

INFORMATION FOR BIDDERS

REQUEST FOR BIDS

The Request for Bids is comprised of this base document, any attachments, technical specifications, and any addenda released before contract award. All attachments, technical specifications, and addenda released in advance of any contract award are incorporated herein by reference. It is the Bidder's responsibility to read this entire document, review all technical specifications, enclosures and attachments, and any addenda thereto, and comply with all specified requirements. All plans and specifications related to this Request for Bids are also available at the Sampson County Administration Building, located at 406 County Complex Road, Building C, Clinton, NC 28328, during normal business hours.

The County is committed to participation by Bidders from diverse backgrounds and invites and encourages participation in the procurement process by businesses owned by minorities, women, disabled individuals, and Veterans. Bidders shall review and satisfy County requirements related to participation by minority bidders, which are available upon request from Sampson County Purchasing and Contracting Officer Juanita Brewington. The lowest responsible, responsive bidder will be required to provide documentation that these minority participation requirements have been satisfied.

Any costs or expenses incurred by Bidders in preparing or submitting bids are the Bidder's sole responsibility; the County will not reimburse any Bidder for any costs incurred prior to contract award.

NOTICE TO BIDDERS REGARDING TERMS AND CONDITIONS

It shall be the Bidder's responsibility to read the instructions, the terms and conditions, all relevant exhibits and attachments, the technical specifications, and any other components made a part of this Request for Bids and comply with all requirements and specifications. Bidders are also responsible for obtaining and complying with all addenda and other changes that may be issued concerning this Request for Bids.

If Bidders have questions, issues, or exceptions regarding any term, condition, or other component of this Request for Bids, those questions, issues, and exceptions **must** be submitted as questions in accordance with the instructions under the section of this Request labeled "Bid Questions". If Sampson County determines that any changes will be made as a result of properly submitted questions, then such decisions will be communicated in the form of an addendum. The County may also elect to leave open the possibility for post-contract negotiation and amendment of specific provisions of the contract that have been addressed during the question-and-answer period. Other than through the Bid Question process, the County rejects and will not be required to evaluate or consider any additional or modified terms and conditions submitted with a bid. This applies to any language appearing in or attached to the Bid document as part of the Bidder's Bid that purports to vary any terms and conditions or Bidder's instructions herein or to render the Bid non-binding or subject to further negotiation. *A Bidder's Bid shall constitute a firm offer.* **By execution and delivery of a Bid in response to this Request for Bids, the Bidder agrees that any additional or modified terms and conditions, whether submitted purposefully or inadvertently, shall have no force or effect, and will be disregarded. Noncompliance with, or any attempt to alter or delete, this paragraph shall constitute sufficient grounds to reject a Bid as nonresponsive. Any Bid that contains language that indicates the Bid is non-binding or subject to further negotiation before a contractual document may be signed shall be rejected.**

If a Bidder desires modification of the terms and conditions of this Request for Bids, it is urged and cautioned to inquire during the question period, in accordance with the instructions in this Request for Bids, about whether specific language proposed as a modification is acceptable to or will be considered by the County. Identification of objections or exceptions to the County's terms and conditions in the Bid itself shall not be allowed and shall be disregarded, or the Bid shall be rejected in its entirety.

SCHEDULE

The table below shows the *intended* schedule for this Request for Bids. Sampson County will make every effort to adhere to this schedule but is not bound thereby. In the event that fewer than three (3) Bids are received from qualified Bidders, Sampson County will re-advertise. If three (3) Bids are still not received,

Sampson County may elect to award the contract to the lowest responsive, responsible Bidder or may elect to reject all Bids.

Event	Responsibility	Date and Time
Issue Request for Bids	County	Wednesday, December 22, 2021
Site Walk (Available upon request)	All interested parties	To Be Determined
Submit Written Questions	Bidder	Friday, January 7, 2022 5:00 p.m.
Provide Responses to Questions	Craig Schulz	Wednesday, January 12, 2022
Submit Bids/Bid Opening	Bidder/County	Friday, January 21, 2022 2:00 p.m.

BID QUESTIONS

Upon review of the Request for Bids documents, Bidders may have questions to clarify or interpret the Request in order to submit the best Bid possible. To accommodate the Bid Questions process, Bidders shall submit any such questions by the above due date. Written questions shall be e-mailed to jbrewington@sampsonnc.com by the date and time specified above. Bidders shall enter "Public Safety Tower – Questions" in the email's subject line. Question submittals should include a reference to the applicable Request for Bids section.

BID SUBMITTAL

Sealed Bids, subject to the conditions made a part hereof and the receipt requirements described below, shall be received at the address indicated below, for furnishing and delivering those items as described herein. Bidders should refer to the section of this Request labeled "Bid Contents" for details on required content of submitted Bids.

Sealed Bids must be received no later than 2:00 p.m. on Friday, January 21, 2022. Bids received after this time will not be considered. Bids should be clearly marked "BID – PUBLIC SAFETY TOWER". Sealed Bids must be delivered to Sampson County, Attention: Juanita Brewington, 406 County Complex Road, Building C, Clinton, NC 28328.

IMPORTANT NOTE: All Bids shall be physically delivered to the office address listed above on or before the Bid deadline in order to be considered timely, regardless of the method of delivery (including U.S. mail). All risk of late arrival due to unanticipated delay—whether delivered by hand, U.S. Postal Service, courier or other delivery service is entirely borne by the Bidder. It is the sole responsibility of the Bidder to have the Bid physically in the County office identified above by the specified time and date of opening.

Bidders shall deliver to the address identified above: **one (1) signed original Bid, three (3) signed Bid copies, and one (1) USB Flash Drive containing the Bid documents.**

Failure to submit a Bid in strict accordance with these instructions shall constitute sufficient cause to reject a Bidder's Bid. However, Sampson County may waive informalities, irregularities, or minor defects in a Bid received and accept the Bid which, in the County's judgment, is in the County's best interests.

BID CONTENTS

All Bids must be made on the required Bid forms, all spaces for Bid prices must be filled in, in ink or typewritten, and the Bid, including, but not limited to, all attachments to this Request for Bids, must be fully completed and executed when submitted. A Bidder's response to this Request for Bids shall include each of the following items:

- a) Signed receipt pages of any addenda released in conjunction with this RFP.

- b) Attachment #1 Bid Form
- c) Attachment #2 Historically Underutilized Businesses
- d) Insurance Certificate
- e) Bid Deposit/Bond (5% of the bid amount)
- f) Performance and Payment Bonds (100% of the Bid amount)
- g) Bidders must present the appropriate NC license as required by the North Carolina Licensing Board for General Contractors and as referenced in the current edition of Laws and Regulations Applicable to General Contracting in the State of North Carolina. The license shall be applicable to all stages of work per the RFP and as required for the contractor to obtain all applicable federal, state, and local permitting and inspections
- h) Attachment #3 Affidavit of Compliance with NC E-Verify Statutes
- i) Requirements noted in the Technical Specification

METHOD OF AWARD

The contract will be awarded in accordance with North Carolina law and the evaluation criteria set forth in this Request for Bids. Prospective Bidders shall not be discriminated against on the basis of any prohibited grounds as defined by law.

All qualified Bids will be evaluated and award will be based on the lowest responsive, responsible bid, taking into consideration quality, performance and the time specified in the proposals for the performance of the contract and meeting the requirements set out herein.

Sampson County reserves the right to reject any and all Bids, to waive informalities and technicalities, and to cancel the Bid process at any time.

BID EVALUATION PROCESS

The County shall review all Bids to confirm that each one complies with the specifications and requirements of this Request for Bids and meets all applicable legal requirements.

REQUIREMENTS

By submitting a Bid, the Bidder agrees to meet all County requirements as well as any other specifications, requirements and terms and conditions included in this Request for Bids. If a Bidder is unclear about a requirement or specification or believes a change to a requirement would allow for the County to receive a better Bid, the Bidder is urged and cautioned to submit these items in the form of a question during the question-and-answer period in accordance with the section of this Request labeled "Bid Questions".

All material and equipment shall be new and of good quality free from faults, defects and in conformance with the contract documents.

Bidders must provide the appropriate NC license as required by the North Carolina Licensing Board as well as project references in which said license was used for design and erection of a tower.

BID

Bid price shall constitute the total cost to Sampson County for delivery fully-assembled and ready for use, including all applicable charges for shipping, delivery, handling, administrative and other similar fees. The Contractor shall not invoice for any amounts not specifically allowed for in this Request for Bids.

COMPLETION DEADLINE AND LIQUIDATED DAMAGES

The Contractor is required to complete the project within 150 calendar days from notice to proceed. It shall be the responsibility of the Contractor to pursue the orderly progression of all work until the project is completed. Should the Contractor fail to assure the completion of the project satisfactorily within the time period specified in the contract, the Contractor shall be charged with liquidated damages at a rate of _____ per calendar day until the total project is successfully completed.

CONTRACT ADDITIONS AND REDUCTION

As the work progresses, the Contractor may be required to perform extra work as required by the County, subject to the terms and conditions of the final Contract. The County also reserves the right to reduce the contract for any reason whatsoever.

ATTACHMENT #1: BID FORM

FURNISH, DELIVER AND INSTALL:

- **Tower site: Commerce and Fontana Street, Clinton, NC 28328**

Tower Height	Item #	DESCRIPTION	PRICE
120 foot	1	Cost of materials (includes shipping if applicable)	
	2	Cost of labor	
		TOTAL	
	3	Tower lighting <u>if applicable</u> in FAA determination letter	
150 foot	4	Cost of materials (includes shipping if applicable)	
	5	Cost of labor	
		TOTAL	
	6	Tower lighting <u>if applicable</u> in FAA determination letter	

Bid furnished by: _____

Address: _____

Telephone #: _____ Fax #: _____

Tax ID #: _____ Email: _____

Specified Sub-Contractors to be used:

Sub-Contractor Name: _____

Address: _____

Telephone: _____

Sub-Contractor Name: _____

Address: _____

Telephone: _____

I (we) have carefully examined the Bid Information, reviewed the Bid Specifications, and all Addenda and therefore furnish the bid proposal as shown above.

Signature: _____ **Date:** _____

Title: _____

ATTACHMENT #2: HISTORICALLY UNDERUTILIZED BUSINESSES

Historically Underutilized Businesses (HUBs) consist of minority, women, Veteran and disabled business firms that are at least fifty-one percent owned and operated by an individual(s) of the categories. Also included in this category are disabled business enterprises and non-profit work centers for the blind and severely disabled.

Pursuant to G.S. 143B-1361(a), 143-48 and 143-128.4, Sampson County invites and encourages participation in this procurement process by businesses owned by minorities, women, disabled, disabled business enterprises and non-profit work centers for the blind and severely disabled. This includes utilizing subcontractors to perform the required functions in this RFP. Any questions concerning NC HUB certification, contact the [North Carolina Office of Historically Underutilized Businesses](#) at (919) 807-2330. The Bidder shall respond to question #1 and #2 below.

a) Is Bidder a Historically Underutilized Business? Yes No

b) Is Bidder Certified with North Carolina as a Historically Underutilized Business?

Yes No

If so, County HUB classification:

Signature: _____ **Date:** _____

Title: _____

ATTACHMENT #3: AFFIDAVIT OF COMPLIANCE WITH NC E-VERIFY STATUTE

STATE OF NORTH CAROLINA

AFFIDAVIT OF COMPLIANCE

COUNTY OF SAMPSON

with N.C. E-Verify Statutes

I, _____ (hereinafter the "Affiant"), being duly authorized by and on behalf of _____ (hereinafter "Contractor") after first being duly sworn hereby swears or affirms as follows:

1. Contractor understands that E-Verify is the federal E-Verify program operated by the United States Department of Homeland Security and other federal agencies, or any successor or equivalent program used to verify the work authorization of newly hired employees pursuant to federal law in accordance with Article 2 of Chapter 64 of the North Carolina General Statutes; and
2. Contractor understands that an "Employer", as defined in NCGS§64-25(4), is required by law to use E-Verify to verify the work authorization of its employees through E-Verify in accordance with NCGS§64-26(a). The term "Employer" does not include State agencies, counties, municipalities, or other governmental bodies.
3. Contractor is a person, business entity, or other organization that transacts business in this State and that employs 25 or more employees in the state of North Carolina. (mark Yes or No)
 - a. YES _____
 - b. NO _____
4. Contractor will ensure compliance with E-Verify to the extent applicable and will ensure compliance by any subcontractors subsequently hired by Contractor to perform work under Contractor's contract with Sampson County.

This ____ day of _____, 2021.

Signature of Affiant: _____

Print or Type Name: _____

State of North Carolina

County of

Signed and sworn to (or affirmed) before me, this the ____

day of _____, 2021.

My Commission Expires:

Signature: _____

NOTARY SEAL

GENERAL CONTRACT TERMS & CONDITIONS

PERFORMANCE, TRANSITION AND DEFAULT: If, through any cause, the Contractor shall fail to fulfill in timely and proper manner the obligations under the Contract, the County shall have the right to terminate the Contract by giving written notice to the Contractor and specifying the effective date thereof. In that event, any or all finished or unfinished deliverable items under the Contract prepared by the Contractor shall, at the option of the County, become County property, and the Contractor shall be entitled to receive just and equitable compensation for any acceptable work completed as to which the option is exercised. Notwithstanding any such termination, the Contractor shall not be relieved of liability to the County for damages sustained by the County by virtue of any breach of the Contract, and the County may withhold any payment due the Contractor for the purpose of setoff until such time as the exact amount of damages due the County from such breach can be determined.

In the event of default by the Contractor, the County may procure the goods and services necessary to complete performance hereunder from other sources and hold the Contractor responsible for any excess costs occasioned thereby. In addition, in the event of default by the Contractor under the Contract, or upon the Contractor filing a petition for bankruptcy or the entering of a judgment of bankruptcy by or against the Contractor, the County may immediately cease doing business with the Contractor, immediately terminate the Contract for cause, and may take action to debar the Contractor from doing future business with the County.

TERMINATION FOR CONVENIENCE: The County may terminate the Contract at any time by providing thirty (30) days notice in writing from the County to the Contractor. In that event, any or all finished or unfinished deliverable items prepared by the Contractor under the Contract shall, at the option of the County, become its property. If the Contract is terminated by the County for convenience, the County shall pay for those items for which such option is exercised, less any payment or compensation previously made.

AVAILABILITY OF FUNDS: Any and all payments to the Contractor shall be dependent upon and subject to the availability of funds to the County for the purposes set forth in the Contract.

AFFIRMATIVE ACTION: The Contractor will take affirmative action in complying with all federal and state requirements concerning fair employment and employment of people with disabilities, and concerning the treatment of all employees without regard to discrimination on the basis of any prohibited grounds as defined by federal and state law.

ASSIGNMENT: No assignment of the Contractor's obligations or right to receive payment under the Contract shall be permitted.

INSURANCE COVERAGE - During the term of the Contract, the Contractor at its sole cost and expense shall provide insurance of such type and with such terms and limits as may be reasonably associated with the Contract. At a minimum, the Contractor shall provide and maintain the following coverage and limits:

Commercial General Liability - General Liability Coverage on a Comprehensive Broad Form on an occurrence basis in the minimum amount of \$1,000,000 Combined Single Limit. Defense cost shall be in excess of the limit of liability.

Worker's Compensation - The Contractor shall provide and maintain Worker's Compensation Insurance, as required by the laws of North Carolina, as well as employer's liability coverage with minimum limits of \$1,000,000, covering all of the Contractor's employees who are engaged in any work under the Contract. If any work is subcontracted, the Contractor shall require the Sub-contractor to provide the same coverage for any of his employees engaged in any work under the Contract within the County.

Automobile - Automobile Liability Insurance, to include liability coverage, covering all owned, hired, and non-owned vehicles, used within North Carolina in connection with the Contract. The minimum combined single limit shall be \$1,000,000.

Providing and maintaining adequate insurance coverage is a material obligation of the Contractor and is of the essence of the Contract. All such insurance shall meet all laws of the State of North Carolina. Such insurance coverage shall be obtained from companies that are authorized to provide such coverage and that are authorized by the Commissioner of Insurance to do business in North Carolina. The Contractor shall at all times comply with the terms of such insurance policies, and all requirements of the insurer under any such insurance policies, except as they may conflict with existing North Carolina laws or the Contract. The limits of coverage under each insurance policy maintained by the Contractor shall not be interpreted as limiting the Contractor's liability and obligations under the Contract.

GENERAL INDEMNITY: The Contractor shall hold and save the County, its officers, agents, and employees, and architects harmless from liability of any kind, including all claims and losses accruing or resulting to any other person, firm, or corporation furnishing or supplying work, services, materials, or supplies in connection with the performance of the Contract, and from any and all claims and losses accruing or resulting to any person, firm, or corporation that may be injured or damaged by the Contractor in the performance of the Contract and that are attributable to the negligence, breach of contract, or intentionally tortious acts of the Contractor.

SUBCONTRACTING: Performance under the Contract by the Contractor shall not be subcontracted without prior written approval of the County. Unless otherwise indicated, acceptance of a Bid shall include approval to use the subcontractor(s) that have been specified in the Contractor's Bid.

CONFIDENTIALITY: Any County information, data, instruments, documents, studies or reports given to or prepared or assembled by or provided to the Contractor under the Contract shall be kept as confidential, used only for the purpose(s) required to perform the Contract and not divulged or made available to any individual or organization without the prior written approval of the County.

COMPLIANCE WITH LAWS: The Contractor shall comply with all laws, ordinances, codes, rules, regulations, and licensing requirements that are applicable to the conduct of its business and its performance in accordance with the Contract, including those of federal, state, and local agencies having jurisdiction and/or authority.

LIQUIDATED DAMAGES: Time is of the essence with respect to work performed pursuant to the Contract. The Contractor shall complete the project within the time specified in the contract to avoid being charged with liquidated damages per calendar day until the project is successfully completed.

ADDITIONAL CONTRACT TERMS: The County reserves the right to include additional terms and conditions not set forth herein in the Contract it enters into with the successful Bidder.



Sampson County, North Carolina
911 and Emergency Services Facilities
Public Safety Tower

December 22, 2021

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1. PROJECT OVERVIEW

1.1. Project Intent

- A. Sampson County, North Carolina, (County) seeks a 120-foot tower (with growth to 150 feet), tower foundation design (to be provided to building general contractor), a lightning protection system (LPS) for the tower, and tower grounding. The building general contractor will be responsible for foundation installation and grounding/bonding of the tower and ancillary equipment in coordination with the selected Respondent for this procurement. Another contractor will install all equipment on the tower; this is not a component of this bid.

1.2. Project Summary

- A. The purpose of this bid document is for the procurement of a tower, tower grounding including an LPS, and tower foundation design. The tower will be located at the new Sampson County 911 and Emergency Services site.
- B. Tower site drawings have been provided in Appendix A.
- C. Geotechnical studies have been conducted at the proposed location of the tower and are provided in Appendix B.
- D. Respondents shall:
 - 1. Furnish and install a new 120-foot self-supporting tower, with growth potential to 150 feet; climbing access; tower cable support ladder; LPS; grounding per Motorola's *Standards and Guidelines for Communication Sites* (Motorola R56®); and other items specifically noted within this document.
 - (a) Antenna, antenna mounts, and cabling will be supplied and installed by a different vendor.
 - 2. Provide a tower foundation design, stamped by a registered professional engineer (P.E.) in the State of North Carolina, appropriate for a 150-foot self-supporting tower to account for future development.
 - (a) Construction of the tower foundation will be the responsibility of the building general contractor.
 - 3. An Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) must be conducted by the selected Respondent through the Federal Aviation Administration (FAA). The selected Respondent shall file the FAA Notice of Proposed Construction or Alteration forms. The filing should be conducted on tower heights of 120 feet and 150 feet. The highest point of the structure shall be used on the application for both cases not the height of the structure steel.

4. A Federal Communication Commission (FCC) TOWAIR must be performed to determine whether registration with the FCC is necessary. If the antenna structure requires registration, the selected Respondent shall be responsible for all tasking associated with registering the structure with the FCC and receiving an Antenna Structure Registration (ASR).
 5. Provide separate costing for 150-foot self-supporting tower, this cost should include materials and labor.
- E. The selected Respondent shall ensure that all grounding is completed per bid documents, facility construction drawings and specifications; is Motorola R56-compliant; and meets all applicable federal, state, and local codes. The more stringent shall apply.
 - F. The selected Respondent shall be responsible for all permits and inspections for the tower installation, at its cost.
 - G. Respondents shall complete the compliance matrix provided in Appendix C. Failure to respond to any item in the compliance matrix may impact your eligibility.
 - H. Respondents shall prepare and submit a timeline of projected accomplishments, such as tower erection. All installations shall meet the building project specifications and Motorola R56 grounding.
 - I. National Environmental Policy Act (NEPA) adherence has been accomplished for the facility project site. Anything specifically needed for the tower project will be the responsibility of the Respondent.

1.3. Respondent Questions

- A. Respondents may submit questions to the County in written or electronic format (email) no later than January 7, 2022, at 5:00 p.m. ET. Questions should be sent to Juanita Brewington: jbrewington@sampsonnc.com.

1.4. Schedule of Events

While the County is not obligated to comply with the following timeline, it intends to comply with the following schedule, which may be changed in the County's sole discretion.

Table 1: Schedule of Events

Event	Date and Time
Solicitation Issued	December 22, 2021
Site Walk (Upon Request)	To Be Determined

Event	Date and Time
Written Questions Due	January 7, 2022, by 5:00 p.m. ET
Response/Addendum Issued	January 12, 2022
Proposal Due	January 21, 2022, by 2:00 p.m. ET

2. TECHNICAL SPECIFICATIONS

2.1. Site Development

2.1.1. Site

- A. The selected Respondent shall keep the project site neat and free from the accumulation of waste material and debris. This shall be completed daily before leaving the project site.
- B. The successful Respondent shall clean equipment and devices internally and externally using methods and materials recommended by manufacturers, and repair damaged finishes.
- C. Cleanup activity related to installation shall be the selected Respondent's responsibility.
- D. The selected Respondent shall perform site clearing and proper disposal of refuse, per federal, state, and local codes and/or ordinances, where applicable.
- E. The selected Respondent shall document, by photograph, existing site conditions before beginning any work onsite.
- F. The selected Respondent shall inform the County project manager or their designated person(s) of any existing spoils, where applicable.
- G. Onsite burning shall not be allowed anywhere on the property.
- H. The selected Respondent shall conduct a site walk with the County and County's representative to identify any areas requiring special attention prior to beginning work.

2.1.2. Site Preparation

- A. The selected Respondent shall provide a final set of state-engineered stamped construction drawings for review and comment by the County prior to commencing final design. Appendix A indicates the location for the tower. The location shall require field verification with the County's representative prior to approval.
- B. The selected Respondent shall carefully examine and study existing conditions, difficulties, and applicable utilities affecting execution of work. Later claims for additional compensation

due to additional labor, equipment, or materials required due to difficulties encountered shall not be considered.

C. Protection:

1. The selected Respondent shall protect and maintain benchmark, monument, property corner, and other reference points, reestablishing them by registered professional surveyor if disturbed or destroyed, at no cost to the County.
2. The selected Respondent shall locate and identify existing utilities or obstructions that are to remain and protect them from damage, reestablishing them if disturbed or destroyed, at no cost to the County.

3. TOWER FOUNDATION

3.1. Foundation Design

- A. A P.E. registered in the State of North Carolina and competent in civil and structural design shall seal all detailed drawings of the structure and foundation. Submittal and seal shall attest that the design is in full compliance with the mechanical, structural, and electrical parameters established by these specifications.

3.2. Tower Foundation

- A. The tower manufacturer shall provide the tower foundation and structural design based on the geotechnical report from the soil survey (see Appendix B).
- B. The foundation for a tower structure shall be in accordance with design and manufacturer's specifications.
- C. The tower and foundation shall be designed to support initial attachments plus future attachments as identified by the County or County's representative for this project.
- D. Complete structural calculations shall include sufficient information to allow an independent engineer to thoroughly review the design of the proposed tower foundation.
- E. As noted, the sealed foundation design shall be provided to the County. The County's general contractor has responsibility for installing the foundation in coordination with the selected Respondent for this procurement.

4. COMMUNICATIONS TOWER

4.1. Intent

- A. The new tower shall meet the current American National Standards Institute (ANSI)/Telecommunications Industry Association (TIA) 222-H, *Structural Standard for Antenna Supporting Structures and Antennas and Small Wind Turbine Support Structures*, Class IV standard.

- B. Respondents shall adhere to the specifications detailed in federal, state, and local building codes and Sampson County-imposed or -required codes, standards, or regulations, and as applies to the new Sampson County 911 and Emergency Services facility project.

4.2. Construction

- A. The safety factor shall meet ANSI/TIA-222, *Structural Standard for Antenna Supporting Structures and Antennas and Small Wind Turbine Support Structures*, latest revision.
- B. Respondents shall confirm the tower it is bidding is designed per ANSI/TIA-222, latest revision, in accordance with the height, style, and present and future loading specifications contained herein and with consideration of the anticipated soil as indicated above.
 - 1. Prior to commencing work, the selected Respondent shall provide to the County's representative complete detailed drawings of the structure and its foundation for approval. Such drawings shall include a certification and seal of a competent State of North Carolina-licensed and -registered P.E. attesting that the design is in full compliance with the mechanical, structural, and electrical parameters established by these specifications.
- C. Respondents shall design the tower to support an additional 50% of proposed current loading.
- D. The structure shall maintain microwave stability within the allowable signal degradation in accordance with ANSI/TIA-222-H, Annex D, *Twist and Sway Deformation Limitations for Microwave Antennas*.
- E. The tower and components shall be fabricated from solid steel protected by hot-dip galvanizing or other approved methods to prevent rusting.
- F. Sections shall be attached to each other using flange plates.
- G. Welding shall be done in the factory prior to the galvanizing process. Field welding is not acceptable.

4.3. Foundation

- A. Foundation design shall be provided by the tower manufacturer based on the geotechnical report (see Appendix B) and loading data.
- B. Complete structural calculations shall include sufficient information to allow an independent engineer to thoroughly review the design of the proposed tower foundation.
- C. The foundation plan shall be provided to the Sampson County 911 and Emergency Services site project general contractor. The general contractor will be responsible for the completion of the tower foundation per the tower manufacturer's specifications, and in coordination with the selected Respondent.

- D. The selected Respondent shall verify that the foundation has been installed per manufacturer specifications before erecting the tower.
- E. The selected Respondent shall coordinate with the general contractor all tower installation timelines to meet Sampson County 911 and Emergency Services site project schedules.
- F. The selected Respondent shall make the general contractor aware of any noted foundation, site, or tower deficiencies or material delays.
- G. The general contractor will be responsible for all concrete installation inspection per the site drawings and specifications. The selected Respondent shall review the inspection reports and observe installation of the tower foundation. If the tower contractor finds any deficiencies, they shall be noted to the general contractor immediately and noted to the owner, owner's representative, and general contractor via email the same day.

4.4. Tower Design and Loading

- A. The tower structure and supporting concrete foundations shall be designed and manufactured in accordance with these specifications and ANSI/TIA-222, latest revision, and shall be designed as a Class IV structure.
- B. The tower and tower foundation shall be designed to support both proposed and future antennas, side arms, mounting hardware, and cable loading.

4.5. Design Calculations and Drawings

- A. The selected Respondent shall submit structural calculations for the tower and foundation, and erection drawings for the selected bid. Complete structural calculations shall include sufficient information to allow an independent engineer to thoroughly review the designs.
- B. Drawings must include tower name and height; manufacturer's name and model number; elevation and plan views indicating tower orientation, tower height and antenna azimuth; and section assembly information including tower members, part numbers, accessories, and appurtenances.
- C. Drawings, certifications, and design calculations shall be prepared by a P.E. licensed and registered in the State of North Carolina.

4.6. Wind and Ice Load Design

- A. The tower shall be designed and installed to the maximum of the loading conditions from ANSI-EIA/TIA-222, latest revision, for a Class IV structure.

4.7. Antenna Load

- A. The selected Respondent shall account for antenna side arms, standoffs, and mounting hardware to support the proposed microwave dishes and antenna systems in the design of the tower.

- B. The brackets used for design purposes shall be a 6-foot standoff for land-mobile radios.
- C. Pipe mount brackets and pipes shall be assumed for each microwave dish planned.
- D. The actual mounting devices will be provided by the radio vendor and will not be the responsibility of the selected Respondent.

4.8. Climbing Access

- A. A ladder, beginning at a point at least 30 feet above ground, shall be included as an integral part of the tower to permit access by authorized personnel.
- B. This ladder shall be designed and installed so that it rises in a straight line from base to top. Ladders having both angled and vertical combinations shall not be acceptable.
- C. The ladder shall be equipped with an Occupational Safety and Health Administration (OSHA)-approved anti-fall safety device.
 - 1. This device shall not interfere with the climber's ease of reach by hand or foot from one rung of the ladder to the next, either going up or coming down.
- D. A portable section of ladder shall be included to provide access to the permanent ladder on the tower. This ladder shall be designed and constructed so that it is securely held to the tower and firmly supported at the bottom when in use. Clamps, hooks, or similar devices shall be acceptable for securing the top and bottom of the ladder in a vertical position.

4.9. Cable Ladder

- A. The transmission line shall be anchored to the tower using hardware recommended by the transmission line manufacturer for that type of tower.
- B. Transmission lines shall not be installed in a way that will impede climbing or safety devices.
- C. Transmission line installation should be planned with consideration for future expansion.
- D. Spacing of anchoring hardware shall be at 3-foot intervals maximum unless the radio frequency (RF) cable manufacturer requires less distance between supports. The width shall accommodate planned RF cabling and 50% growth for each cable quantity.

4.10. Marking and Lighting (if applicable)

- A. Tower obstruction marking and lighting shall be supplied as required by the applicable determination as issued by the FAA for this project and be fully compliant with FAA AC#AC70/7460-1M (or latest revision), Obstruction Marking and Lighting.
- B. The selected Respondent shall ensure the obstruction lighting system is installed by registered certified installers for the manufacturer and the installers have completed

- applicable training programs as required by the lighting system manufacturer. Copies of the certifications shall be provided to the County.
- C. Unless otherwise required by the FCC, the selected Respondent shall provide a dual-obstruction light emitting diode (LED) lighting system consisting of red lights for nighttime and high or medium intensity flashing white lights for day and twilight per FAA AC #AC70/7460-1M (or latest revision), Obstruction Marking and Lighting.
- D. System control circuitry shall be enclosed in galvanized rigid metallic conduit or other approved method to comply with the National Electrical Code (NEC®), current building project specifications, and local electrical codes in effect at the site of installation.
- E. System control circuitry shall provide synchronization and intensity control of the obstruction lighting system and shall monitor the overall integrity of the lighting system for component failures or improper operation.
- F. Form C, dry alarm output relay contacts, rated at 0.3A minimum at 24 volts direct current (VDC)/125 volts alternating current (VAC), shall be provided, as applicable, to indicate:
1. Flash head or power failure
 2. Side marker lamp failure
- G. The selected Respondent shall wire alarms to a County-provided Type 66 block or demarcation point located in the new facility equipment room. Alarms shall be clearly labeled.
- H. The selected Respondent shall furnish the necessary material and labor to prepare the tower lighting equipment, controller, etc. for electrical power provided to the tower area by the general contractor. The following items, shall be provided.
1. The tower lighting control panel shall be mounted on a Respondent-installed H-frame. The H-frame shall be mounted adjacent to the tower and constructed of like material as the tower. The Respondent shall furnish the H-frame for the general contractor to concrete in place. The H-frame posts shall be properly concreted in place per building project fence post detail specification, minimally.
 2. The selected Respondent shall furnish the general contractor with the manufacturer required overcurrent protection device (OCPD) specifications.
 3. All components shall meet requirements for the environment (e.g., electrical enclosures, metallic surfaced, cabling, etc.).
 4. The lighting cable shall be properly supported per Motorola R56 and manufacturer specifications; the more stringent shall apply. A Flash Technology 2-3-4 wrap for securing to the tower structure is preferred; other manufacturer support submittals will be reviewed by the County. The County and its representative shall review and make final determination.

5. All metallic components (H-frame, metallic enclosures, etc.) shall be properly grounded to the exterior grounding system per Motorola R56 by the general contractor.
- I. Pricing for tower lighting shall be listed as an optional pricing item on the pricing form with the RFP. If the FAA determination letter states that no lighting is needed, the optional pricing will not be selected.

4.11. Labeling and Identification

- A. Make, model, and serial numbers shall be clearly labeled near the base of the tower.
- B. The tower height in feet shall be clearly labeled near the base of the tower.
- C. Latitude and longitude in degrees/minutes/seconds shall be clearly labeled near the base of the tower.
- D. FAA and FCC identification numbers, if applicable, shall be clearly labeled near the base of the tower.
- E. Labeling shall be weatherproof and durable, such as a stamped metal plate or equivalent. Labeling can be attached to a leg or cross brace.

4.12. Final Testing and Acceptance

- A. During installation and upon completion, the tower installation shall be inspected to verify compliance with the manufacturer's requirements.
- B. The selected Respondent shall provide to the County as-built documentation and contractual documents.
- C. Upon completion of the work, documentation detailing final inspection shall be submitted, addressing the following:
 1. Steel structure:
 - (a) Vertical alignment and plumb
 - (b) Bolts tight and torqued to specification
 - (c) No damaged or missing structural members
 - (d) No signs of stress or vibration
 - (e) Climbing ladders and other devices installed correctly
 - (f) Labels and tags
 2. Grounding:
 - (a) Verify lugs and exothermic welds
 3. Photographs:

- (a) Overall structure from north, east, south, and west
 - (b) Footers
 - (c) Grounding and lightning protection documented for both beneath- and above-grade applications
 - (d) The selected Respondent is not responsible for taking photographs of the footers but is required to take photographs of any grounding work they perform above and beneath grade
- D. The selected Respondent shall coordinate with the County for third-party inspection to meet County requirements.

4.13. Tower Climbing and Installation Safety Practices

- A. Because the tower installation requires working at heights, the County is very concerned that all work be done in a safe manner.
- 1. The Respondent must submit as part of its bid document response the Respondent's written environmental safety and health program, to which the Respondent agrees it will adhere.
- B. The selected Respondent must adhere to the following:
- 1. When any work on an antenna support structure is being performed above ground level, there must always be at least two certified competent tower climbers onsite. All personnel working on the tower or in the tower compound must wear hard hats during these times.
 - 2. All tower climbers and their supervisors must have completed an OSHA-approved tower climbing safety and rescue course, such as those offered by ComTrain or Tractel, within the last five years. At least one person within the Respondent's company must have completed the course within the last year, to bring others in the company up to date with any new changes in safety regulations, requirements, and procedures. The Respondent must submit certification cards for its personnel with its response.
 - 3. An industry-standard rescue bag must be ready at the tower site whenever a climber is working on a tower. The bag must include at least one 400-foot, properly rated rescue rope with appropriate safety pulley system and all necessary items to allow the safe lowering of an injured worker. The Respondent must supply evidence that it owns at least one of these kits.
 - 4. All climbers must always wear a full-body safety harness—with the appropriate approved shock-absorbing safety lanyard attached to a single D-ring at the top of the climber's back—when on a tower. Each climber must be issued, equipped, and use fall-protection equipment that must ensure a 100% tie-off while climbing. All fall-protection and safety equipment must meet ANSI and OSHA standards and may be inspected by the County or its representatives at any time during the project.

5. A pre-climb safety meeting is required before each climbing of an antenna support structure. A log of such meetings is required and may be inspected by the County at any time during the project.
- C. The County may perform unannounced safety inspections at any time during the project; this in no way infers that the County has accepted any liability for any safety procedure, equipment condition, safety condition, or work action taken by the selected Respondent, regardless of whether the County was aware of the procedure, condition, or work action. The County has the right, as solely determined by the County, to inform the selected Respondent of any actions, procedures, conditions, or equipment that it deems to be unsafe or potentially hazardous. The County also reserves the right to halt work on the site until such time that the County agrees that the action, procedure, condition, or equipment has been returned to a safe condition. The County will not incur additional charges for the above work stoppage.
 - D. All standard, best safety practices must always be followed when working at the radio site. The selected Respondent shall be solely and completely responsible for the safety and supervision of its employees and any other persons engaged by the Respondent for this project.
 - E. The Respondent must submit a copy of its written drug and alcohol policy, including information on what drug and alcohol testing policies are currently used by the Respondent.
 - F. When performing any work on an antenna support structure, or near any RF emitters, such as antennas and microwave dishes, the selected Respondent must comply with the FCC's OET¹ Bulletin 65, Edition 97-01 (including Supplement A), *Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields*. The Respondent must show proof that its personnel have received training in RF exposure, such as a description of a course taken, or other details on the training received, along with the names of the personnel who will be working on this project and as such may be exposed to RF electromagnetic fields.
 1. In addition, the proposal must contain the model number and serial numbers of at least two personal RF safety monitors.
 2. The selected Respondent shall be solely and completely responsible for the RF exposure compliance and safety and supervision of its employees, and any other persons engaged by the Respondent for this work.

4.14. Field Quality Control

- A. Installation Monitoring and Reporting

¹ Office of Engineering and Technology.

1. The County shall be permitted to monitor any activity associated with tower erection and associated components and/or work.

B. Inspection

1. During the project, the selected Respondent shall maintain an adequate inspection system and shall perform such inspections to ensure that the materials supplied, and the work performed, conform to contract requirements.

C. Pre-Final Testing

1. The entire site development, as well as all components, shall be thoroughly tested and documented before being placed in service.
2. The selected Respondent shall submit test plans for each component and the overall design.
 - (a) The Respondent shall submit sample test plans as part of its response.
 - (b) Specific detailed test plans shall be required to be submitted and approved after final design is completed.
3. The intent of this requirement is to ensure that all test plans will provide for the thorough exercise and documentation of functionality and performance as required by this bid document, as well as other features or enhancements that may be proposed.

D. Reports

1. The selected Respondent shall provide written reports of inspections and observations for the County's analysis.
 - (a) The selected Respondent shall provide records of defective materials, workmanship, and unsatisfactory inspection results for the County's analysis.
 - (b) The selected Respondent shall provide records of repairs and adjustments for the County's analysis.

5. GROUNDING

5.1. General

- A. The selected Respondent shall ensure that a Motorola R56-compliant tower ground bus bar (TGB) is provided and properly installed at the base of the tower.
- B. There shall only be one grounding system at the site. Utility grounds, underground piping, structural steel, concrete reinforcing material, lightning protection, and other grounding components shall be bonded together to form one system. This system is referred to as a single-point ground system.

- C. The general contractor shall install all beneath-earth grounding conductors/material. The selected Respondent shall attach tower leg and radial ground conductors to the tower and allow sufficient length of conductor to be buried and attached to the ground ring by the general contractor.

5.2. Tower Ground Bus Bar Installation

The TGB minimal size shall be ¼-inch thick, 4-inches wide, and 24 inches in length.

- A. The bar shall be of a tin-plated copper material.
- B. Hole spacing for each connector shall be at least ¾-inch on center. There shall be enough to accommodate a two-hole irreversible crimp connector for each antenna transmission cable grounding conductor and provide for 50% growth.
- C. A TGB shall be installed at the bottom of the tower below the transmission line grounding kit near the point where the transmission line vertical run meets the horizontal run toward the equipment room. When transmission lines are run underground via polyvinyl chloride (PVC) conduits, the TGB shall be mounted below the top of the conduits.
- D. The TGB shall be bonded to the tower by means of direct attachment, thus less insulators. The attachment shall be made via stainless-steel hardware.
- E. The selected Respondent shall provide two 3/0 stranded, bare, tinned copper conductors, exothermically welded to the bottom tower TGB and long enough to attach to the tower ground ring.
- F. Each conductor shall attach to the bottom left and right corners of the TGB, respectively, via exothermic weld.
- G. The general contractor shall bond the tower, TGB, and tower lighting ancillary metallic equipment to the exterior grounding system per Motorola R56 and building specifications; the more stringent shall apply.

5.3. Tower Lightning Protection System

Air terminals (lightning rods) shall be properly installed on the tower per National Fire Protection Association (NFPA) 780, *Standard for the Installation of Lightning Protection Systems*; UL; and this bid document. The more stringent shall apply.

- A. Air terminals shall be compatible with the tower structure, stainless steel rods are preferred, and have a Class 2 rating (minimum).
- B. Air terminal(s), as required by NFPA 780, may be directly attached to top of the tower legs by approved methods.
- C. When using air-terminal extension rods, a proper size and material down lead shall be used and properly attached to the top extreme of the leg.

- D. Copper or copper-alloy air terminals, conductors, or attachment hardware **shall not** be used on galvanized towers. Stainless steel is recommended, aluminum is acceptable, or as supplied by the tower manufacturer as part of the tower assembly.
- E. The air terminal shall be positioned to properly protect the highest antenna and/or tower lighting. The air terminal shall extend pass the highest item by 24 inches, minimally.

6. FINAL TESTING AND ACCEPTANCE

- A. At substantial completion, the selected Respondent shall conduct a site walk at the tower location with the County's representative to complete punch lists.
- B. The selected Respondent shall correct punch-list items within 30 days of substantial completion, unless otherwise noted in contract documents.
- C. The selected Respondent shall conduct follow-up inspections, if required.

APPENDIX A: TOWER SITE DRAWINGS



SAMPSON COUNTY
911 & ES
FACILITIES

CLINTON,
NORTH CAROLINA

CONSTRUCTION
DOCUMENTS

ARCHITECTURAL
SITE PLAN

DATE	12.04.2020	
PROJECT NO	20003	
REVISIONS		
NUM.	DATE	DESCRIPTION:
REV4	01/20/21	REV4/ADD3

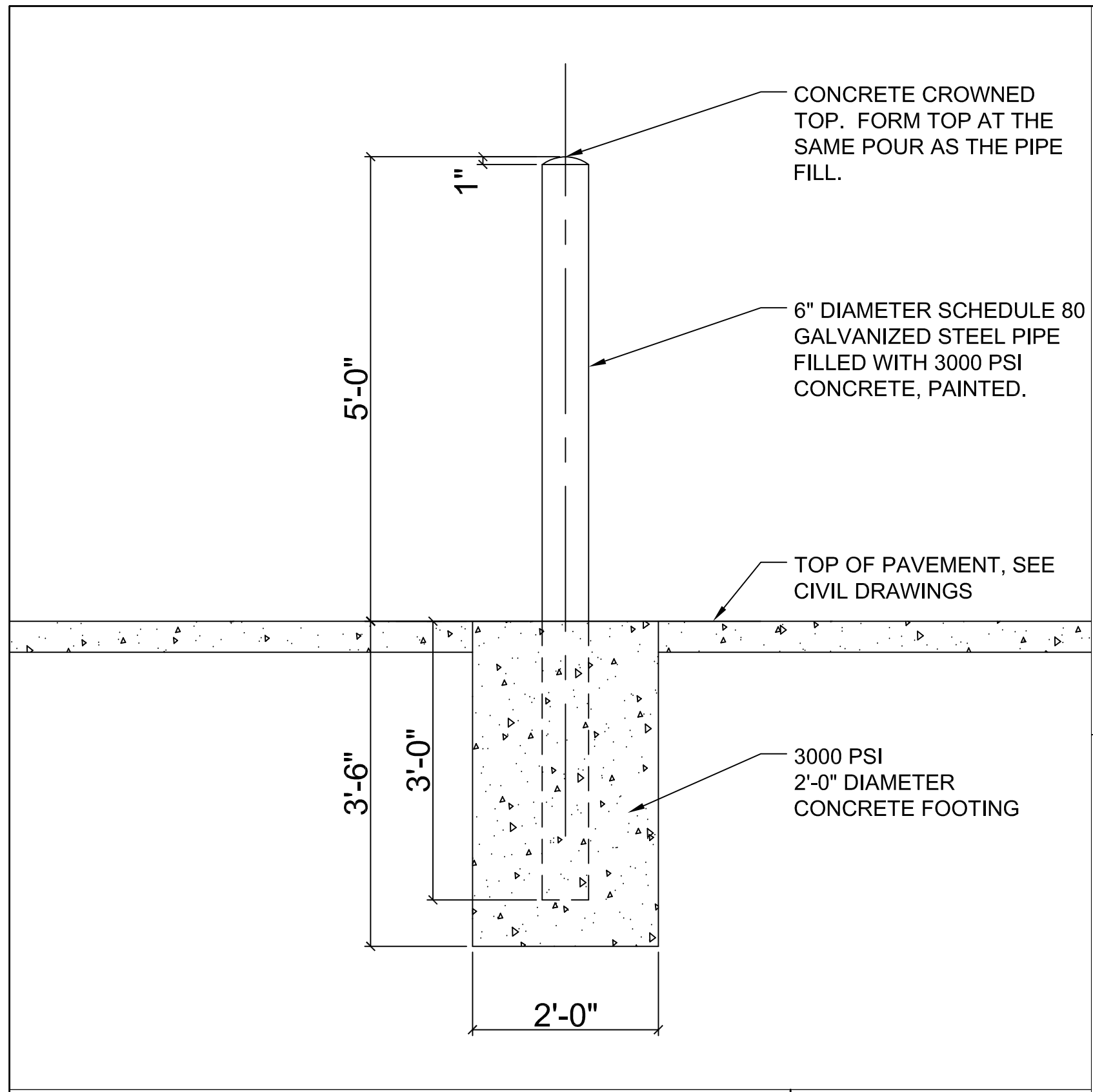
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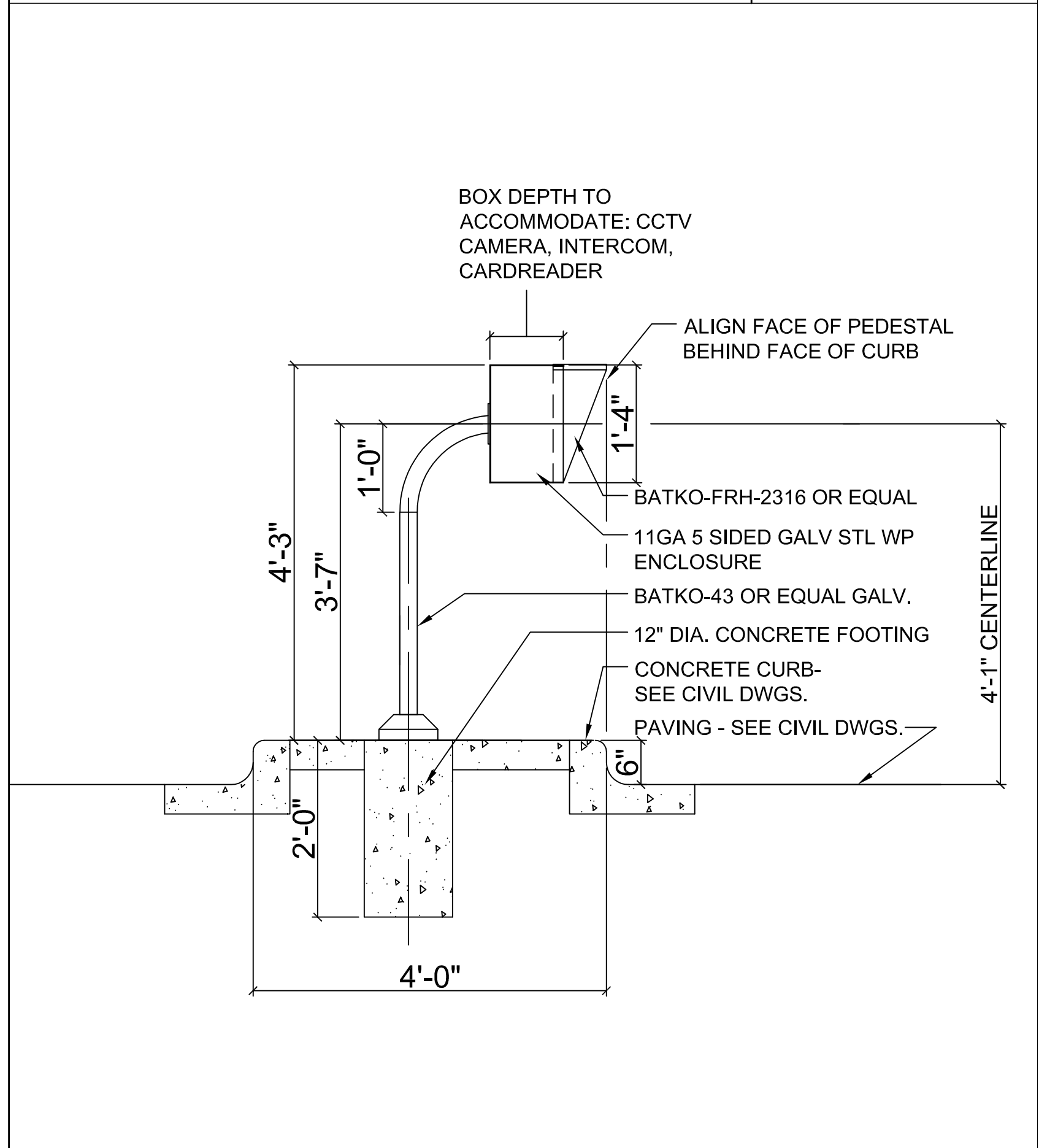
SEAL

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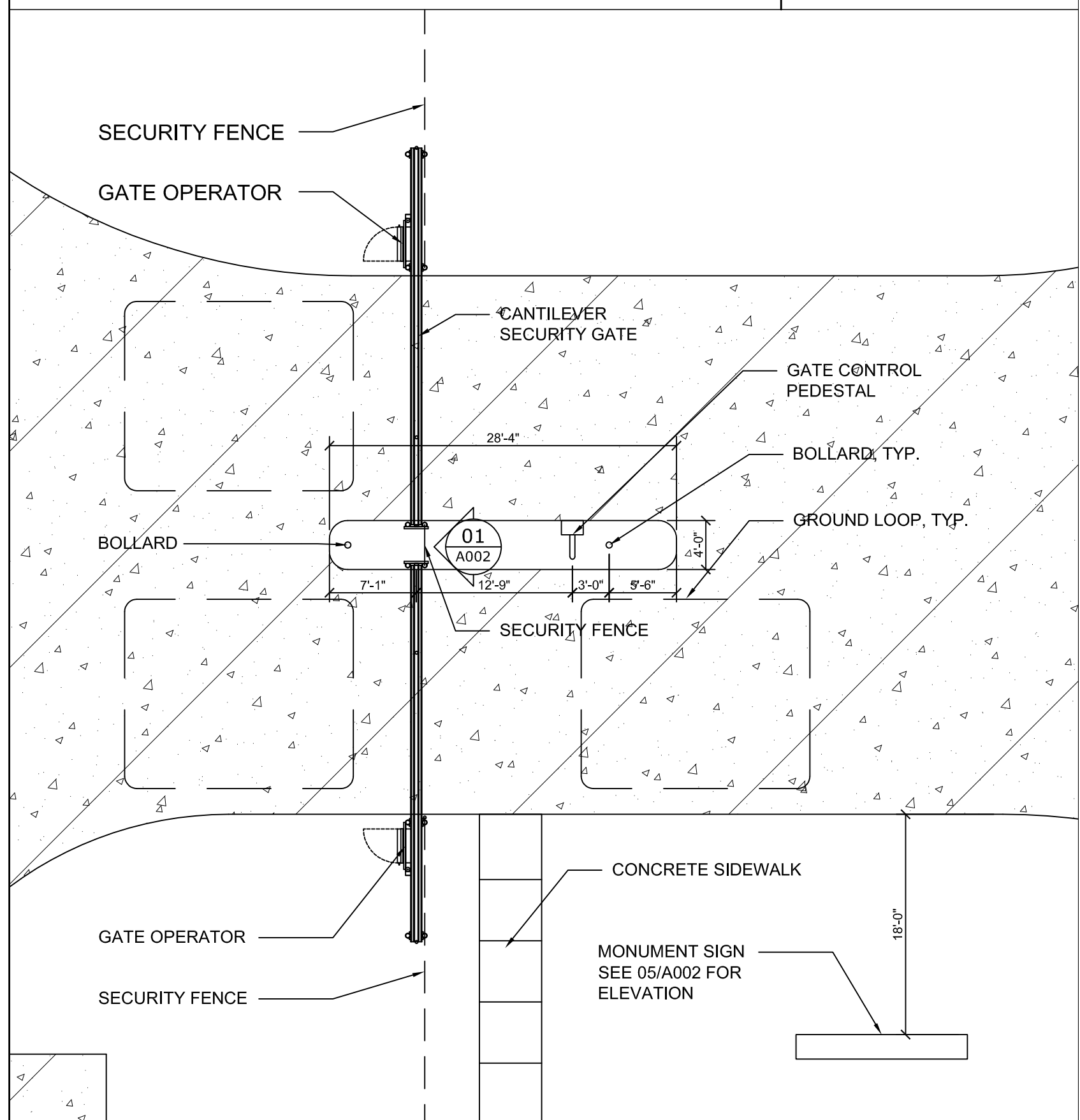
SHEET NUMBER



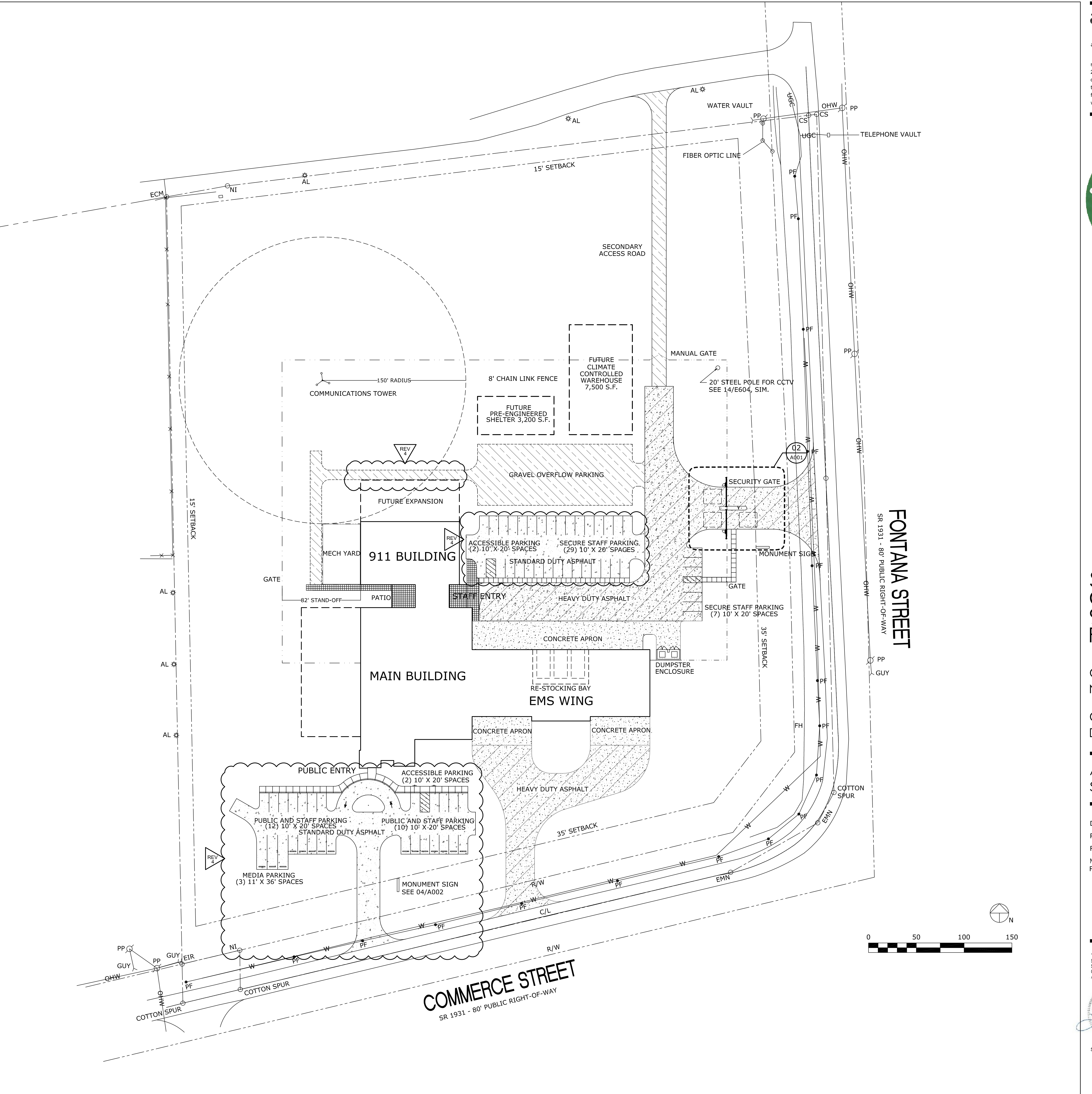
BOLLARD DETAIL SCALE: 3/4" = 1'-0" 4



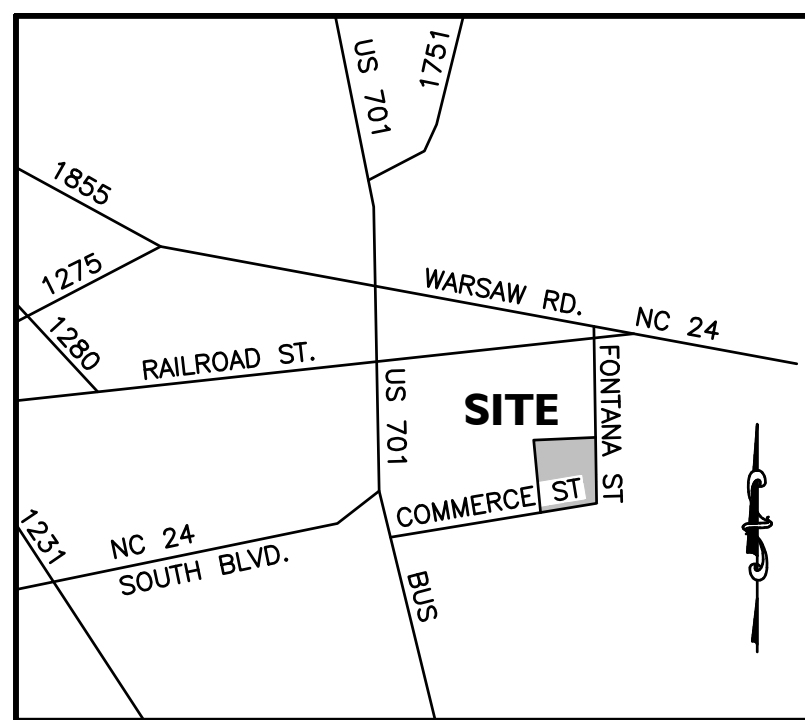
GATE CONTROL PEDESTAL DETAIL SCALE: 3/4" = 1'-0" 3



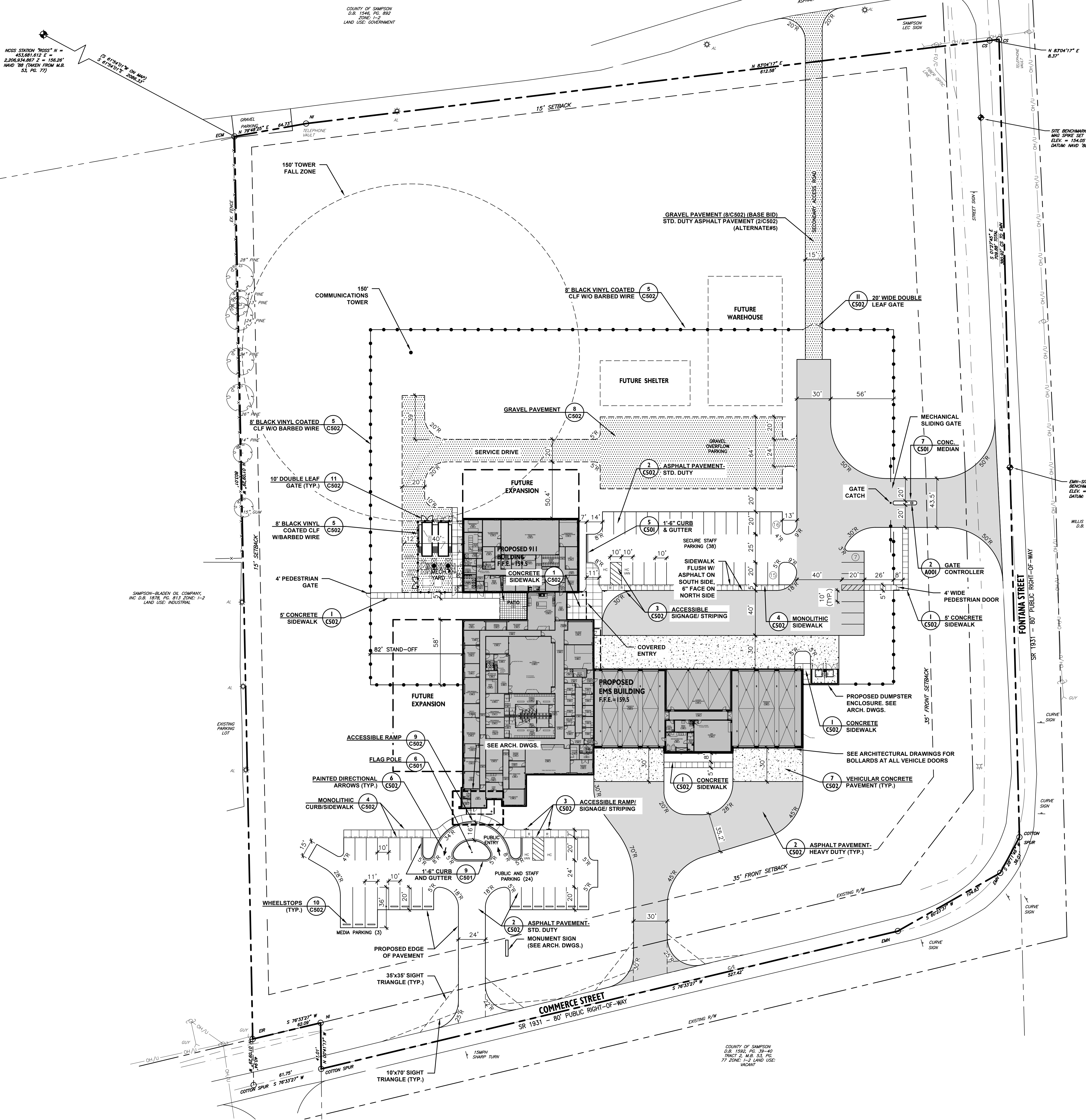
ENLARGED SECURITY GATE PLAN SCALE: 1" = 10' 2



ARCHITECTURAL SITE PLAN SCALE: 1" = 40' 1



VICINITY MAP
NTS

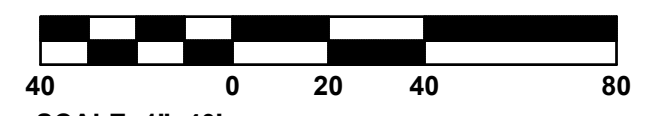


SITE NOTES

- DIMENSIONS AND COORDINATE POINTS ARE TO FACE OF CURB, EDGE OF PAVEMENT, OR CORNER OF BUILDING UNLESS OTHERWISE NOTED.
- ALL IMPROVEMENTS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH STATE AND LOCAL STANDARDS.
- ANY DISCREPANCIES FOUND IN THE FIELD SHALL BE CALLED TO THE ATTENTION OF THE ARCHITECT PRIOR TO PROCEEDING WITH WORK.
- PRIOR TO BEGINNING CONSTRUCTION, UNLESS OTHERWISE PROVIDED IN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS (BOTH SITE AND BUILDING RELATED) INCLUDING BUT NOT LIMITED TO REGULATORY FEES, LICENSES, AND INSPECTIONS NECESSARY FOR PROPER EXECUTION AND COMPLETION OF THE WORK.
- THE GENERAL CONTRACTOR SHALL CONTACT ALL OWNERS OF EASEMENTS, UTILITIES, AND RIGHT-OF-WAYS, PUBLIC AND PRIVATE, PRIOR TO WORKING IN THESE AREAS.
- GENERAL CONTRACTOR SHALL MAINTAIN THE SITE IN A MANNER SO THAT WORKMEN AND THE PUBLIC SHALL BE PROTECTED FROM INJURY.
- SIGHT TRIANGLES SHOWN ARE THE MINIMUM REQUIRED.
- USE CAUTION WHEN REPRODUCING COPIES OF THE CONSTRUCTION DRAWINGS. COPIES ARE SUBJECT TO DISTORTION AND INACCURACY IN THE SCALE OF DRAWINGS. VERIFY ANY DISCREPANCIES WITH BENESCH.
- ALL SIGNS, PAVEMENT MARKINGS, AND OTHER TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), LATEST EDITION AS AMENDED.
- ALL PAVEMENT MARKINGS SHALL BE FOUR (4) INCHES WIDE UNLESS INDICATED OTHERWISE ON THE DRAWINGS.
- CONTRACTOR SHALL FURNISH AND INSTALL ALL PAVEMENT MARKINGS AS SHOWN ON THE PLANS.
- CONTRACTOR SHALL SAW-CUT EXISTING ASPHALT PAVEMENT AREAS TO BE IN SMOOTHLY TO PROPOSED PAVEMENT AT DRIVEWAY ENTRANCES.
- REFER TO ARCHITECTURAL PLANS FOR ACTUAL BUILDING DIMENSIONS.
- THE ENGINEER WILL PROVIDE THE CONTRACTOR WITH AN ELECTRONIC FILE OF THESE DRAWINGS UPON REQUEST. RELEASE FORM REQUIRED.
- CONTACT THE UTILITY COMPANY TO RELOCATE ANY EXISTING UTILITY POLES. ALL EXISTING FACILITIES WHICH CONFLICT WITH THE IMPROVEMENTS UNDER THE SCOPE OF THIS PROJECT MUST BE RELOCATED AT THE EXPENSE OF THE OWNER.
- STOP BEFORE YOU DIG. CALL 811. IT'S THE LAW.
- HEAVY DUTY PAVEMENT SHOWN ON THIS PLAN IS CAPABLE OF SUPPORTING AN 8000 LB FIRE TRUCK.
- ALL ROAD IMPROVEMENTS AT COMMERCE STREET & FONTANA STREET TO BE COORDINATED WITH CITY ENGINEERING DEPARTMENT PRIOR TO CONSTRUCTION.

LEGEND

—	EXISTING SIGN	---	EXISTING CURB AND GUTTER
- - -	PROPOSED SIGN	---	PROPOSED CURB AND GUTTER
⊙	EXISTING IRON PIN	---	PROPOSED FLUSH CURB AND GUTTER
⊙	EXISTING LIGHT POLE	---	PROPERTY LINE
⊙	EXISTING UTILITY POLE	---	EXISTING EASEMENT
R/W	RIGHT-OF-WAY	---	EXISTING FENCE
HC	ACCESSIBLE SPACE	---	EXISTING FENCE
⊙	EXISTING TREE TO REMAIN	---	EXISTING OVERHEAD UTILITY LINE
⊙	EXISTING FIRE HYDRANT	---	PROPOSED STANDARD DUTY ASPHALT PAVEMENT
⊙	# OF PARKING SPACES	---	PROPOSED HEAVY DUTY ASPHALT PAVEMENT
⊙	CENTERLINE	---	PROPOSED GRAVEL PAVEMENT
⊙	ACCESSIBLE RAMP	---	PROPOSED VEHICULAR CONCRETE PAVEMENT
⊙	PROPOSED BOLLARD		



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704.521.9880
Corp. NC License: F-1320
Project #17.000357.01

**SAMPSON COUNTY
911 & ES
FACILITIES**

CLINTON,
NORTH CAROLINA

**CONSTRUCTION
DOCUMENTS**

SITE PLAN

DATE 12.04.2020
PROJECT NO 20003
REVISIONS
NUM. DATE DESCRIPTION:

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SEAL
12/4/20

SHEET NUMBER **C200**

APPENDIX B: GEOTECHNICAL SURVEYS



Geotechnical Engineering Report
Sampson County 911 and
Emergency Services Facility
Clinton, North Carolina
S&ME Project No. 1305-20-023

PREPARED FOR:

Sampson County Public Works
817 Southeast Boulevard
Clinton, North Carolina 28328

PREPARED BY:

S&ME, Inc.
3201 Spring Forest Road
Raleigh, North Carolina 27616

April 30, 2020



April 30, 2020

Sampson County Public Works
817 Southeast Boulevard
Clinton, North Carolina 28328

Attention: Mr. Lin Reynolds

Reference: **Geotechnical Engineering Report**
Sampson County 911 and Emergency Services Facility
Clinton, North Carolina
S&ME Project No. 1305-20-023
N.C. PE Firm License No. F-0176

Dear Mr. Reynolds:

S&ME, Inc. (S&ME) appreciates the opportunity to provide our services on this project. Our services were performed in general accordance with our proposal number 13-2000046, Revision 1, dated February 13, 2020. This report presents a brief summary of our understanding of the project, descriptions of our field exploration, a discussion of encountered subsurface conditions, and conclusions and recommendations.

We appreciate the opportunity to work with Sampson County on this project. Please contact us with any questions, or if you need additional information.

Sincerely,

S&ME, Inc.

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

Kevin A. Nadeau, P.E.
Senior Geotechnical Engineer
N.C. Registration No. 34358



A handwritten signature in blue ink, appearing to read 'J. Adam Browning'.

J. Adam Browning, P.E.
Geotechnical Area Manager



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Appendices

Appendix I – Figures

Appendix II – Boring Logs

Appendix III – Laboratory Test Results

1.0 Project Information

This report is based on the following information:

- ◆ Email and telephone correspondence from Mr. Reynolds to Mr. Adam Browning (S&ME) on January 30, 2020.
- ◆ *Site Plan Concept A* figure prepared by ADW Architects (image at right).
- ◆ Email correspondence between Mr. Reynolds and Mr. Henry Camp (S&ME) on March 12, 2020.
- ◆ Email correspondence between Mr. Lance Williams (Stewart) and Mr. Camp on March 24, 2020.
- ◆ Sampson County GIS.

We understand Sampson County plans to develop a new 911 and emergency services facility on Commerce Street and Fontana Street in Clinton, North Carolina. Conceptually, development will include an approximate 38,800 square foot building with associated paved parking and drive lanes, and gravel parking lot. A communication tower is planned on the west side of the site. Access to the site will be provided via Fontana Street and Commerce Street.



The subject site is comprised of one parcel identified with Sampson County PIN 12013180106 and is approximately 21.5 acres. The site is presently undeveloped agricultural land. Existing ground surface elevations within the site range from about 154 to 156 feet.

Information pertaining to structural loads was provided to us by the structural engineer. Maximum column and wall loads of 95 kips and 5 kips per linear foot, respectively, are anticipated. We have assumed a maximum slab load of 200 pounds per square foot. We have assumed the planned tower will be a self-supporting tower. We understand the owner's intent is to raise site grades with stockpiled soil from the Sampson County Airport.

2.0 Regional Geology

The site is located within the Coastal Plain Physiographic Province of North Carolina. The Coastal Plain Province is typically characterized by marine, alluvial, and aeolian sediments that were deposited during periods of fluctuating sea levels and moving shorelines. The soils and basal formations in the North Carolina Coastal Plain Physiographic Province are typical of those laid down in a shallow sloping sea bottom; interbedded sands and clays with irregular deposits of shells and cemented sands are typical. Alluvial sands, silts, and clays are typically present near rivers and creeks. Deposits of peat, organic silt, and organic clay are also typically present in or near current or former tidal marsh areas in the outer portion of the Coastal Plain.



Specifically, the site is underlain by the Black Creek Formation, a unit of Cretaceous age that generally contains beds of lignitic (carbon-rich) sand, interbedded with clay and laminae of fine-grained micaceous sands. In the upper part of the formation, it is glauconitic (mica-rich), with fossiliferous clayey sand lenses.

3.0 Exploration Program

Our subsurface exploration included a visual site reconnaissance and performance of 16 soil test borings to depths ranging from about 5 to 50 feet beneath the existing ground surface. Test locations were marked in the field with a handheld GPS device. Approximate test locations are shown on Figure 2 in the Appendix.

Soil test borings were advanced using hollow-stem-auger drilling procedures with a CME-550X drill rig mounted on an all-terrain vehicle. Within each boring, samples of subsurface soils were taken at 2.5-foot intervals above a depth of 10 feet, and at 5-foot intervals below 10 feet using a split-spoon sampler. Standard penetration testing was performed in conjunction with split-spoon sampling in general accordance with ASTM D 1586. Groundwater levels measurements were attempted in all boreholes after drilling and after a period of about 24 hours in select boreholes.

S&ME collected three bulk soil samples for laboratory testing from stockpiled material at the nearby Sampson County Airport.

A Generalized Subsurface Conditions profile (Figure 3) along with individual boring logs are included in the appendix. Stratification lines shown on boring logs and profile are intended to represent approximate depths of changes in soil types. Naturally, transitional changes in soil types are often gradual and cannot be defined at particular depths. Ground surface elevations shown on the profile and logs were estimated from Google Earth and should be considered approximate.

4.0 Surface and Subsurface Conditions

General descriptions of soil encountered in our borings are presented below. Stratification lines on the boring logs represent approximate boundaries between soil types; however, the actual transition may be gradual. More detailed information is available on individual boring logs. A Generalized Subsurface Profile is shown in Figure 3, Appendix I.

4.1 Surface Conditions

The site reconnaissance revealed standing water in the southwestern corner of the site. The exploration encountered approximately 4 inches of topsoil at the ground surface. The topsoil depths provided in this report are based on measurements made during drilling and should be considered approximate. We note that the transition from topsoil to underlying soils may be gradual.

Borings were performed in areas which have been used as agricultural land. Typically, cultivated areas produce a layer of dark, stained sandy soils just beneath the topsoil. The stained soils typically do not contain a significant amount of organics to require stripping, but they are often mistaken for topsoil due to their dark color. During



wet periods of the year, these cultivated soils can trap and pond rainwater, saturating them and the underlying soils.

4.2 Coastal Plain Soils

Coastal Plain (natural) soils were encountered below the topsoil at each boring location. The soil profile at this site was generally comprised of very soft to stiff, low to high plasticity clays (USCS classifications CL and CH) overlying very loose to medium dense silty and clayey sands (SM, SC and SP-SM). Typical SPT N-values within the upper 3 feet ranged from 2 to 4 blows per foot (bpf) and from 4 to 11 bpf below 3 feet with isolated higher and lower values. The samples were visually observed as moist to wet. All borings were terminated in Coastal Plain soils at their predetermined depths.

Water was observed in most boreholes at depths of about 2 to 5 feet below the existing ground surface approximately 24 hours after termination of boring. Water levels tend to fluctuate with seasonal and climatic variations. Perched water conditions may exist during the typically wetter winter months above less permeable fine-grained soils. Therefore, groundwater may be encountered during construction at depths not indicated by the borings.

5.0 Laboratory Testing

Natural moisture content, Atterberg limits, and grain size analysis testing was performed on selected split-spoon samples. Individual laboratory test records are included in Appendix III. The following table summarizes the results of that testing.

Table 5-1 – Summary of Laboratory Tests (On Site)

Borehole (Sample depth, ft)	USCS Classification	Natural Moisture Content (%)	% Gravel	% Fines (Silt / Clay)	Atterberg Limits		
					PL	LL	PI
SB-2 (1-2.5)	CL	23.5	ND	ND	23	42	19
SB-6 (18.5-20)	CH	61.4	ND	ND	28	80	52
SB-9 (1-2.5)	CL	21.3	ND	ND	19	37	18
SB-10 (1-2.5)	SM	23.3	0.4	46.8	ND	ND	ND
SB-12 (1-2.5)	CL	23.4	ND	ND	25	45	20
SB-14 (1-2.5)	CL-ML	17.8	ND	ND	15	21	6

PL – Plastic Limit, LL – Liquid Limit, PI – Plasticity Index, ND - Not Determined

A soil stockpile at the Sampson County Airport was identified by Sampson County Public Works as a potential source of off-site borrow material. Three bulk samples of the stockpiled material were submitted for testing including natural moisture content, Atterberg limits, grain size analysis, standard Proctor, and California Bearing Ratio (CBR) determination. The following table summarizes the results of that testing.



Table 5-2 – Summary of Laboratory Tests (Off Site)

Sample # (Depth, ft)	USCS Classification	Natural Moisture Content (%)	% Gravel	% Fines (Silt / Clay)	Standard Proctor		Atterberg Limits			California Bearing Ratio* (%)
					MDD (pcf)	OMC (w, %)	PL	LL	PI	
Bulk-1 (0-1)	SC	5.0	0.1	25.8	118.5	12.3	18	25	7	ND
Bulk-2 (0-1)	SM	5.2	1.3	18.8	123.0	10.8	ND	ND	ND	ND
Bulk-3 (0-1)	SM	8.9	3.2	20.6	119.0	10.9	21	18	3	26.2

PL – Plastic Limit, LL – Liquid Limit, PI – Plasticity Index, ND – Not Determined, *Corrected at 0.1 in penetration, tested @ 98% compaction near OMC.

6.0 Conclusions and Recommendations

The exploration indicates the site is adaptable for the proposed construction. The following presents our geotechnical recommendations regarding site grading and structural support.

6.1 Discussion

Borings performed for this exploration revealed the presence of near-surface, low-consistency soils (N-values of 2 to 4 bpf) across the site. Groundwater levels recorded in borings ranged from about 2 to 5 feet below the ground surface. These conditions will make site development very difficult, particularly if construction is scheduled to begin during typically wetter months of the year (November through April). Additionally, the presence of a cultivated soil layer will make grading this site particularly susceptible to wet weather conditions. To aid in subgrade stabilization we recommend installation of temporary drainage ditches and chemical stabilization, followed by raising site grades at least 3 feet. Further discussion is provided in the following sections.

6.2 Earthwork

6.2.1 Site Preparation - General

Site grading will be very difficult based on subsurface conditions encountered in the borings. This will especially true of site grading occurs during periods of extended rainfall that generally occur during the winter and early spring months. To reduce potential earthwork problems, site preparation and grading should be scheduled during the typically drier months of May through November, if possible. If winter grading is attempted, repair of near-surface soils and possible use of select off-site borrow will be necessary to adequately prepare subgrades for new construction. Heavy rubber-tired construction equipment should not be allowed to operate on exposed subgrades. Dedicated travel paths should be established within the site to reduce ground disturbance from construction equipment. Even during drier periods of the year, we recommend that exposed subgrades be sloped and sealed at the end of each day to promote runoff and reduce infiltration from rainfall.

The site has been used for agricultural purposes and includes a cultivated soil layer. This layer will make this site particularly susceptible to wet weather conditions. During wet periods of the year or after rainfall, cultivated soils will trap and pond rainwater, saturating them and underlying soils. When wet, near surface soils will become



unstable, and will not support rubber-tired construction equipment without rutting and pumping. Schedule delays and additional costs for undercutting or stabilizing near surface soils should be expected if grading occurs during a wet period of the year.

Initial site preparation should include stripping of organics and topsoil and removing any other deleterious materials. Borings performed for this exploration indicated a topsoil thicknesses of about 4 inches. Greater topsoil thicknesses should be anticipated in unexplored areas of the site. We recommend that topsoil stripping be performed with light, tracked equipment to reduce disturbance of underlying, low-consistency soils.

6.2.2 Site Preparation – Subgrade Stabilization

Borings performed for this exploration revealed the presence of near-surface, low-consistency soils (N-values of 2 to 4 bpf) across the site. Groundwater levels recorded in borings ranged from about 2 to 5 feet below the ground surface. Given these conditions, we expect exposed subgrades to be unstable during proofrolling. To aid in subgrade stabilization we recommend a combination of installing temporary shallow drainage ditches followed by chemical treatment (lime or cement).

Temporary Drainage Ditches

To control groundwater and aid in stabilizing subgrade soils within the building footprint and other site areas, we recommend excavating a series of open trenches to allow for initial drainage. Trenches should be installed as early as possible prior to commencement of mass earthwork operations. Trenches should be at least 24 inches wide, deep enough to provide a positive drainage gradient, and spaced at approximate 50-foot centers. We recommend the trenches extend to a depth of at least 3 feet below existing site elevations. The initial drainage period will be dependent on several factors including precipitation amounts and soil types. For planning purposes, we suggest allowing for a drainage period of at least 2 weeks.

After the initial drainage period, trenches should then be cleaned out and converted to permanent French drains. French drains should be lined with a non-woven geotextile fabric (Mirafi 160N or equivalent) and backfilled with washed No. 57 stone. The French drains should be sloped to drain to a daylight point. Additional French drains (or other means of permanent dewatering) will be needed if deeper excavations are planned. Again, the intent of the French drains is to provide permanent drainage and aid in subgrade stabilization prior to structural fill placement to raise site grades.

Chemical Stabilization

Subgrade soils that will be exposed beneath topsoil are generally comprised of low-consistency sands and clays. In order provide a stable subgrade for fill placement within building pads and pavement areas, we recommend that the top 12 inches of subgrade exposed beneath the topsoil be chemically stabilized (i.e. lime or cement). Chemical stabilization, if constructed properly, provides long-term strength, stability, and durability, while also producing a relatively impermeable layer. Construction considerations regarding chemical stabilization are described below.

Underground utilities should be designed and installed in a way so they are not present within the top 12 inches of existing subgrade below the topsoil during chemical stabilization. We recommend that utilities be installed after

the site has been raised to its design subgrade elevation in order to avoid rutting the near-surface low-consistency soils.

Laboratory testing is required to determine percent chemical (lime or cement) required. Based on past experience, we anticipate 4 to 6 percent by dry weight will be required if lime is utilized, and higher amounts required if cement is chosen. The chemical will need to be incorporated into the upper soils to produce a minimum 12-inch thick chemical stabilized layer. S&ME can perform the required laboratory testing to determine the percent chemical required.

The chemical stabilization construction process typically consists of the following steps:

1. Stripping of topsoil, organics, and other deleterious materials.
2. Scarifying soil layer and partial pulverization.
3. Spreading of chemical at rate to be determined based on additional laboratory testing.
4. Rotor mixing the chemical into soil.
5. Lime Only: Allowing soil to mellow for a sufficient period (1 to 4 days) to allow the chemical reaction to occur.
6. Lime Only: Further rotor mixing and pulverizing chemical amended soil to achieve thorough mixing. Obtaining proper moisture in the soils for compaction.
7. Compacting soil/chemical mixture to a desired compaction level of 95 percent of its standard Proctor maximum dry density (ASTM D 698). Moisture content should be maintained within the soil-lime mixture's optimum moisture content (OMC) to 2 percent wet of OMC.
8. Allow compacted chemical stabilized layer to cure to sufficient strength to allow equipment to place and compact subsequent fill lifts without undue instability. Maintain chemical-treated layer near its optimum moisture condition during the curing process.

Chemical stabilization should not be performed when the air temperature is below 45 degrees Fahrenheit. Lime/cement should only be applied in areas that can be initially mixed and sealed during the day of application. Lime/cement should not be applied in windy conditions.

We recommend that S&ME personnel be present during chemical stabilization operations to observe that the following items are in accordance with our recommendations:

- Amount of chemical spread
- Thickness of chemical stabilized layer
- Compaction of chemical stabilized layer

6.2.3 *Subgrade Evaluation and Repair*

After subgrade stabilization is complete, subgrades should be evaluated by the geotechnical engineer or their representative prior to fill placement. This evaluation should include proofrolling with a fully loaded tandem-axle dump truck or similar rubber-tired construction equipment. Any areas that deflect excessively should be repaired. Repair measures may include additional chemical treatment to the unstable layer or undercut and replacement with a geotextile and select backfill material consisting of relatively clean, granular materials (i.e. clean sand or stone). This will be a field decision at time of grading.



6.2.4 *Structural Fill Placement and Compaction*

After subgrade stabilization is complete and subgrades are deemed stable, we recommend site grades be raised at least 3 feet. We understand stockpiled soils located at the Sampson County Airport are intended for use as project fill. Laboratory testing of three bulk samples collected from the stockpile indicate silty and clayey sand (SM and SC) soil types with 18.8 to 25.8 percent fines (silt/clay), standard Proctor MDDs ranging from 118.5 to 123 pcf, and optimum moisture contents (OMCs) ranging from 10.8 to 12.3 percent. Based on our laboratory test results, the tested soils are considered suitable for use as project structural fill. We note that natural moisture contents ranged from 5 to 8.9 percent indicating that moisture conditioning (wetting) will be needed to achieve the soils' OMCs.

If select backfill is determined as required for undercut replacement, we recommend this material contain less than 12 percent fines (silt/clay).

All structural fill should be free of deleterious materials and contain less than 5 percent organics.

Structural fill should be placed in 8 to 10-inch thick lifts (loose measure) and compacted to at least 95 percent of the material's standard Proctor maximum dry density. Within the upper 18 inches of the subgrade, soils should be compacted to at least 98 percent. Structural fill should be placed and compacted within 3 percent of its optimum moisture content.

6.2.5 *Excavations*

Borings typically encountered low to moderate consistency soils and groundwater within about 2 to 5 feet of existing ground surface. Our comments regarding excavation of these materials are below.

Low to moderate consistency soils, and newly placed structural fill, can typically be excavated by routine earth moving equipment. Local excavations for shallow utility trenches and foundations within these materials can be accomplished by a conventional backhoe or large track-mounted backhoe.

Groundwater was encountered across the site at depths ranging from about 2 to 5 feet below existing ground surface. To control groundwater and aid in stabilizing near-surface soils, we recommend a combination of early-construction drainage ditches and permanent French drains as described above. The contractor should be prepared to control any water that collects in excavations. The contractor should be responsible for determining water control measures during excavations.

Excavations should be sloped or shored in accordance with local, state and federal regulations, including OSHA (29 CFR Part 1926) excavation trench safety standards. The contractor is usually responsible for site safety. This information is provided only as a service and under no circumstances should we be assumed responsible for construction site safety.

6.3 **Foundation Recommendations**

Based on soil test borings and provided structural loads, structure foundations can be supported on shallow spread footings provided the site is prepared as recommended herein. Footings should bear at least 18 inches



below exterior grade to avoid frost penetration and develop the design bearing resistance. Continuous wall footings should be at least 18 inches wide, and isolated column footing should be at least 24 inches wide. This recommendation is made to prevent a localized or “punching” shear failure conditions which can occur with very narrow footings.

Maximum column and wall loads of 95 kips and 5 kips per linear foot, respectively, are anticipated. We have assumed a maximum slab load of 200 psf. Based on our evaluation and site preparation recommendations herein, planned spread foundations bearing on approved soils may be designed for a net allowable bearing pressure of 2,000 psf. Estimated maximum total settlements of planned foundations are expected to be 1 inch or less. Maximum differential settlements between similarly loaded columns are expected to be ½ inch or less. We have assumed these total and differential settlement estimates are manageable and acceptable.

6.3.1 Footing Evaluations

The bottom of all foundation excavations should be evaluated by S&ME using a hand auger and dynamic cone penetrometer (DCP) to gauge the consistency of subgrade soils and determine that subsurface conditions beneath foundation elements agree with those encountered in the soil borings. Foundation subgrades that are unstable should be over-excavated and replaced with washed (NCDOT #57) stone. The acceptability of #57 stone for use as over-excavation backfill must be evaluated on a case-by-case basis during construction considering the potential for undermining due to future adjoining excavations, underground repair work, interference with subdrains, etc. Washed stone should be available to immediately backfill overexcavation.

While subgrade stabilization measured are recommended above for site grading considerations, we still anticipate foundation subgrade repair will likely be required. The extent and depths of repair will be based on final foundation bearing elevations and site conditions at time of grading.

The subgrade materials can be sensitive to moisture variations; therefore, foundation excavations should be opened for only a minimum amount of time, particularly during inclement weather. Soils exposed to water may become softened and undercutting may be required prior to placing foundations on these materials. If foundation excavations must remain open overnight, or if rainfall becomes imminent while the bearing soils are exposed, we recommend that a 2 to 4-inch thick “mud-mat” of lean (2,000 psi) concrete be placed on the bearing soils before placement of reinforcing steel to help protect the bearing soils from further disturbance.

6.4 Floor Slabs

A properly prepared subgrade should be suitable for slab-on-grade support. We recommend a 6-inch minimum thickness of compacted dense graded aggregate (NCDOT ABC gradation) beneath slabs to enhance uniform slab support. We recommend a modulus of subgrade reaction value (k-value) of 125 psi/inch be used for slab-on-grade design. A vapor retarder should be included in the slab design if vapor penetration is an unacceptable condition. The slab subgrade should be evaluated by proofrolling with overlapping passes of a loaded tandem-axle dump truck or similar pneumatic tire vehicle with a minimum weight of 20 tons immediately prior to placement of concrete.



6.5 Seismic Site Classification & Liquefaction Potential

Based on our test borings and Section 1613 of the North Carolina Building Code 2018 Edition, the site is a **Seismic Site Class E**.

In addition to a seismic site classification, we performed a liquefaction analysis based on the design earthquake prescribed by the 2015 edition of the International Building Code (IBC 2015). Liquefaction potential was evaluated and determined to be minimal based on results of CPT soundings and shear wave velocity measurements. To help evaluate the consequences of liquefaction, we have computed the Liquefaction Potential Index (LPI), which is an empirical tool used to evaluate the potential for liquefaction to cause damage. The LPI considers the factor of safety against liquefaction, the depth to the liquefiable soils, and the thickness of the liquefiable soils to compute an index that ranges from 0 to 100. An LPI of 0 means there is no risk of liquefaction; an LPI of 100 means the entire profile is expected to liquefy. The level of risk is generally defined as:

- **LPI < 5** – surface manifestation and liquefaction-induced damage not expected.
- **5 ≤ LPI ≤ 15** – moderate liquefaction with some surface manifestation possible.
- **LPI > 15** – severe liquefaction and foundation damage is likely.

We calculated an LPI of 3 for this site, which indicates surface manifestation and liquefaction-induced damage is not expected.

6.6 Pavements

Pavement design procedures are based on AASHTO “Guide for Design of Pavement Structures” (1993) and associated literature. Given current traffic estimates provided by the Sampson County EMS Operations Chief, the following usage assumptions were used in our analysis:

- ◆ 20-year design life
- ◆ 100 passenger vehicles per day
- ◆ 20 emergency vehicles (ambulances) per day
- ◆ 2 fire trucks per month
- ◆ 4 delivery trucks per week
- ◆ 2 garbage trucks per week
- ◆ 2 tractor-trailers per week

The estimated total traffic load over the 20-year design life is approximately 60,000 18-kip equivalent single axle loads (ESALs). We have estimated approximately 5,000 ESALs over a 20-year design life for light-duty pavements (i.e. parking stalls with passenger vehicles only). If actual ESAL values differ, we should be notified to review and revise our recommendations accordingly. The pavement analysis was based on an initial serviceability index of 4.2, a terminal serviceability index of 2.0 and a 20-year design life.



6.6.1 Asphalt Pavement

Based on the laboratory test results for the off-site borrow samples, a design CBR value of 8 percent was used for pavement design. Recommendations for standard duty and heavy duty pavements are provided in Table 7-2 below:

Table 6-1 – Asphalt Pavement Sections

Pavement Type	Light Duty (parking stalls only)	Heavy Duty
Surface Course	2 inches S-9.5B	3 inches* S-9.5B
Aggregate Base Course (ABC) Stone	6 inches	8 inches

**Requires two lifts.*

All materials and construction methods should conform to the 2018 edition of the NCDOT “Standard Specifications for Roads and Structures.” In-place density tests of subgrade soils and crushed stone base course should be performed by a qualified soils technician and the area should be thoroughly proofrolled under his observation.

Asphaltic concrete should conform to Section 610 in the 2018 edition of the NCDOT “Standard Specifications for Roads and Structures.” Sufficient testing and observation should be performed during pavement construction to confirm that the required thickness, density, and quality requirements of the specifications are achieved.

Although our analysis was based on traffic loading for a 20-year design life, our experience indicates that pavement maintenance is necessary due to normal weathering of the asphaltic concrete. Normal weathering (i.e., oxidation) causes asphalt to become more brittle resulting in loss of tensional strength. This loss in strength can cause minor cracking, which provides access for water infiltration into the stone base and subgrade. As the degree of saturation of the subgrade increases, the strength of the subgrade decreases leading to pavement failure. Routine maintenance in the form of sealing, patching, and maintaining proper drainage is required to increase pavement life. It is not uncommon for overlays to be required after 10 to 12 years.

6.6.2 Rigid (Concrete) Pavements

The concrete pavement design was performed using the same design traffic as in the heavy-duty asphalt pavement areas (60,000 ESALs). The compressive strength of the concrete was assumed to be 4,000 psi. A modulus of subgrade reaction of 125 pci was used for design assuming 6 inches of compacted ABC stone. We have assumed that load transfer across contraction (saw) joints will be handled by aggregate interlock. Aggregate base course should meet the material and compaction requirements stated in the “Flexible (Asphalt) Pavement” section above.

Concrete pavement is recommended for heavily loaded traffic areas and dumpster pad areas. It is also recommended for areas where vehicles may idle leading to oil drippings which can cause faster asphalt deterioration. The table below presents our recommended concrete pavement section thicknesses.



Table 6-6 – Concrete Pavement Section

Material Type	Concrete Pavement Design
Air Entrained Concrete (4000 psi)	6 inches
Aggregate Base Course (ABC) stone	6 inches
Maximum Joint Spacing	12 feet in all directions. Saw joints should be cut to a depth of at least ¼ the thickness of the concrete

7.0 Limitations of Geotechnical Report

This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. The conclusions and recommendations contained in this report are based upon applicable standards of our practice in this geographic area at the time this report was prepared. No other representation or warranty either express or implied, is made.

We relied on project information given to us to develop our conclusions and recommendations. If project information described in this report is not accurate, or if it changes during project development, we should be notified of the changes so that we can modify our recommendations based on this additional information if necessary.

Our conclusions and recommendations are based on data from a field exploration program. Subsurface conditions can vary widely outside the explored area. Some variations may not become evident until construction. If conditions are encountered which appear different than those described in our report, we should be notified. This report should not be construed to represent subsurface conditions for the entire site.

Unless specifically noted otherwise, our field exploration program did not include an assessment of regulatory compliance, environmental conditions or pollutants. If there is a concern about these items, other studies should be performed. S&ME can provide a proposal and perform these services if requested.

S&ME should be provided the opportunity to review the final plans and specifications to confirm that our recommendations are properly interpreted and implemented. The recommendations in this report are contingent on S&ME's review of final plans and specifications followed by observation and monitoring during construction activities.

Appendices

Appendix I –Figures



NOTE:
THIS AERIAL PHOTOGRAPH FROM GOOGLE EARTH WAS MODIFIED BY S&ME.



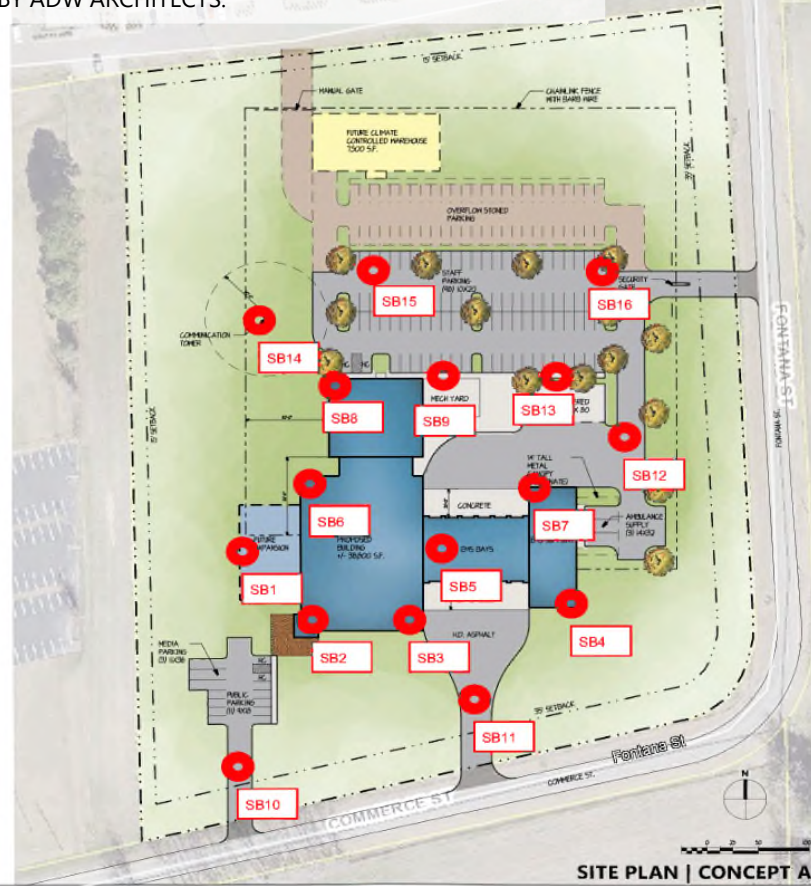
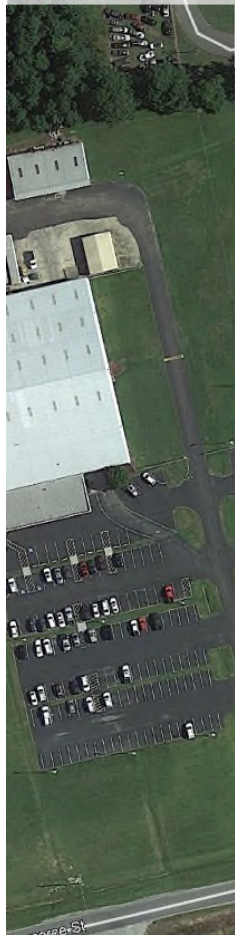
SITE VICINITY PLAN

Sampson County 911 Emergency Services Facility
Clinton, North Carolina

SCALE:
NTS
DATE:
4/29/2020
PROJECT NUMBER
1305-20-023

FIGURE NO.
1

NOTE:
THIS AERIAL PHOTOGRAPH FROM GOOGLE EARTH WAS MODIFIED BY S&M.
OVERLAY PROVIDED BY ADW ARCHITECTS.



SITE PLAN | CONCEPT A

Sampson County | 911 & ES Facilities



adwarchitects
environments for life



BORING LOCATION PLAN

Sampson County 911 Emergency Services Facility
Clinton, North Carolina

SCALE:

NTS

DATE:

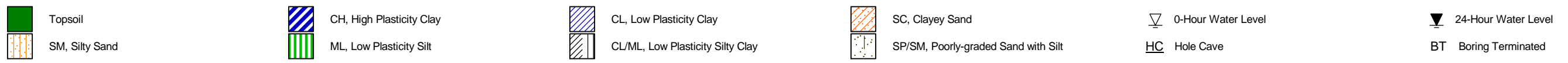
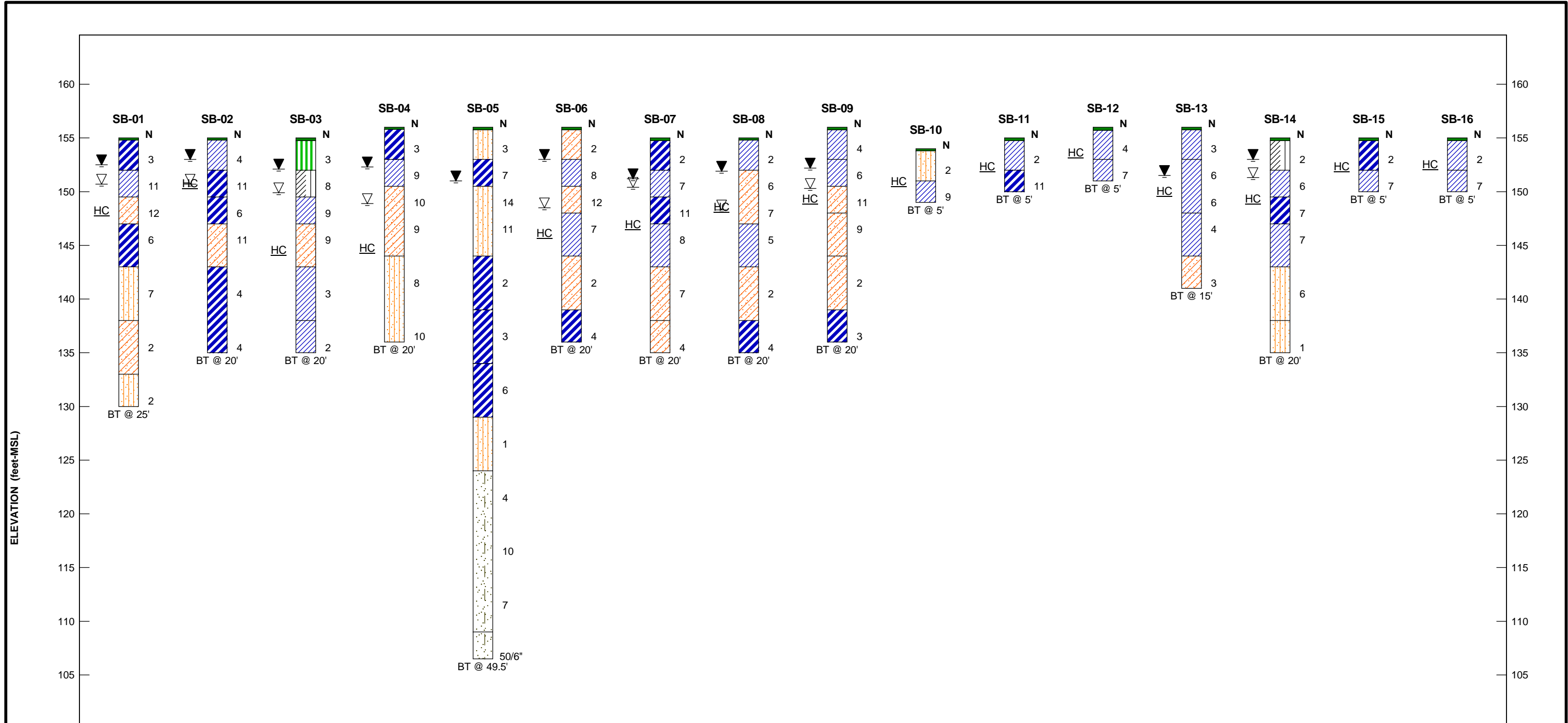
4/29/2020

PROJECT NUMBER

1305-20-023

FIGURE NO.

2





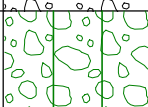
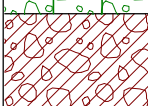

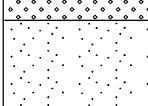
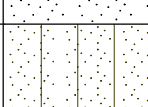
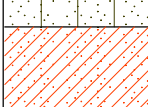
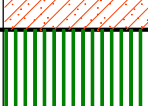
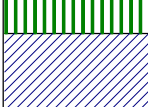
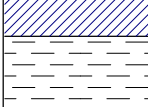

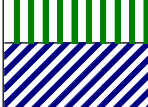



N = Standard Penetration Test resistance value (blows per foot). The depicted stratigraphy is shown for illustrative purposes only. The actual subsurface conditions will vary between boring locations. Elevations are approximate.

Diagram: Generalized Subsurface Profile PROJECT: Sampson Co. 911 Emergency Service Facilities LOCATION: Clinton, NC	JOB NO: 1305-20-023 DATE: 4/29/20		Figure 3
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Appendix II – Boring Logs

SOIL CLASSIFICATION CHART

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS		
			GRAPH	LETTER			
<p>COARSE GRAINED SOILS</p> <p>MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE</p>	<p>GRAVEL AND GRAVELLY SOILS</p>	<p>CLEAN GRAVELS</p> <p>(LITTLE OR NO FINES)</p>		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES		
		<p>MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE</p>	<p>GRAVELS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p>		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES	
			<p>MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE</p>	<p>GRAVELS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p>		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				<p>GRAVELS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p>		GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	<p>SAND AND SANDY SOILS</p>	<p>CLEAN SANDS</p> <p>(LITTLE OR NO FINES)</p>		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES		
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES		
		<p>MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE</p>	<p>SANDS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p>		SM	SILTY SANDS, SAND - SILT MIXTURES	
					SC	CLAYEY SANDS, SAND - CLAY MIXTURES	
<p>FINE GRAINED SOILS</p> <p>MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE</p>	<p>SILTS AND CLAYS</p> <p>LIQUID LIMIT LESS THAN 50</p>		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY			
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS			
			OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY			
	<p>SILTS AND CLAYS</p> <p>LIQUID LIMIT GREATER THAN 50</p>		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS			
			CH	INORGANIC CLAYS OF HIGH PLASTICITY			
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS			
			PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS			
<p>HIGHLY ORGANIC SOILS</p>				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS		

DATE DRILLED: 3/2/20	ELEVATION: 155.0 ft
DRILL RIG: CME 550X	BORING DEPTH: 25.0 ft
DRILLER: J. White	WATER LEVEL: 4.3' ATD, 2.5' 24 hr
HAMMER TYPE: Auto	LOGGED BY: H. Camp

NOTES: Boring location and elevation are approximate.

SAMPLING METHOD: **Split spoon**

DRILLING METHOD: **3/4" H.S.A.**

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft) /REMARKS				N VALUE
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	10	20	30	6080	
0 - 4		TOPSOIL 4 inches												
4 - 5		COASTAL PLAIN: CLAY (CH) soft, brown orange gray, moist	▼		SS-1		1	1	2					3
5 - 6		SANDY CLAY (CL) stiff, orange red gray, gravelly, moist	▼	150.0	SS-2		3	5	6					11
6 - 10		CLAYEY SAND (SC) medium dense, red orange, fine, moist	HC		SS-3		3	6	6					12
10 - 11		CLAY (CH) firm, fine, moist		145.0	SS-4		3	3	3					6
11 - 15		SILTY SAND (SM) loose, orange red gray, loose, wet		140.0	SS-5		3	3	4					7
15 - 20		CLAYEY SAND (SC) very loose, orange gray, fine to medium, wet		135.0	SS-6		2	1	1					2
20 - 25		SILTY SAND (SM) very loose, orange red, fine to coarse, wet		130.0	SS-7		2	1	1					2
25 - 25		Boring terminated at 25 ft												

S&ME BORING LOG NO NORTHING AND EASTING 1305-20-023.GPJ S&ME.GDT 4/30/20

NOTES:

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2. BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.
3. STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
4. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



DATE DRILLED: 3/2/20	ELEVATION: 155.0 ft
DRILL RIG: CME 550X	BORING DEPTH: 20.0 ft
DRILLER: J. White	WATER LEVEL: 4.3' ATD, 2' 24 hr
HAMMER TYPE: Auto	LOGGED BY: H. Camp

NOTES: Boring location and elevation are approximate.

SAMPLING METHOD: **Split spoon**

DRILLING METHOD: **3/4" H.S.A.**

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft) /REMARKS				N VALUE
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	10	20	30	60/80	
0 - 4		TOPSOIL 4 inches												
4 - 5		COASTAL PLAIN: CLAY (CL) soft, tan, moist	▽		SS-1		1	2	2					4
5 - 6		CLAY (CH) stiff, gray purple orange, moist			SS-2		3	5	6					11
6 - 7		CLAY (CH) firm, gray, moist		150.0	SS-3		3	3	3					6
7 - 10		CLAYEY SAND (SC) medium dense, red gray, fine, moist			SS-4		2	5	6					11
10 - 15		CLAY (CH) soft, gray purple orange, moist			SS-5		2	2	2					4
15 - 20		CLAY (CH) soft, gray purple orange, moist			SS-6		1	2	2					4
20		Boring terminated at 20 ft		135.0										

S&ME BORING LOG NO NORTHING AND EASTING 1305-20-023.GPJ S&ME.GDT 4/30/20

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4. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



DATE DRILLED: 3/2/20	ELEVATION: 155.0 ft
DRILL RIG: CME 550X	BORING DEPTH: 20.0 ft
DRILLER: J. White	WATER LEVEL: 5.1' ATD, 2.9' 24 hr
HAMMER TYPE: Auto	LOGGED BY: H. Camp

NOTES: Boring location and elevation are approximate.

SAMPLING METHOD: **Split spoon**

DRILLING METHOD: **3/4" H.S.A.**

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft) /REMARKS				N VALUE
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	10	20	30	60/80	
0 - 4		TOPSOIL 4 inches												
4 - 5		COASTAL PLAIN: SANDY SILT (ML) soft, gray orange, moist			SS-1		1	1	2					3
5 - 6		SANDY SILTY CLAY (CL-ML) firm, gray red orange, moist			SS-2		3	4	4					8
6 - 8		SANDY CLAY (CL) stiff, gray orange, moist			SS-3		3	4	5					9
8 - 10		CLAYEY SAND (SC) loose, orange red, fine, moist			SS-4		3	5	4					9
10 - 15		SANDY CLAY (CL) soft, gray red orange, moist			SS-5		2	1	2					3
15 - 20		SANDY CLAY (CL) very soft, gray red orange, moist			SS-6		1	1	1					2
20 - 20		Boring terminated at 20 ft												

S&ME BORING LOG NO NORTHING AND EASTING 1305-20-023.GPJ S&ME.GDT 4/30/20

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DATE DRILLED: 3/2/20	ELEVATION: 156.0 ft
DRILL RIG: CME 550X	BORING DEPTH: 20.0 ft
DRILLER: J. White	WATER LEVEL: 7.1' ATD, 3.7' 24 hr
HAMMER TYPE: Auto	LOGGED BY: H. Camp

NOTES: Boring location and elevation are approximate.

SAMPLING METHOD: **Split spoon**

DRILLING METHOD: **3/4" H.S.A.**

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft) /REMARKS				N VALUE
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	10	20	30	60/80	
0 - 4		TOPSOIL 4 inches												
4 - 5		COASTAL PLAIN: CLAY (CH) soft, red brown, moist			SS-1		1	2	1					3
5 - 10		SANDY CLAY (CL) stiff, gray red orange, moist	▼	151.0	SS-2		2	4	5					9
10 - 15		CLAYEY SAND (SC) loose, gray red orange, fine, moist	▽		SS-3		4	5	5					10
15 - 20		SILTY SAND (SM) loose, gray red orange, fine to medium, wet	HC	146.0	SS-4		5	4	5					9
20 - 20		Boring terminated at 20 ft		141.0	SS-5		3	4	4					8
				136.0	SS-6		9	7	3					10

S&ME BORING LOG NO NORTHING AND EASTING 1305-20-023.GPJ S&ME.GDT 4/30/20

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DATE DRILLED: 3/4/20	ELEVATION: 156.0 ft
DRILL RIG: CME 550X	BORING DEPTH: 49.5 ft
DRILLER: J. White	WATER LEVEL: 5' 24 hr
HAMMER TYPE: Auto	LOGGED BY: H. Camp

NOTES: Boring location and elevation are approximate.

SAMPLING METHOD: **Split spoon**

DRILLING METHOD: **Mud Rotary**

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft) /REMARKS				N VALUE
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	10	20	30	6080	
0 - 4		TOPSOIL 4 inches												
4 - 5		COASTAL PLAIN: SILTY SAND (SM) very loose, brown, fine, moist			SS-1		1	2	1					3
5 - 6		SANDY CLAY (CH) firm, brown, moist			SS-2		2	3	4					7
6 - 10		SILTY SAND (SM) medium dense, brown, fine, moist			SS-3		3	7	7					14
10 - 12				146.0	SS-4		4	6	5					11
12 - 16		CLAY (CH) very soft, gray brown, wet			SS-5		1	1	1					2
16 - 20		CLAY (CH) soft, gray brown, wet			SS-6		1	2	1					3
20 - 25		CLAY (CH) firm, gray brown, wet			SS-7		2	3	3					6
25 - 49.5		SILTY SAND (SM) very loose, brown, fine, wet			SS-8		1	0	1					1

S&ME BORING LOG NO NORTHING AND EASTING 1305-20-023.GPJ S&ME.GDT 4/30/20

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DATE DRILLED: 3/4/20	ELEVATION: 156.0 ft
DRILL RIG: CME 550X	BORING DEPTH: 49.5 ft
DRILLER: J. White	WATER LEVEL: 5' 24 hr
HAMMER TYPE: Auto	LOGGED BY: H. Camp

NOTES: Boring location and elevation are approximate.

SAMPLING METHOD: **Split spoon**

DRILLING METHOD: **Mud Rotary**

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft) /REMARKS				N VALUE
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	10	20	30	60/80	
		SILTY SAND (SM) very loose, brown, fine, wet (continued)												
35		SAND (SP-SM) very loose to loose, brown, with silt, fine, wet		121.0	SS-9	2	2	2						4
40				116.0	SS-10	2	4	6						10
45				111.0	SS-11	2	3	4						7
		SAND (SP-SM) very dense, reddish brown, fine, wet												
		Boring terminated at 49.5 ft			SS-12	27	50/6"							60/6"

S&ME BORING LOG NO NORTHING AND EASTING 1305-20-023.GPJ S&ME.GDT 4/30/20

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DATE DRILLED: 3/3/20	ELEVATION: 156.0 ft
DRILL RIG: CME 550X	BORING DEPTH: 20.0 ft
DRILLER: J. White	WATER LEVEL: 7.5' ATD, 3' 24 hr
HAMMER TYPE: Auto	LOGGED BY: H. Camp

NOTES: Boring location and elevation are approximate.

SAMPLING METHOD: **Split spoon**

DRILLING METHOD: **3/4" H.S.A.**

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft) /REMARKS				N VALUE
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	10	20	30	60/80	
0 - 4		TOPSOIL 4 inches												
4 - 5		COASTAL PLAIN: CLAYEY SAND (SC) very loose, dark gray, fine, wet	▼		SS-1		1	1	1					2
5 - 6		SANDY CLAY (CL) firm, gray orange red, moist		151.0	SS-2		1	2	6					8
6 - 8		CLAYEY SAND (SC) medium dense, gray orange, fine, moist	▽		SS-3		4	6	6					12
8 - 10		SANDY CLAY (CL) firm, gray orange red, moist	HC	146.0	SS-4		4	4	3					7
10 - 15		CLAYEY SAND (SC) very loose, gray orange, fine to medium, wet			SS-5		1	1	1					2
15 - 20		CLAY (CH) soft, black, trace mica, moist			SS-6		2	2	2					4
20		Boring terminated at 20 ft		136.0										

S&ME BORING LOG NO NORTHING AND EASTING 1305-20-023.GPJ S&ME.GDT 4/30/20

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DATE DRILLED: 3/2/20	ELEVATION: 155.0 ft
DRILL RIG: CME 550X	BORING DEPTH: 20.0 ft
DRILLER: J. White	WATER LEVEL: 4.6' ATD, 3.8' 24 hr
HAMMER TYPE: Auto	LOGGED BY: H. Camp

NOTES: Boring location and elevation are approximate.

SAMPLING METHOD: **Split spoon**

DRILLING METHOD: **3/4" H.S.A.**

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft) /REMARKS				N VALUE
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	10	20	30	60/80	
0 - 0.5		TOPSOIL 4 inches												
0.5 - 4.5		COASTAL PLAIN: CLAY (CH) very soft, brown gray orange, moist			SS-1		1	1	1					2
4.5 - 6.5		SANDY CLAY (CL) firm, gray orange red, moist	▼	150.0	SS-2		2	3	4					7
6.5 - 8.5		CLAY (CH) stiff, gray orange red, moist	▽		SS-3		5	5	6					11
8.5 - 10.5		SANDY CLAY (CL) firm, orange gray, moist	HC	145.0	SS-4		3	4	4					8
10.5 - 15.5		CLAYEY SAND (SC) loose, gray orange red, fine to medium, wet		140.0	SS-5		2	2	5					7
15.5 - 19.5		CLAYEY SAND (SC) very loose, gray orange red, fine to medium, wet		135.0	SS-6		1	2	2					4
19.5 - 20.0		Boring terminated at 20 ft												

S&ME BORING LOG NO NORTHING AND EASTING 1305-20-023.GPJ S&ME.GDT 4/30/20

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DATE DRILLED: 3/3/20	ELEVATION: 155.0 ft
DRILL RIG: CME 550X	BORING DEPTH: 20.0 ft
DRILLER: J. White	WATER LEVEL: 6.7' ATD, 3.1' 24 hr
HAMMER TYPE: Auto	LOGGED BY: H. Camp

NOTES: Boring location and elevation are approximate.

SAMPLING METHOD: **Split spoon**

DRILLING METHOD: **3/4" H.S.A.**

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft) /REMARKS				N VALUE
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	10	20	30	60/80	
0 - 4		TOPSOIL 4 inches												
4 - 5		COASTAL PLAIN: SANDY CLAY (CL) very soft, orange gray, moist			SS-1		1	1	1					2
5 - 7		CLAYEY SAND (SC) loose, gray orange red, fine, moist		150.0	SS-2		1	2	4					6
7 - 10		SANDY CLAY (CL) firm, orange gray, moist			SS-3		2	3	4					7
10 - 15		SANDY CLAY (CL) firm, orange gray, moist		145.0	SS-4		2	2	3					5
15 - 18		CLAYEY SAND (SC) very loose, gray orange red, fine to medium, wet			SS-5		2	1	1					2
18 - 20		CLAY (CH) soft, dark gray red, moist		140.0	SS-6		1	2	2					4
20 - 20		Boring terminated at 20 ft		135.0										

S&ME BORING LOG NO NORTHING AND EASTING 1305-20-023.GPJ S&ME.GDT 4/30/20

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DATE DRILLED: 3/3/20	ELEVATION: 156.0 ft
DRILL RIG: CME 550X	BORING DEPTH: 20.0 ft
DRILLER: J. White	WATER LEVEL: 5.7' ATD, 3.8' 24 hr
HAMMER TYPE: Auto	LOGGED BY: H. Camp

NOTES: Boring location and elevation are approximate.

SAMPLING METHOD: **Split spoon**

DRILLING METHOD: **3/4" H.S.A.**

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft) /REMARKS				N VALUE
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	10	20	30	60/80	
0 - 4		TOPSOIL 4 inches												
4 - 5		COASTAL PLAIN: SANDY CLAY (CL) soft, tan, moist			SS-1		1	2	2					4
5 - 6		SANDY CLAY (CL) firm, red orange gray, moist	▼		SS-2		1	2	4					6
6 - 10		CLAYEY SAND (SC) medium dense, orange gray red, fine, moist	▽	151.0	SS-3		2	6	5					11
10 - 15		CLAYEY SAND (SC) loose, red orange gray, fine, moist	HC	146.0	SS-4		2	4	5					9
15 - 19		CLAYEY SAND (SC) very loose, orange, fine to medium, wet			SS-5		1	1	1					2
19 - 20		CLAY (CH) soft, dark gray red, moist			SS-6		1	1	2					3
20 - 20		Boring terminated at 20 ft		136.0										

S&ME BORING LOG NO NORTHING AND EASTING 1305-20-023.GPJ S&ME.GDT 4/30/20

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DATE DRILLED: 3/2/20	ELEVATION: 154.0 ft
DRILL RIG: CME 550X	BORING DEPTH: 5.0 ft
DRILLER: J. White	WATER LEVEL: Caved dry
HAMMER TYPE: Auto	LOGGED BY: H. Camp

NOTES: Boring location and elevation are approximate.

SAMPLING METHOD: **Split spoon**

DRILLING METHOD: **3/4" H.S.A.**

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft) /REMARKS				N VALUE
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	10	20	30	6080	
0 - 4		TOPSOIL 4 inches												
4 - 5		COASTAL PLAIN: SILTY SAND (SM) very loose, gray, trace organics, fine to medium, wet			SS-1	▲▼	2	1	1					2
5		SANDY CLAY (CL) stiff, red orange gray, moist	HC		SS-2	▲▼	3	4	5					9
5		Boring terminated at 5 ft		149.0										

S&ME BORING LOG NO NORTHING AND EASTING 1305-20-023.GPJ S&ME.GDT 4/30/20

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4. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



DATE DRILLED: 3/2/20	ELEVATION: 155.0 ft
DRILL RIG: CME 550X	BORING DEPTH: 5.0 ft
DRILLER: J. White	WATER LEVEL: Caved dry
HAMMER TYPE: Auto	LOGGED BY: H. Camp

NOTES: Boring location and elevation are approximate.

SAMPLING METHOD: **Split spoon**

DRILLING METHOD: **3/4" H.S.A.**

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft) /REMARKS				N VALUE
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	10	20	30	6080	
0 - 4		TOPSOIL 4 inches												
4 - 5		COASTAL PLAIN: SANDY CLAY (CL) very soft, red orange gray, moist	HC		SS-1		1	1	1					2
5 - 5		CLAY (CH) stiff, red orange gray, moist		150.0	SS-2		3	5	6					11
5 - 5		Boring terminated at 5 ft												

S&ME BORING LOG NO NORTHING AND EASTING 1305-20-023.GPJ S&ME.GDT 4/30/20

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4. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



DATE DRILLED: 3/3/20	ELEVATION: 156.0 ft
DRILL RIG: CME 550X	BORING DEPTH: 5.0 ft
DRILLER: J. White	WATER LEVEL: Caved dry
HAMMER TYPE: Auto	LOGGED BY: H. Camp

NOTES: Boring location and elevation are approximate.

SAMPLING METHOD: **Split spoon**

DRILLING METHOD: **3/4" H.S.A.**

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft) /REMARKS				N VALUE
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	10	20	30	6080	
		TOPSOIL 4 inches												
		COASTAL PLAIN: CLAY (CL) soft, tan yellow, moist	HC		SS-1	▲▼	1	2	2					4
		SANDY CLAY (CL) firm, brown red, moist			SS-2	▲▼	2	3	4					7
5		Boring terminated at 5 ft		151.0										

S&ME BORING LOG NO NORTHING AND EASTING 1305-20-023.GPJ S&ME.GDT 4/30/20

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4. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



DATE DRILLED: 3/3/20	ELEVATION: 156.0 ft
DRILL RIG: CME 550X	BORING DEPTH: 15.0 ft
DRILLER: J. White	WATER LEVEL: 4.5' 24 hr
HAMMER TYPE: Auto	LOGGED BY: H. Camp

NOTES: Boring location and elevation are approximate.

SAMPLING METHOD: **Split spoon**

DRILLING METHOD: **3/4" H.S.A.**

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft) /REMARKS				N VALUE
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	10	20	30	60/80	
0 - 4		TOPSOIL 4 inches												
4 - 5		COASTAL PLAIN: SANDY CLAY (CL) soft, red orange brown, moist			SS-1		2	1	2					3
5 - 7		SANDY CLAY (CL) firm, red orange gray, moist			SS-2		1	3	3					6
7 - 10		SANDY CLAY (CL) soft, red orange gray, moist	▼ HC	151.0	SS-3		2	3	3					6
10 - 15		SANDY CLAY (CL) soft, red orange gray, moist			SS-4		2	2	2					4
15 - 15		CLAYEY SAND (SC) very loose, orange, fine to medium, wet			SS-5		3	2	1					3
15 - 15		Boring terminated at 15 ft		141.0										

S&ME BORING LOG NO NORTHING AND EASTING 1305-20-023.GPJ S&ME.GDT 4/30/20

NOTES:

1. THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.
2. BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.
3. STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
4. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



DATE DRILLED: 3/3/20	ELEVATION: 155.0 ft
DRILL RIG: CME 550X	BORING DEPTH: 20.0 ft
DRILLER: J. White	WATER LEVEL: 3.7' ATD, 2' 24 hr
HAMMER TYPE: Auto	LOGGED BY: H. Camp

NOTES: Boring location and elevation are approximate.

SAMPLING METHOD: **Split spoon**

DRILLING METHOD: **3/4" H.S.A.**

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft) /REMARKS				N VALUE
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	10	20	30	60/80	
0 - 4		TOPSOIL 4 inches												
4 - 5.5		COASTAL PLAIN: SILTY CLAY (CL-ML) very soft, tan, moist	▼		SS-1	2	1	1						2
5.5 - 6.5		SANDY CLAY (CL) firm, red orange gray, moist	▽	150.0	SS-2	2	2	4						6
6.5 - 8.5		CLAY (CH) firm, red orange gray, moist	HC		SS-3	3	3	4						7
8.5 - 10.5		SANDY CLAY (CL) firm, red orange gray, moist		145.0	SS-4	3	4	3						7
10.5 - 15.5		SILTY SAND (SM) loose, red gray, fine, wet		140.0	SS-5	2	3	3						6
15.5 - 20.0		SILTY SAND (SM) very loose, red gray, fine, wet		135.0	SS-6	1	0	1						1
20.0 - 20.0		Boring terminated at 20 ft												

S&ME BORING LOG NO NORTHING AND EASTING 1305-20-023.GPJ S&ME.GDT 4/30/20

NOTES:

1. THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.
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3. STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
4. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.








DATE DRILLED: 3/3/20	ELEVATION: 155.0 ft
DRILL RIG: CME 550X	BORING DEPTH: 5.0 ft
DRILLER: J. White	WATER LEVEL: Caved dry
HAMMER TYPE: Auto	LOGGED BY: H. Camp

NOTES: Boring location and elevation are approximate.

SAMPLING METHOD: **Split spoon**

DRILLING METHOD: **3/4" H.S.A.**

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft) /REMARKS				N VALUE
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	10	20	30	6080	
		TOPSOIL 4 inches												
		COASTAL PLAIN: CLAY (CH) very soft, gray orange, moist			SS-1		1	1	1					2
		SANDY CLAY (CL) firm, red orange gray, moist	HC		SS-2		3	4	3					7
5		Boring terminated at 5 ft		150.0										

S&ME BORING LOG NO NORTHING AND EASTING 1305-20-023.GPJ S&ME.GDT 4/30/20

NOTES:

1. THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.
2. BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.
3. STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
4. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



DATE DRILLED: 3/3/20	ELEVATION: 155.0 ft
DRILL RIG: CME 550X	BORING DEPTH: 5.0 ft
DRILLER: J. White	WATER LEVEL: Caved dry
HAMMER TYPE: Auto	LOGGED BY: H. Camp

NOTES: Boring location and elevation are approximate.

SAMPLING METHOD: **Split spoon**

DRILLING METHOD: **3/4" H.S.A.**

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft) /REMARKS				N VALUE
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	10	20	30	6080	
		TOPSOIL 4 inches												
		COASTAL PLAIN: SANDY CLAY (CL) very soft, tan orange, moist	HC		SS-1	▲▼	1	1	1					2
		SANDY CLAY (CL) firm, red orange gray, moist			SS-2	▲▼	3	3	4					7
5		Boring terminated at 5 ft		150.0										

S&ME BORING LOG NO NORTHING AND EASTING 1305-20-023.GPJ S&ME.GDT 4/30/20

NOTES:

1. THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.
2. BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.
3. STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
4. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



Appendix III – Laboratory Test Results

LABORATORY DETERMINATION OF WATER CONTENT



ASTM D 2216 AASHTO T 265

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

Project #:	1305-20-023	Report Date:	3/11/2020
Project Name:	Sampson Co 911 ES Facilities	Test Date(s):	3/10 - 3/11/2020
Client Name:	Sampson County Public Works		
Client Address:	827 Southeast Blvd		
Sample by:	S&ME	Sample Date(s):	Varies
Sampling Method:	Bulk & Split Spoon	Drill Rig :	N/A

Method:	A (1%) <input type="checkbox"/>	B (0.1%) <input checked="" type="checkbox"/>	Balance ID. 20977	Calibration Date: 4/5/19
			Oven ID. 1454	Calibration Date: 11/29/2019

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt. + Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture
		ft.		grams	grams	grams	grams	%
Stockpile	Bulk-1	0-1		97.20	621.00	595.90	25.10	5.0%
Stockpile	Bulk-2	0-1		78.90	362.50	348.60	13.90	5.2%
Stockpile	Bulk-3	0-1		174.20	633.30	595.60	37.70	8.9%
SB-2	SS-1	1-2.5		47.06	144.20	125.69	18.51	23.5%
SB-6	SS-6	18.5-20		45.96	143.49	106.37	37.12	61.4%
SB-9	SS-1	1-2.5		45.82	145.23	127.79	17.44	21.3%
SB-10	SS-1	1-2.5		8.09	198.00	162.10	35.90	23.3%
SB-12	SS-1	1-2.5		46.55	133.39	116.93	16.46	23.4%
SB-14	SS-1	1-2.5		33.81	143.34	126.78	16.56	17.8%

Notes / Deviations / References

AASHTO T 265: Laboratory Determination of Moisture Content of Soils
 ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

<u>Mal Krajan, ET</u> Technical Responsibility	 Signature	<u>Laboratory Manager</u> Position	<u>3/11/2020</u> Date
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MOISTURE - DENSITY REPORT

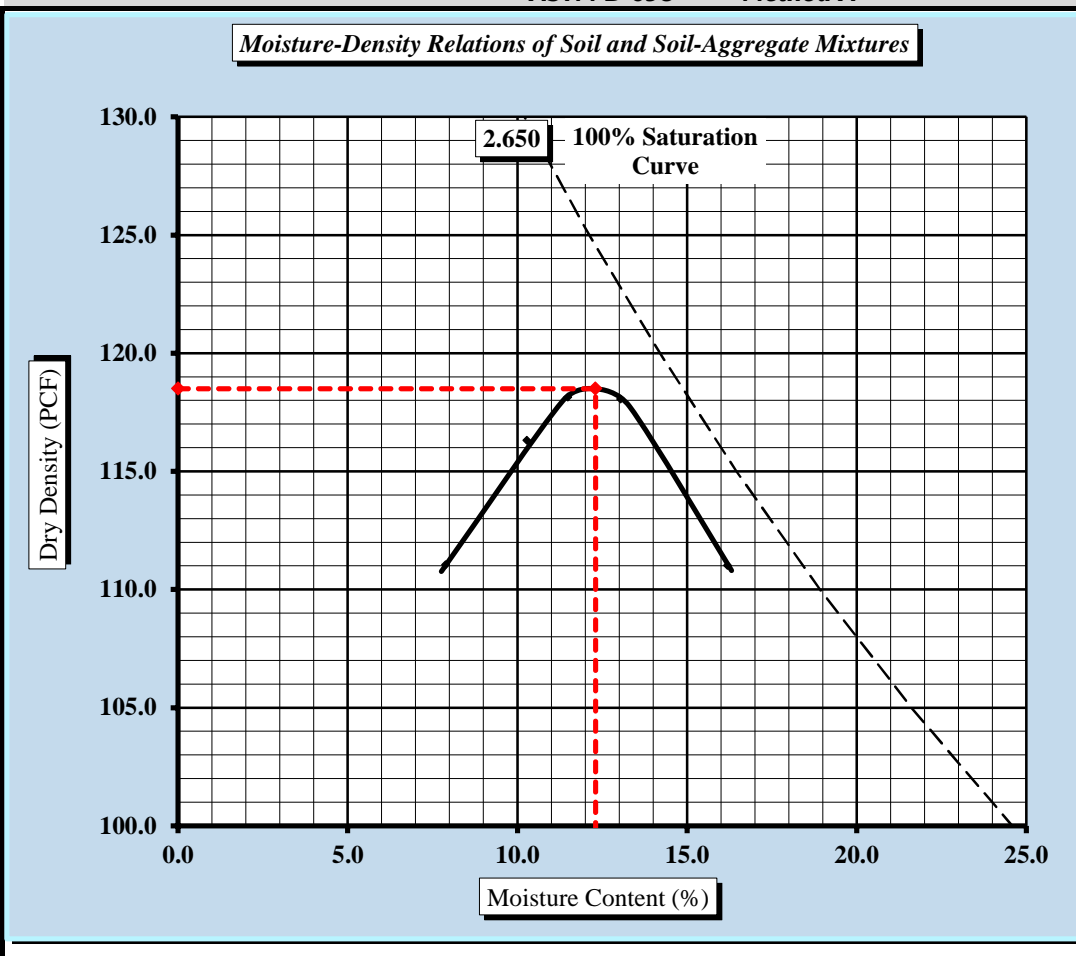


Quality Assurance

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616				
S&ME Project #:	1305-20-023	Report Date:	3/13/2020	
Project Name:	Sampson Co 911 ES Facility	Test Date(s):	3/5 - 3/8/2020	
Client Name:	Sampson County Public Works			
Client Address:	827 Southeast Blvd			
Boring #:	N/A	Sample #:	Bulk 1	Sample Date:
Location:	Offsite Stockpile	Offset:	N/A	Depth (ft):
Sample Description:	Tan Clayey SAND (SC)			

Maximum Dry Density 118.5 PCF. Optimum Moisture Content 12.3%

ASTM D 698 - - Method A



Soil Properties	
Natural Moisture Content	5.0%
Assumed Specific Gravity	2.650
Liquid Limit	25
Plastic Limit	18
Plastic Index	7
% Passing	
3/4"	100.0%
3/8"	100.0%
#4	99.9%
#10	98.4%
#40	73.5%
#60	52.1%
#200	25.8%
Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction Corrected for Oversize Fraction (ASTM D 4718)
 Sieve Size used to separate the Oversize Fraction: #4 Sieve 3/8 inch Sieve 3/4 inch Sieve
 Mechanical Rammer Manual Rammer Moist Preparation Dry Preparation

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
 ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Mal Krajan, ET
 Technical Responsibility

Signature

Laboratory Manager
 Position

4/2/2020
 Date

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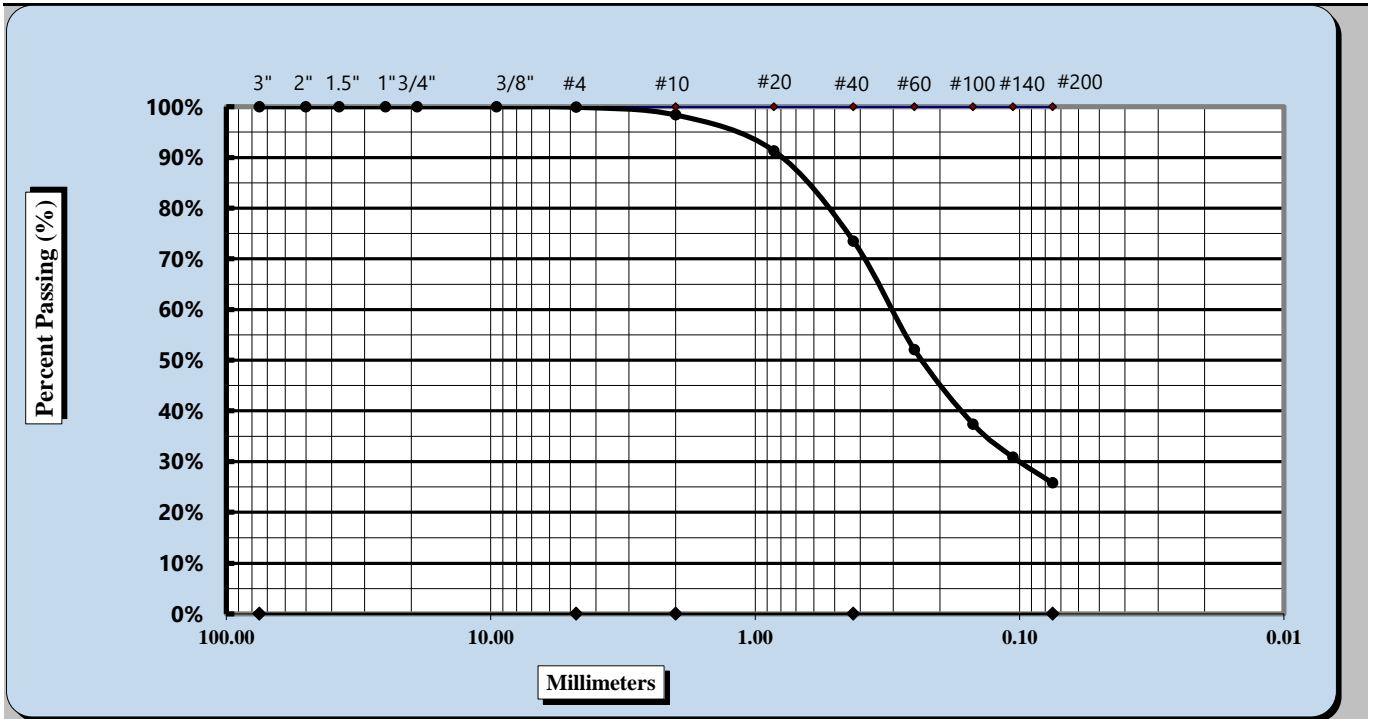
Single sieve set

ASTM D6913

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

Project #:	1305-20-023	Record Date:	4/2/2020
Project Name:	Sampson Co. 911 ES Facilities	Lab Report #:	1
Client Name:	Sampson County Public Works	Date Received:	3/11/2020
Received By:	Lab	Sampled by:	S&ME
Location:	Offsite Stockpile	Boring #:	N/A
Log/Sample Id.	91	Type:	Bulk
		Elev/Depth (ft):	0-1

Sample Description: Tan Clayey SAND (SC)



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Method: B Procedure for obtaining Specimen: Moist

Maximum Particle Size	3/8"	Coarse Sand	1.5%	Fine Sand	47.7%
Gravel	0.1%	Medium Sand	24.9%	Silt & Clay	25.8%
Liquid Limit	25	Plastic Limit	18	Plastic Index	7
Maximum Dry Density	118.5 pcf	Bulk Gravity (C127)	N/A	% Absorption	N/A
Optimum Moisture	12.3%	Natural Moisture	1.8%		

Notes / Deviations / References: ND=Not Determined.

Mal Krajan, ET
Technical Responsibility

Signature

Laboratory Manager
Position

4/2/2020
Date

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LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX



ASTM D 4318 AASHTO T 89 AASHTO T 90

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

Project #:	1305-20-023	Report Date:	4/2/2020
Project Name:	Sampson Co. 911 ES Facilities	Test Date(s)	3/25 - 4/2/20
Client Name:	Sampson County Public Works		
Client Address:	827 Southeast Blvd		
Boring #:	N/A	Sample #:	Bulk 1
		Sample Date:	2/28/2020
Location:	Offsite Stockpile	Offset:	N/A
		Depth (ft):	0-1

Sample Description: Tan Clayey SAND					
Type and Specification	S&ME ID #	Cal Date:	Type and Specification	S&ME ID #	Cal Date:
Balance (0.01 g)	20977	4/5/2019	Grooving tool	1801	5/21/2019
LL Apparatus	1803	8/2/2019			
Oven	1454	11/29/2019			

Pan #	Tare #:	Liquid Limit					Plastic Limit	
A	Tare Weight	8.08	8.57	8.55			8.57	8.62
B	Wet Soil Weight + A	25.41	23.80	24.05			28.01	31.11
C	Dry Soil Weight + A	22.13	20.76	20.72			25.07	27.58
D	Water Weight (B-C)	3.28	3.04	3.33			2.94	3.53
E	Dry Soil Weight (C-A)	14.05	12.19	12.17			16.50	18.96
F	% Moisture (D/E)*100	23.3%	24.9%	27.4%			17.8%	18.6%
N	# OF DROPS	32	23	15			Moisture Contents determined by ASTM D 2216	
LL	LL = F * FACTOR							
Ave.	Average						18.2%	



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic	<input type="checkbox"/>
Liquid Limit	25
Plastic Limit	18
Plastic Index	7
Group Symbol	SC

Multipoint Method
One-point Method

Wet Preparation Dry Preparation Air Dried Estimate the % Retained on the #40 Sieve: 26.5%

Notes / Deviations / References:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Mal Krajan, ET
Technical Responsibility

Signature

Laboratory Manager
Position

4/2/2002
Date

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MOISTURE - DENSITY REPORT

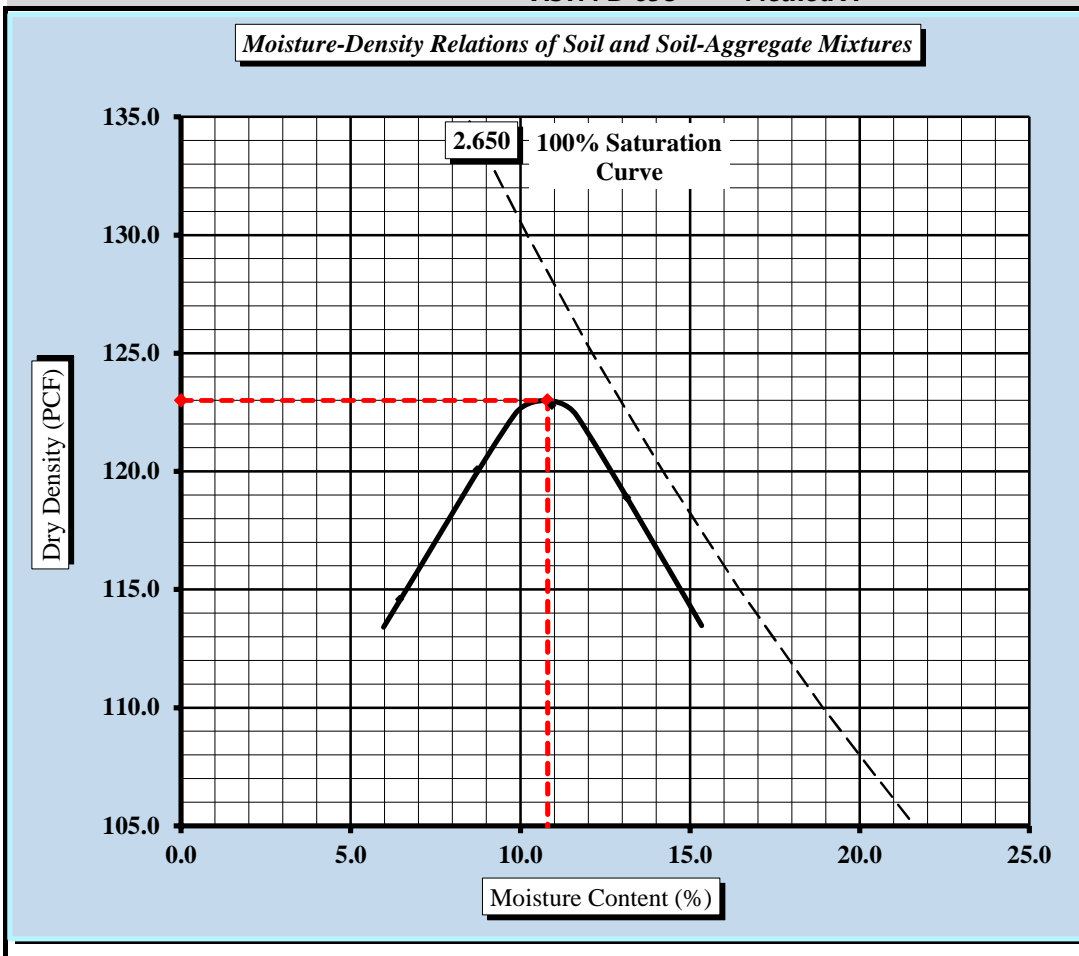


Quality Assurance

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616				
S&ME Project #:	1305-20-023	Report Date:	3/13/2020	
Project Name:	Sampson Co 911 ES Facility	Test Date(s):	3/5 - 3/8/2020	
Client Name:	Sampson County Public Works			
Client Address:	827 Southeast Blvd			
Boring #:	N/A	Sample #:	Bulk 2	Sample Date: 2/28/2020
Location:	Offsite Stockpile	Offset:	N/A	Depth (ft): 0 - 1
Sample Description:	Gray Silty SAND			

Maximum Dry Density 123.0 PCF. Optimum Moisture Content 10.8%

ASTM D 698 - - Method A



Soil Properties

Natural Moisture Content	5.2%
Assumed Specific Gravity	2.650
Liquid Limit	N.P.
Plastic Limit	N.P.
Plastic Index	N.P.
% Passing	
3/4"	100.0%
3/8"	100.0%
#4	98.7%
#10	97.5%
#40	68.7%
#60	43.5%
#200	18.8%
Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction Corrected for Oversize Fraction (ASTM D 4718)
 Sieve Size used to separate the Oversize Fraction: #4 Sieve 3/8 inch Sieve 3/4 inch Sieve
 Mechanical Rammer Manual Rammer Moist Preparation Dry Preparation

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
 ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Mal Krajan, ET
 Technical Responsibility

Signature

Laboratory Manager
 Position

4/2/2020
 Date

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LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX



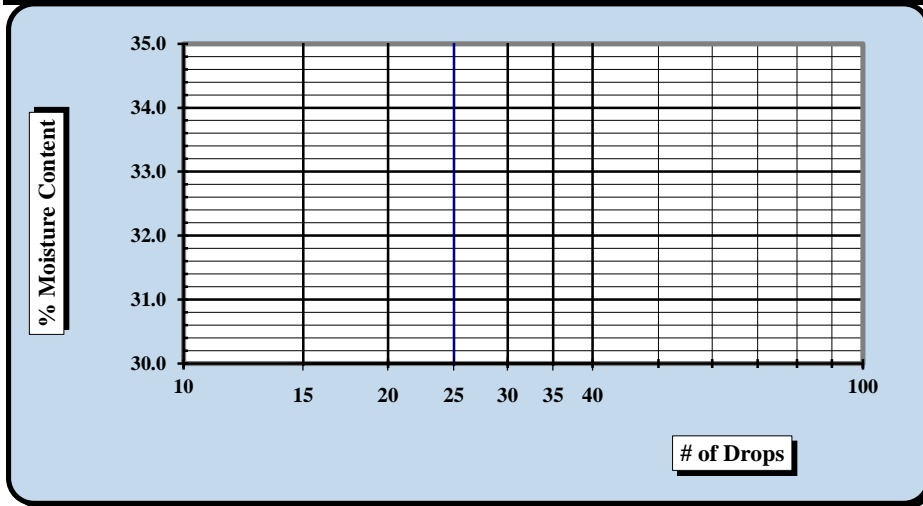
ASTM D 4318 AASHTO T 89 AASHTO T 90

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

Project #:	1305-20-023	Report Date:	4/2/2020
Project Name:	Sampson Co. 911 ES Facilities	Test Date(s)	3/25 - 4/2/20
Client Name:	Sampson County Public Works		
Client Address:	827 Southeast Blvd		
Boring #:	N/A	Sample #:	Bulk 2
		Sample Date:	2/28.2020
Location:	Offsite Stockpile	Offset:	N/A
		Depth (ft):	0-1

Sample Description: Gray Silty SAND					
Type and Specification	S&ME ID #	Cal Date:	Type and Specification	S&ME ID #	Cal Date:
Balance (0.01 g)	20977	4/5/2019	Grooving tool	1801	5/21/2019
LL Apparatus	1803	8/2/2019			
Oven	1454	11/29/2019			

Pan #	Tare #:	Liquid Limit				Plastic Limit	
A	Tare Weight	16.24					
B	Wet Soil Weight + A	28.47					
C	Dry Soil Weight + A	26.75					
D	Water Weight (B-C)	1.72					
E	Dry Soil Weight (C-A)	10.51					
F	% Moisture (D/E)*100	16.4%					
N	# OF DROPS	5					Moisture Contents determined by ASTM D 2216
LL	LL = F * FACTOR						
Ave.	Average						



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic	<input checked="" type="checkbox"/>
Liquid Limit	*ND
Plastic Limit	N.P.
Plastic Index	N.P.
Group Symbol	

Multipoint Method
 One-point Method

Wet Preparation Dry Preparation Air Dried Estimate the % Retained on the #40 Sieve: 31.3%

Notes / Deviations / References: *ND=The Liquid Limit Could Not Be Determined.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Mal Krajan, ET
 Technical Responsibility

 Signature

Laboratory Manager
 Position

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 Date

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CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL



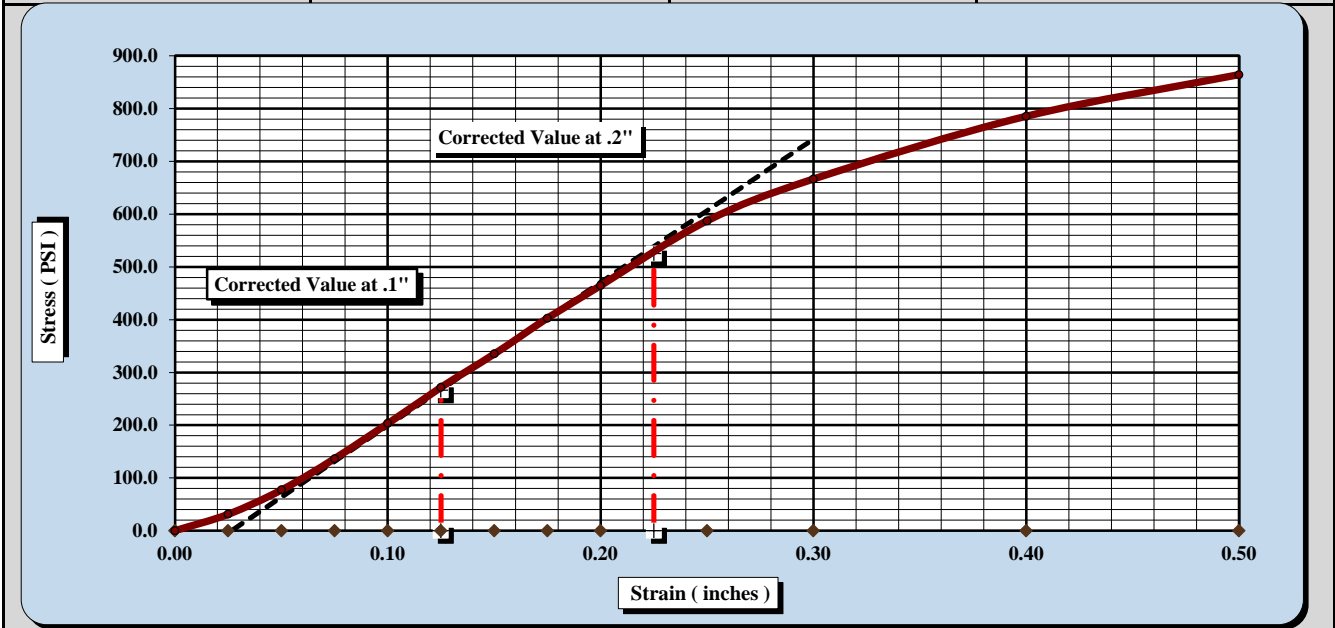
ASTM D 1883

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

Project #:	1305-20-023	Report Date:	3/18/2020
Project Name:	Sampson Co 911 ES Facilities	Test Date(s)	3/12 - 3/18/2020
Client Name:	Sampson County Public Works		
Client Address:	827 Southeast Blvd		
Boring #:	N/A	Sample #:	Bulk 3
		Sample Date:	2/28/2020
Location:	Offsite Stockpile	Offset:	N/A
		Depth (ft):	0 - 1 ft.
Sample Description:	Gray Silty SAND (SM)		

ASTM D 698 Method A	Maximum Dry Density: 119.0 PCF	Optimum Moisture Content: 10.9%	
Compaction Test performed on grading complying with CBR spec.		% Retained on the 3/4" sieve:	0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in.	20.3	CBR at 0.2 in.	31.0
		CBR at 0.1 in.	26.6
		CBR at 0.2 in.	35.0



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		After Soaking	
Compactive Effort (Blows per Layer)	42	Final Dry Density (PCF)	116.9
Initial Dry Density (PCF)	116.6	Average Final Moisture Content	11.0%
Moisture Content of the Compacted Specimen	11.1%	Moisture Content (top 1" after soaking)	12.2%
Percent Compaction	98.0%	Percent Swell	0.0%

Soak Time:	96 hrs.	Surcharge Weight	20.0
Liquid Limit	21	Plastic Index	3
		Surcharge Wt. per sq. Ft.	101.9

Notes/Deviations/References:

Test specimen compacted to 98% at optimum moisture.

Mal Krajan, ET
Technical Responsibility

Signature

Laboratory Manager
Position

4/2/2020
Date

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MOISTURE - DENSITY REPORT

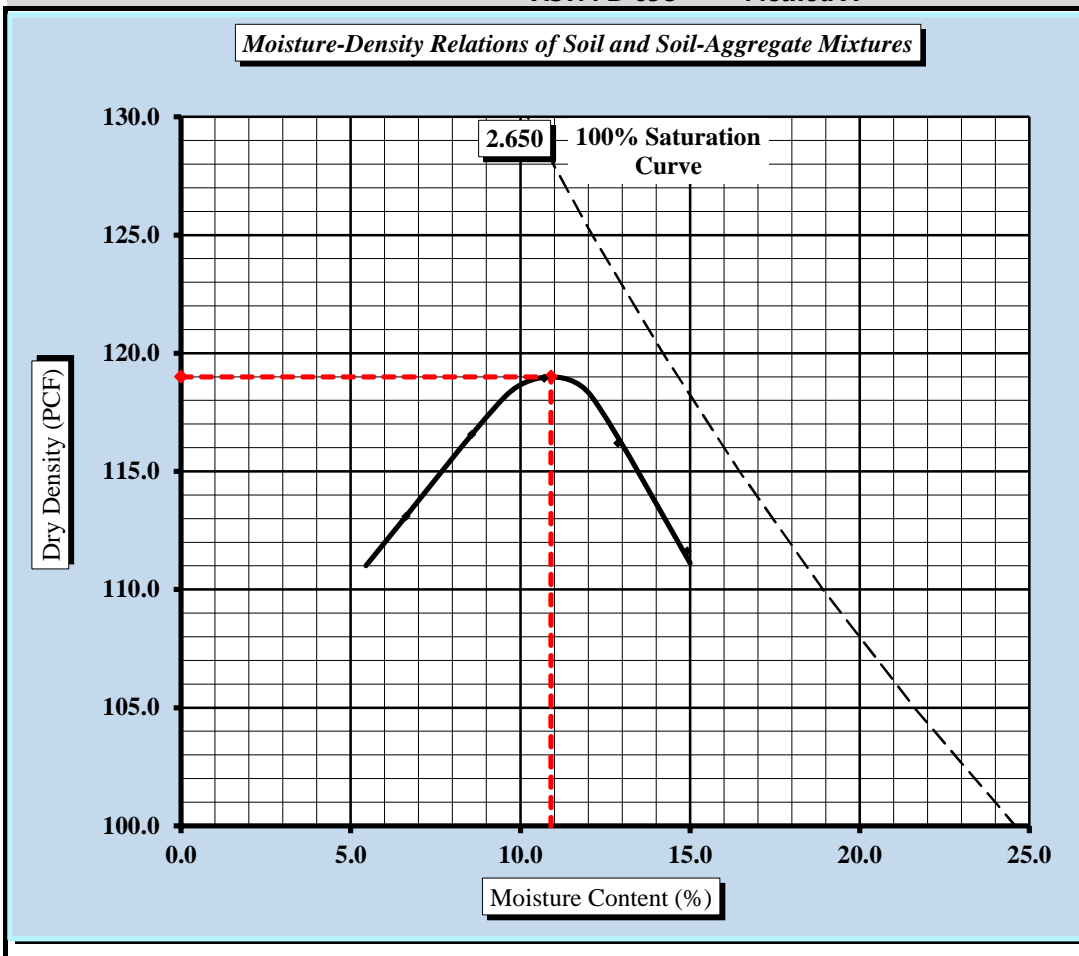


Quality Assurance

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616			
S&ME Project #:	1305-20-023	Report Date:	3/13/2020
Project Name:	Sampson Co 911 ES Facility	Test Date(s):	3/5 - 3/8/2020
Client Name:	Sampson County Public Works		
Client Address:	827 Southeast Blvd		
Boring #:	N/A	Sample #:	Bulk 3
		Sample Date:	2/28/2020
Location:	Offsite Stockpile	Offset:	N/A
		Depth (ft):	0 - 1
Sample Description:	Gray Silty SAND (SM)		

Maximum Dry Density 119.0 PCF. Optimum Moisture Content 10.9%

ASTM D 698 - - Method A



Soil Properties	
Natural Moisture Content	8.9%
Assumed Specific Gravity	2.650
Liquid Limit	21
Plastic Limit	18
Plastic Index	3
% Passing	
3/4"	100.0%
3/8"	99.2%
#4	96.8%
#10	93.0%
#40	67.5%
#60	46.0%
#200	20.6%
Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction Corrected for Oversize Fraction (ASTM D 4718)
 Sieve Size used to separate the Oversize Fraction: #4 Sieve 3/8 inch Sieve 3/4 inch Sieve
 Mechanical Rammer Manual Rammer Moist Preparation Dry Preparation

References / Comments / Deviations: ND=Not Determined.
 ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
 ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Mal Krajan, ET
 Technical Responsibility

Signature

Laboratory Manager
 Position

4/2/2020
 Date

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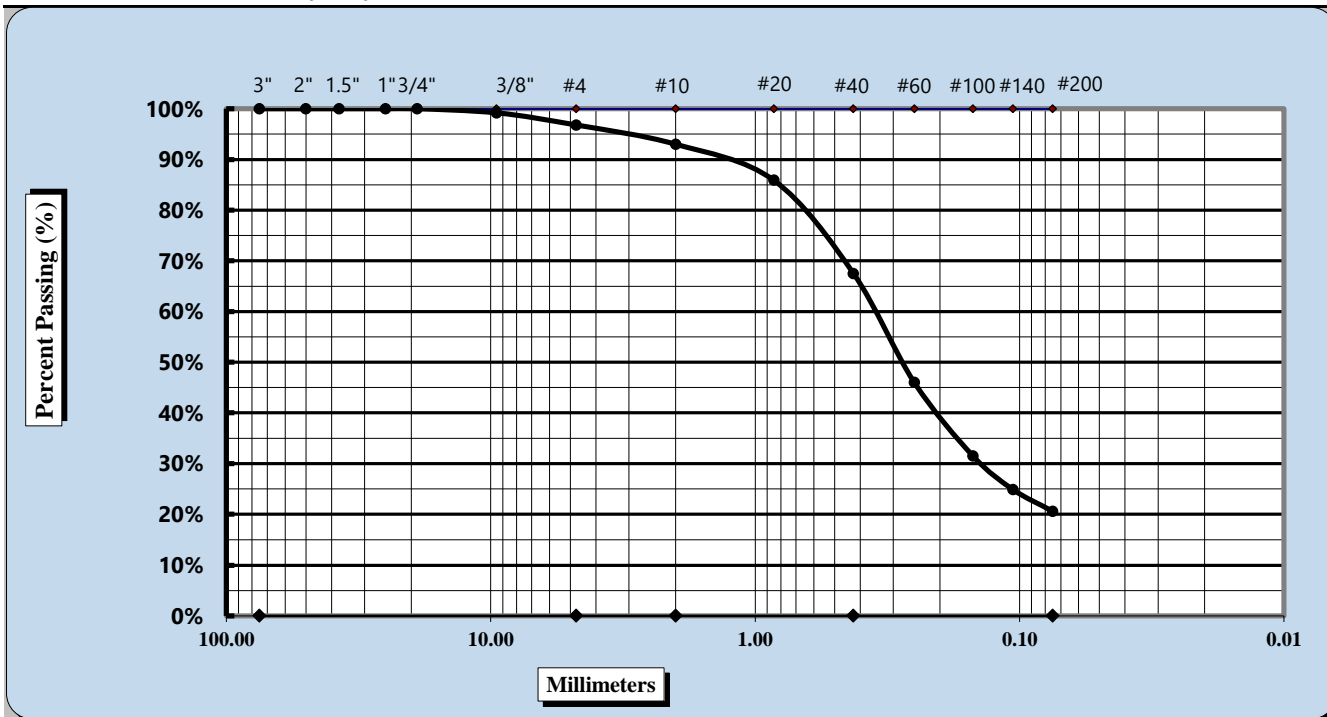
Single sieve set

ASTM D6913

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

Project #:	1305-20-023	Record Date:	4/2/2020
Project Name:	Sampson Co. 911 ES Facilities	Lab Report #:	1
Client Name:	Sampson County Public Works	Date Received:	3/11/2020
Received By:	Lab	Sampled by:	S&ME
Location:	Offsite Stockpile	Boring #:	N/A
Log/Sample Id.	91	Sample #:	Bulk 3
		Elev/Depth (ft):	0-1

Sample Description: Gray Silty SAND (SM)



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Method: B Procedure for obtaining Specimen: Moist

Maximum Particle Size	3/4"	Coarse Sand	3.8%	Fine Sand	46.9%
Gravel	3.2%	Medium Sand	25.5%	Silt & Clay	20.6%
Liquid Limit	21	Plastic Limit	18	Plastic Index	3
Maximum Dry Density	119.0 pcf	Bulk Gravity (C127)	N/A	% Absorption	N/A
Optimum Moisture	10.9%	Natural Moisture	2.1%		

Notes / Deviations / References: ND=Not Determined.

Mal Krajan, ET
Technical Responsibility

Signature

Laboratory Manager
Position

4/2/2020
Date

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LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX



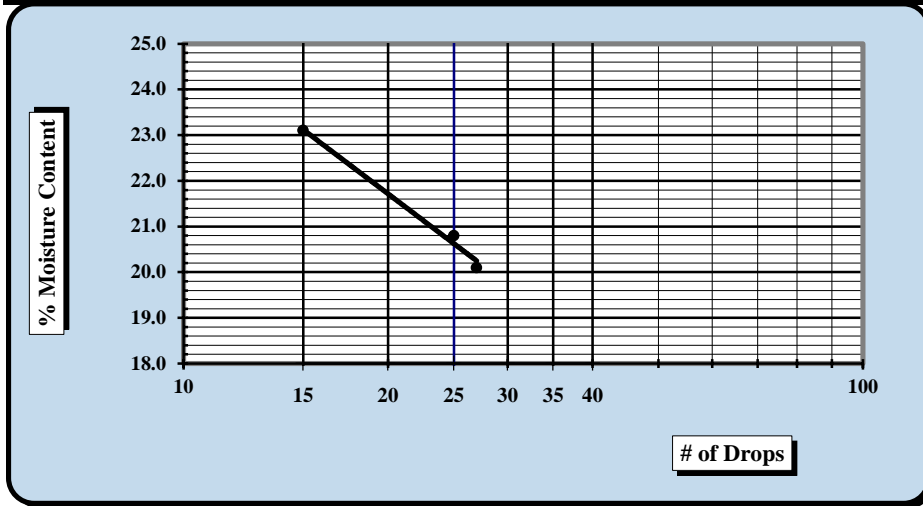
ASTM D 4318 AASHTO T 89 AASHTO T 90

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

Project #:	1305-20-023	Report Date:	4/2/2020
Project Name:	Sampson Co. 911 ES Facilities	Test Date(s)	3/25 - 4/2/20
Client Name:	Sampson County Public Works		
Client Address:	827 Southeast Blvd		
Boring #:	N/A	Sample #:	Bulk 3
		Sample Date:	2/28.2020
Location:	Offsite Stockpile	Offset:	N/A
		Depth (ft):	0-1

Sample Description: Gray Silty SAND					
Type and Specification	S&ME ID #	Cal Date:	Type and Specification	S&ME ID #	Cal Date:
Balance (0.01 g)	20977	4/5/2019	Grooving tool	1801	5/21/2019
LL Apparatus	1803	8/2/2019			
Oven	1454	11/29/2019			

Pan #	Tare #:	Liquid Limit					Plastic Limit	
A	Tare Weight	12.99	13.02	13.01			12.99	12.99
B	Wet Soil Weight + A	23.63	23.58	24.41			19.24	20.24
C	Dry Soil Weight + A	21.85	21.76	22.27			18.32	19.14
D	Water Weight (B-C)	1.78	1.82	2.14			0.92	1.10
E	Dry Soil Weight (C-A)	8.86	8.74	9.26			5.33	6.15
F	% Moisture (D/E)*100	20.1%	20.8%	23.1%			17.3%	17.9%
N	# OF DROPS	27	25	15			Moisture Contents determined by ASTM D 2216	
LL	LL = F * FACTOR							
Ave.	Average						17.6%	



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic	<input type="checkbox"/>
Liquid Limit	21
Plastic Limit	18
Plastic Index	3
Group Symbol	SM

Multipoint Method
One-point Method

Wet Preparation Dry Preparation Air Dried Estimate the % Retained on the #40 Sieve: 32.5%

Notes / Deviations / References:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Mal Krajan, ET
Technical Responsibility

Signature

Laboratory Manager
Position

4/2/2020
Date

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LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX



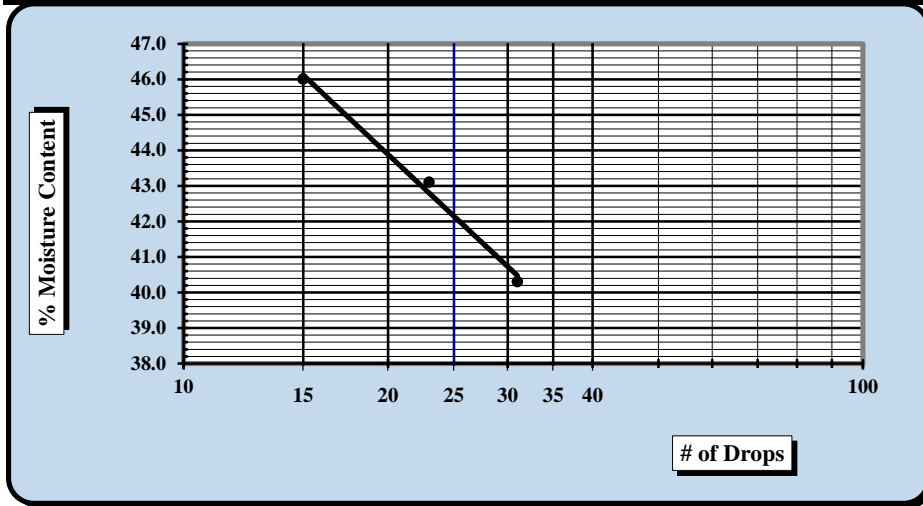
ASTM D 4318 AASHTO T 89 AASHTO T 90

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

Project #:	1305-20-023	Report Date:	4/2/2020
Project Name:	Sampson Co. 911 ES Facilities	Test Date(s)	3/25 - 4/2/20
Client Name:	Sampson County Public Works		
Client Address:	827 Southeast Blvd		
Boring #:	SB-2	Sample #:	SS-1
Location:	Site Borehole	Offset:	N/A
		Sample Date:	3/3/2020
		Depth (ft):	1-2.5

Sample Description: Tan CLAY					
Type and Specification	S&ME ID #	Cal Date:	Type and Specification	S&ME ID #	Cal Date:
Balance (0.01 g)	20977	4/5/2019	Grooving tool	1801	5/21/2019
LL Apparatus	1803	8/2/2019			
Oven	1454	11/29/2019			

Pan #	Tare #:	Liquid Limit				Plastic Limit	
A	Tare Weight	13.60	13.58	21.25		8.54	8.56
B	Wet Soil Weight + A	26.75	26.43	34.77		25.70	27.33
C	Dry Soil Weight + A	22.97	22.56	30.51		22.56	23.87
D	Water Weight (B-C)	3.78	3.87	4.26		3.14	3.46
E	Dry Soil Weight (C-A)	9.37	8.98	9.26		14.02	15.31
F	% Moisture (D/E)*100	40.3%	43.1%	46.0%		22.4%	22.6%
N	# OF DROPS	31	23	15		Moisture Contents determined by ASTM D 2216	
LL	LL = F * FACTOR						
Ave.	Average					22.5%	



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic	<input type="checkbox"/>
Liquid Limit	42
Plastic Limit	23
Plastic Index	19
Group Symbol	CL

Multipoint Method
One-point Method

Wet Preparation Dry Preparation Air Dried Estimate the % Retained on the #40 Sieve: 4.9%

Notes / Deviations / References:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Mal Krajan, ET
Technical Responsibility

Signature

Laboratory Manager
Position

4/2/2020
Date

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LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX



ASTM D 4318 AASHTO T 89 AASHTO T 90

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

Project #:	1305-20-023	Report Date:	4/2/2020
Project Name:	Sampson Co. 911 ES Facilities	Test Date(s)	3/25 - 4/2/20
Client Name:	Sampson County Public Works		
Client Address:	827 Southeast Blvd		
Boring #:	SB-6	Sample #:	SS-6
Location:	Site Borehole	Offset:	N/A
		Sample Date:	3/3/2020
		Depth (ft):	18.5-20

Sample Description: Black CLAY					
Type and Specification	S&ME ID #	Cal Date:	Type and Specification	S&ME ID #	Cal Date:
Balance (0.01 g)	20977	4/5/2019	Grooving tool	1801	5/21/2019
LL Apparatus	1803	8/2/2019			
Oven	1454	11/29/2019			

Pan #	Tare #:	Liquid Limit					Plastic Limit	
A	Tare Weight	13.02	21.16	20.89			8.04	8.46
B	Wet Soil Weight + A	23.96	31.14	31.28			14.52	16.39
C	Dry Soil Weight + A	19.24	26.68	26.61			13.09	14.65
D	Water Weight (B-C)	4.72	4.46	4.67			1.43	1.74
E	Dry Soil Weight (C-A)	6.22	5.52	5.72			5.05	6.19
F	% Moisture (D/E)*100	75.9%	80.8%	81.6%			28.3%	28.1%
N	# OF DROPS	35	25	20			Moisture Contents determined by ASTM D 2216	
LL	LL = F * FACTOR							
Ave.	Average						28.2%	



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic	<input type="checkbox"/>
Liquid Limit	80
Plastic Limit	28
Plastic Index	52
Group Symbol	CH

Multipoint Method
 One-point Method

Wet Preparation Dry Preparation Air Dried Estimate the % Retained on the #40 Sieve: 0.3%

Notes / Deviations / References:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Mal Krajan, ET
 Technical Responsibility

 Signature

Laboratory Manager
 Position

4/2/2020
 Date

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LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX



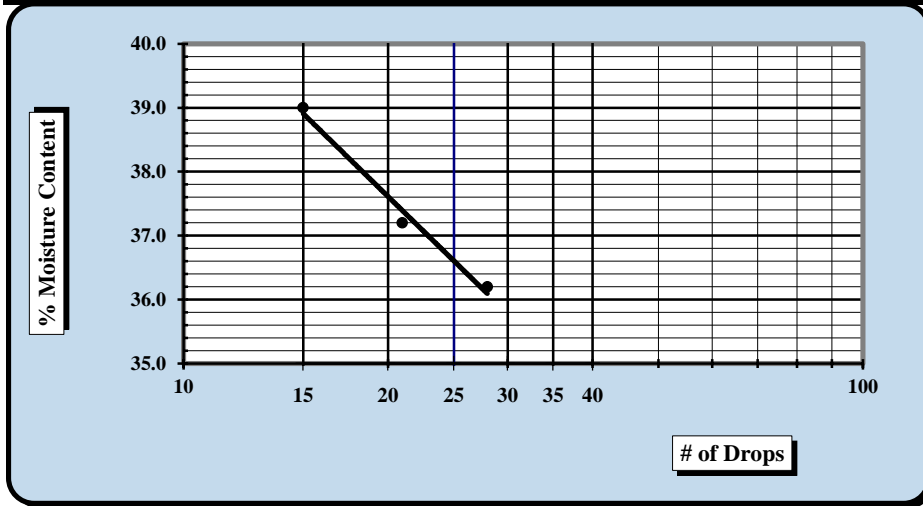
ASTM D 4318 AASHTO T 89 AASHTO T 90

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

Project #:	1305-20-023	Report Date:	4/2/2020
Project Name:	Sampson Co. 911 ES Facilities	Test Date(s)	3/25 - 4/2/20
Client Name:	Sampson County Public Works		
Client Address:	827 Southeast Blvd		
Boring #:	SB-9	Sample #:	SS-1
Location:	Site Borehole	Offset:	N/A
		Sample Date:	3/3/2020
		Depth (ft):	1-2.5

Sample Description: Tan Sandy CLAY					
Type and Specification	S&ME ID #	Cal Date:	Type and Specification	S&ME ID #	Cal Date:
Balance (0.01 g)	20977	4/5/2019	Grooving tool	1801	5/21/2019
LL Apparatus	1803	8/2/2019			
Oven	1454	11/29/2019			

Pan #	Tare #:	Liquid Limit					Plastic Limit	
A	Tare Weight	21.27	21.28	21.14			8.54	8.57
B	Wet Soil Weight + A	35.99	33.90	34.61			22.79	24.65
C	Dry Soil Weight + A	32.08	30.48	30.83			20.56	22.02
D	Water Weight (B-C)	3.91	3.42	3.78			2.23	2.63
E	Dry Soil Weight (C-A)	10.81	9.20	9.69			12.02	13.45
F	% Moisture (D/E)*100	36.2%	37.2%	39.0%			18.6%	19.6%
N	# OF DROPS	28	21	15			Moisture Contents determined by ASTM D 2216	
LL	LL = F * FACTOR							
Ave.	Average						19.1%	



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic	<input type="checkbox"/>
Liquid Limit	37
Plastic Limit	19
Plastic Index	18
Group Symbol	CL

Multipoint Method
One-point Method

Wet Preparation Dry Preparation Air Dried Estimate the % Retained on the #40 Sieve: 6.3%

Notes / Deviations / References:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Mal Krajan, ET
Technical Responsibility

Signature

Laboratory Manager
Position

4/2/2020
Date

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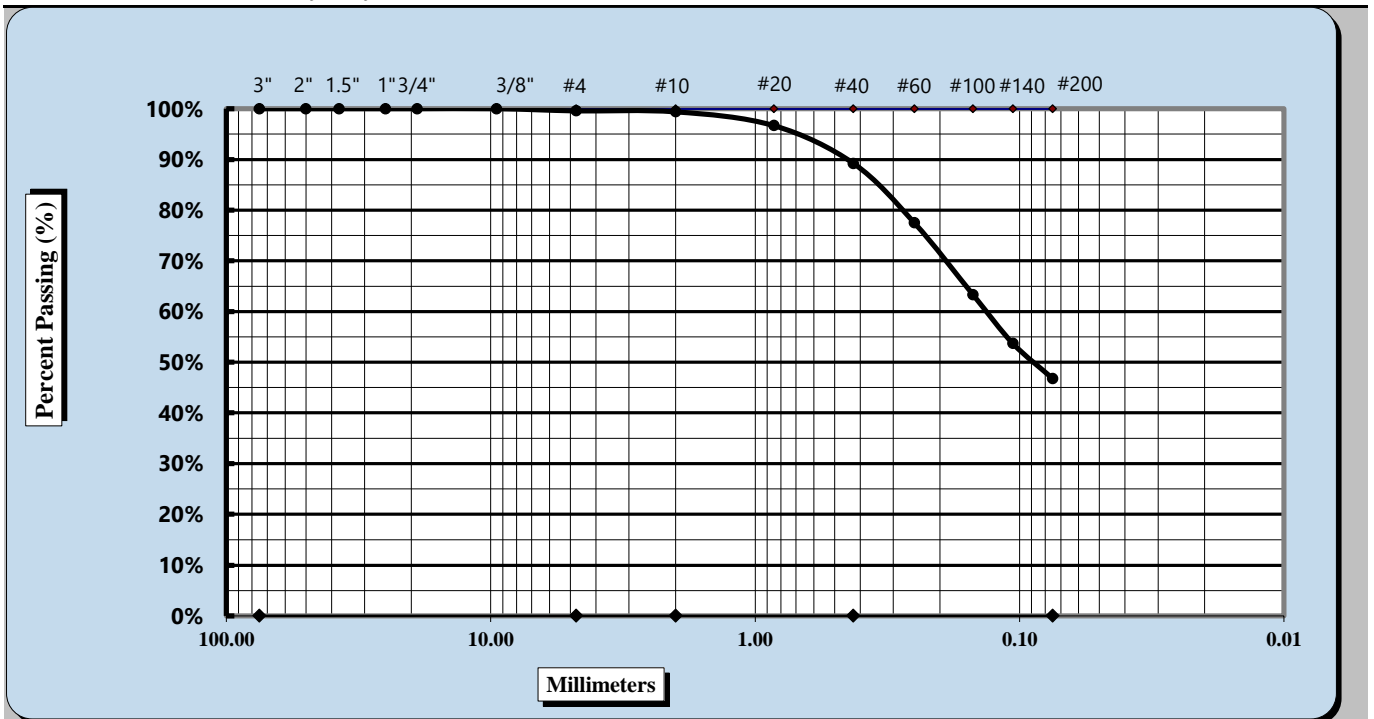
Single sieve set

ASTM D6913

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

Project #:	1305-20-023	Record Date:	4/1/2020
Project Name:	Sampson Co. 911 ES Facilities	Lab Report #:	1
Client Name:	Sampson County Public Works	Date Received:	3/2/2020
Received By:	Laboratory	Sampled by:	S&ME
Location:	Site-Borehole	Boring #:	SB-10
Log/Sample Id.	113	Sample #:	SS-1
		Elev/Depth (ft):	1-2.5

Sample Description: Gray Silty SAND



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Method:	B	Procedure for obtaining Specimen:	Moist
Maximum Particle Size	3/8"	Coarse Sand	0.2%
Gravel	0.4%	Fine Sand	42.4%
Liquid Limit	ND	Medium Sand	10.2%
Maximum Dry Density	ND	Silt & Clay	46.8%
Optimum Moisture	ND	Plastic Limit	ND
		Plastic Index	ND
		Bulk Gravity (C127)	N/A
		% Absorption	N/A
		Natural Moisture	23.3%

Notes / Deviations / References: ND=Not Determined.

Mal Krajan, ET
Technical Responsibility


Signature

Laboratory Manager
Position

4/2/2020
Date

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LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX



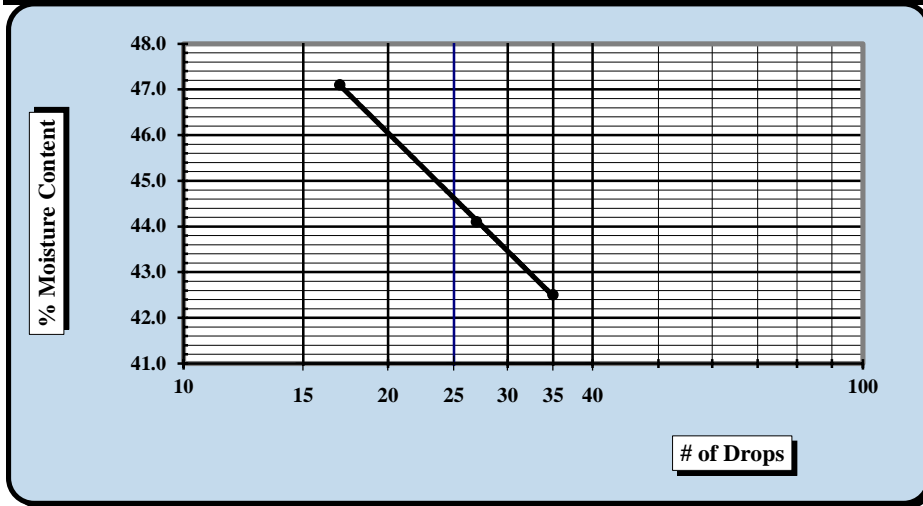
ASTM D 4318 AASHTO T 89 AASHTO T 90

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

Project #:	1305-20-023	Report Date:	4/2/2020
Project Name:	Sampson Co. 911 ES Facilities	Test Date(s)	3/25 - 4/2/20
Client Name:	Sampson County Public Works		
Client Address:	827 Southeast Blvd		
Boring #:	SB-12	Sample #:	SS-1
Location:	Site Borehole	Offset:	N/A
		Sample Date:	3/3/2020
		Depth (ft):	1-2.5

Sample Description: Tan-Yellow CLAY					
Type and Specification	S&ME ID #	Cal Date:	Type and Specification	S&ME ID #	Cal Date:
Balance (0.01 g)	20977	4/5/2019	Grooving tool	1801	5/21/2019
LL Apparatus	1803	8/2/2019			
Oven	1454	11/29/2019			

Pan #	Tare #:	Liquid Limit					Plastic Limit	
A	Tare Weight	8.54	8.73	8.59			8.64	8.62
B	Wet Soil Weight + A	20.25	22.62	21.37			21.02	20.74
C	Dry Soil Weight + A	16.76	18.37	17.28			18.56	18.29
D	Water Weight (B-C)	3.49	4.25	4.09			2.46	2.45
E	Dry Soil Weight (C-A)	8.22	9.64	8.69			9.92	9.67
F	% Moisture (D/E)*100	42.5%	44.1%	47.1%			24.8%	25.3%
N	# OF DROPS	35	27	17			Moisture Contents determined by ASTM D 2216	
LL	LL = F * FACTOR							
Ave.	Average						25.1%	



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic	<input type="checkbox"/>
Liquid Limit	45
Plastic Limit	25
Plastic Index	20
Group Symbol	CL

Multipoint Method
One-point Method

Wet Preparation Dry Preparation Air Dried Estimate the % Retained on the #40 Sieve: 4.7%

Notes / Deviations / References:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Mal Krajan, ET
Technical Responsibility

Signature

Laboratory Manager
Position

4/2/2020
Date

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LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX



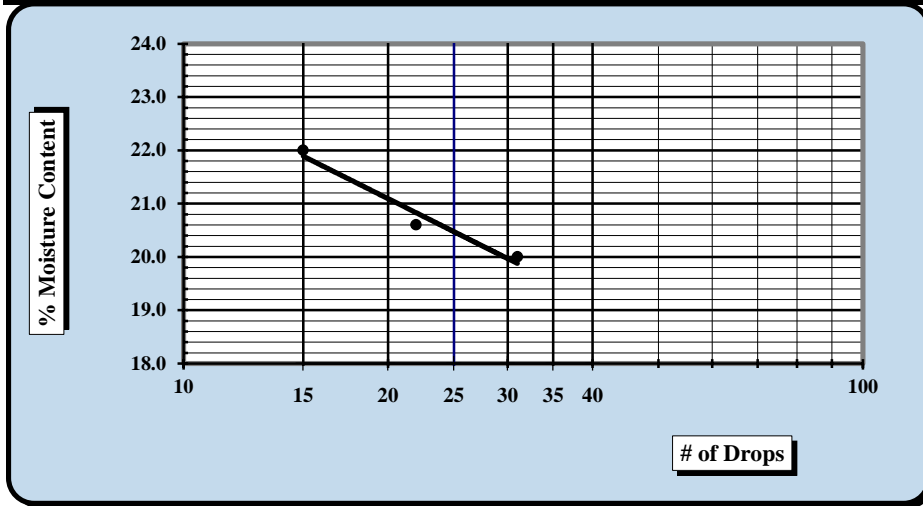
ASTM D 4318 AASHTO T 89 AASHTO T 90

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

Project #:	1305-20-023	Report Date:	4/2/2020
Project Name:	Sampson Co. 911 ES Facilities	Test Date(s)	3/25 - 4/2/20
Client Name:	Sampson County Public Works		
Client Address:	827 Southeast Blvd		
Boring #:	SB-14	Sample #:	SS-1
		Sample Date:	3/3/2020
Location:	Site Borehole	Offset:	N/A
		Depth (ft):	1-2.5

Sample Description: Tan Silty CLAY					
Type and Specification	S&ME ID #	Cal Date:	Type and Specification	S&ME ID #	Cal Date:
Balance (0.01 g)	20977	4/5/2019	Grooving tool	1801	5/21/2019
LL Apparatus	1803	8/2/2019			
Oven	1454	11/29/2019			

Pan #	Tare #:	Liquid Limit					Plastic Limit	
A	Tare Weight	8.51	8.00	8.59			8.60	8.66
B	Wet Soil Weight + A	23.60	23.03	23.04			29.69	24.45
C	Dry Soil Weight + A	21.08	20.46	20.43			26.92	22.36
D	Water Weight (B-C)	2.52	2.57	2.61			2.77	2.09
E	Dry Soil Weight (C-A)	12.57	12.46	11.84			18.32	13.70
F	% Moisture (D/E)*100	20.0%	20.6%	22.0%			15.1%	15.3%
N	# OF DROPS	31	22	15			Moisture Contents determined by ASTM D 2216	
LL	LL = F * FACTOR							
Ave.	Average						15.2%	



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic	<input type="checkbox"/>
Liquid Limit	21
Plastic Limit	15
Plastic Index	6
Group Symbol	CL-ML

Multipoint Method
One-point Method

Wet Preparation Dry Preparation Air Dried Estimate the % Retained on the #40 Sieve: 3.0%

Notes / Deviations / References:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Mal Krajan, ET
Technical Responsibility

Signature

Laboratory Manager
Position

4/2/2020
Date

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September 10, 2020

Sampson County Public Works
817 Southeast Boulevard
Clinton, North Carolina 28328

Attention: Mr. Lin Reynolds

Reference: **Report for Geophysical Services**
Sampson County 911 and Emergency Services Facility
Clinton, North Carolina
S&ME Project No. 1305-20-023 CO-3
N.C. PE Firm License No. F-0176

Dear Mr. Reynolds:

S&ME, Inc. (S&ME) has performed geophysical services at the above referenced site located in Clinton, North Carolina. These services were performed in general accordance with S&ME Change Order Request No. CO-3 dated August 28, 2020.

◆ Project Information

S&ME completed geotechnical engineering services for the planned 911 and emergency services facility and issued our report on April 30, 2020. Based on results of our soil test borings, the site was classified as a Seismic Site Class E. You have requested S&ME perform supplemental geophysical services to determine Seismic Site Class based on shear wave velocity measurements.

◆ Methodology, Field Services, and Data Processing

On September 2, 2020 we completed a seismic surface wave survey to determine the Seismic Site Class at the requested location. The Seismic Site Class is based on the average shear wave velocity (V_s) to a depth of 100 feet (V_{s100}) and analysis of surface waves (Rayleigh waves) can be used to determine shear wave velocities. Surface waves are recorded at the ground surface along a spread of low-frequency geophones. Measurements are then transformed from time domain into frequency domain from which the phase characteristics of the surface waves can be calculated. A dispersion curve (i.e. phase velocity curve) is developed allowing the phase velocity (C_f) of particular frequency waves to be calculated. The dispersion curve is then transformed into a one-dimensional (1D) shear wave velocity profile through an inversion and iterative process in which V_{s100} is calculated.

We performed a combination of Multi-Channel Analysis of Surface Waves (MASW) and Microtremor Array Measurements (MAM) surveys at the requested location as presented on Figure 2 (SW-1). Performing both surveys generally provide greater penetration depth using low frequency surface waves (MAM) without sacrificing resolution at shallower depths by using higher frequency surface waves (MASW). The MASW survey consisted of recording different frequency surface waves generated from an active energy source (sledgehammer striking a metal plate) traveling across a linear array using a Geometrics ES3000 seismograph equipped with twenty-four (24) 4.5 Hz vertical geophones at a set spacing of 5 feet. The MAM survey consisted of recording different



frequency surface waves generated from a passive energy source (e.g. background noise, vehicles, etc.) traveling across a non-linear array using a Geometrics ES3000 seismograph equipped with eleven (11) 4.5 Hz vertical geophones along an "L-shaped" array at a set spacing of 30 feet. Data processing was conducted using the Geogiga Technology Corp. Seismic Pro™ software (SURFACE PLUS module).

◆ Results

Surface wave velocity measurements were obtained to a depth of approximately 157 feet. Based on Sections 20 and Equation 20.4.1 of ASCE 7-10, the calculated weighted average V_{s100} value is 965 ft/s. Based on this result, the site is a **Seismic Site Class D**. The shear wave velocity profile is presented in the attachments.

◆ Limitations

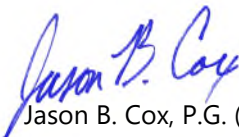
Regardless of the thoroughness of a geophysical survey, there is always a possibility that actual conditions may not match the interpretations. The results should be considered accurate only to the degree implied by the methods used and the method's limitations and data coverage. Accordingly, the possibility exists that not all features at a project site will be located due to either subsurface soil conditions or the occurrence of features outside the lateral limits and below the depth of penetration of the methods used. The geophysical methods used for this survey also has inherent limitations. Site activity (e.g. generators, heavy equipment, traffic, etc.) can cause noise/interference in the data sets. Depth restrictions are also associated with the MASW/MAM methods and the energy source. Depth of penetration using surface wave methods is mainly controlled by the shear properties of the subsurface materials and frequency range of site surface waves (generated active or ambient passive). Generally, penetration depth is greater for stiffer profiles as the signal does not attenuate as rapidly. However, because very small strain is required to determine shear properties, sometimes velocities of very stiff materials are difficult to obtain using traditional active or ambient sources.

◆ Closure


S&ME appreciates the opportunity to assist you during this phase of the project. If you should have any questions concerning this report or if we may be of further assistance, please contact us.

Sincerely,

S&ME, Inc.


Jason B. Cox, P.G. (GA)
Project Geophysicist



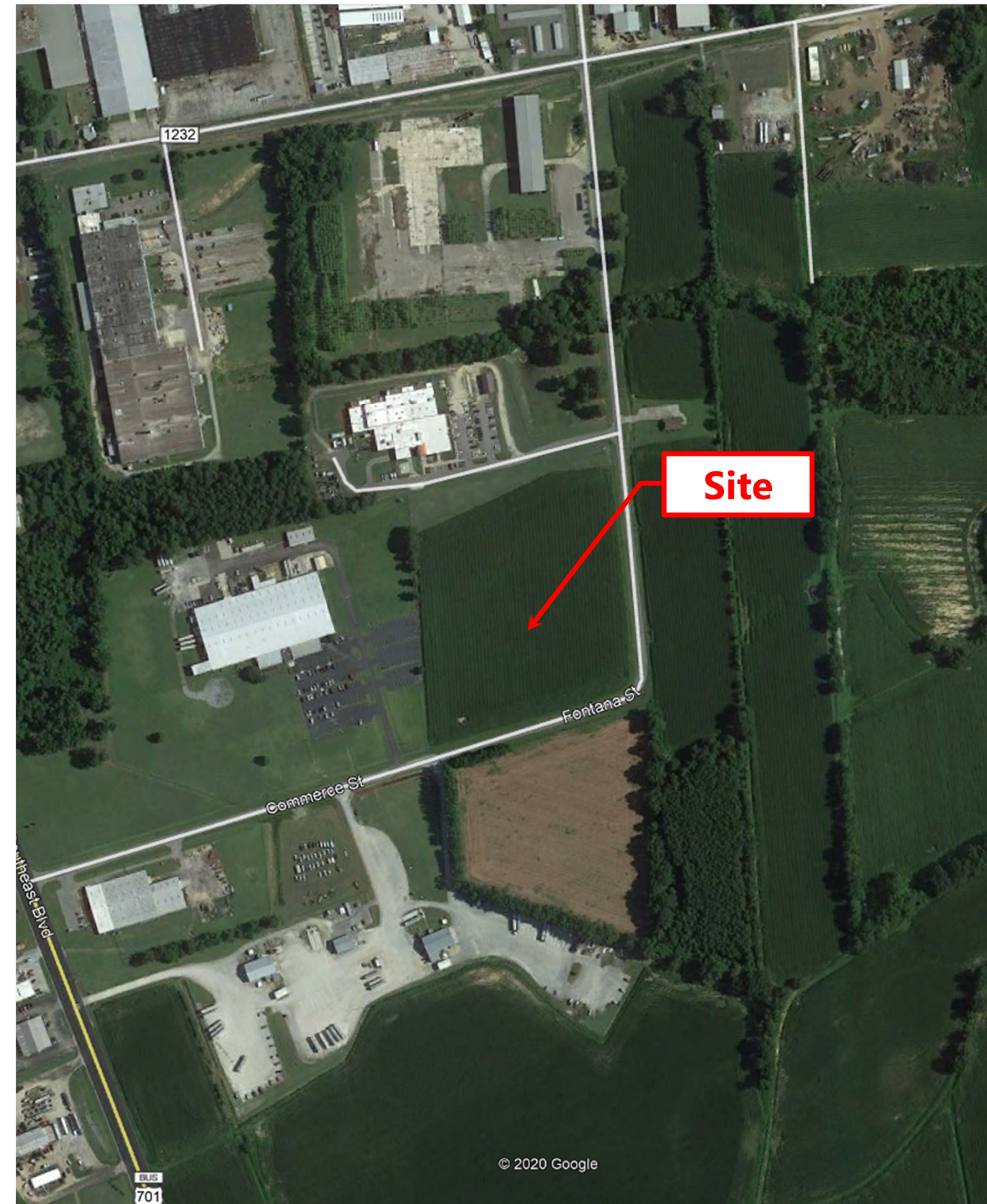

Kevin A. Nadeau, P.E.
Senior Geotechnical Engineer
N.C. Registration No. 34358

Attachments: Site Vicinity Plan Figures and Shear Wave Velocity Profile

Attachments



REFERENCE:
GOOGLE EARTH PRO AERIAL PHOTOGRAPH
(DATED JULY 9, 2018)



SITE VICINITY PLAN
SAMPSON COUNTY 911 AND EMERGENCY SERVICES FACILITY
CLINTON, NORTH CAROLINA

SCALE:
NOT TO SCALE

DATE:
9/10/2020

PROJECT NUMBER
1305-20-023 CO-3

FIGURE NO.

1



REFERENCE:
GOOGLE EARTH PRO AERIAL PHOTOGRAPH
(DATED JULY 9, 2018)



Legend



Approximate Location of MASW Survey



Approximate Location of MAM Survey



Approximate Location of Soil Boring (S&ME 2020)

GEOPHYSICAL SURVEY LOCATION PLAN

SAMPSON COUNTY 911 AND EMERGENCY SERVICES FACILITY
CLINTON, NORTH CAROLINA

SCALE:
NOT TO SCALE

DATE:
9/10/2020

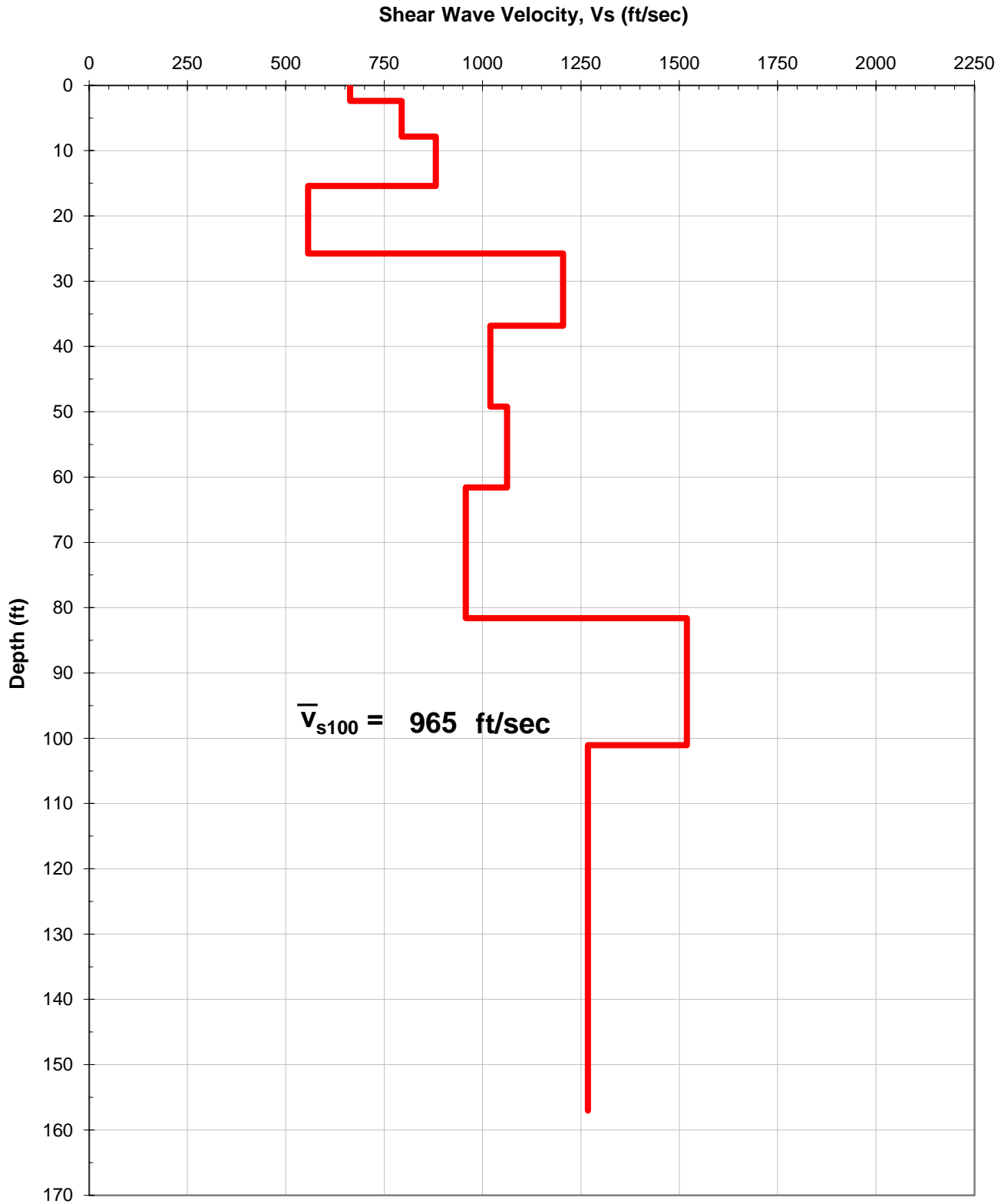
PROJECT NUMBER
1305-20-023 CO-3

FIGURE NO.

2



Shear Wave Velocity Profile SW-1
Sampson County 911 and Emergency Services Facility
Clinton, North Carolina
1305-20-023 CO-3



APPENDIX C: COMPLIANCE MATRIX

Respondents shall only type an uppercase or lowercase "X" (X or x) when identifying their compliance level. Placing an "X" in the Comply box means the Respondent complies with each and every subsection of that level. If even one subsection is not met, the Respondent must select another compliance level.		Compliance Level Met				
		Comply	Comply (w) Clarification	Exception	N/A	
		0	0	0	0	
RFP Section	Description	Compliance Level Met				Respondent's Clarifications and Comments
		Comply	Comply (w) Clarification	Exception	N/A	
1 — Project Overview						
1.1.	Project Intent					
1.2.	Project Summary					
	D.1 Furnish and Install 120-foot tower and specifically noted items					
	D.2 Provide P.E.-stamped and sealed tower foundation design					
	D.3 Obstruction Evaluation / Airport Airspace Analysis (OE/AAA)					
	D.4 Federal Communication Commission (FCC) TOWAIR					
	D.5 Provide separate costing for 150-foot self-supporting tower					
	E Motorola R56-compliant grounding					
	F Responsible for permits and inspections					
	H Project timeline					
1.3.	Pre-Proposal Conference					
1.4.	Schedule of Events					
2 — Technical Specifications						
2.1.	Site Development					
	2.1.1. Site					
	2.1.2. Site Preparation					
3 — Tower Foundation						
3.1.	Foundation Design					
3.2.	Tower Foundation					
4 — Communications Tower						
4.1.	Intent					
4.2.	Construction					
4.3.	Foundation					
4.4.	Tower Design and Loading					
4.5.	Design Calculations and Drawings					
4.6.	Wind and Ice Load Design					
4.7.	Antenna Load					
4.8.	Climbing Access					
4.9.	Cable Ladder					
4.10.	Marking and Lighting					
4.11.	Labeling and Identification					
4.12.	Final Testing and Acceptance					
4.13.	Tower Climbing and Installation Safety Practices					
4.14.	Field Quality Control					
5 — Grounding						

RFP Section	Description	Compliance Level Met				Respondent's Clarifications and Comments
		Comply	Comply (w) Clarification	Exception	N/A	
5.1.	General					
5.2.	Tower Ground Bus Bar Installation					
5.3.	Tower Lightning Protection System					
6 — Final Testing and Acceptance						
Appendix A:	Tower Site Drawings					
Appendix B:	Geotechnical Surveys & Land Surveys					
Appendix C:	Compliance Matrix					