed.

17. QUESTION: Please confirm who supplies and installs the water meter and pays the associated utility fees
    ANSWER: The contractor is responsible for coordination and fees to City of Walterboro Utilities.

18. QUESTION: Please explicitly delineate Heavy Duty (HD) vs. Light Duty (LD) asphalt paving areas on the site plans (e.g., drive lanes vs. parking stalls).
    ANSWER: See answer to Question #2.

19. QUESTION: The site plan reference for HD concrete pavement is incorrect. Please provide valid details for HD concrete pavement, sidewalk delineation, dumpster pad, generator pad, and tower pad.
ANSWER: Heavy duty concrete has been removed see detail 11/C-601 for concrete sidewalk pavement. See detail 3/C-603 for generator pad. See detail 11/C-602 for dumpster pad detail.

20. REFERENCE: CD001 & C501
QUESTION: Sheets CD001 and C501 show no silt fencing or tree protection. Please clarify if silt fence and tree protection are required, and provide locations and detail drawings if applicable.
ANSWER: Silt fence and tree protection has been added to CD001, and C-501.

21. REFERENCE: C201 & C202
QUESTION: Provide the truncated callout note for the concrete apron on Sheet C201 and invert elevations for C/L SD-A Profile on Sheet C202.
ANSWER: This callout has been removed from C-201. All invert elevations have been added to Sheet C-201 and C-202.

22. REFERENCE: C501
QUESTION: Please provide a complete SWPPP/erosion-control legend for Sheet C-501 defining all symbols and abbreviations, including PS, TS, D and CWM. Also, please identify any required Silt Fence, and or other related items.
ANSWER: SWPPP legend has been added see sheet C-501.

23. QUESTION: Please issue the geotechnical report and state whether undercut soil replacement should be carried as a stipulated quantity in the lump sum or priced via a unit price ($/CY).
ANSWER: Geotechnical report attached with Addendum 1 below.

24. QUESTION: Please confirm exact points of connection (details, inverts, etc) for domestic water, fire service, sanitary sewer, storm drainage, electrical service and communications.
ANSWER: Refer to Civil drawings to see utility connection locations.

25. QUESTION: On C-301, Note 2, there is a call out for directional boring under the driveway to ensure that the Dollar General remains operational during business hours. Can a boring detail be provided?
ANSWER: Jack and bore detail has been provided see detail on sheet C-602.

26. QUESTION: Confirm whether any existing utility relocations are required and identify responsible party for associated costs.
ANSWER: There are no relocations anticipated for this site. If any discovery in the field is contradictory to the existing conditions, advise the owner.

27. QUESTION: Specifications reference SCDOT Encroachment Permit No. 301031 and additional provisions. Please provide all permit attachments and special conditions.
ANSWER: SCDOT encroachment permit provided in addendum 1 below.

28. QUESTION: On Sheet C301, there is a callout for "Connection to Existing Natural Gas Main (Shown for Coordination Only)". The drawings suggest a new natural gas line is to be stubbed up within 5' of the proposed generator location. Is this work to be performed by others?
    ANSWER: The general contractor shall be responsible for coordinating this work with the gas supplier.

29. QUESTION: Will the civil CAD files be released prior to the bid date?
    ANSWER: CAD provided in addendum 1 below.

30. QUESTION: Please provide details on the bollards.
    ANSWER: Detail has been added see detail 2/C-602.

31. QUESTION: Please confirm the location of the flag pole on the site.
    ANSWER: No flag pole will be installed.

32. QUESTION: Geotex 701 is noted as required at the asphalt pavement per details. This is atypical - please confirm.
    ANSWER: Geotex 701 is not necessary and has been removed from detail 1/C-601.

33. QUESTION: Tree protection is not shown at the remaining trees. Is protection going to be required?
    ANSWER: Tree protection has been added to Sheet CD001.

34. REFERENCE: C-501
    QUESTION: Is there a key available for the hatched area below at the detention basin? The hatched area is not called out on Sheet C-501.
    ANSWER: See legend on sheet C-501.

35. QUESTION: Please provide details for the dumpster pad, including thickness, reinforcement, dimensions, drainage, and applicable paving requirements.
    ANSWER: Dumpster pad detail has been added, see detail 11/C-602.

ARCHITECTURAL

1. QUESTION: There is not a note of "or equals" on the fixture schedule. Will Colleton County consider substitutions for equal products or does this have to go as specified?
   ANSWER: Neither the County nor JLA will be reviewing substitutions during the procurement/bidding phase. Please price the project as specified.

2. QUESTION: Please provide clarification on the shutter details, including schedules, specifications, functionality, material, dimensions, mounting detail, structural back requirements, color, or finish requirements.
   ANSWER: Bahama shutters are intended as architectural shade shutters and are not required to provide hurricane-impact protection. Basis of design shall be

Architectural Shade Products, ASP Bahama Shutter Awning, fixed aluminum louvered shutter, or approved comparable product. Provide extruded aluminum framing and louvers, fixed support arms, manufacturer-required attachment hardware and structural backing, and factory-applied powder-coat finish. Color shall be selected by the Architect/Owner from the manufacturer's standard range.

3. QUESTION: Please confirm whether any manufacturer self-adhering high temperature underlayment meeting the specified performance requirements, compatible with the selected standing-seam metal roof system, is acceptable subject to submittal approval. If not, please identify the required manufacturer and product.
   ANSWER: Yes. Provide a self-adhering high-temperature underlayment complying with Section 07 41 13.16. The underlayment shall be a minimum 30 mil thick self-adhering sheet with a slip-resistant polyethylene-film top surface over butyl or SBS-modified asphalt adhesive, comply with ASTM D1970/D1970M, remain stable at 240°F, and pass low-temperature flexibility testing at -20°F. No specific manufacturer is required, provided the submitted product complies with the specified requirements and is compatible with the roofing system.

4. QUESTION: Please provide the required gutter profile dimensions and outlet size, or confirm that the roofing manufacturer may furnish a manufacturer-standard Ogee gutter sized to accommodate the design roof drainage area and coordinated with the downspouts and Civil storm system.
   ANSWER: Provide 6-inch Ogee-profile aluminum gutters with 3-inch by 5-inch plain rectangular aluminum downspouts. Gutters and downspouts shall comply with Section 07 71 00, including 0.040-inch aluminum construction, matching gutter straps, and continuous hinged leaf guards. Coordinate downspout locations and connections with the Civil storm drainage system.

5. QUESTION: After reviewing the plans, there isn't a brick manufacture or color listed. Is this building matching a similar one around it or has that detail not been finalized yet.
   ANSWER: Face brick shall comply with Section 04 20 00: ASTM C216, Grade SW, Type FBS, nominal modular-size brick with actual dimensions of 3-5/8 inches by 2-1/4 inches by 7-5/8 inches. The Contract Documents do not presently identify a specific face-brick manufacturer, product, color, or texture. Brick color and texture shall be selected by the Architect/Owner from submitted samples.

6. QUESTION: Please provide a detail and type of fencing at the dumpster enclosure. Provide complete dumpster enclosure plans, elevations, wall/fence material, height, gate size and hardware, finish, foundations, bollards, drainage, required truck clearances, and details for the dumpster gates.
   ANSWER: The Contract Documents do not presently provide sufficient information to establish the complete dumpster enclosure construction, including enclosure material, height, gate construction, foundations, bollards, drainage, and truck-clearance requirements. Dumpster enclosure requirements will be provided. See, C101 and detail 11/C602, included in Addendum 1 attached below.

7. QUESTION: Confirm what if any FF&E is to be contractor provided and/ or installed.
   ANSWER: Furniture, fixtures, and equipment (FF&E) are the responsibility of the Owner unless specifically identified otherwise in the Contract Documents. The General Contractor shall coordinate with Owner-furnished equipment where installation, power, data, or other connections are required. Existing projection screen relocation is Owner-furnished and Contractor-installed. Kitchen appliances/foodservice equipment will be Owner-provided. See Addendum 1 attached below.

8. QUESTION: Sheet A-905 calls out “OWNER PROVIDED PROJECTION SCREEN TO BE RELOCATED”. Is this item to be installed by GC or Owner?
   ANSWER: The existing projection screen is Owner-furnished and shall be relocated and installed by the General Contractor. Coordinate final location and installation requirements with the Owner.

9. REFERENCE: Section 10 14 19 / Elevations
   QUESTION: Spec Section 10 14 19 refers to the plans for actual dimensions of signage; however, no height, verbiage, or mock-ups are shown on the exterior elevations. Please provide the required sign dimensions, text, character height, and layout.
   ANSWER: Provide dimensional letter signage in accordance with Section 10 14 19. Letters shall be cast aluminum with concealed or projecting stud mounting as specified. Sign wording, character height, layout, and location will be indicated in the Addendum drawings. Finish and typeface shall be selected by the Architect from the manufacturer’s full range. See Addendum 1 attached below.

10. QUESTION: Please clarify the extent of exterior brick veneer, including recessed areas, covered porches, wall returns, and columns. Please provide any missing written dimensions needed to establish the total masonry quantities.
    ANSWER: Exterior brick veneer shall be provided at all locations indicated on the architectural exterior elevations, wall sections, and details, including brick water-table areas and brick column bases. Brick veneer shall return at corners, recessed wall conditions, and similar transitions as required to provide a complete finished installation. Brick-wrapped columns shall be constructed as detailed on Sheet A-102. Quantities shall be based on the dimensions and extents shown on the Contract Drawings.

11. QUESTION: Confirm the required depth and extent of brick veneer below finish grade, particularly where footing elevations vary between -2'-0", -3'-0", and -4'-0". Please also confirm whether all below-grade cavities require solid grouting.
    ANSWER: Extend brick veneer below finished grade to the supporting foundation conditions indicated on the Structural Drawings. Grout fill the below-grade cavity continuously up to, or slightly above, finished grade. Provide through-wall flashing and weeps above the top of the grout fill, in accordance with the architectural details and Section 04 20 00.

12. QUESTION: Confirm the required anchor type and spacing, including whether the 16-inch maximum horizontal and vertical spacing specified in Section 042000 governs all veneer locations.

ANSWER: Provide adjustable seismic masonry-veneer anchors in accordance with Section 04 20 00. At masonry veneer locations, space anchors not more than 16 inches o.c. vertically and 16 inches o.c. horizontally, with not less than one anchor for each 2.67 square feet of wall area. Provide additional anchors within 12 inches of openings and at intervals not exceeding 36 inches around the perimeter of openings.

13. QUESTION: Confirm the governing weep-hole spacing and flashing requirements where the architectural details and masonry specifications differ.
ANSWER: Section 04 20 00 shall govern. Provide through-wall flashing as specified and install open-head-joint weeps in the first course of masonry immediately above the flashing at 16 inches O.C.

14. QUESTION: Drawing A-103 references R-6 insulation, while Section 042000 references 2-inch Thermax R-13. Please confirm which insulation is required.
ANSWER: Provide 1-1/2-inch insulated ZIP sheathing with a minimum insulating value of R-6, as indicated on the Architectural Drawings.

15. QUESTION: Confirm reinforcement, doweling, bond beam, and grouting requirements for masonry backing at brick-wrapped columns and any additional CMU locations.
ANSWER: Refer to the Structural Drawings for CMU reinforcement, doweling, bond beam, and grouting requirements at brick-wrapped columns and other structural masonry locations. Architectural details shall be coordinated to indicate “Bond beam, see Structural Drawings” and similar references where applicable.

16. QUESTION: Confirm the specified face-brick manufacturer, color, size, texture, and required mortar color.
ANSWER: See response to Architectural Question No. 5 above.

17. QUESTION: Provide the Type A window specifications as they are missing from the specification book and plan set.
ANSWER: Type A openings are fixed aluminum storefront-framed punched openings, 3'-0" wide by 4'-8" high, and shall comply with Section 08 41 13. Basis of design is Kawneer Trifab VersaGlaze 451T/601T, or approved comparable product.

18. QUESTION: Drawings and Specs do not indicate an Aluminum Color. It says clear and colored and selection to be made by Architect. Can you specify?
ANSWER: Aluminum storefront framing and Type A punched-opening framing shall receive a Class I clear anodized finish.

19. REFERENCE: Section 11 40 00 – Foodservice Equipment / Drawings A-105 and A-106
QUESTION: Neither A-105 nor A-106 provide any details on the Food Service Equipment listed in Section 11 40 00. The project specifications contain language regarding Owner-furnished equipment; however, Section 11 40 00 also directs the Contractor to provide and install the foodservice equipment listed in the Kitchen Equipment Schedule on Drawings A-105 and A-106.

Please provide an equipment list and confirm which foodservice/kitchen equipment shown on A-105 and A-106 is to be furnished and installed by the Contractor and identify any equipment that will be Owner-furnished and/or Owner-installed.
ANSWER: Kitchen and foodservice equipment shall be Owner-furnished. The General Contractor shall provide and coordinate the required utility rough-ins and connections indicated in the Contract Documents for Owner-furnished equipment.

20. QUESTION: The wall assembly references ZIP sheathing, 1½-inch R-6 rigid insulation – please confirm if the intent is to use 1 ½" insulated ZIP panels (which are R= 6.6).
ANSWER: Yes. Provide a 1-1/2-inch insulated ZIP sheathing system with a minimum insulating value of R-6. The approximately R-6.6 value of the specified 1-1/2-inch insulated ZIP panel is acceptable.

21. QUESTION: The required fire-resistance rating for the attic and its enclosing assemblies is unclear.
Please confirm whether any attic assemblies must be fire-rated. Identify required ratings, locations, and assembly details.
ANSWER: No fire-resistance-rated attic walls, ceilings, roof assemblies, or attic enclosure assemblies are required for this project. Refer to Sheets G-002 and G-101. The attic and mezzanine construction shall be provided as indicated on the Architectural and Structural Drawings.

22. QUESTION: Dumpster enclosure: Provide complete dumpster enclosure plans, elevations, wall/fence material, height, gate size and hardware, finish, concrete pad thickness and reinforcement, foundations, bollards, drainage, and required truck clearances.
ANSWER: See response to Architectural Question No. 6 above for dumpster enclosure requirements. Refer also to the response to Civil Question No. 34 for dumpster pad construction requirements.

23. QUESTION: Dumpster equipment responsibility: Confirm dumpster size and quantity and whether the dumpster is owner-furnished, hauler-furnished, or contractor-furnished. Confirm whether an enclosure roof or utilities are required.
ANSWER: The dumpster will be furnished by the Owner. Provide one dumpster enclosure at the location shown on Sheet C-101. Dumpster size shall be coordinated with the Owner's waste-service provider. No enclosure roof or utilities are required. The General Contractor shall provide the dumpster enclosure and pad as indicated by the responses to Architectural Question No. 6 and Civil Question No. 34.

24. QUESTION: Window treatments: Confirm which openings receive blinds or shades, furnishing/installation responsibility and details.
ANSWER: Provide BL-1 horizontal louver blinds in accordance with Section 12 24 94 at exterior Type A windows and other glazed openings where indicated in the Addendum drawings. Blinds shall be Contractor-furnished and Contractor-installed. Color shall be selected by the Architect from the manufacturer's standard range.

25. QUESTION: For acoustical wall panels, provide exact locations and extent, elevations, panel layout, panel sizes, edge treatment, attachment details, finish selections, and confirmed square footage for AWP in the Main EOC Room. The finish specification directs use of an allowance and notes design TBD
Refer to the Finish Schedule on Sheet A901. Acoustical wall panels shall be covered under the $30,000 allowance identified in Specification Section 01 21 00, as issued with Addendum No. 1. Final panel locations, layout, sizes, edge treatments, attachment details, colors, and finishes shall be determined by the Owner and Architect during construction.

26. QUESTION: Only restroom signs are depicted in drawings for Section 101423.16. Will a comprehensive signage schedule (permanent room ID, mechanical/electrical, evacuation plans) be issued? If so, provide complete room signage schedule, ADA signage requirements, mounting heights, and sign message list. For dimensional signage, provide locations, wording, sizes, fonts, and mounting details.
ANSWER: Refer to the Architectural Drawings and Specification Section 01 21 00, as issued with Addendum No. 1, for the interior and exterior signage allowances. Final signage locations, quantities, messages, sizes, fonts, finishes, and mounting details shall be coordinated with the Owner and Architect during construction. All signage shall comply with applicable ADA and code requirements. No additional signage schedules or details will be issued at this time.

27. QUESTION: Identify which specific rooms fall under ICC-500 storm shelter standards, confirm if Risk Category III or IV governs, and clarify if sole-source opening assemblies are required.
ANSWER: Refer to Architectural Sheet G002 and Structural Sheet S001 for designated storm shelter areas and applicable design criteria. The facility is classified as Risk Category IV. Storm shelter openings and assemblies shall comply with ICC 500 where indicated. Any sole-source requirements shall be confirmed by the Architect.

28. QUESTION: Please provide a fully coordinated room finish schedule identifying all floor, wall, and ceiling finishes by room number. Numerous specification sections refer only to finishes "as indicated on drawings."
ANSWER: Please see schedule on A901 in addition to Interior Elevations on A-902-A905.

29. QUESTION: For paint schedule, please provide complete paint color schedule, finish requirements, and coating systems.
ANSWER: Products to be priced based on the manufacturers and product selections indicated on A901, including the full range of available colors and finishes. Final color and finish selections to be determined by Owner during construction.

30. QUESTION: For carpet tile selection, provide manufacturer, style, color, installation pattern, and approved equals for CPT-1 and CPT-2.

ANSWER: Products to be priced based on the manufacturers and product selections indicated on A901, including the full range of available colors and finishes. Final color and finish selections to be determined by Owner during construction. Neither the County nor JLA will be reviewing substitutions during the procurement/bidding phase.

31. QUESTION: For acoustical ceiling assemblies, provide basis-of-design manufacturers, panel types, colors, and any specialty suspension system requirements.
ANSWER: Products to be priced based on the manufacturers and product selections indicated on A901, including the full range of available colors and finishes. Final color and finish selections to be determined by Owner during construction.

32. QUESTION: For countertops, provide colors, edge profiles, sink cutout requirements, backsplash details, and room locations.
ANSWER: Products to be priced based on the manufacturers and product selections indicated on A901, including the full range of available colors and finishes. Final color and finish selections to be determined by Owner. See Millwork Details on A906/A907.

33. QUESTION: For exterior wall assembly coordination, please provide complete wall-type matrix identifying insulation requirements, sheathing, moisture barriers, and finish materials.
ANSWER: Refer to the wall sections, wall types, and associated details indicated in the Construction Documents, together with the applicable Specifications, for exterior wall assembly requirements, including insulation, sheathing, moisture barriers, and finish materials.

34. QUESTION: Provide final louver schedule with sizes, free-area requirements, finishes, and wind-load requirements.
ANSWER: Louver sizes and locations shall be as indicated in the Construction Documents. Refer to Specification Section 10 20 00 for applicable product and performance requirements. Final colors and finishes shall be selected by the Owner and Architect during construction.

35. QUESTION: Provide final roof panel profile, manufacturer, color selection, trim details, and warranty requirements
ANSWER: Refer to Specification Section 07 41 13.16, Standing-Seam Metal Roof Panels, and the associated roof details in the Contract Drawings for panel profile, acceptable manufacturers, trim, flashing, and warranty requirements. Final color and finish selections shall be made by the Owner and Architect during construction. Provide all required trim, flashing, and accessories compatible with the specified roofing system.

36. QUESTION: Doors 105 & 121A note both aluminum storefront and solid core wood. Please confirm material.
ANSWER: Both doors will be SCW/Glass per door schedule. See Addendum 1 to follow with updated door Type.

37. QUESTION: In the specifications 10 22 39, there is a note of walls going in both the multi-purpose room (107), and the gaming/E-sport room. On the drawings, there is only the operable partition in Quiet Room 115. Please clarify.
ANSWER: Operable Partition to only be in Quiet Room 115 per drawings.

38. QUESTION: Please confirm the 5V profile for the drip edge exposed screw.
ANSWER: No exposed screw – refer to drawings for drip edge condition.

STRUCTURAL

1. REFERENCE: Structural drawings / Referenced geotechnical report
QUESTION: The structural drawings reference a geotechnical report that was not included in the documents available for review.
Please provide the latest geotechnical report and applicable addenda, including recommendations for foundations, earthwork, groundwater, and seismic ground improvement
ANSWER: Geotechnical report will be included with Addendum package.

2. REFERENCE: Structural drawings / Geotechnical requirements
QUESTION: This question may be answered by the Geotech report; otherwise, the requirement for earthquake drains and the associated design criteria cannot be confirmed without the referenced geotechnical report.
Please confirm whether earthquake drains are required. If required, provide performance criteria, design responsibility, drainage detail, layout limits, spacing, depth, quantity basis, installation details, testing, and required repair after installation. If design is delegated, identify the responsible party and required design submittals.
ANSWER: Earthquake drains are required for the EOC to remain operational after a design seismic event. Relevant performance criteria can be found on drawing S-001. Drainage details and geometry to be determined by delegated design engineer. A responsible delegated design party has not been determined at the time of Addendum submittal.

3. QUESTION: Liquefaction mitigation: Confirm the selected liquefaction-mitigation approach for the building and whether earthquake drains, structural accommodation, or deep foundationsare required.
ANSWER: Earthquake drains to be used. See response to Structural Question #2 above.

4. QUESTION: Earthquake drains: If earthquake drains are required, provide performance criteria, design responsibility, drainage detail, layout limits, spacing, depth, quantity basis, testing, and required repair after installation.
ANSWER: See answer to Structural Question #2 above.

5. QUESTION: Confirm slab thickness, reinforcing, embeds, block outs, and structural support around the CorDeck cellular raceway, trench duct, floor boxes, and risers.
   ANSWER: See Detail 11 on Drawing S-301 for relevant information.

6. QUESTION: Provide the complete Statement of Special Inspections referenced on the structural sheets and specifications.
   ANSWER: Statement of Special Inspections will be provided.

7. QUESTION: The documents require an AISC-certified fabricator and an AISC-certified erector. Will the Owner/Engineer permit a non-AISC-certified fabricator and/or erector if the work is subject to enhanced third-party special inspection/testing by a qualified independent agency acceptable to the Owner and Engineer? If yes, please identify the inspection scope, frequency, documentation, agency qualifications, and whether IAS AC172 accreditation is acceptable for the fabricator without AISC certification.
   ANSWER: It is permissible, but not advisable. If a non-AISC fabricator is used, a third-party special inspector will need to be present during the fabrication of any structural steel building elements. Relevant structural steel special inspections can be found on Drawings S-002. IAS AC172 certification is acceptable in lieu of AISC certification.

8. QUESTION: Please identify all areas requiring Class A, Class C, and Class J concrete.
   ANSWER: Areas requiring each class of concrete are outlined in the specifications (footings, interior slabs-on-grade, exterior concrete).

9. QUESTION: Confirm soil bearing design values and whether additional site-specific geotechnical recommendations apply beyond structural drawings.
   ANSWER: Design soil values confirmed. Geotechnical report includes provisions for site pavement design. Soil design vales will apply to generator pad, radio tower foundation, light pole foundations, and pavement.

PLUMBING

1. QUESTION: Provide complete plumbing fixture schedule identifying fixture tags, manufacturers, mounting heights, accessories, and specialties.
   ANSWER: See drawing P-301 and division 22 specifications.

2. QUESTION: For the Mixing Valves, identify locations, capacities, and fixture groups served by ASSE 1017 and ASSE 1016 mixing valves.
   ANSWER: See specification 221119 – Domestic Water Piping Specialties for specifications of temperature-actuated, water mixing valves. There is a primary thermostatic mixing valve serving the hot water discharge of the gas water heater (GWH-1). See detail 5/P-401. It serves all plumbing fixtures receiving hot water, except for the lavatories in 123 ADA Tlt and 124 ADA Tlt. All lavatories in the building are also served by a individual-fixture, water tempering valve.

3. QUESTION: Provide final water heater model, storage volume, recovery rate, venting requirements, and controls.
   ANSWER: See drawing P-301 and division 22 specifications.

4. QUESTION: For the Drinking Fountain, please confirm bottle filler requirement, filtration requirements, manufacturer, and mounting criteria.
   ANSWER: See drawing P-301 and specification 224700 – Drinking Fountains and Water Coolers.

5. QUESTION: For the Domestic Water Booster Pump, please confirm room number, pump designation, controls, and electrical responsibilities
   ANSWER: The only domestic water pump is the hot water recirculation pump located in 111 Janitor. See drawing P-301 and specification 221123.21 – Inline, Domestic-Water Pumps.

MECHANICAL

1. QUESTION: Provide complete equipment schedules, capacities, efficiencies, controls, and approved manufacturers.
   ANSWER: See drawing M-201 and division 23 specifications.

2. QUESTION: Provide diffuser, grille, and register schedule with neck sizes, airflow rates, and finish requirements.
   ANSWER: See drawings M-101 and M-201, and specification 233713.13 – Air Diffusers.

3. QUESTION: Clarify whether Building Automation System controls are included and identify integration requirements.
   ANSWER: There is no Building Automation System or direct digital controls. See drawing M-201 for Emergency Ventilation Air Shutdown Sequence of Operations.

4. QUESTION: Provide Testing and Balancing scope limits and required performance benchmarks.
   ANSWER: See specification 230593 – Testing, Adjusting, and Balancing for HVAC.

ELECTRICAL

1. QUESTION: We have been asked to provide a quote for the lighting and controls on this project, but it is specified Lithonia which we do not represent. There is not a note of “or equals” on the fixture schedule. Will Colleton County consider substitutions for equal products or does this have to go as specified?
   ANSWER: Neither the County nor JLA will be reviewing substitutions during the procurement/bidding phase. Please price the project as specified.

2. QUESTION: Please identify the basis of design access control manufacturer/platform(software house, Kan tech, Brivo, etc.)
   ANSWER: PRTC will provide and install all low-voltage systems, equipment, devices, and cabling under the low-voltage allowance. The Contractor shall coordinate all rough-in and access requirements with Mark Davenport (Phone: 843-538-9349, Email: mark.davenport@prtc.us).

3. QUESTION: Credential Technology: Please confirm required credential technology (HID Prox, mobile credentials, etc)
   ANSWER: See answer to question #2.

4. QUESTION: Integration requirements: Is integration required. If so, required between:

   a. Access Control and CCTV
   b. Access Control and Intrusion Detection
   c. Access Control and Building Management Systems
   d. Access Control and Intercom/Video Intercom System

   ANSWER: See answer to question #2.

5. QUESTION: Please confirm whether the Security Contractor is responsible only for access control electronics, or for furnishing the electrified locking hardware identified in the door hardware schedule
   ANSWER: See answer to question #2.

6. QUESTION: Is CCTV requested? If so, please confirm:

   e. Total camera quantities
   f. Camera types (fixed, fisheye, multi-sensor, PTZ, etc.)
   g. Required resolutions
   h. Recording retention requirements
   i. VMS platform
   j. NVR/server requirements
   k. Storage requirements
   l. Analytics requirements

   ANSWER: See answer to question #2.

7. QUESTION: Is MC Cable acceptable?
   ANSWER: MC cable is allowed for connections to light fixtures only in lengths not to exceed 6ft.

8. QUESTION: Can Main Service be Aluminum Feeders?
   ANSWER: All feeders and conductors shall be copper. Aluminum is not approved.

9. QUESTION: The specified low voltage pathway system is identified in the review notes as Cor-Duct; its exact identity and acceptable alternatives require confirmation.
   Please confirm the specified manufacturer and system and whether a particular vendor is mandatory. Provide performance and approval criteria, including requirements for future flexibility.
   ANSWER: Provide In-Floor Raceway System as prescribed in specification 260533: In Floor Cellular Raceway Systems for On-grade Application and on Architectural and Electrical plans. Installer must be certified by manufacturer and have a minimum of five years documented experience installing Cordeck In-Floor Raceway System.

10. QUESTION: Generator docking station: Provide approved manufacturer, enclosure, AIC/SCCR, cam-lock arrangement, breaker/interlock or Kirk-key sequence, mounting detail, pad requirements, signage, and testing.
    ANSWER: Docking station is wall mounted unit by TRYSTAR. Provide Nema 4X enclosure. See sheet E-401.

11. QUESTION: Security/access control: Define the base-contract scope for card readers, keypads, electric locks, door contacts, cameras, control panels, cabling, programming, licensing, testing, and commissioning.
    ANSWER: See answer to question #2.

12. QUESTION: Please confirm whether the Owner is providing all low-voltage data, voice, technology, cameras, and access control, with the General Contractor providing raceways and back boxes only.
    There are no cabling or security systems shown on the drawings or in the specifications. Please confirm whether structured cabling, access control, and video surveillance are included in the General Contractor’s bid or will be released separately to approved data/security contractors or vendors.
    ANSWER: See answer to question #2.

13. QUESTION: Provide confirmed utility provider requirements and service transformer responsibilities.
    ANSWER: See E-401. Coordinate transformer installation requirements with Electrical Service Provider: Dominion Energy, Michael Dandridge, 843-549-8623.

14. QUESTION: For data cabling scope, confirm extent of structured cabling, telecommunications equipment, racks, patch panels, and testing requirements.
    ANSWER: See answer to question #2.

15. QUESTION: For In-Floor Raceway System, please clarify extent, manufacturer, devices, ownership, and installation requirements of the floor cellular raceway system shown on architectural drawings.
    ANSWER: See answer to question #9.

FIRE PROTECTION

1. QUESTION: Is there an existing fire line serving the building? Confirm that the building does not have an automatic sprinkler system.
   ANSWER: There is no existing fire line serving the building. The building will not have an automatic sprinkler system.

2. QUESTION: What is the full fire protection scope, including sprinkler, fire alarm, and whether special clean-agent suppression systems are required?
   ANSWER: Fire alarm only.

3. QUESTION: Fire Alarm Sequence of Operation - Provide complete cause-and-effect matrix, monitoring requirements, annunciator locations, and interface requirements
   ANSWER: Refer to the Electrical Drawings and Division 28 Specifications. The Fire Alarm Contractor shall provide a complete sequence of operations and cause-and-effect matrix, including monitoring, annunciation, and system interfaces, as part of the shop drawing submittal in accordance with NFPA 72. Locations and interfaces shall be coordinated with the Architect, Engineer, and AHJ.

4. QUESTION: Provide complete fire alarm device schedule and quantities.
   ANSWER: Refer to the Electrical Drawings and applicable Division 28 Fire Alarm Specifications for fire alarm device types and requirements. The Fire Alarm Contractor shall verify device quantities and provide a complete device schedule as part of the fire alarm shop drawing submittal. All devices shall comply with NFPA 72, applicable codes, and the Contract Documents.

5. QUESTION: Confirm whether the sprinkler system is included in this contract. Will this work be delegated design or are fire protection drawings available?
   ANSWER: A fire sprinkler system is not in this contract.

6. QUESTION: Will IFP-75/IFP-75B Fire Alarm Control Panel, Farenhyt Series by Honeywell be acceptable as an alternate to the three brands listed in fire alarm specification 284621.11?
   ANSWER: Neither the County nor JLA will be reviewing substitutions during the procurement/bidding phase. Please price the project as specified.

7. QUESTION: Must the fire alarm addressable system be UL-certified?
   ANSWER: Refer to the Electrical Drawings and applicable Division 28 Fire Alarm Specifications for system requirements. Fire alarm equipment shall be UL 864-listed and comply with NFPA 72 and applicable codes. UL certification of the complete installed system is not required unless specifically indicated in the Contract Documents or required by the Authority Having Jurisdiction (AHJ).

ADDENDUM NUMBER 1

I. CHANGES TO SPECIFICATIONS AND DRAWINGS

The following clarifications, amendments, additions, revisions, changes and/or modifications shall take precedence over the drawings and specifications for the above-named project only in the amount and to the extent hereinafter specified in this addendum. Where any item called for in the specifications or indicated on the drawings is not supplemented hereby, the original requirements shall remain in effect. Where any original item is amended, voided or superseded hereby, the provision of such item not specifically amended, voided or superseded shall remain in effect.

SPECIFICATIONS:

1. SECTION 012100 – ALLOWANCES:
    a. Clarified the Owner's General Contingency Allowance of $100,000 and added allowances for Interior Signage, Exterior Signage (building-mounted and roadside), Low-Voltage Systems, and Brick. Clarified the respective allowance amounts and requirements for inclusion in the Contractor's Base Bid.
2. SECTION 031000 – CONCRETE FORMING AND ACCESSORIES:
    a. Revised field quality control requirements to designate the General Contractor, rather than the Owner, as responsible for engaging qualified testing agencies and special inspectors to perform required testing and inspections.
3. SECTION 032000 - CONCRETE REINFORCING
    a. Revised field quality control requirements to designate the General Contractor, rather than the Owner, as responsible for engaging qualified testing agencies and special inspectors to perform required testing and inspections.
4. SECTION 033000 – CAST-IN-PLACE CONCRETE
    a. Revised field quality control requirements to designate the General Contractor, rather than the Owner, as responsible for engaging qualified testing agencies and special inspectors to perform required testing and inspections.
5. SECTION 051200 – STRUCTURAL STEEL
    a. Revised field quality control requirements to designate the General Contractor, rather than the Owner, as responsible for engaging qualified testing agencies and special inspectors to perform required testing and inspections.
6. SECTION 054000 - COLD-FORMED METAL FRAMING
    a. Revised field quality control requirements to designate the General Contractor, rather than the Owner, as responsible for engaging qualified testing agencies and special inspectors to perform required testing and inspections.

7. SECTION 312000 – EARTH MOVING:
    a. Revised field quality control requirements to designate the General Contractor, rather than the Owner, as responsible for engaging qualified testing agencies and special inspectors to perform required testing and inspections.
8. SECTION 3121216 – ASPHALT PAVING:
    a. Revised field quality control requirements to designate the General Contractor, rather than the Owner, as responsible for engaging qualified testing agencies and special inspectors to perform required testing and inspections.

CIVIL DRAWINGS:

1. CD001 – DEMOLITION PLAN
    a. Adjusted call outs on electrical line to #10
    b. Added silt fence and tree protection
2. C101 – SITE LAYOUT AND STAKING PLAN
    a. Various callouts and their respective details
    b. Inset added as well as callouts for dumpster and generator pads
    c. No longer have a flume at dumpster pad
    d. ADA parking and ramp as well as detail callouts
    e. Signage added (ADA parking and stop signs)
3. C201 – GRADING & DRAINAGE PLAN
    a. Inverts added to callouts
    b. Modified grading in dumpster area
    c. Flume removed.
4. C202 – MISCELLANEOUS PROFILES
    a. Inverts added to callouts.
5. C301 – SITE UTILITIES PLAN
    a. Various callouts and their respective details modified.
    b. Steel casing adjusted to 60 LF.
    c. Potable water line and fire water line material callouts
6. C501 – SWPPP PLAN
    a. Silt fence and tree protection added
    b. SWPPP legend added
    c. CWM callout removed
    d. Rip Rap callouts added throughout site
7. C601 – SITE DETAILS AND SPECIFICATIONS
    a. Removed non-applicable details and reorganized sheet layout as necessary.
8. C602 - SITE DETAILS AND SPECIFICATIONS
    a. Details added as required for construction.
    b. Dumpster detail added, 11/C-602.
9. C603 – SITE DETAILS AND SPECIFICATIONS
    a. Details added as required for construction.
    b. Road sign elevation and detail added, 11/C-603.

ARCHITECTURAL DRAWINGS:

1. A103
    a. Modified weep spacing to 16” O.C. instead of 24” O.C. to match specifications.
2. A401
    a. Exterior signage indicated on exterior elevations and noted.
3. A801
    a. Modified door type note to avoid contradicting door schedule, altered how push bar
4. A901
    a. Added note clarifying interior louver blind locations.

ELECTRICAL DRAWINGS:

1. ES100 – SITE PLAN
    a. Added radio tower grounding and bonding diagram 2/ES100.
    b. Revised notes to clarify transformer, concealed wiring, and installation requirements for backlit signage.
2. E-401:
    a. Detail 1 RISER DIAGRAM: add note: Provide Hubbell, Dietek or approved equal. SPD shall meet UL 1449 4th edition
    b. Criteria: Surge current 50ka/mode, 130 ka/phase
       Modes of protection l-n, l-l, l-g, n-g
       Max continuous operating voltage 115% of nominal
       Fault current rating 200,000 AIC
       UL 1449 nominal discharge 20ka
    c. Detail 1 RISER DIAGRAM: add note: Provide wall mounted docking station unit by TRYSTAR. Provide Nema 4X enclosure.

ADDITIONAL DOCUMENTS:

3. GEOTECH REPORT
4. SOIL MAP
5. ARCHEOLOGICAL REPORT

SECTION 012100 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements governing allowances.

1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when directions will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

B. Types of allowances include the following:

1. Lump-sum allowances.
2. Contingency allowances.

C. Related Requirements:
1. Section 014000 "Quality Requirements" for procedures governing the use of allowances for testing and inspecting.

1.3 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.

B. At Architect's request, obtain proposals for each allowance for evaluation and recommendation to the Owner for use in making final selections. Include recommendations that are relevant to performing the Work.

C. Purchase products and systems authorized in writing by the Owner, following Architect’s review for general conformance with the Contract Documents, from the designated supplier.

1.4 ACTION SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

1.5 INFORMATIONAL SUBMITTALS

A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.

C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.6 COORDINATION

A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.7 LUMP-SUM, UNIT-COST, AND QUANTITY ALLOWANCES

A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight, and delivery to Project site.

B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.

C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.

1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.8 CONTINGENCY ALLOWANCES

A. Use the contingency allowance only as authorized in writing by the Owner, based on Architect’s written recommendation, and only by Change Orders that indicate amounts to be charged to the allowance.

B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation, taxes, insurance, equipment rental, and similar costs.

C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit margins.

D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

1.9 ADJUSTMENT OF ALLOWANCES

A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.

1. Include installation costs in purchase amount only where indicated as part of the allowance.
2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
3. Submit substantiation of a change in scope of work, if any, claimed in Change Orders related to unit-cost allowances.
4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.

B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.

1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.
2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

A. **Allowance No. 1**: Owner's General Contingency Allowance: Include a contingency allowance of **$100,000** (one-hundred - Thousand dollars) for use according to Owner's written instructions.

B. **Allowance No. 2**: Low Voltage: Include a stipulated sum allowance of **$70,000** (seventy - Thousand dollars) for low-voltage systems and associated work to be performed by PRTC. The allowance shall include all labor, materials, equipment, accessories, installation, testing, and coordination required for a complete and operational system. Hardware and equipment shall be excluded from this allowance and included separately in the Contractor's Base Bid unless noted otherwise. The allowance shall be used in accordance with the Owner's written instructions.

C. **Allowance No. 3**: Interior Signage: Include a material allowance of **$3,000** (three - Thousand dollars) for acoustic wall panel required by Section 10 14 23.16. The allowance shall include the cost of the selected Exterior Signage, applicable taxes, freight, and delivery to the Project site. Contractor shall include all labor, handling, accessories, installation, waste, overhead, profit, and other costs associated with the installation in the Contract Sum outside of this allowance. Final product, color, and texture shall be selected by the Architect/Owner from submitted samples.

D. **Allowance No. 4**: Exterior Dimensional-Letter Signage: Include a lump-sum allowance of **$30,000** (thirty - Thousand dollars) for exterior dimensional-letter signage required by Section 10 14 19. The allowance shall include furnishing, delivery, installation, mounting hardware, anchorage, illumination components, power supplies, shop drawings, and delegated-design requirements associated with the signage.

E. **Allowance No. 5**: Acoustic Wall Panel: Include a material allowance of **$30,000** (thirty-Thousand dollars) for acoustic wall panel required by Section 09 84 33. The allowance shall include the cost of the selected Acoustic Wall Panel, applicable taxes, freight, and delivery to the Project site. Contractor shall include all labor, handling, accessories, installation, waste, overhead, profit, and other costs associated with the installation in the Contract Sum outside of this allowance. Final product, color, and texture shall be selected by the Architect/Owner from submitted samples.

F. **Allowance No. 6**: Face Brick: Include a material allowance of **$750 per 1,000 face brick** for face brick required by Section 04 20 00. The allowance shall include the cost of the selected face brick, applicable taxes, freight, and delivery to the Project site. Contractor shall include all labor, handling, mortar, accessories, flashing, anchors, installation, waste, overhead, profit, and other costs associated with the masonry work in the Contract Sum outside of this allowance. Final brick manufacturer, product, color, and texture shall be selected by the Architect/Owner from submitted samples.

END OF SECTION 012100

SECTION 031000 - CONCRETE FORMING AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Form-facing material for cast-in-place concrete.
2. Bracing and anchoring.

1.3 DEFINITIONS

A. Form-Facing Material: Temporary structure or mold for the support of concrete while the concrete is setting and gaining sufficient strength to be self-supporting.

B. Formwork: The total system of support of freshly placed concrete, including the mold or sheathing that contacts the concrete, as well as supporting members, hardware, and necessary bracing.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review the following:

a. Special inspection and testing and inspecting agency procedures for field quality control.
b. Construction, movement, contraction, and isolation joints
c. Forms and form-removal limitations.
d. Anchor rod and anchorage device installation tolerances.

1.5 ACTION SUBMITTALS

A. Product Data: For each of the following:
1. As-cast surface form-facing material.
2. Form-release agent.

B. Shop Drawings: Prepared by, and signed and sealed by, a qualified professional engineer responsible for their preparation, detailing fabrication, assembly, and support of forms.

1. Indicate dimension and locations of construction and movement joints required to construct the structure in accordance with ACI 301.

    a. Location of construction joints is subject to approval of the Architect.
2. Indicate proposed schedule and sequence of stripping of forms.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing and inspection agency.

B. Field quality-control reports.

C. Minutes of preinstallation conference.

1.7 QUALITY ASSURANCE

A. Testing and Inspection Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Concrete Formwork: Erect, brace, and maintain formwork in accordance with ACI 301, to support lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads, so that resulting concrete conforms to the required shapes, lines, and dimensions.

1. Design wood panel forms in accordance with APA's "Concrete Forming Design/Construction Guide."
2. Design formwork to limit deflection of form-facing material to 1/240 of center-to-center spacing of supports.

2.2 FORM-FACING MATERIALS

A. As-Cast Surface Form-Facing Material:

1. Provide continuous, true, and smooth concrete surfaces.
2. Furnish in largest practicable sizes to minimize number of joints.
3. Acceptable Materials: As required to comply with Surface Finish designations specified in Section 033000 "Cast-In-Place Concrete, and as follows:

    a. Plywood, metal, or other approved panel materials.
    b. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:

1) APA HDO (high-density overlay).
2) APA MDO (medium-density overlay); mill-release agent treated and edge sealed.
3) APA Structural 1 Plyform, B-B or better; mill oiled and edge sealed.
4) APA Plyform Class I, B-B or better; mill oiled and edge sealed.

2.3 RELATED MATERIALS

A. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.

PART 3 - EXECUTION

3.1 INSTALLATION OF FORMWORK

A. Comply with ACI 301.

B. Construct formwork, so concrete structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117 and to comply with the Surface Finish designations specified in Section 033000 "Cast-In-Place Concrete" for as-cast finishes.

C. Limit concrete surface irregularities as follows:

1. Surface Finish-1.0: ACI 117 Class D, 1 inch.
2. Surface Finish-2.0: ACI 117 Class B, 1/4 inch.
3. Surface Finish-3.0: ACI 117 Class A, 1/8 inch.

D. Construct forms tight enough to prevent loss of concrete mortar.

1. Minimize joints.

E. Construct removable forms for easy removal without hammering or prying against concrete surfaces.

1. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces.
2. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
3. Install keyways and other accessories, for easy removal.

F. Do not use rust-stained, steel, form-facing material.

G. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces.

1. Provide and secure units to support screed strips
2. Use strike-off templates or compacting-type screeds.

H. Do not chamfer exterior corners and edges of permanently exposed concrete.

I. At construction joints, overlap forms onto previously placed concrete not less than 12 inches.

J. Form openings, chases, offsets, sinkages, keyways, and bulkheads required in the Work.

1. Determine sizes and locations from trades providing such items.
2. Obtain written approval of Architect prior to forming openings not indicated on Drawings.

K. Construction and Movement Joints:

1. Construct joints true to line with faces perpendicular to surface plane of concrete.
2. Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

L. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

M. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

N. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 INSTALLATION OF EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete.

1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.
3. Clean embedded items immediately prior to concrete placement.

3.3 REMOVING AND REUSING FORMS

A. Formwork for sides of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations, and curing and protection operations need to be maintained.

B. Clean and repair surfaces of forms to be reused in the Work.

1. Split, frayed, delaminated, or otherwise damaged form-facing material are unacceptable for exposed surfaces.
2. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints.

1. Align and secure joints to avoid offsets.
2. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.4 FIELD QUALITY CONTROL

A. Special Inspections: Engage a special inspector to perform field tests and inspections and prepare test reports.

B. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

C. Inspections:

1. Inspect formwork for shape, location, and dimensions of the concrete member being formed.

END OF SECTION 031000

SECTION 032000 - CONCRETE REINFORCING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Steel reinforcement bars.
2. Welded-wire reinforcement.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review the following:

a. Special inspection and testing and inspecting agency procedures for field quality control.
b. Construction contraction and isolation joints.
c. Steel-reinforcement installation.

1.3 ACTION SUBMITTALS

A. Product Data: For the following:

1. Each type of steel reinforcement.
2. Bar supports.

B. Shop Drawings: Comply with ACI SP-066:

1. Include placing drawings that detail fabrication, bending, and placement.
2. Include bar sizes, lengths, materials, grades, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, location of splices, lengths of lap splices, details of mechanical splice couplers, details of welding splices, tie spacing, hoop spacing, and supports for concrete reinforcement.

C. Construction Joint Layout: Indicate proposed construction joints required to build the structure.

1. Location of construction joints is subject to approval of Architect.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Statements: For testing and inspection agency.

B. Material Test Reports: For the following, from a qualified testing agency:

1. Steel Reinforcement:

a. For reinforcement to be welded, mill test analysis for chemical composition and carbon equivalent of the steel in accordance with ASTM A706/A706M.

C. Field quality-control reports.

D. Minutes of preinstallation conference.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.

B. Mockups: Reinforcing for cast-concrete formed surfaces, to demonstrate tolerances and standard of workmanship.

1. Build panel approximately 100 sq. ft. for formed surface in the location indicated on Drawings or, if not indicated, as directed by Architect.
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

1. Store reinforcement to avoid contact with earth.

PART 2 - PRODUCTS

2.1 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A615/A615M, Grade 60, deformed.

B. Plain-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, plain, fabricated from as-drawn steel wire into flat sheets.

C. Deformed-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, flat sheet.

2.2 REINFORCEMENT ACCESSORIES

A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place.

1. Manufacture bar supports from steel wire or plastic in accordance with CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

B. Steel Tie Wire: ASTM A1064/A1064M, annealed steel, not less than 0.0508 inch in diameter.

1. Finish: Plain.

2.3 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

PART 3 - EXECUTION

3.1 PREPARATION

A. Protection of In-Place Conditions:

1. Do not cut or puncture vapor retarder.
2. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.

3.2 INSTALLATION OF STEEL REINFORCEMENT

A. Comply with CRSI's "Manual of Standard Practice" for placing and supporting reinforcement.

B. Accurately position, support, and secure reinforcement against displacement.

1. Locate and support reinforcement with bar supports to maintain minimum concrete cover.
2. Do not tack weld crossing reinforcing bars.

C. Preserve clearance between bars of not less than 1 inch, not less than one bar diameter, or not less than 1-1/3 times size of large aggregate, whichever is greater.

D. Provide concrete coverage in accordance with ACI 318.

E. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

F. Splices: Lap splices as indicated on Drawings.

1. Bars indicated to be continuous, and all vertical bars to be lapped not less than 36 bar diameters at splices, or 24 inches, whichever is greater.

2. Stagger splices in accordance with ACI 318.

G. Install welded-wire reinforcement in longest practicable lengths.

1. Support welded-wire reinforcement in accordance with CRSI "Manual of Standard Practice."

a. For reinforcement less than W4.0 or D4.0, continuous support spacing to not exceed 12 inches.

2. Lap edges and ends of adjoining sheets at least one wire spacing plus 2 inches for plain wire and 8 inches for deformed wire.
3. Offset laps of adjoining sheet widths to prevent continuous laps in either direction.
4. Lace overlaps with wire.

3.3 JOINTS

A. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

1. Place joints perpendicular to main reinforcement.
2. Continue reinforcement across construction joints unless otherwise indicated.
3. Do not continue reinforcement through sides of strip placements of floors and slabs.

3.4 INSTALLATION TOLERANCES

A. Comply with ACI 117.

3.5 FIELD QUALITY CONTROL

A. Special Inspections: Engage a special inspector to perform field tests and inspections and prepare test reports.

B. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

C. Inspections:

1. Steel-reinforcement placement.

END OF SECTION 032000

SECTION 051200 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Structural-steel materials.
2. Shrinkage-resistant grout.

B. Related Requirements:

1. Section 053100 "Steel Decking" for field installation of shear stud connectors through deck.
2. Section 055000 "Metal Fabrications" for steel lintels and shelf angles not attached to structural-steel frame and other steel items not defined as structural steel.

1.2 DEFINITIONS

A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in ANSI/AISC 303.

1.3 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

A. Product Data:

1. Structural-steel materials.
2. High-strength, bolt-nut-washer assemblies.
3. Anchor rods.
4. Shop primer.
5. Shrinkage-resistant grout.

B. Shop Drawings: Show fabrication of structural-steel components.

1. Include details of cuts, connections, splices, holes, and other pertinent data.
2. Include embedment Drawings.
3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical, high-strength bolted connections.
5. Identify members not to be shop primed.

C. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs): Provide in accordance with AWS D1.1/D1.1M for each welded joint whether prequalified or qualified by testing, including the following:

1. Power source (constant current or constant voltage).
2. Electrode manufacturer and trade name, for demand-critical welds.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For fabricator and installer.

B. Welding certificates.

C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

D. Mill test reports for structural-steel materials, including chemical and physical properties.

E. Product Test Reports: For the following:

1. Bolts, nuts, and washers, including mechanical properties and chemical analysis.
2. Direct-tension indicators.
3. Tension-control, high-strength, bolt-nut-washer assemblies.

F. Survey of existing conditions.

G. Source quality-control reports.

H. Field quality-control reports.

1.7 QUALITY ASSURANCE

A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category BU or is accredited by the IAS Fabricator Inspection Program for Structural Steel (Acceptance Criteria 172).

B. Installer Qualifications: A qualified Installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category CSE.

C. Shop-Painting Applicator Qualifications: Qualified in accordance with AISC's Sophisticated Paint Endorsement P1 or to SSPC-QP 3.

D. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.1/D1.1M.

1. Welders and welding operators performing work on bottom-flange, demand-critical welds are to pass the supplemental welder qualification testing, as required by AWS D1.8/D1.8M. FCAW-S and FCAW-G are to be considered separate processes for welding personnel qualification.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.

1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.

1. Fasteners may be repackaged provided Contractors testing and inspecting agency observes repackaging and seals containers.
2. Clean and relubricate bolts and nuts that become dry or rusty before use.
3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F3125/F3125M, Grade F1852 bolt assemblies and for retesting bolt assemblies after lubrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Comply with applicable provisions of the following specifications and documents:

1. ANSI/AISC 303.
2. ANSI/AISC 360.
3. RCSC's "Specification for Structural Joints Using High-Strength Bolts."

B. Connection Design Information:

1. Connection designs have been completed and connections indicated on the Drawings.

C. Construction: Primary construction is cold-formed steel with minor structural steel elements.

2.2 STRUCTURAL-STEEL MATERIALS

A. W-Shapes: ASTM A992/A992M.

B. Channels, Angles, M-Shapes: ASTM A36/A36M.

C. Plate and Bar: ASTM A36/A36M.

D. Cold-Formed Hollow Structural Sections: ASTM A500/A500M, Grade B structural tubing.

E. Welding Electrodes: Comply with AWS requirements.

2.3 BOLTS AND CONNECTORS

A. High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers; all with plain finish.

2.4 PRIMER

A. Steel Primer:

1. Comply with Section 099600 "High-Performance Coatings."
2. SSPC-Paint 23, latex primer.
3. Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.

2.5 SHRINKAGE-RESISTANT GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.6 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate in accordance with ANSI/AISC 303 and to ANSI/AISC 360.
   1. Mark and match-mark materials for field assembly.
   2. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.

B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.

   1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.

C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.

D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted in accordance with SSPC-SP 1.

F. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.

   1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
   2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
   3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.7 SHOP CONNECTIONS

A. High-Strength Bolts: Shop install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for type of bolt and type of joint specified.

   1. Joint Type: Snug tightened.

B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

   1. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in ANSI/AISC 303 for mill material.

2.8 SHOP PRIMING

A. Shop prime steel surfaces, except the following:

1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
2. Surfaces enclosed in interior construction.

B. Surface Preparation of Steel: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces in accordance with the following specifications and standards:

1. SSPC-SP 2.
2. SSPC-SP 3.
3. SSPC-SP 7 (WAB)/NACE WAB-4.
4. SSPC-SP 14 (WAB)/NACE WAB-8.
5. SSPC-SP 11.
6. SSPC-SP 6 (WAB)/NACE WAB-3.
7. SSPC-SP 10 (WAB)/NACE WAB-2.
8. SSPC-SP 5 (WAB)/NACE WAB-1.
9. SSPC-SP 8.

C. Priming: Immediately after surface preparation, apply primer in accordance with manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
2. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

2.9 SOURCE QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform shop tests and inspections.

1. Allow testing agency access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
2. Bolted Connections: Inspect shop-bolted connections in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
3. Welded Connections: Visually inspect shop-welded connections in accordance with AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:

    a. Liquid Penetrant Inspection: ASTM E165/E165M.
    b. Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
    c. Ultrasonic Inspection: ASTM E164.
    d. Radiographic Inspection: ASTM E94/E94M.

4. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify, with certified steel erector present, elevations of concrete-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.

1. Prepare a certified survey of existing conditions. Include bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated on Drawings.

1. Do not remove temporary shoring supporting composite deck construction and structural-steel framing until cast-in-place concrete has attained its design compressive strength.

3.3 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and in accordance with ANSI/AISC 303 and ANSI/AISC 360.

B. Baseplates, Bearing Plates, and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.

1. Set plates for structural members on wedges, shims, or setting nuts as required.
2. Weld plate washers to top of baseplate.
3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
4. Promptly pack shrinkage-resistant grout solidly between bearing surfaces and plates, so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for grouting.

C. Maintain erection tolerances of structural steel within ANSI/AISC 303.

D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure. Slope roof framing members to slopes indicated on Drawings.
2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.

E. Splice members only where indicated.

F. Do not use thermal cutting during erection.

G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

3.4 FIELD CONNECTIONS

A. High-Strength Bolts: Install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for bolt and joint type specified.

1. Joint Type: Snug tightened.

B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Comply with ANSI/AISC 303 and ANSI/AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
2. Remove backing bars or runoff tabs, back gouge, and grind steel smooth.

3.5 REPAIR

A. Touchup Painting:

1. Immediately after erection, clean exposed areas where primer is damaged or missing, and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

a. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

2. Cleaning and touchup painting are specified in Section 099600 "High-Performance Coatings."

B. Touchup Priming: Cleaning and touchup priming are specified in Section 099600 "High-Performance Coatings."

3.6 FIELD QUALITY CONTROL

A. Special Inspections: Engage a special inspector to perform the following special inspections:

1. Verify structural-steel materials and inspect steel frame joint details.
2. Verify weld materials and inspect welds.
3. Verify connection materials and inspect high-strength bolted connections.

B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

1. Bolted Connections: Inspect bolted connections in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
2. Welded Connections: Visually inspect field welds in accordance with AWS D1.1/D1.1M.

a. In addition to visual inspection, test and inspect field welds in accordance with AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:

1) Liquid Penetrant Inspection: ASTM E165/E165M.
2) Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
3) Ultrasonic Inspection: ASTM E164.
4) Radiographic Inspection: ASTM E94/E94M.

END OF SECTION 051200

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete standards.
2. Concrete materials.
3. Admixtures.
4. Fiber reinforcement.
5. Vapor retarders.
6. Liquid floor treatments.
7. Curing materials.
8. Accessories.
9. Repair materials.
10. Concrete mixture materials.
11. Concrete mixture class types.
12. Concrete mixing.

B. Related Requirements:

1. Section 031000 "Concrete Forming and Accessories" for form-facing materials.
2. Section 032000 "Concrete Reinforcing" for steel reinforcing bars and welded-wire reinforcement.

1.2 DEFINITIONS

A. Cementitious Materials: Portland cement or blended hydraulic cement alone or in combination with one or more of the following:

1. Fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.

B. Water/Cementitious Materials (w/cm) Ratio: The ratio by weight of mixing water to cementitious materials.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:

a. Contractor's superintendent.

b. Independent testing agency responsible for inspections and acceptance testing of concrete at Project site.
c. Ready-mix concrete manufacturer.
d. Concrete Subcontractor.

2. Review the following:

a. Special inspection and testing and inspecting agency procedures for field quality control.
b. Construction joints, control joints, isolation joints, and joint-filler strips.
c. Vapor-retarder installation.
d. Anchor rod and anchorage device installation tolerances.
e. Cold- and hot-weather concreting procedures.
f. Concrete finishes and finishing.
g. Curing procedures.
h. Forms and form-removal limitations.
i. Methods for achieving specified floor and slab flatness and levelness.
j. Floor and slab flatness and levelness measurements.
k. Concrete repair procedures.
l. Concrete protection.
m. Initial curing of standard-cured and field curing of field-cured test cylinders (ASTM C31/C31M.)
n. Protection of field cured field test cylinders.
o. Distribution of test reports.

1.4 ACTION SUBMITTALS

A. Product Data:

1. Portland cement.
2. Blended hydraulic cement.
3. Fly ash.
4. Silica fume.
5. Natural or other pozzolans.
6. Aggregates.
7. Admixtures:
8. Fiber reinforcement.
9. Vapor retarders.
10. Liquid floor treatments.
11. Curing materials.
12. Joint fillers.
13. Repair materials.

B. Design Mixtures: For each concrete mixture, include the following:

1. Mixture identification.
2. Compressive strength at 28 days or other age as specified.
3. Compressive strength required at stages of construction.
4. Durability exposure classes for Exposure Categories F, S, W, and C.
5. Maximum w/cm ratio.

6. Calculated equilibrium and fresh density for lightweight concrete.
7. Slump or slump flow limit.
8. Air content.
9. Nominal maximum aggregate size.
10. Synthetic microfiber content.
11. Intended placement method.
12. Submit adjustments to design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant changes.

C. Shop Drawings:

1. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.

a. Location of construction joints is subject to approval of the Architect.

D. Samples: For vapor retarder.

E. Concrete Schedule: For each location of each class of concrete indicated in "Concrete Mixture Class Types" Article, including the following:

1. Concrete class designation.
2. Location within Project.
3. Exposure class designation.
4. Formed surface finish designation and final finish.
5. Final finish for floors.
6. Floor treatment, if any.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For the following:

1. Installer: Include copies of applicable ACI certificates.
2. Testing Agency: Include documentation indicating compliance with ASTM E329 or ASTM C1077 and copies of applicable ACI certificates for testing technicians or ACI Concrete Construction Special Inspector - MH, ASCC.

B. Material Certificates: For each of the following:

1. Cementitious materials.
2. Admixtures.
3. Fiber reinforcement.
4. Curing compounds.
5. Vapor retarders.
6. Repair materials.

C. Material Test Reports: For the following:

1. Portland cement.
2. Blended hydraulic cement.

3. Performance-based hydraulic cement.
4. Fly ash.
5. Natural or other pozzolans.
6. Aggregates.
7. Admixtures.

D. Floor surface flatness and levelness measurements report, indicating compliance with specified tolerances in accordance with ACI 117 and in compliance with ASTM E1155.

E. Research Reports:

1. For concrete admixtures in accordance with ICC's Acceptance Criteria AC198.
2. For sheet vapor retarder/termite barrier, showing compliance with ICC's Acceptance Criteria AC380.

F. Preconstruction Test Reports: For each mix design.

G. Field quality-control reports.

H. Minutes of preinstallation conference.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified Installer who employs Project personnel qualified as an ACI-certified Concrete Flatwork Associate and Concrete Flatwork Finisher and a supervisor who is a certified ACI Advanced Concrete Flatwork Finisher/Technician or an ACI Concrete Flatwork Finisher with experience installing and finishing concrete.

B. Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.

1. Manufacturer's production facilities and delivery vehicles certified in accordance with NRMCA's certification requirements or equivalent approval by a State DOT.

C. Laboratory Testing Agency Qualifications: A testing agency qualified in accordance with ASTM C1077 and ASTM E329 for testing that performs duties on behalf of the Architect/Engineer.

1. Personnel performing laboratory tests to be an ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Level 1. Testing agency laboratory supervisor tests to be an ACI-certified Concrete Laboratory Testing Technician, Level 2.

D. Field Quality-Control Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.

1. Personnel conducting field tests on plastic concrete properties are to be qualified as an ACI Concrete Field Testing Technician, Grade 1, in accordance with policies from ACI CPP 610.1 or an equivalent certification program.

1.7 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on each concrete mixture.

1. Include the following information in each test report:

a. Admixture dosage rates.
b. Slump.
c. Air content.
d. Seven-day compressive strength.
e. 28-day compressive strength.
f. Evaluation of permeability-reducing admixtures.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Comply with ASTM C94/C94M and ACI 301.

1.9 FIELD CONDITIONS

A. Cold-Weather Placement: Comply with ACI 301 as follows:

1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
2. When air temperature has fallen to, or is expected to fall below 40 deg F during the protection period, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
3. Do not use frozen materials or materials containing ice or snow.
4. Do not place concrete in contact with surfaces less than 35 deg F, other than reinforcing steel.

B. Hot-Weather Placement: Comply with ACI 301 and ACI 305.1, and as follows:

1. Maintain concrete temperature at time of discharge to not exceed 95 deg F.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

1.10 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to furnish replacement sheet vapor retarder/termite barrier material and accessories for sheet vapor retarder/ termite barrier and accessories that do not comply with requirements or that fail to resist penetration by termites within specified warranty period.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 CONCRETE STANDARDS

A. ACI Publications: Comply with ACI 301 unless modified by requirements in the Contract Documents.

2.2 CONCRETE MATERIALS

A. Source Limitations:

1. Obtain all concrete mixtures from a single ready-mixed concrete manufacturer for entire Project.
2. Obtain each type of admixture from single source from single manufacturer.

B. Cementitious Materials:

1. Portland Cement: ASTM C150/C150M, Type II.

C. Normal-Weight Aggregates:

1. Coarse Aggregate: ASTM C33/C33M, Class 1N
2. Maximum Coarse-Aggregate Size: 3/4 inch nominal.
3. Fine Aggregate: ASTM C33/C33M.
4. Recycled Aggregate: Provide documentation of characteristics of recycled aggregate and mechanical properties and durability of proposed concrete, which incorporates recycled aggregate to conform to appliable requirements for the class of concrete.
5. Alkali-Silica Reaction: Comply with one of the following for each aggregate used:

a. Expansion Result of Aggregate: Not more than 0.04 percent at one year when tested in accordance with ASTM C1293.
b. Expansion Results of Aggregate and Cementitious Materials in Combination: Not more than 0.10 percent at an age of 16 days when tested in accordance with ASTM C1567. Do not use this option with fly ash with an alkali content greater than 4.0 percent. Submit supporting data for each aggregate showing expansion in excess of 0.10 percent when tested in accordance with ASTM C1260.
c. Alkali Content in Concrete: Not to exceed 4 lb./cu. yd. for aggregate with expansion greater than or equal to 0.04 percent and less than 0.12 percent or 3 lb./cu. yd. for aggregate with expansion greater than or equal to 0.12 percent and

less than 0.24 percent. Test aggregate reactivity in accordance with ASTM C1293. Calculate alkali content of concrete in accordance with ACI 301. Do not use this option with natural pozzolan or fly ash that has a calcium oxide content greater than 18 percent or an alkali content greater than 4.0 percent; or for an aggregate with expansion at one year greater than or equal to 0.24 percent when tested in accordance with ASTM C1293.

2.3 ADMIXTURES

A. Air-Entraining Admixture: ASTM C260/C260M.

B. Chemical Admixtures: Do not use calcium chloride or admixtures containing calcium chloride in steel-reinforced concrete.

1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
2. Retarding Admixture: ASTM C494/C494M, Type B.
3. Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
5. High-Range, Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type G.
6. Admixtures with special properties, with documentation of claimed performance enhancement, ASTM C494/C494M, Type S.
7. Set-Accelerating Corrosion-Inhibiting Admixture: ASTM C1582/C1582M.

8. Permeability-Reducing Admixture: ASTM C494/C494M, Type S, hydrophilic, permeability-reducing crystalline or colloidal silica admixture, capable of reducing water absorption of concrete exposed to hydrostatic pressure (PRAH).
   a. Permeability: No leakage when tested in accordance with U.S. Army Corps of Engineers CRD C48 at a hydraulic pressure of 200 psi for 14 days.

9. Moisture-Vapor-Reducing Admixture: ASTM C494/C494M, Type S, hydrophilic, moisture-vapor-reducing, capable of reducing water absorption in and moisture-vapor emission from concrete (MVRA).

C. Mixing Water for Concrete Mixtures and Water Used to Make Ice: ASTM C1602/C1602M. Include documentation of compliance with limits for alkalis, sulfates, chlorides, or solids content of mixing water from Table 2 in ASTM C1602/C1602M.

2.4 FIBER REINFORCEMENT

A. Synthetic Monofilament Microfiber: Monofilament polypropylene microfibers complying with ASTM C1116/C1116M, Type III, 1 to 2-1/4 inches long.

B. Synthetic Fibrillated Microfiber: Fibrillated polypropylene microfibers complying with ASTM C1116/C1116M, Type III, 1 to 2-1/4 inches long.

2.5 VAPOR RETARDERS

A. Sheet Vapor Retarder, Class A: ASTM E1745, Class A. Include manufacturer's recommended thickness and adhesive or pressure-sensitive tape.

2.6 LIQUID FLOOR TREATMENTS

A. Penetrating Liquid Floor Treatment: Clear, chemically reactive, waterborne solution of inorganic silicate or siliconate materials and proprietary components; odorless; that penetrates, hardens, and densifies concrete surfaces.

2.7 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

C. Moisture-Retaining Cover: ASTM C171, polyethylene film burlap-polyethylene sheet.

1. Color:

a. Ambient Temperature Below 50 deg F (10 deg C): Black.
b. Ambient Temperature between 50 and 85 deg F (10 and 29 deg C): Any color.
c. Ambient Temperature Above 85 deg F (29 deg C): White.

D. Curing Paper: 8 ft. wide paper, consisting of two layers of fibered kraft paper laminated with double coating of asphalt.

E. Water: Potable water that does not cause staining of the surface.

F. Clear, Waterborne, Membrane-Forming, Curing and Sealing Compound: ASTM C1315, Type 1, Class A.

2.8 ACCESSORIES

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D1751, asphalt-saturated cellulosic fiber.

B. Bonding Agent: ASTM C1059/C1059M, Type II, nonredispersible, acrylic emulsion or styrene butadiene.

C. Floor Slab Protective Covering: 8 ft. wide cellulose fabric.

2.9 REPAIR MATERIALS

A. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface to match adjacent floor elevations.

1. Cement Binder: ASTM C150/C150M portland cement or hydraulic or blended hydraulic cement, as defined in ASTM C219.
2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5000 psi at 28 days when tested in accordance with ASTM C109/C109M.

2.10 CONCRETE MIXTURE MATERIALS

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, in accordance with ACI 301.

1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland or hydraulic cement in concrete assigned to Exposure Class F3 as follows:

1. Fly Ash or Other Pozzolans: 25 percent by mass.
2. Total of Fly Ash or Other Pozzolans and Silica Fume: 35 percent by mass with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.

C. Admixtures: Use admixtures in accordance with manufacturer's written instructions.

1. Use corrosion-inhibiting admixture in concrete mixtures where indicated.
2. Use permeability-reducing admixture in concrete mixtures where indicated.

2.11 CONCRETE MIXTURE CLASS TYPES

A. Class A: Normal-weight concrete used for spread footings and wall footings.

1. Exposure Class: ACI 318 Class F0, Class S1, Class W1, Class C1.
2. Minimum Compressive Strength: 3000 psi at 28 days.
3. Maximum w/cm Ratio: 0.52.
4. Slump Limit: 4 inches, plus or minus 1 inch for concrete.
5. Slump Flow Limit: 22 inches, plus or minus 1-1/2 inches.
6. Air Content: Naturally-entrained

7. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cementitious materials.

8. Compressive strength or alternative methods of estimating in-place strength of concrete by maturity or other nondestructive testing with acceptable correlation between test results and concrete compressive strength.

B. Class C: Normal-weight concrete used for interior slabs-on-ground.

1. Exposure Class: ACI 318 Class F0, Class S0, Class W0, Class C0.
2. Minimum Compressive Strength: 4000 psi at 28 days.
3. Maximum w/cm Ratio : 0.48.
4. Slump Limit: 4 inches, plus or minus 1 inch for concrete.
5. Slump Flow Limit: 22 inches, plus or minus 1.5 inches.
6. Air Content:

   a. Do not use an air-entraining admixture or allow total air content to exceed 3 percent for concrete used in trowel-finished floors.

7. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cement.
8. Synthetic Microfiber: Uniformly disperse in concrete mixture at manufacturer's recommended rate, but not less than a rate of 1.5 lb/cu. yd..

C. Class J: Normal-weight concrete used for exterior porch slabs and stoops

1. Exposure Class: ACI 318 Class F1, Class S0, Class W1, Class C1.
2. Minimum Compressive Strength: 4000 psi at 28 days.
3. Maximum w/cm Ratio: 0.48.
4. Slump Limit: 4 inches, plus or minus 1 inch for concrete.
5. Slump Flow Limit: 22 inches, plus or minus 1.5 inches.
6. Air Content:
   a. Exposure Classes F2 and F3: 4.0 to 6.0 percent at point of delivery for concrete containing 3/4-inch nominal maximum aggregate size.

7. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cement.

2.12 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete in accordance with ASTM C94/C94M and furnish delivery ticket.

B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete in accordance with ASTM C94/C94M. Mix concrete materials in appropriate drum-type batch machine mixer.

1. For mixer capacity of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than five minutes after ingredients are in mixer, before any part of batch is released.
2. For mixer capacity larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd..
3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:

1. Before placing concrete, verify that installation of concrete forms, accessories, reinforcement, and embedded items is complete and that required inspections have been performed.
2. Do not proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide reasonable auxiliary services to accommodate field testing and inspections, acceptable to testing agency, including the following:

1. Daily access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Secure space for storage, initial curing, and field curing of test samples, including source of water and continuous electrical power at Project site during site curing period for test samples.
4. Security and protection for test samples and for testing and inspection equipment at Project site.

3.3 TOLERANCES

A. Comply with ACI 117.

3.4 INSTALLATION OF EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining Work that is attached to or supported by cast-in-place concrete.

1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

3.5 INSTALLATION OF VAPOR RETARDERS

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder in accordance with ASTM E1643 and manufacturer's written instructions.

1. Install vapor retarder with longest dimension parallel with direction of concrete pour.

2. Face laps away from exposed direction of concrete pour.
3. Lap vapor retarder over footings and grade beams not less than 6 inches, sealing vapor retarder to concrete.
4. Lap joints 6 inches and seal with manufacturer's recommended tape.
5. Terminate vapor retarder at the top of floor slabs, grade beams, and pile caps, sealing entire perimeter to floor slabs, grade beams, foundation walls, or pile caps.
6. Seal penetrations in accordance with vapor retarder manufacturer's instructions.
7. Protect vapor retarder during placement of reinforcement and concrete.

    a. Repair damaged areas by patching with vapor retarder material, overlapping damages area by 6 inches on all sides and sealing to vapor retarder.

3.6 INSTALLATION OF CAST-IN-PLACE CONCRETE

A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.

1. Immediately prior to concrete placement, inspect vapor retarder for damage and deficient installation, and repair defective areas.
2. Provide continuous inspection of vapor retarder during concrete placement and make necessary repairs to damaged areas as Work progresses.

B. Notify Architect and testing and inspection agencies 24 hours prior to commencement of concrete placement.

C. Water addition in transit or at the Project site must be in accordance with ASTM C94/C94M and must not exceed the permitted amount indicated on the concrete delivery ticket.

D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness.

1. If a section cannot be placed continuously, provide construction joints as indicated.
2. Deposit concrete to avoid segregation.
3. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
4. Consolidate placed concrete with mechanical vibrating equipment in accordance with ACI 301.

    a. Do not use vibrators to transport concrete inside forms.
    b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer.
    c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.
    d. At each insertion, limit duration of vibration to time necessary to consolidate concrete, and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

E. Deposit and consolidate concrete for slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Do not place concrete slabs in a checkerboard sequence.
2. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
3. Maintain reinforcement in position on chairs during concrete placement.
4. Screed slab surfaces with a straightedge and strike off to correct elevations.
5. Level concrete, cut high areas, and fill low areas.
6. Slope surfaces uniformly to drains where required.
7. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.
8. Do not further disturb slab surfaces before starting finishing operations.

3.7 INSTALLATION OF JOINTS

A. Construct joints true to line, with faces perpendicular to surface plane of concrete.

B. Construction Joints: Coordinate with floor slab pattern and concrete placement sequence.

1. Install so strength and appearance of concrete are not impaired, at locations indicated on Drawings or as approved by Architect.
2. Place joints perpendicular to main reinforcement.

    a. Continue reinforcement across construction joints unless otherwise indicated.

3. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.

C. Control Joints in Slabs-on-Ground: Form weakened-plane control joints, sectioning concrete into areas as indicated. Construct control joints for a depth equal to at least one-fourth of concrete thickness as follows:
1. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random cracks.

D. Isolation Joints in Slabs-on-Ground: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as walls and other locations, as indicated.

1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated on Drawings.
2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface, where joint sealants, specified in Section 079200 "Joint Sealants," are indicated.
3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

3.8 APPLICATION OF FINISHING FLOORS AND SLABS

A. Scratch Finish:

1. While still plastic, texture concrete surface that has been screeded and bull-floated or darbied.
2. Use stiff brushes, brooms, or rakes to produce a profile depth of 1/4 inch in one direction.
3. Apply scratch finish to surfaces [**to receive concrete floor toppings**] [**to receive mortar setting beds for bonded cementitious floor finishes**] <**Insert locations**>.

B. Float Finish:

1. When bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operation of specific float apparatus, consolidate concrete surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats.
2. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture and complies with ACI 117 tolerances for conventional concrete.
3. Apply float finish to surfaces to receive trowel finish.

C. Trowel Finish:

1. After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel.
2. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance.
3. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
4. Do not add water to concrete surface. Use of an approved finishing aid is acceptable.
5. Do not apply troweled finish to concrete, which has a total air content greater than 3 percent.
6. Apply a trowel finish to surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
7. Finish surfaces to the following tolerances, in accordance with ASTM E1155, for a randomly trafficked floor surface:

    a. Slabs on Ground:

        1) Specified overall values of flatness, F_F 25; and of levelness, F_L 20; with minimum local values of flatness, F_F 17; and of levelness, F_L 15.

D. Trowel and Fine-Broom Finish: First apply a trowel finish to surfaces where ceramic or quarry tile is to be installed by either thickset or thinset method. While concrete is still plastic, slightly scarify surface with a fine broom perpendicular to main traffic route.

1. Coordinate required final finish with Architect before application.
2. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

E. Broom Finish: Apply a broom finish to exterior concrete porches, stoops, and locations indicated on Drawings.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with a fiber-bristle broom perpendicular to main traffic route.
2. Coordinate required final finish with Architect before application.

3.9 APPLICATION OF FINISHING FORMED SURFACES

A. As-Cast Surface Finishes:

1. ACI 301 (ACI 301M) Surface Finish SF-1.0: As-cast concrete texture imparted by form-facing material.

a. Patch voids larger than 1-1/2 inches wide or 1/2 inch deep.
b. Remove projections larger than 1 inch.
c. Surface Tolerance: ACI 117, Class D.
d. Apply to concrete surfaces for metal lap pan deck formed surfaces and those surfaces that are buried or covered with subsequent installed surfaces.

3.10 INSTALLATION OF MISCELLANEOUS CONCRETE ITEMS

A. Filling in:

1. Fill in holes and openings left in concrete structures after Work of other trades is in place unless otherwise indicated.
2. Mix, place, and cure concrete, as specified, to match color and texture with in-place construction exposed to view.
3. Provide other miscellaneous concrete filling indicated or required to complete the Work.

3.11 APPLICATION OF CONCRETE CURING

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

1. Comply with ACI 301 for cold weather protection during curing.
2. Comply with ACI 301 and ACI 305.1 for hot-weather protection during curing.
3. Maintain moisture loss no more than 0.2 lb/sq. ft. x h, calculated in accordance with ACI 305R, before and during finishing operations.

B. Curing Formed Surfaces: Comply with ACI 308.1 as follows:

1. Cure formed concrete surfaces, including sides of slab turndownss, and other similar surfaces.
2. If forms remain during curing period, moist cure after loosening forms.
3. If removing forms before end of curing period, continue curing for remainder of curing period as follows:

a. Continuous Fogging: Maintain standing water on concrete surface until final setting of concrete.
b. Continuous Sprinkling: Maintain concrete surface continuously wet.
c. Absorptive Cover: Pre-dampen absorptive material before application; apply additional water to absorptive material to maintain concrete surface continuously wet.
d. Water-Retention Sheeting Materials: Cover exposed concrete surfaces with sheeting material, taping, or lapping seams.
e. Membrane-Forming Curing Compound: Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.

1) Recoat areas subject to heavy rainfall within three hours after initial application.
2) Maintain continuity of coating and repair damage during curing period.

C. Curing Unformed Surfaces: Comply with ACI 308.1 as follows:

1. Begin curing after finishing concrete.
2. Interior Concrete Floors:

a. Floors to Receive Floor Coverings Specified in Other Sections: Contractor has option of the following:

1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.

a) Lap edges and ends of absorptive cover not less than 12 inches.
b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.

2) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive.

a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
b) Cure for not less than seven days.

3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following not in cold weather:

a) Water.
b) Continuous water-fog spray.

b. Floors To Receive Curing and Sealing Compound:

1) Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller in accordance with manufacturer's written instructions.

2) Recoat areas subjected to heavy rainfall within three hours after initial application.
3) Repeat process 24 hours later, and apply a second coat. Maintain continuity of coating, and repair damage during curing period.

3.12 APPLICATION OF LIQUID FLOOR TREATMENTS

A. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller in accordance with manufacturer's written instructions.

3.13 INSTALLATION OF JOINT FILLING

A. Prepare, clean, and install joint filler in accordance with manufacturer's written instructions.

1. Defer joint filling until concrete has aged at least one month(s).

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.

C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints.

D. Overfill joint, and trim joint filler flush with top of joint after hardening.

3.14 INSTALLATION OF CONCRETE SURFACE REPAIRS

A. Defective Concrete:

1. Repair and patch defective areas when approved by Architect.
2. Remove and replace concrete that cannot be repaired and patched to meet specification requirements.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks in excess of 0.01 inch spalls, air bubbles exceeding surface finish limits, honeycombs, rock pockets, fins and other projections on the surface exceeding surface finish limits, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete.

a. Limit cut depth to 3/4 inch.
b. Make edges of cuts perpendicular to concrete surface.
c. Clean, dampen with water, and brush-coat holes and voids with bonding agent.

d. Fill and compact with patching mortar before bonding agent has dried.

2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement, so that, when dry, patching mortar matches surrounding color.

   a. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching.
   b. Compact mortar in place and match surrounding surface.

3. Repair defects on concealed formed surfaces that will affect concrete's durability and structural performance, as determined by Architect.

D. Repairing Unformed Surfaces:

1. Test unformed surfaces, such as floors and slabs, for finish, and verify surface tolerances specified for each surface.

   a. Correct low and high areas.
   b. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

2. Repair finished surfaces containing surface defects, including spalls, popouts, honeycombs, rock pockets, crazing, and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width.
3. After concrete has cured at least 14 days, correct high areas by grinding.
4. Correct localized low areas during, or immediately after, completing surface-finishing operations by adding patching mortar.

   a. Finish repaired areas to blend into adjacent concrete.

5. Correct other low areas scheduled to receive floor coverings with a repair underlayment.

   a. Prepare, mix, and apply repair underlayment and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
   b. Feather edges to match adjacent floor elevations.

6. Correct other low areas scheduled to remain exposed with repair topping.

   a. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations.
   b. Prepare, mix, and apply repair topping and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.

7. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete.

   a. Remove defective areas with clean, square cuts, and expose steel reinforcement with at least a 3/4-inch clearance all around.

b. Dampen concrete surfaces in contact with patching concrete and apply bonding agent.
c. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate.
d. Place, compact, and finish to blend with adjacent finished concrete.
e. Cure in same manner as adjacent concrete.

8. Repair random cracks and single holes 1 inch or less in diameter with patching mortar.

a. Groove top of cracks and cut out holes to sound concrete, and clean off dust, dirt, and loose particles.
b. Dampen cleaned concrete surfaces and apply bonding agent.
c. Place patching mortar before bonding agent has dried.
d. Compact patching mortar and finish to match adjacent concrete.
e. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.15 FIELD QUALITY CONTROL

A. Special Inspections: Engage a special inspector to perform field tests and inspections and prepare testing and inspection reports.

B. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

1. Testing agency to be responsible for providing curing facility for initial curing of strength test specimens on-site and verifying that test specimens are cured in accordance with standard curing requirements in ASTM C31/C31M.
2. Testing agency to immediately report to Architect, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.
3. Testing agency to report results of tests and inspections, in writing, to Owner, Architect, Contractor, and concrete manufacturer within 48 hours of inspections and tests.

a. Test reports to include reporting requirements of ASTM C31/C31M, ASTM C39/C39M, and ACI 301, including the following as applicable to each test and inspection:

1) Project name.
2) Name of testing agency.
3) Names and certification numbers of field and laboratory technicians performing inspections and testing.
4) Name of concrete manufacturer.
5) Date and time of inspection, sampling, and field testing.
6) Date and time of concrete placement.
7) Location in Work of concrete represented by samples.

8) Date and time sample was obtained.
9) Truck and batch ticket numbers.
10) Design compressive strength at 28 days.
11) Concrete mixture designation, proportions, and materials.
12) Field test results of fresh concrete, including slump or slump flow, air content, temperature and density.
13) Information on storage and curing of samples at the Project site, including curing method and maximum and minimum temperatures during initial curing period.
14) Type of fracture and compressive break strengths at seven days and 28 days.

4. Provide a space and source of power or other resources for curing and access to test specimens by the testing agency.

C. Delivery Tickets: comply with ASTM C94/C94M.

D. Inspections:
1. Verification of use of required design mixture.
2. Concrete placement, including conveying and depositing.
3. Curing procedures and maintenance of curing temperature.
4. Verification of concrete strength before removal of forms from slabs.
5. Batch Plant Inspections: On a random basis, as determined by Architect.

E. Concrete Tests: Testing of composite samples of fresh concrete obtained in accordance with ASTM C 172/C 172M to be performed in accordance with the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 150 cu. yd. or fraction thereof.

a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing is to be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C143/C143M:

a. One test at point of delivery for each composite sample, but not less than one test for each day's pour of each concrete mixture.
b. Perform additional tests as needed.

3. Slump Flow: ASTM C1611/C1611M:

a. One test at point of delivery for each composite sample when strength test specimens are cast, but not less than one test for each day's pour of each concrete mixture.
b. Perform additional tests as needed.

4. Air Content: ASTM C231/C231M pressure method, for normal-weight concrete;.

a. One test for each composite sample when strength test specimens are cast, but not less than one test for each day's pour of each concrete mixture.

5. Concrete Temperature: ASTM C1064/C1064M:

    a. One test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample when strength test specimens are cast.

6. Concrete Density: ASTM C138/C138M:

    a. One test for each composite sample when strength test specimens are cast.

7. Unit Weight: ASTM C138/C138M density of fresh structural lightweight concrete.

    a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture. The fresh density should be consistent with that associated with the equilibrium density within a tolerance of plus or minus 4 lb/ft.^{3}.

8. Compression Test Specimens: ASTM C31/C31M:

    a. Cast and standard cure two sets of two 6 inches by 12-inches or three 4-inch by 8-inch cylindrical specimens for each composite sample.
    b. Cast, and field cure two sets of three standard cylindrical specimens for each composite sample.

9. Compressive-Strength Tests: ASTM C39/C39M.

    a. Test one set of three standard cured specimens at seven days and one set of two specimens at 28 days.
    b. Test one set of three field-cured specimens at seven days and one set of two specimens at 28 days.
    c. A compressive-strength test to be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

10. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor to evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
11. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests of standard cured cylinders equals or exceeds specified compressive strength, and no compressive-strength test value falls below specified compressive strength by more than 500 psi if specified compressive strength is 5000 psi, or no compressive strength test value is less than 10 percent of specified compressive strength if specified compressive strength is greater than 5000 psi.
12. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
13. Additional Tests:

    a. Testing and inspecting agency to make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.

b. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by Architect.

1) Acceptance criteria for concrete strength to be in accordance with ACI 301, Section 1.7.6.3.

14. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
15. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

F. Measure floor and slab flatness and levelness in accordance with ASTM E1155 within 24 hours of completion of floor finishing and promptly report test results to Architect.

3.16 PROTECTION

A. Protect concrete surfaces as follows:

1. Protect from petroleum stains.
2. Diaper hydraulic equipment used over concrete surfaces.
3. Prohibit vehicles from interior concrete slabs.
4. Prohibit use of pipe-cutting machinery over concrete surfaces.
5. Prohibit placement of steel items on concrete surfaces.
6. Prohibit use of acids or acidic detergents over concrete surfaces.
7. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.
8. Protect concrete surfaces scheduled to receive surface hardener or polished concrete finish using floor slab protective covering.

END OF SECTION 033000

SECTION 054000 - COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Load-bearing wall framing.
2. Exterior non-load-bearing wall framing.
3. Interior non-load-bearing wall framing.
4. Floor joist framing.
5. Roof rafter framing.
6. Ceiling joist framing.
7. Soffit framing.

B. Related Requirements:

1. Section 055000 "Metal Fabrications" for miscellaneous steel shapes, masonry shelf angles, and connections used with cold-formed metal framing.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For the following:

1. Cold-formed steel framing materials.
2. Load-bearing wall framing.
3. Interior non-load-bearing wall framing.
4. Vertical deflection clips.
5. Floor joist framing.
6. Roof-rafter framing.
7. Post-installed anchors.
8. Power-actuated anchors.
9. Sill sealer gasket.

B. Shop Drawings:

1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.

C. Delegated Design Submittal: For cold-formed steel framing.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Welding certificates.

C. Product Certificates: For each type of code-compliance certification for studs and tracks.

D. Product Test Reports: For each listed product, for tests performed by manufacturer and witnessed by a qualified testing agency.

1. Steel sheet.
2. Expansion anchors.
3. Power-actuated anchors.
4. Mechanical fasteners.
5. Single deflection track.
6. Vertical deflection clips.
7. Miscellaneous structural clips and accessories.

E. Research Reports:

1. For nonstandard cold-formed steel framing post-installed anchors and power-actuated fasteners, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.
2. For sill sealer gasket/termite barrier, showing compliance with ICC-ES AC380.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM E329 for testing indicated.

B. Product Tests: Mill certificates or data from a qualified independent testing agency, or in-house testing with calibrated test equipment, indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic-coating thickness.

C. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified according to the product-certification program of the Steel Stud Manufacturers Association.

D. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect and store cold-formed steel framing from corrosion, moisture staining, deformation, and other damage during delivery, storage, and handling as required in AISI S202.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design cold-formed steel framing.

B. Structural Performance: Provide cold-formed steel framing capable of withstanding design loads within limits and under conditions indicated.

1. Design Loads: As indicated on Drawings.
2. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:

   a. Exterior Load-Bearing Wall Framing: Horizontal deflection of 1/600 of the wall height.
   b. Interior Load-Bearing Wall Framing: Horizontal deflection of 1/360 of the wall height under a horizontal load of 5 lbf/sq. ft..
   c. Interior Non-Load-Bearing Framing: Horizontal deflection of 1/240 of the wall height under a horizontal load of 5 lbf/sq. ft..
   d. Floor Joist Framing: Vertical deflection of 1/360 for live loads and l/240 for total loads of the span.
   e. Roof Rafter Framing: Vertical deflection of 1/240 of the horizontally projected span for live loads.
   f. Ceiling Joist Framing: Vertical deflection of 1/240 of the span for live loads and 1/180 for total loads of the span.

3. Design framing systems to provide for movement of framing members located outside the insulated building envelope without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 deg F.
4. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:

   a. Upward and downward movement of 3/4 inch.

5. Design exterior non-load-bearing wall framing to accommodate horizontal deflection without regard for contribution of sheathing materials.

C. Cold-Formed Steel Framing Standards: Unless more stringent requirements are indicated, framing complies with AISI S100 and AISI S240.

D. Fire-Resistance Ratings: Comply with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency acceptable to authorities having jurisdiction.

2.2 COLD-FORMED STEEL FRAMING MATERIALS

A. Framing Members, General: Comply with AISI S240 for conditions indicated.

B. Steel Sheet: ASTM A1003/A1003M, Structural Grade, Type H, metallic coated, of grade and coating designation as follows:

1. Grade: As required by structural performance.
2. Coating: G60, A60, AZ50, or GF30.

C. Steel Sheet for Vertical Deflection Clips: ASTM A653/A653M, structural steel, zinc coated, of grade and coating as follows:

1. Grade: 33.
2. Coating: G60.

2.3 LOAD-BEARING WALL FRAMING

A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:

1. Minimum Base-Metal Thickness: 0.0538 inch.
2. Flange Width: 1-5/8 inches.

B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with straight flanges, and as follows:

1. Minimum Base-Metal Thickness: 0.0428 inch.
2. Flange Width: 1-1/4 inches.

C. Steel Box or Back-to-Back Headers: Manufacturer's standard C-shapes used to form header beams, of web depths indicated, unpunched, with stiffened flanges, and as follows:

1. Minimum Base-Metal Thickness: 0.0677 inch.
2. Flange Width: 2 inches.

2.4 INTERIOR NON-LOAD-BEARING WALL FRAMING

A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:

1. Minimum Base-Metal Thickness: 0.0329 inch.
2. Flange Width: 1-3/8 inches.

B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:

1. Minimum Base-Metal Thickness: 0.0329 inch.
2. Flange Width: 1-1/4 inches.

C. Vertical Deflection Clips, Interior: Manufacturer's standard head clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.

D. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal loads and transfer them to the primary structure, and as follows:

1. Minimum Base-Metal Thickness: 0.0428 inch.
2. Flange Width: 1 inch plus the design gap for one-story structures.

2.5 FLOOR JOIST FRAMING

A. Steel Joists: Manufacturer's standard C-shaped steel joists, of web depths indicated, unpunched, with stiffened flanges, and as follows:

1. Minimum Base-Metal Thickness: 0.0677 inch.
2. Flange Width: 1-5/8 inches, minimum.

B. Steel Joist Track: Manufacturer's standard U-shaped steel joist track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:

1. Minimum Base-Metal Thickness: 0.0428 inch.
2. Flange Width: 1-1/2 inches, minimum.

2.6 ROOF-RAFTER FRAMING

A. Steel Rafters: Manufacturer's standard C-shaped steel sections, of web depths indicated, with stiffened flanges, and as follows:

1. Minimum Base-Metal Thickness: 0.0677 inch.
2. Flange Width: 1-5/8 inches, minimum.

2.7 FRAMING ACCESSORIES

A. Fabricate steel-framing accessories from ASTM A1003/A1003M, Structural Grade, Type H, metallic coated steel sheet, of same grade and coating designation used for framing members.

B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:

1. Supplementary framing.
2. Bracing, bridging, and solid blocking.
3. Web stiffeners.
4. Anchor clips.
5. End clips.
6. Foundation clips.
7. Gusset plates.
8. Stud kickers and knee braces.
9. Joist hangers and end closures.
10. Hole-reinforcing plates.
11. Backer plates.

2.8 ANCHORS, CLIPS, AND FASTENERS

A. Steel Shapes and Clips: ASTM A36/A36M, zinc coated by hot-dip process according to ASTM A123/A123M.

B. Anchor Bolts: ASTM F1554, Grade 36, threaded carbon-steel hex-headed bolts, carbon-steel nuts, and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A153/A153M, Class C.

C. Post-Installed Anchors: Fastener systems with bolts of same basic metal as fastened metal, if visible, unless otherwise indicated; with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC193 or as appropriate for the substrate.

1. Uses: Securing cold-formed steel framing to structure.
2. Type: Mechanical screw anchors
3. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941, Class Fe/Zn 5, unless otherwise indicated.

D. Power-Actuated Anchors: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

E. Mechanical Fasteners: ASTM C1513, corrosion-resistant-coated, self-drilling, self-tapping, steel drill screws.

1. Head Type: Low-profile head beneath sheathing; manufacturer's standard elsewhere.

F. Welding Electrodes: Comply with AWS standards.

2.9 MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint: ASTM A780/A780M.

B. Cement Grout: Portland cement, ASTM C150/C150M, Type I; and clean, natural sand, ASTM C404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.

C. Nonmetallic, Nonshrink Grout: Factory-packaged, nonmetallic, noncorrosive, nonstaining grout, complying with ASTM C1107/C1107M, and with a fluid consistency and 30-minute working time.

D. Shims: Load-bearing, high-density, multimonomer, nonleaching plastic; or cold-formed steel of same grade and metallic coating as framing members supported by shims.

E. Sill Sealer Gasket: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to match width of bottom track or rim track members as required.

2.10 FABRICATION

A. Fabricate cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.

1. Fabricate framing assemblies using jigs or templates.
2. Cut framing members by sawing or shearing; do not torch cut.
3. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, pneumatic pin fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.

    a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
    b. Locate mechanical fasteners and install according to Shop Drawings, with screws penetrating joined members by no fewer than three exposed screw threads.

4. Fasten other materials to cold-formed steel framing by welding, bolting, pneumatic pin fastening, or screw fastening, according to Shop Drawings.

B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies by means that prevent damage or permanent distortion.

C. Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable variation of 1/8 inch in 10 feet and as follows:

1. Spacing: Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error are not to exceed minimum fastening requirements of sheathing or other finishing materials.
2. Squareness: Fabricate each cold-formed steel framing assembly to a maximum out-of-square tolerance of 1/8 inch.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, conditions, and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Install load-bearing shims or grout between the underside of load-bearing wall bottom track and the top of foundation wall or slab at locations with a gap larger than 1/4 inch to ensure a uniform bearing surface on supporting concrete or masonry construction.

B. Install sill sealer gasket at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.

3.3 INSTALLATION, GENERAL

A. Cold-formed steel framing may be shop or field fabricated for installation, or it may be field assembled.

B. Install cold-formed steel framing according to AISI S200, AISI S202, and manufacturer's written instructions unless more stringent requirements are indicated.

C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.

1. Screw, bolt, or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch.

D. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.

1. Cut framing members by sawing or shearing; do not torch cut.
2. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.

a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
b. Locate mechanical fasteners, install according to Shop Drawings, and comply with requirements for spacing, edge distances, and screw penetration.

E. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.

F. Install temporary bracing and supports to secure framing and support loads equal to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.

G. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.

H. Install insulation, specified in Section 072100 "Thermal Insulation," in framing-assembly members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.

I. Fasten hole-reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.

3.4 INSTALLATION OF LOAD-BEARING WALL FRAMING

A. Install continuous top and bottom tracks sized to match studs. Align tracks accurately and securely anchor at corners and ends, and at spacings as follows:

1. Anchor Spacing: 32 inches.

B. Squarely seat studs against top and bottom tracks, with gap not exceeding 1/8 inch between the end of wall-framing member and the web of track.

1. Fasten both flanges of studs to top and bottom tracks.
2. Space studs as follows:

a. Stud Spacing: 16 inches.

C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar configurations.

D. Align studs vertically where floor framing interrupts wall-framing continuity. Where studs cannot be aligned, continuously reinforce track to transfer loads.

E. Align floor and roof framing over studs according to AISI S200, Section C1. Where framing cannot be aligned, continuously reinforce track to transfer loads.

F. Anchor studs abutting structural columns or walls, including masonry walls, to supporting structure.

G. Install headers over wall openings wider than stud spacing. Locate headers above openings. Fabricate headers of compound shapes indicated or required to transfer load to supporting studs, complete with clip-angle connectors, web stiffeners, or gusset plates.

1. Frame wall openings with not less than a double stud at each jamb of frame. Fasten jamb members together to uniformly distribute loads.
2. Install tracks and jack studs above and below wall openings. Anchor tracks to jamb studs with clip angles or by welding, and space jack studs same as full-height wall studs.

H. Install supplementary framing, blocking, and bracing in stud framing indicated to support fixtures, equipment, services, casework, heavy trim, furnishings, and similar work requiring attachment to framing.

1. If type of supplementary support is not indicated, comply with stud manufacturer's written recommendations and industry standards in each case, considering weight or load resulting from item supported.

I. Install horizontal bridging in stud system, spaced vertically as indicated on Drawings. Fasten at each stud intersection.

1. Channel Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs with a minimum of two screws into each flange of the clip angle for framing members up to 6 inches deep.
2. Strap Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges, and secure solid blocking to stud webs or flanges.
3. Bar Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.

J. Install steel sheet diagonal bracing straps to both stud flanges; terminate at and fasten to reinforced top and bottom tracks. Fasten clip-angle connectors to multiple studs at ends of bracing and anchor to structure.

K. Install miscellaneous framing and connections, including supplementary framing, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.5 INSTALLATION OF INTERIOR NONLOADBEARING WALL FRAMING

A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure.

B. Fasten both flanges of studs to top and bottom track unless otherwise indicated. Space studs as follows:

1. Stud Spacing: 16 inches.

C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.

D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.

1. Install single deep-leg deflection tracks and anchor to building structure.
2. Connect vertical deflection clips to studs and anchor to building structure.

E. Install horizontal bridging in wall studs, spaced vertically in rows indicated but not more than 48 inches apart. Fasten at each stud intersection.

1. Channel Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
2. Strap Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
3. Bar Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.

F. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 12 inches of single deflection track. Install a combination of bridging and stud or stud-track solid blocking of width and thickness matching studs, secured to stud webs or flanges.

1. Install solid blocking at 96-inch centers.

G. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.6 INSTALLATION OF JOIST FRAMING

A. Install perimeter joist track sized to match joists. Align and securely anchor or fasten track to supporting structure at corners, ends, and spacings indicated.

B. Install joists bearing on supporting frame, level, straight, and plumb; adjust to final position, brace, and reinforce. Fasten joists to both flanges of joist track.

1. Install joists over supporting frame with a minimum end bearing of 1-1/2 inches.
2. Reinforce ends and bearing points of joists with web stiffeners, end clips, joist hangers, steel clip angles, or steel-stud sections.

C. Space joists not more than 2 inches from abutting walls, and as follows:

1. Joist Spacing: As indicated on Drawings.

D. Frame openings with built-up joist headers, consisting of joist and joist track or another combination of connected joists if indicated.

E. Install joist reinforcement at interior supports with single, short length of joist section located directly over interior support, with lapped joists of equal length to joist reinforcement.

1. Install web stiffeners to transfer axial loads of walls above.

F. Install bridging at intervals indicated. Fasten bridging at each joist intersection as follows:

1. Joist-Track Solid Bridging: Joist-track solid blocking of width and thickness indicated, secured to joist webs.
2. Combination Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and joist-track solid blocking of width and thickness indicated. Fasten flat straps to bottom flange of joists and secure solid blocking to joist webs.

G. Secure joists to load-bearing interior walls to prevent lateral movement of bottom flange.

H. Install miscellaneous joist framing and connections, including web stiffeners, closure pieces, clip angles, continuous angles, hold-down angles, anchors, and fasteners, to provide a complete and stable joist-framing assembly.

3.7 INSTALLATION TOLERANCES

A. Install cold-formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:

1. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error are not to exceed minimum fastening requirements of sheathing or other finishing materials.

3.8 REPAIR

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanized repair paint according to ASTM A780/A780M and manufacturer's written instructions.

3.9 FIELD QUALITY CONTROL

A. Testing: Engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Field and shop welds will be subject to testing and inspecting.

C. Testing agency will report test results promptly and in writing to Contractor and Architect.

D. Cold-formed steel framing will be considered defective if it does not pass tests and inspections.

E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.10 PROTECTION

A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed steel framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 054000

SECTION 312000 - EARTH MOVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Excavating and filling for rough grading the Site.
2. Preparing subgrades for slabs-on-grade walks pavements turf and grasses and plants.
3. Excavating and backfilling for buildings and structures.
4. Drainage course for concrete slabs-on-grade.
5. Subbase course for concrete walks pavements.
6. Subbase course and base course for asphalt paving.
7. Excavating and backfilling trenches for utilities and pits for buried utility structures.

1.2 DEFINITIONS

A. Backfill: Soil material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.

C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, will be without additional compensation.

G. Fill: Soil materials used to raise existing grades.

H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other fabricated stationary features constructed above or below the ground surface.

I. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

J. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

K. Utilities: On-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct pre-excavation conference at Project site.

1.4 INFORMATIONAL SUBMITTALS

A. Material test reports.

1.5 FIELD CONDITIONS

A. Utility Locator Service: Notify utility locator service for area where Project is located before beginning earth-moving operations.

B. Do not commence earth-moving operations until plant-protection measures are in place.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D2487, or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D2487, or a combination of these groups.

1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.

F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

G. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.

H. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; ASTM D448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and zero to 5 percent passing a No. 8 sieve.

2.2 ACCESSORIES

A. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored to comply with local practice or requirements of authorities having jurisdiction.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth-moving operations.

B. Protect and maintain erosion and sedimentation controls during earth-moving operations.

C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil

materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

3.3 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
2. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended as bearing surfaces.

B. Excavations at Edges of Tree- and Plant-Protection Zones:

1. Excavate by hand or with an air spade to indicated lines, cross sections, elevations, and subgrades. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.4 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.5 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.

1. Clearance: 12 inches each side of pipe or conduit.

C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.

1. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

D. Trenches in Tree- and Plant-Protection Zones:

1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.

3.6 SUBGRADE INSPECTION

A. Proof-roll subgrade below the building slabs and pavements with a pneumatic-tired dump truck to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

B. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

3.7 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by Architect.

1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Architect.

3.8 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.9 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Construction below finish grade.
2. Surveying locations of underground utilities for Record Documents.
3. Testing and inspecting underground utilities.
4. Removing concrete formwork.

5. Removing trash and debris.
6. Removing temporary shoring, bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.10 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

C. Trenches under Footings: Backfill trenches excavated under footings and within 18 inches of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings. Concrete is specified in Section 033000 "Cast-in-Place Concrete."

D. Initial Backfill: Place and compact initial backfill of satisfactory soil, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the pipe or conduit.

1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

E. Final Backfill: Place and compact final backfill of satisfactory soil to final subgrade elevation.

F. Warning Tape: Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

3.11 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use satisfactory soil material.
2. Under walks and pavements, use satisfactory soil material.
3. Under steps and ramps, use engineered fill.
4. Under building slabs, use engineered fill.
5. Under footings and foundations, use engineered fill.

3.12 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.13 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.

C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D698:

1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95 percent.
2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 92 percent.
3. Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 85 percent.
4. For utility trenches, compact each layer of initial and final backfill soil material at 95 percent.

3.14 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to elevations required to achieve indicated finish elevations, within the following subgrade tolerances:

1. Turf or Unpaved Areas: Plus or minus 1 inch.
2. Walks: Plus or minus 1/2 inch.
3. Pavements: Plus or minus 1/2 inch.

C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

3.15 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place subbase course and base course under pavements and walks as follows:

1. Shape subbase course and base course to required crown elevations and cross-slope grades.
2. Place subbase course and base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
3. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D698.

3.16 DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE

A. Place drainage course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:

1. Place drainage course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
2. Compact each layer of drainage course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D698.

3.17 FIELD QUALITY CONTROL

A. Special Inspections: The General Contractor shall engage a qualified special inspector to perform inspections:

B. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

C. Testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

D. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect.

E. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.18 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.19 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 312000

SECTION 321216 - ASPHALT PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Hot-mix asphalt paving.
2. Hot-mix asphalt overlay.
3. Cold milling of existing asphalt pavement.
4. Hot-mix asphalt patching.
5. Asphalt curbs.

B. Related Requirements:
1. Section 312000 "Earth Moving" for subgrade preparation, fill material, separation geotextiles, unbound-aggregate subbase and base courses, and aggregate pavement shoulders.
2. Section 321313 "Concrete Paving" for concrete pavement and for separate concrete curbs, gutters, and driveway aprons.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Herbicide.

B. Hot-mix asphalt designs.

1.4 INFORMATIONAL SUBMITTALS

A. Material Certificates: Include statement that mixes containing recycled materials will perform equal to mixes produced from all new materials.

1. Aggregates.
2. Asphalt binder.
3. Tack coat.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of the South Carolina Department of Transportation for asphalt paving work.

1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

PART 2 - PRODUCTS

2.1 AGGREGATES

A. Coarse Aggregate: ASTM D692/D692M, sound; angular crushed stone, crushed gravel, or cured, crushed blast-furnace slag.

B. Fine Aggregate: ASTM D1073, sharp-edged natural sand or sand prepared from stone, gravel, cured blast-furnace slag, or combinations thereof.

C. Mineral Filler: ASTM D242/D242M, rock or slag dust, hydraulic cement, or other inert material.

2.2 ASPHALT MATERIALS

A. Asphalt Binder: ASTM D6373 or AASHTO M 320 binder designation PG 70-22.

B. Tack Coat: ASTM D977 or AASHTO M 140 emulsified asphalt, or ASTM D2397/D2397M or AASHTO M 208 cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.

2.3 AUXILIARY MATERIALS

A. Recycled Materials for Hot-Mix Asphalt Mixes: Reclaimed asphalt pavement; reclaimed, unbound-aggregate base material; and recycled tires asphalt shingles or glass from sources and gradations that have performed satisfactorily in previous installations, equal to performance of required hot-mix asphalt paving produced from all new materials.

B. Herbicide: Commercial chemical for weed control, registered by the EPA, and not classified as "restricted use" for locations and conditions of application. Provide in granular, liquid, or wettable powder form.

2.4 MIXES

A. Surface Course Limit: Recycled content no more than 10 percent by weight.

B. Hot-Mix Asphalt: Dense-graded, hot-laid, hot-mix asphalt plant mixes; designed in accordance with procedures in AI MS-2, "Asphalt Mix Design Methods"; and complying with the following requirements:

1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.
2. Base Course: Compacted Graded Aggregate.
3. Binder Course: Superpave Asphaltic Concrete.
4. Surface Course: Superpave Asphaltic Concrete.

PART 3 - EXECUTION

3.1 PATCHING

A. Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches into perimeter of adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.

B. Portland Cement Concrete Pavement: Break cracked slabs and roll as required to reseat concrete pieces firmly.

1. Remove disintegrated or badly cracked pavement. Excavate rectangular or trapezoidal patches, extending into perimeter of adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Recompact existing unbound-aggregate base course to form new subgrade.

C. Tack Coat: Before placing patch material, apply tack coat uniformly to vertical asphalt surfaces abutting the patch. Apply at a rate of 0.05 to 0.15 gal./sq. yd..

1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

D. Placing Patch Material: Fill excavated pavement areas with hot-mix asphalt base mix for full thickness of patch and, while still hot, compact flush with adjacent surface.

3.2 SURFACE PREPARATION

A. Ensure that prepared subgrade is ready to receive paving. Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces.

B. Herbicide Treatment: Apply herbicide in accordance with manufacturer's recommended rates and written application instructions. Apply to dry, prepared subgrade or surface of compacted-aggregate base before applying paving materials.

1. Mix herbicide with prime coat if formulated by manufacturer for that purpose.

C. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd..

1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.3 HOT-MIX ASPHALT PLACEMENT

A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand in areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.

1. Place hot-mix asphalt base course and binder course in number of lifts and thicknesses indicated.
2. Place hot-mix asphalt surface course in single lift.
3. Spread mix at a minimum temperature of 250 deg F.
4. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

B. Place paving in consecutive strips not less than 10 feet wide unless infill edge strips of a lesser width are required.

C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.4 JOINTS

A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.

1. Clean contact surfaces and apply tack coat to joints.
2. Offset longitudinal joints, in successive courses, a minimum of 6 inches.
3. Offset transverse joints, in successive courses, a minimum of 24 inches.
4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints using either "bulkhead" or "papered" method in accordance with AI MS-22, for both "Ending a Lane" and "Resumption of Paving Operations**.**

3.5 COMPACTION

A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.

1. Complete compaction before mix temperature cools to 185 deg F.

B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.

C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
1. Average Density, Rice Test Method: 92 percent of reference maximum theoretical density in accordance with ASTM D2041/D2041M, but not less than 90 percent or greater than 96 percent.

D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.

E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

F. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

G. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.6 ASPHALT CURBS

A. Construct hot-mix asphalt curbs over compacted pavement surfaces. Apply a light tack coat unless pavement surface is still tacky and free from dust. Spread hot-mix asphalt at a minimum temperature of 250 deg F.

1. Hot-Mix Asphalt: Same as pavement surface-course mix.

B. Place hot-mix asphalt to curb cross section indicated or, if not indicated, to local standard shapes, by machine or by hand in wood or metal forms. Tamp hand-placed materials and screed to smooth finish. Remove forms after hot-mix asphalt has cooled.

3.7 INSTALLATION TOLERANCES

A. Pavement Thickness: Compact each course to produce thickness indicated within the following tolerances:

1. Base Course and Binder Course: Plus or minus 1/2 inch.
2. Surface Course: Plus 1/4 inch, no minus.

B. Pavement Surface Smoothness: Compact each course to produce surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:

1. Base Course and Binder Course: 1/4 inch.
2. Surface Course: 1/8 inch.

3.8 FIELD QUALITY CONTROL

A. Testing Agency: General contractor shall engage a qualified testing agency to perform tests and inspections.

B. Testing shall be in accordance with SCDOT standards.

C. Replace and compact hot-mix asphalt where core tests were taken.

D. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.9 WASTE HANDLING

A. General: Handle asphalt-paving waste in accordance with local regulations.

END OF SECTION 321216

#1 REV DESCRIPTION:
- ADJUSTED CALL OUTS ON ELECTRICAL LINE TO #10
- ADDED SILT FENCE AND TREE PROTECTION

DEMOLITION LEGEND:

XXXXX · (#) REMOVE
· (#) PROTECT & MAINTAIN
/////// · (#) ABANDON
· (#) SALVAGE

1. BUILDING STRUCTURES (CANOPY; SHED; PORTABLE BLDG.)
2. CONCRETE (PAVEMENT; PAD; SIDEWALK, SAWCUT OR REMOVE FROM NEAREST JOINT)
3. ASPHALT (PAVEMENT; CURB)
4. GRAVEL / SCREENINGS
5. FENCE/GATE
6. NATURAL GAS
7. STORM DRAIN (STRUCTURE; PIPE)
8. SANITARY SEWER (MANHOLE; PIPE; CLEAN-OUT)
9. WATER (POTABLE; FIRE LINE; STRUCTURE; PIPE)
10. ELECTRICAL/POWER POWER POLE; LIGHT POLE, ELEC. BOXES)
11. TELEPHONE/COMMUNICATION/FIBER OPTIC (MANHOLE; JUNCTION BOX; PANEL)
12. VEGETATION (TREES; SHRUBBERY)
13. MISC. ITEMS (SIGN; PAINT MARKER; BOLLARD; AS NOTED)

DEMOLITION NOTES:

1. ITEMS TO BE DEMOLISHED ARE DOUBLE HATCHED; ITEMS TO BE ABANDONED (IF ANY) ARE SINGLE HATCHED; AND BOTH SHOWN DOTTED.
2. UNDERGROUND LOCATIONS ARE APPROXIMATE AND SUPPLIED BY VARIOUS UTILITY COMPANIES. NOTIFY THE CONTRACTING OFFICER IMMEDIATELY IN WRITING OF ANY CONFLICTS OR DISCREPANCIES.
3. CONTRACTOR TO VERIFY ALL EXISTING FIELD CONDITIONS PRIOR TO DEMOLITION & CONSTRUCTION WORK INCLUDING FIELD VERIFY ALL UTILITY LOCATIONS AND HAVE APPROPRIATE UTILITY COMPANY MARK THEIR LOCATION BEFORE DIGGING OR TRENCHING. THIS SHALL INCLUDE BUT IS NOT LIMITED TO THE USE OF SONIC, ELECTRONIC OR MAGNETIC DETECTION DEVICES, BY NOTING PULL BOX AND UTILITY BOX LOCATIONS AT THE SURFACE, AND BY POTHOLING. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY UTILITIES DAMAGED DURING CONSTRUCTION AT NO ADDITIONAL COST TO THE GOVERNMENT.
4. UNLESS OTHERWISE NOTED: DEMOLISHED ITEMS TO BE REMOVED IN ITS ENTIRETY FROM SITE & DISPOSED OF IN LEGAL MANNER OR UPON CONTRACTING OFFICER'S DISCRETION .
5. CONTRACTOR TO PROTECT BENCHMARKS SET BY THE SURVEYOR. PRESERVE BENCHMARKS LOCATED WITHIN THE CONSTRUCTION LIMITS UNTIL NEW BENCHMARK IS RE-ESTABLISHED.
6. THE CONTRACTOR IS REQUIRED TO CONTACT 811 THREE (3) DAYS PRIOR TO ANY DIGGING OR COMMENCING OF CONSTRUCTION.

EXISTING TREE SCHEDULE

ABBREVIATION	TREE
BC	BLACK CHERRY
CDR	CEDAR
LAO	LAUREL OAK
LO	LIVE OAK
MAG	MAGNOLIA
PN	PINE
WAO	WATER OAK
WTO	WHITE OAK

UTILITY WARNING:
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1 CD001 **DEMOLITION PLAN**

SCALE: 1" = 30'

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CLIENT: JOHN T. STIEGLITZ, III
403 E. WASHINGTON STREET, SUITE D WALTERBORO, SC 29488

PROJECT NAME: **COLLETON COUNTY EOC**

PROJECT LOCATION: 375 SNIDERS HIGHWAY, WALTERBORO, SC 29488

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER — JOHNSON, LASCHOBER & ASSOC., PC No. C00790 — CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER — ROBERT W. GILLAM — 10/14/26

REV	DATE	BY	DESCRIPTION
0	02/06/26	HWG	ISSUED FOR BID
1	10/14/26	HWG	ISSUED FOR ADDENDUM #1

PROJECT NO. 3093.2301
DRAWN BY : CDB
CHECKED BY : HWG
DATE: 10/14/26

SHEET TITLE : **DEMOLITION PLAN**

SCALE: 1" = 30'

DRAWING NO. **CD001** REV. 1

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#1 REV DESCRIPTION:
- VARIOUS CALLOUTS AND THEIR RESPECTIVE DETAILS
- INSET ADDED AS WELL AS CALLOUTS FOR DUMPSTER AND GENERATOR PADS
- NO LONGER HAVE A FLUME AT DUMPSTER PAD
- ADA PARKING AND RAMP AS WELL AS DETAIL CALLOUTS
- SIGNAGE ADDED (ADA PARKING AND STOP SIGNS)

SNYDERS HWY- SC HWY 63 - PUBLIC - 45 MPH - R/W VARIES

INSTALL SIGN SEE DETAIL 11/C-603

C.P. NO. 2 N:382948.22 E:2093090.77

FIRE HYDRANT

R/W DISK(O)

ASPHALT APRON

CONCRETE CURB & GUTTER

CONCRETE APRON

C.MON(O)

DOLLAR GENERAL CONCRETE APRON EXTENSION

ASPHALT

DOLLAR GENERAL

SSMH RIM=91.35 IE(A)=82.01 IE(B)=81.99

N 53°32'26" E 278.96'

S 36°28'34" E 229.53'

S 53°31'26" E 180.00'

PAVEMENT MARKINGS SEE DETAIL 2/C-601 (TYP)

N:382868.99 E:2093160.68

24" STOP SIGN (R1-1-36)

50' INGRESS/EGRESS EASEMENT FOR JAMES LARRY CONNELLY (PLAT BOOK 31, PAGE 448)

N:382843.61 E:2093119.89

ASPHALT PAVEMENT SEE DETAIL 1/C-601

PAVEMENT MARKINGS SEE DETAIL 2/C-601 (TYP)

N:382829.83 E:2093116.68

TURNED-DOWN EDGE SIDEWALK (TYP) SEE DETAIL. 9/C-601

CONCRETE SIDEWALK (TYP) SEE DETAIL. 11/C-601

FLEET MAINTENANCE RD - PRIVATE

N 31°38'46" W 352.08'

S 21°14'04" E 375.71'

CONCRETE CURB AND GUTTER 3/C-601

N:382713.91 E:2093223.76

N:382681.45 E:2093277.43

24" STOP SIGN (R1-1-36)

N 24°36'43" E 170.73'

N:382729.74 E:2093127.00

ADA PARKING SIGN SEE DETAIL 10/C-601

ADA 90° PARKING PARKING SEE DETAIL 3/C-603

PROPOSED 8,446 SF BUILDING FFE: 92.5'

N:382652.35 E:2093165.56

N:382636.83 E:2093165.14

N:382650.94 E:2093228.00

N:382574.52 E:2093104.20

CONCRETE SIDEWALK (TYP) SEE DETAIL. 11/C-601

TAPER LAST 3' OF CURB FROM 6" TO 0"

LIMITS OF DISTURBANCE AREA: 2.13 ACRES

CONCRETE CURB AND GUTTER 3/C-601

N:382556.91 E:2093134.10

S 54°17'17" W 292.84'

COMMUNICATIONS TOWER

15' X 15' GRAVEL PAD

FENCE SEE DETIAL 9/C-602

CONCRETE FLUME SEE DETAIL 10/C-601 (TYP)

EDGE OF GRAVEL

GRAVEL PILE

GRAVEL & DIRT PILE

DIRT PILE

COMPUTED POINT IN FENCE POST

PROPOSED DETENTION POND

C.P. NO. 1 N:382823.77 E:2092909.40

3/4" REBAR(O)

1" PIPE(O)

N 82°47'12" W 56.21'

N 25°52'29" W 181.27'

SSMH RIM=92.95 IE(A)=83.37 IE(B)=83.03

BUILDING OFFSET 20'

CHAINLINK FENCE

S 09°05'10" E 181.89'

S 19°55'53" E 281.41'

N 54°47'48" E 20.00'

GATE

C.MON(O)

#1

N:382650.94 E:2093228.00

DUMPSTER PAD SEE DETAIL 11/C-602

DUMPSTER SCREENING FENCE

BOLLARD SEE DETAIL 2/C-602 (TYP)

GENERATOR PAD SEE DETAIL 3/C-603

15' X 4.5' GENERATOR

SEE DRAWING INSET, THIS SHT. DWG, 2/C-101

2 C-101 **SITE LAYOUT & STAKING PLAN**

1 C-101 **SITE LAYOUT & STAKING PLAN**

UTILITY WARNING:
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SCALE: 1" = 30'

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CLIENT: JOHN T. STIEGLITZ, III
403 E. WASHINGTON STREET, SUITE D WALTERBORO, SC 29488

PROJECT NAME: **COLLETON COUNTY EOC**

PROJECT LOCATION: 375 SNIDERS HIGHWAY, WALTERBORO, SC 29488

SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION — JOHNSON, LASCHOBER & ASSOC., PC No. C00790

SOUTH CAROLINA PROFESSIONAL ENGINEER — No. 19648 — ROBERT W. GILLAM — 10/14/26

REV	DATE	BY	DESCRIPTION
1	10/14/26	HWG	ISSUED FOR ADDENDUM #1
0	02/09/26	HWG	ISSUED FOR BID

PROJECT NO.	3093.2301
DRAWN BY :	CDB
CHECKED BY :	HWG
DATE:	10/14/26

SHEET TITLE : **SITE LAYOUT & STAKING PLAN**

SCALE: 1" = 30'

DRAWING NO. **C-101** REV. 1

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K:\30932301\Civil\c-101.dwg Plotted:10/14/2026 11:35 AM By:csteam

BORDER: JLA24x36.VREF.DWG
REV: 07/27/2020 - CDB

REV DESCRIPTION:
- INVERTS ADDED TO CALLOUTS
- GRADING IN DUMPSTER AREA
- FLUME REMOVED

#1

GRADING AND DRAINAGE NOTES

1. THE CONTRACTOR SHALL HAVE A REGISTERED LAND SURVEYOR PROVIDE AN AS-BUILT SURVEY OF THE COMPLETE DRAINAGE SYSTEM IN ACCORDANCE WITH THE TOWN'S GUIDELINES AND CHECKLIST.
2. ALL SURFACES SHALL BE GRADED TO DRAIN TO INLETS, DITCHES, SWALES, OR OTHER DRAINAGE FACILITIES. ADVISE THE ENGINEER OF ANY AREAS THAT INDICATE STANDING WATER CONCERNS.
3. ALL DRAINAGE FACILITIES SHALL BE CCTV'ED AFTER STABILIZATION OF THE SITE AND PRIOR TO FINAL CLOSEOUT TO CONFIRM THE SYSTEM IS CLEAN AND THE JOINTS MEET SPECIFICATIONS. THIS TASK SHALL BE IN ACCORDANCE WITH THE TOWN OF MOUNT PLEASANT STANDARDS.
4. ALL PIPE INSTALLATION SHALL MEET BEDDING AND COVER COMPACTION AS REQUIRED FOR TRAFFIC RATING TO ACCOUNT FOR CONSTRUCTION TRAFFIC. SEE DETAILS SPECIFIC TO THIS WORK.
5. LANDSCAPE BEDS TO BE GRADED SUCH THAT TOPSOIL IS NOMINALLY 1" BELOW TOP OF CURB OR ADJACENT SIDEWALK.
6. ASPHALT PAVEMENT GRADED TO TRUEGRID GRAVEL PARKING AREAS. TYPICAL TRUEGRID GRAVEL GRADED FOR LOW POINT AT UNDERDRAIN.

SNYDERS HWY- SC HWY 63 - PUBLIC - 45 MPH - R/W VARIES
CONCRETE CURB & GUTTER
ASPHALT APRON
SSMH RIM=91.35 IE(A)=82.01 IE(B)=81.99
SSMH RIM=92.95 IE(A)=83.37 IE(B)=83.03
BUILDING OFFSET 20'
3/4" REBAR(O)
FIRE HYDRANT
R/W DISK(O)
C.MON(O)
CONCRETE APRON
DOLLAR GENERAL CONCRETE APRON EXTENSION
CULVERT 3
54 LF-12" CONCRETE PIPE @ 0.18% GRADE
ASPHALT
DOLLAR GENERAL
50' INGRESS/EGRESS EASEMENT FOR JAMES LARRY CONNELLY (PLAT BOOK 31, PAGE 448)
FLEET MAINTENANCE RD - PRIVATE
T. LAND HOLDINGS V, LLC TMS NO. 178-00-00-173 PLAT BOOK 31, PAGE 448 AREA = 2.164 AC./94,279 S.F. ZONING: HCD
COLLETON COUNTY TMS NO. 178-00-00-183 PLAT BOOK 28, PAGE 404 ZONING:HCD
A4 RIM:89.84 I.E.(OUT)=87.59
89 LF-12" RCP @ 0.51% GRADE
A3 RIM:90.23 I.E.(IN)=87.14 I.E.(OUT)=87.14
CULVERT 2
37 LF-12" RCP @ 0.27% GRADE
A2 RIM:90.23 I.E.(IN)=87.02 I.E.(OUT)=87.02
44 LF-15" CONCRETE PIPE @ 0.50% GRADE
A1 RIM:88.32 I.E.(IN)=86.80
24 LF-12" RCP @ 0.50% GRADE
PROPOSED 8,446 SF BUILDING FFE: 92.5'
INSTALL ROOF DRAINS (TYP.) SEE DETAIL. 1/C-602
LOT A CTURGL HOLDING, LLC TMS NO. 178-00-00-141 PLAT BOOK 21, PAGE 152 SLIDE 657, PAGE 8 AREA = 2.504 AC./109,070 S.F. ZONING: HCD
LIMITS OF DISTURBANCE AREA: 2.13 ACRES
B2 RIM:89.57 I.E.(OUT)=86.80
DROP EXISTING PIPE TO IE: 85.89'
GRAVEL PILE
OUTLET CONTROL STRUCTURE SEE DETAIL 7/C-602
1. FIELD VERIFY SIZE, MATERIAL, AND CONDITION OF EXISTING PIPE. DIG OUT TRENCH TO ALLOW PIPE TO BE LOWERED TO IE: 86.09'
2. IF 15" RCP IS IN ACCEPTABLE CONDITION REUSE PIPE.
3. BACK FILL AND RE-GRADE TO ORIGINAL GRADE AND MATERIAL TO MAINTAIN DRIVEWAY ACCESS.
B-1 RIM:88.25 I.E.(IN)=86.25
35 LF-12" RCP @ 1.57% GRADE
20' EMERGENCY OVERFLOW ELEVATION: 90.5' SEE DETAIL 4/C-602
GRAVEL & DIRT PILE
COMPUTED POINT IN FENCE POST
1" PIPE(O)
COLLETON COUNTY TMS NO. 178-00-00-205 PLAT SLIDE 598, PAGE 5 ZONING: HCD
EDGE OF GRAVEL
DIRT PILE
MARGIES LEGA TMS NO. 178-0 PLAT BOOK 30,

UTILITY WARNING:
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1 C-201 **GRADING & DRAINAGE PLAN**

N
30' 15' 0 30' 60'
SCALE: 1" = 30'

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CLIENT: JOHN T. STIEGLITZ, III
403 E. WASHINGTON STREET, SUITE D WALTERBORO, SC 29488

PROJECT NAME: **COLLETON COUNTY EOC**

PROJECT LOCATION: 375 SNIDERS HIGHWAY, WALTERBORO, SC 29488

SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION — JOHNSON, LASCHOBER & ASSOC., PC No. C00790

SOUTH CAROLINA PROFESSIONAL ENGINEER — No. 11649 — 10/14/26 — ROBERT W. GILLAM

REV	DATE	BY	DESCRIPTION
1	10/14/26	HWG	ISSUED FOR ADDENDUM #1
0	02/06/26	HWG	ISSUED FOR BID

PROJECT NO. 3093.2301
DRAWN BY : CDB
CHECKED BY : HWG
DATE: 10/14/26
SHEET TITLE : **GRADING & DRAINAGE PLAN**
SCALE: 1" = 30'
DRAWING NO. **C-201** REV. 1

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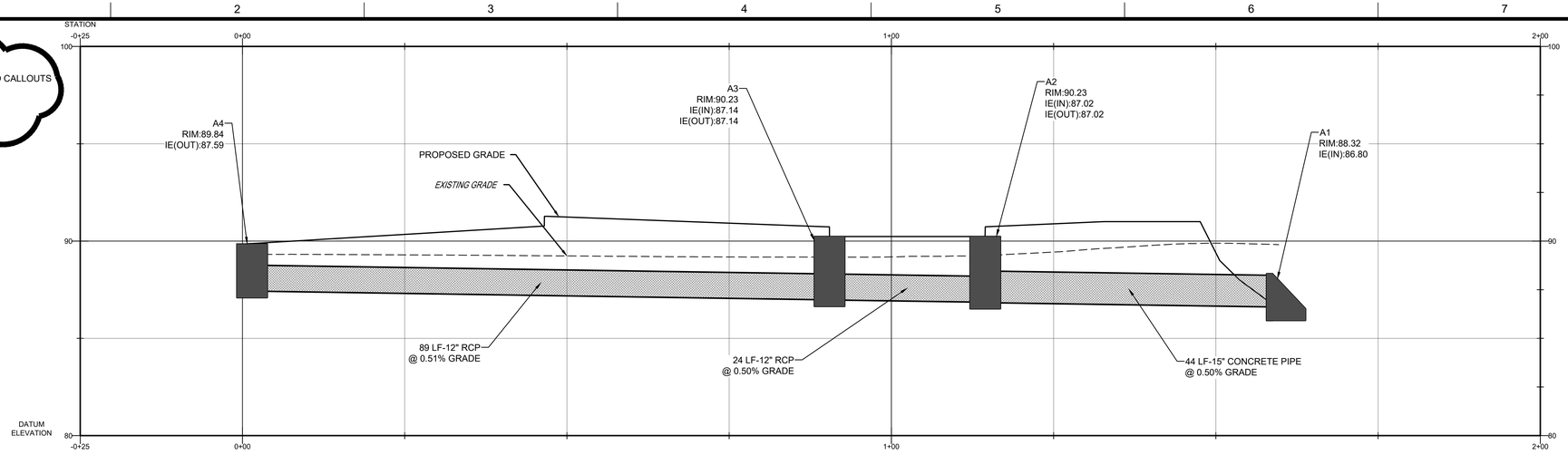
BORDER: JLA24x36.VREF DWG REV: 02/01/2023 CPC

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ISSUED FOR ADDENDUM #1

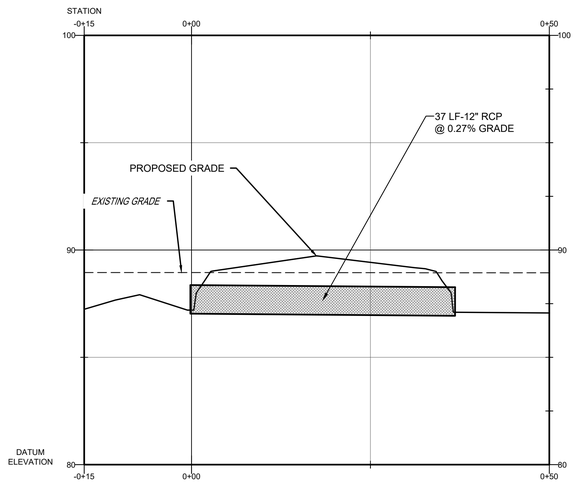
REV DESCRIPTION:
- INVERTS ADDED TO CALLOUTS

#1



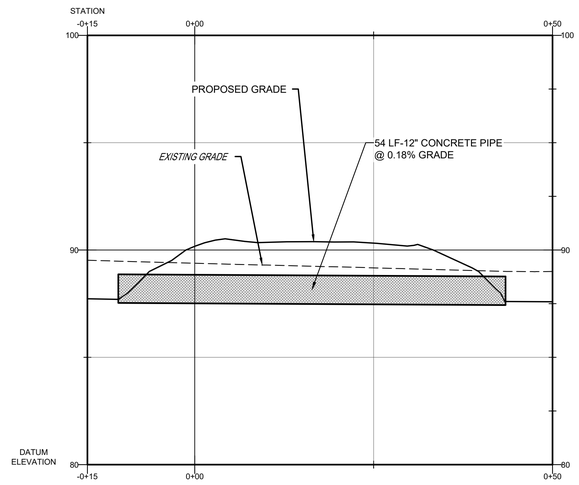
C/L SD - A PROFILE

SCALE: HOR: 1"=10'
VER: 1"=3'



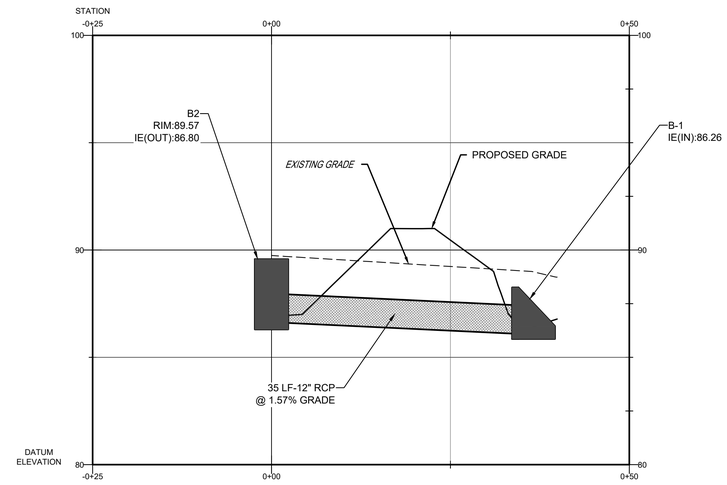
C/L SD-C CULVERT 2 PROFILE

SCALE: HOR: 1"=10'
VER: 1"=3'



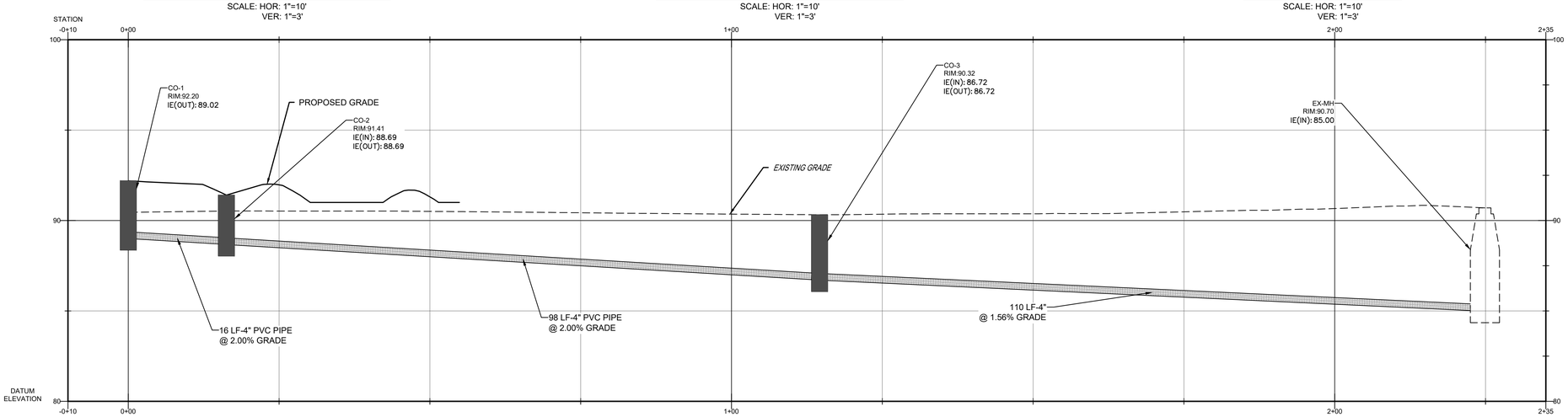
C/L SD-D CULVERT 3 PROFILE

SCALE: HOR: 1"=10'
VER: 1"=3'



C/L SD - B PROFILE

SCALE: HOR: 1"=10'
VER: 1"=3'



C/L SS - A PROFILE

SCALE: HOR: 1"=10'
VER: 1"=3'

1
C-202

MISCELLANEOUS PROFILES

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SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION
JOHNSON, LASCHOBER & ASSOC., PC
No. C00790

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER
10/14/26

REV	DATE	BY	DESCRIPTION
1	10/14/26	HWG	ISSUED FOR ADDENDUM #1
0	02/06/26	HWG	ISSUED FOR BID

PROJECT NO.	3093.2301
DRAWN BY :	CDB
CHECKED BY :	HWG
DATE:	10/14/26

SHEET TITLE :
MISCELLANEOUS PROFILES

SCALE: AS NOTED

DRAWING NO. **C-202** REV. **1**

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REV 10/27/2025

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REV DESCRIPTION:
- VARIOUS CALLOUTS AND THEIR RESPECTIVE DETAILS
- STEEL CASING ADJUSTED TO 60 LF
- POTABLE WATER LINE AND FIRE WATER LINE MATERIAL CALLOUTS

#1

NOTES:

1. NOTIFY THE CITY OF WALTERBORO PRIOR TO CONSTRUCTION OF WATER LINE EXTENSION
2. DIRECTIONAL BORING WILL BE THE METHOD OF INSTALLATION UNDER THE DRIVEWAY TO INSURE DOLLAR GENERAL REMAINS OPERATIONAL DURING BUSINESS HOURS.

60 LF JACK AND BORE MINIMUM DEPTH 48" SEE DETAIL ON SHEET C-603
TRACER WIRE TO BE INSTALLED ENTIRE LENGTH OF WATER LINE EXTENSION
2" SERVICE TAPPING SADDLE STA:1+20.04 (MJ,RJF)
POST INDICATOR VALVE STA:1+24.72 (MJ,RJF)
1 - BACK FLOW PREVENTER
1 - FIRE DEPARTMENT CONNECTION STA:1+35.24
TAPPING SLEEVE SEE DETAIL ON SHEET C-603 STA: 0+00
FIRE HYDRANT
GATE VALVE STA: 0+04.61 (MJ,RJF)
R/W DISK(O)
60 LF OF MINIMUM 10" STEEL CASING BY JACK AND BORE SEE DETAIL ON SHEET C-603
4" DIP W
ASPHALT
CONCRETE APRON
ASPHALT APRON
CONCRETE CURB & GUTTER
SNYDERS HWY- SC HWY 63 - PUBLIC - 45 MPH - R/W VARIES
45° BEND STA:1+50.60 (MJ,RJF)
GATE VALVE STA:1+25.04
WATER METER STA:1+37.13
BACK FLOW PREVEPER STA:1+42.15
DOLLAR GENERAL CONCRETE APRON EXTENSION
MARGIES LEGACY, LLC TMS NO. 178-08-00-039 PLAT BOOK 30, PAGE 390
SSMH RIM=91.35 IE(A)=82.01 IE(B)=81.99
90° BEND STA:1+59.30 (MJ,RJF)
INSTALL WATER LINE PER DETAIL 5/C-601
EX-MH RIM:90.70 IE(IN): 85.00
45° BEND STA:2+22.40 (MJ,RJF)
22.5° BEND STA:2+39.32 (MJ,RJF)
50' INGRESS/EGRESS EASEMENT FOR JAMES LARRY CONNELLY (PLAT BOOK 31, PAGE 448)
DOLLAR GENERAL
BUILDING OFFSET
110 LF-4" @ 1.56% GRADE
CO-3 RIM:90.32 IE(IN): 86.72 IE(OUT): 86.72
2" PVC SCHEDULE 80 POTABLE WATER LINE
FLEET MAINTENANCE RD - PRIVATE
T. LAND HOLDINGS V, LLC TMS NO. 178-00-00-173 PLAT BOOK 31, PAGE 448 AREA = 2.164 AC./94,279 S.F. ZONING: HCD
3/4" REBAR(O)
N:382788.95 E:2093005.80
CONNECTION TO EXISTING NATURAL GAS MAIN
COLLETON COUNTY TMS NO. 178-00-00-183 PLAT BOOK 28, PAGE 404 ZONING:HCD
98 LF-4" PVC PIPE @ 2.00% GRADE
CO-2 RIM:91.41 IE(IN): 88.69 IE(OUT): 88.69
16 LF-4" PVC PIPE @ 2.00% GRADE
CO-1 RIM:92.20 SEE SHEET P-101 FOR CONTIUATION IN THE BUILDING. IE(OUT): 89.02
SEE SHEET P-201 FOR CONTINUATION OF POTABLE WATER LINE IN THE BUILDING
PROPOSED 8,446 SF BUILDING FFE: 92.5
SEE SHEET F-101 FOR CONTINUATION OF FIRE LINE IN THE BUILDING
90° BEND STA: 4+24.05 (MJ,RJF)
C.MON(O)
GATE
GRAVEL PILE
INSTALL ROOF DRAINS (TYP.) SEE DETAIL. 1/C-602
SEE SHEET P-201 FOR CONTINUATION OF GAS LINE IN THE BUILDING
LOT A CTL/RCL HOLDING, LLC TMS NO. 178-00-00-141 PLAT BOOK 21, PAGE 152 SLIDE 657, PAGE B AREA = 2.504 AC./109,070 S.F. ZONING: HCD
CONNECT GAS TO GENERATOR. COORDINATE WITH ELECTRICAL DRAWINGS AND EQUIPMENT MANUFACTURER
LIMITS OF DISTURBANCE AREA: 2.13 ACRES
EDGE OF GRAVEL
CHAIN LINK FENCE
WIRE FENCE
1" PIPE(O)
COMPUTED POINT IN FENCE POST
GRAVEL & DIRT PILE
COLLETON COUNTY TMS NO. 178-00-00-205 PLAT SLIDE 598, PAGE 5 ZONING: HCD
DIRT PILE
SSMH RIM=92.95 IE(A)=83.37 IE(B)=83.03

UTILITY WARNING:
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811 Call before you dig.

1 C-301 **SITE UTILITIES PLAN**

N

30' 15' 0 30' 60'
SCALE: 1" = 30'

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CLIENT: JOHN T. STIEGLITZ, III
403 E. WASHINGTON STREET, SUITE D WALTERBORO, SC 29488

PROJECT NAME: **COLLETON COUNTY EOC**

PROJECT LOCATION: 375 SNIDERS HIGHWAY, WALTERBORO, SC 29488

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SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION JOHNSON, LASCHOBER & ASSOC., PC No. C00790

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER ROBERT W. GILLAM 10/14/26

REV	DATE	BY	DESCRIPTION
0	02/06/26	HWG	ISSUED FOR BID
1	10/14/26	HWG	ISSUED FOR ADDENDUM #1

PROJECT NO. 3093.2301
DRAWN BY : CDB
CHECKED BY : HWG
DATE: 10/14/26
SHEET TITLE :
SITE UTILITIES PLAN
SCALE: 1" = 30'
DRAWING NO. **C-301** REV. 1

K:\30932301\Civil\C-301.dwg Plotted:10/14/2026 11:37 AM By:usteam

BORDER - A.JOHNSON.SHEET.DWG
REV. 10/07/2020 JCE

K:\30932301\Civil\C-301.dwg, 10/14/2026 11:37:43 AM, DWG To PDF.pc3

ISSUED FOR ADDENDUM #1

REV DESCRIPTION:
- SILT FENCE AND TREE PROTECTION ADDED.
- SWPPP LEGEND ADDED
- CWM CALLOUT REMOVED
- RIP RAP CALLOUTS ADDED THROUGHOUT SITE

#1

STABILIZED CONSTRUCTION ENTRANCE / EXIT

SURFACE COURSE CURB INLET FILTER TYPE E

TEMPORARY SEEDING

PERMANENT SEEDING

SILT FENCE

EROSION CONTROL BLANKET

SNYDERS HWY- SC HWY 63 - PUBLIC - 45 MPH - R/W VARIES

ASPHALT APRON

SSMH RIM=91.35 IE(A)=82.01 IE(B)=81.99

N 53°32'26" E 219.96'

HIGHWAY R/W SCDOT DOCKET 315.427

ADDITIONAL HIGHWAY R/W AQUIRED PER BOOK 3056, PH.311

FIRE HYDRANT

R/W DISK(O)

DOLLAR GENERAL CONCRETE APRON EXTENSION

DOLLAR GENERAL

ASPHALT

50' INGRESS/EGRESS EASEMENT FOR JAMES LARRY CONNELLY (PLAT BOOK 31, PAGE 448)

APPROXIMATE TOPOGRAPHIC SURVEYLIMITS FOR TMS NO. 178-00-00-173

TREE PROTECTION FENCE, TYP.

BUILDING OFFSET

3/4" REBAR(O)

FLEET MAINTENANCE RD - PRIVATE

S 37°44'04" E 375.17'

N 37°39'46" W 350.08'

PROPOSED 8,446 SF BUILDING FFE: 92.5

PS

TS

E

S 15°52'26" E 187.19'

S 20°01'24" E 165.98'

N 54°36'43" E 170.73'

S 20°01'24" E 197.25'

S 15°52'26" E 201.47'

C.MON(O)

RIPRAP

GATE

15" RCP IE=87.56

IE=87.42

IE=87.27

IE=86.62

17" CPP IE=88.55

EOB

GRAVEL PILE

GRAVEL & DIRT PILE

DIRT PILE

EDGE OF GRAVEL

CHAIN LINK FENCE

WIRE FENCE

1" PIPE(O)

N 82°47'12" W 56.21'

N 82°47'12" W 262.94'

COMPUTED POINT IN FENCE POST

LIMITS OF DISTURBANCE AREA: 2.13 ACRES

SSMH RIM=92.95 IE(A)=83.37 IE(B)=83.03

1 C-501 SWPPP PLAN

SCALE: 1" = 30'

UTILITY WARNING:
THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE ENGINEER MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE ENGINEER FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE ENGINEER HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.

811 Call before you dig.

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SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER — JOHNSON LASCHOBER & ASSOC., PC No. C00790 — CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER — ROBERT W. GILLAM — 10/14/26

REV	DATE	BY	DESCRIPTION
1	10/14/26	HWG	ISSUED FOR ADDENDUM #1
0	02/06/26	HWG	ISSUED FOR BID

PROJECT NO.	3093.2301
DRAWN BY :	CDB
CHECKED BY :	HWG
DATE:	10/14/26
SHEET TITLE :	SWPPP PLAN
SCALE:	1" = 30'
DRAWING NO.	C-501
REV.	1

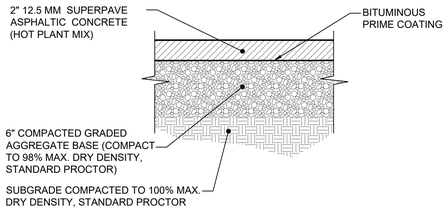
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BORDER - JLA24x36xREF.DWG
REV 10/07/2020 JCE

K:\30932301\Civil\C-501.dwg Plotted:10/14/2026 11:38 AM By:ustaam

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ISSUED FOR ADDENDUM #1



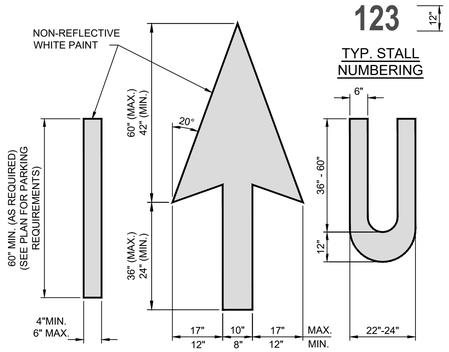
NOTE: WITHIN R/W TOP 8" OF SUBGRADE TO BE MIXED IN PLACE AND COMPACTED 100% MAXIMUM DRY DENSITY. BASE MATERIAL TO MEET SOUTH CAROLINA D.O.T. SPEC. BASE MATERIAL TO BE COMPACTED TO 100% MAXIMUM DRY DENSITY. THE CONTRACTOR WILL PROVIDE COMPACTION TEST RESULTS ON THE SUBGRADE AND COMPACTION AND SOIL ANALYSIS TEST RESULTS FROM AN APPROVED TESTING LABORATORY.

(ALL MATERIALS AND CONSTRUCTION PER SCDOT STANDARDS & SPECIFICATIONS)

TYPICAL SECTION THRU LIGHT-DUTY ASPHALT PAVEMENT & BASE

NO SCALE

1 / C-601

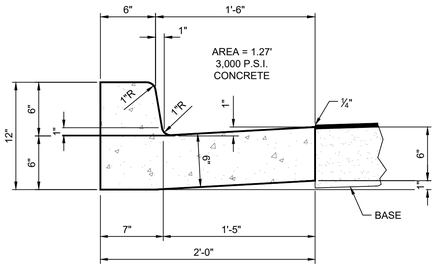


NOTE:
YELLOW PAINT MAY BE USED ON CONC. OR OTHER SURFACES WHERE WHITE PAINT DOES NOT PROVIDE SUFFICIENT CONTRAST.

PAVEMENT MARKINGS

NO SCALE

2 / C-601

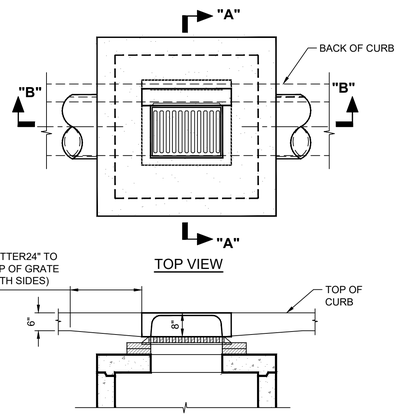


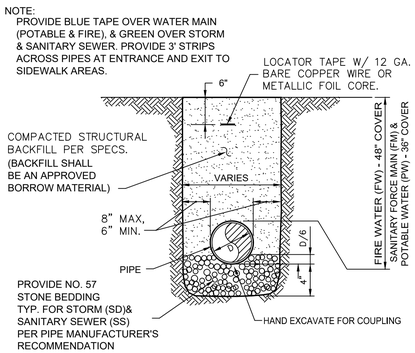
NOTE:
"SPILL" SECTIONS ARE NOT SHOWN BUT ARE REQUIRED AS NEEDED TO PREVENT THE PONDING OF WATER. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO STARTING WORK TO AS CERTAIN WHERE "SPILL" SECTIONS ARE REQUIRED. (TYPICAL ALL CURB SECTIONS)

24" CONCRETE CURB & GUTTER DETAIL

NO SCALE

3 / C-601

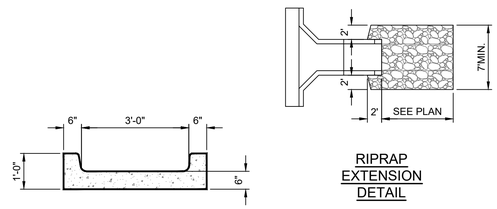




TYPICAL TRENCH SECTION FOR PRESSURE PIPE & GRAVITY SEWER INSTALLATION

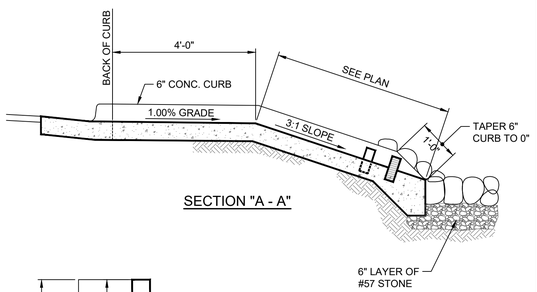
NO SCALE

5 / C-601

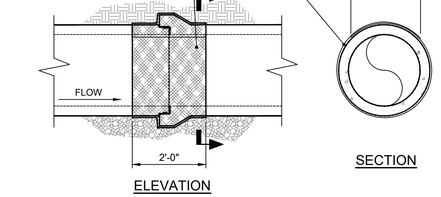


SECTION "B - B"

RIPRAP EXTENSION DETAIL



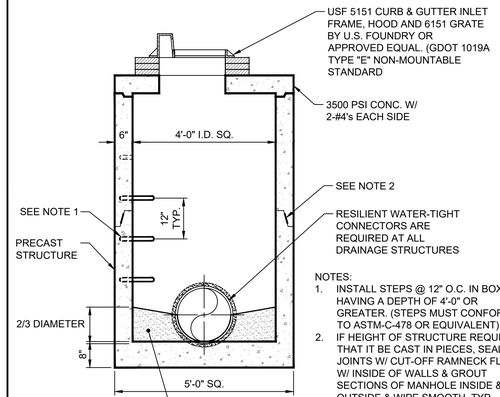
SECTION "A - A"



TYPICAL JOINT FOR RCP GRAVITY STORM SEWER INSTALLATION

NO SCALE

7 / C-601



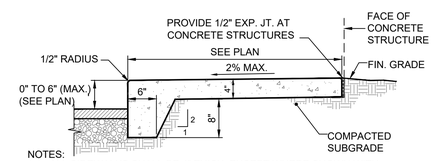
SECTION "A-A"

NOTES:
1. INSTALL STEPS @ 12" O.C. IN BOXES HAVING A DEPTH OF 4'-0" OR GREATER. (STEPS MUST CONFORM TO ASTM-C-478 OR EQUIVALENT)
2. IF HEIGHT OF STRUCTURE REQUIRES THAT IT BE CAST IN PIECES, SEAL JOINTS W/ CUT-OFF RAMNECK FLUSH W/ INSIDE OF WALLS & GROUT SECTIONS OF MANHOLE INSIDE & OUTSIDE & WIPE SMOOTH, TYP.
3. INSIDE DIMENSION OF STRUCTURE SHALL BE 4'-0" MIN. FOR 36"Ø & SMALLER PIPES. FOR LARGER PIPES, INSIDE DIMENSION OF STRUCTURE SHALL BE OUTSIDE DIAMETER OF PIPE PLUS 6" CLEARANCE EACH SIDE & ROUNDED UP TO THE NEAREST FOOT.
4. ALL CONCRETE SHALL BE 3,500 PSI.

HOODBACK TRAP DETAIL

NO SCALE

8 / C-601

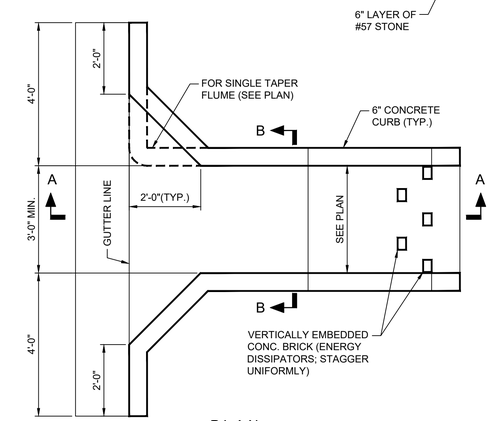


NOTES:
1. ALL SIDEWALKS SHALL BE 4" THICK, EXCEPT WHERE SHOWN WITH TURNED-DOWN EDGE (SEE DETAIL ABOVE).
2. CONTRACTION JOINTS SHALL BE PLACED AT 4 FT. INTERVALS FOR 3' & 4' SIDEWALKS; 5' INTERVALS FOR 5' SIDEWALKS; 6' INTERVALS FOR 6' SIDEWALKS; 4' INTERVALS FOR 8' SIDEWALKS W/ A LONGITUDINAL JOINT IN THE CENTER OF THE 8' WIDE SIDEWALKS; AND 5' INTERVALS FOR 10' SIDEWALKS W/ A LONGITUDINAL JOINT IN THE CENTER OF THE 10' WIDE SIDEWALKS
3. CONTRACTION JOINTS SHALL BE 1" DEEP AND EDGED WITH 1/8" RADIUS.
4. CONSTRUCT 1/4" EXP. JOINT MAXIMUM 50 FT. SPACING BETWEEN JOINTS.
5. INSTALL 1/2" EXP. MATERIAL WHERE CONC. SIDEWALKS ABUT CONCRETE STRUCTURES.
6. A LAYER OF 15# FELT IS REQUIRED BETWEEN WALK AND ADJACENT PARALLELING CONCRETE CURB.
7. CONSTRUCT WHEELCHAIR RAMP AND DETECTABLE WARNING PER GEORGIA D.O.T. STANDARD A3 (SEE SITE PLAN FOR TYPE).
8. ALL CONCRETE SHALL BE 3,000 PSI.
9. SIDEWALK CROSS SLOPE NOT TO EXCEED 2.0%.

TURNED-DOWN EDGE SIDEWALK

NO SCALE

9 / C-601



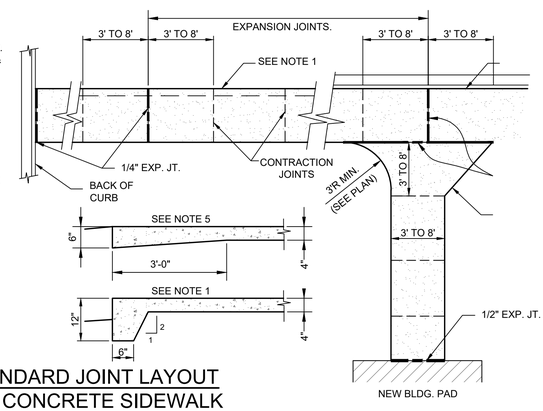
PLAN

TYP. CONCRETE FLUME DETAIL

NO SCALE

10 / C-601

NOTES:
1. ALL SIDEWALKS SHALL BE 4" THICK, EXCEPT WHERE SHOWN WITH TURNED-DOWN EDGE (SEE "TURNED-DOWN EDGE SIDEWALK" DETAIL).
2. CONTRACTION JOINTS SHALL BE PLACED AT 4 FT. INTERVALS FOR 3' & 4' SIDEWALKS; 5' INTERVALS FOR 5' SIDEWALKS; 6' INTERVALS FOR 6' SIDEWALKS; 8' INTERVALS FOR 8' SIDEWALKS 8' SIDEWALKS; AND 5' INTERVALS FOR 10' SIDEWALKS W/ A LONGITUDINAL JOINT IN THE CENTER OF THE 10' WIDE SIDEWALKS.
3. CONTRACTION JOINTS SHALL BE 1" DEEP AND EDGED WITH 1/8" RADIUS.
4. CONSTRUCT 1/4" EXP. JOINT MAXIMUM 50 FT. SPACING BETWEEN JOINTS.
5. WHEN THE SIDEWALK ABUTS A ROADWAY OR WHERE THERE IS NO CURB, THICKEN THE SIDEWALK TO 6" IN 3'-0". WHERE SIDEWALKS ARE USED IN PARKING LOTS IN LIEU OF CURB & GUTTER SEE "TURNED-DOWN EDGE SIDEWALK" DETAIL.
6. INSTALL 1/2" EXP. MATERIAL WHERE CONC. SIDEWALKS ABUT CONCRETE STRUCTURES.
7. A LAYER OF 15# FELT IS REQUIRED BETWEEN WALK AND ADJACENT PARALLELING CONCRETE CURB.
8. CONSTRUCT WHEELCHAIR RAMP AND DETECTABLE WARNING PER SOUTH CAROLINA D.O.T. STANDARD (SEE SITE PLAN FOR TYPE).
9. ALL CONCRETE SHALL BE 3,000 PSI.
10. SIDEWALK CROSS SLOPE NOT TO EXCEED 2.0%.



STANDARD JOINT LAYOUT FOR CONCRETE SIDEWALK

NO SCALE

11 / C-601

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PROJECT NAME: **COLLETON COUNTY EOC**

PROJECT LOCATION: 375 SNIDERS HIGHWAY, WALTERBORO, SC 29488

SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION — JOHNSON, LASCHOBER & ASSOC., PC No. C00790

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER — No. 31648 — ROBERT W. GILLIAM — 10/14/26

REV.	DATE	BY	DESCRIPTION
1	10/14/26	HWG	ISSUED FOR ADDENDUM #1
0	02/06/26	HWG	ISSUED FOR BID

PROJECT NO.	3093.2301
DRAWN BY :	CDB
CHECKED BY :	HWG
DATE:	10/14/26

SHEET TITLE :
SITE DETAILS AND SPECIFICATIONS

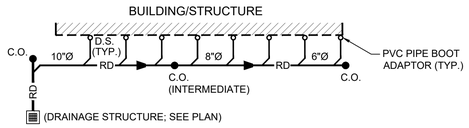
SCALE: 1" = 1'

DRAWING NO. **C-601** REV. 1

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BORDER - JLA24x36REF.DWG
Rev 1 07/2020 CRS

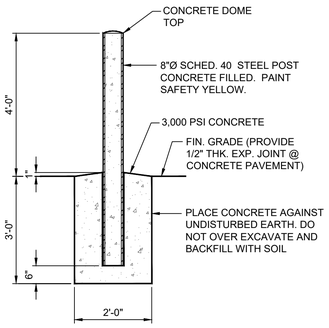


NO. OF DOWN SPOUTS TRIBUTARY TO ROOF DRAIN PIPE	SIZE OF ROOF DRAIN PIPE (INCH-DIA.)
1 - 3	6" Ø
4 - 6	8" Ø
7 - 11	10" Ø
> 12	12" Ø
CIVIL ENGINEER MUST CONFIRM SIZING BASED ON ACTUAL NUMBER AND LOCATION OF DOWN SPOUTS.	

NOTES:
1. REFER TO ARCHITECTURAL PLANS FOR EXACT SIZE, NUMBER REQUIRED AND LOCATIONS OF DOWNSPOUTS.
2. ROOF DRAIN CONNECTIONS INTO CONC. STORM BOXES SHALL BE BY GROUTING USING A HYDRAULIC (NON-SHRINK GROUT MIX TO SEAL THE SPACE BETWEEN THE OUTSIDE OF PIPE AND THE PRECAST HOLE.
3. ROOF DRAIN TIE-INS TO PVC GRATE & RISERS SHALL BE BY A FABRICATED GASKET PUSH-ON JOINT OR A MANUFACTURED NON-CORROSIVE RESILIENT COUPLING WITH STAINLESS STEEL CLAMPS OR EQUAL.
4. ALL ROOF DRAIN PIPE SHALL BE PVC OR CPP & HAVE A MIN. OF 1.0% SLOPE.
5. MAXIMUM DISTANCE BETWEEN CLEAN OUT (C.O.) SHALL BE 75 FEET.

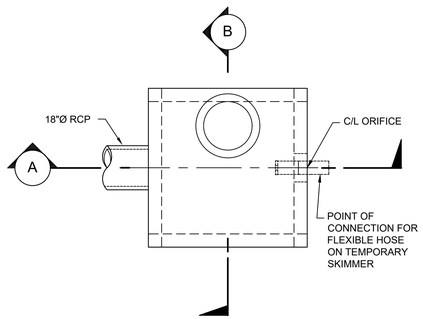
TYP. PIPING SYSTEM FOR ROOF DRAIN (RD) & DOWN SPOUT (DS)
NO SCALE

1 / C-602

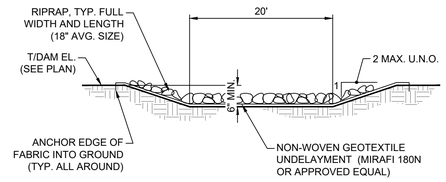


PIPE BOLLARD DETAIL
NO SCALE

2 / C-602



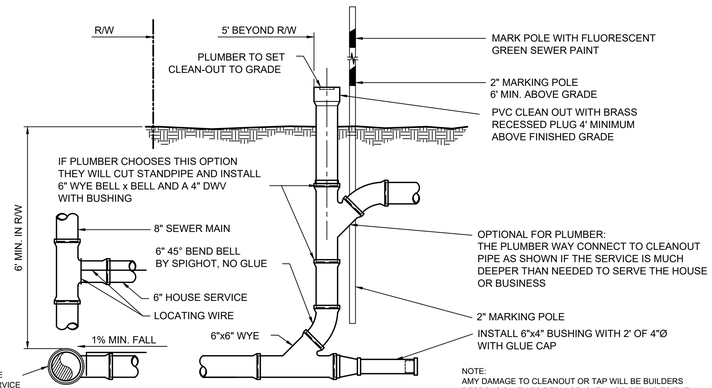
PLAN



SECTION THRU EMERGENCY OVERFLOW
NO SCALE

4 / C-602

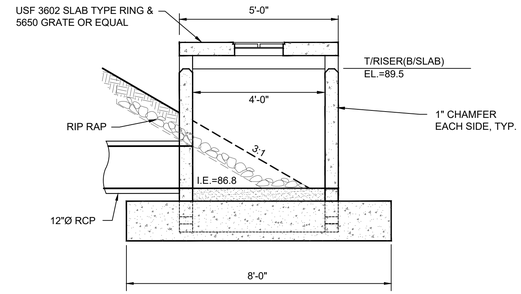
NOTES:
1. MIN. GRADE FOR ALL SERVICES-1.0% UNLESS APPROVED OTHERWISE.
2. MIN. SIZE FOR ALL SERVICE-6"
3. A MANUFACTURER'S PLUG SHALL BE INSTALLED AT THE END OF THE SERVICE.
4. THE SERVICE LOCATION WILL BE MARKED IB THE CURB WITH AN "S". A 2" PVC PIPE SHALL ALSO BE PLACED AT THE END OF EACH SERVICE.
5. ONE SERVICE SHALL BE PLACED FOR EACH BUILDING LOT OR AS DIRECTED BY THE SUPERINTENDENT. ALL SERVICE SHALL EXTEND BEYOND THE RIGHT-OF-WAY AS SHOWN ABOVE.



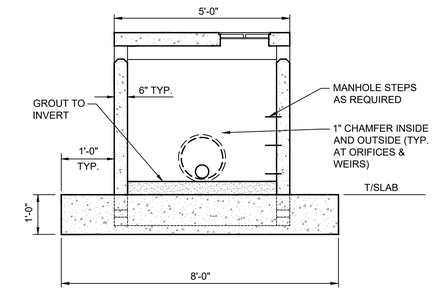
NOTE:
AMY DAMAGE TO CLEANOUT OR TAP WILL BE BUILDERS RESPONSIBILITY TO REPLACE, CLEAN OR REPAIR TO THE SATISFACTION OF COLUMBIA COUNTY WATER DEPARTMENT.

SEWER CLEANOUT DETAIL
NO SCALE

5 / C-602



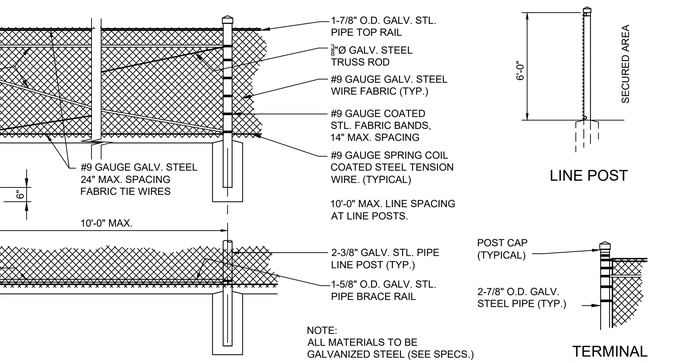
SECTION "A"



SECTION "B"

OUTLET CONTROL STRUCTURE DETAIL (OCS)
NO SCALE

7 / C-602



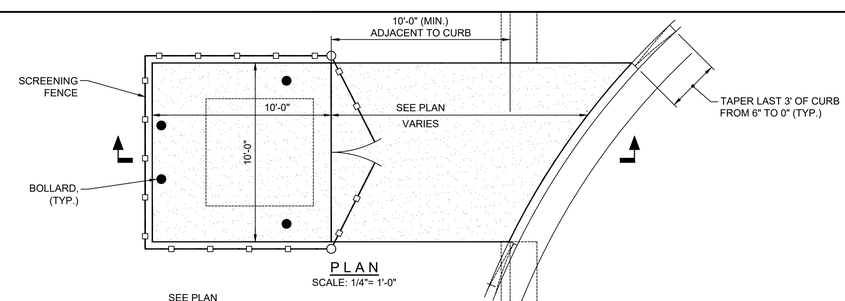
NOTE:
ALL MATERIALS TO BE GALVANIZED STEEL (SEE SPECS.)

LINE POST

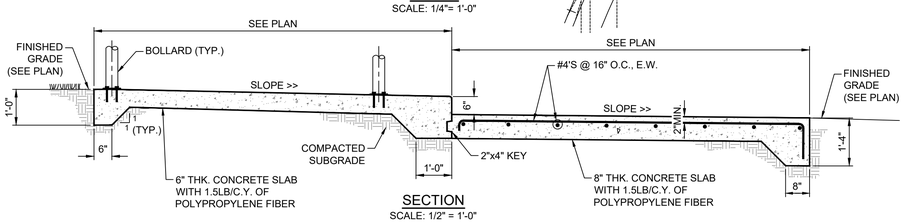
TERMINAL (CORNER) POST

FENCE DETAIL

9 / C-602



PLAN
SCALE: 1/4"= 1'-0"



SECTION
SCALE: 1/2" = 1'-0"

TYP. DUMPSTER PAD DETAIL
NO SCALE

11 / C-602

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CHECKED BY :	HWG
DATE:	10/14/26

SHEET TITLE :
SITE DETAILS AND SPECIFICATIONS

SCALE: 1" = 1'

DRAWING NO. **C-602** REV. 1

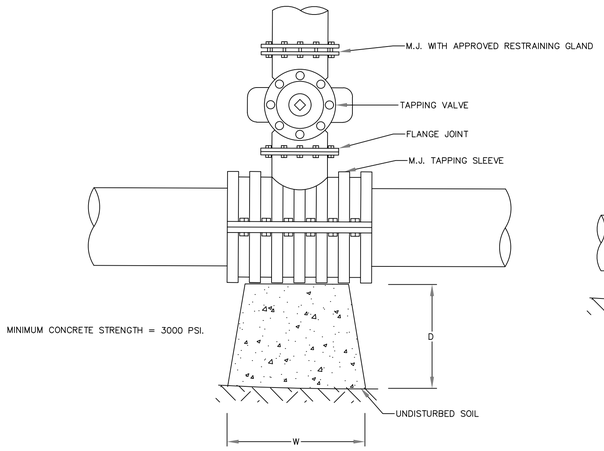
K:\30932301\Civil\C-601.dwg Plotted:10/14/2026 11:39 AM By:csteem

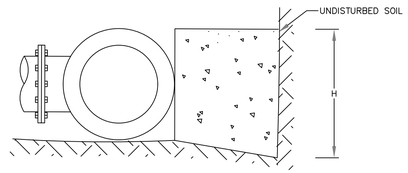
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REV: 07/27/2023 CRC

NOTES:

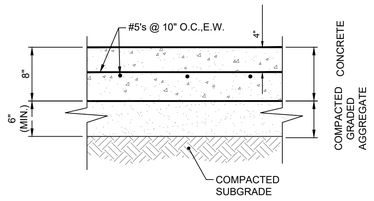
1. TAPPING SLEEVES ARE REQUIRED FOR MAIN-ON-MAIN TAPS.
2. USE THRUST BLOCKING ONLY FOR WET TAPS UNLESS OTHERWISE APPROVED BY CWS.
3. DEPTH FROM GROUND SURFACE TO TOP OF BLOCKING SHALL BE GREATER THAN HEIGHT OF BLOCKING.
4. THE END OF THE TAPPING SLEEVE SHALL BE NO CLOSER THAN 4 FEET TO A JOINT.
5. REFER TO CWS MINIMUM STANDARDS FOR APPROPRIATE MANUFACTURERS, MODEL NUMBERS, INSTALLATION REQUIREMENTS, AND OTHER INFORMATION.

TAP SIZE	DIMENSIONS (FEET)		
	W	H	D
4" & 6"	2.0	1.4	1.0
8"	3.5	2.0	1.4
10"	4.0	2.5	1.8
12"	5.0	3.0	2.5





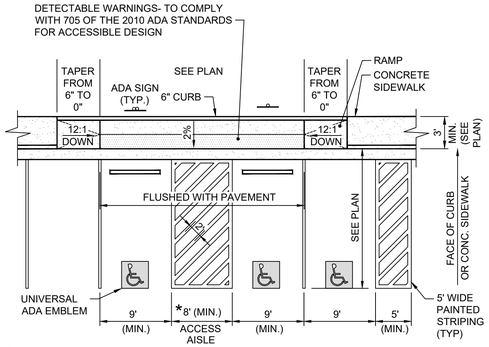
TYPICAL TAPPING SLEEVE
NOT TO SCALE



1. CURBS SHALL BE PLACED MONOLITHICALLY WITH SLAB.
2. COORDINATE SIZE WITH ELECTRICAL DRAWINGS AND EQUIPMENT MANUFACTURER.
3. GENERATOR ANCHOR BOLTS PER EQUIPMENT MANUFACTURER'S RECOMMENDATIONS

GENERATOR PAD SECTION

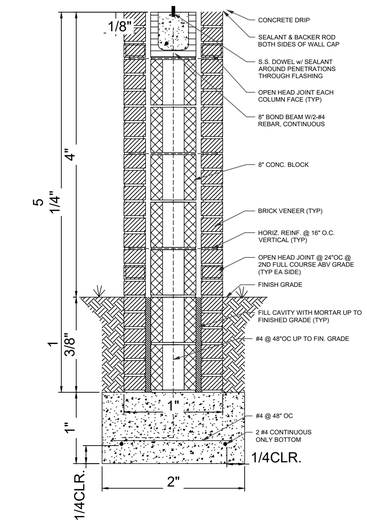
3
C-603



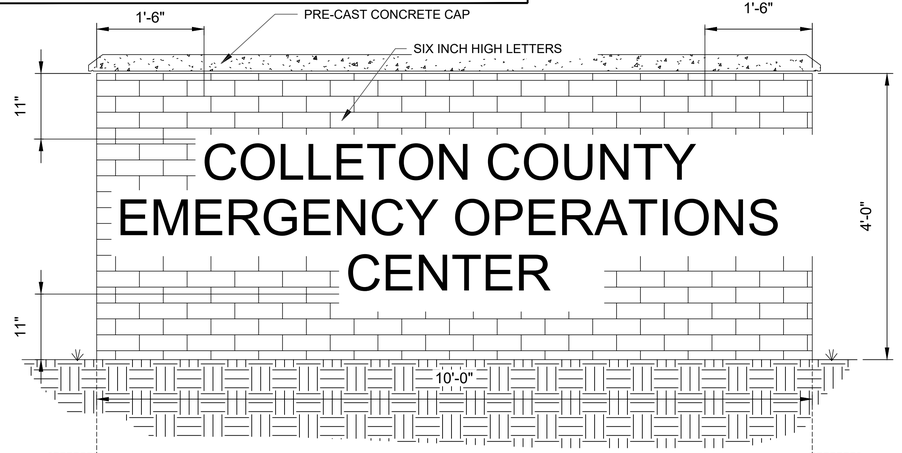
* NOTE: FOR EVERY SIX OR FRACTION OF SIX PARKING SPACES REQUIRED, AT LEAST ONE SHALL BE A VAN PARKING SPACE AS REQUIRED BY 208.2.4 OF THE 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN

TYP. ADA 90° PARKING DETAIL
NO SCALE

4
C-603



7
C-603



11
C-603

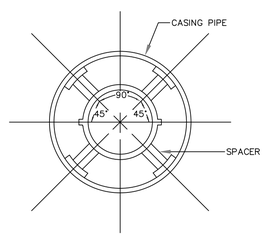
NOTES:

1. REFER TO APPLICABLE PERMITS FOR MINIMUM REQUIREMENTS GOVERNING HIGHWAY OR ROADWAY UNDERCROSSINGS.
2. THE MINIMUM DIAMETER AND THICKNESS OF THE CASING PIPE SHALL BE AS LISTED IN THE TABLE SHOWN IN THIS DETAIL.
3. SEE AGENCY PERMIT FOR LENGTH AND DEPTH REQUIREMENTS.
4. IN CASE OF A CONFLICT BETWEEN THIS DETAIL AND A PERMIT, THE STRICTEST REQUIREMENT SHALL GOVERN.
5. PERFORM ALL EXCAVATION AND BACKFILLING ACTIVITIES IN ACCORDANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 (PL 91-597), AS AMENDED.
6. USE CASING SPACERS (SEE DETAIL) TO MOVE WATERMAIN INTO CASING PIPE. SPACING OF SPACERS WILL BE DICTATED BY THE LENGTH OF CASING PIPE AND NUMBER OF JOINTS OF WATERMAIN. USE A MINIMUM OF 2 SPACERS PER JOINT OF PIPE OR 1 SPACER PER 10'.
7. AT NO TIME DURING THE BORING AND JACKING OPERATION SHALL THE AUGER HEAD BE ALLOWED TO EXTEND OUT IN FRONT OF THE CASING BEING INSTALLED.
8. THE BORING AND JACKING OF THE CASING PIPE SHALL BE A CONTINUOUS INSTALLATION FROM START TO FINISH AND IN ACCORDANCE WITH THE APPLICABLE ENCROACHMENT PERMIT.
9. CONTRACTOR SHALL SUBMIT PLANS AND SPECIFICATIONS FOR DEWATERING TO THE ENGINEER FOR APPROVAL PRIOR TO BEGINNING THE PROCESS (FOR RAILWAYS, RAILWAY AUTHORITY MUST APPROVE ALSO). IT WILL BE THE SOLE JUDGEMENT OF SCDOT OR RAILWAY AUTHORITY AS TO WHEN THE OPERATION CAN BE SAFELY HALTED.
10. BORED INSTALLATIONS SHALL HAVE A BORED HOLE NO MORE THAN 1" GREATER THAN THE OUTSIDE DIAMETER OF THE CASING PIPE.
11. JOINTS BETWEEN LENGTHS SHALL BE COMPLETELY WELDED IN ACCORDANCE WITH AMERICAN WELDING SOCIETY RECOMMENDED PROCEDURES.
12. SEAL CASING ENDS WITH TYPE II CONCRETE GROUT AND CONCRETE BRICKS, SO AS TO PREVENT THE ENTRANCE OF SOIL. LEAVE A 1" GAP AT THE BOTTOM OF CASING TO ALLOW LEAKAGE TO PASS IN CASE OF A MAIN BREAK.
13. PIPING INSIDE CASING SHALL BE POLYWRAPPED.
14. REFER TO CWS MINIMUM STANDARDS FOR APPROPRIATE MANUFACTURERS, MODEL NUMBERS, INSTALLATION REQUIREMENTS, AND OTHER INFORMATION.

STEEL CASING PIPE
SIZE REQUIREMENTS FOR ASTM A139 GRADE B

RESTRAINED JOINT (DIP) CARRIER PIPE SIZE (INCHES)	MINIMUM CASING SIZE (INCHES)	MINIMUM CASING THICKNESS (INCHES)
4	10	0.250

NOTE:
ACTUAL THICKNESS SHALL BE DETERMINED BY THE CASING INSTALLER BASED ON AN EVALUATION OF THE REQUIRED JACKING FORCES.



PROFILE

SPACER DETAIL

JACK AND BORE
NOT TO SCALE

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WWW.THEJLAGROUP.COM

CLIENT: JOHN T. STIEGLITZ, III
403 E. WASHINGTON STREET, SUITE D WALTERBORO, SC 29488

PROJECT NAME: **COLLETON COUNTY EOC**

PROJECT LOCATION: 375 SNIDERS HIGHWAY, WALTERBORO, SC 29488

SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION — JOHNSON, LASCHOBER & ASSOC., PC No. C00790

SOUTH CAROLINA PROFESSIONAL ENGINEER — No. 19519 — 10/14/26 — ROBERT W. GILLAM

REV	DATE	BY	DESCRIPTION
1	10/14/26	HWG	ISSUED FOR ADDENDUM #1
0	02/06/26	HWG	ISSUED FOR BID

PROJECT NO. 3093.2301
DRAWN BY : CDB
CHECKED BY : HWG
DATE: 10/14/26

SHEET TITLE :
SITE DETAILS AND SPECIFICATIONS

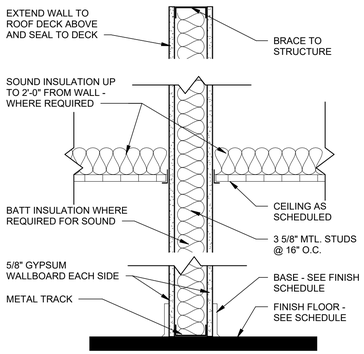
SCALE: 1" = 1'

DRAWING NO. **C-603** REV. 1

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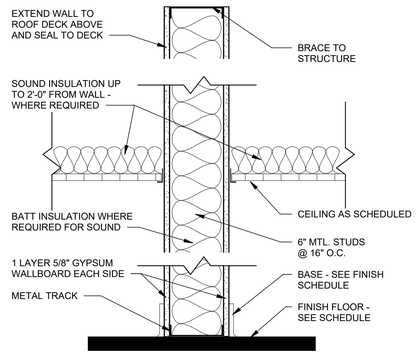
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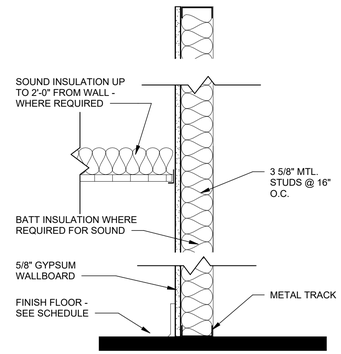
WALL TYPE 1

SCALE: 1 1/2" = 1'-0"



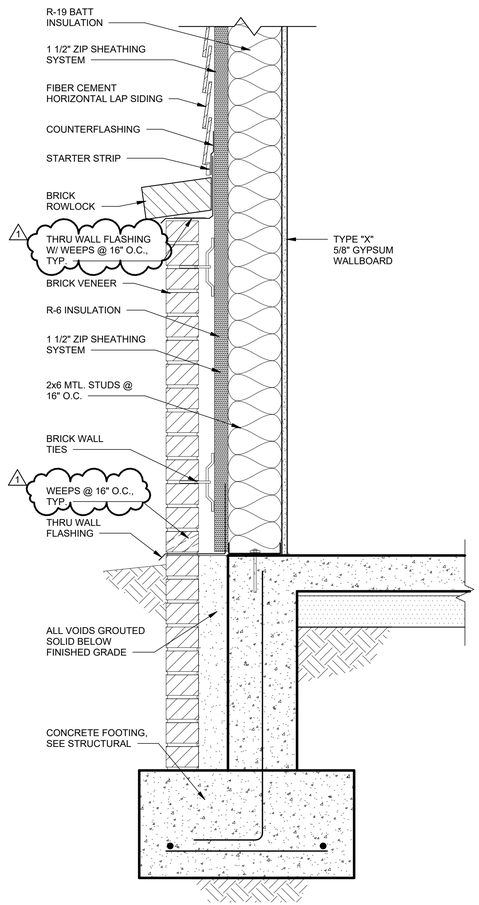
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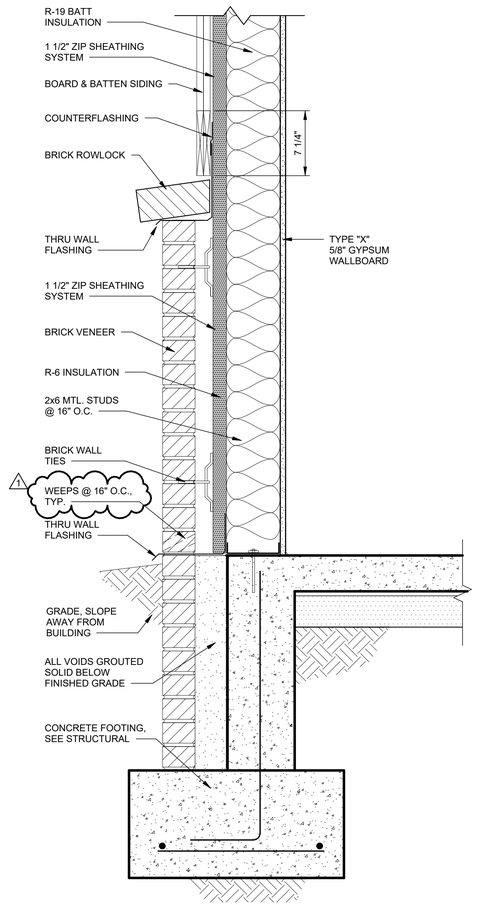
WALL TYPE 3

SCALE: 1 1/2" = 1'-0"



WALL TYPE 4

SCALE: 1 1/2" = 1'-0"



WALL TYPE 5

SCALE: 1 1/2" = 1'-0"

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CLIENT:
COLLETON COUNTY
403 E. WASHINGTON STREET, SUITE D, WALTERBORO, SC 29488

PROJECT NAME:
EMERGENCY OPERATIONS CENTER

PROJECT LOCATION:
375 SNIDERS HWY., WALTERBORO, SC 29488

STATE OF SOUTH CAROLINA
CAMERON LYLE BAKER
Charleston, SC
No. AR 9858
REGISTERED ARCHITECT

STATE OF SOUTH CAROLINA
PINNACLE ARCHITECTURE, PA
Matthews, NC
No. ARF.02087
2/6/2026
REGISTERED ARCHITECTS

REV	DATE	BY	DESCRIPTION
0	02/06/26	CLB	ISSUED FOR BID
1	10/14/26	BS	ADDENDUM NO. 1

PROJECT NO.	3093.2301
DRAWN BY:	CTH
CHECKED BY:	CB
DATE:	02/06/2026

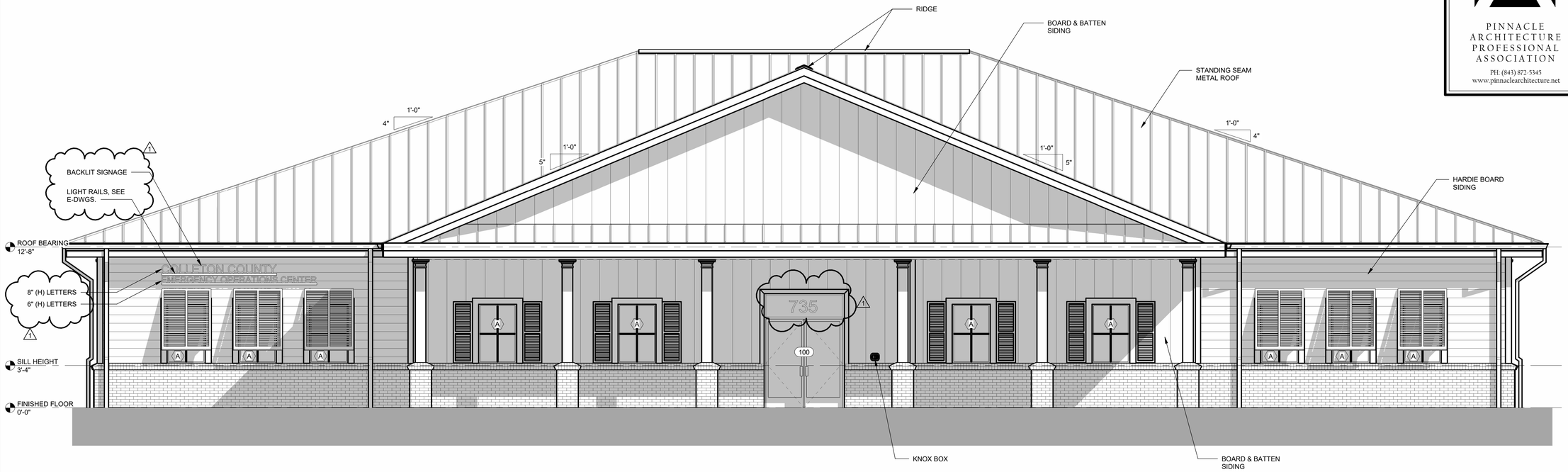
SHEET TITLE:
WALL TYPES

SCALE: AS NOTED

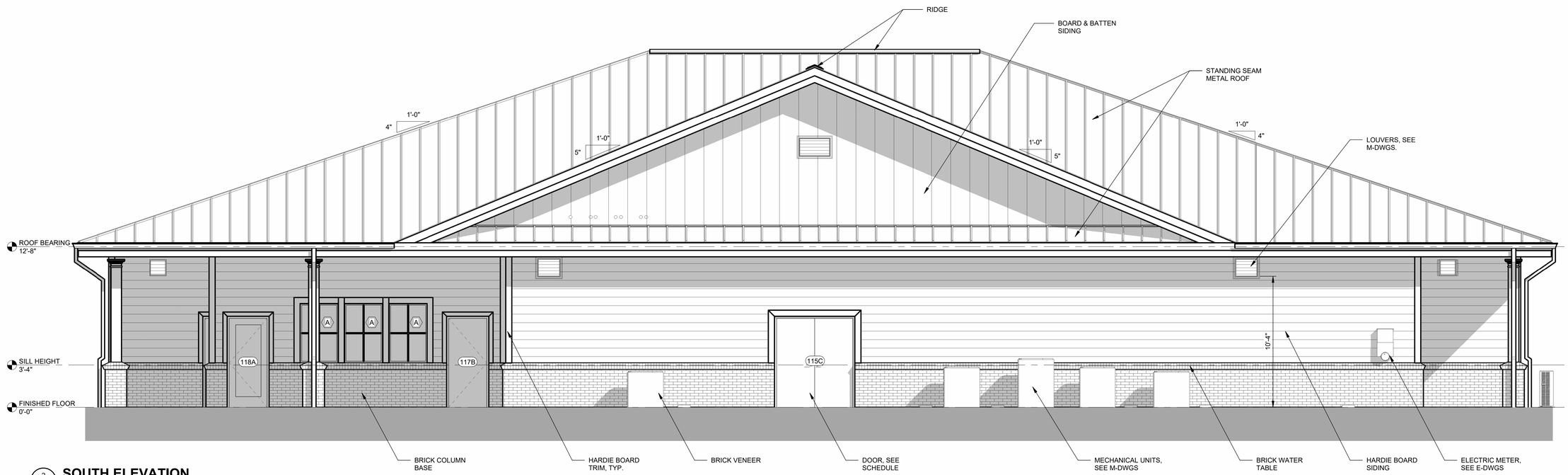
DRAWING NO.: **A-103**
REV.: **1**

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10/14/2026 11:34:20 AM
JLA-36X36 RPA
RA-AR10902 BLB



1 NORTH ELEVATION
A-401 SCALE: 1/4" = 1'-0"



2 SOUTH ELEVATION
A-401 SCALE: 1/4" = 1'-0"

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WWW.THEJLAGROUP.COM

CLIENT: COLLETON COUNTY
403 E. WASHINGTON STREET, SUITE D, WALTERBORO, SC 29488

PROJECT NAME: **EMERGENCY OPERATIONS CENTER**

PROJECT LOCATION: 375 SNIDERS HWY., WALTERBORO, SC 29488

STATE OF SOUTH CAROLINA — CAMERON LYLE BAKER — Charleston, SC — No. AR 9958 — REGISTERED ARCHITECT

STATE OF SOUTH CAROLINA — PINNACLE ARCHITECTURE, PA — Matthews, NC — No. ARF.002687 — 2/6/2026 — REGISTERED ARCHITECTS

REV	DATE	BY	DESCRIPTION
1	10/14/26	BS	ADDENDUM NO. 1
0	02/06/26	CLB	ISSUED FOR BID

PROJECT NO.	3093.2301
DRAWN BY:	CTH
CHECKED BY:	CB
DATE:	02/06/2026

SHEET TITLE: **EXTERIOR ELEVATIONS**

SCALE: AS NOTED

DRAWING NO. **A-401** REV. **1**

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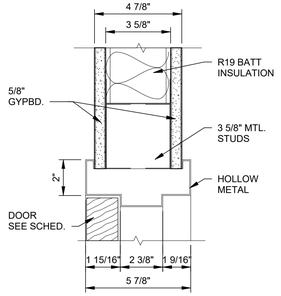
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PLAS.CTB,105.PEN
PLAS.HATCH.PAT
PLAS.MLD

WINDOW SCHEDULE

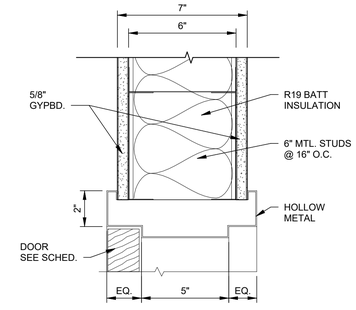
TYPE MARK	R.O. WIDTH	R.O. HEIGHT	TYPE	MANUFACTURER	MODEL	MATERIAL	FINISH	HEAD	JAMB	SILL	GLAZING THICKNESS	GLAZING TYPE	HEAD HEIGHT	COMMENTS
A	3'-0"	4'-8"	Window-Fixed										<varies>	<varies>
23														
Grand total: 23														

DOOR SCHEDULE

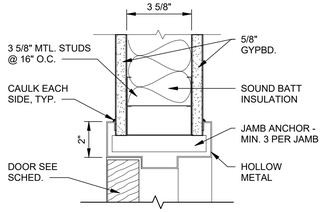
DOOR NUMBER	TYPE	DOOR WIDTH	DOOR HEIGHT	DOOR THICKNESS	DOOR MATERIAL	DOOR FINISH	FIRE RATING	HEAD DETAIL	JAMB DETAIL	SILL DETAIL	HARDWARE	FRAME MATERIAL	FRAME FINISH	COMMENTS
100	DFGA	6'-0"	7'-0"	0'-1 3/4"	ALUM/GL	FF		1/A-802	2/A-802	3/A-802	ACCESS CTRL	ALUM	FF	
101A	DFGA	6'-0"	7'-0"	0'-1 3/4"	ALUM/GL	FF		-	-		ACCESS CTRL	ALUM	FF	
101B	N	3'-0"	7'-0"	0'-1 3/4"	SCW/GL	ST		3/A-801	4/A-801	5/A-801		HM	PT	
101C	N	3'-0"	7'-0"	0'-1 3/4"	SCW/GL	ST		3/A-801	4/A-801	5/A-801		HM	PT	
103	N	3'-0"	7'-0"	0'-1 3/4"	SCW/GL	ST		1/A-801	2/A-801	5/A-801		HM	PT	
104	N	3'-0"	7'-0"	0'-1 3/4"	SCW/GL	ST		1/A-801	2/A-801	5/A-801		HM	PT	
105	FG	3'-0"	7'-0"	0'-1 3/4"	SCW/GL	ST		1/A-801	2/A-801	5/A-801	ACCESS CTRL	HM	PT	
106	F	3'-0"	7'-0"	0'-1 3/4"	SCW	ST		1/A-801	2/A-801	5/A-801		HM	PT	
107	F	3'-0"	7'-0"	0'-1 3/4"	SCW	ST		1/A-801	2/A-801	5/A-801		HM	PT	
108	N	3'-0"	7'-0"	0'-1 3/4"	SCW/GL	ST		3/A-801	4/A-801		ACCESS CTRL	HM	PT	
109	FG	3'-0"	7'-0"	0'-1 3/4"	ALUM/GL	FF		-	-			ALUM	FF	DETAILS LOCATED ON A-805
110	F	3'-0"	7'-0"	0'-1 3/4"	SCW	ST		1/A-801	2/A-801			HM	PT	
111	F	3'-0"	7'-0"	0'-1 3/4"	SCW	ST		1/A-801	2/A-801			HM	PT	
112	F	3'-0"	7'-0"	0'-1 3/4"	SCW	ST		1/A-801	2/A-801			HM	PT	
113	F	3'-0"	7'-0"	0'-1 3/4"	SCW	ST		1/A-801	2/A-801	6/A-801		HM	PT	
114	F	3'-0"	7'-0"	0'-1 3/4"	SCW	ST		1/A-801	2/A-801	6/A-801		HM	PT	
115A	F	3'-0"	7'-0"	0'-1 3/4"	SCW	ST		1/A-801	2/A-801	5/A-801		HM	PT	
115B	F	3'-0"	7'-0"	0'-1 3/4"	SCW	ST		3/A-801	4/A-801	5/A-801		HM	PT	
115C	DF	6'-0"	7'-0"	0'-1 3/4"	HM	PT		4/A-802	5 & 6/A-802		ACCESS CTRL	HM	PT	
117A	F	3'-0"	7'-0"	0'-1 3/4"	HM	PT		4/A-802	5 & 6/A-802		ACCESS CTRL	HM	PT	
117B	F	3'-0"	7'-0"	0'-1 3/4"	HM	PT		4/A-802	5 & 6/A-802		ACCESS CTRL	HM	PT	
118A	FG	3'-0"	7'-0"	0'-1 3/4"	HM/GL	PT		4/A-802	5 & 6/A-802		ACCESS CTRL	HM	PT	
118B	N	3'-0"	7'-0"	0'-1 3/4"	SCW/GL	ST		1/A-801	2/A-801			HM	PT	
119	FG	3'-0"	7'-0"	0'-1 3/4"	ALUM/GL	FF		-	-			ALUM	FF	DETAILS LOCATED ON A-805
120	FG	3'-0"	7'-0"	0'-1 3/4"	ALUM/GL	FF		-	-			ALUM	FF	DETAILS LOCATED ON A-805
121A	FG	3'-0"	7'-0"	0'-1 3/4"	SCW/GL	ST		1/A-801	2/A-801	5/A-801	ACCESS CTRL	HM	PT	
121B	N	3'-0"	7'-0"	0'-1 3/4"	SCW/GL	ST		3/A-801	4/A-801			HM	PT	
121C	FG	3'-0"	7'-0"	0'-1 3/4"	HM/GL	PT		4/A-802	5 & 6/A-802		ACCESS CTRL	HM	PT	
122	F	3'-0"	7'-0"	0'-1 3/4"	SCW	ST		1/A-801	2/A-801			HM	PT	
123	F	3'-0"	7'-0"	0'-1 3/4"	SCW	ST		1/A-801	2/A-801	6/A-801		HM	PT	
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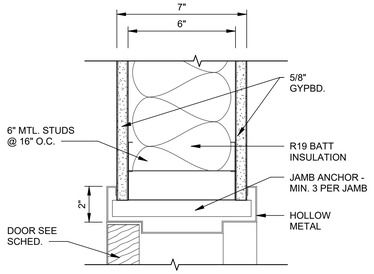
1 A-801 **HEAD DETAIL**
SCALE: 3" = 1'-0"



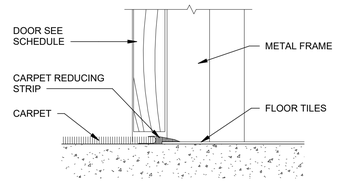
3 A-801 **HEAD DETAIL**
SCALE: 3" = 1'-0"



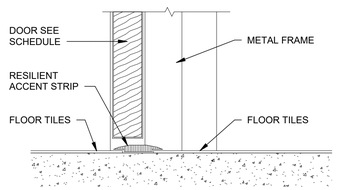
2 A-801 **JAMB DETAIL**
SCALE: 3" = 1'-0"



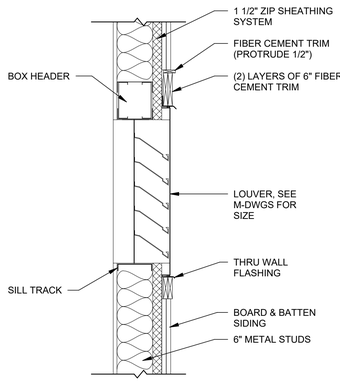
4 A-801 **JAMB DETAIL**
SCALE: 3" = 1'-0"



5 A-801 **SILL DETAIL**
SCALE: 3" = 1'-0"



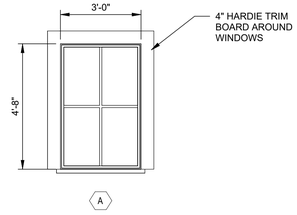
6 A-801 **SILL DETAIL**
SCALE: 3" = 1'-0"



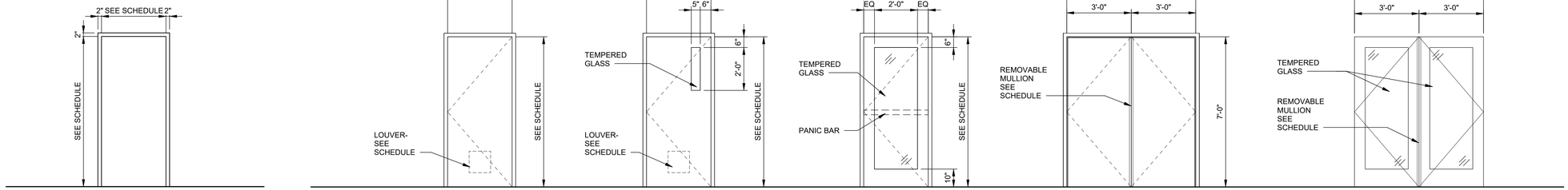
7 A-801 **LOUVER SECTION**
SCALE: 1" = 1'-0"

DOOR LEGEND

ALUM:	ALUMINUM	**HM:**	HOLLOW METAL
CO:	CASED OPENING	**ID:**	INSULATED
EXIST/EX:	EXISTING	**PT:**	PAINT
FF:	FACTORY FINISH/ STANDARD COLORS	**SCW:**	SOLID CORE WOOD
FS:	FLUSH STEEL	**ST:**	PREFINISHED/ STAINED
GL:	GLASS	**WD:**	WOOD



WINDOW TYPES
SCALE: 3/8" = 1'-0"



FRAME TYPES
SCALE: 3/8" = 1'-0"

DOOR TYPES
SCALE: 3/8" = 1'-0"

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CLIENT: COLLETON COUNTY
403 E. WASHINGTON STREET, SUITE D, WALTERBORO, SC 29488

PROJECT NAME: **EMERGENCY OPERATIONS CENTER**

PROJECT LOCATION: 375 SNIDERS HWY., WALTERBORO, SC 29488

STATE OF SOUTH CAROLINA — CAMERON LYLE BAKER — Charleston, SC — No. AR 9858 — REGISTERED ARCHITECT

STATE OF SOUTH CAROLINA — PINNACLE ARCHITECTURE, PA — Matthews, NC — No. ARF.02087 — 2/6/2026 — REGISTERED ARCHITECTS

REV	DATE	BY	DESCRIPTION
0	10/14/26	BS	ADDENDUM NO. 1
1	02/06/26	CLB	ISSUED FOR BID

PROJECT NO. 3093.2301
DRAWN BY: CTH
CHECKED BY: CB
DATE: 02/06/2026
SHEET TITLE: **DOOR, WINDOW SCHEDULE, DETAILS**
SCALE AS NOTED
DRAWING NO. **A-801**
REV. 1

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RA-2WX36 (RFA
RA-2WX48 (RFA
RA-2WX60 BLB

ABBREVIATIONS

ACT:	ACOUSTICAL CEILING TILE
ACB:	ACOUSTICAL CEILING BAFFLE
AWP:	ACOUSTICAL WALL PANEL
CG:	CORNER GUARD
CONC:	CONCRETE
CPT:	CARPET
CT:	CERAMIC OR PORCELAIN TILE
CTB:	CERAMIC OR PORCELAIN TILE BASE
CTF:	CERAMIC OR PORCELAIN TILE FLOORING
CWT:	CERAMIC OR PORCELAIN WALL TILE
EPX:	EPOXY FLOORING
EPC:	EPOXY COATING
EPP:	EPOXY PAINT
ETR:	EXISTING TO REMAIN
EXP:	EXPOSED STRUCTURE
FRP:	FIBER REINFORCED PANEL
GB:	GYPSUM BOARD
GT:	GROUT
LVT:	LUXURY VINYL TILE
MTL:	METAL
OFCI:	OWNER FURNISHED, CONTRACTOR INSTALLED
OFOI:	OWNER FURNISHED, OWNER INSTALLED
PC:	POLISHED CONCRETE
PL:	PLASTIC LAMINATE
PLW:	PLYWOOD
PT:	PAINT
PTB:	PORCELAIN TILE BASE
PTF:	PORCELAIN TILE FLOORING
PWT:	PORCELAIN WALL TILE
RB:	RUBBER / VINYL BASE
RF:	RUBBER FLOOR
RN:	RUBBER NOSING
RS:	ROLLER SHADE
RT:	RUBBER TILE
RSTR:	RUBBER STAIR TREAD/RISER
SC:	SEALED CONCRETE
SPF:	SPORTS FLOORING
SS:	SOLID SURFACE
ST:	STAIN
STC:	STAMPED CONCRETE
SV:	SHEET VINYL
TBD:	TO BE DETERMINED
TR:	TRANSITION STRIP
WAF:	WOOD ATHLETIC FLOORING
WC:	WALL COVERING
WDB:	WOOD BASE
WDF:	WOOD FLOORING
WOC:	WALK OFF CARPET
VCT:	VINYL COMPOSITION TILE
VRB:	VENTED RUBBER BASE

FINISH SCHEDULE

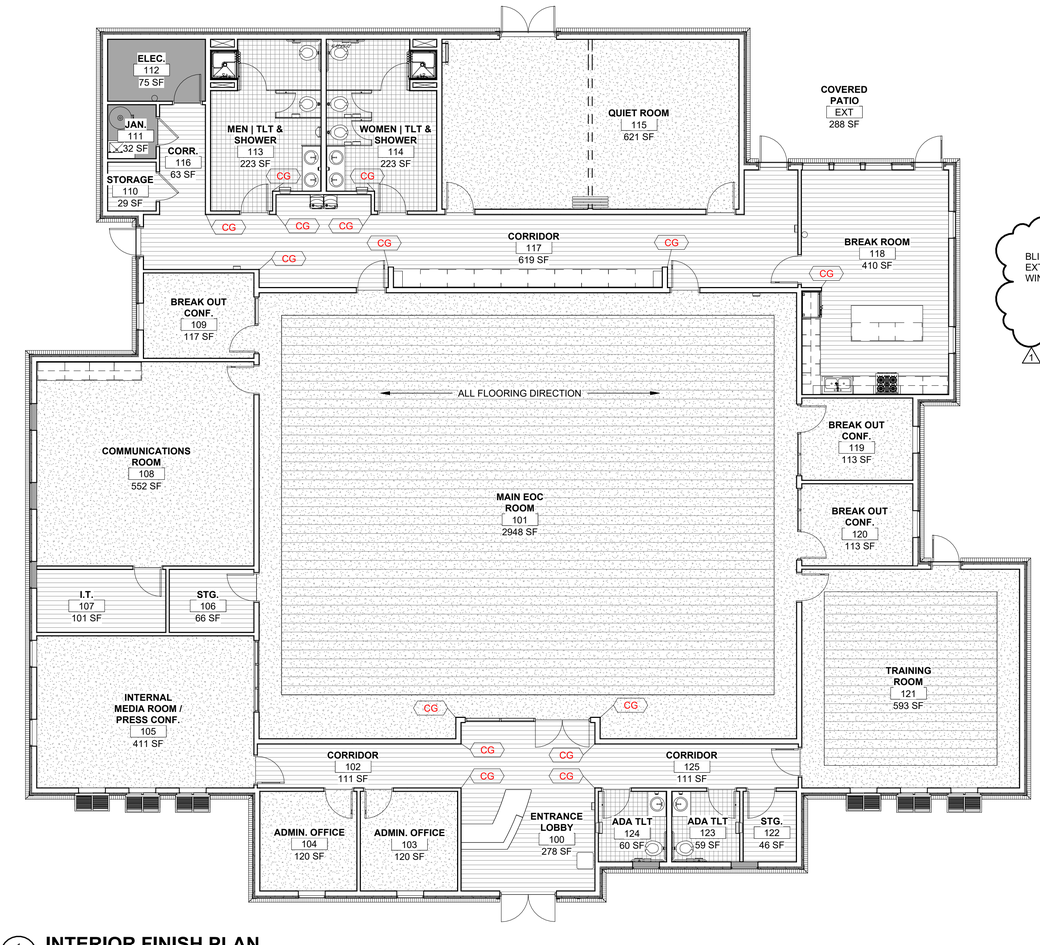
NUMBER	NAME	FLOOR FINISH	BASE	WALL FINISH	CEILING FINISH	CEILING HEIGHT	COMMENTS
100	ENTRANCE LOBBY	LVT-1	RB-1	PT	ACT-1 / PT	VARIES	CEILING HEIGHT VARIES, SEE RCP;
101	MAIN EOC ROOM	CPT-1 / CPT-2	RB-1	PT	ACT-1	15'-0"	
102	CORRIDOR	LVT-1	RB-1	PT	ACT-1	9'-0"	
103	ADMIN. OFFICE	CPT-1	RB-1	PT	ACT-1	9'-0"	
104	ADMIN. OFFICE	CPT-1	RB-1	PT	ACT-1	9'-0"	
105	INTERNAL MEDIA ROOM / PRESS CONF.	CPT-1	RB-1	PT	ACT-1	9'-0"	
106	STG.	LVT-1	RB-2	PT	ACT-2	9'-0"	
107	I.T.	LVT-1	RB-2	PT	ACT-2	9'-0"	
108	COMMUNICATIONS ROOM	CPT-1	RB-1	PT	ACT-2 / PT	9'-0"	
109	BREAK OUT CONF.	CPT-1	RB-1	PT	ACT-2	9'-0"	
110	STORAGE	LVT-1	RB-2	PT	ACT-2	9'-0"	
111	JAN.	SC	RB-2	EPP	ACT-2	9'-0"	
112	ELEC.	SC	RB-2	EPP	ACT-2	9'-0"	
113	MEN | TLT & SHOWER	CT-1	CTB	EPP	ACT-2 / PT	9'-6"	CEILING HEIGHT VARIES, SEE RCP;
114	WOMEN | TLT & SHOWER	CT-1	CTB	EPP	ACT-2 / PT	9'-6"	CEILING HEIGHT VARIES, SEE RCP;
115	QUIET ROOM	CPT-1	RB-1	PT	ACT-2	9'-0"	
116	CORR.	LVT-1	RB-1	PT	PT	9'-0"	
117	CORRIDOR	LVT-1	RB-1	PT	ACT-2 / PT	VARIES	CEILING HEIGHT VARIES, SEE RCP;
118	BREAK ROOM	LVT-1	RB-1	PT	ACT-2	9'-6"	
119	BREAK OUT CONF.	CPT-1	RB-1	PT	ACT-2	9'-0"	
120	BREAK OUT CONF.	CPT-1	RB-1	PT	ACT-2	9'-0"	
121	TRAINING ROOM	CPT-1 / CPT-2	RB-1	PT	ACT-1 / PT	VARIES	CEILING HEIGHT VARIES, SEE RCP;
122	STG.	LVT-1	RB-2	PT	ACT-2	9'-0"	
123	ADA TLT	CT-1	CTB	EPP	ACT-1	9'-0"	
124	ADA TLT	CT-1	CTB	EPP	ACT-1	9'-0"	
125	CORRIDOR	LVT-1	RB-1	PT	ACT-1	9'-0"	

FINISH NOTES

1. INSTALLERS OF EACH FINISH MATERIAL SHALL INSPECT BOTH THE SUBSTRATE AND CONDITIONS UNDER WHICH WORK IS TO BE PERFORMED. INSTALLER SHALL NOT PROCEED UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED IN AN ACCEPTABLE MANNER TO ALL PARTIES AND MEET ALL MANUFACTURERS REQUIREMENTS.
2. PATTERN INDICATES LOCATION ONLY. ACTUAL PATTERN INDICATED IN INTERIOR FINISH SPECIFICATIONS.
3. ALL FLOOR FINISH CHANGES SHALL OCCUR AT THE CENTER LINE OF CLOSED DOOR OR CASED OPENING. PROVIDE TRANSITIONS STRIPS AT ALL FLOOR FINISH TRANSITIONS. SEE INTERIOR SPECIFICATIONS.
4. PT-1 ON ALL WALLS NOT INDICATED ON FINISH PLAN OR ELEVATIONS.
5. SEE FINISH PLAN FOR PT-2 ACCENT PAINT LOCATIONS - **ADDED AT LATER DATE**.
6. PT-3 ON ALL HOLLOW METAL DOOR AND DOOR FRAMES.
7. PT-4 ON ALL GYPSUM CEILINGS, UNLESS NOTED OTHERWISE.
8. EPP-1 ON ALL EXPOSED STRUCTURE. PRIME AND PAINT ALL EXPOSED STRUCTURE, FRAMING, BRACING, DUCTWORK AND CONDUIT.
9. PRIOR TO APPLICATION, PAINT CONTRACTOR SHALL SUBMIT TO ARCHITECT OR DESIGNER, EACH PAINT COLOR FINISH ON AN 8 1/2" x 11" SHEET OF CHIPBOARD FOR PRELIMINARY APPROVAL. FOR FINAL PAINT APPROVAL, PAINT CONTRACTOR SHALL PAINT A 3' x 3' SECTION OF GYPSUM WALLBOARD IN THE SPACE WITH APPROPRIATE LIGHTING FOR OWNER APPROVAL. ACCENT PAINT LOCATIONS TO BE REVIEWED ON SITE WITH OWNER PRIOR TO APPLICATION.

FLOORING LEGEND

- **CPT-1** CARPET
- **CPT-2** CARPET
- **CT** PORCELAIN TILE, FLOORING
- **LVT** LUXURY VINYL TILE / PLANK
- **SC** SEALED CONCRETE



BLINDS - ALL EXTERIOR WINDOWS

1

1 A-901 **INTERIOR FINISH PLAN**
SCALE: 1/8" = 1'-0"

INTERIOR FINISH SPECIFICATIONS

ACT-1 - ACOUSTICAL CEILING TILE	LVT-1 - LUXURY VINYL TILE	TP - TOILET & SHOWER PARTITIONS
MANUFACTURER: ARMSTRONG CEILINGS SPEC: ULTIMA HIGH NRC, 15/16" BEVELED TEGULAR (24"x24"x7/8"); LAY-IN CEILING PANELS INSTALLED IN 15/16" PRELUDE SUSPENSION SYSTEM GRID; WHITE	MANUFACTURER: INTERFACE SPEC: NORTHERN GRAIN 3.0MM SIZE: 25CM x 1M, PATTERN: ASHLAR COLOR: TBD CONTACT: EMILY SLAYTON 404-357-5627, emily.slayton@interface.com	MANUFACTURER: BOBRICK SPEC: DURALINE SERIES CGL (1180); STANDARD HEIGHT; GAP-FREE DOORS & STILES; OVERHEAD-BRACED COLOR: TBD
ACT-2 - ACOUSTICAL CEILING TILE	PL-1 - PLASTIC LAMINATE	TR-1 - TRANSITION STRIPS
MANUFACTURER: ARMSTRONG CEILINGS SPEC: ULTIMA 15/16" SQUARE LAY-IN (24"x24"x3/4"); LAY-IN CEILING PANELS INSTALLED IN 15/16" PRELUDE SUSPENSION SYSTEM GRID; WHITE	MANUFACTURER: FORMICA SPEC: STANDARD FINISH COLOR: TBD CONTACT: GRACE HOLLEY 803-260-5497; gholley@web-don.com	*LVT TO CARPET* MANUFACTURER: JOHNSONITE SPEC: METAL EDGE COLOR: TBD CONTACT: ANGIE CALLAHAN 404-491-2583, angie.callahan@tarkett.com
AWP - ACOUSTICAL WALL PANEL	PL-2 - PLASTIC LAMINATE	TR-2 - TRANSITION STRIPS
MANUFACTURER: TURF DESIGN SPEC: PLANK CARVED WALL TILE DESIGN: TBD - ASSUME APPROX. 880 SF FOR PRICING COLORS: TBD	MANUFACTURER: FORMICA SPEC: STANDARD FINISH COLOR: TBD CONTACT: GRACE HOLLEY 803-260-5497; gholley@web-don.com	*TILE TO LVT* MANUFACTURER: SCHLUTER SPEC: RENO-U COLOR: ANODIZED ALUMINUM CONTACT: DAN HELD 404-695-6026, dheld@schluter.com
BL-1 - HORIZONTAL LOUVER BLINDS	RB-1 - 4" RUBBER PROFILE BASE	EPP - EPOXY PAINT
MANUFACTURER: GRABER SPEC: LAKE FOREST FAUX WOOD BLINDS SIZE: 2" SLATS; SEE PLANS & ELEVS FOR OVERALL SIZE COLOR: MOREL 2" - 2706 VALENCE & DETAILS TO MATCH COLOR	MANUFACTURER: JOHNSONITE SPEC: MILLWORK "REVEAL" 4-1/4" PROFILE COLOR: TBD CONTACT: ANGIE CALLAHAN, 404-491-2583, angie.callahan@tarkett.com	MANUFACTURER: SHERWIN-WILLIAMS SPEC: INTERIOR, EPOXY FINISH COLOR: TBD
CG - CORNER GUARD	RB-2 - 4" RUBBER COVE BASE	PT-1 - WALL PAINT
MANUFACTURER: INPRO SPEC: TAPE-ON CORNER GUARD, 90° SIZE: 1-1/2" WING; 4'-0"H COLOR: TBD (MATCH WALL PAINT)	MANUFACTURER: JOHNSONITE SPEC: JOHNSONITE "BASEWORK" 4 INCHES COLOR: TBD CONTACT: ANGIE CALLAHAN, 404-491-2583, angie.callahan@tarkett.com	MANUFACTURER: SHERWIN-WILLIAMS SPEC: INTERIOR, LOW-GLOSS EGGSHELL COLOR: TBD
CPT-1 - CARPET TILE	SS-1 - SOLID SURFACE	PT-2 - ACCENT WALL PAINT
MANUFACTURER: INTERFACE SPEC: NIGHT FLIGHT SIZE: 50CM x 50CM, PATTERN: BRICK COLOR: TBD CONTACT: EMILY SLAYTON 404-357-5627, emily.slayton@interface.com	MANUFACTURER: FORMICA SPEC: GROUP S300 MIN FOR PRICING COLOR: TBD CONTACT: GRACE HOLLEY 803-260-5497; gholley@web-don.com	MANUFACTURER: SHERWIN-WILLIAMS SPEC: INTERIOR, LOW-GLOSS EGGSHELL COLOR: TBD
CPT-2 - CARPET TILE	SS-2 - SOLID SURFACE	PT-3 - TRIM & DOOR PAINT
MANUFACTURER: INTERFACE SPEC: SHIVER ME TIMBERS SIZE: 25CM x 1M, PATTERN: ASHLAR COLOR: TBD CONTACT: EMILY SLAYTON 404-357-5627, emily.slayton@interface.com	MANUFACTURER: FORMICA SPEC: GROUP S300 MIN FOR PRICING COLOR: TBD CONTACT: GRACE HOLLEY 803-260-5497; gholley@web-don.com	MANUFACTURER: SHERWIN-WILLIAMS SPEC: SEMI-GLOSS FINISH COLOR: TBD
CT-1 - PORCELAIN TILE	ST-1 - DOOR STAIN	PT-4 - GYP CEILING PAINT
MANUFACTURER: TEC+ARTE SPEC: INDUSTRY SIZE: 12"x24", PATTERN: RUNNING BOND COLOR: TBD CONTACT: DAVID CALLAHAN 404-516-3695, David@tec-arte.com	MFR: MASONITE ARCHITECTURAL SPEC: CENDURA SERIES, WHITE MAPLE (PLAIN SLICED) COLOR: TBD	MANUFACTURER: SHERWIN-WILLIAMS SPEC: INTERIOR, FLAT FINISH COLOR: SW 7006 EXTRA WHITE
CTB - PORCELAIN TILE BASE		
MANUFACTURER: TEC+ARTE SPEC: INDUSTRY SIZE: 3"x24" BULLNOSE COLOR: TBD CONTACT: DAVID CALLAHAN 404-516-3695, David@tec-arte.com		

N

0 1 2 4 8 16 24 FT.
SCALE: 1/8" = 1'-0"

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CLIENT: COLLETON COUNTY
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PROJECT NAME: **EMERGENCY OPERATIONS CENTER**

PROJECT LOCATION: 375 SNIDERS HWY., WALTERBORO, SC 29488

STATE OF SOUTH CAROLINA — CAMERON LYLE BAKER — Charleston, SC — No. AR 9858 — REGISTERED ARCHITECT

STATE OF SOUTH CAROLINA — PINNACLE ARCHITECTURE, PA — Matthews, NC — No. ARF-020567 — 2/6/2026 — REGISTERED ARCHITECTS

REV	DATE	BY	DESCRIPTION
0	02/06/26	CLB	ISSUED FOR BID
1	10/14/26	BS	ADDENDUM NO. 1

PROJECT NO. 3093.2301
DRAWN BY: JPT
CHECKED BY: CB
DATE: 02/06/2026

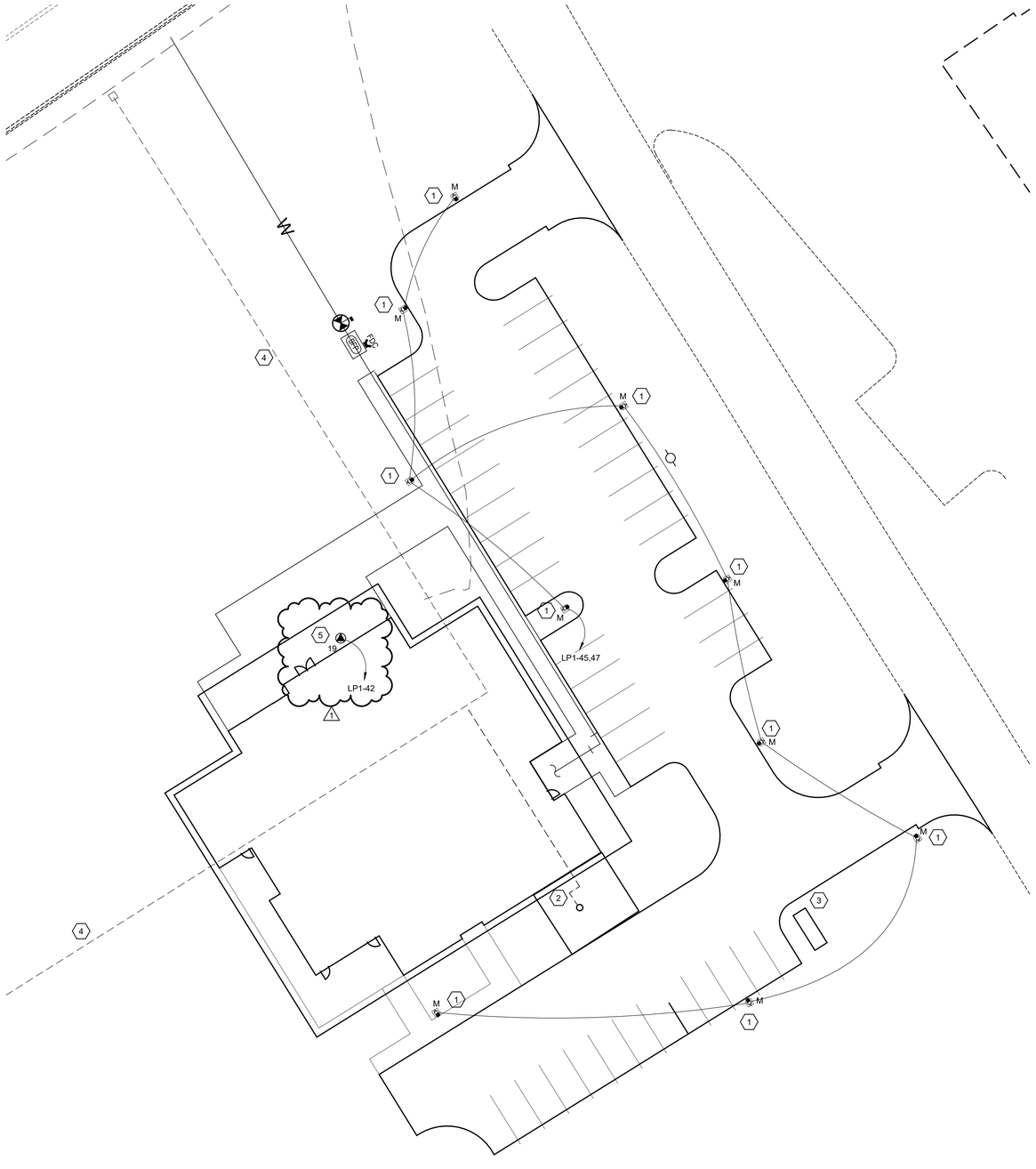
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INTERIOR FINISH SCHEDULE, PLAN, & SPECIFICATIONS

SCALE: AS NOTED

DRAWING NO. **A-901** REV. 1

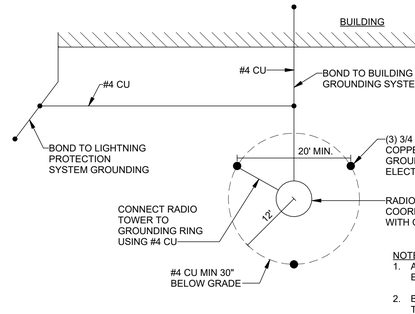
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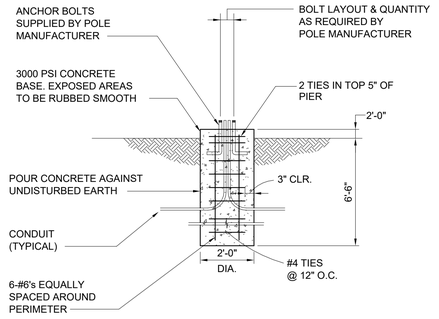
SITE PLAN KEYED NOTES

1. EXTERIOR SITE LIGHTS POLE LOCATION.
2. RADIO TOWER LOCATION PROVIDE TWO 4" CONDUITS TO COMMUNICATIONS ROOM. COORDINATE EXACT LOCATION WITH OWNER.
3. GENERATOR LOCATION.
4. PROVIDE 2" CONDUIT FROM IT ROOM TO UNDERGROUND FRP ENCLOSURE AT ROAD. COORDINATE LOCATION WITH PALMETTO RURAL TELEPHONE COOP (PRTC)
5. PROVIDE 24V TRANSFORMER FOR BACKLIGHT LETTERS. ALL SIGNAGE WIRING SHALL BE CONCEALED. POWER AND CONTROL CABLES FOR BACKLIT METAL LETTERS SHALL BE ROUTED INTERNALLY THROUGH A DEDICATED RACEWAY/RAIL PROVIDED BY SIGNAGE CONTRACTOR AND INSTALLED DIRECTLY BELOW THE LETTER ASSEMBLY.
CONTRACTOR SHALL VERIFY ALL FIELD DIMENSIONS AND COORDINATE MOUNTING DETAILS WITH THE ARCHITECT AND OWNER PRIOR TO INSTALLATION.



NOTE:
1. ALL CONNECTIONS TO BE EXOTHERMIC-WELDED.
2. BOND FENCE AND GATE AROUND TOWER TO GROUNDING SYSTEM AND LIGHTNING PROTECTION USING #4CU.

2 ES100 **RADIO TOWER GROUNDING AND BONDING DIAGRAM**
NO SCALE



3 ES100 **POLE BASE DETAIL**
NO SCALE

1 ES100 **SITE PLAN**
SCALE: 1" = 20'-0"

N

0 5 10 20 40 60 FT.
SCALE: 1" = 20'-0"

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PROJECT NAME: **EMERGENCY OPERATIONS CENTER**

PROJECT LOCATION: 375 SNIDERS HWY., WALTERBORO, SC 29488

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER
No. 42363
CLINTON EDWARD BLANTON
2-6-26

SOUTH CAROLINA
JOHNSON, LASCHOBER & ASSOCIATES, PC
No. C00790
CERTIFICATE OF AUTHORIZATION

REV	DATE	BY	DESCRIPTION
0	02/06/26	CEB	ISSUED FOR BID
1	10/14/26	CEB	ADDENDUM 1

PROJECT NO.	3093.2301
DRAWN BY:	CPH
CHECKED BY:	CEB
DATE:	02/06/2026

SHEET TITLE: **SITE PLAN**

SCALE: AS NOTED

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Colleton County EOC

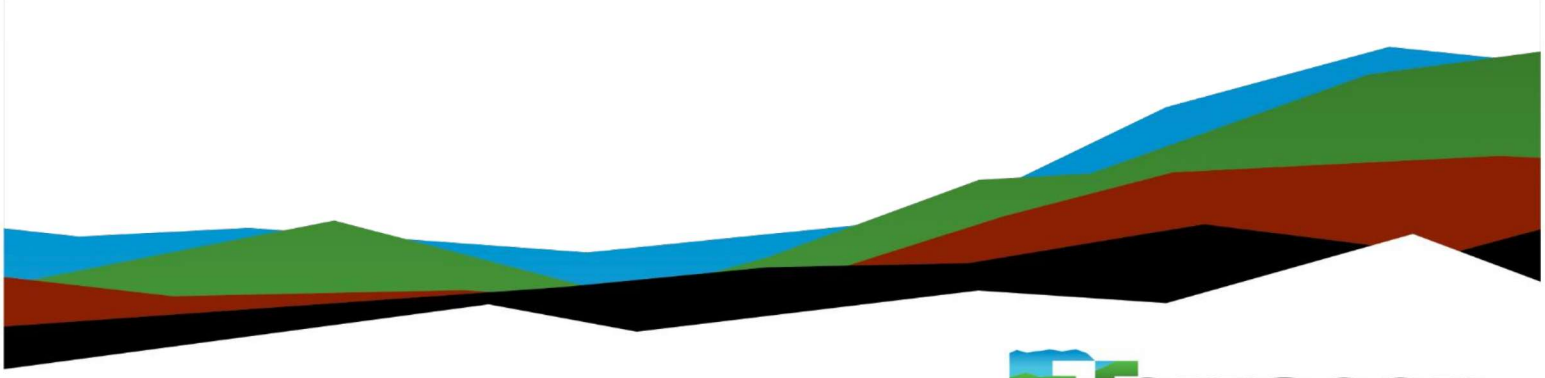
Geotechnical Engineering Report

October 16, 2024 | Terracon Project No. EN235216

Walterboro, South Carolina

Prepared for:

Johnson, Laschober & Associates PC
PO Box 2413
Mt. Pleasant, South Carolina 29465



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October 16, 2024

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PO Box 2413
Mt. Pleasant, South Carolina 29465

Attn: Mr. Herb Gilliam
P: (864) 207-1739
E: hgilliam@thejlagroup.com

Re: Geotechnical Engineering Report
Colleton County EOC
375 Sniders Highway
Walterboro, South Carolina
Terracon Project No. EN235216

Dear Mr. Gilliam:

We have completed the scope of Geotechnical Engineering services for the above referenced project in general accordance with Terracon Proposal No. PEN235216 Rev. 2 dated August 29, 2024. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations, floor slabs and pavements for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,

Terracon





Zachary J. McIntosh, P.E.
Project Engineer
SC Registration No. 40862

Abdul Q. Fekrat, PhD, P.E.
Authorized Project Reviewer

Table of Contents

Introduction **1**
Project Description **1**
Site Conditions **3**
Geotechnical Characterization **3**
Seismicity **4**
Applicable Codes 5
Liquefaction 5
Site Class Evaluation & Seismic Design Parameters 5
Liquefaction Mitigation 6
Geotechnical Overview **7**
Earthwork **8**
Existing Debris and Demolition 8
Site Preparation 8
Subgrade Preparation 9
Excavation 9
Fill Material Types 10
Fill Placement and Compaction Requirements 11
Utility Trench Backfill 11
Grading and Drainage 12
Earthwork Construction Considerations 12
Construction Observation and Testing 13
Shallow Foundations **14**
Design Parameters – Compressive Loads 14
Foundation Construction Considerations 15
Deep Foundations **17**
Deep Foundation Design Recommendations 17
Driven Pile Installation 20
Driven Pile Quality Control 20
ACIP Construction Considerations 21
Lateral Analyses of Deep Foundations 23
Floor Slabs **25**
Floor Slab Design Parameters 25
Floor Slab Construction Considerations 26
Pavements **27**
General Pavement Comments 27
Pavement Design Parameters 27
Pavement Section Thicknesses 27
Pavement Drainage 29
Pavement Maintenance 29
General Comments **30**

Figures

CPT Subsurface Profile
CPT GeoModel
HAB GeoModel

Attachments

Exploration and Testing Procedures
Site Location and Exploration Plans
Exploration and Laboratory Results
Supporting Information

Note: This report was originally delivered in a web-based format. **Blue Bold** text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the Terracon logo will bring you back to this page. For more interactive features, please view your project online at **client.terracon.com**.

Refer to each individual Attachment for a listing of contents.

Introduction

This report presents the results of our subsurface exploration and Geotechnical Engineering services performed for the proposed Colleton County Emergency Operations Center to be located at 375 Sniders Highway in Walterboro, South Carolina. The purpose of these services was to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater conditions
- Seismic site classification per IBC
- Site preparation and earthwork
- Foundation design and construction
- Floor slab design and construction
- Pavement design and construction

The geotechnical engineering Scope of Services for this project included the advancement of in-situ soundings, engineering analysis, and preparation of this report.

Drawings showing the site and boring locations are shown on the **Site Location** and **Exploration Plan**, respectively.

Project Description

Our initial understanding of the project was provided in our proposal and was discussed during project planning. Our final understanding of the project conditions is as follows:

Item	Description
Information Provided	An email request for proposal was provided by Mr. Herb Gilliam to Mr. Kyle Murrell. A Conceptual Site Plan by JLA dated 2/23/2024 was provided. Subsequently a follow up email with information regarding the communications antenna was provided.
Project Description	Based on the information provided, the site will be developed with a new ~8,446 square feet emergency operations center building with adjacent parking and a communications tower.

Item	Description
Maximum Loads	Anticipated structural loads were not provided. In the absence of information provided by the design team, we have used the following loads in estimating settlement based on our experience with similar projects. ▪ Columns: up to 50 kips ▪ Walls: up to 4 kips per linear foot (klf) ▪ Slabs: 150 pounds per square foot (psf) ▪ Communications Tower: We've provided axial, uplift and lateral capacities as a function of depth for two foundation types. The following individual pile loads were assumed for the proposed communications tower: ▪ Auger cast: 200 kips ▪ Pre-stressed concrete: 150 kips We assume a Risk Category IV for the proposed center (per IBC 2021 and ASCE 7-16).
Grading/Slopes	Based on the grading plans provided, we assume that 2 to 3 feet of fill will be required to achieve finished grade.
Below-Grade Structures	Below grade structures such as elevator pits are not anticipated.
Free-Standing Retaining Walls	Retaining walls are not expected to be constructed as part of site development to achieve final grades.
Pavements	Paved driveway and parking will be constructed on the site. We assume both rigid (concrete) and flexible (asphalt) pavement sections will be considered. Traffic loads were not provided. We assumed the following anticipated pavement loads: ▪ Autos/Light Trucks: 500 vehicles per day ▪ Light Delivery Vehicles: 5 vehicles per day ▪ Fire and Trash Collection Trucks: 1 vehicle per day ▪ Pavement Design Life: 20 years
Building Code	IBC 2021

Terracon should be notified if any of the above information is inconsistent with the planned construction, especially the grading and structural information, as modifications to our recommendations may be necessary.

Site Conditions

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

Item	Description
Parcel Information	The project is located at 375 Sniders Highway in Walterboro, South Carolina. Latitude: 32.8847°N, Longitude: 80.6966°W See **Site Location**
Existing Improvements	The site is currently developed with an existing residential home, asphalt/gravel driveway, grass, and trees.
Current Ground Cover	The current ground cover is landscaped grass and partial pavement.

Geotechnical Characterization

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, geologic setting and our understanding of the project. This characterization, termed GeoModel, forms the basis of our geotechnical calculations and evaluation of the site. Conditions observed at each exploration point are indicated on the individual logs. The individual logs can be found in the **Exploration Results** and the GeoModel can be found in the **Figures** attachment of this report.

As part of our analyses, we identified the following model layers within the subsurface profile. For a more detailed view of the model layer depths at each boring location, refer to the GeoModel.

Model Layer	Layer Name	General Description
1	Topsoil	2 to 6 inches of topsoil
2	Sand Mixtures	Loose to very dense sand mixtures
3	Silt and Clay Mixtures	Soft to medium stiff silt and clay mixtures
4	Cooper Marl Formation	Stiff to very stiff silty sand to sandy silt (Cooper Marl Formation)

At the time of our exploration, groundwater was estimated at a depth of approximately 4 to 4½ feet below the existing ground surface. The groundwater depths were determined by measuring the water table depth in the voids left by testing and by estimating the hydrostatic line (height of water below the ground surface) on the penetrometer porewater pressure (u) graph in the CPT log. The water levels as observed during field exploration are noted on the attached in situ and boring logs, in Exploration Results.

Groundwater conditions may be different at the time of construction. Mapping by the Natural Resources Conservation Service (NRCS) indicates a seasonal high groundwater level within 5 feet of ground surface. Groundwater conditions may change because of seasonal variations in rainfall, runoff, and other conditions not apparent at the time of drilling. Long-term groundwater monitoring was outside the scope of services for this project.

Seismicity

Due to the high seismicity of the Coastal Plain of South Carolina, analyzing the effect of earthquake motions on a structure is a major part of the local design process. The intensity of ground shaking at the foundation of structures and the potential for soil under the foundations to liquefy[1] are the principal seismic hazards that must be considered for the design of earthquake-resistant structures.

[1] *Liquefaction is the loss of a cohesionless soil's shear strength due to the increase in porewater pressure resulting from seismic vibrations. This loss of strength can cause bearing capacity failure of shallow foundations and ground surface subsidence due to volumetric compression as pore-pressures dissipate.*

Applicable Codes

The seismic design requirements for buildings and other structures are prescribed by the International Building Code (currently the 2021 edition) based on Seismic Design Category. Site Classification is required to determine the Seismic Design Category for a structure. The Site Classification is based on the upper 100 feet of the site profile defined by a weighted average value of either shear wave velocity (Vs), standard penetration resistance, or undrained shear strength in accordance with Section 20.3 and Table 20.3-1 of ASCE 7-16 (ASCE 7). Per ASCE 7, Section 20.3.1, Site Class is also dictated by the presence of potentially collapsible soils, including liquefiable soils[2].

Liquefaction

The soils on this site have liquefaction potential, and we estimate that such liquefaction could cause up to 3 inches of ground subsidence. (We recommend that up to 75% of the total settlement be assumed to be differential in nature.) Design under the IBC allows for buildings to sustain damage during the design earthquake event, but they must remain standing. Therefore, our liquefaction settlement estimate should be reviewed from the standpoint of risk of total collapse of the structure. While the project's structural engineer should review our estimates, in our experience, this amount of seismic induced settlement can typically be accounted for in the structural design, without requiring ground improvement mitigation techniques, such as earthquake drains.

Site Class Evaluation & Seismic Design Parameters

The seismic evaluation of the site identified potentially liquefiable soils. According to the 2021 IBC and ASCE 7, this potential for liquefaction classifies the site as Site Class F. Section 11.4.8 of ASCE 7 states that a Site-Specific Response Analysis (SSRA) shall be performed for structures on Site Class F sites unless exempted in accordance with Section 20.3.1 of ASCE 7. The exemption in Section 20.3.1 states that for structure(s) with a fundamental period equal to or less than 0.5 seconds, seismic site coefficients Fa and Fv can be determined from Tables 11.4-1 and 11.4-2 using the Site Class as determined in accordance with Section 20.3.

[2] *According to the International Building Code 2021 edition (2021 IBC), the design earthquake has a 50-year exposure period with a 2% probability of exceedance (i.e., a 2475-year design earthquake) with a Moment Magnitude (Mw) of 7.3.*

The structural engineer should verify the fundamental period of the structure(s). If the proposed structures meet the requirements of the exception, then the following seismic design parameters can be used for the site:

Code Used	Site Classification
2021 International Building Code (IBC)	F[1]
Seismic Design Parameter	**Value[2]**
F_a	1.20
F_v	2.148
F_{PGA}	1.145
S_{DS}	0.600 g
S_{D1}	0.324 g
PGA_M	0.521 g

1. *Based on the presence of potentially liquefiable soils.*
2. *Determined using Site Class D in Tables 11.4-1 and 11.4-2 of ASCE 7. This assumes the building meets the fundamental period exception outlined in section 20.3.1 of ASCE 7. Otherwise, a Site-Specific Seismic Response Analysis may be required. Use of Site Class D is based on a weighted average shear wave velocity of 820 feet per second collected at SCPT-01.*

If the proposed structure's fundamental period does not qualify for the exception outlined in Section 20.3 of ASCE 7 a Site-Specific Response Analysis will be required by the International Building Code (IBC) since there are liquefiable soils present on site. Terracon can provide this analysis for an additional fee, upon request.

Liquefaction Mitigation

The most economical mitigation technique in the local area is typically the installation of earthquake drains. Earthquake drains can provide stable subgrade conditions during a seismic event and can be used in conjunction with shallow spread footings. Other potential methods for liquefaction mitigation exist that include stone columns, rammed compaction, deep foundation systems, vibro-floatation, vibro-replacement, dynamic compaction, mat foundations, etc. Terracon can explore these options with the owner and design team if necessary. However, our experience has shown that earthquake drains will likely be the least expensive option. A post-tensioned slab or structural slab may be another option to accommodate the anticipated differential seismic settlement, but this method should be evaluated and designed by the project's structural engineer. If a deep foundation system is proposed for the communications tower structure, the potentially liquefiable soils will be mitigated.

Earthquake Drains

Earthquake drains are prefabricated polymer tubes wrapped in filter fabric, installed vertically in the ground, that allow for dissipation of excess pore water pressures generated during an earthquake, thereby preventing, or greatly reducing the settlements due to liquefaction. The filter fabric deters the migration of fines into the tubes and is an integral part of the system. The excess water is contained within the tubes and is discharged within the sands above the groundwater table.

If earthquake drains are used, we recommend that they be installed after clearing, grubbing, and placing enough fill to create a level working surface for the earthquake drain installation equipment, but before placing any proposed fill. The design, installation details and drainage details for earthquake drains are provided by the specialty contractor and should meet the performance criteria established by the structural engineer.

We recommend that a geotechnical engineer or their representative be present during installation of the earthquake drains. We also recommend that contract documents address grading repair after drain installation, as the installation process often results in subgrade disturbance and can also result in 6 to 12 inches of localized elevation drop. We can provide direction when selecting a geotechnical contractor to install earthquake drains and can also review the earthquake drain submittal prior to construction.

Geotechnical Overview

The site appears suitable for the proposed construction based upon geotechnical conditions encountered in the testing, provided that the recommendations provided in this report are implemented in the design and construction phases of this project.

The sandy site soils are sufficiently incompressible to support the proposed building structure on conventional shallow foundations provided the risk of building settlements due to soil liquefaction is accounted for in the structural design, or mitigated by geotechnical measures such as installation of earthquake drains. In addition, the sandy surficial soils should make site preparation relatively straight forward, with no major concerns with site drainage, surficial stability, or reuse of excavated spoil for site fill.

Based on our experience, and anticipated loads for the communications tower, the proposed structure should be supported on a deep foundation system that is embedded into the Cooper Marl which is located approximately 66 feet below existing grade. Discussion of proposed deep foundation systems are provided in the **Deep Foundations** section.

The recommendations contained in this report are based upon the results of field testing (presented in the **Exploration Results**), engineering analyses, and our current understanding of the proposed project. The **General Comments** section provides an understanding of the report limitations.

Earthwork

Earthwork is anticipated to include demolition, clearing and grubbing, excavations, and engineered fill placement. The following sections provide recommendations for use in the preparation of specifications for the work. Recommendations include critical quality criteria, as necessary, to render the site in the state considered in our geotechnical engineering evaluation for foundations, floor slabs, and pavements.

Existing Debris and Demolition

The proposed building, tower and driveway will be constructed within and adjacent to the footprint of a previously existing building and driveway which has since been demolished. Although no apparent debris or existing fill was encountered below grade at our test locations, we encountered scattered building debris at the ground surface approximately 50 feet south of test location CPT-02. We do not have records indicating the level of control exercised during the previously completed demolition. As such, even with the recommended construction procedures, inherent risk exists for the owner that unsuitable buried material will not be discovered. The risk of unforeseen conditions cannot be eliminated without completely removing the existing material, but it can be reduced by following the recommendations contained in this report. Any remaining foundations, slabs, and utilities encountered during site preparation should be removed from within the proposed building and tower footprint and at least 5 feet beyond the outer edge of foundations.

For areas outside the proposed building and tower footprints and foundation bearing zones, existing foundations, floor slabs, and utilities should be removed where they conflict with proposed utilities, and pavements. In such cases, existing foundations, floor slabs, and utilities should be removed to a depth of at least 2 feet below the affected utility or design pavement subgrade elevation.

Site Preparation

Prior to placing fill, existing vegetation, topsoil, and root mats should be removed. Complete stripping of the topsoil should be performed in the proposed building, tower and parking/driveway areas.

Mature trees are located within or near the footprint of the proposed building, which will require removal at the onset of construction. Tree root systems can remove substantial moisture from surrounding soils. Where trees are removed, the full root ball and all associated dry and desiccated soils should be removed. The soil materials which contain less than 5 percent organics can be reused as engineered fill provided the material is moisture conditioned and properly compacted.

Where fill is placed on existing slopes steeper than 5H:1V, benches should be cut into the existing slopes prior to fill placement. The benches should have a minimum vertical face height of 1 foot and a maximum vertical face height of 3 feet and should be cut wide enough to accommodate the compaction equipment. This benching will help provide a positive bond between the fill and natural soils and reduce the possibility of failure along the fill/natural soil interface.

Subgrade Preparation

The subgrade should be proofrolled with an adequately loaded vehicle such as a fully loaded tandem-axle dump truck. The proofrolling should be performed under the observation of the Geotechnical Engineer or representative. Areas excessively deflecting under the proofroll should be delineated and subsequently addressed by the Geotechnical Engineer. Such areas should either be removed or modified by treating/applying/mixing. Excessively wet or dry material should either be removed, or moisture conditioned and recompacted.

All exposed areas which will receive fill, once properly cleared and benched where necessary, should be scarified to a minimum depth of 10 inches, moisture conditioned as necessary, and compacted per the compaction requirements in this report. Compacted structural fill soils should then be placed to the proposed design grade and the moisture content and compaction of subgrade soils should be maintained until foundation or pavement construction.

Based upon the subsurface conditions determined from the geotechnical exploration, subgrade soils exposed during construction are anticipated to be relatively workable; however, the workability of the subgrade may be affected by precipitation, repetitive construction traffic or other factors. If unworkable conditions develop, workability may be improved by scarifying and drying.

Excavation

We anticipate that excavations for the proposed construction can be accomplished with conventional earthmoving equipment. The bottom of excavations should be thoroughly cleaned of loose soils and disturbed materials prior to backfill placement and/or construction.

Open cut excavation with slopes no greater than 1:2 (vertical:horizontal) can be utilized at this site. Groundwater at the site was estimated at depths of 4 to 4½ feet below existing grades. Dewater using sanded well points will be required for any excavations extending below the groundwater depth. Although deep excavations are not expected, depending on the depth of the excavation and the condition of the excavation bottom, it may be necessary to over excavate 1 to 2 feet below the anticipated bottom of the excavation followed by backfilling with #57 stone. The stone will aid in dewatering the excavation by using sumps and pumps and will also provide a stable working surface during construction. The stone should be wrapped in geotextile separation fabric such as Mirafi HP 270 or similar to limit the migration of fines into the stone.

Fill Material Types

Fill required to achieve design grade should be classified as structural fill and general fill. Structural fill is material used below, or within 10 feet of structures, pavements or constructed slopes. General fill is material used to achieve grade outside of these areas.

Reuse of On-Site Soil: Excavated on-site soil may be selectively reused as fill below pavement and landscaping areas.

Material property requirements for on-site soil for use as general fill and structural fill are noted in the table below:

Property	General Fill	Structural Fill
Composition	Free of deleterious material	Free of deleterious material
Fines content	Not limited	Less than 25% Passing No. 200 sieve
Plasticity	Not limited	Maximum plasticity index of 10
GeoModel Layer Expected to be Suitable[1]	2, 3	2

1. *Based on subsurface exploration. Actual material suitability should be determined in the field at time of construction.*

Imported Fill Materials: Imported fill materials should meet the following material property requirements. Regardless of its source, compacted fill should consist of approved materials that are free of organic matter and debris.

Soil Type[1]	USCS Classification	Acceptable Parameters (for Structural Fill)
Imported Granular Fill	GW, GP, GM, GC, SW, SP, SM, SC	Less than 12% passing No. 200 sieve

1. *Structural fill should consist of approved materials free of organic matter and debris. A sample of each material type should be submitted to the Geotechnical Engineer for evaluation prior to use on this site.*

Fill Placement and Compaction Requirements

Structural and general fill should meet the following compaction requirements.

Item	Structural Fill	General Fill
Maximum Lift Thickness	10 inches or less in loose thickness when heavy, self-propelled compaction equipment is used 4 to 6 inches in loose thickness when hand-guided equipment (i.e. jumping jack or plate compactor) is used	Same as structural fill
Minimum Compaction Requirements[1]	98% of maximum dry density	92% of maximum dry density
Water Content Range[1]	-3% to +3% of optimum	As required to achieve min. compaction requirements

1. *Maximum density and optimum water content as determined by the modified Proctor test (ASTM D 1557).*

Utility Trench Backfill

Any soft or unsuitable materials encountered at the bottom of utility trench excavations should be removed and replaced with structural fill or bedding material in accordance with public works specifications for the utility be supported. This recommendation is particularly applicable to utility work requiring grade control and/or in areas where subsequent grade raising could cause settlement in the subgrade supporting the utility. Trench excavation should not be conducted below a downward 1:1 projection from existing foundations without engineering review of shoring requirements and geotechnical observation during construction.

On-site materials are considered suitable for backfill of utility and pipe trenches from 1 foot above the top of the pipe to the final ground surface, provided the material is free of organic matter and deleterious substances.

Utility trenches should be backfilled with structural fill. Compaction of initial lifts should be accomplished with hand-operated tampers or other lightweight compactors. Flooding or jetting for placement and compaction of backfill is not recommended.

Grading and Drainage

All grades must provide effective drainage away from the building during and after construction and should be maintained throughout the life of the structure. Water retained next to the building can result in soil movements greater than those discussed in this report. Greater movements can result in unacceptable differential floor slab and/or foundation movements, cracked slabs and walls, and roof leaks. The roof should have gutters/drains with downspouts that discharge onto splash blocks at a distance of at least 10 feet from the building.

Exposed ground should be sloped and maintained at a minimum 2% away from the building for at least 10 feet beyond the perimeter of the building. Locally, flatter grades may be necessary to transition ADA access requirements for flatwork. After building construction and landscaping have been completed, final grades should be verified to document effective drainage has been achieved. Grades around the structure should also be periodically inspected and adjusted, as necessary, as part of the structure's maintenance program. Where paving or flatwork abuts the structure, a maintenance program should be established to effectively seal and maintain joints and prevent surface water infiltration.

Earthwork Construction Considerations

Shallow excavations for the proposed structure are anticipated to be accomplished with conventional construction equipment. Upon completion of filling and grading, care should be taken to maintain the subgrade water content prior to construction of grade-supported improvements such as floor slabs and pavements. Construction traffic over the completed subgrades should be avoided. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. Water collecting over or adjacent to construction areas should be removed. If the subgrade freezes, desiccates, saturates, or is disturbed, the affected material should be removed, or the materials should be scarified, moisture conditioned, and recompacted prior to floor slab construction.

The groundwater table could affect overexcavation efforts, especially for overexcavation and replacement of lower strength soils. A temporary dewatering system consisting of

sumps with pumps may be necessary to achieve the recommended depth of overexcavation depending on groundwater conditions at the time of construction.

As a minimum, excavations should be performed in accordance with OSHA 29 CFR, Part 1926, Subpart P, "Excavations" and its appendices, and in accordance with any applicable local and/or state regulations.

Construction site safety is the sole responsibility of the contractor who controls the means, methods, and sequencing of construction operations. Under no circumstances shall the information provided herein be interpreted to mean Terracon is assuming responsibility for construction site safety or the contractor's activities; such responsibility shall neither be implied nor inferred.

Excavations or other activities resulting in ground disturbance have the potential to affect adjoining properties and structures. Our scope of services does not include review of available final grading information or consider potential temporary grading performed by the contractor for potential effects such as ground movement beyond the project limits. A preconstruction/ precondition survey should be conducted to document nearby property/infrastructure prior to any site development activity. Excavation or ground disturbance activities adjacent or near property lines should be monitored or instrumented for potential ground movements that could negatively affect adjoining property and/or structures.

Construction Observation and Testing

The earthwork efforts should be observed by the Geotechnical Engineer (or others under their direction). Observation should include documentation of adequate removal of surficial materials (vegetation, topsoil, any existing building debris and pavements), evaluation and remediation of existing fill materials, as well as proofrolling and mitigation of unsuitable areas delineated by the proofroll.

Each lift of compacted fill should be tested, evaluated, and reworked, as necessary, as recommended by the Geotechnical Engineer prior to placement of additional lifts. Each lift of fill should be tested for density and water content at a frequency of at least one test for every 2,500 square feet of compacted fill in the building areas and 5,000 square feet in pavement areas. Where not specified by local ordinance, one density and water content test should be performed for every 100 linear feet of compacted utility trench backfill and a minimum of one test performed for every 12 vertical inches of compacted backfill.

In areas of foundation excavations, the bearing subgrade should be evaluated by the Geotechnical Engineer. If unanticipated conditions are observed, the Geotechnical Engineer should prescribe mitigation options.

In addition to the documentation of the essential parameters necessary for construction, the continuation of the Geotechnical Engineer into the construction phase of the project provides the continuity to maintain the Geotechnical Engineer's evaluation of subsurface conditions, including assessing variations and associated design changes.

Shallow Foundations

If the site has been prepared in accordance with the requirements noted in **Earthwork**, and the seismic liquefaction is mitigated either geotechnically or structurally, the following design parameters are applicable for shallow foundations. Please note, the following **Shallow Foundation** recommendations are not applicable for the communications tower. Recommendations for the communications tower have been provided in the **Deep Foundation** recommendations section.

Design Parameters – Compressive Loads

Item	Description
Maximum Net Allowable Bearing Pressure[1, 2]	2,000 psf - foundations bearing upon structural fill
Required Bearing Stratum[3]	Structural fill extending to undisturbed native soils
Minimum Foundation Dimensions	18 inches
Ultimate Passive Resistance[4] **(equivalent fluid pressures)**	360 pcf (granular backfill)
Sliding Resistance[5]	0.3 - granular material
Minimum Embedment below Finished Grade[6]	12 inches
Estimated Total Settlement from Structural Loads[2]	Less than about 1 inch
Estimated Differential Settlement[2, 7]	About ½ of total settlement

1. *The maximum net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation.*
2. *Values provided are for maximum loads noted in **Project Description**. Additional geotechnical consultation will be necessary if higher loads are anticipated.*
3. *Unsuitable or soft soils should be overexcavated and replaced per the recommendations presented in **Earthwork**.*
4. *Use of passive earth pressures require the sides of the excavation for the spread footing foundation to be nearly vertical and the concrete placed neat against these vertical faces or that the footing forms be removed and compacted structural fill be placed against the vertical footing*

Item	Description

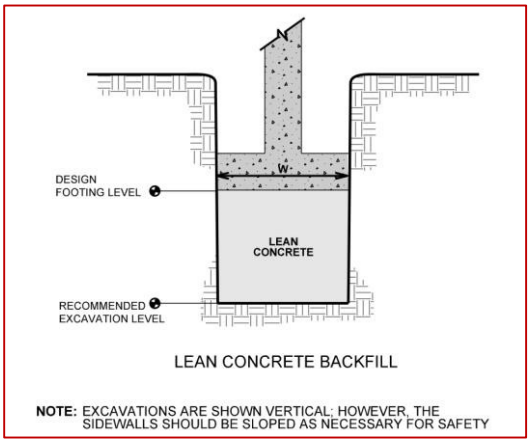
face. Assumes no hydrostatic pressure. An appropriate factor of safety should be used for converting to allowable values.

5. *Can be used to compute sliding resistance where foundations are placed on suitable soil/materials. Frictional resistance for granular materials is dependent on the bearing pressure which may vary due to load combinations.*
6. *Embedment necessary to minimize the effects of seasonal water content variations. For sloping ground, maintain depth below the lowest adjacent exterior grade within 5 horizontal feet of the structure.*
7. *Differential settlements are noted for equivalent-loaded foundations and bearing elevation as measured over a span of 50 feet.*

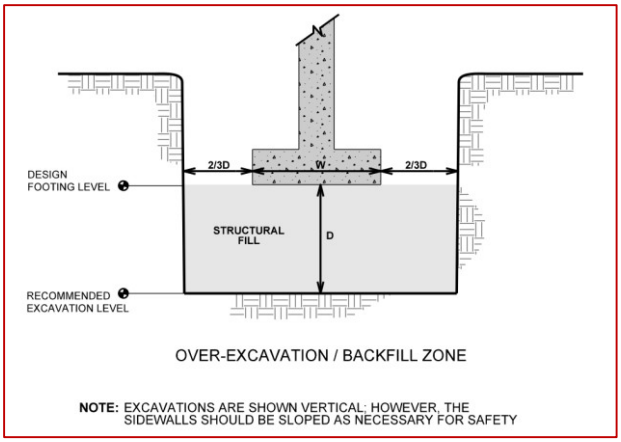
Foundation Construction Considerations

As noted in **Earthwork**, the footing excavations should be evaluated under the observation of the Geotechnical Engineer. The base of all foundation excavations should be free of water and loose soil, prior to placing concrete. Concrete should be placed soon after excavating to reduce bearing soil disturbance. Care should be taken to prevent wetting or drying of the bearing materials during construction. Excessively wet or dry material or any loose/disturbed material in the bottom of the footing excavations should be removed/reconditioned before foundation concrete is placed.

If unsuitable bearing soils are observed at the base of the planned footing excavation, the excavation should be extended deeper to suitable soils, and the footings could bear directly on these soils at the lower level or on lean concrete backfill placed in the excavations. The lean concrete replacement zone is illustrated on the sketch below.



Overexcavation for structural fill placement below footings should be conducted as shown below. The overexcavation should be backfilled up to the footing base elevation, with Structural Fill or crushed #57 stone placed, as recommended in the **Earthwork** section.


2/3D
W
2/3D
DESIGN
FOOTING LEVEL
STRUCTURAL
FILL
D
RECOMMENDED
EXCAVATION LEVEL
OVER-EXCAVATION / BACKFILL ZONE
NOTE: EXCAVATIONS ARE SHOWN VERTICAL; HOWEVER, THE
SIDEWALLS SHOULD BE SLOPED AS NECESSARY FOR SAFETY

Deep Foundations

Deep foundation recommendations are provided due to the following:

- Deep foundation recommendations will be required to resist lateral and uplift forces for the proposed communications tower.
- If seismic liquefaction cannot be accounted for in the structural design or the owner elects to not use geotechnical mitigation (discussed in **Seismicity**), deep foundation can be considered for the proposed operations center. We assume, based on the assumed risk category for the proposed operations center, that deep foundations may be required to mitigate static and seismic settlement.

Due to the assumed pile loads, we recommend deep foundations be embedded into the Cooper Marl Formation which was encountered 66 feet below existing grade during our exploration. Deep foundations will mitigate both excessive static settlement and the potential risk associated with liquefaction.

Deep Foundation Design Recommendations

We've provided recommendations for a deep foundation solution consisting of an 18-inch square driven pre-stressed concrete (PSC) pile and a 30-inch auger cast-in-place (ACIP) pile. The following figures present estimated allowable compressive and uplift capacities for the two pile sizes as a function of depth below existing grade and embedment into the Cooper Marl Formation (CMF), assuming the top of the CMF is 66 feet below existing grade. We recommend that the piles be embedded a minimum of 5 feet into the Cooper Marl Formation. Capacities for additional pile types and sizes can be provided on request.

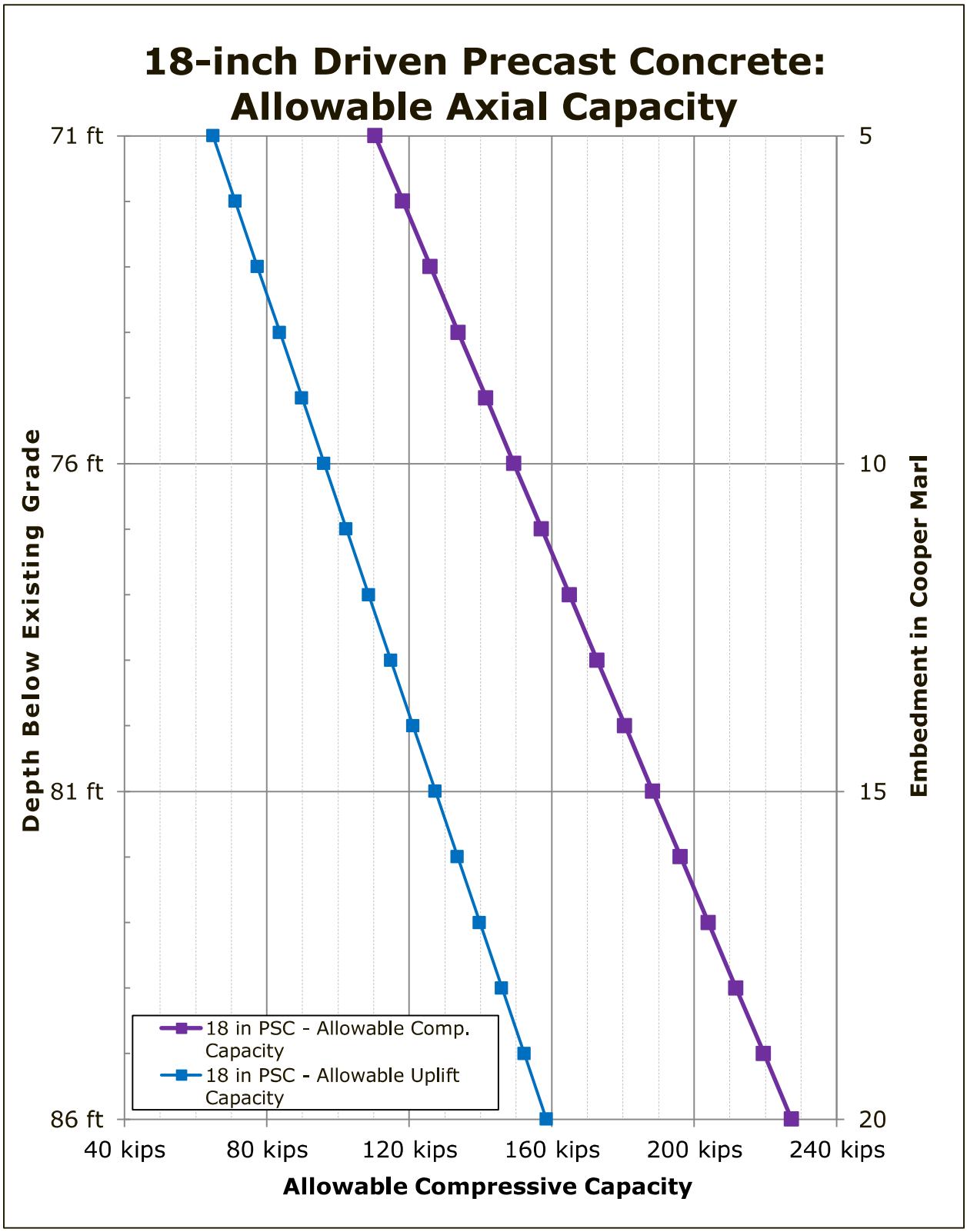


Figure 1: 18-inch PSC Allowable Capacities
F.O.S. of 2.0

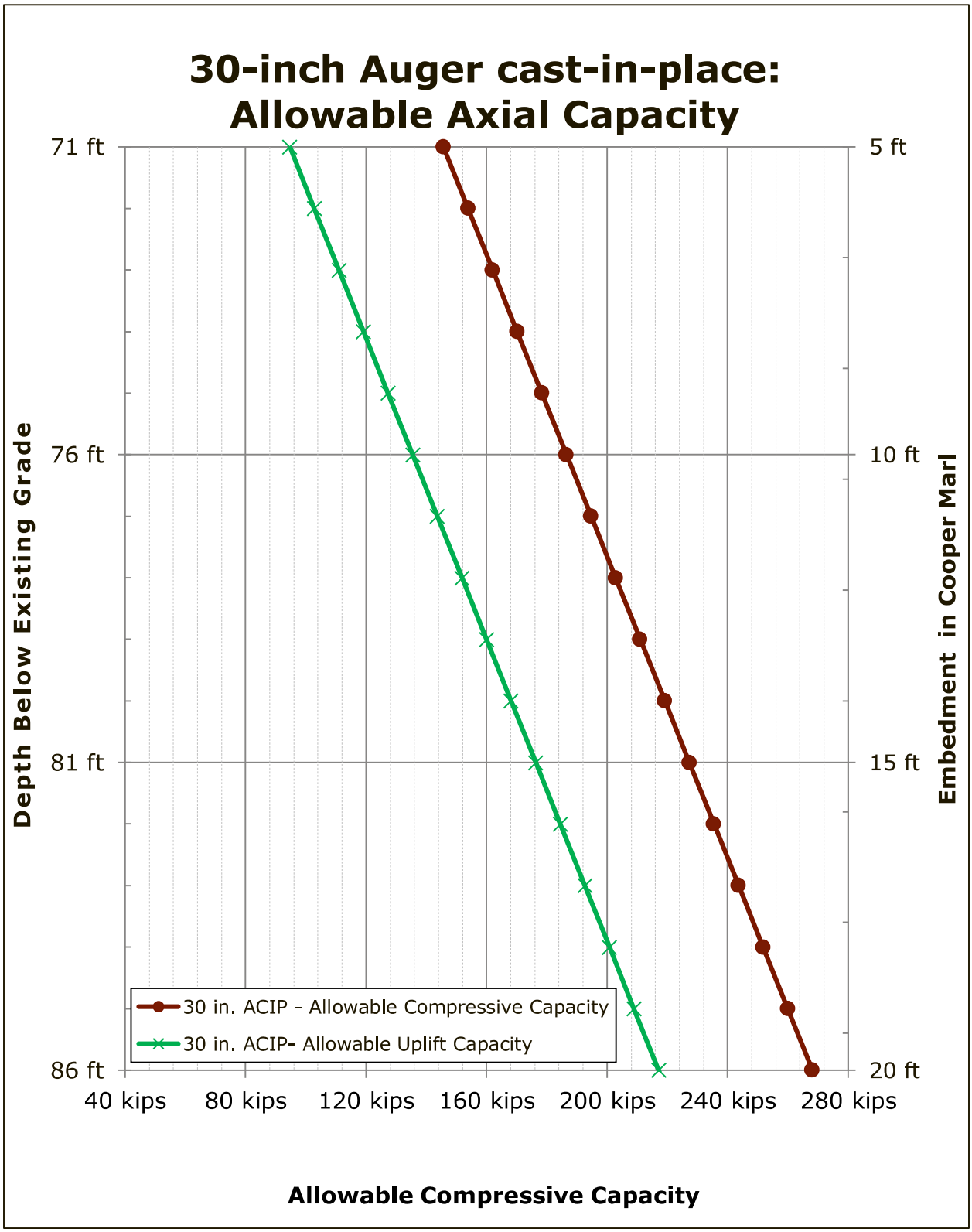


Figure 2: 30-inch PSC Allowable Capacities
F.O.S. of 2.5

The safety factors, noted above, were used to determine the allowable capacities of each foundation element above. This factor of safety assumes a pile load test program will be conducted to verify/modify the pile design. If no load test is to be performed, a larger factor of safety should be applied. Pile elements should be installed at a center-to-center spacing no closer than three times the pile diameter (3D) so that no reduction in axial resistance will be necessary. The structural engineer should verify that the piles can structurally tolerate the allowable geotechnical capacities determined in the above table. The designer should factor in final finished grades of the site when determining final pile lengths.

Driven Pile Installation

Upon selection of the pile size and the contractor's driving system, a Wave Equation Analysis of Piles (WEAP) of the hammer-pile-soil system should be conducted. The WEAP analysis will determine if the selected hammer has sufficient energy to install the selected pile size to the required length, if the driving stresses (both compressive and tensile) during installation are within acceptable limits and provide pile driving criteria. Hammer and/or pile sizes can be varied until an acceptable hammer-pile system is found. Upon request, Terracon can assist in evaluating the selected hammer and determining the pile driving criteria.

Driven Pile Quality Control

Load Test Program

The number of test piles installed to determine final production pile lengths will be based on the footprint and location of deep foundation elements needed to support the proposed structure. The geotechnical engineer or their representative should be present during the installation of the test piles. A hammer restrike will be necessary at a minimum of seven days after installation to determine final capacity. This wait period will account for the time-dependent pile capacity gain characteristics of the Cooper Marl, locally called pile "setup" or "freeze." The piles should be dynamically monitored during installation and hammer restrikes in accordance with ASTM D4945, "Standard Test Method for High-Strain Dynamic Testing of Piles." Test pile lengths should allow for a minimum of 5 feet of the pile to extend above the ground surface after installation to facilitate gage attachment for the dynamic load tests.

Pile Installation Observation

An engineering technician, supervised by a professional engineer licensed in the state of South Carolina, should monitor/document the production pile installations. A pile driving record should be kept for each individual production pile. The individual pile driving records should have the following minimum information:

- Pile size and type
- Installation notes (as required)

- Final pile embedment depth
- Pile tip and head elevation
- Pile installation date and time
- Pile blow counts per 1-foot interval
- Relevant Hammer Information
- Relevant Cushion Information

ACIP Construction Considerations

ACIP piles are constructed by advancing a hollow stem auger to the appropriate depth. Grout is then continuously pumped down through the annulus of the auger and forced into the surrounding soil mass as the auger is removed forming a continuous pile. After the auger has been removed, the steel reinforcement is typically lowered into the wet grout as necessary. However, depth and time constraints can be a limiting factor if cage reinforcement is required as concrete/grout near the base of the pile may set and be too dense to allow for complete installation of reinforcement. Additionally, auger cast piles can generate a significant quantity of spoil that will require disposal.

One disadvantage of ACIP piles is that grouting pressure during pile installation can cause cross-communication between freshly grouted piles and possible loss of pile integrity. In general, piles should not be installed within 12 feet from the nearest pile within 12 hours from its installation. However, the actual distance required to prevent cross-communication varies at each site. The contractor should develop a sequencing plan to allow concrete setup before installing adjacent piles. The test pile program should verify the recommended spacing and effect of sequencing.

The proper installation of ACIP piles is highly operator dependent and requires a greater than average dependence on quality workmanship. In addition, the successful completion of ACIP piles depends to a larger extent on the equipment and installation procedures. The auger should be withdrawn in a controlled manner and a sufficient head of grout should be maintained in the augers to prevent necking down of the fluid grout due to hydrostatic pressures. A representative of Terracon should observe installation of ACIP piles on a full-time basis.

The number of test piles installed to determine final production pile lengths will be based on the footprint and location of deep foundation elements needed to support the proposed structure. We recommend Thermal Integrity Profiling (TIP) be conducted on the test piles to verify their integrity and confirm the contractor's process is suitable. In addition, the geotechnical engineer or their representative should be present during the installation of the test piles. The test pile program and quality control are discussed further below.

The purpose of the test pile program is to verify the contractor's installation procedures, reinforcing steel placement procedures, and the estimated pile capacities. The test piles should undergo load testing to failure (or at least 3X the highest allowable design load) in accordance with ASTM D1143 (Standard Test Methods for Deep Foundations Under Static Axial Compressive Load). The auger cast pile contractor should submit a proposed

load test program to Terracon for review and comment. Integrity testing of at least 10 percent of production piles should be conducted over the course of pile installation by Thermal Integrity Testing (TIP). Additional test piles should be installed if significantly different load-deflection reactions are recorded during the test pile program. The test program should be performed under the direct supervision of a geotechnical engineer. The production piles should be installed using the procedures and criteria established from the test program.

The test and production pile installation should be monitored by a qualified inspector under the direct supervision of a geotechnical engineer registered in the state of South Carolina. An installation record should be kept for each individual pile. The field inspector at a minimum will monitor the following:

- Grout volume
- Sample grout for strength testing
- Final pile depth
- Time for installation
- Rate of withdraw
- Installation notes

Additionally, it may be prudent for the contractor's pile installation equipment be fitted with Automated Monitoring Equipment (AME). The AME should be operational prior to test pile installation and equipment calibration and provide installation data per unit length. A printed report of pile installation results should be supplied to the inspection personnel upon completion of each pile. AME at a minimum should monitor the following parameters during installation:

- Depth of bit/pile
- Angle of bit/pile
- Grout volume
- Grout pressure
- Volume change percent

Lateral Analyses of Deep Foundations

The behavior of deep foundation elements under lateral loads was analyzed using LPILE v2022. The lateral pile analysis was conducted for 18-inch PSC and 30-inch diameter ACIP piles considering the following design requirements and/or assumptions:

- Fixed-head and free-head conditions.
- Seismic loading conditions with a liquefied soil profile.
- Lateral deflection at top of pile 1 inch.
- Concrete compressive strength of 4,000 psi.
- Assumed individual pile loads as noted in **Project Description**.
- Assumed top of pile at surface of existing grade.
- Soil parameters based on correlations from collected geotechnical data.
- No group effects.

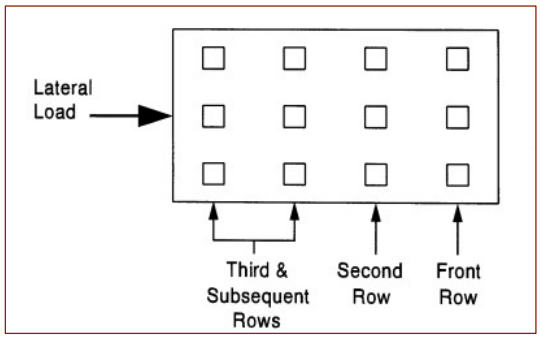
The results of the lateral analysis are presented in the following table. The graphical format of each analysis is supplied in the **Supporting Information** section of the report attachments. The raw lateral pile analysis results and/or data input files can be provided on request. It should be noted that the allowable lateral shear values are equal to ½ the shear load resulting from 1 inch of pile deflection.

LPILE Results for Single Pile

Pile Type	Axial Load [1] (kips)	Foundation Length (ft)[2]	Single Pile Displacement (in)[4]	Pile head Loading Condition	Maximum Shear (kips) / Depth [3]	Maximum Moment (kip-ft) / Depth [3]
18-inch Square PSC	150	77	1	Fixed	47.4 / 0 ft	303.2 / 0 ft
				Free	25.2 / 0 ft	119.5 / 9.2 ft
30-inch Diameter ACIP	200	78	1	Fixed	91.8 / 0 ft	784.0 / 0 ft
				Free	47.1 / 0 ft	288.3 / 13.3 ft

1. *Provided compressive capacities. The structural engineer should verify the structural capacity of the deep foundation element.*
2. *Top of pile modeled at existing grade.*
3. *Depth below top of pile at which maximum value occurs*
4. *Shear and moment reactions assume 1-inch pile top displacement at the ground surface. Seismic conditions assume liquefied strengths for sand-like materials.*

When piles are used in groups, the lateral capacities of the elements in the second, third, and subsequent rows of the group should be reduced as compared to the capacity of a single, independent element. Guidance for applying p-multiplier factors to the p values in the p-y curves for each row of pile foundations within a pile group are as follows:



- Front row: P_m = 0.8
- Second row: P_m = 0.4
- Third and subsequent row: P_m = 0.3

For the case of a single row of piles supporting a laterally loaded grade beam, group action for lateral resistance of piles would need to be considered when spacing is less than three pile diameters (measured center-to-center). However, spacing closer than 3D (where D is the diameter of the shaft) is not recommended, due to potential for the installation of a new shaft disturbing an adjacent installed shaft, likely resulting in axial capacity reduction.

It should be noted that the lateral analysis performed for this project is based on the behavior of a single element. However, dependent upon the final number of foundation elements that support the proposed structure, it may be prudent to consider conducting a group analysis of all the foundation elements proposed for this structure. The behavior of a single pile versus that of a group may differ. Although capacities of subsequent rows of piles are reduced due to shadowing, there are some pile group behavior characteristics that are not captured un the 2-dimensional single pile analysis, which can be accounted for in a 3-dimensional group analysis. The group analysis may be performed utilizing the software Group v7.0 (or similar) which is also developed and distributed by Ensoft. Terracon can provide a proposal detailing costs and an anticipated timeframe to perform this analysis, if deemed necessary by the project structural engineer. It has been our experience that such collaboration between the structural engineer and the geotechnical engineer typically saves 10X to 20X the cost of the analytical effort.

Floor Slabs

Design parameters for floor slabs assume the requirements for **Earthwork** have been followed. Specific attention should be given to positive drainage away from the structure and positive drainage of the aggregate base beneath the floor slab. Concrete floor slabs constructed on grade can be designed using the modulus of subgrade reaction presented in the following table.

Floor Slab Design Parameters

Item	Estimated Subgrade Modulus at Surface (pci)[1, 2]
Undisturbed Native Soils Compacted to 95%	200
Undisturbed Native Soils Compacted to 95% with 6 inches of GABC[3]	250
Undisturbed Native Soils Compacted to 95% with 12 inches of GABC[3]	300

1. *Modulus of subgrade reaction is an estimated value based upon our experience with the subgrade condition, the requirements noted in **Earthwork**, and the floor slab support as noted in this table. It is provided for point loads. For large area loads the modulus of subgrade reaction would be lower.*
2. *Pounds per square inch per inch.*
3. *Graded Aggregate Base Course – SCDOT GABC*

Floor slabs should be structurally independent of building footing or walls to reduce the possibility of floor slab cracking caused by differential movements between the slab and foundation.

The use of a vapor retarder should be considered beneath concrete slabs on grade covered with wood, tile, carpet, or other moisture sensitive or impervious coverings, when the project includes humidity-controlled areas, or when the slab will support equipment sensitive to moisture. When conditions warrant the use of a vapor retarder, the slab designer should refer to ACI 302 and/or ACI 360 for procedures and cautions regarding the use and placement of a vapor retarder.

Saw-cut contraction joints should be placed in the slab to help control the location and extent of cracking. For additional recommendations, refer to the ACI Design Manual. Joints or cracks should be sealed with a waterproof, non-extruding compressible compound specifically recommended for heavy duty concrete pavement and wet environments.

Where floor slabs are tied to perimeter walls or turn-down slabs to meet structural or other construction objectives, our experience indicates differential movement between

the walls and slabs will likely be observed in adjacent slab expansion joints or floor slab cracks beyond the length of the structural dowels. The Structural Engineer should account for potential differential settlement through use of sufficient control joints, appropriate reinforcing or other means.

Floor Slab Construction Considerations

On most project sites, the site grading is generally accomplished early in the construction phase. However, as construction proceeds, the subgrade may be disturbed due to utility excavations, construction traffic, desiccation, rainfall, etc. As a result, the floor slab subgrade may not be suitable for placement of subbase and concrete and corrective action may be required.

We recommend the area underlying the floor slab be rough graded and then proofrolled with a tandem axle dump truck prior to final grading and observed by geotechnical engineer. Areas where unsuitable conditions are located should be repaired by removing and replacing the affected material with properly compacted fill. All floor slab subgrade areas should be moisture conditioned and properly compacted to the recommendations in this report immediately prior to placement of the subbase and concrete. Any trenches should be backfilled with Controlled Fill as described in the Earthwork section in this report.

Finished subgrade, within and for at least 10 feet beyond the floor slab, should be protected from traffic, rutting, or other disturbance and maintained in a relatively moist condition until floor slabs are constructed. If the subgrade should become damaged or desiccated prior to construction of floor slabs, the affected material should be removed, and structural fill should be added to replace the resulting excavation. Final conditioning of the finished subgrade should be performed immediately prior to placement of the floor slab support course.

The Geotechnical Engineer should observe the condition of the floor slab subgrades immediately prior to placement of the floor slab support course, reinforcing steel, and concrete. Attention should be paid to high traffic areas that were rutted and disturbed earlier, and to areas where backfilled trenches are located.

Pavements

General Pavement Comments

Pavement designs are provided for the traffic conditions and pavement life conditions as noted in **Project Description** and in the following sections of this report. A critical aspect of pavement performance is site preparation. Pavement designs noted in this section must be applied to the site which has been prepared as recommended in the **Earthwork** section.

Pavement Design Parameters

A California Bearing Ratio (CBR) of 10 was used for the subgrade for the asphaltic concrete (AC) pavement designs. A modulus of subgrade reaction of 200 pci was used for the portland cement concrete (PCC) pavement designs. The value was empirically derived based upon our experience with the sandy subgrade soils and our expectation of the quality of the subgrade as prescribed by the **Site Preparation** conditions as outlined in **Earthwork**. A modulus of rupture of 550 psi was used in design for the concrete (based on correlations with a minimum 28-day compressive strength of 4,000 psi).

Pavement Section Thicknesses

The following table provides our opinion of minimum thickness for AC sections:

Asphaltic Concrete Design

Layer	Thickness (inches)
	Light Duty (Car Parking Areas)[1]
AC[2]	2.0
Aggregate Base[2]	6.0
Total Thickness	8.0

1. *See **Project Description** for more specifics regarding traffic assumptions.*
2. *All materials should meet the current South Carolina Department of Transportation (SCOT) Standard Specifications for Highway and Bridge Construction.*
   - *AC Surface – SCDOT Type C Surface Course*
   - *Graded Aggregate Base Course – SCDOT GABC*

The following table provides our estimated minimum thickness of PCC pavements.

Portland Cement Concrete Design

Layer	Thickness (inches)	
	Heavy Duty (Truck and Drive Areas)[1]	
PCC[2]	6.0	---
AC[2]	---	2.0
Aggregate Base[2]	4.0	8.0
Total Thickness	10.0	10.0

1. *See **Project Description** for more specifics regarding traffic assumptions.*
2. *All materials should meet the current South Carolina Department of Transportation (SCDOT) Standard Specifications for Highway and Bridge Construction.*
   - *Concrete Pavement – SCDOT Portland Cement Concrete*
   - *AC Surface – SCDOT Type C Surface Course*
   - *Graded Aggregate Base Course – SCDOT GABC*

Areas for parking of heavy vehicles, concentrated turn areas, and start/stop maneuvers could require thicker pavement sections. Edge restraints (i.e. concrete curbs or aggregate shoulders) should be planned along curves and areas of maneuvering vehicles.

Although not required for structural support, a minimum 4-inch thick base course layer is recommended to help reduce potential for slab curl, shrinkage cracking, and subgrade pumping through joints. Proper joint spacing will also be required to prevent excessive slab curling and shrinkage cracking. Joints should be sealed to prevent entry of foreign material and doweled where necessary for load transfer. PCC pavement details for joint spacing, joint reinforcement, and joint sealing should be prepared in accordance with ACI 330 and ACI 325.

Where practical, we recommend early-entry cutting of crack-control joints in PCC pavements. Cutting of the concrete in its "green" state typically reduces the potential for micro-cracking of the pavements prior to the crack control joints being formed, compared to cutting the joints after the concrete has fully set. Micro-cracking of pavements may lead to crack formation in locations other than the sawed joints, and/or reduction of fatigue life of the pavement.

Openings in pavements, such as decorative landscaped areas, are sources for water infiltration into surrounding pavement systems. Water can collect in the islands and migrate into the surrounding subgrade soils thereby degrading support of the pavement. Islands with raised concrete curbs, irrigated foliage, and low permeability near-surface soils are particular areas of concern. The civil design for the pavements with these

conditions should include features to restrict or collect and discharge excess water from the islands. Examples of features are edge drains connected to the stormwater collection system, longitudinal subdrains, or other suitable outlets and impermeable barriers preventing lateral migration of water such as a cutoff wall installed to a depth below the pavement structure.

Pavement Drainage

Pavements should be sloped to provide rapid drainage of surface water. Water allowed to pond on or adjacent to the pavements could saturate the subgrade and contribute to premature pavement deterioration. In addition, the pavement subgrade should be graded to provide positive drainage within the granular base section. Appropriate sub-drainage or connection to a suitable daylight outlet should be provided to remove water from the granular subbase.

Pavement Maintenance

The pavement sections represent minimum recommended thicknesses and, as such, periodic upkeep should be anticipated. Preventive maintenance should be planned and provided for through an on-going pavement management program. Maintenance activities are intended to slow the rate of pavement deterioration and to preserve the pavement investment. Pavement care consists of both localized (e.g., crack and joint sealing and patching) and global maintenance (e.g., surface sealing). Additional engineering consultation is recommended to determine the type and extent of a cost-effective program. Even with periodic maintenance, some movements and related cracking may still occur, and repairs may be required.

Pavement performance is affected by its surroundings. In addition to providing preventive maintenance, the civil engineer should consider the following recommendations in the design and layout of pavements:

- Final grade adjacent to paved areas should slope down from the edges at a minimum 2%.
- Subgrade and pavement surfaces should have a minimum 2% slope to promote proper surface drainage.
- Install pavement drainage systems surrounding areas anticipated for frequent wetting.
- Install joint sealant and seal cracks immediately.
- Seal all landscaped areas in or adjacent to pavements to reduce moisture migration to subgrade soils.
- Place compacted, low permeability backfill against the exterior side of curb and gutter.

- Place curb, gutter and/or sidewalk directly on clay subgrade soils rather than on unbound granular base course materials.

General Comments

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly effect excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety and cost estimating including excavation support and dewatering requirements/design are the responsibility of others. Construction and site development have the potential to affect adjacent properties. Such impacts can include damages due to vibration, modification of groundwater/surface water flow during construction, foundation movement due to undermining or subsidence from excavation, as well as noise or air quality concerns. Evaluation of these items on

nearby properties are commonly associated with contractor means and methods and are not addressed in this report. The owner and contractor should consider a preconstruction/precondition survey of surrounding development. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

Figures

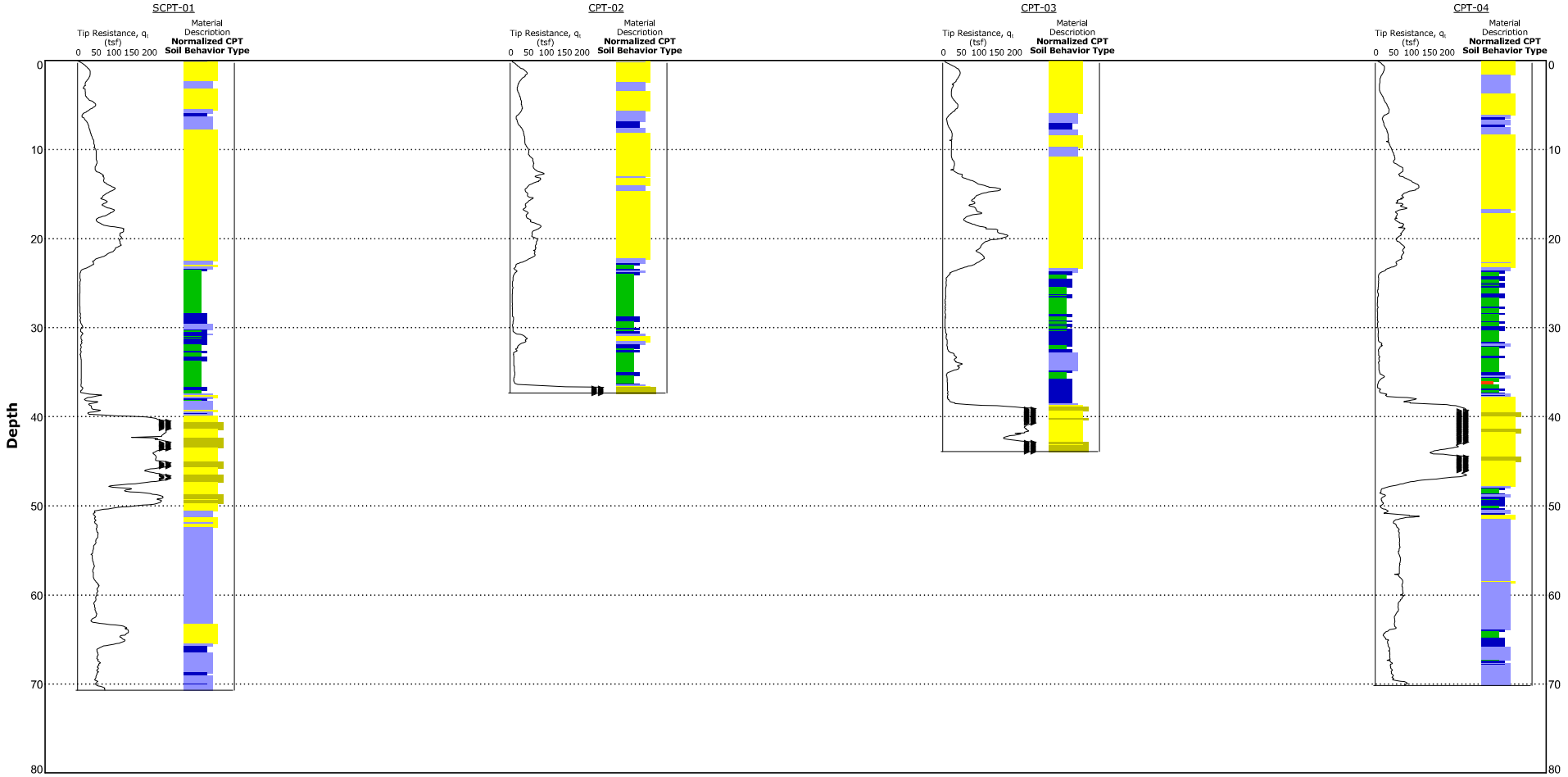
Contents:

CPT Subsurface Profile
CPT GeoModel
HAB GeoModel

Colleton County EOC
Mabel T Willis Blvd | Walterboro, SC
Terracon Project No. EN235216

Subsurface Profile

Terracon
1800 Reynolds Ave
North Charleston, SC

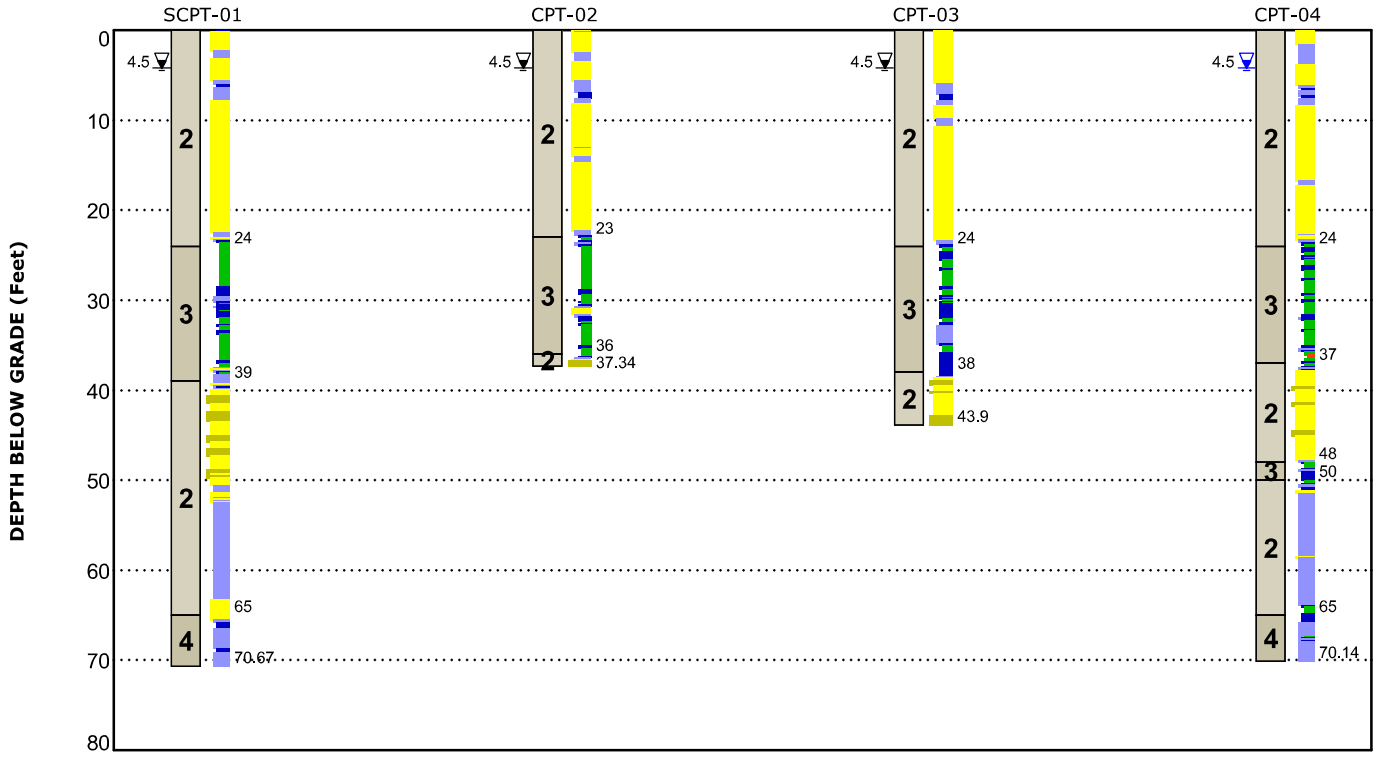


Notes	Water Level Observations	Explanation	CPT Soil Classification Graphic Color Code
See Exploration Plan for orientation of soil profile. See General Notes in Supporting Information for symbols and soil classifications. Soils profile provided for illustration purposes only. Soils between borings may differ AR - Auger Refusal BT - Boring Termination		SCPT-01 — Borehole Number Moisture Content — %w LL PL — Liquid and Plastic Limits Sampling (See General Notes) Borehole Lithology AR / BT — Borehole Termination Type	1 Sensitive, fine grained 2 Organic soils - clay 3 Clay - silty clay to clay 4 Silt mixtures - clayey silt to silty clay 5 Sand mixtures - silty sand to sandy silt 6 Sands - clean sand to silty sand 7 Gravelly sand to dense sand 8 Very stiff sand to clayey sand 9 Very stiff fine grained

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CPT GeoModel



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description	Legend
1	**Topsoil**	2 to 6 inches of topsoil	
2	**Sand Mixtures**	Loose to very dense sand mixtures	
3	**Silt and Clay Mixtures**	Soft to medium stiff silt and clay mixtures	
4	**Cooper Marl Formation**	Stiff to very stiff silty sand to sandy silt (Cooper Marl Formation)	

Soil Behavior Type (SBT)

- **7 Gravelly sand to dense sand**
- **8 Very stiff sand to clayey sand**
- **3 Clay - silty clay to clay**
- **1 Sensitive, fine grained**
- **2 Organic soils - clay**
- **6 Sands - clean sand to silty sand**
- **4 Silt mixtures - clayey silt to silty clay**
- **5 Sand mixtures - silty sand to sandy silt**
- **9 Very stiff fine grained**

CPT Assumed Water Depth
CPT Water Depth
First Water Observation

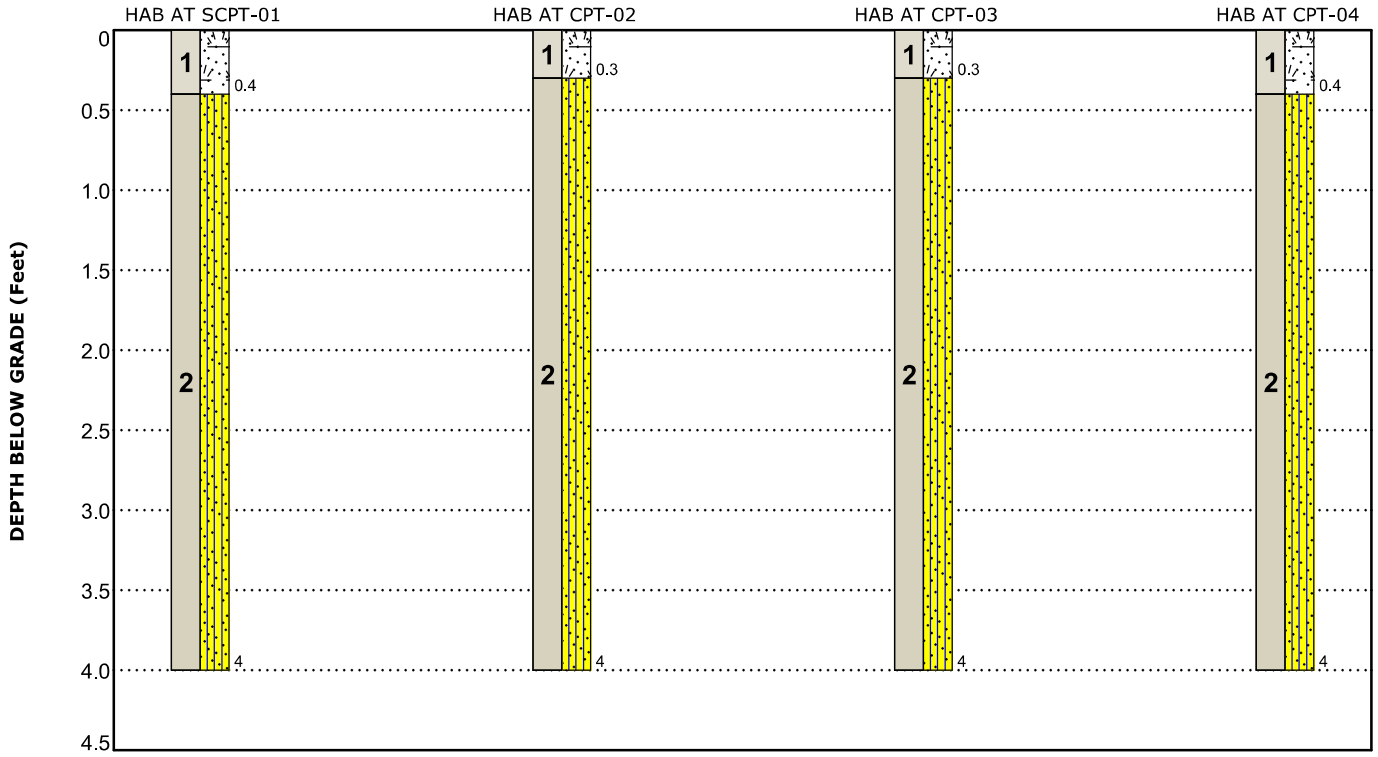
Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time.
Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project.
Numbers adjacent to soil column indicate depth below ground surface.

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HAB GeoModel



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Legend

Topsoil
Silty Sand

▽ First Water Observation

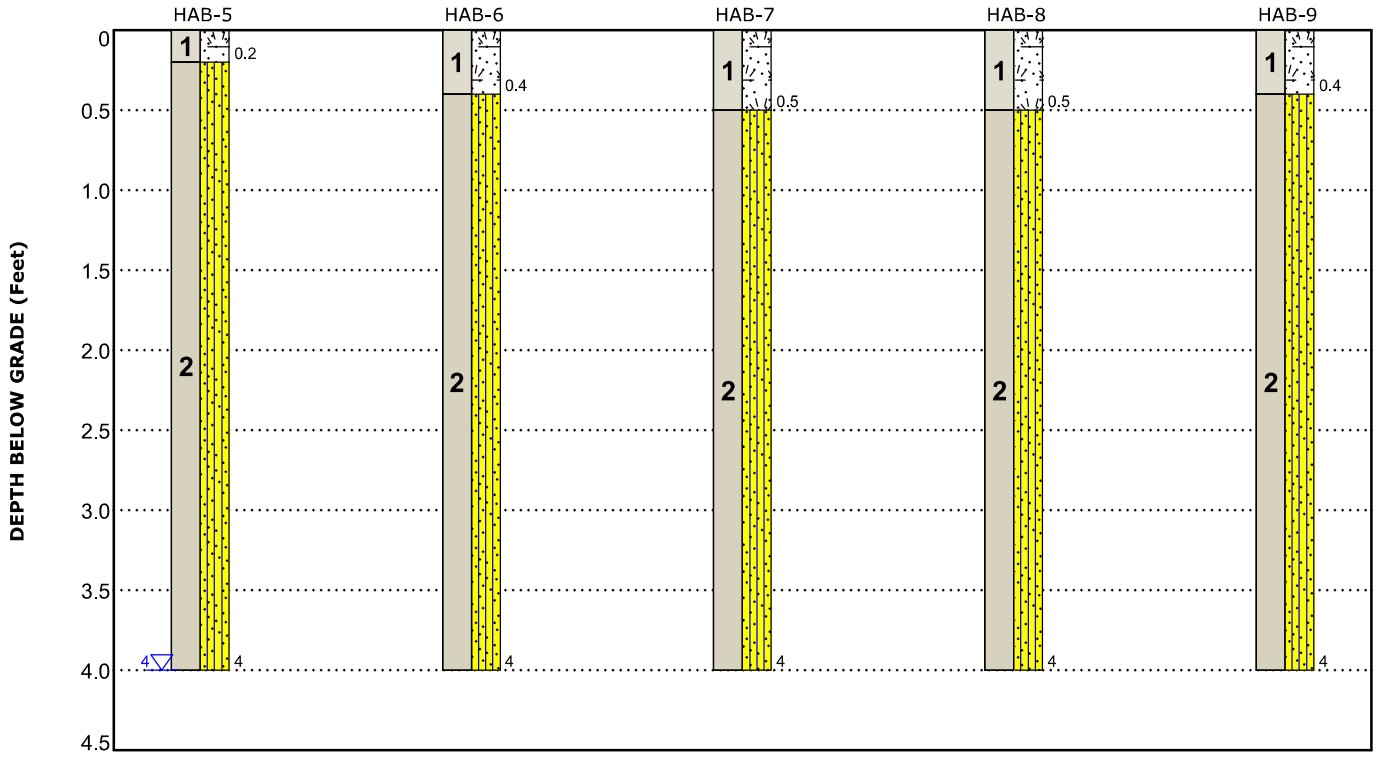
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Legend

Topsoil
Silty Sand

▽ First Water Observation

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Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

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Numbers adjacent to soil column indicate depth below ground surface.

Attachments

Exploration and Testing Procedures

Field Exploration

Type of Test	Number of Tests	Approximate Test Depth[1]	Location
Seismic Cone Penetration Test (SCPT)	1	71 feet	Proposed Building
Cone Penetration Test (CPT)	2	37 to 44 feet	Proposed Building
	1	70 feet	Proposed communications tower
Hand Auger Boring (HAB)	4	4 feet	Adjacent to each CPT
	5	4 feet	Proposed drive areas

1. *Below the existing ground surface*

Boring Layout and Elevations: Terracon personnel provided the boring layout using handheld GPS equipment (estimated horizontal accuracy of about ±10 feet) and referencing existing site features. Approximate ground surface elevations were not obtained. If elevations and a more precise boring layout are desired, we recommend borings be surveyed.

Subsurface Exploration Procedures: All exploration is compliant with ASTM D3740, "*Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction*".

All Cone Penetration Testing was conducted in general accordance with the following procedure:

- ASTM D5778, "*Standard Test Method for Electronic Friction Cone and Piezocone Penetration Testing of Soils*"

These methods describe the procedure for collection on cone tip resistance (q_t), sleeve friction (f_s), and porewater pressure (u_2) for use in determination of site stratigraphy and engineering recommendations. These properties can be used to estimate soil behavior continuously throughout the depth of the profile.

Additional description of symbols and abbreviations can be found in CPT General Notes in **Supporting Information**.

All Hand Auger Borings a were conducted in general accordance with:

- ASTM D1452, *"Standard Practice for Soil Exploration and Sampling by Auger Borings"*

Site Location and Exploration Plans

Contents:

Site Location Plan
Exploration Plan

Note: All attachments are one page unless noted above.

Site Location



DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan

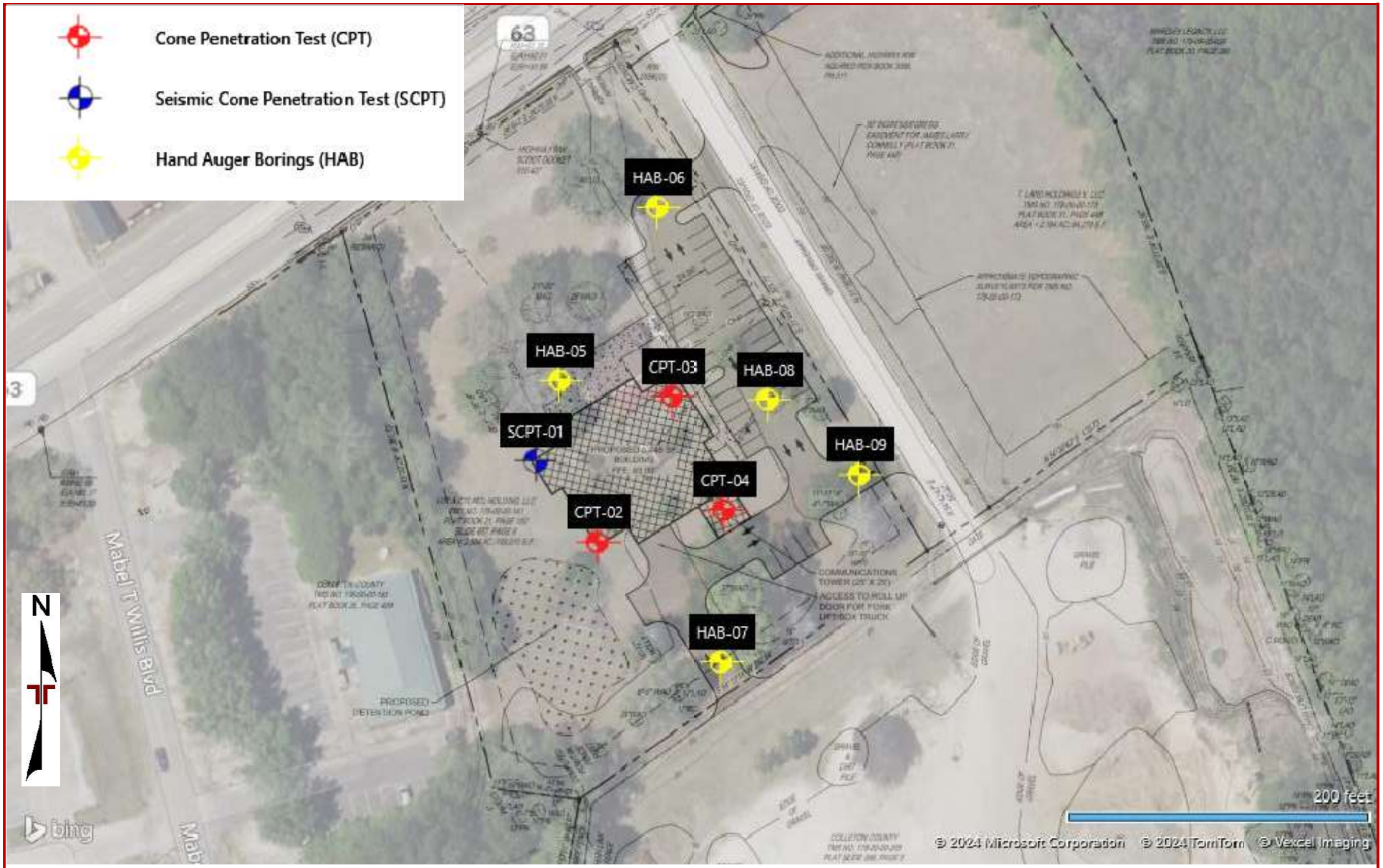


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration and Laboratory Results

Contents:

CPT Sounding Logs (4 Pages)
HAB Logs (9 Pages)

Note: All attachments are one page unless noted above.

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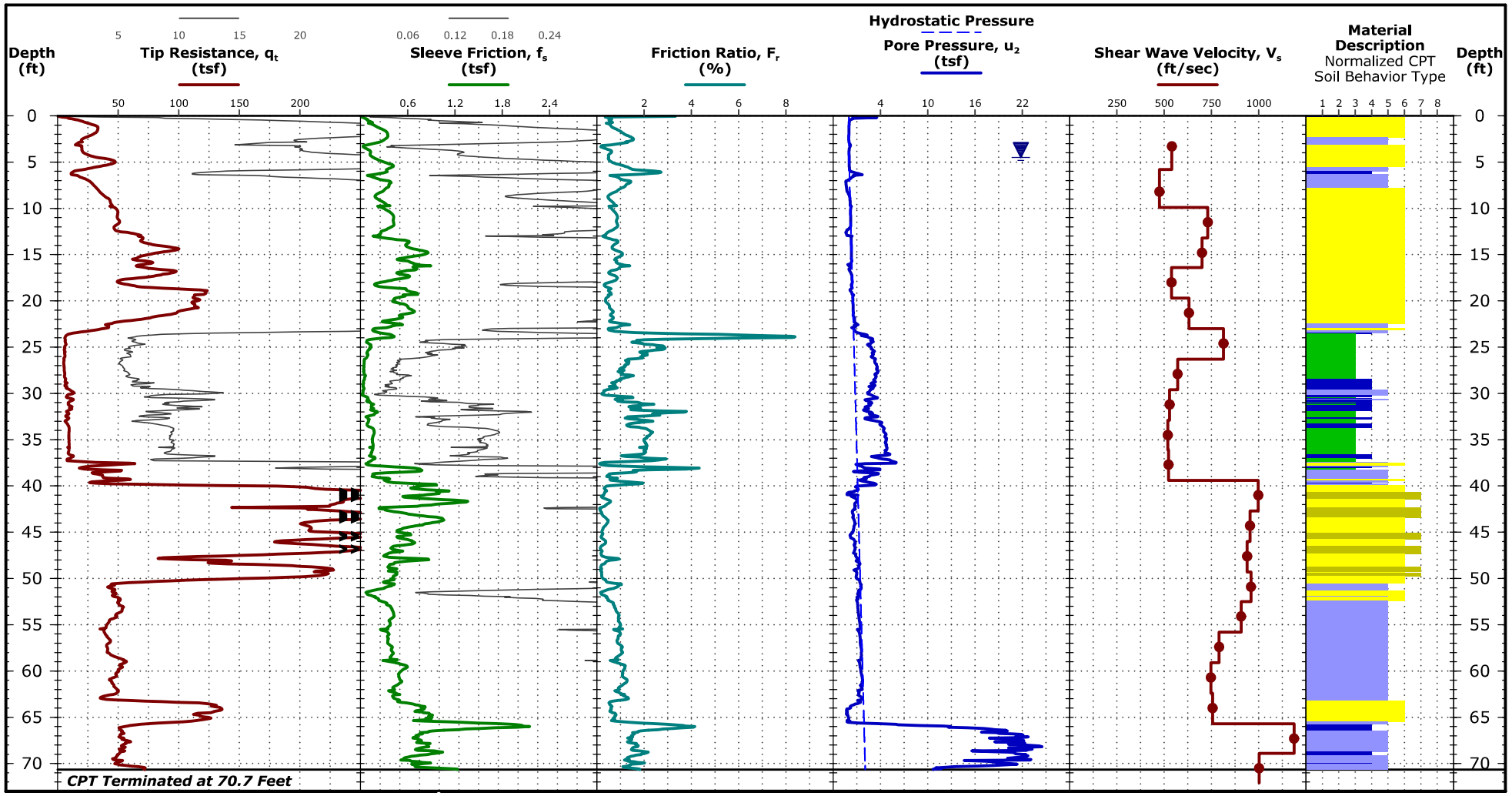
CPT Sounding ID SCPT-01

Latitude: 32.8847° Longitude: -80.6969°

Terracon
1800 Reynolds Ave
North Charleston, SC

CPT Started: 9/6/2024
CPT Completed: 9/6/2024

Elevation Reference: Elevations not obtained



See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data, if any.

See Supporting Information for explanation of symbols and abbreviations.

Notes

Test Location: See Exploration Plan

CPT Equipment

CPT Rig: Geoprobe

Operator: LB/AJ

CPT sensor calibration reports available upon request

Probe No. 5890 with net area ratio of .84

Manufactured by Geoprobe Systems- Calibrated 4/4/2024

Tip and sleeve areas of 10 cm^2 and 150 cm^2

Water Level Observation

4.5 ft estimated water depth

(used in normalizations and correlations)

Normalized Soil Behavior Type
(Robertson 1990)

1 Sensitive, fine grained
2 Organic soils - clay
3 Clay - silty clay to clay
4 Silt mixtures - clayey silt to silty clay
5 Sand mixtures - silty sand to sandy silt
6 Sands - clean sand to silty sand
7 Gravelly sand to dense sand
8 Very stiff sand to clayey sand
9 Very stiff fine grained

Colleton County EOC
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Terracon Project No. EN235216

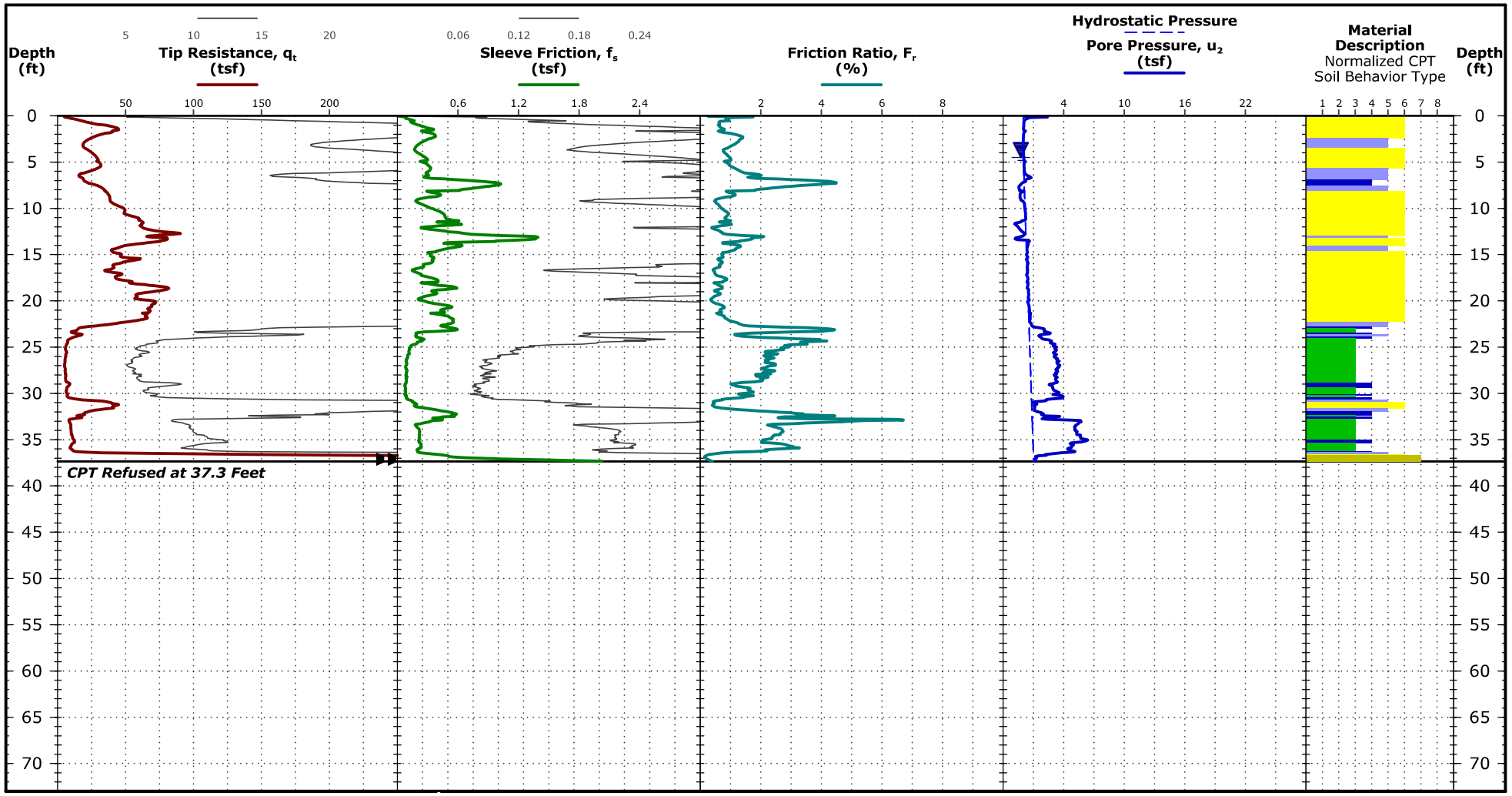
CPT Sounding ID CPT-02

Latitude: 32.8846° Longitude: -80.6968°

Elevation Reference: Elevations not obtained

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1800 Reynolds Ave
North Charleston, SC

CPT Started: 9/6/2024
CPT Completed: 9/6/2024



See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data, if any.

See Supporting Information for explanation of symbols and abbreviations.

Notes

Test Location: See Exploration Plan

CPT Equipment

CPT Rig: Geoprobe

Operator: LB/AJ

CPT sensor calibration reports available upon request

Probe No. 5890 with net area ratio of .84

Manufactured by Geoprobe Systems- Calibrated 4/4/2024

Tip and sleeve areas of 10 cm^2 and 150 cm^2

Water Level Observation

4.5 ft estimated water depth

(used in normalizations and correlations)

Normalized Soil Behavior Type
(Robertson 1990)

1 Sensitive, fine grained
2 Organic soils - clay
3 Clay - silty clay to clay
4 Silt mixtures - clayey silt to silty clay
5 Sand mixtures - silty sand to sandy silt
6 Sands - clean sand to silty sand
7 Gravelly sand to dense sand
8 Very stiff sand to clayey sand
9 Very stiff fine grained

Colleton County EOC
Mabel T Willis Blvd | Walterboro, SC
Terracon Project No. EN235216

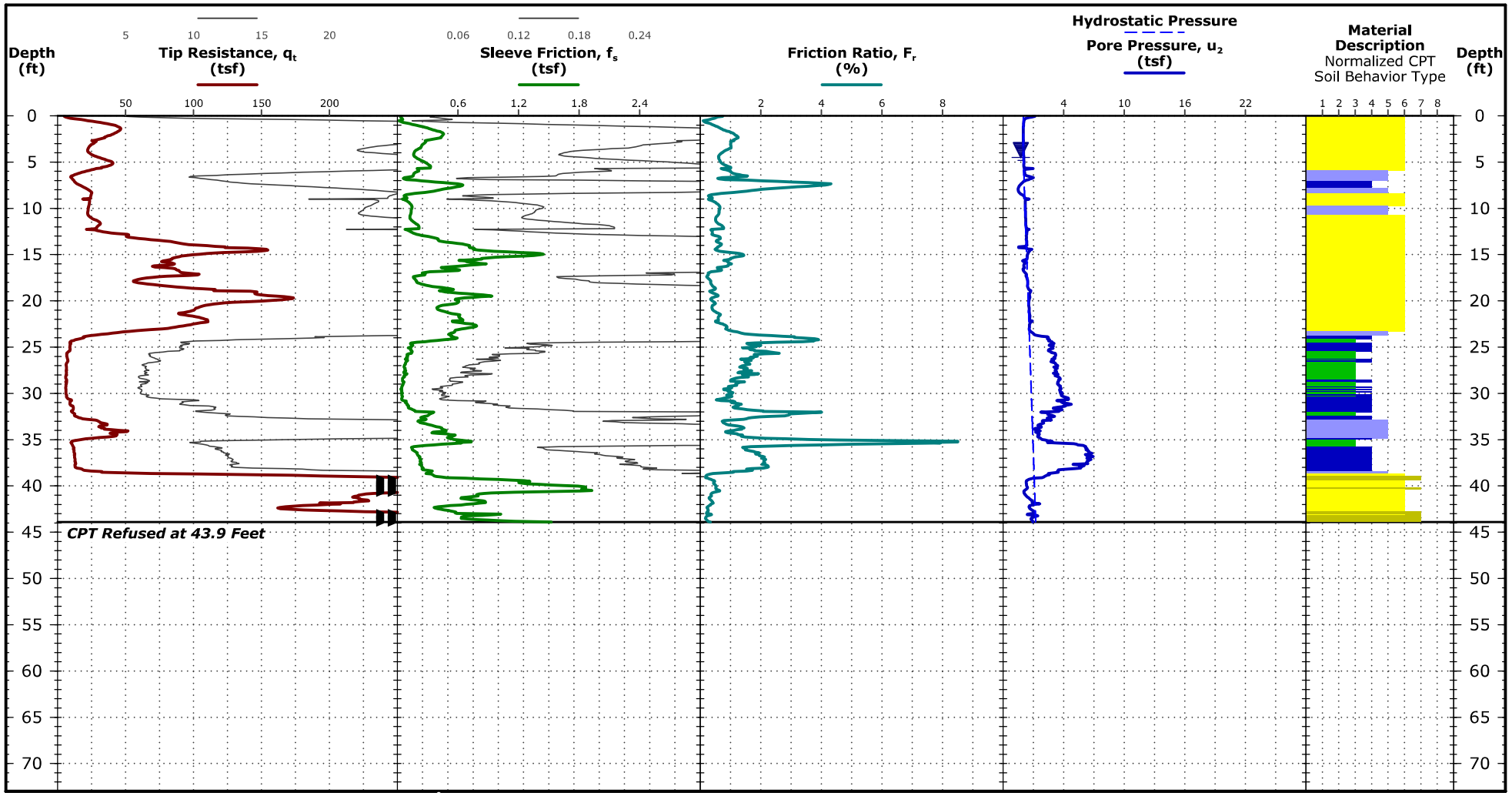
CPT Sounding ID CPT-03

Latitude: 32.8848° Longitude: -80.6966°

Elevation Reference: Elevations not obtained

Terracon
1800 Reynolds Ave
North Charleston, SC

CPT Started: 9/6/2024
CPT Completed: 9/6/2024



See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data, if any.

See Supporting Information for explanation of symbols and abbreviations.

Notes

Test Location: See Exploration Plan

CPT Equipment

CPT Rig: Geoprobe

Operator: LB/AJ

CPT sensor calibration reports available upon request

Probe No. 5890 with net area ratio of .84

Manufactured by Geoprobe Systems- Calibrated 4/4/2024

Tip and sleeve areas of 10 cm^2 and 150 cm^2

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4.5 ft estimated water depth

(used in normalizations and correlations)

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7 Gravelly sand to dense sand
8 Very stiff sand to clayey sand
9 Very stiff fine grained

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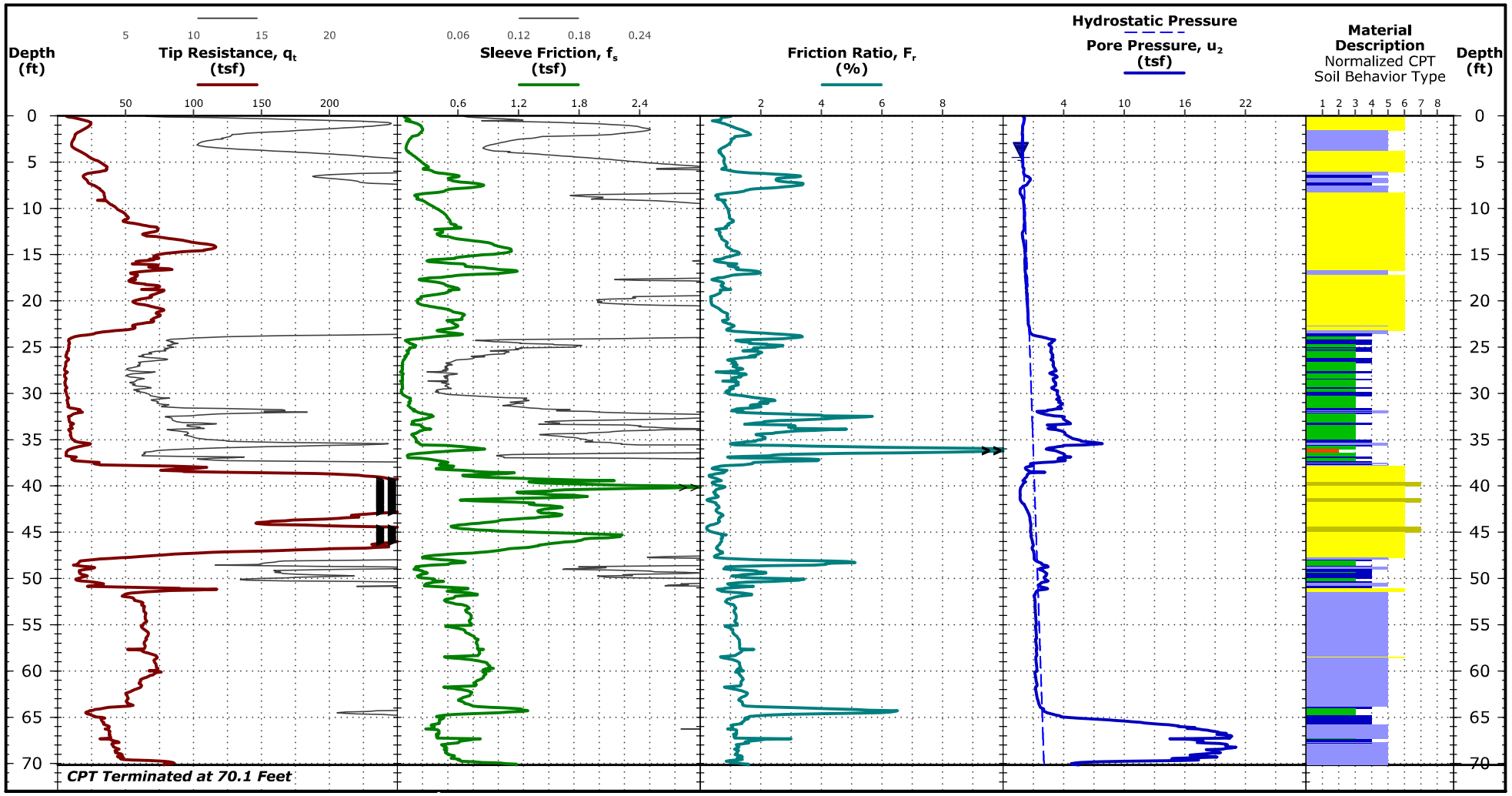
CPT Sounding ID CPT-04

Latitude: 32.8846° Longitude: -80.6965°

Terracon
1800 Reynolds Ave
North Charleston, SC

CPT Started: 9/6/2024
CPT Completed: 9/6/2024

Elevation Reference: Elevations not obtained



See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data, if any.

See Supporting Information for explanation of symbols and abbreviations.

Notes

Test Location: See Exploration Plan

CPT Equipment

CPT Rig: Geoprobe

Operator: LB/AJ

CPT sensor calibration reports available upon request

Probe No. 5890 with net area ratio of .84

Manufactured by Geoprobe Systems- Calibrated 4/4/2024

Tip and sleeve areas of 10 cm^2 and 150 cm^2

Water Level Observation

4.5 ft measured water depth

(used in normalizations and correlations)

Normalized Soil Behavior Type
(Robertson 1990)

1 Sensitive, fine grained
2 Organic soils - clay
3 Clay - silty clay to clay
4 Silt mixtures - clayey silt to silty clay
5 Sand mixtures - silty sand to sandy silt
6 Sands - clean sand to silty sand
7 Gravelly sand to dense sand
8 Very stiff sand to clayey sand
9 Very stiff fine grained

Terracon
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Boring Log No. HAB AT SCPT-01

Location: See Exploration Plan

Latitude: 32.8847° Longitude: -80.6969°

Model Layer	Graphic Log	Depth (Ft.)	Description	Depth (Ft.)	Water Level Observations	Sample Type
1		0.4	**TOPSOIL**, 5 inches			
2		4.0	**SILTY SAND (SM)**, light brown	1, 2, 3, 4		
			Boring Terminated at 4 Feet			

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations not obtained

Water Level Observations
Groundwater not encountered

Drill Rig
Hand Auger

Hammer Type
NA

Driller
LB/AJ

Notes

Advancement Method
Auger

Logged by

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Boring Started
09-06-2024

Boring Completed
09-06-2024

Colleton County EOC
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Terracon Project No. EN235216

Terracon
1800 Reynolds Ave
North Charleston, SC

Boring Log No. HAB AT CPT-02

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 32.8846° Longitude: -80.6968° Depth (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type
1		**TOPSOIL**, 4 inches 0.3			
2		**SILTY SAND (SM)**, light brown 4.0	1 2 3 4		
		Boring Terminated at 4 Feet			

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.
Elevation Reference: Elevations not obtained

Water Level Observations
Groundwater not encountered

Drill Rig
Hand Auger

Hammer Type
NA

Driller
LB/AJ

Notes

Advancement Method
Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Logged by

Boring Started
09-06-2024

Boring Completed
09-06-2024

Colleton County EOC
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Terracon Project No. EN235216

Terracon
1800 Reynolds Ave
North Charleston, SC

Boring Log No. HAB AT CPT-03

Location: See Exploration Plan

Latitude: 32.8848° Longitude: -80.6966°

Model Layer	Graphic Log	Depth (Ft.)		Depth (Ft.)	Water Level Observations	Sample Type
1		0.0	**TOPSOIL**, 2 inches			
		0.3				
2			**SILTY SAND (SM)**, brown	1		
			light brown	2		
				3		
		4.0		4		
			Boring Terminated at 4 Feet			

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations not obtained

Water Level Observations
Groundwater not encountered

Drill Rig
Hand Auger

Hammer Type
NA

Driller
LB/AJ

Logged by

Notes

Advancement Method
Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Boring Started
09-06-2024

Boring Completed
09-06-2024

Colleton County EOC
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Terracon Project No. EN235216

Terracon
1800 Reynolds Ave
North Charleston, SC

Boring Log No. HAB AT CPT-04

Location: See Exploration Plan

Latitude: 32.8846° Longitude: -80.6965°

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type
1		**TOPSOIL**, 4 inches 0.4		
2		**SILTY SAND (SM)**, brown light brown 4.0		
		Boring Terminated at 4 Feet		

Depth (Ft.): 1, 2, 3, 4

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations not obtained

Water Level Observations
Groundwater not encountered

Drill Rig
Hand Auger

Hammer Type
NA

Driller
LB/AJ

Logged by

Notes

Advancement Method
Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Boring Started
09-06-2024

Boring Completed
09-06-2024

Colleton County EOC
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Terracon Project No. EN235216

Terracon
1800 Reynolds Ave
North Charleston, SC

Boring Log No. HAB-5

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 32.8848° Longitude: -80.6969° Depth (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type
1		**TOPSOIL**, 2 inches 0.2			
2		**SILTY SAND (SM)**, light brown 4.0	1 2 3 4	▽	
		Boring Terminated at 4 Feet			

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations not obtained

Water Level Observations
▽ Groundwater encountered 4 feet below grade at the completion of drilling

Drill Rig
Hand Auger

Hammer Type
NA

Driller
LB/AJ

Logged by

Boring Started
09-06-2024

Boring Completed
09-06-2024

Notes

Advancement Method
Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Colleton County EOC
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Terracon Project No. EN235216

Terracon
1800 Reynolds Ave
North Charleston, SC

Boring Log No. HAB-6

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 32.8852° Longitude: -80.6966° Depth (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type
1		**TOPSOIL**, 5 inches 0.4			
2		**SILTY SAND (SM)**, light brown	1 2 3		
		4.0 ***Boring Terminated at 4 Feet***	4		

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.
Elevation Reference: Elevations not obtained

Water Level Observations
Groundwater not encountered

Drill Rig
Hand Auger

Hammer Type
NA

Driller
LB/AJ

Notes

Advancement Method
Auger

Logged by

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Boring Started
09-06-2024

Boring Completed
09-06-2024

Colleton County EOC
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Terracon Project No. EN235216

Terracon
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Boring Log No. HAB-7

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 32.8843° Longitude: -80.6965° Depth (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type
1		**TOPSOIL**, 6 inches			
		0.5			
2		**SILTY SAND (SM)**, light brown	1 2 3		
		4.0	4		
		Boring Terminated at 4 Feet			

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations not obtained

Water Level Observations
Groundwater not encountered

Drill Rig
Hand Auger

Hammer Type
NA

Driller
LB/AJ

Notes

Advancement Method
Auger

Logged by

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Boring Started
09-06-2024

Boring Completed
09-06-2024

Colleton County EOC
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Terracon Project No. EN235216

Terracon
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North Charleston, SC

Boring Log No. HAB-8

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 32.8848° Longitude: -80.6964° Depth (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type
1		**TOPSOIL**, 6 inches 0.5			
2		**SILTY SAND (SM)**, light brown 4.0	1 2 3 4		
		Boring Terminated at 4 Feet			

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.
Elevation Reference: Elevations not obtained

Water Level Observations
Groundwater not encountered

Drill Rig
Hand Auger

Hammer Type
NA

Driller
LB/AJ

Notes

Advancement Method
Auger

Logged by

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Boring Started
09-06-2024

Boring Completed
09-06-2024

Colleton County EOC
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Terracon Project No. EN235216

Terracon
1800 Reynolds Ave
North Charleston, SC

Boring Log No. HAB-9

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 32.8847° Longitude: -80.6962° Depth (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type
1		**TOPSOIL**, 5 inches 0.4			
2		**SILTY SAND (SM)**, light brown 4.0	1 2 3 4		
		Boring Terminated at 4 Feet			

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.
Elevation Reference: Elevations not obtained

Water Level Observations
Groundwater not encountered

Drill Rig
Hand Auger

Hammer Type
NA

Driller
LB/AJ

Notes

Advancement Method
Auger

Logged by

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Boring Started
09-06-2024

Boring Completed
09-06-2024

Supporting Information

Contents:

CPT General Notes
General Notes
Unified Soil Classification System
LPILE Output Graphs (2 Pages)

Note: All attachments are one page unless noted above.

CPT GENERAL NOTES

DESCRIPTION OF MEASUREMENTS AND CALIBRATIONS

To be reported per ASTM D5778:

Uncorrected Tip Resistance, q_c
Measured force acting on the cone divided by the cone's projected area

Corrected Tip Resistance, q_t
Cone resistance corrected for porewater and net area ratio effects
$q_t = q_c + u_2(1 - a)$

Where a is the net area ratio, a lab calibration of the cone typically between 0.70 and 0.85

Pore Pressure, u
Pore pressure measured during penetration
u_1 - sensor on the face of the cone
u_2 - sensor on the shoulder (more common)

Sleeve Friction, f_s
Frictional force acting on the sleeve divided by its surface area

Normalized Friction Ratio, F_r
The ratio as a percentage of f_s to q_t, accounting for overburden pressure

To be reported per ASTM D7400, if collected:

Shear Wave Velocity, V_s
Measured in a Seismic CPT and provides direct measure of soil stiffness

DESCRIPTION OF GEOTECHNICAL CORRELATIONS

Normalized Tip Resistance, Q_{tn}
$Q_{tn} = ((q_t - \sigma_{v0})/P_a)(P_a/\sigma'_{v0})^n$
$n = 0.381(I_c) + 0.05(\sigma'_{v0}/P_a) - 0.15$

Over Consolidation Ratio, OCR
$OCR\ (1) = 0.25(Q_{tn})^{1.25}$
$OCR\ (2) = 0.33(Q_{tn})$

Undrained Shear Strength, S_u
$S_u = Q_{tn} \times \sigma'_{v0}/N_{kt}$
N_{kt} is a soil-specific factor (shown on S_u plot)

Sensitivity, S_t
$S_t = (q_t - \sigma_{v0}/N_{kt}) \times (1/f_s)$

Effective Friction Angle, ϕ'
$\phi'\ (1) = \tan^{-1}(0.373[\log(q_t/\sigma'_{v0}) + 0.29])$
$\phi'\ (2) = 17.6 + 11[\log(Q_{tn})]$

Unit Weight, γ
$\gamma = (0.27[\log(F_r)]+0.36[\log(q_t/atm)]+1.236) \times \gamma_{water}$
σ_{v0} is taken as the incremental sum of the unit weights

Small Strain Shear Modulus, G_0
$G_0\ (1) = \rho V_s^2$
$G_0\ (2) = 0.015 \times 10^{(0.55Ic + 1.68)}(q_t - \sigma_{v0})$

Soil Behavior Type Index, I_c
$I_c = [(3.47 - \log(Q_{tn}))^2 + (\log(F_r) + 1.22)^2]^{0.5}$

SPT N_{60}
$N_{60} = (q_t/atm) / 10^{(1.1268 - 0.2817Ic)}$

Elastic Modulus, E_s (assumes $q/q_{ultimate} \sim 0.3$, i.e. FS = 3)
$E_s\ (1) = 2.6\psi G_0$ where $\psi = 0.56 - 0.33\log Q_{tn,clean\ sand}$
$E_s\ (2) = G_0$
$E_s\ (3) = 0.015 \times 10^{(0.55Ic + 1.68)}(q_t - \sigma_{v0})$
$E_s\ (4) = 2.5q_t$

Constrained Modulus, M
$M = \alpha_M(q_t - \sigma_{v0})$
For $I_c > 2.2$ (fine-grained soils)
$\alpha_M = Q_{tn}$ with maximum of 14
For $I_c < 2.2$ (coarse-grained soils)
$\alpha_M = 0.0188 \times 10^{(0.55Ic + 1.68)}$

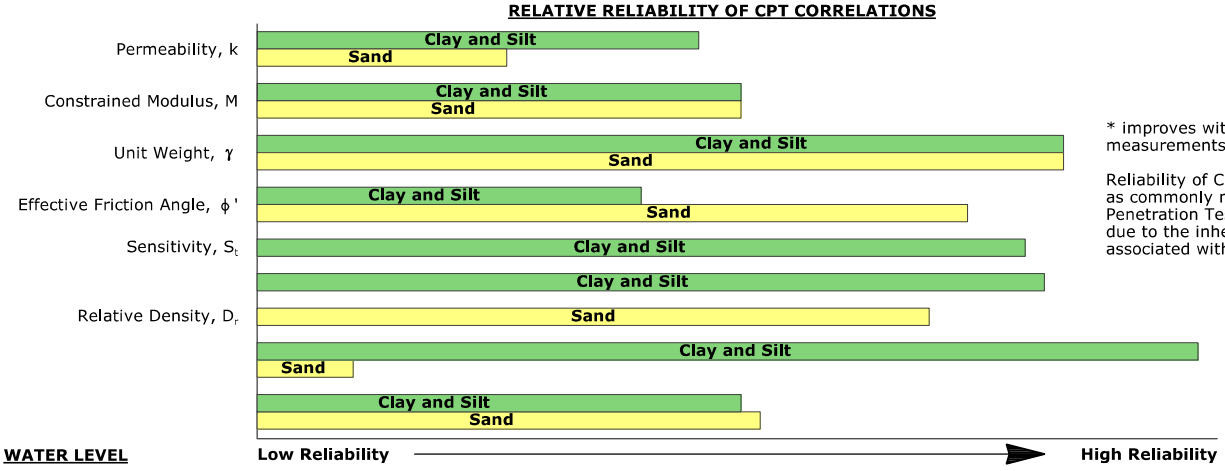
Hydraulic Conductivity, k
For $1.0 < I_c < 3.27$ $k = 10^{(0.952 - 3.04Ic)}$
For $3.27 < I_c < 4.0$ $k = 10^{(-4.52 - 1.37Ic)}$

Relative Density, D_r
$D_r = (Q_{tn} / 350)^{0.5} \times 100$

REPORTED PARAMETERS

CPT logs as provided, at a minimum, report the data as required by ASTM D5778 and ASTM D7400 (if applicable). This minimum data include q_t, f_s, and u. Other correlated parameters may also be provided. These other correlated parameters are interpretations of the measured data based upon published and reliable references, but they do not necessarily represent the actual values that would be derived from direct testing to determine the various parameters. To this end, more than one correlation to a given parameter may be provided. The following chart illustrates estimates of reliability associated with correlated parameters based upon the literature referenced below.

RELATIVE RELIABILITY OF CPT CORRELATIONS



* improves with seismic V_s measurements

Reliability of CPT-predicted N_{60} values as commonly measured by the Standard Penetration Test (SPT) is not provided due to the inherent inaccuracy associated with the SPT test procedure.

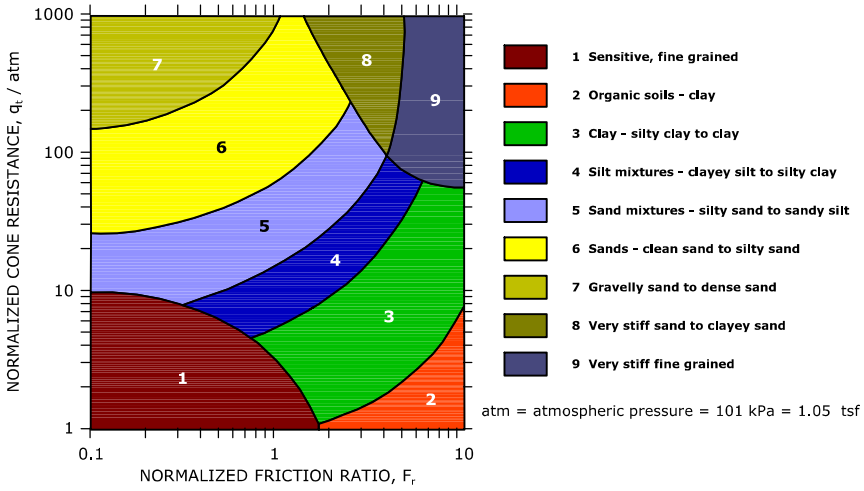
WATER LEVEL

The groundwater level at the CPT location is used to normalize the measurements for vertical overburden pressures and as a result influences the normalized soil behavior type classification and correlated soil parameters. The water level may either be "measured" or "estimated:"
Measured - Depth to water directly measured in the field
Estimated - Depth to water interpolated by the practitioner using pore pressure measurements in coarse grained soils and known site conditions
While groundwater levels displayed as "measured" more accurately represent site conditions at the time of testing than those "estimated," in either case the groundwater should be further defined prior to construction as groundwater level variations will occur over time.

CONE PENETRATION SOIL BEHAVIOR TYPE

The estimated stratigraphic profiles included in the CPT logs are based on relationships between corrected tip resistance (q_t), friction resistance (f_s), and porewater pressure (u_2). The normalized friction ratio (F_r) is used to classify the soil behavior type.

Typically, silts and clays have high F_r values and generate large excess penetration porewater pressures; sands have lower F_r's and do not generate excess penetration porewater pressures. The adjacent graph (Robertson *et al.*) presents the soil behavior type correlation used for the logs. This normalized SBT chart, generally considered the most reliable, does not use pore pressure to determine SBT due to its lack of repeatability in onshore CPTs.



atm = atmospheric pressure = 101 kPa = 1.05 tsf

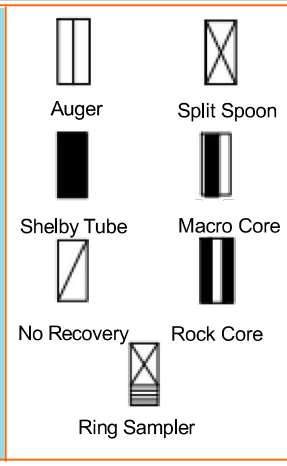
REFERENCES

Kulhawy, F.H., Mayne, P.W., (1997). "Manual on Estimating Soil Properties for Foundation Design," Electric Power Research Institute, Palo Alto, CA.
Mayne, P.W., (2013). "Geotechnical Site Exploration in the Year 2013," Georgia Institue of Technology, Atlanta, GA.
Robertson, P.K., Cabal, K.L. (2012). "Guide to Cone Penetration Testing for Geotechnical Engineering," Signal Hill, CA.
Schmertmann, J.H., (1970). "Static Cone to Compute Static Settlement over Sand,"*Journal of the Soil Mechanics and Foundations Division*,96(SM3), 1011-1043.

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

SAMPLING



GROUNDWATER

- Groundwater Initially Encountered
- Groundwater Level After a Specified Period of Time
- Static Groundwater Level After a Specified Period of Time
- No Groundwater Observed

Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.

FIELD TESTS

(HP)	Hand Penetrometer
(T)	Torvane
(b/f)	Standard Penetration Test (blows per foot)
(PID)	Photo-Ionization Detector
(OVA)	Organic Vapor Analyzer

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance Includes gravels, sands and silts.		CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance		
Descriptive Term (Density)	Std. Penetration Resistance (blows per foot)	Descriptive Term (Consistency)	Undrained Shear Strength (kips per square foot)	Std. Penetration Resistance (blows per foot)
Very Loose	0 - 3	Very Soft	less than 0.25	0 - 1
Loose	4 - 9	Soft	0.25 to 0.50	2 - 4
Medium Dense	10 - 29	Medium-Stiff	0.50 to 1.00	5 - 7
Dense	30 - 50	Stiff	1.00 to 2.00	8 - 14
Very Dense	> 50	Very Stiff	2.00 to 4.00	15 - 30
		Hard	above 4.00	> 30

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 15
With	15 - 29
Modifier	> 30

GRAIN SIZE TERMINOLOGY

Descriptive Term(s) of other constituents	Percent of Dry Weight
Boulders	Over 12 in. (300 mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm
Silt or Clay	Passing #200 sieve (0.075mm)

RELATIVE PROPORTIONS OF FINES

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 5
With	5 - 12
Modifier	> 12

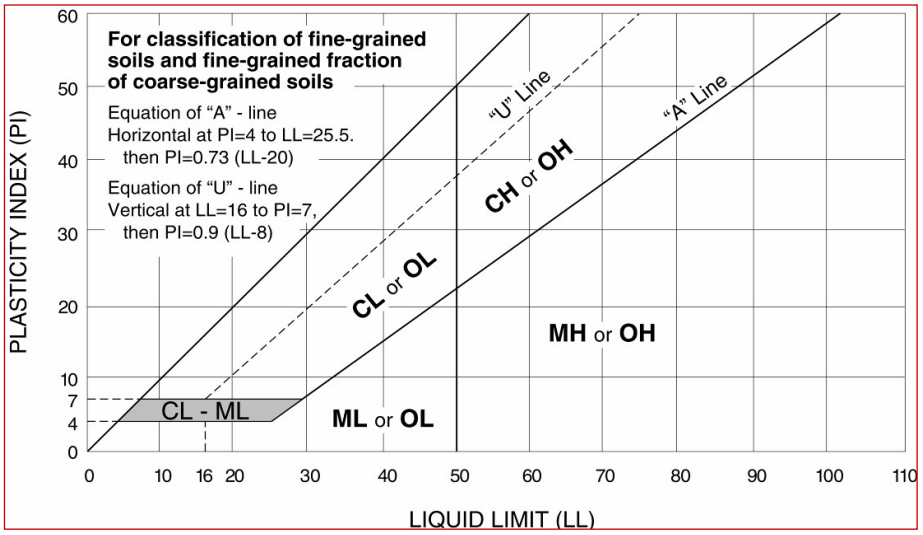
PLASTICITY DESCRIPTION

Term	Plasticity Index
Non-plastic	0
Low	1 - 10
Medium	11 - 30
High	> 30

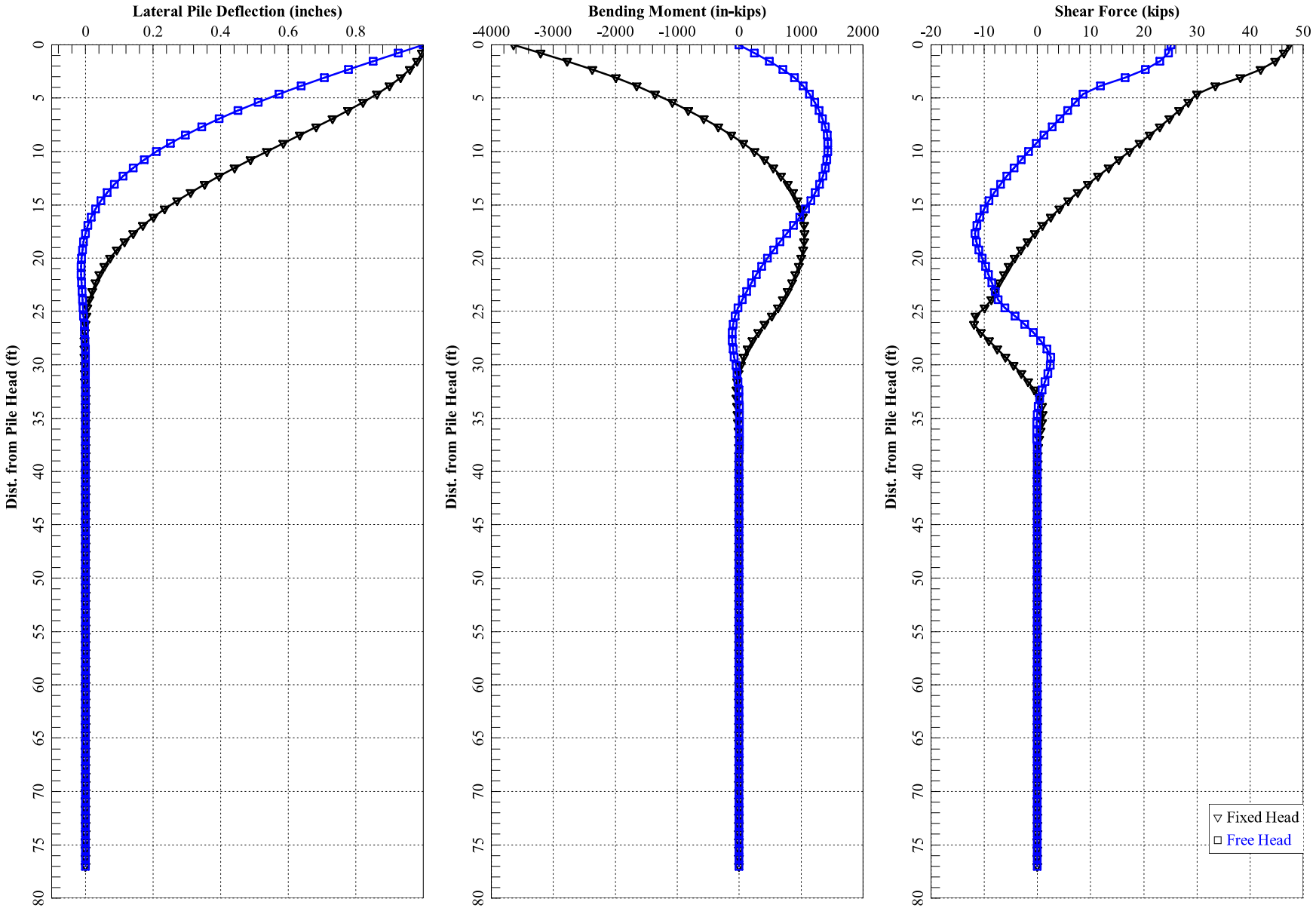
Unified Soil Classification System

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]				Soil Classification	
				Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 4 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	Cu≥4 and 1≤Cc≤3 [E]	GW	Well-graded gravel [F]
			Cu<4 and/or [Cc<1 or Cc>3.0] [E]	GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH	GM	Silty gravel [F, G, H]
			Fines classify as CL or CH	GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	Cu≥6 and 1≤Cc≤3 [E]	SW	Well-graded sand [I]
			Cu<6 and/or [Cc<1 or Cc>3.0] [E]	SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH	SM	Silty sand [G, H, I]
			Fines classify as CL or CH	SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots above "A" line [J]	CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]	ML	Silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried} < 0.75$	OL	Organic clay [K, L, M, N]
					Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line	CH	Fat clay [K, L, M]
			PI plots below "A" line	MH	Elastic silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried} < 0.75$	OH	Organic clay [K, L, M, P]
					Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor			PT	Peat

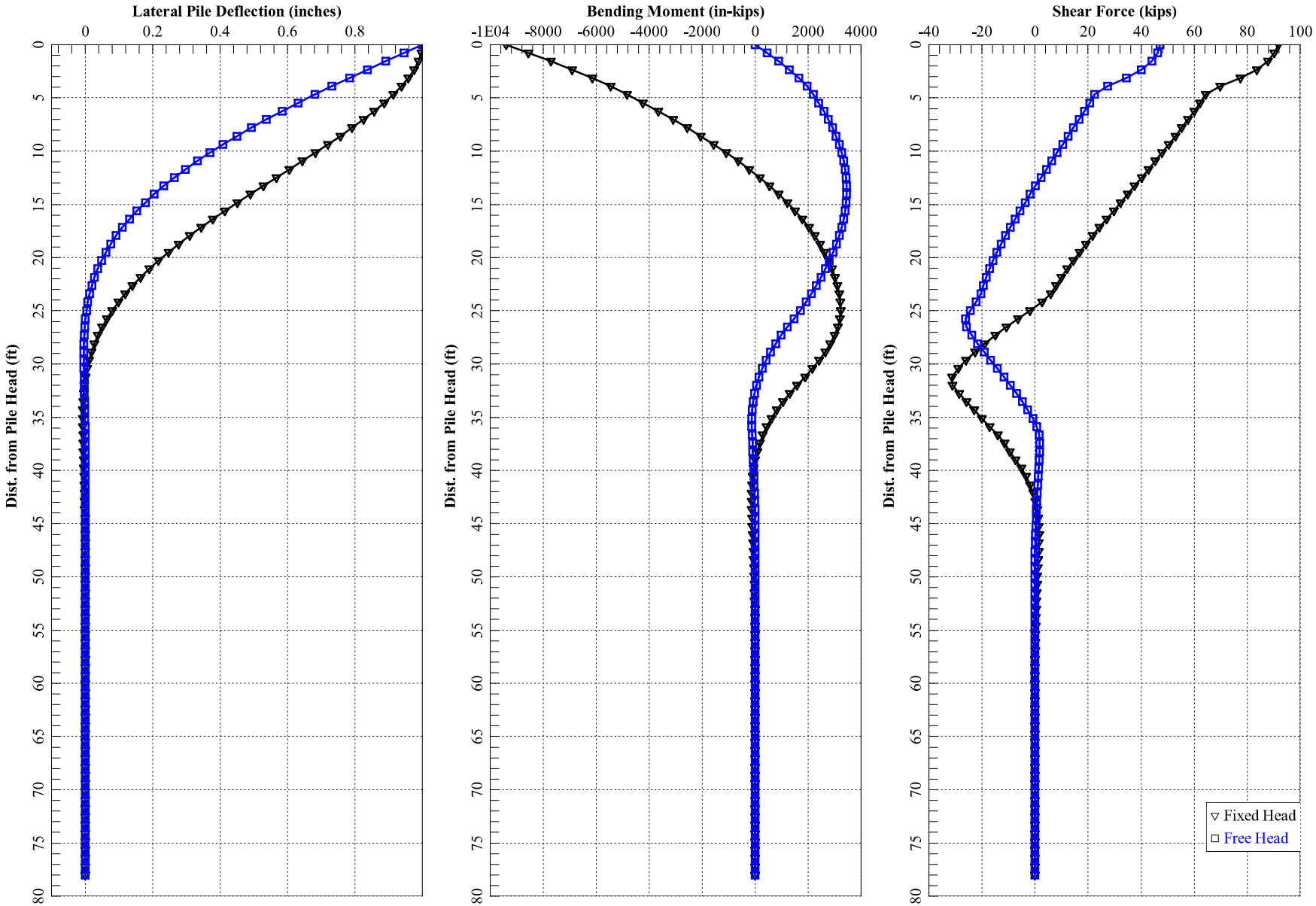
[A] Based on the material passing the 3-inch (75-mm) sieve.
[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.
[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.
[E] $Cu = D_{60}/D_{10}$ $Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$
[F] If soil contains ≥ 15% sand, add "with sand" to group name.
[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.
[H] If fines are organic, add "with organic fines" to group name.
[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.
[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.
[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.
[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.
[N] PI ≥ 4 and plots on or above "A" line.
[O] PI < 4 or plots below "A" line.
[P] PI plots on or above "A" line.
[Q] PI plots below "A" line.



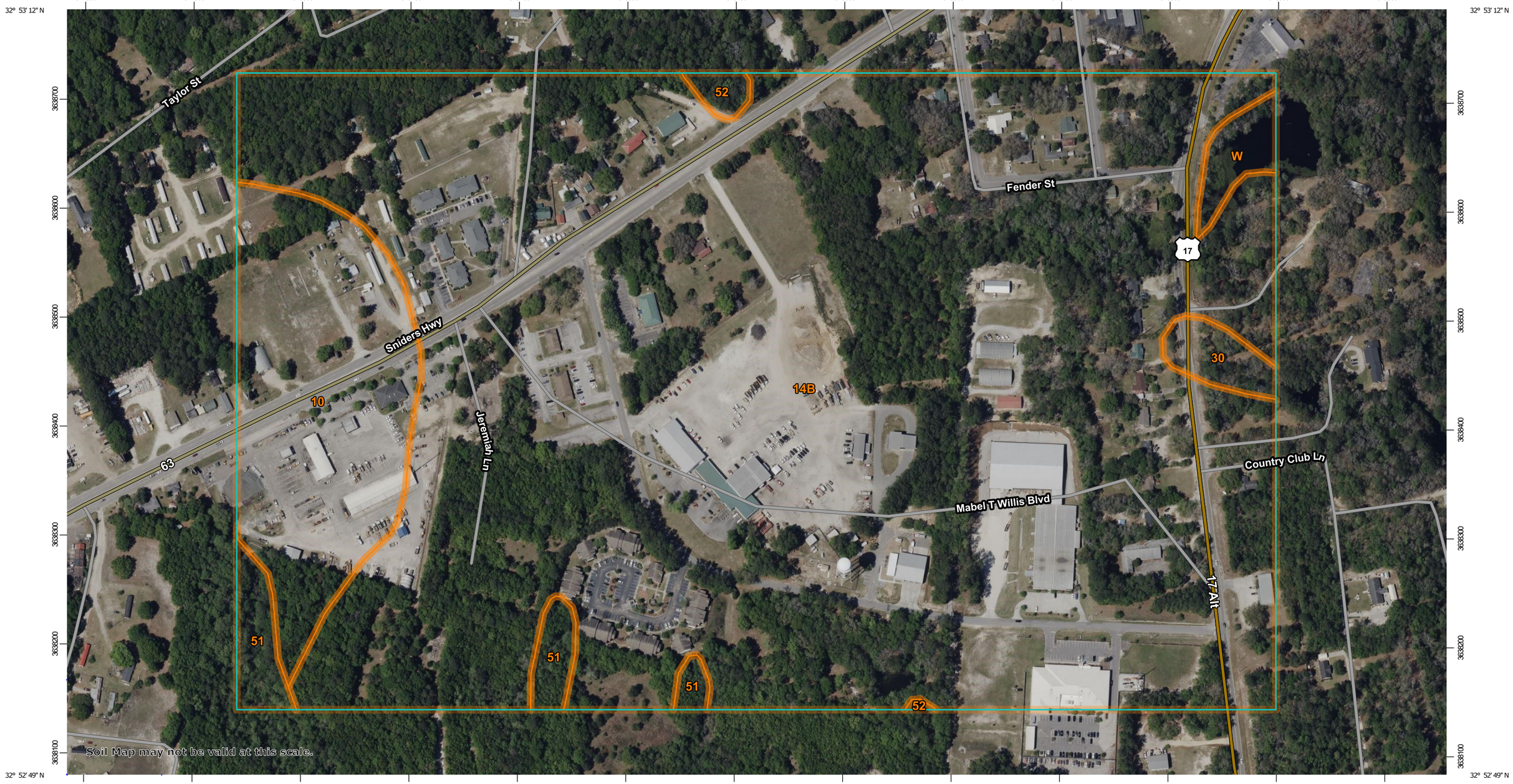
EN235216 Colleton County EOC - 18-inch PSC - 1 inch deflection - Seismic Loading Condition - No Group Effect



EN235216 Colleton County EOC - 30 inch ACIP - 1 inch deflection - Seismic Loading Condition - No Group Effect



Soil Map—Colleton County, South Carolina
(PZL277 - Soils Data)



Map Scale: 1:3,430 if printed on B landscape (17" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Colleton County, South Carolina
Survey Area Data: Version 20, Aug 29, 2023

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

Date(s) aerial images were photographed: Apr 15, 2022—Jun 2, 2022

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
10	Albany loamy sand, 0 to 2 percent slopes	13.7	9.9%
14B	Blanton loamy fine sand, 0 to 6 percent slopes	119.8	86.2%
30	Echaw loamy fine sand	1.2	0.9%
51	Pelham loamy sand, 0 to 2 percent slopes	2.5	1.8%
52	Pickney loamy sand	0.5	0.4%
W	Water	1.2	0.9%
Totals for Area of Interest		**138.9**	**100.0%**

ARCHAEOLOGICAL SURVEY
375 SNIDERS HIGHWAY
COLLETON COUNTY, SOUTH CAROLINA

FINAL REPORT

Prepared for:

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Terracon Project No: EN267001

Author:
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Archaeologist

Blue Nelson, M.A., RPA
Authorized Project Reviewer

FEBRUARY 2026

MANAGEMENT SUMMARY

Terracon Consultants, Inc. (Terracon) on behalf of Johnson Laschober & Associates PC (JLA) (Client) has completed archaeological investigations of an approximately 2.5-acre parcel located along Sniders Highway in Colleton County, South Carolina. In a letter dated December 16, 2025, to Colleton County, the Federal Emergency Management Agency (FEMA) requested a Phase I archaeological survey.

The cultural resource investigations were conducted under contract to the Client in general accordance with proposal number PEN267001, dated January 7, 2026. The purpose of the investigation is to support the Client in their Project, particularly in regard to compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (54 U.S.C. § 300101 et seq.).

Fieldwork for the current investigation was conducted on February 24 and February 25, 2026. As a result of the survey, one new recorded archaeological site (**38CN1175**) was excavated and is recommended Not Eligible for the National Register of Historic Places (NRHP). Based on the results of the current investigation, Terracon recommends that **no historic properties will be affected** by the Project.

TABLE OF CONTENTS

MANAGEMENT SUMMARY i
1.0 INTRODUCTION 1
2.0 ENVIRONMENTAL CONTEXT 4
PHYSICAL LOCATION AND SETTING 4
GEOLOGY AND TOPOGRAPHY 4
HYDROLOGY 4
SOILS 4
CURRENT LAND USE AND VEGETATION 6
3.0 CULTURAL CONTEXT 8
PRECONTACT PERIOD 8
Paleoindian Period (ca. 13,500–10,000 BP) 8
Archaic Period (ca. 10,000–3,000 BP) 10
Woodland Period (ca. 3,000–1,000 BP) 13
Mississippian Period (ca. 1,000–450 BP) 15
Contact and Early Historic Period (ca. AD 1550–1800) 15
HISTORIC PERIOD 17
Early Settlement 17
An Agricultural Economy 18
Nineteenth and Twentieth Centuries 19
HISTORICAL MAPS 20
4.0 BACKGROUND RESEARCH 25
PREVIOUSLY RECORDED ARCHAEOLOGICAL SITES 25
5.0 METHODS 26
ARCHAEOLOGICAL FIELD METHODS 26
LABORATORY METHODS 26
ARCHAEOLOGICAL SITE DEFINITIONS AND EVALUATIONS 27
6.0 RESULTS OF INVESTIGATIONS 29
7.0 CONCLUSIONS 37
8.0 REFERENCES CITED 38
APPENDIX A: ARTIFACT CATALOG 50

FIGURES

Figure 1. Project Vicinity 2
Figure 2. Topographic Map of Project Area. 3
Figure 3. NRCS Soils Map. 5
Figure 4. Vegetation towards the western portion of the project area, facing west. 6
Figure 5. Vegetation towards the southwestern portion of the project area, facing southwest. 7
Figure 6. Vegetation towards the eastern portion of the project area, facing east. 7
Figure 7. 1918 *Walterboro, SC* USGS Topographic Maps. 22
Figure 8. 1988 *Walterboro, SC* USGS Topographic Maps. 23
Figure 9. 2022 Aerial Google Earth. Project Location in White Outline. 24

TABLES

Table 1. Soils in the Project Area. 6
Table 2. Summary of Historical Maps and Aerial Imagery. 21
Table 4. Artifacts Recovered from Site 38CN1175 32

1.0 INTRODUCTION

Terracon Consultants, Inc. (Terracon) on behalf of Johnson Laschober & Associates PC (JLA) (Client) has completed supplemental Phase I archaeological investigations of an approximately 2.5-acre parcel located at 375 Sniders Highway Colleton County, South Carolina (**Figures 1 and 2**).

The archaeological investigations were conducted in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (54 U.S.C. § 300101 et seq.). In a letter dated December 16, 2025, the Federal Emergency Management Agency (FEMA) requested a Phase I archaeological survey to Colleton County.

Fieldwork for the Project was conducted on February 23 and February 24, 2026, by Archaeologist Ethan Gilbert, M.A. Blue Nelson, M.A. served as the Principal Investigator. Ethan Gilbert, M.A., is the author of this report.

This report has been prepared in compliance with the National Historic Preservation Act of 1966, as amended (54 U.S.C. § 300101 et seq.). The investigation and report meet the qualifications outlined in the Secretary of the Interior Standards and Guidelines for Archaeology and Historic Preservation (Federal Register 48:44716–44742) and the *South Carolina Standards and Guidelines for Archaeological Investigations* (SCDAH et al., 2024)). The Principal Investigator for the project meets the Secretary of the Interior's Professional Qualification Standards (36 CFR Part 61) and is a Registered Professional Archaeologist (RPA).

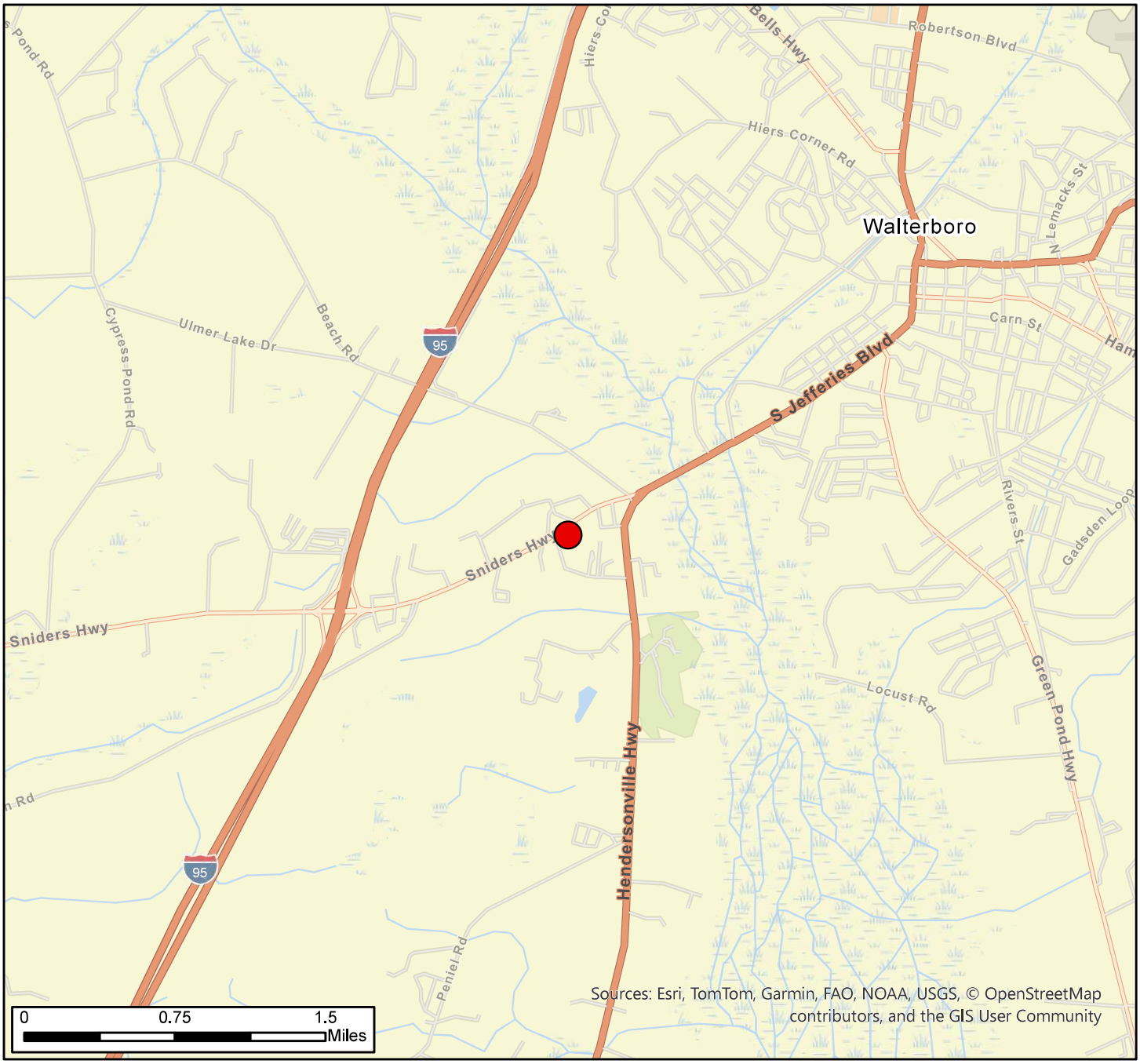
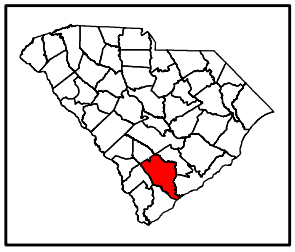


Figure 1. Project Vicinity
Base Map: Esri World Street Map

Project Location



Project No.	EN267001
Date:	February 2026
Drawn By:	ETG
Reviewed By:	BN

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521 Clemson Rd. Columbia, SC
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PROJECT VICINITY MAP

Colleton County EOC
Colleton County, SC

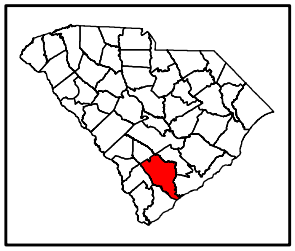
FIGURE

1



Figure 2. Colleton County EOC Phase I Survey
Base Map: Walterboro, SC (1988) USGS 7.5 Minute Quadrangle Topographic Map, Scale 1:24,000

Project Area
Site Boundary



N
W E
S

Project No.	EN267001
Date:	February 2026
Drawn By:	ETG
Reviewed By:	BN

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TOPOGRAPHIC MAP

Colleton County EOC
Colleton County, SC

FIGURE

2

2.0 ENVIRONMENTAL CONTEXT

PHYSICAL LOCATION AND SETTING

The 375 Sniders Highway Project is located approximately 2.18 miles southwest of Walterboro, Colleton County, South Carolina. Colleton County is in the southwest of South Carolina and is bordered by Charleston and Dorchester Counties to the east; Beaufort and Hampton Counties to the west; Bamberg County to the northwest, and Orangeburg County to the north.

The overall project area consists of approximately 2.5-acre parcel located at 375 Sniders Highway, Colleton County, South Carolina. The project is bordered to the north by Sniders Highway, to the east by Fleet Maintenance Road, to the south by Colleton County Fire Rescue Headquarters, and to the west by South Carolina Highway Patrol Troop 6 Post B (see Figure 2). Vegetation in the project area consisted of primarily an open grassy field with mixed scrub brushes, hardwoods, and pinewoods spread around lightly/sparingly.

GEOLOGY AND TOPOGRAPHY

The project area is located within the Coastal Plain region of South Carolina. This region consists of relatively flat areas, swamps, and Carolina bays and is composed of relatively young Pleistocene sands. Deposits in this area largely consist of clayey sand and clay facies or freshwater swamp deposits of organic mud and peats (Weems et al. 2013). Elevations within the project area are relatively flat, ranging from around 90 to 96 feet above mean sea level (AMSL).

HYDROLOGY

The project area falls within the Coosawhatchie and Combahee drainage basins, which extends from the ocean up to the Coosawhatchie and Combahee Rivers (SCDNR 2013). The closest water source is the Ashepoo River located approximately 0.55 miles east of the project area.

SOILS

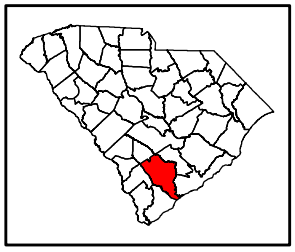
Soil development is dependent upon biotic and abiotic factors that include past geologic activities, nature of parent material, environmental and human influences, plant and animal activity, age of sediments, climate, and topographic position. A general soil association contains one or more mapping units occupying a unique natural landscape position. The map units (soil series) are named for the major soil or soils within the unit but may have minor inclusions of other soils. The soil map for Colleton County shows one soil units occurring within the proposed project area (NRCS 2024; **Table 1**; **Figure 3**).



Figure 3. Colleton County EOC Phase I Survey
Base Map: Bing Maps Aerial Imagery

Project Area

14B: Blanton loamy fine sandy, 0-6 percent slope



Project No.	EN267001
Date:	January 2026
Drawn By:	ETG
Reviewed By:	BN

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SOILS MAP

Colleton County EOC
Colleton County, SC

FIGURE

3

Table 1. Soils in the Project Area.

Unit Symbol	Soil Type	Slope	Landform	Drainage Class
14B	Blanton loamy fine sand	0–6%	Interfluves	Moderately Well Drained

CURRENT LAND USE AND VEGETATION

Throughout the latter half of the twentieth century, forests of the eastern U.S. were categorized according to the classification system based on the work of Lucy Braun (1950), which placed the project area in the Southeastern evergreen region. In 2006, Dyer revised these forest regions, with the project area now categorized as a Southern Mixed Forest (Dyer 2006). Vegetation in this region consists of loblolly and longleaf pine, sweetgum, water oak, southern red oak, and red maple (Dyer 2006). Vegetation in the project area consisted of primarily an open grassy field with mixed scrub brushes, hardwoods, and pinewoods spread around lightly/sparingly. (**Figures 4–6**).



Figure 4. Vegetation towards the western portion of the project area, facing west.



Figure 5. Vegetation towards the southwestern portion of the project area, facing southwest.



Figure 6. Vegetation towards the eastern portion of the project area, facing east.

3.0 CULTURAL CONTEXT

PRECONTACT PERIOD

The timing and manner of human migration to North America has been a subject of debate among scholars over the past three decades. The most widely supported theory states that the first North Americans traveled east from Asia via the Bering land bridge—a narrow strip of land connecting Alaska to Siberia which appeared approximately 13,500 years ago during the Pleistocene epoch (NPS 2025). These migrants then made their way south, navigating an ice-free corridor between the Cordilleran and Laurentide ice sheets before eventually settling throughout North and South America. While the popular theoretical timeline of America's settling has fluctuated as new technology and data emerge, recent studies suggest human presence on the North American continent between 23,000 and 21,000 years ago, and that human migration is likely to have occurred as soon as the Bering land bridge allowed for passage (Bennett et al. 2021; Farmer et al. 2022; Bennett et al. 2020). Alternatively, some scholars ascribe to the theory that humans instead sailed along the Pacific coast of North America, employing a strategy wherein they would "bounce" from shore to shore rather than navigating the still-harsh terrain of an ice-free corridor (Erlandson et al. 2007; Fladmark 1979).

Recently these interpretations have been called into question, with several sites providing possible evidence for earlier (Pre-Clovis) occupations. These sites include Monte Verde in southern Chile (Dillehay 1989; Meltzer et al. 1997), Meadowcroft Rockshelter in Pennsylvania (Adovasio et al. 1979, 1980a, 1980b, 1990), the Cactus Hill (McAvoy and McAvoy 1997) and Saltville (McDonald 2000) sites in Virginia, and the Topper site located along the Savannah River in Allendale County, South Carolina (Goodyear 2005). Suggested dates for some of these sites (e.g., Topper) go back more than 50,000 years, although the evidence for this is hotly contested. More recently, a number of sites providing possible evidence for a presence in the Americas between 13,500 and 15,000 years ago have been discovered. Although far from numerous, these sites are scattered across North and South America, including the Page-Ladson site in Florida, as well as sites in Alaska, Oregon, Texas, Wisconsin, and southern Chile. Thus, it does appear that humans may have been in the Americas as far back as 15,000 years ago, although more research is needed to validate this claim.

Paleoindian Period (ca. 13,500–10,000 BP)

The Paleoindian Period can be tentatively dated from about 13,500–10,000 BP, possibly extending as far back as 15,000 years ago. At the beginning of this period, most of the land that is now South Carolina was cool and dry, with boreal tundra and spruce-pine forests covering most of the state. By the end of this period, the climate ameliorated, rainfall became more frequent, and the state was covered with deciduous forests that included beech, elm, hickory, oak, and birch (Anderson et al. 1996; Goodyear et al. 1989). It was also during this time that the megafauna, including mammoth, mastodon, giant sloth, and bison became extinct. It is still not clear whether humans or the climate played a more prevalent role in the extinction of these large animals, although it is likely that both contributed to their extinction.

Most of our knowledge about the Paleoindian Period in the Southeast is based on the distribution of surface finds and inference rather than controlled excavations. However, excavations at the Topper Site located along the Savannah River in Allendale County (Miller 2010; Smallwood 2012, 2015) and the Tree House Site located along the Saluda River in Lexington County (Nagle and Green 2010) are beginning to shed light on Paleoindian lifeways in the region. The Tree House Site is a multi-component, deeply stratified precontact site that contains occupations ranging from the Early Paleoindian through Mississippian Periods. Evidence indicates that during the Paleoindian Period, the site was occupied by a small, relatively mobile group of people. All of the Paleoindian tools found at the site, including a single in-situ Clovis point, could have been used for hunting and butchering, and it is likely that this site was used as a hunting camp during the Early and Late Paleoindian subperiods. Lithic materials associated with the Paleoindian component were made of high-quality stone such as Black Mingo chert, Coastal Plain chert, and crystal quartz, although lesser quality materials such as milky quartz was also used as well (Nagle and Green 2010:264).

Though information regarding Paleoindian foodways is limited, available evidence suggests that early Native Americans practiced a mixed subsistence strategy wherein food was obtained both by hunting/scavenging large and small game as well as foraging for wild species of edible plants and seeds. People likely organized into small, mobile bands comprised of multiple nuclear and/or extended families; these efficiently limited social groups could easily move across the landscape in order to exploit seasonally dependent and migratory resources. Archaeological investigations into Paleoindian settlement patterns reflect concentrations of hamlets located along major rivers near the Fall Line and in the Coastal Plain; however, rising sea levels since the Last Glacial Maximum have likely resulted in the loss of many additional Paleoindian sites along the coast (Anderson et al. 1992; Anderson and Sassaman 1996).

Paleoindian artifact assemblages typically consist of diagnostic lanceolate projectile points, scrapers, gravers, unifacial and bifacial knives, and burins. Projectile point types include fluted and unfluted forms, such as Clovis, Cumberland, Suwanee, Quad, and Dalton (Anderson et al. 1992; Justice 1987). Tools were typically well-made and manufactured from high quality cryptocrystalline rock such as Coastal Plain and Ridge and Valley chert, as well as Piedmont metavolcanics such as rhyolite (Goodyear 1979). Paleoindians traveled long distances to acquire these desirable raw materials, and it is likely that particularly favored quarries were included in seasonal rounds, allowing them to replenish their stock of raw material on an annual basis.

In South Carolina, the Clovis (Early Paleoindian) subperiod is generally thought to date from around 11,500 to 11,000 BP (Sassaman et al. 1990:8). Recent radiocarbon dates indicate that a more accurate time frame for Clovis in North America may be 11,050 to 10,800 BP (Waters and Stafford 2007); however, this has yet to gain widespread acceptance. Suwanee points, which are slightly smaller than Clovis points, are dated from 11,000 to 10,500 BP, and Dalton points, which mark the end of the Paleoindian Period and beginning of the Early Archaic, date from around 10,500 to 9,900 BP.

Archaic Period (ca. 10,000–3,000 BP)

Major environmental changes at the end of the Pleistocene led to changes in human settlement patterns, subsistence strategies, and technology. As the climate warmed and the megafauna became extinct, population size increased and there was a concomitant decrease in territory size and settlement range. Mixed oak-history forests dominated much of the Southeastern landscape during the early Archaic Period, giving way to southern pine communities in the inter-riverine uplands during the Hypsithermal interval between 8,000 and 4,000 BP. This interval also supported the formation of riverine swamps, which became prevalent over the course of the early Holocene (Anderson et al. 1996; Delcourt and Delcourt 1985; Willard 2007). Technology became more diversified during the Archaic with the introduction of ground stone woodworking and plant processing tools, carved stone bowls, atlatl weights, and stone pipes and beads (Benson 2006:35). There is also a shift toward the use of smaller projectile points, which may reflect a transition from hunting larger megafauna to that of smaller game (Anderson and Joseph 1988:102; Goodyear 1974).

The chronology of the Archaic Period in the Southeast is still derived primarily from the seminal work of Coe (1964) from his investigations in the North Carolina Piedmont. Based on this work the Archaic Period has typically been divided into three subperiods, Early Archaic (10,000–8,000 BP), Middle Archaic (8,000–5,000 BP), and Late Archaic (5,000–3,000 BP). These subperiods are based on gradual changes in projectile point morphology, settlement patterns, and subsistence practices, with the greatest changes occurring during the Late Archaic when pottery was introduced and shellfish became an important resource.

Early Archaic (10,000–8,000 BP)

During the Early Archaic there appears to be a gradual, but steady increase in human population and a shift in settlement patterns. Scholars have put forward multiple models which postulate theories of Early Archaic social organization and settlement patterns in the Carolinas and Georgia (Anderson et al. 1992; Anderson and Hanson 1988). Such models generally suggest that societies were comprised of small communities of 25 to 30 individuals. The primary territory of these band-sized groups would have surrounded part of a major river, such as the Saluda, Broad, or Congaree Rivers (Anderson and Hanson 1988: Figure 3). In the early spring, the lower Coastal Plain would serve as the most productive foraging grounds. Groups would then gradually move inland to temporary camps in the Piedmont and Appalachian Summit regions over the course of summer and fall, ultimately aggregating into larger base camps in the upper Coastal Plain over late fall and winter. Movement of these groups has historically thought to have been restricted to a major river drainage. Bands are also thought to have sometimes congregated into larger "macrobands" of 500 to 1500 individuals; these organizations would have occasionally gathered at strategic locations near the Fall Line, participating in communal activities such as food harvesting, rituals, trade, and the exchange of mates and information.

Early Archaic settlement may also have been influenced by access to lithic material. Daniel (1998, 2001) argues against the idea that people would scarcely have diverted from one river

drainage system to another, positing instead that movement between these areas would have been just as easy as moving within them. According to his theory, it was high-quality stone quarries which attracted and tethered individuals to a place, not specific river drainages. Both models—differing settlement drives aside—agree that patterns of band/macroband settlement reflect a relatively high degree of mobility. This mobility allowed people to efficiently follow concentrations of seasonally available resources such as nuts, waterfowl, and white-tailed deer.

Diagnostic artifacts of the Early Archaic Period include a variety of side and corner-notched projectile point types such as Hardaway, Palmer, Kirk, Taylor, and Big Sandy, and bifurcated points such as LeCroy, St. Albans, MacCorkle, and Kanawha types. These points were more frequently made of locally available lithic materials (e.g., quartz and orthoquartzite) than tools made during the preceding Paleoindian Period (Goodyear 1989). Other tools of the Early Archaic include hafted and non-hafted scrapers, adzes, perforators, drills, gravers, hammerstones, grinding stones, and choppers, and probably perishable items such as traps, nets, snares, and basketry (Coe 1964; Daniel 1998:74; Sassaman et al. 2002). In the Coastal Plain of South Carolina, archaeological investigations at the Kolb Site have revealed evidence of substantial Early Archaic occupations that included Dalton, Hardaway, Palmer, Kirk, Taylor, and Lecroy points (King 2016).

Middle Archaic (8,000–5,000 BP)

The onset of the Middle Archaic subperiod (ca. 8,000–5,000 BP) saw the replacement of widespread oak-hickory forests with a dense pine landscape reminiscent of the modern-day Southeast region. This replacement occurred in tandem with the beginning of the Altithermal (or Hypsithermal) interval, a significant warming trend that coincided with the formation of extensive riverine swamps as well as modern river and estuary configurations. The widespread climatic, environmental, and cultural shifts which occurred during this period are all entangled in a web of relationships which are still poorly understood by modern scholars; however, more data may lead to new insights about how early North Americans navigated their rapidly shifting landscape (Sassaman and Anderson 1995:5–14).

Regardless of whether there was a population increase, small, mobile hunting and gathering bands probably still formed the core social and economic unit during the Middle Archaic Period. More intensively occupied sites tended to occur along rivers, while smaller upland lithic scatters were encountered along the interriverine landscape. Subsistence practices were likely based on a wide variety of resources such as white-tailed deer, squirrel, nuts, fish, and migratory birds, although direct evidence of Middle Archaic subsistence is generally lacking in South Carolina. Unlike the subsequent Late Archaic Period, shellfish do not seem to have been an integral part of the human diet.

Middle Archaic tools tend to be expediently manufactured and have a more rudimentary appearance than those found during the preceding Paleoindian and Early Archaic Periods. They are also made predominately of locally available raw materials such as quartz (Blanton and Sassaman 1989). Diagnostic projectile points of the Middle Archaic include stemmed

points such as Stanly and Morrow Mountain, and several transitional Middle Archaic-Late Archaic forms such as Guilford, Brier Creek, and Allendale. Ground stone tools such as axes, adzes, grinding stones, and atlatl weights also become more common during the Middle Archaic.

Late Archaic (5,000–3,000 BP)

The Late Archaic subperiod saw a number of important developments in the region, including increased sedentism, the introduction of soapstone and ceramic vessel technology, the use of pit storage, and possibly the beginnings of small-scale horticulture. Analyses of Late Archaic settlement patterns suggest that groups of people gathered in large numbers at sites along major rivers in the spring and summer and established base camps near large tributaries that were occupied during the spring through early fall. These large gathering areas may have been used for ritual feasting and other communal activities; at least one site, Stallings Island, in the middle Savannah River Valley, seems to have functioned as a mortuary center as well (Sassaman et al. 2006). These congregation areas are probably analogous to the Late Archaic shell rings on the Coast, which served as seasonal gathering, feasting, and ceremonial areas (Saunders and Russo 2002), and at times residential areas as well (Thompson 2007; Thompson and Andrus 2011).

Evidence suggests that shellfish served as a primary source of spring and summer subsistence during the Late Archaic subperiod (Garland and Thompson 2023). Abundant and high in nutrients, it is not fully understood why this resource does not appear to have been extensively exploited earlier on by people living along the coast. It is possible that shifting environmental conditions of the Late Archaic subperiod encouraged the formation of highly productive shellfish beds, which Indigenous communities would continue to farm for thousands of years. At the same time that shellfish abounded, people would also have hunted freshwater fish, white-tailed deer, small mammals, birds, and turtles (House and Ballenger 1976). During late fall and winter, the Late Archaic diet would have included animals such as white-tailed deer and turkey and nuts like hickory and acorn. Early cultigens such as squash and gourds (*Cucurbita*), sunflower, sumpweed, and chenopod may also have been raised in small gardens at this time; however, there is little evidence for such practice in South Carolina thus far.

Savannah River points, featuring a distinctive broad blade and stemmed base, are the most common diagnostic stone tool of the Late Archaic Period (Coe 1964). Savannah River points can be found on sites ranging from Florida all the way north into Canada. Variants of this type include points such as the Otarre Stemmed and the Small Savannah River, which date slightly later to the transitional Late Archaic/Early Woodland period.

The oldest pottery in the region, and possibly the greater Americas, was thought for many years to be the fiber-tempered Stallings Island type. Thom's Creek pottery was believed to have appeared a few centuries later, distinctive from Stallings Island in its use of sand rather than fiber temper (Sassaman 1993). Recent studies at shell ring sites, however, have demonstrated that both types date from about 4,500–3,000 BP and exhibit a variety of surface

treatments and designs (Heide and Russo 2003; Russo and Heide 2003; Saunders and Russo 2002). Some evidence even suggests that Thom's Creek wares predate the Stalling Island variety at sites along the coast.

Woodland Period (ca. 3,000–1,000 BP)

The Woodland Period sees a number of important developments in the Southeast, including a gradual increase in population and sedentism; the widespread adoption of ceramic vessel technology; the introduction of bow and arrow technology; the intensification of horticultural activities; the establishment of long-distance trading networks; and the use of conical burial mounds for interring the dead. The Woodland Period is traditionally divided into three subperiods: Early Woodland (3,000–2,500 BP), Middle Woodland (2,500–1,500 BP), and Late Woodland (1,500–1,000 BP). Each of these subperiods is discussed below.

Early Woodland (3,000–2,500 BP)

Pottery was both widely used and varied throughout most of the Southeast by 2,500 BP. Refuse Phase ceramics—characterized by a coarse sand-temper and simple stamped, punctated, plain, or dentated stamped surface treatment—are attributed to the Early Woodland subperiod on South Carolina's Coastal Plain (DePratter 1979; Sassaman 1993; Williams 1968). Within the Piedmont region, ceramic types such as Badin (coarse sand-tempered) and Dunlap (fabric-impressed and cordmarked) are indicative of the same time period. Ceramic assemblages exhibiting mostly check-stamped and plain pottery are generally associated with the Deptford culture, a widespread Southeastern cultural complex which first appears during the Early Woodland and ranged from above the Cape Fear River in North Carolina to the St. Johns River in Florida (Espenshade and Brockington 1989). Early Woodland subperiod biface types include Otarre, Swannanoa, Plott, and Gary stemmed points along with Badin Crude Triangular points (Anderson and Joseph 1988; Coe 1964:123–124; Sassaman et al. 1990).

Middle Woodland (2,500–1,500 BP)

Coastal regions of South Carolina, Georgia, and Florida all exhibit evidence of Deptford series pottery, a coarse sand/grit tempered ware dating to the Middle Woodland subperiod and representing a continuation of the Early Woodland Refuge series. Deptford pottery dates from around 2,800–1,500 BP, and includes surface treatments such as plain, check stamped, linear check stamped, cordmarked, and simple stamped (Depratter 1979; Waring and Holder 1968). The Deep Creek series, similar in temper and exhibiting cordmarked and simple stamped decoration, is also present along the northern coast of South Carolina and into North Carolina. Deep Creek ceramics are unique in that they commonly exhibit fabric- and net-impressed surface treatments but not check-stamping (Phelps 1983; Trinkley 1989).

There is sparse evidence of Middle Woodland settlement styles in inland South Carolina. While coastal sites are similarly non-prolific, these models are generally able to follow the "seasonal transhumance" theory posited by Milanich for the Deptford Period in Florida (Milanich 1971;

Milanich and Fairbanks 1980). Seasonal transhumance suggests that bands of people gathered along the South Carolina coast during the winter and summer months to exploit resources from tidal creeks and marshes. These bands would have formed small transient villages in ideal locations for fishing and foraging. Moving further inland in the fall, people would have aimed for terraces adjacent to swamps where white-tailed deer and nuts could be found (Cantley and Cable 2009:29; Trinkley 1989:78–79). More extensive cultivation practices are generally believed to have been adopted during the Middle Woodland subperiod, and this may have also been the case in South Carolina despite a lack of archaeological evidence to date.

Late Woodland (1,500–1,000 BP)

It is likely that, at least on the lower Coastal Plain of South Carolina, year-round exploitation of resources and more permanent habitation was possible in the Late Woodland subperiod (Brooks and Canouts 1984:14). Riverine-associated sites exhibit a relatively high density and diversity of artifacts, and it appears that—at least on a seasonal basis—population concentrations generally increased. Ceramic types for this period are either sand or grog-tempered and include the Wilmington, Hanover, Mount Pleasant, and Cape Fear types (Anderson et al. 1996). Surface treatments tend to be either cordmarked or fabric-impressed. While there is significant overlap between grog-tempered and cordmarked Wilmington pottery and Hanover grog-tempered fabric-impressed pottery, the former is more often found along the southern coast, while the latter to the north (DePratter 1979; Herbert and Mathis 1996:149). There is also evidence that the Hanover series was produced for much longer and somewhat later than was originally assumed (Herbert 2003).

Cape Fear pottery differs from the Hanover series most obviously in its temper (sand rather than grog), and common surface treatment (fabric-impressed appears more often than cordmarking; Herbert and Mathis 1996). The Mattassee Lake Site (38BK226), Sandy Island Site (38GE469), and Tidewater sites (38HR254) have all produced evidence of Cape Fear ceramics with dates ranging from 1430–820 BP (Anderson et al. 1982:354; Clement et al. 2001:30; Southerlin et al. 1997:75–77). A more precise date (910 ±70 BP) was obtained at the Barnard's Creek site (31NH254) along the Cape Fear River in Wilmington, North Carolina, after Cape Fear pottery was found in a post mold (Moser et al. 2010:188, 221).

More localized ceramic styles emerged at the end of the Late Woodland subperiod and into the Mississippian Period along the South Carolina coast. Some of these styles include St. Catherines pottery, occurring in the lower part of the state and into the Georgia coast, and Santee Simple Stamped along the upper coast and into the interior Coastal Plain. The St. Catherines series is grog-tempered, with cordmarked, net impressed, plain, and burnished surface decorations (Anderson et al. 1996; DePratter 1979). Dates for Santee Simple Stamped pottery extend from 1140 BP to 610 BP, well into the Early Mississippian subperiod.

Mississippian Period (ca. 1,000–450 BP)

Many significant changes took place throughout the Southeast during the Mississippian Period. While the previously observed broader settlement pattern of transhumance persists into the first century BP, archaeological, ethnohistorical, and environmental-ecological data from South Carolina's lower Coastal Plain suggest year-round exploitation and/or habitation of the region was occurring by this time (Brooks and Canouts 1984:9). It was during this era that mound-centered societies, typically situated in floodplains along major river systems, came to rise. The Mississippian mound society consisted of a flat-topped platform mound surrounded by villages and hamlets. These outlying vassal-like communities provided food, tribute payment, and services to the chief in exchange for protection and sociopolitical inclusion. The platform mound was not only a physical grounding point for Mississippian societies upon which a chief resided (and was laid to rest in many cases)—it served as a symbol of hierarchical power and the complex religious system which connected chiefdoms throughout the Southeastern Atlantic Coast as well as west and north as far as Oklahoma and Wisconsin. Intensive maize agriculture is a hallmark of Mississippian culture, though other cultigens such as beans and squash were also grown in garden plots. This subsistence strategy was supplemented by hunting and gathering of other common terrestrial and aquatic resources like deer, turkey, shellfish, and turtles (Anderson 1994; King and Stephenson 2000). Trade goods were another hallmark of Mississippian society, ceremonial items of bone, shell, mica, copper, and other imported materials served as symbols of chiefly authority and status. Ceramic styles during this period also widely varied, allowing for scholars to subdivide the period into distinct temporal and physical cultural areas.

Contact and Early Historic Period (ca. AD 1550–1800)

Initial European exploration and colonization mark the end of the precontact period in the Southeast United States. The sixteenth century was a period of intensive interest in exploration and colonization. European nations sought to increase their wealth and power by claiming large tracts of territory, with each attempting to outdo the others. The early 1500s witnessed the successful Spanish colonization of the Caribbean and by the 1520s they had become interested in the coastal areas of North America, including the region that would eventually become South Carolina.

According to Bense (1994), the first Europeans the Indians met were slave traders shipwrecked sailors; explorers, and missionaries. Over time settlers eventually followed. In 1526, Spain attempted to colonize an area along the Carolina coastline. Lucas Vazquez de Ayllon arrived in Winyah Bay near present day Georgetown, South Carolina with 600 colonists, supplies, and livestock, looking for an area suitable for colonization. De Ayllon's expedition travelled north to what is today Pawleys Island. Finding the area unsuitable for their purposes, de Ayllon turned south and founded the colony San Miguel de Gualdape, probably near Georgetown. This settlement was ultimately unsuccessful, lasting less than a year.

In the spring of 1540, Spanish explorers under the command of Hernando de Soto crossed into Georgia from Florida. His army of almost 700 soldiers, in addition to enslaved persons

and livestock, had a devastating impact on the aboriginal peoples of the Southeast. Hudson (1997) points out that this impact was both direct and indirect. Direct consequences resulted from warfare, the disruption of agricultural activities, and the appropriation of agricultural produce and other goods. The indirect consequences were shifts in the balance of power between rival polities, disruption of exchange and alliance systems, and possibly the introduction of Old-World diseases for which Indigenous populations had no immunity.

De Soto's excursion through the Southeast was well documented by its chroniclers—Garcilaso de la Vega, Rodrigo Ranjel, Luys Hernandez de Biedma, and the anonymous Portuguese observer known as the Gentleman of Elvas—and has been the interest of scholarly pursuit for much of the last century (e.g., Clayton et al. 1993; Hudson 1997; Swanton 1939). Consequently, much of his army's route is known with a good degree of certainty and many of the villages and towns that he visited have been identified archaeologically.

Hudson's (1997) synthesis of the De Soto entrada provides an informative narrative account of the expedition. De Soto arrived near modern-day Tampa Bay in May of 1539 and traveled north to Anhaica, the principal town of the Apalachee. De Soto occupied the town and quartered his army there over the winter. In the spring of 1540, the army traversed southern Georgia, crossing the Flint River near Newton. Here they entered the Chiefdom of Capachequi, which was centered on the area of Chickasawhatchee Swamp. From Capachequi, the army traveled northeast near present-day Albany, up the Flint River to the chiefdom of Toa. From Toa they moved on to the Chiefdom of Ichisi, which is likely the Lamar Mound site. De Soto and his party continued through central Georgia, passing the Chiefdoms of Tama and Ocute, and then into central South Carolina. In central South Carolina, de Soto encountered Aymay before continuing on to Cofitachequi, which is considered by some to be the Mulberry site (DePratter 1989).

After departing Cofitachequi, de Soto and his party continued into the western portion of North Carolina, and eastern Tennessee prior to returning to north Georgia in the late summer of 1540. They continued on to the chiefdom of Itaba, believed to be the Etowah site, before crossing into what is now Alabama. They continued on their journey through Mississippi, Arkansas, east Texas, and then back again to Arkansas, ultimately traveling down the Mississippi River where they made their way across the gulf into Mexico.

Although the settlement of San Miguel de Gualdape was a failure, the Spanish desire to establish a permanent colony in South Carolina remained. The Spanish initiated colonization of the Southeast in the mid-sixteenth century with the founding Santa Elena in South Carolina and St. Augustine in Florida and soon established Jesuit and Franciscan missions along the Florida and Georgia coasts. The founding of Santa Elena in 1566 was driven by Spain's need to protect its profitable territories in Florida from the French, who had previously attempted to establish a settlement, Charles Fort, at the same location as Santa Elena on Parris Island in Beaufort County. The Spanish colony at Santa Elena lasted for 21 years, until 1587 when Spain sought to consolidate its North American power at St. Augustine.

The mission system greatly disrupted the Indian's way of life, as did tensions between Spain, England, and France. The Europeans frequently used the Indians to attack their enemies, both European and Indian, and situated them between rivaling colonies to guard against hostilities. By the seventeenth century, Indians in South Carolina probably lived in small, politically and socially autonomous, semi-sedentary groups (Waddell 1980).

During the seventeenth and early eighteenth century, trade between the Indians and the colonists flourished as the Indians traded deerskins and Native American slaves for European goods such as firearms, kettles, cloth, and beads. Aboriginal material culture was profoundly altered with the introduction of these items (Crane 1928; Green 1992).

HISTORIC PERIOD

Early Settlement

The earliest known European ventures along the coast of what is now South Carolina were those of Francisco Gordillo and Pedro de Quejo in 1521 and Lucas Vasquez de Ayllon in 1526, all of Spain (Hoffman 1994). Saint Helena Island was first noted by Spanish explorers in 1521, who called the land "Santa Elena". Sustained contact with the natives of coastal South Carolina began in 1562 with the arrival of 150 French Huguenots under the command of Jean Ribault, who claimed the island and surrounding area, calling the area Porte Royalle. After entering Port Royal Sound, they spent the next several days reconnoitering various coastal waterways such as the Beaufort River, Broad River, and Archer's Creek (DePratter and South 1990). Within a month, the French had built a small fort (named Charlesfort) which is known to be on Parris Island. Before departing for France, Ribault left a small contingent at the fort and promised that reinforcements would arrive within six months. However, complications in Europe as well as the Americas would ensue, and the French would never return to Charlesfort.

In 1629, King Charles I created the first charter giving the area of "Carolana" to Sir Robert Heath (Lewis 2007). This grant, named in honor of Charles I, included all land from Albemarle Sound to Florida. Official attempts at settling this area failed repeatedly; however, explorers, hunters, and fur-trappers traveled in the region. The area known as "Carolana" was renamed in 1663 to Carolina, and King Charles II granted the colony to eight Englishmen known as the Lords Proprietors: William Berkeley, John Colleton, Edward Hyde, George Monck, William Crave, George Carteret, Anthony Ashley Cooper, and John Berkeley. They were given extensive powers to establish civil structures, collect taxes, and maintain order. However, their governance was inefficient, and settlement of the area slowed. In 1669, Lord Anthony Ashley Cooper led an expedition along the Carolina coast, ultimately establishing the settlement of Charles Town at Albemarle Point.

The founding of Walterboro, South Carolina occurred in 1783, and received its name from Jacob and Paul Walter, who were both rice farmers. In 1817 Walterboro was selected as the county seat of Colleton County, and 1826 was when the city was incorporated. The Walter brothers chose their location to get away from the summer heat during the year. It was seen

as a good escape from the Charleston area in the summer (CHS Regional MLS 2026). Agriculture was a main source of the economic system for Walterboro and Colleton County (ACHP 2023).

Colleton County is one of the counties that King Charles II granted to be established in 1663. Robert Sanford in 1666 was the first person to arrive in Colleton County (Statehouse Report 2026). There were three original parishes that made up Colleton County, which were organized by 1730. Those parishes were St. John's Colleton, St. Bartholmew's, and St. Paul's. Colleton County had the highest population in terms of a rural county in South Carolina around the year 1720. There was 1,778 slave and servant persons, mostly of African American descent, and 1,240 mainly English free peoples. There were many factors that made life difficult for the inhabitants of Colleton County, which included: hurricanes, disease, rebellion by slaves, and armed attacks from the Spanish and French. Those who had the best luck, whether individually or family oriented, saw their standards of living rise by gaining more land and more slaves. Rice was one main cash crop for Colleton County, and the proximity of the Charleston ports made it a highly valuable exported good. Indigo was also of great importance, and it grew in areas with higher elevations. There were several small towns and villages in Colleton County that dotted the landscape in the final few decades of the 18th century (Statehouse Report 2026).

An Agricultural Economy

Residents of Colleton County largely relied on agricultural production for income. Some of the most common grown crops in Colleton County was cotton, rice, and indigo. Indigo seeds were brought to South Carolina by early settlers, and by 1744 Eliza Lucas, one of the first to plant indigo, had a profitable crop. Her strain of indigo resulted in the rise of a stable cash crop, and South Carolina became the British Empire's major producer of dye. However, South Carolina indigo was known for its poor quality due to improper processing and, in an effort to improve the quality, Moses Lindo was appointed as the indigo inspector. Profits from indigo increased after 1749, when a Parliamentary bounty intended to aid the textile industry was instated (Fick 1992:14; Edgar 1998:146–149).

Although indigo crops were successful, they became a supplemental crop to rice. While initial rice crops relied upon a freshwater irrigation system, after 1750 the tidal culture method was developed. Tidal cultivation used the power of tides. Dikes or dams were built along the riverbanks to channel fresh water for irrigation, increasing the quality and quantity of rice along rivers that had strong tides above the highest level of saltwater. These rivers included the Santee, Cooper, and South Edisto rivers, and Toogoodoo and Awendaw creeks (Fick 1992:13). By the late 1700s, rice exports from South Carolina exceeded 70 million pounds annually (Carney 1996:108).

Enslaved laborers were increasingly imported in areas that had labor-intensive crops such as indigo and rice, and the success of these crops relied largely on that enslaved labor. Enslaved persons of West African descent provided crucial knowledge of rice cultivation, in part due to a cropping system commonly used in West Africa and unknown to European plantation owners

(Carney 1996:125). By the early 1700s, enslavement of Native Americans declined, and enslaved persons of African origin began to outnumber white settlers in South Carolina (Carney 1996:112).

Nineteenth and Twentieth Centuries

The town of Walterboro was bustling in the early 1800s, and it was the seat location for Colleton County. By the year 1826 Walterboro had many storefronts, a library, and a local tavern. A big development that aided in the expansion of Walterboro (and the surrounding area) was when trains were established. During the summer months the population of the town was around 900 by 1832 and would decrease to fifty-precent less than that in the winter months. Many buildings were around and in use for the summer months, including academies for boys and girls, the courthouse, and several churches. The pattern for the development of the town's streets were designed in 1839. In the antebellum era of the 1800s, three main topics that many residents in Walterboro were concerned with included western expansion, the issues of slavery, and tariffs (CHS Regional MLS 2026). In the years following the Civil War, there was a population boom again and agriculture was once again on the rise. The number of churches grew to eight, and thirteen stores, respectively, by the year 1880. The train systems were the biggest in the middle of Savannah and Charleston in the mid-1890s (Lowcountry & Resort Islands Tourism Commission 2026).

1800 was the year the General Assembly established Colleton County, and the economy focused on slave labor and rice, with the second most valuable crop shifting from indigo over to cotton (Statehouse Report 2026). There was a very high population of African American slave laborers in Colleton County in the 1800s, and around 1860 the total population of the county was over three-fourths slaves. During the Civil War, the white population of the county fought for states' rights and to keep slavery intact. Once the war ended, it was a challenging time to adjust for both white and black people. The economy of the county still heavily relied on agriculture, even though the production of fertilizer was a small and short boost to the economy, and timber production also started (Charleston Currents 2026).

For Walterboro in the 1900s, it was still difficult to be prosperous early on, even though timber production was on the rise and there was a small boost to the economy in phosphate mining. There were electric lights in the town starting in 1915, which was the same time cars were being seen on the streets. In the early 1920s, the two main streets in Walterboro were paved (Charleston Currents 2026).

From the years of World War I until the end of World War II, there was a great amount of change that took place in Colleton County. Two of the biggest changes that would affect the county were the economy and agriculture. In the ten year gap from 1910 to 1920, the manufacturing of rice would decrease from 10.2 million pounds to just 2.1 million pounds. By 1930, there was a cease in the production of rice for Colleton County, since around 160,000 pounds were produced that year. This was the final nail in the coffin for Colleton County and its long history of rice cultivation. In the first half of the twentieth century, agriculture took a hard hit in Colleton County, with the number of farms decreasing by one-third in a timespan

of 40 years from 1910 to 1950. This was also the case for tenant farmers as there was around a 50 percent decrease in thirty years, from 1920 to 1950 (The Jaegar Company 1995).

In the second half of the twentieth century, Colleton County has still been able to keep a consistent growth. One sector of the economy that is still going strong is the manufacturing of timber. The construction of new roads and interstates also has boosted the county, with Interstate 95 helping areas to grow in terms of commercial and industrial aspects (The Jaegar Company 1995).

Something that impacted Colleton County, and the southeastern United States, was when Hurricane Hugo made landfall in 1989. Sixty-seven people lost their lives in the hurricane, and the hurricane impacted two million people. Hurricane Hugo was classified as Category 5, and it was the biggest system to ever hit along the east coast. In Colleton County, there was a high volume of damage that occurred, with roads being impassable, downed power lines, and down trees (Perez and Yosbin 2026).

HISTORICAL MAPS

Topographic maps, aerial photography, United States Department of Agriculture (USDA) soil survey maps, and historical maps were examined for information on natural or cultural factors that might have affected site locations or preservation, and to determine if structures were located within the project area. Historical aerial photography was also consulted to determine changes in land use over time as well as to look for former structure locations.

For the most part, historic topographic maps appear to show current road alignments near the project area. The entirety of the project area appears to have been relatively rural, until at least the mid twentieth century. The 1918 Walterboro, SC (1:62,500) topographic quadrangle depicts no structures within the project area (**Figure 7**). Only two structures are visible on the historic topographic maps within the project area (**Figure 8**), however not showing up until 1988, on the 1988 Walterboro, SC (1:24,000) topographic map, with the structure seemingly demolished sometime after the 2023 imagery. A summary of historical maps and aerial imagery is shown on **Table 2**.

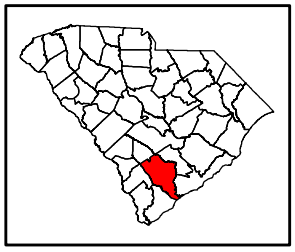
Table 2. Summary of Historical Maps and Aerial Imagery.

Source	Content
1918 *Walterboro, SC* Topographic Map (1:62,500) [Figure 7]	No structures are depicted in the project area.
1943 *Walterboro, SC* Topographic Map (1:62,500) [Not Depicted]	No structures are depicted in the project area.
1957 *Savannah*, GA, Topographic Map (1:250,000) [Not Depicted]	No structures are depicted in the project area.
1960 *Savannah*, GA, Topographic Map (1:250,000) [Not Depicted]	No structures are depicted in the project area.
1988 Walterboro, SC Topographic Map (1:24,000) [Figure 8]	Imagery depicts two structures within the central and southwestern portion of the project area.
2022 Google Earth Aerial Imagery [Figure 9]	Imagery depicts a structure within a central portion of the project area.



Figure 7. Colleton County EOC Phase I Survey
Base Map: Walterboro, SC (1918) USGS 7.5 Minute Quadrangle Topographic Map, Scale 1:62,500

Project Area



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Project No.	EN267001
Date:	March 2026
Drawn By:	ETG
Reviewed By:	BN

terracon
521 Clemson Rd. Columbia, SC
PH. (803) 741-9000 terracon.com

TOPOGRAPHIC MAP

Colleton County EOC
Colleton County, SC

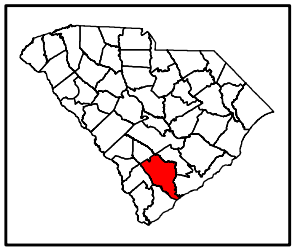
FIGURE

7



Figure 8. Colleton County EOC Phase I Survey
Base Map: Walterboro, SC (1988) USGS 7.5 Minute Quadrangle Topographic Map, Scale 1:24,000

Project Area



Project No.	EN267001
Date:	March 2026
Drawn By:	ETG
Reviewed By:	BN

Terracon
521 Clemson Rd. Columbia, SC
PH. (803) 741-9000 terracon.com

TOPOGRAPHIC MAP

Colleton County EOC
Colleton County, SC

FIGURE

8



Figure 9. 2022 Aerial Google Earth. Project Location in White Outline.

4.0 BACKGROUND RESEARCH

The goal of the background research was to acquire a working familiarity with the natural and cultural developments of the area. Background research was conducted using ArchSite, a GIS program depicting previously recorded archaeological and historic resources in South Carolina administered by SCIAA and the South Carolina Department of Archives and History (SCDAH).

PREVIOUSLY RECORDED ARCHAEOLOGICAL SITES

Background research for the project was conducted on January 29, 2026. The records examined included ArchSite, a GIS program depicting previously recorded archaeological and historic resources in South Carolina. The area within the project boundary was examined to identify previously documented historic and archaeological resources. No historic or archaeological resources were identified within the project boundary.

5.0 METHODS

ARCHAEOLOGICAL FIELD METHODS

Field survey methods employed by Terracon during the investigation included systematic shovel testing combined with pedestrian inspection (visual survey) of the project area. Areas of clear visibility were systematically inspected for artifacts and other surface signs of precontact or historic period cultural activity. Shovel testing was conducted at 30-meter intervals within areas of proposed ground disturbance that were undisturbed. Closer interval (15-m) shovel tests were excavated to delineate archaeological site boundaries.

Shovel tests measured approximately 30 centimeters in diameter and were excavated to 80 centimeters in depth, sterile subsoil, the water table, or an impenetrable obstacle. Excavated sediments were screened through 6.35-millimeter (0.25-inch) hardwire mesh. Pertinent field data, including locations, soil color and texture, notes on the stratigraphy, environmental setting, topography, etc. were recorded for shovel test locations. Shovel test locations were marked on a field map of the archaeological study area and were generally assigned identifying Transect and Shovel Test numbers.

LABORATORY METHODS

Upon completion of the fieldwork, the artifacts and data were processed and analyzed according to standard archaeological procedures. Analyses included the preparation of maps showing the location of shovel tests and surface artifacts; description of soils in the project area (including preparation of soil profiles where appropriate); and classification and quantification of artifacts and other cultural materials.

Artifacts collected during field investigations were transported to the Terracon laboratory in Columbia, South Carolina. During fieldwork, a catalog system was employed to ensure that provenience data were recorded for each recovered artifact. In the laboratory, artifacts were washed with a soft bristle brush and allowed to air dry. Artifacts were analyzed, typed, quantified, and described according to material type and function, when possible. Vessel morphology was noted whenever possible for ceramics.

Historic period artifacts were analyzed according to material type and function, when possible. Vessel morphology (i.e., bowl, plate, etc.) as well as the type of fragment (basal/footing, neck, rim/lip, body, etc.) were noted whenever possible for glass and ceramics. If necessary, specific references for bottle glass, nails, and other miscellaneous items were consulted (Ellis 1997; Tremont Nail Company n.d.; Israel 1993).

Ceramic sherds recovered during the investigation were brushed clean of surface dirt, washed, and allowed to air dry. Ceramic analysis generally focused on identifying particular ceramic attributes diagnostic of particular temporal or cultural traditions (cf. FLMNH 2014). Typological

attributes included standard descriptive categories including ceramic type, glaze or slip color, decoration, vessel form, size, and vessel portion. An attempt was made to classify all historic period ceramics according to published pottery types. Those sherds not easily recognized were assigned a descriptive name based on surface treatment and paste (e.g., refined earthenware, stoneware). Diagnostic ceramic types and maker's marks, when present, were used to determine relative dates for site activities.

Glass artifacts were described by color, shape (e.g., curved, flat), decoration (e.g., molded, plain), vessel shape and portion (e.g., bottle, jar, base, neck) and any identifying maker's marks or other decorative attributes.

Metal artifacts were brushed clean of surface dirt and kept dry. Artifacts were described by size, shape, and function, whenever possible. Nail manufacturing techniques and nail portion (head, shank, etc.) were recorded when identifiable.

ARCHAEOLOGICAL SITE DEFINITIONS AND EVALUATIONS

Archaeological sites are defined as discrete and potentially interpretable loci of cultural material (Plog et al. 1978). For the present study, an archaeological site is defined as a location where at least one artifact or cultural feature greater than 50 years old has been identified.

NRHP Eligibility Criteria

In order for a site, building, etc. to be considered a significant historic property, it must meet one or more of four specific criteria established in 36 CFR Part 60 (*National Register of Historic Places*) and 36 CFR Part 800 (*Protection of Historic Properties*). The evaluation of a precontact or historic period archaeological site for inclusion on the NRHP rests largely on its research potential, that is, its ability to contribute important information through preservation and/or additional study (Criterion D).

The NRHP criteria for evaluation are stated as follows:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and;

Criterion A: Properties that are associated with events that have made a significant contribution to broad patterns of our history;

Criterion B: Properties that are associated with the lives of persons significant in our past;

Criterion C: Properties that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values,

or that represent a significant and distinguishable entity whose components may lack individual distinction; and
Criterion D: Properties that have yielded, or may be likely to yield, important information in prehistory or history.

According to the NRHP Bulletin 15, *Guidelines for Applying the NRHP Criteria for Evaluation*, integrity is defined as "the authenticity of a property's historic identity, evidenced by the survival of physical characteristics that existed during the property's historic or prehistoric period." The seven aspects of integrity are *Location, Design, Setting, Materials, Workmanship, Feeling*, and *Association*.

Archaeological Sites and the NRHP

While many archaeological sites are recommended as eligible for the NRHP under *Criterion D*, this criterion is somewhat vague. In order to clarify the issue of site importance, the following attribute evaluations add a measure of specificity that can be used in assessing site significance and NRHP eligibility:

- *Site Integrity* – Does the site contain intact cultural deposits or is it disturbed?;
- *Preservation* – Does the site contain material suited to in-depth analysis and/or absolute dating such as preserved features, botanical and/or faunal remains, or human skeletal remains?;
- *Uniqueness* – Is the information contained in the site redundant in comparison to that available from similar sites, or do the remains provide a unique or insightful perspective on research concerns of regional importance?;
- *Relevance to Current and Future Research* – Would additional work at this site contribute to our knowledge of the past? Would preservation of the site protect valuable information for future studies? While this category is partly a summary of the above considerations, it also recognizes that a site may provide valuable information regardless of its integrity, preservation, or unique qualities.

6.0 RESULTS OF INVESTIGATIONS

Field investigations were conducted between February 23 and 24, 2026. The archaeological survey was conducted by Ethan Gilbert, MA.

The parcel is bordered to the north by Sniders Highway, to the east by Fleet Maintenance Road, to the south by Colleton County Fire Rescue Headquarters, and to the west by South Carolina Highway Patrol Troop 6 Post B. The study area within the parcel consisted of primarily an open grassy field with mixed scrub brushes, hardwoods, and pinewoods spread around lightly/sparingly. A house was located on the site from at least the 1950's until at least 2023, since the house was demolished sometime after then. See Figures 4–6 for representative study area photographs.

Shovel testing was conducted at 30-meter (approximately 98.4-foot) intervals within the project study area. Shovel testing was accompanied by pedestrian (visual) inspection for above-ground structures, visible cultural features, or potential microlandforms capable of supporting past human habitation. Positive (artifact-bearing) shovel tests were delineated with 15-meter interval shovel tests.

As result of the investigation, a total of 27 shovel tests were excavated, one shovel test was unexcavated and labeled a "No Dig" due to the presence of a large push pile (**Figure 10**). In general, there were two dominant reoccurring shovel test profiles. Shovel tests consisted of either A: approximately 0 to 20 cm of dark gray (10YR 4/1) sand over 20 to 70 cm yellowish brown (10YR 5/6) sand over 70-90 cm yellowish brown (10YR 5/8) sand or, B: 0 to 30 cm of dark gray (10YR 4/1) sand over 30-60 cm of yellowish brown (10YR 5/6) sand over 60-80 cm of very pale brown (10YR 7/4) sand. Representative shovel test photographs are shown in **Figures 11 and 12**.

As a result of the survey, one new recorded site (38CN1175) was surveyed and is described below.

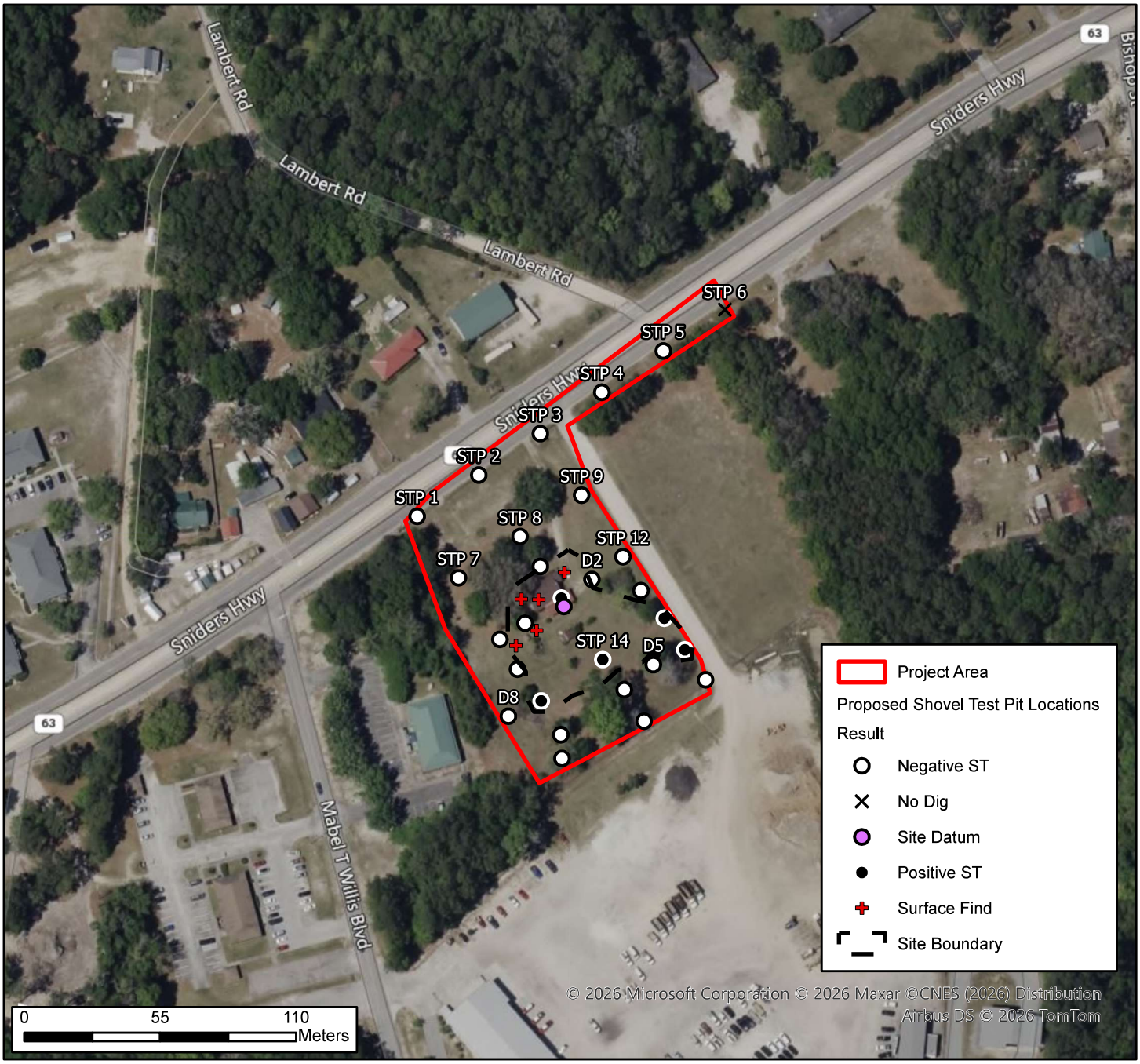
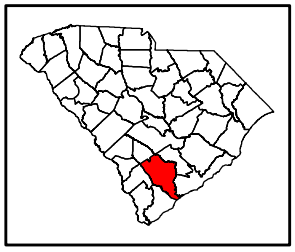


Figure 10. Colleton County EOC Phase I Survey
Base Map: Bing Maps Aerial Imagery



Project No.	EN267001
Date:	March 2026
Drawn By:	ETG
Reviewed By:	BN

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521 Clemson Rd. Columbia, SC
PH. (803) 741-9000 terracon.com

SHOVEL TEST MAP

Colleton County EOC
Colleton County, SC

FIGURE

10



Figure 11. Representative Soil Profile, STP 1.



Figure 12. Representative Soil Profile, STP 8.

Site 38CN1175
UTM: 17S 528373E, 3638559N
Site Size: 45 m N/S by 60m E/W
Elevation: 94 to 96 amsl
Environmental Setting: Grassy Area with Mixed Pine/Hardwood, Light Scrub Brush
Soils: Blanton loamy fine sand. 0-6% slopes
Surface Visibility: 10-20%
Field Procedures: Shovel Testing (*n*=20)
Cultural Affiliation: Historic 20th c.
Site Function: Historic–Artifact Scatter
Site Integrity: Poor
Recommendations: Not Eligible; No Further Work

Site Description: Site **38CN1175** was recorded during the current survey, the area surrounding the mapped site boundaries was excavated at 15-meter intervals to delineate the site. The site could not be fully delineated due to project boundary restrictions (**Figure 10**). In addition, an intensive pedestrian inspection of the area was conducted to look for above ground features such as structural remains. Shovel testing yielded 65 artifacts from 5 positive shovel tests, and the pedestrian survey yielded 15 artifacts from two surface artifact scatters. STP D4 stands for "Delineation 4" when the site was tested out (**Table 3)**.

Table 3. Artifacts Recovered from Site 38CN1175

Provenience	Depth (cmbs)	Description	Total Number
STP 11	0-25	Glass: Misc. shard (Green)	1
STP 11	0-25	Glass: Misc. shard (Aqua)	2
STP 11	0-25	Architectural (Brick)	3
STP 11	0-25	Glass: Misc. shard (Colorless)	2
STP 11	0-25	Modern (Plastic)	1
STP 11	0-25	Clothing (Button)	1
STP 13	0-15	Architectural (Brick)	1
STP 13	30-50	Metal/Hardware (Fence Wire)	2
STP 14	0-20	Glass: Container (Colorless)	1
STP 14	30-50	Metal/Hardware (Nail, Cut)	1
STP 14	70-80	Glass: Container (Colorless)	1
STP 15	10-25	Glass: Container (Colorless) Bottle	1
STP 15	30-60	Glass: Container (Colorless)	1
STP 15	30-60	Metal/Container: Beer can frag.	1
STP 15	30-60	Metal/Container: Beer can frag.	1
STP 15	30-60	Metal/Container: Beer can pull tab	1

Provenience	Depth (cmbs)	Description	Total Number
STP 15	30-60	Metal/Container: Beer can pull tab	1
STP 15	30-60	Glass: Container (Colorless) Liquor Bottle	1
STP 15	30-60	Glass: Container (Colorless) Mason Bottle Jar	1
STP 15	30-60	Glass: Container (Colorless) Bottle Jar	1
STP 15	30-60	Glass: Container (Colorless) Mason Bottle Jar	1
STP 15	60-75	Metal/Hardware (Nail, Cut)	1
STP 15	60-75	Metal/UID Metal	4
STP D4	0-15	Glass: Container (Colorless)	1
STP D4	0-15	Glass: Container (Amber)	1
STP D4	0-15	Metal/UID Metal	5
STP D4	15-25	Metal/UID Metal	1
STP D4	15-25	Glass: Container (Colorless)	1
STP D4	15-25	Glass: Container (Amber)	1
STP D4	40-65	Glass: Flat (Window)	1
STP D4	40-65	Metal/UID Metal	1
STP D4	40-65	Metal/UID Metal	2
STP D4	40-65	Metal/Hardware	3
STP D4	40-65	Metal/Hardware	1
STP D4	40-65	Glass: Container (Amber)	5
STP D4	40-65	Glass: Container (Colorless)	11
Surface Find 1	N/A	H. Ceramic: Refined Earthenware (Whiteware)	1
Artifact Scatter 1	N/A	Architectural (Brick)	2
Artifact Scatter 1	N/A	Architectural (Brick)	1
Artifact Scatter 1	N/A	Glass: Container (Colorless)	1
Artifact Scatter 1	N/A	Glass: Container (Colorless)	1
Artifact Scatter 1	N/A	Architectural (Mortar)	2
Artifact Scatter 2	N/A	Architectural (Mortar)	1
Artifact Scatter 2	N/A	Glass: Flat (Window)	4
Artifact Scatter 2	N/A	Architectural (Brick)	1

Artifact Scatter 2	N/A	Architectural (Brick)	1
Total			**80**

Artifacts recovered from the site included brick fragments, cut nails, corroded metal, glass shards, glass bottles, window glass, refined earthenware sherds, metal fence wire, mortar fragments, and metal pull tab style beer cans. Materials generally suggested a twentieth century component associated with the former residence and possible secondary dumping.

The majority of materials recovered consisted of metal fragments (either unidentified or identified) and colorless glass shards. In addition to subsurface artifacts, two surface scatters of modern and recent historic materials was noted around the former house site.

Surface artifacts included a refined earthenware sherd, brick fragments, mortar fragments, flat glass (window), and colorless container glass.

Temporally diagnostic materials include two mid-twentieth century Old Milwaukee pull tab style beer cans and one sherd of refined earthenware whiteware (dated from 1815 to the present time).

Two surface scatters consisting of brick, mortar, glass sherds, a modern water supply well was observed, and other miscellaneous metal fragments were noted. **Figures 13–15** show views of the site.

Soils at the site were similar to the surrounding parcel, consisting of up to 30 cm of dark gray (10YR 4/1) sand over 30 to 70 cm of yellowish brown (10YR 5/4) sand, over 70 to 80 cm of very pale brown (10YR 7/4) sand. The majority of the artifacts were recovered from depths of 15 cm to 65 cm below surface (n=27; 34% of the whole artifact total).

Summary and Recommendations: This site consists of a low-density subsurface and surface scatters of historic period materials with known structural remains from a house that shows up on aerial photographs from 1957 through 2023. Historical maps depict two structures in the project area on the Walterboro SC 1988 map. The house has since been demolished sometime after 2023.

The site is not associated with events (Criterion A) or persons (Criterion B) significant to local or regional history. The artifact scatter remains are limited to piles of bricks, mortar, glass fragments, an old well pipe, and other miscellaneous metal fragments, and do not retain integrity nor qualify the site as unique or significant under Criterion C. The archaeological remains do not have the potential to yield significant or unique information regarding local or regional history (Criterion D). This site is recommended Not Eligible for the NRHP under Criteria A–D; no additional archaeological work is recommended for this location.



Figure 13. Artifact Scatter One, facing North-Northeast.



Figure 14. Artifact Scatter Two, facing North-Northeast.



Figure 15. Overview of Site, facing South

7.0 CONCLUSIONS

Terracon, on behalf of Johnson Laschober & Associates PC (JLA), has completed an archaeological survey of the proposed 375 Sniders Highway project in Colleton County, South Carolina. As a result of the archaeological survey, one new archaeological site was recorded (38CN1175). Based on the results of the current investigation, this site is recommended Not Eligible for the NRHP. Terracon recommends that the project should be allowed to proceed without concern for impacts to significant cultural resources.

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APPENDIX A: ARTIFACT CATALOG

Cat. No.	Provenience	Strat	Artifact Depth	Total Number	Weight (g)	Description	Period Type	Class	Descript for Rpt	Category	Subcategory	Description/Type	Pattern Group	Portion
1.00	STP 11	1	0-25 CMBS	1	1.1	Glass, Container	Historic	Glass	Miscellaneous Shard	Miscellaneous Shard		Green	Kitchen	Fragment
1.01	STP 11	1	0-25 CMBS	2	0.5	Glass, Container	Historic	Glass	Miscellaneous Shard	Miscellaneous Shard		Aqua	Kitchen	Fragment
1.02	STP 11	1	0-25 CMBS	3	3.2	Architectural (Brick)	Historic	Architectural	Brick	Brick			Architectural	
1.04	STP 11	1	0-25 CMBS	2	0.00	Glass, Container	Historic	Glass	Miscellaneous Shard	Miscellaneous Shard		Colorless	Kitchen	Fragment
1.05	STP 11	1	0-25 CMBS	1	0.00	Plastic/Modern	Historic/Modern	Plastic	Plastic			Brown		Fragment
1.06	STP 11	1	0-25 CMBS	1	0.2	Clothing	Historic	Button	Personal Item	Personal Item		White		
2.00	STP 13	1	0-15 CMBS	1	6.4	Architectural (Brick)	Historic	Architectural	Brick	Brick			Architectural	
2.01	STP 13	2	30-50 CMBS	2	17.1	Metal/Hardware	Historic	Metal	Metal	Hardware		Fence Wire	Architectural	
3.00	STP 14	1	0-20 CMBS	1	1.8	Glass, Container	Historic	Glass	Container	Container		Colorless	Kitchen	Rim
3.01	STP 14	2	30-50 CMBS	1	4.1	Metal/Hardware	Historic	Metal	Nail	Nail	Cut		Architectural	
3.02	STP 14	3	70-80 CMBS	1	3.2	Glass, Container	Historic	Glass	Container	Container		Colorless	Kitchen	Fragment
4.00	STP 15	1	10-25 CMBS	1	155.9	Glass, Container	Historic	Glass	Container	Container		Colorless	Kitchen	Full-Intact
4.01	STP 15	2	30-60 CMBS	1	1.5	Glass, Container	Historic	Glass	Container	Container		Colorless	Kitchen	Fragment
4.02	STP 15	2	30-60 CMBS	1	2.1	Metal/Container	Historic	Metal	Container	Container			Kitchen	Fragment
4.03	STP 15	2	30-60 CMBS	1	6.3	Metal/Container	Historic	Metal	Container	Container			Kitchen	Fragment
4.04	STP 15	2	30-60 CMBS	1	116.4	Metal/Container	Historic	Metal	Container	Container			Kitchen	Full-Intact
4.05	STP 15	2	30-60 CMBS	1	119.6	Metal/Continaer	Historic	Metal	Container	Container			Kitchen	Full-Intact
4.06	STP 15	2	30-60 CMBS	1	220.04	Glass, Container	Historic	Glass	Container	Container		Colorless	Kitchen	Full-Intact
4.07	STP 15	2	30-60 CMBS	1	389.6	Glass, Container	Historic	Glass	Container	Container		Colorless	Kitchen	Full-Intact, except for broken Rim
4.08	STP 15	2	30-60 CMBS	1	397.9	Glass, Container	Historic	Glass	Container	Container		Colorless	Kitchen	Full-Intact
4.09	STP 15	2	30-60 CMBS	1	398.2	Glass, Container	Historic	Glass	Container	Container		Colorless	Kitchen	Full-Intact
4.10	STP 15	3	60-75 CMBS	1	16.9	Metal/Hardware	Historic	Metal	Nail	Nail	Cut		Architectural	
4.11	STP 15	3	60-75 CMBS	4	4.1	Metal/UID Metal	Historic	Metal	UID Metal	UID Metal	Unidentified			Fragment
5.00	STP D4	1	0-15 CMBS	1	4.5	Glass, Container	Historic	Glass	Container	Container		Colorless	Kitchen	Fragment
5.01	STP D4	1	0-15 CMBS	1	34	Glass, Container	Historic	Glass	Container	Container		Amber	Kitchen	Base
5.02	STP D4	1	0-15 CMBS	5	23.6	Metal/UID Metal	Historic	Metal	UID Metal	UID Metal	Unidentified			Fragment
5.03	STP D4	2	15-25 CMBS	1	6.2	Metal/UID Metal	Historic	Metal	UID Metal	UID Metal	Unidentified			Fragment
5.04	STP D4	2	15-25 CMBS	1	5.9	Glass, Container	Historic	Glass	Container	Container		Colorless	Kitchen	Fragment
5.05	STP D4	2	15-25 CMBS	1	8.9	Glass, Container	Historic	Glass	Container	Container		Amber	Kitchen	Fragment
5.06	STP D4	3	40-65 CMBS	1	4	Glass, Flat	Historic	Glass	Flat Glass	Flat Glass	Window Glass	Colorless	Architectural	Fragment
5.07	STP D4	3	40-65 CMBS	1	3.9	Metal/UID Metal	Historic	Metal	UID Metal	UID Metal				Fragment
5.08	STP D4	3	40-65 CMBS	2	14.4	Metal/UID Metal	Historic	Metal	UID Metal	UID Metal				Fragment
5.09	STP D4	3	40-65 CMBS	3	3.6	Metal/Hardware	Historic	Metal	Nail	Nail	Cut		Architectural	Fragment
5.10	STP D4	3	40-65 CMBS	1	3.5	Metal/Hardware	Historic	Metal	Nail	Nail	Cut		Architectural	Fragment
5.11	STP D4	3	40-65 CMBS	5	89.7	Glass, Container	Historic	Glass	Container	Container		Amber	Kitchen	Fragment
5.12	STP D4	3	40-65 cmbs	11	34	Glass, Container	Historic	Glass	Container	Container		Colorless	Kitchen	Fragment
6.00	Surface Find 1	N/A	N/A	1	57.4	Historic Ceramic: Refined Earthenware	Historic	H. Ceramic	Refined Earthenware	Refined Earthenware	Whiteware	White	Kitchen	Fragment
7.00	Artifact Scatter 1	N/A	N/A	2	31.2	Architectural (Brick)	Historic	Architectural	Brick	Brick			Architectural	Fragment
7.01	Artifact Scatter 1	N/A	N/A	1	355.1	Architectural (Brick)	Historic	Architectural	Brick	Brick			Architectural	Fragment
7.02	Artifact Scatter 1	N/A	N/A	1	4.7	Glass, Container	Historic	Glass	Container	Container		Colorless	Kitchen	Fragment
7.03	Artifact Scatter 1	N/A	N/A	1	26.1	Glass, Container	Historic	Glass	Container	Container		Colorless	Kitchen	Fragment
7.04	Artifact Scatter 1	N/A	N/A	2	168.1	Architectural (Mortar)	Historic	Architectural	Mortar	Mortar			Architectural	Fragment
7.05	Artifact Scatter 2	N/A	N/A	1	42.6	Architectural (Mortar)	Historic	Architectural	Mortar	Mortar			Architectural	Fragment
7.07	Artifact Scatter 2	N/A	N/A	4	29.4	Glass, Flat	Historic	Glass	Flat Glass	Flat Glass	Window Glass	Colorless	Architectural	Fragment
7.08	Artifact Scatter 2	N/A	N/A	1	218.8	Architectural (Brick)	Historic	Architectural	Brick	Brick			Architectural	Fragment
7.09	Artifact Scatter 2	N/A	N/A	1	430.91	Architectural (Brick)	Historic	Architectural	Brick	Brick			Architectural	Fragment