



REQUEST FOR BIDS

FOR

Maggie Harris Road Bridge Replacement over Branch of Little River West Fork

Project Number: 13921.04

Bids Due: Tuesday, February 20, 2024, at 10:00 AM

Length: 0.007 Miles

Type: Bridge Replacement in Fairfield County, SC

Engineer: Davis & Floyd, Inc (D|F)

Contractor: _____

Address: _____

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SECTION I: NOTICE TO CONTRACTORS

PROJECT NAME: Maggie Harris Road Bridge Replacement

PROJECT NUMBER: 13921.04

PROJECT LOCATION: Fairfield County, SC

BID BOND/SECURITY: Required at 5% of the bid amount

PERFORMANCE BOND: Required at 100% of the bid amount

PAYMENT BOND: Required at 100% of the bid amount

DBE PARTICIPATION: Encouraged at 5% or greater

DESCRIPTION OF PROJECT: Replace Bridge over Branch of Little River West Fork in Fairfield County

AGENCY/OWNER: FAIRFIELD COUNTY, 250 N. Walnut Street, Winnsboro SC 29180

ENGINEER: DAVIS & FLOYD, INC (D/F): Project Manager, Rob Stevenson, 1319 Highway 72/221 E Greenwood, SC 29649 Phone: 864-229-5211 Email: rstevens@davisfloyd.com

QUESTIONS: All questions, requests, and correspondence shall be addressed to the Project Manager, Rob Stevenson. All questions concerning the Bid Documents shall be in writing and submitted by COB **February 9, 2024**.

PLANS AND BID DOCUMENTS ON FILE: Fairfield County Procurement Office, DAVIS & FLOYD, INC (D/F) Greenwood, SC

PLAN DEPOSIT: Bid Documents may be obtained as a hard copy from the Engineer for \$200.00 non-refundable fee or electronic copy for no charge.

PRE-BID CONFERENCE: There will be no pre-bid conference. Any questions or concerns should be addressed by email only to Rob Stevenson, at rstevens@davisfloyd.com. All questions with answers will be forwarded to all known plan holders.

BID CLOSING AND OPENING: Tuesday, February 20, 2024, 10:00 AM

BID SUBMITTAL: Submit Sealed Bids clearly marked "RFB: 13921.04" with the bidder's name, address, and South Carolina contractor license number on the envelope to: Fairfield County Procurement, Attn: Ms. Cathy Washington, County Government Complex, 250 North Walnut Street, Winnsboro SC 29180"

SUBSTANTIAL COMPLETION: Project will be completed within 240 calendar days from notice to proceed.

**IF YOU DOWNLOAD THIS
DOCUMENT WITH INTENT TO BID,
PLEASE EMAIL ROB STEVENSON AT
RSTEVENSON@DAVISFLOYD.COM
TO RECEIVE ANY
ADDENDA OR OTHER
MODIFICATIONS THAT MAY BE ISSUED
AT A LATER DATE**

SECTION II: GENERAL CONDITIONS AND CONTRACT

GENERAL CONDITIONS

1. BID INSTRUCTIONS AND SUBMITTAL:

- a. Bids shall be publicly opened at the time and place as indicated in the Notice to Contractors.
- b. Sealed bids shall be enclosed and secured in an envelope bearing the markings as described under Bid Submittals in the Notice to Contractors. Bids shall be addressed to the Fairfield County Procurement Office, Attention: Ms. Cathy Washington, County Government Complex, 250 North Walnut Street, Winnsboro, SC 29180.
- c. Bids shall be submitted no later than **February 20, 2024, at 10:00 AM**, if mailed or hand delivered in the places and manners as described in paragraph b above and on the date indicated by the Notice to Contractors. Bids received after these times are considered late bids. Late bids shall not be considered unless the delay was caused by improper handling by the County's employees.
- d. The County shall not accept responsibility for unidentified bids.
- e. In the event that a bid is unintentionally opened prior to the official time set for the bid opening, the employee opening such bid shall immediately inform the Procurement Officer or his/her assistant who shall, in the presence of another of equal rank or above, immediately contact the vendor submitting the bid.
- f. The vendor so contacted will be informed as to the circumstances and shall be invited to come to the office of Procurement to reseal and submit or withdraw the bid, if the vendor elects to reseal and submit the bid, such vendor shall be required to sign, date and indicate the time of resealing on the bid envelope. If the vendor directs the Procurement Office to reseal the bid, both the employee making the contact to the vendor and the owner witness present, shall sign, date and indicate the time of sealing on the bid envelope.
- g. In the event that the Procurement Office is directed by the vendor to return the bid, a statement properly witnessed stating the action taken and when, shall be duly filed.
- h. All prices and quotations shall be entered in ink or typewritten and shall remain firm for no less than sixty (60) days from the date of the bid. Mistakes may be crossed out and corrections inserted adjacent there to and shall be initialed in ink by the person signing the bid. The bidder shall insert the net price per stated unit and the extension against each item, which he/she proposed to deliver. The price shall include in the grand total column all delivery charges, installation and applicable taxes when necessary.
- i. Bids Will Not Be Considered unless the bidder is legally qualified under the provisions of the South Carolina Contractor's Licensing Law (South Carolina Code of Laws as amended).
- j. Bids Will Not Be Considered unless accompanied by a sealed, bidder's bond, for 5 percent (5%) of the amount of the bid. Bid bond will be duly executed by the bidder as principal & having as surety thereon a surety company licensed to do business in the State of South Carolina. Successful bidder will be required to furnish a satisfactory performance & payment bond each in the amount of 100 percent (100%) of the bid.
- k. The County Reserves the Right to accept or reject any & all responses, to waive technicalities & informalities, to negotiate further with the Contractor of its choice, & to request additional information, to interview & to make an award deemed in its own best interest. All submittals shall become property of the County and is subject to the Freedom of Information Act (FOIA) regulations.

2. TAXES: When applicable, South Carolina sales tax shall be shown as a separate entry on the bid total summation. In other words, there shall be a bid subtotal with South Carolina tax added in to create a grand total. When required, exemption certificates shall be furnished on forms provided by the vendor.

3. PROPRIETARY INFORMATION: Bidders shall visibly mark as "CONFIDENTIAL" each part of their bid which considers proprietary information. Price may not be considered confidential proprietary information.
4. AMBIGUOUS BIDS: Bids which are uncertain as to terms, delivery, quantity, or compliance with requirements and/or specifications may be rejected or otherwise disregarded.
5. COVENANT AGAINST CONTINGENT FEES: The vendor warrants that no person or selling agency has been employed or retained to solicit or secure this contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the vendor for the purpose of securing business. For breach or violation of this warranty, Fairfield County shall have the right to annul this contract without liability or in its discretion to deduct from the contract price or consideration, or otherwise recover the full amount of such commission, percentage, brokerage, or contingent fee.
6. BIDDER'S QUALIFICATIONS: Bids shall be considered only from bidders who are regularly established in the business called for and who in the judgment of the Owner are financially responsible and able to show evidence of their reliability, ability, experience, equipment supervised by them to render prompt and satisfactory service in the volume called for under this contract. **Bids Will Not Be Considered unless the bidder is legally qualified under the provisions of the South Carolina Contractor's Licensing Law (South Carolina Code of Laws as amended). Interested bidders must be on current SCDOT prequalified prime contractors list to be eligible for Fairfield County Road Paving and/or Grading Projects.**
7. ACKNOWLEDGEMENT OF AMENDMENTS TO REQUEST FOR BIDS:
 - a. Bidders shall acknowledge receipt of any amendments to this solicitation either by signing and returning one (1) copy of the amendment or by letter or by telegram or by fax, or e-mail and by acknowledging the amendment on the Bid Form.
 - b. Fairfield County must receive the acknowledgment by the time, date, and at the place specified for receipt of bids.
8. AFFIRMATIVE ACTION: The successful bidder will take affirmative action in complying with all Federal and State requirements concerning fair employment, employment of the handicapped, and concerning the treatment of all employees, without regard or discrimination by reason of race, color, religion, sex, national origin and/or physical handicap and to ENSURE EQUAL EMPLOYMENT OPPORTUNITY is provided for as applicable.
9. EXPLANATION TO PROSPECTIVE BIDDERS:
 - a. Any prospective bidder desiring an explanation or interpretation of this solicitation shall request it in writing soon enough to allow a reply to reach all prospective bidders before submission of their bids.
 - b. Oral explanation and/or instructions given before the award of the contract shall not be binding.
 - c. Any information given to a prospective bidder pertaining to this solicitation shall be furnished promptly to other prospective bidders as an amendment, if that information is necessary in submitting bids or if the lack of it would be prejudicial to other prospective bidders.
10. AWARDING POLICY: The County reserves the right to select and award on an individual item basis, lot (group) basis or an "all or none" basis, whichever the County determines to be most advantageous. Therefore, individual prices per item must be indicated on the bid form. Bidders are encouraged to offer discounts for consideration of consolidated award. Furthermore, the County in determining the lowest responsible bidder on each of the items shall consider, in addition to the bid prices, the quality, training, suitability and adaptability of the services required by this solicitation. The County reserves the right to reject or accept any or all bids and to waive any informalities and/or irregularities thereof.

In the event that identical bids are received on like items, the Procurement Officer, subject to the

approval of the County Administrator, shall award bids by whichever of the following procedures is deemed most appropriate under the circumstances:

- a. Award to the firm whose primary business establishment is physically located:
 - i. within the boundaries of Fairfield County; and
 - ii. within the boundaries of the State of South Carolina.
- b. If all of the above are equal, the County shall award by a toss of a coin with all interested parties given an opportunity to witness. The County shall have a minimum of two witnesses for the coin toss.

11. WITHDRAWAL OF BIDS: Any bidder may withdraw his bid prior to the closing time scheduled for the receipt of bids. No bid shall be withdrawn for a period of sixty (60) days after the schedule closing time for the receipt of bids. The County reserves the right to award contracts for a period of sixty (60) days.
12. SUBMISSION OF DATA: Each bidder, upon request, shall submit evidence of Liability Insurance, Workmen's Compensation (if required), and other data regarding experience relating to this bid and proposes to satisfy the requirements of this solicitation and fulfillment of a contract.
13. ACCIDENTS: The vendor shall hold the County harmless from any and all damages and claims that may arise by reason of any negligence on the part of the vendor, his agents or employees in the performance of this contract. In case any action is brought against the County or any of its agents or employees, the vendor shall assume full responsibility for the defense thereof. Upon his failure to do so after proper notice, the County reserves the right to defend such motion and charge all costs thereof to the vendor. The vendor shall take all precautions necessary to protect the public against injury.
14. STATEMENT OF COMPLIANCES AND ASSURANCES: By submitting a bid and signing the bid schedule, vendors are providing written assurance of non-collusion and understanding, and acceptance of all general and special conditions stated in this contract. In addition, this signature certifies that the firm or agency represented in the bid submitted complies with all applicable federal and state laws and regulations.
15. BIDDERS RESPONSIBILITY: Each bidder shall fully acquaint himself/herself with conditions relating to the scope and restrictions attending the execution of the work under the conditions of this bid. It is expected that this will sometimes require on-site observation. The failure or omission of bidder to acquaint himself/herself with existing conditions shall in no way relieve the bidder of any obligations with respect to this bid or contract.
16. FAILURE TO SUBMIT BID: Recipients of this solicitation not responding with a bid should not return this solicitation, unless it specified otherwise. Instead, they should advise the issuing office by letter or postcard whether they want to receive future consideration for similar requirements. If a recipient does not submit a bid or fails to respond by submitting a "no bid" for three (3) consecutive bids for the same commodity, they shall be removed from the applicable vendor list.
17. EXAMINATION OF RECORDS:
 - a. The County Administrator of Fairfield County or his duly authorized representative(s) and/or duly authorized representative(s) from the office of the County Auditor shall, until three (3) years after final payment under this contract, have access to and the right to examine any of the Contractors' directly pertinent books, documents, papers, or other records involving transactions related to this contract.
 - b. He/She agrees to include in first-tier subcontracts under this contract a clause to the effect that the County Administrator of Fairfield County or his duly authorized representative(s), and/or duly authorized representative(s) from the office of the County Auditor shall, until three (3) years after final payment under the subcontract, have access to and the right to examine any of the subcontractors' directly pertinent books, documents, papers or other records involving transactions related to the subcontract(s).

18. MATERIALS REQUIRED: Materials required must be in conformity with the specifications and shall be subject to inspection and approval after delivery and shall comply in quality and type of material and method of manufacture with all applicable local or state laws pertaining thereto. The right is reserved to reject and return at the risk and expense of the vendor such portions of any shipment which may be defective or fail to comply with specifications and without validating the remainder of the order.
19. "OR APPROVED EQUAL" CLAUSES: Certain processes, types of equipment or kinds of materials are described in the specifications and on the drawings by means of trade names and catalog numbers. In each instance where this occurs, it is understood and inferred that such description is followed by the words "or approved equal". Such method of description is intended merely as a means of establishing a standard of comparison. However, the County reserves the right to select the items which, in the judgment of the County, are best suited to the needs of the County, based on price, quality, service, availability and other relative factors. Bidders must indicate brand name, model, model number, size, type, weight, color, etc., of the item bid if not exactly the same as the item specified. Vendor's stock number or catalog number is not sufficient to meet this requirement. If any bidder desires to furnish an item different from that specifically mentioned in the specifications, he/she shall submit with his bid the information, data, pictures, cuts, designs, etc., of the material he/she plans to furnish so as to enable the County to compare the material specified; and, such material will be given due consideration. The County reserves the right to insist upon and receive the items as specified, if the submitted items do not meet the County's standards for acceptance.
20. PATENTS: The vendor shall hold the County, its officers, agents, and employees harmless from liability of any nature or kind whatsoever, on account of use by the publisher or author, manufacturer or agent, of any copyrighted or copyrighted composition, secret process, article or appliance furnished or used under this bid.
21. INSTALLATION: Where equipment is called for to be installed under this bid, it shall be placed, leveled and accurately fastened into place by the vendor. He/she shall be responsible for obtaining dimensions and other such data which may be required to assure exact fit to work under another contract or as intended by the County. The vendor shall be responsible providing an appropriate amount of lead-in to equipment requiring electrical, water or other basic service. The County will normally be responsible for bringing the appropriate service to the lead-in. The vendor shall completely remove from the premises all packing, crating, and other letter due to his/her work. He/she shall also be responsible for the cost of repair of any damage to existing work which is caused by him/her equipment.
22. GUARANTEE: The vendor shall supply a guarantee for all workmanship for the equipment the/she is furnishing for a period comparable to the standards in the industry. When defects or faulty material is discovered during the guarantee period, the vendor shall, immediately, upon notification by the County, proceed at his/her own expense, to repair or replace the same, together with any damage to all finishes, equipment, and furnishings that may have been damaged as a result of the defective equipment or workmanship.
23. PROPER INVOICE: Invoices submitted for payment for goods or services provided under this Contract, shall contain, as a minimum the following information:
- Name of business concern
 - Contract number or other authorization for delivery of service or property
 - Complete description
 - Price and quantity of property or service delivered or executed
 - Name where applicable
 - Title, telephone number and complete mailing address of responsible official to whom payment is to be sent; and other substantiating documentation of information as required by the contract or owner.

24. CONFLICTS IN SPECIFICATIONS: When contract language or specifications are in conflict, the Engineer shall choose the language/specification that is applicable to the project condition covered, and shall generally choose the more stringent, restrictive or costly language/specification.
25. SERVICE FACILITIES: In considering the services bid upon, the County shall take into consideration past performance of existing work and installations, service and facilities provided by the bidder. The bidder shall have available a local organization that is trained in proper construction methods.
26. S.C. LAW CLAUSE: Upon award of a contract under this bid, the person, partnership, association, or corporation to whom the award is made must comply with the laws of South Carolina which require such person or entity to be authorized and/or licensed to do business in this State. Notwithstanding the fact that applicable statutes may exempt or exclude the successful bidder from requirements that it be authorized and/or licensed to do business in this State, by submission of this signed bid, the bidder agrees to subject itself to the jurisdiction and process of the courts of the State of South Carolina as to all matters and disputes arising or to arise under the contract and the performance thereof, including any questions as to the liability for taxes, licenses, or fees levied by the State.
27. COMPETITION: There are no Federal or State laws that prohibit bidders from submitting a bid lower than a price or bid given to the United States Government. Bidders may bid lower than the United States Government Contract price without any liability because the State is exempt from provisions of the Robinson-Pitman Act and other related laws.
28. EXCUSABLE DELAY: The Contractor shall not be liable for any excess costs of the failure to perform the contract arising out of causes beyond the control and without the fault or negligence of the Contractor. Such causes may include, but are not restricted to acts of God or of the public enemy, acts of the Government in either its sovereign or contractual capacity, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and unusually severe weather; but, in every case the failure to perform must be beyond the control and without the fault or negligence of Contractor. If the failure to perform is caused by the default of a subcontractor, and if such default arises out of causes beyond the control of both the Contractor and subcontractor, and without the fault or negligence of either of them, the Contractor shall not be liable for any excess costs or failure to perform, unless the supplies or services to be furnished by the subcontractor were obtainable from other sources in sufficient time to permit the Contractor to meet the required delivery schedule.
29. ASSIGNMENT: No contract may be assigned, sublet, or transferred without a written consent of the Procurement Officer.
30. SPECIFICATIONS: Any deviation from specifications indicated herein must be clearly pointed out; otherwise, it will be considered that items offered are in strict compliance with these specifications, and the successful bidder shall be held responsible thereof.
31. INCORPORATION BY REFERENCE: The contents of this Request for Bids, including all drawings, attachments, specifications, and any addenda, will become part of the contract for this Project.
32. PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS:
- a. The Contractor shall preserve and protect all structures, equipment, and vegetation (such as grass, trees, and shrubs) or on or adjacent to the work sites, which are not to be removed and which do not unreasonably interfere with the work required under this contract. The Contractor shall only remove trees when specifically authorized to do so and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during contract performance, or by any careless operation of equipment, or by workman, the

- Contractor shall trim those limbs or branches with a clean cut and paint the cut with tree pruning compound as directed by the Engineer.
- b. The Contractor shall protect from damage all existing improvements and utilities at or near the work site and on adjacent property of a third party, the locations of which are known to or should be known by the Contractor. The Contractor shall repair any damage to those facilities, including those that are the property of a third party resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refuses to repair the damage promptly, the County representatives(s) may recommend that the necessary work be performed and charge the cost to the Contractor.
33. **BID FORMS:** Documentation contained in Section "V" shall be completed and submitted along with the Proposal. A bid bond as required by these General Conditions shall also be included.
34. **TERMINATION:** Subject to the provisions below, the contract may be terminated by the Procurement Officer providing a thirty (30) day advance notice in writing is given to the Contractor.
- a. Termination for Convenience. In the event that this contract is terminated or cancelled upon request and for the convenience of the County without the required thirty (30) day advance notice, then the County shall negotiate reasonable termination costs, if applicable.
- b. Termination for Cause. Termination by the County for cause, default or negligence on the part of the Contractor shall be excluded from the foregoing provisions; termination costs, if any, shall not apply. The thirty (30) day advance notice requirement is waived and the default provision in this bid shall apply.
35. **SAFETY AND PROTECTION:** Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to all persons on the Site or who may be affected by the Work, all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.
36. **SECURITY REQUIRED:**
- a. Bid Security – Each Bid must be accompanied by a Bid Bond acceptable to the County. Bid Bonds must be issued by a corporate surety registered and authorized to do business in the State of South Carolina. Bid Bonds shall be payable to the County, shall be for at least five (5%) percent of the total amount of the Bid, and shall serve as a guaranteed deposit that the bid will be carried out to the complete satisfaction of the County.
- b. Forfeiture of Bid Security – Nonperformance by the successful Bidder, or its failure to execute the Contract and meet performance and payment bond requirements and insurance requirements within five (5) calendar days after issuance of Notice of Award, shall result in its bid security being forfeited as liquidated damages, and the Notice of Award and Contract will be rescinded and awarded to another Bidder. Withdrawal or attempted withdrawal of a Bid after the closing date and time but prior to sixty (60) calendar days after the closing date may also result in forfeiture of bid security.
- c. Return of Bid Security – Bid security will be returned to all bidders after the successful Bidder has executed the Contract and delivered all required bonds and insurance certificates. Unsuccessful Bidders will not be entitled to any interest earnings on returned funds.
- d. Payment and Performance Security
- i. The successful Bidder shall provide Performance and Payment Bonds, in a form satisfactory to the County (see Attached "Sample Forms"), in the following amounts no later than at the time of execution of the Contract:

- Payment Bond: 100% of the total amount of the Contract.
- Performance Bond: 100% of the total amount of the Contract.
- ii. The aforesaid Payment and Performance Bonds must be issued by a corporate surety registered and authorized to do business in South Carolina and must be counter-signed by a licensed, authorized South Carolina agent.
- iii. Attorneys-in-fact who sign Bid Bonds or Performance Bonds must file with each Bond a certified and effective, dated copy of their power of attorney.
- iv. The time to be covered by the Performance Bond shall commence on the date of execution of any contract resulting from this RFB and terminate upon final payment to Bidder by County. The time to be covered by the Payment Bond shall commence on the date of execution of any contract resulting from this RFB and terminate twelve (12) months after the date of final acceptance of the Work by the County.
- v. Contractor shall execute the attached Form of Agreement upon contract award.

37. CHANGE ORDER:

- a. A Change Order is a written order to the Contractor, signed by the authorized County representative, directing changes in the work within the provisions of the Contract.
- b. A Change Order is used to change contract quantities for items with unit prices, provide for incentives, penalties, and adjustments for unit price items as provided in the original Contract, delete contract items, and revise contract time.
- c. A Change Order may include written agreement made and entered into by and between the Contractor and the Owner, covering alterations and unforeseen work incidental to the proper completion of the project, when such work is paid for at an agree unit or lump sum price. Such Change Order becomes a part of the Contract when approved and properly executed.

38. PERMITS/LICENSING: It shall be the responsibility of the contractor to comply with County Ordinances by securing necessary permits and licenses.

39. ENVIRONMENTAL MANAGEMENT: Vendor/Supplier/Contractor will be responsible for complying with all federal, state, and local environmental regulations relating to transportation, handling, storage, spillage and any other aspect of providing the services specified herein, as applicable.

40. SITE INSPECTION:

- a. The bidder is expected to have become familiar with and take into consideration, site conditions which may affect the work and to check all dimensions at the site.
- b. Each bidder shall acquaint themselves thoroughly as to the character and nature of the work to be done. Each bidder furthermore shall make a careful examination of the site of the work and inform themselves fully as to the difficulties to be encountered in performance of the work, the facilities for delivering, storing and placing materials and equipment and other conditions relating to construction and labor.
- c. The bidder shall examine the premises and the site and compare them with any applicable drawings and specifications. He/she shall familiarize themselves with the existing conditions such as obstructive area levels and any problems related to erecting the required systems.
- d. No plea of ignorance of conditions that exist or may hereafter exist on the site of the work, or difficulties that may be encountered in the execution of the work, as a result of failure to make necessary investigations and examinations, will be accepted as an excuse for any failure or omission on the part of the Contractor to fulfill in every detail all the requirements of the contract documents and to complete the work for the consideration set forth therein, or as a basis for any claim whatsoever.
- e. Insofar as possible, the Contractor, in carrying out his/her work, must employ such methods or means as will not cause interruption of or interference with the work of any other Contractor, or County personnel at the site.

FORM OF AGREEMENT**BETWEEN OWNER AND CONTRACTOR
FOR CONSTRUCTION CONTRACT**

THIS AGREEMENT is by and between FAIRFIELD COUNTY ("Owner") and
____ ("Contractor").

Owner and Contractor hereby agree as follows:

ARTICLE 1 – WORK

Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows: **Replace Maggie Harris Road Bridge over Branch of Little River West Fork in Fairfield County, SC.**

ARTICLE 2 – THE PROJECT

2.01 The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows:

Maggie Harris Road Bridge Replacement**ARTICLE 3 – ENGINEER**

3.01 The Project has been designed by *DAVIS & FLOYD, INC (D/F)*, (Engineer), which is to act as Owner's representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

ARTICLE 4 – CONTRACT TIMES**4.01 Time of the Essence**

- a. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 Dates for Substantial Completion and Final Payment

- a. **The project will be completed within 240 calendar days from notice to proceed and be ready for final payment in accordance with the General Conditions on or before the above dates.**

4.03 Liquidated Damages

- a. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial loss if the Work is not completed within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty), Contractor shall pay Owner **\$500.00** for each day that expires after the time specified in Paragraph 4.02 above for Substantial Completion until the Work is substantially complete.

ARTICLE 5 – CONTRACT PRICE

5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amounts determined in the bid documents:

- a. For all Work other than Unit Price Work, a lump sum of: \$ N/A
All specific cash allowances are included in the above price.
- b. For all Unit Price Work, an amount equal to the sum of the established unit price for each
- c. For all Work, at the prices stated in Contractor's Bid, attached hereto as an exhibit.

ITEM #	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	EXTENDED PRICE
STRUCTURAL					
2028100	Removal and Disposal of Existing Bridge	LS	NEC		
2052000	No. 57 Stone for Backfill	TON	52		
7011400	Conc. for Structures – Class 4000	CY	23.8		
7031200	Reinf. Steel for Structures (Bridge)	LBS	3,236		
7045991	3'-0" x 1'-9" Cored Slabs	LF	279.1		
7051005	Precast Barrier	LF	80		
7110010	Pile Driving Set-Up	EA	6		
7111530	Reinf. Pile Tips (HP12 x 74)	EA	6		
7112160	Steel H Bearing Piling (HP12 x 74)	LF	102.9		
7243100	Elastomeric Bearing	EA	14		
8143000	Waterproofing (Bridge Deck)	SY	106		
ROADWAY					
1031000	Mobilization	LS	NEC		
1032010	Bonds and Insurance	LS	1		
1050800	Construction Stakes, Lines and Grades	EA	1		
1071000	Traffic Control	LS	NEC		
2011000	Clearing and Grubbing within Right of Way	LS	NEC		
2031000	Unclassified Excavation	CY	122		
2081001	Fine Grading	SY	729		
3031006	Sand-Clay Base Course (6" Uniform)	CY	122		
3069900	Maintenance Stone	TON	20		
8041020	Rip-Rap (Class B)	TON	97		
8042800	Geotextile Fabric for Erosion Control under Rip-Rap (Class 2)	SY	156		
8051050	Pre-mash W-Beam Strong Post System WSP3	LF	100		
8051210	Pre-mash W-Beam Bridge Connection TL2 WBBC2	EA	4		
8057050	Pre-mash Type T TL2 Leading 25FT	EA	4		
8100100	Permanent	ACRE	0.3		
8100200	Temporary Cover	ACRE	0.3		

\$

(words)

The Bid prices for Unit Price Work set forth as of the Effective Date of the Agreement are based on estimated quantities. As provided in the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by Engineer as provided in of the General Conditions.

ARTICLE 6-- PAYMENT PROCEDURES

6.01 Submittal and Processing of Payments

Contractor shall submit Applications for Payment in accordance with the General Conditions.

Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02 Progress payments; Retainage

- a. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about the 15th day of each month during performance of the Work

as provided in Paragraph 6.02.A.1 below. All such payments will be measured by the schedule of values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no schedule of values, as provided in the General Requirements.

- b. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Engineer may determine or Owner may withhold, including but not limited to liquidated damages, in accordance with the General Conditions.
- c. 95 percent of Work completed (with the balance being retainage). If the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage; and
- d. 95 percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).
- e. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 95 percent of the Work completed, less such amounts as Engineer shall determine in accordance with the General Conditions and less 95 percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the tentative list of items to be completed or corrected attached to the certificate of Substantial Completion.

6.03 Final Payment

- a. Upon final completion and acceptance of the Work in accordance with the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer.

ARTICLE 7 - INTEREST

- 7.01 All moneys not paid when due as provided in the General Conditions shall bear interest at the rate of 12 percent per annum.

ARTICLE 8 – CONTRACTOR RESPONSIBILITIES

8.01 In order to induce Owner to enter into this Agreement, Contractor makes the following representations:

- a. Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.
- b. Contractor has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
- c. Contractor is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.
- d. Contractor does not consider that further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.
- e. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
- f. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
- g. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

ARTICLE 9 – CONTRACT DOCUMENTS

9.01 Contents

- a. The Contract Documents consist of the following:
- b. This Agreement
- c. Performance bond
- d. Payment bond
- e. General Conditions
- f. Standard Specifications and Drawings as referenced in the bid documents.
- g. The contents of the Request for Bids, including all drawings, attachments, specifications, special

- provisions, supplemental specifications, and any addenda
- h. Bridge drawings consisting of 15 pages and Roadway drawings consisting of 9 pages.
 - i. Addenda (numbers X to X, inclusive).
 - j. Exhibits to this Agreement (enumerated as follows):
 - k. Contractor's Bid
 - l. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:
 - 1. Notice to Proceed
 - 2. Work Change Directives.
 - 3. Change Orders.
 - 4. The documents listed in paragraph 9.01. and are attached to this agreement (except as expressly noted otherwise above)

There are no contract documents other than those listed in this Article 9.

The contract documents may only be amended, modified, or supplemented as provided in the General Conditions.

ARTICLE 10 – MISCELLANEOUS

10.01 Terms

- a. Terms used in this Agreement will have the meanings stated in the General Conditions and the Supplementary Conditions.

10.02 Assignment of Contract

- a. No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

10.03 Successors and Assigns

- a. Owner and Contractor each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

10.04 Severability

- a. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

10.05 Contractor's Certifications

- a. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 10.05:
 - 1. "Corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;
 - 2. "Fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
 - 3. "Collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
 - 4. "Coercive practice" means harming or threatening to harm, directly or indirectly, persons or

their property to influence their participation in the bidding process or affect the execution of the Contract.

10.06 Warranty

The Contractor agrees to a one-year warranty against defects, failures etc. caused by materials and workmanship, beginning on the date of final acceptance of punch list.

REMAINDER OF PAGE INTENTIONALLY LEFT BLANK

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement. Counterparts have been delivered to Owner and Contractor. All portions of the Contract Documents have been signed or have been identified by Owner and Contractor or on their behalf.

This Agreement will be effective on _____ 2023, (which is the Effective Date of the Agreement).

OWNER:Fairfield County, South Carolina

By: _____

Title: _____

CONTRACTOR

By: _____

Title: _____

(If Contractor is a corporation, a partnership, or a joint venture, attaches evidence of authority to sign.)

Attest: _____ Attest: _____

Title: _____ Title: _____

Address for giving notices:

Fairfield CountyPO Drawer 60Winnsboro, SC 29180

Address for giving notices:

License No.: _____

(Where applicable)

(If Owner is a corporation, attach evidence of authority to sign. If Owner is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)

Agent for service of process:

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that _____, as Principal, hereinafter called Contractor, and _____, as Surety, hereinafter called Surety, are held and firmly bound unto Fairfield County, 250 North Walnut Street, Winnsboro, SC 29180, as obligee, hereinafter called Owner, in the amount of: _____ Dollars (\$ _____), for the payment whereof Contractor and Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Contractor has entered into a certain contract with the Owner, dated _____ day of _____, 2023, for the construction of **MAGGIE HARRIS ROAD BRIDGE REPLACEMENT, RFB# 13921.04**, in accordance with the Drawings and Specifications prepared by DAVIS & FLOYD, INC, which contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if Contractor shall promptly and faithfully perform said Contract, then this obligation shall be null and void; otherwise, it shall remain in full force and effect.

The Surety hereby waives notice of any alteration or extension of time made by the Owner.

Whenever Contractor shall be, and declared by Owner to be in default under the Contract, the Owner having performed Owner's obligations there under, the Surety may promptly remedy the default, or shall promptly:

- 1) Complete the Contract accordance with its terms and conditions, or
- 2) Obtain a bid or bids for completing the Contract in accordance with its terms and conditions, and upon determination by Surety of the lowest responsible bidder, or, if the Owner elects, upon determination by the Owner and the Surety jointly of the lowest responsible bidder, arrange for a contract between such bidder and Owner, and make available as Work progresses (even though there should be a default or a succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the contract price; but not exceeding, including other costs and damages for which Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term "balance of the contract price", as used in this paragraph, shall mean the total amount payable by Owner to Contractor under the Contract and any amendments thereto, less the amount properly paid by Owner to Contractor.

Any suit under this bond must be instituted before the expiration of two (2) years from the date on which final payment under the Contract falls due.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the Owner named herein or the heirs, executors, administrators, or successors of the Owner.

Signed and sealed this _____ day of _____, 2023.

PRINCIPAL**SURETY**

Bidder's Name and Corporate Seal (Seal)

Surety's Name and Corporate Seal (Seal)

By: _____
Signature and Title

By: _____
Signature and Title
(Attach Power of Attorney)

Attest: _____
Signature and Title

Attest: _____
Signature and Title

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS, that _____, as Principal, hereinafter called Contractor, and _____, as Surety, hereinafter called Surety, are held and firmly bound unto Fairfield County, 250 North Walnut Street, Winnsboro, SC 29180, as obligee, hereinafter called Owner, in the amount of: _____ Dollars (\$ _____), for the payment whereof Contractor and Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal has entered into a certain contract with the Owner, dated _____ day of _____, 2023, for the construction of: **MAGGIE HARRIS ROAD BRIDGE REPLACEMENT, RFB# 13921.04**, in accordance with the Drawings and Specifications prepared by: DAVIS & FLOYD, INC (D|F): which contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if Principal shall promptly make payment to all claimants as hereinafter defined, for all labor and material used or reasonably required for use in the performance of the Contract, then this obligation shall be void; otherwise, it shall remain in full force and effect, subject, however, to the following conditions:

1. A claimant is defined as one having a direct contract with the Principal or with a Subcontractor of the Principal for labor, material, or both, used or reasonably required for use in the performance of the Contract, labor and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental of equipment directly applicable to the Contract.
2. The above named Principal and Surety hereby jointly and severally agree with the Owner that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work or labor was done or performed, or materials were furnished by such claimant, may sue on this bond for the use of such claimant, prosecute the suit to final judgment for such sum or sums as may be justly due claimant, and have execution thereon. The Owner shall not be liable for the payment of any costs or expenses of any such suit.
3. No suit or action shall be commenced hereunder by any claimant:
 - a) Unless claimant, other than one having a direct contract with the Principal, shall have given written notice to any two of the following: the Principal, the Owner, or the Surety above named, within ninety (90) days after such claimant did or performed the last of the work or labor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, Postage prepaid, in an envelope addressed to the Principal, Owner, or Surety, at place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the aforesaid project is located, save that such service need not be made by a public officer.
 - b) After the expiration of one (1) year following the date on which Principal Ceased Work on said Contract, it being understood, however, that if any limitation embodied in this bond is prohibited by any law controlling the construction hereof such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.
4. The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanics' liens which may be filed of record against said improvement, whether or not claim for the amount of such lien be presented under and against this bond.

Signed and sealed this _____ day of _____, 2022.

PRINCIPAL

(Seal)

Bidder's Name and Corporate SealBy: _____
Signature and TitleAttest: _____
Signature and Title**SURETY**

(Seal)

Surety's Name and Corporate SealBy: _____
Signature and Title
(Attach Power of Attorney)Attest: _____
Signature and Title

SECTION III: SPECIAL PROVISIONS

SPECIAL PROVISIONS

PROJECT NUMBER
RFB # 13921.04

COUNTY
FAIRFIELD

This project is to be constructed under the South Carolina Department of Transportation's Specifications for Highway Construction Edition of 2007, the South Carolina Department of Transportation's 2004 Construction Manual, and the Supplemental Technical Specifications in effect at the time of the letting, and the following Special Provisions.

DEFINITION AND TERMS:

Delete Paragraph 101.3.27, (the) Engineer, of the 2007 Version of the Standard Specifications for Highway Construction in its entirety and replace with the following:

Fairfield County, acting directly or through his duly authorized representative, such representative acting within the scope of particular assigned duties or authority. On this Project the firm of DAVIS & FLOYD, INC (D|F): shall function as the Engineer's duly authorized representative with authority as described in Section 105, "CONTROL OF WORK", of the Standard Specifications for Highway Construction, latest Edition.

The project Owner is FAIRFIELD COUNTY. In the specifications where the terms "SCDOT" or "Department" or other like terms are used to describe the facility Owner, it shall be interpreted as meaning Fairfield County, as appropriate.

Add "Notice-to-Proceed" to Section 101 as follows:

Notice-to-Proceed. A written notice to the Contractor fixing the date on which the Contract Time will commence to run and on which the Contractor may start to perform obligations under the Contract Documents.

It is the intentions of the owner to have the Contractor begin work on this project as soon as practical. The owner anticipates that an award and contract will be issued within two weeks after bids are received. The owner will require that the completed contract, bonds, insurance and other information required by the contract shall be completed within two weeks after bids are received.

ERRATA TO 2007 STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION:

The Bidders are hereby advised that this project shall be constructed using the SCDOT Supplemental Specifications with all updates effective at the time of the letting. The Supplemental Specifications are available for download at <https://www.scdot.org/business/road-supplemental-specs.aspx>.

SUBSTANTIAL COMPLETION OF WORK:

Substantial Completion of Work is the point in the project when work has been constructed to the typical section in the Plans over the entire length of the project including tie-ins, all pay items have been installed in reasonable conformance with the plans and specifications over the entire length of the project and all lanes of traffic are open to the public in their final configuration with the final applications of thermoplastic and raised pavement markers with the only remaining work to be performed being punch list items.

Contractor shall have the work substantially complete **within 240 calendar days from notice to proceed.**

STANDARD DRAWINGS:

The Bidders are hereby advised that this project shall be constructed using the SCDOT 2023 Standard Drawings with all updates effective at the time of the letting. The Standard Drawings are available for download at <https://www.scdot.org/business/standard-drawings.aspx>. All drawings that are updated are labeled with their effective letting date in red.

The Standard Drawings are available to purchase through the SCDOT Engineering Publications Sales Center. The Engineering Publication Sales Center is located in Room G-19 (basement level) of the SCDOT Headquarters Building, 955 Park Street, Columbia, South Carolina.

All references in the plans, standard specifications, supplemental specifications, supplemental technical specifications, or special provisions to drawings under the previous numbering system are hereby updated to the new drawing numbers. Refer to sheets 000-205-01 through 000-205-07 to find new drawing numbers when looking for references to older drawing numbers.

STANDARD DRAWING ERRATA:

The Bidders are hereby advised that the following note changes apply to the published Standard Drawings:

On sheet **605-005-05**, replace entire text of General Note #4 with the following text:

4. The square footage of sign panels attached to 2½" x 2½" 12-gauge sign support secured to a 3" x 3" 7-gauge breakaway anchor shall not exceed 20 square feet.

On sheet **610-005-00**, revise the following information as noted below:

Add (**OPTIONAL**) underneath "TRUCK MOUNTED ATTENUATOR" adjacent to the illustration.

A chart, entitled "Truck Mounted Attenuator", displaying the minimum length of buffer space required when a truck mounted attenuator is not utilized.

The buffer area illustration has been updated to illustrate the requirements necessary when a truck mounted attenuator is utilized and the requirements necessary when a truck mounted attenuator is not utilized.

Underneath the section entitled "PORTABLE TRUCK MOUNTED ATTENUATOR", update Note 4 to read as follows:

A trailer mounted advance warning arrow panel may be utilized in advance of the work area when this traffic control setup is utilized for asphalt concrete placement operations.

On sheet **610-405-00**, revise the following information as noted below:

Add (**OPTIONAL**) underneath "LEAD VEHICLE" adjacent to the illustration.

The "WORK VEHICLE" signing requirements have been updated. When the "LEAD VEHICLE" is omitted, the first "WORK VEHICLE" in the work train will also include the signing requirements specified for the "LEAD VEHICLE" in addition to the standard signing requirements for the "WORK VEHICLE".

Note 2 of the "Operation Notes" have been updated to describe the requirements for the "WORK VEHICLE" when the "LEAD VEHICLE" is omitted from the work train.

On sheet **720-305-00**, delete the entire note directly above main detail: ~~If sidewalk exists, the driveway opening should...~~

On sheet **720-405-00** section B replace dimension 2'-6" maximum with:
2'-6" minimum

On sheet **720-901-01** replace note 5.04 with:

5.04 When a mid-block crossing is required, consider mid-block staggered crossing (720-955-41) to encourage eye contact between the pedestrian and the oncoming traffic. Always angle the stagger so that the pedestrian travels through the refuge facing the oncoming traffic.

On sheet **722-305-00** Detail 4 replace note "French Drain see note 21" with: French Drain see note 4.5.

On sheet **722-305-00** table 722-305A, 4th column, change the following: Delete (SF)

Replace text "up to 36" with "up to 3'X3' "

Replace text "larger than 36" with "larger than 3'X3' "

On sheet **804-105-00** Title Block replace text "Riprap (Bridge End)" with: Riprap (Bridge End)

On sheet **805-325-00** detail 2 replace text "rectangular washers (FWR03) See 805-005-00" with: "rectangular washers (FWR03) See 805-090-00"

On sheet **805-325-00** change text of note 5 to the following:

1. For project specific requirements such as additional offset blocks, extra length posts, and post attachment details, see Project Plans. Include all costs of project specific requirements in the Guardrail Thrie-Beam Bridge Connector pay item.

On sheet **805-330-00** detail 2 replace text "rectangular washers (FWR03) See 805-005-00" with: "rectangular washers (FWR03) See 805-090-00"

On sheet **805-330-00** change text of note 4 to the following:

4. For project specific requirements such as additional offset blocks, extra length posts, and post attachment details, see Project Plans. Include all costs of project specific requirements in the Guardrail Thrie-Beam Bridge Connector pay item.

On sheet **805-510-00** detail 3 replace guardrail base plate note with the following: See standard drawings 805-655-xx for guardrail base plate options.

On sheet **805-655-M1** replace note 30.4 with the following:

30.4 Install adhesive anchors to a depth sufficient to develop a minimum factored (reduced) ultimate tensile capacity of 21 kips per anchor bolt. Increase minimum embedment shown in detail 4 as required by adhesive manufacturer's recommendations for the existing material properties, anchor bolt pattern, edge conditions, and any other design reduction.

On sheet **805-811-01** Type 11A barrier wall reinforcement add the following note:

Provide reinforcement equal to the stem reinforcement and bending details shown for the Type 11B concrete barrier (drawing 805-811-02).

On sheet **000-205-05**, add the following information under the columns below:

OLD DRAWING NAME	NEW DRAWING NAME
720-905-01 to 720-905-05	720-901-01 to 720-993-32

On sheet **605-005-05**, replace entire text of General Note #4 with the following text:

4. The square footage of sign panels attached to 2½" x 2½" 12-gauge sign support secured to a 3" x 3" 7- gauge breakaway anchor shall not exceed 20 square feet.

On sheet **610-005-00**, revise the following information as noted below:

Add **(OPTIONAL)** underneath "TRUCK MOUNTED ATTENUATOR" adjacent to the illustration.

A chart, entitled "Truck Mounted Attenuator", displaying the minimum length of buffer space required when a truck mounted attenuator is not utilized.

The buffer area illustration has been updated to illustrate the requirements necessary when a truck

mounted attenuator is utilized and the requirements necessary when a truck mounted attenuator is not utilized.

Underneath the section entitled "PORTABLE TRUCK MOUNTED ATTENUATOR", update Note 4 to read as follows:

A trailer mounted advance warning arrow panel may be utilized in advance of the work area when this traffic control setup is utilized for asphalt concrete placement operations.

On sheet **610-405-00**, revise the following information as noted below:

Add (**OPTIONAL**) underneath "LEAD VEHICLE" adjacent to the illustration.

The "WORK VEHICLE" signing requirements have been updated. When the "LEAD VEHICLE" is omitted, the first "WORK VEHICLE" in the work train will also include the signing requirements specified for the "LEAD VEHICLE" in addition to the standard signing requirements for the "WORK VEHICLE".

Note 2 of the "Operation Notes" have been updated to describe the requirements for the "WORK VEHICLE" when the "LEAD VEHICLE" is omitted from the work train.

On sheet **720-305-00**, delete the entire note directly above main detail: ~~If sidewalk exists, the driveway opening should...~~

On sheet **720-405-00** section B replace dimension 2'-6" maximum with: 2'-6" minimum

On sheet **720-901-01** replace note 5.04 with:

5.04 When a mid-block crossing is required, consider mid-block staggered crossing (720-955-41) to encourage eye contact between the pedestrian and the oncoming traffic. Always angle the stagger so that the pedestrian travels through the refuge facing the oncoming traffic.

On sheet **722-305-00** Detail 4 replace note "French Drain see note 21" with: French Drain see note 4.5.

On sheet **722-305-00** table 722-305A, 4th column, change the following: Delete (SF)

Replace text "up to 36" with "up to 3'X3' "

Replace text "larger than 36" with "larger than 3'X3' "

On sheet **804-105-00** Title Block replace text "Riprap (Bridge End)" with: Riprap (Bridge End)

On sheet **805-325-00** detail 2 replace text "rectangular washers (FWR03) See 805-005-00" with: "rectangular washers (FWR03) See 805-090-00"

On sheet **805-325-00** change text of note 5 to the following:

5. For project specific requirements such as additional offset blocks, extra length posts, and post attachment details, see Project Plans. Include all costs of project specific requirements in the Guardrail Thrie-Beam Bridge Connector pay item.

On sheet **805-330-00** detail 2 replace text "rectangular washers (FWR03) See 805-005-00" with: "rectangular washers (FWR03) See 805-090-00"

On sheet **805-330-00** change text of note 4 to the following:

4. For project specific requirements such as additional offset blocks, extra length posts, and post attachment details, see Project Plans. Include all costs of project specific requirements in the Guardrail Thrie-Beam Bridge Connector pay item.

On sheet **805-510-00** detail 3 replace guardrail base plate note with the following: See standard drawings 805-655-xx for guardrail base plate options.

On sheet **805-655-M1** replace note 30.4 with the following:

30.4 Install adhesive anchors to a depth sufficient to develop a minimum factored (reduced)

Ultimate tensile capacity of 21 kips per anchor bolt. Increase minimum embedment shown in detail 4 as required by adhesive manufacturer's recommendations for the existing material properties anchor bolt pattern, edge conditions, and any other design reduction.

On sheet **805-811-01** Type 11A barrier wall reinforcement add the following note:

Provide reinforcement equal to the stem reinforcement and bending details shown for the Type 11B concrete barrier (drawing 805-811-02).

AWARD OF CONTRACT:

Subsection 103.2 of the Standard Specifications is amended to allow sixty (60) days for the award of a contract after the opening of proposals.

PROPOSAL ITEMS AND QUANTITIES:

A list of bid items and quantities is on **page 49**.

CONSTRUCTION STAKES, LINES AND GRADES:

Stakes, Lines, and Grades shall be provided by the Contractor as necessary.

QUALIFIED PRODUCT LISTINGS:

All references to "Approval Sheet" or "Approval Policy" are to be replaced with "Qualified Products Listings (QPL)" and "Qualified Products Policies (QPP)" respectively. This change includes all references in the SCDOT Standard Drawings, SCDOT Standard Specifications, SCDOT Supplemental Specifications, SCDOT Special Provisions, SCDOT Supplemental Technical Specifications, SCDOT Internet and Intranet websites, and all other documents produced by SCDOT.

SOUTH CAROLINA MINING ACT:

See Attached Supplemental Specification Dated **March 20, 2003**, on **page 33**.

This Supplemental Specification is hereby modified as follows:

Paragraph 9 is hereby deleted and replaced with the following:

The deputy secretary for engineering, or his duly appointed representative, will make a final inspection of the reclaimed area and keep a permanent record of his approval thereof. A map or sketch providing the location and approximate acreage of each pit used on the project will be provided to the resident construction engineer for inclusion in the final plans.

The last paragraph is hereby deleted and replaced with the following:

The contractor shall comply with the provisions of the plan that are applicable to the project as determined by the engineer. Seeding or other work necessary to comply with the plan on pits furnished by the contractor shall be at the expense of the contractor. Seeding shall be in accordance with SC-M-810 (latest version) which can be found at http://scdot.org/doing/sup_tech_specs.shtml.

DBE PARTICIPATION:

The Bidder is encouraged to utilize DBE subcontractors on this project. All DBE participation shall be reported to the Engineer prior to Substantial Completion.

CONSTRUCTION QUALITY CONTROL TESTING:

The contractor shall provide construction quality control testing for this project, except for MANUFACTURERS MATERIALS CERTIFICATIONS AND CERTIFIED TEST REPORTS where materials are furnished by others.

INSURANCE REQUIREMENTS:

In addition to the requirements as set forth in Section 103.8 of the Standard Specifications (Edition of 2007), the Contractor shall purchase and maintain, in a company or companies acceptable to the Owner, general liability and automobile liability insurance written on an occurrence basis, with minimum limits as shown below or as required by law, whichever is greater. **The Contractor shall include the OWNER, and DAVIS & FLOYD, INC (DIF): as Additional Insured's.** The authorized insurance company shall provide a Waiver of Subrogation in all policies maintained by the insured for the performance of the Contract.

GENERAL LIABILITY	LIMIT
General Aggregate	\$1,000,000.00
Products – Comp/Ops Aggregate	\$500,000.00
Personal & Advertising Injury	\$500,000.00
Each Occurrence	\$500,000.00
Fire Damage (any one fire)	\$25,000.00
Medical Expense (any one person)	\$10,000.00

AUTOMOBILE LIABILITY (Any Auto)	
Combined Single Limit	\$500,000.00

The Contractor shall also purchase and maintain in a company or companies acceptable to the Owner, Worker's Compensation and Employer's Liability Insurance with minimum limits as shown below or as required by law, whichever is greater:

<u>WORKER'S COMPENSATION and EMPLOYER'S LIABILITY (statutory)</u>	<u>LIMIT</u>
(Each Accident)	\$100,000.00
(Disease-Policy Limit)	\$500,000.00
(Disease-Each Employee)	\$100,000.00

Certificates of Insurance acceptable to the Owner shall be filed not less than 10 days after notification of award.

The Certificate of Insurance shall not be changed to the extent that limits are decreased by endorsement, canceled or non-renewed without thirty (30) days prior written notice to the Owner. The Contractor shall provide and maintain the overages as required by Section 103.08 and these additional requirements. Failure to provide and maintain the required coverage will be grounds to declare the Contractor in default of the Contract.

The criteria which Insurance Company or Companies are deemed satisfactory by the Owner shall include, but not be limited to the following:

- The above required insurance coverage shall be written by a Company or Companies licensed in the areas of required coverage by the Insurance Commissioner of the South Carolina Department of Insurance, and
- The Insurance Company or Companies shall be assigned a rating of "A-" or better by A. M. Best Company on its most recent Best's Insurance Report, and
- The Owner considers the "ACORD Certificate of Insurance" as an acceptable form of certificate.

RETAINAGE:

If the Contractor's progress is judged to be delinquent or portions of the work are defective, the County reserves the right to withhold additional retainage. The total amount retained will be sufficient to cover anticipated liquidated damages and the cost to correct defective work.

PROMPT PAYMENT CLAUSE:

See attached Supplemental Specification dated **July 2017**, on **page 34**.

MANUFACTURERS MATERIALS CERTIFICATIONS AND CERTIFIED TEST REPORTS:

The contractor shall supply the Engineer with all required materials certifications and manufacturers test reports for items to be permanently incorporated into the project, prior to their use. The County must approve these certifications and reports before payment can be made to the contractor for these items.

REQUIRED MEDIA NOTIFICATION FOR CONSTRUCTION PROJECTS:

Contractors are encouraged to co-operate with the news media since project is constructed with public funds. If the scope of this project will cause disruption of normal traffic flow, the Contractor is required to notify the public, in a timely manner, of disruptive activities such as lane closures.

The Contractor is required to utilize area media to accomplish public notification of traffic disruptions.

The Contractor is required to deal directly with the news media and all reasonable efforts should be made to co-operate with the media. However, the safety, security and construction schedule on site should not be disrupted in order to accomplish this. The Contractor may coordinate these activities with and receive guidance from the Engineer.

CONTRACT PROVISION TO REQUIRE CERTIFICATION AND COMPLIANCE CONCERNING ILLEGAL ALIENS:

By submission of this bid, the bidder as the prime contractor does hereby agree:

- a. to certify its compliance with the requirements of Chapter 14 of Title 8 of the S.C. Code of Laws regarding Unauthorized Aliens and Public Employment.
- b. to provide SCDOT with any documents required to establish such compliance upon request; and
- c. to register and participate and require agreement from subcontractors and subcontractors to register and participate in the federal work authorization program to verify the employment authorization of all new employees, or to employ only workers who supply the documents required pursuant to S.C. Code 8-14-20(B)(2).

PROSECUTION OF THE ROAD IMPROVEMENT WORK:

It is the County's intentions that work on this contract be performed in a sequential manner. Once a construction activity has started, the Contractor will continue this activity until it is complete. In the event the Contractor elects to use multiple crews on this project, work may proceed on more than one area. However, in no case will construction activities be initiated on more area than the number of work crews engaged in the work without the approval of the Resident Construction Engineer.

CONTRACT TIME AND DETERMINATION AND EXTENSION OF CONTRACT TIME:

Any extensions of these completion dates will adhere to Section 108.6 of the Standard Specifications.

FAILURE TO COMPLETE THE WORK ON TIME:

Delete Section 108.9 in its entirety and substitute the following in its place:

Owner and Contractor recognize that time is of the essence and that the Owner will suffer financial loss if the work is not substantially complete in accordance with the time(s) specified herein. They also recognize the delays, expenses and difficulties involved in proving in a legal or arbitration preceding the actual loss suffered by the Owner if the work is not completed on time.

Accordingly, instead of requiring such proof, the Owner and the Contractor agree that as liquidated damages for delay (but not as a penalty) the Contractor shall pay the Owner **\$500.00 per day** for each calendar day past the contract specified interim and final completion dates.

COORDINATION OF UTILITY RELOCATION WORK WITH HIGHWAY CONSTRUCTION:

It is the responsibility of the contractor to coordinate any temporary and permanent utility relocations required for the construction of the project.

It shall be the responsibility of the contractor to inspect the site for potential utility conflicts.

It is the responsibility of the Contractor to call Palmetto Utility Protection Service (PUPS @ 1-888-721-7877) three (3) days prior to work so that existing utilities can be properly marked.

ROADWAYS TO BE INCLUDED IN THIS PROJECT:

Fairfield County, due to budget considerations, reserves the right to adjust the amount of work to be performed on this project. Work items may be added or deleted only at the discretion of the County. The Contractor shall, by signing this request for bids, agree to adjust, as indicated by the County, the lengths or quantities of project and corresponding pay items to be performed, at the times and locations determined to be beneficial to the County.

ROADWAY TYPICAL SECTION:

Each roadway or section of roadway shall have a corresponding ROADWAY TYPICAL SECTION that the final roadway surface shall be graded and surfaced to meet. The ROADWAY TYPICAL SECTION drawing is included in the roadway drawings in **Appendix B** attached to these bid documents. The Typical Section contains profile and cross slope criteria that shall be met for the entire length of each roadway or roadway section. Contractor shall grade the existing roadway to generally improve vertical curves and to create uniform roadway profiles and alignments. Roadway profiles shall be graded to maintain drainage and to minimize dips or steepness (minimum of .05% or as directed by Engineer). Slope and profile shall be subject to approval by Engineer prior to cement stabilization.

MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES:

The Contractor is advised that all work involving design or installation of traffic control devices, including but not limited to signs, pavement markings, elements of work zone traffic control, signals, etc., shall be in compliance with the FHWA's Manual on Uniform Traffic Control Devices (MUTCD), latest edition. The latest edition is defined as the edition that the Traffic Engineering Division of SCDOT recognizes as having been officially adopted (Engineering Directive, Memorandum 19) at the time the project is let, unless stated otherwise in the Special Provisions.

Permanent construction signs on this project will be furnished by others.

TRAFFIC CONTROL:

The Contractor shall execute the item of Traffic Control as required by the Standard Specifications, the plans, the Standard Drawings For Road Construction, these special provisions, all supplemental specifications, the MUTCD, and the Engineer.

CONSTRUCTION SCHEDULE:

The successful Bidder shall, prior to commencement of work, submit to the Engineer a schedule showing the order in which he proposes to carry on the Work indicating the periods during which he will perform work on each roadway. The County of Fairfield reserves the right to determine priority of schedule items, but unless modified by the parties, in writing, the successful Bidder shall have sole Responsibility for following and coordinating its schedule.

SURPLUS MATERIAL:

The contract bid price for other items of work shall be full payment for excavating, hauling, disposing of and seeding any surplus material. All milled material shall be disposed of at an approved site.

SEEDING:

Section 810.2.3.3 is hereby amended by adding the following note to the table:

The use of Annual Sudan Grass for temporary vegetation shall be prohibited statewide.

All seeding will be mulched using Method C: Hydro seeding.

MAINTENANCE STONE:

Maintenance Stone used on this project shall conform to the gradation requirements of Section 305, or to the gradation specified for Aggregate No. CR-14 in the Standard Specifications. Maintenance will be used in driveways and elsewhere as directed by the engineer. All pipe will be backfilled with maintenance stone.

STATION GRADING

The station grading pay item for this project is as per Station (100 linear feet) of the roadway to be graded, mixed and surfaced. The quantities indicated on the bid form are estimates only. Bidders are encouraged to inspect the site in order to determine the actual amount of unclassified excavation, borrow and other work needed to complete the project. The contract pay item price for Station Grading shall be full compensation for excavation, hauling, borrow, shaping, compacting and disposing of surplus material associated with the grading of the roadway.

Items that shall be considered as incidental to STATION GRADING are listed below:

1. Relocations such as signs, mail and paper boxes
2. Borrow
3. Unclassified Excavation
4. Hauling
5. Fine grading and compaction
6. Disposal of excess materials, drainage pipe, and other debris
7. Shaping of roadway to meet Typical Section profile and cross slope criteria
8. Application of temporary vegetation control prior to Bituminous Surfacing
9. Pulling out ditches

It is anticipated by the Engineer that borrow and excavation will be minimal amounts, and that the existing roadway and existing base will be shaped and mixed in place. Any extra stone will be paid on a unit price basis, only as directed by the Engineer. Existing back slope disturbance shall be minimized to prevent erosion and sedimentation problems. The exception to this section is specifically addressed in the special provisions under BORROW MATERIAL.

PERMANENT PIPE CULVERTS:

Section 714 of the Standard Specifications, Permanent Pipe Culverts, is deleted in its entirety and replaced with Section 714, Pipe Culverts, in the Standard Specifications Edition of 2000.

PIPE DISPOSAL

Any pipe that has to be removed shall be removed by the contractor to an approved site. The cost of pipe disposal is to be included in the cost of the new pipe.

LUMP SUM BID ITEMS

It is predetermined that all lump sum bid items shall be applied equally among all roads, unless otherwise stated. This will apply to pay estimates as well as deletion or addition of roads should this occur.

ASPHALT BINDER ADJUSTMENT INDEX

The base asphalt binder index on this project is the SCDOT Index for January 2023 but will be used only on Single and Double treatment.

WARRANTY

The Contractor agrees to a one-year warranty against defects, failures etc. caused by materials and workmanship, beginning on the date of final acceptance of punch list.

TESTING

The contractor will be responsible for all quality control and testing. Proctors will be furnished on each road. One-point proctors will be accepted if necessary. A minimum of one compaction test will be run every 2500 feet or at least one per lane per road. **The engineer will furnish to the contractor the application rate for cement as well as the proctor results for each road.**

WORK SCHEDULE

There will be no work on this project from 4 PM on Friday to 7AM on Monday, without written permission of the engineer.

CLEAN UP

Prior to beginning of placing HMA or Asphalt Surface Treatment, all excess materials that were a result of the reclamation process and any other foreign material on the shoulders will be removed from site.

RIP RAP

Riprap will be used at ends of bridge abutments as necessary to prevent erosion.

SECTION IV: SUPPLEMENTAL SPECIFICATIONS

March 20, 2003

THE SOUTH CAROLINA MINING ACT

The South Carolina Mining Act enacted by the General Assembly in 1973 requires that the Department adopt reclamation standards to govern activities of the Department and any person acting under contract with the Department, on highway rights-of-way or material pits maintained solely in connection with the construction, repair and maintenance of the public road systems in South Carolina.

STANDARD PLAN FOR THE RECLAMATION OF EXCAVATED AREAS ADOPTED BY THE South Carolina DEPARTMENT OF TRANSPORTATION

Reclamation plans as stated herein shall include all areas disturbed in excavations of borrow and material pits, except planned inundated areas.

The final side slopes of areas excavated for borrow and material pits shall be left at such an angle so as to minimize erosion and the possibility of slides. The minimum slope in every case shall be not less than 3:1.

Small pools of water should not be allowed that are, or are likely to become noxious, odious, or foul to collect or remain on the borrow pit. Suitable drainage ditches, conduits, or surface gradient shall be constructed to avoid collection of noxious, odious, or foul pools of water unless the borrow pit is to be reclaimed into a lake or pond.

Borrow pits reclaimed to a lake or pond must have an adequate supply of water to maintain a water sufficient level to maintain a minimum water depth of four (4) feet on at least fifty (50) percent of the surface area of the lake or pond.

Excavated areas will be drained where feasible unless otherwise requested by the property owner where, in such instances, the property owner may wish to develop the excavated area for recreational purposes or for the raising of fish, or for other uses, in compliance with the South Carolina Mining Act.

Where material is stripped from the ground surface in relatively thin layers, the area, after excavation has been completed, will be thoroughly scarified and terraced and planted to establish satisfactory vegetation necessary to control erosion. Vegetative cover should be established on a continuing basis to ensure soil stability appropriate to the area. Conservation practices essential for controlling both on-site and off-site erosion and siltation must be established. A minimum of seventy-five (75) percent vegetative ground cover, with no substantial bare spots, must be established and maintained into the second growing season.

Excavated areas that are drained will be seeded to obtain a satisfactory vegetative cover. The side slopes of excavated area will be planted to vegetation.

The State Highway Engineer, or his duly appointed representative, will make a final inspection of the reclaimed area and keep a permanent record of his approval thereof. A map or sketch providing the location and approximate acreage of each pit used on the project will be made available to the Final Plans Engineer.

All applicable regulations of agencies and statutes relating to the prevention and abatement of pollution shall be complied with by the contractor in the performance of the contract.

The Contractor shall comply with the provisions of the Plan which are applicable to the project as determined by the Engineer. Seeding or other work necessary to comply with the plan on pits furnished by the contractor shall be at the expense of the contractor. Bermuda shall not be planted on ground surface pit areas. The quantity of fescue seed specified in Subsection 810.04 of the Standard Specifications shall be increased to fifteen (15) pounds in lieu of the deleted Bermuda seed.

July 2017

PROMPT PAYMENT CLAUSE

(1) Subject to the provisions on retainage provided in Paragraph (2) below, when a subcontractor has satisfactorily performed a work item of the subcontract, the Contractor must pay the subcontractor for the work item within seven (7) calendar days of the Contractor's receipt of payment from SCDOT. A subcontractor shall be considered to have "satisfactorily performed a work item of the subcontract" when the SCDOT pays the Contractor for that work item. In the case of a second or third tier subcontractor, the 7-day time period begins to run when the 1st tier subcontractor receives payment from the Contractor or when the 2nd tier subcontractor receives payment from the 1st tier subcontractor.

(2) The Contractor may withhold as retainage up to five (5%) percent of a subcontractor's payment until satisfactory completion of all work items of the subcontract. "Satisfactory completion of all work items of the subcontract" shall mean when the SCDOT accepts the last work item of the subcontract. The Contractor must release to the subcontractor any retainage withheld within seven (7) calendar days from the date the Contractor receives payment from SCDOT for the last work item of the subcontract or within seven (7) days from SCDOT's acceptance of the last work item of the subcontract, whichever is the latest to occur. However, upon documentation of good cause provided by the contractor and written concurrence by the Director of Construction, the Contractor may continue to withhold the 5% retainage.

(3) Prior to receiving payment of each monthly estimate, the Contractor shall (a) certify to SCDOT that the construction estimate is complete and that its subcontractors have been paid for work covered by previous estimates, for which they are entitled to be paid, in accordance with paragraphs (1) and (2) above, and (b) submit verification that Contractor has received similar certifications or evidence from its subcontractors that lower tier subcontractors have been paid in accordance with paragraph (1). No payment will be made to Contractor unless such documentation/certification is received or SCDOT has issued written approval for delayed payment and required status reports as follows:

- (i) The obligation to promptly pay subcontractors (all tiers) or to release retainage does not arise if there is a legitimate subcontract dispute with first tier and/or lower tier subcontractors. If there is a subcontract dispute, the Contractor may submit a written request to SCDOT to approve a delay in payment to the subcontractor which shall explain the nature of the dispute and identify relevant subcontract provisions as support. The explanation may include those reasons set forth in the SC Prompt Pay Act (S.C. Code Section 29-6-40). Payment to the subcontractor shall not be withheld without prior SCDOT written approval.
- (ii) Contractor shall submit a status report of the dispute in each monthly progress payment. The status report shall contain:
 - justification for the continuation of nonpayment in the form of a pending judicial proceedings, alternate dispute resolution (ADR) process or administrative proceedings, as evidence of why the delay shall continue; or
 - a certification that the matter is resolved, and payment has been issued to the subcontractor (first tier and/or lower tier subcontractors).

(4) Failure to comply with any of the above provisions shall constitute a material breach of the contract and shall result in one or more of the following sanctions: (1) no further payments to the Contractor unless and until compliance is achieved; (2) monetary sanctions; and/or (3) the Contractor being declared in default and being subject to termination pursuant to Section 108.10 of the Standard Specifications.

(5) Any subcontractor who believes it is due payment in accordance with the Prompt Payment Clause may request information from the servicing Resident Construction Engineer (RCE) as to whether and when payment for the subcontractor's work has been made to the Contractor. If payment has been made to the Contractor, and a subcontractor certifies to the RCE that the subcontractor has not been paid within seven (7) calendar days of SCDOT's payment to the Contractor or paid as provided in paragraph (1) for sub-tiers, the RCE will notify the Director of Construction. If SCDOT has not approved the delay in payment pursuant to paragraph 3 above, appropriate remedies set forth in paragraph (4) will be applied. On federally funded projects, the subcontractor may contact the Federal Highway Administration should SCDOT fail to address the non-payment issue.

(6) The Contractor agrees by submitting this bid or proposal that it will include this clause titled "PROMPT PAYMENT CLAUSE," provided by the SCDOT, without modification, in all subcontracts with its subcontractors. Contractor is responsible for requiring all of its subcontractors to include this PROMPT PAYMENT CLAUSE in all lower tier subcontracts. If Contractor knowingly enters or knowingly allows a subcontractor or lower tier subcontractor to enter into a subcontract without the PROMPT PAYMENT CLAUSE, SCDOT may apply the appropriate remedies set forth in paragraph (4) or pursue other available remedies, including breach of contract.

January 1, 2018

ERRATA TO 2007 STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION

Make the changes listed below to correct errata in the SCDOT 2007 *Standard Specifications for Highway Construction*:

DIVISION 100 GENERAL PROVISIONS**SECTION 101 DEFINITIONS AND TERMS****Subsection 101.2 Abbreviations and Acronyms**

Amend the table of **SCDOT OFFICIALS AND OFFICES** as follows:

DELETIONS		REPLACEMENTS	
BDE*	Bridge Design Engineer	PSE*	Preconstruction Support Engineer
BDGE*	Bridge Design Geotechnical Engineer	GDSE*	Geotechnical Design Support Engineer
SHE*	State Highway Engineer	DSE*	Deputy Secretary for Engineering

*Wherever it appears in the text, replace the deleted abbreviation with the new abbreviation.

SECTION 102 BIDDING REQUIREMENTS AND CONDITIONS**Subsection 102.8 Irregular Bids**

Paragraph 2, item E, first sentence; delete the word "the" after the word "When".

SECTION 105 CONTROL OF WORK**Subsection 105.6 Cooperation with Utilities**

Paragraph 1, last sentence; change the word "THE" to "the".

DIVISION 200 EARTHWORK**SECTION 202 REMOVAL OF STRUCTURES AND OBSTRUCTIONS****Subsection 202.5 Measurement**

Paragraph 5, second bullet; change the words "Brick sidewalk" to "Concrete, brick or stone sidewalks".

SECTION 204 STRUCTURE EXCAVATION**Subsection 204.2.1.2 Structure Excavation for Culverts**

Paragraph 1, at the end of the first sentence; change "**Subsection 204.4**" to "**Subsection 204.5**".

DIVISION 400 ASPHALT PAVEMENTS**SECTION 401 HOT MIXED ASPHALT (HMA) PAVEMENT****Subsection 401.2.1.2 Liquid Anti-Stripping Agent**

Paragraph 1, first sentence; delete the period at the end of the sentence and add "and SC-M-406."

Subsection 401.2.5 Material for Full Depth Patching

Paragraph 1, delete and replace with the following:

"Use an approved SCDOT Intermediate Type C mix for all Full Depth Patching."

Subsection 401.5 Measurement

After paragraph 10, add the following paragraph:

- 11 The measurement of Prime Coat is the number of gallons of asphalt material applied to the completed and accepted base course.

Subsection 401.6 Payment

After paragraph 12, add the following paragraph:

- 13 "The payment for Prime Coat is at the contract unit price for Prime Coat and includes compensation for all labor, equipment, tools, maintenance, and incidentals necessary to complete that work."

Subsection 401.6 Payment

Paragraph 13, **Table of Pay Items**

Change paragraph reference number "13" to "14" and add the following Pay Item:

Item No.	Pay Item	Unit
4010005	Prime Coat	GAL

SECTION 403 HMA SURFACE COURSE**Subsection 403.5 Measurement**

Paragraph 1, first sentence; change "HMA Intermediate Course" to "HMA Surface Course".

Subsection 403.6 Payment

Paragraph 1, first sentence; change "HMA Intermediate Course" to "HMA Surface Course".

SECTION 407 ASPHALT SURFACE TREATMENT – DOUBLE TREATMENT**Subsection 407.5 Measurement**

Paragraph 1, first sentence; add the word "is" after "(Double Treatment Type (1, 2, 3, 4, or 5))".

SECTION 408 ASPHALT SURFACE TREATMENT – TRIPLE TREATMENT**Subsection 408.5 Measurement**

Paragraph 1, first sentence; add the word "is" after "(Triple Treatment Type (1 or 2))".

DIVISION 600 MAINTENANCE AND TRAFFIC CONTROL**SECTION 625 PERMANENT PAVEMENT MARKINGS FAST DRY
WATERBOURNE PAINT****Subsection 625.2.2.4.11 Lead Content**

Paragraph 1, first sentence; change 6% to 0.06%.

SECTION 627 THERMOPLASTIC PAVEMENT MARKINGS**Subsection 627.4.10 Inspection and Acceptance of Work**

Paragraph 2, first sentence; change "period of 90 days" to "period of 180 days".

Subsection 627.4.10 Inspection and Acceptance of Work

Paragraph 2, second sentence; change "90-day observation period" to "180-day observation period".

Subsection 627.4.10 Inspection and Acceptance of Work

Paragraph 3, first sentence; change "90-day period" to "180-day period".

DIVISION 700 STRUCTURES**SECTION 709 STRUCTURAL STEEL****Subsection 709.4.3.5.2 Submittals and Notification**

Paragraph 1, delete the last two sentences and replace them with, "The Department's review and acceptance are required before any field welding will be permitted."

Subsection 709.6.3 Pay Items (page 650)

Subsection heading number; change subsection heading number from "709.6.3" to "709.6.4".

SECTION 712 DRILLED SHAFTS AND DRILLED PILE FOUNDATIONS**Subsection 712.4.4 Dry Construction Method**

Paragraph 2, last sentence in A; change "Drilled Shaft Report" to "Drilled Shaft Log".

Subsection 712.4.10.4 Excavation Cleanliness

Paragraph 1, last sentence; change "Drilled Shaft Report" to "Drilled Shaft Log".

Subsection 712.4.10.6 Shaft Load Test

Change first paragraph reference number from "2" to "1".

Subsection 712.6.10 Drilled Pile Set-Up

Insert paragraph reference number "1" to the left of the first paragraph.

SECTION 723 DECK JOINT STRIP SEAL**Subsection 723.1 Description**

Insert paragraph reference number "3" to the left of the third paragraph.

SECTION 726 BRIDGE DECK REHABILITATION**Subsection 726.4.1 General**

Insert paragraph reference number "1" to the left of the first paragraph.

Subsection 723.4.6 Full Depth Patching (page 790)

Subsection heading number; change subsection heading number from "723.4.6" to "726.4.6"

Subsection 726.6.8 Concrete Overlay (Latex) or (Portland Cement) (page 802)

Paragraph 2, the equation is changed to $AP = CP \times (ACS/RCS)^2$

SECTION 727 CROSSHOLE SONIC LOGGING OF DRILLED SHAFT FOUNDATIONS**Subsection 726.6 Payment (page 807)**

Subsection heading number; change subsection heading number from "726.6" to "727.6"

DIVISION 800 INCIDENTAL CONSTRUCTION**SECTION 805 GUARDRAIL****Subsection 805.5 Measurement**

Paragraph 4; amend as follows:

"The quantity for the pay item 8053000 Additional Length Guardrail Post is the length of required post installed in excess of the standard-length post based on the system being installed, measured by the linear foot (LF), complete, and accepted."

Subsection 815.1 Description

Paragraph 1, first sentence; change "temporary flexible pipe" to "temporary pipe".

Subsection 815.5 Measurement

Paragraph 13; delete the first sentence and replace it with the following sentence: "The quantity for Temporary Pipe Slope Drains is measured and paid for in accordance with **Subsections 803.5 and 803.6** respectively."

Subsection 815.5 Measurement

Delete paragraph 19.

Subsection 815.6 Payment

After paragraph 15, add the following paragraph:

¹⁶ Payment for Removal of Silt Retained by Silt Fence is full compensation for removing and disposing of sediment deposits accumulated by silt fences as specified or directed and includes all materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other terms of the Contract.

Subsection 815.6 Payment

Change original paragraph number "16" to "17".

Subsection 815.6 Payment

Pay Item table; change the Unit for Item No. 8156214 to "EA".

INDEX:

Amend as follows:

Page I-3, after "Bridge Deck Rehabilitation, measurement and payment:" Delete page 807.

Page I-12, after "Letting:"
Replace page 19 with page 9.

Page I-13, after "Overhead Sign Structure:" Replace page 488 with page 495.

Page I-15, after "Proof Rolling:" Delete page 98.

Page I-18, after "Structural Steel, turned and ribbed bolts:"
Replace page 624 with page 625.

Page I-19, after "Waterproofing, bridge deck:" Delete page 907.

Page I- Drawings:"
Replace page 543 with page 779.

January 1, 2018

REMOVAL OF EXISTING ASPHALT PAVEMENT BEFORE PATCHING

Delete Subsection 401.4.14 Removal of Existing Asphalt Pavement before Patching, of the Standard Specifications in its entirety and replace with the following:

The **RCE** will determine the limits of distressed pavement and will mark width and length of patches. **RCE / RME** will inspect the road and ensure that drainage is adequate, and no additional work needs to be done to the ditches and shoulders to promote proper drainage. The **RCE** may elect to obtain random cores if needed to determine proper depth of distressed area to be patched. Construct patches with a minimum size of 6.5 feet x 6.5 feet with at least 25 feet between patches. Care should be taken to ensure that longitudinal joints do not end up in the wheel paths. In the event that considerable quantities of full depth patching (FDP) are encountered, the RCE will consult with the State Pavement Design Engineer to consider other rehabilitation methods.

Remove the pavement to the depth indicated in the Plans, ensuring that the face of the cut is straight and vertical, with the exception of tapers needed to get equipment in and out of the patched area. If unstable material is encountered, remove additional material as directed by the **RCE**. Backfill the volume of the material removed below the patch with material meeting the requirements of **Section 305**, Graded Aggregate Base, and thoroughly compact in layers not exceeding 4 inches with a vibratory compactor. Thoroughly tack the sides of the existing pavement before placing the asphalt patch material in the hole.

Place the patch material in relatively uniform layers not to exceed the number of lifts in the table below. Ensure that the patch material is selected from the table below. Compact each layer with a vibratory compactor and a pneumatic roller. Whenever practical, allow lifts to cool down prior to placing the next lift, especially when doing multiple patches in the same area. The 175° F requirement between lifts does not apply to FDP. Conduct the work so that patches are opened and filled each day, with the roadway being opened to traffic by the end of each day's operation. Ensure that the finished patch is smooth riding by using a straight edge. Temperature and calendar restrictions found in **Section 401.4.4** do not apply, however no FDP will be permitted if the area is wet or frozen prior to removing the old pavement.

Full Depth Patching Materials		
Depth of FDP	Select mixture type below based on Depth of FDP	
	Alternate Mixture Options	Typical Mixture
4" or Less	Surface Type B / C 2 Lifts	Intermediate C 2 Lifts
6"	Surface Type B / C 2 Lifts	Intermediate C 2 Lifts
8"	Intermediate B Special 2 lifts	Intermediate C 3 lifts
10"	Intermediate B Special 2 lifts	Intermediate C 3 lifts
12" or More	Consult with the State Pavement Design Engineer	

Supplemental Technical Specification for

Cement Modified Recycled Base

SCDOT Designation: SC-M-306 (01/18)

1.0 DESCRIPTION

1.1 This section contains specifications for the materials, equipment, construction, measurement, and payment for the modification of an existing paved roadway or shoulder by scarifying the existing pavement structure, mixing it with Portland cement, and constructing the base course in conformance with the lines, grades, dimensions, and cross-sections shown on the Plans or as directed by the RCE.

2.0 MATERIALS

- 2.1 Portland Cement - Use Portland cement that conforms to the requirements of **Subsection 301.2.1**.
- 2.2 Water - Use water conforming to the requirements of **Subsection 701.2.11**.
- 2.3 Asphalt Material – Use asphalt material conforming to the requirements of **Subsection 301.2.4**.

3.0 EQUIPMENT

- 3.1 Ensure that the equipment necessary for the proper construction of the work is on site and in acceptable working condition. Provide sufficient equipment to enable prosecution of the work in accordance with the project schedule and completion of the work in the specified time.
- 3.2 Construct the base with self-propelled rotary mixer(s)/reclaimer(s) capable of mixing in place to the required depth. The mixer(s)/reclaimer(s) shall have a mechanism for controlling the reclaimed material gradation via breaker bar and/or a door opening on the mixer(s)/reclaimer(s). Mixer(s)/reclaimer(s) shall be fitted with an integrated liquid injection system capable of introducing liquid into the cutting drum during the mixing process.
- 3.3 Provide a sufficient number of water trucks on the jobsite at all times of operation to maintain the moisture requirements listed in **Subsection 9**. Ensure that the water truck used in conjunction with the reclaimer uses a direct injection system, and additional trucks maintain surface moisture during grading and compaction work and until the curing treatment is applied in accordance with **Subsection 13**. Accomplish this using a controlled and uniform application of water without eroding or otherwise damaging the CMRB surface.
- 3.4 Provide a spreader/distributor capable of achieving consistent, accurate and uniform distribution across the entire length and width of the roadway while minimizing dust. Ensure that the spreader has adjustable openings or gate headers and is not solely dependent on vehicle speed to obtain the required spread rate.
- 3.5 Provide a combination of sheepfoot rollers, smooth wheel tandem rollers, and/or pneumatic-tired rollers that have the ability to adequately compact reclaimed material throughout the entire specified CMRB thickness. Ensure the necessary weight, size and number of rollers to achieve the requirements of **Subsection 10**.

4.0 CONSTRUCTION

- 4.1 Regulate the sequence of work to process the necessary quantity of material to provide the full depth of modification as shown on the Plans:
 - 4.1.1 Ensure structural integrity of reclaimed material is consistent throughout the depth of the modification.
 - 4.1.2 Ensure surface quality is sufficient to provide durable temporary pavement structure surface and supports permanent pavement structure performance.
 - 4.1.3 Incorporate appropriate material as specified in the plans for drainage correction, cross slope correction or roadway strengthening.

5.0 QUALITY CONTROL PLAN, TEST STRIP & CORRECTIVE ACTION REQUIREMENTS

- 5.1 Prepare an annual Quality Control Plan that ensures that operational techniques and activities provide integral and finished material of acceptable quality for each Cement

Modified Recycled Base project. Submit a Quality Control Plan for acceptance to the Chemical Stabilization Engineer (CSE) in writing a minimum of two weeks before work begins for the year.

- 5.2** The Quality Control Plan should include, but not be limited to addressing the following items;
 - 5.2.1** Contingency plans for pulverization, mixing and compaction when specifications criteria are not met. Consider the specific roadway conditions of various project sites.
 - 5.2.2** Plan for identifying in-situ moisture conditions, adjusting the moisture content to meet specifications, and maintaining moisture content through the time of curing. Include a description of the methods and minimum contractor testing for moisture. Consider specific environmental conditions of various project sites and schedules.
- 5.3** Test Strips
 - 5.3.1** The first load of cement on the roadway will be used as a test strip to determine if the contractor is capable of producing a mixture according to specifications. Particular attention will be paid to the moisture and compaction requirements set in **Subsection 10**, mixing and processing requirements set in **Subsection 9**, pulverization requirements set in **Subsection 7**, depth requirements in **Subsection 17**, and cement tolerances in **Subsection 8**. Cease production after the first load if any of the requirements of the specification are outside of the tolerances and change procedures to contingency plans approved in the QC Plan to continue work. Continue production as normal on the same day when the test strip meets the specification requirements.
 - 5.3.2** The first load applied with the contingency plans will be used as a test strip to evaluate the corrective action plan. Cease production after this initial load of cement if the requirements of this specification are still not being met and submit a revised corrective action plan to the RCE for acceptance prior to continuing work.
 - 5.3.3** If the requirements of this specification are not being met in a section not defined as a test strip (a section is defined as one load of cement) then one additional load of cement will be allowed. Cease production after this additional load of cement if the requirements are still not being met and submit a corrective action plan to the RCE for acceptance prior to continuing work.

6.0 SHOULDERS & ROADWAY PREPARATION

- 6.1** Remove all excess vegetation generated from the clipping and cleaning of shoulders from the roadway and any other debris, including Reflective Pavement Markers, prior to performing the mixing operations. Remove material from the shoulders as necessary to ensure proper drainage at all times.

7.0 PULVERIZATION

- 7.1** Provide means, methods, and equipment necessary to obtain satisfactory pulverization of the pavement so that at the completion of pulverization and mixing (prior to compactive efforts), a uniform mixture is created in which 100% of the reclaimed material mixture (by weight) passes a 3 inch sieve and 95% of the reclaimed material mixture (by weight) passes a 2 inch sieve. When necessary, SC-T-

1 Section 6.6 will be used for sampling to run gradation tests. Rework areas not meeting this gradation control measure as necessary, adhering to the time limitations in **Subsection 11**. The pulverization pass is defined as at least one pass of the mixer prior to the application of cement. Additional passes are allowed. Lightly compact following each pass of the mixer to produce a uniform layer. Carefully control the depth of pulverization and conduct operations in a manner to ensure that the surface of the roadbed below the pulverized material remains undisturbed and conforms to the required cross-section. Means, methods and equipment including but not limited to additional passes of the reclaimer, milling in place or the use of supplementary equipment to achieve pulverization is the responsibility of the contractor and incidental to the process.

- 7.2** If the requirements of pulverization are not being met in a section not defined as a test strip (a section is defined as one load of cement) then one additional load of cement will be allowed. Cease production after this additional load of cement if the requirements are still not being met and submit a corrective action plan to the RCE for acceptance prior to continuing work.

8.0 APPLICATION OF CEMENT

- 8.1** The CSE will determine the rate of cement based on test results supplied in writing by the Contractor. Do not commence construction until an approved rate has been determined by the CSE. Allow two weeks from the date of submittal for the results and selection of appropriate cement rate. The test results will be conducted according to SC-T-26 by an AASHTO-accredited laboratory with material obtained from the roadway in which construction is to occur. Ensure that the roadway sampling and mix design testing is representative of the entire area and depth to be treated, several samples and/or designs may be necessary.
- 8.2** Spread Portland Cement uniformly on the pulverized material at the rate established by the CSE, taking care to minimize fugitive dust and minimize overlapping of the passes (maximum 6 inches). Apply cement only when the temperature is 40°F in the shade and rising, and no freezing temperatures are predicted for at least 48 hours. Do not perform work on frozen or excessively wet subgrade. A tolerance of 5% (of the rate) is allowed in the spread rate for individual sections (load of cement) of roadway; however, adjustments should be made in order to keep the actual spread rate as close to that established by the CSE. Only apply cement to such an area that all the operations (including final compaction) can be continuous and completed in daylight, unless adequate artificial light is provided. Ensure that all operations (including final compaction) can be completed within 3 hours of application of cement.
- 8.3** Do not allow the percentage of moisture in the reclaimed material mixture at the time of cement application to exceed the quantity that permits uniform and thorough mixture of reclaimed material or that creates instability of the roadway. Do not allow equipment, except that used in spreading and mixing, to pass over the freshly spread cement until it is mixed with the reclaimed material mixture.
- 8.4** If the requirements of cement application are not being met in a section not defined as a test strip (a section is defined as one load of cement) then one additional load of cement will be allowed. Cease production after this additional load of cement if the requirements are still not being met and submit a corrective action plan to the RCE for acceptance prior to continuing work.

9.0 MIXING & PROCESSING

- 9.1** Pulverize material as necessary to meet the requirements given in **Subsection 7**. The pulverization pass is defined as at least one pass of the mixer prior to the application of cement. Lightly compact following each pass of the mixer to produce a uniform layer.
- 9.2** After the cement has been applied per **Subsection 8**, mix and uniformly add necessary moisture to the reclaimed material to ensure that the moisture content is above the optimum value as set in the approved mix design when tested within 30 minutes of final compaction. Mix with at least one pass of the reclaimer after cement application at minimum. Additional passes are allowed, adhering to time limitations set forth within this specification. Ensure full width pulverizing and mixing by overlapping a minimum of 6 inches with each longitudinal pass, including at the longitudinal joint of each lane, and a minimum of 2 feet with each transverse joint. Additional mixing passes may be required in the contract documents. Lightly compact following each pass of the mixer to produce a uniform layer.
- 9.3** Immediately begin final compaction after the mixing process has been completed so that the requirements of **Subsection 10** are met.
- 9.4** Remove excess material generated from the mixing process after final grading operations have been completed.
- 9.5** If the requirements of mixing and processing are not being met in a section not defined as a test strip (a section is defined as one load of cement) then one additional load of cement will be allowed. Cease production after this additional load of cement if the requirements are still not being met and submit a corrective action plan to the RCE for acceptance prior to continuing work.

10.0 COMPACTION

- 10.1** Before beginning compaction, ensure that the mixture is free from excessive fluff and overly compacted areas to allow for uniform compaction of the layer. Continue compaction until the entire depth of the base course mixture is uniformly compacted to not less than 95% of the maximum density. SC-T-23, SC-T-26, SC-T-27, or SC-T-29 will be used at the discretion of

the RCE to determine the maximum density of the composite mix. If tests show that 95.0% requirement is not being met, adjust construction operations to obtain the required density. Complete the compaction work within 1 hour of the final mixing pass.

- 10.2** After the mixture is compacted, reshape the surface of the base course as necessary to conform to the required lines, grades, and cross-section. Perform light scarifying to a depth which removes the sheepsfoot imprints at minimum. Continue as required to obtain a uniform surface and to prevent scaling and delamination.
- 10.3** Perform compacting and finishing in a manner that produces a smooth, closely knit surface, free from equipment imprints, cracks, ridges, or loose material. Maintain the moisture content of the mixture and surface above optimum moisture as determined by the pre-approved mix design, to the time of final curing coat being applied. The moisture content and density requirements for compaction will be tested for acceptance within 30 minutes of final compaction. Additional moisture contents tests will be randomly performed for acceptance through the curing application to ensure that the surface moisture is maintained above optimum moisture.
- 10.4** If the requirements of compaction are not being met in a section not defined as a test strip (a section is defined as one load of cement) then one additional load of cement will be allowed. Cease production after this additional load of cement if the requirements are still not being met and submit a corrective action plan to the RCE for acceptance prior to continuing work.

11.0 CONSTRUCTION LIMITATIONS

- 11.1** Perform work in daylight hours unless adequate artificial light is provided. Limit the area over which the cement-pavement mixture is spread so that all operations specified in **Subsections 7, 8, 9, 10 and 13** are performed continuously until completion of a section (load of cement). Complete all grading and compaction work on a section (load of cement) within 2 hours after the initial mixing pass of the reclaimer unless the RCE approves a longer period.
- 11.2** If operations are interrupted for a continuous period of greater than 1 hour after the cement has been mixed with the reclaimed material, reconstruct the entire affected section (area of interruption) in accordance with these specifications. When the un- compacted reclaimed material mixture and cement is wetted so that the moisture content exceeds that specified, manipulate and aerate the mixture to reduce the moisture to the specified content provided the base course is completed within the time limits of these specifications.
- 11.3** Begin subsequent lifts of asphalt or chip seals which cover the Cement Modified Recycled Base curing methods and act as a final riding surface within 7 calendar days of completion of the CMRB section unless the RCE approves a longer period. Begin these subsequent lifts so that no more than 4 miles have temporary surfacetreatment on them at any time. A section is defined as the contract section of roadway receiving CMRB treatment. When using Curing Methods B or C, ensure that a milled surface is not left open to the public for more than 72 hours.

12.0 WEATHER LIMITATIONS

- 12.1** Apply cement only when the temperature is 40°F in the shade and rising, and no freezing temperatures are predicted for at least 48 hours. Do not perform work on frozen or excessively wet subgrade. The temperature restrictions for single treatment, when used as a curing option, shall meet the requirements of this reclamation specification. If the successive course is a final riding course, the seasonal restrictions of December, January and February apply unless otherwise approved by the DOC.

13.0 CURING

- 13.1** After the Cement Modified Recycled Base has been finished as specified, cure the surface using the specified method in the plans or contract. Dampen and sweep the CMRB immediately prior to the application of the surface treatment.
 - Curing Method A: Surface (Single) Treatment*
 - Curing Method B: Surface (Single) Treatment with Milling*
 - Curing Method C: Surface (Double) Treatment with Milling*
- 13.2** After the Cement Modified Recycled Base has been finished as specified, protect the base from rapid drying and traffic by placing Asphalt Surface Treatment as specified in **Section**

406 or 407, with the exception that lightweight aggregate is not required, and CRS-2 may be used in place of CRS-2P. Perform this operation daily to protect the newly constructed Cement Modified Recycled Base, unless otherwise directed by the RCE.

- 13.3** Prior to placement of the HMA course in Methods B & C, mill the Cement Modified Recycled Base course surface to obtain a true and level finish for the asphalt placement. Ensure that a diamond milling pattern with a double or triple strike is clearly visible in the finished surface. Consider the final thickness during construction, leaving the specified depth of treatment after the milling has occurred. Ensure that the surface is left in a condition ready for paving, free from scabbing, scaling and other defects. Ensure that any structure lost to additional, deeper milling to remove these defects is replaced with asphalt. Include this cost in the Cement Modified Recycled Base price.

14.0 CONSTRUCTION JOINTS

- 14.1** At the end of each day's construction, form a straight construction joint as specified in **Subsection 301.4.9**.

15.0 SURFACE SMOOTHNESS

- 15.1** Ensure that the finished surface of the recycled base meets the requirements of **Subsection 301.4.10**. The grade of the road will be based on existing conditions of the roadway. Grade the cross slope to obtain positive drainage as well as smooth transitions from crown to superelevated sections of the roadway, re-grade roads with a pre-existing cross slope of 2% or greater to the same cross slope. On roads with a pre-existing cross slope of less than 2%, the Contractor and RCE will determine the measures required to obtain positive drainage and the final cross slope.

16.0 RIDEABILITY

- 16.1** Ensure that the final asphalt surface placed on Cement Modified Recycled Base course meets the Rideability requirements of SC-M-403 for either New Construction or Resurfacing, whichever is applicable based on the specified pavement structure.

17.0 THICKNESS TOLERANCE

- 17.1** The thickness of the completed Cement Modified Recycled Base will be measured at random intervals not to exceed 1,000 feet in length. The average job thickness will be measured daily using the average value of all measurements taken by the inspector each day. Where the measured thickness is more than 1 inch greater than the specified thickness, the thickness of that location will be considered the specified thickness plus 1 inch. If the average job thickness varies from the specified job thickness by more than ½ inch, an adjusted unit price is used for calculating payment. The pay factor will be calculated as below and applied;

$$\text{Pay Factor} = 1 - \frac{(\text{Average Job Thickness} - \text{Specified Job Thickness})}{\text{Specified Job Thickness}}$$

$$\text{Adjusted Contract Unit Price} = \text{Pay Factor} \times \text{Contract Unit Price}$$

- 17.2** If the requirements of thickness (any single test value greater than 1 inch different from the specified depth) are not being met in a section not defined as a test strip (a section is defined as one load of cement) then one additional load of cement will be allowed. Cease production after this additional load of cement if the requirements are still not being met and submit a corrective action plan to the RCE for acceptance prior to continuing work.

18.0 OPENING TO TRAFFIC

- 18.1** Local traffic may use completed portions of the Cement Modified Recycled Base provided the base has hardened sufficiently to prevent marring, damaging or visible rutting of the surface by such usage. Ensure that no damage occurs to the curing coat. With approval of the District Office, temporary detours may be utilized during the reclamation process to reduce the traffic on the reclaimed roadway. Use the subgrade shoulders or completed pavement, when available, for transporting materials, workers, and equipment throughout the project. Do not place construction equipment on the base without the approval of the RCE unless it is being used in the subsequent construction operation.

19.0 MAINTENANCE

19.1 Maintain the Cement Modified Recycled Base in accordance with **Subsection 301.4.13**.

20.0 MEASUREMENT

20.1 The quantity for the pay item Cement Modified Recycled Base (of the uniform thickness required) is the surface area of a uniform base constructed by applying and mixing cement with the subgrade as specified and is measured by the square yard (SY) of the modified base in-place, complete and accepted. Cement Modified Recycled Base constructed outside the designated area is not measured for payment.

20.2 The quantity for the pay item Portland Cement for Cement Modified Recycled Base is the weight of cement incorporated into the base at the rate established by the CSE and is measured by the ton (TON), complete and accepted. Portland cement incorporated in excess of 5% of the amount established by the CSE is not included in the measurement. Furnish the RCE with invoices of all cement received to verify weight.

21.0 PAYMENT

21.1 Payment for the accepted quantity of Cement Modified Recycled Base (of the uniform required thickness) or Portland Cement for Cement Modified Recycled Base, measured in accordance with **Subsection 20** is determined using the contract unit bid price for the applicable item.

21.2 Payment for Cement Modified Recycled Base (of the uniform required thickness) is full compensation for constructing the Cement Modified Recycled Base course as specified or directed and includes pulverizing and scarifying the existing pavement, applying and spreading cement, processing and mixing base course material, watering and maintaining proper moisture content, compacting, finishing, curing, hauling and disposing of excess shoulder material and curing base course, forming construction joints, and all other materials, labor, equipment, tools, transportation, and incidentals necessary to complete the work in accordance with the Plans, the Specifications, and other terms of the Contract.

21.3 Base course that is deficient in thickness is paid for at the adjusted unit price specified in **Subsection 20**.

21.4 Payment for Portland Cement for Cement Modified Recycled Base is full compensation for furnishing and weighing the cement as specified or directed and includes all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to complete the work in accordance with the Plans, the Specifications, and other terms of the Contract.

21.5 Payment for excess reclaimed material generated from the roadway (excluding shoulder material) is paid for as unclassified excavation.

21.6 Payment for each item includes all direct and indirect costs or expenses required to complete the work.

21.7 Pay items under this section include the following:

Item No.	Pay Item	Unit
3063306	Cement Modified Recycled Base (6" Uniform)	SY
3063308	Cement Modified Recycled Base (8" Uniform)	SY
3063310	Cement Modified Recycled Base (10" Uniform)	SY
3063312	Cement Modified Recycled Base (12" Uniform)	SY
3064000	Portland Cement for Cement Modified Recycled Base	TON

SECTION V: BID FORM

SECTION ONE**MAGGIE HARRIS ROAD BRIDGE REPLACEMENT, RFB: 13921.04**

BY SUBMITTING THIS BID, THE UNDERSIGNED BIDDER REPRESENTS:

- A. that he has carefully examined the plans and specifications with the related documents and visited the site of the Project for which he is submitting a Bid.
- B. that he is familiar with all the conditions surrounding the performance of the Work required for this Project, including the availability of materials, equipment, supplies and labor, and has visited the site and is therefore familiar with all physical conditions affecting the work and has considered same in calculating his bid
- C. that, if he is awarded the Contract, he will provide all labor, material, supplies. And equipment and execute the Work in accordance with the Contract Documents.
- D. that, if awarded the Contract he will commence work after the issuance of a "Notice to Proceed" as required herein.
- E. that, if awarded the Contract, he agrees that if the Work or any part thereof is not completed according to the specifications and terms of the Contract Documents and within Contract Time (including any extension thereof), he and his sureties will be liable for Liquidated Damages in accordance with the Contract.
- F. that he will hold his Bid open for sixty (60) calendar days after the date Bids are opened or else forfeit the Bid Security to the Owner.
- G. that, if awarded the Contract, he will provide a Performance Bond and a Payment Bond together with insurance coverage as required herein.
- H. that he understands that the Owner reserves the right to reject any Bids which do not meet the Bid Requirements, or all Bids in the event that the Project is canceled or postponed, or if such is in the best interests of the County.
- I. that if awarded the Contract the successful Bidder will enter and execute a contract as required herein.
- J. that the Bidder is legally able to enter into and perform a contract, if awarded.
- K. that the Bidder is current on all taxes and fees owed to the County.
- L. that the bidder agrees to commence work upon issuance of Notice to Proceed with an adequate force, carry the work forward as rapidly as possible, and complete the Project as required by the Special Provisions.
- M. that the bidder agrees that in the case of failure or refusal on his part to execute the Contract within five (5) calendar days after the issuance of a Notice of Award, the check, cash, or Bid Bond accompanying this Bid shall be paid into the funds of the County's account set aside for this Project, as liquidated damages, and not as penalty, for such failure; otherwise the check, cash, or Bid Bond accompanying this Bid shall be returned to the undersigned.
- N. that the unit price per ton, square yard, linear foot, etc., must reflect all materials, supplies, equipment, supervision, labor costs, quality control services, and sales tax necessary to complete the project. All costs for grading, sweeping, cleaning, shaping, tacking, compacting, etc.; shall also be included in the unit bid price.

- O. that he acknowledges and understands that all Contractor "As Bid" unit measures for the various Project Elements will be reviewed by The County and, where any discrepancies are noted The County reserves the right to advise the bidder and make the necessary corrections and thereby adjust the Contractor's sum total bid amount accordingly. All adjustments, if any, will be predicated on work measurement as represented on the plans. We shall have the option to decline any reasonable unit measure adjustment that will reflect an increase in our base bid. Therefore, it is understood that unless declined, any adjustments reflecting an increase in the element costs will, when adjusted, reflect an overall increase in the base bid and will be considered in determining the most responsive
- P. that the undersigned, certify that this Bid does not violate Federal or State Antitrust Laws and I have received and read the Request for Bids and understand that this Bid is subject to all conditions thereof. A signature below indicates that the Offeror herein, his agents, servants and/or employees, have not in any way colluded with anyone for and on behalf of the Offeror, or themselves, to gain any favoritism in the award of the Contract herein.
- Q. that the undersigned certifies that the Contractor listed below will provide a "drug-free workplace" as that term is defined in Section 44-107-30 of the Code of Laws of South Carolina, 1976, as amended, by complying with the requirements set forth in Title 44, chapter 107
- R. CONTRACTORS NAME: _____

FEDERAL IDENTIFICATION NUMBER: _____

CONTRACTOR'S CLASSIFICATIONS AND SUBCLASSIFICATIONS WITH LIMITATIONS

(Classification)

(Sub-Classification)

(Limitations)

(S.C. Contractor's License Number)

SECTION TWO
MAGGIE HARRIS ROAD BRIDGE REPLACEMENT, RFB: 13921.04

BID OF (CONTRACTOR NAME): _____

CONTACT EMAIL: _____

ITEM #	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	EXTENDED PRICE
STRUCTURAL					
2028100	Removal and Disposal of Existing Bridge	LS	NEC		
2052000	No. 57 Stone for Backfill	TON	52		
7011400	Conc. for Structures – Class 4000	CY	23.8		
7031200	Reinf. Steel for Structures (Bridge)	LBS	3,236		
7045991	3'-0" x 1'-9" Cored Slabs	LF	279.1		
7051005	Precast Barrier	LF	80		
7110010	Pile Driving Set-Up	EA	6		
7111530	Reinf. Pile Tips (HP12 x 74)	EA	6		
7112160	Steel H Bearing Piling (HP12 x 74)	LF	102.9		
7243100	Elastomeric Bearing	EA	14		
8143000	Waterproofing (Bridge Deck)	SY	106		
ROADWAY					
1031000	Mobilization	LS	NEC		
1032010	Bonds and Insurance	LS	1		
1050800	Construction Stakes, Lines and Grades	EA	1		
1071000	Traffic Control	LS	NEC		
2011000	Clearing and Grubbing within Right of Way	LS	NEC		
2031000	Unclassified Excavation	CY	122		
2081001	Fine Grading	SY	729		
3031006	Sand-Clay Base Course (6" Uniform)	CY	122		
3069900	Maintenance Stone	TON	20		
8041020	Rip-Rap (Class B)	TON	97		
8042800	Geotextile Fabric for Erosion Control under Rip-Rap (Class 2)	SY	156		
8051050	Pre-mash W-Beam Strong Post System WSP3	LF	100		
8051210	Pre-mash W-Beam Bridge Connection TL2 WBBC2	EA	4		
8057050	Pre-mash Type T TL2 Leading 25FT	EA	4		
8100100	Permanent	ACRE	0.3		
8100200	Temporary Cover	ACRE	0.3		
GRAND TOTAL				\$	

(Grand Total in Words)

The Bid prices for Unit Price Work set forth as of the Effective Date of the Agreement are based on estimated quantities. As provided in the General Conditions, estimated quantities are not guaranteed, and

determinations of actual quantities and classifications are to be made by Engineer as provided in of the General Conditions.

SECTION THREE

MAGGIE HARRIS ROAD BRIDGE REPLACEMENT, RFB: 13921.04

LISTING OF SUBCONTRACTORS:

Any bidder in response to this Request for Bids shall set forth in his bid the name and location of the place of business for each of the following subcontractors (if so specified) who may perform work or render services to the Prime Contractor to or about the construction, or who will specifically fabricate or install a portion of the work. If the Prime Contractor determines to use his own employees to perform any portion of the work for which he would otherwise be required to list a subcontractor, and if the Prime Contractor is qualified to perform such work under the terms of the Request for Bids, the Prime Contractor shall indicate this in his bid and not subcontract any of that work except with the approval of owner for good cause shown.

Failure to list specified subcontractors shall render the prime Contractor's bid non-responsive. No Prime Contractor whose bid is accepted shall substitute any person as a subcontractor in place of the subcontractor listed in the original bid, except as specified within the contract documents.

Subcontractor: _____

Work to be undertaken: _____

Place of Business: _____

Principal: _____

License No _____

Subcontractor: _____

Work to be undertaken: _____

Place of Business: _____

Principal: _____

License No _____

Subcontractor: _____

Work to be undertaken: _____

Place of Business: _____

Principal: _____

License No _____

Subcontractor: _____

Work to be undertaken: _____

Place of Business: _____

Principal: _____

License No _____

SECTION FOUR**MAGGIE HARRIS ROAD BRIDGE REPLACEMENT, RFB: 13921.04**

Respectfully submitted this ____ day of _____, 2023

Company Name: _____

Authorized Signature: _____

Name and Title (type or print) _____

Email Address (type or print) _____

Principal of Company (e.g., Name of President, General Partner, Owner, etc.)

State of Incorporation: _____

Business Address: _____

City, State, Zip Code: _____

Telephone Number: _____ Fax Number: _____

Contractor's Federal Tax I.D. No.: _____

S.C. Contractor's License No.: _____

S.C. Bidder's License No.: _____

ACKNOWLEDGMENT OF RECEIPT OF AGENDA:

(If more addenda are issued, then add to the list.)

Addendum No.1 dated: _____

Addendum No.2 dated: _____

Addendum No.3 dated: _____

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we _____, as Principal, a
(____corporation,____partnership,____individual) duly authorized by law to do business as a construction
contractor in the State of South Carolina, and _____, as
Surety, a corporation duly authorized to transact surety business under the Law of the state of South
Carolina, are held and firmly bound unto Fairfield County as oblige, in the penal sum of:

Five Percent (5%) of the Bid Amount

for the payment of which sum well and truly to be made, the said Principal and the said Surety, bind
ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by
these presents.

WHEREAS, the Principal has submitted a bid for the project named:

Maggie Harris Road Bridge Replacement - RFB: 13921.04

NOW, THEREFORE, if the Oblige shall accept the bid of the Principal and the Principal shall enter into a
Contract with the Oblige in accordance with the terms of such bid and give such bonds as may be specified
in the bidding or Contract Documents with good and sufficient surety acceptable to the Oblige, then this
obligation shall be null and void, otherwise to remain in full force and effect.

Signed and sealed this _____ day of _____, 2023 .

PRINCIPAL**SURETY**

_____(Seal)
Bidder's Name and Corporate Seal

_____(Seal)
Surety's Name and Corporate Seal

By: _____
Signature and Title

By: _____
Signature and Title
(Attach Power of Attorney)

Attest: _____
Signature and Title

Attest: _____
Signature and Title

Note: A copy of the agent's Power of Attorney for the Surety Company must be attached to this bond
form.

APPENDIX A: BRIDGE DRAWINGS

SCALE: 50,000 ft. / in.
PEN TABLE: C:\Resource\Standards\Bentley\Vertical\Plotting\DO NOTHING-BRIDGES.tbl
PLOT DRIVER: G:\Resource\Standards\Bentley\Vertical\Plotting\BRIDGES.pdf MS I:ptcrg
FILE: H:\Jobs\04\13921-04\Production\Structural\Drawings\013921-04_L-664_BR_01_Title Sheet.dgn
7/19/2023

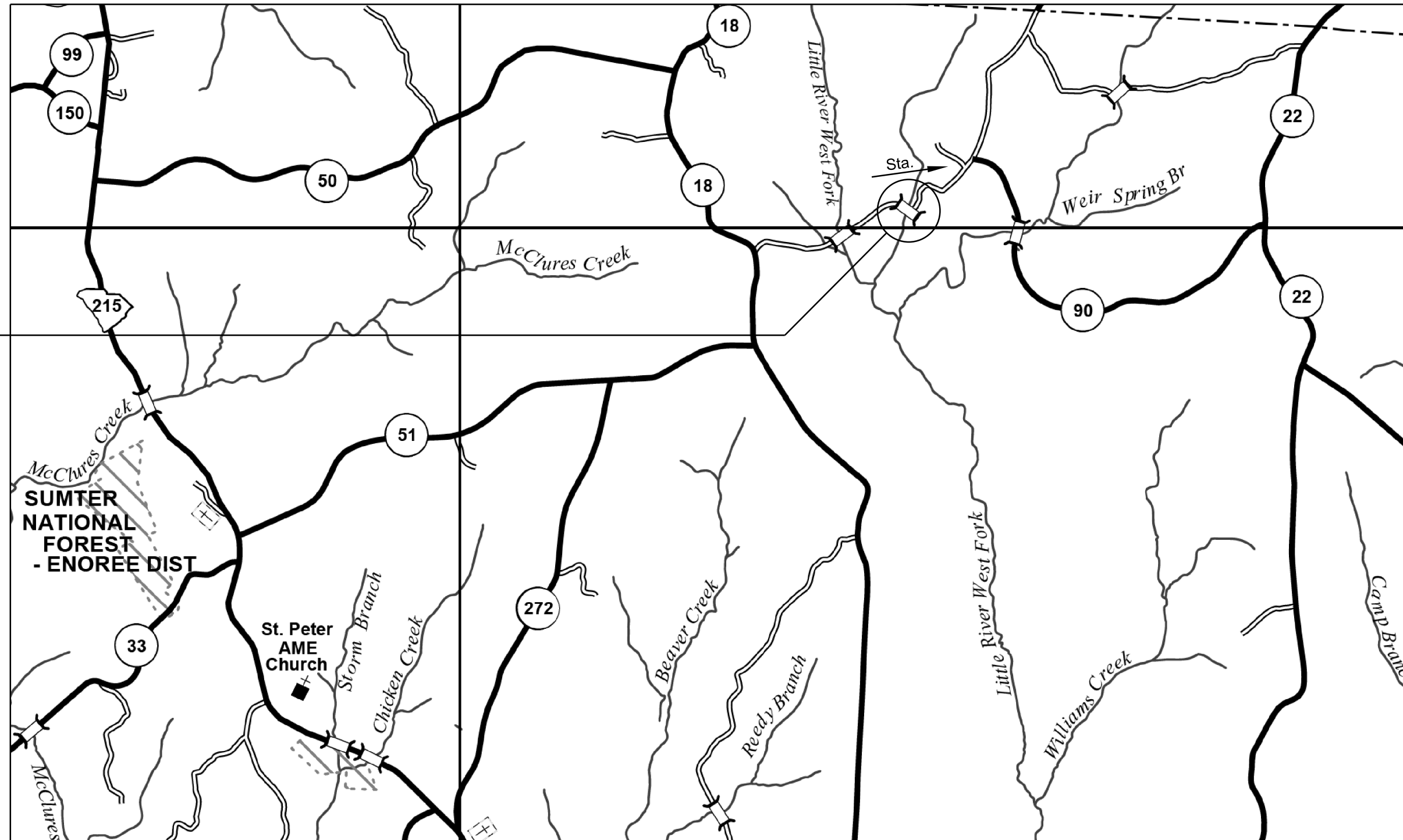
INDEX OF SHEETS

1. TITLE SHEET
2. SUMMARY OF ESTIMATED QUANTITIES
3. GENERAL NOTES & DETAILS
4. REINFORCING BENDING DETAILS
5. ROADWAY TYPICAL SECTION
6. ROADWAY PLAN & PROFILE
7. BRIDGE PLAN & PROFILE
8. BORING LOGS
9. FOUNDATION LAYOUT
10. END BENT PLAN & ELEVATION
11. END BENT DETAILS
12. 40'-0" PRESTRESSED CONC. CORED SLAB SPAN (3'-0" X 1'-9")
13. PRESTRESSED CONC. CORED SLAB DETAILS
14. PRECAST BARRIER DETAILS (SHEET 1 OF 2)
15. PRECAST BARRIER DETAILS (SHEET 2 OF 2)



PROPOSED PLANS
FOR
FAIRFIELD COUNTY
L-664 (MAGGIE HARRIS ROAD)
REPLACE BRIDGE OVER BRANCH OF
LITTLE RIVER WEST FORK

SITE LOCATION



LAYOUT
(NOT TO SCALE)

NET LENGTH OF ROADWAY	0.000	MILES
NET LENGTH OF BRIDGES	0.007	MILES
NET LENGTH OF PROJECT	0.007	MILES
LENGTH OF EXCEPTIONS	0.000	MILES
GROSS LENGTH OF PROJECT	0.007	MILES

NOTE: EXCEPT AS MAY OTHERWISE BE SPECIFIED ON THE PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIALS AND WORKMANSHIP ON THIS PROJECT SHALL CONFORM TO THE SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2007 EDITION) AND THE STANDARD DRAWINGS FOR ROAD CONSTRUCTION IN EFFECT AT THE TIME OF LETTING.

Design Reference for these plans is the:

LVB

Supplemental Design Criteria For
Low Volume Bridge Replacement Projects

Submit Shop Plans to:

Davis & Floyd, Inc.
1319 Highway 72/221E
Greenwood, SC 29649

Telephone: (864) 229-5211

Approximate Location of Bridge is

Latitude 34° - 32' - 49" N
Longitude 81° - 17' - 23" W

3 DAYS BEFORE DIGGING IN
SOUTH CAROLINA
CALL 811
SOUTH CAROLINA 811 (SC811)
WWW.SC811.COM
ALL UTILITIES MAY NOT BE A MEMBER OF SC811

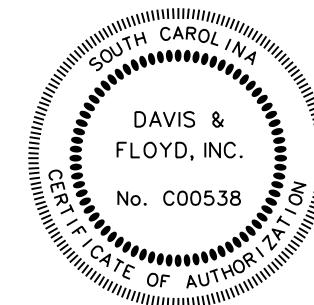
EXISTING ASSET ID 1464
NEW ASSET ID TBD

TRAFFIC DATA

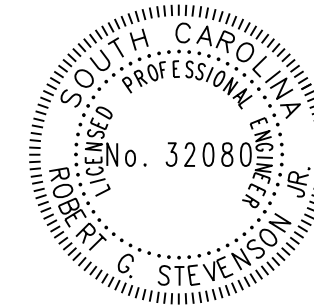
2023 ADT <400 V.P.D.

TRUCKS 5 %

CONSULTING ENGINEERING FIRM



ENGINEER OF RECORD

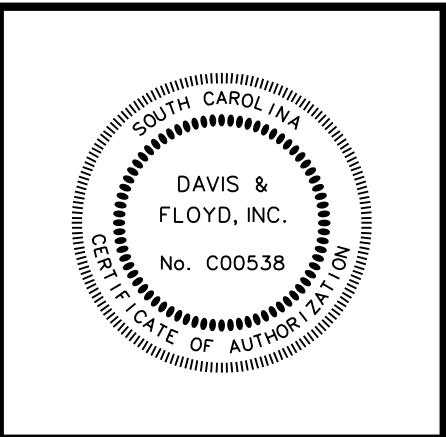


FOR CONSTRUCTION : 7/20/23
DATE

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7/19/2023

TABULATION OF ESTIMATED QUANTITIES										
ITEM	NO. 57 STONE BACKFILL	CONC. FOR STRUC. - CLASS 4000	REINF STEEL FOR STRUCT (BRIDGE)	3'-0" X 1'-9" CORED SLAB	PRECAST BARRIER	PILE DRIVING SET-UP	REINF. PILE TIPS (HP12X74)	STEEL H BEARING PILING (HP12X74)	ELASTOMERIC BEARING	WATERPROOF. (BRIDGE DECK)
	TON	CY.	LBS.	L.F.	L.F.	EA.	EA.	L.F.	EA.	SY.
END BENT 1	26	11.9	1,618	-	-	3	3	58.8	-	-
END BENT 2	26	11.9	1,618	-	-	3	3	44.1	-	-
SUPERSTRUCTURE	-	-	-	279.1	80	-	-	-	14	106
TOTALS	52	23.8	3,236	279.1	80	6	6	102.9	14	106

SUMMARY OF ESTIMATED QUANTITIES			
ITEM NO.	BID ITEM	UNIT	QUANTITY
2028100	REMOVAL & DISPOSAL OF EXISTING BRIDGE	L.S.	NECESSARY
2052000	NO. 57 STONE FOR BACKFILL	TON	52
7011400	CONC. FOR STRUCTURES - CLASS 4000	CY.	23.8
7031200	REINF. STEEL FOR STRUCTURES (BRIDGE)	LBS.	3,236
7045991	3'-0" X 1'-9" CORED SLABS	L.F.	279.1
7051005	PRECAST BARRIER	L.F.	80
7110010	PILE DRIVING SET-UP	EA.	6
7111530	REINF. PILE TIPS (HP12 X 74)	EA.	6
7112160	STEEL H BEARING PILING (HP12 X 74)	L.F.	102.9
7243100	ELASTOMERIC BEARING	EA.	14
8143000	WATERPROOFING (BRIDGE DECK)	SY.	106



REV.			
REV.			
REV.			
REVIEWED CLM			
QUAN.	ZMA	RGS	02-23
DR.	ZMA	RGS	01-23
DES.	ZMA	RGS	01-23
	BY	CHK	DATE

DAVIS & FLOYD

SINCE 1954

1319 HWY 72/221 E.
GREENWOOD, SC 29649
(864) 229-5211

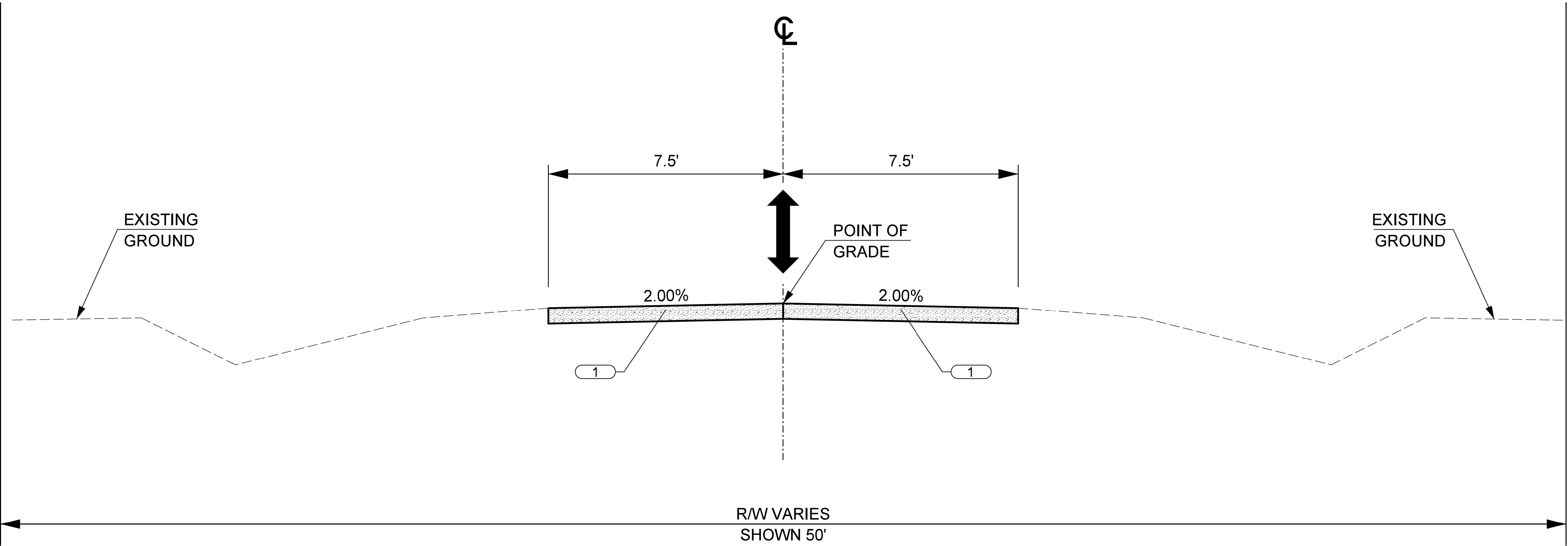
FAIRFIELD COUNTY

SUMMARY OF ESTIMATED QUANTITIES

COUNTYFAIRFIELDROUTE L-664

FED. ROAD DIV.NO.	STATE	COUNTY	D&F PROJECT ID	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	S.C.	FAIRFIELD	13921.04	L-664		

BRIDGE PLANS SHEET NO.
5



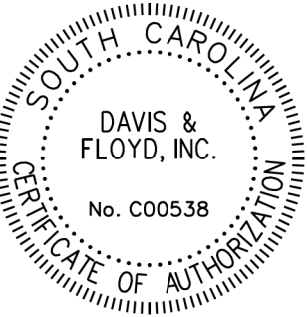
①
MAGGIE HARRIS ROAD
TYPICAL SECTION
STA. 11+81.14 TO STA. 16+14.61

FOR INFORMATION ONLY

SCALE: 1.9765 ft / in.
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PLOT DRIVER: PDF.pltcfq
FILE: H:\JobsOdd\13921-04\Production\Transportation\SHEETS\003_13921-04_TYPICAL SHEETS.DGN
2/28/2023

① ② 6' UNIFORM EARTH TYPE COURSE

RTE. HILL ROAD		DESIGN SPEED	
MPH	FROM STA.	TO STA.	
RTE.			

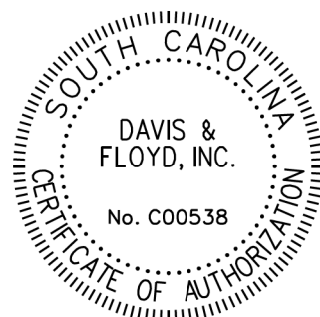


DAVIS & FLOYD
SINCE 1954

1940 ALGONQUIN ROAD, SUITE 301
CHARLESTON, SC 29405
(843)-554-8602

5			
4			
3			
2			
1			
REV. NO.	BY	DATE	DESCRIPTION OF REVISION
DESIGNED BY	AM	DRAWN BY	JJG
CHECKED BY	AM		

FAIRFIELD COUNTY	
FAIRFIELD COUNTY TYPICAL SECTION SHEET MAGGIE HARRIS ROAD	
NTS	PLOT SIZE = 22" x 34"



1940 ALGONQUIN ROAD, SUITE 30
CHARLESTON, SC 29405
(843)-554-8602

FAIRFIELD COUNTY

FAIRFIELD COUNTY
PLAN AND PROFILE SHEET
MAGGIE HARRIS ROAD

SCALE: 1"=20' PLOT SIZE = 22" x 34"


SCALE: 19,7647 ft / in.
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3/2/2023

Maggie Harris Road RBO Unnamed Tributary Carlisle, Fairfield County, South Carolina G6782.00						LOG OF BORING No. B-1					
Date Drilled: 12/12/22			Supervisor: L. Guempel			Notes:					
Date Completed: 12/12/2022			Approx. Ground Elevation (ft): 436								
Drill Machine: CME 550X			Drilling Method: HSA								
Water T.O.B. (ft): NR			Water 24 HR (ft): 9								
Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample Type-No.	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	STD. PENETRATION TEST DATA (blows/ft) 5 10 20 40 70
	0.3	GRAVEL (3")		0.0							
	2.0	Loose, Moist, Reddish Brown, Non-Plastic, Silty Fine to Medium SAND (SMA-2-4) =>@SS-1: LL=NP, PL=NP, PI=NP, NMC=12.0%, % $\#200$ =30.4		2.0	SS-1	2	5	4	5	9	
		Dense, Moist, Yellowish Brown, Non-Plastic, Silty Fine to Medium SAND (SMA-A-4) =>@SS-2: LL=NP, PL=NP, PI=NP, NMC=10.1%, % $\#200$ =25.8		4.0	SS-2	10	23	10	9	33	
431.0		=> Loose, Reddish Brown =>@SS-3: LL=NP, PL=NP, PI=NP, NMC=13.0%, % $\#200$ =41.0		6.0	SS-3	4	5	3	3	8	
	8.0	Very Dense, Moist, Dark Brownish Gray, Non-Plastic, Silty Fine to Medium SAND (SM)		8.0	SS-4	4	4	3	11	7	
426.0					SS-5	4	8	6	3	14	
				13.5							
421.0					SS-6	16	26	29		55	
	18.5	Dense, Moist, Dark Grayish Brown, Non-Plastic, Fine to Course SAND (SP) with Gravel		18.5	SS-7	16	15	42		57	
416.0											
	22.0	Very Dense, Moist, Greenish Gray, Non-Plastic, Fine to Medium SAND (SP) with Silt		23.5							
411.0	24.2	Auger Refusal at 24.2 Feet Below Ground Surface, Begin Rock Coring.		24.2	SS-8	50/5.5"				100+	>
		PHYLLITE REC: 82% RQD: 52% =>UC: 4,980 psi =>UC: 5,240 psi			NQ-1						
406.0	29.2	PHYLLITE REC: 88% RQD: 58% =>UC: 7,030 psi		29.2	NQ-2						
401.0	34.2	Coring Terminated at 34.2 Feet Below Ground Surface.									

LEGEND

SAMPLER TYPE		DRILLING METHOD
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger
ST - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	RC - Rock Core
		PHD - Percussion Hammer Drill

F&ME PRIVATE LOG G6782.00 - MAGGIE HARRIS ROAD GRU FME2017.GDT 2/8/23

		Maggie Harris Road RBO Unnamed Tributary Carlisle, Fairfield County, South Carolina G6782.00		LOG OF BORING No. B-2 Latitude: 34.547025 Longitude: -81.289732							
Date Drilled: 12/13/22		Supervisor: L. Guempel		Notes:							
Date Completed: 12/13/2022		Approx. Ground Elevation (ft): 435									
Drill Machine: CME 550X		Drilling Method: HSA									
Water T.O.B. (ft): 7		Water 24 HR (ft): NR									
Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample Type-No.	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	STD. PENETRATION TEST DATA (blows/ft)
											5 10 20 40 70
430.0	0.3	GRAVEL (3") Medium Dense, Moist, Dark Yellowish Brown, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-1-b) with Gravel ==>@SS-2: LL=NP, PL=NP, PI=NP, NMC=9.4%, % $\#200$ =22.8		0.0	SS-1	6	3	7	7	12	
				2.0	SS-2	6	5	6	26	11	
				4.0	SS-3	10	20	15	8	35	
	6.0	Very Loose, Moist, Brownish Yellow, Non-Plastic, Silty Fine to Medium SAND (SM/A-4) ==>@SS-4: LL=NP, PL=NP, PI=NP, NMC=17.5%, % $\#200$ =44.3		6.0	SS-4	2	2	1	2	3	
425.0	8.0	Medium Dense, Moist, Yellowish Brown, Non-Plastic, Silty Fine to Medium SAND (SM/A-2-4) ==>@SS-5: LL=NP, PL=NP, PI=NP, NMC=15.5%, % $\#200$ =23.2		8.0	SS-5	2	5	7	8	12	
				13.5	SS-6	50	1.5			100	>
420.0	13.5	Very Dense, Moist, Blueish Gray, Non-Plastic, GRAVEL (GW) with Fine to Medium Sand		18.5	SS-7	50	1			100	>
	18.6	==> Greenish gray Auger Refusal at 18.6 Feet Below Ground Surface, Begin Rock Coring.		18.6	NQ-1						
415.0	23.6	PHYLLITE REC:58% RQD: 0%		23.6	NQ-2						
410.0	28.6	PHYLLITE REC:67% RQD: 20%		28.6	NQ-3						
405.0	33.6	PHYLLITE REC:85% RQD: 13%		33.6	NQ-4						
400.0	38.6	Coring Terminated at 38.6 Feet Below Ground Surface.									
395.0											
LEGEND											
SAMPLER TYPE SS - Split Spoon ST - Undisturbed Sample AWG - Rock Core, 1-1/8" NQ - Rock Core, 1-7/8" CU - Cuttings CT - Continuous Tube						DRILLING METHOD HSA - Hollow Stem Auger CFA - Continuous Flight Augers DC - Driving Casing RW - Rotary Wash RC - Rock Core PHD - Percussion Hammer Drill					

FOR INFORMATION ONLY

REV.			
REV.			
REV.			
REVIEWED CLM			
QUAN.			
DR.	ZMA	RGS	02-23
DES.			
	BY	CHK.	DATE

DAVIS & FLOYD
SINCE 1954

1319 HWY 72/221 E.
GREENWOOD, SC 29649
(864) 229-5211

FAIRFIELD COUNTY

BORING LOGS

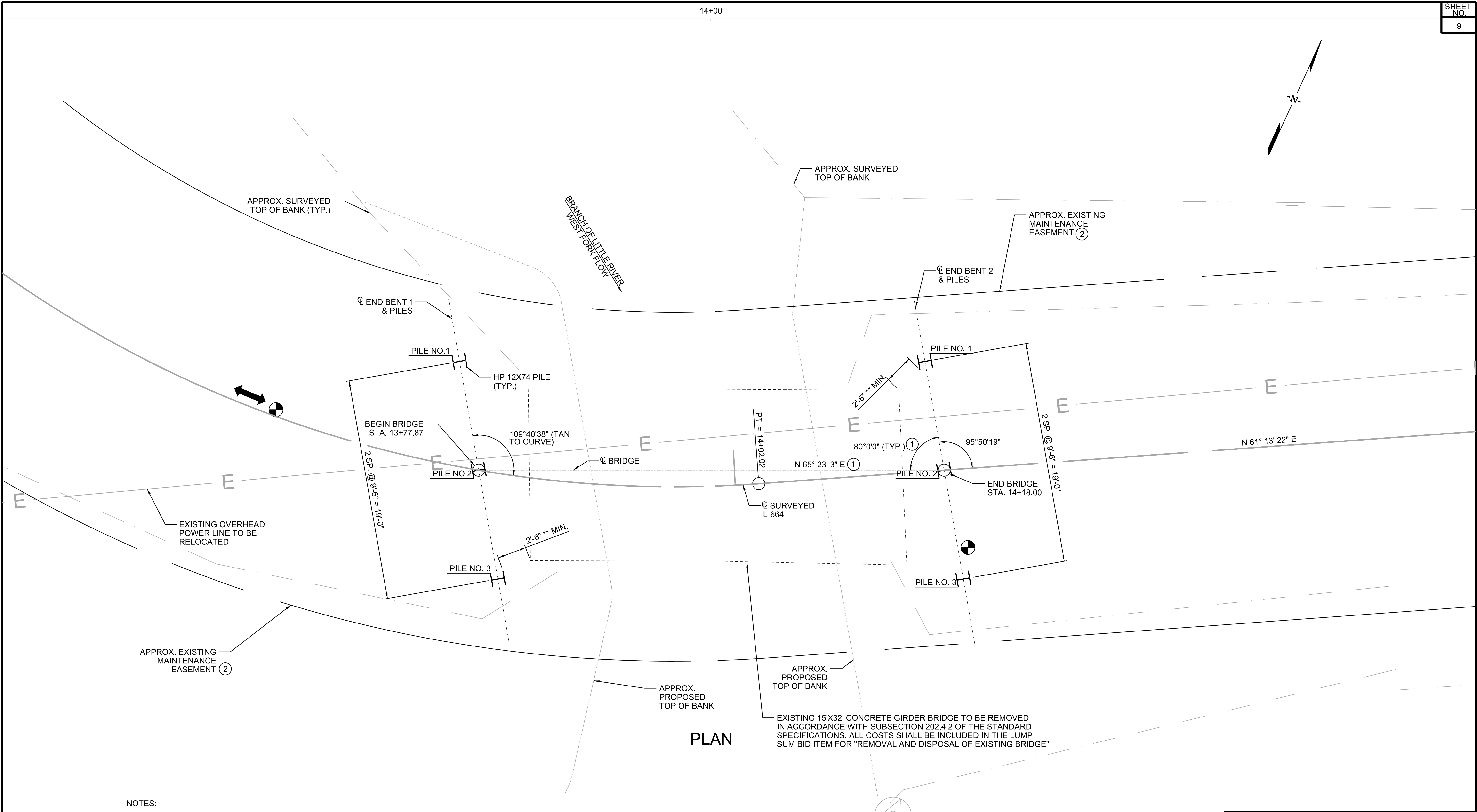
COUNTY

FAIRFIELD

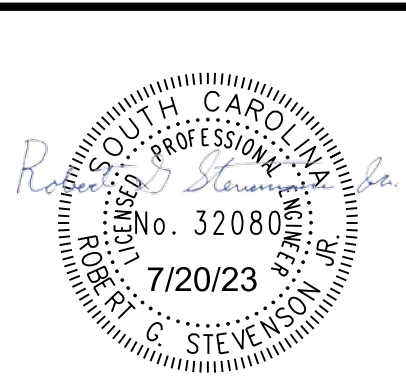
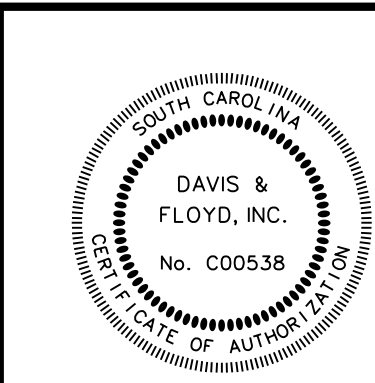
ROUTE

-664

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7/19/2023



- NOTES:
- ** = APPROXIMATE
- ➔ DENOTES DIRECTION OF TRAVEL
- ① MEASURED TO/ALONG CL BRIDGE.
- ② MAINTENANCE EASEMENT SHOWN AT 15' FROM CL SURVEYED L-644. ACTUAL EASEMENT WIDTH VARIES AND IS FROM DITCH TO DITCH.



REV.			
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REV.			
REVIEWED	CLM		
QUAN.			
DR.	ZMA	RGS	02-23
DES.	ZMA	RGS	02-23
	BY	CHK	DATE

DAVIS & FLOYD SINCE 1954		1319 HWY 72/221 E. GREENWOOD, SC 29649 (864) 229-5211	
FAIRFIELD COUNTY		ROUTE L-664	
FOUNDATION LAYOUT			
COUNTY	FAIRFIELD	ROUTE	L-664



2.000 ft / in.
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PEN TABLE:
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7/19/2023

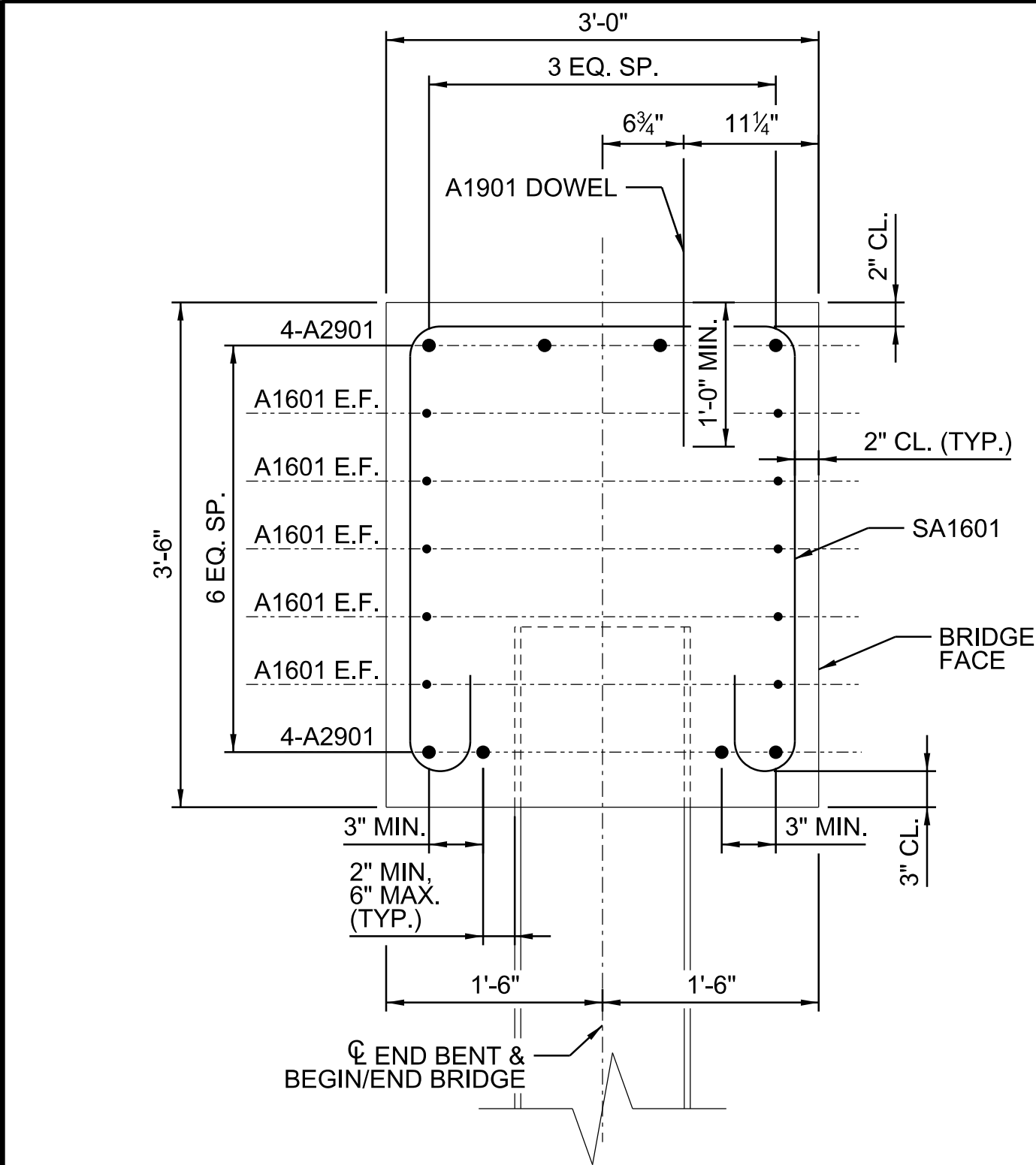
1319 HWY 72/221 E.
GREENWOOD, SC 29649
(864) 229-5211

END BENT PLAN & ELEVATION

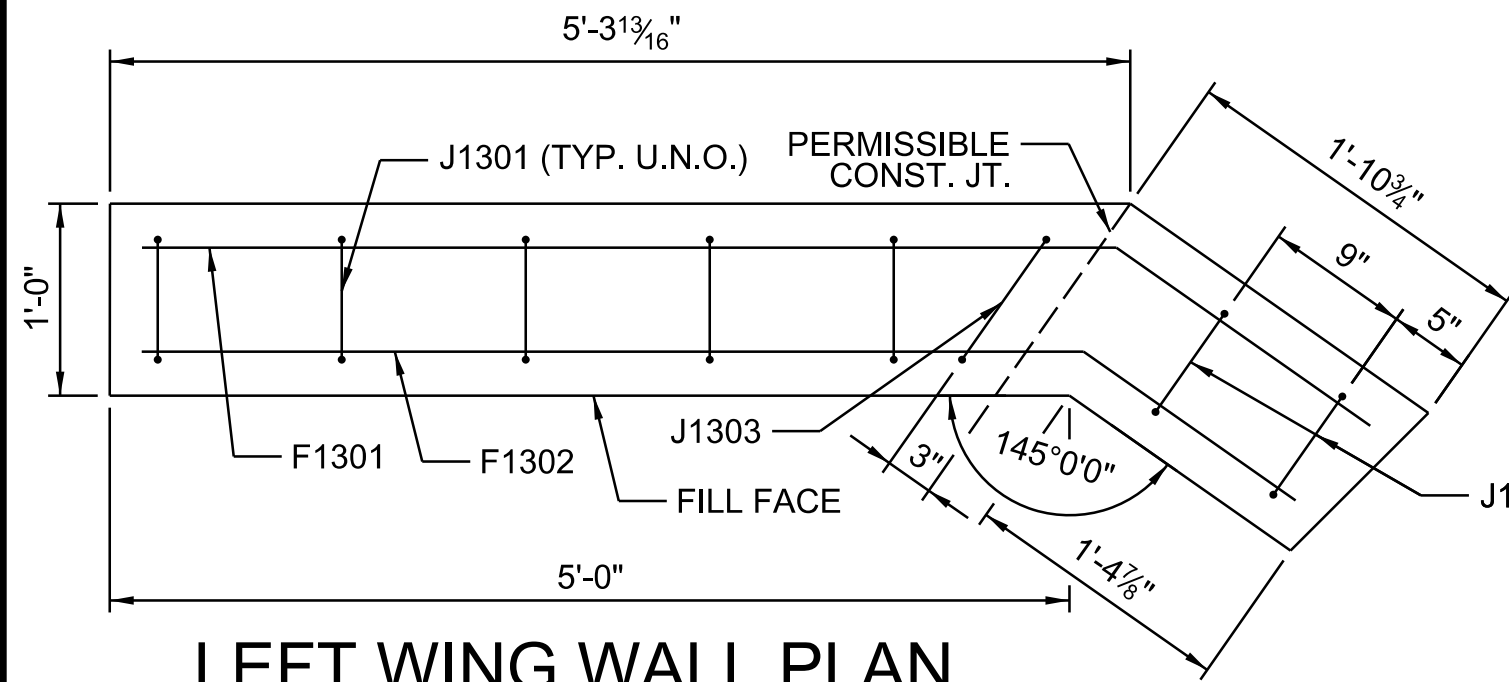
ROUTE	L-664
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REVIEWED CLM			
QUAN.			
DR.	DLH	RGS	12-22
DES.	DLH	RGS	12-22
	BY	CHK.	DATE

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7/19/2023

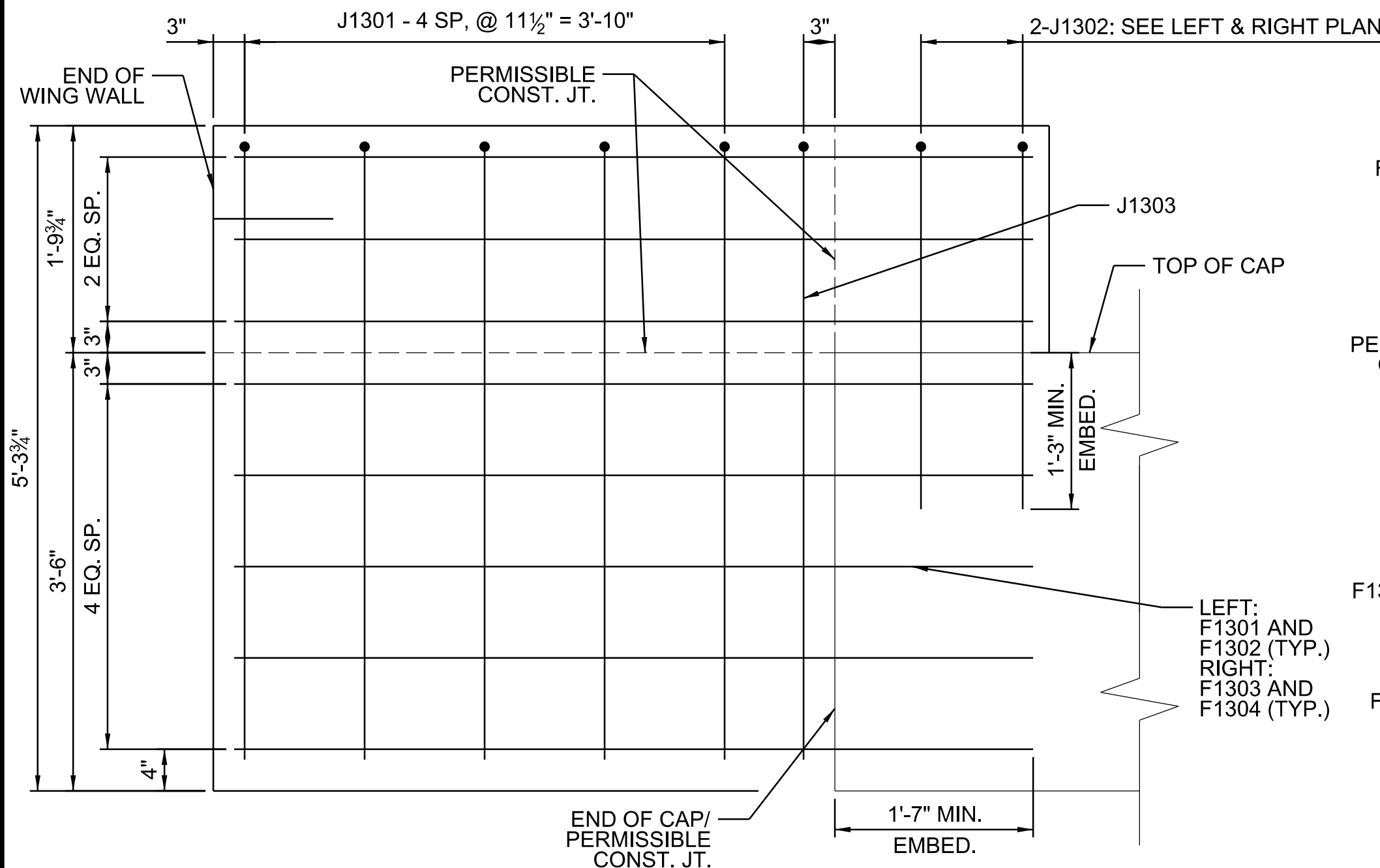


SECTION A-A



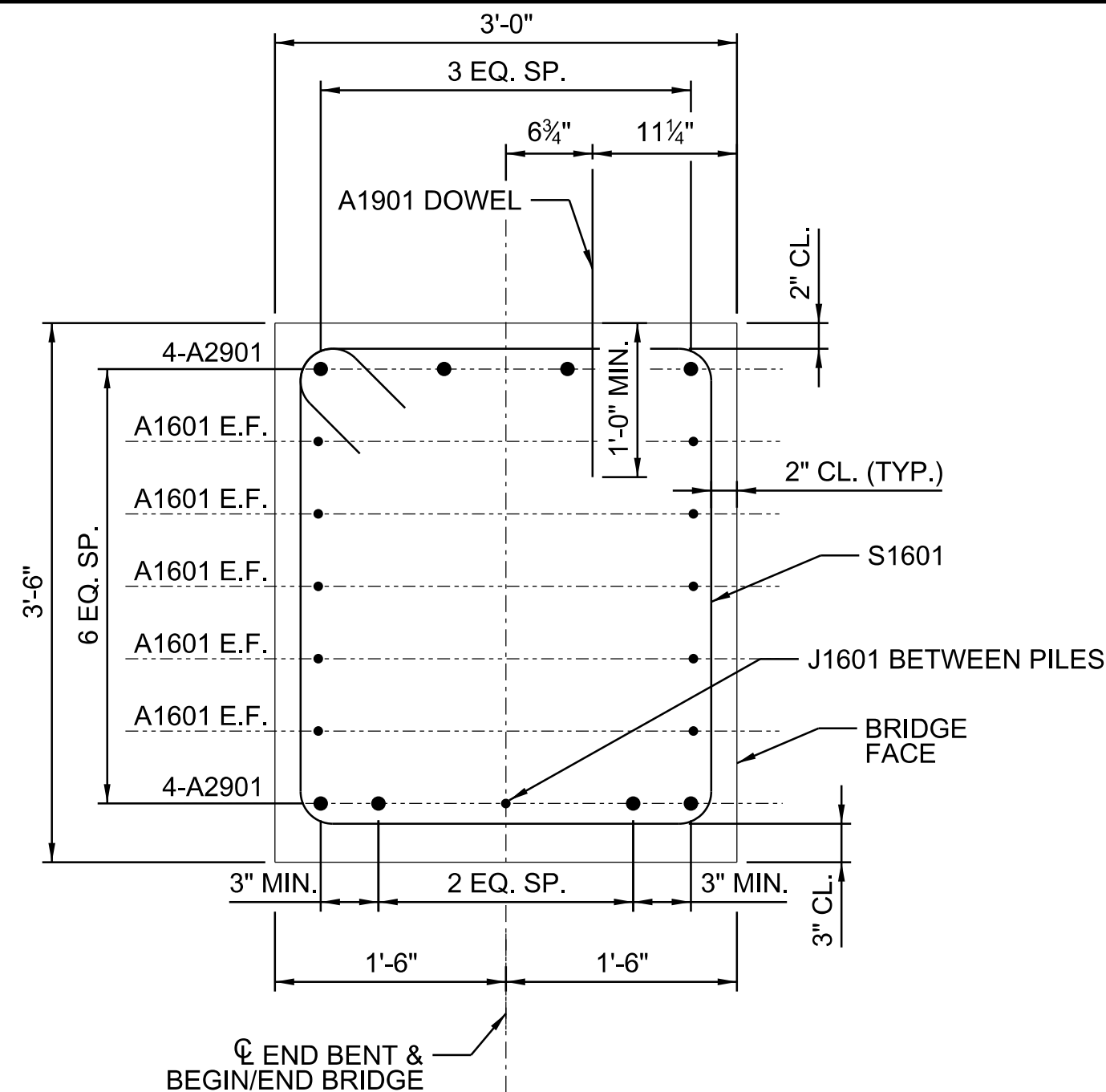
LEFT WING WALL PLAN

EB1 SHOWN, EB2 RIGHT WING WALL SIMILAR

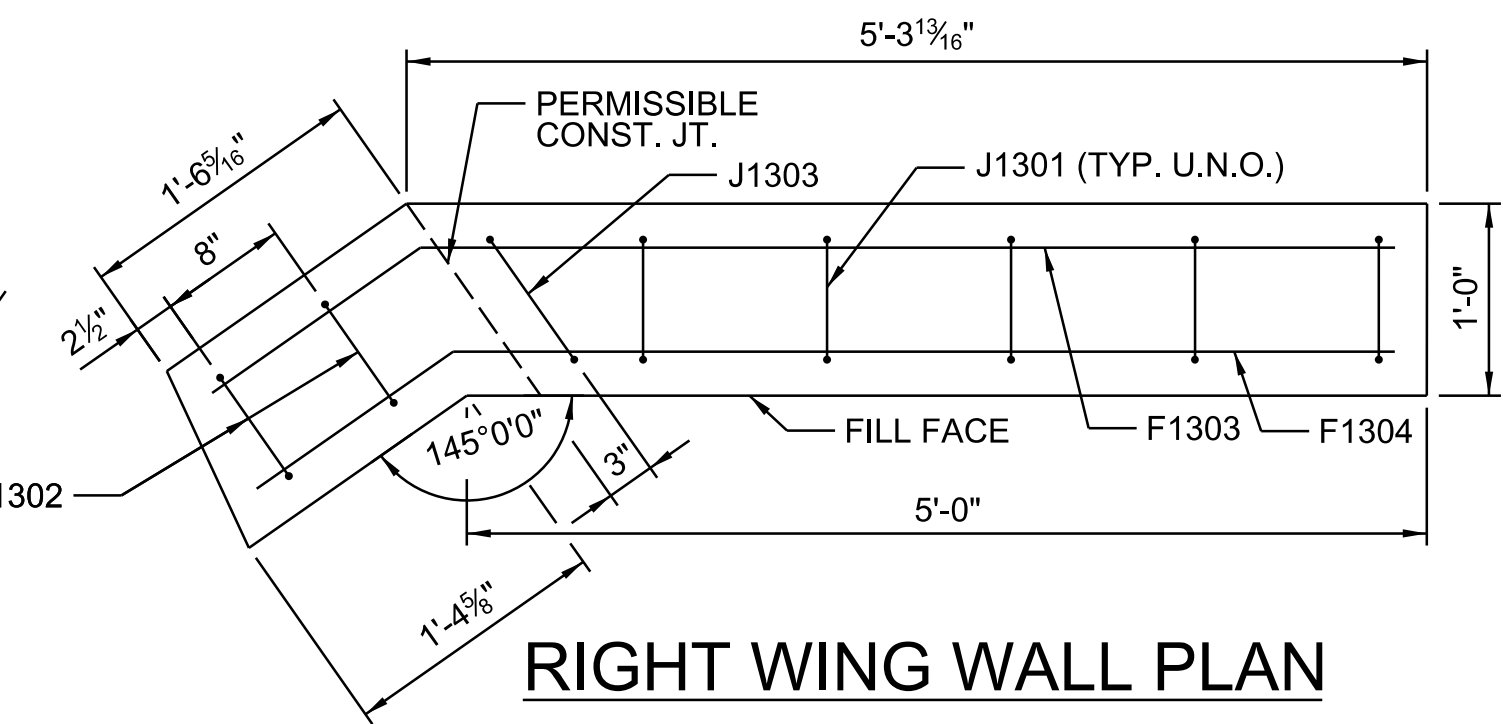


WING WALL ELEVATION

EB1 LEFT WING WALL SHOWN, OTHER WING WALLS SIMILAR

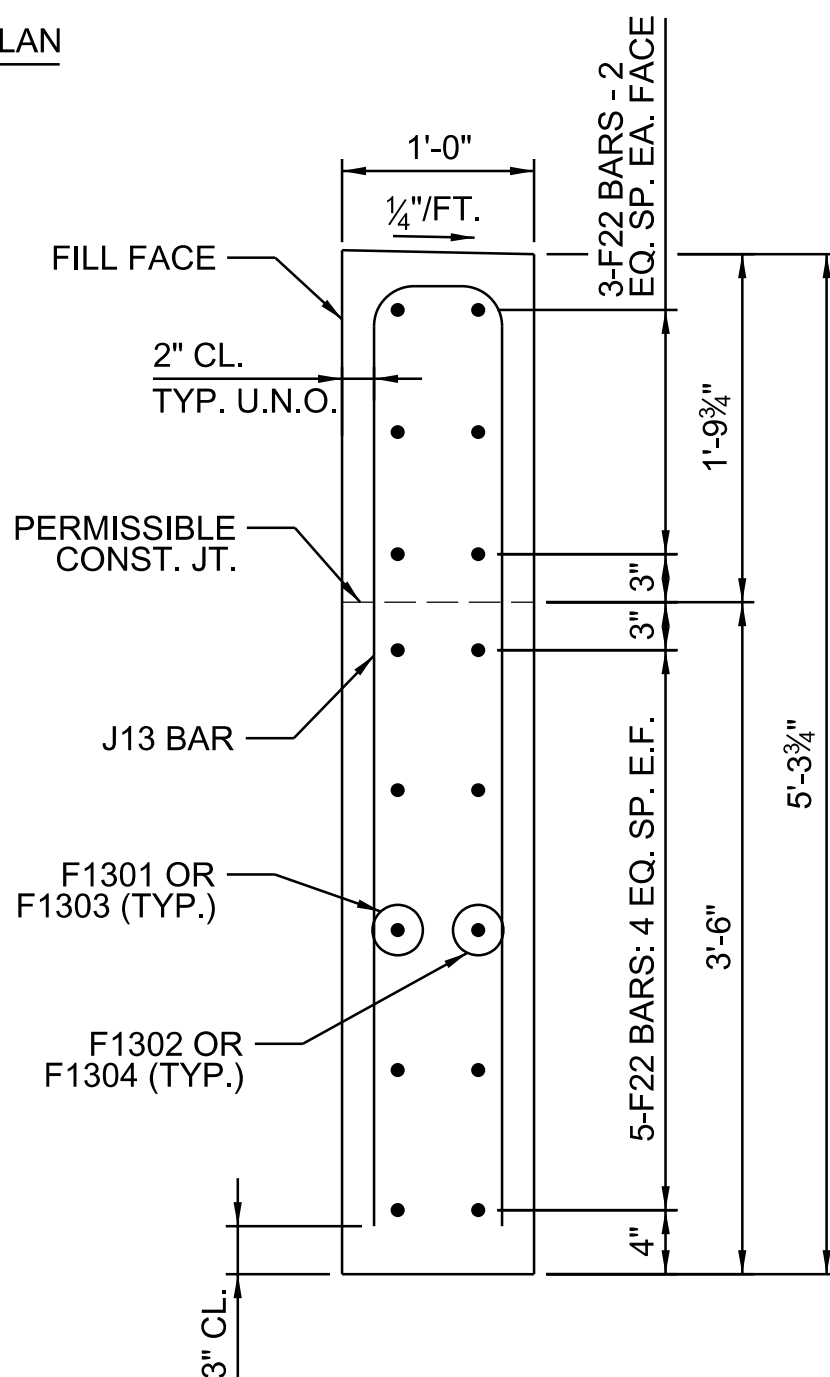


SECTION B-B



RIGHT WING WALL PLAN

EB1 SHOWN, EB2 LEFT WING WALL SIMILAR



WING WALL SECTION

HP 12X74 PILE BEARING

BENT I.D.	EB1 & EB2
FACTORED DESIGN LOAD	200 KIPS
FACTORED STATIC DOENDRAG LOAD	0 KIPS
GEOTECHNICAL RESISTANCE FACTOR	0.50
NOMINAL RESISTANCE	400 KIPS
RESISTANCE FROM DESIGN FLOOD SCOURABLE SOILS	0 KIPS
UNFACTORED STATIC DOWNDRAG LOAD	0 KIPS
REQUIRED DRIVING DISTANCE	400 KIPS

THE REQUIRED MINIMUM PILE TIP ELEVATION TO ACHIEVE LATERAL STABILITY AND THE REQUIRED AXIAL CAPACITY ARE PROVIDED IN THE FOLLOWING TABLE:

PILE TIP ELEVATION TABLE

BENT I.D.	MINIMUM PILE TIP ELEVATION (FT-NAVD88)	ESTIMATED PILE TIP ELEVATION (FT-NAVD88) ¹
EB1	+420	+411.8
EB2	+420	+416.4

¹ ACTUAL TIP ELEVATIONS MAY VARY DUE TO ANTICIPATED TOP OF ROCK VARIATION ALONG THE BENT LINE.

THE FOLLOWING ESTIMATED PARAMETERS WERE USED FOR PERFORMING A DRIVABILITY ANALYSIS FOR EB1 AND EB2:

ESTIMATED PILE DRIVABILITY ANALYSIS PARAMETERS:

	EB1	EB2
SKIN QUAKE (QS)	0.10 IN.	0.10 IN.
TOE QUAKE (QT)	0.04 IN.	0.04 IN.
SKIN DAMPING (SD)	0.05 SEC/FT	0.05 SEC/FT
TOE DAMPING (TD)	0.15 SEC/FT	0.15 SEC/FT
% SKIN FRICTION	5%	5%
DISTRIBUTION SHAPE NO.	1.0 ¹	1.0 ¹
BEARING GRAPH	PROPORTIONAL ²	PROPORTIONAL ²
PILE PENETRATION	75%	60%
HAMMER ENERGY RANGE	40-60 KIP-FT	40-60 KIP-FT

¹ DISTRIBUTION SHAPE NO. VARIES WITH DEPTH: 0 AT THE GROUND SURFACE AND 1.0 AT THE PILE TIP ELEVATION.

² BEARING GRAPH OPTIONS - PROPORTIONAL, CONSTANT SKIN FRICTION, AND CONSTANT END BEARING.

NOTE: GRLWEAP (2010) REFERENCE TABLES WERE USED TO DETERMINE PARAMETERS.

METHOD OF VERIFYING THE IN-PLACE PILE RESISTANCE: PILE INSTALLATION CHART FROM WAVE EQUATION ANALYSIS WITHOUT STRESS MEASUREMENTS DURING DRIVING.

A PILE HAMMER HAVING A RATED ENERGY AS INDICATED ABOVE IS CONSIDERED SUITABLE FOR DRIVEN PILE INSTALLATION. HOWEVER, FINAL HAMMER APPROVAL IS BASED ON A WAVE EQUATION ANALYSIS THAT ACCURATELY REFLECTS THE CONTRACTOR'S PROPOSED DRIVING SYSTEM.

REINFORCED PILE TIPS ARE REQUIRED TO PENETRATE PARTIALLY WEATHERED ROCK. INSTALL THE REINFORCED PILE TIPS IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION RECOMMENDATIONS.

PILES ARE ANTICIPATED TO EXHIBIT PRACTICAL REFUSAL OF THE PILE HAMMER SYSTEM WHEN DRIVEN TO BEARING ON VERY HARD SOIL OR ROCK CONDITIONS. TO AVOID POSSIBLE PILE DAMAGE, PRACTICAL REFUSAL DURING PILE INSTALLATION SHOULD BE DEFINED AS MORE THAN TWENTY (20) BLOWS PER INCH OR EQUIVALENT FRACTIONS THEREOF.

REFERENCE THE 2007 STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION FOR DRIVEN PILE FOUNDATIONS, SECTION 711. NOTES INCLUDED IN THESE PLANS ARE IN ADDITION TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS.

IN THE EVENT THE PILES EXPERIENCE PRACTICAL REFUSAL BEFORE MINIMUM TIP ELEVATION IS REACHED, NOTIFY THE COUNTY AND BRIDGE ENGINEER OF RECORD WITHIN 24 HOURS. CONSTRUCTION OF THE CAP SHOULD NOT CONTINUE UNTIL THE AS DRIVEN CONDITION OF THE PILES IS EVALUATED BY THE COUNTY AND BRIDGE ENGINEER OF RECORD.

REINF. STEEL SCHEDULE (ONE END BENT)

LOCATION	MARK	NO. REQ'D	DIMENSION				LENGTH
			"a"	"b"	"c"	"d"	
CAP	A1601	10	24'-8"	-	-	-	24'-8"
CAP	A1901	14	2'-0"	-	-	-	2'-0"
CAP	A2901	8	24'-8"	-	-	-	24'-8"
WING WALL	F1301	8	5'-1"	1'-7 1/2"	1'-4"	11 1/4"	6'-9"
WING WALL	F1302	8	4'-11"	1'-4"	1'-1"	9"	6'-3"
WING WALL	F1303	8	5'-1"	1'-4"	1'-1"	9"	6'-5"
WING WALL	F1304	8	4'-11"	1'-3"	1'-0 1/4"	8 1/2"	6'-2"
WING WALL	J1301	10	8"	4'-10 1/2"	-	-	10'-5"
WING WALL	J1302	4	8"	2'-11"	-	-	6'-6"
WING WALL	J1303	2	9 3/4"	4'-10 1/2"	-	-	10'-7"
CAP	J1601	2	8'-6"	8"	-	-	9'-10"
CAP	S1601	24	2'-8"	3'-1"	8"	-	12'-10"
CAP	SA1601	3	2'-8"	3'-1"	8"	-	10'-2"
CAP	V1901	6	2'-0"	-	-	-	4'-0"

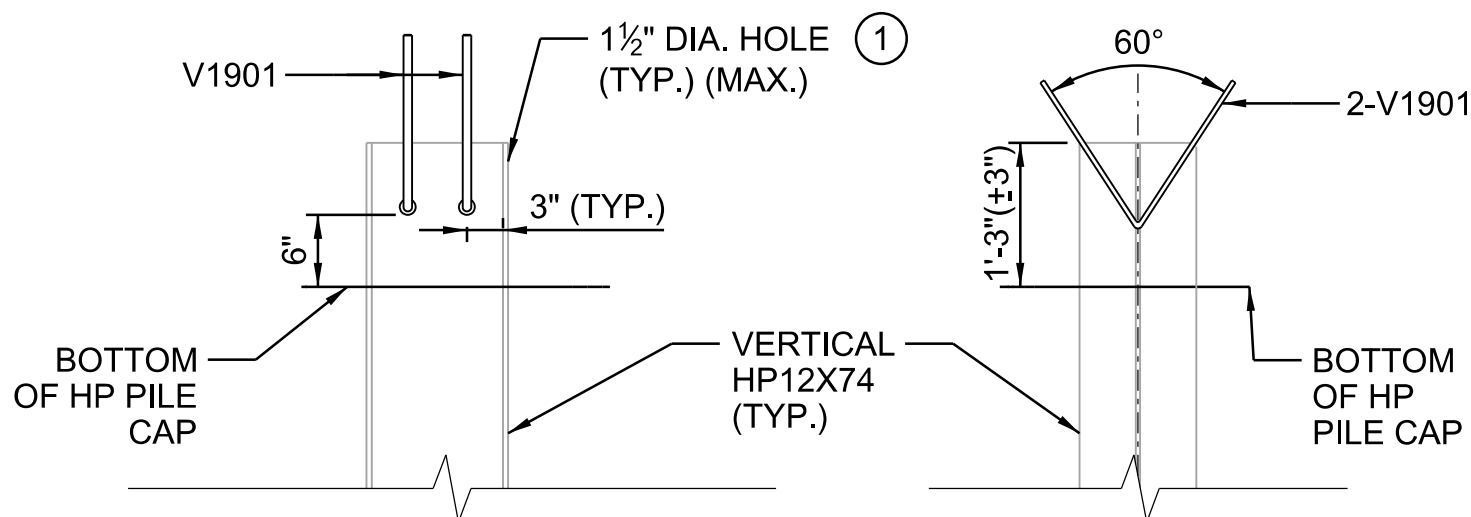
QUANTITIES (ONE END BENT)

ITEM	UNIT	QTY.
NO. 57 STONE FOR BACKFILL	TON	26
CONC. FOR STRUCTURES CLASS 4000	CY	11.9
REINF. STEEL FOR STRUCTURES(BRIDGES)	LB	1,618
PILE DRIVING SET-UP	EA	3
STEEL PILING (HP 12X74)	LF	(2)
REINF. PILE TIPS (HP 12X74)	EA	3

- HOLE DIAMETER SHALL BE A MINIMUM OF 1" AND A MAXIMUM OF 1 1/2". DRILL OR FLAME CUT THE HOLES, GRIND AREA AROUND HOLES TO REMOVE BURRS, TIE OR WEDGE TIGHTLY THE REINFORCING AGAINST THE TOP OF THE HOLE.
- END BENT 1: 58.8
END BENT 2: 44.1

NOTES:

- SHIFT STIRRUPS (S16 & SA16) AS NECESSARY TO CLEAR DOWELS.
- TOP OF WING WALLS SHALL BE CAST AFTER PLACEMENT OF CORED SLABS.
- CONTRACTOR MAY ELECT TO CAST BOTTOM PORTION OF WING WALLS WITH BENT CAP.
- ALL PILES SHALL CONFORM TO AASHTO M270 (ASTM A709 GRADE 50) AND HAVE A MINIMUM YIELD STRENGTH OF 50 KSI.
- CONTRACTOR SHALL NOTIFY FAIRFIELD COUNTY, AND BRIDGE ENGINEER A MINIMUM OF 5 DAYS PRIOR TO THE DRIVING OF ANY PILE. A PRELIMINARY DRIVING LOG SHALL BE PROVIDED FOR EACH PILE WITHIN 24 HOURS OF COMPLETION OF DRIVING OF THE PILE FOR REVIEW.
- PILE LENGTHS WERE CALCULATED BASED ON AN EMBEDMENT LENGTH INTO THE CAP OF 1'-3" AND THE ESTIMATED PILE TIP ELEVATIONS SHOWN ON THIS SHEET.



HP-PILE ANCHORAGE DETAIL

DAVIS & FLOYD

SINCE 1954

1319 HWY 72/221 E.
GREENWOOD, SC 29649
(864) 229-5211

FAIRFIELD COUNTY

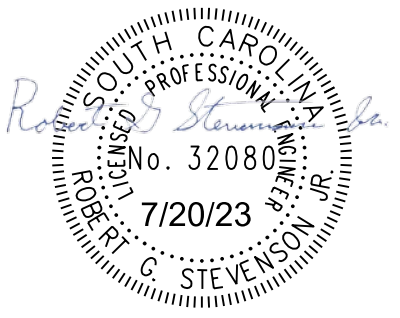
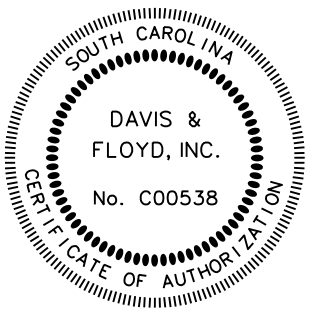
END BENT DETAILS

COUNTY

FAIRFIELD

ROUTE

L-664



REV.			
REV.			
REV.			
REVIEWED	CLM		
QUAN.	ZMA	RGS	02-23
DR.	DLH	RGS	02-23
DES.	DLH	RGS	02-23
BY	CHK	DATE	

DEAD LOAD DEFLECTION & CAMBER

CAMBER AT ERECTION (SLAB ALONE IN PLACE)	+1 $\frac{1}{16}$ "
DEFLECTION DUE TO PRECAST BARRIER AND WEARING SURFACE	-1 $\frac{1}{8}$ "
FINAL CAMBER	+9 $\frac{1}{16}$ "

¹ CAMBER AND DEFLECTIONS ARE FOR INTERIOR CORED SLABS CARRYING PRECAST BARRIER DEAD LOAD. EXTERIOR SLABS AND INTERIOR SLABS WITH NO BARRIER LOAD FINAL CAMBER VALUES ARE WITHIN ALLOWABLE TOLERANCES SHOWN ON SH. 13.

BILL OF MATERIAL
ONE 40' CORED SLAB UNIT

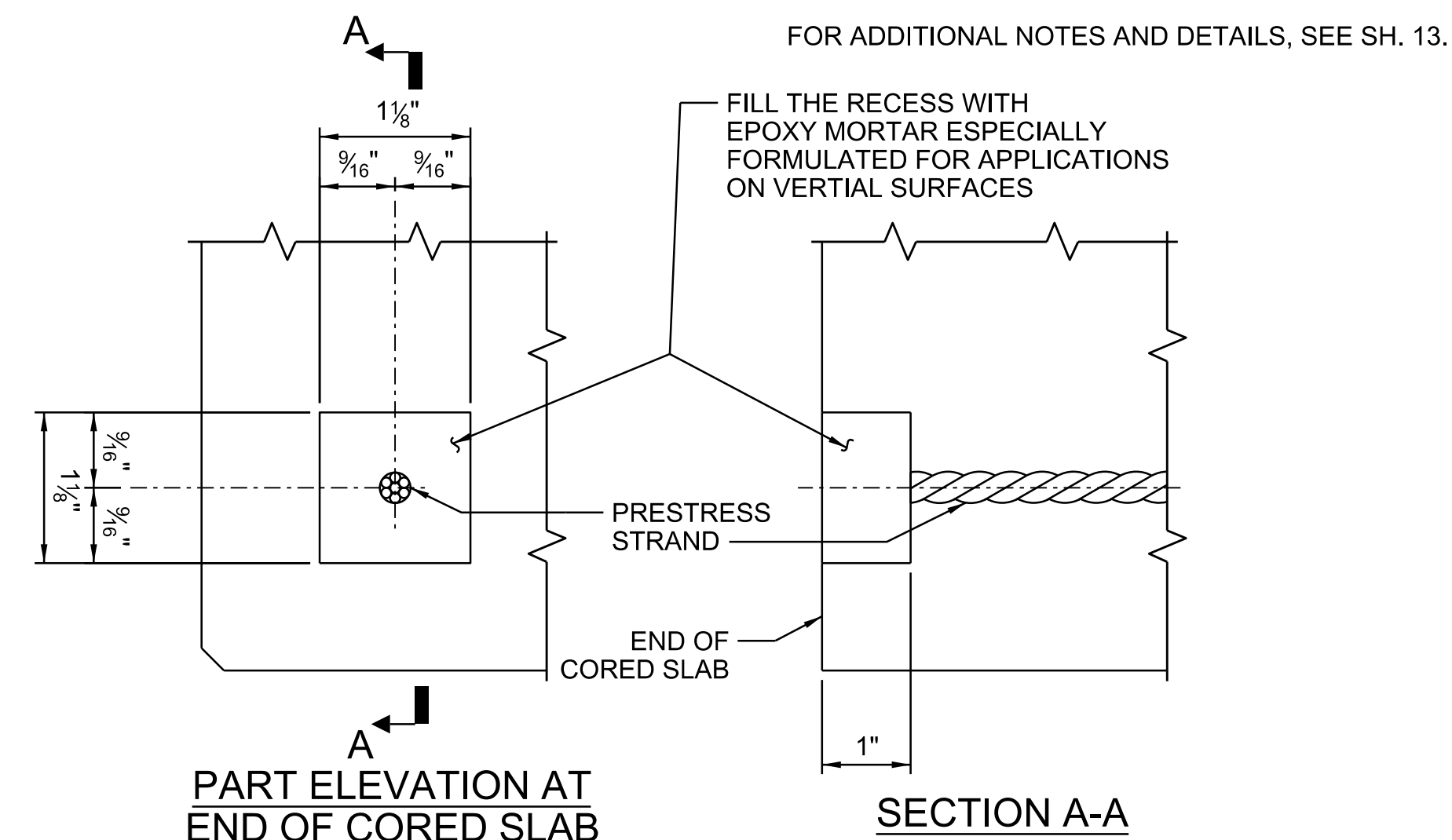
MARK	TOTAL REQ'D.	DIMENSION				LENGTH
		"a"	"b"	"c"	"d"	
A1301	4	20'-10"	-	-	-	20'-10"
J1301	8	1'-9"	1'-4"	-	-	4'-5"
J1302	92	2'-8"	1'-4"	-	-	5'-4"
J1303	4	1'-5½"	2'-8"	-	-	6'-10"
JC1601	8	2'-7"	6"	-	-	3'-7"

QUANTITIES

ITEM	UNIT	INTERIOR	EXTERIOR
REINFORCING STEEL	LB	445	445
CONCRETE, CLASS 5000	CY	5.8	6.2
½" DIA. L.R. STRANDS	LF	638	638

ESTIMATED QUANTITIES - ONE 40' SPAN

ITEM	UNIT	TOTAL
3'-0" X 1'-9" CORED SLAB	LF	279.2
ELASTOMERIC BEARING	EA	14
PRECAST BARRIER PARAPET	LF	80
DECK WATERPROOFING	SY	106



GROUTED RECESS AT END OF
PRETENSIONED STRAND

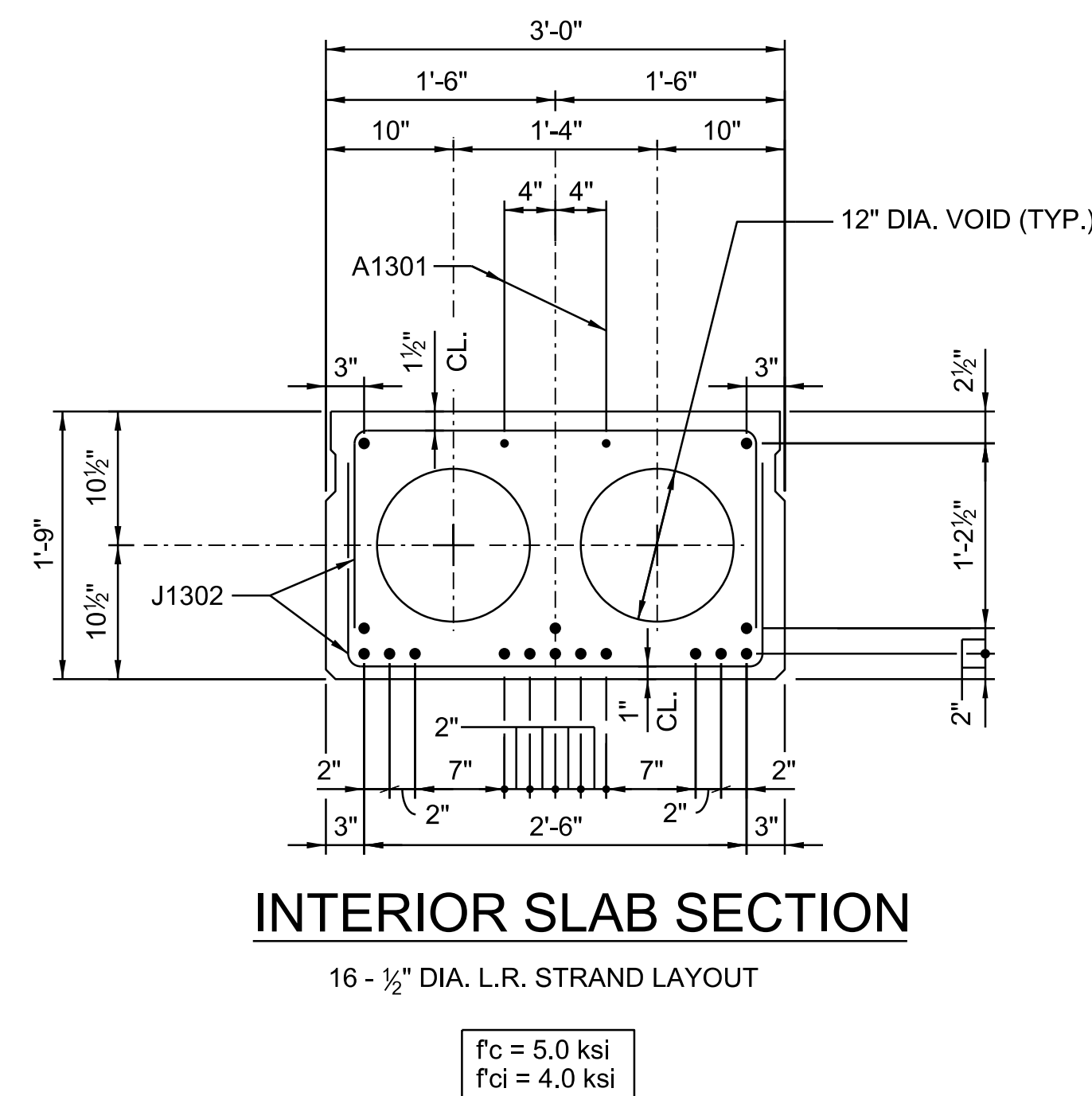
DAVIS & FLOYD
SINCE 1954

1319 HWY 72/221 E.
GREENWOOD, SC 29649
(864) 229-5211

FAIRFIELD COUNTY

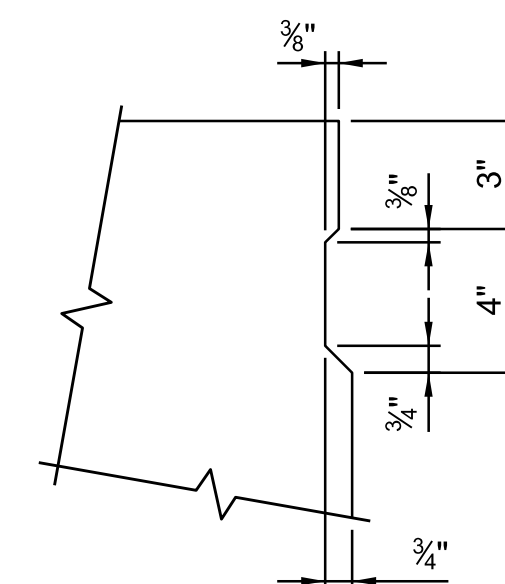
40'-0" PRESTRESSED
CONC. CORED SLAB SPAN
(3'-0" X 1'-9")

COUNTY	SAN FAIRFIELD	ROUTE	1-664
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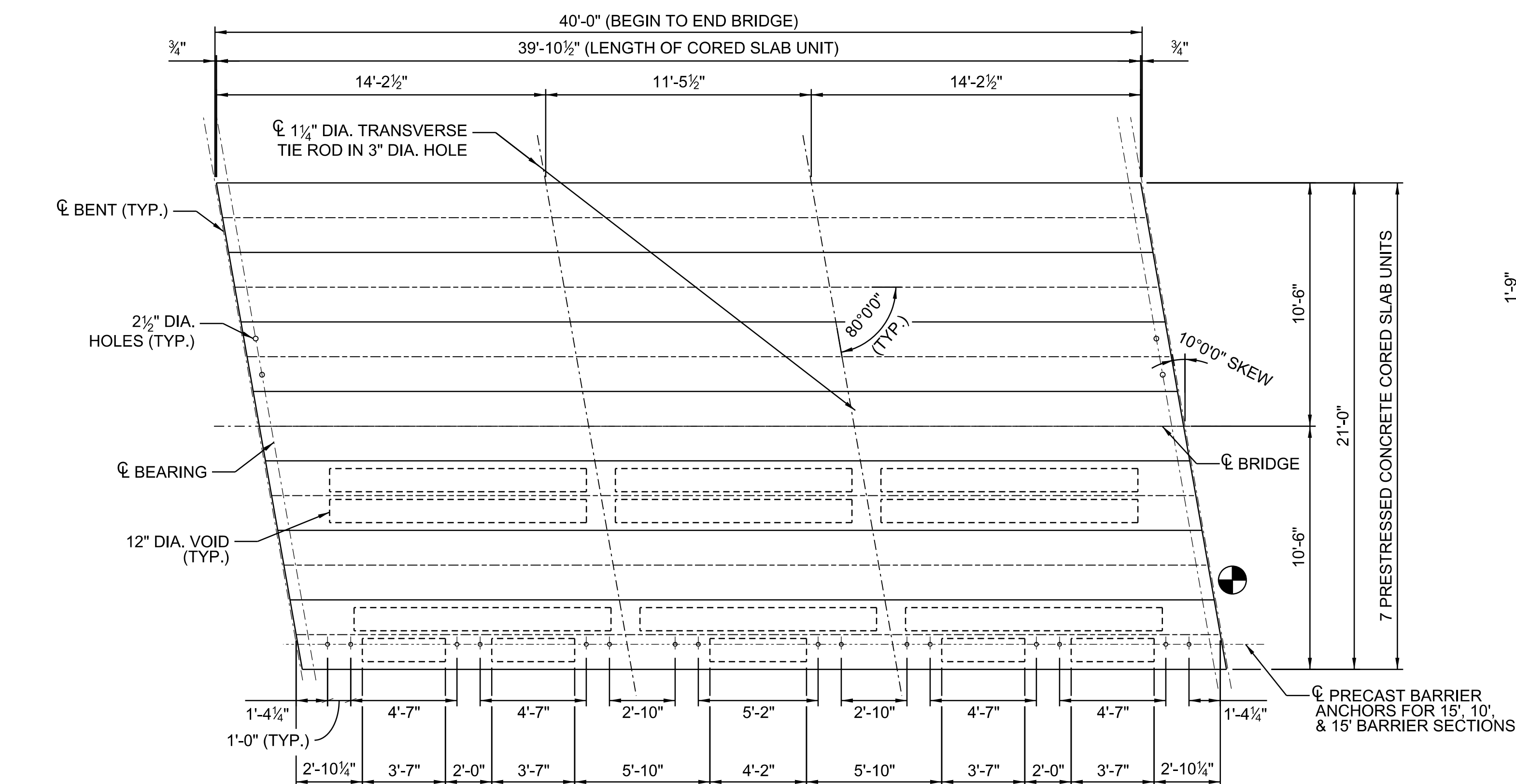
STRAND DATA

(1/2 DIA. LOW RELAXATION GRADE 270)	
AREA	0.153 in ²
TENSIONING LOAD	31.0 Kips

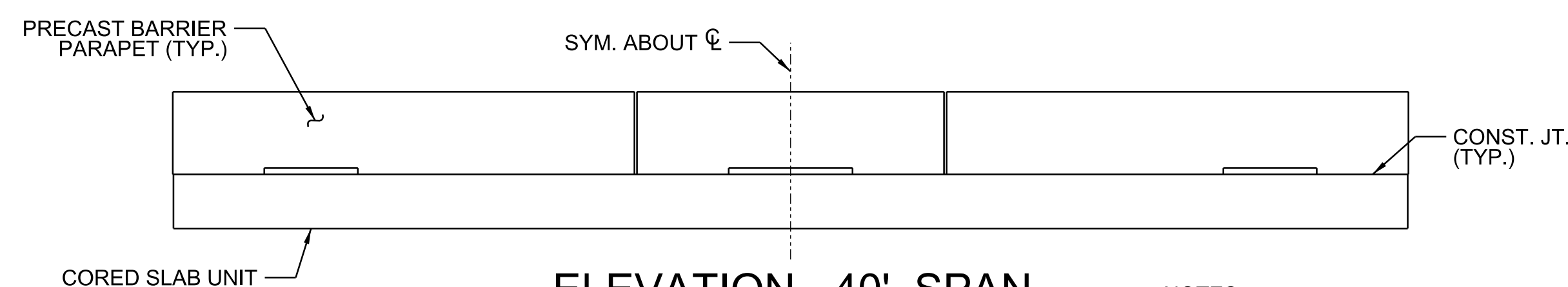


SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE
OF EXTERIOR CORED SLABS.



PLAN - 40' SPAN

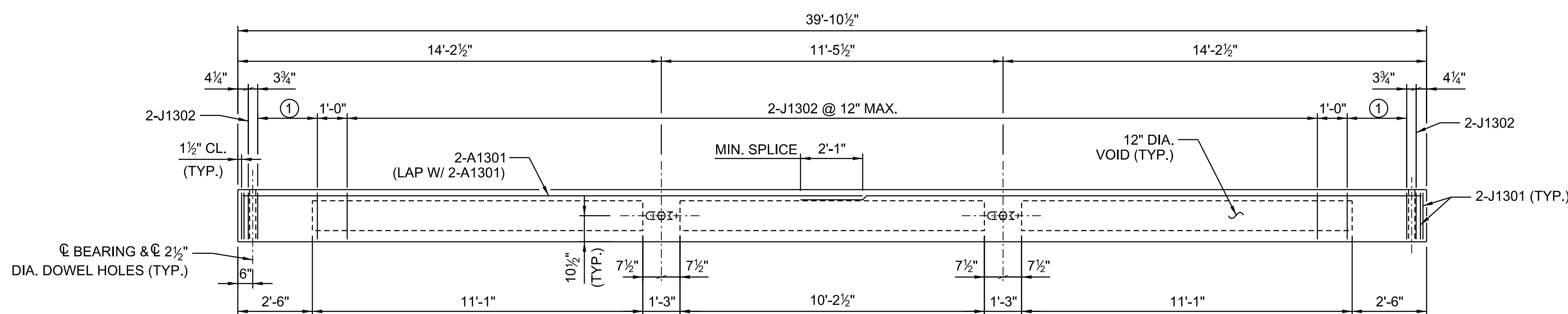


ELEVATION - 40' SPAN

NOTES:

SHIFT J1302 STIRRUPS AS NECESSARY
TO CLEAR TRANSVERSE TIE RODS.

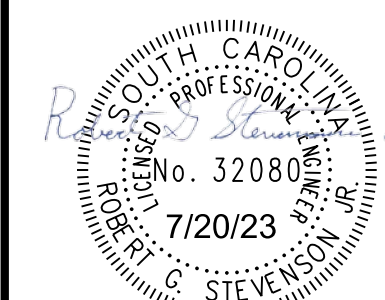
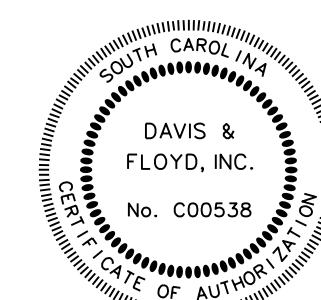
J1303 AND JC1301 BARS NOT SHOWN FOR CLARITY.



TYPICAL ELEVATION - 40' INTERIOR CORED SLAB UNIT

(MEASURED ALONG \mathbb{C} CORED SLAB)

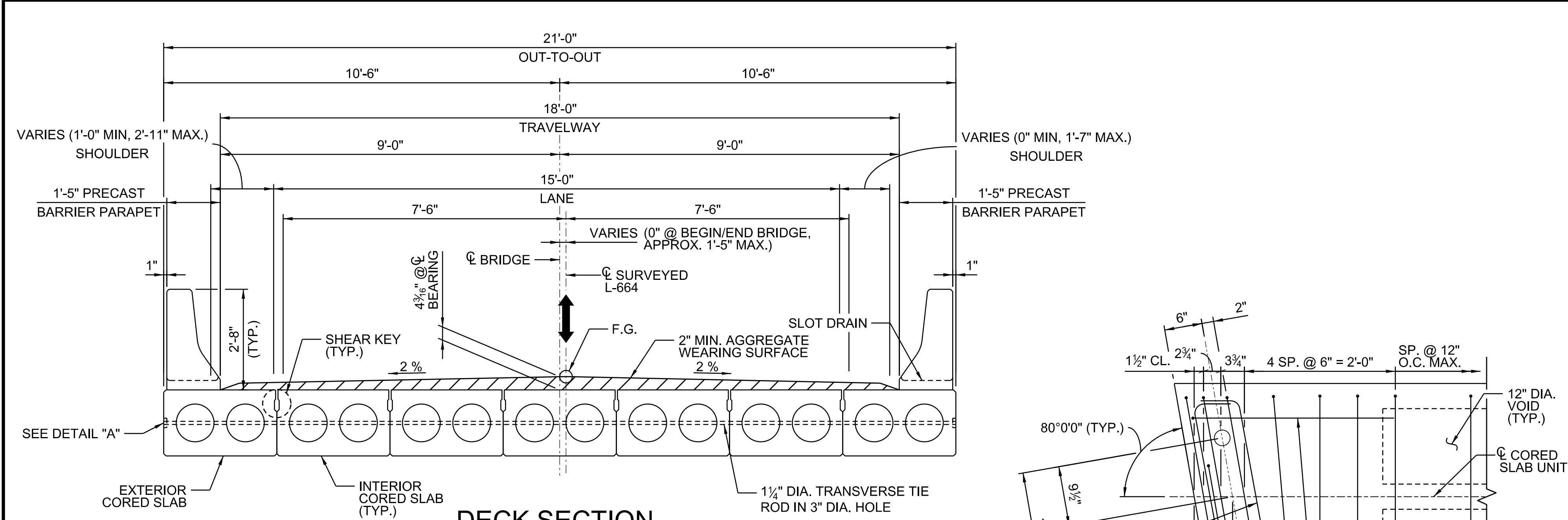
① 2-J1302 @ 6" = 2'-0"



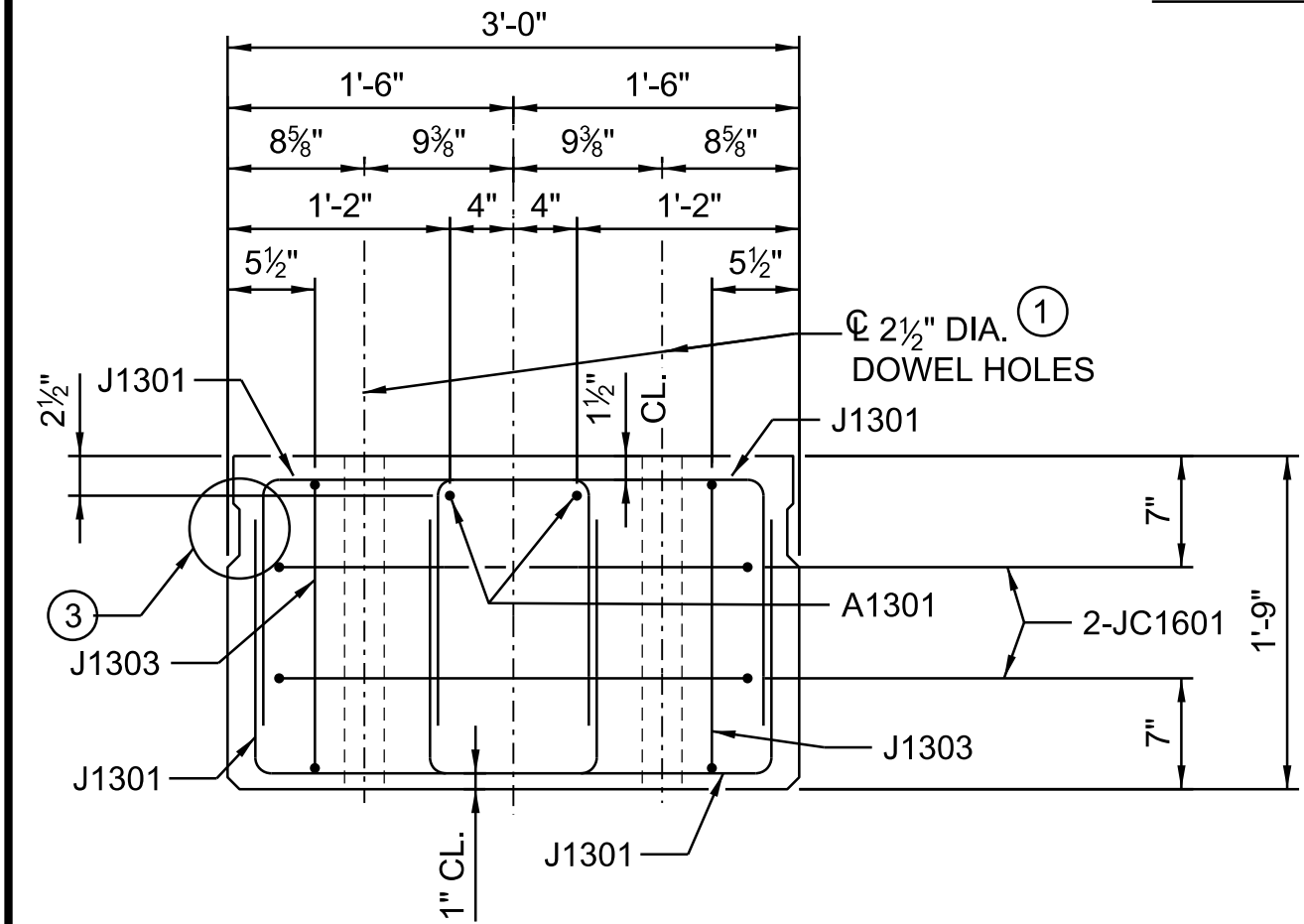
REV.			
REV.	ZMA	RGS	02-23
	L-664 BRIDGE		
REV.	MRW	SAN	01-10
	PLAN & NOTES		
REVIEWED CLM			
QUAN.	MRW	SAN	05-08
DR.	MRW	SAN	05-08
DES.	MRW	SAN	05-08
	BY	CHK	DATE

4:0 ft.in / in.
SCALE:
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PLOT DRIVER:
FILE: 7/19/2023

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7/19/2023



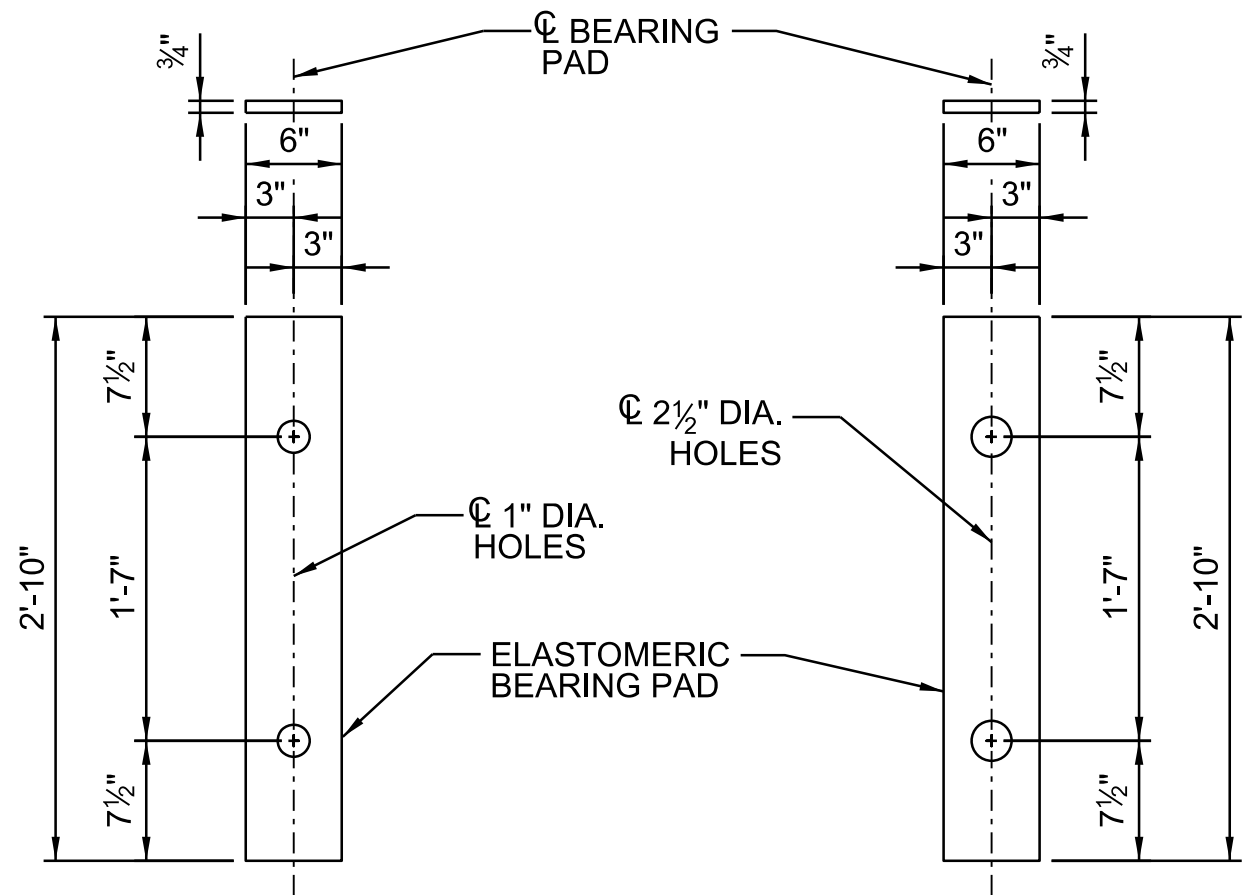
DECK SECTION



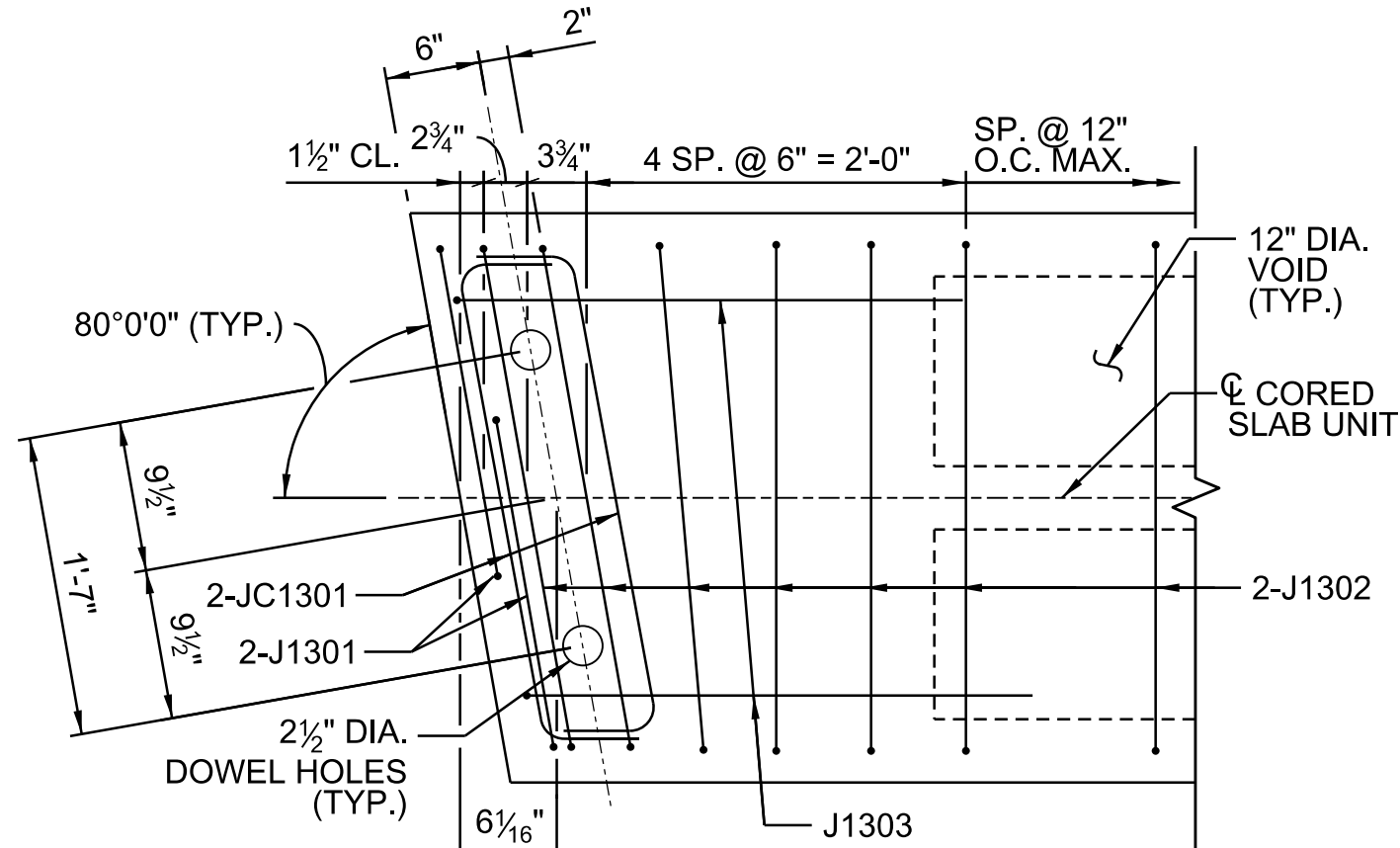
END ELEVATION 2

INTERIOR SLAB SECTION SHOWN (EXTERIOR SLAB SECTION SIMILAR EXCEPT SHEAR KEY LOCATION.)

- 1 REMOVE ALL PIPES PRIOR TO GROUTING.
- 2 FOR PRESTRESSED STRAND LAYOUT, SEE SECTION ON SH. 12.
- 3 OMIT SHEAR KEY AT OUTSIDE FACE OF EXTERIOR SLAB.



FIXED END
EXPANSION END
ELASTOMERIC BEARING DETAILS
(60 DUROMETER)



PART PLAN - END OF CORED SLAB

(INTERIOR AND EXTERIOR SLABS)
PRESTRESSING STRANDS/A1301 BARS NOT SHOWN FOR CLARITY

NOTES:
SEE SECTION 704 OF THE STANDARD SPECIFICATIONS AND THE SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS AND INFORMATION REGARDING PRESTRESSED CONCRETE CORED SLAB UNITS. SUBMIT SHOP DRAWINGS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

INCLUDE ALL COSTS ASSOCIATED WITH FURNISHING, FABRICATING, AND PLACING CONCRETE, PRESTRESSING STRANDS, AND REINFORCING STEEL CAST INTO THE CORED SLAB UNITS IN THE UNIT PRICE BID FOR 3'-0" X 1'-9" CORED SLAB AS APPROPRIATE FOR THIS PROJECT.

USE PRESTRESSING STRANDS THAT CONFORM TO THE LATEST AASHTO M 203 FOR GRADE 270 (LOW RELAXATION).

USE REINFORCING STEEL THAT CONFORMS TO AASHTO M 31, TYPE W GRADE 60.

THE TENSIONING LOAD IN ALL 1/2" DIA. LOW RELAXATION STRANDS IS 31 KIPS. DO NOT RELEASE THE STRANDS UNTIL THE COMPRESSIVE STRENGTH OF THE CONCRETE HAS REACHED THE VALUE SHOWN FOR f_{ci} .

WHEN CASTING THE CORED SLABS, USE A POSITIVE HOLD-DOWN SYSTEM TO PREVENT THE VOIDS FROM RISING OR MOVING SIDWAYS. USE A NON-CORROSIVE HOLD-DOWN SYSTEM THAT IS DESIGNED TO REMAIN IN PLACE UNTIL THE CONCRETE ATTAINS THE SPECIFIED RELEASE STRENGTH. AT LEAST THREE WEEKS PRIOR TO CASTING THE CORED SLAB UNITS, SUBMIT TO THE RCE, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. INCLUDE STRUCTURAL DETAILS, LOCATIONS, AND SPACING FOR THE PROPOSED HOLD-DOWN SYSTEM IN THE SUBMITTAL.

ALWAYS MAINTAIN CORED SLAB UNITS IN AN UPRIGHT POSITION. USE LIFTING DEVICES LOCATED WITHIN 2'-6" OF THE ENDS TO LIFT OR HANDLE THE CORED SLAB UNITS. PROVIDE A 1" DEEP RECESS AT THE LIFTING DEVICES. GROUT THE RECESSES PRIOR TO WATERPROOFING THE TOP SURFACE OF THE CORED SLAB UNITS. DO NOT PERMIT THE CORED SLAB UNITS TO BE PLACED OR STORED ON INTERIOR SUPPORTS CAUSING NEGATIVE MOMENTS.

TIE ROD ASSEMBLIES INCLUDE A 1" DIA. ROD, TWO HEAVY HEX NUTS, TWO LOCKWASHERS, AND TWO 5" X 5" X 5/8" PLATE WASHERS. THREAD 8" ON EACH END OF THE TIE RODS. PROVIDE TIE RODS AND PLATE WASHERS MEETING THE REQUIREMENTS OF AASHTO M 270, GRADE 36. PROVIDE NUTS MEETING THE REQUIREMENTS OF ASTM A 563, GRADE A. GALVANIZE TIE RODS AND ALL HARDWARE IN ACCORDANCE WITH ASTM A 123, ASTM A 153, OR ASTM F 2329 AS APPLICABLE. TIE RODS ARE TO BE INSTALLED FOR TEST FIT DURING FIT UP OF SPAN IN CASTING YARD. INCLUDE ALL COSTS ASSOCIATED WITH FURNISHING AND INSTALLING TIE ROD ASSEMBLIES IN THE UNIT PRICE BID FOR 3'-0" X 1'-9" CORED SLAB AS APPROPRIATE FOR THIS PROJECT.

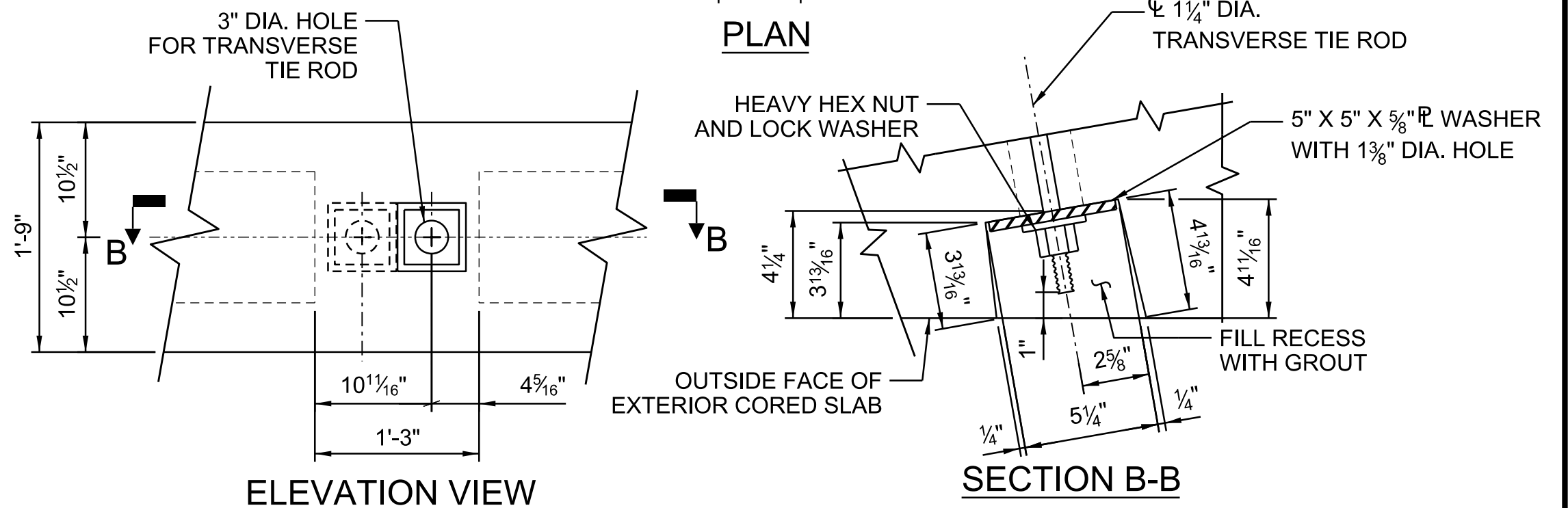
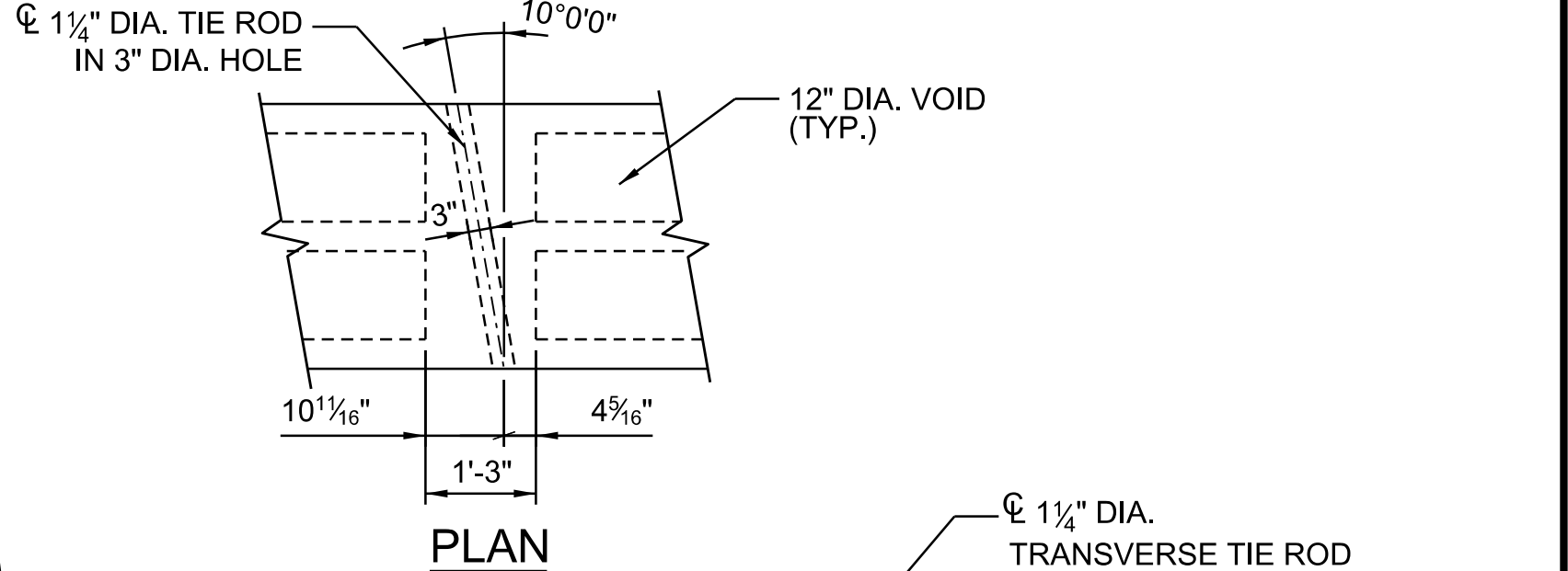
PLACE CORED SLAB UNITS SO THAT THE MAXIMUM TRANSVERSE JOINT WIDTH AT ANY LOCATION ALONG THE BENT DOES NOT EXCEED 1".

GROUT ALL SHEAR KEYS, DOWEL HOLES, AND RECESSES FOR TRANSVERSE TIE RODS AFTER TIGHTENING THE TRANSVERSE TIE RODS. AT EXPANSION ENDS OF SLAB UNITS, FILL THE DOWEL HOLES WITH COLD APPLIED ELASTIC FILLER TO 1" ABOVE THE TOP OF DOWELS AND FILL THE REMAINING PORTION WITH GROUT. AFTER THE GROUT HAS CURED FOR A MINIMUM OF THREE DAYS, AND HAS ATTAINED THE REQUIRED STRENGTH, PLACE THE BARRIER PARAPET.

APPLY A BRIDGE DECK WATERPROOFING SYSTEM, THAT COMPLIES WITH THE REQUIREMENTS OF SECTION 814 OF THE STANDARD SPECIFICATIONS, TO THE TOP SURFACE OF THE CORED SLAB UNITS PRIOR TO PLACING THE AGGREGATE WEARING SURFACE. BRIDGE DECK WATERPROOFING SYSTEM IS TO BE EXTENDED DOWN END FACE OF HOLLOW CORE SLABS AND A MINIMUM OF 1'-0" ONTO END BENT CAP. SEE SECTION AT END BENT ON SH. 3.

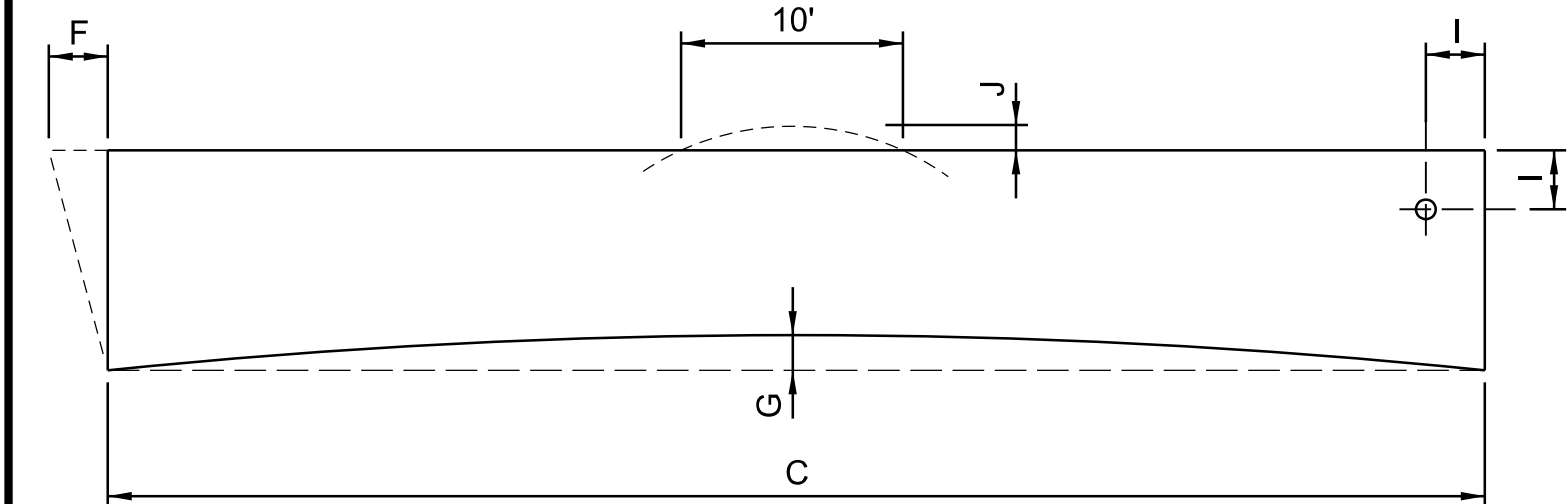
INCLUDE ALL COSTS ASSOCIATED WITH FURNISHING AND INSTALLING JOINT, SHEAR KEY, RECESS, AND DOWEL HOLE FILLER MATERIALS INCLUDING GROUT, BACKER ROD, AND COLD APPLIED ELASTIC FILLER IN THE UNIT PRICE BID FOR 3'-0" X 1'-9" CORED SLAB AS APPROPRIATE FOR THIS PROJECT.

FOR LOCATIONS OF FIXED AND EXPANSION BEARINGS, SEE SH. 7.

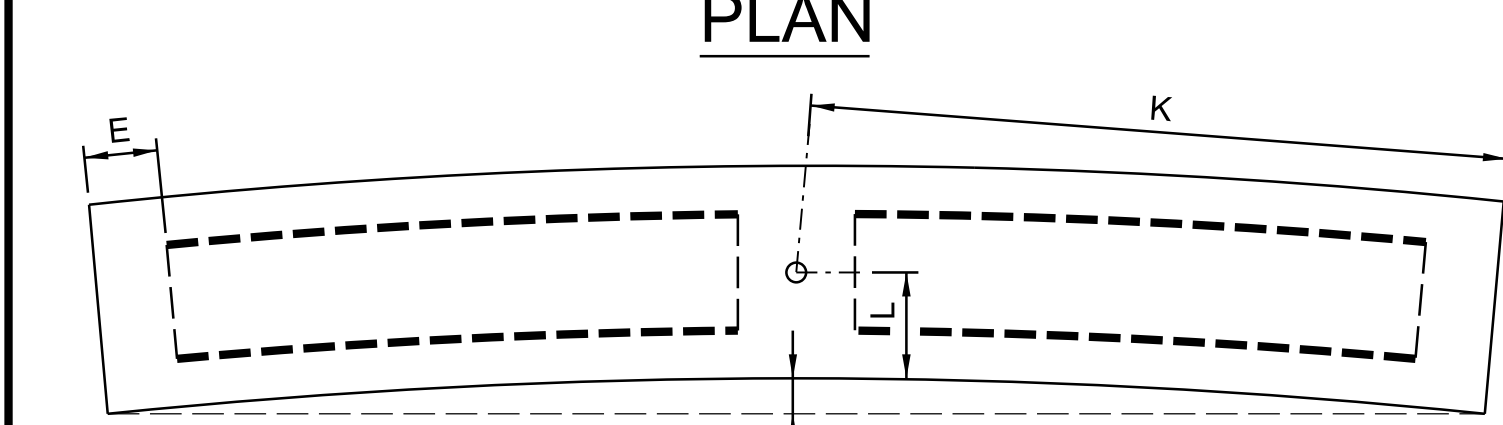


DETAIL "A"

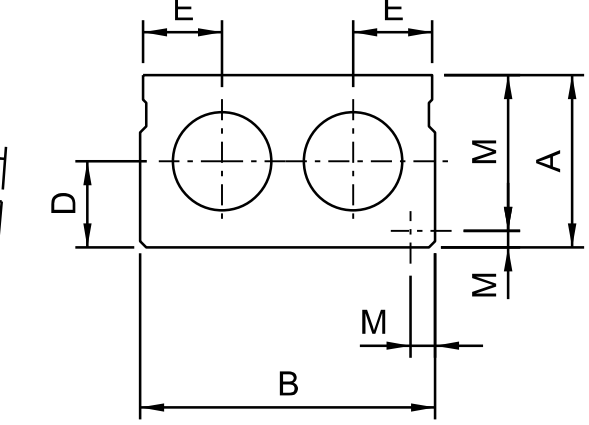
TOLERANCES



PLAN

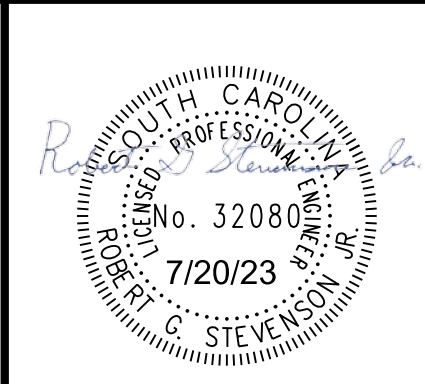
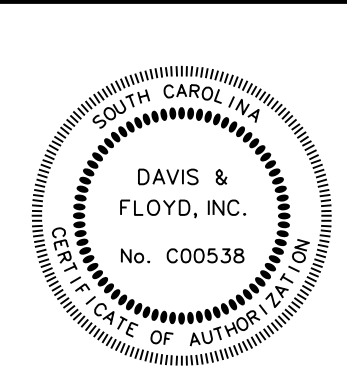


ELEVATION



CROSS SECTION

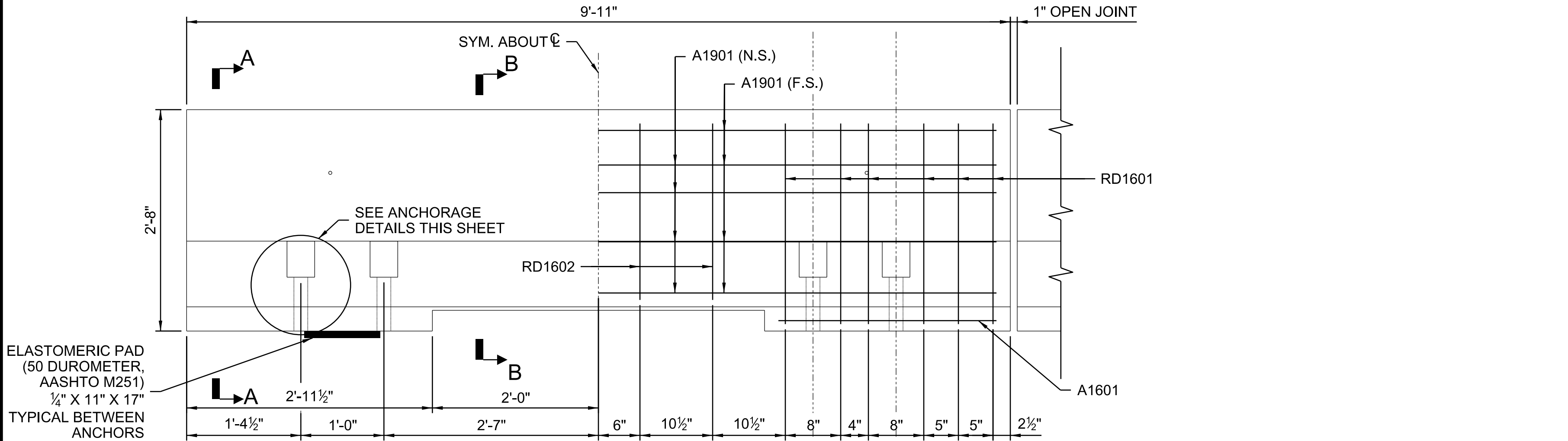
A	DEPTH	+3/8" to -1/8"
B	WIDTH	± 1/4"
C	LENGTH (LENGTH OF ADJACENT CORED SLAB UNITS MUST BE WITHIN ± 1/4")	± 1/8" PER 10'
D	POSITION OF VOIDS: VERTICAL	± 3/8"
E	POSITION OF VOIDS: HORIZONTAL	± 3/8"
F	POSITION OF VOID ENDS: LONGITUDINAL	± 1"
F	SQUARE ENDS: DEVIATION FROM SQUARE (HORIZONTAL OR VERTICAL) OR DESIGNATED SKEW	± 1/4"
G	HORIZONTAL ALIGNMENT: DEVIATION FROM A STRAIGHT LINE PARALLEL TO THE CENTER LINE OF MEMBER	± 3/8"
H	CAMBER: DIFFERENTIAL BETWEEN ADJACENT UNITS	1/4" IN 10', 3/4" MAX.
H	CAMBER: DIFFERENTIAL BETWEEN HIGH AND LOW MEMBERS OF THE SAME SPAN	3/4" MAX.
I	POSITION OF DOWEL HOLES: DEVIATION FROM PLAN POSITION	± 1/4"
I	WIDTH: DIFFERENTIAL OF ADJACENT SPANS IN THE SAME STRUCTURE	± 3/4"
I	BEARING AREA: DEVIATION FROM PLAN SURFACE	± 1/16"
J	LOCAL SMOOTHNESS	1/4" IN 10'
K	HORIZONTAL POSITION OF HOLES FOR TRANSVERSE TIE RODS	± 1/2"
L	VERTICAL POSITION OF HOLES FOR TRANSVERSE TIE RODS	± 3/8"
M	POSITION OF STRANDS	± 1/4"



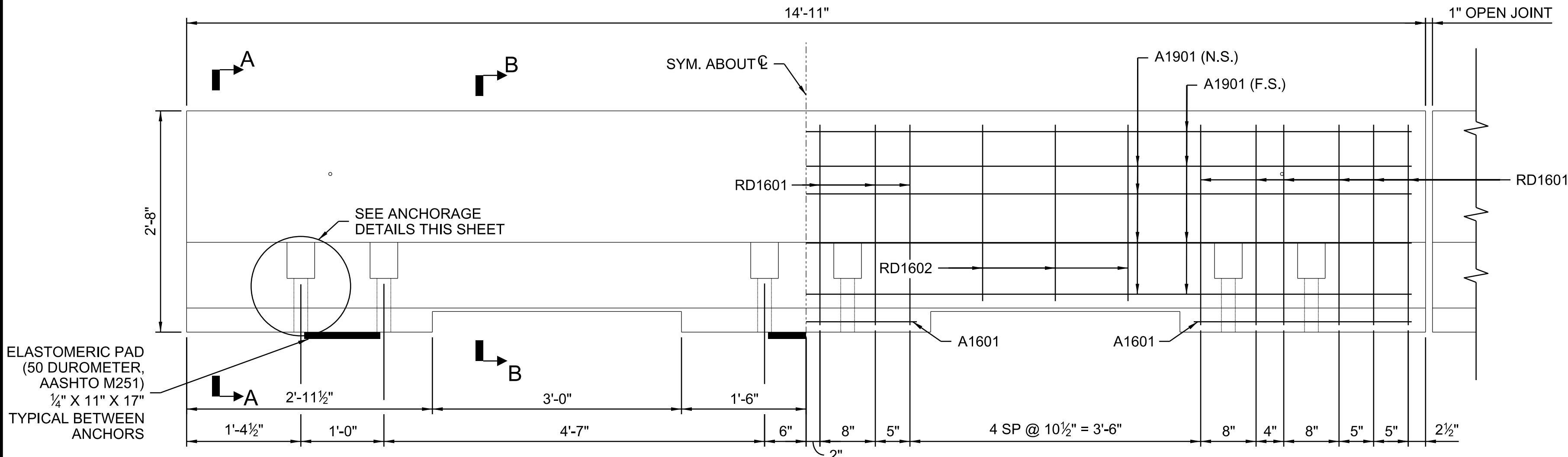
REV.	ZMA	RGS	02-23
			L-664 BRIDGE
REV.	PCW	HL	10-20
			LA1601 LAP LEN
REV.	PCW	HL	10-20
			AASHTO M 31
REVIEWED	CLM		
QUAN.	PNP	SAN	05-08
DR.	PNP	SAN	05-08
DES.	ZMA	RGS	02-23
	BY	CHK	DATE

DAVIS & FLOYD		1319 HWY 72/221 E. GREENWOOD, SC 29649 (864) 229-5211	
SINCE 1954			
		FAIRFIELD COUNTY	
		PRESTRESSED CONC. CORED SLAB DETAILS	
COUNTY	FAIRFIELD	ROUTE	L-664

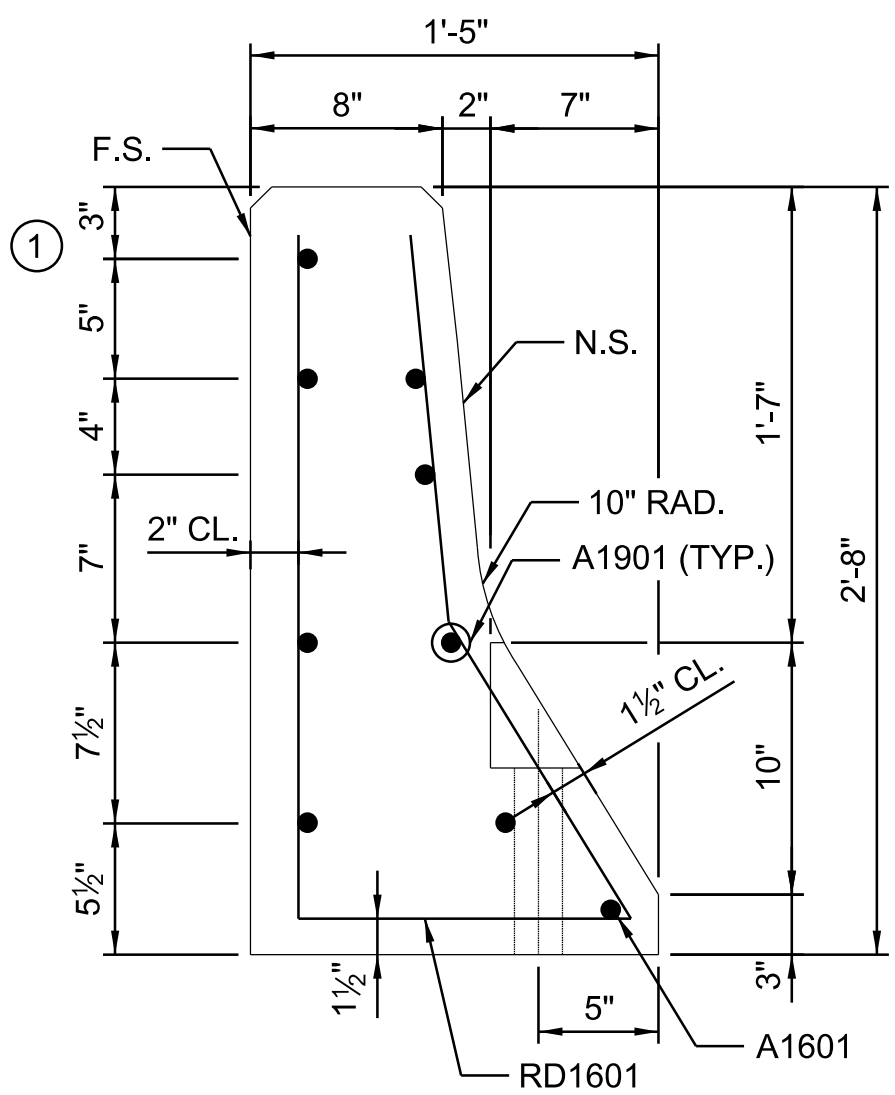
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7/19/2023



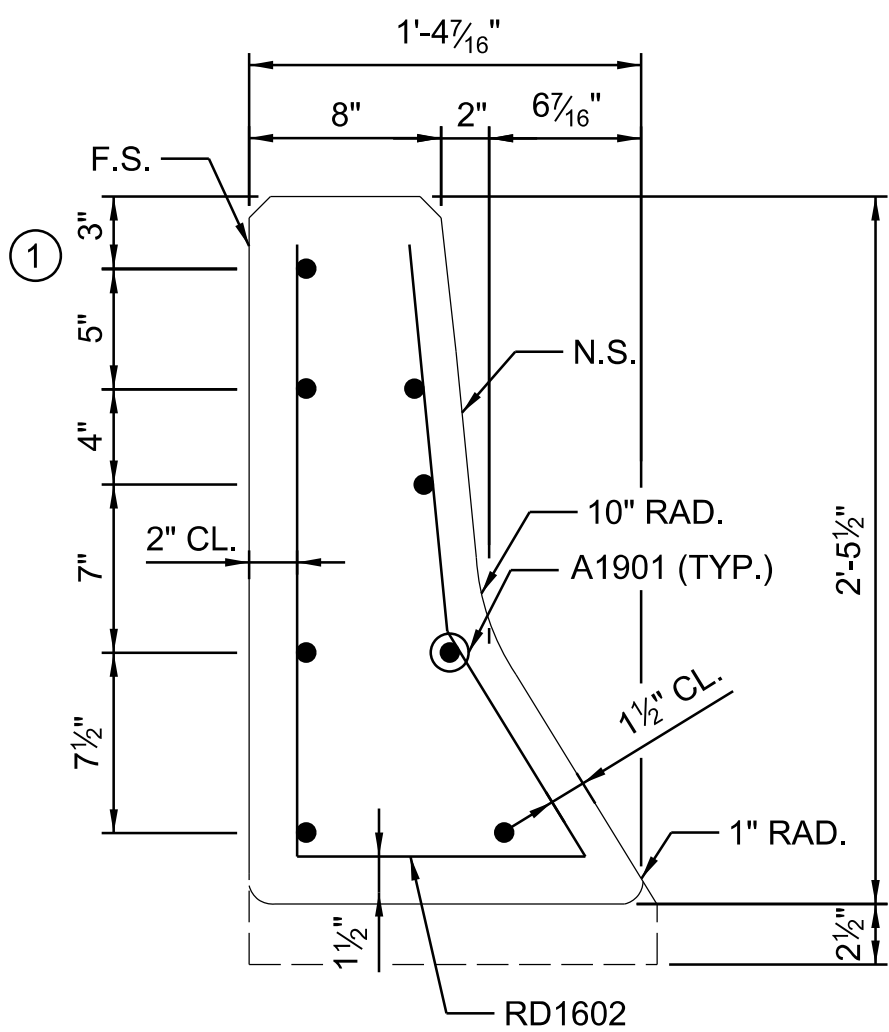
ELEVATION - 10' SECTION



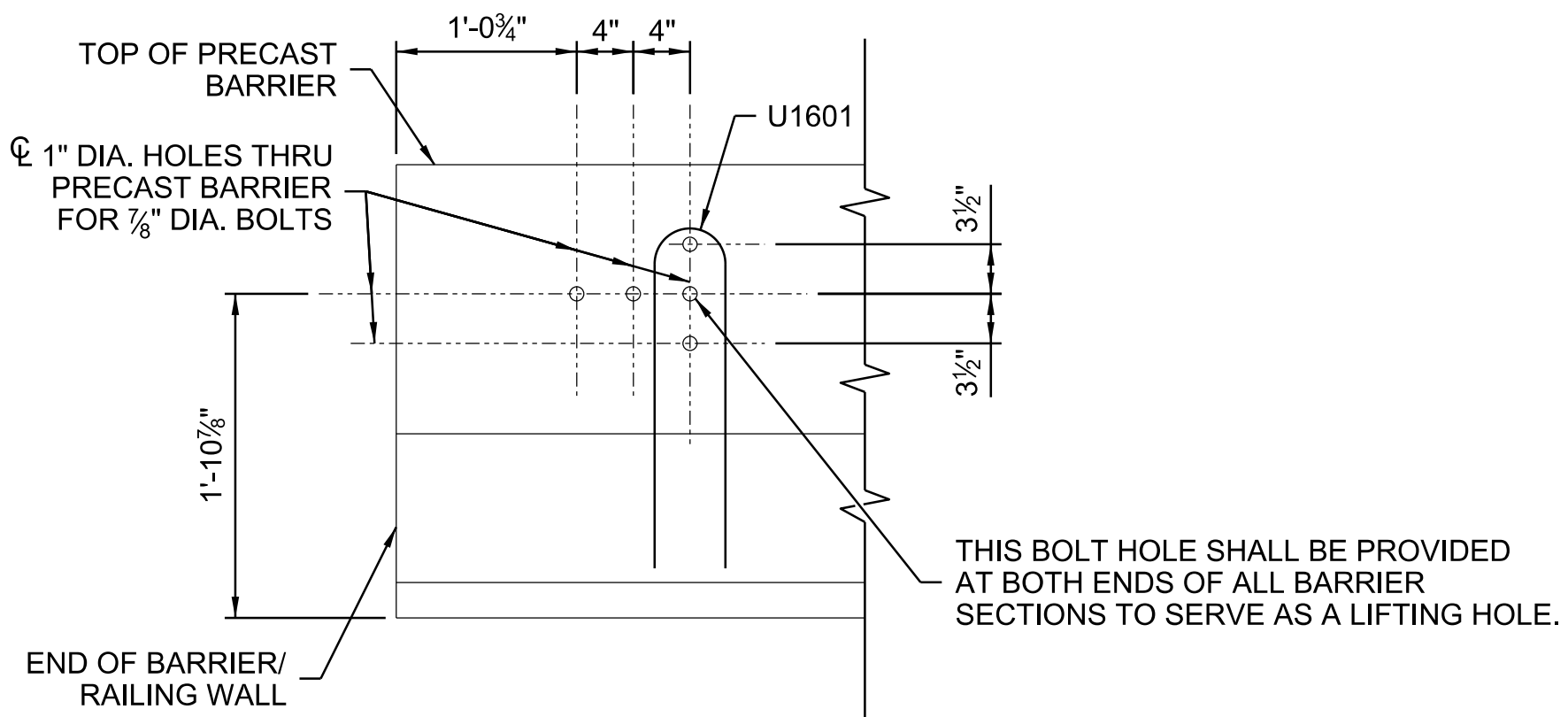
ELEVATION - 15' SECTION



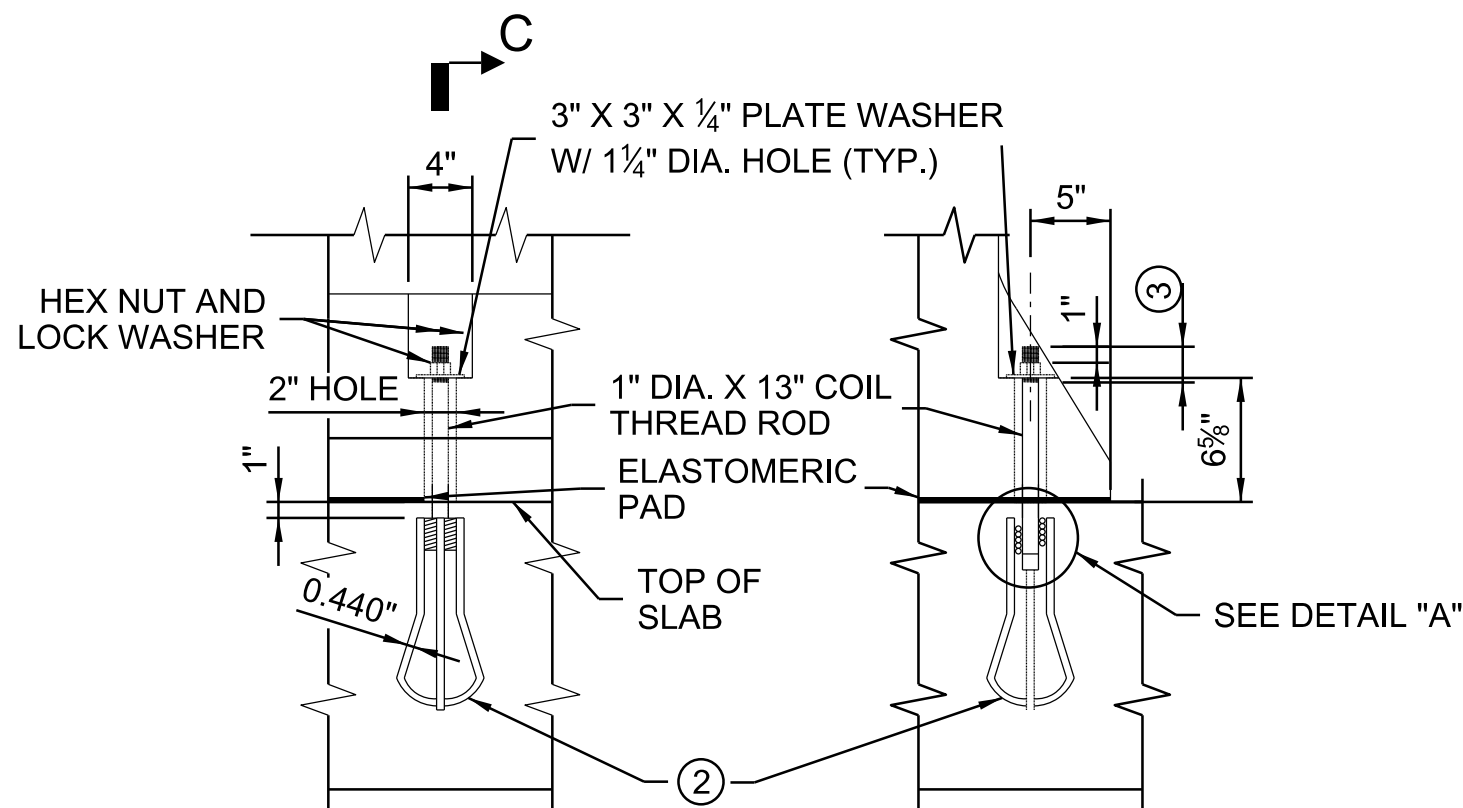
SECTION A-A



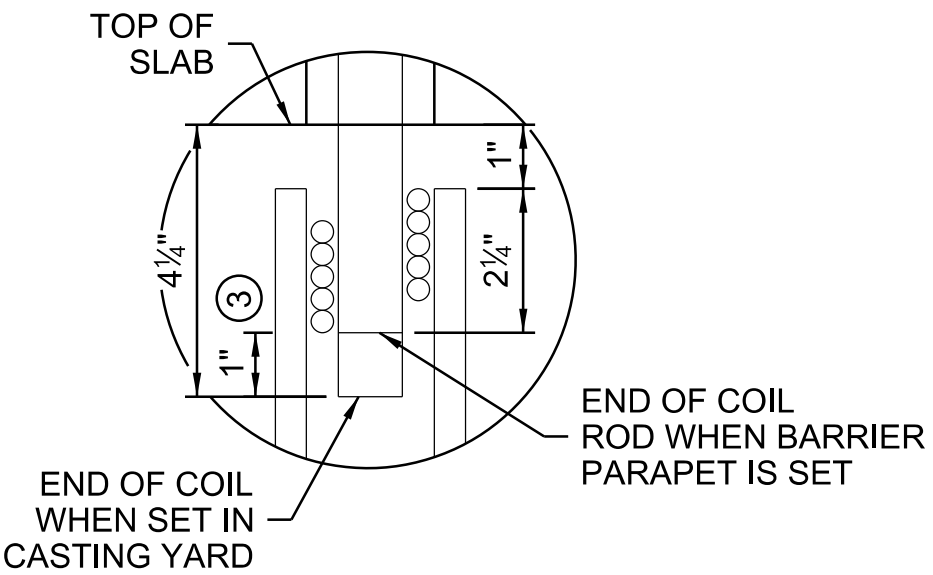
SECTION B-B



GUARDRAIL ATTACHMENT DETAIL



SECTION C-C

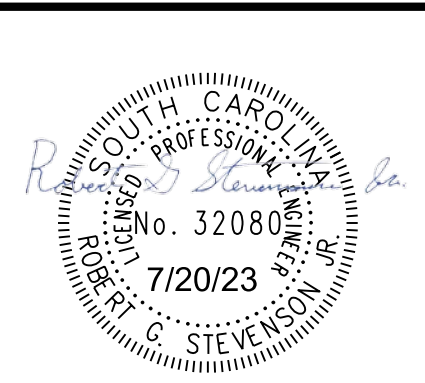
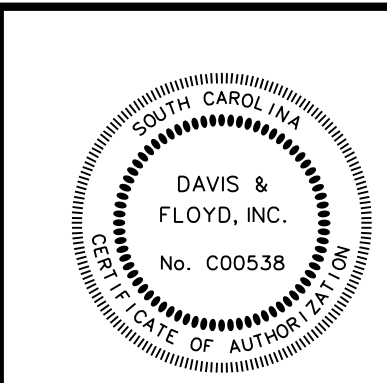


DETAIL 'A'

ANCHORAGE DETAILS

SEE SH. 15 FOR REINFORCING STEEL SCHEDULE, QUANTITIES, AND ADDITIONAL NOTES.

- VARY THIS DIMENSION TO MISS GUARDRAIL CONNECTION HOLE.
- DAYTON SUPERIOR B-33, 1" X 12 1/2" DOUBLE FLARED COIL LOOP INSERT OR APPROVED EQUAL.
- THE COIL ROD FOR SETTING THE INSERT IN THE CASTING YARD SHALL BE SET 4 1/4" INTO THE SLAB SECTION. WHEN SETTING THE BARRIER PARAPET IN THE FIELD THE COIL ROD SHALL BE SET A MINIMUM OF 3 1/4" INTO SLAB SECTION. THIS WILL ALLOW ADJUSTMENT IN THE LENGTH OF ROD PROJECTING ABOVE THE NUT WHEN PLACING BARRIERS. THE PROJECTION OF THE ROD ABOVE THE NUT SHOULD BE A MINIMUM OF 1". HOWEVER, CARE SHOULD BE TAKEN TO ENSURE THAT THE ROD DOES NOT PROJECT BEYOND THE PLANE OF THE BARRIER FACE.



REV.			
REV.			
REV.			
REVIEWED	CLM		
QUAN.			
DR.	ZMA	RGS	01-23
DES.	ZMA	RGS	01-23
BY	CHK	DATE	

DAVIS & FLOYD SINCE 1954		1319 HWY 72/221 E. GREENWOOD, SC 29649 (864) 229-5211	
FAIRFIELD COUNTY		PRECAST BARRIER DETAILS (SHEET 1 OF 2)	
COUNTY	FAIRFIELD	ROUTE	L-664

SCALE: 1'-0 ft=1in / 1in
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FILE: H:\JobsOdd\13921-04\Production\Structural\Drawings\013921-04_L-664_BR_15_Precast Barrier Details (Sheet 2 of 2).dgn
7/19/2023

NOTES:

BARRIER SECTIONS MAY BE REMOVED FROM THE FORMS AT THE FABRICATOR'S DISCRETION. THIS SHALL NOT RELIEVE THE FABRICATOR OF HIS RESPONSIBILITY TO FURNISH A DAMAGE FREE PRODUCT.

THE FRONT, TOP, BACK, AND END FACES OF THE BARRIER SECTIONS SHALL RECEIVE A FINAL SURFACE FINISH IN ACCORDANCE WITH SUBSECTION 702.4.11.3 AND 702.4.11.4 OF THE SCDOT STANDARD SPECIFICATIONS.

SPECIFICATIONS: AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 8TH EDITION AND 2007 SCDOT STANDARD SPECIFICATIONS.

1" DIA. THREADED RODS SHALL BE AASHTO M270 GRADE 36. NUTS AND STANDARD WASHERS SHALL BE IN ACCORDANCE WITH PARAGRAPH 709.2.4 OF THE STANDARD SPECIFICATIONS.COIL THREAD RODS SHALL BE B-12 WITH A SAFE WORKING LOAD OF 50,000 LBS. AND COIL NUT SHALL BE B-13 WITH A SAFE WORKING LOAD OF 24,000 LBS., BOTH AS MANUFACTURED BY DAYTON-SUPERIOR OR AN APPROVED EQUAL. PLATE WASHERS SHALL BE ASTM AASHTO M270 GRADE 36.

ALL BOLTS, NUTS, WASHERS, PLATE WASHERS, INSERTS, AND RODS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123 OR ASTM 153 AS APPLICABLE.

DRAIN SLOTS TO BE OMITTED IN BARRIER SECTIONS THAT ARE TO BE PLACED ABOVE THE END FILLS WITHOUT RIP RAP BELOW DRAIN SLOT. ALTERNATIVELY, DRAIN SLOT MAY BE FILLED WITH AN APPROVED DRY PACK GROUT WHEN LOCATED ABOVE END FILLS WITHOUT RIP RAP BELOW THE DRAIN SLOT.

THE MANUFACTURER'S IDENTIFYING MARK AND THE YEAR CAST SHALL BE CAST INTO THE BACK OR TOP FACE OF EACH BARRIER SECTION. CHARACTERS SHALL HAVE A HEIGHT OF 3" TO 4" AND SHALL BE EMBEDDED 1/8" TO 1/4".

HOLES FOR GUARDRAIL ATTACHMENT ARE REQUIRED IN BARRIER SECTIONS TO BE PLACED AT THE BRIDGE ENDS ON BOTH SIDES OF THE ROADWAY. FORM 1" DIA. HOLES WITH PLASTIC OR PVC PIPE HAVING AN INSIDE DIAMETER OF 1" (±1/8").

AS AN ALTERNATE -- GALVANIZED 1" I.D. STD. WT. STEEL PIPE MAY BE SUBSTITUTED FOR THE PLASTIC OR PVC PIPE. CUT ENDS OF STEEL PIPE TO BE FIELD GALVANIZED.

QUANTITIES ON THIS SHEET ARE FOR INFORMATION ONLY. MANUFACTURER TO VERIFY ALL QUANTITIES.

- ①
- ONE U1601 BAR TO BE PROVIDED FOR BARRIERS WITH GUARDRAIL ATTACHMENT ONLY. QUANTITIES FOR ONE BARRIER SECTION INCLUDE ADDITIONAL 4 LB FOR ONE U1601 BAR.
- ②
- PROVIDE ONE ADDITIONAL HEX NUT PER SPAN TO BE USED AS A SPARE AND FOR TURNING RODS WITH A DOUBLE NUT.
- ③
- QUANTITY PROVIDED FOR BARRIER WITH SLOT DRAIN(S).

REINFORCING STEEL SCHEDULE - 10' BARRIER SECTION

LOCATION	MARK	NO. REQ'D	DIMENSION					LENGTH
			"a"	"b"	"c"	"d"	"e"	
10' BARRIER	A1601	2	2'-7"	-	-	-	-	2'-7"
10' BARRIER	A1901	8	9'-7"	-	-	-	-	9'-7"
10' BARRIER	RD1601	12	2'-4½"	1'-1⅞"	1'-2⅞"	1'-4⅞"	11⅞"	6'-2"
10' BARRIER	RD1602	4	2'-2"	1'-0⅞"	11⅞"	1'-4⅞"	9⅞"	5'-6"
10' BARRIER	U1601	①	2'-0"	5"	-	-	-	4'-2"

QUANTITIES - ONE 10' SECTION

ITEM	UNIT	QTY.
CONC. FOR STRUCTURES CLASS 4000	③ CY	0.9
REINF. STEEL FOR STRUCTURES	① LB	225

HARDWARE PER 10' SECTION

ITEM	NO.
B-33.1" x 12 ½" INSERT	4
1" DIA. COIL HEX NUT	② 4
1" DIA. LOCK WASHER	4
3" x 3" x ¼" PLATE WASHER	4
1" DIA. x 13" COIL THREAD ROD	4
ELASTOMERIC PAD (¼" x 11" x 17")	2

ESTIMATED WEIGHT OF ONE 10' BARRIER SECTION WITH DRAIN SLOTS = 3466 LB

REINFORCING STEEL SCHEDULE - 15' BARRIER SECTION

LOCATION	MARK	NO. REQ'D	DIMENSION					LENGTH
			"a"	"b"	"c"	"d"	"e"	
15' BARRIER	A1601	3	2'-7"	-	-	-	-	2'-7"
15' BARRIER	A1901	8	14'-7"	-	-	-	-	14'-7"
15' BARRIER	RD1601	18	2'-4½"	1'-1⅞"	1'-2⅞"	1'-4⅞"	11⅞"	6'-2"
15' BARRIER	RD1602	6	2'-2"	1'-0⅞"	11⅞"	1'-4⅞"	9⅞"	5'-6"
15' BARRIER	U1601	①	2'-0"	5"	-	-	-	4'-2"

QUANTITIES - ONE 15' SECTION

ITEM	UNIT	QTY.
CONC. FOR STRUCTURES CLASS 4000	③ CY	1.4
REINF. STEEL FOR STRUCTURES	① LB	338

HARDWARE PER 15' SECTION

ITEM	NO.
B-33.1" x 12 ½" INSERT	6
1" DIA. COIL HEX NUT	② 6
1" DIA. LOCK WASHER	6
3" x 3" x ¼" PLATE WASHER	6
1" DIA. x 13" COIL THREAD ROD	6
ELASTOMERIC PAD (¼" x 11" x 17")	3

ESTIMATED WEIGHT OF ONE 15' BARRIER SECTION WITH DRAIN SLOTS = 5214 LB

REV.

REV.

REV.

REVIEWED

CLM

QUAN.

DR.

ZMA

RGS

01-23

DES.

ZMA

RGS

01-23

BY

CHK

DATE

7/20/23

7/20/23

7/20/23

7/20/23

DAVIS & FLOYD

SINCE 1954

1319 HWY 72/221 E.

GREENWOOD, SC 29649

(864) 229-5211

FAIRFIELD COUNTY

PRECAST BARRIER

DETAILS (SHEET 2 OF 2)

COUNTY

FAIRFIELD

ROUTE

L-664

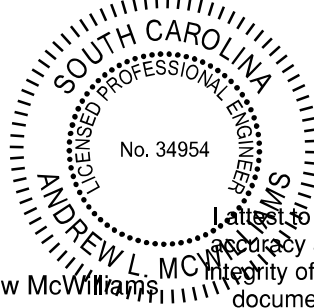
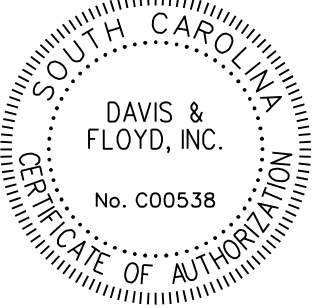
APPENDIX B: ROADWAY DRAWINGS

CONSTRUCTION PLANS

FED. ROAD DIV. NO.	STATE	COUNTY	D&F PROJECT ID	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	S.C.	FAIRFIELD	13921.04	L-664	2	

ITEM NO.	PAY ITEM	QUANTITY	PAY UNIT
1031000	MOBILIZATION		LS
1032010	BONDS AND INSURANCE		LS
1050800	CONSTRUCTION STAKES, LINES & GRADES		EA
1071000	TRAFFIC CONTROL		LS
2011000	CLEARING & GRUBBING WITHIN RIGHT OF WAY		LS
2031000	UNCLASSIFIED EXCAVATION		CY
2081001	FINE GRADING		SY
3031006	SAND-CLAY BASE CR. 6" UNIFORM		CY
3069900	MAINTENANCE STONE		TON
8041020	RIP-RAP (CLASS B)		TON
8042800	GEOTEXTILE FABRIC FOR EROSION CONTROL UNDER RIPRAP (CLASS 2)		SY
8051050	PREMASH W-BEAM STRONG POST SYSTEM WSP3		LF
8051210	PREMASH W-BEAM BRIDGE CONN TL2 WBBC2		EA
8057050	PREMASH TYPE T TL2 LEADING 25FT		EA
8100100	PERMANENT COVER		ACRE
8100200	TEMPORARY COVER		ACRE

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PLOT DRIVER: PDF-plotrig
FILE: H:\JobsOdd\13921-04\Production\Sheets\002_13921-04_SEQ_SHEETS.DGN
7/20/2023



DAVIS & FLOYD
SINCE 1954

5			
4			
3			
2			
1			
REV. NO.	BY	DATE	DESCRIPTION OF REVISION
DESIGNED BY	<u>AM</u>	DRAWN BY	<u>JJG</u> CHECKED BY <u>AM</u>

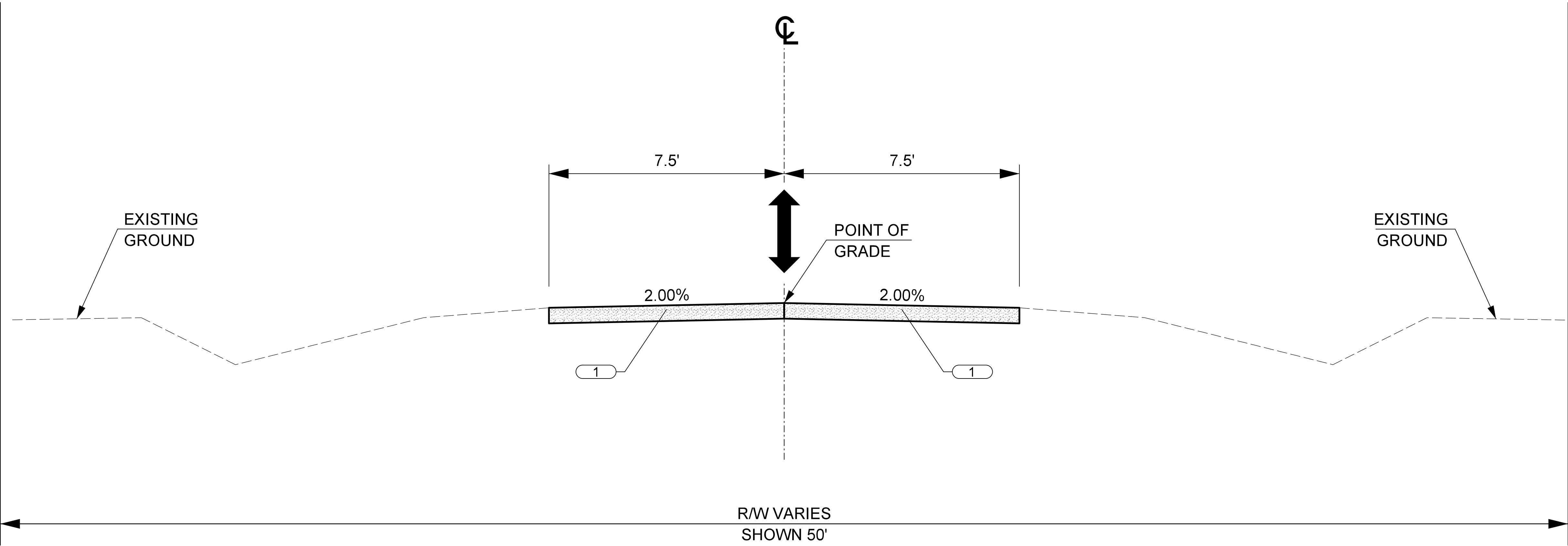
FAIRFIELD COUNTY

FAIRFIELD COUNTY
SUMMARY OF ESTIMATED QUANTITIES SHEET
MAGGIE HARRIS ROAD

N.T.S.

PLOT SIZE = 22" x 34"

FED. ROAD DIV.NO.	STATE	COUNTY	D&F PROJECT ID	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	S.C.	FAIRFIELD	13921.04	L-664	3	

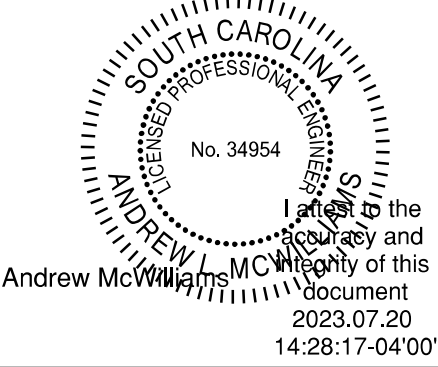
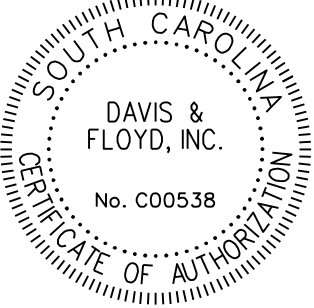


MAGGIE HARRIS ROAD
TYPICAL SECTION
STA. 11+81.14 TO STA. 16+14.61

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7/20/2023

1 6' UNIFORM EARTH TYPE COURSE

RTE. HILL ROAD		DESIGN SPEED	
MPH	FROM STA.	TO STA.	
RTE.			



DAVIS & FLOYD
SINCE 1954

1940 ALCONQUIN ROAD, SUITE 301
CHARLESTON, SC 29405
(843)-554-8602

5			
4			
3			
2			
1			
REV. NO.	BY	DATE	DESCRIPTION OF REVISION
DESIGNED BY <u>AM</u> DRAWN BY <u>JJG</u> CHECKED BY <u>AM</u> NTS			

FAIRFIELD COUNTY

FAIRFIELD COUNTY
TYPICAL SECTION SHEET
MAGGIE HARRIS ROAD

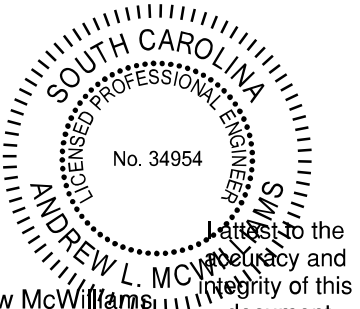
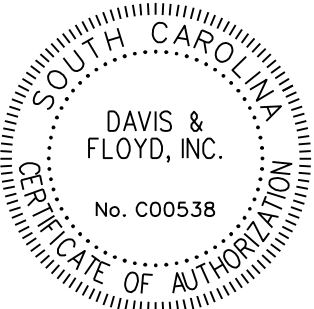
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7/20/2023

CONSTRUCTION PLANS

FED. ROAD DIV.NO.	STATE	COUNTY	D&F PROJECT ID	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	S.C.	FAIRFIELD	13921.04	L-664	5A	

CONTROL POINTS/BENCHMARKS					
ID	NORTH	EAST	ELEVATION	STATION	OFFSET
2	987685.10	1912366.67	471.48	N/A	N/A
3	987472.04	1912629.63	435.94	12+93.11	9.42
4	987453.38	1912760.94	432.74	14+11.47	29.31
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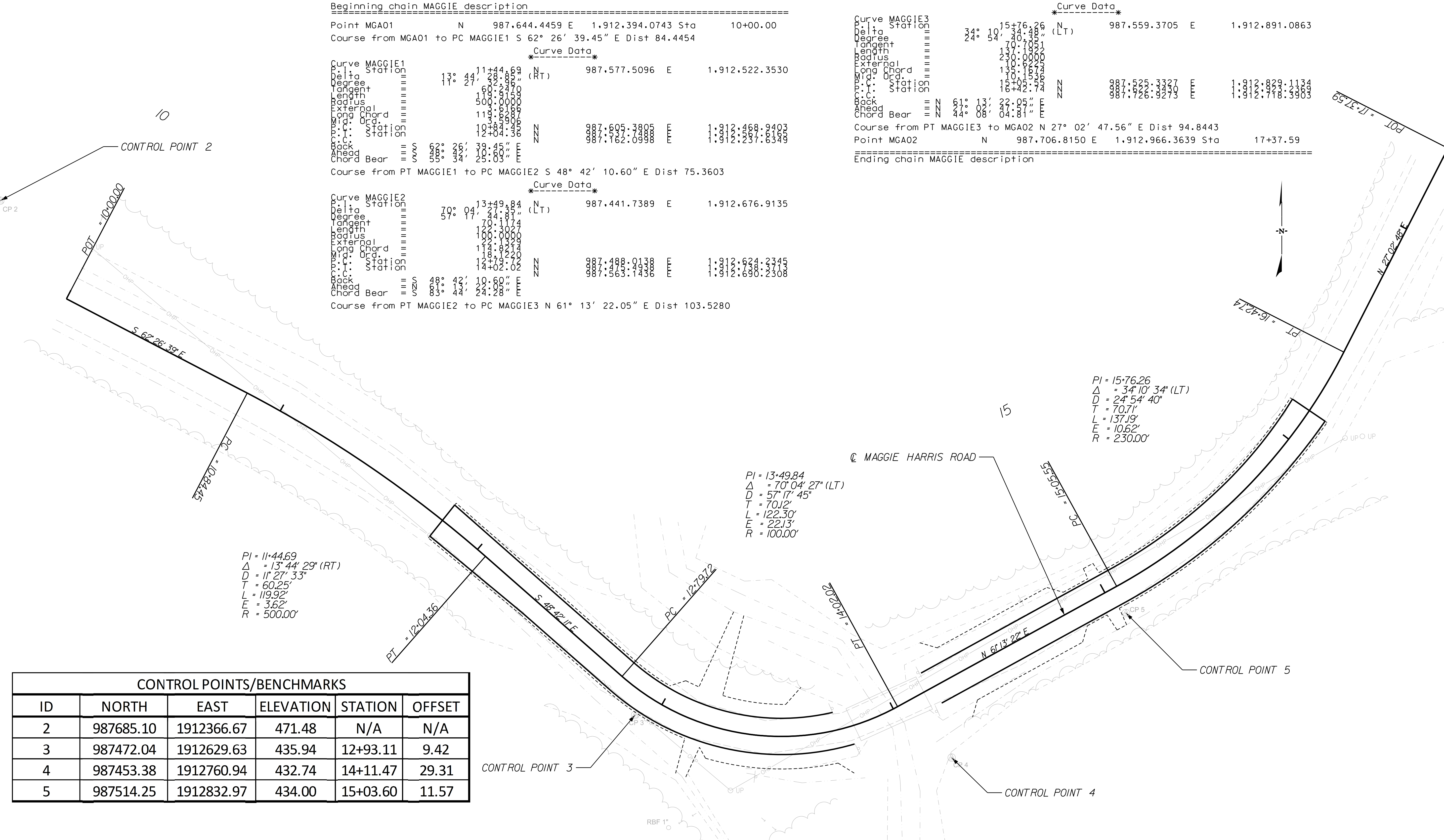


DAVIS & FLOYD
SINCE 1954

1940 ALCONQUIN ROAD, SUITE 301
CHARLESTON, SC 29405
(843)-554-8602

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
5			
4			
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2			
1			
DESIGNED BY			AM
DRAWN BY			JJG
CHECKED BY			AM

FAIRFIELD COUNTY	
FAIRFIELD COUNTY REFERENCE DATA SHEET MAGGIE HARRIS ROAD	
SCALE: 1"=20'	PLOT SIZE = 22" x 34"



Beginning chain MAGGIE description
=====

Point MGA01 N 987,644.4459 E 1,912,394.0743 Sta 10+00.00
Course from MGA01 to PC MAGGIE1 S 62° 26' 39.45" E Dist 84.4454

Curve Data
=====

Curve MAGGIE1
Delta Station 11+44.69 (RT) 987,577.5096 E 1,912,522.3530
Delta 13° 44' 27" 160.24150
Tangent 119.61500
Radius 500.00000
Long Chord 113.66667
External 113.66667
Mid. Ord. 12+04.366
P.C. Station 10+00.000
Back Sight 12+04.366
Ahead S 62° 26' 39.45" E
Chord Bear S 55° 34' 25.03" E

Course from PT MAGGIE1 to PC MAGGIE2 S 48° 42' 10.60" E Dist 75.3603

Curve Data
=====

Curve MAGGIE2
Delta Station 13+49.84 (LT) 987,441.7389 E 1,912,676.9135
Delta 70° 04' 17" 170.1174
Tangent 100.00000
Radius 100.00000
Long Chord 114.13440
External 114.13440
Mid. Ord. 14+02.022
P.C. Station 12+00.000
Back Sight 14+02.022
Ahead S 48° 42' 10.60" E
Chord Bear S 83° 44' 24.28" E

Course from PT MAGGIE2 to PC MAGGIE3 N 61° 13' 22.05" E Dist 103.5280

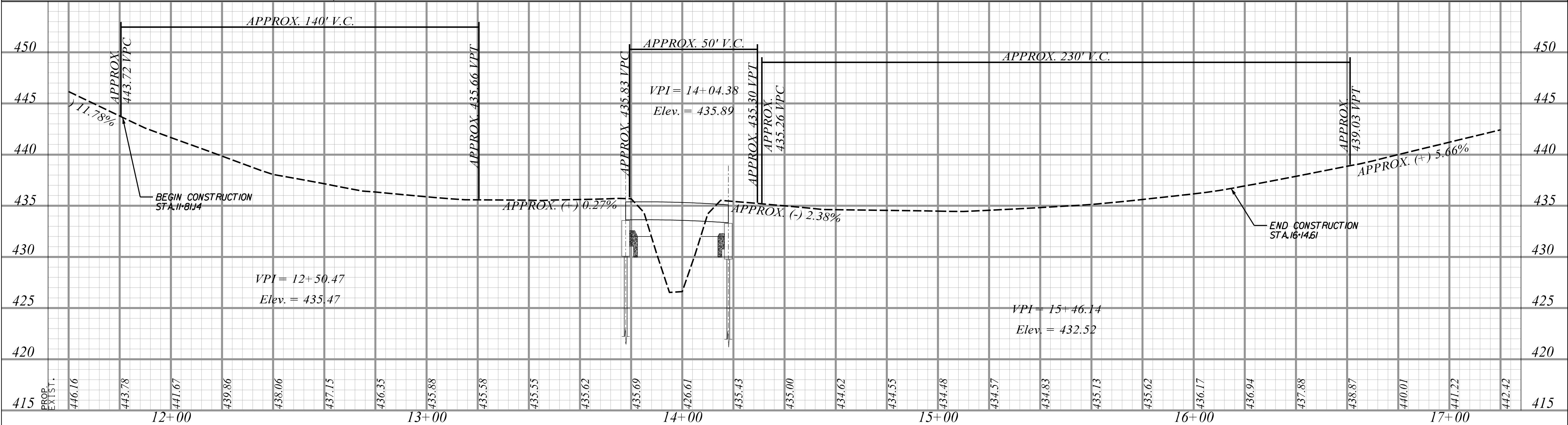
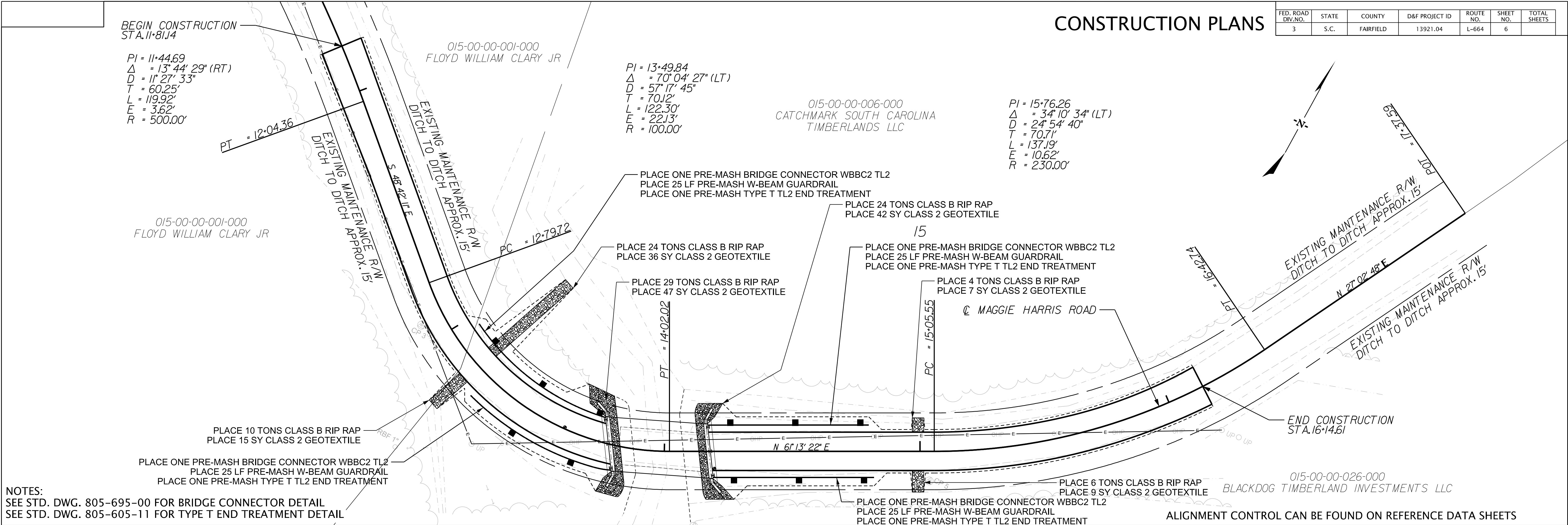
Curve Data
=====

Curve MAGGIE3
Delta Station 15+76.26 (LT) 987,559.3705 E 1,912,891.0863
Delta 34° 10' 34" 137.16333
Tangent 137.16333
Radius 230.00000
Long Chord 130.96430
External 130.96430
Mid. Ord. 16+42.756
P.C. Station 13+00.000
Back Sight 16+42.756
Ahead N 61° 13' 22.05" E
Chord Bear N 27° 02' 47.56" E

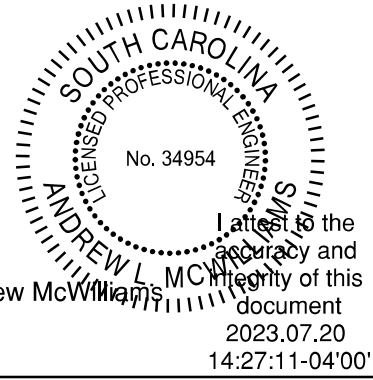
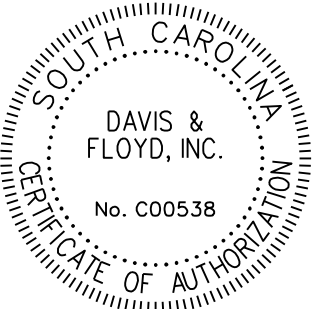
Course from PT MAGGIE3 to MGA02 N 27° 02' 47.56" E Dist 94.8443
Point MGA02 N 987,706.8150 E 1,912,966.3639 Sta 17+37.59
Ending chain MAGGIE description
=====

CONSTRUCTION PLANS

FED. ROAD DIV. NO.	STATE	COUNTY	D&F PROJECT ID	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	S.C.	FAIRFIELD	13921.04	L-664	6	



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7/20/2023



DAVIS & FLOYD
SINCE 1954

1940 ALGONQUIN ROAD, SUITE 301
CHARLESTON, SC 29405
(843) 554-8802

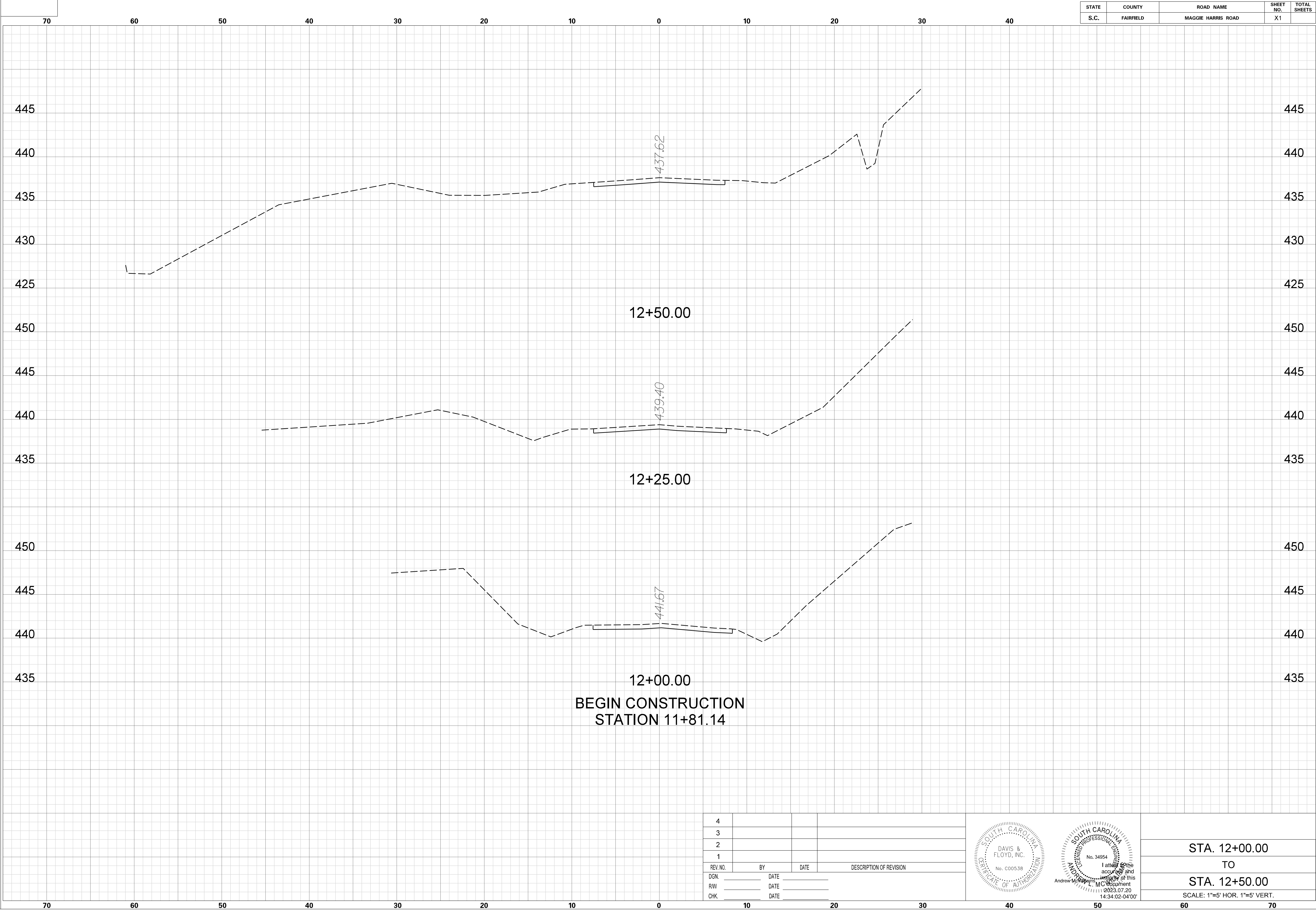
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4			
3			
2			
1			
DES. BY	AM	DRAWN BY	JJG
REVIEWED BY	AM	CHECKED BY	AM

FAIRFIELD COUNTY
FAIRFIELD COUNTY PLAN AND PROFILE SHEET MAGGIE HARRIS ROAD
SCALE: 1"=20' PLOT SIZE = 22" x 34"

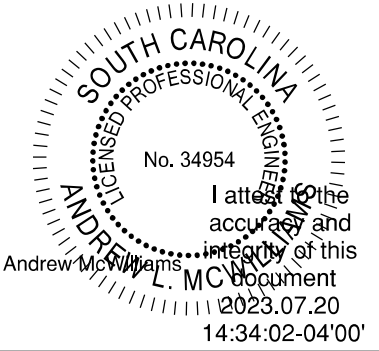
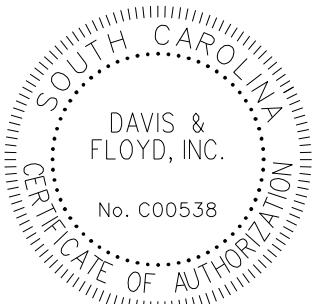
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7/20/2023

STATE	COUNTY	ROAD NAME	SHEET NO.	TOTAL SHEETS
S.C.	FAIRFIELD	MAGGIE HARRIS ROAD	X1	



4			
3			
2			
1			
REV. NO.	BY	DATE	DESCRIPTION OF REVISION
DGN.		DATE	
RW		DATE	
CHK.		DATE	



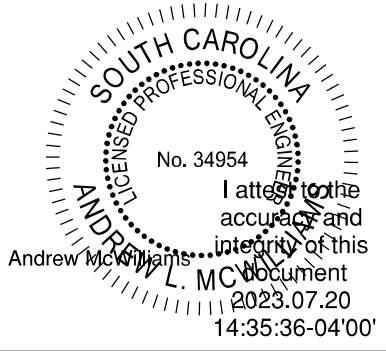
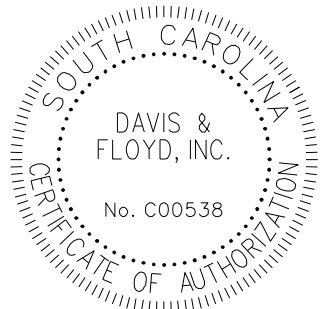
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TO
STA. 12+50.00
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7/20/2023

STATE	COUNTY	ROAD NAME	SHEET NO.	TOTAL SHEETS
S.C.	FAIRFIELD	MAGGIE HARRIS ROAD	X2	



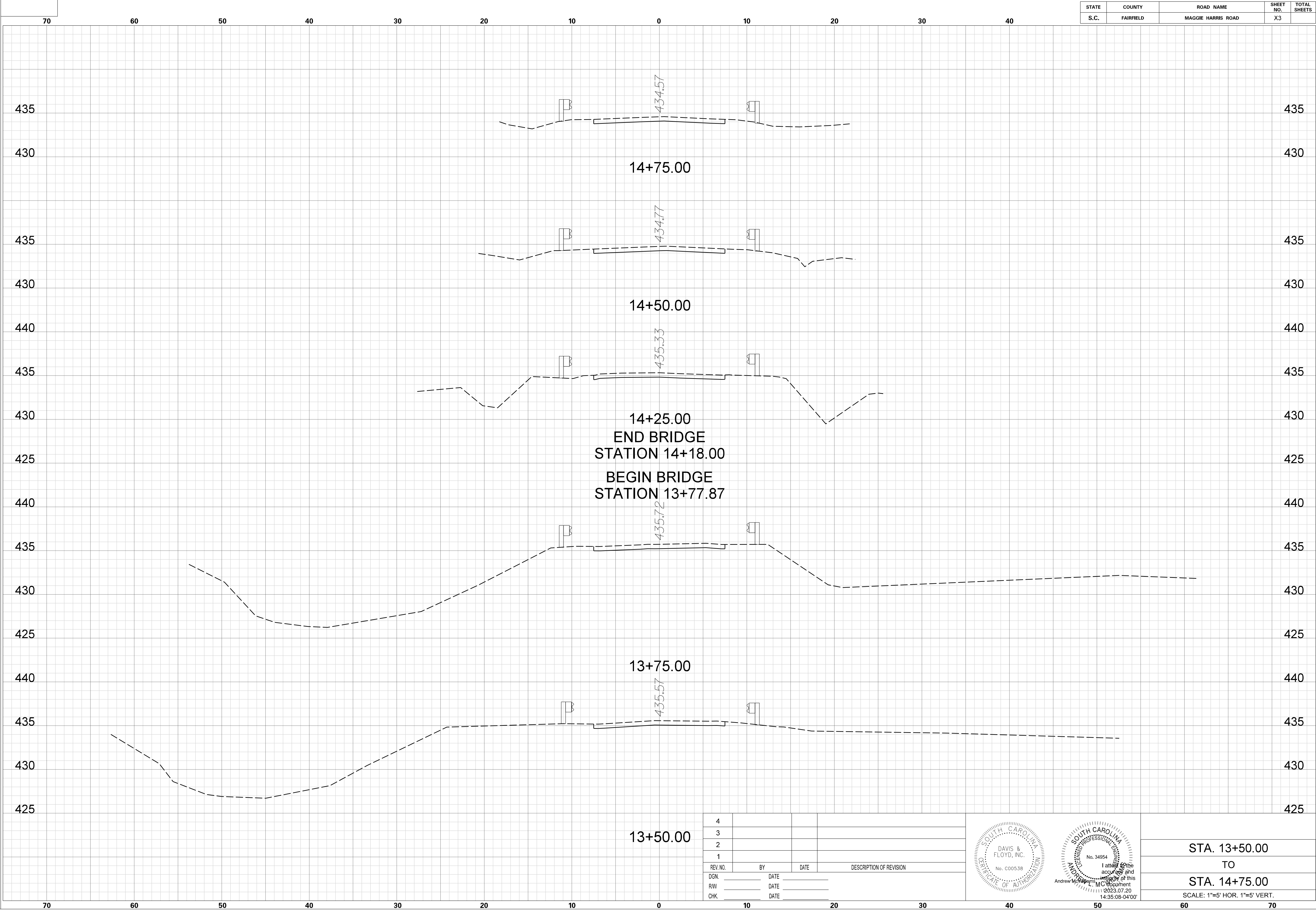
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3			
2			
1			
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DGN.		DATE	
RW		DATE	
CHK.		DATE	



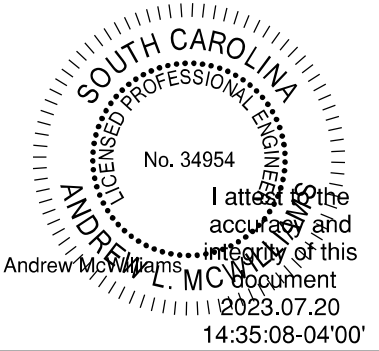
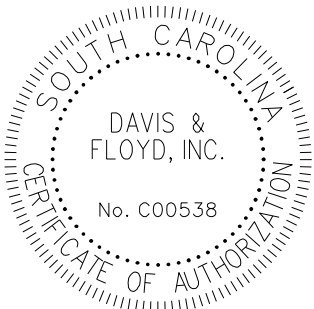
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TO
STA. 13+25.00
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SCALE: 5.0000 ft / in.
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7/20/2023

STATE	COUNTY	ROAD NAME	SHEET NO.	TOTAL SHEETS
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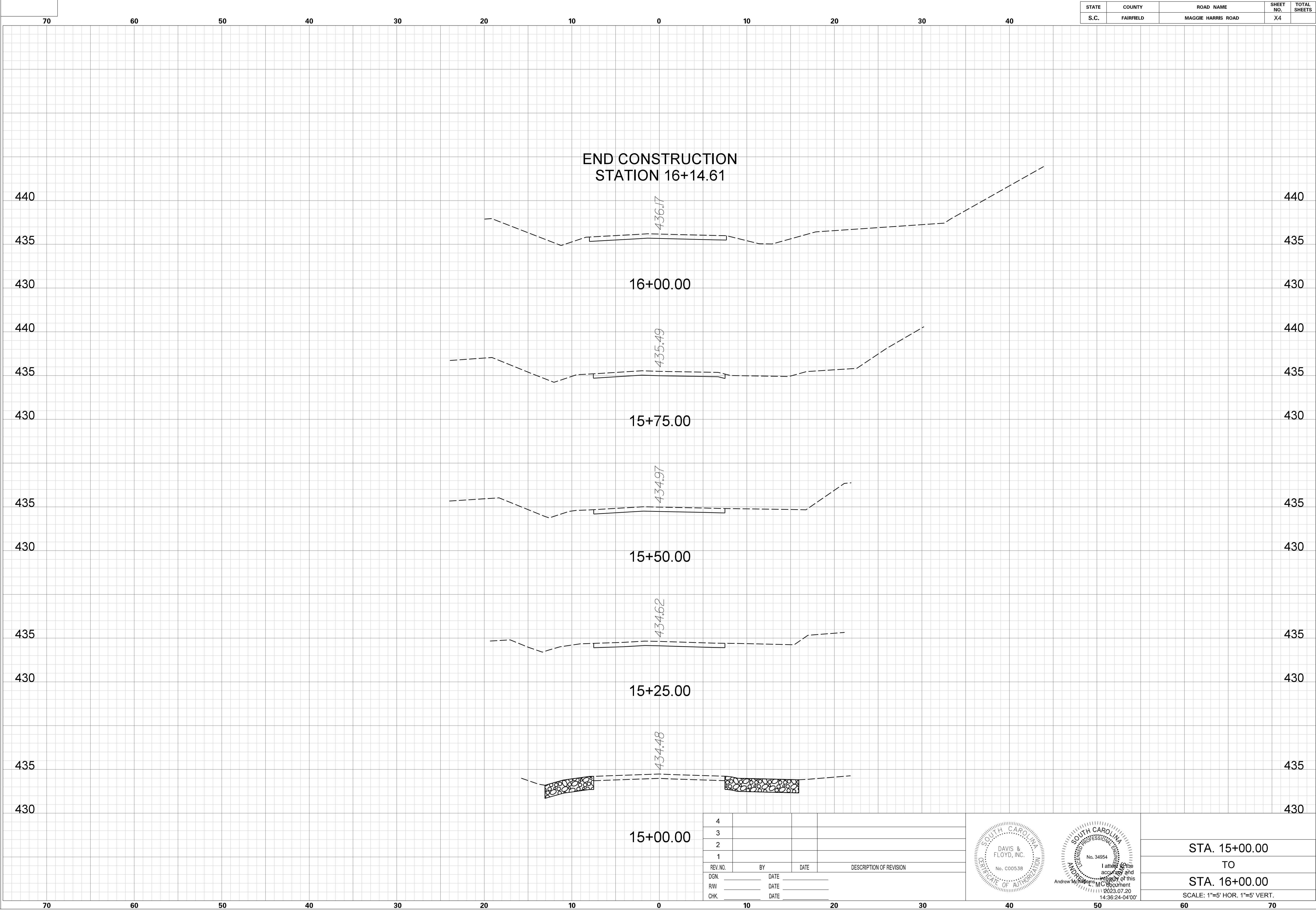
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REV. NO.	BY	DATE	DESCRIPTION OF REVISION
DGN.		DATE	
RW		DATE	
CHK.		DATE	



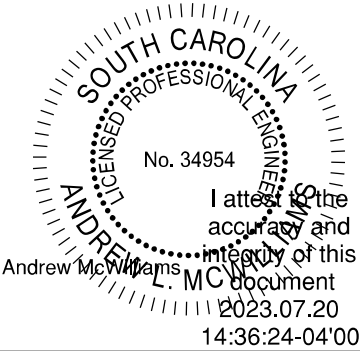
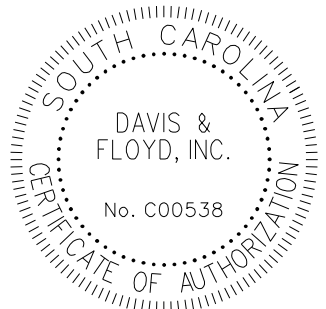
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TO
STA. 14+75.00
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7/20/2023

STATE	COUNTY	ROAD NAME	SHEET NO.	TOTAL SHEETS
S.C.	FAIRFIELD	MAGGIE HARRIS ROAD	X4	



4			
3			
2			
1			
REV. NO.	BY	DATE	DESCRIPTION OF REVISION
DGN.		DATE	
RW		DATE	
CHK.		DATE	



STA. 15+00.00
TO
STA. 16+00.00
SCALE: 1"=5' HOR. 1"=5' VERT.

APPENDIX C: GEOTECHNICAL REPORT

February 24, 2023

Todd Warren, PE
Vice President
Davis & Floyd, Inc.
240 Stoneridge Drive, Suite 305
Columbia, SC 29210

Re: Report of Geotechnical Exploration
Maggie Harris Road
Bridge Replacement Over Unnamed Tributary of West Fork Little River
Carlisle, South Carolina
FME Proposal No.: G2022127
FME Project No.: G6782.000

Dear Mr. Warren:

F&ME Consultants, Inc. (FME) is pleased to submit this geotechnical exploration report for the preparation of the replacement of Maggie Harris Bridge over an Unnamed Tributary of the West Fork Little River. Please notify us if there are any questions or if we may be of further assistance with the implementation of our recommendations.

Sincerely,

F&ME Consultants

A handwritten signature in black ink, appearing to read 'A Chandler'.

Alex M Chandler, EIT
Geotechnical Staff Professional

A handwritten signature in blue ink, appearing to read 'A Whitfield'.

Andy Whitfield, PE
Senior Geotechnical Engineer



PROJECT DESCRIPTION

Project information was obtained on October 14, 2022 telephone conversation between Todd Warren of Davis & Floyd, Inc. (D&F) and Andy Whitfield of FME. An existing bridge on Maggie Harris Road over an unnamed tributary of the West Fork Little River needs replacement. We have included a Site Location Plan as Figure 1 in Appendix A of this report. Maggie Harris Road is a Fairfield County owned road which has three (3) stream crossings. When traveling from Ashford Ferry Road towards Banks Weir Road along Maggie Harris Road, the bridge in question is the third stream crossing or the most easterly stream crossing on Maggie Harris Road.

Mr. Warren requested a geotechnical proposal for the replacement bridge and stated that FME should assume a single span bridge will replace the existing bridge on the same horizontal alignment. The approaches may be raised depending on the hydrologic and hydraulic study, but generally the project will be a bridge replacement on the existing alignment near the existing approach elevations. Mr. Warren said that seismic analysis is not requested and that the SCDOT Geotechnical Design Manual will not govern the project. The new replacement bridge end to end length will be approximately fifty (50) feet and no retaining walls are expected. The actual bridge alignment and embankment cross-sections were provided in February 21, 2023 e-mail from Rob Stevenson of D&F to Alex Chandler of FME.

FIELD EXPLORATION

FME contacted South Carolina 811 (SC 811) for utility marking prior to mobilization of field drilling equipment to help avoid damage to public utilities from our subsurface exploration activities. Drilling operations were performed on December 13, 2023. The approximate locations of FME's borings are shown on the Boring Location Plan (Figure 2) included in Appendix A of this report.

FME performed two (2) Standard Penetration Test (SPT) borings as part of the geotechnical exploration. Borings were labeled B-1 and B-2 and extended to depths of 34.2 and 38.6 feet below existing ground surface, respectively. Auger refusal was encountered at a depth of twenty-four point two (24.2) feet for boring B-1 and eighteen point six (18.6) feet in boring B-2 below present ground surfaces.

The test borings were performed utilizing a CME 550X ATV mounted drill rig with a hammer efficiency ratio of 87.0%. SPT drilling was performed with hollow-stem augers to maintain borehole stability. SPT sampling was performed continuously in the top ten (10) feet of the boring, and then at five (5) foot intervals until auger refusal depth was encountered. Ten (10) and twenty (20) feet of rock coring was performed in borings B-1 and B-2, respectively. The final depth of rock coring was determined based upon obtained Rock Quality Designation (RQD) at the time of the coring operation.

Soil samples and rock cores were collected during SPT drilling and rock coring. Collected soil and rock samples were classified in the field and sealed in plastic bags or rock boxes for transport to FME's laboratory. The soil samples were visually classified based upon the Unified Soil Classification System (USCS). The descriptions of soil and rock encountered are shown on the test boring logs contained in Appendix B of this report. As with any geologic formation, soil transitions between the described soil stratigraphy may be gradual and the descriptions as presented on the test boring logs and in the soil stratigraphy section of this report should be considered as general subsurface conditions and not as an absolute indicator.

Groundwater level, if encountered, was measured at the time of the borings or twenty-four after the time of boring. The borings were backfilled with auger cuttings after groundwater levels were recorded.

STRATIGRAPHY

The soils encountered below the ground surface were classified as mainly poorly graded sand (SP) and silty sand (SM). Soil relative density varied from loose to very dense with N-values ranging from three (3) to over one hundred (100) blows per foot (bpf). FME encountered one hundred (100) blow material in borings B-1 and B-2 at a depth of twenty-three point five (23.5) and thirteen point five (13.5) feet below ground surface, respectively. Overall, the soils encountered in the borings performed are soils typical of those found in the stream valley within the Piedmont Region of South Carolina.

In test borings B-1 and B-2, rock was encountered below the soil material at depths of twenty-four point two (24.2) and eighteen point six (18.6) feet below ground surface, respectively. The rock was classified as metamorphic slate or shale (i.e. Phyllite). More detail of the soils and rock encountered in the test borings are provided on the boring logs included in Appendix B of this report.

GROUNDWATER

Groundwater was encountered in the borings performed. The table below (Table 1) shows either the depth to groundwater at the time of boring (TOB) or at twenty-four (24) hours after TOB for the test borings.

Boring ID	Groundwater TOB (ft.)	24-Hour (ft.)
B-1	NR	9.0
B-2	7.0	NR

Table 1: Groundwater levels

It should be noted that groundwater levels will fluctuate seasonally and following periods of prolonged or heavy precipitation events. Groundwater levels may be encountered at depths shallower than our boring depths during periods of above average precipitation and changes in the creek stage at this bridge crossing location.

LABORATORY SOIL AND ROCK TESTING PROGRAM

In order to verify visual classifications as logged in the field during drilling, soil samples collected from the test borings and transported to our laboratory were selected for USCS classification testing. Three (3) soil samples from each test boring were selected, for a total of six (6) soil classification tests. In addition to soil classification testing, the six (6) soil samples were also tested for natural moisture content (NMC). The results of the soil laboratory testing program are presented in Appendix C of this report.

Rock core unconfined compressive (UC) strength testing was performed on selected portions of recovered rock core samples from boring B-1. Three (3) rock sample locations of the recovered core were prepared and tested for determination of rock UC strength. The laboratory derived UC strength test data results indicate a UC rock strength ranging from 4,980 psi to 7,030 psi. The rock testing data sheets are included in Appendix C of this report.

SITE PREPARATION

All existing utilities and subsurface obstructions should be located and their potential impact on the proposed construction assessed. If existing utilities are to be removed or allowed to remain within the construction area, then care should be taken to properly compact trenches and excavations in order to ensure that all existing trenches have been properly backfilled and compacted.

Temporary and permanent site drainage should be established soon after land disturbance occurs to promote drainage away from disturbed areas of the site during grading once construction begins. The shear strength of near surface soils will decrease with increasing moisture content. Decreased shear strength of soils may result in rutting and/or instability when above optimum moisture content.

Positive drainage must be maintained through construction to help minimize the saturation of on-site subgrade soils after rainfalls. Permanent site drainage like ditches and culverts should be maintained to provide positive flow away from the roadway. This is to prevent subgrade soils beneath new pavements from becoming saturated and to minimize fluctuations in moisture contents. If drainage improvements are planned, then the drainage improvements should be installed as early as possible during construction.

Moisture conditioning, if needed, may include drying the in-place soil by windrowing or disking. If too dry, then moisture may need to be added to the soil from a water truck. In either case, the subgrade soil should fall within plus or minus three (3) percent of the optimum moisture content during compaction.

The subgrade should be tested for moisture content and compaction by a technician working under the direction of a geotechnical engineer licensed in the state of South Carolina. Prior to fill placement, proofrolling of the subgrade should be performed. Proofrolling should be observed by the technician who performs the compaction testing. Proofrolling should be performed by the contractor with a loaded on-road, tandem-axle dump truck before any fill is placed. Cut sections should also be subjected to proofrolling once the cut soils have been removed and the design subgrade elevation has been established by fine grading.

Any areas that pump or rut during proofrolling should be explored with test pits. If unstable subgrade is found to be wet of optimum, then it can be dried and recompacted. If drying is impractical, then soft or loose soils should be undercut and replaced with on-site borrow or select fill. If select fill is imported to the site, then it should be free of organic matter and consist of soils classified as SP, SW, SC, SM, or SP-SM with less than thirty percent (30%) passing the #200 sieve.

GRADING AND FILL PLACEMENT

Structural fill for approach embankments should be placed in successive lifts not to exceed eight (8) inches loose. Each lift should be compacted to at least ninety-five percent (95%) of the soil's Standard Proctor maximum dry unit weight. Backfill for new utility lines should also be placed in 8-inch loose lifts and each lift compacted to at least ninety-five percent (95%) of the soil's Standard Proctor maximum dry unit-weight before placing a subsequent lift.

Soils encountered in our borings are satisfactory for use as structural fill. Near surface soils are expected to be lower than the optimum moisture content, therefore moisture conditioning may be needed. If necessary, moisture conditioning may include drying the in-place soil by windrowing or disking. If too dry, then moisture may need to be added to the soil from a water truck. In either case, the subgrade soil should fall within plus or minus three percent (3%) of optimum moisture content during compaction.

If off-site borrow is imported for use as structural fill, then it should be select fill free of organic and deleterious material. Off-site borrow should meet one of the following USCS Classifications: SW, SP, SC, SM, or SP-SM with less than thirty percent (30%) passing the #200 sieve.

Fill and backfilled should be tested for compaction prior to placement of subsequent lifts. Compaction testing should be performed by a qualified engineering technician working under the direction of licensed South Carolina geotechnical engineer. Test frequency should be per the 2007 *SCDOT Standard Specifications for Highway Construction*. Test frequency should be at least one (1) test per lift per one hundred (100) feet in utility line backfill.

GROUNDWATER MITIGATION

Shallow groundwater should not pose to be a challenge at the site during construction. If groundwater is identified above the depth of the bottom of the end cap of the proposed bridge then FME should notified to provide mitigation recommendations.

LPILE ANALYSIS

FME performed a lateral pile analysis using loads provided to FME in a February 3, 2023 e-mail from Robert Stevenson Jr., PE of D&F. FME performed the analysis using Lpile Version 2019. Lpile analysis was run based upon the provided loadings, and the soil profile as encountered in the test borings performed during this exploration. The pile head was modeled as fixed-head in the transverse loading direction (relative to bridge centerline) to account for bracketing effects of the multi-pile foundation geometry. In the longitudinal loading direction (relative to bridge centerline), the pile head was modeled as a free-head condition.

The Lpile data tables showing the lateral analysis input variables, soil modeled soil profile, and the Lpile analysis graph results showing maximum deflections and moments achieved under the provided loads are provided in Appendix D of this report.

Based on our Lpile analysis, the end bent piles will need to be installed with a minimum embedment of ten (10) feet below the pile cap which FME estimates to be pile tip elevation of 420.0 ft-MSL or deeper in order to achieve adequate lateral stability for the service case lateral loadings.

BRIDGE FOUNDATION RECOMMENDATIONS

Bridge strength case axial loadings of two hundred (200) kips were provided to FME in a February 3, 2023 e-mail. Based on a three (3) pile bent line, the end bent foundations are considered as a non-redundant system and a geotechnical resistance factor of 0.5 is stipulated for calculation of ultimate axial bearing requirements. The following table (Table 2) presents installed pile bearing requirements.

Pile Bearing Design Requirements	
Bent I.D.	EB1 & EB2
Factored Design Load	200 Kips
Factored Static Downdrag Load	0 Kips
Geotechnical Resistance Factor	0.50
Nominal Resistance	400 Kips
Resistance from Design Flood Scourable Soils	0 Kips
Unfactored Static Downdrag Load	0 Kips

Required Driving Resistance	400 Kips
-----------------------------	----------

Table 2: Pile Bearing Design Properties

Based on the information collected, the piles will obtain the maximum driving resistance of four hundred (400) kips in tip bearing when encountering hard weathered rock or true rock conditions. We anticipate that piles will be installed to refusal, which is the anticipated top of rock elevation. The required minimum pile tip elevation to achieve lateral stability and the required axial capacity are provided in the following table:

Bent I.D.	Minimum Pile Tip Elevation (ft-NAVD88)	Estimated Pile Tip Elevation (ft-NAVD88)
EB1	420.0	411.8
EB2	420.0	416.4

Table 3: Pile Tip Elevation Table

¹Estimated tip elevations vary due to anticipated top of rock variation along the bent line.

Following determination of installed pile required ultimate axial resistance requirements, FME performed a preliminary GRLWEAP analysis for the estimation of pile driving stresses that might be expected for piles driven to the required axial capacity and when driven to refusal on hard soil/rock conditions. Based on this pile driving stress analysis, FME recommends that the end bent pile section used for bridge foundation be HP 12x74 so as not to exceed the predicted steel pile section's maximum allowable driving stress.

RECOMMENDED BRIDGE PLAN TABLES AND NOTES

The following tables and notes are recommended to be inserted into the Bridge Plan sheets.

<i>Pile Bearing Requirements</i>	
<i>Bent I.D.</i>	<i>EB1 & EB2</i>
<i>Factored Design Load</i>	<i>200 Kips</i>
<i>Factored Static Downdrag Load</i>	<i>0 Kips</i>
<i>Geotechnical Resistance Factor</i>	<i>0.50</i>
<i>Nominal Resistance</i>	<i>400 Kips</i>
<i>Resistance from Design Flood Scourable Soils</i>	<i>0 Kips</i>
<i>Unfactored Static Downdrag Load</i>	<i>0 Kips</i>
<i>Required Driving Resistance</i>	<i>400 Kips</i>

<i>Bent I.D.</i>	<i>Minimum Pile Tip Elevation (ft-NAVD88)</i>	<i>Estimated Pile Tip Elevation (ft-NAVD88)</i>
<i>EB1</i>	<i>420.0</i>	<i>411.8</i>
<i>EB2</i>	<i>420.0</i>	<i>416.4</i>

The following estimated parameters should be used for performing a drivability analysis for EB1 and EB2 pile installations:

	<i>EB1</i>	<i>EB2</i>
<i>Skin Quake (QS)</i>	<i>0.10 in.</i>	<i>0.10 in.</i>
<i>Toe Quake (QT)</i>	<i>0.04 in.</i>	<i>0.04 in.</i>
<i>Skin Damping (SD)</i>	<i>0.05 sec/ft</i>	<i>0.05 sec/ft</i>
<i>Toe Damping (TD)</i>	<i>0.15 sec/ft</i>	<i>0.15 sec/ft</i>
<i>% Skin Friction</i>	<i>5%</i>	<i>5%</i>
<i>Distribution Shape No.</i>	<i>1.0¹</i>	<i>1.0¹</i>
<i>Bearing Graph</i>	<i>Proportional²</i>	<i>Proportional²</i>
<i>Pile Penetration</i>	<i>75%</i>	<i>60%</i>
<i>Hammer Energy Range</i>	<i>40-60 kip-ft</i>	<i>40-60 kip-ft</i>

¹*Distribution Shape No. varies with depth: 0 at the ground surface and 1.0 at the pile tip elevation*

²*Bearing Graph Options – proportional, constant skin friction, and constant end bearing.*

Note: GRLWEAP (2010) reference tables were used to determine parameters

Method of verifying the in-place pile resistance: Pile Installation Chart from wave equation analysis without stress measurements during driving.

A pile hammer having a rated energy as indicated above is considered suitable for driven pile installation. However, final hammer approval is based on a wave equation analysis that accurately reflects the Contractor's proposed driving system.

Reinforced pile tips are required to penetrate partially weathered rock. Install the reinforced pile tips in accordance with the manufacturer's installation recommendations.

Pile are anticipated to be exhibit practical refusal of the pile hammer system when driven to bearing on very hard soil or rock conditions. To avoid possible pile damage, practical refusal during pile installation should be defined as more than twenty (20) blows per inch or equivalent fractions thereof.

Reference the SCDOT 2007 Standard Specifications for Highway Construction for Driven Pile Foundations, Section 711. Notes included in these plans are in addition to the requirements of the Standard Specifications.

In the event the piles experience practical refusal before minimum tip elevation is reached, piles shall be extracted and pre-drilled and/or rock socketed to required minimum tip elevations. Reference the SCDOT 2007 Standard Specifications for Highway Construction for Drilled Shafts and Drilled Pile Foundations, Section 712. Notes included in these plans are in addition to the requirements of the Standard Specifications.

The pre-drilled/rock socket diameter for drilled piles if required shall be twenty-four inches.

SLOPE STABILITY ANALYSIS AND RECOMMENDATIONS

FME has performed static global slope stability analyses for the roadway embankment side slopes. FME utilized the computer software program *Slide* v. 2018 8.032 developed by Rocscience for the global slope stability analyses. The slope stability methodology utilized for analysis was the Spencer Method. The subsurface soil stratigraphy, ground water conditions, and soil strength parameters utilized in these analyses were based on generalized conditions as indicated by the test borings performed at the end bent locations of the proposed bridge replacement. A uniform distributed live loading of 250 pounds per square foot (psf) was applied within planned pavement areas.

The SLIDE output yields factor of safety results while the GDM design criteria lists resistance factors. In accordance with the GDM, the factor of safety results was inverted to convert the values to corresponding resistance factor results. The following table (Table 5) presents the calculated geotechnical resistance factor (ϕ) results from our slope stability analyses.

Global Embankment Slope Stability Results Summary					
Alignment	Station	Side Slope	Design Event	Resistance Factor, ϕ	Design Criteria ¹
				Spencer Method	
Maggie Harris	13+75	Left	Static	0.70	0.75
Maggie Harris	13+75	Right	Static	0.70	0.75
Maggie Harris	14+25	Left	Static	0.70	0.75
Maggie Harris	14+25	Right	Static	0.65	0.75

Table 5 – Global Stability Locations

¹ Resistance Factor based on Global Stability Fill Section

The *Slide* output graphs depicting the slope geometry, soil strength parameters, soil profiles, and the computer-generated critical failure circles of each of the above listed slope stability analyses are presented in Appendix E of this report.

Based on the slope stability analyses, soil reinforcement is required at both bridge embankments to meet the design criteria stated in The Geotechnical Design Manual (GDM) Version 2022. Two

(2) layers of uniaxial geogrid are required at each end of the bridge embankment to meet slope stability design requirements. The soil reinforcement concept will consist of uniaxial geogrids with a minimum Available Long-Term Tension Strength (T_{al}) of 450 lb/ft. In accordance with SCDOT's Supplemental Technical Specification SC-M-203-2, this T_{al} equates to a Type U1 geogrid. The table above shows the calculated resistance factor after installation of soil reinforcement.

LIMITATIONS OF REPORT

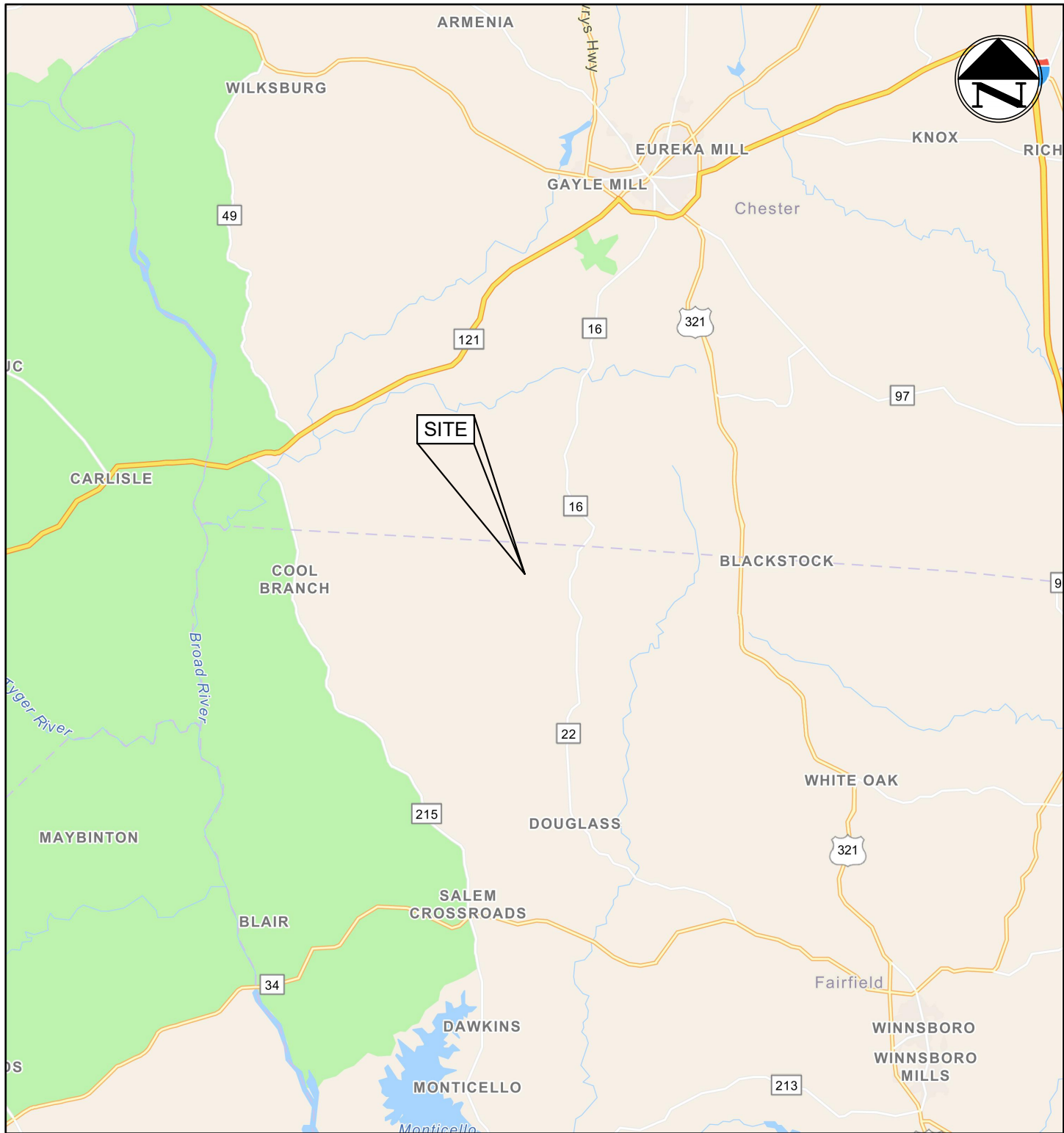
FME's recommendations rely on the subsurface information provided from the borings, the results of the laboratory testing program, and our experience on similar projects in this geological setting. If the subsurface conditions are found to differ from the exploration during construction, then FME must be notified and given an opportunity to adjust our recommendations to match the conditions encountered in the field.

Exploration and testing for environmental contaminants were not part of our scope of work, and these services were not performed.

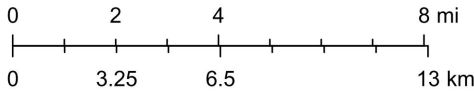
APPENDIX A

Location Plans





1:288,000



F&ME CONSULTANTS, INC.
COLUMBIA, SC

MAGGIE HARRIS ROAD RBO UNNAMED TRIBUTARY
FAIRFIELD COUNTY, SOUTH CAROLINA

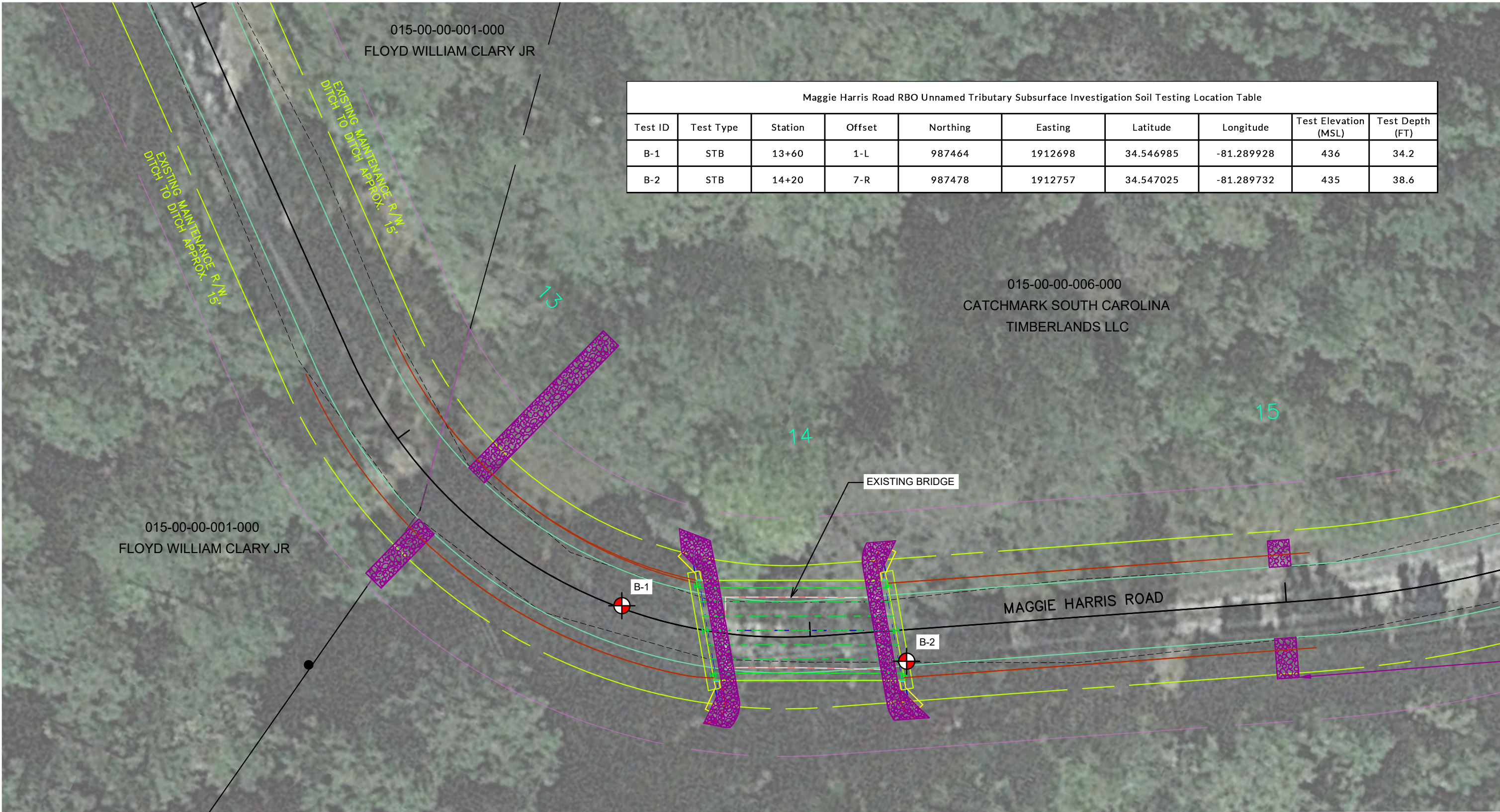
SITE LOCATION PLAN

F&ME JOB NO. G6782

SCALE: AS NOTED

FIGURE 1


4			
3			
2			
1			
REV.	BY	DATE	DESCRIPTION OF REVISION
TOPO.		DATE	
DWG.	CTC	DATE 1.25.23	GROUP -- --
R/W		DATE	



Maggie Harris Road RBO Unnamed Tributary Subsurface Investigation Soil Testing Location Table									
Test ID	Test Type	Station	Offset	Northing	Easting	Latitude	Longitude	Test Elevation (MSL)	Test Depth (FT)
B-1	STB	13+60	1-L	987464	1912698	34.546985	-81.289928	436	34.2
B-2	STB	14+20	7-R	987478	1912757	34.547025	-81.289732	435	38.6



LEGEND:

 SOIL TEST BORING LOCATION

4			
3			
2			
1			
REV.	BY	DATE	DESCRIPTION OF REVISION
TOPO.		DATE	
DWG.	CTC	DATE 2.9.23	GROUP -
R/W		DATE	

 F&ME CONSULTANTS, INC.
COLUMBIA, SC

MAGGIE HARRIS ROAD RBO UNNAMED TRIBUTARY
FAIRFIELD COUNTY, SOUTH CAROLINA

BORING LOCATION PLAN

F&ME JOB NO. G6782

SCALE: 1"=10' FIGURE 2

APPENDIX B

Test Boring Logs

Maggie Harris Road RBO Unnamed Tributary
Carlisle, Fairfield County, South Carolina
G6782.00

LOG OF BORING No. B-1

Latitude: 34.546985
Longitude: -81.289928

Date Drilled: 12/12/22	Supervisor: L. Guempel
Date Completed: 12/12/2022	Approx. Ground Elevation (ft): 436
Drill Machine: CME 550X	Drilling Method: HSA
Water T.O.B. (ft): NR	Water 24 HR (ft): 9

Notes:

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample Type-No.	1st 6" 2nd 6" 3rd 6" 4th 6"				N Value	STD. PENETRATION TEST DATA (blows/ft)				
						1st 6"	2nd 6"	3rd 6"	4th 6"		5	10	20	40	70
	0.3	GRAVEL (3")		0.0	SS-1	2	5	4	5	9					
	2.0	Loose, Moist, Reddish Brown, Non-Plastic, Silty Fine to Medium SAND (SMA-2-4) =>@SS-1: LL=NP, PL=NP, PI=NP, NMC=12.0%, %200=30.4		2.0	SS-2	10	23	10	9	33					
		Dense, Moist, Yellowish Brown, Non-Plastic, Silty Fine to Medium SAND (SM/A-4) =>@SS-2: LL=NP, PL=NP, PI=NP, NMC=10.1%, %200=25.8		4.0	SS-3	4	5	3	3	8					
431.0		=>@SS-4: LL=NP, PL=NP, PI=NP, NMC=13.0%, %200=41.0		6.0	SS-4	4	4	3	11	7					
	8.0	Very Dense, Moist, Dark Brownish Gray, Non-Plastic, Silty Fine to Medium SAND (SM)		8.0	SS-5	4	8	6	3	14					
426.0															
				13.5	SS-6	16	26	29		55					
421.0															
	18.5	Dense, Moist, Dark Grayish Brown, Non-Plastic, Fine to Course SAND (SP) with Gravel		18.5	SS-7	16	15	42		57					
416.0															
	22.0	Very Dense, Moist, Greenish Gray, Non-Plastic, Fine to Medium SAND (SP) with Silt		23.5											
	24.2	Auger Refusal at 24.2 Feet Below Ground Surface, Begin Rock Coring.		24.2	SS-8	50/5.5"				100+					
411.0		PHYLLITE REC: 82% RQD: 52% =>UC: 4,980 psi =>UC: 5,240 psi			NQ-1										
	29.2	PHYLLITE REC: 88% RQD: 58% =>UC: 7,030 psi		29.2	NQ-2										
406.0															
	34.2	Coring Terminated at 34.2 Feet Below Ground Surface.													
401.0															

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
ST - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	PHD - Percussion Hammer Drill

Maggie Harris Road RBO Unnamed Tributary
Carlisle, Fairfield County, South Carolina
G6782.00

LOG OF BORING No. B-2

Latitude: 34.547025
Longitude: -81.289732

Date Drilled: 12/13/22	Supervisor: L. Guempel
Date Completed: 12/13/2022	Approx. Ground Elevation (ft): 435
Drill Machine: CME 550X	Drilling Method: HSA
Water T.O.B. (ft): 7	Water 24 HR (ft): NR

Notes:

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample Type-No.	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	STD. PENETRATION TEST DATA (blows/ft)				
											5	10	20	40	70
	0.3	GRAVEL (3") Medium Dense, Moist, Dark Yellowish Brown, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-1-b) with Gravel =>@SS-2: LL=NP, PL=NP, PI=NP, NMC=9.4%, %200=22.8		0.0	SS-1	6	3	7	7	12					
				2.0	SS-2	6	5	6	26	11					
				4.0	SS-3	10	20	15	8	35					
430.0	6.0	Very Loose, Moist, Brownish Yellow, Non-Plastic, Silty Fine to Medium SAND (SM/A-4) =>@SS-4: LL=NP, PL=NP, PI=NP, NMC=17.5%, %200=44.3		6.0	SS-4	2	2	1	2	3					
	8.0	Medium Dense, Moist, Yellowish Brown, Non-Plastic, Silty Fine to Medium SAND (SM/A-2-4) =>@SS-5: LL=NP, PL=NP, PI=NP, NMC=15.5%, %200=23.2		8.0	SS-5	2	5	7	8	12					
425.0															
	13.5	Very Dense, Moist, Blueish Gray, Non-Plastic, GRAVEL (GW) with Fine to Medium Sand		13.5	SS-6	50/1.5"				100+					
420.0															
	18.6	==> Greenish gray Auger Refusal at 18.6 Feet Below Ground Surface, Begin Rock Coring. PHYLLITE REC:58% RQD: 0%		18.5	SS-7	50/1"				100+					
415.0				18.6											
	23.6	PHYLLITE REC:67% RQD: 0%		23.6	NQ-1										
410.0															
	28.6	PHYLLITE REC:67% RQD: 20%		28.6	NQ-2										
405.0															
	33.6	PHYLLITE REC:85% RQD: 13%		33.6	NQ-3										
400.0															
	38.6	Coring Terminated at 38.6 Feet Below Ground Surface.		38.6	NQ-4										
395.0															

LEGEND

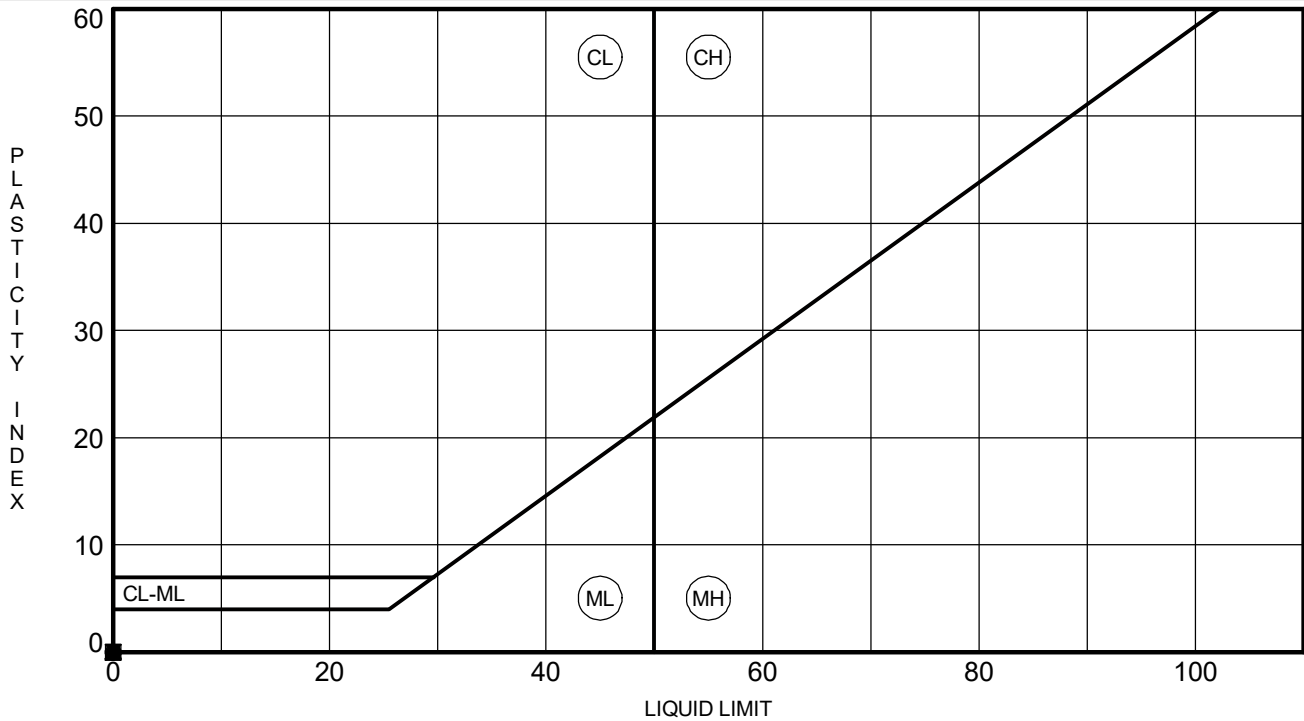
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
ST - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	PHD - Percussion Hammer Drill

APPENDIX C

Laboratory Test Results

PROJECT NAME Maggie Harris Road RBO Unnamed Tributary

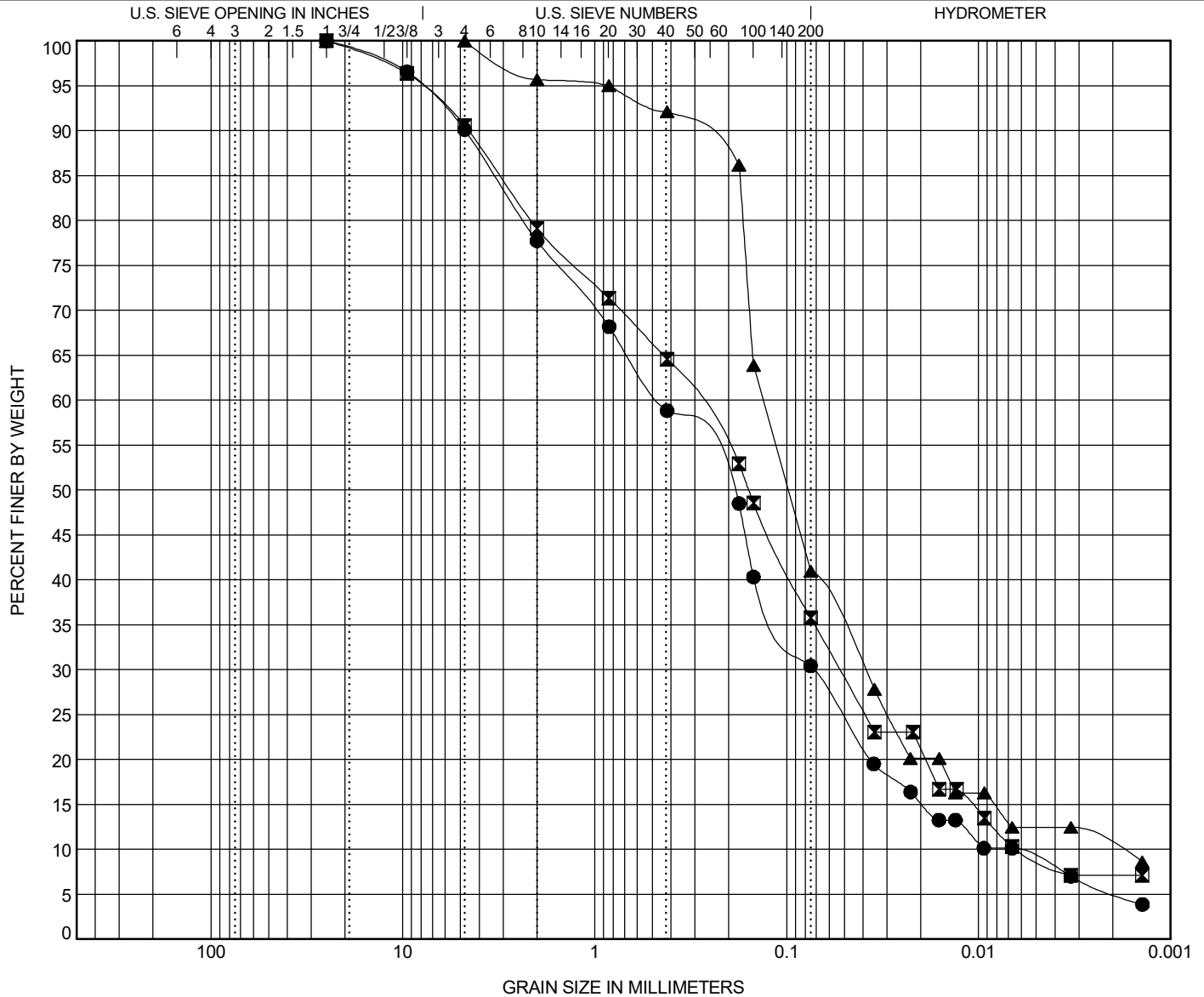
PROJECT LOCATION Fairfield County - Carlisle, South Carolina

[illegible]

PROJECT ID G6782.00

PROJECT NAME Maggie Harris Road RBO Unnamed Tributary

PROJECT LOCATION Fairfield County - Carlisle, South Carolina



F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	Maggie Harris Road	FME PROJECT No.:	G6782.00
SAMPLE NUMBER:	22-3348	DATE SAMPLE RECEIVED:	12/21/2022
DESCRIPTION OF SOIL:	VARIOUS		
SET UP BY:	TP & DH	DATE OF TESTING:	12/22/2022
WEIGHED BY:	DH	DATE OF WEIGHING:	12/23/2022

BORING NO.	B-1	B-1	B-1		
SAMPLE NO.	SS-1	SS-2	SS-4		
SAMPLE DEPTH (Ft.)	0.0 - 2.0	2.0 - 4.0	6.0 - 8.0		
WATER CONTENT, W%	12	10.1	9.4		

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

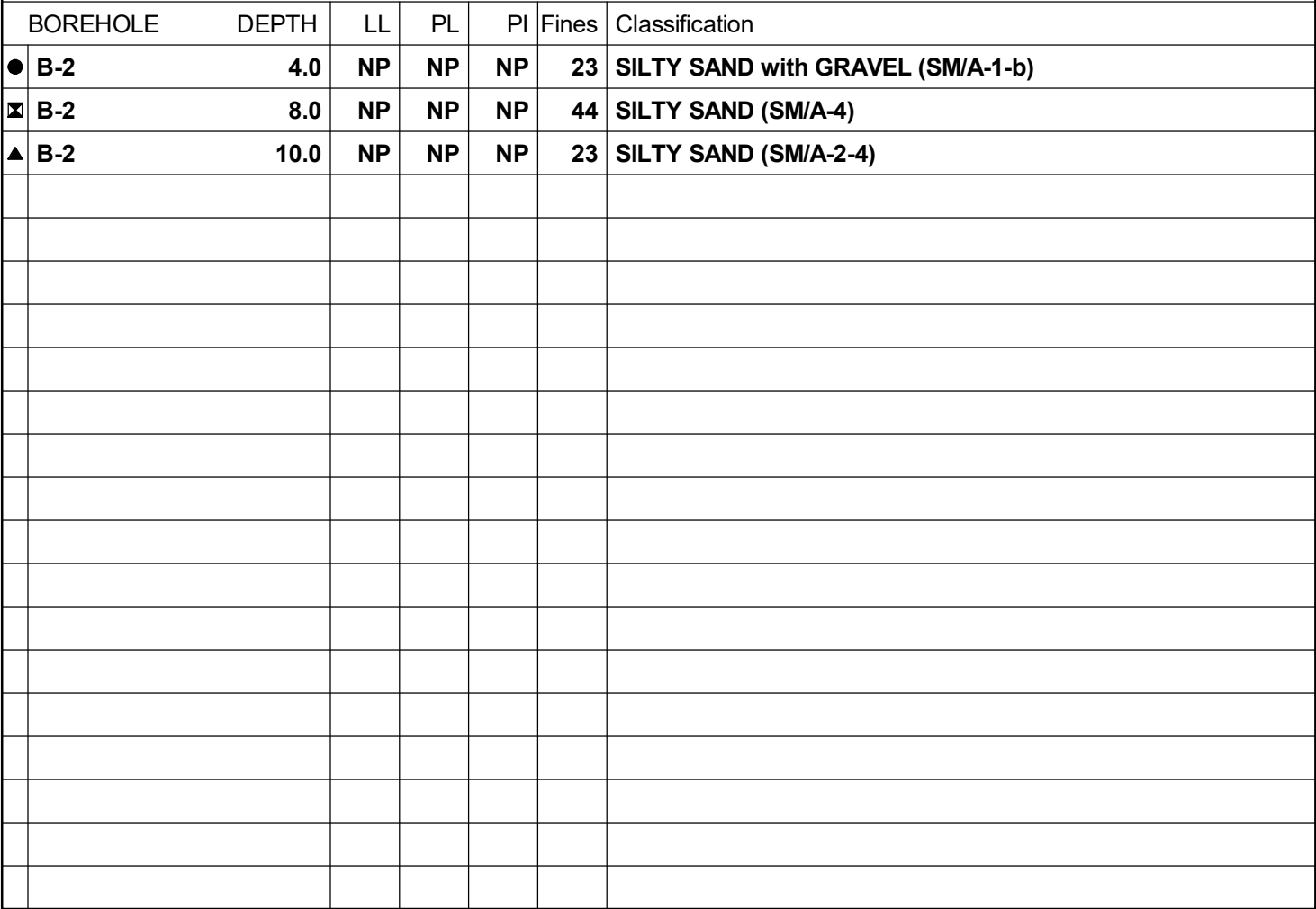
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					



PROJECT NAME Maggie Harris Road RBO Unnamed Tributary

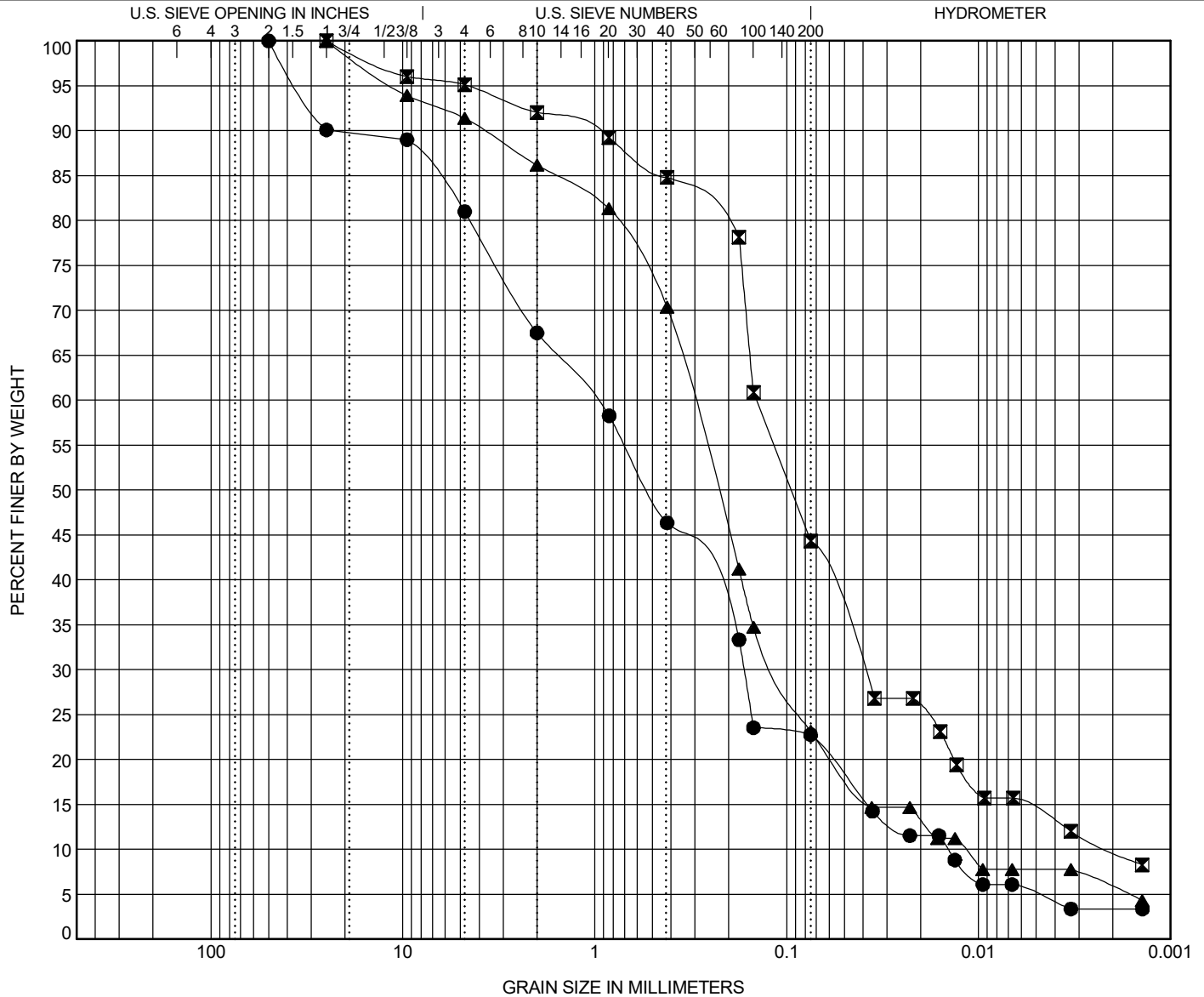
PROJECT LOCATION Fairfield County - Carlisle, South Carolina



PROJECT ID G6782.00

PROJECT NAME Maggie Harris Road RBO Unnamed Tributary

PROJECT LOCATION Fairfield County - Carlisle, South Carolina



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification	MC%	LL	PL	PI	Cc	Cu
● B-2	4.0	SILTY SAND with GRAVEL (SM/A-1-b)	9.4	NP	NP	NP	1.95	68.39
■ B-2	8.0	SILTY SAND (SM/A-4)	17.5	NP	NP	NP	5.37	69.20
▲ B-2	10.0	SILTY SAND (SM/A-2-4)	15.5	NP	NP	NP	3.47	26.16

BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
● B-2	4.0	50	35.236	0.519	0.014	19.0	58.2	17.8	5.0
■ B-2	8.0	25	4.591	0.095	0.002	4.9	50.8	30.1	14.2
▲ B-2	10.0	25	11.291	0.23	0.012	8.6	68.2	15.4	7.8

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	Maggie Harris Road	FME PROJECT No.:	G6782.00
SAMPLE NUMBER:	22-3349	DATE SAMPLE RECEIVED:	12/21/2022
DESCRIPTION OF SOIL:	VARIOUS		
SET UP BY:	TP & DH	DATE OF TESTING:	12/22/2022
WEIGHED BY:	DH	DATE OF WEIGHING:	12/23/2022

BORING NO.	B-2	B-2	B-2		
SAMPLE NO.	SS-2	SS-4	SS-5		
SAMPLE DEPTH (Ft.)	2.0 - 4.0	6.0 - 8.0	8.0 - 10.0		
WATER CONTENT, W%	9.4	17.5	15.5		

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

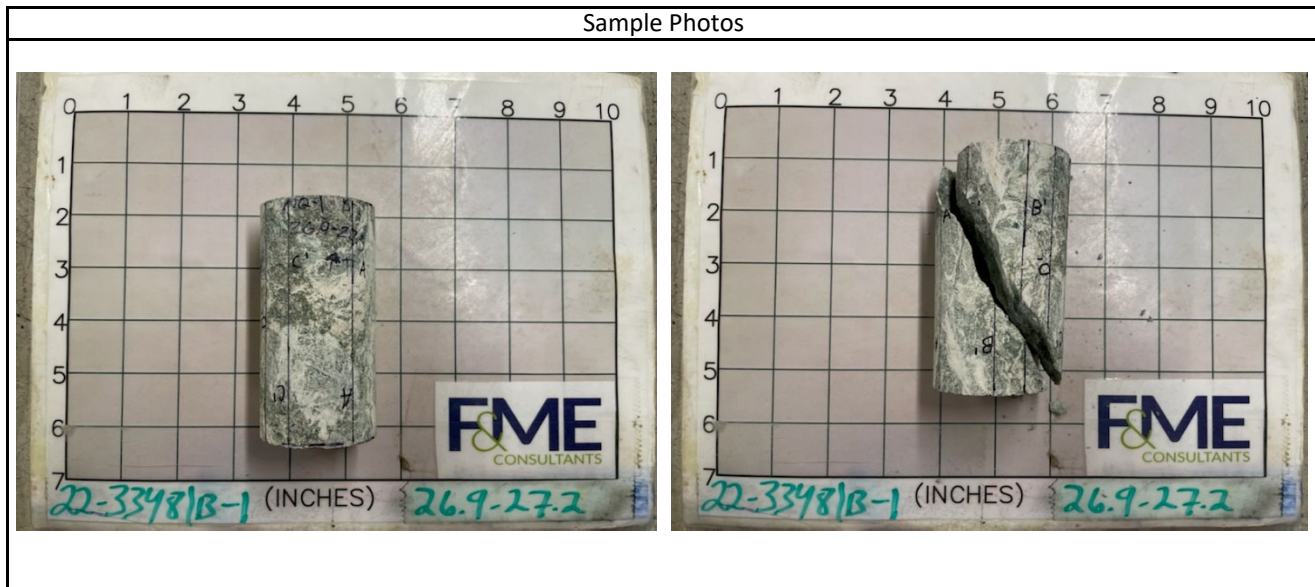
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

Compressive Strength and Elastic Moduli of Intact Rock Core Specimens
ASTM D7012 - Method D / SC-T-39

Project	Maggie Harris Rd. RBO Unnamed Tributary			Date	1/12/2023
Project No.	G6782	Sample Diameter (in.)	1.871	Tested By	WAP
SCDOT ID	N/A	Sample Length (in.)	3.858	Reviewed By	WJG
Boring	B-1	Unit Weight (pcf)	159.1	Core Size	NQ
Sample No.	NQ-1 / 22-3348A	L/D Ratio	2.06	Recovery	82%
Depth	26.9' - 27.2'	Load Rate (psi/sec)	20	RQD	52%
Description	Blue/White/Gray Phyllite				

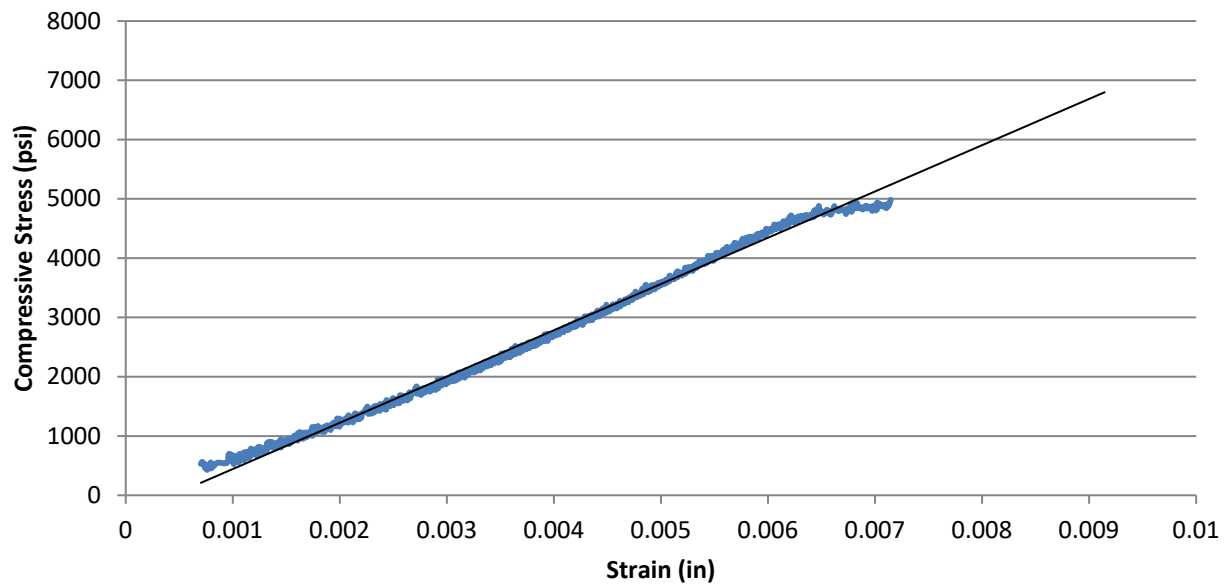
Test Data						
Percent of Failure Load	Strain (10^{-6})		Load (lbs)	Compressive Stress (psi)	Secant Modulus $\times 10^6$ (psi)	Poisson's Ratio
	Axial	Radial				
10%	-761	396	1,351	491	1.29	0.52
20%	-1661	330	2,734	994	1.20	0.20
30%	-2388	341	4,131	1,502	1.26	0.14
40%	-3069	412	5,495	1,999	1.30	0.13
50%	-3734	540	6,848	2,491	1.33	0.14
60%	-4359	692	8,242	2,998	1.38	0.16
70%	-4906	836	9,555	3,475	1.42	0.17
80%	-5440	1037	10,993	3,998	1.47	0.19
90%	-6049	1316	12,306	4,476	1.48	0.22
100%	-7145	2120	13,694	4,981		



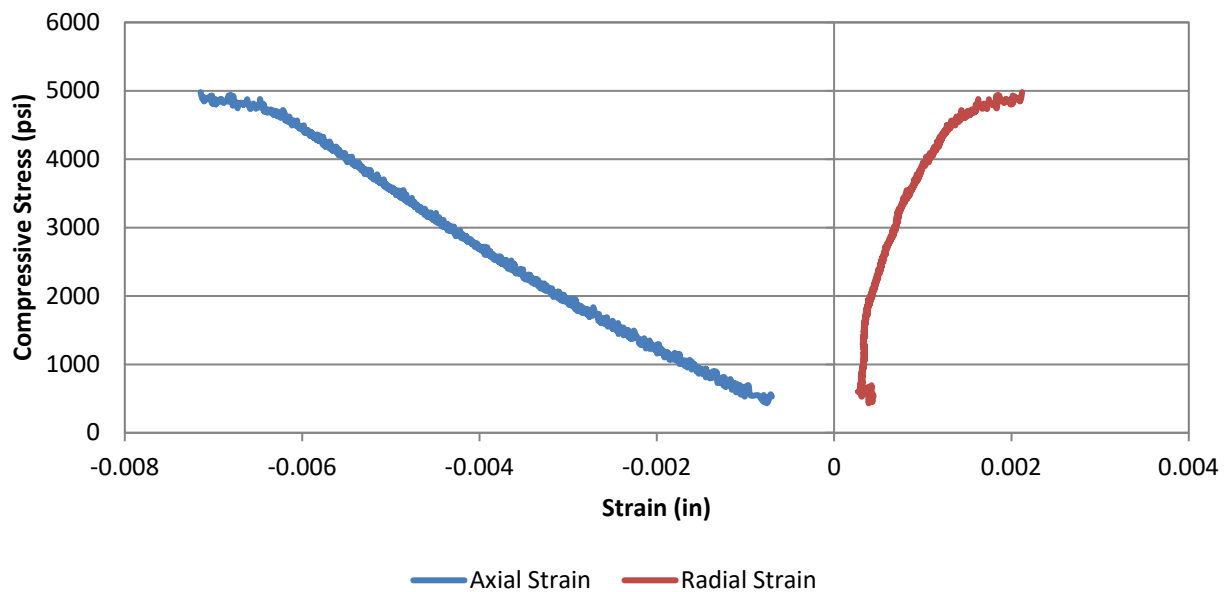
Test Results			
Unconfined Compressive Strength (psi)		4,980	Elastic Modulus (psi)
			1.46E+06
			Poisson's Ratio in Elastic Range
			0.17
Comments	Elastic range was taken as between 0.002 and 0.005 inches of axial strain. This range was chosen to avoid any non-linear behavior from the initial loading and the inflection point at the end of the elastic range.		

Project	Maggie Harris Rd. RBO Unnamed Tributary			Date	1/12/2023
Project No.	G6782	Sample Diameter (in.)	1.871	Tested By	WAP
SCDOT ID	N/A	Sample Length (in.)	3.858	Reviewed By	WJG
Boring	B-1	Unit Weight (pcf)	159.1	Core Size	NQ
Sample No.	NQ-1 / 22-3348A	L/D Ratio	2.06	Recovery	82%
Depth	26.9' - 27.2'	Load Rate (psi/sec)	20	RQD	52%
Description	Blue/White/Gray Phyllite				

Axial Stress vs. Strain

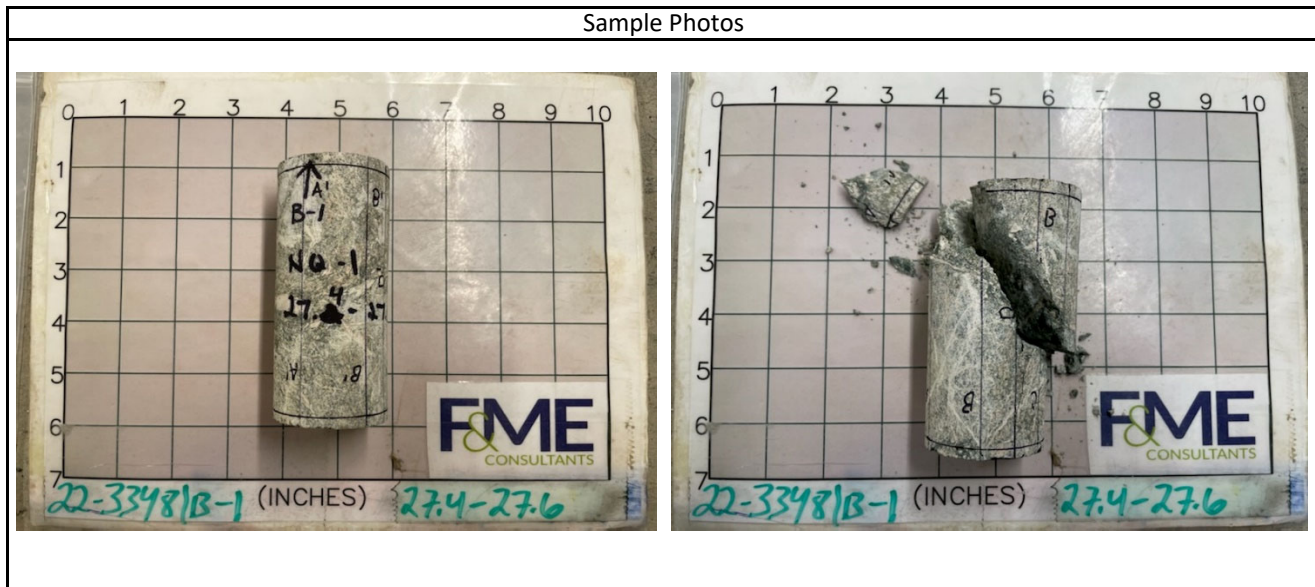


Stress vs. Strain



Project	Maggie Harris Rd. RBO Unnamed Tributary			Date	1/12/2023
Project No.	G6782	Sample Diameter (in.)	1.868	Tested By	WAP
SCDOT ID	N/A	Sample Length (in.)	4.291	Reviewed By	WJG
Boring	B-1	Unit Weight (pcf)	159.5	Core Size	NQ
Sample No.	NQ-1 / 22-3348B	L/D Ratio	2.30	Recovery	82%
Depth	27.4' - 27.7'	Load Rate (psi/sec)	20	RQD	52%
Description	Blue/White/Gray Phyllite				

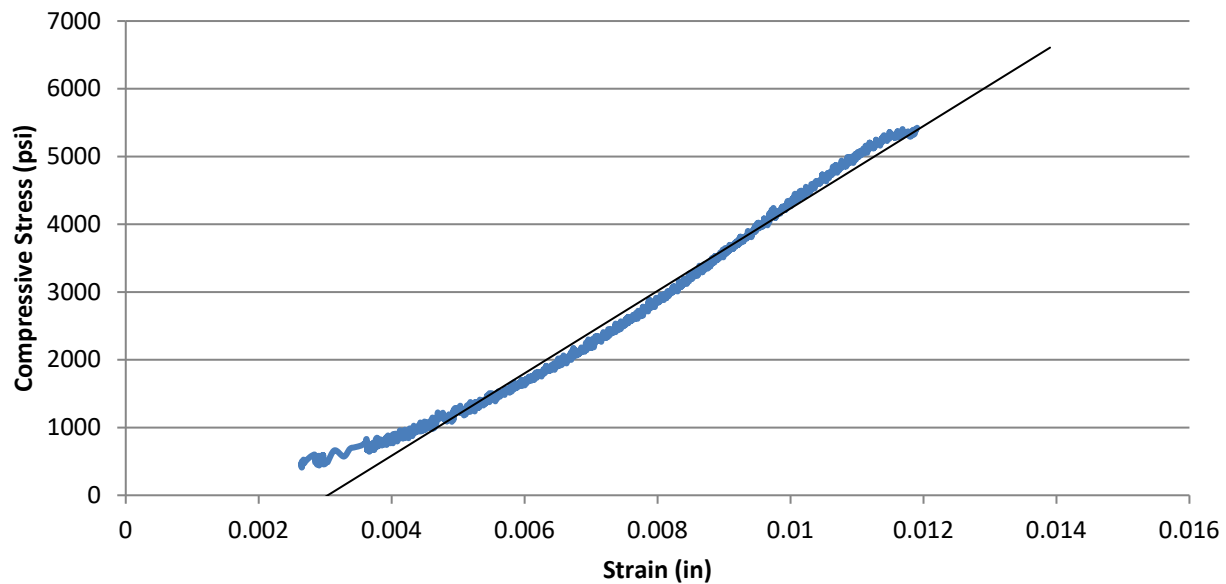
Test Data						
Percent of Failure Load	Strain (10^{-6})		Load (lbs)	Compressive Stress (psi)	Secant Modulus $\times 10^6$ (psi)	Poisson's Ratio
	Axial	Radial				
10%	-2875	47	1,459	532	0.37	0.02
20%	-4592	3	3,030	1,106	0.48	0.00
30%	-5884	29	4,445	1,622	0.55	0.00
40%	-6893	104	5,961	2,175	0.63	0.02
50%	-7809	224	7,479	2,729	0.70	0.03
60%	-8555	389	8,911	3,252	0.76	0.05
70%	-9330	594	10,406	3,797	0.81	0.06
80%	-10000	787	11,844	4,322	0.86	0.08
90%	-10821	1019	13,378	4,881	0.90	0.09
100%	-11903	1304	14,865	5,424		



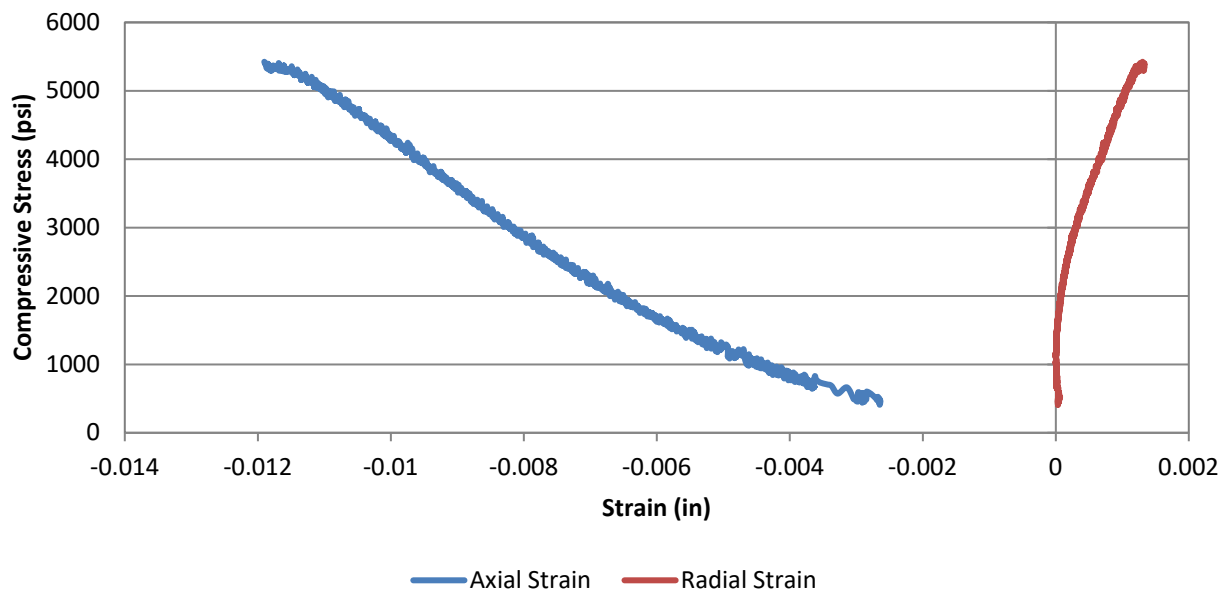
Test Results				
Unconfined Compressive Strength (psi)		5,240	Elastic Modulus (psi)	7.26E+05
			Poisson's Ratio in Elastic Range	0.04
Comments	Elastic range was taken as between 0.006 and 0.01 inches of axial strain. This range was chosen to avoid any non-linear behavior from the initial loading and the inflection point at the end of the elastic range. The Poisson's Ratio for this sample does not appear to be reasonable and should be used with care.			

Project	Maggie Harris Rd. RBO Unnamed Tributary			Date	1/12/2023
Project No.	G6782	Sample Diameter (in.)	1.868	Tested By	WAP
SCDOT ID	N/A	Sample Length (in.)	4.291	Reviewed By	WJG
Boring	B-1	Unit Weight (pcf)	159.5	Core Size	NQ
Sample No.	NQ-1 / 22-3348B	L/D Ratio	2.30	Recovery	82%
Depth	27.4' - 27.7'	Load Rate (psi/sec)	20	RQD	52%
Description	Blue/White/Gray Phyllite				

Axial Stress vs. Strain



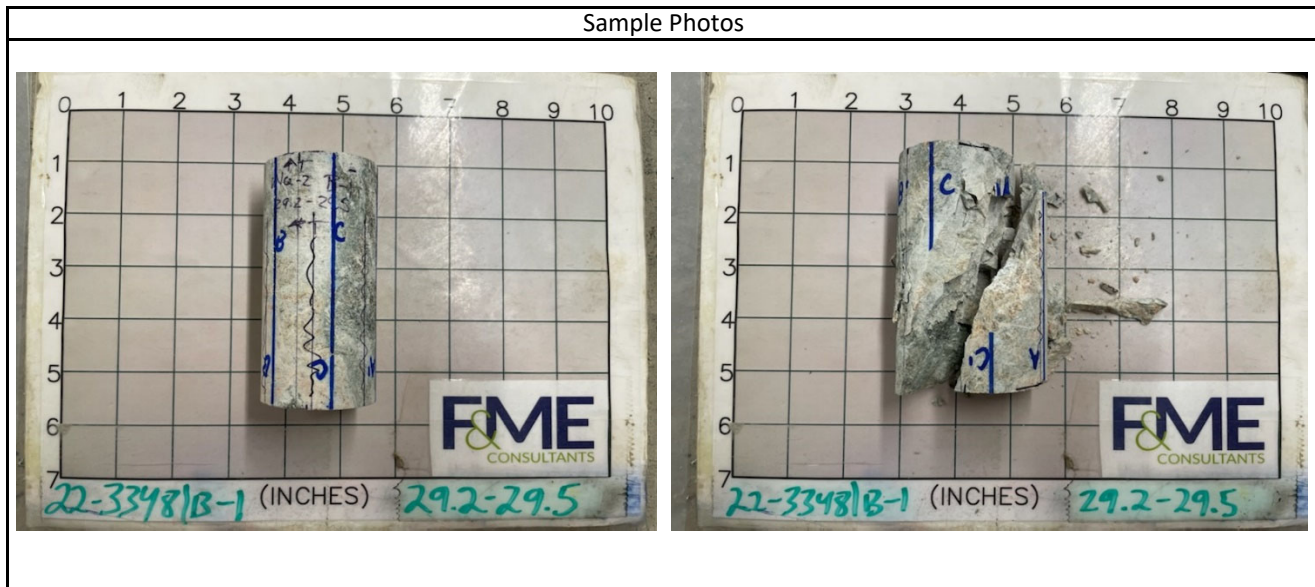
Stress vs. Strain



Compressive Strength and Elastic Moduli of Intact Rock Core Specimens
ASTM D7012 - Method D / SC-T-39

Project	Maggie Harris Rd. RBO Unnamed Tributary			Date	1/12/2023
Project No.	G6782	Sample Diameter (in.)	1.873	Tested By	WAP
SCDOT ID	N/A	Sample Length (in.)	3.976	Reviewed By	WJG
Boring	B-1	Unit Weight (pcf)	157.5	Core Size	NQ
Sample No.	NQ-2 / 22-3348C	L/D Ratio	2.12	Recovery	88%
Depth	29.2' - 29.5'	Load Rate (psi/sec)	20	RQD	58%
Description	Blue/White/Gray Phyllite				

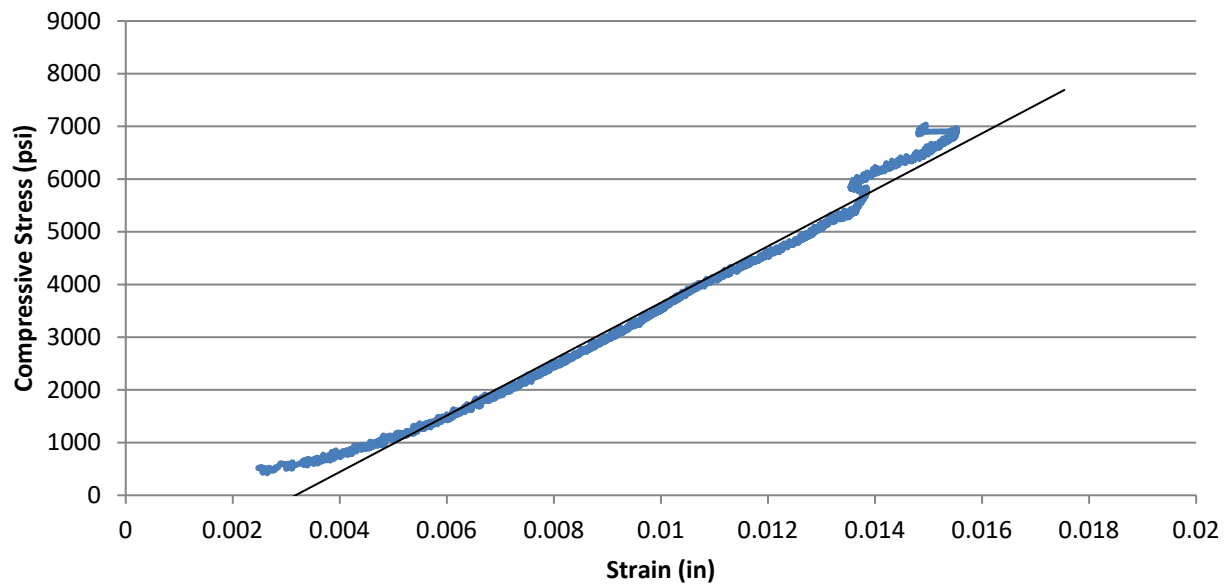
Test Data						
Percent of Failure Load	Strain (10^{-6})		Load (lbs)	Compressive Stress (psi)	Secant Modulus $\times 10^6$ (psi)	Poisson's Ratio
	Axial	Radial				
10%	-3728	48	1,938	703	0.38	0.01
20%	-5863	71	3,827	1,389	0.47	0.01
30%	-7394	148	5,814	2,110	0.57	0.02
40%	-8650	294	7,737	2,808	0.65	0.03
50%	-9955	645	9,688	3,516	0.71	0.06
60%	-11173	999	11,684	4,241	0.76	0.09
70%	-12717	1145	13,586	4,931	0.78	0.09
80%	-13780	743	15,523	5,634	0.82	0.05
90%	-14442	86	17,447	6,332	0.88	0.01
100%	-14948	-586	19,378	7,033		



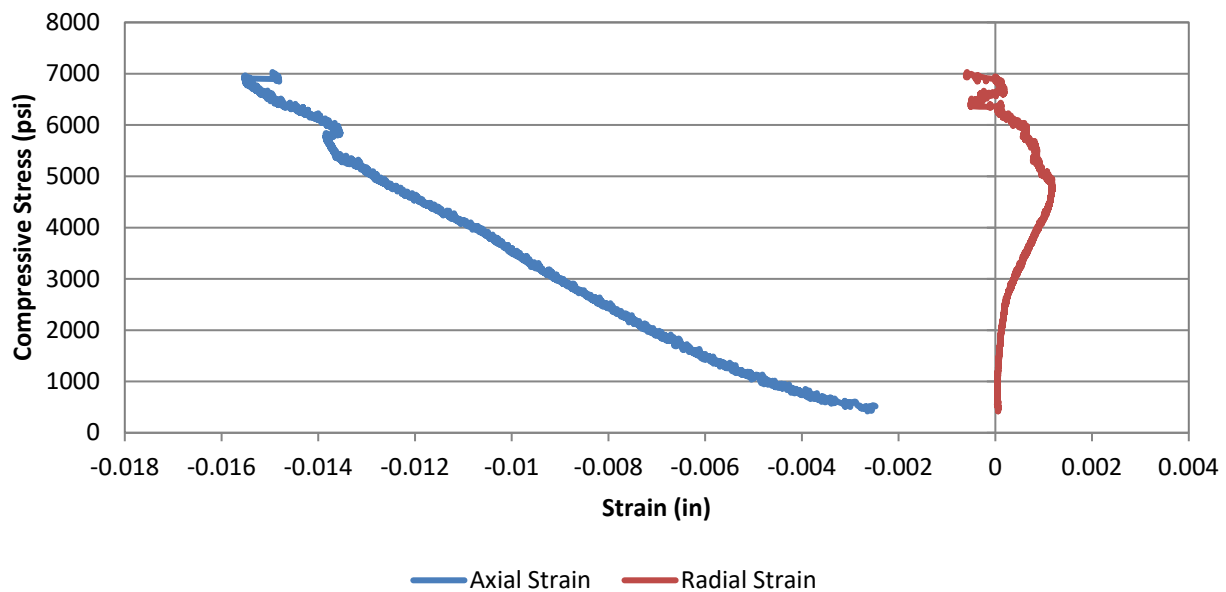
Test Results				
Unconfined Compressive Strength (psi)		7,030	Elastic Modulus (psi)	6.54E+05
			Poisson's Ratio in Elastic Range	0.05
Comments	Elastic range was taken as between 0.006 and 0.012 inches of axial strain. This range was chosen to avoid any non-linear behavior from the initial loading and the inflection point at the end of the elastic range. The Poisson's Ratio for this sample does not appear to be reasonable and should be used with care.			

Project	Maggie Harris Rd. RBO Unnamed Tributary			Date	1/12/2023
Project No.	G6782	Sample Diameter (in.)	1.873	Tested By	WAP
SCDOT ID	N/A	Sample Length (in.)	3.976	Reviewed By	WJG
Boring	B-1	Unit Weight (pcf)	157.5	Core Size	NQ
Sample No.	NQ-2 / 22-3348C	L/D Ratio	2.12	Recovery	88%
Depth	29.2' - 29.5'	Load Rate (psi/sec)	20	RQD	58%
Description	Blue/White/Gray Phyllite				

Axial Stress vs. Strain



Stress vs. Strain



APPENDIX D

Lpile Results

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LPile for Windows, Version 2019-11.001

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

Path to file locations:

\Geotechnical\G6700's\G6782.000 - Maggie Harris Rd RBO Unnamed Tributary-West Fork
Little River\LPile\

Name of input data file:

EB1 (Long.).lp11

Name of output report file:

EB1 (Long.).lp11

Name of plot output file:

EB1 (Long.).lp11

Name of runtime message file:

EB1 (Long.).lp11

Date and Time of Analysis

Date: February 13, 2023

Time: 10:34:19

Problem Title

Project Name: Maggie Harris Rd. RBO Unnamed Tributary-West Fork Little

Job Number: G6782

Client: Davis & Floyd

Engineer: AMC / MM

Description: End Bent 1 Long.

Program Options and Settings

Computational Options:

- Use unfactored loads in computations (conventional analysis)

Engineering Units Used for Data Input and Computations:

- US Customary System Units (pounds, feet, inches)

Analysis Control Options:

- | | | |
|--|---|---------------|
| - Maximum number of iterations allowed | = | 500 |
| - Deflection tolerance for convergence | = | 1.0000E-05 in |
| - Maximum allowable deflection | = | 100.0000 in |
| - Number of pile increments | = | 100 |

Loading Type and Number of Cycles of Loading:

- Static loading specified

- Use of p-y modification factors for p-y curves not selected
- Analysis uses layering correction (Method of Georgiadis)
- No distributed lateral loads are entered
- Loading by lateral soil movements acting on pile not selected
- Input of shear resistance at the pile tip not selected
- Input of moment resistance at the pile tip not selected
- Computation of pile-head foundation stiffness matrix not selected
- Push-over analysis of pile not selected
- Buckling analysis of pile not selected

Output Options:

- Output files use decimal points to denote decimal symbols.
- Report only summary tables of pile-head deflection, maximum bending moment, and maximum shear force in output report file.
- No p-y curves to be computed and reported for user-specified depths
- Print using wide report formats

Pile Structural Properties and Geometry

Number of pile sections defined	=	1
Total length of pile	=	18.200 ft
Depth of ground surface below top of pile	=	0.0000 ft

Pile diameters used for p-y curve computations are defined using 2 points.

p-y curves are computed using pile diameter values interpolated with depth over the length of the pile. A summary of values of pile diameter vs. depth follows.

Point No.	Depth Below Pile Head feet	Pile Diameter inches
1	0.000	12.2150
2	18.200	12.2150

Input Structural Properties for Pile Sections:

Pile Section No. 1:

Section 1 is a H strong axis steel pile	
Length of section	= 18.200000 ft
Pile width	= 12.215000 in
Shear capacity of section	= 0.0000 lbs

Ground Slope and Pile Batter Angles

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

Soil and Rock Layering Information

The soil profile is modelled using 4 layers

Layer 1 is Piedmont residual soil

Distance from top of pile to top of layer	=	0.0000 ft
Distance from top of pile to bottom of layer	=	2.000000 ft
Effective unit weight at top of layer	=	105.000000 pcf
Effective unit weight at bottom of layer	=	105.000000 pcf
The type of field test is the Standard Penetration Test (SPT)		
SPT N60 at top of layer	=	10.000000 blows/ft
SPT N60 at bottom of layer	=	10.000000 blows/ft

Layer 2 is Piedmont residual soil

Distance from top of pile to top of layer	=	2.000000 ft
Distance from top of pile to bottom of layer	=	7.000000 ft
Effective unit weight at top of layer	=	110.000000 pcf
Effective unit weight at bottom of layer	=	110.000000 pcf
The type of field test is the Standard Penetration Test (SPT)		
SPT N60 at top of layer	=	20.000000 blows/ft
SPT N60 at bottom of layer	=	20.000000 blows/ft

Layer 3 is Piedmont residual soil

Distance from top of pile to top of layer	=	7.000000 ft
Distance from top of pile to bottom of layer	=	19.000000 ft
Effective unit weight at top of layer	=	135.000000 pcf
Effective unit weight at bottom of layer	=	135.000000 pcf
The type of field test is the Standard Penetration Test (SPT)		

SPT N60 at top of layer	=	81.000000 blows/ft
SPT N60 at bottom of layer	=	81.000000 blows/ft

Layer 4 is strong rock (vuggy limestone)

Distance from top of pile to top of layer	=	19.000000 ft
Distance from top of pile to bottom of layer	=	30.000000 ft
Effective unit weight at top of layer	=	145.000000 pcf
Effective unit weight at bottom of layer	=	145.000000 pcf
Uniaxial compressive strength at top of layer	=	2000. psi
Uniaxial compressive strength at bottom of layer	=	2000. psi

(Depth of the lowest soil layer extends 11.800 ft below the pile tip)

Summary of Input Soil Properties

Layer In-situ Layer Test Num. Property	Soil Type Name (p-y Curve Type)	Layer Depth ft	Effective Unit Wt. pcf	Uniaxial qu psi	In-situ Test Type
-----	-----	-----	-----	-----	-----
1 10.0000	Piedmont	0.00	105.0000	--	SPT
10.0000	Residual Soil	2.0000	105.0000	--	SPT
2 20.0000	Piedmont	2.0000	110.0000	--	SPT
20.0000	Residual Soil	7.0000	110.0000	--	SPT
3 81.0000	Piedmont	7.0000	135.0000	--	SPT
81.0000	Residual Soil	19.0000	135.0000	--	SPT
4 --	Strong Rock	19.0000	145.0000	2000.	--
--	(Vuggy Limestone)	30.0000	145.0000	2000.	--
--					

Static Loading Type

Static loading criteria were used when computing p-y curves for all analyses.

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 1

Load Compute No.	Load Top y Type vs. Pile Length	Condition 1	Condition 2	Axial Thrust Force, lbs
1	1	V = 11400. lbs	M = 0.0000 in-lbs	130000.
No				

V = shear force applied normal to pile axis

M = bending moment applied to pile head

y = lateral deflection normal to pile axis

S = pile slope relative to original pile batter angle

R = rotational stiffness applied to pile head

Values of top y vs. pile lengths can be computed only for load types with specified shear loading (Load Types 1, 2, and 3).

Thrust force is assumed to be acting axially for all pile batter angles.

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

Axial thrust force values were determined from pile-head loading conditions

Number of Pile Sections Analyzed = 1

Pile Section No. 1:

Dimensions and Properties of Steel H Strong Axis:

Length of Section	=	18.200000 ft
Flange Width	=	12.215000 in
Section Depth	=	12.130000 in
Flange Thickness	=	0.610000 in

Web Thickness	=	0.605000 in
Yield Stress of Pipe	=	36.000000 ksi
Elastic Modulus	=	29000. ksi
Cross-sectional Area	=	21.502850 sq. in.
Moment of Inertia	=	560.355554 in ⁴
Elastic Bending Stiffness	=	16250311. kip-in ²
Plastic Modulus, Z	=	103.840248 in ³
Plastic Moment Capacity = Fy Z	=	3738.in-kip

Axial Structural Capacities:

Nom. Axial Structural Capacity = Fy As	=	774.103 kips
Nominal Axial Tensile Capacity	=	-774.103 kips

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

Number	Axial Thrust Force kips
-----	-----
1	130.000

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

Load No.	Axial Thrust kips	Nominal Moment Capacity in-kips
----	-----	-----
1	130.0000000000	3520.

Note that the values in the above table are not factored by a strength reduction factor for LRFD.

The value of the strength reduction factor depends on the provisions of the LRFD code being followed.

The above values should be multiplied by the appropriate strength reduction factor to compute ultimate moment capacity according to the LRFD structural design standard being followed.

Layering Correction Equivalent Depths of Soil & Rock Layers

Layer No.	Top of Layer Below Pile Head ft	Equivalent Top Depth Below Grnd Surf ft	Same Layer Type As Layer Above	Layer is Rock or is Below Rock Layer	F0 Integral for Layer lbs	F1 Integral for Layer lbs
1	0.00	0.00	N.A.	Yes	N.A.	N.A.
2	2.0000	2.0000	No	Yes	N.A.	N.A.
3	7.0000	7.0000	No	Yes	N.A.	N.A.
4	19.0000	19.0000	No	Yes	N.A.	N.A.

Notes: The F0 integral of Layer n+1 equals the sum of the F0 and F1 integrals for Layer n. Layering correction equivalent depths are computed only for soil types with both shallow-depth and deep-depth expressions for peak lateral load transfer. These soil types are soft and stiff clays, non-liquefied sands, and cemented c-phi soil.

Summary of Pile-head Responses for Conventional Analyses

Definitions of Pile-head Loading Conditions:

Load Type 1: Load 1 = Shear, V, lbs, and Load 2 = Moment, M, in-lbs
 Load Type 2: Load 1 = Shear, V, lbs, and Load 2 = Slope, S, radians
 Load Type 3: Load 1 = Shear, V, lbs, and Load 2 = Rot. Stiffness, R, in-lbs/rad.
 Load Type 4: Load 1 = Top Deflection, y, inches, and Load 2 = Moment, M, in-lbs
 Load Type 5: Load 1 = Top Deflection, y, inches, and Load 2 = Slope, S, radians

Load Case No.	Load Type	Load Max Shear in Pile	Load Moment in Pile	Load Type	Pile-head Load 2	Axial Loading lbs	Pile-head Deflection inches	Pile-head Rotation radians	Max in lbs
1	V, lb	11400.		M, in-lb	0.00	130000.	0.1399	-0.00209	
		356463.							

Maximum pile-head deflection = 0.1399396044 inches

Maximum pile-head rotation = -0.0020921300 radians = -0.119870 deg.

The analysis ended normally.

=====

LPile for Windows, Version 2019-11.001

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

Path to file locations:

\Geotechnical\G6700's\G6782.000 - Maggie Harris Rd RBO Unnamed Tributary-West Fork
Little River\LPile\

Name of input data file:

EB1 (Trans.).lp11

Name of output report file:

EB1 (Trans.).lp11

Name of plot output file:

EB1 (Trans.).lp11

Name of runtime message file:

EB1 (Trans.).lp11

Date and Time of Analysis

Date: February 13, 2023

Time: 10:38:01

Problem Title

Project Name: Maggie Harris Rd. RBO Unnamed Tributary-West Fork Little

Job Number: G6782

Client: Davis & Floyd

Engineer: AMC / MM

Description: End Bent 1 Trans.

Program Options and Settings

Computational Options:

- Use unfactored loads in computations (conventional analysis)

Engineering Units Used for Data Input and Computations:

- US Customary System Units (pounds, feet, inches)

Analysis Control Options:

- | | | |
|--|---|---------------|
| - Maximum number of iterations allowed | = | 500 |
| - Deflection tolerance for convergence | = | 1.0000E-05 in |
| - Maximum allowable deflection | = | 100.0000 in |
| - Number of pile increments | = | 100 |

Loading Type and Number of Cycles of Loading:

- Static loading specified

- Use of p-y modification factors for p-y curves not selected
- Analysis uses layering correction (Method of Georgiadis)
- No distributed lateral loads are entered
- Loading by lateral soil movements acting on pile not selected
- Input of shear resistance at the pile tip not selected
- Input of moment resistance at the pile tip not selected
- Computation of pile-head foundation stiffness matrix not selected
- Push-over analysis of pile not selected
- Buckling analysis of pile not selected

Output Options:

- Output files use decimal points to denote decimal symbols.
- Report only summary tables of pile-head deflection, maximum bending moment, and maximum shear force in output report file.
- No p-y curves to be computed and reported for user-specified depths
- Print using wide report formats

Pile Structural Properties and Geometry

Number of pile sections defined	=	1
Total length of pile	=	18.200 ft
Depth of ground surface below top of pile	=	0.0000 ft

Pile diameters used for p-y curve computations are defined using 2 points.

p-y curves are computed using pile diameter values interpolated with depth over the length of the pile. A summary of values of pile diameter vs. depth follows.

Point No.	Depth Below Pile Head feet	Pile Diameter inches
1	0.000	12.2150
2	18.200	12.2150

Input Structural Properties for Pile Sections:

Pile Section No. 1:

Section 1 is a H weak axis steel pile	
Length of section	= 18.200000 ft
Pile width	= 12.130000 in
Shear capacity of section	= 0.0000 lbs

Ground Slope and Pile Batter Angles

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

Soil and Rock Layering Information

The soil profile is modelled using 4 layers

Layer 1 is Piedmont residual soil

Distance from top of pile to top of layer	=	0.0000 ft
Distance from top of pile to bottom of layer	=	2.000000 ft
Effective unit weight at top of layer	=	105.000000 pcf
Effective unit weight at bottom of layer	=	105.000000 pcf
The type of field test is the Standard Penetration Test (SPT)		
SPT N60 at top of layer	=	10.000000 blows/ft
SPT N60 at bottom of layer	=	10.000000 blows/ft

Layer 2 is Piedmont residual soil

Distance from top of pile to top of layer	=	2.000000 ft
Distance from top of pile to bottom of layer	=	7.000000 ft
Effective unit weight at top of layer	=	110.000000 pcf
Effective unit weight at bottom of layer	=	110.000000 pcf
The type of field test is the Standard Penetration Test (SPT)		
SPT N60 at top of layer	=	20.000000 blows/ft
SPT N60 at bottom of layer	=	20.000000 blows/ft

Layer 3 is Piedmont residual soil

Distance from top of pile to top of layer	=	7.000000 ft
Distance from top of pile to bottom of layer	=	19.000000 ft
Effective unit weight at top of layer	=	135.000000 pcf
Effective unit weight at bottom of layer	=	135.000000 pcf
The type of field test is the Standard Penetration Test (SPT)		

SPT N60 at top of layer	=	81.000000 blows/ft
SPT N60 at bottom of layer	=	81.000000 blows/ft

Layer 4 is strong rock (vuggy limestone)

Distance from top of pile to top of layer	=	19.000000 ft
Distance from top of pile to bottom of layer	=	30.000000 ft
Effective unit weight at top of layer	=	145.000000 pcf
Effective unit weight at bottom of layer	=	145.000000 pcf
Uniaxial compressive strength at top of layer	=	2000. psi
Uniaxial compressive strength at bottom of layer	=	2000. psi

(Depth of the lowest soil layer extends 11.800 ft below the pile tip)

Summary of Input Soil Properties

Layer In-situ Layer Test Num. Property	Soil Type Name (p-y Curve Type)	Layer Depth ft	Effective Unit Wt. pcf	Uniaxial qu psi	In-situ Test Type
----- -----	-----	-----	-----	-----	-----
1 10.0000	Piedmont	0.00	105.0000	--	SPT
10.0000	Residual Soil	2.0000	105.0000	--	SPT
2 20.0000	Piedmont	2.0000	110.0000	--	SPT
20.0000	Residual Soil	7.0000	110.0000	--	SPT
3 81.0000	Piedmont	7.0000	135.0000	--	SPT
81.0000	Residual Soil	19.0000	135.0000	--	SPT
4 --	Strong Rock	19.0000	145.0000	2000.	--
--	(Vuggy Limestone)	30.0000	145.0000	2000.	--
--					

Static Loading Type

Static loading criteria were used when computing p-y curves for all analyses.

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 1

Load Compute No.	Load Top y Type vs. Pile Length	Condition 1	Condition 2	Axial Thrust Force, lbs
1	3	V = 1000.000000 lbs	R = 0.0000 in-lbs	130000.
No				

V = shear force applied normal to pile axis

M = bending moment applied to pile head

y = lateral deflection normal to pile axis

S = pile slope relative to original pile batter angle

R = rotational stiffness applied to pile head

Values of top y vs. pile lengths can be computed only for load types with specified shear loading (Load Types 1, 2, and 3).

Thrust force is assumed to be acting axially for all pile batter angles.

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

Axial thrust force values were determined from pile-head loading conditions

Number of Pile Sections Analyzed = 1

Pile Section No. 1:

Dimensions and Properties of Steel H Weak Axis:

Length of Section = 18.200000 ft

Flange Width = 12.215000 in

Section Depth = 12.130000 in

Flange Thickness = 0.610000 in

Web Thickness	=	0.605000 in
Yield Stress of Pipe	=	36.000000 ksi
Elastic Modulus	=	29000. ksi
Cross-sectional Area	=	21.502850 sq. in.
Moment of Inertia	=	185.494324 in ⁴
Elastic Bending Stiffness	=	5379335. kip-in ²
Plastic Modulus, Z	=	46.506232in ³
Plastic Moment Capacity = Fy Z	=	1674.in-kip

Axial Structural Capacities:

Nom. Axial Structural Capacity = Fy As	=	774.103 kips
Nominal Axial Tensile Capacity	=	-774.103 kips

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

Number	Axial Thrust Force kips
-----	-----
1	130.000

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

Load No.	Axial Thrust kips	Nominal Moment Capacity in-kips
----	-----	-----
1	130.0000000000	1608.

Note that the values in the above table are not factored by a strength reduction factor for LRFD.

The value of the strength reduction factor depends on the provisions of the LRFD code being followed.

The above values should be multiplied by the appropriate strength reduction factor to compute ultimate moment capacity according to the LRFD structural design standard being followed.

Layering Correction Equivalent Depths of Soil & Rock Layers

Layer No.	Top of Layer Below Pile Head ft	Equivalent Top Depth Below Grnd Surf ft	Same Layer Type As Layer Above	Layer is Rock or is Below Rock Layer	F0 Integral for Layer lbs	F1 Integral for Layer lbs
1	0.00	0.00	N.A.	Yes	N.A.	N.A.
2	2.0000	2.0000	No	Yes	N.A.	N.A.
3	7.0000	7.0000	No	Yes	N.A.	N.A.
4	19.0000	19.0000	No	Yes	N.A.	N.A.

Notes: The F0 integral of Layer n+1 equals the sum of the F0 and F1 integrals for Layer n. Layering correction equivalent depths are computed only for soil types with both shallow-depth and deep-depth expressions for peak lateral load transfer. These soil types are soft and stiff clays, non-liquefied sands, and cemented c-phi soil.

Summary of Pile-head Responses for Conventional Analyses

Definitions of Pile-head Loading Conditions:

Load Type 1: Load 1 = Shear, V, lbs, and Load 2 = Moment, M, in-lbs
 Load Type 2: Load 1 = Shear, V, lbs, and Load 2 = Slope, S, radians
 Load Type 3: Load 1 = Shear, V, lbs, and Load 2 = Rot. Stiffness, R, in-lbs/rad.
 Load Type 4: Load 1 = Top Deflection, y, inches, and Load 2 = Moment, M, in-lbs
 Load Type 5: Load 1 = Top Deflection, y, inches, and Load 2 = Slope, S, radians

Load Case No.	Load Type	Load Max Shear in Pile	Load Moment in Pile	Load Type	Pile-head Load 2	Axial Loading lbs	Pile-head Deflection inches	Pile-head Rotation radians	Max in lbs
1	V, lb	1000.0000	R, in-lb/r	0.00	130000.	0.01211	-2.52E-04		
		1000.	19795.						

Maximum pile-head deflection = 0.0121083279 inches

Maximum pile-head rotation = -0.0002521804 radians = -0.014449 deg.

The analysis ended normally.

=====

LPile for Windows, Version 2019-11.001

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

Path to file locations:

\Geotechnical\G6700's\G6782.000 - Maggie Harris Rd RBO Unnamed Tributary-West Fork
Little River\LPile\

Name of input data file:

EB2 (Long.).lp11

Name of output report file:

EB2 (Long.).lp11

Name of plot output file:

EB2 (Long.).lp11

Name of runtime message file:

EB2 (Long.).lp11

Date and Time of Analysis

Date: February 13, 2023

Time: 10:40:51

Problem Title

Project Name: Maggie Harris Rd. RBO Unnamed Tributary-West Fork Little

Job Number: G6782

Client: Davis & Floyd

Engineer: AMC / MM

Description: End Bent 2 Long.

Program Options and Settings

Computational Options:

- Use unfactored loads in computations (conventional analysis)

Engineering Units Used for Data Input and Computations:

- US Customary System Units (pounds, feet, inches)

Analysis Control Options:

- | | | |
|--|---|---------------|
| - Maximum number of iterations allowed | = | 500 |
| - Deflection tolerance for convergence | = | 1.0000E-05 in |
| - Maximum allowable deflection | = | 100.0000 in |
| - Number of pile increments | = | 100 |

Loading Type and Number of Cycles of Loading:

- Static loading specified

- Use of p-y modification factors for p-y curves not selected
- Analysis uses layering correction (Method of Georgiadis)
- No distributed lateral loads are entered
- Loading by lateral soil movements acting on pile not selected
- Input of shear resistance at the pile tip not selected
- Input of moment resistance at the pile tip not selected
- Computation of pile-head foundation stiffness matrix not selected
- Push-over analysis of pile not selected
- Buckling analysis of pile not selected

Output Options:

- Output files use decimal points to denote decimal symbols.
- Report only summary tables of pile-head deflection, maximum bending moment, and maximum shear force in output report file.
- No p-y curves to be computed and reported for user-specified depths
- Print using wide report formats

Pile Structural Properties and Geometry

Number of pile sections defined	=	1
Total length of pile	=	14.000 ft
Depth of ground surface below top of pile	=	0.0000 ft

Pile diameters used for p-y curve computations are defined using 2 points.

p-y curves are computed using pile diameter values interpolated with depth over the length of the pile. A summary of values of pile diameter vs. depth follows.

Point No.	Depth Below Pile Head feet	Pile Diameter inches
1	0.000	12.2150
2	14.000	12.2150

Input Structural Properties for Pile Sections:

Pile Section No. 1:

Section 1 is a H strong axis steel pile	
Length of section	= 14.000000 ft
Pile width	= 12.215000 in
Shear capacity of section	= 0.0000 lbs

Ground Slope and Pile Batter Angles

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

Soil and Rock Layering Information

The soil profile is modelled using 4 layers

Layer 1 is Piedmont residual soil

Distance from top of pile to top of layer	=	0.0000 ft
Distance from top of pile to bottom of layer	=	3.000000 ft
Effective unit weight at top of layer	=	100.000000 pcf
Effective unit weight at bottom of layer	=	100.000000 pcf
The type of field test is the Standard Penetration Test (SPT)		
SPT N60 at top of layer	=	4.000000 blows/ft
SPT N60 at bottom of layer	=	4.000000 blows/ft

Layer 2 is Piedmont residual soil

Distance from top of pile to top of layer	=	3.000000 ft
Distance from top of pile to bottom of layer	=	8.000000 ft
Effective unit weight at top of layer	=	110.000000 pcf
Effective unit weight at bottom of layer	=	110.000000 pcf
The type of field test is the Standard Penetration Test (SPT)		
SPT N60 at top of layer	=	17.000000 blows/ft
SPT N60 at bottom of layer	=	17.000000 blows/ft

Layer 3 is Piedmont residual soil

Distance from top of pile to top of layer	=	8.000000 ft
Distance from top of pile to bottom of layer	=	14.000000 ft
Effective unit weight at top of layer	=	140.000000 pcf
Effective unit weight at bottom of layer	=	140.000000 pcf
The type of field test is the Standard Penetration Test (SPT)		

SPT N60 at top of layer	=	100.000000 blows/ft
SPT N60 at bottom of layer	=	100.000000 blows/ft

Layer 4 is strong rock (vuggy limestone)

Distance from top of pile to top of layer	=	14.000000 ft
Distance from top of pile to bottom of layer	=	30.000000 ft
Effective unit weight at top of layer	=	145.000000 pcf
Effective unit weight at bottom of layer	=	145.000000 pcf
Uniaxial compressive strength at top of layer	=	2000. psi
Uniaxial compressive strength at bottom of layer	=	2000. psi

(Depth of the lowest soil layer extends 16.000 ft below the pile tip)

Summary of Input Soil Properties

Layer In-situ Layer Test Num. Property	Soil Type Name (p-y Curve Type)	Layer Depth ft	Effective Unit Wt. pcf	Uniaxial qu psi	In-situ Test Type
1 4.0000	Piedmont	0.00	100.0000	--	SPT
4.0000	Residual Soil	3.0000	100.0000	--	SPT
2 17.0000	Piedmont	3.0000	110.0000	--	SPT
17.0000	Residual Soil	8.0000	110.0000	--	SPT
3 100.0000	Piedmont	8.0000	140.0000	--	SPT
100.0000	Residual Soil	14.0000	140.0000	--	SPT
4 -- --	Strong Rock (Vuggy Limestone)	14.0000 30.0000	145.0000 145.0000	2000. 2000.	-- --

Static Loading Type

Static loading criteria were used when computing p-y curves for all analyses.

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 1

Load Compute No.	Load Top y Type vs. Pile Length	Condition 1	Condition 2	Axial Thrust Force, lbs
1	1	V = 11400. lbs	M = 0.0000 in-lbs	130000.
No				

V = shear force applied normal to pile axis

M = bending moment applied to pile head

y = lateral deflection normal to pile axis

S = pile slope relative to original pile batter angle

R = rotational stiffness applied to pile head

Values of top y vs. pile lengths can be computed only for load types with specified shear loading (Load Types 1, 2, and 3).

Thrust force is assumed to be acting axially for all pile batter angles.

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

Axial thrust force values were determined from pile-head loading conditions

Number of Pile Sections Analyzed = 1

Pile Section No. 1:

Dimensions and Properties of Steel H Strong Axis:

Length of Section = 14.000000 ft

Flange Width = 12.215000 in

Section Depth = 12.130000 in

Flange Thickness = 0.610000 in

Web Thickness	=	0.605000 in
Yield Stress of Pipe	=	36.000000 ksi
Elastic Modulus	=	29000. ksi
Cross-sectional Area	=	21.502850 sq. in.
Moment of Inertia	=	560.355554 in ⁴
Elastic Bending Stiffness	=	16250311. kip-in ²
Plastic Modulus, Z	=	103.840248in ³
Plastic Moment Capacity = Fy Z	=	3738.in-kip

Axial Structural Capacities:

Nom. Axial Structural Capacity = Fy As	=	774.103 kips
Nominal Axial Tensile Capacity	=	-774.103 kips

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

Number	Axial Thrust Force kips
-----	-----
1	130.000

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

Load No.	Axial Thrust kips	Nominal Moment Capacity in-kips
----	-----	-----
1	130.0000000000	3520.

Note that the values in the above table are not factored by a strength reduction factor for LRFD.

The value of the strength reduction factor depends on the provisions of the LRFD code being followed.

The above values should be multiplied by the appropriate strength reduction factor to compute ultimate moment capacity according to the LRFD structural design standard being followed.

Layering Correction Equivalent Depths of Soil & Rock Layers

Layer No.	Top of Layer Below Pile Head ft	Equivalent Top Depth Below Grnd Surf ft	Same Layer Type As Layer Above	Layer is Rock or is Below Rock Layer	F0 Integral for Layer lbs	F1 Integral for Layer lbs
1	0.00	0.00	N.A.	Yes	N.A.	N.A.
2	3.0000	3.0000	No	Yes	N.A.	N.A.
3	8.0000	8.0000	No	Yes	N.A.	N.A.
4	14.0000	14.0000	No	Yes	N.A.	N.A.

Notes: The F0 integral of Layer n+1 equals the sum of the F0 and F1 integrals for Layer n. Layering correction equivalent depths are computed only for soil types with both shallow-depth and deep-depth expressions for peak lateral load transfer. These soil types are soft and stiff clays, non-liquefied sands, and cemented c-phi soil.

Summary of Pile-head Responses for Conventional Analyses

Definitions of Pile-head Loading Conditions:

Load Type 1: Load 1 = Shear, V, lbs, and Load 2 = Moment, M, in-lbs
 Load Type 2: Load 1 = Shear, V, lbs, and Load 2 = Slope, S, radians
 Load Type 3: Load 1 = Shear, V, lbs, and Load 2 = Rot. Stiffness, R, in-lbs/rad.
 Load Type 4: Load 1 = Top Deflection, y, inches, and Load 2 = Moment, M, in-lbs
 Load Type 5: Load 1 = Top Deflection, y, inches, and Load 2 = Slope, S, radians

Load Case No.	Load Type	Load Max Shear in Pile	Load Moment Pile-head	Load Type	Load Pile-head	Axial Loading lbs	Pile-head Deflection inches	Pile-head Rotation radians	Max in lbs
1	V, lb	11400.	M, in-lb	0.00	130000.	0.2581	-0.00333		
		510753.							

Maximum pile-head deflection = 0.2580725444 inches

Maximum pile-head rotation = -0.0033258093 radians = -0.190555 deg.

The analysis ended normally.

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

Path to file locations:

\Geotechnical\G6700's\G6782.000 - Maggie Harris Rd RBO Unnamed Tributary-West Fork
Little River\LPile\

Name of input data file:

EB2 (Trans.).lp11

Name of output report file:

EB2 (Trans.).lp11

Name of plot output file:

EB2 (Trans.).lp11

Name of runtime message file:

EB2 (Trans.).lp11

Date and Time of Analysis

Date: February 13, 2023

Time: 10:42:11

Problem Title

Project Name: Maggie Harris Rd. RBO Unnamed Tributary-West Fork Little

Job Number: G6782

Client: Davis & Floyd

Engineer: AMC / MM

Description: End Bent 2 Trans.

Program Options and Settings

Computational Options:

- Use unfactored loads in computations (conventional analysis)

Engineering Units Used for Data Input and Computations:

- US Customary System Units (pounds, feet, inches)

Analysis Control Options:

- | | | |
|--|---|---------------|
| - Maximum number of iterations allowed | = | 500 |
| - Deflection tolerance for convergence | = | 1.0000E-05 in |
| - Maximum allowable deflection | = | 100.0000 in |
| - Number of pile increments | = | 100 |

Loading Type and Number of Cycles of Loading:

- Static loading specified

- Use of p-y modification factors for p-y curves not selected
- Analysis uses layering correction (Method of Georgiadis)
- No distributed lateral loads are entered
- Loading by lateral soil movements acting on pile not selected
- Input of shear resistance at the pile tip not selected
- Input of moment resistance at the pile tip not selected
- Computation of pile-head foundation stiffness matrix not selected
- Push-over analysis of pile not selected
- Buckling analysis of pile not selected

Output Options:

- Output files use decimal points to denote decimal symbols.
- Report only summary tables of pile-head deflection, maximum bending moment, and maximum shear force in output report file.
- No p-y curves to be computed and reported for user-specified depths
- Print using wide report formats

Pile Structural Properties and Geometry

Number of pile sections defined	=	1
Total length of pile	=	14.000 ft
Depth of ground surface below top of pile	=	0.0000 ft

Pile diameters used for p-y curve computations are defined using 2 points.

p-y curves are computed using pile diameter values interpolated with depth over the length of the pile. A summary of values of pile diameter vs. depth follows.

Point No.	Depth Below Pile Head feet	Pile Diameter inches
1	0.000	12.2150
2	14.000	12.2150

Input Structural Properties for Pile Sections:

Pile Section No. 1:

Section 1 is a H weak axis steel pile	
Length of section	= 14.000000 ft
Pile width	= 12.130000 in
Shear capacity of section	= 0.0000 lbs

Ground Slope and Pile Batter Angles

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

Soil and Rock Layering Information

The soil profile is modelled using 4 layers

Layer 1 is Piedmont residual soil

Distance from top of pile to top of layer	=	0.0000 ft
Distance from top of pile to bottom of layer	=	3.000000 ft
Effective unit weight at top of layer	=	100.000000 pcf
Effective unit weight at bottom of layer	=	100.000000 pcf
The type of field test is the Standard Penetration Test (SPT)		
SPT N60 at top of layer	=	4.000000 blows/ft
SPT N60 at bottom of layer	=	4.000000 blows/ft

Layer 2 is Piedmont residual soil

Distance from top of pile to top of layer	=	3.000000 ft
Distance from top of pile to bottom of layer	=	8.000000 ft
Effective unit weight at top of layer	=	110.000000 pcf
Effective unit weight at bottom of layer	=	110.000000 pcf
The type of field test is the Standard Penetration Test (SPT)		
SPT N60 at top of layer	=	17.000000 blows/ft
SPT N60 at bottom of layer	=	17.000000 blows/ft

Layer 3 is Piedmont residual soil

Distance from top of pile to top of layer	=	8.000000 ft
Distance from top of pile to bottom of layer	=	14.000000 ft
Effective unit weight at top of layer	=	140.000000 pcf
Effective unit weight at bottom of layer	=	140.000000 pcf
The type of field test is the Standard Penetration Test (SPT)		

SPT N60 at top of layer	=	100.000000 blows/ft
SPT N60 at bottom of layer	=	100.000000 blows/ft

Layer 4 is strong rock (vuggy limestone)

Distance from top of pile to top of layer	=	14.000000 ft
Distance from top of pile to bottom of layer	=	30.000000 ft
Effective unit weight at top of layer	=	145.000000 pcf
Effective unit weight at bottom of layer	=	145.000000 pcf
Uniaxial compressive strength at top of layer	=	2000. psi
Uniaxial compressive strength at bottom of layer	=	2000. psi

(Depth of the lowest soil layer extends 16.000 ft below the pile tip)

Summary of Input Soil Properties

Layer In-situ Layer Test Num. Property	Soil Type Name (p-y Curve Type)	Layer Depth ft	Effective Unit Wt. pcf	Uniaxial qu psi	In-situ Test Type
-----	-----	-----	-----	-----	-----
1 4.0000	Piedmont	0.00	100.0000	--	SPT
4.0000	Residual Soil	3.0000	100.0000	--	SPT
2 17.0000	Piedmont	3.0000	110.0000	--	SPT
17.0000	Residual Soil	8.0000	110.0000	--	SPT
3 100.0000	Piedmont	8.0000	140.0000	--	SPT
100.0000	Residual Soil	14.0000	140.0000	--	SPT
4 -- --	Strong Rock (Vuggy Limestone)	14.0000 30.0000	145.0000 145.0000	2000. 2000.	-- --

Static Loading Type

Static loading criteria were used when computing p-y curves for all analyses.

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 1

Load Compute No.	Load Top y Type vs. Pile Length	Condition 1	Condition 2	Axial Thrust Force, lbs
1	3	V = 1000.000000 lbs	R = 0.0000 in-lbs	130000.
No				

V = shear force applied normal to pile axis
M = bending moment applied to pile head
y = lateral deflection normal to pile axis
S = pile slope relative to original pile batter angle
R = rotational stiffness applied to pile head
Values of top y vs. pile lengths can be computed only for load types with specified shear loading (Load Types 1, 2, and 3).
Thrust force is assumed to be acting axially for all pile batter angles.

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

Axial thrust force values were determined from pile-head loading conditions

Number of Pile Sections Analyzed = 1

Pile Section No. 1:

Dimensions and Properties of Steel H Weak Axis:

Length of Section	=	14.000000 ft
Flange Width	=	12.215000 in
Section Depth	=	12.130000 in
Flange Thickness	=	0.610000 in

Web Thickness	=	0.605000 in
Yield Stress of Pipe	=	36.000000 ksi
Elastic Modulus	=	29000. ksi
Cross-sectional Area	=	21.502850 sq. in.
Moment of Inertia	=	185.494324 in ⁴
Elastic Bending Stiffness	=	5379335. kip-in ²
Plastic Modulus, Z	=	46.506232in ³
Plastic Moment Capacity = Fy Z	=	1674.in-kip

Axial Structural Capacities:

Nom. Axial Structural Capacity = Fy As	=	774.103 kips
Nominal Axial Tensile Capacity	=	-774.103 kips

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

Number	Axial Thrust Force kips
-----	-----
1	130.000

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

Load No.	Axial Thrust kips	Nominal Moment Capacity in-kips
----	-----	-----
1	130.0000000000	1608.

Note that the values in the above table are not factored by a strength reduction factor for LRFD.

The value of the strength reduction factor depends on the provisions of the LRFD code being followed.

The above values should be multiplied by the appropriate strength reduction factor to compute ultimate moment capacity according to the LRFD structural design standard being followed.

Layering Correction Equivalent Depths of Soil & Rock Layers

Layer No.	Top of Layer Below Pile Head ft	Equivalent Top Depth Below Grnd Surf ft	Same Layer Type As Layer Above	Layer is Rock or is Below Rock Layer	F0 Integral for Layer lbs	F1 Integral for Layer lbs
1	0.00	0.00	N.A.	Yes	N.A.	N.A.
2	3.0000	3.0000	No	Yes	N.A.	N.A.
3	8.0000	8.0000	No	Yes	N.A.	N.A.
4	14.0000	14.0000	No	Yes	N.A.	N.A.

Notes: The F0 integral of Layer n+1 equals the sum of the F0 and F1 integrals for Layer n. Layering correction equivalent depths are computed only for soil types with both shallow-depth and deep-depth expressions for peak lateral load transfer. These soil types are soft and stiff clays, non-liquefied sands, and cemented c-phi soil.

Summary of Pile-head Responses for Conventional Analyses

Definitions of Pile-head Loading Conditions:

Load Type 1: Load 1 = Shear, V, lbs, and Load 2 = Moment, M, in-lbs
 Load Type 2: Load 1 = Shear, V, lbs, and Load 2 = Slope, S, radians
 Load Type 3: Load 1 = Shear, V, lbs, and Load 2 = Rot. Stiffness, R, in-lbs/rad.
 Load Type 4: Load 1 = Top Deflection, y, inches, and Load 2 = Moment, M, in-lbs
 Load Type 5: Load 1 = Top Deflection, y, inches, and Load 2 = Slope, S, radians

Load Case No.	Load Type	Load Max Shear in Pile	Load Moment in Pile	Load Type	Pile-head Load 2	Axial Loading lbs	Pile-head Deflection inches	Pile-head Rotation radians	Max in lbs
1	V, lb	1000.0000	R, in-lb/r	0.00	130000.	0.02283	-4.07E-04		
		29203.							

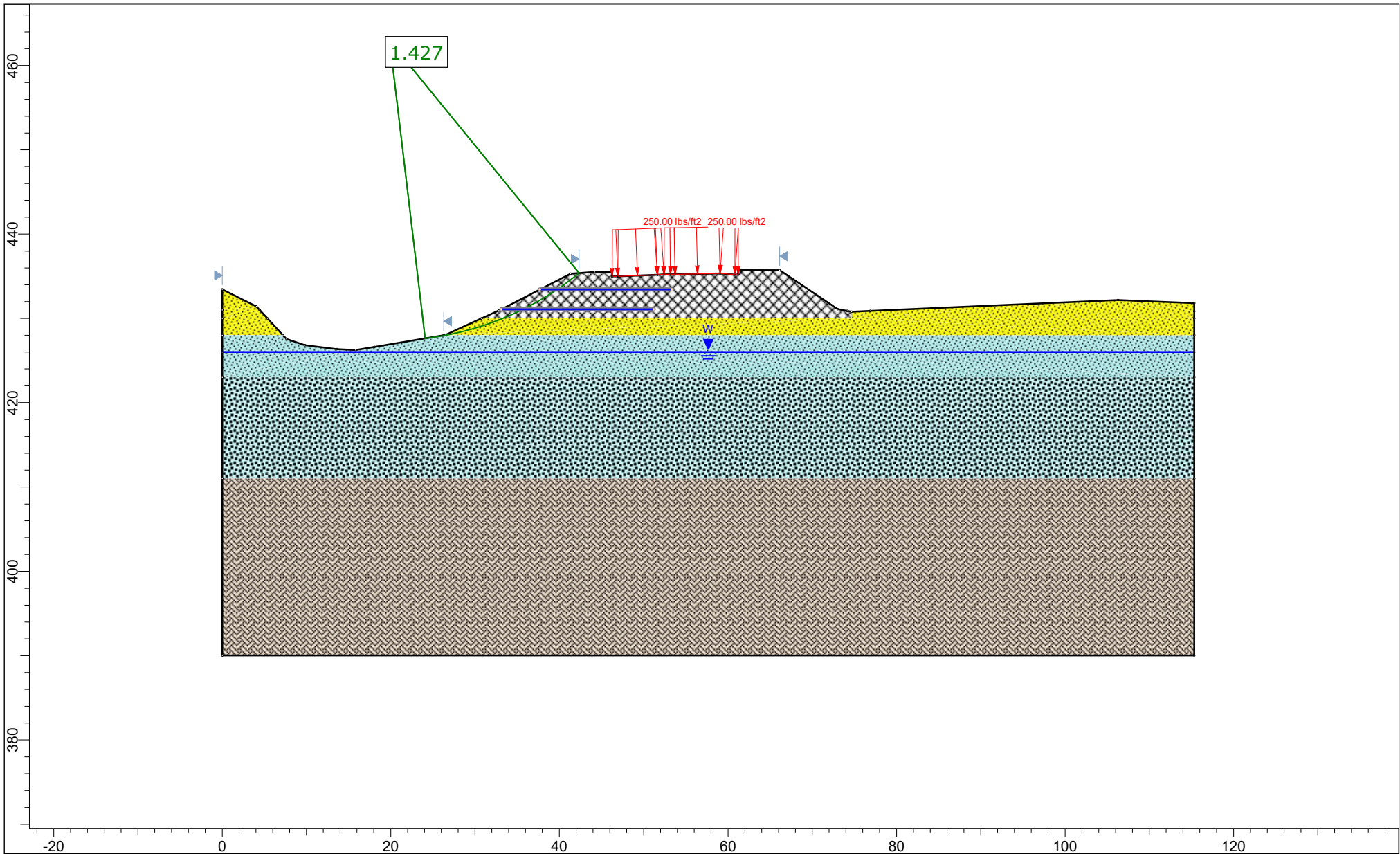
Maximum pile-head deflection = 0.0228251556 inches


Maximum pile-head rotation = -0.0004072043 radians = -0.023331 deg.

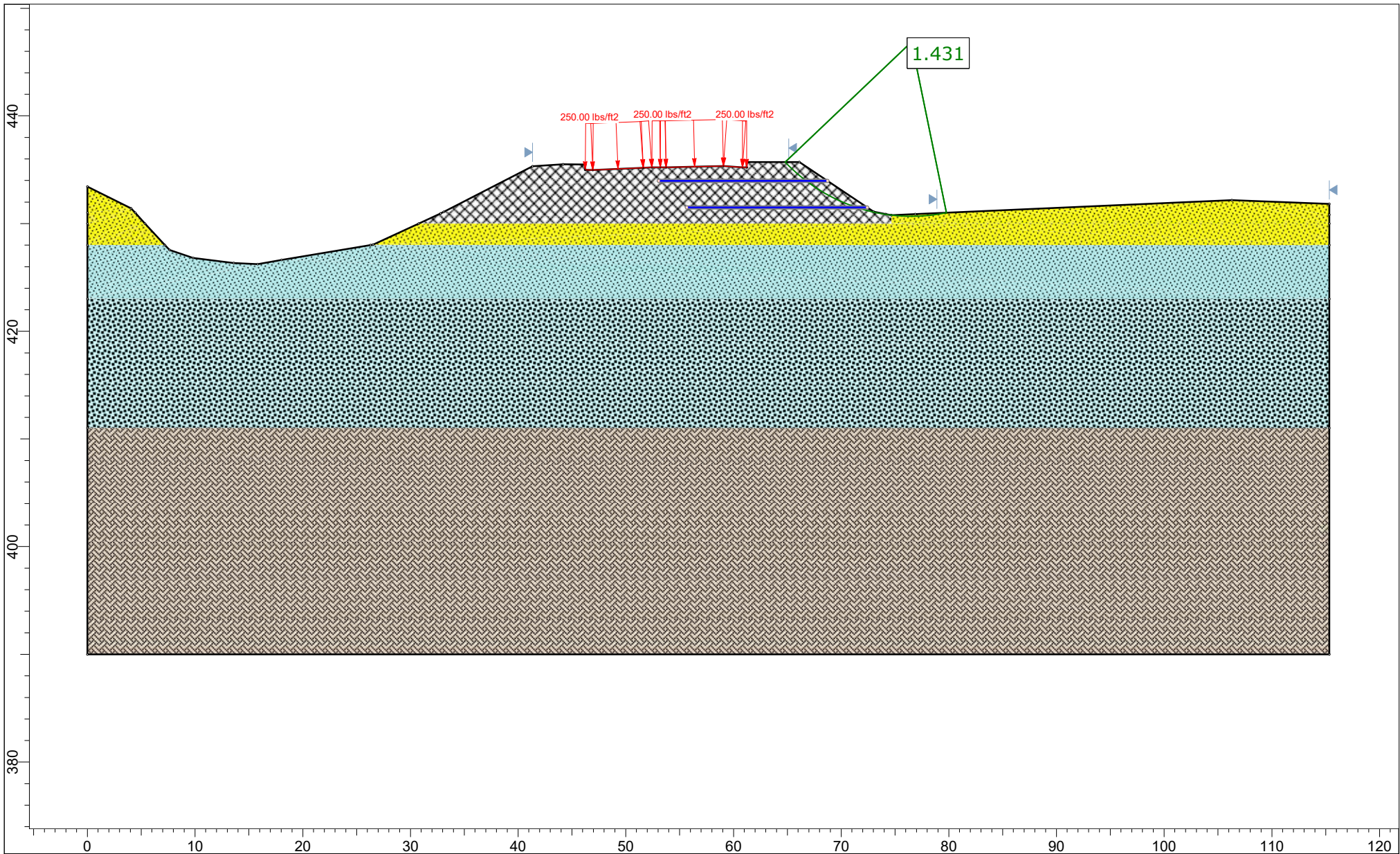
The analysis ended normally.


APPENDIX E

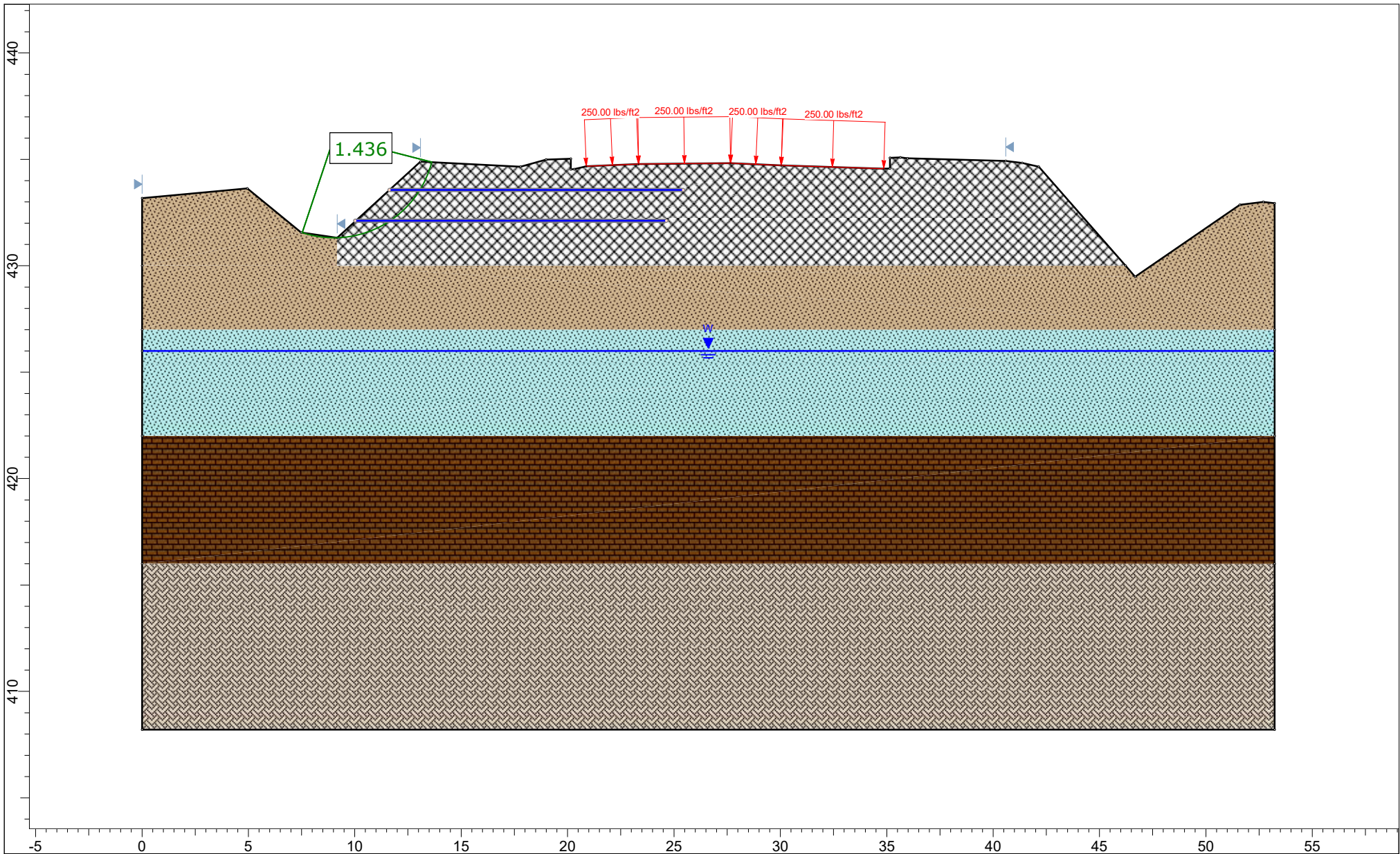
Slope Stability Analysis




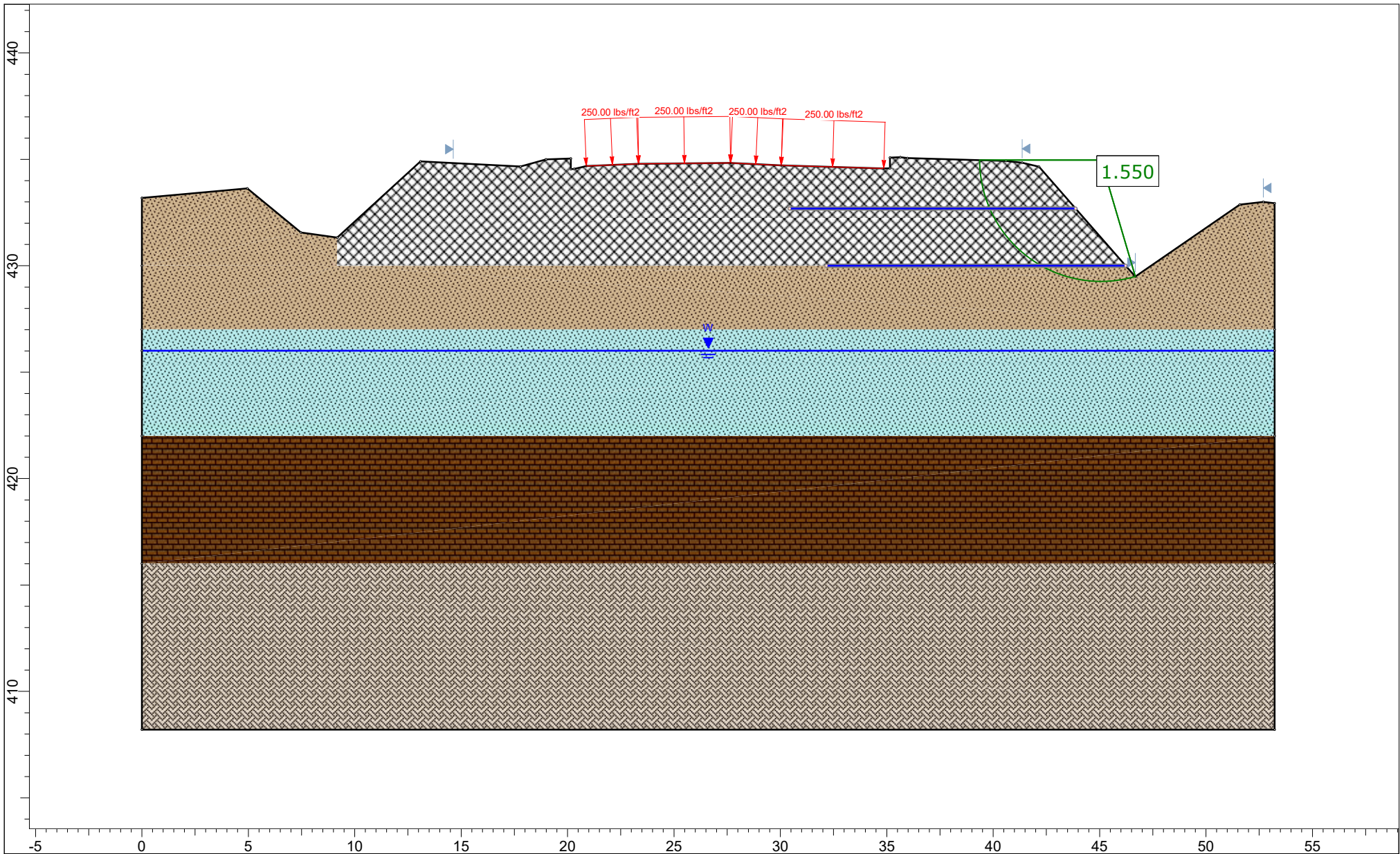
	Project			Maggie Harris Rd. RBO Tributary-West Fork Little River	
	Analysis Description			B-1 / EB-1 Static	
	Drawn By	AMC	Scale	1:189	Company
	Date	2/23/2023			F&ME Consultants
				File Name	B-1.slmd




	Project			Maggie Harris Rd. RBO Tributary-West Fork Little River	
	Analysis Description			B-1 / EB-1 Static	
	Drawn By	AMC	Scale	1:148	Company F&ME Consultants
	Date	2/23/2023			File Name B-1.slm



	Project			Maggie Harris Rd. RBO Unnamed Tributary-West Fork Little River		
	Analysis Description			B-2 / EB-2 Static		
	Drawn By		AMC	Scale	1:75	Company
	Date		2/23/2023	File Name		F&ME Consultants
						B-2.slm



	Project			Maggie Harris Rd. RBO Unnamed Tributary-West Fork Little River	
	Analysis Description			B-2 / EB-2 Static	
	Drawn By	AMC	Scale	1:75	Company
	Date	2/23/2023			F&ME Consultants
				File Name	B-2.slmd